PRELIMINARY

INSTALLATION INSTRUCTIONS

for the

IBM 1410 DATA PROCESSING SYSTEM

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CE Installation Publications
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This publication is intended to serve as a guide for installing the IBM 1410 Data Processing System. It presents mechanical data and preliminary test procedures relevant to making the equipment operational in the customer's facility.

The overall content of the manual is summarized in the Machine-Subject Reference Chart on the following page. Reading horizontally across the chart gives the coverage for a particular machine and reading vertically down the chart yields the same subject information for all the machines. Blanks in the chart indicate either the information is not applicable or that the material is located elsewhere, refer to the applicable machine reference and/or instruction manual. The last vertical column (Manual) indicates an item number which is keyed to the manual listing beneath the chart.

IBM MACHINE NO.	EXTERNAL CABLING	SYSTEM PLACEMENT	POWER TESTING	MANUAL TESTING	MARGINAL CHECKING	DIAGNOSTIC	MISC.	CABLING INFORMATION	MANUAL (SEE ITEM NO.)
729	2-14	3-23	4-2	7-1	8-3	8-6		B-37	1.
1009	2-9								2.
1011	2-9	3-22	4-3						3.
1014	2-9	B-26						B-26	4.
1301	2-17	3-24				8-6			5.
1402	2-9	3-21	4-2 4-6	6-1			B-38 *		6.
1403	2-9	3-22	4-2	6-1		8-5			7.
1405	2-5	3-24	4-3		8-3	8-6		B-30 B-33 B-36	8.
1410	2-5	3-1	4-1	5-1		8-5	B-1 **	B-17	9.
1411	2-5	3-2	4-2 4-5	5-1	8-1	8-6			
1411E	2-5	B-39 B-42						B-13	
1411Z		B-3			8-2			B-3	
1412	2-5								10.
1414 MOD I, II, III	2-14	3-23	4-2 4-6		8-1	8-6	B-38 *		
1414 MOD III, IV, V	2-9	3-19 B-20	4-2 4-6	6-1	8-1	8-6		B-20	
1415	2-5	3-17		5-2					
1419	2-5								
7223	B-18	B-18						B-18	11.
7330	2-14	3-23	4-3	7-2	8-2	8-6		B-37	12.
7631	2-17	B-28				8-6		B-28	13.
7750	B-17							B-17	14.

* CONTINUITY CHECKS. ** SUPPLEMENTAL INFORMATION

	MANUALS		FORM NO.	
1.	IBM 729 CE REF MANUAL		223-6868	
	IBM 729 CE INSTR MANUAL		223-6845	
2.	IBM 1009 CE REF MANUAL		225-6561	
	IBM 1009 CE INSTR MANUAL		R25-1532	
3.	IBM 1011 CE REF MANUAL		227-5545	
	IBM 1011 CE INSTR MANUAL		227-5546	
4.	IBM 1014 CE INSTR MANUAL		225-8163	
5.	IBM 1301 CE INSTR MANUAL	IBM 1301 CE REF MANUAL	227-5582	R27-5581
6.	IBM 1402 CE INSTR-REF MANUAL		231-0002	
7.	IBM 1403 CE INSTR MANUAL		225-6492	
	IBM 1403 CE REF MANUAL		225-6493	
8.	IBM 1405 CE REF MANUAL		227-5541	
9.	IBM 1410 CE INSTR MANUAL		225-6549	
	IBM 1410 CE REF MANUAL		225-6551	
10.	IBM 1412 CE INSTR MANUAL		R25-1498	
11.	IBM 7223 CE INSTR-REF MANUAL		223-6892	
12.	IBM 7330 CE REF MANUAL		223-6967	
	IBM 7330 CE INSTR MANUAL		R25-1542	
13.	IBM 7631 CE INSTR-REF MANUAL		R23-2541	
14.	IBM 7750 PRELIMINARY INSTALLATION INSTRUCTIONS		NO FORM NUMBER	

All Customer Engineers are thoroughly indoctrinated in IBM Safety practices during the early phases of their training. It is expected that this training has become a part of routine practice. However, personnel safety cannot be over-emphasized. Follow the safety practices outlined in the C. E. Safety Practices card, IBM Form 124-0002-1, issued to all Customer Engineers.

Specific safety items for this system are:

A. Make sure that CO_2 fire extinguishers are available in each room where frames of the system are set up.

B. Check the wiring on the AC plug. Make sure the customer's receptacle is correctly polarized and that the correct voltage and frequency is being supplied.

C. Replace safety covers before going on to another operation. Hazardous voltages are present in this equipment; forgetfulness could be fatal.

D. Discharge capacitors before working on DC power supplies.

E. Turn DC power off when removing or inserting an SMS card. You may cause component damage by shorting to an adjacent card.

F. Open flip-covers all the way before pulling down swinging gates to prevent skinned knuckles.

G. Watch your head. When working on a B module, don't forget that an over-hanging A module gate may be in your way when you arise.

H. Always turn off power before replacing any fuse.

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1. GENERAL CONTENTS OF MANUAL

This manual has been prepared to provide the necessary instructions for installing a maximum IBM 1410 system configuration, rather than a special set of instructions for each system configuration which may be installed. It will therefore be the installer's responsibility to become familiar with the machine types and quantities which will be provided for a particular installation. By becoming familiar with the system configuration, the CE can take exception to information provided in this manual which is not applicable to his installation.

The CE should also be aware of special features ordered for the system to be installed as information on items such as this may require special attention that has not been specifically covered in the manual.

The main objective of the manual is to provide the necessary instructions to enable efficient and safe installation of the equipment. To accomplish this objective, however, it is necessary for the CE to read the manual very carefully before any supplies or equipment is received, so that full understanding of the information and the sequence of the installation process is achieved.

Preliminary operations consist of:

A.) Setting up the customer engineering room

B.) Planning placement of individual units

C.) Checking power facilities

D.) Supervising the placement of sub-floor cables

Upon system's arrival at the site, the customer engineer advises the movers on the placement of machines so that they can be unpacked, checked, and repaired if necessary.

Frames are moved to final positions, leveled and cabled with external and internal cables and interframe jumper cables.

Voltages are checked and final adjustments made where necessary.

The entire system is tested and when the tests are satisfactorily completed, the 1410 is ready for customer use.

CAUTION: Do not use any units as work benches during installation, because damage can result to the top surfaces. This applies particularly to the IBM 1415 Console.

1. TOOLS AND TEST EQUIPMENT

The tools and test equipment recommended to expedite the installation of the 1410 system are:

1. five-foot step ladder
2. 10-inch adjustable wrench
3. box wrench (2)
   a. 7/16 x 1/2 (for adjusting doors)
   b. 9/16 x 5/8 (for connecting frames)
4. Weston DC Voltmeter
5. Tektronix* Model 535 oscilloscope (in addition to the system-assigned Tektronix Model 310).
6. Carpenters level

* Trademark of Tektronix, Inc.

2. MACHINE ROOM PREPARATION

2.1 Preliminary

Complete the machine room prior to system arrival in accordance with the Physical Planning Manual. The following specific items should be checked and/or performed:

A. Check that proper subfloor with cutouts is installed. Where a subflooring is not specified, provide sufficient ramps to protect the cables located above floor.

B. In the event that external cables are not routed in a raised floor cables will be routed in step cover area and exit through opening provided in special end covers at each end of the front base section on units 1411 and 1414.

CAUTION

1. DO NOT cut covers.

2. DO NOT use cable strain reliefs.

When a raised floor is not used the cables must be protected to prevent damage to the cables in a manner which will not present a safety hazard to operating personnel.

C. Test wall circuit breakers mechanically to see that they are operating properly.

D. Check the receptacle case and building ground to insure proper grounding.

E. All three phase ac power receptacles must be checked for proper phase rotation. If possible perform this check before the system arrives. (See Phase Rotation.)

2.1 Preliminary (Continued)

F. Check that the correct voltage is supplied for all outlets. (Can be either 208V or 230V.)

G. Mark the floor with masking tape to show the location of each frame or unit.

H. IBM 1405-Floor Location/Address (Floor Marking)

2.2 IBM 1405-Floor Location/Address (Floor Marking)

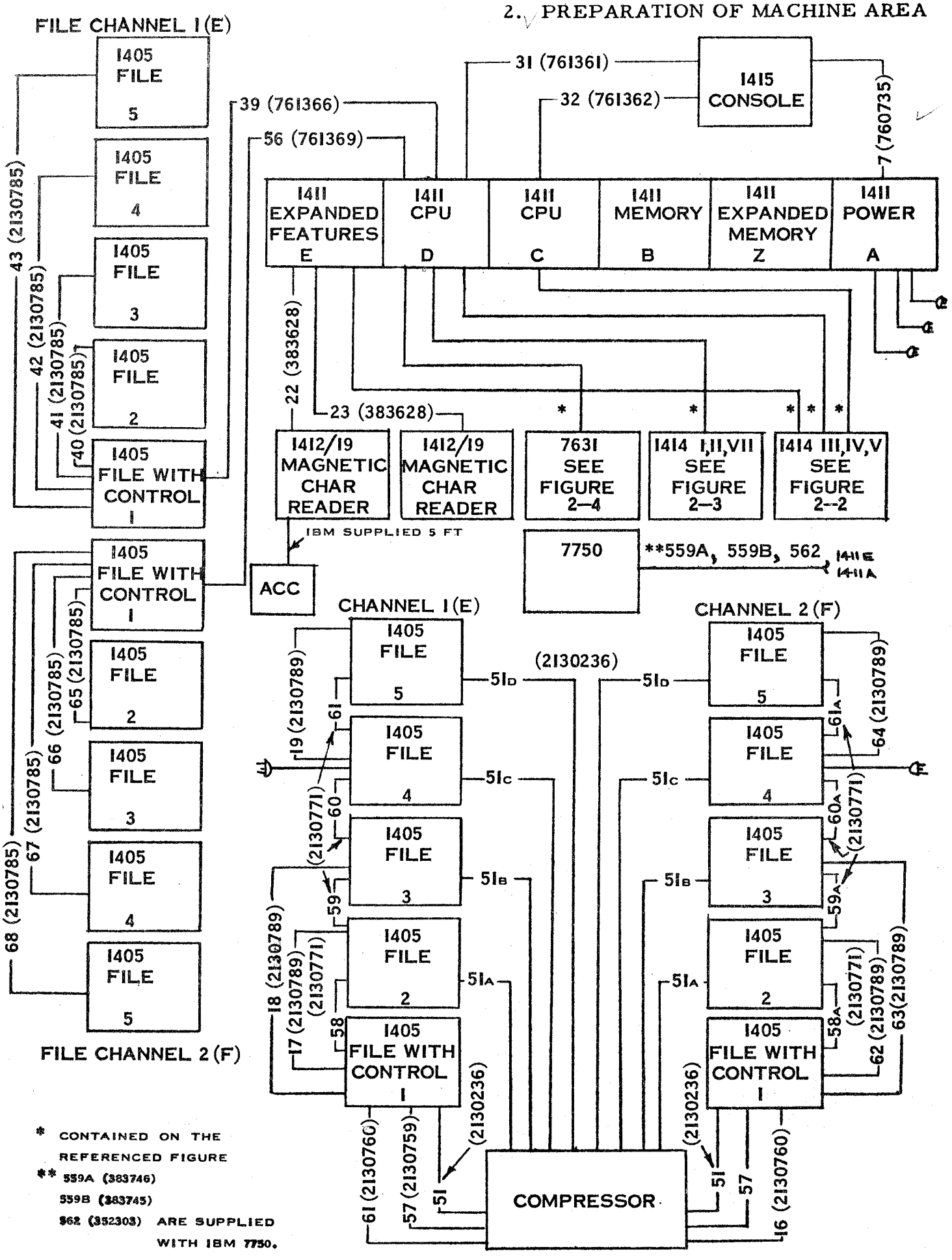
Addresses are assigned and written on the 1405 disks before shipment. The units are then tagged to indicate the address assignment. The address assignments are module Ø, 1, 2, 3 and 4 for each channel group. The 1405 File Control Unit is always assigned address Ø (zero). The File Control Unit must be located in accordance with the customer floor plan. Determine from the customer which physical location he plans to assign to the various addresses (module 1, 2, 3 and 4). Mark the floor plan and the floor to reflect this assignment. When the disks arrive it will then be possible to position them on the floor without delay. If early assignment is made it will also be possible to tag the signal cables which interconnect the File Control Unit and the secondary files. The plug locations in the Control Unit are dependent upon the file address.

3. EXTERNAL CABLE PLACEMENT

The external cable routing data includes information for connecting the cables. This information will be referred to during the various stages of mechanical assembly. All external cables are shipped first and are laid prior to system arrival. Placement of the external cables can be determined by the use of the following External Cable Routing Diagrams and their associated tables:

Figure 2-1	IBM 1410 SYSTEM
Figure 2-2	IBM 1414, MOD III, IV, and V
Figure 2-3	IBM 1414, MOD I, II, and VII
Figure 2-4	IBM 7631

To insure proper identification, each end of the cable is labeled with a part number and a key number. A red label identifies the "from" end of a cable, and a white label identifies the "to" end of a cable.



* CONTAINED ON THE REFERENCED FIGURE

** 559A (383746)
559B (383745)
562 (352303) ARE SUPPLIED WITH IBM 7750.

FIGURE 2-1 EXTERNAL CABLE ROUTING DIAGRAM, 1410 SYSTEM

Part No.	Key No.	Name	Red Tag (From)	White Tag (To)	System Components
760735	7	1411A to 1415 (Console)	1411A-CC1	1415-CC	Basic
2130760	16	1405 (Control) to Compressor	1405 (Control)	Compressor	1405
2130789	17	1405 (Control) to 2nd 1405	↓	2nd 1405	↓
↓	18	1405 (Control) to 3rd 1405	↓	3rd 1405	↓
	19	4th 1405 to 5th 1405	4th 1405	5th 1405	↓
383628	22	1411E to 1st 1412/1419	1411E	1st 1412	1412/1419
↓	23	1411E to 2nd 1412/1419	↓	2nd 1412	↓
761361	31	1411D, C to 1415 (Console)	1411D7-L1, 19, 21, 23, 30, 32, 51, 52; 1411C7-L1, 3, 4, 5, 18, 20, 41, 43, 45, 47, 49, 51	1415-A-1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31	Basic
761362	32	1411C to 1415 (Console)	1411C7-L22, 23, 24	1415-B-1, 3	Basic
761366	39	1411D, C to 1405 (Control-1)	1411D7-L8, 9, 10, 34; C7-L10, 11, 12, 13	1405-XA-XB-YA(SC-1)	1405
2130785	40	1st 1405 to 2nd 1405	1405-01A1 YH, -01A1 XH	1405-01B1 YE, -01B1 YF	
↓	41	↓ 3rd ↓	↓ YG ↓ XG	↓	↓

TABLE 2-1A EXTERNAL CABLE ROUTING DATA, 1410 SYSTEM

Part No.	Key No.	Name	Red Tag (From)	White Tag (To)	System Components
2130785	42	1st 1405 to 4th 1405	1405-01A1 YF, -01A1 XF	1405-01B1 YE, -01B1 YF	1405
↓	43	↓ 5th ↓	↓ YB ↓ YC	↓	↓
2130236	51	Compressor to 1st 1405	Compressor	1405	Air Hose
↓	51a	↓ 2nd ↓	↓	↓	↓
	51b	3rd			
	51c	4th			
↓	51d	↓ 5th ↓	↓	↓	↓
761369	56	1411D to 1405 (Control-2)	1411D7-L44, 45, 46, 47, 48, 49, 50	1405-XA, -XB, -YA, (SC-1)	1405
2130759	57	1405 (Control) to Compressor	1405 (Control)	Compressor	↓
2130771	58	1405 (Control) to 2nd 1405	(Channel E)	2nd 1405	
↓	58a	↓ to 2nd	↓ (Channel F)	2nd ↓	
	59	2nd 1405 to 3rd	2nd 1405 (Channel E)	3rd	
↓	59a	2nd ↓ to 3rd ↓	2nd ↓ (Channel F)	3rd ↓	↓

TABLE 2-1B EXTERNAL CABLE ROUTING DATA, 1410 SYSTEM

Part No.	Key No.	Name	Red Tag (From)	White Tag (To)	System Components
2130771	60	3rd 1405 to 4th 1405	3rd 1405 (Channel E)	4th 1405	1405
	60a	3rd to 4th	3rd (Channel F)	4th	
	61	4th to 5th	4th (Channel E	5th	
	61a	4th to 5th	4th (Channel F)	5th	
2130789	62	1405 (Control) to 2nd 1405	1405 (Control) (Channel F)	2nd 1405	1405
	63	to 3rd		3rd	
	64	4th 1405 to 5th	4th 1405	5th	
2130785	65	1st 1405 to 2nd 1405	1405 (Channel F)	1405	1405
	66	to 3rd			
	67	to 4th			
	68	to 5th			

TABLE 2-1C EXTERNAL CABLE ROUTING DATA, 1410 SYSTEM

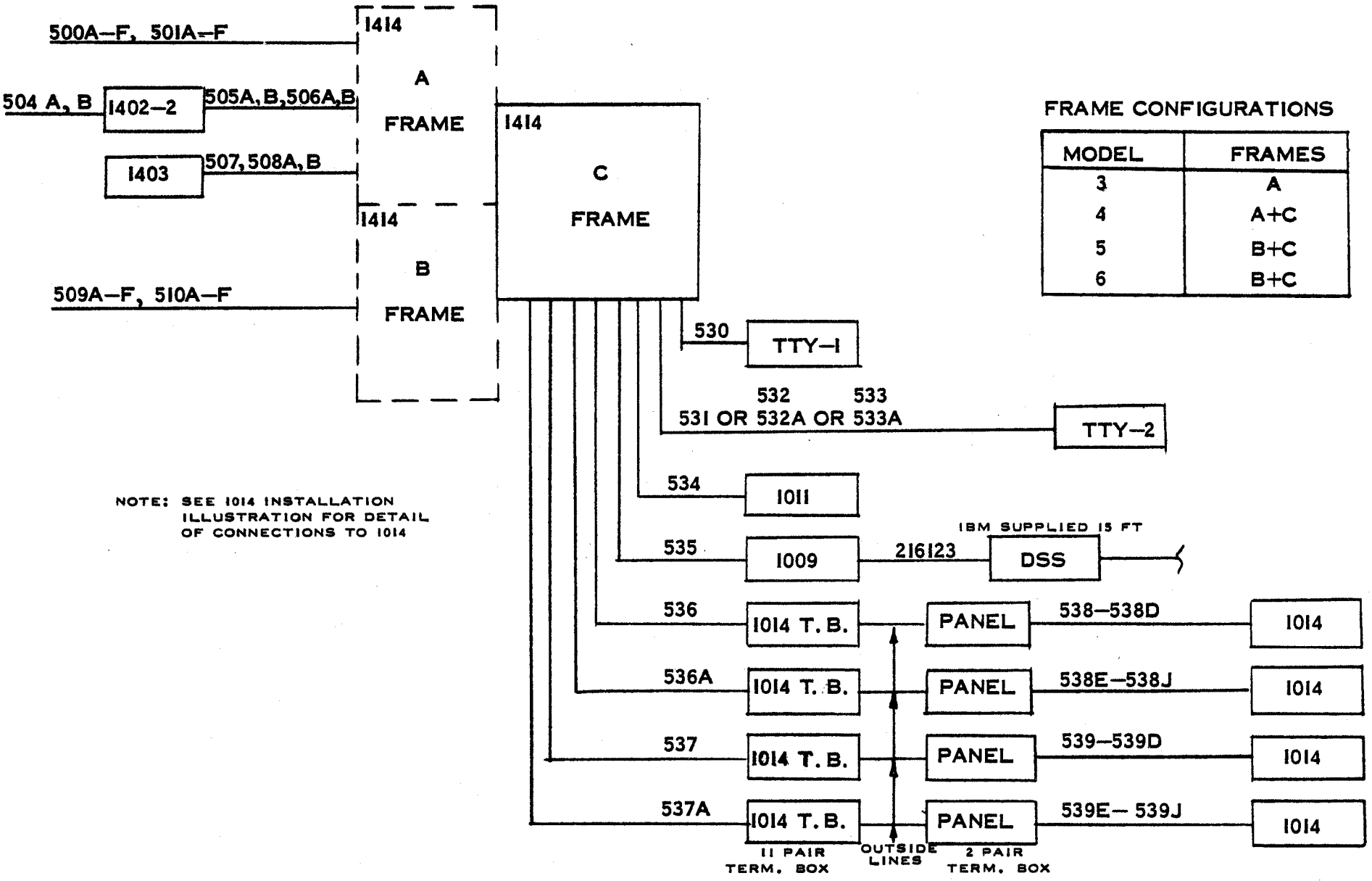


FIGURE 2-2 EXTERNAL CABLE ROUTING DIAGRAM, 1414 MOD III, IV, V

Part No.	Key No.		Name	Red Tag (From)	White Tag (To)
761363	500A	27	1414A to 1411C Ch E, Mod III, IV	1414A7-L33, L34	1411C7-L7, L8
761364	500B	28	1411D	1414A7-U33, U34	1411D7-L5, L4
761365	500C	70	1411D	1414A7-L32	1411D7-L24
760368	500D	69	1411C	1414A7-U30	1411C7-L26
761365	500E	29	1411D	1414A7-L25	1411D7-L17
761370	500F	30	1411D	1414A7-L30, L31	1411D7-L6, L7
761363	501A		1411A to 1411E Ch F, Mod III, IV	1414A7-L33, L34	1411E-F7-U21, U20
761364	501B			1414A7-U33, U34	1411E-F7-L26, L25
761365	501C			1414A7-L32	1411E-F7-L22
760368	501D			1414A7-U30	1411E-F7-U23
761365	501E			1414A7-L25	1411E-F7-L23
761370	501F			1414A7-L30, L31	1411E-F7-U25, U24
760736	504A	10	1402 to 1411A Ch E, Mod III, IV	1402-2-CC2	1411A-CC2
↓	504B		Ch F,	↓	1411A-CC4
760737	505A	12	1414A to 1402 Mod III, IV	1414A7-CC6	1402-2-CC6
760741	505B	13	1414A to 1402 Mod III, IV	1414A-TBA3-4	1402-2-DC2 & 4

TABLE 2-2A EXTERNAL CABLE ROUTING DATA, 1414 MOD III, IV, V

Part No.	Key No.		Name	Red Tag (From)	White Tag (To)
760672	506A	44	1414A to 1402 Mod III, IV	1414A7-L36, 37, 39, 40, 42 43; U36, 37, 39, 40, 42, 43	1402-2-PC
760671	506B	45	1414A to 1402 Signal Mod III, IV	1414A7-L45, 46, 48, 49, 50, 51, 52;U45, 46, 48, 49, 51, 52	1402-2-RC
760754	507	11	1414A to 1403 Power Mod III, IV	1414A-TBA2	1403-Burndy Conn
760674	508A	47	1414A to 1403 Signal Mod III, IV	1414A7-L18, 19, 21, 22, 24; U18, 19, 21, 22, 24, 25	1403-SC-2
760673	508B	46	1414A to 1403 Signal Mod III, IV	1414A7-L9, 10, 12, 13, 15; U9, 10, 12, 13, 15, 16	1403-SC-1
761363	509A		1414B to 1411C Ch E Mod V	1414B7-L33, L34	1411C7-L7, L8
761364	509B		1411D	1414B7-U33, U34	1411D7-L4, L5
761365	509C		1411D	1414B7-L32	1411D7-L24
760368	509D		1411C	1414B7-U30	1411C7-L26
761370	509E		1411D	1414B7-L30, L31	1411D7-L6, L7
763337	509F		1411A	1414B7-CC6	1411A-CC2
761363	510A		1411E Ch F Mod V	1414B7-L33, L34	1411E-F7-U20, U21
761364	510B			1414B7-U33, U34	1411E-F7-L25, L26

TABLE 2-2B EXTERNAL CABLE ROUTING DATA, 1414 MOD III, IV, V

Part No.	Key No.		Name	Red Tag (From)	White Tag (To)
761365	510C		1414B to 1411E Ch F Mod V	1414B7-L32	1411E-F7-L22
760368	510D			1414B7-U30	1411E-F7-U23
761370	510E			1414B7-L30, L31	1411E-F7-U24, U25
763337	510F		1411A	1414B7-CC6	1411A-CC4
762735	530	49	1414C to TTY	1414C7-A1, B1	TTY-1 Send/Rec
↓	531	50		1414C7-A2, B2	TTY-2 Send/Rec
762733	532	75	1414C to TTY	1414C7-A2	TTY-2 1st Send
↓	532A	75A		1414C7-B2	TTY-2 2nd Send
762732	533	76	1414C to TTY	1414C7-A2	TTY-2 1st Rec
↓	533A	76A		1414C7-B2	TTY-2 2nd Rec
760683	534	48	1414C to Paper Tape Reader	1414C7-L1, 3	1011
763345	535	77	1414C to 1009	1414C7-L12, 14, 17, 18, 20	1009
761289	536	20	1414C to Term Box (22 Pos)	1414C7-L30, 31	Term Box (22 Pos) 1014
↓	536A	20A	↓	1414C7-L33, 34	↓

TABLE 2-2C EXTERNAL CABLE ROUTING DATA, 1414 MOD III, IV, V

Part No.	Key No.		Name	Red Tag (From)	White Tag (To)
761289	537	21	1414C to Term Box (22 Pos)	1414C7-L36, L37	Term Box (22 Pos) 1014
↓	537A	21A	↓	1414C7-L39,40	↓
761290	538	*	Term Box (4 Pos) to 1014	Term Box (4 Pos) 1014	1014 Station
↓	539	**	↓	↓	↓

* 78-78D
** 79-79D

TABLE 2-2D EXTERNAL CABLE ROUTING DATA, 1414 MOD III, IV, V

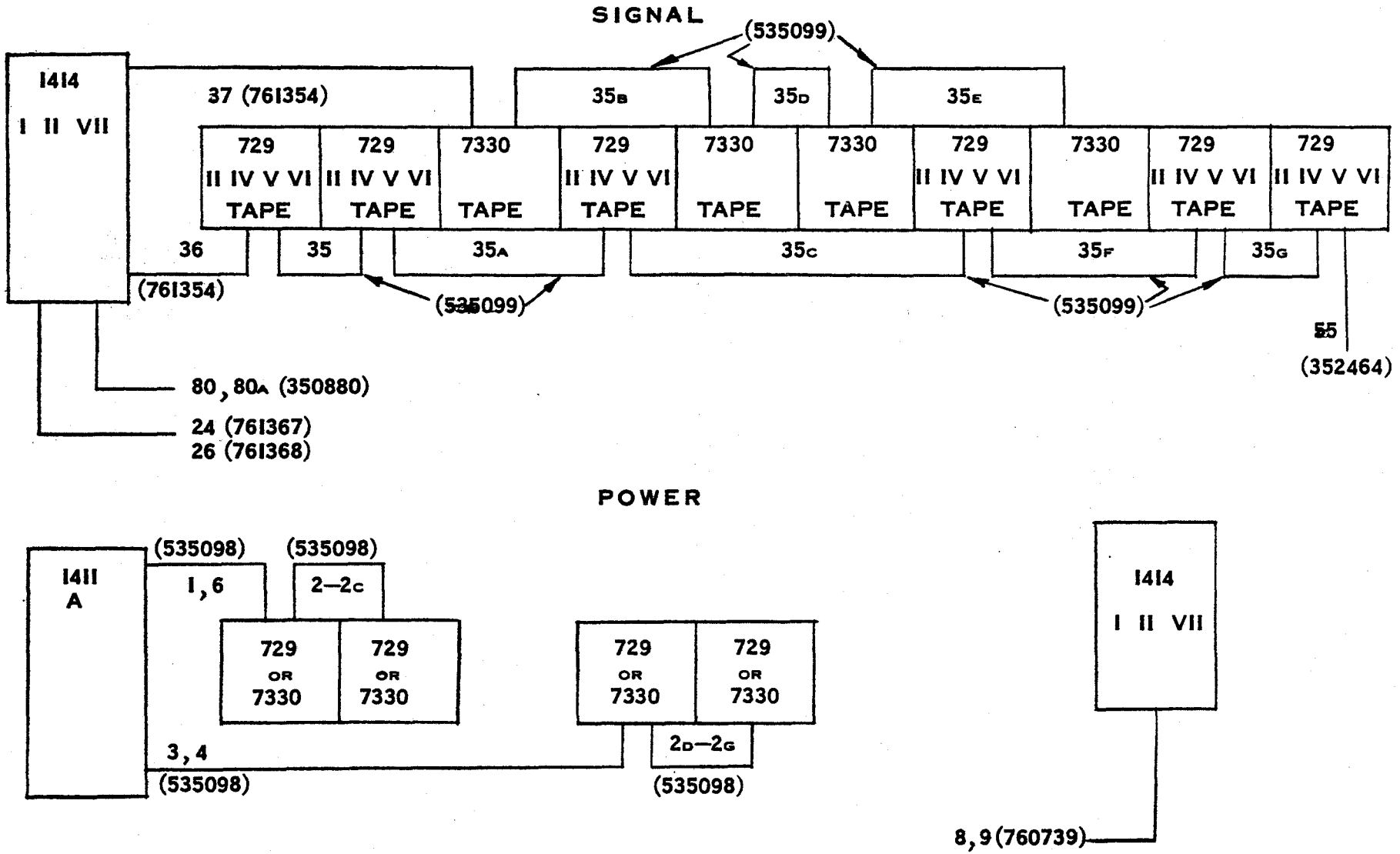


FIGURE 2-3 EXTERNAL CABLE ROUTING DIAGRAM, 1414 MOD I, II, VII

Part No.	Key No.	Name	Red Tag (From)	White Tag (To)	Channel
535098	1	1411A to 729/7330	1411A-BC1	729/7330	1
	2	729/7330 to 729/7330	729/7330	729/7330	-
	2a				-
	2b				-
	2c				-
	2d				-
	2e				-
	2f				-
	2g				-
535098	3	1411A to 729/7330	1411A-BC2	729/7330	1
	4		1411A-BC3		2
	6		1411A-BC4		2
760739	8	1411A to 1414D	1411A-CC3	1414D	1
	9		1411A-CC5		2
761367	24	1411C7, D7 to 1414D	1411C7-L14—L16, D7-L12—L17	1414D7-L12—L18	2

TABLE 2-3A EXTERNAL CABLE ROUTING DATA 1414 MOD I, II, VII

Part No.	Key No.	Name	Red Tag (From)	White Tag (To)	Channel
761368	26	1411D7 to 1414D	1411D7-L37—L42	1414D7-L12—L18	12
535099	35	729/7330 to 729/7330	729/7330	729/7330	-
	35a				-
	35b				-
	35c				-
	35d				-
	35e				-
	35f				-
	35g				-
761354	36	1414D to 729	1414D-L01—L04, U01—U04	729	1/2
761354	37	1414D to 7330	1414D-L07—L10, U07—U10	7330	1/2
352464	55	-	729	Other control or systems	-
350880	80	1411D to 1414D	1411D7-L16	1414D7-L11	1
	80a		1411D7-L36		2

TABLE 2-3B EXTERNAL CABLE ROUTING DATA 1414 MOD I, II, VII

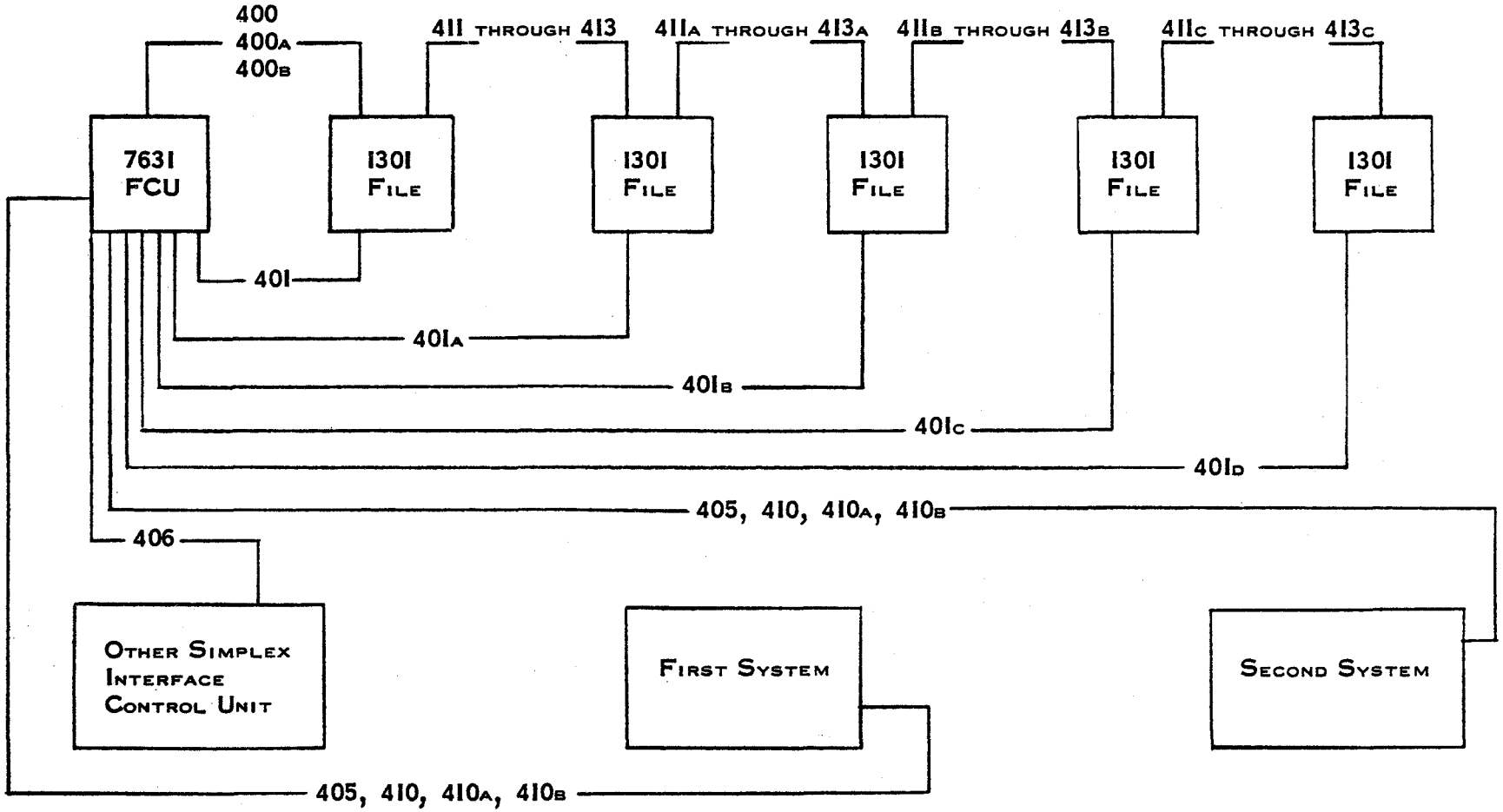


FIGURE 2-4 EXTERNAL CABLE ROUTING DIAGRAM, IBM 7631

Part No.	Key No.	Name	Red Tag (From)	White Tag (To)
553379	400	7631 to 1301 (Signal)	7631 U01	1301 05D
	400A		L01	09D
	400B		L03	07D
587387	401	7631 to 1st 1301 (Signal)	7631 U03	1301 11D
	401A	2nd	L05	
	401B	3rd	U05	
	401C	4th	L07	
	401D	5th	U07	
352303	405	7631 to 1411A (Power)		
352303	406	7631 to Simplex Interface Control Units Emergency Off		
553343	410	7631 to 1411D (Signal)	*	*
	410A			
	410B			

* REFER TO 7631 CABLE CONNECTOR CHART AND 1410 CABLE CONNECTOR CHART. SEE PAGE B-29.

TABLE 2-4A EXTERNAL CABLE, ROUTING DATA, IBM 7631

Part No.	Key No.	Name	Red Tag (From)	White Tag (To)
553379	411	1301 to 1301 (Signal)	1301 05A	1301 05D
	411A			
	411B			
	411C			
553379	412	1301 to 1301 (Signal)	1301 09A	1301 09D
	412A			
	412B			
	412C			
553379	413	1301 to 1301 (Signal)	1301 07A	1301 07D
	413A			
	413B			
	413C			

TABLE 2-4B EXTERNAL CABLE ROUTING DATA, IBM 7631

1. SYSTEM ARRIVAL AND UNLOADING

The movers bring the units into the machine room and position them as prescribed by the customer engineer. Whenever possible, the movers should do all of the necessary moving and uncrating.

Use caution in moving the units, to prevent casters striking cables protruding from the sub-floor and to avoid rolling into floor openings. Check each unit for shipping damage when it is being unloaded.

Make all machine movements on plywood or tempered masonite, supplied by the movers, so that no floor damage will result.

2. IBM 1411 CPU

2.1 Inspection and Assembly

A. Place the 1411 A and B frames in their assigned positions. Place frames C and D approximately two feet to the rear of their assigned positions. Each frame is assigned a frame number located on the lower cross member directly behind the caster. Check the DC power distribution cables to make sure they can be easily reached after frames are bolted together. (The DC power distribution cables are those that are placed across the top of the 1411 frames).

B. Install the four leveling pads in each frame. Level the 1411 A, adjusting the leveling pads so that the pads rather than the casters are supporting the frame.

C. With the 1411 B in position, adjust the leveling pads until frame B is level and in line with frame A. Bolt the two frames together with the six bolts provided. Of the 10 holes available, use only the center holes and the extreme upper and lower holes on each side. Remove inner doors from frames C and D. Straighten the ribbon cables attached to frame B.

D. Move frame C into position and level. Use caution when moving frame C into position to avoid damage to any of the ribbon cables, and to be sure that all ribbon cables pass into the adjacent frame. Bolt frame C to frame B. Straighten the ribbon cables attached to frame C.

E. Move frame D into position. Exercise the same caution as with frame C. Level frame D and bolt to frame C. Replace inner doors.

2.2 IBM 1411 CPU - Internal Cable Connection

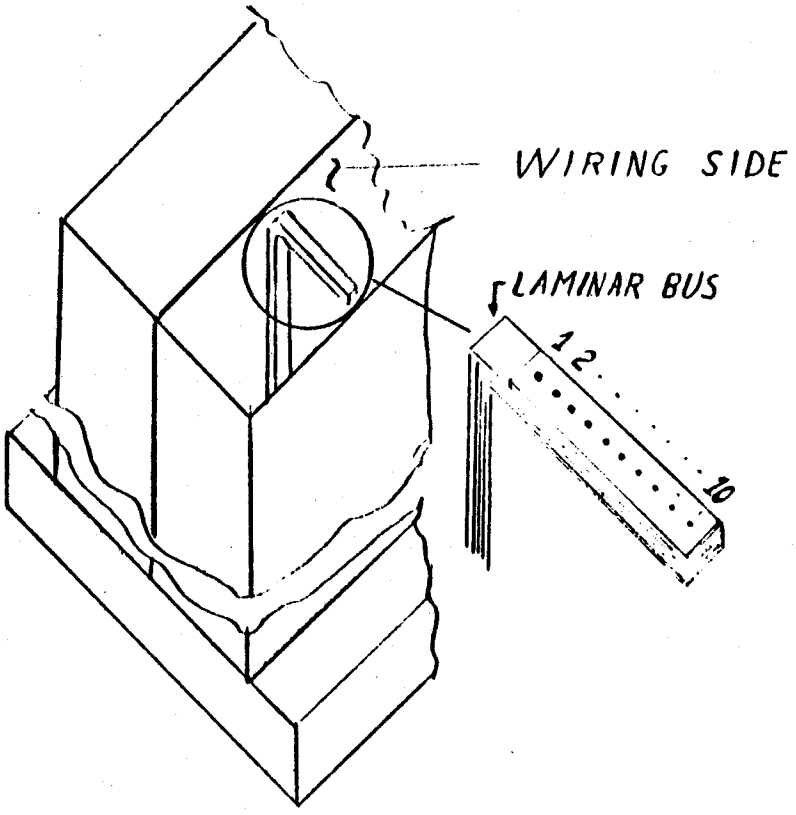
Internal Cables should be connected as follows:

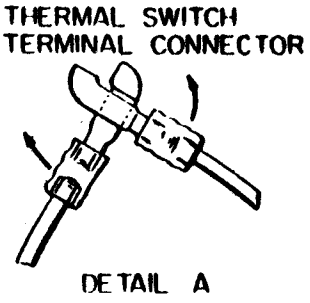
A. The three DC distribution cables and a thermal sense cable are attached to and stored in the top of the 1411A frame.

B. Remove the top covers from the four 1411 frames and place the cables across the top of the frames.

C. The shortest cable connects to 1411B frame; the next longer cable connects to the 1411C frame, and the longest cable connects to the 1411D frame (Figure 3-1).

D. The thermal sense cable, Part No. 760108 extends across all frames. (Cable identification is shown in Figure 3-2). The first tie-off in the thermal sense cable goes to the 2-position terminal block located on the resistor chassis above core storage in frame 11B. From the card side of the machine, the wire goes to the terminal on the left. The second tie-off from the thermal sense cable is a smaller cable that is attached to TB 11 located at the bottom rear of the core array. The first two wires in the tie-off go to terminal 1: the next four wires go to terminals 2, 3, 4, and 5. The next two wires go to terminal 7: the remaining three wires go to terminals 8, 9, and 10. Connect the thermal sense connectors to the thermal switch leads for chassis 11B3. The next tie-off in the thermal sense cable contains three wires. The short red wire goes to the frame 1411 laminar bar, terminal 5. The black wire goes to terminal 6, and the longer red wire goes to terminal 7.





FRAME 1411 B

CABLE NO.		WIRE NO.
760106 TB No	350847 TB No	
3	1	1
4	2	S-1
8	8	2
4	4	S-2
1	3	3
2	4	S-3

FRAME 1411 C

CABLE NO 760102		WIRE NO.
COLOR WIRE	TERM POS	
RED	1	1
GND	2	
WHITE	3	2
GND	4	
BLUE	3	3
GND	4	
VIOLET	7	4
GND	8	
BROWN	7	5
GND	8	

FRAME 1411 D

CABLE NO 760103		WIRE NO.
COLOR WIRE	TERM POS	
RED	1	1
GND	2	
WHITE	3	2
GND	4	
BLUE	3	3
GND	4	
VIOLET	7	4
GND	8	
BROWN	7	5
GND	8	

NOTE:

Old cables will be shipped until present stock is exhausted.	
Old Cable No.	New Cable No.
760106	350847
760102	350848
760103	350849

FIGURE 3-1 LAMINAR BUS AND THERMAL SWITCH CONNECTIONS

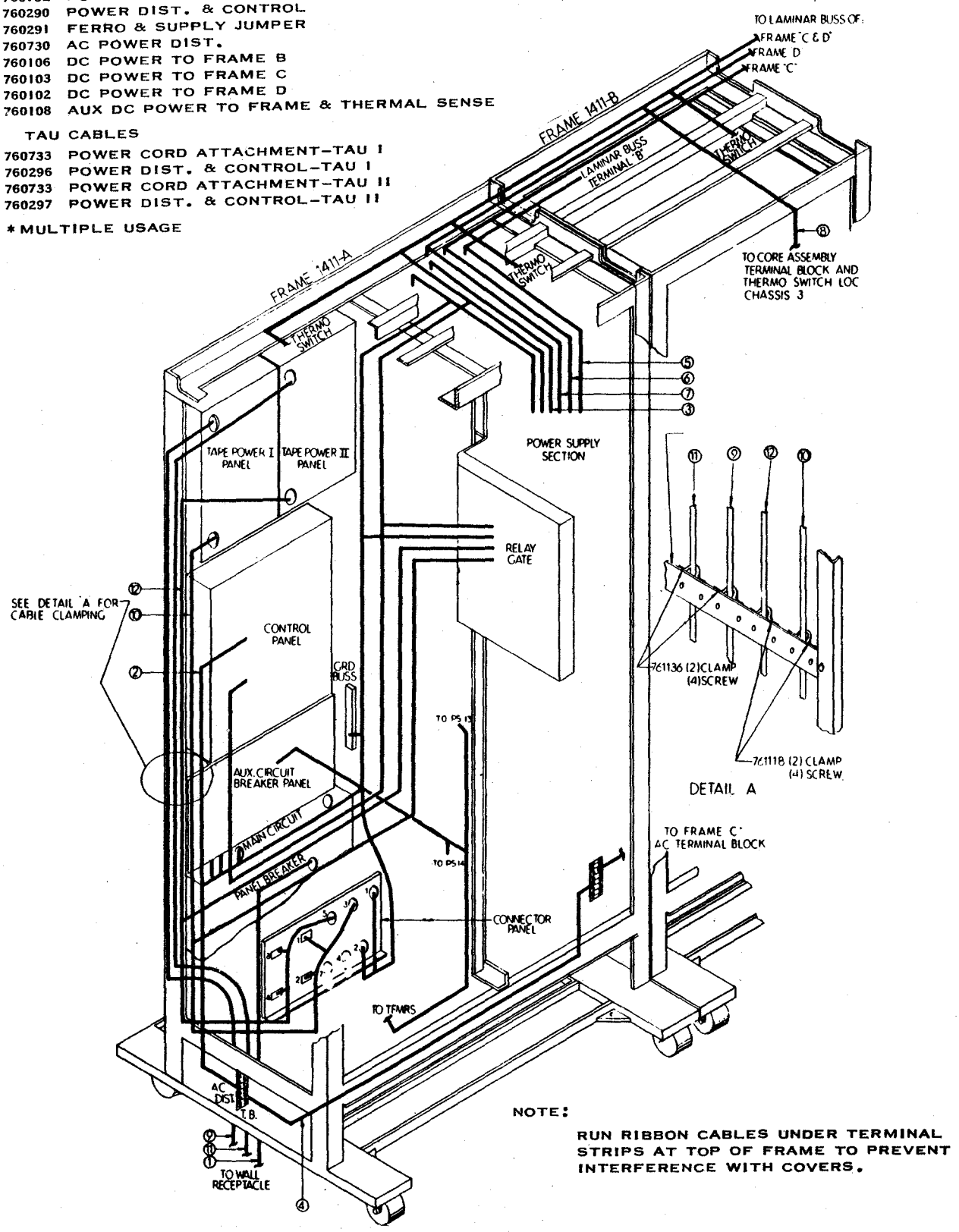
BASIC CABLES

KEY NO.		DESCRIPTION
1	760732	POWER CORD ATTACHMENT
2	760290	POWER DIST. & CONTROL
3	760291	FERRO & SUPPLY JUMPER
4	760730	AC POWER DIST.
5	760106	DC POWER TO FRAME B
6	760103	DC POWER TO FRAME C
7	760102	DC POWER TO FRAME D
8	760108	AUX DC POWER TO FRAME & THERMAL SENSE

TAU CABLES

* 9	760733	POWER CORD ATTACHMENT–TAU I
10	760296	POWER DIST. & CONTROL–TAU I
* 11	760733	POWER CORD ATTACHMENT–TAU II
12	760297	POWER DIST. & CONTROL–TAU II

*MULTIPLE USAGE



NOTE:

RUN RIBBON CABLES UNDER TERMINAL STRIPS AT TOP OF FRAME TO PREVENT INTERFERENCE WITH COVERS.

FIGURE 3-2 INTERNAL POWER AND CONTROL CABLE ROUTING

2.2 IBM 1411 - CPU - Internal Cable Connection (Continued)

In frames 1411C and 1411D, connect the red wires to laminar bar terminal 5, and connect the black wire to laminar bar terminal 6. Also, connect the wires to the thermal sense cables in each frame (detail A of Figure 3-1). Thermal switch cable, Key No. 8 in Figure 3-2, has a red No. 20 wire that breaks out of the cable at 1411C-LB-TB. Connect this wire to 1411C2A01A.

E. A DC supply cable, Part No. 762580, is located in the lower channel of the 1411A frame. This cable supplies + 30 volts, + 60 volts, and + 12 volts to the 1411B,chassis 3. The four wires in the first tie-off are connected as follows:

Wire No.	Wire	Plugging Location
7	Short Black	11B3 J 01 J
2	Short Pink	11B3 J 01 L
8	Long Black	11B3 K 01 J
3	Long Pink	11B3 K 01 L

The two wires in the next tie-off are connected as follows:

Wire No.	Wire	Plugging Location
6	Black	11B3 H 17 J
1	Pink	11B3 H 17 L

The four wires in the final tie-off are connected as follows:

Wire No.	Wire	Plugging Location
9	Short Black	11B3 E 01 J
4	Short White/Red	11B3 E 01 Q
10	Long Black	11B3 F 01 J
5	Long White/Red	11B3 F 01 Q

2.2 IBM 1411 - CPU - Internal Cable Connection (Continued)

F. There are two 14-wire cables used to control DC power sequencing in the IBM 1405 Disk Storage Units (refer to Systems Page 98.11.38.0). These cables are stored in the 1411A frame. Unroll the cables and run them along the bottom of the frames. The shorter cable P/N 760755 goes to the 1411C frame (Channel 1) and the longer cable P/N 760756 goes to the 1411D frame (Channel 2).

The cables are connected to the connector racks (chassis 7) of each frame location L13 for C7 and L44 for D7. The red wire in each cable goes to pin A. The wires are laced out in pairs in the manner that they are to be connected. Cables manufactured to EC 250230 will have Quick labels to indicate the proper pin connections for the slip-on connectors. These slip-on connectors should be attached before the paddle connectors are inserted in the sockets.

On earlier cables the leads should be fanned out so that the two wires in each pair extend in opposite directions. The wires coming out the same side as the red wire (group 1) go to pins A, C, E, G, J, L, and N. The wires coming out the other side (group 2) go to pins B, D, F, H, K, M, and P.

The following chart shows the wire numbers, colors and associated pin connections.

2.2 IBM 1411 - CPU - Internal Cable Connection (Continued)

Group 1			Group 2		
Wire No.	Color	Pin	Wire No.	Color	Pin
1	Red	A	2	Yellow	B
3	Yellow	C	4	Yellow	D
5	Yellow	E	6	Yellow	F
7	Yellow	G	8	Yellow	H
9	Black	J	14	Black	K
10	Black	L	11	Black	M
12	Black	N	13	Black	P

The wires in group 1 come out one side of the cable, while the wires in group 2 come out the opposite side.

NOTE: If there is no red wire in the cables, it may be necessary to locate Wire No. 1 by continuity checks. Wire No. 1 in the cable going to 11C7L13 goes to relay 11A51-4 operating point. Wire No. 1 in the cable going to 11D7L44 goes to relay 11A51-5 operating point.

G. Connect the priority processing-feature cable (connected to chassis 1411 C7 and stored at the bottom of the 1411C frame) to the following locations on the 1411B chassis. The list starts with the shortest wire in the first tie-off and extends through the longest wire in the last tie-off. The wire No's with a "T" are twisted pairs.

2.2 IBM 1411 - CPU - Internal Cable Connection (Continued)

Wire No.	Destination	Wire No.	Destination
9	K26Q	5	K25E
T 9	K26J	2	K25C
T11	K26J	6	K25F
T12	K26G	4	K25D
T10	K26G	3	K25B
10	K26E	T8	K24J
12	K26H	8	K24D
11	K26D	1	K20K
7	K25G	1	K20K

H. Connect the blower and convenience outlet cables (located at the bottom of the card side of the 1411 frames) to the terminal strips of the adjacent frames (Figure 3-3). Replace all safety shields.

I. Connect the chassis ground cables (green jumper wire located on the lower front portion of the 1411 frames).

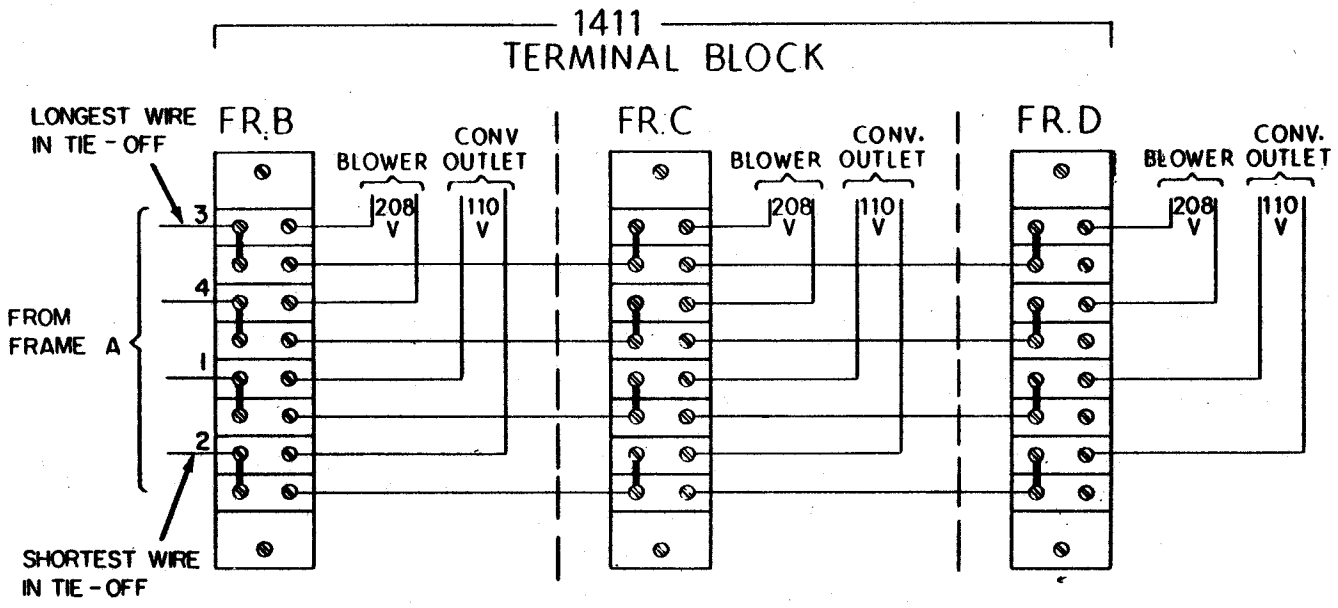


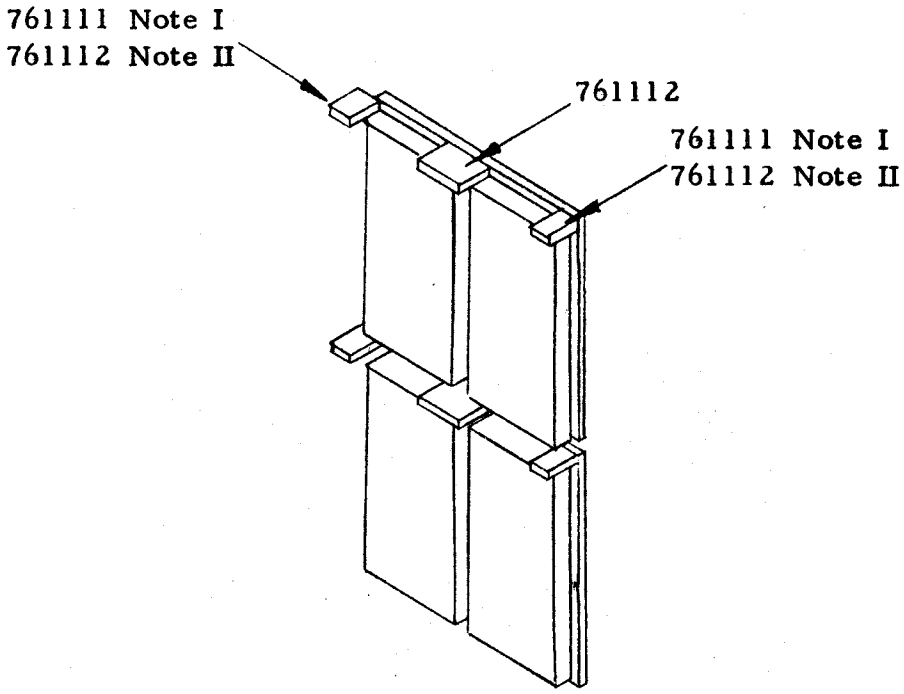
FIGURE 3-3 BLOWER AND CONVENIENCE OUTLET CABLE CONNECTION

2.2 IBM 1411 - CPU - Internal Cable Connection (Continued)

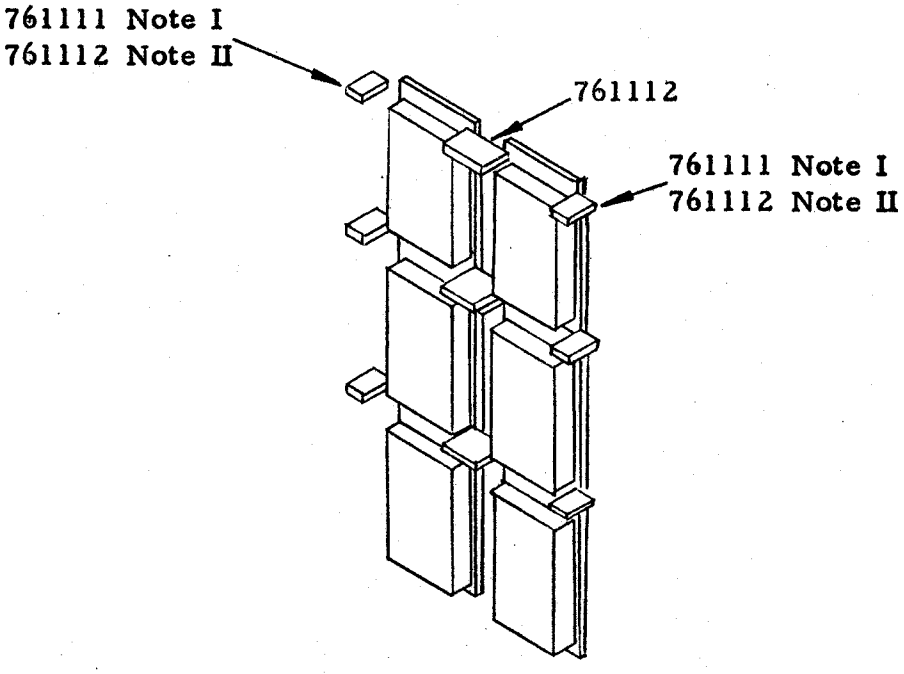
J. Connect the interframe jumper cables. The interframe jumper cables are the flat, ribbon-type cables that connect a chassis of one frame to a chassis of an adjacent frame. One end of each interframe jumper cable remains attached when the system is shipped. The other end of each interframe jumper cable is connected according to the interframe jumper wire list that is shipped with the system. Make sure that all air baffle sponges are in place after plugging of interframe jumper cables is completed. See Figure 3-4.

When installing the interframe jumper cables, the unit plugging charts should be consulted to determine the proper location for the paddle cards. Basically, this procedure is as follows: Go to the unit plugging chart that lists the end of the cable that is still connected. This chart will in turn reference a second chart that lists the terminating points of both end of the cable. A typical example follows:

In unit plugging chart 11.04.06.0 for the 1411 CPU, Chassis D1, socket K01 refers to logic page 11.04.06.3 locations 1H for the destination of the cable. Logic page 11.04.06.3 indicates that this cable goes from 1411D1-K01 to 1411C2-K28. In this case socket K28 is assumed since it is the corresponding socket in 1411C2 and there is no note to indicate otherwise.



Baffle Positions for
Large Chassis Frame



Baffle Positions for
Small Chassis Frame

Note:

I Use only when end cover is to be used
II Use only when butting with another frame

FIGURE 3-4 PLACEMENT OF AIR BAFFLE SPONGES

2.3 IBM 1411 - CPU - Special Instructions

A. The external cables are plugged into the connector racks (Table 2-1 and Figure 3-5). The cables should pass over the clamp mounting bars. Each paddle card is properly labeled to identify the plugging location in the connector.

B. Input Power Cables. Connect the input power cable to the main circuit-breaker panel in the 1411A frame (Figure 3-6). If the system includes one or two 1414D frames (Tape Adapter Units), connect the input power cables to the Tape Power Contactor in the 1411A frame (Figure 3-7). To aid in installing these cables, first install the cable to the TAU 2 circuit breaker. Install the cable to the TAU 1 circuit breaker next, followed by the cable to the main circuit breaker.

C. Thermometer Adjustment. The thermometer mounted inside the plastic cover on top of the core array should be checked and adjusted if necessary so as to be easily readable. The top and back covers should be on the machine when the thermometer is being viewed, since stray light through the plastic cover can cause sufficient glare to obscure the reading.

D. Emergency Off Switch Jumper. An Emergency Off Switch Jumper wire has been included to accommodate the 1405 Disk Files. The logic for this switch is located on pages 98.11.10.0, 75.58.11.1, and 75.58.51.1. The logics for the feature jumper blocks and the console 'Off Line' lights are located on page 98.11.03.0.

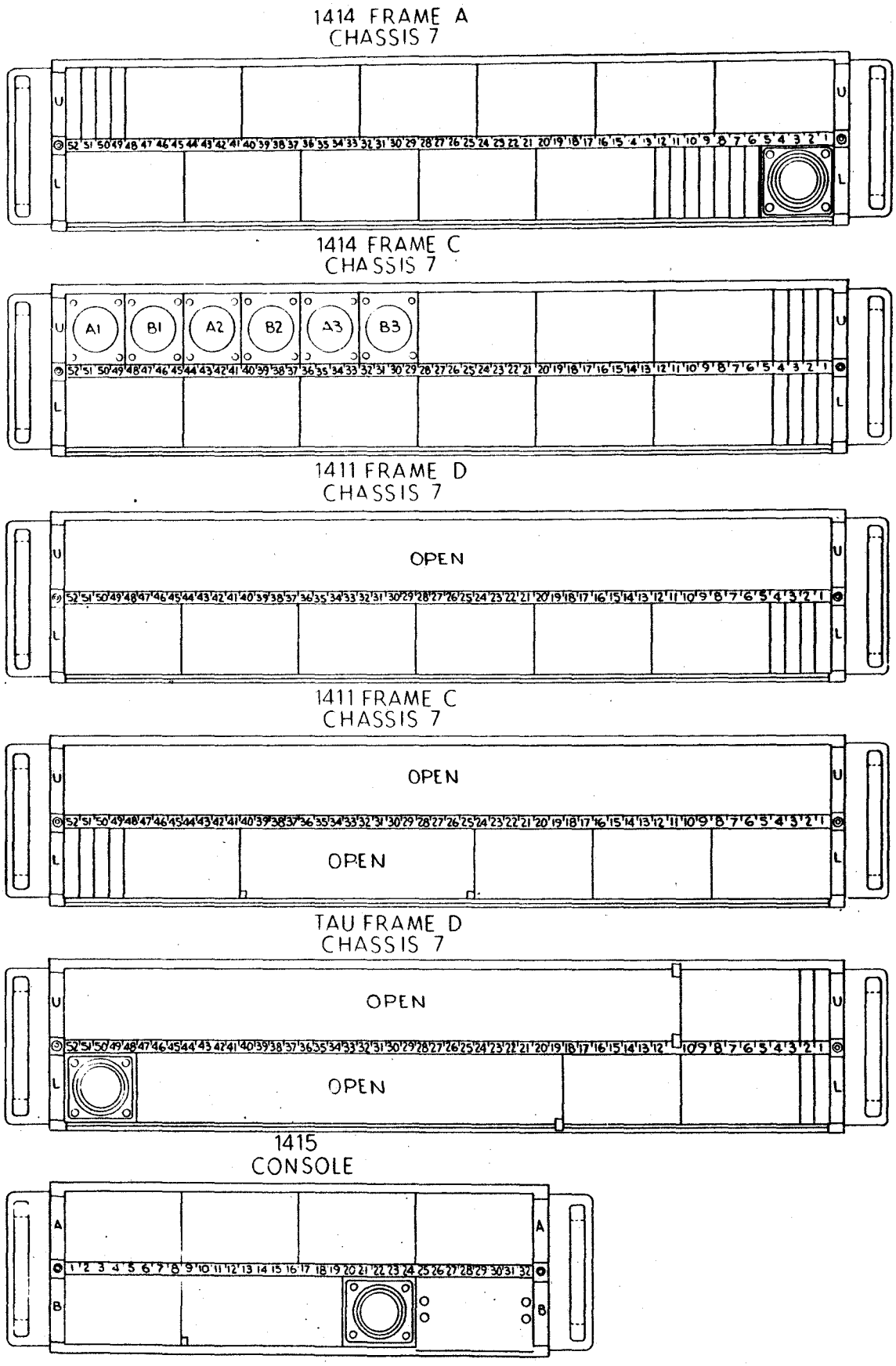
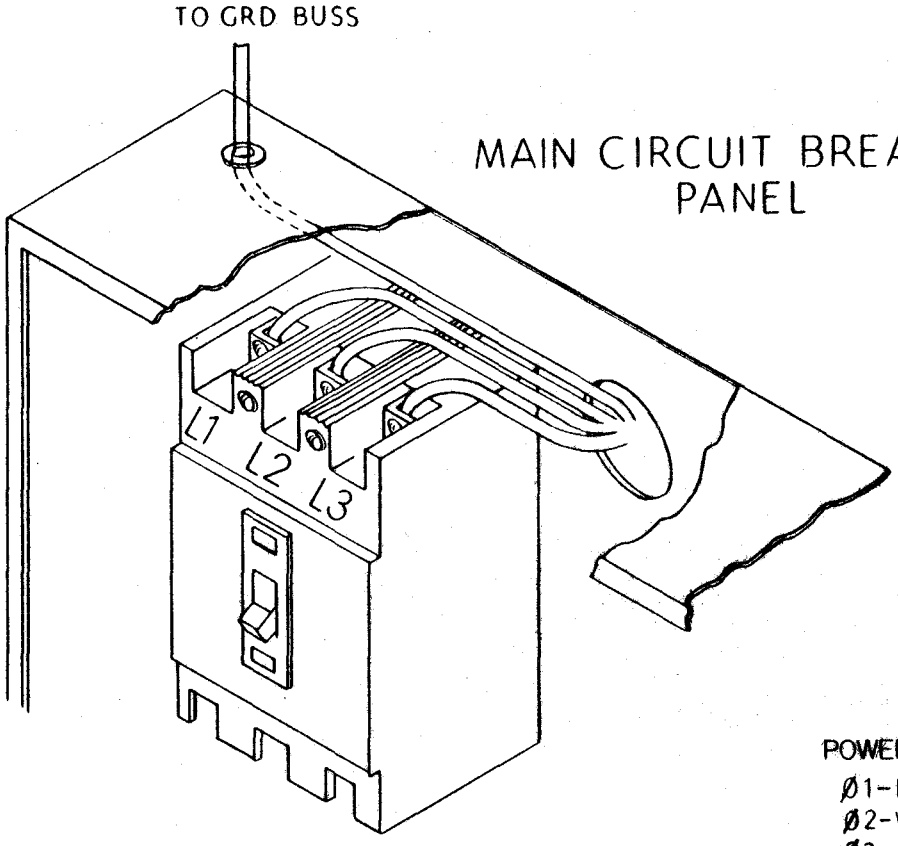
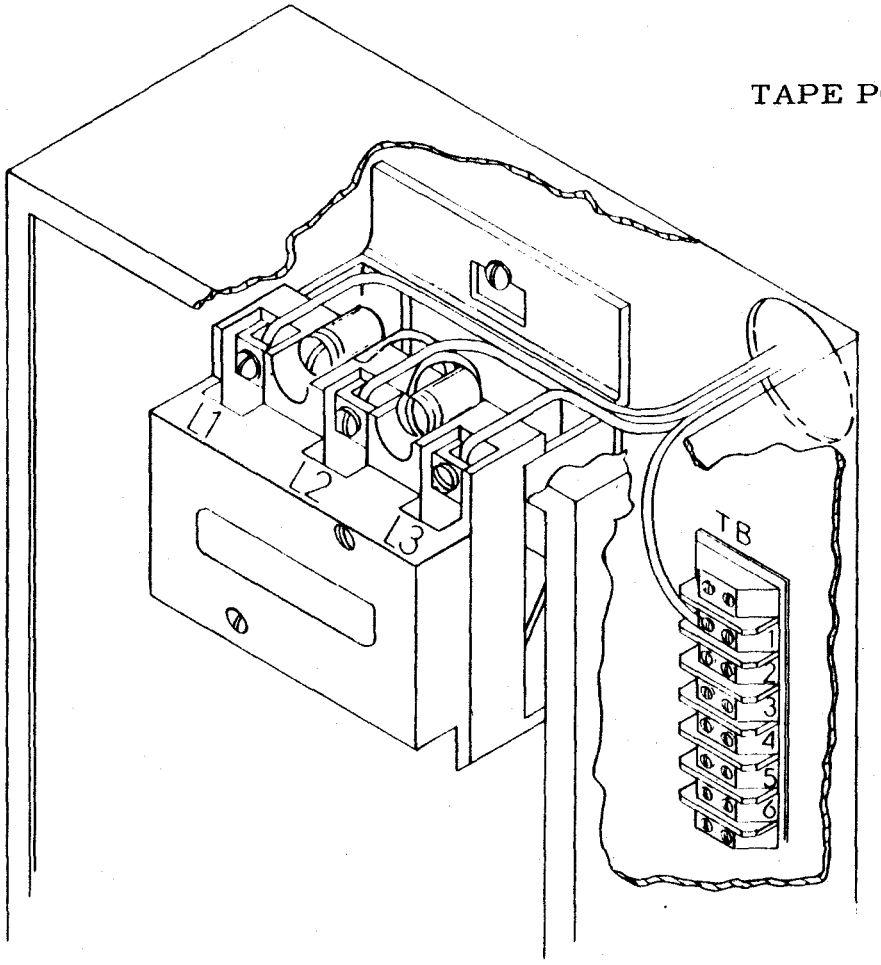


FIGURE 3-5 CONNECTOR ASSEMBLIES



POWER CABLE CONNECTIONS
Ø1-RED WIRE TO L1
Ø2-WHITE WIRE TO L2
Ø3-BLACK WIRE TO L3
GRD-GREEN WIRE TO GRD BUSS

FIGURE 3-6 MAIN CIRCUIT BREAKER



TAPE POWER I OR POWER II
PANEL

POWER CABLE CONNECTIONS
Ø1-RED WIRE TO L1
Ø2-WHITE WIRE TO L2
Ø3-BLACK WIRE TO L3
GRD-GREEN WIRE TO TB-1

FIGURE 3-7 TAU POWER CONTACTOR

3. IBM 1415 CONSOLE

To expose the 1415 Console connector rack assembly (Figure 3-5) open the modesty panel (left side from rear), and left rear panel by pulling out the two plungers located in the channel rail directly under each panel. Remove these panels by pulling the plungers at the pivot points. Before connecting the external cables to the bottom rear of the console, slip the cable chute over the cables, connect the cables as labeled and secure to the bottom rail with clamps to eliminate any strain on the connectors. The following instructions should be followed in installing the I/O printer:

CAUTION

1) To avoid damage to contacts and other adjustments, lift machine by grasping under the left keyboard side plate and lower rod across rear of printer. Do not lift the machine from the sides as the contacts may be damaged. This results in unnecessary machine adjustments.

2) When power is on, -36 volts is present on all contacts and -48 volts is present on solenoid and magnet terminals.

A. Remove printer from carton and unbolt unit from wood pallet.

B. Stand printer on back and remove protective cardboard from bottom sides.

C. Install special legs and feet on four leg studs replacing those used for shipping.

3. IBM 1415 CONSOLE (Continued)

D. Stand printer on legs and remove any additional tape and packing materials.

E. Inspect printer carefully for any visual signs of damage.

F. Insert hand tool (Tool No. 9900110) in the right side of the operational shaft. Cycle the printer manually (counter-clockwise) to make sure that it operates freely. Remove hand tool.

G. Locate the two ends and plug together the 6 pin Jones plug.

H. Insert three paddle cards at positions 28, 30, and 32 as labeled.

I. Guide printer cable through opening and lower printer into well, make certain that the two left legs fall over the two pins located in the bottom of the well.

J. Remove platen, install cover, and replace platen. On pin feed units, install special bar on cover just to the rear and above platen so that the notches on both ends of the pin feed mechanism are guided on the bar and do not rotate with the platen.

K. Using the 1415 operator's console in conjunction with the I/O printer keyboard, make sure that the I/O printer operates properly with the 1410 System. See "Test Check Routines" in Chapter 5.

4. IBM 1414 A & C SYNCHRONIZER

Position the 1414 A frame and level it using the leveling pads. If a 1414 C frame is used, remove and store the inner side panels of both the 1414 A and the 1414 C frames. Position, level, and bolt the two frames as described in the section on the IBM 1411 CPU.

The cables from various frames that plug into connectors on chassis 7 and terminal blocks of frame A (See Figure 3-5) should be clamped as follows from left to right starting with the third clamping position.

Key # 45
44
27, 28
69, 70, 29
47
46
13
12
11

Connect the blower and convenience outlet cables as specified in Chapter 3, Section 2.2H. on the IBM 1411 CPU.

The power cables that connect to the terminal strip in the 1414 A frame (front, lower right) are labeled. These terminal strips are designated TB-A2, TB-A3 and TB-A4 from top to bottom. TB-A1 is located in the rear of the frame under the step cover. Replace all safety shields.

Attach the DC power distribution cable to the 1414 C frame laminar bus. The first wire in the tie-off goes to terminal 10; the others go to terminals 9, 8, 7, 6, and 5. See Systems Page 98.14.13.

4. IBM 1414 A & C SYNCHRONIZER (Continued)

Attach the power cable (five-wire cable from the 1414 A power supply) to the terminal block TB-1 of the 1414 C power supply. The first wire in the tie-off goes to terminal 1; the others go to terminals 2, 3, and 4. The green wire goes to terminal 8.

The thermal sense cable is connected to the thermal sense switch connector (detail A of Figure 3-1). Cable No. 761395 is a four wire cable that extends from 1414ACC6-W and X to 1414C07L01 Q and R respectively. Also 1414ACC6L and Sb go to 1414CO70L14 Q and R respectively. These wires are disconnected at the C frame for shipment. This cable is shown on Systems Page 98.14.12.0.

5. IBM 1402-2 CARD-READ PUNCH

Position the machine and connect the required cables (Figure 2-1 and Table 2-1). AC power distribution cable, Key No. 13 should be connected to the 1414 A frame at TB-A3 and TB-A4. These terminal strips are located at the front lower right section of the frame. Starting at the top of TB-A3, each wire shall be identified with the associated terminal number.

The other end of this cable, Key No. 13 should be connected to terminal boards DC-4 and DC-2 in the 1402-2. The first tie-off goes to DC-4, and the second goes to DC-2. Each wire shall be identified with a terminal position number.

On later machines, a special clamp is provided to reduce cover interference of the three large cables connected to the rear of the 1402-2. Follow the installation procedure in the IBM 1402 Reference Manual. Make the voltage checks and machine tests later when power is applied to the system.

6. IBM 1403 PRINTER

Position the machine and connect the required cables. AC power distribution cable, Key 11, should be connected to the 1414A frame at TB-A2. Starting at the top of the terminal strip (TB-A2) the wiring numbers and associated TB locations are as follows:

Wire No.	TB-A2
1	1
2	2
13	3
4	4
8	8
9	9
10	10
11	11
12	12
3	Frame Bond

Follow the installation procedure outlined in the IBM 1403 Reference Manual. Also, lift the carriage brushes and open the T-casing. Complete the voltage checks and machine tests after system power has been applied.

7. IBM 1011 PAPER-TAPE READER

Position the machine and connect the required cables (Figure 2-1 and Table 2-1). Follow the installation procedure outlined in the IBM 1011 CE Reference Manual.

8. IBM 1414-D TAPE ADAPTER UNIT

Position the 1414 D frame and level, using the leveling pads. Connect the cables in their specified locations (Figure 2-1 and Table 2-1). If two 1414 D frames are used, they may be butted together and bolted with six bolts and nuts or may be left as separate frames.

9. IBM 729-II, 729-IV, AND 7330 TAPE UNITS

Position the tape units in their assigned locations. Attach cables according to Figure 2-1 and Table 2-1. If more than one drive is used, attach drives in series. 729 II and 729 IV can be placed in the same string, but 7330 tape drives cannot be placed in the same string with 729's.

Attach dummy shoe to the last tape-drive unit in a string. The 7330 and the 729 dummy shoes are not interchangeable.

10. IBM 7330 TAPE UNITS

Clean the entire tape transport and chamber, the filter chamber, and top of door screen, if necessary. Check that all cards, cable paddles, and wire contact relays are securely seated. Install terminator shoe P/N 556801.

CAUTION

Do not at any time turn power on without terminator shoe installed. Serious machine damage may otherwise result.

11. IBM 1405 DISK STORAGE UNIT

Position compressor and file units in their allotted position and level using leveling pads. (See 1405 CE Reference Manual for additional information).

Attach the 1405 control unit and any additional files as shown in the external cable routing and identification chart. (See Figures 2-2 thru 2-6).

12. IBM 1301 DISK FILE

A. Remove packing material as specified in unpacking instructions. Do not install drawers.

B. Inspect machine for shipping damage especially in the power contactor box, hydraulic power supply and SMS gates.

WARNING: Applying power to machine with loose or damaged connections in these areas can cause damage to the machine and its surrounding area.

C. Before securing electronic frame to mechanical frame, connect all power cables from mechanical frame to electronic frame. Level electronic frame with mechanical frame. Verify that frame-grounding washers are secured between frames.

D. It is necessary to rearrange some of the components in the I/O area depending upon whether the file is the last one, (or only one) of a series of files, or if it is not the last one.

12. IBM 1301 DISK FILE (Continued)

1. Last File (or only one)

The End-of-Line Terminators, (TCK-), 370334 should be placed in C02, C03, C04 and C05. The dummy biscuit connector (2123269) should be placed in A20.

2. Not Last File

The End-of-Line Terminators should be placed in B02, B03, B04 and B05. The dummy biscuit connector should be placed in A01.

E. Swing out the receiver (see receiver swing out procedure*).

F. Clear the disks. Refer to disk cleaning section.

G. As the drawers are installed, inspect the drawer and clean the heads. These units are adjusted at the plant to be interchangeable with each other.

H. Swing receiver into the array (see receiver swing in procedure*). Check for binds in loading mechanism.

WARNING: Never load or unload the heads when they are out of the array.

I. Push access fully into disk array against inner crash stop.

J. Check that the carriage way wipers are not dry and the way is not dirty.

K. Replace actuator shield.

L. Before applying power, check that the voltage at outlet agrees with that shown on the nameplate.

*Refer to IBM 1301 Disk Storage CE Reference Manual (Form No. R27-5581-0).

M. Start disk drive motor and check disk rotation as indicated by arrow on filter frame. Start oil pump, electronic DC, gate blowers, and solenoid DC.

N. Reinspect drawer profiles.

WARNING: Do not load the heads.

O. Allow the disk array to run (purge) for three hours before loading the heads.

P. Load heads for 30 minutes.

Q. Unload heads and turn machine off. Check run-down of disk array and compare it to the run down time recorded on the decal in the power sequence gate. Present run-down time should not be shorter than recorded time minus four minutes.

R. After the disks have come to a complete stop, remove the access cover and again inspect and clean heads and disks.

S. Manually load and unload heads to ensure correct alignment.

T. Replace actuator shield.

U. Purge system for 15 minutes before loading heads.

V. Reinspect the heads and disks again at the end of the first, second, and third weeks of operation. After that time, refer to the scheduled Maintenance Routine Chart in CE Reference Manual R27-5581 for correct inspection frequency.

1. SYSTEM POWER ON

When all cables have been properly attached and clamped, the system input power cables can be connected to the wall sockets.

1.1 Phase Rotation

Power supplied to the system must have the correct phase rotation. This can be checked with an oscilloscope, or with a phase meter if one is available. Check phase rotation at all three-phase power inputs. To check rotation with an oscilloscope, connect the sync lead to the phase 1 terminal (Figures 3-6 and 3-7), and adjust the oscilloscope to display one cycle. Using vertical input probe, observe the voltage at the phase 2 terminal. Phase 2 should occur 120^{o} later than phase 1. Observe phase 3 next. It should occur 120^{o} later than phase 2 (240^{o} later than phase 1).

If possible, check the phase rotation with a phase meter before the system arrives. (It may be possible to have the electrical contractor do this.) Looking at the wall power receptacle, phase rotation should be counter-clockwise. Starting at the ground terminal, phase 1 should be the next counter-clockwise terminal.

In either case, the customer is responsible for correct voltage and phase rotation, and the customer engineer should advise customer engineering management if any discrepancies occur.

1.2 IBM 1411, 1414 (All Frames)

Press the Power On key on the 1415 Console. Before DC power comes up, check all frames to make sure the blowers are operating. The power supply blower in the 1411-A should start when DC power comes up.

1.3 IBM 1403 Printer

Check the Main Line switch located under the exterior covers at left rear, to be sure that it is closed before attempting to bring up power.

Referring to the installation procedure in the IBM 1403 CE Reference Manual, check the motors for proper phase rotation. If rotation is correct, close T-casting.

1.4 IBM 1402-2 Card-Read Punch

Check the power supply voltages at the customer engineer service panel. Check for operation of the power supply cooling fans. (See Instruction-Reference Manual 231-0002). There are two fans. One is located above the -12 volt supply. The other one is located at the reader end of the machine above the -20 volt supply under a cover. Hold an IBM card under the edge of the cover to check for air flow.

1.5 IBM 729 II and 729 IV Tape Units

Load a reel of tape. Apply power and check rotation of motors by pressing the Load Rewind key. If the head does not come down, check for vacuum in columns. If air is blowing out, the phasing is reversed.

1.5 IBM 729 II and 729 IV Tape Units (Continued)

If air is being sucked in, phasing is correct and something else is preventing the head from coming down. If rotation is incorrect, turn off all power and remove the input power cables from the wall outlets. Reverse any two phases at the appropriate TAU Contactor (Figure 3-7).

1.6 IBM 7330 Tape Units

Load a reel of tape. Apply power and press the Load Rewind key. Check to see that tape is at Load position.

1.7 IBM 1011 Paper Tape Reader

Install the paper tape and check off-line and system operation of paper tape reader as specified in the CE Reference Manual (Form 227-5545).

1.8 IBM 1405 Disk Storage Unit and Compressor

Check for proper rotation of disks (arrow on top of disk unit). Check for proper compressor operation (arrow on fly-wheel).

2. SYSTEM VOLTAGE CHECKS

Voltages in the SMS power supplies of individual modules are adjusted during final testing at the plant and should not need re-adjustment. Do not readjust any voltage unless it is out of tolerance. Check connections, input voltages, etc. before making any power supply re-adjustments. Check all voltages as indicated in Table 4-1.

A series of tests, both manual and programmed, is performed on the system. These tests aid the customer engineer in locating any failures that may have been caused in shipment.

The following pages contain squares along the right hand margin for the purpose of checking off items completed.

1411 Voltages	Tolerance	Location	PS#	Remarks	Check
+ 30 M	±4%	11B3 J01L	7	Each memory unit has the +30 and +60 volts set at optimum working voltage. The tolerance is ± 4% from this voltage. Labels showing the optimum voltages appear between the adjustment pots for the 30 M and 60 M supplies.	
+ 60 M	±4%	11B3 E01Q	8		
+ 30	±4%	TB11-B9	10	TB11 is located under the core array in the back of the machine.	
- 36	±4%	TB11-B8	11		
-48	±10%	TB11-B1	14		
+ 12 (Marginal)	±4%	LB (All frames)	12	PS 12 also feeds +12 to sense Amps. This +12 is not marginal (98.11.17) TB11-B10.	
- 6	±4%	LB B-8	9		
- 12	±4%	LB B-1	1		
		LB C1 &D1	2		
		LB D-3	3		
		LB B-3	4		
		LB C-3	5		
		LB C-7	6		
		LB D-7	13		

TABLE 4-1a SYSTEM VOLTAGE REQUIREMENTS

1414 A Voltages	Tolerance	Location	PS#	Remarks	Check
-6	±4%	LB A-8	1		
+6	±4%	LB A-7	2		
-12	±4%	LB A-3	3	PS 3 is on 1414 only. Otherwise, A3 is connected to A-1 (-12 from 1402-2).	
Note: The remaining voltages are fed to the 1414 from the 1402-2.					
-12	±4%	LB A-1		PS located right side of 1402.	
+12 (Marginal)	±4%	LB A-5		PS located left side of 1402.	
-20	±4%	1414A2A28 (J-R)		PS located left side of 1402.	
-60	±4%	1402-2 CE Panel			
TAU Voltages					
-6	±4%	LB D-8		Right side, back of TAU	
-12	±4%	LB D-1		Left side, back of TAU	
+12	±4%	LB D-7		Left side, front of TAU	
+12 (Marginal)	±4%	LB D-5		Left side, front of TAU	

TABLE 4-1b SYSTEM VOLTAGE REQUIREMENTS

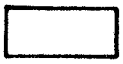
1. MANUAL OPERATIONS, CENTRAL PROCESSING UNIT

1.1 Test Check Routine

All CE switches should be set to Normal before checking out or operating a 1410 system.

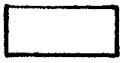
With system power on, perform the test check routine. This insures that all checking circuits are functioning properly.

1.2 Address Set



Perform the address set routine in all registers with random combinations of numbers to check address register read-in.

1.3 Storage Scan, Load + 1



Perform this function with the Check Control switch in the Restart position. Press the Start key with all Bit switches on. Observe the 1411 CE Panel to see that the bits are being loaded. Flip the bit switches off, one at a time, making sure that the correct bits are being entered into storage. Be sure to reload storage with valid characters when finished.

1.4 Storage Scan, Regen + 1

Set the Check Control switch to Stop Normal. Depress the Computer Reset button. Press the Start key to be sure that the regen circuitry is functioning properly. Set the Check Control switch to the Restart position. Set the Storage Scan switch to Load + 0 and load an invalid character in any one storage position, then set the Storage Scan switch to the Regen + 1 position. Set the Check Control switch to Stop Normal and depress the Computer Reset button. Press the Start key; the system should stop when

1.4 Storage Scan, Regen + 1 (Continued)

the invalid character is read out. Clear storage (insert C-bits) in preparation for the following steps.

1.5 Start Print-Out

Press the Start Print-Out button and examine the printed results for correct operation.

1.6 Display and Alter

Perform the Display and Alter functions of the IBM 1415 Console. Load a word mark to define the field before the display operation is initiated. Alter the field using various characters (including word marks) to test all bits.

1.7 Sample Instruction

Write the program instruction J 0000 1 b . starting at location 00001. Execute the instruction in the Logic Step and Single Cycle modes; then allow the instruction to run in the Run Mode. This checks instruction read-out and instruction execution.

1. ERROR CIRCUITRY, ALL BUFFERS

Load invalid characters in several scattered positions. Perform the check search operation and verify that the errors are detected.

2. PRINTER OPERATION

Set up the CE Panel to perform the print integrated buffer off-line mode and print several lines. Check the printed results to insure proper printing.

3. CARD READER OPERATION

This check requires a punched deck of cards. Any cards can be used, but a deck that is ripple-punched is easiest to use to detect errors. Use approximately 50 cards. Set up and perform a read-to-print operation. Check the printed results.

4. CARD PUNCH OPERATION

Using the ripple-punched card deck, perform the read-to-punch operation. When this operation is completed, place the newly punched cards in the reader feed and perform another read-to-print operation. Compare the printed output with the results obtained in the previous read-to-print operation. Return the I/O synchronizer to the On-Line status.

1. IBM 729 TAPE UNIT

1.1 Error Circuitry

Using the CE Panel, write a record in odd redundancy. Read this record back in even redundancy to check error detection circuitry. When reading, the Stop-On-Error switch should be on.

1.2 Write, Backspace, and Erase Functions

Using the CE Panel plugboard, set up a Write-Backspace-Erase loop and allow the routine to run for several minutes.

1.3 Tape Mark Recognition

At the completion of the Write, Backspace, and Erase Functions, write a tape mark. Rewind the tape. Start the tape reading. The tape should stop when the tape mark is read.

1.4 Unload, and Unload and Rewind

Check for correct unload, and unload and rewind functions on the CE Panel.

1.5 Tape Selection

Using the CE Panel plugboard, check that each tape drive can be selected with all assigned numbers.

At this time all doors, covers, and step covers can be mounted and secured.

2. IBM 7330 TAPE UNIT

2.1 Preliminary Checks

The following checks should be made on the 7330 Tape Units.

A. Set the Main Power switch to Off.

CAUTION: Do not at any time turn power on without terminator shoe installed. Serious machine damage may otherwise result.

B. Check to insure that the circuit breakers in the tape unit power supply are on.

C. Place rewind arm in the Up position and close the door.

NOTE: Never turn machine power on or off with rewind arm in down position.

D. For off line checking, connect external power cable, P/N 460663 to power source. Systems power may be used, if desired, using system power cables.

CAUTION: Insure that machine and service line voltages are compatible first.

If time and manpower will permit, the following power on checks should be done off line with the 7330 Tape Unit Tester, P/N 461142. The checks can be made on line, if necessary.

E. Turn the Tape Unit Power switch on. The File Protect and Density light should go on.

2.1 Preliminary Checks (Continued)

F. Place empty reel on machine reel hub.

G. Load tape as follows:

a) Place file reel on machine with about 18 inches of tape hanging.

b) Open center and right column door.

c) Thread tape through tape transport (as indicated on inside of center cover).

d) Transfer load point to right of transport area by turning machine reel clockwise. (Leave tape without slack).

e) With the Reel Release button depressed, lower the rewind arm.

f) Let the Reel Release button out for a few seconds.

g) After vacuum comes up, depress the Reel Release button and turn left reel clockwise, right reel counter-clockwise loading tape into columns. Let out the Reel Release button.

h) Seat rewind arm and close door, depress Low Speed Rewind. Tape should return to load point. ☐

NOTE: The above procedure should be demonstrated to customer operators.

H. Depress the Start button. The Ready light should go on. ☐

I. Set the Address switch to zero on the tape unit. The Select light should go on. ☐

2.1 Preliminary Checks (Continued)

J. Using the 7330 Reference Manual (Form #223-6967) as a guide, check the following: ☐

a) Start-stop waveforms.

b) Skew

c) Write circuit feed-thru ("H" shield adjustments).

d) General functional operation.

Make only adjustments which obviously need changing.

2.2 On Line Checks

A. Read Buss pre-amplifier levels at TAU use Standard Signal Level Tape P/N 461108. Set to 8.8 volts high density (if necessary. ☐

B. Run Inter Record Gap Test. Make fine single shot or mechanical adjustments if necessary. If diagnostic indicates backward creep, varify visually before adjusting. ☐

C. Run Reliability diagnostics.

1. MARGINAL CHECKING

1.1 General

The following procedures should be used when running marginal checks during use of diagnostic test routines:

A. Voltage Adjustments

Unit	Voltage Adjustment		Remarks
	Above Nominal	Below Nominal	
1411-C	3 V	3 V	Check that DISPLAY and ALTER modes operate properly
1411-C, D, B2 1414-A 1414-C 1414-D	3 V 3 V 3 V 3 V	3 V 3 V 3 V 3 V	Run program M004D for 8 passes at each margin. This is applicable to all systems.
1405	1.2 V	1.2 V	Run program D004B for 5 minutes at each marginal voltage

B. Place the 1410-1401 COMPATIBILITY switch in the 1401 position. Adjust the marginal check supply to 3 volts above and 3 volts below nominal (by frame) and run 1401 diagnostic programs at each marginal voltage as follows:

Frame	Program	Time	Applicable To
1411-B2	9020-C	3 Minutes	All Systems
1411-C	9020-C	3 Minutes	All Systems
1411-D	9020-C	3 Minutes	All Systems
1414-A	1080-A	3 Minutes	Systems with 1414 III or IV
1414-D	*5500-B	3 Minutes	Systems with 1414 I or II

*Note: Program 5500-B (Inter-record Gap) will cause inconsistent results due to difference between 1401 and 1410 CPU timings. Do not use these typeouts to check tape drive adjustments.

1.1 General (Continued)

C. Run Diagnostic Program CO18 (Memory worst case) for each of the following voltage settings on the 1411-B3 (1411-Z3) and B4 (Z4). The +30 and +60 nominal voltages refer to the nominal settings established by the schmoo curves. These values should be posted on the 1411-A frame between the +30 and +60 volt variacs.

Passes					
1.	+12	+60N	+6%	+30N	
2.	+12	+60N	-6%	+30N	
3.	+12	+60N		+30N	+6%
4.	+12	+60N		+30N	-6%
5.	+15	+60N		+30N	
6.	+ 9	+60N		+30N	

D. Adjust the marginal check supply to 3 volts above and 3 volts below nominal and run all other tests listed in Table 8-1.

1.2 IBM 7330 Tape Drives

A. Write Circuits

The Write Current is 65.8 +2.0 - 1.8 milliamperes.

B. Base Line Shift

The base line shift must be less than 0.40 volts at the read bus.

C. Cross Talk (Read)

Read "Cross-Talk" must be less than 0.30 volts peak to peak at the read bus on an unwritten track with all "ones" written in phase on all other tracks.

1.3 IBM 729 Tape Drives

A. Erase Head Check

1. The Erase Head should not affect the shape or amplitude of the signal.

2. With the Write Head disconnected, the Erase Head should erase an 8.8 V peak to peak signal to below 400 MV peak to peak.

1.4 IBM 1405 Operating Conditions

All machine functions must operate correctly at the following voltage limits when any one DC voltage is varied individually with the remaining DC voltages held at nominal values. Voltages listed are those measured at the power supplies.

+30	+27.6	to	+32.4
+ 6	+ 5.5	to	+ 6.5
+ 6M	+ 4.8	to	+ 7.2
- 6	- 5.5	to	- 6.4
-12	-11.0	to	-13.0
-12M	-10.8	to	-13.2
-36	-33.1	to	-38.1
-48 (Not adjustable)	±6% from 10% to 100% rated load of 10a.		

1.5 IBM 1405 Voltage Requirements

A. Input Supply Voltages

All DC supply voltages must be within plus or minus 2% with the exception of the 48 volt supply which must be within plus or minus 6%.

AC Voltage	Maximum	Minimum
208	228	187
220	242	198

1.5 IBM 1405 Voltage Requirements (Continued)

Bonding and grounding shall be such that the electrical resistance between the metallic frame or shell of any electrical component and the system frame does not exceed 10 ohms when measured with an ohmmeter whose open circuit voltage does not exceed 1.5 volts DC.

B. Contactor Box

1. All switches in the Contactor Box shall operate for proper Off/On control of all File motors.

2. For system operation, the 1405 must come on in the following sequence:

a) Disk array motor.

b) Access motor(s), Gate blowers, and DC supplies.

1.6 IBM 1405 Single Shots

Seek to any record and perform a continuous read operation. Check the NB single shot at location 01A2G18 (75.28.11.1) for an output pulse duration of 240 usec $\pm$ 10 usec. Adjust if necessary.

2. DIAGNOSTIC PROCEDURES

Load the IBM 1410 Diagnostic Load routine. Run the tests indicated in Table 8-1. Check to see that the routines are executed by printing the titles on the IBM 1403 Printer. Run the indicated tests at normal voltages as well as with a ± 3 volt variation of the marginal supply voltage in the specified frames.

Run all the IBM 1401 diagnostic tests except the following:

Block	Test Identification
3000B	Move and Binary Decode
3010B	Move and Binary Code
3020B	Punch Column Binary
3030B	Read Column Binary
3500B	Read-Punch Release
3600C	Punch Feed Read
3800A	51 Column Read
5330B	Compressed Tape Read and Expand
9100C	Core Storage, Worst Pattern

In addition, the use of 1401 test block No's 3210 A, Divide: 9030 B, Branch on Reader Error; and 5500 B, Inter-record Gap Measurement; will result in errors or misleading indications due to differences between the 1401 and the 1410 systems.

When all diagnostic tests have been satisfactorily completed (meets minimum data check requirements) run a customer program to insure proper system operation. The IBM 1410 System can then be turned over to the customer.

Test Number	Description	Marginal Checked Frames	Check
C001 through C018	CPU	1411B, 1411B2, 1411C, 1411D	✓
W001 through W003	Printer	1414A	
R001 through R002	Integrated Synchronizer	1414A	
T002	Tape Functions		
T004* T005 T006	Multi-Channel Tape Record Gap Measurement Tape Overlap	1411C, 1411D, 1414D, (Both Channels)	
D001 D002 D003	Function Test ARM Speed ARM Alignment	1405 1405 1405	
D004	Multiple Channel Seek Write/Read	1405	
M001	Integrated Synchronizer Options		
M002	Integrated Synchronizer Options	1414C	
M004D	System Check		
DA02 DA03 DA05	Surface Analysis Reliability Test Mechanical Test	1301-7631 1301-7631 1301-7631	

NOTE: Run this test in both the Move and Load modes, with both even and odd parity, and both overlapped and non-overlapped. When the test is complete, give a single Write Instruction, varying the unit number character, to make sure all tape drives can be selected by the CPU.

TABLE 8-1 DIAGNOSTIC TESTS

FIGURE	WAVEFORM	AMPLITUDE	START TIME	MAX T.R. USEC	MAX T.F. USEC	PULSE WIDTH USEC	MAX DROOP	MAX OVER SHOOT
2	Y Read	255 MA±10	SP +.9±.1	.28	.35	1.24±.1	10 MA	10%
3	Y Write	255 MA±10	SP+2.8±.1	.28	.35	1.4±.1	10 MA	10%
4	X Read	255 MA±10	SP+1.3±.1	.28	.35	0.9±.1	10 MA	5%
5	X Write	255 MA±10	SP+3.2±.1	.28	.35	1.0±.1	10 MA	5%
6	Inhibit	240 MA±10	SP+2.8±.1	.25	.325	1.6±.1		
7	Y Drivers	39V ±2		.28	.35			
8	X Drivers	39V ±2		.28	.35			
9	INH Drivers	37V ±2		.25	.315			
10	Sense Amp Strobe		(See Note)	.15	.1	0.5±.1		

Note:

Adjust the 30VM supply to 30V. Then decrease the +60VM until the storage unit fails. Try adjusting the taps on card 11B4J15 (11Z4J15 for Z frame), as indicated on page 39.10.03.1 (25.90.03.1 for Z frame) of the ALD's, recording the lowest voltage at which the storage unit will work for each tap. Repeat the test while trying to run the highest possible setting of the 60 VM supply. Use the tap setting of the 60VM supply. This is the correct setting of the strobe pulse.

TABLE A-1 MEMORY WAVEFORM DATA

WAVEFORM	AMPLITUDE READER-PUNCH BUFFER	MAX Tr USEC	MAX Tf USEC
Read 2 (Units)	270 ± 10% MA	0.5 usec	0.35 usec
Read 1 (Tens)	270 ± 10% MA	0.35 usec	0.25 usec
Inhibit (Units WR)	270 ± 10% MA	0.5 usec	0.35 usec
Write (Tens)	270 ± 10% MA	0.35 usec	0.25 usec
Inhibit	270 ± 10% MA	0.35 usec	0.25 usec
	PRINT BUFFER		
Read (Units and Tens)	270 ± 10% MA	0.35 usec	0.25 usec
Write (Units and Tens)	270 ± 10% MA	0.35 usec	0.25 usec
Inhibit	270 ± 10% MA	0.35 usec	0.25 usec

TABLE A-2 I/O SYNCHRONIZER WAVEFORM DATA

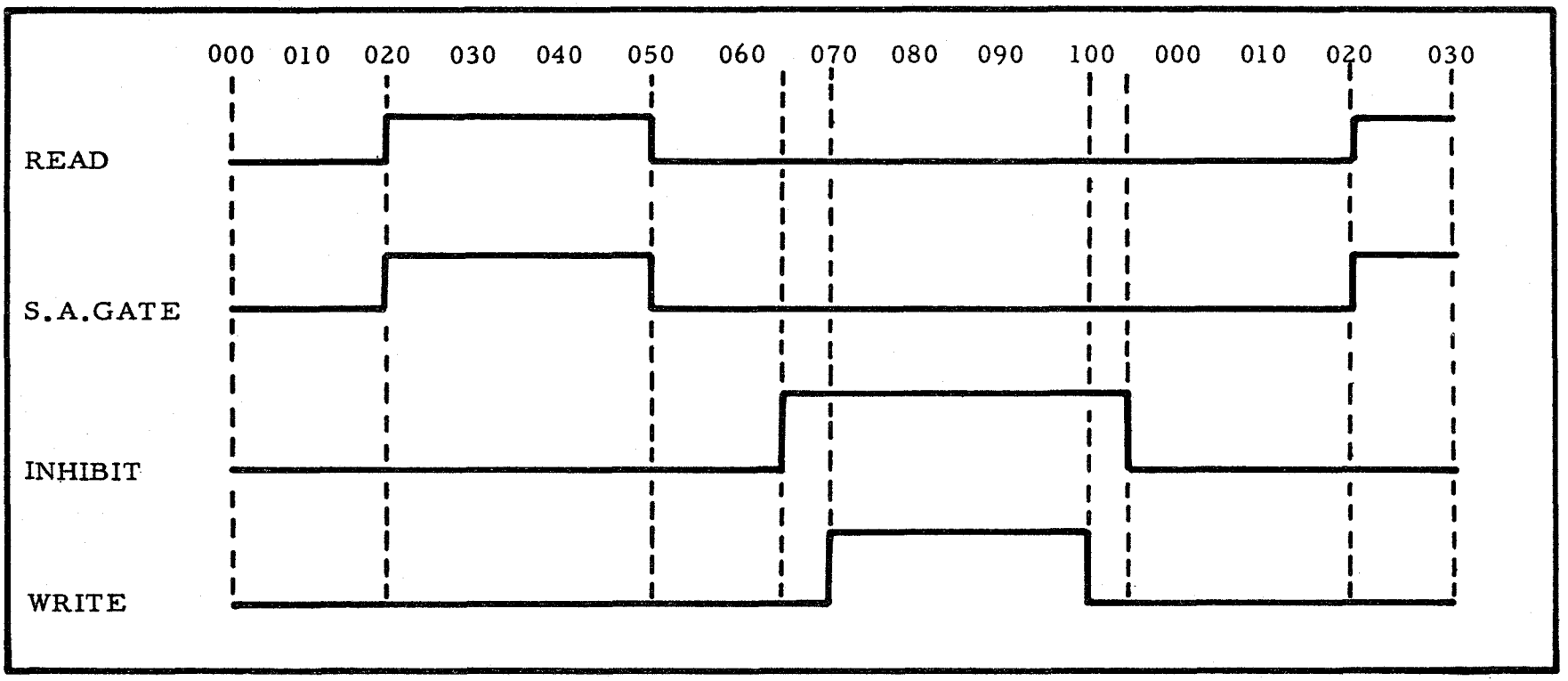


FIGURE A-1 PRINT BUFFER WAVEFORMS

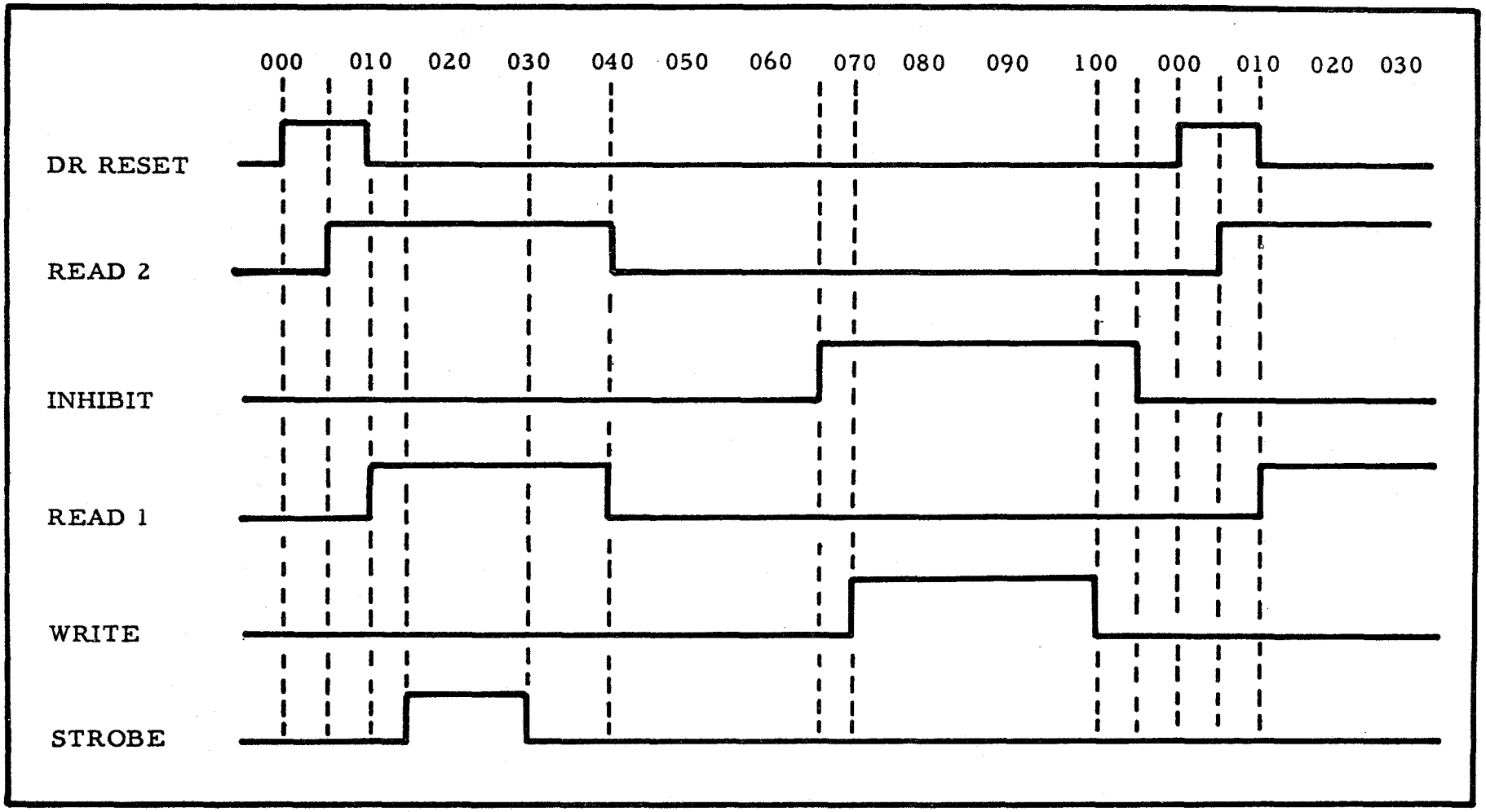
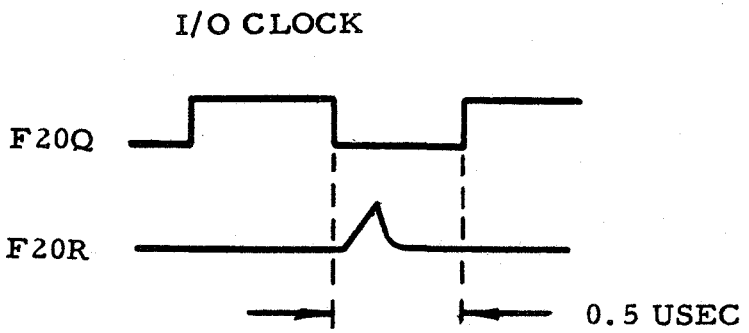


FIGURE A-2 READER-PUNCH BUFFER WAVEFORMS



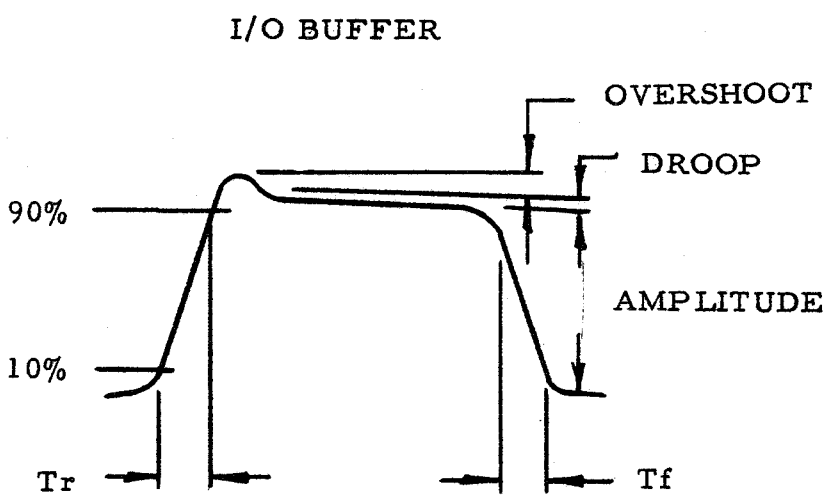
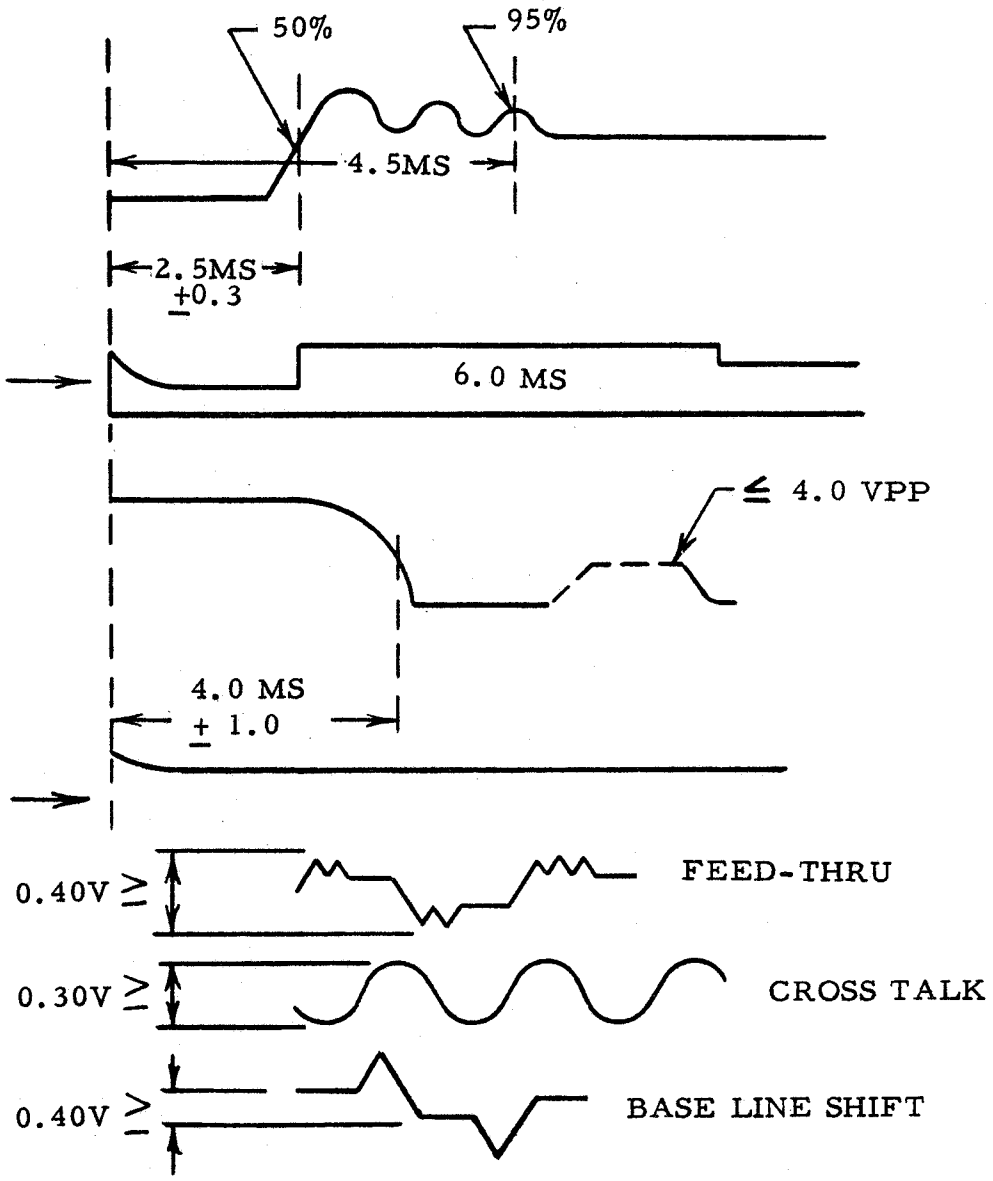
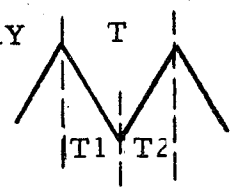


FIGURE A-3 I/O SYNCHRONIZER WAVEFORMS



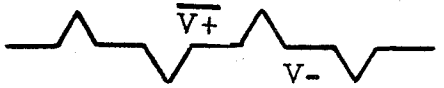
READ PULSE ASYMMETRY

TIME ASYMMETRY



T1-T2 ≤ 3.0 USEC
T = 1% OF NORMAL PERIOD OF 100.0 USEC

AMPLITUDE ASYMMETRY



(V+)-(V-) ≤ 5% NORMAL

FIGURE A-4 IBM 7330 WAVEFORMS

LINE NAME	TR (NSEC)	TF (NSEC)	MEASURED AT CHASSIS LOC
–Y START MEMORY CLOCK (FREQ)	1.33 MC		11B4H22A 11Z4H22A
–Y READ CALL	70 ± 30	100 ± 50	11B4H22B 11Z4H22B
–Y WRITE CALL	70 ± 30	100 ± 50	11B4H22E 11Z4H22E
–Y ASSEMBLY CH I BIT			11B4A04A 11Z4A04A
+S B DATA REG BIT			11B4D08A 11Z4D08A

TIMING:

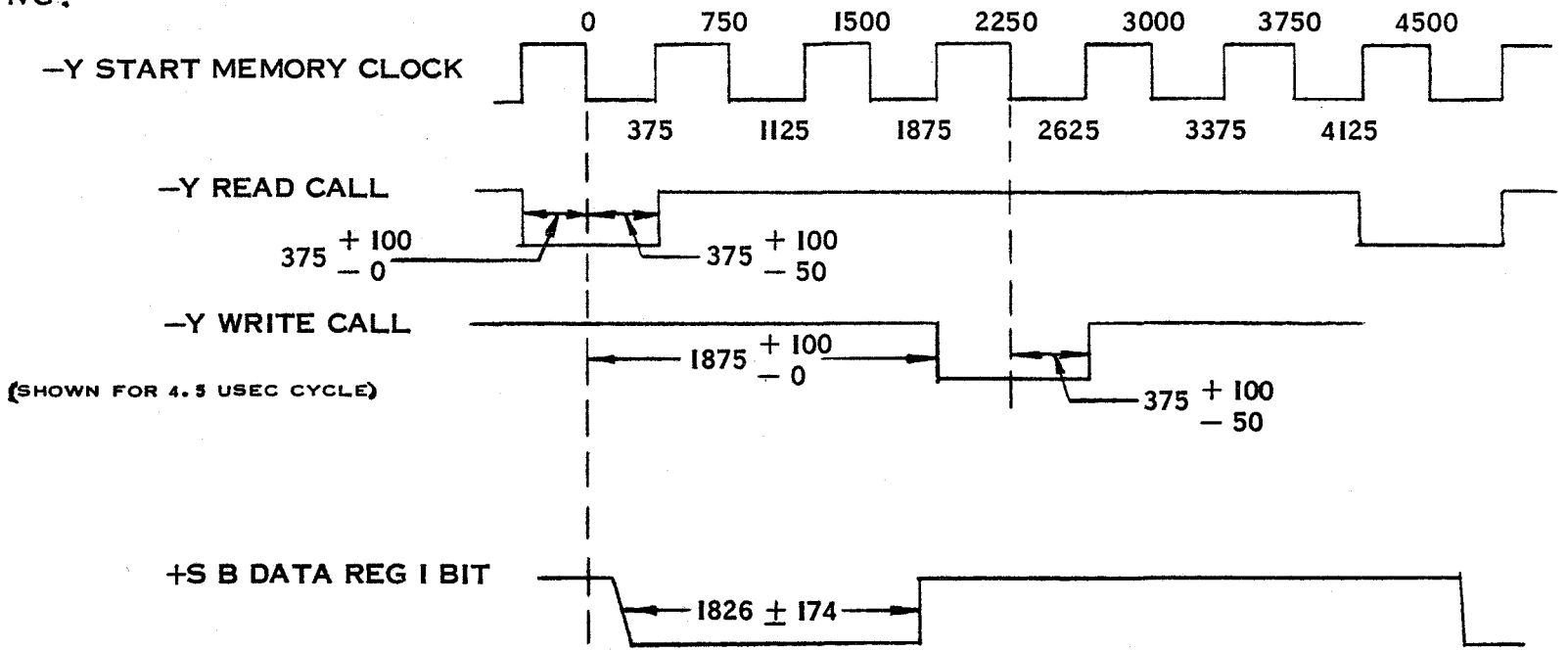


FIGURE A-5 MEMORY WAVEFORMS

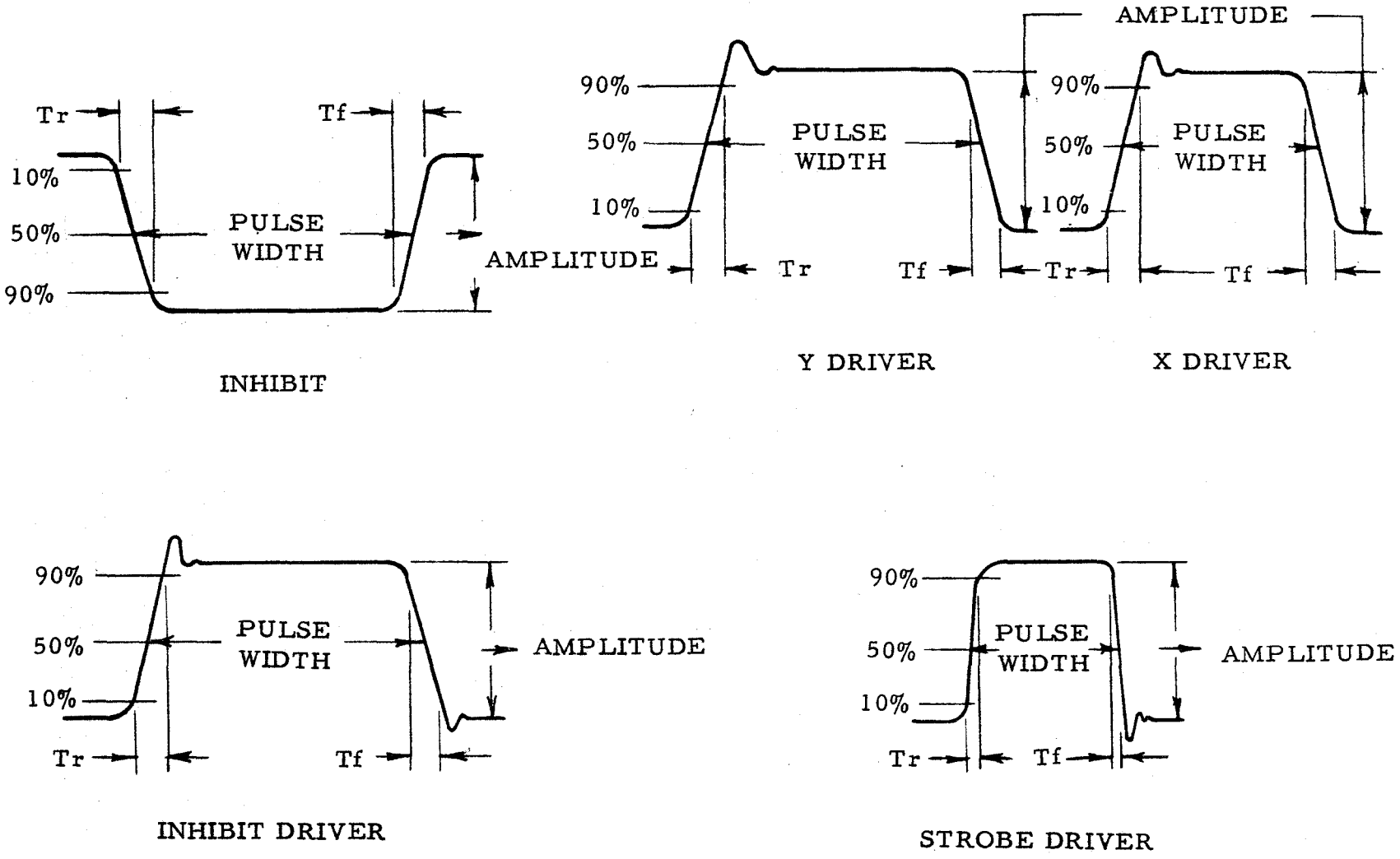
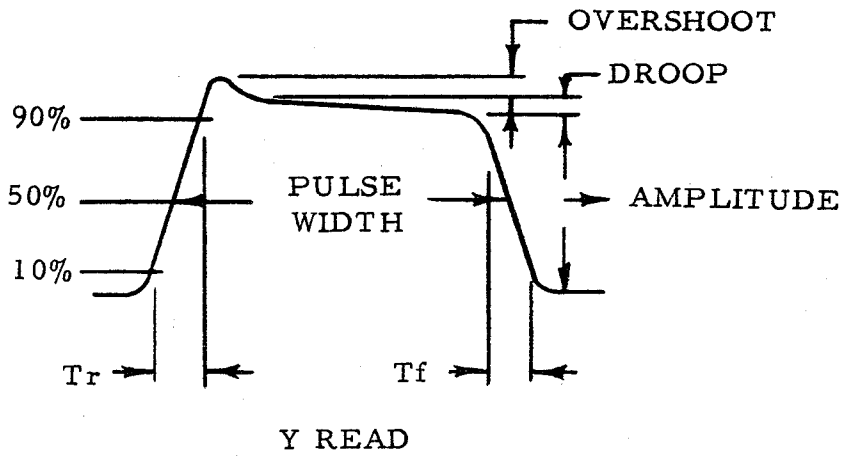
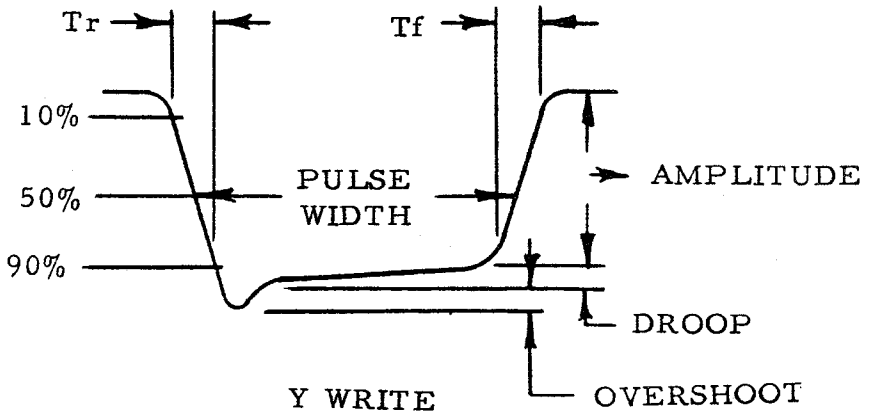


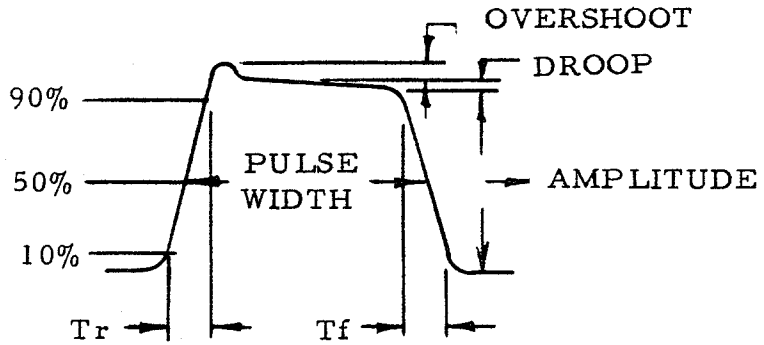
FIGURE A-6 MEMORY WAVEFORMS



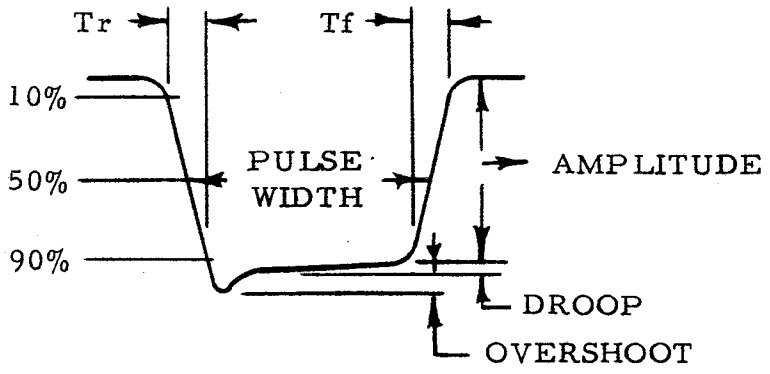
Y READ



Y WRITE



X READ



X WRITE

FIGURE A-7 MEMORY WAVEFORMS

1. SUPPLEMENTAL INFORMATION

General

The information contained in this portion of the manual has been added to expand the present coverage of the IBM 1410 System. In the future this material will be incorporated into the body of the manual.

Listed below are the contents of this appendix.

1.1 General (Continued)

9. IBM 7631 File Control Unit

   Cable Assembly 553343 (Key numbers 410, 410A, and 410B)

10. IBM 1405 Disk Storage Unit - Cabling

    10.1 IBM 1405 - External Cables
    10.2 IBM 1405 FCU to Secondary 1405's - Single Cable P/N 2130785 (Key numbers 40 and 65)
    10.3 Cable #2130789 - Key Numbers 17, 18, 19, 62, 63, and 64.

11. IBM 729 and 7330 Tape Units - Cabling

    Cable Assembly 761354 (Key numbers 36 and 37)

12. Continuity Checks

    12.1 IBM 1402 Reader Punch Unit to IBM 1414 TAU (Cable number 760741, Key number 13)

13. IBM 1411E - Internal Cable Connections

    13.1 Cable Assembly 383636
    13.2 Cable Assembly 383652
    13.3 Cable Assembly 383731

14. IBM 1411E - Features Cable Connections

2. IBM 1411Z - INTERNAL CABLE CONNECTION

For shipment the 1411Z internal cables are disconnected from all but one frame and are stored inside that frame. Cable assembly 383635 is attached and stored within the Z frame. The other five cable assemblies (383643, 383649, 383650, 383651, and 383712) remain connected to and are stored in the A frame. Figure B-1 is the 1411Z Cable Routing Diagram.

NOTE: Wire connections are listed by wire length (order of tie-off) short to long from the attached portion of the cable assembly.

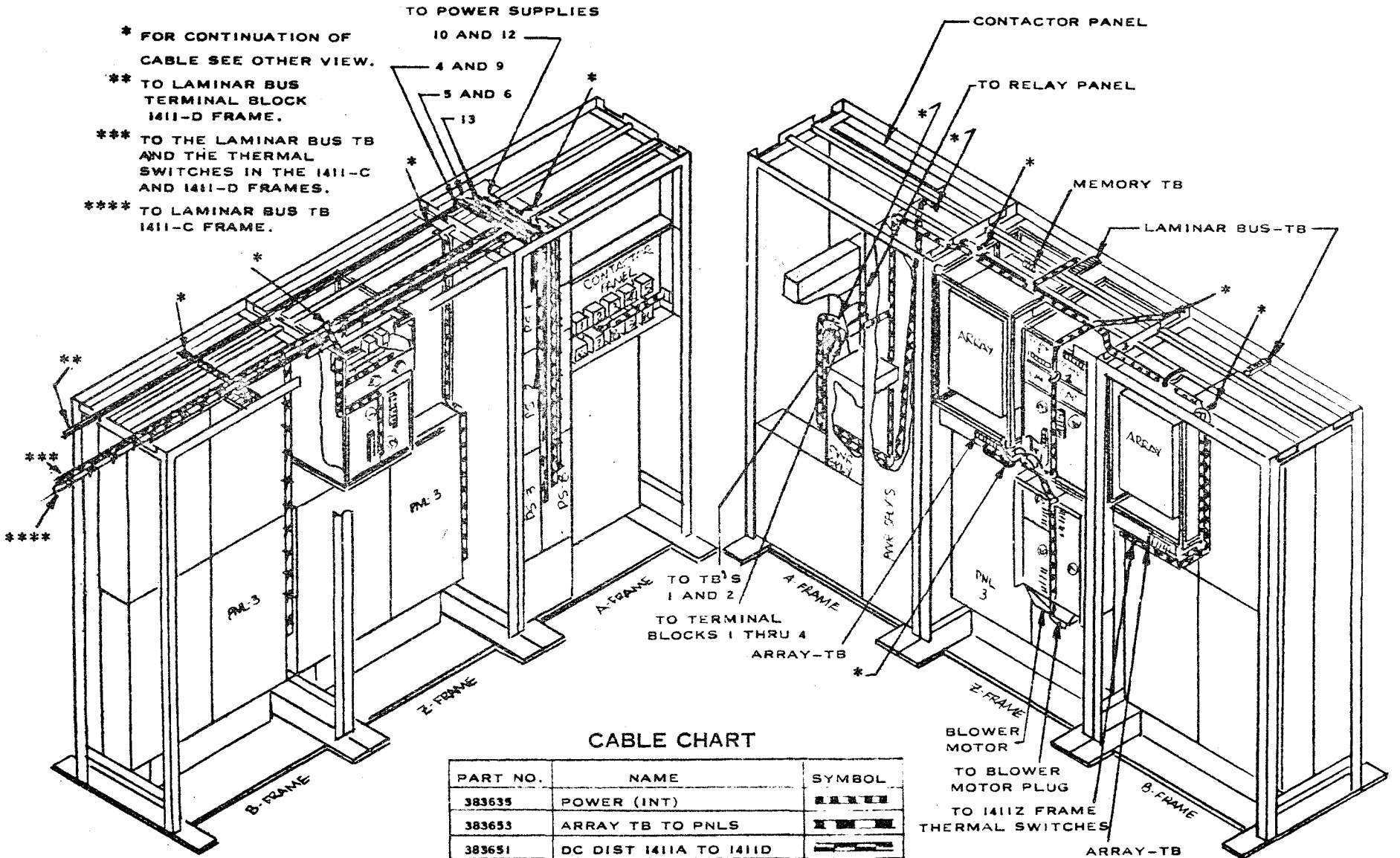
2.1 Cable Assembly 383635

A. Route the four-wire branch of the cable assembly across the tops of the frames from 1411Z to 1411B.

B. Connect the first tie-off (black wire) to Memory laminar bus, terminal 6.

C. The remaining three white-orange leads are routed to the ARRAY TB and are connected to terminals 1, 2, and 3, beginning with the first tie-off.

D. The remaining portion of the cable assembly is routed from 1411Z to 1411A across the top of the frames. Connect the leads of the cable assembly to their destination using Figure B-2 and Table B-1 for reference. The cable branch numbers have been arbitrarily assigned; the sequence generally begins with the shortest branch with respect to the previous frame.



CABLE CHART

PART NO.	NAME	SYMBOL
383635	POWER (INT)	
383653	ARRAY TB TO PNLS	
383651	DC DIST 1411A TO 1411D	
383649	DC DIST 1411A TO 1411B	
383643	VOLT 1411A TO 1411B. C & D	
383650	DC DIST 1411A TO 1411C	
383712	CHASSIS 3 TO P. S. 7 & 8	

FIGURE B-1 IBM 1411-Z CABLE ROUTING DIAGRAM

2.1 Cable Assembly 383635 (Continued)

Cable Branch No.	NO. OF WIRES IN THE TIE-OFF	COLOR	CONNECTION
	1st major tie-off 13		
1	tie-off 6	black	Relay 45-3 (pick coil B)
		white-orange	Relay 49-1 (N/O)
		yellow	Relay 50-2 (N/O)
		yellow	Relay 50-1 (OP)
		yellow	Relay 53-1 (N/C)
		yellow	Relay 53-1 (N/C)
2	4	black	Relay 21-A (OP-lower)
		black	Relay 21-A (OP-upper)
		black	Relay 22-A (N/O-lower)
		black	Relay 22-A (N/O-upper)
3	3	black	Relay 6A-4 (N/O)
		yellow	Relay 7A-6 (OP)
		yellow	Relay 10A-3 (OP)
	2nd major tie-off 10		
4	6	black	TB-P3-12
		white-orange	TB-P1-12
		black	TB-P4-3
		black	TB-P4-13
		white-orange	TB-P2-13
		black	TB-P4-14
5	4	black	K3-T2
		black	K3-T1
		black	K2-T2
		black	K2-T1

TABLE B-1 CABLE ASSEMBLY 383635, 1411A CONNECTIONS ONLY

NOTE: For additional information refer to Logic Page 98.16.02.

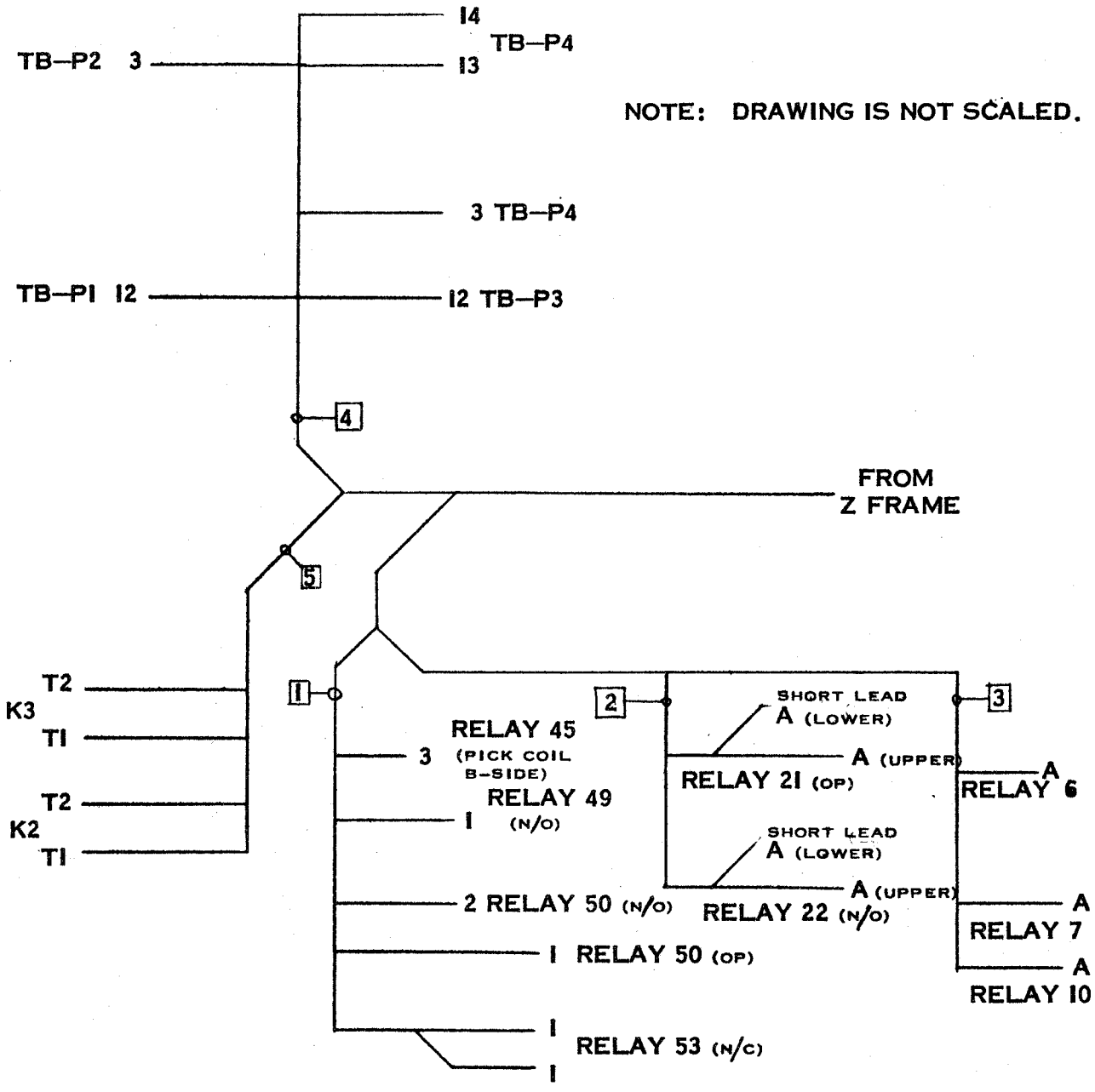


FIGURE B-2 CABLE ASSEMBLY 383635, 1411A CONNECTIONS ONLY

2.2 Cable Assembly 383643

Route the cable assembly from 1411A across the top of the frames to the destinations indicated on Figure B-3, keyed reference diagram. Refer to Table B-2 for detailed connection information.

Cable Branch No.	NO. OF WIRES IN THE TIE-OFF	COLOR	CONNECTION
1	1	red	1411B Memory Gate TB, terminal 1
2	3	red black red	1411B LB-TB-5 LB-TB-6 LB-TB-7
	15 (major)		
3	2	yellow yellow	1411B TS2 TS2
4	2	yellow	1411C TS1 TS1
5	2	red black	1411C LB-TB-5 LB-TB-6
6	1	red	1411C Ch 2 A01-A
7	2	yellow yellow	1411C TS2 TS2
8	2	yellow yellow	1411D TS1 TS1
9	2	red black	1411D LB-TB-5 LB-TB-6
10	2	yellow yellow	1411D TS2 TS2

TABLE B-2A CABLE ASSEMBLY 383643, 1411A CONNECTIONS OMITTED

2.2 Cable Assembly 383643 (Continued)

Cable Branch No.	NO. OF WIRES IN THE TIE-OFF	COLOR	CONNECTION
	16 (major)		
11	10	yellow yellow yellow black black yellow yellow red red red	1411B Memory TB-B11-1 TB-B11-1 TB-B11-2 TB-B11-4 TB-B11-5 TB-B11-7 TB-B11-7 TB-B11-8 TB-B11-9 TB-B11-10
12	2	yellow yellow	Thermoswitch (above Ch 3)
13	2	yellow yellow	Thermoswitch 2 (above Ch 4)
14	2	yellow yellow	Thermoswitch 1 (above Ch 3)

TABLE B-2B CABLE ASSEMBLY 383643,
1411A CONNECTIONS OMITTED

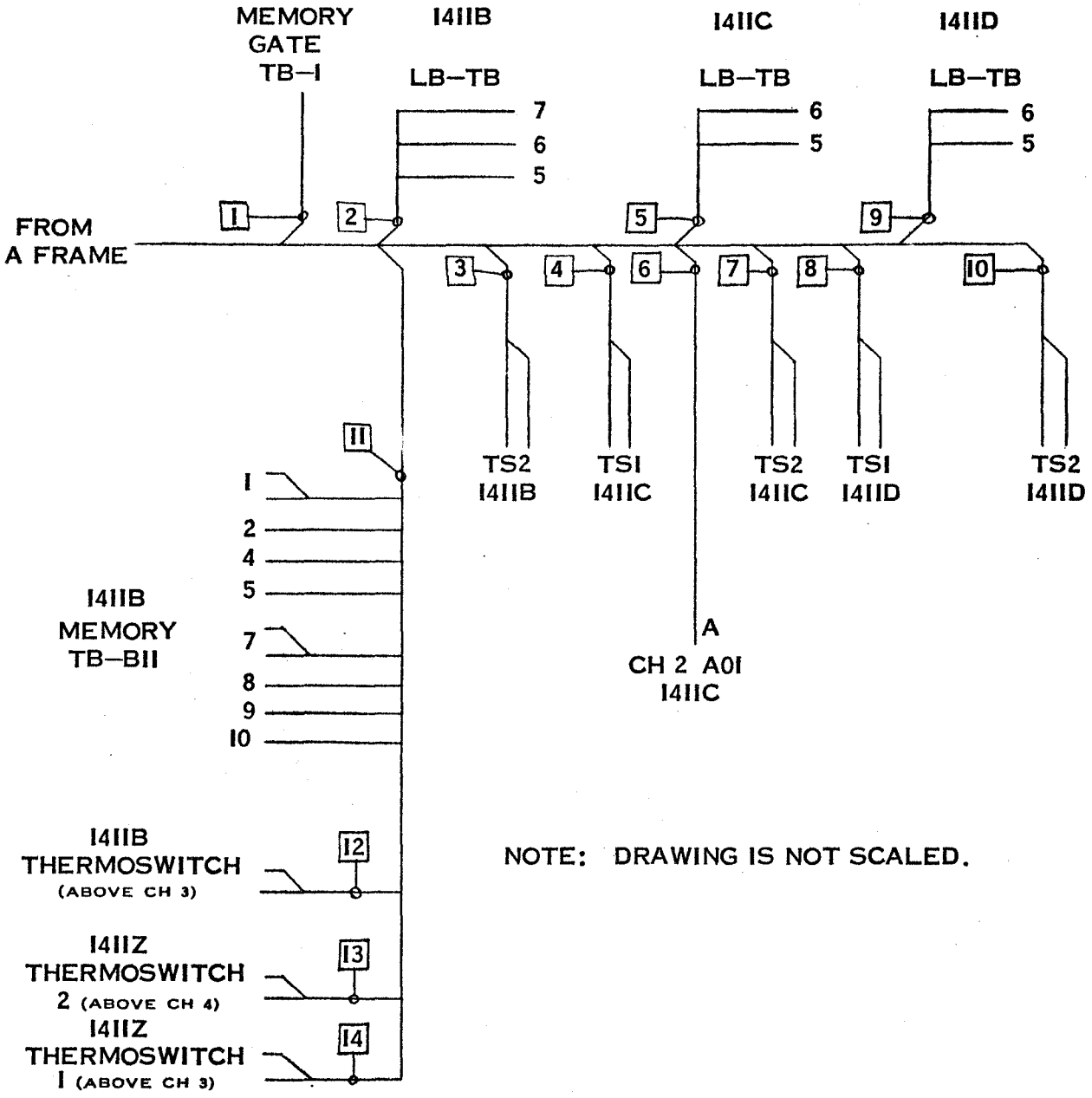


FIGURE B-3 CABLE ASSEMBLY 383643,
1411A CONNECTIONS OMITTED

2.3 Cable Assembly 383649

A. Route the cable assembly from 1411A across the top of the frames to 1411B.

B. Connect the leads as follows:

To (1411B)	From (1411A)
LB-TB-3	PS4-TB-7
LB-TB-4 (Shield)	PS4-TB-6
LB-TB-8	PS9-TB-7
LB-TB-4 (Shield)	PS9-TB-6
LB-TB-1	PS1-TB-7
LB-TB-2 (Shield)	PS1-TB-6

2.4 Cable Assembly 383650

A. Route the cable assembly from 1411A across the top of the frames to 1411C.

B. Connect the wires as follows:

Color	Destination
Red	LB-TB-1
(Shield)	LB-TB-2
White	LB-TB-3
(Shield)	LB-TB-4
Blue	LB-TB-3
(Shield)	LB-TB-4
Violet	LB-TB-7
(Shield)	LB-TB-8
Brown	LB-TB-7
(Shield)	LB-TB-8

2.5 Cable Assembly 383651

A. Route the cable assembly from 1411A across the top of the frames to 1411D.

2.5 Cable Assembly 383651 (Continued)

B. Connect the wires as follows:

Color	Destination
Red	LB-TB-1
(Shield)	LB-TB-2
White	LB-TB-3
(Shield)	LB-TB-4
Blue	LB-TB-3
(Shield)	LB-TB-4
Violet	LB-TB-7
(Shield)	LB-TB-8
Brown	LB-TB-7
(Shield)	LB-TB-8

2.6 Cable Assembly 383712

A. Route the cable assembly from 1411A across the top of the frames to chassis 3 of 1411B.

B. Connect the wires as follows:

Color	Destination
Pink	Row J-1-L
Black	J-1-J
Black	Row K-1-J
Pink	K-1-L
White-Red	Row E-1-Q
Black	E-1-J
Black	Row E-1-J
White-Red	F-1-Q
Black	Row H-17-J
Pink	H-17-L

2.7 1411Z Frame Jumper Cables

A. Interframe jumper cables are terminated at both ends with paddle connectors. They plug into card sockets located at the rear of the frames and provide signal connections between frames. Remove the inner doors at the rear of the frames to gain access to the card sockets.

B. The Z Frame jumper cables are listed below.

From	Cable P/N	To
1411B4G01	383654	1411Z4E27
G02	↓	E26
G03		E25
G04		F27
G05		F26

3. ACCELERATED THRU-PUT FEATURE CABLING

3.1 Cable Assembly 5319230

A. The cable assembly is terminated on both ends in paddle connectors which plug into tailgate connections on 1411C and 1411D. One end of the cable assemble remains attached during shipment. Route the cable through the frames to its destination.

B. The cable assembly connects:

1411C7U05	1411D7U10
1411C7U04	1411D7U09

3.2 Cable Assembly 5319237

A. This cable assembly is to be connected as follows:

1411A		Color	1411C
Power Supply 15	TB6	orange	LB-TB-9
	TB7	black	LB-TB-6

B. One end of the cable assembly is attached. Route the cable through the frames to the proper destination and connect.

3.3 Interconnect and Jumper Cables

Table B-3 lists the remaining cables necessary to complete the wiring of the Accelerated Thru-Put Feature.

PART NO.	FROM	TO
539494	11B2 A28	11C1 A01
↓	↓ B28	↓ B01
	C28	C01
	D28	D01
	E28	E01
	F28	F01
	G28	G01

TABLE B-3A ACCELERATED THRU-PUT FEATURE-CABLING

3.3 Interconnect and Jumper Cables (Continued)

PART NO.	FROM	TO
761115	11B2 H28	11C1 H01
761113	J28	11C3 A02
↓	K28	D01
539494	11B4 E28	E01
↓	F28	F01
	G28	G01
761114	11C1 A26	11D1 A02
761117	E27	11D2 D02
↓	G27	11D1 G02
	H28	↑ H02
761116	11C1 J27	11D1 B02
761114	↓ K27	K02
539494	11C2 A28	A01
↓	B28	B01
	C27	C02
	C28	C01
	D28	D01
	E27	E02
	E28	E01
	F27	F02
	F28	F01
	G28	G01
	H28	H01
	J27	J02
	J28	J01
	K28	K01
761115	11C3 E27	↓ K03
761117	↓ F27	11D2 H02
761113	11C4 A27	11D1 K08
539494	A28	11D3 A01
↓	B27	B02
	B28	B01
	C27	C02
	C28	↓ C01
761113	D28	11D1 K04
539494	11C4 E27	11D3 E02
↓	E28	E01
	F27	F02
	F28	F01
	G28	G01
	H27	H02
	H28	H01
	J28	J01
	K28	↓ K01

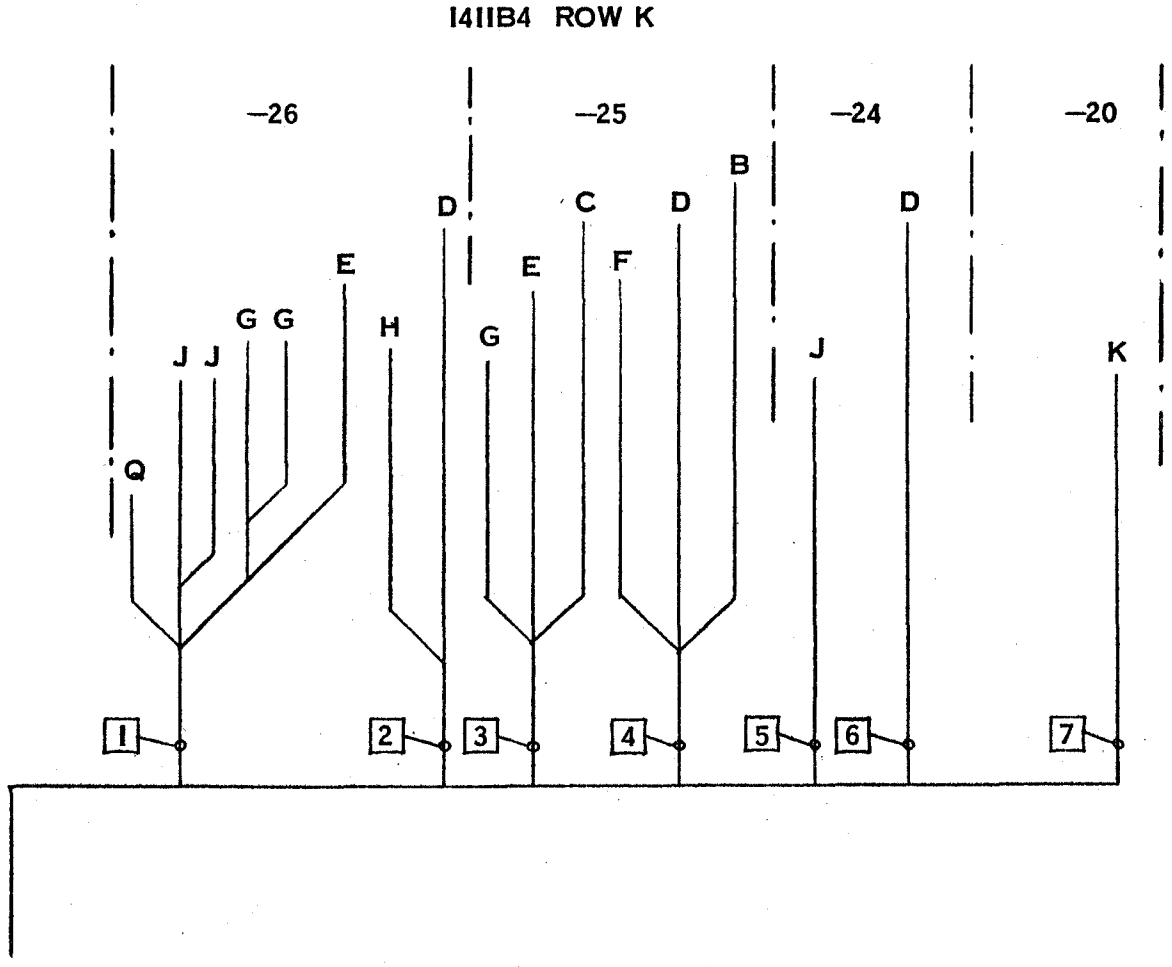
TABLE B-3B ACCELERATED THRU-PUT FEATURE-CABLING

4. PRIORITY PROCESSING FEATURE CABLE (762595)

The cable assembly is attached to 1411C7 and stored at the bottom of the 1411C frame during shipment. Connect the cable to the destinations listed in Table B-4, using the reference diagram (Figure B-4) to determine applicable tie-offs. The listing begins with the shortest wire in the first tie-off and progresses to the longest wire in the last tie-off.

Cable Branch No.	NO. OF WIRES IN TIE-OFF	COLOR	DESTINATION
1	6		1411B4 K26Q
		Black	K26J
		Black	K26J
		Black	K26G
		Black	K26G
			K26E
2	2		1411B4 K26H
			K26D
3	3	Yellow	1411B4 K25G
		Yellow	K25E
		Yellow	K25C
4	3	Yellow	1411B4 K25F
		Yellow	K25D
		Yellow	K25B
5	1	Black	1411B4 K24J
6	1		1411B4 K24D
7	1	Yellow	1411B4 K20K

TABLE B-4 CABLE ASSEMBLY 762595,
1411B CONNECTIONS ONLY



NOTE: DRAWING NOT SCALED.

FIGURE B-4 CABLE ASSEMBLY 762595, 1411B CONNECTIONS ONLY

5. INTERFACE CABLES IBM 7750 to IBM 1410

System interconnection between the 7750 and the 1410 is accomplished through two standard interface cables and an emergency off interlock cable. Complete 7750 cabling is contained in the Preliminary Installation Instructions for the IBM 7750.

The interface cables (383745 and 383746 key numbers 559B and 559A, respectively) connect 7750 frame B (C49L and C45L, respectively) to 1411E7 tailgate card positions -15. -16, -17 and -18. -19, -20, respectively.

NOTE: For channel-1 operation plug card into upper row.

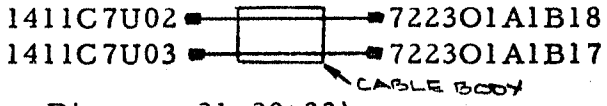
For channel-2 operation plug card into lower row.

The emergency off interlock cable (352303 key number 562) connects frame K of the 7750 with 1411A. Plug connections are indicated on the cable.

6. IBM 7223 CONSOLE CARD READER - CABLING

6.1 External Cabling - Cable 761363 (Signal)

The paddle connectors of cable assembly 761363 are connected as follows:



(Refer to System Diagram 21.20.33).

6.2 Cable Assembly 5308973

Cable Assembly 5308973 connects 1411C with 1411D. For shipment the connections at 1411C are removed and the cables assembly is stored in 1411D. Route the cable into the 1411C and connect to its destination using Figure B-5 and Table B-5 for reference.

CABLE BRANCH NO.	NO. OF WIRES IN THE TIE-OFF	COLOR	CONNECTION
1	2	Yellow Black	1411C4B16Q B16J
2	12	Yellow Black Yellow Black Yellow Black Yellow Black Yellow Black Yellow Black	1411C7U03R U03Q U03M U03N U03K U03J U03H U03G U03D U03C U03B U03A
3	14	Yellow Black Yellow Black Yellow Black Yellow Black Yellow Black Yellow Black Yellow Black	11C7 U02P U02N U02M U02L U02K U02J U02H U02G U02F U02E U02D U02C U02B U02A

TABLE B-5 CABLE ASSEMBLY 5308973, 1411C CONNECTIONS ONLY

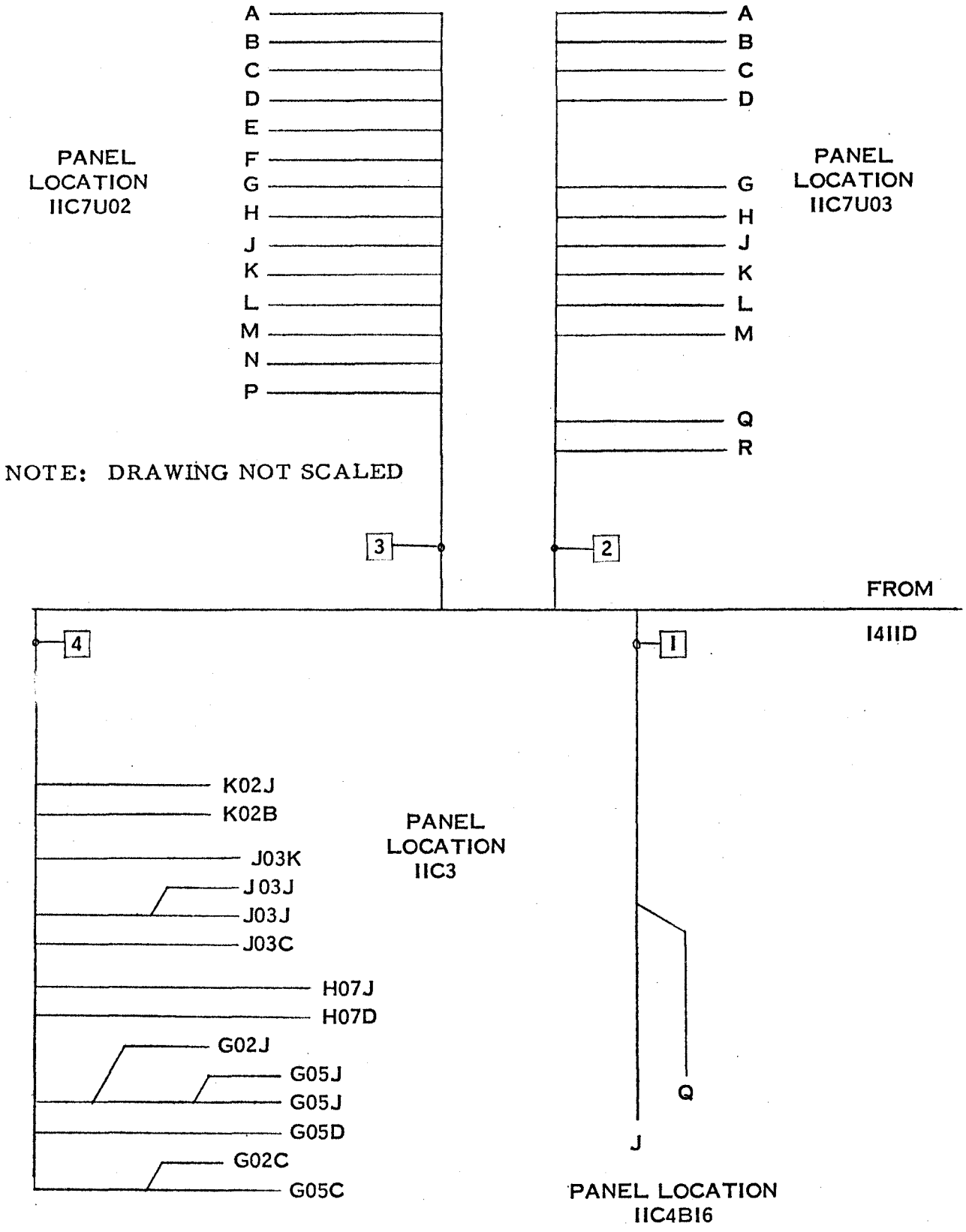


FIGURE B-5 CABLE ASSEMBLY 5308973, 1411C CONNECTIONS ONLY

7. IBM 1414 MOD III, IV and V - CABLING

7.1 External Cabling

Complete external cabling information for 1414 I/O Synchronizers is contained in Figure 2-2 and Table 2-2. In order to facilitate installation of a particular model of 1414, Table B-6, IBM 1414 Cable Usage Chart, lists the cable part numbers, with applicable key numbers for each model.

7.2 Frame Configurations

The different models of the 1414 I/O Synchronizer each have different combinations of the basic frames; refer to figure 2-2 to determine the frames used with a particular model. Also, because of the optional features available on the various models different frame configurations exist. Figure B-6 illustrates the different models of the 1414 I/O Synchronizer and indicates the chassis locations of the applicable features.

CABLE NO.	KEY NO. FOR 1414			CABLE USAGE
	MOD III	MOD IV	MOD V	
760671	506B	506B	-	
760672	506A	506A	-	
760736	504A	504A	-	Basic
	504B	504B	-	Machine
760737	505A	505A	-	Cables
760741	505B	505B	-	
761363	500A	500A	509A	
	501A	501A	510A	
761364	500B	500B	509B	
	501B	501B	510B	
761365	500C	500C	509C	
	501C	501C	510C	
761370	500F	500F	509E	
	501F	501F	510E	
763337	-	-	509F	
	-	-	510F	
760673	508B	508B	-	1403
760674	508A	508A	-	Attachment
760754	507	507	-	
761365	500E	500E	-	
	501E	501E	-	
760368	500D	500D	509D	Priority
	501D	501D	510D	Feature
760683	-	534	534	1011 Paper Tape Read
762732	-	533	533	Telegraph I/O Feature
	-	533A	533A	
762733	-	532	532	
	-	532A	532A	
762735	-	530	530	
	-	531	531	
763345	-	535	535	1009 Data Trans
761289	-	536	536	1014 Remote
	-	536A	536A	Inquiry Unit
	-	537	537	
	-	537A	537A	

TABLE B-6 IBM 1414 MOD III, IV, V; CABLE USAGE CHART

1414
MOD III
A FRAME

CH. 2	CH. 1
RD-PCH BUFFER CLOCK BUFFER CONTROLS	PRT RINGS ERROR CIRCUITS PRINTER CONTROLS CE PANEL
CH. 4	**CH. 3**
RD-PCH CONTROLS CE CONTROLS 1410 INTERFACE	PRINTER BUFFER CARRIAGE CONTROLS HAMMER MATRIX

1414
MOD IV
C FRAME | A FRAME

CH. 2	CH. 1	CH. 2	CH. 1
PWR SUPPLIES RELAY GATE	1014 OR 1009 TTY PANEL	RD-PCH-OPT BUFFERS CLOCK BUFFER CONTROLS	PRT RINGS ERROR CIRCUITS CONTROLS CE PANEL
CH. 4	**CH. 3**	**CH. 4**	**CH. 3**
TTY OR 1014 OR 1009	TTY TRANSLATOR	RD-PCH CONTROLS CE CONTROLS SERIAL DEVICE CONTROLS 1410 INTERFACE	PRINTER BUFFER CARRIAGE CONTROLS HAMMER MATRIX
CH. 6	**CH. 5**		
TTY OR 1014 OR 1009	COLUMN BINARY PAPER TAPE READER		

1414
MOD V OR VI
C FRAME | B FRAME

CH. 2	CH. 1	CH. 2	CH. 1
PWR SUPPLIES RELAY GATE	1014 OR 1009 TTY PANEL	OPT BUFFERS CLOCK BUFFER CONTROLS	PWR SUPPLIES CE PANEL
CH. 4	**CH. 3**	**CH. 4**	**CH. 3**
TTY OR 1014 OR 1009	TTY TRANSLATOR	CE CONTROLS SERIAL DEVICE CONTROLS 1410 INTERFACE OR CORP SIMPLEX INTERFACE	
CH. 6	**CH. 5**		
TTY OR 1014 OR 1009	PAPER TAPE READER		

FIGURE B-6 IBM 1414 MOD III, IV, V; FRAME CONFIGURATIONS

7.3 Internal Cabling

The internal cabling within the 1414 I/O Synchronizer will depend a large degree upon the features that are included within the system. Tables B-7 and B-8 contain the cable plug data for the IBM 1014 Remote Inquiry Unit and IBM 1009 Data Transmission Unit adapters, respectively. To fully utilize the cable plug charts, determine which chassis location the feature is mounted in (1414C1, 1414C4, or 1414C6), then refer to that portion of the cable plug chart to obtain the applicable cables. Only the interframe cables have been disconnected for shipment.

CHASSIS 14C1 CABLES		
PART NO.	FROM	TO
762792	14C1C26	CE Panel
762771	14C1A01	14A2F28
762772	14C1B01	14A4B27
	14C1B02	14A4A28
	14C1C01	14A4A27
Note	14C1C02	14A4A27
763215	14C1D26	14C2 Row F
Note	14C1D26	14C2 Row G
763214	14C2 Row F	14C7L30
		14C7L31
		14C7L33
		14C7L34
Note	14C2 Row G	14C7L36
		14C7L37
		14C7L39
		14C7L40

CHASSIS 14C4 CABLES		
PART NO.	FROM	TO
762728	14C4C26	CE Panel
762771	14C4A01	14A2H28
762730	14C4B01	14A4D27
	14C4B02	14A4C28
	14C4C01	14A4C27
Note	14C4C02	14A4C27
763216	14C4D26	14C2 Row F
Note	14C4D26	14C2 Row G
763214	14C2 Row F	14C7L30
		14C7L31
		14C7L33
		14C7L34
Note	14C2 Row G	14C7L36
		14C7L37
		14C7L39
		14C7L40

CHASSIS 14C6 CABLES		
PART NO.	FROM	TO
762729	14C6C26	CE Panel
762255	14C6A01	14A2G28
762731	14C6B01	14A4F27
	14C6B02	14A4E28
	14C6C01	14A4E27
Note	14C6C02	14A4E27
763336	14C6D26	14C2 Row F
Note	14C6D26	14C2 Row G
763214	14C2 Row F	14C7L30
		14C7L31
		14C7L33
		14C7L34
Note	14C2 Row G	14C7L36
		14C7L37
		14C7L39
		14C7L40

PART NO.	TYPE	INQUIRY
763213	Power	INQ1
763440	Power	INQ2

PART NO.	FROM	TO	STATION
761289	14C7L30	*	Inq 1 1-5
	14C7L31		
761289	14C7L33	*	Inq 1 6-10
	14C7L34		
761289	14C7L36	*	Inq 2 1-5
	14C7L37		
761289	14C7L39	*	Inq 2 6-10
	14C7L40		

NOTE: IF SECOND INQUIRY IS INSTALLED SUBSTITUTE THESE CONNECTIONS FOR THE ONES SHOWN ABOVE.

* WALL BOX

TABLE B-7 CABLE PLUG DATA, IBM 1014 REMOTE INQUIRY UNIT

CHASSIS 14C1		
PART NO.	FROM	TO
762792	14C1 C26	CE Panel
762771	14C1 A01	14A2 F28
762771	14C1 A02	14A2 E28
762772	14C1 B01	14A4 B27
	14C1 B02	14A4 A28
	14C1 C01	14A4 A27
763344	14C1 D26	14C7 L12
	14C1 E26	14C7 L14
	14C1 E25	14C7 L17
	14C1 F26	14C7 L18
	14C1 F25	14C7 L20
763345	14C7	1009
CHASSIS 14C6		
762729	14C6 C26	CE Panel
762255	14C6 A01	14A2 G28
762255	14C6 A02	14A2 E28
762731	14C6 B01	14A4 F27
	14C6 B02	14A4 E28
	14C6 C01	14A4 E27
763342	14C6 D01	14C7 L12
	14C6 E01	14C7 L14
	14C6 E02	14C7 L17
	14C6 F01	14C7 L18
	14C6 F02	14C7 L20
763345	14C7	1009
CHASSIS 14C4		
762728	14C4 C26	CE Panel
762771	14C4 A01	14A2 H28
762771	14C4 A02	14A2 E28
762730	14C4 B01	14A4 D27
	14C4 B02	14A4 C28
	14C4 C01	14A4 C27
763343	14C4 D01	14C7 L12
	14C4 E01	14C7 L14
	14C4 E02	14C7 L17
	14C4 F01	14C7 L18
	14C4 F02	14C7 L20
763345	14C7	1009

TABLE B-8 CABLE PLUG DATA, IBM 1009 DATA TRANSMISSION UNIT

8. IBM 1014 INSTALLATION CABLING

The detailed installation cabling for IBM 1014 Remote Inquiry Unit is illustrated in Figure B-7. This figure supplements the information contained in Figure 2-2 and Table 2-2.

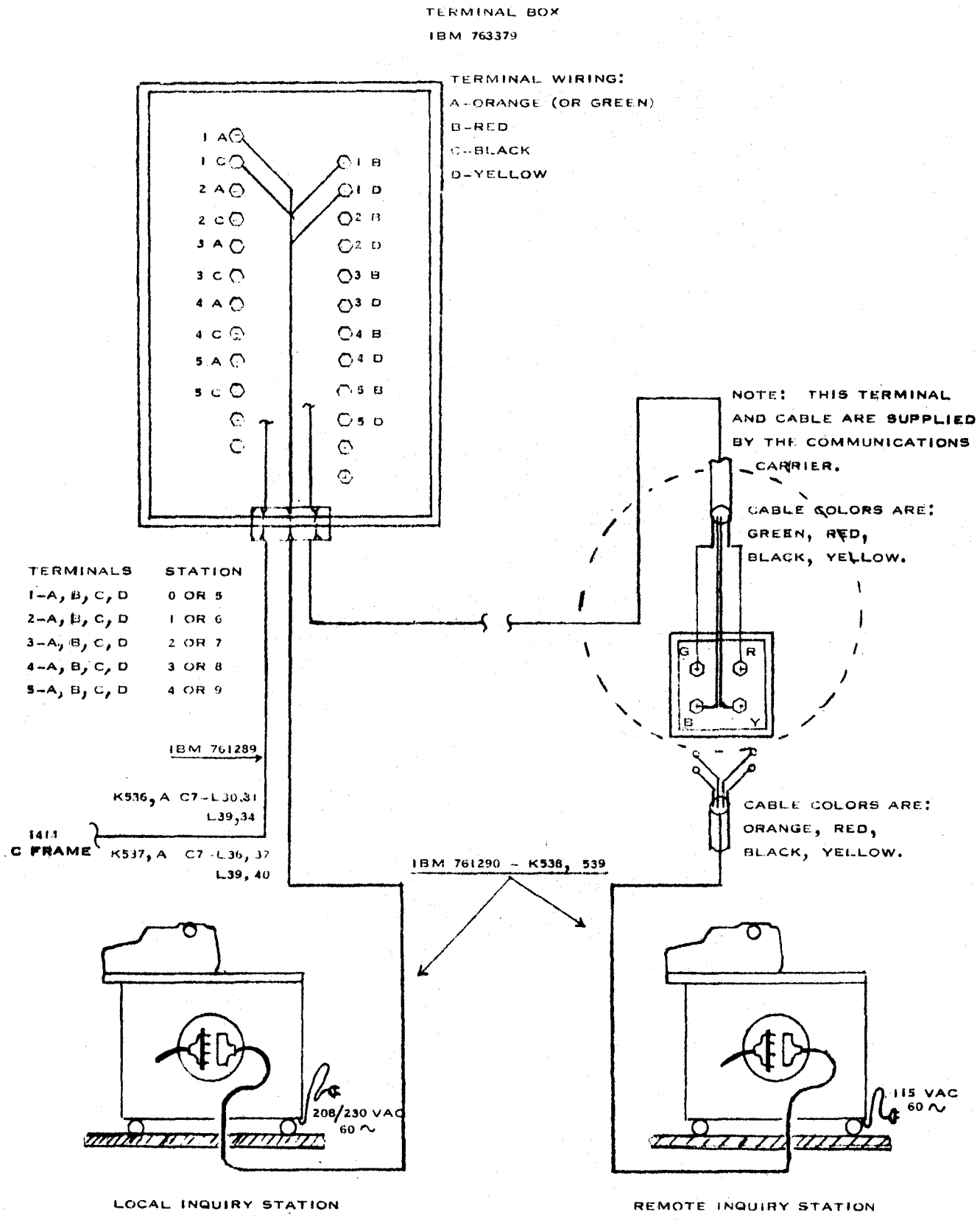


FIGURE B-7 IBM 1014 INSTALLATION CABLING

9. IBM 7631 FILE CONTROL UNIT

Instructions for the installation of the IBM 7631 are contained in IBM 7631 File Control Unit Reference Manual (Form No. R23-2541-1).

Cable Assembly 553343 (Key numbers 410, 410A, and 410B)

Routing of cable assembly 553343 is contained in Table 4-4; however, detailed connection information is not included. Refer to Tables B-9 and B-10 for the Connector Chart of the IBM 1410 and IBM 7631 connections.

Cable Key Numbers	Channel	Conn Pos	Card Identification
410	E	1411D7U03 -	A -
410a	E	1411C7L27 1411C7L28	A B
410b	E	1411D7U01 1411D7U02	A B
410	F	1411D7U08 -	A -
410a	F	1411D7U07 1411D7U05	A B
410b	F	1411D7U06 1411D7U04	A B

TABLE B-9 CABLE 553343 CONNECTOR CHART, IBM 1410 CONNECTIONS

Model Number	Cable Key Numbers	Conn Pos 1st System	Conn Pos 2nd System
I	410 410a 410b	U11 U09 L09	- - -
III	410 410a 410b	- - -	U15 L13 U13
V	410 410a 410b	U11 U09 L09	L11 L13 U13

TABLE B-10 CABLE 553343 CONNECTOR CHART, IBM 7631 CONNECTIONS

10. IBM 1405 DISK STORAGE UNIT - CABLING

10.1 IBM 1405 - External Cables

Several of the cables and their air hoses which connect the 1405's are not adequately marked to assure proper placement in the floor, and connection. Several sketches and supplemental instructions follow which will assure proper placement and connection of these cables.

See Figures B-8 to B-12, inclusive.

1405 FILE COMPRESSOR

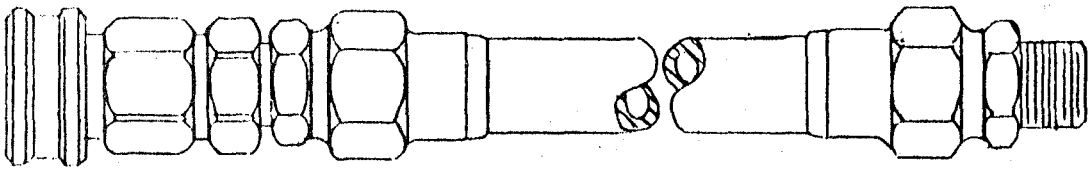
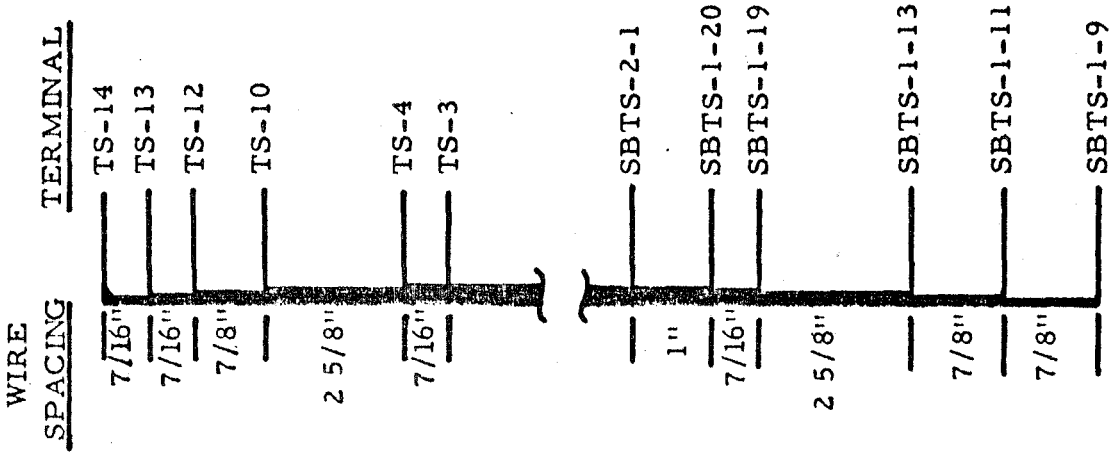


FIGURE B-8 AIR HOSE - P/N 2130236 (KEY 51)

To Connections in
Compressor
Starter Box

From Connections in
1405 - Control File
Starter Box



NOTE: Check spacing of wires as they are tied off in cable, to determine end of cable which connects the compressor, and the Control File, respectively.

FIGURE B-9 CABLE - P/N 2130759 (KEY 57)

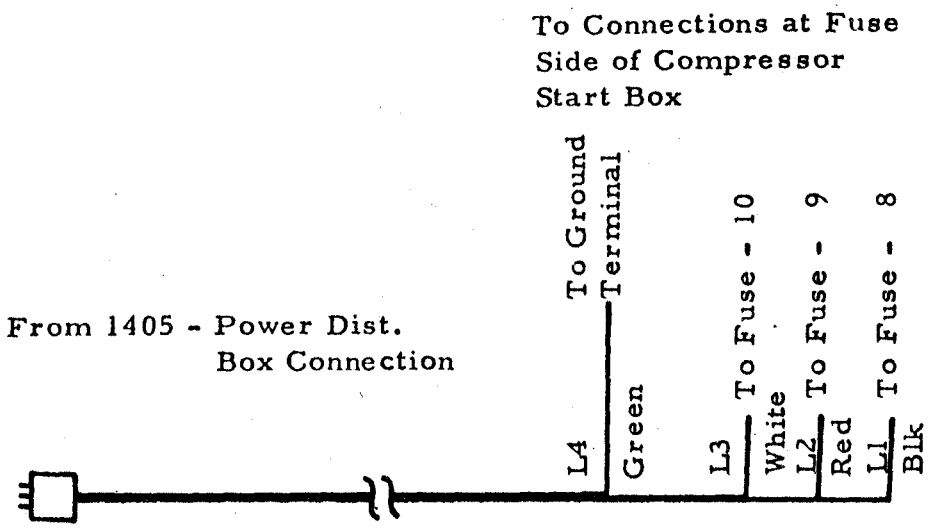


FIGURE B-10 CABLE - P/N 2130760 (KEY 16 and 61)

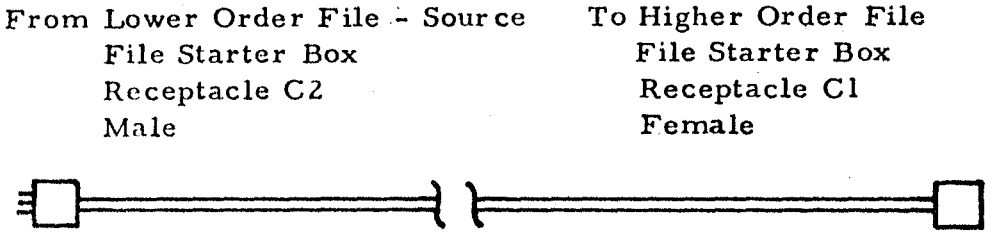


FIGURE B-11 CABLE - P/N 2130771
(KEY 58 thru 61 and 58A thru 61A)

10.2. IBM 1405 FCU to Secondary 1405's - Signal Cable P/N 2130785 (Key 40 & 65)

These cables are not marked with sufficient information since the logical addresses of the various units with respect to their physical floor locations are not known, prior to shipment.

As previously indicated the Address of the File Control Unit is module Ø (zero) followed by module 1, 2, 3 and 4 for succeeding units on a maximum channel group. Check the floor plan assignment, and/or floor marking to determine the address of the various physical locations of the 1405's. (Instructions for determining the File Address and Marking tne floor plan and floor are provided under Preparation of Machine Area.)

Mark the cables in accordance with Figure B-12 and the following instructions:

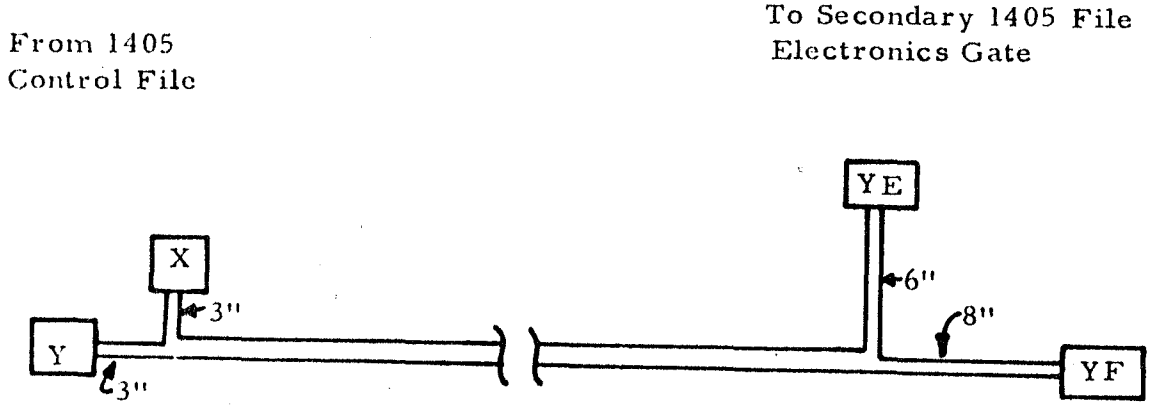


FIGURE B-12 CABLE - P/N 2130785 (KEY 40 and 65)

10.2 IBM 1405 FCU to Secondary 1405's (Continued)

A. If the cable is not marked with the "X", "Y", "YE" and "YF" designations the connectors may be identified by checking with an ohmmeter. The pins in the "YE" connector (6" branch) are wired 1 to 1, 2 to 2, etc. with the "X" connector. Pins in the "Y" and "YF" connectors are similarly wired.

B. Mark or tag the connector as indicated above and in addition identify the 6" and 8" branches with the address of the secondary file that will be connected by the cable. (If time permits the full connector designations (see step C) may be marked on the cables at this time. This will permit plugging of the cables without further reference when the Disk Files are positional.

C. The complete cable plugging designations for each address are provided in Table B-11. Cables will be plugged at the location indicated for each secondary file address.

1405 Secondary File Address	From Plugging Location 1405 Control File (FCU)	To Plugging Location Secondary - 1405 File Elect. Gate (FEG)
* Module Ø	01A2XB 01A2XF	01B1YE 01B1YF
Module 1	01A1XH 01A1YH	01B1YE 01B1YF
Module 2	01A1XG 01A1YG	01B1YE 01B1YF
Module 3	01A1XF 01A1YF	01B1YE 01B1YF
Module 4	01A1YB 01A1YC	01B1YE 01B1YF

* Module Ø (zero) is always the address for the 1405-File Control Unit.

The interconnecting cable is installed at the factory prior to shipment.

(For additional reference see logic 75.20.71.1).

TABLE B-11 CABLE ADDRESS ASSIGNMENTS - P/N 2130785
(KEY 40 thru 43 and 65 thru 68)

10.3 Cable #2130789 - Key #'s 17, 18, 19, 62, 63 and 64

The cable end with the twist connector goes into the 1405 File Control power distribution box, (Key #17, 18 for Channel 1 and Key 62 and 63 for Channel 2). The twist connectors for cables with Key #19 and 64 go to the 4th File Control respectively for Channels 1 and 2. The other end of these cables are provided with ring tongue terminals which are connected to terminal CB-1 in the secondary file starter box as follows:

Black wire to L1

Red wire to L2

White wire to L3

Green wire to GND Lug

11. IBM 729 and 7330 TAPE UNITS - CABLING

External cable routing for the IBM 729 and 7330 is contained in Table 2-3.

Cable assembly 761354 (Key #'s 36 and 37)

Cable assembly 761354 connects the IBM 1414 TAU to the applicable Tape Drive Unit (IBM 729 and 7330). Table B-12 is the plugging chart for the cable.

1414D to Card Socket Position	1414D to 729 Tape Drive (Key No. 36)	1414D to 7330 Tape Drive (Key No. 37)
A	Lower - 1	Lower - 7
B	Upper - 1	Upper - 7
C	Lower - 2	Lower - 8
D	Upper - 2	Upper - 8
E	Lower - 3	Lower - 9
F	Upper - 3	Upper - 9
G	Lower - 4	Lower - 10
H	Upper - 4	Upper - 10

TABLE B-12 CABLE 761354 PLUGGING CHART

12. CONTINUITY CHECKS

IBM 1402 Reader Punch Unit to IBM 1414 TAU (Cable #76074, Key #13)

To avoid the possibility of blowing hammer driver fuses and/or hammer drive coils make the following continuity checks before applying power:

Check the wires in cable key 13 for continuity between:

a) 1402 DC4 - 1 and 1414-III TBA4 - 2

b) 1402 DC4 - 2 and 1414-III TBA4 - 1

Also check that there is continuity between TBA4-2 and TBA3-12. This is the -60V DC return for the IBM 1403 Printer. See Systems page 98.14.11.0.

13. IBM 1411E - INTERNAL CABLE CONNECTIONS

Three cable assemblies (383636, 383652, and 383731) connect power to the 1411E frame from other 1411 frames. Installation of these cables, which are stored and already connected to the 1411E frame, consists of routing the cables to their destinations and making proper connections. Figure B-13 is the 1411E Cable Routing Diagram. The following paragraphs describe the detailed connections.

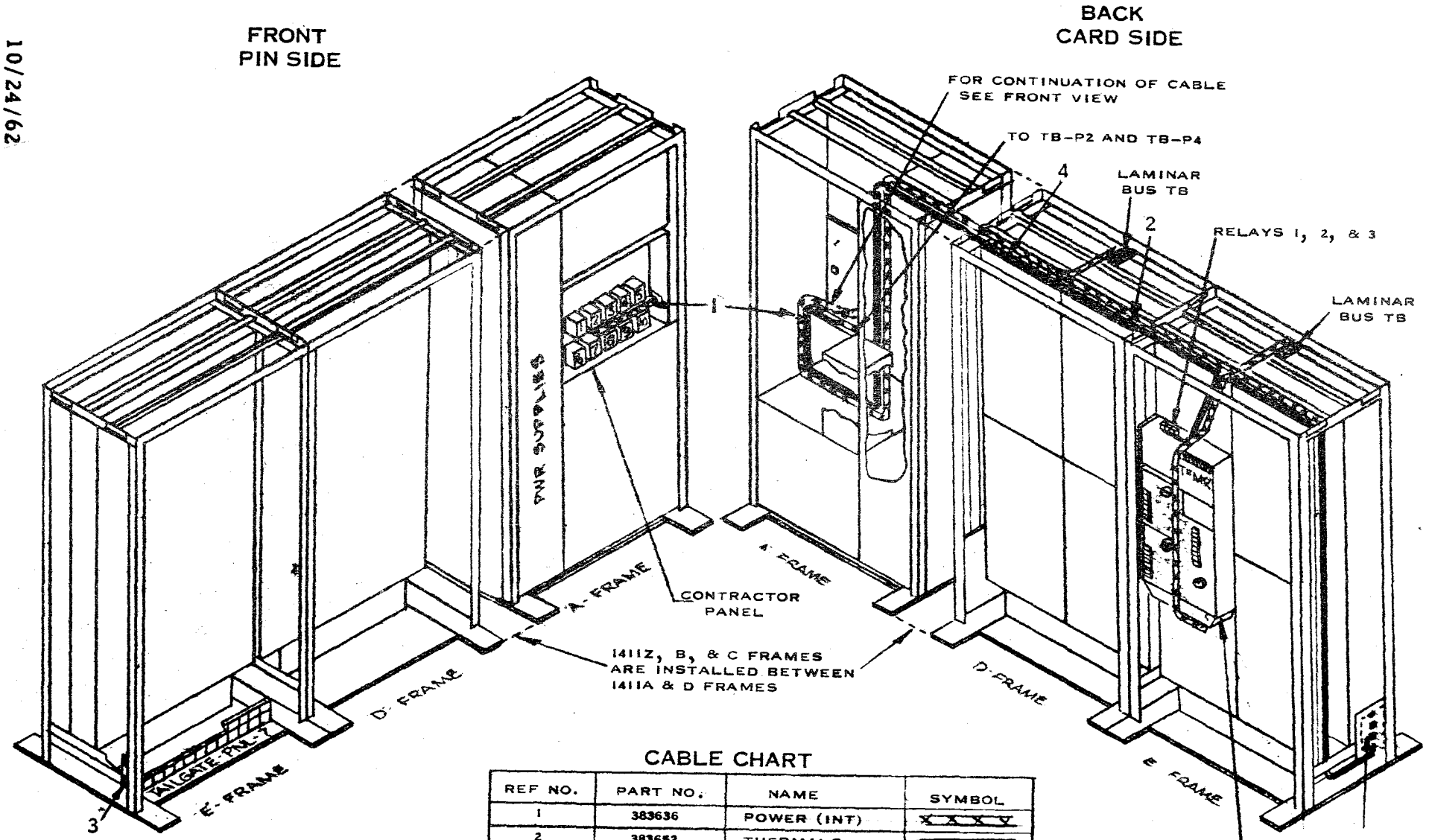
NOTE: Wire connections are listed by wire length (order of tie-off) short-to-long from the attached portion (E frame).

13.1 Cable Assembly 383636

A. Connect the single black lead to 1411D, laminar bus terminal 6.

B. Connect the four remaining leads to 1411A as follows:

Wire Color	Destination
black	TB-4-2
white-orange	TB-2-13
black (short)	K2-T4
black (long)	K2-T3



CABLE CHART

REF NO.	PART NO.	NAME	SYMBOL
1	383636	POWER (INT)	
2	383652	THERMALS	
* 3	383711	TB TO TAILGATE	
4	383731	RELAYS TO TB'S	

* CABLE ASSEMBLY 383711 IS PERMANENTLY INSTALLED

FIGURE B-13 IBM 1411E CABLE ROUTING DIAGRAM

13.2 Cable Assembly 383652

A. Connect the wire originating at thermal switch 1 on 1411E to thermal switch 2 on 1411D.

B. Connect the wire originating at thermal switch 2 on 1411E to return line 1411D.

NOTE: It may be necessary to unhook the return in 1411D in order to make the above connection.

13.3 Cable Assembly 383731

Connect the short lead to TB-P4-15 in 1411A and the long lead to TB-P4-7 in 1411A.

14. IBM 1411E - FEATURES CABLE CONNECTIONS

The cable connections for the features contained in the 1411E frame are summarized in Table B-13. For installation only interframe cables must be connected; the internal frame cables have been connected prior to shipment.

The chart contains the following information:

A. Feature name

B. Location of the feature in the E frame

NOTE: The E frame panels are designated E1-E7 and F1-F7 from top to bottom, with the F panels on the left as the frame is viewed from the pin side. Panels E7 and F7 are tailgate connector panels.

C. Cable Reference Number (not equivalent of a cable key number)

D. Cable Part Numbers

E. Connector Positions

To utilize the chart for a particular feature, read down that feature column noting the X's, which indicates an applicable connection.

In cases where two features prescribe the same reference number (same connector positions), only one set of cables is required to incorporate both features.

14. IBM 1411E - FEATURES CABLE CONNECTIONS (Continued)

Example: Incorporation of SIF Channel 2 and 1414 2nd Channel I/O. For the SIF Channel 2 feature reference numbers 5, 7, 8, 10, 19, 25, 29, 35, and 36 are applicable. For the 1414 2nd Channel I/O feature reference numbers 3, 7, 8, 9, 10, 11, 12, 17, 20, 25, 35, and 36 are applicable. Connect one set of each of the cables referenced. Reference numbers 7, 8, 10, 25, 35, and 36 are common to both features.

Figure B-14 is the IBM 1411E Cable Routing Diagram. It includes all the cables listed in Table B-13 with the exception of cable assembly 383723 (Reference No. 36) which is illustrated in Figure B-15.

REF NO.	CABLE PART NO.	CONNECTOR POSITIONS	E FRAME LOCATION AND FEATURE										
			E1	E2	E3	E4	E5		F1	F2	F3	F4	F5	F6
			SIF CH1	SIF CH2			1412/19 CH1	1412/19 CH2						1414 2ND CH I/O
1	383762 383684	IIE6A01 IID7U25 IID3Z5–8	X				X	X						
2		IIE6A03 IID7U27 IID3Z9–12	X				X							
3		IIE6A05 IID7U29 IID3ZI3–16												X
4		IIE6A07 IID7U31 IID3ZI7–20	X											
5		IIE6A09 IID7U33 IID3Z21–24		X										
7	383762 383683	IIE6AI3 IID7U37 IID4Z5–8		X				X						X
8		IIE6AI5 IID7U39 IID4Z9–12		X				X						X
9		IIE6AI7 IID7U41 IID4ZI3–16												X
10		IIE6AI9 IID7U43 IID4ZI7–20		X										X
11		IIE6A21 IID7U45 IID4Z21–24												X
12	383762 383683	IIE6A23 IID7U47 IID4Z25–28												X
17	383762 383682	IIE6B05 IID7UI7 IIDIYI3–16												X
18	383762 383683	IIE6BI3 IID7U40 IID4Z0I–04						X						
19	383762 383682	IIE6B07 IID7UI9 IIDIY9–12	X	X			X	X						
20		IIE6B09 IID7U21 IIDIY5–8					X	X						X
21		IIE6BII IID7U23 IIDIYI–4					X	X						

TABLE B-13A IBM 1411E FRAME - FEATURES
CABLE INSTALLATION CHART

REF NO.	CABLE PART NO.	CONNECTOR POSITIONS	E FRAME LOCATION AND FEATURE										
			E1	E2	E3	E4	E5		F1	F2	F3	F4	F5	F6
			SIF CH1	SIF CH2			1412/19 CH1	1412/19 CH2						1414 2ND CH I/O
24	383763 383682	IIE6C05 IIC7U29 IICIY17–19					X	X						
25	383763 383684	IIE6C07 IIC7U31 IIC3Z13–16	X	X			X	X						X
26		IIE6C09 IIC7U33 IIC3Z17–20	X											
29	383763 383683	IIE6CI5 IIC7U39 IIC4Z13–16	X	X			X	X						
35	383763 383681	IIE6C27 IIC7U51 IIC2Y17–20	X	X										X
36	383723	IIE6A27 IIB4T22–24	X	X										X *

* PRIORITY PROCESSING 2ND CH

TABLE B-13B IBM 1411E FRAME - FEATURES
CABLE INSTALLATION CHART

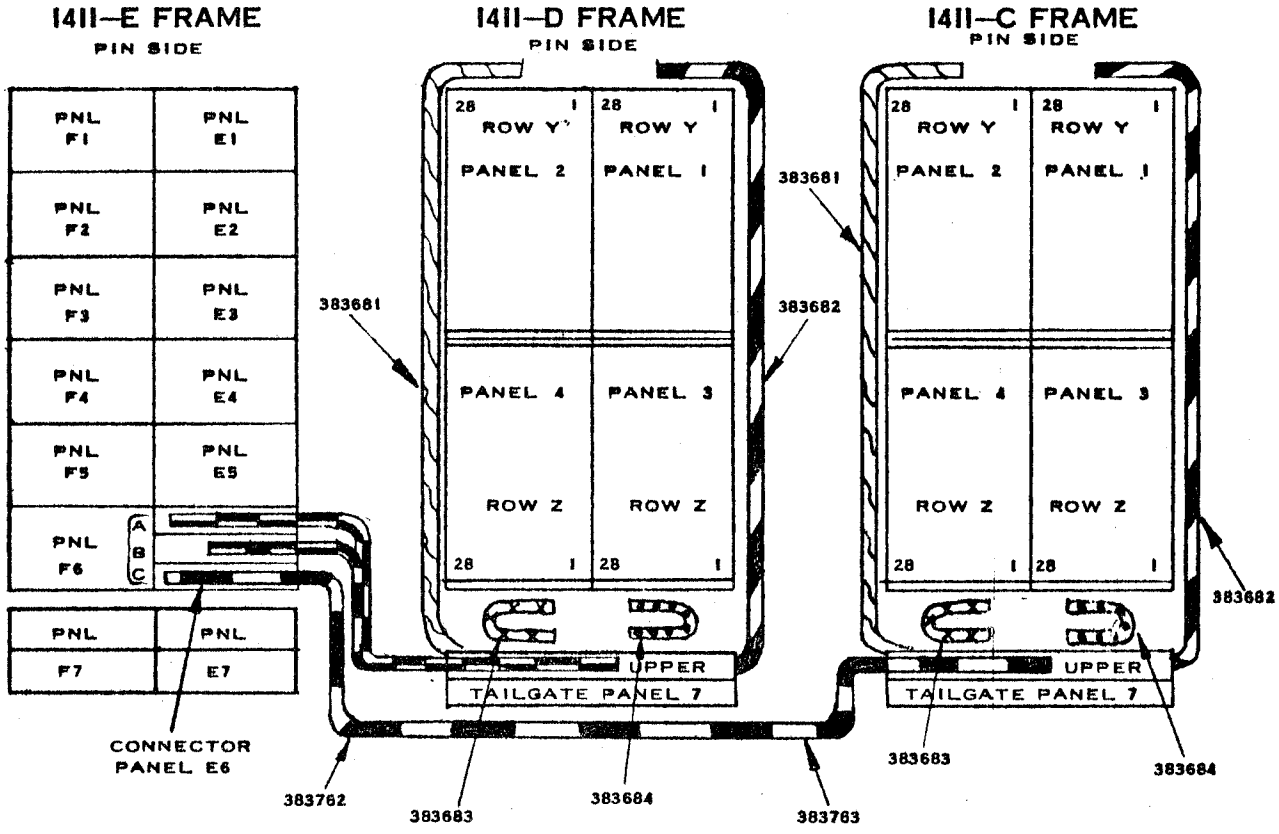


FIGURE B-14 IBM 1411E-FEATURES CABLE ROUTING DIAGRAM

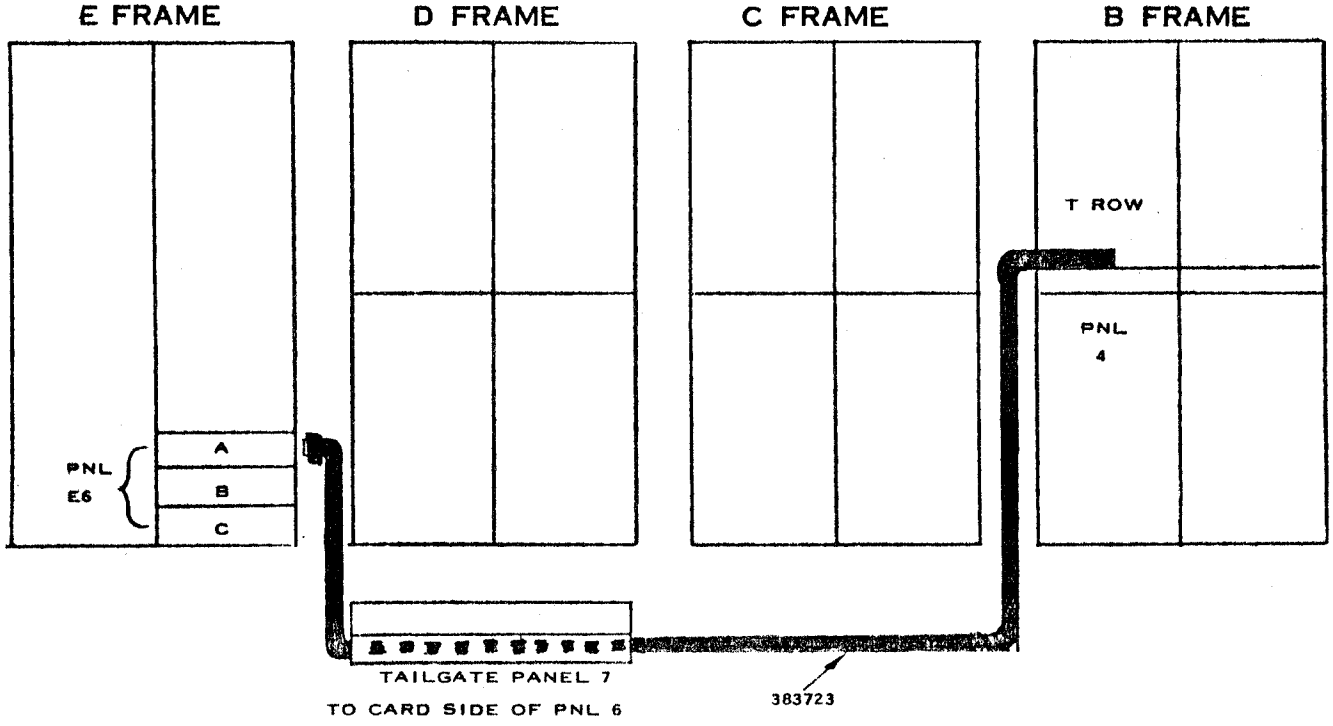


FIGURE B-15 CABLE ASSEMBLY 383723 ROUTING DIAGRAM

C Cables, P/N (continued)

I (continued)

S (continued)

TABLE 5-1 1414 TAU EXTERNAL CABLE CONNECTIONS

Key No.	Part No.	Red Tag - From	White Tag - To	Ch
8	760739	1411A-CC3	1414D	1
9	760739	1411A-CC5	1414D	2
24	761367	1411C7	1414D7 L12 to L18	1
26	761368	1411D7	1414D7 L12 to L18	2
36	761354	1414D L1, 2, 3, 4 U1, 2, 3, 4	729	1/2
37	761354	1414D L7, 8, 9, 10 U7, 8, 9, 10	7330	1/2
80	350880	1411D7	1414D7 L11	2
80a	350880	1411D7	1414D7 L11	1

TABLE 5-2 CABLE 761354 PLUGGING CHART

1414D to Card Socket Position	1414D to 729 Tape Drive (Key No. 36)	1414D to 7330 Tape Drive (Key No. 37)
A	Lower - 1	Lower - 7
B	Upper - 1	Upper - 7
C	Lower - 2	Lower - 8
D	Upper - 2	Upper - 8
E	Lower - 3	Lower - 9
F	Upper - 3	Upper - 9
G	Lower - 4	Lower - 10
H	Upper - 4	Upper - 10

Power Distribution and Control Sequence

The AC CB1 supplies power to pick K1 through the emergency off reset. K1 applies power to T1. R6 holds with T1 power if the system interlock and emergency off are a complete circuit. The power on switch depressed causes R1, K2 and R2 to pick and the power on indicator to light. K2 applies power to the blower. R1 picks R3 and the thermal indicator goes off. R3 picks K3; K3 applies line power to the DC +12 and −12 volt supplies. The output of the supplies causes R5 to pick. (R5 picks at 22 volts and drops at 14 volts.) R5 picks R4 and causes the DC on indicator to light; R4 drops R1 to complete the sequence. If the DC power drops below 14 volts, R5 drops causing K3 and R4 to drop, which removes the line power from both DC supplies. The DC off has the same effect as R5.

Minus six volts for NAND circuits in supplies from SMS cards are shown on ALD page 90.34. The ACY card at 5A supplies the reference (−6 volts) for the remaining driver cards on ALD page 90.34.

SHIFT REGISTER TEST (Eight-bit Mode)

HAO-CE WRITE AGC of HA-1
(All active levels are negative)

For convenience, set the write inhibit switch on and a seek to a CE track is not necessary.

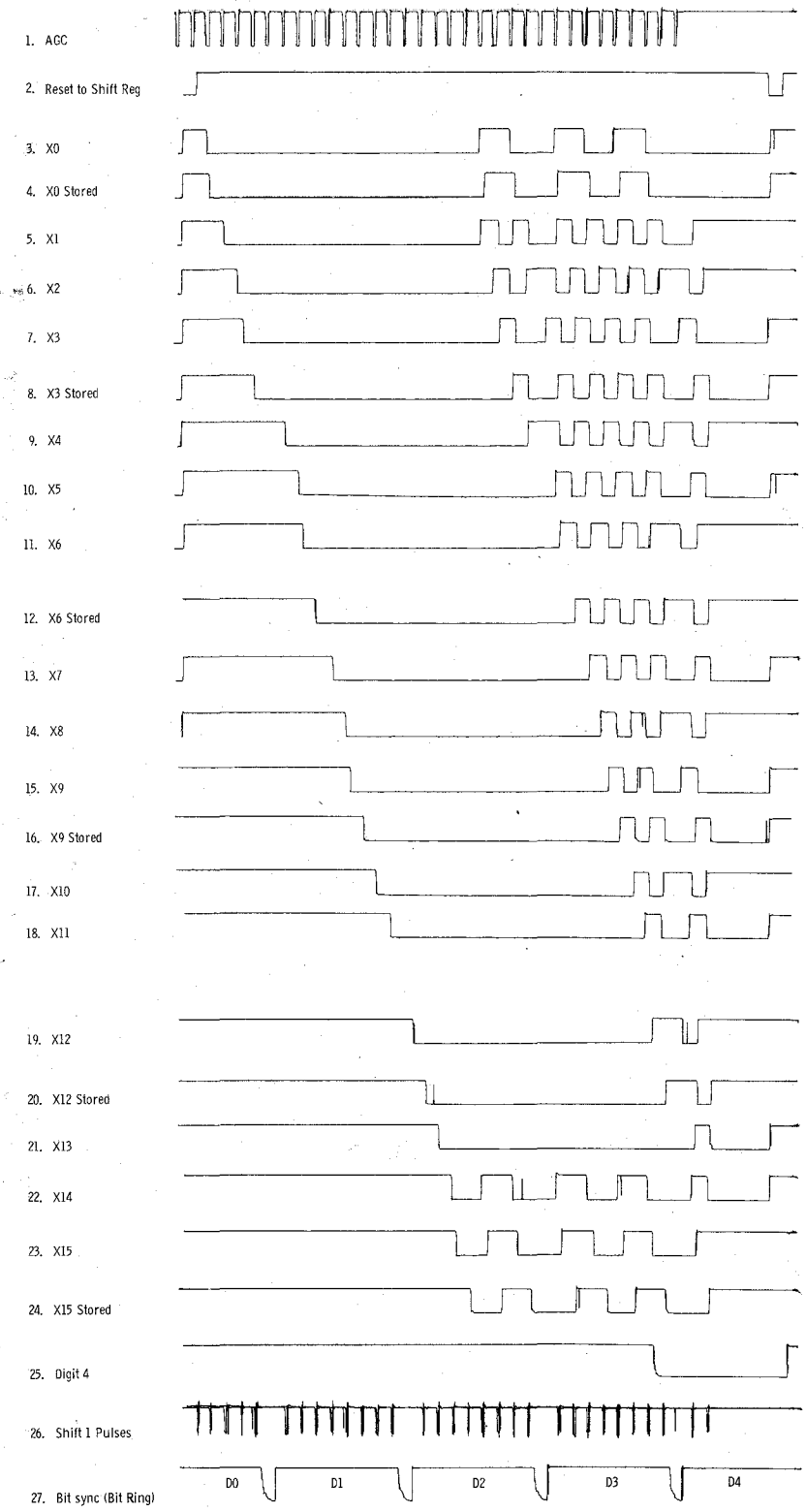


Figure 123. Shift Register Test Eight-Bit Mode