

*2302 Installation*

10/5/64

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AII-0 through AII-28

*2302 Installation*

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PRELIMINARY  
INSTALLATION INSTRUCTIONS  
for the  
IBM 7631 FILE CONTROL  
IBM 1301/1302 DISK STORAGE  
IBM 7320 DRUM STORAGE

Prepared by  
IBM CE Installation Publications  
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## 5. USE METER CHECK

## 5.1 IBM 1301

- A. With the Customer Switch on the 1301 Meter Box in the OFF position, the file must be INOPERABLE from the System.
- B. With the Customer Switch ON, check that the file programs run properly, and that the meter runs and accumulates time as long as the CPU is running, and the 7631 is ON LINE.
- C. With the Customer Switch OFF, and with the CPU running (any program that does not use the file), check that the meter on the file does not run.
- D. With the Customer Switch OFF and the CPU running, as in C above, turn the Customer Switch ON, check that the meter on the file does not run until the CPU halts and then starts again.
- E. With the Customer Switch ON, start the CPU and check that meter is running. With the meter running, turn the Customer Switch OFF. Check that the meter continues to run until the CPU stops. Restart the CPU and check that the meter on the file does not restart.

## 5.2 IBM 7631

- A. With the 7631 in TEST MODE 1, perform any control operation (i. e. Seek) for approximately one minute. The meter must not record time.

## 5.2 IBM 7631 (continued)

- B. Switch the 7631 Mode Switch to NORMAL and the meter switch to DISABLE. Run any file diagnostic program. (The CPU meter should NOT be in CE MODE). When attempting to run the diagnostic program, the system should receive a NOT READY or NOT OPERATIONAL signal from the 7631.
- C. Halt CPU, turn 7631 meter switch to the ENABLE position. Start program and observe that the meter on 7631 is recording.
- D. While the program is running, turn 7631 meter switch to DISABLE. Observe that the meter still records until the CPU is halted.
- E. Turn CPU meter switch to the CE position and the 7631 meter switch to ENABLE. Start program and observe that the 7631 meter does not record.

## NOTE

For more detailed procedures, refer to  
CE Meter Manual, Form No. 223-2728.

6. PRELIMINARY TESTS

6.1 Attachment Feature Single Shot Timing

NOTE:

The setting of a gap sensor is to be measured from the fall of the last pulse of a series of pulses, at the input to the rise of the output of the gap sensor.

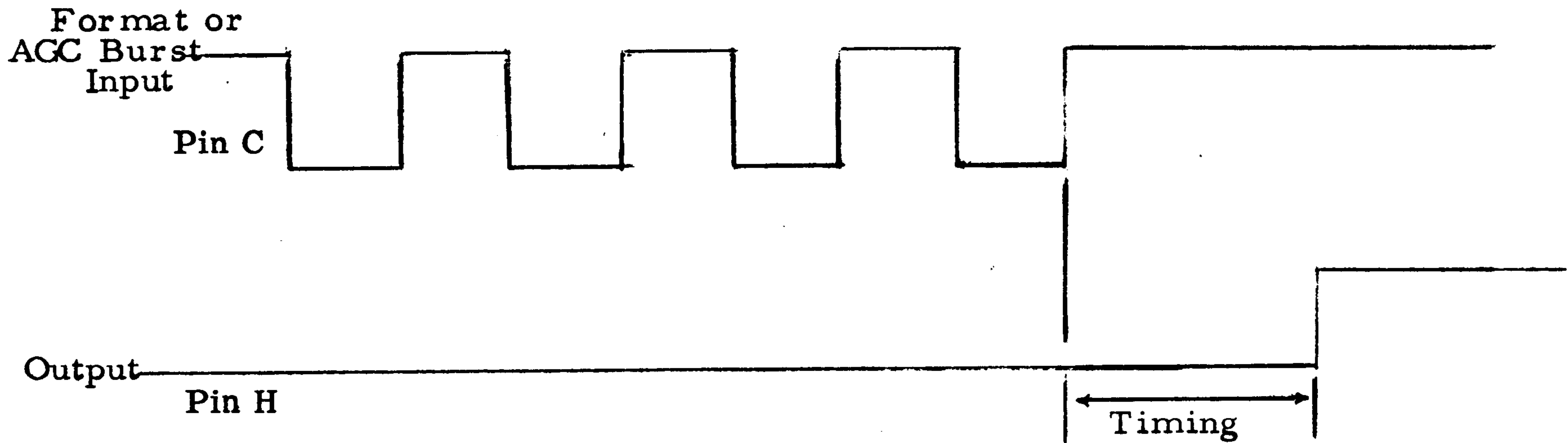


FIGURE AI-6 SINGLE SHOT TIMING

TABLE AI-2 SINGLE -SHOT ADJUSTMENTS

Input=C		Output = H	
S. S.	Drum	Location 1302 & Drum	Nominal Limits
Data Gap	B 7	H 22	3.0 usec ± 0.1 usec
Long Gap	B 7	H 21	10.0 usec ± 0.2 usec
Short Gap	B 7	H 20	3.4 usec ± 0.1 usec

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1. INTRODUCTION

This section supplements the instructions in the 7631/1301 CE Installation Manual, for installing an IBM 1302 Disk Storage.

The 1302 (Mod. 1 or 2), communicates with the using system through the IBM 7631 Disk Storage Control, Mod. 2, Serial No. 12000 and above, with a 1302 Attachment #7950.

2. GENERAL INFORMATION

The 1302 will take a little longer to install than the 1301, because it has more interframe cables and more drawer assemblies. The same introductory remarks and assembly instructions in chapters 1 and 2, for the 1301, apply also to the 1302.

Cabling instructions given in chapter 3 of this manual are adequate for external cabling of the 1302. However, some mechanical and logical changes plus a variation in numbering interframe cable connectors on the 1302, required several revised drawings and checkout procedures, which you will find here.

Note particularly, that Figure AII-1 shows a new panel on the 7631, for the 1302/7320 feature. Table AII-1 is a voltage check-list for the 1302. Figure AII-2 is the rear view of the 7631. Figures AII-3 and AII-4 show component locations and cable connector designations for the 1302. Table AII-2, Figures AII-5, AII-6, and AII-6 (EF), are concerned with interframe cabling. Figure AII-7 is a 1302 tailgate drawing. Figure AII-8 shows the

### Format Track Layout for the 1302.

With the exception of Table AII-1, which is part of paragraph 5.3, Tables and Figures are located at the end of this section.

### 3. PRELIMINARY INSTRUCTIONS - 1302

Prior to any mechanical preparation (disk and head cleaning, drawer installation and adjustment), perform a five-minute purge to insure removal of airborne foreign particles from the disk array chamber. The purge can be done by powering the 1302 independently.

#### 3.1 Power-On Preparation

##### DANGER

Check phasing before power-on. (See chapter 1). Also, make sure that the ground connection between 7631/1302/7320 is common and electromechanically stable.

To bring up power on the 1302, without power on the 7631, (all cables connected on both units, 7631 connected to customer power), temporarily jumper EPO plugs C1 and C2 on the 7631, using the EPO cable. See Figure AII-1. If only one I/O Channel on the 7631 is being used, (EPO cable plugged into C1), it will also be necessary to have a terminating jumper plug PN 553298 installed in Emergency Off plug C2. Installation of this jumper will complete the Emergency Off circuit, enabling power to be brought up on the 1302.

#### 3.2 Five-Minute Purge

- A. Make sure that the power cable is connected to customer's 208-volt receptacle. If not, set CB1 and CB2 to OFF and connect power. See Figure AII-2.

APPENDIX II  
IBM 1302 DISK STORAGE

- B. Set CB1 and CB2 to ON.
- C. Set Auto Control switch to LOCAL.  
Set Sequence Control to MANUAL.
- D. Press Auto Start switch.
- E. Press Disk Drive On button. Disk Drive On indicator will light and disks will rotate in a counter-clockwise direction, in accordance with the directional arrow on the machine.

WARNING

Clock-wise rotation will result in having no hydraulic pressure. Manual loading of heads may result in damage to the disks.

- F. Remove paper cover from over access aperture.
- G. With covers on, allow the file to run for five minutes, then proceed to the next step.
- H. Depress Disk Drive Off switch.  
Depress Auto Stop switch.
- I. Set CB 1 and CB 2 to OFF.

4. MECHANICAL PREPARATION - 1302

This section deals with drawer installation, disk and head cleaning, and receiver operation. It is not concerned with general assembly and mechanical preparation, which you will find in chapter 2 of this manual. More detailed descriptions of the following operations, if needed, can be found in the IBM 1302 CE Maintenance Manual, Form # 227-5864-, and the IBM CE Manual of Instruction for the 1302, Form # 227-5863-0.

WARNING

Use extreme care in handling the receiver, drawer assemblies, and heads during the mechanical preparation of the disk storage. They are

easily damaged. Also, dust and debris in the machine and its environment can damage the disks.

#### 4.1 Receiver Swing Out

- A. Remove module receiver shields.
- B. Move the carriage to the outer limit stop. For the rear actuator, remove the dummy rear crash stop.
- C. Loosen the two set screws at the rear of the carriage swing-out shaft housing. Loosen the outermost screw on the swing-out shaft cap.
- D. Depress carriage locking-levers. Apply a slight inboard pressure on the receiver to make unlocking easier. Do not press on drawer stiffeners.
- E. Swing receiver out carefully. Make sure that flex-rings clear the disk array shield.
- F. Cover the access entry port with the long door.
- G. Remove the actuator shield.
- H. Use the swing-out brace, PN 2164240, provided in the 1302 Shipping Group, to hold the receiver in position. Place the stud end of the arm into the actuator locking-lever pin hole. The hole on the other end of the brace engages the receiver locking-lever pin.
- I. Check that locknuts on yoke and tie rods are secure. Check motion transducer, with a non-magnetic feeler gauge, for a clearance of  $.006 \pm .002$ . (IBM card stock is approximately .005 in.) Check inner, center and outer positions.
- J. Check carriage-ways and actuator housings for proper lubrication.

#### 4.2 Disk Cleaning

- A. With disk cleaning paddle, PN 2108474, wrapped in lint-free tissue and moistened with (915) isopropyl alcohol, place paddle between the disks, (through access aperture in plastic shield), and rotate array manually; work from the top down.

4.2 Disk Cleaning (continued)

- B. Replace tissue on paddle as oxide pickup shows on tissue.
- C. Replace paper covering over access aperture until heads are ready for installation.

4.3 Drawer Installation and Head Cleaning

Do not discard data drawer shipping containers. You will need them to store spare drawers. Also note, that when a drawer is removed from the receiver and reinstalled or a new drawer substituted, you must read out the entire area serviced by both heads and then rewrite, or the information will be lost. If it has not been possible to read out the data before removing the drawer, try to recover the information with the new one, or use the tool drawers PN's 2164250 and 2164251. After recovery, the data must be re-written with the new drawer.

- A. Inspect drawer assemblies for proper engagement of torsion spring fingers with arms.
- B. Clean head assemblies with lint-free tissue moistened with (91%) isopropyl alcohol.
- C. Remove drawer retaining rod.
- D. Check markings on drawer, to see if it belongs in front or rear.
- E. Make sure that drawer retaining screw in receiver is out far enough to permit drawer insertion.
- F. Install drawer. With care--never handle assembly by stiffeners or arms. Also, check for proper position of torsion rod.
- G. Seat drawer firmly by tightening the retaining screw.
- H. Insert retaining pin through holes in drawers until cotter pin rests against the top drawer.

4.4 Receiver Swing-In

- A. Use the comb assembly, PN 2108776, to check the drawers for proper position and straightness.
- B. Remove the swing-out brace, and swing receiver in far enough

4.4 Receiver Swing-In (continued)

to allow installation of actuator shield. Install shield.

- C. Remove long door.
- D. With carriage against outer stop, swing receiver in carefully.
- E. Press on receiver to lock wedges. Do not put any pressure on drawer stiffeners. Apply slight pressure on levers in direction of spring force.
- F. Tighten the outer screw on the swing-out shaft cap.
- G. Tighten the two carriage swing-out shaft set screws.
- H. Install rear actuator dummy outer limit stop.
- I. Install actuator shield door and access short door.
- J. Make sure that the clock head is in an unload position.

Load heads manually. Then unload heads and manually rotate disk array while checking for an even amount of clearance between disks and drawer assemblies. Be sure heads are not cocked.

5. UNIT TESTING

5.1 Power on 7631

- A. Assure that power cables for both the 1302 and 7631, are connected to customer's 208 volt receptacle. Refer to chapter 3 and Figure AII-7 for external cable connections.
- B. On the 1302:
  - 1. Set CB 1 and CB 2 ON.
  - 2. Set Auto Control switch to LOCAL.
  - 3. Set Sequence Control to MANUAL.

5.1 Power on 7631 (continued)

C. On the 7631:

1. Set CB 1 to ON.
2. Depress Power On switch. Power On and DC On indicators will light.
3. After DC On indicator lights, the 7631 will receive an automatic reset and the following indicators will light.

Availability 1 and Availability 2\*

Digit Ring On

5 + 6 and

Bit Rings BS + O and B7 + 8

5.2 Power On 1302

With the 7631 powered, perform the following operations on the 1302:

A. Depress Auto Start switch. The following indicators will light:

1. Remote Stop
2. Air Press Normal
3. Heads Unloaded

B. Depress Disk Drive On switch. The following indicators will light:

1. Timer
2. Disk Drive

\* On mod III, IV, and V only.

5.2 Power On 1302 (continued)

C. Depress the following switches. Their respective indicators will light:

1. Elec DC On
2. Sol DC On
3. Oil Pump

D. At this point, allow to purge for one hour. During this time, all voltage, oil pressure and temperature checks can be performed, (Sect. 3.3 and 3.4)

WARNING

Inspect fittings for oil leakage.

E. Upon completion of the purge, proceed:

Depress Head Load switch. Make sure that Mod 0, front & rear heads load.

F. Depress Head Load switch a second time. The following will occur:

1. Heads Unloaded indicator will go off.
2. Access Retracted indicator will light. (This indicator will be lit only as long as head Load switch is depressed).

G. Depress HL Check switch. Observe the following indicators:

1. Heads Loaded
2. File Ready



5.2 Power on 1302 (continued)

- H. Set Auto Control switch to REMOTE and Sequence Control to AUTO.
- I. At this point, allow unit to run for 30 minutes with heads loaded. Any off-line file operations may be performed during this time. Upon completion, continue:
- J. Depress Power Off switch on the 7631. Indicators on both units should go off. Check to be sure all heads unload.
- K. Check and record the coast-down time against that measured at the factory. That information is noted on a sticker located on the CE panel door, behind the right-side cover of the electronic module.
- L. Clean the heads and array. Check for oxide build-up. Perform another purge for 30 minutes with heads unloaded. When this is done, continue sequencing file completely.
- M. Prior to systems testing, check that EPO cables and connectors are in place. Refer to Chapter 3, Section 3 for cabling information.

5.3 Voltage Checks

- A. 7631. Check all back Panel DC voltages measured at the laminar bus. The voltages should be within - 2% of the given value.

5.3 Voltage Checks (continued)

B. 1302. Check voltages measured at the laminar bus for a tolerance of  $\pm 2\%$  of the values. Table AII-1 gives the voltage requirements.

TABLE AII-1 1302 VOLTAGE CHECKS

Terminal	Color	Voltage	Remarks
1	Black	GND	
2	Blue	-6	
3	Orange	+6	
4	Black	GND	
5	Violet	-12	
6	Black	GND	
7	White	+12M	
8	Brown	-36	
9	Gray	+12	
10	Pink	+30	

5.4 Bias Checks

- A. 7631. Plug Bias Box (P/N 210860) into AC outlet and insert jack into the + 12M receptacle. The receptacle is located below the power supply C. B. Check the + 12M volts on the SMS panel for a maximum variation of  $\pm 1.5$  volts.
- B. 1302. The + 12M receptacle is located to the left of the power supply--above the gate blower. Check the + 12M volts on the SMS panel for a maximum variation of  $\pm 3$  volts.

NOTE

Clock head signal amplitude must be checked before proceeding with diagnostic testing. Refer to instructions in the CE Reference Manual.

6. DIAGNOSTIC TESTING

Refer to the respective control unit CE Installation Manual (7907, 7908, 7909), or the 1410 system CEIM for diagnostic programs to be run.

6.1 Factory-Written Format Track

All 1302's shipped have a format track written on cylinder 222. This format track (see Figure AII-8), permits testing from the 7631 CE panel during the installation of the 1302, reducing the system hours required for preliminary testing.

6.1.1 Writing Addresses at Location 8888

Use the following procedure, from the CE panel, to write HA1, HA2, RA and record at location 8888. RUN THE FOLLOWING IN 8-BIT MODE.

- A. Turn power on. 7631 in test mode one.
- B. Perform a Seek operation to address 888888 (track 222) of access zero. Turn on WR Inhibit switch.

NOTE

Before any successful WR op can be performed, the following Single-Shots and VFO (Variable Frequency Oscillator) have to be adjusted.

6.1.2 VFO Adjustment

- A. Gain Adjustment: Loop Mode switch off. Connect a voltmeter to pins 7K13A and 7K13D. Adjust the 200-ohm potentiometer at 7J13 for 1.0 V DC (Syst. Page 01.10.16.2).
- B. Frequency Adjustment: Load a PV-HAO with HAO-CE Switch on. Use 00888888 address. This will select track 222, head 8. Turn on loop mode, Bit Switch 4 and WR. Sync scope on the positive shift of "first Index" trigger in the 7631 at 01B13D. Use a dual-trace input unit and observe the clock pulses at 1H04A (+Y Phase One, Page 01.40.19.1) on one sweep, and VFO Binary Trigger (7K12F, Page 01.10.16.2) on the other sweep. Double-sync internally on positive transition of phase one. Delay sweep by 400us to observe an area before the end of the index.

Adjust the horizontal speed of the scope so that ten clock-pulses appear on the screen (one for each vertical line). Observing the VFO binary trigger output at 7K12F, adjust the 1K.-ohm potentiometer at 7J13 so that exactly two positive transitions appear for every vertical marking. For

6.1.2 VFO Adjustment (continued)

best accuracy, use the entire screen. (Syst. Page 01.10.16.2)

C. Adjust format gap Single-Shots (Syst. 01.40.05.2):

1. Adjust Single-Shot at 7H20H for 3.4 us.

2. Adjust Single-Shot at 7H21H for 10 us.

Refer to CE manual for adjustment procedure of Gap Detectors' Single-Shot.

D. Turn off WR INHIBIT Switch, add temporary jumper from 01B1A10D to 01B1A10J. Perform a WR HAO CE, without errors, using bit switch 4.

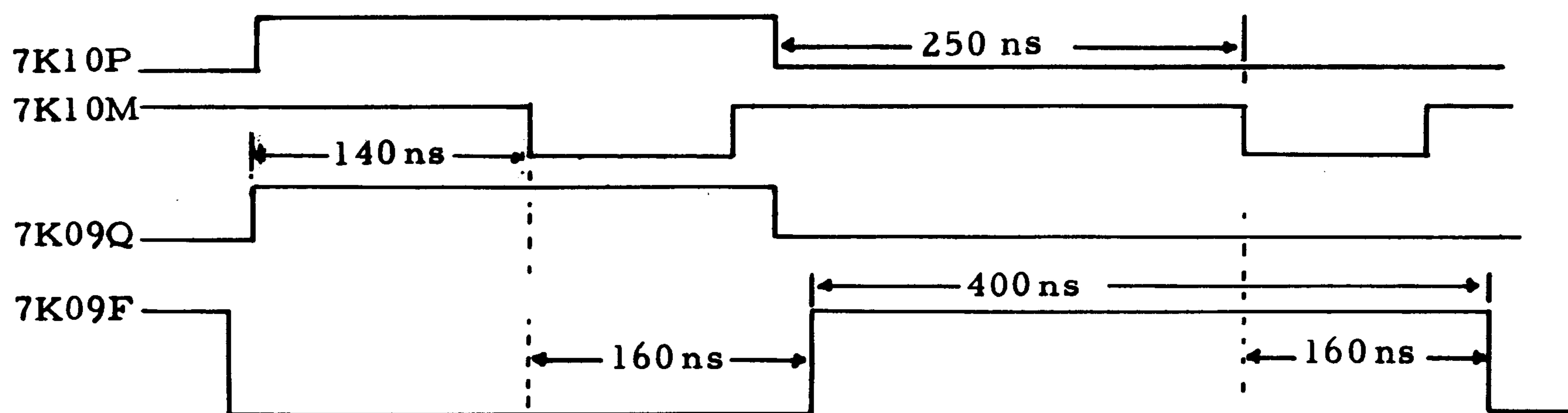
6.1.3 Separation Circuit Adjustments

Perform a RD HAO CE. Before a successful RD can be performed, the following circuits have to be adjusted:

- A. Delay Line Adjustment: Observe the unseparated read data at 7K10M and the VFO binary trigger DIF output at 7K09F. (DIF levels swing from 0 to +3V. See Page 01.10.16.4). Delay a sweep until the 2F AGC character of the HA1 is observed. Double sync on the VFO binary trigger. Adjust the delay line at 7K11 so that the leading edge of each data bit occurs 160 ns before the next transition of the VFO binary trigger. The delay line contains three optional delays: 20 ns between pins B and C, 10 ns between pins D and E, and 5 ns between pins F and G. Using wire jumpers on the back-panel, connect the required delays in series between output pin A and load-resistor P. Example: To add 25 ns of delay, connect jumpers from 7K11A to 7K11B, from 7K11C to 7K11D, and from 7K11E to 7K11P. Use the 50% transition points for time reference.
- B. Gate Generator Adjustments: Observe pins 7K10M (-F Raw Data) and 7K10P (+F Data Gate). Adjust the top potentiometer at 7J14 so

6.1.3 Separation Circuit Adjustments (continued)

that the trailing edge (negative transition) of the data gate precedes the leading edge (negative transition) of the following clock bit by 250 ns. Move the probe from 7K10P to 7K09Q. Adjust the lower potentiometer at 7J14 so that the leading edge (positive transition) of data gate precedes the leading edge of the following data bit by 140 ns, as illustrated here:



- C. Adjust data gap Single-Shot, (Page 01.40.05.2) at 7H22H to be 3 us. NOTE: This single-shot should be adjusted at the end of the AGC area. Upon completion of the above adjustments, RD HAO should perform without error.
- D. Turn off CE HAO switch and perform RD HAO, error free. This will insure that we can successfully compare address.
- E. Perform a write HAO with the "2, 3, and 5" bit switches On.

Separation Circuit Adjustments (continued)

- F. Turn off customer HAO switch.
- G. Load address of 8888DD and perform a write TRO with the "6" bit switch On.
- H. Address 8888 now has an HA1 containing 8's and HA2 containing D's, and a record address containing 2's. All 7631 read and write operations can now be tested, using address 8888. e.g., an SRO operation may be performed using a record address of all 2's.
- I. REMOVE JUMPER THAT WAS INSTALLED IN STEP 6.1.2 D.

NOTE

This procedure will allow only the use of head 8 on cylinder 222. Using any other address results in an error because of the absence of HA1's and HA2's. Refer to disk storage devices CEM Service Aid #7 for detailed operating instructions of the 7631 CE Panel.

7. USE METER CHECK

7.1 IBM 1302

- A. With the Customer Switch on the 1302 Meter Box in the OFF position, the file must be INOPERABLE from the System.
- B. With the Customer Switch ON, check that the file programs run properly, and that the meter runs and accumulates time as long as the CPU is running, and the 7631 is ON LINE.
- C. With the Customer Switch OFF, and with the CPU running (any program that does not use the file), check that the meter on the file does not run.
- D. With the Customer Switch OFF and the CPU running, as in C above, turn the Customer Switch ON, check that the meter on the file does not run until the CPU halts and then starts again.
- E. With the Customer Switch ON, start the CPU and check that meter is running. With the meter running, turn the Customer Switch OFF. Check that the meter continues to run until the CPU stops. Restart the CPU and check that the meter on the file does not restart.

7.2 IBM 7631

- A. With the 7631 in TEST MODE 1, perform any control operation (i. e. Seek) for approximately one minute. The meter must not record time.



7.2 IBM 7631 (continued)

- B. Switch the 7631 Mode Switch to NORMAL and the meter switch to DISABLE. Run any file diagnostic program. (The CPU meter should NOT be in CE MODE). When attempting to run the diagnostic program, the system should receive a NOT READY or NOT OPERATIONAL signal from the 7631.
- C. Halt CPU, turn 7631 meter switch to the ENABLE position. Start program and observe that the meter on 7631 is recording.
- D. While the program is running, turn 7631 meter switch to DISABLE. Observe that the meter still records until the CPU is halted.
- E. Turn CPU meter switch to the CE position and the 7631 meter switch to ENABLE. Start program and observe that the 7631 meter does not record.

NOTE

For more detailed procedures, refer to  
CE Meter Manual, Form No. 223-2728.

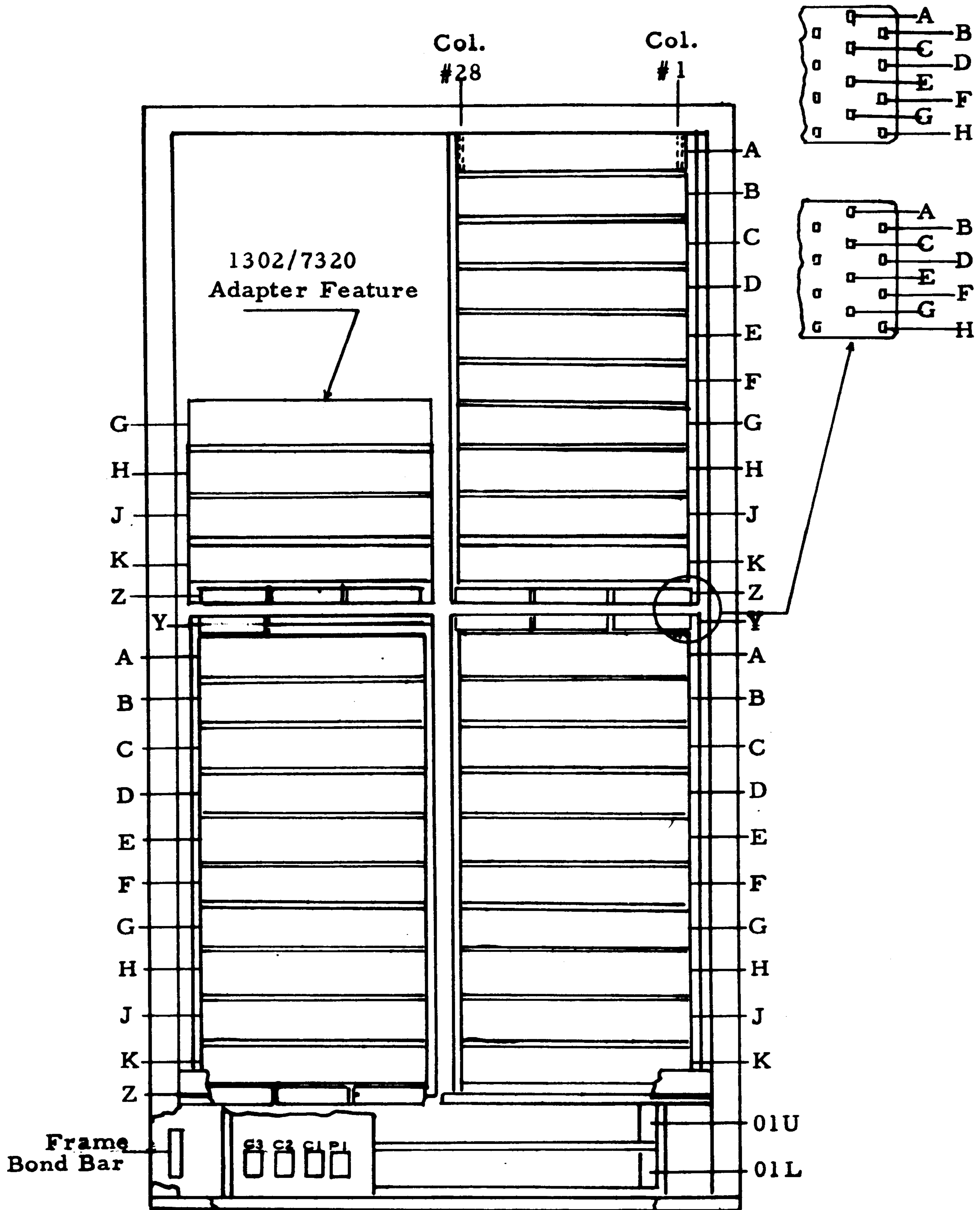


FIGURE AII-1 COMPONENT LOCATION--7631 WITH 1302/7320 ADAPTER  
(FRONT)

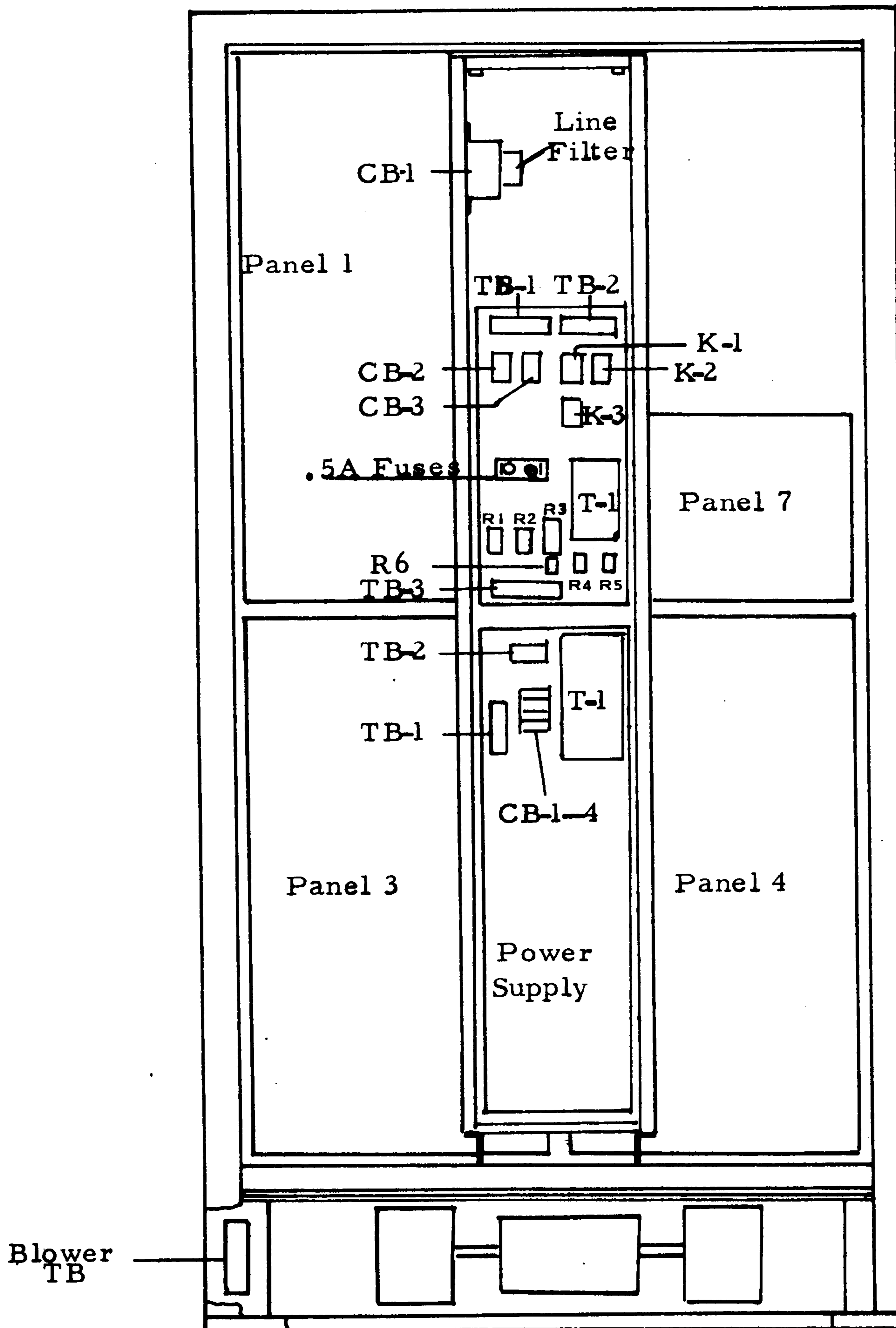


FIGURE AII-2 COMPONENT LOCATION--7631 (SERIAL NO. 12000 & ABOVE)

(REAR)

TABLE AII-2 INTERFRAME CABLES - 1302

PART NUMBER	DESCRIPTION
2122010	Input block cable assm.
2122012	Input cable
2122130	Power supply cable assm.
2122268	Contactor to sequence cable assm.
2122272	Compressor cable
2122274	Transistor Cable
2122660	Connector outlet cable asm.
2122951	48 V Gnd. return, pnl. D
2122952	48 V Gnd. return, panel E
2123046	Power supply blower cable asm.
2123285	Power supply cable to laminar bus.
2155811	Hydraulic Power supply to contactor
2163810	Receiver cable
2164296	Power supply cable to B gate.
2176610	Sequence cable S1 to clock.
2176683	Meter signal cable
2176702	Fuse and Resistor cable asm.
2176703	Solenoid, fuse and resistor cable
2176704	Line filter to CB 1
2176705	Fuse & resistor panel cable.
2176707	Contactor to power supply cable.

TABLE AII-2 INTERFRAME CABLES - 1302 (continued)

PART NUMBER	DESCRIPTION
2176709	Write driver to gate, module 2
2176712	A1 to B1 cable asm.
2176713	Write driver to A and B gates
2176718	Write driver to gate, module 1.
2176724	Decoder to tailgate
2176725	Decoder to tailgate
2176729	Decoder voltage cable.
2176750	A and B gate blower cable
2176751	Contacto <del>r</del> to power supply blower
2176754	Sequence cable, S3
2176755	Sequence cable, S4
2176759	Sequence cable, S5
2176760	Seque <del>ance</del> cable, S2
2178256	On-line cable asm.
2178258	On-line cable asm.
2178282	Tailgate to A1 gate
2178283	Tailgate to B1 panel
2181500	Convenience outlet cable

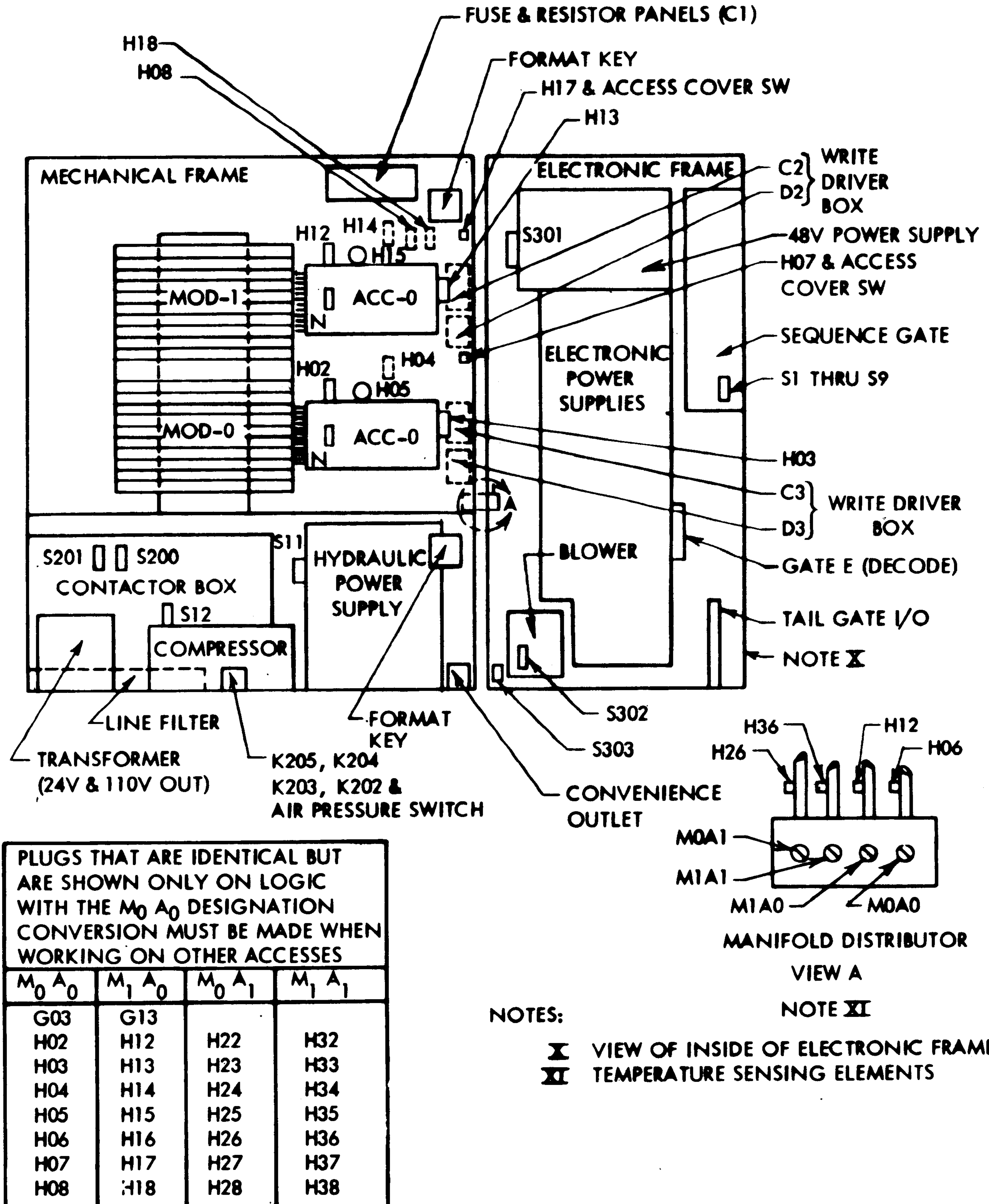


FIGURE AII-3 COMPONENT LOCATION - 1302 (FRONT)

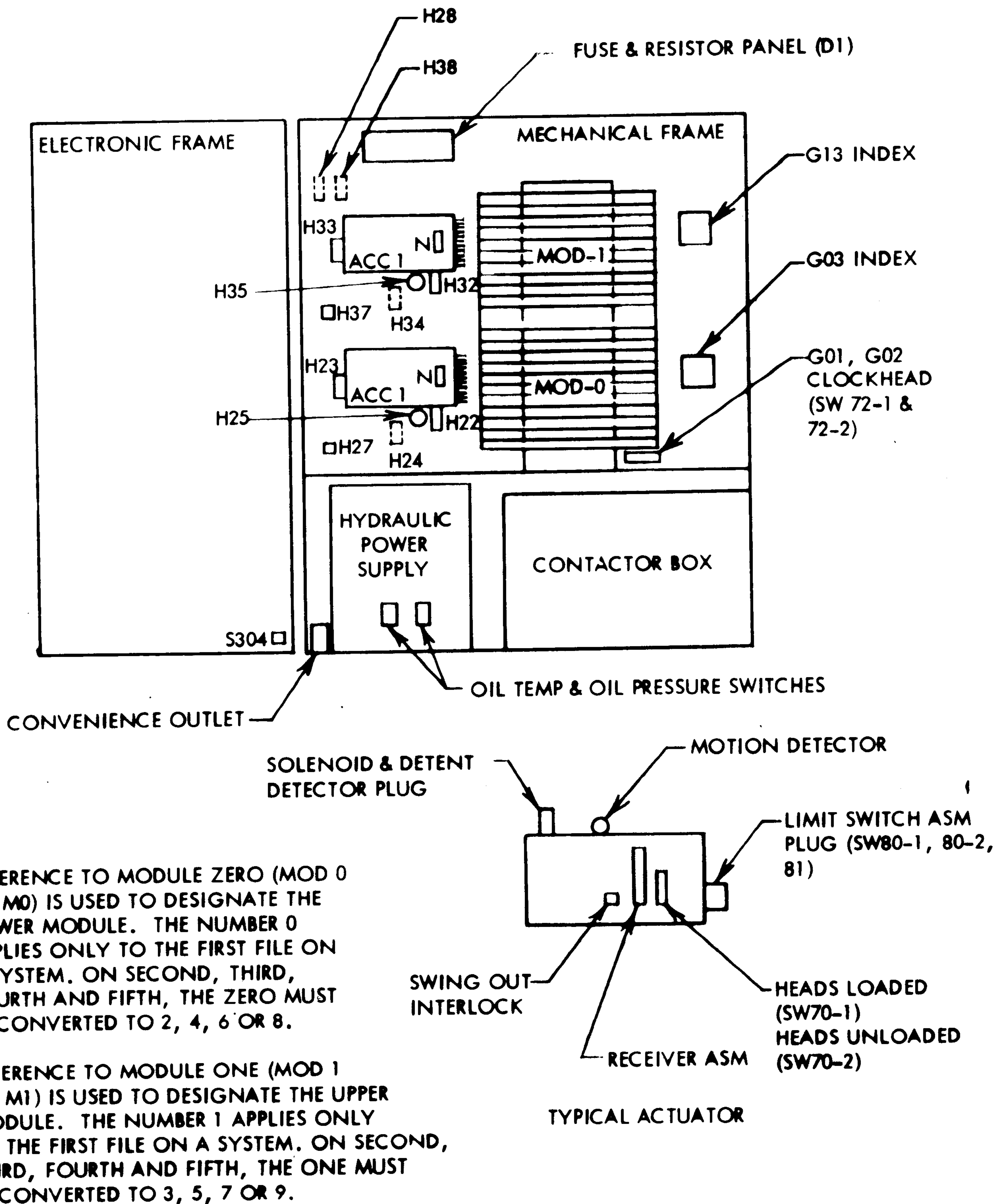


FIGURE AII-4 COMPONENT LOCATION - 1302 (REAR)

APPENDIX II  
IBM 1302 DISK STORAGE

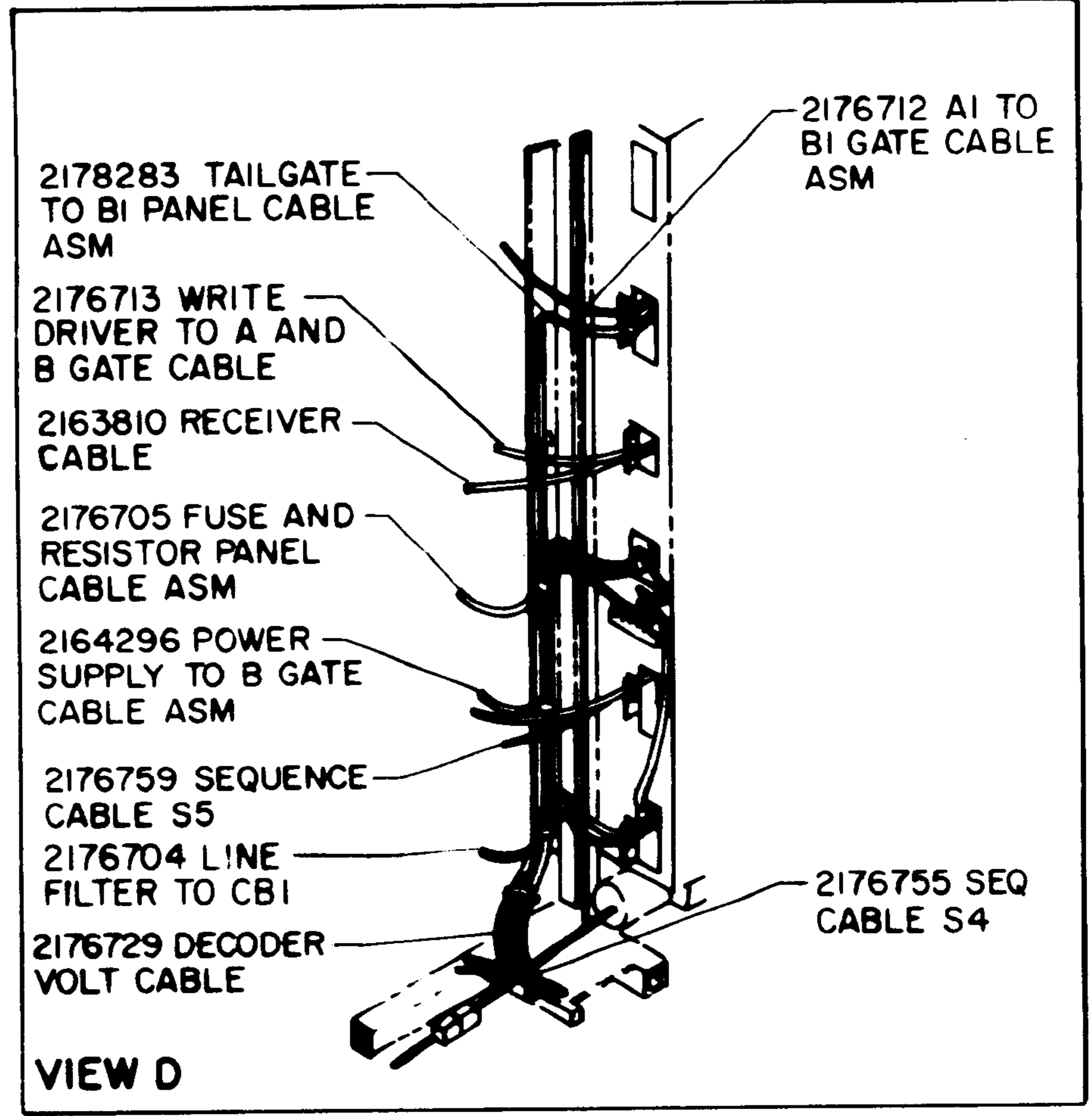
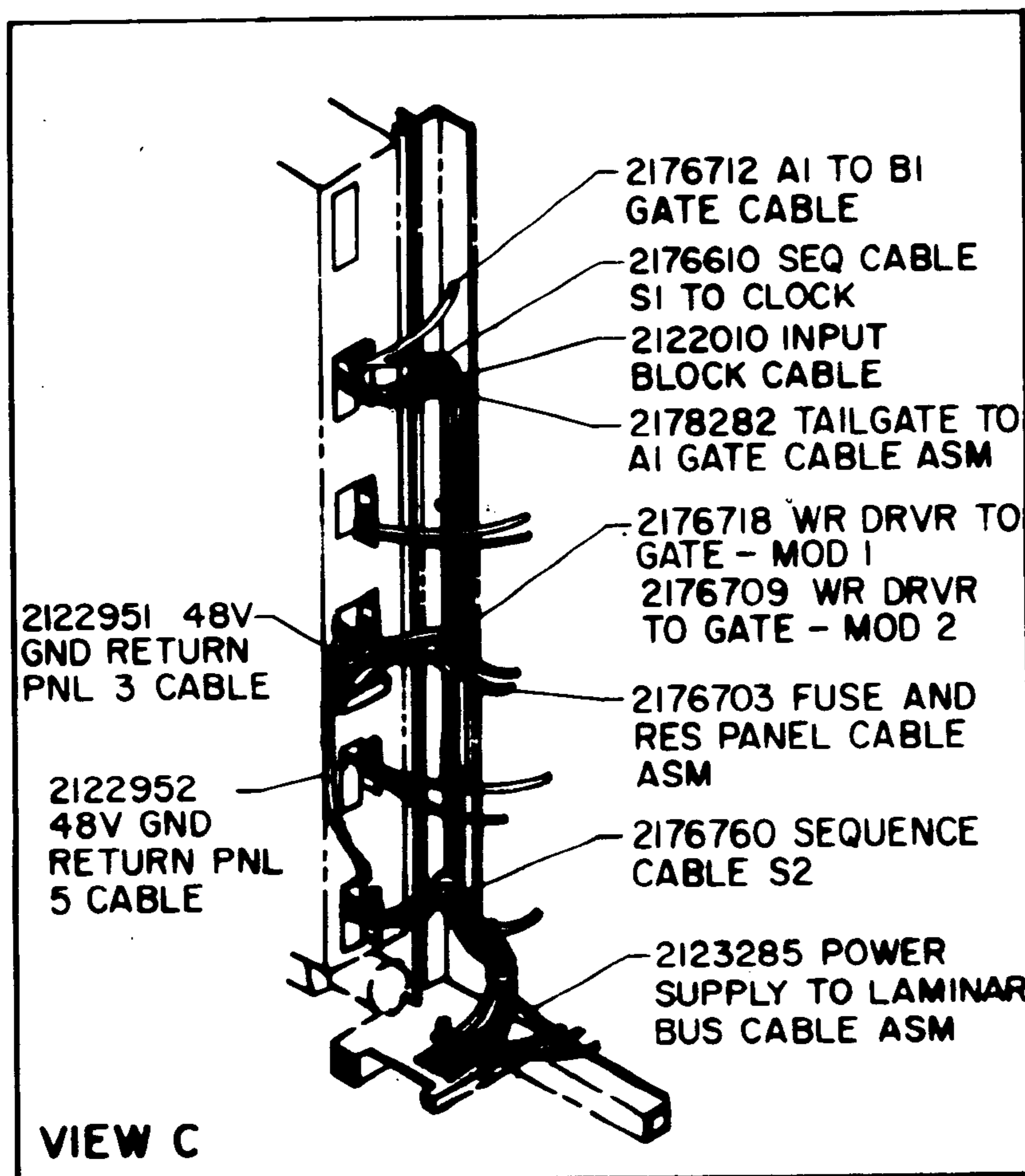
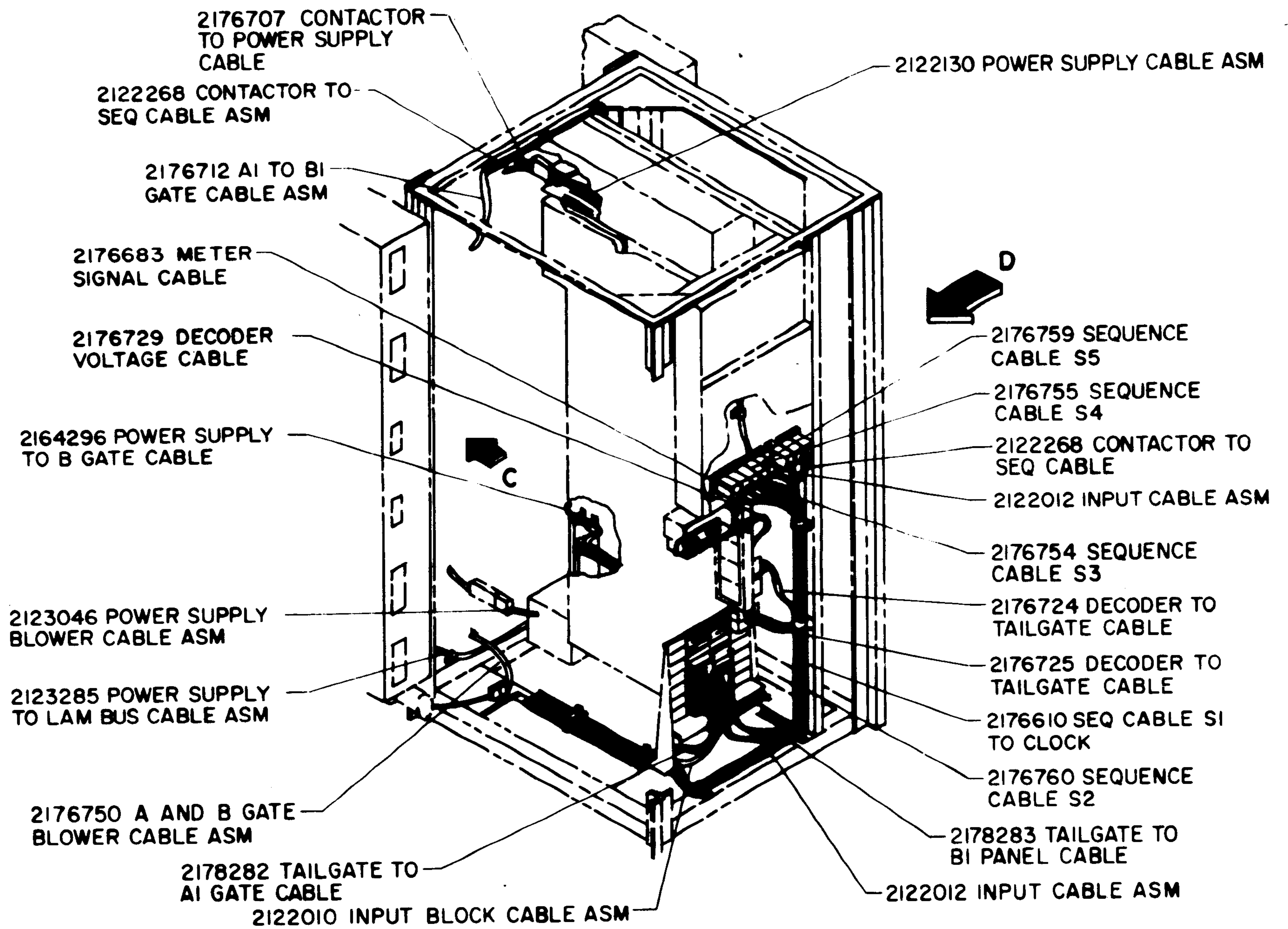


FIGURE AII-5 INTERFRAME CABLE ROUTING-ELECTRONIC FRAME



APPENDIX II  
IBM 1302 DISK STORAGE

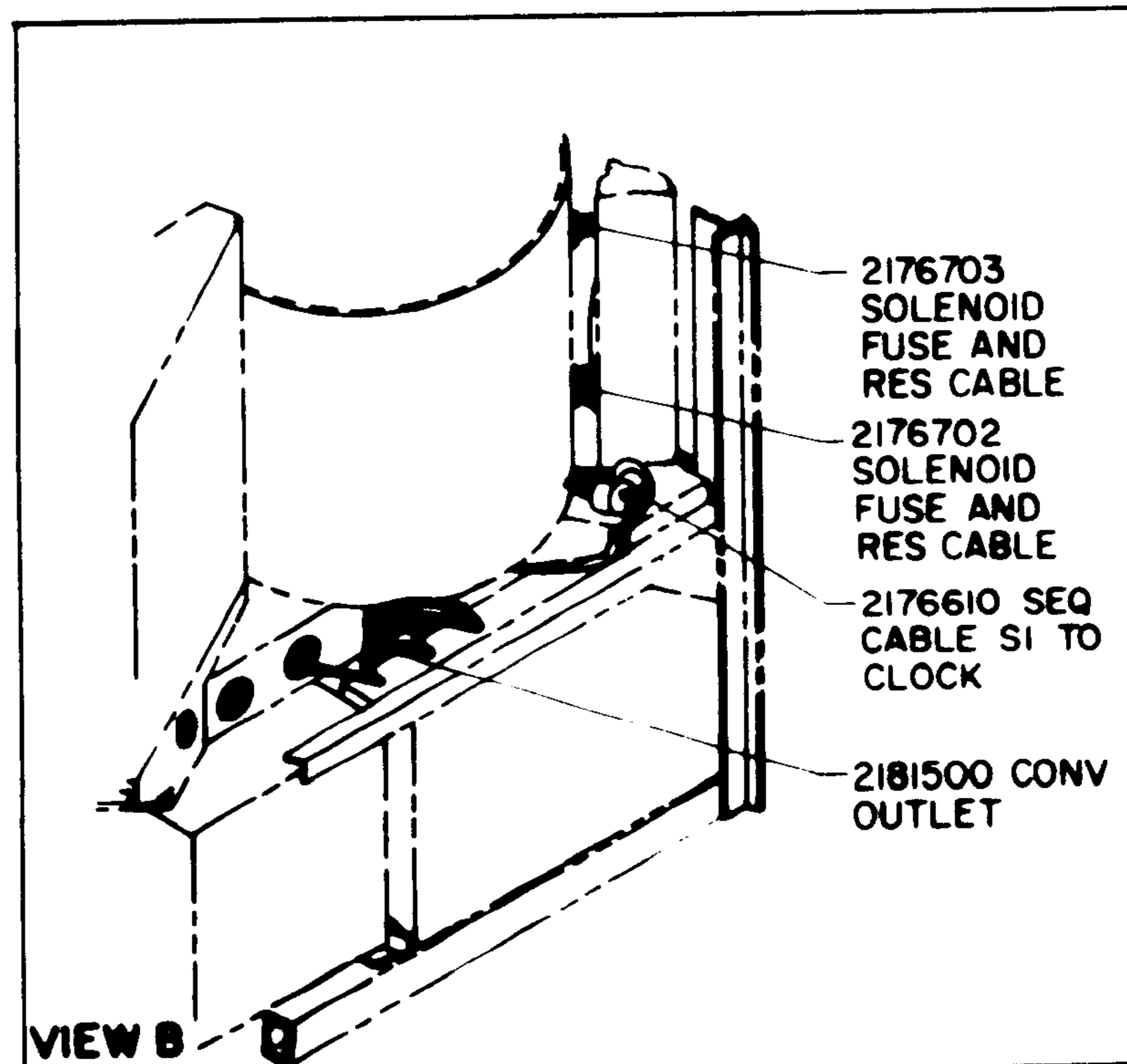
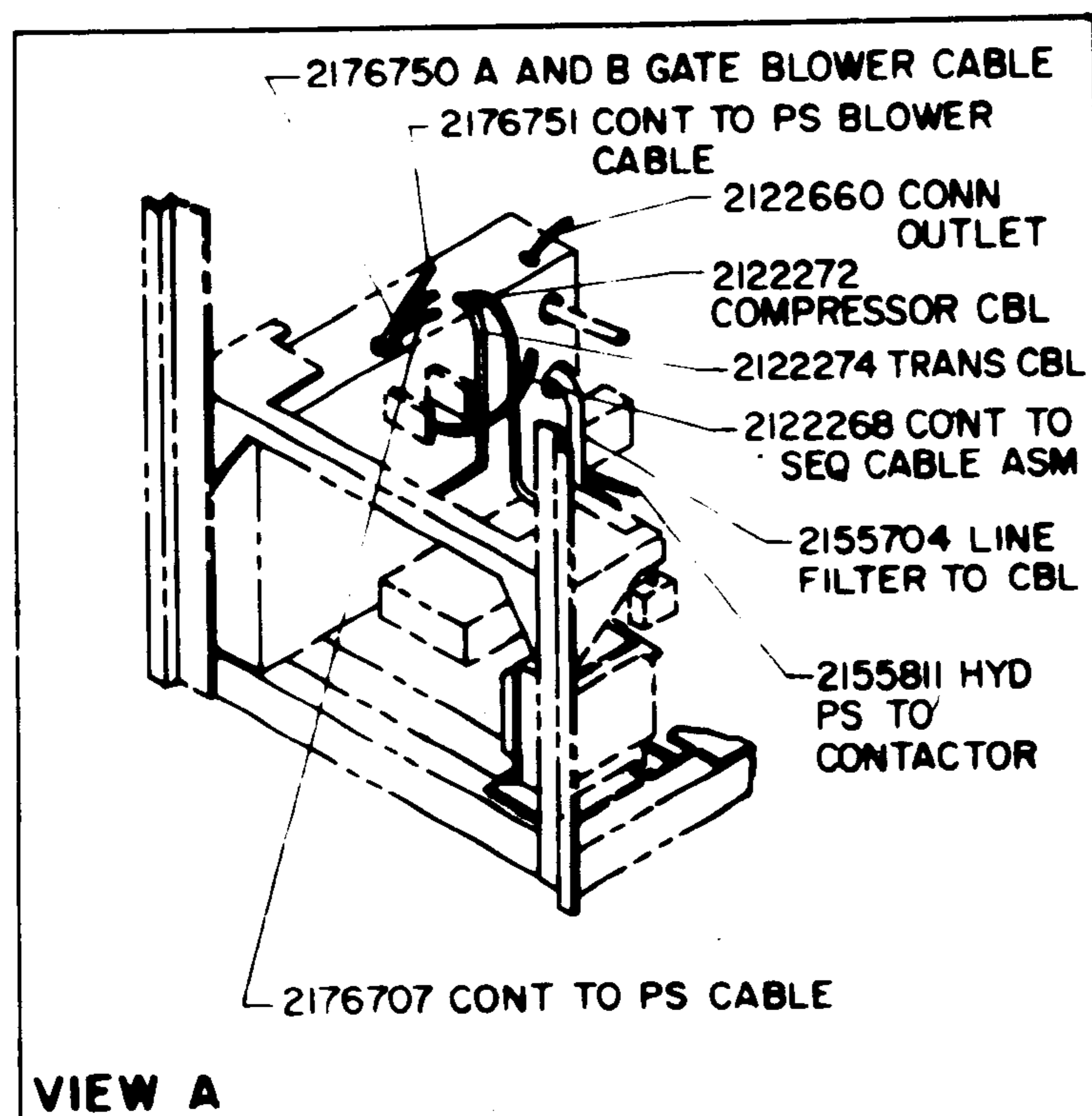
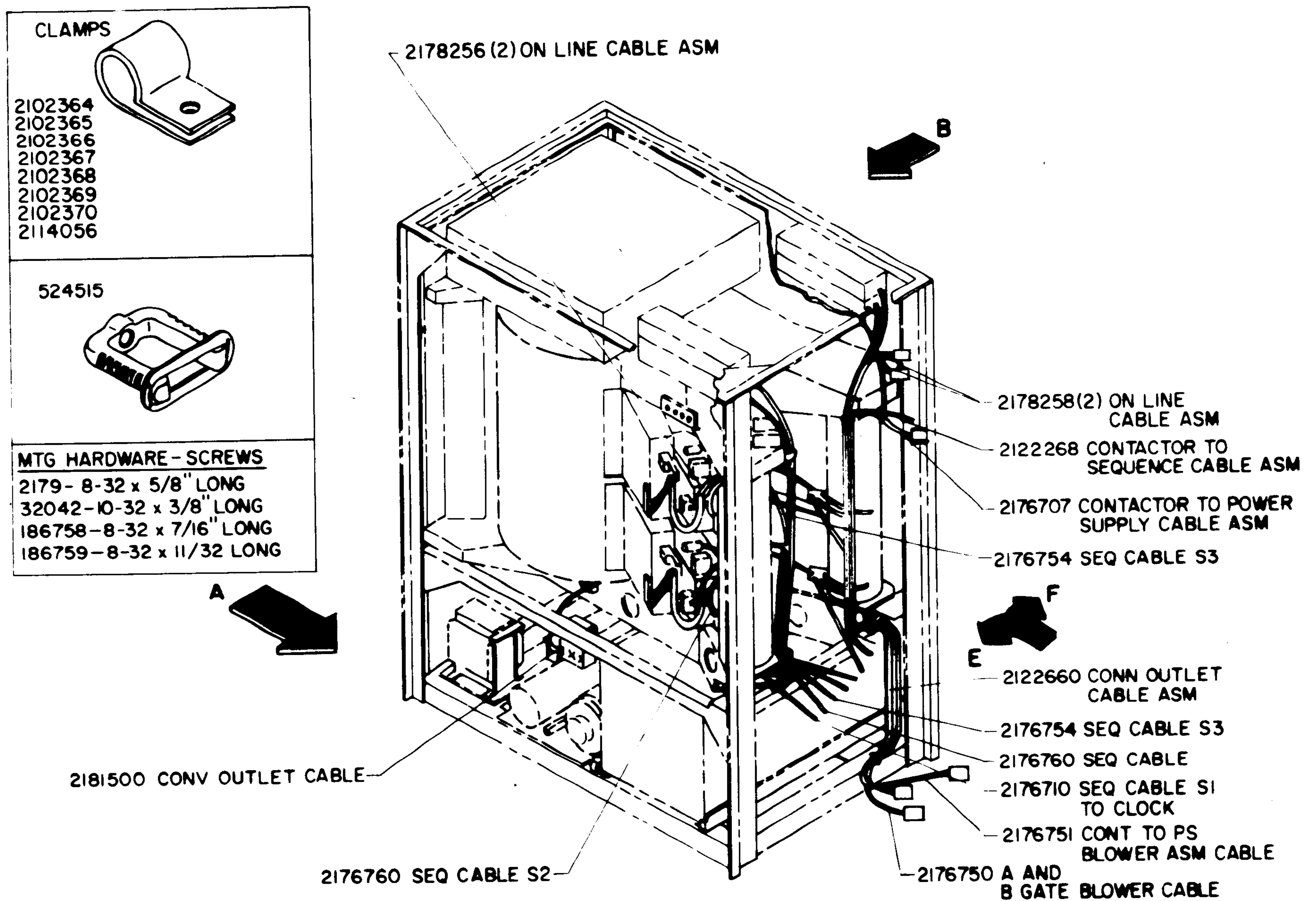


FIGURE AII-6 INTERFRAME CABLE ROUTING-MECHANICAL FRAME

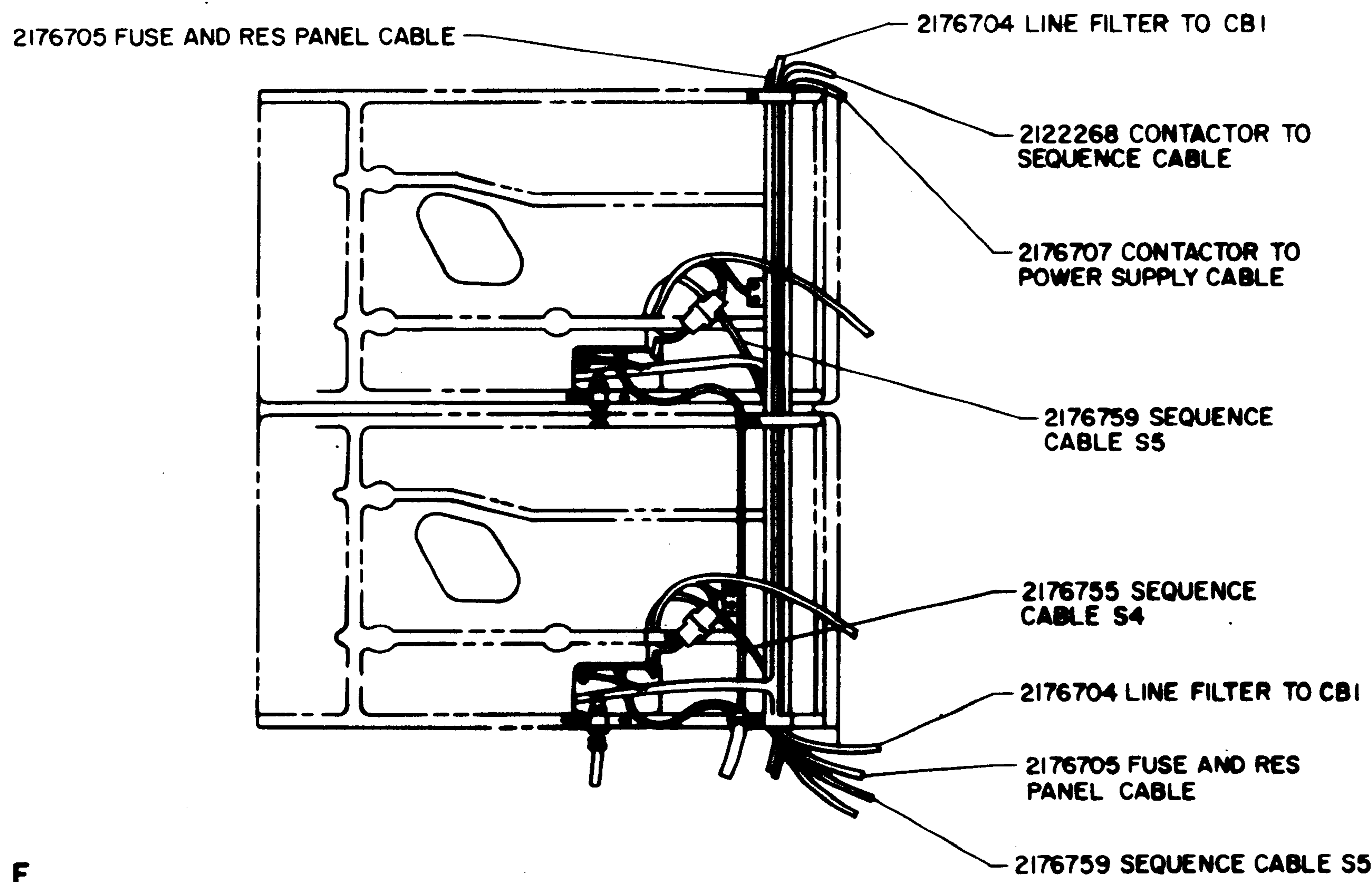
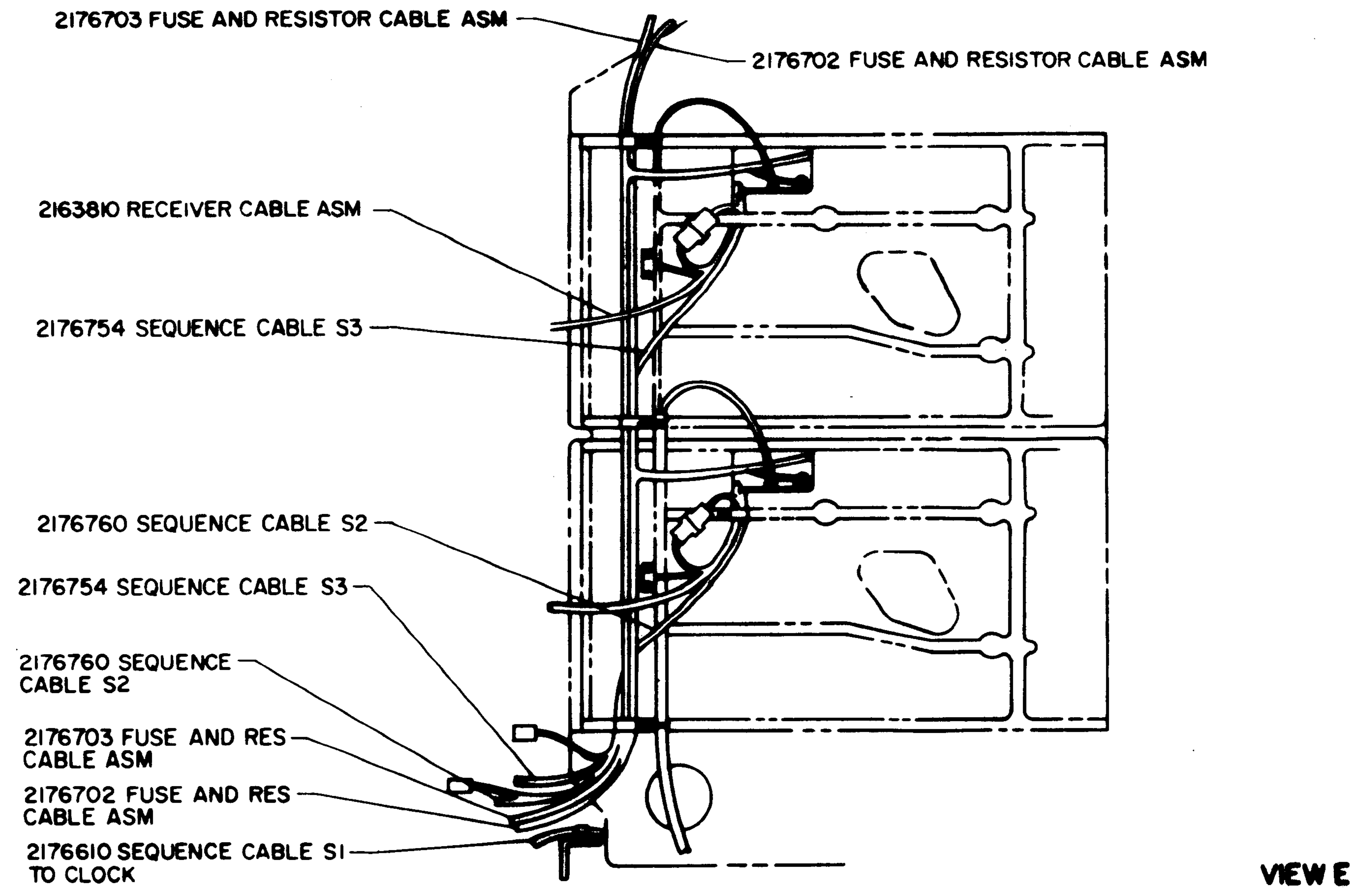
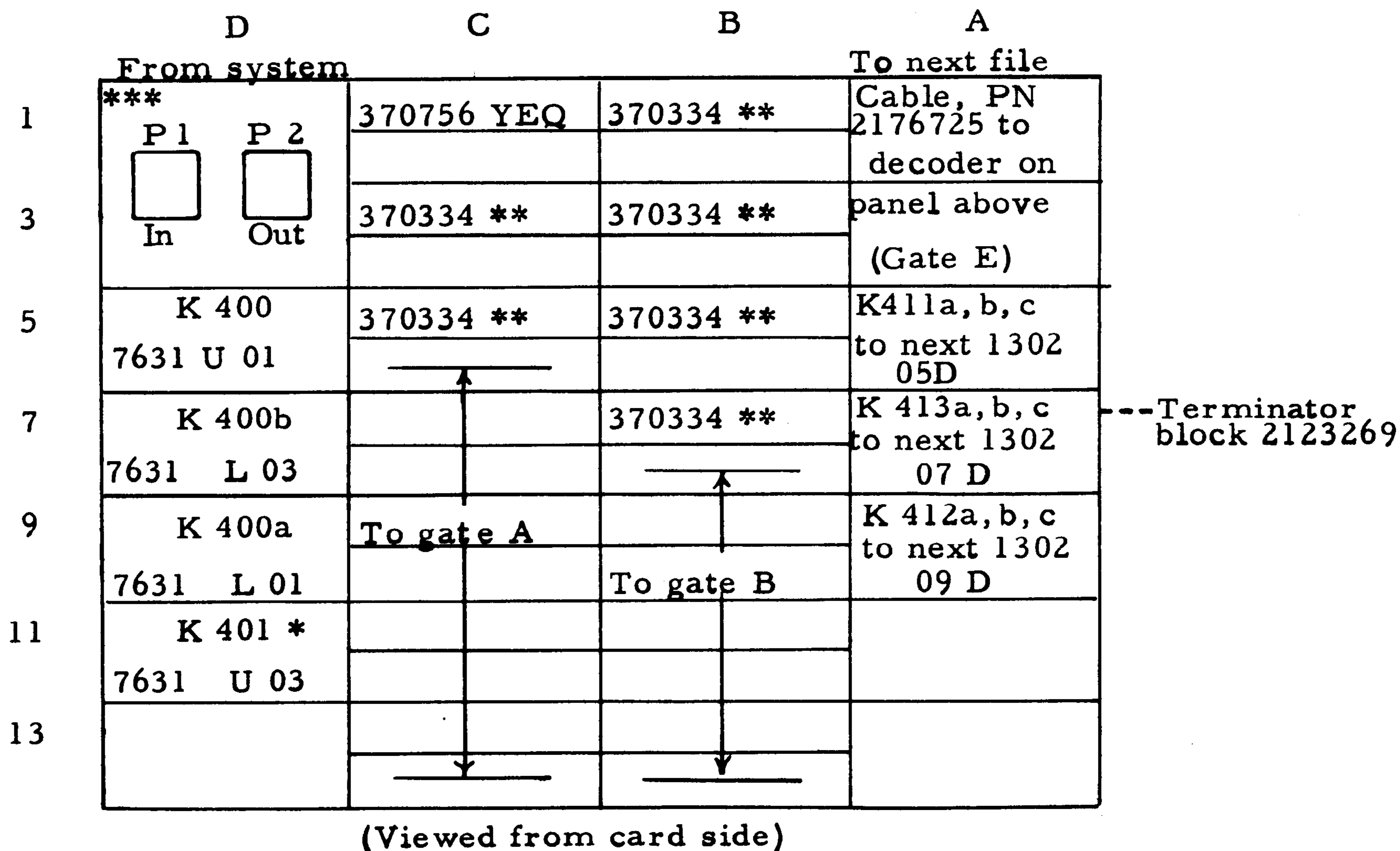


FIGURE AII-6 (E-F) INTERFRAME CABLE ROUTING- MECHANICAL FRAME

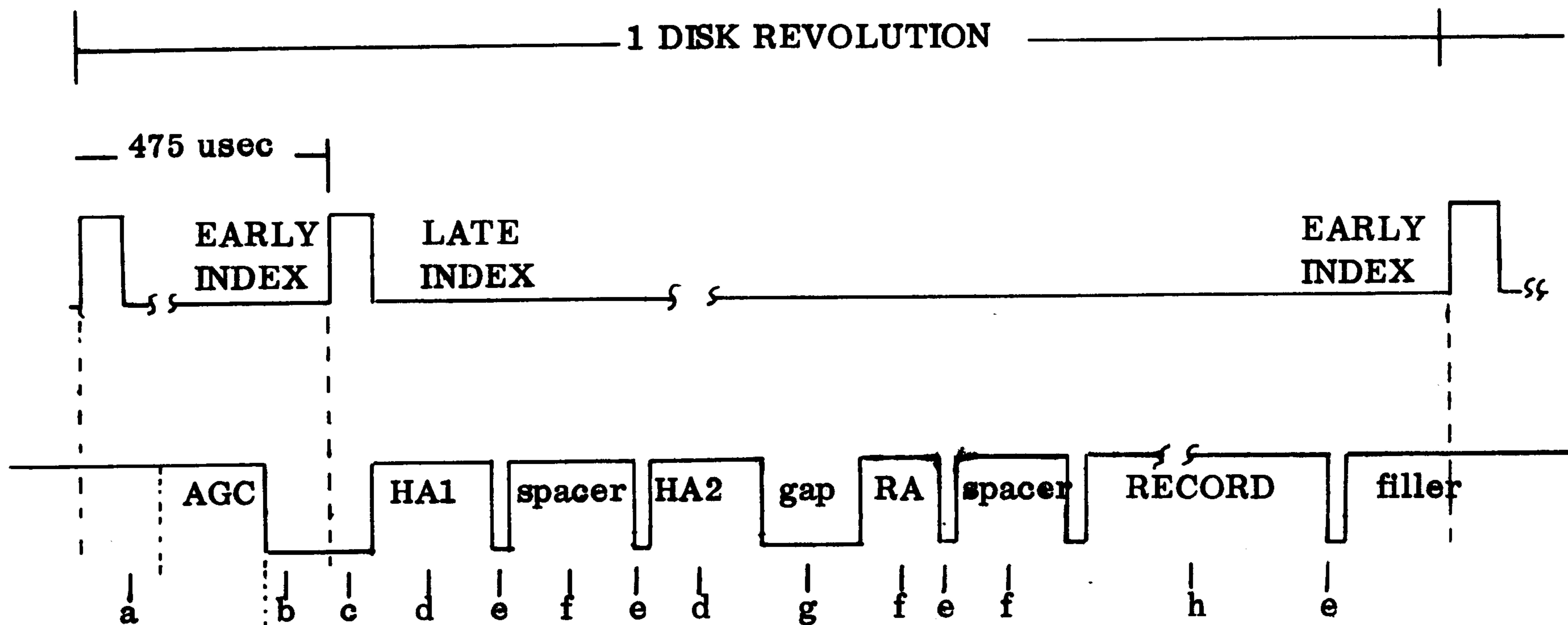


\* K 401 is for the first 1302. K 401a, b, or c, are plugged into the same connector (11 D), on the 2nd, 3rd, 4th and 5th 1302, but come from 7631--L05, U05, L07, and U07, respectively.

\*\* These are TCK terminator cards. Three are sent in the 7631 Shipping Group. They are used only in the last file in line. In addition, each 1302 shipped from San Jose will have a card in position 5C; this card must remain in place on all 1302's.

\*\*\* K 419, used with 7631, Serial No. 12000 and above.

FIGURE AII-7 1302 TAILGATE CABLING



Note: All characters are written in an 8-bit mode (9 bits per character),  
800 nanoseconds per bit, nominal.

Code: a - 350 microseconds  $\pm$  25 usec, from early index to end of AGC burst  
 b - 125 microseconds  $\pm$  15 usec  
 c - 54 "no bits" (6 characters)  
 d - 108 bits (12 characters)  
 e - 9 "no bits" (one character)  
 f - 117 bits (13 characters)  
 g - 135 "no bits" (15 characters)  
 h - 18,432 bits (2048 characters)

FIGURE AII-8 FORMAT TRACK PATTERN - 1302