

S/N 14029

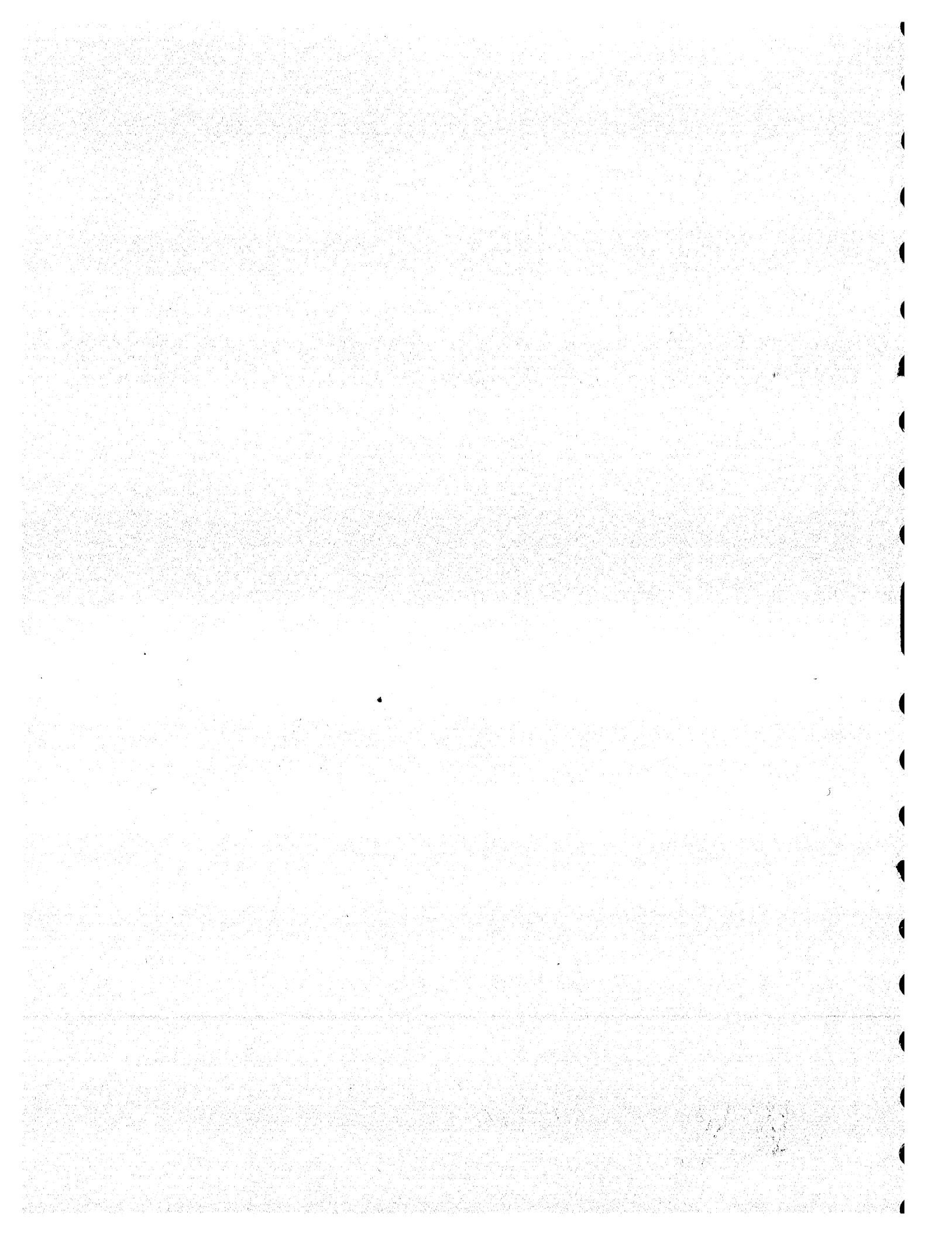
**CONTROL DATA® 9461  
DISK STORAGE DRIVE**

A12 AND ABOVE  
B12 AND ABOVE

**DIAGRAMS &  
CIRCUIT DESCRIPTION  
CARD PLACEMENT  
WIRE LISTS**

**CONTROL DATA**

**CUSTOMER ENGINEERING MANUAL**



**CONTROL DATA<sup>®</sup> 9461**  
**DISK STORAGE DRIVE**

A12 AND ABOVE  
B12 AND ABOVE

DIAGRAMS &  
CIRCUIT DESCRIPTION  
CARD PLACEMENT  
WIRE LISTS

## RECORD of REVISIONS

REVISION	NOTES
A • (2-14-69)	Manual released. This manual incorporates all change orders released prior to 2-14-69.
B (6-2-69)	Engineering Change Order PM5534 incorporating the following: ECO PM4243C affecting pages 1-1, 1-5, 1-7. ECO PM4539B affecting pages 3-37, 3-40, 3-41, 3-42, 3-43. ECO PM4645 affecting pages 1-13. ECO PM4677 affecting pages 3-26, 3-27. ECO PM4772 affecting pages 3-47. ECO PM4787 affecting pages 3-37, 3-40. ECO PM4823 affecting pages 3-37, 3-38, 3-39, 3-40, 3-41, 3-42, 3-43, 3-44, 3-45. ECO PM4843A affecting pages 1-1, 1-5. ECO PM4914 affecting pages 3-24, 3-25. ECO PM4949 affecting pages 1-9. ECO PM4950 affecting pages 3-24, 3-25. ECO PM5020 affecting pages 1-13, 3-37, 3-40, 3-41, 3-42. ECO PM5033 affecting pages 1-13. ECO PM5037 affecting pages 3-44, 3-45. ECO PM5038 affecting pages 3-37, 3-40, 3-41. ECO PM5279 affecting pages 1-5.
C (7-31-69)	Engineering Change Order PE12154 incorporating the following: ECO PM4840B affecting pages 1-15. ECO PM5186 affecting pages 1-3, 1-5, 1-11, 3-2, 3-9. ECO PE12095 affecting pages 1-14, 1-15.
D (1-13-70)	Engineering Change Order PE12524 incorporating the following: FCO PM5354A/ECO PM5354B affecting pages 1-13, 3-28, 3-29. FCO PE12101A/ECO PE12101 affecting pages 1-1, 1-9, 3-13. FCO PE12005 affecting pages 1-9, 1-11, 3-13, 3-14. FCO PE12126 affecting page 1-11. FCO PE12131 affecting pages 1-13, 1-15. ECO PE12054A affecting pages 3-44, 3-47. ECO PE12074A affecting pages 1-9, 1-11, 3-13, 3-14. ECO PE12078A affecting pages 1-13, 1-15, 3-37 thru 3-43. ECO PE12211 affecting page 1-5. ECO PE12231 affecting page 3-32. ECO PE12245 affecting pages 1-9, 3-15. ECO PE12328 affecting pages 1-1, 1-11, 3-1.

FORM CA230 REV. 1-67

Pub No. 41248400  
© 1969, 1970  
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Printed in United States of America

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St. Paul, Minnesota 55112

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## PREFACE

Customer Engineering material for the CONTROL DATA<sup>®</sup> 9461 (Mods 12 and above) Disk Storage Drive is contained in four separate manuals, and provides all information required for installation, operation, and maintenance.

Publication No. 41246800	General Description, Operation, Installation and Checkout, Maintenance
Publication No. 41248400	Theory of Operation, Diagrams, Wire Lists
Publication No. 41245200	Illustrated Parts List
Publication No. 40826700	Disk Storage Drive (OEM) 1604 Logic Modules Manual





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**PART 1**

**DIAGRAMS & CIRCUIT DESCRIPTION**

Logic diagrams represent a symbolic approach to electronic schematics. By using symbols to represent building block circuits, the diagram becomes easy to read if the reader understands the function of the symbols. In Control Data Corporation logic, two signals, a logical 0 ("0") and logical 1 ("1"), are the possible input or output conditions of a circuit. A circuit with an output of "1" is "up" and a circuit with an output of "0" is "down". Detailed descriptions of logic symbols and their associated building block circuit cards are contained in the appropriate printed circuit manual (1604 and 3600 Card Types). Refer to the Literature Distribution Center Catalog for the publication number and latest revision level.

### STANDARD LOGIC SYMBOLS

Standard logic diagram symbols for Control Data equipment using 1604- or 3600-type cards are inverters, flip-flops, control delays, capacitive delays, inductive delays, and line drivers and receivers.

#### Inverters

An inverter is a logic element which provides an output that is an inversion of its input. When more than one input is provided to an inverter, "1's" take precedence over "0's" and drive the output of the inverter to "0". Because any "1" input of several inputs drives the output to a "0", an inverter may be considered an inverting OR (NOR) gate when more than one input is present.



Figure 1. Inverter Symbols

Acceptable conventions for showing multiple OR inputs are given in Figure 2.



Figure 2. OR Circuit Conventions

An AND gate requires that all its inputs be "1's" in order that its output be a "1". If one or more of the inputs to an AND gate are "0", the output is a "0". Figure 3 illustrates conventions for showing AND gates feeding an inverter.

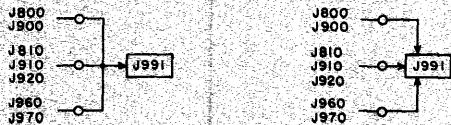


Figure 3. AND Circuit Conventions

Figure 4 illustrates a combination AND/OR input.

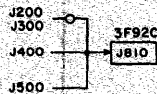


Figure 4. AND/OR Circuit Convention

## KEY TO LOGIC SYMBOLS

(STANDARD 1604 OR 3600 CARD TYPES).

#### Flip-Flops (FF)

The flip-flop (FF) is a storage device with two stable states - designated as Set and Clear - and is composed of two or more inverters. The logic symbols (Figure 5) are formed by the combination of inverter symbols. By convention, Set inputs and outputs are shown in the upper part of the symbol and Clear inputs and outputs are shown in the lower part of the symbol.

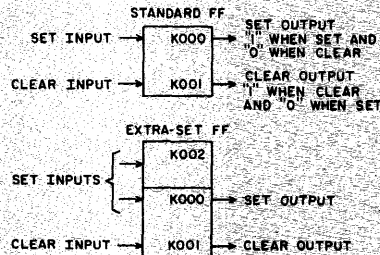


Figure 5. Flip-Flop Symbols

Figure 6 illustrates the interconnection of inverter symbols to form a flip-flop symbol. The term numbers assigned to each flip-flop are the term numbers of the internal inverters as seen by comparing the terms in Figure 5 with those in Figure 6. Notice that the Set output is the output of inverter K001, and the Clear output is the output of inverters K000 and K002.

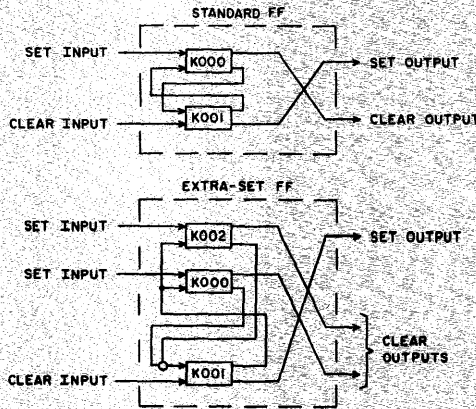


Figure 6. Internal Inverter Connections for a Flip-Flop

#### Control Delay

A control delay is a timing device consisting of an H term which receives the input and one or more V, Y, or N terms to provide the outputs. The H term is essentially a flip-flop with controlled feedback and occupies an entire printed circuit card. The output term(s) are inverter(s) located elsewhere on the logic chassis. The "1" outputs from a control delay are clocked pulses which are delayed one phase time from the "1" inputs. Clock inputs are not shown on the logic diagrams for any H, V, Y, or N terms; these terms, which control the start and duration of the delayed output pulses, may be found in the Equation Summary. Figure 7 illustrates two representative forms of the control delay symbol, with possible inputs and outputs labeled. Figure 8 shows the electrical connections for the two forms.

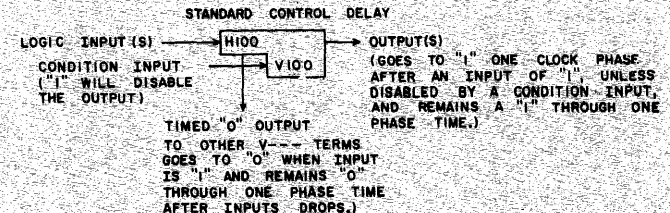


Figure 7. Control Delay Symbols

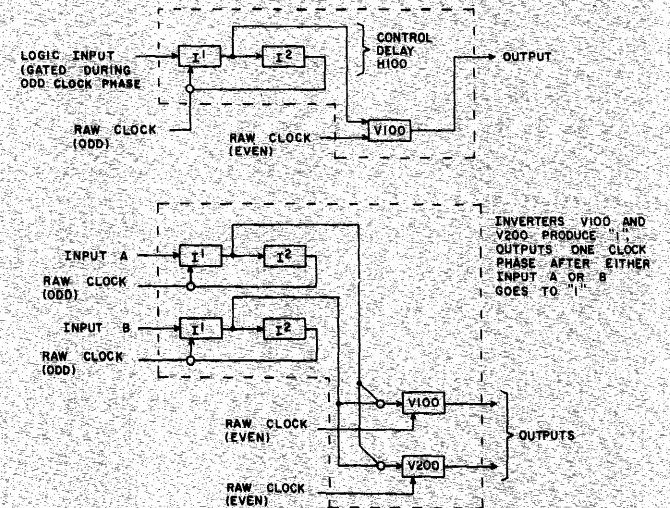


Figure 8. Electrical Connections for Control Delay

Control delays may have multiple inputs and/or multiple outputs. When a control delay has multiple output terms (i. e., more than one V, Y, or N term), each output term may have a separate conditioning input.

### Capacitive Delays

A capacitive delay is used to delay the "1" input to a logic element. ("0" inputs are not affected by the delay.) Capacitive delays may be active or passive, depending upon whether or not transistors are used as part of the delaying circuit. Delay periods are checked by using a dual-trace scope connected to the input and output of the delay producing element. The actual connection points for the scope and probes vary for different cards and should be determined by referring to the Printed Circuit Manual.

Active delays may be recognized by the circuit letter always present as part of the card location. Pin numbers are also shown when external wiring is needed to connect the proper capacitance. In Figure 9, the pluggable delay uses this wiring to connect to capacitors on the same card. In the third example, this wiring connects to capacitors located on two separate capacitor cards.

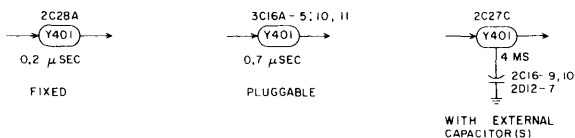


Figure 9. Active Capacitive Delays

All passive capacitive delays (Figure 10) are formed by wiring grounded capacitors, located on one or more capacitor cards, as an AND input to the affected logic element. For this reason, all passive delays show pin numbers to provide this external wiring data.

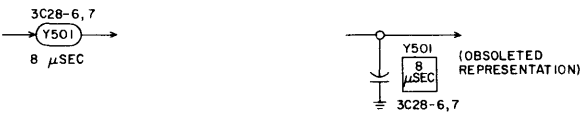


Figure 10. Passive Capacitive Delays

Capacitive delays may be adjustable or nonadjustable, depending on the card type and/or the external wiring connections on the card. When it is necessary to adjust the delay period in order to obtain specified circuit operation (usually done by varying a potentiometer in the RC network), a diagonal arrow is added to the delay symbol as shown in Figure 11.



Figure 11. Adjustable Capacitive Delays

### Inductive Delays

An inductive delay is used to delay either the "1" or "0" input to a logic element or as a tapped delay line for timing of operations. The symbol for this delay is an elongated oval with a double vertical line just within the input end of the oval. When used as a tapped delay line, the inductive delay is terminated in its characteristic impedance. Inductive delays are identified

in the same manner as capacitive delays (except for the vertical lines) unless they are used as delay lines. On multi-section cards where no identifying circuit letters are present, pin numbers are shown adjacent to the input and output arrows. Figure 12 shows both kinds of inductive delays.

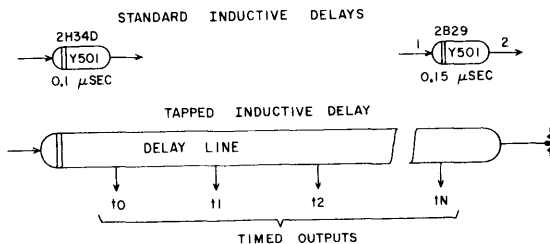


Figure 12. Inductive Delays

### Line Drivers/Receivers

Voltage levels used to represent "1's" and "0's" on cables are different from those used for internal logic. The level shift to and from internal logic is made by line drivers and line receivers. These cards may be considered as inverting the signal electrically, but not logically. The letters commonly associated with these cards are L & M (1604) and R & T (3000 Series). A 3000 Series Receiver may also be used to perform a logical inversion by swapping the twisted pair wires. This usage is indicated by a circle on the input side of the symbol. In Figure 13, "1's" and "0's" have been added to clarify the logic states; they are not part of the symbol.

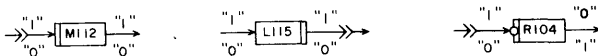


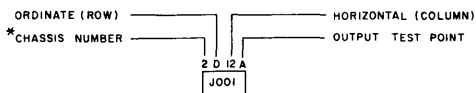
Figure 13. Typical Line Driver/Receiver Symbols

### NON-LOGIC CONVENTION

The use of the double vertical bar, as shown in Figure 13, denotes a shift in signal voltage level from that used in internal logic. The double bar appears on the input or output side of the symbol, depending on which side connects to the non-logic-level signal. No particular voltage level is implied by the double bar - only that it is non-logic.

### JACK ASSIGNMENTS

Each numbered term in the logic diagrams contains a jack assignment showing the physical location of that hardware element and the test point (circuit section) associated with it. For some card types, the test point letter is replaced by a pin number. For these cases, a card extender must be used in order to test that section of the card. Also, some symbols show no test point. This is because the entire card is used for one purpose (e. g. a single inverter, FF, or control delay). Figure 14 illustrates the inverter J001, with 2D12A representing its jack assignment.



\*When most or all jack assignments are located on one chassis, the chassis numbers for that chassis are omitted. All multi-chassis devices include a chassis number as part of each jack assignment.

Figure 14. Jack Assignment Scheme

### CABLE IDENTIFICATION

Cable connections are represented by the MIL-STD-15 symbol and identified as to connector location and pins used, as shown in Figure 15.

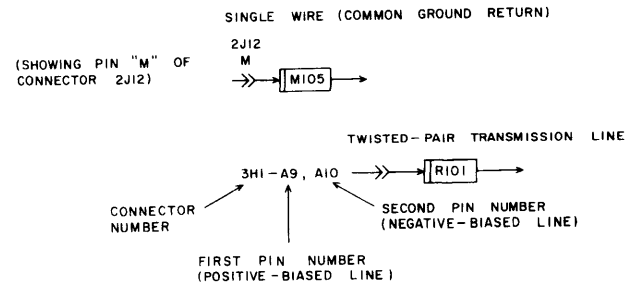


Figure 15. Cable Connections

### SPECIAL LOGIC SYMBOLS

Nonstandard elements (special logic and/or non-logic elements) are represented by a special circuit symbol (generally a rectangle as shown in Figure 16). The special circuit symbol always shows the symbol designation, jack location, and the card type. Supplemental information may also be shown such as in the case of special delay cards which indicate the delay period. For detailed information refer to the specific card type in the appropriate Printed Circuit or Logic Module Manual.

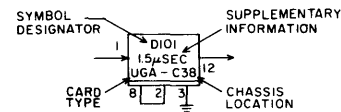


Figure 16. Symbol for Special Circuits

### INPUT/OUTPUT DESIGNATIONS

Where several pages of logic are involved, a symbol index and term list (side cars) are incorporated within the manual. Also in certain instances such as special card types or on equipments for which no equation summary exists (as for peripheral devices) input and output pin numbers are indicated on each logic element as are the output destinations of the elements (Figure 17).

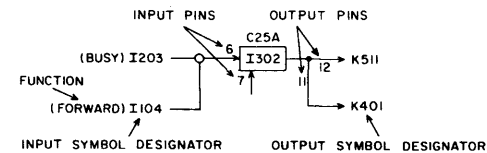


Figure 17. Input/Output Designations

## UNIT SELECT

The controller can select any one of eight disk storage drives by applying a select module signal to receiver R012. If the disk storage drive is on-line, the following lines are returned to the controller:

1. Selected Module via T007. This line is used by the controller to check if the disk storage drive is selected.
2. Selected On Line, via T006. When the heads are loaded, this line indicates that the selected disk storage drive is available.

## ADDRESS AND CONTROL BUS

The address and control bus consists of eight input/output lines which carry information between the controller and the disk storage drive. The function of the signals carried on these lines is defined by one of the accompanying select lines.

## SELECT LINES

## Set Difference

After the controller has computed the difference between the disk storage drive current cylinder address and the desired cylinder address, the controller applies a -Q set difference pulse to R008. This indicates to the selected disk storage drive that the address and control bus contains head positioning information. This information, indicating tracks-to-go to the desired cylinder, is then loaded into the decrement counter.

## Set Cylinder

The -Q set cylinder pulse applied to R009, indicates that the address and control bus contains head positioning information. This information is used to reset the disk storage drive cylinder address register to the new cylinder address.

## Set Head and Direction

The controller applies a -Q pulse to R010 when the address and control bus contains head select information and the cylinder access direction. The head select information (bits 4 thru 7) is gated into the head address register to select which head shall read or write. Bit 0 of the bus is applied to the Reverse FF (K214/215) to establish the direction of the next seek.

## Control Select

The -Q level control select signal is applied to R011. When this signal is up, the address and control bus contains control information. Bit assignments and their functions are as follows:

1. Bit 0 - Write Gate, -Q level. Commands a write operation by enabling the write driver.
2. Bit 1 - Read Gate, -Q level. Commands a read function by enabling the read lines.
3. Bit 2 - Start Seek, -Q level. Initiates carriage positioning according to that previously specified by the Set Head and Direction tag.
4. Bit 3 - Reset Head, -Q level. Resets head address to zero.
5. Bit 4 - Erase Gate, -Q level. Commands an erase function by enabling the erase driver.
6. Bit 5 - Head Set, -Q level. Enables the head indicated by the head address register.
7. Bit 6 - Return to Zero Seek (RTZS), -Q level. Move heads in reverse to the home position, then forward to cylinder zero.

8. Bit 7 - Head Advance, -Q level. Increments the head address register so that the next head in order can be selected. This function can be used to select heads sequentially on a cylinder for multiple track reading or writing.

## INDEX/SECTOR

Each cylinder is divided into 20 sectors. The controller knows which sector is under the heads by means of a sector disk which rotates with the disks. The sector disk has 21 notches in its outer rim. As the disk rotates, the notches cover and uncover photocells to generate sector pulses.

The starting, or reference, point is the index pulse. This pulse is generated by two notches close together on the sector disk. When light passes through both notches simultaneously, the output of I028 goes to "1". If the unit is selected and on line, T004 returns a selected index, -Q pulse.

## END OF CYLINDER

If the heads are selected sequentially on a cylinder, the head address register is incremented by the Head Advance Command. While heads 0 thru 9 are selected, none of the AND gates into I026 are made. When the next head advance command is applied to R007 to advance the head address register from 9 to 10, the gate into I026 is completed. T005 returns a -Q level End of Cylinder signal to the controller to inform it that the last head of a cylinder has been used.

All input/output signals are Q or L levels or pulses. These signals are within the following voltage ranges:

+Q = +3.5 to +0.65 vdc, -Q = -0.5 to -3.5 vdc, +L = +6.28 to +2.0 vdc, and -L = +0.3 to 0.0 vdc.



**DECREMENT COUNTER**

The decrement counter is set by the Set Difference input to the address and control bus. This select sets the counter to the number of cylinders to go during a seek. Direction of seek is controlled by the Set Head and Direction line.

As the heads move toward the new cylinder, the trailing edge of each track pulse provides an enabling term to pulse generator K160/161 and K162/163. This pulse generator provides the two phase pulses necessary to decrement the counter. As the counter counts down towards zero, inverter I171, I173, I174, I177, and I178 decode the output of the counter to indicate the number of tracks to go. These lines will be used to control the speed of the carriage motor and, ultimately, to stop the heads on the desired track.

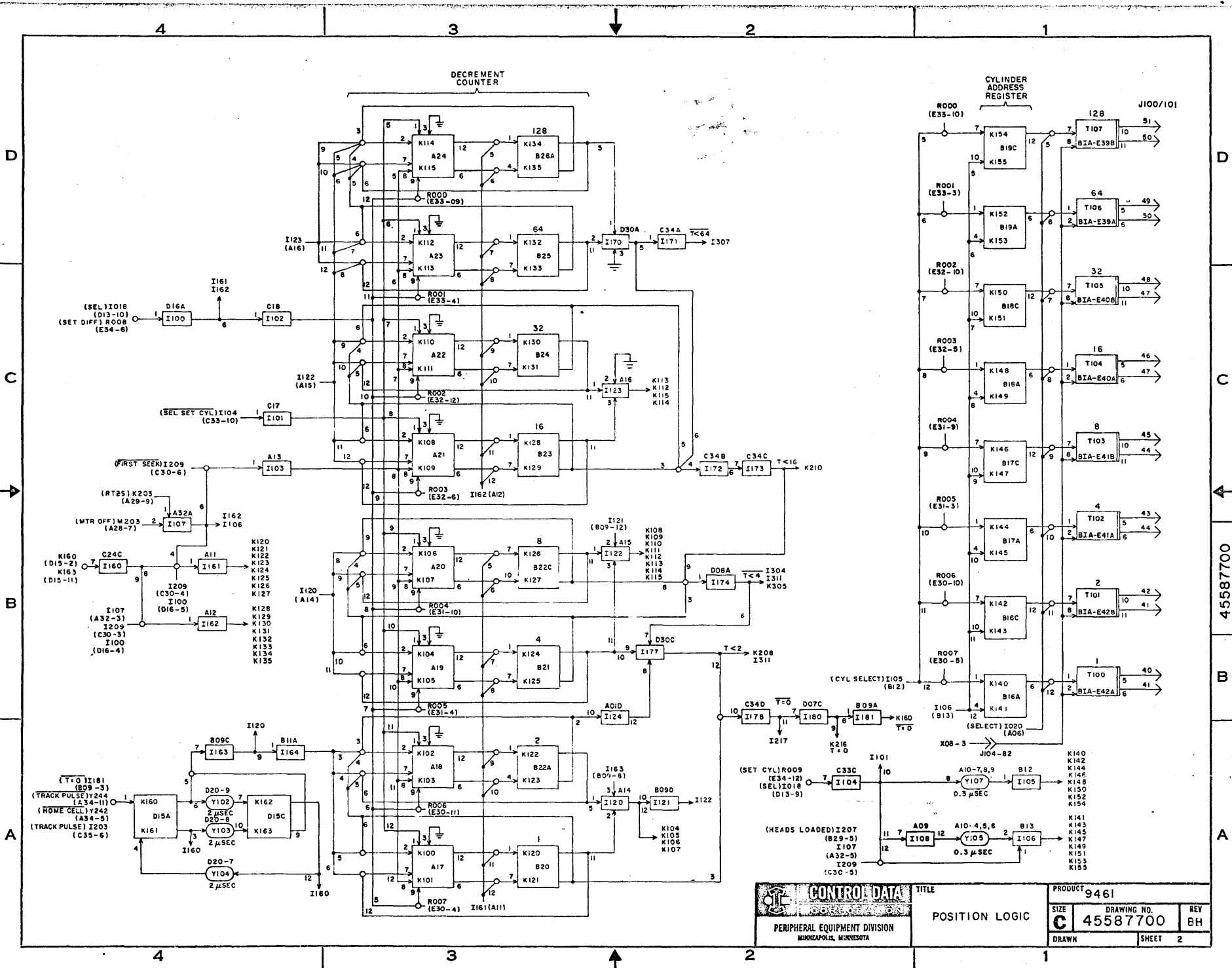
**CYLINDER ADDRESS REGISTER**

The cylinder address register is set by the Set Cylinder input to the address and control bus. The number stored in the register indicates which cylinder the heads are currently positioned on.



1-3

REV D



 <b>CONTROL DATA</b> PERIPHERAL EQUIPMENT DIVISION MINNEAPOLIS, MINNESOTA	TITLE	PRODUCT
	POSITION LOGIC	9461
SIZE	DRAWING NO.	REV
C	45587700	BH
DRAWN	SHEET	2

45587700

A

B

C

D

4

3

2

1

REV A

### HOME CELL

The home cell is a photocell which receives light if the heads are positioned on an illegal cylinder (less than cylinder 00 or more than 202). This signal is used to detect a seek error or to position the heads on cylinder 00 during a return to zero seek or first seek.

### DIRECTION CONTROL

The direction of carriage motion is controlled by the forward FF. The FF forces forward motion when it is set by any of the following:

1. Heads unloaded and first seek.
2. Home cell lights while driving in reverse.
3. After a seek has been completed.

The Forward FF is cleared by:

1. Return to zero seek.
2. Reverse seek command.
3. After heads are loaded during first seek.
4. When heads are unloaded with motor off.

The Reverse FF forces reverse motion by clearing the Forward FF. The Reverse FF is set by a set head and direction or if a forward seek error occurs. It is cleared at the end of the reverse seek or upon completion of the seek error recovery.

The RTZS (Return to Zero Seek) FF is set by a control select from the controller. Setting the FF clears the Forward FF to enable reverse drive to the home cell. RTZS FF clears when the home cell lights.

The Slow FF is set when tracks-to-go are less than sixteen. The output of the FF acts on the motion circuit to prevent the carriage from moving faster than 6 ips. The FF is cleared by any seek command.

Stop FF commands the carriage to stop. As the decrement counter counts down during a direct seek, the output of I177 goes to "1" on the trailing edge of the next to last track pulse (that is, when T<sup>2</sup>). On the leading edge of the next track pulse. Y243 goes to "1" to complete the AND gate to set the FF. The FF is cleared by an any seek command or a motor off and heads unloaded condition.

First Seek FF is used to initially load the heads. When the disks come up to speed, the FF sets. This sets the forward FF. When the heads are loaded, the Forward FF clears. Note that the First Seek FF is also set if a seek error occurs during a forward seek.

Seek Error FF senses an error if the home cell is uncovered during a direct seek. The FF is cleared upon receipt of a return to zero seek command or power-off seek.

### DETENT

The Detent FF (K212/213) controls the detent pawl which locks the carriage on its specified track. When the FF is set, cards L200 and L201 are turned off. This deenergizes the detent coil, allowing the detent pawl to engage the gear. Normally, the Detent FF is set by the trailing edge of the last track pulse during a seek. It is also set when the disks are not up to speed and the carriage velocity is less than 2 ips. This prevents head scoring.

Upon receipt of any seek command, the FF clears. This completes the AND gate into card L201. Turning on the card applies a high current through coil L210 to quickly pull the pawl away from the gear teeth. After 2 ms, the Y312 term into card L201 goes to zero. Card L200 then controls current through coil L210 to hold the detent in its retracted position.

### SELECTED DRIVE READY

The selected drive ready signal informs the controller that the heads have reached the addressed cylinder. This -Q level is returned to the controller via T202 10.2 ms after the Detent FF sets. The selected drive ready will be disabled and replaced by the seek incomplete signal, if the selected drive ready signal is not returned to the controller within 600 ms. Seek incomplete is a -Q level sent to the controller via T204. No matter which of the two previously mentioned signals is sent to the controller, it will be accompanied by a -Q level Attention sent via T203.

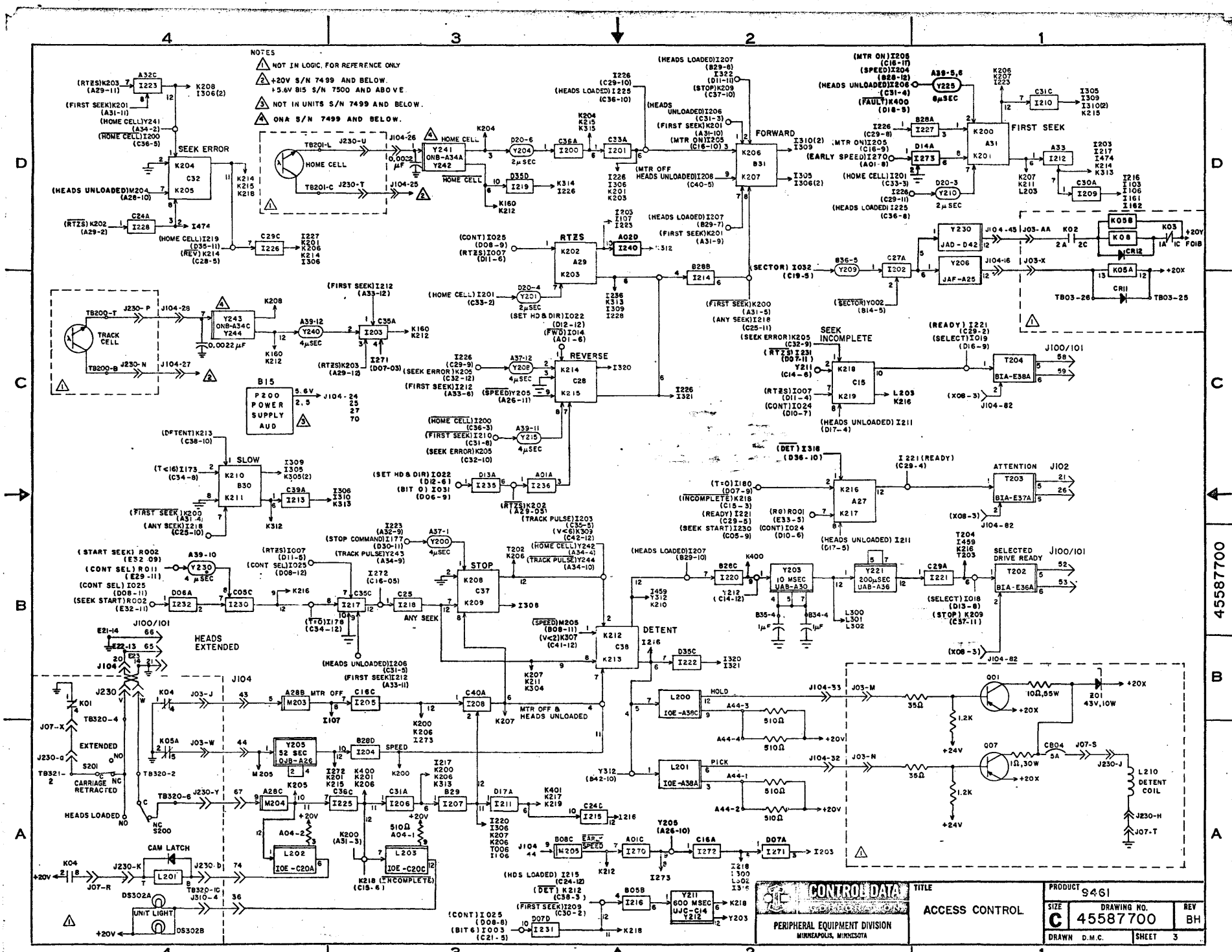
### TRACK CELL

The glass timing disk has 203 slots on its middle ring to indicate cylinder position. As the heads move across the disks, the timing disk rotates. Each time a slot passes the track cell, allowing light to hit the cell, the output on ONA Y244 goes to "0" and Y243 goes to "1". As the cell goes dark the input to I203 from Y244 goes to a "1" after 4 usec. ANDing the outputs of Y244 and I203 provides a 4 usec trailing edge "1" pulse to decrease the decrement counter and partially enable Detent FF. The ONA outputs are also used to partially enable the Stop FF.

All input/output signals are Q or L levels or pulses. These signals are within the following voltage ranges:  
+Q = +3.5 to +0.65 vdc, -Q = -0.5 to -3.5 vdc, +L = +6.28 to +2.0 vdc, and -L = +0.3 to 0.0 vdc.

1-5

Rev D



45587700

B

A

		TITLE		PRODUCT
		ACCESS CONTROL		9461
SIZE	DRAWING NO.	REV		
C	45587700	BH		
DRAWN	D.M.C.	SHEET	3	

## SPEED CELL

The glass timing disk has slots in its outer ring used to indicate speed of carriage motion. As each slot permits light to hit the speed photocell, the leading edge of the pulse out of ONA Y321/322 is used to initiate a timing chain generator composed of FF's K300/301 and K302/303. The outputs of these FF's are applied to three UAB delay cards: Y305, Y306 and Y307. If the speed is low enough to allow one or more of these delays to time out, their associated inverters will output a "1" to signify head speeds of less than 15 ips, 6 ips, or 2 ips. These outputs are applied to the set inputs of V<2 FF K306/307, V<6 FF K308/309, and V<15 FF K310/311. The outputs of these FF's in turn, are used to control carriage motion.

## MOTION

The printed circuit motor which drives the carriage is controlled by an H-switch consisting of Q03 through Q06. The motor drives forward when the AND gate into L300 is made. Operation of the circuit during a forward seek is explained below.

Upon receipt of a forward command, the Forward FF (K206/207) is set; the Detent FF (K212/213) clears to pull the detent pawl. The direction of seek is sensed by I305 and I309; all inputs to I305 must be "0" to drive forward. Since velocity is 0 ips at this time, I305 outputs a "1" and forward motion starts. (I309 in the reverse circuit operates in a similar manner; if all of its inputs are "0" the motor drives in reverse.)

Rate of motor acceleration is controlled by the Not Max Drive FF (K212/213). When the FF is cleared transistor Q02 is turned on to permit high current flow through the access motor's H-switch, this causes maximum acceleration or, in the case where opposing current is enabled, maximum deceleration. When a seek starts where tracks-to-go exceed 4, the FF clears after delay Y312 times out; the delay permits the detent pawl to clear its gear.

Assume a full 199 track seek. The motor accelerates to a full speed of approximately 35 ips until there are less than 64\* tracks to go. The output of I305 goes to "0" when T (tracks-to-go) is less than 64 and V (carriage velocity) is greater than 15 ips. At the same time, the "1" input to I310 in the reverse drive circuit causes opposing current to flow through the H-switch. The motor is then rapidly braked to 15 ips. When V is less than 15, the Not Max Drive FF sets to turn off high current. The 15 ips speed is maintained by serving the motor; I305 and I310 alternately output "1's" and "0's" to maintain a constant speed.

When tracks-to-go are less than 16, the slow FF sets. The Per Dy Brk (Permit Dynamic Braking) FF (which was set at the start of the seek) enables the AND gate input to I310 to again apply reverse current. At the same time, Not Max Drive FF is again cleared. Therefore, the motor is rapidly slowed to 6 ips. When the speed is less than 6 ips, Not Max Drive FF sets, while Per Dy Brake FF clears. Speed is maintained in a "hit and coast" manner. That is, I305 turns on the motor when speed is less than 6 ips, then turns it off when speed exceeds 6 ips.

\*Less than 80 tracks to go for units with serial no.980 and below not having FCO 1846 installed.

When tracks-to-go are less than 4, I311 sets K304/305. The motor is again dynamically braked until speed is less than 2 ips. Note that the braking action is now low current since the Not Max Drive FF remains set. Speed of 2 ips is maintained in a hit and coast manner.

The trailing edge of the next to last track pulse causes a stop command which combines with the leading edge of the last pulse to set the Stop FF.

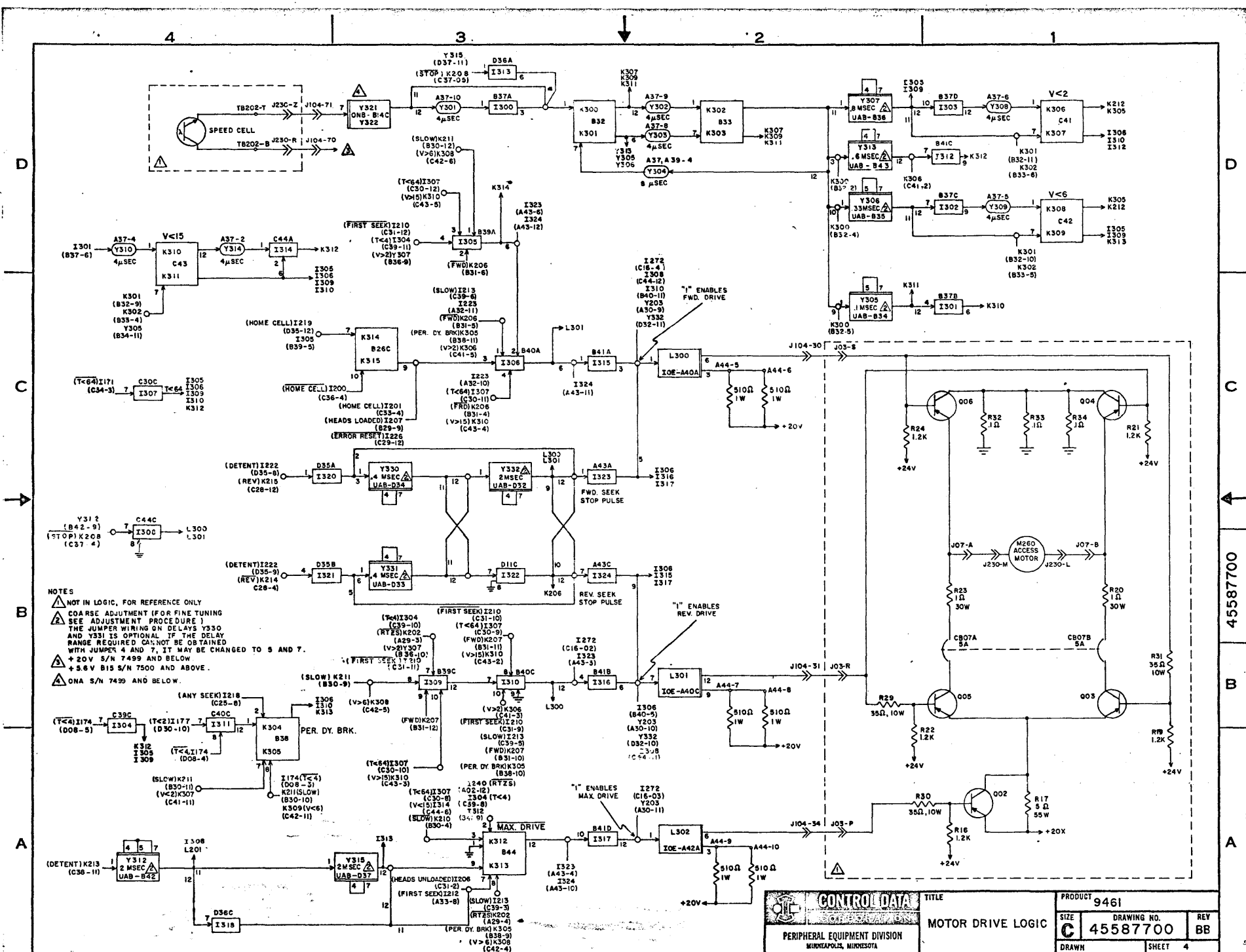
Detent FF sets on the trailing edge of the last track pulse. The circuit consisting of I320 through I324, and delays Y330 through Y332 provide a motor stop pulse. In a forward seek, after the Detent FF sets, a 2 ms "0" pulse delayed by Y331 from I323 is applied through inverters to cards L301 and L302 to stop the motor by the time the detent pawl meshes with its gear.

Operation of this circuit during a return to zero seek is as follows:

1. With RTZS FF set and Forward FF cleared, reverse drive is supplied by the "1" output of I309. Acceleration is retarded since Not Max Drive FF is set.
2. Speed is maintained in a hit and coast manner at 6 ips by the V greater than 6 term that is applied to I309.
3. When the home cell lights, the RTZS FF clears and Forward FF sets. The output of FF K314/315 forces forward drive back to cylinder 00.

I-7

REV B



- NOTES**
- ⚠ NOT IN LOGIC, FOR REFERENCE ONLY
  - ⚠ COARSE ADJUSTMENT (FOR FINE TUNING SEE ADJUSTMENT PROCEDURE)
  - ⚠ THE JUMPER WIRING ON DELAYS Y330 AND Y331 IS OPTIONAL IF THE DELAY RANGE REQUIRED CANNOT BE OBTAINED WITH JUMPER 4 AND 7. IT MAY BE CHANGED TO 5 AND 7.
  - ⚠ +20V S/N 7499 AND BELOW
  - ⚠ +5.6V B15 S/N 7500 AND ABOVE.
  - ⚠ ONA S/N 7499 AND BELOW.

		TITLE	
		MOTOR DRIVE LOGIC	
PRODUCT 9461		SIZE	REV
PERIPHERAL EQUIPMENT DIVISION MINNEAPOLIS, MINNESOTA		C	BB
DRAWN		DRAWING NO.	SHEET
		45587700	4

**FAULT**

The Fault FF K400/401 is set if one of the following malfunctions occurs:

1. More than one head selected.
2. Write current OR non-complement write current AND no erase current.
3. Erase current AND no write current OR no non-complement write current (if condition exists for more than 200 usec).
4. Read, Write, OR Erase Gate AND no Selected Drive Ready.
5. Write Gate OR Erase Gate AND Read Gate.
6. Write Gate AND no ac write current.
7. Low voltage condition on disk storage  $\pm 20$  vdc or + 36 vdc outputs.
8. Loss of ac line voltage (from controller) to disk storage drive.

One or more of the above conditions will:

1. Generate a -Q level Drive Unsafe signal.
2. Remove all write and erase current from the heads.
3. Disable the Set Head and Direction tag.
4. Set all Q-level type output cards (except Drive Unsafe and Selected Module) to the +Q level.
5. Light the SELECT LOCK switch/indicator.

All input/output signals are Q or L levels or pulses, these signals are within the following voltage ranges:  
 +Q = +3.5 to +0.65 vdc, -Q = -0.5 to -3.5 vdc, +L = +6.28 to +2.0 vdc, and -L = +0.3 to 0.0 vdc.

**HEAD ADDRESS REGISTER**

The head address register consists of FF A400/401 through A416/417. The output of the register is applied to the 10 head select cards (G40-) to control which head will read, write, or erase.

The register may be set in two ways. One method is by means of the Set Head and Direction line. When this line is up, the address and control bus directly sets up the register to select the desired head.

If it is desired to select the heads sequentially on a cylinder the Control Select line and bit 3 of the address bus is used to initially set the register to zero. Thereafter, a head advance signal may be applied to I473 to increment the register to the next head.

In either method, the timing pulse generator consisting of FF K402/403 and K404/405 provides the enabling pulses to transfer the count in rank I to rank II of the register.

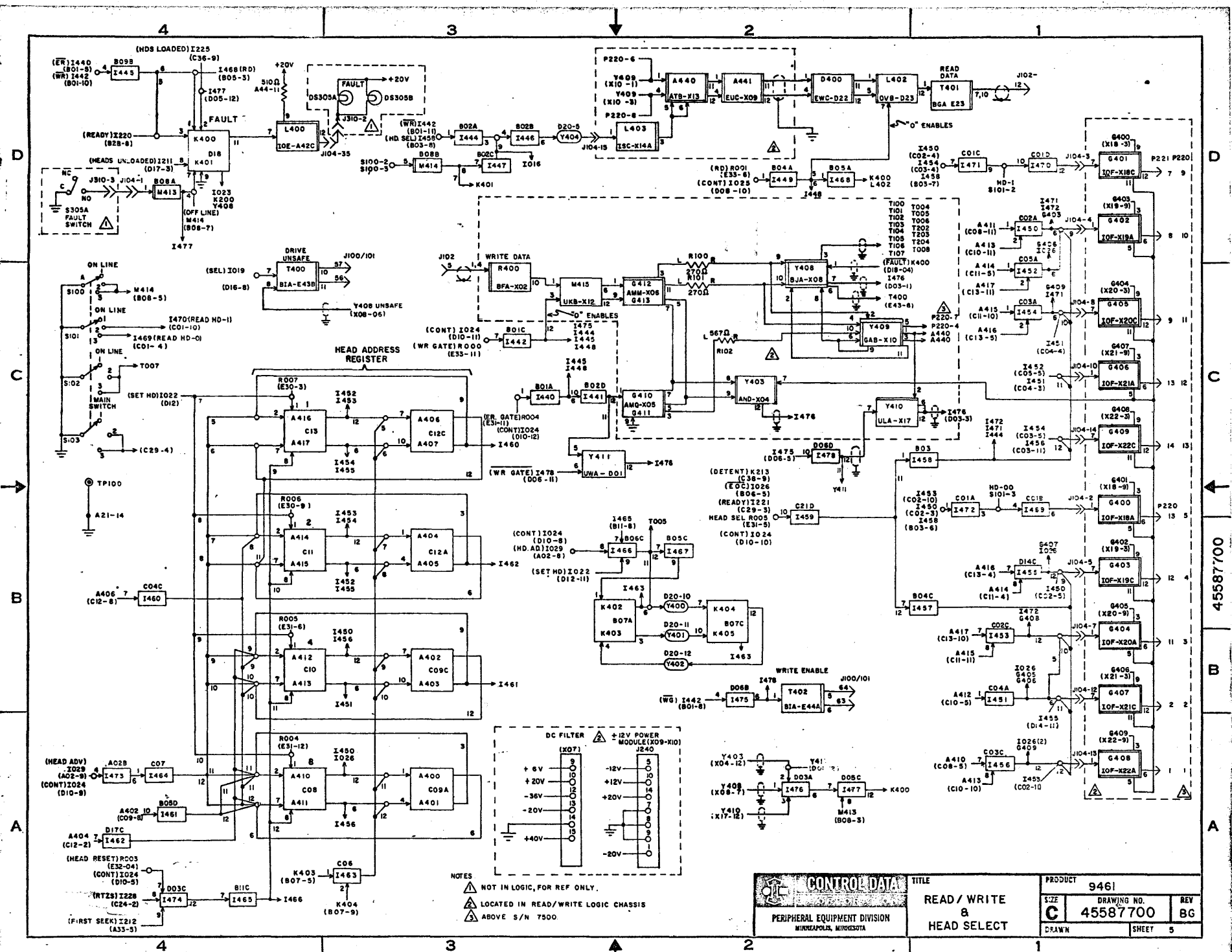
**READ CHAIN**

The read chain consists of cards A440, A441, D400, L402, and T401. The analog output of the selected head is applied to the ATB gated read amplifier, then amplified by the EUC differential amplifier A441. Shaper D400 converts the analog input from the heads to a square wave output. If the read mode has been selected, the OVA pulse shaper gates the square wave output to T401 for transmission to the controller in the form of +L pulses.

**WRITE CHAIN**

Erase enable is applied to AM- erase driver G410/411 via I440 and I441. In order to write, a write enable must be applied through I442 to UKB toggle M415. Write information, in the form of -L level data pulses, is applied to UKB toggle M415 via R400. The UKB switches state at the leading edge of each write data pulse; its output is applied to AMG G412/413. Write current is then allowed to flow through the head selected by the head address register. Outputs of both AM-drivers are applied to AND card Y403 to check for any unbalance of the output voltages. (If there is an unbalance, Y403 sets the Fault FF K400/401.)

1-0



NOTES  
 ⚠ NOT IN LOGIC, FOR REF ONLY.  
 ⚡ LOCATED IN READ/WRITE LOGIC CHASSIS  
 ⚡ ABOVE S/N 7500

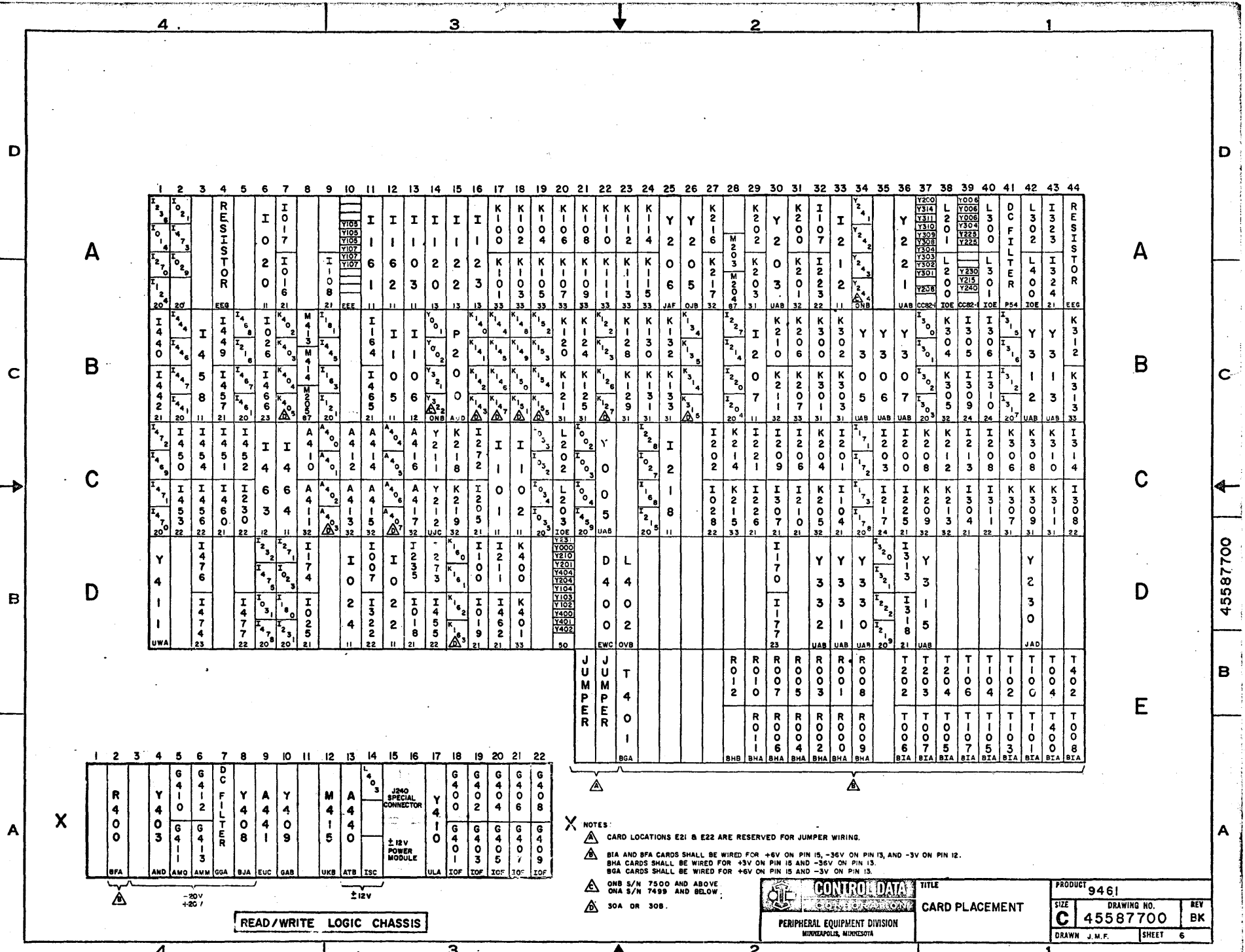
	CONTROL DATA	TITLE	PRODUCT 9461		
	PERIPHERAL EQUIPMENT DIVISION MINNEAPOLIS, MINNESOTA	READ / WRITE & HEAD SELECT	SIZE C	DRAWING NO. 45587700	REV BG
			DRAWN	SHEET 5	

45587700





1-11



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
R 4 0 0	Y 4 0 3	G 4 1 0	G 4 1 2	D C C F I L T E R	Y 4 0 8	A 4 4 1	Y 4 0 9	M 4 1 5	A 4 4 0	L 4 0 3	J240 SPECIAL CONNECTOR	Y 4 1 0	G 4 0 0	G 4 0 2	G 4 0 4	G 4 0 6	G 4 0 8	G 4 0 1	G 4 0 3	G 4 0 5	G 4 0 7	G 4 0 9
BFA	AND	AMO	AMM	GGA	BJA	EUC	GAB	UKB	ATB	ISC	±12V POWER MODULE	ULA	IOF	IOF	IOF	IOF	IOF	IOF	IOF	IOF	IOF	IOF

-20V  
+20V

±12V

**READ/WRITE LOGIC CHASSIS**

- NOTES:**
- ⚠ CARD LOCATIONS E21 & E22 ARE RESERVED FOR JUMPER WIRING.
  - ⚠ B1A AND BFA CARDS SHALL BE WIRED FOR +6V ON PIN 15, -36V ON PIN 13, AND -3V ON PIN 12.
  - ⚠ BHA CARDS SHALL BE WIRED FOR +6V ON PIN 15 AND -36V ON PIN 13.
  - ⚠ BGA CARDS SHALL BE WIRED FOR +6V ON PIN 15 AND -3V ON PIN 13.
  - ⚠ ONB S/N 7500 AND ABOVE
  - ⚠ ONA S/N 7499 AND BELOW
  - ⚠ 30A OR 30B.

	TITLE <b>CARD PLACEMENT</b>	PRODUCT 9461
PERIPHERAL EQUIPMENT DIVISION MINNEAPOLIS, MINNESOTA	SIZE <b>C</b>	DRAWING NO. <b>45587700</b>
	DRAWN J.M.F.	REV <b>BK</b> SHEET 6

45587700

## GENERAL

The power supply is completely solid state to provide low dissipation and high reliability to the operating system. The power supply provides an adjustable  $\pm 20$  vdc to the logic chassis, +24 vdc and +20X vdc to the access motor and detent solenoid, +20Y vdc and +36 vdc to the power sequencing circuit, +40 vdc to the Write circuit and dynamic braking circuit, and 24 vac to the brush motor circuit.

The main power supply is supplemented by an auxiliary power unit which provides +5.7 vdc for the fiber optic source lamp.

These voltages are sequenced and coupled to the related circuit in such a way as to prevent improper head loading, track accessing, or disk movement.

## DC POWER CIRCUIT

The 208-volt input power is applied through the closed contacts of the MAIN POWER circuit breakers to the line voltage indicators, to the fan motors, and to the primary windings of ferroresonant transformer T01.

Since T01 is a ferroresonant transformer, the voltage developed in the secondary windings tend to remain constant, regardless of the voltage variation of the applied signal or the load applied to the secondary. The voltage developed across the secondary of T01 is coupled from pins 8 and 9 to the primary of transformer T02 and rectifier diodes CR01, CR02, and CR04. Also coupled from pin 8 is 24 vac which is supplied to the brush motor circuit.

Rectifier diodes CR04A and CR04B, and rectifier diodes CR01A and CR02A develop +20 vdc and -20 vdc, respectively, at their junctions. Capacitors C01 through C04 and chokes L01 and L02 filter the voltages before they are supplied to the logic chassis. Rheostats R03 and R04 are used to adjust the voltages to their proper levels. R01 and R02 are bleeder resistors.

The voltage applied to the primary windings of transformer T02 is coupled to the secondary. The secondary voltage is applied to rectifier diodes CR03A and CR03B which develop +40 vdc at their junction. Capacitor C07 filters the voltage before it is applied through relay K05B to the read/write/erase circuit in the logic chassis. Also developed at the junction of CR03A and CR03B is +40X vdc which is applied to resistors R08 and R25.

Resistors R07 and R08 and resistors R25 and R41 form voltage dividers. The +20Y vdc developed at diodes CR01B and CR02B is applied to resistors R07 and R41. The junction of resistors R07 and R08 is driven to +24 vdc which is applied to the H switch and detent circuits. Resistors R25 and R41 develop +36 vdc at their junction for power sequencing.

The +20Y volts is also applied to filter capacitors C09, C10, and C11. Resistor R06 is a bleeder to discharge the capacitors once the unit has been turned off. The filtered +20Y vdc is used for power sequencing.

## FIBER OPTICS POWER SUPPLY

The secondary voltage of transformer T01 is coupled from pins 5 and 7 to rectifier diodes CR01A and CR01B in the fiber optics power supply. Rectifier diodes CR01A and CR01B develop +5.7 vdc at their junction and apply the voltage to filter capacitors C01 and C02 and filter choke L01. The filtered voltage is coupled through rheostat R03 to the photocell lamp. Resistor R01 is a bleeder to discharge the capacitors once the unit has been turned off.

## POWER-ON SEQUENCE

Sequencing of power within the power supply is accomplished by seven relays. This sequencing is necessary to prevent damage to the heads and/or disks and to ensure proper control of the actuator mechanism by the logic.

Motor sequence relay K01 is energized when the unit receives a sequence in from either the control unit or the previous storage drive on the line. If the disk drive unit START switch is not lighted (S301 set to OFF), the sequence out level is applied to the next storage drive. This sequencing of the storage drives is necessary to prevent loading of the primary power source.

Assume that a Power-On command is received from the control unit and the START switch (S301) is lighted. The +36 vdc is applied through connector J03 to complete the path and energize relay K01. When relay K01 is energized, contacts 1 and 7 close to energize relay K02. When K02 is energized, contacts 3A and 3C close to supply +20 vdc to the logic chassis, and contacts 4C and 4A close to supply -20 vdc to the logic chassis.

Relay K01 also completes the path through contacts 3

and 9 to energize relay K04 (assuming the disk pack is on, both top covers are closed, and the START switch is lighted). Contacts 2 and 5 of K04 open and remove +20Y volts to the brake solenoid, L300. This causes the pawl to free the spindle and close the spindle interlock switch, S333. Contacts 2 and 8 of K04 close to provide +20X to the sector solenoid, L301. The solenoid energizes, swinging the sector sensor assembly into the disk pack, thus closing the pack cover on switch, S334.

With switches S333 and S334 closed, a path is completed to energize relay K03. K03 contacts 2A/2C, 3A/3C, and 4A/4C close to apply power to the spindle motor, M360. K04 contacts 1 and 4 open and apply an output signal, indicating that the motor is on. Contacts 1A and 1C of K03 close so that power will be applied to the head latch solenoid (L200) and the cam latch solenoid (L201) when the disk pack is up to speed.

At 80 percent of the rated speed, the logic completes a circuit to energize relay K05A through J03-X. When this relay energizes contacts 1 and 4 open and a signal is applied to the logic, indicating that the pack is up to speed. This signal is applied to a 52-second delay card which allows time for the air to be purged from the disk pack area before loading the heads and for the brush assembly to complete a clean cycle of the disk pack.

Contacts 1 and 7 of K05A close to provide +40 vdc to the Write circuit and contacts 2 and 8 close to apply power to the head latch (L200). Once the heads are loaded, the solenoid armature holds the heads loaded.

## POWER-OFF SEQUENCE

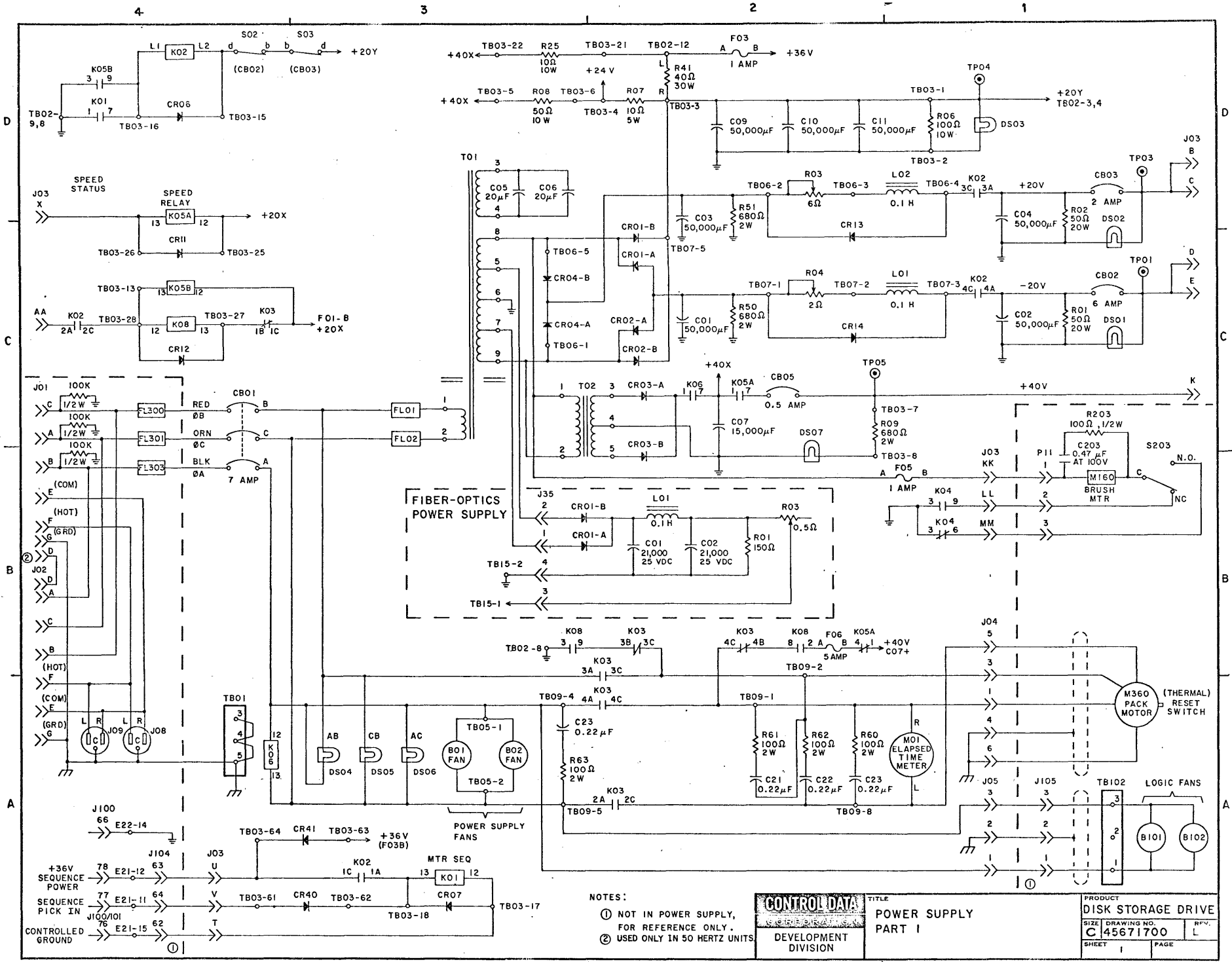
Power in the disk storage drive can be cycled off in any of three ways: from the START switch on the disk storage drive operator control panel, by opening either top cover, or from the control unit. It is assumed that the purpose for this Power-Off sequence is to change packs. The sequence is initiated when START switch S301 is pressed, opening the contacts of S301A and breaking the circuit that holds relays K03 and K04 energized. The following events occur:

1. K03 contacts 2A/2C, 3A/3C, and 4A/4C open and remove power to the spindle motor, M360 (rotation begins to slow).

(continued)

1-13

REV E



NOTES:  
 ① NOT IN POWER SUPPLY, FOR REFERENCE ONLY.  
 ② USED ONLY IN 50 HERTZ UNITS.

CONTROL DATA CORPORATION	TITLE	PRODUCT
	POWER SUPPLY PART I	DISK STORAGE DRIVE
DEVELOPMENT DIVISION	SIZE	DRAWING NO.
		C 45671700
	SHEET	PAGE
	1	L

## Power-Off Sequence (cont'd)

2. K03 contacts 3B/3C and 4B/4C close (partially completes circuit that will later dynamically brake the spindle motor).
3. K04 contacts 1 and 4 close and signal logic that the spindle motor is off.
4. K04 contacts 2 and 5 close (partially complete circuit that will energize the brake solenoid when spindle motor speed is less than 50 rpm).
5. K03 contacts 1A and 1C open to remove power to the head latch (L200) and cam latch (L201) solenoids (heads unload and carriage starts retracting).
6. K03 contacts 1B and 1C close to energize relay K08.

Energizing K08 closes contacts 2/8 and +40 vdc is applied to the windings of the spindle drive motor. This causes a magnetic field to form. The field opposes further rotation and the motor speed slows rapidly (dynamic braking).

When the logic senses the spindle motor speed is less than 50 rpm it de-energizes relay K05B. This causes the following events:

1. K05B contacts 2 and 8 open to remove the +20X voltage to the sector solenoid. (L301) and the access motor H switch (prevents further movement of the carriage).
2. Contacts 3 and 6 close to energize the brake solenoid (L300) so that the pawl on the spindle lock assembly engages the spindle lock disk to hold the spindle stationary.
3. Contacts 3 and 9 open, de-energizing relay K02.

When relay K02 de-energizes, contacts 3A/3C and 4A/4C open, removing +20 vdc to the logic chassis.

## DETECT CIRCUIT

Upon receipt of any seek command, transistors Q01 and Q07 are forward biased and the transistors are gated on. When the transistors are gated on a high current pulse is applied through the detent coil L210 which quickly pulls the detent pawl away from the gear teeth. After approximately 2 msec transistor Q07 is gated off. Transistor Q01 remains gated on to provide holding current for the detent coil until a detent command is received.

The holding current flows through resistor R13, reducing the current to approximately 2 amps. When the detent command is received, power is removed from the base of Q01 and current flow is stopped. In approximately 2 msec the spring-loaded pawl is pulled into and engages the detent gear.

## PRINTED CIRCUIT MOTOR MOTION CONTROL

The printed circuit motor, which moves the carriage drive and positioning mechanism, is controlled by a 5-transistor switching circuit. By controlling the transistor selection and the amount of current through these transistors, the motor is driven fast or slow in the reverse or forward direction. Transistors Q03 and Q06 are switched on for a forward operation, causing the printed circuit motor to drive the carriage forward. Transistors Q04 and Q05 are switched on for a reverse operation, connecting the switching circuit in such a manner as to allow motor current flow in the reverse direction.

The five transistors (Q02 through Q06) are normally gated off by the +24 volts applied through resistors to each base. Emitter voltage, applied to the PNP transistors, is supplied by the +20X voltage source. The base bias voltage is greater than the applied emitter voltage to assure that the transistors are cut off when not selected. When a move command is applied, the base resistors complete a voltage divider resulting in a forward-biased transistor.

Resistors R29 and R31 prevent overdrive of transistors Q03 and Q05 respectively. This allows the amplifier card inputs to the switching circuit to drive both switching transistors (Q05 and Q04, or Q03 and Q06) in parallel, even though the emitter reference voltages are different. The values of R29 and R31 are selected to provide equal drive to the parallel-switching transistors.

The magnitude of current in the printed circuit drive motor is determined by the power supply voltage and the total effective series resistance in the circuit. The voltage supplied to the switching transistors is fixed, but the total circuit resistance during the high current drive, excluding the saturation resistance of the switching transistors, is approximately 2.5 ohms. After the current is reduced, the total circuit resistance is approximately 12.5 ohms.

The use of series resistor R17 during slow speeds prevents excessive current and motor torque when

not needed. Slow speeds are maintained by servoing and not current limiting. Circuit breaker CB07 prevents sustained high-level currents from damaging the printed circuit motor.

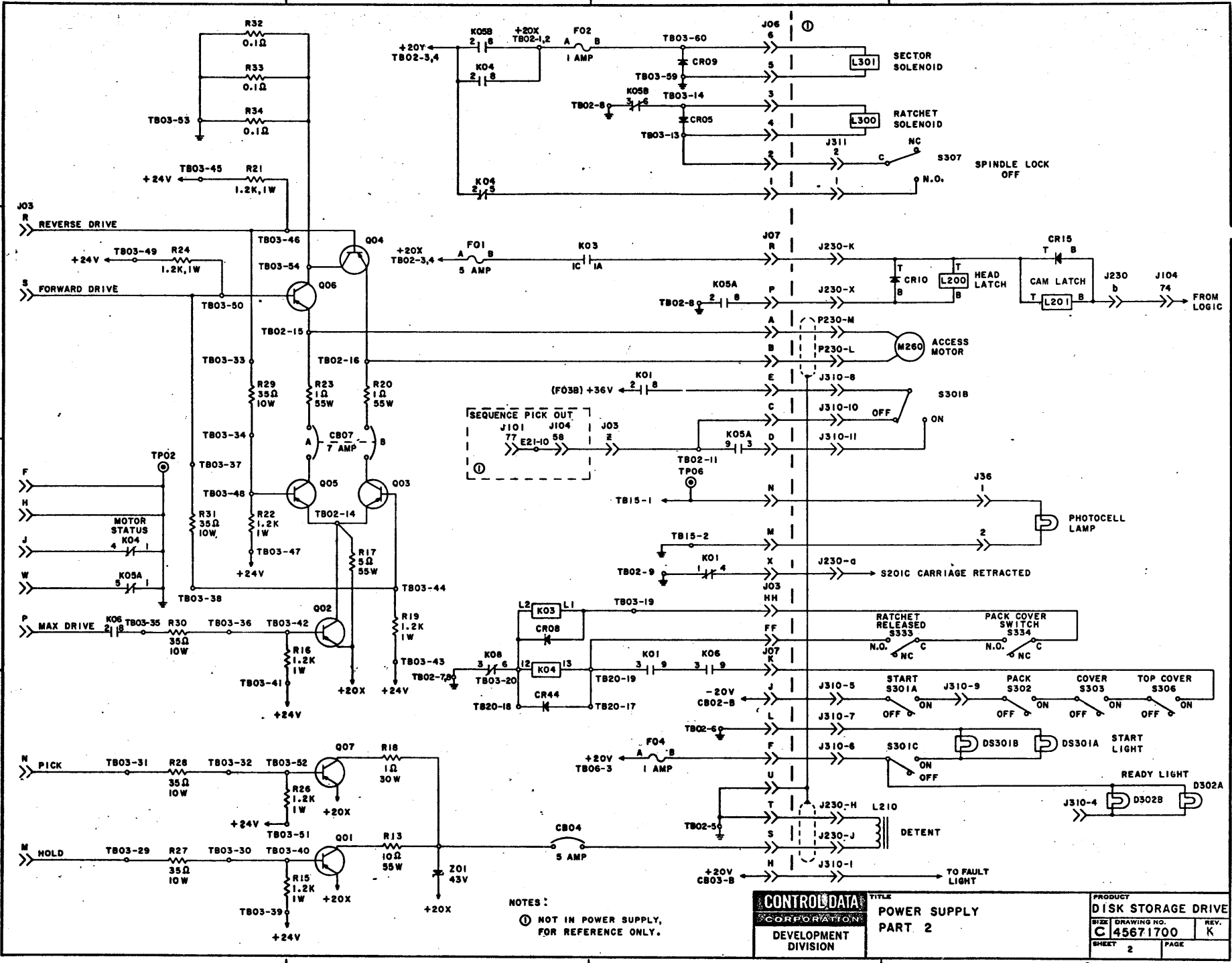
Assume that a forward move command of greater than 64 tracks is received; ground is applied through pins P and S of power supply jack J03 to bias on the respective transistors. The Fast command or ground level applied to J03-P turns on Q02. The ground level applied through J03-S forward biases Q06 and Q03. Electron flow is through parallel resistors R32, R33, and R34, through forward biased transistor Q06 to the one side of the printed circuit motor. From the motor, electron flow is through resistor R20, forward biased Q03, and forward biased Q02 to +20X vdc. With electron flow through Q03 and Q06, the motor is driven forward. Transistor Q02 shunts resistor R17, resulting in maximum current flow through the motor and consequently maximum motor acceleration. When the Decrement counter indicates less than 64 tracks remaining, and if the carriage velocity is greater than 15 inches per second, the following occurs:

1. Q03 and Q06 are switched off and Q04 and Q05 are switched on (Q02 remains on). The reverse current through the motor causes the motor to slow the carriage down.
2. When the carriage speed has slowed to 15 inches per second in the forward direction, Q02, Q04, and Q05 are turned off.
3. From this time until the Decrement counter indicates less than 16 tracks remaining, current pulses through the H switch are used to sustain 15 inches per-second carriage speed.
4. With 15 tracks remaining, Q02, Q04, and Q05 turn on (Q03 and Q06 turn off), and again the motor is used as a brake, slowing the carriage to 6 inches per second.
5. At 6 inches per second, Q02, Q04, and Q05 turn off and current pulses (through R17, Q03, the motor, and Q06) sustain a carriage velocity of 6 inches per second.
6. With 3 tracks remaining, Q02, Q04, and Q05 turn on and Q03 and Q06 turn off and slow the carriage to 2 inches per second.
7. At 2 inches per second, Q02, Q04, and Q05 turn off and current pulses (through R17, Q03, the motor, and Q06) sustain a carriage velocity of 2 inches per second.

When the selected track is reached, the spring-loaded pawl is dropped.

1-15

REV D



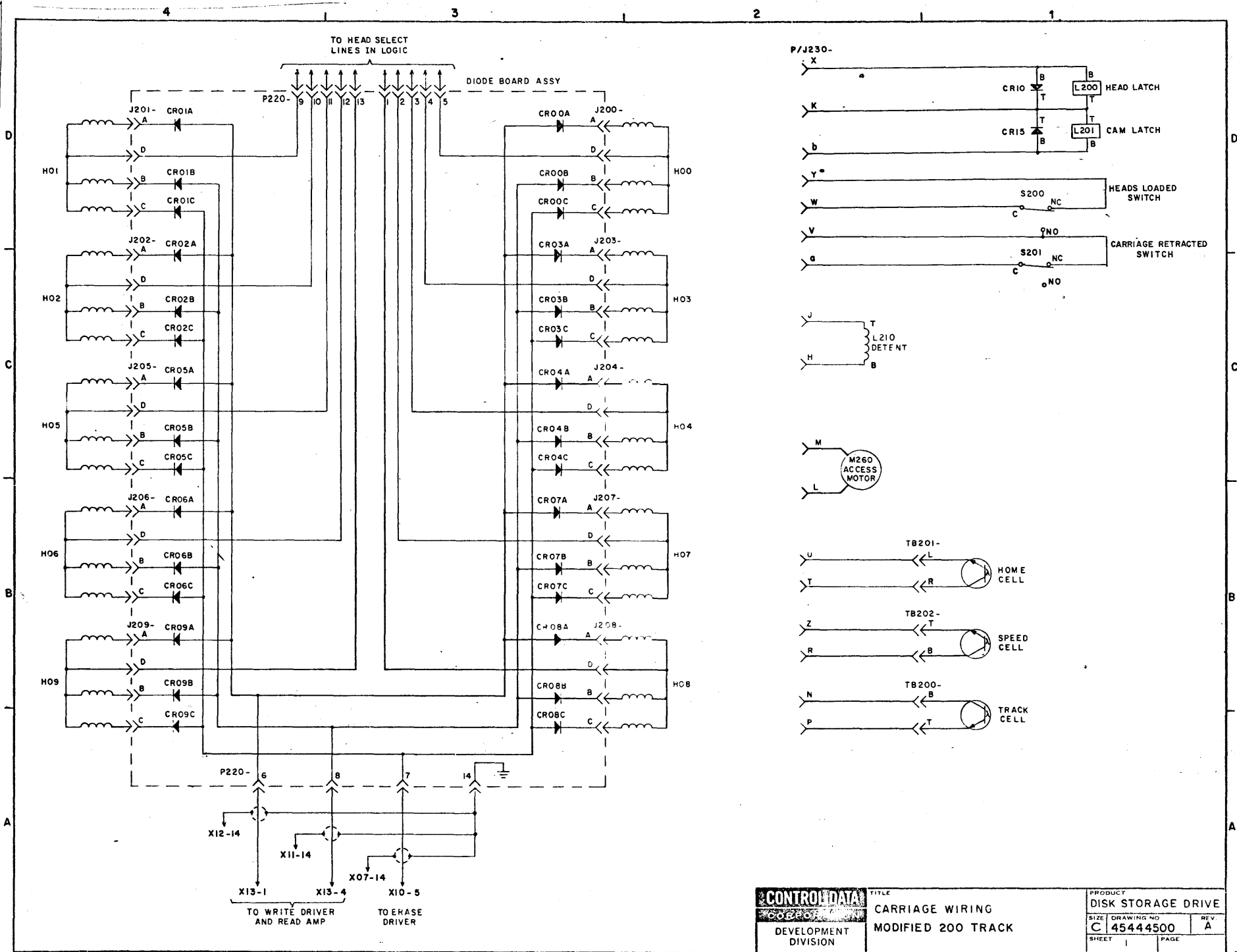
NOTES:  
 ① NOT IN POWER SUPPLY, FOR REFERENCE ONLY.

<b>CONTROL DATA CORPORATION</b> DEVELOPMENT DIVISION	TITLE	<b>POWER SUPPLY</b> <b>PART 2</b>	PRODUCT	<b>DISK STORAGE DRIVE</b>
	SIZE	DRAWING NO.	REV.	
		<b>C 45671700</b>	<b>K</b>	
	SHEET	2	PAGE	

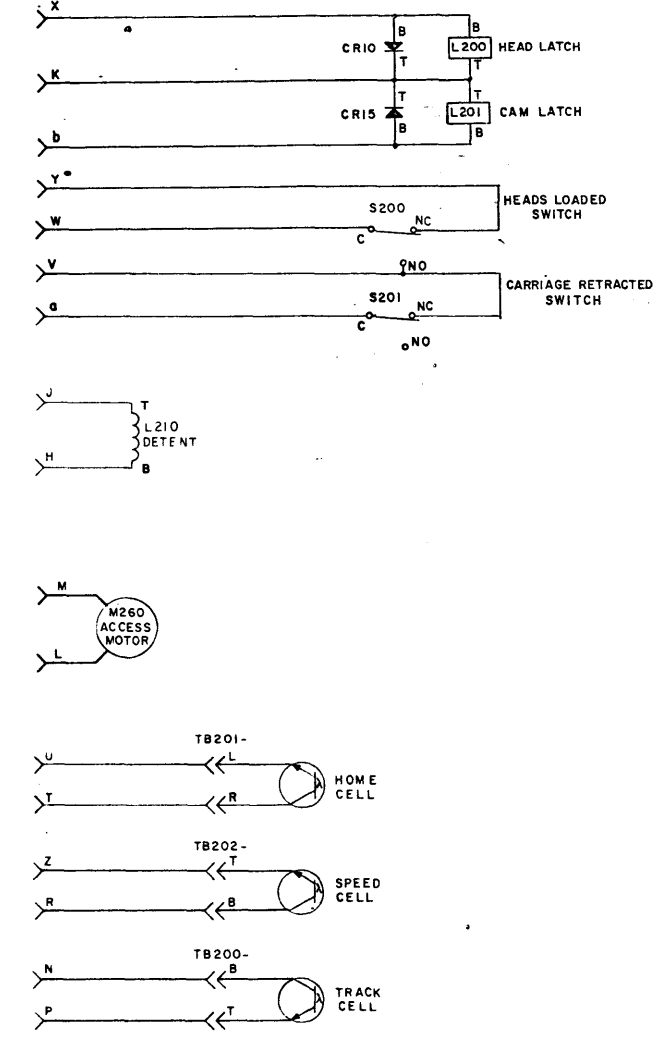


1-17

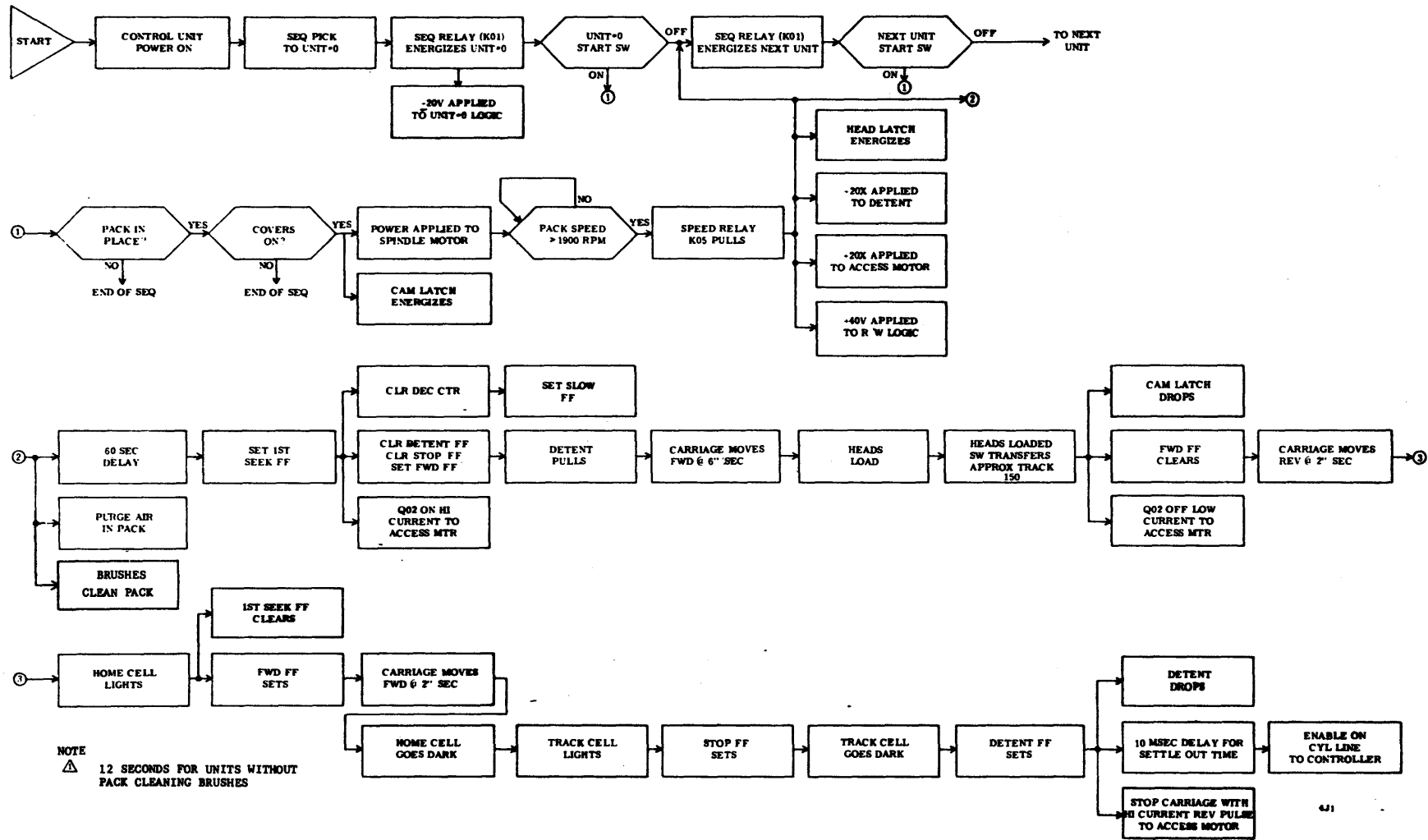
REV D



P/J230-



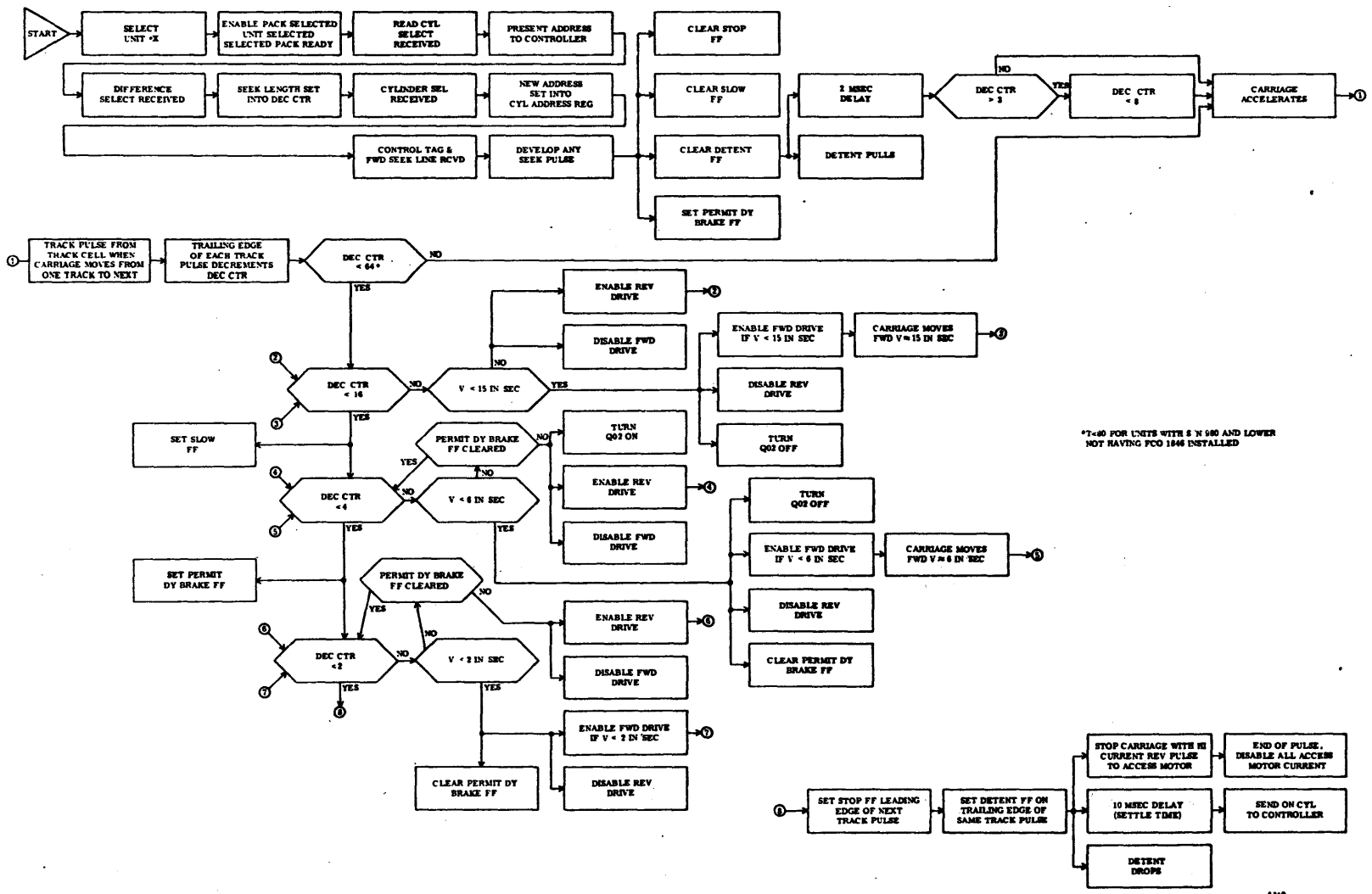
<b>CONTROL DATA</b> CORPORATION	TITLE	PRODUCT
	CARRIAGE WIRING MODIFIED 200 TRACK	DISK STORAGE DRIVE
DEVELOPMENT DIVISION	SIZE	DRAWING NO.
		C 45444500
	SHEET	PAGE
	1	A



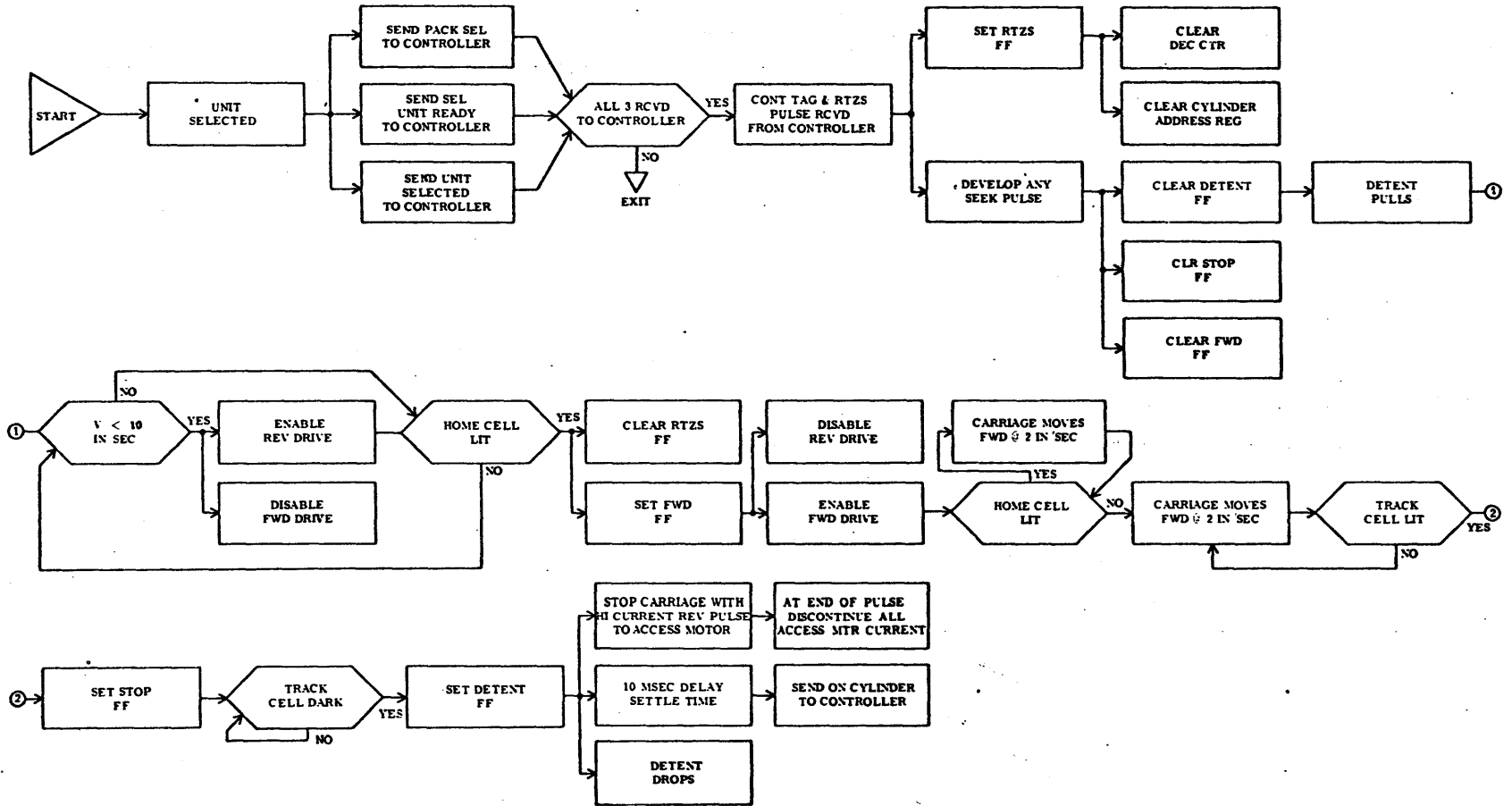
NOTE  
 △ 12 SECONDS FOR UNITS WITHOUT  
 PACK CLEANING BRUSHES

First Seek

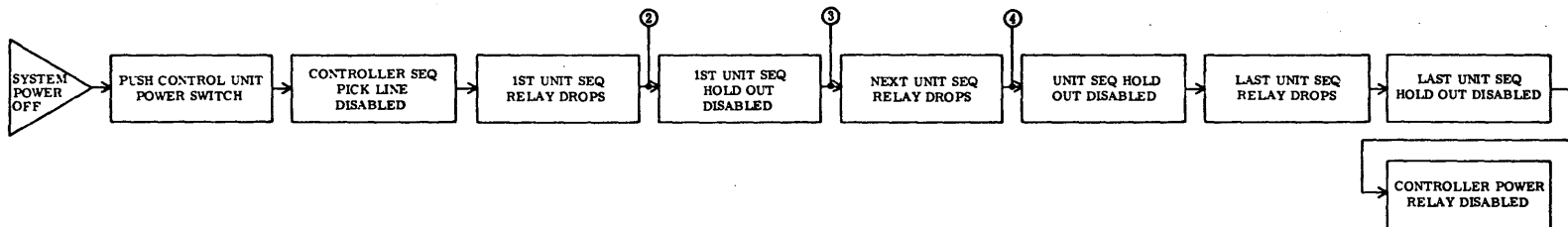
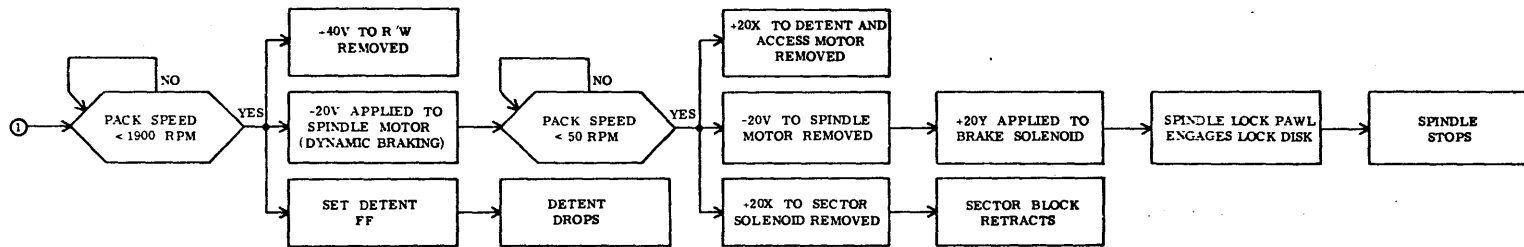
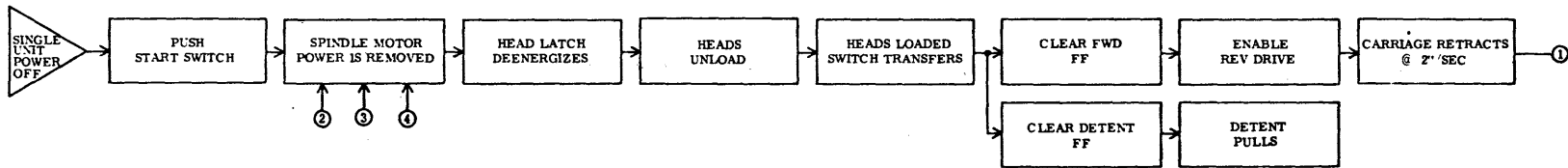




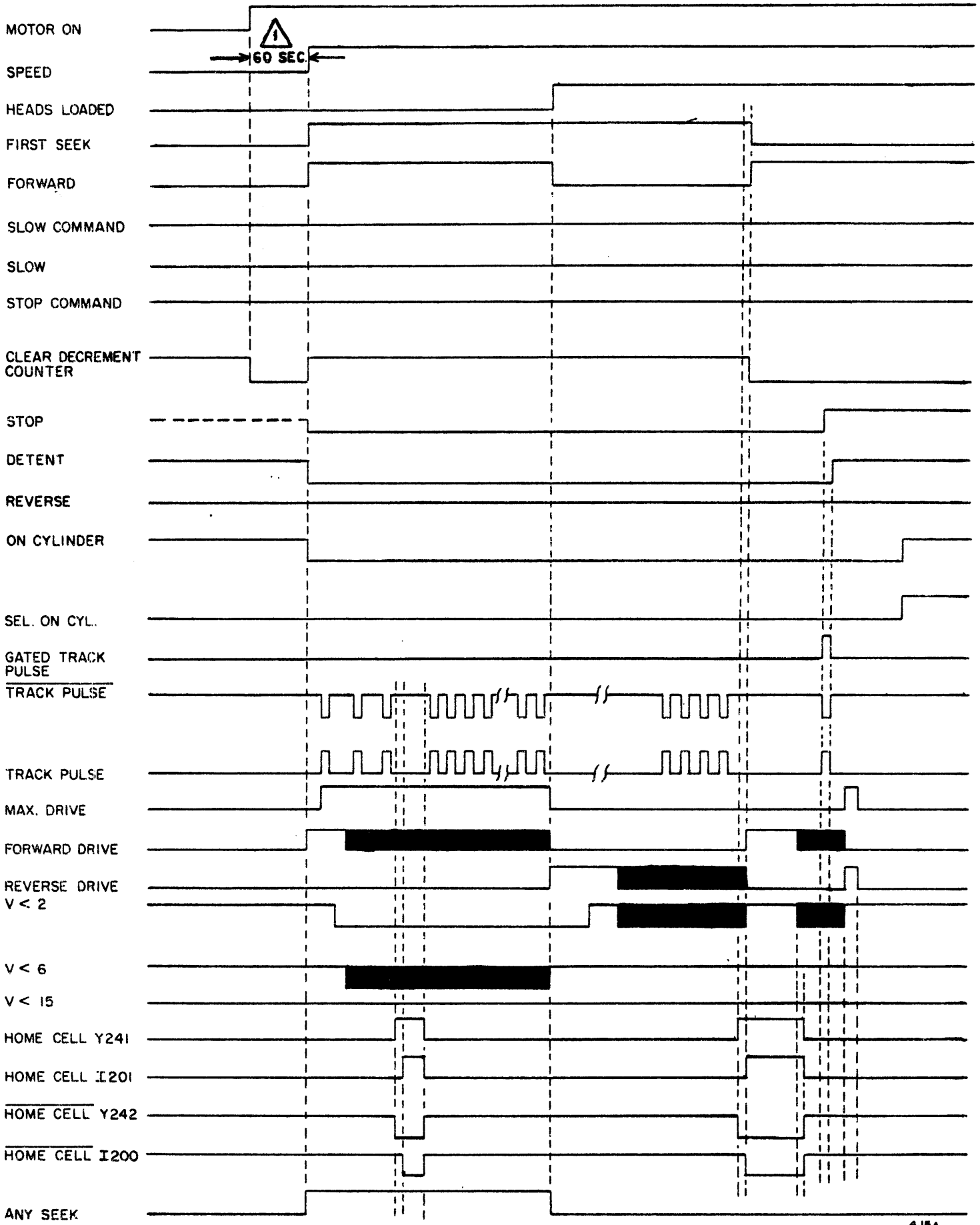
\*T-80 FOR UNITS WITH S N 980 AND LOWER NOT HAVING PCO 1846 INSTALLED



Return to Zero Seek



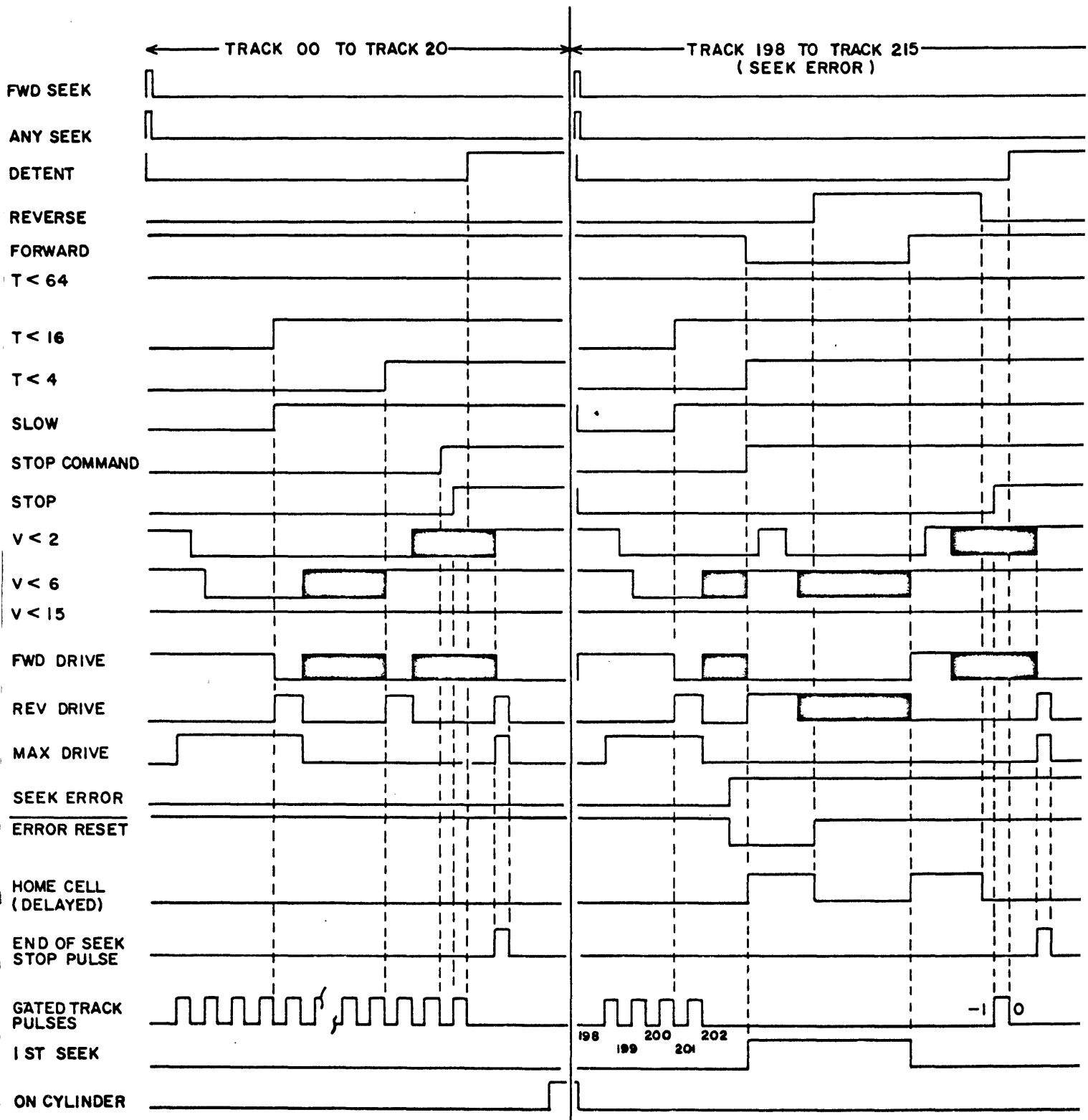
Power Off Seek

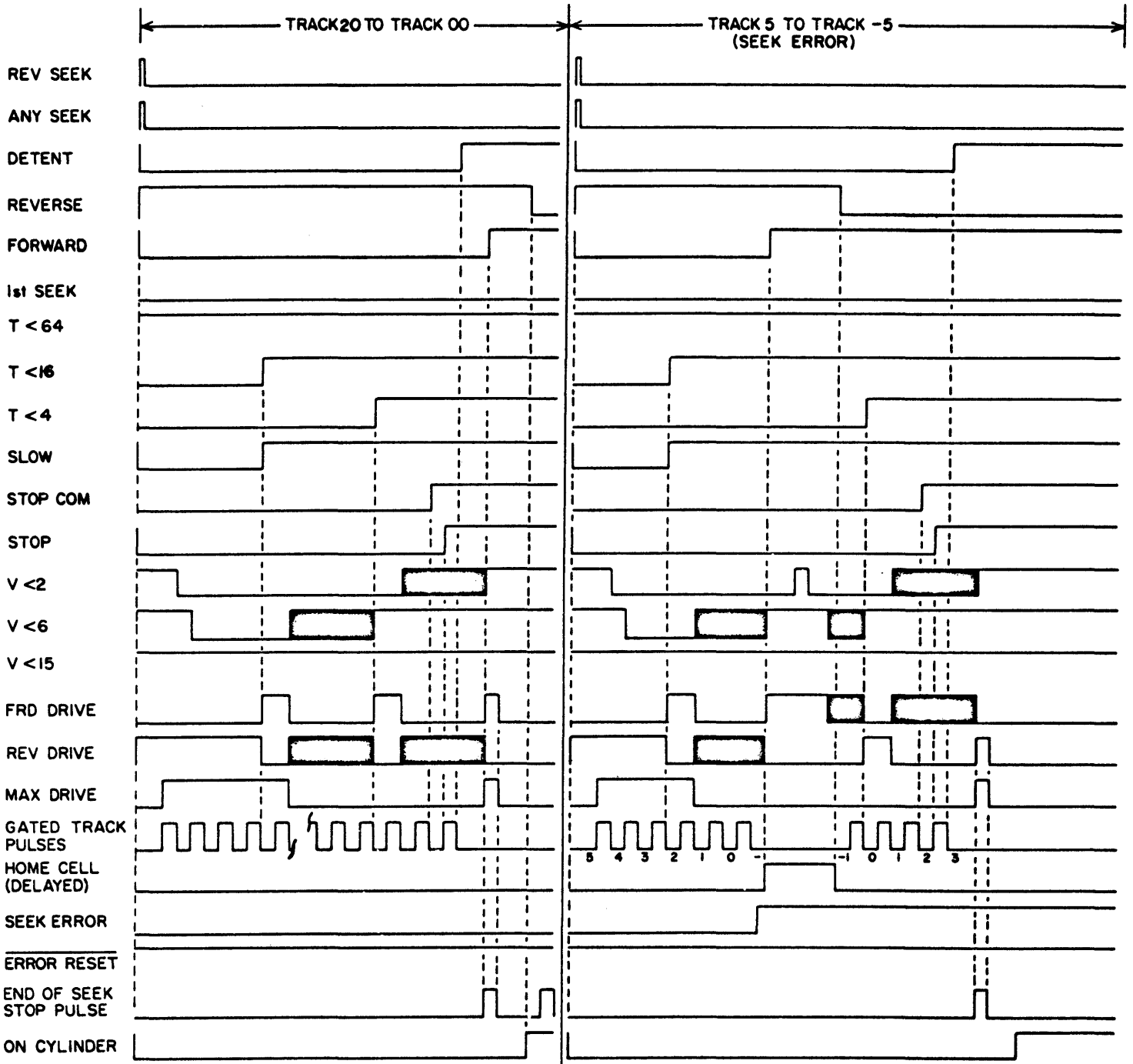


NOTE:  12 SEC. FOR UNITS WITHOUT  
PACK CLEANING BRUSHES.

FIRST SEEK

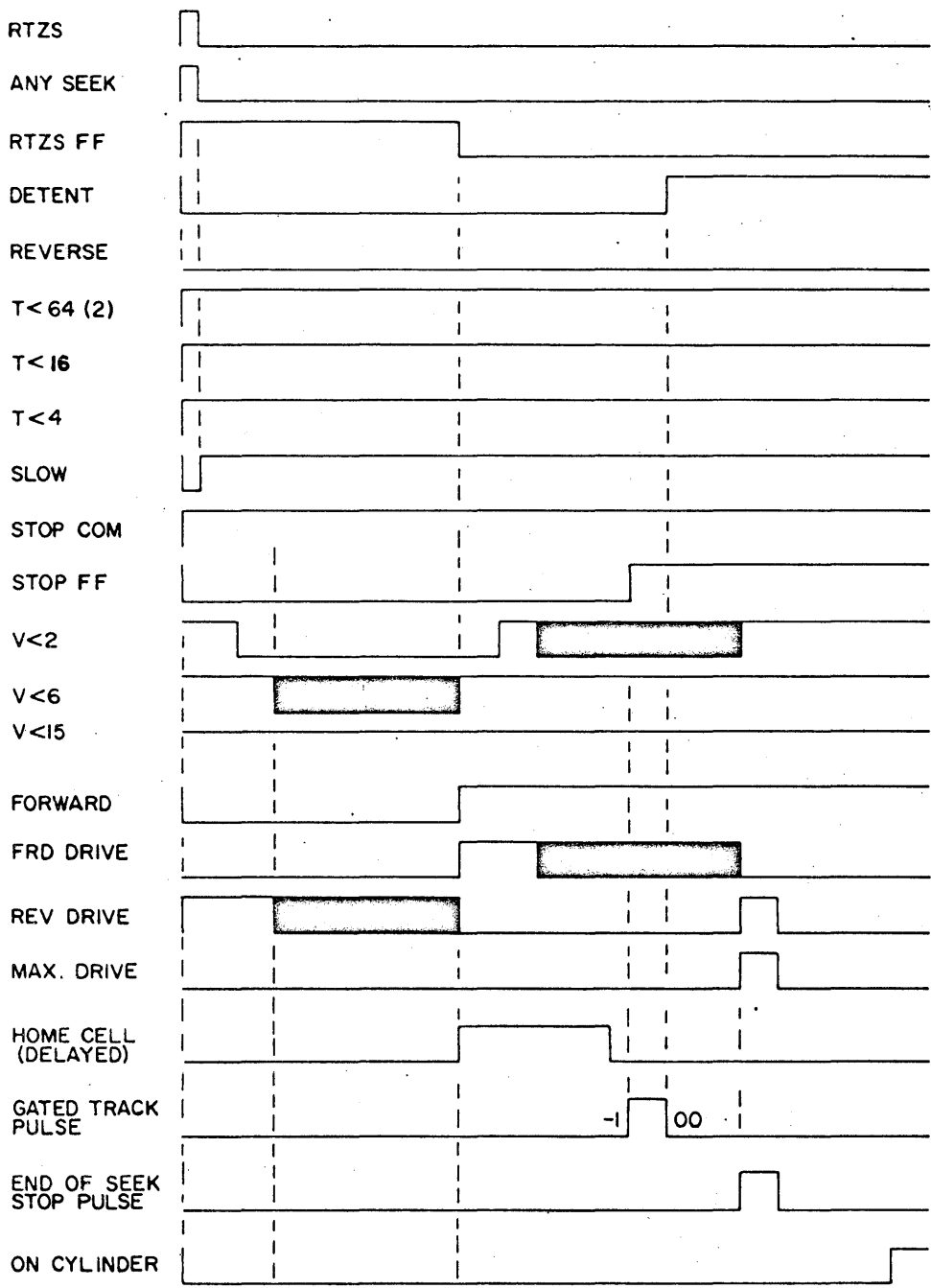
4J5A



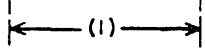


4J20

DIRECT SEEK REVERSE

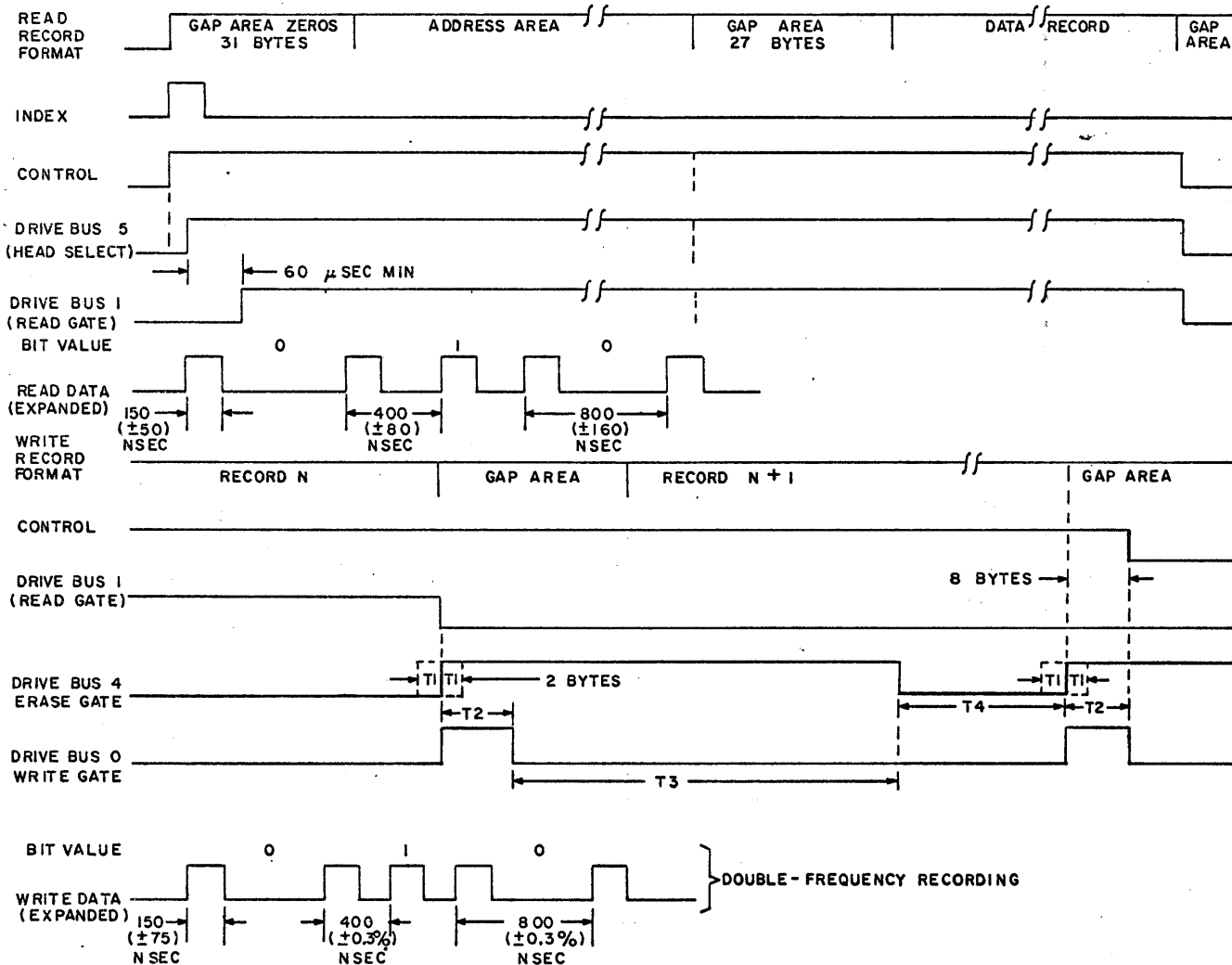


NOTE:  
 (1) THE LENGTH OF THIS TIME IS DIRECTLY DEPENDENT UPON POSITION OF CARRIAGE PRIOR TO DOING A RTZS.  
 (2) T < 80 FOR UNITS WITH S/N 980 AND LOWER NOT HAVING FCO 1846 INSTALLED



4J21

RTZS



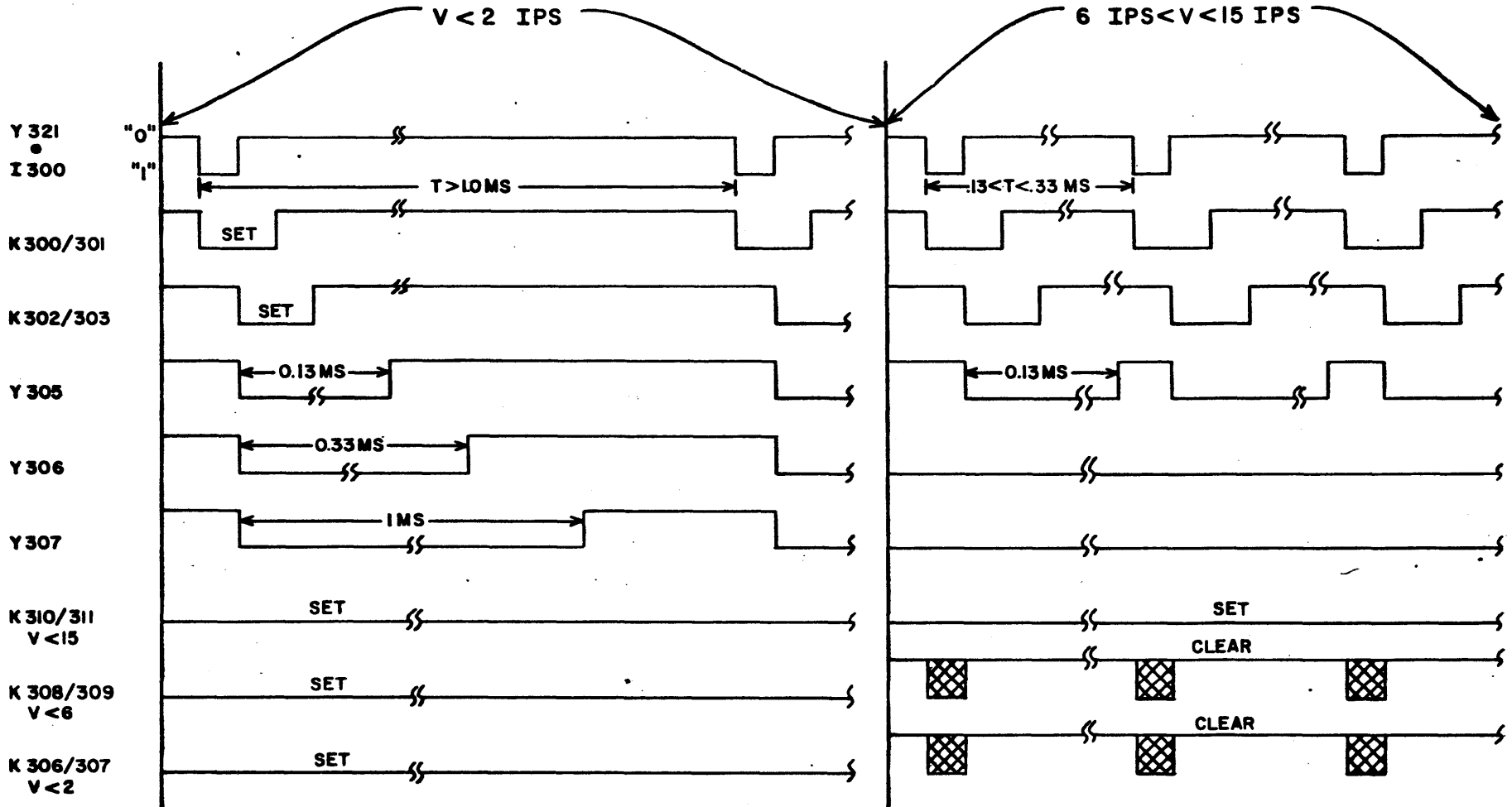
NOTE:

1. T1 - ERASE GATE MUST COME ON COINCIDENT WITH WRITE GATE WITHIN 10 USEC.
2. T2 - WRITE GATE MUST REMAIN ON FOR A MINIMUM OF 45 USEC.
3. T3 - ERASE GATE MUST BE DROPPED WITHIN A MAXIMUM OF 80 USEC. AFTER WRITE GATE IS DROPPED.
4. T4 - WRITE GATE MUST REMAIN OFF FOR A MINIMUM OF 12 USEC.



I-27

Rev A

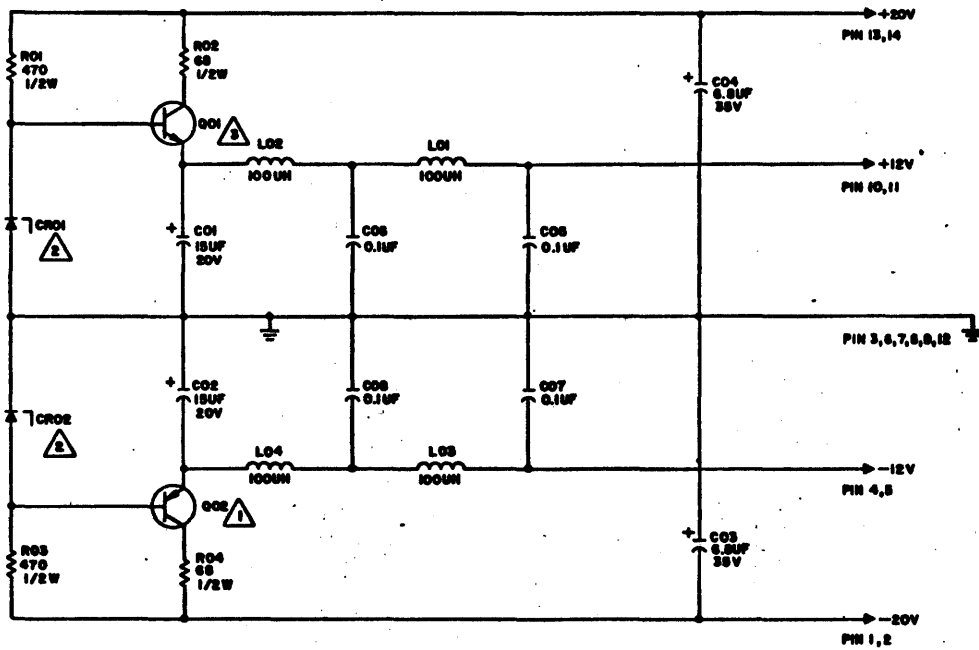


NOTE: CROSSHATCHING INDICATES TIMES THAT CLEARING SIGNALS ARE APPLIED TO FF.




4110

### SPEED CELL TIMING





NOTE:

-  PNP GERMANIUM 50220101.
-  ZENER 50240116.
-  NPN SILICON 50220800.

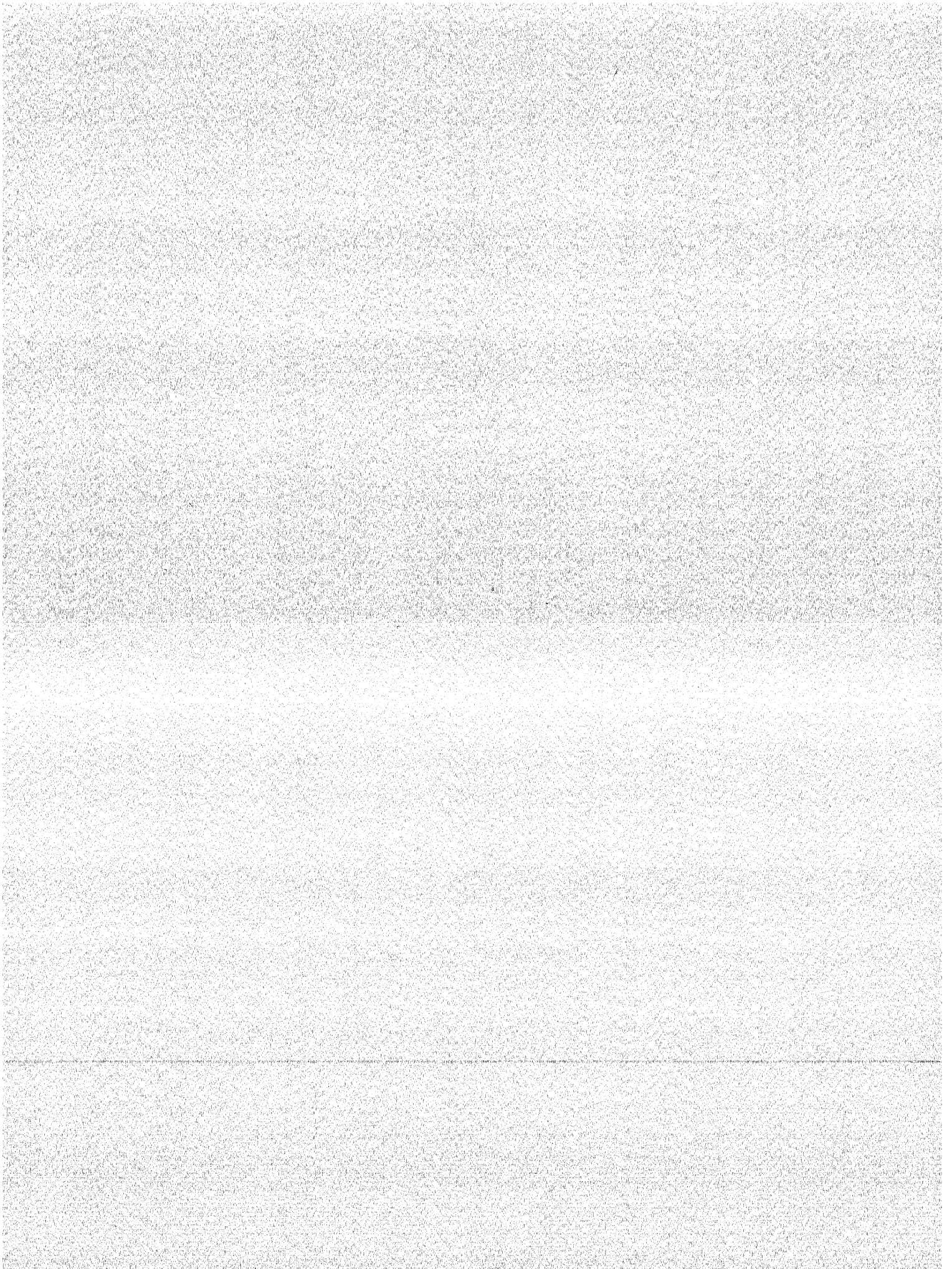
±12V. VOLTAGE REGULATOR



## PART 2

### CARD PLACEMENT

Card Placement information  
for the 9461 will be found  
on Page 1-11 in this manual.



**PART 3**

**WIRE LISTS**

## DESCRIPTION OF WIRE LISTS

The two types of wire lists are:

1. The line printer format which shows logic wiring.
2. The corporate (typed) form which shows non-logic wiring.

### LOGIC WIRE LISTS

The following is an example of the logic wire lists with an identification, and an explanation of the columns.

Wire Identification	Wire Length	Wire Origin Location	Wire Origin Pin Number	Component Code	Wire Destination Location	Wire Destination Pin Number	Twisted Pair	Wire Size	Color Code	Change Order
K10310	06	A18	07	O	B11	04				
K10311	05	B11	04	O	B20	05				
K10312	03	B20	05	O	B22	06				
K10320	04	A18	08	O	A13	11				
600300	21	J104	33	X	A38	12	20	4	0970	
600310	25	J104	34	X	A42	06	20	4	0970	
600320	25	J104	35	X	A42	12	20	4	0970	
600330	58	J104	36	X	A28	09	20	4	0970	
600340	15	J104	37	X	SHIELD		E	5	0970	
600350	15	J104	38	X	A02	01	24	E	0	0970

#### Wire Identification

If the first term in this column begins with a letter, the wire originates at a logic card; the letter and the first three digits represents the logic symbol of that card. If the first term begins with a numeral, the wire originates at a point other than logic, for



example at a switch or resistor. A sequential advance in the second to the last digit indicates additional inputs to the same card.

A sequential advance in the last digit indicates the interconnections of an AND input.

K10310	}	Three input AND to K103
K10311		
K10312		
K10320 - Single input OR to K103		

### Wire Length

This column gives the wire length in inches.

### Wire Origin Location

This column locates the origin of the wire on the logic chassis. Wires having a common signal at two or more locations are interconnected in series. In the sample, the first three wires shown have a common signal. The Wire Destination Location of the first wire becomes the Wire Origin Location of the second so that the series string is from A18 to B11 to B20 to B22. Note that the first four characters of the Wire Identification terms are the same for the three wires and that the sequencing is from 10 to 11 to 12 in the last two characters.

### Wire Origin Pin Number

This column identifies the origin pin or terminal of the wire.

### Component Code

This column identifies the components that are located in the Wire Origin Location column. The code letters are identified as follows:

- 0 - Logic Card
- R - Miscellaneous Component (Switch, Resistor, etc.)
- X - Jack

### Wire Destination Location

This column locates the destination of the wire on the logic chassis.

Wire Destination Pin Number

This column identifies the destination pin or terminal of the wire.

Wire Size

This column identifies the size (AWG) of the wire.

Twisted Pair

When two successive wires have the same letter in this column, this identifies them as a twisted pair.

Color Code

Solid colored wires are identified by a one digit number in this column. Multicolored wires are identified by a number having two or three digits. Each digit of the number identifies one of the colors. The code numbers are identified as follows:

- |           |            |            |            |           |            |
|-----------|------------|------------|------------|-----------|------------|
| 0 - Black | 2 - Red    | 4 - Yellow | 6 - Blue   | 8 - Gray  | S - Shield |
| 1 - Brown | 3 - Orange | 5 - Green  | 7 - Violet | 9 - White |            |

Change Order

This column identifies the engineering, field, or publications change order that affected and/or altered that wire.

CONTROL DATA		WIRE LISTING							WL	DOCUMENT NO.	REV.
COMPUTER DIVISION									SHEET	OF	
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS
	29	24	993	03	X12	03		X12	09		
21	29	↑	993	03	X13	03		X13	09		
22	29		993	03	X14	03		X14	09		
23	29		993	03	X15	03		X15	09		
24	29		993	03	X16	03		X16	09		

Wire lists other than logic are on a standard corporate form. The remaining columns of the form contain information NOT normally applicable to field usage and therefore are not explained.

The other columns indicate:

- Gauge (Ref) - Size of conductor (AWG)
- Color (Ref) - Color information
- Length (Approx) - Length of conductor in inches
- Origin - Origin point of conductor
- Destination - Destination point of conductor
- Remarks - Useful comments

In multi-digit color codes, the first digit denotes base color and the remaining digits denote tracer colors. The color codes for the non-logic lists are the same as those for logic wiring.

LW45587600 9461 DSD

A40010	04	C09	01	0	C08	12	9461 DSD	
A40110	02	C09	04	0	C08	06	9461 DSD	
A40011	03	C08	12	0	C06	11	9461 DSD	
A40111	03	C08	06	0	C06	12	9461 DSD	
A40210	03	C09	07	0	C10	12	9461 DSD	
A40211	03	C09	07	0	C06	09	9461 DSD	
A40310	02	C09	10	0	C10	06	9461 DSD	
A40311	03	C09	10	0	C06	10	9461 DSD	
A40410	04	C12	01	0	C11	12	9461 DSD	
A40411	04	C11	12	0	C06	07	9461 DSD	
A40510	02	C12	04	0	C11	06	9461 DSD	
A40511	04	C11	06	0	C06	08	9461 DSD	
A40610	03	C12	07	0	C13	12	9461 DSD	
A40611	04	C12	07	0	C06	05	9461 DSD	
A40710	03	C12	10	0	C13	06	9461 DSD	
A40711	04	C12	10	0	C06	06	9461 DSD	
A41010	14	C08	01	0	E31	12	9461 DSD	
A41011	07	C08	01	0	D12	10	9461 DSD	
A41020	03	C08	02	0	C07	11	9461 DSD	
A41021	03	C07	11	0	C04	11	9461 DSD	
A41022	02	C08	02	0	C09	03	9461 DSD	
A41023	08	C09	03	0	D17	11	9461 DSD	12343 1542
A41024	05	C04	11	0	B05	11	9461 DSD	1542
A41110	03	C08	07	0	C07	12	9461 DSD	
A41111	03	C07	12	0	C04	12	9461 DSD	
A41112	05	C04	12	0	B05	12	9461 DSD	
A41113	02	C08	07	0	C09	06	9461 DSD	
A41114	08	C09	06	0	D17	12	9461 DSD	
A41120	06	C08	08	0	B11	12	9461 DSD	
A41210	13	C10	01	0	E31	06	9461 DSD	
A41211	06	C10	01	0	D12	09	9461 DSD	
A41220	03	C10	02	0	C09	09	9461 DSD	
A41221	03	C09	09	0	C07	09	9461 DSD	
A41222	03	C07	09	0	C04	09	9461 DSD	
A41223	07	C10	02	0	D17	09	9461 DSD	
A41310	03	C10	07	0	C09	12	9461 DSD	
A41311	03	C09	12	0	C07	10	9461 DSD	
A41312	03	C07	10	0	C04	10	9461 DSD	
A41313	07	C10	07	0	D17	10	9461 DSD	
A41320	05	C10	08	0	B11	11	9461 DSD	
A41410	06	C11	01	0	D12	08	9461 DSD	
A41411	10	D12	08	0	E30	09	9461 DSD	
A41420	02	C11	02	0	C12	03	9461 DSD	
A41421	03	C11	02	0	C07	07	9461 DSD	
A41422	03	C07	07	0	C04	08	9461 DSD	
A41510	02	C11	07	0	C12	06	9461 DSD	
A41511	03	C12	06	0	C12	11	9461 DSD	
A41512	03	C11	07	0	C07	08	9461 DSD	
A41520	05	C11	08	0	B11	10	9461 DSD	
A41610	11	C13	01	0	E30	03	9461 DSD	
A41611	10	E30	03	0	D12	07	9461 DSD	
A41620	03	C13	02	0	C12	09	9461 DSD	
A41621	04	C12	09	0	C07	05	9461 DSD	
A41710	03	C13	07	0	C12	12	9461 DSD	
A41711	04	C12	12	0	C07	06	9461 DSD	

A41720	05	C13	08	0	B11	09	9461 DSD	
I00210	11	C21	01	0	E30	12	9461 DSD	
I00310	02	C21	04	0	C21	03	9461 DSD	
I00410	11	C21	07	0	E30	06	9461 DSD	
I00710	06	D11	01	0	D20	02	9461 DSD	
I00711	07	D11	01	0	C21	06	9461 DSD	
I00720	07	D11	02	0	C21	02	9461 DSD	
I01410	20	A01	04	0	E33	12	9461 DSD	
I01610	19	A07	07	0	E28	06	9461 DSD	
I01611	18	E28	06	0	B02	08	9461 DSD	
I01710	03	A07	01	0	A07	11	9461 DSD	
I01810	11	D13	07	0	A07	12	9461 DSD	
I01910	12	D16	07	0	A07	10	9461 DSD	
I02020	03	A06	01	0	A07	09	9461 DSD	
I02110	14	A02	01	0	D13	11	9461 DSD	
I02111	09	D13	11	0	E29	06	9461 DSD	
I02210	12	D12	01	0	A02	03	9461 DSD	
I02310	05	D07	04	0	D13	12	9461 DSD	
I02311	04	D13	12	0	D18	06	9461 DSD	
I02312	08	D18	06	0	E29	12	9461 DSD	
I02410	03	D10	01	0	D07	05	9461 DSD	
I02510	02	D08	07	0	D07	06	9461 DSD	
I02610	06	B06	01	0	C05	04	9461 DSD	
I02611	03	C05	04	0	C03	10	9461 DSD	
I02620	07	B06	02	0	C08	10	9461 DSD	
I02621	04	C08	10	0	C04	02	9461 DSD	
I02630	06	B06	03	0	C03	09	9461 DSD	
I02631	11	B06	03	0	D14	10	9461 DSD	
I02710	11	C24	04	0	B06	06	9461 DSD	
I02810	11	C27	07	0	A39	01	9461 DSD	4103
I02811	02	A39	01	0	B14	06	9461 DSD	12328
I02812	02	A39	02	0	A39	03	9461 DSD	12328
I02813	13	A39	03	0	B14	06	9461 DSD	12328
I02820	05	C27	08	0	C19	06	9461 DSD	4103
I02910	15	A02	07	0	C21	09	9461 DSD	
I03110	12	D06	07	0	A01	05	9461 DSD	
I03210	06	C19	04	0	B14	04	9461 DSD	4103
I03310	04	C19	01	0	C22	11	9461 DSD	4103
I03410	04	C19	07	0	C22	12	9461 DSD	4103
I03411	08	C22	12	0	B14	03	9461 DSD	4103
I30510	02	C19	10	0	C19	09	9461 DSD	4103
I10010	04	D16	01	0	D13	10	9461 DSD	
I10011	10	D16	01	0	E34	06	9461 DSD	
I10110	09	C17	01	0	C33	10	9461 DSD	
I10210	06	C18	01	0	D16	06	9461 DSD	
I10310	09	A13	01	0	A32	06	9461 DSD	
I10311	09	A32	06	0	C30	06	9461 DSD	
I10410	11	C33	07	0	D13	09	9461 DSD	
I10411	09	C33	07	0	E34	12	9461 DSD	
I10510	04	B12	01	0	A10	07	9461 DSD	
I10511	02	A10	07	0	A10	08	9461 DSD	
I10512	02	A10	08	0	A10	09	9461 DSD	
I10513	11	B12	01	0	C33	08	9461 DSD	
I10610	10	B13	01	0	A32	05	9461 DSD	
I10611	09	A32	05	0	C30	05	9461 DSD	
I10612	12	B13	01	0	C33	12	9461 DSD	
I10613	05	C30	05	0	B29	05	9461 DSD	1193

LW45587600 9461 DSD

I10620	05	B13	02	0	A10	04	9461 DSD	
I10621	02	A10	04	0	A10	05	9461 DSD	
I10622	02	A10	05	0	A10	06	9461 DSD	
I10623	02	A10	06	0	A09	12	9461 DSD	2211
I10710	04	A32	01	0	A29	09	9461 DSD	
I10720	04	A32	02	0	A28	07	9461 DSD	
I10810	14	A09	07	0	C33	11	9461 DSD	2211A
I12010	07	A14	01	0	B22	05	9461 DSD	
I12020	07	A14	02	0	B20	11	9461 DSD	
I12030	06	A14	03	0	B09	08	9461 DSD	
I12110	05	B09	10	0	A14	12	9461 DSD	
I12210	07	A15	01	0	B22	11	9461 DSD	
I12220	07	A15	02	0	B09	12	9461 DSD	
I12230	07	A15	03	0	B21	11	9461 DSD	
I12310	08	A16	01	0	B24	11	9461 DSD	
I12320	04	A16	02	0	A16	14	9461 DSD	
I12330	07	A16	03	0	B23	11	9461 DSD	
I12410	11	A01	10	0	B22	02	9461 DSD	
I16010	07	C24	07	0	D15	02	9461 DSD	
I16011	03	D15	02	0	D15	11	9461 DSD	
I16110	10	A11	01	0	A32	04	9461 DSD	
I16111	14	A32	04	0	D16	05	9461 DSD	
I16112	12	A11	01	0	C24	08	9461 DSD	
I16113	05	C24	08	0	C30	04	9461 DSD	
I16210	10	A12	01	0	A32	03	9461 DSD	
I16211	09	A32	03	0	C30	03	9461 DSD	
I16212	09	C30	03	0	D16	04	9461 DSD	
I16213	11	A12	01	0	C24	09	9461 DSD	
I16310	09	B09	07	0	D15	05	9461 DSD	
I16311	03	D15	05	0	D15	09	9461 DSD	
I16410	04	B11	01	0	B09	09	9461 DSD	
I17010	08	D30	01	0	B26	05	9461 DSD	
I17020	08	D30	02	0	B25	11	9461 DSD	
I17030	03	D30	03	0	D30	14	9461 DSD	
I17110	07	C34	01	0	D30	05	9461 DSD	
I17210	06	C34	04	0	D30	06	9461 DSD	
I17211	08	C34	04	0	B23	03	9461 DSD	
I17212	03	B23	03	0	B24	05	9461 DSD	
I17310	02	C34	07	0	C34	06	9461 DSD	
I17410	13	D08	01	0	C34	09	9461 DSD	
I17411	09	C34	09	0	B22	08	9461 DSD	
I17412	03	B22	08	0	B21	03	9461 DSD	1703
I17710	11	D30	07	0	D08	06	9461 DSD	
I17720	17	D30	08	0	A01	12	9461 DSD	
I17730	10	D30	09	0	B21	10	9461 DSD	
I17810	06	C34	10	0	D30	12	9461 DSD	
I17811	09	C34	10	0	B20	03	9461 DSD	
I18010	14	D07	07	0	C34	11	9461 DSD	
I18110	10	B09-01	0	D07-08			9461 DSD	5186
I20010	08	C36	01	0	A34	03	9461 DSD	
I20011	09	C36	01	0	D20	06	9461 DSD	
I20110	03	C33	01	0	C36	06	9461 DSD	
I20210	05	C27	01	0	C19	05	9461 DSD	4103
I20211	06	C27	01	0	B36	05	9461 DSD	
I20220	08	C27	02	0	B14	05	9461 DSD	
I20310	07	C35	01	0	A33	12	9461 DSD	

T20311	09	E37	01	0	C29	04	9461 DSD	2539
I20320	07	C35	02	0	A34	12	9461 DSD	
I20321	04	A34	12	0	A39	12	9461 DSD	
I20330	08	C35	03	0	A29	12	9461 DSD	
I20340	15	C35	04	0	D07	03	9461 DSD	1522
I20410	05	B28	10	0	A26	12	9461 DSD	
I20510	10	C16	07	0	A28	08	9461 DSD	1522
I20610	05	C31	01	0	C36	11	9461 DSD	
I20710	06	B29	01	0	C31	06	9461 DSD	
I20810	12	C40	01	0	C16	12	9461 DSD	1522
I20820	06	C40	02	0	B29	12	9461 DSD	
I20910	08	C30	01	0	A33	07	9461 DSD	
I21010	08	C31	07	0	A31	12	9461 DSD	
I21110	07	D17	01	0	B29	11	9461 DSD	
I21210	03	A33	01	0	A31	06	9461 DSD	
I21310	06	C39	01	0	B30	06	9461 DSD	
I21410	05	B28	04	0	A29	06	9461 DSD	
I21411	05	B28	04	0	C28	06	9461 DSD	
I21510	06	C24	10	0	D17	06	9461 DSD	2539
I21610	13	B05	04	0	C30	02	9461 DSD	2029
I21611	07	C30	02	0	C38	03	9461 DSD	2029
I21612	15	C38	03	0	D07	12	9461 DSD	2539
I21613	10	D07	12	0	C24	12	9461 DSD	2539
I21710	12	C35	07	0	D11	05	9461 DSD	1193
I21711	04	D11	05	0	D08	12	9461 DSD	1193
I21720	03	C35	08	0	C34	12	9461 DSD	
I21721	15	C34	12	0	C05	12	9461 DSD	
I21730	04	C35	09	0	C31	05	9461 DSD	
I21731	08	C31	05	0	A33	11	9461 DSD	
I21740	02	C35	10	0	C35	14	9461 DSD	1522
I21810	06	C25	01	0	C35	12	9461 DSD	
I21811	06	C25	01	0	C16	05	9461 DSD	1522A
I21910	12	D35	10	0	A34	06	9461 DSD	
I22010	02	B28	07	0	B29	10	9461 DSD	
I22011	07	B29	10	0	C38	12	9461 DSD	
I22110	08	C29	01	0	A36	12	9461 DSD	
I22210	06	D35	07	0	C38	06	9461 DSD	
I22310	03	A32	07	0	A29	11	9461 DSD	
I22320	02	A32	08	0	A31	11	9461 DSD	
I22510	09	C36	07	0	A28	11	9461 DSD	
I22610	02	C29	07	0	C28	05	9461 DSD	
I22611	03	C29	07	0	C32	11	9461 DSD	
I22612	05	C32	11	0	D35	11	9461 DSD	
I22710	06	B28	01	0	C29	08	9461 DSD	
I22810	11	C24	01	0	A29	02	9461 DSD	
I23010	05	C05	07	0	D06	03	9461 DSD	
I23020	19	C05	08	0	A39	10	9461 DSD	1557
I23021	16	A39	10	0	E32	09	9461 DSD	1557B
I23022	03	E32	09	0	E29	11	9461 DSD	3683A
I23110	02	D07	10	0	D08	08	9461 DSD	2539
I23111	09	D07	10	0	C21	05	9461 DSD	2539
I23210	15	D06	01	0	E32	11	9461 DSD	
I23211	04	D06	01	0	D08	11	9461 DSD	
I23510	03	D13	01	0	D12	06	9461 DSD	2658
I23511	06	D13	01	0	D06	09	9461 DSD	

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I23610	14	A01	01	0	D13	06	9461 DSD	
I23611	14	D13	06	0	A29	05	9461 DSD	1703
I24010	12	A29	10	0	A02	10	9461 DSD	1703A
I27010	07	A01	07	0	B08	12	9461 DSD	1522
I27110	07	D07	01	0	C16	06	9461 DSD	1522
I27210	09	C16	01	0	A26	10	9461 DSD	1522
I27211	12	A26	10	0	A01	09	9461 DSD	1522
I27310	05	D14	01	0	C16	09	9461 DSD	1522A
I27311	11	C16	09	0	A01	08	9461 DSD	1522A
I27320	03	D14	02	0	D14	14	9461 DSD	1522
I30010	04	B37	01	0	A37	10	9461 DSD	
I30011	12	A37	10	0	B14	12	9461 DSD	4103
I30110	04	B37	04	0	B34	12	9461 DSD	
I30210	03	B37	07	0	B35	12	9461 DSD	
I30310	02	B37	10	0	B36	12	9461 DSD	
I30410	15	C39	07	0	D08	05	9461 DSD	
I30510	06	B39	01	0	B30	12	9461 DSD	
I30511	06	B39	01	0	C42	06	9461 DSD	
I30520	05	B39	02	0	B31	06	9461 DSD	
I30530	06	B39	03	0	C43	05	9461 DSD	
I30531	08	B39	03	0	C30	12	9461 DSD	
I30540	04	B39	04	0	B36	09	9461 DSD	1703
I30541	06	B36	09	0	C39	11	9461 DSD	1703
I30542	05	C39	11	0	C31	12	9461 DSD	
I30610	04	B40	01	0	B38	11	9461 DSD	
I30611	05	B38	11	0	B31	05	9461 DSD	
I30612	04	B31	05	0	A32	11	9461 DSD	
I30613	06	B40	01	0	C39	06	9461 DSD	
I30614	03	C39	06	0	C41	05	9461 DSD	
I30620	03	B40	02	0	B39	06	9461 DSD	
I30621	04	B40	02	0	A43	12	9461 DSD	
I30622	03	A43	12	0	A43	06	9461 DSD	
I30630	07	B40	03	0	B29	09	9461 DSD	
I30631	03	B29	09	0	B26	09	9461 DSD	
I30632	06	B26	09	0	C29	12	9461 DSD	
I30633	04	C29	12	0	C33	04	9461 DSD	
I30640	06	B40	04	0	B31	04	9461 DSD	
I30641	04	B31	04	0	A32	10	9461 DSD	
I30642	06	B40	04	0	C43	04	9461 DSD	
I30643	07	C43	04	0	C30	11	9461 DSD	
I30710	04	C30	07	0	C34	03	9461 DSD	
I30810	05	C44	07	0	B42	09	9461 DSD	1703
I30811	05	B42	09	0	C37	04	9461 DSD	1703
I30820	03	C44	08	0	C43	14	9461 DSD	1703
I30910	06	B39	07	0	C39	10	9461 DSD	
I30911	06	C39	10	0	B36	10	9461 DSD	1703
I30912	08	B39	07	0	A29	03	9461 DSD	
I30913	10	A29	03	0	C31	11	9461 DSD	1703
I30920	05	B39	08	0	C42	05	9461 DSD	
I30921	08	C42	05	0	B30	09	9461 DSD	1703
I30930	05	B39	09	0	B31	12	9461 DSD	
I30940	05	B39	10	0	C43	03	9461 DSD	
I30941	07	C43	03	0	C30	10	9461 DSD	1703
I31010	03	B40	07	0	B39	12	9461 DSD	
I31020	05	B40	08	0	B31	11	9461 DSD	



I31021	05	B31	11	0	C31	10	9461 DSD	
I31022	02	C31	10	0	C30	09	9461 DSD	
I31023	07	C30	09	0	C43	02	9461 DSD	
I31030	03	B40	09	0	B40	14	9461 DSD	
I31040	03	B40	10	0	B38	10	9461 DSD	
I31041	05	B38	10	0	B31	10	9461 DSD	
I31042	05	B31	10	0	C31	09	9461 DSD	
I31043	05	C31	09	0	C39	05	9461 DSD	
I31044	03	C39	05	0	C41	03	9461 DSD	
I31110	08	C40	07	0	D30	10	9461 DSD	1703
I31120	16	C40	08	0	D08	04	9461 DSD	
I31210	05	B41	07	0	C41	02	9461 DSD	1703
I31211	04	C41	02	0	B43	12	9461 DSD	1703
I31310	03	D36	01	0	D37	11	9461 DSD	1703
I31311	06	D37	11	0	C37	05	9461 DSD	1703
I31410	04	C44	01	0	C43	12	9461 DSD	
I31411	10	C43	12	0	A37	02	9461 DSD	
I31420	02	C44	02	0	C43	06	9461 DSD	
I31510	02	B41	01	0	B40	06	9461 DSD	
I31511	04	B41	01	0	A43	11	9461 DSD	
I31610	03	B41	04	0	B40	12	9461 DSD	
I31611	06	B41	04	0	A43	03	9461 DSD	
I31612	12	B40	12	0	C16	02	9461 DSD	1522
I31710	03	B41	10	0	B44	12	9461 DSD	
I31711	05	B41	10	0	A43	10	9461 DSD	
I31712	03	A43	10	0	A43	04	9461 DSD	
I31810	08	D36	07	0	B42	12	9461 DSD	1214
I32010	03	D35	01	0	D35	08	9461 DSD	
I32011	06	D35	01	0	C28	12	9461 DSD	
I32110	02	D35	04	0	D35	09	9461 DSD	
I32111	07	D35	04	0	C28	04	9461 DSD	1402
I32210	11	D11	07	0	D33	12	9461 DSD	
I32211	02	D33	12	0	D34	11	9461 DSD	
I32220	03	D11	08	0	D11	14	9461 DSD	
I32310	12	A43	01	0	D35	02	9461 DSD	
I32311	04	D35	02	0	D32	12	9461 DSD	
I32312	11	D32	12	0	D11	10	9461 DSD	
I32410	12	A43	07	0	D35	05	9461 DSD	
I32411	04	D35	05	0	D32	09	9461 DSD	
I32412	11	D32	09	0	D11	12	9461 DSD	
I44010	19	B01	01	0	E31	11	9461 DSD	
I44011	12	E31	11	0	D10	12	9461 DSD	
I44110	02	B02	10	0	B01	06	9461 DSD	
I44210	20	B01	07	0	E33	11	9461 DSD	
I44211	13	E33	11	0	D10	11	9461 DSD	
I44410	03	B02	01	0	B01	11	9461 DSD	
I44411	03	B02	01	0	B03	08	9461 DSD	
I44510	05	B09	04	0	B01	05	9461 DSD	
I44511	03	B01	05	0	B01	10	9461 DSD	
I44610	02	B02	04	0	B02	03	9461 DSD	
I44611	03	B02	04	0	B02	09	9461 DSD	
I44710	05	B02	07	0	B08	08	9461 DSD	
I44910	17	B04	01	0	E33	06	9461 DSD	
I44911	10	B04	01	0	D08	10	9461 DSD	
I45010	05	C02	01	0	C08	11	9461 DSD	

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I45020	06	C02	02	0	C10	11	9461 DSD	
I45110	05	C04	01	0	C10	05	9461 DSD	
I45210	05	C05	01	0	C11	05	9461 DSD	
I45220	05	C05	02	0	C13	11	9461 DSD	
I45310	06	C02	07	0	C13	10	9461 DSD	
I45320	06	C02	08	0	C11	11	9461 DSD	
I45410	06	C03	01	0	C11	10	9461 DSD	
I45420	06	C03	02	0	C13	05	9461 DSD	
I45510	06	D14	07	0	C13	04	9461 DSD	
I45520	06	D14	08	0	C11	04	9461 DSD	
I45610	05	C03	07	0	C08	05	9461 DSD	
I45620	05	C03	08	0	C10	10	9461 DSD	
I45710	12	B04	07	0	C21	12	9461 DSD	1193
I45810	12	B03	01	0	C21	11	9461 DSD	1193
I45910	09	C21	10	0	C38	09	9461 DSD	
I45911	09	C21	10	0	B06	05	9461 DSD	
I45912	12	B06	05	0	C29	03	9461 DSD	
I45913	11	C29	03	0	D10	10	9461 DSD	
I45914	11	D10	10	0	E31	05	9461 DSD	
I46010	05	C04	07	0	C12	08	9461 DSD	
I46110	06	B05	10	0	C09	08	9461 DSD	
I46210	07	D17	07	0	C12	02	9461 DSD	
I46310	05	C06	01	0	B07	05	9461 DSD	
I46320	05	C06	02	0	B07	09	9461 DSD	
I46410	10	C07	01	0	A02	06	9461 DSD	
I46510	10	B11	07	0	D03	12	9461 DSD	1350B
I46610	04	B06	07	0	B11	08	9461 DSD	
I46620	06	B06	08	0	A02	08	9461 DSD	
I46621	09	B06	08	0	D10	08	9461 DSD	
I46630	09	B06	09	0	D12	11	9461 DSD	
I46710	03	B05	07	0	B06	12	9461 DSD	
I46810	03	B05	01	0	B04	06	9461 DSD	
I46910	02	C01	04	0	C01	03	9461 DSD	
I47010	02	C01	10	0	C01	09	9461 DSD	
I47110	02	C01	07	0	C02	04	9461 DSD	
I47111	02	C02	04	0	C03	04	9461 DSD	
I47112	05	C03	04	0	B03	07	9461 DSD	
I47210	02	C01	01	0	C02	03	9461 DSD	
I47211	03	C02	03	0	C02	10	9461 DSD	
I47212	06	C02	10	0	B03	06	9461 DSD	
I47310	03	A02	04	0	A02	09	9461 DSD	
I47311	12	A02	09	0	D10	09	9461 DSD	
I47410	04	D03	07	0	D10	05	9461 DSD	1350
I47411	11	D10	05	0	E32	04	9461 DSD	1350
I47420	11	D03	08	0	C24	02	9461 DSD	1350B
I47430	18	D03	09	0	A33	05	9461 DSD	1350B
I47510	08	D06	04	0	B01	08	9461 DSD	
I47620	04	D03	02	0	D01	12	9461 DSD	4059
I47710	03	D05	07	0	D03	06	9461 DSD	
I47720	09	D05	08	0	B08	03	9461 DSD	
I47810	03	D06	10	0	D06	05	9461 DSD	
K10010	10	A17	01	0	C17	12	9461 DSD	
K10020	06	A17	02	0	B11	05	9461 DSD	
K10021	06	B11	05	0	B20	06	9461 DSD	
K10030	04	A17	03	0	A17	14	9461 DSD	

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K10110	06	A17	07	0	B20	12	9461 DSD
K10111	06	B20	12	0	B11	06	9461 DSD
K10120	04	A17	08	0	A13	12	9461 DSD
K10130	08	A17	09	0	C18	05	9461 DSD
K10131	11	C18	05	0	E30	04	9461 DSD
K10210	10	A18	01	0	C17	11	9461 DSD
K10220	06	A18	02	0	B11	03	9461 DSD
K10221	05	B11	03	0	B20	04	9461 DSD
K10222	03	B20	04	0	B22	03	9461 DSD
K10230	04	A18	03	0	A18	14	9461 DSD
K10310	06	A18	07	0	B11	04	9461 DSD
K10311	05	B11	04	0	B20	05	9461 DSD
K10312	03	B20	05	0	B22	06	9461 DSD
K10320	04	A18	08	0	A13	11	9461 DSD
K10330	08	A18	09	0	C18	06	9461 DSD
K10331	11	C18	06	0	E30	11	9461 DSD
K10410	10	A19	01	0	C17	10	9461 DSD
K10420	04	A19	02	0	A14	10	9461 DSD
K10421	06	A19	02	0	B21	06	9461 DSD
K10430	04	A19	03	0	A19	14	9461 DSD
K10510	04	A19	07	0	A14	11	9461 DSD
K10511	06	A19	07	0	B21	12	9461 DSD
K10520	04	A19	08	0	A13	10	9461 DSD
K10530	09	A19	09	0	C18	07	9461 DSD
K10531	10	C18	07	0	E31	04	9461 DSD
K10610	10	A20	01	0	C17	09	9461 DSD
K10620	04	A20	02	0	A14	08	9461 DSD
K10621	05	A20	02	0	B21	04	9461 DSD
K10622	03	B21	04	0	B22	09	9461 DSD
K10630	04	A20	03	0	A20	14	9461 DSD
K10710	04	A20	07	0	A14	09	9461 DSD
K10711	05	A20	07	0	B21	05	9461 DSD
K10712	03	B21	05	0	B22	12	9461 DSD
K10720	04	A20	08	0	A13	09	9461 DSD
K10730	09	A20	09	0	C18	08	9461 DSD
K10731	11	C18	08	0	E31	10	9461 DSD
K10810	04	A21	01	0	C17	08	9461 DSD
K10820	05	A21	02	0	A15	11	9461 DSD
K10821	06	A21	02	0	B23	06	9461 DSD
K10830	04	A21	03	0	A25	14	9461 DSD
K10910	04	A21	07	0	A15	12	9461 DSD
K10911	06	A21	07	0	B23	12	9461 DSD
K10920	05	A21	08	0	A13	08	9461 DSD
K10930	09	A21	09	0	C18	09	9461 DSD
K10931	11	C18	09	0	E32	06	9461 DSD
K11010	10	A22	01	0	C17	07	9461 DSD
K11020	05	A22	02	0	A15	09	9461 DSD
K11021	06	A22	02	0	B23	04	9461 DSD
K11022	03	B23	04	0	B24	06	9461 DSD
K11030	04	A22	03	0	A26	14	9461 DSD
K11110	05	A22	07	0	A15	10	9461 DSD
K11111	05	A22	07	0	B23	05	9461 DSD
K11112	03	B23	05	0	B24	12	9461 DSD
K11120	05	A22	08	0	A13	07	9461 DSD
K11130	09	A22	09	0	C18	10	9461 DSD

1092A

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K11131	11	C18	10	0	E32	12	9461 DSD
K11210	09	A23	01	0	C17	06	9461 DSD
K11220	05	A23	02	0	A16	11	9461 DSD
K11221	03	A16	11	0	A15	07	9461 DSD
K11222	06	A23	02	0	B25	06	9461 DSD
K11230	04	A23	03	0	A23	14	9461 DSD
K11310	05	A23	07	0	A16	12	9461 DSD
K11311	03	A16	12	0	A15	08	9461 DSD
K11312	06	A23	07	0	B25	12	9461 DSD
K11320	06	A23	08	0	A13	06	9461 DSD
K11330	09	A23	09	0	C18	11	9461 DSD
K11331	11	C18	11	0	E33	04	9461 DSD
K11410	10	A24	01	0	C17	05	9461 DSD
K11420	05	A24	02	0	A16	09	9461 DSD
K11421	03	A16	09	0	A15	05	9461 DSD
K11422	03	A24	02	0	B25	04	9461 DSD
K11423	02	B25	04	0	B26	03	9461 DSD
K11430	04	A24	03	0	A24	14	9461 DSD
K11510	05	A24	07	0	A16	10	9461 DSD
K11511	03	A16	10	0	A15	06	9461 DSD
K11512	05	A24	07	0	B25	05	9461 DSD
K11513	02	B25	05	0	B26	06	9461 DSD
K11520	06	A24	08	0	A13	05	9461 DSD
K11530	09	A24	09	0	C18	12	9461 DSD
K11531	11	C18	12	0	E33	09	9461 DSD
K12010	04	B20	01	0	A17	12	9461 DSD
K12011	04	A17	12	0	A11	11	9461 DSD
K12110	06	B20	07	0	A17	06	9461 DSD
K12111	05	A17	06	0	A11	12	9461 DSD
K12210	04	B22	01	0	A18	12	9461 DSD
K12211	05	A18	12	0	A11	09	9461 DSD
K12310	06	B22	04	0	A18	06	9461 DSD
K12311	05	A18	06	0	A11	10	9461 DSD
K12410	04	B21	01	0	A19	12	9461 DSD
K12411	05	A19	12	0	A11	07	9461 DSD
K12510	06	B21	07	0	A19	06	9461 DSD
K12511	05	A19	06	0	A11	08	9461 DSD
K12610	05	B22	07	0	A20	12	9461 DSD
K12611	06	A20	12	0	A11	05	9461 DSD
K12710	06	B22	10	0	A20	06	9461 DSD
K12711	06	A20	06	0	A11	06	9461 DSD
K12810	04	B23	01	0	A21	12	9461 DSD
K12811	05	A21	12	0	A12	11	9461 DSD
K12910	06	B23	07	0	A21	06	9461 DSD
K12911	06	A21	06	0	A12	12	9461 DSD
K13010	04	B24	01	0	A22	12	9461 DSD
K13011	06	A22	12	0	A12	09	9461 DSD
K13110	05	B24	07	0	A22	06	9461 DSD
K13111	06	A22	06	0	A12	10	9461 DSD
K13210	04	B25	01	0	A23	12	9461 DSD
K13211	06	A23	12	0	A12	07	9461 DSD
K13310	05	B25	07	0	A23	06	9461 DSD
K13311	06	A23	06	0	A12	08	9461 DSD
K13410	04	B26	01	0	A24	12	9461 DSD
K13411	07	A24	12	0	A12	05	9461 DSD

1193

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K13510	05	B26	04	0	A24	06	9461 DSD	
K13511	07	A24	06	0	A12	06	9461 DSD	
K14010	04	B16	01	0	B12	12	9461 DSD	
K14011	13	B12	12	0	E30	05	9461 DSD	
K14110	04	B16	04	0	B13	12	9461 DSD	
K14210	04	B16	07	0	B12	11	9461 DSD	
K14211	14	B12	11	0	E30	10	9461 DSD	
K14310	03	B16	10	0	B13	11	9461 DSD	
K14410	04	B17	01	0	B12	10	9461 DSD	
K14411	13	B12	10	0	E31	03	9461 DSD	
K14510	03	B17	04	0	B13	10	9461 DSD	
K14610	04	B17	07	0	B12	09	9461 DSD	
K14611	14	B12	09	0	E31	09	9461 DSD	
K14710	04	B17	10	0	B13	09	9461 DSD	
K14810	14	B18	01	0	E32	05	9461 DSD	
K14811	05	B18	01	0	B12	08	9461 DSD	
K14910	04	B18	04	0	B13	08	9461 DSD	
K15010	14	B18	07	0	E32	10	9461 DSD	
K15011	04	B18	07	0	B12	07	9461 DSD	
K15110	04	B18	10	0	B13	07	9461 DSD	
K15210	14	B19	01	0	E33	03	9461 DSD	
K15211	05	B19	01	0	B12	06	9461 DSD	
K15310	04	B19	04	0	B13	06	9461 DSD	
K15410	14	B19	07	0	E33	10	9461 DSD	
K15411	05	B19	07	0	B12	05	9461 DSD	
K15510	05	B19	10	0	B13	05	9461 DSD	
K16010	10	D15	01	0	C35	06	9461 DSD	
K16011	08	C35	06	0	A34	11	9461 DSD	5186
K16012	03	A34	11	0	A34	05	9461 DSD	5186
K16013	12	B09	01	0	D07	08	9461 DSD	5186
K16110	03	D15	04	0	D15	12	9461 DSD	
K16111	04	D15	12	0	D20	07	9461 DSD	
K16210	02	D15	07	0	D15	06	9461 DSD	
K16211	04	D15	06	0	D20	09	9461 DSD	
K16310	03	D15	10	0	D15	03	9461 DSD	
K16311	04	D15	03	0	D20	08	9461 DSD	
K20010	06	A31	01	0	B28	03	9461 DSD	
K20020	07	A31	02	0	B28	12	9461 DSD	
K20021	04	B28	12	0	C31	04	9461 DSD	
K20022	08	C31	04	0	C16	11	9461 DSD	1522
K20023	05	C16	11	0	D18	05	9461 DSD	1522A
K20024	06	A31	02	0	A39	05	9461 DSD	3179
K20025	02	A39	05	0	A39	06	9461 DSD	3179
K20110	09	A31	07	0	C36	08	9461 DSD	
K20111	09	A31	07	0	C29	11	9461 DSD	
K20112	04	C29	11	0	C33	03	9461 DSD	
K20113	08	C33	03	0	D20	03	9461 DSD	
K20120	14	A31	08	0	D14	06	9461 DSD	1522A
K20210	15	A29	01	0	D11	06	9461 DSD	
K20211	03	D11	06	0	D08	09	9461 DSD	1193
K20310	08	A29	07	0	C33	02	9461 DSD	
K20311	08	C33	02	0	D20	04	9461 DSD	
K20410	04	C32	01	0	C36	05	9461 DSD	
K20411	07	C32	01	0	A32	12	9461 DSD	
K20412	03	A32	12	0	A34	02	9461 DSD	

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0420	04	C32	02	0	C32	14	9461 DSD	
0510	09	C32	07	0	A28	10	9461 DSD	1522A
0520	07	C32	08	0	C24	03	9461 DSD	
0610	06	B31	01	0	C31	03	9461 DSD	
0611	04	B31	01	0	A31	10	9461 DSD	
0612	08	C31	03	0	C16	10	9461 DSD	1522
0620	03	B31	02	0	B29	08	9461 DSD	
0621	12	B29	08	0	D11	11	9461 DSD	
0622	08	B31	02	0	C37	10	9461 DSD	
0630	07	B31	03	0	C36	10	9461 DSD	
0631	07	B31	03	0	C29	10	9461 DSD	
0632	04	C29	10	0	C33	06	9461 DSD	
0710	05	B31	07	0	A31	09	9461 DSD	
0711	03	B31	07	0	B29	07	9461 DSD	
0720	03	B31	08	0	B28	06	9461 DSD	
0721	06	B28	06	0	A31	05	9461 DSD	
0722	06	B31	08	0	C25	11	9461 DSD	
0730	07	B31	09	0	C40	05	9461 DSD	
0810	08	C37	01	0	A37	01	9461 DSD	
0811	04	A37	01	0	A34	09	9461 DSD	
0812	02	A34	09	0	A32	09	9461 DSD	
0813	08	C37	01	0	D30	11	9461 DSD	
0820	04	C37	02	0	C37	14	9461 DSD	
0910	07	C37	07	0	C25	12	9461 DSD	
0920	03	C37	08	0	C40	06	9461 DSD	
1010	08	B30	01	0	C38	10	9461 DSD	
1020	07	B30	02	0	C34	08	9461 DSD	
1110	06	B30	07	0	A31	04	9461 DSD	
1111	06	B30	07	0	C25	10	9461 DSD	
1120	03	B30	08	0	B30	14	9461 DSD	
1210	04	C38	01	0	C41	12	9461 DSD	
1211	14	C38	01	0	B08	11	9461 DSD	1522
1220	03	C38	02	0	C37	12	9461 DSD	
1221	03	C37	12	0	C35	05	9461 DSD	
1222	09	C35	05	0	A34	04	9461 DSD	
1223	03	A34	04	0	A34	10	9461 DSD	
1224	04	C38	02	0	C42	12	9461 DSD	
1310	03	C38	07	0	C40	04	9461 DSD	
1311	07	C38	07	0	B28	11	9461 DSD	
1320	08	C38	08	0	C25	09	9461 DSD	
1410	14	C28	01	0	A01	06	9461 DSD	
1411	14	A01	06	0	D12	12	9461 DSD	
1420	03	C28	02	0	C29	09	9461 DSD	
1421	08	C29	09	0	C32	12	9461 DSD	
1422	08	C28	02	0	A37	12	9461 DSD	
1423	05	A37	12	0	A33	06	9461 DSD	
1430	04	C28	03	0	C28	14	9461 DSD	1402
1510	15	C28	07	0	A01	03	9461 DSD	
1520	03	C28	08	0	C31	08	9461 DSD	
1521	02	C31	08	0	C32	10	9461 DSD	
1522	04	C32	10	0	C36	03	9461 DSD	
1523	07	C36	03	0	A39	11	9461 DSD	
1530	08	C28	09	0	A26	11	9461 DSD	1402
1610	14	A27	01	0	D36	10	9461 DSD	2539
1620	14	A27	02	0	C05	09	9461 DSD	

## LW45587600 9461 DSD

K21621	05	C05	09	0	D07	09	9461 DSD	
K21622	07	D07	09	0	C15	03	9461 DSD	
K21623	08	A27	02	0	C29	05	9461 DSD	
K21710	15	A27	07	0	E33	05	9461 DSD	
K21711	12	E33	05	0	D10	06	9461 DSD	
K21720	11	A27	08	0	D17	05	9461 DSD	
K21810	09	C15	01	0	C32	09	9461 DSD	
K21820	03	C15	02	0	C14	06	9461 DSD	
K21821	08	C14	06	0	D07	11	9461 DSD	2539
K21910	05	C15	07	0	D11	04	9461 DSD	
K21911	03	D11	04	0	D10	07	9461 DSD	
K21920	05	C15	08	0	D17	04	9461 DSD	
K30010	04	B32	01	0	B37	03	9461 DSD	
K30011	12	B37	03	0	B14	11	9461 DSD	4103
K30012	10	B32	01	0	D36	06	9461 DSD	1703
K30110	03	B32	07	0	B33	12	9461 DSD	
K30111	07	B33	12	0	A37	07	9461 DSD	
K30112	04	A37	07	0	A39	04	9461 DSD	2089A
K30210	04	B33	01	0	B32	12	9461 DSD	
K30211	07	B32	12	0	A37	09	9461 DSD	
K30310	02	B33	07	0	B32	06	9461 DSD	
K30311	05	B32	06	0	A37	08	9461 DSD	
K30410	08	B38	01	0	C40	12	9461 DSD	
K30420	09	B38	02	0	C25	08	9461 DSD	
K30510	05	B38	07	0	B30	11	9461 DSD	
K30511	06	B38	07	0	C41	11	9461 DSD	
K30520	05	B38	08	0	B30	10	9461 DSD	
K30521	06	B38	08	0	C42	11	9461 DSD	
K30522	16	C42	11	0	D08	03	9461 DSD	
K30610	04	C41	01	0	B37	12	9461 DSD	
K30611	06	B37	12	0	A37	06	9461 DSD	
K30710	06	C41	07	0	B36	11	9461 DSD	
K30711	04	B36	11	0	B33	06	9461 DSD	
K30712	03	B33	06	0	B32	11	9461 DSD	
K30810	05	C42	01	0	B37	09	9461 DSD	
K30811	06	B37	09	0	A37	05	9461 DSD	
K30910	06	C42	07	0	B35	11	9461 DSD	
K30911	03	B35	11	0	B33	05	9461 DSD	
K30912	02	B33	05	0	B32	10	9461 DSD	
K31010	06	C43	01	0	B37	06	9461 DSD	
K31011	06	B37	06	0	A37	04	9461 DSD	
K31110	07	C43	07	0	B34	11	9461 DSD	
K31111	03	B34	11	0	B33	04	9461 DSD	
K31112	03	B33	04	0	B32	09	9461 DSD	
K31210	04	B44	01	0	B42	14	9461 DSD	1703A
K31220	07	B44	02	0	C39	08	9461 DSD	1703
K31221	05	C39	08	0	B41	09	9461 DSD	1703
K31222	18	B44	02	0	A02	12	9461 DSD	1703A
K31230	06	B44	03	0	C44	06	9461 DSD	
K31231	08	C44	06	0	C30	08	9461 DSD	
K31232	06	C30	08	0	B30	04	9461 DSD	
K31310	08	B44	07	0	C31	02	9461 DSD	
K31311	08	C31	02	0	A33	08	9461 DSD	
K31312	10	B44	07	0	D36	11	9461 DSD	
K31320	05	B44	08	0	B38	09	9461 DSD	

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K31321	05	B38	09	0	C42	04	9461 DSD	
K31322	03	C42	04	0	C39	03	9461 DSD	
K31323	10	C39	03	0	A29	04	9461 DSD	
K31330	10	B44	09	0	D36	12	9461 DSD	1441
K31331	02	D36	12	0	D37	12	9461 DSD	1441
K31410	07	B26	07	0	B39	05	9461 DSD	
K31411	10	B39	05	0	D35	12	9461 DSD	
K31510	07	B26	10	0	C36	04	9461 DSD	
K40010	09	D18	01	0	B09	06	9461 DSD	
K40011	04	B09	06	0	B05	03	9461 DSD	
K40020	07	D18	02	0	D05	12	9461 DSD	
K40021	10	D18	02	0	C36	09	9461 DSD	
K40030	13	D18	03	0	B09	05	9461 DSD	12343
K40031	09	D18	03	0	B28	08	9461 DSD	
K40110	10	D18	07	0	B08	04	9461 DSD	
K40111	03	B08	04	0	B08	07	9461 DSD	
K40120	06	D18	08	0	D17	03	9461 DSD	
K40130	03	D18	09	0	D18	14	9461 DSD	
K40210	04	B07	01	0	B05	09	9461 DSD	
K40310	03	B07	04	0	B07	12	9461 DSD	
K40311	11	B07	12	0	D20	12	9461 DSD	
K40410	02	B07	07	0	B07	06	9461 DSD	
K40411	03	B07	06	0	B06	11	9461 DSD	
K40412	11	B06	11	0	D20	10	9461 DSD	
K40510	03	B07	10	0	B07	03	9461 DSD	
K40511	11	B07	10	0	D20	11	9461 DSD	
L20010	09	A38	07	0	C38	05	9461 DSD	
L20110	07	A38	01	0	B42	10	9461 DSD	
L20111	05	B42	10	0	C38	04	9461 DSD	
L20210	08	C20	01	0	A28	12	9461 DSD	
L20310	04	C20	07	0	C15	06	9461 DSD	2539
L20311	10	C20	07	0	A31	03	9461 DSD	
L20312	10	A31	03	0	C36	12	9461 DSD	
L30010	07	A40	01	0	B40	11	9461 DSD	
L30011	03	B40	11	0	B41	03	9461 DSD	
L30012	11	B41	03	0	D32	11	9461 DSD	
L30013	03	A40	01	0	A43	05	9461 DSD	
L30014	08	A43	05	0	A30	09	9461 DSD	
L30015	10	A30	09	0	C16	04	9461 DSD	1522
L30016	08	D32	11	0	C44	12	9461 DSD	1703
L30110	05	A40	07	0	B40	05	9461 DSD	
L30111	02	B40	05	0	B41	06	9461 DSD	
L30112	11	B41	06	0	D32	10	9461 DSD	
L30113	03	A40	07	0	A43	09	9461 DSD	
L30114	07	A43	09	0	A30	10	9461 DSD	
L30116	08	D32	10	0	C44	11	9461 DSD	1703
L30210	07	A42	01	0	B41	12	9461 DSD	
L30211	07	A42	01	0	A30	11	9461 DSD	
L30212	10	A30	11	0	C16	03	9461 DSD	1522
L40010	16	A42	07	0	D18	11	9461 DSD	
L40210	03	D23	01	0	D22	11	9461 DSD	
L40220	03	D23	05	0	D22	12	9461 DSD	
L40230	13	D23	07	0	B04	05	9461 DSD	
M20510	12	B08	09	0	A26	01	9461 DSD	1522
T00410	13	E43	01	0	D16	11	9461 DSD	4103
T00411	06	D16	11	0	C19	12	9461 DSD	4103

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LW45587600 9461 DSD

T00510	10	E38	07	0	C24	06	9461	DSD	
T00511	11	C24	06	0	A07	03	9461	DSD	
T00512	05	A07	03	0	B06	10	9461	DSD	1210
T00610	14	E36	07	0	B29	06	9461	DSD	
T00611	09	B29	06	0	D16	12	9461	DSD	
T00710	06	E37	07	0	E28	05	9461	DSD	
T00810	14	E44	07	0	C19	03	9461	DSD	4103
T00811	06	C19	03	0	B14	02	9461	DSD	4103
T00812	06	B14	02	0	A07	06	9461	DSD	4103
T10010	16	E42	01	0	B16	06	9461	DSD	
T10011	07	B16	06	0	A06	12	9461	DSD	
T10110	16	E42	07	0	B16	12	9461	DSD	
T10111	08	B16	12	0	A06	11	9461	DSD	
T10210	15	E41	01	0	B17	06	9461	DSD	
T10211	08	B17	06	0	A06	10	9461	DSD	
T10310	15	E41	07	0	B17	12	9461	DSD	
T10311	08	B17	12	0	A06	09	9461	DSD	
T10410	15	E40	01	0	B18	06	9461	DSD	
T10411	08	B18	06	0	A06	08	9461	DSD	
T10510	15	E40	07	0	B18	12	9461	DSD	
T10511	07	B18	12	0	A06	07	9461	DSD	
T10610	15	E39	01	0	B19	06	9461	DSD	
T10611	06	B19	06	0	A06	06	9461	DSD	
T10710	15	E39	07	0	B19	12	9461	DSD	
T10711	09	B19	12	0	A06	05	9461	DSD	
T20210	09	E36	01	0	C29	06	9461	DSD	
T20211	05	C29	06	0	C37	11	9461	DSD	2028
T20212	11	E36	01	0	D13	08	9461	DSD	
T20310	15	E37	01	0	A27	12	9461	DSD	
T20410	11	E38	01	0	D16	09	9461	DSD	
T20411	06	D16	09	0	C15	10	9461	DSD	
T20412	08	C15	10	0	C29	02	9461	DSD	2539
T40010	08	E43	07	0	D16	08	9461	DSD	
T40110	08	E23	01	0	D23	12	9461	DSD	
T40210	18	E44	01	0	D06	06	9461	DSD	
Y00510	05	C22	01	0	C27	12	9461	DSD	4103
Y20310	07	A30	01	0	B28	09	9461	DSD	
Y20610	09	A25	01	0	C27	06	9461	DSD	
Y21110	07	C14	01	0	B05	06	9461	DSD	
Y22110	05	A36	01	0	A30	12	9461	DSD	
Y23010	12	D42	01	0	C27	05	9461	DSD	2242
Y20311	09	B28	09	0	C14	12	9461	DSD	2539
Y30510	03	B34	01	0	B33	09	9461	DSD	
Y30511	04	B33	09	0	B32	05	9461	DSD	2089
Y30610	04	B35	01	0	B33	10	9461	DSD	
Y30611	04	B33	10	0	B32	04	9461	DSD	2089
Y30710	04	B36	01	0	B33	11	9461	DSD	
Y31210	07	B42	01	0	C38	11	9461	DSD	
Y31310	06	B43	01	0	B33	08	9461	DSD	1703
Y31311	03	B33	08	0	B32	02	9461	DSD	1703
Y31510	08	D37	01	0	B42	11	9461	DSD	1703
Y33010	02	D34	01	0	D35	03	9461	DSD	
Y33110	03	D33	01	0	D35	06	9461	DSD	
Y33210	03	D32	01	0	D33	11	9461	DSD	
Y33211	02	D33	11	0	D34	12	9461	DSD	
Y41110	09	D01	05	0	B02	11	9461	DSD	4059

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Y41120	05	D01	06	0	D06	11	9461 DSD	4059
100010	02	A26	02	0	A26	04	9461 DSD	
100030	04	A38	03	0	A44	01	9461 DSD	
100031	02	A44	01	0	A44	02	9461 DSD	
100040	04	A38	09	0	A44	03	9461 DSD	
100041	02	A44	03	0	A44	04	9461 DSD	
100050	02	A30	04	0	A30	05	9461 DSD	
100051	02	A30	05	0	A30	07	9461 DSD	
100052	05	A30	07	0	B34	04	9461 DSD	
100053	02	B34	04	0	B35	04	9461 DSD	
100060	02	B34	05	0	B34	07	9461 DSD	
100070	02	B35	05	0	B35	07	9461 DSD	
100080	02	B36	04	0	B36	07	9461 DSD	
100090	03	A40	03	0	A44	05	9461 DSD	
100091	02	A44	05	0	A44	06	9461 DSD	
100100	03	A40	09	0	A44	07	9461 DSD	
100101	02	A44	07	0	A44	08	9461 DSD	
100110	03	A42	03	0	A44	09	9461 DSD	
100111	02	A44	09	0	A44	10	9461 DSD	
100120	02	B42	04	0	B42	05	9461 DSD	
100121	02	B42	05	0	B42	07	9461 DSD	
100130	02	B43	04	0	B43	07	9461 DSD	1703
100170	11	B08	05	R	S100	02	9461 DSD	
100171	01	S100	02	R	S100	03	9461 DSD	
100180	18	C01	10	R	S101	02	9461 DSD	
100190	19	C01	04	R	S101	03	9461 DSD	
100200	09	A30	14	R	S100	C	9461 DSD	
100201	03	S100		C	R	S101	C	9461 DSD
100210	03	C02	06	0	C05	06	9461 DSD	
100211	05	C05	06	0	B03	09	9461 DSD	
100220	05	C02	05	0	B04	09	9461 DSD	
100221	10	B04	09	0	D14	12	9461 DSD	
100230	03	C02	12	0	C04	05	9461 DSD	
100231	05	C04	05	0	B04	10	9461 DSD	
100240	02	C03	06	0	C04	04	9461 DSD	
100241	05	C04	04	0	B03	10	9461 DSD	
100250	02	C04	03	0	C05	05	9461 DSD	
100251	05	C05	05	0	B03	11	9461 DSD	
100260	05	C04	06	0	B04	11	9461 DSD	
100261	10	B04	11	0	D14	11	9461 DSD	
100270	02	C03	12	0	C02	11	9461 DSD	
100271	05	C02	11	0	B04	12	9461 DSD	
100280	03	C03	11	0	C03	05	9461 DSD	
100281	05	C03	05	0	B03	12	9461 DSD	
100290	12	D20	05	0	B02	06	9461 DSD	
100300	02	C22	03	0	C22	04	9461 DSD	4103
100301	02	C22	04	0	C22	07	9461 DSD	4103
100320	02	D34	04	0	D34	07	9461 DSD	
100330	02	D33	04	0	D33	07	9461 DSD	4023
100340	02	D32	04	0	D32	07	9461 DSD	
100350	02	A36	05	0	A36	07	9461 DSD	
100360	10	TP100		R	A21	14	9461 DSD	
100370	02	D37	04	0	D37	07	9461 DSD	
100380	12	C20	03	0	A04	02	9461 DSD	
100390	12	C20	09	0	A04	01	9461 DSD	

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100400	07	C101	T R	E24	15	9461 DSD	20	2	1611
100401	24	C101	T R	TP107		9461 DSD	20	2	
100402	03	C101	T R	E35	15	9461 DSD	20	2	
100403	02	E36	15 O	E37	15	9461 DSD	24	2	
100404	02	E38	15 O	E39	15	9461 DSD	24	2	
100405	02	E40	15 O	E41	15	9461 DSD	24	2	
100406	02	E42	15 O	E43	15	9461 DSD	24	2	
100411	24	C102	T R	TP108		9461 DSD	20	2	
100412	03	C102	T R	E28	15	9461 DSD	20	2	
100413	02	E28	15 O	E29	15	9461 DSD	24	2	
100414	02	E30	15 O	E31	15	9461 DSD	24	2	
100415	02	E32	15 O	E33	15	9461 DSD	24	2	
100420	25	C103	T R	TP109		9461 DSD	20	6	
100421	04	C103	T R	E25	12	9461 DSD	20	6	
100422	04	C103	T R	E23	13	9461 DSD	20	6	
100423	06	C103	T R	E36	12	9461 DSD	20	6	
100424	02	E36	12 O	E37	12	9461 DSD	24	6	
100425	02	E37	12 O	E38	12	9461 DSD	24	6	
100426	02	E38	12 O	E39	12	9461 DSD	24	6	
100427	02	E39	12 O	E40	12	9461 DSD	24	6	
100428	02	E40	12 O	E41	12	9461 DSD	24	6	
100429	02	E41	12 O	E42	12	9461 DSD	24	6	
100430	02	E42	12 O	E43	12	9461 DSD	24	6	
100431	02	E43	12 O	E44	12	9461 DSD	24	6	
100440	26	C104	T R	TP110		9461 DSD	0	6	
100441	06	C104	T R	E25	13	9461 DSD	20	6	
100442	04	C104	T R	E34	13	9461 DSD	20	6	
100443	02	E34	13 O	E35	13	9461 DSD	24	6	
100444	02	E36	13 O	E37	13	9461 DSD	24	6	
100445	02	E38	13 O	E39	13	9461 DSD	24	6	
100446	02	E40	13 O	E41	13	9461 DSD	24	6	
100447	02	E42	13 O	E43	13	9461 DSD	24	6	
100448	02	E33	13 O	E32	13	9461 DSD	24	6	
100449	02	E31	13 O	E30	13	9461 DSD	24	6	
100450	02	E29	13 O	E28	13	9461 DSD	24	6	
100460	04	TP110	03 R	LCG		9461 DSD	14	0	
100470	03	S102	C R	S101	C	9461 DSD	24	4	
100480	01	S102	02 R	S102	03	9461 DSD	24	4	
100481	28	S102	02 R	E37	08	9461 DSD			1193
100482	03	S103	0C R	S102	0C		PE12245		
100483	01	S103	02 R	S103	03		PE12245		
100484	21	S103	02 R	G29	04		PE12245		
100490	05	E43	02 O	E38	02	9461 DSD			
100491	02	E38	02 O	E37	02	9461 DSD			
100492	02	E37	02 O	E36	02	9461 DSD			
100493	05	E36	02 O	E42	02	9461 DSD			
100494	03	E42	02 O	E42	08	9461 DSD			
100495	02	E42	08 O	E41	08	9461 DSD			
100496	02	E41	08 O	E40	08	9461 DSD			
100497	02	E40	08 O	E39	08	9461 DSD			
100498	04	E39	08 O	E41	02	9461 DSD			
100499	02	E41	02 O	E40	02	9461 DSD			
100500	02	E40	02 O	E39	02	9461 DSD			
100501	04	E39	02 O	E36	08	9461 DSD			
100502	03	E36	08 O	E38	08	9461 DSD			
100503	04	E38	08 O	E44	08	9461 DSD			3346
100504	02	D01	04 O	D01	05	9461 DSD			4059
100720	02	A42	09 O	A44	11	9461 DSD			1056A

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200010	44	J100	01	X	E33	07	9461 DSD	24A	4	
200020	44	J100	02	X	E33	08	9461 DSD	24A	0	
200021	44	J100	02	X	E33	02	9461 DSD	24B	0	1536
200030	44	J100	03	X	E33	01	9461 DSD	24B	4	1536
200040	44	J100	04	X	E32	07	9461 DSD	24C	4	1536
200050	44	J100	05	X	E32	08	9461 DSD	24C	0	1536
200051	44	J100	05	X	E32	02	9461 DSD	24D	0	1536
200060	44	J100	07	X	E32	01	9461 DSD	24D	4	1536
200070	44	J100	08	X	E31	07	9461 DSD	24E	4	1536
200080	44	J100	10	X	E31	08	9461 DSD	24E	0	1536
200081	44	J100	10	X	E31	02	9461 DSD	24F	0	1536
200090	44	J100	11	X	E31	01	9461 DSD	24F	4	1536
200100	44	J100	12	X	E30	07	9461 DSD	24G	4	1536
200110	44	J100	13	X	E30	08	9461 DSD	24G	0	1536
200111	44	J100	13	X	E30	02	9461 DSD	24H	0	1536
200120	44	J100	14	X	E30	01	9461 DSD	24H	4	1536
200130	44	J100	15	X	E34	01	9461 DSD	24I	4	1536
200140	44	J100	16	X	E34	02	9461 DSD	24I	0	1536
200141	44	J100	16	X	E34	08	9461 DSD	24J	0	1536
200150	44	J100	17	X	E34	07	9461 DSD	24J	4	1536
200160	42	J100	18	X	E29	01	9461 DSD	24K	4	1536
200170	42	J100	20	X	E29	02	9461 DSD	24K	0	1536
200171	42	J100	20	X	E29	08	9461 DSD	24L	0	1536
200180	42	J100	21	X	E29	07	9461 DSD	24L	4	1536
200190	48	J100	40	X	E42	05	9461 DSD	24M	4	1536
200200	48	J100	41	X	E42	06	9461 DSD	24M	0	1536
200201	48	J100	41	X	E42	11	9461 DSD	24N	0	1536
200210	48	J100	42	X	E42	10	9461 DSD	24N	4	1536
200220	48	J100	43	X	E41	05	9461 DSD	24O	4	1536
200230	48	J100	44	X	E41	06	9461 DSD	24O	0	1536
200231	48	J100	44	X	E41	11	9461 DSD	24P	0	1536
200240	48	J100	45	X	E41	10	9461 DSD	24P	4	1536
200250	48	J100	46	X	E40	05	9461 DSD	24Q	4	1536
200260	48	J100	47	X	E40	06	9461 DSD	24Q	0	1536
200261	48	J100	47	X	E40	11	9461 DSD	24R	0	1536
200270	48	J100	48	X	E40	10	9461 DSD	24R	4	1536
200280	48	J100	49	X	E39	05	9461 DSD	24S	4	1536
200290	48	J100	50	X	E39	06	9461 DSD	24S	0	1536
200291	48	J100	50	X	E39	11	9461 DSD	24T	0	1536
200300	48	J100	51	X	E39	10	9461 DSD	24T	4	1536
200310	44	J100	52	X	E36	05	9461 DSD	24U	4	1536
200320	44	J100	53	X	E36	06	9461 DSD	24U	0	1536
200321	44	J100	53	X	E36	11	9461 DSD	24V	0	
200330	44	J100	54	X	E36	10	9461 DSD	24V	4	
200340	46	J100	55	X	E43	05	9461 DSD	24W	4	1536
200350	46	J100	56	X	E43	06	9461 DSD	24W	0	1536
200351	46	J100	56	X	E43	11	9461 DSD	24X	0	
200360	46	J100	57	X	E43	10	9461 DSD	24X	4	
200370	44	J100	58	X	E38	05	9461 DSD	24Y	4	
200380	44	J100	59	X	E38	06	9461 DSD	24Y	0	
200381	44	J100	59	X	E38	11	9461 DSD	24Z	0	1536
200390	44	J100	60	X	E38	10	9461 DSD	24Z	4	1536
200400	46	J100	63	X	E44	06	9461 DSD	24A	0	
200410	46	J100	64	X	E44	05	9461 DSD	24A	4	
200420	42	J100	65	X	E21	13	9461 DSD	24B	4	1536

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200430	42	J100	66	X	E21	14	9461 DSD	24B	0	1536
200431	42	J100	66	X	E22	14	9461 DSD	24C	0	
200440	42	J100	78	X	E21	12	9461 DSD	24C	4	
200450	42	J100	76	X	E21	15	9461 DSD	24D	0	1536
200460	42	J100	77	X	E21	11	9461 DSD	24D	4	1536
200470	38	J100	80	X	TB110	01	9461 DSD	16	0	
200480	38	J100	82	X	TB110	01	9461 DSD	16	0	
200490	38	J100	22	X	E21	01	9461 DSD	24E	4	
200500	38	J100	23	X	E21	02	9461 DSD	24E	0	
200501	38	J100	23	X	E21	04	9461 DSD	24F	0	
200510	38	J100	24	X	E21	03	9461 DSD	24F	4	
200520	46	J100	62	X	E44	10	9461 DSD	24G	4	3346
200530	46	J100	63	X	E44	11	9461 DSD	24G	0	3346
300010	40	J101	01	X	E33	07	9461 DSD	24A	4	1536
300020	40	J101	02	X	E33	08	9461 DSD	24A	0	1536
300021	40	J101	02	X	E33	02	9461 DSD	24B	0	1536
300030	40	J101	03	X	E33	01	9461 DSD	24B	4	1536
300040	40	J101	04	X	E32	07	9461 DSD	24C	4	1536
300050	40	J101	05	X	E32	08	9461 DSD	24C	0	1536
300051	40	J101	05	X	E32	02	9461 DSD	24D	0	1536
300060	40	J101	07	X	E32	01	9461 DSD	24D	4	1536
300070	40	J101	08	X	E31	07	9461 DSD	24E	4	1536
300080	40	J101	10	X	E31	08	9461 DSD	24E	0	1536
300081	40	J101	10	X	E31	02	9461 DSD	24F	0	1536
300090	40	J101	11	X	E31	01	9461 DSD	24F	4	1536
300100	40	J101	12	X	E30	07	9461 DSD	24G	4	1536
300110	40	J101	13	X	E30	08	9461 DSD	24G	0	1536
300111	40	J101	13	X	E30	02	9461 DSD	24H	0	1536
300120	40	J101	14	X	E30	01	9461 DSD	24H	4	1536
300130	42	J101	15	X	E34	01	9461 DSD	24I	4	1536
300140	42	J101	16	X	E34	02	9461 DSD	24I	0	1536
300141	42	J101	16	X	E34	08	9461 DSD	24J	0	1536
300150	42	J101	17	X	E34	07	9461 DSD	24J	4	1536
300160	40	J101	18	X	E29	01	9461 DSD	24K	4	1536
300170	40	J101	20	X	E29	02	9461 DSD	24K	0	1536
300171	40	J101	20	X	E29	08	9461 DSD	24L	0	1536
300180	40	J101	21	X	E29	07	9461 DSD	24L	4	1536
300190	44	J101	40	X	E42	05	9461 DSD	24M	4	1536
300200	44	J101	41	X	E42	06	9461 DSD	24M	0	1536
300201	44	J101	41	X	E42	11	9461 DSD	24N	0	1536
300210	44	J101	42	X	E42	10	9461 DSD	24N	4	1536
300220	44	J101	43	X	E41	05	9461 DSD	24O	4	1536
300230	44	J101	44	X	E41	06	9461 DSD	24O	0	1536
300231	44	J101	44	X	E41	11	9461 DSD	24P	0	1536
300240	44	J101	45	X	E41	10	9461 DSD	24P	4	1536
300250	42	J101	46	X	E40	05	9461 DSD	24Q	4	1536
300260	42	J101	47	X	E40	06	9461 DSD	24Q	0	1536
300261	42	J101	47	X	E40	11	9461 DSD	24R	0	1536
300270	42	J101	48	X	E40	10	9461 DSD	24R	4	1536
300280	44	J101	49	X	E39	05	9461 DSD	24S	4	1536
300290	44	J101	50	X	E39	06	9461 DSD	24S	0	1536
300291	44	J101	50	X	E39	11	9461 DSD	24T	0	1536
300300	44	J101	51	X	E39	10	9461 DSD	24T	4	1536
300310	40	J101	52	X	E36	05	9461 DSD	24U	4	1536
300320	40	J101	53	X	E36	06	9461 DSD	24U	0	1536

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300321	40	J101	53	X	E36	11	9461 DSD	24V	0	1536
300330	40	J101	54	X	E36	10	9461 DSD	24V	4	1536
300340	44	J101	55	X	E43	05	9461 DSD	24W	4	1536
300350	44	J101	56	X	E43	06	9461 DSD	24W	0	1536
300351	44	J101	56	X	E43	11	9461 DSD	24X	0	1536
300360	44	J101	57	X	E43	10	9461 DSD	24X	4	1536
300370	44	J101	58	X	E38	05	9461 DSD	24X	4	1536
300380	44	J101	59	X	E38	06	9461 DSD	24X	0	1536
300381	34	J101	59	X	E38	11	9461 DSD	24Z	0	
300390	44	J101	60	X	E38	10	9461 DSD	24Z	4	1536
300400	44	J101	63	X	E44	06	9461 DSD	24A	0	1536
300410	44	J101	64	X	E44	05	9461 DSD	24A	4	1536
300420	40	J101	65	X	E21	13	9461 DSD	24B	4	1536
300430	40	J101	66	X	E21	14	9461 DSD	24B	0	1536
300440	40	J101	76	X	E21	15	9461 DSD	24D	0	1536
300450	40	J101	77	X	E21	10	9461 DSD	24D	4	1536
300460	40	J101	79	X	E29	15	9461 DSD	16	2	1536
300470	34	J101	80	X	TB110		9461 DSD	16	0	1536
300480	34	J101	82	X	TB110		9461 DSD	16	0	1536
300490	40	J101	22	X	E21	01	9461 DSD	24A	4	1536
300500	40	J101	23	X	E21	02	9461 DSD	24A	0	1536
300501	40	J101	23	X	E21	04	9461 DSD	24B	4	1536
300510	40	J101	24	X	E21	03	9461 DSD	24B	0	1536
300520	44	J101	62	X	E44	10	9461 DSD	24C	4	3346
300530	44	J101	63	X	E44	11	9461 DSD	24C	0	3346
400010	34	J102	01	X	C101	8	9461 DSD	14	2	2494
400020	34	J102	02	X	C101	8	9461 DSD	14	2	2494
400030	26	J102	03	X	TB110	01	9461 DSD	14	0	1536
400040	26	J102	04	X	TB110	02	9461 DSD	14	0	1536
400050	26	J102	10	X	TB110	02	9461 DSD	14	0	1536
400060	26	J102	11	X	TB110	03	9461 DSD	14	0	1536
400110	36	J102	12	X	E23	07	9461 DSD	14E	5	1536
400120	36	J102	12	X	E23	10	9461 DSD	14E	9	1536
400130	33	J102	13	X	C102	B	9461 DSD	14	2	2494
400140	33	J102	14	X	C102	B	9461 DSD	14	2	2494
400150	31	J102	15	X	C104	B	9461 DSD	16	6	2494
400190	32	J102	19	X	C103	B	9461 DSD	14	6	2494
400200	32	J102	20	X	C103	B	9461 DSD	14	6	2494
400210	44	J102	21	X	E37	05	9461 DSD	24A	4	1536
400220	44	J102	26	X	E37	06	9461 DSD	24A	0	1536
400230	44	J102	22	X	E37	10	9461 DSD	24B	0	1536
400240	44	J102	27	X	E37	11	9461 DSD	24B	4	1536
400250	44	J102	23	X	E28	01	9461 DSD	24C	4	1536
400260	44	J102	28	X	E28	02	9461 DSD	24C	0	1536
400280	30	J102	25	X	TB110	03	9461 DSD	14	0	1536
600010	32	J104	01	X	B08	01	9461 DSD	20	4	1536
600020	32	J104	02	X	C01	06	9461 DSD	24	4	1536
600030	32	J104	03	X	C01	12	9461 DSD	24	4	1536
600040	32	J104	04	X	C02	06	9461 DSD	24	4	1536
600050	34	J104	05	X	C02	05	9461 DSD	24	4	
600070	32	J104	07	X	C02	12	9461 DSD	24	4	1536
600080	32	J104	08	X	C03	06	9461 DSD	24	4	1536
600100	32	J104	10	X	C04	03	9461 DSD	24	4	1536
600130	32	J104	12	X	C04	06	9461 DSD	24	4	1536
600140	32	J104	13	X	C03	12	9461 DSD	24	4	

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600150	32	J104	14	X	C03	11	9461 DSD	24	4	1536
600160	38	J104	15	X	D20	05	9461 DSD	24	4	1536
600170	38	J104	16	X	A25	12	9461 DSD	24	4	
600210	42	J104	20	X	E22	13	9461 DSD	24D	4	
600220	42	J104	21	X	E23	14	9461 DSD	24D	0	
600230	34	J104	22	X	B15	07	9461 DSD	24E	9	4243
600240	34	J104	23	X	B14	01	9461 DSD	24E	4	4243
600250	34	J104	24	X	B15	05	9461 DSD	24E	0	4243
600260	51	J104	25	X	B15	02	9461 DSD	24F	0	4243
600270	42	J104	26	X	A34	01	9461 DSD	24F	4	
600280	51	J104	27	X	B15	02	9461 DSD	24G	0	4243
600290	42	J104	28	X	A34	07	9461 DSD	24G	4	1536
600310	44	J104	30	X	A40	06	9461 DSD	20	4	
600320	44	J104	31	X	A40	12	9461 DSD	20	4	
600330	46	J104	32	X	A38	06	9461 DSD	20	4	1536
600340	44	J104	33	X	A38	12	9461 DSD	20	4	
600350	46	J104	34	X	A42	06	9461 DSD	20	4	1536
600360	46	J104	35	X	A42	12	9461 DSD	20	4	1536
600370	38	J104	36	X	C20	12	9461 DSD	20	4	
600440	42	J104	43	X	A28	05	9461 DSD	24	4	
600450	38	J104	44	X	A26	01	9461 DSD	24	4	
600520	44	J104	51	X	-20 BUSS		9461 DSD	16	4	
600530	44	J104	52	X	-20 BUSS		9461 DSD	16	4	
600540	44	J104	53	X	-20 BUSS		9461 DSD	16	4	
600550	44	J104	54	X	820 BUSS		9461 DSD	16	4	
600560	44	J104	55	X	820 BUSS		9461 DSD	16	4	
600570	44	J104	56	X	820 BUSS		9461 DSD	16	4	
600590	46	J104	58	X	E21	10	9461 DSD	20	4	1536
600610	48	J104	60	X	E25	12	9461 DSD	20		1536
600630	44	J104	62	X	E22	15	9461 DSD	20	4	
600640	46	J104	63	X	E21	12	9461 DSD	20	4	
600650	44	J104	64	X	E21	11	9461 DSD	20	4	1536
600680	42	J104	67	X	A28	09	9461 DSD	20	4	1536
600710	35	J104	70	X	B15	05	9461 DSD	24H	0	4243
600720	35	J104	71	X	B14	07	9461 DSD	24H	4	4243
600730	48	J104	72	X	E24	15	9461 DSD	20	4	1536
600750	36	J104	74	X	C20	06	9461 DSD	20	4	
600810	48	J104	77	X	E26	13	9461 DSD	20	4	1536
600850	17	J104	45	X	D42	12	9461 DSD			2242

<b>CONTROL DATA</b> CORPORATION MINNEAPOLIS, MINNESOTA	TITLE R/W LOGIC CHASSIS ASSEMBLY				WL	DOCUMENT NO. 46809800	REV. C
	PRODUCT DISK STORAGE DRIVE				SHEET 1 OF 6		

REVISION STATUS OF SHEETS						REVISIONS						
1	2	3	4	5	6	REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.
A	A	A	A	A	A	A		RELEASED		3-2-67		JJD
B	A	A	A	A	B	B	FM 1698	SEE C. O.	S.D.	9/1/67	KW	
C	A	A	A	B	B	C	PE12370	SEE CO	DL	1-9-70		

NOTES:  
 1. DETACHED LISTS  
 A. PL 46810000  
 B. DN & MECH ASSY 46810000  
 2. ASSOCIATED DOCUMENTS  
 A. CP 46809900  
 B. SCHEMATIC 45587700

⚠ LOGIC CHASSIS GROUND.  
 ⚠ TOLERANCE OF LENGTHS TO BE +1 -0.

COPIES TO				BY	C.M.	DATE	2/22/67	CHKD.	IRD	DATE	2-25-67	ENGR	OPadd	DATE	2-25-67
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<b>CONTROL DATA</b> CORPORATION MINNEAPOLIS, MINNESOTA	TITLE WIRE LISTING				WL	DOCUMENT NO. 46809800	REV. A
	SHEET 2 OF 6						

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
1	45	24	992	02	X13	05		X13	06		
2					X13	05		X14	03		
3					X18	05		X19	05		
4					X19	05		X20	05		
5					X20	05		X21	05		
6					X21	05		X22	05		
7					X22	11		X21	11		
8					X21	11		X20	11		
9					X20	11		X19	11		
10					X19	11		X18	11		
11					X10	06		X10	09		
12					X07	12		X08	11		
13					X07	11		X08	12		
14					X07	10		X07	09		
15					X04	08		X05	07		
16					X05	07		X06	07		
17	45		992		X05	05		X06	05		
18	37		222		X18	15		X19	15		
19	37	24	222	02	X20	15		X21	15		



<b>CONTROL DATA</b>	TITLE						<b>WL</b>	DOCUMENT NO.	REV.
	<b>WIRE LISTING</b>							46809800	A
MINNEAPOLIS, MINNESOTA						SHEET 3 OF			

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS
20	37	24	222	02	X04	15		X05	15		
21	37	24	222	02	X06	15		X07	15		
22	39	COAX	000	03	X02	14		X03	14		
23	39	COAX	000	03	X04	14		X05	14		
24	39	COAX	000	03	X06	14		X07	14		
25	38	24	666	02	X04	13		X05	13		
26	↑	↑	↑	↑	X06	13		X07	13		
27					X08	13		X09	13		
28					X18	13		X19	13		
29	↓				X20	13		X21	13		
30	38		666	↓	X10	13		X11	13		
31	37		222	02	X10	15		X11	15		
32	46		993	03	X22	05		X22	11		
33	↑		↑	↑	X08	02		X10	11		
34					X10	02		X08	09		
35					X10	04		X08	10		
36					X10	06		X08	08		
37					X13	01		X10	01		
38	46	24	993	03	X13	04		X10	03		

<b>CONTROL DATA</b>	TITLE						<b>WL</b>	DOCUMENT NO.	REV.
	<b>WIRE LISTING</b>							46809800	A
MINNEAPOLIS, MINNESOTA						SHEET 4 OF			

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS
39	46	24	993	03	X18	03		X18	09		
40	↑	↑	↑	↑	X19	03		X19	09		
41	↑				X20	03		X20	09		
42					X21	03		X21	09		
43					X22	03		X22	09		
44					X09	15		X07	10		
45					X17	06		X17	12		
46	↓	↓	↓		X07	03		X07	09		
47	46	24	993		X04	09		X05	05		
48	39	COAX	000		X08	14		X09	14		
49	↑	↑	↑		X10	14		X11	14		
50					X12	14		X13	14		
51	↓	↓	↓	↓	X18	14		X19	14		
52	39	COAX	000	03	X20	14		X21	14		
53	47	24	994	04	X09	01		X13	11		
54	47	↑	994	↑	X09	04		X13	12		
55	41	↓	222		X07	01		X07	15		
56	42	24	666	↓	X07	02		X07	13		
57	40	COAX	000	04	X14	14		X17	14		

<b>CONTROL DATA</b> <small>COMMUNICATIONS</small> MINNEAPOLIS, MINNESOTA	<b>TITLE</b> WIRE LISTING	<b>WL</b>	DOCUMENT NO. 46809800	REV. D
	SHEET 5 OF			

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
58											
59	43	24	222	05	X12	15		X17	15		
60	44	↑	666	05	X17	02		X10	01		
61	44	↑	666	05	X12	13		X17	13		
62	48		996	06	X06	01		X12	06		
63	48		996	06	X06	09		X12	12		
64	49		998	08	X12	01		X02	10		
65	50		900	10	X04	07		X18	05		
66	35		4	5 ▲	X06	03	33,36	R100	L	34	
67	↑		↑	5 ↑	X06	11	↑	R101	L	↑	
68	↑		↑	6 ↑	X05	03	↑	R102	L	↑	
69	↑		↑	5 ↑	X10	02	↑	R100	R	↑	
70	↓		↓	5 ↓	X10	04	↓	R101	R	↓	
71	35	24	4	6 ▲	X10	10	33,36	R102	R	34	
72	6				J240	1		X10	13		
73	↑					5		X14	13		
74						7		X13	14		
75						8		X14	14		
76	6				J240	10		X14	15		

FORM AA1669

<b>CONTROL DATA</b> <small>COMMUNICATIONS</small> MINNEAPOLIS, MINNESOTA	<b>TITLE</b> WIRE LISTING	<b>WL</b>	DOCUMENT NO. 46809800	REV. D
	SHEET 6 OF			

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
77	6				J240	14		X12	15		
78											
79	55	24	222	03	X08	12		X02	15		
80	56	24	666	03	X08	11		X02	13		
81	46	24	993	03	X05	09		X03	14		
82	51	COAX	000	06	X01	14		▲			
83	51	COAX	000	06	X22	14		▲			

FORM AA1669



TITLE CONTROL PANEL ASSEMBLY  
 PRODUCT DISK STORAGE DRIVE

WL DOCUMENT NO. 45588200 REV. A  
 SHEET 1 OF 3

REVISION STATUS OF SHEETS					REVISIONS						
1	2	3	REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.		
A	A	A	A	/	RELEASED		11-29-66		MB		

NOTES:  
 1. DETACHED LISTS:  
 A. PL 45592600  
 B. MECH ASSY 45592600  
 2. TOLERANCES ON LENGTHS TO BE +1" -0"

COPIES TO BY C.M. DATE 11/1/66 CHKD. KenT DATE 11-28-66 ENGR ODodd DATE 11-27-66



TITLE WIRE LISTING

WL DOCUMENT NO. 45588200 REV. A  
 SHEET 2 OF 3

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
1	15	20	4	16	P310	1	DS305A	1	+20V
2	↑	↑	↑	16	DS305A	2	P310	2	17
3				15	P310	3	S305A	NO	
4				15	DS302A	1	P310	4	17
5				4	S301C	C	DS302B	2	+20V (TB06-3)
6				12	S301C	C	P310	6	17 +20V (TB06-3)
7				13	P310	7	DS301A	2	GRD
8				12	S301B	C	P310	8	17 +36V
9				11	P310	9	S301A	NO	
10	↓	↓		11	S301B	NC	P310	10	17
11	15	20		11	P310	11	S301B	NO	
12	16	24		04	S301C	NO	DS301A	1	
13	↑	↑		02	DS301A	1	DS301B	1	
14				02	DS301A	2	DS301B	2	
15				02	DS302A	1	DS302B	1	
16				02	DS302A	2	DS302B	2	
17	↓	↓	↓	12	P310	5	S301A	C	-20V
18	16	24	4	07	DS301B	2	S305A	C	
19									

<b>CONTROL DATA</b> <small>WIRE LISTING</small>		TITLE <b>WIRE LISTING</b>					WL 45588200	DOCUMENT NO. 45588200	REV. A	
MINNEAPOLIS, MINNESOTA		SHEET 3 OF								
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX.)	ORIGIN		DESTINATION		ACCESS. FIND NO.	REMARKS
20	16	24	4	02	DS305A	2	DS305B	2		
21	16	24	4	02	DS305A	1	DS305B	1		

<b>CONTROL DATA</b> <small>WIRE LISTING</small>		TITLE <b>WIRE LIST - ACTUATOR HARNESS</b>					WL 45498100	DOCUMENT NO. 45498100	REV. C
MINNEAPOLIS, MINNESOTA		SHEET 1 OF 3							
PRODUCT <b>DISK STORAGE DRIVE</b>									
REVISION STATUS OF SHEETS						REVISIONS			
REV.	ECO	DESCRIPTION			DRFT.	DATE	CHKD.	APPD.	
A		RELEASED				9-12-67			
B	PM4950	SEE CO				3-13-69			
C	PM4914	SEE CO				4-4-69			

NOTES:  
1. FOR MECH ASSY AND PL SEE 45497800.

COPIES TO		BY	DATE	CHKD.	DATE	ENGR	DATE
		P. L. H.	9-12-67	P. L. H.	9-12-67	J. M. H.	9-12-67

DN 45498100
DETACHED LISTS

<b>CONTROL DATA</b> MINNEAPOLIS, MINNESOTA	TITLE		<b>WIRE LISTING</b>	<b>WL</b>	DOCUMENT NO.	REV.
					45498100	C
					SHEET 2 OF 3	

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
1	9	20	4	19	P220	1	X22	06	6,13
2	↑	↑	↑	↑	P220	2	X21	12	6,13
3	↓	↓	↓	↓	P220	3	X20	06	6,13
4	∇	∇	∇	∇	P220	4	X19	12	6,13
5	9	20	4	19	P220	5	X18	06	6,13
6	8								△3
6A			9	17	COND 7		COND 8		
6B			SHIELD	16	COND 9		COND 10		
7	10	24	4	1 3/4	P220	6	COND 6A		
8	10	24	4	1.5	COND 6A		X13	01	5,12
9	11	24	0	2.5	P220	14	SHIELD	COND 6B	
10	11	24	0	3	SHIELD	COND 6B	X12	14	5,12
11	8								△4
11A			9	17	COND 12		COND 13		
11B			SHIELD	16	COND 14		COND 15		
12	10	24	4	1 3/4	P220	7	COND 11A		
13	10	24	4	1.5	COND 11A		X10	05	5,12
14	11	24	0	1 1/2	COND 6B		COND 11B		
15	11	24	0	3	SHIELD	COND 11B	X10	14	5,12

FORM AA 1669

<b>CONTROL DATA</b> MINNEAPOLIS, MINNESOTA	TITLE		<b>WIRE LISTING</b>	<b>WL</b>	DOCUMENT NO.	REV.
					45498100	C
					SHEET 3 OF 3	

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
16	8								△5
16A			9	17	COND 17		COND 18		
16B			SHIELD	16	COND 19		COND 20		
17	10	24	4	1 3/4	P220	8	COND 16A		
18	10	24	4	1.5	COND 16A		X13	04	5,12
19	11	24	0	1 1/2	COND 11B		COND 16B		
20	11	24	0	3	SHIELD	COND 16B	X11	14	5,12
21	9	20	4	19	P220	09	X18	12	6,13
22	↑	↑	↑	↑	P220	10	X19	06	6,13
23	↓	↓	↓	↓	P220	11	X20	12	6,13
24	∇	∇	∇	∇	P220	12	X21	06	6,13
25	9	20	4	19	P220	13	X22	12	6,13

FORM AA 1669

MINNEAPOLIS, MINNESOTA	TITLE	WIRE LIST - ACTUATOR	WL	DOCUMENT NO.	45444100	REV.	B
	PRODUCT	DISK STORAGE DRIVE	SHEET 1 OF 3				

REVISION STATUS OF SHEETS				REVISIONS			
REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.	
A	-	RELEASED		9-13-68			
B	PM4677	SEE CO	TM	5-12-69			

NOTES:   
 1. A HEXAGON IN THE ACCESS FIND NO. COLUMN INDICATES THAT THE CONDUCTOR IS ONE OF SEVERAL (ALL WITH THE SAME NUMBER IN THE HEXAGON) GOING INTO THE SAME TERMINAL. THE NUMBER IN FRONT OF THE HEXAGON IS THE TERMINAL FIND NO.   
 2. USE EXISTING LEADS FROM L210.   
 3. USE EXISTING LEADS FROM M260.   
 4. USE EXISTING LEADS FROM CR10 & CR15.

COPIES TO	BY	B. Mc	DATE	9-13-68	CHKD.	JF	DATE	9-13-68	ENGR	BBM	DATE	9/13/68
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FORM AA 1672

MINNEAPOLIS, MINNESOTA	TITLE	WIRE LISTING	WL	DOCUMENT NO.	45444100	REV.	B
	SHEET 2 OF						

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
1	8	24	4	11	L210	T	J230	J	6
2	8	24	4	11	L210	B	J230	H	2
3		18	2	14	M260		J230	M	94
4		18	0	14	M260		J230	L	94
5	2	24							7
5A			0	16	J230	N	T8200	B	3,4
5B			4	16	J230	P	T8200	T	3,4
6	2	24							
6A			0	8	J230	T	T8201	R	3,4
6B			4	8	J230	U	T8201	L	3,4
7	2	24							
7A			0	14	J230	R	T8202	B	3,4
7B			4	14	J230	Z	T8202	T	3,4
8	2	30							7
8A			6	12	L200	B	J230	X	1
8B			9	12	L200	T	J230	K	1
8C			5	13	S200	NC	J230	Y	1
8D	2		2	13	S200	C	J230	W	1
9	3	30	4	13	S200	NO	J230	V	1

FORM AA 1669

MINNEAPOLIS, MINNESOTA			TITLE <b>WIRE LISTING</b>					WL	DOCUMENT NO. 45444100	REV. B		
MINNEAPOLIS, MINNESOTA											SHEET 3 OF	
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS	
10	9		4	8	L201	T	7	J230	K	(1) 8		
11	9		4	12	S201	NC	8	J230	V	(2) 8		
12	17	24	4	10	L201	B	1.5	J230	b	1	7	
13	17	24	4	12	S201	C	1.8	J230	a	1	7	
14	93										9	
14A					CR15	T	(5)	L201	T		9	
14B					CR15	B	(5)	L201	B		9	
15	93										9	
15A					CR10	T	(5)	L200	T		9	
15B					CR10	B	(5)	L200	B		9	

FORM AA 1659

MINNEAPOLIS, MINNESOTA			TITLE <b>Duo-TYPE CONNECTOR ASSEMBLY</b>					WL	DOCUMENT NO. 45513300	REV. A		
MINNEAPOLIS, MINNESOTA											SHEET 1 OF 2	
CONTROL DATA CORPORATION											PRODUCT DISK PAK	
REVISION STATUS OF SHEETS					REVISIONS							
1	2				REV.	ECO	DESCRIPTION		DRFT.	DATE	CHKD.	APPD.
A	A				A	/	RELEASED			4/22/66		MB

**NOTES:** 1. DETACHED LISTS:

(3) TOLERANCES ON THESE LENGTHS TO BE  $+1^M$   
 $-0^M$

A. PL 45519200  
B. FOR MECH ASSY SEE 45519200

(2) FOR CONDUCTOR DESIGNATION SEE R/W LOGIC WIRE LIST

FORM AA 1672

COPIES TO			BY	PJN	DATE	4-21-66	CHKD.	LRO	DATE	4-21-66	ENGR	JCP	DATE	4-21-66
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<b>CONTROL DATA</b> CORPORATION MINNEAPOLIS, MINNESOTA	TITLE	DOCUMENT NO.	REV.
	WIRE LISTING	45513300	A

WL

SHEET 2 OF

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
1	3	24	6	5	J240	1				2	
2	4	24	6	3		5				2	
3	5	24	2	4		14				2	
4	6		0			7					
5	6		0			8					
6	7	24	2	2	J240	10				2	

<b>CONTROL DATA</b> CORPORATION MINNEAPOLIS, MINNESOTA	TITLE	DOCUMENT NO.	REV.
	FILTER BOX ASSY	45472600	G
PRODUCT		SHEET 1 OF 2	
DISK STORAGE DRIVE			

REVISION STATUS OF SHEETS				REVISIONS							
REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.					
A		RELEASED									
B	PM1651	P/W & MECH ASSY NUMBERS CHANGE (455397800)	DRHDT	12-2-67	KENS	12-19-67					
C	PM2529	45472600 WAS 4682200	DGT	3-18-68	TLT	3-26					
D	PM2529A	SEE CO	EW	5-21-68	R-2	5-21-68					
E	PM3093	SEE CO	EW	6-14-68	TLT	6-18-68					
F	PM5354	INACTIVE SERVICE USE ONLY									
	SN13,000	SUPERCEDED BY NO 45964900	DC	7-29-69	97	8-5-69					
G	PM5354B	REACTIVATED DWG.	78C	11-18-69	97	11-29-69					

NOTES:  
 1. DETACHED LISTS:  
 A. PL 45472700  
 B. MECH ASSY 45472700

COPIES TO	BY	C.M.	DATE	10/28/66	CHKD.	K.M.T.	DATE	11-20-66	APPD.	O.S.A.	DATE	11-29-66
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FORM 4506A



<b>CONTROL DATA</b> CORPORATION MINNEAPOLIS, MINNESOTA	TITLE	DOCUMENT NO.	REV.
	WIRE LISTING	WL 45472600	G
	SHEET 2 OF		

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS
1	16	12	0	6	J01	B	23	FL303	B	21	
2	18	12	9	2		C		FL300	B	21	
3	17	12	2	3		A		FL301	B	21	
4	19	16	0	7		E		J08	T	22	
5	20	16	9	7		F		J08	B	22	
6	15	12	5	6	J01	G		J08	GRD	21	
7	16	12	0	3	J02	A		FL303	B	21	
8	18	12	9	5		B		FL300	B	21	
9	17	12	2	3		C		FL301	B	21	
10	19	16	0	4		E		J09	T	22	
11	20	16	9	4		F		J09	B	22	
12	15	12	5	3	J02	G	23	J09	GRD	21	
13	25	20									
13A		20	4		TB30	1		FL300	B		
13B		20	4		TB30	2		FL300	B		
13C		20	4		TB30	3		FL303	B		
13D		20	4		TB30	5			GRD		

FORM AA 1669

<b>CONTROL DATA</b> CORPORATION MINNEAPOLIS, MINNESOTA	TITLE	DOCUMENT NO.	REV.
	FINAL ASSEMBLY I	WL 45592100	B
	PRODUCT DISK STORAGE DRIVE	SHEET 1 OF 2	

REVISION STATUS OF SHEETS						REVISIONS						
1	2	3	4	5	6	REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.
A	A					A		RELEASED		12-7-66		MB
B	B					B	PM3727A	SEE CO		10-4-68		C.B.H.

NOTES: **1** A HEXAGON IN THE ACCESS FIND NO. COLUMN INDICATES THAT THE CONDUCTOR IS ONE OF SEVERAL (ALL WITH THE SAME NUMBER IN THE HEXAGON) GOING INTO THE SAME TERMINAL. A NUMBER IN FRONT OF A HEXAGON IS THE TERMINAL FIND NO.

**2. DETACHED LISTS:**  
 A. PARTS LIST 41253123-24  
 B. MECH ASSY 41253123-24

**3** FOR FIND NO'S & ACCESS FIND NO'S SEE:  
 A. W11 WIRE LIST 41288600  
 B. W11 PARTS LIST 41262300

**4** TOLERANCES ON LENGTHS TO BE  $\pm 0.00$ "

COPIES TO				
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BY	C.M.	DATE	11/3/66	CHKD.	KenT	DATE	#-3-66	ENGR	D. Dodd	DATE	11-3-66
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FORM AA 1672

<b>CONTROL DATA</b> MINNEAPOLIS, MINNESOTA		TITLE <b>WIRE LISTING</b>					<b>WL</b>	DOCUMENT NO. 45592100	REV. B		
SHEET 2 OF 2											
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS
1	51	24	4	9	J230	K	57	L201	T	66 (1)	
2	51	24	4	11	L201	T	(1)	TB320	8	58	
3	51	24	4	12	TB320	10	58	L201	B	66	
4	51	24									
4A			4	8	J230	V	67	TB320	4	58	
4B			4	8	J230	W	67	TB320	2	58	
5	51	24	4	8	J230	X	67	TB321	8	58	
6	(3)										
6A	↑				L200	B		TB320	7		
6B					S200	NC		TB320	5		
6C					S200	NO		TB320	3		
6D	↓				S200	C		TB320	1		
6E	(3)				L200	T		TB321	7		
7	89	24	9	8	J230	b	67	TB320	9	58	
8	↑	↑	↑	8	J230	a	67	TB321	2	58	
9				2	TB321	4	58	TB320	3	58	
10				8	J230	Y	67	TB320	6	58	
11	↓	↓	↓	8	S201	C	90	TB321	1	58	
12	89	24	9	8	S201	NC	90	TB321	3	58	

<b>CONTROL DATA</b> MINNEAPOLIS, MINNESOTA		TITLE VOLTAGE ADJ. ASSEMBLY (+20 VDC)					<b>WL</b>	DOCUMENT NO. 46815900	REV. A			
SHEET 1 OF 2												
REVISION STATUS OF SHEETS						REVISIONS						
1	2					REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.
A	A					A		RELEASED		5-6-67		MB

NOTES:

1. THESE DESIGNATIONS; L, (LEFT) C, (CENTER) & R, (RIGHT) ARE WHEN VIEWED FROM TERMINAL BLOCK SIDE OF ASSEMBLY.

2. DETACHED LISTS:  
A. PL 46815500  
B. MECHANICAL ASSY 46815500

3. TOLERANCES ON LENGTHS INDICATED TO BE  $\begin{matrix} +1'' \\ -0 \end{matrix}$

4. TERMINAL USED IS SUPPLIED WITH RECTIFIER MOUNTING HARDWARE, FIND NO. 7 OF PL 46815500.

COPIES TO			BY	C.H.	DATE	CHKD.	LRO	DATE	APPD.	JWL	DATE
					4/21/67			4-21-67			4-24-67

FORM 4886A

CONTROL DATA CORPORATION MINNEAPOLIS, MINNESOTA					TITLE WIRE LISTING			WL		DOCUMENT NO. 46815900		REV. A
SHEET 2 OF 2												
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX.)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS			
1	8	16	4	6	TB06	2	9	R03	L	9		
2	↑	↑	↑	6	TB06	2	9	R03	C	↑		
3	↑	↑	↑	6	TB06	3	9	R03	R	↑		
4				3	CRO4A	A		TB06	5			
5				3	CRO4B	A		TB06	1			
6	↓	↓	↓	6	CRO4A	C	⚠	TB06	2	↓		
7	8	16	4	6	CRO4B	C	⚠	TB06	2	9		
8	4				TB06	2		TB06	4			

CONTROL DATA CORPORATION MINNEAPOLIS, MINNESOTA			TITLE VOLTAGE ADJ. ASSEMBLY (-20 VDC)					WL		DOCUMENT NO. 46816100		REV. A					
SHEET 1 OF 2																	
REVISION STATUS OF SHEETS										REVISIONS							
1	2									REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.	
A	A									A		RELEASED		5-6-67			MB

NOTES:

1. THESE DESIGNATIONS; L, (LEFT) C, (CENTER) & R, (RIGHT) ARE WHEN VIEWED FROM TERMINAL BLOCK SIDE OF ASSEMBLY.      2. TOLERANCES ON LENGTHS SHOWN TO BE +1" -0.

2. DETACHED LISTS:  
A. PL 46815700-01  
B. MECHANICAL ASSY 46815700.

COPIES TO						BY	C.M.	DATE	4/3/67	CHKD.	LRO	DATE	4/3/67	ENGR	JWL	DATE	4-27-67
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CONTROL DATA					CODE IDENT	SHEET 2 of 2	WL	DOCUMENT NO. 46816100	REV. A
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS FIND NO.	DESTINATION	ACCESS FIND NO.	REMARKS
1	7	16	4	6	TB07	1 6	R04 L	6	
2	7	16	4	6	TB07	1 6	R04 C	6	
3	7	16	4	6	TB07	2 6	R04 R	6	
4	4				TB07	1	TB07 3		

AA3183 PRINTED IN U.S.A.

<b>CONTROL DATA</b>	TITLE FRONT PANEL ASSEMBLY	WL	DOCUMENT NO. 45481500	REV. D
MINNEAPOLIS, MINNESOTA	PRODUCT DISK STORAGE DRIVE	SHEET 1 OF 2		

REVISION STATUS OF SHEETS				REVISIONS						
1	2	3	4	REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.
A	A			A		RELEASED		4-24-68		MB
B	B			B	PM 3041	SEE CO	AS	7-9-68	TLT	7-17-68
C	C			C	PE 12231	SEE CO	DL	1-8-70		
D	D			D	PE 12226	SEE CO	DL	1-9-70		

NOTES:  
1. DETACHED LISTS:  
A. PL 70534000 & 7053200  
B. MECH ASSY 70534000 & 70534200  
2. TOLERANCE ON ALL LENGTHS TO BE +.1" / -.0"

COPIES TO	BY	BS	DATE 4-24-68	CHKD.	RGP	DATE 4-24-68	ENGR	TES	DATE 4-24-68
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TITLE  
**WIRE LISTING**

WL DOCUMENT NO. 45481500 REV. B

MINNEAPOLIS, MINNESOTA

SHEET 2 OF

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX.)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
1	38	24	4	3	CB03	B	41	TP03			
2	↑	↑	↑	↑	CB05	B	41	TP05			
3	↓	↓	↓	↓	CB02	B	41	TP01			
4	↓	↓	↓	↓	TP03			DS02	T	39	
5	↓	↓	↓	↓	TP04			DS03	T	39	
6	38	24		3	TP01			DS01	T	39	
7	26	16			TB09	8		M01	L		
8	↑	↑			TB09	5		CB01C	B		
9	↓	↓			TB09	4		K03	4A		
10	↓	↓			TB09	2		K03	3C		
11	26	16			TB09	1		K03	4C		
12	38	24		5	CB01A	B	37 (1)	DS04	T	39	
13	↑	↑		↑	CB01A	B	(1)	DS06	B		
14	↓	↓		↓	CB01B	B	37 (2)	DS05	T		
15	↓	↓		↓	CB01B	B	(2)	DS04	B		
16	↓	↓	↓	↓	CB01C	B	37 (3)	DS05	B		
17	38	24	4	5	CB01C	B	(3)	DS06	T	39	



TITLE  
**HARNES, D.C. POWER PANEL**

PRODUCT  
**DISK PAK**

WL DOCUMENT NO. 46819600 REV. D

MINNEAPOLIS, MINNESOTA

SHEET 1 OF 3

REVISION STATUS OF SHEETS										REVISIONS						
1	2	3								REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.
A	A	A								A		RELEASED		10/27/65		
B	B	B								B	PM 0315	SEE C.O.	DK	2/28/66	KW	
C	C	C								C	PM 1987	DWG NO. WAS 41280100	ZAK	10-11-67	KW	
D	D	C								D	PM 1987D	SEE C.O.				

NOTES

1. A HEXAGON IN THE ACCESS FIND NO. COLUMN INDICATES THAT THE CONDUCTOR IS ONE OF SEVERAL (ALL WITH THE SAME NUMBER IN THE HEXAGON) GOING INTO THE SAME TERMINAL. A NUMBER IN FRONT OF A HEXAGON IS THE TERMINAL FIND NO.

2. DETACHED LISTS:  
A. PL 46819700

3. FOR MECH ASSY SEE #46819700.

4. IN THESE COLUMNS (2), UNLESS OTHERWISE SPECIFIED:  
A. T INDICATES TOP  
B. B INDICATES BOTTOM  
C. L INDICATES LEFT  
D. R INDICATES RIGHT

COPIES TO	BY	LM	DATE	9-22-65	CHKD.	LM	DATE	10-26-65	ENGR	JCP	DATE	10-27-65
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FORM AA 1672

CONTROL DATA CORPORATION MINNEAPOLIS, MINNESOTA				TITLE WIRE LISTING					WL		DOCUMENT NO. 46819600		REV. D
SHEET 2 OF													
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN <sup>4</sup>	ACCESS. FIND NO. <sup>4</sup>	DESTINATION <sup>4</sup>	ACCESS. FIND NO. <sup>4</sup>	REMARKS				
1	1	16	4		TB07	1	7	CO1	-	6	1		
2	↑	↑	↑		CO1	+	6	3	CO2	+	6	2	
3					CO2	+	2	CO1	+	3			
4					CO1	+	3	T01	6	4	5		
5					T01	6	5	CO1	+	6	4		
6					CO1	+	4	CO3	-	6	7		
7					CO3	-	7	T01	6	4	6		
8					T01	6	6	CO3	-	7			
9					CO3	-	6	8	CO4	-	6	9	
10					CO4	-	9	CO3	-	8			
11					TB07	5	7	CRO1	TR	5			
12					CRO1	TL	5	CO1	-	1			
13					CO1	-	1	CRO2	TL	5			
14					CRO2	TR	5	TB07	5	10			
15					CO3	+		TB06	2	7			
16					CRO1	B	5	T01	8	3			
17					T01	9	3	CRO2	B	5			
18	↓	↓	↓		RO1	B		CO2	+	2			
19	1	16	4		CO2	-	3	RO1	T				

CONTROL DATA CORPORATION MINNEAPOLIS, MINNESOTA				TITLE WIRE LISTING					WL		DOCUMENT NO. 46819600		REV. C
SHEET 3 OF													
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN <sup>4</sup>	ACCESS. FIND NO. <sup>4</sup>	DESTINATION <sup>4</sup>	ACCESS. FIND NO. <sup>4</sup>	REMARKS				
20	1	16	4		CO5	R	7	CO6	L	7			
21	↑	↑	↑		CO6	R	7	CO5	L	7			
22					RO2	T		CO4	+	3			
23	↓	↓	↓		CO4	-	9	RO2	B				
24	1	16	4		CO3	-	8	CO1	+	4			

FORM AA 1669

<b>CONTROL DATA CORPORATION</b> MINNEAPOLIS, MINNESOTA	TITLE D.C. POWER PANEL (MISC. WIRING)	WL	DOCUMENT NO. 46819400	REV. B
	PRODUCT DISK PAK	SHEET 1 OF 2		

REVISION STATUS OF SHEETS				REVISIONS					
1	2	REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.	
A	A	A	/	RELEASED		2/8/66		JMB	
B	B	B	PM 1987	DWG NO. WAS 41289700	ZAK	10-12-67	KW		

NOTES:

1. DETACHED LISTS:  
 A. PL 46819500  
 B. FOR MECH ASSY SEE 46819500

△ TOLERANCES ON WIRE LENGTHS TO BE  $\pm 1/32$ "

△ USING EXISTING LEADS FROM L01 & L02

COPIES TO	BY	K.T.	DATE	1-7-66	CHKD.	LRO	DATE	2-8-66	ENGR	JCP	DATE	2-8-66
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<b>CONTROL DATA CORPORATION</b> MINNEAPOLIS, MINNESOTA	TITLE WIRE LISTING	WL	DOCUMENT NO. 46819400	REV. B
	SHEET 2 OF 2			

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
1	34	16	4	3	TO1	3		CO6	L		
2	34	16	4	3	TO1	4		CO6	R		
3				7	L01	T	△ 2	TB07	2	35	
4				7	L01	B	△ 2	TB07	3	35	
5				7	L02	T	△ 2	TB06	3	35	
6				7	L02	B	△ 2	TB06	4	35	



TITLE  
HARNESS ASSEMBLY, A.C. (POWER SUPPLY)

PRODUCT  
DISK STORAGE DRIVE

WL DOCUMENT NO. 45465300 REV. B

SHEET 1 OF 3

REVISION STATUS OF SHEETS			REVISIONS						
1	2	3	REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.
A	A	A	A		RELEASED		12/9/66		MB
B	B	B	B	PM 2242	DWG. NO. WAS 45590200	JPH	2-5-68	EW	2-23

NOTES: 1 A HEXAGON IN THE ACCESS FIND NO. COLUMN INDICATES THAT THE CONDUCTOR IS ONE OF SEVERAL (ALL WITH THE SAME NUMBER IN THE HEXAGON) GOING INTO THE SAME TERMINAL. THE NUMBER IN FRONT OF A HEXAGON IS THE TERMINAL FIND NO.

2. DETACHED LISTS:  
A. PL 45465200

COPIES TO: \_\_\_\_\_ BY: C.M. DATE: 11/21/69 CHKD.: LRO DATE: 12-2-67 ENGR: O. Dodd DATE: 12-2-67



TITLE  
WIRE LISTING

WL DOCUMENT NO. 45465300 REV. B

SHEET 2 OF 2

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
1	1	16	4		M01	L 8 <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">1</span>	K03 C2	10	
2	↑	↑	↑		K03	A2 15 <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">7</span>	TB05 2	9	
3					TB05	1 9	CB01A B	7 <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">2</span>	
4					CB01A	B <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">2</span>	J05 1	11	
5					J05	3 11	CB01C B	7 <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">3</span>	
6					CB01C	B <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">3</span>	FLO2 L	6 <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">4</span>	
7					FLO1	L 5	CB01B B	6 <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">5</span>	
8					CB01B	B <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">5</span>	K03 A3	10	
9					K03	C3 10	J04 3	11	
10					J04	4 11	TB01 3	10	
11					TB01	3 10	J04 6	11	
12					J04	5 11	M01 L	<span style="border: 1px solid black; border-radius: 50%; padding: 1px;">1</span>	
13					K03	A2 <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">7</span>	CB01C B	<span style="border: 1px solid black; border-radius: 50%; padding: 1px;">3</span>	
14					CB01A	B <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">2</span>	K03 A4	15 <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">8</span>	
15					K03	C4 10	M01 R	8 <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">6</span>	
16					M01	R <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">6</span>	J04 1	11	
17					J05	2 11	TB01 3	10	
18	↓	↓	↓		FLO2	L <span style="border: 1px solid black; border-radius: 50%; padding: 1px;">4</span>	K06 13	14	
19	1	16	4		K06	12 14	K03 A4	<span style="border: 1px solid black; border-radius: 50%; padding: 1px;">8</span>	

FORM AA 1669





TITLE

## WIRE LISTING

WL

DOCUMENT NO.

45465300

REV.

B

MINNEAPOLIS, MINNESOTA

SHEET 3 OF

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
20	1	16	4		T01	1	5	FLO1	R	5	
21	1	16	4		FLO2	R	5	T01	2	5	



TITLE

HARNES ASSEMBLY, DC (POWER SUPPLY)

WL

DOCUMENT NO.

46079700

REV.

H

MINNEAPOLIS, MINNESOTA

SHEET 7 OF 13

PRODUCT

DISK STORAGE DRIVE

REVISION STATUS OF SHEETS					REVISIONS				
REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.			
A		RELEASED							
B	PM4539	SEE CO	CC	2-4-69	BOH	3-3-69			
C	PM4787	SEE CO	DB	3-4-69	BOH	3-20-69			
D	PM5020	W/L CHG. ONLY	BL	4-8-69	97	4-9-69			
E	PM4823	SEE CO	GV	4-28-69	BOH	5-8			
F	PM5038	SEE CO	HK	5-23-69	97	5-26-69			
G	PE12078	DWG NO WAS 45447500 S/N 13,000	DC	8-1-69	97	8-7-69			
H	PE12515	EXTENSIVE CHANGES - FU 18 TO 27	EW	2/2/70	97	II			

NOTES:

1. A HEXAGON IN THE ACCESS FIND NO. COLUMN INDICATES THAT THE CONDUCTOR IS ONE OF SEVERAL (ALL WITH THE SAME NUMBER IN THE HEXAGON) GOING INTO THE SAME TERMINAL. A NUMBER IN FRONT OF A HEXAGON IS THE TERMINAL FIND NO.

2. DETACHED LISTS:  
A. P/L 46075700

COPIES TO

BY	DATE	CHKD.	DATE	ENGR	DATE
	9-15-68	RRP	10-1-68	97	11/1/68

RM AA 1672

PERIPHERAL DATA		TITLE						DOCUMENT NO.		REV.	
PERIPHERAL EQUIP. DIV.		WIRE LISTING						WL 46079700		H	
PERIPHERAL EQUIP. DIV.								SHEET 2 OF			
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS
1	15	16	4		C11	+	4	C10	+	10 (1)	
2	15	16	4		C10	+	(1)	C09	+	10 (2)	
3	15	16	4		C09	+	(2)	TB02	3	13	
4	15	16	4		TB02	2	13	R17	R	2	
5	15	16	4		R17	L	2	TB02	14	13	
6	15	16	4		TB02	14	13	Q02	C	5	
7	15	16	4		Q02	B	5	TB02	2	13	
8	15	16	4		TB02	2	13	Q07	B	5	
9	15	16	4		Q07	C	5	R18	L	2	
10	15	16	4		R18	R	2	CB04	T	(3)	
11	15	16	4		TP04	-		K05B	2	17-27	
12	15	16	4		K05A	7	17-27	CB05	T	4	
13	15	16	4		TB02	1	3	Q01	B	5	
14	15	16	4		Q01	C	5	R13	T	2	
15	15	16	4		R13	B	2	CB04	T	11 (3)	
16	15	16	4		CB04	T	(3)	Z01	Stud	4	
17	15	16	4		Z01	Term		TB02	1	13	
18	15	16	4		TB02	5	13	J03	F	6	
19	15	16	4		J03	H	6	TB02	5	13	

FORM 385-2 REVISED 4/2/64

PERIPHERAL DATA		TITLE						DOCUMENT NO.		REV.	
PERIPHERAL EQUIP. DIV.		WIRE LISTING						WL 46079700		H	
PERIPHERAL EQUIP. DIV.								SHEET 3 OF			
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS
20	15	16	4		TB02	5	13	J07	U	6	
21	15	16	4		J03	D	6	CB02	B	11 (4)	
22	15	16	4		CB02	B	(4)	J03	E	6	
23	15	16	4		J03	B	6	CB03	B	11 (5)	
24	15	16	4		CB03	B	(5)	J03	C	6	
25	15	16	4		J03	J	6	K04	4	17-27	
26	15	16	4		TB02	14	13	Q05	B	5	
27	15	16	4		Q05	C	5	CB07A	B	4	
28	15	16	4		CB07A	T	4	R23	R	2	
29	15	16	4		R20	R	2	CB07B	T	4	
30	15	16	4		CB07B	B	4	Q03	C	5	
31	15	16	4		Q03	B	5	TB02	14	13	
32	15	16	4		TB02	15	13	R23	L	2	
33	15	16	4		R20	L	2	TB02	16	13	
34	15	16	4		TB02	16	13	Q04	B	5	
35	15	16	4		Q06	B	5	TB02	15	13	
36	15	16	4		J03	K	6	CB05	B	10 (6)	
37	15	16	4		K05A	1	17-27	C07	+	10 (7)	
38	15	16	4		C07	+	10 (8)	K06	7	17-27	

FORM 385-2 REVISED 4/2/64

CONTROL DATA		TITLE										DOCUMENT NO.	REV.
PERIPHERAL EQUIP. DIV.		WIRE LISTING										WL 46079700	H
												SHEET 4 OF	
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS		
39	15	16	4		CB02	T	10 (9)	C02	-	4			
40	15	16	4		T01	6	10 (10)	C09	-	10 (11)			
41	15	16	4		C09	-	(11)	C10	-	10 (12)			
42	15	16	4		C10	-	(12)	C09	-	10 (13)			
43	15	16	4		C09	-	(13)	T01	6	(10)			
44	15	16	4		C04	-	4	TB02	10	13			
45	15	16	4		TB02	10	13	T02	4	10 (14)			
46	15	16	4		T02	4	(14)	C07	-	4			
47	15	16	4		T02	1	4	T01	8	4			
48	15	16	4		T01	9	4	T02	2	4			
49	15	16	4		T02	5	4	CR03	B	5			
50	15	16	4		CR03	R	5	K06	1	17-27			
51	15	16	4		CB02	T	(9)	K02	A4	13			
52	15	16	4		K02	C4	13	TB07	3	13			
53	15	16	4		TB06	4	13	K02	C3	13			
54	15	16	4		K02	A3	13	CB03	T	10 (15)			
55	15	16	4		CB03	T	(15)	C04	+	4	Cut		
56	15	16	4		K05B	8	17-27	TB02	2	13	Start		
57	15	16	4		CR03	T	5	T02	3	4			

FORM 335-2 REVISED 4/2/64

CONTROL DATA		TITLE										DOCUMENT NO.	REV.
PERIPHERAL EQUIP. DIV.		WIRE LISTING										WL 46079700	H
												SHEET 5 OF	
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS		
58	16	20	4		C11	-	4	TB03	2	9-27			
59	16	20	4		TB03	2	9-27	TB03	53	9-27			
60													
61													
62	16	20	4		TB03	53	9-27	TB03	55	9-27			
63	16	20	4		TB03	51	9-27	TB03	49	9-27			
64	16	20	4		TB03	49	9-27	TB03	47	9-27			
65	16	20	4		TB03	47	9-27	TB03	45	9-27			
66	16	20	4		TB03	45	9-27	TB03	43	9-27			
67	16	20	4		TB03	43	9-27	TB03	41	9-27			
68	16	20	4		TB03	41	9-27	TB03	39	9-27			
69	16	20	4		TB03	39	9-27	TB03	6	9-27			
70	16	20	4		TB03	7	9-27	CB05	B	(6)			
71	16	20	4		S03	D		TB02	4	3			
72													
73	16	20	4		K04	3	17-27	TB02	8	3			
74	16	20	4		TB02	1	13	TB03	25	9-27			
75	16	20	4		TB03	15	9-27	S02	D				
76	16	20	4		S02	D		K02	L2	3			

FORM 335-2 REVISED 4/2/64

GENERAL DATA		TITLE		DOCUMENT NO.		REV.			
PERIPHERAL EQUIP. DIV.				WIRE LISTING				WL 46079700	H
PERIPHERAL EQUIP. DIV.								SHEET 6 OF 11	
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
77	16	20	4		K04	5	J06	1	8
78	16	20	4		TB02	13	K05B	13	17-27
79	16	20	4		K05B	12	K03	C1	(20)
80	16	20	4		TB02	1	F02	A	
81	16	20	4		TB03	60	J06	6	8
82	16	20	4		J06	5	TB03	59	9-27
83	16	20	4		TB03	59	TB02	9	3
84	16	20	4		TB02	6	J07	L	7
85									
85									
87	16	20	4		TB03	5	C07	+	(7)
88	16	20	4		C07	+	TB03	22	9-27
89	16	20	4		TB03	21	R41	L	20
90	16	20	4		R41	L	TB02	12	3
91	16	20	4		TB02	12	F03	A	-
92	16	20	4		K01	3	TB20	19	9-27
93	16	20	4		TB20	19	K04	13	17-27
94	16	20	4		J03	HH	TB03	19	9-27
95	16	20	4		TB03	19	K03	L1	3

FORM 305-2 REVISED 4/2/64

GENERAL DATA		TITLE		DOCUMENT NO.		REV.			
PERIPHERAL EQUIP. DIV.				WIRE LISTING				WL 46079700	H
PERIPHERAL EQUIP. DIV.								SHEET 7 OF 11	
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
96	16	20	4		K03	12	TB03	20	9-27
97	16	20	4		TB02	9	K01	1	17-27
98	16	20	4		K01	7	TB03	16	9-27
99	16	20	4		TB03	16	K02	L1	3
100	16	20	4		J03	LL	K04	9	17-27
101	16	20	4		TB20	18	K04	12	17,27
102	16	20	4		K08	9	K03	3B	3
103	16	20	4		TB03	20	TB20	18	17-27
104	16	20	4		K02	L1	K05B	9	17-27
105	16	20	4		TB03	13	J06	4	8
105	16	20	4		J06	3	TB03	14	9-27
107	16	20	4		TB03	14	K05B	6	17-27
108	16	20	4		K05B	3	TB02	8	3
109									
110	16	20	4		TB02	16	J07	B	7
111	16	20	4		J07	A	TB02	15	3
112	16	20	4		J03	X	TB03	26	9-27
113	16	20	4		TB03	29	J03	M	7
114	16	20	4		J03	N	TB03	31	9-27

FORM 305-2 REVISED 4/2/64

CONTROL DATA		TITLE										DOCUMENT NO.	REV.
PERIPHERAL EQUIP. DIV.		WIRE LISTING										WL 46079700	H
												SHEET 8 OF 11	
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS		
115	16	20	4		TB03	32	9-27	TB03	52	9-27			
116	16	20	4		TB03	52	9-27	Q07	T	5			
117	16	20	4		Q06	C	5	TB03	54	9-27			
118	16	20	4		TB03	54	9-27	Q04	C	5			
119	16	20	4		Q04	T	5	TB03	46	9-27			
120	16	20	4		TB03	46	9-27	TB03	33	9-27			
121	16	20	4		TB03	33	9-27	J03	R	7			
122	16	20	4		J03	P	7	K06	Z	17-27			
123	16	20	4		TB03	34	9-27	TB03	48	9-27			
124	16	20	4		TB03	48	9-27	Q05	T	5			
125	16	20	4		Q06	T	5	TB03	50	9-27			
126	16	20	4		TB03	50	9-27	TB03	37	9-27			
127	16	20	4		TB03	37	9-27	J03	S	7			
128	16	20	4		J03	W	7	K05A	5	17-27			
129	16	20	4		K05A	9	17-27	TB02	11	3			
130	16	20	4		TB02	11	3	J03	Z	7			
131	16	20	4		J03	T	7	TB03	17	9-27			
132	16	20	4		TB03	17	9-27	K01	12	17-27			
133	16	20	4		K01	13	17-27	K02	A1	13 (13)			

FORM 385-2 REVISED 4/2/64

CONTROL DATA		TITLE										DOCUMENT NO.	REV.
PERIPHERAL EQUIP. DIV.		WIRE LISTING										WL 46079700	H
												SHEET 9 OF 11	
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS		
134	16	20	4		K02	A1	(18)	TB03	18	9-27			
135	16	20	4		TB03	18	9-27	TB03	62	9-27			
136	16	20	4		TB03	63	9-27	F03	B	-			
137	16	20	4		TB02	11	3	J07	C	7			
138	16	20	4		J07	D	7	K05A	3	17-27			
139	16	20	4		K05A	2	17-27	TB02	8	3			
140	16	20	4		TB02	7	3	K04	1	17-27			
141	16	20	4		K04	2	17-27	TB02	3	3			
142	16	20	4		TP04	-		TB02	3	3			
143	16	20	4		F01	B	-	K03	C1	13 (20)			
144	16	20	4		K02	A2	3	J03	AA	7			
145	16	20	4		J03	V	7	TB03	61	9-27			
146	16	20	4		TB03	64	9-27	K02	C1	3			
147	16	20	4		TB03	26	9-27	K05A	13	17-27			
148	16	20	4		K05A	12	17-27	TB02	2	3			
149	16	20	4		TB02	10	3	TP02	-				
150													
151													
152	16	20	4		J07	P	7	K05A	8	17-27			

FORM 385-2 REVISED 4/2/64

CONDUCTOR DATA		TITLE					DOCUMENT NO.		REV.		
		WIRE LISTING					WL 46079700		H		
PERIPHERAL EQUIP. DIV.							SHEET 10 OF				
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
153											
154	16	20	4		K01	8	17-27	J07	E	7	
155	16	20	4		J07	F	7	F04	B	-	
156	16	20	4		TB03	1	9-27	TB02	3	3	
157	16	20	4		TB02	5	3	J07	T	7	
158	16	20	4		J07	S	7	CB04	B	4	
159	16	20	4		S02	B		S03	B		
160	16	20	4		DS02	B	20	TB02	6	3	
161	16	20	4		TB02	6	3	DS03	B	20	
162	16	20	4		K06	9	17-27	J07	K	7	
163											
164	16	20	4		J07	J	7	CB02	B	(4)	
165	16	20	4		DS01	B	20	TB02	7	3	
166	16	20	4		TB02	7	3	DS07	B	20	
167	16	20	4		DS07	T	20	TB03	8	9-27	
168	16	20	4		TB03	30	9-27	TB03	40	9-27	
169	16	20	4		TB03	40	9-27	Q01	T	5	
170	16	20	4		Q02	T	5	TB03	42	9-27	
171	16	20	4		TB03	42	9-27	TB03	36	9-27	

FORM 305-2 REVISED 4/2/64

CONDUCTOR DATA		TITLE					DOCUMENT NO.		REV.		
		WIRE LISTING					WL 46079700		H		
PERIPHERAL EQUIP. DIV.							SHEET 11 OF				
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
172	16	20	4		TB03	38	9-27	TB03	44	9-27	
173	16	20	4		TB03	44	9-27	Q03	T	5	Cut
174	16	20	4		TB03	64	9-27	J03	U	7	Start
175	16	20	4		J07	X	7	K01	4	17-27	
176											
177	16	20	4		K04	8	17-27	TB02	1	3	
178	16	20	4		J07	H	7	CB03	B	(5)	
179	16	20	4		K06	3	17-27	K01	9	17-27	
180	16	20	4		TB07	5	3	TB03	3	9-27	
181	16	20	4		TB03	3	9-27	R41	R	2	
182	15	16	4		C09	+	11	TB07	5	13	
184	16	20	4		F01	A	-	TB02	1	3	
185	16	20	4		F02	B	-	TB03	60	9-27	
186	16	20	4		K01	2	12-27	F03	B	-	
187	16	20	4		F04	A	-	TB06	3	3	
188					TB02	13	3	TB03	28	9-27	
189					TB03	28	9-27	K02	C2	3	
190					K08	13	17-27	TB03	27	9-27	
191	16	20	4		TB03	27	9-27	K03	18	19	

FORM 305-2 REVISED 4/2/64

CONTROL DATA		TITLE								DOCUMENT NO.		REV.
		WIRE LISTING								WL	46079700	H
MINNEAPOLIS, MINNESOTA										SHEET 12 OF		
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS	
192	16	20	4		TB02	13	19	K08	12	17-27		
193												
194												
195												
196	16	20	4		K08	2	17-27	F06	A			
197	16	20	4		K05A	4	17-27	F06	B			
198	16	20	4		J03	FF	7	TB20	17	19		
199	16	20	4		K03	4B	3	K08	8	17-27		
200												
201	15	16	4		T01	8	4	F05	A	-		
202	16	20	4		K08	3	17,27	TB02	8	19		
203	16	20	4		K03	L2	(19)	K08	6	17,27		
204	16	20	4		J03	KK	7	F05	B	-		
205	16	20	4		K04	6	17,27	J03	MM	7		
206	16	20	4		TB03	35	9-27	K06	8	17,27		
207	16	20	4		K03	1A	3	J07	R	7		
208	15	16	4		T01	08	4	TB06	5	13		
209	15	16	4		T01	09	4	TB06	1	13		
210	16	20	4		J06	02	8	TB03	13	9-27		

FORM AA1659

CONTROL DATA		TITLE								DOCUMENT NO.		REV.
		WIRE LISTING								WL	46079700	H
MINNEAPOLIS, MINNESOTA										SHEET 13 OF 13		
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS	
211	15	16	4		T01	5	4	J35	2	8		
212					T01	7	4	J35	1	8		
213					T01	6	4	TB15	2	13		
214					J35	3	8	TB15	1	13		
215					J35	4	8	TB15	2	13		
216					TB15	2	13	J07	M	8		
217					TB15	1	13	TP06	-			
218	15	16	4		TB15	1	13	J07	N	8		

FORM AA1659

<b>CONTROL DATA</b> MINNEAPOLIS, MINNESOTA	TITLE W3 CABLE ASSEMBLY	DOCUMENT NO. WL 45675100	REV. T
	PRODUCT DISK STORAGE DRIVE	SHEET 1 OF 8	

REVISION STATUS OF SHEETS		REVISIONS						
REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.		
A		RELEASED						
B	PM1223	SEE CO	TGT	3-20-67	RTR			
C	PM1856	SEE CO	S.C.	8/3/67	KJ			
D	PM2303	SEE CO	DHS	8-25-67				
E	PM2304	SEE CO	EL	12-21-67				
F	PM2337	SEE CO	DGT	1-18-68				
G	PM2242	WAS 45458600	JPH	2-2-68	RH	2-22		
H	PM2242A	SEE CO	JF	3-25-68	RTR			
J	PM2242B	SEE CO	RJ	4-30-68	TLT	5-3-68		
K	PM3190	SEE CO	EW	7-1-68	KJ	7-2-68		
L	PM3173	45490400 WAS 45463800	DGT	7-18-68	TLT	8-20-68		
M	PM3645	DWG. NO. WAS 45490400	CC	10-2-68	KJ	10-12-68		
N	PM4158	DWG. NO WAS 45448900	EW	12-11-68	RCH	12-18-68		
P	PM4772	SEE CO	GV	2-27-69	RCH	3-3-69		
R	PM4823	SEE CO	GV	4-15-69	RCH	5-6		
S	PM 5037	WIRE LISTING CHANGE SHEET 4	JEF	5-15-69	97	5-15-69		
T	PE12654	SEE CO	DL	1-7-70				

- NOTES:
- 1. A HEXAGON IN THE ACCESS FIND NO. COLUMN INDICATES THAT THE CONDUCTOR IS ONE OF SEVERAL (ALL WITH THE SAME NUMBER IN THE HEXAGON) GOING INTO THE SAME TERMINAL. THE NUMBER IN FRONT OF A HEXAGON IS THE TERMINAL FIND NO.
  - 2. FOR MECH. ASSY PL SEE 45675200. NO ASSEMBLY DRAWING AVAILABLE.
  - 3. INDICATES END OF SHIELD IS FLOATING.
  - 4. PIN AND BUGGIE DESIGNATIONS OMITTED ON DRAWING BECAUSE OF TABULATION OF NUMEROUS MODELS. CONDUCTOR LENGTHS TO BE SAME. ONLY PIN DESTINATIONS WILL BE DIFFERENT. SEE W/L 45463800.
  - 5. USE HEAT SHRINK TO COVER TERMINAL.

<b>CONTROL DATA</b> MINNEAPOLIS, MINNESOTA	TITLE WIRE LISTING	DOCUMENT NO. WL 45675100	REV. S
	SHEET 2 OF 8		

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS FIND NO	DESTINATION	ACCESS. FIND NO.	REMARKS
1									
2									
3									
4									
5	34	20	4		X07	09 17,45	P104 72	15	
6									
7									
8	34	20	4		P104	77 15	X07 12	17,45	
9	34	20	4		S306	C 23	S304 NO	23	
10	34	20	4		S304	C 23	S302 NC	23	
11	34	20	4		S302	C 23	J310 9	21	
12	34	20	4		J310	10 21	P07 C	12	
13	34	20	4		P07	D 12	J310 11	21	
14	34	20	4		J310	4 21	P104 36	15	
15	34	20	4		P104	35 15	J310 2	21	
16	34	20	4		J310	8 21	P07 E	12	
17	34	20	4		P07	P 12	P230 X	15	
18	34	20	4		P230	K 15	P07 R	12	
19	34	16	4		P07	N 11	J36 1	61	

FORM AA1669



CONTROL DATA		TITLE								DOCUMENT NO.		REV.
		WIRE LISTING								WL 45675100		S
MINNEAPOLIS, MINNESOTA										SHEET 3 OF 7		
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS	
20	34	16	4		J36	2	21	P07	M	17		
21												
22												
23												
24												
25	34	20	4		P07	H	12	J310	1	21		
26	34	20	4		J310	5	21	P07	J	12		
27	34	20	4		P07	F	12	J310	6	21		
28	34	20	4		J310	7	21	P07	L	12		
29	34	20	4		P07	X	12	P230	a	15		
30	34	20	4		P230	Y	15	P104	67	15		
31	34	20	4		P104	74	15	P230	b	15		
32	34	20	4		S306	NO	23	P07	K	12		
33	34	20	4		P03	X	12	P104	16	15		
34	34	20	4		P104	30	15	P03	S	12		
35	34	20	4		P03	R	12	P104	31	15		
36	34	20	4		P104	34	15	P03	P	12		
37	34	20	4		P03	N	12	P104	32	15		
38	34	20	4		P104	33	15	P03	M	12		

FORM AA 1669

CONTROL DATA		TITLE								DOCUMENT NO.		REV.
		WIRE LISTING								WL 45675100		S
MINNEAPOLIS, MINNESOTA										SHEET 4 OF 7		
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS	
39	34	20	4		P03	T	12	P104	62	15		
40	34	20	4		P104	63	15	P03	U	12		
41	34	20	4		P03	V	12	P104	64	15		
42	34	20	4		P104	65	15	P03	DD	12		
43	34	20	4		P03	EE	12	P104	66	15		
44	34	20	4		P104	1	15	J310	3	21		
45	34	20	4		J310	12	21	P07	V	12		
46	34	20	4		P03	Z	12	P104	58	15		
47	34	20	4		P104	57	15	P03	Y	12		
48	34	20	4		P03	BR	12	P104	46	15		
49	42	20	5		X02	12	17,45	P104	60	15		
51	33	24	4		P104	15	14	X14	01	16,44		
52	33	24	4		X18	01	16,44	P104	2	14		
53	33	24	4		P104	3	14	X18	07	16,44		
54	33	24	4		X19	01	16,44	P104	4	14		
55	33	24	4		P104	5	14	X19	07	16,44		
56	33	24	4		X20	01	16,44	P104	7	14		
57	33	24	4		P104	8	14	X20	07	16,44		

FORM AA 1669

CONDUCTOR IDENT.		FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS
58	33	24	4			X21	01	16,44	P104	10	14	
59	33	24	4			P104	12	14	X21	07	16,44	
60	33	24	4			X22	01	16,44	P104	13	14	
61	33	24	4			P104	14	14	X22	07	16,44	
62												
63	33	24	4			P104	45	14,1	P03	AA	11	
64	33	24	4			P03	CC	11	P104	47	14	
65	33	24	4			P104	44	14	P03	W	11	
66	33	24	4			P03	J	11	P104	43	14	
67	36	16	0			X17	14	18,46	P104	48	29	
68	36	16	0			P104	49	29	P03	F	13	
69	36	16	0			P03	H	13	P104	50	29	
70	37	16	2			X17	15	18,46	P104	54	29	
71	37	16	2			P104	55	29	P03	B	13	
72	37	16	2			P03	C	13	P104	56	29	
73	38	16	6			X17	13	18,46	P104	51	29	
74	38	16	6			P104	52	29	P03	D	13	
75	38	16	6			P03	E	13	P104	53	29	
76	35	16	4			P03	K	13	X08	15	18,46	

FORM AA1669

CONDUCTOR IDENT.		FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS
77	27	24										
77A			0			P230	N	14	P104	27	14	
77B			4			P230	P	14	P104	28	14	
78	27	24										
78A			0			P104	25	14	P230	T	14	
78B			4			P104	26	14	P230	U	14	
79	27	24										
79A			0			P230	W	14	P104	21	14	
79B			4			P230	V	14	P104	20	14	
80	27	24										
80A			0			P104	70	14	P230	R	14	
80B			4			P104	71	14	P230	Z	14	
81	26	24										
81A			0			P104	24	14	TB302	C	24,56	
81B			4			P104	23	14	TB302	L	24,56	
81C			9			P104	22	14	TB302	R	24,56	

FORM AA1669

CONTROL DATA		TITLE WIRE LISTING						DOCUMENT NO. WL 45675100		REV. T	
MINNEAPOLIS, MINNESOTA										SHEET 7 OF	
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
82	47	20									
82A			5		P06	04	51	L300	01	50	
82B			0		L300	02	50	P06	03	51	
82C											
83	48	20									
83A			4		P06	05	51	L301	01	49	
83B			0		L301	02	49	P06	06	51	
83C											
84	32	20									
84A			SHIELD					P07	U	13	
84B			0		P230	L	15	P07	B	12	
84C			2		P230	M	15	P07	A	12	
85	32	20									
85A			SHIELD		P07	U	12				
85B			0		P07	T	12	P230	H	15	
85C			2		P07	S	12	P230	J	15	
86	34	20	4		P03	HH	12	S334	C	23,66	
87	34	20	4		P03	FF	12	S333	NO	23	
88	34	20	4		S333	C	23	S334	NO	23,66	

FORM AA 1689

CONTROL DATA		TITLE WIRE LISTING						DOCUMENT NO. WL 45675100		REV. S	
MINNEAPOLIS, MINNESOTA										SHEET 8 OF 8	
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
89	47	20									
89A			5		P06	01	51	P311	01	21	
89B			0		P311	02	21	P06	02	51	
90	34	20	4		P03	KK	12	P11	1	21	
91	34	20	4		P03	LL	12	P11	2	21	
92	34	20	4		P03	MM	12	P11	3	21	

FORM AA 1689

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## COMMENT SHEET

MANUAL TITLE CONTROL DATA 9461 DISK STORAGE DRIVE

Diagrams and Wire List Manual

PUBLICATION NO. 41248400 REVISION D

FROM: NAME: \_\_\_\_\_

BUSINESS  
ADDRESS: \_\_\_\_\_

### COMMENTS:

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CUT ALONG LINE

NO POSTAGE STAMP NECESSARY IF MAILED IN U. S. A.

STAPLE

STAPLE

FOLD

FOLD

FIRST CLASS  
 PERMIT NO. 8241  
 MINNEAPOLIS, MINN.

**BUSINESS REPLY MAIL**  
 NO POSTAGE STAMP NECESSARY IF MAILED IN U.S.A.

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**CONTROL DATA CORPORATION**  
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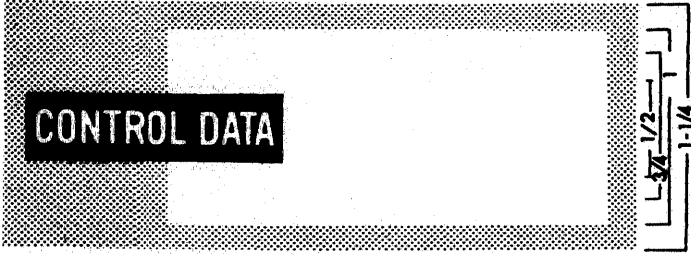


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