

**CONTROL DATA<sup>®</sup> 9465**  
**DISK STORAGE DRIVE**

P12 AND ABOVE

DIAGRAMS &  
CIRCUIT DESCRIPTION  
CARD PLACEMENT  
WIRE LISTS



PART 1

DIAGRAMS & CIRCUIT DESCRIPTION



FOREWARD

Customer Engineering material for the CONTROL DATA® 9465 Disk Storage Drive is contained in four separate manuals, and provides all information required to install, operate, and maintain a 9465.

Publication No. 41247200

General Description,  
Operation, Installation  
and Checkout, Maintenance

Publication No. 41248800

Theory of Operation,  
Diagrams, Wire Lists

Publication No. 40860200

Illustrated Parts List

Publication No. 40826700

Disk Storage Drive (OEM)  
1604 Logic Modules Manual



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Part 2. Card Placement

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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.

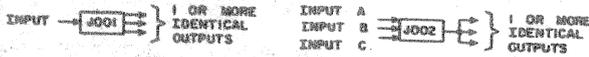


Figure 1. Inverter Symbols

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.

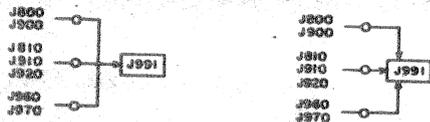


Figure 3. AND Circuit Conventions

Figure 4 illustrates a combination AND/OR input.

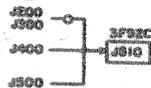


Figure 4. AND/OR Circuit Convention

## 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.

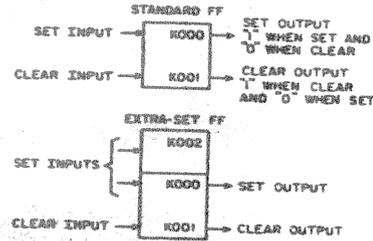


Figure 5. Flip-Flop Symbols

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.

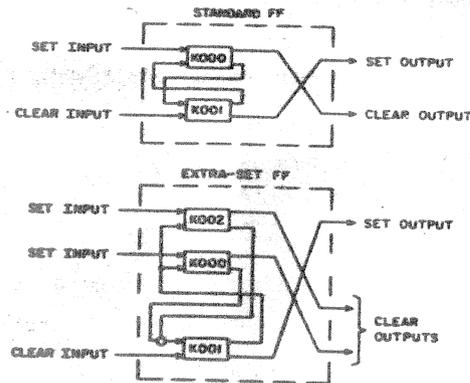


Figure 6. Internal Inverter Connections for a Flip-Flop

#### 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.

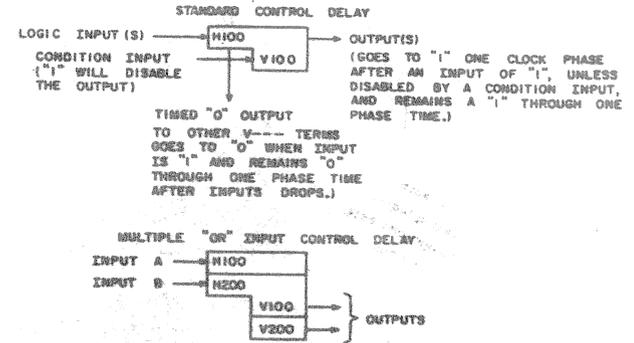


Figure 7. Control Delay Symbols

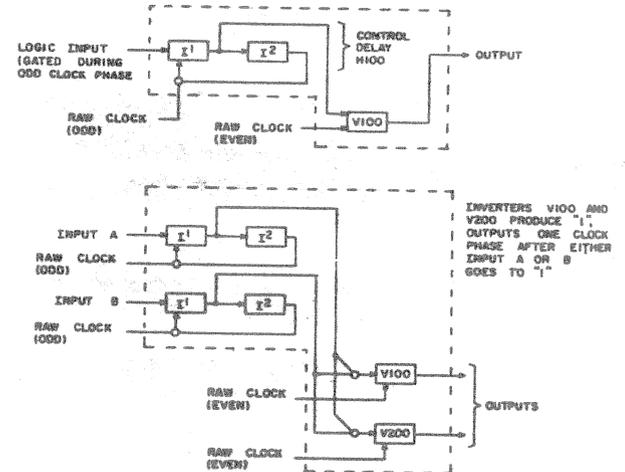


Figure 8. Electrical Connections for Control Delay



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.

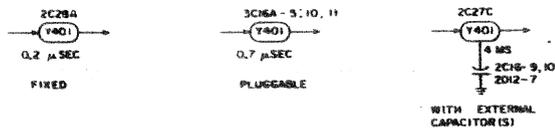


Figure 9. Active Capacitive Delays

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.

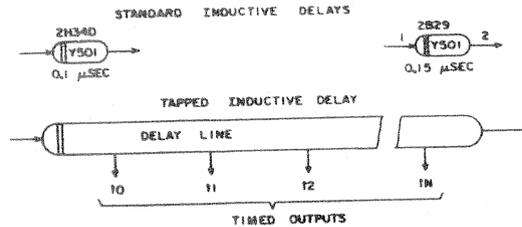


Figure 12. Inductive Delays

#### 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.

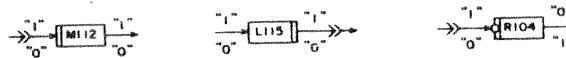


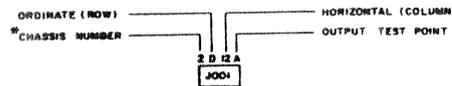
Figure 13. Typical Line Driver/Receiver Symbols

#### 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.

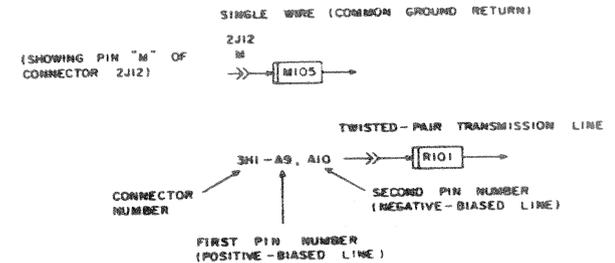


Figure 15. Cable Connections

#### 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 to the appropriate Printed Circuit or Logic Module Manual.

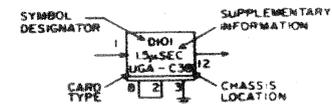


Figure 16. Symbol for Special Circuits

#### 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).

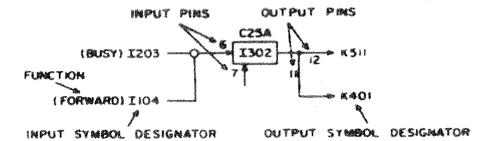
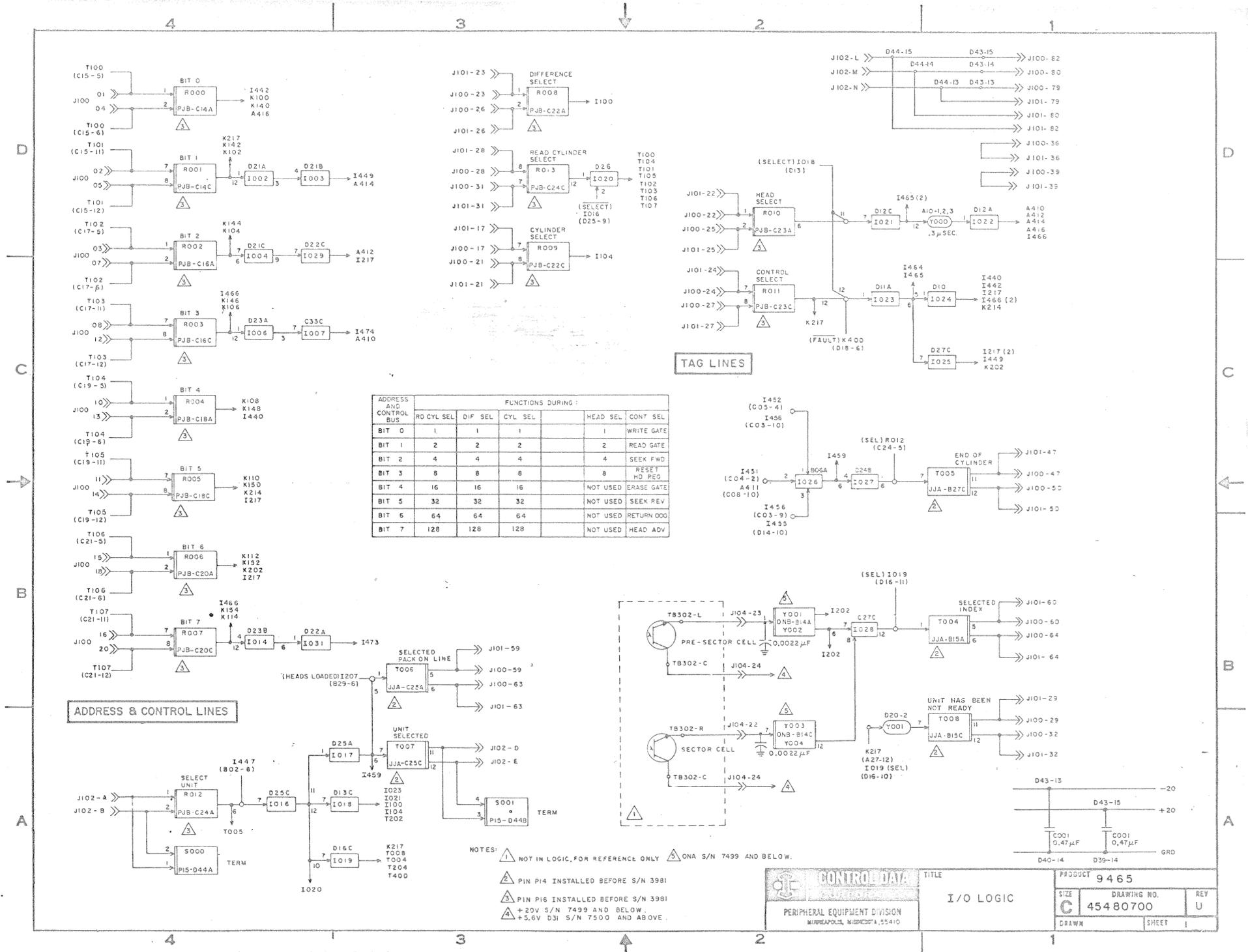


Figure 17. Input/Output Designations





NOTES:   
 1 NOT IN LOGIC, FOR REFERENCE ONLY   
 2 ONA S/N 7499 AND BELOW.   
 3 PIN P14 INSTALLED BEFORE S/N 3981   
 4 PIN P16 INSTALLED BEFORE S/N 3981   
 5 +20V S/N 7499 AND BELOW.   
 6 +5.6V D31 S/N 7500 AND ABOVE.

 PERIPHERAL EQUIPMENT DIVISION MINNEAPOLIS, MINNESOTA 55410	TITLE	PRODUCT
	I/O LOGIC	9465
SIZE	DRAWING NO.	REV
C	45480700	U
DRAWN	SHEET 1	

#### DECREMENT COUNTER

The decrement counter is set by the Difference Select 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 Control Select line.

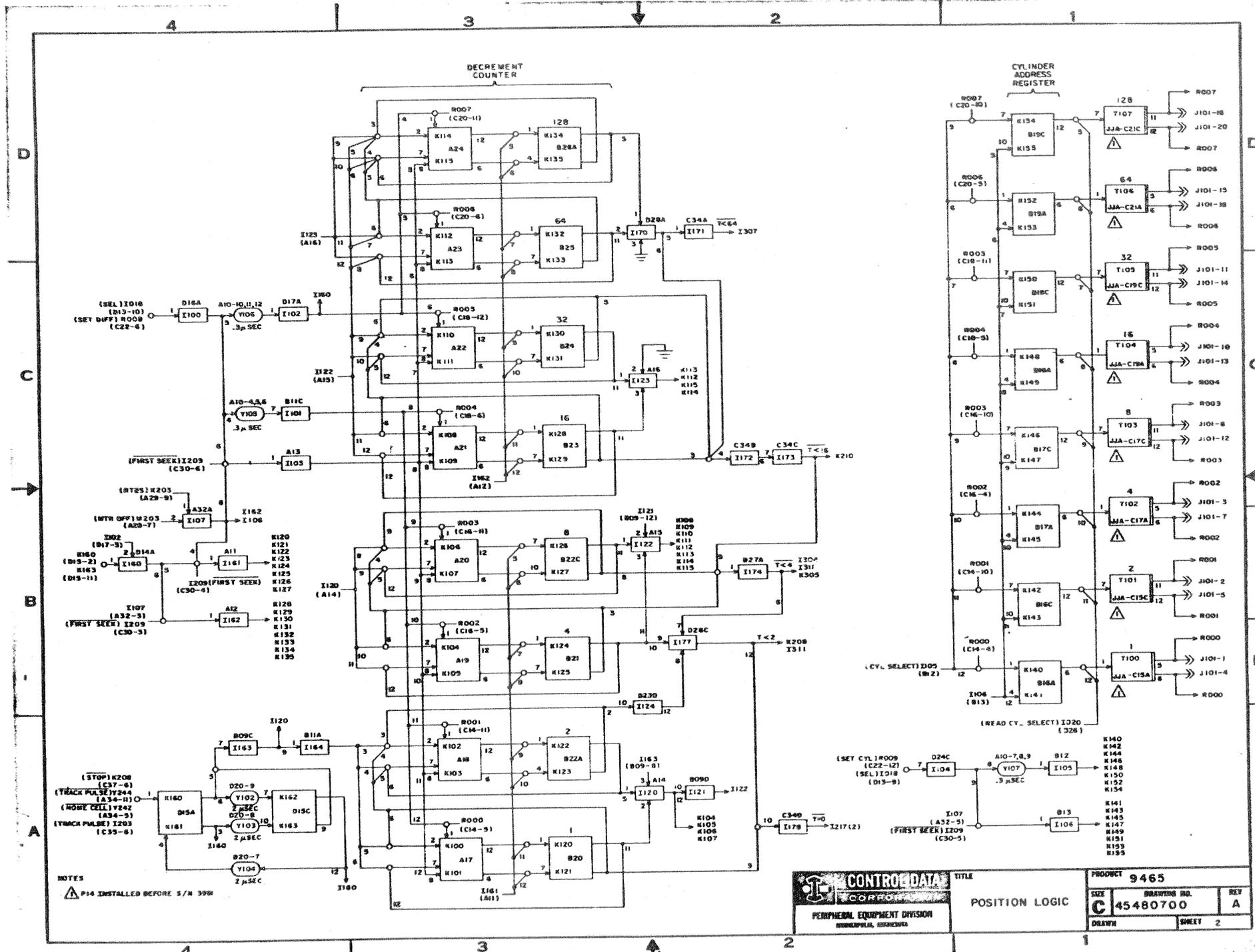
As the heads move toward the new cylinder, the trailing edge of each track pulse provides an enabling term to pulse generator K160/161 and K162/163. This pulse generator provides the two phase pulses necessary to decrement the counter. As the counter counts down towards zero, inverters I171, I173, I174, 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 Cylinder Select 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 A



NOTES  
 ⚠ P14 INSTALLED BEFORE S/N 399

TITLE  
 POSITION LOGIC

PRODUCT  
 9465

SIZE  
 C

DRAWING NO.  
 45480700

REV  
 A

DRAWN  
 SHEET 2



## 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 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 control select 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  $T < 2$ ). 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. This returns a selected seek error signal to the controller. 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.

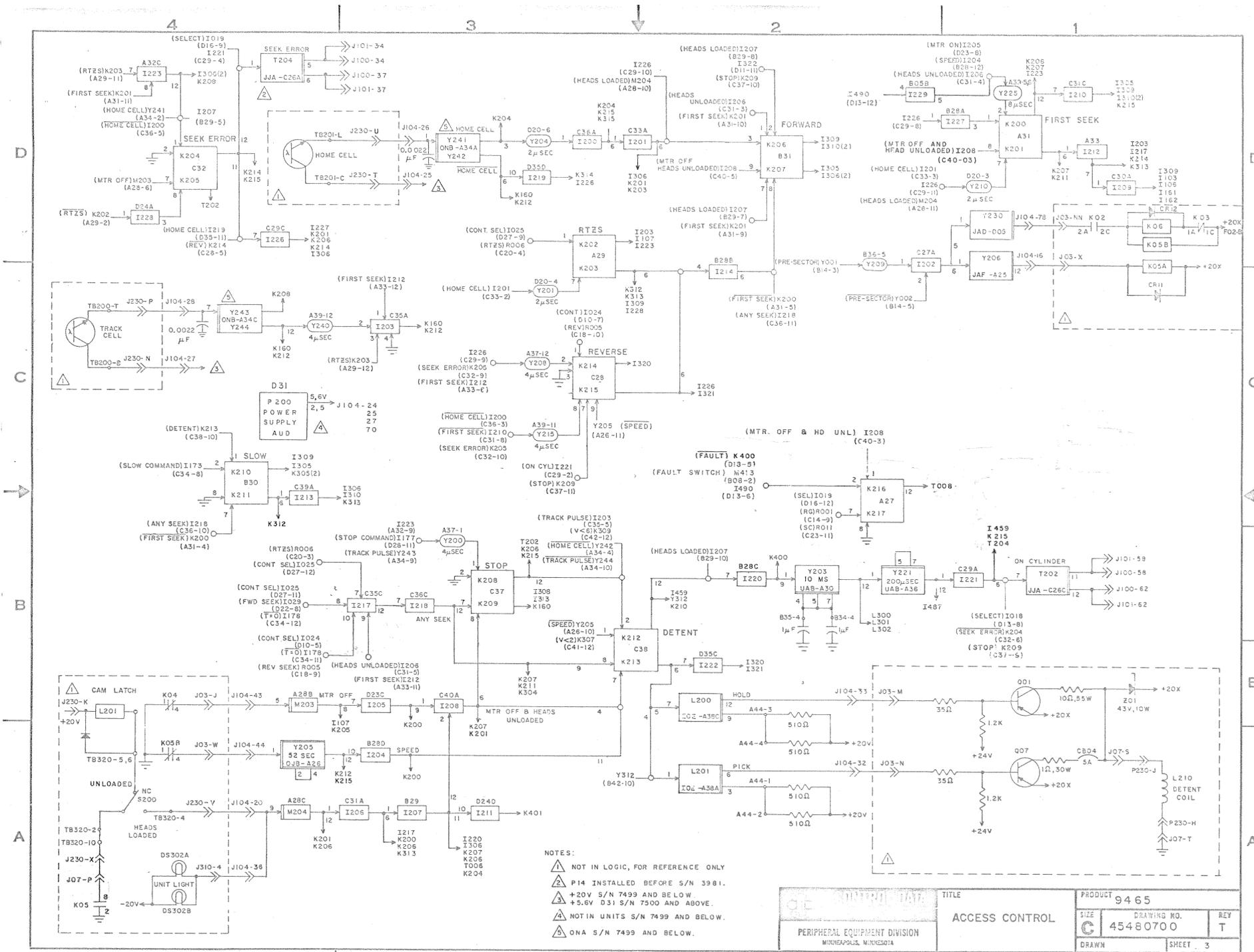
## ON CYLINDER

The on cylinder signal informs the controller that the heads have reached the addressed cylinder. This signal is returned to the controller via T202 10.2 ms after the Detent FF sets.

## 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 "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.





- NOTES:
- ⚠ NOT IN LOGIC, FOR REFERENCE ONLY
  - ⚡ +20V S/N 7499 AND BELOW
  - ⚡ +5.6V D31 S/N 7500 AND ABOVE.
  - ⚠ NOT IN UNITS S/N 7499 AND BELOW.
  - ⚡ ONA S/N 7499 AND BELOW.

PERIPHERAL EQUIPMENT DIVISION MINNEAPOLIS, MINNESOTA	TITLE	PRODUCT
	ACCESS CONTROL	9465
	SIZE	DRAWING NO.
	C	45480700
	DRAWN	SHEET
		3



## FAULT

The Fault FF K400/401 is set and returns a Data Un-safe signal to the controller if one of the following mal-functions occurs:

1. More than one head is selected.
2. Both write (or erase) and read gates on.
3. Erase driver on without write driver on.
4. Erase driver on with either both or no write driver.
5. Read, write, or erase gate on while not on cylinder.

## 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 Head Select 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 Y405 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.

## 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 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 AM- 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.)









## GENERAL

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

The main power supply is supplemented by an auxiliary power unit which provides  $\pm 5.7$  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  $380$ -volt input power is applied through the MAIN POWER chassis fans, and the spindle drive motor, M360, power supply fans, and the logic chassis fans, POWER circuit breaker to the logic chassis fans, The  $220$ -volt input power is controlled by the DC POWER INPUT and MAIN POWER circuit breakers and is applied to the 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 primary. 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  $\pm 20$  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  $\pm 40$  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  $\pm 40$  vdc which is applied to resistor R08.

Resistors R07 and R08 form a voltage divider. The  $\pm 20$  vdc developed at the junction of rectifier diodes CR01B and CR02B is applied to resistor R07. The junction of resistors R07 and R08 is driven to approximately  $\pm 24$  vdc. This voltage is applied to the H switch and detent circuits for transistor bias. The  $\pm 20$  volts at R07 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  $\pm 20$  vdc is used for power sequencing of the unit.

## 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  $\pm 5.7$  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.

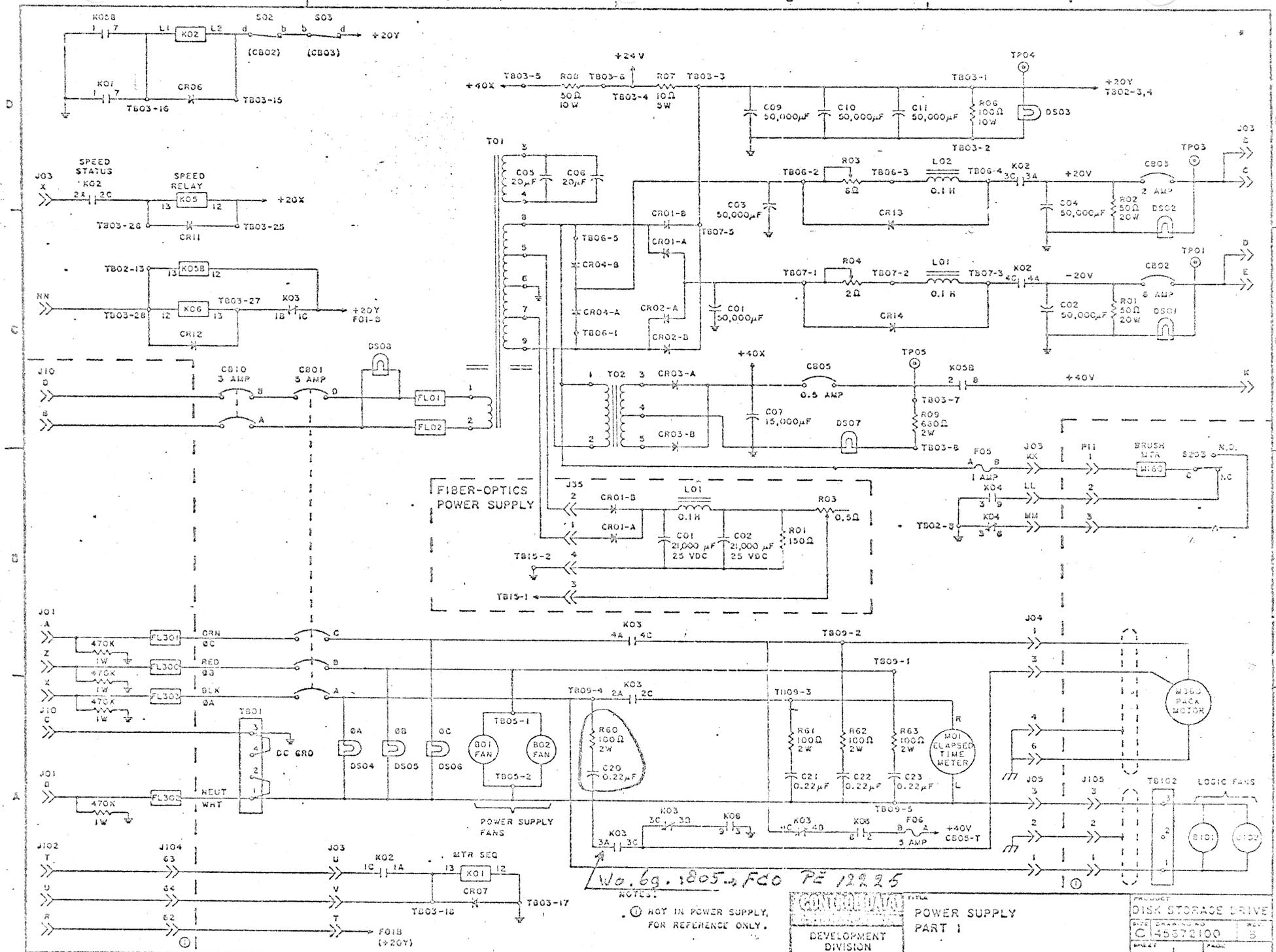
At 80 percent of the rated speed, the logic completes a circuit to energize relay K05A through J03-X. When this relay energizes contacts 1 and 4 open and signal is applied to the logic, indicating that the pack is up to speed. This signal is applied to a  $52$ -second delay card which allows time for 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. Relay contacts 2 and 8 of K05A 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: K03 contacts 3A/3C and 4A/4C open and remove power to the spindle motor, M360, (rotation begins to slow).

Relay K01 also completes the path through contacts 3

(continued)



No. 69. 1805-FCO PE 12225  
NOTES:

(1) NOT IN POWER SUPPLY, FOR REFERENCE ONLY.

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DEVELOPMENT DIVISION

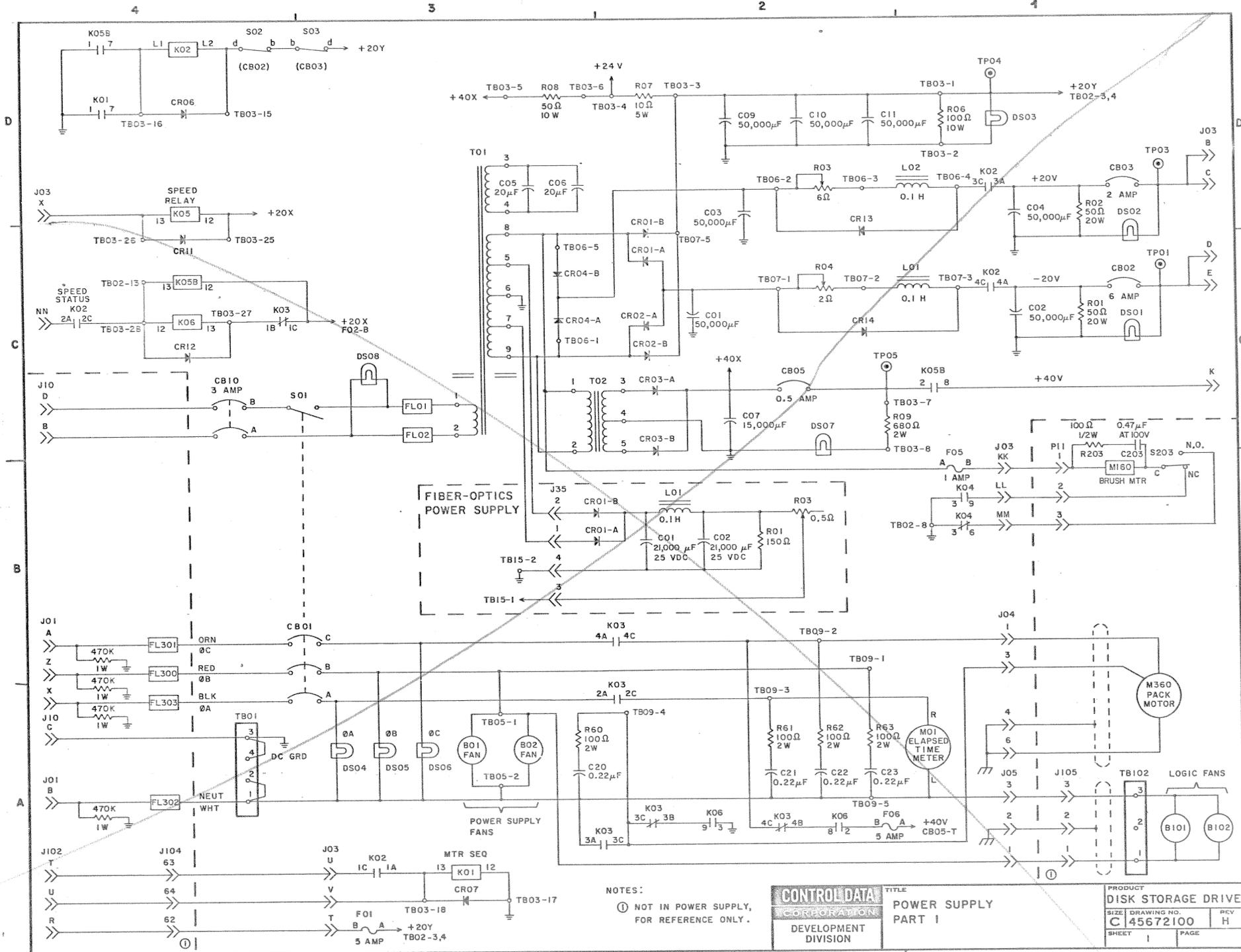
TITLE  
POWER SUPPLY  
PART 1

PRODUCT  
DISK STORAGE DRIVE  
SIZE DRAWING NO  
C 45672100  
PAGE 1



1-13

REV D



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

**CONTROL DATA CORPORATION**  
 DEVELOPMENT DIVISION

TITLE  
**POWER SUPPLY PART I**

PRODUCT  
**DISK STORAGE DRIVE**

SIZE DRAWING NO.  
**C 45672100**

SHEET 1 PAGE

## 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 (1200) and cam latch (1201) solenoids (heads unload and carriage starts retracting).
6. K03 contacts 1B and 1C close to energize relay K06.

Energizing K06 closes contacts 2/8 and 4/0 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, removing +40 vdc to the write circuit.

2. Contacts 3 and 9 open to remove the +20X volt-  
age to the sector solenoid, L301, and the ac-  
cess motor H switch (prevents further movement of the carriage).
3. Contacts 1 and 4 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.
4. Contacts 1 and 7 open, de-energizing relay K02.

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

## DETCNT 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 +74 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.

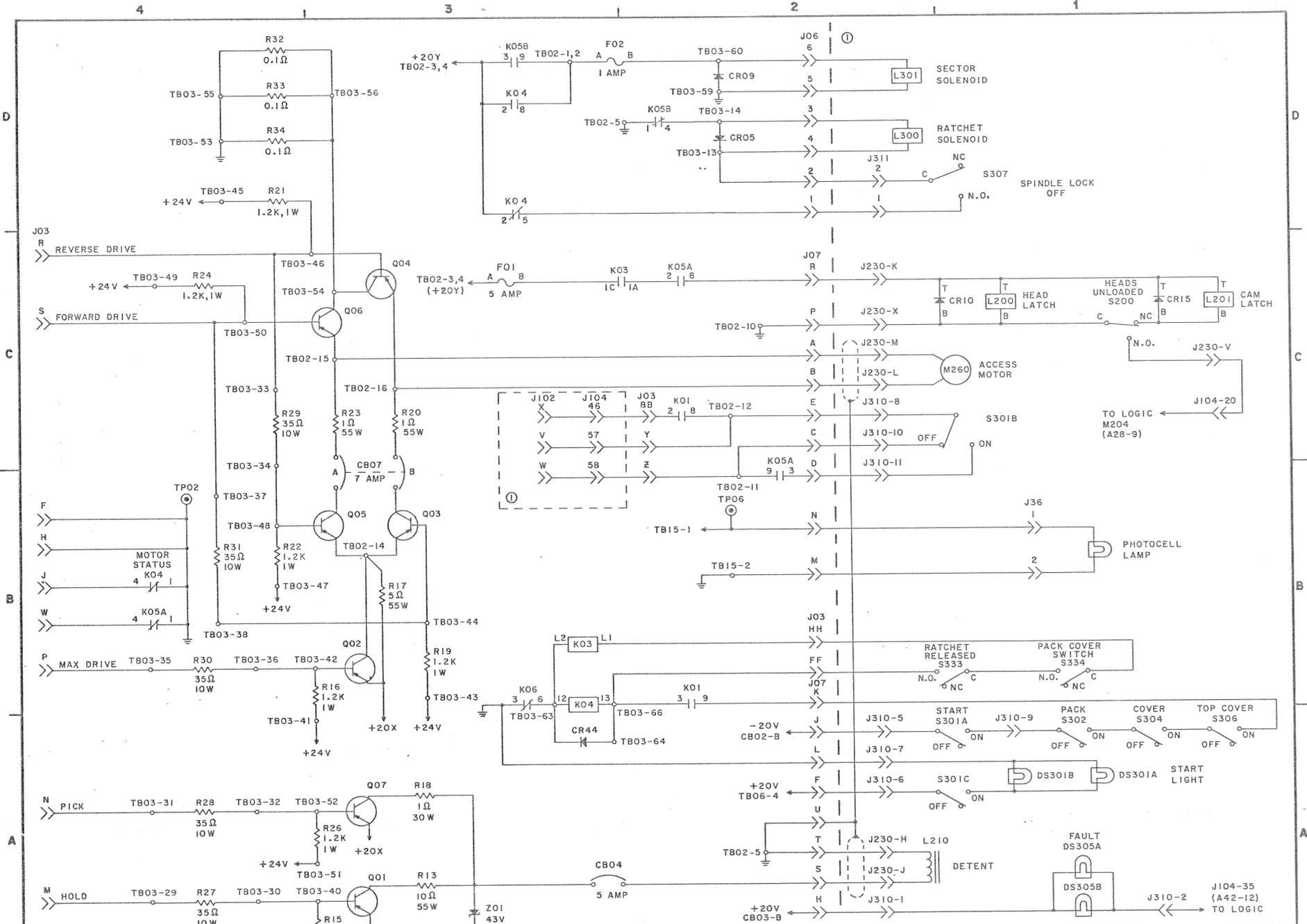
The use of series resistor R17 during slow speeds prevents excessive current and motor torque when the selected track is reached, the spring-loaded pawl is dropped.

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 in the motor is used as a brake, slowing the carriage to 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.
  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 2 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.

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

1-15

REV D



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

<b>CONTROL DATA</b> CORPORATION DEVELOPMENT DIVISION	TITLE	POWER SUPPLY PART 2
	PRODUCT	DISK STORAGE DRIVE
	SIZE	DRAWING NO. C 45672100
	SHEET 2	PAGE

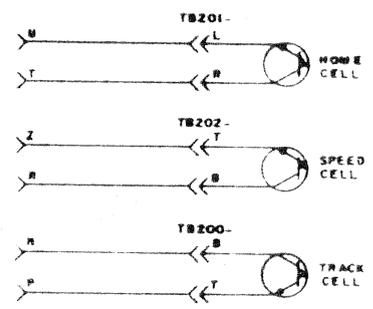
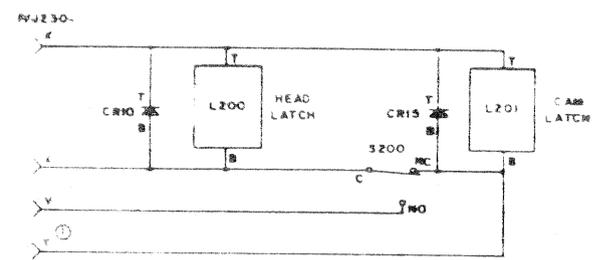
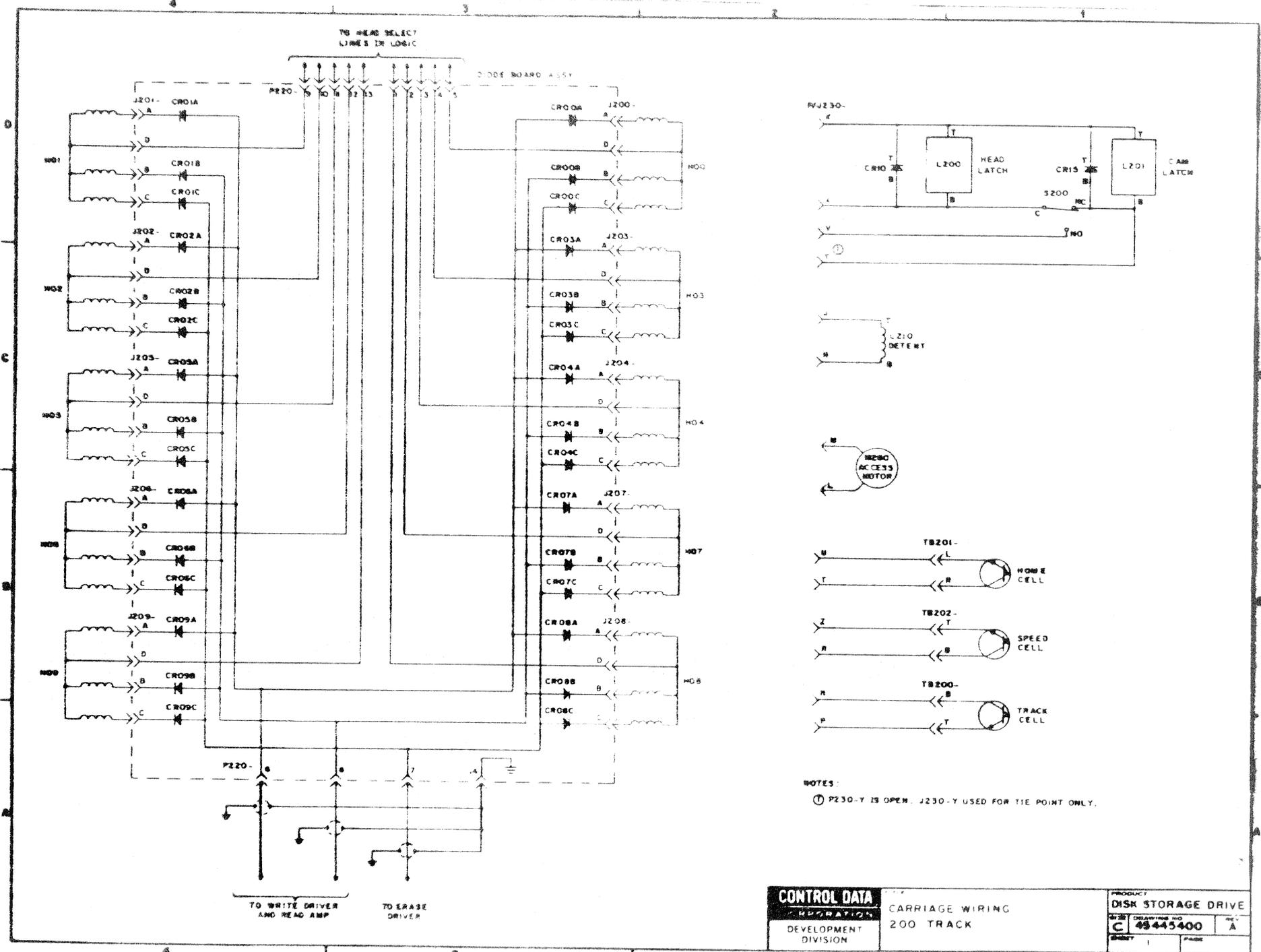
REV.	D
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1-17

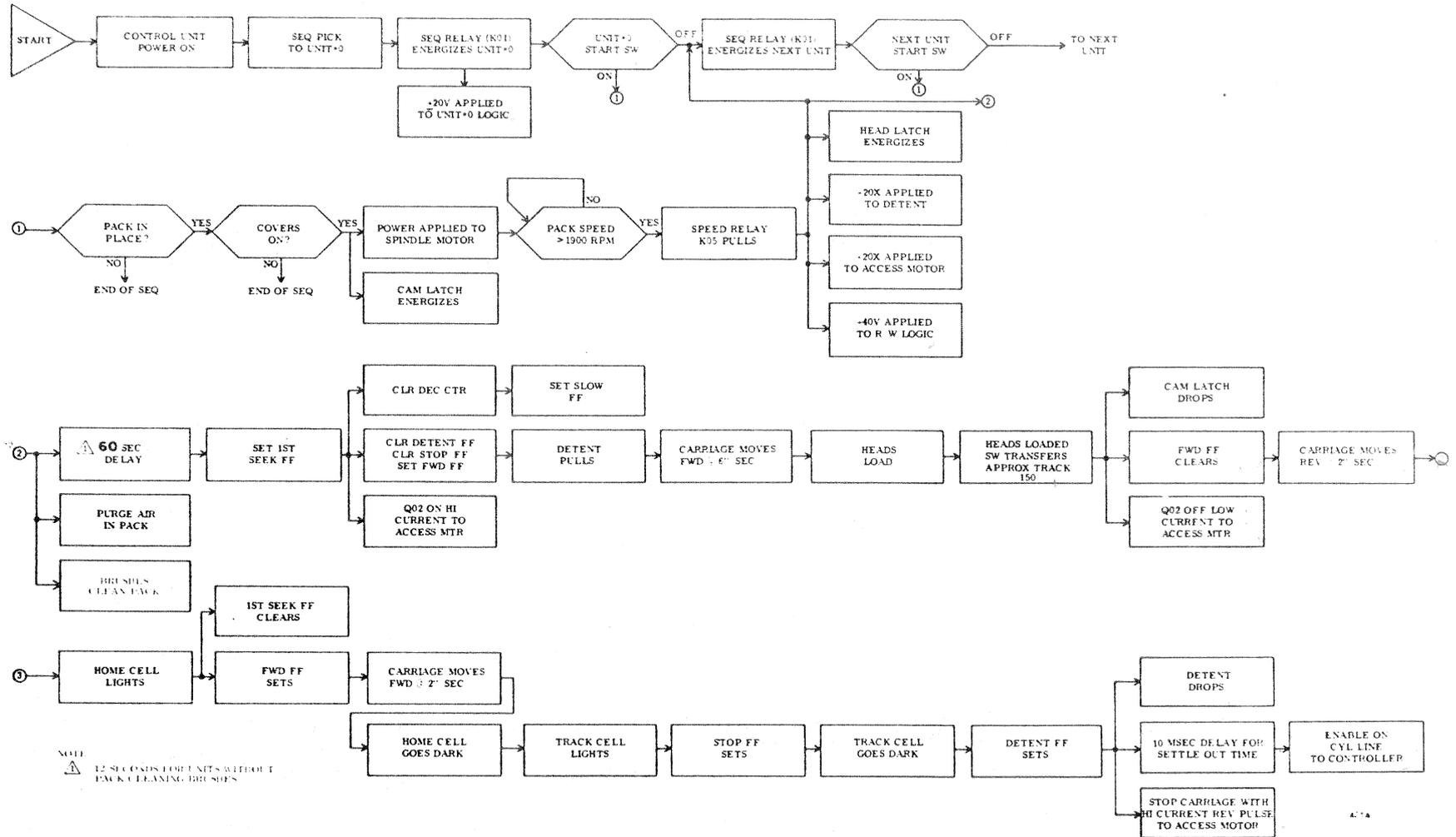
Rev A



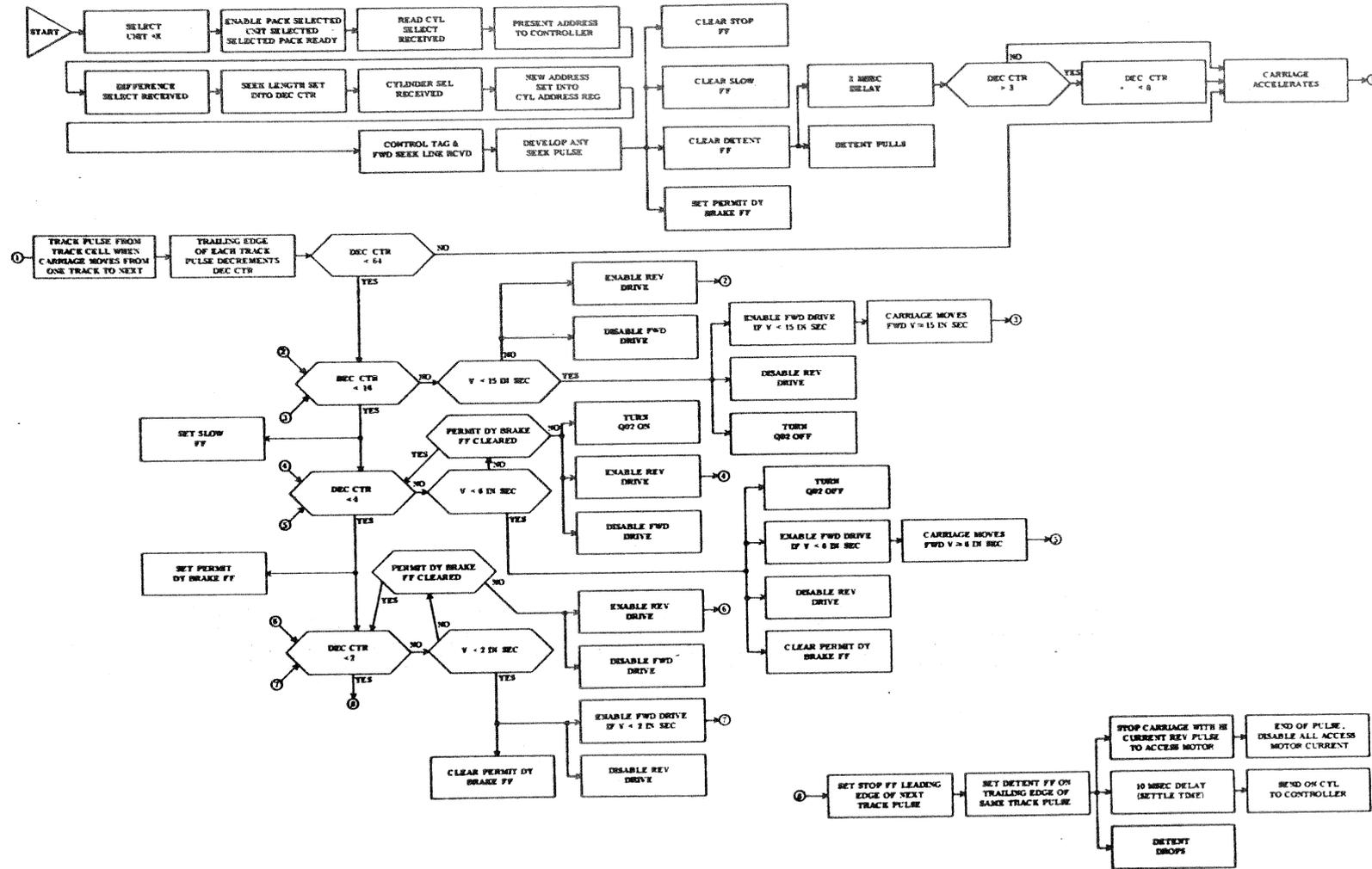
NOTES:  
 ① P230-T IS OPEN. J230-Y USED FOR TIE POINT ONLY.

CONTROL DATA CORPORATION DEVELOPMENT DIVISION	PRODUCT	DISK STORAGE DRIVE
	DESCRIPTION	CARRIAGE WIRING 200 TRACK
DRWING NO C 48445400	PAGE	A
DATE	1	PAGE

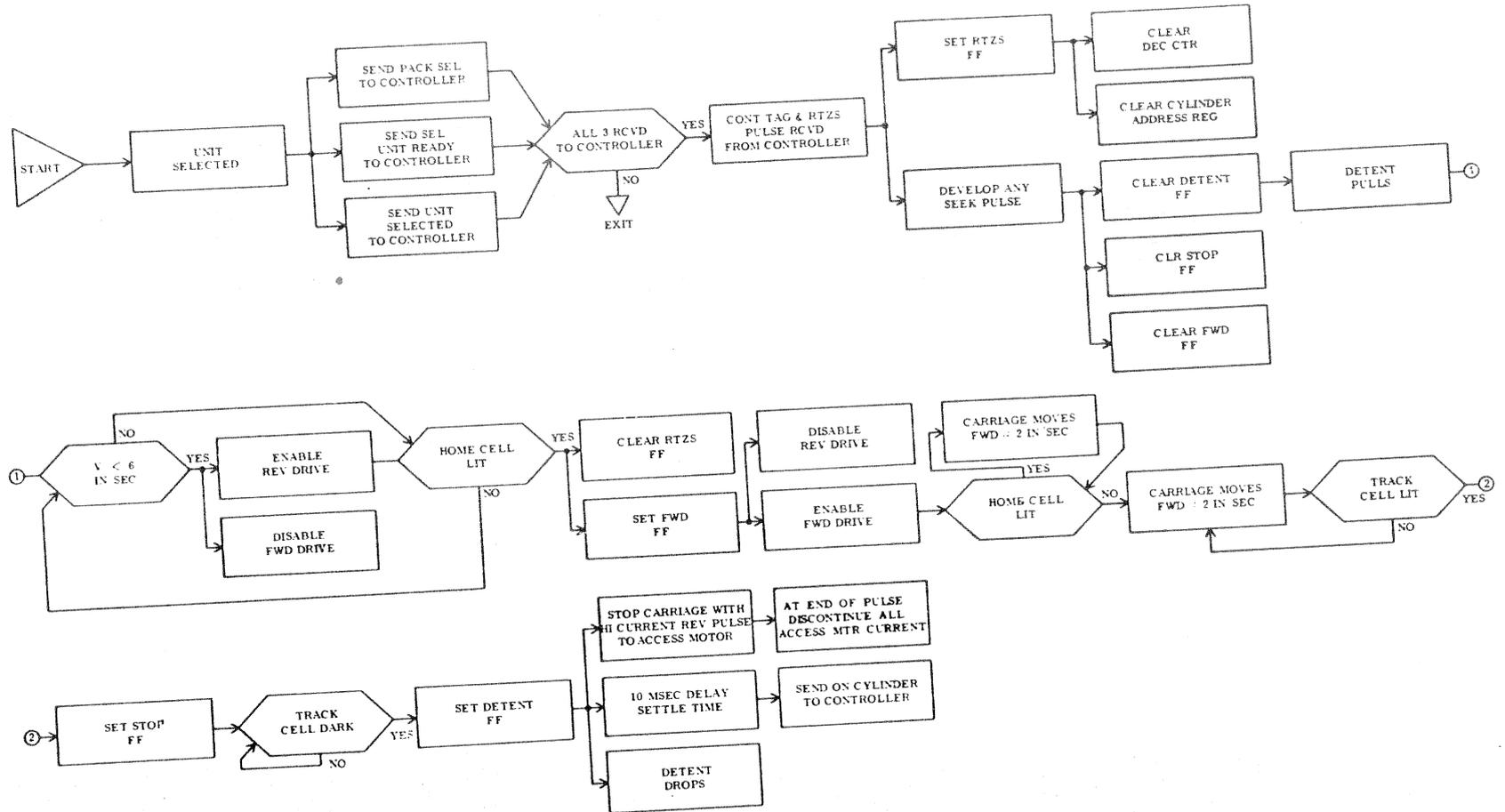




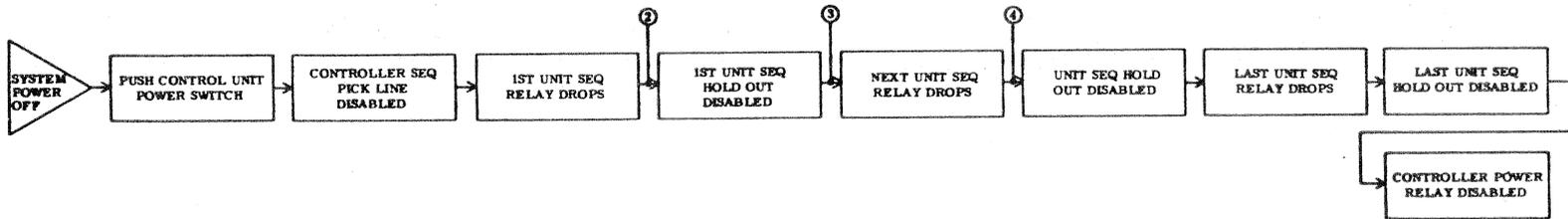
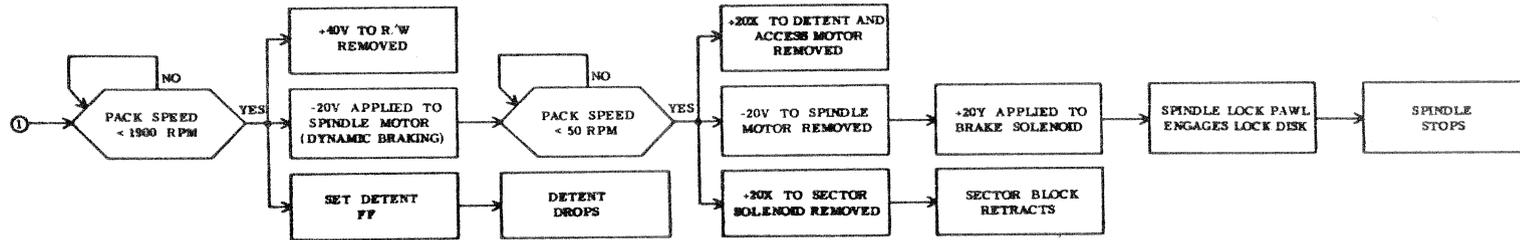
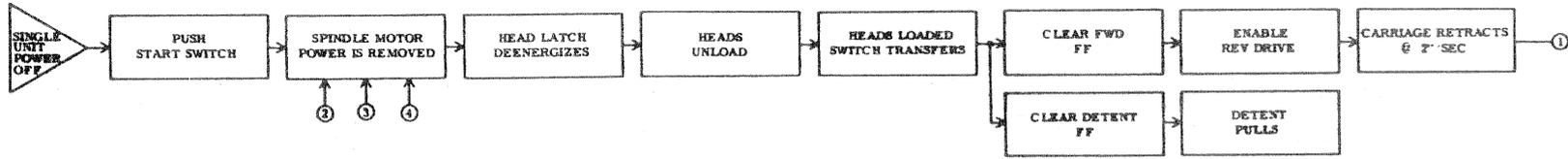






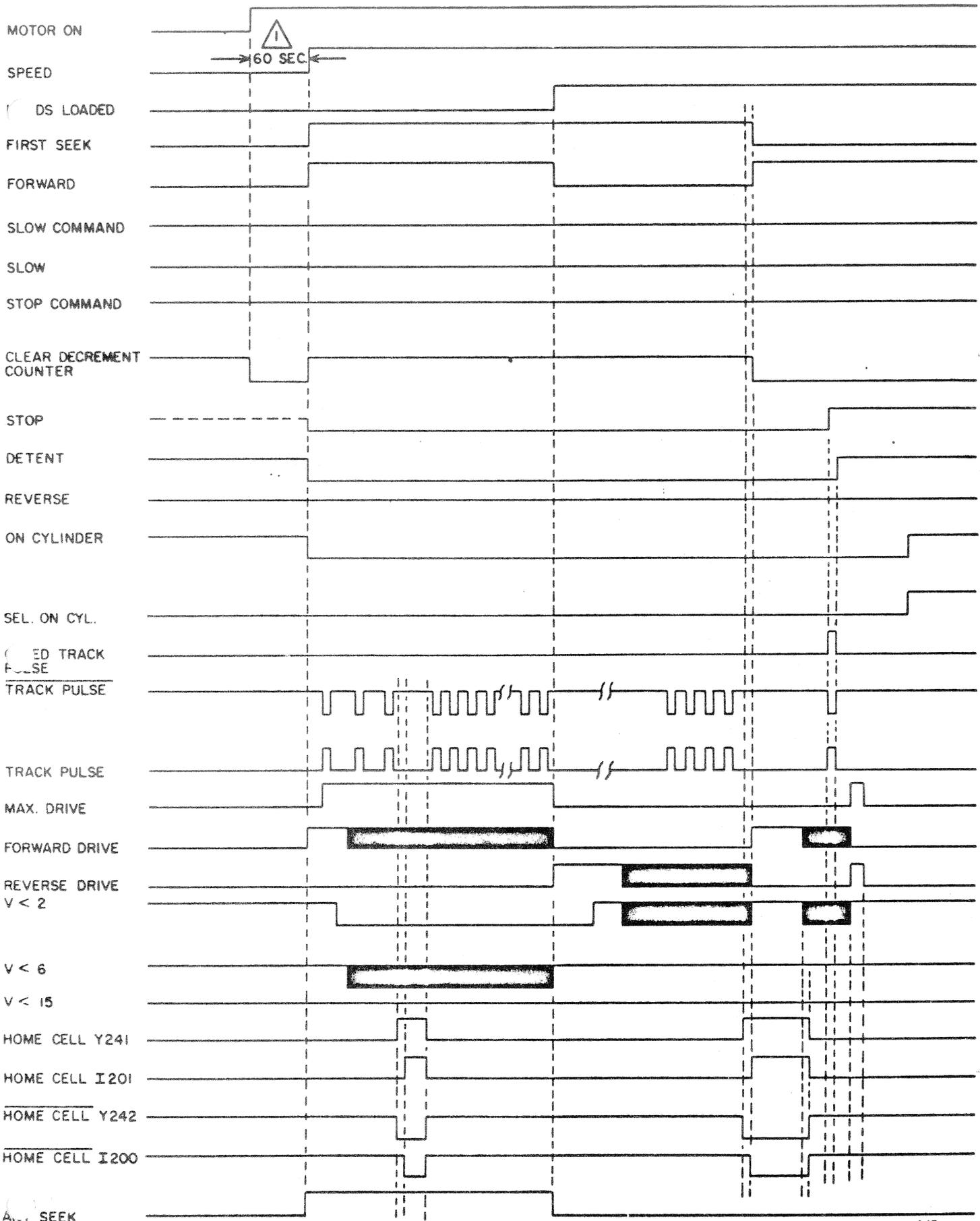






Power OFF Seek



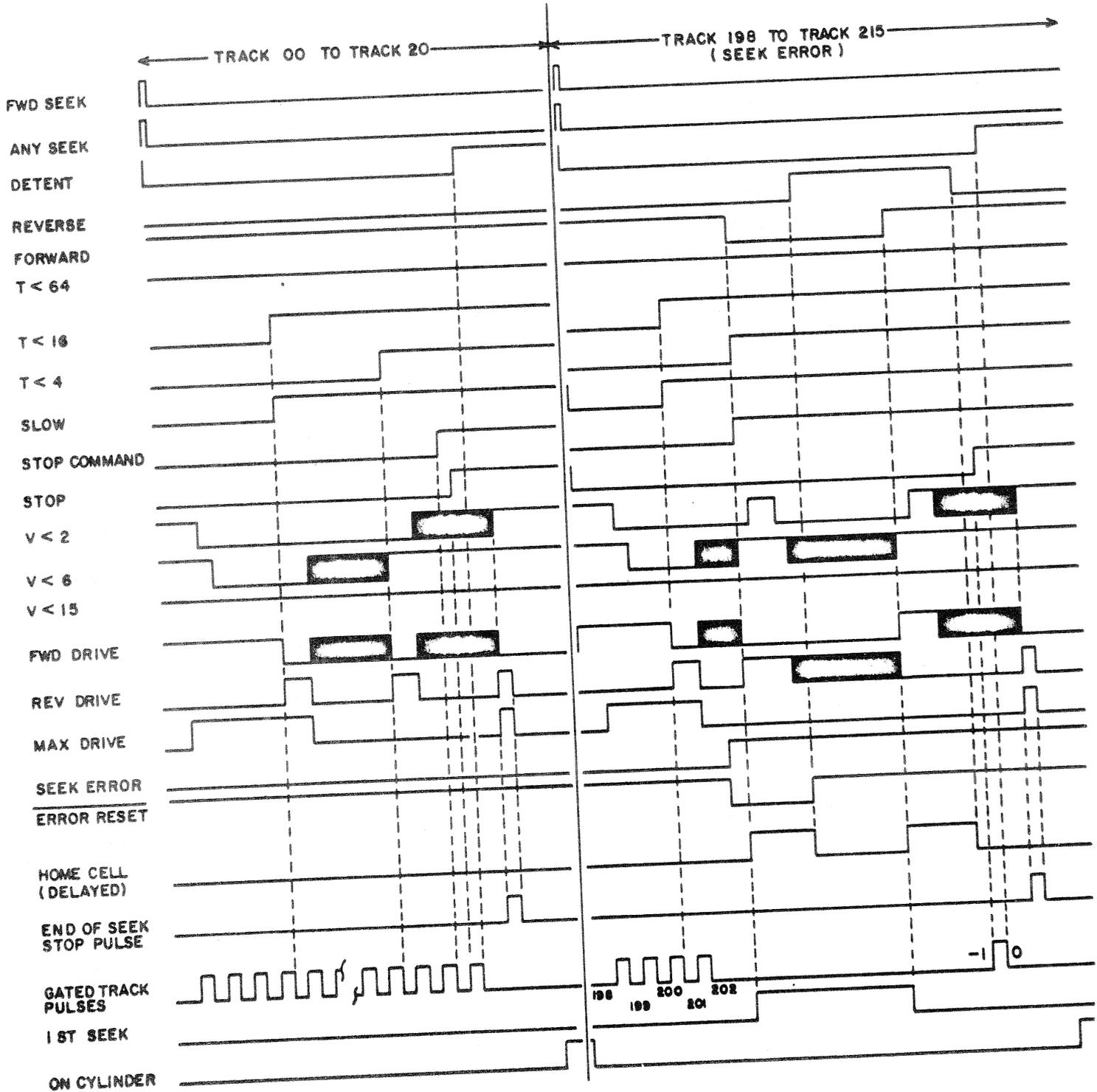


NOTE:  12 SEC. FOR UNITS WITHOUT PACK CLEANING BRUSHES.

FIRST SEEK

4J5A

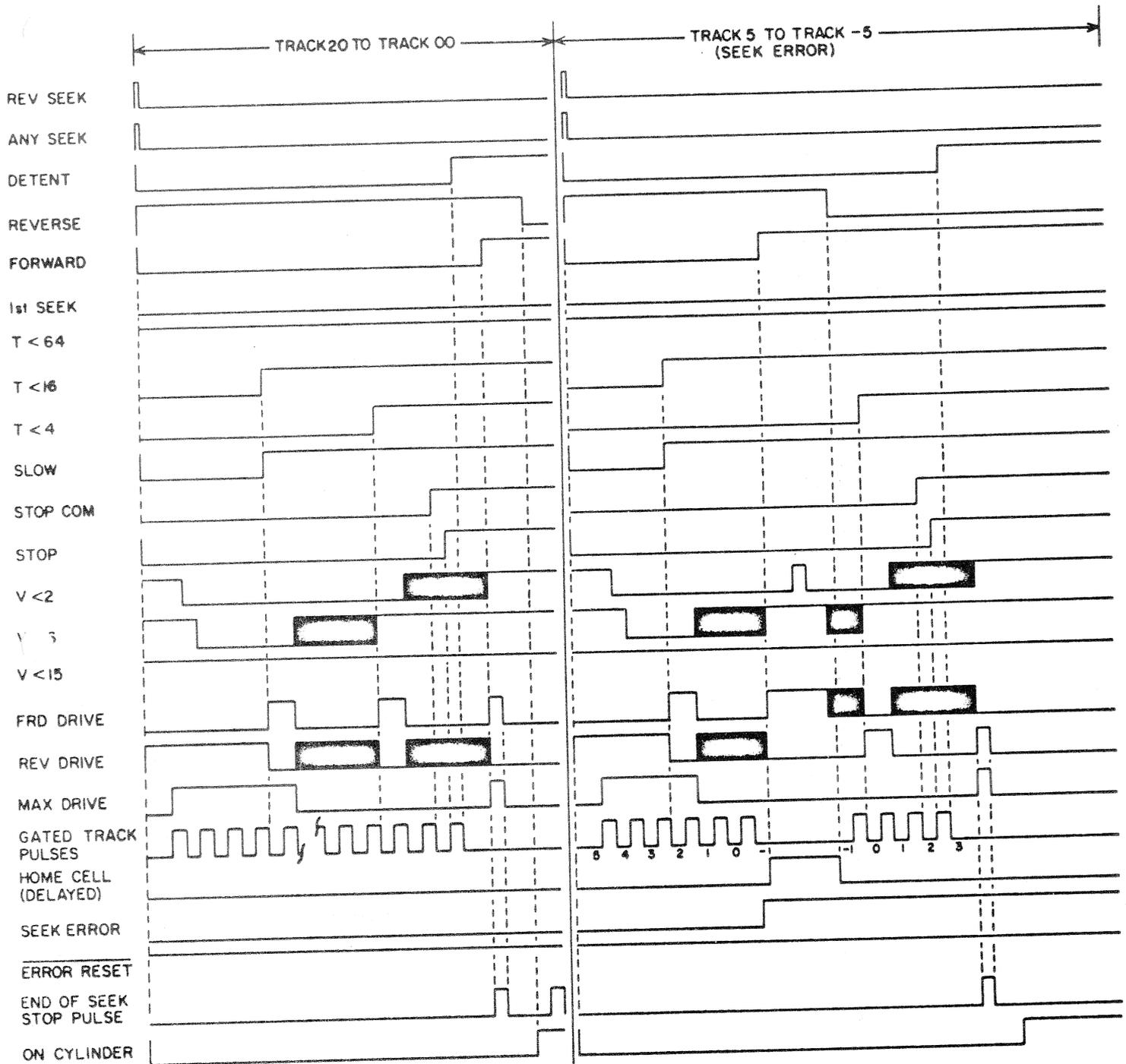




DIRECT SEEK FORWARD

4J11

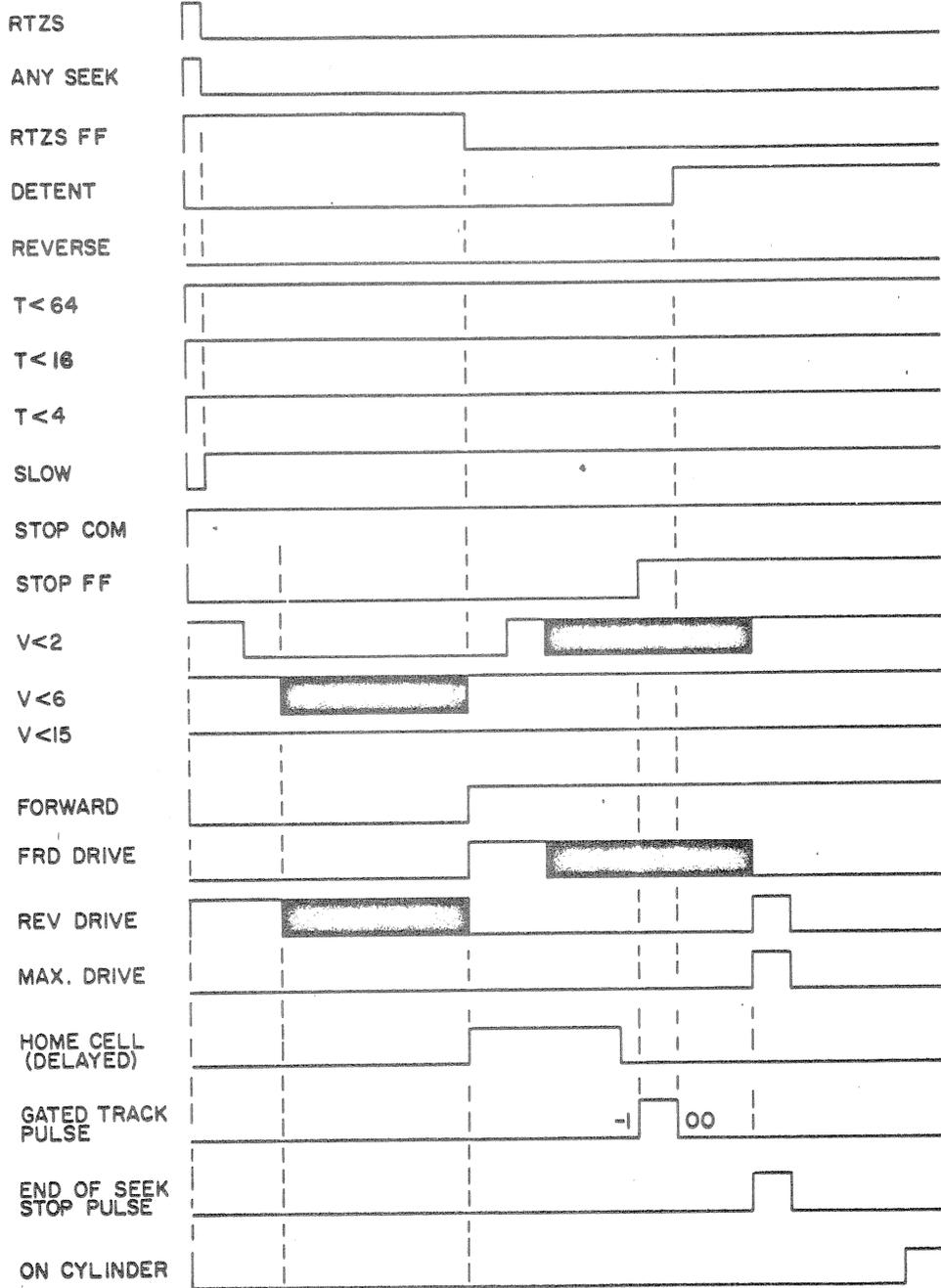




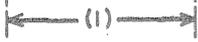
4J12

**DIRECT SEEK REVERSE**



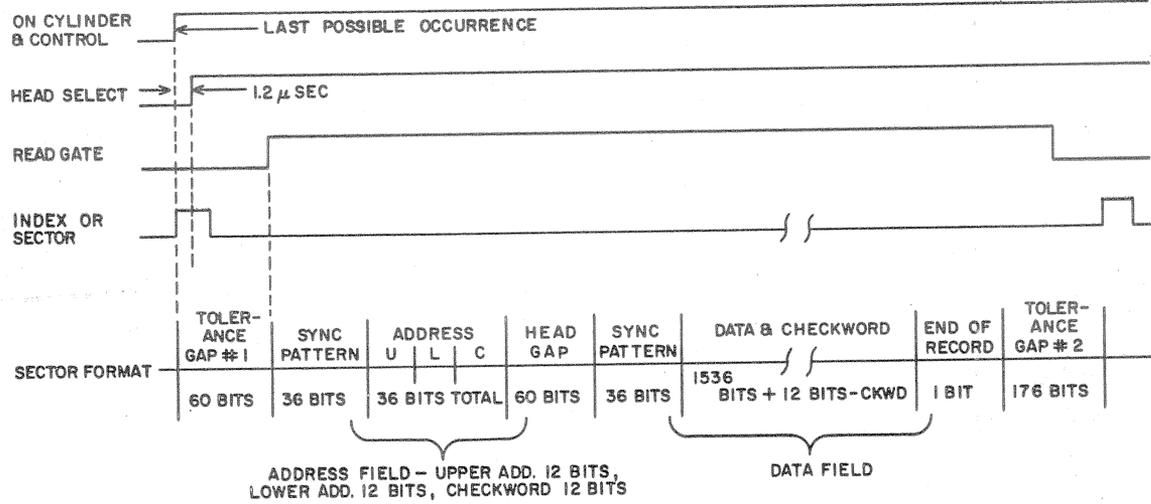


NOTE:  
 (1) THE LENGTH OF THIS TIME IS DIRECTLY  
 DEPENDENT UPON POSITION OF CARRIAGE  
 PRIOR TO DOING A RTZS.

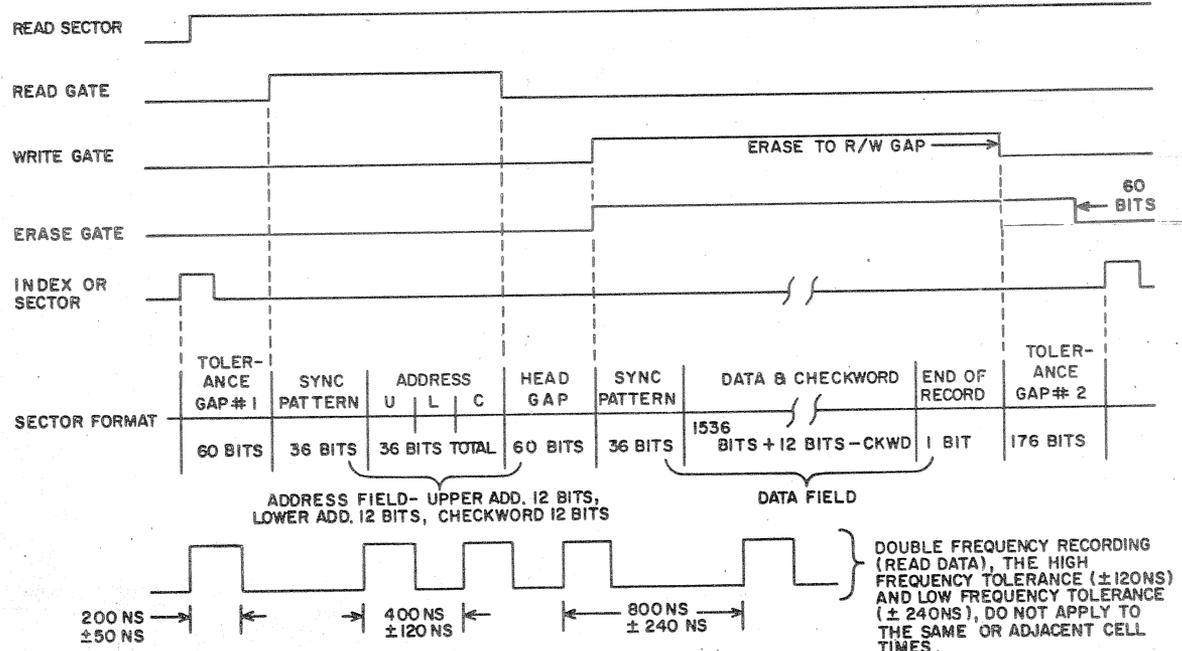


4J13

RT ZS

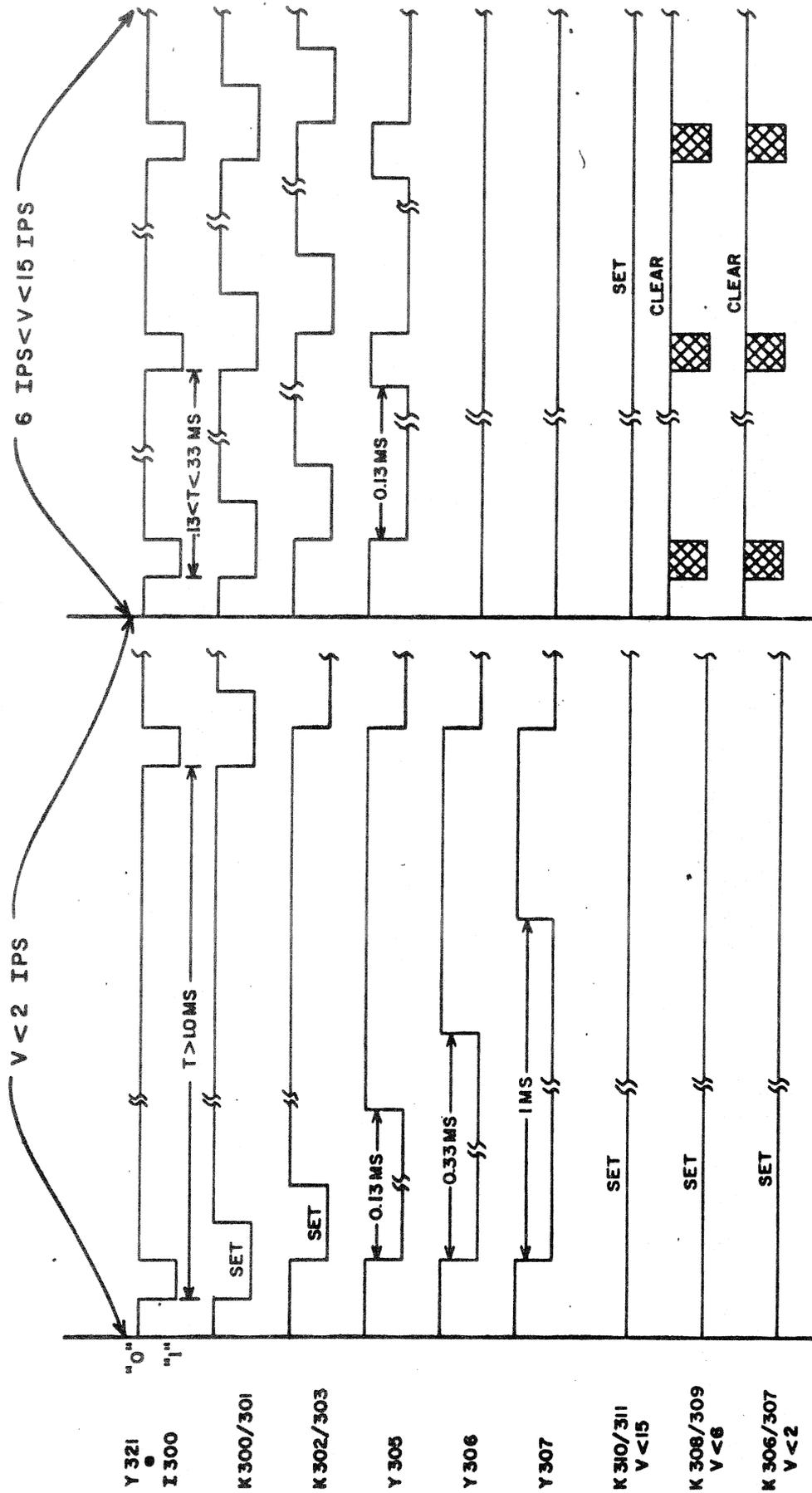


DATA & DATA CONTROL TIMING FOR READING ONE RECORD



DATA & DATA CONTROL TIMING FOR WRITING ONE RECORD

4J9A

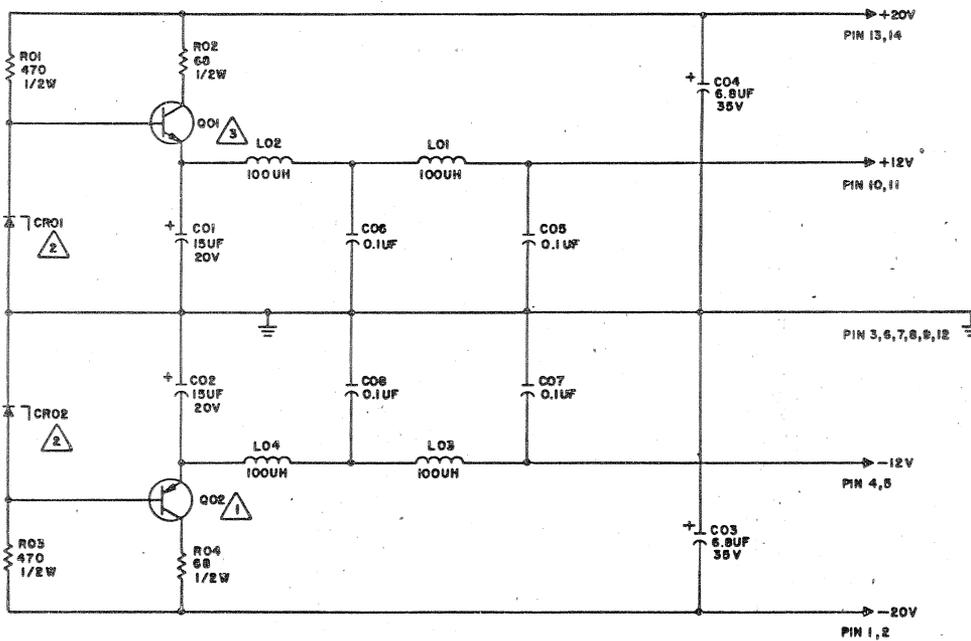


NOTE: CROSSHATCHING INDICATES TIMES THAT CLEARING SIGNALS ARE APPLIED TO FF.

4H10

SPEED CELL TIMING





NOTE:

- △ PNP GERMANIUM 50220101.
- △ ZENER 50240118.
- △ NPN SILICON 50220800.

±12V. VOLTAGE REGULATOR



PART 2

CARD PLACEMENT

Card Placement information  
for the 9465 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		Component Code	Wire Destination Location		Wire Size	Twisted Pair	
		Wire Origin Location	Pin Number		Wire Destination Pin Number	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	27	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	S	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.



NON-LOGIC LISTS

CONTROL DATA		TITLE		DOCUMENT NO.		REV.			
COMPUTER DIVISION		WIRE LISTING				WL			
				SHEET		OF			
CONDUCTOR IDENT.	PIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS PIND NO.	DESTINATION	ACCESS PIND NO.	REMARKS
20	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.



LW45480600 9465 DSD

A40010	04	C09	01	0	C08	12	9465	DSD
A40011	03	C08	12	0	C06	11	9465	DSD
A40110	02	C09	04	0	C08	06	9465	DSD
A40111	03	C08	06	0	C06	12	9465	DSD
A40210	03	C09	07	0	C10	12	9465	DSD
A40211	03	C09	07	0	C06	09	9465	DSD
A40310	02	C09	10	0	C10	06	9465	DSD
A40311	03	C09	10	0	C06	10	9465	DSD
A40410	04	C12	01	0	C11	12	9465	DSD
A40411	04	C11	12	0	C06	07	9465	DSD
A40510	02	C12	04	0	C11	06	9465	DSD
A40511	04	C11	06	0	C06	08	9465	DSD
A40610	03	C12	07	0	C13	12	9465	DSD
A40611	04	C12	07	0	C06	05	9465	DSD
A40710	03	C12	10	0	C13	06	9465	DSD
A40711	04	C12	10	0	C06	06	9465	DSD
A41010	13	C08	01	0	C33	12	9465	DSD
A41011	06	C08	01	0	D12	06	9465	DSD
A41020	03	C08	02	0	C07	11	9465	DSD
A41021	03	C07	11	0	C04	11	9465	DSD
A41022	05	C04	11	0	P05	11	9465	DSD
A41023	02	C08	02	0	C09	03	9465	DSD
A41024	08	C09	03	0	D17	11	9465	DSD
A41110	03	C08	07	0	C07	12	9465	DSD
A41111	03	C07	12	0	C04	12	9465	DSD
A41112	05	C04	12	0	P05	12	9465	DSD
A41113	02	C08	07	0	C09	06	9465	DSD
A41114	08	C09	06	0	D17	12	9465	DSD
A41120	03	C08	09	0	C05	12	9465	DSD
A41210	09	C10	01	0	D22	09	9465	DSD
A41211	06	C10	01	0	D12	05	9465	DSD
A41220	03	C10	02	0	C09	09	9465	DSD
A41221	03	C09	09	0	C07	09	9465	DSD
A41222	03	C07	09	0	C04	09	9465	DSD
A41223	07	C10	02	0	D17	09	9465	DSD
A41310	03	C10	07	0	C09	12	9465	DSD
A41311	03	C09	12	0	C07	10	9465	DSD
A41312	03	C07	10	0	C04	10	9465	DSD
A41313	07	C10	07	0	D17	10	9465	DSD
A41320	04	C10	08	0	C05	11	9465	DSD
A41410	06	C11	01	0	D12	04	9465	DSD
A41411	05	D12	04	0	D21	05	9465	DSD
A41420	02	C11	02	0	C12	03	9465	DSD
A41421	04	C11	02	0	C07	07	9465	DSD
A41422	03	C07	07	0	C04	08	9465	DSD
A41510	02	C11	07	0	C12	06	9465	DSD
A41511	03	C12	06	0	C12	11	9465	DSD
A41512	03	C11	07	0	C07	08	9465	DSD
A41520	04	C11	08	0	C05	10	9465	DSD
A41610	02	C13	01	0	C14	03	9465	DSD
A41611	05	C14	03	0	D12	03	9465	DSD
A41620	03	C13	02	0	C12	09	9465	DSD
A41621	04	C12	09	0	C07	05	9465	DSD
A41710	03	C13	07	0	C12	12	9465	DSD
A41711	04	C12	12	0	C07	06	9465	DSD
A41720	05	C13	08	0	C05	09	9465	DSD



I00210	05	D21	01	0	C14	12	9465	DSD
I00310	02	D21	04	0	D21	03	9465	DSD
I00410	06	D21	07	0	C16	06	9465	DSD
I00610	05	D23	01	0	C16	12	9465	DSD
I00710	07	C33	07	0	D23	03	9465	DSD
I01410	04	D23	04	0	C20	12	9465	DSD
I01610	05	D25	07	0	C24	06	9465	DSD
I01611	11	C24	06	0	B02	08	9465	DSD
I01710	03	D25	01	0	D25	11	9465	DSD
I01810	07	D13	07	0	D25	12	9465	DSD
I01910	05	D16	07	0	D25	10	9465	DSD
I02010	04	D26	01	0	C24	12	9465	DSD
I02020	03	D26	02	0	D25	09	9465	DSD
I02110	03	D12	07	0	D13	11	9465	DSD
I02111	08	D13	11	0	C23	06	9465	DSD
I02210	03	D12	01	0	D12	12	9465	DSD
I02211	13	D12	12	0	A10	01	9465	DSD
I02212	02	A10	01	0	A10	02	9465	DSD
I02213	02	A10	02	0	A10	03	9465	DSD
I02310	04	D11	01	0	D13	12	9465	DSD
I02311	04	D13	12	0	D18	06	9465	DSD
I02312	05	D18	06	0	C23	12	9465	DSD
I02410	03	D10	01	0	D11	05	9465	DSD
I02510	08	D27	07	0	D11	06	9465	DSD
I02610	06	B06	01	0	C05	04	9465	DSD
I02611	03	C05	04	0	C03	10	9465	DSD
I02620	07	B06	02	0	C08	10	9465	DSD
I02621	04	C08	10	0	C04	02	9465	DSD
I02630	06	B06	03	0	C03	09	9465	DSD
I02631	11	B06	03	0	D14	10	9465	DSD
I02710	12	D24	04	0	B06	06	9465	DSD
I02810	08	C27	07	0	B14	06	9465	DSD
I02820	08	C27	08	0	B14	12	9465	DSD
I02910	02	D22	07	0	D21	09	9465	DSD
I03110	03	D22	01	0	D23	06	9465	DSD
I10010	04	D16	01	0	D13	10	9465	DSD
I10011	06	D16	01	0	C22	06	9465	DSD
I10110	08	B11	07	0	D16	04	9465	DSD
I10111	06	B11	07	0	A10	04	9465	DSD
I10112	02	A10	04	0	A10	05	9465	DSD
I10113	02	A10	05	0	A10	06	9465	DSD
I10210	03	D17	01	0	D16	05	9465	DSD
I10211	11	D16	05	0	A10	10	9465	DSD
I10212	02	A10	10	0	A10	11	9465	DSD
I10213	02	A10	11	0	A10	12	9465	DSD
I10310	10	A13	01	0	A32	06	9465	DSD
I10311	09	A32	06	0	C30	06	9465	DSD
I10312	13	A13	01	0	D16	06	9465	DSD
I10410	06	D24	07	0	D13	09	9465	DSD
I10411	05	D24	07	0	C22	12	9465	DSD
I10510	04	B12	01	0	A10	07	9465	DSD
I10511	02	A10	07	0	A10	08	9465	DSD
I10512	02	A10	08	0	A10	09	9465	DSD
I10513	11	B12	01	0	D24	08	9465	DSD
I10610	10	B13	01	0	A32	05	9465	DSD
I10611	09	A32	05	0	C30	05	9465	DSD



LV45480600 9465 DSD

I10612	11	B13	01	0	D24	09	9465	DSD
I10710	04	A32	01	0	A29	09	9465	DSD
I10720	04	A32	02	0	A28	07	9465	DSD
I12010	07	A14	01	0	B22	05	9465	DSD
I12020	07	A14	02	0	B20	11	9465	DSD
I12030	06	A14	03	0	B09	08	9465	DSD
I12110	05	B09	10	0	A14	12	9465	DSD
I12210	08	A15	01	0	B22	11	9465	DSD
I12220	07	A15	02	0	B09	12	9465	DSD
I12230	07	A15	03	0	B21	11	9465	DSD
I12310	08	A16	01	0	B24	11	9465	DSD
I12320	04	A16	02	0	A16	14	9465	DSD
I12330	08	A16	03	0	B23	11	9465	DSD
I12410	09	D23	10	0	B22	02	9465	DSD
I16010	02	D14	01	0	D15	02	9465	DSD
I16011	03	D15	02	0	D15	11	9465	DSD
I16020	03	D14	02	0	D17	03	9465	DSD
I16110	10	A11	01	0	A32	04	9465	DSD
I16111	09	A32	04	0	C30	04	9465	DSD
I16112	12	A11	01	0	D14	05	9465	DSD
I16210	10	A12	01	0	A32	03	9465	DSD
I16211	09	A32	03	0	C30	03	9465	DSD
I16212	12	A12	01	0	D14	06	9465	DSD
I16310	09	B09	07	0	D15	05	9465	DSD
I16311	03	D15	05	0	D15	09	9465	DSD
I16410	04	B11	01	0	B09	09	9465	DSD
I17010	09	D28	01	0	B26	05	9465	DSD
I17020	08	D28	02	0	B25	11	9465	DSD
I17030	04	D28	03	0	D28	14	9465	DSD
I17110	06	C34	01	0	D28	05	9465	DSD
I17210	06	C34	04	0	D28	06	9465	DSD
I17211	08	C34	04	0	B23	03	9465	DSD
I17212	03	B23	03	0	B24	05	9465	DSD
I17310	02	C34	07	0	C34	06	9465	DSD
I17410	05	D27	01	0	C34	09	9465	DSD
I17411	09	C34	09	0	B22	08	9465	DSD
I17412	03	B22	08	0	B21	03	9465	DSD
I17710	02	D28	07	0	D27	06	9465	DSD
I17720	04	D28	08	0	D23	12	9465	DSD
I17730	10	D28	09	0	B21	10	9465	DSD
I17810	06	C34	10	0	D28	12	9465	DSD
I17811	09	C34	10	0	B20	03	9465	DSD
I20010	09	C36	01	0	A34	03	9465	DSD
I20011	10	C36	01	0	D20	06	9465	DSD
I20110	03	C33	01	0	C36	06	9465	DSD
I20210	08	C27	01	0	B14	03	9465	DSD
I20211	06	C27	01	0	B36	05	9465	DSD
I20220	08	C27	02	0	B14	05	9465	DSD
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I20321	04	A34	12	0	A39	12	9465	DSD
I20330	08	C35	03	0	A29	12	9465	DSD
I20340	03	C35	04	0	C35	14	9465	DSD
I20410	05	B28	10	0	A26	12	9465	DSD
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I20610	07	C31	01	0	A28	12	9465	DSD



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I20710	06	B29	01	0	C31	06	9465	DSD
I20810	10	C40	01	0	D23	09	9465	DSD
I20820	07	C40	02	0	B29	12	9465	DSD
I20910	08	C30	01	0	A33	07	9465	DSD
I21010	08	C31	07	0	A31	12	9465	DSD
I21110	09	D24	10	0	B29	11	9465	DSD
I21210	03	A33	01	0	A31	06	9465	DSD
I21310	06	C39	01	0	B30	06	9465	DSD
I21410	05	B28	04	0	A29	06	9465	DSD
I21411	05	B28	04	0	C28	06	9465	DSD
I21710	09	C35	07	0	C20	03	9465	DSD
I21711	07	C20	03	0	D27	12	9465	DSD
I21720	03	C35	08	0	C34	12	9465	DSD
I21721	07	C34	12	0	D27	11	9465	DSD
I21722	04	D27	11	0	D22	08	9465	DSD
I21730	04	C35	09	0	C31	05	9465	DSD
I21731	08	C31	05	0	A33	11	9465	DSD
I21740	02	C35	10	0	C34	11	9465	DSD
I21741	09	C34	11	0	C18	09	9465	DSD
I21742	07	C18	09	0	D10	05	9465	DSD
I21810	03	C36	07	0	C35	12	9465	DSD
I21910	12	D35	10	0	A34	06	9465	DSD
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I22011	07	B29	10	0	C38	12	9465	DSD
I22110	08	C29	01	0	A36	12	9465	DSD
I22210	06	D35	07	0	C38	06	9465	DSD
I22310	03	A32	07	0	A29	11	9465	DSD
I22320	02	A32	08	0	A31	11	9465	DSD
I22610	02	C29	07	0	C28	05	9465	DSD
I22611	03	C29	07	0	C32	11	9465	DSD
I22612	05	C32	11	0	D35	11	9465	DSD
I22710	06	B28	01	0	C29	08	9465	DSD
I22810	12	D24	01	0	A29	02	9465	DSD
I22910	09	B05	04	0	D13	02	9465	DSD
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I30110	04	B37	04	0	B34	12	9465	DSD
I30210	03	B37	07	0	B35	12	9465	DSD
I30310	02	B37	10	0	B36	12	9465	DSD
I30410	08	C39	07	0	D27	05	9465	DSD
I30510	06	B39	01	0	B30	12	9465	DSD
I30511	06	B39	01	0	C42	06	9465	DSD
I30520	05	B39	02	0	B31	06	9465	DSD
I30530	06	B39	03	0	C43	05	9465	DSD
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I30540	04	B39	04	0	B36	09	9465	DSD
I30541	06	B36	09	0	C39	11	9465	DSD
I30542	05	C39	11	0	C31	12	9465	DSD
I30610	04	B40	01	0	B38	11	9465	DSD
I30611	05	B38	11	0	B31	05	9465	DSD
I30612	04	B31	05	0	A32	11	9465	DSD
I30613	06	B40	01	0	C39	06	9465	DSD
I30614	03	C39	06	0	C41	05	9465	DSD
I30620	03	B40	02	0	B39	06	9465	DSD
I30621	04	B40	02	0	A43	12	9465	DSD
I30622	03	A43	12	0	A43	06	9465	DSD



I30630	07	B40	03	0	B29	09	9465 DSD
I30631	03	B29	09	0	B26	09	9465 DSD
I30632	06	B26	09	0	C29	12	9465 DSD
I30633	04	C29	12	0	C33	04	9465 DSD
I30640	06	B40	04	0	B31	04	9465 DSD
I30641	04	B31	04	0	A32	10	9465 DSD
I30642	06	B40	04	0	C43	04	9465 DSD
I30643	07	C43	04	0	C30	11	9465 DSD
I30710	04	C30	07	0	C34	03	9465 DSD
I30810	05	C44	07	0	B42	09	9465 DSD
I30811	05	B42	09	0	C37	04	9465 DSD
I30820	03	C44	08	0	C42	14	9465 DSD
I30910	06	B39	07	0	C39	10	9465 DSD
I30911	06	C39	10	0	B36	10	9465 DSD
I30912	08	B39	07	0	A29	03	9465 DSD
I30913	05	A29	03	0	C30	02	9465 DSD
I30920	05	B39	08	0	C42	05	9465 DSD
I30921	08	C42	05	0	B30	09	9465 DSD
I30930	05	B39	09	0	B31	12	9465 DSD
I30940	05	B39	10	0	C43	03	9465 DSD
I30941	07	C43	03	0	C31	11	9465 DSD
I30942	02	C31	11	0	C30	10	9465 DSD
I31010	03	B40	07	0	B39	12	9465 DSD
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I31021	05	B31	11	0	C31	10	9465 DSD
I31022	02	C31	10	0	C30	09	9465 DSD
I31023	08	C30	09	0	C43	02	9465 DSD
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I31040	03	B40	10	0	B38	10	9465 DSD
I31041	05	B38	10	0	B31	10	9465 DSD
I31042	05	B31	10	0	C31	09	9465 DSD
I31043	05	C31	09	0	C39	05	9465 DSD
I31044	03	C39	05	0	C41	03	9465 DSD
I31110	08	C40	07	0	D28	10	9465 DSD
I31120	08	C40	08	0	D27	04	9465 DSD
I31210	05	B41	07	0	C41	02	9465 DSD
I31211	04	C41	02	0	B43	12	9465 DSD
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I31410	04	C44	01	0	C43	12	9465 DSD
I31411	10	C43	12	0	A37	02	9465 DSD
I31420	02	C44	02	0	C43	06	9465 DSD
I31510	02	B41	01	0	B40	06	9465 DSD
I31511	04	B41	01	0	A43	11	9465 DSD
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I31611	06	B41	04	0	A43	03	9465 DSD
I31710	03	B41	10	0	B44	12	9465 DSD
I31711	05	B41	10	0	A43	10	9465 DSD
I31712	03	A43	10	0	A43	04	9465 DSD
I31810	08	D36	07	0	B42	12	9465 DSD
I32010	03	D35	01	0	D35	08	9465 DSD
I32011	06	D35	01	0	C28	12	9465 DSD
I32110	02	D35	04	0	D35	09	9465 DSD
I32111	07	D35	04	0	C28	04	9465 DSD
I32210	11	D11	07	0	D33	12	9465 DSD
I32211	02	D33	12	0	D34	11	9465 DSD



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I32310	12	A43	01	0	D35	02	9465	DSD
I32311	04	D35	02	0	D32	12	9465	DSD
I32312	11	D32	12	0	D11	10	9465	DSD
I32410	12	A43	07	0	D35	05	9465	DSD
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I32412	11	D32	09	0	D11	12	9465	DSD
I44010	10	B01	01	0	C18	04	9465	DSD
I44011	08	C18	04	0	D10	12	9465	DSD
I44110	02	B02	10	0	B01	06	9465	DSD
I44210	08	B01	07	0	C14	06	9465	DSD
I44211	06	C14	06	0	D10	11	9465	DSD
I44410	03	B02	01	0	B01	11	9465	DSD
I44411	03	B02	01	0	B03	08	9465	DSD
I44510	05	B09	04	0	B01	05	9465	DSD
I44511	03	B01	05	0	B01	10	9465	DSD
I44610	02	B02	04	0	B02	03	9465	DSD
I44611	03	B02	04	0	B02	09	9465	DSD
I44710	05	B02	07	0	B08	08	9465	DSD
I44810	04	B09	01	0	B04	04	9465	DSD
I44811	03	B04	04	0	B01	04	9465	DSD
I44812	03	B01	04	0	B01	09	9465	DSD
I44910	12	B04	01	0	D21	06	9465	DSD
I44911	04	D21	06	0	D27	10	9465	DSD
I45010	05	C02	01	0	C08	11	9465	DSD
I45020	06	C02	02	0	C10	11	9465	DSD
I45110	05	C04	01	0	C10	05	9465	DSD
I45210	05	C05	01	0	C11	05	9465	DSD
I45220	06	C05	02	0	C13	11	9465	DSD
I45310	07	C02	07	0	C13	10	9465	DSD
I45320	06	C02	08	0	C11	11	9465	DSD
I45410	06	C03	01	0	C11	10	9465	DSD
I45420	06	C03	02	0	C13	05	9465	DSD
I45510	06	D14	07	0	C13	04	9465	DSD
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I45610	05	C03	07	0	C08	05	9465	DSD
I45620	05	C03	08	0	C10	10	9465	DSD
I45710	10	B04	07	0	D09	12	9465	DSD
I45810	10	B03	01	0	D09	11	9465	DSD
I45910	04	D21	10	0	D25	04	9465	DSD
I45911	10	D21	10	0	C38	09	9465	DSD
I45912	06	C38	09	0	C29	03	9465	DSD
I45913	12	C29	03	0	B06	05	9465	DSD
I45914	02	B06	05	0	B06	10	9465	DSD
I45915	12	C29	03	0	B06	05	9465	DSD
I46010	05	C04	07	0	C12	08	9465	DSD
I46110	06	B05	10	0	C09	08	9465	DSD
I46210	07	D17	07	0	C12	02	9465	DSD
I46310	05	C06	01	0	B07	05	9465	DSD
I46320	05	C06	02	0	B07	09	9465	DSD
I46410	10	C07	01	0	D22	06	9465	DSD
I46420	06	C07	02	0	D11	04	9465	DSD
I46510	07	C05	07	0	D12	11	9465	DSD
I46511	06	D12	11	0	D22	12	9465	DSD
I46520	06	C05	08	0	D11	03	9465	DSD
I46521	03	D11	03	0	D12	10	9465	DSD
I46610	08	B06	07	0	C16	09	9465	DSD

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I46620	09	B06	08	0	C20	09	9465	DSD
I46621	09	B06	08	0	D10	08	9465	DSD
I46630	09	B06	09	0	D12	02	9465	DSD
I46710	03	B05	07	0	B06	12	9465	DSD
I46810	03	B05	01	0	B04	06	9465	DSD
I46910	02	C01	04	0	C01	03	9465	DSD
I47010	02	C01	10	0	C01	09	9465	DSD
I47110	02	C01	07	0	C02	04	9465	DSD
I47111	02	C02	04	0	C03	04	9465	DSD
I47112	05	C03	04	0	B03	07	9465	DSD
I47210	02	C01	01	0	C02	03	9465	DSD
I47211	03	C02	03	0	C02	10	9465	DSD
I47212	06	C02	10	0	B03	06	9465	DSD
I47310	02	D22	04	0	D22	03	9465	DSD
I47311	09	D22	03	0	B10	10	9465	DSD
I47312	02	B10	10	0	B10	09	9465	DSD
I47410	08	D22	10	0	C33	09	9465	DSD
I47411	12	C33	09	0	B10	12	9465	DSD
I47412	02	B10	12	0	B10	11	9465	DSD
I48110	06	D02	04	0	B01	08	9465	DSD

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I48210	03	D03	01	0	D02	05	9465	DSD
I48220	04	D03	02	0	D03	14	9465	DSD
I48310	03	D02	01	0	D03	05	9465	DSD

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I48410	04	D06	01	0	D02	02	9465	DSD
I48510	03	D02	07	0	D06	09	9465	DSD

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I48610	07	D04	01	0	D18	10	9465	DSD
I48710	18	D04	04	0	A36	10	9465	DSD
I48810	03	D04	07	0	D03	04	9465	DSD
I48910	02	D04	10	0	D04	09	9465	DSD
I49010	05	D13	01	0	D18	04	9465	DSD
I49110	03	D03	07	0	D04	12	9465	DSD
I49111	09	D04	12	0	B01	12	9465	DSD
I49120	03	D03	08	0	D02	06	9465	DSD
I49121	04	D02	06	0	D06	06	9465	DSD
I49210	03	D06	07	0	D03	12	9465	DSD
I49310	02	D06	04	0	D06	03	9465	DSD

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K10010	08	A17	01	0	B11	12	9465	DSD
K10011	05	B11	12	0	C14	05	9465	DSD
K10020	06	A17	02	0	B11	05	9465	DSD
K10021	06	B11	05	0	B20	06	9465	DSD
K10110	06	A17	07	0	B20	12	9465	DSD
K10111	06	B20	12	0	B11	06	9465	DSD
K10120	04	A17	08	0	A13	12	9465	DSD
K10210	08	A18	01	0	B11	11	9465	DSD
K10211	06	B11	11	0	C14	11	9465	DSD
K10220	06	A18	02	0	B11	03	9465	DSD
K10221	05	B11	03	0	B20	04	9465	DSD
K10222	03	B20	04	0	B22	03	9465	DSD
K10310	06	A18	07	0	B11	04	9465	DSD
K10311	05	B11	04	0	B20	05	9465	DSD
K10312	03	B20	05	0	B22	06	9465	DSD
K10320	04	A18	08	0	A13	11	9465	DSD
K10410	08	A19	01	0	B11	10	9465	DSD
K10411	05	B11	10	0	C16	05	9465	DSD
K10420	04	A19	02	0	A14	10	9465	DSD
K10421	06	A19	02	0	B21	06	9465	DSD
K10510	04	A19	07	0	A14	11	9465	DSD

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K10511	06	A19	07	0	B21	12	9465	DSD
K10520	04	A19	08	0	A13	10	9465	DSD
K10610	08	A20	01	0	B11	09	9465	DSD
K10611	06	B11	09	0	C16	11	9465	DSD
K10620	04	A20	02	0	A14	08	9465	DSD
K10621	05	A20	02	0	B21	04	9465	DSD
K10622	03	B21	04	0	B22	09	9465	DSD
K10710	04	A20	07	0	A14	09	9465	DSD
K10711	05	A20	07	0	B21	05	9465	DSD
K10712	03	B21	05	0	B22	12	9465	DSD
K10720	05	A20	08	0	A13	09	9465	DSD
K10810	08	A21	01	0	B11	08	9465	DSD
K10811	10	A21	01	0	C18	06	9465	DSD
K10820	05	A21	02	0	A15	11	9465	DSD
K10821	06	A21	02	0	B23	06	9465	DSD
K10910	04	A21	07	0	A15	12	9465	DSD
K10911	06	A21	07	0	B23	12	9465	DSD
K10920	05	A21	08	0	A13	08	9465	DSD
K11010	10	A22	01	0	C18	12	9465	DSD
K11011	05	C18	12	0	D17	06	9465	DSD
K11020	05	A22	02	0	A15	09	9465	DSD
K11021	06	A22	02	0	B23	04	9465	DSD
K11022	03	B23	04	0	B24	06	9465	DSD
K11110	05	A22	07	0	A15	10	9465	DSD
K11111	05	A22	07	0	B23	05	9465	DSD
K11112	03	B23	05	0	B24	12	9465	DSD
K11120	05	A22	08	0	A13	07	9465	DSD
K11210	10	A23	01	0	C20	06	9465	DSD
K11211	06	C20	06	0	D17	05	9465	DSD
K11220	05	A23	02	0	A16	11	9465	DSD
K11221	03	A16	11	0	A15	07	9465	DSD
K11222	06	A23	02	0	B25	06	9465	DSD
K11310	05	A23	07	0	A16	12	9465	DSD
K11311	03	A16	12	0	A15	08	9465	DSD
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K11320	06	A23	08	0	A13	06	9465	DSD
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K11421	03	A16	09	0	A15	05	9465	DSD
K11422	05	A24	02	0	B25	04	9465	DSD
K11423	02	B25	04	0	B26	03	9465	DSD
K11510	05	A24	07	0	A16	10	9465	DSD
K11511	03	A16	10	0	A15	06	9465	DSD
K11512	05	A24	07	0	B25	05	9465	DSD
K11513	02	B25	05	0	B26	06	9465	DSD
K11520	06	A24	08	0	A13	05	9465	DSD
K12010	04	B20	01	0	A17	12	9465	DSD
K12011	04	A17	12	0	A11	11	9465	DSD
K12110	06	B20	07	0	A17	06	9465	DSD
K12111	05	A17	06	0	A11	12	9465	DSD
K12210	04	B22	01	0	A18	12	9465	DSD
K12211	05	A18	12	0	A11	09	9465	DSD
K12310	06	B22	04	0	A18	06	9465	DSD
K12311	05	A18	06	0	A11	10	9465	DSD
K12410	04	B21	01	0	A19	12	9465	DSD

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K12411	05	A19	12	0	A11	07	9465	DSD
K12510	06	B21	07	0	A19	06	9465	DSD
K12511	05	A19	06	0	A11	08	9465	DSD
K12610	05	B22	07	0	A20	12	9465	DSD
K12611	06	A20	12	0	A11	05	9465	DSD
K12710	06	B22	10	0	A20	06	9465	DSD
K12711	06	A20	06	0	A11	06	9465	DSD
K12810	04	B23	01	0	A21	12	9465	DSD
K12811	05	A21	12	0	A12	11	9465	DSD
K12910	06	B23	07	0	A21	06	9465	DSD
K12911	06	A21	06	0	A12	12	9465	DSD
K13010	04	B24	01	0	A22	12	9465	DSD
K13011	06	A22	12	0	A12	09	9465	DSD
K13110	05	B24	07	0	A22	06	9465	DSD
K13111	06	A22	06	0	A12	10	9465	DSD
K13210	04	B25	01	0	A23	12	9465	DSD
K13211	06	A23	12	0	A12	07	9465	DSD
K13310	05	B25	07	0	A23	06	9465	DSD
K13311	06	A23	06	0	A12	08	9465	DSD
K13410	04	B26	01	0	A24	12	9465	DSD
K13411	07	A24	12	0	A12	05	9465	DSD
K13510	05	B26	04	0	A24	06	9465	DSD
K13511	07	A24	06	0	A12	06	9465	DSD
K14010	04	B16	01	0	B12	12	9465	DSD
K14011	04	B12	12	0	C14	04	9465	DSD
K14110	04	B16	04	0	B13	12	9465	DSD
K14210	04	B16	07	0	B12	11	9465	DSD
K14211	05	B12	11	0	C14	10	9465	DSD
K14310	03	B16	10	0	B13	11	9465	DSD
K14410	04	B17	01	0	B12	10	9465	DSD
K14411	05	B12	10	0	C16	04	9465	DSD
K14510	04	B17	04	0	B13	10	9465	DSD
K14610	04	B17	07	0	B12	09	9465	DSD
K14611	06	B12	09	0	C16	10	9465	DSD
K14710	04	B17	10	0	B13	09	9465	DSD
K14810	06	B18	01	0	C18	05	9465	DSD
K14811	05	B18	01	0	B12	08	9465	DSD
K14910	04	B18	04	0	B13	08	9465	DSD
K15010	06	B18	07	0	C18	11	9465	DSD
K15011	04	B18	07	0	B12	07	9465	DSD
K15110	04	B18	10	0	B13	07	9465	DSD
K15210	06	B19	01	0	C20	05	9465	DSD
K15211	05	B19	01	0	B12	06	9465	DSD
K15310	04	B19	04	0	B13	06	9465	DSD
K15410	06	B19	07	0	C20	10	9465	DSD
K15411	05	B19	07	0	B12	05	9465	DSD
K15510	05	B19	10	0	B13	05	9465	DSD
K16010	11	D15	01	0	C35	06	9465	DSD
K16011	03	C35	06	0	C37	06	9465	DSD
K16012	08	C37	06	0	A34	11	9465	DSD
K16013	03	A34	11	0	A34	05	9465	DSD
K16110	03	D15	04	0	D15	12	9465	DSD
K16111	04	D15	12	0	D20	07	9465	DSD
K16210	02	D15	07	0	D15	06	9465	DSD
K16211	04	D15	06	0	D20	09	9465	DSD
K16310	03	D15	10	0	D15	03	9465	DSD



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K16311	04	D15	03	0	D20	08	9465 DSD
K20010	06	A31	01	0	B28	03	9465 DSD
K20020	07	A31	02	0	B28	12	9465 DSD
K20021	04	B28	12	0	C31	04	9465 DSD
K20022	08	C31	04	0	D23	08	9465 DSD
K20023	14	A31	02	0	B05	05	9465 DSD
K20024	06	A31	02	0	A39	05	9465 DSD
K20025	02	A39	05	0	A39	06	9465 DSD
K20110	03	A31	07	0	A28	11	9465 DSD
K20111	09	A28	11	0	C29	11	9465 DSD
K20112	04	C29	11	0	C33	03	9465 DSD
K20113	08	C33	03	0	D20	03	9465 DSD
K20120	10	A31	08	0	C40	03	9465 DSD
K20210	10	A29	01	0	C20	04	9465 DSD
K20211	07	C20	04	0	D27	09	9465 DSD
K20310	08	A29	07	0	C33	02	9465 DSD
K20311	08	C33	02	0	D20	04	9465 DSD
K20410	04	C32	01	0	C36	05	9465 DSD
K20411	07	C32	01	0	A32	12	9465 DSD
K20412	04	A32	12	0	A34	02	9465 DSD
K20413	07	A34	02	0	B29	05	9465 DSD
K20420	04	C32	02	0	C32	14	9465 DSD
K20510	09	C32	07	0	A28	06	9465 DSD
K20520	07	C32	08	0	D24	03	9465 DSD
K20610	06	B31	01	0	C31	03	9465 DSD
K20611	04	B31	01	0	A31	10	9465 DSD
K20620	03	B31	02	0	B29	08	9465 DSD
K20621	12	B29	08	0	D11	11	9465 DSD
K20622	08	B31	02	0	C37	10	9465 DSD
K20630	05	B31	03	0	A28	10	9465 DSD
K20631	07	B31	03	0	C29	10	9465 DSD
K20632	04	C29	10	0	C33	06	9465 DSD
K20710	05	B31	07	0	A31	09	9465 DSD
K20711	03	B31	07	0	B29	07	9465 DSD
K20720	03	B31	08	0	B28	06	9465 DSD
K20721	06	B28	06	0	A31	05	9465 DSD
K20722	07	B31	08	0	C36	11	9465 DSD
K20731	07	B31	09	0	C40	05	9465 DSD
K20810	09	C37	01	0	A37	01	9465 DSD
K20811	04	A37	01	0	A34	09	9465 DSD
K20812	02	A34	09	0	A32	09	9465 DSD
K20813	08	C37	01	0	D28	11	9465 DSD
K20820	04	C37	02	0	C37	14	9465 DSD
K20910	03	C37	07	0	C36	12	9465 DSD
K20920	03	C37	08	0	C40	06	9465 DSD
K21010	08	B30	01	0	C38	10	9465 DSD
K21020	07	B30	02	0	C34	08	9465 DSD
K21110	06	B30	07	0	A31	04	9465 DSD
K21111	07	B30	07	0	C36	10	9465 DSD
K21120	03	B30	08	0	B30	14	9465 DSD
K21210	04	C38	01	0	C41	12	9465 DSD
K21211	09	C38	01	0	A26	10	9465 DSD
K21220	03	C38	02	0	C37	12	9465 DSD
K21221	03	C37	12	0	C35	05	9465 DSD
K21222	09	C35	05	0	A34	04	9465 DSD
K21223	03	A34	04	0	A34	10	9465 DSD
K21224	04	C38	02	0	C42	12	9465 DSD
K21310	03	C38	07	0	C40	04	9465 DSD

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K21311	07	C38	07	0	B28	11	9465 DSD
K21320	03	C38	08	0	C36	09	9465 DSD
K21410	06	C28	01	0	C18	10	9465 DSD
K21411	06	C18	10	0	D10	07	9465 DSD
K21420	03	C28	02	0	C29	09	9465 DSD
K21421	03	C29	09	0	C32	09	9465 DSD
K21422	09	C32	09	0	A37	12	9465 DSD
K21423	05	A37	12	0	A33	06	9465 DSD
K21430	04	C28	03	0	C28	14	9465 DSD
K21510	03	C28	07	0	C29	02	9465 DSD
K21511	06	C29	02	0	C37	11	9465 DSD
K21520	03	C28	08	0	C31	08	9465 DSD
K21521	02	C31	08	0	C32	10	9465 DSD
K21522	04	C32	10	0	C38	03	9465 DSD
K21523	08	C36	03	0	A39	11	9465 DSD
K21530	08	C28	09	0	A26	11	9465 DSD
K21610	11	A27	01	0	C40	03	9465 DSD
K21620	11	A27	02	0	B08	02	9465 DSD
K21621	14	A27	02	0	D18	05	9465 DSD
K21622	05	D18	05	0	D13	06	9465 DSD
K21710	10	A27	07	0	C23	11	9465 DSD
K21711	06	C23	11	0	C14	09	9465 DSD
K21712	06	C14	09	0	D16	12	9465 DSD
K21720	03	A27	08	0	A27	14	9465 DSD
K30010	04	B32	01	0	B37	03	9465 DSD
K30011	05	B37	03	0	A35	02	9465 DSD
K30012	10	B32	01	0	D36	06	9465 DSD
K30110	03	B32	07	0	B33	12	9465 DSD
K30111	07	B33	12	0	A37	07	9465 DSD
K30112	04	A37	07	0	A39	04	9465 DSD
K30210	04	B33	01	0	B32	12	9465 DSD
K30211	07	B32	12	0	A37	09	9465 DSD
K30310	02	B33	07	0	B32	06	9465 DSD
K30311	06	B32	06	0	A37	08	9465 DSD
K30410	08	B38	01	0	C40	12	9465 DSD
K30420	07	B38	02	0	C36	08	9465 DSD
K30510	05	B38	07	0	B30	11	9465 DSD
K30511	06	B38	07	0	C41	11	9465 DSD
K30520	05	B38	08	0	B30	10	9465 DSD
K30521	06	B38	08	0	C42	11	9465 DSD
K30522	08	C42	11	0	D27	03	9465 DSD
K30610	04	C41	01	0	B37	12	9465 DSD
K30611	06	B37	12	0	A37	06	9465 DSD
K30710	06	C41	07	0	B36	11	9465 DSD
K30711	04	B36	11	0	B33	06	9465 DSD
K30712	03	B33	06	0	B32	11	9465 DSD
K30810	05	C42	01	0	B37	09	9465 DSD
K30811	06	B37	09	0	A37	05	9465 DSD
K30910	06	C42	07	0	B35	11	9465 DSD
K30911	03	B35	11	0	B33	05	9465 DSD
K30912	02	B33	05	0	B32	10	9465 DSD
K31010	06	C43	01	0	B37	06	9465 DSD
K31011	06	B37	06	0	A37	04	9465 DSD
K31110	07	C43	07	0	B34	11	9465 DSD
K31111	03	B34	11	0	B33	04	9465 DSD
K31112	03	B33	04	0	B32	09	9465 DSD



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K31210	04	B44	01	0	B42	14	9465	DSD
K31220	07	B44	02	0	C39	08	9465	DSD
K31221	05	C39	08	0	B41	09	9465	DSD
K31222	09	B44	02	0	A29	05	9465	DSD
K31230	06	B44	03	0	C44	06	9465	DSD
K31231	08	C44	06	0	C30	08	9465	DSD
K31232	06	C30	08	0	B30	04	9465	DSD
K31310	08	B44	07	0	C31	02	9465	DSD
K31311	08	C31	02	0	A33	08	9465	DSD
K31312	10	B44	07	0	D36	11	9465	DSD
K31320	05	B44	08	0	B38	09	9465	DSD
K31321	05	B38	09	0	C42	04	9465	DSD
K31322	03	C42	04	0	C39	03	9465	DSD
K31323	10	C39	03	0	A29	04	9465	DSD
K31330	10	B44	09	0	D36	12	9465	DSD
K31331	02	D36	12	0	D37	12	9465	DSD
K31410	07	B26	07	0	B39	05	9465	DSD
K31411	10	B39	05	0	D35	12	9465	DSD
K31510	07	B26	10	0	C36	04	9465	DSD
K40010	09	D18	01	0	B09	06	9465	DSD
K40011	04	B09	06	0	B05	03	9465	DSD
K40020	07	D18	02	0	D04	06	9465	DSD
K40021	17	D04	06	0	A28	04	9465	DSD
K40030	10	D18	03	0	B09	03	9465	DSD
K40031	09	D18	03	0	B28	08	9465	DSD
K40110	10	D18	07	0	B08	04	9465	DSD
K40120	04	D18	08	0	D24	12	9465	DSD
K40130	03	D18	09	0	D18	14	9465	DSD
K40210	04	B07	01	0	B05	09	9465	DSD
K40310	03	B07	04	0	B07	12	9465	DSD
K40311	11	B07	12	0	D20	12	9465	DSD
K40410	02	B07	07	0	B07	06	9465	DSD
K40411	03	B07	06	0	B06	11	9465	DSD
K40412	11	B06	11	0	D20	10	9465	DSD
K40510	03	B07	10	0	B07	03	9465	DSD
K40511	11	B07	10	0	D20	11	9465	DSD
L20010	09	A38	07	0	C38	05	9465	DSD
L20110	07	A38	01	0	B42	10	9465	DSD
L20111	05	B42	10	0	C38	04	9465	DSD
L30010	07	A40	01	0	B40	11	9465	DSD
L30011	03	B40	11	0	B41	03	9465	DSD
L30012	11	B41	03	0	D32	11	9465	DSD
L30013	03	A40	01	0	A43	05	9465	DSD
L30014	08	A43	05	0	A30	09	9465	DSD
L30016	06	D32	11	0	C44	11	9465	DSD
L30110	05	A40	07	0	B40	05	9465	DSD
L30111	02	B40	05	0	B41	06	9465	DSD
L30112	11	B41	06	0	D32	10	9465	DSD
L30113	03	A40	07	0	A43	09	9465	DSD
L30114	07	A43	09	0	A30	10	9465	DSD
L30116	08	D32	10	0	C44	12	9465	DSD
L30210	07	A42	01	0	B41	12	9465	DSD
L30211	07	A42	01	0	A30	11	9465	DSD
L40010	16	A42	07	0	D18	11	9465	DSD
L40210	03	A01	01	0	A02	11	9465	DSD
L40220	03	A01	05	0	A02	12	9465	DSD



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L40230	06	A01	07	0	B04	05	9465	DSD
S00010	10	D44	01	0	C24	01	9465	DSD
S00020	10	D44	02	0	C24	02	9465	DSD
S00110	10	D44	03	0	C25	11	9465	DSD
S00120	10	D44	04	0	C25	12	9465	DSD
T00410	09	B15	01	0	C27	12	9465	DSD
T00411	07	C27	12	0	D16	11	9465	DSD
T00510	09	B27	07	0	D24	06	9465	DSD
T00511	05	B27	07	0	C24	05	9465	DSD
T00610	05	C25	01	0	B29	06	9465	DSD
T00611	06	C25	01	0	D25	05	9465	DSD
T00710	05	C25	07	0	D25	06	9465	DSD
T00810	08	B15	07	0	A27	12	9465	DSD
T00811	09	B15	07	0	D16	10	9465	DSD
T00812	09	D16	10	0	C29	05	9465	DSD
T00813	08	C29	05	0	D20	02	9465	DSD
T10010	05	C15	01	0	B16	06	9465	DSD
T10011	09	C15	01	0	D26	12	9465	DSD
T10110	05	C15	07	0	B16	12	9465	DSD
T10111	08	C15	07	0	D26	11	9465	DSD
T10210	05	C17	01	0	B17	06	9465	DSD
T10211	08	C17	01	0	D26	10	9465	DSD
T10310	05	C17	07	0	B17	12	9465	DSD
T10311	07	C17	07	0	D26	09	9465	DSD
T10410	05	C19	01	0	B18	06	9465	DSD
T10411	07	C19	01	0	D26	08	9465	DSD
T10510	05	C19	07	0	B18	12	9465	DSD
T10511	07	C19	07	0	D26	07	9465	DSD
T10610	05	C21	01	0	B19	06	9465	DSD
T10611	07	C21	01	0	D26	06	9465	DSD
T10710	05	C21	07	0	B19	12	9465	DSD
T10711	06	C21	07	0	D26	05	9465	DSD
T20210	03	C26	07	0	C29	06	9465	DSD
T20211	03	C29	06	0	C32	06	9465	DSD
T20212	09	C26	07	0	D13	08	9465	DSD
T20213	05	C32	06	0	C37	09	9465	DSD
T20410	08	C26	01	0	D16	09	9465	DSD
T20411	03	C26	01	0	C29	04	9465	DSD
T20412	04	C29	04	0	C32	12	9465	DSD
T40010	04	D19	01	0	D18	12	9465	DSD
T40011	03	D18	12	0	D16	08	9465	DSD
T40110	14	D19	07	0	A01	12	9465	DSD
Y20310	07	A30	01	0	B28	09	9465	DSD
Y20610	09	A25	01	0	C27	06	9465	DSD
Y22110	05	A36	01	0	A30	12	9465	DSD
Y23010	13	D05	01	0	C27	05	9465	DSD
Y30510	03	B34	01	0	B33	09	9465	DSD
Y30511	04	B33	09	0	B32	05	9465	DSD
Y30610	04	B35	01	0	B33	10	9465	DSD
Y30611	04	B33	10	0	B32	04	9465	DSD
Y30710	04	B36	01	0	B33	11	9465	DSD
Y31210	07	B42	01	0	C38	11	9465	DSD
Y31310	06	B43	01	0	B33	08	9465	DSD
Y31311	03	B33	08	0	B32	02	9465	DSD
Y31510	08	D37	01	0	B42	11	9465	DSD
Y33010	02	D34	01	0	D35	03	9465	DSD



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Y33110	03	D33	01	0	D35	06	9465	DSD
Y33210	03	D32	01	0	D33	11	9465	DSD
Y33211	02	D33	11	0	D34	12	9465	DSD
Y40710	07	D09	01	0	D21	12	9465	DSD
Y41010	14	A39	10	0	D18	04	9465	DSD
100010	02	A26	02	0	A26	04	9465	DSD
*100020	02	A26	05	0	A26	07	9465	DSD
100030	04	A38	03	0	A44	01	9465	DSD
100031	02	A44	01	0	A44	02	9465	DSD
100040	04	A38	09	0	A44	03	9465	DSD
100041	02	A44	03	0	A44	04	9465	DSD
100050	02	A30	04	0	A30	05	9465	DSD
100051	02	A30	05	0	A30	07	9465	DSD
100052	05	A30	07	0	B34	04	9465	DSD
100053	02	B34	04	0	B35	04	9465	DSD
100060	02	B34	05	0	B34	07	9465	DSD
100070	02	B35	05	0	B35	07	9465	DSD
100080	02	B36	04	0	B36	07	9465	DSD
100090	03	A40	03	0	A44	05	9465	DSD
100091	02	A44	05	0	A44	06	9465	DSD
100100	03	A40	09	0	A44	07	9465	DSD
100101	02	A44	07	0	A44	08	9465	DSD
100110	03	A42	03	0	A44	09	9465	DSD
100111	02	A44	09	0	A44	10	9465	DSD
100120	02	B42	04	0	B42	05	9465	DSD
100121	02	B42	05	0	B42	07	9465	DSD
100130	02	B43	04	0	B43	07	9465	DSD
100170	14	B08	05	R	S100	02	9465	DSD
100171	01	S100	02	R	S100	03	9465	DSD
100180	18	C01	10	R	S101	02	9465	DSD
100190	19	C01	04	R	S101	03	9465	DSD
100200	09	A30	14	R	S100	C	9465	DSD
100201	03	S100	C	R	S101	C	9465	DSD
100210	02	C14	01	0	C15	05	9465	DSD
100220	02	C14	02	0	C15	06	9465	DSD
100230	02	C14	07	0	C15	11	9465	DSD
100240	02	C14	08	0	C15	12	9465	DSD
100250	02	C16	01	0	C17	05	9465	DSD
100260	02	C16	02	0	C17	06	9465	DSD
100270	02	C16	07	0	C17	11	9465	DSD
100280	02	C16	08	0	C17	12	9465	DSD
100290	02	C18	01	0	C19	05	9465	DSD
100300	02	C18	02	0	C19	06	9465	DSD
100310	03	C18	07	0	C19	11	9465	DSD
100320	03	C18	08	0	C19	12	9465	DSD
100330	03	C20	01	0	C21	05	9465	DSD
100340	03	C20	02	0	C21	06	9465	DSD
100350	03	C02	06	0	C05	06	9465	DSD
100351	05	C05	06	0	B03	09	9465	DSD
100360	05	C02	05	0	B04	09	9465	DSD
100361	10	B04	09	0	D14	12	9465	DSD
100370	03	C02	12	0	C04	05	9465	DSD
100371	05	C04	05	0	B04	10	9465	DSD
100380	02	C03	06	0	C04	04	9465	DSD
100381	05	C04	04	0	B03	10	9465	DSD
100390	02	C04	03	0	C05	05	9465	DSD

\*NOT ON UNITS S/N 7500 AND ABOVE  
5279

100391	05	C05	05	0	B03	11	9465 DSD
100400	05	C04	06	0	B04	11	9465 DSD
100401	10	B04	11	0	D14	11	9465 DSD
100410	02	C03	12	0	C02	11	9465 DSD
100411	05	C02	11	0	B04	12	9465 DSD
100420	03	C03	11	0	C03	05	9465 DSD
100421	05	C03	05	0	B03	12	9465 DSD
100430	12	D20	05	0	B02	06	9465 DSD
100460	02	D34	04	0	D34	07	9465 DSD
100470	02	D33	05	0	D33	07	9465 DSD
100480	02	D32	04	0	D32	07	9465 DSD
100490	02	A36	05	0	A36	07	9465 DSD
100500	02	D09	08	0	D09	09	9465 DSD
100510	10	TP100		R	A21	14	9465 DSD
100600	02	D37	04	0	D37	07	9465 DSD
100700	02	C20	07	0	C21	11	9465 DSD
100710	02	C20	08	0	C21	12	9465 DSD
100720	02	A42	09	0	A44	11	9465 DSD
100730	03	D02	09	0	D04	03	9465 DSD
200010	10	J100	01	X	C14	01	9465 DSD
200020	10	J100	04	X	C14	02	9465 DSD
200030	10	J100	02	X	C14	07	9465 DSD
200040	10	J100	05	X	C14	08	9465 DSD
200050	11	J100	03	X	C16	01	9465 DSD
200060	11	J100	07	X	C16	02	9465 DSD
200070	10	J100	08	X	C16	07	9465 DSD
200080	10	J100	12	X	C16	08	9465 DSD
200090	11	J100	10	X	C18	01	9465 DSD
200100	11	J100	13	X	C18	02	9465 DSD
200110	11	J100	11	X	C18	07	9465 DSD
200120	11	J100	14	X	C18	08	9465 DSD
200130	12	J100	15	X	C20	01	9465 DSD
200140	12	J100	18	X	C20	02	9465 DSD
200150	12	J100	16	X	C20	07	9465 DSD
200160	12	J100	20	X	C20	08	9465 DSD
200170	12	J100	17	X	C22	07	9465 DSD
200180	12	J100	21	X	C22	08	9465 DSD
200190	13	J100	22	X	C23	01	9465 DSD
200200	13	J100	25	X	C23	02	9465 DSD
200210	13	J100	23	X	C22	01	9465 DSD
200220	13	J100	26	X	C22	02	9465 DSD
200230	12	J100	24	X	C23	07	9465 DSD
200240	12	J100	27	X	C23	08	9465 DSD
200250	12	J100	28	X	C24	08	9465 DSD
200260	12	J100	31	X	C24	07	9465 DSD
200270	13	J100	29	X	B15	11	9465 DSD
200280	13	J100	32	X	B15	12	9465 DSD
200290	09	J100	30	X	D19	05	9465 DSD
200300	09	J100	33	X	D19	06	9465 DSD
200310	13	J100	34	X	C26	05	9465 DSD
200320	13	J100	37	X	C26	06	9465 DSD
200330		J100	35	X			9465 DSD
200340		J100	38	X			9465 DSD
200350	12	J100	36	X	J101	36	9465 DSD
200360	12	J100	39	X	J101	39	9465 DSD
200370		J100	40	X			9465 DSD
200380		J100	43	X			9465 DSD

33311

24	A	0
24	A	4
24	B	0
24	B	4
24	C	0
24	C	4
24	D	0
24	D	4
24	E	0
24	E	4
24	F	0
24	F	4
24	G	0
24	G	4
24	H	0
24	H	4
24	J	0
24	J	4
24	K	0
24	K	4
24	L	0
24	L	4
24	M	0
24	M	4
24	N	0
24	N	4
24	P	0
24	P	4
24	R	0
24	R	4
24	S	0
24	S	4

24 4  
24 4

200390		J100	41	X			9465	DSD		
200400		J100	44	X			9465	DSD		
200410		J100	42	X			9465	DSD		
200420		J100	45	X			9465	DSD		
200430		J100	46	X			9465	DSD		
200440		J100	49	X			9465	DSD		
200450	17	J100	47	X	B27	11	9465	DSD	24	T 0
200460	17	J100	50	X	B27	12	9465	DSD	24	T 4
200490	09	J100	52	X	D19	11	9465	DSD	24	V 0
200500	09	J100	55	X	D19	12	9465	DSD	24	V 4
200510		J100	53	X			9465	DSD		
200520		J100	56	X			9465	DSD		
200530		J100	54	X			9465	DSD		
200540		J100	57	X			9465	DSD		
200550	13	J100	58	X	C26	11	9465	DSD	24	W 0
200560	13	J100	62	X	C26	12	9465	DSD	24	W 4
200570	13	J100	59	X	C25	05	9465	DSD	24	X 0
200580	13	J100	63	X	C25	06	9465	DSD	24	X 4
200590	14	J100	60	X	B15	05	9465	DSD	24	Y 0
200600	14	J100	64	X	B15	06	9465	DSD	24	Y 4
200610		J100	65	X			9465	DSD		
200620		J100	70	X			9465	DSD		
200630		J100	66	X			9465	DSD		
200640		J100	71	X			9465	DSD		
200650		J100	67	X			9465	DSD		
200660		J100	72	X			9465	DSD		
200670		J100	73	X			9465	DSD		
200680		J100	76	X			9465	DSD		
200690		J100	74	X			9465	DSD		
200700		J100	77	X			9465	DSD		
200710		J100	75	X			9465	DSD		
200720		J100	78	X			9465	DSD		
200730	18	J100	79	X	D43	13	9465	DSD	24	6
200740	18	J100	80	X	D43	14	9465	DSD	24	0
200750	18	J100	82	X	D43	15	9465	DSD	24	2
300010	11	J101	01	X	C15	05	9465	DSD	24	A 0
300020	11	J101	04	X	C15	06	9465	DSD	24	A 4
300030	10	J101	02	X	C15	11	9465	DSD	24	B 0
300040	10	J101	05	X	C15	12	9465	DSD	24	B 4
300050	11	J101	03	X	C17	05	9465	DSD	24	C 0
300060	11	J101	07	X	C17	06	9465	DSD	24	C 4
300070	10	J101	08	X	C17	11	9465	DSD	24	D 0
300080	10	J101	12	X	C17	12	9465	DSD	24	D 4
300090	10	J101	10	X	C19	05	9465	DSD	24	E 0
300100	10	J101	13	X	C19	06	9465	DSD	24	E 4
300110	09	J101	11	X	C19	11	9465	DSD	24	F 0
300120	09	J101	14	X	C19	12	9465	DSD	24	F 4
300130	11	J101	15	X	C21	05	9465	DSD	24	G 0
300140	11	J101	18	X	C21	06	9465	DSD	24	G 4
300150	11	J101	16	X	C21	11	9465	DSD	24	H 0
300160	11	J101	20	X	C21	12	9465	DSD	24	H 4
300170	11	J101	17	X	C22	07	9465	DSD	24	J 0
300180	11	J101	21	X	C22	08	9465	DSD	24	J 4
300190	11	J101	22	X	C23	01	9465	DSD	24	K 0
300200	11	J101	25	X	C23	02	9465	DSD	24	K 4
300210	11	J101	23	X	C22	01	9465	DSD	24	L 0
300220	11	J101	26	X	C22	02	9465	DSD	24	L 4
300230	10	J101	24	X	C23	07	9465	DSD	24	M 0

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300240	10	J101	27	X	C23	08	9465 DSD	24	M	4
300250	10	J101	28	X	C24	08	9465 DSD	24	N	0
300260	10	J101	31	X	C24	07	9465 DSD	24	N	4
300270	14	J101	29	X	B15	11	9465 DSD	24	P	0
300280	14	J101	32	X	B15	12	9465 DSD	24	P	4
300290	09	J101	30	X	D19	05	9465 DSD	24	R	0
300300	09	J101	33	X	D19	06	9465 DSD	24	R	4
300310	11	J101	34	X	C26	05	9465 DSD	24	S	0
300320	11	J101	37	X	C26	06	9465 DSD	24	S	4
300330		J101	35	X			9465 DSD			
300340		J101	38	X			9465 DSD			
300370		J101	40	X			9465 DSD			
300380		J101	43	X			9465 DSD			
300390		J101	41	X			9465 DSD			
300400		J101	44	X			9465 DSD			
300410		J101	42	X			9465 DSD			
300420		J101	45	X			9465 DSD			
300430		J101	46	X			9465 DSD			
300440		J101	49	X			9465 DSD			
300450	15	J101	47	X	B27	11	9465 DSD	24	T	0
300460	15	J101	50	X	B27	12	9465 DSD	24	T	4
300490	08	J101	52	X	D19	11	9465 DSD	24	V	0
300500	08	J101	55	X	D19	12	9465 DSD	24	V	4
300510		J101	53	X			9465 DSD			
300520		J101	56	X			9465 DSD			
300530		J101	54	X			9465 DSD			
300540		J101	57	X			9465 DSD			
300550	10	J101	58	X	C26	11	9465 DSD	24	W	0
300560	10	J101	62	X	C26	12	9465 DSD	24	W	4
300570	11	J101	59	X	C25	05	9465 DSD	24	X	0
300580	11	J101	63	X	C25	06	9465 DSD	24	X	4
300590	17	J101	60	X	B15	05	9465 DSD	24	Y	0
300600	17	J101	64	X	B15	06	9465 DSD	24	Y	4
300610		J101	65	X			9465 DSD			
300620		J101	70	X			9465 DSD			
300630		J101	66	X			9465 DSD			
300640		J101	71	X			9465 DSD			
300650		J101	67	X			9465 DSD			
300660		J101	72	X			9465 DSD			
300670		J101	73	X			9465 DSD			
300680		J101	76	X			9465 DSD			
300690		J101	74	X			9465 DSD			
300700		J101	77	X			9465 DSD			
300710		J101	75	X			9465 DSD			
300720		J101	78	X			9465 DSD			
300730	13	J101	79	X	D44	13	9465 DSD	24		6
300740	13	J101	80	X	D44	14	9465 DSD	24		0
300750	13	J101	82	X	D44	15	9465 DSD	24		2
400010	11	J102	A	X	C24	01	9465 DSD	24	A	0
400020	11	J102	B	X	C24	02	9465 DSD	24	A	4
400030	12	J102	D	X	C25	11	9465 DSD	24	B	0
400040	12	J102	E	X	C25	12	9465 DSD	24	B	4
400070		J102	H	X			9465 DSD			
400080		J102	J	X			9465 DSD			
400090		J102	K	X			9465 DSD			
400100	11	J102	L	X	D44	15	9465 DSD	24		2

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400110	11	J102	M	X	D44	14	9465	DSD	24		0
400120	11	J102	N	X	D44	13	9465	DSD	24		6
600010	14	J104	01	X	B08	01	9465	DSD	20		4
600020	10	J104	02	X	C01	06	9465	DSD	24		4
600030	11	J104	03	X	C01	12	9465	DSD	24		4
600040	11	J104	04	X	C02	06	9465	DSD	24		4
600050	11	J104	05	X	C02	05	9465	DSD	24		4
600060	11	J104	07	X	C02	12	9465	DSD	24		4
600070	11	J104	08	X	C03	06	9465	DSD	24		4
600080	11	J104	10	X	C04	03	9465	DSD	24		4
600100	11	J104	12	X	C04	06	9465	DSD	24		4
600110	11	J104	13	X	C03	12	9465	DSD	24		4
600120	10	J104	14	X	C03	11	9465	DSD	24		4
600130	14	J104	15	X	D20	05	9465	DSD	24		4
600140	19	J104	16	X	A25	12	9465	DSD	24		4
600150		J104	17	X			9465	DSD			
600170	17	J104	20	X	A28	09	9465	DSD	24	A	4
600180	17	J104	21	X	A28	14	9465	DSD	24	A	0
600190	12	J104	22	X	B14	07	9465	DSD	24	B	9
600200	12	J104	23	X	B14	01	9465	DSD	24	B	4
600210	12	J104	24	X	B14	15	9465	DSD	24	B	0
600220	19	J104	25	X	A33	15	9465	DSD	24	C	0
600230	19	J104	26	X	A34	01	9465	DSD	24	C	4
600240	20	J104	27	X	A34	15	9465	DSD	24	D	0
600250	20	J104	28	X	A34	07	9465	DSD	24	D	4
600270	24	J104	30	X	A40	06	9465	DSD	20		4
600280	23	J104	31	X	A40	12	9465	DSD	20		4
600290	23	J104	32	X	A38	06	9465	DSD	20		4
600300	23	J104	33	X	A38	12	9465	DSD	20		4
600310	25	J104	34	X	A42	06	9465	DSD	20		4
600320	25	J104	35	X	A42	12	9465	DSD	20		4
600330	21	J104	36	X	A28	09	9465	DSD	20		4
600400	21	J104	43	X	A28	05	9465	DSD	24		4
600410	21	J104	44	X	A28	01	9465	DSD	24		4
600420		J104	45	X			9465	DSD			
600430	16	J104	46	X	J102	X	9465	DSD	20		4
600440		J104	47	X			9465	DSD			
600450	06	J104	48	X	LCG		9465	DSD	16		4
600460	06	J104	49	X	LCG		9465	DSD	16		4
600470	06	J104	50	X	LCG		9465	DSD	16		4
600480	22	J104	51	X	NEG	20	9465	DSD	16		4
600490	22	J104	52	X	NEG	20	9465	DSD	16		4
600500	22	J104	53	X	NEG	20	9465	DSD	16		4
600510	22	J104	54	X	POS	20	9465	DSD	16		4
600520	22	J104	55	X	POS	20	9465	DSD	16		4
600530	22	J104	56	X	POS	20	9465	DSD	16		4
600540	16	J104	57	X	J102	V	9465	DSD	20		4
600550	16	J104	58	X	J102	W	9465	DSD	20		4
600560	08	J104	59	X	D18	02	9465	DSD	24		4
600560	08	J104	59	X	D02	07	9465	DSD			
600580	16	J104	62	X	J102	R	9465	DSD	20		4
600590	16	J104	63	X	J102	T	9465	DSD	20		4
600600	16	J104	64	X	J102	U	9465	DSD	20		4
600610	24	J104	70	X	A35	15	9465	DSD	24	G	0
600620	24	J104	73	X	A35	01	9465	DSD	24	G	4
600630	22	J104	79	X	A28	01	9465	DSD			
600640	08	J104	80	X	D02	09	9465	DSD			

LW45480600 9465 DSD

600650 05 J104 78 X 005 12 9465 DSD

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LV45480600 9465 DSD

600650	08	J104	59	X 002	07	9465 DSD
700650	05	J104	78	X 005	12	9465 DSD









TITLE  
**WIRE LISTING**

WL DOCUMENT NO. 46809600 REV. 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	39	COAX	000	03	X05	14		X04	14		
21	39	COAX	000	03	X03	14		X02	14		
22	37	24	222	02	X07	15		X06	15		
23	↑	↑	↑	↑	X03	15		X02	15		
24					X12	15		X13	15		
25					X18	15		X19	15		
26	37			02	X20	15		X21	15		
27	43		222	05	X09	15		X04	15		
28	38		666	02	X05	13		X04	13		
29	↑		↑	↑	X07	13		X06	13		
30					X03	13		X02	13		
31					X08	13		X09	13		
32					X18	13		X19	13		
33					X20	13		X21	13		
34	38		666	02	X12	13		X13	13		
35	46		993	03	X22	05		X22	11		
36	46		993	03	X08	02		X10	11		
37	46		993	03	X10	02		X08	09		
38	46	24	993	03	X10	04		X08	10		



TITLE  
**WIRE LISTING**

WL DOCUMENT NO. 46809600 REV. 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	51	COAX	000	04	X01	14		3			
40	46	24	993	03	X18	03		X18	09		
41	↑	↑	↑	↑	X19	03		X19	09		
42					X20	03		X20	09		
43					X21	03		X21	09		
44					X22	03		X22	09		
45					X04	06		X05	01		
46					X06	09		X06	14		
47					X10	10		X08	11		
48	46	24	993		X14	01		X03	06		
49	39	COAX	000		X08	14		X09	14		
50	↑	↑	↑		X10	14		X11	14		
51					X12	14		X13	14		
52					X18	14		X19	14		
53	39	COAX	000	03	X20	14		X21	14		
54	47	24	994	04	X09	01		X12	11		
55	47	24	994	04	X09	04		X12	12		
56	40	COAX	000	04	X14	14		X17	14		
57	51	COAX	000	04	X22	14		3			

FORM AA 1609



CONTROL DATA	TITLE	CONTROL PANEL ASSEMBLY	WL	DOCUMENT NO.	41283000	REV.	E
	PRODUCT	DISK PAK	SHEET 1 OF 3				

REVISION STATUS OF SHEETS				REVISIONS						
1	2	3		REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.
A	A	A		A		RELEASED		10/23/60		
B	B	B		B	PM0460	SEE CO	BL	5-5-66	Kil	
C	C	B		C	PM0250	SEE CO	DK	3-30-62		
				D	PM3049	SEE CO	DGT	6-28-62	TLT	7-3-62
				E	PE12298	CHG GAUGE, COLOR, LENGTH, & NOTE 2	TRC	11-7-69	97	11-10-69

NOTES:

- DETACHED LISTS:  
A. PL 41274400
- FOR MECH. ASSY SEE 41274400 & 45525700

COPIES TO	BY	L M	DATE	8-20-65	CHKD.	L M	DATE	10-14-65	APPD.	TRP	DATE	10-15-65
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CONTROL DATA	TITLE	WIRE LISTING	WL	DOCUMENT NO.	41283000	REV.	E
	PERIPHERAL EQUIP. DIV.	SHEET 2 OF					

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
1	13	20	4	16	P310	1	14 DS305A	1	
2	13	20	4	16	DS305A	2	P310	2	14
3	13			16	P310	3	S305A	NO	
4	13			14	DS302A	1	P310	4	14
5	13			14	P310	5	14 DS302B	2	
6	13			12	S301C	C	P310	6	14
7	13			14	P310	7	14 DS301A	2	
8	13			12	S301B	C	P310	8	14
9	13			12	P310	9	14 S301A	NO	
10	13			12	S301B	NC	P310	10	14
11	13	20		12	P310	11	14 S301B	NO	
12	15	24		02	S301C	NO	DS301A	1	
13	15	24		03	DS301A	1	DS301B	1	
14	15	24		03	DS301A	2	DS301B	2	
15	15	24		03	DS302A	1	DS302B	1	
16	15	24		03	DS302A	2	DS302B	2	
17	13	20		08	DS302A	2	S301A	C	
18	13	20	4	10	DS301B	2	S305A	C	
19									

FORM 385-2 REVISED 4/2/64



**CONTROL DATA**  
CONTROL DATA CORPORATION

TITLE  
**WIRE LISTING**

WL DOCUMENT NO. 45498200 REV. C  
 SHEET 2 OF

MINNEAPOLIS, MINNESOTA

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	2	X22	06	6,13	
2	↑	↑	↑	↑	P220	2	2	X21	12	6,13	
3	↓	↓	↓	↓	P220	3	2	X20	06	6,13	
4	↓	↓	↓	↓	P220	4	2	X19	12	6,13	
5	9	20	4	19	P220	5	2	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	1	COND 6A			
8	10	24	4	1.5	COND 6A			X12	01	5,12	
9	11	24	0	2.5	P220	14	1	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	1	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	

**CONTROL DATA**  
CONTROL DATA CORPORATION

TITLE  
**WIRE LISTING**

WL DOCUMENT NO. 45498200 REV. C  
 SHEET 3 OF 3

MINNEAPOLIS, MINNESOTA

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	1	COND 16A			
18	10	24	4	1.5	COND 16A			X12	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	2	X18	12	6,13	
22	↑	↑	↑	↑	P220	10	2	X19	06	6,13	
23	↓	↓	↓	↓	P220	11	2	X20	12	6,13	
24	↓	↓	↓	↓	P220	12	2	X21	06	6,13	
25	9	20	4	19	P220	13	2	X22	12	6,13	

FORM AA 1669



**CONTROL DATA**  
CORPORATION  
MINNEAPOLIS, MINNESOTA

TITLE  
**WIRE LISTING**

WL DOCUMENT NO. 45444900 REV. B

SHEET 3 OF

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
10	9	24	4	8	L201	T	7	J230	K	2	8
11	9	24	4	9	L201	B	7	J230	Y	3	8
12	93										9
12A					CR15	T	5	L201	T		
12B					CR15	B	5	L201	B		
13	93										
13A					CR10	T	5	L200	T		
13B					CR10	B	5	L200	B		9

**CONTROL DATA**  
CORPORATION  
MINNEAPOLIS, MINNESOTA

TITLE  
DUO-TYPE CONNECTOR ASSEMBLY  
PRODUCT  
DISK PAK

WL DOCUMENT NO. 45513300 REV. A

SHEET 1 OF 2

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" -0"

A. PL 45519200  
B. FOR MECH ASSY SEE 45519200

2 FOR CONDUCTOR DESIGNATION SEE R/W LOGIC WIRE LIST

COPIES TO

BY PJN DATE 4-21-66 CHKD. LRO DATE 4-21-66 ENGR JCP DATE 4-21-66

FORM AA 1672



<b>CONTROL DATA</b> MINNEAPOLIS, MINNESOTA		TITLE <b>WIRE LISTING</b>					DOCUMENT NO. 45479200		REV. A	
						WL		SHEET 2 OF 2		
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		DESTINATION		REMARKS	
1	B	16								
1A			0		PO1	A	FL303	B	ØA	
1B			3		PO1	D	FL301	B	ØC	
1C			2		PO1	E	FL300	B	ØB	
1D			9		PO1	B	FL302	B	NEUTRAL	
1E			5		PO1	C	GROUND	-		

FORM AA 1672

<b>CONTROL DATA</b> MINNEAPOLIS, MINNESOTA		TITLE <b>FINAL ASSEMBLY I</b>					DOCUMENT NO. 45526700		REV. C	
PRODUCT <b>DISK PAK</b>						WL		SHEET 1 OF 2		
REVISION STATUS OF SHEETS				REVISIONS						
1	2	REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.		
A	A	A		RELEASED		5-20-66		NB		
B	B	B	PM 1164	SEE CO	LRH	3-9-67	RTR			
C	C	C	PM 2131	SEE CO	S.C.	11-1-67	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. A NUMBER IN FRONT OF A HEXAGON IS THE TERMINAL FIND NO.

**2.** DETACHED LISTS:  
A. PARTS LIST  
B. FOR MECH ASSY SEE 41251000

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

**4** TOLERANCES ON LENGTHS SHOWN TO BE  $\pm 1''$   
 $\pm 0''$

COPIES TO	BY	K.T.	DATE	4-21-66	CHKD.	LRO	DATE	4-21-66	ENGR	JW	DATE	4/21/66
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FORM AA 1672





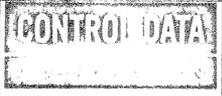
TITLE  
**WIRE LISTING**

WL DOCUMENT NO. 45526700 REV. C

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	51	24	4	9	J230	K	67	L201	T	66 (1)	
2	51	24	4	11	L201	T	(1)	TB320	8	58	
3	62	24	4	12	TB320	6	58	L201	B	66	
4	51	24	4	8	J230	V	67	TB320	4	58	
5	108	20	4	8	J230	X	109	TB320	10	58	
6	(3)										
6A					L200	B		TB320	7		
6B					S200	NC		TB320	5		
6C					S200	NO		TB320	3		
6D					S200	C		TB320	1		
7	(3)				L200	T		TB320	9		
8	108	20	4	8	TB320	10	58	TB320	2	58	



TITLE  
VOLTAGE ADJ. ASSEMBLY (+20VDC)

PRODUCT  
DISK PAK

WL DOCUMENT NO. 41297200 REV. A

MINNEAPOLIS, MINNESOTA

SHEET 1 OF 2

REVISION STATUS OF SHEETS				REVISIONS							
1	2			REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.	
A	A			A		RELEASED		2/7/66		DLE	

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

2 DETACHED LISTS:  
A. P/L 41253200  
B. FOR MECH ASSY SEE 41253200

COPIES TO	BY	K.T.	DATE	2-4-66	CHKD.	LRO	DATE	2-4-66	ENGR	KY	DATE	2-4-66
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FORM AA 1872











<b>CONTROL DATA</b> MINNEAPOLIS, MINNESOTA		TITLE <b>WIRE LISTING</b>					WL		DOCUMENT NO. 41289600	REV. D	
SHEET 2 OF											
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION <sup>2</sup>		ACCESS. FIND NO.	REMARKS
1	7	24	4	14	S100	02				6,8	
2	11	22		1	S100	03		S100	02		
3	9	24	4	18	S101	02				6,8	
4	10	24	4	20	S101	03				6,8	
5	8	24	4	10	S100	A				6,8	
6	6	24	4	4	S101	B		S100	A		
7	13	24	4	10	TP100					6,8	

<b>CONTROL DATA</b> MINNEAPOLIS, MINNESOTA		TITLE FRONT PANEL ASSY					WL		DOCUMENT NO. 70538000	REV. E
PRODUCT DISK STORAGE DRIVE										
SHEET 1 OF 2										

REVISION STATUS OF SHEETS		REVISIONS							
REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.			
1	2								
	A	RELEASED		4-29-68					
	B	PM3088 SEE CO	EW	6-14-68	TLT	6-18-68			
	C	PM5334 DRAWING WAS 45480300	DC	6-17-69	97	6-20-69			
	D	PEI2231 NOTE CHG ONLY S/N 13000	FJC	10-17-69	97	10-22-69			
	E	12225 DWG NO WAS 45419200 S/N 13000	DC	10-28-69	TLT	11-3-69			

NOTES:

- DETACHED LISTS:  
A. PL 70537700  
B. FOR MECH ASSY SEE 70537700

<sup>2</sup> THESE CONDUCTORS ARE PART OF ARC SUPPRESSOR ASSY. F/N 50.

COPIES TO	BY	J.L.S.	DATE	4-15-68	CHKD.	HJ	DATE	4-15-68	ENGR	TLT	DATE	4/15
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FORM AA 1672

CONDUCTOR IDENT.		FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS
1	△ 2					K03	4C		TB09	2		
2	38	24	4		CB01C	B	39	DS06	B	40		
3	△ 2				CB01B	B	43	TB09	I			
4	38	24	4		CB01B	B	39	DS05	B	40		
5	△ 2				K03	3C		TB09	4			
6					K03	2C	48	M01	R	49		
7	38	24	4		CB01A	B	39	DS04	B	40		
8	△ 2				M01	L	49	TB09	5			
9	41	16	4		CB10B	B	43	S01	T	43		
10	41	16	4		CB10B	B	43	DS08	B	42		
11	41	16	4		DS08	T	42	CB10A	B	43		
12	△ 2				TB09	3		K03	2C			
13	38	24	4		CB02	B	39	TPO1				
14	38	24	4		CB03	B	39	TPO3				
15	38	24	4		CB05	B	39	TPO5				

FORM AA 1669

CONTROL DATA		TITLE	WL	DOCUMENT NO.	REV.
MINNEAPOLIS, MINNESOTA		HARNESS, D.C. POWER PANEL		46819600	D
CORPORATION		PRODUCT	SHEET 1 OF 3		
		DISK PAK			

REVISION STATUS OF SHEETS				REVISIONS						
1	2	3		REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.
A	A	A		A		RELEASED		10/27/65		<i>[Signature]</i>
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









<b>CONTROL DATA</b> CORPORATION MINNEAPOLIS, MINNESOTA	TITLE	HARNES ASSY, A.C. (POWER SUPPLY)	DOCUMENT NO.	REV.
	PRODUCT	DISK STORAGE DRIVE	WL 45419600	D

REVISION STATUS OF SHEETS			REVISIONS						
1	2	3	REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.
			A		RELEASED		4-23-68		
			B	PM2952	SEE CO	EW	6-19-68	TLT	6-20-68
			C	PM4823	SEE CO	GV	4-15-69	DCY	5-6
			D	PM5334	DWG WAS 45480400	DS	6-17-69	97	6-20-69

NOTES:  
1. DETACHED LISTS:  
A. PL 45480900

COPIES TO	BY	RWP	DATE	4/17/68	CHKD.	DS	DATE	4/18/68	ENGR	DWP	DATE	4/19/68
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<b>CONTROL DATA</b> CORPORATION MINNEAPOLIS, MINNESOTA	TITLE	WIRE LISTING	DOCUMENT NO.	REV.
			WL 45419600	D

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
1	1	16	4		TB09	2	J04	1	8
2	↑	↑	↑		FLO1	L	TB05	1	6
3					FLO1	L	J05	1	8
4					TB01	1	K03	3A	7
5					K03	3C	J04	3	6
6					TB01	1	M01	L	5
7	↓	↓			TB01	1	TB05	2	6
8	1	16			TB01	2	J05	3	8
9	11	24			TB01	2	DS04	T	12
10	11	24			TB01	2	DS05	T	12
11	14	24			TB01	2	DS06	T	12
12	1	16			CB10B	B	FLO1	L	3
13	↑	↑			FLO1	R	T01	1	↑
14					CB10A	B	FLO2	L	↓
15					FLO2	R	T01	2	3
16					T01	6	TB01	3	7
17					TB01	3	T01	6	3
18	↓	↓	↓		J04	4	SAFETY GROUND		3
19	1	16	4		J04	6	SAFETY GROUND		3

FORM AA 1069



<b>CONTROL DATA</b> MINNEAPOLIS, MINNESOTA	TITLE	HARNES ASSY, A.C. (POWER SUPPLY)	DOCUMENT NO.	REV.
	PRODUCT	DISK STORAGE DRIVE	WL 70537900	E
			SHEET 1 OF 3	

REVISION STATUS OF SHEETS			REVISIONS						
1	2	3	REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.
			A		RELEASED		4-23-68		
			B	PM2952	SEE CO	EW	5-19-68	TLT	6-20-68
			C	PM4823	SEE CO	GV	4-15-69	SCY	5-6
			D	PM5334	DWG WAS 45480400	DS	5-17-69	97	6-20-69
			E	12225	DWG NO WAS 45419600	DC	10-28-69	TLT	11-3-69

NOTES:  
1. ASSOCIATED DOCUMENTS:  
A. PL 70537800.

COPIES TO		BY	<i>RSP</i>	DATE	4/17/68	CHKD.	<i>AF</i>	4/18/68	ENGR	<i>TRP</i>	DATE	4/18/68
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FORM AA 1672

<b>CONTROL DATA</b> MINNEAPOLIS, MINNESOTA	TITLE	WIRE LISTING	DOCUMENT NO.	REV.
			WL 70537900	E
			SHEET 2 OF	

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
1	1	16	4		TB09	2	J04	1	8
2	↑	↑	↑		CB01	B	TB05	1	6
3					TB05	1	J05	1	8
4					TB01	1	K03	3A	7
5					K03	3C	J04	3	8
6					TB01	1	M01	L	5
7	↓	↓			TB01	1	TB05	2	6
8	1	16			TB01	2	J05	3	8
9	11	24			TB01	2	DS04	T	12
10	11	24			TB01	2	DS05	T	12
11	11	24			TB01	2	DS06	T	12
12	1	16			SO1	B	FL01	L	3
13	↑	↑			FL01	R	T01	1	3
14					CB10A	B	FL02	L	3
15					FL02	R	T01	2	3
16					T01	6	TB01	3	7
17					TB01	3	T01	6	3
18	↓	↓	↓		J04	4	SAFETY GROUND	3	
19	1	16	4		J04	6	SAFETY GROUND	3	



MINNEAPOLIS, MINNESOTA	TITLE	DOCUMENT NO.	REV.
	WIRE LISTING	70539600	J

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
1	15	16	4		C11	+	C10	+	10(1)
2	↑	↑	↑		C10	+	C09	+	10(2)
3					C09	+	TB07	5	18
4					R17	R	TB02	2	18
5					TB02	2	Q02	B	5
6					Q02	C	TB02	14	18
7					TB02	14	Q05	B	5
8					Q05	C	CB07A	B	4
9					CB07B	T	R20	R	2
10					R23	R	CB07A	T	4
11					CB07B	B	Q03	C	5
12	↓	↓	↓		Q03	B	TB02	14	18
13	15	16	14		TB02	14	R17	L	2
14									
15	15	16	14		C04	+	CB03	T	10(3)
16	↑	↑	↑		CB03	T	K02	3A	18
17					K02	3C	TB06	4	18
18	↓	↓	↓		TB07	3	K02	4C	18
19	15	16	4		K02	4A	CB02	T	10(4)

FORM AA1669

MINNEAPOLIS, MINNESOTA	TITLE	DOCUMENT NO.	REV.
	WIRE LISTING	70539600	J

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
20	15	16	4		CB02	T	C02	-	4
21	↑	↑	↑		T01	6	C09	-	10(5)
22					C09	-	C10	-	10(7)
23					C10	-	C09	-	(5)
24					C09	-	T01	6	(6)
25					C04	-	TB02	10	18
26					TB02	10	T02	4	11(8)
27					T02	4	C07	-	4
28					C07	+	CB05	T	4
29					CB05	B	K05B	2	12-19
30					K05B	8	J03	K	6
31					J07	U	TB02	5	18
32					TB02	5	J03	H	6
33					J03	F	TB02	5	18
34					TB02	3	C09	+	(2)
35					C07	+	CR03	R	5
36					CR03	B	T02	5	4
37	↓	↓	↓		T02	2	T01	9	4
38	15	16	4		T01	8	T02	1	4

FORM AA1669

MINNEAPOLIS, MINNESOTA		TITLE WIRE LISTING							WL		DOCUMENT NO. 70539600	REV. J	
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	15	16	4		T02	3	4	CR03	T	5			
40	↑	↑	↑		TB02	1	18	Z01	TERM	17			
41					Z01	STUD	4	CB04	T	11 (11)			
42					TP04		17	K05B	3	12			
43					TB02	15	18	R23	L	2			
44					R20	L	2	TB02	16	18			
45					TB02	16	18	Q04	B	5			
46					Q06	B	5	TB02	15	18			
47					K05B	9	12,19	TB02	1	(19)			
48					TB02	1	(18)	Q01	B	5			
49					Q01	C	5	R13	T	2			
50					R13	B	2	CB04	T	(11)			
51					CB02	B	11 (12)	J03	D	6			
52					J03	E	6	CB02	B	(12)			
53					CB03	B	11 (13)	J03	B	6			
54					J03	J	6	K04	4	12			
55					TB02	2	18	Q07	B	5			
56	↓	↓	↓		R18	R	2	CB04	T	(11)			
57	15	16	4		CB03	B	(13)	J03	C	6			

FORM AA 1669

MINNEAPOLIS, MINNESOTA		TITLE WIRE LISTING							WL		DOCUMENT NO. 70539600	REV. J	
MINNEAPOLIS, MINNESOTA												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	9-26			
59	↑	↑	↑		TB03	5	9-26	C07	+	(9)			
60					J03	NN	7	K02	2A	3			
61					K02	2C	3	TB03	28	9-26			
62					TB02	13	3	K05B	13	12-19			
63					K05B	12	12-19	K03	1C	18, (20)			
64					TB02	2	3	K05A	12	12-19			
65					K05A	13	12-19	TB03	26	9			
66	↓	↓	↓		TB02	12	3	K01	8	12-19			
67	16	20	4		K01	9	12-19	J07	K	7			
68													
69	16	20	4		J07	J	7	CB02	B	(12)			
70	↑	↑	↑		DS01	B	2	TB02	7	3			
71					TB02	7	3	DS07	B	2			
72					DS07	T	2	TB03	8	9-26			
73					TB03	7	9-26	CB05	B	(10)			
74					DS03	B	2	TB02	6	3			
75	↓	↓	↓		TB02	6	3	DS02	B	2			
76	16	20	4		CB04	B	4	J07	S	7			

FORM AA 1669

CONTROL DATA		TITLE								WL	DOCUMENT NO.	REV.
		WIRE LISTING									70539600	J
MINNEAPOLIS, MINNESOTA												
SHEET 6 OF												
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS	
77	16	20	4		J07	T	7	TB02	5	3		
78	16	20	4		TB02	3	3	TB03	1	9-26		
79												
80												
81	16	20	4		TB06	4	9-26	J07	F	7		
82	↑	↑	↑		J07	E	7	TB02	12	3		
83					K05A	1	12-19	TB02	8	3		
84					TB02	1	3	K04	8	12-19		
85					K04	13	12-19	TB03	64	9-26		
86					TB03	64	9-26	K01	3	12-19		
87					K01	7	12-19	TB03	16	9-26		
88					TB03	16	9-26	K02	L1	18		
89					TB02	13	3	K06	12	12-19		
90					TB03	63	9-26	K04	12	12-19		
91					J03	FF	7	TB03	66	9-26		
92					TB02	3	3	TP04	—	17		
93	∇	∇	∇		TB02	3	3	K04	2	12-19		
94	16	20	4		K04	1	12-19	TB02	7	3		
95												

FORM AA1669

CONTROL DATA		TITLE								WL	DOCUMENT NO.	REV.
		WIRE LISTING									70539600	J
MINNEAPOLIS, MINNESOTA												
SHEET 7 OF												
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS	
96	16	20	4		K05A	3	12-19	J07	D	7		
97	↑	↑	↑		J07	C	7	TB02	11	3		
98					TB02	11	3	J03	Z	7		
99	∇	∇	∇		J03	T	7	F01	B	17		
100	16	20	4		TB02	6	3	J07	L	7		
101												
102												
103	16	20	4		TB03	13	9-26	J06	4	25		
104	↑	↑	↑		J06	3	25	TB03	14	9		
105	∇	∇	∇		TB03	14	9-26	K05B	4	12-19		
106	16	20	4		TB02	8	3	K06	3	12-19		
107									1			
108	16	20	4		TB02	16	3	J07	B	7		
109	↑	↑	↑		J07	A	7	TB02	15	3		
110					TB02	12	3	J03	Y	7		
111					TB02	6	3	TB03	17	9-26		
112					TB03	17	9-26	K01	12	12-19		
113	∇	∇	∇		K01	13	12-19	K02	1A	18 (16)		
114	16	20	4		K02	1A	(16)	TB03	18	9-26		

FORM AA1669

MINNEAPOLIS, MINNESOTA		TITLE										WL		DOCUMENT NO.	REV.
												70539600	J		
												SHEET 8 OF			
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS				
115	16	20	4		TB03	18	9-26	J03	V	7					
116	16	20	4		J03	U	7	K02	1C	3					
117															
118	16	20	4		J03	BB	7	K01	2	12-19					
119	▲	▲	▲		K01	1	12-19	TB02	9	3					
120	▼	▼	▼		K06	6	12-19	K03	L2	18(23)					
121	16	20	4		K03	11	3	J03	HM	7					
122															
123	16	20	4		TB03	53	9-26	TB03	55	9-26					
124	▲	▲	▲		TB03	54	9-26	Q06	C	5					
125					Q07	T	5	TB03	52	9-26					
126					TB03	54	9-26	Q04	C	5					
127					Q04	T	5	TB03	46	9-26					
128					TB03	46	9-26	TB03	33	9-26					
129					TB03	33	9-26	J03	R	7					
130					J03	P	7	TB03	35	9-26					
131					TB03	34	9-26	TB03	48	9-26					
132	▼	▼	▼		TB03	48	9-26	Q05	T	5					
133	16	20	4		Q06	T	5	TB03	50	9-26					

FORM AA 1669

MINNEAPOLIS, MINNESOTA		TITLE										WL		DOCUMENT NO.	REV.
												70539600	J		
												SHEET 9 OF			
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS				
134	16	20	4		TB03	51	9-26	TB03	49	9-26					
135	▲	▲	▲		TB03	49	9-26	TB03	47	9-26					
136					TB03	47	9-26	TB03	45	9-26					
137					TB03	45	9-26	TB03	43	9-26					
138					TB03	43	9-26	TB03	41	9-26					
139	▼	▼	▼		TB03	41	9-26	TB03	39	9-26					
140	16	20	4		TB03	39	9-26	TB03	6	9-26					
141	16	20	4		TB03	3	9-26	TB07	5	3					
142	16	20	4		TB02	10	3	TP02	—	17					
143															
144															
145	16	20	4		J07	P	7	TB02	10	3					
146															
147					J06	1	25	K04	5	12-19					
148	16	20	4		TB03	53	9-26	TB03	2	9-26					
149	16	20	4							12-19					
150															
151	16	20	4		TB03	63	9-26	K03	L2	(23)					
152	16	20	4		K05A	9	12-19	TB02	11	3					

FORM AA 1669

MINNEAPOLIS, MINNESOTA		TITLE WIRE LISTING							WL	DOCUMENT NO. 70539600	REV. J
SHEET 10 OF											
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS. FIND NO.	DESTINATION		ACCESS. FIND NO.	REMARKS
154	16	20	4		K05A	8	12-19	J07	R	7	
155	▲	▲	▲		J03	S	7	TB03	37	9-26	
156					TB03	37	9-26	TB03	50	9-26	
157					TB03	52	9-26	TB03	32	9-26	
158					TB03	31	9-26	J03	N	7	
159					J03	M	7	TB03	29	9-26	
160					TB03	30	9-26	TB03	40	9-26	
161					TB03	40	9-26	Q01	T	5	
162					Q02	T	5	TB03	42	9-26	
163					TB03	42	9-26	TB03	36	9-26	
164					TB03	38	9-26	TB03	44	9-26	
165					TB03	44	9-26	Q03	T	5	
166					J03	W	7	K05A	4	12-19	
167					J07	H	7	CB03	B	(13)	
168					J06	5	25	TB03	59	9-26	
169					TB03	59	9-26	TB02	9	3	
170	▼	▼	▼		J06	6	8	TB03	60	9-26	
171	16	20	4		TB03	60	9-26	FO2	B	7	

FORM AA 1669

MINNEAPOLIS, MINNESOTA		TITLE WIRE LISTING							WL	DOCUMENT NO. 70539600	REV. J
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		TB02	8	3	K04	3	12, 19	
173	16	20	4		K04	9	12-19	J03	LL	7	
174	15	16	4		Q07	C	5	R18	L	2	
175	16	20	▲		K02	L2	3	S02	D	17	
176	16	20			S02	B	17	S03	B	17	
177	16	20			S03	D	17	TB02	4	3	
178	16	20			TB03	15	9-26	S02	D	17	
179	16	20			TB03	25	9-26	TB02	1	(19)	
180	15	16			T01	08	4	TB06	5	3	
181	15	16			T01	09	4	TB06	1	3	
182	16	20	▼		FO1	A	17	TB02	4	3	
183	16	20	4		FO2	A	17	TB02	1	3	
184	16	20	4		K05B	7	12, 19	K02	L1	20	
185	▲	▲	▲		K06	13	12-19	TB03	27	9-26	
186	▲	▲	▲		K03	1B	3	TB03	27	9-26	
187	▲	▲	▲		K06	8	12-19	K03	4B	3	
188	▲	▲	▲		J03	X	7	TB03	26	9-26	
189	▼	▼	▼		TB02	13	3	TB03	28	9-26	
190	16	20	4		K03	1C	18 (20)	FO2	B		

FORM AA 1669

CONTROL DATA		TITLE		DOCUMENT NO.		REV.			
MINNEAPOLIS, MINNESOTA		WIRE LISTING		WL 70539600		J			
				SHEET 12 OF 12					
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS. FIND NO.	DESTINATION	ACCESS. FIND NO.	REMARKS
191	16	20	4		JO3 MM	7	K04 6	12-19	
192									
193	16	20	4		CB05	T 4	F06 A	-	
194					K05A	2 12-19	K03 1A	3	
195	16	20	4		K03	3B 3	K06 9	12-19	
196	15	16	4		F05	A -	T01 8	4	
197	16	20	4		F05	B -	JO3 KK	7	
198	16	20	4		K06	2 12, 19	F06 B	-	
199	16	20	4		K05B	1 12, 19	TB02 5	3	
200	16	20	4		J06	2 25	TB03 13	9-26	
201	15	16	4		T01	5 4	J35 2	8	
202					T01	7 4	J35 1	8	
203					T01	6 4	TB15 2	18	
204					J35	3 8	TB15 1	18	
205					J35	4 8	TB15 2	18	
206					TB15	2 18	J07 M	6	
207					TB15	1 18	TP06 -		
208	15	16	4		TB15	1 18	J07 N	6	

CONTROL DATA		TITLE		DOCUMENT NO.		REV.							
MINNEAPOLIS, MINNESOTA		CABLE ASSEMBLY (W3)		WL 45449700		K							
		PRODUCT		SHEET 1 OF 7									
		DISK STORAGE DRIVE											
REVISION STATUS OF SHEETS							REVISIONS						
1	2	3	4	5	6	7	REV.	ECO	DESCRIPTION	DRFT.	DATE	CHKD.	APPD.
A	A	A	A	A	A	-	A		RELEASED				
B	A	A	A	A	B	-	B	PM1257	SEE CO DWG NO WAS 46710300	S.C.	10-21-67	MM	2-22
C	C	C	C	C	C	-	C	PM1257	SEE CO DWG WAS 40776300	JF	10-27-67	MM	2-22
D	D	D	D	D	D	-	D	PM2242	DWG NO WAS 40175700	JPM	2-2-68	MM	2-22
E	E	E	E	E	E	-	E	PM3645	DWG. NO. WAS 45464200	CC	10-2-68	MM	10-12-68
							F	PM4309	SEE CO	EW	12-17-68	MM	12-18-68
							G	PM4772	SEE CO	GV	2-27-69	MM	3-3-69
							H	PM4823	SEE CO	GV	4-15-69	MM	5-6
							J	PM5207	SEE CO	DS	6-30-69	MM	7-17-69
							K	PEI2054	SEE CO	GV	7-24-69	MM	7-27-69

NOTES:



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.

- DETACHED LISTS:  
A. PL 40849500.
- FOR MLCB ASSEMBLY SEE 40849500.
- INDICATES END OF SHIELD IS FLOATING.

COPIES TO

BY C.M. DATE 2/24/67 CHKD. B.M. DATE 3/4/67 ENGR J.W.L. DATE 3-7-67

FORM AA 1672

CONTROL DATA		TITLE							DOCUMENT NO.		REV.
CORPORATION		WIRE LISTING							WL 45449700		K
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	33	24	4		P104	15	14	X14	1	16,45	
2					P104	2	14	X18	1	16,45	
3					X18	7	16,45	P104	3	14	
4					P104	4	14	X19	1	16,45	
5					X19	7	16,45	P104	5	14	
6					P104	7	14	X20	1	16,45	
7					X20	7	16,45	P104	8	14	
8					P104	10	14	X21	1	16,45	
9					X21	7	16,45	P104	12	14	
10					P104	13	14	X22	1	16,45	
11					X22	7	16,45	P104	14	14	
12	33	24			P104	59	14	X07	12	16,45	
13	34	20			P104	57	15	P03	Y	12	
14	34	20			P03	Z	12	P104	58	15	
15	33	24			P104	45	14	P03	AA	11	
16	34	20			P03	BB	12	P104	46	15	
17	33	24			P104	47	14	P03	CC	11	
18	33	24			P03	W	11	P104	44	14	
19	33	24	4		P104	43	14	P03	J	11	

CONTROL DATA		TITLE							DOCUMENT NO.		REV.
CORPORATION		WIRE LISTING							WL 45449700		K
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	34	20	4		P07	K	12	S306	NO.	23	
21					S304	C	23	S302	NC.	23	
22					S302	C	23	J310	9	21	
23					J310	10	21	P07	C	12	
24					P07	D	12	J310	11	21	
25					J310	4	21	P104	36	15	
26					P104	35	15	J310	2	21	
27					J310	B	21	P07	E	12	
28					P07	P	12	P230	X	15	
29		20			P230	K	15	P07	R	12	
30		16			P07	N	13	J36	I	64	
31		20									
32											
33											
34		20								15	
35		16			J36	Z	64	P07	M	13	
36		20			P07	H	12	J310	1	21	
37		20			J310	S	21	P07	J	12	
38	34	20	4		P07	F	12	J310	6	21	

CONTROL DATA		TITLE										DOCUMENT NO.		REV.
CORPORATION		WIRE LISTING										WL 45449700		CK
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	34	20	4		J310	7	21	P07	L	12				
40	↑	↑	↑		P03	X	12	P104	16	15				
41					P104	30	15	P03	S	12				
42					P03	R	12	P104	31	15				
43					P104	34	15	P03	P	12				
44					P03	N	12	P104	32	15				
45	↓	↓	↓		P104	33	15	P03	M	12				
46	34	20	4		J310	3	21	P104	1	15				
47	36	16	0		X17	14	18,47	P104	48	29				
48	36	↑	0		P104	49	29	P03	F	13				
49	36		0		P03	H	13	P104	50	29				
50	37		2		X17	15	18,47	P104	54	29				
51	37		2		P104	55	29	P03	B	13				
52	37		2		P03	C	13	P104	56	29				
53	38		6		X17	13	18,47	P104	51	29				
54	38		6		P104	52	29	P03	D	13				
55	38		6		P03	E	13	P104	53	29				
56	35	16	4		P03	K	13	X08	15	18,47				

CONTROL DATA		TITLE										DOCUMENT NO.		REV.
CORPORATION		WIRE LISTING										WL 45449700		CK
MINNEAPOLIS, MINNESOTA												SHEET 5 OF		
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO	DESTINATION		ACCESS FIND NO.	REMARKS			
57	27	24												
57A			0		P230	N	14	P104	27	14				
57B			4		P230	P	14	P104	28	14				
58	26	24												
58A			0		P104	24	14	TB302	C	24				
58B			4		P104	23	14	TB302	L	24				
58C			9		P104	22	14	TB302	R	24				
59	27	24												
59A			0		P230	T	14	P104	25	14				
59B			4		P230	U	14	P104	26	14				
60	27	24												
60A			4		P104	20	14	P230	V	14				
60B			0		P104	21	14	P230	W	14				
61	32	20												
61A			SHIELD		△		—	P07	U	13(1)				
61B			0		P230	L	15	P07	B	12				
61C			2		P230	M	15	P07	A	12				

FORM RA 1959





# COMMENT SHEET

MANUAL TITLE CONTROL DATA 9465 DISK STORAGE DRIVE

Diagrams and Wire List Manual

PUBLICATION NO. 41248800 REVISION \_\_\_\_\_

FROM: NAME: \_\_\_\_\_  
BUSINESS ADDRESS: \_\_\_\_\_

## COMMENTS:

This form is not intended to be used as an order blank. Your evaluation of this manual will be welcomed by Control Data Corporation. Any errors, suggested additions or deletions, or general comments may be made below. Please include page number references and fill in publication revision level as shown by the last entry on the Record of Revision page at the front of the manual. Customer engineers are urged to use the TAR.

CUT ALONG LINE

PRINTED IN U.S.A.

AA 3419

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CUT ALONG LINE

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**CONTROL DATA**

3/4 1/2 1/4

>>> CUT OUT FOR USE AS LOOSE-LEAF BINDER TITLE TAB

**CONTROL DATA**

**CORPORATION**

**8100 34th AVE. SO., MINNEAPOLIS, MINN. 55440**

**LITHO IN U.S.A.**



TITLE: 9465 Diagrams and Wire List Manual

REASON FOR CHANGE:

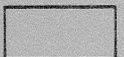
Engineering Change Order PE12527 incorporating the following:

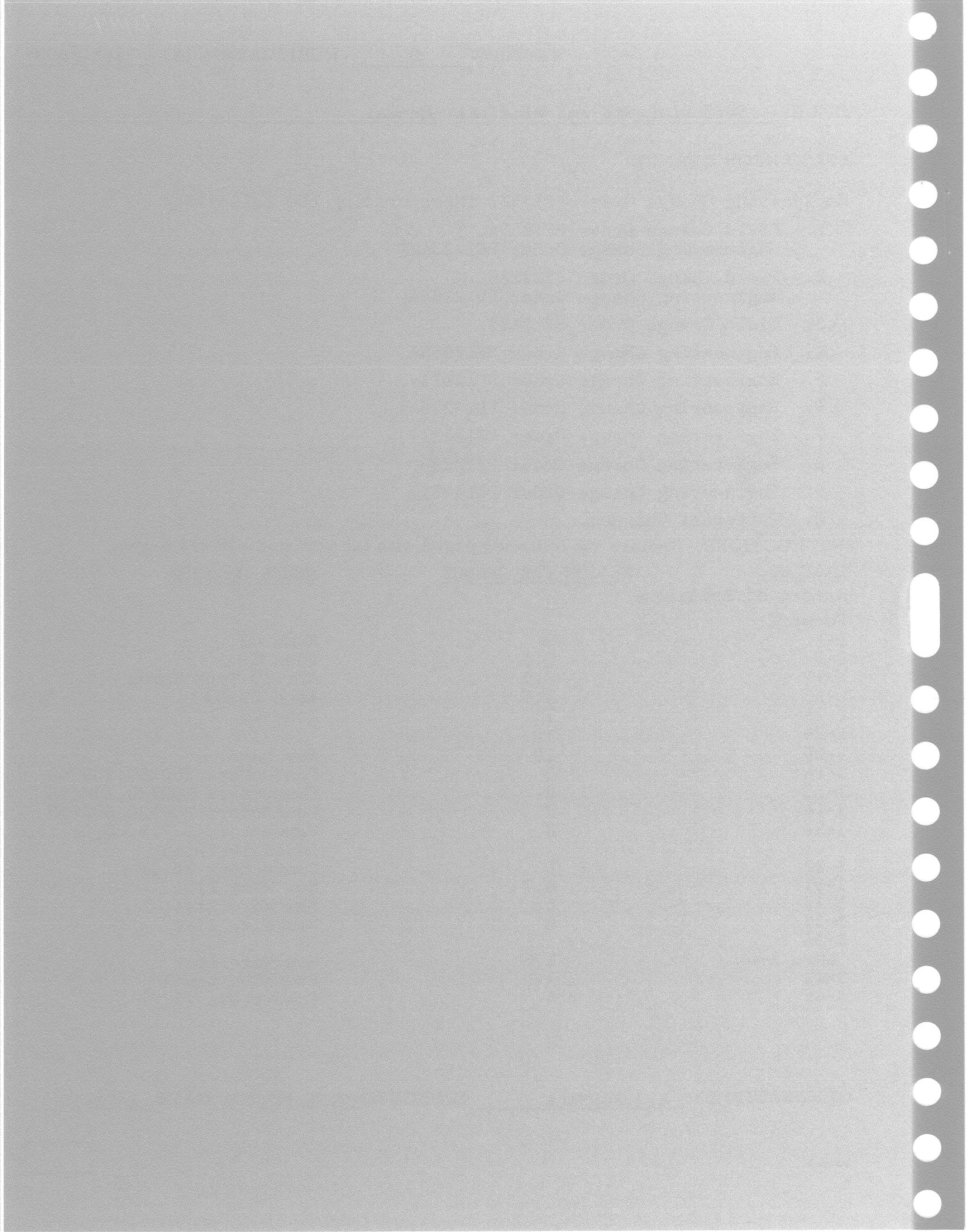
1. Field Change Order PE12234.  
Engineering Change Order PE12234.
2. Field Change Order PE12285.  
Engineering Change Order PE12285A.
3. Field Change Order PE12126.
4. Engineering Change Order PE12054A.
5. Engineering Change Order PE12211.
6. Engineering Change Order PE12225A.
7. Engineering Change Order PE12231.
8. Engineering Change Order PE12298.
9. Engineering Change Order PE12461.
10. Editorial Changes.

INSTRUCTIONS: Replace the following pages with the attached revised pages:

<u>PAGE NO.</u>	<u>REASON FOR CHANGE</u>	<u>WHERE CHANGED</u>
Record of Revisions		
Forward		
1-1	2	Zone C3
1-5	1,5	Zone C1
1-11	3,9	All 30 Type Cards
1-13	1,6	Zone C3,A3
1-15	1	Zone C3
1-26	10	
1-29	10	New Page
3-14	2	Conductors 200350,200360
3-15	2	Conductors 200730,200750
3-16	2	Conductors 300730,300750
3-21	8	Conductors 3,7,9,10,11,13, 14,15,16,17,18
3-22	8	Conductors 20,21
3-31	6,7	New Wire List
3-32	6	New Wire List
3-35	6	New Wire List
3-36		
thru 3-41	1,6	New Wire List
3-42	4	Revision Level
3-45	4	Conductors 75,77

ORIGINATED BY L.J.RUSSELL APPROVED C. H. BERTSCH DATE 1-13-70





4095

REVISION     C     PUBLICATION NO. 41248800

TITLE: 9465 Disk Storage Drive - Diagrams & Wire List Manual

REASON FOR CHANGE:

Engineering Change Order PE12158 incorporating the following:

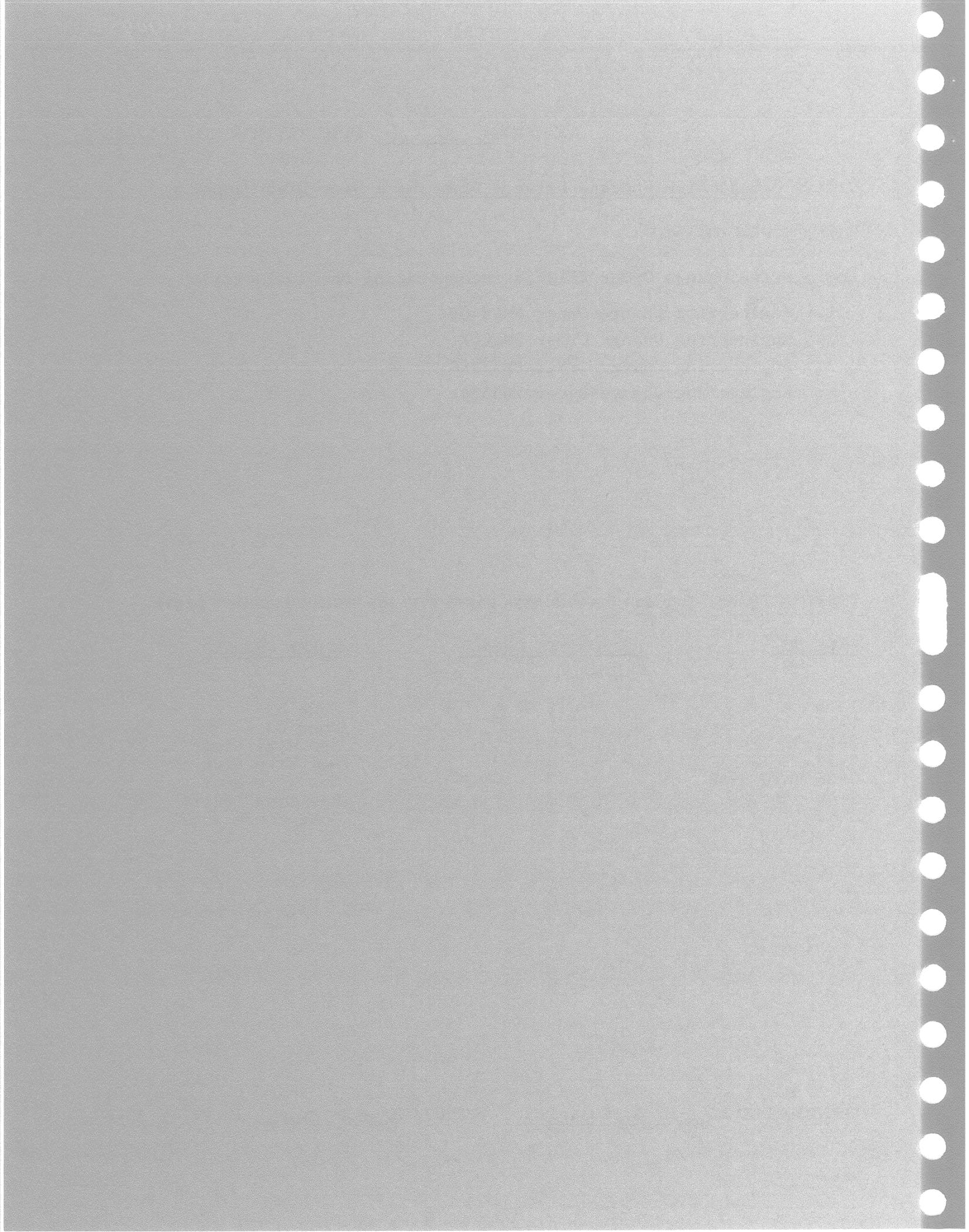
- 1. Engineering Change Order PM4840B.
- 2. Engineering Change Order PM5207.
- 3. Engineering Change Order PM5296A.
- 4. Engineering Change Order PM5334.

INSTRUCTIONS: Replace the following pages with the attached revised pages:

<u>PAGE NO.</u>	<u>REASON FOR CHANGE</u>	<u>WHERE CHANGED</u>
1-13	3	Zone D3
1-15	1	Zone C3
3-31, 32	4	New Wire List
3-35	4	New Wire List
3-36 thru 3-42	3	New Wire List
3-42	2	Revision Level
3-43	2	Conductors 30, 35

ORIGINATED BY L. J. Russell APPROVED J. K. Cohen DATE 7-30-69





TITLE:     9465 Diagrams, Card Placement, Wire List Manual    

REASON FOR CHANGE:

Engineering Change Order PM5347 incorporating the following:

1. Engineering Change Order PM4638A.
2. Engineering Change Order PM4646.
3. Engineering Change Order PM4677.
4. Engineering Change Order PM4772.
5. Engineering Change Order PM4843.
6. Engineering Change Order PM4914.
7. Engineering Change Order PM4949.
8. Engineering Change Order PM4950.
9. Engineering Change Order PM5038A.
10. Engineering Change Order PM5279.

INSTRUCTIONS: Replace the following pages with the attached revised pages:

<u>PAGE</u>	<u>REASON</u>	<u>WHERE CHANGED</u>
Record of Revisions		
1-1	5	Zone B2
1-5	10	Y205
1-9	1,7	Zone C-3, D-2,3,4
1-11	1	A39, D2, D3, D
3-6	1	I484110 - I49310
3-13	10	100020
3-17	1	600560
3-18	1	600650
3-22	6,8	Revision status
3-23	6,8	Conductors 7, 9, 12, 14, 17, 19
3-24	3	Conductors 3, 4, 5A, 5B, 6A, 6B, 7A, 7B, 7A, 7B, 8A, 9
3-25	3	Conductors 10, 11
3-36	2,9	Revision status
3-38	9	Conductor 63
3-40	2	Conductor 141
3-42	4	Revision status
3-45	4	Added Conductors 84-89B

ORIGINATED BY     Thomas Moore     APPROVED     J. R. Cohen     DATE     5-15-69    

