SERVICE MANUAL

MODEL MPS 801 PRINTER

Preliminary

JAN. 1985   PN—314003-04

Ct commodore
COMPUTERS

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Commodore Business Machines, Inc.
1200 Wilson Drive, West Chester, Pennsylvania 19380 U.S.A.

CONTENTS

SPECIFICATIONS

PRINT METHOD	• Uni-directional impact dot matrix
CHARACTER MATRIX	• 6 X 7 Dot matrix
CHARACTERS	• Upper & lower case letter, numerals and symbols • All PET graphic characters
GRAPHICS	• 7 vertical dots—480 columns maximum • Dot addressable
CHARACTER CODES	• CBM ASCII code
CHARACTER SIZE	• Height: 7 dots (0.111 inch) • Width: 6 dots (0.099 inch)
PRINT SPEED	• 50 CPS left to right uni-directional
MAXIMUM COLUMNS	• 80 Columns
CHARACTER SPACING	• 10 Characters/inch
LINE FEED SPACING	• 6 Lines/inch in character mode • 9 Lines/inch in graphic mode
LINE FEED SPEED	• 5 Lines/sec in character mode • 7.5 Lines/sec in graphics mode
PAPER FEED	• Pin feed
PAPER WIDTH	• 4.5 to 10'' width (including tractor feed holes) • 8.5'' Width (after tractor holes)
MULTIPLE COPIES	• Original plus maximum of 2 copies
COMPUTERS	• C 64, SX 64, PLUS/4, C-16 (not compatible with VIC 20)
POWER REQUIREMENTS	• 120 Volts AC, 60 Hz
POWER CONSUMPTION	• 25 Watts maximum

BLOCK DIAGRAM

POWER PCB

AC POWER → POWER SWITCH → FUSE 0.16A...220/240VAC / 0.63A...120VAC → TRANSFORMER

F1 FUSE 1.6A → REGULATOR → 5VDC
F2 FUSE 1.6A → REGULATOR → 20 VDC

CONTROL PCB

INPUT DATA → CONTROL CIRCUIT → DRIVERS

LF SWITCH → CONTROL CIRCUIT
POWER LAMP
DOT SENSOR
HOME SENSOR

LINE FEED MECHANISM

PAPER FEED KNOB

LF MOTOR → TRACTOR / PAPER FEED SHAFT → LINE FEED

PRINT MECHANISM

MOTOR → ROTATION DETECTOR → GEAR TRAIN → CLUTCH → TIMING BELT → CARRIER → PRINT HEAD → PRINT

PLATEN

RIBBON

PIN

H SOLENOID

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FLOWCHARTS

1. Main flowchart

```
                    ┌─────────────┐
                   (   Power on    )
                    └──────┬──────┘
                           │
                    ┌──────┴──────┐
                    │ Initializing │
                    │  operation   │
                    └──────┬──────┘
                           │
                    ┌──────┴──────┐
                    │ Enters READY │
                    │ status to input │◄──────────┐
                    └──────┬──────┘               │
                           │                      │
                          ╱ ╲                     │
                        ╱     ╲        NO          │
                      ╱ Input data╲───────────────┤
                      ╲ appears?  ╱                │
                        ╲       ╱                  │
                          ╲   ╱                    │
                           │ YES                   │
                    ┌──────┴──────┐                │
                    │ Enters BUSY  │               │
                    │ status to input │            │
                    └──────┬──────┘                │
                           │                       │
                          ╱ ╲                      │
                        ╱     ╲                     │
                      ╱ Input data is╲              │
                      ╲ print command?╱            │
                        ╲          ╱               │
                          ╲      ╱                  │
                           │ NO                     │
                    ┌──────┴──────┐                │
                    │ Writes the input │           │
                    │ data in buffer   │           │
                    └──────┬──────┘                │
                           │                       │
                          ╱ ╲                      │
                        ╱     ╲        NO           │
                      ╱ Buffer  ╲──────────────────┤
                      ╲ is full? ╱                  │
                        ╲      ╱                    │
                          ╲  ╱                      │
                           │ YES                    │
                    ┌──────┴──────┐                │
                   / Prints out all the /           │
                  /  data in buffer    /            │
                  └─────────┬─────────┘             │
                            │                        │
                            └────────────────────────┘
```

3
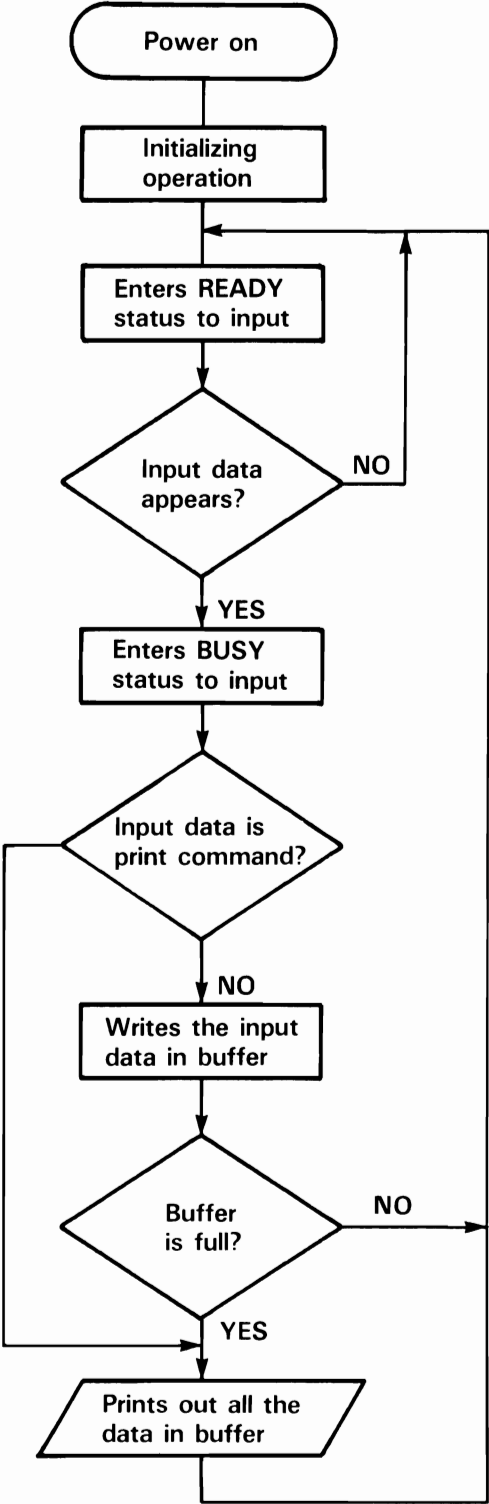
2. Hammer drive (pin drive) flowchart

```
              ┌──────────────┐
              │  PIN DRIVE   │
              └──────┬───────┘
                     │
              ┌──────┴───────┐
              │ Reset PIN CNT │
              └──────┬───────┘
                     │
              ┌──────┴────────┐
              │ Shift PIN REG │
              │ right by one  │
              └──────┬────────┘
                     │
              ╱──────┴──────╲
     NO      ╱   DOT SNS     ╲
  ◄─────────╲    =1          ╱
             ╲──────┬───────╱
                  YES │
              ╱──────┴──────╲
     NO      ╱  PIN DATA     ╲
  ◄─────────╲   REG=1        ╱
             ╲──────┬───────╱
                  YES │
              ╱──────┴──────╲
             ╱  PREVIOUS     ╲   NO
             ╲  DOT=ON       ╱ ───────┐
              ╲──────┬──────╱         │
                 YES │                │
           ┌─────────┴──────┐  ┌──────┴──────┐
           │  HEAD COIL     │  │  HEAD COIL  │
           │  210μS ON      │  │  250μS ON   │
           └────────┬───────┘  └──────┬──────┘
                    │                 │
              ╱─────┴──────╲          │
             ╱  DOT SNS    ╲  YES     │
             ╲   =1         ╱ ────────┘
              ╲─────┬──────╱
                 NO │
            ┌───────┴──────┐
            │  PIN CNT =   │
            │  PIN CNT+1   │
            └───────┬──────┘
                    │
              ╱─────┴──────╲
     NO      ╱  PIN CNT    ╲
  ◄─────────╲    =7         ╱
             ╲─────┬───────╱
                YES │
              ┌─────┴─────┐
              │   END     │
              └───────────┘
```

CHARACTER PATTERN "A"

FIRST DOT

SEVENTH DOT

PIN-REG   **PIN DATA REG**

| 1 | 1 | 1 | 1 | 1 | 1 | 0 | → | □ |

FIRST DOT
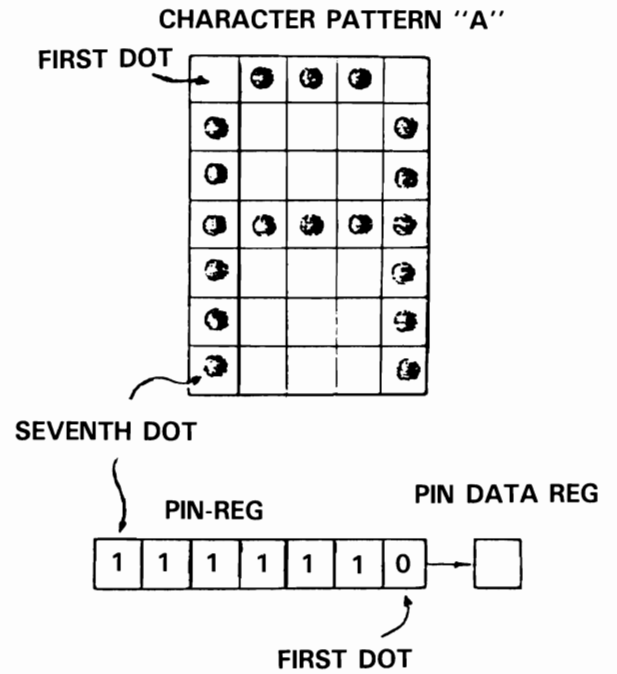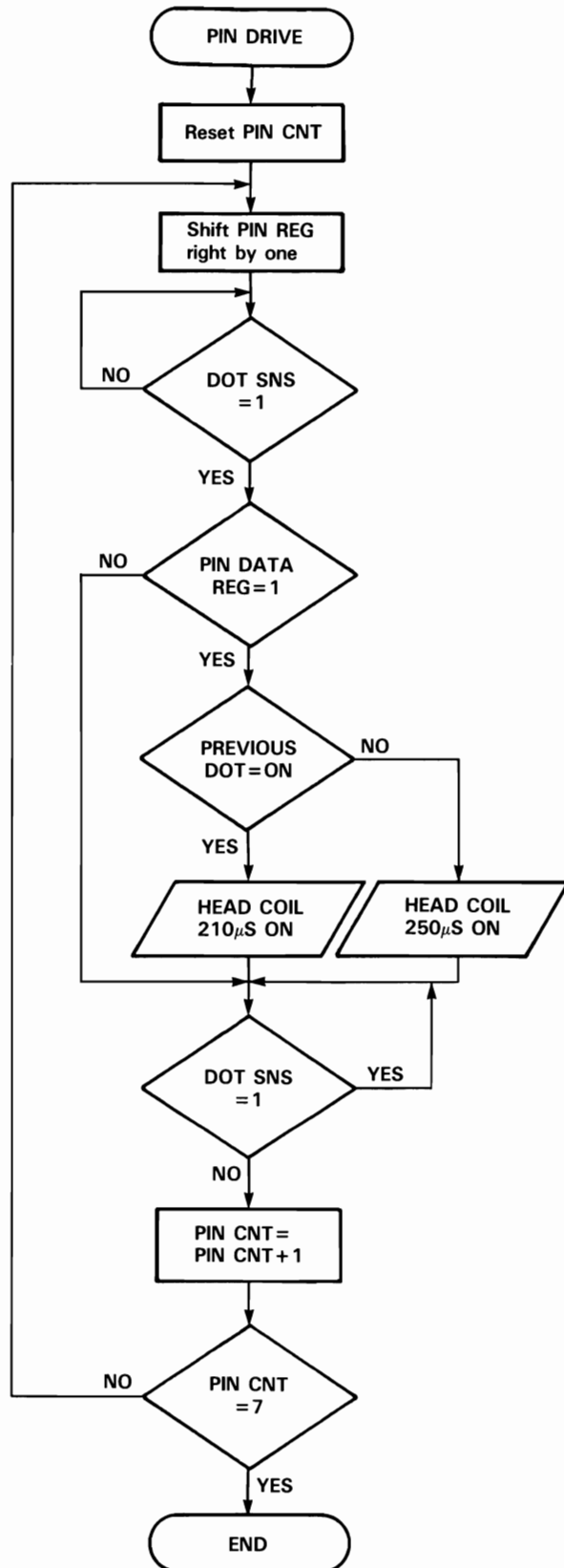
PIN CNT: Counter for 1 column (7 dots)
               of character pattern
PIN REG: Register storing 1 column (7 dots)
               of character pattern
DOT SNS: Timing signal for each dot
PIN DATA   1 bit register for a dot
 **REG**   to be printed

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3. Line feed flowchart

```
              ┌───────────────┐
              │   LINE FEED   │
              └───────┬───────┘
                      │
              ╱───────────────╱
             ╱  LF PW "ON"   ╱
            ╱───────────────╱
                      │
              ┌───────────────┐
              │     10 ms     │
              └───────┬───────┘
                      │
              ┌───────────────┐
              │ Move LF STEP  │
              │ REG to LF CNT │
              └───────┬───────┘
                      │
              ╱───────────────╱
             ╱  Drive LF     ╱
            ╱ Stepping motor╱
           ╱   by 1 step   ╱
            ╱─────────────╱
                    │
            ┌───────────────┐
            │  Subtract 1   │
            │  from LF CNT  │
            └───────┬───────┘
                  YES
                    ◇  LF CNT = 0?
                  YES
            ┌───────────────┐
            │     10 ms     │
            └───────┬───────┘
            ╱───────────────╱
           ╱  LF PW "OFF"  ╱
            ╱─────────────╱
            ┌───────────────┐
            │      END      │
            └───────────────┘
```
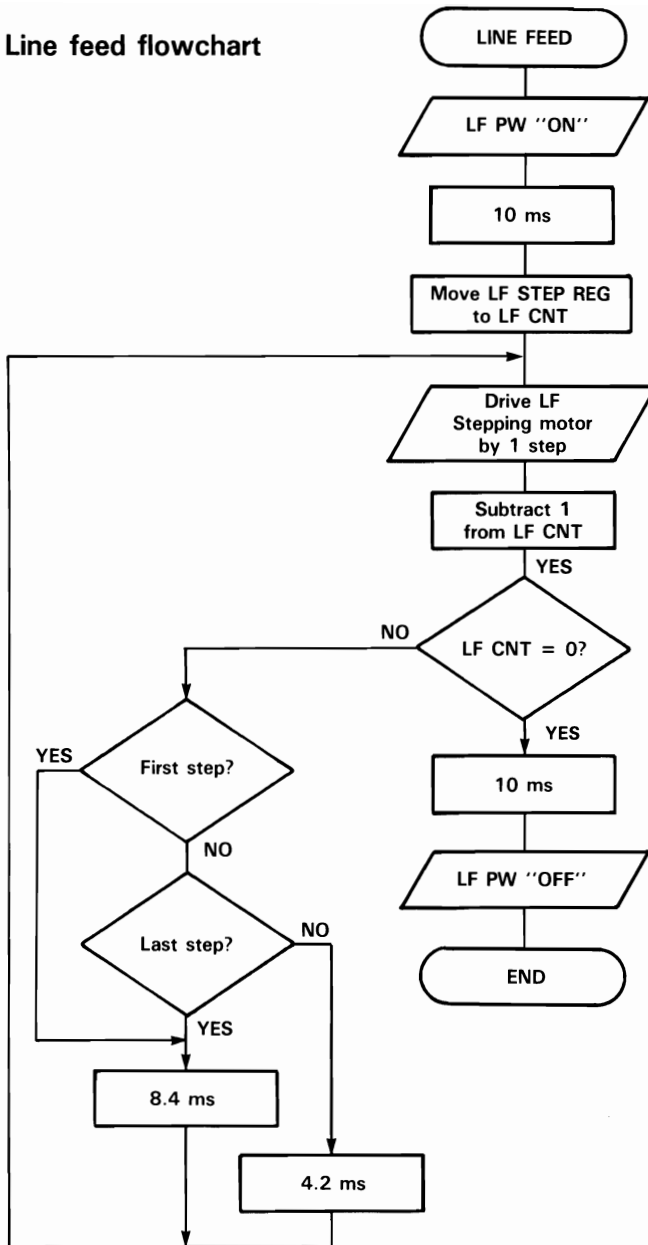
LF CNT: A step counter for the LF stepping motor.
LF STEP REG: A register memorizing the number of steps per line feed.
LF PW: Power for the LF stepping motor.
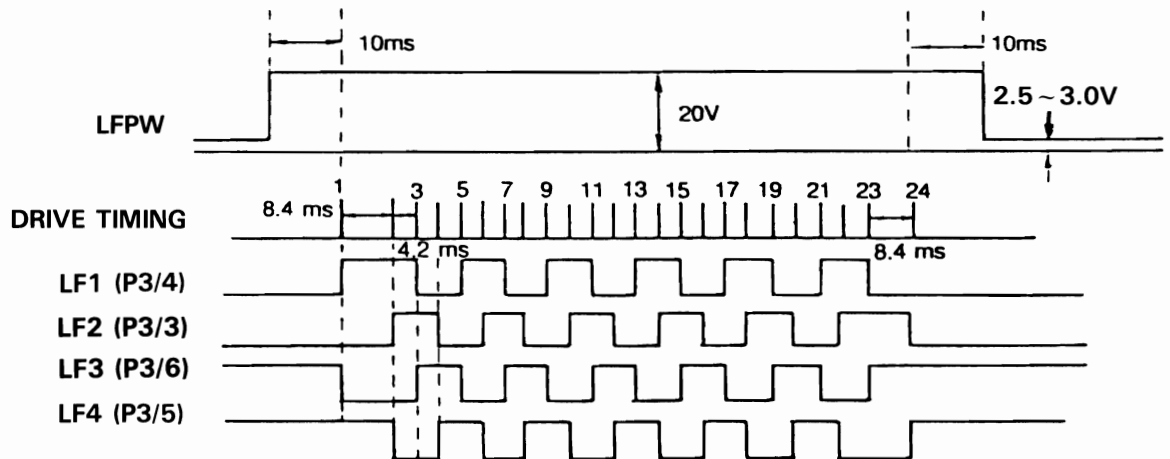
First step? — YES / NO
Last step? — YES / NO

8.4 ms

4.2 ms

LFPW   10ms   20V   10ms   2.5~3.0V

DRIVE TIMING   8.4 ms   1 3 5 7 9 11 13 15 17 19 21 23 24   8.4 ms
                          4.2 ms

LF1 (P3/4)
LF2 (P3/3)
LF3 (P3/6)
LF4 (P3/5)

1/144 inch is the smallest unit of movement and occurs when the LF stepping motor is driven one step. 24 pulses of the DRIVE TIMING perform a line feed of 24 X 1/144=1/6 inch.

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PRINTING METHOD

This printer is based on the *uni-hammer* printing system which is quite different from other impact dot printing systems. In this system one dot is printed when the hammer strikes a raised ridge on a platen.
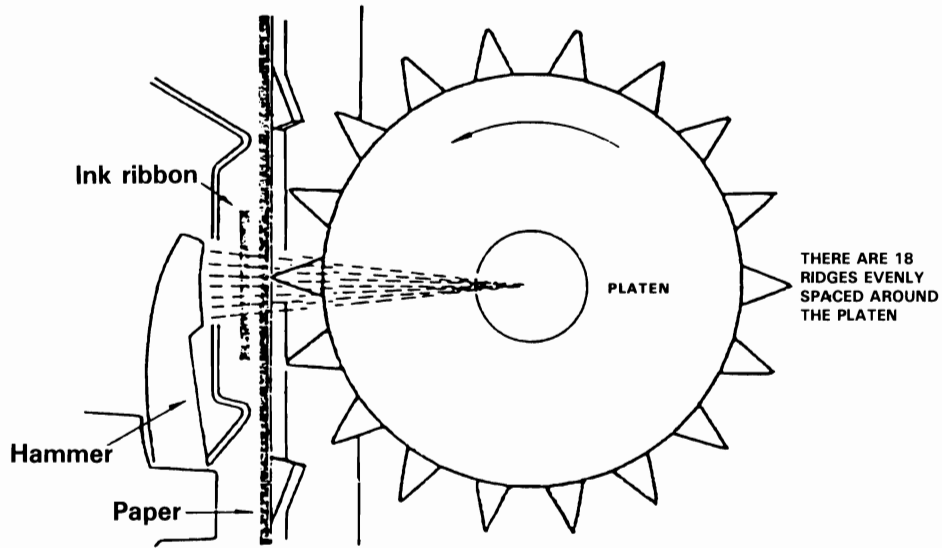
PRINTING MECHANISM

The timing for the hammer depends upon the dot signals generated by the revolution of the rotation detector which is attached to the motor shaft. The hammer motion, the left to right movement of the hammer, and the revolution of the platen are precisely synchronized.

As the platen rotates, for each ridge, seven dot signals are sent to the CPU. The CPU then selects whether or not to activate the print head hammer for the given dot according to the character pattern being printed. The hammer can be activated seven separate times as one ridge passes by the hammer-head. The hammer head is slanted to compensate for the constant left to right motion of the hammer. Each pass of a ridge causes one dot column to be printed.
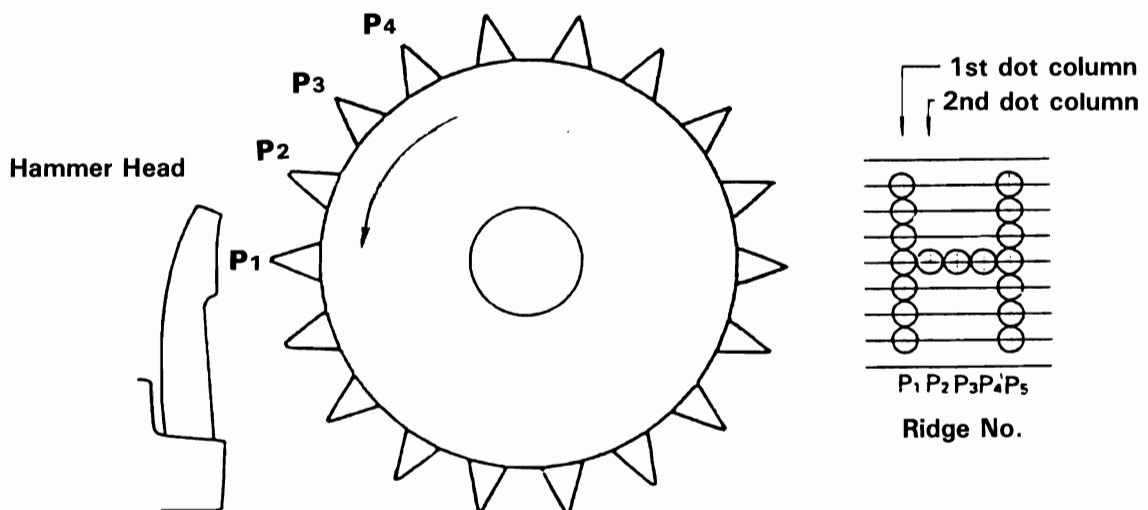
PLATEN ROTATION

THEORY OF OPERATION

1. Initialization Sequence

When power is applied or $\overline{\text{RES}}$ signal is input, the printer executes the following initialization:

1. Resets the control circuit.
2. Generates and stores a print start timing value by moving the print head twice.
3. Brings the print head back to the home position.

When power is applied, P 5/4 (Pin 4 of the CPU chip located at P 5) receives the $\overline{\text{RESET}}$ signal. The CPU is reset as long as this signal is LOW. The CPU is activated as soon as the $\overline{\text{RESET}}$ signal rises from LOW to HIGH.

First, in order to align the phase of the LF stepping motor, the LFl (P3/4) and LF2 (P3/3) signals are both raised to HIGH and the LF3 (P3/6) and LF4 (P3/5) signals are brought LOW. The drivers (P3/13, 14) go LOW (ON) and the drivers (P3/11, 12) go HIGH (OFF). Then lowering the $\overline{\text{LFPW}}$ signal (P5/28) makes the driver (P3/15) go LOW and turns the GP-DR-2/3 ON so that LFPW rises to + 20V from the standby voltage (2.5V ~ 3.0V). The $\overline{\text{LFPW}}$ signal (P5/28) is brought HIGH approximately 10 ms later. Thus the driver (P3/15) goes HIGH to return the $\overline{\text{LFPW}}$ to the standby voltage (2.5 ~ 3.0V).

Next, the CPU sets the $\overline{\text{MOT}}$ signal (P5/30) and $\overline{\text{HC}}$ signal (5/29) LOW which turns the driver (GP-DR-2/7) ON (LOW). When it is ON, the H solenoid is activated, which allows the recovery spring to return the print head to the home position. The HOME signal (TEST PIN), which is shaped from the output of the home sensor, is HIGH when the print head is at the home position, and LOW when it is away from the home position. After the CPU sets the $\overline{\text{HC}}$ signal LOW, it checks the HOME signal to see whether it is HIGH or LOW. If it is HIGH, the CPU will go to the next routine after about 110ms; if it is LOW, the CPU waits until it becomes HIGH and then, about 110ms later, the CPU will go to the next routine. The next routine is to move the print head twice from the home position to approximately the 15th character column and back to the home position. During both movements, the $\overline{\text{PIN}}$ signal and the $\overline{\text{LFPW}}$ signal remain inactive. During the second movement, the CPU checks and stores the timing of the falling-edge of the HOME signal relative to the DOT signal (TEST PIN). This timing is used by the CPU to decide when to start printing.

The initialization sequence explained so far will also be executed when a $\overline{\text{RESET}}$ signal input is received.
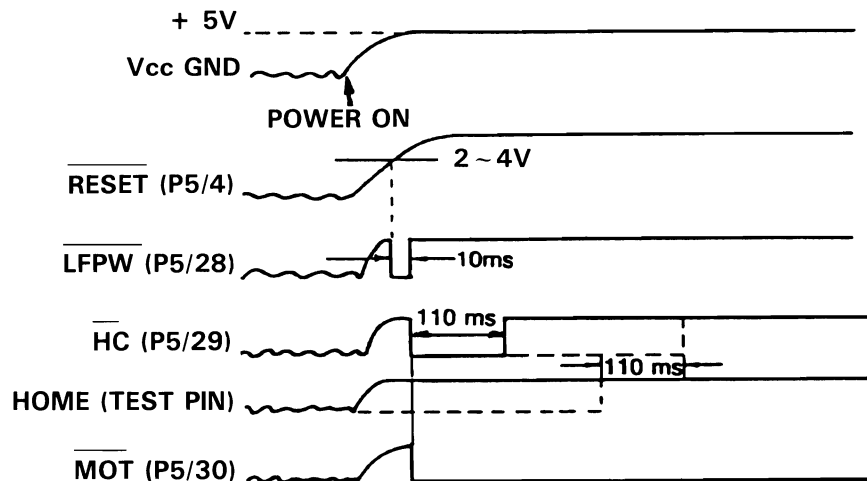
Dotted lines show the case when the print head is away from the home position.

2. Start of the Printing Operation

When printing starts, the CPU sets the $\overline{MOT}$ signal (P5/30) and the $\overline{HC}$ signal (P5/29) LOW. When the $\overline{MOT}$ signal goes LOW, the driver GP-DR-2/10 goes LOW (ON) causing the motor to rotate. Since the $\overline{HC}$ signal is LOW, the H solenoid is activated, which disengages the motor shaft from the print head carrier so that the motor can reach a constant speed before any movement of the print head occurs. After approximately 160 ms, the HC signal is set HIGH, which causes the motor shaft and the print head carrier to engage, and allows the print head to be driven to the right. Next, the CPU waits to see if the print head leaves the home position by sampling the HOME signal. After confirming that the HOME signal has gone LOW, which means the print head carrier has moved out of the home position, the CPU checks the $\overline{DOT}$ signal in order to decide when to start printing. The $\overline{DOT}$ signal is a shaped output signal from the dot sensor and, as shown in the figure below, it comes in groups of 34 sequential pulses. When the HOME signal goes LOW, the CPU starts to count the number of dot pulses until the $\overline{DOT}$ signal stays HIGH for approximately 0.9ms. The CPU then compares this number with the number stored during initialization in order to decide when to start printing.
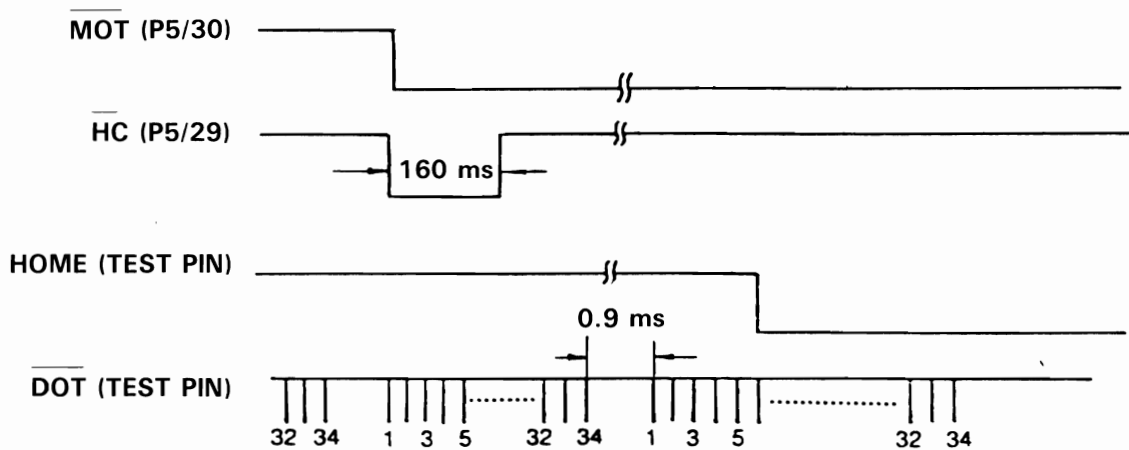
3. Printing Operation

The CPU synchronizes the $\overline{PIN}$ signal (P5/27) to the $\overline{DOT}$ signal. The $\overline{PIN}$ signal is for driving the print hammer; when it goes LOW, the driver (GP-DR-2/1) goes LOW (ON) to activate a print hammer to print a dot.
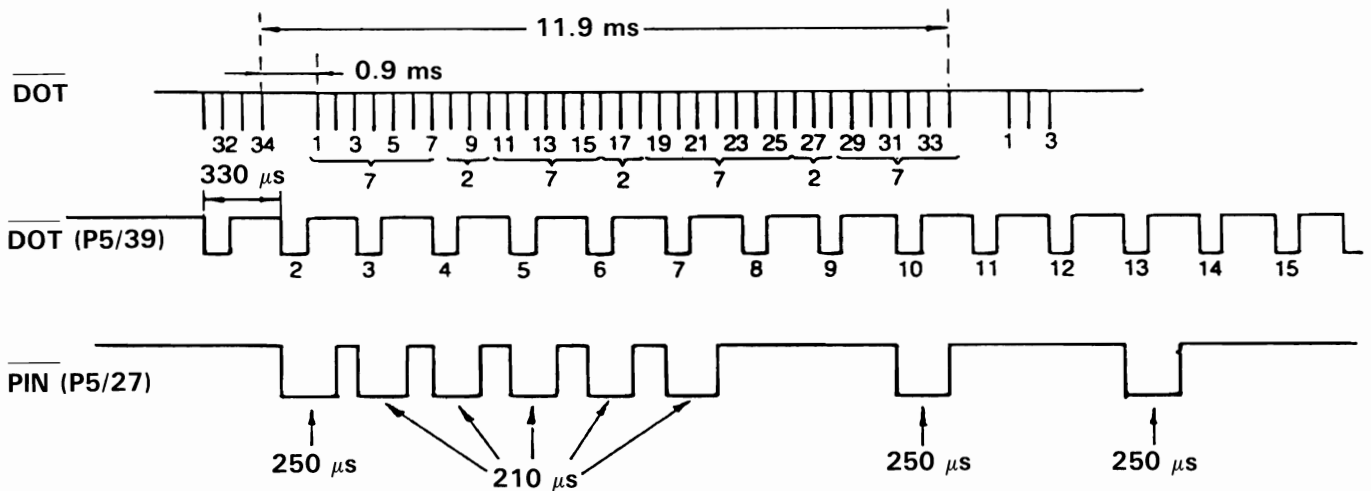
The diagram above shows what happens when character 'A' is printed. Dot pulses 1 ~ 7, 10 ~ 16, 19 ~ 25 and 28 ~ 34 are synchronized to activate the PIN signal.

4. Carrier Return Operation

After printing a line, the CPU sets the $\overline{MOT}$ signal (P5/30) HIGH and the $\overline{HC}$ signal (P5/29) LOW. The motor then stops and the print head begins to return to the home position because it is pulled by the recovery spring. If a carrier return operation includes a line feed, the CPU sets the $\overline{LFPW}$ signal (P5/28) LOW and drives the stepping motor about 10ms later. Refer to the linefeed flowchart.

After performing a line feed, the CPU waits until the HOME signal goes HIGH, which means the print head has returned to the home position.

When the HOME signal becomes HIGH, the CPU sets the $\overline{HC}$ signal HIGH, about 160ms later, ending the carrier return operation.
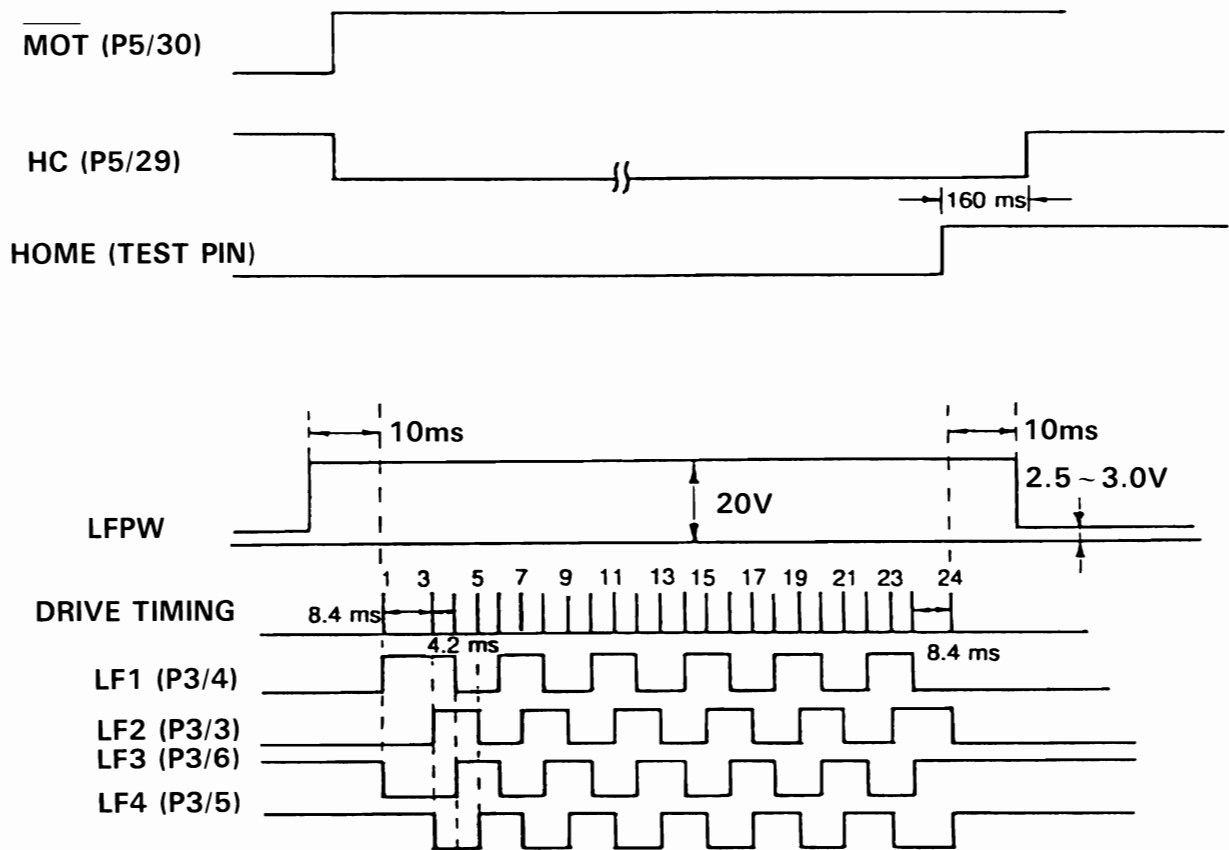
1/144 inch is the smallest unit of movement and occurs when the LF stepping motor is driven one step. 24 pulses of the DRIVE TIMING perform a line feed of 24 X 1/144 = 1/6 inch.

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SERVICE PRECAUTIONS

1. Be sure to unplug the power cord from the outlet before removing the upper case.

2. Do not try to move or apply undue force to the print head and carrier unit.
   They can be moved manually by removing the ribbon cassette and pressing the top of the head solenoid to free the clutch. See page 27.

3. Since the enclosure material is plastic, it is recommended that the 6 screws which hold the upper and lower cases together not be overtightened.

4. Do not use lubricate other than the designated ones.

5. To detach the parallel cable from the PCB, lift the connector housing and pull up on the cable. The cable is secured by lifting the connector housing, inserting the cable, and then pressing the housing down until it clicks into position. make sure the connection is good by pulling up on the cable slightly.

6. The smooth side of an E-ring should face a rotating gear.

SELF TEST

This unit has a pre-programmed self-checking capability. The program may be used to test the print head operation, print quality and printer mechanism (ribbon feed function, linefeed, etc.). The self-test function is initiated by selecting ''T'' on the device selector switch.

NOTE: While in the self-test mode, communication with other devices is not possible. Do not operate self-test without paper in the printer. The test will continue until the unit is turned off.

T 5 4
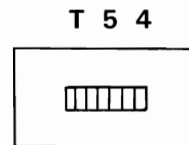
DEVICE SELECTOR SWITCH

Position ''4'' selects operation as device #4

Position ''5'' selects operation as device #5

CLEANING

Due to its material, each part has its own proper cleaning liquid and method. It should be noted that if an improper cleaning liquid is used or the cleaning method is incorrect, parts may be damaged or may not function properly. Follow the instructions in Table 1 to clean.

PARTS	CLEANING METHOD	CLEANING OIL	REMARKS
Metal parts	Brush washing	Benzine	
Plastic parts of the Mechanisms	Brush washing	Benzine	• Do not use any liquid other than the one designated. • Wash quickly, wipe with a cloth and dry rapidly. • Use good quality clean liquids.
Plastic parts of the enclosure	–	–	Wipe off dirt.
Rubber parts	–	–	Wipe off dirt.
Electrical parts	Do not wash		Wipe off dirt with a cloth dampened with benzine or alcohol.

CAUTION: CLEANING FLUIDS ARE FLAMMABLE. Keep away from heat. Air dry ONLY, prior to re-installation.

LUBRICATION

NOTE – Be sure that all points requiring lubrication are thoroughly cleaned before beginning.

Lubricate out of warranty units when service is required using a light spray oil. CRC or WD40 will do fine but be careful not to use a product that will attract and hold dust and dirt.

SEE SECTION 2 and 5 of MECHANICAL ASSEMBLIES (pages 27 and 29) for LUBRICATION POINTS.

TROUBLESHOOTING GUIDE

SYMPTOM 1. The POWER lamp does not light.
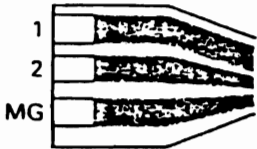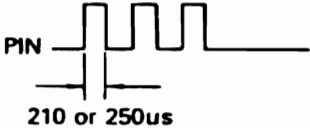
	POSSIBLE CAUSE	SOLUTIONS
1.	Fuse is blown (F1).	Replace only with a fuse of the same rating
2.	Power switch is broken.	Replace it
3.	Transformer is bad.	Remove ribbon cable from CN6 and CAREFULLY check the secondary output of the transformer. With a meter set on 200 VAC, you should read approximately: 25 VAC between pins 2 and 3 10 VAC between pins 4 and 5 16 VAC between pins 1 and 6

SYMPTOM 2. The carrier unit does not move or movement is too slow or too fast.

	POSSIBLE CAUSE	SOLUTIONS
1.	Recovery spring is broken.	Replace it.
2.	H solenoid is defective.	To check H solenoid, remove cable at connector CN 4. Take an ohmmeter reading between pins 1 and 2. Approximately 63 ohms resistance should be present.
3.	Timing belt is broken.	Replace it.
4.	Motor does not revolve.	To check carriage motor, remove cable at connector CN 4. Take an ohmmeter reading between pins 2 and 3. Approximately 28 ohms resistance should be present. If motor resistance is good, check control PCB.
5.	Guide pillar B is not oiled.	Lubricate with the designated oil.
6.	The position of the idler pulley is not correct.	The idler pulley sits just above the recovery spring and can be adjusted (see Section 5 of Mechanical Assembly).
7.	The print head position is too near to the platen.	Readjust the position.

TROUBLESHOOTING GUIDE (Continued)

SYMPTOM 3. The carrier unit moves, but there is no printing.

	POSSIBLE CAUSE	SOLUTIONS
1.	The print head is defective.	With meter set at 200 ohm range, a reading of about 3.5 to 4 ohms of resistance should be measured between pins 1 and 2. Replace print head if defective.
2.	Control PCB is defective.	Check the output of PIN. Repair it.

SYMPTOM 4. Some part of a printed character is missing.

	POSSIBLE CAUSE	SOLUTIONS
1.	Part of the platen ridge is broken.	Replace the platen.
2.	Control PCB is defective.	Repair it.
3.	The position of the dot sensor is not correct.	Adjust it.

SYMPTOM 5. Printing is too light.

	POSSIBLE CAUSE	SOLUTIONS
1.	Ribbon clutch spring is broken. (Ribbon shaft does not revolve to re-ink the ribbon.)	Replace it.
2.	Inker in the ribbon cassette is not correctly installed.	Reinstall or replace the inker.
3.	Print head is defective.	Replace it.

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TROUBLESHOOTING GUIDE (Continued)

SYMPTOM 6. Improper paper feeding.

		POSSIBLE CAUSE	SOLUTIONS
1.		LF motor is defective.	To check LF motor, remove cable at connector CN 4. Using pin 4 as a reference point, take an ohmmeter reading at pins 5 through 8. Approximately 80 ohms resistance should be present at each pin.
2.		Control PCB is defective.	Check signals LF1~LF4 and repair.

SYMPTOM 7. Self test does not work.

		POSSIBLE CAUSE	SOLUTIONS
1.		Dot sensor is bad.	Replace it or repair control PCB.
2.		Home sensor is bad.	Replace it or repair control PCB.
3.		Connections to PCB are defective or loose.	Replace or repair connections.

NOTE: It is good practice to check motors and solenoid before replacing PCB. This procedure will avoid damaging a good board.

HOME SENSOR

RELAY
PCB {
BLUE
BLACK

YELLOW
BLACK

BLU
C
Y K

RELAY PCB

KS N30 700

TO
CN 5

VC {
PRINT
HEAD PCB

HEAD PCB

VC {
RELAY
PCB

E-62384 94HB

TO
CN 4

9 2 0 2 1 4 3 6

BLUE
ORANGE
YELLOW
BROWN

RED
} LF MOTOR

9 2 0 2

BLACK
RED
} CARRIAGE
MOTOR

WHITE
WHITE
} H SOLENOID CLUTCH
CARRIAGE RETURN

TO
CN3

9 2 0 4 6 0 3 0

BLUE
BLACK
BLACK
} HOME SENSOR

YELLOW

RED

BLACK
} DOT SENSOR

DOT SENSOR

PINK
WHITE
} CONTROL PCB

BLACK
RED
} RELAY PCB
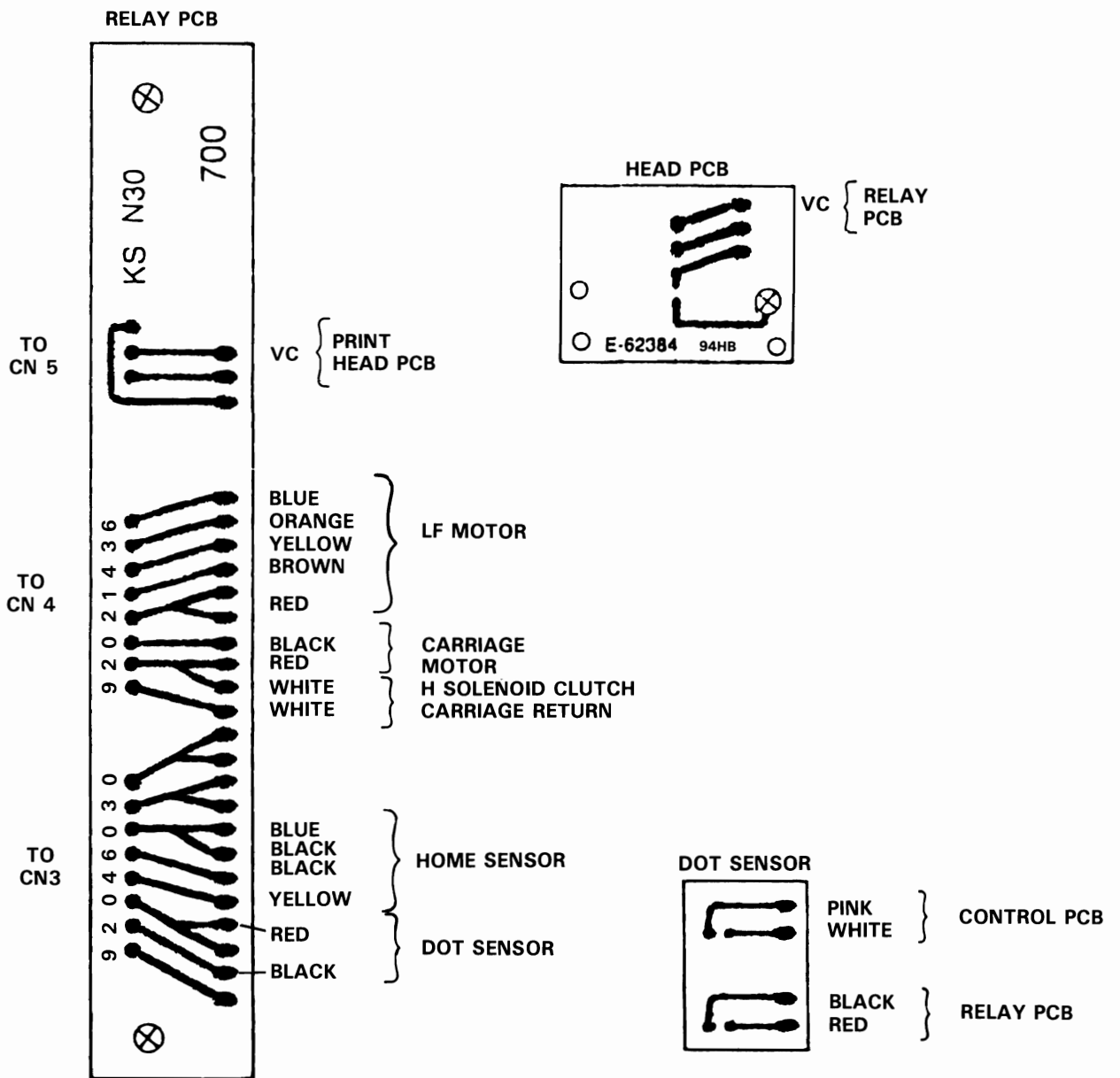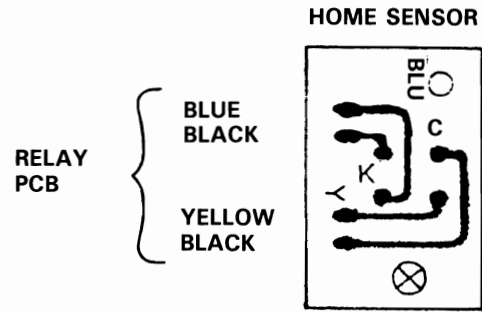
CONNECTOR NOTES

CAUTION:

- The terminal of the dot sensor is inserted into CN8 of the control PCB, NOT into test pins of HOME and DOT signals. You may make mis-connection since they are the same style receptacle.

Interface Connector
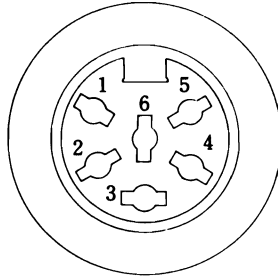
Pin No.	Signal
1	SERIAL SRQ
2	GND
3	SERIAL ATN
4	SERIAL CLK
5	SERIAL DATA
6	$\overline{\text{RES}}$

- The No. 1 terminal of the lamp PCB unit must be connected to pin 1 of CN7 (connector 7 of the control PCB). The wire of the lamp harness is marked with white to indicate pin 1.

Bottom view of lamp
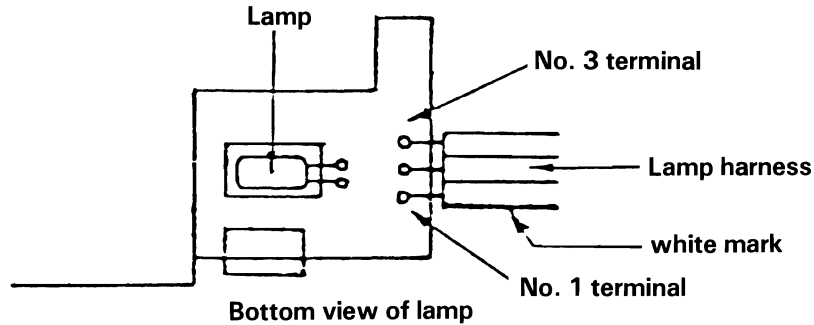
- The No. 13 terminal of the transformer PCB is connected to pin 1 of CN6 of the control PCB.
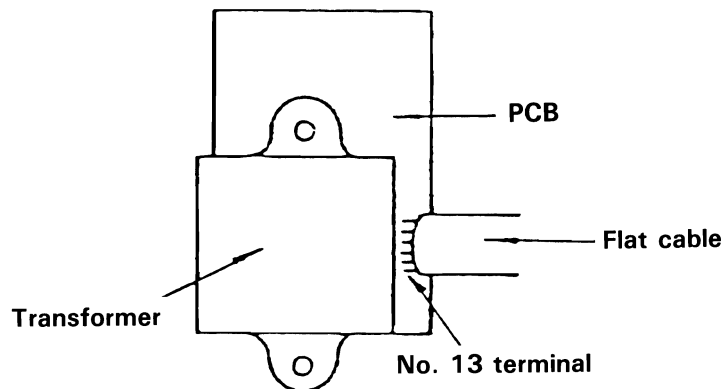
- Take extreme care when removing and installing flat cables. Unless noted above, the white line indicates the opposite of pin 1 of the housing.

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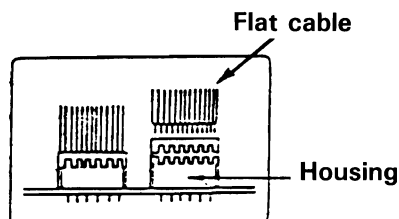
PART LIST
TRANSFORMER PCB ASSEMBLY

		SIEKOSHA PART #	COMMODORE PART #
Power Switch	WK2A44 (KAUTT and BUX)	84802-5155	ALL PARTS
AC Cord Set	SVT AWG18	84802-5351U	INCLUDED IN
F1	Fuse MT4 630 mA 250V	84802-5301	BOTTOM CASE
L1	Toroidal Coil SC-02--101,2A	8409-30200	ASSEMBLY # 314555-01
C1	Ceramic Cap 10000 pF 125V (MURATA)	8409-02043	
C2	Ceramic Cap 4700 pF 125V (MURATA)	8409-02042	
C3	Ceramic Cap 4700 pF 125V (MURATA)	8409-02042	
T1	Transformer GPT02A (MINEBEA-DENSHI)	84802-5201	

PRIMARY CIRCUIT

PCB

TRANSFORMER

SECONDARY

PRIMARY

AC23V
AC15V
AC9V

13 12 11 10 9 8

1 2 3 4 5 6

C2 C3 C1

L1

F1

POWER SWITCH

AC117V

AWG18
UL STYLE 1007
CSA TYPE TR-54
GREEN/YELLOW SPIRAL

CHASIS GND
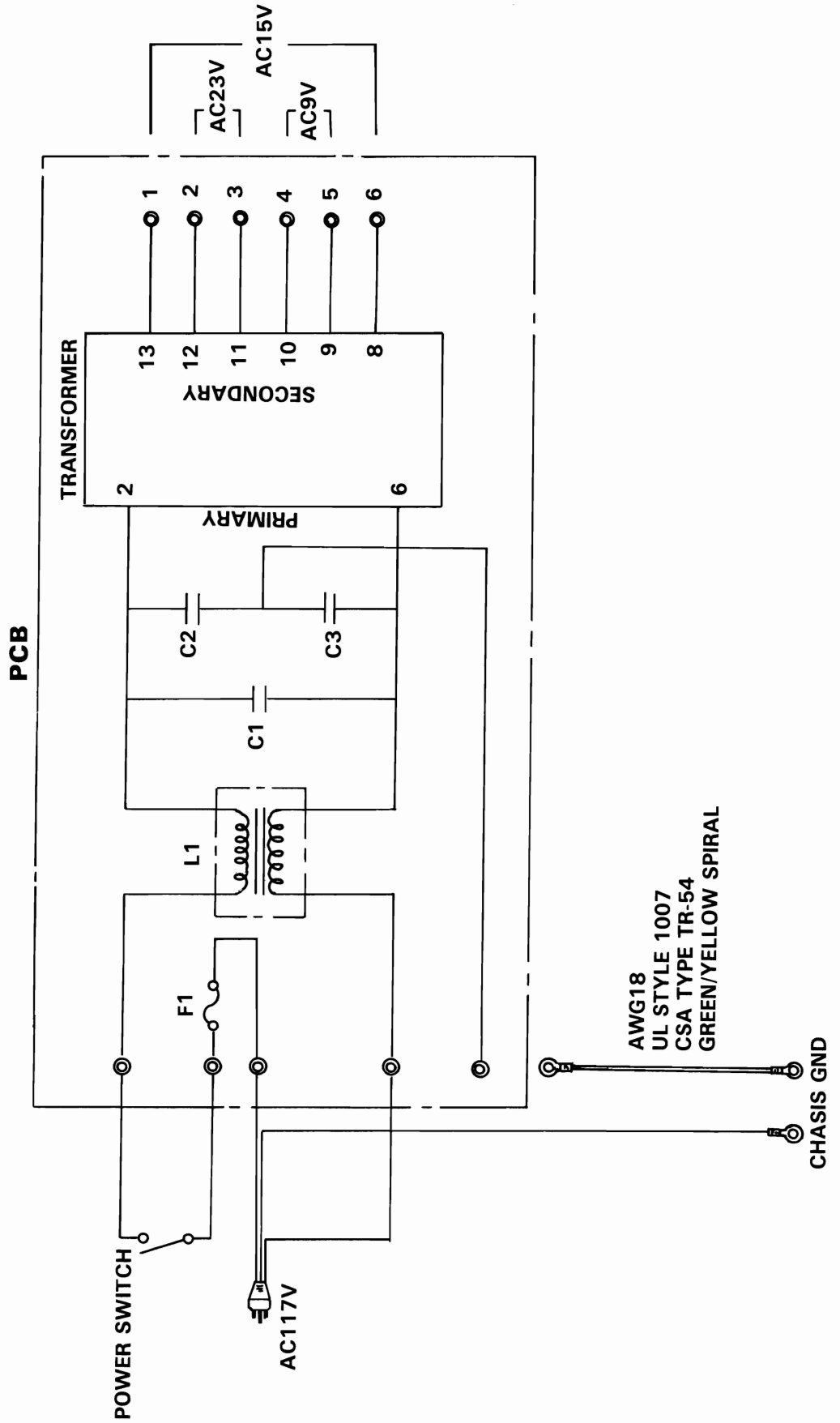
PARTS LIST
PCB ASSEMBLY #314556-01

PLEASE NOTE:

Commodore part numbers are provided for reference only and do not indicate the availability of parts from Commodore. Industry standard parts (Resistors, Capacitors, Connectors) should be secured locally. Approved cross-references for TTL chips, Transistors, etc. will be available in manual form through the Service Department in November of 1984. Unique or non-standard parts will be stocked by Commodore and are indicated on the parts list by a ''C''. Vendor Name and part number have been provided for your convenience in ordering custom or unique parts.

		SIEKOSHA PART #	COMMODORE PART #
INTEGRATED CIRCUITS			
P1	74LS74	8409-08074	901521-06
P2	74LS04	8409-08004	901521-02
P3	ULN2003 Driver 7 Channel CMOS, TTL Inputs SIGNETICS, T.I.	8409-10002	
P4	7406	8409-10000	901522-06
P5	MBL8039H, CPU 128 X 8, NEC, FUJITSU, INTEL SIGNETICS	8409-10112	
P6	74LS74	8409-08074	901521-06
P7	74LS373	8409-08373	901521-29
P8	ROM	8409-10400	5JW-2
GP-DR-2	CUSTOM PART	8409-10007	
TRANSISTORS			
Q1	Small Signal 2SC458C (Hitachi)	8409-07201	
Q2	2SD1276 ⓜ	8409-07300	
Q3	Voltage Reg μA 7805VC	8409-14000	901527-02
DIODES			
D1	152076 (Hitachi)	8409-11102	
D2	152076 (Hitachi)	8409-11102	
D3	152076 (Hitachi)	8409-11102	
D4	21V Zener HZ22-1 (Hitachi)	8409-12124	
D5[1]	Rectifier S2VB10 (Sindegen, Sanyo)	8409-11210	251026-02
D6	Zener HZ6C2 (Hitachi)	8409-12044	
D7	Rectifier S2VB10	8409-11210	251026-02
RESISTORS			
R1	Carbon 1/4W, 1K	8409-03072	901550-01
R2	Carbon 1/4W, 100K	8409-03048	901550-49
R3	Carbon 1/4W, 2.2K	8409-03080	901550-18
R4	Carbon 1/4W, 150K	8409-03052	901550-89
R5	Carbon 1/4W, 150K	8409-03052	901550-89
R6	Carbon 1/4W, 1K	8409-03272	901550-01
R7	Carbon 1/4W, 1K	8409-03072	901550-01
R8	Carbon 1/4W, 1K	8409-03072	901550-01
R9	Carbon 1/4W, 1K	8409-03072	901550-01

PARTS LIST PCB ASSEMBLY #314556-01 (Continued)

|		SIEKOSHA PART #	COMMODORE PART #
RESISTORS (Continued)			
R10	Metal Oxide Film 510Ω, 1W	8409-04241	
R11	Metal Oxide Film 510Ω, 1W	8409-04241	
R12	3K	8409-03083	901550-33
R13	10K	8409-03096	901550-20
R14	2.2K	8409-03080	901550-18
R15	1K	8409-03072	901550-01
R16	1K	8409-03072	901550-01
R17	4.7K	8409-03088	901550-19
R18	1K	8409-03072	901550-01
R19	Metal Oxide Film 150Ω, 2W	8409-04328	
RA1	Carbon Array 1KΩ, 1/8W	8409-06306	
CAPACITORS			
C1	Ceramic .001μF, 25V	8409-01250	
C2	Ceramic .022μF, 25V	8409-01266	
C3	Ceramic .022μF, 25V	8409-01266	
C4	Ceramic 30pF, 50V	8409-02200	
C5	Ceramic .001μF, 25V	8409-01250	
C6	Al Electrolytic 4.7μF, 25V	8409-01040	900100-11
C7	Ceramic .022μF, 25V	8409-01266	
C8	Ceramic .022μF, 25V	8409-01266	
C9	Ceramic .022μF, 25V	8409-01266	
C10	Ceramic .022μF, 25V	8409-01266	
C11	Ceramic .022μF, 25V	8409-01266	
C12	Ceramic .022μF, 25V	8409-01266	
C13	Ceramic .022μF, 100V	8409-01320	
C14	Ceramic .022μF, 100V	8409-01320	
C15	Al Electrolytic 470μF, 50V	8409-01048	
C16	Al Electrolytic 1μF, 50V	8409-01081	900108-50
C17	Al Electrolytic 3300μF, 50V	8409-01732	
C18	Al Electrolytic 2200μF, 16V	8409-01029	
C19	Al Electrolytic 220μF, 6.3V	8409-01003	
C20	Ceramic .022μF, 25V	8409-01266	
C21	Ceramic .022μF, 16V	8409-01266	
MISCELLANEOUS			
X1	Ceramic Oscillator 10 MHz, CSA 10.00 MT	8409-13001	
F1, F2	Fuse 1.6A, 125V	8409-18229	
SW1	Slide Switch SSP2X3MB5.8X9	8409-24001	
CN1, 2	Connector TCS4460-01-1011	8409-21603	
CN3, 4	Connector 8P-RVQ	8409-21205	
CN5	Connector 3P-RVQ	8409-21200	
CN6	Connector 6P-RVQ	8409-21203	
CN7	Connector 3P-RVQ	8409-21200	
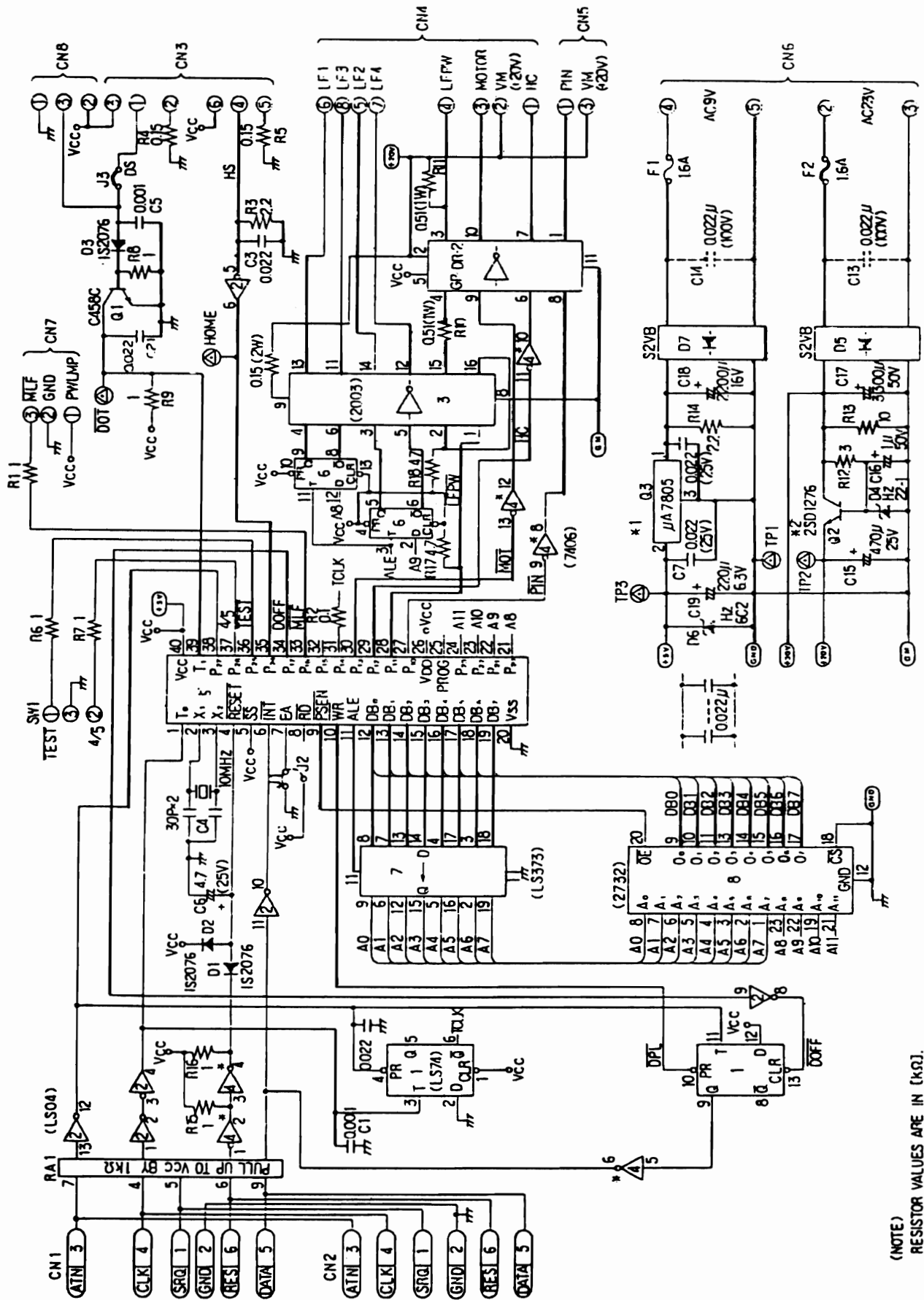
(NOTE)
RESISTOR VALUES ARE IN [kΩ].
CONDENSER VALUES ARE IN [μF] UNLESS OTHERWISE SPECIFIED.
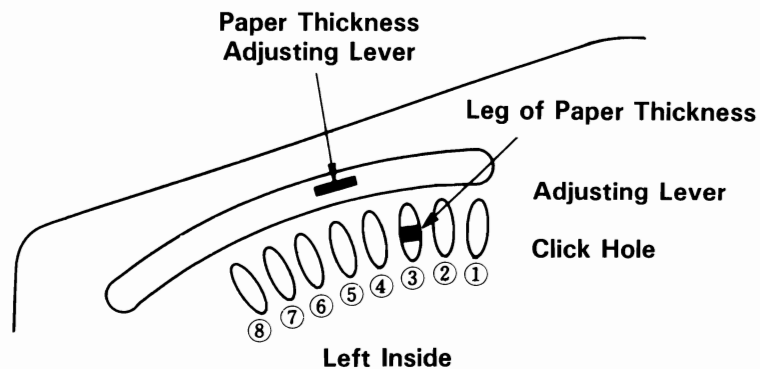*1, *2 WITH HEAT SINK.

MECHANICAL ADJUSTMENTS

Guide pillar B installation: (Refer to Section 2, NOTE 2C, on page 27.)

(1) Insert the damper, the carrier spacer, and the carrier unit onto guide pillar B. Insert guide pillar B into the ground plate R and L assemblies along with the bearing on both ends. Guide pillar should be placed so that part Ⓐ , which protrudes the most as shown in the figure below, is at the top position.
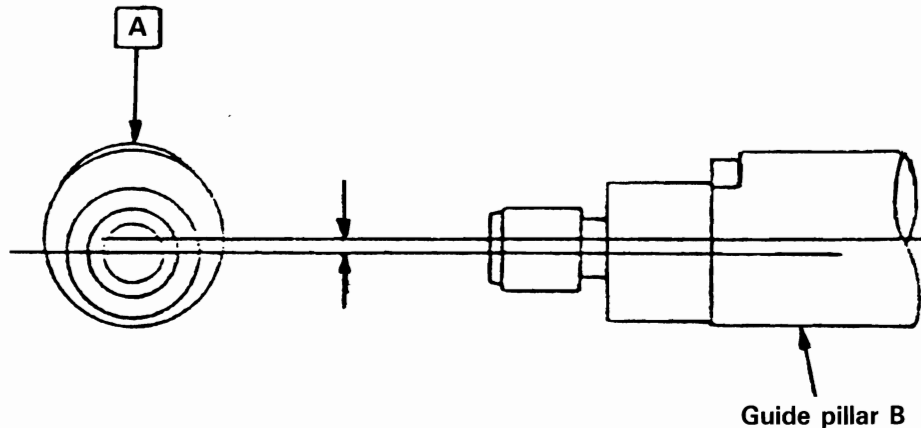
Guide pillar B

(2) Insert the head adjustment lever into the left end of guide pillar B and tighten the flange nut (C) so that the foot of the lever is set in click hole ③ , as shown in the figure below, when part Ⓐ of guide pillar B is facing up. When tightening the flange nut, it is O.K. to grasp the leftmost end of guide pillar B with pliers, since it is covered with the damper.

Paper Thickness
Adjusting Lever

Leg of Paper Thickness

Adjusting Lever

Click Hole

Left Inside

NOTE: Be sure that after tightening the flange nut, part Ⓐ of guide pillar B (the part which protrudes the most), is at the top position when the foot of the lever is set in click hole ③ .

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MECHANICAL ADJUSTMENTS (Continued)

Print head position adjustment:

(1) Place the print head unit on top of the carrier so that both ends of spring Ⓒ appear.

(2) Loosely tighten the two screws Ⓐ . Insert an adjusting screw to hole Ⓑ .

(3) Adjust the printed character quality with screw Ⓑ when the foot of the head adjustment lever is at position ③ , as shown on page 22 (Guide Pillar Adj.).

(4) Firmly tighten up the two screws Ⓐ and make sure that smudging does not appear when the foot of the lever is at the position 1 .

(5) Remove the screw Ⓑ which is a tool for adjusting print head position.

TWO SCREWS Ⓐ

PRINT HEAD UNIT

SCREW Ⓑ

SPRING ENDS Ⓒ

TOP VIEW OF PRINT HEAD
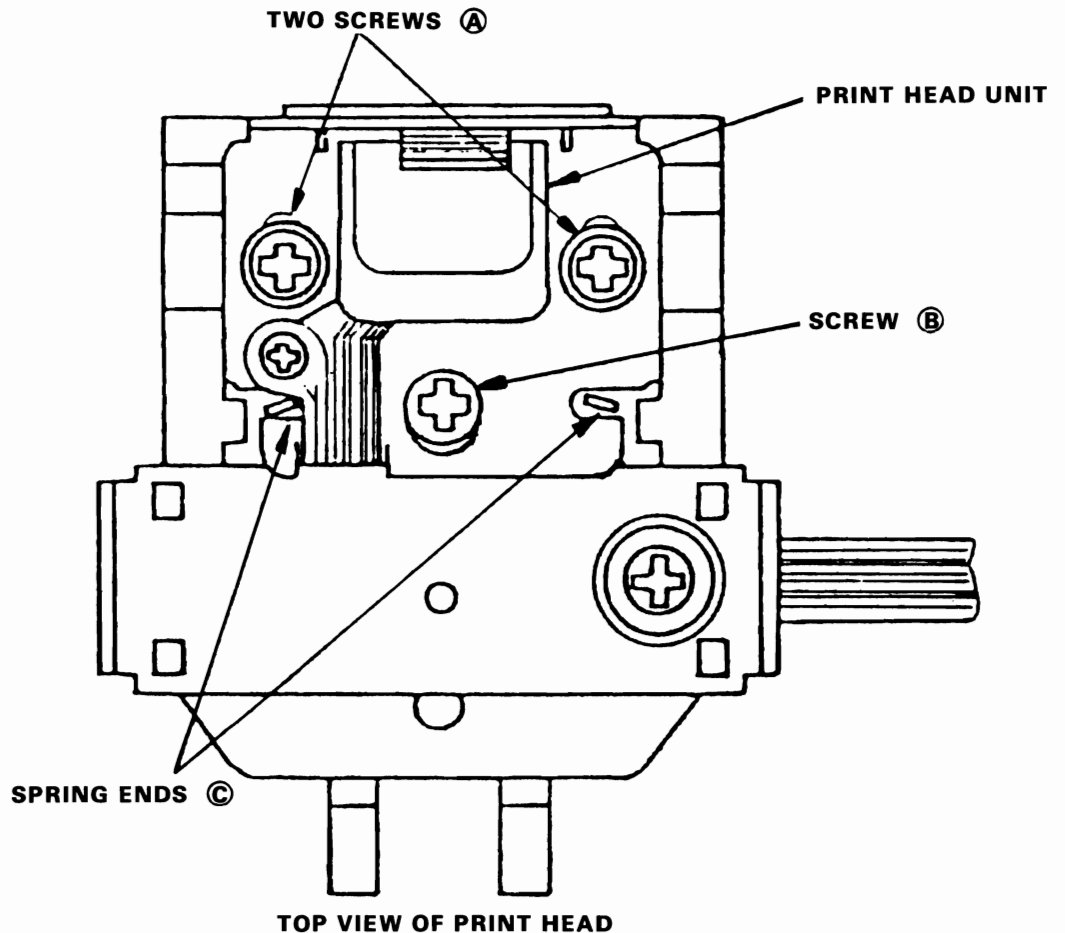
NOTE: Screw Ⓑ is not included with printer. We suggest that you secure a suitable screw from a local hardware store.

MECHANICAL ADJUSTMENTS (Continued)

Dot Sensor Unit Adjustment:

With ribbon cassette and paper installed, run the self test. (See page 10) Check the upper and lower portion of the characters for proper printing. If a portion of the characters is missing, adjust the position of the dot sensor unit as follows:

(a)   (b)   (c)
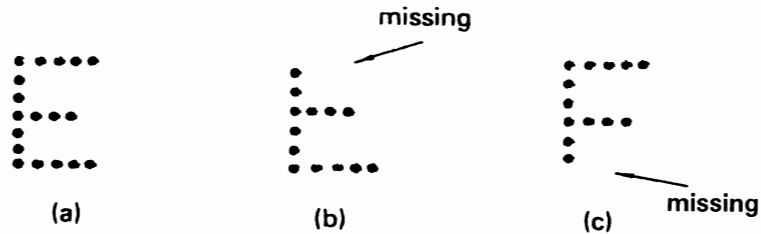
(a) Normal

(b) The uppermost part is missing.
The hammer starts printing too early when a platen ridge has not yet reached the correct position.

To correct: Move the dot sensor unit counter-clockwise.

(c) The lower portion is missing.
The hammer starts printing too late.

To correct: Move the dot sensor unit clockwise.

24

MECHANICAL ADJUSTMENTS (Continued)
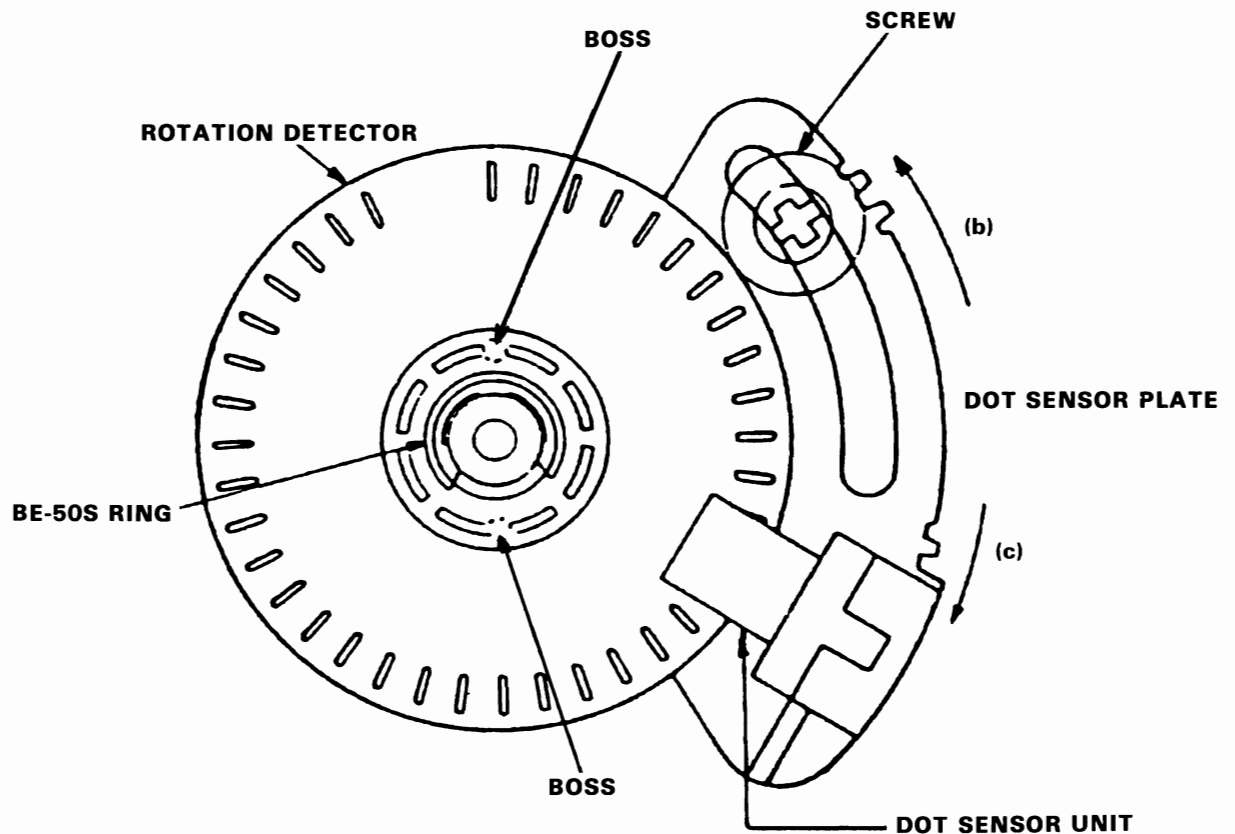
Rotation Detector Adjustment:

If adjustment of the dot sensor unit does not produce satisfactory results, the rotation detector must be adjusted. To adjust the rotation detector, remove the BE-50S ring and dot sensor unit. Move the rotation detector 4 holes, clockwise in the case of (b), OR counterclockwise in the case of (c). When replacing the rotation detector, be careful that the two bosses are engaged with the gears of the head motor.

PLATEN GEAR

HOLE H

HOLE G

X

S

REDUCTION GEAR
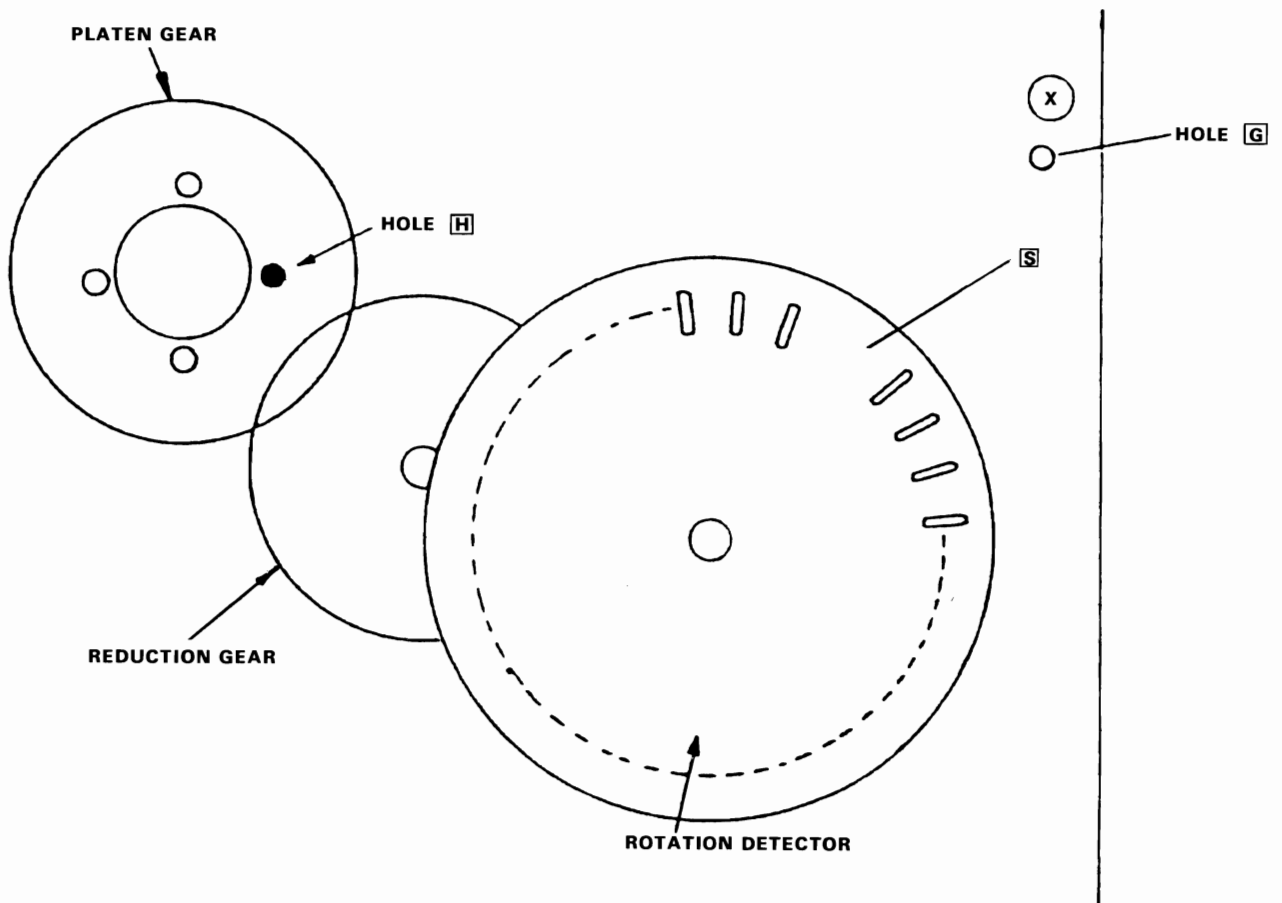
ROTATION DETECTOR

Rotate the platen gear so that one of the holes of it matches hole H in the ground plate. Keep holding the platen gear while setting the rotation detector.

Set the rotation detector so that part S , where there is no hole, is facing hole G of the ground plate. Setting up by this method insures that it is possible to eliminate the missing upper or lower part of a character by only adjusting the position of the dot sensor unit.

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# CASEWORK — MECHANICAL ASSEMBLIES

SECTION 1. CASEWORK/POWER SUPPLY

REF. NO.		
1-1	C 31455001 801	PAPERFEED KNOB
1-2	C 31455101 801	SOUNDPROOF COVER
		w/PAPER SHELF
1-3	C 31455201 801	FRONT BEZEL UNIT
1-4	C 31455301 801	TOP CASE
1-5	C 31455401 801	DECORATIVE PLATE ASSY.
		1-Plate w/Paper Advance Switch
		2-Lamp, PCB & Harness
1-6	C 31455501 801	BOTTOM CASE w/PWR/SUP.
		ASSY.
		1-Plastic Case
		2-Power Supply Assy. w/Pwr. Cord
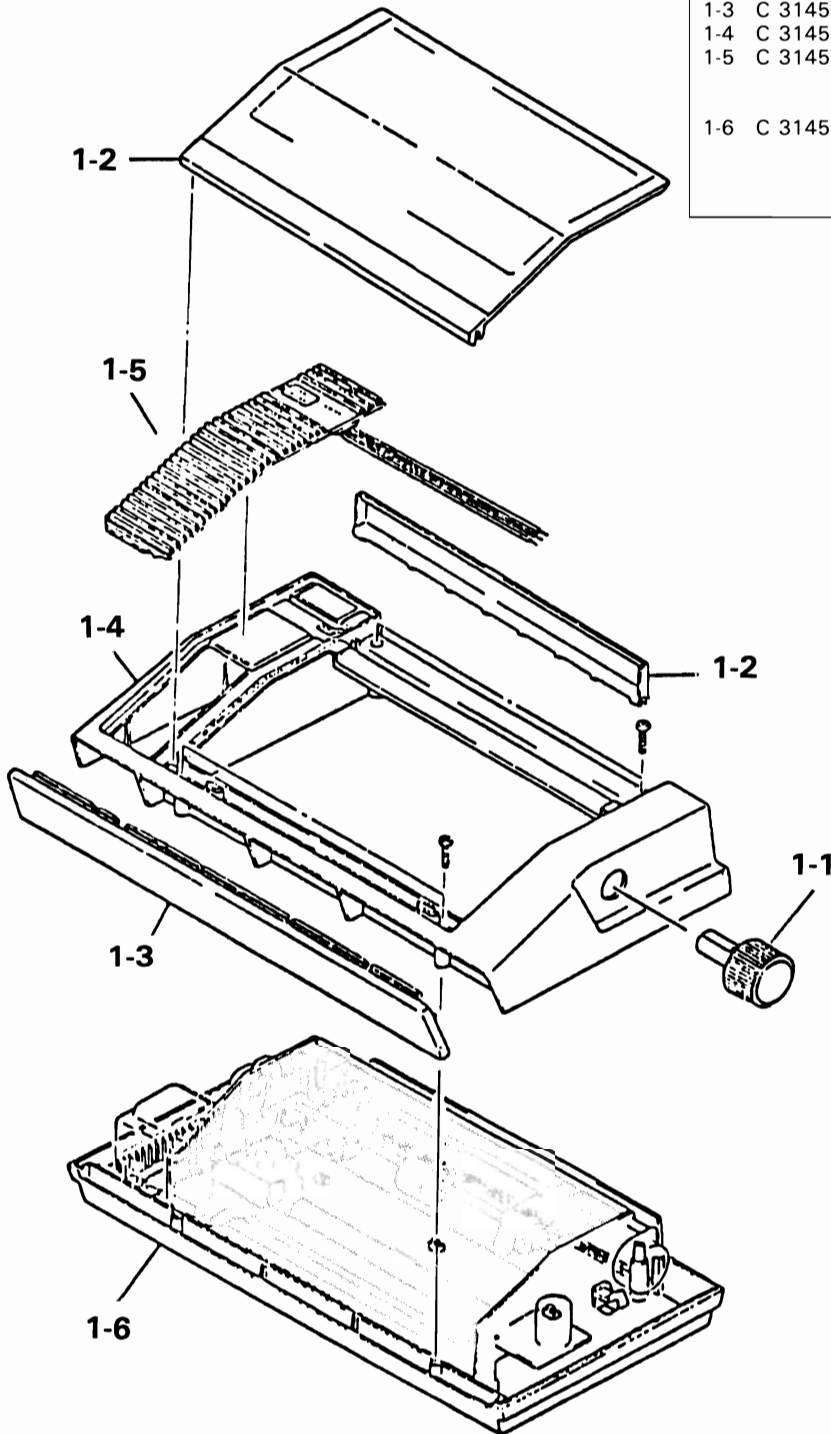
CASEWORK — MECHANICAL ASSEMBLIES (Continued)

SECTION 2. Print Head/Ribbon Feed/Carriage

REF. NO.

2-1   C 31455701   801 PRINT HEAD ASSY.
          1-Print Head w/Carrier Unit
          2-Flexible Cable

2-2   C 31455801   801 RIBBON FEED & CARRIAGE
          ASSY.
          1-Ribbon Drive Pulley, Spring &
          Shaft
          2-Carrier Guide Pillar w/Head Adj.
          Lever
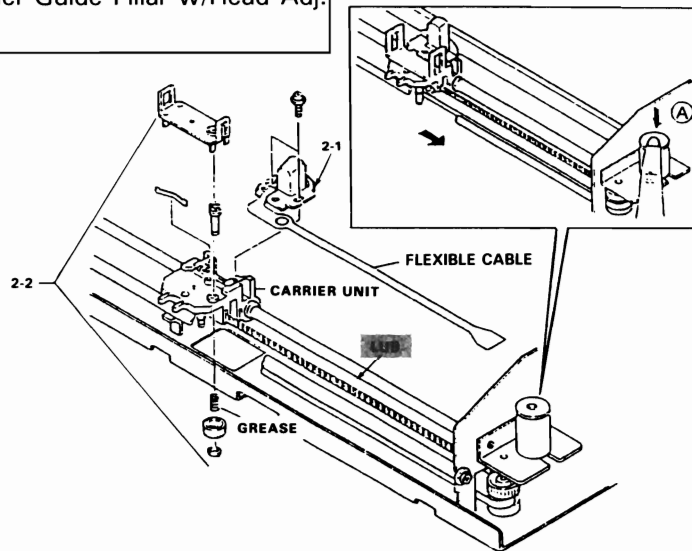
NOTE 2A: The carrier unit with print head can be manually moved when the head solenoid is pressed as indicated by the black arrow Ⓐ

NOTE 2B: When installing the print head on the carrier, refer to "Print head position adjustment."
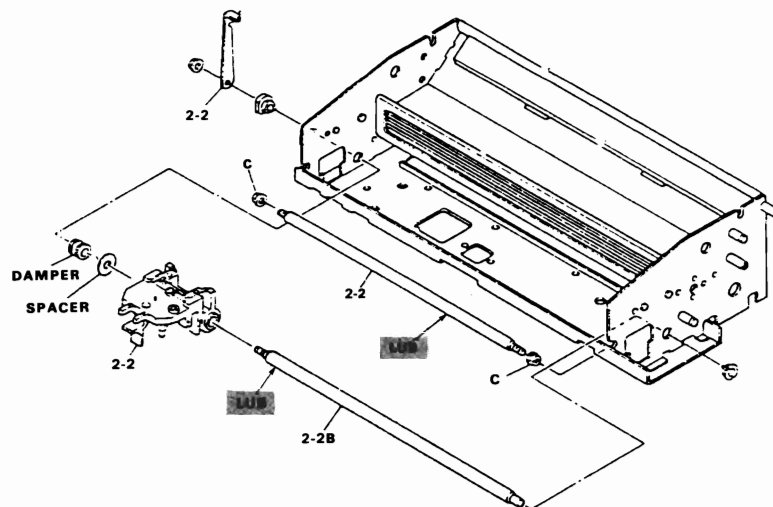
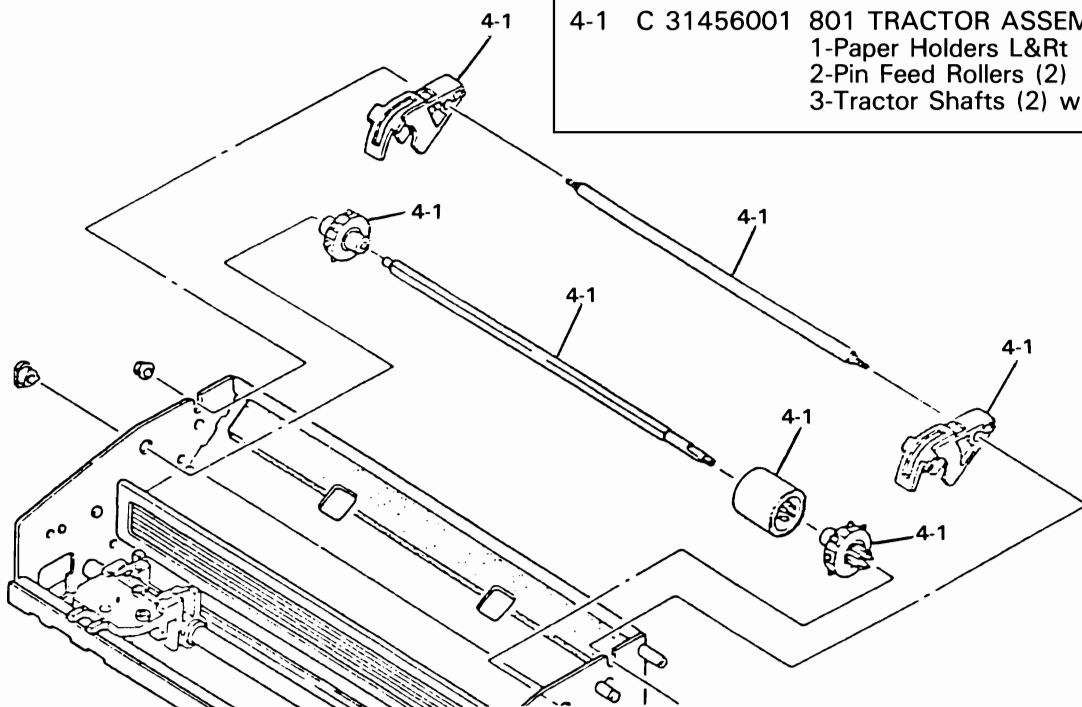**NOTE 2C:** When tightening the hex nuts at location C, refer to "Guide pillar installation."

CASEWORK — MECHANICAL ASSEMBLIES (Continued)

SECTION 3. Platen/Ground Plates
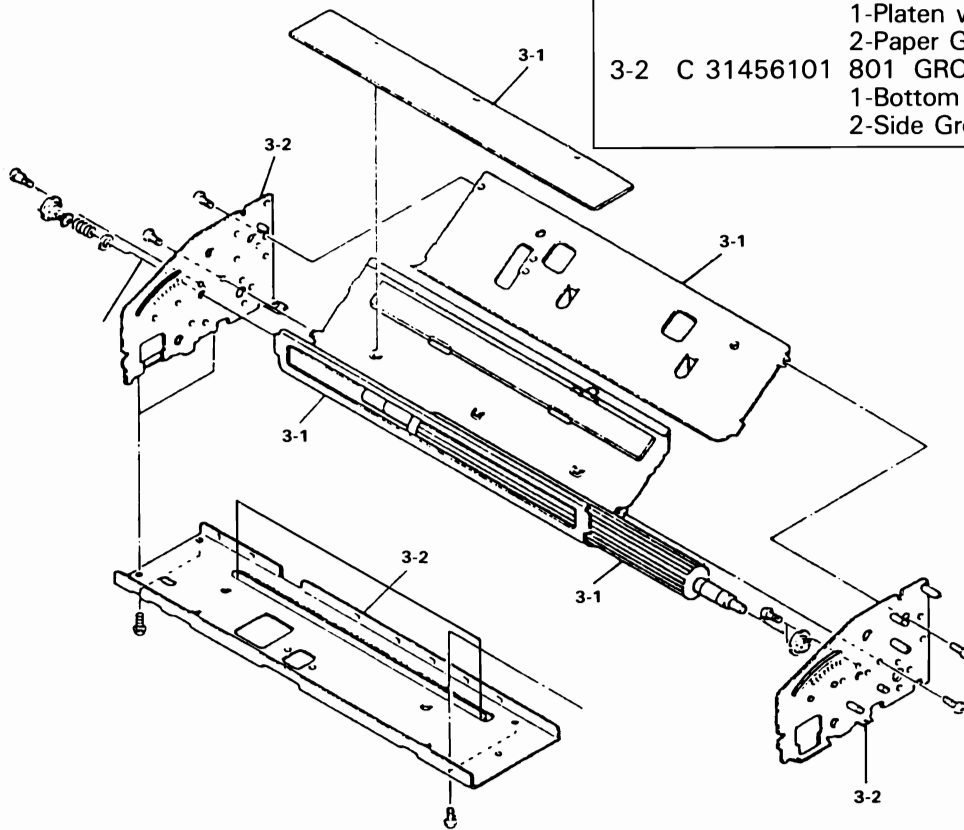
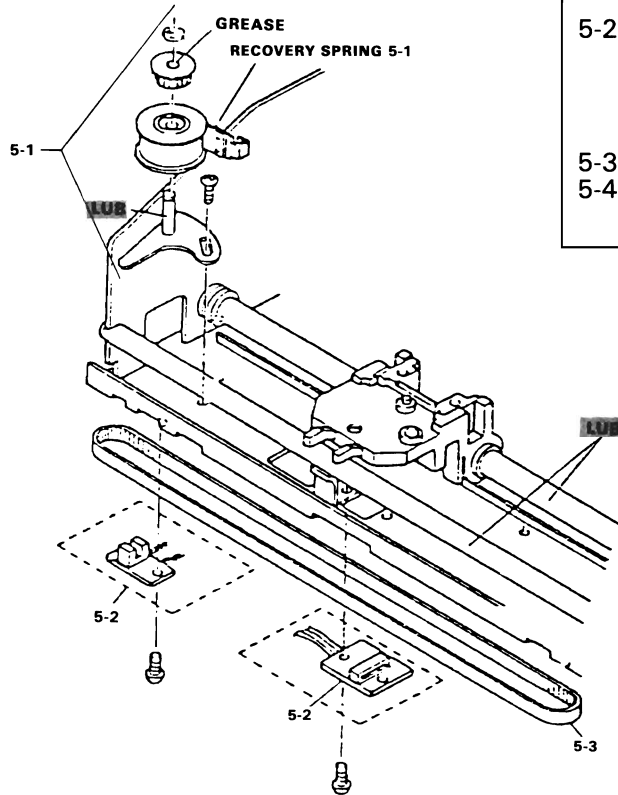| REF. NO. |
|---|
| 3-1   C 31455901 801 PLATEN ASSEMBLY |
| 1-Platen w/Upper Cover |
| 2-Paper Guides (2) |
| 3-2   C 31456101 801 GROUND PLATE ASSEMBLY |
| 1-Bottom Ground Plate |
| 2-Side Ground Plates (2) |

SECTION 4. Tractor

REF. NO.
4-1   C 31456001 801 TRACTOR ASSEMBLY
1-Paper Holders L&Rt
2-Pin Feed Rollers (2)
3-Tractor Shafts (2) w/Rubber Ring

SECTION 5. Gears/Sensors/Motors

| REF. NO. |
|---|
| 5-1 C 31456201 801 GEAR REPLACEMENT KIT |
| 1-All Plastic Gear Parts |
| 2-Rotation Detector |
| 3-Recovery Spring |
| 5-2 C 31456301 801 SENSOR ASSEMBLY |
| 1-Home Sensor w/PCB |
| 2-Dot Sensor w/PCB |
| 3-Wiring Harness w/PCB |
| 4-Cable Connector w/PCB |
| 5-3 C 31456401 801 CARRIAGE DRIVE BELT |
| 5-4 C 31456501 801 HEAD SOLENOID |
| 1-Head Solenoid w/Mounting Plate |
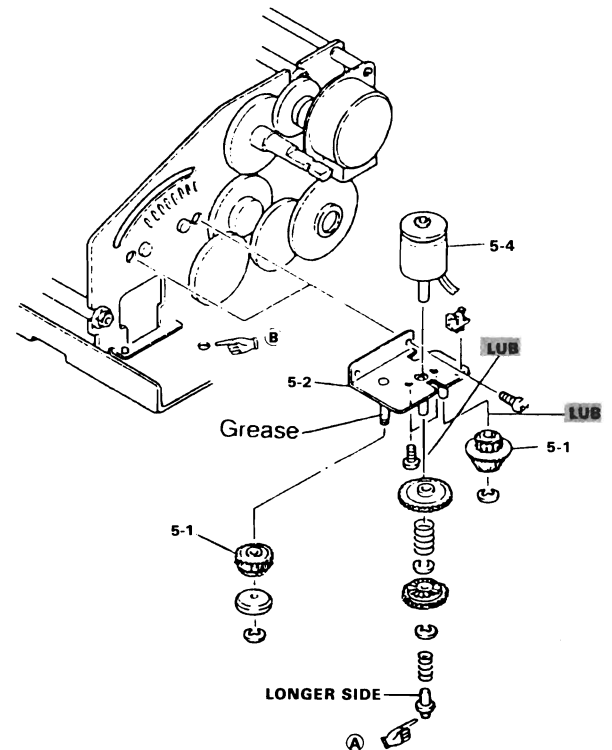
NOTE 5A: Be careful not to cut your finger when detaching the recovery spring of 5-1 from the carrier. It is very strong.

NOTE 5B: The longer side of the spring step should face top and the shorter side, indicated by hand Ⓐ should go into the hole which is pointed to by hand Ⓑ.

CASEWORK — MECHANICAL ASSEMBLIES (Continued)

SECTION 5. Gears/Sensors/Motors (Continued)

REF. NO.			
5-5	C 31456701	801	LINEFEED MOTOR
5-6	C 31456601	801	HEAD MOTOR

LUB

5-4

5-2

5-5

5-1

5-6

5-2

5-1
NOTE D

5-1

LUB

5-1

NOTE C
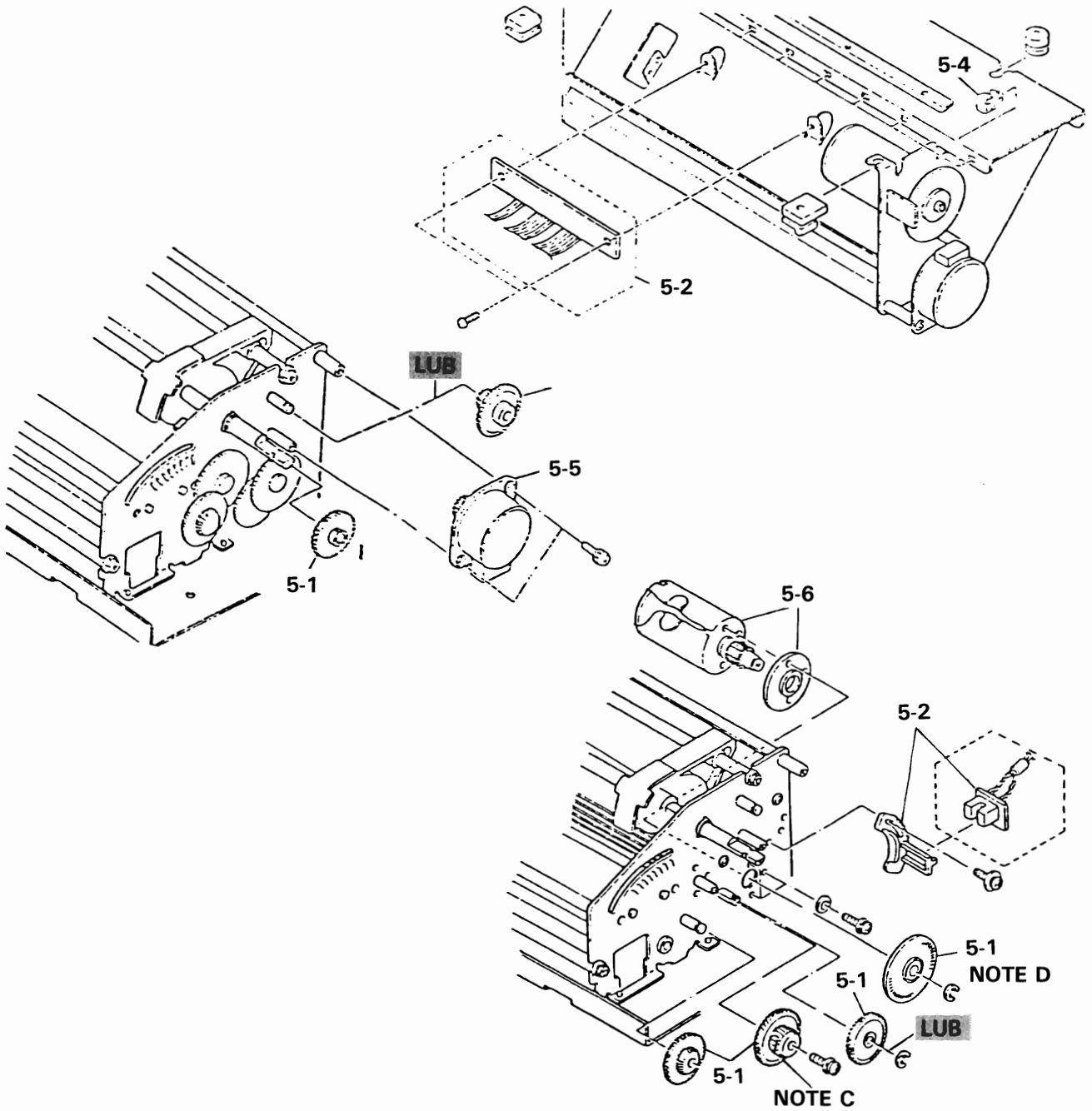
NOTE 5C: When inserting (C) into the platen shaft, be sure to reach the utmost end by rotating (C) while inserting.

NOTE 5D: To attach (D), refer to ''Dot sensor unit adjustment.''