G215E

SERVICE MANUAL

G-215E SERVICE MANUAL

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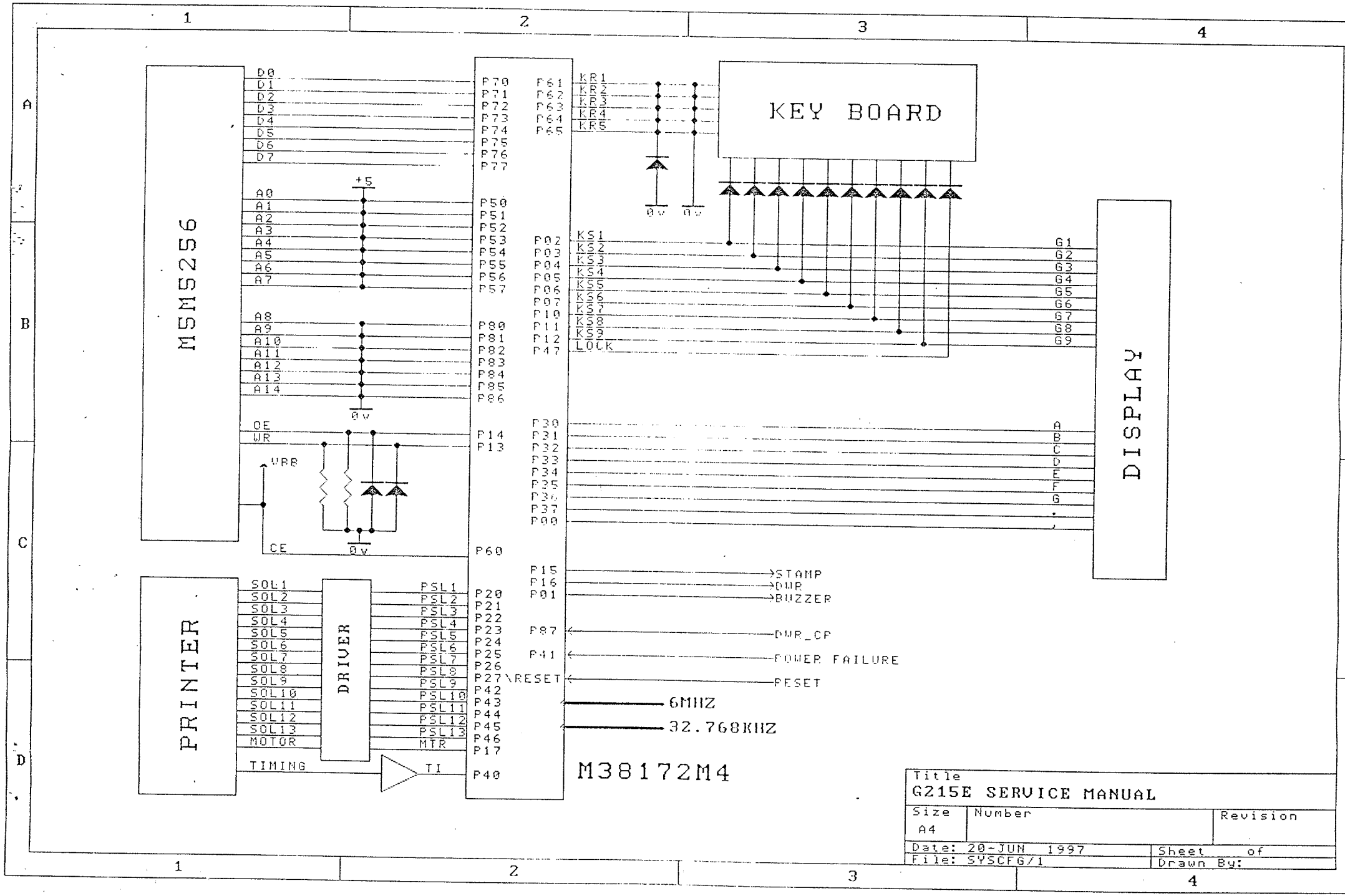
M5M5256
D0
D1
D2
D3
D4
D5
D6
D7
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
A13
A14
OE
WR
WRB
CE
+5
0v
P70
P71
P72
P73
P74
P75
P76
P77
P50
P51
P52
P53
P54
P55
P56
P57
P80
P81
P82
P83
P84
P85
P86
P14
P13
P60
KEY BOARD
KR1
KR2
KR3
KR4
KR5
P61
P62
P63
P64
P65
KS1
KS2
KS3
KS4
KS5
KS6
KS7
KS8
KS9
LOCK
P02
P03
P04
P05
P06
P07
P10
P11
P12
P47
DISPLAY
G1
G2
G3
G4
G5
G6
G7
G8
G9
P30
P31
P32
P33
P34
P35
P36
P37
P00
A
B
C
D
E
F
G
.
,
PRINTER
SOL1
SOL2
SOL3
SOL4
SOL5
SOL6
SOL7
SOL8
SOL9
SOL10
SOL11
SOL12
SOL13
MOTOR
TIMING
DRIVER
PSL1
PSL2
PSL3
PSL4
PSL5
PSL6
PSL7
PSL8
PSL9
PSL10
PSL11
PSL12
PSL13
MTR
TI
P20
P21
P22
P23
P24
P25
P26
P27\RESET
P42
P43
P44
P45
P46
P17
P40
P15
P16
P01
P87
P41
STAMP
DWR
BUZZER
DWR_CP
POWER FAILURE
RESET
6MHZ
32.768KHZ
M38172M4
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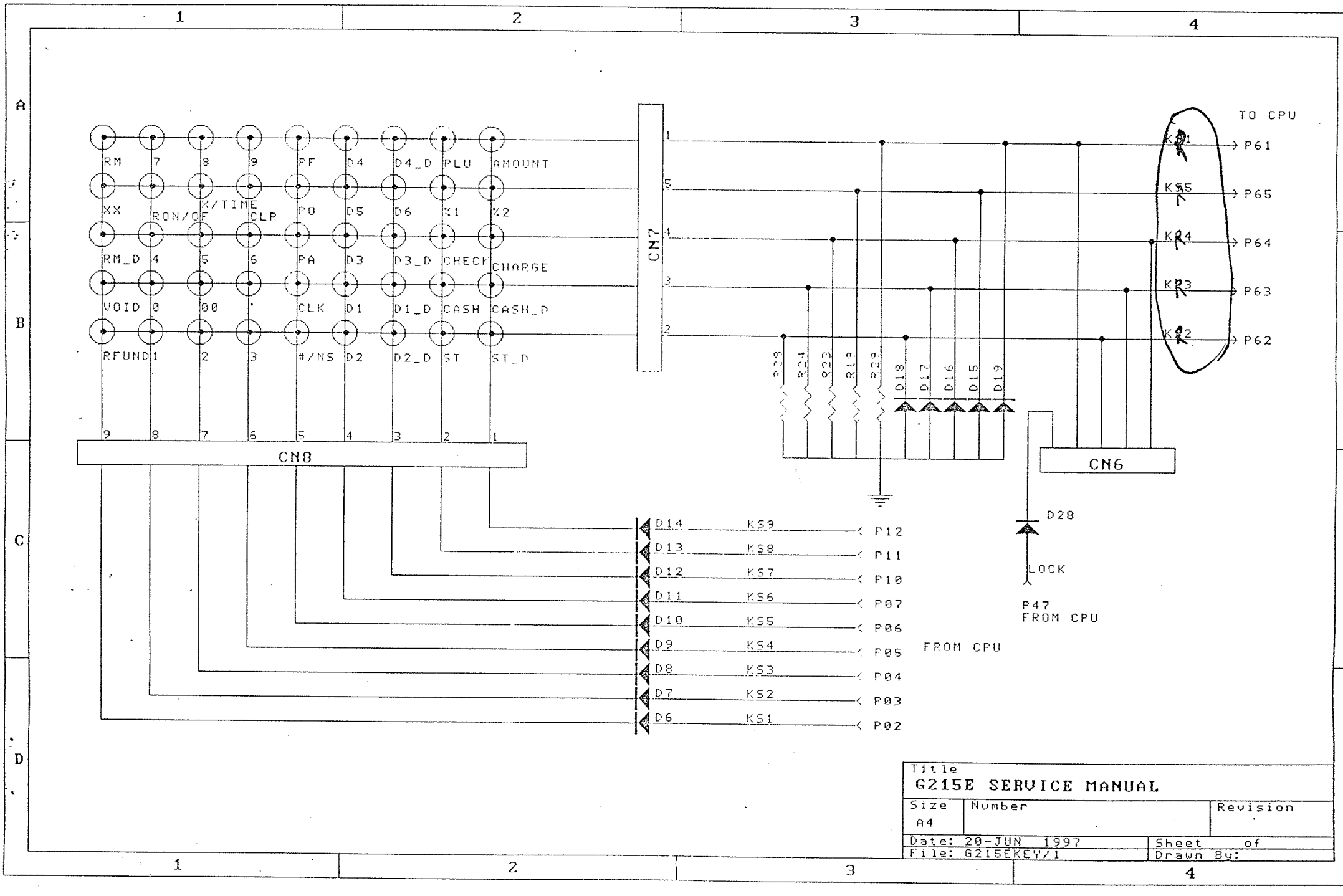
2. KEYBOARD CIRCUIT

Input and output signals for keyboard scanning are passing through CN6,CN7,and CN8.The output signals from output port (P02-P07,P10,P11,P12) of IC1 are encoded signals. They are applied to key matrix via CN8.

When a certain key is depressed, one of decoded signals is applied to port(P61-P65) of IC1 via CN7 . Thus IC1(CPU) recognizes which key is depressed and executes depressed key's specific operation.

The scanning signals are also used for digit indicator signals for display LED as well.

The scanning signal from IC1(P47) scans control lines KR1-KR4 and then they are applied to IC1(CPU)as control signals via CN6. According to the status of control signals, IC1(CPU) executes specific operation.



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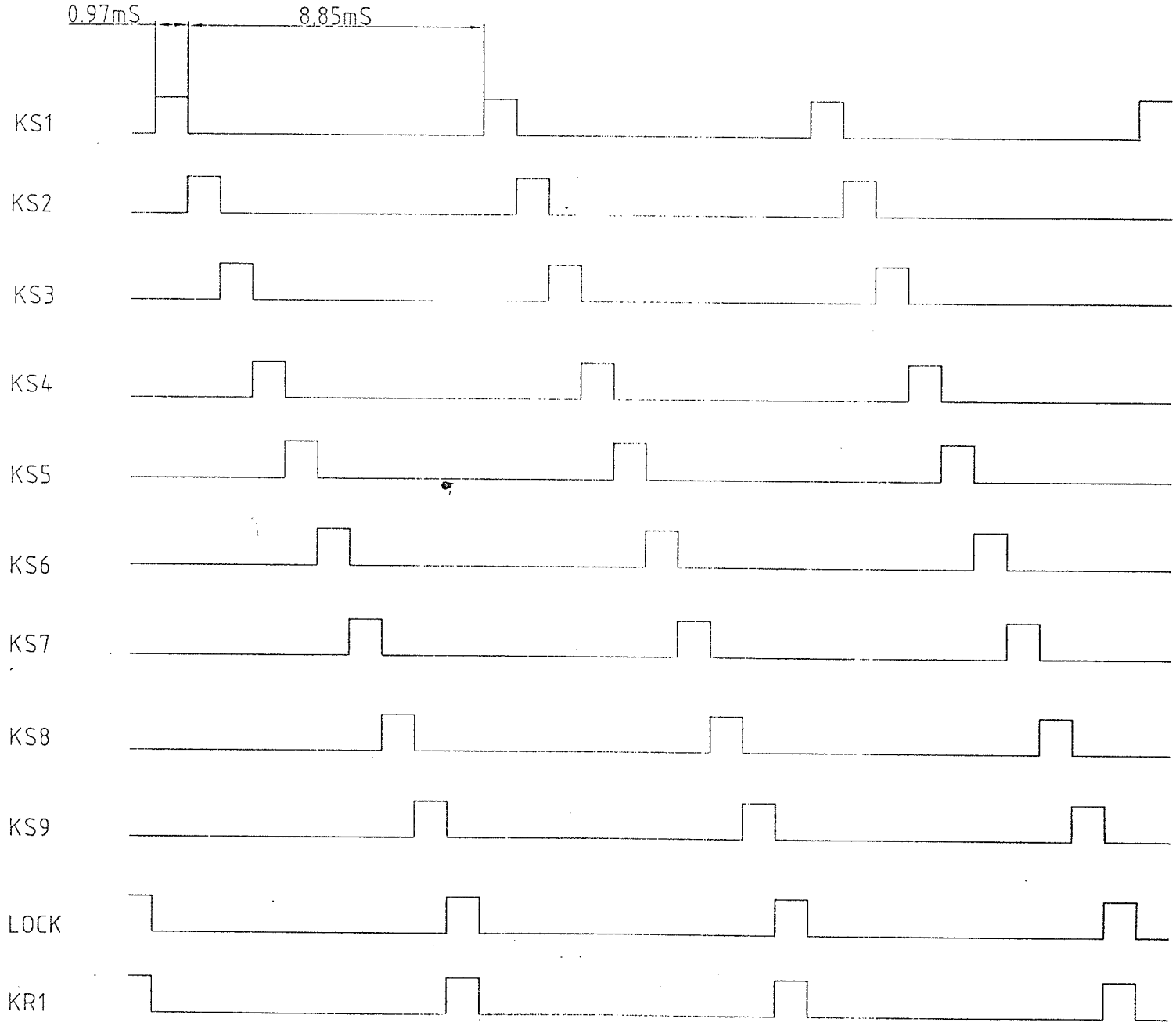


REG MODE

3. DISPLAY CIRCUIT

Display signals are applied to the display circuit board via HEAD.

The display signals for digit indication are also used for key scan signals . The display signals apply to the display tube on display circuit board.

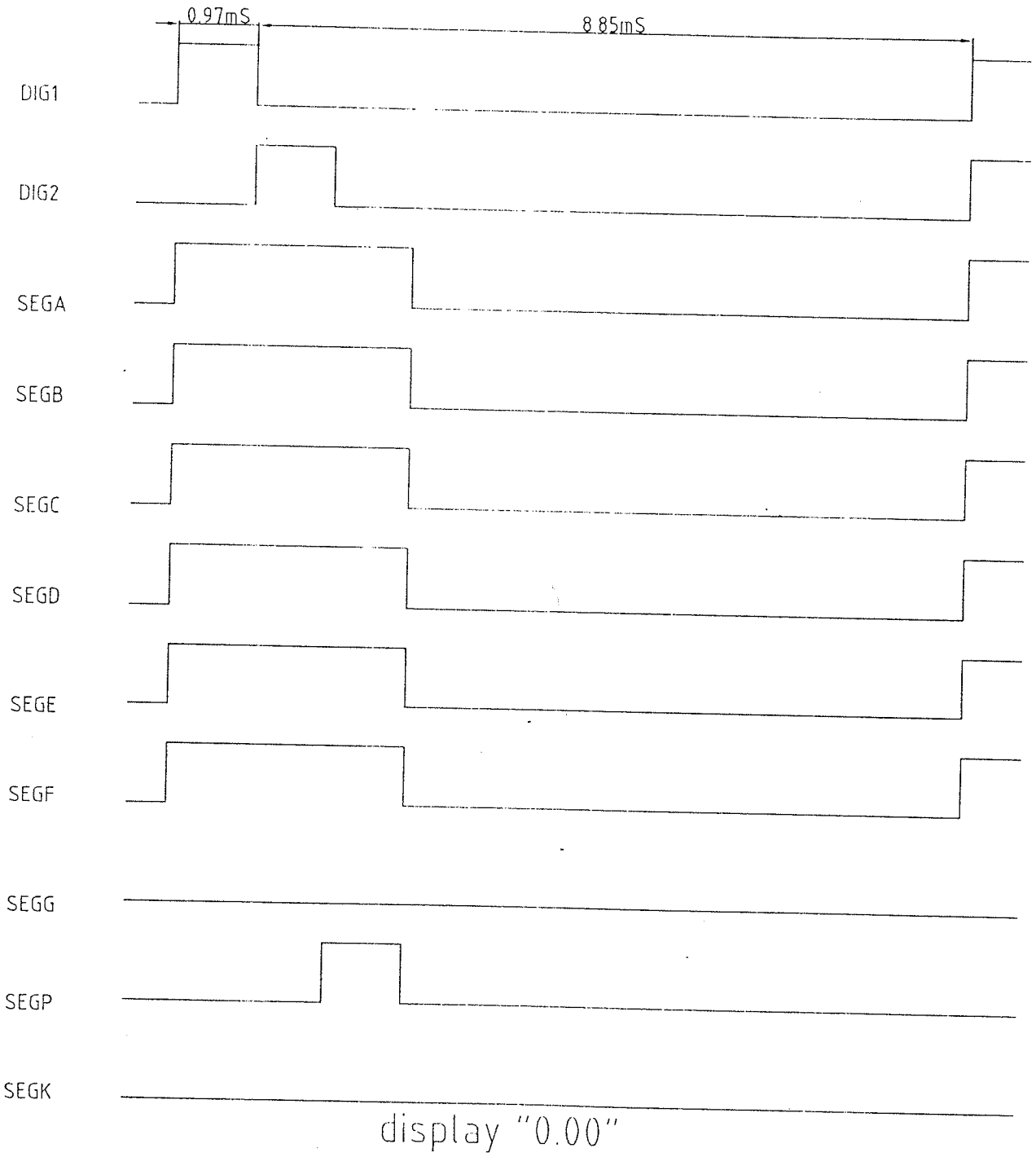
The display signals for segment indication are output from port of CPU(P30-P37,P00).They apply to the display tube on display circuit board.

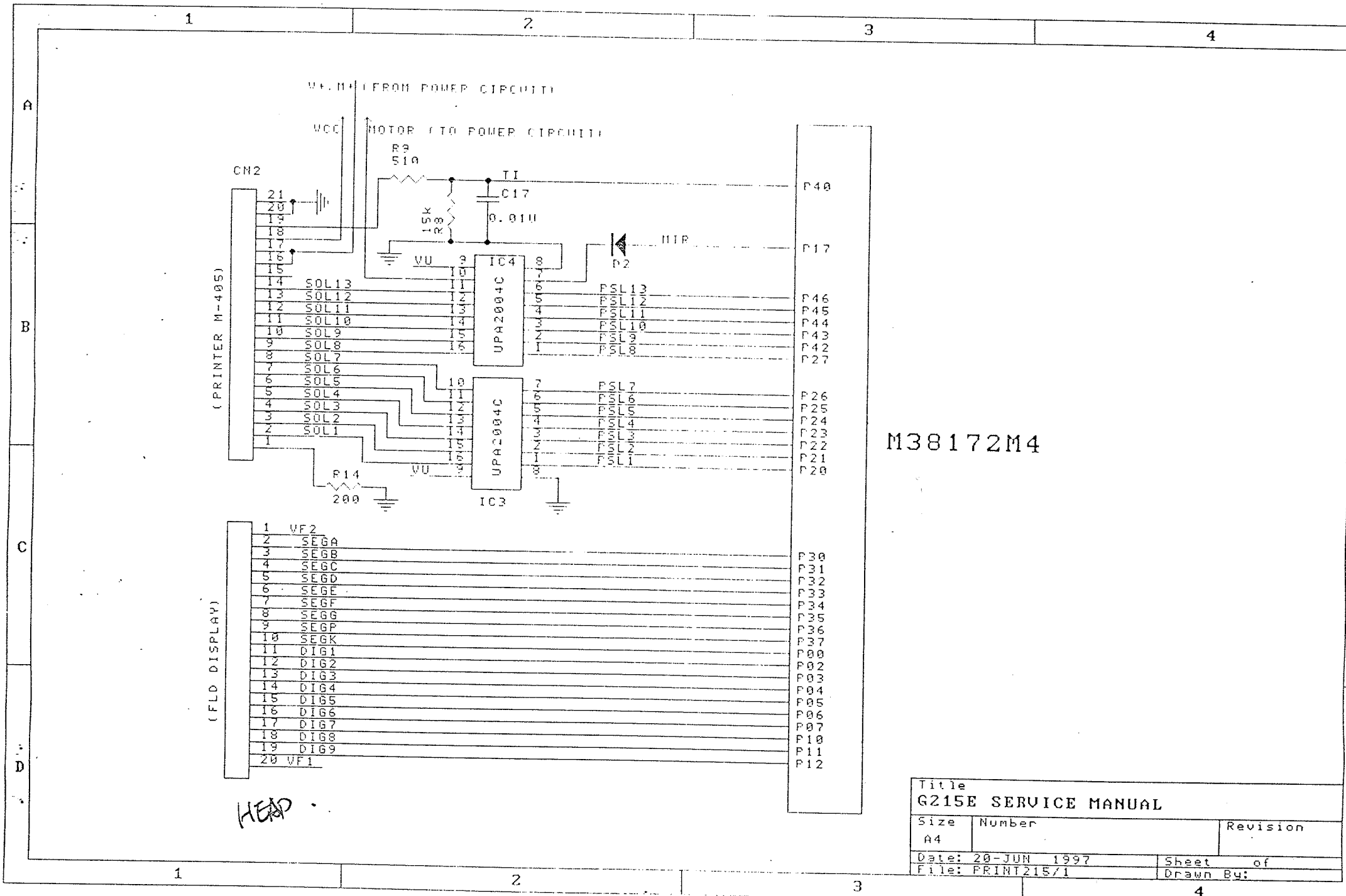
4. PRINTER DRIVE CIRCUIT

Printer drive circuit consists of CPU(IC1), IC4 and IC3(driver). Usually, P17 of IC1 outputs "H" level, pass through IC4, P1(D1142) base level is "L", P1 turns on. No motor power apply to printer. No power apply to wind motor . When one of DEPARTMENT or FUNCTION key is depressed, CPU outputs motor-start signal("L")from output port (P17), passes through IC4, "H" level is applied to P1 base. And P1 turns OFF. Thus the motor on printer mechanism is activated.

The printer mechanism outputs TIMING signal, as the motor drives it. The wave form of TIMING signal is applied to P40 of CPU.

When CPU receives TIMING signal, CPU makes trigger magnet signals (T0-T12)from TIMING signal and desired character data. The trigger magnet signals("H")are output from output port(P20-P27,P42-P46)of CPU. After being amplified at IC4 and IC3,the signals are applied to the trigger magnets on printer mechanism. Thus the printer prints the desired character.


0.97mS
8.85mS
DIG1
DIG2
SEGA
SEGB
SEGC
SEGD
SEGE
SEGF
SEGG
SEGP
SEGK
display "0.00"



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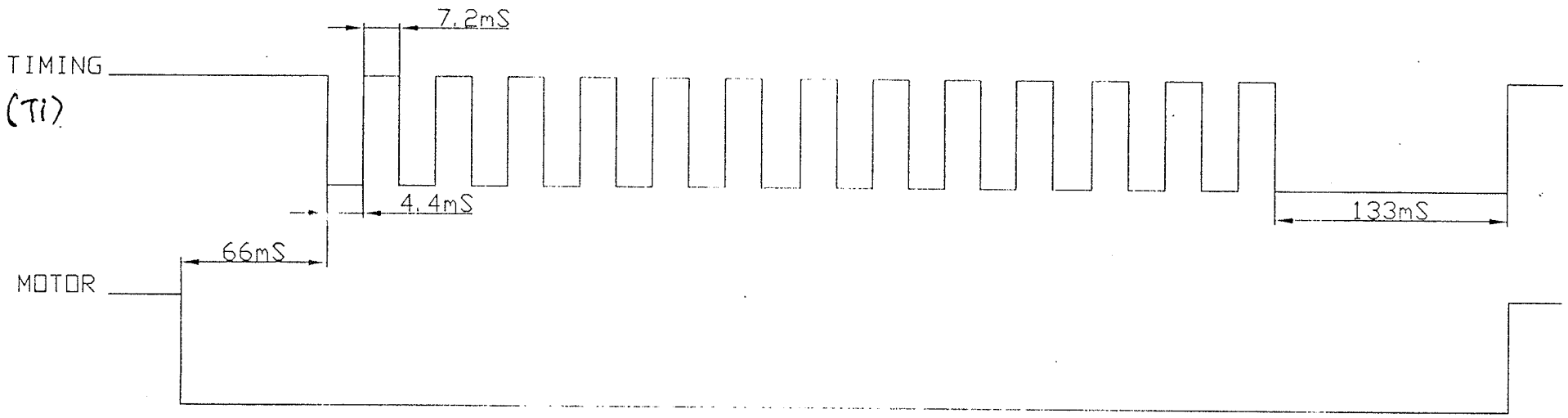
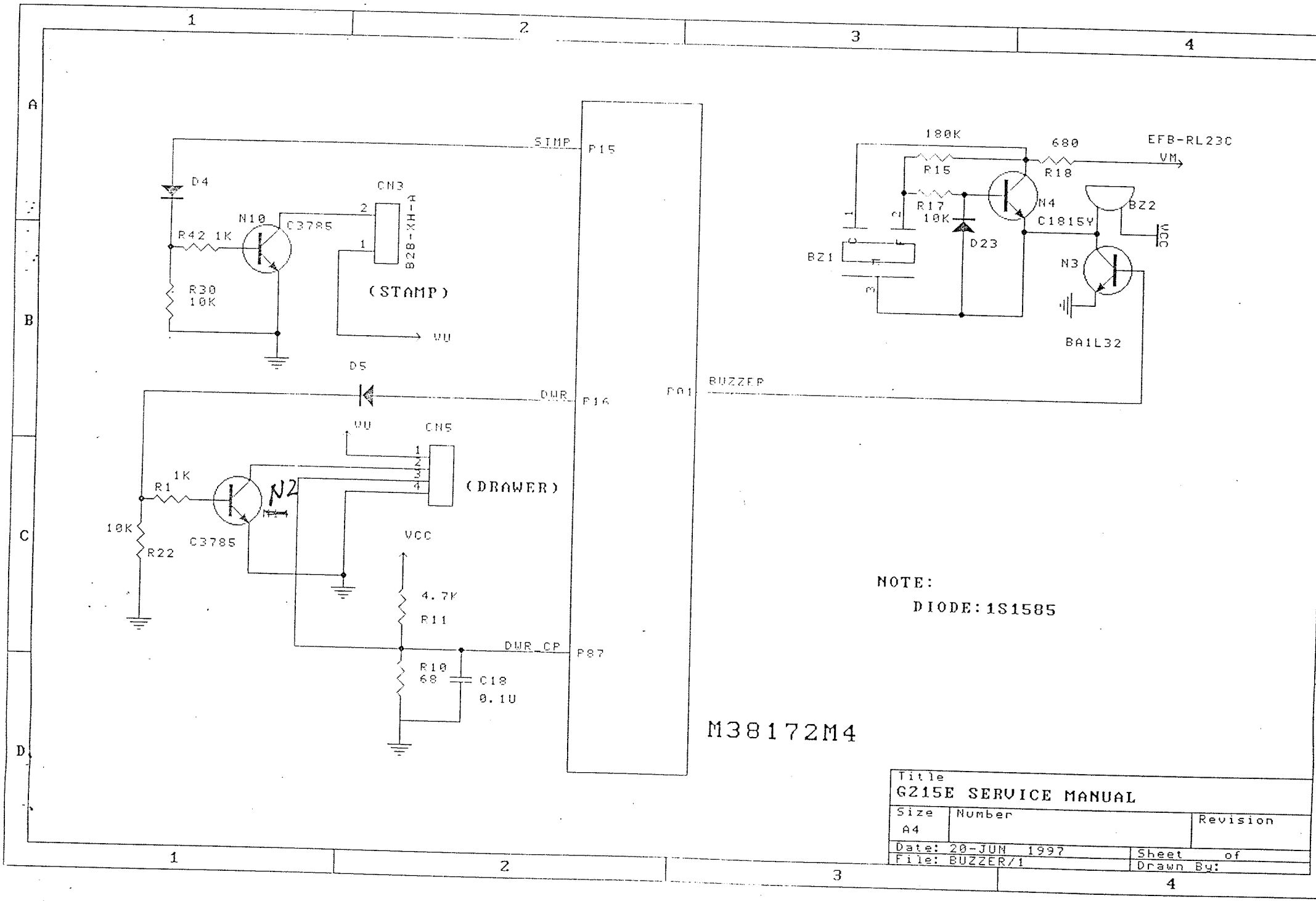

7.2mS
TIMING
(TI)
4.4mS
133mS
66mS
MOTOR

5. BUZZER AND DRAWER CIRCUITS

BUZZER CIRCUIT: Buzzer is driven by oscillator circuits consists of R15,R17,R18,D23 and N4. When P01 of CPU outputs "H" signal, N3 turns on and oscillator circuit is activated. Thus the buzzer sounds.

DRAWER CIRCUIT: When P16 of CPU outputs "H" signal,N14 turns ON and drawer magnet is driven. Thus the drawer is opened. If drawer is opened, CN5.3 is connected GND, DWR_CP is low level. CPU can recognize the status of drawer by level of input port P87.

STAMP CIRCUIT: When P15 of CPU outputs "H" signal,N10 turns ON and stamp magnet is driven. Thus the stamp is printed.


STMP
P15
D4
CN3
N10
C3785
R42 1K
B2B-XH-A
R30
10K
(STAMP)
VU
D5
DWR
P16
P01
BUZZER
VU
CN5
1K
R1
N2
(DRAWER)
10K
R22
C3785
VCC
4.7K
R11
DWR_CP
P87
R10
68
C18
0.1U
180K
R15
680
R18
EFB-RL23C
VM
R17
10K
N4
C1815Y
BZ2
D23
BZ1
N3
BA1L32
NOTE:
DIODE:1S1585
M38172M4
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6. POWER CIRCUIT BLOCK

POWER VOLTAGE (+5V(VCC),VEE,VF1,VF2) REGULATOR CIRCUIT

After passing through F1 and the noise filter, AC output from secondary side of the AC power transformer is rectified and smoothed by rectifier (RB153) and capacitor(E5). It is converted unregulated DC power VU(approx. 28V DC). The unregulated DC power VU is supplied to two power supply circuit as follows.

This power supply circuit employs flyback-converter-type switching regulator system.

At the initial condition, as the level of point "I" is 0V,N9 keeps OFF condition. When VU begins to rise up after power ON, the level of point "H" rises up and N8 turns ON. And then the power is applied to primary side of pulse transformer.

When the power is applied to primary side of the pulse transformer, the level of point "I" (secondary side of the pulse transformer) rises up, and if it is exceed the zenner voltage of Z5(+5V),N8 turns on and the level of point "H" becomes 0V.

Therefore ,N8 is in OFF condition and supplement to primary input of pulse transformer is cut off , with that the level of point "I" becomes initial condition again and N8 turns ON. Thus, switching the supplement of power to primary side of pulse transformer, secondary output (+5V,VEE,VF1,VF2) is stable.

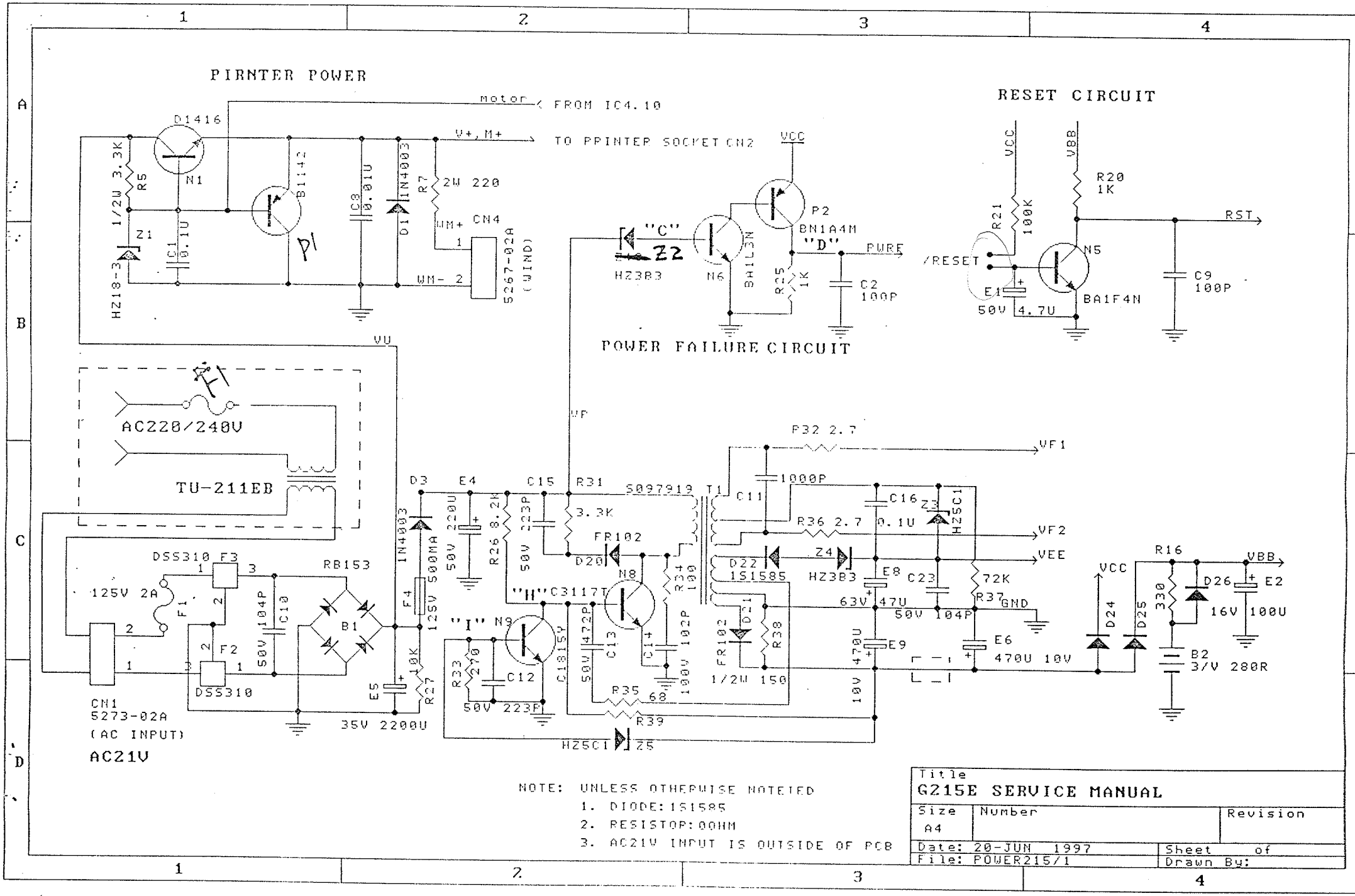
Each secondary output voltage is determined by the ratio of coil turning numbers on primary and secondary sides of pulse transformer. The VEE is smoothed by E8. The +5V(VCC) is smoothed by E9 and comprising ripples are absorbed E6.

7. PWRF, Vbb and RESET CIRCUITS

PWRF CIRCUIT: When the power is turn on, the level of point "C" becomes "H" and N6 and P2 turn on. Thus the level of PWRF line turns "H". When the power is turned off, the level of point "C" becomes "L" , and N6 and P2 turn off. Thus the level of PWRF line turn "L".

RESET CIRCUIT: RST is normal "H" level, When the two jumper is shorted, N5 is turned on, and RTS becomes "L"

Vbb CIRCUIT: When the power is turn on, +5V is applied to Vbb line and recharge current is applied to the rechargeable battery via R16. When the power is turn off, battery output is applied to Vbb and RST line. When the power is turn off, battery output backs up the memory contents of RAM chip and CPU internal RAM.


PIRNTER POWER
motor
FROM IC4.10
D1416
N1
B1142
1/2W 3.3K
R5
Z1
HZ18-3
C1 0.1U
C8 0.01U
D1 IN4003
R7 2W 220
V+, M+
TO PPINTER SOCKET CN2
WM+
WM- 2
CN4
5267-02A
(WIND)
VU
VCC
P2
BN1A4M
"C"
"D"
PURE
Z2
HZ3B3
N6
BA1L3N
R25 1K
C2 100P
POWER FAILURE CIRCUIT
RESET CIRCUIT
VCC
VBB
R20 1K
R21 100K
/RESET
RST
N5
BA1F4N
E1 50V 4.7U
C9 100P
F1
AC220/240V
TU-211EB
CN1
5273-02A
(AC INPUT)
AC21V
DSS310 F3
125V 2A
F2
DSS310
RB153
B1
C10 104P 50V
E5 35V 2200U
F4 125V 500MA
R27 10K
VP
D3 1N4003
E4 50V 220U
C15 50V 223P
R26 8.2K
R31 3.3K
S097919 T1
FR102
D20
N8
"H" C3117T
"I" N9
C18157
R33 270
C12 50V 223P
C13 472P 50V
C14 102P 100V
R34 100
R35 68
R39
HZ5C1 Z5
P32 2.7
VF1
C11 1000P
R36 2.7
VF2
VEE
D22 1S1585
Z4 HZ3B3
C16 0.1U
Z3 HZ5C1
E8 63V 47U
C23 50V 104P
R37 72K
GND
D21 FR102
R38 1/2W 150
E9 10V 470U
E6 470U 10V
R16 330
D24
D25
D26 16V
E2 100U
B2 3/V 280R
VBB
NOTE: UNLESS OTHERWISE NOTEIED
1. DIODE: 1S1585
2. RESISTOR: OOHM
3. AC21V INPUT IS OUTSIDE OF PCB
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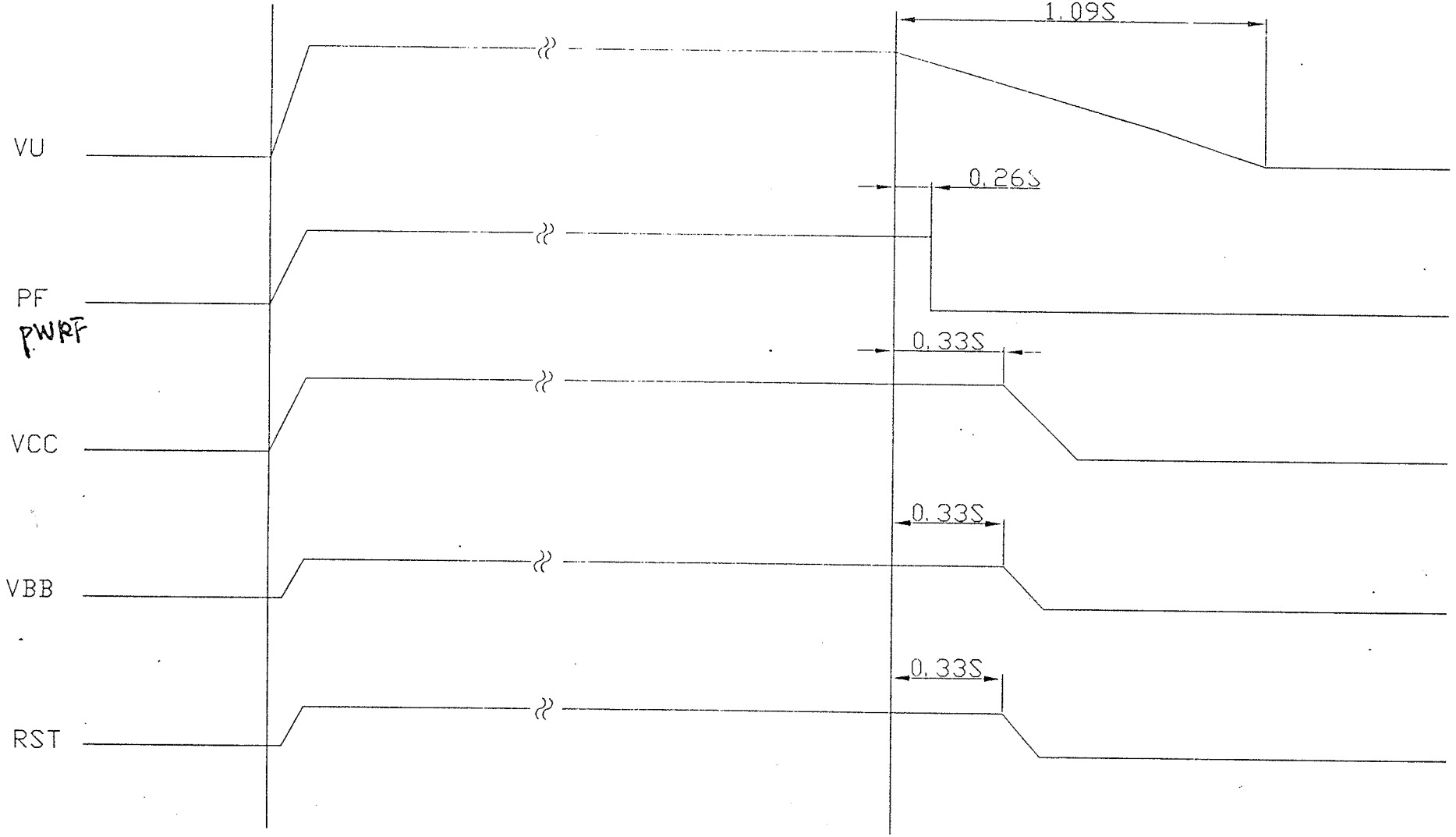
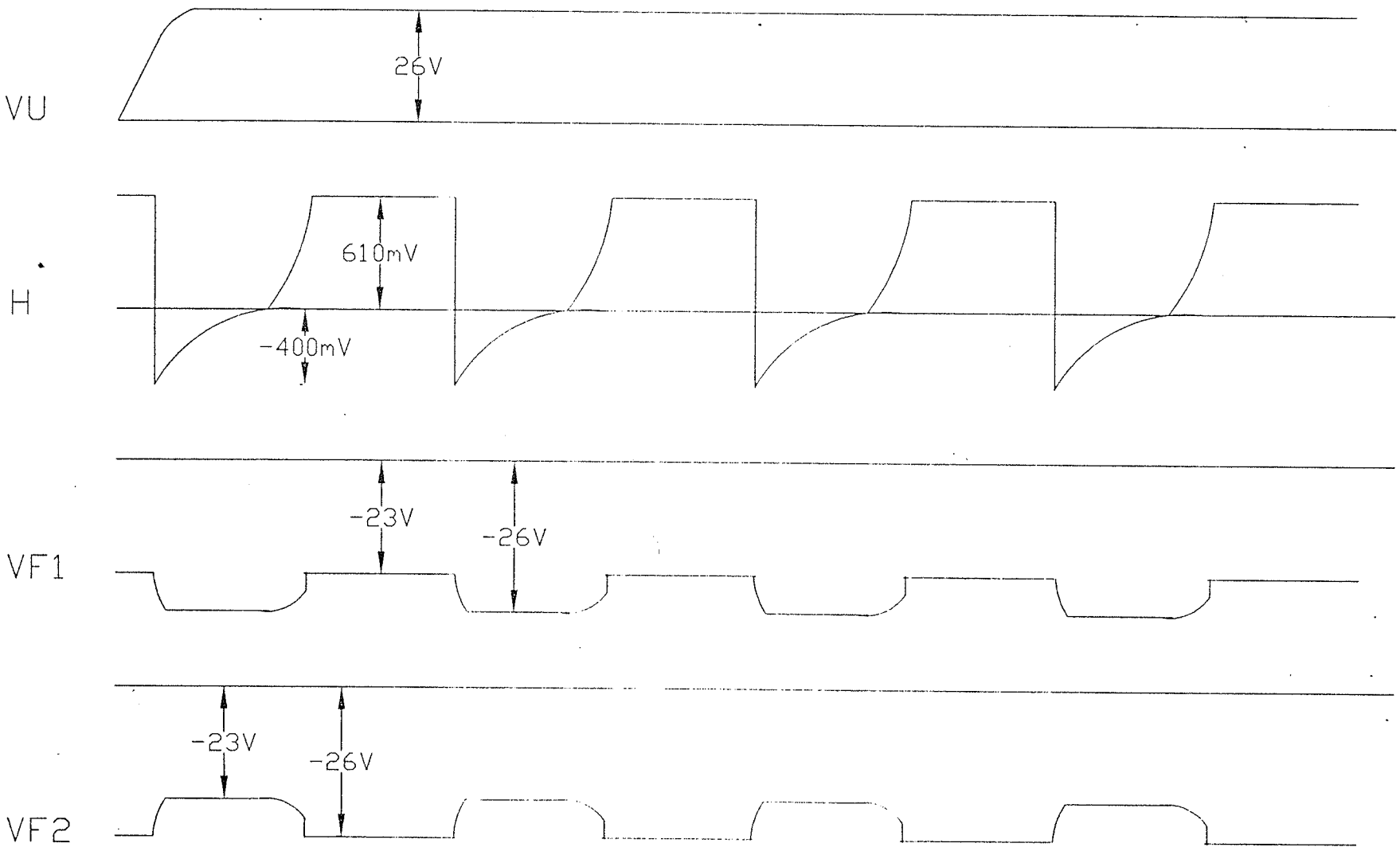
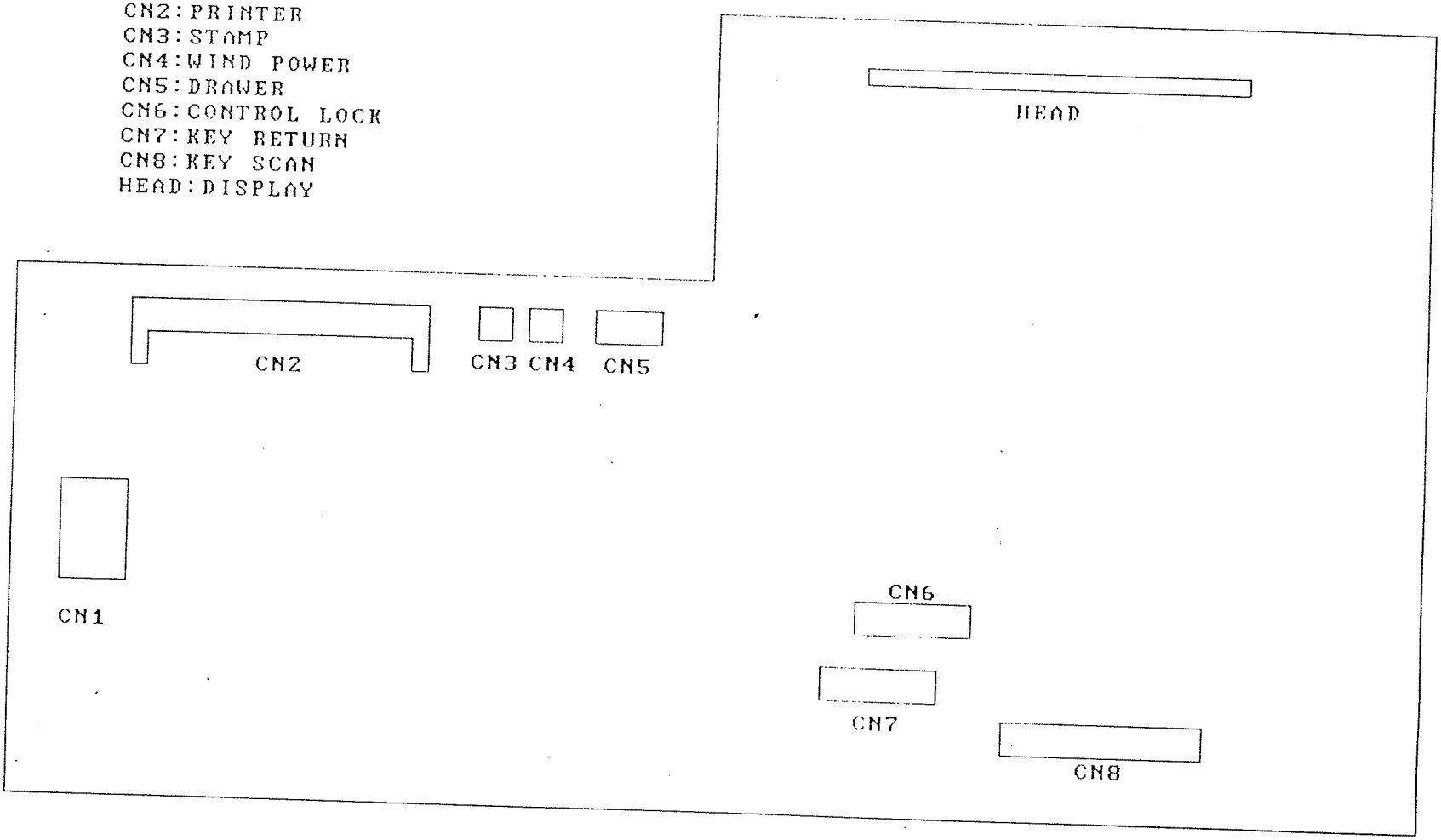

1.09S
VU
0.26S
PF
PWRF
0.33S
VCC
0.33S
VBB
0.33S
RST


VU
26V
H
610mV
-400mV
VF1
-23V
-26V
VF2
-23V
-26V

CN1:POWER
CN2:PRINTER
CN3:STAMP
CN4:WIND POWER
CN5:DRAWER
CN6:CONTROL LOCK
CN7:KEY RETURN
CN8:KEY SCAN
HEAD:DISPLAY



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PHENOMENON	CONDITION	CONSIDERABLE CAUSE	CHECK POINT/METHOD	REMEDY
Machine doesn't work at all.	Printer doesn't work after power on.	AC power is not supplied. AC power is not applied to AC power transformer.	Is AC power plug connected to outlet? Is outlet voltage normal? Is fuse (primary side of AC power transformer) OK? Is 21V AC output from secondary side of the AC power transformer OK?	Connect the plug to outlet. Replace the fuse(primary side of AC power transformer). Replace the AC power transformer.
		Is DC power voltage normal? VU(+28V DC) is not generated. VCC(+5V)is not generated.	Is fuse OK? Is B1 defect? Does collector of N8 output oscillation wave? is Z5 defect?	Replace the fuse . Replace B1. Replace N8 Replace Z5 Replace converter transformer
		Crystal is not oscillating	Check wave form of pin 30 and pin 31 of IC1.(Frequency 6MHz)	Replace crystal (X1) Replace IC1(M38172M4).
		The levels of PWRF lines don't become "H". The levels of RST lines don't become "H".	Is Z2 defect? Are N6 and P2 defect? Are N5 defect?	Replace Z2. Replace N6 and P2 Replace N5.
Date/Time data fails.	Date doesn't increment. Date/Time data doesn't increment correctly.	Crystal(32.768kHz) is not oscillating properly.	Check wave from of pin 28 and pin 29 of IC1.(frequency 32.768kHz)	Replace crystal(X2).

PHENOMENON	CONDITION	CONSIDERABLE CAUSE	CHECK POINT/METHOD	REMEDY
Buzzer doesn't sound.		Trouble in buzzer circuit.	When pin 55(P01) of IC1 outputs "H", buzzer is driven. Is N3 defect ? Is N4 defect? Is D23 defect? Are R15,R17,R18 defect?	Replace the buzzer. Replace N3(BA1L3Z). Replace N4(C1815Y). Replace D23(1S1585). Replace R15(180Kohms). Replace R17(10Kohms). Replace R18(680ohms).
Drawer is not opened	Drawer solenoid doesn't operate.	Trouble in drawer circuit	When pin 42(P16) of IC1 outputs "H", drawer1 solenoid is driven. Is N2 defect?	Replace N2 (C3785).
Abnormal data	Data is changed in case of power ON/OFF	Battery voltage is too low trouble in Vbb circuit.	Check battery voltage.(Tolerance :2.5-3.9V DC)	Replace the battery.
	Specific data fail	RAM chip is defect.		Replace IC2(M5M5256).
Abnormal print out	Printed character is not desired.	The level of timing signal is not stable. Printer is defect	Is the signal level of pin 26(IC1) stable?	Replace printer.
User stamp is not printed	User stamp unit is not operated.	Trouble in user stamp drive circuit.	When pin 43(P15) of IC1 outputs "H", user stamp circuit is activated.	Replace N10(C3785). Replace IC1(M38173M6).

PHENOMENON	CONDITION	CONSIDERABLE CAUSE	CHECK POINT/METHOD	REMEDY
Printer doesn't work at all	Printer motor doesn't rotate	DC power for printer unit is not output.	Is VU(28V DC) supplied? Is Z1(HZ18-3) defect?(Is cathode voltage of Z1 18V DC?)	Check F1 (5TT-2A). Replace Z1(HZ18-3).
			Is V+(20V DC) supplied?	Replace N1(D1416). Replace P1(D1142).
		Trouble in printer drive circuit.	When pin 18(P17) of IC1 outputs "L", motor rotates. Check base voltage of P1 if base level about 18V	Replace N1(D1416). Replace P1(D1142).
Printer dose not stop working	Printer motor dose not stop rotating	Trouble in printer drive circuit.	When pin 41(P17) of IC1 outputs "H", motor stops. Check if P1 base level is about 0.6V	Replace P1. Replace IC4 Replace IC1
		MCU can not RESET	When power on, motor starts. If MCU works,P41 outputs"H" to stop motor.Refer to "Machine doesn't work at all "	
		Timing signal is not generated.	Check signal wave from of P40 of IC1.	
Abnormal display	Display does not light.	The cable for CPU and FD units connection is broken	Check conduction of the cable	Replace the cable.
		Display tube is broken.	Is the display tube cracked?	Replace the display tube.
Specific digit is not lit correctly	Key input correct	Trouble in FD driver.	Check condition of the cable	Replace the cable.

PHENOMENON	CONDITION	CONSIDERABLE CAUSE	CHECK POINT/METHOD	REMEDY
Specific segment is not lit correctly	Display data and time data are correct.	Trouble in segment drive.	Check condition of the cable	Replace the cable.
Key input cannot be accepted	Specific key input cannot be accepted.	2 key are depressed together.	Check whether any key keeps depressing.	Replace keyboard unit.
		Control mode is in lock position	When control lock is released, lock signal is applied to KR lines (KR1-KR4)	Replace D28. Check conduction of the control key.
		Diodes(D6-D14) are defect.	Check the diode on the output line of specific key's key matrix	Check diodes on key matrix output.
		Key depressing section is defect.		Replace key depressing section.