

SHARP SERVICE MANUAL

CODE: 00ZER2590SM-E

A32 C3



ELECTRONIC CASH REGISTER

MODEL **ER-2590**

OPTIONS:

ER-34DW3* ¹ /34DW5* ² /34DW7* ³	ER-25MD5
ER-46PL1	ER-12KT2
ER-12HK2	ER-22KT2
ER-11KT2	ER-11DK2
ER-25MD1	ER-51DK2
ER-25MD2	ER-33CC* ¹ /33CC1* ²
ER-25MD3	ER-25CL
ER-25MD4	ER-25RS* ⁴

*¹ for U.S.A. *² for Canada *³ for South Africa*⁴ See the service manual ER-25RS for details

PRINTER: CR-910C

SRV KEY: LKGIM686IRCZZ (No Mode Key No.)

CONTENTS

1. Internal block diagram	1
2. Special service tools	2
3. Reference documents	2
4. Options	2
5. Specifications	4
6. Quick reference to program job numbers affecting keys, functions and reports	10
7. SRV (Service) mode	11
8. PGM1, PGM2 (Program) modes	19
9. Print skipping on X/Z report via SRV1/PGM2 mode programming	24
10. Reading & resetting modes (CLK X/Z, X1, Z1/X2/Z2)	25
11. Outline of functions	25
12. Test function (In the SRV1 mode)	28
13. Circuit block diagram	33
14. μ PD7801G and SM551-23P terminal signals	34
15. Circuit descriptions	38
16. Service precautions	46
17. Adjustments	47
18. Installation of Service Options	47
19. Circuit diagram and P.W.B. layout	56
Parts Guide	

1. INTERNAL BLOCK DIAGRAM

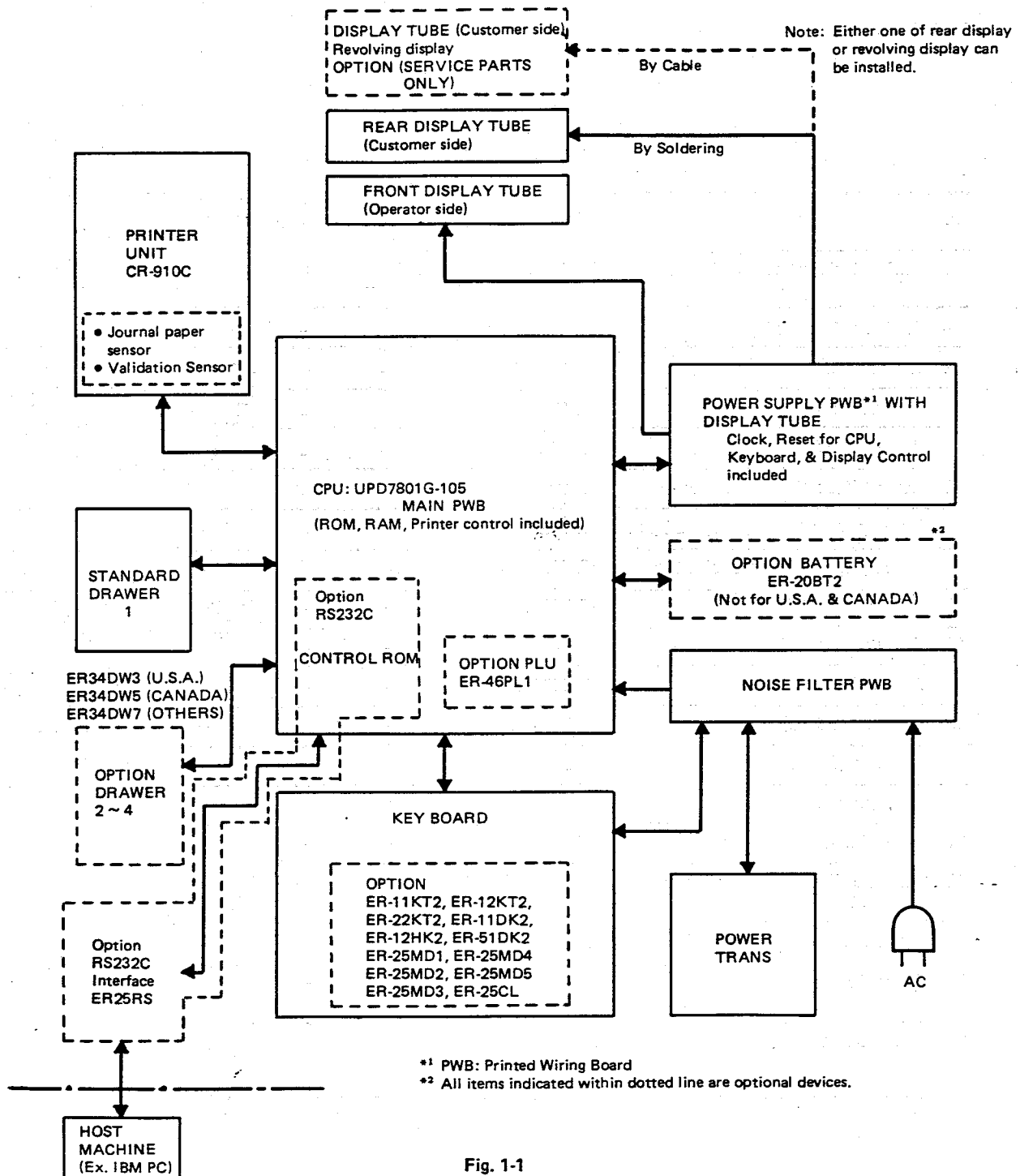


Fig. 1-1

2. SPECIAL SERVICE TOOLS

TOOL NAME	PARTS CODE	PRICE RANK
Key switch removal tool	UKOG-6635RCZZ	AX
KEY TOP and DUMMY KEY, removal tool	UKOG-6636RCZZ	AX

3. REFERENCE DOCUMENTS

1. Cash Register Basic Manual
2. Printer CR-910/CR-910C Service Manuals
3. Options Installation Manual

4. OPTIONS

No.	Description	Model name, Parts code	RAM	Key SET-up	SRV1 setting	Note
1	PLU/SUB department 475 PLU	ER-46PL1	8KB 6264 x 1	○	Job Code #902 "D"	200 standard PLU (Max. 675)
2	Clerk key 15var. x 2 pcs.	ER-25CL	—	—	—	
3	Key kit (1 x 1 size) x 30 pcs.	ER-11KT2	—	○	Job Code #901 "C", "D" #950	• Department expandable up to 40 Depts. • Flexible key
4	Key kit (1 x 2 size) x 30 pcs.	ER-12KT2	—	○		
5	Key kit (2 x 2 size) x 10 pcs.	ER-22KT2	—	○		
6	Key kit (1.5 x 2 size) x 10 pcs.	ER-12HK2	—	○		
7	Dummy key kit (1 x 1 size) x 30 pcs.	ER-11DK2	—	○	—	
8	Dummy key kit (5 x 1 size) x 10 pcs.	ER-51DK2	—	○	—	
9	Remote Drawer (6B/6C)	ER-34DW3	—	—	Job Code #902 "A"	for U.S.A.
10	Remote Drawer (6B/5C)	ER-34DW5	—	—		for CANADA
11	Remote Drawer (4B/8C)	ER-34DW7	—	—		for South Africa
12	Coin case (6B/6C)	ER-33CC	—	—	—	American bill size
13	Coin case (6B/5C)	ER-33CC1	—	—	—	
14	Water proof key cover	GCOVB6822RCZZ	—	—	—	Service option
15	Pedestal customer display	DKIT-8213RCZZ	—	—	—	
16	Validation/Journal paper near end sensor kit	DKIT-8187RCZZ	—	—	Job Code #902 "C"	
17	Exclusive mode key 20var. x 2 pcs.	ER-25MD1~MD5	—	—	—	
18	External battery	ER-20BT2	—	—	—	Not for U.S.A. and CANADA
19	RS-232C interface	ER-25RS	—	—	Job Code #901 "A"	Control ROMx1, i/F board, cable, connector etc.

Note: For the installation of above options except for Service options, please refer to options Installation Manual for ER-2590.

4-1. ER-25CL (Option Clerk Switch)

- It consists of 15 pairs of clerk switches numbered "D03" to "D32".
Each pair has two clerk switches in one piece and the clerk key has own key pattern which can be provided 15 different variation.
- The contents of a ER-25CL is as follows;
 - ① Clerk switch body x 15 sets
 - ② Clerk key 2 x 2 each x 15 sets
 - ③ Key label A, B, D, E x 2 sheets
- The optional clerk switch can be installed on the right side of the standard clerk switch or can be placed on the left side.

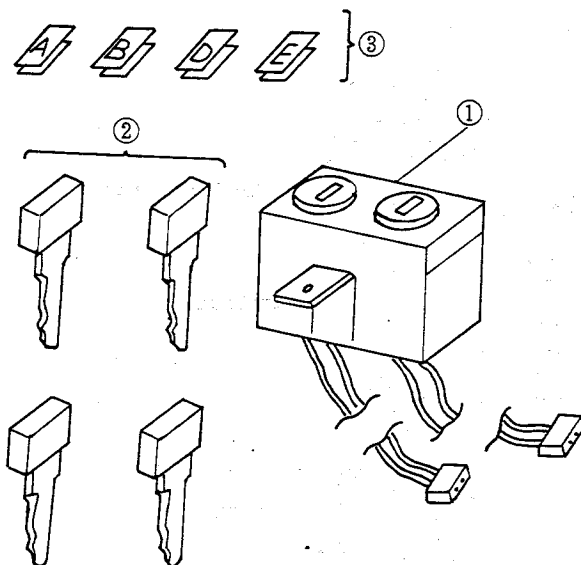


Fig. 4-1 A set of clerk switch

4-2. ER-25MD1, 25MD2, 25MD3, 25MD4, 25MD5 (Option Mode Switch)

- It consists of 20 sets of key bodys, OP, SM, MA mode keys which can be provided 20 different key variation with a ER-25MDx.
- Key numbering
 - ER-25MD1 (001-020)
 - ER-25MD2 (021-040)
 - ER-25MD3 (041-060)
 - ER-25MD4 (061-080)
 - ER-25MD5 (081-100)

5. SPECIFICATIONS

5-1. Appearance and rating

(1) Appearance

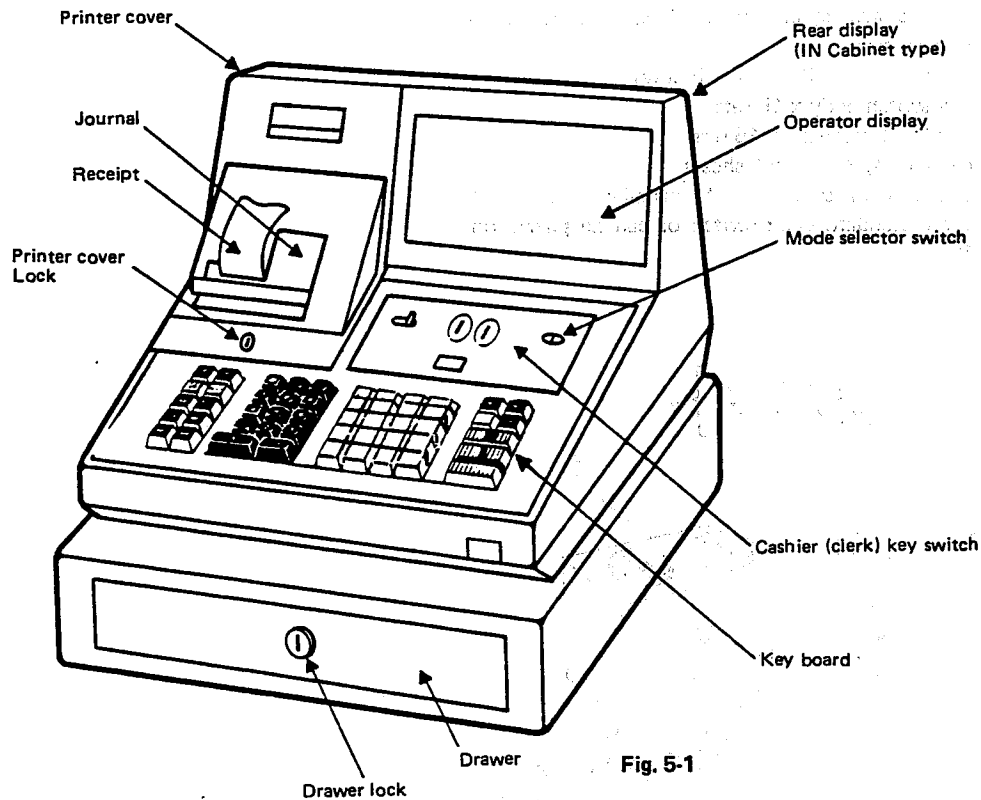


Fig. 5-1

(2) Rating

Model name	ER-2590
Power source	Local AC voltage $\pm 10\%$ 50/60Hz* ¹
Power consumption	40 W
Operating temperature	0°C to 40°C
Overall dimensions	367.5(H)x440(W)x460(D)mm* ²

*¹: 120V (U.S.A., CANADA)
220V (South Africa)
110V ~ 240V (Depends on the AC voltage of the area.)

*²: 14-15/32 x 17-5/16 x 18-1/8 inches
(H) (W) (D)

NS	: No-Sale
PRINT	: Print operation
VOID	: Void
1 ~ 20	: Department
%1 %2	: Percent 1, 2
PLU/SUB	: Price look up, Sub-department
CH1 ~ CH5	: Charge sale
CHK	: Check
MDSE SBTL	: Merchandise sub-total

5-2. Keyboard

(1) Key top name (At standard feature)

0 00 ~ 9	: Numeric entry
•	: Decimal point
CL	: Clear
@/FOR	: Multiplication, split pricing
↑	: Paper feed (Receipt & Journal)
#/SBTL	: Non add code print, Time display, sub-total,
CA/AT	: Cash, Amount tender
RA	: Received on account
PO	: Paid out
TAX 1 SHIFT	TAX 2 SHIFT : Tax shift 1, 2
⊖1 ⊖2	: Discount 1, 2
RFND	: Refund

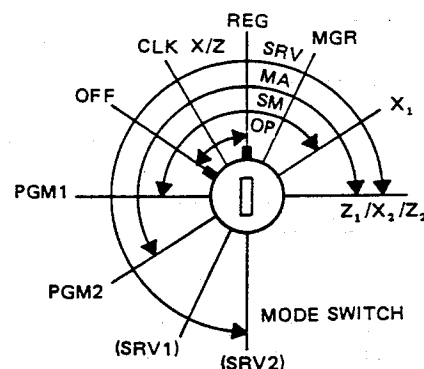
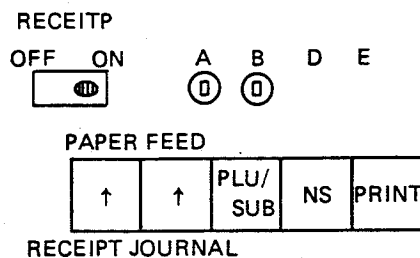
(2) Mode switch positions

(SRV2)	: Service 2 mode
(SRV1)	: Service 1 mode (SRV programming)
PGM 2	: Program mode 2
PGM 1	: Program mode 1
OFF	: Power off
CLK X/Z	: Clerk sales reading and resetting mode.
REG	: Registration mode
MGR	: Manager mode (Registration and transaction void)
X1	: Daily total reading and resetting mode.
Z1/X2/Z2	: Monthly total reading and resetting mode.

(3) Mode select keys

SRV	: Service key	LKGiM6861RCZZ
MA	: Master key	LKGiM6860RCZZ
SM	: Sub-master key	LKGiM6859RCZZ
OP	: Operator key	LKGiM6858RCZZ

STANDARD KEY BOARD LAYOUT



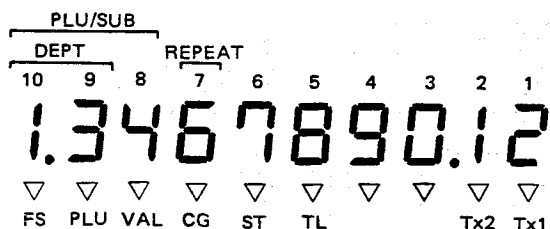
RA	PO	@/ FOR	•	CL	5	10	15	20	CH4	CH5
TAX1 SHIFT	TAX2 SHIFT	7	8	9	4	9	14	19	CH2	CH3
⊖1	⊖2	4	5	6	3	8	13	18	CH1	#/ SBTL
%1	%2	1	2	3	2	7	12	17	CHK	MDSE SBTL
REND	V01D	0	00		1	6	11	16	CA/AT	

Fig. 5-2

5-3. Display

(1) Operator side display

(fluorescent display tube): 10-LT-07Z



Contents of display	No. of digits	Column No.	Pattern
Numerals	Numeric input 7 digits	1 to 7	1 2 3 4 5 6 7 8 9 0
	Amount/SUB TTL 8 digits	1 to 8	
Symbol	1 digit 1 digit 1 digit 1 digit	4 to 9 10 10 10	{-} Minus sign (floating) (P) PGM mode (E) Error (D) Deficit symbol & ST
PLU/SUB	3 digits	8 to 10	3-digit display (zero-suppressed)
Dept.	2 digits	9 to 10	2-digit display (zero-suppressed)
Repeat	1 digit	7	Endless count, starting from 2
Decimal point	1 digit	2	Decimal point (1 to 3). TAB (2 to 4)
		10	Cash in drawer has exceeded a programmed amount.

Fig. 5-3

The following legends are indicated by small triangular lamp in the operator display.

(Position)

- 10 FS: Lights up when an eligible food stamp is entered.
- 9 PLU: Lights up each time a PLU/SUB item is entered.
- 8 VAL: Lights up when the machine is set for compulsory validation printing.
- 7 CG: Lights up whenever the change due amount appears in the display or when the total sale amount is negative.
- 6 ST:
 - Light up alone or together with other lamps when the register has computed subtotals:
 - This lamp lights up alone when the merchandise subtotal has been figured out.
 - The "ST" lamp and the deficit symbol "D" light up together when the tax-included subtotal has been calculated.
 - The "ST" and "TX1" lamps light up together when the taxable 1 subtotal has been calculated.
 - The "ST" and "TX2" lamps light up together when the taxable 2 subtotal has been calculated.
 - The "ST", "TX1" and "TX2" lamps light up together when the taxable 1 and 2 subtotal has been calculated.
- 5 TL: Lights up when a registration is finalized by pressing the CA/AT, CA2, CHK, or CH1 thru CH5 without any amount tendered entry.
- 2 TX2: Lights up when the tax shift 2 key is depressed or a taxable 2 item is registered.
- 1 TX1: Lights up when the tax shift 1 key is depressed or a taxable 1 item is registered.

(NOTE)

The number of repeats is displayed from "2" and counted up with each repeat. When ten registrations are done, the display shows "0".

Example: (2 - 3 - 4 9 - 0 - 1 - 2)

(2) Customer side display (rear side display)

Fluorescent display tube: 9-LT-03Z

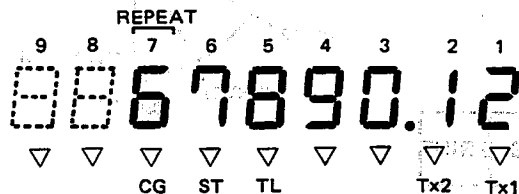


Fig. 5-4

"-" (Minus symbol) in the 4 to 7th positions can appear on the customer display.

5.4. Printer: CR-910C**(1) Outline of the printer**

Printer system	2-station, printing wheel selection printer Model: CR-910C
Number of digits	Total: 12 digits (both in receipt and journal) Amount: 10 digits (columns 3 to 12) Symbol: 2 digits (columns 1 and 2)
Printing dimensions (mm)	Character dimensions Numeral: 3.2(H) x 1.7(W) Symbol: 3.2(H) x 2.4(W) Character pitch Between digits: 3.0±0.1 Between lines: 5.2±0.5
Printing speed	Print: About 2.9 l/sec. (DC+19V, 25°C) About 2.7 l/sec. (DC+18V, 25°C) Quick paper feed: About 13 l/sec. (J/R paper feed) About 18 l/sec. (Receipt issue)
Additional functions	- Stamp function - Receipt on/off and journal print selection - Receipt/journal independent paper feed - One line validation print
Paper width	Both receipt and journal: 44.5±0.5mm (1.75") Max. roll diameter: 83mm (3.26")
Paper quality	Recording paper: woodfree paper (thickness: 0.06 to 0.09mm; weight: 52.3 to 64.0g/cm²) Validation paper: plain paper + carbon paper or pressure-sensitive paper (thickness: less than 0.3mm)
Reliability	MCBF: 5,000 000 lines
Print color (ink roller)	Purple
Ink roller	NROLR6638RCZZ

• Major difference between CR-910 and CR-910C

Item	CR-910	CR-910C
Motor governor	Mechanical governor system	Non-governor system
Safety mechanism for paper free	Yes	No

See CR-910C service Manual for the details.

(2) Stamp

Type	Porous rubber
Stamp color	Purple alone
Max. printable size	30(W) x 20(H)
Stamp pattern (standard)	One of the following is provided as standard depending on the destination: VIELEN DANK, THANK YOU, MERCI, MUCHAS GRACIAS, DANK U, TACK, THANK YOU/DANKIE.
Replenishment ink	UINK-1001CCZZ (For stamp only)

(3) Printing wheel pattern

	12	11	10	9	8	7	6	5	4	3	2	1	
TR	#	.	.	PL	.	.	.	.	DC	CA	VD		0
-	-	-	-	-	-	-	-	-	X	CH	TD		1
(*)	(*)	(*)	(*)	(*)	(*)	(*)	No	/	/	Z	HA	GG	2
\$	\$	\$	\$	\$	\$	\$							3
GT	NS	0	0	0	0	0	0	0	0	0	FS	FS	4
◇	1	1	1	1	1	1	1	1	1	1	%	1	5
P	2	2	2	2	2	2	2	2	2	2	⊖	2	6
A	3	3	3	3	3	3	3	3	3	3	@	3	7
B	4	4	4	4	4	4	4	4	4	4	Q	4	8
D	5	5	5	5	5	5	5	5	5	5	KG	5	9
E	6	6	6	6	6	6	6	6	6	6	LB	ST	10
T _x ¹	7	7	7	7	7	7	7	7	7	7	TX	TL	11
T _x ²	8	8	8	8	8	8	8	8	8	8	RF	RA	12
T ₂ ¹	9	9	9	9	9	9	9	9	9	9	CP	PO	13

Print wheel part code: 00BM711002020 (\$)

Print wheel part code: 00BM711002040 (*)

Symbol of print wheel

Symbol	Description
0 ~ 9	Numeric 0 ~ 9
.	Decimal point
#	Non add
PL	PLU
CA	Cash sale
VD	Void
-	Negative sign
X	Multiply, Split, Read
Ch	Check charge 1 — 5
TD	Check tender
\$	Memory overflow/ Amount mark
2	Reset
CG	Change
GT	Grand total
NS	No sale
◇	Gas dept. mark
%	Percent

Symbol	Description
1 — 5	Charge 1 — 5
A	AM, Clerk A
P	PM
Tx ¹	Taxable 1
Tx ²	Taxable 2
T ₂ ¹	Taxable 1 and 2
⊖	Discount
@	Unit price
Q	Quantity
TX	Manual tax
RF	Refund
CP	Coupon
ST	Sub total
TL	Total
RA	Received on account
PO	Pay out
No	Number
B ~ E	Clerk B ~ E

(2) Locks

2-1) DRAWER LOCK (For USA and Canada) KEY No. B01

LOCK: 180° counter clockwise

UNLOCK: 180° clockwise

(For South Africa)

OPEN: 90° clockwise

2-2) PRINTER COVER LOCK KEY No. 224

LOCK: 90° clockwise

UNLOCK: 90° counter clockwise

2-3) Cashier Key

The key is removalbe by turning the key top counter-clockwise.

And turning the key top clockwise, it stays "ON" state.

Double assignment causes an error.

(The error occurs at the first operation of a tarnsaction after the double assignment.)

5-5. Drawer/Lock

(1) Drawer (standard)

- Metallic drawer (SP-460)
- Open/close operation with a micro switch

*Country	U.S.A., SD, RB6	CANADA SJ, RA7, RB2 RB7, RB8	SOUTH AFRICA SH, SG, SM
Part			
Compartment	6B/6C	6B/5C	4B/8C
Bill separator	X	X	○
Coin sub case	X	X	X
Rotation	180°	180°	90°
Micro switch	○	○	○

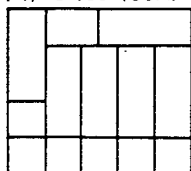
*: See detination code table for country name.

○: Installed as a standard feature.

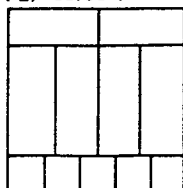
X: Not installed or not applicable.

(COMPARTMENTS PATTERN)

1-1) 6B/6C (USA)



1-2) 6B/5C (Canada)



1-3) 4B/8C (South Africa)

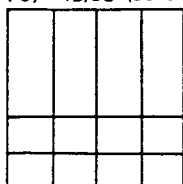


Fig. 5-5

5-6. Totalizers, counters and presets

ITEM	TOTALIZER	COUNTER	PRESET	NOTE
GT	12Dg x 3S			
Z counter		4Dg x 1 (2)		
DEPARTMENT	8Dg x 20S (40)	6Dg x 20S (40) xxxx.xx	6Dg x 20 (40)* 1Dg x 20 (40)* 1 x 20 (40) 1 x 20 (40) 1 x 20 (40) 1 x 20 (40) 1 x 20 (40) 1 x 5 1 x 20 (40) 1 x 20 (40)	*UNIT PRICE *HALO +/- TAX SORT 1/2 FS SORT SIS or SIF Inhibit or provide GAS/NOT OPEN and/or PRESET VALIDATION enforce
DEPT. TTL	8Dg x 4S			
PLU	8Dg x 200S (675)	6Dg x 200S (675)	6Dg x 200* (675) 1 x 200 (675) 1 x 200 (675) 1 x 200 (675) 1 x 200 (675) 2Dg x 200 (675) 4Dg x 200 (675) 2Dg x 200 (675)	*UNIT PRICE (or HALO amount) +/- TAX SORT 1/2 FS SORT Inhibit or provide Split pricing denominator Free code Dept. number
NET	8Dg x 3S			
VOID	8Dg x 3	4Dg x 3		VOID in REG. mode, two kind of VOID TTL in VOID mode
REFUND	8Dg x 1S	4Dg x 1S		
P/O	8Dg x 1S	4Dg x 1S		
R/A	8Dg x 1S	4Dg x 1S		
TX'BL SALES	8Dg x 2S			
TAX TTL	8Dg x 9S		112 steps* 4Dg x 2	*for 2 Tables for %TAX
MEDIA TTL	8Dg x 6S	4Dg x 6	8Dg x 1*	*Sentinel
(-)	8Dg x 2S	4Dg x 2S		
%	8Dg x 4S	4Dg x 4S	4Dg x 4* 1 x 4 1 x 4	% rate +/- ITEM/SBTL
GAS DISCOUNT	8Dg x 2S	4Dg x 2S		
CASH SALE	8Dg x 2S	4Sg x 2S		
CHK CHANGE	8Dg x 1		8Dg x 1*	*HALO
- PLU TTL	8Dg x 1S	4Dg x 1S		
FS SALE	8Dg x 1	4Dg x 1		
FS CHANGE	8Dg x 1			
no sale		4Dg x 1		
validation		4Dg x 1		
customer		4Dg x 1		
FS TAX FORGIVENESS	8Dg x 2			
F. CURRENCY	8Dg x 1		6Dg x 1	
D. open counter		4Dg x 1		0 ~ 255
PERIODIC TTL	8Dg x (58)	4Dg x (47)		
consecutive		4Dg x 1		
machine No.			3Dg x 1	
HOURLY TTL	8Dg x 48	4Dg x 48		
Cashier SALES PO RA GAS DISCOUNT FS SALE REFUND VOID (-) MEDIA	8Dg x 1 x 4 8 x 1 x 4 8 x 1 x 4 8 x 2 x 4 8 x 1 x 4 8 x 1 x 4 8 x 1 x 4 8 x 2 x 4 8 x 6 x 4	4Dg x 1 x 4 4 x 1 x 4 4 x 1 x 4 4 x 2 x 4 4 x 1 x 4 4 x 1 x 4 4 x 1 x 4 4 x 2 x 4 4 x 6 x 4		
Drawer counter		4Dg x 1 x 4		
%	8 x 4 x 4	4 x 4 x 4		
F. currency in drawer	8 x 4 x 4			

(NOTE)
ABBREVIATIONS

----- x -----

SIZE OF A BLOCK OF MEMORY	QUANTITY OF MEMORY BLOCKS
---------------------------------	---------------------------------

- The number in () is the maximum number with all options.
- The number out of () indicates standard amount with no option installed.
- "S" means "with +/- sign".
- "Dg" = Digits
- "FS" = Food stamp
- "F. currency" = Foreign currency

5-7. Overflow Indication

If any amount totalizer except GTs which is printed on X or Z reports has overflowed, three dollar marks are printed for each totalizer on the report.

There is a possibility that the marks may be printed amounts less than the totalizer's capacity. (i.e. in case a negative registration after having overflowed causes the new amount to be within the totalizer's capacity, the marking is printed.) A "\$\$\$" (★★★) mark is printed on the column from the most left digit just above the total line to indicate the overflow.

Example:
(1)

#0001	X	1
1	18.00 Q	
\$\$\$		
\$799999.82		
100.00%		
\$\$\$		
\$799999.82	TL	

Overflow mark

5-8. In Case of Power Failure

When power is lost, the machine retains its memory contents and all information on sales registrations.

- (1) When a power failure is detected in either the register idling state or during registration, the machine returns to the normal state of operation after power recovery.
- (2) When power-failure is detected during a print cycle, the register prints "-----" and then carries out the correct printing procedure.

5-9. Motor Seizure Detecting Function

When motor seizure is sensed due to a paper jam inside the machine or ink ribbon jam, power to the motor is shut off to prevent the motor from overheating.

(1) Motor seizure sensing method

After the motor starts to run, the CPU monitors printer timing pulses continuously.

When a timing pulse is delayed beyond the predetermined cycle, the CPU interprets it as a motor seizure and therefore turns the motor power-on signal PC6 to low level to stop the motor.

(2) Motor seizure alarm

The CPU issues intermittent buzzer-on signal PC4 after stopping the motor to alert the condition.

(3) Release of the motor seized condition.

- a) Power off.
- b) Remove the cause of motor seizure, such as a paper jam or ink ribbon jam.
- c) Power on.
- d) Depress the **CL** key.

(NOTE)

During the motor lock condition, all the keys are inoperable.

6. QUICK REFERENCE TO PROGRAM JOB NUMBERS AFFECTING KEYS, FUNCTIONS AND REPORTS

	SUBJECT	SRV1 JOB#	PGM2 JOB#	PGM1 JOB#
A	Amount Leading Symbol	905		
C	Cashier	901, 902		
	CA/AT	902		
	CA2, CA		262, 260	
	CH		262, 260	
	Check change	905	261	
	CHK		262, 260	
	Clerk		256	
	Consecutive number		253	
	Coupon	904, 905	236	
	Currency conversion	901		
D	Date	905	250	
	Department	901	210, 211, 212	110
	Discount		260, 270	
	Drawer	902, 903	260, 263	
E	Error	903		
F	Food stamp	906	211, 221	
	Fraction treatment	903	231	
	Free key layout	950		
G	Gallionage	906	210, 260, 270	
	GT1	904, 912, 913		
	GT2	904, 914, 915		
	GT3	904		
H	HALO		212, 232, 237, 262	120
J	Journal	902	256	
K	Key	902, 903		
	Key layout	950		
L	Last item void		256	
M	Machine number		256	
	(-) Key		231, 232, 236	
N	Near End	902		
	Non add	903	260	
	No Sale	903		

	SUBJECT	SRV1 JOB#	PGM2 JOB#	PGM1 JOB#
P	Past item void		256	
	%		231, 235, 237	130
	PLU	904		120
	PLU1			121
	PLU2		221	
	PLU/SUB	902		
	PO		230, 232	
	Print format	903, 904, 905	256	
	Print skip	904		
R	RA	903	230, 232	
	RAM option	902		
	Read (Prog.)			110, 120, 130
	Read (SRV)	900, 950		
	Refund	904	256	
	RS232C	901		
S	Secret (PGM1)		280	
	Secret (PGM2)	930		
	Secret (X1, Z1)		281	
	Secret (X2, Z2)		282	
	Sentinel		257	
	Single item		210	
	Singapore tax	903		
	Sign		211, 221, 231	
	ST	905		
	Stack report		286	
T	TAX	903, 904	211, 221, 231, 232, 240, 241, 260	
	Tender		260	
	Time	905	251	
V	Validation	905	210, 230, 255, 256, 260	
	Void	902		
X	X report	904, 905		
Z	Zero skip	901, 902		
	Z report	904, 905		

7. SRV (SERVICE) MODE

Service (SRV) Key is Required to Use Service Mode 1 or 2.

7-1. Program Reset

In the event the unit becomes "LOCKED" in a program loop, the programming may be restarted without altering memory in the following manner:

Turn the mode switch from the service 2 position to the service 1 position. (SRV2 to SRV1)

(NOTE)

This operation will not clear the memory of the date and time.

7-2. Master Reset (All Memories Clear)

To clear ALL memory and place the program in a key halt (wait) condition, do the following:

- (1) Turn the mode switch to the service 2 mode position.
- (2) Depress and hold journal paper feed key.
- (3) While holding the key down, turn the mode switch from the service 2 mode position to the service 1 mode position. (SRV2 to SRV1)

(NOTE 1)

After performing this procedure the unit must be completely reprogrammed in both the service (SRV) mode and program (PGM) mode.

(NOTE 2)

After turning the mode switch to the service 2 mode position, the memory of the date and time is cleared. Therefore the unit must be set in the PGM2 mode.

If the MASTER RESET operation is performed, the following readouts should be printed for service 1 (SRV-1) mode program and PGM mode program. See Sample Fig. 7-1 and Fig. 7-2.

SRV-1 mode

Key operation:

900 → #/SBTL → CA/AT

YOUR RECEIPT

THANK YOU

06-24-86

Date

#0900

Job #900

901 0020

Job #901 0 0 0 4

902 1402

Job #902 ↑ ↑ ↑ ↑

903 5000

Job #903 A B C D

904 0000

Job #904

905 0100

Job #905

906 0502

Job #906

930 0000

Job #930

0000 Z 1

Z1 counter

0000 Z 2

Z2 counter

GT 1 \$000000

GT1

0000.00

GT 2 \$000000

GT2

0000.00

GT 3 \$000000

GT3

0000.00

#0950

Job #950

Function code

1 16

Free key position No.

2 17

3 18

⋮ ⋮

18 33

19 34

20 35

21 --

22 --

⋮ ⋮

38 --

39 --

40 --

Functions are inhibited

68	NO 08
69	NO 04
70	NO 09
71	--
72	NO 05
73	NO 10
74	NO 50
75	--
76	--
77	NO 51
78	--
79	--
80	--

A 12-00
A 0001 NO 000

AM Time
Clerk/C-No/M-No

(NOTE)
C-No: Consecutive No.
M-No: Machine No.

Fig. 7-1

\$999999.99 CH CG
.1.
000000
\$999999.99 CA ST
#263 0
#280 0000
#281 0000
#282 0000
#286
1 --- 1
2 --- 4
3 --- 5
4 --- 0
5 --- 0

A 12-03
A 0002 NO 000

High amount limitation for check change.
Quantity of validation printings.
Job #256 (Optional feature A~F).
Sentinel amount in drawer
Alarm length of drawer opening time
Secret code (PGM1)
Secret code (Z1)
Secret code (Z2)

Stacked report

AM Time
Clerk/C-No./M-No.

Fig. 7-2

*(NOTE)

*Mark is printed instead of \$ mark for the models other than U.S.A. and Canada.

PGM2 mode

YOUR RECEIPT
THANK YOU

00-00-00

#0130

-0.00%1
99.99/0
-0.00%2
99.99/0
7 0 1
/0
7 0 2
/0
7 0 RA
7 0 PO
TX - 800000 CH 1
800000 CH 2
800000 CH 3
800000 CH 4
800000 CH 5
800000 CH
000000 CA

Date

Job #130

Percent 1

Manual percent rate limitation/% item or % SBTL (Job #235)

Percent 2

Manual percent rate limitation/% item or % SBTL (Job #236)

Discount 1 Limitation

Vender or store coupon selection (Job #235)

Discount 2 Limitation

Vender or store coupon selection (Job #236)

Received on Account Limitation and Validation print compulsory

Pay out Limitation and Validation print compulsory

TX - 800000

DE A B C F G H

A: Upper entry limits
B: Overtendering
(for charge 1 ~ 5 and check)
C: Validation compulsory
D: Tax 2 calculation status
E: Tax 1 calculation status
F: Drawer open
G: Compulsory non-add code printing
H: Amount tendering compulsory

for cash 1, 2,
charge 1 ~ 5,
and check

7-3. Service Mode Programming (SRV.1 mode)

All programming procedures have the following key entry sequence.

xxx → → # / SBT L → A B C D → CA / AT

(JOB CODE #) (Max. 4 digits)

The part of

A	B	C	D
---	---	---	---

 is described in each detail item section.

As long as the decimal key is not depressed, the programming in the machine will not change.

LIST OF SRV MODE PROGRAMMING

(JOB #)	PAGE	JOB
901	13	Dept. programming
902	13	Optional features
903	14	Optional features
904	15	Print skipping
905	16	Printing MISC
906	16	Food stamp, Gallonage
912	16	GT1 upper 6 digits setting
913	16	GT1 lower 6 digits setting
914	16	GT2 upper 6 digits setting
915	16	GT2 lower 6 digits setting
930	16	Secret code for PGM2 mode setting
950	17	KEY LAYOUT

The following explains the detail of the programmings.

[JOB CODE #901]

Key operation:

Numeric entry Job No.

901 → [] → #/SBTL →

(4 digits)

[A] [B] [C] [D]

Set to "0"

*MRS 0020

CA/AT

* MRS means Master Reset which is the default preset after a SRV mode initialization.

#901-A

1. Number of cashier 4 or 2.
2. Enable or inhibit RS232C (ER25RS).

1. Number of cashier	2. RS232C (ER-25RS)	Key entry
2	Inhibit	0
	Enable	1
4	Inhibit	2
	Enable	3

#901-B

1. Enable or inhibit currency conversion.
2. Zero skip on department report on the X1 and Z1/X2/Z2 modes.

1. Currency conversion	2. Zero skip on dept. report on X1, Z1/X2/Z2 modes	Key entry
Inhibit	Skip	0
	No skip	1
	Skip	2
	No skip	3
Enable	Skip	4
	No skip	5
	Skip	6
	No skip	7

#901-C, D

Number of departments

NUMBER OF DEPARTRMENTS	KEY ENTRY
1	01
2	02
3	03
4	04
5	05
6	06
7	07
8	08
~	~
38	38
39	39
40	40

(NOTE)

The number of departments can be expanded to 40 by the key option (ER11KT2, ER12KT2, ER22KT2, ER12HK2, ER11DK2, ER51DK2). For the key top layout of the department expansion, refer to JOB #950.

[JOB CODE #902]

Key operation:

902 → → → → → →

Numeric entry Job No. (4 digits) Set to "0" MRS = 1402

#902-A

Number of drawers.

The cashier A, B, D and E are assigned to a drawer by a fixed relation which is decided automatically by the number of drawers used for an ECR.

Number of drawer	(Cashier) drawer #	KEY ENTRY
0	No drawer	0
1	(A, B, D, E)1	1
2	(A, B)1, (D, E)2	2
3	(A)1, (B)2, (D, E)3	3
4	(A)1, (B)2, (D)3, (E)4	4

Drawer #1 = Standard fixed drawer

Drawer #2-4 = Optional remote drawers
(ER-34DW3, ER-34DW5, ER34DW7)

#902-B

1. Separate **NS** and **CA/AT** keys or combined **CA/AT/NS** key.
2. Cashier sales TTL includes tax or not.
3. Cashier extra TTLs exists or not.

1. CA/AT or CA/AT/NS key	2. Cashier sales TTL includes TAX	3. Cashier extra TTLs exists	Key entry
CA/AT/NS	Included	No	0
		Yes	1
	Not included	No	2
		Yes	3
CA/AT	Included	No	4
		Yes	5
	Not included	No	6
		Yes	7

#902-C

1. To enable or inhibit a Journal End sensing error to be cleared by the **CL** key.
2. Key buffer will be cleared after a receipt is issued or not cleared.
3. Enable or inhibit void mode.

1. Journal End error clear	2. Key buffer clearing after a receipt issue	3. Void mode	Key entry
Enable	Yes	Enable	0
		Inhibit	1
	No	Enable	2
		Inhibit	3
Inhibit	Yes	Enable	4
		Inhibit	5
	No	Enable	6
		Inhibit	7

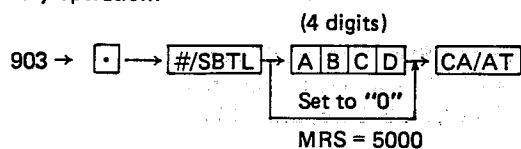
#902-D

1. Enable or inhibit additional PLU's (675 total PLU's).
2. Enable or inhibit PLU/SUB department.
3. Enable or inhibit zero skip on a PLU report.

1. Additional PLU's (ER46PLI)	2. PLU/SUB dept. enable	3. Zero skip on PLU report	Key entry
Inhibit	Inhibit	Skip	0
		Not skip	1
	Enable	Skip	2
		Not skip	3
Enable	Inhibit	Skip	4
		Not skip	5
	Enable	Skip	6
		Not skip	7

[JOB CODE #903]

Key operation:



#903-A

Fraction treatment for multiplication and % calculation:

Fraction treatment	KEY ENTRY
Round down	0
Round off	5
Round up	9

EXAMPLE

Result	Example of regist. *0.03@ 30% = *0.00 (9)	*0.03@ 10% = *0.00 (3)
Round down (0)	*0.00	*0.00
Round off (5)	*0.01	*0.00
Round up (9)	*0.01	*0.01

() = rounded digit

#903-B

1. Enforcement of Non-Add code entry prior to Dept. or PLU entry.
2. Drawer closed compulsory or not.
3. Singapore tax or Normal Sales tax.

1. Non-add code	2. Drawer closed compulsory	3. Singapore tax normal tax	Key entry
Not Enforced	Non-comp.	Normal	0
		Singapore	1
	Compulsory	Normal	2
		Singapore	3
Enforced	Non-comp.	Normal	4
		Singapore	5
	Compulsory	Normal	6
		Singapore	7

#903-C

1. Enable or disable tax delete function.
2. Error action for incorrect operation.
LOCK ERROR: Long error released by **CL** key.
(2 seconds)
ONE SHOT ERROR: Short error (**CL** key clear is not required.)

3. Enable or inhibit key catch sound.

1. Tax delete	2. Error action	3. Key catch sound	Key entry
Disable	All lock	Enable	0
		Inhibit	1
	Lock & one shot	Enable	2
		Inhibit	3
Enable	All lock	Enable	4
		Inhibit	5
	Lock & one shot	Enable	6
		Inhibit	7

#903-D

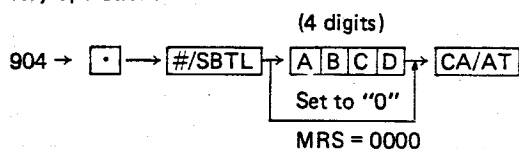
1. Received on account (RA) with tendering or Direct Received on account.
2. Allow no sale after Non-add code print.

3. Enable or inhibit No sale function.

1. RA with tender or direct RA	2. Allow no sale after Non-add code print	3. No sale	Key entry
With tender	Enable	Enable	0
		Inhibit	1
	Inhibit	Enable	2
		Inhibit	3
Direct	Enable	Enable	4
		Inhibit	5
	Inhibit	Enable	6
		Inhibit	7

[JOB CODE #904]

Key operation:



#904-A

- GT1 (Grand total 1) is printed on Z report or skipped.
GT1 = Grand total of plus registrations.
- GT2 (Grand total 2) is printed on Z report or skipped.
GT2 = Grand total of minus registration.
- GT3 (Grand total 3) is printed on Z report or skipped.
GT3 = Net grand total (GT1 - GT2)

1. GT1	2. GT2	3. GT3	Key entry
Print	Print	Print	0
		Skip	1
	Skip	Print	2
		Skip	3
Skip	Print	Print	4
		Skip	5
	Skip	Print	6
		Skip	7

#904-B

- GT3 is printed on X reports./Skipped.
- Coupon PLU is printed on X, Z reports./Skipped.
- Net sales SBTL is printed on X, Z reports./Skipped.

1. X report GT3 Print	2. X/Z report coupon PLU Print	3. X/Z report Nets ST Print	Key entry
Skip	Print	Print	0
		Skip	1
	Skip	Print	2
		Skip	3
Print	Print	Print	4
		Skip	5
	Skip	Print	6
		Skip	7

#904-C

- Taxable 1 subtotal is printed on X, Z reports or skipped.
- Gross Tax 1 and refund Tax 1 total are printed on X, Z reports or skipped.
- Net Tax 1 total is printed on X, Z reports or skipped.

1. Taxable 1 subtotal	2. Gross Tax 1 & Refund Tax 1 total	3. Net Tax 1 total	Key entry
Print	Print	Print	0
		Skip	1
	Skip	Print	2
		Skip	3
Skip	Print	Print	4
		Skip	5
	Skip	Print	6
		Skip	7

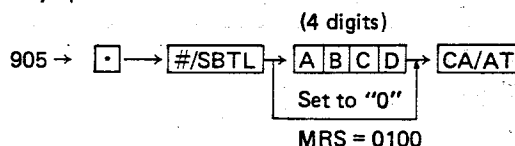
#904-D

- Taxable 2 subtotal is printed on X, Z reports or skipped.
- Gross Tax 2 and refund Tax 2 total are printed on X, Z reports or skipped.
- Net Tax 2 total is printed on X, Z reports or skipped.

1. Taxable 2 subtotal	2. Gross Tax 2 & Refund Tax 2 total	3. Net Tax 2 total	Key entry
Print	Print	Print	0
		Skip	1
	Skip	Print	2
		Skip	3
Skip	Print	Print	4
		Skip	5
	Skip	Print	6
		Skip	7

[JOB CODE #905]

Key operation:



#905-A

- Gross manual tax and refund manual tax are printed on X, Z reports or skipped.
- Net manual tax total is printed on X, Z reports or skipped.

1. Gross manual tax & refund manual tax	2. Net manual tax	Key entry
Print	Print	0
	Skip	1
Skip	Print	2
	Skip	3

#905-B

- Print symbol selection for coupon keys "CP" or "(--)".
- Check change TTL is printed on X, Z reports or skipped.

1. Print symbol for coupon key	2. Check change TTL	Key entry
Print (--) symbol	Print	0
	Skip	1
	Print	2
	Skip	3
Print CP Symbol	Print	4
	Skip	5

#905-C

- Two or one line total validation print.
- Compulsory finalize after SBTL
- Enable or inhibit MDSE ST print.

1. Validation line	2. Compulsory finalize after SBTL	3. MDSE-ST print (when processed)	Key entry
One line	No	Inhibit	0
		Enable	1
	Yes	Inhibit	2
		Enable	3
Two line	No	Inhibit	4
		Enable	5
	Yes	Inhibit	6
		Enable	7

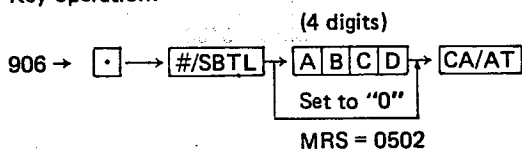
#905-D

- Enable or inhibit time print.
- Date format: Day-Month-Year or Month-Day-Year.
- Amount leading symbol selection.

1. Time print	2. Date format	3. Amount leading symbol	Key entry
Enable	Month-Day-Year	\$	0
		Blank	1
	Day-Month-Year	\$	2
		Blank	3
Inhibit	Month-Day-Year	\$	4
		Blank	5
	Day-Month-Year	\$	6
		Blank	7

[JOB CODE #906]

Key operation:



#906-A

Tax payment in Food Stamp*

Tax payment in Food Stamp	KEY ENTRY
No food stamp is selected	0
Tax paid by F.S.	1
Tax paid by cash, check, charge	2
Tax forgiven	3

* Food stamp function is enabled via Job #950 (enabling FS SHIFT, FS TEND keys).

#906-B

Rounding for the calculated gasoline volume from each sales amount.

Fraction treatment	Key entry
Round down	0
Round off	5
Round up	9

EXAMPLE

Unit price = \$0.95/gallon, Digits of decimal = xx.xx

Example of regist.	\$10.00 0.95@ 10.52 (6)	\$5.00 0.95@ 5.26 (3)
Result		
Round down (0)	10.52	5.26
Round off (5)	10.53	5.26
Round up (9)	10.53	5.27

(): rounded digit

#906-C

- Enable or inhibit gasoline calculation.
- Number of digits to the right of the decimal point. "\$xxxx.xxx" or "\$xxxx.xx"

1. Gasoline calculation allowed/Not	2. Number of digit to the right of the decimal point (for price per gallon)	Key entry
Inhibit	\$XXXX.XX	0
	\$XXX.XXX	1
Enable	\$XXXX.XX	2
	\$XXX.XXX	3

#906-D

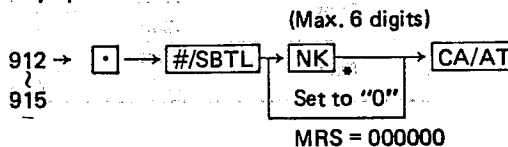
Number of digits to the right of the decimal point. (Gallon TAB setting.)

Number of Digits to the right of the decimal point	Key entry
XX.	0
XX.X	1
XX.XX	2
XX.XXX	3

[JOB CODE #912] ~ [JOB CODE #915]

GTs counter setting (Max. 6 digit)

Key operation:



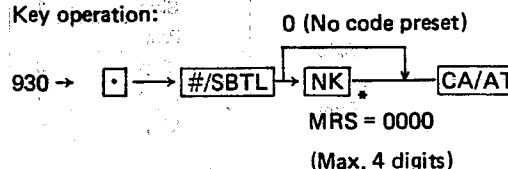
* [NK] = Numeric key

- 912: GT1 upper 6 digits setting. = 0 - 999999
- 913: GT1 lower 6 digits setting. = 0 - 999999
- 914: GT2 upper 6 digits setting. = 0 - 999999
- 915: GT2 lower 6 digits setting. = 0 - 999999

[JOB CODE #930]

Secret code for PGM2 mode.

Key operation:



* [NK] = Numeric key

Secret code for PGM2 mode = 0 - 9999

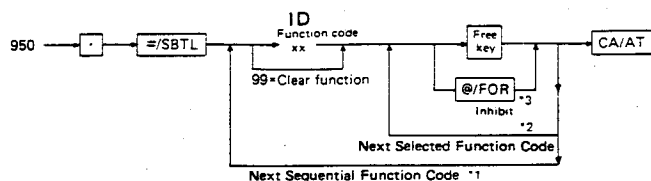
[Z counters]

The amount of Z₁ and Z₂ counters can not be changed manually. They can only be reset by doing a MASTER RESET.

[JOB CODE #950]

Flexible key layout function

Up to 51 positions are reserved for free function keys. The related printing on the general reports are also defined to be printed or skipped by this programming.



*1. To override the automatic assignment.

*2. To update the function code automatically to a new one.

*3. To inhibit the entered function.

Be sure to inhibit every function that is not to be used.

① Function codes are as shown in the following table.

FUNCTION CODE TABLE

Function Code	Free Key Function Name	Function Code	Free key Function Name
1 ~ 40	DEPARTMENTS	69	TAX SHIFT 1
51	PLU/SUB	70	TAX SHIFT 2
52	CASH 2	71	TAX (MANUAL TAX)
53	CHARGE 1	72	RA
54	CHARGE 2	73	PO
55	CHARGE 3	74	No Sale
56	CHARGE 4	75	F.S. SHIFT
57	CHARGE 5	76	F.S. TEND./ST
58	CHECK	77	PRINT
59	MDSE SBTL	78	RECEIPT
60	TRAY TOTAL	79	Gas Discount- SBTL
61	VOID	80	Conversion Key
62	REFUND	81	
63	%1	82	
64	%2	83	
65	%3	84	
66	%4	85	
67	⊖ 1	99	OPEN
68	⊖ 2		

② The free key area on the keyboard and free key position number.

The free key area and free key position numbers are shown in Fig. 7-3.

The free key may be assigned with a function and cleared of a previous assignment. There are a total of 51 keys which may be involved in the assignment process.

1	1	49	50	51
---	---	----	----	----

receipt journal

5	10	⊖ FOR	CL	15	20	25	30	35	40	45	48	
4	9	1	8	9	14	19	24	29	34	39	44	47
3	8	4	5	6	13	18	23	28	33	38	43	#/ SBT
2	7	1	2	3	12	17	22	27	32	37	42	46
1	6	0	00	11	16	21	26	31	36	41	CA/A	

Fig. 7-3 Free key area and free key position number

1	1	PLU/SUB	NS	PRINT
---	---	---------	----	-------

RA	PO	⊖ FOR CL			5	10	15	20	CH4	CH5
TAX1 SHIFT	TAX2 SHIFT	1	8	9	4	9	14	19	CH2	CH3
⊖1	⊖2	4	5	6	3	8	13	18	CH1	#/SBT
%1	%2	1	2	3	2	7	12	17	CHK	MDSE SBT
RFND	VOID	0		00	1	6	11	16	CA/AT	

Fig. 7-4 Factory preset keyboard layout
(Same as the layout after Master Reset)

Key operation for key layout report:

950 → #/SBTL → CA/AT

#0950	
1	№16
2	№17
3	№18
4	№19
5	№20
6	№21
7	№22
8	№23
9	№24
10	№25
11	№26
12	№27
13	№28
14	№29
15	№30
16	№31

71	--
72	№05
73	№10
74	№50
75	--
76	--
77	№51
78	--
79	--
80	--

Function code

Free key position

Fig. 7-5 Example of key layout report

(NOTE)

1. The hatched area  is reserved for fixed key positions.
2. For removing key switch and key top, use the special tools (UKOG-6635RCZZ, UKOG-6636RCZZ); refer to page 2.

③ Remarks on key assignment

- 1) ID (identification) is the first function to be assigned to a key according to "The function code table".
- 2) Department assignments are allowed only to the maximum number specified in JOB CODE #901.
- 3) The function code indicated on the display is assigned to a key by simply depressing the key which is to be assigned. The machine will automatically update the display with the next sequential function code.
- 4) The fact that there are no more codes in the table for assignment or that a function code ID (identification) number greater than the largest valid code in the machine is signalled by a "99" on the display. By entering a code number prior to the function key, a new function number may be entered or the CA/AT may be depressed to end the job.
- 5) The @/FOR key is used to inhibit the function and update the ID number to the next one.
- 6) Up date to the next sequential function ID is handled by the machine.
- 7) If a large number of function ID's are to be skipped before the next assignment or if a previous entry must be corrected then the new function ID may be entered as indicated.
- 8) The code 99 is not incremented and thus may be used to quickly clear any number of keys.
- 9) The function code will be indicated on the display along with the programming.
- 10) On the general report, a related printing is also defined to print or skip after this assignment.

7.4. Reading of SRV1 mode programming

[JOB CODE #900]

All SRV programming reports including the key layout report are printed in the SRV1 mode by JOB code #900.
Key operation:

900 →  → 

[JOB CODE #950]

The key layout report is only printed in the SRV1 mode by JOB code #950.

Key operation:

950 →  → 

YOUR RECEIPT			
THANK YOU		25	--
06-28-86		26	--
#0900		27	--
901	0020	28	--
902	1402	29	--
903	5000	30	--
904	0000	31	--
905	0100	32	--
906	0502	33	--
930	0000	34	--
		35	--
		36	--
		37	--
		38	--
		39	--
		40	--
		51	49
		52	--
		53	43
		54	44
		55	47
		56	45
		57	48
		58	42
		59	46
		60	--
		61	06
		62	01
		63	02
		64	07
		65	--
		66	--
		67	03
		68	08
		69	04
		70	09
		71	--
		72	05
		73	10
		74	50
		75	--
		76	--
		77	51
		78	--
		79	--
		80	--
#0950		A	12-00
1	16	A	00020000
2	17		
3	18		
4	19		
5	20		
6	21		
7	22		
8	23		
9	24		
10	25		
11	26		
12	27		
13	28		
14	29		
15	30		
16	31		
17	32		
18	33		
19	34		
20	35		
21	--		
22	--		
23	--		
24	--		

Fig. 7-6 SRV Reading
Print Sample

7-5. Supplemental Descriptions for SRV Programming

① JOB CODE #903B(3): Singapore tax

Tax amount will be rounded as shown below (Ex. Round off)

BEFORE ROUNDING	AFTER ROUNDING
0.000 ~ 0.004	0.00
0.050 ~ 0.054	0.05
0.055 ~ 0.099	0.10

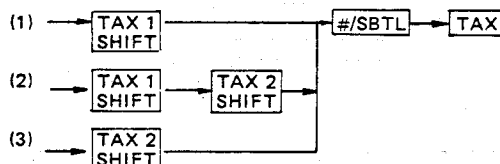
NOTE: Rounding procedure depends on programming in JOB #903A.

② JOB CODE #903C(1): Tax delete operation

TAX DELETE:

If the "TAX" key is depressed without a numeric entry after obtaining a taxable sub-total, the itemizer that corresponds to a specified displayed tax sort is reset to 0 and a related message is printed.

KEY OPERATION (in the REG, MGR modes):



Notes:

- (1) Taxable 1 and refund taxable 1 sub-totals are reset to 0.
- (2) Taxable 1, refund taxable 1, taxable 2 and refund taxable 2 sub-totals are reset to 0.
- (3) Taxable 2 and refund taxable 2 sub-totals are reset to 0.

8. PGM1, PGM2 (PROGRAM) MODES

Your ER-2590 allows you to program it in two modes: PGM1 and PGM2.

The PGM1 mode is used for programming those items that need to be changed often: Unit prices of departments, plus, and percentage.

The PGM2 mode is used for programming all PGM1 mode program and those items that require no frequent change: date, time, tax table, tax rate, and the function of each key. The programming or setting procedures of various items is described below. Program every item necessary for the store into the machine following the corresponding procedures.

* To set the mode switch to the PGM1 position, use the manager or submanager key. And to set the PGM2 position, use the manager key.

● GENERAL ENTRY SEQUENCE (PGM1 and PGM2 MODE Programming)

xxx → → #/SBTL → (DATA) → CA/AT
JOB CODE #

● SECRET CODE ENTRY

To start the operation of ECR in PGM1 or PGM2, the secret code which has been preset for the each mode should be entered by the following procedure.

(PROCEDURE)

In the PGM1 or PGM2 mode.

CA/AT → (xxxx) → CA/AT
(Secret Code)

The secret code for PGM1 mode is preset in the PGM2 mode and the code for PGM2 mode is preset in the SRV mode.

Different codes are presettable from each other of PGM1 and PGM2 for the individual controlling.

Once the secret code has been entered, the re-entry is not necessary to continue the operation in the same mode.

If the secret number has been preset as zero, no secret code entry is necessary.

8-1. The job code list

Job #	Page	Job
110*	20	Department price preset.
210	20	Department functions - 1.
211	20	Department functions - 2.
212	20	Department functions - 3.
120*	20	PLU price preset (HALO preset for SUB).
121*	20	PLU programming - 1.
221	20	PLU programming - 2.
130*	20	% rate programming for %1 and %2.
230	21	MISC. keys programming - 1.
231	21	MISC. keys programming - 2.
232	21	MISC. keys programming - 3.
235	21	% ITEM/% SBTL selection
236	21	Store/Vender coupon selection
237	21	HALO for % keys
240	21	Tax tables.
241	22	% tax rate.
250	22	Date.
251	22	Time.
252	22	Machine number.
253	22	Consecutive number.
255	22	Print time limitation for validating.
256	23	Optional feature selection.
257	23	Sentinel amount setting.
260	23	Media keys programming - 1.
261	23	Media keys programming - 2. (High amount limitation for check change and check cashing.)
262	23	Media keys programming - 3.
263	23	Drawer open time.
270	23	Discount rate for gasoline cash sales
280	23	Secret code for PGM1 mode
281	23	Secret code for Z1 reports
282	23	Secret code for Z2 reports
286	23	Stack report

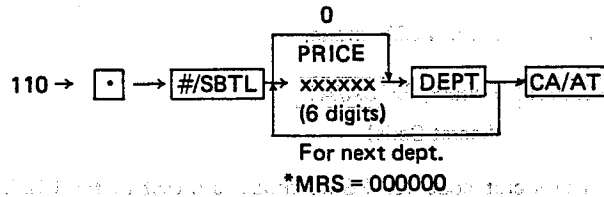
*: The jobs which have 100 level code numbers may be programmed in both PGM1 and PGM2 mode.

The jobs which have 200 level code numbers may be programmed in the PGM2 mode only.

8-2. Programming

[JOB CODE #110]

DEPARTMENT PRICE PRESET
Up to 6 digits (\$9999.99)



* MRS means Master Reset. Default value after MRS is 000000.

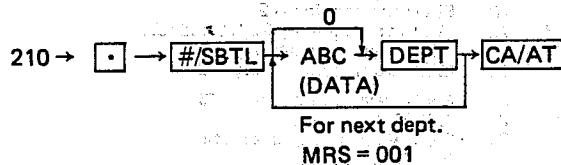
[JOB CODE #210]

DEPARTMENT FUNCTIONS - 1

- A. Validation enforced*1/Optional. = 1/0
B. Single item finalize./Single item sale./Normal. = 2/1/0
C. GAS Dept/Open & preset./Preset./Open./Inhibit*2 = 4/3/2/1/0 (Dept 1 - 5 only for gas dept.)

*1 The "enforced" is effective only when the validation print counter has been preset to a number (JOB #255) other than zero.

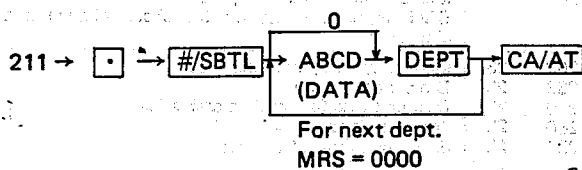
*2 If you select "Inhibit", the dept. item is print skipped on X/Z report.



[JOB CODE #211]

DEPARTMENT FUNCTIONS - 2

- A. -./+. sign = 1/0
B. Food stampable./Not. = 1/0
C. Taxable 2./Not. = 1/0
D. Taxable 1./Not. = 1/0

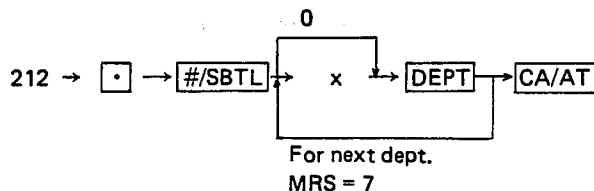


[JOB CODE #212]

DEPARTMENT FUNCTIONS - 3

HALO digits (x) = 0 - 7

The HALO preset will be overridden in the MGR. mode.

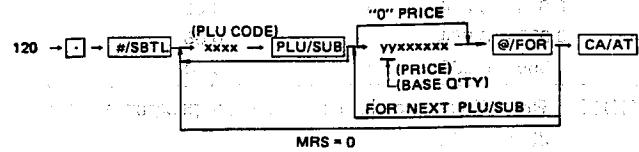


[JOB CODE #120]

PLU PRICE PRESET (HALO PRESET FOR SUB DEPTs)

The PLU number must have been preset by JOB #121

- Up to 6 digits for price or HALO: xxxxxx (000000 - 999999)
- 2 digits for split base quantity: yy (00 - 99)



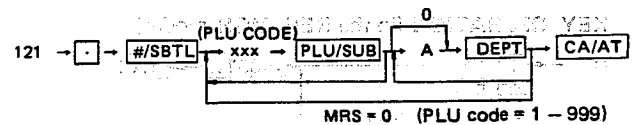
[JOB CODE #121]

PLU PROGRAMMING - 1

A. Clear out/PLU/Sub-dept./Inhibit. = 3/2/1/0

The Dept. to be used with the PLU/SUB is preset by this programming.

The "clear out" makes all the data tied to the PLU zero.

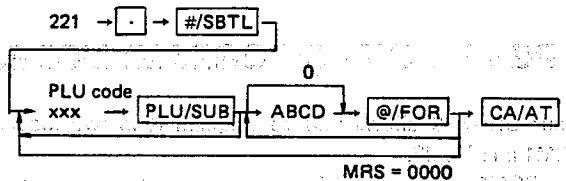


[JOB CODE #221]

PLU PROGRAMMING - 2

(The PLU number must have been preset by JOB #121)

- A. -./+. sign = 1/0
B. Food stampable/Not. = 1/0
C. Taxable 2./Not. = 1/0 (PLU code = 1 - 999)
D. Taxable 1./Not. = 1/0

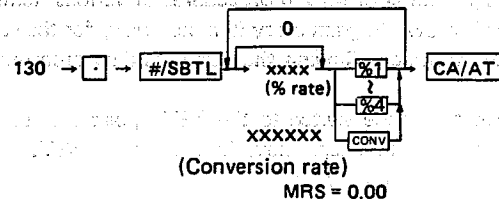


[JOB CODE #130]

% RATE PROGRAMMING FOR %1 THRU %4

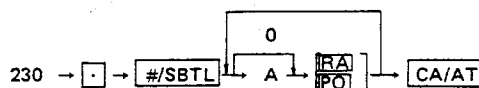
% rate: 0.00% - 99.99%

Conversion rate: 000.000 - 999.999



[JOB CODE #230]**MISC. KEYS PROGRAMMING - 1**

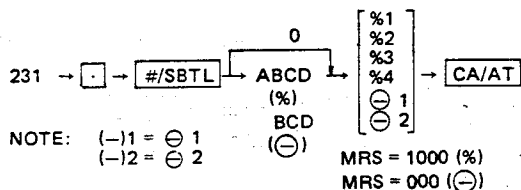
A. Validation enforced./Optional. for RA and PO. = 1/0



MRS = 0 for the all

[JOB CODE #231]**MISC. KEYS PROGRAMMING - 2**

- A. -./+. sign (for % keys only) = 1/0
 B. Food stampable./Not. = 1/0
 C. Taxable 2./Not. = 1/0
 D. Taxable 1./Not. = 1/0

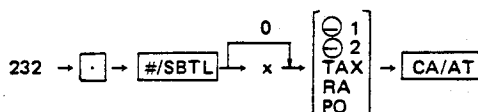


NOTE: (-)1 = ⊖ 1
 (-)2 = ⊖ 2

MRS = 1000 (%)
 MRS = 000 (⊖)

[JOB CODE #232]**MISC. KEYS PROGRAMMING - 3**

HALO digits for (-)1, (-)2, TAX, RA and PO. = 0 - 7
 The HALO preset will be overridden in the MGR. mode operation.



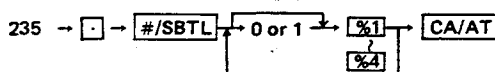
MRS = 7 for the all

[JOB CODE #235]

%ITEM/%SBTL selection for %1, %2, %3 and %4.

0: % SBTL

1: % ITEM

(PROGRAMMING PROCEDURE)

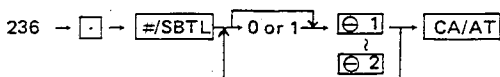
MRS = 0

[JOB CODE #236]

Vender/Store coupon selection for ⊖ 1, ⊖ 2.

0: Vender

1: Store

(PROGRAMMING PROCEDURE)

MRS = 0

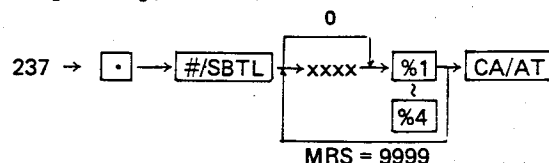
[JOB CODE #237]

HALO amount setting for %1 THRU %4.

0.00% to 99.99% can be set (9999 must be entered for 99.99).

(0.00 means the function prohibition)

(Programming procedure)



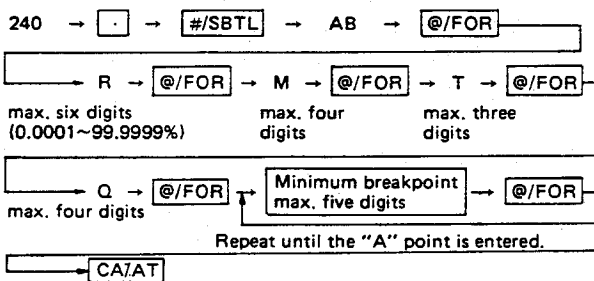
MRS = 9999

[JOB CODE #240]**TAX TABLES**

112 break points can be split into two tables. (56 each)

A. The difference between a break point and the next one is \$1.00 or more./Less than \$1.00. = 1/0

B. Table 1 programming./Table 2. = 1/2



MRS = No table

NOTE: If you make an incorrect entry before entering the M in programming a tax table, cancel it with the CL key; and if you make an error after entering the M, cancel it with the #/SBTL key. Then program again from the beginning correctly.

(1) Programming the tax table

① For this example, refer to the New Jersey tax table below (column A) New Jersey tax table: 6% rate

Tax	A		B	C
	Minimum breakpoint	Maximum breakpoint	Breakpoint difference(¢)	
.00	.01	.10	-	Non-cyclic
.01→T	.11→Q	.22	10	
.02	.23	.38	12	Cyclic (I)
.03	.39	.56	16	
.04	.57	.72	18	
.05	.73	.88	16	
.06	.89	1.10	16	Cyclic (II)
.07	1.11→"A" point	1.22	22	
.08	1.23	1.38	12	
.09	1.39	1.56	16	
.10	1.57	1.72	18	Cyclic (III)
.11	1.73	1.88	16	
.12	1.89	2.10	16	
.13	2.11	2.22	22	

The information which must be supplied to the ECR for tax table oriented calculations include the following:

R: The Rate (R) is entered as a six-digit number (2-digit integer and 4-digit decimal). Thus, a 6% rate would be entered as 60000. If the rate is fractional (e.g. 4 3/8%), then the fractional portion (3/8) would be converted to its decimal equivalent (i.e. 3750) and the

resulting rate of 43750 would be entered. Note that the nominal rate (R) is generally indicated on the tax table.

The other values which must be entered for correct table-based tax calculations are as follows:

- Q: The smallest amount for which tax must be collected. In some states, there are amounts which are not subject to tax (e.g. if amounts of \$0.01 to \$0.10 are not taxed, the value of Q — being the smallest taxable amount — would be \$0.11).
- T: The amount of tax which is associated with the amount Q.
- M: The value is associated with the cyclical nature of many tax tables. In fact, the need to support tax tables as opposed to the use of a straight percentage calculation is because there are amounts where the result of applying the percentage calculation does not result in a tax amount which is the same as the related table amount. The table must, therefore, be used to obtain the data (i.e. the value M) necessary for the register to obtain the correct tax amount. The procedures to obtain this value are as follows:

The tax table must be examined in order to find repeating cycles in terms of the breakpoint differences as indicated in the preceding tax table (Note that a 'breakpoint' is that amount at which a tax amount increment takes place).

As you can see from the table, the breakpoint differences indicated by Cycle I repeat in Cycle II. I indicates the tax table's cyclical pattern and thus the value for M is determined by adding the breakpoint difference amounts associated with I (i.e. for purposes of the sample table, this value is 100).

The value of $\underline{M}$ may be viewed as the taxable amount which is covered by the cycle. Thus, it can be determined by adding all of the breakpoint differences in a cycle or by simply taking the difference between the first breakpoint of the cycle and the first breakpoint of the next cycle.

Example: Programming the sample tax table shown below is tax table 1.

Key operation		
240	•	#SBTL
	1	@/FOR
R→	60000	@/FOR
M→	100	@/FOR
T→	1	@/FOR
Q→	11	@/FOR
The first cyclic portion	{	23 @/FOR
		39 @/FOR
		57 @/FOR
		73 @/FOR
		89 @/FOR
"A" point →	{	111 @/FOR
		CA/AT

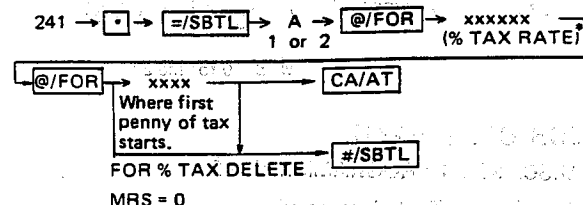
[JOB CODE #241]

% TAX RATE

A. For TAX 1 ($A = 1$) and TAX 2 ($A = 2$)

Presettable TAX RATE range = 0.0001 – 99.9999%

Lowest taxation limit = €1 – \$99.99

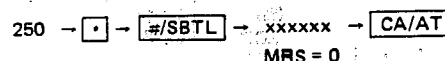


* No decimal point key is required.

[JOB CODE #250]

DATE _____

MM/DD/YR or DD/MM/YR (Ref. to SRV. program #905D)



[JOB CODE #251]

TIME

Enter the time in 24-hour format.

1 AM = 100

1 PM = 1300

C



[JOB CODE #252]

MACHINE NUMBER

3 digits

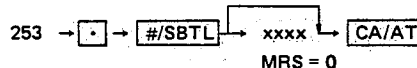


[JOB CODE #253]

CONSECUTIVE NUMBER

4 digits

0

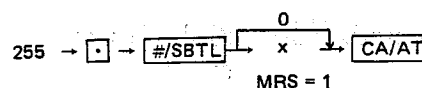


[JOB CODE #255]

LIMIT ON THE NUMBER OF TIMES OF VALIDATION

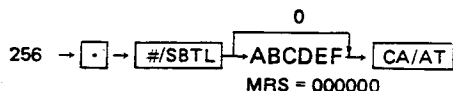
A number of 0 through 9. (0 means no validation allowed.)
is presettable for validation.

(PROGRAMMING PROCEDURE)

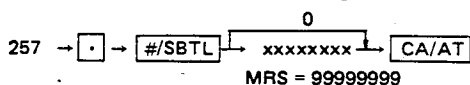


[JOB CODE #256]**OPTIONAL FEATURE SELECTION**

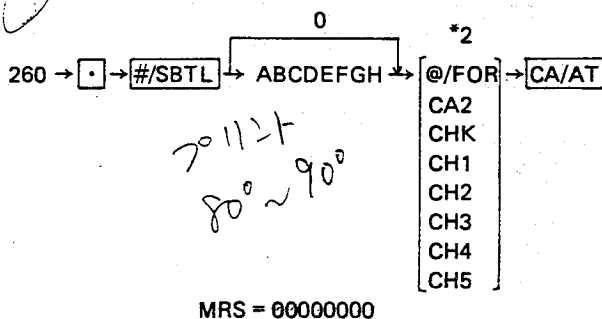
- A. CLK X/Z mode inhibited./Exists. = 1/0
 B. Inhibit past item void in REG. mode./Not. = 1/0
 C. Inhibit last item void in REG. mode./Not. = 1/0
 D. Inhibit refund in REG. mode./Not. = 1/0
 E. Validation compulsory to REFUND./Not. = 1/0
 F. Journal select./Full print. = 1/0

**[JOB CODE #257]****SENTINEL AMOUNT SETTING**

\$0.00 – \$999999.99 (Up to 8 digits)

**[JOB CODE #260]****MEDIA KEYS PROGRAMMING – 1**

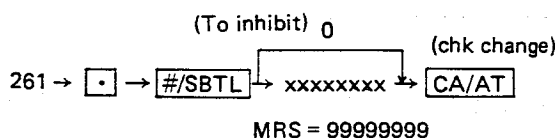
- A. Automatic discount allowed for cash payments for gasoline./Not.
 (For Cash 1 and 2 key only) = 1/0
 B. OVER TENDER disallowed./Allowed.
 (for CH1~5, CHK) = 1/0
 C. VALIDATION compulsory./Not.*1 = 1/0
 D. TAX 2 delete./Not. = 1/0
 E. TAX 1 delete./Not. = 1/0
 F. DRAWER open./Not. = 0/1
 G. NON ADD code compulsory./Not. = 1/0
 H. AMOUNT TENDERING compulsory./Optional for
 amount tendering for cashes and check. *3 or inhibit
 amount tendering for charges 1 – 5.*4 = 1/0



- *1 The "Compulsory" is effective only when the validation print counter is preset to a number (JOB #255) other than zero.
 *2 The "@/FOR" key is used for "CA1" (i.e. CA/AT) key programming.
 *3 Credit card type function will be selected.
 *4 House charge or new balance key type function will be selected.

[JOB CODE #261]**MEDIA KEYS PROGRAMMING – 2****HIGH AMOUNT LIMITATION FOR CHECK CHANGE**

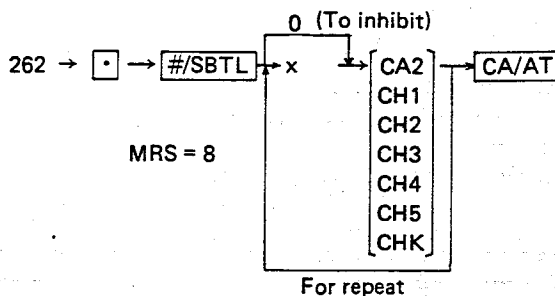
\$0.00 – \$999999.99

**[JOB CODE #262]****MEDIA KEYS PROGRAMMING – 3**

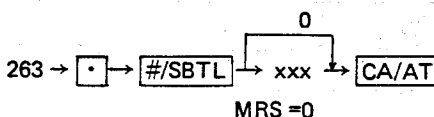
HALO digit for 5 media keys. = 0 – 8

(CA/AT key has no limitation.)

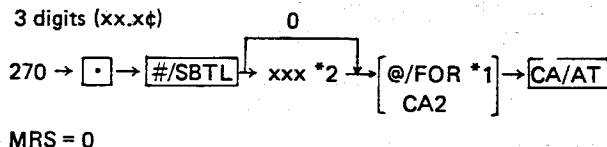
The HALO preset will be overridden in the MGR. mode.

**[JOB CODE #263]**

Time interval for drawer open count. 0 to 255 seconds
 (PROGRAMMING PROCEDURE)

**[JOB CODE #270]****DISCOUNT AMOUNT FOR GALLON
(PROGRAMMING PROCEDURE)**

3 digits (xx.x¢)



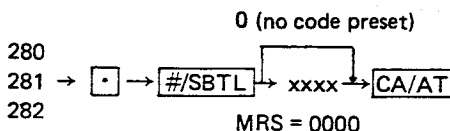
*1 The "@/FOR" key is used for "CA1" (i.e. CA/AT) key programming.

*2 999 must be entered for 99.9¢

[JOB CODE #280, 281 and 282]

Secret code (4 digits) for

PGM1 mode: #280
 Z1 (Z1/X2/Z2 mode): #281
 Z2 (Z1/X2/Z2 mode): #282

**[JOB CODE #286]****STACKED REPORT**

Maximum 5 reports can be memorized in the stack report.

(PROGRAMMING PROCEDURE)

286 → [] → #/SBTL → xx → @/FOR → CA/AT

xx: Report JOB # or 1, 4, 5, 20, 30
MRS = 1, 4, 5

8-3. Program Reading (PGM1 or PGM2 mode)**LIST OF PROGRAM READING**

xx → #/SBTL → (Report Range)*1 → CA/AT

JOB CODE #

JOB #	REPORT NAME
110*1	DEPARTMENT PRESETS
120*1	PLU/SUB PRESETS
130	% RATE AND THE OTHER MISCELLANEOUS FUNCTION PRESETS (INCLUDING MEDIAS)
240	TAX TABLE
900	FULL SRV MODE REPORT
950	KEY LAYOUT REPORT

The jobs which have 100 level code numbers are allowed to be read in both PGM1 and PGM2 modes. The jobs which have 200 level code numbers are allowed to be read in PGM2 mode only.

The jobs which have 900 level code numbers are allowed to be read in the SRV mode only.

(NOTES)

*1. A reporting range must be specified for those reports indicated in the table. The standard sequence to indicate the range is:

→ xx → @/FOR → xx →
Range Range
Start End
One Item

[JOB CODE #110]**DEPARTMENT PRESET REPORT**

110 → #/SBTL → (Report Range) → CA/AT

[JOB CODE #120]**PLU/SUB PRESETS REPORT**

120 → #/SBTL → (Report Range) → CA/AT

[JOB CODE #130]

% RATE and the other MISCELLANEOUS functions pre-sets (including MEDIAS)

130 → #/SBTL → CA/AT

[JOB CODE #240]**TAX TABLES READING**

240 → #/SBTL → CA/AT

9. PRINT SKIPPING ON X/Z REPORT VIA SRV1/PGM2 MODE PROGRAMMING

Many items on the General Report can be print-skipped by SRV programming.

There are two types of the programming to skip printing.

① Automatic selection.

Corresponding to the key layout programming or optional feature selection programming in SRV mode, the unnecessary printings on the report are skipped.

② Manual selection.

Some of the items which do not correspond to any key or optional feature can be print-skipped by SRV mode programmings JOB #904, 905A and 905B.

The table shows which item is skipped on the general reports (i.e. X1, Z1, X2 and Z2) when the related key or feature is absent. (i.e. Automatic Selection)

① Automatic Selection Print Skipping Table

No.	ITEMS TO BE PRINT SKIPPED	RELATED KEY OR FEATURE	JOB # FOR FEATURE SEL.
1	DEPARTMENTS Q,T,%	#of DEPT.	901C, D
2	"-" DEPT. TTL T	- preset D.	211
3	(-)-1 - (-) 2 Q,T	(-)-1, (-)-2 keys	950
4	%1 - %4 Q,T	%1 - 4 keys	950
5	VOID 1 Q,T	VOID key	950
6	VOID 2 & VOID 3 2Q,2T	VOID mode	902C
7	REFUND Q,T	REFUND key	950
8	VAL.P. counter Q	PRINT key	950
9	CA2 Q,T	CASH 2 key	950
10	PO Q,T	PO key	950
11	RA Q,T	RA key	950
12	CH1 - CH5 Q,T	CH1 - 5 key	950
13	CHK Q,T	CHK key	950
14	No Sale counter Q	NS function	903D
15	FOOD STAMP Q,T	FS function	906A
16	GAS DISCOUNT Q,T	GAS function	906C
17	Foreign Currency T	CONVERSION key	901B

② Manual Selection Print Skipping Table

ITEMS TO BE PRINT SKIPPED	JOB CODE #
GT1 T	904A
GT2 T	904A
GT3 on Z report T	904A
GT3 on X report T	904B
Coupon PLU Q,T	904B
Net sales SBTL T	904B
Net taxable1 SBTL T	904C
TAX 1 TTL for + sales & 2T	904C
TAX 1 TTL for refunds T	904C
Net TAX 1 TTL T	904D
Net taxable 2 SBTL T	904D
TAX 2 TTL for + sales & 2T	904D
TAX 2 TTL for refunds T	904D
Net TAX 2 TTL T	904D
Manual TAX for + sales & 2T	905A
Manual TAX for refunds T	905A
Net manual TAX TTL T	905A
Total TAX T	905A
CHCG (Check change) TTL T	905B

(NOTE)
Q: counter
T: total
%: percent share

(NOTE)

1. The parts which have JOB # are print skipped via the programming of the JOB #.
2. The jobs which have 200 level code numbers may be programmed in the PGM2 mode.
3. The jobs which have 900 level code numbers may be programmed in the SRV1 mode.

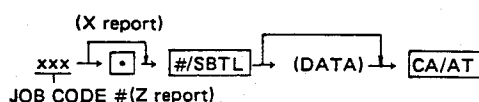
10. READING & RESETING MODES (CLK X/Z, X1, Z1/X2/Z2)

10-1. Reports

The following categories of reports can be printed by the ECR;

- (1) CLK X/Z mode reports (clerk and cashier reports)
- (2) X1 mode reports (daily sales reports)
- (3) Z1/X2/Z2 mode reports (periodic sales reports)

To print reports, use the following key entry sequences:



The report will be printed on journal and receipt tapes with this procedure.

The (DATA) part will be described in the "LIST OF REPORT".

(NOTE) - GENERAL RULE -

- ① If the ☐ key is depressed following a JOB code number entry with these procedures, data inside of the ECR will be cleared (i.e. Z reports).
(Some job code numbers do not allow the ☐ key to follow.)
- ② If the ☐ key is not depressed following a JOB code number, data inside of the ECR will be maintained (i.e. X reports).
- ③ The ☐ key is allowed only after a secret code entry when the mode switch position has been changed (i.e. when the mode switch is turned and an effective entry is entered, the effect of secret code entry is disappeared).
- ④ The CLK X/Z mode operations can be suppressed by PGM2 Job code #256A.

LIST OF REPORTS

Job CODE #	REPORT NAME	MODE			(DATA)
		CLKX/Z	X	Z	
1	General Report		X1	Z1	- *3
201				X2/Z2*1	
2	Individual Cashier Report	X/Z	X1	Z1	Cashier key
4	Hourly TTL Report 48 half hours		X1		(RANGE)2 *5
			X1*2	Z1*2	-
5	All Cashier Report		X1	Z1	-
205				X2/Z2*2	-
9	Stacked Report			Z1	-
209				X2/Z2*2	-
12	Manual Group Report		X1		Dept. keys
212				X2*1	
20	PLU Report by Range		X1	Z1	(RANGE)1 *4
30	CID Report		X1		-

(NOTES)

X or Z (including them with the suffix of 1 or 2) signifies that the X or Z report is accessible in the each mode of CLK X/Z, Z1, Z1/X2/Z2.

- *1 RAM option required
- *2 Zero Skip Printing
- *3 -: No entry required
- *4 (RANGE)1: xxx @/FOR (xxx)
- *5 (RANGE)2: xxx @/FOR (xxx) pxxx= 0 - 2330; No entry for 0 data

The date must be every half hour step otherwise the machine errors.

(i, e, 0, 30, 100, 130, 200 2330)

10-2. Validation printing of check in and checkout time

The ER2590 allows the operator to print the employee arrival and departure times, etc. using the validation printing function.

- (1) Turn the mode switch to the "CLK X/Z" position.
- (2) Put a card into the paper chute and perform the following key operation.
 - 1) Arrival time (printed on the receipt)
Numeric key 1 →
 - 2) Departure time (printed on the journal)
Numeric key 2 →
- (3) Sample printout

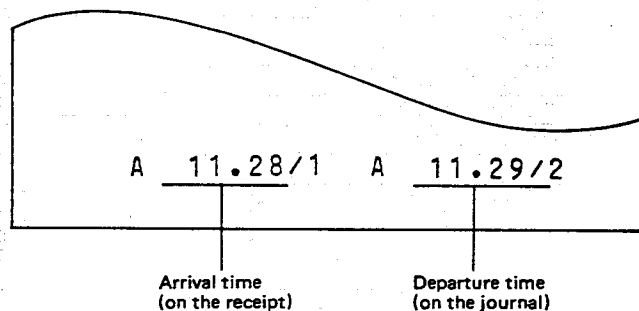


Fig. 10-1

11. OUTLINE OF FUNCTIONS

The SHARP ER2590 is a sophisticated featured ECR with a numeric printer, flexible key layout and RS232C interface.

The machine is designed as a general purpose ECR basically, having the additional special features for small size gas stations.

The machine also has functions which are required by major accounts.

11-1. Function List

FEATURES		NUMBER
Number of Departments (Standard)		20
Department Expandability Max Number of Departments		OPTION 40
Number of PLU (Standard)		200
Number of PLU Expandability Max Number of PLU's		OPTION 675
Number of Cashier (Standard)		2
Max Number of Cashier		Option 4
Number of Media CASH, CA2, CHECK, CHARGE 1~5		8
Number of Free Key Positions		51
Number of Different Free Key Functions other than Departments		31
Number of Digits in The Operator Display		10
No. of Digits of Pedestal Display (Service)		7
Number of Digits in The Customer Display		7
Type of Receipt/Journal Printer		CR910C
Number of Drawers		1
Max number of drawers		Option 4
Number of Different reports		8
Number of Different Reports by Option		3
Print Skip on Reports		Yes
Drawer Open Enforce		Yes
Currency Conversion		Yes
Sparate No Sale Key		Yes
RS-232C Interface		Option Yes
Secret Code		Yes
Gallon Calculation		Yes
Exclusive Mode Key Selection		Option Yes
Exclusive Cashier Key Selection		Option Yes
Validation Sensor (Service)		Yes
Journal Near End Sensor (Service)		Yes
Department	Gasoline Calculation	Yes
	Non Add Code Enforce	Yes
	No. of Digits in Unit Price Preset	6
	+/-	Yes
	HALO digits	0~7
	Tax tables	2
	(SIS) Single Item Sale	Yes
	(SIF) Single Item Finalize	Yes
	Inhibit and Preset	Yes
	Validation Enforce	Yes
	No. of Digits of Totalizer	8
	No. of Digits of Counter	6

(Service) = Service option

No. = Number

FEATURES		NUMBER
PLU	No. of Digits of Totalizer	8
	No. of Digits of Counter	6
	No. of Digits of Unit Price	6
	Free Code	3
	Food Stamp Sort	Yes
	+/-	Yes
	HALO	Yes
	Kind of Tax Sort	2
	Inhibit and Preset	Yes
	Sub Department	Yes
	No. of Digits of Split Price Base	2
	Number of Departments	2
Real Type Clerk Key (max.)		4
MEDIAS	Number of CASH Keys	2
	CHECK	1
	CHARGE	5
	CHECK CHANGE TOTAL	1
	Drawer OPEN DETECT (SRV SETTING)	Yes
	Validation Enforce (SRV SETTING)	Yes
	Tax Delete	Yes
KEY	Departments (Max)	40
	PLU	1
	CASH	2
	CHECK	1
	CHARGE	5
	MDSE ST	1
	VOID	1
	REFUND	1
	%1	1
	%2	1
	⊖ 1	1
	⊖ 2	1
	TAX SHIFT 1	1
	TAX SHIFT 2	1
	PO	1
	RA	1

FEATURES		NUMBER
KEY	NS	ENT 1
	PRINT	ENT 1
	JOURNAL-FEED	ENT 1
	RECEIPT-FEED	1
	NUMERIC 0~9	10
	00	1
	DECIMAL POINT	1
	CLEAR	1
	@/FOR	1
	#/SBTL	1
FUNCTIONS	MULTIPLICATION	Yes
	SPLIT PRICING	Yes
	⊖ 1 (NOT NET DEPT)	Yes
	⊖ 2 (NET DEPT)	Yes
	%1 (NOT NET DEPT)	Yes
	%2 (NET DEPT)	Yes
	PAST VOID, LAST VOID	Yes
	VOID MODE	Yes
	Gas Discount	Yes
	Cash Sale	Yes
	Check Change	Yes
	- PLU Total	Yes
	Food Stamp	Yes
	Tax Forgiveness	Yes
	Currency Conversion	Yes
	Time Validation	Yes
	Coupon Store/Vender Sel.	Yes
	% Item/SBTL Selection	Yes
	Sentinel Amount	Yes
	CLOCK	Yes
	OVERRIDE	Yes
	SEPARATE ITEMIZERS	Yes
	FOR REFUND	Yes
	No. of Tax Tables	2
No. of Digits of % Tax	6	
RE-PORTS	Stacked	Yes
	CLERK	Yes
	DAILY GENERAL	Yes
	PLU/Sub Department	Yes
	CASH IN DRAWER	Yes
	HOURLY	Yes
	MONTHLY GENERAL	Yes
	MANUAL GROUP	Yes
	MONTHLY MANUAL GROUP	Yes

11-2. Functional Descriptions

① GALLON CALCULATION (New)

The function will calculate gallons from preset unit prices, prints the result and accumulate them automatically by entering an amount of gas sold.

The gas volume is calculated as;

$$\text{GAS VOLUME} = \text{AMOUNT ENTERED/PRESET UNIT PRICE}$$

PROGRAMMINGS RELATED WITH THE FUNCTION (SRV MODE PRESETS)

- Selection to allow or not to allow the gas function
- Key layout
- Digit selection of unit price for gasoline
- Rounding method of calculated gas volume
- Selection of decimal part digits for gas sales volume total (PGM2 MODE PRESET)

- Department type selection (Ordinary /Gas)
Each of #1-5 department can have this selection

- Tax sort
Tax 1, 2 or 1 & 2

(PGM1 MODE PRESET)

- Unit price: 6 digits for each department
\$xxx.xxx or \$xxx.xx
- Gas discount amount: 3 digits; discount amount/gallon
xx.x cents for each CA1 and CA2 key

(NOTE)

Any PLU can not be tied to a gas department. This will cause an error to occur during REG/MGR mode operations.

② CURRENCY CONVERSION (New)

The function allows foreign currency tendering and calculates changes.

One kind of conversion rate (0.000 thru 999.999 for \$1.00) can be preset in the PGM2 or PGM1 mode.

Only cash payments (i.e. CA1 or CA2) are allowed after a conversion calculation.

③ Open Drawer Count

If a drawer is opened by a normal operation^{*1} and is kept opened more than the preset time interval,^{*2} a drawer open counter corresponding to the cashier is incremented by one. For this purpose, the drawer open counter is provided for each cashier and a totalizer for the sum of the counters. If the drawer is closed, or an effective key operation^{*3} (Permitted even with the drawer open) is performed before passage of the preset time interval, the timer stops and the counter does not increment.

(The machine will not recognize that the drawer was open.)

^{*1}: If the drawer is opened irregularly such as manual-open this function will not work.

^{*2}: The time interval for open drawer counting can be programmed in the PGM2 (Job code #263) and it ranges from 0 to 255 seconds.

^{*3}: Validation print, etc.

④ TAX FORGIVENESS (Food Stamp Payment)

This machine has the new calculation system for tax

forgiveness

For this purpose, the following food stampable sub-totals (i.e. itemizers) for a transaction exist in the machine.

These sub-totals accumulate the amount of food stampable items during a registration.

⑤ MGR. MODE OPERATIONS

All the REG. mode operations are allowed in MGR. mode. Changing mode between REG. and MGR. is available during a transaction by turning the mode switch.

Entry limitations are overridden in MGR. mode.

The PGM. mode program #256 can make last and past item void, and refund effective in MGR. mode only.

By depressing void key as the first operation in the MGR. mode or as a key operation just after a finalization, the ECR becomes "VOID MODE" and all the calculation are reversed in positive and negative value.

Void mode mark print is added to the receipt and journal.

This operation can be prohibited by SRV mode preset #902C.

⑥ SECRET CODE ENTRY

After entering the secret code by the following procedure, the Z reports are available to be printed by adding the ☐ key depressing in the report reading procedure.

To change PGM1 programs, also the secret code is required to enter.

The secret code is preset in the PGM2 mode.

Different codes are presettable from each other of Z1 and Z2 for the individual controlling.

Once the secret code has been entered, the re-entry is not necessary to take the multiple number of Z-reports in the same mode.

If the secret number has been preset as zero, no secret code entry is necessary to print Z-report.

(PROCEDURE)

In the PGM1, PGM2 or Z1/X2/Z2 mode.

CA/AT — xxxx — CA/AT

(Secret Code)

⑦ STACKED REPORT

The machine has the stacked report feature, which issues multiple kinds of report by one sequential operation.

This report can not include the job number of 2, 3 or 12. If the numbers are included in an operation, the steps for the numbers are ignored (i.e. the reports for the numbers are not printed but the other reports are printed). For reports 4 and 20, no range can be specified (i.e. allways all items are printed with zero skipping).

Up to 5 kinds of report can be printed consecutively by an operation. Same report number can be included in the operation, but if the data is changed after the former one's printing, the latter report prints the changed data (i.e. consecutive number or Z report).

12. TEST FUNCTION (IN THE SRV1 MODE)

12-1. General

These test programs have been included in the unit and will be helpful when checking it for the following:

- ① Inspecting the unit after unpacking.
- ② Checking the unit after repairing it.
- ③ Trouble shooting.
- ④ Burn-IN/Aging test.

1) This test function is designed to test various machine operations in the production line and during field servicing. Test programs are implemented in the ROM of the machine and executed by the CPU (UPD7801G).

The following conditions are required for the proper operation of the test program:

- a) Normal voltage levels to the logic system. (+5V, POF).
- b) All I/O signals and CPU logic should be in normal operating condition, except for PA, PB, INT0, INT2, and WAIT of the CPU. An entire CKDC and part of the address decoder, address bus, data bus, and RAM1 should be in normal working condition.
- 2) After program initiation, test status or test command code will be printed on the receipt and journal of the printer for indicating execution of the test program, regardless of the RECEIPT ON/OFF switch position.
- 3) If power interrupt occurs during program execution, one of the following actions will take place depending on the MODE switch position at the time of power restoration:
 - a) SRV1: Program Reset is performed.
 - b) Other than SRV1 and SRV2: Continues program execution.
 - c) SRV2: CPU does not start. Program will be reset when the mode switch is turned to SRV1.
- 4) All totalizer and preset values still keep its contents even after the test function executed except for optional PLU RAM (No. 11) Clear.
- 5) Test commands must be entered in the following format in the SRV1 mode.

JOB # (NK) → CA/AT

NK: DATA according to LIST 12-3.

12-2. Test procedure

- (1) Check out after unpacking:
Use; Test No. 1 ~ No. 7

12-3. List of test commands

Test No.	NK Data	Test Function Item	Option
1	1	Printer Test	
2	2	Display, Buzzer, Drawer, & Receipt ON/OFF Switch Test	
3	4	Key Test	
4	5	Clerk & Mode Switch Test	
5	10	ROM (UPD7801G) Test (No.7)	
	11	ROM (27256) Test (No.8)	
	12	ROM (27128) Test (No.9 RS-232C)	
6	13	RAM (6264 Standard No. 10) Test	
	14	RAM (6264 PLU Option No. 11) Test	
	15	RAM (6264 PLU Option No. 11) Clear	*4
7	21	Drawer open sensor test (DR1)	
	22	Drawer open sensor test (DR2)	
	23	Drawer open sensor test (DR3)	
	24	Drawer open sensor test (DR4)	
8	30	Free Key Position Code Read Test	
9	3	Aging Test (Printing the "Printer Test")	
10	6	Validation paper sensor test	
11	7	Paper near-end sensor test	
12	8	Auto-Cutter	
13	40	RS-232C I/F *2	

*1: Service option

*2: For details, see the service manual ER-25RS.

*3: Auto-cutter option is not scheduled to release at present.

*4: After optional RAM has been installed, you must clear the RAM using Test No. 6 RAM clear (NK Data 15).

12-4. Individual Tests

[1] Printer Test

Start: 1 → CA/AT

The following print format is printed on the receipt if no malfunction occurs. (See next page for print format).

[2] Display, Buzzer, Drawer and Receipt ON/OFF Switch Test.

START: 2 → CA/AT

After the start key operation, the buzzer sounds, the drawer opens, then the following display indications will be seen.

(1) Display Test

All display digits light. (See Fig. 12-2)

Print Format

YOUR RECEIPT
THANK YOU

06-22-86

TR # . . . PL DC CA VD
-----X CH TD
\$\$\$\$\$\$\$ / / Z HA CG

GT NS 000000000 FS FS
01111111111%1
P22222222202
A333333333@3
B4444444444Q4
D5555555555KG5
E6666666666LBST
T7777777777TXTL
T8888888888RFRARA
T9999999999CPPO
VD
CH
Z

0
1
2
3
4
5
6

A 2-07
A 00230000

STOP: Auto Stop

Fig. 12-1

Repeats here when executing printer aging test

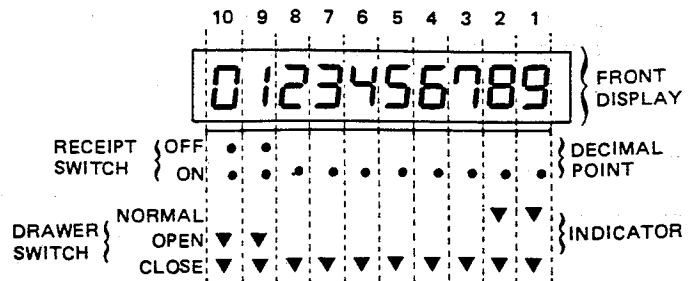


Fig. 12-2

(NOTE)

The digits 8 THRU 10 ON THE REAR DISPLAY are not visible.

(2) Drawer Test

During the drawer test, each indicator digit of the display lights according to the condition of the drawer.

- When the drawer is normal:
The indicator of 1, 2 digits light.
- When the drawer is open (Drawer switch can not be closed):
The indicator 9, 10 digits light.
- When the drawer is closed (Drawer switch can not be opened):
The indicator of 1 ~ 10 digits light.

(3) Receipt ON/OFF Switch Test.

During the receipt on/off switch test, each decimal point of the display lights according to the position of the receipt on/off switch.

- When in the OFF position:
The decimal point of 9 and 10 digits light.
- When in the ON position:
The decimal point of 1 ~ 10 digits light.

STOP: Depress "any key" in the SRV 1 mode.
(Finalizing message print: 02)

[3] Key test

The numeric key and the function key can be checked via this test:

① START: 4 → CA/AT

② Test procedure

After the start key operation, depress all keys one by one in the following order on next page.

This key test can be done only on the standard key layout.

③ STOP: Depress CA/AT key

The test mode can be stopped anywhere within the test sequence by depressing the CA/AT key. An error message print is given when interrupting the sequence by depressing the CA/AT key.

④ Result

- When the keys check out OK:

The key catch tone sounds and the normal finalizing message is printed as follows.

Normal finalizing message print

04

- When an error is detected:

The key catch tone does not sound and the error message is printed with the error mark "E" as follows.

Error message print
E04

Fig. 12-3 Key Test Sequence

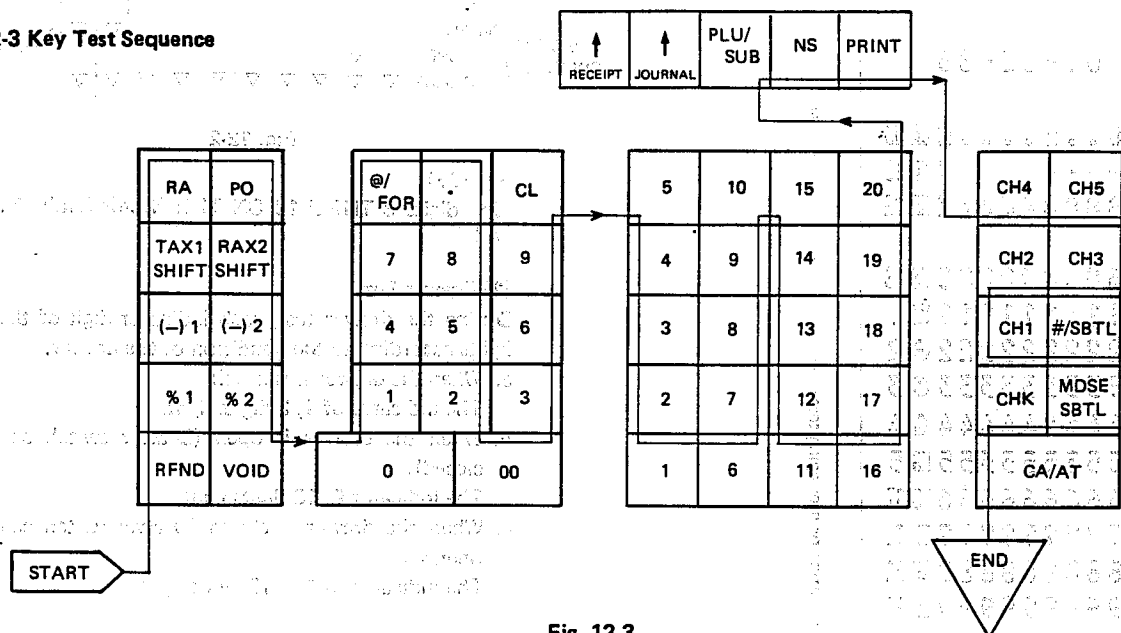


Fig. 12-3

[4] Clerk and Mode Switch Test

- START: 5 → **CA/AT**

- Test procedure:

After the start key operation, Depress the clerk key A to E in order, turn the mode switch from SRV1 to Z1/X2/Z2 position and return it to SRV1 mode.

During the clerk and mode switch test, the display indicates the appropriate number shown in Fig. 12-4.

- STOP: Turn the mode switch to the SRV1 position.
- Result:

Normal finalizing
message print.

Error message print.

05 E05

*1: Leave the clerk (B) key in the locked position, then goes to mode switch test.

*2: Needs optional key (ER-25CL) to excute and preset programming.

When not installed, skip this part.

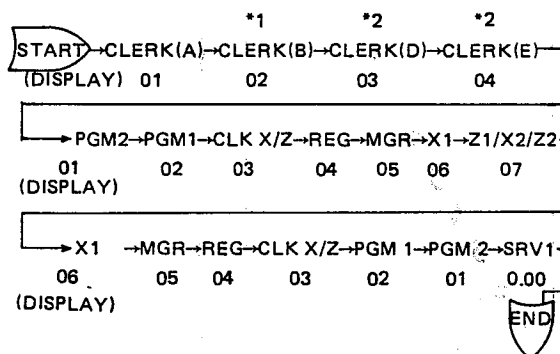


Fig. 12-4

[5] ROM Test

The internal ROM included in the UPD7801G-105, the external ROM (27256 and optional 27128) and the Address Bus can be checked via this test.

(1) Start	Target ROM	Check Address	(2) Test Result Indication on the printer	
			No error	Error
10 → CA/AT	For UPD7801G-105	0000H ~ 0FFFFH	10	E 10
11 → CA/AT	For 27256 (System ROM)	1000H ~ 7FFFFH	11	E 11
12 → CA/AT	For 27128 (Option)	8000H ~ 9FFFFH & C000H ~ DFFFFH	12	E 12

[6] RAM Test/Clear (NK data #15 only)

(1) Start	Target RAM	Check Address	(2) Test Result Indication on the printer	
			No error	Error
13 → CA/AT	For the standard RAM 6264 No. 10	A000H ~ AFFH & B000H ~ BFFFFH (Bank 0)	13	En 13
14 → CA/AT	For the PLU option RAM 6264 No. 11	B000H ~ BFFFFH (Bank 1) B000H ~ BFFFFH (Bank 2)	14	En 14
15 → CA/AT	For the PLU option RAM 6264 No. 11	B000H ~ BFFFFH (Bank 1) B000H ~ BFFFFH (Bank 2)	15	

N: 1 or 2

(NOTE)

The NK data numbers 13 and 14 are to test the RAMs and the data will be kept in the same RAM even after the test. NK data number 15 is to clear the RAM No. 11 (This function is mainly used for the installation.)

TEST 13 and 14:

When an error is encountered during the read/write test or chip select test, the test is immediately terminated with the error message on the printer.

Check to see that the end message is printed correctly.

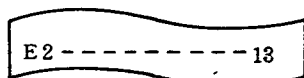
An example of RAM No. 10.



Normal ending
message



Read/write
error message



Chip select
error message

If the read data from bank 0, 1, 2 is not identical with the written data, same message (E2) will be given as well. Even after this test, the principle data of the RAMs is kept.

TEST 15:

All the addresses of the optional PLU RAM (No. 11) are filled with data 00H to clear the contents.

[7] Drawer open sensor test

① Start: 21 thru 24 → CA/AT

② Test procedure:

The specified drawer opens.

Drawer open: 0 is displayed in the first digit.

Drawer closed: C is displayed in the first digit.

21: Drawer 1 (main drawer)

22: Drawer 2 (option drawer 1)

23: Drawer 3 (option drawer 2)

24: Drawer 4 (option drawer 3)

Check item

All drawers must be tested when option drawer is installed.

③ Stop:

Auto stop.

[8] Free key position code read test

The position of the key top which is installed, can be checked.

① Start: 30 → CA/AT

② Test procedure:

After the start key operation, depress the installed position keys except the fixed position keys one by one. Then the number corresponding with the key position will be displayed. Refer to Fig. 12-3.

③ Stop: CA/AT

The finalizing message is printed by the stop key as follows.

Normal finalizing message print

[9] Aging test (Printing the "Printer Test")

An aging test of the printer can be performed:

- ① Start: 3 → **CA/AT**
- ② Stop: Move the receipt ON/OFF switch to OFF position which will cause the test to stop after one print cycle.

NOTE: When the receipt switch is "ON" position, it is printed without the consecutive number, the date and the time.

But if the receipt switch is turned to the OFF position, it is printed with the consecutive number, the date and the time.

[10] Validation paper sensor test

To excute this test, an optional Validation sensor unit is to be installed.

- ① Start: 6 → **CA/AT**
- ② Test procedure:
 - 1) Depress SBTL key and check to see if the status segment of first digit is not lit.
 - 2) Insert a validation paper, after detected the paper, the following print is given and the status segment (▼) is lit.

GT NS 0 0 0 0 0 0 0 0 (Receipt/Journal)

- ③ Stop: Depress any one of the keys.

- ④ Result: (on the printer)

0 6

[11] Journal paper near end sensor test

To excute this test, an optional Near end sensor unit is to be installed.

- ① Start: 7 → **CA/AT**
- ② Test procedure:
 - 1) When journal paper is set;
The status segment (▼) of first digit is lit.
 - 2) When journal paper is not in there;
The status segment (▼) is not lit.

- ③ Result: (on the printer)

0 7

[12] Auto-cutter test

This test is not applicable since the auto-cutter unit is not available.

[13] RS-232C i/F test

See the ER-25RS service manual for details.

13. CIRCUIT BLOCK DIAGRAM

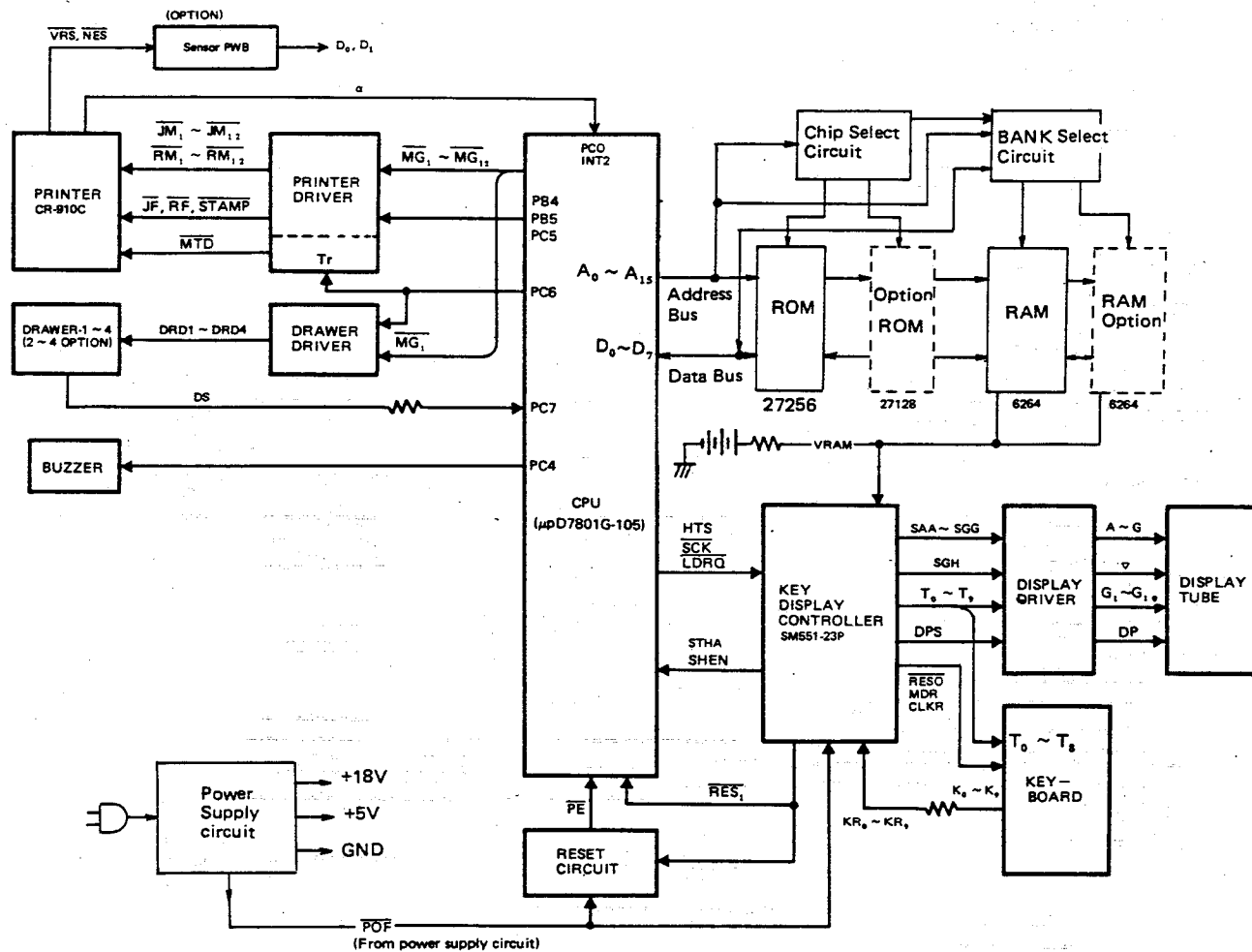


Fig. 13-1

14. μ PD7801G AND SM551-23P TERMINAL SIGNALS

14-1. UPD7801G descriptions [MAIN CPU]

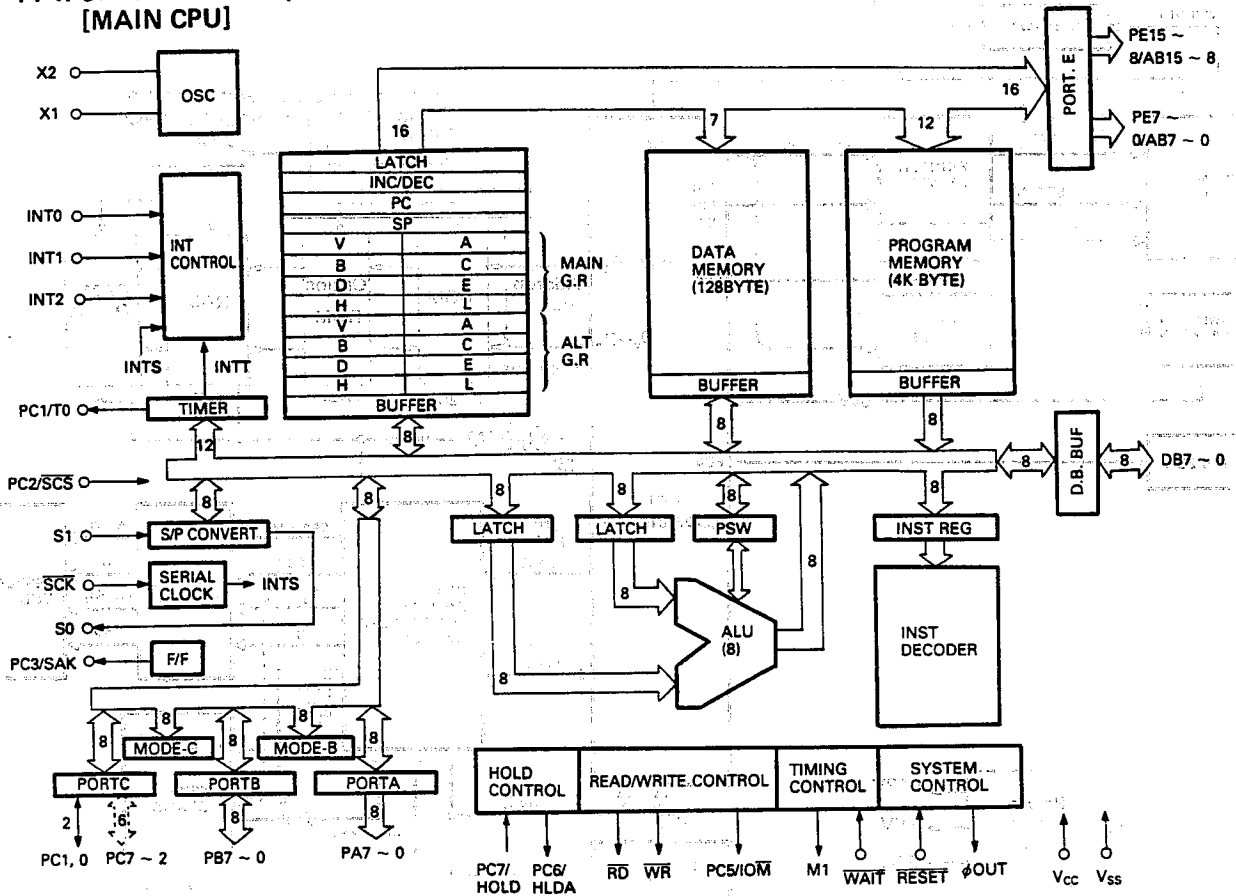
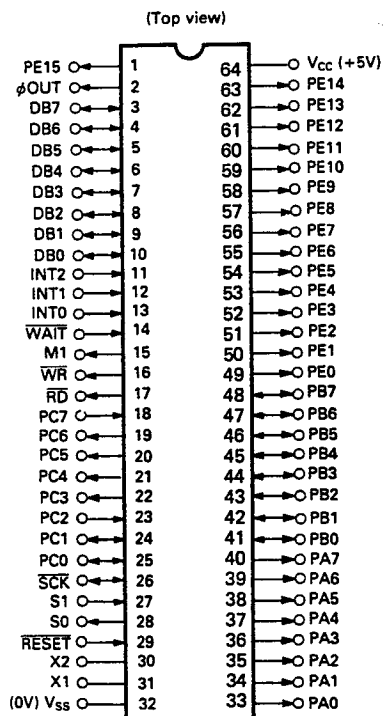
Fig. 13-2 μ PD7801 Block Diagram

Fig. 13-3

μ PD7801G-105

Pin	Terminal Name	Signal Name	I/O	Descriptions
1	PE15	A15	Out	Address bus
2	ϕ Out	ϕ Out	Out	Clock output
3	D ₇	D ₇	In/Out	Data bus
4	D ₆	D ₆	In/Out	Data bus
5	D ₅	D ₅	In/Out	Data bus
6	D ₄	D ₄	In/Out	Data bus
7	D ₃	D ₃	In/Out	Data bus
8	D ₂	D ₂	In/Out	Data bus
9	D ₁	D ₁	In/Out	Data bus
10	D ₀	D ₀	In/Out	Data bus
11	INT2	α'	In	Interrupt request (α from printer)
12	INT1	SHEN	In	Shift enable (SHEN)
13	INT0	PE	In	Interrupt request (PE)
14	WAIT	WAIT	In	Wait
15	M1	M1	Out	Not used
16	WR	WR	Out	Write
17	RD	RD	Out	Read
18	PC7	D05	In	Drawer open sense
19	PC6	MD	Out	Motor drive
20	PC5	ST	Out	Stamp drive
21	PC4	BZ	Out	Buzzer
22	PC3	LDRQ	Out	Load request
23	PC2	SHEN	In	Shift enable detect acknowledge
24	PC1	SCK	Out	Serial clock detect acknowledge
25	PC0	α'	In	α from printer detect acknowledge
26	SCK	SCK	In	Serial clock
27	Si	STH	In	Serial input data
28	So	HTS	Out	Serial output data
29	REST	RES1	In	Reset signal
30	X ₂	X ₂	In	Basic clock pulse
31	X ₁	X ₁	Out	Basic clock pulse
32	GND	GND	—	GND (0V)
33	PA ₀	MG1	Out	Printer trigger magnet - 1
34	PA ₁	MG2	Out	Printer trigger magnet - 2
35	PA ₂	MG3	Out	Printer trigger magnet - 3
36	PA ₃	MG4	Out	Printer trigger magnet - 4
37	PA ₄	MG5	Out	Printer trigger magnet - 5
38	PA ₅	MG6	Out	Printer trigger magnet - 6
39	PA ₆	MG7	Out	Printer trigger magnet - 7
40	PA ₇	MG8	Out	Printer trigger magnet - 8
41	PB ₀	MG9	Out	Printer trigger magnet - 9
42	PB ₁	MG10	Out	Printer trigger magnet - 10
43	PB ₂	MG11	Out	Printer trigger magnet - 11
44	PB ₃	MG12	Out	Printer trigger magnet - 12
45	PB ₄	JFDS	Out	Journal paper feed
46	PB ₅	PFDS	Out	Receipt paper feed
47	PB ₆	JCS	Out	Journal print
48	PB ₇	RCS	Out	Receipt print
49	PE ₀	A ₀	Out	Address bus
50	PE ₁	A ₁	Out	Address bus
51	PE ₂	A ₂	Out	Address bus
52	PE ₃	A ₃	Out	Address bus
53	PE ₄	A ₄	Out	Address bus
54	PE ₅	A ₅	Out	Address bus
55	PE ₆	A ₆	Out	Address bus
56	PE ₇	A ₇	Out	Address bus
57	PE ₈	A ₈	Out	Address bus
58	PE ₉	A ₉	Out	Address bus
59	PE ₁₀	A ₁₀	Out	Address bus
60	PE ₁₁	A ₁₁	Out	Address bus
61	PE ₁₂	A ₁₂	Out	Address bus
62	PE ₁₃	A ₁₃	Out	Address bus
63	PE ₁₄	A ₁₄	Out	Address bus
64	VCC	VCC	—	+5V

SM551-23P (CKDCII)

Pin	Terminal Name	Signal Name	I/O	Descriptions
1	CK1	CK1	—	CK1
2	CK2	CK2	—	CK2
3	V _{DD}	VRAM	—	VRAM
4	OSC in	OSC in	—	OSC in
5	OSC out	OSC out	—	OSC out
6	INTA	LDRQ	In	Load request
7	INTB	VRAM	—	VRAM
8	GND	GND	—	GND
9	φ	φ	Out	φ out
10	P0 ₀	T0	Out	Key Scan and Display 1st digit
11	P0 ₁	T1	Out	Key Scan and Display 2nd digit
12	P0 ₂	T2	Out	Key Scan and Display 3rd digit
13	P0 ₃	T3	Out	Key Scan and Display 4th digit
14	P1 ₀	T4	Out	Key Scan and Display 5th digit
15	P1 ₁	T5	Out	Key Scan and Display 6th digit
16	P1 ₂	T6	Out	Key Scan and Display 7th digit
17	P1 ₃	T7	Out	Key Scan and Display 8th digit
18	P2 ₀	T8	Out	Key Scan and Display 9th digit
19	P2 ₁	T9	Out	Display 10th digit
20	P2 ₂	T10	Out	Not used
21	P2 ₃	T11	Out	Not used
22	P3 ₀	SHEN	Out	Shift enable output.
23	P3 ₁	SGH	Out	Indicator
24	P3 ₂	RES1	Out	RES1
25	P3 ₃	—	—	Not used
26	P4 ₀	HTS	In	Serial data
27	P4 ₁	SCK	In	Shift clock for Serial
28	P4 ₂	STHA	Out	Serial data
29	P4 ₃	SCK	In	Reset order
30	P5 ₀	MODR	In	Mode return
31	P5 ₁	CLRKR	In	Clerk reseipt switch return
32	P5 ₂	IVR	In	Event read cancel
33	P5 ₃	LDRQ	In	Load request
34	P6 ₀	SCAN0	In	Not used (+5V)
35	P6 ₁	SCAN1	In	Not used (GND)
36	P6 ₂	—	—	Not used
37	P6 ₃	POF	In	P-OFF
38	GND	GND	—	GND
39	TEST	GND	—	TEST
40	P7 ₀	KR0	In	Key return input 0
41	P7 ₁	KR1	In	Key return input 1
42	P7 ₂	KR2	In	Key return input 2
43	P7 ₃	KR3	In	Key return input 3
44	P8 ₀	KR4	In	Key return input 4
45	P8 ₁	KR5	In	Key return input 5
46	P8 ₂	KR6	In	Key return input 6
47	P8 ₃	KR7	In	Key return input 7
48	P9 ₀	KR8	In	Key return input 8
49	P9 ₁	KR9	In	Key return input 9
50	P9 ₂	KR10	In	Not used (GND)
51	P9 ₃	KR11	In	Not used (GND)
52	PA ₀	SGA	Out	Display segment "A"
53	PA ₁	SGB	Out	Display segment "B"
54	PA ₂	SBC	Out	Display segment "C"
55	PA ₃	SBD	Out	Display segment "D"
56	PB ₀	SBE	Out	Display segment "E"
57	PB ₁	SBF	Out	Display segment "F"
58	PB ₂	SGG	Out	Display segment "G"
59	PB ₃	DPS	Out	Display segment "DP"
60	RESET	RES0	Out	RES0

15. CIRCUIT DESCRIPTIONS

15-1. μ PD7801G (CPU) and SM551-23P (CKDCII)

Basic functions of the CPU and CKDCII are as listed in Section 13 and 14.

FOR THE DESCRIPTION OF μ PD7801G (μ COM87), REFER TO CHAPTER 16 (μ PD7802G) OF THE CASH REGISTER BASIC MANUAL.

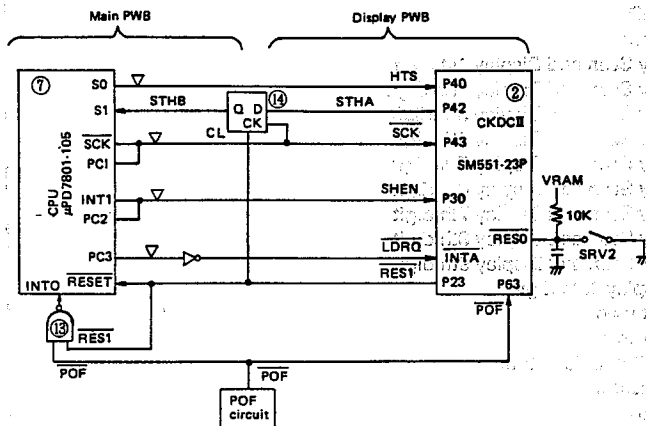


Fig. 15-1

STHA: Serial input
HTS: Serial output
SCK: Shift clock
LDRQ: Load request
SHEN: Shift enable
RES0: System reset (for CPU, RAM, I/O)
POF: Power off detect

15-2. Action at Power On and Off

(1) At power off

Even after power is turned off, the contents of the CKDCII (SM551-23P) is retained by VRAM supplied from the Ni-Cd battery backup power source, during which time the CKDCII continues the following operation.

- 1) Time keeping of the clock/counter
- 2) Detection of POF level

AC power	VRAM
ON	+5V
OFF	+3.6V, to +4.2V

- The POF signal checks for a power failure in intervals of 1 sec until it goes high.
- CKDCII (SM551-23P) operating voltage range: +3V to +7V
- Illustrated above is the wave form of the CKDCII basic clock (CK1/CK2) during power off.

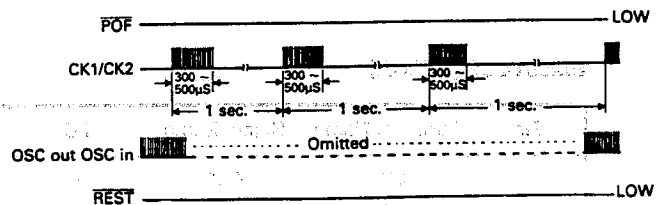


Fig. 15-2

The CPU (7801G) is at a complete halt because V_{cc} (+5V) is not supplied during power off.

(2) At power on (OFF to ON)

By examining POF every one second, the CKDCII monitors the power supply condition (ON or OFF). As POF rises from low to high state when the +5V supply became stable after power on, the CKDCII performs mode scan* and key scan*.

NOTE(*): Mode scan

Mode at the time of power on is interrogated. If it is in the SRV1 mode, it proceeds to check if the journal key is in depression in order to discriminate whether it is program reset or master reset.

At Power on:

If the journal key is in depression in the SRV1 mode, master reset is sensed.

If the journal key is not in depression in the SRV1 mode, program reset is sensed.

If not in the SRV1 mode, it reads the mode.

Then, a high state of RES0 appears on #24-pin of the CKDCII to cancel reset to the CPU.

After cancellation of reset, the CPU initializes all ports at (2) and reads the start condition.

The CKDCII displays the data in the display buffer until a display related command is received from the CPU.

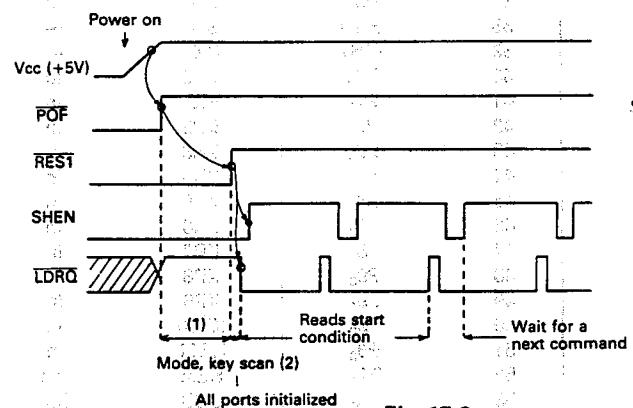


Fig. 15-3

(3) At power off (ON to OFF)

When power is turned off, POF turns from high to low state and directly inputted to the CPU. The CPU receiving a low state of POF issues a reset request to the CKDCII after executing necessary internal processing.

CPU procedure required for a reset request:

- 1) All CPU interrupt lines are disabled.
- 2) Set SCK to low level.

- 3) $\overline{\text{LDRQ}}$ is kept high for more than 30 microseconds, then forced low.
- 4) 1) through 3) repeated.
- 5) $\overline{\text{LDRQ}}$ continues to appear until $\overline{\text{RES1}}$ goes low.

Having received a reset request, the CKDCII issues a low state of $\overline{\text{RES1}}$ to the CPU to reset it. The CKDCII goes into the following state.

All ports go high impedance except, $\overline{\text{RES1}}$, SHEN, SGA thru SGG, DPS, and T0 thru T9 which are all in 0 volt level.

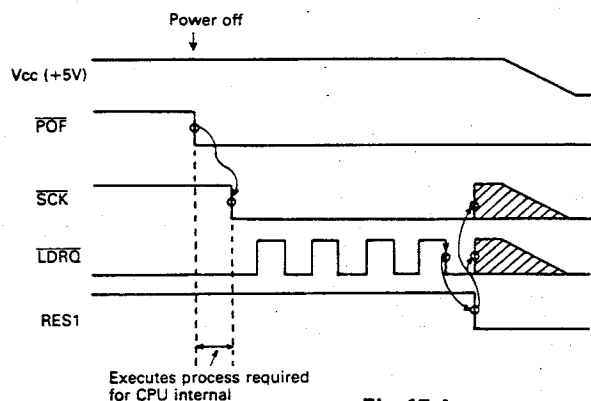


Fig. 15-4

15-3. Action at the time of CKDCII reset ... $\overline{\text{RES0}}$

As shown in Fig. 15-1, the CKDCII contains the reset pin ($\overline{\text{RES0}}$). A high state on this line resets the CKDCII, after which time each of pins are brought to the following conditions:

T0-T9: Low, SGA-SGH: low, $\overline{\text{RES1}}$: low, SHEN: low, Other pins: high impedance

As $\overline{\text{RES0}}$ turns to high level (VDD) with the mode switch at the SRV2 position, it resets the CKDCII. As $\overline{\text{RES1}}$ turns low level at this point, it cause the CPU to reset and halt. Turning the mode switch to the SRV2 mode, even while power is on, causes the CKDCII and the CPU to reset and halt their operation. When the mode switch is turned from the SRV2 to SRV1 position, it makes $\overline{\text{RES0}}$ of the CKDCII turn low and releases the CKDCII from the reset state, and, at the same time, the CKDCII changes $\overline{\text{RES1}}$ from low to high state to free the CPU and RAMs from their reset state. Then, the same procedure as in "at the time of power on" of 15-2-(2) takes place. In other words, the following are two ways of "program reset" and "master rest".

- 1) Plug the ac cord in to the wall outlet while in the SRV1 mode: (The CKDCII is not initialized.)
- 2) With the ac cord connected to the wall outlet, turn the mode switch from the SRV2 to SRV1 position, which will initialize the CKDCII.

Although the above procedures are for program reset, simultaneous depression of Journal paper feed key performs master reset (all memories clear).

Since all CKDCII internal circuits are also reset when the CKDCII is in the reset state, all signal output pins become high impedance.

15-4. Data transfer (SHIFT) between the CPU and CKDCII

Data transfer between the CPU and CKDCII

Data are transferred in synchroization with $\overline{\text{SCK}}$ from the CPU. $\overline{\text{SCK}}$ becomes effective with a high state of SHEN. Because of one byte consists of eight bits, data transfer terminates at a high to low transition of $\overline{\text{LDRQ}}$ after completely shifting eight bits.

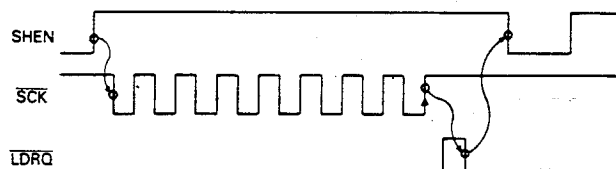


Fig. 15-5

a) Transfer from the CPU to CKDCII

It requires one dummy byte in addition to transferring bytes. A low to high transition of SHEN is senses as an end of transmission after sending of the dummy byte.

(Ex): To send two bytes of 15H and 24H.

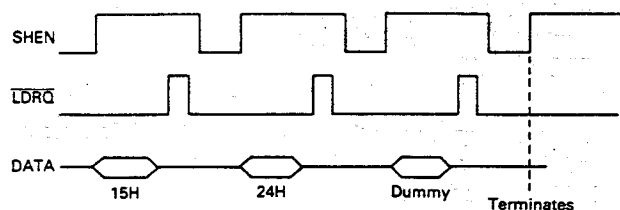


Fig. 15-6

b) Transfer from the CKDCII to CPU

To send two same data.

(Ex): To send 15H, 15H, 24H and 24H.

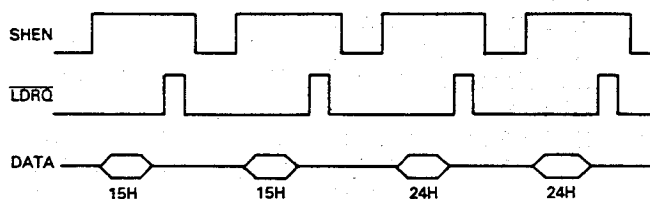


Fig. 15-7

15-5. Oscillator circuit for CPU ($\mu\text{PD7801G}$)

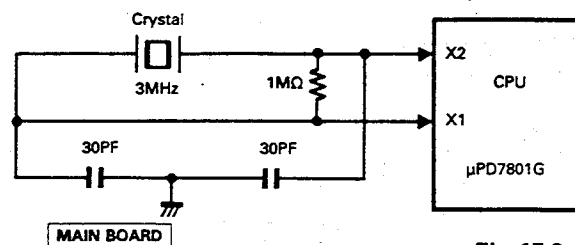


Fig. 15-8

The basic clock frequency is generated from a 3 MHz crystal oscillator. Output from the oscillators is connected directly to the CPU.

Waveforms for X1 and X2 are on the following page.

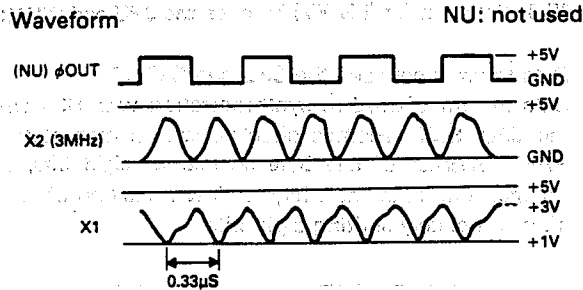


Fig. 15-9

15-6. Oscillator circuit for CKDCII (SM551-23P)

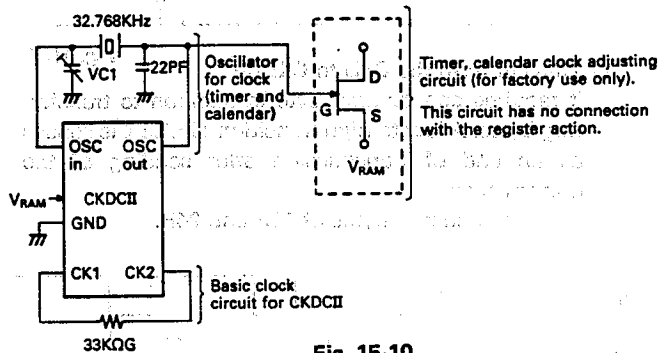


Fig. 15-10

This circuit generates the CKDCII basic clock frequency and timer and calendar clock frequency.

1) CKDCII basic clock

Insertion of the 33K ohms resistor causes the oscillation circuit in the CKDCII to operate to oscillate the prescribed frequency (0.8 to 1.3 microseconds).

2) Timer, calendar clock

OSC in and OSC out calibrated by the trimmer capacitor (VC1) is input to the CKDCII.

The timer and the calendar are operated by VRAM which is supplied to the CKDCII even during power is off to the register.

NOTE: Since the trimmer capacitor had been adjusted precisely using a special instrument at the factory, it should not never be tried to manipulated on field. In case it should be manipulated incidentally, it has to be sent to Sharp factory service for adjustment.

15-7. Power off (POF) circuit

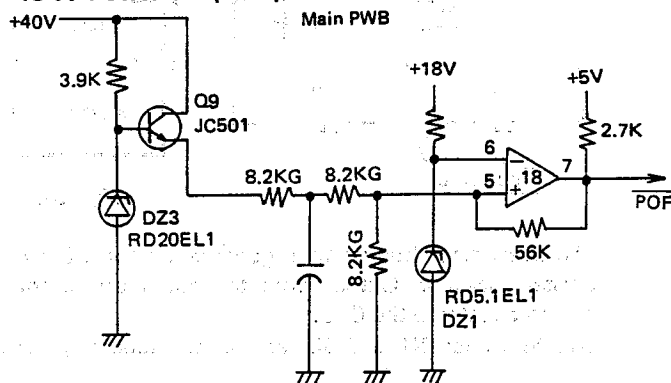


Fig. 15-11

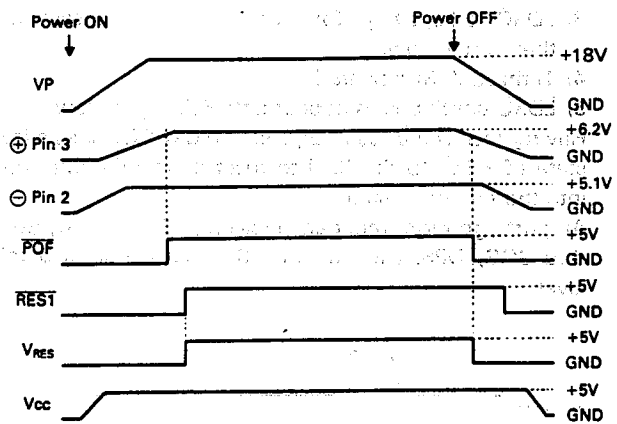


Fig. 11

(1) POF Circuit

ACTION OF COMPARATOR

- When (+) input level is higher than (-) input level: POF is at a high level.
- When (+) input level is lower than (-) input level: POF is at a low level.

The signal POF is a signal which represents condition of the AC power source.

Its level becomes a high level when AC power source is turned on, and becomes low level when the AC power source is disconnected or drops to 0 (zero).

ACTION OF THE CIRCUIT

1. With Power ON

The signal POF changes from a low level to a high level when the potential of (+) input becomes higher than the (-) input (+5.1V) after turning on the AC power source. As soon as the signal POF becomes a high, the CPU will start its operation.

2. With Power OFF

The signal POF changes from a high level to a low level as the potential of (+) input becomes a low faster than (-) input after turning off the AC power source. As soon as the signal POF becomes a low, the CPU will stop its operation.

(2) VRES Circuit

VRES is a +5V power source which is controlled by the signal POF and is developed from VDD.

VRES is supplied to the printer and drawer circuits in order to prevent a malfunction of these circuits at the time of power up and down.

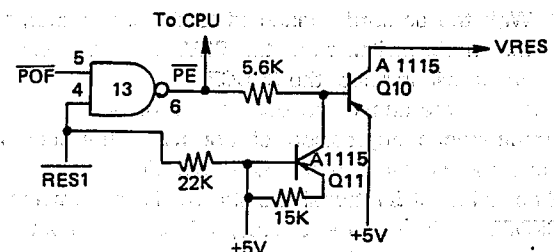


Fig. 15-12

15-8. NI-CD battery circuit

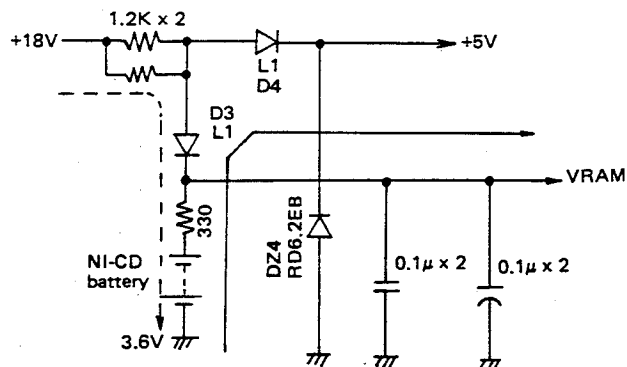


Fig. 15-13

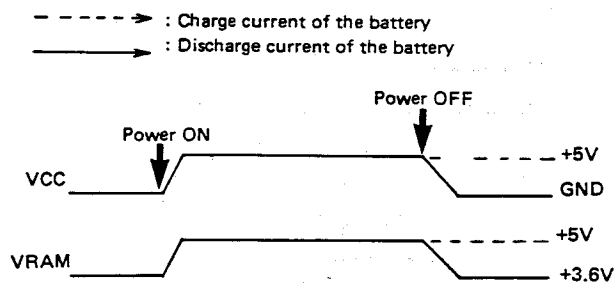


Fig. 15-14

15-9. Memory address map

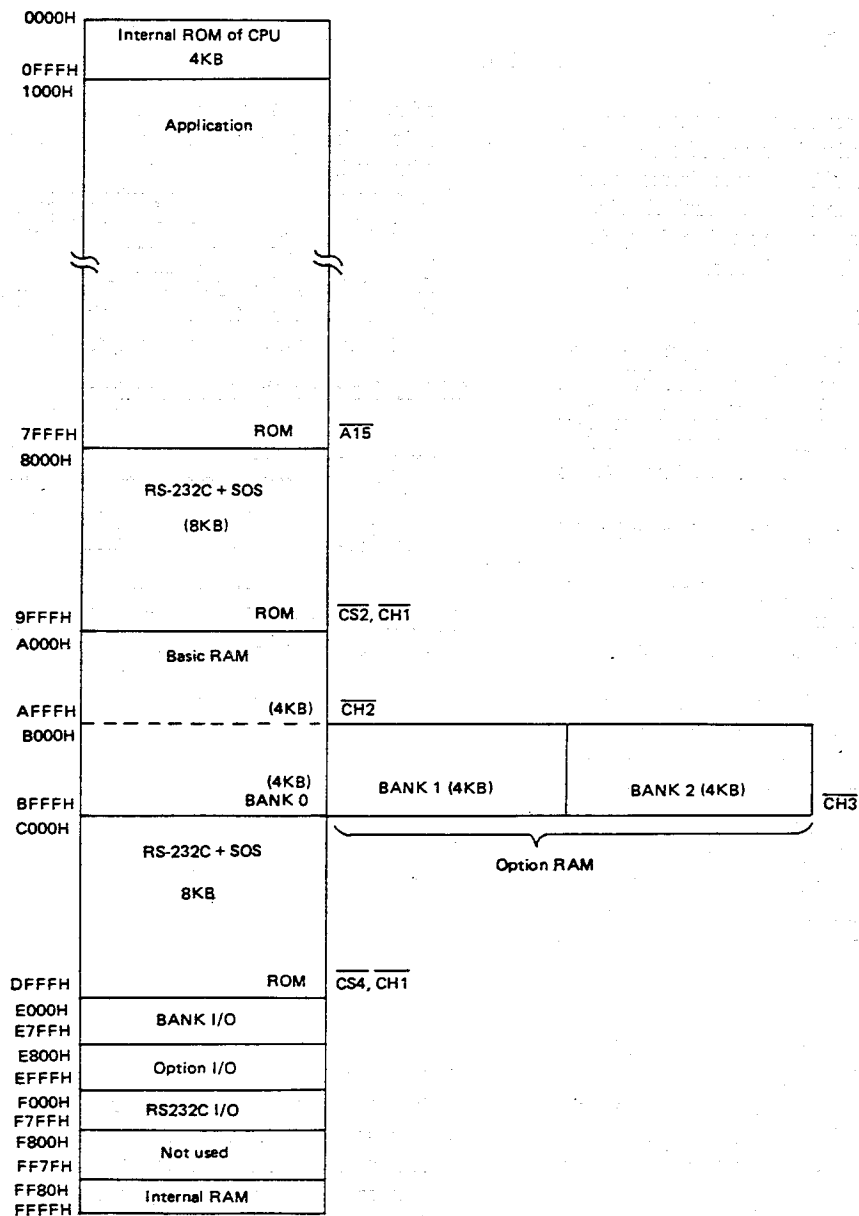


Fig. 15-15

15-10. RAM bank circuit

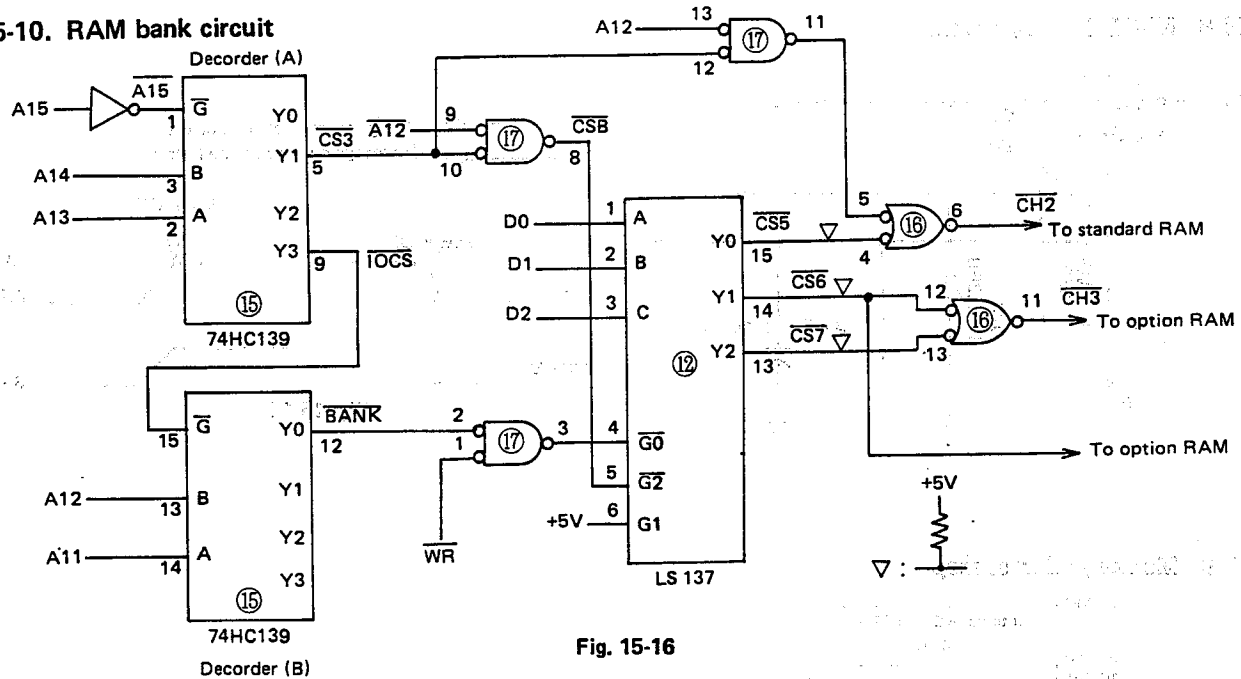


Fig. 15-16

The RAMs used in this model are selected by the chip select and bank circuits. The low order 4K bytes of the standard RAM are chip selected by the CPU address information and the high order 4K bytes are selected by the bank circuit. A (8KB) RAM option is divided into the high order and low order 4K bytes and one RAM has two banks.

(1) Standard RAM chip select

a) To select the low order 4K bytes, the IC17 pin 11 output is forced low with an active state of $\overline{CS3}$ from the decoder (A) if A12 input to IC17 is at a low. This makes the IC16 pin 6 output ($\overline{CH2}$) set active. As $\overline{CH2}$ is connected to $\overline{CE1}$ (pin 20) of the RAM. The RAM is therefore chip selected.

Because A12 is at a low level, only the low order 4K bytes of the RAM is selected.

b) To select the high order 4K bytes, the bank circuit is used. Chip selected by means of the bank circuit is achieved by furnishing the bank information to the LS137 (IC12).

First, the CPU issues the address, E000H thru E7FFH and the $\overline{BANK}$ signal is set active (IC15, pin 12). At this point, the CPU writes a 3-bit bank information (D0 thru D2) which is latched in IC12 (LS137)). Then, the CPU sends on the address bus the address, B000H thru BFFFH to access the RAM. This causes the IC12 (LS137) pin 15 ($\overline{CS5}$) to set active and transferred to the $\overline{CE2}$ input of the standard RAM via IC16 (HC08) to select the RAM chip. Since the address A12 has been high, the high order 4KB are selected.

(2) Option RAM chip select

Option RAM is selected by the bank circuit and is used the same manner discussed above.

a) As pin 14 of IC12 ($\overline{CS6}$) becomes active (low), the signal $\overline{CH3}$ is set active via IC16. Since the signal $\overline{CH3}$ is input to $\overline{CE1}$ of the option RAM, the option RAM chip selection will be done.

In the meantime, as the signal $\overline{CS6}$ is input to the

address line A12 of the option RAM, if the signal $\overline{CS6}$ is low, the low order 4K bytes of the option RAM is addressed.

b) In contrast with the above, when addressing the high order 4K bytes, an active low signal $\overline{CH3}$ is obtained by a signal $\overline{CS7}$ of IC12 (pin 13) instead of $\overline{CS6}$ before. At this time, the signal $\overline{CS6}$ is being high and so as the address line A12 of the option RAM. This causes the high order 4K bytes of the option RAM to select.

15-11. Key and Switch Scanning

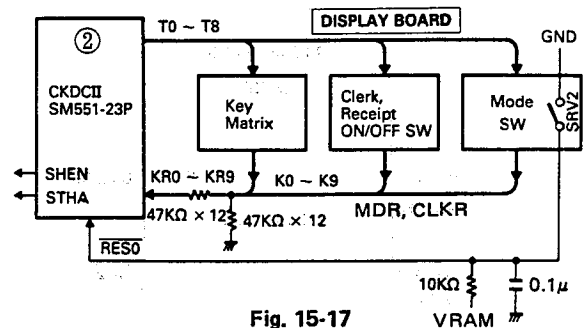


Fig. 15-17

Signal Descriptions

T0 ~ T8: Key/switch scan

K0 ~ K9: Key/switch return

RES0: CKDCII initialize (reset)

CKDCII output signals T0 ~ T8 are not only used for key/switch scan signals, but also for the display digit signals as mentioned in the paragraph to follow.

As shown in Fig. 15-18, the CKDCII continuously strobes T0 ~ T8 high.

At the same time the CKDCII checks for appearance of high state signal on key return lines (K0 ~ K9).

- If there is any high state on K0 ~ K9, it means that one of keys has been depressed.
- If there is no high state signal on K0 ~ K9, it means that no key has been depressed.

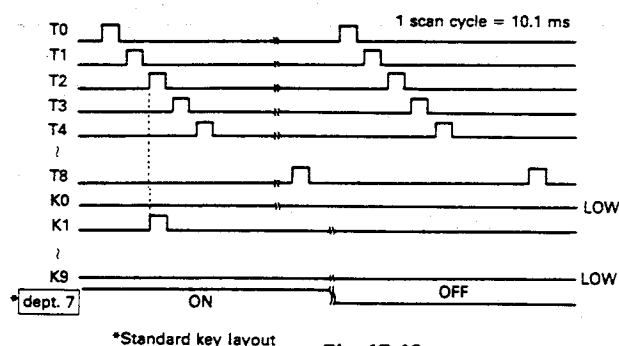


Fig. 15-18

The CKDCII sends the key/switch data to the CPU via STHA in response to the request from the CPU.

15-12. Display Control

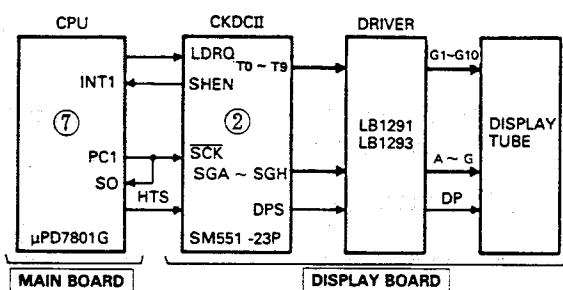


Fig. 15-19

Signal Descriptions

T0 ~ T9 (G1 ~ G10): Display digit signal
 SGA ~ SGH (A ~ G, ∇): Display segment signal
 DPS (DP): Decimal point segment signal

Display Segment Arrangement

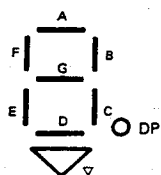


Fig. 15-20

- Display data is directly sent from the CPU to the CKDCII via HTS. The CKDCII controls the display tube via the driver (LB1291/LB1293), in accordance with the display data sent from the CPU.
- That is, once the CKDCII receives the display data from the CPU, it will be able to perform independent control of the display without CPU intervention.
- When a numeric key is pushed or when the operational result is put on the display, the CPU sends new display data to the CKDCII.

Display tube driver (LB1291/LB1293)

A fluorescent display tube is used for the display. It activates with a +41V digit signal or segment signal. The driver (LB1291/LB1293) is used to convert the digit signal and segment signal from GND, +5V to GND, +41V.

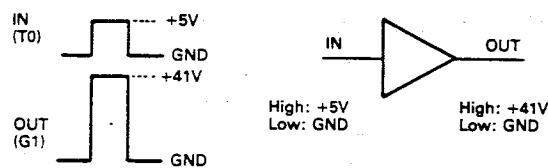


Fig. 15-21

LB1291: Driver × 8 circuits

LB1293: Driver × 6 circuits

For the operational theory of the fluorescent display tube, refer to Chapter 9-4 of "Cash Register Basic Manual."

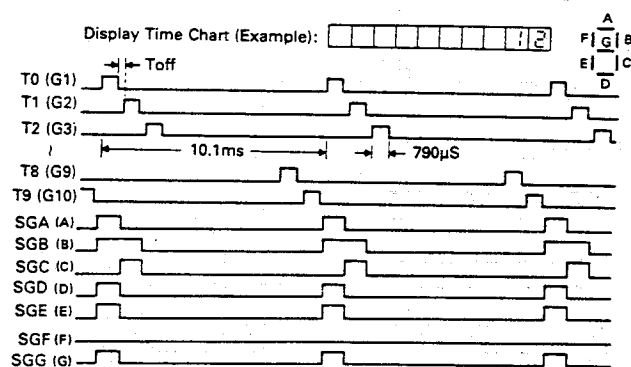


Fig. 15-22

Toff: Display blanking time (for preventing blur caused by changing digital column designation)

15-13. Printer Control

(1) Block Diagram

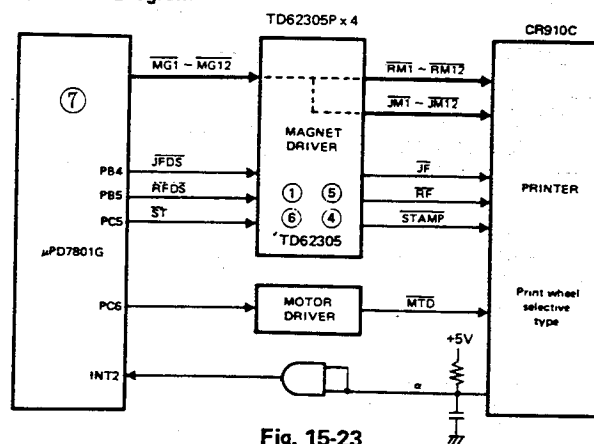


Fig. 15-23

SIGNAL NAME

RM1 ~ RM12 : Receipt magnet select signals (1st ~ 12th digit)
 JM1 ~ JM12 : Journal magnet select signals (1st ~ 12th digit)
 JFDS, JF : Journal feed magnet signal
 RFDS, RF : Receipt feed magnet signal
 ST, STAMP : Stamp magnet signal
 MTD : Motor signal
 α : Printer character (Timing) signal
 REST : Reset signal

Control of the printer is done by the μPD7801G through drivers. The controls signals for the printer CR-910C are as follows.

(2) Time chart for one-line printing

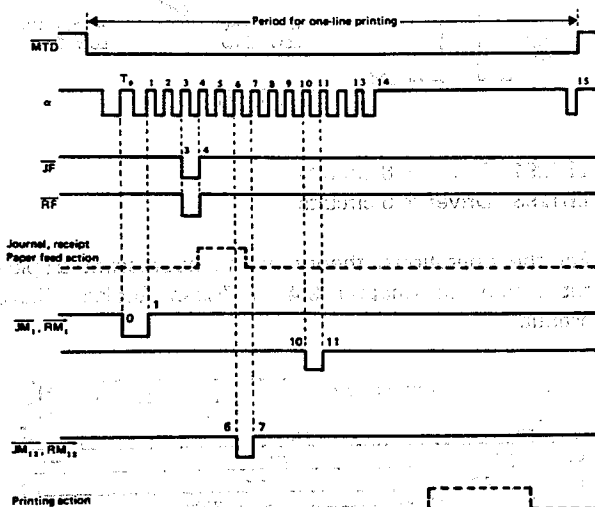


Fig. 15-24

FOR FURTHER DETAILED EXPLANATIONS OF THE PRINTER, PLEASE REFER TO THE CR-910 SERVICE MANUAL.

For the print control of the print wheel selective type printer, please refer to Chapter 9-6 of the cash Register Basic Manual.

15-14. Drawer drive

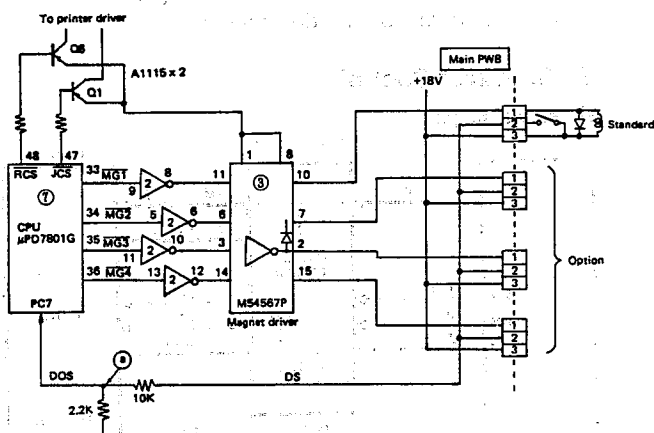


Fig. 15-25

MG1 ~ MG4 : Drawer open signals
PC7 : Drawer open/close sense (DOS)
RCS, JCS : Drawer/printer select signal

- Drawer switch is closed with drawer open.
- Drawer-1 is the main drawer.
- Drawer-2 ~ 4 are optional remote drawers — ER-34DW3/34DW5/34DW7.
- When any one of the drawer switches are closed, the voltage potential of point ③ will be +3.4V (High level).

VOLTAGE POTENTIAL OF POINT ③	DRAWER
GND (Low)	Closed
+3.4V (High)	Open

- The condition of the drawer is read by the CPU from the terminal PC7.

15-15. Buzzer drive

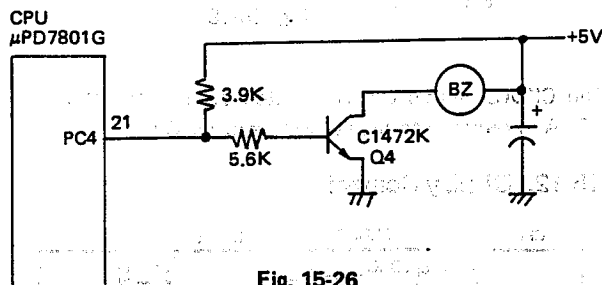


Fig. 15-26

When PC4 of the CPU pin 21 is at a high, the transistor (C1472K) is active so that the buzzer is driven.

15-16. Power supply

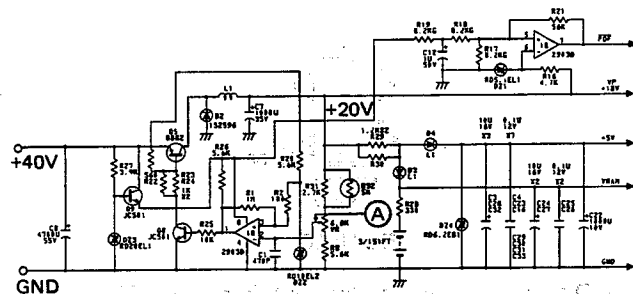
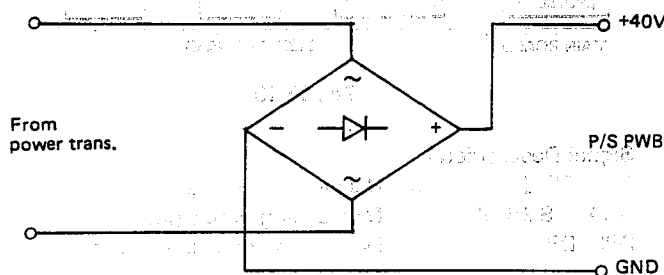


Fig. 15-28

On the power supply PWB, the rectified +40V is divided into +18V and +5V in the switching regulator located on the main PWB.

- (1) Having the positive side input (10V of the IC18 comparator as a reference voltage, the +18V output is divided by a resistor and connected to the negative side. If the voltage at point (A) is not greater than the reference voltage, the IC18 comparator output turns high which causes the Q8 and Q5 to be active. On the contrary, if it is greater than the reference voltage, the IC18 comparator output goes low which causes the transistor Q5 to be inactive. This action is repeated to create the +18V supply. For voltage adjustment at (A), refer to the adjustment procedure discussed in Section 17.
- (2) With a zener diode (RD6.2EB2), the +5V supply is derived from the +18V supply.
- (3) Display drive power (Fig. 15-29 and Fig. 15-30)
The display drive voltage is created on the display PWB using the dc-dc converter for the +18V supply.

Description of the dc-dc converter

18VDC is intermittently supplied to the primary side coil N1 by the switching action of the 2SC2334 transistor (Q5) and electromotive force is induced proportionate to the windings on the secondary coils (N2, N3, N4). The current is then rectified using diodes to produce a dc supply.

The following two elements are applied for the on/off action of the switching transistor (Q5), but majority is affected by the action in the output regulator circuit under a normal condition.

- ((1)) Self-oscillation of Q5 itself by the I_c^* current saturation characteristics.
- ((2)) Action in the output regulator circuit.

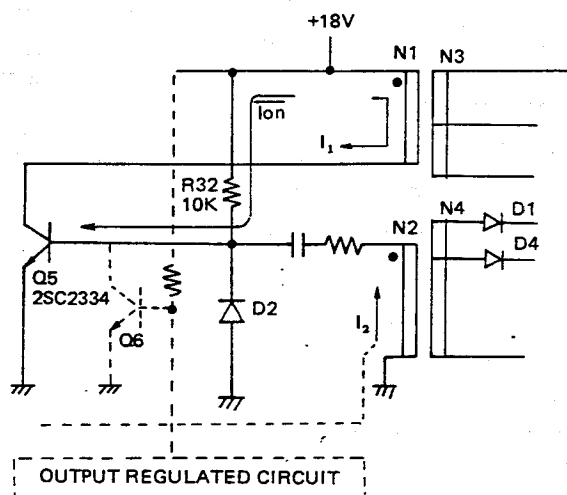


Fig. 15-29

- [1] First, not considering the action in ((2)) above, let us discuss the on/off action of Q5. That is, it is assumed that Q3 is not active.

(I) Q5 off to on

Q5 turns active with I_{on} supplied from +18V. So, magnetic flux appears in the primary windings of the converter transformer. This magnetic flux evokes counter-electromotive force in the secondary windings N2 so that the current I_2 flows through the coil. As this I_2 is increasing more than the Q5 base current, it causes the Q5 collector current I_c to increase abruptly. In this manner, Q5 promptly turns from off to on.

(II) Q5 on to off

The current I_c rapidly increased by the positive feedback action of the coil N2 immediately reaches the saturation zone. Thus, no more change takes place in the current flowing through N1 including magnetic flux change induced within the converter transformer. So there occurs in the secondary windings electromotive force opposite to before. As the electromotive force occurring in N2 is towards turning off Q5, not only Q5 immediately turns off, but the counter-electromotive force induced in N2 at the same time is consumed through the diode D2.

When the counter-electromotive force of N2 has been consumed, Q5 then turns on again by I_{on} .

With repetition of above (I) and (II), Q5 continues to perform switching action.

* I_c : Collector-to-Emitter current

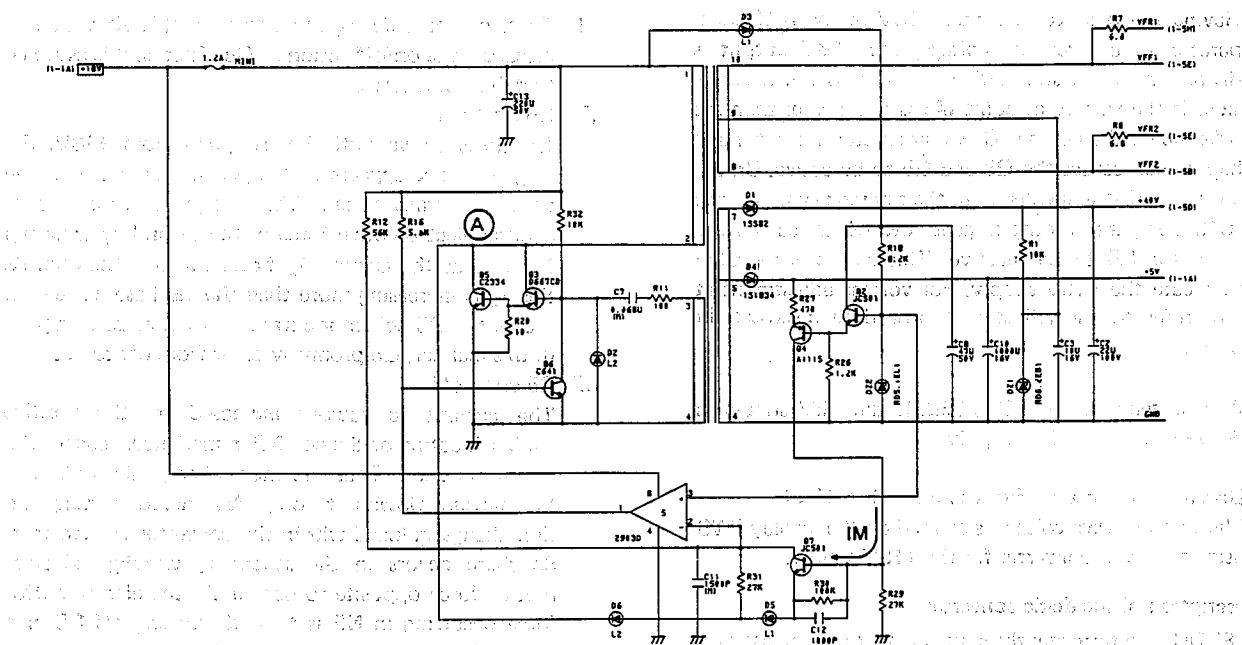


Fig. 15-30

- [2] Now, let us discuss how Q5 switching action is controlled by the output regulator circuit.

(Outline)

As the state of the secondary output +5V supply is monitored by the secondary side, Q6 is turned on and off according to a voltage variation in +5V, in order to maintain the secondary output to the given level by controlling the Q5's on and off time.

The positive side voltage of IC5 is fixed to 5.1V using DZ2.

- a) When +5V is rising

+5V starts rising when Q5 is off by the electromotive force induced on the secondary side while Q5 was on. +5V rising keeps until Q5 turns on again when the comparator negative input voltage becomes higher than the positive voltage. In this course, IM starts to rise when Q4 starts to be active at a certain period, but flows to GND through R29 (27K) as Q7 fails to be active because the potential at (A) is higher. So, +5V potential rises freely as long as Q5 is off. The Q5 continues to be off until the comparator negative input becomes higher than the positive input as C11 is charged via R12 (56K).

- b) When +5V is falling

When Q5 becomes active after the negative input voltage became higher than the positive voltage, the potential at point (A) starts dropping; and Q7 is forced active by Q4. As the charge stored in C11 begun discharging, the negative potential becomes lower than the positive potential, so that Q5 turns off. That is, the transistor Q7 accelerates discharge of C11 and the Q5-on-time is therefore controlled.

With the above action, the secondary output is maintained to the specified voltage level.

16. SERVICE PRECAUTIONS

Replacing Component Parts On The Main PWB

Since a new type of printed circuit board (CC-4) is used for the Main P.W.B. of this model, care should be taken in handling the board because it is susceptible to separation of printed wire by heat as compared with conventional types of printed boards.

- 1) Use a low power soldering iron of 20 to 40W, keep the temperature at the tip of the iron below 300°C (572°F), and do not let it touch the board for more than 3 seconds. Use of the following type soldering iron is recommended:

No.	Parts Code	Descriptions	Price Rank
1	UK5G-0115CSZZ	Soldering iron 40W 100V/120V (Including No. 2) 150°C ~ 350°C (adjustable)	BY
2	UK5G-0116CSZZ	Iron chip (spare)	AX
3	UK5G-0117CSZZ	Transformer with iron holder 220/240V → 100V	BX
4	UK5G-0118CSZZ	Solder puller (3-step changeover type)*	BK
5	UK5G-0006CSZZ	Spare Tip for solder puller	AW
6	UK5GE0024CSZZ	Thermometer for soldering iron	**

* 3-step changeover type: Strong — Middle — Weak

Use the solder puller at "weak" position for CC-4 board.

- 2) Do not push the printed wire with the tip of the soldering iron and the top of the solder puller.

3) Parts replacement procedure

- ① Remove solder on all of leads (pins) in the shortest possible time using the soldering iron and solder puller.
- ② Replace and solder the new parts on the board.

17. ADJUSTMENTS

17-1. Printer speed adjustment

This adjustment requires an oscilloscope.

- (1) Place probe on test terminal A.
- (2) Hold journal feed key down to activate the printer.
- (3) Observe the signal JC and if the waveform is out of specification shown below, adjust the trimmer located on the side of IC No. 18.

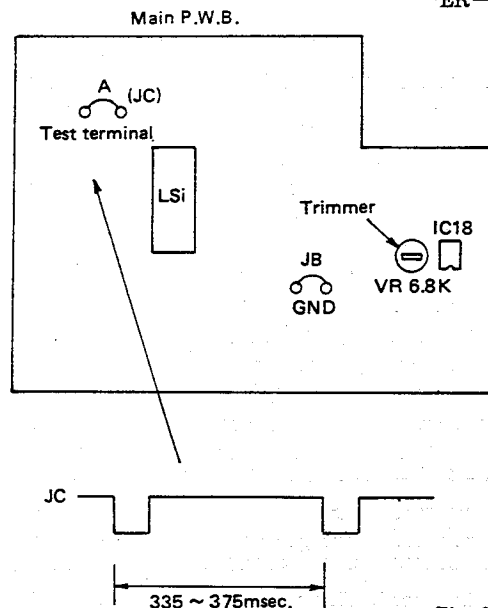


Fig. 17-1

(NOTE)

Please note that the voltage V_p is within the following range during this adjustment;

$V_p = +17.4V \sim 20.0V$ (Typically $+18.0V$)

18. INSTALLATION OF SERVICE OPTIONS

18-1. Validation paper/Journal paper near end sensor kit [DKIT-8187RCZZ]

(1) Parts List

1 Sensor P.W.B.*1 & Electrical Parts

NO.	PART CODE	PRICE RANK	NEW MARK	PART RANK	Q'TY	DESCRIPTION	KIT	VAL/NE	VAL	NE
1	QCNCM6731RC1B	AD		C	1	Connector (Male) 12-pin				
2	VCEAAU1CW106Q	AB		C	1	Capacitor (16WV 10 μ F)				
3	VCTYPU1NX104M	AB		C	2	Capacitor (12WV 0.10 μ F)				
4	VHIT74LS125-C	AF		B	1	iC				
5	VHITC40H002P1	AF		B	1	iC				
6	VHITC40H032-1	AF		B	1	iC				
7	VRD-ST2EY153J	AA		C	6	Resistor (1/4W 15k Ω)				
8	QCNCW6861RC03	AL	N	C	1	Connector (Female) 12-pin w/wire	O	O		
9	XUPSD30P08000	AA		C	2	Sensor P.W.B. fixing screw (3 x 8)	O	O		
	(unit) CPWBF6926RC05	BL		B	1	Sensor P.W.B. unit (Includes No. 1 thru 7)	O	O		

2 Electrical Parts of Printer P.W.B. for Validation Sensor

NO.	PART CODE	PRICE RANK	NEW MARK	PART RANK	Q'TY	DESCRIPTION	KIT	VAL/NE	VAL	NE
1	VHIM51204L/-1	AA		B	1	iC	O		O	
2	VRD-ST2EY163J	AA		C	1	Resistor (1/4W 16k Ω)	O		O	
3	VRD-ST2EY472J	AA		C	1	Resistor (1/4W 4.7k Ω)	O		O	
4	VRD-ST2EY561J	AA		C	1	Resistor (1/4W 560 Ω)	O		O	
5	VRD-ST2EY682J	AA		C	1	Resistor (1/4W 6.8k Ω)	O		O	

3 Mechanical Parts for Validation Sensor and Near End Sensor

NO.	PART CODE	PRICE CODE	NEW MARK	PART RANK	Q'TY	DESCRIPTION	KIT	VAL/NE	VAL	NE
3-3	00BF701152040	AP		C	1	Near end sensor detection frame				O
3-4	LX-BZ6703RCZZ	AF		C	1	Adjustment screw	O			O
3-5	00BC109302070	AC		C	1	Detection lever spring				O
3-6	00BC901308000	AG		C	1	Detection lever assy				O
3-7	00BC106302080	AE		C	1	Paper rolling shaft holder				O
3-8	00BA156010201	AR		B	1	Micro switch				O
3-9	00BF701153010	AF		C	1	Validation sensor holder			O	
3-10	00BA111200534	AZ		B	1	Validation sensor			O	
CPS	00BB030103711	AC		C	2	C.P.S. screw (3 x 14)				O
CS	00BB040300311	AA		C	1	Cup screw (2 x 5)			O	
CS	LX-BZ6716RCZZ	AA		C	1	Cup screw (3 x 5)	O		O	
3-A	DUNTK8188RCZZ	AZ	N	B	1	Validation sensor unit *3	O		O	
3-B	DUNTK8052RCZZ	AX		B	1	Near end sensor unit *4	O			O

*1: The sensor P.W.B. has both functions for sensing Validation and Near End.

*2: The circle (O) indicates the parts included or used for the "Kit", "VAL/NE (Validation and/or Near End)", "VAL" or "NE".

*3: Includes No. 3-9, 3-10 and CS (2 x 5)

*4: Includes No. 3-3, 3-5 thru 3-8 and CPS.

(2) Parts Guide & Mounting Chart

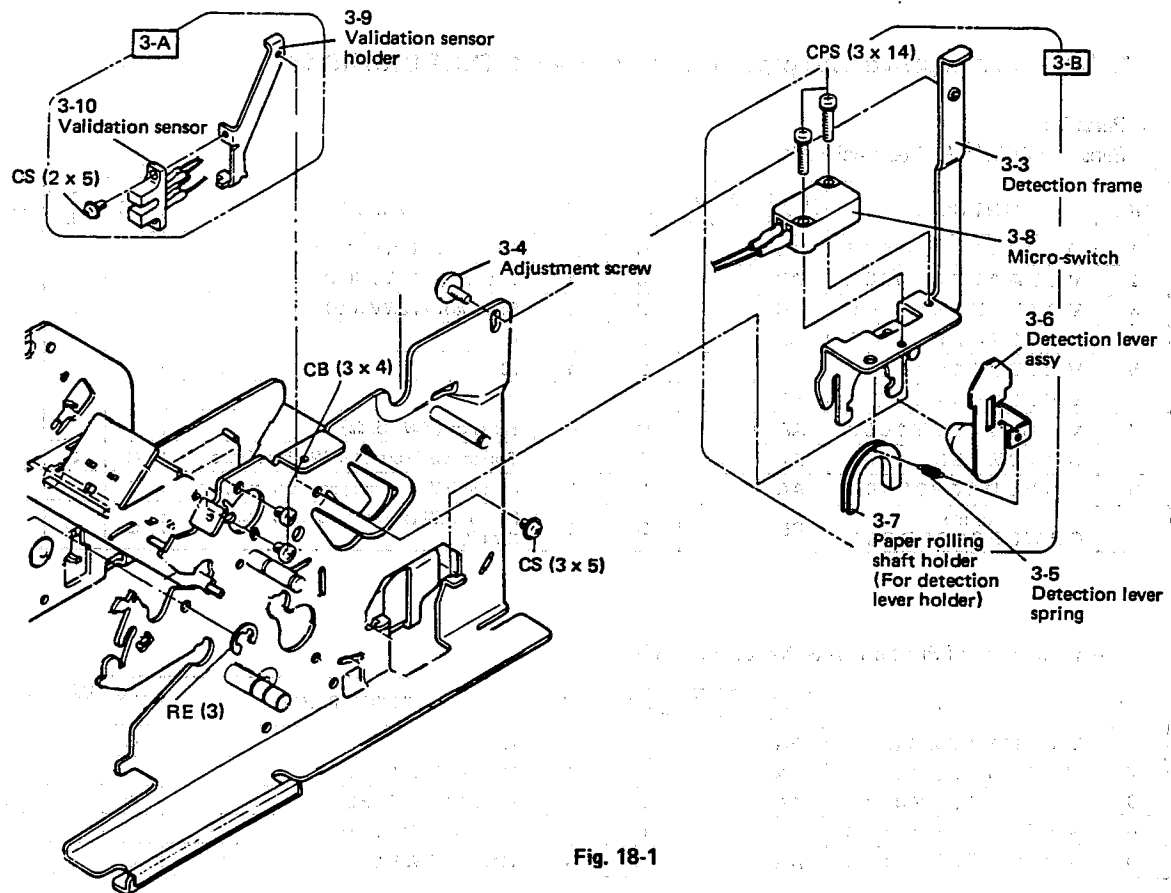
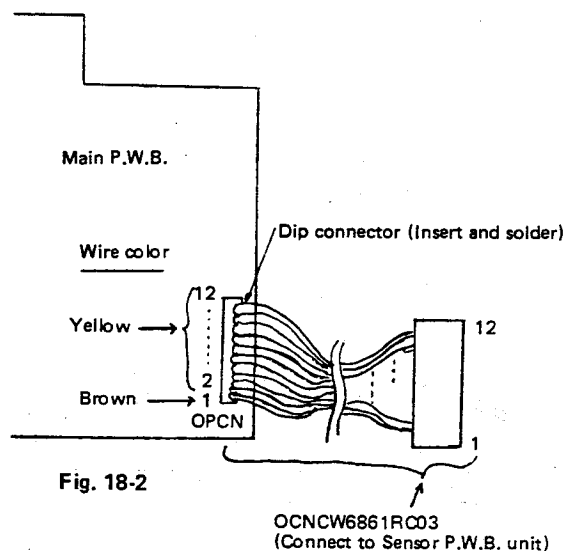


Fig. 18-1

(3) Installation**3-1) Sensor P.W.B unit**

- ① Insert and solder DIP connector (QCNCW6861RC03) at the place shown "OPCN" on the main P.W.B. (See Fig. 18-2.)

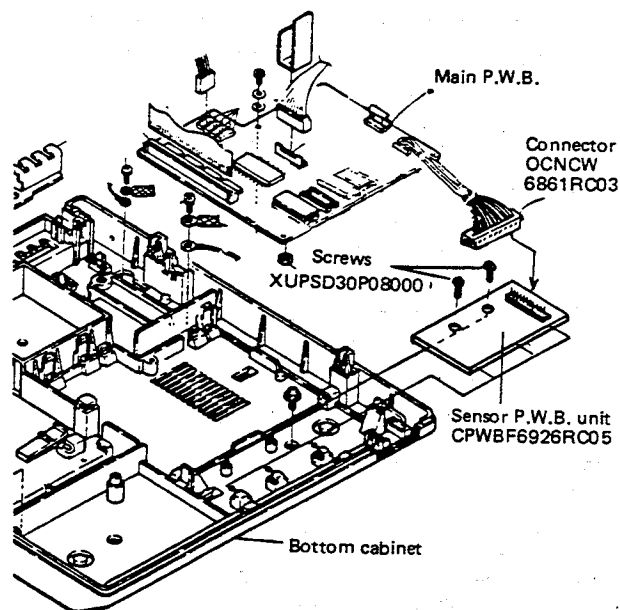
Note: Be sure that the brown lead wire goes to Pin No.1 of OPCN.



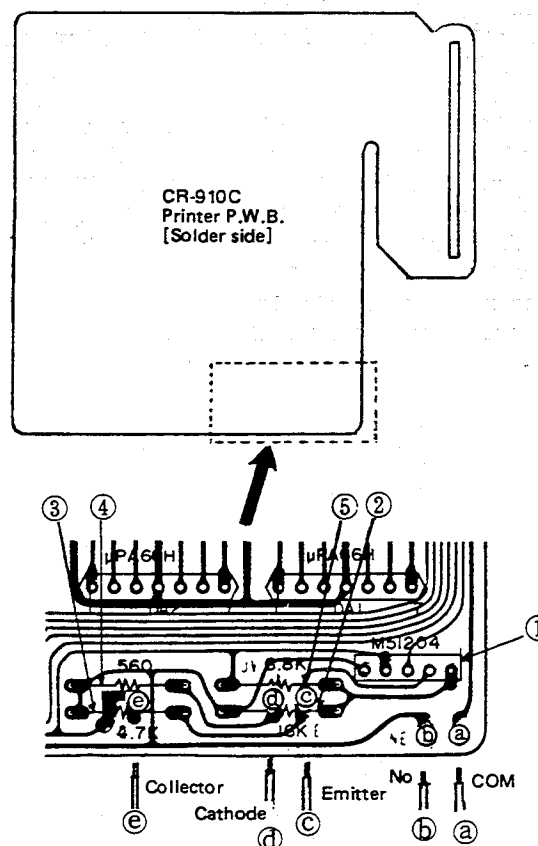
Connector Shape	Pin No.	Signal	Wire color	Note
□ 1	1	WR	Brown	
□	2	A2	Yellow	
□	3	OPiO		
□	4	A4		
□	5	RES1		
□	6	VRS		
□	7	D1		
□	8	NES		
□	9	D0		
□	10	CUTS		Not USED
□	11	+5V		
□ 12	12	GND		

Fig. 18-3

- ② Mount the sensor P.W.B. into the bottom cabinet by using two screws as shown in Fig. 18-4.
- ③ Connect the female side connector to sensor P.W.B.

**3-2) Printer CR-910C P.W.B. and wiring.**

- ① Remove printer P.W.B. unit. (Refer to CR-910 printer service manual page. 3-7 ~ 3-11)
- ② When the validation sensor is installed, mount the parts listed in block 2 of the parts list into the printer P.W.B. as shown in Fig. 18-5. (① ~ ⑤)



- ③ Solder the lead wires from the validation and near end sensors to the points (a) thru (e) shown in Fig. 18-5 and as follow;

COM	②	Grey/Black	From Near end sensor
No	①	Yellow/Black	
Emitter	③	Pink	From Validation sensor
Cathode	④	Orange	
Collector	⑤	Blue	

3-3) Validation sensor unit

- ① The validation sensor unit is to be mounted at the inner most part (Frame J side) of the printer frame as shown in Fig. 18-1 and Fig. 18-6.

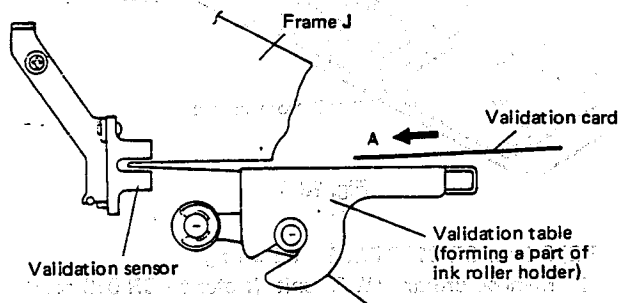


Fig. 18-6 Validation sensor

3-4) Journal paper near end sensor unit

- ① Mount the unit on the Frame J side by the adjustment screw (3-4).
- ② Adjustment:
- The detecting position can be adjusted in five steps. This is performed by moving the position of the detection frame as indicated by arrows A and B in Fig. 18-7.
 - When using a standard roll paper shown in Fig. 18-8, set the detection frame so that the scale three (---) comes to the top of frame J.
 - When using other kind of roll paper, adjust the detection frame according to the size of the paper.

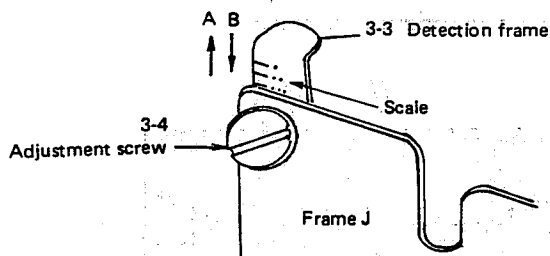


Fig. 18-7

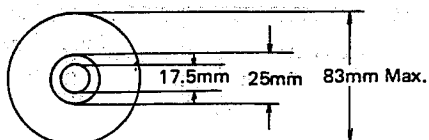


Fig. 18-8 Standard roll paper

(4) Service mode programming [SRV1 mode]

4-1) Near end sensor

Selection of **[CL]** key enable/inhibition when sensing paper near end.

- ① Check the service mode preset value (Job code #902-c) before programming.

900 → **[#/SBTL]** → **[CA/AT]**

	A	B	C	D
#0900				
901	00	20		
902	14	02		
903	50	00		

- ② Change the preset value "C" as required. (Programming procedure)

902 → **[.]** → **[#/SBTL]** → A B **[C]** D → **[CA/AT]**

[CL] key selection when sensed paper near end	Key entry "C"
enable*1	0
inhibit*2	4

*1: Even after sensed paper near end, the transaction can be continued by pressing **[CL]** key.

*2: Once a paper near end is detected, unless a new roller paper is set, All the key including **[CL]** key is locked.

4-2) Validation sensor

There is no service programming preset relating to validation sensor.

(5) Programming mode (PGM1, PGM2)

There is no programming presets relating to near end/validation sensors.

(6) Electrical description

6-1) Journal paper near end/validation sensor circuit

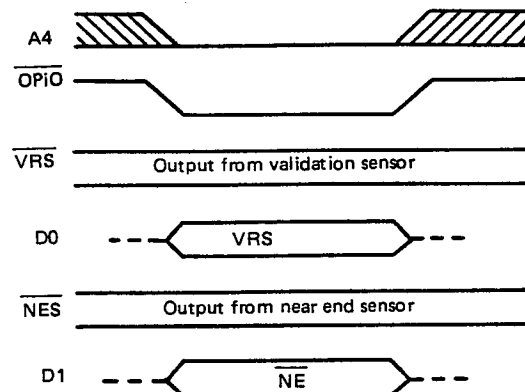


Fig. 18-9

5. 23

sensors →

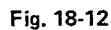


To Printer Connector

To Printer Connector



Fig. 18-11



6-5) Arrangement of Lead Wires

(1) Routing

*1: Validation sensor

*2: Near end sensor

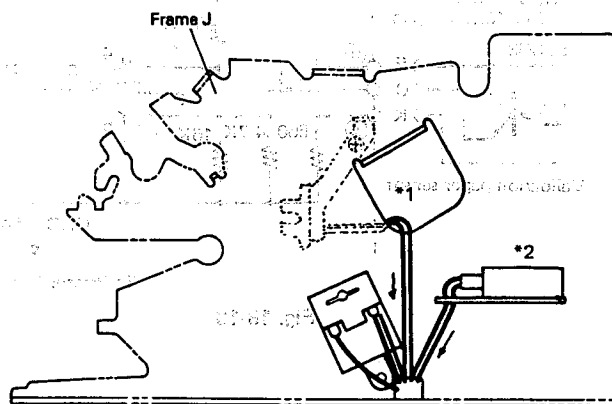


Fig. 18-13

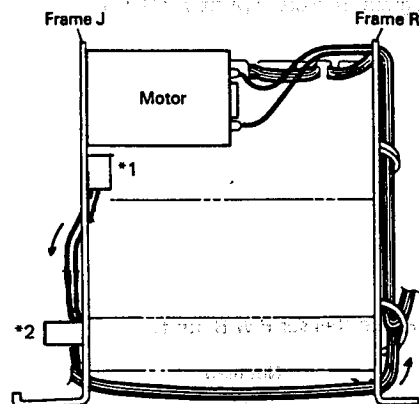


Fig. 18-14 Back view

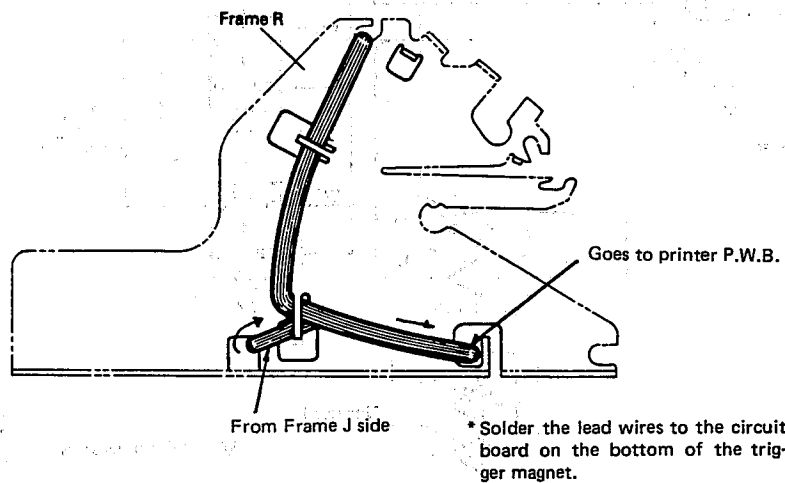


Fig. 18-15

18-2. Pedestal type Customer Display

The display works as a complete replacement for the standard rear display.

(1) Parts List

NO.	PART CODE	PRICE RANK	NEW MARK	PART RANK	Q'TY	DESCRIPTION
1	CCABB6912RCZZ	AR	N	D	1	Front cab unit
2	VVDH09LT-03Z1	AZ		B	1	Display tube (H09LT-03Z1)
3	QPWBF6934RCZZ	AH		C	1	Customer display P.W.B. (Without parts)
4	GCABA6805RCZZ	AH		D	1	Rear cab
5	QCNCW6845RC01	AL		C	1	Connector 12-pin (Female with wires)
6	QCNCW6845RC05	AH		C	1	Connector 8-pin (Female with wires)
7	PRNGP6627RCZZ	AE		D	1	Fixing ring
8	GFTAB6683RCZZ	AG		D	1	Fixing cover
9	QCNCM6846RC0H	AC		C	1	Connector 8-pin (Male)
10	QCNCM6846RC1B	AL		C	1	Connector 12-pin (Male)
11	GCOVA6809RCZZ	AU		D	1	Rear cover
12	HBDGD6664RCZZ	AG		D	1	Badge
13	GCOVD6703RCZZ	AH		D	1	Dust cover
	DKIT-8213RCZZ	**	N	-	-	Pedestal display kit

(2) Parts Guide

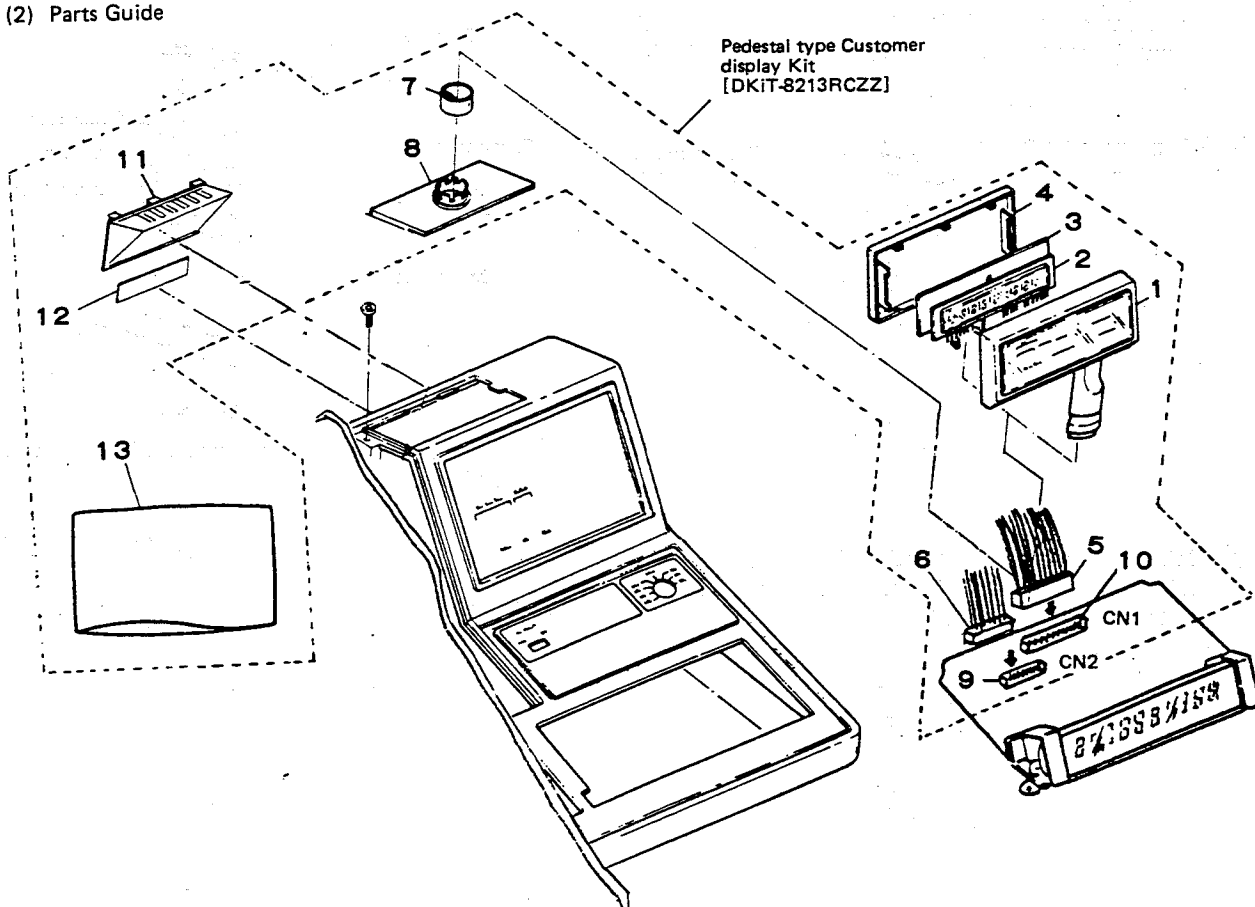


Fig. 18-16

(3) Installation

3-1) Assembly of the pedestal display

Assemble P.W.B. unit into the front cabinet unit with the rear of the pedestal unit facing front.

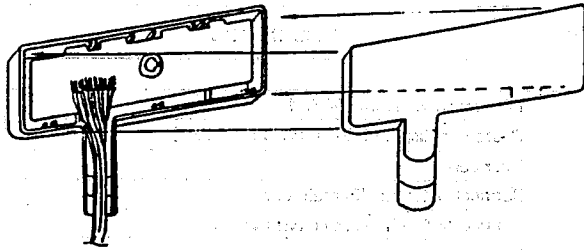


Fig. 18-17

3-2) Display R.W.B. unit

① Remove the top cabinet and then remove the display P.W.B. unit.

② Remove the two holders fixing the rear display tube, remove the rear display tube from the P.W.B. unit by cutting its legs.

(Since the power supply unit is not able to drive the rear and customer displays together, the rear display must be removed when using the pedestal display.)

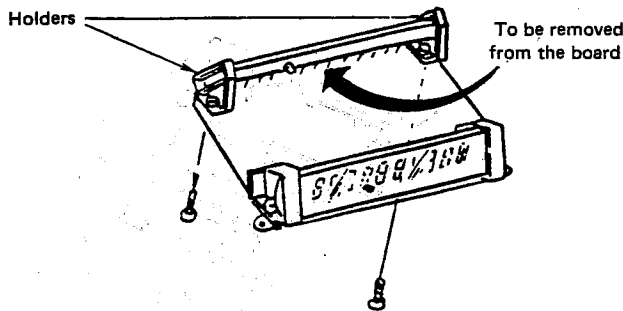


Fig. 18-18

③ Solder the connector QCNCM6846RC0H (8-pin) and QCNCM6846RC1B (12-pin) onto the display P.W.B. unit as shown in Fig. 18-19.

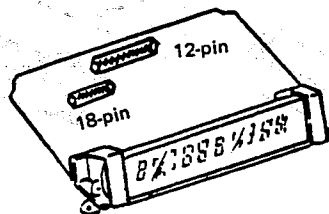


Fig. 18-19

④ Mount the display P.W.B. unit into the top cabinet and put it into the machine.

3-4) Removing top cover

- ① Loosen the screw fixing the top cover.
- ② Then slide the top cover to the direction of the arrow and lift and remove.
(The top cover is no longer used.)

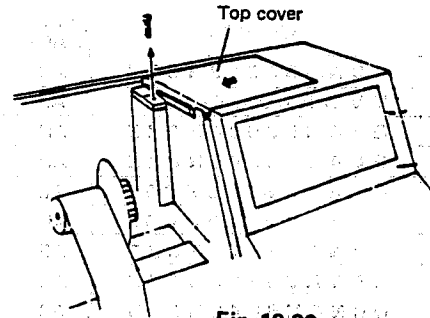


Fig. 18-20

3-5) Mounting the revolving display

- ① Set up the units (revolving display, fixing ring and fixing cover) as shown in Fig. 18-21 and temporarily secure the sets by rotating the fixing ring clockwise.

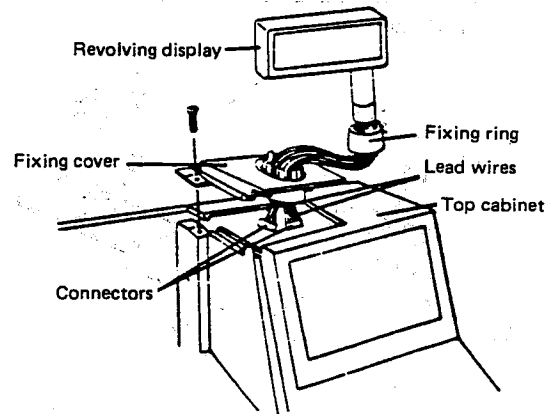


Fig. 18-21

- ② Insert the connectors as shown in Fig. 18-22 through the hole on the top cabinet.

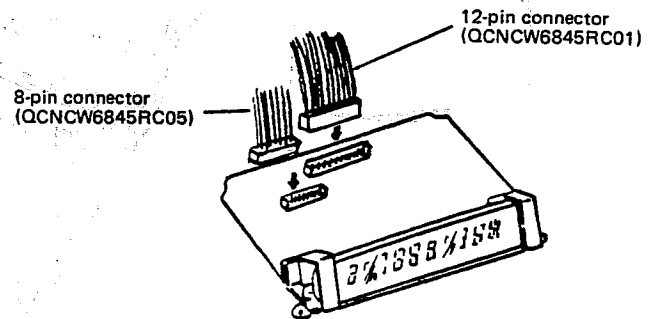


Fig. 18-22

- ③ Mount the fixing cover on the top cabinet, repeat the procedure of par. 3-1 ~ 3-2 reversely.
- ④ Secure the fixing cover by using the screw which was used for securing the top cover.
- ⑤ Mount the rear cover and SHARP badge as shown in Fig. 18-16.

3-6) Adjustment of the position

- ① Loosen the fixing ring about a half turn. (Counter-clockwise)
- ② Rotate the revolving display to the position required.
- ③ Rotate the fixing ring clockwise to secure the revolving display unit.

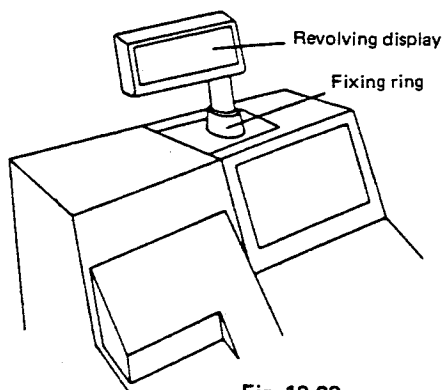


Fig. 18-23

3-7) Working test

After all the installation has completed, check the customer display to see if it works properly.

When checking the display, use test function "2" → **CA/AT** in SRV1 mode.

19. CIRCUIT DIAGRAM AND P.W.B. LAYOUT PARTS GUIDE

19-1. Key Board Circuit Diagram

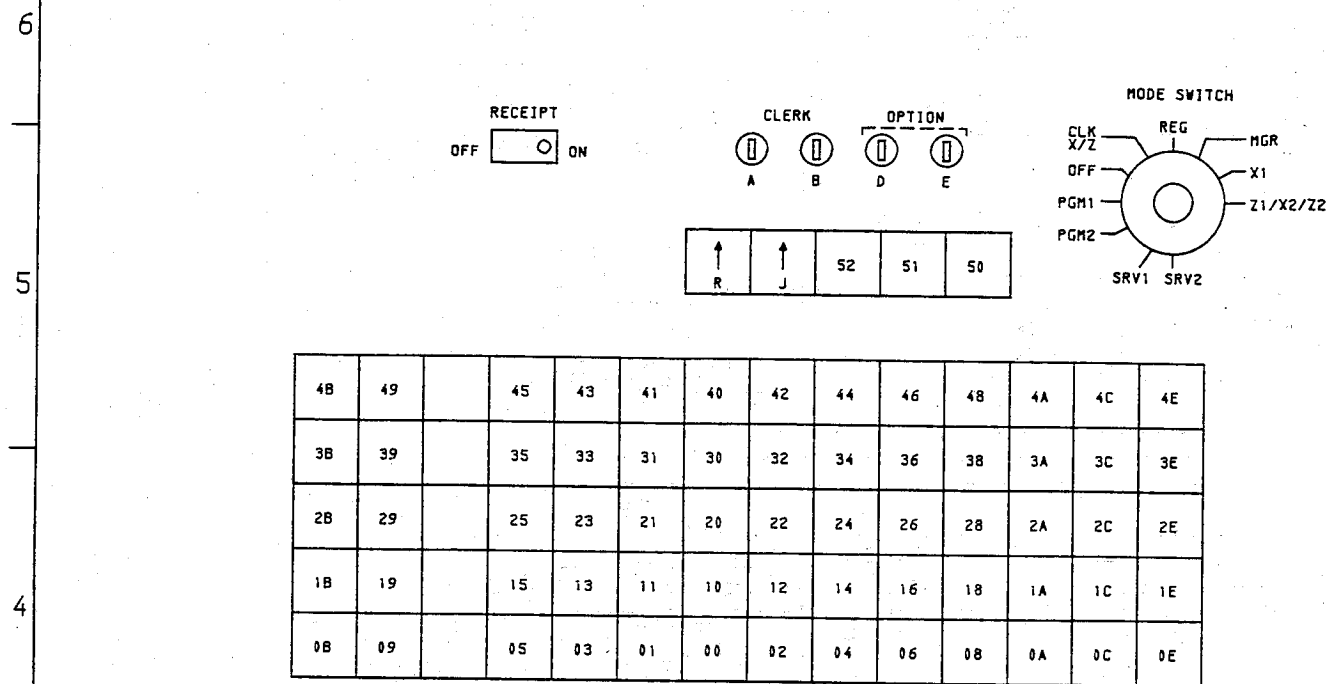
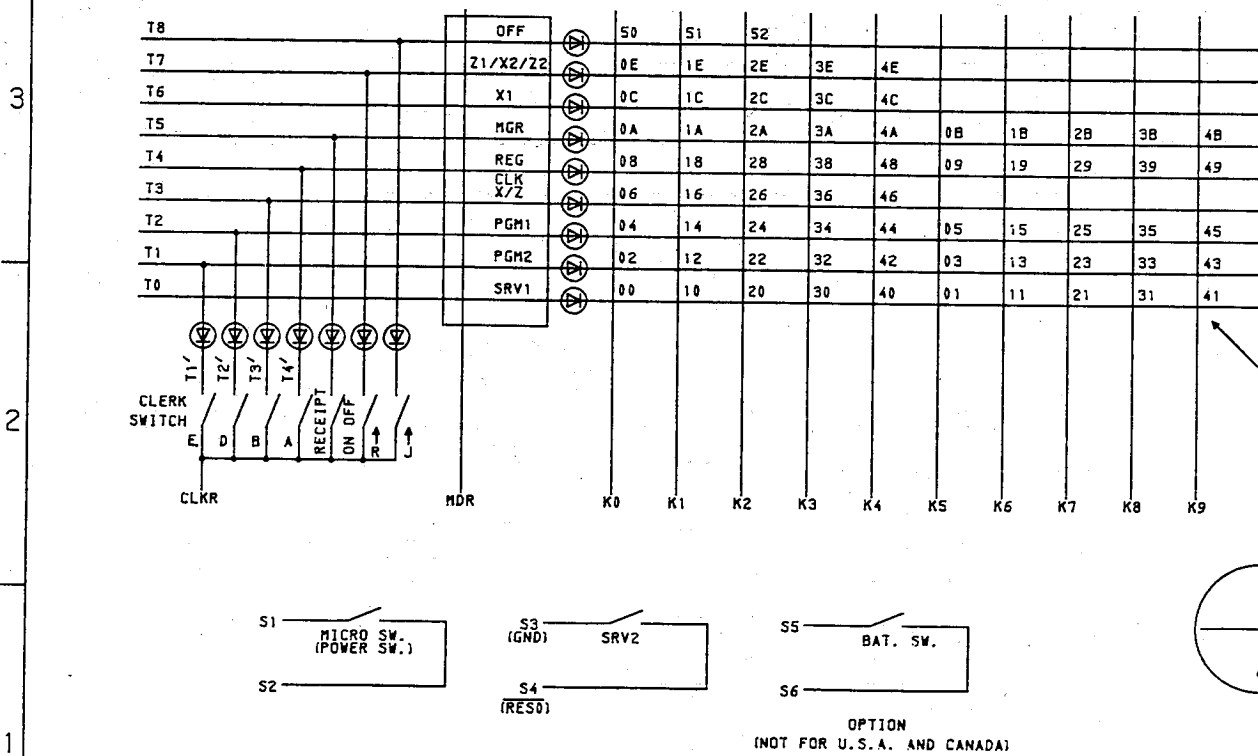


FIG. 1



ER2590 : DUNTK8126RCZZ U.S.A. , CANADA
 DUNTK8175RCZZ OTHER COUNTRIES (RB2.RB8.SH.SG.SJ.SM) (220V)
 DUNTK8177RCZZ OTHER COUNTRIES (RA7.RB6.RB7.SD) (120V)

PIN NO	SIGNAL
A1	GND
A2	NU
A3	RES0
A4	T8
A5	T7
A6	T6
A7	T5
A8	T4
A9	T3
A10	T2
A11	T1
A12	T0
B1	K4
B2	K3
B3	K2
B4	K1
B5	K0
B6	MDR
B7	CLKR
B8	K5
B9	K6
B10	K7
B11	K8
B12	K9

PIN NO	SIGNAL
1	MDR
2	GND (S3)
3	RES0 (S4)
4	NU (T8)
5	T7
6	T6
7	T5
8	T4
9	T3
10	T2
11	T1
12	T0

PIN NO	SIGNAL
1	S1
2	S2

PIN NO	SIGNAL
1	T4'
2	T3'
3	CLKR

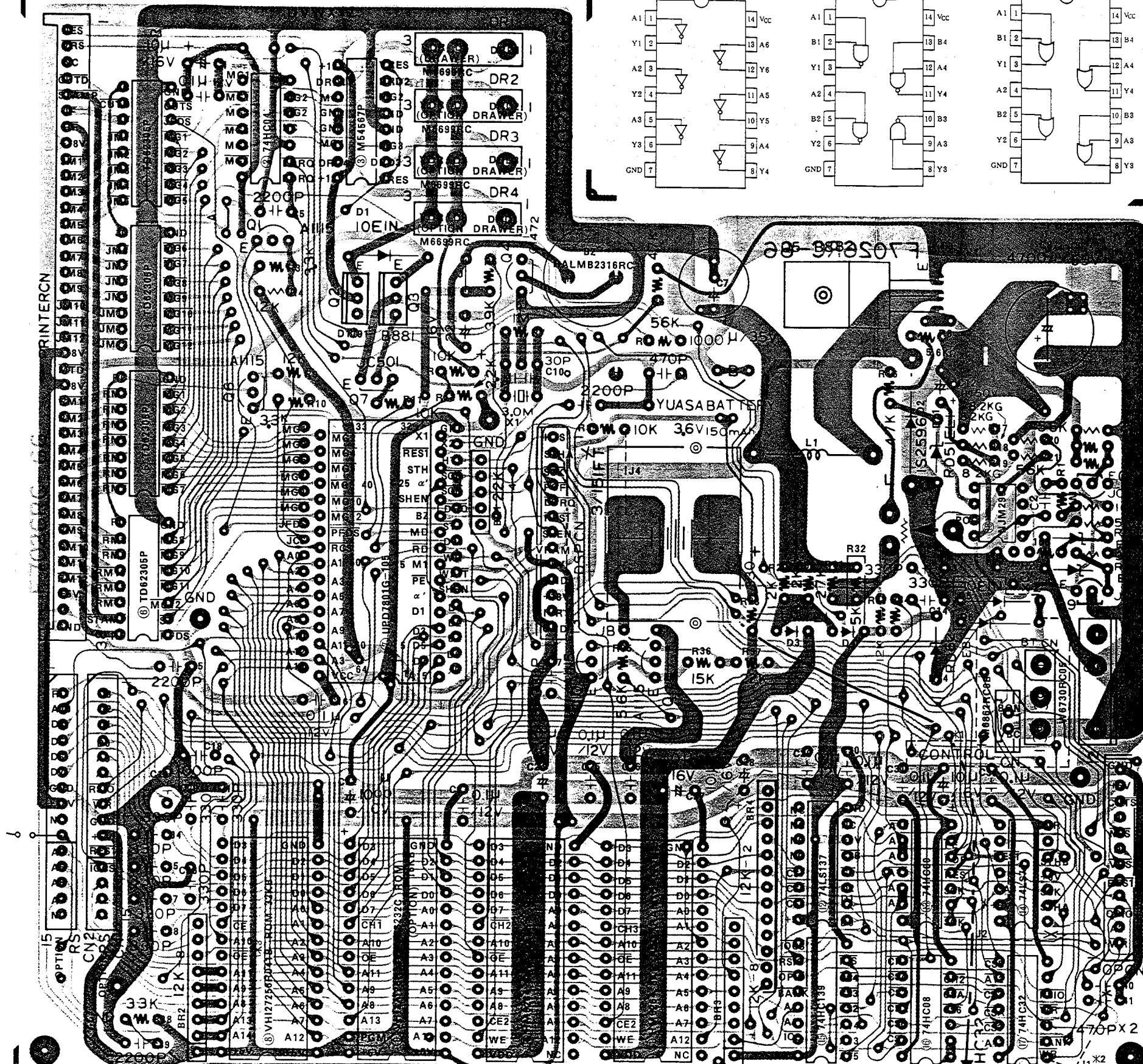
PIN NO	SIGNAL
1	T2'
2	T1'
3	CLKR

OPTION

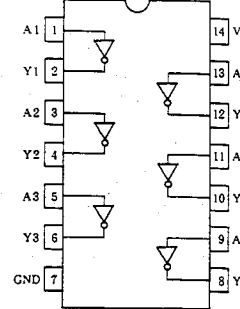
PIN NO	SIGNAL
1	S5
2	S6

OPTION (NOT FOR U.S.A. AND CANADA)

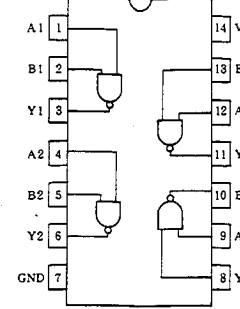
19-3. Main P.W.B. Layout (P.W.B. code : F7026RC)



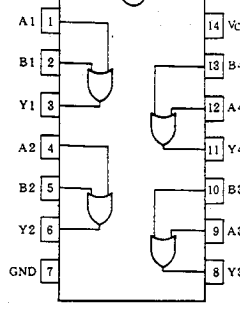
MC74HC04
(Hex inverter)



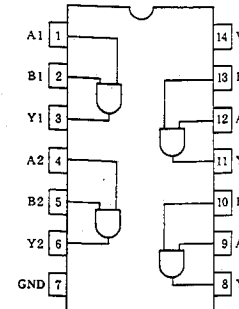
MC74HC00
(Quad 2-input NAND gate)



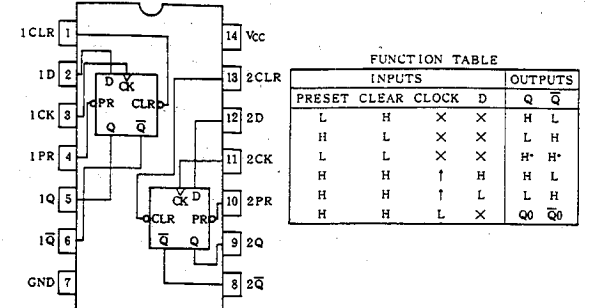
MC74HC32
(Quad 2-input OR gate)



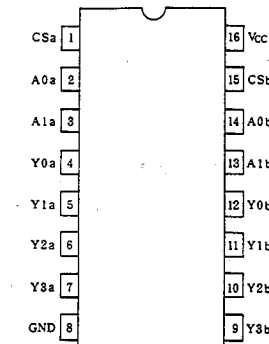
MC74HC08
(Quad 2-input AND gate)



T74LS74
(Dual D-type positive edge-trigger flip-flop)



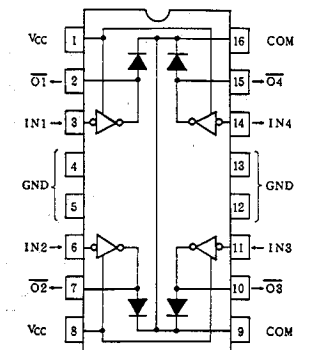
MC74HC139N
(Dual 1-of-4 Decoder/Demultiplexer)



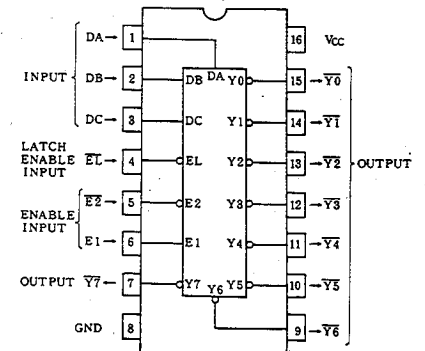
Inputs		Outputs			
CS	A1 A0	Y0	Y1	Y2	Y3
H	X X	H	H	H	H
L	L L	L	H	H	H
L	L H	H	L	H	H
L	H H	H	H	L	H

X = Don't Care

MC54567P
(4-unit Darlington transistor array)



M74LS137P
(3-to-8 Decoder/Demultiplexer with address latch)



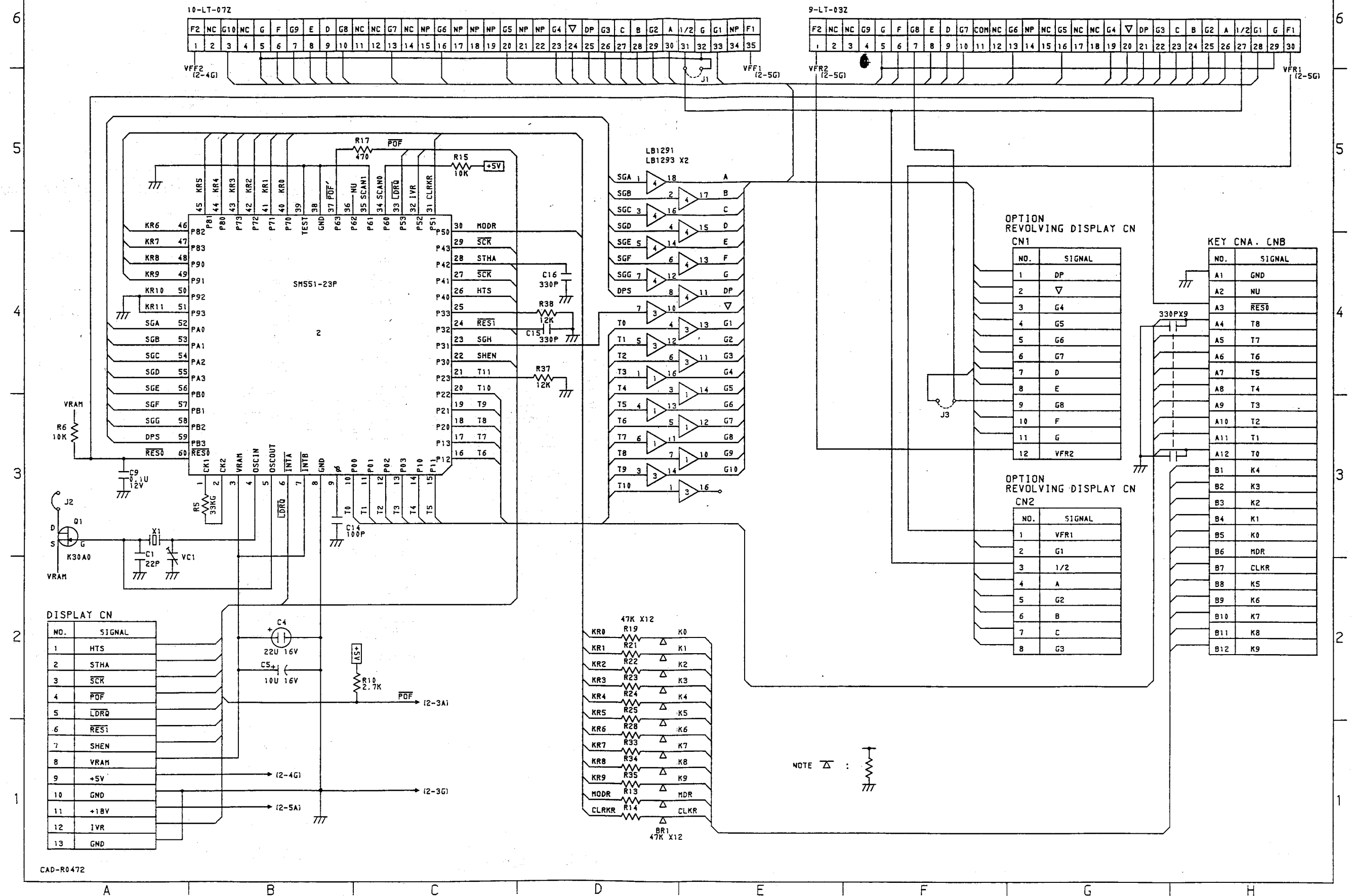
EL	E1	E2	DC	DB	DA	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	X	X	X	X	X	H	H	H	H	H	H	H	H
X	L	X	X	X	X	H	H	H	H	H	H	H	H
X	L	L	X	X	X	H	H	H	H	H	H	H	H
X	L	L	L	X	X	H	H	H	H	H	H	H	H
X	L	L	L	L	X	H	H	H	H	H	H	H	H
X	L	L	L	L	L	H	H	H	H	H	H	H	H
L	H	X	X	X	X	L	H	H	H	H	H	H	H
L	H	X	X	X	L	H	L	H	H	H	H	H	H
L	H	X	X	L	X	H	H	L	H	H	H	H	H
L	H	X	X	L	L	H	H	H	L	H	H	H	H
L	H	L	X	X	X	H	H	H	H	L	H	H	H
L	H	L	X	X	L	H	H	H	H	H	L	H	H
L	H	L	L	X	X	H	H	H	H	H	H	L	H
L	H	L	L	L	X	H	H	H	H	H	H	H	L
L	H	L	L	L	L	H	H	H	H	H	H	H	H
L	H	L	L	L	L	L	H	H	H	H	H	H	H
L	H	L	L	L	L	L	L	H	H	H	H	H	H
L	H	L	L	L	L	L	L	L	H	H	H	H	H
L	H	L	L	L	L	L	L	L	L	H	H	H	H
L	H	L	L	L	L	L	L	L	L	L	H	H	H
L	H	L	L	L	L	L	L	L	L	L	L	H	H
L	H	L	L	L	L	L	L	L	L	L	L	L	H
L	H	L	L	L	L	L	L	L	L	L	L	L	L

ラッチされたアドレスに対応した出力のみ "L", 他出力は全て "H"
(Only the output with address latched goes "L", others are all "H")

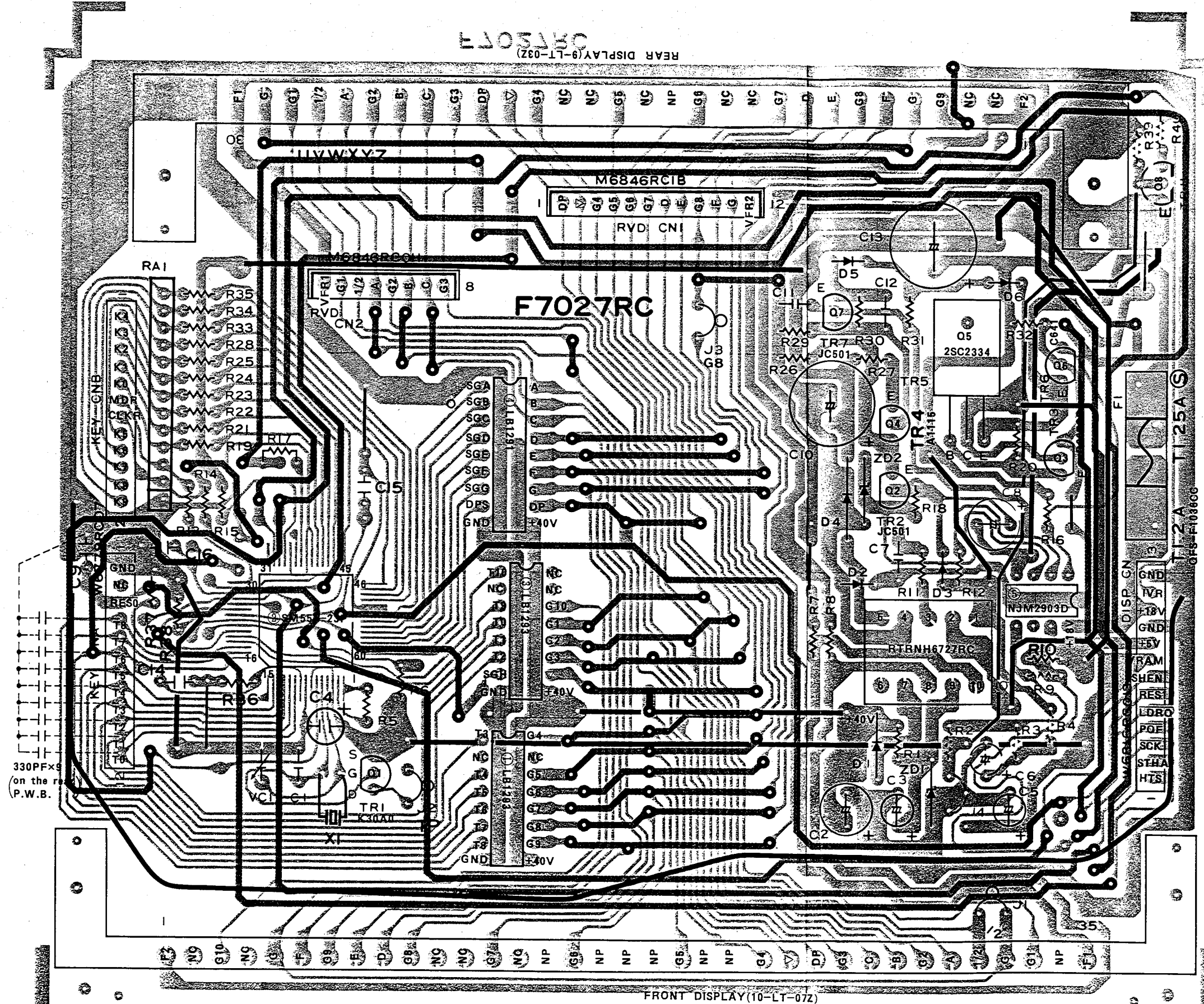
NOTE: 1. C10, C41 are not installed.
2. NC = Non-connection.
3. J1 (C10) is not for USA, CANADA.
J2 J1 to J4 are jumper wires.
J3 The PROM VHI27256R041A is used for June prod., 1986 though, it has been changed from 041A to 041B from July, 1986 prod.

19-4. Display Circuit Diagram

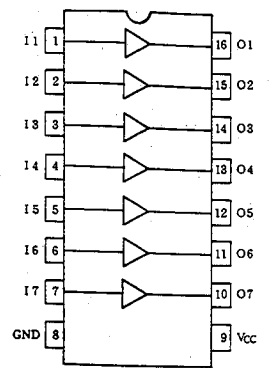
BOARD CODE : F7027RCZZ



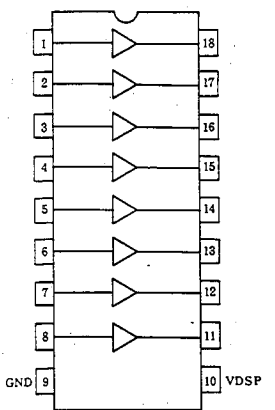
19-5. Display/Power Supply P.W.B. Layout (P.W.B. code : F7027RC)



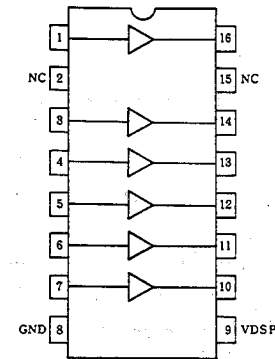
TD62305P
(Low input active driver)



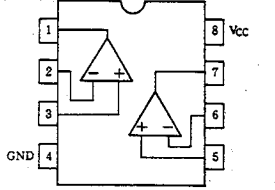
I.C
LB1291



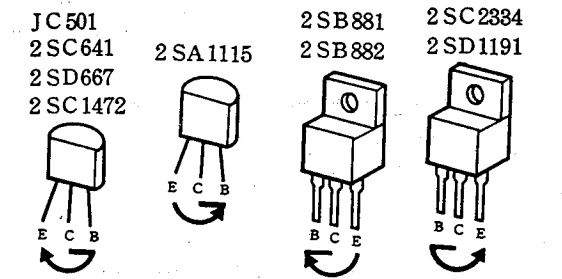
LB1293



NJM2903D

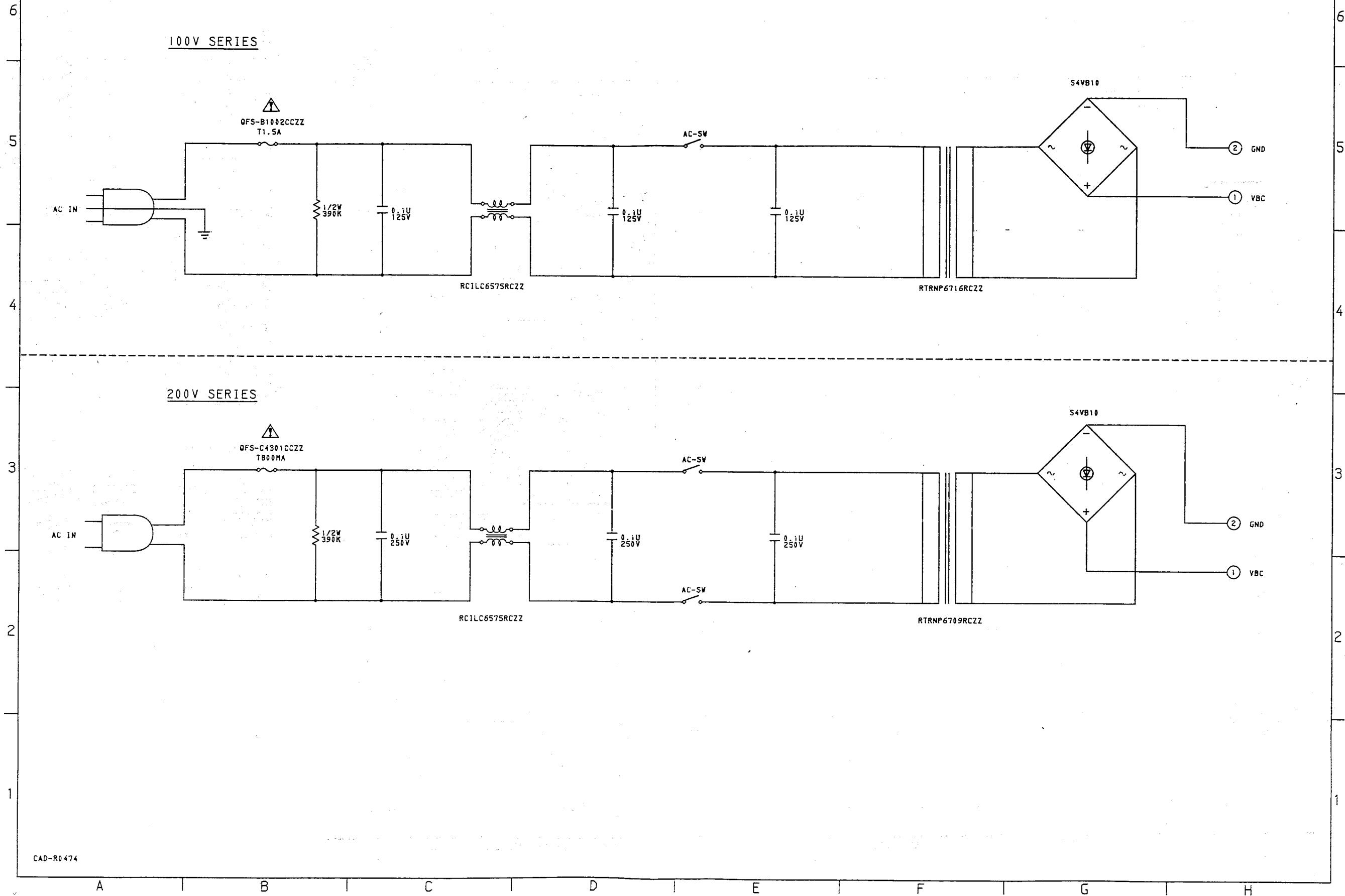


TRANSISTOR



19-6. Noise Filter and Power Trans Circuit Diagram

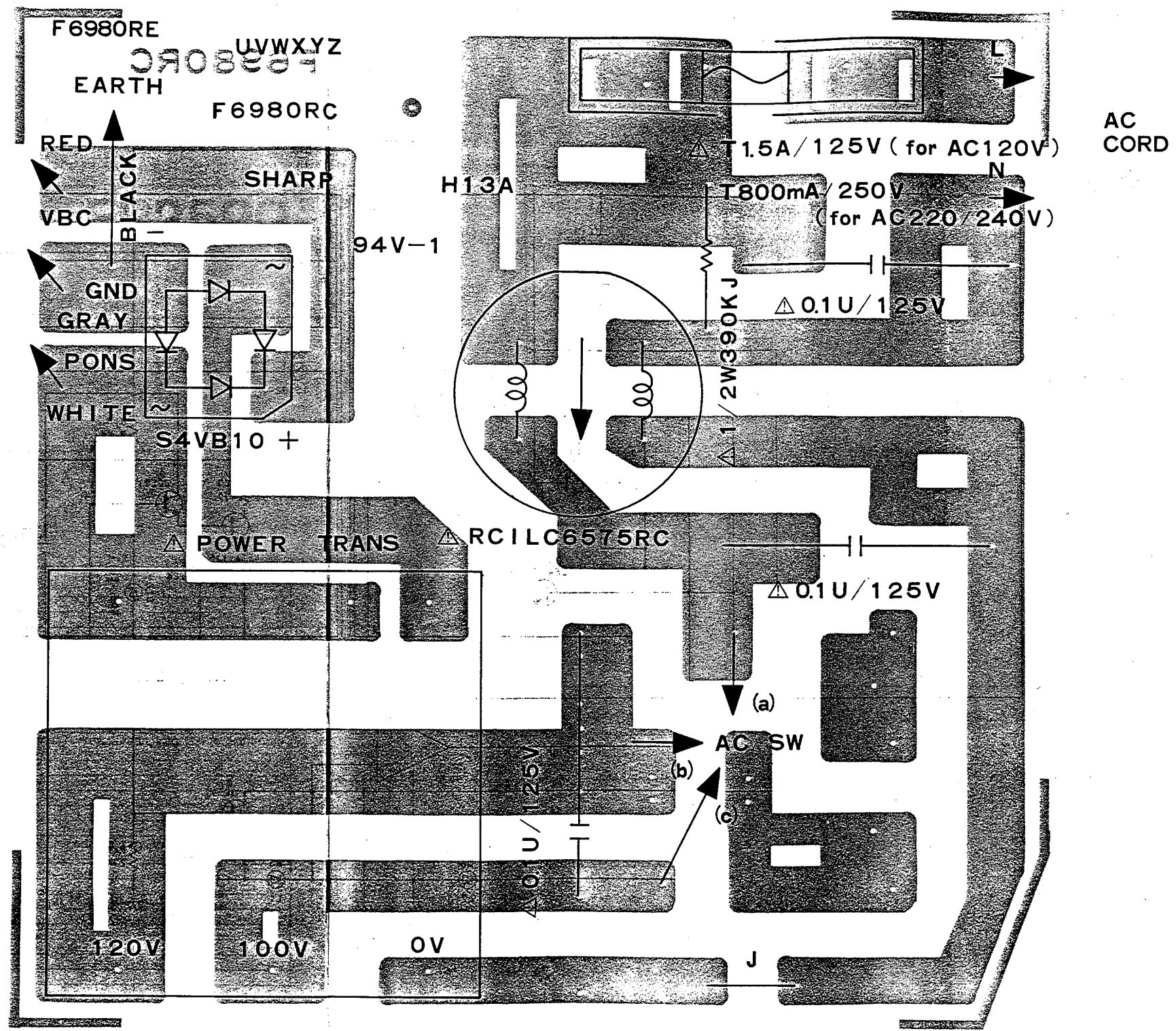
BOARD CODE : F6980RCZZ



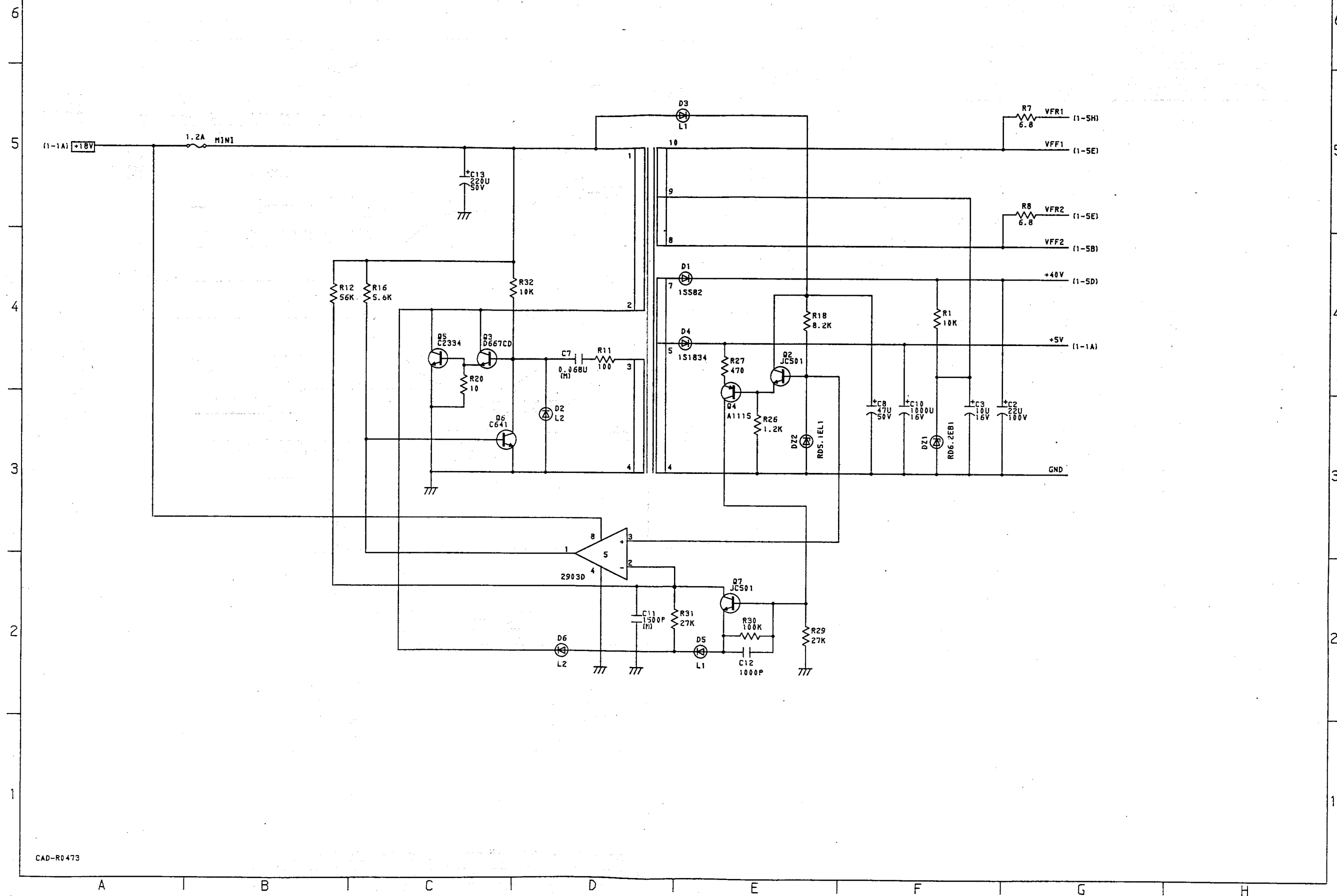
19-7. Noise Filter and Power Trans Board Layout

[The board layout is for the models bound for the countries using AC 120V. The difference is shown in the table below.]

Part Name	AC 120V area	AC 220V or 240V area
Fuse	QFS-B1002CCZZ (1.5A/125V)	QFS-C4301CCZZ (800mA/250V)
PWB	QPWBF6980RCZZ	QPWBF6964RCZZ
Power Trans	RTRNP6716RCZZ	RTRNP6709RCZZ
Capacitor	RC-FZ6030RCZZ (0.1μ/125V)	VCE9HE2EP104K (0.1μ/250V)



Parts marked with “⚠” are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.



SHARP PARTS GUIDE

MODEL ER2590

Table of destinations

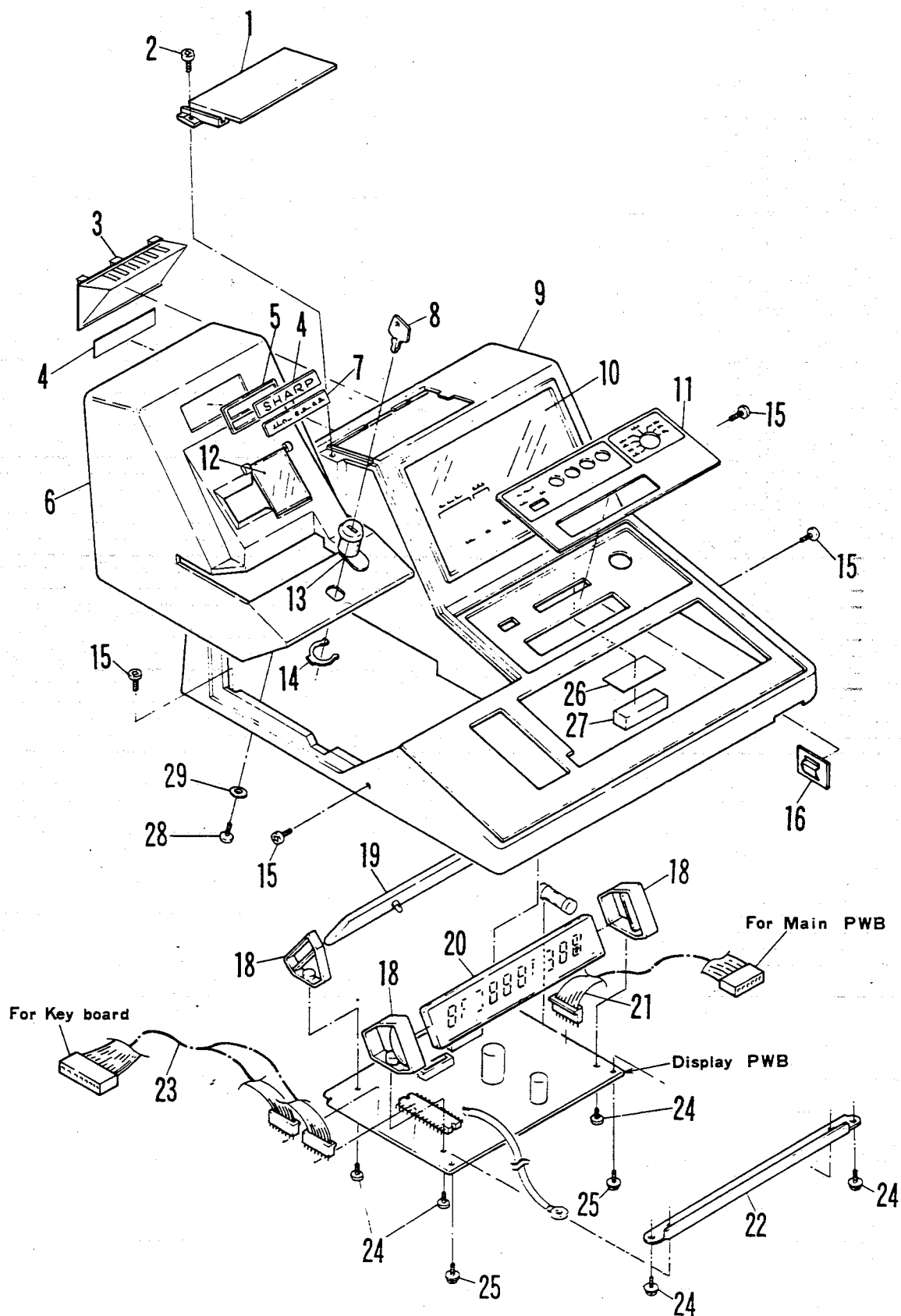
SELECTION CODE	COUNTRIES
KA	Australia
KB	U. Kingdom
SA	Korea
SB	Saudi Arabia
SBL	Saudi Arabia (Drawer TYPE:Large)
SBS	Saudi Arabia (Drawer TYPE:Small)
SC	Formosa
SD	R. of Colombia, Costa Rica, Dominican Republic, R. of Guatemala, Honduras, Venezuela, Nicaragua, El Salvador, Mexico, Cuba
SE	Hong Kong
SG	Kuwait, Lebanon, Bahrain, Thailand, Indonesia (Drawer coin case 4B-3C), Tahiti, Pakistan, Iran, Syria, Turkey, Jordan, Iraq, U.A.R., Sultanate of Oman, Sudan
SH	South Africa
SJ	Philippines
SL	New Zealand
SM	Kenya, Malta, UAE
SMT	Nigeria
TQ	SEEG territory other than Germany (Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, France, Finland, Hungary, Iceland, Italy, Norway, France, Switzerland, Portugal, Netherlands, Poland, Romania, Sweden)
TR	Spain
TS	Germany
RA1	Tunisia, West Africa, Ivory coast, Algeria, Cameroon, Chad, Dahomey, Gabon, Congo, Togo, Senegal, Niger, Burkina Faso
RA2	Argentine Republic, R. of Paraguay
RA3	Greece
RA4	R. of Chile, R. of Uruguay
RA5	Sri Lanka
RA6	Egypt
RA7	Curacao, Guam, Netherlands Antilles
RA8	Liberia
RA9	R. of Peru
RB1	F. R. of Brazil
RB2	Barbados (220V) REFER TO RB7
RB3	Indonesia (Drawer coin case 6B-5C)
RB4	
RB5	Cyprus
RB6	R. of Panama
RB7	Barbados (120V) REFER TO RB2
RB8	Malaysia, Singapore
RB9	China

Parts marked with "†" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

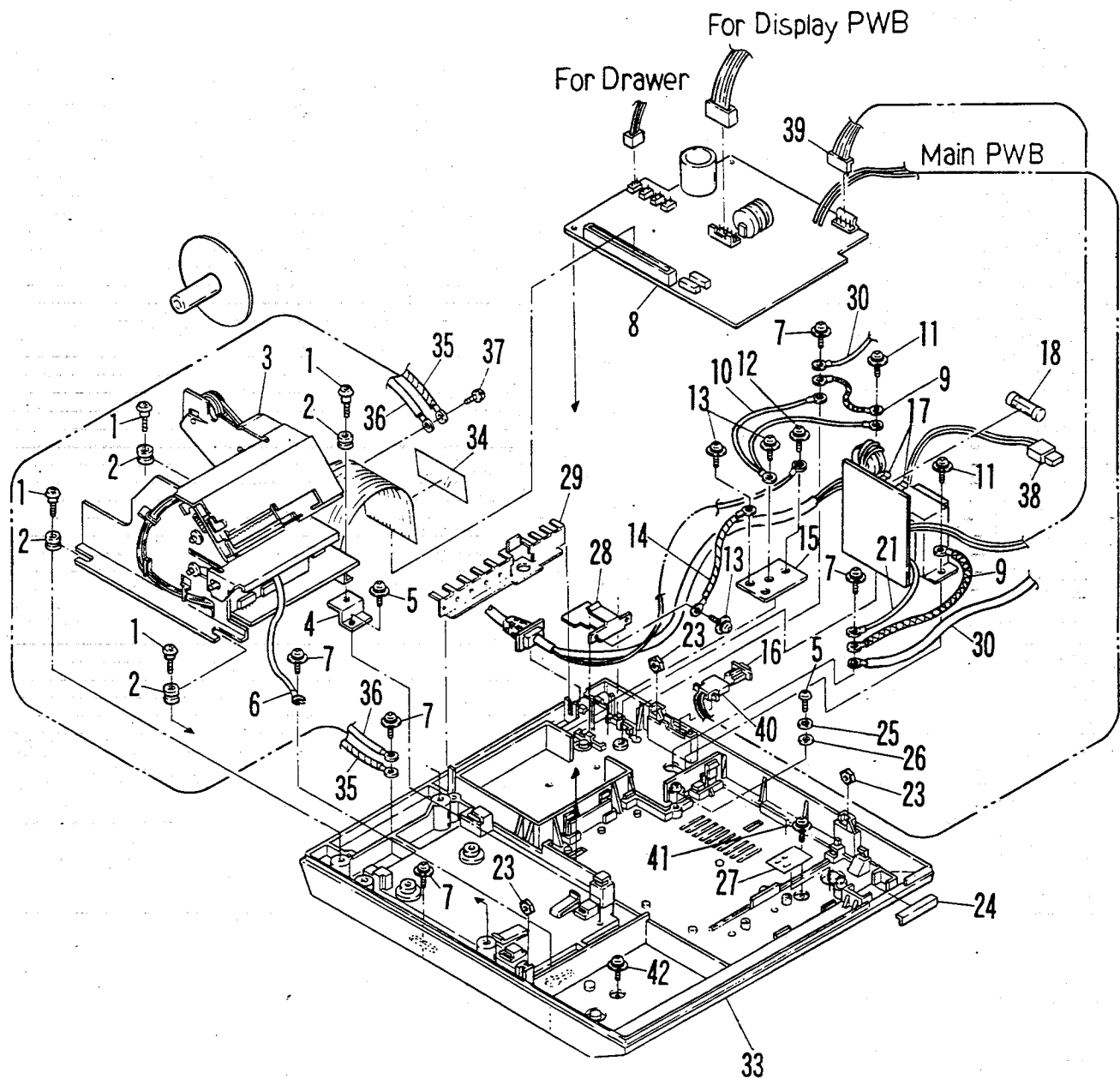
1 Cabinet etc.

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	GFTAT6681RCZZ	AG		D	Top cover
2	XBBSC30P06000	AA		C	Screw (3×6)
3	PFIW6769RCZZ	AQ		C	Rear filter
4	HBDGD6664RCZZ	AG		D	SHARP badge
5	GDAI-6629RCZZ	AC		C	Badge fitting plate
6	GCOVP6818RCZZ	AU		D	Printer cover (U.S.A., Canada)
7	HBDGD6807RCZZ	AC	N	C	Printer cover (Other countries)
8	LKGIW6960RCZZ	AG		B	Model badge
9	CPWBF7026RC01	CC	N	E	Printer cover lock key(No.224) (2pcs/set)
10	CPWBF7026RC02	CC	N	E	Main PWB unit (U.S.A., Canada)
11	GCAB66852RCZZ	BA		D	Main PWB unit (Other countries)
12	PFIW6784RCZZ	AP	N	D	Top cabinet GCAB66966RCZZ (88.1 ~ 5Q-077 T/R)
13	HPNLC6733RCZZ	AH	N	D	Front filter
14	PFIW6714RCZZ	AD		D	Key switch decoration panel
15	LKGIW6953RCZZ	AN		B	Journal filter
16	MSPRK6676RCZZ	AC		C	Lock switch(body)
17	XBBSC30P10000	AA		C	Lock switch spring
18	LHLDW2341RCZZ	AB		C	Screw (3×10)
19	LHLDZ6669RCZZ	AC		C	Cable holder (CKN05)
20	VVDH09LT-03Z1	AZ		B	Display holder
21	VVDH10LT-07Z1	BB		B	Display tube (H09LT-03Z1)
22	QCNCW6816RC13	AC		C	Display tube (H10LT-07Z1)
23	LANGK7170RCZZ	AE		C	Connector (13pin with wires)
24	QCNCW6779RC07	AR		C	PWB angle
25	XUPSD30P08000	AA		C	Connector (24pin with wires)
26	XBPSD30P06KS0	AA		C	Screw (3×8)
27	HPNLC6736RCZZ	AE		D	Screw (3×6KS)
28	PCUSS6695RCZZ	AC	N	C	Clerk panel
29	XCPSD20P04000	AA		C	Cushion
30	XWHSD20-04060	AA		C	Screw (2×4)
31					Washer
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1 Cabinet etc.



- 3 -

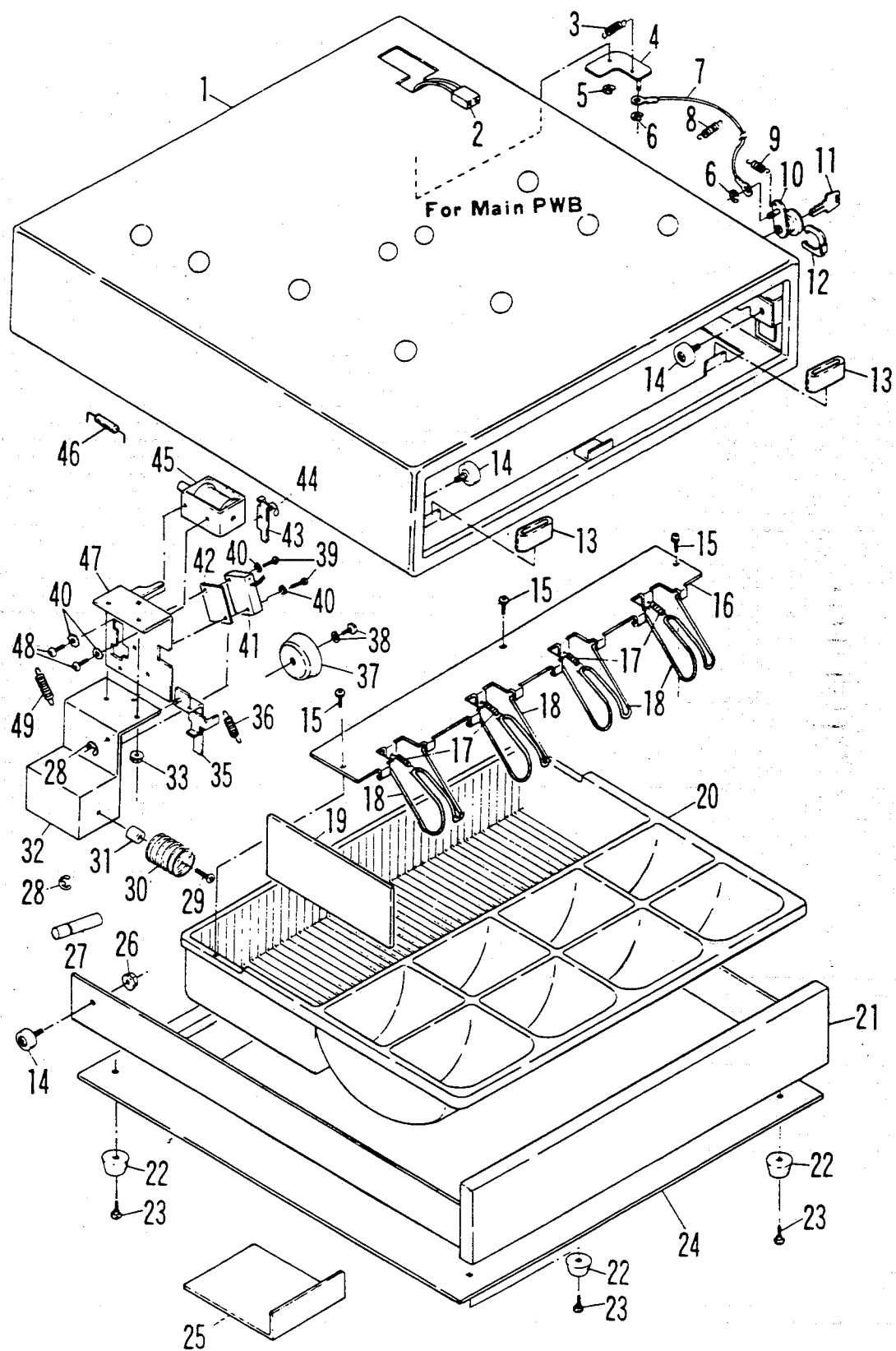
2 Printer and other interior parts

- 5 -

4 Drawer box unit 1(SH,SM,SG)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	GCABM6843RCZZ	BQ	N	D	Drawer cabinet
2	QCNCW6645RC02	AD		B	Connector (3pin with wires)
3	MSPRT6665RCZZ	AB		C	Open arm spring
4	MARMM6630RCZZ	AD		C	Open arm
5	XRES40-06000	AA		C	E type ring
6	XRESJ30-06000	AA		C	E type ring
7	PWIR-6627RCZZ	AK		C	Wire wire
8	MSPRT6670RCZZ	AB		C	Wire hold spring
9	MSPRT6664RCZZ	AB		C	Open key spring
10	LKGIW6945RCZZ	AL		B	Drawer open key(body)
11	LKGIM6946RCZZ	AF		B	Drawer open key (2pcs/set)
12	MSPRK6660RCZZ	AC		C	Clip
13	LSTPG6640RCZZ	AB		C	Stopper rubber
14	NROLP6632RCZZ	AE		B	Roller
15	XUPSD30P06000	AA		C	Screw
16	LBRC-6646RCZZ	AQ		C	Bracket
17	MSPRK6629RCZZ	AC		C	Bill presser spring
18	MLEV-6536RCZZ	AG		C	Bill presser lever
19	GITAU6626RCZZ	AN		C	Bill sepalator
20	GCASP6630RCZZ	AZ		C	Coin case
21	GDRW-6646RCZZ	BB		D	Drawer case
22	GLEGG6047RCZZ	AE		C	Rubber foot
23	LX-BZ6646RCZZ	AB		C	Screw
24	GITAU6679RCZZ	AS		C	Bottom plate
25	GCASP6020RCZZ	AH		C	Bill separator
26	LX-NZ6002RCZZ	AA		C	Nut
27	LPINS6630RCZZ	AB		C	Lock pin
28	XRES50-06000	AA		C	E type ring
29	OAGXBD803315S	AA		C	Screw
30	OAGMST805460A	AD		C	Spring
31	GLEGG6634RCZZ	AB		C	Rubber stopper
32	OAGLCS201MKSS	AH		C	Unit chassis
33	LX-NZ6001RCZZ	AA		C	Nut
35	MLEVF6643RCZZ	AE		C	Lever
36	MSPRT6648RCZZ	AC		C	Spring
37	RALML6636RCZZ	AD		C	Alarm
38	XBPSD40P08K00	AA		C	Screw
39	XBPSD30P14K00	AA		C	Screw (3×14K)
40	LX-WZ6648RCZZ	AA		C	Washer
41	QSW-M6659RCZZ	AS		B	Micro switch
42	PSHEP6635RCZZ	AA		C	Insulator sheet
43	MLEVP6674RCZZ	AB		C	Lever
44	XRES40-05000	AA		C	E type ring
45	RPLU-6634RCZZ	AR		B	Plunger
46	VHD10D1///-1	AD		B	Diode (10D1)
47	MLOKS6629RCZZ	AV		C	Lock
48	XBPSD30P06000	AA		C	Screw
49	MSPRT6647RCZZ	AC		C	Lock spring
	(Unit)				
901	GBOXD6809RCZZ	BV		E	Drawer box unit (SH,SM,SG)

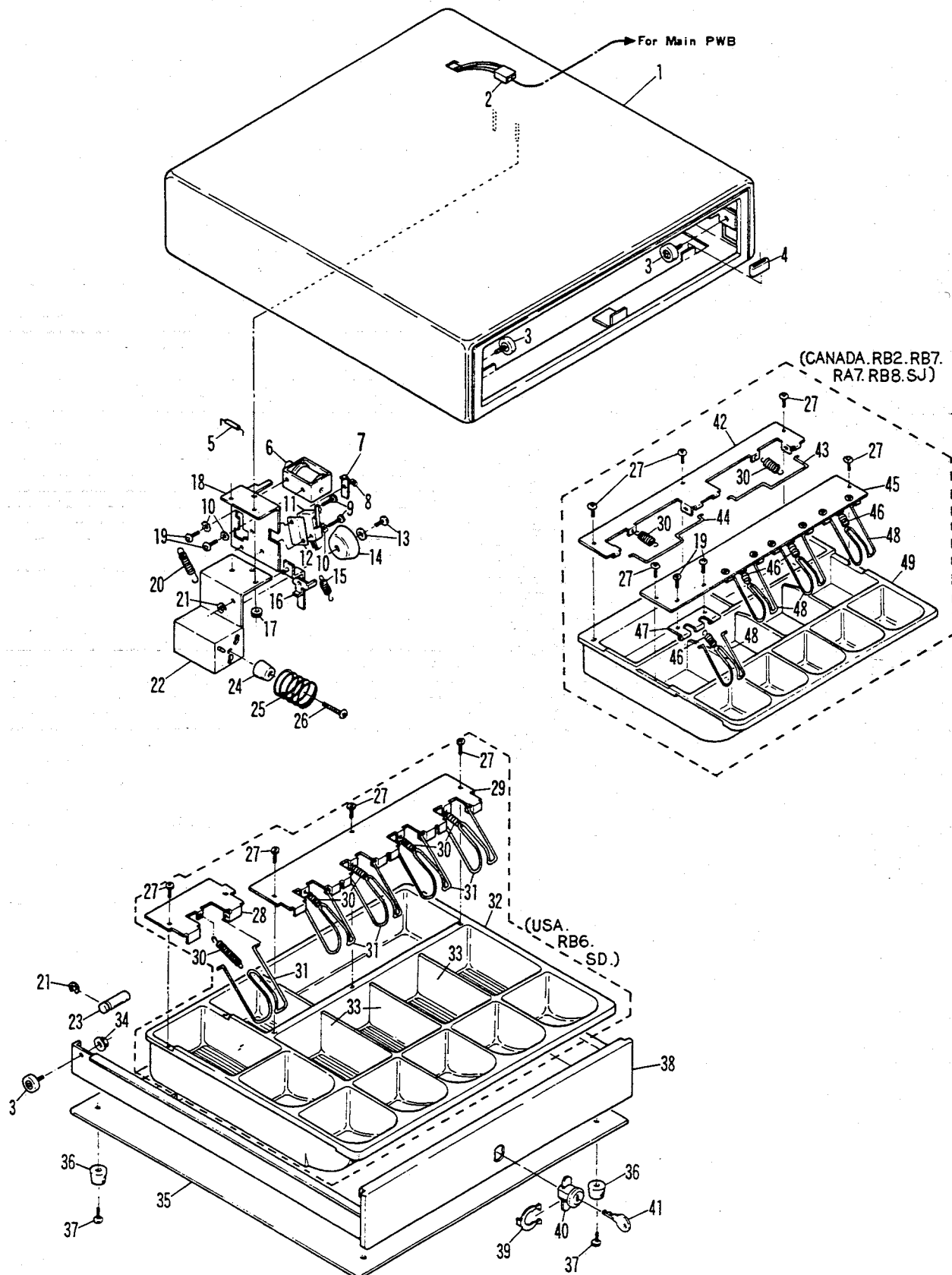
4 Drawer box unit 1(SH,SM,SG)



5 Drawer box unit 2(U.S.A.,&other countries)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	GCABM6856RCZZ	BF		D	Drawer cabinet
2	QCNCW6645RC02	AD		B	Connector (3pin with wires)
3	NROL P6632RCZZ	AE		B	Roller
4	LSTPG6640RCZZ	AB		C	Stopper rubber
5	VHD10D1////-1	AD		B	Diode (10D1)
6	RPLU-6634RCZZ	AR		B	Plunger
7	MLEV F6642RCZZ	AC		C	Lever
8	XRESD40-05000	AA		C	E type ring
9	XBPSD30P14000	AA		C	Screw (3×14)
10	LX-WZ6648RCZZ	AA		C	Washer
11	QSW-M6659RCZZ	AS		B	Micro switch
12	PSHEP6635RCZZ	AA		C	Insulator sheet
13	XBPSD40P08K00	AA		C	Screw
14	RALML6636RCZZ	AD		C	Alarm
15	MSPRT6648RCZZ	AC		C	Spring
16	MLEV F6643RCZZ	AE		C	Lever
17	LX-NZ6001RCZZ	AA		C	Nut
18	MLOKS6629RCZZ	AV		C	Lock
19	XBPSD30P06000	AA		C	Screw
20	MSPRT6647RCZZ	AC		C	Rock spring
21	XRESD50-06000	AA		C	E type ring
22	OAGLCS201MKSS	AH		C	Unit shassis
23	LPINS6630RCZZ	AB		C	Lock pin
24	OAGGLG8022017	AB		C	Rubber stopper
25	OAGMST805460A	AD		C	Pushout spring
26	OAGXBD803315S	AA		C	Screw (3×15)
27	XUPSD30P06000	AA		C	Screw
28	LBRC-6647RCZZ	AH		C	Bill presser bracket 1B
29	LBRC-6648RCZZ	AQ		C	Bill presser bracket 4B
30	MSPRK6629RCZZ	AC		C	Bill presser spring
31	MLEV-6536RCZZ	AG		C	Bill presser lever
32	GCASP6641RCZZ	AV		C	Coin case
33	GITAU6642RCZZ	AE		C	Bill separator
34	LX-NZ6002RCZZ	AA		C	Nut 5mm
35	GITAU6647RCZZ	AU		C	Bottom plate
36	GLEGG6047RCZZ	AE		C	Rubber foot
37	LX-BZ6646RCZZ	AB		C	Screw
38	GDRW-6651RCZZ	BA		C	Drawer case
39	MSPRK6669RCZZ	AD		C	Lock key spring
40	LKGIW6865RCZZ	AT		B	Drawer lock(body)
41	LKGI M6866RCZZ	AP		B	Drawer lock key(NaB01) (2pcs/set)
42	LBRC-6639RCZZ	AH		C	Bill presser bracket 2B
43	MLEV-6644RCZZ	AE		C	Bill presser lever 2B Right
44	MLEV-6645RCZZ	AG		C	Bill presser lever 2B Left
45	LBRC-6649RCZZ	AQ		C	Bill presser bracket 4B
46	MSPRT6571RCZZ	AB		C	Bill presser spring
47	GITAU6571RCZZ	AE		C	Bill presser plate
48	MLEV-6571RCZZ	AE		C	Bill presser plate
49	GCASP6643RCN1	AX		C	Coin case
	(Unit)				
901	GBOXD6823RCZZ	BU		E	Drawer box unit
	GBOXD6824RCZZ	BU		E	Drawer box unit

5 Drawer box unit 2(U.S.A.,&other countries)



6 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	PRDAF6630RCZZ	AB		C	Heat sink (for transistor)
2	QCNCM6660RCZZ	AC		B	Connector (3pin)
3	QCNCM6699RCZZ	AC		B	Connector (3pin)
4	QCNCM6823RC1C	AE		C	Connector (13pin)
5	QCNCM6862RC0B	AB		B	Connector (2pin) (Except U.S.A., Canada)
6	QCNCM6865RC1A	AD		C	Connector (11pin)
7	QCNCM6865RC1J	AC		C	Connector (10pin)
8	QCNCW6730RC05	AF		B	Connector (3pin with wires) (Except U.S.A., Canada)
9	QCNCW6836RC3H	AL		C	Connector (38pin)
10	QS0CZ6428ACZZ	AE		C	IC socket (28pin)
11	RALMB2316RCZZ	AL		B	Buzzer (HMB-06)
12	RC-CZH300RCZZ	AD		C	Capacitor (50WV 30pF)
13	RC-FZ6633RCZZ	AP		C	Capacitor (55WV 4700μF)
14	RCILC6632RCZZ	AQ		C	Coil
15	RCSRSP6631RCZZ	AE		B	Crystal (3.0MHz)
16	RMPTCB123QCJB	AC		B	Block resistor (12KΩ×12 1/8W ±5%)
17	RMPTC4223QCJB	AB		B	Block resistor (22KΩ×4 1/8W ±5%)
18	RMPTC8123QCJB	AB		B	Block resistor (12KΩ×8 1/8W ±5%)
19	RVR-MF310QCZZ	AC		B	Variable resistor (6.8KΩ)
20	UBATN2183CCZZ	AV		B	Battery (151FT 3CELL)
21	VCEAGU1AW108M	AC		C	Capacitor (10WV 1000μF)
22	VCEAGU1CW106M	AA		C	Capacitor (16WV 10μF)
23	VCEAGU1CW226M	AA		C	Capacitor (16WV 22μF)
24	VCEAGU1EW108M	AD		C	Capacitor (25WV 1000μF)
25	VCEAGU1HW105M	AA		C	Capacitor (50WV 1.0μF)
26	VCKYPU1HB222K	AA		C	Capacitor (50WV 2200pF)
27	VCKYPU1HB331K	AA		C	Capacitor (50WV 330pF)
28	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)
29	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)
30	VHDDS1588L2-1	AB		B	Diode (DS1588L2)
31	VHD1S2596-1	AG		B	Diode (1S2596)
32	VHD10E1N-1	AB		B	Diode (10E1)
33	VHERD10EL2-1	AB		B	Zener diode (RD10EL2)
34	VHERD20EB1-1	AB		B	Zener diode (RD20EB1)
35	VHERD5.1EL1-1	AB		B	Zener diode (RD5.1EL1)
36	VHERD6.2EB1-1	AB		B	Zener diode (RD6.2EB1)
37	VHH5KD5-1	AB		B	Thermistor (5KD5)
38	VH1HM6264LP15	BN		B	IC (HM6264LP15)
39	VH1MC74HC00-1	AE		B	IC (TC74HC00)
40	VH1MC74HC04-1	AE		B	IC (MC74HC04)
41	VH1MC74HC08-1	AE		B	IC (MC74HC08)
42	VH1MC74HC139N	AG		B	IC (MC74HC139N)
43	VH1MC74HC32-1	AE		B	IC (MC74HC32N)
44	VH1M54567P-1	AK		B	IC (M54567P)
45	VH1NJM2903N-1	AH		B	IC (NJM2903N)
46	VH1TD62305P-1	AL		B	IC (TD62305P)
47	VH1T74LS137-C	AF		B	IC (T74LS137)
48	VH1T74LS74-C	AE		B	IC (T74LS74)
49	VH127256R041A	BG	N	B	IC (27256R041A) (To June prod., U.S.A. only)
	VH127256R041B	BG	N	B	IC (27256R041B) (From July prod.)
50	VH17801G105-1	BE		B	IC (7801G105)
51	VRD-ST2EY000J	AA		C	Resistor (1/4W 0Ω ±5%)
52	VRD-ST2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)
53	VRD-ST2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)
54	VRD-ST2EY105J	AA		C	Resistor (1/4W 1.0MΩ ±5%)
55	VRD-ST2EY122J	AA		C	Resistor (1/4W 1.2KΩ ±5%)
56	VRD-ST2EY123J	AA		C	Resistor (1/4W 12KΩ ±5%)
57	VRD-ST2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)
58	VRD-ST2EY222J	AA		C	Resistor (1/4W 2.2KΩ ±5%)
59	VRD-ST2EY223J	AA		C	Resistor (1/4W 22KΩ ±5%)
60	VRD-ST2EY272J	AA		C	Resistor (1/4W 2.7KΩ ±5%)
61	VRD-ST2EY331J	AA		C	Resistor (1/4W 330Ω ±5%)
62	VRD-ST2EY332J	AA		C	Resistor (1/4W 3.3KΩ ±5%)
63	VRD-ST2EY392J	AA		C	Resistor (1/4W 3.9KΩ ±5%)
64	VRD-ST2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)
65	VRD-ST2EY561J	AA		C	Resistor (1/4W 560Ω ±5%)
66	VRD-ST2EY562J	AA		C	Resistor (1/4W 5.6KΩ ±5%)
67	VRD-ST2EY563J	AA		C	Carbon resistor (1/4W 56KΩ ±5%)
68	VRD-SU2EY153J	AA		C	Resistor (1/4W 15KΩ ±5%)
69	VRD-SU2EY822G	AA		C	Resistor (1/4W 8.2KΩ ±2%)
70	VSJC501-P//QC	AB		B	Transistor (JC501-P//QC)
71	VS2SA1115-1	AB		B	Transistor (2SA1115)
72	VS2SB881-1	AH		B	Transistor (2SB881)
73	VS2SC1472K-1	AE		B	Transistor (2SC1472K)
74	VS2SD1191-1	AH		B	Transistor (2SD1191)
75	XBPSD30P08KS0	AA		C	Screw (3×8KS)
76	XNESD30-24000	AA		C	Nut (3NS)
	(Unit)				
901	CPWBF7026RC01	CC	N	E	Main PWB unit (U.S.A., Canada)
	CPWBF7026RC02	CC	N	E	Main PWB unit (Other countries)
901	CPWBF7026RC01	CC			Main PWB unit (U.S.A., Canada)
49	74.27256R041A	BB		5	IC (27256R041A) (Canada)

7 Noise filter PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LBNDJ0004UCZZ	AA		C	Band
2	QCNCW6770RC03	AF		B	Connector(3pin with wires) (U.S.A.,Canada,RA7,RB6,RB7,SD)
3	QCNCW6838RC02	AE		B	Connector(2pin with wires) (U.S.A.,Canada,RA7,RB6,RB7,SD)
4	QCNCW6838RC03	AF		B	Connector (3Pin with wires) (RB2,RB8,SG,SH,SJ,SM)
5	QCNCW6869RC01	AF		C	Connector (4pin with wires) (RB2,RB8,SG,SH,SJ,SM)
6	QCNW-6871RCZZ	AB		C	Earth wire (Noise filter-Drawer)
7	QFS-B1002CCZZ	AE		A	Fuse(1.5A 125V) (U.S.A.,Canada,RA7,RB6,RB7,SD)
8	QFS-C1021CCZZ	AF		A	Fuse (0.8A/250V) (RB2,RB8,SG,SH,SJ,SM)
9	QFSHA1002CCZZ	AB		C	Fuse holder (SN-3E) (RB2,RB8,SG,SH,SJ,SM)
10	QFSHB1003CCZZ	AB		C	Fuse holder (SN-3E) (U.S.A.,Canada,RA7,RB6,RB7,SD)
11	RC-FZ6030RCZZ	AH		C	Capacitor(125WV 0.1 μ F) (U.S.A.,Canada,RA7,RB6,RB7,SD)
12	RCiLC6575RCZZ	AN		C	Coil (for line filter)
13	RTRNP6709RCZZ	AZ		B	Power transformer (RB2,RB8,SG,SH,SJ,SM)
14	RTRNP6716RCZZ	BA		B	Power transformer (U.S.A.,Canada,RA7,RB6,RB7,SD)
15	VCE9HE2EP104K	AK		C	Capacitor (0.1 μ F 250WV) (RB2,RB8,SG,SH,SJ,SM)
16	VHDS4VB10//--1	AL		B	Diode (S4VB10F)
17	VRD-ST2HY394J	AB		C	Resistor (1/2W 390K Ω $\pm$ 5%)
	(Unit)				
901	CPWBF6980RC02	BN		E	Noise filter PWB unit (U.S.A.,Canada,RA7,RB6,RB7,SD)
	CPWBF6964RC07	BN		E	Noise filter PWB unit (Other countries)
77	V525B832-1X-1	AH		B	Transistor (2SB332) (Ji-230 61.6~) ←当初 2SB581使用。(A5)

8 Display PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LANGK7170RCZZ	AE		C	PWB angle
2	LHLDZ6669RCZZ	AC		C	Display holder
3	QCNCW6779RC07	AR		C	Connector (24pin with wires)
4	QCNCW6816RC13	AC		C	Connector (13pin with wires)
5	QCNW-6904RCZZ	AB		C	Jumper wire 1 (80mm)
6	QCNW-6923RCZZ	AB		C	Ground wire
7	QCNW-6925RCZZ	AB		C	Ground wire
8	QCNW-6926RCZZ	AB		C	Earth wire
9	QCNW-6932RCZZ	AB		C	Earth wire
10	QFS-A1036CCZZ	AD		A	Fuse (1.2A)(MINI TYPE)
11	QFSHA1002CCZZ	AB		C	Holder,fuse (SN-3E)
12	RC-KZ1018CCZZ	AE		C	Capacitor (250WV 25pF)
13	RCRSP1003CCZZ	AT		B	Crystal (32KHz)
14	RMPTCB473QCJB	AC		B	Block resistor (47K Ω $\times$ 12 1/8W $\pm$ 5%)
15	RTRNH6727RCZZ	AP		B	Converter transformer (ER2908I)
16	VCCCPU1HH220J	AA		C	Capacitor (50WV 22PF)
17	VCEAGU1CW106M	AA		C	Capacitor (16WV 10 μ F)
18	VCEAGU1CW108M	AD		C	Capacitor (16WV 1000 μ F)
19	VCKYPU1HB101K	AA		C	Capacitor (50WV 100pF)
20	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000pF)
21	VCKYPU1HB222K	AA		C	Capacitor (50WV 2200pF)
22	VCKYPU1HB331K	AA		C	Capacitor (50WV 330pF)
23	VCEAGU1HW227M	AC		C	Capacitor (50WV 220 μ F)
24	VCEAGU1HW476M	AB		C	Capacitor (50WV 47 μ F)
25	VCEAGU2AW226M	AB		C	Capacitor (100WV 22 μ F)
26	VCQYKU1HM152K	AA		C	Capacitor (50WV 1500pF)
27	VCQYKU1HM683K	AB		C	Capacitor (50WV 0.068 μ F)
28	VCSATU1AE226M	AD		C	Capacitor (10WV 22 μ F)
29	VHDDS1588L2-1	AB		B	Diode (DS1588L2)
30	VHD1SS82//--1	AB		B	Diode (1SS82)
31	VHD1S1834//--1	AE		B	Diode (1S1834)
32	VHERD5.1EL1-1	AB		B	Zener diode (RD5.1EL1)
33	VHERD6.2EB1-1	AB		B	Zener diode (RD6.2EB1)
34	VHILB1291//--1	AH		B	IC (LB1291)
35	VHILB1293//--1	AH		B	IC (LB1293)
36	VHILU55123P-1	AY		B	IC (LU55123P)
37	VHINJM2903N-1	AH		B	IC (NJM2903N)
38	VRD-ST2EY000J	AA		C	Resistor (1/4W 0 Ω $\pm$ 5%)
39	VRD-ST2EY101J	AA		C	Resistor (1/4W 100 Ω $\pm$ 5%)
40	VRD-ST2EY103J	AA		C	Resistor (1/4W 10K Ω $\pm$ 5%)
41	VRD-ST2EY104J	AA		C	Resistor (1/4W 100K Ω $\pm$ 5%)
42	VRD-ST2EY122J	AA		C	Resistor (1/4W 1.2K Ω $\pm$ 5%)
43	VRD-ST2EY123J	AA		C	Resistor (1/4W 12K Ω $\pm$ 5%)
44	VRD-ST2EY272J	AA		C	Resistor (1/4W 2.7K Ω $\pm$ 5%)
45	VRD-ST2EY471J	AA		C	Resistor (1/4W 470 Ω $\pm$ 5%)
46	VRD-ST2EY473J	AA		C	Resistor (1/4W 47K Ω $\pm$ 5%)
47	VRD-ST2EY562J	AA		C	Resistor (1/4W 5.6K Ω $\pm$ 5%)
48	VRD-ST2EY563J	AA		C	Carbon resistor (1/4W 56K Ω $\pm$ 5%)
49	VRD-SU2EY100J	AA		C	Resistor (1/4W 10 Ω $\pm$ 5%)
50	VRD-SU2EY273J	AA		C	Resistor (1/4W 27K Ω $\pm$ 5%)
51	VRD-SU2EY333G	AA		C	Resistor (1/4W 33K Ω $\pm$ 2%)
52	VRD-SU2EY6R8J	AA		C	Resistor (1/4W 6.8 Ω $\pm$ 5%)

8 Display PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
53	VRD-SU2EY822J	AA		C	Resistor (1/4W 8.2KΩ ±5%)
54	VSJC501-P//QC	AB		B	Transistor (JC501-P//QC)
55	VS2SA1115-/-1	AB		B	Transistor (2SA1115)
56	VS2SC2334-/-1	AL		B	Transistor (2SC2334)
57	VS2SC641KC/-1	AE		B	Transistor (2SC641KC)
58	VS2SD667-/-1	AD		B	Transistor (2SD667)
59	VS2SK30A0-/-1	AE		B	Transistor (2SK30A0)
60	VVDH09LT-03Z1	AZ		B	Display tube (H09LT-03Z1)
61	VVDH10LT-07Z1	BB		B	Display tube (H10LT-07Z1)
62	XBPSD30P06KS0	AA		C	Screw (3×6KS)
63	XBPSD30P08K00	AA		C	Screw (3×8K)
64	XNESD30-24000	AA		C	Nut (3NS)
65	XUPSD30P08000	AA		C	Screw (3×8)
	(Unit)				
901	CPWBF7027RC01	BX	N	E	Display PWB unit

9 Packing material&Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	GCOVD6810RCZZ	AP		D	Dust cover
	PSTM-6665RCZZ	AR		D	Stamp (THANK DANKI) (SH)
2	PSTM-6660RCZZ	AR		D	Stamp (MUCHAS GRACIAS) (RB6,SD)
	PSTM-6658RCZZ	AR		D	Stamp (THANK YOU) (Other countries)
3	GCOVB6822RCZZ	AW		D	Water proof key cover
4	SPAKA7155RCZZ	AP		D	Packing cushion (Right)
5	SPAKA7156RCZZ	AP		D	Packing cushion (Left)
6	SPAKC7422RCZZ	AT	N	D	Packing case
7	SSAKA0001SCZZ	AA		D	Vinyl bag (200×300mm)
8	SSAKA2012KCZZ	AF		D	Vinyl bag (600×540×510mm)
9	SSAKH3015CCZZ	AA		D	Vinyl bag (240×360mm)
10	SSAKA5004CCZZ	AA		D	Vinyl bag (100×300mm)
11	TCADH6653RCZZ	AB		D	Caution card (U.S.A. only)
	TCADH6654RCZZ	AB		D	Caution card (Other countries)
12	TINSE6991RCZZ	AW	N	D	Instruction book (U.S.A. only)
	TINSK6992RCZZ	BF	N	D	Instruction book (Other countries)
13	UBNDA1008CCZZ	AA		C	AC cord band
14	UINK-1001CCZZ	AK		S	Ink(for stamp only) (5cc)
15	TCADH6698RCZZ	AD		D	Operation card (Except U.S.A.)
16	LKGI M6861RCZZ	AG		B	Mode key(SRV)
17	LKGI M7094RCZZ	AH	N	B	Mode key(SRV) (for ER25MD1~5)
18	SPAKF7025RCZZ	AC		D	Packing bag(for AC plug) (RB2,RB8,SH,SM)

10 Articles of consumptions

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	UINK-1001CCZZ	AK		S	Ink(for stamp only) (5cc)
2	IDPAPR1006CSZZ	AR		S	Roll paper (5roll/pack)
3	NROLR6638RCZZ	AY		S	Ink roller

11 Spare unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	CPWBF7026RC01	CC	N	E	Main PWB unit (U.S.A.,Canada)
	CPWBF7026RC02	CC	N	E	Main PWB unit (Other countries)
2	KI-0B6701RCZZ	CC	N	E	Printer(CR910C) (U.S.A.,Canada)
	KI-0B6703RCZZ	CC	N	D	Printer(CR910C) (Other countries)
	DUNTK8126RCZZ	BV	N	E	Keyboard unit (U.S.A.,Canada)
3	DUNTK8175RCZZ	BV	N	E	Keyboard unit (RB2,RB8,SG,SH,SM,SJ)
	DUNTK8177RCZZ	BV	N	E	Keyboard unit (RA7,RB6,RB7,SD)
	GBOXD6823RCZZ	BU		E	Drawer box unit (6B/6C) (U.S.A.,RB6,SD)
4	GBOXD6824RCZZ	BU		E	Drawer box unit (6B/5C) (Canada,RA7,RB2,RB7,RB8,SJ)
	GBOXD6809RCZZ	BV		E	Drawer box unit (4B/8C) (SH,SM,SG)
5	CPWBF7026RC01	CC	N	E	Main PWB unit (U.S.A.,Canada)
	CPWBF7026RC02	CC	N	E	Main PWB unit (Other countries)
6	CPWBF6980RC02	BN		E	Noise filter PWB unit (U.S.A.,Canada,RA7,RB6,RB7,SD)
	CPWBF6964RC07	BN		E	Noise filter PWB unit (Other countries)
7	CPWBF7027RC01	BX	N	E	Display PWB unit
15	CPWBF7026RC05	CC		E	Main PWB unit (ECR-150) (Canada)

12 AC CORD

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QACCJ1413QCZZ	AG		B	AC cord Japan, RA7, RA8, RA9, RB6, RB7, SA, SC, SD, SJ
2	QACCD8411QCZZ	AN		B	AC cord U. S. A. Canada, Japan (Okinawa)
3	QACCE1422QCZZ	AM		B	AC cord RA1, RA2, RA4, RB1, RB3, RB5, RB9, SB, SG, TQ, TR, TS AC cord Yugoslavia
4	QPLGA4501CCZZ	AK		B	Plug SE
	QCNW-6629RCZZ	AN		B	AC cord SE
	QPLGA0018WRE0	AN		B	Plug SH, RA5
5	QCNW-6629RCZZ	AN		B	AC cord SH, RA5
	PHOG-1023CCZZ	AB		B	Bushing for AC cord SH, RA5
6	QACCL7421QCZZ	AS		B	AC cord KA, SL
7	QPLGA6626CCZZ	AN		B	Plug KB, RB2, RB8, SM, SMT
	QCNW-6629RCZZ	AN		B	AC cord KB, RB2, RB8, SM, SMT
8	QACCZ6421QCZZ	AU		B	AC cord RA3
9	QCNW-6629RCZZ	AN		B	AC cord RB4 (AC cord only. The plug is not included.)

Note: Instead of AC cords QACCZ3421QCZZ, QACCK1008CCZZ, the AC cord QACCE1422QCZZ(No.3) is supplied as service spare part.

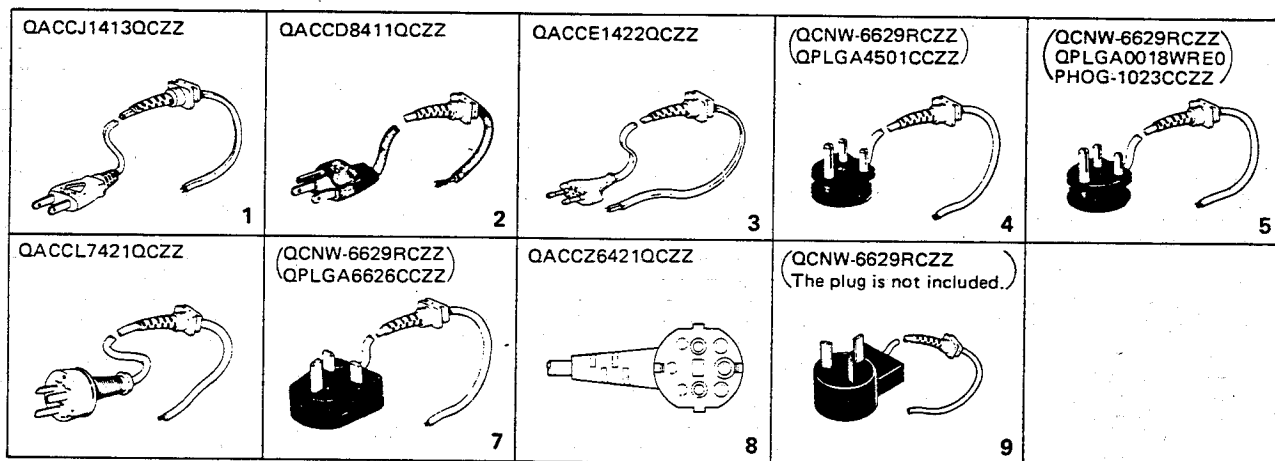


Table of destinations

SELECTION CODE	COUNTRIES
KA	Australia
KB	U. Kingdom
SA	Korea
SB	Saudi Arabia
SBL	Saudi Arabia (Drawer TYPE:Large)
SBS	Saudi Arabia (Drawer TYPE:Small)
SC	Formosa
SD	R. of Colombia, Costa Rica, Dominican Republic, R. of Guatemala, Honduras, Venezuela, Nicaragua, El Salvador, Mexico, Cuba
SE	Hong Kong
SG	Kuwait, Lebanon, Bahrain, Thailand, Indonesia (Drawer coin case 4B 3C), Tahiti, Pakistan, Iran, Syria, Turkey, Jordan, Iraq, U.A.R., Sultanate of Oman, Sudan
SH	South Africa
SJ	Philippines
SL	New Zealand
SM	Kenya, Malta, UAE
SMT	Nigeria
TQ	SEEG territory other than Germany (Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, France, Finland, Hungary, Iceland, Italy, Norway, France, Switzerland, Portugal, Netherlands, Poland, Romania, Sweden)
TR	Spain
TS	Germany
RA1	Tunisia, West Africa, Ivory coast, Algeria, Cameroon, Chad, Dahomey, Gabon, Congo, Togo, Senegal, Niger, Burkina Faso
RA2	Argentine Republic, R. of Paraguay
RA3	Greece
RA4	R. of Chile, R. of Uruguay
RA5	Sri Lanka
RA6	Egypt
RA7	Curacao, Guam, Netherlands Antilles
RA8	Liberia
RA9	R. of Peru
RB1	F. R. of Brazil
RB2	Barbados (220V) REFFER TO RB7
RB3	Indonesia (Drawer coin case 6B 5C)
RB4	
RB5	Cyprus
RB6	R. of Panama
RB7	Barbados (120V) REFER TO RB2
RB8	Malaysia, Singapore
RB9	China

Parts marked with "1" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

Index

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
[C]				
CFRM-6632RCZZ	3- 12	AD		B
CFRM-6635RCZZ	3- 11	AD		B
CFRM-6636RCZZ	3- 13	AD		B
CLABH6770RCZZ	3- 7	AU	N	C
CPWBF6964RC07	7- 901	BN		E
"	11- 6	BN		E
CPWBF6980RC02	7- 901	BN		E
"	11- 6	BN		E
CPWBF7026RC01	1- 8	CC	N	E
"	6- 901	CC	N	E
"	11- 1	CC	N	E
"	11- 5	CC	N	E
CPWBF7026RC02	1- 8	CC	N	E
"	6- 901	CC	N	E
"	11- 1	CC	N	E
"	11- 5	CC	N	E
CPWBF7027RC01	8- 901	BX	N	E
"	11- 7	BX	N	E
[D]				
DPAPR1006CSZZ	10- 2	AR		S
DUNTK8126RCZZ	3- 901	BV	N	E
"	11- 3	BV	N	E
DUNTK8175RCZZ	3- 901	BV	N	E
"	11- 3	BV	N	E
DUNTK8177RCZZ	3- 901	BV	N	E
"	11- 3	BV	N	E
[G]				
GBOXD6809RCZZ	4- 901	BV		E
"	11- 4	BV		E
GBOXD6823RCZZ	5- 901	BU		E
"	11- 4	BU		E
GBOXD6824RCZZ	5- 901	BU		E
"	11- 4	BU		E
GCABA6839RCZZ	2- 33	BA		D
GCABA6853RCZZ	2- 33	BC		D
GCABB6852RCZZ	1- 9	BA		D
GCABM6843RCZZ	4- 1	BQ	N	D
GCABM6856RCZZ	5- 1	BF		D
GCASP6020RCZZ	4- 25	AH		C
GCASP6630RCZZ	4- 20	AZ		C
GCASP6641RCZZ	5- 32	AV		C
GCASP6643RCN1	5- 49	AX		C
GCOVB6822RCZZ	9- 3	AW		D
GCOVD6810RCZZ	9- 1	AP		D
GCOVP6808RCZZ	1- 6	AU		D
GCOVP6818RCZZ	1- 6	AU		D
GDAI-6629RCZZ	1- 5	AC		C
GDRW-6646RCZZ	4- 21	BB		D
GDRW-6651RCZZ	5- 38	BA		C
GFTAB6264RCZZ	2- 16	AB		D
GFTAT6681RCZZ	1- 1	AG		D
GFTAT6684RCZZ	2- 24	AD		D
GFTAT6691RCZZ	2- 24	AD		D
GITAU6571RCZZ	5- 47	AE		C
GITAU6626RCZZ	4- 19	AN		C
GITAU6642RCZZ	5- 33	AE		C
GITAU6647RCZZ	5- 35	AU		C
GITAU6679RCZZ	4- 24	AS		C
GITAU6695RCZZ	2- 15	AD		C
GLEGG6047RCZZ	4- 22	AE		C
"	5- 36	AE		C
GLEGG6634RCZZ	4- 31	AB		C
[H]				
HBDGD6664RCZZ	1- 4	AG		D
HBDGD6807RCZZ	1- 7	AC	N	C
HPNLC6733RCZZ	1- 11	AH	N	D
HPNLC6736RCZZ	1- 26	AE		D
[J]				
JKNBZ6751RCZZ	3- 6	AB		C
JKNBZ6752RCZZ	3- 6	AB		C
JKNBZ6753RCZZ	3- 6	AB		C
JKNBZ6754RCZZ	3- 6	AB		C
JKNBZ6755RCZZ	3- 6	AB		C
JKNBZ6756RCZZ	3- 6	AB		C
JKNBZ6757RCZZ	3- 6	AB		C
JKNBZ6758RCZZ	3- 6	AB		C
JKNBZ6759RCZZ	3- 6	AB		C
JKNBZ6761RCZZ	3- 6	AC		C
JKNBZ6763RCZZ	3- 6	AB		C

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
JKNBZ6766RCZZ	3- 4	AA		C
"	3- 6	AA		C
JKNBZ6767RCZZ	3- 1	AA		C
"	3- 6	AA		C
JKNBZ6770RCZZ	3- 5	AC		C
"	3- 6	AC		C
JKNBZ6771RCZZ	3- 2	AC		C
"	3- 6	AC		C
JKNBZ6777RCZZ	3- 6	AB		C
JKNBZ6778RCZZ	3- 6	AB		C
JKNBZ6787RCZZ	3- 3	AF		C
JKNBZ6788RCZZ	3- 6	AB		C
[K]				
KI-OB6701RCZZ	2- 3	CC	N	E
"	11- 2	CC	N	E
KI-OB6703RCZZ	2- 3	CC	N	D
"	11- 2	CC	N	D
[L]				
LANGK7127RCZZ	2- 29	AE		C
LANGK7128RCZZ	2- 28	AK		C
LANGK7169RCZZ	2- 4	AD		C
LANGK7170RCZZ	1- 22	AE		C
"	8- 1	AE		C
LBNDJ0004UCZZ	7- 1	AA		C
LBRC-6639RCZZ	5- 42	AH		C
LBRC-6646RCZZ	4- 16	AQ		C
LBRC-6647RCZZ	5- 28	AH		C
LBRC-6648RCZZ	5- 29	AQ		C
LBRC-6649RCZZ	5- 45	AQ		C
LHLDW2341RCZZ	1- 16	AB		C
"	3- 37	AB		C
LHLDZ6669RCZZ	1- 18	AC		C
"	8- 2	AC		C
LKGI6858RCZZ	3- 8	AG		B
LKGI6859RCZZ	3- 8	AG		B
LKGI6860RCZZ	3- 8	AG		B
LKGI6861RCZZ	9- 16	AG		B
LKGI6866RCZZ	5- 41	AP		B
LKGI6946RCZZ	4- 11	AF		B
LKGI6960RCZZ	1- 8	AG		B
LKGI7094RCZZ	9- 18	AH	N	B
LKGI7097RCZZ	3- 19	AK	N	B
LKGI7098RCZZ	3- 19	AK	N	B
LKGIW6865RCZZ	5- 40	AT		B
LKGIW6945RCZZ	4- 10	AL		B
LKGIW6953RCZZ	1- 13	AN		B
LKGIW7068RCZZ	3- 9	AW		B
LKGIW7088RCZZ	3- 9	AU		B
LKGIW7095RCZZ	3- 18	AY	N	B
LPINS6630RCZZ	4- 27	AB		C
"	5- 23	AB		C
LPLTM6636RCZZ	3- 43	AC	N	C
LSTPG6640RCZZ	4- 13	AB		C
"	5- 4	AB		C
LX-BZ1007CCZZ	2- 1	AB		C
LX-BZ6646RCZZ	4- 23	AB		C
"	5- 37	AB		C
LX-BZ6672RCZZ	3- 16	AA		C
LX-NZ6001RCZZ	4- 33	AA		C
"	5- 17	AA		C
LX-NZ6002RCZZ	4- 26	AA		C
"	5- 34	AA		C
LX-WZ6648RCZZ	4- 40	AA		C
"	5- 10	AA		C
[M]				
MARMM6630RCZZ	4- 4	AD		C
MLEV-6536RCZZ	4- 18	AG		C
"	5- 31	AG		C
MLEV-6571RCZZ	5- 48	AE		C
MLEV-6644RCZZ	5- 43	AE		C
MLEV-6645RCZZ	5- 44	AG		C
MLEVF6642RCZZ	5- 7	AC		C
MLEVF6643RCZZ	4- 35	AE		C
"	5- 16	AE		C
MLEV6674RCZZ	4- 43	AB		C
MLOKS6629RCZZ	4- 47	AV		C
"	5- 18	AV		C
MSPRK6629RCZZ	4- 17	AC		C
"	5- 30	AC		C
MSPRK6660RCZZ	4- 12	AC		C

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
MSPRK6669RCZZ	5- 39	AD		C
MSPRK6676RCZZ	1- 14	AC		C
MSPRT6571RCZZ	5- 46	AB		C
MSPRT6647RCZZ	4- 49	AC		C
"	5- 20	AC		C
MSPRT6648RCZZ	4- 36	AC		C
"	5- 15	AC		C
MSPRT6664RCZZ	4- 9	AB		C
MSPRT6665RCZZ	4- 3	AB		C
MSPRT6670RCZZ	4- 8	AB		C
[N]				
NRÖLP6632RCZZ	4- 14	AE		B
"	5- 3	AE		B
NRÖLR6638RCZZ	10- 3	AY		S
[P]				
PCUS-4101CCZZ	2- 2	AB		C
PCUSS6695RCZZ	1- 27	AC	N	C
PFI LW6714RCZZ	1- 12	AD		D
PFI LW6769RCZZ	1- 3	AQ		C
PFI LW6784RCZZ	1- 10	AP	N	D
PGIDM6680RCZZ	3- 14	AD		B
PGIDM6683RCZZ	3- 15	AD		B
PRDAF6630RCZZ	6- 1	AB		C
PSHEP6635RCZZ	4- 42	AA		C
"	5- 12	AA		C
PSPAY6654RCZZ	3- 10	AA		C
PSTM-6658RCZZ	9- 2	AR		D
PSTM-6660RCZZ	9- 2	AR		D
PSTM-6665RCZZ	9- 2	AR		D
PWIR-6627RCZZ	4- 7	AK		C
PZETM2326RCZZ	2- 34	AE		C
[Q]				
QCNCM6660RCZZ	6- 2	AC		B
QCNCM6699RCZZ	6- 3	AC		B
QCNCM6823RC1C	6- 4	AE		C
QCNCM6862RC0B	6- 5	AB		B
QCNCM6865RC1A	6- 6	AD		C
QCNCM6865RC1J	6- 7	AC		C
QCNCW6645RC02	4- 2	AD		B
"	5- 2	AD		B
QCNCW6730RC05	2- 40	AF		B
"	6- 8	AF		B
QCNCW6770RC03	2- 22	AF		B
"	2- 38	AF		B
"	7- 2	AF		B
QCNCW6779RC07	1- 23	AR		C
"	8- 3	AR		C
QCNCW6816RC13	1- 21	AC		C
"	8- 4	AC		C
QCNCW6836RC3H	6- 9	AL		C
QCNCW6838RC02	2- 19	AE		B
"	2- 39	AE		B
"	7- 3	AE		B
QCNCW6838RC03	2- 39	AF		B
"	7- 4	AF		B
QCNCW6869RC01	2- 38	AF		C
"	7- 5	AF		C
QCNCW-6790RCZZ	2- 14	AB		C
QCNCW-6830RCZZ	2- 10	AC		C
QCNCW-6831RCZZ	2- 35	AC		C
QCNCW-6868RCZZ	2- 36	AD		C
QCNCW-6869RCZZ	2- 9	AC		C
QCNCW-6871RCZZ	2- 21	AB		C
"	7- 6	AB		C
QCNCW-6890RCZZ	2- 30	AF		C
"	3- 42	AF		C
QCNCW-6904RCZZ	8- 5	AB		C
QCNCW-6923RCZZ	8- 6	AB		C
QCNCW-6924RCZZ	2- 6	AB		C
QCNCW-6925RCZZ	8- 7	AB		C
QCNCW-6926RCZZ	8- 8	AB		C
QCNCW-6932RCZZ	3- 45	AB		C
"	8- 9	AB		C
QFS-A1036CCZZ	8- 10	AD		A
QFS-B1002CCZZ	2- 18	AE		A
"	7- 7	AE		A
QFS-C1021CCZZ	7- 8	AF		A
QFSHA1002CCZZ	7- 9	AB		C
"	8- 11	AB		C
QFSHB1003CCZZ	2- 17	AB		C

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
QFSHB1003CCZZ	7- 10	AB		C
QSÖCZ6428ACZZ	6- 10	AE		C
QSW-M6659RCZZ	4- 41	AS		B
"	5- 11	AS		B
QTANP0004HCZZ	2- 32	AB		C
[R]				
RALMB2316RCZZ	6- 11	AL		B
RALML6636RCZZ	4- 37	AD		C
"	5- 14	AD		C
RC-CZH300RCZZ	6- 12	AD		C
RC-FZ6030RCZZ	7- 11	AH		C
RC-FZ6633RCZZ	6- 13	AP		C
RC-KZ1018CCZZ	8- 12	AE		C
RCILC6575RCZZ	7- 12	AN		C
RCILC6632RCZZ	6- 14	AQ		C
RCRSP1003CCZZ	8- 13	AT		B
RCRSP6631RCZZ	6- 15	AE		B
RMPTCB123QCJB	6- 16	AC		B
RMPTCB473QCJB	8- 14	AC		B
RMPTC4223QCJB	6- 17	AB		B
RMPTC8123QCJB	6- 18	AB		B
RPLU-6634RCZZ	4- 45	AR		B
"	5- 6	AR		B
RTRNH6727RCZZ	8- 15	AP		B
RTRNP6709RCZZ	7- 13	AZ		B
RTRNP6716RCZZ	2- 20	BA		B
"	7- 14	BA		B
RVR-MF310QCZZ	6- 19	AC		B
[S]				
SPAKA7155RCZZ	9- 4	AP		D
SPAKA7156RCZZ	9- 5	AP		D
SPAKC7422RCZZ	9- 6	AT	N	D
SPAKF7025RCZZ	9- 17	AC		D
SSAKA0001SCZZ	9- 7	AA		D
SSAKA2012KCZZ	9- 8	AF		D
SSAKA5004CCZZ	9- 10	AA		D
SSAKH3015CCZZ	9- 9	AA		D
[T]				
TCADH6653RCZZ	9- 11	AB		D
TCADH6654RCZZ	9- 11	AB		D
TCADH6698RCZZ	9- 15	AD		D
TCAUS1003RCZZ	2- 27	AC		D
TINSE6991RCZZ	9- 12	AW	N	D
TINSK6992RCZZ	9- 12	BF	N	D
[U]				
UBATN2183CCZZ	6- 20	AV		B
UBNDA1008CCZZ	9- 13	AA		C
UINK-1001CCZZ	9- 14	AK		S
"	10- 1	AK		S
[V]				
VCCCPU1HH220J	8- 16	AA		C
VCEAGU1AW108M	6- 21	AC		C
VCEAGU1CW106M	6- 22	AA		C
"	8- 17	AA		C
VCEAGU1CW108M	8- 18	AD		C
VCEAGU1CW226M	6- 23	AA		C
VCEAGU1EW108M	6- 24	AD		C
VCEAGU1HW105M	6- 25	AA		C
VCEAGU1HW227M	8- 23	AC		C
VCEAGU1HW476M	8- 24	AB		C
VCEAGU2AW226M	8- 25	AB		C
VCE9HE2EP104K	7- 15	AK		C
VCKYPU1HB101K	8- 19	AA		C
VCKYPU1HB102K	8- 20	AA		C
VCKYPU1HB222K	6- 26	AA		C
"	8- 21	AA		C
VCKYPU1HB331K	6- 27	AA		C
"	8- 22	AA		C
VCKYPU1HB471K	6- 28	AA		C
VCQYKU1HM152K	8- 26	AA		C
VCQYKU1HM683K	8- 27	AB		C
VCSATU1AE226M	8- 28	AD		C
VCTYPU1NX104M	6- 29	AB		C
VHDDS1588L2-1	3- 35	AB		B
"	6- 30	AB		B
"	8- 29	AB		B
VHDS4VB10///-1	7- 16	AL		B
VHD1SS82///-1	8- 30	AB		B
VHD1S1834///-1	8- 31	AE		B
VHD1S2596///-1	6- 31	AG		B

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