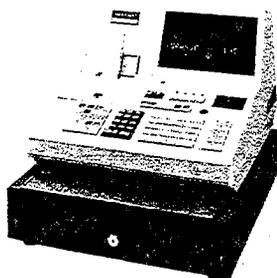


SHARP

SERVICE MANUAL



MODEL ER-4230

ELECTRONIC CASH REGISTER

PRINTER : Model-220F
 SRV KEY : LKGIM6861RCZZ
 (No Mode Key No.)

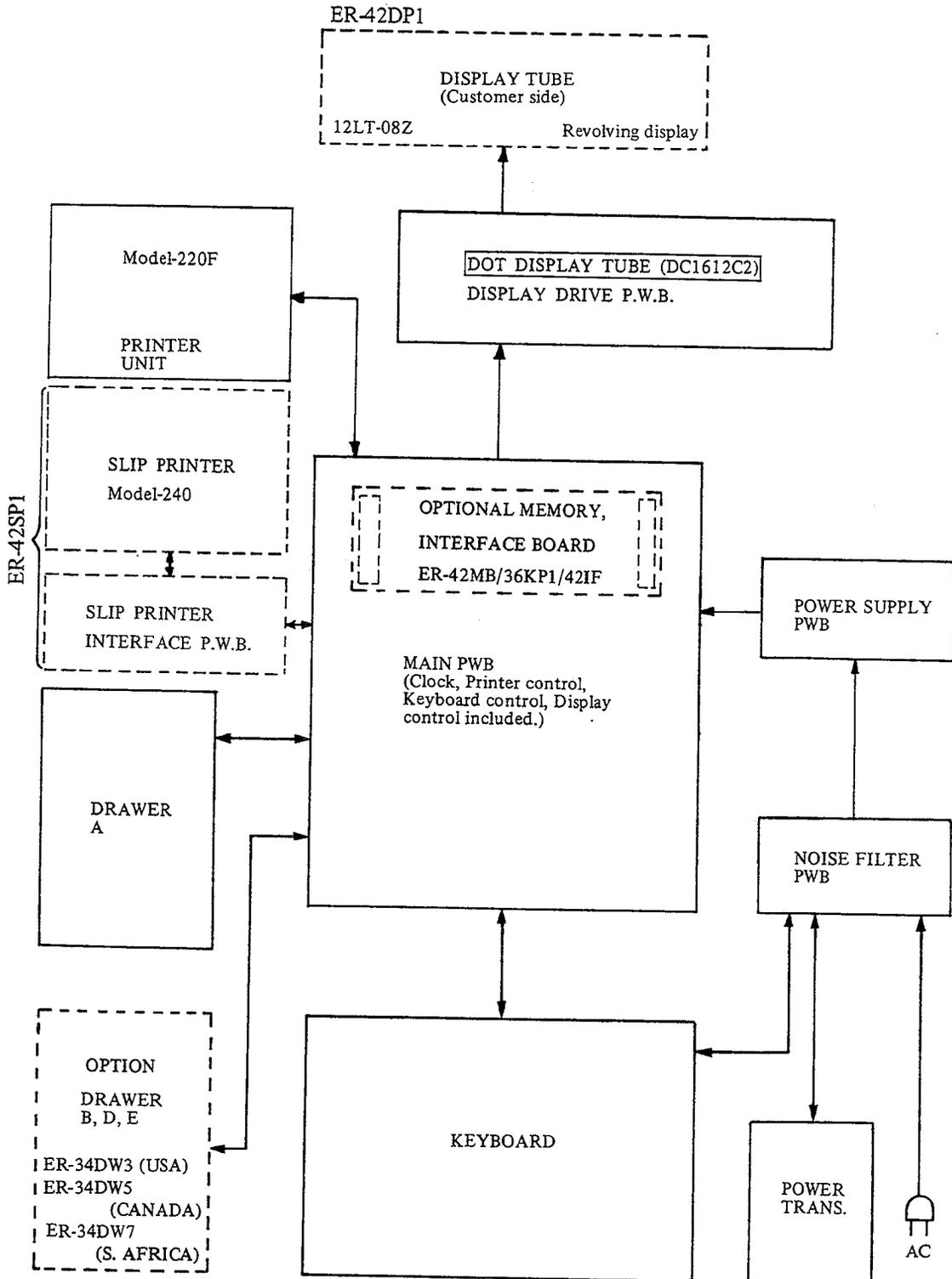
CAUTION

EXTREME CAUTION MUST BE TAKEN WHEN SERVICING THIS MACHINE. EVEN THOUGH THE MODE SWITCH IS IN THE OFF POSITION, VOLTAGE IS STILL SUPPLIED TO THE ENTIRE MACHINE. WHEN WORKING ON THIS MACHINE MAKE SURE THAT THE POWER CORD IS REMOVED FROM THE WALL OUTLET.

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1. INTERNAL BLOCK DIAGRAM



The blocks indicated with dotted line are optional devices.

2. SPECIAL SERVICE TOOLS

Tool Name	Tool Code	Price Rank
Expansion cable with* 30-pin connectors for optional P.W.B.	UKOGG0061CSZZ	BF
Flexible cables with a P.W.B. (40 pins) for Data Pack ER-67LD1	CPWBN6910RC01	AZ
Service battery with 2-pin connector for Main P.W.B. and optional memory P.W.B. (ER-42MB/36KP1)	CKOG-6626RCZZ	AX

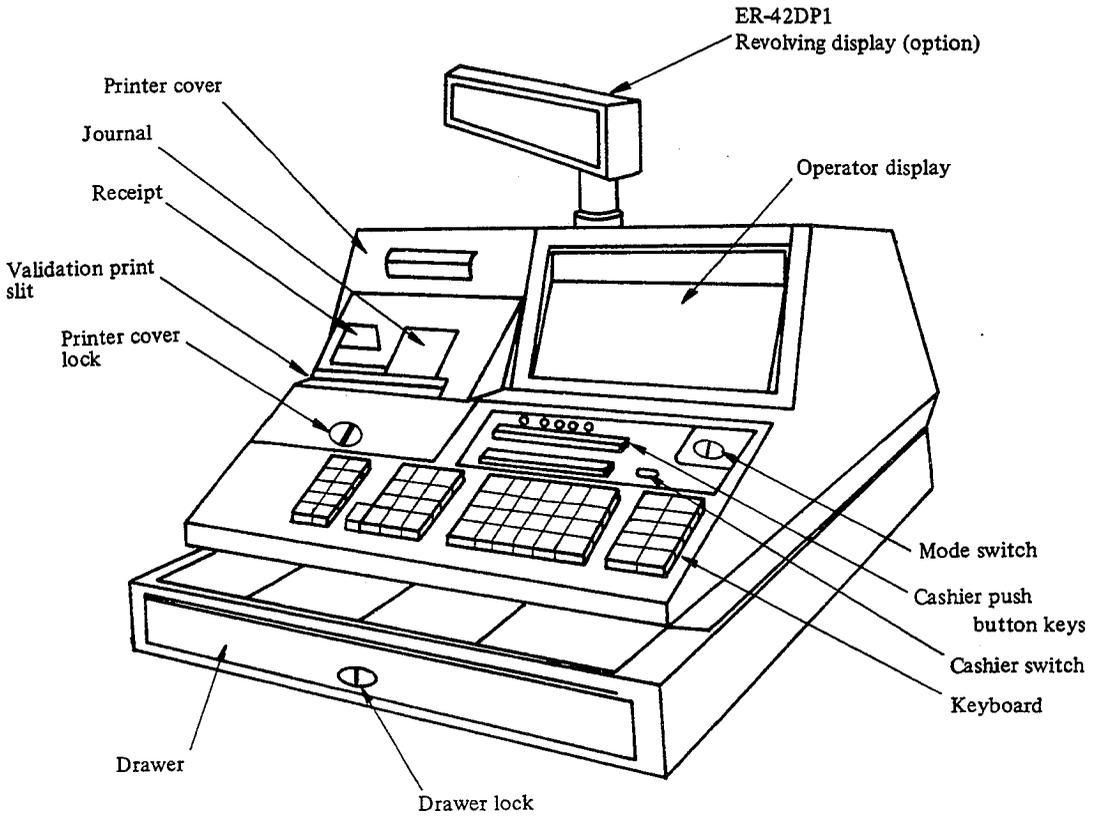
Note) * 2 pcs. are required. (for ER-42MB/36KP1/42IF)

REFERENCE DOCUMENTS

1. Cash Register Basic Manual
2. Printer Model-220F Service Manual (00ZM220F-SM-E)
3. Option Service Manual for ER-4230 (00ZER42PTSM-E)

3. SPECIFICATIONS

3-1. APPEARANCE

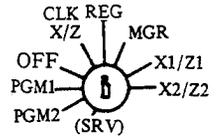
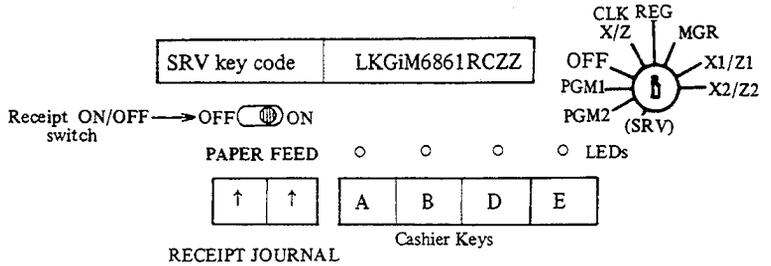


3-2. RATING

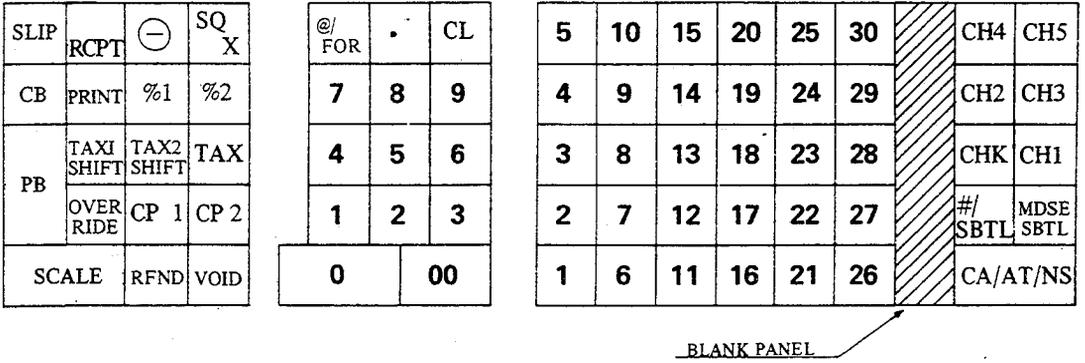
Power source	AC rating $\pm 10\%$
Power consumption	57W (max.)
Operating temperature	0°C to 40°C
Overall dimensions	407(H) x 440(W) x 507(D) mm
Weight	18.2 kg (40 lbs)

3-3. KEYBOARD

1) Key Layout



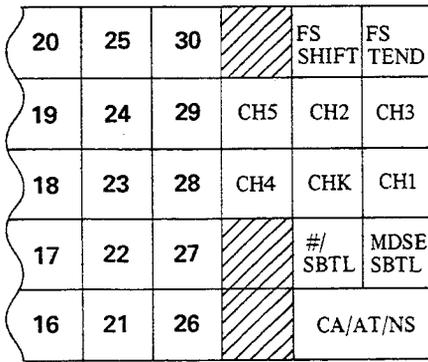
(option) STANDARD



Notes:

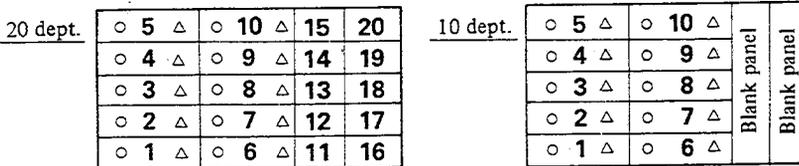
- The manual scale function is already available in this model.
- PLU/SUB key cannot function without optional RAM; but the key-top "PLU/SUB" is supplied as a standard accessory.
- The food stamp function is available when the following key layout is employed. * ER-11KT/11DK

* ER-11KT is not available in U.S.A.



Remove the blank panel and mount three dummy keys as well as the CH4 and CH5 keys.

- The key layout can be changed in response to the change in the number of departments.



• Change the key layout as shown above and change the SRV programming properly as well.

NOTE)

○ : Key lever (contact), △ : Key guide

KEY NAME	KEY TOP LABEL	DESCRIPTION
Receipt feed	↑	• Paper feed occurs continuously while this key is pressed.
Journal feed		
Cashier push keys	A ~ E	<ul style="list-style-type: none"> • The corresponding LED lights up with depression of each push button cashier key "A" thru "E." • Any push button cashier key "A" thru "E" can be pressed when used with the "K" key. (The corresponding LED lights up.)
PLU/sub key	PUL/SUB	<ul style="list-style-type: none"> • PLU registration • Sub-department registration
Received on account key	RA	<ul style="list-style-type: none"> • Entry of the amount received on account • Received-on-account in-cash function works when tendering is impossible.
Paid out key	PO	• Paid out in cash
Numeric keys	00.0,1 ~ 9	
Decimal point key	.	• Entry of a percentage, weight, length, etc. (numeric entry is possible down to three decimals.)
At for key	@/FOR	• Separator for the entry of (1) q'ty x unit price or (2) q'ty of purchase x no. of packages x unit price.
Square multi, key	SQ. X	Separator for the entry of length x length, unit area x length (or reverse), etc.
Receipt key	RCPT	Total receipt issue after finalizing.
Clear key	CL	Clear the numeric entry
Print key	PRINT	Item and total validation key.
Scale key	SCALE	Separator for tare entry and weight entry.
Override key	OVER-RIDE	HALO, LALO override for dept. and subdept.
Amount discount key	⊖	Amount discount
Percent 1 key	%1	Percent discount or premium key
Percent 2 key	%2	
Coupon 1 key	CPI	Manufacturer's coupon
Coupon 2 key	CP2	Store coupon
Tax 1 shift Tax 2 shift	TAX 1 SHIFT TAX 2 SHIFT	Taxable/non taxable state reversal key
Food stamp shift key	FS SHIFT	Food stamp able state reversal key
Food stamp tend key	FS TEND	Food stamp tendering and FS subtotal key
Manual tax key	TAX	Manual tax entry key
Refund key	RFND	Refund/not refund state reversal key
Slip key	SLIP	Slip print key
Credit balance key	CB	Credit balance pick up key
Previous balance key	PB	Previous balance pick up key
Clerk # key	CLK #	Clerk ID # entry key

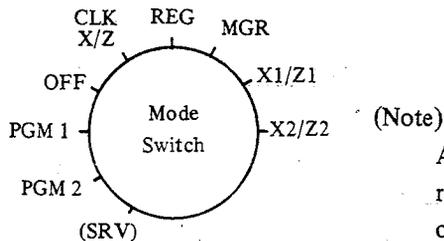
KEY NAME	KEY TOP LABEL	DESCRIPTION
Void key	VOID	(1) Last item void (REG, MGR) (2) Past item void (REG, MGR) (3) Void mode entry (MGR)
Department key	1 ~ 30	
Check key	CHK	(1) Finalizing in check (2) Check tendering
Charge key	CH1 ~ CH5	(1) Credit usage (tendering enforced) (2) House charge
Non add or subtotal key	#/SBTL	(1) Non add key (2) Subtotal with tax read (3) Time display
Merchandise subtotal key	MDSE SBTL	Net merchandise subtotal read
Cash/amount tender/no sale key	CA/AT/NS	(1) Finalizing in cash (2) Amount tendering in cash (3) No sale

2) Mode Switch and Mode Keys

Four types of mode keys are supplied with the ER-4230; three of them are for users and the other – service key is only for dealers.

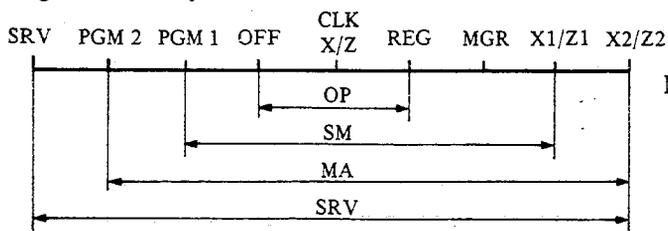
The operative range of each key and the available modes are as follows.

1. Mode switch



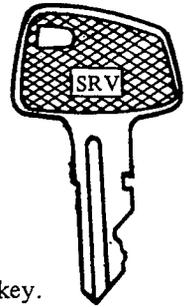
All keys can be inserted or removed from mode switch only at the "OFF" and "REG" positions.

2. Operative range of mode keys



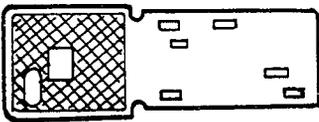
3. Major function of each mode

- SRV mode: ★ This mode can be selected with the SRV key.
- Machine initialization (partial, full)
 - Feature selection
 - List of options
 - Special data correction
GT1, GT2, GT3, Z1/Z2 counter, etc.
- PGM 2 mode: ★ This mode can be selected only with the SRV or MA key.
- Programming data of store control level that does not need to be frequently modified.
- PGM 1 mode: ★ This mode can be selected with any keys other than the OP key.
- Programming of departmental unit price, PLU unit price, %1 and %2 rates, etc.
- OFF mode: ★ Any key can be inserted or removed from the mode switch when it is in the "OFF mode" position.
- Turns off the display (Power is not turned off.)
- CLK X/Z mode: • Individual reading and resetting for cashiers or clerks.
- REG mode: ★ Any key can be inserted or removed from the mode switch when it is in the "REG mode" position.
- General registrations
- MGR mode: ★ This mode can be selected with any keys other than the OP key.
- All REG-mode operations and transaction void.
 - Overriding of pre-set limitation in the REG mode.
- X1/Z1 mode: • Reading and resetting of daily general reports.
- Generation of various analysis reports.
- X2/Z2 mode: • Reading and resetting of periodically accumulated reports.
- Generation of analysis reports.



3) Cashier keys (A, B, D, E, K and M)

(1) Cashier A, B, D, and E keys :



These keys serve to identify cashiers. Put one of the A, B, D, and E keys in the cashier switch. The LED lamp above the associated cashier push-button key lights up and the machine is ready for operation.

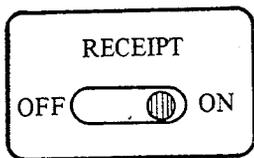
(2) Cashier K key (master cashier key)

The manager will use this key when he or she operates the register as a cashier. Putting this key in the cashier switch enables the operation of every cashier push-button key (A , B , D , E), so the manager can operate the machine regardless of which cashier is selected.

(3) Cashier M key

You will use this key when your machine is equipped with the optional inter-register communication system. This key cannot be used as a cashier key.

(4) Receipt ON-OFF switch

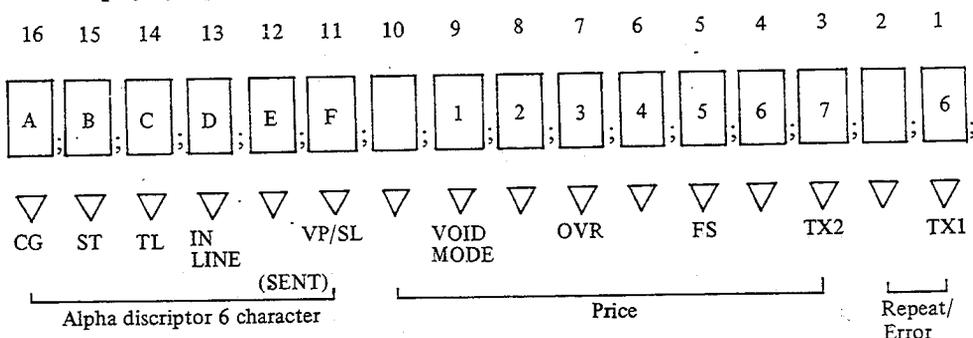


This switch permits or prohibits receipt generation. To permit printing on the journal alone without receipt generation, slide the switch to the OFF position. To permit printing on both the journal and the receipt, slide the switch to the ON position.

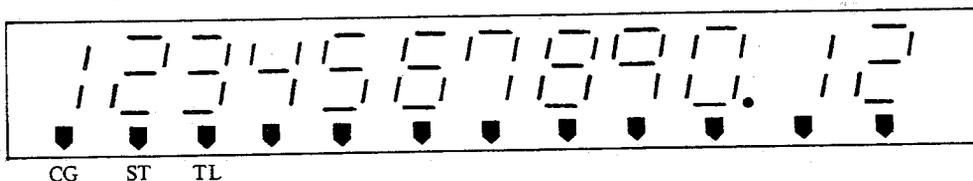
Note: The register will generate receipts regardless of the position of this switch except when the mode switch is in the REG position. That the receipt roll must be installed even when this switch is kept in the OFF position.

3-4 DISPLAYS

1. Operator display (Display tube : DC1612C2)



2. Customer display (Display tube : 12LT-08Z) --- Revolving display (option : ER-42DP1)



★ The number of repeats is displayed from "2" and counted up with each repeat. When you've registered ten times, the display shows "0."

Example: (2 → 3 → 4 9 → 0 → 1 → 2)

3. Machine state indicator lamps

- CG: Lights up whenever the change due amount appears in the display or when the total sale amount is negative.
- ST: Lights up alone or together with other lamps when the register has computed sub-totals:
 - This lamp lights up alone when the tax-included subtotal or merchandise subtotal has been figured out.
 - 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 computed.
- The “ST” and “FS” lamps light up when the food stamp eligible subtotal has been computed.

TL: Lights up when you finalize a transaction by pressing the **CA/AT/NS** , **CHK** , or **CH1** thru **CH5** without any amount tendered entry.

(SENT): Lights up when the cash/check in drawer exceeds a programmed sentinel amount.

VP/SL Lights up when the machine is set for compulsory validation printing or slip printing.

VOID: Lights up when the void (VOID mode) takes place.
MODE

OVR: Lights up when the override entry is enabled with the **OVERRIDE** key.

IN LINE: Lights up only when the register is equipped with the optional interregister communication system and during data transmission.

FS: Lights up when an item eligible for food stamps is entered. (for U.S.A. only)

TX1: Lights up when a taxable 1 item is entered.

TX2: Lights up when a taxable 2 item is entered.

o Machine state symbols

P : Appears in the 1st place — where the number of repeats appears — during programming or when the journal roll nears end.

E : Appears in the 1st place when an error is detected.

— : Appears when an entry into a minus department or PLU/subdept. or of discount, (Floating) deduction, coupon, or refund is made or corrected.

CLOSE 1: Appears when the machine is in the machine close-1 state caused by the machine close operation (90 → #/SBTL → CA/AT/NS) in the X1/Z1 mode. Refer to page 67.

CLOSE 2: Appears when the machine is in the machine close-2 state caused by a resetting operation in the X1/Z1 or X2/Z2 mode when the machine has been programmed for “MACHINE LOCK-UP” in the SRV mode (JOB#904-A).

Refer to pages 47 and 68.

DUE: Shown at tendering stage after the RA key operation, which indicates # that is due to be entered into cash or check amount. Refer to page 18.

VD: Appears when a void item is entered.

RF: Appears when a refund item is entered.

@: Appears when a number is entered with @/FOR key

X: Appears when a number is entered with SQX key

/: Appears when a split pricing number is entered.

CG: Appears with a food stamp change or cash change.

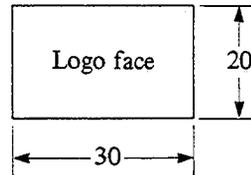
3-5 PRINTER

(1) Overview of the printer

- a. Printing system: 2-station print dot matrix printer (M-220F)
- b. Printing capacity: 15 digits in all (15 digits for both receipt and journal)
- c. Printing speed: about 2.4 lines/sec.
- d. Paper feeding speed: about 14.2 lines/sec. (receipt) about 7.1 lines/sec (journal)
- e. Functions:
 - Sampling
 - Receipt ON-OFF and journal select function.
 - Individual receipt and journal paper feeding.
 - One-line validation printing.
 - Validation slip paper detection. (journal side only)
 - Journal paper roll end sensing.
- f. Paper width: 37.5 ± 0.5 mm for receipt and journal, max. roll diameter: 80 mm.
- g. Paper quality:
 - Receipt and journal paper: bond paper (0.07 to 0.09 mm in thickness 52.3 to 64.0 g/m² in weight).
- h. Reliability: MCBF 2 mill. line. (excluding print head unit) Print head unit: 40 mill. characters (life)
- i. Color of print: Purple (single color)
- j. Paper cutter: Manual cutter.
- k. Ribbon cassette: Life: about 6 mill. characters.

(2) Logo unit

- a. Type: Porous rubber.
- b. Color of stamp: Purple (single color)
- c. Max. logo dimensions: 30(W) x 10(H) mm



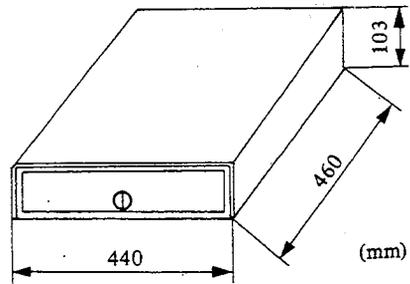
(3) Validation printing

- 1. Number of validation printing lines: 1 line.
- 2. Number of validation columns: 35 digits
- 3. Recommended validation card
 - 3-1 Type of paper : ordinary paper
 - 3-2 Minimum paper width: 130 mm (5.12 inches)
 - 3-3 Paper thickness
 - ordinary paper 0.07 ~ 0.15 mm

3-6 CASHDRAWER/LOCK/ACCESSORIES

1. Drawer

- Large-size metallic drawer (New type)
- Open/close operation (with microswitch)



2. Lock

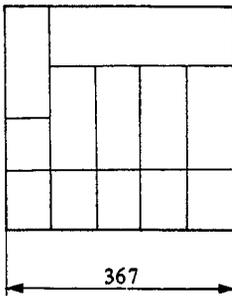
- 1) Drawer lock (key No. : B01), South Africa: No. 035
 - To open the drawer, turn the key clockwise 180 degrees.
 - To close the drawer, turn the key counterclockwise 180 degrees.
- 2) Printer cover lock (key No. : 224)
 - To open the printer cover, turn the key clockwise 90 degrees.
 - To close the printer cover, turn the key counterclockwise 90 degrees.

3. Accessories

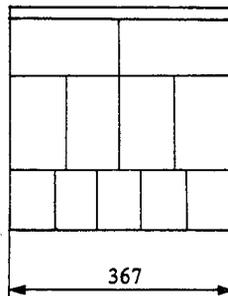
Paper roll	2	Standard logo (mounted on the main body)	1
Ink ribbon	1	Logo ink	1
Operator key (OP)	2	Dust cover	1
Sub-master key (SM)	2	Take-up spool	1
Master key (MA)	2	Instruction manual	1
Drawer key (B01)	2	Warranty card	1
Printer cover key (224)	2	Cashier key; A, B, D, E, K, M	2 each

4. Drawer

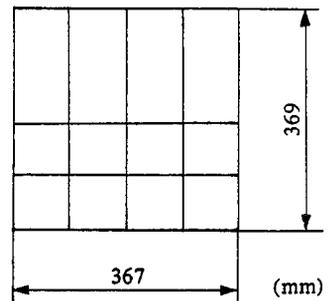
(1) U.S.A., PANAMA, general



(2) CANADA



(3) SOUTH AFRICA



3-7 TOTALIZERS AND COUNTERS

Item	Digits
GT1 ~ GT3	12S
Z1 Counter	4
Department (#1 ~ #30)	
Sold amount	8S
Quantity	6S
(Preset price)	6
Plus real department total	8S
Minus & department total	8S

S: sign

Item	Digits
Plus hash dept total	8S
Minus hash dept total	8S
Net taxable 1 subtotal	8S
Real sales tax 1 total	8S
Refund tax 1 total	8S
Net tax 1 total	8S
Net taxable 2 subtotal	8S
Real sales tax 2 total	8S
Refund tax 2 total	8S
Net tax 2 total	8S
Net manual tax total	8S

Coupon 1 ~ coupon 2	
Amount total	8S
Activity count	4S
%1, %2	
Amount total	8S
Activity count	4S
(Rate, sign)	4S
Discount ⊖	
Amount total	8S
Activity count	4S
Net sales total	8S
Coupon like PLU	
Amount total	8S
Activity count	4S
Non add activity	
Count	4S
No sale activity	
Count	4S
Validation count	4
Slip print count	4
Customer count	4S
Whole sales total	8S
Foodstamp	
Tendering count	4S
Sales total	8S
In drawer total	8S
Cash change	
For FS tendering	8S
CH 1 ~ CH5	
Amount total	8S
Activity count	4S
Check	
Amount total	8S
Received check count	4S
Cash	
Sales total	8S
Transaction count	
Paid by cash	4S

Tax including sales total	8S
Item void total	
Amount total	8S
Activity count	4S
Item total in void mode	
Amount total	8S
Activity count	4S
Void transaction	
Amount total	8S
Activity count	4S
Refund	
Amount total	8S
Activity count	4S
Hash dept. void	
Amount total	8S
Activity count	4S
Hash dept. refund	
Amount total	8S
Activity count	4S
RA	
Amount total	8S
Activity count	4S
CH1 ~ CH5 in RA	
Total	8S
Count	4S
Check in RA	
Total	8S
Count	4S
Cash change for	
CH1 ~ CH5 and CHK	
Tendering in RA	8S
Cash in RA	
Total	8S
Count	4S
CH1 ~ CH5 in drawer	8S
Check in drawer	8S
Cash in drawer	8S
Customer counter	4
Each cashier's (A ~ E)	
Totals and counts	
Customer count	4S
Sales amount	8S
Cash in drawer	8S

Cash change for CH1 ~ CH5 and check tendering	8S
Paid out	
Amount total	8S
Activity count	4S

PO Amount total	8S
Activity count	4S
RA Amount total	8S
Activity count	4S
Refund	
Amount total	8S
Activity count	4S
Void (Item void)	
Amount total	8S
Activity count	4S
Coupon 1, Coupon 2	
Amount total	8S
Activity count	4S
FS in drawer	8S
CH 1 ~ CH5	
Amount total	8S
Activity count	4S
Check	
Received check total	8S
Received check count	4S

**ADDITIONAL TOTALIZERS AND COUNTERS
INSTALLED BY OPTIONS**

Item	Digits
Hourly sales (24 slots) Sales amount per one time slot	8S
Customer count per one time slot	4S
PLU/Sub sales total (Max. 512)	
Amount total	8S
Quantity	6S
(Price)	6
Stock count	6S

Monthly dept. total	
Amount total (126 dept. max.)	8S
Quantity (126 dept. max.)	6S
Z2 counter	4
Plus real sales total	8S
Minus sales total	8S
Hash plus sales total	8S
Hash minus sales total	8S
Clerk sales total (20 clerks)	8S
Previous balance look up	
PB amount total	8S
text	6

4. OPTION LIST

Model name	ER-36KP1	ER-36KP2	ER-42MB	ER-45PL4	ER-42IF	ER-45DI	ER-45SI	ER-11DK	ER-11KT*	ER-67LD1	ER-67RA1	ER-42LD1	ER-42TR	ER-42SL	ER-42MA	ER-42SP1	ER-42DP1
Optional function	○	○															
Department Expansion (key pad)	○																
PUL/sub-department			○														
PLU stock control			○	○													
Previous Balance Look up			○	○													
Monthly dept. report hourly report			○	○													
Coin dispenser controller					○	○											
Auto scale entry					○		○										
Food stamp function								○	○								
Data pack (level 1)										○	○						
Data pack (level 2)			○							○	○	○					
IRC (slave)			○	○									○	○			
IRC (master)			○	○									○	○			
Slip printer																○	
Revolving display																	○
Remote drawer	ER-34DW3 (U.S.A.), ER-34DW5 (CANADA), ER-34DW7 (SOUTH AFRICA)																

(Note) ○ : Required model * ER-11KT: Not available U.S.A.

For descriptions of the optional devices, refer to the ER-4230 option service manual (00ZER42PTSM-E)

5. OUTLINE OF FUNCTIONS

1. Item registration

- 1) Dept.: Unit price preset (6D, max)
Single cash sale, single item finalize
Plus/minus
Hash/Non hash
Taxable 1, 2, food stampable
Scale enforce/inhibit
HALO, LALO, validation enforce, inhibit/open enforce/preset enforce/
open or preset, grouping preset for analysis report.
- 2) PLU/sub: Unit price preset (PLU)
Dept. assignment
Taxable 1, 2, food stampable
Inhibit/usable/PLU/subdepartment
HALO, LALO (sub dept.)
Plus/minus
Scale enforce/inhibit (through assigned dept)
Denominator for split pricing
- 3) CP1, CP2 : Store coupon, manufacturer's coupon HALO, LALO
(CP1) (CP2)
- 4) %1, %2 : Plus/minus
Subtotal % (%1)
Item % (%2)
- 5) \ominus : Subtotal amount discount
HALO, LALO
- 6) Manual tax: HALO, LALO
- 7) Tax delete:
- 8) Past and last void
- 9) Non add
- 10) Refund registration
- 11) Transaction void
- 12) Previous balance (PB) and credit balance (CB) registration
- 13) Previous balance look up

(Note) Special registrations include:

Repeat, multiply, square multiply, split pricing, manual scale
(with or without split pricing) and auto scale (option) registrations.

2. Finalizing

- 1) Cash: With change calculation
- 2) Check: With tendering limit (high, low) change limit
- 3) Charge (1 ~ 5): Presetable for hash media
- 4) Food stamp:
- 5) Paid out: With HALO, LALO
- 6) Received on account: Cash only/with tendering selectable, HALO, LALO

3. Others

- 1) Validation: Enforce/optional
Max. limit
Item/Amount tendered/Transaction total
- 2) Receipt issue after finalizing: Total receipt
- 3) Clock function: Display & printing

6. NEW FUNCTIONS

1) Sub-department (Open PLU) Function (Option)

A maximum of 512 PLU/SUBs can be added by installing the required number of RAM options. (One 2K-bytes RAM allows an increase of 93 PLUs.)

A sub-department is a PLU that does not have a programmed preset price. Any or all available PLU's may be used either as PLU's or as sub-departments. A sub-department cannot be used as a PLU.

(Ex.) A machine with 100 available PLU's may be programmed for any combination of PLU's and sub-departments equal to 100. For example, 50 PLU's and 50 sub-departments, 75 PLU's and 25 sub-departments, or 99 subdepartments and 1 PLU.

It should be noted that the use of sub-departments is an expansion of the number of departments through the PLU memory.

When performing PLU registrations, a preset unit price may be used. When the PLU is used as a sub-department the unit price must be entered manually.

The same memory can be used as sub-department memory by programming it for in the PGM1 mode sub-department to each free code (sub-dept. No.)

PLU/SUB, which is given specialized amount and quantity totalizers, is not reset even when a dialy general Z report is taken. (Independent resetting function is provided.)

2) • HALO, LALO (Amount limitation) function

- The ER-4230 is programmed for the amount limitation table, which serves to check the higher and lower limits of amount entries in various registrations.

15 pairs of higher and lower amount limits are provided.

- For those functions that should be limited in amount entry, element numbers – shown in the amount limitation table – corresponding to respective higher and lower limits are programmed.
- For details, refer to page 52.

3) Override Entries (MGR mode)

You are not allowed to make any REG- or MGR-mode entries that violate programmed amount entry limits; and if you attempt them, the machine detects an error. However, you can achieve department and subdepartment entries alone by using the OVER-RIDE key in the MGR mode. For instance, when you ring up the amount \$10.00 to a department (dept. 1) or a subdepartment (code no. 250) whose programmed amount entry limits are \$1.00 (lower limit) and \$9.99 (upper one), follow the procedure below.

1. Ring-up to department 1.

- (1) Turn the mode switch to the MGR position.
- (2) Enter the amount as 1000.
- (3) Press the OVER-RIDE key. This illuminates the “OVR” lamp in the display.
- (4) Press the department key “1.”
- (5) Turn the mode switch to the REG position.

```

4:47AM12/06/82
101#0017 B 0001
OVER RIDE
001DPT $10.00
CASH $10.00
  
```

OVER-RIDE
This mark is not printed on the receipt.)

2. Ring-up to a subdepartment (code no. 250)

- (1) Turn the mode switch to the MGR position.
- (2) Enter the subdepartment code no. 250.
- (3) Press the OVER-RIDE key. This illuminates the “ OVR” lamp in the display.
- (4) Press the PLU/SUB key.
- (5) Enter the amount as 1000.
- (6) Press the PLU/SUB key.
- (7) Turn the mode switch to the REG position.

```

4:45AM12/06/82
101#0016 B 0001
OVER RIDE
250PLU $10.00
CASH $10.00
  
```

Note: The standard register allows override entries only in the MGR mode but can also be set to allow them in the REG mode. Refer to SRV mode JOB# 904-B. (Page 31)

[CORRECTION AFTER FINALIZING A TRANSACTION (AFTER GENERATING A RECEIPT) MGR mode.

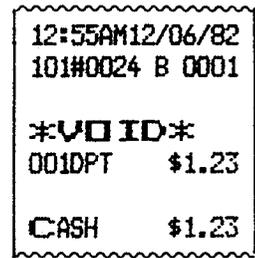
When you need to void incorrect entries that a cashier cannot correct (incorrect entries that are found after finalizing a transaction or cannot be corrected by direct or indirect void), follow this procedure in the MGR mode.

- (1) Turn the mode switch to the “MGR” position.
- (2) Press the VOID key to put your register in the VOID mode. The “ VOID MODE” lamp lights up in the display to tell you that the register is in the VOID mode.
- (3) Repeat the entries that are recorded on an incorrect receipt, then cancel the receipt.

Note: The machine leaves the VOID mode whenever a receipt is cancelled. Therefore,

you need to repeat steps (2) and (3) above when you cancel two or more incorrect receipts.

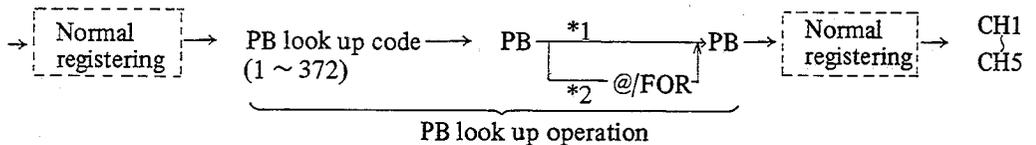
Sample of Receipt for VOID operation



4) PB (Previous Balance) Look Up Function

1. The purpose of the PB look up function is to automatically read the previous balance amount (8 digits max. with +/- sign) and the ALPHA/number characters (6 characters) by using PB look up codes (1 ~ 372).
2. The PB look up function may be enabled in the SRV mode JOB#914-A. When the PB look up function has been enabled, RAM6 and RAM7 on the optional memory board (ER-42MB) will be used as PB look up memory. Therefore RAM6 and RAM7 can not be used for PLU/sub-dept., memory.
 (NOTE) 1. Max. # of PLU/sub-dept. will be limited to 372, when PB look up function is furnished through SRV programming JOB#914-A.
 2. The usage of "CB" key causes a lock error (released by CL key), and the operation of the "PB" key is slightly changed as follows.
3. Character (EX. room # in a hotel) settings are required for each PB look up code in the PGM2 mode (item 19).
4. Key sequence for the PB look up;

① Registration



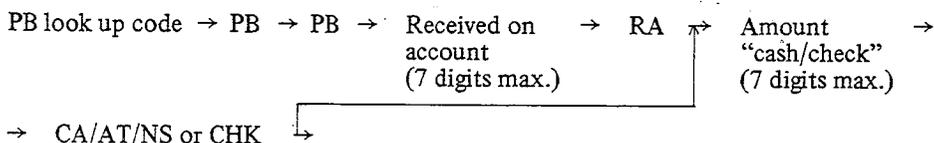
*1: Previous balance (PB) look up without empty file search.

*2: Empty file search will be started by depressing the @/FOR key.

The search is performed by incrementing the file # until an empty file is located.

- Registration including PB look up operation should be treated as a charge transaction. Therefore the registration can only be finalized by keys CH1 thru CH5.

② Payment



∴ Display "DUE" during payment operation indicates that cash or check amount should be entered by using CA/AT/NS or CHK key.

< EXAMPLES OF PB LOOK UP OPERATION >

EX.	STEP #	KEY OPERATION	DISPLAY	NOTE
EX. 1	1	226	226	
	2	PB	RM#226 10.05	
	3	PB	RM#226 10.05	Printed on R & J
EX. 2	1	116	116	
	2	PB	RM#116 40.50	
	3	@/FOR	RM#201 0.00	
	4	PB	RM#201 0.00	Printed on R & J

*1 *2

*1. Characters which have been programmed in the PGM2 mode.

*2. Previous balance amount/PB look up code (File #).

EX.1 Step 1. File # entry

Step 2. The contents of File #226 is displayed.

Step 3. Readout file is printed on receipt and journal and the same contents are loaded into slip print buffer.

EX.2 Step 1. and Step 2. Same as EX. 1

Step 3. File #116 thru #200 are occupied. (zero file search is performed).

Step 4. Same as EX. 1 - Step 3.

NOTE: These procedures can be performed at any time before entering into the tendering stage.

5) Clerk #

Accountability for clerk sales activities is provided as a standard feature.

- Programmable 4-digit clerk ID #. (PGM2 mode, item 17)
- Totalizers and activity counters for 20 clerks are available.
- By designation of clerk # at the head of each transaction in the REG/MGR modes, the registered amount and quantity go to the totalizer and counter of the clerk who has been designated.

< Clerk # entry key sequence >

CLK # → Clerk code*(#) → CLK # → Registering or Individual clerk reading, resetting...

*NOTE: The clerk code (#) must be a number which has been preset in the PGM1 mode (item 17).

6) PB (Previous Balance) and CB (Credit Balance) Function

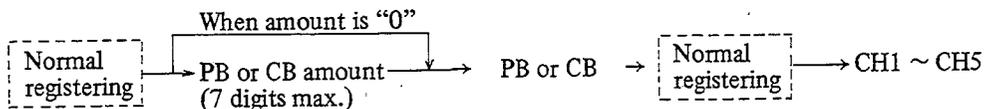
1. Manual balance pick up registration is available by using "PB" and "CB" keys in the REG and MGR modes.

PB key: For positive balance pick up

CB key: For negative balance pick up

2. PB and CB registration can be initiated at any time before entering the tendering stage.
3. Allowable times of PB and CB registrations are not limited in one transaction.
4. Key sequence for the PB and CB registration.

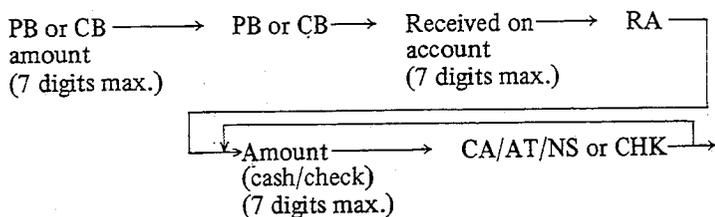
① Registration



NOTE)1. Registration including the PB or CB registration, should be finalized by one of the charge keys (CH1 ~ CH5).

2. If PB operations are performed twice in one transaction, totals of two previous balance amount will be added together.
3. When the optional PB look up function has been enabled through the SRV JOB#914-A, the manual balance pick up (PB, CB) function will be inhibited.
Refer to the section of "PB Look Up function" on page 18.

② Payment



7) Machine Close Function

Two types of machine close state are available in this machine.

1. Machine close-1 Display: CLOSE 1
2. Machine close-2 Display: CLOSE 2

When the machine is in the machine close state, the machine does not do any registering or programming operations until the close state is released. For details, refer to pages 47, 67 and 68.

**7.. QUICK REFERENCE TO PROGRAM JOB NUMBERS
AFFECTING KEYS, FUNCTIONS AND REPORTS -- 1**

SUBJECT

PROGRAMMING

KEYS:

	SRV	PGM-2	PGM-1	REF. PAGE
	JOB #	JOB #	JOB #	
RCPT (Receipt After Total)-----	902, 912			28, 42
PRINT (Validation)-----	902, 909, 912	210, 255		27, 37, 41 54, 60
TAX 1/TAX 2 SHIFT-----	903, 912			29, 41
TAX-----	904 903, 910 912	233		29, 30, 38, 41, 59
OVER-RIDE (HALO/LALO)-----	904, 912			31, 41
SCALE-----	902, 905, 910			28, 34, 39
⊖ (Dollar Discount)-----	912	232		42, 59
%1/%2 (Mdse Sbt/Item)-----	904, 912	230	130	31, 32, 58
CP1/CP2 (Mfr/Store)-----	904, 909, 912	231, 234		31, 32, 41, 58, 61
RFND-----	910	257		38, 60
VOID-----	910	257		38, 60
SQ X (Square Multiply)-----	912			42
@/FOR, CL-----	903, 911	233		29, 39, 59
PLU/SUB-----	901, 904 914	221, 224	121, 120 122	26, 31, 44, 56, 57, 61,
RA-----	903, 909, 911	233		29, 30, 37, 39, 59
PO-----	903, 909, 911	233		30, 37, 39 59
Departments (Main Keyboard & Remote Keypads)	901, 904,	210, 211, 212, 213, 214	110	27, 31, 54, 55, 61
FS SHIFT/FS TEND-----	902, 911	211, 221, 231, 232		27, 40, 55, 57, 58, 59
CH1 - CH5-----	907, 908, 909, 911	233 234		34, 35, 36 37, 40, 59, 61
CHK-----	908, 909, 911	233 234		36, 37, 40 59, 61
SLIP-----	913, 914	258		42, 43, 44, 61

CB -----	910	234		39, 61
PB -----	910, 913	234		39, 43, 61
CLK # -----	910, 914		140	39, 44, 61

**QUICK REFERENCE TO PROGRAM JOB NUMBERS
AFFECTING KEYS, FUNCTIONS AND REPORTS - 2**

SUBJECT

PROGRAMMING

KEYS: (Continued)

	SRV	PGM-2	PGM-1	REF. PAGE
	JOB #	JOB #	JOB #	
#/SBTL -----	903, 911			30, 40
MDSE SBTL -----	904, 911	233		30, 40, 59
CA/AT/NS -----	908, 909			35, 37
A, B, D, E (Cashiers) -----	906			34

OTHER FUNCTIONS:

VOID MODE -----	901			26
DATE FORMAT -----	902	250		27, 49
IRC -----	902			28
PROGRAM/MEMORY LOADER(DATA PACK)	902			28
TIME -----		251		50
CONSECUTIVE # -----	903	253		29, 50
COMPULSORY DRAWER CLOSED -----	903			29
KEY TONE -----	903			29
NO-SALE -----	903			30
"SHARE %" -----	904			32
"HASH" DEPTS. -----	904			33

ZERO-PRINT SKIP-----	904		33
ROUNDING-----	905		33
RESET GT'S 1-3, on Z1-----	905		33

**QUICK REFERENCE TO PROGRAM JOB NUMBERS
AFFECTING KEYS, FUNCTIONS AND REPORTS - 3**

SUBJECT

PROGRAMMING

	SRV	PGM-2	PGM-1	REF. PAGE
<u>OTHER FUNCTIONS:</u> (Continued)	JOB #	JOB #	JOB#	
LB or KILO; TARE ENTRY-----	905			34
COMPULSORY AMOUNT TEND.-----	908			35, 36
CHANGE ON CHI - 5-----	908			36
COMPULSORY VALIDATION-----	909, 910			37, 38
SET Z1, Z2 COUNTERS-----	917, 918			44, 45
SET GT1, GT2-----	919, 920 921, 922			45
HALO, LALO-----		211, 221, 231, 232, 233, 242, 243		53, 55, 57 58, 59
PRICE-----		210	110, 120	54, 56
TAX TABLES, TAX RATE-----		240, 241		51, 52
MACHINE #-----		252		50
JOURNAL PRINT-----		254		60
TRAINING MODE-----			157, 158	65
COIN DISPENSER-----	902			28
PB LOOK UP-----	901, 914	260		26, 44 62
MEMORY CLEAR/MACHINE LOCK UP-----	904			30
LOGO-----	903	259		29, 62
AMOUNT SYMBOL (\$/*)-----	910			38

**QUICK REFERENCE TO PROGRAM JOB NUMBERS
AFFECTING KEYS, FUNCTIONS AND REPORTS - 4**

SUBJECT

PROGRAMMING

REPORTS: (Continued)

DAILY AUTO GROUP X -----

DAILY MANUAL GROUP X -----

PLU'S, BY RANGE, X/Z -----

PLU'S, BY ASSIGNED DEPT. X -----

CID, ALL CASHIERS X -----

MONTHLY ALL DEPTS X/Z -----

MONTHLY AUTO GROUP X -----

MONTHLY MANUAL GROUP X -----

INDIVIDUAL CASHIER MEDIA X/Z -----

DAILY GENERAL X/Z -----

ALL CASHIERS MEDIA X/Z -----

HOURLY TOTALS X/Z -----

ALL DEPARTMENTS X -----

INDIVIDUAL CLERK MEDIA X/Z -----

ALL CLERKS MEDIA X/Z -----

PLU'S, BY STOCK X -----

PB LOOK UP'S X -----

SRV	PGM-2	PGM-1	REF. PAGE
JOB #	JOB #	JOB #	
904			32
903, 905 904			29, 30, 33
	256		60
903, 904			29, 30
904			30
902 904			27, 30
904 910			30, 38
904 910			30, 38
914		122	44, 57

8. SRV (Service) MODE

**DURING THE SERVICE MODE OPERATION THE SERVICE (SRV) KEY IS REQUIRED.
AS WELL AS ONE OF REAL CASHIER KEYS (A ~ E, K).**

8-1. PROGRAM RESET

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

1. Remove the power cord from the AC outlet.
2. Turn the mode switch to the service position (SRV).
3. Re-insert the AC plug into the outlet.

8-2. MASTER RESET (All Memories Clear)

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

1. Remove the power cord from the AC outlet.
2. Turn the mode switch to the service position (SRV).
3. Depress and hold numeric key 9.
4. While holding the key depressed, re-insert the AC plug into the outlet.

NOTE: After performing this procedure the unit must be completely reprogrammed in both the SRV and program (PGM) modes.

NOTE: After the Master Reset operation, display will disappear for about ten seconds in order to execute the Master Reset.

If the MASTER RESET operation is performed, the following readouts should be seen for the Service Mode program.

Reading of SRV Programming: 900 → #/SBTL → CA/AT/NS

2:47AM02/01/00	Time (AM), Date
000#0001 B	Register No., Consecutive No., Cashier (B)
#0900	JOB#(900: Reading)
F01 0002	Programming Contents (JOB#901 ~ 914)
F02 0000	
F03 0000	
F04 0000	
F05 5000	
F06 0000	
F07 0000	
F08 0000	
F09 0000	
F10 0000	
F11 0000	
F12 0000	
F13 0000	
F14 0000	
Z1 0000	Daily reset counter
Z2 0000	Monthly reset counter
GT1	
\$0000000000.00	Grand total (GT1)
GT2	
\$0000000000.00	Grand total (GT2)
GT3	
\$0000000000.00	Grand total (GT3)

Ex. F01 0 0 0 2
 | | | | |
 JOB#901 A B C D

#901 - C

Number of expanded department by B.R.P.

(Basic Remote Key Pad) OPTION (ER-36KP1/ER-36KP2)

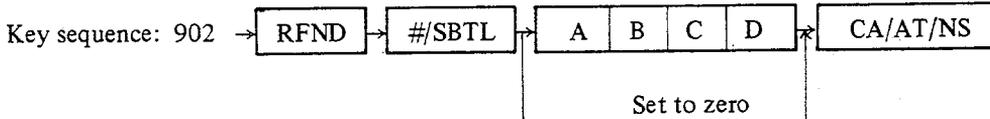
ENTRY	EXPANDED DEPARTMENT	REQUIRED NUMBER OF B.R.P.	
		ER-36KP1	ER-36KP2
0	0	0	0
1	32	1	0
2	64	1	1
3	96	1	2

901 - D

Number of department

ENTRY	DEPARTMENT
0	10
1	20
2	30

[JOB # 902]



902 - A

Tax payment for Food Stamp * OPTION (ER-11KT/ER-11DK)

ENTRY	TAX PAYMENT FOR FOOD STAMP	
0	NO FOOD STAMP TENDERING FUNCTION	
1	TAX PAYMENT IN FOOD STAMP IS DISABLE	
2	TAX PAYMENT IN FOOD STAMP IS ENABLE	*1 } Refer
3	TAX FORGIVENESS	*2 } to page 46.

Note) * Food stamp function is an option. (ER-11DK, ER-11KT)

※ ER-11KT : Not available U.S.A.

#902 - B

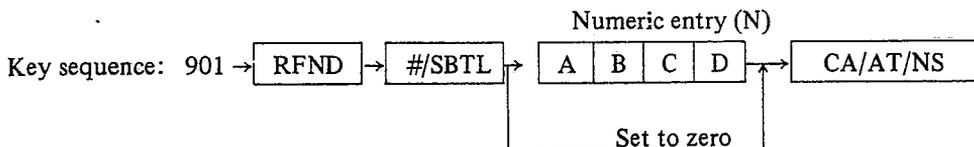
- ① Hourly total function OPTION (ER-42MB/ER-45PL4)
- ② Date format (Day-Month-Year/Month-Day-Year) Refer to page 46.
- ③ Validation print format.

ENTRY	① HOURLY TOTAL	② DATE FORMAT	③ VALIDATION PRINT FORMAT
0	DISABLE	M - D - Y	REGISTER # AND CONSECUTIVE #
1	ENABLE		
2	DISABLE	D - M - Y	
3	ENABLE		
4	DISABLE	M - D - Y	TIME AND DATE
5	ENABLE		
6	DISABLE	D - M - Y	
7	ENABLE		

8-3. SRV MODE PROGRAMMING (Feature Selection)

The Service Mode program is entered in numerically coded groups (A – D). A four digit entry in each group will determine which feature will be selected or inhibited. By using the right program combinations, you will be able to custom program this unit to the individual users needs.

[JOB # 901]



Numeric entry (N) Input the 4-digit code according to table A thru D.

Note 1. The first "0" is not necessary to enter in the numeric entry.

Note 2. For more information about the service mode programmings, refer to chapter "7-5. SUPPLEMENTAL DESCRIPTIONS OF SRV PROGRAMMING". (refer to page 46)

901 - A

- ① Monthly total (Periodic consolidation) function OPTION (ER-42MB/ER-45PL4)
- ② Void mode operation

ENTRY	MONTHLY TOTAL (X2/Z2 MODE)	VOID MODE
0	DISABLE	ENABLE *
1	ENABLE	
4	DISABLE	DISABLE
5	ENABLE	

* Void mode should be selected in the MGR mode by depressing VOID key. (refer to page 17.)

#901 - B

Number of PLU/sub-department OPTION (ER-42MB/ER-45PL4)

ENTRY	*PLU/SUB-DEPARTMENT	REQUIRED NUMBER OF RAM
0	0	0
1	93	1 pc. (2K bytes) RAM1
2	186	2 pcs. (4K bytes) RAM2
3	279	3 pcs. (6K bytes) RAM3
4	372	4 pcs. (8K bytes) RAM5
5	465	5 pcs. (10K bytes) RAM6
6	512	6 pcs. (12K bytes) RAM7

* NOTE:

1. When the PB Look up function has been enabled in the JOB#914, RAM6 and RAM7 are used as PB Look up memory. In this case, input 0 thru 4, never input 5 or 6 for JOB#901-B.
2. RAM1 to RAM7 are optional RAM chips on the optional memory board (ER-42MB). Refer to JOB#914-A on pages 44 and 48.
ER-45PL4 : RAM (μPD449D x 1)

#902 - C

- ① Coin dispenser connection OPTION (ER-42IF/ER-45DI)
- ② Scale connection OPTION (ER-42IF/ER-45SI)

ENTRY	① COIN DISPENSER	② SCALE
0	DISABLE	DISABLE *3
1	ENABLE	
2	DISABLE	ENABLE
3	ENABLE	

*3 Manual scale key entry is allowed only for the machine without scale interface (ER-42IF).

#902 - D

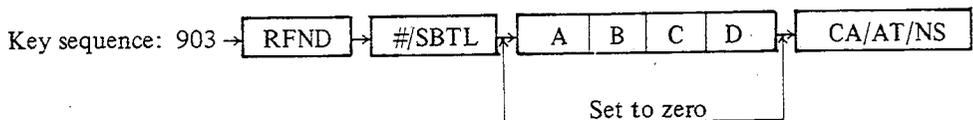
- ① I.R.C. (Inter Register Communication)
 OPTION (ER-42 TR/ER-42SL/ER-42MA)
- ② DATA PACK function (Level-1 only/Level 1, 2)
 OPTION (ER-67LD1/ER-42LD1)
- ③ Receipt issuing function after finishing the transaction. (Possible only when the receipt switch is at OFF position/ Possible regardless of the position of the receipt switch.)

ENTRY	① I.R.C.	② *DATA PACK	③ RECEIPT ISSUE AFTER TRANS.
0	DISABLE	LEVEL - 1 ONLY	WHEN RECEIPT SW. AT "OFF" ONLY *4
1	ENABLE		
2	DISABLE	LEVEL - 1, 2	
3	ENABLE		
4	DISABLE	LEVEL - 1 ONLY	WHEN RECEIPT SW. AT "ON/OFF". *5
5	ENABLE		
6	DISABLE	LEVEL - 1, 2	
7	ENABLE		

*DATA PACK Level-1: ER-67LD1/ER-67RA1
 Level-2: ER-67LD1/ER-67RA1+ER-42LD1.

- *4 : A copy of receipt can be issued if the previous transaction is finalized with receipt switch turned off by the RCPT key.
- *5 : A copy of receipt can be issued after finalizing regardless of the receipt switch's position in the previous transaction by the RCPT key.

[JOB # 903]



- #903 - A
- ① Amount tendering for RA transaction.
 - ② Tax delete operation.
 - ③ Logo text print on the receipt.

	①	②	③
ENTRY	AMOUNT TENDER FOR RA	TAX DELETE OPERATION	LOGO TEXT PRINT
0	COMPULSORY	ENABLE	DISABLE
1	INHIBIT		
2	COMPULSORY	DISABLE	
3	INHIBIT		
4	COMPULSORY	ENABLE	ENABLE
5	INHIBIT		
6	COMPULSORY	DISABLE	
7	INHIBIT		

- #903 - B
- ① Consecutive No. presetting in the PGM2 mode.
 - ② Consecutive No. resetting after Z1 report printing
 - ③ Consecutive No. resetting after Z2 report printing

	①	②	③
ENTRY	CONSECUTIVE NO. PRESET IN PGM2 MODE	CONSECUTIVE NO. RESET IN Z1 MODE	CONSECUTIVE NO. RESET IN Z2 MODE
0	ENABLE	NOT RESET	NOT RESET
1	DISABLE		
2	ENABLE	RESET	
3	DISABLE		
4	ENABLE	NOT RESET	RESET
5	DISABLE		
6	ENABLE	RESET	
7	DISABLE		

- B - ① DISABLE : Presetting of consecutive No. in the PGM2 mode is inhibited.
- B - ② RESET : Consecutive No. is reset to zero when daily general reset report has been printed out in the X1/Z1 mode.
- B - ③ RESET : Consecutive No. is reset to zero when periodic consolidation (monthly total) all dept. reset report has been printed out in the X2/Z2 mode.

- #903 - C
- ① Error for mis-operation (one shot error/lock error)
 - ② Key catch sound
 - ③ Operation with drawer open (Drawer compulsory)

	①	②	③
ENTRY	ERROR FOR MIS-OPERATION	KEY CATCH SOUND	DRAWER COMPULSORY
0	LOCK ERROR	YES	COMPULSORY
1	ONE SHOT ERROR		
2	LOCK ERROR	NO	
3	ONE SHOT ERROR		
4	LOCK ERROR	YES	NON COMPULSORY
5	ONE SHOT ERROR		
6	LOCK ERROR	NO	
7	ONE SHOT ERROR		

C-① LOCK ERROR : Continuous error which is released by CL key.

ONE SHOT ERROR: Short error with one shot buzzer sound.

C-③ COMPULSORY: Key operations in the REG, VOID and MGR modes are inhibited when the drawer is open.

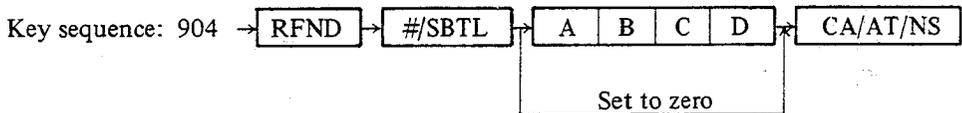
#903 - D

- ① Non add code printing on no - sale receipt.
- ② Non add code printing for RA and PO registration.
- ③ #/SBTL key compulsory for finalizing of the transaction and tendering.

ENTRY	NON - ADD # ON NO-SALE	NON - ADD # ON RA/PO	SUBTOTAL (#/SBTL) COMPULSORY
0	ENABLE	NON COMPULSORY	NON COMPULSORY
1	DISABLE		
2	ENABLE	COMPULSORY	NON COMPULSORY
3	DISABLE		
4	ENABLE	NON COMPULSORY	COMPULSORY
5	DISABLE		
6	ENABLE	COMPULSORY	COMPULSORY
7	DISABLE		

C-① DISABLE : Non add # print is inhibited on the no sale receipt.

[JOB # 904]



#904 - A

- ① Tax calculation (Standard/Special)
- ② Merchandise subtotal by MDSE SBTL key (Display only/Display and print)
- ③ Memory clear/machine lock-up by resetting in the X1/Z1 and X2/Z2 modes.

ENTRY	TAX CALCULATION	MERCHANDISE SUBTOTAL	MEMORY CLEAR/MACHINE LOCK-UP IN X1/Z1, X2/Z2
0	STANDARD	DISPLAY ONLY	MEMORY CLEAR
1	SPECIAL *1		
2	STANDARD	DISPLAY AND PRINT	MEMORY CLEAR
3	SPECIAL *1		
4	STANDARD	DISPLAY ONLY	MACHINE LOCK-UP (NO MEMORY CLEAR)
5	SPECIAL *1		
6	STANDARD	DISPLAY AND PRINT	MACHINE LOCK-UP (NO MEMORY CLEAR)
7	SPECIAL *1		

③ : Refer to page 47.

A-①: *1. Tax amount will be rounded as shown below. (for Singapore)

BEFORE ROUNDING	AFTER ROUNDING
0.000 ~ 0.004	0.00
0.005 ~ 0.054	0.05
0.055 ~ 0.099	0.10

904 - B

- ① Discount (⊖), %1, %2, CP1, CP2, negative department, negative PLU/sub-department, past item void, refund operation in the REG, MGR mode.
- ② OVER RIDE key operation in the REG, MGR mode.
- ③ Over-ride indication print on the journal.

ENTRY	① ⊖, %1, %2, CP1, CP2, * VOID, (-) DEPT., (-) PLU/ SUB, RFND	② OVER RIDE KEY OPE.	③ OVER RIDE INDICATION
0	REG AND MGR *1	MGR ONLY	PRINTED ON JOURNAL *2
1	MGR ONLY		
2	REG AND MGR *1	REG AND MGR	
3	MGR ONLY		
4	REG AND MGR *1	MGR ONLY	NO INDICATION PRINT
5	MGR ONLY		
6	REG AND MGR *1	REG AND MGR	
7	MGR ONLY		

* Including coupon-like PLU/sub-department

```

10:14PM01/31/83
101#0196 B 1111
001DFT1 $1.00
022DFT $2.60
  OVER RIDE
003DFT $2.50
002DFT $5.20
004DFT $4.50
MDS ST $15.80
TAX1 $0.05
CASH $15.85
    
```

B-① *1 (REG AND MGR) : Negative media registrations (⊖ %1, %2, CP1, CP2, Minus PLU/SUB) are allowed in both the REG and MGR modes.

B-③ *2 : By the OVER-RIDE Key operation, the indication mark is printed on the journal.

← Over-ride entry mark

904 - C

- ① Share % print-out of real plus departments on the X/Z reports.
- ② %2 and CP2 registrations affect the totalizers of department or PLU/SUB-department to which %2 or CP2 is applied, or no affect.
- ③ Total amount of coupon-like PLU/SUB-department is printed on the daily general X/Z report, or not printed.

ENTRY	① SHARE % PRINT OF PLUS DEPT.	② %2, CP2 REG. TO DEPT, PLU/SUB	③ COUPON-LIKE PLU/SUB PRINT IN X/Z MODE
0	PRINT *3	AFFECT *4	NO PRINT *5
1	NO PRINT		
2	PRINT *3	NO AFFECT	
3	NO PRINT		
4	PRINT *3	AFFECT *4	PRINT *6
5	NO PRINT		
6	PRINT *3	NO AFFECT	
7	NO PRINT		

*3 (PRINT) : The share % printout will be skipped in the following cases.

- (1) When the summing total of real plus-departments is negative.
- (2) When the total of designated real plus-department is negative. (only for the designated dept.)

*4 (AFFECT) : Registered amount of %2 and CP2 are calculated to the amount totalizers of the department or PLU/sub-department to which %2 or CP2 is applied.

%2 : item discount or premium.

CP2 : store coupon (item coupon)

C-③ Daily total reading receipt

*5 (NO PRINT)

*6 (PRINT)

```

9:17AM06/22/82
101#0103 B 1112

#0001 *X1*

CP2      00
          $0.00
%2       00
          $0.00
  
```

```

10:24PM01/31/83
101#0202 B 1111

#0001 *X1*

CP2      00
          $0.00
%2       00
          $0.00
CPNPLU   20
          $10.00
  
```

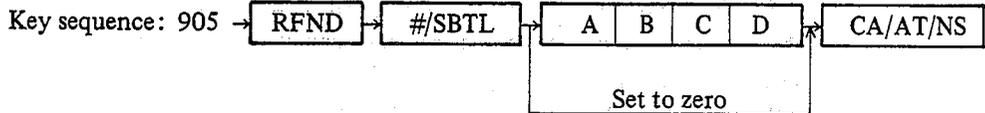
Coupon-like PLU

#904 - D

- ① Zero skip printing for Department report in the X1/Z1, X2/Z2 modes.
- ② Zero skip printing for PLU report in the X1/Z1 mode.
- ③ Hash department programming in the PGM2 mode (JOB #210)

	①	②	③
ENTRY	DEPARTMENT ZERO SKIP	PLU ZERO SKIP (SUB-DEPT.)	HASH DEPT. PROGRAMING
0	SKIP	SKIP	DISABLE
1	NON SKIP		
2	SKIP	NON SKIP	
3	NON SKIP		
4	SKIP	SKIP	ENABLE
5	NON SKIP		
6	SKIP	NON SKIP	
7	NON SKIP		

[JOB # 905]



#905 - A, B

Fraction treatment for multiplication result.

ENTRY	FRACTION TREATMENT
00	ROUND DOWN
50	ROUND OFF
90	ROUND UP

↑↑
A B

EXAMPLE

EXAMPLE OF REGIST. TREATMENT	*0.03 @ 30% ⇒ *0.00 ⑨	*0.03 @ 10% = *0.00 ③
ROUND DOWN (00)	*0.00	*0.00
ROUND OFF (50)	*0.01	*0.00
ROUND UP (90)	*0.01	*0.01

905 - C

- ① Grand totals (GT1, GT2, GT3) printing on the Z1 report.
- ② GT1, GT2, GT3 printing on the Z2 report.
- ③ GT1, GT2, GT3 and daily reset counter (Z1) resetting after Z2 report printing.

	①	②	③
ENTRY	GT1, GT2, GT3 PRINT ON Z1 REPORT	GT1, GT2, GT3 PRINT ON Z2 REPORT	GT1, GT2, GT3, Z1 RESET IN Z2 MODE
0	GT1, GT2, GT3	GT1, GT2, GT3	NOT RESET
1	GT3 ONLY		
2	GT1, GT2, GT3	GT3 ONLY	
3	GT3 ONLY		
4	GT1, GT2, GT3	GT1, GT2, GT3	RESET *1
5	GT3 ONLY		
6	GT1, GT2, GT3	GT3 ONLY	
7	GT3 ONLY		

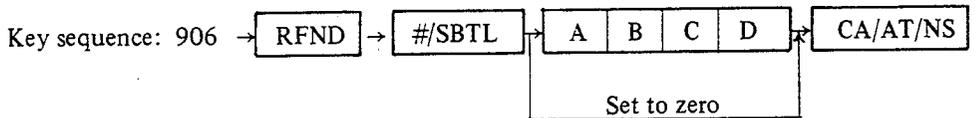
*1 (RESET) : GT1 ~ GT3 and Z1 counter are reset by taking a periodic consolidation (monthly total).

#905 - D

- ① Tare entry when the optional scale is installed.
 ② Unit of measurement for the optional scale (lb/kg) } OPTION (ER-42IF,ER-45SI)

ENTRY	① TARE ENTRY FOR SCALE	② MEASUREMENT UNIT FOR SCALE
0	DISABLE	lb. (POUND)
2	ENABLE	
4	DISABLE	kg. (KILOGRAM)
6	ENABLE	

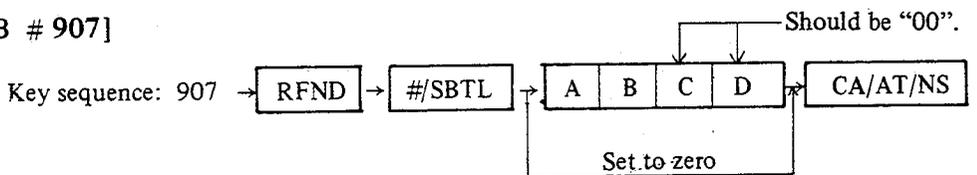
[JOB # 906]



- #906 - A : Drawer assignment for cashier A
 #906 - B : Drawer assignment for cashier B
 #906 - C : Drawer assignment for cashier D
 #906 - D : Drawer assignment for cashier E

ENTRY	#906 - A	#906 - B	#906 - C	#906 - D
	CASHIER A	CASHIER B	CASHIER D	CASHIER E
0	STANDARD DRAWER			
1	OPTIONAL DRAWER NO.1			
2	OPTIONAL DRAWER NO.2			
3	OPTIONAL DRAWER NO.3			

[JOB # 907]



#907 - A

Drawer opening on CH4 and CH5 finalizing

ENTRY	DRAWER OPEN ON CH4	DRAWER OPEN ON CH5
0	OPEN	OPEN
1	NOT OPEN	
2	OPEN	NOT OPEN
3	NOT OPEN	

907 - B

Drawer opening on CH1, CH2 and CH3 finalizing.

ENTRY	CH1	CH2	CH3
0	OPEN	OPEN	OPEN
1	NOT OPEN		
2	OPEN	NOT OPEN	
3	NOT OPEN		
4	OPEN	OEPN	NOT OPEN
5	NOT OPEN		
6	OPEN	NOT OPEN	
7	NOT OPEN		

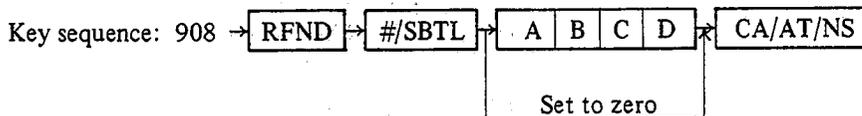
907 - C : Not used.

Be sure to input "0".

907 - D : Not used.

Be sure to input "0".

[JOB # 908]



908 - A : Tendering for CH4, CH5 and CA/AT (Cash)

ENTRY	TENDERING FOR CH4	TENDERING FOR CH5	TENDERING FOR CA/AT
0	INHIBIT	INHIBIT	NON-COMP
1	COMP		
2	INHIBIT	COMP	
3	COMP		
4	INHIBIT	INHIBIT	COMP
5	COMP		
6	INHIBIT	COMP	
7	COMP		

Note) COMP: Compulsory

908 - B : Tendering for CH1, CH2 and CH3

ENTRY	TENDERING FOR CH1	TENDERING FOR CH2	TENDERING FOR CH3
0	INHIBIT	INHIBIT	INHIBIT
1	COMP		
2	INHIBIT	COMP	
3	COMP		
4	INHIBIT	INHIBIT	COMP
5	COMP		
6	INHIBIT	COMP	
7	COMP		

Note) COMP: Compulsory

Compulsive tendering is automatically overridden when the amount is negative on zero.

908 - C

- ① Change computation on CH4 and CH5
- ② Tendering for CHK

ENTRY	① CHANGE ON CH4	① CHANGE ON CH5	② TENDERING FOR CHK
0	ENABLE	ENABLE	NON-COMP
1	DISABLE		
2	ENABLE	DISABLE	
3	DISABLE		
4	ENABLE	ENABLE	COMP
5	DISABLE		
6	ENABLE	DISABLE	
7	DISABLE		

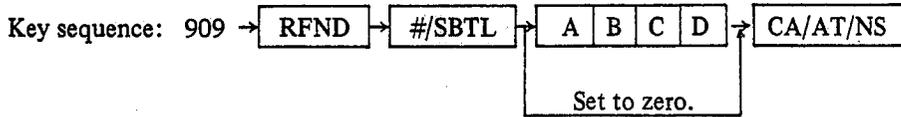
908 - D

Change computation on CH1, CH2 and CH3

ENTRY	CHANGE ON CH1	CHANGE ON CH2	CHANGE ON CH3
0	ENABLE	ENABLE	ENABLE
1	DISABLE		
2	ENABLE	DISABLE	
3	DISABLE		
4	ENABLE	ENABLE	DISABLE
5	DISABLE		
6	ENABLE	DISABLE	
7	DISABLE		

Note) Compulsive tendering is automatically overridden when the amount is negative or zero.

[JOB # 909]



909 - A : Validation print for CH4, CH5 and CA/AT

ENTRY	VALIDATION PRINT FOR CH4	VALIDATION PRINT FOR CH5	VALIDATION PRINT FOR CA/AT
0	NON COMP	NON COMP	NON COMP
1	COMP		
2	NON COMP	COMP	
3	COMP		
4	NON COMP	NON COMP	COMP
5	COMP		
6	NON COMP	COMP	
7	COMP		

Note) COMP: Compulsory

909 - B : Validation print for CH1, CH2 and CH3

ENTRY	VALIDATION PRINT FOR CH1	VALIDATION PRINT FOR CH2	VALIDATION PRINT FOR CH3
0	NON COMP	NON COMP	NON COMP
1	COMP		
2	NON COMP	COMP	
3	COMP		
4	NON COMP	NON COMP	COMP
5	COMP		
6	NON COMP	COMP	
7	COMP		

Note) COMP: Compulsory

909 - C : Validation print for PO, RA and CHK

ENTRY	VALIDATION PRINT FOR PO	VALIDATION PRINT FOR RA	VALIDATION PRINT FOR CHK
0	NON COMP	NON COMP	NON-COMP
1	COMP		
2	NON COMP	COMP	
3	COMP		
4	NON COMP	NON COMP	COMP
5	COMP		
6	NON COMP	COMP	
7	COMP		

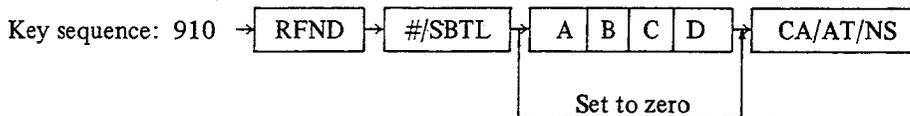
Note) COMP: Compulsory

909 - D : Validation Print for CP2 and CP1

ENTRY	VALIDATION PRINT FOR CP2	VALIDATION PRINT FOR CP1
0	NON COMP	NON COMP
1	COMP	
2	NON COMP	COMP
3	COMP	

Note) COMP: Compulsory

[JOB # 910]



910 - A

- ① Validation print for item void
- ② Validation print for refund registration
- ③ Validation print for tax delete

ENTRY	① VALIDATION FOR ITEM VOID	② VALIDATION FOR REFUND REGIST.	③ VALIDATION FOR TAX DELETE
0	NON COMP	NON COMP	NON COMP
1	COMP		
2	NON COMP	COMP	NON COMP
3	COMP		
4	NON COMP	NON COMP	COMP
5	COMP		
6	NON COMP	COMP	COMP
7	COMP		

Note) COMP: Compulsory

#910 - B

- ① Amount symbol (\$ or *) EX. \$123 or *123.
- ② Clerk # input before each transaction, individual reading/resetting.
- ③ Clerk sales total (with tax or without tax).

ENTRY	① AMOUNT SYMBOL	② CLERK # INPUT FOR EACH TRANS.	③ CLERK SALES TOTAL
0	\$	NON-COMPULSORY	WITHOUT TAX
1	*		
2	\$	COMPULSORY	WITHOUT TAX
3	*		
4	\$	NON-COMPULSORY	WITH TAX
5	*		
6	\$	COMPULSORY	WITH TAX
7	*		

B-②, ③ : Refer to pages 47 and 48.

#910 - C: Inhibition of CLK#, CB, PB keys.

ENTRY	CLK #	CB	PB
0	—	—	—
1	INHIBIT		
2	—	INHIBIT	
3	INHIBIT		
4	—	—	INHIBIT
5	INHIBIT		
6	—	INHIBIT	
7	INHIBIT		

NOTE) The (—) symbol means “NOT INHIBITED”.

Keys inhibited are disabled in the REG and MGR modes.

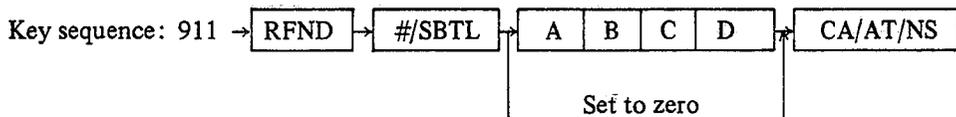
910 - D : Inhibition of VOID, RFND, SCALE keys.

ENTRY	VOID	RFND	SCALE
0	—	—	—
1	INHIBIT		
2	—	INHIBIT	
3	INHIBIT		
4	—	—	INHIBIT
5	INHIBIT		
6	—	INHIBIT	
7	INHIBIT		

Note) The (—) symbol means “NOT INHIBITED” or is “ALLOWED”.

Keys inhibited are disabled in the REG and MGR modes.

[JOB # 911]



#911 - A : Inhibition of PO, RA, @/FOR keys.

ENTRY	PO	RA	@/FOR
0	—	—	—
1	INHIBIT		
2	—	INHIBIT	
3	INHIBIT		
4	—	—	INHIBIT
5	INHIBIT		
6	—	INHIBIT	
7	INHIBIT		

Note) The (—) symbol means “NOT INHIBITED” or is “ALLOWED”.

Keys inhibited are disabled in the REG and MGR modes.

#911 - B : Inhibition of MDSE SBTL, #/SBTL, FS SHIFT Keys.

ENTRY	MDSE SBTL	#/SBTL	FS SHIFT
0	—	—	—
1	INHIBIT		
2	—	INHIBIT	—
3	INHIBIT		
4	—	—	INHIBIT
5	INHIBIT		
6	—	INHIBIT	
7	INHIBIT		

Note) The (—) symbol means “NOT INHIBITED” or is “ALLOWED”.
 Keys inhibited are disabled in the REG and MGR modes.

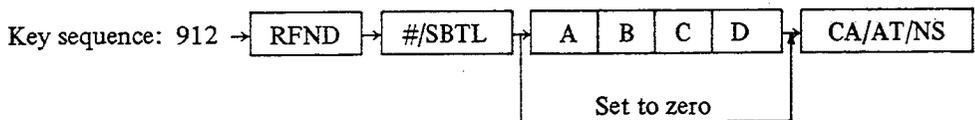
#911 - C : Inhibition of CH4, CH5, CHECK Keys.

ENTRY	CH4	CH5	CHK (CHECK)
0	—	—	—
1	INHIBIT		
2	—	INHIBIT	—
3	INHIBIT		
4	—	—	INHIBIT
5	INHIBIT		
6	—	INHIBIT	
7	INHIBIT		

#911 - D : Inhibition of CH1, CH2, CH3 Keys

ENTRY	CH1	CH2	CH3
0	—	—	—
1	INHIBIT		
2	—	INHIBIT	—
3	INHIBIT		
4	—	—	INHIBIT
5	INHIBIT		
6	—	INHIBIT	
7	INHIBIT		

[JOB # 912]



#912 - A : Inhibition of CP2, CP1, OVER-RIDE Keys.

ENTRY	CP2	CP1	OVER-RIDE
0	—	—	—
1	INHIBIT		
2	—	INHIBIT	—
3	INHIBIT		
4	—	—	INHIBIT
5	INHIBIT		
6	—	INHIBIT	INHIBIT
7	INHIBIT		

Note) The (—) symbol means “NOT INHIBITED” or is “ALLOWED”.
 Keys inhibited are disabled in the REG and MGR modes.

#912 - B : Inhibition of TAX, TAX 2 SHIFT, TAX 1 SHIFT Keys.

ENTRY	TAX	TAX 2 SHIFT	TAX 1 SHIFT
0	—	—	—
1	INHIBIT		
2	—	INHIBIT	—
3	INHIBIT		
4	—	—	INHIBIT
5	INHIBIT		
6	—	INHIBIT	INHIBIT
7	INHIBIT		

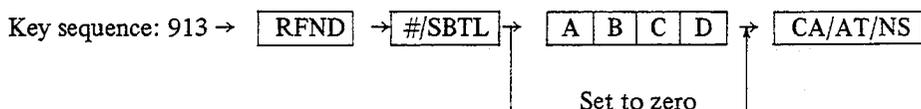
#912 - C : Inhibition of %2, %1, PRINT Keys.

ENTRY	%2	%1	PRINT
0	—	—	—
1	INHIBIT		
2	—	INHIBIT	—
3	INHIBIT		
4	—	—	INHIBIT
5	INHIBIT		
6	—	INHIBIT	INHIBIT
7	INHIBIT		

#912 - D : Inhibition of SQx, ⊖, RCPT Keys.

ENTRY	SQX	⊖	RCPT
0	-	-	-
1	INHIBIT		
2	-	INHIBIT	
3	INHIBIT		
4	-	-	INHIBIT
5	INHIBIT		
6	-	INHIBIT	
7	INHIBIT		

[JOB # 913]



#913 - A : Compulsive slip print on CH4, CH5, CASH

ENTRY	SLIP PRINT		
	CH4	CH5	CASH (CA/AT/NS)
0	NON-COMP	NON-COMP	NON-COMP
1	COMPULSORY		
2	NON-COMP	COMPULSORY	
3	COMPULSORY		
4	NON-COMP	NON-COMP	COMPULSORY
5	COMPULSORY		
6	NON-COMP	COMPULSORY	
7	COMPULSORY		

#913 - B : Compulsive slip print on CH1, CH2, CH3.

ENTRY	SLIP PRINT		
	CH1	CH2	CH3
0	NON-COMP	NON-COMP	NON-COMP
1	COMPULSORY		
2	NON-COMP	COMPULSORY	
3	COMPULSORY		
4	NON-COMP	NON-COMP	COMPULSORY
5	COMPULSORY		
6	NON-COMP	COMPULSORY	
7	COMPULSORY		

#913 - C

- ① Compulsive PB (previous balance) operation on CH4 and CH5
- ② Compulsive slip print on CHK

ENTRY	PB OPERATION		SLIP PRINT ON CHK
	CH4	CH5	
0	NON-COMP	NON-COMP	NON-COMP
1	COMPULSORY		
2	NON-COMP	COMPULSORY	
3	COMPULSORY		
4	NON-COMP	NON-COMP	COMPULSORY
5	COMPULSORY		
6	NON-COMP	COMPULSORY	
7	COMPULSORY		

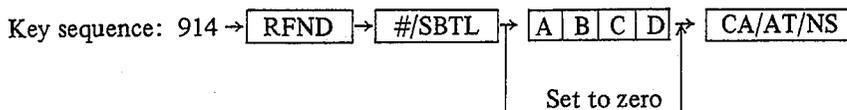
C - ① COMPULSORY: To finalize the registration by CH1 to CH5, the registration should be preceded by a PB or a PB look up operation only.

#913 - D : Compulsive PB operation on CH1, CH2, CH3.

ENTRY	PB OPERATION		
	CH1	CH2	CH3
0	NON-COMP	NON-COMP	NON-COMP
1	COMPULSORY		
2	NON-COMP	COMPULSORY	
3	COMPULSORY		
4	NON-COMP	NON-COMP	COMPULSORY
5	COMPULSORY		
6	NON-COMP	COMPULSORY	
7	COMPULSORY		

NOTE:COMPULOSRY: To finalize the registration by CH1 to CH5, the registration should be preceded by a PB or a PB look up operation only.

[JOB # 914]



#914 - A

- ① Slip print format (Full print/Simple print) OPTION (ER-42SP1)
- ② PLU stock control function OPTION (ER-42MB/ER-45PL4)
- ③ PB (Previous Balance) look up function OPTION (ER-42MB/ER-45PL4)

ENTRY	SLIP PRINT FORMAT	PLU STOCK CONTROL	PB LOOK UP
0	FULL PRINT	DISABLE	DISABLE
1	SIMPLE PRINT		
2	FULL PRINT	ENABLE	ENABLE
3	SIMPLE PRINT		
4	FULL PRINT	DISABLE	ENABLE
5	SIMPLE PRINT		
6	FULL PRINT	ENABLE	ENABLE
7	SIMPLE PRINT		

A - ① : Refer to page 48. A - ② , ③ : Refer to page 48.

#914 - B

- ① Clerk # display and print
- ② Slip printer connection OPTION (ER-42SP1)

ENTRY	CLERK #		SLIP PRINTER
	DISPLAY	PRINT	
0	1 2 3 4	1 2 3 4	DISABLE
1	* * * *	* * 3 4	
2	* * * *	* * * *	
4	1 2 3 4	1 2 3 4	ENABLE
5	* * * *	* * 3 4	
6	* * * *	* * * *	

B - ② : Refer to page 49.

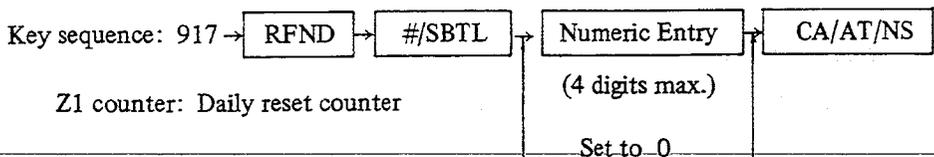
NOTE) Number (clerk #) in the above table is an example. (# : 1234)

#914 - C, D: Number of positions the slip print will be shifted OPTION (ER-42SP1)

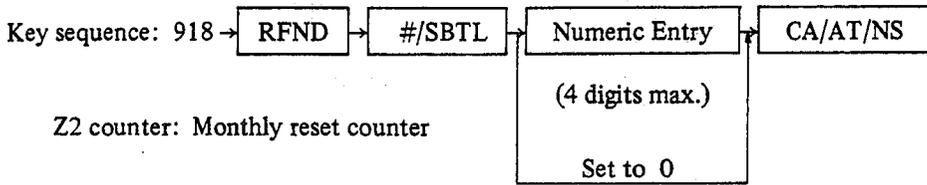
ENTRY		SHIFTED DIGIT OF SLIP PRINT
C	D	
0	0	NO SHIFT
0	1	1 DIGIT
1	5	15 DIGITS

Refer to page 49.

[JOB # 917] : Z1 counter setting (4 digits max.)

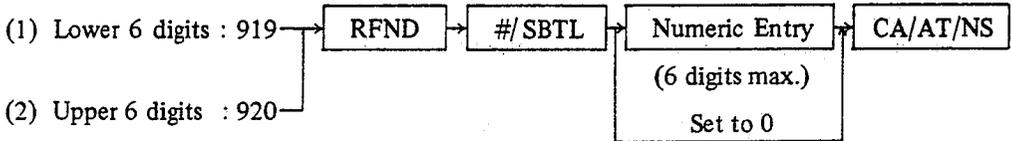


[JOB #918] : Z2 counter setting (4 digits max.)



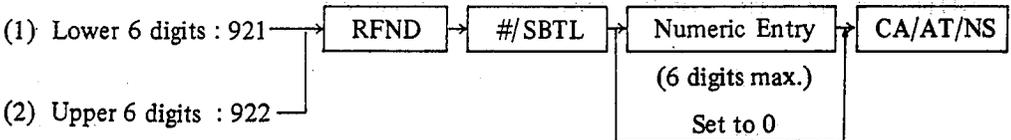
[JOB # 919, # 920] : GT1 setting (12 digits max.)

Key sequence;



[JOB # 921, # 922] : GT2 setting (12 digits max.)

Key sequence;

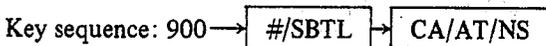


NOTE: GT3 is recalculated at the end of each service entry in JOBS (# 919 ~ # 922) according to the following equation.

$$GT\ 3 = GT1 - GT2$$

- GT1 : Grand total of plus registrations
- GT2 : Grand total of minus registrations
- GT3 : Grand total of net sales total

7-4 READING OF SRV MODE PROGRAMMING



For the reading print format, refer to page 25.

8-5 SUPPLEMENTAL DESCRIPTIONS FOR SRV PROGRAMMING

[JOB # 901]

- A - ① ENABLE : Enables the monthly total function and the operations in the X2/Z2 mode.
- C. Maximum number of departments : $30 + 96 = 128$

[JOB # 902]

- A. *1 : Tax collected for foodstamp eligible and taxable items can be paid in food stamp.
- A. *2 : A taxable amount deduction will be caused by foodstamp eligible and taxable items total.
- B - ① : RAM chip for the Hourly total is commonly used for the Monthly total (Periodic consolidation).
- B - ③ : REGISTER # AND CONSECUTIVE # :

	101#0019 B 0001	C-ASH	\$12.00
TIME AND DATE :			
	4:52AM06/22/82B	C-ASH	\$12.00

[JOB # 903]

- A - ① "COMPULSORY": New RA function.

– Key sequence –

Amount (7 digits max.)	→ RA →	Amount (cash/check) (7 digits max.)	→ CA/AT/NS or CHK (Receipt issued)
---------------------------	--------	--	---------------------------------------

"INHIBIT": Conventional RA function.

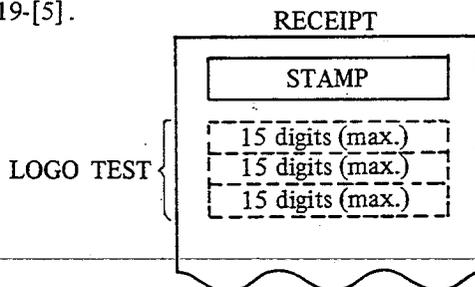
– Key sequence –

Amount (7 digits max.)	→ RA (Receipt issued)
---------------------------	-----------------------

- A - ② ENABLE: Tax delete operation in the REG mode is allowed.

	TAX1SHIFT	and/or →	#/SBTL →	TAX
Tax delete operation : Registering (in the REG mode)			TAX2SHIFT	

- A - ③ . If logo text is enabled (max. 45 digits) in the PGM2 mode the logo text will be printed out under the LOGO STAMP on the receipt. The LOGO TEXT characters should be preset in the PGM2 mode item-19-[5].



Refer to page 62.

[JOB # 904]

A-③. MEMORY CLEAR: The memory contents of the X1/Z1 or X2/Z2 reset report will be cleared upon completion of that report. This is the same as a normal "Z" report in other cash registers.

MACHINE LOCK-UP: When the following resetting reports have been taken in the (No memory clear) X1/Z1 or X2/Z2 mode, the machine enters the lock-up state with "CLOSE2" displayed.

RESETTING REPORTS WHICH CAUSE A MACHINE LOCK-UP.

- X1/Z1 mode:
 - ① General sales resetting.
 - ② PLU/sub-dept resetting.
 - ③ Hourly sales resetting.
 - ④ All cashiers resetting.
 - ⑤ All clerks resetting.
 - X2/Z2 mode:
 - ① All departments resetting.
 - ② All clerks resetting.
- } These cause the "CLOSE2" state.

1. Display of the "CLOSE2" state;

CLOSE2	0.00
--------	------

2. In the CLOSE2 (machine lock-up) state, the machine does not allow any operations in any modes other than which caused the CLOSE2 state.

If the machine enters the CLOSE2 state by the daily general resetting (X1/Z1), operations will be allowed in the X1/Z1 mode only.

MACHINE LOCK UP: The memory contents of the X1/Z1 or X2/Z2 reset report will not be cleared (NO MEMORY CLEAR) upon completion of that report. The cash register will enter a "CLOSED 2" state and the memory will be cleared when the "LOCK-UP release operation" is performed. (Refer to pages 67 and 68.)

LOCK-UP RELEASE OPERATION : X1/Z1, X2/Z2 mode.

Key Sequence : 99 → RFND → #/SBTL → CA/AT/NS

[JOB # 910]

B-② COMPULSORY: Clerk # should be entered before each transaction by CLK # key. Refer to page 19.

NOTES:

1. When the program is changed from "Non-compulsory" to "Compulsory" If the Clerk # has been entered before the change in the program, the entry of the clerk # does not become compulsory for the first transaction. However a Clerk # must be entered for every transaction thereafter.

2. When the program is changed from "Compulsory" to "Non-Compulsory"

Entry of the clerk # becomes compulsory only for the first transaction only. The register will be disabled until a clerk # entry has been performed.

B - ③ WITHOUT TAX: Subtotal excluding tax amount (merchandise subtotal) goes to clerk memory (totalizer).

WITH TAX: Subtotal including tax amount (merchandise subtotal + tax amount) goes to clerk memory (totalizer).

[JOB # 914]

A - ① Slip print format

Sample of Full print type

```

9:07PM01/31/83 101#0159 B 1111
001DPTT1 $1.00
002DPT $3.20
DSCNT -0.20
MDS ST $4.00
TAX1 $0.05
CASH $4.05
    
```

Sample of Simple print type

```

9:10PM01/31/83 101#0161 B 1111
CASH $4.05
    
```

A - ② ENABLE: PLU stock control is possible by mounting a 2K-byte RAM in the socket for the PLU stock control (RAM4) on the ER-42MB (Memory Board).

(512 stock counters are furnished by a 2K-byte RAM.)

- PLU/subdept. registrations can be done even when its stock counter goes to minus.
- PLU stock quantities should be preset in the PGM1 mode (Item 8 - [4]).

A - ③

	FILE NUMBER (MAX.)	
	PLU/SUB-DEPT.	PB LOOK UP
DISABLE	512 (RAM1 ~ RAM3, RAM5 ~ RAM7)	0
ENABLE	372 (RAM1 ~ RAM3, RAM5)	372 (RAM6, RAM7)

If PB look up is enabled, RAM6 and RAM7 must be mounted on the ER-42MB memory board.

(Refer to "SRV JOB #901-B" on page 26.)

NOTE:

After enabling the PB look up function, be sure to clear the RAM6 and RAM7 by performing the RAM test in the SRV mode. Refer to page 81. Characters settings for each PB look up code are also required in the PGM2 mode (item 19.) before using the PB look up function. (Refer to page 62.)

B - ② When the optional slip printer has been connected and enabled, validation printing is performed on the slip printer only.

C, D Number of positions the slip print will be shifted.

The print-out position of the first column can be shifted toward the left.

(Shiftable digits are 16 digits max.)

COLUMN	CONTENTS OF PRINT
1st Column	Time, Date, Register No., Consecutive No. Cashier, Clerk #
2nd Column	Registering items, Items for closing transaction

Samples of Print

9:15PMD1/31/83 101#0168 B 1111 — 1st column
 002DPT \$12.00
 CASH \$12.00 } 2nd column
 Shifted digit : 0

9:16PMD1/31/83 101#0169 B 1111 — 1st column
 002DPT \$12.00
 CASH \$12.00 } 2nd column
 Shifted digits: 5

9:16PMD1/31/83 101#0170 B 1111 — 1st column
 002DPT \$12.00
 CASH \$12.00 } 2nd column
 Shifted digits: 10

9:17PMD1/31/83 101#0171 B 1111 — 1st column
 002DPT \$12.00
 CASH \$12.00 } 2nd column
 Shifted digits: 16

9. PROGRAM MODE (PGM1, PGM2)

9-1. PROGRAMMING ITEMS

1. Date setting (PGM2 mode)

Enter month (one or two digits), day (two digits), and year (two digits) or D-M-Y*.

Procedure

250 → RFND → #/SBTL → Date (5 or 6 digits) → CA/AT/NS

* The date format should be selected by SRV JOB #902-B.

2. Time setting (PGM2 mode)

Set the time on the military time (24-hour) system.

Procedure

Time: Hour-Minute

251 → RFND → #/SBTL → Time (max. 4 digits) → CA/AT/NS

3. Register number setting (PGM2 mode)

Procedure

To set the register number "0"

252 → RFND → #/SBTL → Register number (max. 3 digits) → CA/AT/NS

4. Consecutive number setting (PGM2 mode)

Procedure

To set begin the count from 0001

253 → RFND → #/SBTL → Start number (max. 4 digits) → CA/AT/NS

(NOTE) This programming may be inhibited by SRV JOB #903-B.

5. Programming for the automatic tax calculation function (PGM2 mode)

[1] Tax table (PGM2 mode)

(1) Sample of tax table (State of New Jersey)

Tax	A (\$)		B (¢)	C
	Minimum breakpoint	Maximum breakpoint	Breakpoint difference	
.00	.01	.10	—	Non-cyclic
.01 → T	.11 → Q	.25	10	
.02	.26	.46	15 ... (1)	Cyclic
.03	.47	.67	21 ... (2)	
.04	.68	.88	21 ... (3)	
.05	.89	1.10	21 ... (4)	
.06	1.11 → "A" point	1.25	22 ... (5) = N	
.07	1.26	1.46	15	Cyclic
.08	1.47	1.67	21	
.09	1.68	1.88	21	
.10	1.89	2.10	21	
.11	2.11	2.25	22	

(2) Obtain this information from columns A, B, and C:

"A" point (the last minimum breakpoint in the first cyclic pattern) = 1.11;

N (number of breakpoint differences in a cyclic pattern) = 5

M (total of differences between consecutive minimum breakpoints in a cyclic pattern) = 100

Q (the lowest minimum breakpoint subject to taxation) = \$0.11 = 11¢

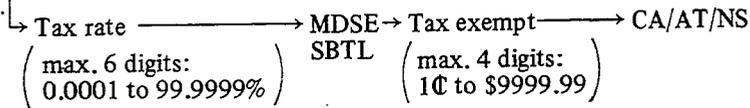
T (tax imposed on Q) = \$0.01 = 1¢

Notes: If you make an incorrect entry before pressing the **MDSE** key in programming a tax table, cancel it with the CL key, and if you make an error after pressing the **MDSE** key, cancel it with the **SBTL** key. Then program again from the beginning correctly.

[2] Tax rate (PGM2 mode)

Procedure

241 → RFND → #/SBTL → 1 or 2* → @/FOR



*When you program a tax rate as tax rate 1, enter "1," and when you program it as tax rate 2, enter "2."

6. Programming the limit amounts table (PGM2 mode) HALO, LALO

(1) Outline

The ER-4230 allows you to program these items:

- Digit entry limits (upper and lower ones) for department and subdepartment (option) keys, as well as the CP1, CP2, ⊖, TAX, RA, PO, CH1 thru CH5, and CHK keys.
- Change amount limit for check sale.
- Sentinel amount for cash in drawer.

However, the ER-4230 must be programmed with a limit amounts table before the above programming; and you may set 15 pairs of upper and lower limits for this table.

(2) Before programming

- You may set both upper and lower limit amounts in a maximum of seven digits. Any four- to seven-digit amounts are programmed into the machine after they are converted into the form like $ABC \times 10^D$.*

* ABC: First, second, and third digit entries

D: Number of fourth and subsequent digit entries

If you enter the amount 12345¢, for example, ABC is 123 and D is 2, and the amount is programmed as $123 \times 10^2 = \$123.00$. (12345 — 2 digits: D = 2)

Therefore, if you need to program four- to seven-digit amounts, or \$10.00 or more, enter them in the form of $ABC \times 10^D$.

- It is advisable to make a limit amounts table as shown below by setting a maximum of 15 pairs of upper and lower limit amounts necessary for the store and as signing them element numbers 01 through 15 and then entering amounts programmed in this table. This makes it easier when you need to program this table or set digit entry limits for various function keys.

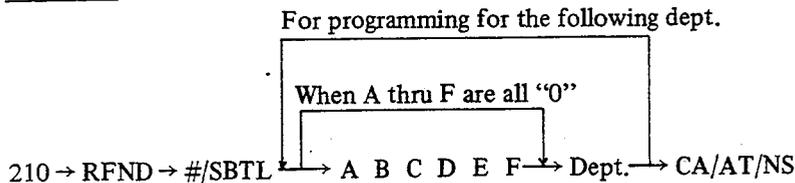
- (2) If the element number "15" is entered for department or subdepartment keys, unit prices programmed for those keys are handled as upper or lower limit amounts.
- (3) The amount equal to the upper or lower limit amount is permitted to be entered.
For instance, if the upper limit amount is \$12.00 and the lower one \$8.00, amounts from \$8.00 to \$12.00 are allowed to be entered.

7. Programming for departments

The ER-4230 allows you to perform the following programming for standard departments 1 thru 30 and optional departments 31 through 126.

[1] Functional programming 1 (PGM2 mode)

Procedure



- A: Hash/no hash (normal) 0: No hash (real dept.), 1: hash
 B: Scale entry compulsory/inhibited
 0: inhibited, 1: compulsory (manual or auto.)
 C: Counting method of selling quantity in split-pricing entries
 0: selling quantity ÷ base quantity, 1: selling quantity (normal)
 D: SIS (Single item cash sale)*
 0: no SIS, 1: SIS #1, 2: SIS #2
 E: Item validation print compulsory/non-compulsory
 0: non-compulsory, 1: compulsory
 F: Type of unit price entry
 0: inhibited department, 1: manual entry only, 2: preset unit price only,
 3: Both manual entry and preset unit price are enabled.

(NOTE)*

SIS (single item cash sale)

(1) SIS #1

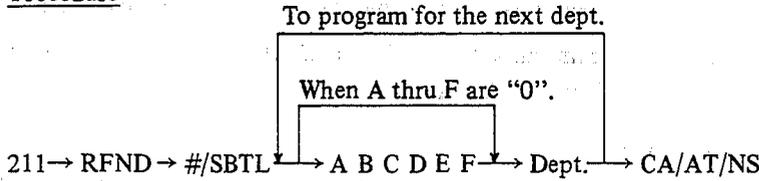
- If the first ring-up is to a department set for SIS #1, the sale is finalized as soon as the department key is pressed.
- If the sale is preceded by ring-ups to departments not set for SIS #1, a ring-up to a department set for SIS # 1 does not finalize and can be repeated until the CA/AT/NS key is pressed.

(2) SIS #2

- If the first ring-up is to a department set for SIS #2, the sale is finalized as soon as the department key is pressed. (Same as SIS #1)
- If the sale is preceded by ring-ups to departments not set for SIS #2, a ring-up to a department set for SIS #2, as the last item, will immediately finalize as soon as that department key is pressed.

[2] Functional programming-2 (PGM2 mode)

Procedure



A: Sign ... 0: plus, 1: minus.

B: Tax status, food stamp status

B	Taxable - 1	Taxable - 2	Food Stamp
0	NON TAX	NON TAX	NON ELIGIBLE
1	TAXABLE		
2	NON TAX	TAXABLE	
3	TAXABLE		
4	NON TAX	NON TAX	ELIGIBLE
5	TAXABLE		
6	NON TAX	TAXABLE	
7	TAXABLE		

NON TAX : NON TAXABLE

CD: Upper limit amount (00 – 15)

Consult your limit amounts table and enter an element number 00 thru 15 that corresponds to the upper limit amount you are going to set. ... refer to page 53.

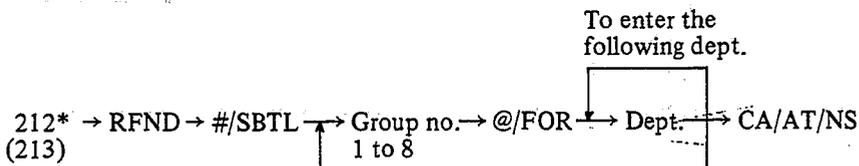
EF: Lower limit amount (00 – 15)

Consult your limit amount table and enter an element number 00 thru 15 that corresponds to the lower limit amount you are going to set. ... refer to page 53.

[3] Programming for grouping (PGM2 mode)

- Department can be formed into a maximum of eight groups (groups 1 thru 8).
Assign every department to one of the eight groups.

Procedure

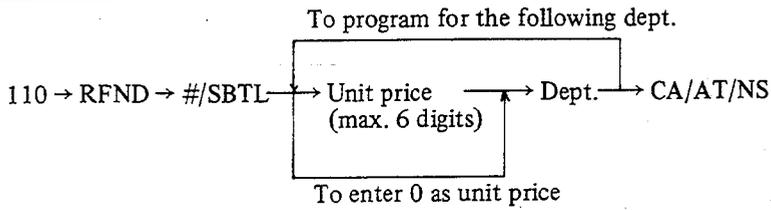


*To cancel the assignment of some department to some group, enter 213 in place of 212.

[4] Programming unit prices (PGM1 mode)

You may program unit prices in a maximum of six digits (\$9999.99).

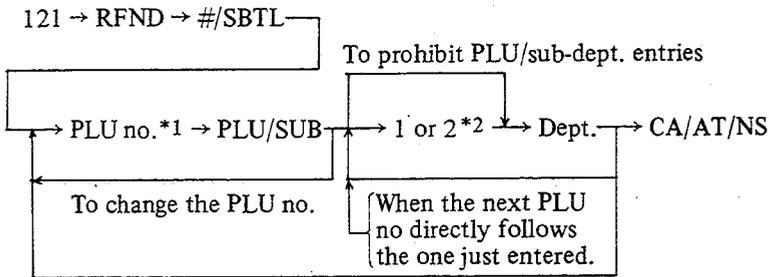
Procedure



8. Price look up (PLU) programming (option)

[1] Programming the PLU/subdepartment mode and associated departments (PGM1 mode)

Procedure



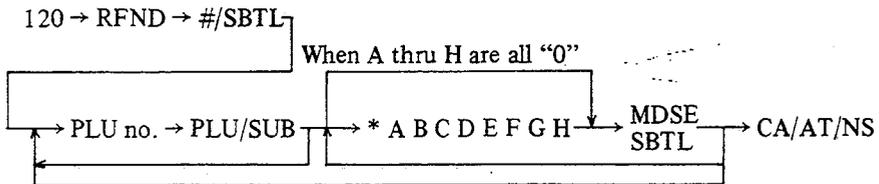
When the next PLU no. does not directly follow the one just entered.

- *1. Available PLU numbers or sub-department numbers vary depending upon the number of provided PLUs. (1 thru 512 max.)
- *2. Selection of PLU/subdepartment mode.
 - 1: Subdepartment mode.
 - 2: PLU mode.

Note: As soon as the programming is completed for one PLU, the next PLU number appears in the display.

[2] Programming unit prices, and base quantities or weights for split-pricing entries (PGM1 mode)

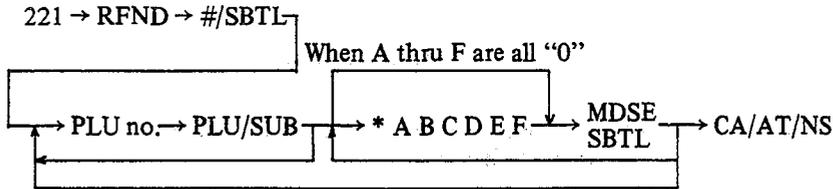
Procedure



- *AB: Base quantity or weight (00 – 99)
- C thru H: Unit price (000000 – 999999)

[3] Programming sign (+/-), tax status, food stamp status, and digit entry limits (PGM2 mode).

Procedure



*A: Sign (+/-) ... 0: plus, 1: minus
 B: Tax status, food stamp status

B	Taxable - 1	Taxable - 2	Food Stamp
0	NON TAX	NON TAX	NON ELIGIBLE
1	TAXABLE		
2	NON TAX		
3	TAXABLE	TAXABLE	ELIGIBLE
4	NON TAX	NON TAX	
5	TAXABLE		
6	NON TAX	TAXABLE	
7	TAXABLE		

NON TAX : NON TAXABLE

CD: Upper limit amount (High Amount Lock Out)

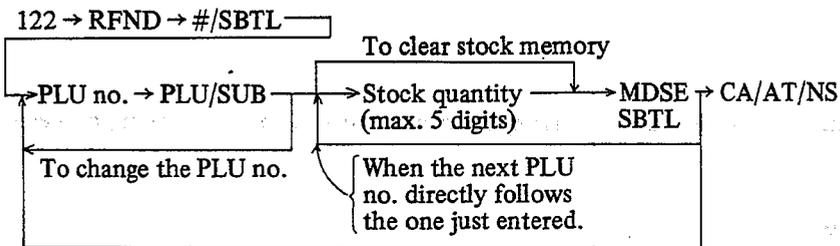
Choose proper element numbers (00 – 15) from your limit amounts table and enter them.

EF: Lower limit amount (Low Amount Lock Out)

Choose proper element numbers (00 – 15) from your limit amounts table and enter them.

[4] Programming the PLU stock quantity (PGM 1 mode)

Procedure



When the next PLU no. does not directly follow the one just entered.

NOTE 1. Entered stock quantity will be added to the stock memory.

Total stock quantity (old Q'ty + added Q'ty) will be printed on the journal and receipt.

2. When the machine has been equipped with the optional slip printer (ER-42SP1), if a slip has been inserted into the slip printer, the entered (added) stock quantity will be printed on the slip.

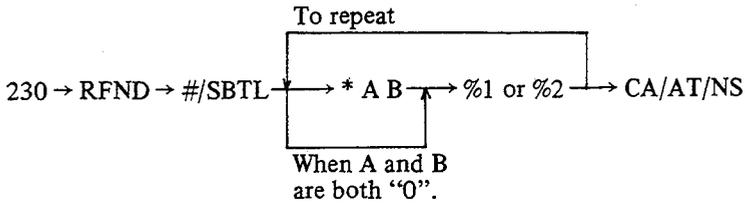
9. Programming for the %1 and %2 keys

%1 key: Achieves percent calculations for merchandise subtotals.

%2 key: Achieves percent calculations for department and PLU/subdept. entries.

[1] Programming +/- sign, tax status, and food stamp status (PGM2 mode)

Procedure



*A: +/- sign ... 0: + (premium), 1: - (discount)

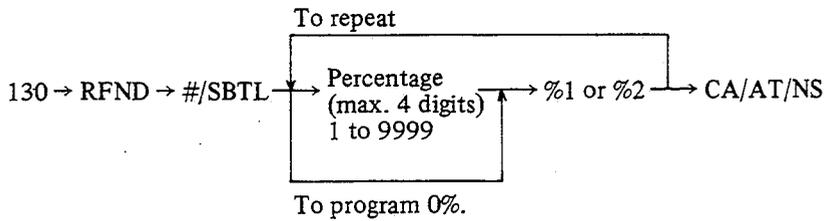
B: Tax status, food stamp status

B	Taxable - 1	Taxable - 2	Food Stamp
0	NON TAX	NON TAX	NON ELIGIBLE
1	TAXABLE		
2	NON TAX	TAXABLE	
3	TAXABLE		
4	NON TAX	NON TAX	ELIGIBLE
5	TAXABLE		
6	NON TAX	TAXABLE	
7	TAXABLE		

NON TAX : NON TAXABLE

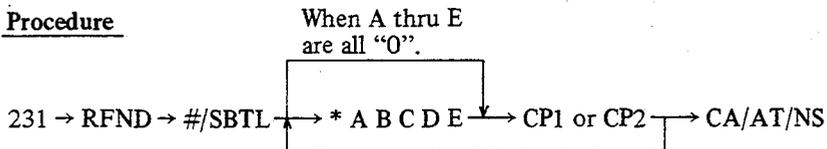
[2] Percentage programming (PGM1 mode)

You register allows you to program up to 99.99%. (0.00 ~ 99.99%)



10. Programming for the CP1 (manufacture coupon) and CP2 (store coupon) keys (PGM 2 mode)

Procedure



*A: Tax status and food stamp status

A	Taxable - 1	Taxable - 2	Food Stamp
0	NON TAX	NON TAX	NON ELIGIBLE
1	TAXABLE		
2	NON TAX	TAXABLE	
3	TAXABLE		
4	NON TAX	NON TAX	ELIGIBLE
5	TAXABLE		
6	NON TAX	TAXABLE	
7	TAXABLE		

NON TAX : NON TAXABLE

BC: Upper limit amount

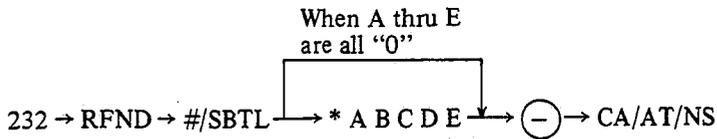
Choose proper element numbers (00 – 15) from your limit amounts table and enter them.

DE: Lower limit amount.

Choose proper element numbers (00 – 15) from your limit amounts table and enter them.

11. Programming for the \ominus key (PGM 2 mode)

Procedure



*A: Tax status and food stamp status

A	Taxable - 1	Taxable - 2	Food Stamp
0	NON TAX	NON TAX	NON ELIGIBLE
1	TAXABLE		
2	NON TAX	TAXABLE	
3	TAXABLE		
4	NON TAX	NON TAX	ELIGIBLE
5	TAXABLE		
6	NON TAX	TAXABLE	
7	TAXABLE		

NON TAX : NON TAXABLE

BC: Upper limit amount

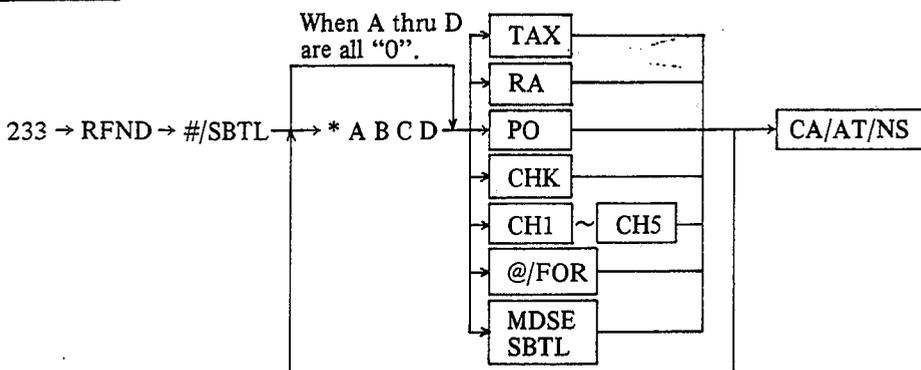
Choose proper element numbers (00 – 15) from your limit amounts table and enter them.

DE: Lower limit amount

Choose proper element numbers (00 – 15) from your limit amounts table and enter them.

12. Programming amount entry limits for function keys (PGM 2 mode)

Procedure



@/FOR: Limitation of change amount for check sale

MDSE : Sentinel amount of cash in drawer
SBTL :

*AB: Upper limit amount

Choose proper element numbers (00 – 15) from your limit amount table and enter them.

CD: Lower limit amount

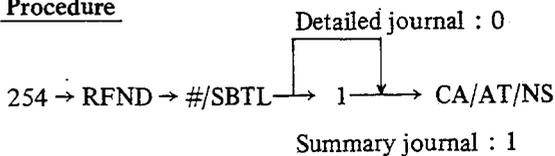
Choose proper element numbers (00 – 15) from your limit amounts table and enter them.

13. Programming the journal print form (PGM2 mode)

You may choose either of the following forms.

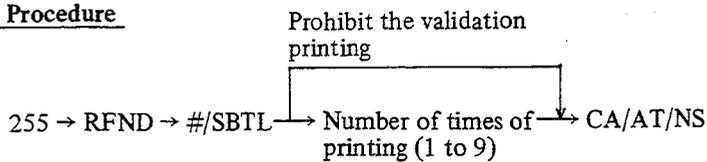
- (1) Detailed journal print that shows the details of all entries – the same information as printed on the receipt.
- (2) Summary journal print that shows tax 1, tax 2, and total amounts only.

Procedure



14. Programming the limit to the number of times of validation printing (PGM2 mode)

Procedure

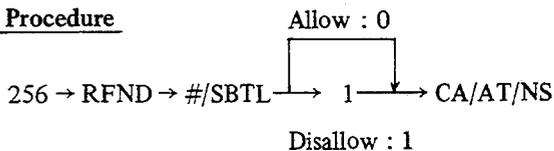


(NOTE) If compulsory validation is programmed for a certain function, its validations are enforced up to the limited times.

15. Programming the CLK X/Z mode availability (PGM2 mode)

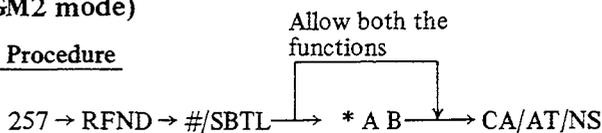
When a cashier needs to take the cashier X or Z report, he or she will use the CLK X/Z mode. This programming decides whether he or she should be allowed to use this mode or not.

Procedure



16. Programming the availability of the REG-mode refund entry and indirect void (PGM2 mode)

Procedure

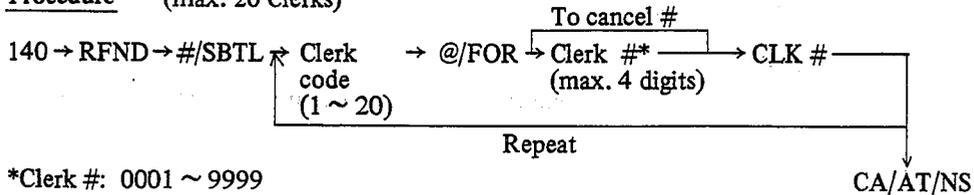


*A: Indirect void availability ... 0: allow, 1: disallow

B: Refund entry availability ... 0: allow, 1: disallow

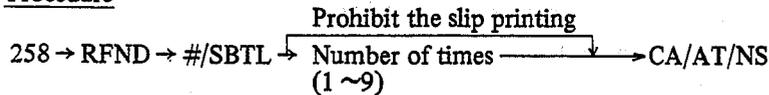
17. Programming the Clerk # (PGM 1 mode)

Procedure (max. 20 Clerks)



18. Programming the limit to the number of times of slip printing (PGM 2 mode)

Procedure

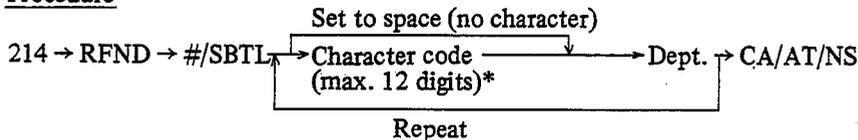


19. Programming the characters

- For the programming of characters, refer to the character code table on page 63.
- Character code entry should be even numbers within 12 digits.

[1] Department character (PGM2 mode)

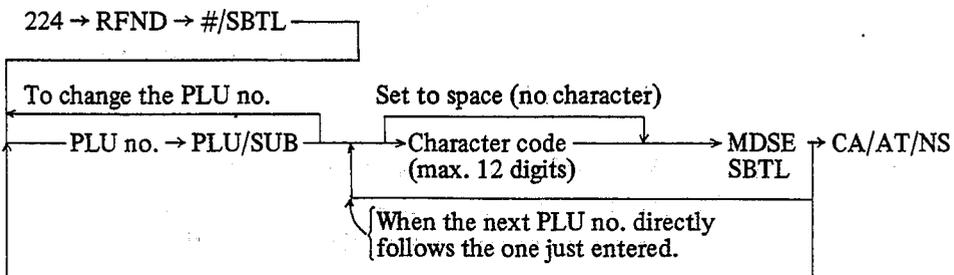
Procedure



*12-digit number represent 6 characters.

[2] PLU Character (PGM2 mode)

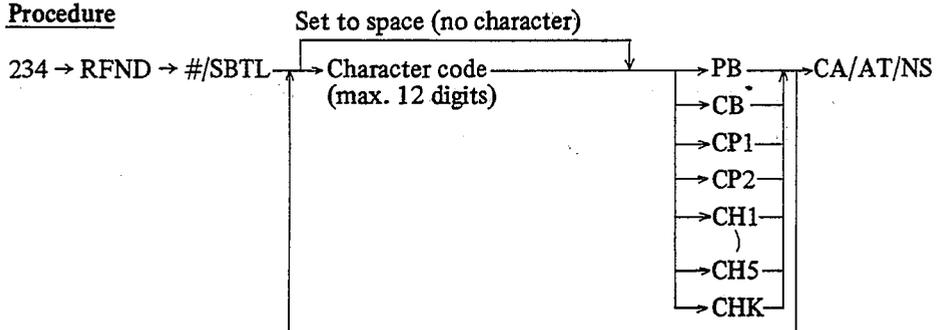
Procedure



When the next PLU no. does not directly follow the one just entered.

[3] PB, CB, CP1, CP2, CH1 ~ CH5, CHK character (PGM2 mode)

Procedure



CHARACTER CODE TABLE

CODE	CHARACTER	CODE	CHARACTER	CODE	CHARACTER
00	0	19	I	38	\$
01	1	20	J	39	%
02	2	21	K	40	&
03	3	22	L	41	'
04	4	23	M	42	,
05	5	24	N	43	.
06	6	25	O	44	*
07	7	26	P	45	/
08	8	27	Q	46	@
09	9	28	R	47	!
10	(SPACE)	29	S	48	(
11	A	30	T	49)
12	B	31	U	50	+
13	C	32	V	51	-
14	D	33	W	52	→
15	E	34	X	53	←
16	F	35	Y	54	Double size * character
17	G	36	Z		
18	H	37	#		

NOTE* Double size character code (54) should be entered prior to the character code.

EX. "SHAR" : Input, 54,29,18,11,28 (10 digits)

↑
Double size character

9-2. READING OF PGM1, PGM2 PROGRAMMING

Program for:	Mode switch position	JOB#	Procedure
(1) Departments	PGM2	210	For individual reading # /SBTTL → Start dept. no. → @ /FOR → End dept. no. * → CA /AT /NS
	PGM1	110	
(2) Grouping of departments	PGM2	212	# /SBTTL → CA /AT /NS
(3) PLUs and/or subdepartments	PGM2	220	For individual reading # /SBTTL → Start PLU/subdept. no. → @ /FOR → End PLU/subdept. no. * → CA /AT /NS
	PGM1	120	
(4) Percentages (%1, %2)	PGM1	130	
(5) Function keys	PGM2	230	# /SBTTL → CA /AT /NS
	PGM2	240	
(7) Limit amounts table	PGM2	242	
(8) Clerk #	PGM1	140	# /SBTTL → CA /AT /NS
(9) Character of PB look ups	PGM2	260	For individual reading # /SBTTL → (Start) PB look up no. → @ /FOR → (End) PB look up no. → CA /AT /NS

Note) * End no. should be larger than start no.

9-3. ACTIVATION/CANCELLATION OF TRAINING MODE (PGM1 mode)

The TRAINING mode is used if you need to train someone in register operations without any change in register's memory.

When the training is completed, cancel this mode and put the machine back to normal mode.

(1) Activation and cancellation procedures

- For activation

157 → #/SBTL

```

10:28PM01/31/83
101#---- B

*TRNG*
    
```

- For cancellation

158 → #/SBTL

```

10:29PM01/31/83
101#0206 B

*TRNG*
DELETE
    
```

(2) TRAINING-mode operations

- Any practices entry are allowed only when the mode switch is in the REG position.
- The register, in order to indentify training entries from actual ones, prints the symbol "TR" to the left of the total sales amount, amount tendered, and change due amount.
- None of the entries are added to any totalizers or counters.
- The consecutive number counter is not incremented, and the register prints "----" instead of a consecutive number.

Sample printout
of TRAINING-mode
entries

```

10:28PM01/31/83
101#---- B 0000

*TRNG*
001DPTT1 $2.00
003DPT $5.60
001PLU $12.00
002DPT $5.60
MDS ST $25.20
TAX1 $0.10

CASH $25.30
    
```

9-4. SLIP PRINTER PAPER RELEASE (PGM1/PGM2 modes)

Procedure : SLIP

In case the slip is hard to insert, depress the SLIP key, then try to insert the slip again.

10. READING AND RESETTING (CLK X/Z, X1/Z1, X2/Z2 modes)

10-1. CLK X/Z MODE: Individual cashier total

Note: The CLK X/Z-mode reading and resetting is allowed only when the machine has been programmed for "CLK X/Z mode available" in the PGM2 mode (item 15.).

No.	Item	X/Z	Key Operation
1	Individual chashier* ¹	X	2 → #/SBTL → CA/AT/NS
		Z	2 → RFND → #/SBTL → CA/AT/NS
2	Individual Clerk* ²	X	3 → #/SBTL → CA/AT/NS
		Z	3 → RFND → #/SBTL → CA/AT/NS

*1. Reading or resetting is performed to a cashier who has been designated by the real cashier key or cashier push button key.

*2. To designate a clerk perform the following sequence;

CLK # → Clerk code (#) → CLK # --- → Reading/Resetting
key operation
(4 digits max.)

*The clerk code (#) must be a number which has been preset in the PGM1 mode (item 17).

NOTE: If the machine is equipped with the optional slip printer (ER42 SP1) the CLK X/Z, X1/Z1 and the X2/Z2 reports can be printed on the slip printer by depressing the SLIP key instead of the CA/AT/NS key.

- Resettings in the CLK X/Z mode do not cause any machine close state (machine lock-up state).
- During the printing of reading report;
If the slip ends, the machine will be in a error state with continuous buzzer sound and "E" display clear this state by the CL key and insert a new slip, then depress the SLIP key.

10-2. X1/Z1 MODE : Daily Sales Total

1) Reading and Resetting

X : Reading Z : Resetting

No.	Item	X/Z	Key Operation
1.	General sales	X	1 → #/SBTL → CA/AT/NS
		Z	1 → RFND → #/SBTL → CA/AT/NS
2.	Individual cashier	X	2 → #/SBTL → CA/AT/NS
		Z	2 → RFND → #/SBTL → CA/AT/NS
3.	All cashier sales (A, B, D, E)	X	5 → #/SBTL → CA/AT/NS
		Z	5 → RFND → #/SBTL → CA/AT/NS
4.	Cash in drawer	X	30 → #/SBTL → CA/AT/NS
5.	All department (Including optional departments)	X	10 → #/SBTL → CA/AT/NS

6	Individual programmed groups	X	11 → #/SBTL → Group no. (1-8) → CA/AT/NS
7	Manually formed groups	X	12 → #/SBTL → Dept. → CA/AT/NS
8	PLU/sub-department by block NOTE)* N1 : PLU/subdept. No. Max. 3 digits (Start No.) N2 : PLU/subdept. No. Max. 3 digits (End No.) (option)	X	20 → #/SBTL → N1* → @/FOR → N2* → CA/AT/NS *1
		Z	20 → RFND → #/SBTL → N1* → @/FOR → N2* → CA/AT/NS *1
9	PLU/subdepartment belonging to each department (Option)	X	21 → #/SBTL → Dept. → CA/AT/NS
10	Hourly sales (Option)	X	4 → #/SBTL → CA/AT/NS
		Z	4 → RFND → #/SBTL → CA/AT/NS
11	Individual clerk	X	3 → #/SBTL → CA/AT/NS
		Z	3 → RFND → #/SBTL → CA/AT/NS
12	All clerks (20 clerks max.)	X	6 → #/SBTL → CA/AT/NS
		Z	6 → RFND → #/SBTL → CA/AT/NS
13	PLU stock	X	22 → #/SBTL → N1* → @/FOR → N2* → CA/AT/NS *1
14	PB look up	X	60 → #/SBTL → N1* → @/FOR → N2* → CA/AT/NS *1

NOTE)* N1 : PLU/subdept. no. or PB look up no. Max. 3 digits (start no.)

N2 : PLU/subdept. no. or PB look up no. Max. 3 digits (End no.)

*1. Individual reading or resetting

2) Machine Close/Open and Memory Clear

No.	Item	Key Operation
1	Machine Close	90 → #/SBTL → CA/AT/NS
2	Machine Open	91 → #/SBTL → CA/AT/NS
3	Memory clear of daily total memory (Lock up release)	99 → RFND → #/SBTL → CA/AT/NS

NOTE)

No.1 : After the machine-close operation, all operations will be prohibited, but readings and resettings in the CLK X/Z, X1/Z1 and X2/Z2 modes are possible. (Display: CLOSE1)

Print sample (No.1)

```

11:14AM05/04/83
123#1519 A 1001
CLOSED

```

No.2 : By the machine-open operation, the machine will be released from the closed state 1 (Display: CLOSE1 0.00) which has been caused by the "Machine close" operation.

Print sample
(No.2)

```
11:15AM05/04/83
123#1520 A 1001

OPEN
```

No.3: Performing the memory clear operation, will clear the daily total memory. This operation is only effective when the machine is in the lock-up state (CLOSE 2) caused by the daily total resetting operation.

The machine enters the lock-up state after performing resetting operation in the X1/Z1 mode, when the machine has been programmed for "MACHINE LOCK-UP" in the SRV mode (JOB#904, A - ③).

..... Refer to pages 9 and 47.

Sample Print of Memory Clear:

```
9:14AM06/22/82
101#0101 B 1112

#0004 M.CLR (D)
#0020 M.CLR (D)
```

(D): Daily total memory

---- Hourly sales

---- PLU/sub-dept.

10-3. X2/Z2 MODE : Monthly Total (Periodic Summing)

X : Reading
Z : Resetting

No.	Item	X/Z	Key Operation
1	All departments	X	10 → #/SBTL → CA/AT/NS
		Z	10 → RFND → #/SBTL → CA/AT/NS
2	Individual programmed groups	X	11 → #/SBTL → Group No. → CA/AT/NS
3	Manually formed groups	X	12 → #/SBTL → Dept. → CA/AT/NS
4	All clerks	X	6 → #/SBTL → CA/AT/NS
		Z	6 → RFND → #/SBTL → CA/AT/NS
5	Memory clear of monthly total memory (Lock up release)		99 → RFND → #/SBTL → CA/AT/NS

Dept. : Department key (1 ~ 30), optional 31 ~ 126.

NOTE)

No.5: Performing the memory clear operation will clear the monthly total memory.

This operation is effective on the machine which is in the lock-up state (CLOSE 2) after performing the monthly total resetting.

Machine becomes the lock-up state by the resetting operation in the X2/Z2 mode, when the machine has been programmed for "MACHINE LOCK-UP" in the SRV mode (JOB#904-A- ③).

..... Refer to pages 9 and 47.

Sample Print of Memory Clear:

```
9:26AM06/22/82
101#0112 B 1112

#0006 M.CLR (M)
```

(M) : Monthly total memory

---- All clerk's sales

10-4. SAMPLE OF X/Z REPORT

1. Daily General X Report

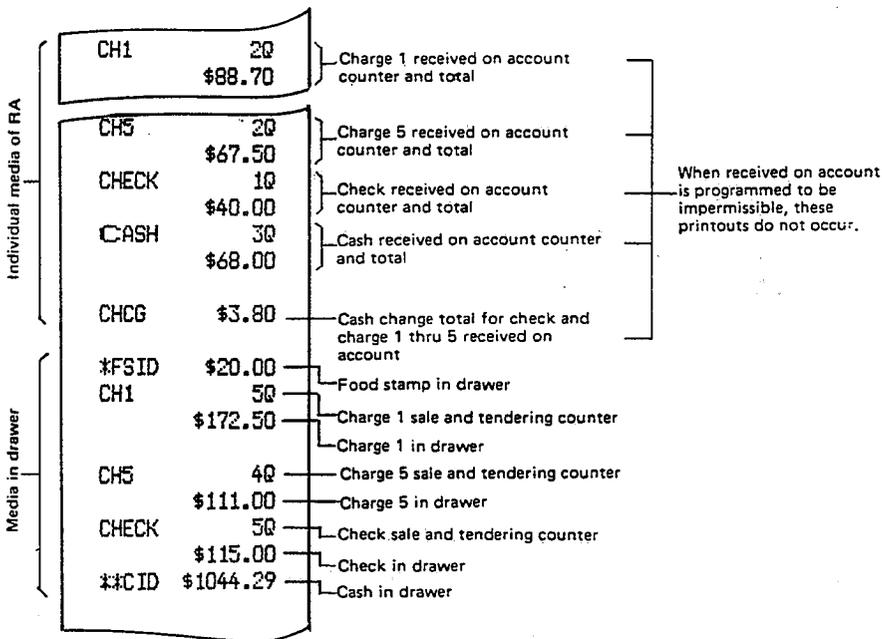
2. Daily General Z Report

1. Daily General X Report		2. Daily General Z Report	
Time	9:03PM05/01/83	Time	2:25PM05/03/83
Date	123#1128 A 1020	Date	123#1469 A 1010
Register no./Consecutive no./Cashier code/Clerk no.		Register no./Consecutive no./Cashier code/Clerk no.	
Report no.	#0001 *X1*	Report no.	#0001 *Z1*
Read symbol		Read symbol	
Dept. no.		Dept. no.	
Sales q'ty	0010DPT 22.000	Reset counter	Z1 0001
Sales amount	001 \$192.50	Grand total of plus registrations	GT1 \$0000005935.89
Ratio of dept. 1 sales amount to "+" real dept.	15.04%	Grand total of minus registrations	GT2 \$0000000137.24
	002DPT 15.000	Net grand total (GT1-GT2)	GT3 \$0000005798.65
	002 \$137.85		
	10.77%		
	003DPT 27.000		
	003 \$158.40		
	12.37%		
	004DPT 9.000		
	004 \$26.18		
	2.05%		
	005DPT 25.000		
	005 \$78.40		
	6.12%		
	016DPT 3.000		
	016 \$15.52		
	1.21%		
	017DPT 4.000		
	017 \$14.40		
	1.12%		
"+" real departments			
	025DPT 8.000		
	025 \$60.85		
	4.75%		
	*:TTL \$1280.13	"+" real dept. total	
"-" real departments			
	026DPT 1.000		
	026 -0.50		
	027DPT 5.000		
	027 -0.60		
	*:TTL -1.10	"-" real dept. total	
Subtotal level modifiers			
	CP1 20	Coupon 1 (manufacturer coupon) counter and total	
	%1 \$3.50	Percent 1 counter and total	
	DSCNT 10	Deduction counter and total	
	*NET1 \$0.18	Net sales total	
Item level modifiers			
	CP2 20	Coupon 2 (store coupon) counter and total	
	%2 \$1.25	Percent 2 counter and total	
	029DPT 2.000	When store coupon like PLU entries are made, their counter and total are printed here. This printing occurs, however, only when your machine is programmed to print them.	
	029 \$6.70		
	030DPT 1.000		
	030 \$3.50		
"+" hash departments			
	*HATL \$10.20	"+" hash dept. total	

↓
The subsequent prinout occurs in the same format as in the sample X report.

* If coupon 2 and percent 2 are programmed for item non-netting, coupon 2 counter and total follow coupon 1 counter and total and percent 2 counter and total do percent 1 counter and total.

"- " hash departments	028DPT	4.000	
	028	-7.75	
	#HATL	-7.75	"-" hash dept. total
Tax related totals	TX1ST	\$110.85	Net taxable subtotal (including hash dept. total)
	GRTX1	\$5.73	Tax 1 total of "+" sales
	RFTX1	-0.18	Tax 1 total of refund (minus) entries
	NTTX1	\$5.55	Net tax 1 total
	TX2ST	\$30.65	Tax 2 total
	GRTX2	\$1.41	
	RFTX2	-0.18	
	NTTX2	\$1.23	Net manual tax total
	MTAX	\$0.50	
	#NET2	\$1283.64	Sales total including tax
Void, refund related totals	VOID	100	Item void counter and total
		\$52.43	
	MGRVD	20	VOID-mode counter and total
		\$6.18	
	VD TTL	10	VOID-mode transaction counter and total (including RA, PO and no-sale)
		\$6.18	
	RFMD	50	Refund counter and total
		\$32.20	
	HAVOID	10	Hash item void counter and total
		\$8.50	
	HARFND	10	Hash item refund counter and total
		\$3.50	
	#	50	Non-add print counter
NDSALE	40	No-sale (Exchange) counter	
VP CNT	40	Validation print counter	
SLPCNT	00	Slip print counter	
Sales media	**SALE	860	Customer counter
		\$1286.09	Sales total (including hash dept. total)
	FSSALE	40	Food stamp counter
		\$17.91	Food stamp total
	CH1	30	Charge 1 counter and total
		\$77.10	
	Sales media	CH5	20
		\$39.30	
CHECK		40	Check counter and total
		\$64.25	
CASH		750	Cash counter and total
	\$1030.03		
P, PO totals	CHCG	\$17.85	Cash change total for check and charge 1 thru 5 sale (tendering)
	FCACG	\$2.09	Cash change total for food stamp tendering
	***P/D	10	Paid out counter and total
		\$30.00	
	***R/A	70	Received on account counter and total
		\$264.20	



10-5. CALCULATION FORMULA

(1) Net sales total (ST) formula

$$ST = ("+" \text{ real dept. total}) + ("-" \text{ real dept. total}) - (\text{Coupon 1 total}) + (\%1 \text{ total}) - (\text{Deduction total}) - (\text{Coupon 2 total}) * + (\%2 \text{ total}) *$$

*This total is effective only when coupon 2 or %2 is programmed for item non-netting.
.... (SRV mode JOB #904-C)

(2) Cash in drawer (CATL) formula

$$CATL = (\text{Cash sales total}) - (\text{Paid out total}) + (\text{Cash received on account total}) - (\text{cash change total for check and charge 1 thru 5 sale (tendering)}) - (\text{Cash change total for check and charge 1 thru 5 received on account}) - (\text{Cash change total for food stamp tendering})$$

(3) Grand total (GT) formula

The non-resettable GT figure which appears on the Z report is a result of the following calculation.

$$\begin{aligned} \text{Current GT1} = & \text{Old GT1 (i.e. from the previous Z report)} \\ & + ("+" \text{ real department total}) \\ & + (\text{Tax 1 and 2 totals of "+" sales}) \\ & + (\text{Net manual tax}) \\ & + (\text{Item void total}) \\ & + (\text{VOID-mode total}) \\ & + (\text{Refund total}) \\ & + (\text{Store coupon-like PLU total}) \\ & + (\%1 \text{ plus total}) * 1 \\ & + (\text{Coupon 2 total}) * 2 \\ & + (\%2 \text{ plus total}) * 3 \\ & - (\%2 \text{ minus total}) * 4 \end{aligned}$$

- Notes: *1. This total can be obtained when %1 is assigned the “+” (premium) sign.
 *2. This total is figured out when coupon 2 is programmed for item netting (SRV mode JOB #904-C).
 *3. This total is computed when %2 is assigned the “+” (premium) sign and programmed for item non-netting. (SRV mode JOB # 904-C).
 *4. This total can be obtained when %2 is assigned the “-” (discount) sign and programmed for item netting. (SRV mode JOB #904-C).

Current GT2 = Old GT2

- (“-” real department total)
- [tax 1 and tax 2 totals of refund (minus) entries]
- + (Item void total)
- + (VOID-mode total)
- + (Refund total)
- + (Store coupon-like PLU total)
- + (Coupon 1 total)
- + (Coupon 2 total)
- + (Deduction total)
- (%1 minus total)*
- (%2 minus total)*

Note: * These totals are figured out when %1 and %2 are assigned the “-” (discount) sign.

Current GT3 = Old GT3

- + (Net sales total)
- + (Tax 1 and tax 2 totals of “+” sales)
- + [Tax 1 and tax 2 totals of refund (minus) entires]
- + (Net manual tax)
- = Current GT1 – Current GT2
- = Old GT3
- + (“+” real department total)
- + (“-” real department total)
- + (Tax 1 and tax 2 totals of “+” sales)
- + [Tax 1 and tax 2 totals of refund (minus) entires]
- + (Net manual tax)
- + (%1 plus total)
- + (%1 minus total)
- + (%2 plus total)*1
- + (%2 minus total)*2
- (Coupon 1 total)
- (Deduction total)
- (Coupon 2 total)*3

- Notes: *1. This total is computed when %2 is assigned the “+” (premium) sign and programmed for item netting. (SRV mode JOB #904-C)
 *2. This total is computed when %2 is assigned the “-” (discount) sign and programmed for item non-netting. (SRV mode JOB #904-C)
 *3. This total is figured out when coupon 2 is programmed for item non-netting. (SRV mode JOB #904-C)

11. PRECAUTIONS ON SERVICING

1. Removing the Power Cord from the Wall Outlet

The power cord has to be disconnected from the wall outlet when the cabinet is to be removed or connectors are to be inserted or removed. Even though the mode switch is in the OFF position, voltage is still supplied to the entire machine.

2. Cautions in handling the printer connector and the data pack connectors

Because the flexible flat cable (FFC) is used for above cables, care must be taken in the following points in handling the FFC cable.

- (1) To remove the FFC cable from the connector, hold both edges of the cable with your fingers and lift it straight upwards.

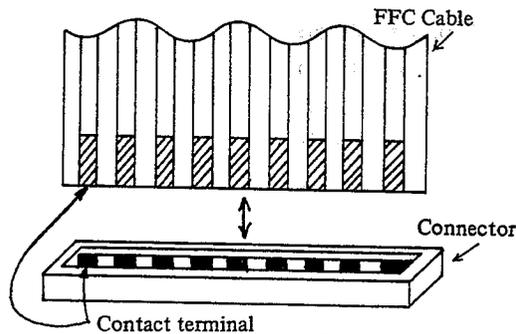


Fig. A

- (2) To insert the FFC cable, hold both edges of the cable with your fingers and insert it into the connector straight downwards. Match the leading edges of the cable lines with those of the connector.
- (3) When the data pack connectors or printer connector have to be installed after replacement of those items, make sure that the connectors face the directions described in Fig. B.

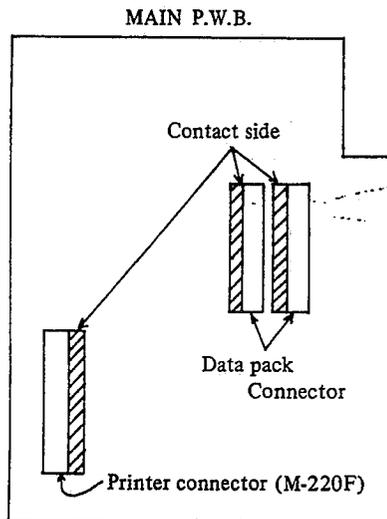


Fig. B

3. Replacement of the printer dot wire driver IC (M54532P)

Replace the dot wire driver (M54532P) after observing the following procedures.

- Measure the resistance of the Printer dot wire solenoid using the ohmmeter.

PRINTER CONNECTOR TERMINAL ASSIGNMENT (M-220F)

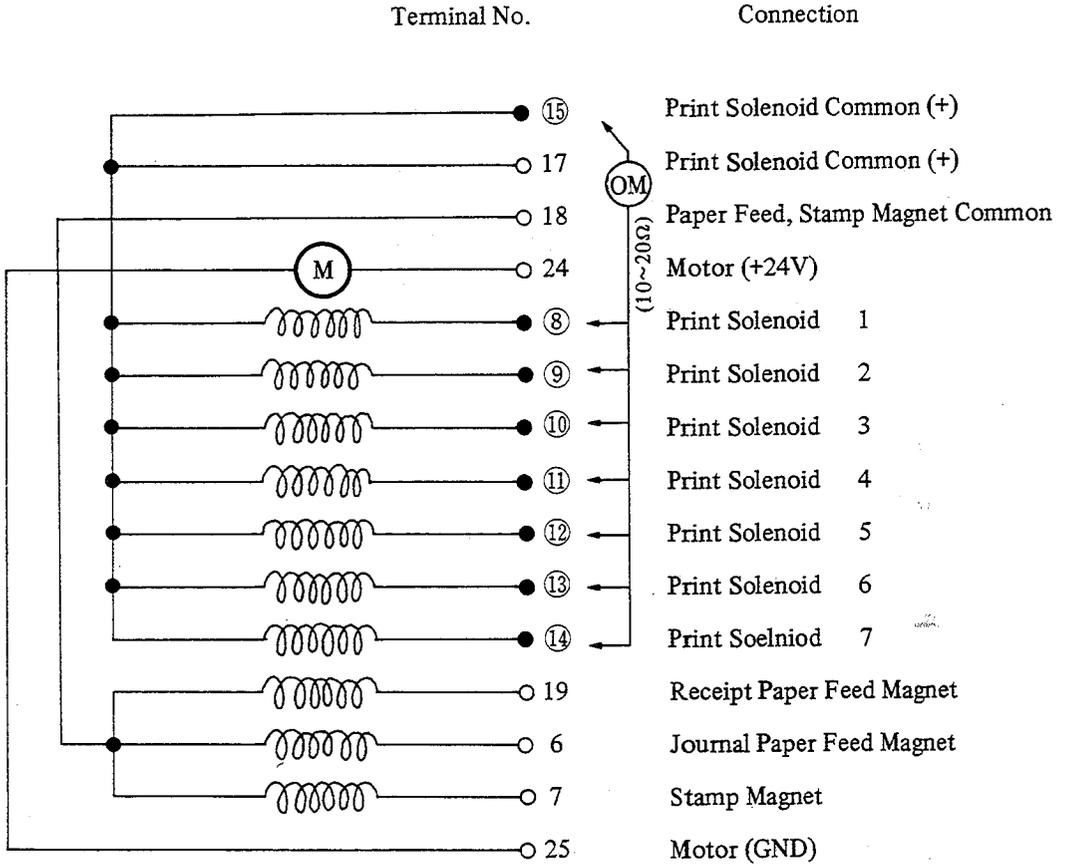


Fig. C

OM: ohm meter

Replacement will be necessary if the resistances between the terminal 1 and terminals 5 thru 11 are within a range of 10 to 20 ohms, respectively.

Should there be any terminal showing a zero ohm, the relevant solenoid has to be replaced with the new one first before the replacement of the M54532P driver, as that solenoid must have a short circuit.

4. Earth wire of the Keyboard.

In case the keyboard has to be removed to be repaired, pull out the earth wire shown in Fig. D from the quick connector using pliers. Be sure to reconnect the ground wire to the quick connector securely after replacing the keyboard.

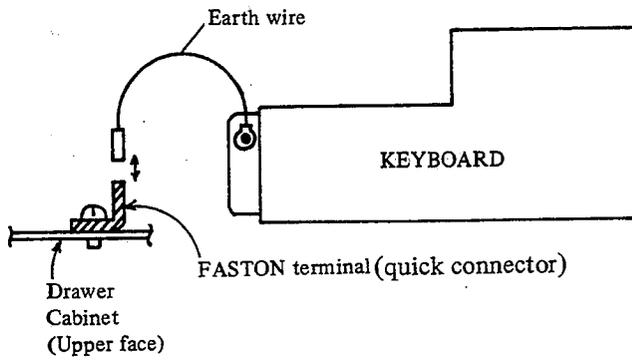


Fig. D

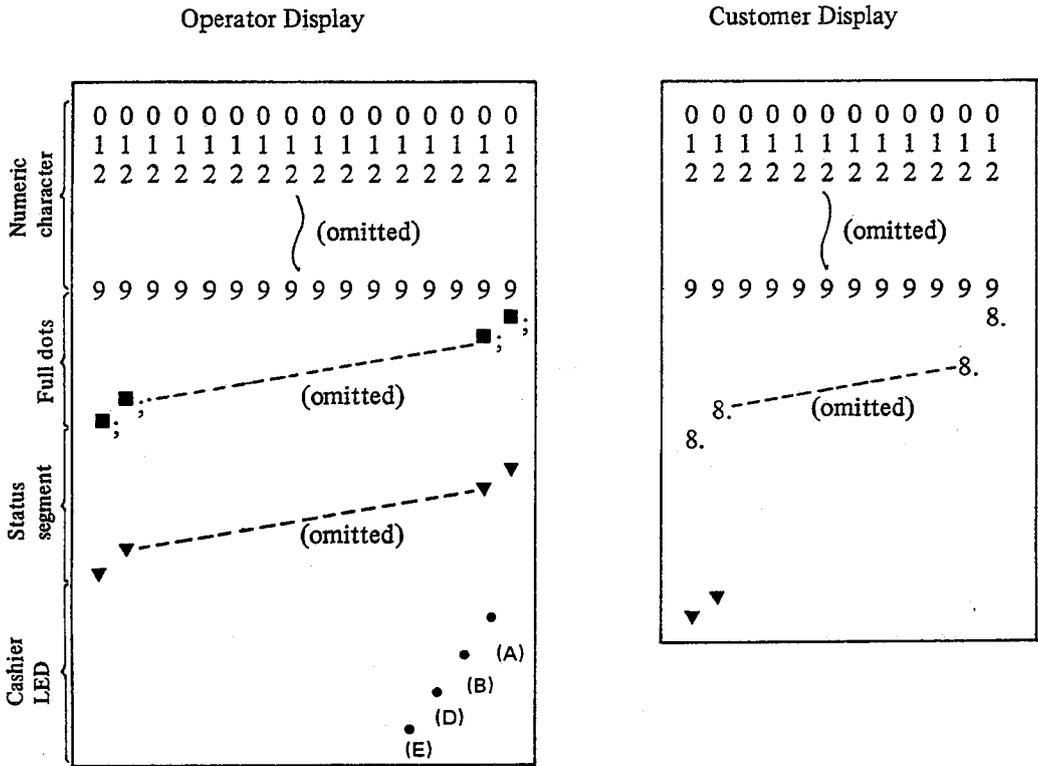
5. Wiring treatment of the DC power supply cable and the revolving display cable

Thread the cable in such a manner as to avoid the dc power supply cable and the revolving display cable to come in contact with heat sink fin, since the heat sink fin of the power supply PWB may be in high temperature. It is recommended to secure it to a spare hole provided on right upper corner of the display PWB using the cable holder (wiring tie).

[3] Display Test

START: 102 → CA/AT/NS

The following display will be shown. (One cycle only)



STOP: Auto-stop (Finalizing message print; 102)

[4] Printer & Display Test (For aging test)

START: 103 → CA/AT/NS

The above printer (M-220F) and display tests are executed alternately.

STOP: Depress "any key" once. --- If will stop after one-cycle printing and display.

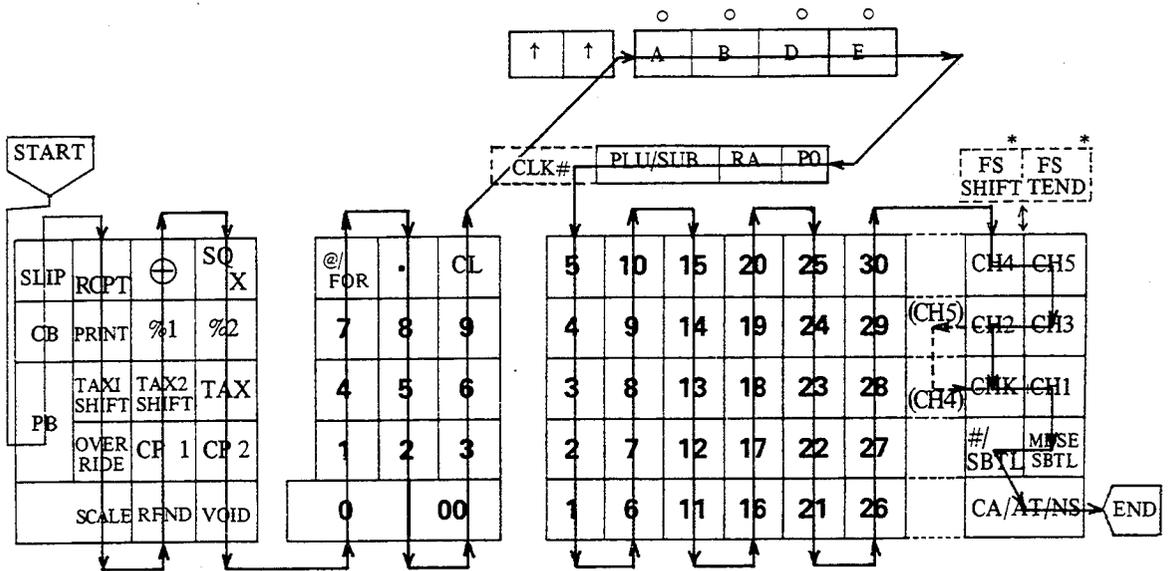
[5] Key Test-1 (For the ER-4230 Keyboard)

START: 104 → CA/AT/NS

Test procedure: After the start key operation, depress all keys one by one in the following order.

NOTE: *Marked keys are optional.

For 10 or 20 department machine, depress the dept. key 1 to 10 or 20 .



30 DEPT.

STOP: The key test will be finalized when the CA/AT/NS key has been depressed.
The test can be finalized at any time by the CA/AT/NS key.

(1) Normally finalizing message print

104

(2) Error message print

E-----104

[6] Key Test-2 (For the optional BRP, dept. 31 ~ 126 max.)

START: 105 → CA/AT/NS

Test procedure: After the start key operation, depress all keys one by one from the dept.
31 to dept. 126 (max.)

[7] Mode Switch Test

START: 106 → CA/AT/NS

Test procedure: After the start key operation, turn the mode switch from SRV to X2/Z2 position and return it to SRV position.

During the mode switch test, ∇ segment of each display digit lights according to the position of the mode switch.

DISPLAY

Digit	9th	8th	7th	6th	5th	4th	3rd	2nd	1st
	∇	∇	∇	∇	∇	∇	∇	∇	∇
Position	X ₂ /Z ₂	X ₁ /Z ₁	MGR	REG	CLK X/Z	OFF	PGM1	PGM2	SRV

STOP: Depress "any key" in SRV (any) mode

(Finalizing message print: 106)

[8] Receipt ON/OFF Switch Test

START: 107 → CA/AT/NS

During the receipt on/off switch test, ▽ segment of the first display digit lights according to the position of the receipt on/off switch.

- a. When ON position: The 1st digit (▽) lights.
- b. When OFF position: The 1st digit (▽) does not light.

STOP: Depress “any key” in the SRV (any) mode.

(Finalizing message print: 107)

[9] Validation Paper Sensor Test

START: 108 → CA/AT/NS

During the validation paper sensor test, ▽ segment of the first display digit lights according to condition of the paper insertion.

- a. When no paper is inserted: The 1st digit (▽) does not light.
- b. When paper is inserted properly: The 1st digit (▽) lights.

STOP: Depress “any key” in the SRV (any) mode.

(Finalizing message print: 108)

NOTE) During the validation paper sensor test, the 2nd digit (▽) lights.

[10] Paper Near End Sensor Test

START: 109 → CA/AT/NS

During the paper near end sensor test, ▽ segment of the first display digit lights according to the condition of the roll paper.

- a. When not near end: The 1st digit (▽) does not light.
- b. When near end or no paper: The 1st digit (▽) lights.

STOP: Depress “any key” in the SRV (any) mode.

(Finalizing message print: 109)

[11] Slip Paper Sensor Test

START: 110 → CA/AT/NS

During the slip paper sensor test, ▽ segment of the first and second display digits light according to the condition of the slip paper.

- a. When the TOP OF FORM sensor does not detect the slip:
The 1st digit (▽) does not light.
- b. When the TOP OF FORM sensor detects the slip:
The 1st digit (▽) lights.
- c. When the BOTTOM OF FORM sensor does not detect the slip:
The 2nd digit (▽) does not light.
- d. When the BOTTOM OF FORM sensor detects the slip:
The 2nd digit (▽) lights.

STOP: Depress “any key” in the SRV (any) mode.

(Finalizing message print: 110)

[12] Drawer Open Test

- START: 111 → CA/AT/NS (Standard drawer)
 112 → CA/AT/NS (Optional drawer-1)
 113 → CA/AT/NS (Optional drawer-2)
 114 → CA/AT/NS (Optional drawer-3)

During the drawer test, ▽ segment of the first display digit lights according to the condition of the drawer.

- a. When drawer is open:
 The 1st digit (▽) does not light.
- b. When drawer is closed (not open):
 The 1st digit (▽) lights or not connected.

STOP: Depress "any key" in the SRV mode.
 (Finalizing message print: 111) --- Standard drawer
 112) --- Optional drawer-1
 113) --- Optional drawer-2
 114) --- Optional drawer-3

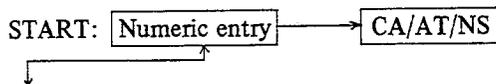
[13] Data Pack SW1 Test

START: 116 → CA/AT/NS

During the Data Pack SW1 test, segment of the first display digit lights according to the condition of the SW1 (ER-67LD1).

- a, When the Diagnostic program select switch (SW1) is at OFF position:
 The 1st digit (▽) does not light.
- b. When the Diagnostic Program select switch (SW1) is at ON position:
 The 1st digit (▽) lights.

[14] ROM Test



No.	ROM	PWB	ADDRESS	BYTES	BANK
200	ROM inside μ PD7801G-096	Main PWB	0000 ~ 0FFF	4K	-
201	ROM 1		2000 ~ 3FFF	8K	-
202	ROM 2		4000 ~ 5FFF	8K	-
203	ROM 3		6000 ~ 7FFF	8K	-
204	ROM 4		8000 ~ 8FFF	4K	-
205	IRC - ROM 1	ER-42MB	A000 ~ BFFF	8K	0
206	Data Pack level-2 ROM		A000 ~ BFFF	8K	1
207	IRC - ROM 2		F000 ~ FFFF	4K	-

STOP: Auto-stop

Result of the test will be printed out on the receipt and journal as follows.

a. All ROM's are normal
(No error)

(Print)

```

200
201
202
203
204
205
206
207
    
```

b. Sample of error
(ROM 2 and ROM 4 are failed or not mounted.)

(Print)

```

200
201
E ..... 202
203
E ..... 204
205
206
207
    
```

Error message

Error message

[15] RAM Test

START: →

No.	RAM	PWB	Address	Bank	Bytes	
300	Standard RAM 1 and RAM 2	Main PWB	1000 ~ 1FFF		4K	
301	PLU-1 1 ~ 93 (RAM 1)	ER-42MB	C000 ~ C7FF	1	2K	
302	PLU-2 94 ~ 186 (RAM 2)		C800 ~ CFFF	1	2K	
303	PLU-3 187 ~ 279 (RAM 3)		D000 ~ D7FF	1	2K	
304	PLU-4 280 ~ 372 (RAM 5)		C000 ~ C7FF	2	2K	
305	PLU-5 373 ~ 465 (RAM 6)		C800 ~ CFFF	2	2K	
306	PLU-6 466 ~ 512 (RAM 7)		D000 ~ D7FF	2	2K	
307	PLU stock (RAM 4)		D800 ~ DFFF	1	2K	
308	Monthly total		H/T RAM	C000 ~ C6FF	0	2K
309	Hourly total			C700 ~ C7FF	0	
310	RAM for Remote Key Pad (B.R.P.)		ER-36KP1	C800 ~ CFFF	0	2K
311	RAM for IRC (IRC RAM 1)	ER-42MB	D000 ~ D7FF	0	2K	
312	RAM for IRC (IRC RAM 2)		D800 ~ DFFF	0	2K	

NOTE: Cashier push key must be depressed after each RAM check.

STOP: Auto-Stop

Result of the test will be printed out on the receipt and journal as follows.

a. All RAM's are normal
(No error)

(Print)

```

300
301
302
303
304
305
306
307
308
309
310
311
312
    
```

b. Sample of error
(PLU-1 RAM and PLU-6 RAM are failed or not mounted.)

(Print)

```

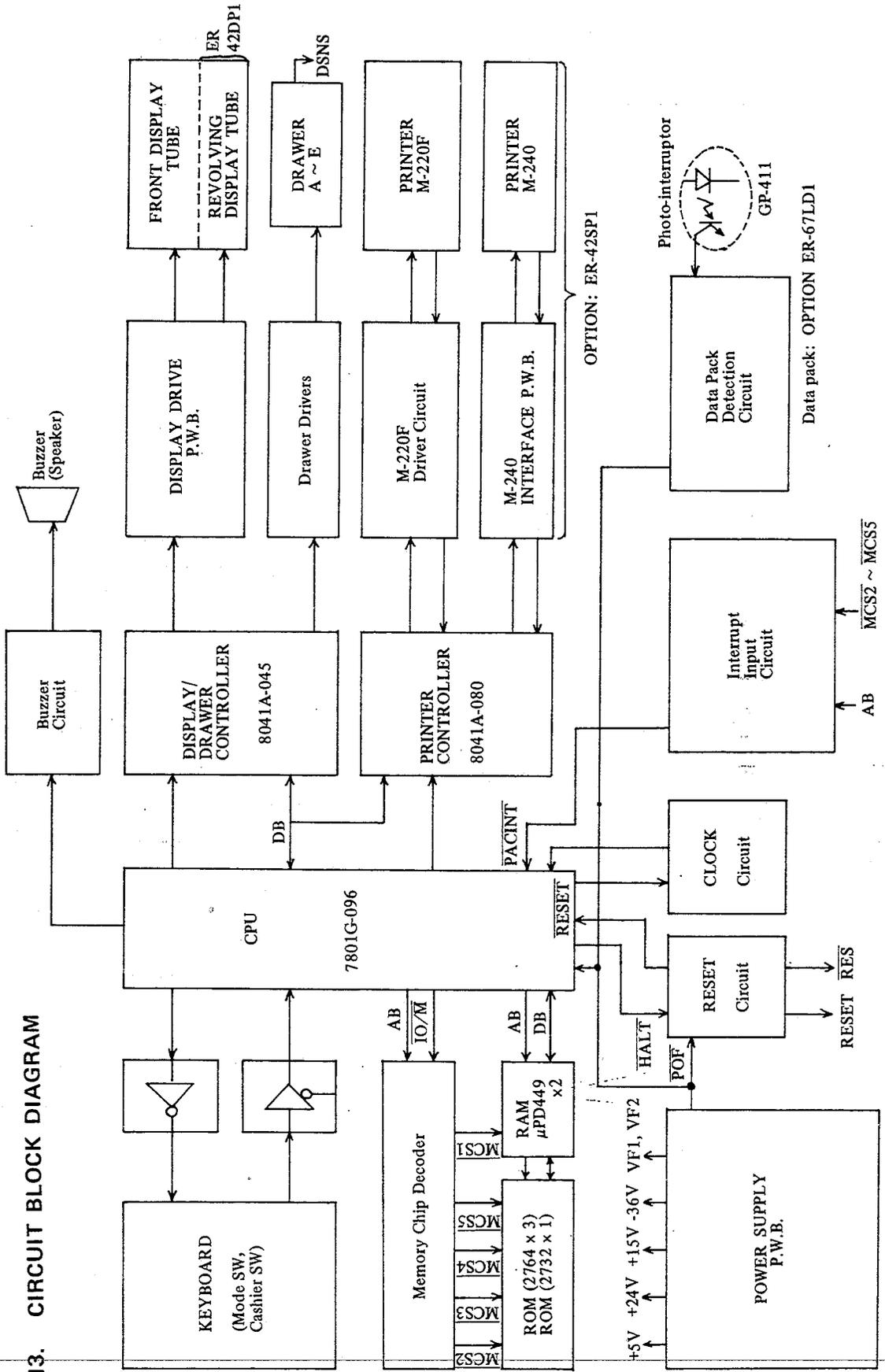
300
E ..... 301
302
303
304
E ..... 305
306
307
308
309
310
311
312
    
```

Error message

Error message

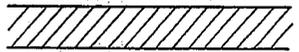
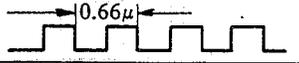
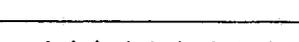
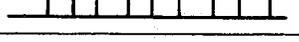
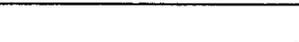
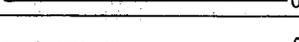
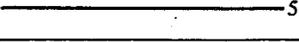
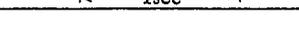
NOTE: RAM's which are tested will be cleared. You can utilize the RAM test function as an individual RAM clear operation.

13. CIRCUIT BLOCK DIAGRAM



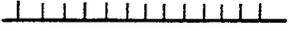
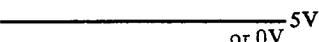
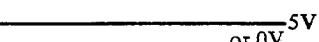
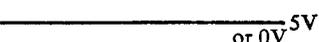
14. Terminal Signals of μ PD7801G-096

* "TIME/DIV" of oscilloscope: 10 μ s range

Pin No.	Terminal Name	Descriptions	Waveforms (at key halt condition)	In/Out
1	PE15	Address bus AB15	 *	Out
2	ϕ OUT	Clock output		Out
3~10	DB ₇ ~DB ₀	Data bus (D ₇ ~D ₀)	 *	In/Out
11	INT ₂	Interrupt request ($\overline{\text{IRCINT}}$)	 0V	In
12	INT ₁	Interrupt request (PINT)	 0V	In
13	INT ₀	Interrupt request (POF, PACINT)	 0V	In
14	$\overline{\text{WAIT}}$	Wait	 5V	In
15	M1	Machine cycle M1	* 	Out
16	$\overline{\text{WR}}$	Write	* 	Out
17	$\overline{\text{RD}}$	Read	* 	Out
18	PC7	Printer interrupt input (PINT)	 0V	In
19	PC6	Gate enable (MASKP)	 5V	Out
20	PC5	I/O, memory select	* 	Out
21	PC4	Buzzer (Low tone)	 0V	Out
22	PC3	Buzzer (High tone)	 0V	Out
23	PC2	Interrupt input (EXINT)	 0V	In
24	PC1	Power off POF	 5V	Out
25	PC0	Reset request	 5V	Out
26	$\overline{\text{SCK}}$	Serial clock for CLOCK	 5V	In
27	SI	Input data from CLOCK (DO)	 1sec	In
28	SO	Output data to CLOCK (DIN)	 0V	Out
29	$\overline{\text{RESET}}$	Reset signal	 5V	In
30	X ₂	Basic clock pulse (3.0 MHz)		In
31	X ₁	Basic clock pulse (3.0 MHz)	 0.3 μ s	In

* It is difficult to observe the waveforms clearly by a oscilloscope.

*Oscilloscope time range: 2 ms

Pin No.	Terminal Name	Descriptions	Waveforms (at key halt condition)	In/Out
32	GND	Power source 0V	 0V	
33	PA ₀	Bank ROM select (BROM0)	 *	Out
34	PA ₁	Bank ROM select (BROM1)	 *	Out
35	PA ₂	Bank ROM select (BROM2)	 0V	Out
36	PA ₃	No connection	 0V	Out
37	PA ₄	Bank RAM select (BRAM0)	 0V	Out
38	PA ₅	Bank RAM select (BRAM1)	 0V	Out
39	PA ₆	Bank RAM select (BRAM 2)	 0V	Out
40	PA ₇	Bank RAM select (BRAM 3)	 0V	Out
41	PB ₀	Clock pulse of CLOCK (TCK)	 5V	Out
42	PB ₁	Serial clock (SCK) input	 5V	Out
43	PB ₂	Strobe for CLOCK (STB)	 5V	Out
44	PB ₃	No connection	 5V	Out
45	PB ₄	Cashier LED (LED1)	 5V or 0V	Out
46	PB ₅	Cashier LED (LED2)	 5V or 0V	Out
47	PB ₆	Cashier LED (LED3)	 5V or 0V	Out
48	PB ₇	Cashier LED (LED4)	 5V or 0V	Out
49 ? 60	PE ₀ ? PE ₁₁	Address bus (A ₀) and key scan signal (KS ₀) ? Address bus (A ₁₁) and key scan signal (KS ₁₁)	 *	Out } Out
61 ? 63	PE ₁₂ ? PE ₁₄	Address bus (A ₁₂) (KS ₁₂) ? Address bus (A ₁₄)	 *	Out } Out
64	V _{CC}	Power source (+5V)	 5V	

FOR FURTHER DETAIL INFORMATION OF THE μ PD7801G, REFER TO CHAPTER 16 OF THE "CASH REGISTER BASIC MANUAL" (μ PD7802G).

※ It is difficult to observe these waveforms clearly with a oscilloscope.

15. Circuit Descriptions

15-1. OSCILLATOR CIRCUIT

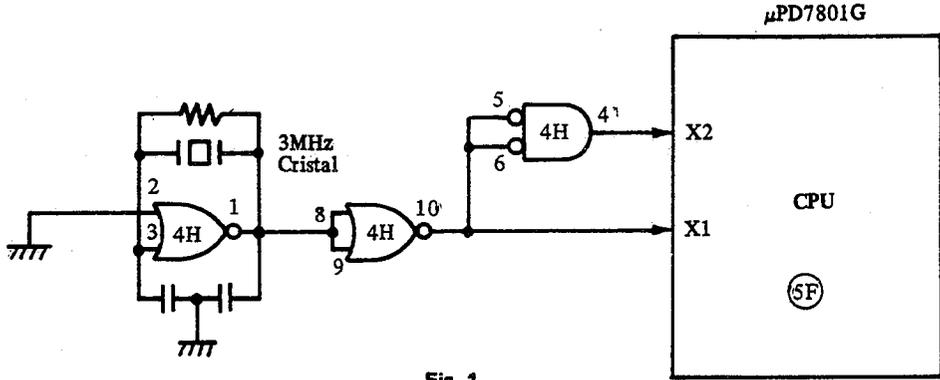


Fig. 1

The basic clock frequency is generated from a 3 MHz crystal. Waveforms for X1 and X2 are shown below.

Waveforms

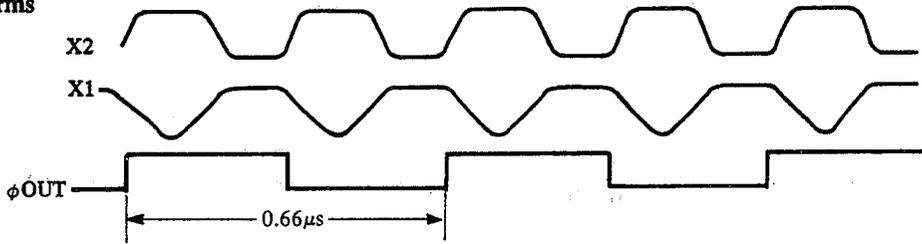


Fig. 2

15-2. RESET CIRCUIT

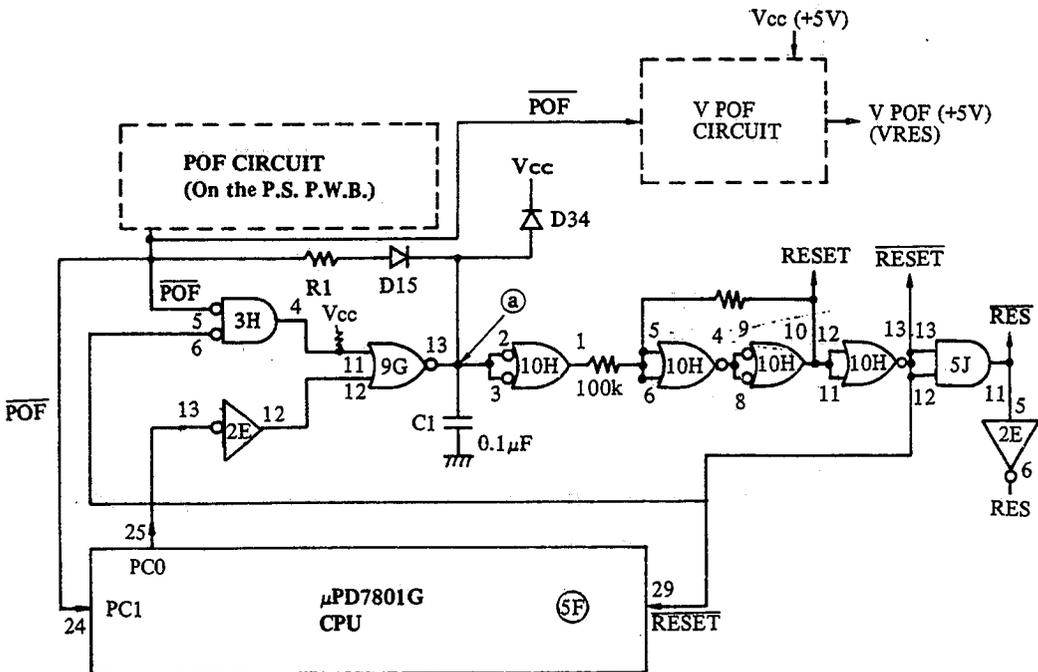


Fig. 3

POWER ON CONDITION:

With POF at a low level, point (a) will also be at a low level. This will cause RESET to go to a low level. When RESET is at a low level the CPU is in a reset condition. This reset condition will result in the signal PC0 going to a high level.

When POF goes to a high level, capacitor C1 will charge up through resistor R1. After C1 has charged up point (a) will reach a high level. This will result in RESET going to a high level causing all circuits to release from a reset condition and allowing the CPU to start operating.

POWER OFF CONDITION:

Upon power off the signal POF will go to a low level. When the CPU detects this condition the signal PC0 will also go to a low level.

By PC0 going low the point (a) will also go low and cause capacitor C1 to discharge driving point (a) to a low level. At the same time RESET also goes to a low level resulting in putting all the circuits in a reset condition ready for power failure.

TIME CHART

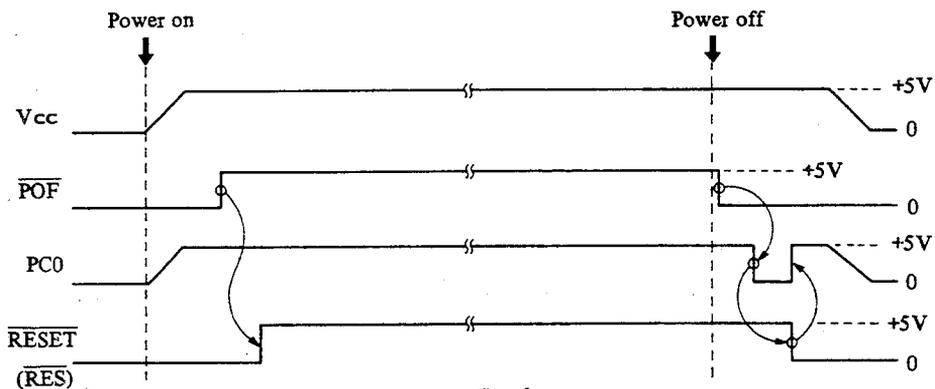


Fig. 4

RESET SIGNAL CONNECTION DIAGRAM

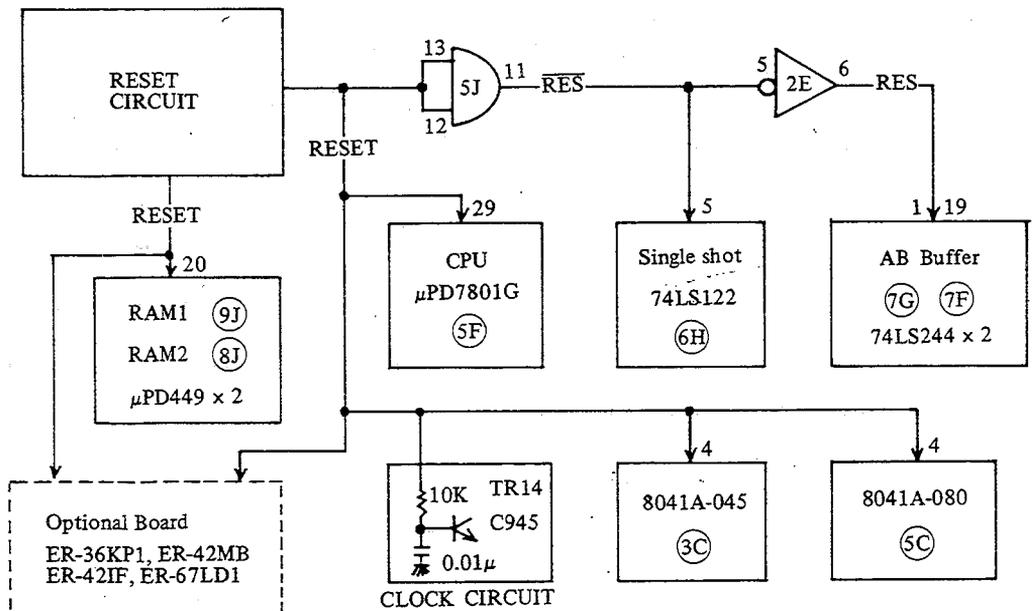


Fig. 5

(1) VPOF Circuit

VPOF is a +5V power source which is controlled by the signal $\overline{\text{POF}}$ and is developed from Vcc.

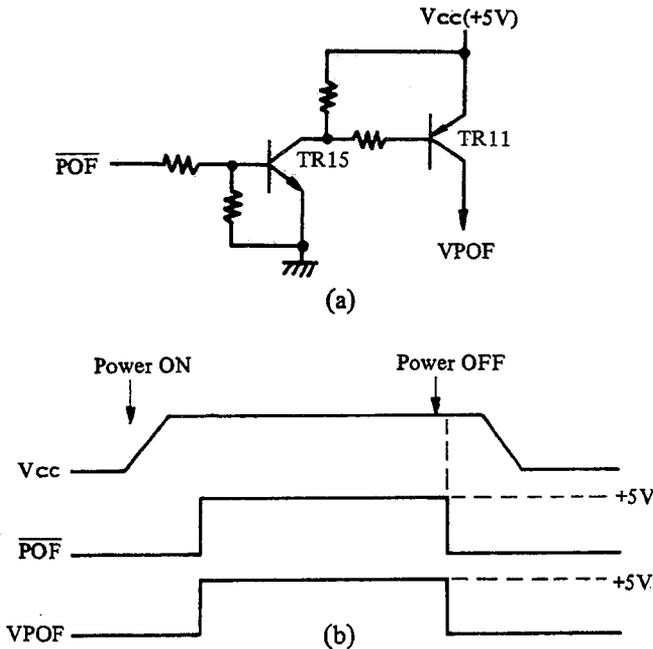


Fig. 6

VPOF is supplied to the display, buzzer, printer and drawer drive circuits in order to prevent a malfunction of these circuits at the time of power up and down.

(2) Battery Circuit

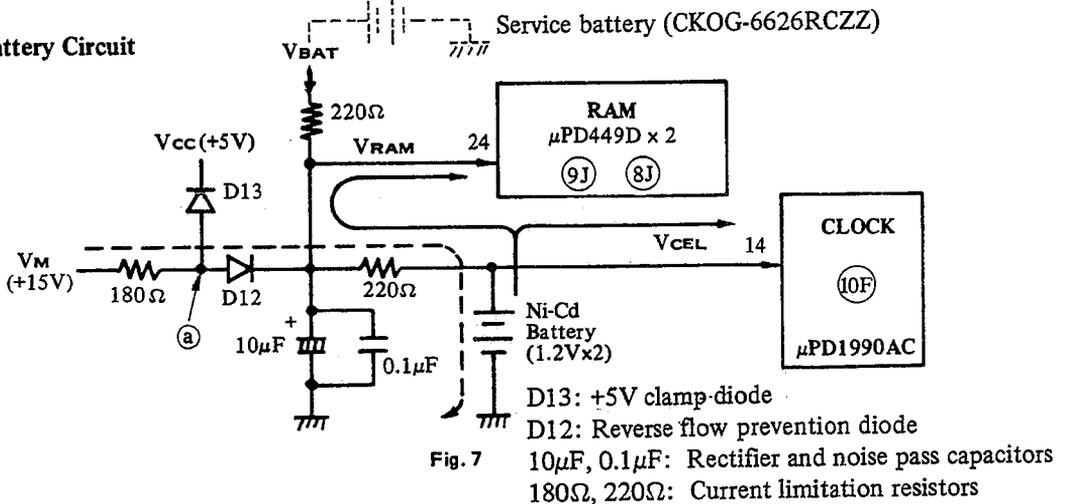


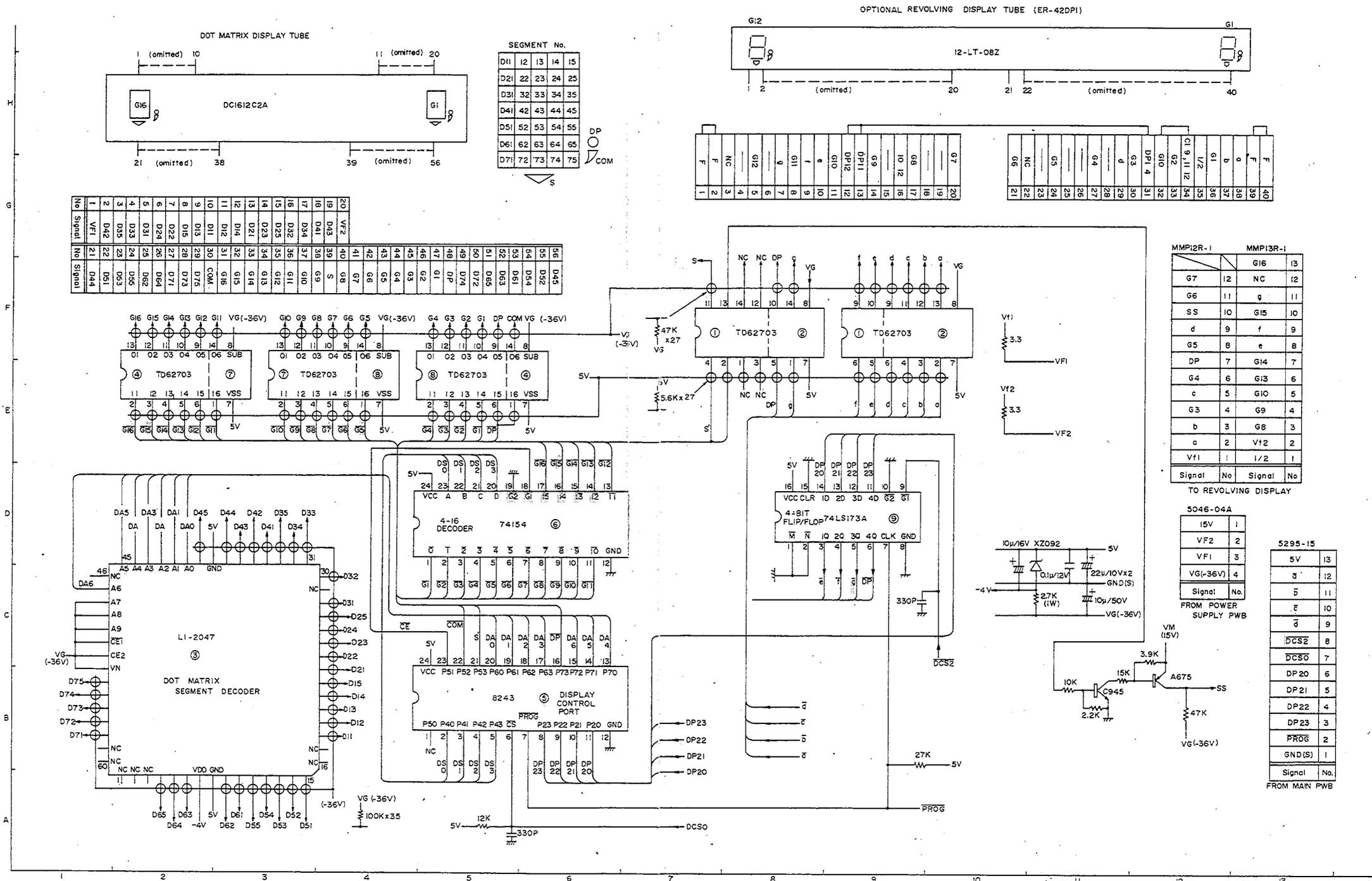
Fig. 7

----->: Charge current of the battery
 —————>: Discharge current of the battery

The voltage level at each point is as follows.

AC power	Point (a)	V _{RAM}	V _{CEL}
OFF	0V	+2.4V	+2.4V
ON	+5.7V	+5V	+2.4V

6. DISPLAY DRIVE CIRCUIT



15-3. ROM, RAM CONTROL

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

1) Block Diagram

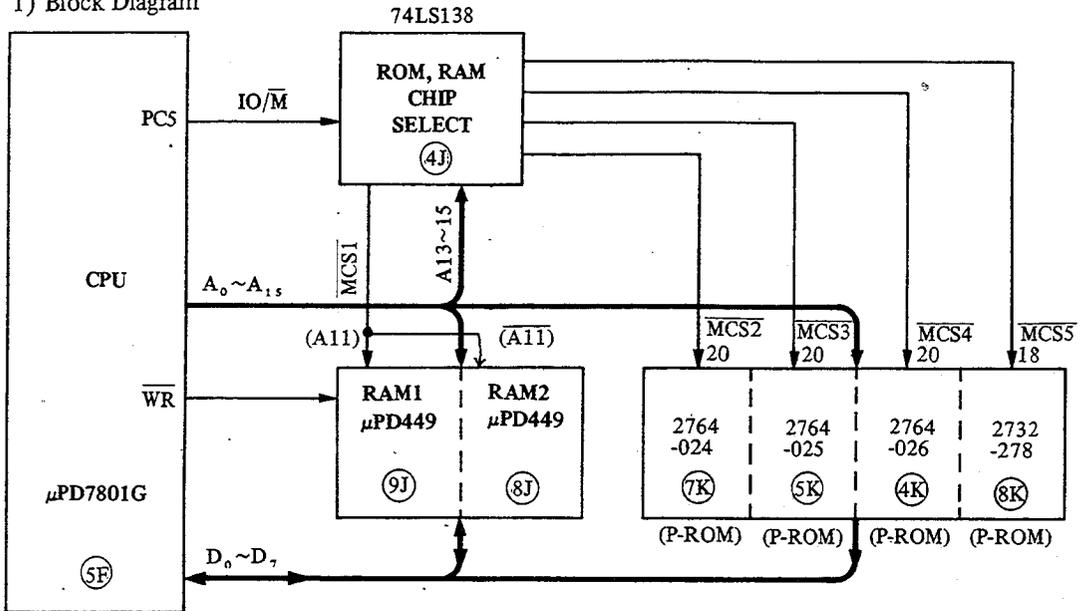


Fig. 8

NOTE: 1. Bus buffers (74LS245, 74LS244) for the data bus and address bus are omitted in Fig. 8.

- PC5 ($\overline{IO/M}$): IO/Memory select signal
- A₀~A₁₅ : Address bus
- D₀~D₇ : Data bus
- \overline{WR} : Write signal
- $\overline{MCS1}$: RAM select signal
- $\overline{MCS2}$: ROM1 select signal
- $\overline{MCS3}$: ROM2 select signal
- $\overline{MCS4}$: ROM3 select signal
- $\overline{MCS5}$: ROM4 select signal
- $\overline{MCS6}$: IRC-ROM1, Data Pack ROM/RAM select signal
- $\overline{MCS7}$: RAM (Hourly/term total, BRP, IRC, PLU. PB LOOK UP) select signal
- $\overline{MCS8}$: IRC-ROM2 select signal

2) Memory Address

SELECT SIGNAL	MEMORY ADDRESS	CONTENTS					
—	0000 ~ 0FFF (4K bytes)	Internal ROM (4KB) in the CPU (μ PD7801G-096)					
$\overline{\text{MCS1}}$	1000 ~ 17FF	RAM 1 (2KB) on the Main PWB					
	1800 ~ 1FFF	RAM 2 (2KB) on the Main PWB					
$\overline{\text{MCS2}}$	2000 ~ 2FFF	ROM 1 (8KB) on the Main PWB					
	3000 ~ 3FFF						
$\overline{\text{MCS3}}$	4000 ~ 4FFF	ROM 2 (8KB) on the Main PWB					
	5000 ~ 5FFF						
$\overline{\text{MCS4}}$	6000 ~ 6FFF	ROM 3 (8KB) on the Main PWB					
	7000 ~ 7FFF						
$\overline{\text{MCS5}}$	8000 ~ 8FFF	ROM 4 (4KB) on the Main PWB					
	9000 ~ 9FFF	(Not used)					
$\overline{\text{MCS6}}$	A000 ~ AFFF	BANK 0	IRC-ROM 1 (8KB)	BANK 1	Data Pack Level-2 ROM (8KB)		
	B000 ~ BFFF						
$\overline{\text{MCS7}}$	C000 ~ CFFF	BANK 0	H/T RAM (2KB)	BANK 1	RAM1 (2KB)	BANK 2	RAM5 (2KB)
			BRP RAM (2KB)		RAM2 (2KB)		RAM6 (2KB)
	D000 ~ DFFF		IRC RAM1 (2KB)		RAM3 (2KB)		RAM7 (2KB)
			IRC RAM2 (2KB)		RAM4 (2KB)		(Not used)
$\overline{\text{MCS8}}$	E000 ~ EFFF	Data Pack RAM (16KB) on the ER-67LD1 Board					
		ROM 5 (2KB) Not used.					
	F000 ~ FFFF (4K bytes)	IRC-ROM 2 (4KB)					
<p>Note) ● 4KB : 4K bytes</p> <ul style="list-style-type: none"> ● BRP RAM: Basic Remote Key Pad RAM on the BRP memory board (ER-36KP1) ● H/T RAM: Hourly/Term (monthly) total RAM ● RAM1 ~ RAM7: PLU/sub-dept., (PB Look up) RAM ● IRC-RAM1/IRC-RAM2 for IRC function ● IRC-ROM1/IRC-ROM2, Data Pack Level-2 ROM <p style="text-align: right;">} on the optional memory board (ER-42MB)</p>							

15-4. KEY & SWITCH SCANNING

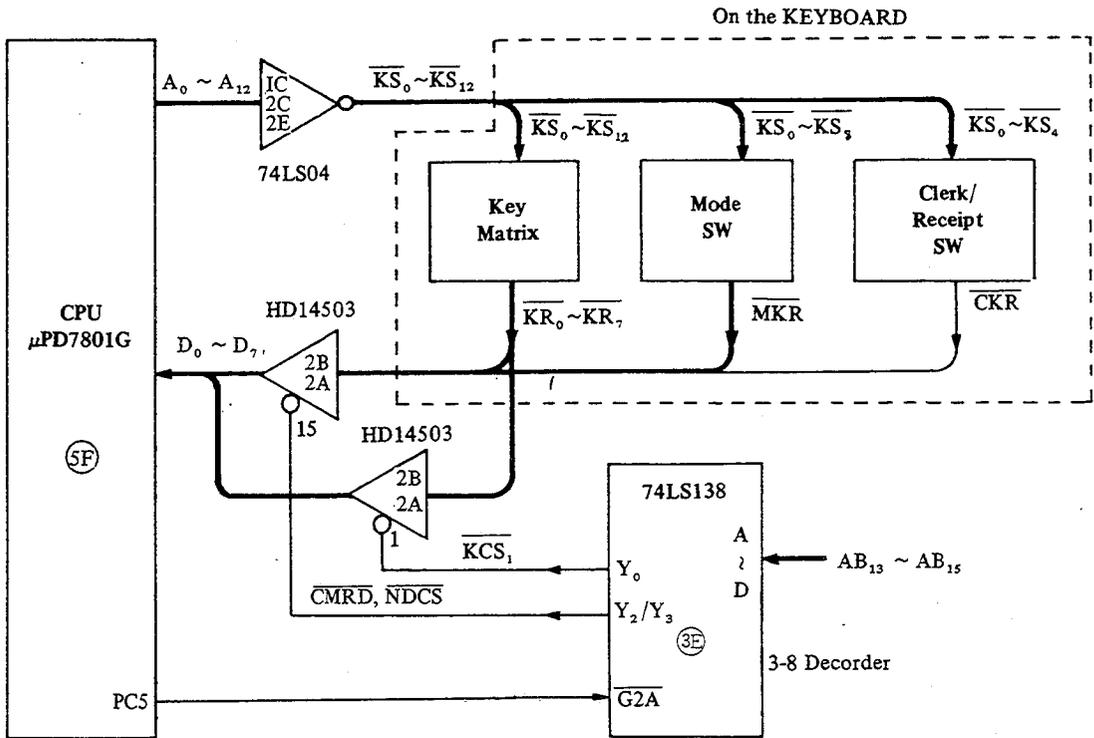


Fig. 9

NOTE: Data bus buffer (74LS245) and address bus buffers (74LS244) are omitted in the Fig. 9.

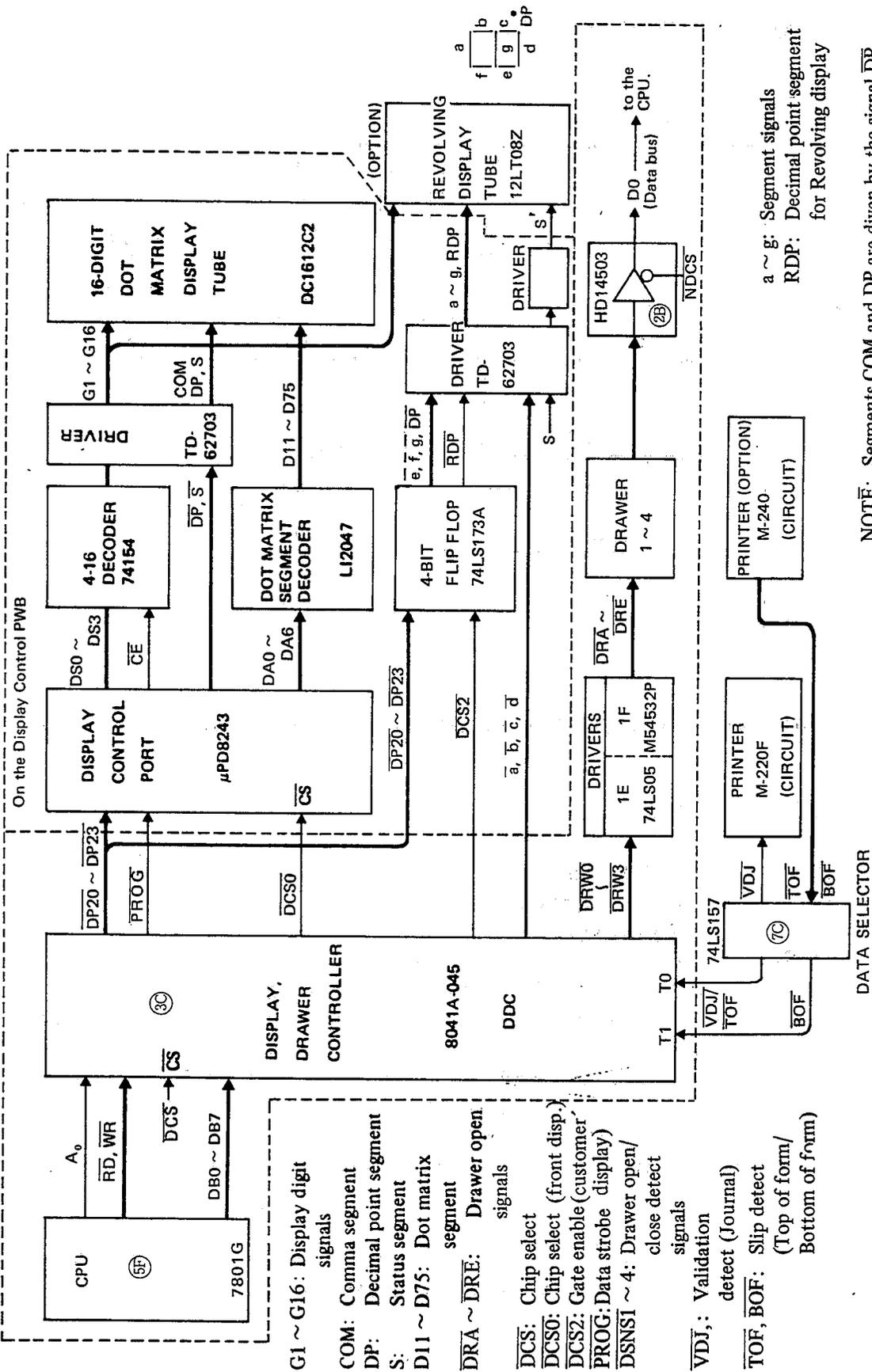
- $\overline{KS0} \sim \overline{KS12}$: Key scan signal
- $\overline{KR0} \sim \overline{KR7}$: Key return signal
- \overline{MKR} : Mode SW return signal
- \overline{CKR} : Cleak/Receipt SW return signal
- $\overline{KCS1}$: Key read signal
- \overline{CMRD} : Clerk SW, mode SW, receipt SW read signal
- \overline{NDCS} : Paper near end, drawer open sense signals read signal

In order to read the keyboard the CPU will send out key scan signals $\overline{KS0} \sim \overline{KS12}$ to the keyboard. These scan signals are negative going pulses that are generated one after the other. The CPU continually monitor these signals by checking the key return signals ($\overline{KR0} \sim \overline{KR7}$) to see whether a low pulse appears or not. By knowing the appropriate KS signal and KR signal, the CPU can determine which key has been depressed. Mode switch, clerk switch and receipt on/off switch are read in the same manner as reading the keyboard.

FOR FURTHER DETAILED INFORMATION OF KEY READ OPERATION, REFER TO CHAPTER 9-2 AND 9-4 OF THE "CASH REGISTER BASIC MANUAL".

15-5. DISPLAY AND DRAWER CONTROL

1) Display and Drawer Control Block Diagram



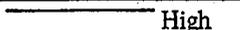
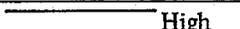
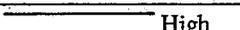
2) 8041A-045 Terminal Signals (Display Controller)

*TIME/DIV of oscilloscope: 2μs range

Terminal No.	Terminal Name	Descriptions	Waveforms at Key halt condition	In/Out
1	T0	Validation/slip paper sense (VDJ/TOF)	ON: Low OFF: High	In
2	X1	Clock 6MHz	 6MHz	In
3	X2	Clock 6MHz	 6MHz	In
4	RES	Reset (RESET)	High	In
5	SS	+5V (Not used)	High	-
6	CS	Chip select (DCS)	 17μs	In
7	EA	GND (Not used)	Low	-
8	RD	Read		In
9	A0	Address bus (AB0)	* 	In
10	WR	Write	* 	In
11	SYNC	No connection	* 	-
12 ? 19	D0 ? D7	Data bus (DB0 ~ DB7)	* 	In/Out
20	GND	Power source (0V)	Low	In
21 ? 24	DP20 ? DP23	Display Control (DP20 ~ DP23)	* 	Out
25	PROG	Control port (8243) control (PROG)	* 	Out
26	VDD	Power source (+5V)	High	In
27	P10	Segment (a) select	Low	In
28	P11	Segment (b) select	Low	In
29	P12	Segment (c) select	High	In
30	P13	Segment (d) select	Low	In

* Difficult to observe the waveforms clearly by oscilloscope.

8041A-045 Terminal Signals

Terminal No.	Terminal Name	Descriptions	Waveforms at Key halt condition	In/Out
31	P14	Drawer-1 drive ($\overline{\text{DRW0}}$)	 High	Out
32	P15	Drawer-2 drive ($\overline{\text{DRW1}}$)	 High	Out
33	P16	Drawer-3 drive ($\overline{\text{DRW2}}$)	 High	Out
34	P17	Drawer-4 drive ($\overline{\text{DRW3}}$)	 High	Out
35	P24	Chip select for front display control port μPD8243 (DCS0)	 Low	Out
36	P25	No connection		
37	P26	Chip select for rear display control port μPD8243 (DCS2)	 High	Out
38	P27	No connection		—
39	T1	Validation/slip paper sense ($\overline{\text{BOF}}$)	Low: Detected	In
40	VCC	Power source (+5V)	 High	In

For the basic functions of the $\mu\text{PD8041A-XXX}$, refer to chapter 13 (page 93) of the cash register basic manual.

3) General

Display tube (including the optional customer display) and drawer are controlled by the Display/drawer controller 8041A-045 (DDC).

The DDC also has functions to detect status signals of printers (M-220F and the optional M-240).

4) Display control

- Fluorescent display tube (Dot matrix type) is used for the display.
- Control fo the display by the DDC thru the Display Control Port (μPD8243).
- The CPU sends display data to the DDC via the data bus line (D0 ~ D7).
- After the CPU has finished sending data to the DDC. The DDC will continue to display the data entered until new display data is sent from the CPU.
- Display digit signals are produced from a 4 – 16 decoder (SN74154).
The inputs of the 4 – 16 decoder are DS0 ~ DS3.
CE goes to a low level in order to produce the outputs ($\overline{\text{G1}}$ to $\overline{\text{G16}}$).
- Display segment signals (D11 to D75) are produced from a Dot Matrix Decoder (LI2047).
The inputs of the Dot Matrix Decoder are DA0 to DA6.
- The output signals (D11 to D75) of the Dot Matrix Decoder are converted to the appropriate voltage level (+5V, -36V) to drive the display tube directly.
- The output signals (digit position) of the 4 – 16 decoder and segment signals ($\overline{\text{DP}}$, $\overline{\text{S}}$) are converted to the appropriate voltage level (+5V, -36V) to drive the display tube. This is accomplished with driver chips (TD62703, Transistors).

FOR FURTHER DETAILED EXPLANATION OF DISPLAY CONTROL OPERATION, REFER TO CHAPTER 9-3 AND CHAPTER 9-4 OF THE "CASH REGISTER BASIC MANUAL", PAGE 57.

NOTE:

- Signals (T0 ~ T7) of the BASIC MANUAL correspond to digit position signals (G1 ~ G16).
- Signals (a ~ g) of the BASIC MANUAL correspond to segment select signals (D11 ~ D75).

(1) Dot Matrix Decoder (LI2047)

The LI2047 is a 5 × 7 dot matrix decoder which generates 126 numerical, alphabetical and symbolic display characters. This decoder is capable of directly driving the fluorescent display tube.

(2) Dot input vs. Dot output

a) When the chip enable inputs ($\overline{CE1}$ and $\overline{CE2}$) are at a low level, dot select output signals (D11 ~ D75) are generated.

Dot select outputs are determined by the input (DA0 ~ DA6).

b) When chip enable input $\overline{CE1}$ is at a high level, no dot outputs are generated.

c) Voltage level

Input (DA0 ~ DA6)

High: +5V

Low: GND

Output (D11 ~ D75)

High: +5V

Low: -36V

Dot Positions and Dot Select Signal

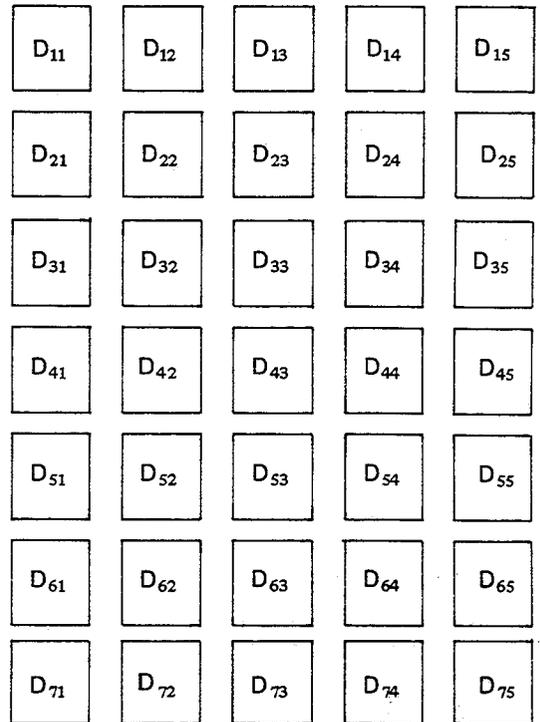


Fig. 10

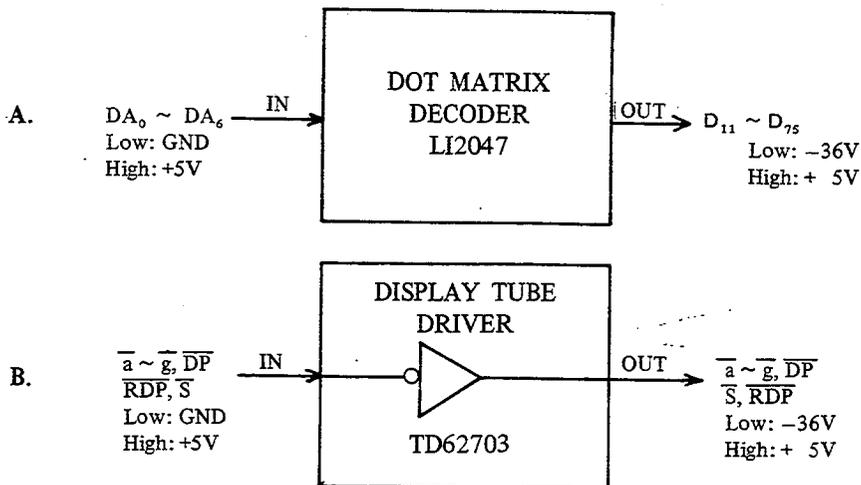


Fig. 11

5) Cashier LED Control

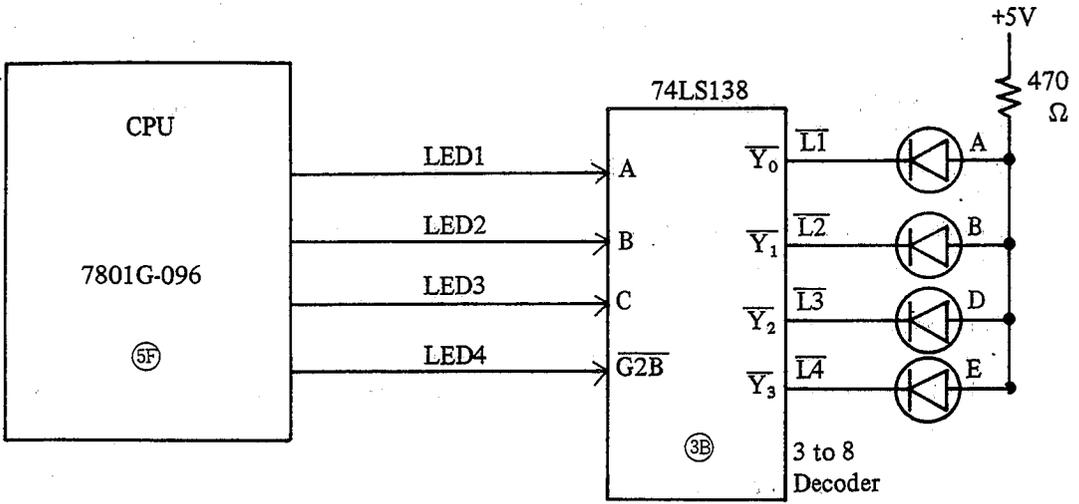


Fig. 12

Cashier LEDs (A, B, D, E) are controlled by the signals LED1 thru LED4.

74LS138 (3 to 8 Decoder)

INPUT SIGNALS				OUTPUT SIGNALS				LED
LED1	LED2	LED3	LED4	L1	L2	L3	L4	
L	L	L	L	L	H	H	H	A
H	L	L	L	H	L	H	H	B
L	H	L	L	H	H	L	H	D
H	H	L	L	H	H	H	L	E

6) Drawer Control on the Main PWB

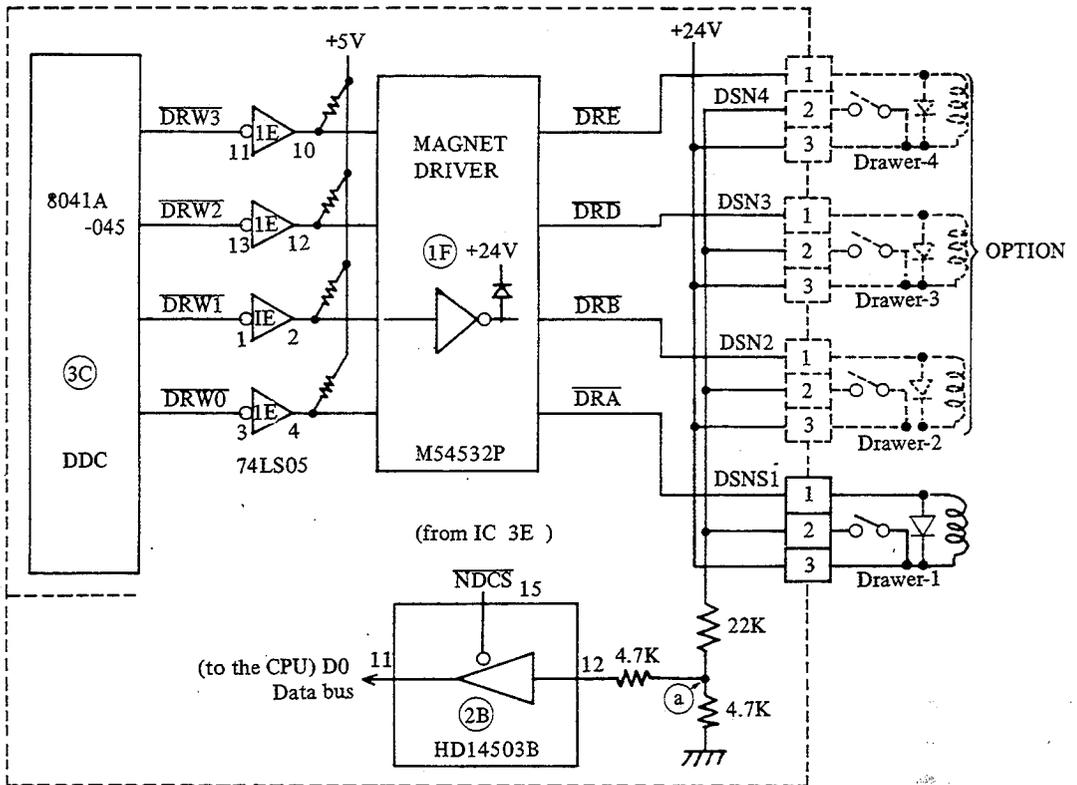


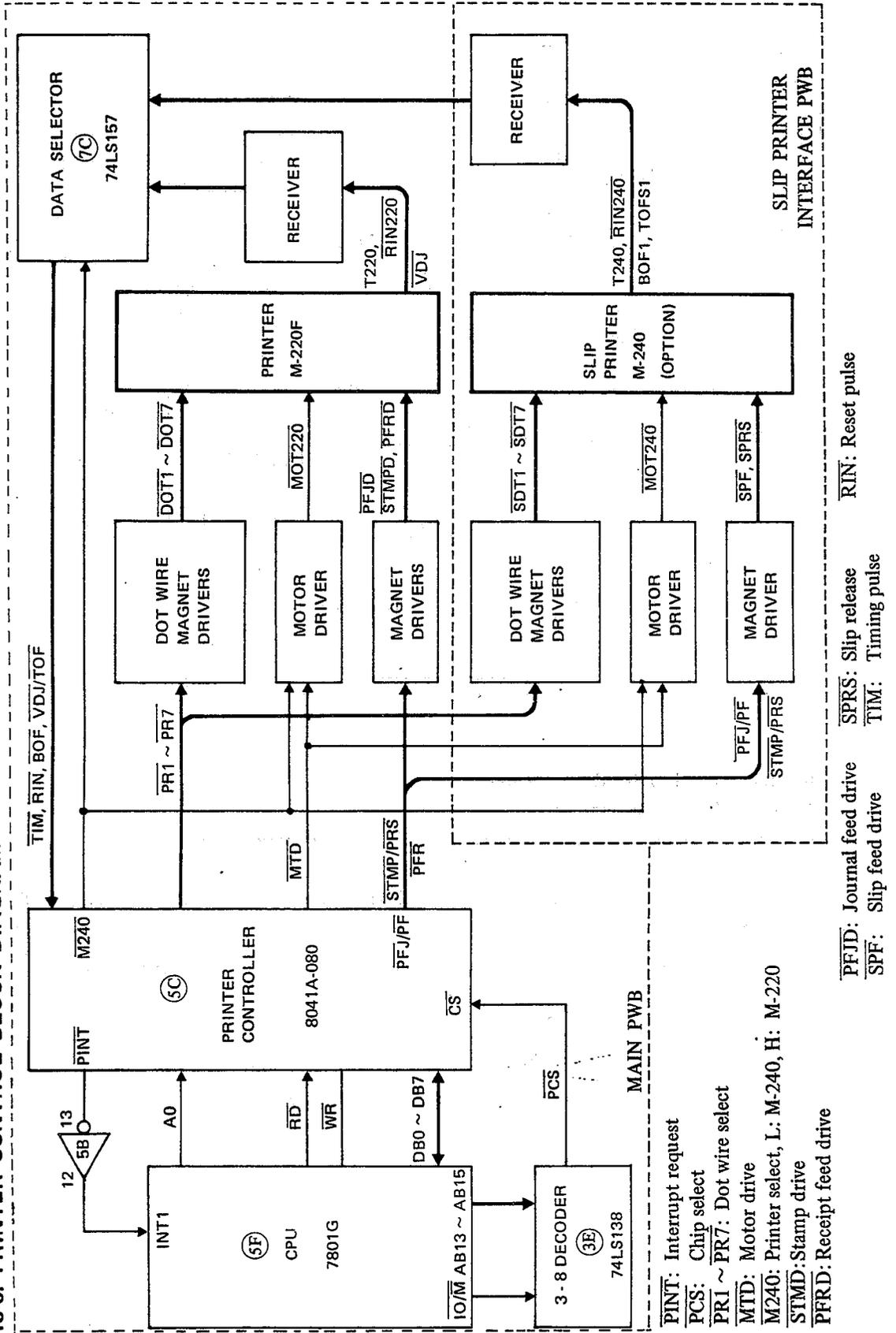
Fig. 13

- 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 (a) will be +4.2V (High level).

VOLTAGE POTENTIAL OF POINT (a)	DRAWER
GND (Low)	Closed
+ 4.2V (High)	Open

- The condition of the drawer is read by the CPU via the data bus (D0).

15-6. PRINTER CONTROL BLOCK DIAGRAM



1) OUTLINE OF PRINTER CONTROL

- Whenever the CPU wants to send or receive data to the printer controller, it will select the controller by means of the signal \overline{PCS} and the address A0.
Once the printer controller has been selected, the data can now be transferred on the data bus lines ($DB_0 \sim DB_7$)
- Whenever data is to be sent to the printer controller the CPU will issue \overline{WR} (write command) as a low.
- Whenever data is to be received by the CPU from the printer controller (meaning, status information), the CPU will issue the \overline{RD} signal as a low (indicating a read condition).
- The \overline{PINT} signal going to the CPU is the interrupt request signal or busy signal issued by the printer controller during the print cycle.

2) MOTOR DRIVE CIRCUIT (M-220F)

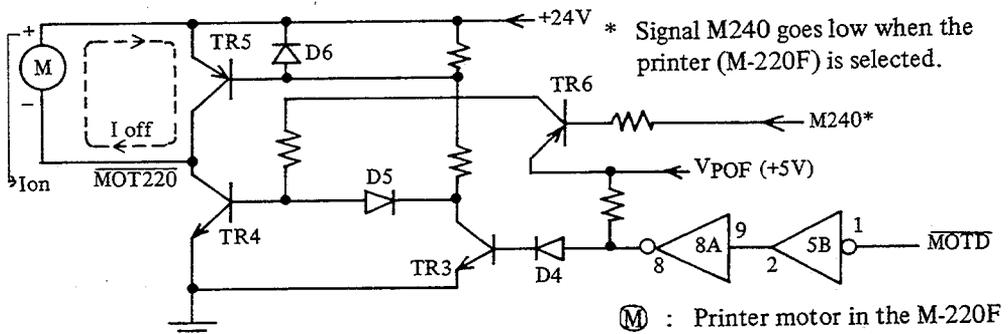


Fig. 14

- The motor drive circuit turns on the motor by providing a ground necessary to allow current to flow through the motor.
- In turning off the motor, we want to insure that the motor is turned off as quickly as possible. This circuit accomplishes that by putting a direct short across the motor, thus, giving us a braking effect.

3) CIRCUIT DESCRIPTION We are going to discuss control of the M-220F

- Motor on (Signal M240 should be at a low level for the M-220F printer)
 - 1) The \overline{MOTD} signal is issued as a low.
 - 2) The low is inverted twice, giving a low to the base of transistor TR3, turning it off.
 - 3) With TR3 off V_p (+24V) goes to one side of the motor and is also sent through a resistor to the base of TR4.
 - 4) A positive to the base of TR4, will turn it on, which provides the ground to the other side of the motor. Current (I_{on}) is now allowed to flow through the motor. Motor turns on.
NOTE: TR5 are off at this time due to the positive voltage (at the voltage divider) being applied to the base of TR5
- Motor off and braking
 - 1) \overline{MOTD} is issued as a high.
 - 2) High inverted twice gives us a high at base of TR3, TR3 \rightarrow on
 - 3) TR3: on, a low (GND) through diode to the base of TR4, TR4 \rightarrow off
 - 4) TR3: on, also provide a low to base of TR5 \rightarrow on
 - 5) TR5: on, which provide a direct short across the motor. The motor will go off very quickly.
 I_{on} : current flow when motor is on.
 I_{off} : current flow when motor is off.

M-220F PRINTING MECHANISM

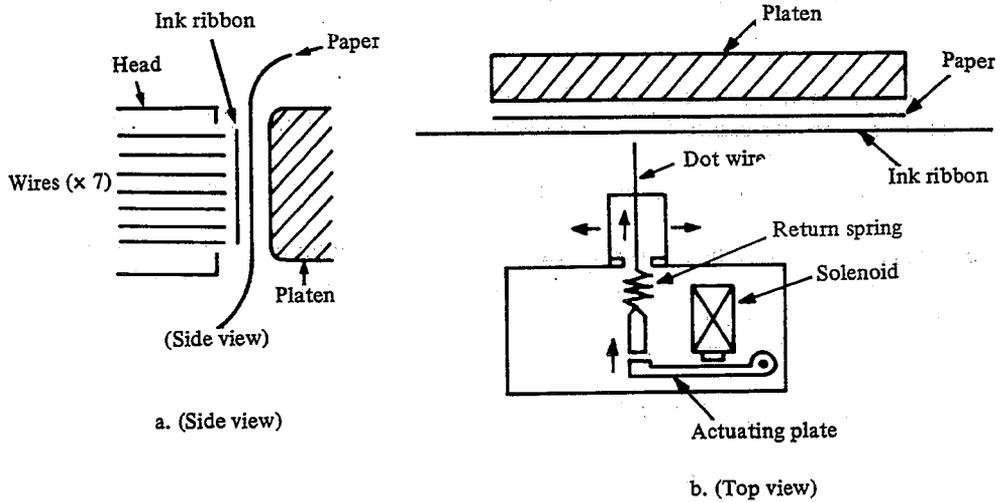


Fig. 15

- 1) As the motor rotates, when the motor signal is issued, the printing head (hereinafter called the head) moves left to right.
- 2) When the motor is in rotation, with the head in a motion, the printer is always generating timing pulses $RIN220$.
 $RIN220$: Is developed when the head starts to move from the left end to the right.
- 3) Print operation may start from the left side (receipt).
- 4) Seven wires are contained in the head and when the appropriate solenoid is energized, the actuating plate is pulled toward the solenoid. The dot wire will be ejected to print on the paper (dot printing) through the ink ribbon. When the solenoid de-energizes the wire will be restored to its original position by the return spring.
- 5) At the time the head is moving to the right, the energizing of the wire solenoids will be selected according to the generation of timing pulses TIM . These selections will result in the printing of various types of characters.
- 6) The wire solenoid will be energized one time (wire will hit the paper one time) per two generations ($T_n + T_n'$) of the timing pulses.

4) DOT SOLENOID DRIVER (SOLENOIDS 1 ~ 7)

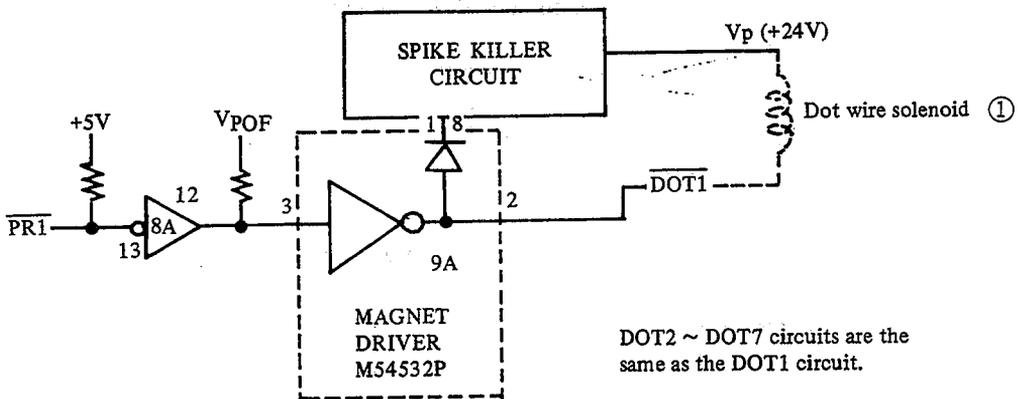


Fig. 16 (a)

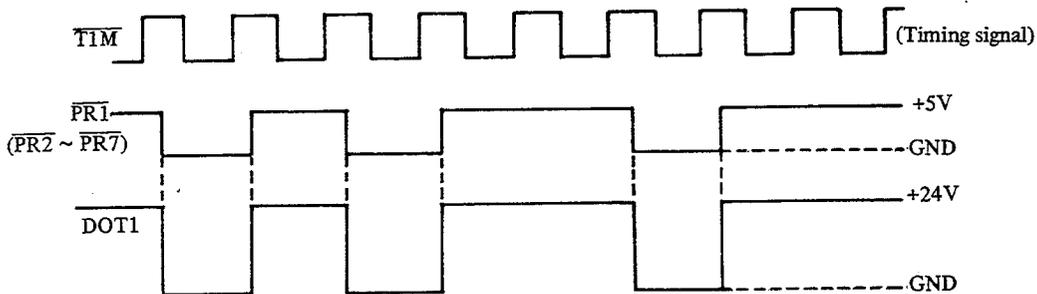


Fig. 16 (b)

- The $\overline{PR1}$ is issued by the printer controller as a low.
 - The low is inverted twice, giving a low to the $\overline{DOT1}$.
 - Current flows through solenoid \rightarrow solenoid energized.
- NOTE: When the solenoid becomes de-energized, the spike (produced by the collapsing magnetic field around the solenoid) will be absorbed by the SPIKE KILLER CIRCUIT which is connected between V_p (+24V) and spike killer diode of the magnet drivers (M54532P).
- The spike killer circuit is described in the next section.

5) SPIKE KILLER CIRCUIT FOR SOLENOID

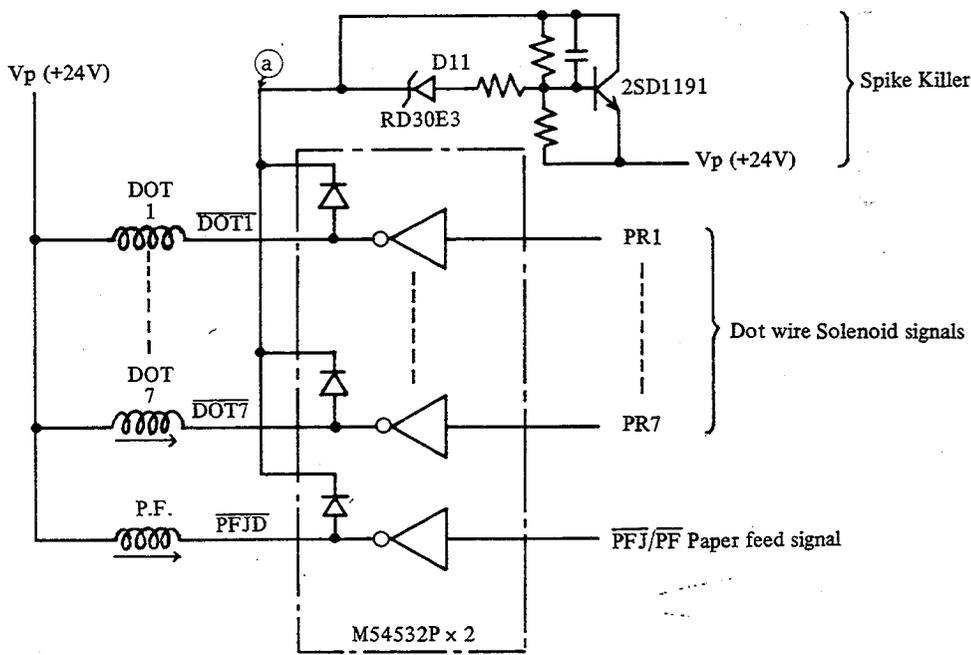


Fig. 17

A counterelectromotive force shown with an arrowhead in Fig. 17 is generated upon shutting off the power supply to the dot wire solenoids (dot-1 thru dot-7) and the paper feed solenoid (PF). The spike killer circuit is used to abate it by introducing it to the power source VP.

When the potential at point (a) reaches about 55V due to the counter electromotive force generated in the solenoid after shutting off the power to the solenoid, it makes the zenor diode RD30E3 active and the transistor 2SD1191, so that the counterelectromotive force is absorbed in VP via collector and emitter of the 2SD1191.

6) TIMING SIGNAL GENERATION

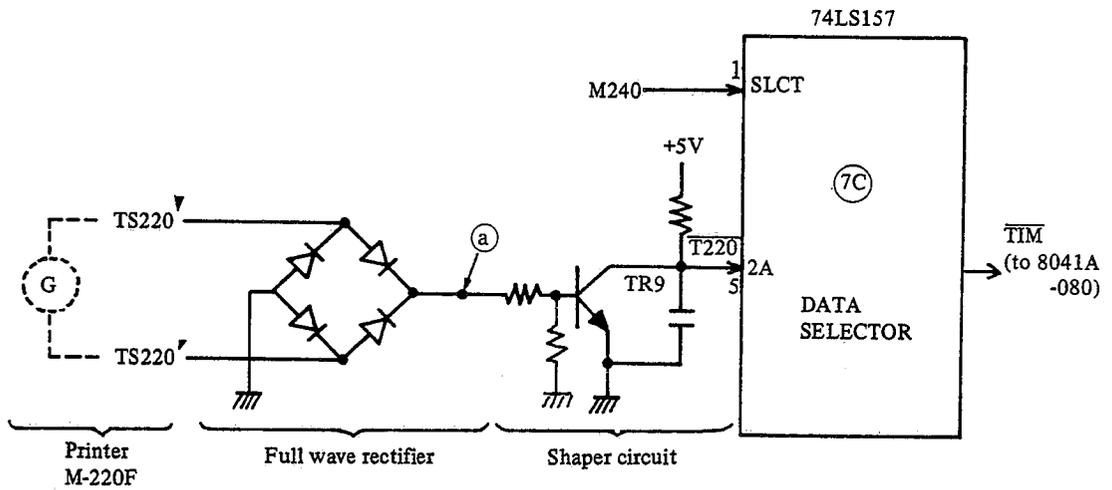


Fig. 18 (a)

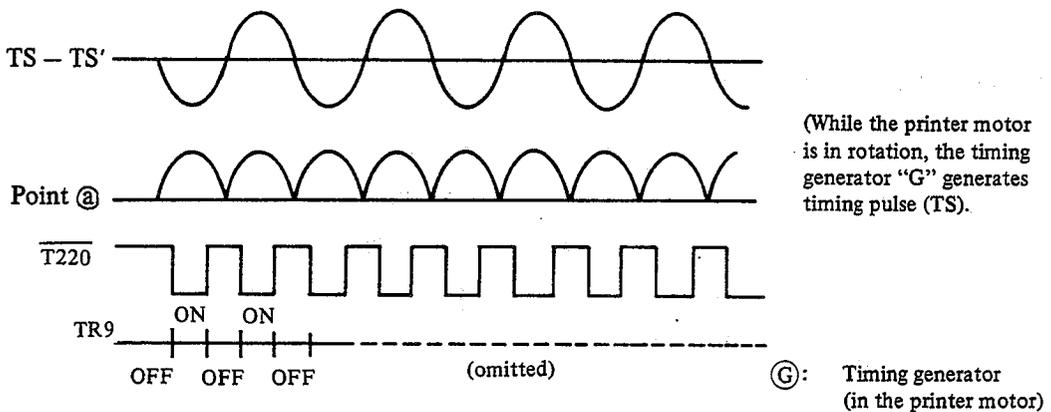


Fig. 18 (b)

When the motor is on and rotating, a generator within the motor will produce the timing pulse, TS (TS-TS'). This TS pulse is rectified and shaped to the timing signal T220. Dot wire selection will occur in relation to the timing signal (T220).

NOTE) TS: TS220

7) VALIDATION PAPER SENSE CIRCUIT

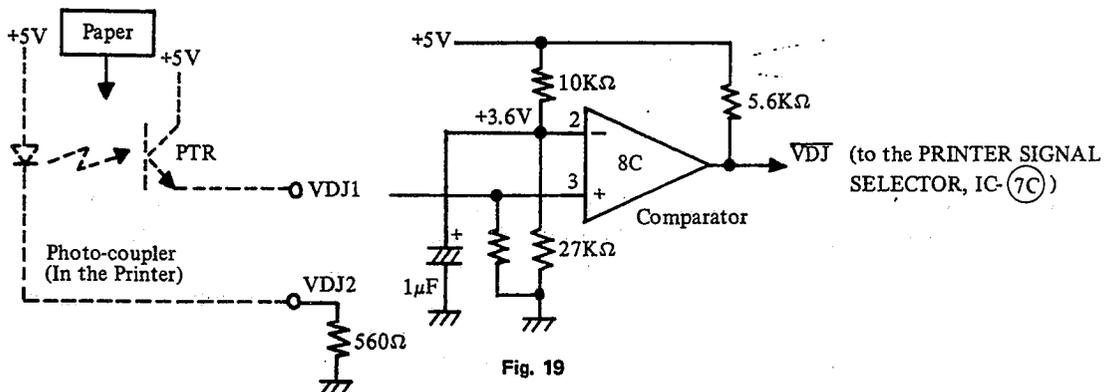


Fig. 19

$\overline{\text{VDJ}}$: Validation paper sense (Journal side)

ACTION OF THE CIRCUIT

- 1) No slip; ① PTR (photo-transistor) is turned on.
② VDJ1 goes to high which is higher than (-) input.
③ $\overline{\text{VDJ}}$ goes to high level.
- 2) Slip inserted;
① PTR is off.
② VDJ1 goes to low which is lower than (-) input.
③ $\overline{\text{VDJ}}$ goes to low level.

8) PRINTER SIGNAL SELECT CIRCUIT

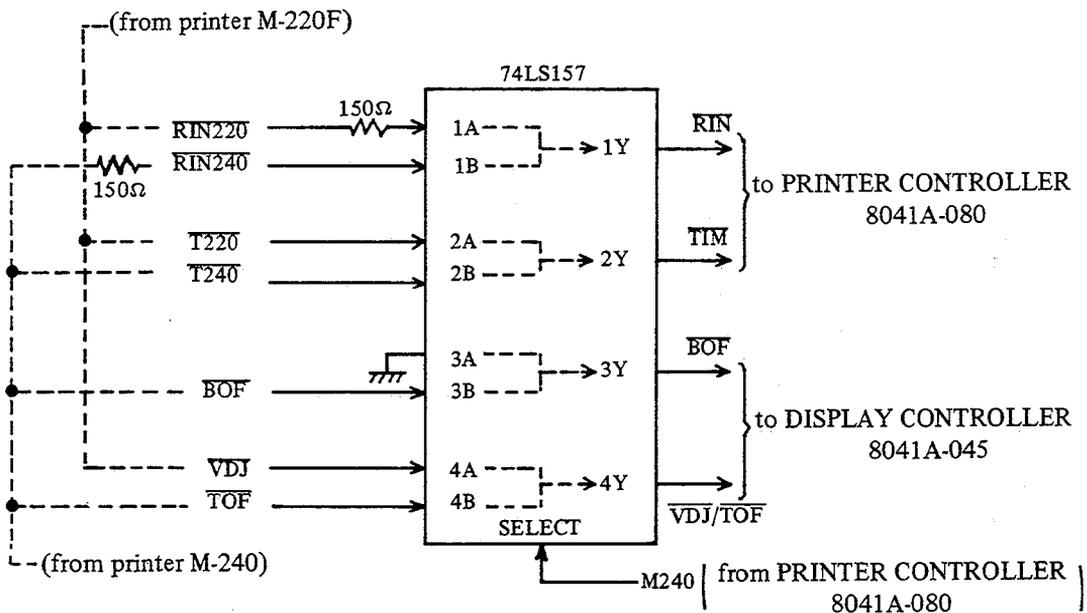


Fig. 20

ACTION OF THE CIRCUIT

- When the signal M240 is at a high level, signals of the M-240 are selected and they are output from the output terminals "1Y thru 4Y".
- When the signal M240 is at a low level, signals of the M-220F are selected and they are output from the output terminals "1Y thru 4Y".
- Signal M240 is a printer select signal.
M240: High → Selects the Printer M-240.
M240: Low → Selects the Printer M-220F.

9) SIGNAL DESCRIPTION

SIGNAL	DESCRIPTION
$\overline{\text{PINT}}$	Interrupt request. --- goes to low when the 8041A-080 requires data for the next print line, etc.
$\overline{\text{PCS}}$	Printer controller (8041A-080) chip select. Low: selected
$\overline{\text{PR1}} \sim \overline{\text{PR7}}$	Dot wire select signals Low: selected $\overline{\text{DOT1}} \sim \overline{\text{DOT7}} \rightarrow \text{M-220F}$ $\overline{\text{SDT1}} \sim \overline{\text{STD7}} \rightarrow \text{M-240}$
$\overline{\text{MTD}}$	Motor drive Low: ON, High: OFF $\overline{\text{MOT220}} \rightarrow \text{M-220F}, \overline{\text{MOT240}} \rightarrow \text{M-240}$
$\overline{\text{PFJ/PF}}$	Paper feed Low: fed $\overline{\text{PFJD}}$ (Journal feed) $\rightarrow \text{M-220F}$ $\overline{\text{SPF}}$ (Slip feed) $\rightarrow \text{M-240}$
$\overline{\text{STMP/PRS}}$	Stamp/Slip release drive Low: ON $\overline{\text{STMPD}}$ (Stamp dirve) $\rightarrow \text{M-220F}$ $\overline{\text{SPRS}}$ (Slip release) $\rightarrow \text{M-240}$
$\overline{\text{PFR}}$	Receipt feed ($\overline{\text{PFRD}}$) Low: fed M-220F
$\overline{\text{M240}}$	Printer select Low: M-240, High: M-220F
$\overline{\text{TIM}}$	Timing pulse T220 \leftarrow M220F, T240 \leftarrow M-240
$\overline{\text{RIN}}$	Reset pulse $\overline{\text{RIN220}} \leftarrow \text{M-220F}, \overline{\text{RIN240}} \leftarrow \text{M-240}$
$\overline{\text{BOF}}$	Slip detect Low: detected M240 (BOFS1)
$\overline{\text{VDJ/TOF}}$	Paper detect Low: detected $\overline{\text{VDJ}}$ (Validation paper detect) $\leftarrow \text{M-220F}$ $\overline{\text{TOF}}$ (Slip detect --- Top of form) $\leftarrow \text{M-240 (TOFS1)}$

NOTE: For detailed printer control timing chart, refer to the Model-220F printer service manual.

15-7. BUZZER CONTROL

Buzzer Circuit

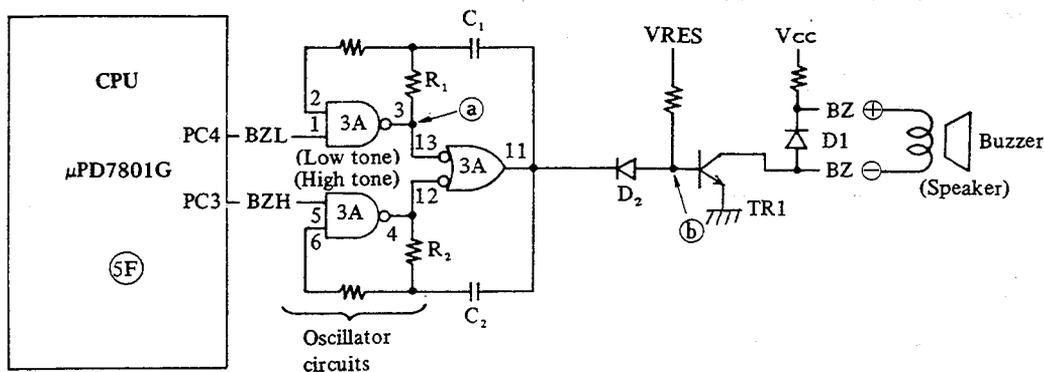


Fig. 21

Buzzer circuit includes two oscillator circuits for low tone and high tone.

Drive signal for low tone is BZL and for high tone is BZH.

BZL and BZH are output signals of the CPU. When these signals go to a high level, the respective oscillator circuit will start oscillating. Oscillation frequency determined by R_1 (R_2) and C_1 (C_2).

Ex. Time chart for Buzzer Circuit (for low tone)

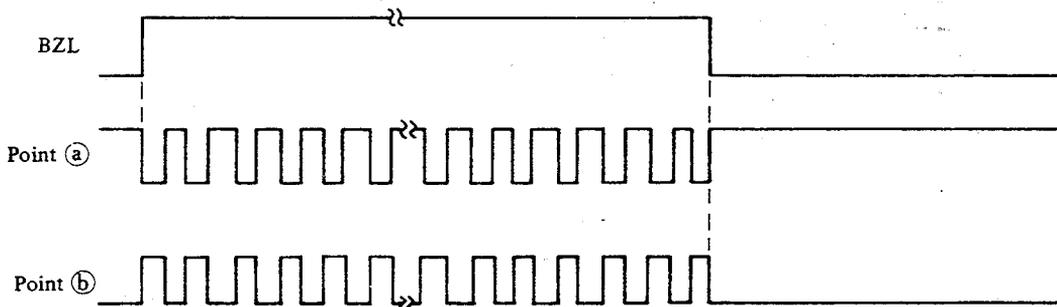


Fig. 22

NOTE: For the high tone, the frequency may be higher than that of the low tone.

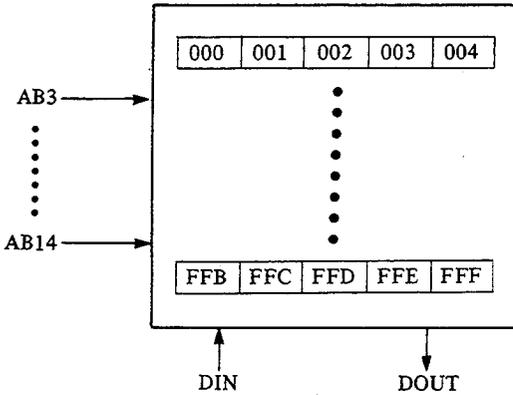
15-10. INTERRUPT INPUT CIRCUIT

RAM (M5T4044S30) of 4096 bits capacity is used in this circuit, and corresponds to one step of address.

The Chip Select signal pin (\overline{CE}) of the RAM (M5T4044S30) is connected with the ROM Chip Select signal input ($\overline{MCS2} \sim \overline{MCS5}$) so that the RAM (M5T4044S30) may be selected at any time when one of ROM1 ~ ROM4 is selected.

AB3-AB14 is the address bus input to the RAM (M5T4044S30), and each RAM bit (address) corresponds with ROM address in the following manner.

RAM (M5T4044S30): 4096-bit RAM (1 address = 1 bit)



Each bit of RAM (M5T4044S30) corresponds with program address in the following manner:

RAM address	Program address
000	8000-8007 (8 addresses)
001	8008-800F (8 addresses)
002	8010-8017 (8 addresses)
.	.
.	.
FFD	7FE8-7EEF (8 addresses)
FFE	7FF0-7FF7 (8 addresses)
FFF	7FF8-7FFF (8 addresses)

Fig. 24

As the pin DIN (D6) of the RAM (M5T4044S30) is the data input pin to M5T4044S30, it becomes necessary to turn the pin \overline{WE} (\overline{WR}) to low level in order to write data in the RAM.

When pin \overline{CE} turns to low level with the pin \overline{WE} at high level, the data (0 or 1) stored in the address specified by AB3-AB14 is sent out from the pin DOUT.

1. When the data in the specified address is "1":

Since the trigger input (negative edge trigger input) of monomultivibrator (74LS122 6H) shown in Fig. 25 is in a high state in this case, it does not activate the 74LS122 (6H). This keeps its output Q in a low state and so the CPU interrupt request pin INT0 (active high) is held in low level, as well. Consequently, it causes no influence on the CPU.

2. When the data in the specified address is "0":

The trigger input (negative edge trigger input) of the monomultivibrator (74LS122 6H) shown in Fig. 25 turns to low level and it makes the 74LS122 (6H) triggered so that the output pin Q goes high for a period of about 10 microsecond. This makes the CPU interrupt request INT0 (active high) turn high to apply the interrupt to the CPU. With this, the program branches to the specified program address. The pin PC6, however, is at a high level while the interrupt request input is enabled.

Data (0 or 1) stored in the M5T4044S30 depends on key entry.

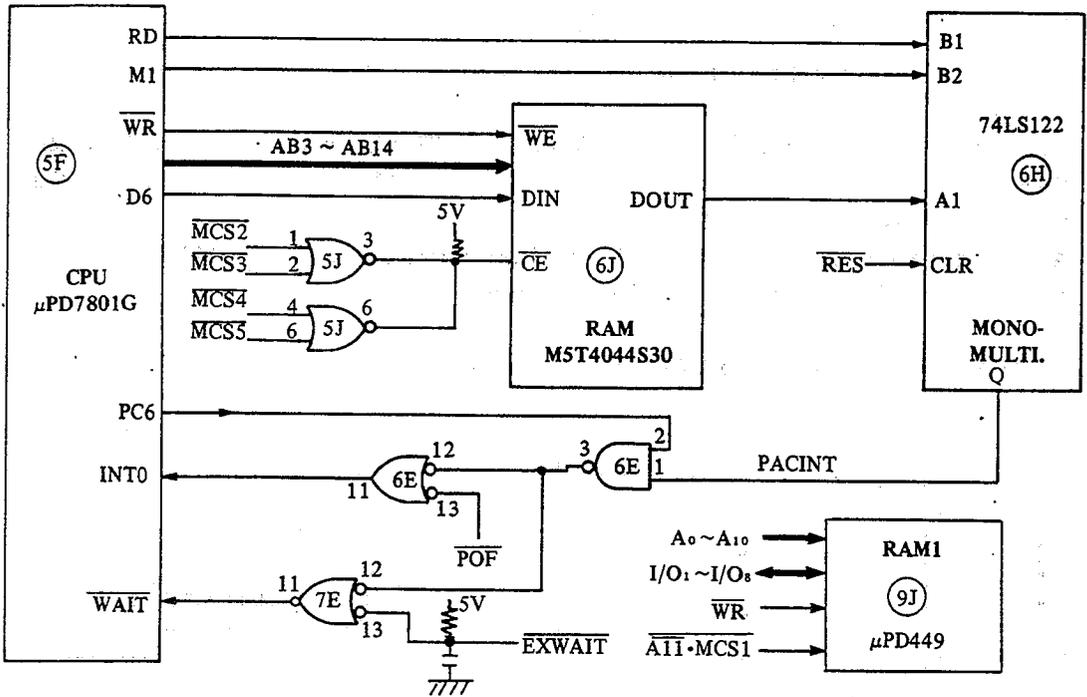


Fig. 25

Address

$\overline{\text{MCS2}}$: ROM select signal (2000-3FFF) ... ROM1 (8K bytes)

$\overline{\text{MCS3}}$: ROM select signal (4000-5FFF) ... ROM2 (8K bytes)

$\overline{\text{MCS4}}$: ROM select signal (6000-7FFF) ... ROM3 (8K bytes)

$\overline{\text{MCS5}}$: ROM select signal (8000-8FFF) ... ROM4 (4K bytes), 9000 ~ 9FFF: Not used.

TIMING CHART (ex: specified address 5000)

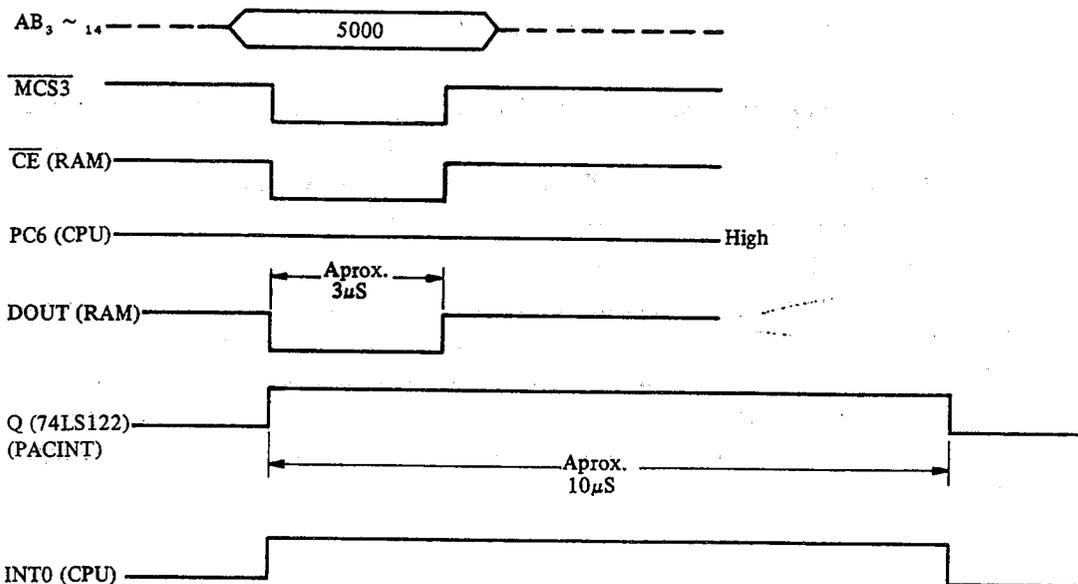


Fig. 26

15-11. DATA PACK (ER-67LD1) CONNECTION DETECTING CIRCUIT

By this circuit the signal \overline{POF} is turned to a low level during the connection of the DATA PACK to simulate a power failure state which holds the CPU operation and all other circuits to allow connection and disconnection of the DATA PACK with the power being on.

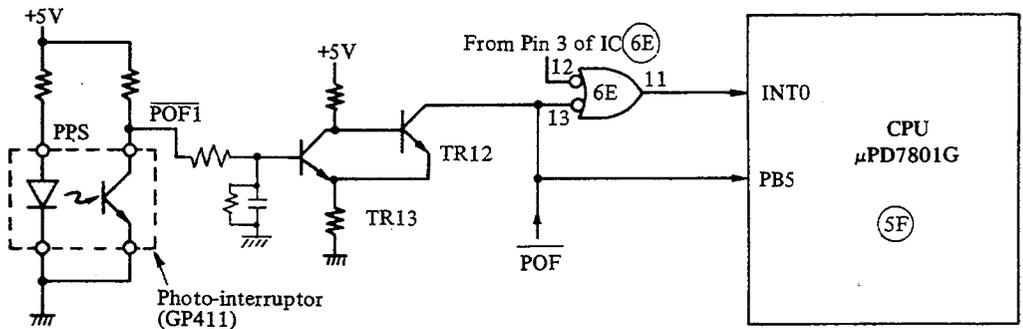


Fig. 27

As the detection lever is pushed towards the arrowhead (1) (Fig. 28) by the portion A of the DATA PACK when the DATA PACK is connected to the ER-4230, its tip goes out of photo interruptor range and causes the detect signal $\overline{POF1}$ to turn low level. This turns TR13 off, TR12 on and makes \overline{POF} low level to simulate a power failure condition. This holds the CPU from operating momentarily. Further insertion of the DATA PACK causes the lever to return to the position shown by (a) of Fig. 28 and causes the front edge of the lever to be inserted within the operating range of the photo interruptor to start the CPU again.

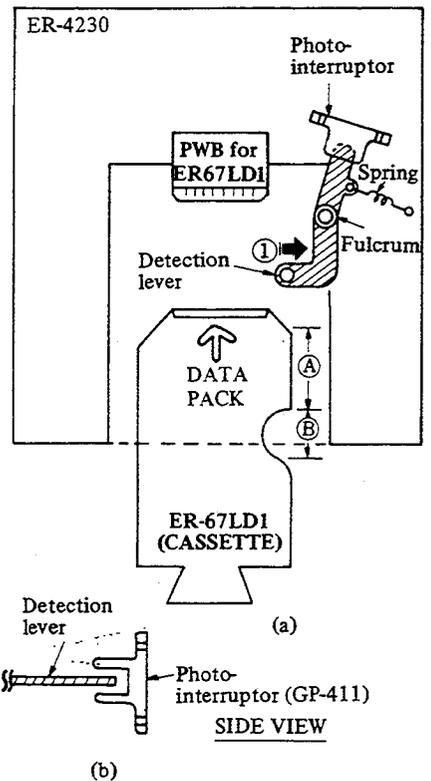


Fig. 28

15-12. POWER SUPPLY

(1) Block Diagram

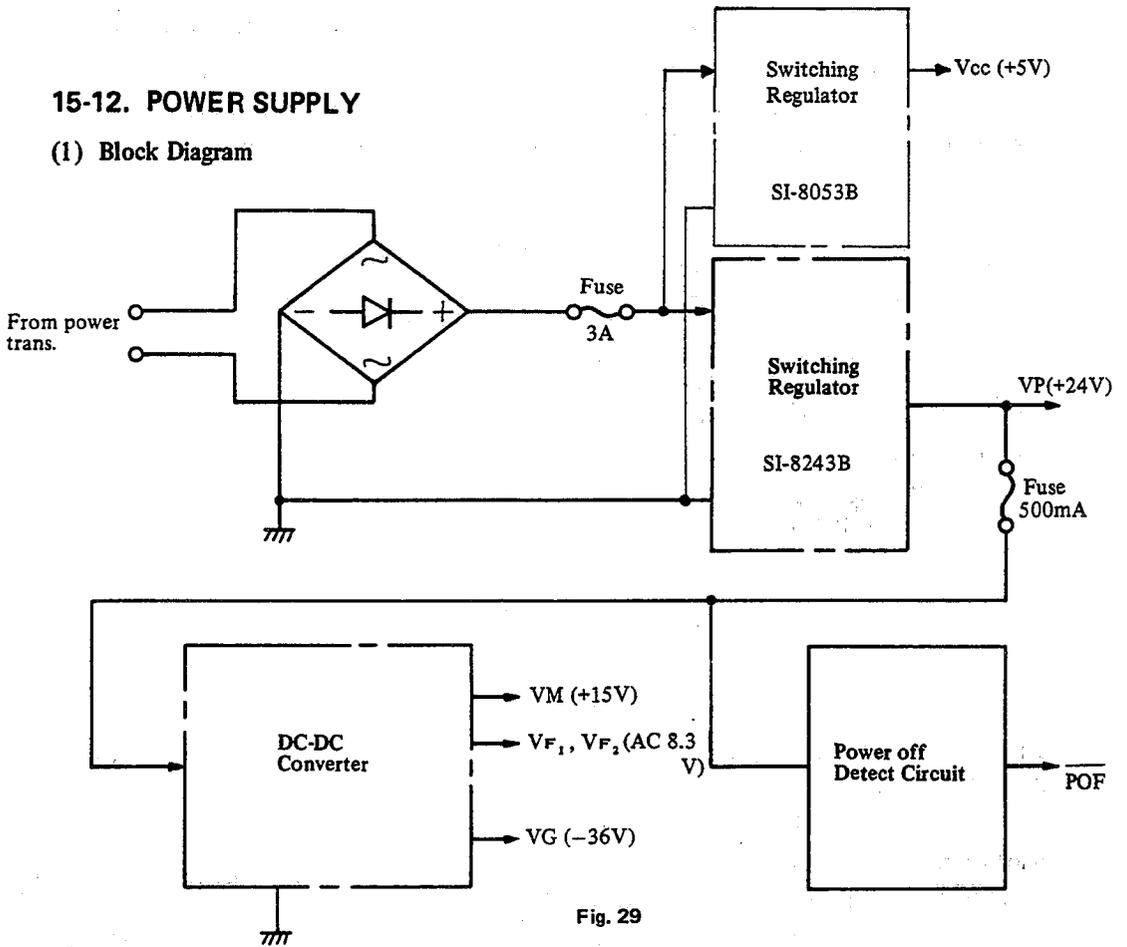


Fig. 29

(2) Power off (POF) Circuit

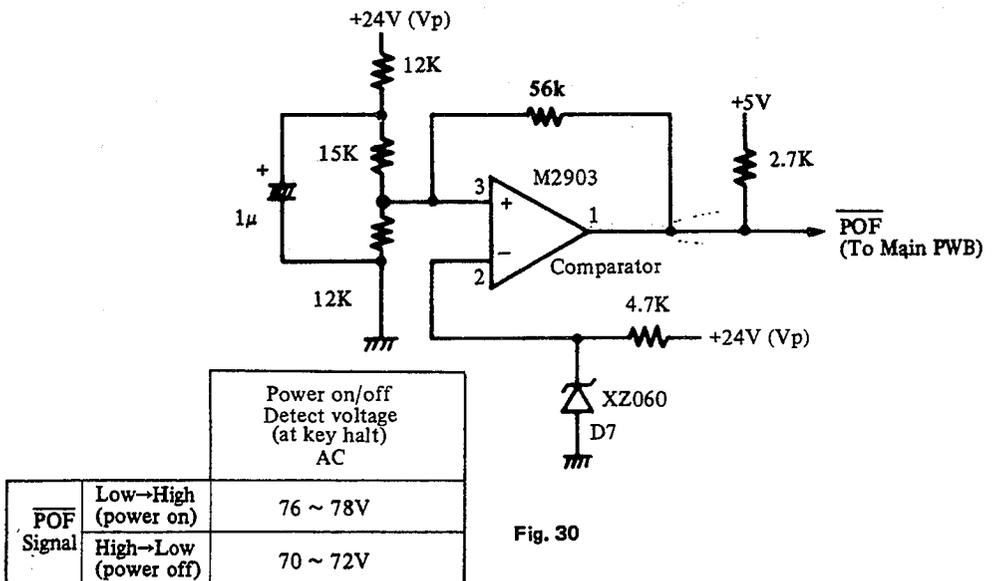


Fig. 30

ACTION OF COMPARATOR

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

The signal \overline{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 \overline{POF} converts from a low level to a high level when the potential of (+) input becomes higher than the (-) input (+6V) after turning-on of the AC power source. As soon as the signal \overline{POF} becomes a high, the CPU will start its operation.

2. With Power OFF

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

FOR THE DC-DC CONVERTER REFER TO CHAPTER 8 "8-1-3. (ii), 8-1-6. (2)" OF THE "CASH REGISTER BASIC MANUAL".

(3) Switching Regulator Circuit (V_p , V_{cc} Power Source)

- V_p Power Source (+24V)

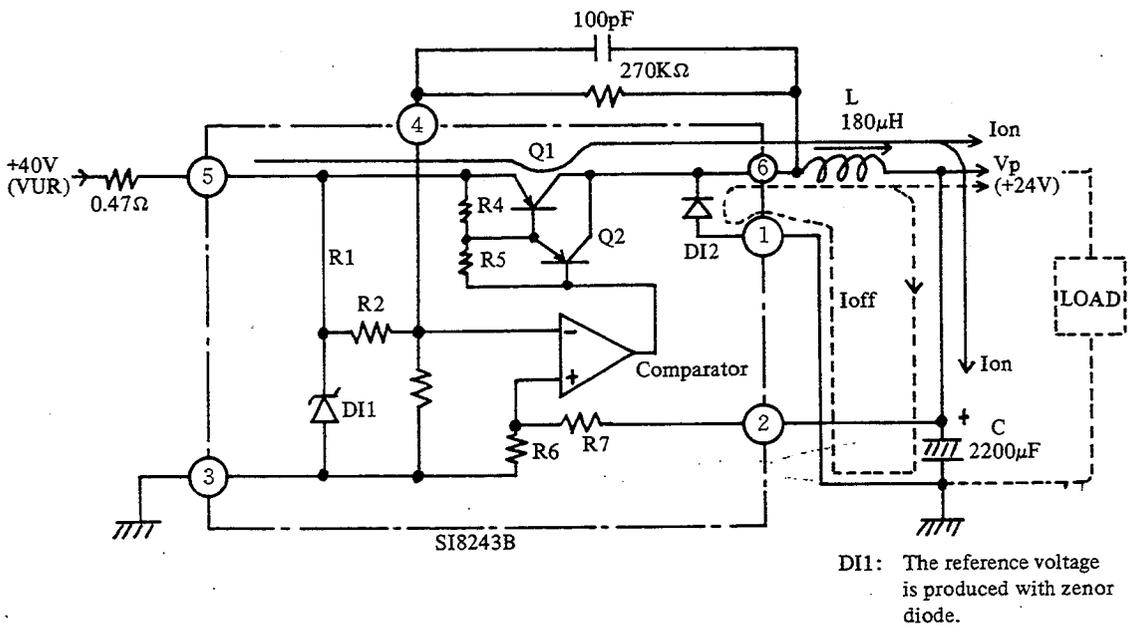


Fig. 31

VUR (+40V) is a unregulated DC power source which is supplied to the switching regulator circuits (V_p , V_{cc}).

The power is supplied intermittently to the coil ($180\mu\text{H}$) from the VUR (+40V) by the switching action of the Q1 to obtain DC power (V_p) via L.C. network. The output V_p is held to the constant voltage by controlling the ratio of on/off period of the Q1.

I_{on} : the current when the Q1 is turned on.

I_{off} : the current when the Q1 is turned off. - - - (induced counter electromotive force of coil " $180\mu\text{H}$ ")

- (i) When Q1 is turned on, provided V_p is 0V or below +24V
 V_p is 0V or below +24V \rightarrow "+" input level of the comparator is lower than the "-" input level (reference voltage) \rightarrow Output level of the comparator goes to low \rightarrow Q2 and Q1 are turned on \rightarrow VUR (+40V) is supplied to the coil ($180\mu\text{H}$) and the load $\rightarrow V_p$ is increased.
 - (ii) When Q1 is turned off, provided V_p is above +24V
 V_p is above +24V \rightarrow "+" input level of the comparator is higher than the "-" input level (reference voltage) \rightarrow Output level of the comparator goes to high \rightarrow Q2 and Q1 are turned off \rightarrow Supplying VUR power is stopped, at the same time, counter-electromotive force is generated in the coil ($180\mu\text{H}$) in the direction (arrow mark) as shown in Fig. 31, which is supplied to capacitor $2200\mu\text{F}$ and the load. $\rightarrow V_p$ is decreased.
- As the above steps (i) and (ii) are repeated and the ratio of on/off of Q1 is controlled according to the amount of the load, constant voltage V_p is obtained.

• Vcc Power source (+5V)

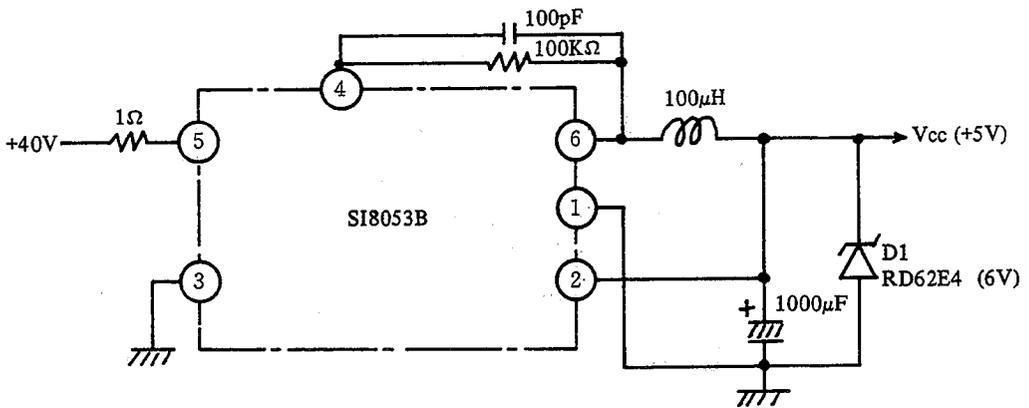
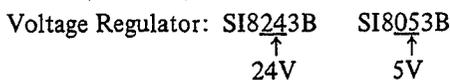


Fig. 32

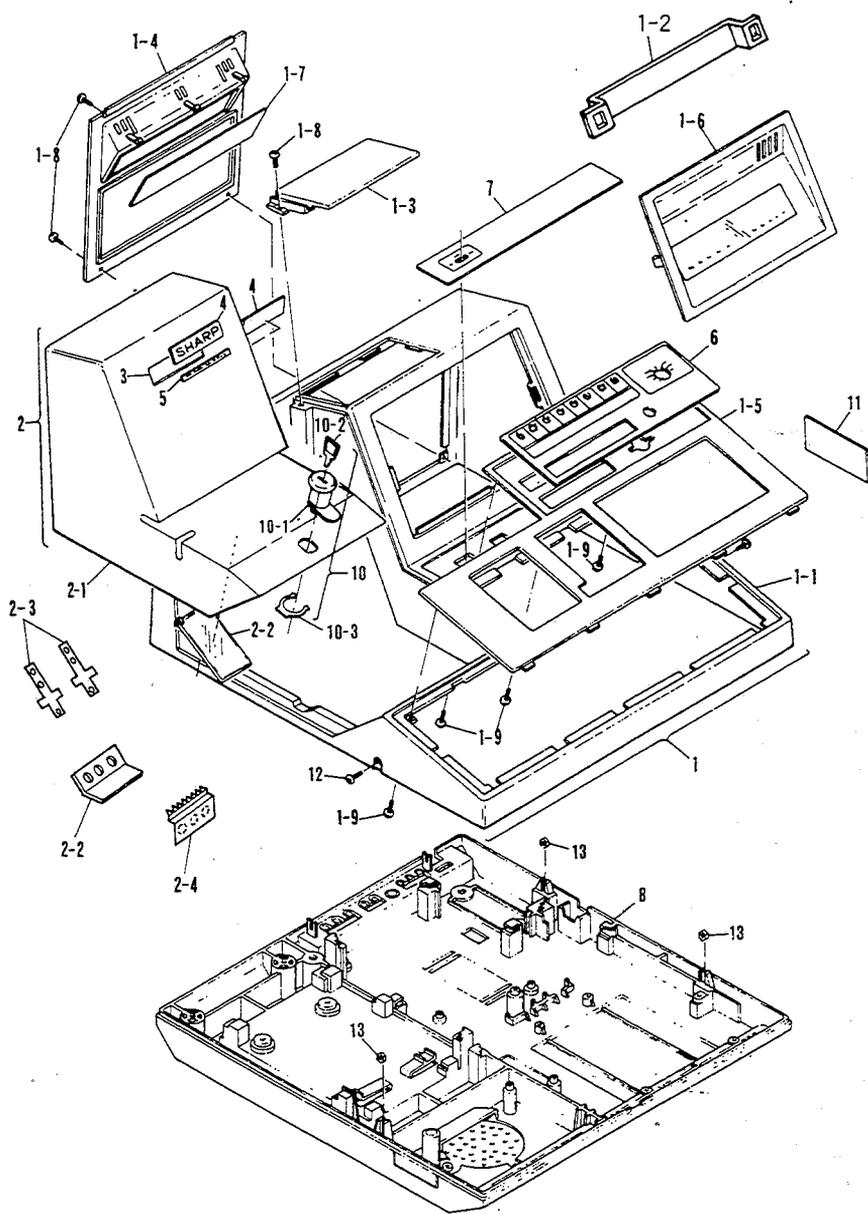
D1: Voltage limitation diode (Zener diode)
 The voltage level of V_{cc} is limited to about 6V by D1 in order to prevent circuit elements (IC, LSI) from their damages when the voltage regulator (SI8053) is failed.

The circuit is the same as that of the V_p circuit. Refer to explanation of the V_p power source (SI8243B)



PARTS GUIDE

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
1	CCABB6780RCZZ	Cabinet unit (RA7, RB2, SD, SH, SM)	N	D	BM
	CCABB6762RCZZ	Cabinet unit (U.S.A, CANADA)	N	D	BM
1-1	_____	_____	_____	_____	_____
1-2	_____	_____	_____	_____	_____
1-3	GFTAT6671RCZZ	Cabinet cover		D	AG
	GFTAT6681RCZZ	Cabinet cover		D	AG
1-4	GFTAR6673RCZZ	Back cover (RA7, RB2, SD, SH, SM)		D	AP
	GFTAR6682RCZZ	Back cover (U.S.A, CANADA)	N	D	AP
1-5	HPNLC6698RCZZ	Key panel (RA7, RB2, SD, SH, SM)		D	AP
	HPNLC6696RCZZ	Key panel (U.S.A, CANADA)		D	AQ
1-7	PFLW6718RCZZ	Filter (Back)		D	AG
1-6	PFLW6726RCZZ	Filter (Front)	N	D	AV
1-8	XBBSC30P06000	Screw X3T+8S		C	AA
1-9	XCPSD30P08000	Tapping screw X3P+8S		C	AA
2	CCOVA6813RC01	Printer cover unit (RA7, RB2, SD, SH, SM)		D	AY
	CCOVA6804RC01	Printer cover unit (U.S.A, CANADA)	N	D	AY
2-1	_____	_____	_____	_____	_____
2-2	GITAR6694RCZZ	Cover plate	N	D	AS
2-3	LANGT6634RCZZ	Filter fitting angle		C	AC
2-4	PCUT-6631RCZZ	Paper cutter	N	C	AC
2-5	PFLW6727RCZZ	Journal filter	N	C	AD
3	GDAI-6629RCZZ	Badge fitting plate		D	AC
4	HBDGD6664RCZZ	SHARP badge		D	AG
5	HBDGD6737RCZZ	Model badge	N	D	AC
6	HDECE6702RCZZ	Key decolation panel		D	AN
7	HDECE6694RCZZ	Receipt ON-OFF panel		D	AG
8	GCABA6846RCZZ	Bottom cabinet (RA7, RB2, SD, SH, SM)	N	D	BE
	GCABA6834RCZZ	Bottom cabinet (U.S.A, CANADA)	N	D	BE
9	GITAR6698RCZZ	Shield plate	N	C	AD
10	QSW-Z6709RCZZ	Lock key unit	N	B	AN
10-1	LKGIW6783RCZZ	Lock key		B	AM
10-2	LKGI M6784RCZZ	Key		B	AD
10-3	MSPRK6660RCZZ	Clip		B	AC
11	TSPC-6898RCZZ	Specification panel U.S.A	N	D	AE
	TSPC-6899RCZZ	Specification panel CANADA	N	D	AE
	TSPC-6919RCZZ	SPecification panel (RA7, RB2, SD, SH, SM)	N	D	AE
12	XBBSC30P08000	Screw X3P+8S		C	AA
13	XNESD30-24000	Nut 3mm		C	AA

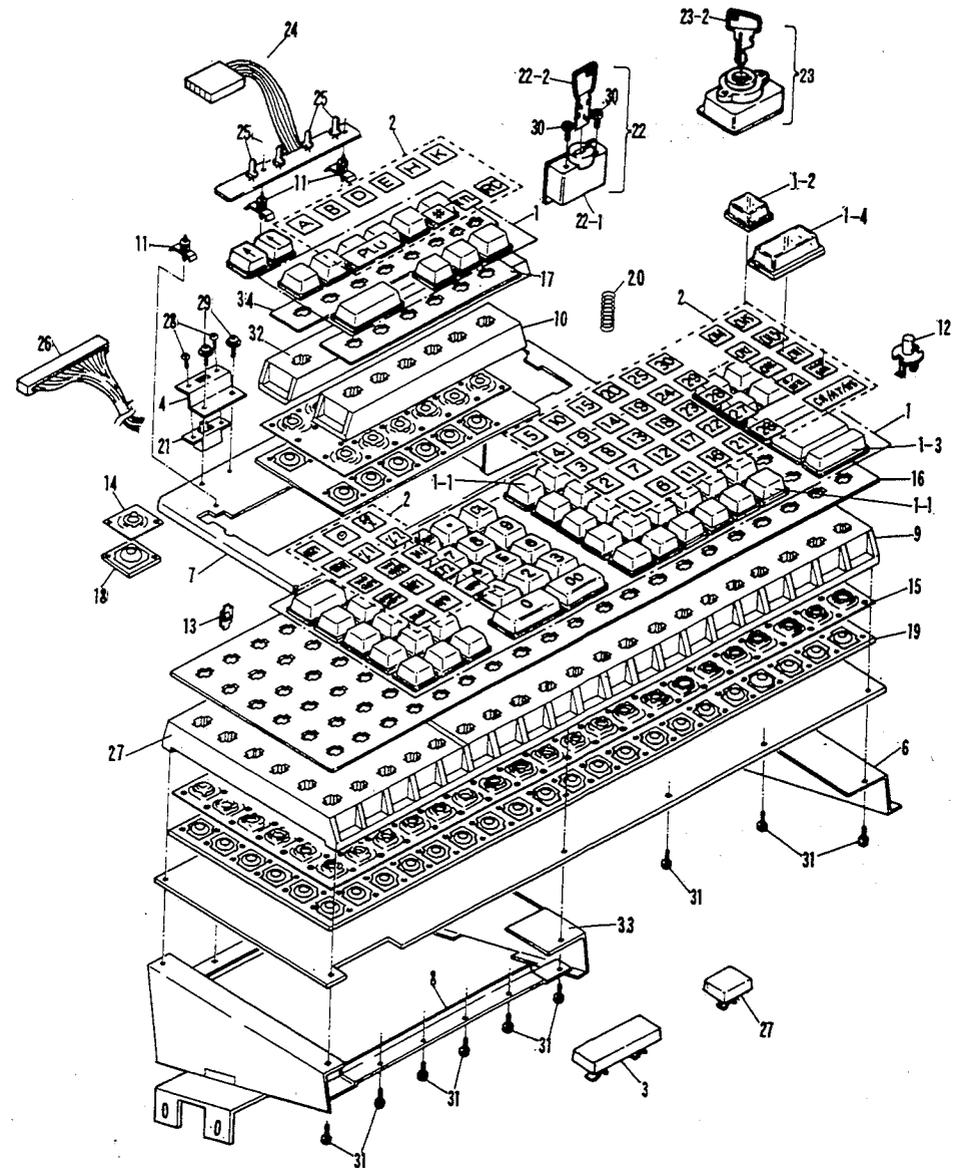


KEYBOARD UNIT DUNTK7587RCZZ

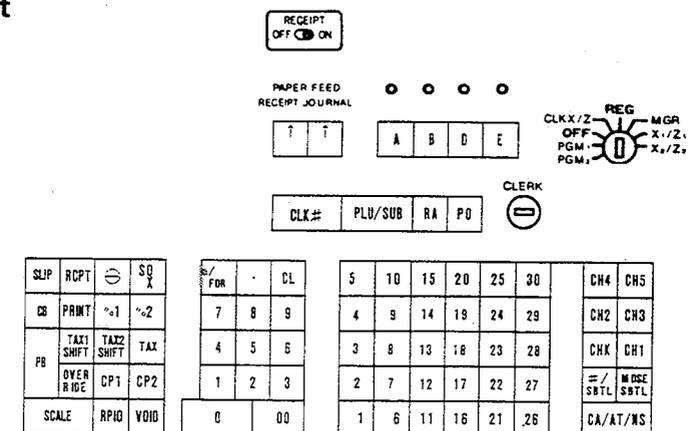
NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
1					
1-1	JKNBZ6381RCZZ	Key top blank 1X1		C	AC
1-2	JKNBZ6382RCZZ	Key cap 1X1		C	AC
1-3	JKNBZ6385RCZZ	Key top blank 1X2		C	AD
1-4	JKNBZ6386RCZZ	Key cap 1X2		C	AD
	JKNBZ6669RCZZ	Key top ↑		C	AB
	JKNBZ6670RCZZ	Key top 1		C	AB
	JKNBZ6671RCZZ	Key top 2		C	AB
	JKNBZ6672RCZZ	Key top 3		C	AB
	JKNBZ6673RCZZ	Key top 4		C	AB
	JKNBZ6674RCZZ	Key top 5		C	AB
	JKNBZ6675RCZZ	Key top 6		C	AB
	JKNBZ6676RCZZ	Key top 7		C	AB
	JKNBZ6677RCZZ	Key top 8		C	AB
	JKNBZ6678RCZZ	Key top 9		C	AB
	JKNBZ6679RCZZ	Key top 0 1X2		C	AB
	JKNBZ6680RCZZ	Key top 00 1X1.5		C	AB
	JKNBZ6698RCZZ	Key top CL		C	AB
JKNBZ6705RCZZ	Key top . 1X1		C	AB	
JKNBZ6750RCZZ	Key top @/FOR		C	AB	
2	CLABH6698RCZZ	Key label unit	N	C	AN
3	JKNBZ6731RCZZ	Dummy key 1X5		C	AE
4	LANGK7130RCZZ	Receipt switch angle		C	AC
33	LANGK7132RCZZ	Key holder angle (Center)		C	AF
6	LANGK7133RCZZ	Key holder angle (Right)		C	AF
7	LANGK7136RCZZ	Clerk key angle		C	AK
8	LANGK7138RCZZ	Key fitting angle		C	AD
5	LANGK7167RCZZ	Key holder angle (Left)	N	C	AH
9	LFRM-6631RCZZ	Key frame 6X15		C	AK
27	LFRM-6633RCZZ	Key frame 5X6		C	AP
10	LFRM-6657RCZZ	Key frame 1X6		C	AD
32	LFRM-6658RCZZ	Key frame 1X8		C	AD
11	LHLDF6668RCZZ	holder	N	C	AB
12	LPINS1002CCZZ	Key guide		C	AA
13	MLEVP6671RCZZ	Key lever		C	AA
14	MSPRP1083CCZZ	Key spring 1key		B	AA
	MSPRP1090CCZZ	Key spring 4key		B	AC
15	MSPRP1100CCZZ	Key spring 5key		B	AC
16	PFLT-2321RCZZ	Key felt		C	AE
17	PFLT-6645RCZZ	Key felt 1X6		C	AA
	PFLT-6647RCZZ	Key felt 1X8		C	AA
18	PGUMM1036CCZZ	Key rubber 1key		B	AB
	PGUMM1041CCZZ	Key rubber 5key		B	AE

KEYBOARD UNIT DUNTK7587RCZZ

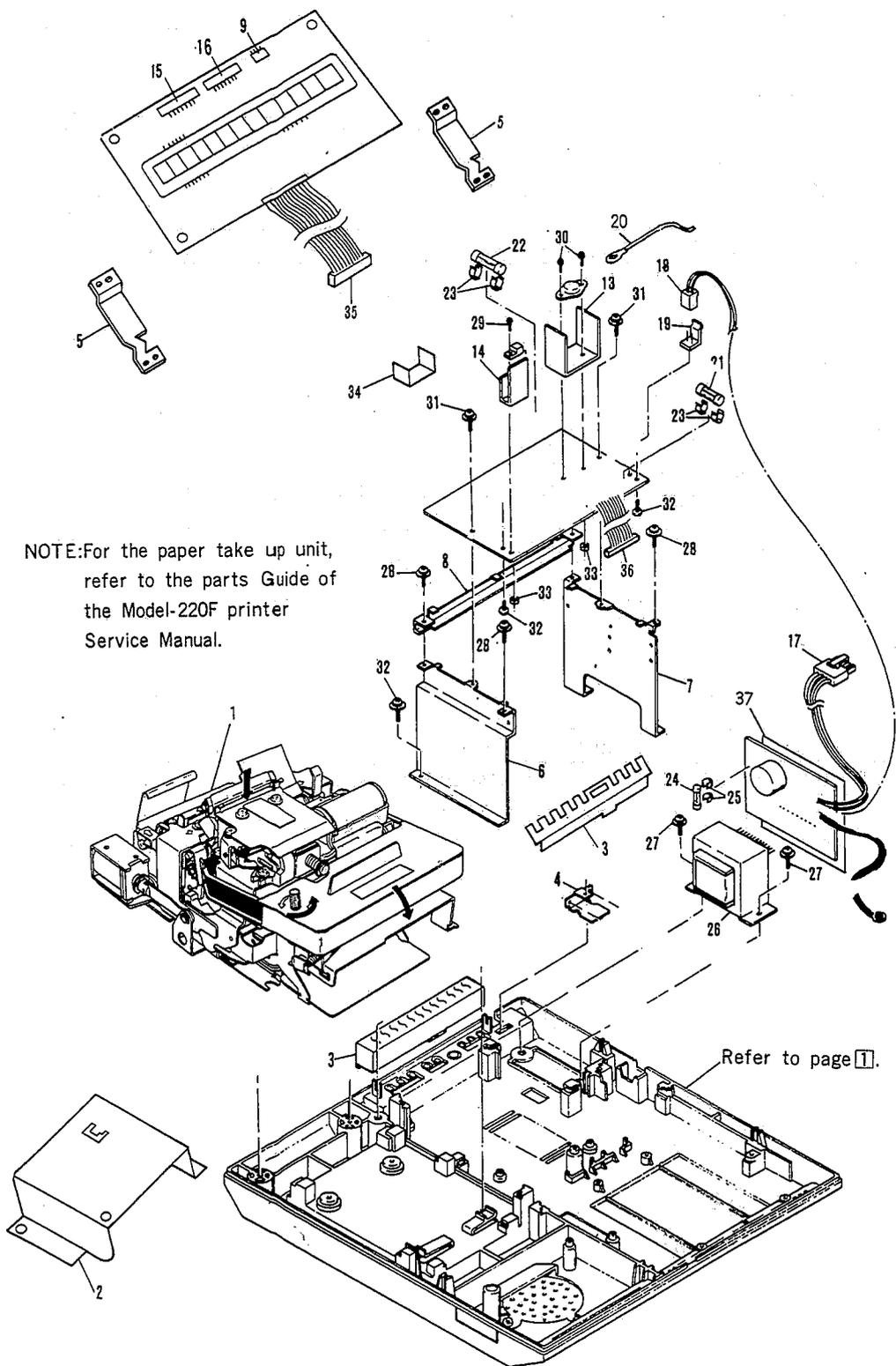
NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
19	PGUMM1097CCZZ	Key rubber 5key		B	AD
21	QSW-S6708RCZZ	Slide switch		C	AH
22					
22-1	LKGiW6852RCZZ	Clerk key switch (Body)		B	AW
22-2	LKGiM6853RCZZ	Clerk key A		B	AG
22-2	LKGiM6854RCZZ	Clerk key B		B	AG
22-2	LKGiM6855RCZZ	Clerk key D		B	AG
22-2	LKGiM6856RCZZ	Clerk key E		B	AG
22-2	LKGiM6864RCZZ	Clerk key K		B	AG
22-2	LKGiM6870RCZZ	Clerk key M		B	AG
23					
23-2	LKGiM6858RCZZ	Spare key OP		B	AG
23-2	LKGiM6859RCZZ	Spare key SM		B	AG
23-2	LKGiM6860RCZZ	Spare key MA		B	AG
23-1	LKGiW6942RCZZ	Mode switch		B	AW
24	QCNCW6816RCO4	Connector 5pin with wires		C	AF
25	VHPGL3AR2///1	LED		B	AD
26	QCNCW6839RCO2	Connector 23pin with wires		C	AR
27	VHDDS1588L1-1	Diode DS1588L1		B	AD
28	XBPSD20P04000	Screw X2P+4S		C	AA
29	XBPSD30P06K00	Screw X3P×6S with spring washer		C	AA
30	XCPSD26P06000	Tapping screw X2.6P+6S		C	AA
31	XUPSD30P08000	Tapping screw X3T+8S		C	AA
20	MSPRC6674RCZZ	Spring (between key panel and clerk key angle)		C	AB



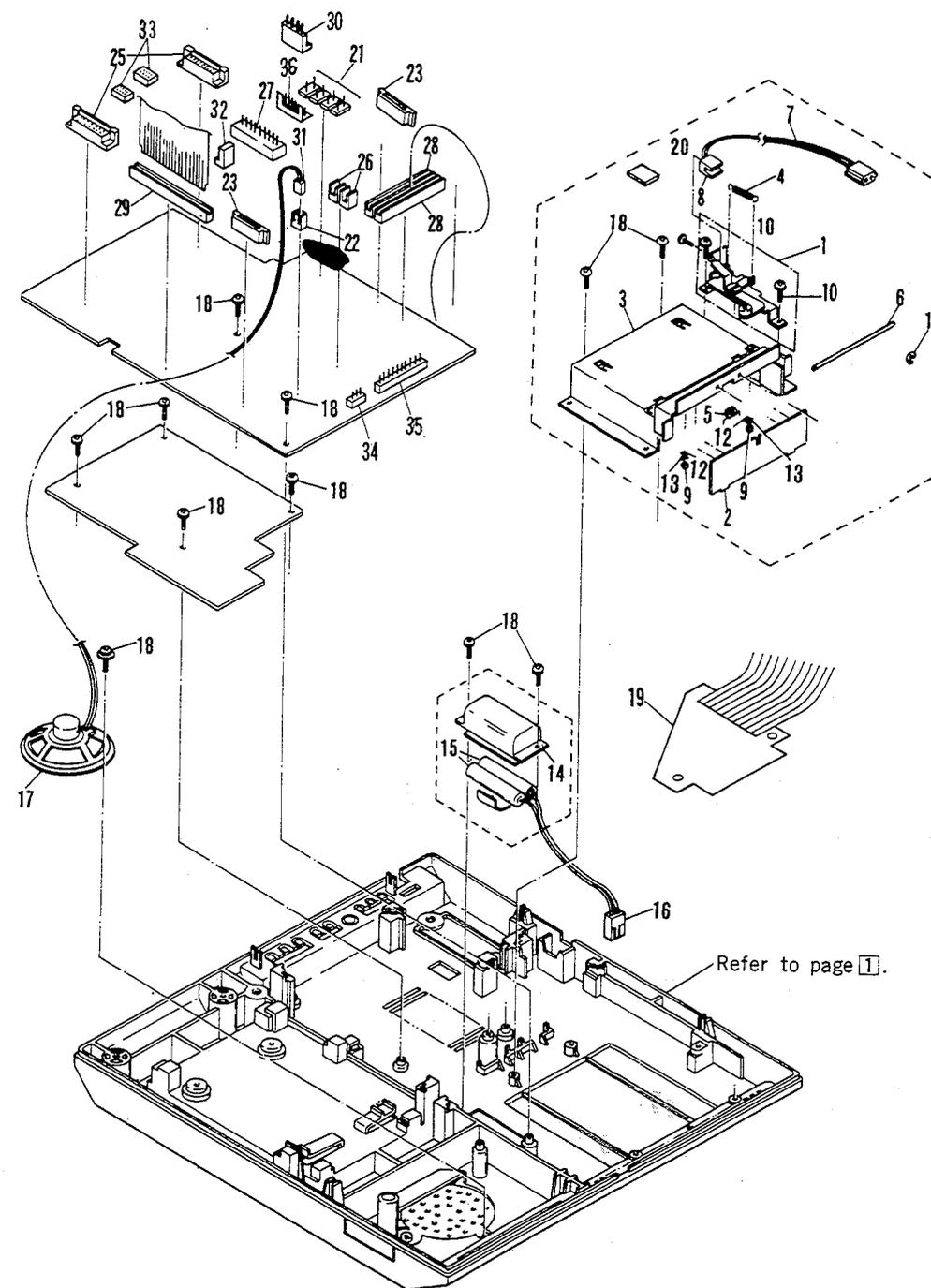
Key layout



NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK	
1	K i - 0 B 6 6 7 4 R C Z Z	Printer unit Model-22DF	N	E	**	
2	G D A i - 6 6 5 2 R C Z Z	Winder fitting angle	N	C	AF	
3	L A N G K 7 1 2 7 R C Z Z	Cable angle		C	AE	
4	L A N G K 7 1 6 2 R C Z Z	AC cord angle		C	AD	
5	L A N G K 7 1 6 3 R C Z Z	Display PWB hold angle	N	C	AE	
6	L A N G K 7 1 3 4 R C Z Z	PWB holder angle (Right)		C	AG	
7	L A N G K 7 1 3 5 R C Z Z	PWB holder angle (Left)		C	AG	
8	L A N G K 7 1 3 7 R C Z Z	PWB angle		C	AD	
9	Q C N C M 6 8 5 2 R C O D	Connector 4pin	N	C	AB	
10	L X - B Z 1 0 0 7 C C Z Z	Printer fitting screw		C	AB	
11	P C U S G 6 6 3 3 R C Z Z	Printer cushion		C	AB	
12	P C L R - 6 6 2 7 R C Z Z	Spacer		C	AB	
13	P R D A F 2 3 1 7 R C Z Z	Heat sink (for SI8053B)		C	AG	
14	P R D A F 6 6 3 0 R C Z Z	Heat sink (for 2SC2334)		C	AB	
15	Q C N C M 6 8 5 2 R C I B	Connector 12pin	N	C	AE	
16	Q C N C M 6 8 5 3 R C I C	Connector 13pin	N	C	AE	
17	Q C N C W 6 7 2 0 R C O 5	Connector 4pin with wires		C	AG	
18	Q C N C W 6 8 3 5 R C O 2	Connector 2pin with wire		B	AE	
19	Q C N C M 6 8 3 7 R C O B	Connector 2pin		B	AB	
20	Q C N W - 6 7 7 9 R C Z Z	Wire for SI8053B		B	AB	
△	21	Q F S - A 0 0 1 6 H C Z Z	Fuse 3A 125V		A	AC
△	22	Q F S - A 0 0 3 8 H C Z Z	Fuse 0.5A (500mA)		A	AD
	23	Q F S H A 0 0 0 6 H C Z Z	Fuse holder		C	AB
△	24	Q F S - B 1 0 0 2 C C Z Z	Fuse 1.5A 125V		A	AE
	25	Q F S H B 1 0 0 3 C C Z Z	Fuse holder		C	AB
△	26	R T R N P 6 7 1 6 R C Z Z	Power transformer (U.S.A, CANADA, SD, RA7)		B	BA
△		R T R N P 6 7 0 9 R C Z Z	Power transformer (SM, SH, RB2)		B	AZ
	27	X B P B Z 4 0 P 0 6 K 0 0	Screw X4P+6S with spring washer		C	AA
	28	X B P S D 3 0 P 0 6 K S O	Screw X3P+6S with plane washer and spring washer		C	AA
	29	X B P S D 3 0 P 0 6 K 0 0	Screw X3P+6S with spring washer		C	AA
	30	X B P S C 3 0 P 0 6 0 0 0	Screw X3P+6S		C	AA
	31	X B P S D 3 0 P 0 8 K S O	Screw X3P+8S with plane washer and spring washer		C	AA
	32	X C P S D 3 0 P 0 8 0 0 0	Tapping screw X3T+8S		C	AA
	33	X N E S D 3 0 - 2 4 0 0 0	Nut 3mm		C	AA
	34	P R D A F 6 6 3 6 R C Z Z	Heat sink for SI8243B	N	C	AG
	35	Q C N W - 6 8 2 4 R C Z Z	Connector 13pin with wires	N	C	AK
	36	Q C N W - 6 8 2 5 R C Z Z	Connector 7pin with wires	N	C	AK
	37	G I T A R 6 6 9 8 R C Z Z	Shield sheet	N	C	AD



NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
1	DUNTM7545RCZZ	Lever unit		C	AR
2	GC0VA6805RCZZ	Data pack cover		C	AH
3	LANGK7164RCZZ	Data pack fitting angle		C	AL
4	MSPRT2316RCZZ	Spring		C	AD
5	MSPRC6672RCZZ	Data pack cover spring	N	C	AC
6	NSFTZ6639RCZZ	Shaft	N	C	AD
7	QCNCW-6816RCZZ	Connector 4pin with wires	N	C	AE
8	VHPGP411///-1	Photo interrupter GP-411		B	AM
9	XBPSD20P06000	Screw X2P+6S		C	AA
10	XBPSD30P06KSO	Screw X3P+6S with plane washer and spring washer		C	AA
11	XRESJ15-04000	E type ring 15mm		C	AA
12	XWHSD20-04060	Plane washer 2mm		C	AA
13	XWSSD20-05000	Spring washer 2mm		C	AA
14	GCASP6651RCZZ	Battery case		C	AE
15	UBATN6627RCZZ	Battery (Ni-CAD)		B	AV
16	QCNCW6816RC03	Connector 2pin with wire		B	AC
17	VSP0080PB508N	Speaker		B	AN
18	XCP3D30P08000	Tapping screw X3T+8S		C	AA
19	CPWBN6910RC01	Flat cables with PWB for data pack	N	C	AZ
20	QPWBF6889RCZZ	PWB (without parts) for GP-411		C	AA
21	QCNCM6699RCZZ	Connector 3pin 5066-03A		B	AC
22	QCNCM6775RCOB	Connector 2pin		B	AB
23	QCNCM6780RC2B	Connector 22pin		C	AG
24	QCNCM6780RC2F	Connector 26pin		C	AH
25	QCNCW-6786RC3J	Connector 30pin		C	AQ
26	QCNCM6802RC0B	Connector 2pin 5222-02A		B	AC
27	QCNCM6832RC0G	Connector 7pin 5283-07A	N	C	AD
28	QCNCW6836RC2J	Connector 20pin FF20P		C	AE
29	QCNCW1193CCZZ	Connector 38pin FF-38-01		C	AL
30	QCNCM2334RC0E	Connector 5pin 5045-05A	N	C	AC
31	QCNCW6774RC09	Connector 2pin with wire		B	AL
32	QCNCM6828RC0D	Connector 4pin 5233-04A		C	AB
33	QS0CZTB24SCZZ	L.S.i Socket 24pin		C	AH
34	QCNCM6851RC0C	Connector 3pin	N	B	AC
35	QCNCM6823RC1H	Connector 18pin 5045-18A	N	C	AF
36	QCNCM6823RC1C	Connector 13pin 5045-13A	N	C	AE

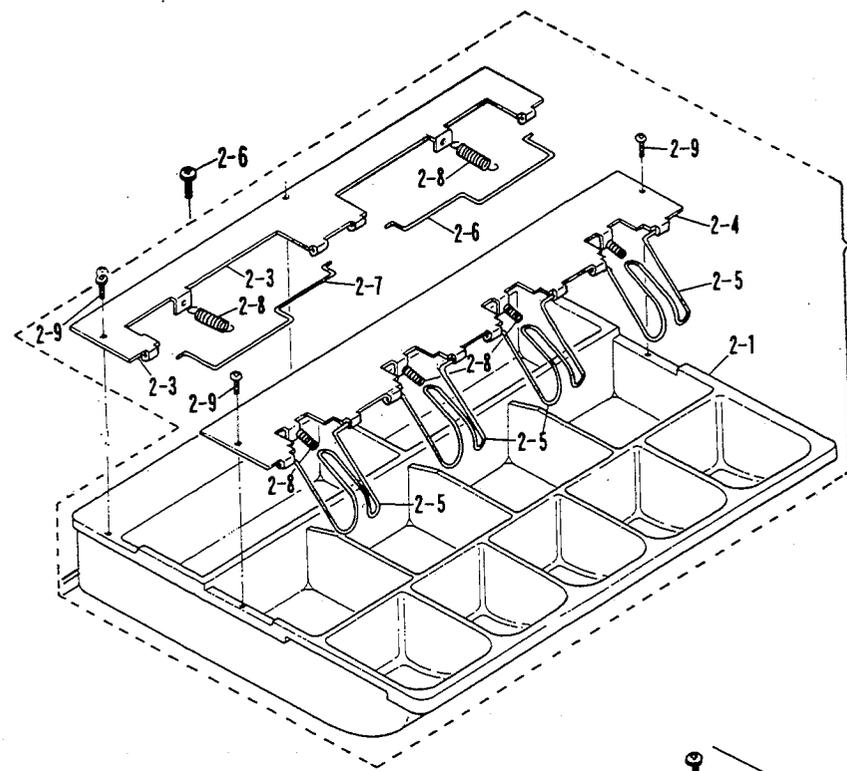
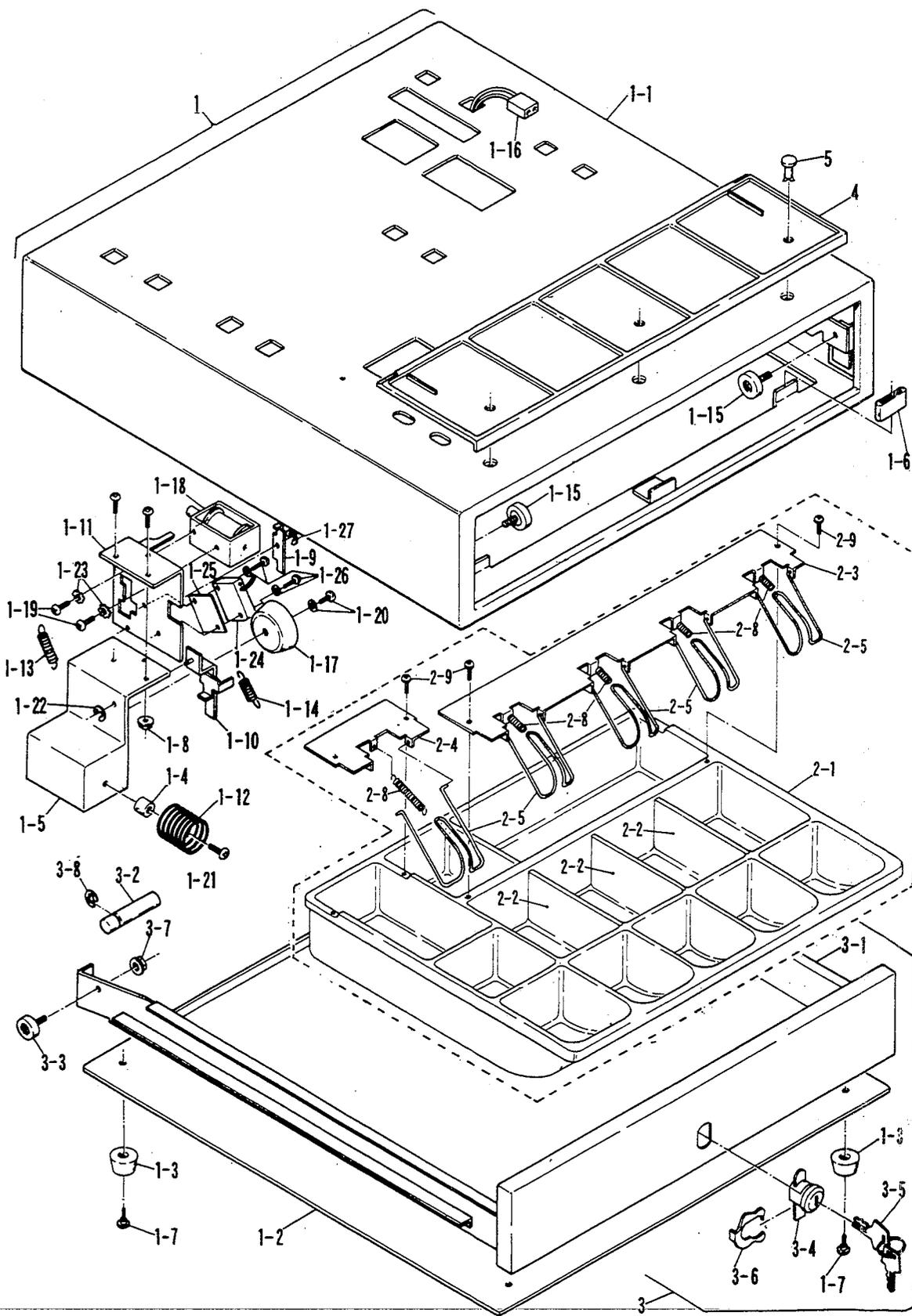


DRAWER BOX UNIT

GBOXD6776RCZZ...SM
 GBOXD6806RCZZ...SH
 GBOXD6802RCZZ...U.S.A SD
 GBOXD6803RCZZ...CANADA RB2.RA7

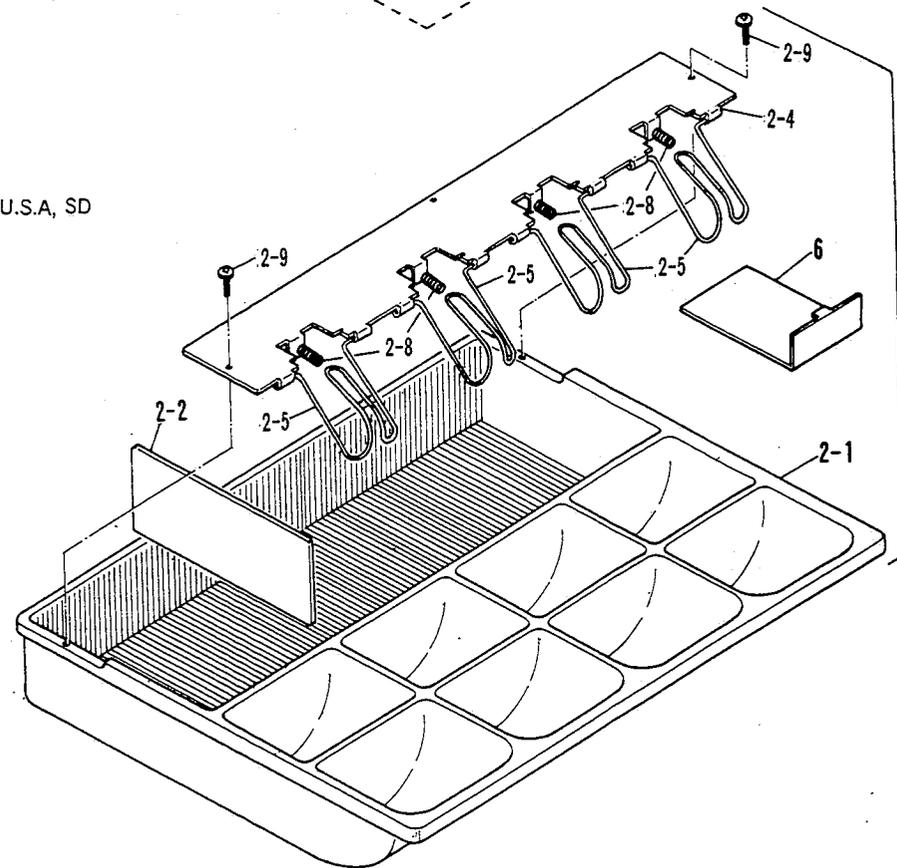
NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
1	CCABM6764RCZZ	Drawer cabinet unit SH		D	
	CCABM6733RCZZ	Drawer cabinet unit U.S.A SD.CANADA RA7.RB2.SM		D	BQ
1-1	GCABM6807RCZZ	Drawer cabinet unit		D	BL
1-2	GiTAU6656RCZZ	Bottom plate		C	AU
1-3	GLEGG6047RCZZ	Rubber foot		C	AE
1-4	GLEGG6634RCZZ	Rubber stopper		C	AB
1-5	LCHSS6649RCZZ	Unit shassis		C	AH
1-6	LSTPG6640RCZZ	Stopper rubber		C	AB
1-7	LX-BZ6646RCZZ	Screw with spacer		C	AB
1-8	LX-NZ6001RCZZ	Nut		C	AA
1-9	MLEVF6674RCZZ	Lever		C	AB
1-10	MLEVF6643RCZZ	Lever		C	AE
1-11	MLOKS6629RCZZ	Lock		C	AV
1-12	MSPRT6047RCZZ	Bill presser spring		C	AC
1-13	MSPRT6647RCZZ	Rock spring		C	AC
1-14	MSPRT6648RCZZ	spring		C	AC
1-15	NROLP6632RCZZ	Roller		B	AE
1-16	QCNCW6645RC04	Connector 3pin with wire		B	AF
1-17	RALML6636RCZZ	Alarm		C	AD
1-18	RPLU-6634RCZZ	Plunger		B	AR
1-19	XBPSD30P06000	Screw X3P+6S		C	AA
1-20	XBPSD40P08K00	Screw X4P+8P with spring washer		C	AA
1-21	XBPSD40P10000	Screw X4P+10S		C	AA
1-22	XRES D50-06000	E type ring 5mm		C	AA
1-23	LX-WZ6648RCZZ	Washer		C	AA
1-24	QSW-M6659RCZZ	Micro switch		B	AS
1-25	PSHEP6635RCZZ	Insulator		C	AA
1-26	XBPSD30P14K00	Screw X3P+14S with spring washer		C	AA
1-27	XRES D40-05000	E type ring 4mm		C	AA
2	CCASP6665RC01	Coin case unit(CANADA) RB2.RA7		D	BD
	CCASP6641RC01	Coin case unit(U.S.A) SD		D	AZ
	CCASP6630RC01	Coin case unit SH, SM		D	BA
2-1	GCASP6630RCZZ	Coin case SH, SM		C	AZ
	GCASP6641RCZZ	Coin case (U.S.A) SD		C	AV
	GCASP6643RCN1	Coin case (CANADA) RB2.RA7		D	AX
2-2	GiTAU6626RCZZ	Bill separator		C	AN
	GiTAU6642RCZZ	Bill separator (U.S.A) SD		C	AE
2-3	LBRC-6646RCZZ	Bill presser bracket		C	AQ
	LBRC-6648RCZZ	Bill presser bracket 4B (U.S.A)		C	AQ
	LBRC-6639RCZZ	Bill presser bracket 2B (CANADA)		C	AQ
2-4	LBRC-6647RCZZ	Bill presser bracket 1B (U.S.A)		C	AH
	LBRC-6638RCZZ	Bill presser bracket 4B (CANADA)		C	AQ

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
2-5	MLEV-6536RCZZ	Bill presser lever		C	AG
2-6	MLEV-6644RCZZ	Bill presser lever 2B Right		C	AE
2-7	MLEV-6645RCZZ	Bill presser lever 2B Left (CANADA)		C	AG
2-8	MSPRK6629RCZZ	Bill presser spring		C	AC
2-9	XUPSD30P06000	Tapping screw X3T+6S (U.S.A)		C	AA
3	CDRW-6645RCZZ	Drawer case unit SH		D	BE
	CDRW-6649RCZZ	Drawer case unit U.S.A CANADA.SD.RB2.RA7.SM		D	BE
3-1	GDRW-6646RCZZ	Drawer case (body)		C	BB
	GDRW-6651RCZZ	Drawer case (body) U.S.A.CANADA.SD.SM		C	BA
3-2	LPINS6630RCZZ	Lock pin		C	AB
3-3	NROLP6632RCZZ	Roller		B	AE
3-4	LKGiW6865RCZZ	Manual lock		B	AT
3-5	LKGiM6866RCZZ	Key		B	AP
3-6	MSPRK6669RCZZ	Clip		C	AD
3-7	LX-NZ6002RCZZ	Nut 5mm		C	AA
3-8	XRES D50-06000	E type ring 5mm		C	AA
4	GTOP-6626RCZZ	Plate		C	AN
5	LPINS6633RCZZ	Pin		C	AB
6	GCASP6020RCZZ	Bill separator SH		C	AH



2...CANADA,
RB2, RA7

2...U.S.A., SD

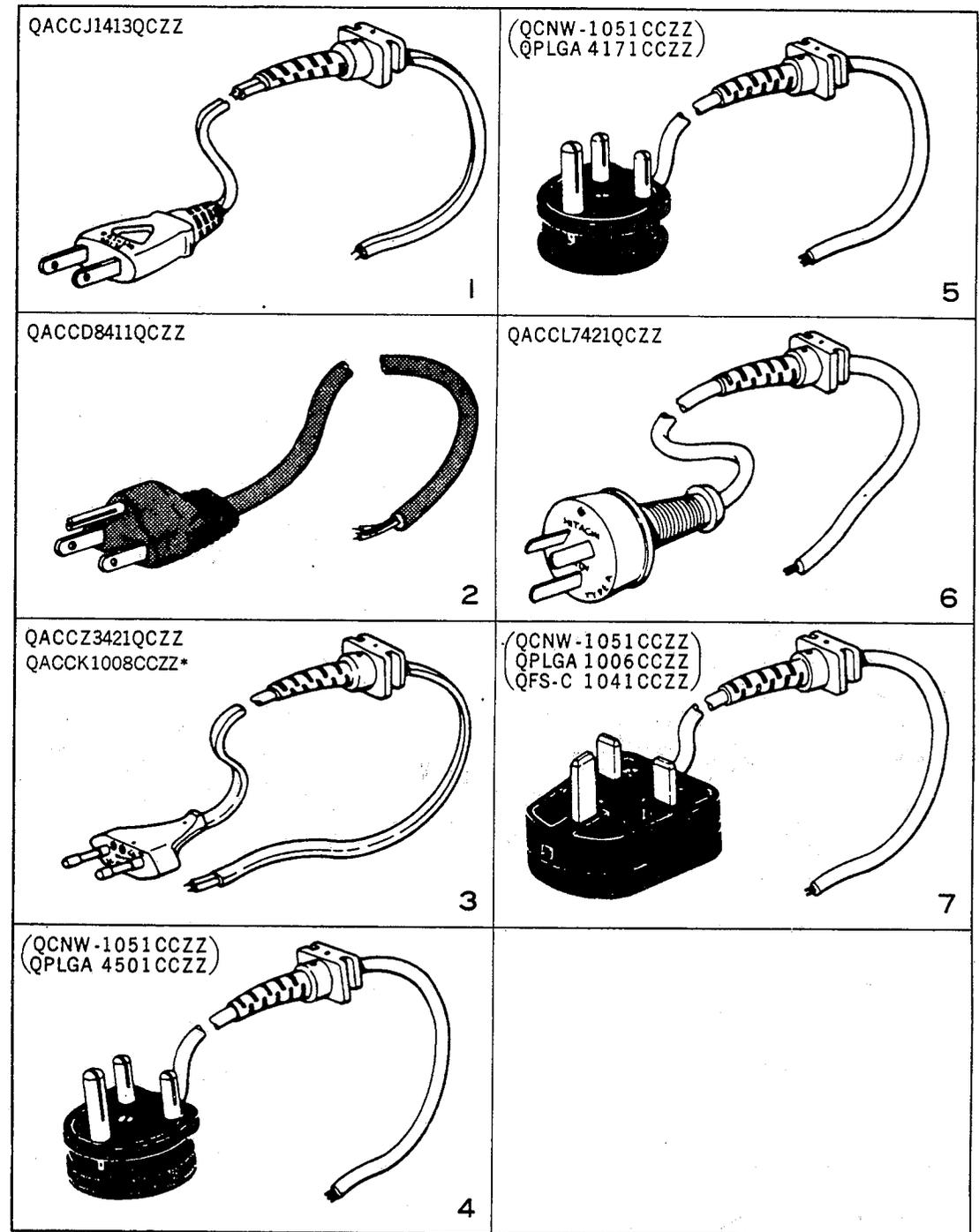


2...SH, SM

NO.	PARTS CODE	DESCRIPTION	PARTS RANK	PRICE RANK
△ 1	QACCJ1413QCZZ	Japan, Formose, Philippines, R. of Bolivia R. of Mexico, R. of Venezuela, R. of Ecuador, R. of Guatemala, R. of Jamaica, R. of Panama, R. of Colombia.	B	AG
△ 2	QACCD8411QCZZ	U.S.A. Canada	B	AN
△ 3	QACCZ3421QCZZ	Sweden, W. Germany, France, Switzerland, Belginm, Spain, Portugal, Yugoslavia, Indonesia, Lebanon, Kuwait, Malta, R. of Ghana, R. of Congo, R. of Zambia, Angola, Nigeria, Tunisia, Morocco, Saudi Arabia R. of Madagascar, Uganda, R. of Tanzania, U.S. of Brazil, R. of Peru, R. of Argentine, R. of Chile, R. of Uruguay, R. of Paraguay.	B	AM
△ 4	QPLGA4501CCZZ	Algeria, Kenya, Rhodesia, R. of Malawi, Hong Kong	B	AK
	QCNW-1051CCZZ		B	AN
△ 5	QPLGA4171CCZZ	South Africa	B	AN
	QCNW-1051CCZZ		B	AN
△ 6	QACCL7421QCZZ	Australia, New Zealand	B	AS
△ 7	QPLGA1006CCZZ	U. Kingdom, Ireland	B	AN
	QCNW-1051CCZZ		B	AN
	QFS-C1041CCZZ		A	AC
△ 3	QACCK1008CCZZ	Fowest Germany only	B	AR

Table of destinations

SELECTION CODE	COUNTRIES
KA	Australia
KB	U. Kingdom
SA	Korea
SB	Saudi Arabia, U.S of Brazil
SC	Formosa
SD	R. of Colombia, Costa, Rica, Dominican Rapublic, R. of Panama, R. of Guatemala, Honduras, Venezuela, Nicaragua, El Salvador
SE	Hong Kong
SF	Thailand
SG	Kuwait, Cyprus, Lebanon, Bahrain, Thailand, Indonesia, Tahit, Pakistan, Iran, Syria, Turkey, Jordan, Iraq
SH	South Africa
SJ	Philippines
SL	New Zealand
SM	Kenya, Malta, UAE, Malaysia, Singapore
TQ	SEEG territory other than Germany
TS	Garmany
RA1	Tunisia, West Africa
RA2	R. of Argentine, R. of Paraguay
RA3	Greece
RA4	R. of Chile, R. of Uruguay
RA5	Sri Lanka
RA6	Egypt
RA7	Curacao, Barbados
RA8	Liberia
TR	Spain
SMT	Nigeria
RB1	U.S of Brazil
RB2	Barbados (220V)



*QACCK1008CCZZ is used for the machine which is more than 10kg in weight (for West Germany only).

ARTICLES OF CONSUMPTION

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	DPAPR1022CSZZ	Roll paper 10Roll/1pack		S	AV
	UINK-1001CCZZ	Stamp ink 5cc		S	AK
	PRBN-2314RCZZ	Cassette ink ribbon		S	AX

PACKING MATERIAL

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	SPAKA7056RCZZ	Packing cushion (Left)		D	AN
	SPAKA7057RCZZ	Packing cushion (Right)		D	AN
	SPAKC7128RCZZ	Packing case	N	D	AU
	SSAKA0001SCZZ	Vinyle sack 200X300		D	AA
	SSAKA0005WCZZ	Vinyle sack 160X260		D	AA
	SSAKA2012KCZZ	Vinyle sack 600X540X510		D	AF
	SSAKH3015CCZZ	Vinyle sack 260X360		D	AA
	SSAKA5004CCZZ	Vinyle sack 100X300		D	AA
	SPAKF7025RCZZ	AC plug packing case (SH only)		D	AC

SPARE UNIT

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	CPWBF6871RC05	Noise filter PWB unit (U.S.A. CANADA SD. RA7)		E	BG
	CPWBN6890RC01	Main PWB unit	N	E	**
	CPWBF6892RC01	Display PWB unit	N	E	BY
	CPWBF6893RC01	Power supply unit	N	E	BS
	DUNTK7587RCZZ	Keyboard unit	N	E	CB
	Ki-OB6674RCZZ	Printer Model-220F	N	E	**
	GBOXD6802RCZZ	Drawer box unit (U.S.A.SD)		E	BU
	GBOXD6803RCZZ	Drawer box unit (CANADA. RB2. RA7)		E	BU
	GBOXD6776RCZZ	Drawer box unit (SM)		E	BU
	CPWBF6870RC05	Noise filter PWB unit (SM. SH. RB2)		E	BG
	GBOXD6806RCZZ	Drawer box unit (S. H)		E	BU

MAIN PWB UNIT CPWBN6890RC01

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	HINDP0030PAZZ	Label		C	AB
	QCNCW6854RC3A	Connector-31pin HBLB31S-2J	N	C	AH

MAIN PWB UNIT CPWBN689ORCOI

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	QCNCM2334RCOE	Connector 5pin 5045-05A	N	C	AC
	QCNCM6699RCZZ	Connector 3pin 5066-03A		B	AC
	QCNCM6775RCOB	Connector 2pin		B	AB
	QCNCM6780RC2F	Connector 26pin		C	AH
	QCNC-6786RC3J	Connector 30pin		C	AQ
	QCNCM6802RCOB	Connector 2pin 5222-02A		B	AC
	QCNCM6823RC1C	Connector 13pin 5045-13A	N	C	AE
	QCNCM6823RC1H	Connector 18pin 5045-18A	N	C	AF
	QCNCM6828RCOD	Connector 4pin 5233-04A		C	AB
	QCNCM6832RCOG	Connector 7pin 5283-07	N	C	AD
	QCNCW6836RC2J	Connector 20pin		C	AE
	QCNCM6851RCOC	Connector 3pin 5285-03A	N	C	AC
	QSOCTB24SCZZ	Socket 24pin		C	AH
	RC-KZ1018CCZZ	Capatitor (trimmer)		C	AE
	RCRSP1003CCZZ	Crystal KF38		B	AT
	RCRSP6631RCZZ	Crystal 3.0MHz		B	AE
	RCRSP6633RCZZ	Crystal 6MHz	N	B	AE
	RMPTC6333QCKB	Block resistor $\frac{1}{8}$ W 33K Ω 6block		B	AC
	RMPTC7152QCKB	Block resistor $\frac{1}{8}$ W 1.5K Ω 7block		B	AD
	RMPTC7223QCKB	Block resistor $\frac{1}{8}$ W 22K Ω 7block	N	B	AC
	RMPTC8103QCKB	Block resistor $\frac{1}{8}$ W 10K Ω 8block		B	AD
	RMPTC8223QCKB	Block resistor $\frac{1}{8}$ W 22K Ω 8block		B	AD
	VCCCPU1HH101J	Capacitor 50WV 100PF		C	AB
	VCEAAU1VW107Q	Capacitor 35WV 100 μ F		C	AC
	VCQYKU1HM103K	Capacitor 50WV 0.01 μ F		C	AB
	VCQYKU1HM332K	Capacitor 50WV 0.0033 μ F		C	AA
	VCQYKU1HM333K	Capacitor 50WV 0.033 μ F		C	AB
	VCQYKU1HM682K	Capacitor 50WV 6800PF		C	AB
	VCQYKU1HM104K	Capacitor 50WV 0.1 μ F		C	AB
	VCSATU1CE106K	Capacitor 16WV 10 μ F		C	AD
	VHD10DC1///-1	Diode 10DC1		B	AE
	VHERD30EB5/-1	Diode RD30EB5		B	AC
	VRD-ST2EY151J	Resistor $\frac{1}{4}$ W 150 Ω \pm 5%		C	AA
	VRD-ST2EY303G	Resistor $\frac{1}{4}$ W 30K Ω \pm 2%		C	AA
	VRD-ST2EY334G	Resistor $\frac{1}{4}$ W 330K Ω \pm 2%		C	AA
	VRD-ST2EY393J	Resistor $\frac{1}{4}$ W 39K Ω \pm 5%		C	AA
	VRD-ST2EY394G	Resistpr $\frac{1}{4}$ W 390K Ω \pm 2%		C	AA
	VRD-ST2HY220J	Resistor $\frac{1}{2}$ W 22 Ω \pm 5%		C	AB
	VRD-SU2EY181J	Resistor $\frac{1}{4}$ W 180 Ω \pm 5%		C	AA
	VRD-SU2EY273J	Resistor $\frac{1}{4}$ W 27K Ω \pm 5%		C	AA

DOT WIRE DRIVER TRANSISTOR VS2SD558111-1 SUBS TO
VS2SD1509-1-1

MAIN PWB UNIT CPWBN6890RC01

NO.	PASTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	VRD-SU2EY560J	Resistor 1/4W 56Ω ±5%		C	AA
	VRD-SU2EY821J	Resistor 1/4W 820Ω ±5%		C	AA
	VRS-PT3AB181K	Resistor 1W 180Ω ±10%		C	AB
	VS2SA673-C/-1	Transistor 2SA673-C		B	AE
	VS2SA733-R/-1	Transistor 2SA733R		B	AE
	VS2SB881-///-1	Transistor 2SB881		B	AH
	VS2SC1472K/-1	Transistor 2SC1472K		B	AE
	VS2SC945-P/QC	Transistor 2SC945-P, QC		B	AC
	VS2SD1191-/-1	Transistor 2SD1191		B	AH
	VS2SD985-///-1	Transistor 2SD985		B	AF
	XNESD30-24000	Nut 3mm		C	AA
	XBPSD30P08K00	Screw X3P+8S with spring washer		C	AA
	VCEAAU1CW106Q	Capacitor 16WV 10μF		C	AB
	VCEAAU1HW105Q	Capacitor 50WV 1μF		C	AB
	VCKYPU1HB102K	Capacitor 50WV 1000PF		C	AA
	VCKYPU1HB222K	Capacitor 50WV 2200PF		C	AA
	VCKYPU1HB331K	Capacitor 50WV 330PF		C	AA
	VCKYPU1HB471K	Capacitor 50WV 470PF		C	AA
	VCQYKU1HM222K	Capacitor 50WV 2200PF		C	AA
	VCTYPU1NX104M	Capacitor 12WV 0.1μF		C	AB
	VHDDS1588L1-1	Diode DS1588L1		B	AD
	VHi7801G096-1	L.S.i 7801G096 CPU	N	B	BH
	VHiHD14503B-1	I.C HD14503B		B	AH
	VHiM5L8041080	L.S.i M5L8041080	N	B	BB
	VHiM5T4044S30	L.S.i M5T4044S30		B	AS
	VHiM54532P/-1	I.C M54532P		B	AU
	VHiNJM2903N-1	I.C NJM2903N		B	AH
	VHiSN74LS00-1	I.C SN74LS00		B	AE
	VHiSN74LS04-1	I.C SN74LS04		B	AE
	VHiSN74LS05-1	I.C SN74LS05		B	AE
	VHiSN74LS08-1	I.C SN74LS08		B	AE
	VHiSN74LS09-1	I.C SN74LS09		B	AE
	VHiSN74LS122N	I.C SN74LS122N		B	AH
	VHiSN74LS138N	I.C SN74LS138N		B	AG
	VHiSN74LS157N	I.C SN74LS157N		B	AK
	VHiSN74LS244N	I.C SN74LS244N		B	AS
	VHiSN74LS245N	I.C SN74LS245N		B	AR
	VHiSN74LS32-1	I.C SN74LS32		B	AF
	VHiSN74LS33-1	I.C SN74LS33		B	AF
	VHiTC40H002P1	I.C TC40H002P1		B	AF
	VHiTC40H004PN	I.C TC40H004PN		B	AF
	VHiTC4011BP-1	I.C TC4011BP-1		B	AF
	VHiUPD1990ACC	L.S.I UPD1990ACC		B	AT

MAIN PWB UNIT CPWBN6890RC01

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	VHiUPD449D/-1	LS.i UPD449D RAM		B	BH
	VHiUPD8041045	LS.i UPD8041045		B	AY
	VRD-ST2EY000J	Resistor $\frac{1}{4}$ W 0 Ω \pm 5%		C	AA
	VRD-ST2EY102J	Resistor $\frac{1}{4}$ W 1K Ω \pm 5%		C	AA
	VRD-ST2EY103J	Resistor $\frac{1}{4}$ W 10K Ω \pm 5%		C	AA
	VRD-ST2EY104J	Resistor $\frac{1}{4}$ W 1M Ω \pm 5%		C	AA
	VRD-ST2EY105J	Resistor $\frac{1}{4}$ W 1M Ω \pm 5%		C	AA
	VRD-ST2EY123J	Resistor $\frac{1}{4}$ W 12K Ω \pm 5%		C	AA
	VRD-ST2EY183J	Resistor $\frac{1}{4}$ W 18K Ω \pm 5%		C	AA
	VRD-ST2EY221J	Resistor $\frac{1}{4}$ W 220 Ω \pm 5%		C	AA
	VRD-ST2EY222J	Resistor $\frac{1}{4}$ W 2.2K Ω \pm 5%		C	AA
	VRD-ST2EY223J	Resistor $\frac{1}{4}$ W 22K Ω \pm 5%		C	AA
	VRD-ST2EY272J	Resistor $\frac{1}{4}$ W 2.7K Ω \pm 5%		C	AA
	VRD-ST2EY333J	Resistor $\frac{1}{4}$ W 3.3K Ω \pm 5%		C	AA
	VRD-ST2EY392J	Resistor $\frac{1}{4}$ W 3.9K Ω \pm 5%		C	AA
	VRD-ST2EY471J	Resistor $\frac{1}{4}$ W 470 Ω \pm 5%		C	AA
	VRD-ST2EY472J	Resistor $\frac{1}{4}$ W 4.7K Ω \pm 5%		C	AA
	VRD-ST2EY474J	Resistor $\frac{1}{4}$ W 470K Ω \pm 5%		C	AA
	VRD-ST2EY561J	Resistor $\frac{1}{4}$ W 560 Ω \pm 5%		C	AA
	VRD-ST2EY562J	Resistor $\frac{1}{4}$ W 5.6K Ω \pm 5%		C	AA
	VRD-ST2EY563J	Resistor $\frac{1}{4}$ W 56K Ω \pm 5%		C	AA
	VRD-ST2EY682J	Resistor $\frac{1}{4}$ W 6.8K Ω \pm 5%		C	AA
	VHi2764024-45	LS.i P-ROM 2764-024	N	B	BL
	VHi2764025-45	LS.i P-ROM 2764-025	N	B	BL
	VHi2764026-45	LS.i P-ROM 2764-026	N	B	BL
	VHiM2732278-C	LS.I.P-ROM 2732-278	N	B	BA

DISPLAY PWB UNIT CPWBF6892RC01

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	QCNCM6852RC0D	Connector 4pin	N	C	AB
	QCNCM6852RC1B	Connector 12pin	N	C	AE
	QCNCM6853RC1C	Connector 13pin	N	C	AE
	QCNW-6824RCZZ	Connector 13pin with wire (CPU \leftrightarrow Display)	N	C	AK
	RMPTC8104QCKB	Block resistor $\frac{1}{8}$ W 100K Ω 8block		B	AD
	RMPTC9104QCKB	Block resistor $\frac{1}{8}$ W 100K Ω 9block	N	B	AD
	RMPTC9473QCKB	Block resistor $\frac{1}{8}$ W 47K Ω 9block	N	B	AD
	RMPTC9562QCKB	Block resistor $\frac{1}{8}$ W 5.6K Ω 9block		B	AD
	VCEAAU1AW226Q	Capacitor 10WV 22 μ F		C	AB
	VCEAAU1CW106Q	Capacitor 16WV 10 μ F		C	AB
	VCEAAU1HW106Q	Capacitor 50WV 10 μ F		C	AC
	VCKYPU1HB331K	Capacitor 50WV 330PF		C	AA
	VCTYPU1NX104M	Capacitor 12WV 0.1 μ F		C	AB

DISPLAY PWB UNIT CPWBF6892RC01

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	VHEXZ092///-1	Zenner diode XZ092		B	AE
	VHiLi2047///-1	I.C Li2047		B	BB
	VHiSN74LS173N	I.C SN74LS173N		B	AL
	VHiSN74154N-1	I.C SN74154N		B	AR
	VHiTD62703/-1	L.S.i TD62703		B	AN
	VHiUPD8243/-1	L.S.i UPD8243		B	AX
	VRD-ST2EY103J	Resistor 1/4W 10KΩ ±5%		C	AA
	VRD-ST2EY123J	Resistor 1/4W 12KΩ ±5%		C	AA
	VRD-ST2EY153J	Resistor 1/4W 15KΩ ±5%		C	AA
	VRD-ST2EY222J	Resistor 1/4W 2.2KΩ ±5%		C	AA
	VRD-ST2EY273J	Resistor 1/4W 27KΩ ±5%		C	AA
	VRD-ST2EY392J	Resistor 1/4W 3.9KΩ ±5%		C	AA
	VRD-ST2EY473J	Resistor 1/4W 47KΩ ±5%		C	AA
	VRD-ST2EY6R8J	Resistor 1/4W 6.8Ω ±5%		C	AA
	VRS-PT3AB272K	Resistor 1W 2.7KΩ		C	AA
	VS2SA675-///-1	Transistor 2SA675		B	AD
	VS2SC945-P/QC	Transistor 2SC945-P,Q		B	AC
	VVDDC1612C2-1	Display tube DC1612C2		B	BN

POWER SUPPLY PWB UNIT CPWBF6893RC01

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	PRDAF2317RCZZ	Heat sink		C	AG
	PRDAF6630RCZZ	Heat sink		C	AB
	PRDAF6636RCZZ	Heat sink	N	C	AG
	QCNM6837RCOB	Connector 2pin 5281-02A		B	AB
	QCNW-6779RCZZ	Wire		C	AB
	QCNW-6825RCZZ	Connector 7pin with with(Main↔P.S)	N	C	AK
	QCNW-6836RCZZ	Connector 4pin with wire(P.S↔Display)	N	C	AG
△	QFS-A0016HCZZ	Fuse 3A		A	AC
△	QFS-A0038HCZZ	Fuse 0.5A		A	AD
	QFSHA0006HCZZ	Fuse holder		C	AB
	QLUGE0002WCZZ	Lug terminal		C	AB
	RC-EZ0099FCZZ	Capacitor 35WV 1000μF		C	AF
	RC-EZ1042CCZZ	Capacitor 35WV 470μF		C	AD
	RC-FZJ337RCZZ	Capacitor 63WV 330μF	N	C	AD
	RC-FZL688RCZZ	Capacitor 55WV 6800μF	N	C	AS
	RC-FZ6626RCZZ	Capacitor 35WV 2200μF		C	AE
	RCiLC6632RCZZ	Coil MS-0503	N	C	AQ
	RCiLC6633RCZZ	Coil SR-03-018	N	C	AL
	RTRNH6720RCZZ	Convertor trans	N	B	AR

POWER SUPPLY PWB UNIT CPWBF6893RC01

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	VCEAAU1HW105Q	Capacitor 50WV 1 μ F		C	AB
	VCEAAU1HW226Q	Capacitor 50WV 22 μ F		C	AC
	VCEAAU2AW226Q	Capacitor 100WV 22 μ F		C	AC
	VCEAAU2AW335Q	Capacitor 100WV 3.3 μ F		C	AB
	VCKYPU1HB101K	Capacitor 50WV 100PF		C	AA
	VCKYPU1HB102K	Capacitor 50WV 1000PF		C	AA
	VCQYKU1HM152K	Capacitor 50WV 1500PF		C	AA
	VCQYKU1HM683K	Capacitor 50WV 0.068 μ F		C	AB
	VHDBB1////////-1	Diode BB1		B	AD
	VHDBB2////////-1	Diode BB2		B	AE
	VHDDS1588L2-1	Diode DS1588L2		B	AB
	VHDS4VB10F/-1	Diode S4VB10F		B	AK
	VHERD62E4///-1	Zenner diode RD62E4		B	AD
	VHEXZ060///-1	Zenner diode XZ060		B	AC
	VHiNJM2903N-1	I.C NJM2903N		B	AH
	VHiSi8053B/-1	I.C Si8053B		B	AQ
	VHiSi8243B/-1	I.C Si8243B		B	AQ
	VRD-ST2EY100J	Resistor $\frac{1}{4}$ W 10 Ω \pm 5%		C	AA
	VRD-ST2EY101J	Resistor $\frac{1}{4}$ W 100 Ω \pm 5%		C	AA
	VRD-ST2EY102G	Resistor $\frac{1}{4}$ W 1K Ω \pm 2%		C	AA
	VRD-ST2EY103J	Resistor $\frac{1}{4}$ W 10K Ω \pm 5%		C	AA
	VRD-ST2EY104J	Resistor $\frac{1}{4}$ W 100K Ω \pm 5%		C	AA
	VRD-ST2EY122J	Resistor $\frac{1}{4}$ W 1.2K Ω \pm 5%		C	AA
	VRD-ST2EY123G	Resistor $\frac{1}{4}$ W 12K Ω \pm 2%		C	AA
	VRD-ST2EY153G	Resistor $\frac{1}{4}$ W 15K Ω \pm 2%		C	AA
	VRD-ST2EY153J	Resistor $\frac{1}{4}$ W 15K Ω \pm 5%		C	AA
	VRD-ST2EY272J	Resistor $\frac{1}{4}$ W 2.7K Ω \pm 5%		C	AA
	VRD-ST2EY273J	Resistor $\frac{1}{4}$ W 27K Ω \pm 5%		C	AA
	VRD-ST2EY274J	Resistor $\frac{1}{4}$ W 270K Ω \pm 5%		C	AA
	VRD-ST2EY472J	Resistor $\frac{1}{4}$ W 4.7K Ω \pm 5%		C	AA
	VRD-ST2EY562J	Resistor $\frac{1}{4}$ W 5.6K Ω \pm 5%		C	AA
	VRD-ST2EY563J	Resistor $\frac{1}{4}$ W 56K Ω \pm 5%		C	AA
	VRD-ST2EY821G	Resistor $\frac{1}{4}$ W 820 Ω \pm 2%		C	AA
	VRS-PT3AB272K	Resistor 1W 2.7K Ω \pm 10%		C	AA
	VRS-PT3AB392K	Resistor 1W 3.9K Ω \pm 10%		C	AB
	VRW-PT3LW1ROK	Resistor 3W 1 Ω \pm 10%		C	AD
	VRW-PT3MWR47K	Resistor 3W 47 Ω \pm 10%		C	AG
	VS2SA733-R/-1	Transistor 2SA733R		B	AE
	VS2SC2334-/-1	Transistor 2SC2334		B	AL
	VC2SC641KC/-1	Transistor 2SC641KC		B	AE
	VS2SC945-P/QC	Transistor 2SC945-P, Q C		B	AC
	VS2SD667-///-1	Transistor 2SD667		B	AD
	XBPSD30P10K00	Screw X3P+10S with spring washer		C	AA

POWER SUPPLY PWB UNIT CPWBF6893RC01

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	XBPSD30P12K00	Screw X3P+12S with spring washer		C	AC
	XNESD30-24000	Nut 3mm		C	AA

**NOISE FILTER PWB UNIT CPWBF6871RC05...U.S.A, CANADA, SD, RA7
CPWBF6870RC05...SM, SH, RB2**

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	QCNCW6835RC02	Connector 2pin		B	AE
△	QFS-B1002CCZZ	Fuse 1.5A 125V (U.S.A, CANADA) SD, RA7		A	AE
	QFSHB1003CCZZ	Fuse holder (U.S.A, CANADA, SD, RA7)		C	AB
	RC-FZ6030RCZZ	Capacitor 0.1μF 125V (U.S.A, CANADA) SD, RA7		C	AH
	RCiLC6575RCZZ	Line filter		C	AN
△	RTRNP6716RCZZ	Power trans (U.S.A, CANADA, SD, RA7)		B	BA
	VRD-ST2HY394J	Resistor 1/2W 390KΩ ±5%		C	AB
△	QFS-C4301CCZZ	Fuse 0.8A 125V (SM, SH, RB2)		A	AE
	QFSHA0006HCZZ	Fuse holder (SM, SH, RB2)		C	AB
△	RTRNP6709RCZZ	Power trans (SM, SH, RB2)		B	AZ
	VCE9HE2EP104K	Capacitor 0.1μF 250V (SM, SH, RB2)		C	AK

OTHER PARTS

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	GCOVD6784RCZZ	Dust cover		D	AR
	PSTM-6267RCZZ	Stamp THANK YOU (U.S.A, CANADA) SM, RB2, RA7		D	AV
	TINSE6843RCZZ	Instruction book (SH, U.S.A, SM, SD) RB2, RA7	N	D	
	TINSK6844RCZZ	Instruction book (CANADA)	N	D	
	QCNW-6775RCZZ	Ground wire 180mm		C	AF
	QCNW-6783RCZZ	Ground wire 70mm		C	AE
	QCNW-6787RCZZ	Ground wire 40mm		C	AE
	TCAUS1003RCZZ	Battery label		C	AC
	TCAUS6650RCZZ	Battery caution label		C	AB
	TCAUS1150CCZZ	U.L label		C	AA
	TLABF6720RCZZ	FCC label		C	AB
	GDAi-6653RCZZ	Writing board	N	C	AF
	PSHEP6656RCZZ	Shield sheet	N	C	AF
	LKGIM6861RCZZ	Service key		B	AG
	GCOVB6802RCZZ	Water proof key cover		B	AZ
	PSTM-6268RCZZ	Stamp MUCHASGRACIAS (SD)		D	AV
	LHLDW4081CCZZ	AC cord holder		C	AC
	PSTM-6651RCZZ	Stamp DANKIE THANK YOU (SH)		D	AV

OTHER PARTS

NO.	PARTS CODE	DESCRIPTION	NEW MARK	PARTS RANK	PRICE RANK
	G i T A R 6 6 9 8 R C Z Z	Sheild sheet(for NOISE FILTER PWB)	N	C	AD
	Q C N W - 6 7 7 5 R C Z Z	Ground wire		C	AF
	Q C N W - 6 7 8 7 R C Z Z	Ground wire		C	AE
	Q C N W - 6 7 9 0 R C Z Z	Ground wire		C	AB
	Q T A N D 2 3 1 5 R C Z Z	Terminal		C	AB

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