SHARP SERVICE MANUAL

CODE: 00ZER2540SM-E

ELECTRONIC CASH REGISTER

MODEL ER-2540

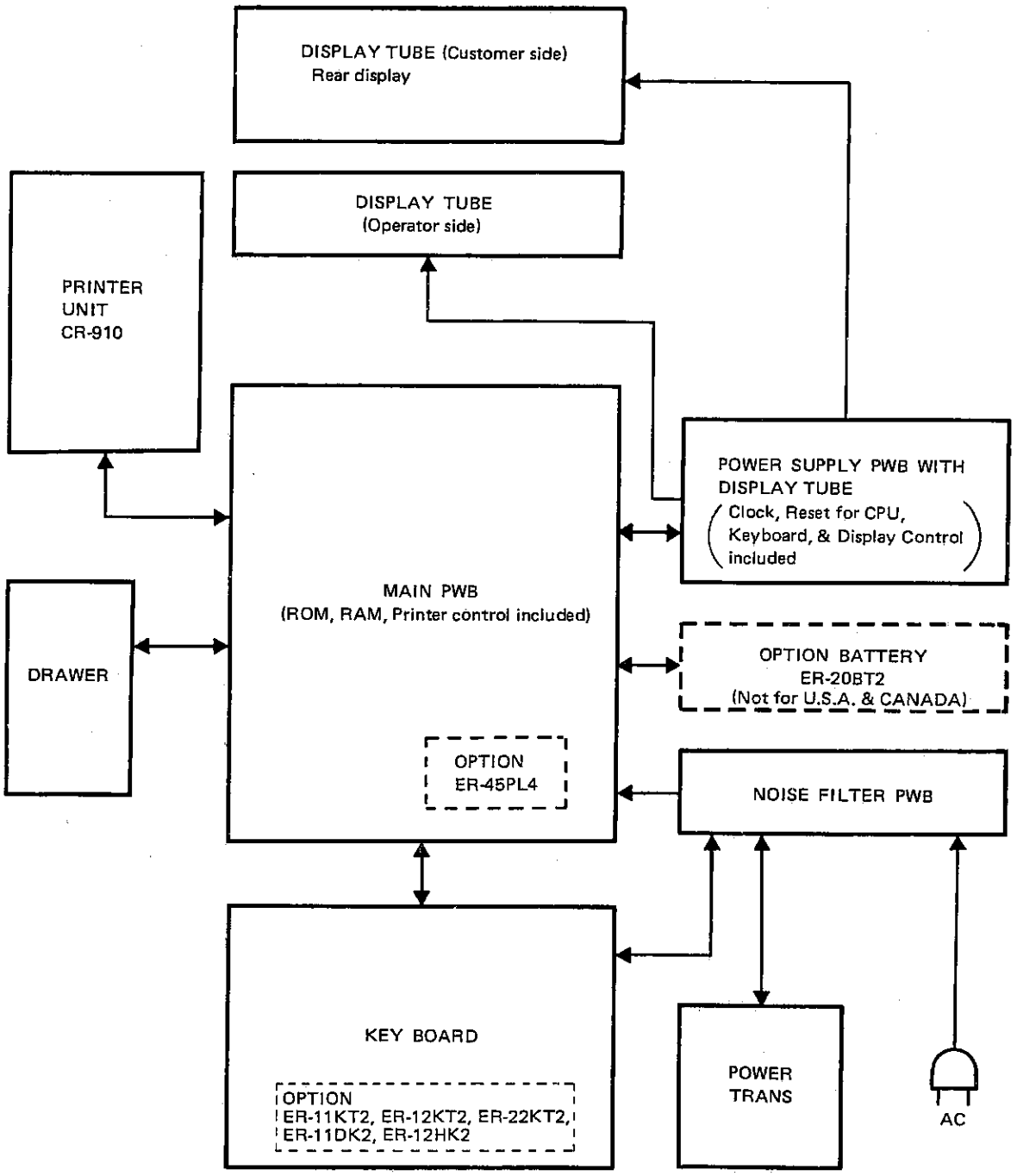
OPTION: ER-45PL4
ER-12HK2
ER-11KT2
ER-12KT2
ER-22KT2
ER-11DK2

PRINTER: CR-910
SRV KEY: LKGIM6959RCZZ(2B5)

CONTENTS

SHARP CORPORATION

1. INTERNAL BLOCK DIAGRAM



The items indicated within dotted line are optional devices.

2. SPECIAL SERVICE TOOLS

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

3. REFERENCE DOCUMENTS

1. Cash Register Basic Manual
2. Printer CR-910 Service Manual

4. OPTIONS

No.	Description	Model name, Parts code	RAM	Key	SVR setting (SRV1)	Note
1	PLU/Sub department Max. 99 PLU	ER-45PL4	2K (μPD449)	○	Job Code #902, D	
2	Periodic total on X2/Z2 mode	ER-45PL4	2K (μPD449)	–	Job Code #902, D	
3	Key kit (1 x 1 size) x 30 pcs.	ER-11KT2	–	○	Job Code #901-C, D #950	• Department expandable up to 12 dept. • Flexible key layout
4	Key kit (1 x 2 size) x 30 pcs.	ER-12KT2	–	○		
5	Key kit (2 x 2 size) x 10 pcs.	ER-22KT2	–	○		
6	Key kit (1.5 x 2 size) x 10 pcs.	ER-12HK2	–	○		
7	Dummy key kit (1 x 1 size) x 30 pcs.	ER-11DK2	–	○		
8	Water proof key cover	GCOVB6822RCZZ	–	–	–	• Service parts only
9	External option battery	ER-20BT2	–	–	–	Not for USA, CANADA
10	Drawer open/close detecting kit	* –	–	–	Job Code #903, B	*Refer to below. • Service parts only.
11	Coin case	ER-33CC	–	–	–	

- **Parts List of Drawer open/close detection kit.**

	Parts Name	Parts Code	Q'ty	Price Rank
①	Micro Switch	QSW-M6659RCZZ	1	AS
②	Insulator	PSHEP6635RCZZ	1	AA
③	Screw	XBPSD30P14K00	2	AA
④	Washer	LX-WZ6648RCZZ	2	AA
⑤	Connector	QCNCW6645RC02	1	AD

- **Installation Procedure of Drawer open/close detection kit.**
  - ① Fix the insulator and the micro switch on the lock unit with the two screws and washers.
  - ② Change the connector QCNCW6645RC03 having two wires to connector QCNCW6645RC02 having three wires.
  - ③ Connect the wires as follows. (shown in Fig. A)

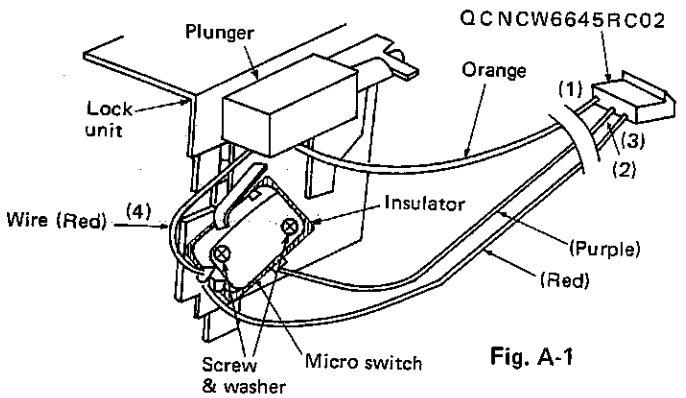


Fig. A-1

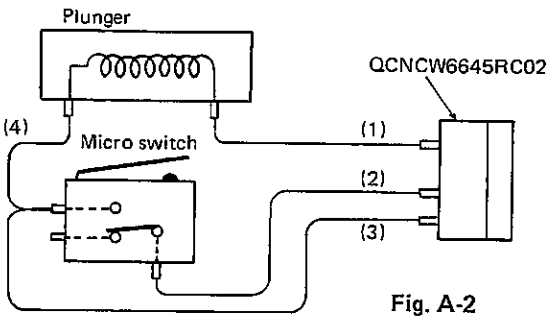
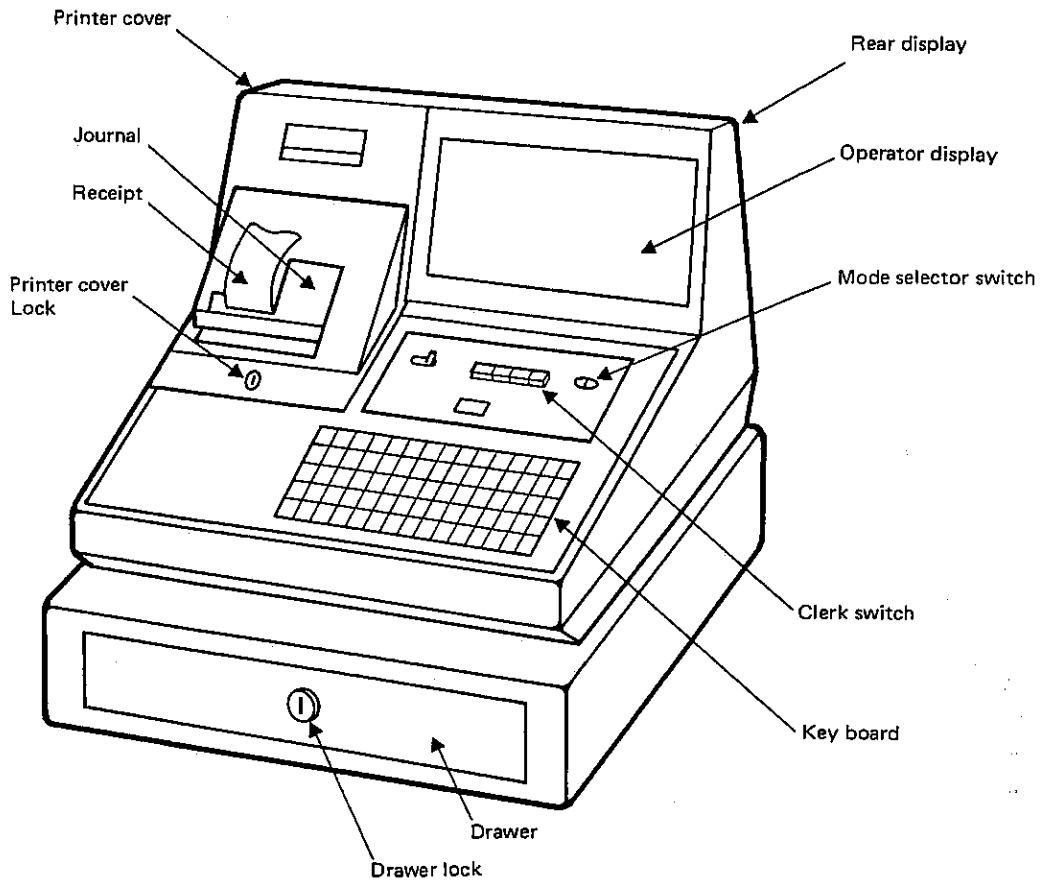


Fig. A-2

5. SPECIFICATIONS

5-1. Appearance and rating

Appearance



2) Rating

Model name	ER-2540
Power source	AC 115V±10% 50/60 Hz
Power consumption	36 W
Operating temperature	0°C to 40°C
Overall dimensions	367.5(H) x 440(W) x 460(D)mm
	14-15/32 x 17-5/16 x 18-1/8 in (H) (W) (D)

5-2. Keyboard

1) Key top name (At standard feature)

[0] [00] ~ [9] : Numeric entry
[•] : Decimal point
[CL] : Clear
[@/FOR] : Multiplication, split pricing
[↑] : Paper feed (Receipt & Journal)
[#/SBTL] : Non add code print, Time display, sub-total,
[CA/AT/NS] : Cash, Amount tender, No sale
[RA] : Received on account
[PO] : Paid out
[TAX 1 SHIFT] [TAX 2 SHIFT] : Tax shift 1, 2
[TAX] : Tax
[⊖1] : Discount
[RFND] : Refund
[VOID] : Void
[1] ~ [4] : Department
[%1] [%2] : Percent 1, 2
[PLU/SUB] : Price look up, Sub-department
[CH1] ~ [CH3] : Charge sale
[CHK] : Check
[MDSE SBTL] : Merchandise sub-total

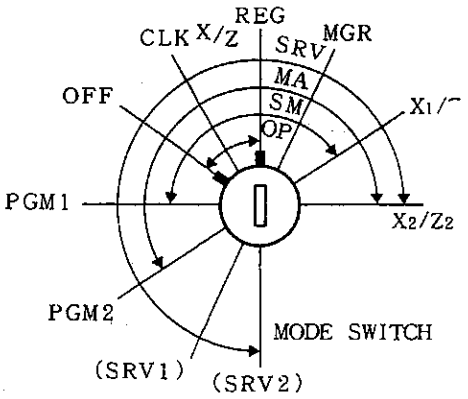
2) Mode switch positions

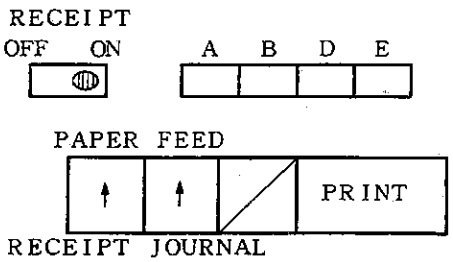
(SRV2) : Service 2 mode
(SRV1) : Service 1 mode (SRV programming)
PGM 2 : Program mode 2
PGM 1 : Program mode 1
OFF : Power off
CLK X/Z : Clerk sales reading and resetting mode.
REG : Registration mode
MGR : Manager mode (Registration and transaction void)
X1/Z1 : Daily total reading and resetting mode.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

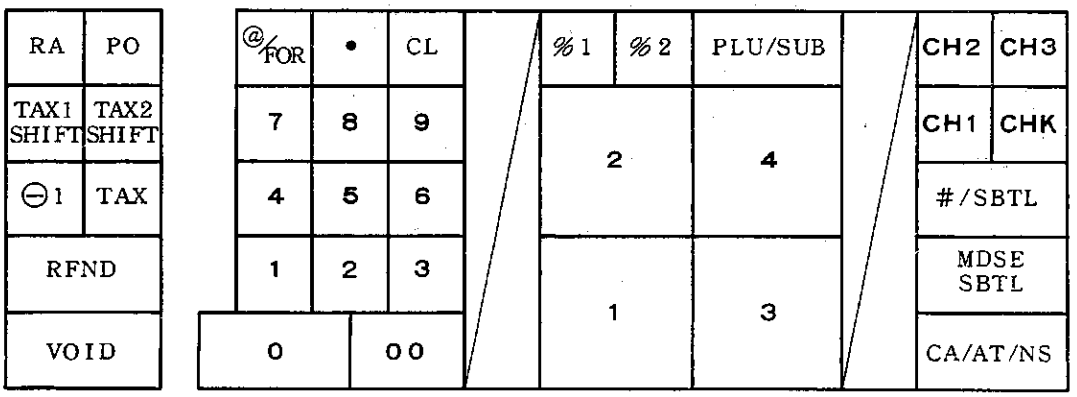
3) Mode select keys

SRV : Service key (No. 2B5) LKGiM6959RCZZ
MA : Master key (No. 6B5)
SM : Sub-master key (No. 3B2)
OP : Operator key (No. 0B9)

STANDARD KEY BOARD LAYOUT

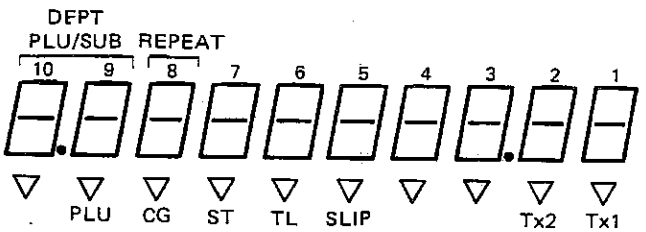






5-3. Display

(1) Operator side display (fluorescent display tube): 10-LT-07Z



Contents of display	No. of digits	Column No.	Pattern
Numerals	Numeric input 7 digits	1 to 7	1234567890
	Amount 7 digits	1 to 7	
Symbol	1 digit 1 digit 1 digit 1 digit	4 to 10 10 10 10	(–) Minus sign (floating) (P) PGM mode (E) Error (□) Deficit symbol
PLU	2 digits	9 to 10	2-digit display (zero-suppressed)
Dept.	2 digits	9 to 10	2-digit display (zero-suppressed)
Repeat	1 digit	8	Endless count, starting from 2
Decimal point	1 digit	2	Decimal point (1 to 3). TAB (2 to 4)
		10	Cash in drawer has exceeded a programmed amount.

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

PLU: Lights up each time a PLU/SUB item is entered.

CG: Lights up whenever the change due amount appears in the display or when the total sale amount is negative.

ST: Light up alone or together with other lamps when the register has computed subtotals:

This lamp lights up alone when the merchandise subtotal has been figured out.

The "ST" lamp and the deficit symbol "□" light up together when the tax-included subtotal has been calculated.

The "ST" and "TX1" lamps light up together when the taxable 1 subtotal has been calculated.

The "ST" and "TX2" lamps light up together when the taxable 2 subtotal has been calculated.

The "ST", "TX1" and "TX2" lamps light up together when the taxable 1 and 2 subtotal has been calculated.

TL: Lights up when a registration is finalized by pressing the CA/AT/NS, CA2, CHK, or CH1 thru CH3 without any amount tendered entry.

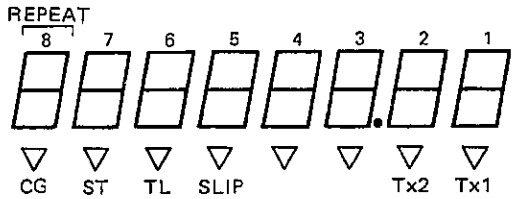
SLIP: Lights up when the machine is set for compulsory validation.

TX2: Lights up when the tax shift 2 key is depressed or a taxable 2 item is registered.

TX1: Lights up when the tax shift 1 key is depressed or a taxable 1 item is registered.

(NOTE)
The number of repeats is displayed from "2" and counted up with each repeat. When ten registrations are done, the display shows "0".
Example: (2 – 3 – 4 ..... 9 – 0 – 1 – 2 .....)

(2) Customer side display (rear side display)
Fluorescent display tube: 9-LT-03Z

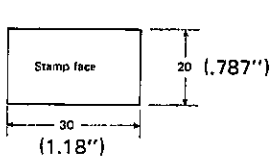


5-4. Printer: CR-910

1. Outline of the printer

Printer system	2-station, printing wheel selection printer Model: CR-910
Number of digits	Total: 12-digits (both in receipt and journal) Amount: 10 digits (columns 3 to 12) Symbol: 2 digits (columns 1 and 2)
Printing dimensions (mm)	Character dimensions Numeral: 3.2(H) x 1.7(W) Symbol: 3.2(H) x 2.4(W) Character pitch Between digits: 3.0±0.1 Between lines: 5.2±0.5
Printing speed	Print: about 3 lines/second Paper feed: about 9 lines/second
Additional functions	• Stamp function • Receipt on/off and journal print selection • Receipt/journal independent paper feed • One line validation print
Paper width	Both receipt and journal: 44.5±0.5mm (1.75") Max. roll diameter: 83mm (3.26")
Paper quality	Recording paper: woodfree paper (thickness: 0.06 to 0.09mm; weight: 52.3 to 64.0g/cm²) Validation paper: plain paper + carbon paper or pressure-sensitive paper (thickness: less than 0.3mm)
Reliability	MCBF: 5,000,000 lines
Print color (ink roller)	Purple

2. Stamp

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

3. Printing wheel pattern

12	11	10	9	8	7	6	5	4	3	2	1	
TR	#	·	·	PL	·	·	·	·	DC	CA	VD	0
–	–	–	–	–	–	–	–	–	X	CH	TD	1
(★) $	(★) $	(★) $	(★) $	(★) $	(★) $	No	/	/	Z	HA	CG	2
												3
GT	NS	0	0	0	0	0	0	0	0	FS	FS	4
◇	1	1	1	1	1	1	1	1	1	%	1	5
P	2	2	2	2	2	2	2	2	2	⊖	2	6
A	3	3	3	3	3	3	3	3	3	@	3	7
B	4	4	4	4	4	4	4	4	4	Q	4	8
D	5	5	5	5	5	5	5	5	5	KG	5	9
E	6	6	6	6	6	6	6	6	6	LB	ST	10
T_X^1	7	7	7	7	7	7	7	7	7	TX	TL	11
T_X^2	8	8	8	8	8	8	8	8	8	RF	RA	12
T_2^1	9	9	9	9	9	9	9	9	9	CP	PO	13

Print wheel part code: 00BM711002020 ($)
Print wheel part code: 00BM711002040 (★)

Symbol of print wheel

Symbol	Description
0 ~ 9	Numeric 0~9
·	Decimal point
#	Non add
PL	PLU
CA	Cash sale
VD	Void
–	Negative sign
X	Multiply, Split, Read
CH	Check charge 1~3
TD	Check tender
$	Amount mark
2	Reset
CG	Change
GT	Grand total
NS	No sale
◇	Memory overflow
%	Percent

Symbol	Description
1 ~ 3	Charge 1 ~ 3
A	AM, Clerk A
P	PM
Tx^1	Taxable 1
Tx^2	Taxable 2
T_2^1	Taxable 1 and 2
⊖	Discount
@	Unit price
Q	Quantity
TX	Manual tax
RF	Refund
CP	Coupon
ST	Sub total
TL	Total
RA	Received on account
PO	Pay out
No	Number
B~E	Clerk B ~ E

5-5. Drawer/Lock

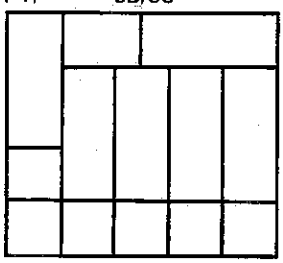
1) Drawer

- Metallic drawer
- Open/close operation with the micro switch (Service option)

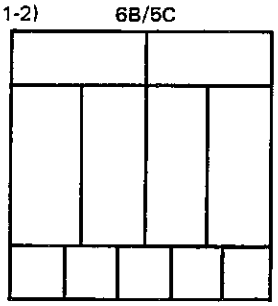
Part \ Country	U.S.A., PANAMA	CANADA	SOUTH AFRICA
Compartment	6B/6C	6B/5C	4B/8C
Bill separator			
Coin sub case			
Rotation	180°	180°	90°
Micro switch	X	X	X

(COMPARTMENTS PATTERN)

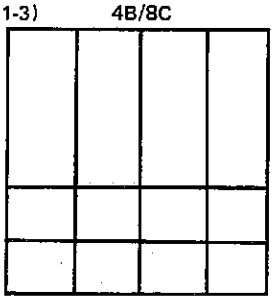
1-1) 6B/6C



1-2) 6B/5C



1-3) 4B/8C



2) LOCKS

2-1) DRAWER LOCK (For USA and Canada)
LOCK: 180 counter clockwise
UNLOCK: 180 clockwise
(For South Africa)
OPEN: 90 clockwise

2-2) PRINTER COVER LOCK
LOCK: 90 clockwise
UNLOCK: 90 counter clockwise

2) Totalizers, counters and presets

Item	Totalizer	Counter	Preset	Note
GT	12Dgx3 S			
Z counter		4Dgx1(2)		
DEPART-MENT	8Dgx4 S (12)	6Dgx4 S (12) xxxx.xx	Unit price 6Dgx4(12) Halo (digit) Tax sort 1/2 SIS or SIF Inhibit or provide OPEN and/or PRESET VALIDATION enforce	
PLU	8Dgx(99) S	6Dgx(99) S	Unit price 6Dgx(99) (or HALO amount) +/− Tax sort 1/2 Inhibit or provide Split pricing denominator 2 digits Dept. number 2 digits	
NET	8Dgx4 S			
VOID	8Dgx3	4Dgx3		VOID in REG. mode and two kind of VOID TTL in VOID mode.
REFUND	8Dgx1 S	4Dgx1 S		
PO	8Dgx1 S	4Dgx1 S		
RA	8Dgx1 S	4Dgx1 S		Tend./Direct
TX'BL SALES	8Dgx2 S			
TAX TTL	8Dgx9 S		113 steps for 2 Tbl. % TAX 4Dgx2	
MEDIA TTL	8Dgx5 S	4Dgx4		
(−)	8Dgx2 S	4Dgx2 S		
%	8Dgx2 S	4Dgx3 S	% rate 4Dgx2 +/−	
CASH SALE	8Dgx2 S	4Dgx2 S		
CHK CHANGE	8Dgx1	4Dgx1	8Dgx1	
no sale		4Dgx1		
validation		4Dgx1		
customer		4Dgx1		
consecutive		4Dgx1		
PERIODIC TTL	8Dgx(51)	4Dgx(37)		
HOURLY TTL	8Dgx(24)	4Dgx(24)		

(NOTE)
ABBREVIATIONS

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

The number in ( ) is the maximum number with a options.
The number out of ( ) indicates standard amount with no option installed.
"S" means "with +/− sign".
"Dg" = Digits

6. SRV (Service) MODE

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

6-1. Program Reset

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

1) Method A

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

Note: This operations will not clear the memory of the date and time.

2) Method B

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

Note: This operation will clear the memory of the date and time.

6-2. Master Reset (All Memories Clear)

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

(1) Turn the mode switch to the service 2 mode position.
(2) Depress and hold numeric key 9.
(3) While holding the key depressed, turn the mode switch from the service 2 mode position to the service 1 mode position.

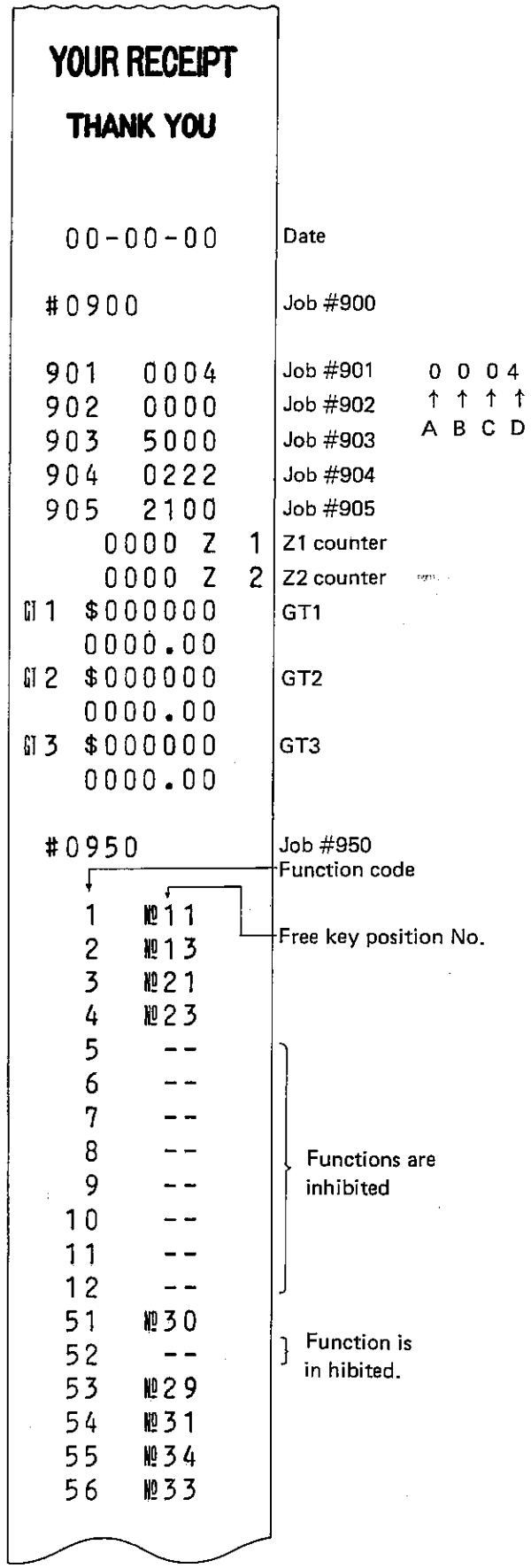
Note 1: After performing this procedure the unit must be completely reprogrammed in both the service (SRV) mode and program (PGM) mode.

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

If the MASTER RESET operation is performed, the following readouts should be seen for service 1 (SRV-1) mode program and PGM mode program.

SRV-1 mode
Key operation:

900 → [#/SBTL] → [CA/AT/NS]



```
    57   №32
    58   №06
    59   №07
    60   №15
    61   №20
    62   №03
    63   --
    64   №04
    65   №09
    66   №08
    67   №05
    68   №10
    69   №01

A   12-01          AM Time
A  0001№000        Clerk/C-No/M-No
```

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

PGM2 mode

```
YOUR RECEIPT
THANK YOU
  00-00-00          Date

#0130               Job #130

       0.00%1       Percent 1
       0.00%2       Percent 2
   7       Θ1       Discount 1 Limitation 7
   7       Θ2       Discount 2 Limitation 7
   7       TX       Manual Tax Limitation 7
   7  0      RA     Received Account 7
   7  0      PO     Pay out 7
   8  0000   CH1    Charge 1 Limitation 8
   8  0000   CH2    Charge 2 Limitation 8
   8  0000   CH3    Charge 3 Limitation 8
   8  0000   CH     Check Limitation 8
      0000   CA     Cash
   8  0000   CA2    Cash 2 Limitation 8
$999999.99 CH CG    High amount limitation for check change.
     .1.            Quantity of validation printings.
     0000           {Journal print form/Availability of refund entry/
                    {Availability of indirect void/CLK X/Z mode availability.
A   12-00           AM Time
A  0001№000         Clerk/C-No./M-No.
```

6-3. Service Mode Programming (SRV1 mode)

All programming procedures have the following key entry sequence.

xxx → [.] → [#/SBTL] → [A][B][C][D] → [CA/AT/N.]
(JOB CODE #) — Numeric entry (N) (Max. 4 digits)

The part of [A][B][C][D] is described in each detail item section.

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

LIST OF SRV MODE PROGRAMMING

(JOB #)

901 Dept. programming
902 Optional features
903 Optional features
904 Print skipping
905 Printing MISC
910 Z1 counter setting
911 Z2 counter setting
912 GT1 upper 6 digits setting
913 GT1 lower 6 digits setting
914 GT2 upper 6 digits setting
915 GT2 lower 6 digits setting
950 KEY LAYOUT

The following explains the detail of the programmings.

[JOB CODE #901]
Key operation:

901 → [.] → [#/SBTL] → [B][C][D] (3 digits) → [CA/AT/NS]
(Numeric entry Job No.)
Set to "0"

(B): Zero skip on department report on the X1/Z1 and X2/Z2 mode.

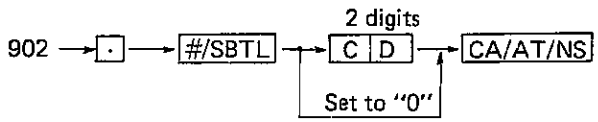
KEY ENTRY	ZERO SKIP ON DEPT REPORT ON X1/Z1 and X2/Z2
0	NO SKIP
1	SKIP

(C), (D): Number of departments

KEY ENTRY	NUMBER OF DEPARTMENTS
01	1
02	2
03	3
04	4
05	5
06	6
07	7
08	8
09	9
10	10
11	11
12	12

The number of departments can be expanded to 12 by the key option (ER11KT2, ER12KT2, ER22KT2, ER12HK2, ER11DK2). For the key top layout of the department expansion refer to JOB #950.

[JOB CODE #902]
Key operation



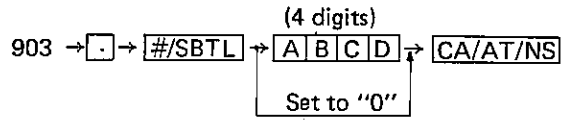
(C) 1. Clerk sales total to include tax or not include tax.
2. Enable or inhibit of void mode in the MGR mode.

KEY ENTRY	(1) Clerk sales total includes tax or not	(2) Void mode
0	Does not include	Enable
1		Inhibit
4	Includes	Enable
5		Inhibit

(D) 1. Enable or disable periodic report on the X2/Z2 mode.
2. Enable of disable PLU/Sub department function.
3. Zero skip on PLU report in the X1/Z1 mode.

KEY ENTRY	(1) Periodic report (X2/Z2)	(2) PLU/ Sub dept.	(3) Zero skip on PLU
0	Inhibit	Inhibit	Skip
1			Not skip
2		Enable	Skip
3			Not skip
4	Enable	Inhibit	Skip
5			Not skip
6		Enable	Skip
7			Not skip

[JOB CODE #903]
Key operation



(A) Fraction treatment for multiplication and % calculation.

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

EXAMPLE

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

(B) 1. The key operation is possible or impossible when the drawer is open.
2. Selection of either Singapore tax or normal tax.

KEY ENTRY	(1) Operation with drawer open	(2) Singapore tax or normal tax
0	Enable	Normal tax
1		Singapore tax
2	Disable	Normal tax
3		Singapore tax

NOTE: The micro switch which allows the unit to sense the drawer open/close status must be installed to enable of drawer open to be effective.
Refer to page 2 for this part.

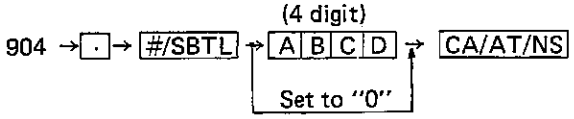
(C) 1. enable or disable tax delete function.
2. Error action for incorrect operation.
LOCK ERROR: Long error released by CL key.
ONE SHOT ERROR: Short error
3. Enable or inhibit key catch sound.

KEY ENTRY	(1) Tax delete	(2) Error action	(3) Key catch sound
0	Disable	All lock	Enable
1			Inhibit
2		Lock & One shot	Enable
3			Inhibit
4	Enable	All lock	Enable
5			Inhibit
6		Lock & One shot	Enable
7			Inhibit

(D) 1. Received on account (RA) with tendering or Direct Received on account.
2. Enable or inhibit No sale after non add code (#) print.
3. Enable or inhibit No sale function.

KEY ENTRY	(1) RA with tender or direct RA	(2) No sale after non add code print	(3) No sale
0	With tender	Enable	Enable
1			Inhibit
2		Inhibit	Enable
3			Inhibit
4	Direct	Enable	Enable
5			Inhibit
6		Inhibit	Enable
7			Inhibit

[JOB CODE #904]
Key operation:



(A) 1. G1 (Grand total 1) is printed on X/Z report or skipped.
G1 = Grand total of plus registrations.
2. G2 (Grand total 2) is printed on X/Z report or skipped.
G2 = Grand total minus registration.
3. G3 (Grand total 3) is printed on X/Z report or skipped.
G3 = Net grand total (GT1 – GT2)

KEY ENTRY	(1) GT1	(2) GT2	(3) GT3
0	Print	Print	Print
1			Skip
2		Skip	Print
3			Skip
4	Skip	Print	Print
5			Skip
6		Skip	Print
7			Skip

(B) 1. Coupon PLU is printed on X/Z reports or skipped.
2. Net is printed on X/Z reports or skipped.

KEY ENTRY	(1) Coupon PLU print	(2) Net print
0	Print	Print
1		Skip
2	Skip	Print
3		Skip

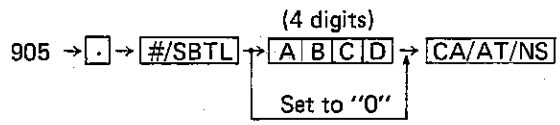
(C) 1. Taxable 1 subtotal is printed on X/Z reports or skipped.
2. Gross Tax 1 and refund Tax 1 total are printed on X/Z report or skipped.
3. Net Tax 1 total is printed on X/Z reports or skipped.

KEY ENTRY	(1) Taxable 1 subtotal	(2) Gross Tax 1 & Refund Tax 1 total	(3) Net Tax 1 total
0	Print	Print	Print
1			Skip
2		Skip	Print
3			Skip
4	Skip	Print	Print
5			Skip
6		Skip	Print
7			Skip

(D) 1. Taxable 2 subtotal is printed on X/Z reports or skipped.
2. Gross Tax 2 and refund Tax 2 total are printed on X/Z reports or skipped.
3. Net Tax 2 total is printed on X/Z reports or skipped.

KEY ENTRY	(1) Taxable 2 subtotal	(2) Gross Tax 2 & Refund Tax 2 total	(3) Net Tax 2 total
0	Print	Print	Print
1			Skip
2		Skip	Print
3			Skip
4	Skip	Print	Print
5			Skip
6		Skip	Print
7			Skip

[JOB CODE #905]
Key operation:



(A) 1. Gross manual tax and refund manual tax are printed on X/Z reports or skipped.
2. Net manual tax total is printed on X/Z reports or skipped.

KEY ENTRY	(1) Gross manual Tax, & Refund manual Tax	(2) Net manual Tax
0	Print	Print
1		Skip
2	Skip	Print
3		Skip

(B) 1. Clerk report (Counter & Total) is printed on X/Z reports or skipped.
2. Check change total is printed on X/Z reports or skipped.

KEY ENTRY	(1) Clerk report	(2) Check change total
0	Print	Print
1		Skip
2	Skip	Print
3		Skip

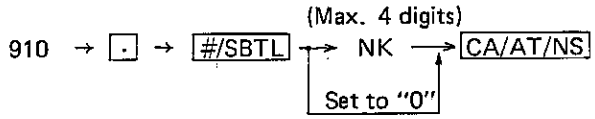
(C) 1. Two line validation or one line validation.
2. Print symbol selection of – 1 and – 2: CP or ·— .
3. Merchandise subtotal is printed or skipped.

KEY ENTRY	(1) Validation	(2) Print symbol for discount	(3) Merchandise subtotal
0	One line	–	Skip
1			Print
2		CP	Skip
3			Print
4	Two lines	–	Skip
5			Print
6		CP	Skip
7			Print

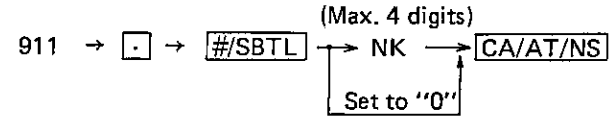
(D) 1. Enable or inhibit time printing.
2. Date format: Day – Month – Year or Month – Day – Year
3. Amount leading symbol: No symbol or $/★.

KEY ENTRY	(1) Time print	(2) Date format	(3) Amount leading symbol
0	Enable	Month-Day-Year	$ (★)
1			No symbol
2		Day-Month-Year	$ (★)
3			No symbol
4	Inhibit	Month-Day-Year	$ (★)
5			No symbol
6		Day-Month-Year	$ (★)
7			No symbol

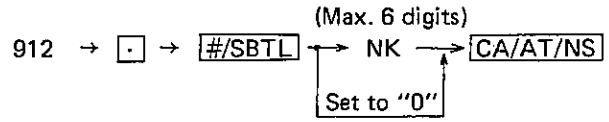
[JOB CODE #910]
Z1 counter setting (Max. 4 digit)
Key operation:



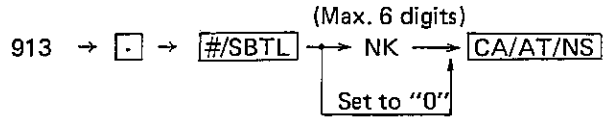
[JOB CODE #911]
Z2 counter setting (Max. 4 digits)
Key operation:



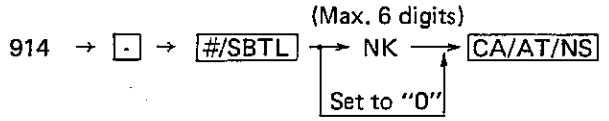
[JOB CODE #912]
GT1 (Grand total of plus registration) upper 6 digits setting.
Key operation:



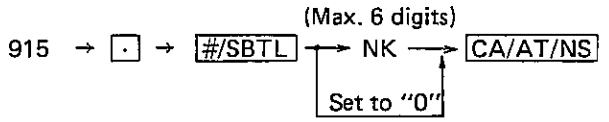
[JOB CODE #913]
GT1 (Grand total of plus registration) lower 6 digits setting.
Key operation:



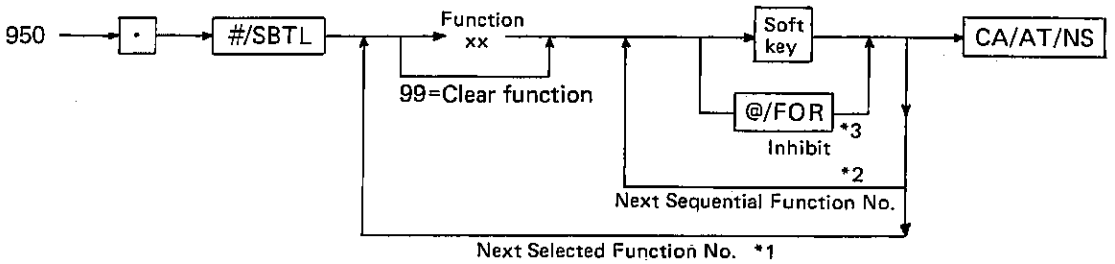
[JOB CODE #914]
GT2 (Grand total of minus registration) upper 6 digits setting.
Key operation:



[JOB CODE #915]
GT2 (Grand total of minus registration) lower 6 digits setting.
Key operation:



[JOB CODE #950]
Flexible key layout function
Up to 46 positions are reserved for free function keys. The related printing on the general reports are also defined to be printed or skipped by this programming.
① Key operation:



Function codes are as shown in Table 1 (next page).
*1. To override the automatic assignment.
*2. To update the function code automatically to a new one.
*3. To inhibit the entered function.
Be sure to inhibit every function that is not to be used.

② The function code for the free key function name LIST

Table 1

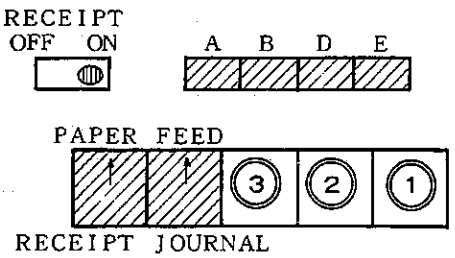
Function Code	Free Key Function Name
1 ~ 12	DEPARTMENTS
51	PLU/SUB
52	CASH 2
53	CHARGE 1
54	CHARGE 2
55	CHARGE 3
56	CHECK
57	MDSE SBTL
58	VOID
59	REFUND

Function Code	Free key Function Name
60	%1
61	%2
62	⊖1
63	⊖2
64	TAX SHIFT 1
65	TAX SHIFT 2
66	TAX (MANUAL TAX)
67	RA
68	PO
69	PRINT
99	OPEN (Not use)

NOTE: The function code is indicated in the display.

③ The free key area on the keyboard
The free key area is shown in Fig. 1.
The free key may be assigned with a function and cleared of a previous assignment. There are a total 46 keys which may be involved in the assignm process. Some of these keys are physically connected together, as indicated within the attached diagram, thus allowing for an actual total of 34 keys to be uniquely defined.

FREE KEY AREA



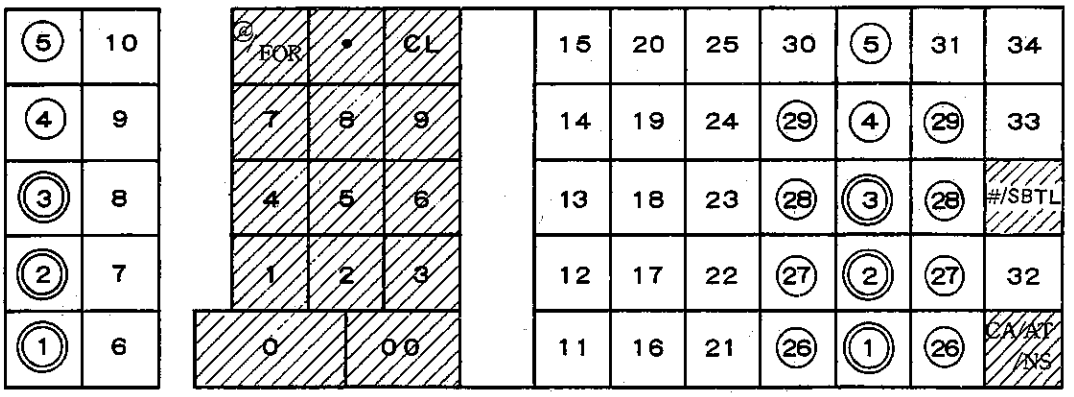


Fig. 1

(NOTE)

1. Numbers 1 thru 3 are assigned to three positions respectively, and numbers 4, 5, 26 thru 29 to two positions respectively.
2. The hatched area is reserved for fixed key positions.

④ Key assignment procedure

(1) The preparation for entry involves completing the attached form and placing the desired keys on the key board.
(2) ID (identification) of the first function to be assigned to a key according to "The function code for the free key function name LIST".
(3) Department assignments are allowed only to the maximum number specified in JOB CODE #901.
(4) The function code indicated in the display is assigned to a key by simply depressing the function key which is to be assigned. The machine will automatically update the display with the next sequential function code.
(5) The fact that there are no more codes in the table for assignment or that a function code ID (identification) number greater than the largest valid code in the machine is signalled by a "99" in the display. By entering a code number prior to the function key, a new function number may be entered or the CA/AT/NS may be depressed to end the job.
(6) The @/FOR key is used to inhibit the function and up date the ID number to the next one.
(7) Up date to the next sequencial function ID is handled by the machine.
(8) If a large number of function ID's are to be skipped before the next assignment or if a previous entry must be corrected then the new function ID may be entered as indicated.
(9) The code 99 is not incremented and thus may be used to quickly clear any number of keys.

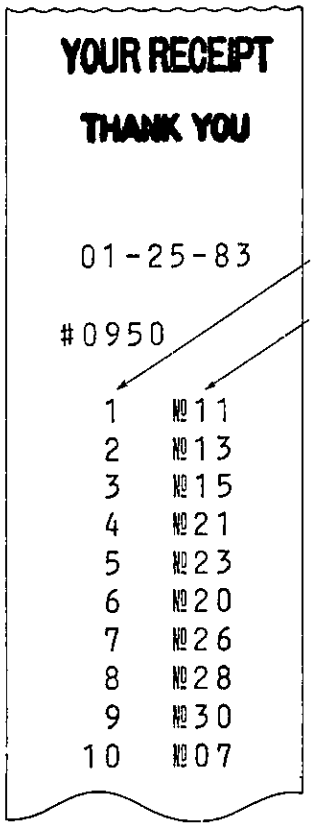
NOTE: For removing key switch and key top, use the special tools (UKOG-6635RCZZ, UKOG-6636-RCZZ); refer to page 2.

⑤ Example of the free key assignments

(1) SRV-1 Programming Sample

Key Operation:

950 → [#/SBTL] → [CA/AT/NS]

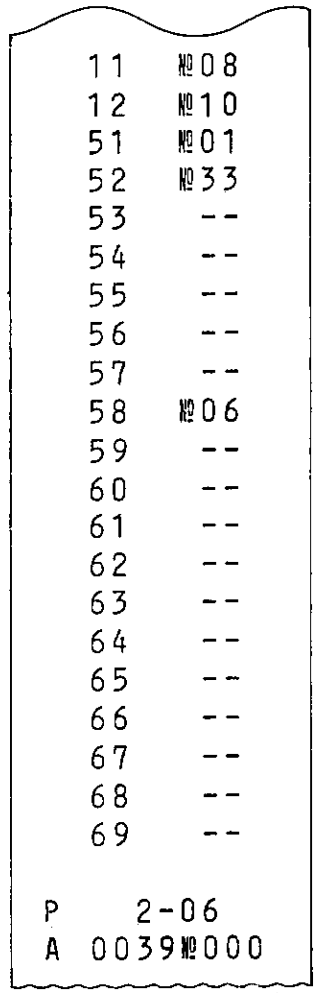


Function code No.

Free key position No.

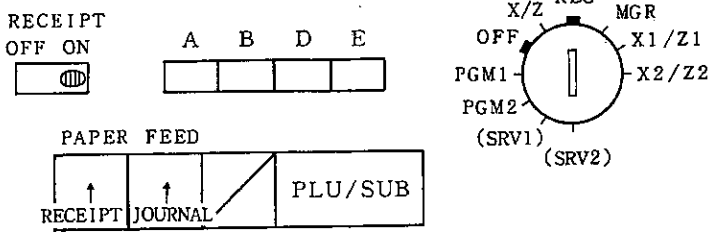
(Function Name)

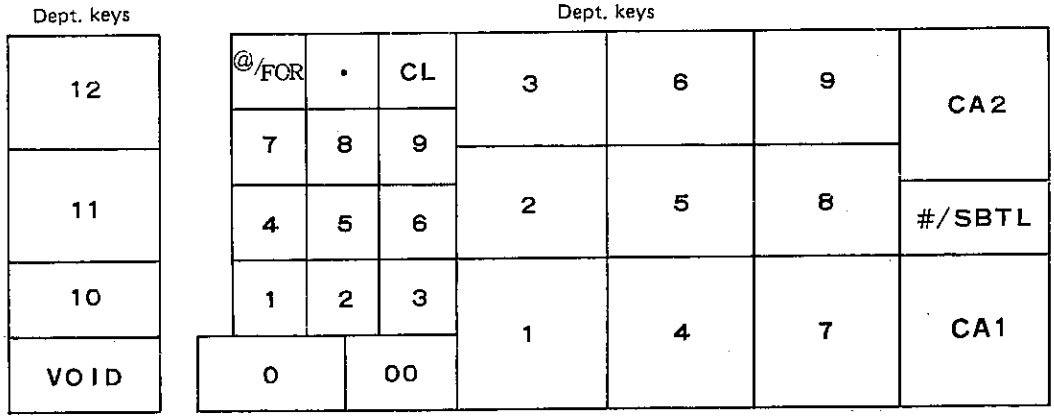
Department 1
Department 2
Department 3
Department 4
Department 5
Department 6
Department 7
Department 8
Department 9
Department 10



Department 11
Department 12
PLU/SUB
CASH 2
VOID
PM Time
Clerk/C-No./M-No.

(2) Key assignments Sample





6-4. Reading of SRV1 mode programming

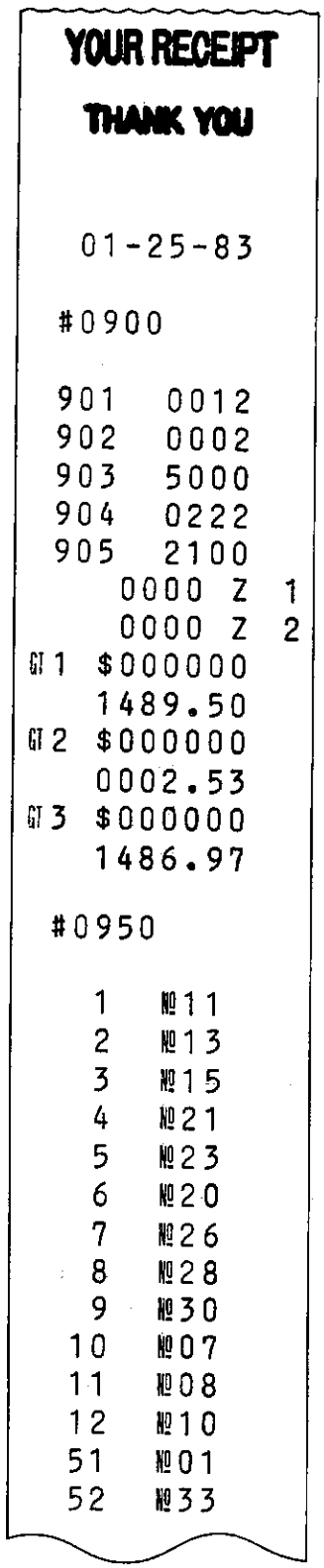
[JOB CODE #900]

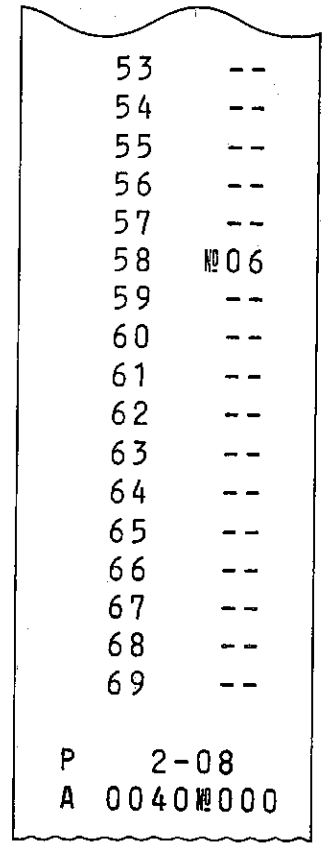
All SRV programming reports including the key layout report are printed in the SRV1 mode by JOB code #900.

Key operation:

900 → [#/SBTL] → [CA/AT/NS]

SRV Print sample





[JOB CODE #950]

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

Key operation:

950 → [#/SBTL] → [CA/AT/NS]

7. PGM1, PGM2 (PROGRAM) MODE

Your ER-2540 allows you to program it in two modes: PGM1 and PGM2.
The PGM1 mode is used for programming those items that need to be changed often: Unit prices of departments, plus, and percentage.
The PGM2 mode is used for programming all PGM1 mode program and those items that require no frequent change: date, time, tax table, tax rate, and the function of each key. The programming or setting procedures of various items is described below. Program every item necessary for the store into the machine following the corresponding procedures.

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

GENERAL ENTRY SEQUENCE (PGM1 and PGM2 MODE Programming)

xxx → [.] → [#/SBTL] – (DATA) – [CA/AT/NS]
JOB CODE #

THE JOB CODE LIST

110 Department price preset.
210 Department functions – 1.
211 Department functions – 2.
212 Department functions – 3.
120 PLU price preset (HALO preset for SUB).
121 PLU programming – 1.
221 PLU programming – 2.
130 % rate programming for %1 and %2.
230 MISC. keys programming – 1.
231 MISC. keys programming – 2.
232 MISC. keys programming – 3.
240 Tax tables.
241 % tax rate.
250 Date.
251 Time.
252 Machine number.
253 Consecutive number.
255 Limitation for the quantity of validation.
Print operations.
256 Optional feature selection.
260 Media keys programming – 1.
261 Media keys programming – 2.
(High amount limitation for check change.)
262 Media keys programming – 3.

The jobs which have 100 level code numbers may be programmed in both PGM1 and PGM2 mode.
The jobs which have 200 level code numbers may be programmed in the PGM2 mode only.

1. Setting the date and time (PGM2 mode)

(1) Setting the date

Procedure

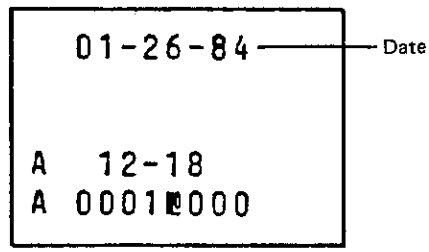
250 → [.] → [#/SBTL] → Date (five or six digits) → [CA/AT/NS]

Example: Jan. 26, 1984

Key operation

2 5 0 [.] [#/SBTL]
1 2 6 8 4 [CA/AT/NS]

Print



Note: The date just entered does not print on the receipt and journal published just after this setting; it prints on the next and subsequent receipts and journals.

(2) Setting the time

Set the time on the military time (24-hour) system. For example, when the time is set to 2:30 AM, enter 230; and when it is set to 2:30 PM, enter 1430. The time is printed and displayed on the real time system. For example, A2-30 is printed and displayed for 2:30 AM, and P2-30, for 2:30 PM. The captions A and P stand for AM and PM, respectively.

Procedure

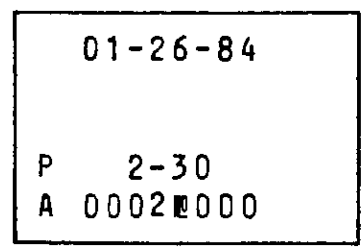
251 → [.] → [#/SBTL] → Time (max. four digits) → [CA/AT/NS]

Example: Setting the time as 2:30 PM (14:30)

Key operation

2 5 1 [.] [#/SBTL]
1 4 3 0 [CA/AT/NS]

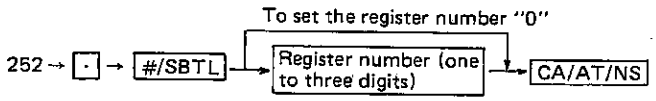
Print



2. Setting the register number (PGM2 mode)

When your store has two or more register, it is practical to set separate register numbers for their identification. You may set them to a maximum of three digits.

Procedure



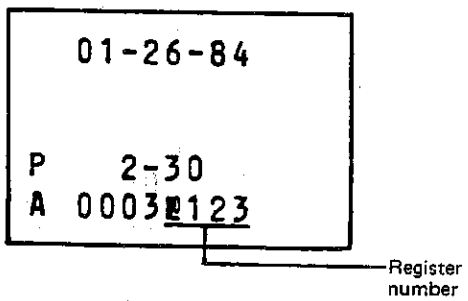
Example: To set the register number as "123"

Key operation

2 5 2 [.] [#/SBTL]

1 2 3 [CA/AT/NS]

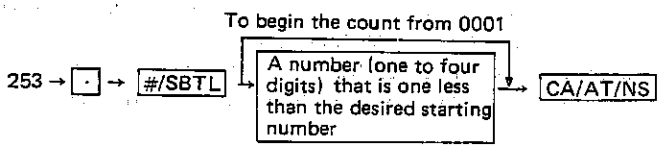
Print



3. Setting the consecutive number (PGM2 mode)

The consecutive number is incremented by one each time a receipt is published. Enter a number (one to four digits) that is one less than the desired starting number.

Procedure



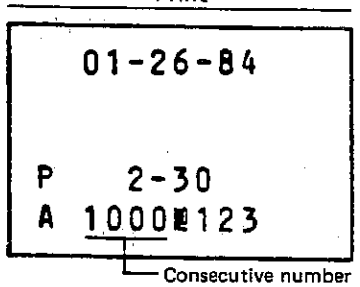
Example: Setting the count start number as "1000"

Key operation

2 5 3 [.] [#/SBTL]

1 0 0 0 [CA/AT/NS]

Print



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

Your ER-2540 has the automatic tax calculation function and allows you to program two tax tables and rates fo function.

Automatic tax calculations require to program, in addition to the tax table and rate, the tax status of each pertinent department, PLU/subdept., and function key which will be described later.

(1) Programming the tax table

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

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

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

R: The Rate (R) is entered as a six-digit number (2-digit integer and 4-digit decimal). Thus, a 6% rate would be entered as 60000. If the rate is fractional (e.g. 4 3/8%), then the fractional portion (3/8) would be converted to its decimal equivalent (i.e. 3750) and the resulting rate of 43750 would be entered. Note that the nominal rate (R) is generally indicated on the tax table.

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

Q: The smallest amount for which tax must be collected. In some states, there are amounts which are not subject to tax (e.g. if amounts of $0.01 to $0.10 are not taxed, the value of Q – being the smallest taxable amount – would be $0.11).

T: The amount of tax which is associated with the amount Q.

M: The value is associated with the cyclical nature of many tax tables. In fact, the need to support tax tables as opposed to the use of a straight percentage calculation is because there are amounts where the result of applying the percentage calculation does not result in a tax amount which is the same as the related table amount. The table must, therefore, be used to obtain the data (i.e. the value M) necessary for the register obtain the correct tax amount. The procedures obtain this value are as follows:

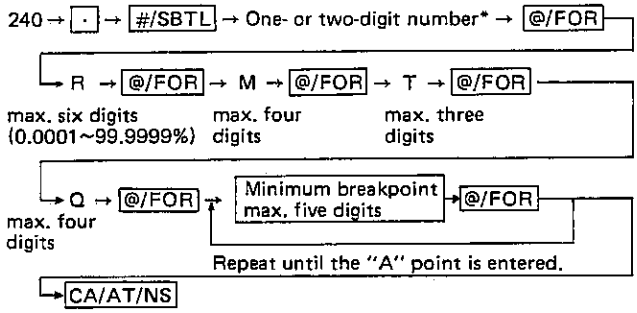
The tax table must be examined in order to find repeating cycles in terms of the breakpoint differences as indicated in the preceding tax table (Note that a 'breakpoint' is that amount at which a tax amount

increment takes place).

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

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

Procedure



* First figure: The first figure to be entered depends upon whether the difference between a minimum breakpoint to be entered and the preceding minimum breakpoint is not less than $1.00 or more than 99¢. When the difference is not less than $1.00, enter "1," and when it is not more than 99¢, enter "0" or nothing.

Second figure: The second figure depends upon whether your tax table is to be programmed as tax table 1 or 2. When your tax table is to be programmed as tax table 1, enter "1," and when it is to be programmed as tax table 2, enter "2."

- **Limitations to the entry of minimum breakpoints**

The largest number of minimum breakpoints your register can accommodate varies depending upon whether you intend to program one or two tax tables and whether the difference between consecutive minimum breakpoints is not more than 99¢ or less than $1.00.

a. When you program a single tax table, you may enter up to 112 minimum breakpoints if each breakpoint difference is 99¢ or less and up to 56 minimum breakpoints if the difference is $1.00 or more.

b. When you program two tax tables, you may enter up to 98 minimum breakpoints if each breakpoint difference is 99¢ or less and up to 48 minimum breakpoints if each breakpoint difference is $1.00 or more.

Example: Programming the sample tax table show above as tax table 1.

Key operation

	240 [·]	[#/SBTL]
	1	[@/FOR]
R→	60000	[@/FOR]
M→	100	[@/FOR]
T→	.1	[@/FOR]
Q→	11	[@/FOR]
The first cyclic portion	23	[@/FOR]
	39	[@/FOR]
	57	[@/FOR]
	73	[@/FOR]
	89	[@/FOR]
"A" point→	111	[@/FOR]
		[CA/AT/NS]

Print (New Jerjey)

```
   6.0000%
     1.00TX1
1    0.11
2    0.23
3    0.39
4    0.57
5    0.73
6    0.89
7    1.11
```

Notes: 1. If you make an incorrect entry before entering the M in programming a tax table, cancel it with the [CL] key; and if you make an error after entering the M, cancel it with the [#/SBTL] key. Then program again from the beginning correctly.

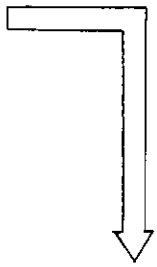
2. When you program two tax tables as tax tables 1 and 2, be sure to program tax table 1 first. Also, when you have programmed two tax tables as tax tables 1 and 2 and need to re-program tax table 1, it is necessary to re-program tax table 2 as well because reprogramming tax table 1 automatically cancels tax table 2.

② If the tax is not provided for every cent, modify the tax tax table by setting the tax for every cent in the following way.

When setting the tax, consider the minimum breakpoint corresponding to unprovided tax to be the same as the one corresponding to the tax provided on a larger amount.

Sample tax table
Example

Tax	Minimum breakpoint
.00	.01
.01	.11
.02	.26
.03	.47
.06	.89
.09	1.11
.10	1.26
.11	1.47
.12	1.68
.14	1.89
.17	2.11



Modification of the left tax table

Tax	Minimum breakpoint	Breakpoint difference (¢)	
.00	.01	1	Non-cyclic
.01←T	.11←Q	10	
.02	.26	15	Cyclic
.03	.47	21	
.04	.68	21	
.05	.89	21	
.06	.89	0	
.07	1.11←"A" point	22	
.08	1.11	0	
.09	1.11	0	
.10	1.26	15	Cyclic
.11	1.47	21	
.12	1.68	21	
.13	1.89	21	
.14	1.89	0	
.15	2.11	22	
.16	2.11	0	
.17	2.11	0	

From the modified tax table above;
"A" point = 1.11, R = 8(%), M = 100, T = $0.01 = 1¢, Q = 0.11 = 11¢

(2) Programming the tax rate

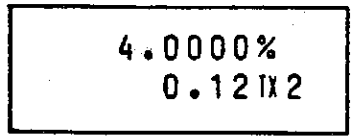
241 → [·] → [#/SBTL] → 1 or 2* → [@/FOR] → [Tax rate] (max. six digits: 0.0001 to 99.9999%) → [@/FOR] → [Tax exempt] (max. four digits: 1¢ to $99.99) → [CA/AT/NS]

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

Example: Programming the tax rate 4.0000% as tax rate 2 with tax exempt as 12¢.

Key operation	
241 [·]	[#/SBTL]
2	[@/FOR]
40000	[@/FOR]
12	[CA/AT/NS]

Print



Note: If you make an incorrect entry before pressing the second [@/FOR] key in programming a tax table, cancel it with the [CL] key; and if you make an error after pressing the second [@/FOR] key, cancel it with the [#/SBTL] key. Then program again from the beginning correctly.

5. Programming for departments

Your ER-2540 allows you to perform the following programming for every department.

(1) Functional programming 1 (PGM2 mode)
You can set each department for:
① Compulsory item validation print
If item entries must be validated, set the corresponding department for compulsory item validation print.
Note: A department cannot concurrently be set for SIS (SIS#1 or SIS#2) and compulsory item validation print.

② SIS (single item cash sale)
(a) 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 press
- If the sale is preceded by ring-ups to departments not s 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.

(b) SIS#2
- Whenever a ring-up is to a department set for SIS#2, the sale is finalized as soon as the department key is pressed.

③ Four types of unit price entry
You may select one of the following four types of unit price entry for each department.
(a) Open and preset
(b) Preset only
(c) Open only
(d) Inhibit department key

Procedure

For programming for the following dept.

210 → [·] → [#/SBTL] → [*A B C] (When A thru C are all zeroes) → [Dept.] → [CA/AT/NS]

A: Item validation print compulsory/non-compulsory
To set a department for item validation print compulsory, enter 1; and to set it for item validation print non-compulsory, enter 0.

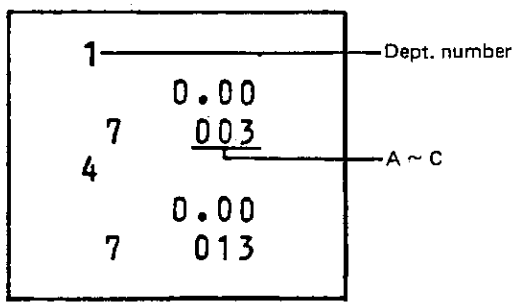
B: SIS (single item cash sale)
To set a department for SIS#2, enter 2; to set it fo SIS#1, enter 1, and to set it for neither of SIS#1 and #2, enter 0.

C: Type of unit price entry
To set a department for "Open and preset," enter 3; to set it for "Preset only," enter 2; to set it for "Open only," enter 1; and set if for "Inhibit department key," enter 0.

Example: Programming for departments 1 and 4
Enter A = 0, B = 0, and C = 3 for department 1, and A = 0, B = 1, and C = 3 for department 4.

Key operation	
210	· #/SBTL
3	1
13	4
	CA/AT/NS

Print



(2) Functional programming 2 (PGM2 mode)

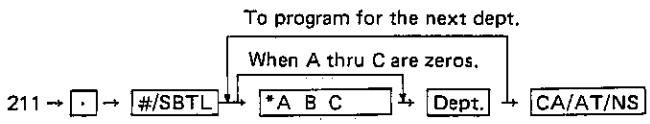
① Sign (plus/minus)

- Assign a plus sign to those departments in which normal sale amounts are to be entered.
- Assign a minus sign to those departments in which payments for such as bottle returns are to be entered.

② Tax status

- Assign a tax status (taxable 1, taxable 2, taxable 1 and 2, or non-taxlable) to each department.
- When entries are made into taxable departments in a transaction, tax is automatically computed according to the associated tax table or rate as soon as the transaction is completed.

Procedure



*A: Sign
To assign the plus sign, enter 0; and to assign the minus sign, enter 1.

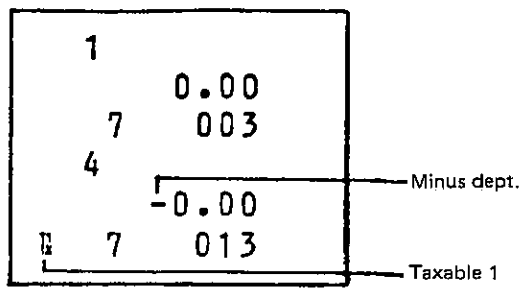
B: Tax 2 status,
- To assign "non-taxable", enter 0.
- To assign "taxable 2", enter 1.

C: Tax 1 status,
- To assign "non-taxable" enter 0.
- To assign "taxable 1" enter 1.

Example: Programming for departments 1 and 4
Enter A = 0, B = 0, C = 0 for department 1.
Enter A = 1, B = 0, C = 1 for department 4.

Key operation	
211	· #/SBTL
	1
101	4
	CA/AT/NS

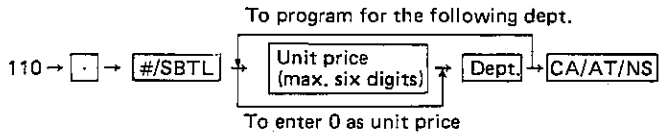
Print



(3) Programming unit prices (PGM1 or PGM2 mode)

You may program unit prices up to a maximum of six digits ($9999.99).

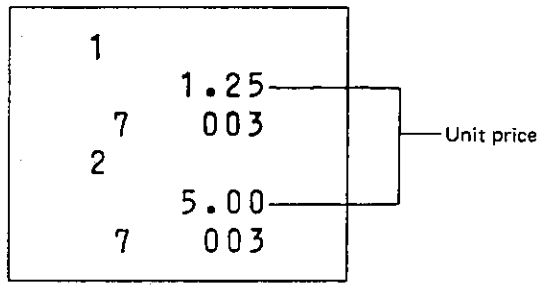
Procedure



Example: Programming $1.25 for dept. 1 and $5.00 for dept. 2

Key operation	
110	· #/SBTL
125	1
500	2
	CA/AT/NS

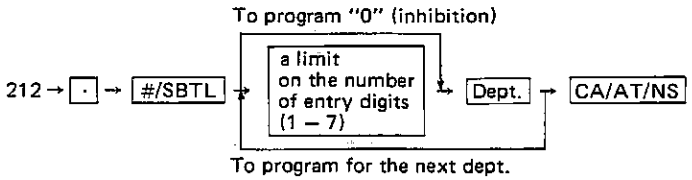
Print



(4) Programming a limit on the number of entry digits (PGM2 mode)

The ER-2540 can be programmed to limit the number of digits for the price entry for each department. The limitation is effective for REG mode operations and is overridden for operations in the MGR mode.

Procedure



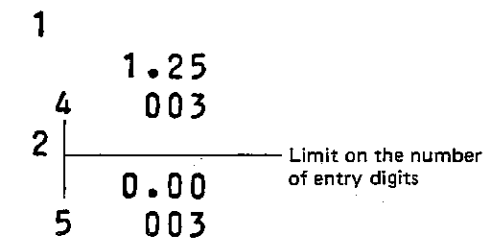
* For example, the preset "2" here means that amount entries up to 99 cents are allowed in REG mode.

Example: Programming 4 digits for dept. 1 and 5 digits for dept. 2.

Key operation

2 1 2	· #/SBTL
4	1
5	2
	CA/AT/NS

Print



6. Price lookup (PLU) programming (option)

Each PLU must be pre-programmed.

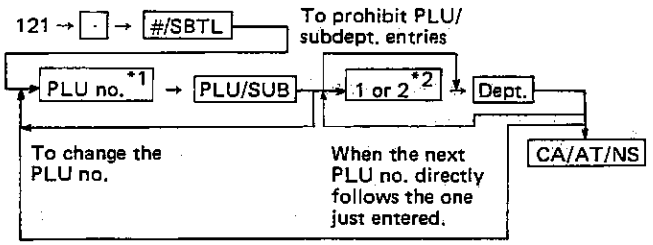
- **PLU/subdepartment mode**
  - If the PLU mode is selected, individual PLU entries can be used, with preset prices, by entering assigned PLU numbers and pressing the PLU/SUB key.
  - If the subdepartment mode is selected, every PLU/subdepartment entry requires the entry of a unit price; any preset prices are ignored.
- **Associated department**
  When a PLU is associted with a department, the following functions of the PLU depend on the programming for the department.
  (1) Single item cash sale
  (2) Item validation print compulsory/prohibited
- **Unit price (max. six digits)**
  You will usually use unit prices programmed for individual PLUs as PLU unit prices, but when you set HALO entry limits for subdepartments, you will use these prices as upper limit amounts.
  If you program the unit price "0" for a PLU, you can enter only the selling quantity into the PLU is the PLU can be used only as a counter.
- **Base quantity for split-pricing entries – two digits.**
  Program a base quantity for each of PLU/subdepartm numbers dedicated to split-pricing entries.
- **Sign (+/–)**
  The function of every PLU/subdepartment varies according to the combination of its sign and its associated department's sign as follows:

Sign		Function of PLU/subdepartment
Dept.	PLU/subdept.	
+	+	• Serves as a normal plus PLU/subdept.
–	–	• Serves as a normal minus PLU/subdept.
+	–	• Accepts store coupon entries, but not multiplication and split-pricing.
–	+	• Not valid; not accepted.

- **Tax status (taxable 1 and/or 2, non-taxable)**

(1) Programming the PLU/subdepartment mode and associated departments (PGM1 mode and PGM2 mode)

Procedure



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

*1. 1 thru 99.
*2. To select the subdept. mode, enter 1, and to select the PLU mode, enter 2.

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

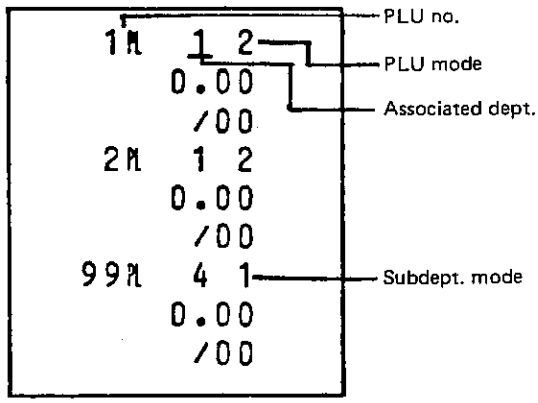
Example: Programming for PLU nos. 1, 2, and 99 as follows.

PLU no.	PLU/subdept. mode	Associated dept.
1	PLU	1
2	PLU	1
99	Subdept.	4

Key operation

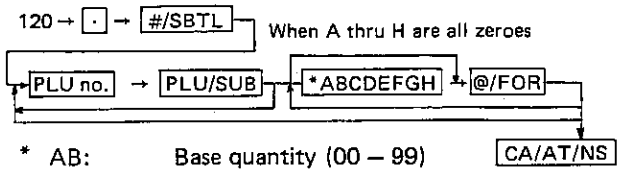
1 2 1	·		#/SBTL
1	PLU/SUB	2	1
		2	1
99	PLU/SUB	1	4
			CA/AT/NS

Print



(2) Programming unit prices, and base quantities for split-pricing entries (PGM1 mode and PGM2 mode)

Procedure



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

Note: The preset amount (C thru H) will work as unit price for PLUs and work as HALO amount for SUB Depts.
In the case of SUB Depts., zero preset means inhibiting the SUB Dept. and 9999.99 preset means no limitation.
In the case of PLUs, zero nd 9999.99 preset have no special meaning (i.e., 0 amount preset is available).

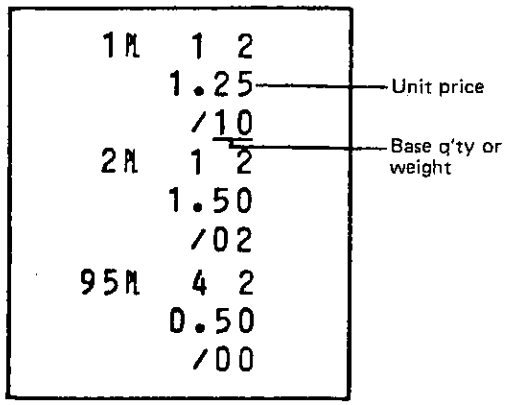
Example: Programming for PLU nos. 1, 2, and 95 as follows.

PLU no.	Base q'ty	Unit price
1	10	1.25
2	02	1.50
95	Nothing entered	0.50

Key operation

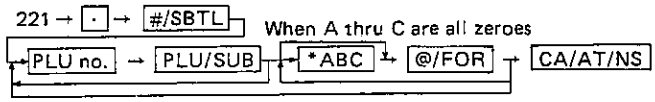
	120 ·	#/SBTL
1 PLU/SUB	10000125	@/FOR
	2000150	@/FOR
95 PLU/SUB	50	@/FOR
		CA/AT/NS

Print



(3) Programming sign (+/–) and tax status (PGM2 mode).

Procedure



*A: Sign (+/–)
To set as a plus PLU/subdept., enter 0; and to set as a minus PLU/subdept., enter 1.
B: Tax 2 status,
- To assign "non-taxable", enter 0.
- To assign "taxable 2", enter 1.

C: Tax 1 status,
- To assign "non-taxable", enter 0.
- To assign "taxable 1", enter 1.

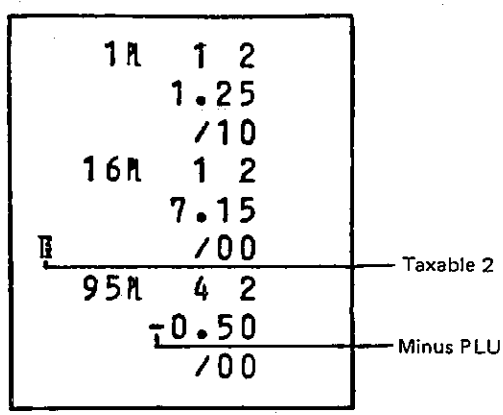
Example: Programming for PLU nos. 1, 16 and 95 as follows.

PLU no.	Sign	Tax status,
1	+	Non-taxable
16	+	Taxable 2
95	–	Non-taxable

Key operation

	221 ·	#/SBTL
1 PLU/SUB		@/FOR
16 PLU/SUB	10	@/FOR
95 PLU/SUB	100	@/FOR
		CA/AT/NS

Print



7. Programming for the %1 and %2 keys

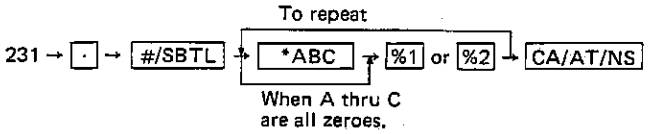
%1 key: Provides percent calculations for merchandise subtotals.

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

(1) Programming +/– sign and tax status (PGM2 mode)

- +/– sign: Programming of the +/– sign assigns the premium or discount function for each key.
- Tax status: Programming of the tax status determines whether a premium or discount should be dealt with as a taxable (taxable 1 or 2, or taxable 1 and 2) or non-taxable amount.

Procedure



*A: +/– sign
To select the + (premium) sign, enter nothing and to select the – (discount) sign, enter 1.

B: Tax 2 status,
- To assign "non-taxable", enter 0.
- To assign "taxable 2", enter 1.

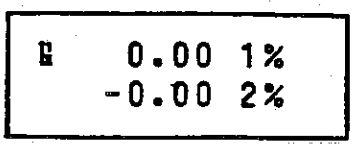
C: Tax 1 status
- To assign "non-taxable", enter 0.
- To assign "taxable 1", enter 1

Example: Assigning the "+" sign and "taxable 1," to the %1 key and the "–" sign and "non-taxable" to the %2 key.

Key operation

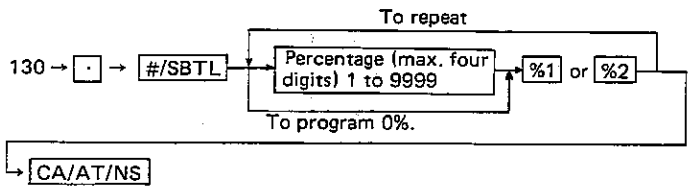
231	·	#/SBTL	
		1	%1
		100	%2
			CA/AT/NS

Print



(2) Percentage programming (PGM1 mode and PGM2 mode)

The register can be programmed up to 99.99%.

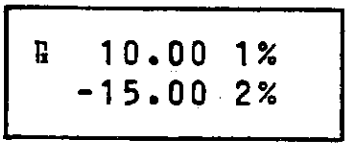


Example: Assigning 10.00% to the %1 key and 15.00% to the %2 key.

Key operation

130	·	#/SBTL	
		1000	%1
		1500	%2
			CA/AT/NS

Print

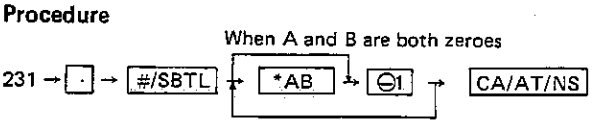


8. Programming for the ⊖1 key

(1) Tax status programming (PGM2 mode)

This programming decides whether ⊖1 amounts should be handled as taxable (taxable 1 or 2, or taxable 1 and 2) amounts or non-taxable ones.

Procedure



*A: Tax 2 status
- To assign "non-taxable", enter 0.
- To assign "taxable 2", enter 1.

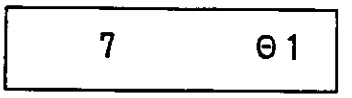
B: Tax 1 status
- To assign "non-taxable", enter 0.
- To assign "taxable 1", enter 1.

Example: Assigning "non-taxable" to the ⊖1 key.

Key operation

231	·	#/SBTL	
		⊖1	
			CA/AT/NS

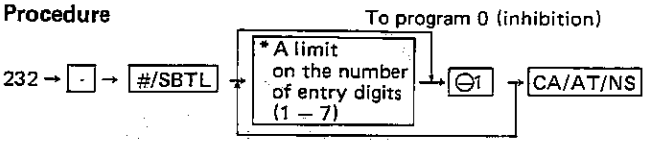
Print



(2) Programming a limit on the number of entry digits (PGM2 mode)

The limit is effective for REG mode operations and can be overriden for operations in the MGR mode.

Procedure



* For example, presetting 2 here means that amount entries up to 99 cents are allowed in the REG mode.

Example: Programming the limit to 3 for the ⊖1 key.

Key operation

232	·	#/SBTL	
		3	⊖1
			CA/AT/NS

Print

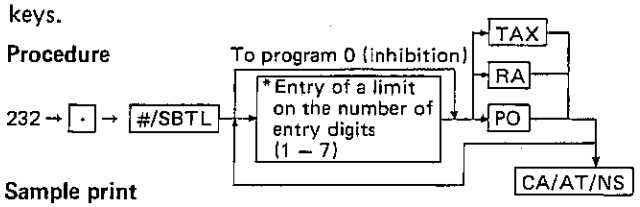
```
3        Θ1
```

9. Programming of TAX, RA, and PO keys

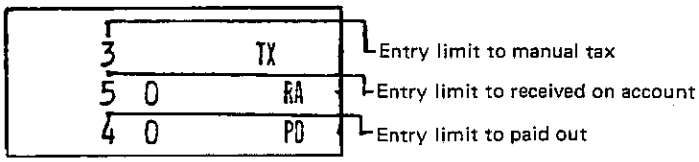
(1) Programming a limit on the number of entry digits for TAX, RA and PO keys (PGM2 mode)

The ER-2540 can be programmed to limit the number of digits in the amount entry for the TAX, RA and PO keys.

Procedure

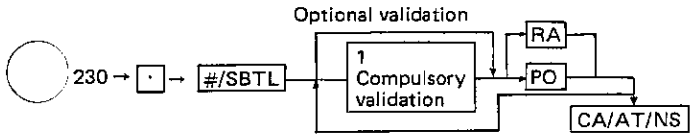


Sample print

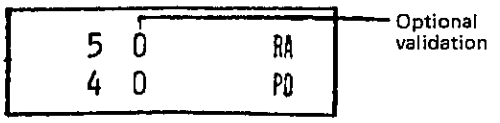


(2) Programming compulsory validation printing for RA or PO.

Procedure



Sample print



10. Programming for optional feature selection (PGM2 mode)

① Programming the CLK X/Z mode availability

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

Note: You can take cashier X and Z reports in the X1/Z1 mode regardless of the above programming.

② Programming the availability of the REG-mode indirect void

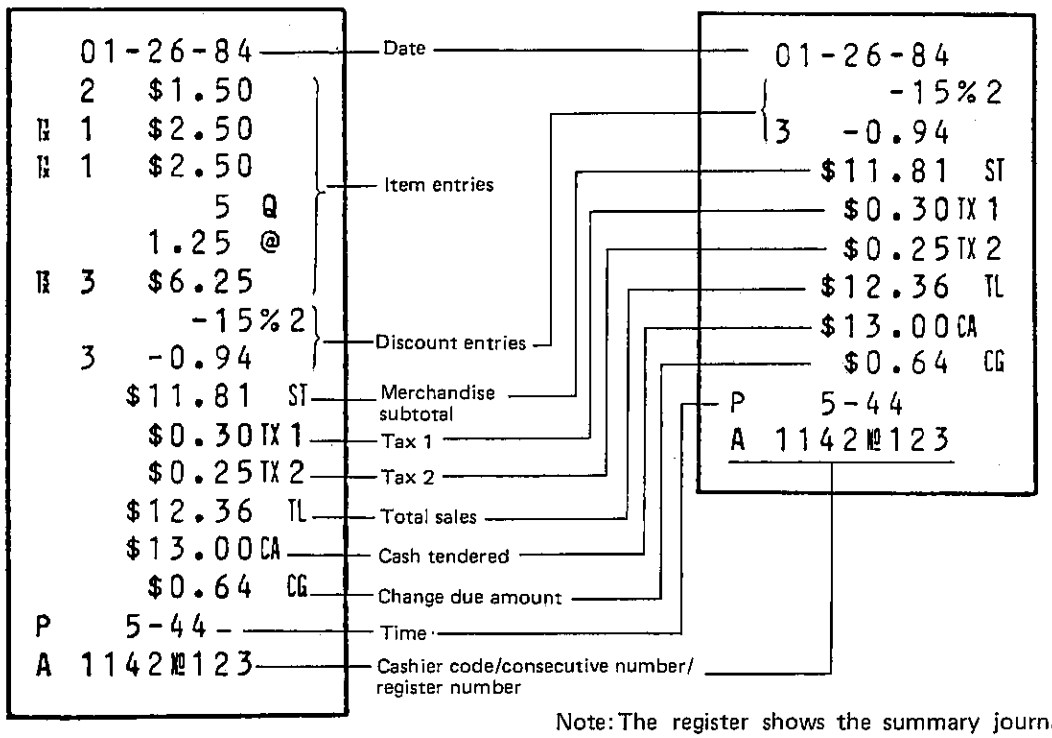
③ Programming the availability of the REG-mode refund entry

④ Programming the journal print form

You may choose either of the following forms.

- Detailed journal print that shows the details of all entries – the same information as printed on the receipt.
- Summary journal print that shows information about all entries other than sale items (entries into "+" real departments and their associated "+" PLUs and subdepartments).

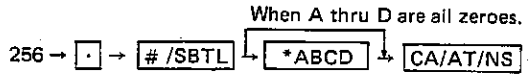
Sample detailed journal



Sample summary journal

Note: The register shows the summary journal print only for REG-mode entries; for MGR-mode entries, it shows the detailed journal print even if it is programmed for summary journal print form.

Procedure



*A: CLK X/Z mode availability
To allows the use of this mode, enter nothing; and to disallow it, enter 1.

B: Indirect void availability
To allow the REG-mode indirect void, enter 0; and to disallow it, enter 1.

C: Refund entry availability
To allow the REG-mode refund entry, enter 0; and to disallow it, enter 1.

D: Journal print form
To select detailed journal, enter 0; and to select summary journal, enter 1.

Example: Programming the register to allow the CLK X/Z mode and the indirect void, disallow the refund entry, and select summary journal.

Key operation

256	[·] [#/SBTL]
11	[CA/AT/NS]

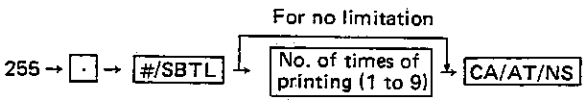
Print

0011

11. Programming the limit to the number of validation printing (PGM 2 mode) operations

The register provides the validation printing of every item, amount tendered, and total sale amount and can be programmed to limit to the number of print operations.

Procedure



Example: Setting the limit to 1.

Key operation

255	[·] [#/SBTL]
1	[CA/AT/NS]

Print

•1•

12. Programming for the [CA/AT/NS], [CHK] and [CH1] thru [CH3] keys

(1) Functional programming (PGM2 mode)

① Compulsory validation print
If media entries must be validated. set the corresponding media key for compulsory validation pirnt.

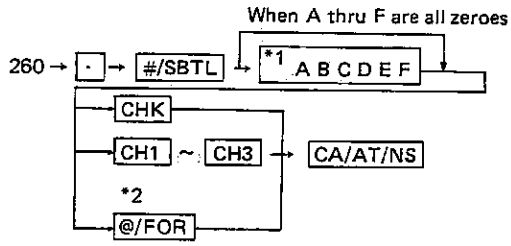
② Tax delete.
You can set any media key to delete tax which calculated when it is depressed.

③ Drawer open
You can select if the media key should open the drawer or not.

④ Subtotal compulsory
You can select a forced subtotal key pressing just before each media key.

⑤ Amount tendered compulsory
You may select amount tendering compulsory or optional amount tendering for [CA/AT/NS] and [CHK] keys.
You may select amount tendering compulsory or inhibited for [CH1] thru [CH3] keys.

Procedure



*1 A: Validation compulsory
To select validation compulsory, enter 1.
To select optional validation, enter nothing.

B: Tax2 calculation status
To delete tax 2, enter 1.
To calculate tax 2, enter 0.

C: Tax 1 calculation status
To delete tax 1, enter 1.
To calculate tax 1, enter 0.

D: Drawer open
To set drawer open, enter 0.
To set drawer closed, enter 1.

E: Subtotal compulsory
To enforce subtotal key pressing, enter 1.
To set optional subtotal key pressing, enter 0.

F: Amount tendering compulsory
To set amount tendering compulsory, enter 1.
To set optional amount tendering for [CA/AT/NS] or [CHK] keys, or to inhibit amount tendering for [CH1] thru [CH3] keys, enter 0.

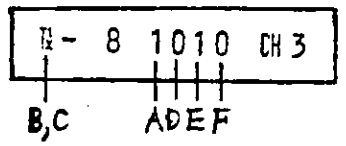
*2 The [@/FOR] key is used for [CA/AT/NS] key programming.

Example: Programming for the [CH3] key
Enter A = 1, B = 0, C = 1, D = 0, E = 1, and F = 0 for the CH3 key.

Key operation

260	[·] [#/SBTL]
101010	[CH3]
	[CA/AT/NS]

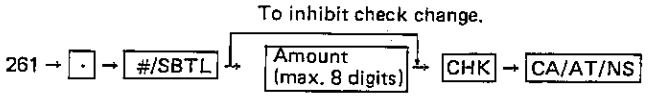
Print



(2) High amount limitation for check change

The ER2540 can be programmed for change amount limit for check sale with the amount range of $0.00 (i.e. inhibiting check change) to $999999.99.

Procedure

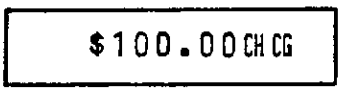


Example: Setting the limit to 100.00.

Key operation

261	·	#/SBTL
10000		CHK
		CA/AT/NS

Print

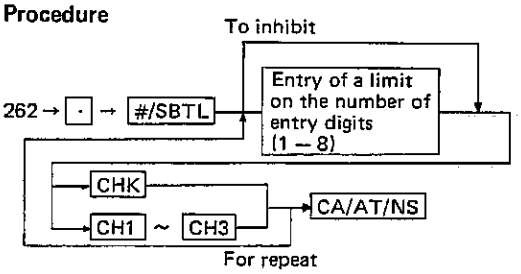


(3) Limit of entry digits

A limit on the number of entry digits for each charge key (CH1 thru CH3) and CHK key can be made within a range from 0 to 8 digits.

If "0" is assigned, the key becomes in operative.

Procedure

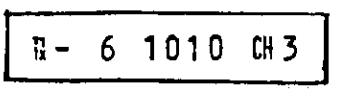


Example: Setting the limit to 6 for the CH3 key.

Key operation

262	·	#/SBTL
6		CH3
		CA/AT/NS

Print



13. Reading stored programs

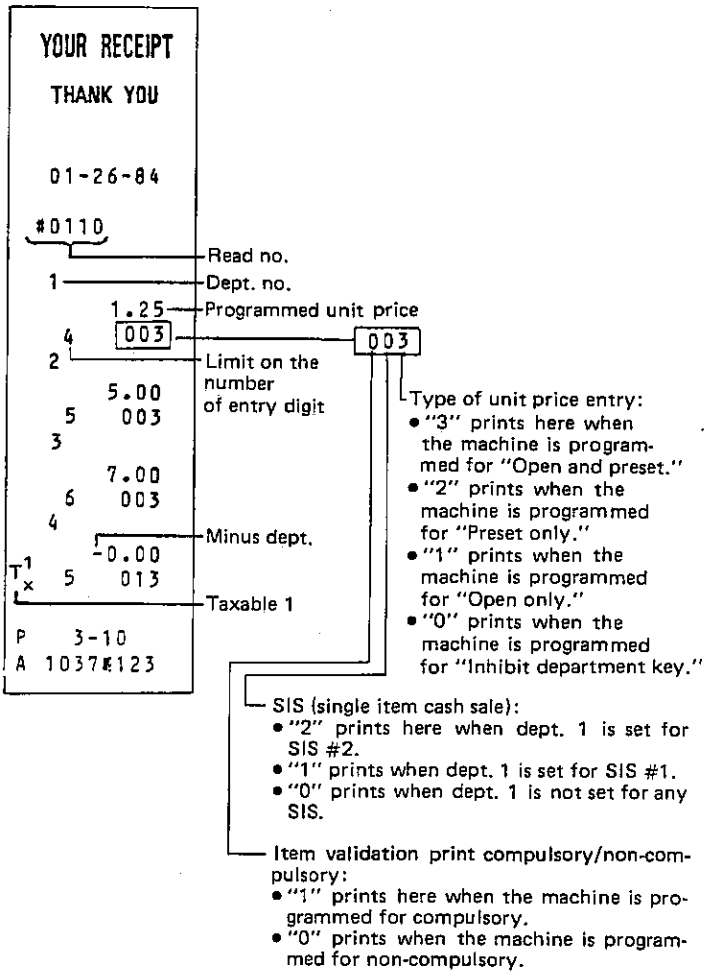
Each program stored in the PGM1 and 2 modes can be printed via the following steps.

(1) Program details and procedures for their reading

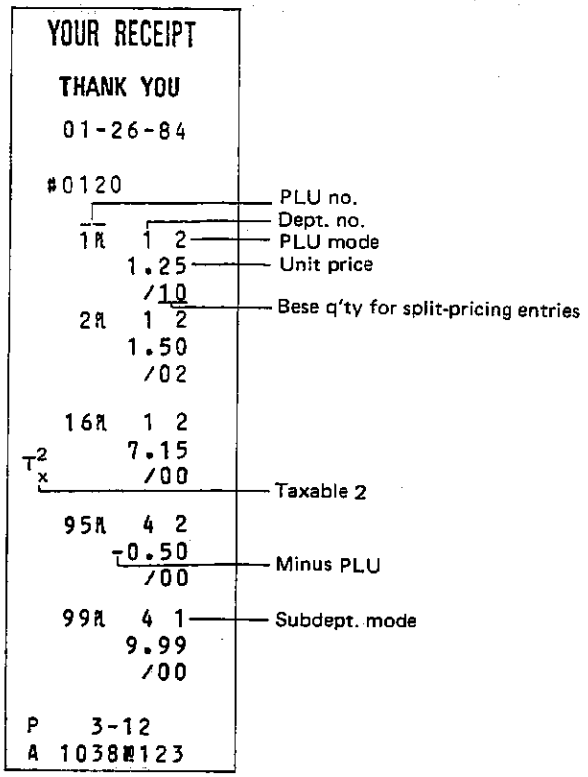
Program for:	Mode switch position	Procedure	Sample printout
① Departments	PGM2 or PGM1	→ 110 → #/SBTL → Start dept. no. For individual reading @/FOR → End dept. no. → CA/AT/NS	See below
② PLUs and/or subdepartment	PGM2 or PGM1	→ 120 → #/SBTL → Start PLU/subdept. no. For individual reading @/FOR → End PLU/subdept. no. → CA/AT/NS	See page 26
③ Miscellanicas function preset	PGM1 or PGM2	→ 130 → #/SBTL → CA/AT/NS	See page 26
④ Tax tables or rates	PGM2	→ 240 → #/SBTL → CA/AT/NS	See page 26

(2) Sample printouts

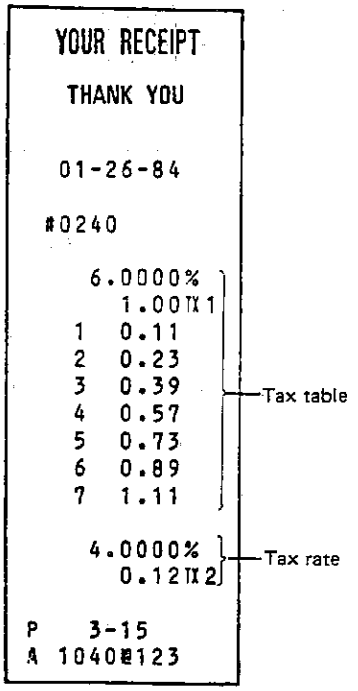
① Reading of programmed items for departments (Reading in the PGM1 and PGM2 modes)



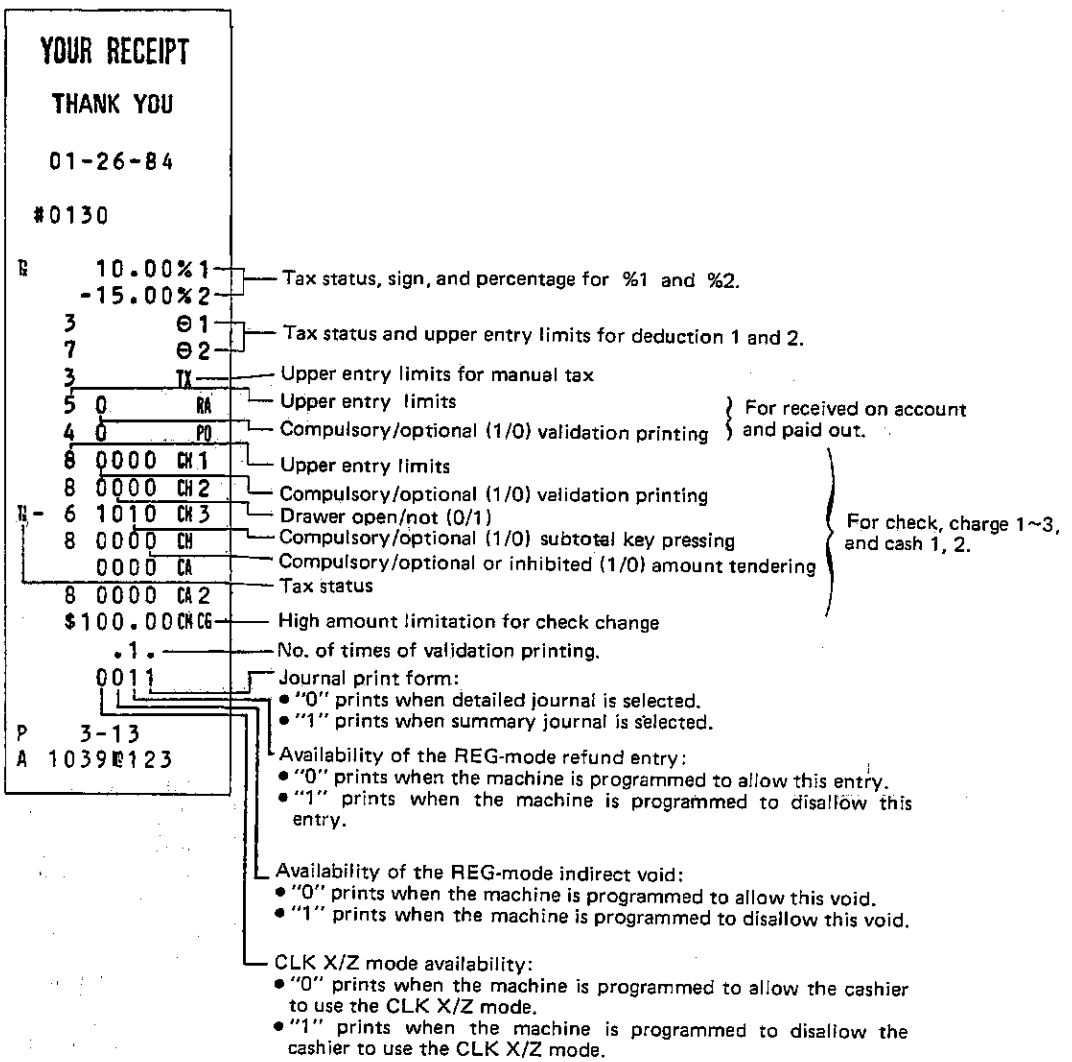
② Reading of programmed items for PLU/subdept. (Reading in the PGM1 and PGM2 modes)



④ Reading of programmed tax tables and rates (Reading in the PGM2 mode)



③ Reading of programmed items for miscellaneous function keys (Reading in the PGM1 and PGM2 mode)



8. READING & RESETTING (CLK X/Z, X1/Z1, X2/Z2) MODE

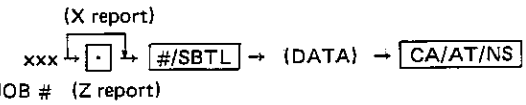
- Use the reading function (X) when you need to take a reading of sales information so far entered during business hours. You can take this reading any number of times as it will not affect the register's memory.
- Use the resetting function (Z) when you need to clear the register's memory.
  Resetting prints all sales information so far recorded and then clears the entire memory except for the GT1 thru GT3, reset count, and consecutive number.

REPORTS

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

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

To print reports, use the following key entry sequences:



The report will be printed by journal and receipt printers with this procedure.
The (DATA) part will be described in the explanation of each report.

(NOTE) – GENERAL RULE –

If the [·] key is depressed following a JOB code number entry with these procedures, data inside of the ECR will be cleared (i.e. Z reports).
(Some job code numbers do not allow the [·] key to follow.)
If the [·] key is not depressed following a JOB code number, data inside of the ECR will be maintained (i.e. X reports).

LIST OF REPORTS

Job Code #	Report Name	Mode			DATA (Data form)
		CLK X/Z	X1/Z1 DAILY	X2/Z2 PERIOD	
1	General Report		X1/Z1	X2/Z2*1	–*4
2	Individual Clerk Report	X/Z	X1/Z1		–
4	Hourly TTL Report		X1		(RANGE)1*5
			X1/Z1*3		–
12	Manual Group Report		X1	X2*1	Dept. keys
20	PLU Report by Range		X1/Z1*2		(RANGE)2*6
30	CID Report		X1		–

(Notes)
X or Z (including those with the suffix of 1 or 2) signifies that the X or Z report is accessable in these modes:
CLK X/Z, X1/Z1 or X2/Z2.

*1 Monthly Report Option
*2 PLU/SUB-Department Option
*3 Zero Skip Printing
*4 –: No entry required
*5 (RANGE)1: (xx) → [@/FOR] → (xx)
*6 (RANGE)2: (yy) → [@/FOR] → (yy)

xx: 0 ~ 23, No entry for "0" data
yy: 1 ~ 99

9. TEST FUNCTIONS (in the SRV1 mode)

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

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

10-1. Test function

You will be able to trouble shoot a predeterminated item by using the test function. The test function consists of the seventeen test items shown below:

Test No.	NK Data	Test Function Item
1	1	Printer Test
2	2	Display, Buzzer, Drawer, & Receipt ON/OFF Switch Test
3	4	Key Test
4	5	Clerk & Mode Switch Test
5	10	ROM (UPD7801G) Test
6	11	ROM (M2764-059) Test
7	12	ROM (M2764-060) Test
8	13	RAM (UPD449 Standard No. 10) Test
9	14	RAM (UPD449 Option PLU No. 11) Test
10	15	RAM (UPD449 Option Periodic No. 12) Test
11	18	RAM Select Signal Test
12	6	System Clock Test
13	7	Time Clock Test
14	3	Aging Test (Printing the "Printer Test")
15	30	Free Key Position Code Read Test
16	16	PLU Option RAM (UPD449, No. 11) Clear
17	17	Periodic Option RAM (UPD449, No. 12) Clear

10-2. Test procedure

(1) Check out after unpacking:
Use; Test No. 1 ~ No. 11

(2) To inspect the unit after repairing:
Use: Test No. 1 ~ No. 11
If the UPD7507C-036 was replaced, Use test No. 12, and No. 13.

(3) To isolate a problem to a specific area:
Use the test function associated with the problem.

10-3. Key operation (SRV1 mode)

NK → [CA/AT/NS]

NK: DATA according to LIST 10-1.

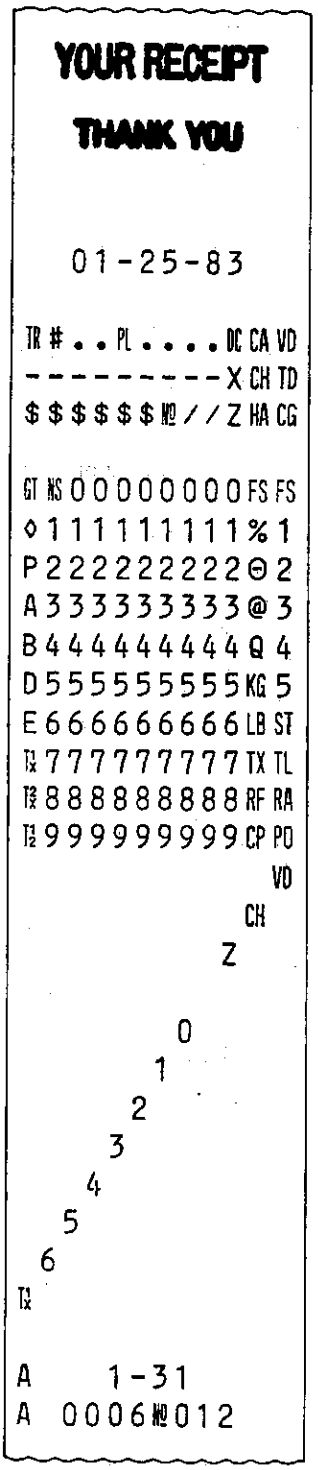
10-4. Individual Tests

(1) Printer Test

Start: 1 → [CA/AT/NS]

The following print format is printed on the receipt if no malfunction occurs.

Print Format



STOP: Auto Stop

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

START: 2 → [CA/AT/NS]

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

(1) Display Test

All display digits light.

(2) Drawer Test

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

a. When the drawer is normal:
The indicator of 1, 2 digits light.

b. When the drawer is open (Drawer switch can not be closed):
The indicator 9, 10 digits light.

c. When the drawer is closed (Drawer switch can not be open):
The indicator of 1 ~ 10 digits light.

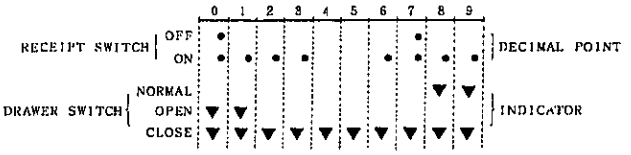
(3) Receipt ON/OFF Switch Test.

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

a. When in the OFF position:
The decimal point of 3 and 10 digits light.

b. When in the ON position:
The decimal point of 1 ~ 4, 7 ~ 10 digits light.

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



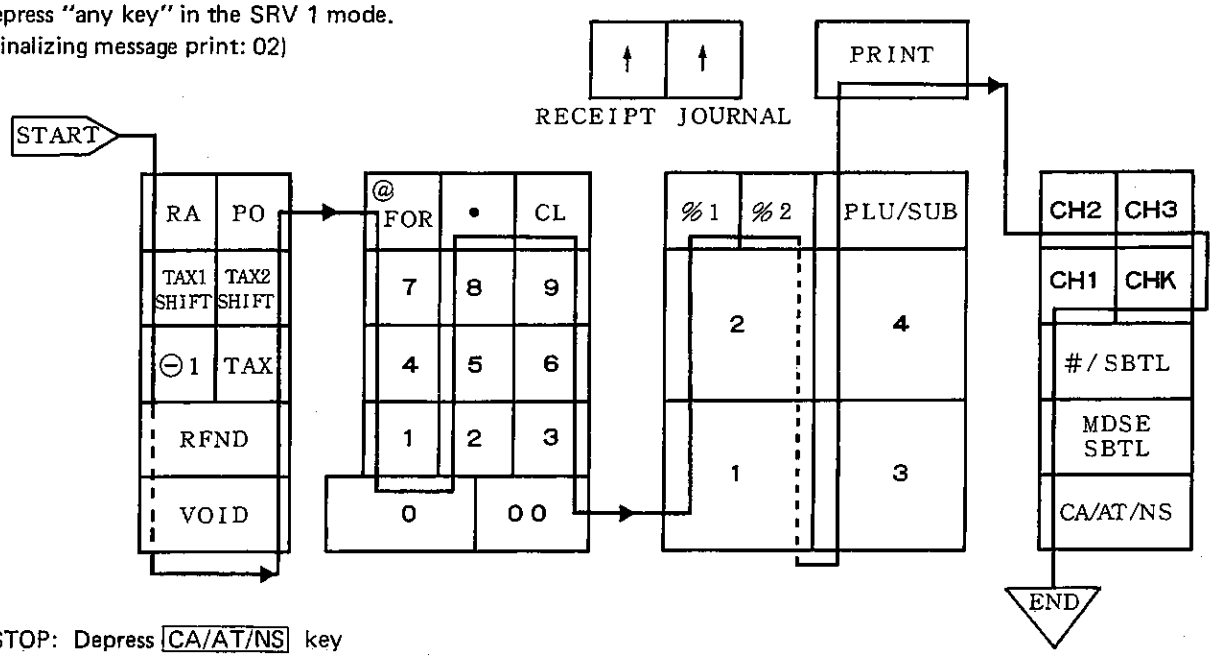
NOTE: ▼ : The indicator lights.
▽ : The indicator goes off.

[3] Key test

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

① START: 4 → CA/AT/NS

② Test procedure
After the start key operation, depress all keys one by one in the following order.
This key test can be done on the standard key layout.



③ STOP: Depress CA/AT/NS key

④ Result

- When the keys check out OK:
The key catch tone sounds and the normal finalizing message is printed as follows.

Normally finalizing message print
04

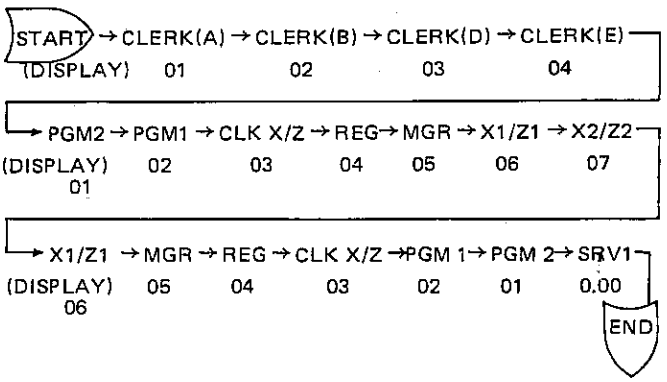
- When an error is detected:
The key catch tone does not sound and the error message is printed with the error mark "E" as follows.

Error message print
E ---------- 04

[4] Clerk and Mode Switch Test

① START: 5 → CA/AT/NS

② Test procedure:
After the start key operation, Depress the clerk key A to E in order, turn the mode switch from SRV1 to X2/Z2 position and return it to SRV1 mode.
During the clerk switch and the mode switch test, each display digit lights according to the position of the clerk switch and the mode switch.



③ STOP: Turn the mode switch to the SRV1 position.
④ Result:

Normally finalizing message print. Error message print.

05 E ---------- 05

[5] ROM Test

The internal ROM included in UPD7801G-105, the external ROM (M2764-059 and M2674-060) and the Address Buss can be checked via this test.

① START:

10 → CA/AT/NS For UPD7801G-105

11 → CA/AT/NS For M2764-059

12 → CA/AT/NS For M2764-060

② Test Result Indication:
When the ROM tests good; the normal finalizing message is printed as follows:

10 For UPD7801G-105

11 For M2764-059

12 For M2764-060

When a ROM error is detected, the test number is printed with the error mark "E" as follows.

E ---------- 10 For UPD7801G-105

E ---------- 11 For M2764-059

E ---------- 12 For M2764-060

[6] RAM Test

One function of this test is to verify the standard RAM (No. 10 UPD449) and the option RAM (No. 11, No. 12 UPD449). Another function of this test is to check the RAM select signal ($\overline{\text{RAS 1}}$ signal, $\overline{\text{RAS 2}}$ signal and $\overline{\text{RAS 3}}$ signal).

① Start key operation to verify the RAM

13 → CA/AT/NS For the standard RAM UPD449, No. 10.

14 → CA/AT/NS For the PLU option RAM, UPD449, No. 11

15 → CA/AT/NS For the periodic option RAM, UPD449, No. 12.

② Start key operation to check the RAM select signal.

18 → CA/AT/NS

③ Test Result Indication for verifying the RAM.

- When the RAM tests good, the normal finalizing messages are printed as follows:

For the standard RAM UPD449, No. 10

13

For the PLU option RAM UPD449, No. 11

14

For the Periodic option RAM UPD449, No. 12

15

- When a RAM error is detected, the error message "E" is printed as follows:

For the standard RAM UPD449, No. 10

E ---------- 13

For the PLU option RAM UPD449, No. 11

E ---------- 14

For the periodic option RAM UPD449, No. 12.

E ---------- 15

④ Test Result Indication for checking the RA' select signals.

- When the RAM select signals ($\overline{\text{RAM1}}$, $\overline{\text{RAM2}}$ and $\overline{\text{RAM3}}$) are good, the normal finalizing message is printed with the test number 18 as follows.

18

- When the RAM select signal error is detected, the test number 18 and 19 are printed with the error message "E" as follows.

For the PLU RAM UPD449, No. 11

E ---------- 18

For the Periodic RAM UPD449, No. 12

E ---------- 19

[7] System clock Test

The system clock in the UPD7507C-036 which is controlled by the external resistor and capacitor, can be tested:

① START: 6 → CA/AT/NS

② Test Procedure:
After the start key is depressed, no display will

seen and a pulse of 880 ~ 900 μsec should be observed at the output terminal P21 (Pin #3) of UPD7507C-036.

③ Result:
If the pulse of 880 ~ 900 μsec is not at the correct frequency, it will be necessary to adjust the frequency of the system clock by the Trim-pot (100kΩ) on the display PWB.

④ Stop:
Turn the mode switch from SRV1 position to the PGM2 position.

NOTE: Be sure to return mode switch to the SRV1 position.

[8] Time clock Test

The time clock in the UPD7507C-036 which is controlled by the external crystal and capacitor, can be tested:

① Start: 7 → CA/AT/NS

② Test procedure:
After the start key is depressed, no display will be seen and a pulse of 2048Hz should be observed at the output terminal P21 (Pin #3) of UPD7507C-036.

③ Stop:
Turn the mode switch from SRV1 position to the PGM2 position.

④ Result:
Pulse should be at 2048Hz if it is not, do not attempt to make any adjustments. This is a factory preset adjustment and must be returned to SHARP factory service if further adjustment is required.

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

An aging test of the printer can be performed:

① Start: 3 → CA/AT/NS

② Stop: Move the receipt ON/OFF switch to OFF position which will cause the test to stop after one print cycle.

NOTE: When the receipt switch is "ON" position, it is printed without the consecutive number, the date and the time.
But if the receipt switch is turned to the OFF position, it is printed with the consecutive number, the date and the time.

[10] Free key position code read test

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

① Start: 30 → CA/AT/NS

② Test procedure:
After the start key operation, depress the installed position keys except the fixed position keys one by one. Then the number corresponding with the key position will be displayed. Refer to Fig. 1.

③ Stop: CA/AT/NS

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

[11] Option RAM clear

After the PLU option RAM or the periodic option RAM has been installed, you must perform this key operation to clear the RAM.

① Key operation

For PLU option RAM (UPD449, No. 11)

16 → CA/AT/NS

For the periodic option RAM (UPD449, No. 12)

17 → CA/AT/NS

10. OUTLINE OF FUNCTIONS

FEATURES		NUMBER
Number of Departments		4
Department Expandability Max Number of Departments		OPTION 12
Number of PLU Expandability Max Number of PLU's		OPTION 99
Number of Clerks (Max.)		4
Number of Media CASH, CHECK, CHARGE 1 ~ 3		5
Number of Free Key Positions		34
Number of Different Free Key Function Eexcept Department		19
Number of Digits in The Operator Display		10
Number of Digits in The Customer Display		8
Type of Receipt/Journal Printer		CR-910
Number of Drawers		1
Number of Different reports		5
Number of Different Reports by Option		3
Print Skip on Reports		Yes
Department	No. of Digits in Unit Price Preset	6
	+/–	Yes
	HALO digits	0 ~ 7
	Tax Sort	2
	(SIS) Single Item Sale	Yes
	(SIF) Single Item Finalize	Yes
	Inhibit and Preset	Yes
	Validation Enforce	Yes
	No. of Digits of Totalizer	8
	No. of Digits of Counter	6

No. = Number

FEATURES		NUMBER
PLU	No. of Digits of Totalizer	8
	No. of Digits of Counter	6
	No. of Digits of Unit Price	6
	+/–	Yes
	HALO	Yes
	Kind of Tax Sort	2
	Inhibit and Preset	Yes
	Sub Department	Yes
	No. of Digits of Split Price Base	2
	Number of Departments	2
Push Down Type Clerk		4
MEDIAS	Number of CASH Keys	2
	CHECK	1
	CHARGE	3
	CHECK CHANGE TOTAL	1
	Drawer OPEN DETECT (SRV SETTING)	Yes
	Validation Enforce (SRV SETTING)	Yes
	Tax Delete (SRV SETTING)	Yes
KEY	Departments (Max)	12
	PLU's	1
	CASH	2
	CHECK	1
	CHARGE	3
	MDSE ST	1
	VOID	1
	REFUND	1
	%1	1
	%2	1
	⊖ 1	1
	⊖ 2	1
	TAX SHIFT 1	1
	TAX SHIFT 2	1
	MANUAL TAX	1
	RA	1

FEATURES		NUMBER
KEY	PO	1
	PRINT	1
	JOURNAL – FEED	1
	RECEIPT – FEED	1
	NUMERIC 0 ~ 9	10
	00	1
	DECIMAL POINT	1
	CLEAR	1
	@/FOR	1
	#/SBTL	1
FUNC-TIONS	MULTIPLICATION	Yes
	SPLIT PRICING	Yes
	⊖ 1 (NOT NET DEPT)	Yes
	⊖ 2 (NET DEPT)	Yes
	%1 (NOT NET DEPT)	Yes
	%2 (NET DEPT)	Yes
	PAST VOID, LAST VOID	Yes
	VOID MODE	Yes
	CLOCK	Yes
	OVERRIDE	Yes
	SEPARATE ITEMIZERS	Yes
	FOR REFUND	Yes
	NO. OF TAX TABLES	2
	NO. OF DIGITS OF % TAX	6
RE-PORTS	CLERK	Yes
	DAILY GENERAL	Yes
	PLU	OPTION
	CASH IN DRAWER	Yes
	HOURLY	Yes
	MONTHLY GENERAL	OPTION
	MANUAL GROUP	Yes
	MONTHLY MANUAL GROUP	OPTION

No. = Number

11. PRECAUTION ON SERVICING

Replacing Component Parts On The Main PWB

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

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

No.	Parts Code	Descriptions	Price Rank
1	UKŌG-0115CSZZ	Soldeirng iron 40W 100V/120V (Including No. 2) 150°C ~ 350°C (adjustable)	BY
2	UKŌG-0116CSZZ	Iron chip (spare)	AX
3	UKŌG-0117CSZZ	Transformer with iron holder 220/240V → 100V	BX
4	UKŌG-0118CSZZ	Solder puller (3-step changeover type)*	BK
5	UKŌG-0006CSZZ	Spare Tip for solder puller	AW
6	UKŌGE0024CSZZ	Thermometer for soldering iron	**

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

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

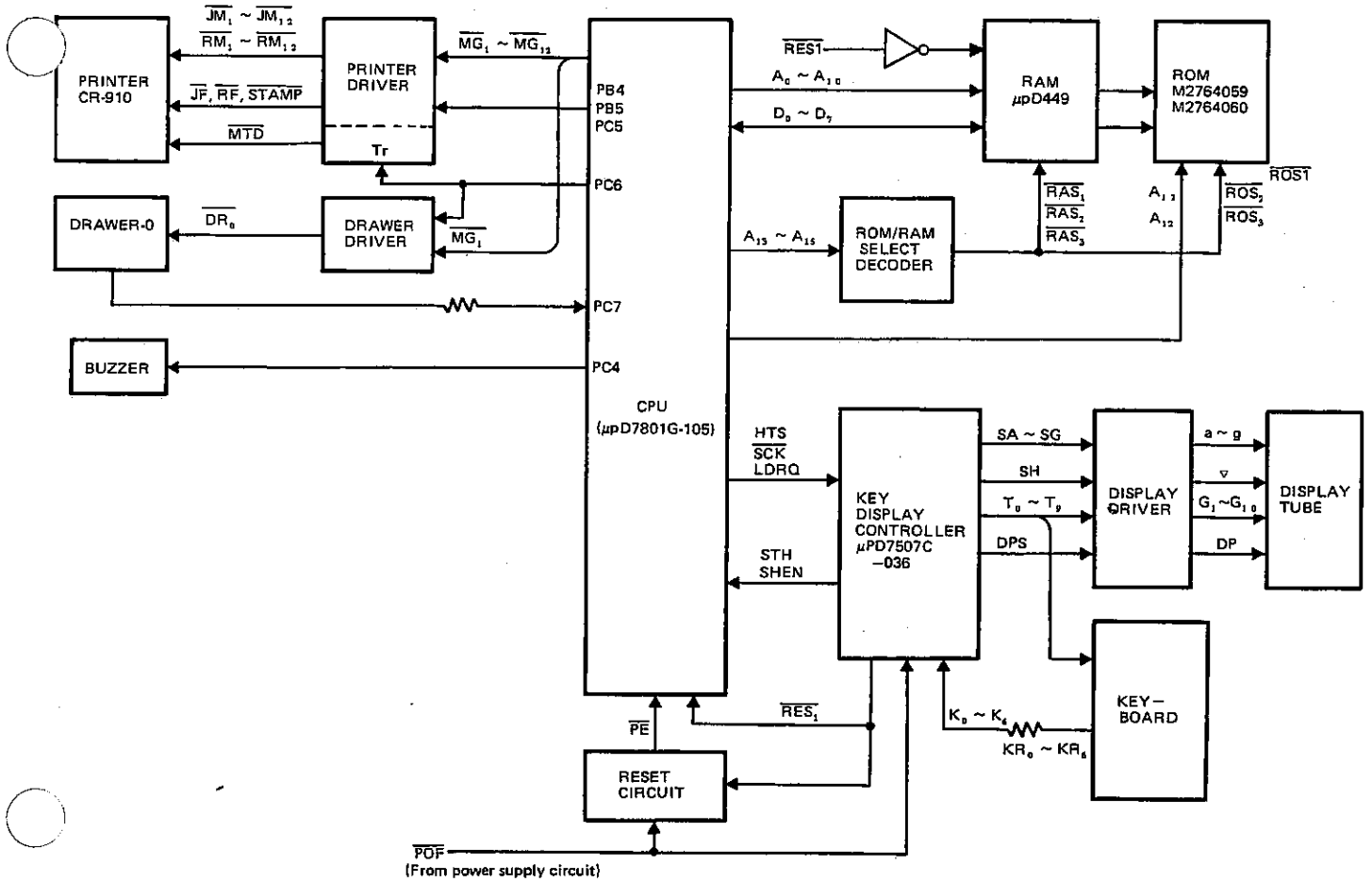
2) Do not push the printed wire with the tip of the soldering iron and the top of the solder puller.

3) Parts replacement procedure

① Remove solder on all of leads (pins) in the shortest possible time using the soldering iron and solder puller.

② Replace and solder the new parts on the board.

12. CIRCUIT BLOCK DIAGRAM



13. μPD7801G AND μPD7507C TERMINAL SIGNALS

μPD7801G-105

Pin No.	Terminal Name	Description	In/out
1	PE_{15}	Address bus AB_{15}	out
2	φOUT	Clock output	out
3 ~ 10	$D_7 \sim D_0$	Data Bus ($DB_7 \sim DB_0$)	In/out
11	INT_2	Interrupt request (α from printer)	In
12	INT_1	Shift Enable (SHEN)	In
13	INT_0	Interrupt request ($\overline{PE}$)	In
14	$\overline{WAIT}$	WAIT	In
15	M_1	Not used	out
16	$\overline{WR}$	Write	out
17	$\overline{RD}$	Read	out
18	PC_7	Drawer open sense	In
19	PC_6	Motor drive	out
20	PC_5	Stamp drive ($\overline{ST}$)	out
21	PC_4	Buzzer (BZ)	out
22	PC_3	Load request (LDRQ)	out
23	PC_2	Shift enable detect acknowledge	In
24	PC_1	Serial clock detect acknowledge	out
25	PC_0	α from printer detect acknowledge	In
26	$\overline{SCK}$	Serial clock	In
27	SI	Serial Input data (STH)	In
28	SO	Serial Output data (HTS)	out
29	$\overline{RESET}$	Reset signal ($\overline{RES1}$)	In
30	X_2	Basic clock pulse	In
31	X_1	Basic clock Pulse	out
32	GND	Power source 0V	
33	PA_0	Printer trigger magnet-1 $\overline{MG1}$	out
34	PA_1	Printer trigger magnet-2 $\overline{MG2}$	out
35	PA_2	Printer trigger magnet-3 $\overline{MG3}$	out
36	PA_3	Printer trigger magnet-4 $\overline{MG4}$	out
37	PA_4	Printer trigger magnet-5 $\overline{MG5}$	out
38	PA_5	Printer trigger magnet-6 $\overline{MG6}$	out
39	PA_6	Printer trigger magnet-7 $\overline{MG7}$	out
40	PA_7	Printer trigger magnet-8 $\overline{MG8}$	out
41	PB_0	Printer trigger magnet-9 $\overline{MG9}$	out
42	PB_1	Printer trigger magnet-10 $\overline{MG10}$	out
43	PB_2	Printer trigger magnet-11 $\overline{MG11}$	out
44	PB_3	Printer trigger magnet-12 $\overline{MG12}$	out
45	PB_4	Joural paper feed ($\overline{JFDS}$)	out
46	PB_5	Receipt paper feed ($\overline{RFDS}$)	out
47	PB_6	Journal print ($\overline{JCS}$)	out
48	PB_7	Receipt print ($\overline{RCS}$)	out
49	PE_0	Address bus (A_0)	out
50	PE_1	Address bus (A_1)	out
51	PE_2	Address bus (A_2)	out
52	PE_3	Address bus (A_3)	out
53	PE_4	Address bus (A_4)	out
54	PE_5	Address bus (A_5)	out
55	PE_6	Address bus (A_6)	out
56	PE_7	Address bus (A_7)	out
57	PE_8	Address bus (A_8)	out
58	PE_9	Address bus (A_9)	out
59	PE_{10}	Address bus (A_{10})	out
60	PE_{11}	Address bus (A_{11})	out
61	PE_{12}	Address bus (A_{12})	out
62	PE_{13}	Address bus (A_{13})	out
63	PE_{14}	Address bus (A_{14})	out
64	VDD	Power source (+5V)	

μPD7507C-036

Pin No.	Terminal Name	Description	In/out
1	X_2	Timer count clock pulse	In
2	T_9	Key scan signal 9 & Display 10th digit (G10)	out
3	T_8	Key scan signal 8 & Display 9th digit (G9)	out
4	SHEN	Shift enable	out
5	$\overline{RES_1}$	Reset signal acknowledge	out
6	K_0	Key return signal (0)	In
7	K_1	Key return signal (1)	In
8	K_2	Key return signal (2)	In
9	K_3	Key return signal (3)	In
10	T_0	Key scan signal (0) & Display 1st digit (G1)	out
11	T_1	Key scan signal (1) & Display 2nddigit (G2)	out
12	T_2	Key scan signal (2) & Display 2rd digit (G3)	out
13	T_3	Key scan signal (3) & Display 4th digit (G4)	out
14	T_4	Key scan signal (4) & Display 5th digit (G5)	out
15	T_5	Key scan signal (5) & Display 6th digit (G6)	out
16	T_6	Key scan signal (6) & Display 7th digit (G7)	out
17	T_7	Key scan signal (7) & Display 8th digit (G8)	out
18	RES0	Reset signal	In
19	CL_1	Basic clock	In

20	Vram	Power source When power on : +5V When power off : +3.0 ~ 4.2V	
21	CL_2	Basic clock	out
22	LDRQ	Load request	In
23	$\overline{POF}$	Power OFF detect	In
24	$\overline{SCK}$	Serial clock	In
25	(SO) STH	Serial output data	out
26	(SI) HTS	Serial input data	In
27	K_4	Key return signal (4)	In
28	K_5	Key return signal (5)	In
29	K_6	Key return signal (6)	In
30	SH	Status display "▽"	out
31	SG	Display segment "g"	out
32	SF	Display segment "f"	out
33	SE	Display segment "e"	out
34	SD	Display segment "d"	out
35	SC	Display segment "c"	out
36	SB	Display segment "b"	out
37	SA	Display segment "a"	out
38	DPS	Display segment "DP"	out
39	GND	Power source 0V	
40	X_1	Timer count clock pulse	out

14. CIRCUIT DISCRIPTIONS

-1 Oscillator Circuit

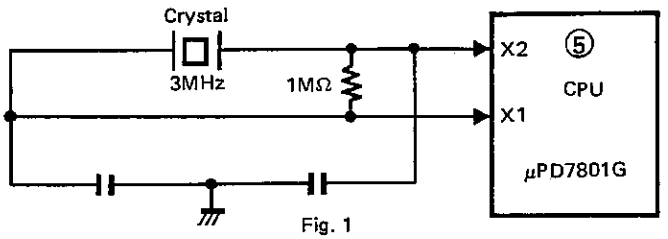


Fig. 1

The basic clock frequency is generated from a 3 MHz crystal oscillator. Output from the oscillator is connected directly to the CPU.
Waveforms for X1 and X2 are shown below:

Waveform NU: Not used

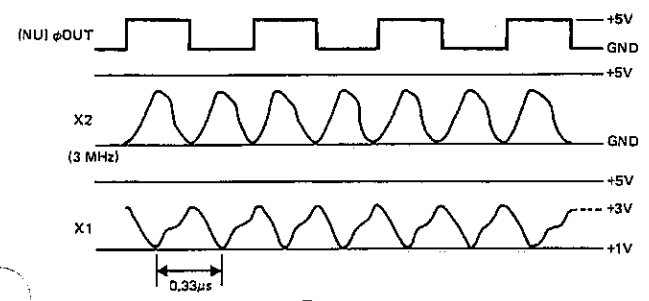


Fig. 2

14-2 POF Circuit

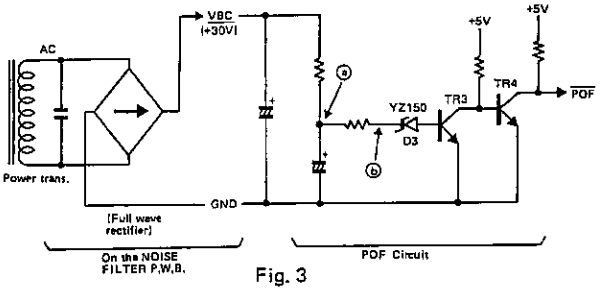


Fig. 3

POWER ON CONDITION:

When power is applied to the full wave rectifier the voltage V_{BC} goes to a high level. When V_{BC} reaches about 15V the zener diode (YZ150) will conduct.
When it conducts, the base potential of TR3 will rise turning on TR3. When TR3 is turned on, transistor TR4 will be turned off. This action will result in the signal $\overline{POF}$ going from a low to a high level.

POWER OFF CONDITION:

When power is turned off, V_{BC} will go to 0V. Below the 15V level the zener diode will cutoff. With the zener diode off, TR3 will turn off and TR4 will turn on. This will result in $\overline{POF}$ going from a high to a low level.

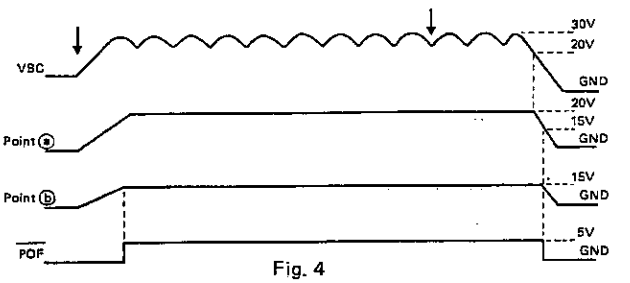


Fig. 4

14-3. Reset Circuit

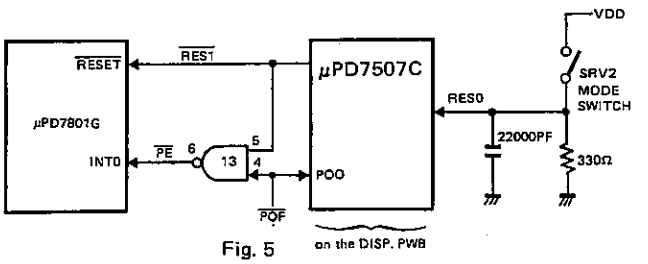


Fig. 5

TIMING CHART

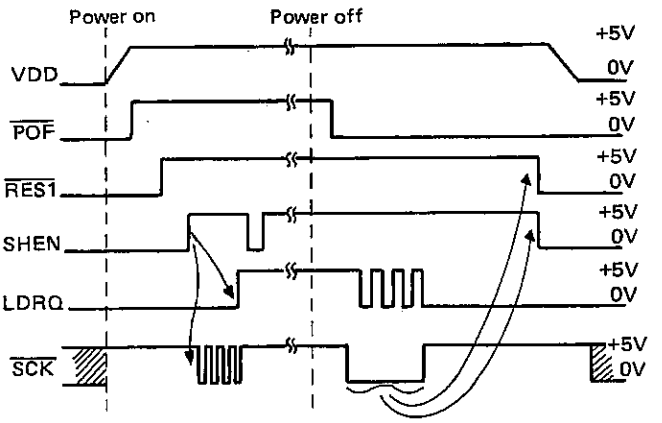


Fig. 6

(1) V_{RES} Circuit

V_{RES} is a +5V power source which is controlled by the signal $\overline{POF}$ and is developed from V_{DD}.

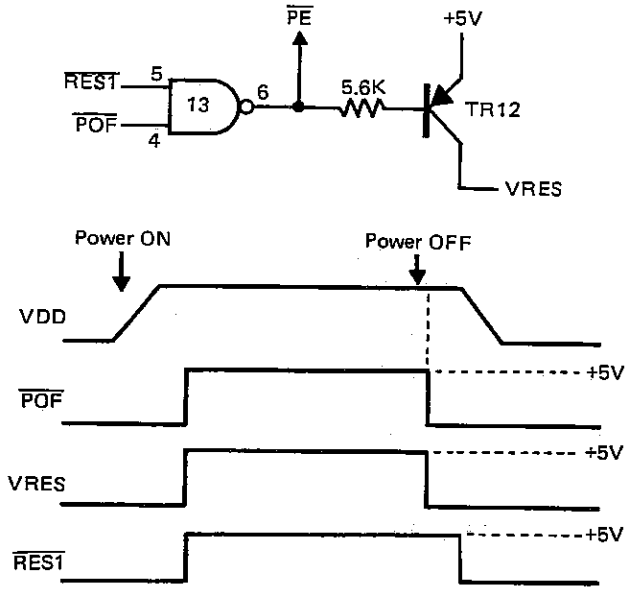


Fig. 7

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

(2) Battery Circuit

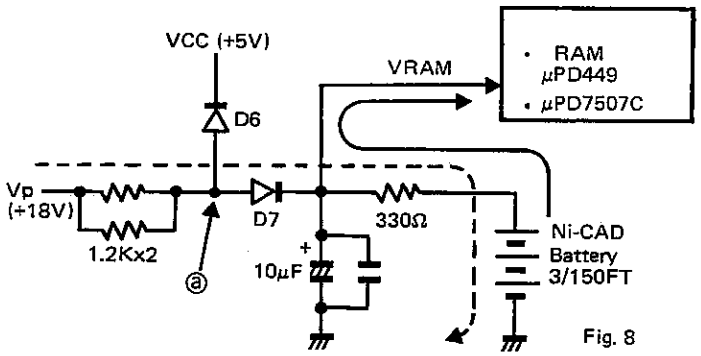


Fig. 8

⟶ : Charge current of the battery

⟶ : Discharge current of the battery

The voltage level at each point is as follows.

AC power	Point ⓐ	VRAM
OFF	0V	+3.6V
ON	+5.7V	+5V

14-4. ROM RAM Control

FOR THE DESCRIPTION OF μPD7801G (μCOM87), REFER TO CHAPTER 16 (μPD7802G) of the "CASH REGISTER BASIC MANUAL"

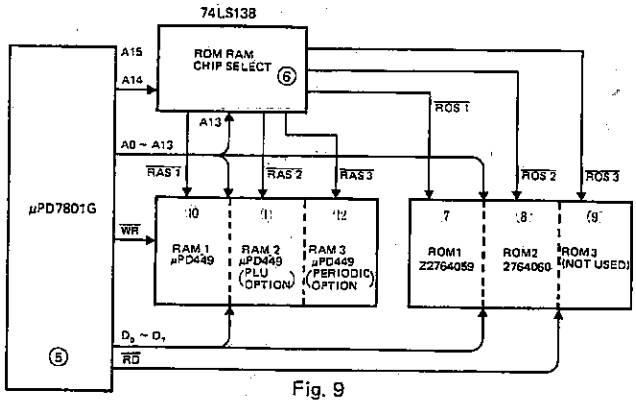


Fig. 9

$A_0 \sim A_{15}$	: Address bus
$\overline{ROS_1}$	: ROM_1 select signal
$\overline{ROS_2}$	: ROM_2 select signal
$\overline{ROS_3}$	: ROM_3 select signal
$\overline{RAS_1}$	: RAM_1 select signal
$\overline{RAS_2}$	: RAM_2 select signal
$\overline{RAS_3}$	: RAM_3 select signal
$D_0 \sim D_7$	: Data bus
$\overline{WR}$	: Write signal
$\overline{RD}$	: Read signal

14-5. The Signals Between μPD7507C-036 and μPD7801G

Timing chart:

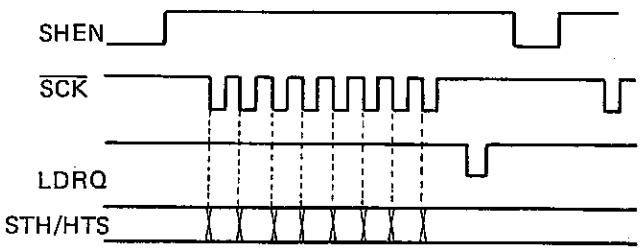


Fig. 10

SHEN: This signal indicates the fact that the data transmission from μPD7507C-036 to μPD7801G is possible.

$\overline{SCK}$: Clock for DATA Transmission.

LDRQ: This signal is output when the 8 data bits of μPD7801G have been transfered.

STH/HTS: Data line.

14-6. Key & Switch Scanning

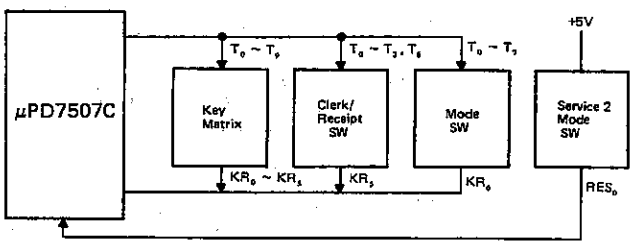


Fig. 11

$T_0 \sim T_9$	: Key scan signal
$KR_0 \sim KR_5$	: Key return signal
KR_5	: Clerk/Receipt SW return signal
KR_6	: Mode SW return signal
RES_0	: Service 2 mode SW return signal

14-7. Display Control

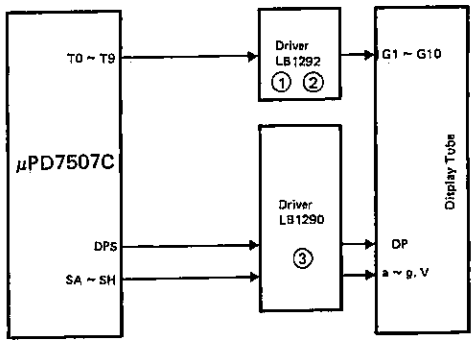


Fig. 12

T0 ~ T9: Display digit
SA ~ SH: Display segment
DPS: Decimal point
G1~G10:Display digit
a ~ g, V: Display segment
DP: display decimal point

14-8. Printer Control

(1) Block Diagram

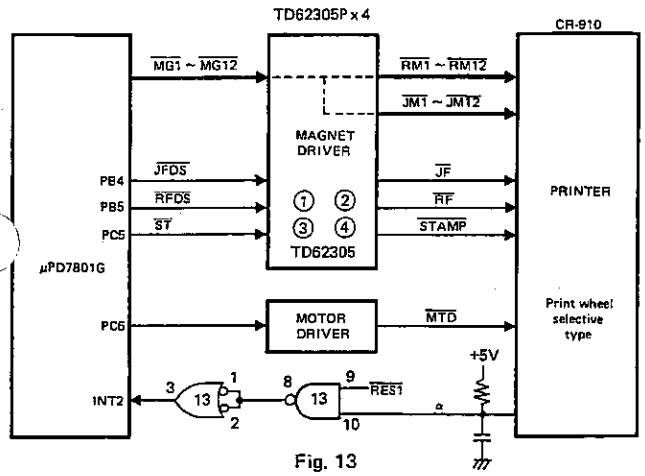


Fig. 13

SIGNAL NAME

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

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

(2) Time chart for one-line printing

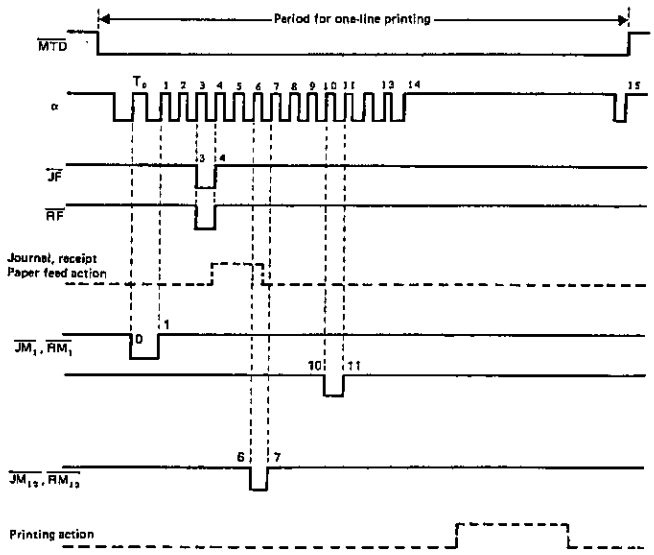


Fig. 14

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

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

14-9. Drawer Control

One drawer is furnished in each model as a standard feature ... Drawer 0

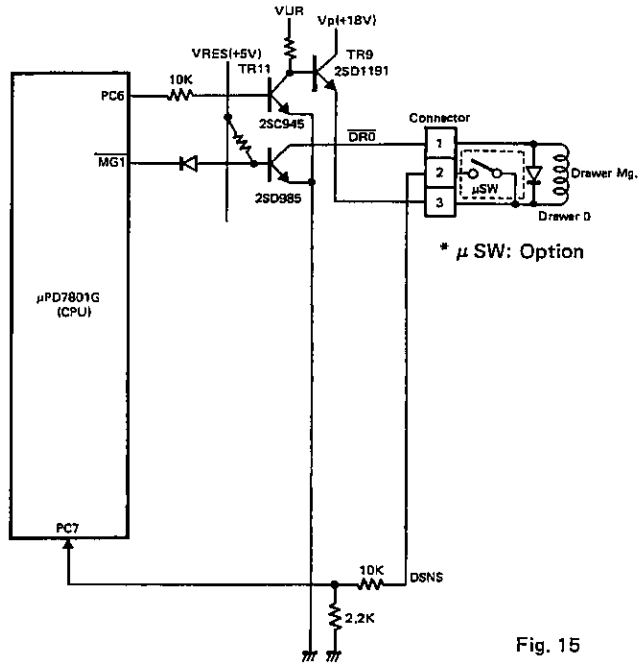


Fig. 15

DSNS SIGNAL

- When drawer is opened: High (+18V)
- When drawer is closed: Low (GND)
- Drawer open/close condition is detected by a micro-switch installed inside each drawer. DSNS is the detecting signal which comes from the drawer.

14-10. Power Supply Circuit

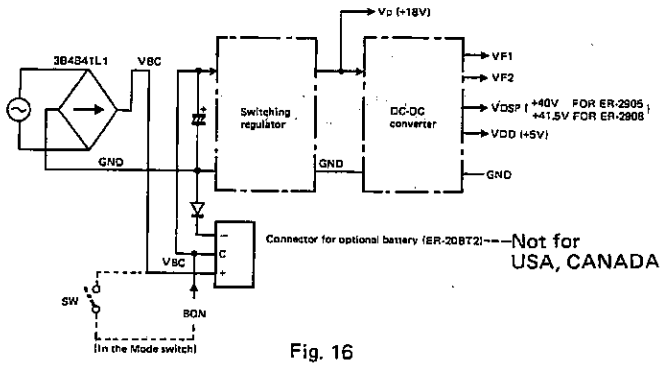


Fig. 16

Vp : For printer, drawer Mg.,
GND(P) : GND for magnets and motor.
VF1 ~ VF2: For the heater of display tube (biased at +6V)
V_{DSP} : For the display grid and plate
V_{DD} : For most of the circuits buzzer.
V_{BC} : For optional battery controller
VRAM : Power Supply for RAM
VRES : For Printer motor and magnets

(1) Vp (+18V) Power Source (Switching Regulator)

The power supply circuit consist of a Noise suppression filter, Power transformer, Rectifier, Switching regulator and DC-DC converter circuit.
When AC power is on, zener diode D4 maintains a constant 19 volt level at the base of TR5. Transistor TR5 wil then be properly biased and conduct. When TR5 conducts, TR6 becomes properly biased thru the voltage divider network, turning TR6 on. TR6 is the pass transistor supplying the +18V (Vp) to the transformer primary.
When the voltage on the Vp line increases above +18V, the potential at the emitter of TR5 also increases. As the emitter approaches the proper bias voltage, TR5 will turn off. When TR5 is cutoff, TR6 will cutoff and cause the potential at Vp to fall. When the potential at Vp decreases, TR5 will once again conduct and the cycle is then repeated.

Switching Regulator Circuit

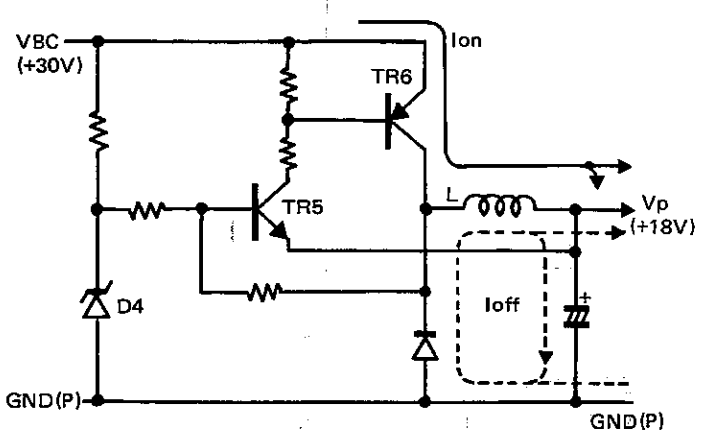


Fig. 17

Waveforms

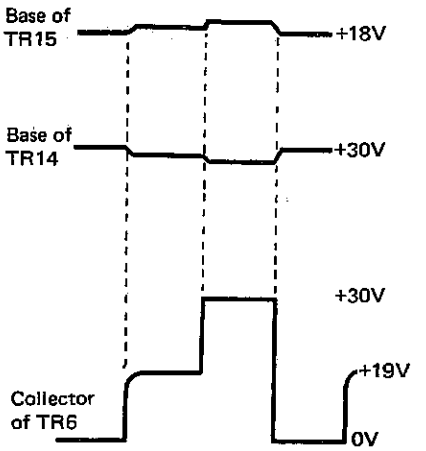


Fig. 18

The power is supplied intermittently to the coil L from the V_{BC} by the switching action of TR6 to obtain DC power (Vp) via the LC network. The output Vp is held to a constant voltage by controlling the ratio of on/off period of TR6.

I_{on}: the current when TR6 is turned on.
I_{off}: the current when TR6 is turned off (induced counter electromotive force of L).

FOR THE DC-DC CONVERTER CIRCUIT DESCRIPTION, PLEASE REFER TO CHAPTER 8-1-4 OF TH "CASH REGISTER BASIC MANUAL".