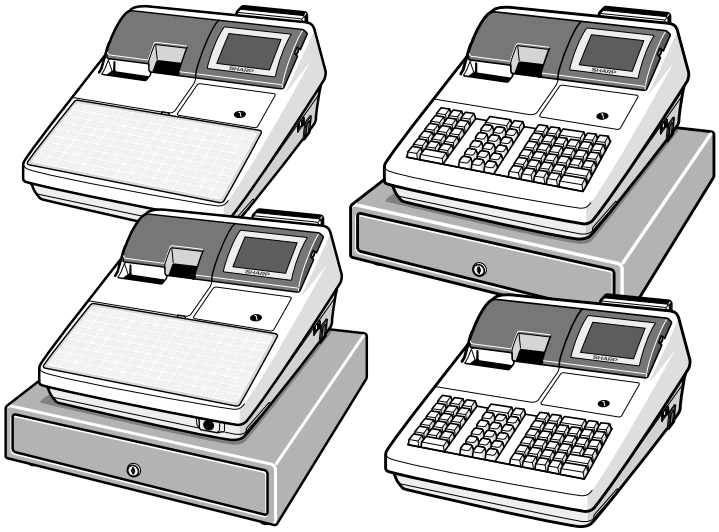
SHARP SERVICE MANUAL

CODE : 00ZUP600VSM/E



UP-700 UP-600

MODEL UP-600 UP-700

SRV Key : LKGIM7113RCZZ
PRINTER : PR-58HA
(For "V" version)

CONTENTS

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

SHARP CORPORATION

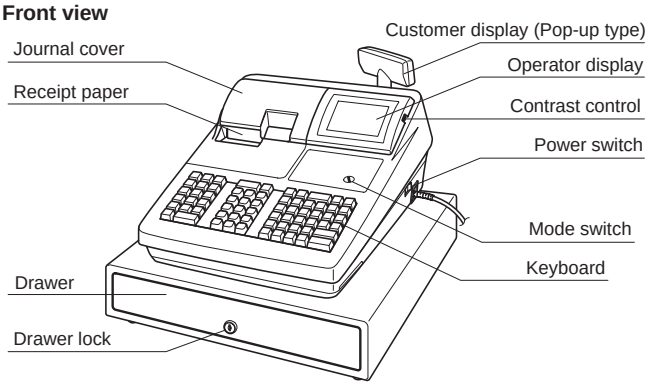
CHAPTER 1. SPECIFICATION

1. APEARANCE

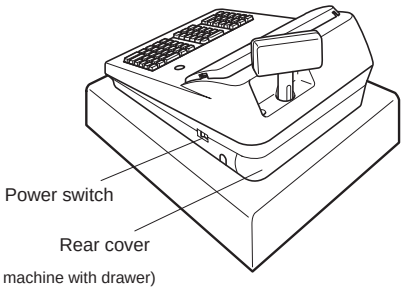
External view

<UP-600>

Front view



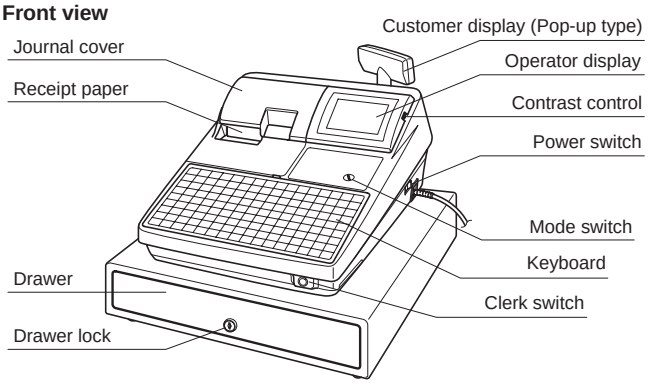
Rear view



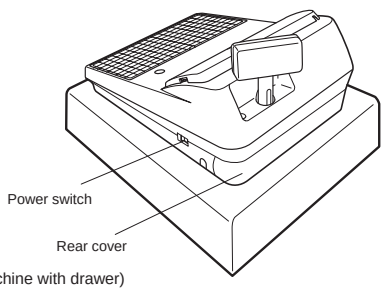
(The machine with drawer)

<UP-700>

Front view



Rear view



(The machine with drawer)

2. RATING

	UP-600	UP-700
External dimensions : With a drawer (With the pop-up displayed housed)	420 (W) x 448 (D) x 306 (H) mm	
External dimensions : Without a drawer (With the pop-up displayed housed)	340 (W) x 433 (D) x 202 (H) mm	
Weight : With a drawer	15.0kg	
Weight : Without a drawer	7.0kg	
Power source	Official (normal) voltage and frequency	
Power consumption	Stand-by : 18 W Operating : 68 W (max.)	
Working temperatures	0 to 40 °C	

∗ TQ, TR, TS version : Without a drawer.

∗ KA, KB version : With a drawer.

∗ The height of the ECR is 50 mm higher when the pop-up display is pulled up.

3. KEYBOARD

1) STANDARD KEYBOARD LAYOUT

<UP-600>

RECEIPT	JOURNAL	RCPT		PLU/EAN	AMT		CUST	REPEAT	PRICE CHANGE		INQ	CASH #
MISC FUNC	CANCEL	ENTER		⊗	•	CL	5	10	15	20	AUTO 1	AUTO 2
PAGE UP	↑	PAGE DOWN		7	8	9	4	9	14	19	EX #	CHARGE
←	↓	→		4	5	6	3	8	13	18	CH #	CR #
RA	PO	#/TM		1	2	3	2	7	12	17	ST	
RF	∞			0	00	000	1	6	11	16	TL	

<UP-700>

RECEIPT	JOURNAL	G.C. RCPT	AUTO 1	TEXT #	9	18	27	36	45	54	63	72	81	90	99
MISC FUNC	CANCEL	ENTER	AUTO 2	LEVEL #	8	17	26	35	44	53	62	71	80	89	98
PAGE UP	↑	PAGE DOWN	VAT SHIFT	EX #	7	16	25	34	43	52	61	70	79	88	97
←	↓	→	PLU/ SUB	∞	6	15	24	33	42	51	60	69	78	87	96
⊗	•	CL	BS	RECALL GLU	5	14	23	32	41	50	59	68	77	86	95
7	8	9	OPENED GLU	GLU	4	13	22	31	40	49	58	67	76	85	94
4	5	6	CH #	NBAL	3	12	21	30	39	48	57	66	75	84	93
1	2	3	CR #	FINAL	2	11	20	29	38	47	56	65	74	83	92
00	0	000	ST	TL	1	10	19	28	37	46	55	64	73	82	91

2) KEY TOP NAME

① Standard key top

KEY TOP	DESCRIPTION	UP-600	UP-700
0-9, 00, 000	Numeric keys	○	○
●	Decimal Point key	○	○
CL	Clear key	○	○
⊗	Multiplication key	○	○
RECEIPT ↑	Receipt paper feed key	○	○
JOURNAL ↑	Journal paper feed key	○	○
PAGE UP	Page up key	○	○
PAGE DOWN	Page down key	○	○
RA	Received-on-account key	○	-
PO	Paid-out key	○	-
MISC FUNC	Miscellaneous function key	○	○
#/TM	Non-add code / Date & time key	○	-
CANCEL	Cancel key	○	○
← → ↑ ↓	Cursor keys	○	○
ENTER	Enter key	○	○
EX#	Foreign currency exchange menu key	○	○
RF	Refund Key	○	-
CASH#	Cashier code entry key	○	-
RCPT	Receipt print Key	○	-
∞	Void Key	○	○
PLU/EAN	PLU/EAN code entry key	○	-
PLU/SUB	PLU/SUB dept. code entry key	-	○
AMT	Amount entry key	○	-
(Dept) 1 to 20	DeparTent 1 to 20 keys	○	-
(D-PLU) 1 to 99	Direct PLU 1 to 99 keys	-	○
PRICE CHANGE	Price Change key	○	-
INQ	Inquiry key	○	-
REPEAT	Repeat entry key	○	-
AUTO1, 2	Automatic sequencing1 and 2 keys	○	○
CR#	Credit Menu Key	○	○
CH#	Check Menu Key	○	○
ST	Subtotal Key	○	○
TL	Total Key	○	○
CUST	Customer Code entry key	○	-
CHARGE	Tentative Finalization key	○	-
FINAL	Tentative finalization key	-	○
TEXT#	Text Menu key	-	○
LEVEL#	PLU level shift key	-	○
OPENED GLU	Opened GLU list key	-	○
GLU	Guest Look-up key	-	○
NBAL	New Balance key	-	○
RECALL GLU	Recall GLU key	-	○
G.C.RCPT	Guest Check Receipt key	-	○
BS	Bill Separate key	-	○
VAT SHIFT	TAX Shift Key	-	○

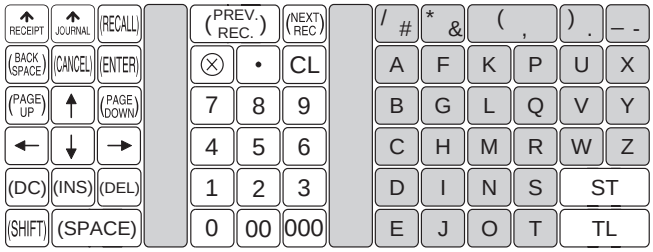
② Optional key top

KEY TOP	DESCRIPTION	UP-600	UP-700
BACK SPACE	Back space key	○	○
(D-PLU) 1 to 89	Direct PLU 1 to 89 Keys	○	-
(D-PLU) 100 to 123	Direct PLU 100 to 123 Keys	-	○
(Dept) 21 to 99	Department 21 to 99 Keys	○	-
(Dept) 1 to 99	Department 1 to 99 Keys	-	○
TEXT 1 to 10	Text 1 to 10 keys	○	○
%1 to 5	Percent 1 to 5 keys	○	○
(-) 1 to 5	Discount 1 to 5 keys	○	○
CR1 to 9	Credit 1 to 9 keys	○	○
CA#	Cash menu key	○	-
CA2 to 5	Cash total 2 to 5 keys	○	○
EX1 to 9	Foreign currency exchange 1 to 9 keys	○	○
RA1 to 2	Received-on-Account 1 and 2 keys	-	○
RA2	Received-on-Account 2 key	○	-
PO1 to 2	Paid out key 1 and 2 keys	-	○
PO2	Paid out key 2 key	○	-
AUTO3 to 10	Automatically Entry 3 to 10 Keys	○	○
CH1 to 5	Check 1 to 5 keys	○	○
FINAL	Tentative finalization key	○	-
P-SHIFT#	Price level shift number key	○	○
LEVEL#	PLU level shift key	○	-
GUEST#		○	-
OPENED GLU	Opened GLU list key	○	-
GLU	Guest Look-up key	○	-
NBAL	New Balance key	○	-
CASH TIP	Cash tip key	○	○
NON-CASH TIP	Non-cash tip key	○	○
TIP PAID	Tip paid key	○	○
12	1/2 key	○	○
NS	No sale key	○	○
CLERK#	Clerk code entry key	○	○
SCALE	Scale entry key	○	○
OPEN TARE	Tare entry key	○	○
SLIP	Slip printer key	○	○
RCP SW	Receipt ON/OFF key	○	○
PINT	Pint key	○	○
DEPO (+)	Deposit plus entry key	○	○
DEPO (-)	Deposit minus entry key	○	○
DEPT#	Department number key	○	○
TEXT#	Text number key	○	-
WITH	With key	○	○
WITH OUT	Without key	○	○
G.C. RCPT	Guest check receipt key	○	-
TRANS OUT	Transfer out key	○	○
TRANS IN	Transfer in key	○	○

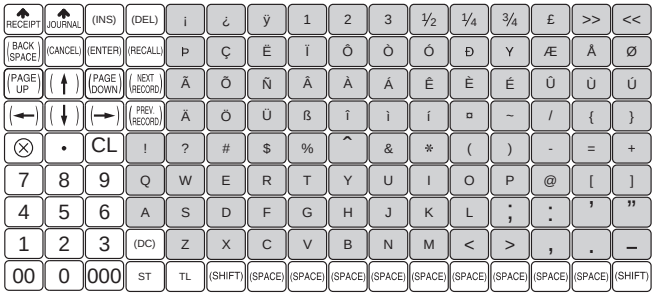
KEY TOP	DESCRIPTION	UP-600	UP-700
RCP SW	Receipt shift key	○	○
BS	Bill separation key	○	-
BT	Bill totalize / bill transfer key	○	○
VP	Validation print key	○	○
RTN	Return key	○	○
DIFFER ST	Difference subtotal key	○	○
VAT	Value-added tax key	○	○
VAT SHIFT	Value-added tax shift key	○	-
GC COPY	Guest check copy key	○	○
VIP1 to 3	VIP sale 1 to 3 keys	○	○
CLK1 to 10	Clerk entry 1 to 10 keys	○	○
CHK PRINT	Check print key	○	○
L1 to 3	PLU level shift 1 to 3 keys	○	○
PRICE SHIFT1 to 3	Price level shift 1 to 3 keys	○	○
PLU MENU01 to 25	PLU menu 1 to 25 keys	○	○
C_NEXT	Condiments next key	○	○
E.BILL	Entertaiment bill key	○	○
RECALL GLU	Recall total status key	○	-
S.SFT	Sort group shift key	○	○
DEL	Delete key	○	○
RF	Refund key	-	○
AMT	Amount entry key	-	○
#/TM	Non-add code / Date & Time display key	-	○
CASH#	Cashier code entry key	-	○
RCPT	Receipt print key	-	○
REPEAT	Repeat key	-	○
INQ	Inquiry key	-	○
CUST	Customer code entry key	-	○
PRICE CHANGE	EAN price change key	-	○
CHARGE	Charge key	-	○

3) TEST PROGRAMMING KEY SHEET LAYOUT

<UP-600 : Keyboard cover type>



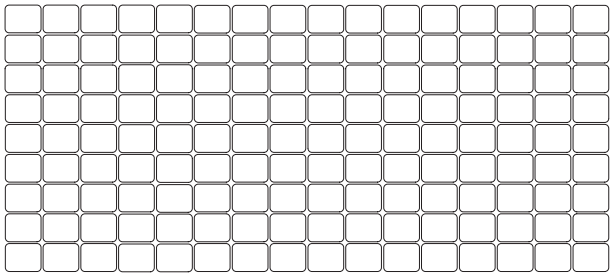
<UP-700 : Keyboard sheet type>



: The shaded area contains the character keys which are used for programming characters.

KEY TOP	DESCRIPTION
SHIFT	Used for programming characters. For more information about programming characters, see the section "How to Enter Alphanumeric Characters."
DC	
INS	
DEL	
BACK SPACE	
→ ← ↑ ↓	Used to move the cursor.
ENTER	Used to program each setting.
TL	Used to finalize programming.
CANCEL	Used to cancel programming and to get back to the previous screen.
PREV RECORD	Used to go back to the previous record, e.g. from the department 2 programming window back to the department 1 programming window.
NEXT RECORD	Used to go to the next record, for example, in order to program unit prices for sequential departments.
PAGE DOWN	Used to scroll the window to go to the next page.
PAGE UP	Used to scroll the window to go back to the previous page.
CL	Used to clear the last setting you have programmed or clear the error state.
●	Used to toggle between two or more options.
ST	Used to list those options which you can toggle by the [●] key.
RECALL	Used to call up a desired code.
Numeric keys	Used for entering figures.

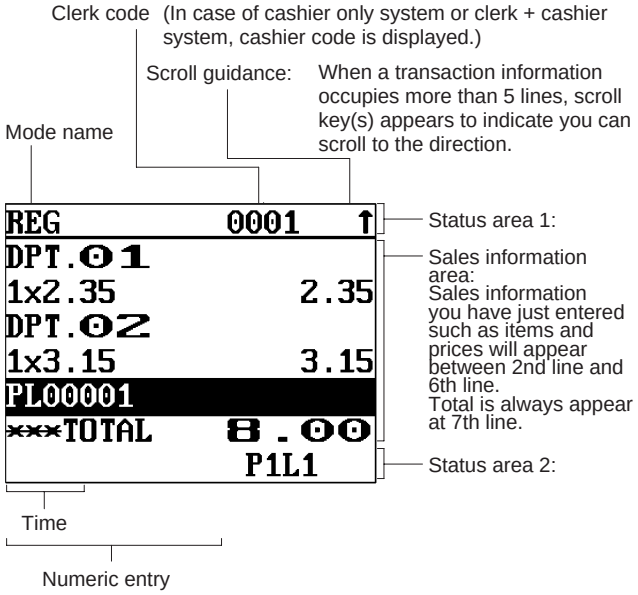
4) BLANK KEY SHEET LAYOUT (Only for UP-700)



3. DISPLAY

1) OPERATOR DISPLAY

- Screen example 1 (REG mode)



Price level shift indicator (P1-P3) : Shows the PLU/EAN price level currently selected.

PLU level shift indicator (L1-L3) : Shows the PLU level currently selected.

Receipt shift indicator (r) : Shows the receipt shift status.

T-Log near full indicator (■) : Appears (■) when the used memory is 80%.

: Appears (■) when the used memory is 90%.

: Appears (■) when the used memory is 95%.

Stock alarm indicator (!) : Appears when the stock of the PLU which you entered is zero, negative or reaches the minimum stock.

VAT shift status indicator (V) : Appears when the VAT status is shifted.

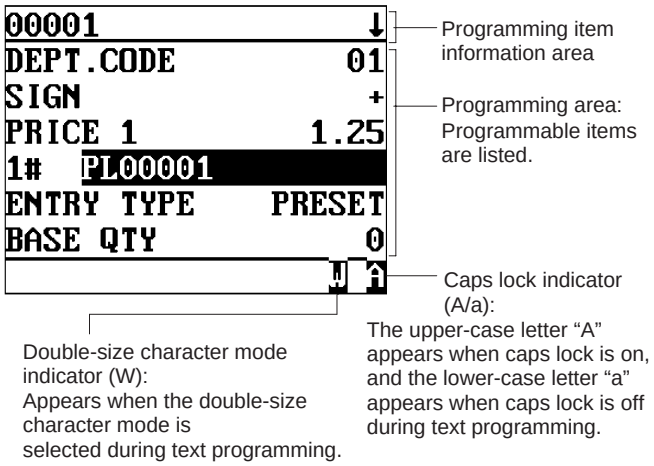
Electronic mail indicator (M) : Appears when an electronic mail is received. (Status 1 area)

Receipt ON/OFF status indicator (R) : Appears when the receipt ON-OFF function signs OFF.

Sentinel mark (X) : Appears in the lower right corner of the screen when the cash in drawer exceeds a programmed sentinel amount. The sentinel check is performed for the total cash in drawer.

VMP file full indicator (1,2, or 3) : When a VMP file used memory is 90% or more, its file number is indicated.

- Screen example 2 (PGM mode)



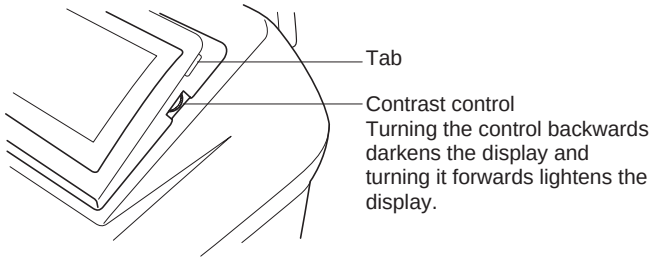
Screen save mode

When you want to save the electric power or save the display's life, use the screen save function. This function can turn the LCD off when any server does not operate the POS terminal for an extended period of time. You can program the time for which your POS terminal should keep the normal status (in which the backlight is "ON") before it goes into the screen save mode.
To go back to the normal mode, press any key.

Device type	LCD display
Dot format	320(W) x 240(H) Full dot
Dot size	0.24 (W) x 0.21 (H) mm
Dot space	0.02 mm
Dot color	White
Back color	Dark blue

2) DISPLAY ADJUSTMENT (OPERATION DISPLAY)

You can adjust the contrast of the display by using the contrast control, and also you can adjust the display angle. Pull up the tab, the display will head up.

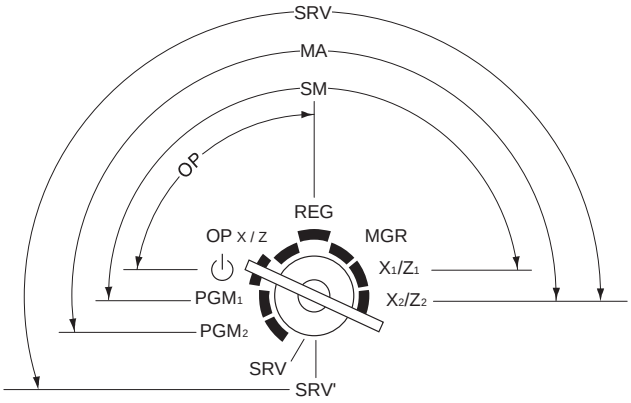


The backlight in the display is a consumable part.
When the LCD display may no longer be adjusted and becomes darker, you should change the backlight.
Consult your authorized SHARP dealer for further details.

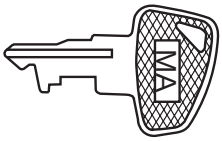
3) CUSTOMER DISPLAY (Pop-up-type)

4. KEYS AND SWITCHES

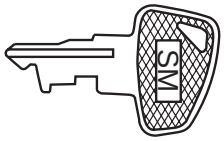
1) MODE SWITCH AND MODE KEYS



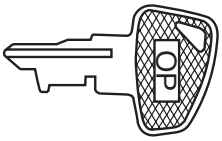
• Manager key (MA)



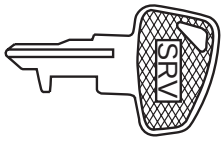
• Submanager key (SM)



• Operator key (OP)



• Service key (SRV)



The mode switch has these settings:

⏻: This mode locks all register operations. No change occurs to register data.

OP X/Z: This setting allows cashiers/clerks to take X or Z reports for their sales information. (This setting may be used only when your register has been programmed for "OP X/Z mode available" in the PGM2 mode.)

REG: For entering sales

PGM1: To program those items that need to be changed often: e.g., unit prices of departments, PLUs or EANs, and percentages

PGM2: To program all PGM1 items and those items that do not require frequent changes: e.g., date, time, or a variety of register functions

MGR: For manager's and submanager's entries
The manager can use this mode to make entries that are not permitted to be made by cashiers -for example, after-transaction voiding and override entry.

X1/Z1: To take the X/Z report for various daily totals

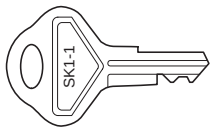
X2/Z2: To take the X/Z report for various periodic (weekly or monthly) consolidation

2) CLERK KEYS (Standard for the UP-700)

This POS terminal allows the operator to use clerk keys (real clerk keys) for clerk identification.
12 real clerk keys are provided with your POS terminal, and a maximum 126 real clerk keys can be provided.

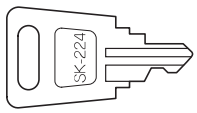
3) DRAWER LOCK KEY

This key locks and unlocks the drawer. To lock it, turn 90 degrees counterclockwise. To unlock it, turn 90 degrees clockwise.
(In case your POS terminal has not the drawer supplied by SHARP, this key is not supplied.)



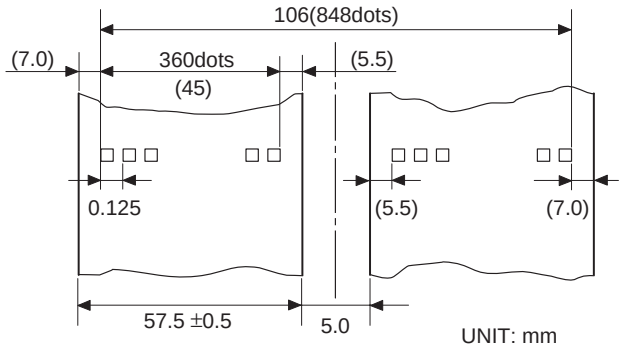
4) PRINTER COVER LOCK KEY

This key locks and unlocks the printer cover. To lock it, turn 90 degrees counterclockwise. To unlock, turn 90 degrees clockwise.

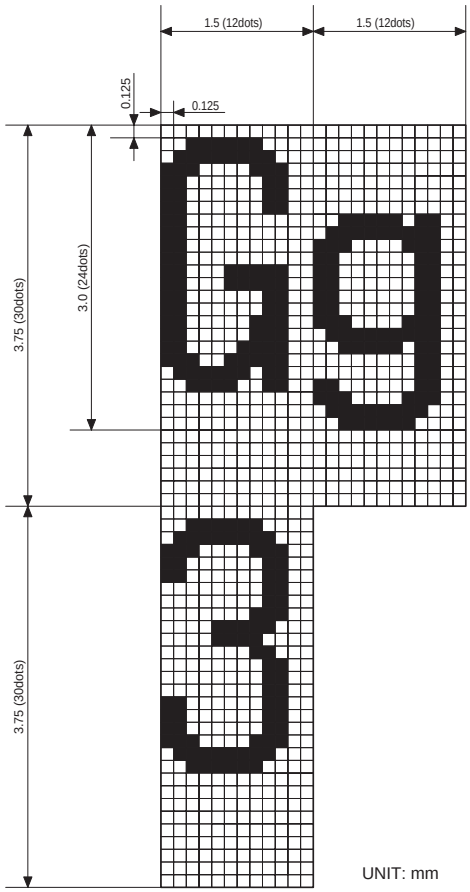


5. PRINTER

1) PRINTER (PR-58HA)

Item	Description	
No. of station	2: Receipt and Journal	
Validation	No	
Printing system	Line thermal	
No. of dot	Receipt:	360 dots
	Journal	360 dots
Dot pitch	Horizontal:	0.125 mm
	Vertical:	0.125 mm
Font	10 dots (W) x 24 dots (H)	
Printing capacity	Receipt:	Max. 30 characters
	Journal:	Max. 30 characters
Character size	1.25 mm (W) x 3.0 mm (H):	At 10 x 24 dots
Print pitch	Column distance:	1.5 mm
	Row distance:	3.75 mm
Paper feed speed	Approximate 65 mm/s	
Reliability	Mechanism:	MCBF 5 milion lines
Paper end sensor	Yes (Receipt and Journal)	
Cutter	Auto	
Paper near end sensor	No	
Printing area		

Item	Description
Printing format	12 x 24 font



2) AUTOCUTTER

Item	Description
Cutting method	• Full cutting (excluding 4 points) • Partial cutting (excluding 3 points)
Cuttable thickness	Thermal paper: 60 - 80 μ mm
Cuttable width	57.5 ± 0.5 mm
Reliability	Life: 300,000 times

3) PAPER

Item	Description
Name	Heat-quality paper
Roll dimension	57.5 ± 0.5 mm in width
Thickness	0.06 mm to 0.08 mm

6. DRAWER (Used for only KA and KB version)

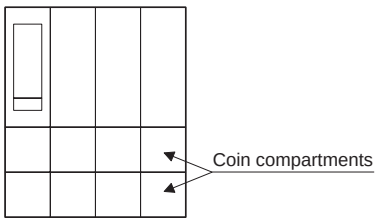
1) SPECIFICATION

(1) Drawer box and drawer

Model name	SK-423
Size	420 (W) x 427 (L) x 114 (H)
Color	GRAY 368
Material	Metal
Bell	—
Release lever	Standard equipment; Situated at the bottom
Drawer open sensor	Standard equipment

2) MONEY CASE

Separation from the drawer	Allowed
Separation of the coin compartments from the money case	Allowed
Bill separator	Standard (1 pcs)
Number of compartments	4B/8C



4B/8C

3) LOCK

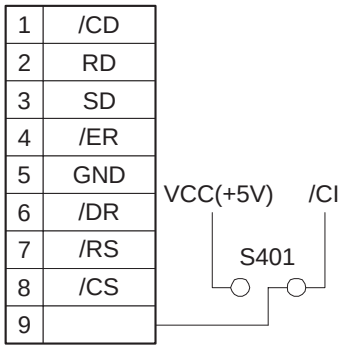
Location of the lock	Front	
Method of locking and unlocking	Locking:	Insert the drawer lock key into the lock and turn it 90 degrees counterclockwise.
	Unlocking:	Insert the drawer lock key into the lock and turn it 90 degrees clockwise.
Key No.	SK1-1	

7. RS232 INTERFACE

This machine have two the RS232 standard port for the communication to PC, Hand scanner (ER-A6HS1) and etc.

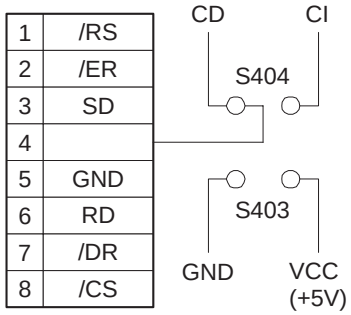
1) PORT 1 (CH1) (CN402)

Connector type: D-SUB 9pin
Data rate: max. 38,400 bps



2) PORT2 (CH2) (CN403)

Connector type: Modular jack RJ45 8pin
Data rate: max. 115,200 bps



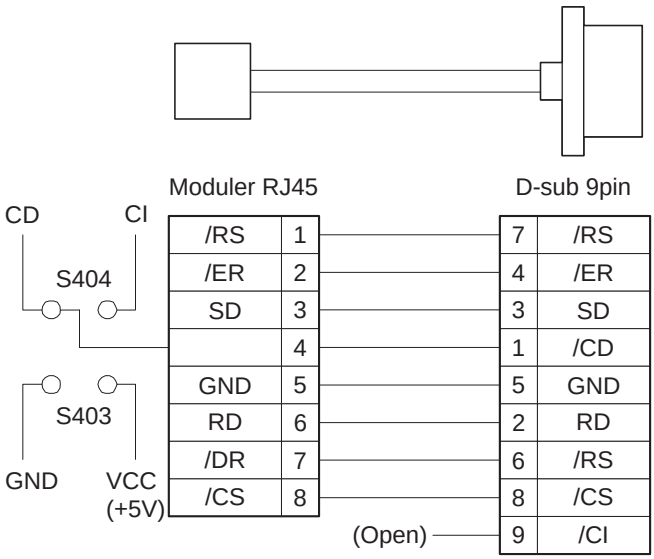
3) OPTIONAL DEVICES THAT CAN BE CONNECTED

	Standard port		Option port (ER-A5RS, ER-01EF)	
Port No.	Port1: CH1	Port2: CH2	Port3:	Port4:
Type	D-SUB 9pin	Moduler RJ45	D-SUB 9pin	D-SUB 9pin
CI/+5V selectable	○	–	○	○
ER-A6HS1 (+5V necessary)	○	–	○	○
Scanner (+5V not necessary)	○	○	○	○
Modem	○	–	○	○
PC	○	○	○	○
Printer, Scale	○	○	○	○
POS utility, 02fd.exe	–	○	–	–

∗ The ER-A6HS1 cannot be connected to port 2 because it requires +5V.

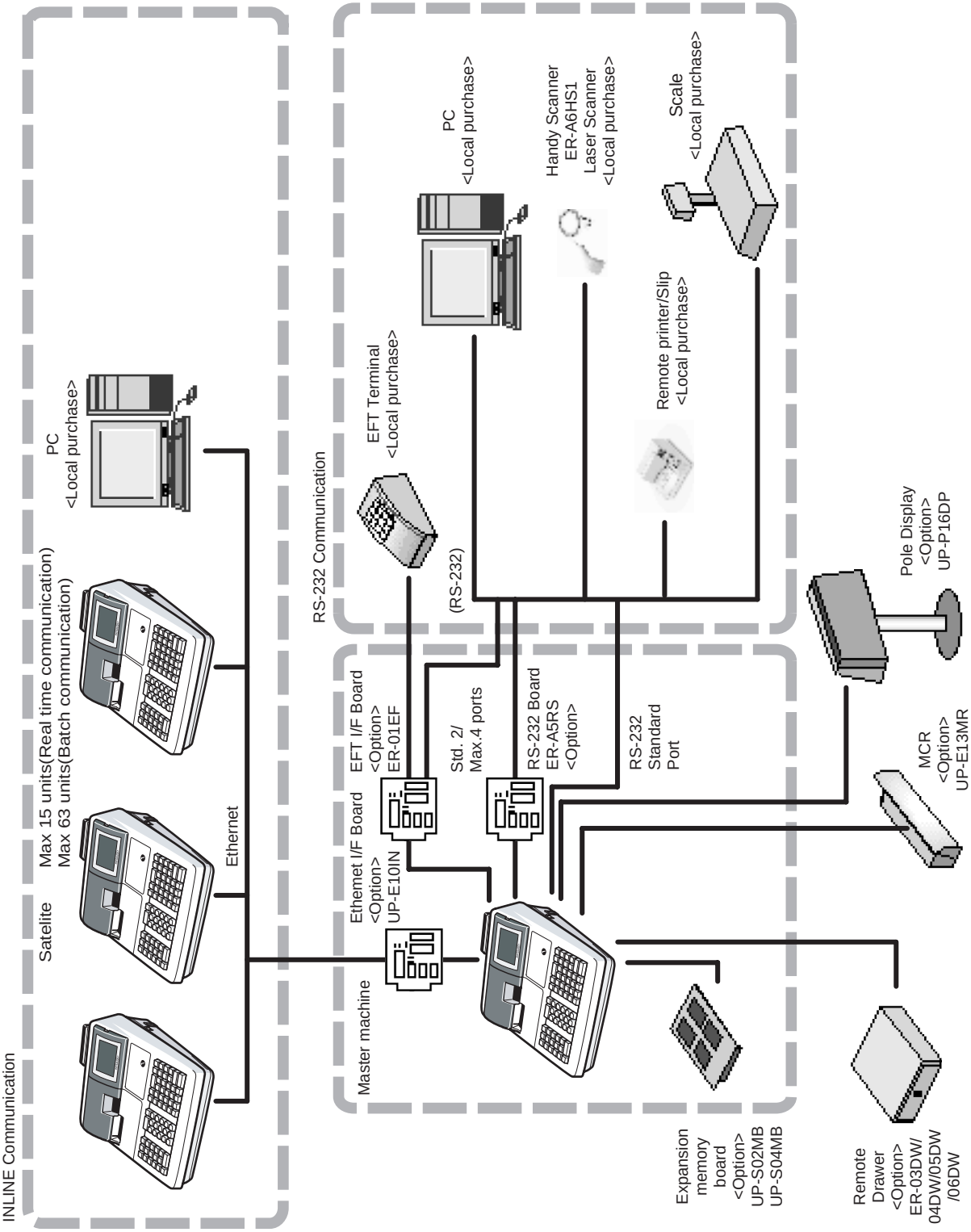
∗ The modem cannot be connected to port 2 because it uses a different signal line.

∗ For the conversion cable for the D-sub 9 pin and modular RJ-45, see the following.



CHAPTER 2. OPTIONS

1. System configuration



2. SALES OPTIONS

No.	CLASSIFICATION	COMPONENT NAME	MODEL NAME	REMARK
1	Memory	Expansion RAM board	UP-S02MB	2M bytes PS-RAM board
			UP-S04MB	4M bytes PS-RAM board
2	Display	Remote display (Pole type)	UP-P16DP	11-Dig.7-Seg. + 16-Dig.Dot
3	Drawer	Remote drawer	ER-03DW	
			ER-04DW	
			ER-05DW	
		Coin case	ER-48CC2	4B/8C
			ER-48CC3	4B/8C
			ER-58CC2	5B/8C
		Coin case cover	ER-01CV1-5	
			ER-02CV1-5	
			ER-03CV	
4	On-line function	RS232 I/F board	ER-A5RS	2 ports RS232 I/F
5	In-line funnction	In-line I/F	UP-E10IN	Ethernet I/F
6	Card reader	MCR (Magnetic Card Reader)	UP-E13MR	ISO Type 1 : 3 stripe card
7	EFT function	EFT terminal I/F	ER-01EF	
8	Scanner	Barcord hand scanner	ER-A6HS1	
9	Key kit	1 x 1 key top kit	ER-11KT7	
		1 x 2 key top kit	ER-12KT7	
		2 x 2 key top kit	ER-22KT7	
		1 x 1 dummy key top kit	ER-11DK7G	
		5 x 1 dummy key top kit	ER-51DK7G	

3. LOCAL PURCHASE OPTIONS

No.	COMPONENT NAME	MODEL NAME	
1	External printer	TM-T85/T88/T88(2)	
		TM-U210	
2	Slipprinter	TM-295	
3	Scale I/F		

4. SERVICE OPTIONS

No.	NAME	PARTS CODE	PRICE	DESCRIPTION
1	1 hole clerk key The key No.1 to No.12 ore supplied together with UP-700.	LKGiM1004BH13	BH	Key No. 13
		LKGiM1004BH14	BH	Key No. 14
		LKGiM1004BH15	BH	Key No. 15
		LKGiM1004BH16	BH	Key No. 16
		LKGiM1004BH17	BH	Key No. 17
		LKGiM1004BH18	BH	Key No. 18
		LKGiM1004BH19	BH	Key No. 19
		LKGiM1004BH20	BH	Key No. 20
		LKGiM1004BH21	BH	Key No. 21
		LKGiM1004BH22	BH	Key No. 22
		LKGiM1004BH23	BH	Key No. 23
		LKGiM1004BH24	BH	Key No. 24
		LKGiM1004BH25	BH	Key No. 25
		LKGiM1004BH26	BH	Key No. 26
		LKGiM1004BH27	BH	Key No. 27
		LKGiM1004BH28	BH	Key No. 28
		LKGiM1004BH29	BH	Key No. 29
		LKGiM1004BH30	BH	Key No. 30
		LKGiM1004BH31	BH	Key No. 31
		LKGiM1004BH32	BH	Key No. 32
		LKGiM1004BH33	BH	Key No. 33
		LKGiM1004BH34	BH	Key No. 34
		LKGiM1004BH35	BH	Key No. 35
		LKGiM1004BH36	BH	Key No. 36
		LKGiM1004BH37	BH	Key No. 37
		LKGiM1004BH38	BH	Key No. 38
		LKGiM1004BH39	BH	Key No. 39
		LKGiM1004BH40	BH	Key No. 40
		LKGiM1004BH41	BH	Key No. 41
		LKGiM1004BH42	BH	Key No. 42
		LKGiM1004BH43	BH	Key No. 43
		LKGiM1004BH44	BH	Key No. 44
		LKGiM1004BH45	BH	Key No. 45
		LKGiM1004BH46	BH	Key No. 46
		LKGiM1004BH47	BH	Key No. 47
		LKGiM1004BH48	BH	Key No. 48
		LKGiM1004BH49	BH	Key No. 49
		LKGiM1004BH50	BH	Key No. 50
		LKGiM1004BH51	BH	Key No. 51
		LKGiM1004BH52	BH	Key No. 52
		LKGiM1004BH53	BH	Key No. 53
		LKGiM1004BH54	BH	Key No. 54
		LKGiM1004BH55	BH	Key No. 55
		LKGiM1004BH56	BH	Key No. 56
		LKGiM1004BH57	BH	Key No. 57
		LKGiM1004BH58	BH	Key No. 58
		LKGiM1004BH59	BH	Key No. 59
		LKGiM1004BH60	BH	Key No. 60
		LKGiM1004BH61	BH	Key No. 61
		LKGiM1004BH62	BH	Key No. 62
		LKGiM1004BH63	BH	Key No. 63
		LKGiM1004BH64	BH	Key No. 64
		LKGiM1004BH65	BH	Key No. 65
		LKGiM1004BH66	BH	Key No. 66
		LKGiM1004BH67	BH	Key No. 67
		LKGiM1004BH68	BH	Key No. 68
		LKGiM1004BH69	BH	Key No. 69
		LKGiM1004BH70	BH	Key No. 70

No.	NAME	PARTS CODE	PRICE	DESCRIPTION
1	1 hole clerk key The key No.1 to No.12 ore supplied together with UP-700.	LKGiM1004BH71	BH	Key No. 71
		LKGiM1004BH72	BH	Key No. 72
		LKGiM1004BH73	BH	Key No. 73
		LKGiM1004BH74	BH	Key No. 74
		LKGiM1004BH75	BH	Key No. 75
		LKGiM1004BH76	BH	Key No. 76
		LKGiM1004BH77	BH	Key No. 77
		LKGiM1004BH78	BH	Key No. 78
		LKGiM1004BH79	BH	Key No. 79
		LKGiM1004BH80	BH	Key No. 80
		LKGiM1004BH81	BH	Key No. 81
		LKGiM1004BH82	BH	Key No. 82
		LKGiM1004BH83	BH	Key No. 83
		LKGiM1004BH84	BH	Key No. 84
		LKGiM1004BH85	BH	Key No. 85
		LKGiM1004BH86	BH	Key No. 86
		LKGiM1004BH87	BH	Key No. 87
		LKGiM1004BH88	BH	Key No. 88
		LKGiM1004BH89	BH	Key No. 89
		LKGiM1004BH90	BH	Key No. 90
		LKGiM1004BH91	BH	Key No. 91
		LKGiM1004BH92	BH	Key No. 92
		LKGiM1004BH93	BH	Key No. 93
		LKGiM1004BH94	BH	Key No. 94
		LKGiM1004BH95	BH	Key No. 95
		LKGiM1004BH96	BH	Key No. 96
		LKGiM1004BH97	BH	Key No. 97
		LKGiM1004BH98	BH	Key No. 98
		LKGiM1004BH99	BH	Key No. 99
		LKGiM1004BH00	BH	Key No. 100
		LKGiM1004BHA1	BH	Key No. 101
		LKGiM1004BHA2	BH	Key No. 102
		LKGiM1004BHA3	BH	Key No. 103
		LKGiM1004BHA4	BH	Key No. 104
		LKGiM1004BHA5	BH	Key No. 105
		LKGiM1004BHA6	BH	Key No. 106
		LKGiM1004BHA7	BH	Key No. 107
		LKGiM1004BHA8	BH	Key No. 108
		LKGiM1004BHA9	BH	Key No. 109
		LKGiM1004BHA0	BH	Key No. 110
		LKGiM1004BHB1	BH	Key No. 111
		LKGiM1004BHB2	BH	Key No. 112
		LKGiM1004BHB3	BH	Key No. 113
		LKGiM1004BHB4	BH	Key No. 114
		LKGiM1004BHB5	BH	Key No. 115
		LKGiM1004BHB6	BH	Key No. 116
		LKGiM1004BHB7	BH	Key No. 117
		LKGiM1004BHB8	BH	Key No. 118
		LKGiM1004BHB9	BH	Key No. 119
		LKGiM1004BHB0	BH	Key No. 120
		LKGiM1004BHC1	BH	Key No. 121
		LKGiM1004BHC2	BH	Key No. 122
		LKGiM1004BHC3	BH	Key No. 123
		LKGiM1004BHC4	BH	Key No. 124
		LKGiM1004BHC5	BH	Key No. 125
		LKGiM1004BHC6	BH	Key No. 126
2	Mode key grip cover	LKGiM7126BHZZ	AX	For MA key only
3	Dripproof keyboard cover	GCOVB7109BHZZ	BF	For UP-600 only
4	Dripproof mode switch cover	GCOVB7108BHZZ	BA	
5	Text preset key cover	GCOVB7110BHSA	BG	For UP-600 only
6	1 hole clerk kit	DKiT-8669BHZZ	BP	For UP-600 only
7	Drawer separation kit	DKiT-3409BHZZ	AP	

5. SERVICE TOOLS

No.	NAME	PARTS CODE	PRICE	DESCRIPTION
1	Service key	LKGiM7113RCZZ	AF	
2	RS232 Loop Back Connector	UKOG-6705RCZZ	BC	For RS232 D-SUB 9pin connector
3	RS232 modular Loop Back Connector	UKOG-6729BHZZ	AZ	For RS232 RJ45 Modular jack connector
4	Expansion PWB for option board	CKOG-6708RCZZ	BU	For ER-A5RS or ER-01EF
5	MCR test card	UKOG-2357RCZZ	BL	For UP-E13MR
6	Keytop remover	UKOG-6634RCZZ	AX	For UP-600 only
7	Keytop inst. jig	UKOG-6725BHZZ	BB	For 2 X 2 key top

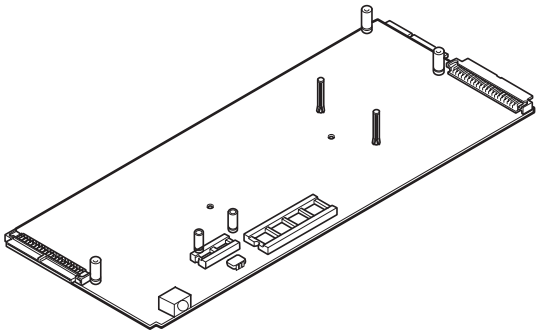
6. SUPPLIES

No.	NAME	PARTS CODE	PRICE	DESCRIPTION
1	Thermal roll paper	TPAPR6656RC05	BA	5 Rolls / pack
2	Thermal roll paper (High preservatic type)	TPAPR6657RC05	BD	5 Rolls / pack
3	Key sheet (Normal key layout)	PSHEK2926BHZA	AQ	For UP-700 only
4	Key sheet (Character key layout)	PSHEK2927BHZA	AG	For UP-700 only
5	Key sheet (Blank key layout)	PSHEK2930BHZA	AG	For UP-700 only

7. HOW TO USE SERVICE TOOLS

7-1. EXPANSION PWB : CKOG-6708RCZZ

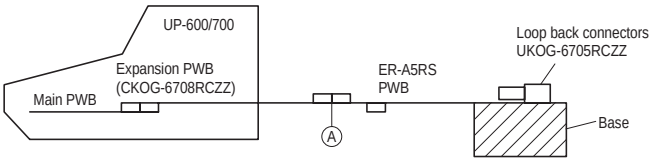
- External view



Purpose 1 : Used for servicing and repairing of options (such as the and the ER-A5RS) wich are connected with the main body option connector.

[Procedure 1]

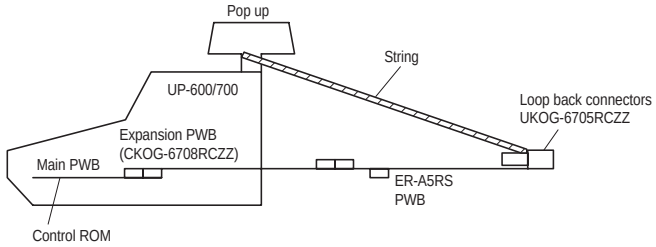
Use an insulator base as shown in shaded section and perform servicing.



To check the option I/F PWB from the solder side, connect the I/F PWB to OPTCN2. To check from the parts side, connect to OPTCN3.

(Note) The option I/F PWB should be held horizontally so that no excessive stress is applied to connecting section Ⓐ.

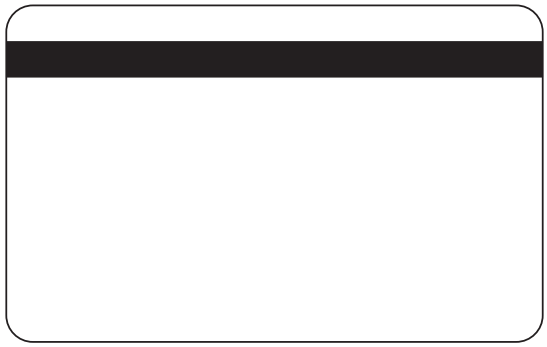
[Procedure 2]



Put a string between the pop up and the option PWB. Adjust the length of the string so that the CKOG-6708RCZZ and the option PWB are not binding. Then perform servicing.

7-2. MCR TEST CARD : UKOG-2357RCZZ

- Used when executing the diagnostics of the UP-E13MR.
- External view



CHAPTER 3. SERVICE PRECAUTION

1. IPL (Initial Program Loading) FUNCTION

1) INTRODUCTION

The application software of the UP-600/700 written in the flash ROM. In the following cases, writing procedure of the application software into the flash ROM is required

- When the flash ROM is replaced with new one. The service part flash ROM does not include the application software in it.
- When IPL writing is required because of change in the software.

∗ The service part ofthe main PWB unit includes the flash ROM with the application software written in it, and there is no need for writing the application software when replacing the main PWB unit.

2) IPL PROCEDURE

There are two ways of IPL procedures.

- IPL from P-ROM
- IPL from PC communication (Please refer the next section)

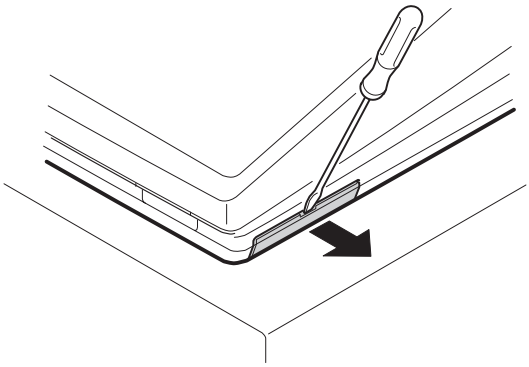
The detailed descriptions on the above procedures are given below.

3) IPL FROM P-ROM

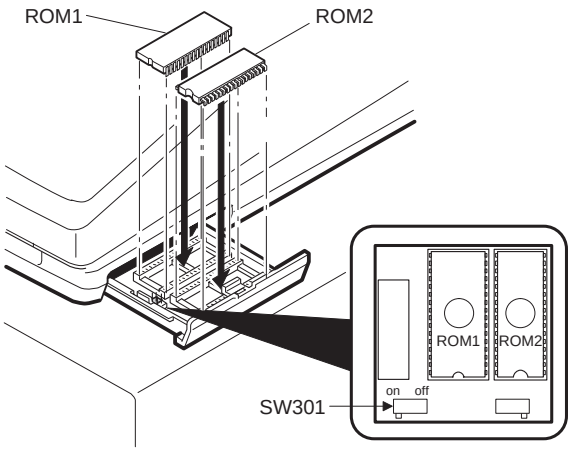
Master ROM-1 : VHI27801RAP1A
Master ROM-2 : VHI27801RAQ1A

Before working on the installation, turn off the power switch on the UP-600/700 and unplug the AC code from the AC outlet.

1. Insert a screwdriver into the slit on the right side of the lower cabinet to remove the option RAM case.



2. IPL switch (SW301) on the IPL ROM PWB: Set the IPL switch (SW301) to ON position.
3. Install to the IC sockets on the IPL ROM PWB.



4. Turn on the power switch of the UP-600/700.
5. The following display is shown and the IPL procedure is started. When the procedure is completed, the message of "Completed" is shown.

IPL from PROM Version check… Erase …	IPL write start
26 27 28 29 2A 2B 2C 2D 2E 2F 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F Verify … Completed.	IPL write completed

6. Turn off the power switch of UP-600/700.
7. Remove to the IC sockets on the IPL ROM PWB.
8. IPL switch (SW301) on the IPL ROM PWB: Set the IPL switch (SW301) to OFF position.
9. Perform the master reset.

2. UP-600/700 Utility tools

1) OUTLINE

This Specification document describes the explanation about "POSUTILITYTOOL.EXE and "02FD.EXE".

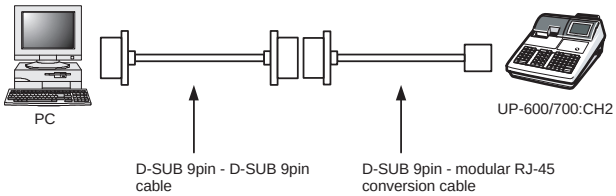
"POSUTILITYTOOL.EXE"and "02FD.EXE" works on Windows 95/98 of PC and they have the following
Functions by connecting UP-600/700 with RS232.

POSUTILITYTOOL.EXE	: IPL of UP-600/700 Program Object
02FD.EXE	: All RAM Data Upload/Download (PC software tool instead of the current ER-02FD.)

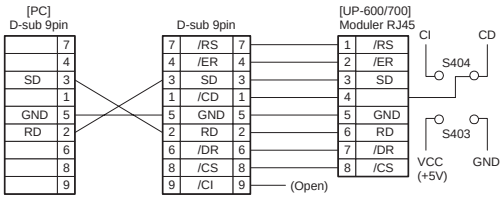
2) ENVIRONMENT

PC and UP-600/700 are connected by RS232.

Connect the CH2 port of the UP-600/700 to the RS-232 interface of the PC.

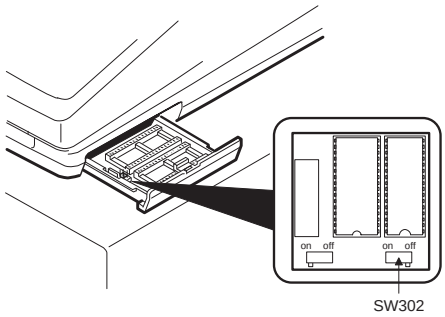
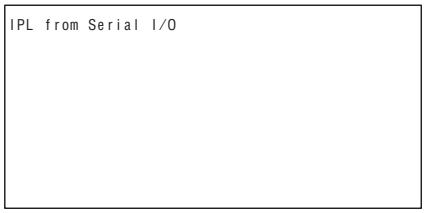


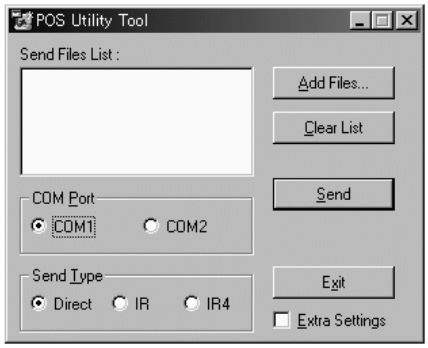
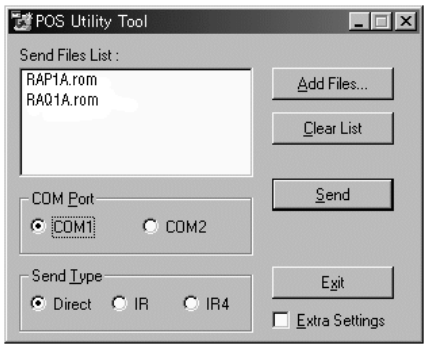
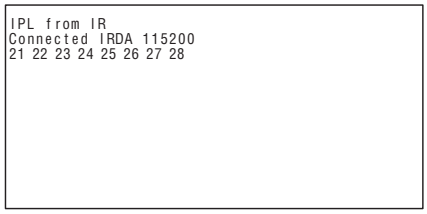
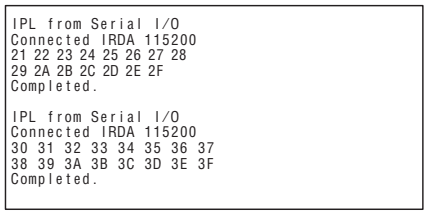
RS232 Cable Connecting:



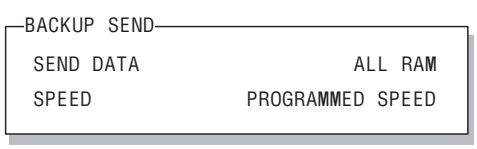
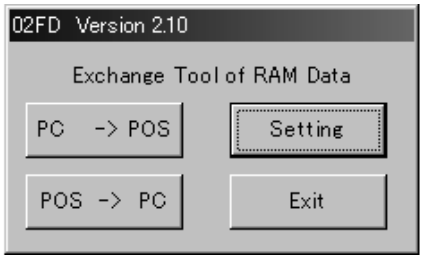
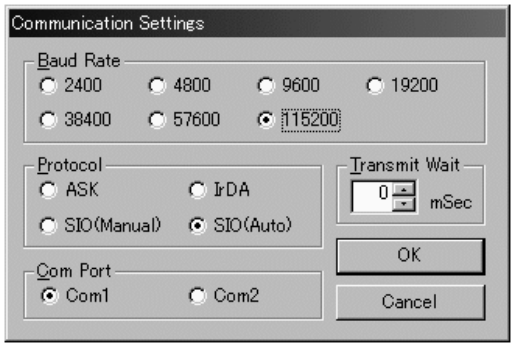
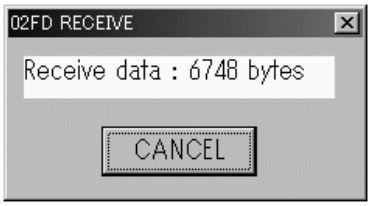
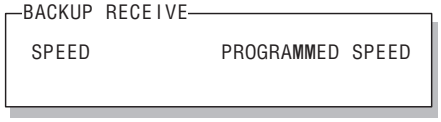
3) PROCEDURE

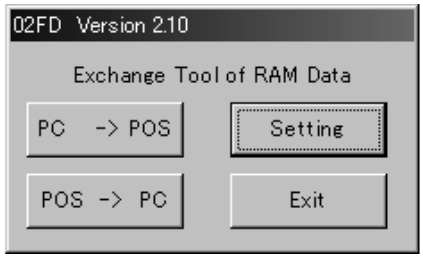
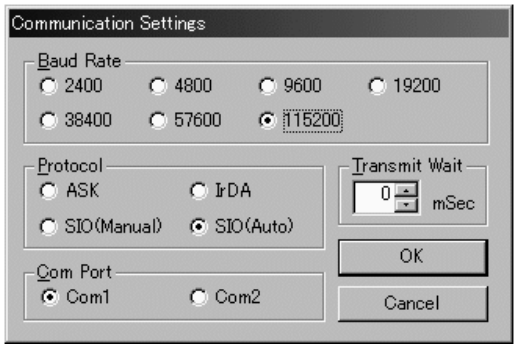
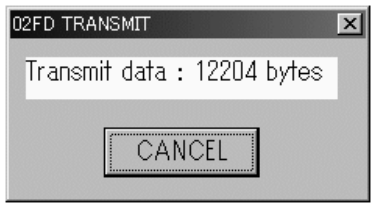
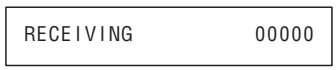
3) -1. POS UTILITY TOOL

No	Procedure on P.C. side	No	Procedure on UP-600/700 side
1	Install "POSUTILITYTOOL.EXE" on the P.C.		
		2	Turn OFF the power.
		3	Select "IPL Mode". Set "IPL Switch" (SW302) of UP-600/700 to "ON". 
		4	Turn ON the power.
		5	Starting of "IPL Mode". UP-600/700 shows "IPL from Serial I/O" 
6	Connect P.C. and UP-600/700 (CH2) via RS232. (Fig 1)		

No	Procedure on P.C. side	No	Procedure on UP-600/700 side
7	Execute "POSUTILITUTOOL.EXE" on P.C. *Don't execute the other Software at the same time. 		
8	Select the ROM object Files by "Add Files.." button. 		
9	Push "SEND" button. Program data is sent to UP-600/700 automatically. 	9	Program data is received from P.C. automatically. UP-600/700 shows 
10	When sending is completed, the initial Window is shown after "Complete" window.	10	UP-600/700 shows "Completed." 
		11	Turn OFF the power.
		12	Select "Normal Mode". Set "IPL switch" to "OFF". (Ref. Hardware manual)
		13	Execute "Service Reset" on UP-600/700.

3) -2. 02FD

No	Procedure on P.C. side	No	Procedure on UP-600/700 side
1	Install "02FD.EXE" on the P.C. ALL RAM Data UpLoad : Go to "2" ALL RAM Data DownLoad : Go to "9"		
2	ALL RAM Data UpLoad Connect P.C. and UP-600/700 (CH2) via RS232. (Fig 1)	2	Enter the SRV mode. Select " 2 SETTING ". Select " 14 BACKUP SEND"
		3	UP-600/700 shows 
4	Execute "02FD.EXE" on P.C. *Don't execute the other Software at the same time. 		
5	Set the Communication method by "Setting" Button.  Push "OK" Button.		
6	Push "Receive Start" Button. And Select the Receiving File.		
7	Communication starts. 	7	Push TL key. UP-600/700 shows 
8	UpLoad is completed. The initial Window is shown. Push "Exit" Button.	8	UpLoad is completed. The SETTING menu is shown.
9	ALL RAM Data UpLoad Connect P.C. and UP-600/700 (CH2) via RS232. (Fig 1)	9	Enter the SRV mode. Select " 2 SETTING". Select " 15 BACKUP RECEIVE"
		10	UP-600/700 shows  Push TL key.

No	Procedure on P.C. side	No	Procedure on UP-600/700 side
11	Execute "02FD.EXE" on P.C. *Don't execute the other Software at the same time. 		
12	Set the Communication method by "Setting" Button.  Push "OK" Button.		
13	Push "Transmit Start" Button. And Select the Sending File.		
14	Communication starts. 	14	UP-600/700 shows 
15	DownLoad is completed. The initial Window is shown. Push "Exit" Button.	15	DownLoad is completed. The SETTING menu is shown.
		16	Execute " Service Reset " on UP-600/700

3. NOTE FOR HANDLING OF LCD

- The LCD elements are made of glass. BE careful not to give them strong mechanical shock, or they may be broken. Use extreme care not to break them.
- If the LCD element is broken and the liquid is leaked, do not lick it. If the liquid is attached to your skin or cloth, immediately clean with soap.
- Use the unit under the rated conditions to prevent against damage.
- Be careful not to drop water or other liquid on the display surface.
- The reflection plate and the polarizing plate are easily scratched. BE careful not to touch them with a hard thing such as glass, tweezers. Never hit, push, or rub the surface with hard things.
- When installing the unit, be careful not to apply stress to the LCD module. If an excessive stress is applied, abnormal display or uneven color may result.

CHAPTER 4. SRV. RESET AND MASTER RESET

The SRV key is used for operating in the SRV mode.

1. SRV. reset (Program Loop Reset)

Used to return the machine back to its operational state after a lock-up has occurred.

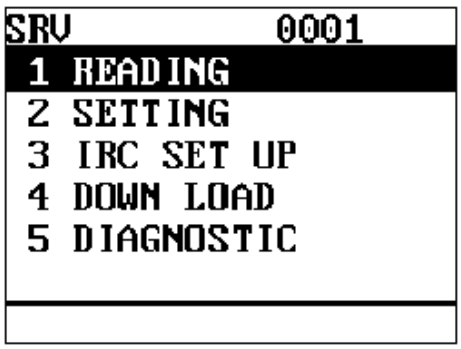
Procedure

- Method 1
  1) Turn off the AC switch.
  2) Set the mode switch to (SRV') position.
  3) Turn on the AC switch.
  4) Turn to (SRV) position from (SRV') position.
- Method 2
  1) Set the mode switch to PGM2 position.
  2) Turn off the AC switch.
  3) While holding down JOURNAL FEED key and RECEIPT FEED key, turn on the AC switch.

Note: When disassembling and reassembling always power up using method 1 only. Method 2 will not reset the CKDC9.

Note: SRV programming job#926-B must be set to "4" to allow PGM program loop reset.

PRG. RESET∗∗∗



2. Master reset (All memory clear)

There are two possible methods to perform a master reset.

- MRS-1

Used to clear all memory contents and return machine back to its initial settings.

Return keyboard back to default. for default key-board layout.

Procedure

1) Turn off the AC switch.
2) Set the MODE switch to the (SRV') position.
3) Turn on the AC switch.
4) While holding down JOURNAL FEED key, turn to (SRV) position from (SRV') position.

- MRS-2

Used to clear all memory and keyboard contents.

This reset returns all programming back to defaults. The keyboard must be entered by hand.

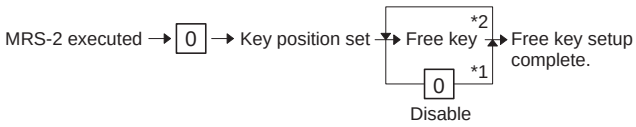
This reset is used if an application needs different keyboard layout other than that supplied by a normal MRS-1.

Procedure

1) Turn off the AC switch.
2) Set the MODE switch to the (SRV') position.
3) Turn on the AC switch.
4) While holding down JOURNAL FEED key and RECEIPT FEED key, turn to (SRV) position from (SRV') position.
5) Key position assignment:

∗ After the execution of MRS-2, only the RECEIPT FEED and JOURNAL FEED keys can remain effective on key assignment. Any key can be assigned on any key position on the main key-board.

[key setup procedure]



MASTER PRESET∗∗∗

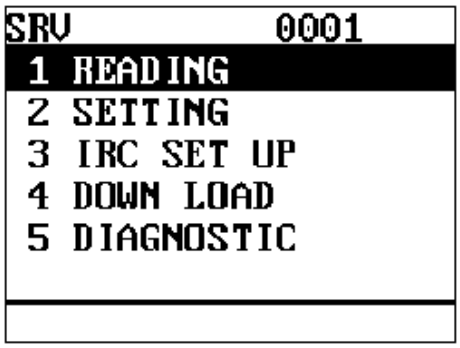
NOTES:

*1: When the 0 key is pressed, the key of the key number on display is disabled.

*2: Push the key on the position to be assigned. With this, the key of the key number on display is assigned to that key position.

*3: When relocating the keyboard, the PGM 1/2 mode use standard key layout.

Key No.	Key name	Key No.	Key name	Key No.	Key name
001	"0" key	011	"00" key	021	"CANCEL" key
002	"1" key	012	"000" key	022	"ENTER" key
003	"2" key	013	Decimal point "." key	023	"TL" key
004	"3" key	014	"CL" key		
005	"4" key	015	"(X)" key		
006	"5" key	016	"ST" key		
007	"6" key	017	UP "↑" key		
008	"7" key	018	DOWN "↓" key		
009	"8" key	019	LEFT "←" key		
010	"9" key	020	RIGHT "→" key		



CHAPTER 5. DIAGNOSTICS SPECIFICATIONS

1. GENERAL DESCRIPTION

This Diag Program consists of a number of Diag. programs for the UP-600/700, which facilitate the PWB check, process check and the operation check of the system during servicing.

The Service Diag. programs are all contained in the standard ROM.

2. SYSTEM COMPOSITION

UP-25X main only

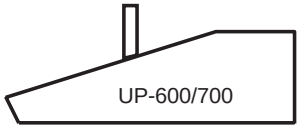


Fig 2-1. Service

3. DIAG.

Starting the Diag. Program

The Diag. Program is written on the external ROM, which is executed by the CPU (H8/510) and it runs on the following conditions:

① The logic power supply is normal.
(+5V, VCKDC, POFF, +24V)

② Both the I/O pins of the CPU and the CPU internal logic are normal, and the CKDC9 and MPCA9, system bus, and standard ROM/RAM are normal.

When starting the SET for the first time, MASTER RESET the system. If you want to add any OPTION UNIT when the SET is operating normally, perform PROGRAM RESET.

3-1. Executing Diag Program

To start the Diag. Program, enter the SRV mode. Select the option item DIAGNOSTICS from the MENU using the cursor keys and press the ENTER key.

The DIAG. MAIN MENU appears on screen as given below. The cursor shown in reverse video can be moved using the up/down arrow keys. Move the cursor to the menu item you want and press ENTER to execute the corresponding Diag. program. When each Diag. program is completed, the screen returns to the DIAG. MAIN MENU. Pres the CANCEL key to exit the Diag. Program and the screen returns to the MENU screen in the SRV mode.

```
UP-600/700 DIAG V1.0A
PRODUCT&TEST
RAM&ROM&SSP
CLOCK&KEY&SWITCH
SERIAL I/O
DISPLAY&PRINTER
MCR&EFT&DRAWER
TCP/IP
```

The cursor moves along through the menu items by entering numbers with the numeric keypad. This allows you to reduce the number of key operations. (Example: By entering the number 7, the cursor moves to the menu item TCP/IP.) This method also applies to other SUB MENUs.

The menu item "EFT Diagnostics" are availalable only for the European market. For North America,

the this menu item (&EFT) is omitted and everything the following it moves up to compensate.

3-2. RAM & ROM & SSP Diagnositcs

This program tests the standard RAM, expanded RAM, standard and service ROMs, and SSp circuit. RAM&ROM&SSP is selected on the MAIN MENU, the following submenu screen appears. The cursor shown in reverse video can be moved using the up/down arrow keys. Move the cursor to the menu item you want and press the ENTER to execute the corresponding program. Press the CANCEL key to return the screen to this submenu.

```
RAM&ROM&SSP DIAG
Standard RAM Check
UP-S04MB Check
UP-S02MB Check
Standard ROM Check
Service ROM Check
SSP Check
```

1) Standard RAM check

① Checking

The program performs the following checks on the standard 512KB of RAM. Data in memory remains unchanged before and after the checks.

The following operations are performed for the memory addresses to be checked (780000H - 7FFFFFH).

PASS1 : Save data in memory
PASS2 : Write data "0000H"
PASS3 : Read and compare data "0000H" and write data "5555H".
PASS4 : Read and compare data "5555H" and write data "AAAAH"
PASS5 : Read and compare data "AAAAH"
PASS6 : Return data into memory

If any comparison is not normal during the check sequence from PASS 1 through 6, the error message appears.

If any error is not found up to the final address, the sequence ends normally.

Then, another round of address checks is carried out using the above check sequence

If an error occurs, the error message appears and the check stops. The read/write of the address where the error occurs is repeated.

Check point address = 780000H, 780001H
780002H, 780004H
780008H, 780010H
780020H, 780040H
780080H, 780100H
780200H, 780400H
780800H, 781000H
782000H, 784000H
788000H, 790000H
7A0000H, 7C0000H

② Display

The capacity checked is displayed in units of 64KB.

```
Standard RAM Check
512KB:PASS!!(or ERROR!!)
Error:XXXXXXH
Write:XXXXH
Read:XXXXH
```

The error address and bit are displayed only when an error occurs (They are not displayed if there is no error.)

③ How to exit the program

You can exit the program by pressing the CANCEL key after the result of checking is displayed.

2) UP-S02MB Check

① Checking

The program checks for the presence of the UP-S02MB in the following procedure.

Data in memory remains unchanged before and after checking.

i. Write 55AAH in 9FFFFEH.

ii. Read 9FFFFEH and compare the data with 55AAH.If both data are correct and BFFFFEH is the same as 55AAH, perform the following tests. If not correct, the message "0KB: ERROR!!" appears and checking ends.

The following checks are performed on the UP-S02MB.

The following operations are performed for the address space to be checked (800000H - 9FFFFFH).

PASS1 : Save data in memory.
PASS2 : Write data "0000H".
PASS3 : Read and compare data "0000H" and write data "5555H".
PASS4 : Read and compare data "5555H" and write data "AAAAH".
PASS5 : Read and compare data "AAAAH".
PASS6 : Return data into memory.

If any comparison is not normal during the check sequence from PASS 1 through 6, the error message appears.

If any error is not found up to the final address, the sequence ends normally.

Then, another round of address checks is carried out using the above check sequence.

If an error occurs, the error message appears and the check stops. The read/write of the address where the error occurs is repeated.

Check point address = 800000H, 800001H
800002H, 800004H
800008H, 800010H
800020H, 800040H
800080H, 800100H
800200H, 800400H
800800H, 801000H
802000H, 804000H
808000H, 810000H
820000H, 840000H
880000H, 900000H

② Display

The capacity checked is displayed in units of 64KB.

```
UP-S02MB Check
2048KB:PASS!!(or ERROR!!)
Error:XXXXXXH
Write:XXXXH
Read:XXXXH
```

The error address and bit are displayed only when an error occurs (They are not displayed if there is no error.)

③ How to exit the program

You can exit the program by pressing the CANCEL key after the result of checking is displayed..

3) UP-S04MB Check

① Checking

The program checks for the presence of the UP-S04MB in the following procedure. Data in memory remains unchanged before and after checking.

i. After writing 55AAH in BFFFFEH, write AA55H in 9FFFFEH.

ii. Read BFFFFEH and compare the data with 55AAH. Data in BFFFEH is correct, the following checks are performed. Data read is AA55H, the message "UP-S02MB!!" appears and the check ends. If the data read is not either 55AAH or AA55H, the message "0KB:ERROR!!" appears and the check ends.

The following checks are performed on the UP-S04MB.

The following operations are performed for the address space to be checked (800000H - BFFFFFH).

PASS1 : Save data in memory.
PASS2 : Write data "0000H".
PASS3 : Read and compare data "0000H" and write data "5555H".
PASS4 : Read and compare data "5555H" and write data "AAAAH".
PASS5 : Read and compare data "AAAAH".
PASS6 : Return data into memory.

If any comparison is not normal during the check sequence from PASS 1 through 6, the error message appears.

If any error is not found up to the final address, the sequence ends normally.

Then, another round of address checks is carried out in the above check sequence.

If an error occurs, the error message appears and the check stops. The read/write of the address where the error occurs is repeated.

Check point address = 800000H, 800001H
800002H, 800004H
800008H, 800010H
800020H, 800040H
800080H, 800100H
800200H, 800400H
800800H, 801000H
802000H, 804000H
808000H, 810000H
820000H, 840000H
880000H, 900000H
A00000H

② Display

The capacity checked is displayed in units of 64KB.

```
UP-S04MB Check
4096KB:PASS!!(or ERROR!!)
Error:XXXXXXH
Write:XXXXH
Read:XXXXH
```

The error address and bit are displayed only when an error occurs (They are not displayed if there is no error.)

③ How to exit the program

You can exit the program by pressing the CANCEL key after the result of checking is displayed.

4) Standard ROM Check

① Checking

The standard ROM area (200000H - 3FFFFFH) is added in units of bytes. The lowest 2 digits of the result is 20H, it is regarded as normal.

In addition, the ROM version and model name code stored in the addresses 31FFE0H - 31FFFFH where the ROM version and checksum correction data are stored are displayed. Data (ASCII) is stored in the following formats:

31FFE0H~31FFEFH : Model name CODE (Example: "UP-600", to be displayed until DATA becomes 00H.)

31FFF0H~31FFF9H : 27801R****(****=PROGRAM VERSION)

31FFFAH~31FFFBH : BLOCK NO.("20"~"3F")

31FFFCH : TERMINATOR ("=")

31FFFDH~31FFFEH : BLOCK VERSION (Example: "00")

31FFFFH : CHECK SUM correction DATA

FLASH ROM used as the standard ROM has 64K-byte-unit rewrite BLOCKs. To perform VERSION management in the BLOCK unit, these BLOCKs have the same 16 byte organization as those after the previous 31FFF0H and arranged every 64KBYTE. At this time, the checksum for each BLOCK is corrected to be 01H so that the entire 2MBYTE become a total of 20H.

Regarding the display of the PROGRAM VERSION, the FLASH write MASTER EPROM has 2-chip 8 Mbits to allow manage in units of chip. The PROGRAM VERSION stored in blocks at 21H and 31H are displayed.

0 PAGE (BLOCK) where IPL is stored displays the PROGRAM VERSION of IPL to make it possible to manage individual programs.

② Display

The capacity checked is displayed in units of 64KB.

```
Service ROM Check
PASS!!(or ERROR!!)
APL: 27801R****
       27801R****
IPL:**
```

③ JOURNAL print

```
BLOCK Version.
20=** 21=** 22=** 23=**
24=** 25=** 26=** 27=**
. . . . . .
3C=** 3D=** 3E=** 3F=**
```

③ How to exit the program

④ You can exit the program by pressing the CANCEL key after the result of checking is displayed.

5) SERVICE ROM Check

① Checking

The SERVICE ROM area composed of two EPROMs (D00000H - EFFFFFH) is added in units of bytes for each chip. If the lowest 2 digits are 10H, it is regarded as normal.

In addition, the ROM version and model name code stored in the addresses D1FFE0H - D1FFFFH where the ROM version and checksum correction data are stored are displayed. Data (ASCII) is stored in the following formats:

D1FFE0H~D1FFEFH : Model name CODE(Example: "UP-600", to be displayed until data is 00H.)

D1FFF0H~D1FFF9H : 27801R****(****=PROGRAM VERSION)

D1FFFAH~D1FFFBH : BLOCK NO.("20"~"2F")

D1FFFCH : TERMINATOR("=")

D1FFFDH~D1FFFEH : BLOCK VERSION(Example:"00")

D1FFFFH : CHECK SUM correction DATA

This SERVICE ROM is used to write data into FLASH ROM if any error occurs during rewriting FLASH ROM and it is not possible to resume the operation. Its configuration is the same as the standard ROM.

0 PAGE (BLOCK) where IPL is stored displays the PROGRAM VERSION of IPL to make it possible to manage individual programs.

② Display

The capacity checked is displayed in units of 64KB.

```
Service ROM Check
ROM1:PASS!!(or ERROR!!)
ROM2:PASS!!(or ERROR!!)
APL: 27801R****
       27801R****
IPL:**
```

③ JOURNAL print

```
BLOCK Version.
20=** 21=** 22=** 23=**
24=** 25=** 26=** 27=**
. . . . . .
3C=** 3D=** 3E=** 3F=**
```

④ How to exit the program

You can exit the program by pressing the CANCEL key after the result of checking is displayed.

6) SSP Check

① Checking

When started, this check program automatically sets the test SSP, performs SSP check and displays the check result.

The SSP check sets check data in the empty space in the SSP entry register. After checking is completed, only the check data is erased. Any setting remains intact before and after this check program is executed.

② Display

```
SSP Check
PASS!!(or ERROR!!)
```

③ How to exit the program

You can exit the program by pressing the CANCEL key after the result of checking is displayed.

3-3. Timer & Keyboard & Clerk Switch Diagnostics

This program checks the operation of the CKDC's clock crystal, key-board and tests the clerk switch and mode switch.

You can return to the Diag menu screen by pressing the CANCEL key.

```
Timer&Key&Clerk DIAG
YY/MM/DD&HH:MM:SS
KEY CODE=***
CLERK CODE=***
MODE SWITCH=* (0~7,E:Intermediate position,
                F:Multiple ERROR)
```

1) Timer Check

① Checking

Check the operation of the CKDC9's clock crystal.

The area showing "YY/MM/DD & MM:HH" is continuously displayed. Check whether the display blinks in black and white every 0.5 seconds and the time shown is updated.

2) Keyboard Check

① Checking

The program check the input through the keyboard of the UP-600/700.

A 3-digit position code corresponding to a key pressed appears on screen, along with a catch sound.

3) Clerk SW Check

① Checking

The code of the key inserted into the clerk key switch appears in a decimal number.

4) Mode Switch Check

① Checking

The mode switch position code is displayed in a hexadecimal number.

SRV:0, PGM2:1, PGM1:2, OFF:E, OP X/Z:3, REG:4, MGR:5, X1/Z1:6, X2/Z2:7

Intermediate code:E, Multiple error F

3-4. RS232 I/F Diagnostics

The program tests the RS232 interface for the main PWB and the optional board ER-A5RS. Attach a 9-pin D-sub loop back connector (UKOG-6717RCZZ) wired as shown in Fig. 3-11, to the port you are going to test.

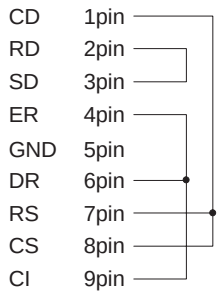


Fig. 3-11. Wiring diagram of loop back connector (UKOG-6717RCZZ)

The following menu appears on screen. The cursor shown in reverse video can be moved using the up/down arrow keys. Move the cursor to the menu item you want to execute and select by pressing the Enter key to the corresponding Diag. Program. Press the CANCEL key to return the screen to this submenu.

When setting the channel for the RS232 interface, do not set more than two ports to the same channel. The UP-600/700 accommodates up to one ER-A5RS board, but use caution not to allow each port to have the same channel; otherwise hardware might be destroyed.

```
RS232 I/F DIAG
CH1 Check
CH3 Check
CH4 Check
CH8 Check
```

When Diag. Is started, channel check is performed and only the channels already set appear on screen.

1) CHANNEL Check

① Checking

The screen shows only the channels for which the channels of the RS232 connect to the ECR. Compare the channels shown on screen and the settings of channel setting DIPSW on the RS232 interface board.

The RS232 on the main PWB of the UP-600/700 is fixed to CH1 and CH8. It is therefore necessary for the ER-A5RS to set the channel to any of CH2 - CH7.

(Ref) ER-A5RS channel settings ("1" = SW OFF, "0" = SW ON)

ER-A5RS CON3

S1-1	S1-2	S1-3	CHANNEL
0	0	0	Disabled
0	0	1	No setting allowed (Standard RS)
0	1	0	CHANNEL 2
0	1	1	CHANNEL 3
1	0	0	CHANNEL 4
1	0	1	CHANNEL 5
1	1	0	CHANNEL 6
1	1	1	CHANNEL 7

ER-A5RS CON4

S1-4	S1-5	S1-6	CHANNEL
0	0	0	Disabled
0	0	1	No setting is allowed (Standard RS)
0	1	0	CHANNEL 2
0	1	1	CHANNEL 3
1	0	0	CHANNEL 4
1	0	1	CHANNEL 5
1	1	0	CHANNEL 6
1	1	1	CHANNEL 7

② How to exit the program

Press the CANCEL key to exit the program.

2) CH1 Check

① Checking

If any channel is not set, the error message (ERROR: CH1) appears. When any channel is set, the following checks are performed.

i. Control signal check

ERn	RSn	DRn	Cin	CDn	CSn
OFF	OFF	OFF	OFF	OFF	OFF
OFF	ON	OFF	OFF	ON	ON
ON	OFF	ON	ON	OFF	OFF
ON	ON	ON	ON	ON	ON

The program performs the read checks of the above inputs and interrupt checks of CS, CI, and CD.

During the read check, ER and RS are changed over in the above order, checking the logic of DR, CI, CD and CS.

If the check result does not agree with the logic in the table, the error message appears. The ON in the table means active low and the OFF means active high.

In the interrupt check, the CS, CI and CD interrupts are permitted one by one (The mask is canceled.).

The error message appears if an interrupt does not occur when each signal is active or if an interrupt occurs when each signal is not active.

Four cycles of the above check is performed.

ii. Data transfer check

As check data, loop back data transfer of 256 bytes of 00H - 0FFH is performed. The baud rate is 38400 bp.

iii. TIMER CHECK (RS232 ON BOARD TIMER)

Before starting the check ii, perform the RCVDT start of the timer you want to check and set to 5 ms. Make sure::

- No TRQ- is generated during the implementation of check ii.
- TRQ- is generated at 5 ms after check ii is completed.

② Display

RS232 CH1 Check
PASS!!(or ERROR!!)

All the details of errors are printed on the journal.

ERROR No.	ERROR print	Details of ERROR
1	ER-DR : ERROR	ER-DR LOOP ERROR
2	ER-CI : ERROR	ER-CI LOOP ERROR
3	RS-CD : ERROR	RS-CD LOOP ERROR
4	RS-CS : ERROR	RS-CS LOOP ERROR
5	CI INT : ERROR	No CI interrupt occurs.
6	CD INT : ERROR	No CD interrupt occurs.
7	CS INT : ERROR	No CD interrupt occurs.
8	TXEMP : ERROR	TXEMP is not set.
9	TXEMP INT : ERROR	TXEMP interrupt does not occur.
10	TXRDY : ERROR	TXRDY is not set.
11	TXRDY INT : ERROR	TXRDY interrupt does not occur.
12	RCVRDY : ERROR	RCVRDY is not set. (Not possible to receive. TRQ- occurs during the implementation of check ii.)
13	RCVRDY INT : ERROR	RCVRDY interrupt does not occur.
14	SD-RD : ERROR	SD-RD LOOP ERROR (DATA ERROR)
15	SD-RD : ERROR	SD-RD LOOP ERROR (DATA ERROR)
16	TIMER : ERROR	TIMER ERROR (After check ii is completed)
17	TIMER INT : ERROR	TRQ1- interrupt does not occur.

③ How to exit the program

Press the CANCEL key to exit the program.

3) CH2 Check

① Checking

The procedure for checking, display and the method of exiting the programs are the same as for CH1 check.

4) CH3 Check

① Checking

The procedure for checking, display and the method of exiting the program are the same as for CH1 check.

5) CH4 Check

① Checking

The procedure for checking, display and the method of exiting the program are the same as for CH1 check.

6) CH5 Check

① Checking

The procedure for checking, display and the mothod of exiting the programs are the same as for CH1 check.

7) CH6 Check

① Checking

The procedure for checking, display and the method of exiting the programs are the same as for CH1 check.

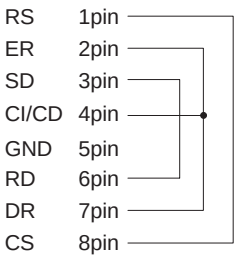
8) CH7 Check

① Checking

The procedure for checking, display and the method of exiting the programs are the same as for CH1 check.

9) CH8 Check

For checking CH8, the following loop-back connectors are used.



① Checking

When channels are set, the following checks are performed.

i. Control signal check

ER8	RS8	DR8	Ci8	CD8	CS8
OFF	OFF	OFF	OFF	OFF	OFF
OFF	ON	OFF	**	**	ON
ON	OFF	ON	**	**	OFF
ON	ON	ON	**	**	ON

The program performs the read checks of the above inputs.

During the read check, ER and RS are changed over in the above order, checking the logic of DR, CI, CD and CS.

If the logic is different from those listed in the table, the error message appears. For logics marked with "**" the display appears like the tables given below.

PETTERN 1

ER8	RS8	CI8	CD8
OFF	ON	OFF	OFF
ON	OFF	OFF	OFF
ON	ON	OFF	OFF

"No Connect" is displayed on the next line of PASS!!.

PETTERN 2

ER8	RS8	CI8	CD8
OFF	ON	OFF	OFF
ON	OFF	ON	OFF
ON	ON	ON	OFF

"CI Connect is displayed on the next line of PASS!!

PETTERN 3

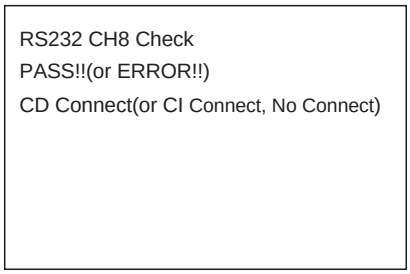
ER8	RS8	CI8	CD8
OFF	ON	OFF	OFF
ON	OFF	OFF	ON
ON	ON	OFF	ON

"CD Connect! is displayed on the next line of PASS!!
If the logic is different from those in PATTERN 1 - 3, the error message appears.
ON means active low and OFF active high.
The above checks are repeated four cycles.

ii. Data transfer check

As check data, loop back data transfer of 256 bytes of 00H - 0FFH is performed. The baud rate is set for115200 bp..

② Display



All the details of errors are printed on the journal.

ERROR No.	ERROR print	Details of ERROR
1	ER-DR : ERROR	ER-DR LOOP ERROR
2	ER-CI : ERROR	ER-CI LOOP ERROR
3	RS-CD : ERROR	RS-CD LOOP ERROR
4	RS-CS : ERROR	RS-CS LOOP ERROR
5		
6		
7		
8	TXEMP : ERROR	TXEMP is not set.
9	TXEMP INT : ERROR	TXEMP interrupt does not occur.
10	TXRDY : ERROR	TXRDY is not set.
11	TXRDY INT : ERROR	TXRDY interrupt does not occur.

ERROR No.	ERROR print	Details of ERROR
12	RCVRDY : ERROR	RCVRDY is not set. (Not possible to receive. TRQ- occurs during the implementation of check ii.)
13	RCVRDY INT : ERROR	RCVRDY interrupt does not occur.
14	SD-RD : ERROR	SD-RD LOOP ERROR (DATA ERROR)
15	SD-RD : ERROR	SD-RD LOOP ERROR (DATA ERROR, FRAMING ERROR, and others)
16		
17		
18	CI : ERROR	The logic of C1 is ON, but different from those in 1~3.
19	CD : ERROR	The logic of CD is ON, but different from those in 1~3.

③ How to exit the program.
Press the CANCEL key to exit the program.

3-5. LCD/Popup/Pole Display & PRINTER Diagnostics

The program tests the LCD and popup and pole displays of the UP-600/700.

The following menu appears on screen. The cursor shown in reverse video can be moved using the up/down arrow keys. Move the cursor to the menu item you want to execute and select by pressing the Enter key to execute the corresponding Diag. program. You can return the screen to this submenu by pressing the CANCEL key.

```
DISPLAY&PRINTER DIAG
LCD Check
POPUP Check
POLE Check
PRINTER Check
PRINTER CG Check
PES&NES SENSOR Check
A/D CONVERTER Check
```

The test program displays the following test patterns in the order shown below. You can move to the next pattern by pressing the ENTER key.

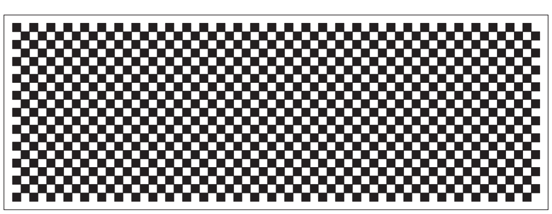
You can return the screen to this submenu by pressing the ENTER key when the final test pattern is shown on screen or by pressing the CANCEL key during the implementation of the check.

1) Liquid Crystal Display Check

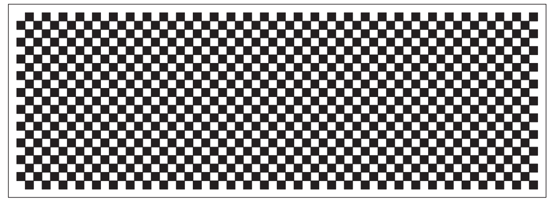
① Checking

The screen shows the following test patterns. Press the ENTER key to move to the next test pattern.

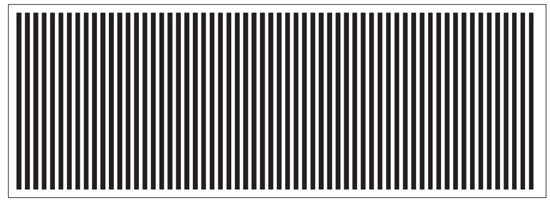
i. Black and white checkered pattern with 1-dot spacing.



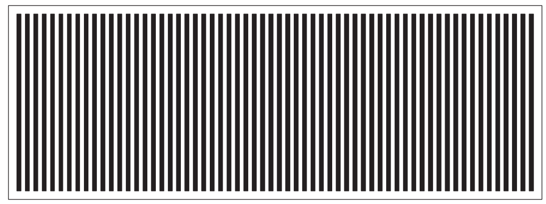
ii. Reverse-videoed test pattern of i



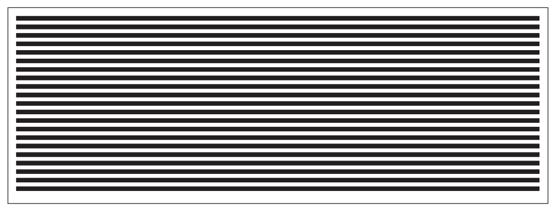
iii. Vertical stripe pattern with 1-dot spacing



iv. Reverse-videoed test pattern of iii

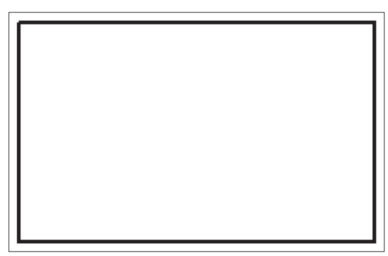


v. Horizontal stripe pattern with 1-dot spacing



vi. Reserve-videoed test pattern of v

vii. The outermost periphery of LCD's active area is displayed in 1-dot line.



viii. "H" pattern. "H" is displayed in 20 digits and 8 lines. "H" is displayed in 19 digits only in the 8th line.

```
HHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHH
```

③ How to exit the program.

You can exit the program by pressing the ENTER key when the final test pattern is shown on screen or by pressing the CANCEL key during checking.

2) Pole Display Check

① Checking

The screen shows the following test patterns in the order given below. Press ENTER to move to the next pattern.

i. The following test patterns are displayed.

DOT DISPLAY : 0 1 2 3 4 5 6 7 8 9 ; A a B b C

7SEG DISPLAY : 0. 1. 2. 3. 4. 5. 6. 7. 8. 9. -.

ii. The test pattern where all digits are turned ON is displayed.

② Display

POLE Display Check

③ How to exit the program.

You can return to the Diag. submenu by pressing the ENTER key after the 2nd test pattern where all digits are turned ON has been displayed. Or press the CANCEL key to erase the screen to exit the program.

3) Popup Display Check

① Checking

The screen shows the following test patterns in the order given below. Press ENTER to move to the next pattern.

i. The following test patterns are displayed.

7SEG DISPLAY : 0. 1. 2. 3. 4. 5. 6.

ii. The test pattern where all digits are turned ON is displayed.

② Display

POPUP Display Check

③ How to exit the program

You can return to the Diag. submenu by pressing the ENTER key after the 2nd test pattern where all digits are turned ON has been displayed. Or press the CANCEL key to erase the screen to exit the program.

4) PRINTER Check

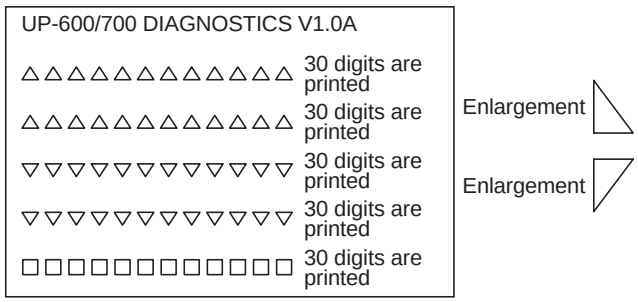
① Checking

The printer prints on the RECEIPT/JOURNAL PRINTER.

② Display

PRINTER Check

③ JOURNAL/RECEIPT print



④ How to exit the program

One second after printing is completed, the screen returns to the PRINTER Check of the DISPLAY & PRINTER MENU.

5) PRINTER CG Check

① Checking

The printer prints the built-in CG onto the RECEIPT/JOURNAL PRINTER.

For standard characters are printed in 16 characters/line and extended ASCII characters (enlarged characters) are printed in 8 characters/line.

The standard characters are printed first, followed by the extended ASCII characters.

Check the outputted print to see if CG is correctly printed.

② Display

PRINTER CG Check

③ How to exit the program.

Press the CANCEL key to exit the program after 1 cycle of printing is performed.

6) PES & NES SENSOR Check

① Checking

The screen displays the operating status of the paper end sensor and paper near end sensor of the receipt/journal printer.

② Display

```
PES&NES SENSOR Check
NES : 0   (or 1)
RPES : 0   (or 1)
JPES : 0   (or 1)
OPBS : 0   (or 1)
```

Display	Status	Description
NES	0	Senses the near end of the journal paper roll.
	1	Does not sense the near end of the journal paper roll.
RPES	0	Senses the end of the receipt paper roll.
	1	Does not sense the end of the receipt paper roll.
JPES	0	Senses the end of the journal paper roll.
	1	Does not sense the end of the journal paper roll.
OPBS	0	IPL ROM PWB connected
	1	IPL ROM PWB not connected

③ How to exit the program

Press the CANCEL key to exit the program.

7) A/D CONVERTOR Check

① Checking

The screen displays the digitally converted values of the signals in turns that have been inputted into the CPU's A/D converter. The values are updated at an interval of about 1 second by the timer.

② Display

```
A/D CONVERTER Check
TM=***
VRF=***
VP=***
```

(Note 1) : The VRF means an estimated VRF voltage on the assumption that VCC is +5 V.

(Note 2) : *** means 10-bit data of the A/D converter expressed in hexadecimal numbers.

Therefore, the values range from "000" to "3FF".

③ How to exit the program.

Press the CANCEL key to exit the program.

3-6. TCP/IP STACK Network Diagnostics

The program performs the TCP/IP stack test.
The test requirements are as follows:

- UP-600/700
- 10BASE-T cable (for data transfer testing)
- HUB (for loop back test and data transfer test where more than 2 units of satellites are used.)

The following menu appears. The cursor shown in reverse video can be moved using the up/down arrow keys. Move the cursor to the menu item you want to execute and press the ENTER key to execute the corresponding check program. After the said Diag. program is completed, the screen returns to this menu.

Press the CANCEL key to return the screen to the Diag. submenu.

```
TCP/IP&PRINTER DIAG
SELF Check
LOOPBACK Check
MAC ADDR&FIRM Ver. Read
MAC ADDR&FIRM WRITE
DATA Trans.(MA)
DATA Trans.(SA)
```

1) SELF Check

① Checking

The program executes Diag's built in the TCP/IP stack board and displays the results.

i. Execute the flash memory test command and display the result.

ii. Execute the SRAM test command and displays the result.

iii. Execute the dual-port RAM test and displays the result.

iv. Execute the interrupt test command and displays the result.

The information inside the error status is as follows:

b7	Reserved ("0" is always displayed)
b6	Reserved ("0" is always displayed)
b5	Reserved ("0" is always displayed)
b4	Reserved ("0" is always displayed)
b3	HR_RST : If /INTHR cannot be canceled
b2	HR_ACK:If /INTHR does not enter after waiting for 10 ms
b1	HW_RST : If /INTHW cannot be canceled
b0	Reserved ("0" is always displayed)

② Display

```
SELF Check
FLASH : PASS (or ERROR)
SRAM : PASS (or ERROR)
XXXXXXXX : XX :  XX        <- When an error occurs, the address and data are displayed.
DPRAM : PASS (or ERROR)
XXXXXXXX : XX :  XX        <- When an error occurs, the address and data are displayed.
INTERRUPT : PASS (or ERROR)
XXXXXXXX                   <- When an error occurs, the data is displayed.
```

③ How to exit the program.

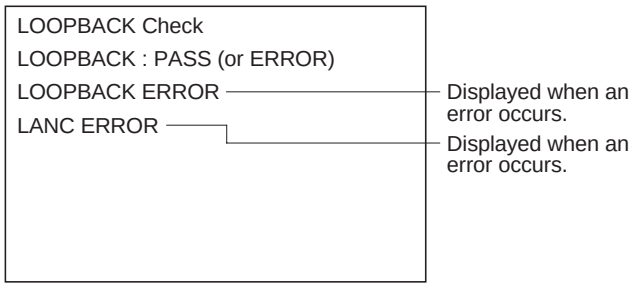
Press the CANCEL key to exit the program.

2) LOOPBACK Check

① Checking

Install a straight cable between the RJ45 connector and the HUB and execute the loop back test command to send and receive 1 packet of data.

② Display



③ How to exit the program

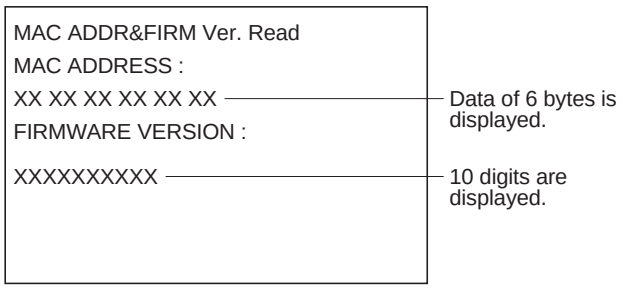
Press the CANCEL key to exit the program.

3) MAC ADDRESS&FIRM Ver. read Check

① Checking

The program reads the version of the MAC address and firmware and displays the result.

② Display



③ How to exit the program

Press the CANCEL key to exit the program.

4) MAC ADDRESS&FIRM write UTILITY

① Operation

This utility writes MAC address and firmware.
(Procedure)

Install EPROM on the TCP/IP board and turn the IPL switch on the board to the "program write mode."

Connect the board to the ECR and turn on the ECR.

The IPL program on the TCP/IP board starts.

Input 3 sets of 3-digit decimal numbers through the keyboard of the ECR and press the ENTER key.

Following the SHARP maker code (08, 00, 1F), the 3 sets of numbers input through the keyboard are converted into hexadecimal numbers. The program then writes a total of 6 bytes MAC address into dual port RAM (800000H -).

Turn off the power supply and remove the TCP/IP board from the ECR.

Remove EPROM from the TCP/IP board and turn the IPL switch to the "normal mode."

Connect the board to the ECR and turn on the ECR.

Input : DUAL PORT RAM (800000H')

08	00	1F	XX	YY	ZZ								

MAC ADDRESS (XX, YY, ZZ are converted to 16 hexadecimal numbers.)

Output : DUAL PORT RAM(800800H')

During writing

I	P	L		0	0	—	0	7					0	0

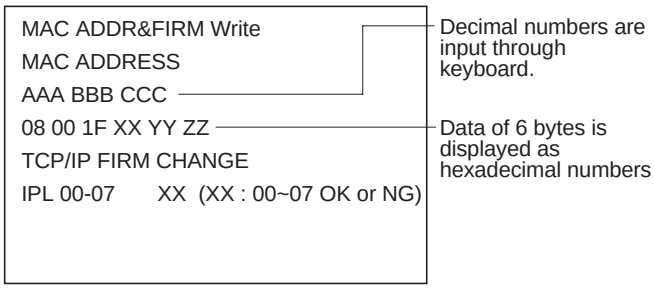
When writing is completed(The same applies when copy is skipped at the first verification.)

I	P	L		0	0	—	0	7					O	K

When writing process ends with an error.

I	P	L		0	0	—	0	7					N	G

② Display



TCP/IP FIRM CHANGE :

A | ERASE 00-07 00 |

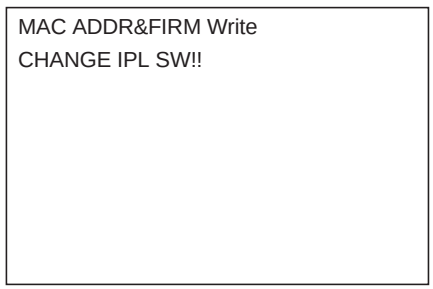
B | COPY 00-05 00 |

C | FIRM CHANGE PASS!! |

While the address and firmware are being rewritten, the message A and then B appears.

When the address and firmware have been rewritten, the message C is displayed.

The following screen appears when the IPL switch is not turned to the write mode.



③ How to exit the program.

Press the CANCEL key to exit the program.

∗ After rewriting, make sure to turn the power off and then turn it on again.

5) Data Transmission Check

The program performs a data transfer test using an actually established system.

The system consists of 1 master machine and up to 31 satellite machines.
Caution to be taken when starting the test.

- If this test is performed on the ECRs set for LAN, cancel the settings before starting the test.
- If this test is performed using an established system, disconnect the LAN cables from the ECRs you do not want to test or cancel their LAN settings. If the test is performed with those ECRs set for LAN, their data might be destroyed.
- After canceling the LAN settings of all ECRs on the system, set them for data transfer test.
  Set the satellite machines first, and then set the master machine.
- The Diag of the UP-600/700 uses a private IP address. Each IP address is unique on the Internet. When building a private network, you should be careful not to allow your internal packet used for your own network to leak to the Internet, because it might cause a confusion. The Internet Assigned Numbers Authority (IANA) specifies IP addresses that can be used without registration. These addresses can only be used within a private network and are not route controlled between sites of the Internet.

  Class A : 10.x.x.x
  Class B : 172.16.x.x 172.31.x.x
  Class C : 192.168.0.x?192.168.255.x

  It is strongly recommended to use addresses within the above range when building a private network.

  In this Diag. program, the following private IP addresses are assigned to the terminal Nos. (0 - 31).

  TERMINAL NO.1 = 192.168.0.1

  TERMINAL NO.2 = 192.168.0.2

  .....

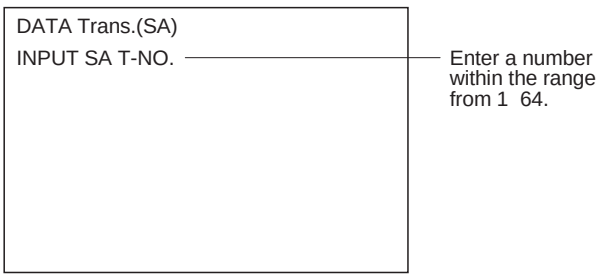
  TERMINAL NO.31 = 192.168.0.31

  TERMINAL NO.32 = 192.168.0.32

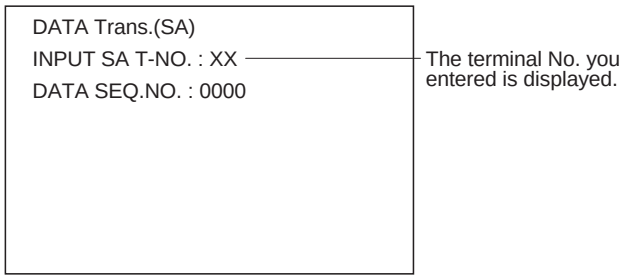
① Setting

i. Setting satellite machines

On the menu screen, select DATA Trans. (SA). The screen looks like this:

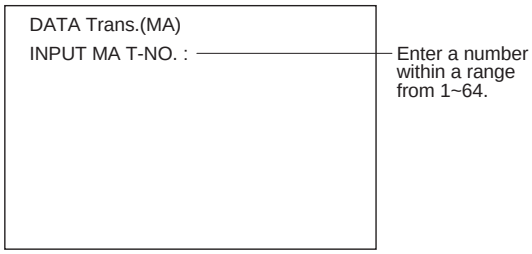


Enter the terminal No. of the machine you are going to test (a 2-digit number from 1 - 32) + Enter. The screen looks like this:

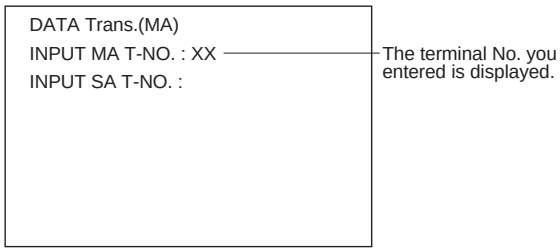


i. Setting master machine.

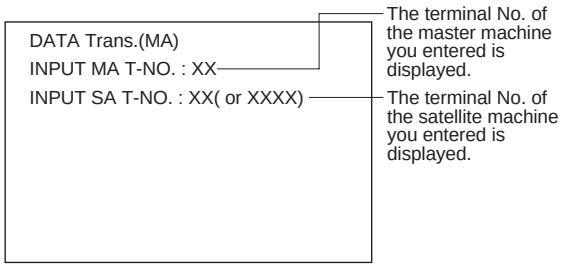
On the menu screen, select DATA Trans. (MA). The screen looks like this:



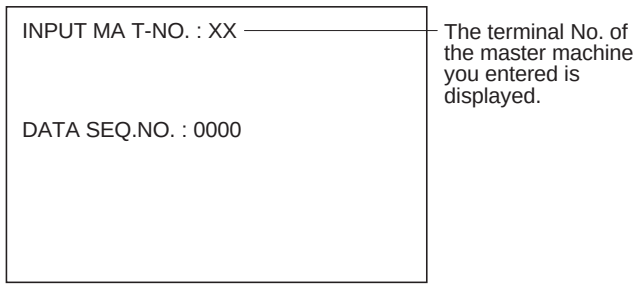
Enter the terminal No. of the machine you want to test (a 2-digit number from 1 - 64)+ Enter. The screen looks like this:



Enter the terminal No. (a 2-digit number from 1 -64) of the satellite machine which is to be connected to the test machine + Enter. The screen looks like this:



When performing the test with multiple satellite machines, type their terminal numbers (2-digit numbers within the range from 1~64) and press Enter. In addition, you specify the satellite machines using the area specification function without typing terminal numbers. This is achieved by typing the first terminal number (2 digits) and the last terminal number (2 digits) of the satellite machines and then press Enter. For example, if you want to specify the terminal numbers of satellite machines from 5 to 15, type "0515" for T-No. and press Enter.
When executing, press the Enter key only without typing the terminal numbers.
The display appears like this:
Note that the terminal numbers of the master machine and satellite machines should not be the same. When the terminal numbers are to be specified using the area specification function, any terminal number that is used for the master machine will be excluded from the specification of satellite machine terminal numbers.



With the above setting, data transfer is performed between the master machine and the satellite machines.

② Checking

i. The master machine sends data of the following format consisting of 2-byte sequence No. and 254-byte AAH data to the satellite machine. The master machine displays the sequence Nos.

Test data format (1 packet: 256 bytes)

1	2	3	4	5	•••	•••	•••	254	255	256	byte
XX	XX	AA	AA	AA	•••	•••	•••	AA	AA	AA	

XXXX : Sequence No. 2 bytes (4-digit binary coded decimal number)

AA : Transfer (AAH) ~ 254 bytes

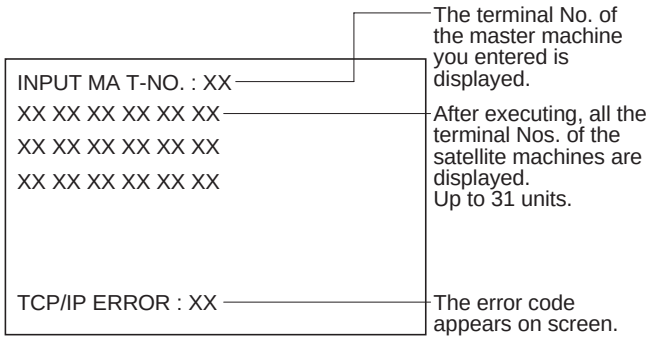
ii. The satellite machine returns the data it has received, to the master machine as it is. The satellite machine displays the sequence No. on the screen.

iii. The master machine receives the data and then checks the sequence Nos. and 254-byte AAH data. If an error occurs, the master machine displays an error code and ends the test. If there are multiple satellite machines, steps i and ii are repeated.

The master machine advances the sequence No. when data is transferred successfully between it and the satellite machines.

Steps i - iii are repeated.

③ Error display



The following error codes are used(same as for TCP/IP HANDLER)

01	Command error (excluding the time when data is sent)
02	No data received
03	Received data size present Received data left
04	Receiving station not ready for receiving (when sending) "NRDY" is returned because the receiving station is not ready for receiving.
05	Receiving buffer full(when sending) The receiving side's controller receive buffer is full.
06	Resend error(When sending) The number of retries exceeds the setting (5 times) when no response is obtained.
07	Collision error (When sending) If a collision occurs
08	Line busy time out Data cannot be sent due to multiple stations communicating
09	Receiving data size over (when receiving) Insufficient size of receiving buffer.
0A	Hardware error Interface error (No SRN interface or defective SRN controller)

③ How to exit the program
Press the CANCEL key to exit the program.

3-7. EFT & MCR & DRAWER Diagnostics

The program checks the EFT(ER-01EF)and MCR and drawer.

The following menu appears on screen.

The cursor shown in reverse video can be moved using the up/down arrow keys. Move the cursor to the menu item you want to execute and select by pressing the ENTER key to execute the corresponding program. Press the CANCEL key to return the screen to this sub-menu.

```
EFT&MCR&DRAWER Check
EFT Check
MCR Check
DRAWER 1 Check
DRAWER 2 Check
```

1) EFT Check

Select the EFT Diag on the menu and turn the power off.

```
EFT Check
```

Set all DIPSW1 on the ER-01EF to OFF. Turn the power ON, and the program automatically starts the EFT check.

① Checking

(i) For the EFT connector, the loop back test is performed on ER-DRAER-CI and RS-CS.

(ii) Turn on the switches 1 - 8 of the DIPSW1 one by one to check them for operation.

(iii) If they operate normally, the sum check is performed on EFT ROM and write/read check on RAM.

② JOURNAL print(When ending normally)

```
DIAG0 (SELF TEST)     :OK
VHI27040R**1*         :OK
256K SRAM             :OK
```

③ JOURNAL print(when not ending normally)

```
In Loop Back Error
  ER-DR LOOP ERROR
  ER-CI LOOP ERROR
  RS-CS LOOP ERROR
In Self Test Error
  DIP SW ERROR
In Self Test Error
  VHI27040R**1*       :ERROR
  256K SRAM           :ERROR
```

④ Display

```
EFT Check
```

⑤ How to exit the program

Press the CANCEL key to exit the program.

2) Magnetic Card Reader Check

The program performs the read test of an optional UP-E13MR.

The test program reads a magnet card of the ISO7811/1-5 standard and prints data on the journal.

Press the CANCEL key to return the screen to submenu.

① Checking

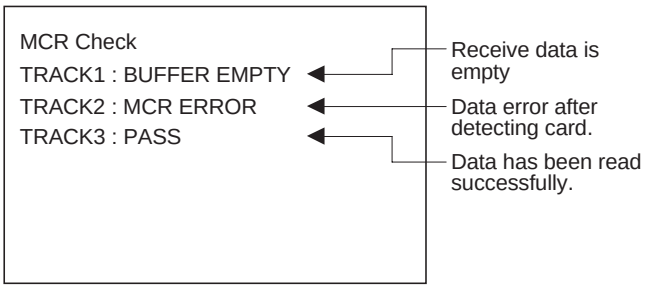
The program reads tracks 1 - 3 of a magnet card of the ISO7811/1'5 standard and prints data with the ASCII codes.

② JOURNAL print

```
MCR Check
TRACK1:
XXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXX
TRACK2:
XXXXXXXXXXXXXXXXXXXXXXXXXXXX
TRACK3:
XXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

Data read by the MCR is printed in the areas XXXXX. If an error occurs, the following error codes are displayed. Until the program is terminated, the error code is repeated, standing by for reading.

③ Display



④ How to exit the program.

Press the CANCEL key to exit the program.

3) Drawer 1 Check

① Checking

The program turns on the drawer 1 solenoid, senses the value of the drawer open sensor every 100 ms, and displays the operating status.

② Display

```
DRAWER 1 Check

Open Sensor : OPEN  (or CLOSE)
```

③ How to exit the program

Press the CANCEL key to exit the program.

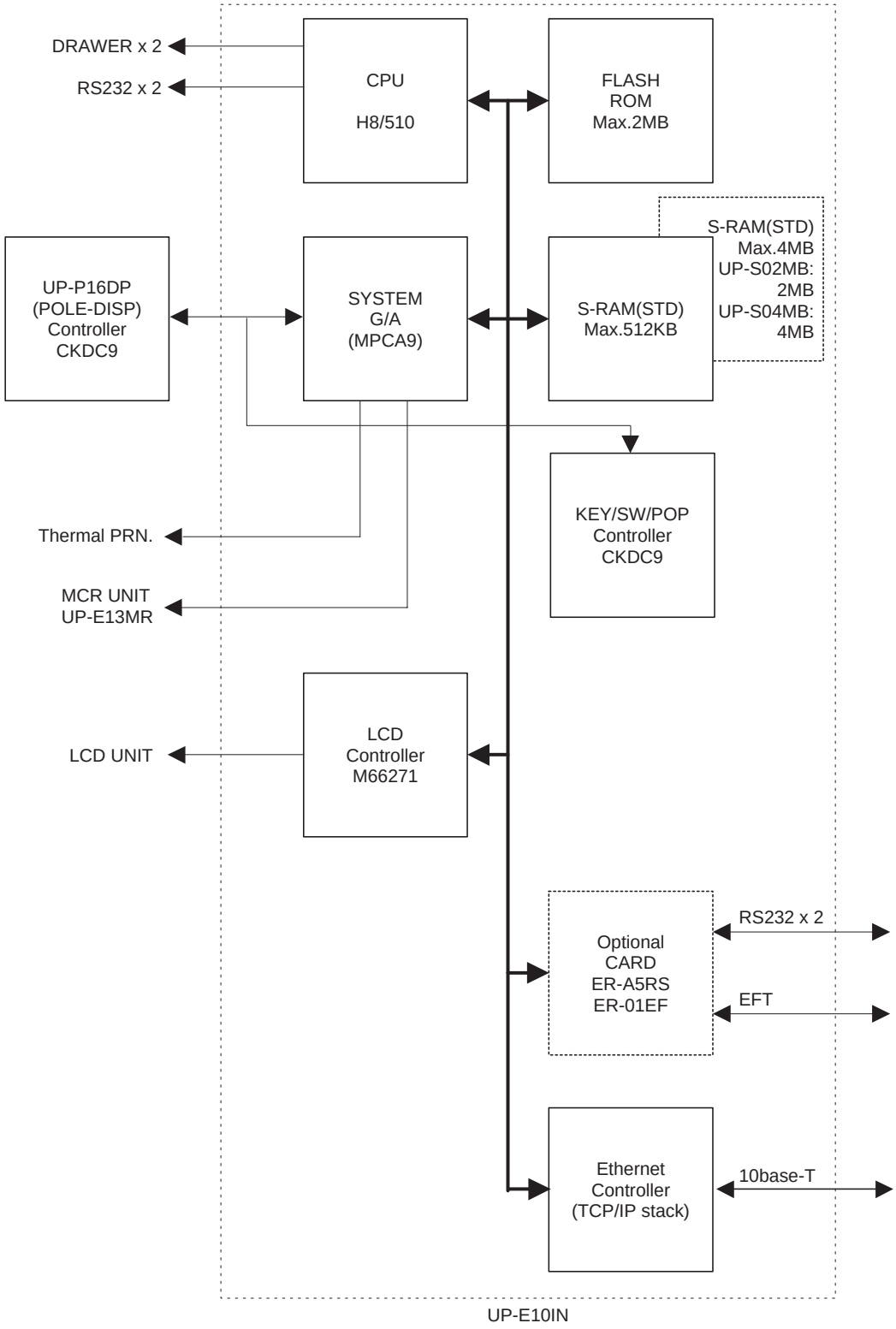
4) Drawer 2 Check

① Checking

The program turns on the drawer 2 solenoid, senses the value of the drawer 2open sensor every 100 ms, and displays the operating status. The procedure for displaying the menu and exiting the program are the same as for the drawer 1 check.

CHAPTER 6. CIRCUIT DESCRIPTION

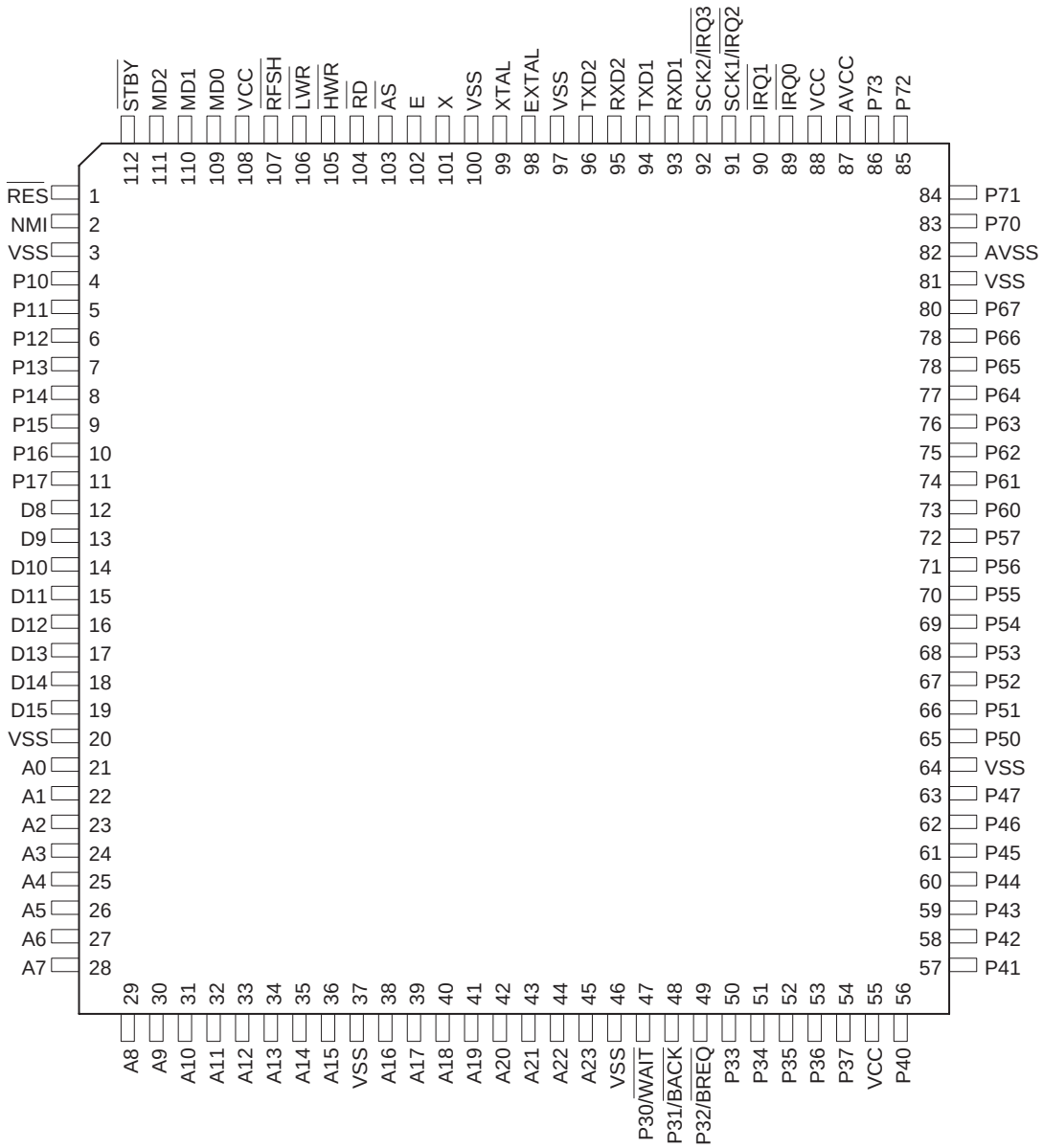
1. Hardware block diagram



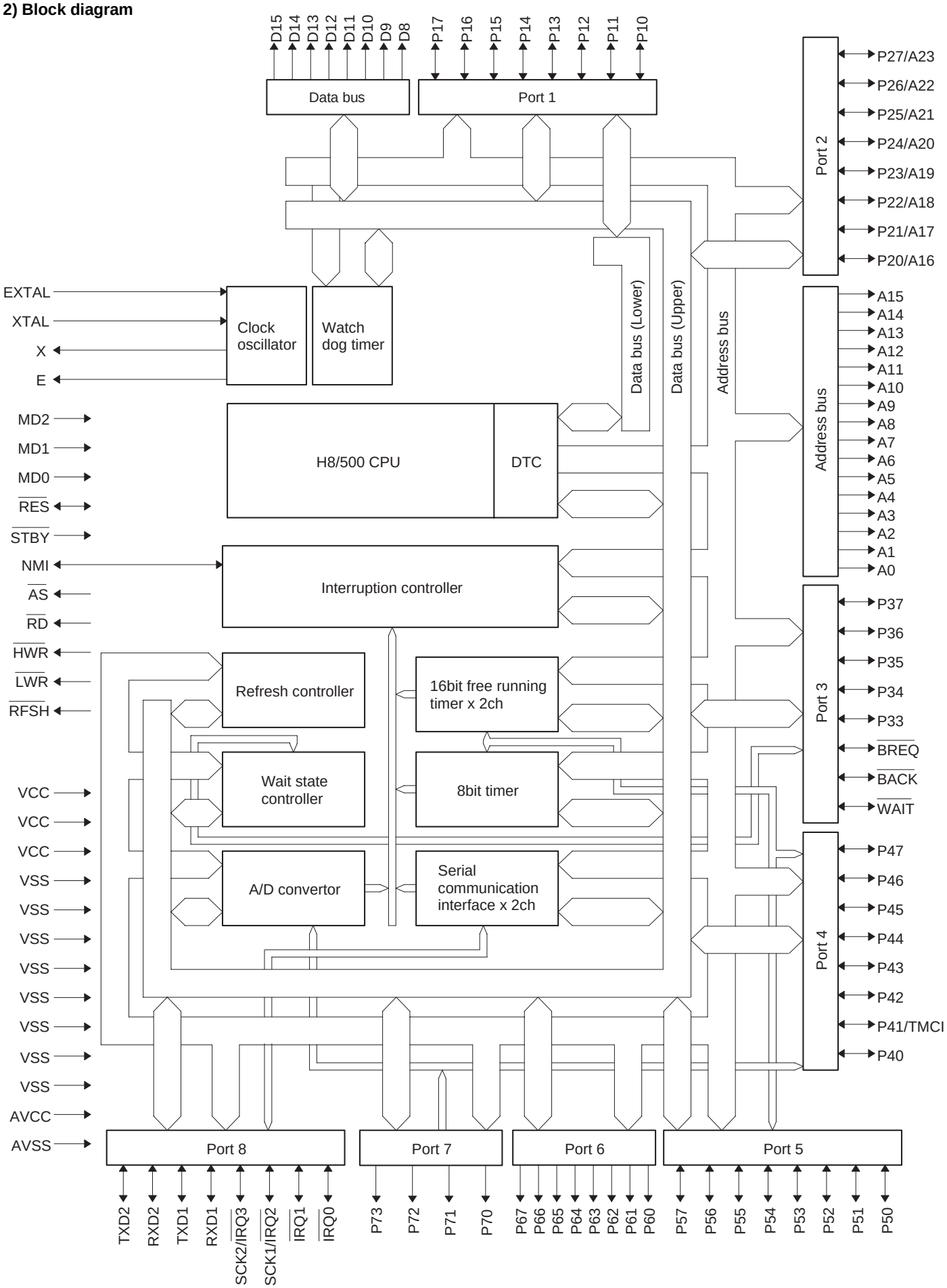
2. Description of main LSI's

2-1. CPU (HD6415108FX)

1) Pin description



2) Block diagram



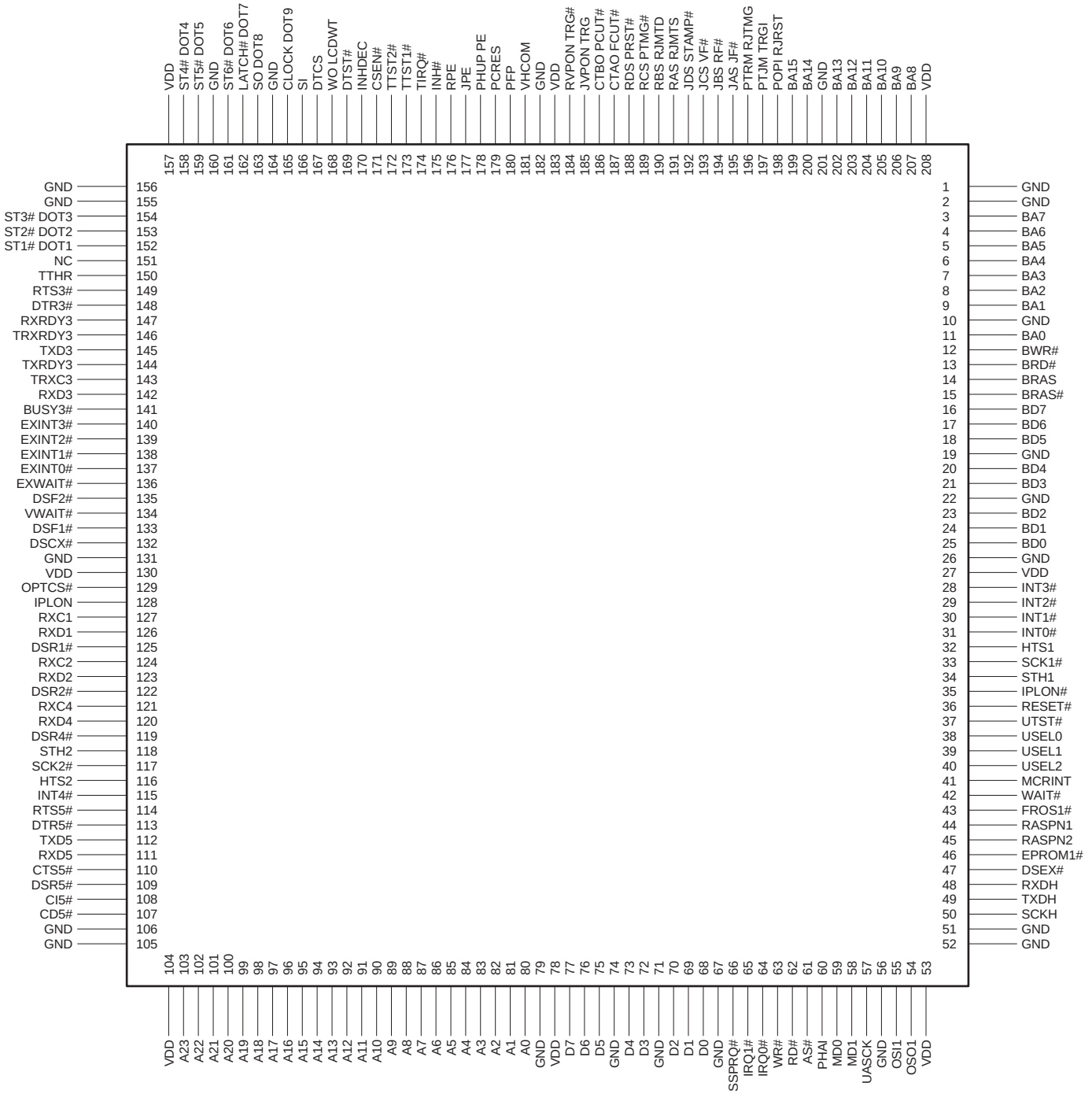
3) Pin description

Pin No.	Symbol	Signal name	In/ Out	Function
1	/RES	/RESET	In	Reset signal
2	NMI	NMI	In	Non-maskable interrupt input for SSP interrupt input.
3	VSS	GND	In	GND
4	D0	D0	I/O	Data bus
5	D1	D1	I/O	Data bus
6	D2	D2	I/O	Data bus
7	D3	D3	I/O	Data bus
8	D4	D4	I/O	Data bus
9	D5	D5	I/O	Data bus
10	D6	D6	I/O	Data bus
11	D7	D7	I/O	Data bus
12	D8	D8	I/O	Data bus
13	D9	D9	I/O	Data bus
14	D10	D10	I/O	Data bus
15	D11	D11	I/O	Data bus
16	D12	D12	I/O	Data bus
17	D13	D13	I/O	Data bus
18	D14	D14	I/O	Data bus
19	D15	D15	I/O	Data bus
20	VSS	GND	In	GND
21	A0	A0	Out	Address bus
22	A1	A1	Out	Address bus
23	A2	A2	Out	Address bus
24	A3	A3	Out	Address bus
25	A4	A4	Out	Address bus
26	A5	A5	Out	Address bus
27	A6	A6	Out	Address bus
28	A7	A7	Out	Address bus
29	A8	A8	Out	Address bus
30	A9	A9	Out	Address bus
31	A10	A10	Out	Address bus
32	A11	A11	Out	Address bus
33	A12	A12	Out	Address bus
34	A13	A13	Out	Address bus
35	A14	A14	Out	Address bus
36	A15	A15	Out	Address bus
37	VSS	GND	In	GND
38	A16	A16	Out	Address bus
39	A17	A17	Out	Address bus
40	A18	A18	Out	Address bus
41	A19	A19	Out	Address bus
42	A20	A20	Out	Address bus
43	A21	A21	Out	Address bus
44	A22	A22	Out	Address bus
45	A23	A23	Out	Address bus
46	VSS	GND	In	GND
47	P30	/WAIT	In	Wait signal
48	P31	/BACK	Out	Bus control request acknowledge signal
49	P32	/BREQ	In	Bus control request signal
50	P33	DOPS	In	Drawer open signal
51	P34	/DR0	Out	Option drawer open signal
52	P35	/DR1	Out	Option drawer open signal
53	P36	NC	NC	NC
54	P37	NC	NC	NC
55	VCC	VCC	In	+5V
56	P40	VCC	In	+5V
57	P41	GND	In	GND
58	P42	GND	In	GND

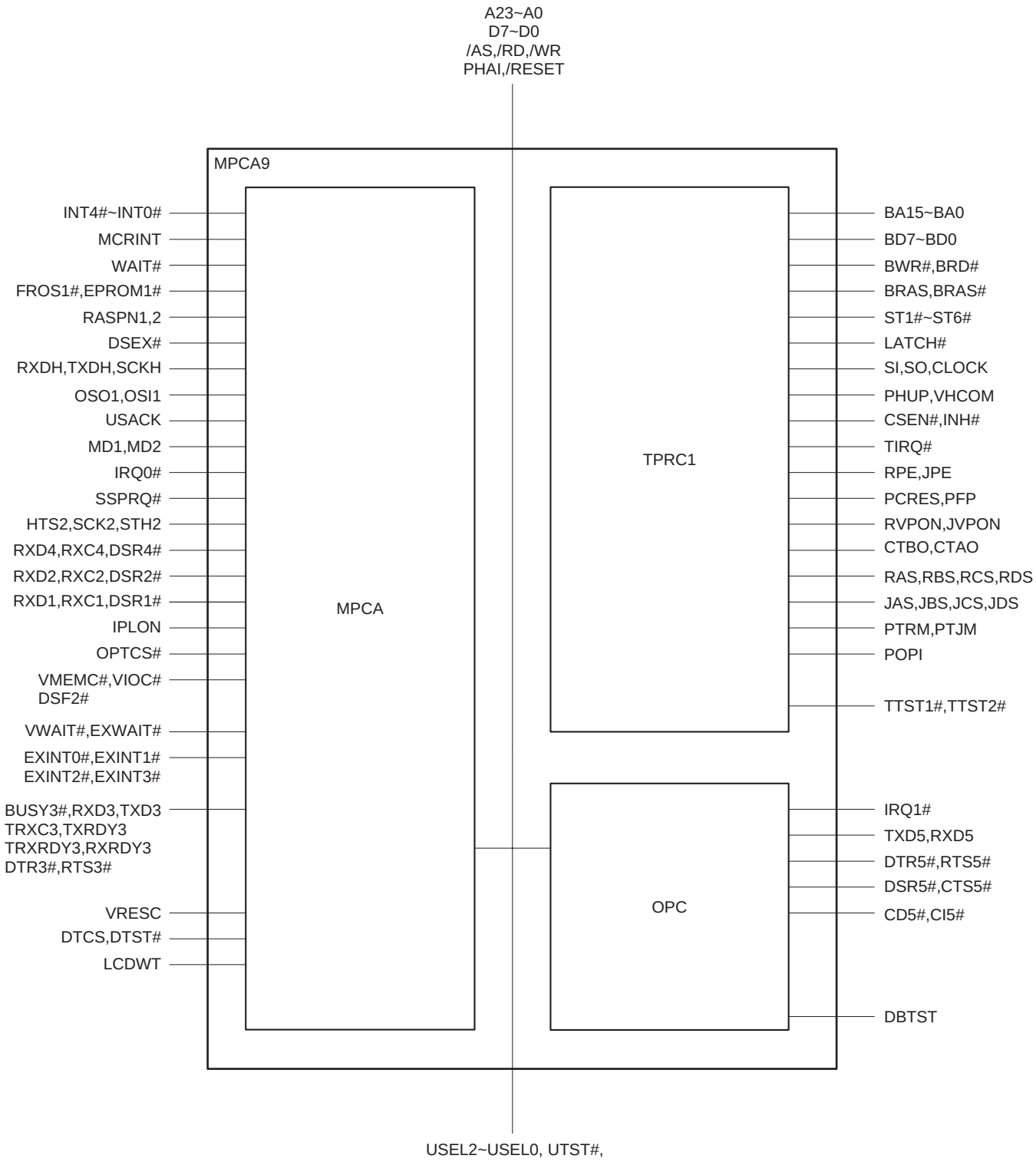
Pin No.	Symbol	Signal name	In/ Out	Function
59	P43	GND	In	GND
60	P44	MCRINT	In	MCR interrupt signal
61	P45	GND	In	GND
62	P46	/SHEN	In	CKDC interface shift enable signal
63	P47	GND	In	GND
64	VSS	GND	In	GND
65	P50	–	Out	/DTR2 : Data Terminal Ready2
66	P51	–	In	/DSR2 : Data Set Ready2
67	P52	–	In	/CTS2 : Clear To Send2
68	P53	–	In	/DCD2 : Carriar Detect2
69	P54	–	In	NC
70	P55	NC	Out	/RTS2:Request To Send2
71	P56	–	In	/CI2:Calling Indicator2
72	P57	/STOP	Out	System reset output signal
73	P60	/IPLON0	In	From IPL SW
74	P61	/IPLON1	In	From IPL SW
75	P62	GND	In	GND
76	P63	NORDY	In	Flash Memory ready ("H" active)
77	P64	FVPON	Out	Flash Memory write protect ("L" active)
78	P65	BANK	Out	For IPL ROM
79	P66	GND	In	GND
80	P67	GND	In	GND
81	VSS	GND	In	GND
82	AVSS	GND	In	GND
83	P70	GND	In	GND
84	P71	GND	In	GND
85	P72	GND	In	GND
86	P73	GND	In	GND
87	AVCC	VCC	In	+5V
88	VCC	VCC	In	+5V
89	/IRQ0	/IRQ0	In	Interrupt signal 0
90	/IRQ1	/IRQ1	In	Interrupt signal 1
91	/IRQ2	UASCK	In	Synchronizing shift clock signal for USART
92	/IRQ3	SCKI	Out	CKDC interface synchronizing shift clock
93	RXD1	/RCVDT2	In	RXD signal for RS232
94	TXD1	TXD2	Out	TXD signal for RS232
95	RXD2	RXDI	In	CKDC interface shift input data
96	TXD2	TXDI	Out	CKDC interface shift output data
97	VSS	GND	In	GND
98	EXTAL	EXTAL	In	Crystal oscillator connection 19.6MHz
99	XTAL	XTAL	In	Crystal oscillator connection 19.6MHz
100	VSS	GND	In	GND
101	X	#	Out	System clock
102	E	NC	NC	NC
103	/AS	/AS	Out	Address strobe
104	RD	/RD	Out	Read signal
105	/HWR	/HWR	Out	Write signal (HIGH)
106	/LWR	/LWR	Out	Write signal (LOW)
107	/RFSH	/RFSH	Out	Refresh cycle signal
108	VCC	VCC	In	+5V
109	MD0	IPLON0	In	From IPL SW
110	MD1	IPLON0	In	From IPL SW
111	MD2	/IPLON0	In	From IPL SW
112	/STBY	VCC	In	+5V

2-2. G.A.(MPCA9)

1) Pin configuration



2) Block diagram



3) Pin description

Pin No.	Name	IN/OUT	Description
1	GND	-	GND
2	GND	-	GND
3	BA7	O	Address bus 7 for PB-RAM
4	BA6	O	Address bus 6 for PB-RAM
5	BA5	O	Address bus 5 for PB-RAM
6	BA4	O	Address bus 4 for PB-RAM
7	BA3	O	Address bus 3 for PB-RAM
8	BA2	O	Address bus 2 for PB-RAM
9	BA1	O	Address bus 1 for PB-RAM
10	GND	-	GND
11	BA0	O	Address bus 0 for PB-RAM
12	BWR#	O	PB-RAM write strobe signal
13	BRD#	O	PB-RAM read strobe signal
14	BRAS	O	PB-RAM chip select : Active High (NU)
15	BRAS#	O	PB-RAM chip select : Active Low
16	BD7	I/O	Data Bus 7 for PB-RAM
17	BD6	I/O	Data Bus 6 for PB-RAM
18	BD5	I/O	Data Bus 5 for PB-RAM
19	GND	-	GND
20	BD4	I/O	Data Bus 4 for PB-RAM
21	BD3	I/O	Data Bus 3 for PB-RAM
22	GND	-	GND
23	BD2	I/O	Data Bus 2 for PB-RAM
24	BD1	I/O	Data Bus 1 for PB-RAM
25	BD0	I/O	Data Bus 0 for PB-RAM
26	GND	-	GND
27	VDD	-	+3.3V
28	INT3#	I	Interrupt signal 3 (NU)
29	INT2#	I	Shift enable for CKDC9
30	INT1#	I	Keyboard request for CKDC9
31	INT0#	I	Power off signal input
32	HTS1	O	8 bit serial port output (for CKDC9)
33	SCK1#	O	Serial port shift clock output (for CKDC9)
34	STH1	I	8 bit serial port input (for CKDC9)
35	IPLON#	I	IPL switch 0 ON signal
36	RESET#	I	MPCA reset
37	UTST#	I	MPCA test pin (+3.3V)
38	USEL0	I	MPCA test pin (GND)
39	USEL1	I	MPCA test pin (GND)
40	USEL2	I	MPCA test pin (GND)
41	MCRINT	O	MCR interrupt signal
42	WAIT#	O	Wait request signal
43	FROS1#	O	Flash ROM 1 chip select signal
44	RASPN1	O	RAM 1 chip select signal
45	RASPN2	O	RAM 2 chip select signal
46	EPROM1#	O	EP-ROM 1 chip select signal
47	DSEX#	O	EP-ROM 2 chip select signal
48	RXDH	O	8 bit serial port output to CPU
49	TXDH	I	8 bit serial port input from CPU
50	SCKH	I	Serial port shift clock input from CPU
51	GND	-	GND
52	GND	-	GND
53	VDD	-	+3.3V
54	OSO1	O	System clock (7.37MHz)

Pin No.	Name	IN/OUT	Description
55	OSI1	I	System clock (7.37MHz)
56	GND	-	GND
57	UASCK	O	USAT clock to CPU
58	MD1	I	MPCA test pin (GND)
59	MD0	I	MPCA test pin (GND)
60	PHAI	I	System clock (9.83MHz)
61	AS#	I	Address strobe
62	RD#	I	Read Strobe
63	WR#	I	Write Strobe
64	IRQ0#	O	Interrupt request 0 to CPU
65	IRQ1#	O	Interrupt request 1 to CPU
66	SSPRQ#	O	SSP interrupt request to CPU
67	GND	-	GND
68	D0	I/O	Data Bus 0
69	D1	I/O	Data Bus 1
70	D2	I/O	Data Bus 2
71	GND	-	GND
72	D3	I/O	Data Bus 3
73	D4	I/O	Data Bus 4
74	GND	-	GND
75	D5	I/O	Data Bus 5
76	D6	I/O	Data Bus 6
77	D7	I/O	Data Bus 7
78	VDD	-	+3.3V
79	GND	-	GND
80	A0	I	Address bus 0
81	A1	I	Address bus 1
82	A2	I	Address bus 2
83	A3	I	Address bus 3
84	A4	I	Address bus 4
85	A5	I	Address bus 5
86	A6	I	Address bus 6
87	A7	I	Address bus 7
88	A8	I	Address bus 8
89	A9	I	Address bus 9
90	A10	I	Address bus 10
91	A11	I	Address bus 11
92	A12	I	Address bus 12
93	A13	I	Address bus 13
94	A14	I	Address bus 14
95	A15	I	Address bus 15
96	A16	I	Address bus 16
97	A17	I	Address bus 17
98	A18	I	Address bus 18
99	A19	I	Address bus 19
100	A20	I	Address bus 20
101	A21	I	Address bus 21
102	A22	I	Address bus 22
103	A23	I	Address bus 23
104	VDD	-	+3.3V
105	GND	-	GND
106	GND	-	GND
107	CD5#	I	RS-232 ch1 CD signal
108	CI5#	I	RS-232 ch1 CI signal

Pin No.	Name	IN/OUT	Description
109	DSR5#	I	RS-232 ch1 DSR signal
110	CTS5#	I	RS-232 ch1 CTS signal
111	RXD5	I	RS-232 ch1 RXD signal
112	TXD5	O	RS-232 ch1 TXD signal
113	DTR5#	O	RS-232 ch1 DTR signal
114	RTS5#	O	RS-232 ch1 RTS signal
115	INT4#	I	Shift enable for option display
116	HTS2	O	8 bit serial port output (for option display)
117	SCK2#	O	Serial port shift clock output (for option display)
118	STH2	I	8 bit serial port input (for option display)
119	DSR4#	I	MCR track 3 CLS signal
120	RXD4	I	MCR track 3 RDD signal
121	RXC4	I	MCR track 3 RCP signal
122	DSR2#	I	MCR track 2 CLS signal
123	RXD2	I	MCR track 2 RDD signal
124	RXC2	I	MCR track 2 RCP signal
125	DSR1#	I	MCR track 1 CLS signal
126	RXD1	I	MCR track 1 RDD signal
127	RXC1	I	MCR track 1 RCP signal
128	IPLON	O	IPL switch 0 ON signal to CPU
129	OPTCS#	O	Chip select base signal for expansion option
130	VDD	-	+3.3V
131	GND	-	GND
132	VMEMC#	O	VRAM chip select signal
133	VIOC#	O	LCDC chip select signal
134	VWAIT#	I	LCDC wait signal
135	DSF2#	O	DPRAM chip select signal
136	EXWAIT#	I	External wait signal
137	EXINT0#	I	External interrupt signal 0
138	EXINT1#	I	External interrupt signal 1
139	EXINT2#	I	External interrupt signal 2
140	EXINT3#	I	External interrupt signal 3
141	BUSY3#	I	Fiscal memory BUZY signal (NU)
142	RXD3	I	Fiscal memory RXD signal (NU)
143	TRXC3	I	Fiscal memory CLOCK signal (NU)
144	TXD3	O	Fiscal memory TXD signal (NU)
145	TXRDY3	O	NU
146	TRXRDY3	O	NU
147	RXRDY3	O	Fiscal memory READY signal (NU)
148	DTR3#	O	Fiscal memory DTR signal (NU)
149	RTS3#	O	Fiscal memory RTS signal (NU)
150	DBTST	I	MPCA test pin (GND)
151	VRESC	O	NU
152	ST1#	O	Thermal head drive strobe signal 1
153	ST2#	O	Thermal head drive strobe signal 2
154	ST3#	O	Thermal head drive strobe signal 3
155	GND	-	GND
156	GND	-	GND
157	VDD	-	+3.3V
158	ST4#	O	Thermal head drive strobe signal 4
159	ST5#	O	Thermal head drive strobe signal 5 (NU)
160	GND	-	GND
161	ST6#	O	Thermal head drive strobe signal 6 (NU)
162	LATCH#	O	Thermal head latch signal

Pin No.	Name	IN/OUT	Description
163	SO	O	Thermal head serial output data
164	GND	-	GND
165	CLOCK	O	Thermal head clock signal
166	SI	I	Thermal head serial return data
167	DTCS	O	Printer control select signal (GND)
168	LCDWT	I	Wait request signal to CPU (+3.3V)
169	DTST#	I	MPCA test pin (+3.3V)
170	INHDEC	I	CSEN# enable signal (GND)
171	CSEN#	I	TPRC chip select (GND)
172	TTST2#	I	MPCA test pin (+3.3V)
173	TTST1#	I	MPCA test pin (+3.3V)
174	TIRQ#	O	TPRC interrupt request
175	INH#	I	Thermal head drive inhibit
176	RPE	I	Receipt paper end signal
177	JPE	I	Journal paper end signal
178	PHUP	I	Printer head up signal
179	PCRES	I	Auto cutter unit reset signal
180	PFP	I	Auto cutter unit FP signal
181	VHCOM	I	Head drive common power control
182	GND	-	GND
183	VDD	-	+3.3V
184	RVPON	O	Receipt side paper feed pulse motor common power control signal
185	JVPON	O	Journal side paper feed pulse motor common power control signal (NU)
186	CTBO	O	Cutter motor control signal
187	CTAO	O	Cutter motor control signal
188	RDS	O	Receipt side paper feed pulse motor drive signal, phase D
189	RCS	O	Receipt side paper feed pulse motor drive signal, phase C
190	RBS	O	Receipt side paper feed pulse motor drive signal, phase B
191	RAS	O	Receipt side paper feed pulse motor drive signal, phase A
192	JDS	O	Journal side paper feed pulse motor drive signal, phase D
193	JCS	O	Journal side paper feed pulse motor drive signal, phase C
194	JBS	O	Journal side paper feed pulse motor drive signal, phase B
195	JAS	O	Journal side paper feed pulse motor drive signal, phase A
196	PTRM	I	Receipt motor connector sens signal
197	PTJM	I	Journal motor connector sense signal
198	POPI	I	GND
199	BA15	O	Address bus 15 for PB-RAM
200	BA14	O	Address bus 14 for PB-RAM
201	GND	-	GND
202	BA13	O	Address bus 13 for PB-RAM
203	BA12	O	Address bus 12 for PB-RAM
204	BA11	O	Address bus 11 for PB-RAM
205	BA10	O	Address bus 10 for PB-RAM
206	BA9	O	Address bus 9 for PB-RAM
207	BA8	O	Address bus 8 for PB-RAM
208	VDD	-	+3.3V

2-3. CKDC9 (HD404728B02FS)

1) General description

The CKDC9 is a 4-bit microcomputer developed for the UP-600/700 and provides functions to control the real-time clock, keys, and displays. The basic functions of the CKDC7 are shown below.

Keys: The CKDC9 is capable of controlling a maximum of 256 momentary keys. (Sharp 2-key rollover control)
Simultaneous scanning of key and switch
(When a key is scanned, the state of a mode and clerk switch is also buffered. The host can scan the state of switch together with the key entry data at the same time the key is scanned.)

Switches: Mode switch with 14 positions maximum
8-bit clerk (cashier) switch
2-bit feed switch
1-bit receipt on/off switch
1-bit option switch
4-bit general-purpose switch (1-bit is used for keyboard select)

Displays: 16-column dot display
12-column 7-segment display (column digit selectable)
All column blink controlled for the dot and 7-segment display decimal point and indicators
Programmable patterns for 7-segment display:
Four patterns
Internal driver for 7-segment display

Buzzer: Single tone control

Clock: Year, month, day of month, day of week, hour, minute

Alarm: Hour, minute

Interrupt request (event control):

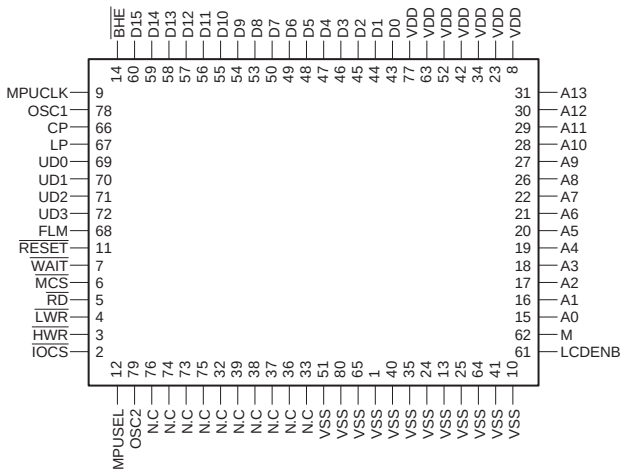
Detection of key input, switch position change, alarm issue, and counter overflow

2) Pin description

Pin No.	Symbol	Signal name	In/ Out	Function
1	SB	SB	Out	Segment B
2	SC	SC	Out	Segment C
3	SD	SD	Out	Segment D
4	SE	SE	Out	Segment E
5	SF	SF	Out	Segment F
6	SG	SG	Out	Segment G
7	P4	AP	Out	
8	P0	NC	—	NC
9	P1	NC	—	NC
10	P2	DP	Out	Decimal point
11	P3	ID	Out	Indicator
12	$\overline{\text{MODR}}$	VCC	—	+5V
13	$\overline{\text{CFSR}}$	$\overline{\text{CFSR}}$	In	Clerk key, Feed key, Switch return signal
14	KEX0	NC	Out	NC
15	KEX1	NC	Out	NC
16	RQ	GND	—	GND
17	SKR0	VCC	—	+5V
18	ST0	ST0	Out	Key strobe signal
19	ST1	ST1	Out	Key strobe signal
20	ST2	ST2	Out	Key strobe signal
21	ST3	ST3	Out	Key strobe signal
22	$\overline{\text{POFF}}$	$\overline{\text{POFF}}$	In	Power off signal
23	$\overline{\text{STOP}}$	$\overline{\text{STOP}}$	In	STOP signal
24	$\overline{\text{DDIG}}$	VCC	—	+5V
25	$\overline{\text{DCS}}$	$\overline{\text{DCS}}$	—	Dot display controller chip select $\overline{\text{DCS}}$
26	VCC	$\overline{\text{VCKDC}}$	—	+5V
27	$\overline{\text{SCK}}$	$\overline{\text{SCK}}$	In	Clock signal
28	HTS	HTS	In	Key data from host
29	STH	STH	Out	Key data to host
30	SDISP	GND	—	GND
31	BUZZ	BUZZ	Out	Buzzer
32	$\overline{\text{DSCK}}$	$\overline{\text{DSCK}}$	—	Dot display controller $\overline{\text{SCK}}$
33	$\overline{\text{SRES}}$	$\overline{\text{RESET}}$	Out	Reset signal
34	DS0	$\overline{\text{DSO}}$	—	Dot display controller SO
35	$\overline{\text{SHEN}}$	$\overline{\text{SHEN}}$	Out	Shift enable signal
36	$\overline{\text{IRQ}}$	$\overline{\text{KRQ}}$	Out	Key request signal
37	KR0	$\overline{\text{KR0}}$	In	Key return signal
38	KR1	$\overline{\text{KR1}}$	In	Key return signal
39	KR2	$\overline{\text{KR2}}$	In	Key return signal
40	KR3	$\overline{\text{KR3}}$	In	Key return signal
41	RESET	CKDCR	In	CKDC reset signal
42	OSC2	OSC2	—	Clock
43	OSC1	OSC1	—	Clock
44	GND	GND	—	GND
45	CL1	CL1	—	Time clock
46	CL2	CL2	—	Time clock
47	TEST	VCKDC	—	+5V
48	G0	G1	Out	Display digit signal
49	G1	G2	Out	Display digit signal
50	G2	G3	Out	Display digit signal
51	G3	G4	Out	Display digit signal
52	G4	G5	Out	Display digit signal
53	G5	G6	Out	Display digit signal
54	G6	G7	Out	Display digit signal
55	G7	G8	Out	Display digit signal
56	G8	G9	Out	Display digit signal
57	G9	G10	Out	Display digit signal
58	G10	G11	Out	Display digit signal
59	G11	NC	Out	NC
60	PO0	NC		NC
61	PO1	NC		NC
62	PO2	NC	—	NC
63	PO3	NC	—	NC
64	SA	SA	—	Segment A

2-4. LCD controller (M66271FB)

1) Pin configration



2) Pin configration

Pin No.	Name	Description
1	VSS	GND
2	IOCS#	Chip select input for control register
3	HWR#	High write strobe input
4	LWR#	Low write strobe input
5	RD#	Read strobe input
6	MCS#	Chip select input for VRAM
7	WAIT#	WAIT output to MPU
8	VDD	+5V
9	MPUCLK	MPU clock
10	VSS	GND
11	RESET#	Reset input
12	MPUSEL	8/16-bit selective input to MPU
13	VSS	GND
14	BHE#	Bus high enable input
15	A0	MPU address bus 0
16	A1	MPU address bus 1
17	A2	MPU address bus 2
18	A3	MPU address bus 3
19	A4	MPU address bus 4
20	A5	MPU address bus 5
21	A6	MPU address bus 6
22	A7	MPU address bus 7
23	VDD	+5V
24	VSS	GND
25	VSS	GND
26	A8	MPU address bus 8
27	A9	MPU address bus 9
28	A10	MPU address bus 10
29	A11	MPU address bus 11
30	A12	MPU address bus 12
31	A13	MPU address bus 13
32	N.C	
33	N.C	
34	VDD	+5V
35	VSS	GND
36	N.C	
37	N.C	
38	N.C	
39	N.C	
40	VSS	GND
41	VSS	GND
42	VDD	+5V
43	D0	MPU data bus 0
44	D1	MPU data bus 1
45	D2	MPU data bus 2
46	D3	MPU data bus 3
47	D4	MPU data bus 4
48	D5	MPU data bus 5
49	D6	MPU data bus 6
50	D7	MPU data bus 7
51	VSS	GND
52	VDD	+5V
53	D8	MPU data bus 8
54	D9	MPU data bus 9
55	D10	MPU data bus 10
56	D11	MPU data bus 11
57	D12	MPU data bus 12
58	D13	MPU data bus 13
59	D14	MPU data bus 14
60	D15	MPU data bus 15
61	LCDENB	LCD (ON/OFF) control signal input
62	M	LCD AC-conversion signal output
63	VDD	+5V
64	VSS	GND
65	VSS	GND
66	CP	Display data transfer clock
67	LP	Display data clutch pulse
68	FLM	FIRST LINE MARKER signal output
69	UD0	LCD display data bus 0
70	UD1	LCD display data bus 1
71	UD2	LCD display data bus 2
72	UD3	LCD display data bus 3
73	N.C	
74	N.C	
75	N.C	
76	N.C	
77	VDD	+5V
78	OSC1	Oscillation input terminal
79	OSC2	Oscillation output terminal
80	VSS	GND

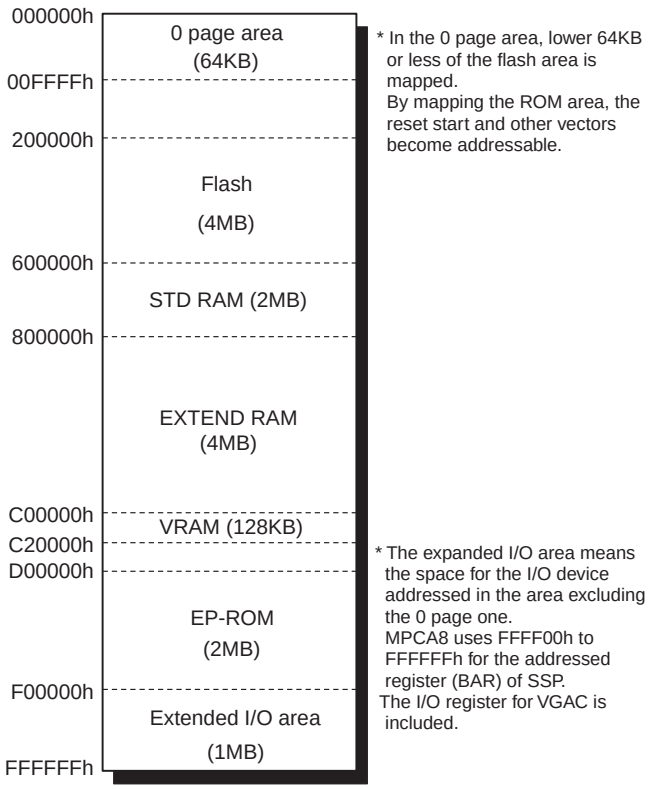
3. Address map

3-1. Total memory space

The address map of the total memory space is shown below. As you can see, the memory space is divided into the following 5 blocks:

0page area (including the I/O area)

- VRAM
- RAM
- ROM
- Extended I/O area



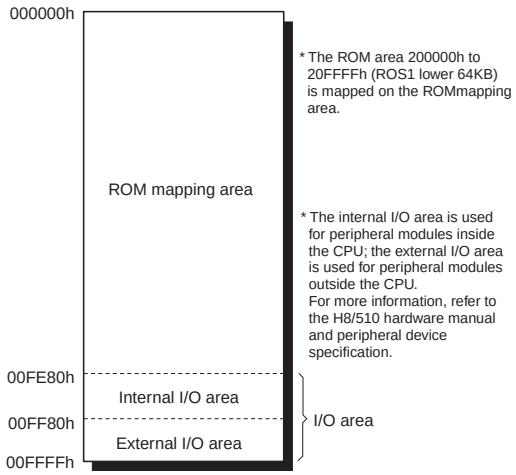
3-2. 0page area

The 0page area consists of four spaces: the ROM mapped area, internal and external I/O areas.

The ROM mapped space have been devised for the following purposes:

① Simplifying the procedure for booting the IPL program

② Achieving high-speed accessing, and accessing by abbreviated instructions.

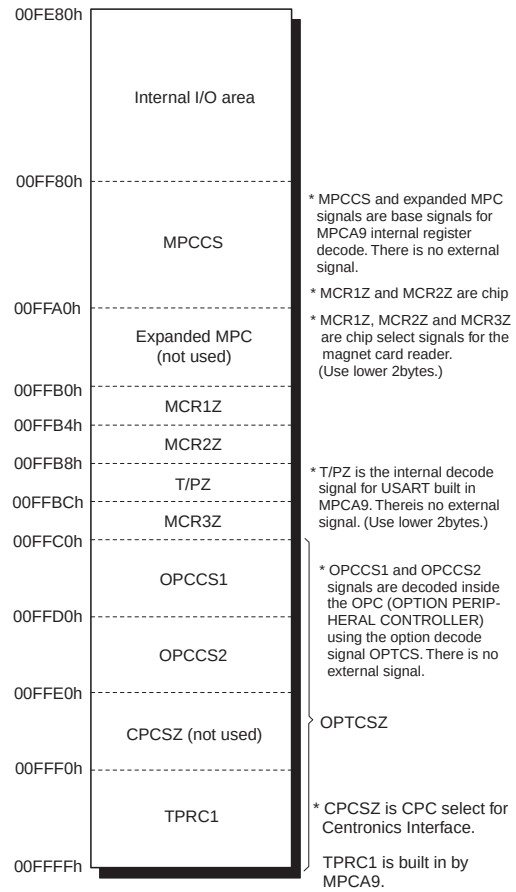


3-3. I/O areas

The addresses from 00FF80h to 00FFFFh are called the internal I/O area.

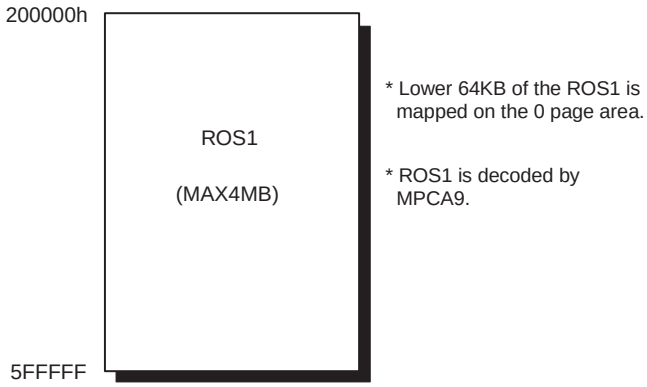
The internal I/O area is a space where the control registers and built-in ports inside the CPU are addressed.

The external I/O area is a space where the peripheral devices outside the CPU or devices on an optional card are addressed.



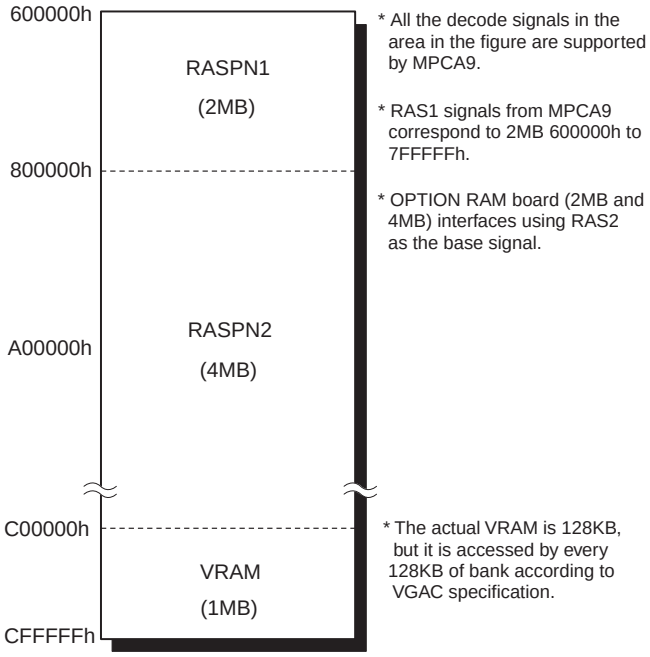
3-4. ROM space

Fig.5 shows the ROM space. The UP-600/700 uses 2MB of NOR-type flash memory instead of conventional ROM, so that the FROS1# from the MPCA9 is input into the chip enable of the flash memory.



3-5. VRAM & RAM space

The VRAM is the display memory of the LCD.



3-6. Extended I/O area

The addresses from F00000h to FFFFFFh are called an extended I/O area. The UP-600/700 uses the following addresses as the break address register (BAR) for SSP.

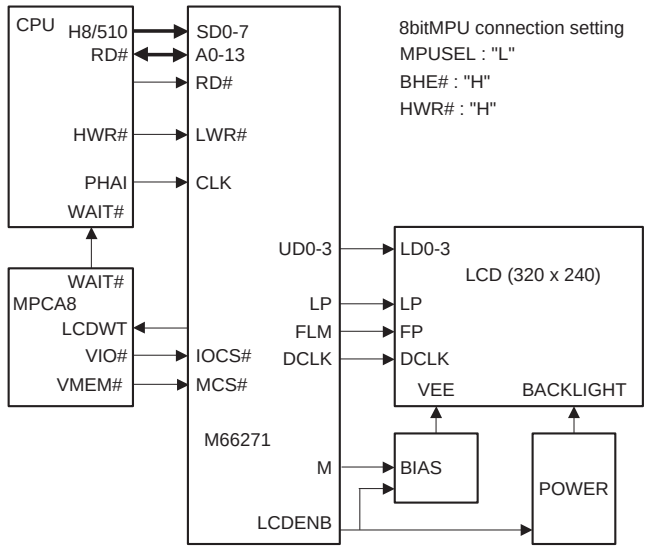
- FFFF00h ~ FFFFFFh

4. LCD display

The UP-600/700 uses a 320 x 240 dot monochromatic LCD for the main display and VGAC (M66271) for the display controller which is connected to H8/510 in the ISA bus connection mode.

4-1. Block diagram

Here is the block diagram of the LCD and its allied components.



4-2. LCD panel

The LCD panel uses a dot-matrix liquid crystal module with monochromatic STN and CCFT backlight. The resolution is 320 x 240.

4-3. Display controller

Matsushita VGAC (M66271) is used for display controller.

VRAM is present on the address space of the CPU and it is possible to write and read data from the CPU side through the lower 9600 byte address of 128 KB size in addresses C00000H ~ C1FFFFH.
C00000H - C1FFFH:

4-4. LCD ON control

The LCD is turned on and off by controlling the bias power supply for the LCD using the terminal LCDENB of the M66271.
LCDENB is in low level when resetting. When bit 0 of the mode resistor of the M66271 by software is set to high level, the power is supplied to the LCD, thus turning on the LCD.

4-5. Back light control

The backlight ON/OFF is controlled by the same LCDENB as used for controlling the LCD ON.

4-6. Luminance and contrast adjustment

- Luminance: Luminance is adjusted with an inverter which has dimming function. (Fixed)
- Contrast: Contrast is adjusted by controlling the contrast adjustment voltage (VO) of the LCD.

5. Customer display

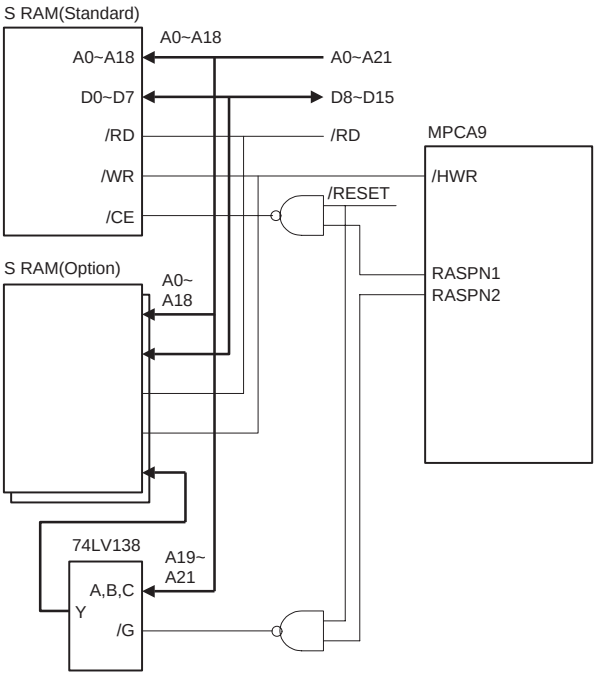
The UP-600/700 can incorporate a UP-P16DP for the customer display.

6. SRAM (Standard)

The device is HYUNDAI 4MB SRAM (HY628400ALLT2-70 512K 8bit) with access time of 70ns.

6-1. CPU interface

The figure below shows a typical pseudo SRAM interface in the UP-600/700.



6-2. SRAM address

Standard SRAM is decoded as follows by the RASPN1 signal.

① 780000h ~ 7FFFFFh

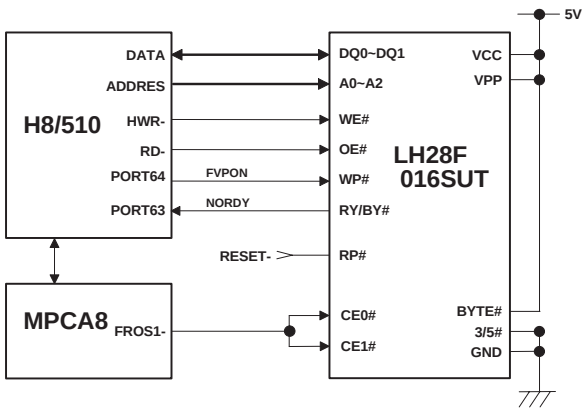
The base signal is 2MB. It thus wraparounds with 600000H ~ 7FFFFFH 1.5MB.

7. NOR-type flash memory

Here is the explanation for the interface of NOR-type flash memory. The device is Sharp's LH28F016SU flash memory which consists of 512 K words × 16 or 1 MB × 8, with 32 blocks of 64 KB.

7-1. CPU interface

The figure below shows a typical interface for the LH28F016SU of the UP-600/700 system.



7-2. Device control

After resetting, the device automatically enters the array read mode and perform the same action as the usual ROM, thus requiring no special consideration when reading data.

Data can be written at high speed by using the page buffer.

8. SSP control

The UP-600/700 uses flash memory in the place of EPROM, so it is possible to rewrite the contents of the flash memory in changing the program. However, since the existing gate array MPCA8 is used, it is also possible to use the conventional SSP.

8-1. Operation

Like the MPCA5 ~ 8, the MPCA9 adopts the break address register comparison method for detecting addresses. The operation of this method is briefly explained below.

The gate array always compares the break address register (BAR) built in the gate array, with the address bus to monitor the address bus.

If both agree, the gate array outputs the NMI signal to the CPU, which in turn shifts from normal handling to exception handling.

In both the MPCA5 ~ 8 and the MPCA9, SSP is achieved by the above operation.

The setting of the break address register (BAR) is directly written in the addresses from FFFF00h to FFFFFFh.

9. Interrupt control

There are roughly two types of interrupts:

- Internal interrupts: Controlled inside the CPU
- External interrupts: Input into the CPU from outside

9-1. Internal interrupts

Device interrupts built in the CPU are used for the following applications:

Event factor		Application
SC11		Interrupt source as RS232 : CH8
SC12		Not used (SC1 is used for CKDC interface.)
FRT1	(ICI) (OCRA) (OCRB) (OVF)	INTMCR ~ MCR interrupt (to FT11 terminal)
FRT2	(ICI)	Standard SHEN event (for CKDC)
	(OCRA)	Simple IRC timer event
	(OCRB)	RS232 timer event
	(OVF)	System timer (53 ms)
TMR	(CMA) (CMB) (OVF)	
WDT	(OVF)	Drawer open timer
A/D		Not used
NMI		SSP request

9-2. External interrupts

The following types of external interrupts are available:

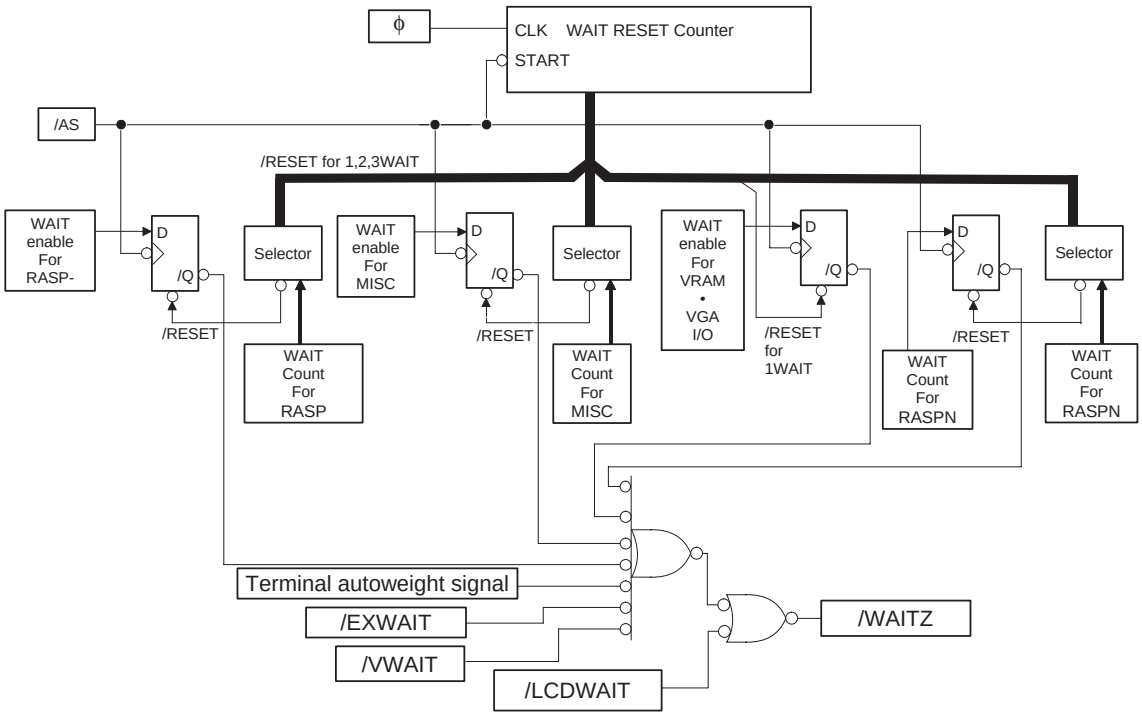
- $\overline{\text{NMI}}$ (SSP)
- $\overline{\text{IRQ0}}$ (Standard I/O interrupt)
- $\overline{\text{IRQ1}}$ (RS232 interrupt)
- $\overline{\text{IRQ2}}$ (Not Used)
- $\overline{\text{IRQ3}}$ (Used as SCK terminal)

10. WAIT control

The weight control function built in the MPCA9 is used to provide an interface with low-speed devices.

10-1. Block diagram

The block diagram of the wait control function is shown.



In the figure, the decoder, wait enabling register, AND-OR sections are the same as those in the MPCA6 or 7, but other components are newly incorporated in the MPCA5.

EXWAITZ and WAITZ are external weight signals which are to be ORed inside the MPCA9 and output to the WAITZ. The EXWAITZ is a general-purpose wait request terminal, and WAITZ is the wait request signal from the VGA controller.

11. CKDC9

The UP-600/700 on CKDC9 for the CKDC PWB and one CKDC9 for POLE display (option) to carry out the following control operations.

CKDC PWB CKDC9:

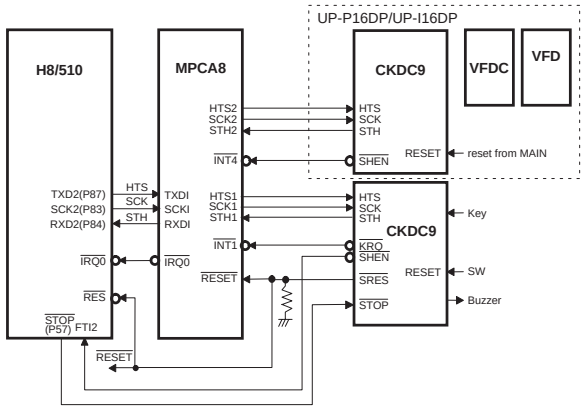
- Clock (second data readable)
- Buzzer
- System reset
- Key/Clerk switch

POLE CKDC9(UP-P16DP)

- Customer display tube

11-1. Interface

CKDC9 is connected through the MPCA8.



12. Option RAM interface

12-1. Interface

The expanded RAM connector terminals are shown in the table.

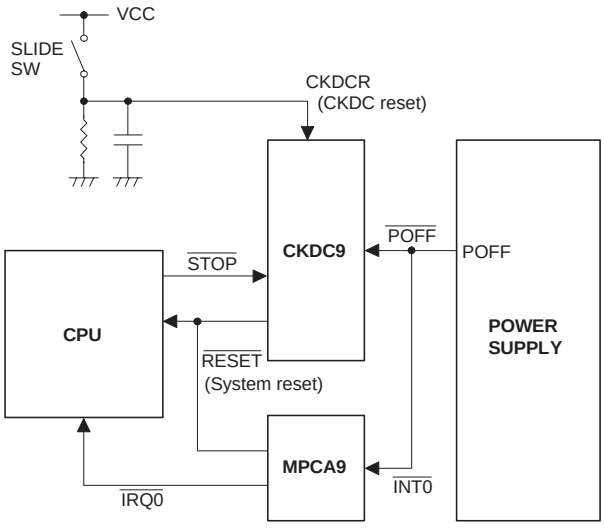
The 40-pin RAM is used for the connector.

Extension RAM connector terminals

Signal Name	Pin No.		Pin No.	Signal Name
+5V	1		2	N.C.
$\overline{\text{HWR}}$	3		4	N.C.
GND	5		6	A21
A20	7		8	A19
A18	9		10	A17
A16	11		12	A15
A14	13		14	A13
A12	15		16	A11
A10	17		18	A9
A8	19		20	A7
A6	21		22	A5
A4	23		24	A3
A2	25		26	A1
A0	27		28	$\overline{\text{RD}}$
D7	29		30	D6
D5	31		32	D4
D3	33		34	D2
D1	35		36	D0
$\overline{\text{RASPN2}}$	37		38	VCKDC
GND	39		40	GND

13. Reset sequence

The reset sequence block diagram is shown below. Note that $\overline{\text{RESET}}$ signal (system reset) and $\overline{\text{CKDCR}}$ signal (CKDC reset) are different from each other.



13-1. Power ON/OFF

The flow of signal processing at the time of the power supply turning On/Off is as follows:

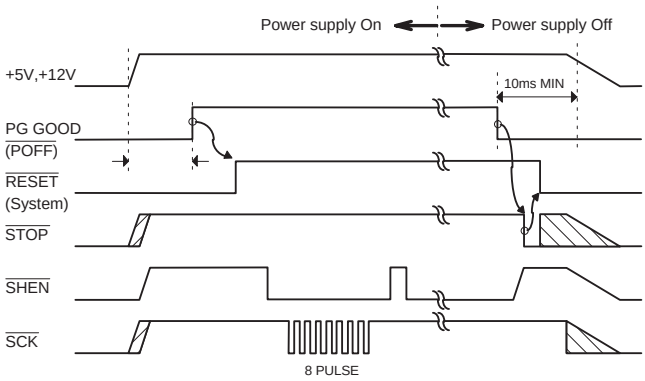
<Power OFF> **Table 19**

	Power supply	MPCA9	CPU	CKDC9
1	$\overline{\text{POFF}}$ → L			
2		$\overline{\text{IRQ0}}$ → L		
3			$\overline{\text{STOP}}$ → L	
4				$\overline{\text{RESET}}$ → L (System reset)

<Power ON> **Table 20**

	Power supply	MPCA9	CPU	CKDC9
1	$\overline{\text{POFF}}$ → H			
2			$\overline{\text{STOP}}$ → H	
3				$\overline{\text{RESET}}$ → H (System reset)

The table below shows the timing chart.

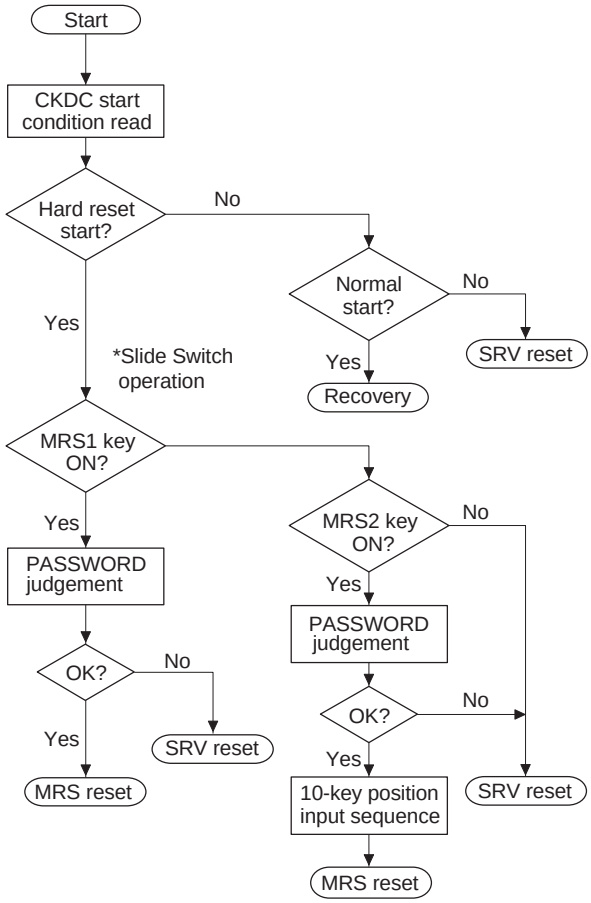


13-2. MRS, SRV reset

The UP-600/700 does not have the mode switch. The procedure for resetting MRS, SRV is different from that of conventional cash registers.
in the UP-600/700, MRS, SRV resetting is selected and executed by the key which has bee depressed when the CKDC reset is released to start the system.

(In the case of MRS, security is added by a key operation equivalent to a pass word.)

Flow chart



14. Drawer

The UP-600/700 can use up to 2 optional external drawers.

14-1. Drawer solenoid drive

P34 ~ P37 inside the CPU are allocated for the port output of the drawer solenoid drive.

Built-in port	Signal name	Remarks
P34	$\overline{DR0}$	Drawer 1 (optional drawer)
P35	$\overline{DR1}$	Drawer 2 (optional drawer)
P36	$\overline{DR2}$	Reserved
P37	$\overline{DR3}$	Reserved

One port corresponds to one drawer. Theoretically, it is possible to drive multiple drawers at the same time, but this processing must be inhibited softwarewisely because of power supply capacity and driver hardware factors. If a power failure is detected, the drawer solenoid drive must be stopped as soon as possible.

∗ The drawer solenoid drive time must controlled in the range of 40 ms to 50 ms by the timer.

14-2. Drawer open/close sense

The drawer open/close sense signal is input into the built-in port of the CPU. the sense signal of an optional drawer sensor is also wired ORed before inputting.

- P33=1: Any of the drawers is open.

15. TCP/IP STACK

The LAN of the UP-600/700 uses as a protocol Ethernet, which supports TCP/IP.

The interface with the TCP/IP board is achieved through 2 interrupt signals and dual-port RAM.

The decode of dual-port RAM is located in the following space:

DP-RAM: F20000H - F2FFFFH (max. 64 KB)

The interruption from the TCP/IP is allocated as follows:

EXINTO: INTSW (SLAVE WRITE interrupt) bit 6 of 00FF81H

EXINT1: INTSR (SLAVE READ interrupt) bit 0 of 00FF80H

<TCP/IP connector terminals>

Signal Name	Pin No.		Pin No.	Signal Name
+5V	2		1	+5V
+5V	4		3	+5V
A14	6		5	A15
A12	8		7	A13
$\overline{HWR}$	10		9	$\overline{DPCS}$
A10	12		11	A11
A0	14		13	$\overline{RD}$
A2	16		15	A1
A4	18		17	A3
A6	20		19	A5
A8	22		21	A7
D7	24		23	A9
D5	26		25	D6
D3	28		27	D4
D1	30		29	D2
$\overline{LRES}$	32		31	D0
$\overline{INTSW}$	34		33	$\overline{INTSR}$
-	36		35	-
GND	38		37	GND
GND	40		39	GND

16. RS232

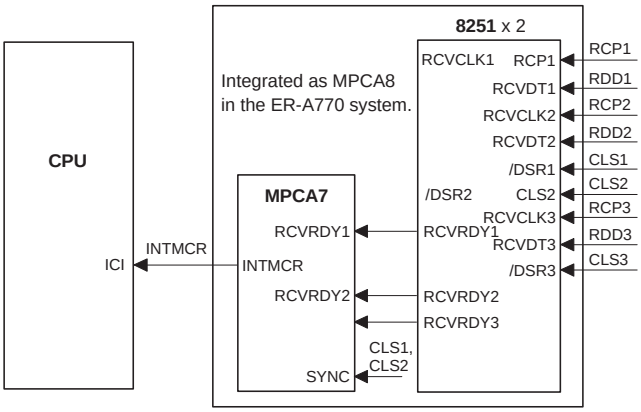
Two standard RS232 channels are compatible with the ER-A5RS. However, while the ER-A5RS uses the $\overline{IRQ2}$ terminal of the CPU for interruption of the RS232, the UP-600/700 cannot use the $\overline{IRQ1}$ terminal instead of it. (The $\overline{IRQ2}$ terminal is used for IR as the SCK1 terminal.)
The standard RS232 is fixed to the logic channels 1 and 8. Use the channels 2, 3, 4, 5, 6 and 7 for the ER-A5RS.

17. MCR

This paragraph describes MCR option (UP-E13MR) control defined by UP-600/700 hardware architecture.
3 channels of the serial port (interchangeable with 8251) built in the MPCA9 are used. 3 tracks of data are read simultaneously. Supports the first and second tracks MCR of ISO. (UP-E13MR)

17-1. CPU interface

The CPU interface for the USART (8251) and magnet card reader (MCM-21) in the UP-600/700 system is shown below.



Signal description

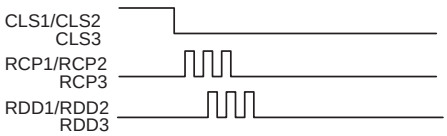
RCP1	TRACK 1 CLOCK PULSE
RDD1	TRACK 1 DATA SIGNAL
RCP2	TRACK 2 CLOCK PULSE
RDD2	TRACK 2 DATA SIGNAL
RCP3	TRACK 3 CLOCK PULSE
RCD3	TRACK 3 DATA SIGNAL
CLS1	TRACK 1 CARD DETECTION SIGNAL
CLS2	TRACK 2 CARD DETECTION SIGNAL
CLS3	TRACK 3 CARD DETECTION SIGNAL
RCVRDY1	TRACK 1 DATA RECEIVING SIGNAL
RCVRDY2	TRACK 2 DATA RECEIVING SIGNAL
RCVRDY3	TRACK 3 DATA RECEIVING SIGNAL
INTMCR	INTERRUPT SIGNAL OR-SYNTHESIZED from RCVRDY and SYNC input

2 chip select signals for 8251 are generated inside MPCA8.

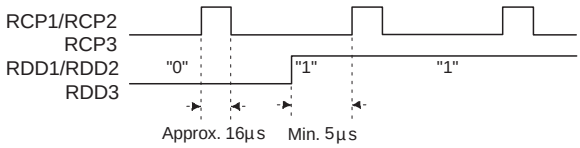
17-2. MCR interface

The operating timing of the MCR interface signals is given below.

(1) Example of timing



(2) Detailed timing (relation between DATA and CLOCK PULSE)

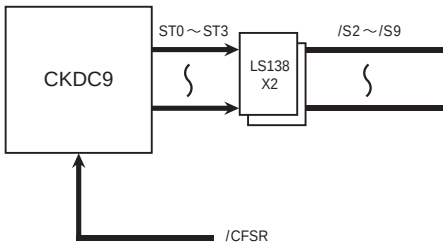


The "NULL" CODE is basically written prior to the opening code. The opening code detection algorithm is considered because data may become corrupt before and after the CARD detection signal due to a worn magnet stripe.

18. 1-HOLE CLERK

On the UP-600/700, 1-hole clerk key with up to 8 bits can be used.

The 1-hole clerk switch is controlled through the CKDC9 on the main board.



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