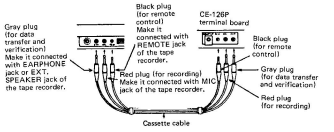
SHARP SERVICE MANUAL

CODE : 00ZCE126PSM/E

MODEL CE-126P



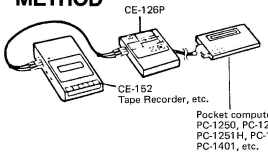
1. PRODUCTS OUTLINE

The CE-126P printer is an optional printer with the cassette interface designed for use with the pocket computer models PC-1245, PC-1250, PC-1251, and PC-1401 (EL-5500).

2. SPECIFICATIONS

Printer type:	Dot matrix thermal printer (MTP-201), identical to the one used for the CE-125
Printing positions:	24 printing positions
Print speed:	Approx. 0.8 lines/second
Paper feed speed:	Approx. 0.8 lines/second
Recording paper:	CPAPR1025CC05 (EA1250P, identical to the one used for the CE-125) Thermal recording paper (paper roll with outer diameter of 18 mm, maximum, and width of 58mm)
Power supply:	Uses four UM3 (AA) dry cell batteries. Options: AC adaptor (EA-23E) NiCd battery (EA-27B) (use of the EA-23E for recharge)
Power consumption:	3 watts
Battery life:	UM3: Approx. 2000 lines SUM3: Approx. 3000 lines EA-27B: Approx. 5000 lines (recharge time: about 15 hours)
Physical dimensions:	140.5(W) x 116(D) x 23(H) mm

3. TAPE RECORDER INTERFACING METHOD



- Use of the CE-125 Tape Recorder exclusively designed for the Pocket Computer is recommended.

Cassette Tape Recorder
The following is a description of the minimum tape recorder specifications necessary for interfacing with the CE-126P.

Item	Requirements
1. Recorder Type	Any tape recorder, standard cassette or micro-cassette recorder, may be used in accordance with the requirements outlined below.
2. Input Jack	The recorder should have a mini-jack input labeled "MIC". Never use the "AUX" jack.
3. Input Impedance	The input jack should be a low impedance input (200 ~ 1,000 OHM.)
4. Minimum Input Level	Below 3 mV or −50 dB.
5. Output jack	Should be a minijack labeled "EXT. (EXTernal speaker", "MONITOR", "EAR (EARphone" or quivalent.
6. Output impedance	Should be below 10 OHM.
7. Output level	Should be above 1V (practical maximum output above 100 mW)
8. Distortion	Should be within 15% within a range of 2 kHz through 4 kHz.
9. Wow and Flutter	0.3% maximum (W.R.M.S)
10. Other	Recorder motor should not fluctuate speed.

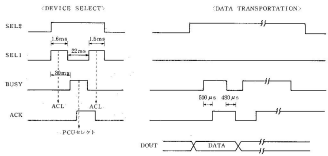
NOTES:

- Some of tape recorders may not operate properly owing to different specification or electrical characteristics affected by signal distortion, electrical noise, level drop-out caused after long years of use.
- When using the tape recorder fitted with the mixing feature, it needs to disable the mixing function for both recording and playback.
- Depending on the tape recorder used, better reading result may be attained when the red plug is unplugged from the MIC jack.
- As it may impede proper data transfer and verification depending on the position of the volume control, tone control, bass control, and treble control, try to find the optimum level by varying their positions.

4. CIRCUIT DESCRIPTION

The CE-126P has two microprocessors; the P-CPU by which data transfer is carried out with the host CPU (M-CPU) and the printer control PCU. Since the host CPU (PC-1245, 1250, 1251, 1401, (EL5500) have different CPU actions, the CE-126P CPU therefore performs different action.

M-CPU to P-CPU data transfer method (for PC-1245, 1250, 1251)



4-1.

What action should the P-CPU take prior to data transfer is dependent on the state of SEL1 and SEL2 from the M-CPU. (DEVICE SELECT)

SEL1	SEL2	Action
L	L	Nop
L	H	PCU select
H	L	Remote ON
H	H	ACL

4-2.

The following actions take place before data transfer.

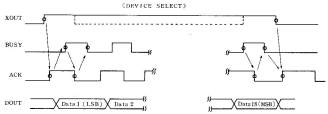
(1) SEL1 goes low and SEL2 high.
(2) BUSY from the M-CPU turns high level.
(3) Upon receipt of BUSY, ACK of the P-CPU is set high and the data is received to the P-CPU.

Since the data is transferred in bit by bit serial mode, above steps (2) and (3) are repeated eight times to complete transfer of one data. For instance, those steps are repeated for 192 times (24 x 8) in order to transfer a 24 digits data. The print command, however, is sent out to the P-CPU at the end of the data in a form of the code "0D"

4-3.

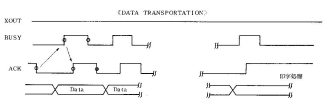
M-CPU to P-CPU data transfer method (for PC-1401, EL5500)

Since there are no SEL1 and SEL2 used for the PC-1401 and EL5500, DEVICE SELECT is dependent on the contents of data.



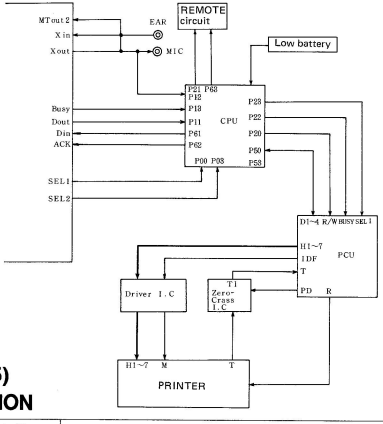
(1) For DEVICE SELECT, XOUT becomes high.
(2) As the P-CPU receives a high state of XOUT, it sends ACK to the M-CPU.
(3) As the M-CPU receives ACK, it sends back BUSY.
(4) Data is received to the P-CPU with a high state of BUSY. ACL, REMOTE ON, CPU select actions is carried out depending on the contents of data.

4-4. Print data transfer



XOUT goes low when the print data is transferred. Data transfer is done in a manner identical to those of the PC-1250.

5. BLOCK DIAGRAM



6. CPU (UPD7506G515) SIGNAL DESCRIPTION

Pin No.	Signal Name	In/Out	Description
P03	SEL2	In	Select
P00	SEL1	In	Select
P13	BUSY	In	Handshake, active high
P12	XOUT	In	Device select, active high
P11	DOUT	In	Data, active high
P10	DOUT	In	Printer error
P23	ACL/SEL1	Out	High: ACL Low: nornal
P22	CS/SEL2	Out	High: chip select Low: non-select
P21	REMO2	Out	Remote off ⎍‾⎍ Remote off pulse generation
P20	R/W	Out	High: read, "High to low transition: write
P43	P/S	In	Data transfer mode High: parallel Low: serial
P42	NORMAL PAPER/ THERMAL PAPER	In	PCU select High: normal paper PCU Low: thermal paper PCU
P41	LOW BATTERY	In	Low battery check High: normal Low: low battery
P40	ACK	In	Handshake (PCU to printer CPU)
P53	D3	In/Out	Data line between CPU and PCU MSB (High ..... 1, Low ..... 0)
P52	D2	In/Out	Data line between CPU and PCU (High ..... 1, Low ..... 0)
P51	D1	In/Out	Data line between CPU and PCU (High ..... 1, Low ..... 0)
P50	D0	In/Out	Data line between CPU and PCU LSB (High ..... 1, Low ..... 0)
P63	REMO1	Out	Remote on ⎍‾⎍ Remote on pulse generation
P62	ACK	Out	Handshake (to host CPU), active high
P61	DIN	Out	Printer error (to host CPU) High: printer error Low: normal
P60	BUSY	Out	Handshake (printer CPU to PCU), active high

7. PCU (SC6994) SIGNAL DESCRIPTION

Pin No.	Signal Name	In/Out	Description
1	SEL2	In	Select
2	SEL1	In	Select
3	VDD	Out	Power supply
4	ACL		Not used
5	BUSY	In	High: chip select - - - - - - - - - Low: Non-select
6	R/W	In	High: read High to low transition: write
7 ~ 10	D4 ~ 1	In	Data input
11	STP		Not used
12	S	In	Data transfer mode select line High: serial input - - - - - - - - Low: parallel input/output
13	24	In	Print digit select line High: 24 digits (GND connected) Low: 16 digits
14	IDF	Out	Printer motor drive signal
15	H7	Out	Printhead element on pulse
16	H6	Out	Printhead element on pulse
17	GND	In	Power supply
18 ~ 22	H5 ~ H1	Out	Printhead element on pulse
23	R	In	Printer reset (printhead home position detect)
24	PD	Out	Power down (in supply during printer operating cycle, otherwise, power is not supplied to the printer drive circuit.
25	T	In	Printer timing (generated from the tachogenerator of the motor)
26 ~ 28	TS1 ~ 3	In	Test pins
29	VP1	Out	Printer control circuit supply power
30 ~ 32	BC1 ~ 3	In/Out	PCU frequency control
33	CCK	Out	Clock test pin
34	HA	In	Not used → (Print density adjust pin ... JA and JB pin connection varies according to the printhead rank).
35	HB		
36	HC	In	
37, 38	CL1, 2	In	Basic clock pulse control resistor fitting pin
39	$\overline{PF}$	In	Paper feed key input
40	NP	In	GND Connected
41	ACL	In	All clear input
42	OP3	Out	ACL select (high when on)
43	OP2		Not used.
44	OP1		Not used.

8. SERVICE CAUTIONS

8-1. Cautions in exchanging the printer unit

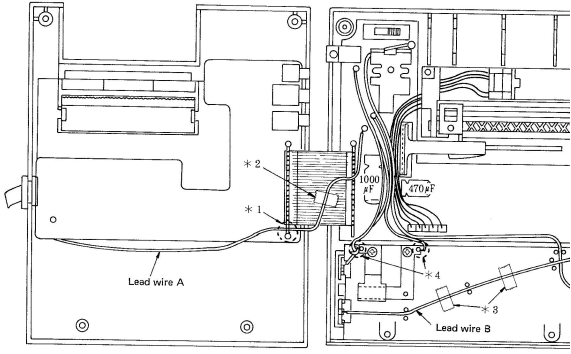
In order to prevent print density variation caused by thermal head resistance variation, the printhead is classified into three ranks of A, B, and C, and the rank is indicated on the reverse side of the printer unit F.P.C. After exchange of the printer unit, relevant circuit change must be observed in accordance with the procedure mentioned below.

Short JA when the rank A printer is used.
Leave all open when the rank B printer is used.
Short JC when the rank C printer is used.

After the above procedure, adjust by mean Kohms protentiometer so that an optimum p obtained. The circuit has been so designed as best result with the potentiometer set at its mi Therefore, existence of a remarkable print den might involve the following problems:

1. Drop in head performance
2. Quality change in the thermal recording pap
3. Throuble in the thermal control circuit

8-2. Threading lead wires

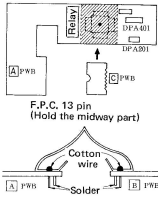


- Be sure to observe the following cautions in installing lead wire.
  - *1,*2: The lead wire A most be threaded under the cotton wire and fixed on the F.P.C. using the adhesive tape.
  - *3: The lead wire B should be fixed with the adhesive tape along the rib of the bottom cabinet.
  - *4: Do not allow the strayed lead wire a extend out of the Ni-Cd battery ter printer unit, when the lead wire is be to the NiCd battery terminal.

Unless lead wires A and B are threaded pro cause to recharge the dry battery (UM3 or of slack lead wires, when the AC adaptor dry batteries in installation.

8-3. C Installing PWB

(1) Set the lead wire to the given location of the A PWB and solder it.
(2) As shown in the figure, apply the double tack adhesive tape over the CPU (UPD7506G) on the A PWB, then set the C PWB over it with the hole facing the relay.
(3) After the installation of the C PWB, solder the lead wire to the C PWB.

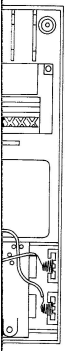


8-4. Connecting A with B

As shown in the figure, fix the 13-pin F.P.C. with the cotton wire. The cotton wire also has to be soldered in a same manner as the F.P.C.

means of the 20-
m print quality is
d as to attain the
s midway.
density variation

paper

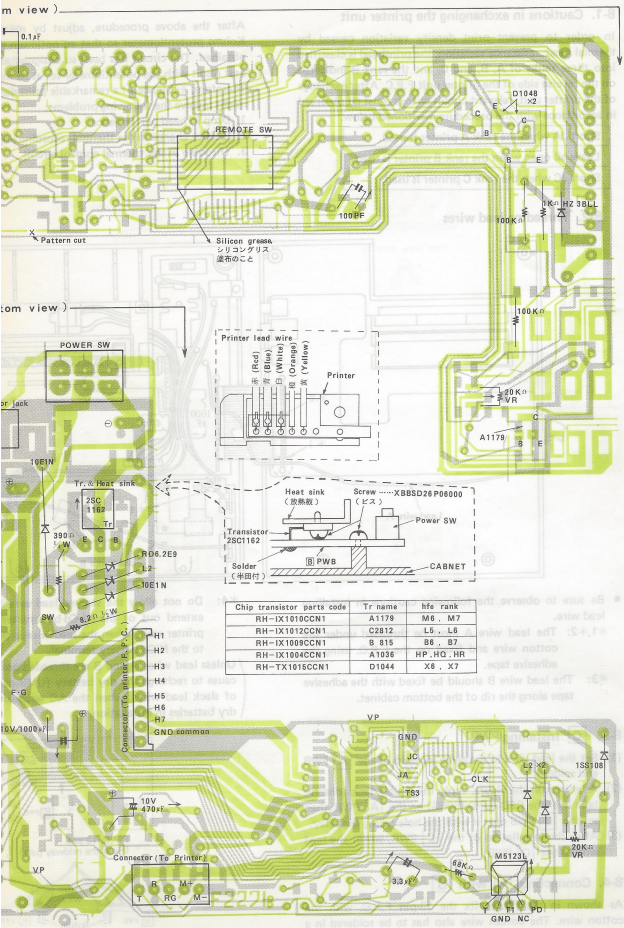


ire and solder to
terminal to the
is being soldered

properly, it may
3 or AA) because
ptor is used with

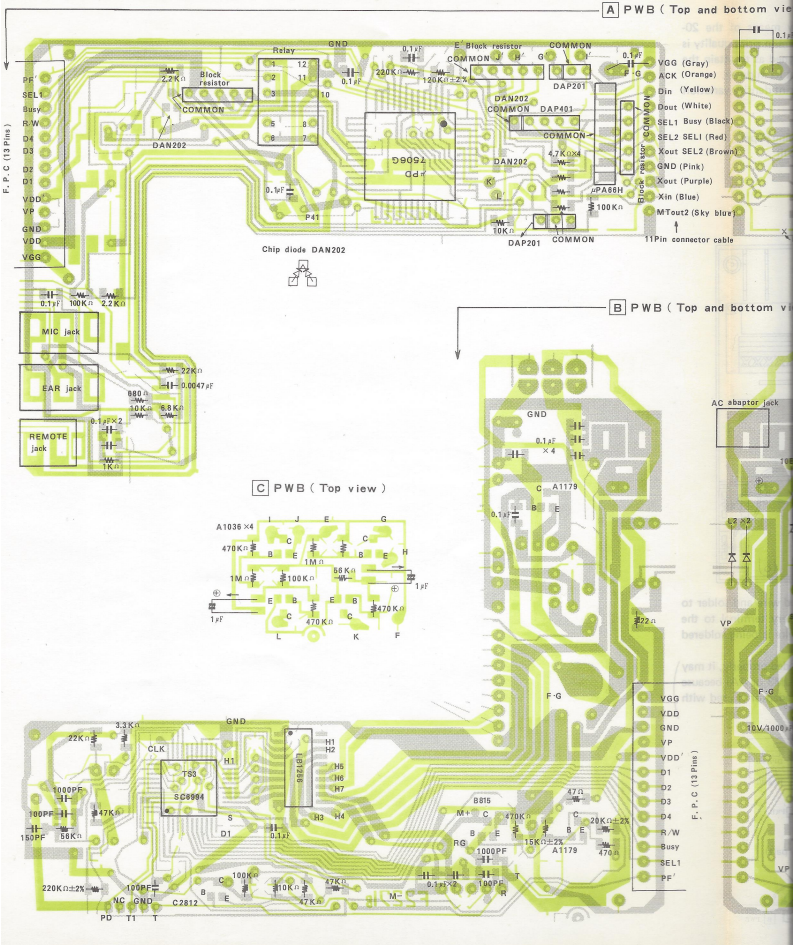
A-101
A-201

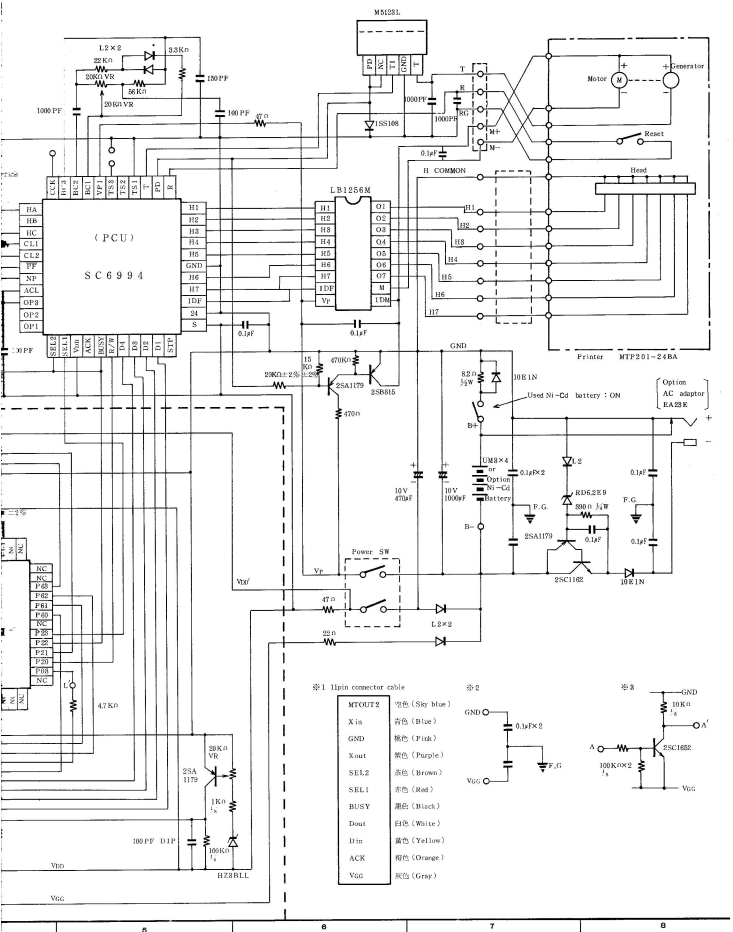
PWB



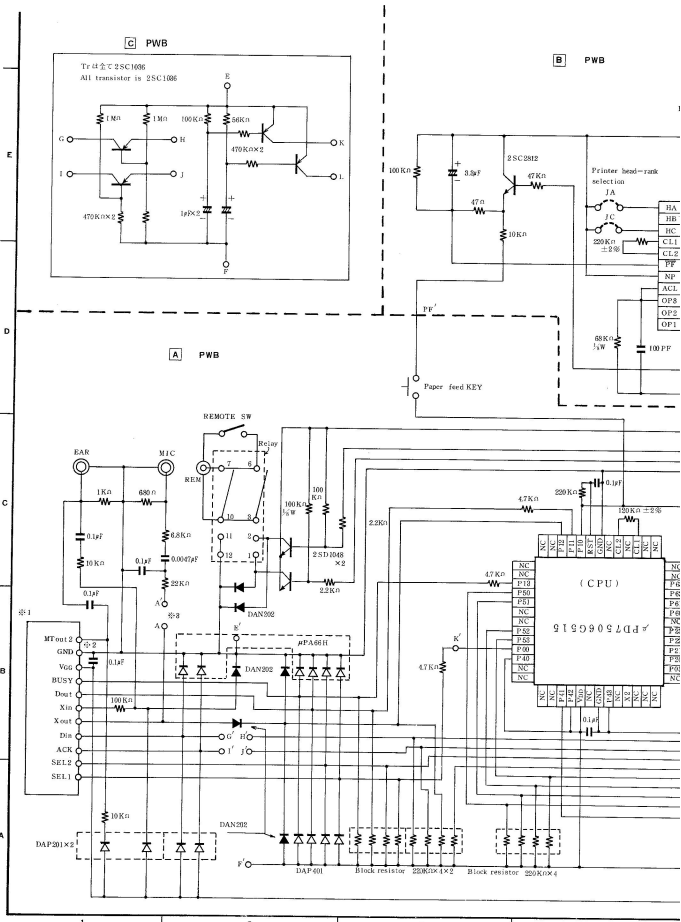
Chip transistor parts code	Tr name	hfe rank
RH-IX1010CCN1	A1179	M6 , M7
RH-IX1012CCN1	C2812	L6 , L8
RH-IX1009CCN1	B 815	B6 , B7
RH-IX1004CCN1	A1036	HP , HQ , HR
RH-TX1015CCN1	D1044	X6 , X7

9. PARTS & SIGNALS POSITION




M51281L
PD
NC
P
GND
T
T
E
REG
M+
M−
Motor
Generator
Reset
Head
H COMMON
Printer MTP201-24BA
LB1256M
SC6994
(PCU)
H1
H2
H3
H4
H5
H6
H7
GND
1DF
Vp
1DM
M
S
O1
O2
O3
O4
O5
O6
O7
L2×2
33Kn
22KΩ
220Ω1VR
20KΩ VR
56KΩ
150PF
1000PF
100PF
470
1SS108
0.1μF
2SA1179
2SB815
470Ω
29KΩ±2%
15KΩ
82Ω 1/2W
10E1N
Used Ni-Cd battery : ON
Option
AC adaptor
EA23K
UM3×4
or
Option
Ni-Cd
battery
10V
470μF
10V
1000μF
RD6.2E9
880Ω 1/2W
F.G.
2SA1179
2SC1162
Power SW
Vp
Vm
4.7KΩ
20KΩ VR
1KΩ 1/8
100KΩ 1/8
100PF D1F
HZ8RLL
VDD
VGG
※1 11pin connector cable
MTOUT2 空色(Sky blue)
Xin 青色(Blue)
GND 桃色(Pink)
Xout 紫色(Purple)
SEL2 茶色(Brown)
SEL1 赤色(Red)
BUSY 黒色(Black)
Dout 白色(White)
Din 黄色(Yellow)
ACK 橙色(Orange)
VGG 灰色(Gray)
※2
※3
10KΩ 1/8
100KΩ×2 1/8
2SC1682
A
A'

10. CIRCUIT DIAGRAM



11. PARTS LIST & GUIDE

1 Exteriors (外装機構部品)

NO.	PARTS CODE	PRICE RANK Ja	PRICE RANK Ex	NEW MARK	PART RANK	DESCRIPTION
1	QCOVA1363CCZZZ	DF	AD		D	ペーパーカバー / Paper cover
2	PCUT-1025CCZZZ	DD	AC		D	ペーパーカッター / Paper cutter
3	QCABB2761CCZZZ	DS	AG	N	D	キャビウエ / Top cabinet
4	JKNBZ1225CC01	DA	AA		C	スイッチ SW ツマミ / Slide switch knob
5	QCNTM1042CCZZZ	DA	AA		C	スライドSW コンタクト / Slide switch terminal
6	JKNBZ1877CC01	DK	AE		C	キートップ / Key top (Paper feed key)
7	PGUMM1337CCZZZ	DB	AB		B	ゴムスプリング / Rubber spring
8	QCNW-1268CCZZZ	FG	AT	N	C	11PIN コネクター ケーブル / 11pin connector cable
9	TCAUK1211CCZZZ	DA	AA	N	D	ケンコウイ ラベル / Caution label (Japanese & English)
10	PHOG-1093CCZZZ	DC	AB		D	11ピン コネクターケーブルヨウ ゴムキャップ / Rubber cap for 11pin connector cable
11	XUBSD20P04000	DA	AA		C	ビス / Screw
12	PSLDG1430CCZZZ	DD	AC		C	シールドバン / Shield
13	QTANZ1454CCZZZ	DB	AB		C	デンチターミナル(-) / Battery terminal (-)
14	GCABA2762CCZZZ	DS	AG		D	キャビソコ / Bottom cabinet
15	GFTAB1189CC001	DD	AC		D	デンチ フタ / Battery lid
16	PCUSS1227CCZZZ	DA	AA	N	C	デンチオサエヨウ クッション / Cushion
17	QTANZ1186CCZZZ	DA	AA		B	デンチターシ / Battery terminal (+)
18	GLEGG1011CCZZZ	DA	AA		B	ゴムアシ / Rubber leg
19	XUBSF26P10000	DA	AA		C	ビス / Screw
20	LX-BZ110CCZZZ	DA	AA		C	ビス / Screw
21	QCNTM1062CCZZZ	DB	AB	N	C	ニッカドヨウカドウ / Ni-Cd terminal
22	QCNTF1061CCZZZ	DB	AB	N	C	ニッカドヨウ コテイ / Ni-Cd terminal
23	PSHEP1108CCZZZ	DA	AA	N	C	SL-SW カラー / SL-SW spacer
24	PCUSG1228CCZZZ	DA	AA	N	C	ラバー タイキャクブム / Rubber cushion
25	PCUSS1218CCZZZ	DA	AA		C	プリンターヨウ / Printer cushion
26	K1-0B0081CCZZZ	HL	BG		E	サーマルプリンター / Thermal printer unit (MTP-201)
27	QCNCW1321CC03	DJ	AE		B	コネクター 5PIN / Connector 5pin (with lead wire)

2 PWB unit (基板ユニット)

NO.	PARTS CODE	PRICE RANK Ja	PRICE RANK Ex	NEW MARK	PART RANK	DESCRIPTION
1	PRDAR1035CCZZZ	DE	AC	N	B	ホウネツバン / Heat sink
2	PTPEH1224CCZZZ	DA	AA	N	C	コテイテープ / Adhesived tape (for C-PWB)
3	QCNCW1308CCAi	DE	AC		B	サーマルプリンターFPCヨウ コネクター / Connector for printer (Spin Black)
4	QCNCM1323CC0F	DB	AG		B	コネクター / Connector (5pin Blue)
5	QCNW-1278CCZZZ	DE	AC	N	B	F.P.C. / F.P.C. (13pin)
6	QJAKC1003CCZZZ	DH	AD		B	ジャック / Jack (for AC adaptor)
7	QJAKC1013CCZZZ	DD	AC		C	ジャック / Jack (for MIC,EAR)
8	QJAKC1016CCZZZ	DH	AC		B	ジャック / Jack (for Remote)
9	QSW-S0075FCZZZ	DL	AF		B	スライドスイッチ / Slide switch
10	VCTYPU1NX104M	DB	AB		C	コンデンサー / Capacitor (12WV 0.10μF)
11	RC-EZ108BCC1A	DE	AC		C	コンデンサー / Capacitor (10V 1000μF)
12	RC-EZ477ACC1A	DD	AC		C	コンデンサー / Capacitor (10V 470μF)
13	RC-SZ1007CCZZZ	DL	AF		C	コンデンサー / Capacitor (1μF)
14	RC-SZ1021CCZZZ	DE	AC		C	コンデンサー / Capacitor (10WV 3.3μF)
15	RH-iX1010CCZZZ	DC	AB		B	トランジスター / Transistor (A1179,M6)
16	RH-TX1015CCZZZ	DD	AC		B	トランジスター / Transistor (D1048,×6 ×7)
17	RH-TX1016CCZZZ	DD	AC		B	トランジスター / Transistor (C1652-PQR)
18	RMPTC4224QCKB	DY	AK		C	ブロックテイコウ / Block resistor (1/8W 220KΩ×4 ±10%)
19	RRLYZ2400QCZZZ	EN	AP		B	リレー / Relay
20	RVR-M2415QCZZZ	DF	AD		B	ボリウム / Variable resistor
21	VCKYPU1HB101K	DA	AA		C	コンデンサー / Capacitor (50WV 100pF)
22	VHDDS1588L2-1	DB	AB		B	ダイオード / Diode (DS1588L2)
23	VHDISS108//-1	DB	AB		B	ダイオード / Diode
24	VHD10E1N////-1	DB	AB		B	ダイオード / Diode (10E1N)
25	VHEHZ3BLL//-1	DD	AC		B	ツェナーダイオード / Zener diode
26	VHERD6.2E9//-1	DB	AB		B	ツェナーダイオード / Zener diode
27	VHiDAP201//-1	DE	AC		B	ダイオードアレイ / Diode array
28	VHiDAP401//-1	DQ	AE		B	ダイオードアレイ / Diode array
29	VHiLB1256MFP1	EA	AK		B	IC / IC
30	VHiM5123L//-1	DS	AG		B	IC / IC M5123L
31	VHiUPA66H//-1	DL	AF		B	ダイオードアレイ / Diode array
32	VRD-ST2BY102J	DA	AA		C	テイコウ / Resistor (1/8W 1.0KΩ ±5%)
33	VRD-ST2BY103J	DA	AA		C	テイコウ / Resistor (1/8W 10KΩ ±5%)
34	VRD-ST2BY104J	DA	AA		C	テイコウ / Resistor (1/8W 100KΩ ±5%)
35	VRD-ST2BY683J	DA	AA		C	テイコウ / Resistor (1/8W 68KΩ ±5%)
36	VRD-ST2EY391J	DB	AA		C	カーボンテイコウ / Resistor (1/4W 390Ω ±5%)
37	VRD-ST2HY8R2J	DA	AA		C	テイコウ / Resistor (1/2W 8.2Ω ±5%)
38	VS2SC1162-CDC	DL	AE		B	トランジスター / Transistor
39	XBBSD26P06000	DA	AA		C	ビス / Screw
40	RC-CZ102ICCN1	DB	AB		C	コンデンサー / Capacitor (0.1μF)
41	RC-CZ103ICCN1	DB	AB		C	コンデンサー / Capacitor (1000PF)
42	RC-CZ1035CCN1	DB	AB		C	コンデンサー / Capacitor (100pF)
43	RC-CZ1039CCN1	DB	AB		C	コンデンサー / Capacitor (4700pF)

2 PWB unit (基板ユニット)

NO.	PARTS CODE	PRICE RANK Ja	PRICE RANK Ex	NEW MARK	PART RANK	DESCRIPTION
44	RC-CZ1052CCN1	D B	A B		C	コンデンサー
45	RH-DZ1008CCN1	D D	A C		B	ダイオードアレイ
46	RH-iX1004CCN1	D H	A D		B	トランジスター
47	RH-iX1009CCN1	D D	A C		B	トランジスター
48	RH-iX1010CCN1	D D	A C		B	トランジスター
49	RH-iX1012CCN1	D D	A C		B	トランジスター
50	RR-KZ1051CCN1	D A	A A		C	テイコウ
51	RR-KZ1053CCN1	D A	A A		C	テイコウ
52	RR-KZ1066CCN1	D A	A A		C	テイコウ
53	RR-KZ1067CCN1	D A	A A		C	テイコウ
54	VHiD7506G-515	F J	A U		B	IC
55	VHiSC6994//-1	F C	A S		B	IC
56	VRS-TP2BD102J	D A	A A		C	テイコウ
57	VRS-TP2BD103J	D A	A A		C	テイコウ
58	VRS-TP2BD104J	D A	A A		C	テイコウ
59	VRS-TP2BD105J	D A	A A		C	テイコウ
60	VRS-TP2BD220J	D A	A A		C	テイコウ
61	VRS-TP2BD222J	D A	A A		C	テイコウ
62	VRS-TP2BD223J	D A	A A		C	テイコウ
63	VRS-TP2BD224J	D A	A A		C	テイコウ
64	VRS-TP2BD332J	D A	A A		C	テイコウ
65	VRS-TP2BD470J	D A	A A		C	テイコウ
66	VRS-TP2BD471J	D A	A A		C	テイコウ
67	VRS-TP2BD472J	D A	A A		C	テイコウ
68	VRS-TP2BD473J	D A	A A		C	テイコウ
69	VRS-TP2BD474J	D A	A A		C	テイコウ
70	VRS-TP2BD563J	D A	A A		C	テイコウ
71	VRS-TP2BD681J	D A	A A		C	テイコウ
72	VRS-TP2BD682J	D A	A A		C	テイコウ
	ユニット (Unit)					
900	DUNTK7627CCZZ	M V	B R	N	E	PWB ユニット / PWB unit

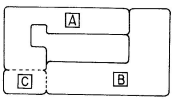
3 Accessory (付属品)

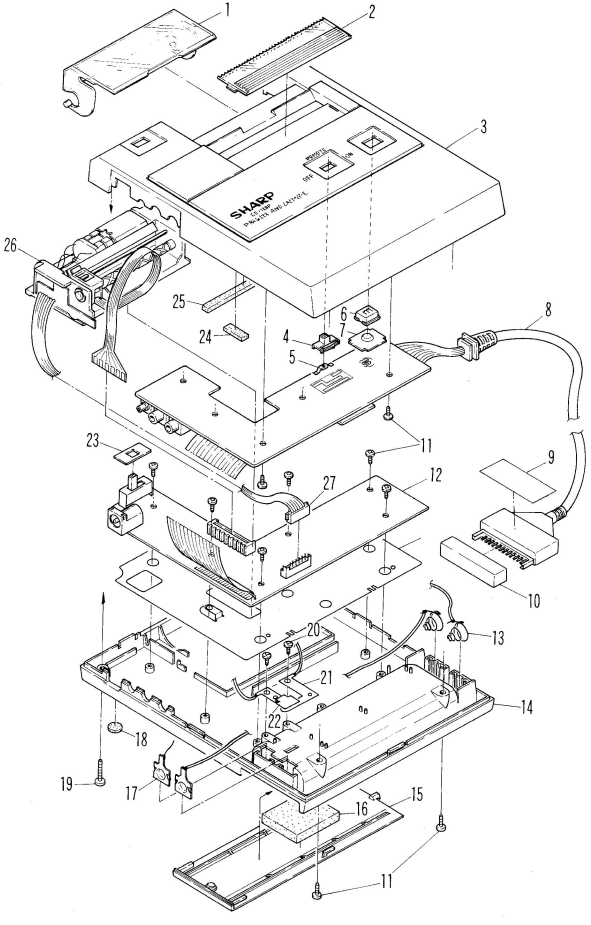
NO.	PARTS CODE	PRICE RANK Ja	PRICE RANK Ex	NEW MARK	PART RANK	DESCRIPTION
1	SPAKA8215CCZZ	D M	A F	N	D	SET ヨウ クッション / Packing cushion for set
2	SPAKA8216CCZZ	D E	A C	N	D	フゾク ヨウ クッション / Packing cushion for Accessories
3	SPAKC8217CCZZ	D R	A G	N	D	パッキングケース / Packing case (Japan)
	SPAKC8219CCZZ	D R	A F	N	D	パッキングケース / Packing case (Other country)
4	TiNSJ4040CCZZ	D P	A F	N	D	トリアツカイセツメイショ / Instruction book (Japan)
	TiNSE4041CCZZ	D Y	A K	N	D	トリアツカイセツメイショ / Instruction book (U.S.A.)
	TiNSM4043CCZZ	E J	A N	N	D	トリアツカイセツメイショ / Instruction book (E,F,G,S,I)
5	UBAGC1382CCZZ	D U	A G	N	D	ソフトケース / Soft case
6	QPLGJ1014CCZZ	F B	A R		D	カセットプラグ A / Cassette cable
7	CPAPR1025CC05	Z Z			S	ロールペーパー (ヨコ/1パック) / (Japan only)
8	TLABH1955CCZZ	D B	A B			セツメイ ラベル / Operation label (Except Japan)

* PWB unit

The PWB unit (DUNTK7627CCZZ) consists of A, B, and C, altogether.

PWB unit




1
2
3
SHARP
26
25
24
6
4
5
8
11
23
27
12
9
10
20
13
21
14
22
18
19
17
16
15
11

SHARP

SHARP CORPORATION
Industrial Instruments Group
Reliability & Quality Control Department
Yamatokoriyama, Nara 639-11, Japan

1983 October Printed in Japan Ⓢ