SHARP SERVICE MANUAL

EL-2901E
EL-2901C
EL-2192P

CODE : 00ZEL2901ESME

MODEL
EL-2901E
EL-2901C
EL-2192P

STANDARD FUNCTION	12 digits	1M

DISPLAY SECTION

`1234567890.12` M/EG

ELEMENT : LCD	PARTS NAME : 9060ATRH
NUMERAL : 12 digits	SYMBOL : 2 digit(s)
CHARACTER PITCH : 9.0mm	

18.75
6.9
(mm)

M/EG

LSI

Name :	u3866-015H
Type :	CHIP
Pin :	76 pins

POWER SUPPLY	AC : O		DC : X
BATTERY TYPE	AC only		

AC ADAPTER	
RECHARGEABLE BATTERY	
POWER CONSUMPTION	30mA : AAC, ABC, AC7, TLC 5.2W, 47mA : UIC
AUTO POWER OFF TIME	
MEMORY PROTECT	Yes*[1](TAX / EURO only)
DIMENSIONS (mm)	200 (D) x 251(W) x 60 (H) mm
CALCULATIONS	

Four arithmetic calculations, Constant calculation, Power calculation, Reciprocal calculation, Chain calculation, % calculation, Add-on (discount) calculation,memory calculation, adding mode, etc.

NOTE) *1 : This calculator operates only on AC power. Further, the memory is retained only while the AC cord is plugged in and clears when the AC cord is disconnected.

KEY LAYOUT

F 3 2 1 0 A 5/4 ↓ GT · OFF · P P·IC   ON

MM	→	+/−							MU	*M
GT	÷	7	8	9	−			%	◊M	
STR	=	4	5	6			+	# / ◊	M−	
TAX+	×	1	2	3				*	M+	
TAX-	C/CE	0	00	·						

for SEEG : TAX- TAX+ ⟶ 100 ▶€

KEY SYSTEM : Plastic key + Key rubber

PRINTER SECTION

|	
MODEL NAME	MFL87 (KI-OB1078CCZZ)
PRINTING SYSTEM	Serial print system
PRINTING CAPACITY	19 digits
CHARACTER DIMENSION	1.6(W) 3.5 (H) mm
INPUT BUFFER	12 stages
PRINTING SPEED	Approx. 2.6 lines / sec.
PAPER FEED SPEED	Approx. 8.5 lines / sec.
PAPER RELEASE MECHANISM	Yes
INK RIBBON	
INK ROLLER	Black : EA-781R-BK, Red : EA-781R-RD
PAPER	Plain paper
PAPER SIZE (Roll Paper)	58 $^{+0}_{-1}$mm (W), 80mm in diameter (max.) (DPAPR1004CSZZ...5 rolls / pack)
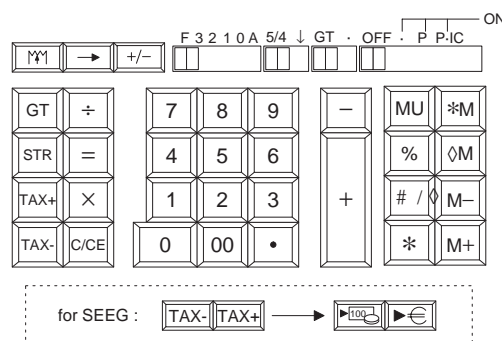
Parts marked with " ⚠ " is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

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The contents are subject to change without notice.

EL-2901E
EL-2901C
EL-2192P

1. Block diagram

───── : Power supply line

---------- : Signal line
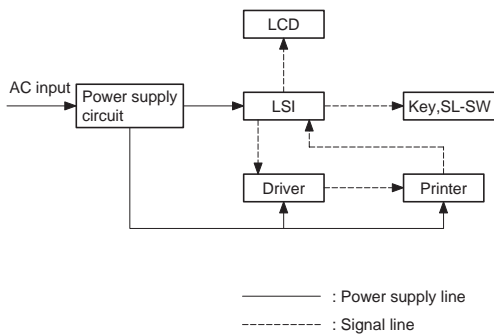
2. Tax/Euro exchange functions

LSI used for this machine has a tax function and a EURO exchange function. Either function is selected depending on the destination of the product.

Model name	SPEC CODE	Tax function	EURO exchange function	Country
EL-2192P	U1C	O		SECL
EL-2901E	AC7		O	SEEG
EL-2901C	AAC / ABC / TLC	O		SUK, SCA, Agent

<Selecting between Tax/EURO exchange functions>

Either of the Tax and Euro exchange functions can be selected by changing the signal with the jumper cables on the KEY PWB.

<Backup of Tax/EURO exchange functions>

This machine is an AC type which retains Tax data (tax rates and others) and EURO exchange data in memory only while the AC cord is plugged in. Therefore, data in memory cannot be retained if the AC cord is disconnected.

3. PTMFL87 PRINTER CAUTION NOTES

3-1. Servicing

The printer model PTMFL87 (Ki-OB1078CCZZ) used for the EL-2192P / EL-2901C / 2901E is available for service by an entire unit and therefore none of individual service parts is available for supply.

3-2. Cautions for handling

(1) Cautions for holding

Hold the sections shown with the arrows to carry the printer.
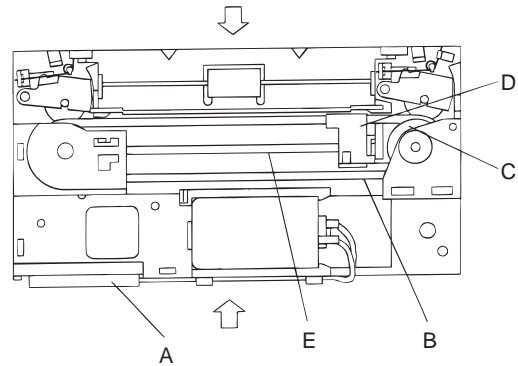
(2) Sections which a force must not be applied to :

1) PWB A

2) Do not turn the front belt B manually.

3) Do not turn the pulley C manually.

4) Do not apply a force to the hammer holder D.

(3) Sections which must not be touched :

1) Do not touch the shaft E with a bare hand.

2) Do not touch the font belt B with a bare hand.

3-3. Detecting Mechanism

The detector is of mechanical contact type and consists of the code plate to output the character position detection signal to correspond to each character on the character belt, sensor gear unit to output the standard position signal, and fixed contact-piece unit.
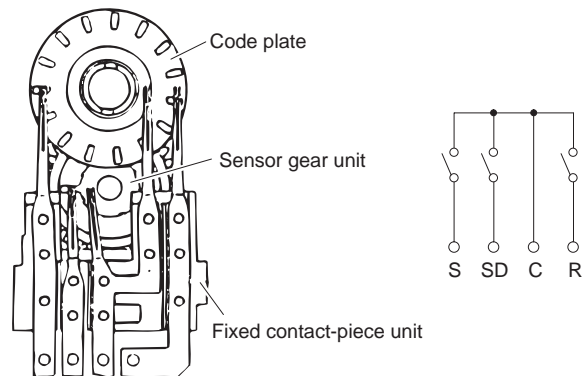
Fig. 1 Detecting Mechanism   Fig. 2 Equivalent Circuit

Fig. 3 Time Chart

The character position detecting signal (CP) is to be made by the user from the leading edges of the set signal and reset signal. This CP corresponds to the character on the character belt. The standard signal (SD) is a signal output once to the 75CP pulse, and the signal to be made by the user utilizing the leading edge of the second CP from the leading edge of this signal is the standard position signal (SP).

The reason why CP and SP are made using the raw signals output from the detector is that the effect of chattering is taken into consideration.
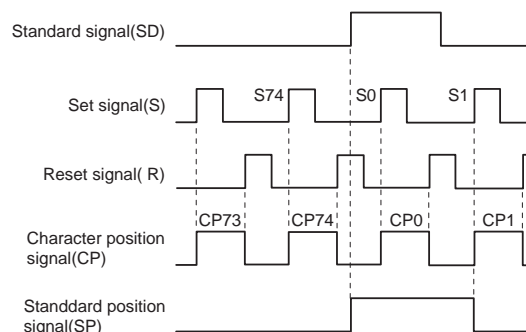
The following will explain the basic operation.

3-4. Operation Sequence

The basic operation is explained

(1) Initialization

In order to make sure that the hammer holder is at its home position, i.e. the first column, print the space after power is turned on, and after the carry / return, do one-line paper feeding and set the hammer holder at its home position. This completes the initialization.
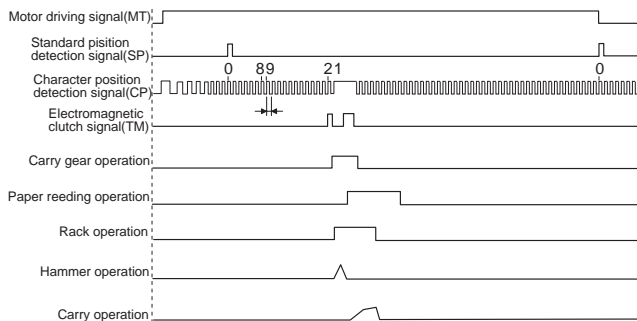

Fig. 4 Time Chart at Initialization

(2) 1-line printing operation

1) The printing operation is started by setting the motor driving signal (MT) ON.

2) Prior to 1-line printing, detect the standard position signal (SP) once and make the time from the leading edge of the character position detection signal CP8 to the leading edge of CP9 to and make it standard pulse width. (This to setting must be done at the initialization and prior to the 1-line printing. to is utilized for error detection.)

3) The character belt rotates until the desired CP pulse is detected.

4) If the desired CP pulse is detected, power is supplied to the electromagnetic clutch unit, the character belt is stopped, and printing operation / carry operation are done. In the meantime, the power to the electromagnetic unit is cut off. (For the detail, see 1.3.2. Printing / Carry Mechanism.)

5) After completion of the printing / carry operation, the character belt rotates again.

6) The operations 3) through 5) are repeated and 1-line printing is completed.

7) After the most significant digit printing, the electromagnetic clutch signal TM becomes OFF, and then between T3 and T4, paper feeding / column return operation is done by turning the electromagnetic clutch ON again.

T3 = 80 to 200 μ sec

T4 = (2.0 ~ 2.4) x Tcp

8) After paper feeding is started, it is completed when about 19CP is

counted.

9) The motor driving signal is turned OFF after 19CP counting after the paper feeding is started. In case SP is not found within 19CP after the paper feeding is started, it is turned OFF after SP is detected.

Printing pattern through the adove operation
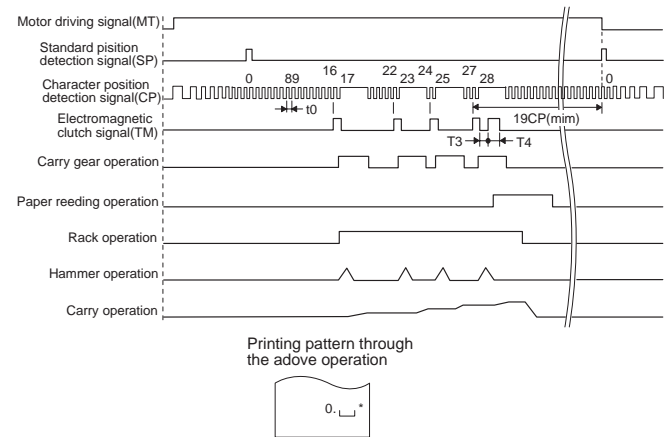
Fig. 5 Time Chart for 1-Line Printing (0. ⌐ * printing)

(3) Continuous printing operation

1) After the 1-line printing operation in (2), the motor driving signal (MT) is not turned OFF and the operations 2) through 8) are continuously done for the necessary number of columns while the motor is run.

2) After the most significant digit of the last line is printed, the operations 7), 8) and 9) in (2) are done and the motor is stopped.

(4) Paper feeding operation

For the paper feeding operation, 1-line printing of space may be done in the same way as for the printing operation sequence.

3-5. Troubleshooting dislocated print belt

Install the character belt on the drive pulley and driven pulley. When installing the character belt, the following points must be considered.

1) If the driven pulley is removed and mismatched with the CC cam, it should be aligned as follows.
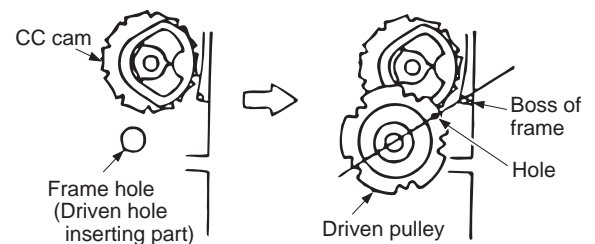
2) The character belt should be positioned as follows.

Manually turn the motor to the position where the SD pulse appears.

EL-2901E
EL-2901C
EL-2192P

• A. Drive pulley side

Adjust the "−" of the character belt to the position of the hole (mark).
("−" shown in the above arrangement of characters)

Cutout

Driven pulley

$+-X÷=0*W.X' \cdot \cdot$
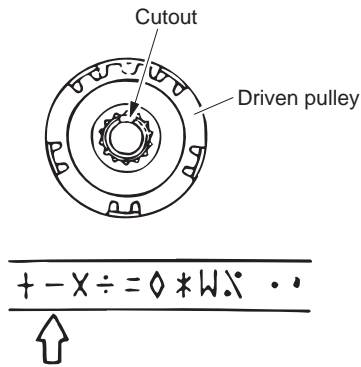
• B. Driven pulley side
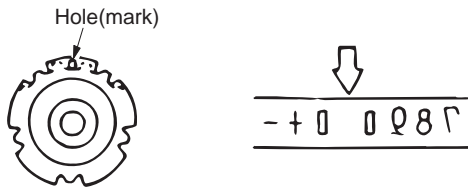
Hole(mark)

Adjust the center of the space of the character belt to the position of
hole (mark).

4. Note for disassembly and assembly

4-1. Disassembly of upper / lower cabinets

1) Hold the bottom housing and push down the upper housing at
circled 1 and slide the upper housing outwards.

2) Do the same at circled 2 and then 3.
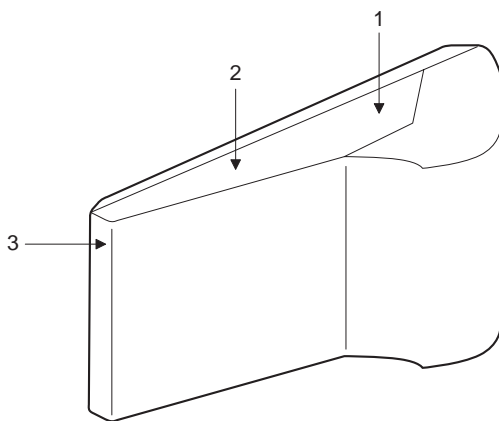
4-2. Tightening torgue value

1) Key PWB : 1.5± 0.2kg

UPPER CASE

UPPER CASE
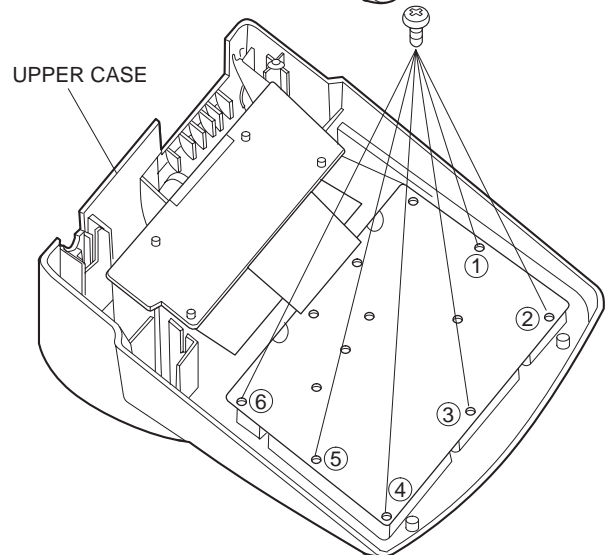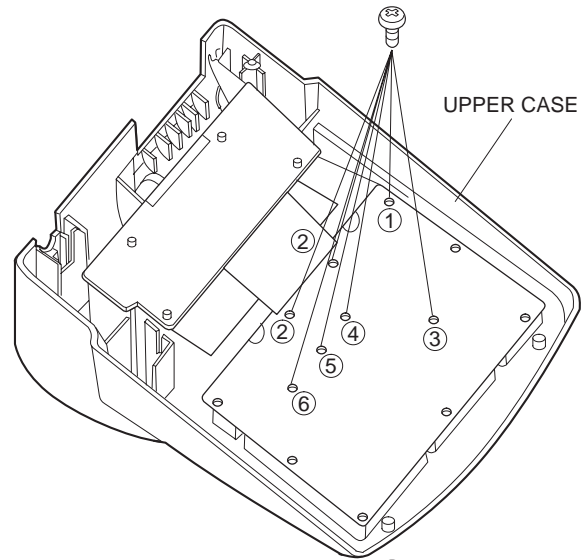
2) Lower case : 2.5± 0.5kg

3 x 8

LOWER CASE
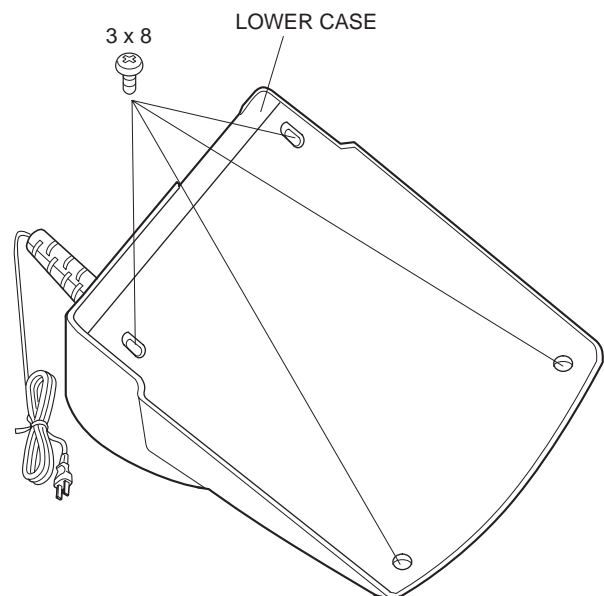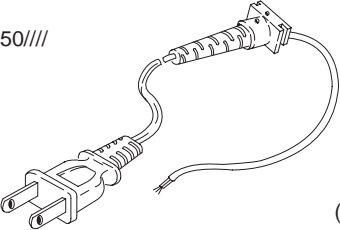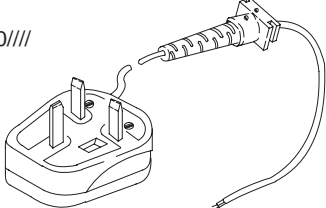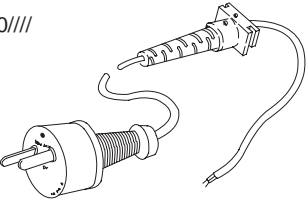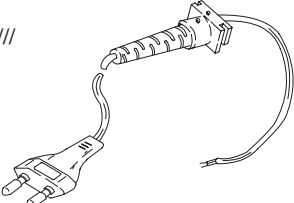
List of destinations (Destinations are determined by the name plate voltage and the plug shape.)

Destination	To identify destination		Major shipping country	Remarks
	Name plate voltage	Plug shape No.		
U1C	120V 60Hz	1	Canada	
AAC	220-230V 50Hz	2	U. Kingdom	
ABC	230-240V 50Hz	3	Austraria	
AC7, TLC	220-230 50Hz	4	Germany, Agent	

AC cord

NO.	PARTS CODE	PRICE RANK	TYPE OF LEAD		DESCRIPTION	MODEL NAME		
			2 LEAD	3 LEAD		EL-2901C	EL-2901E	EL-2192P
1	0GS5420150////	AP	O		AC cord U1C			O
2	0GS5420220////	AZ	O		AC cord AAC	O		
3	0GS5420170////	AS	O		AC cord ABC	O		
4	0GS5420160////	AP	O		AC cord AC7, TLC	O	O	

Plug shape

0GS5420150////

1

(U1C)

0GS5420220////

2

(AAC)

0GS5420170////

3

(ABC)

0GS5420160////

4

(AC7,TLC)

5. CIRCUIT DIAGRAM

6. PWB LAYOUT

(1) MAIN PWB

(2) KEY PWB

(OPEN) TAX specifications
(SHORT) EURO specifications

EL-2901E/C
EL-2192P

■ Parts guide

1 Exteriors

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	0 G S 6 1 7 7 4 9 0 / / / /	AG		C	Paper cutter
2	0 G S 6 3 4 5 1 0 0 / / / /	AF		D	Paper holder
3	0 G S 6 1 4 3 2 5 0 / / / /	AS	N	D	Display window (EL-2192P) [EL-2192P]
	0 G S 6 1 4 3 2 6 0 / / / /	AS	N	D	Display window (EL-2901E) [EL-2901E]
	0 G S 6 1 4 3 2 7 0 / / / /	AS	N	D	Display window (EL-2901C) [EL-2901C:AAC,ABC,TLC]
4	0 G S 6 1 7 7 8 6 0 E / / /	AD	N	C	Key top (HALF)(3KEY)
5	0 G S 6 1 7 7 8 6 0 B / / /	AE	N	C	Key top (MEMORY)(5KEY)
6	0 G S 6 1 7 7 8 6 0 D / / /	AG	N	C	Key top (FUNCTION)(9KEYS)
7	0 G S 6 1 7 7 8 6 0 F / / /	AD	N	C	Key top (TAX)(2KEY) [EL-2192P,EL-2901C]
	0 G S 6 1 7 7 8 7 0 F / / /	AD	N	C	Key top (EURO)(2KEY) [EL-2901E]
8	0 G S 6 1 7 7 5 0 0 A / / /	AH		C	Key top (NUMBER)
9	0 G S 6 1 7 7 5 0 0 C / / /	AC		C	Key top (-)
10	0 G S 6 1 7 7 5 0 0 G / / /	AC		C	Key top (+)
11	0 G S 6 3 4 5 1 2 0 / / / /	AC		C	Key top bar
12	0 G S 6 1 1 6 7 2 0 / / / /	AU	N	D	Upper case
13	0 G S 6 1 7 7 5 4 0 / / / /	AD		C	SL-SW arm
14	0 G S 6 1 7 7 8 5 0 / / / /	AC	N	C	SL-SW mask-L (BLINDER)
15	0 G S 6 1 7 7 8 4 0 / / / /	AC	N	C	SL-SW knob-L
16	0 G S 6 1 7 7 5 2 1 / / / /	AC	N	C	SL-SW mask-S (BLINDER)
17	0 G S 6 1 7 7 5 1 1 / / / /	AC	N	C	SL-SW knob-S
18	0 G S 6 3 4 5 1 1 0 / / / /	AC		C	SL-SW contact
19	0 G S 6 3 1 4 4 2 0 / / / /	AF	N	C	SL-SW sheet (SPACER)
20	0 G S 5 5 3 3 3 5 0 / / / /	AP	N	C	Key rubber
21	X U B S D 2 6 P 0 5 0 0 0	AA		C	Screw (2.6×5) [for PWB,P/H]
22	K i − Ō B 1 0 7 8 C C Z Z	BC		E	Printer unit (MFL87)
23	0 G S 5 1 1 0 2 7 0 / / / /	AD	N	C	Flat cable (P/H,M/B)
24	0 G S 6 3 1 4 4 3 0 / / / /	AD	N	D	Back-up tape (FOR H/SEAL)
25	0 G S 2 1 9 2 L C D / / / /	AY	N	E	LCD unit (LCD + H.M.F)
26	0 G S 6 3 1 4 4 7 0 / / / /	AE	N	C	Insulation sheet (45×40×0.1)(FOR FLAT CABLE)
27	0 G S 5 1 1 0 2 6 0 / / / /	AF	N	C	Flat cable (M/B,K/B)
28	0 G S 2 1 9 2 P W B / / / /	BF	N	E	PWB unit (PWB + LCD + H.M.F)
⚠ 29	0 G S 3 1 2 0 0 6 0 / / / /	AX	N	B	Transformer (120V)(for CANADA) [EL-2192P]
⚠	0 G S 3 1 2 0 0 7 0 / / / /	AZ	N	B	Transformer (220-230V) [EL-2901E,EL-2901C:AAC,TLC]
⚠	0 G S 3 1 2 0 0 8 0 / / / /	AZ	N	B	Transformer (230-240V)(for AUSTRALIA) [EL-2901C:ABC]
30	0 G S 6 3 1 4 2 5 0 / / / /	AD		C	LCD cushion
31	0 G S 6 1 2 6 5 5 0 / / / /	AU	N	D	Lower case
32	X U P S N 3 0 P 0 8 0 0 0	AA		C	Screw (3×8) [for CABINET]
33	0 G S 6 3 2 2 0 0 0 / / / /	AC		D	Foot rubber
⚠ 34	0 G S 5 4 2 0 1 5 0 / / / /	AP	N	B	AC cord (for CANADA) [EL-2192P]
⚠	0 G S 5 4 2 0 1 6 0 / / / /	AP	N	B	AC cord (for SEEG) [EL-2901C:AC7,TLC]
⚠	0 G S 5 4 2 0 2 2 0 / / / /	AZ	N	B	AC cord (for ENGLAND) [EL-2901C:AAC]
⚠	0 G S 5 4 2 0 1 7 0 / / / /	AS	N	B	AC cord (for AUSTRALIA) [EL-2901C:ABC]
35	P T U B U 1 0 0 4 C C Z Z	AA		C	Protection tube (M4)
36	0 G S 9 4 3 2 1 3 0 / / / /	AD	N	D	Rating label [EL-2192P]
	0 G S 9 4 3 2 1 7 0 / / / /	AD	N	D	Rating label [EL-2901E]
	0 G S 9 4 3 2 1 4 0 / / / /	AD	N	D	Rating label [EL-2901C:AAC]
	0 G S 9 4 3 2 1 5 0 / / / /	AD	N	D	Rating label [EL-2901C:ABC]
	0 G S 9 4 3 2 1 6 0 / / / /	AD	N	D	Rating label [EL-2901C:TLC]

1 Exteriors

CCP00076

2 Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
	0 G S 9 2 0 8 8 6 0 ／／／／	AD		D	Manual(E/F/S) [EL-2192P]
1	0 G S 9 2 0 8 9 2 0 ／／／／	AP	N	D	MANUALManual [EL-2901E]
	0 G S 9 2 0 8 9 1 0 ／／／／	AD	N	D	Manual(E/F/S) [EL-2901C]
2	0 G S 9 4 6 4 6 4 0 ／／／／	AC		C	Important label [EL-2901C:AAC]

3 PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	V R D － H T 2 E Y 8 2 2 J	AA		C	Resistor (1/4W 8.2KΩ ±5%) [R1]
2	V R D － H T 2 E Y 1 0 4 G	AA		C	Resistor (1/4W 100KΩ ±2%) [R2]
3	V R D － H T 2 E Y 2 0 4 J	AA		C	Resistor (1/4W 200KΩ ±5%) [R3]
4	V R D － H T 2 E Y 2 4 4 J	AA		C	Resistor (1/4W 240KΩ ±5%) [R4,R5,R6]
5	V R D － H T 2 E Y 1 2 2 J	AA		C	Resistor (1/4W 1.2KΩ ±5%) [R7]
6	V R D － H T 2 E Y 5 6 3 J	AA		C	Resistor (1/4W 56KΩ ±5%) [R8,R10]
7	V R D － H T 2 E Y 1 0 2 J	AA		C	Resistor (1/4W 1.0KΩ ±5%) [R9]
8	V R D － H T 2 E Y 2 0 5 G		N	C	Resistor (1/4W 2MΩ ±2%) [R11]
9	V R D － H T 2 E Y 1 3 3 J	AA		C	Resistor (1/4W 13KΩ ±5%) [R12]
10	V R D － H T 2 H Y 3 3 1 J	AA		C	Resistor (1/2W 330Ω ±5%) [R13]
11	V R D － H T 2 H Y 8 2 0 J	AA		C	Resistor (1/2W 82Ω ±5%) [R14]
12	V R D － H T 2 H Y 5 1 1 J	AA		C	Resistor (1/2W 510Ω ±5%) [R15]
13	V R D － H T 2 E Y 8 2 3 J	AA		C	Resistor (1/4W 82KΩ ±5%) [R16]
14	R M P T C 5 8 2 3 Q C K B	AB		B	Block resistor (82KΩX5 1/8W ±10%) [RP1,RP2]
15	V C E A G U 1 C W 2 2 8 M	AE		C	Capacitor (16WV 2200μF) [C1]
16	V C E A G U 1 C W 2 2 7 M	AB		C	Capacitor (16WV 220μF) [C2]
17	V C E A G U 1 H W 1 0 5 M	AA		C	Capacitor (50WV 1μF) [C4]
18	V C K Y P U 1 H B 1 0 2 K	AA		C	Capacitor (50WV 0.001μF) [C5,C6,C7]
19	V C K Y P U 1 H B 1 0 3 K	AA		C	Capacitor (50WV 0.01μF) [C8,C9]
20	V C T Y P U 1 E X 1 0 4 M	AB		C	Capacitor (25WV 0.1μF) [C10]
21	V S 2 S C 1 8 1 5 － G R C	AB		B	Transistor (2SC1815-GRC) [Q1]
22	V S 2 S C 3 0 6 8 － ／ － 1	AD		B	Transistor (2SC3068) [Q2]
23	V S 2 S C 3 0 7 0 － ／ － 1	AE		B	Transistor (2SC3070) [Q3]
24	V H E H Z 6 B 1 L ／／ － 1	AA		B	Zener diode (HZ6BL1) [ZD1]
25	V H D 1 0 E 1 N ／／／ － 1	AB		B	Diode (10E1N) [D1,D2,D3,D4]
26	V H D D S S 1 3 1 ／／ － 1	AA		B	Diode (DSS131) [D5,D6,D9,D10]
⚠ 27	0 G S 3 6 1 0 3 3 0 ／／／／	AE		A	Fuse (250V/750mA) (EL-2192P)[F1]
⚠ 28	0 G S 3 6 1 0 3 5 0 ／／／／	AF	N	A	Fuse (250V/800mA) (EL-2901E/C)[F1]
101	0 G S 2 1 9 2 L C D ／／／／	AY	N	E	LCD unit (LCD + H.M.F)
102	K i － Ō B 1 0 7 8 C C Z Z	BC		E	Printer unit (MFL87)
	(Unit)				
901	0 G S 2 1 9 2 P W B ／／／／	BF	N	E	PWB unit (PWB + LCD + H.M.F)

EL-2901E
EL-2901C
EL-2192P

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