

THERMAL PRINTER
TUP900 SERIES

TECHNICAL MANUAL

[SECOND EDITION]

INTRODUCTION

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This manual describes the thermal printer TUP900 series.

It is designed for use as a reference for periodic inspections and maintenance procedures to be executed by service personnel. It is not intended for the general user. Users of this manual should have a basic knowledge and understanding of the English language.

- This manual is divided into the following sections:

Chapter 1	Adjustments
Chapter 2	Maintenance and Lubrication
Chapter 3	Parts List

- First edition : Apr. 2003 TUP992 only
Second edition : Sep. 2003 Add TUP942

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- The above notwithstanding, STAR can assume no responsibility for any errors in this manual.

CHAPTER 1 ADJUSTMENTS

1

This printer has undergone various adjustments so that it will attain a given standard of performance. In this chapter, a brief explanation is given of the methods for making adjustments. Follow the instructions when performing maintenance inspections or when replacing parts to correct malfunctions.

- 1. Adjustment of the Paper End & Black Mark Sensor 2**
- 2. Adjustment of the Paper Near End Sensor 3**

1. Adjustment of the Paper End & Black Mark Sensor

1. Turn the printer off and unplug the power cord.
2. Remove the screws. Then, remove the board chassis.

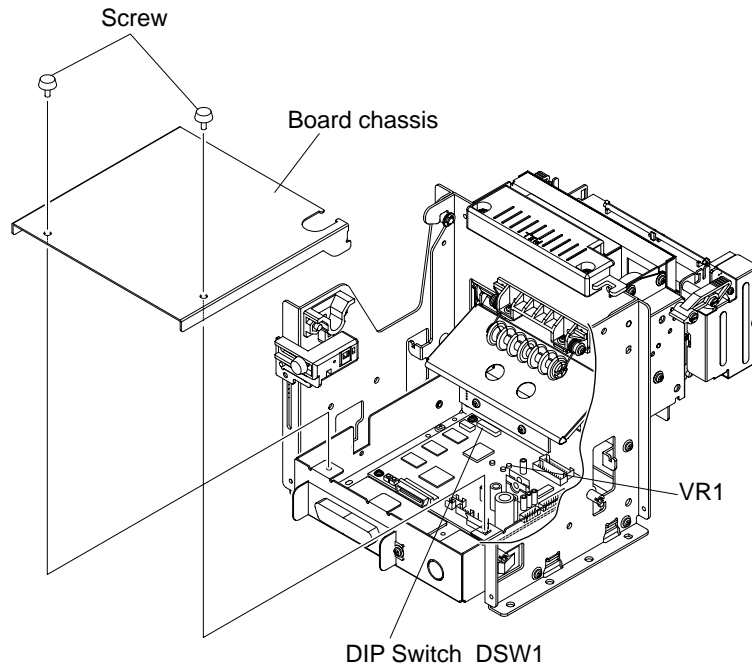


Fig. 1-1 Adjustment Volume

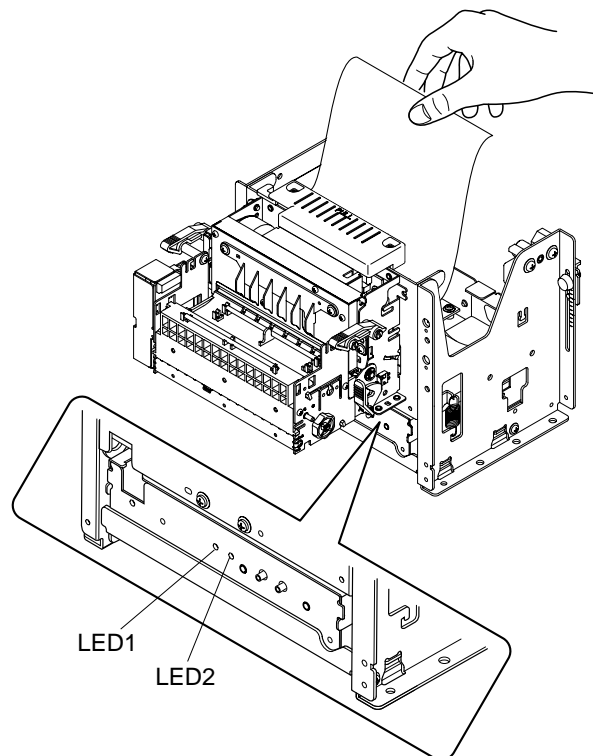


Fig. 1-2 Control Panel

3. Since it is adjusted by rotating the volume VR1, check the position of the volume. Prepare a small slotted screwdriver.
4. Set the paper not for black mark.
5. Use the tip of a thin object to turn off the DIP switch DSW 1-4.
6. Turn the power on.
7. Rotate the volume VR1 using micro screwdriver, to adjust it to a position whereat both the LED1 (green LED) and the LED2 (red LED) lamps light.
8. Turn the power OFF.
9. Turn the DIP switch DSW 1-4 to its original setting of ON.

This completes the paper end & black mark sensor adjustment.

2. Adjustment of the Paper Near End Sensor

1. Turn the printer off and unplug the power cord.
2. Remove the screws. Then, remove the board chassis.

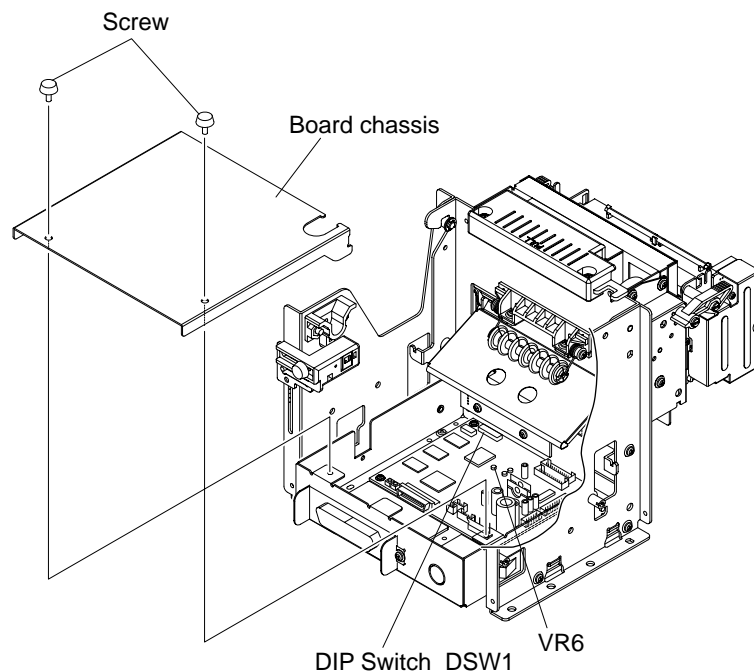


Fig. 1-3 Adjustment Volume

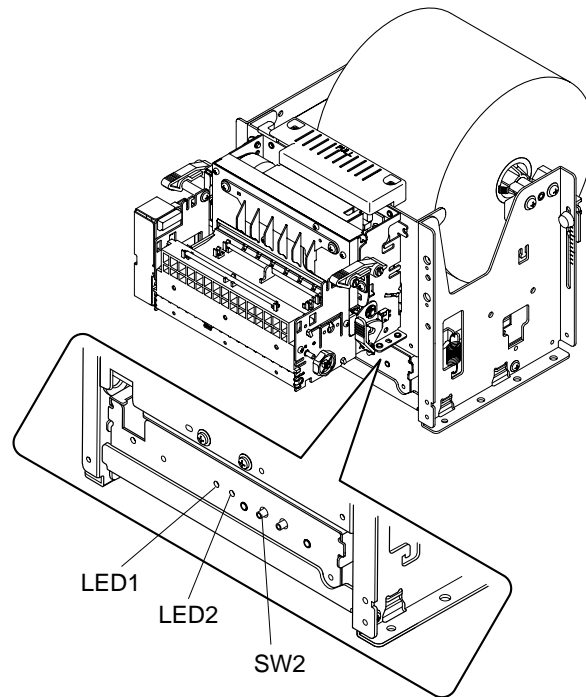


Fig. 1-4 Control Panel

3. Since it is adjusted by rotating the volume VR6, check the position of the volume. Prepare a small slotted screwdriver.
4. Set the roll paper.
5. Use the tip of a thin object to turn off the DIP switch DSW 1-4.
6. Press the SW2 switch on the control panel while turning the power switch ON.
7. Rotate the volume VR6 using micro screwdriver, to adjust it to a position whereat both the LED1 (green LED) and the LED2 (red LED) lamps light.
8. When the position where both LEDs for LED1/LED2 light cannot be found by adjusting VR6, Adjust VR6 to the position where the LED2 lights and LED1 extinguishes.
9. Turn the power OFF.
10. Turn the DIP switch DSW1-4 to its original setting of ON.

This completes the paper near end sensor adjustment.

CHAPTER 2

MAINTENANCE AND LUBRICATION

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1. Maintenance

In order to maintain the optimum performance of this printer and to prevent trouble, maintenance must be carried out according to the following items.

1-1. Cleaning the Thermal Head and Platen

To ensure long-term and stable printing, periodically clean the thermal head and the platen. It is recommended that you clean every 500,000 lines.

The thermal head and platen can be cleaned by opening the platen unit with the release lever.

- To clean the thermal head heating elements, wipe with a cotton swab dampened with an alcohol based cleaner (such as ethanol or methanol). Also, do not apply excessive force when doing so. Wipe the heating elements gently. After cleaning, check that the alcohol has completely evaporated before closing the platen unit.
- Use a soft, dry cotton swab to clean the platen. Wipe away the dirt while rotating the platen. Also, complete wipe away all of the paper dust on the rubber platen. If the cleaning is incomplete, there may be problems in paper feeds.

1-2. Handling Paper Jams

If recording paper should become jammed, open the platen unit and remove the jammed paper.

Never pull on the jammed paper unnecessary while the printer unit is closed because this can damage the drive system parts.

Fig. 2-1 shows the locations to operate (levers/knob) when paper becomes jammed. Remove jammed paper according to the following procedures.

<TUP992 >

- Procedure 1. Remove the right and left lock levers.
2. Open the platen unit (including the presenter unit) using the release lever.
3. Rotate the knob to remove the jammed paper.
4. Close the platen unit (including the presenter unit) and lock the left and right lock levers.

<TUP942 >

- Procedure 1. Open the platen unit using the release lever.
2. Rotate the knob to remove the jammed paper.
3. Close the platen unit. Check that it has been completely closed at this time.

- Notes**
- 1) When removing the jammed paper, never move your hands near the tear bar or the auto-cutter because it is very dangerous. Also, when opening or closing the rotating portions, be careful not to get your hands or fingers caught.
 - 2) When locking the cutter blades, do not forcefully rotate the platen unit (or the presenter unit) because this can be the cause of machine failure.
See the following pages for releasing the cutter lock and opening the platen unit.
 - 3) Fig. 2-1 is a conceptual view of a model equipped with a presenter. On models not equipped with a presenter, operate only the release lever to open the platen unit.

1-3. How to Release the Cutter Lock

Use the following procedures to release the auto-cutter lock if trouble occurs, such as when paper becomes chewed.

- Procedure 1. Turn the apparatus power off.
2. Rotate the emergency knobs in the direction of the arrows on the top of the auto-cutter unit case to return the cutter blades to their home position.
- The emergency knob should be rotated using a tweezers, screwdriver or ball-point pen to prevent accidents.

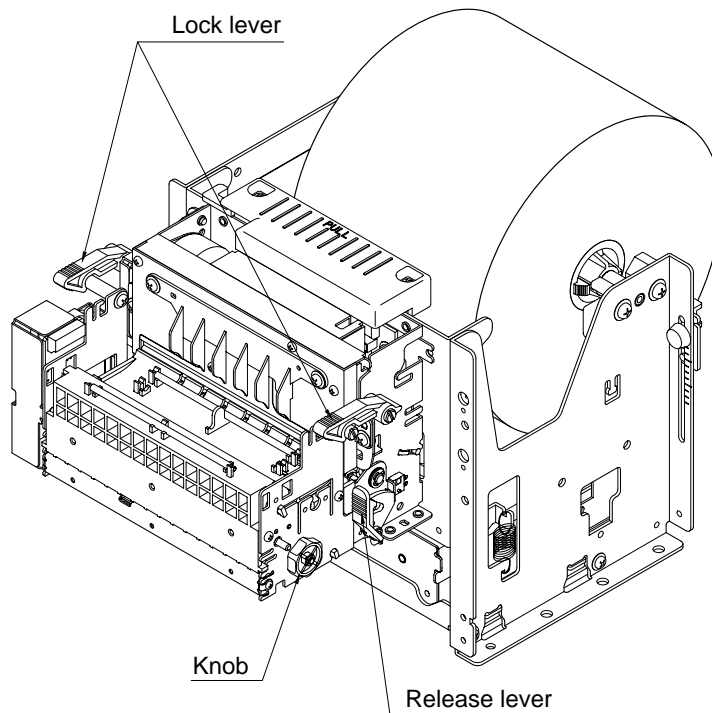


Fig. 2-1 Handling Paper Jams

2. Lubrication

Lubrication is very important to maintain optimum performance and to prevent trouble.

2-1. Lubricant

The type of lubricant greatly affects the performance and durability of the printer, especially in a low temperature environment. We recommend use of the grease listed below for this printer.

Type of oil	Product name	Maker
Grease	Molykote EM-30L	Dow Corning Corporation

2-2. Lubricating Method

When lubrication is carried out in assembly and disassembly, wash parts well to remove dust and dirt before lubrication. Lubrication must be carried out regularly once every 6 months or after 1 million lines have been printed. Lubrication is necessary irrespective of the regular lubrication whenever lubricant becomes deficient after cleaning or whenever parts have been disassembled or replaced.

2-3. Lubricated Areas

NO.	Lubricating Point	Grease/Oil
①	Rubbing surfaces of Lock shaft and Platen holder	EM-30L
②	Rubbing surfaces of Lock shaft and Base Frame Unit	EM-30L
③	Rubbing surfaces of Platen Pivot and Base Frame Unit	EM-30L
④	Rubbing surfaces of Gear and Gear	EM-30L
⑤	Rubbing surfaces of Gear and Shaft	EM-30L
⑥	Rubbing surfaces of Shaft and Holder roller	EM-30L
⑦	Rubbing surfaces of PF roller bearing and Shaft	EM-30L
⑧	Rubbing surfaces of Rear guide and Paper holder	EM-30L

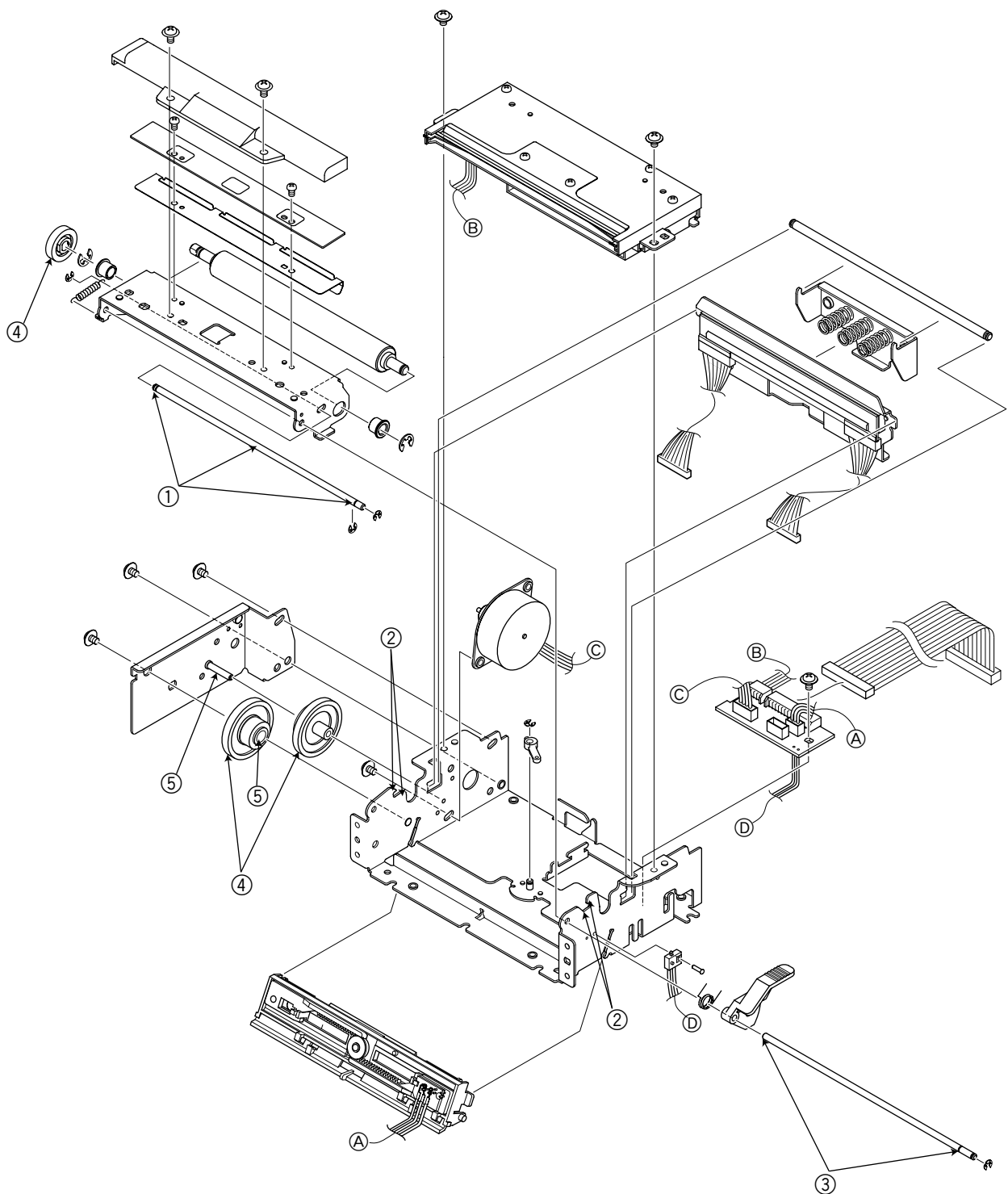


Fig. 2-2 Lubricated Areas (TMP942)

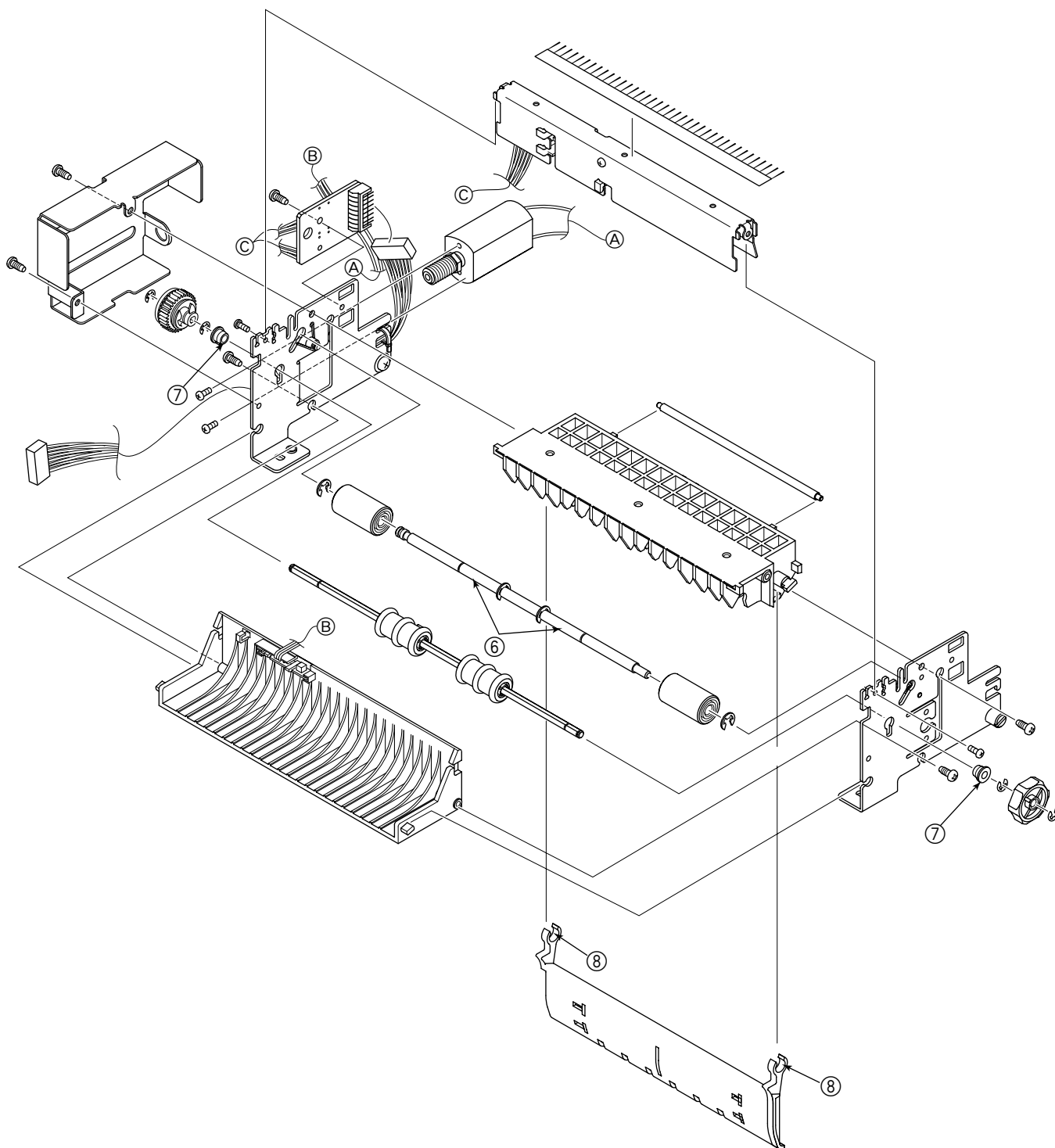


Fig. 2-3 Lubricated Areas (PR921)

CHAPTER 3

PARTS LIST

HOW TO USE PARTS LIST

- (1) DRWG. NO.
This column shows the drawing number of the illustration.
- (2) REVISED EDITION MARK
This column shows a revision number.
Part that have been added in the revised edition are indicated with “#”.
Part that have been abolished in the revised edition are indicated with “*”.
#1 : First edition → Second edition
*1 : First edition → Second edition
- (3) PARTS NO.
Parts numbers must be notified when ordering replacement parts. Parts described as “NPN” have no parts number and are not in stock, unavailable.
- (4) PARTS NAME
Parts names must be notified when ordering replacement parts.
- (5) Q'TY
This column shows the number of the part used as indicated in the figure.
- (6) REMARKS
Where differences in specifications exist depending on location/destination.
- (7) RANK
Parts marked “S” in the rank column can be ordered. Other parts, as a rule, cannot be supplied even if ordered.
Parts marked “O” are optional parts.

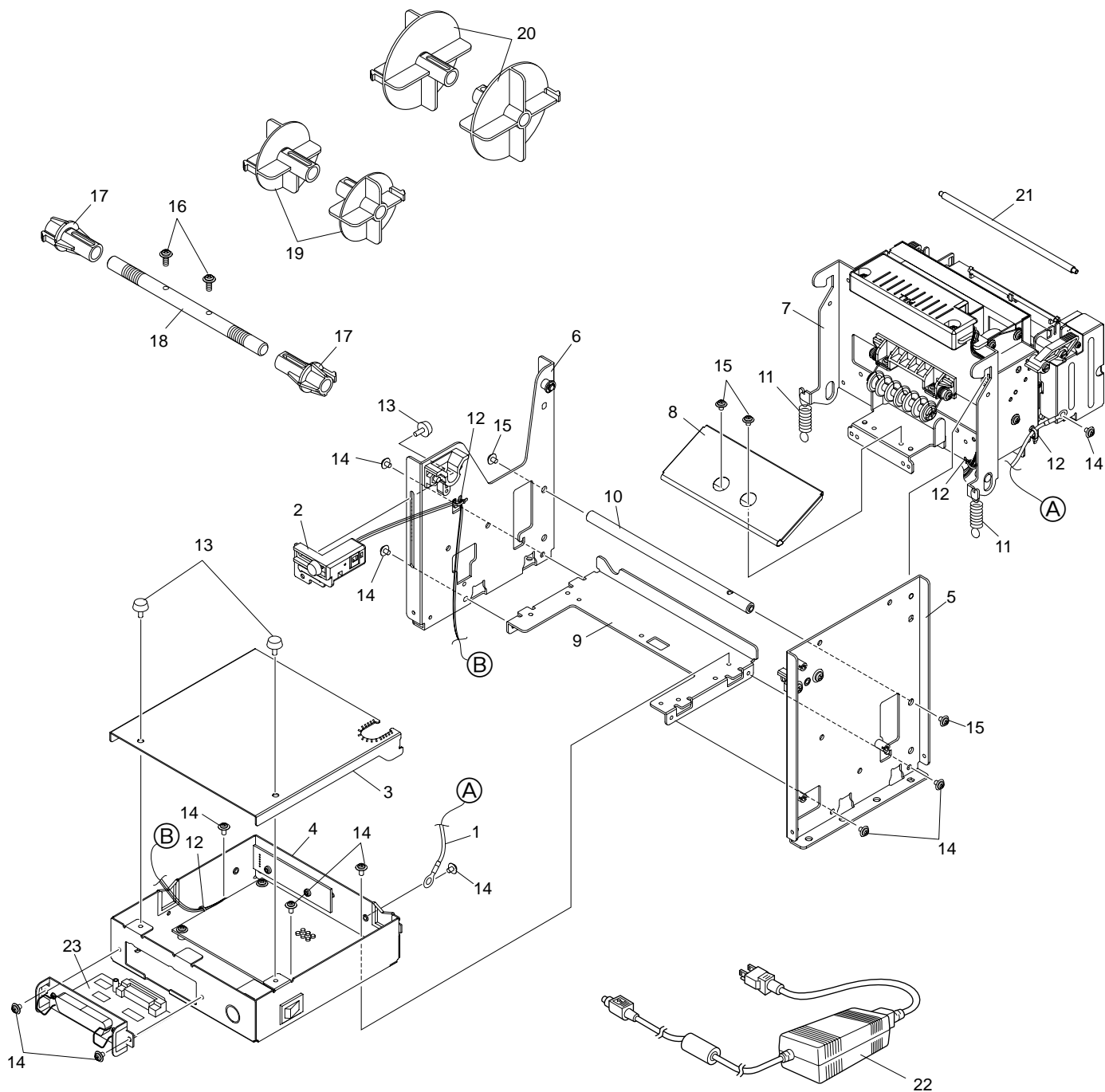
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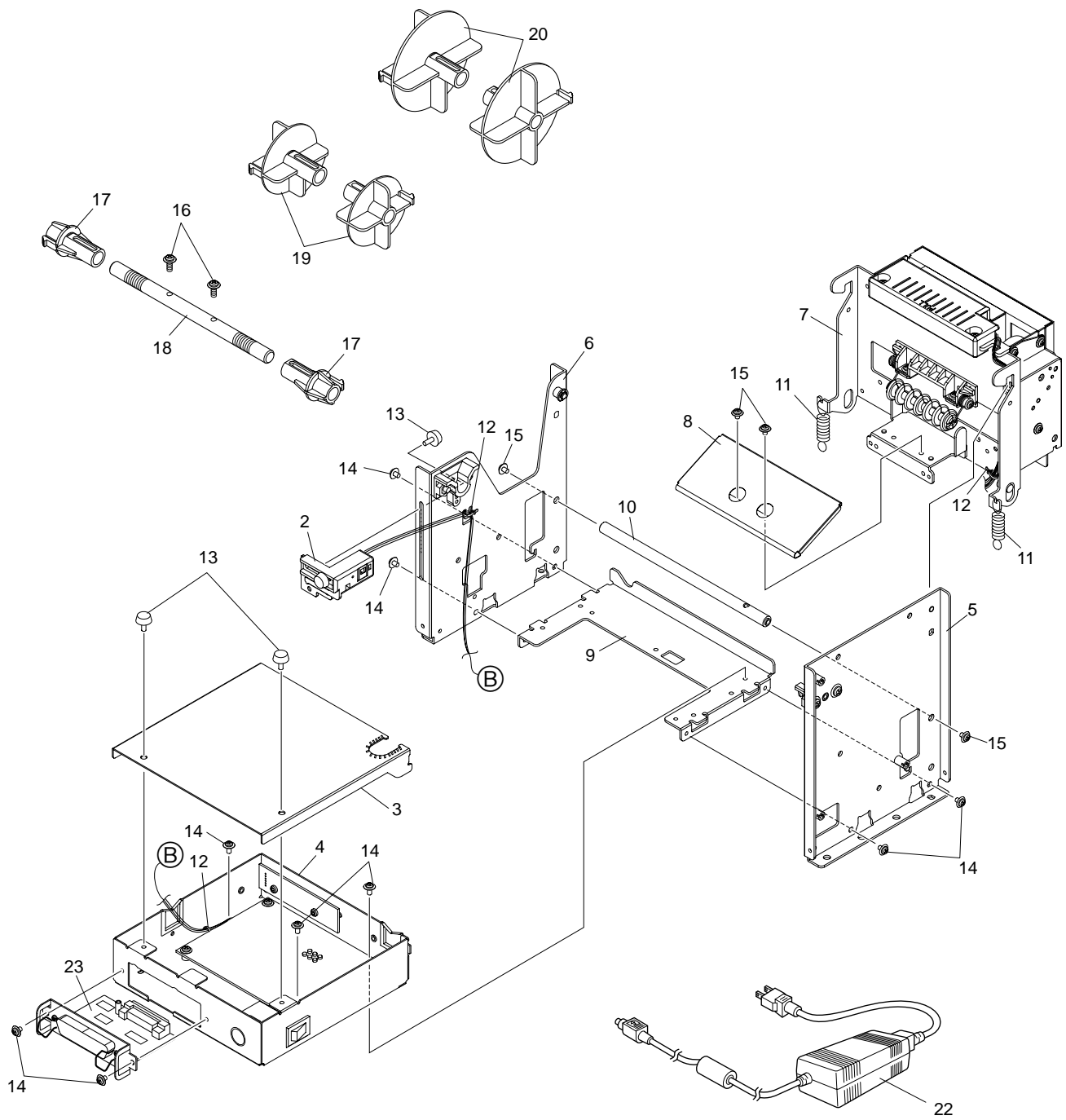
1. Printer Assembly

1-1. Disassembly Drawing

A. TUP992



B. TUP942



1-2. Parts List

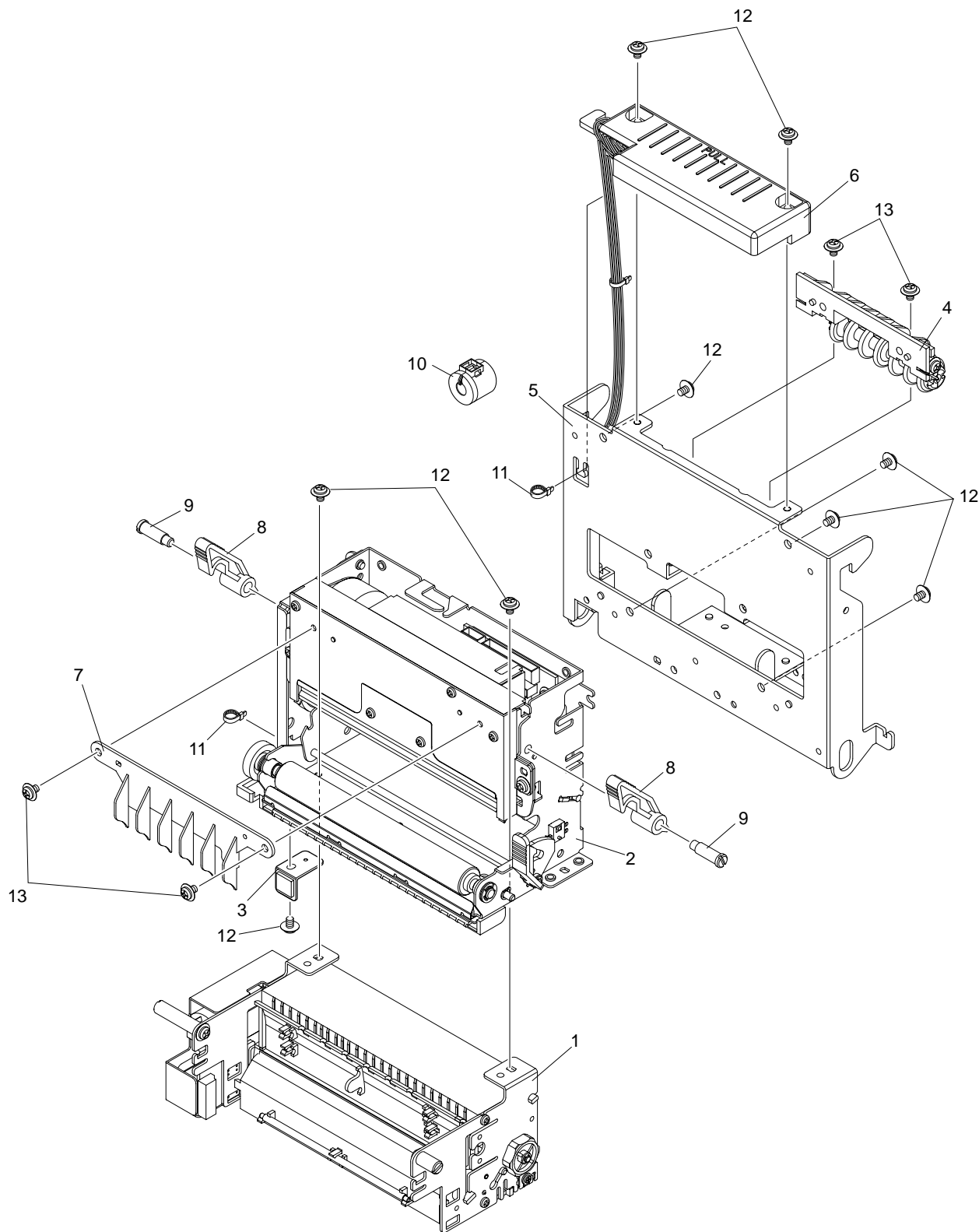
Printer Assembly

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
1		80701770	WIRE 18UL1007BRN145TT	1	TUP992	S
2		37497000	NEAR-END DETECTOR UNIT TUP9	1		0
3		37490050	BOARD CHASSIS U UNIT TUP9	1		S
4		NPN	BOARD CHASSIS UNIT TUP9	1		
5		NPN	FRAME L UNIT TUP9	1		
6		NPN	FRAME R UNIT TUP9	1		
7		37490000	MECHANISM BASE UNIT TUP9	1	TUP992	S
		37490060	MECHANISM BASE A UNIT TUP9	1	TUP942	S
8		32045600	PAPER GUIDE TUP9	1		S
9		NPN	BOTTOM FRAME TUP9	1		
10		NPN	FRAME STAY TUP9	1		
11		30510530	SPRING E100-100-0284	2		S
12		04991204	FASTENER T18S	4	TUP992	S
12		04991204	FASTENER T18S	3	TUP942	S
13		01923004	DESIGNED SCREW 3-4	3		S
14		01903101	SCREW TAT 3-6 CT-FL	11	TUP992	S
		01903101	SCREW TAT 3-6 CT-FL	9	TUP942	S
15		01903030	SCREW TR 3-4 FL	4		S
16		01914003	SCREW TR 4-10 WS/WF	2		S
17		33910660	ROLL PAPER HOLDER 1 TUP9	2		S
18		31380100	ROLL PAPER SHAFT TUP9	1		S
19		33910670	ROLL PAPER HOLDER 2 TUP9	2		S
20		33910680	ROLL PAPER HOLDER 3 TUP9	2		S
21		31382040	SHAFT C TMP7	1	TUP992	S
22		30781440	ADAPTER SET PS60L-24A US	1	OPTION	0
		30781450	ADAPTER SET PS60L-24A EU	1	OPTION	0
		30781460	ADAPTER SET PS60L-24A UK	1	OPTION	0
		30781470	ADAPTER SET PS60L-24A AS	1	OPTION	0
		30781480	ADAPTER SET PS60L-24A CH	1	OPTION	0
23		39607400	INTERFACE BOARD IFBD-HD04	1	SERIAL IF (25 PIN)	0
		39607430	INTERFACE BOARD IFBD-HN04	1	SERIAL IF (9 PIN)	0
		39607421	INTERFACE BOARD IFBD-HU04	1	SERIAL IF (USB)	0
		39607440	INTERFACE BOARD IFBD-HE04	1	ETHERNET	0
		39607411	INTERFACE BOARD IFBD-HC04	1	PARALLEL IF	0
-		39590020	RHU-T900	1	OPTION	0

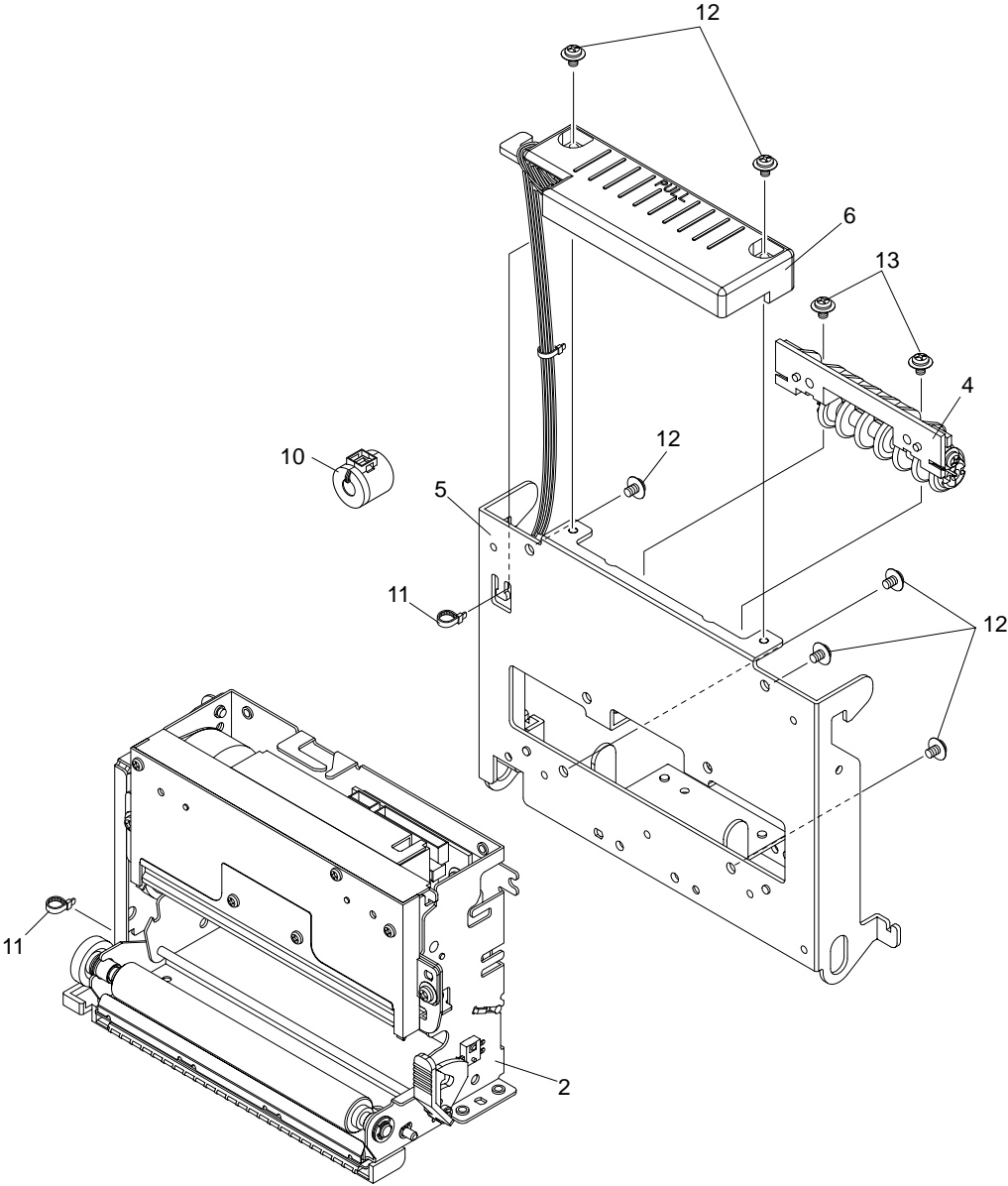
2. Mehcanism Base Unit

2-1. Disassembly Drawing

A. TUP992



B. TUP942



2-2. Parts List

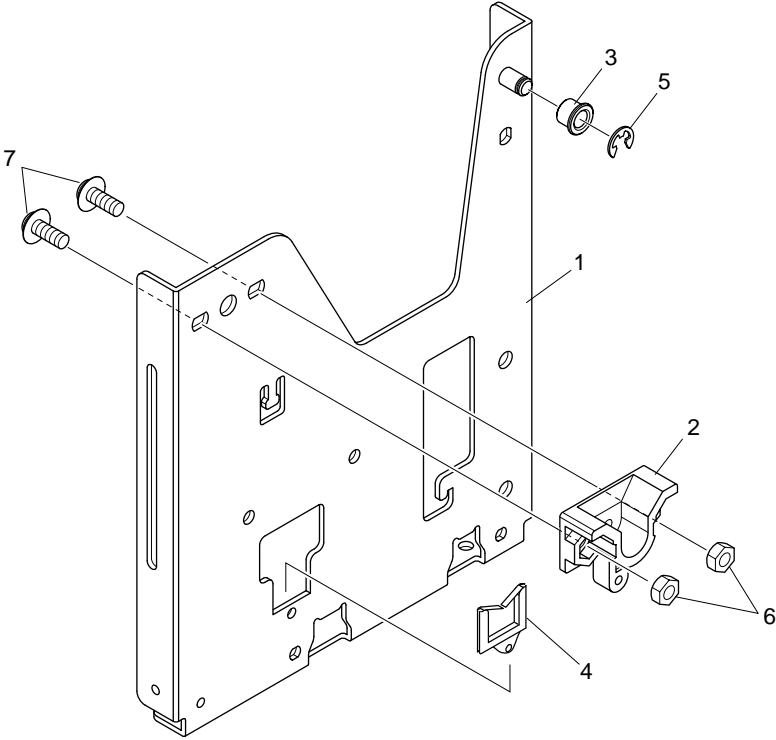
Mechanism Base Unit

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
1		38515000	PR921-24	1	TUP992	0
2		38448300	TMP942-24	1		0
3		37491510	STOPPER ASSY TUP9	1	TUP992	S
4		37491500	DAMPER ROLLER ASSY TUP9	1		0
5		NPN	MECHANISM BASE ASSY TUP9	1		
6		33913000	HANDLE TUP9	1		S
7		33910480	LOOP GUIDE PR9	1	TUP992	S
8		33400130	LOCK LEVER PR9	2	TUP992	S
9		31900000	LEVER SCREW PR9	2	TUP992	S
10		09990762	FERRITE CORE K5BRC16X16X8-M	1		S
11		04991204	FASTENER T18S	3	TUP992	S
		04991204	FASTENER T18S	2	TUP942	S
12		01903101	SCREW TAT 3-6 CT-FL	9	TUP992	S
		01903101	SCREW TAT 3-6 CT-FL	6	TUP942	S
13		01903030	SCREW TR 3-4 FL	4	TUP992	S
		01903030	SCREW TR 3-4 FL	2	TUP942	S

3. Sub-Assembly

3-1. Frame R Unit

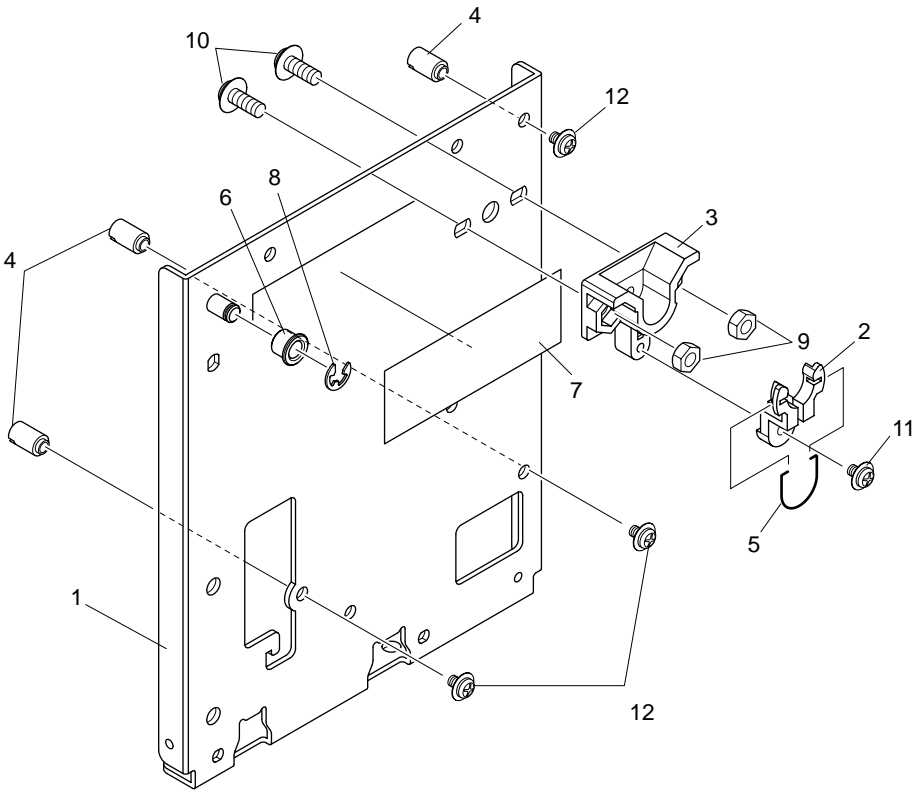
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DRWG.NO.	REV.	PARTS NO.	PARTS NAME		Q'TY	REMARKS	RANK
9-1		NPN	FRAME R ASSY	TUP9	1		
9-2		33210520	BUSHING	TUP9	1		S
9-3		30211050	PF ROLLER BEARING	TMP6	1		S
9-4		04991254	CORD CLAMP EDS-1208U		1		S
9-5		04020016	STOP RING SE4.0		1		S
9-6		02010401	HEXAGON NUT NH4-1		2		S
9-7		01914003	SCREW TR 4-10 WS/WF		2		S

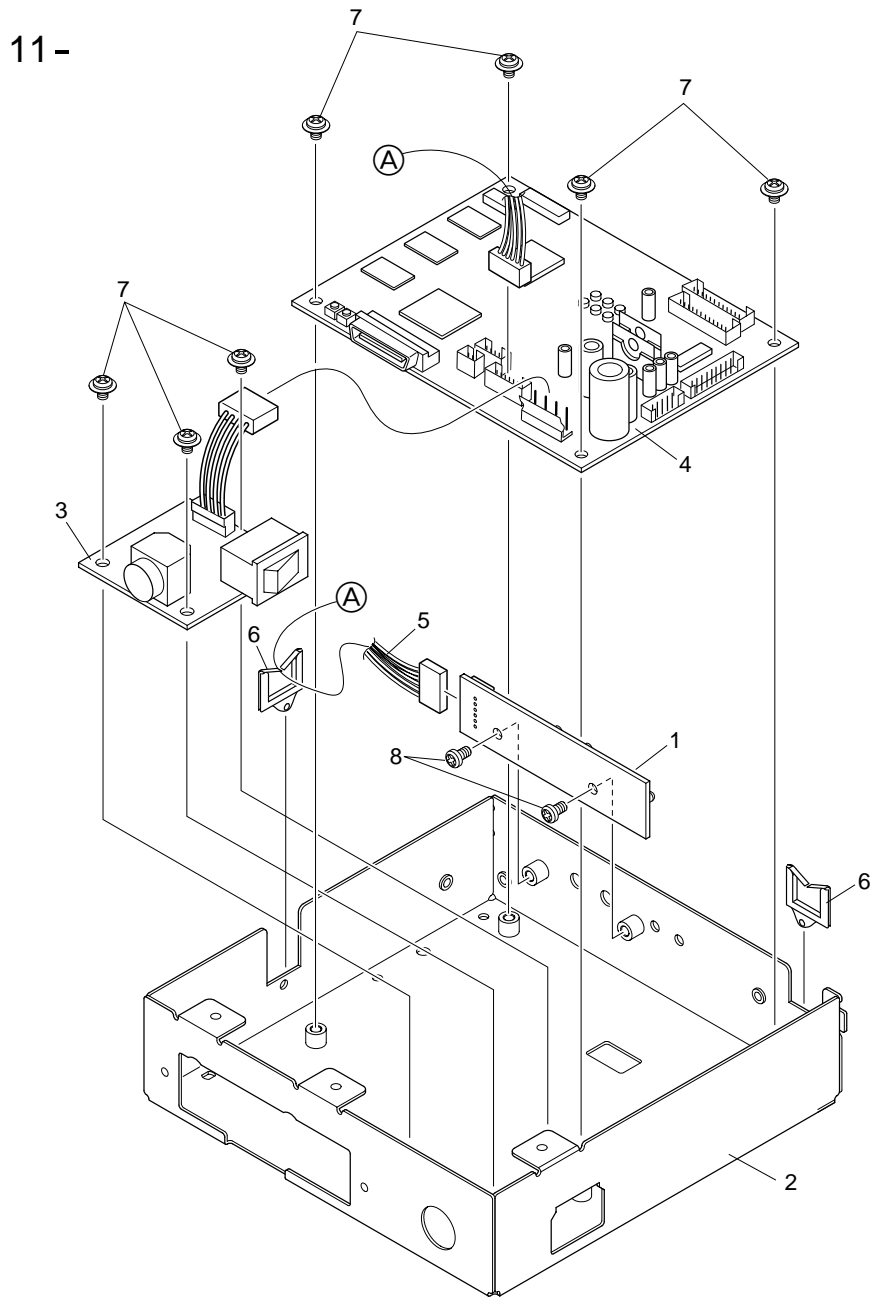
3-2. Frame L Unit

10-



DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
10-1		NPN	FRAME L ASSY	TUP9	1	
10-2		33912000	CLAMP	TUP9	1	S
10-3		33210520	BUSHING	TUP9	1	S
10-4		31382070	SHAFT A	TUP9	3	S
10-5		30531180	CLAMP SPRING	TUP9	1	S
10-6		30211050	PF ROLLER BEARING	TMP6	1	S
10-7		NPN	PAPER SET SEAL	TUP9	1	
10-8		04020016	STOP RING SE4.0		1	S
10-9		02010401	HEXAGON NUT NH4-1		2	S
10-10		01914003	SCREW TR 4-10 WS/WF		2	S
10-11		01903060	SCREW TAT 3-8 PT-FL		1	S
10-12		01903030	SCREW TR 3-4 FL		3	S

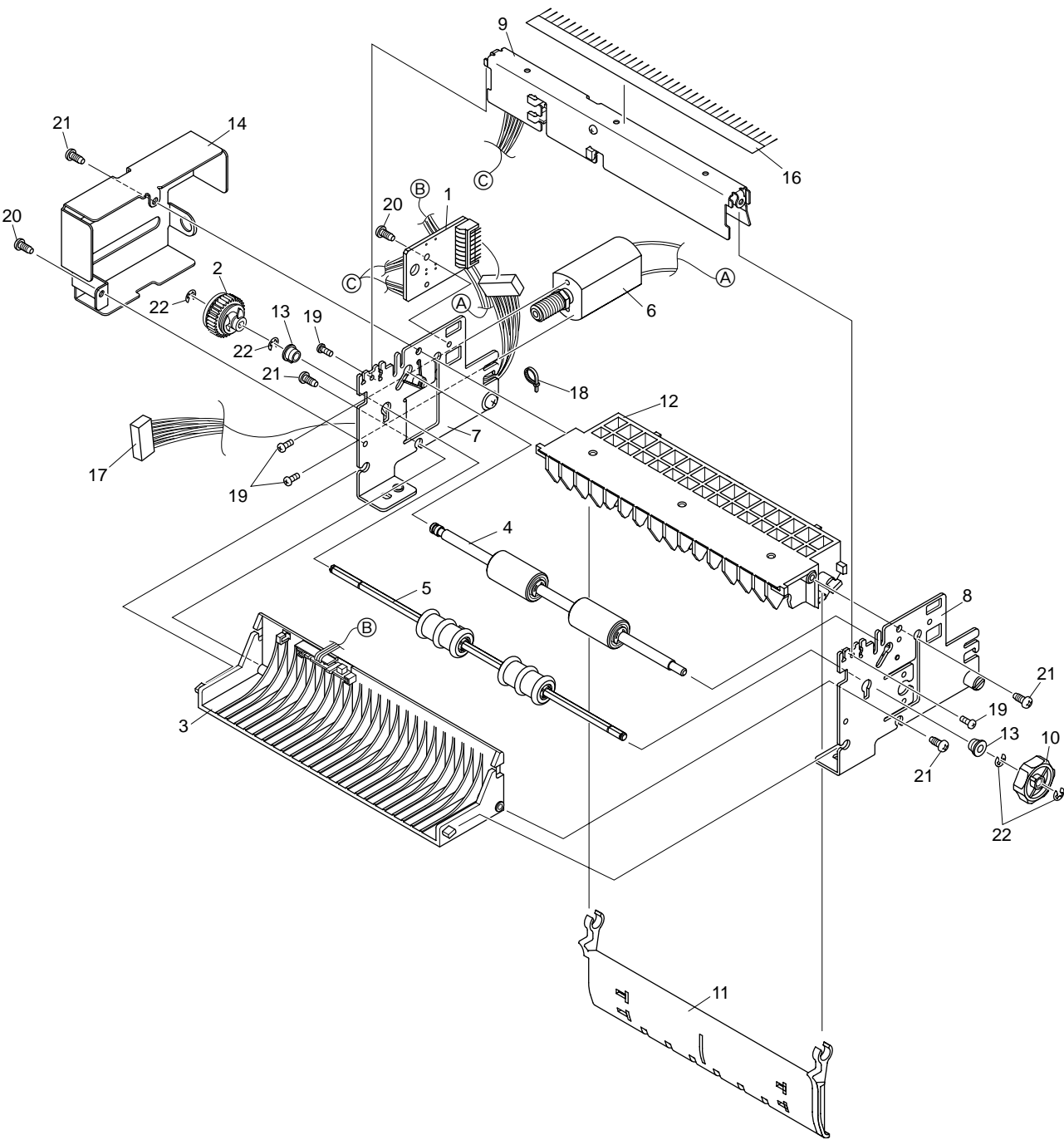
3-3. Board chassis Unit



DRWG.NO.	REV.	PARTS NO.	PARTS NAME		Q'TY	REMARKS	RANK
11-1		37497200	CONTROL BOARD UNIT	TUP9	1		0
11-2		37490530	BOARD CHASSIS L ASSY	TUP9	1		S
11-3		37220200	SUB-BOARD UNIT	PBD-9	1		0
11-4		37220001	MAIN LOGIC BOARD UNIT	TBD9	1		0
11-5		30721760	CABLE UNIT 6X220CC	TUP9	1		S
11-6		04991254	CORD CLAMP EDS-1208U		2		S
11-7		01903030	SCREW TR 3-4 FL		7		S
11-8		00630504	SCREW TR 3-5		2		S

3-4. Presenter Unit PR921
Disassembly Drawing

1 -

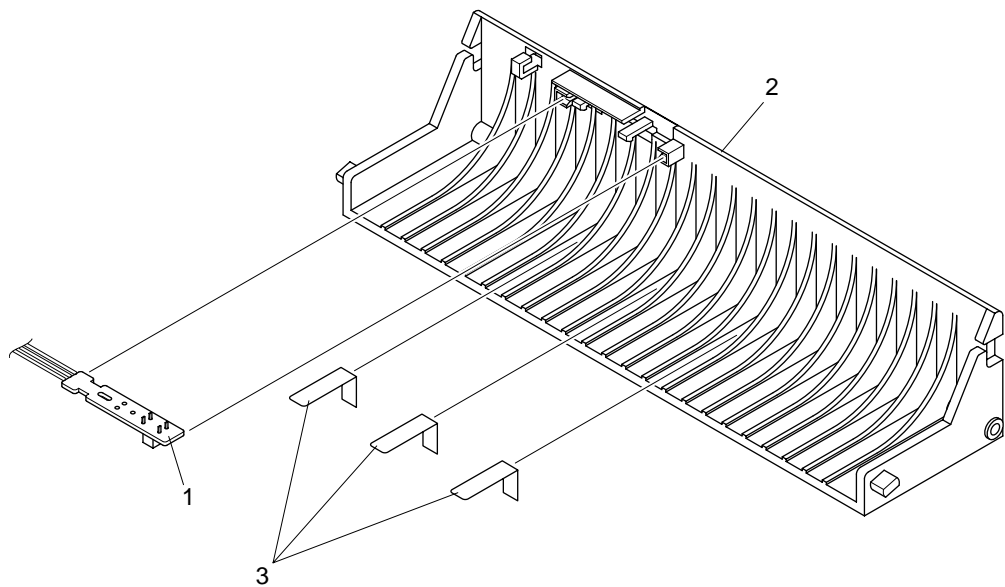


Presenter Unit PR921

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
1-1		37517030	TERMINAL BOARD UNIT PR9	1		S
1-2		37514020	SLIP WHEEL PR9	1		S
1-3		37513070	PAPER GUIDE UNIT PR9	1		S
1-4		37513060	HOLDER ROLLER UNIT PR9	1		S
1-5		37513050	PAPER FEED ROLLER UNIT PR9	1		S
1-6		37512030	PAPER FEED MOTOR UNIT PR9	1		S
1-7		NPN	SIDE FRAME L UNIT PR9	1		
1-8		NPN	SIDE FRAME R UNIT PR9	1		
1-9		37510030	GUIDE FRAME UNIT PR9	1		S
1-10		33990010	KNOB PR9	1		S
1-11		33910641	PAPER HOLDER PR9	1		S
1-12		33910470	REAR GUIDE PR9	1		S
1-13		33215010	PF ROLLER BEARING PR1	2		S
1-14		NPN	GEAR COVER PR9	1		
1-16		30992030	DISCHARGE BRUSH PR9	1		S
1-17		30721740	CABLE UNIT 8X350CC PR9	1		S
1-18		04991204	FASTENER T18S	1		S
1-19		00820304	SCREW TR 2-3	4		S
1-20		00926403	SCREW TAT 2.6-4 CT	2		S
1-21		01902615	SCREW TAT 2.6-6 PT	4		S
1-22		04020010	STOP RING SE2.0	4		S

3-5. Paper Guide Unit (PR921)

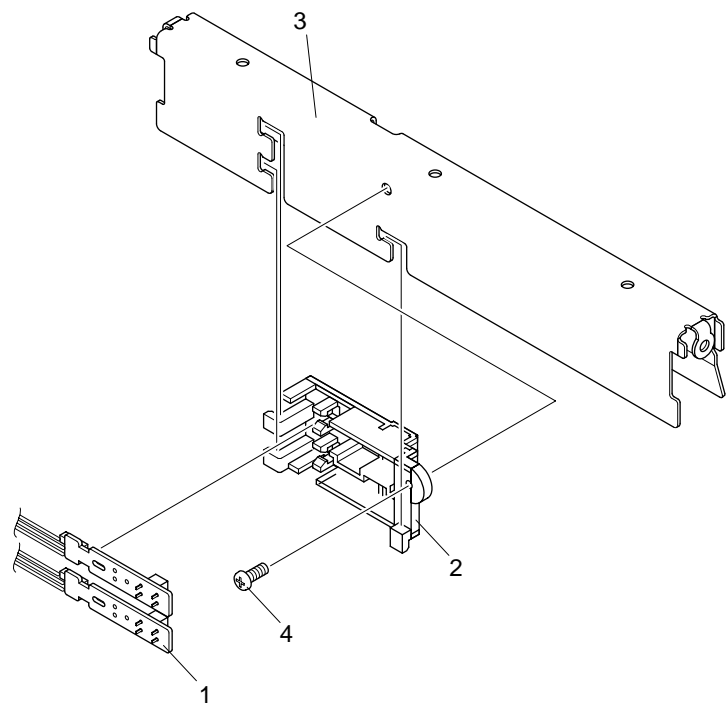
1-3-



DRWG.NO.	REV.	PARTS NO.	PARTS NAME		Q'TY	REMARKS	RANK
1-3-1		37517200	PE DETECTOR ASSY	PR9	1		S
1-3-2		NPN	PAPER GUIDE	PR9	1		
1-3-3		30045090	GUIDE	PR9	3		S

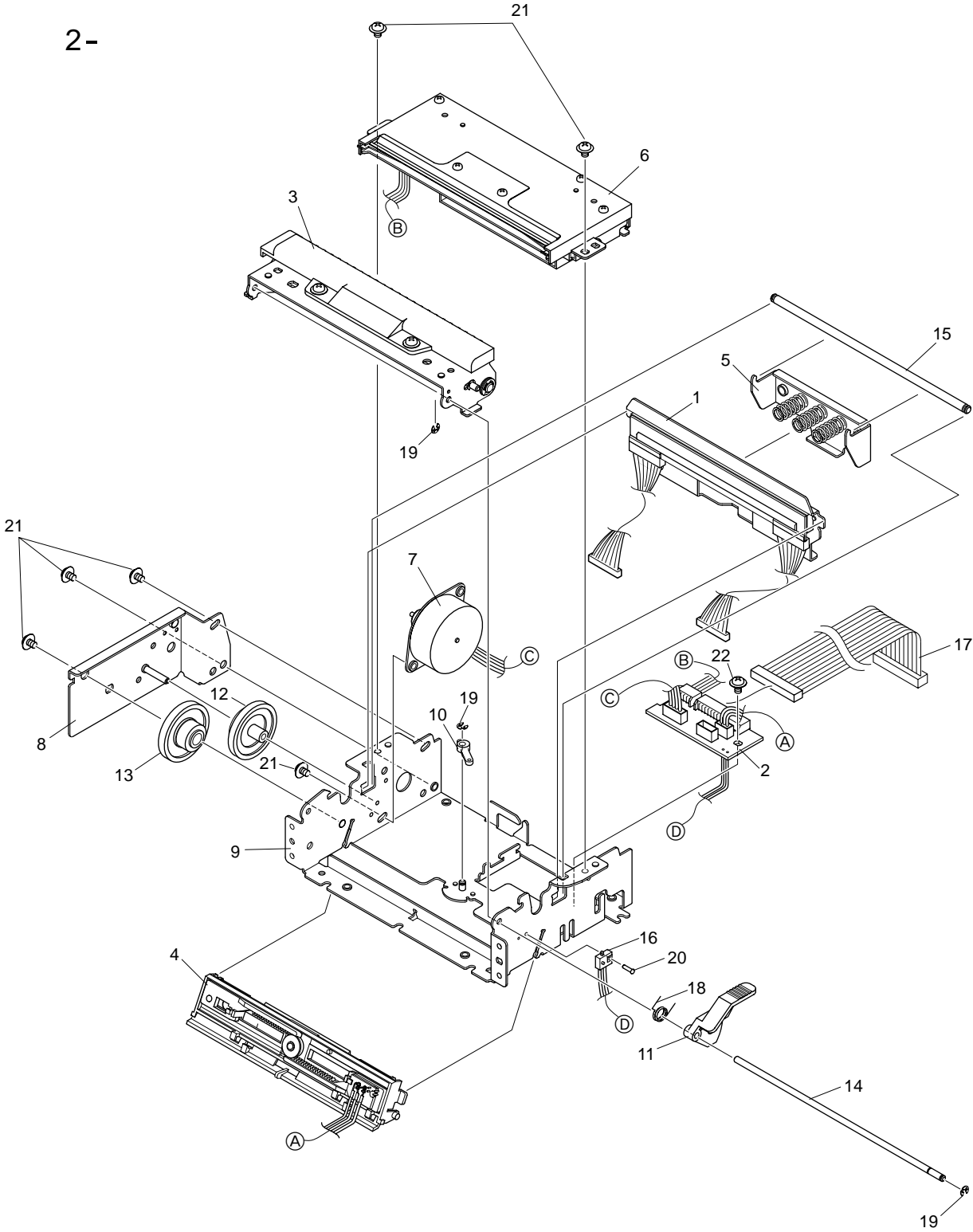
3-6. Guide Frame Unit

1-9-



DRWG.NO.	REV.	PARTS NO.	PARTS NAME		Q'TY	REMARKS	RANK
1-9-1		37517200	PE DETECTOR ASSY	PR9	2		S
1-9-2		NPN	DETECTOR HOLDER	PR9	1		
1-9-3		NPN	GUIDE FRAME	PR9	1		
1-9-4		01902028	SCREW TAT 2-4		1		S

3-7. Mechanism Unit TMP942

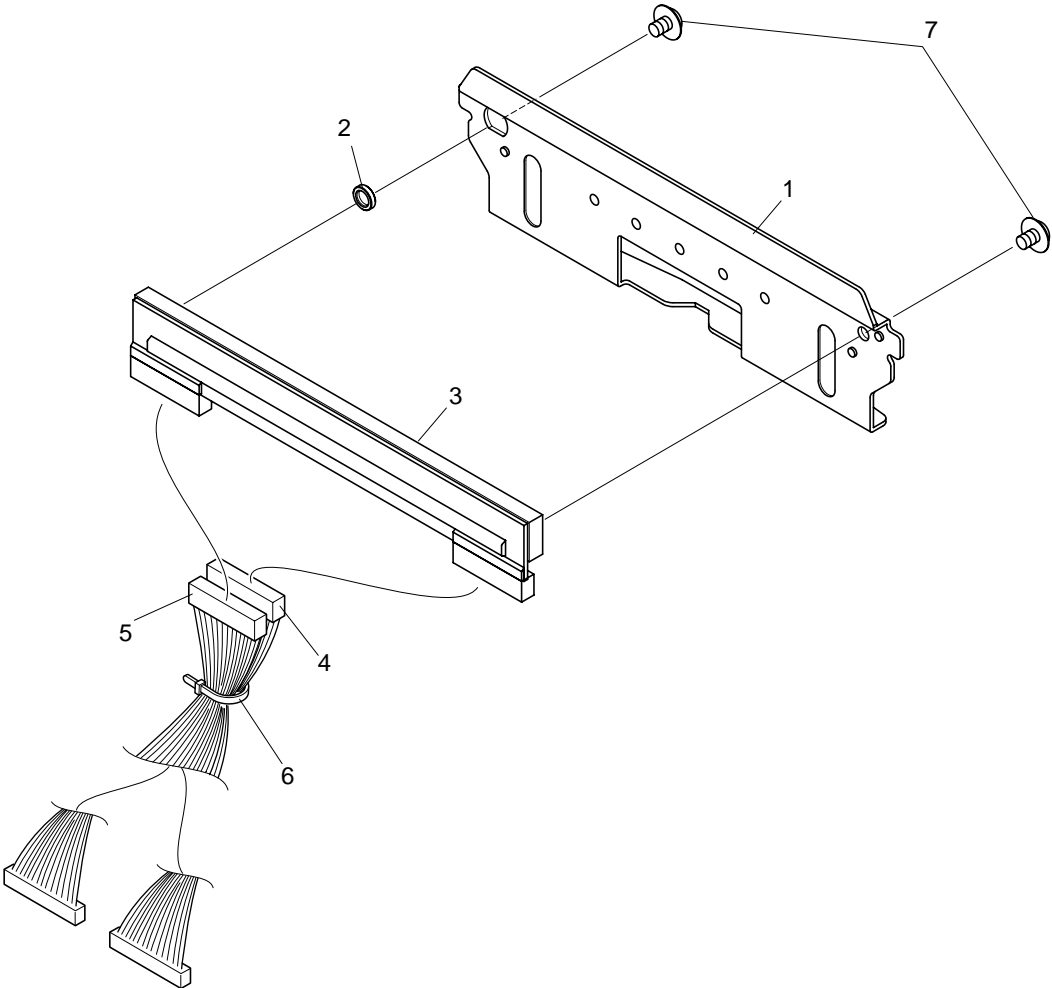


Mechanism Unit TMP942

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
2-1		37489011	HEAD UNIT TMP9	1		S
2-2		37487700	TERMINAL BOARD ASSY TMP9	1		S
2-3		37483110	PLATEN HOLDER UNIT TMP9	1		S
2-4		37483040	PAPER GUIDE UNIT TMP9	1		S
2-5		37483030	SPRING HOLDER UNIT TMP9	1		S
2-6		37482110	CUTTER UNIT TMP9	1		S
2-7		37482010	PAPER FEED MOTOR UNIT TMP9	1		S
2-8		NPN	GEAR COVER UNIT TMP9	1		
2-9		NPN	BASE FRAME UNIT TMP9	1		
2-10		33490060	HEAD ADJUSTER TMP9	1		S
2-11		33400121	RELEASE LEVER TMP9	1		S
2-12		33102300	GEAR 36X56X0.5 TMP9	1		S
2-13		33102290	GEAR 18X0.7-58X0.5 TMP9	1		S
2-14		NPN	PLATEN PIVOT TMP9	1		
2-15		NPN	PRESS SHAFT TMP9	1		
2-16		37487320	PLATEN SWITCH ASSY TMP9	1		S
2-17		30721701	CABLE UNIT 14X380CC TMP9	1		S
2-18		30531160	RELEASE SPRING TMP9	1		S
2-19		04020010	STOP RING SE2.0	3		S
2-20		00716604	SCREW TR 1.6-6	1		S
2-21		01903030	SCREW TR 3-4 FL	6		S
2-22		01903101	SCREW TAT 3-6 CT-FL	1		S

3-8. Head Unit

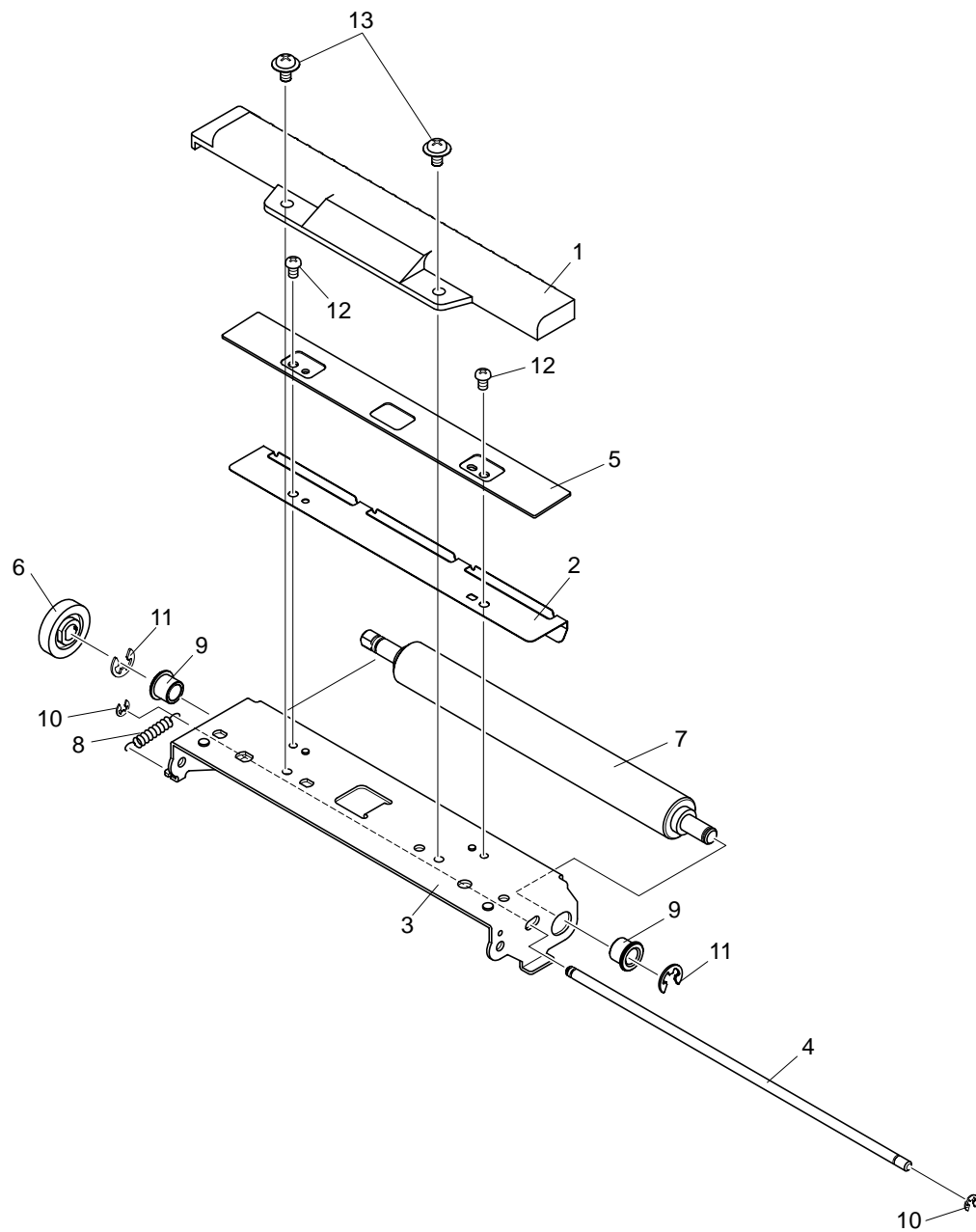
2-1-



DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
2-1-1		NPN	HEAD HOLDER	TMP9	1	
2-1-2		31210001	COLLAR	TMP8	1	S
2-1-3		30905040	THERMAL HEAD KF2004-GD31B		1	S
2-1-4		30721720	CABLE UNIT B	TMP9	1	S
2-1-5		30721711	CABLE UNIT A	TMP9	1	S
2-1-6		04991204	FASTENER T18S		1	S
2-1-7		01903030	SCREW TR 3-4 FL		2	S

3-9. Platen Holder Unit

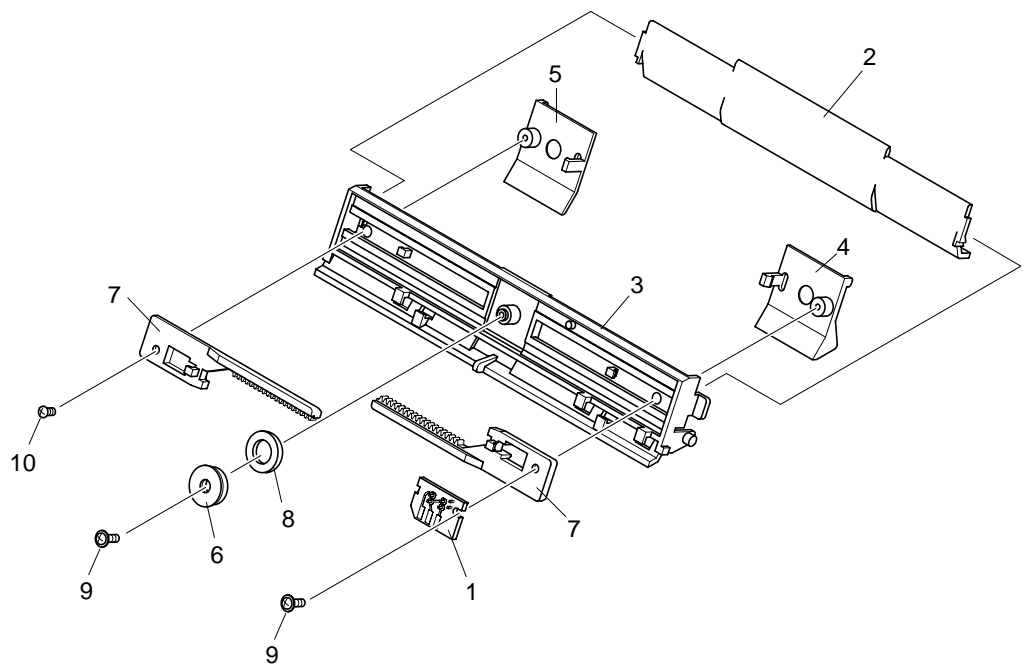
2-3-



DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
2-3-1		NPN	BLADE COVER	1		
2-3-2		NPN	BLADE GUIDE	1		
2-3-3		NPN	PLATEN HOLDER	1		
2-3-4		NPN	LOCK SHAFT	1		
2-3-5		30903070	STATIONARY KNIFE KC-GS120	1		S
2-3-6		33103020	PLATEN GEAR 22X0.7	1		S
2-3-7		30375050	PLATEN	1		S
2-3-8		NPN	SPRING E030-032-0114	1		
2-3-9		30211050	PF ROLLER BEARING	2		S
2-3-10		04020010	STOP RING SE2.0	2		S
2-3-11		04020016	STOP RING SE4.0	2		S
2-3-12		00926403	SCREW TAT 2.6-4 CT	2		S
2-3-13		01903101	SCREW TAT 3-6 CT-FL	2		S

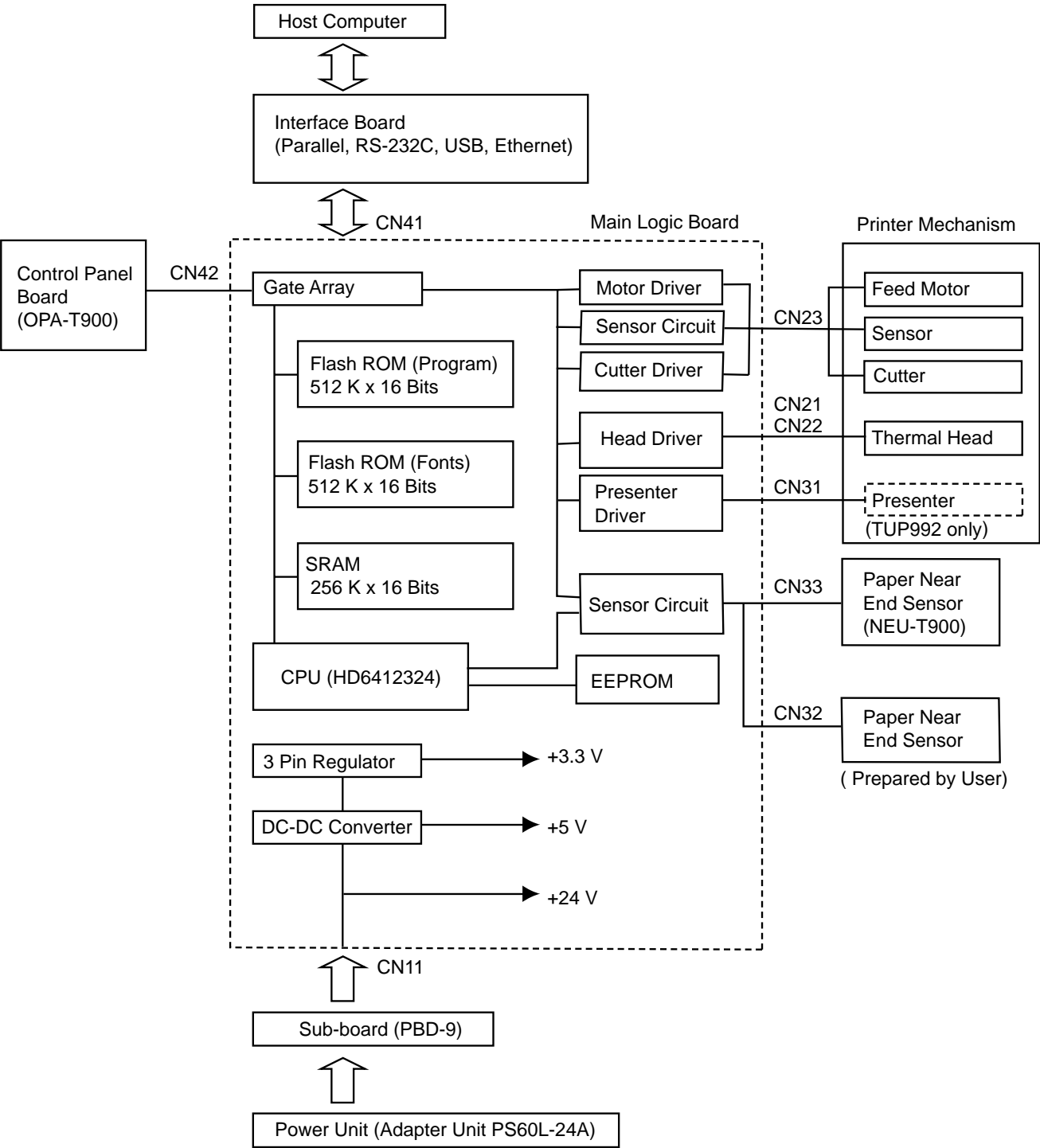
3-10. Paper Guide Unit (TMP942)

2-4-



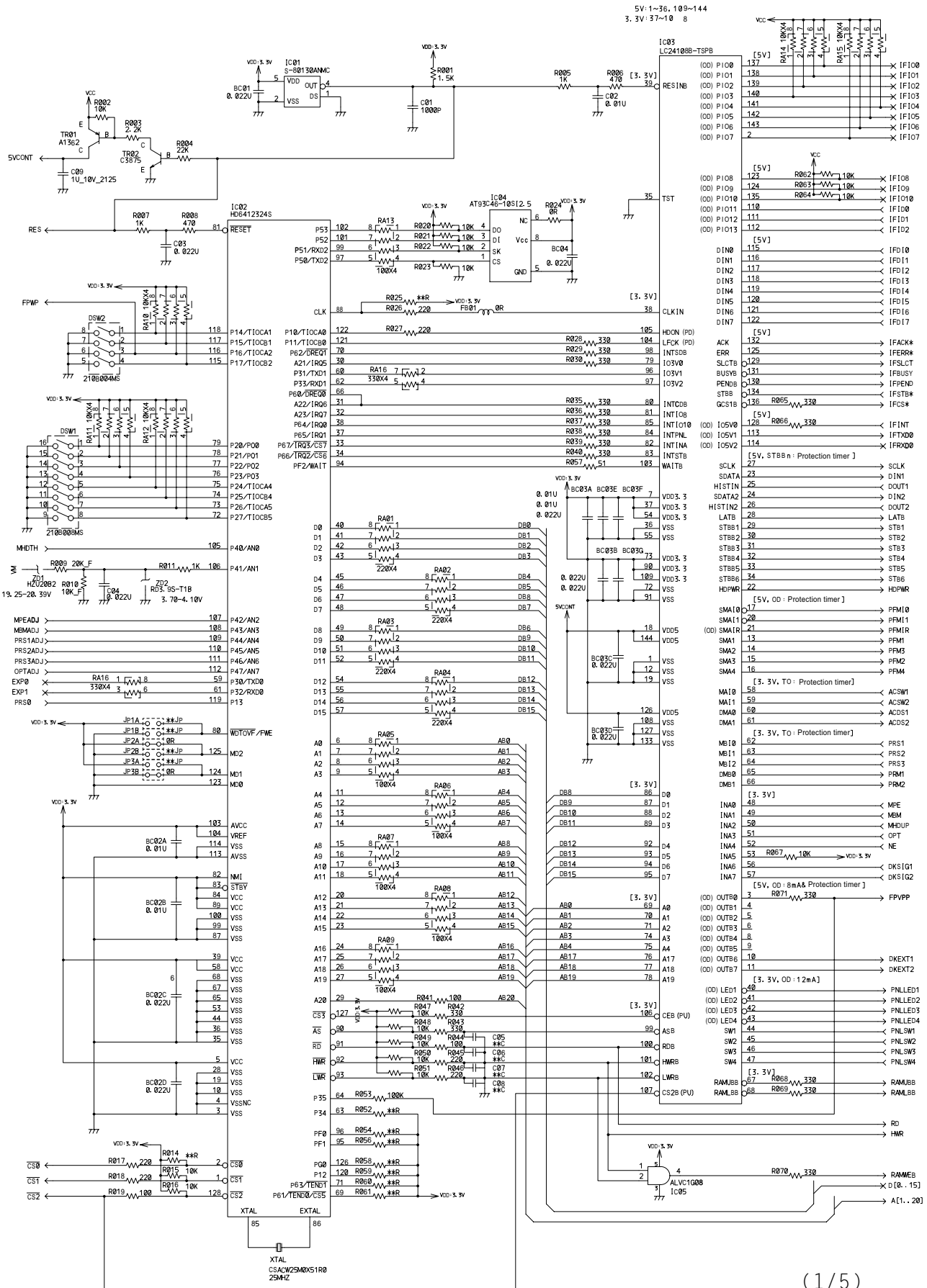
DRWG.NO.	REV.	PARTS NO.	PARTS NAME		Q'TY	REMARKS	RANK
2-4-1		37487330	PE DETECTOR ASSY	TMP9	1		S
2-4-2		NPN	UPPER GUIDE	TMP9	1		
2-4-3		NPN	PAPER GUIDE BASE	TMP9	1		
2-4-4		33910440	SIDE GUIDE L	TMP9	1		S
2-4-5		33910430	SIDE GUIDE R	TMP9	1		S
2-4-6		NPN	GUIDE PINION 18X0.5	TMP9	1		
2-4-7		NPN	RACK	TMP9	2		
2-4-8		04300782	O-RING 7.8X1.9 P8SILICON50		1		S
2-4-9		01902024	SCREW TAT 2-6		2		S
2-4-10		01902028	SCREW TAT 2-4		1		S

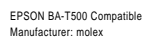
4. Block Diagram



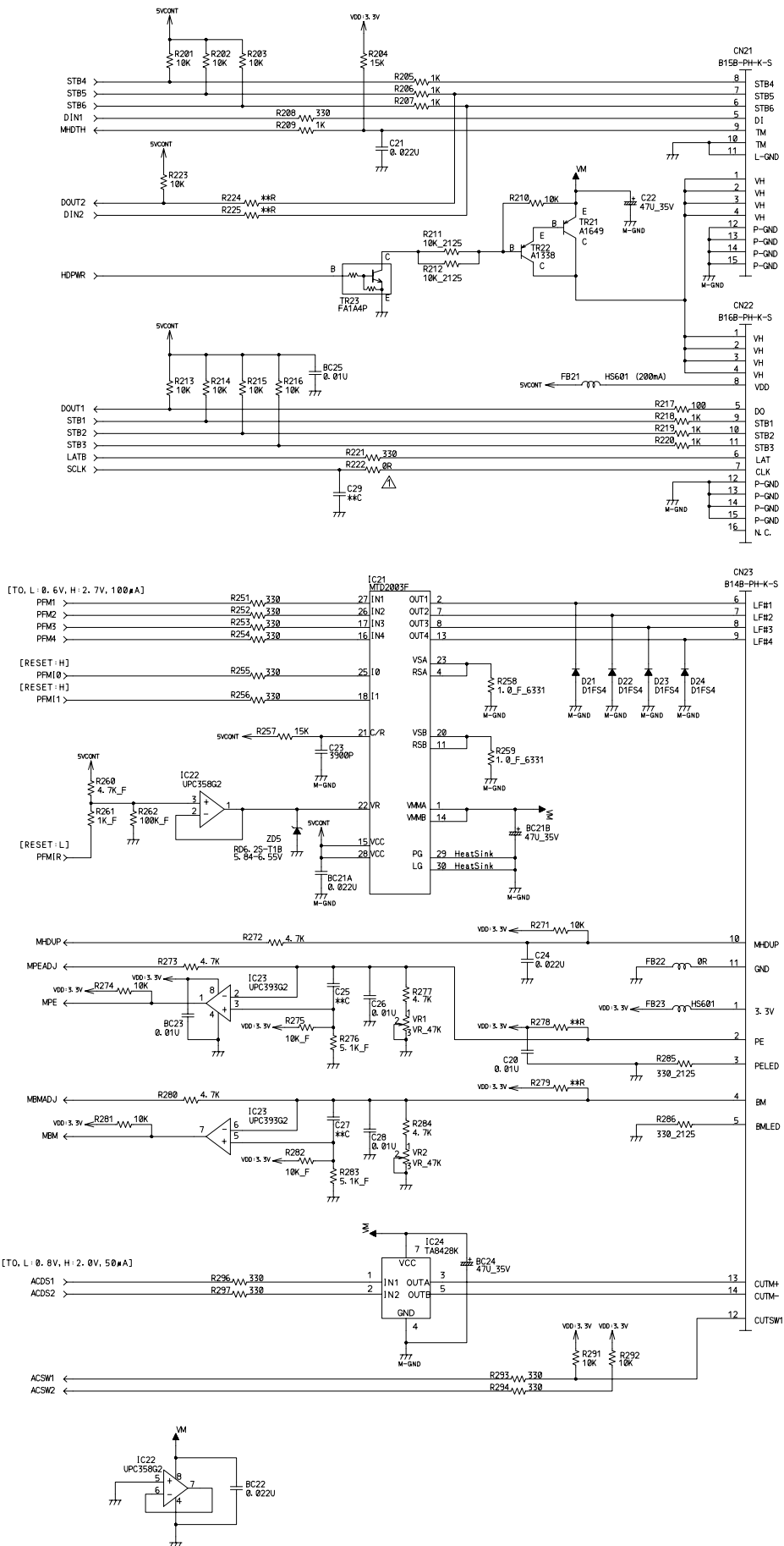
5. Main Logic Board

5-1. Circuit Diagram

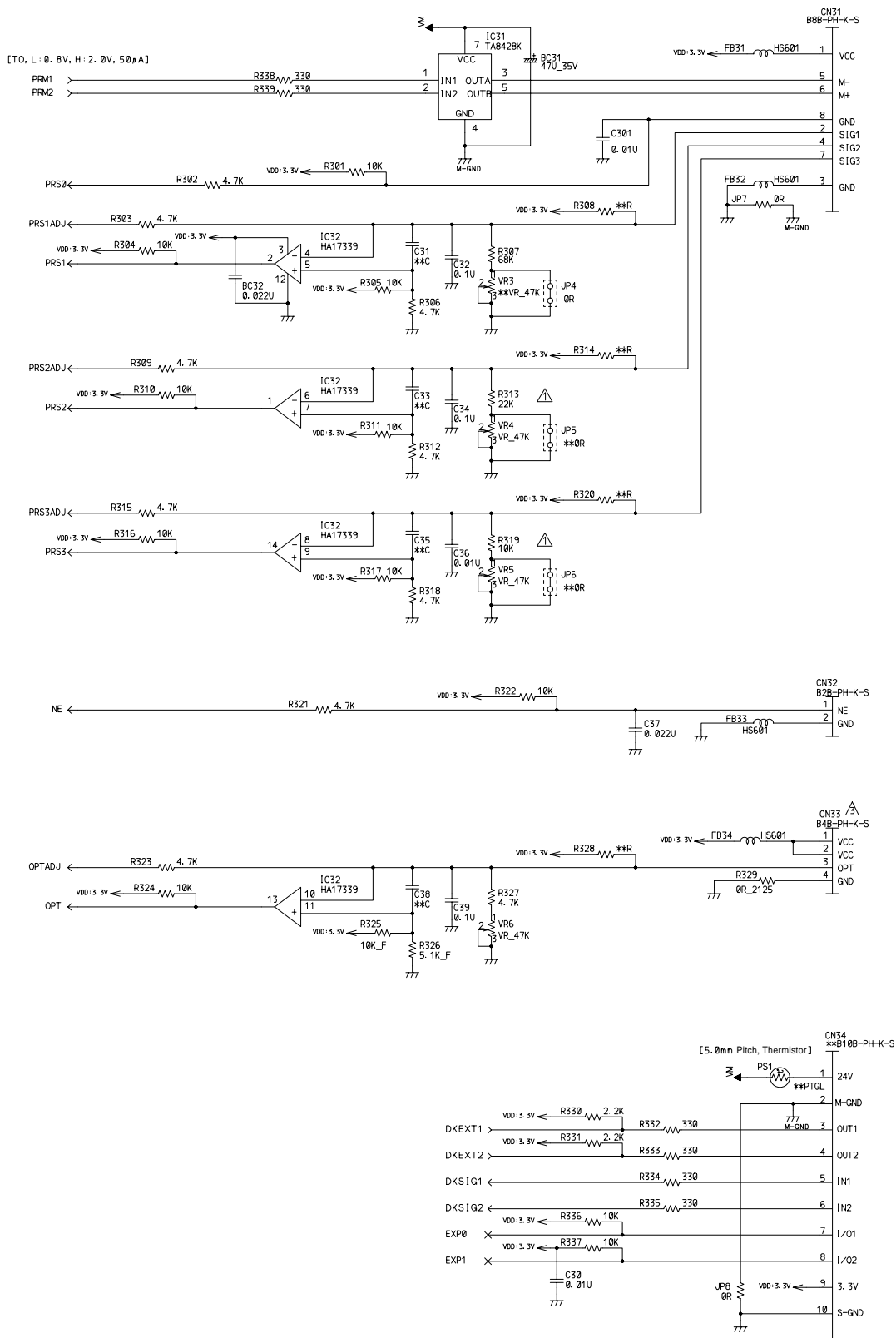




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5-2. Parts List

Main Logic Board

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
BC01		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
BC02A-2B		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	2		
BC02C-2D		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	2		
BC03A		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
BC03B-3D		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	3		
BC03E		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
BC03F-3G		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	2		
BC04		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
BC11		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
BC12-13		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	2		
BC14		NPN	CERA. CAPA. CHIP 0.1UF 50V	1		
BC21A		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
BC21B		NPN	CHEM. CAPA. 47UF 35V	1		
BC22		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
BC23		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
BC24		NPN	CHEM. CAPA. 47UF 35V	1		
BC25		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
BC31		NPN	CHEM. CAPA. 47UF 35V	1		
BC32		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
C01		NPN	CERA.CAPA.CHIP1608 1000PF 50V	1		
C02		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
C03-04		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	2		
C09		NPN	CERA. CAPA. CHIP 1UF 10V	1		
C12		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	1		
C13		NPN	CHEM. CAPA. 1000UF 35V	1		
C14		NPN	CHEM. CAPA. 100UF 50V	1		
C15		NPN	CHEM. CAPA. 470UF 10V	1		
C16		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	1		
C17		NPN	CERA. CAPA. CHIP 1UF 10V	1		
C18		NPN	CHEM. CAPA. 220UF 10V	1		
C20		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
C21		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
C22		NPN	CHEM. CAPA. 47UF 35V	1		
C23		NPN	CERA.CAPA.CHIP1608 3900PF 50V	1		
C24		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
C26		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
C28		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
C30		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
C301		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
C32		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	1		
C34		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	1		
C36		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
C37		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
C39		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	1		
C40		NPN	CERA. CAPA. CHIP 100PF 50V	1		
C400-404		NPN	CERA.CAPA.CHIP1608 470PF 50V	5		
C405-408		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	4		
C41-42		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	2		
C43-44		NPN	CERA.CAPA.CHIP1608 1000PF 50V	2		
C45-46		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	2		
C47		NPN	CERA. CAPA. CHIP 100PF 50V	1		
C48-49		NPN	CERA.CAPA.CHIP1608 1000PF 50V	2		
CN11		NPN	CONNECTOR 5273-04A	1		
CN21		NPN	CONNECTOR B15B-PH-K-S	1		
CN22		NPN	CONNECTOR B16B-PH-K-S	1		

Main Logic Board

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
CN23		NPN	CONNECTOR B14B-PH-K-S	1		
CN31		NPN	CONNECTOR B8B-PH-K	1		
CN32		NPN	CONNECTOR B2B-PH-K-S	1		
CN33		NPN	CONNECTOR B4B-PH-K-S	1		
CN41		NPN	CONNECTOR PHEC40R-R111	1		
CN42		NPN	CONNECTOR B6B-PH-K-S	1		
D11		NPN	SCHOTTKY DIODE RB160L-40*	1		
D21-24		NPN	SCHOTTKY DIODE CHIP D1FS4*	4		
DSW1		NPN	DIP SWITCH 210B008MS	1		
DSW2		NPN	DIP SWITCH 210B004MS	1		
FB01		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
FB11A-12A		NPN	BEADS INDUCTOR RH035047RT-Y7	2		
FB21		NPN	CHIP BEADS IND. BK1608HS601*	1		
FB22		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
FB23		NPN	CHIP BEADS IND. BK1608HS601*	1		
FB31-34		NPN	CHIP BEADS IND. BK1608HS601*	4		
FB41-42		NPN	CHIP BEADS IND. BK1608HS601*	2		
IC01		NPN	IC-RESET S-80130AN*	1		
IC02		NPN	CPU HD6412324SVF25	1		
IC03		NPN	GATE ARRAY LC24108B-TSPB	1		
IC04		NPN	EEPROM AT93C46-10SI25	1		
IC05		NPN	CMOS 74ALVC1G08*	1		
IC11		NPN	FLASH MEMORY 28F800BJ-70	1	TB9 *.*	
IC12		NPN	FLASH MEMORY 28F800BJ-70	1	T9#CH*.*	
IC11-12		NPN	FLASH MEMORY SEAL KEI-801	2		
IC13		NPN	SRAM D444012AGY-B55X	1		
IC14		NPN	IC-REG BP5250-24	1		
IC15		NPN	IC-REG L88M33T*TL	1		
IC21		NPN	IC-MOTOR MTD2003F-4072	1		
IC22		NPN	IC-LIN UPC358G2*T1	1		
IC23		NPN	IC-LIN UPC393G2*T1	1		
IC24		NPN	IC-MOTOR TA8428K	1		
IC31		NPN	IC-MOTOR TA8428K	1		
IC32		NPN	IC-LIN HA17339F*EL	1		
JP2A		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
JP3B		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
JP4-8		NPN	CHIP RESISTOR 0 OHM 1/16W	5		
JP9A-9B		NPN	CHIP RESISTOR 0 OHM 1/10W	2		
L1		NPN	INDUCTOR CDH74-220L*	1		
LED1		NPN	LED CHIP LT1E40A*	1		
LED2		NPN	LED CHIP LT1D40A*	1		
Q1		NPN	FET CHIP CPH6306*TL	1		
R001		NPN	CHIP RES1608 1.5 KOHM 1/16W 5%	1		
R002		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R003		NPN	CHIP RESISTOR 2.2 K-OHM 1/16W	1		
R004		NPN	CHIP RESISTOR 22 K-OHM 1/16W	1		
R005		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R006		NPN	CHIP RESISTOR 470 OHM 1/16W	1		
R007		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R008		NPN	CHIP RESISTOR 470 OHM 1/16W	1		
R009		NPN	CHIP RESISTOR 20 K-OHM 1/16W	1		
R010		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R011		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R015-16		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R017-18		NPN	CHIP RES1608 220 OHM 1/16W 5%	2		

Main Logic Board

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
R019		NPN	CHIP RESISTOR 100 OHM 1/16W	1		
R020-23		NPN	CHIP RESISTOR 10 K-OHM 1/16W	4		
R024		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
R026-27		NPN	CHIP RES1608 220 OHM 1/16W 5%	2		
R028-30		NPN	CHIP RESISTOR 330 OHM 1/16W	3		
R035-40		NPN	CHIP RESISTOR 330 OHM 1/16W	6		
R041		NPN	CHIP RESISTOR 100 OHM 1/16W	1		
R042-43		NPN	CHIP RESISTOR 330 OHM 1/16W	2		
R044		NPN	CHIP RESISTOR 100 OHM 1/16W	1		
R045-46		NPN	CHIP RES1608 220 OHM 1/16W 5%	2		
R047-51		NPN	CHIP RESISTOR 10 K-OHM 1/16W	5		
R053		NPN	CHIP RESISTOR 100 K-OHM 1/16W	1		
R057		NPN	CHIP RESISTOR 51 OHM 1/16W	1		
R062-64		NPN	CHIP RESISTOR 10 K-OHM 1/16W	3		
R065-66		NPN	CHIP RESISTOR 330 OHM 1/16W	2		
R067		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R068-71		NPN	CHIP RESISTOR 330 OHM 1/16W	4		
R101		NPN	CHIP RESISTOR 22 K-OHM 1/16W	1		
R102		NPN	CHIP RESISTOR 15 K-OHM 1/16W	1		
R103		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R104		NPN	CHIP RESISTOR 2.2 K-OHM 1/16W	1		
R105		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R106		NPN	CHIP RESISTOR 15 K-OHM 1/16W	1		
R107		NPN	CHIP RES3216 0.1 OHM 1/4W 5%	1		
R108		NPN	CHIP RES1608 30 KOHM 1/16W 1%	1		
R109		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R201-203		NPN	CHIP RESISTOR 10 K-OHM 1/16W	3		
R204		NPN	CHIP RESISTOR 15 K-OHM 1/16W	1		
R205-207		NPN	CHIP RESISTOR 1 K-OHM 1/16W	3		
R208		NPN	CHIP RESISTOR 330 OHM 1/16W	1		
R209		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R210		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R211-212		NPN	CHIP RESISTOR 10 K-OHM 1/10W	2		
R213-216		NPN	CHIP RESISTOR 10 K-OHM 1/16W	4		
R217		NPN	CHIP RESISTOR 100 OHM 1/16W	1		
R218-220		NPN	CHIP RESISTOR 1 K-OHM 1/16W	3		
R221		NPN	CHIP RESISTOR 330 OHM 1/16W	1		
R222		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
R223		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R251-256		NPN	CHIP RESISTOR 330 OHM 1/16W	6		
R257		NPN	CHIP RESISTOR 15 K-OHM 1/16W	1		
R258-259		NPN	CHIP RESISTOR 1.0 OHM 1W	2		
R260		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R261		NPN	CHIP RES1608 1 KOHM 1/16W 1%	1		
R262		NPN	CHIP RES1608 100 KOHM 1/16W 1%	1		
R271		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R272		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R273		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R274		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R275		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R276		NPN	CHIP RES1608 5.1 KOHM 1/16W 1%	1		
R277		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R280		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R281		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R282		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		

Main Logic Board

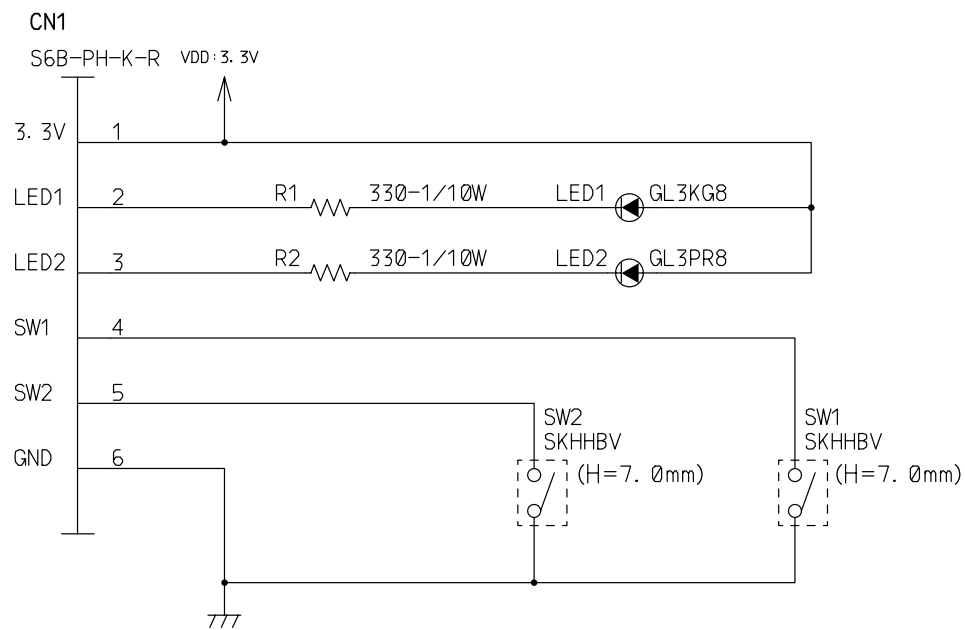
DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
R283		NPN	CHIP RES1608 5.1 KOHM 1/16W 1%	1		
R284		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R285-286		NPN	CHIP RESISTOR 330 OHM 1/10W	2		
R291-292		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R293-294		NPN	CHIP RESISTOR 330 OHM 1/16W	2		
R296-297		NPN	CHIP RESISTOR 330 OHM 1/16W	2		
R301		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R302-303		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	2		
R304-305		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R306		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R307		NPN	CHIP RES1608 68 KOHM 1/16W 5%	1		
R309		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R310-311		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R312		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R313		NPN	CHIP RESISTOR 22 K-OHM 1/16W	1		
R315		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R316-317		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R318		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R319		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R321		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R322		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R323		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R324		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R325		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R326		NPN	CHIP RES1608 5.1 KOHM 1/16W 1%	1		
R327		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R329		NPN	CHIP RESISTOR 0 OHM 1/10W	1		
R330-331		NPN	CHIP RESISTOR 2.2 K-OHM 1/16W	2		
R332-335		NPN	CHIP RESISTOR 330 OHM 1/16W	4		
R336-337		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R338-339		NPN	CHIP RESISTOR 330 OHM 1/16W	2		
R401-403		NPN	CHIP RESISTOR 100 K-OHM 1/16W	3		
R404		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R405		NPN	CHIP RESISTOR 100 K-OHM 1/16W	1		
R407-408		NPN	CHIP RESISTOR 100 K-OHM 1/16W	2		
R411-412		NPN	CHIP RESISTOR 100 OHM 1/16W	2		
R413-414		NPN	CHIP RESISTOR 470 OHM 1/10W	2		
R415-418		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	4		
R419-422		NPN	CHIP RESISTOR 10 K-OHM 1/16W	4		
R423-424		NPN	CHIP RESISTOR 330 OHM 1/16W	2		
R433		NPN	CHIP RES1608 220 OHM 1/16W 5%	1		
RA01-04		NPN	RESIS. ARRAY CHIP MNR14J221*	4		
RA05-09		NPN	RESIS. ARRAY CHIP MNR14J101*	5		
RA10-12		NPN	RESIS. ARRAY CHIP MNR14J103*	3		
RA13		NPN	RESIS. ARRAY CHIP MNR14J101*	1		
RA14-15		NPN	RESIS. ARRAY CHIP MNR14J103*	2		
RA16-20		NPN	RESIS. ARRAY CHIP MNR14J331*	5		
SW1-2		NPN	PUSH SWITCH SKHHAL	2		
TR01		NPN	CHIP TRANSISTOR 2SA1362GR*85L	1		
TR02		NPN	CHIP TRANSISTOR 2SC3875S-G*AL	1		
TR11		NPN	DIGITAL TRANSISTOR FN1A4P	1		
TR12		NPN	CHIP TRANSISTOR 2SC3875S-G*AL	1		
TR13		NPN	CHIP TRANSISTOR 2SA1362GR*85L	1		
TR14		NPN	DIGITAL TRANSISTOR FA1A4P	1		
TR21		NPN	CHIP TRANSISTOR 2SA1649Z*E1	1		

Main Logic Board

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
TR22		NPN	CHIP TRANSISTOR 2SA1338-67*TA	1		
TR23		NPN	DIGITAL TRANSISTOR FA1A4P	1		
VR1-2		NPN	RP CHIP RESISTOR EVM3S-47K	2		
VR4-6		NPN	RP CHIP RESISTOR EVM3S-47K	3		
XTAL		NPN	CERA. OSC CSACW25M0X51*	1		
ZD1		NPN	ZENER DIODE CHIP HZU20B2TRF	1		
ZD2		NPN	ZENER DIODE CHIP RD3.9SB1*	1		
ZD3		NPN	ZENER DIODE CHIP RD6.2SB1*	1		
ZD4		NPN	ZENER DIODE CHIP RD3.9SB1*	1		
ZD5		NPN	ZENER DIODE CHIP RD6.2SB1*	1		
-		NPN	S/N SEAL KEI-802	1		

6. Control Panel Board

6-1. Circuit Diagram



6-2. Parts List

Control Panel Board						
DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
CN1		09100860	CONNECTOR S6B-PH-K-R	1		
LED1		08300101	LED GL3KG8	1		
LED2		08300069	LED GL3PR8	1		
R1-2		06753314	CHIP RESISTOR 330 OHM 1/10W	2		
SW1-2		09010068	PUSH SWITCH SKHHBV	2		
-		30721760	CABLE UNIT 6X220CC TUP9	1		
		09991910	S/N SEAL KEI-802	1		

8-1. Circuit Diagram



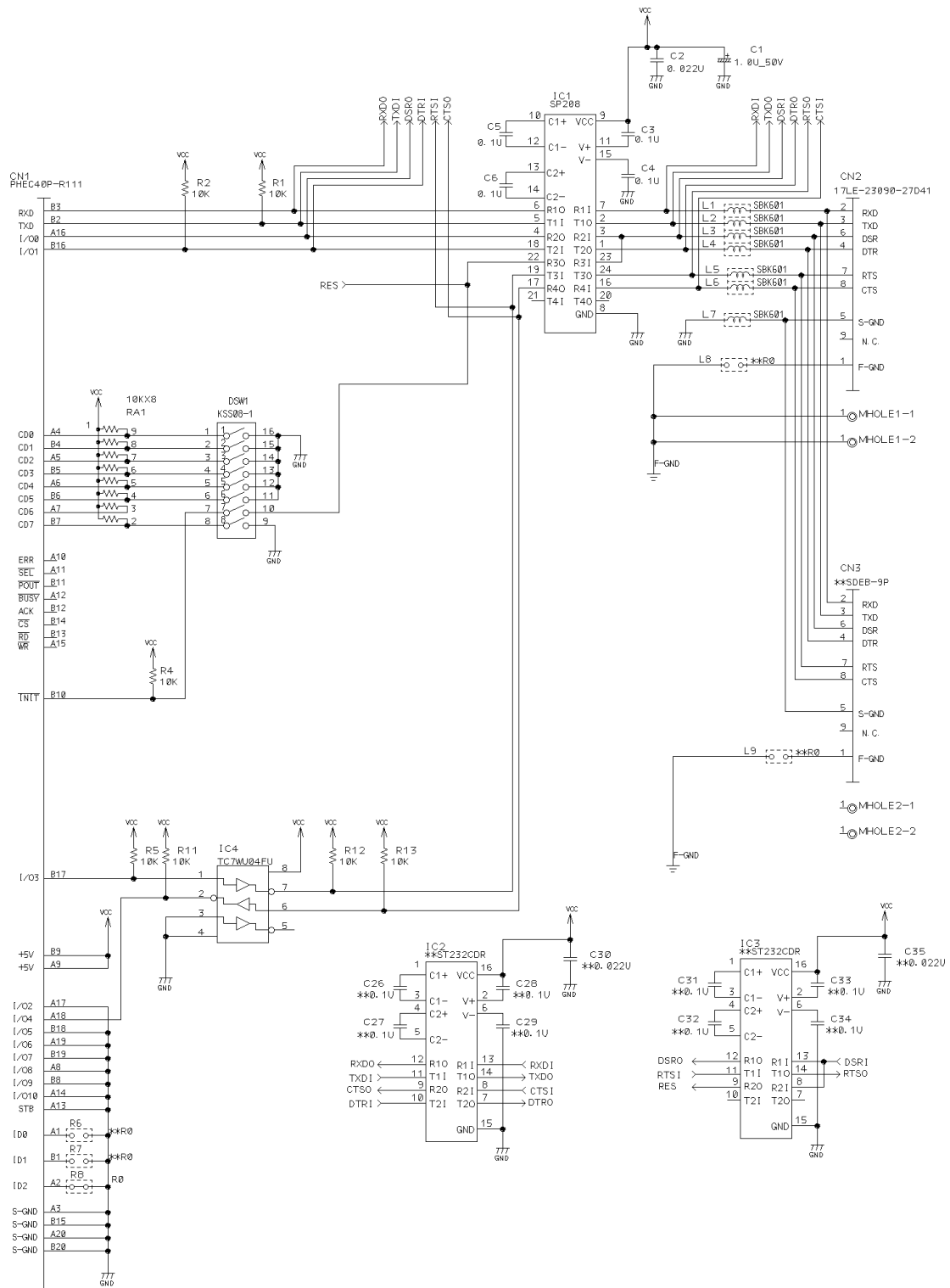
8-2. Parts List

Serial Interface Board (25pin)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
C1		NPN	CHEM. CAPA. 1UF 50V	1		
C2		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
C3-6		NPN	CHEM. CAPA. 1UF 50V	4		
C7-8		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	2		
C9		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	1		
CN1		NPN	CONNECTOR PHEC40P-R111	1		
CN2		NPN	CONNECTOR DBLD-J25SAF-21L9-1	1		
D1-2		NPN	DIODE CHIP MC2840	2		
D3		NPN	DIODE CHIP MC2836	1		
D4-5					NOT MOUNTED	
DSW1		NPN	DIP SWITCH 210B008MS	1		
IC1		08200201	IC-I/F ST232CWR*	1		S
IC2		NPN	IC-LIN UPC393G2*T1	1		
L1-7		NPN	CHIP BEADS IND. BK1608HS601*	7		
L8		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
L9					NOT MOUNTED	
R1-2		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R3-4		NPN	CHIP RESISTOR 100 OHM 1/16W	2		
R5-6		NPN	CHIP RESISTOR 10 K-OHM 1/10W	2		
R7		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R8		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R9		NPN	CHIP RESISTOR 10 K-OHM 1/10W	1		
R10		NPN	CHIP RESISTOR 100 K-OHM 1/16W	1		
R11-12		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R13		NPN	CHIP RESISTOR 100 K-OHM 1/16W	1		
R14-15		NPN	CHIP RESISTOR 100 OHM 1/16W	2		
R16		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R17		NPN	CHIP RESISTOR 10 K-OHM 1/10W	1		
R18		NPN	CHIP RES1608 2.7 KOHM 1/16W 5%	1		
R19-20		NPN	CHIP RESISTOR 10 K-OHM 1/10W	2		
R21		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R22		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R23		NPN	CHIP RESISTOR 33 K-OHM 1/10W	1		
R24		NPN	CHIP RESISTOR 3.3 K-OHM 1/10W	1		
RA1		NPN	RESIS. ARRAY 10 K-OHM 1/8W 8EL	1		
TR1		NPN	CHIP TRANSISTOR 2SC3875S-G*AL	1		
TR2		NPN	CHIP TRANSISTOR 2SA1179M6-STR	1		
TR3		NPN	DIGITAL TRANSISTOR FN1A4P	1		
TR4		NPN	DIGITAL TRANSISTOR FA1A4P	1		
TR5		NPN	DIGITAL TRANSISTOR FN1A4P	1		
TR6		NPN	DIGITAL TRANSISTOR FA1A4P	1		

9. Serial Interface Board (9pin)

9-1. Circuit Diagram



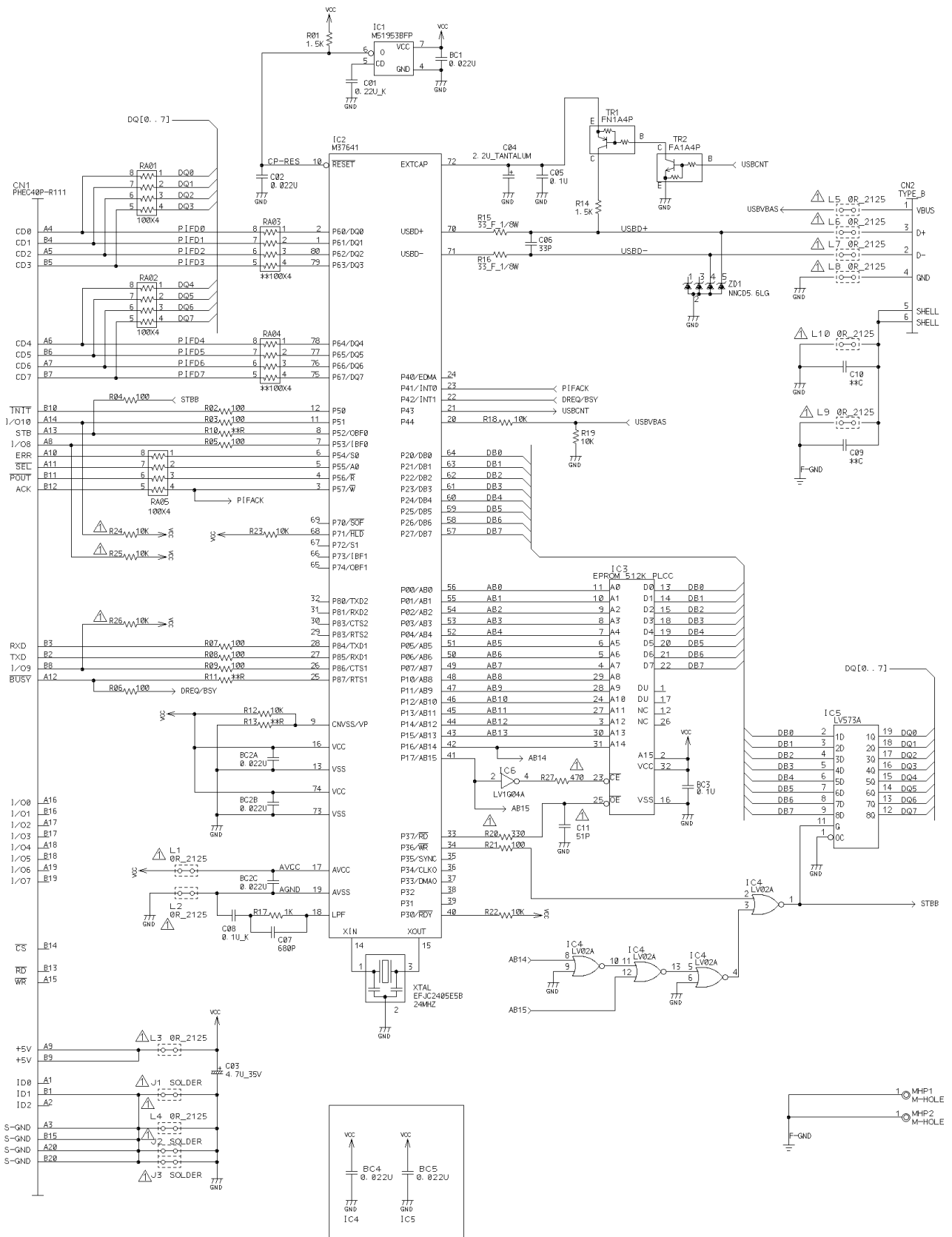
9-2. Parts List

Serial Interface Board (9pin)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
C1		NPN	CHEM. CAPA. 1UF 50V	1		
C2		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
C3-6		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	4		
C26-35					NOT MOUNTED	
R1-2		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R4-5		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R6-7					NOT MOUNTED	
R8		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
R11-13		NPN	CHIP RESISTOR 10 K-OHM 1/16W	3		
RA1		NPN	RESIS. ARRAY 10 K-OHM 1/8W 8EL	1		
IC1		08200203	IC-I/F SP208ECA/TR*	1		S
IC2-3					NOT MOUNTED	
IC4		NPN	CMOS TC7WU04FU*12L	1		
L1-7		NPN	CHIP BEADS IND. BK1608HS601*	7		
L8-9					NOT MOUNTED	
DSW1		NPN	DIP SWITCH 210B008MS	1		
CN1		NPN	CONNECTOR PHEC40P-R111	1		
CN2		NPN	CONNECTOR 17LE-23090-27D41	1		
CN3					NOT MOUNTED	

10. USB Interface Board

10-1. Circuit Diagram



10-2. Parts List

USB Interface Board

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
BC1		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
BC2A-2C		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	3		
BC3		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	1		
BC4-5		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	2		
C01		NPN	CERA.CAPA.CHIP1608 0.22UF 10V	1		
C02		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
C03		NPN	CHEM. CAPA. CHIP 4.7UF 35V	1		
C04		NPN	TANTALUM CAPA. CHIP 2.2UF 16V	1		
C05		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	1		
C06		NPN	CERA.CAPA.CHIP1608 33PF 50V	1		
C07		NPN	CERA.CAPA.CHIP1608 680PF 50V	1		
C08		NPN	CERA.CAPA.CHIP1608 0.1UF 16V	1		
C09-10					NOT MOUNTED	
C11		NPN	CERA. CAPA. CHIP 51PF 50V	1		
CN1		NPN	CONNECTOR PHEC40P-R111	1		
CN2		NPN	CONNECTOR V23590-T3111	1		
IC1		NPN	IC-RESET M51953BFP*E2	1		
IC2		NPN	CPU M37641M8-128FP	1		
IC3		NPN	IC SOCKET IC160-0324-300	1		
		NPN	OTPROM A276308AL-70	1		
IC4		NPN	CMOS 74LV02AFP*EL	1		
IC5		NPN	CMOS 74LV573AFP*EL	1		
IC6		NPN	CMOS 74LV1G04ACME*	1		
L1-10		NPN	CHIP RESISTOR 0 OHM 1/10W	10		
RA01-02		NPN	RESIS. ARRAY CHIP MNR14J101*	2		
RA03-04					NOT MOUNTED	
RA05		NPN	RESIS. ARRAY CHIP MNR14J101*	1		
R01		NPN	CHIP RES1608 1.5 KOHM 1/16W 5%	1		
R02-09		NPN	CHIP RESISTOR 100 OHM 1/16W	8		
R10-11					NOT MOUNTED	
R12		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R13					NOT MOUNTED	
R14		NPN	CHIP RES1608 1.5 KOHM 1/16W 5%	1		
R15-16		NPN	CHIP RES3216 33 OHM 1/8W 1%	2		
R17		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R18-19		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R20		NPN	CHIP RESISTOR 330 OHM 1/16W	1		
R21		NPN	CHIP RESISTOR 100 OHM 1/16W	1		
R22-26		NPN	CHIP RESISTOR 10 K-OHM 1/16W	5		
R27		NPN	CHIP RESISTOR 470 OHM 1/16W	1		
TR1		NPN	DIGITAL TRANSISTOR FN1A4P	1		
TR2		NPN	DIGITAL TRANSISTOR FA1A4P	1		
ZD1		NPN	ZENER DIODE CHIP NNCD5.6LG*T1	1		
XTAL		NPN	CERA. OSC CHIP EFJC2405E5B*	1		

11-1. Circuit Diagram



11-2.Parts List

Parallel Interface Board

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
BC1-3		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	3		
C1					NOT MOUNTED	
C2		NPN	CERA.CAPA.CHIP1608 1000PF 50V	1		
C3-4					NOT MOUNTED	
C5		NPN	CHEM. CAPA. 1UF 50V	1		
CN1		NPN	CONNECTOR PHEC40P-R111	1		
CN2		NPN	CONNECTOR CA-M57R41-2754C	1		
IC1		08211042	TTL IC 74LS374NSR*EL	1		S
IC2		NPN	TTL IC 74ALS32FP*EL	1		
IC3		08210126	TTL IC 74LS05FP*EL	1		S
L1-2		NPN	CHIP RESISTOR 0 OHM 1/16W	2		
L3-6		09990754	CHIP BEADS IND. BK1608HS601*	4		S
L7		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
L8-10		NPN	CHIP BEADS IND. BK2125HS470*	3		
R1		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R2-9		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	8		
R10		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R11		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R12		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R13		NPN	CHIP RESISTOR 100 OHM 1/16W	1		
R14		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R15		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R16		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R17					NOT MOUNTED	
R18		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R19-20		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	2		
R21		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R22		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R23		NPN	CHIP RES1608 3.9 KOHM 1/16W 5%	1		
R24		NPN	CHIP RESISTOR 2.2 K-OHM 1/16W	1		
R25		NPN	CHIP RESISTOR 330 OHM 1/16W	1		
RA1		NPN	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
RA2		NPN	RESIS. ARRAY 1.8K-OHM 1/8W 5EL	1		
TR1		NPN	CHIP TRANSISTOR 2SC3875S-G*AL	1		



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