

THERMAL PRINTER

TSP700 Series

TECHNICAL MANUAL

[FIRST EDITION]

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INTRODUCTION

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This manual describes the thermal printer TSP700 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 Parts Replacement and Adjustments
 - Chapter 2 Maintenance and Lubrication
 - Chapter 3 Parts List

- First edition : Mar. 2001

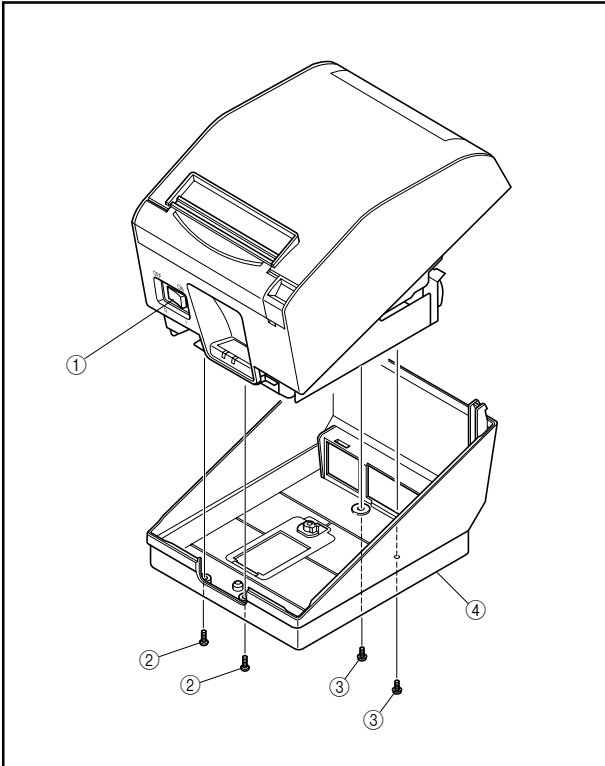
CHAPTER 1

PARTS REPLACEMENT

This chapter explains disassembly and reassembly of the printer. Note the following precautions during disassembly and reassembly.

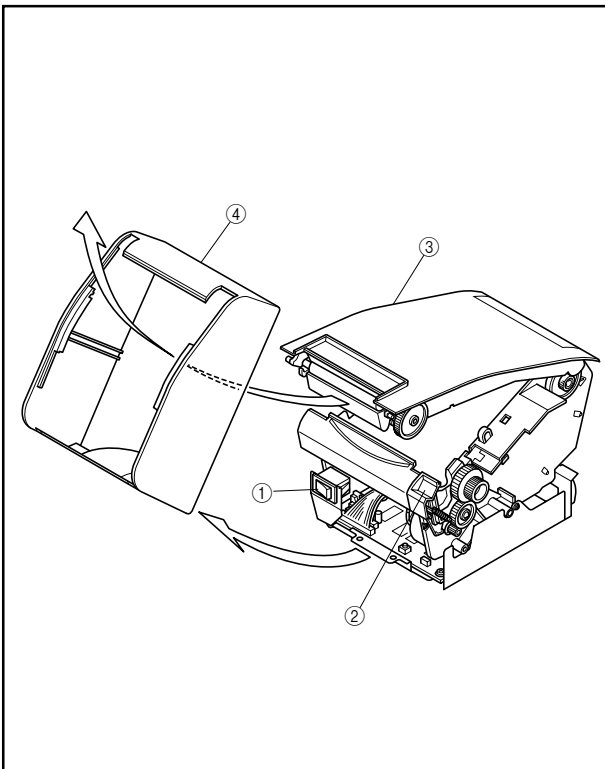
1. Disconnect the printer power cord plug from the wall outlet before servicing it.
2. Assembly is the reverse of disassembly unless otherwise specified.
3. After reassembly, coat the screw heads with locking sealant.
4. Lubrication information is not provided in this chapter. Refer to item 2 of chapter 2.
5. The printer has no adjustable parts.

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1. Lower Case Unit

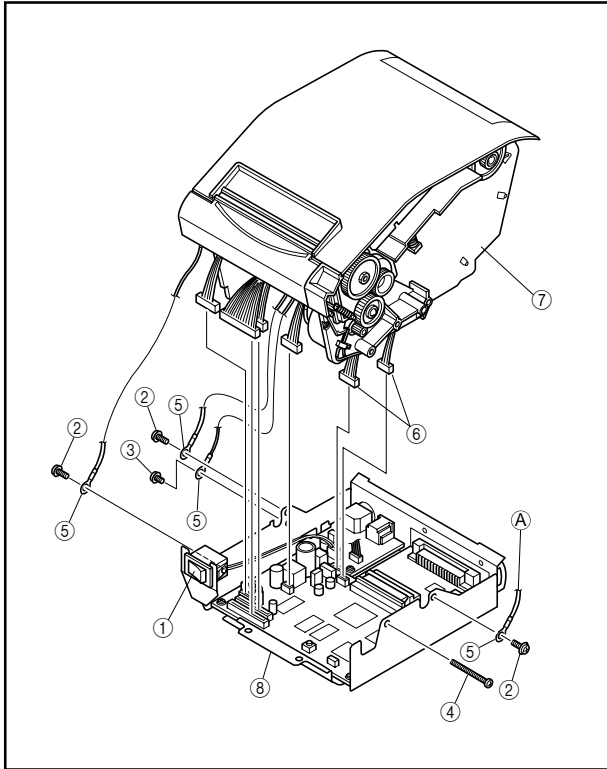
- (1) Turn off the power switch ①, disconnect the power cord from the wall outlet.
- (2) Remove
 - Two tapping screws ②
 - Two tapping screws ③
 - Lower case unit ④



2. Upper Case Unit

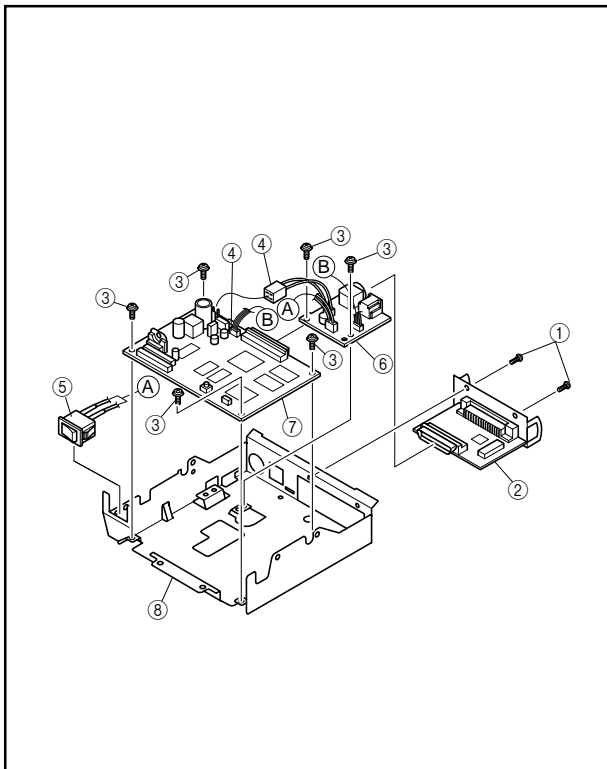
- (1) Turn off the power switch ①, disconnect the power cord from the wall outlet.
- (2) Remove the lower case unit according to the procedure described in item 1.
- (3) Push the cover open lever ②, and open the printer cover ③.
- (4) Remove the upper case unit ④.

PARTS REPLACEMENT



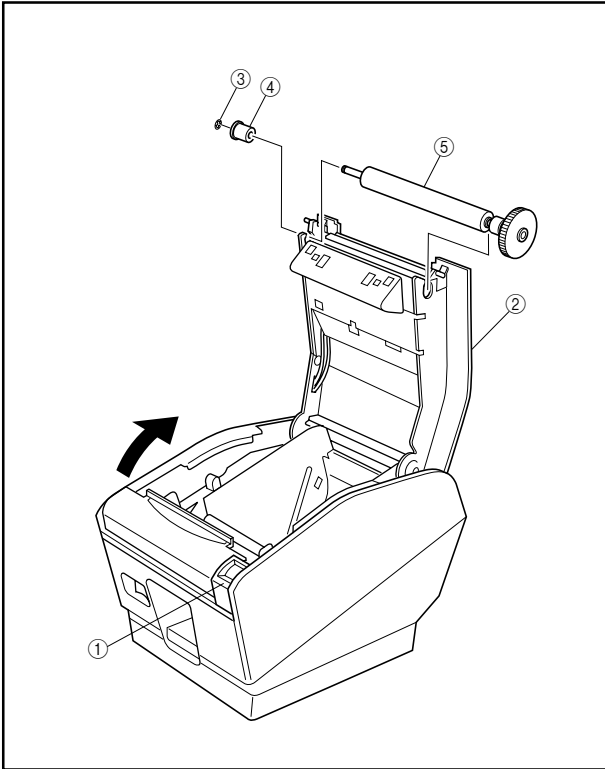
3. Board Chassis Unit

- (1) Turn off the power switch ①, disconnect the power cord from the wall outlet.
- (2) Remove
 - Upper case according to the procedure described in item 2.
 - Three screws ②
 - Screw ③
 - Screw ④
 - Three wires ⑤
 - Six connectors ⑥
 - Printer mechanism ⑦
 - Board chassis unit ⑧



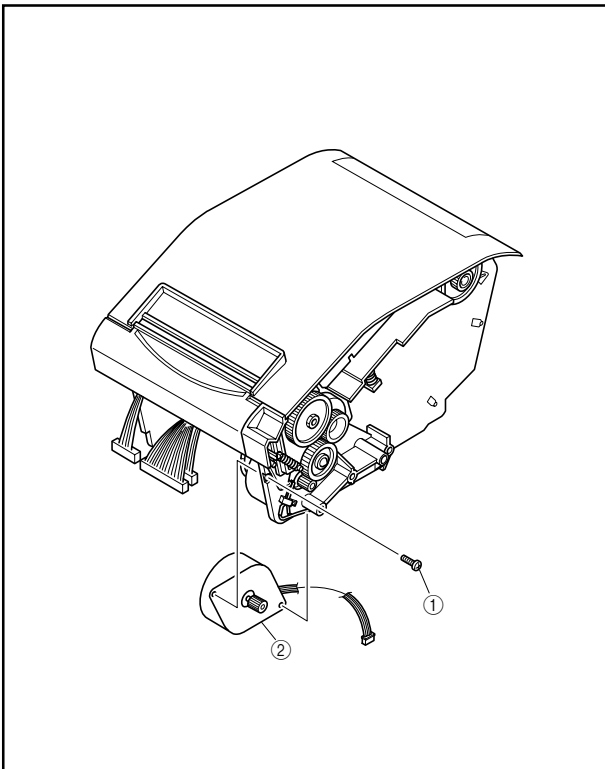
4. Main Logic Board

- (1) Turn off the power switch, disconnect the power cord from the wall outlet.
- (2) Remove
 - Board chassis unit according to the procedure described in item 3.
 - Two screws ①
 - Interface board unit ②
 - Six screws ③
 - Two connectors ④
 - Power switch ⑤
 - Sub-board ⑥
 - Main logic board ⑦
 - Board chassis ⑧



5. Platen Unit

- (1) Turn off the power switch, disconnect the power cord from the wall outlet.
- (2) Push the cover open lever ①, and open the printer cover ②.
- (3) Remove
 - Stop ring ③
 - Bearing ④
 - Platen unit ⑤



6. Paper Feed Motor

- (1) Turn off the power switch, disconnect the power cord from the wall outlet.
- (2) Remove
 - Printer mechanism according to the procedure described in item 3.
 - Screw ①
 - Paper feed motor unit ②

CHAPTER 2

MAINTENANCE AND LUBRICATION

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1. Maintenance

Carry out maintenance control items listed below to maintain the original performance of this printer and prevent trouble from occurring.

1-1. Cleaning

- (1) Removal of dirt.

Clean the dirt with tissue or soft cloth.

Note: Do not use thinners or trichlene/ketone base solvents for cleaning as they can damage plastic parts.
Be careful not to damage electrical parts, wired areas or mechanisms and avoid getting them wet.

- (2) Removal of dust, pile, etc.

Clean with a vacuum cleaner.

Note: Check the amount of oil after cleaning and lubricate if necessary.

1-2. Checks

Maintenance checks for this printer is divided into the two areas of “daily check” that the person using the printer carries out during normal use and “regular check” that can be done only by an experienced person with a knowledge of the equipment.

- (1) Daily check:

Check that the printer is being properly used.

- Is the paper set correctly?
- Is there any dirt or foreign object in the printer?

- (2) Regular check:

Carry out regular check and lubrication after six months use or after printing 1 million lines.

- Check for bending of springs.
- Remove any dirt or dust in the area of the detectors.

MAINTENANCE AND LUBRICATION

2. Lubrication

Lubrication is extremely important for preserving the original performance of the printer over a long period of time.

2-1. Type of oil

The type of oil used has a major influence on the performance and durability of the printer. You should pay particular attention to the cold temperature properties of the oil. We recommend use of the grease and lubrication oils listed below for this printer.

Type of oil	Product name	Manufacturer
Grease	Molykote EM-30L	Dow Corning Corp.

2-2. Lubrication method

When lubricating during disassembly or assembly operations, be sure to wash and clean the equipment well prior to lubrication to remove dirt and dust.

Lubricate the equipment at regular intervals of six months or after every one million lines. Be sure to lubricate equipment after disassembling or replacing parts when oil has been removed by cleaning.

2-3. Lubrication locations

Lubrication locations		Type of oil
①	Rubbing surface of Shaft C and Frame	Molykote EM-30L
②	Rubbing surface of Case stopper and Screw and Frame	Molykote EM-30L
③	Rubbing surface of Gear 24 × 0.7 - 55 × 0.5 and Frame shaft	Molykote EM-30L
④	Rubbing surface of Gear 40 × 0.5 and Frame shaft	Molykote EM-30L
⑤	Rubbing surface of Cover B assy and Lock lever	Molykote EM-30L
⑥	Rubbing surface of Lock lever and Cover open lever	Molykote EM-30L
⑦	Rubbing surface of Release plate and Cover B assy	Molykote EM-30L
⑧	Rubbing surface of Release plate and Lock plate	Molykote EM-30L
⑨	Rubbing surface of Lock plate and Cover B assy	Molykote EM-30L
⑩	Rubbing surface of Lock plate and Lock plate spring	Molykote EM-30L
⑪	Rubbing surface of detector holder and near-end detector cover	Molykote EM-30L

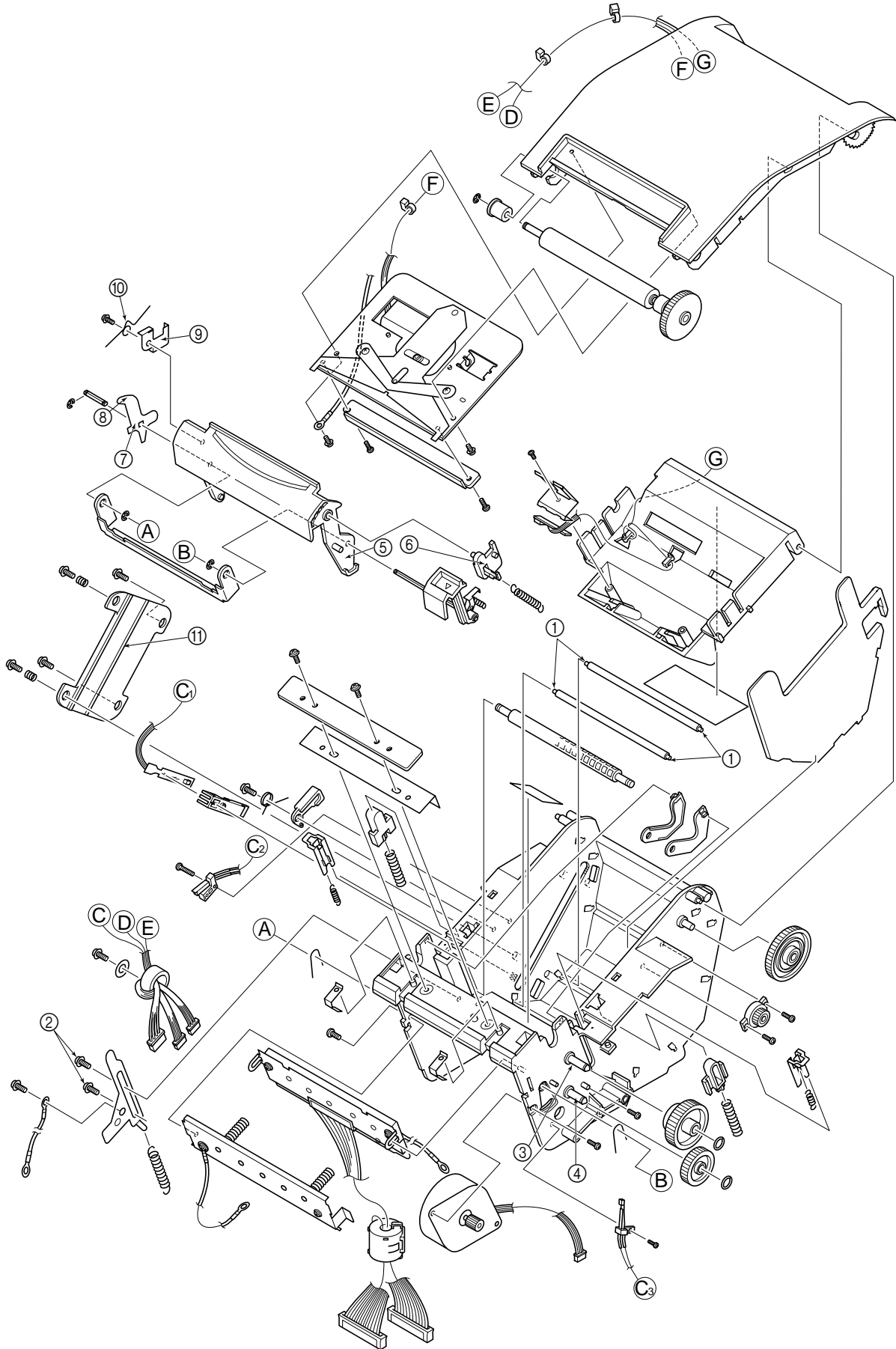


Fig. 2-1 Lubricated Area

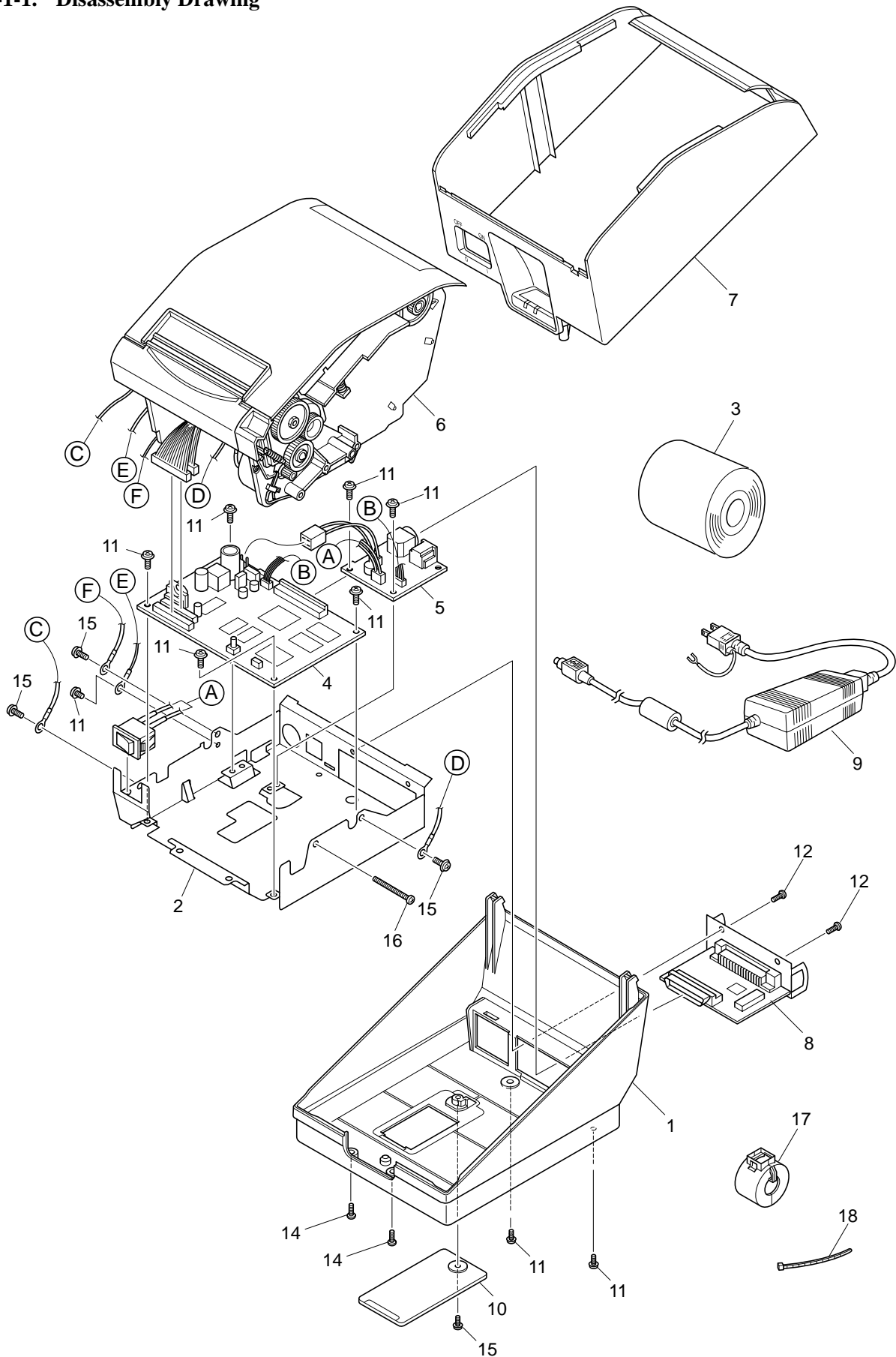
CHAPTER 3 PARTS LIST

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.
- (3) PART NO.
Parts numbers must be notified when ordering replacement parts. Parts described as “NPN” have no parts number and are not in stock, i.e., 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
When differences in specifications exist depending on location/destination.
- (7) RANK
Parts marked “S” a service parts. Service parts are recommended to be in stock for maintenance.

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3-1. Printer Assembly
3-1-1. Disassembly Drawing

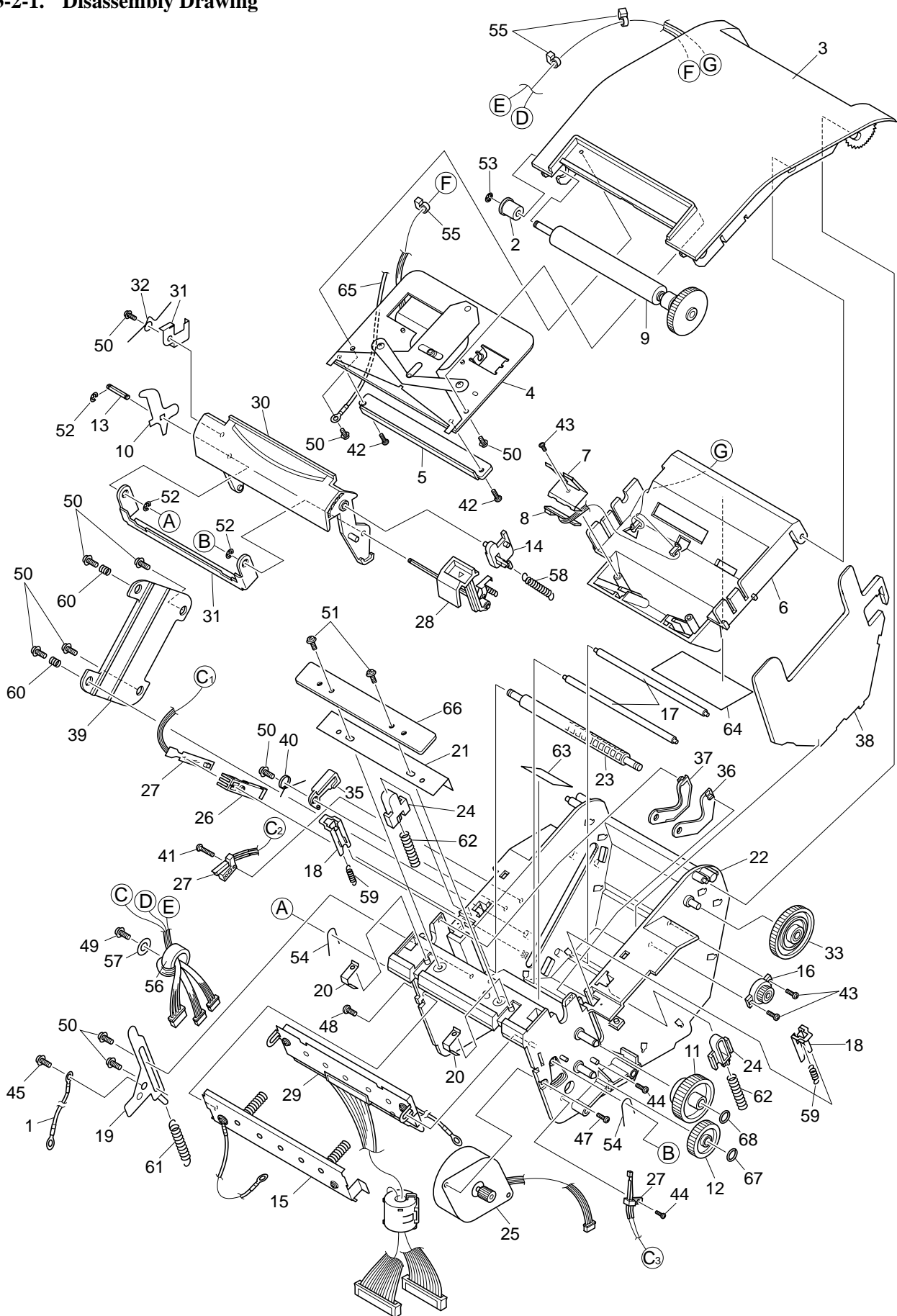


3-1-2. Parts List

Printer Assembly

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
1		37450030	LOWER CASE UNIT TSP7	1		
2		NPN	BOARD CHASSIS TSP7	1		
3		30970040	THERMAL ROLL PAPER 80X35D	1		
4		37457020	MAIN LOGIC BOARD UNIT TSP7	1		
5		37457210	SUB-BOARD UNIT TSP7	1		
6		38440000	TMP743-24	1		S
7		37451030	UPPER CASE UNIT TSP7	1		
8		39607200	INTERFACE BOARD IFBD-HD03	1	OPTION:SERIAL 25 PIN	
		39607300	INTERFACE BOARD IFBD-HN03	1	OPTION:SERIAL 9 PIN	
		39607220	INTERFACE BOARD IFBD-HU03	1	OPTION:SERIAL USB	
		39607210	INTERFACE BOARD IFBD-HC03	1	OPTION:PARALLEL IF	
9		30781180	ADAPTER SET PS60-24A JP	1	OPTION	
		30781190	ADAPTER SET PS60-24A US	1	OPTION	
		30781200	ADAPTER SET PS60-24A EU	1	OPTION	
		30781210	ADAPTER SET PS60-24A UK	1	OPTION	
		30781220	ADAPTER SET PS60-24A AS	1	OPTION	
10		NPN	SWITCH COVER TSP8	1		
11		01903101	SCREW TAT 3-6 CT-FL	9		
12		00930609	SCREW TAT 3-6 CT	2		
14		01903047	SCREW TAT 3-12 PT-FL	2		
15		01903060	SCREW TAT 3-8 PT-FL	4		
16		01903093	SCREW TR 3-25	1		
17		NPN	FERRITE CORE K5BRC24X14X11	1	PARALLEL IF	
18		04991204	FASTENER T18S	1	PARALLEL IF	

3-2. Printer Mechanism
3-2-1. Disassembly Drawing



3-2-2. Parts List

Printer Mechanism

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
1		NPN	WIRE 26UL1007BLK060TT	1		
2		33215020	BEARING	1	TMP8	S
3		NPN	COVER A	1	TMP7	
4		30903040	CUTTER UNIT ORC-RSY90	1		S
5		NPN	PAPER GUIDE B	1	TMP7	
6		NPN	PAPER GUIDE A	1	TMP7	
7		NPN	PE DETECTOR COVER UNIT	1	TMP8	
8		NPN	PE DETECTOR UNIT	1	TMP8	
9		37463110	PLATEN UNIT	1	TMP7	S
10		NPN	RELEASE PLATE	1	TMP8	
11		33102250	GEAR 24X0.7-55X0.5	1	TMP8	
12		33102260	GEAR 40X0.5	1	TMP8	
13		NPN	SHAFT B	1	TMP7	
14		NPN	LOCK LEVER	1	TMP8	
15		NPN	HEAD HOLDER PLATE UNIT	1	TMP7	
16		NPN	OIL DAMPER 058E-F	1		
17		NPN	SHAFT C	2	TMP7	
18		NPN	TENSION SHAFT HOLDER	2	TMP7	
19		NPN	CASE STOPPER	1	TMP8	
20		NPN	GROUND PLATE A	2	TMP8	
21		NPN	CUTTER PLATE	1	TMP7	
22		NPN	FRAME UNIT	1	TMP7	
23		NPN	TENSION SHAFT	1	TMP7	
24		NPN	PUSH LEVER	2	TMP8	
25		37462001	PF MOTOR UNIT	1	TMP8	S
26		NPN	NEAR-END DETECTOR COVER	1	TMP7	
27		37467310	NEAR-END DETECTOR ASSY	1	TMP7	
28		NPN	COVER OPEN LEVER UNIT	1	TMP7	
29		37469010	HEAD UNIT	1	TMP7	
30		NPN	COVER B ASSY	1	TMP7	
31		NPN	LOCK PLATE	1	TMP8	
32		NPN	LOCK PLATE SPRING	1	TMP7	
33		NPN	GEAR 14X40X0.8	1	TMP8	
34		NPN	SHAFT LEVER	1	TMP7	
35		NPN	DETECTOR LEVER	1	TMP7	
36		NPN	HEAD LEVER R	1	TMP7	
37		NPN	HEAD LEVER L	1	TMP7	
38		33910350	ROLL PAPER GUIDE	1	TMP7	
39		NPN	DETECTOR HOLDER	1	TMP7	
40		NPN	LOCK PLATE SPRING	1	TMP8	
41		01902032	SCREW TAT 2-10 PT	1		
42		00820304	SCREW TR 2-3	2		
43		01902028	SCREW TAT 2-4	3		
44		00920603	SCREW TAT 2-6 PT	2		
45		01903077	SCREW TAT 3-5 CT-FL	1		
47		00630504	SCREW TR 3-5	1		
48		00930609	SCREW TAT 3-6 CT	1		
49		00930603	SCREW TAT 3-6 PT	1		
50		01903061	SCREW TAT 3-6 PT-FL	10		
51		00930803	SCREW TAT 3-8 PT	2		
52		04020010	STOP RING SE2.0	3		
53		04020015	STOP RING SE3.0	1		
54		NPN	CLAMP SPRING	2	TMP8	
55		04991204	FASTENER T18S	3		
56		NPN	FERRITE CORE BP53-19-12-8	1		
57		82200010	COLLAR	1	822	

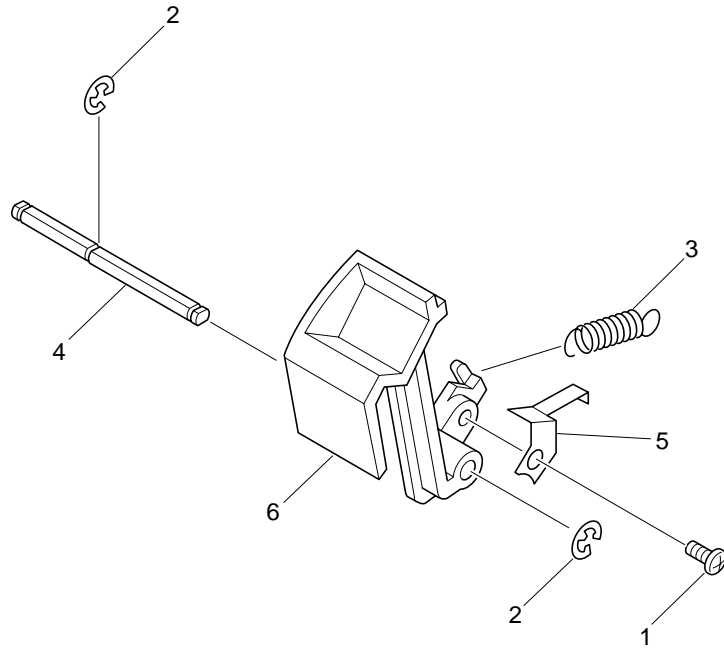
Printer Mechanism

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
58		NPN	SPRING E043-035-0164	1		
59		NPN	SPRING E050-032-0141	2		
60		NPN	SPRING C068-050-0065	2		
61		NPN	SPRING C075-060-0300	1		
62		NPN	SPRING C075-070-0238	2		
63		NPN	CAUTION SEAL TMP8	1		
64		NPN	PAPER SET SEAL TMP8	1		
65		NPN	WIRE 18UL1007BLK245TT	1		
66		30903030	STATIONARY KNIFE ORC-RSY90	1		S
67		02841000	CUT WASHER 4.1X6.5X0.5	1		
68		02852000	CUT WASHER 5.2X8.0X0.5	1		

3-3. Sub-Assembly

3-3-1. Cover Open Lever Unit

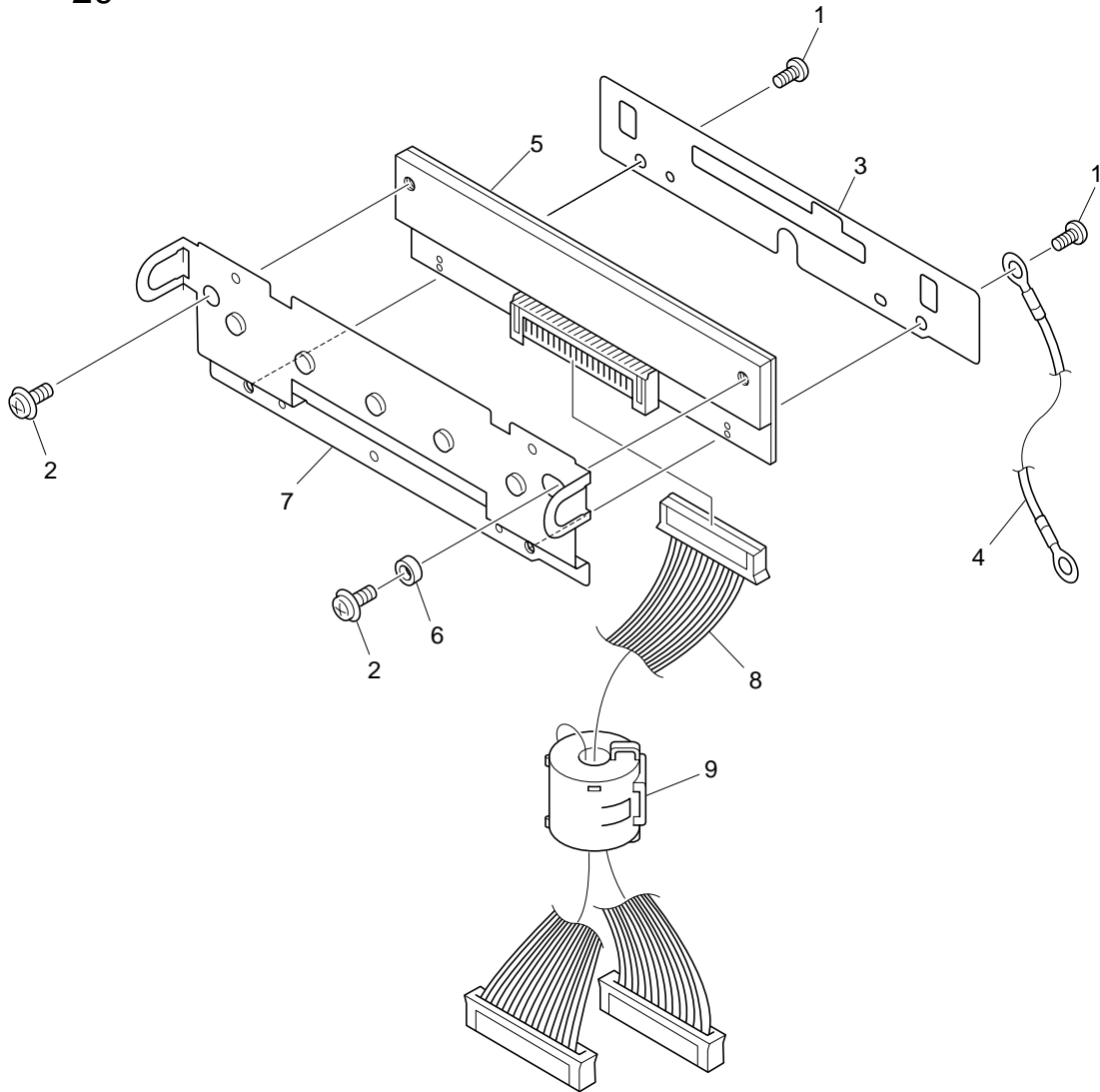
28-



DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
28-1		NPN	SCREW TAT 2-4	1		
28-2		NPN	STOP RING SE2.0	2		
28-3		NPN	SPRING E038-030-0142	1		
28-4		NPN	SHAFT A	TMP7	1	
28-5		NPN	LEVER PLATE	TMP8	1	
28-6		NPN	COVER OPEN LEVER	TMP8	1	

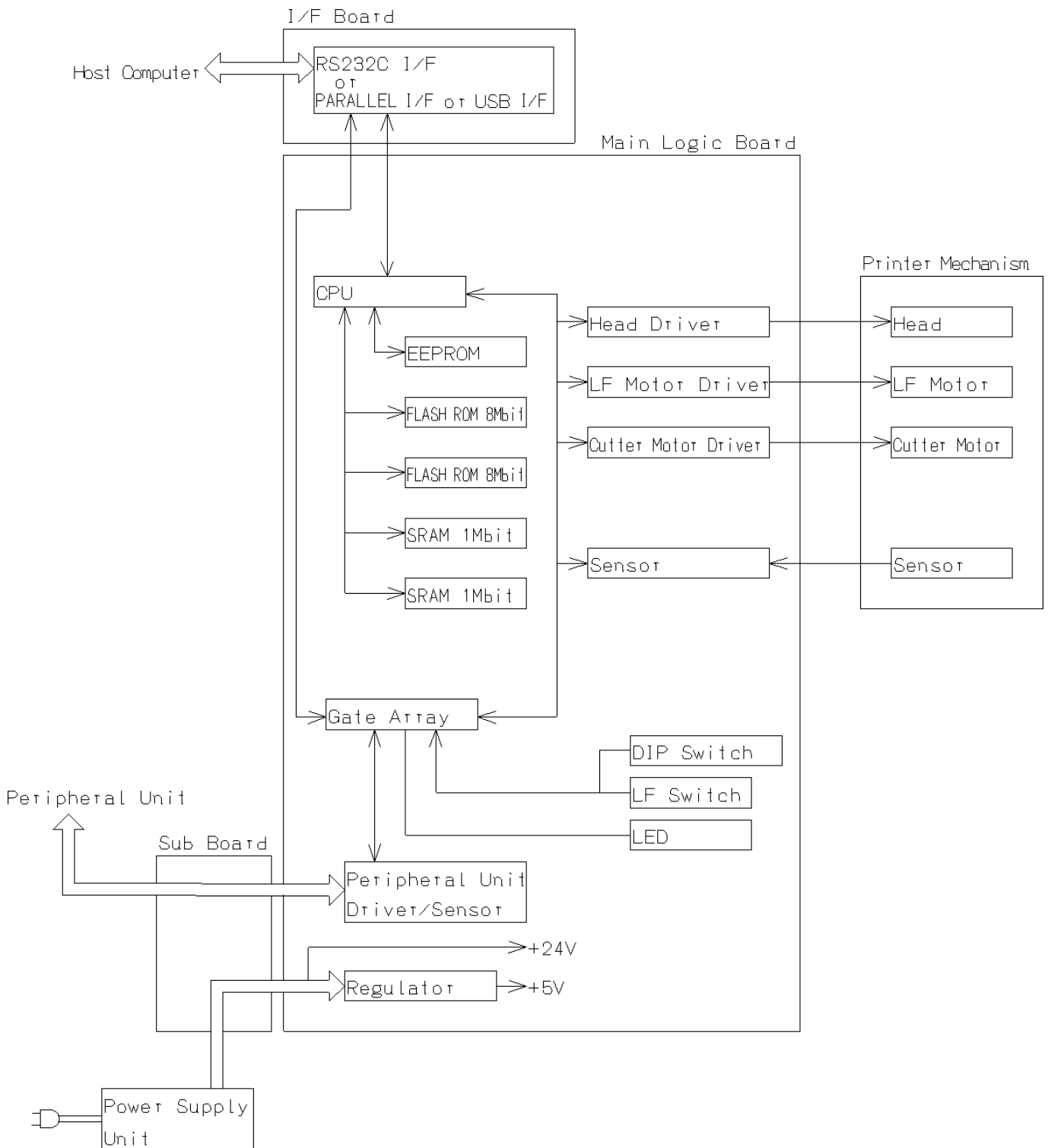
3-3-2. Head Unit

29-



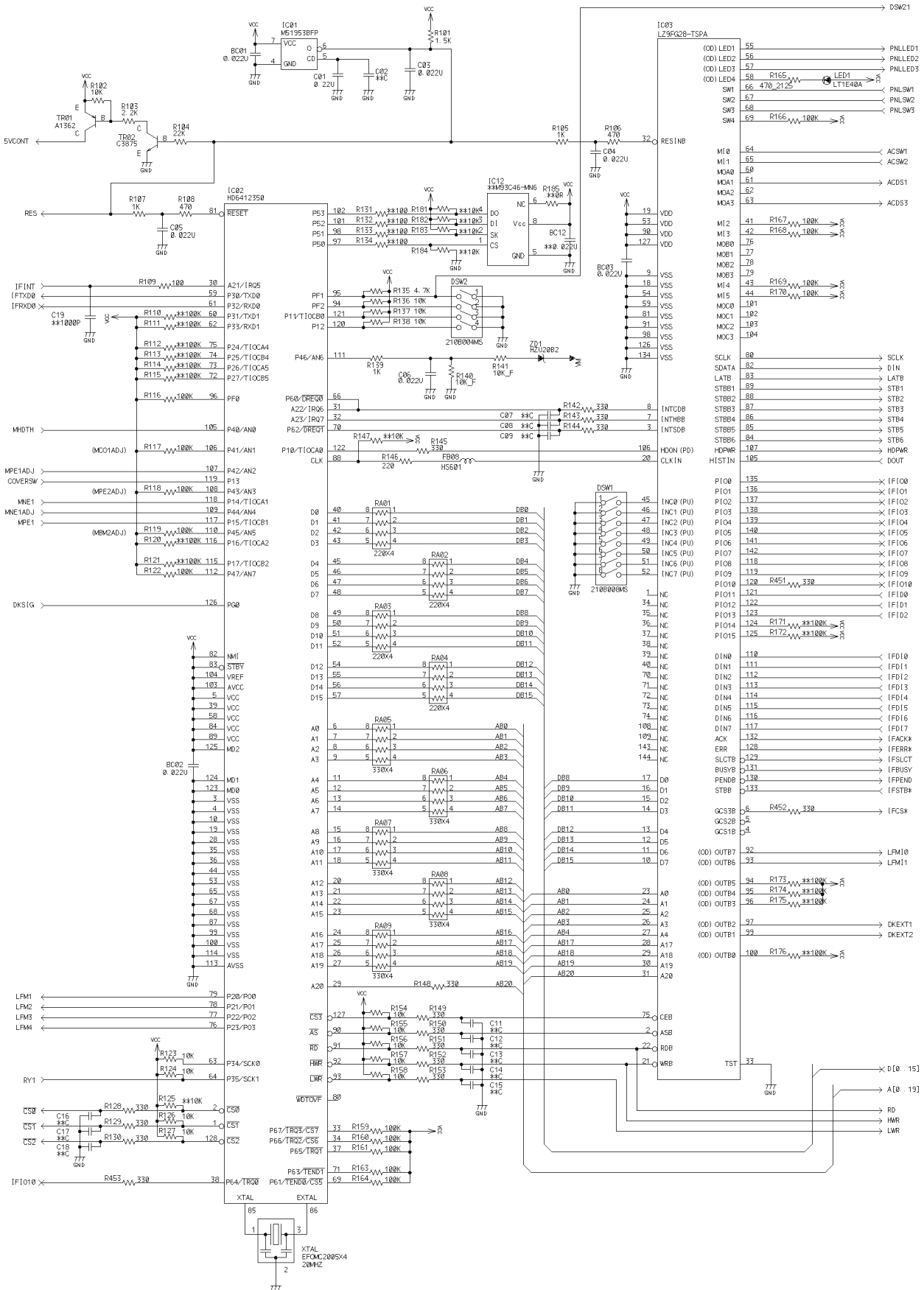
DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
29-1		00926403	SCREW TAT 2.6-4 CT	2		
29-2		01903030	SCREW TR 3-4 FL	2		
29-3		NPN	HEAD EARTH PLATE TMP7	1		
29-4		NPN	WIRE 18UL1007BRN145TT	1		
29-5		30905050	THERMAL HEAD AE080-H8E801	1		S
29-6		31210000	COLLAR TMP8	1		
29-7		NPN	HEAD PLATE TMP7	1		
29-8		30721500	CABLE UNIT 15X175CC TMP7	1		
29-9		NPN	FERRITE CORE K5BRC16X16X8-M	1		

3-4. Block Diagram

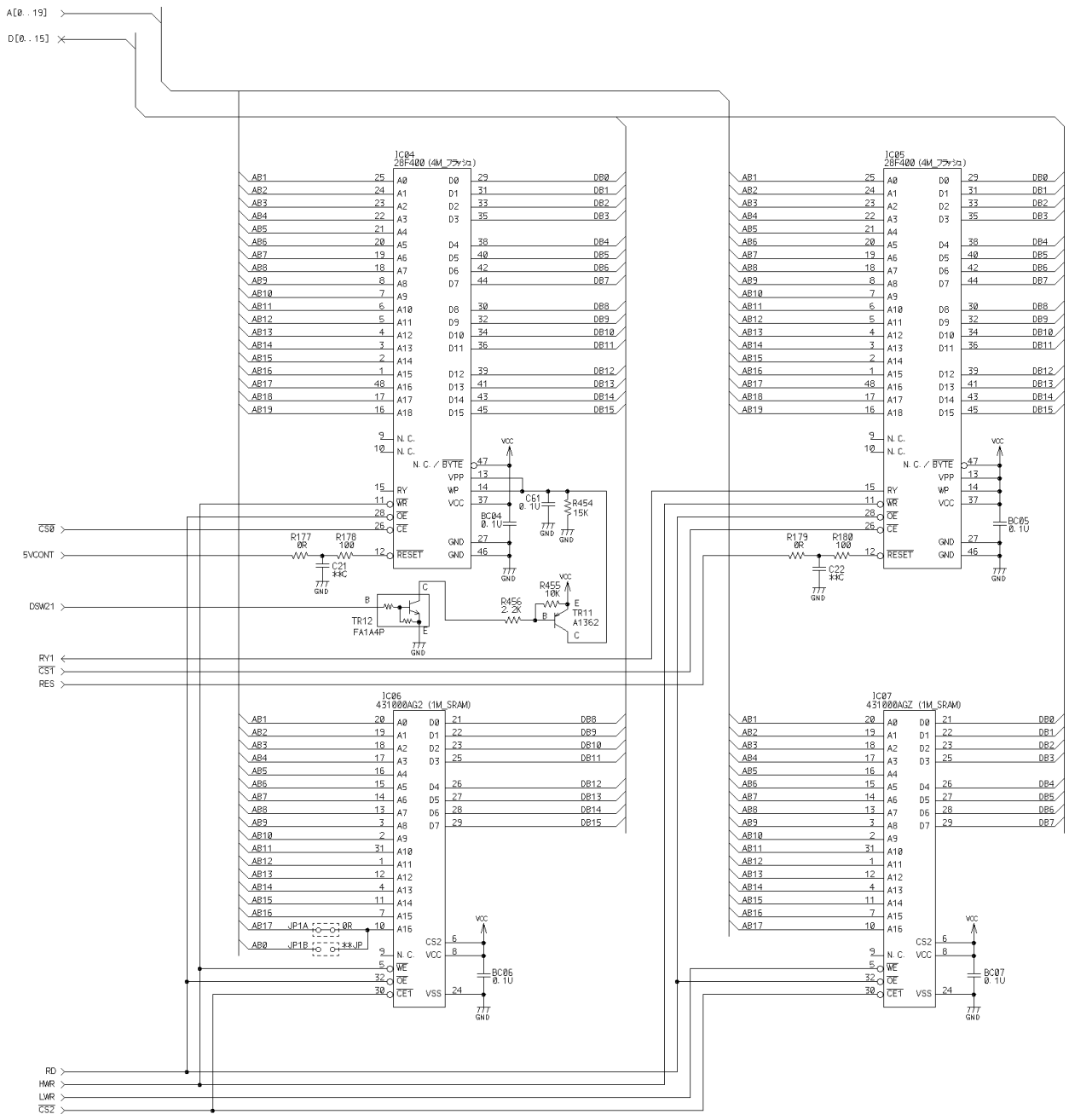


3-5. Main Logic Board

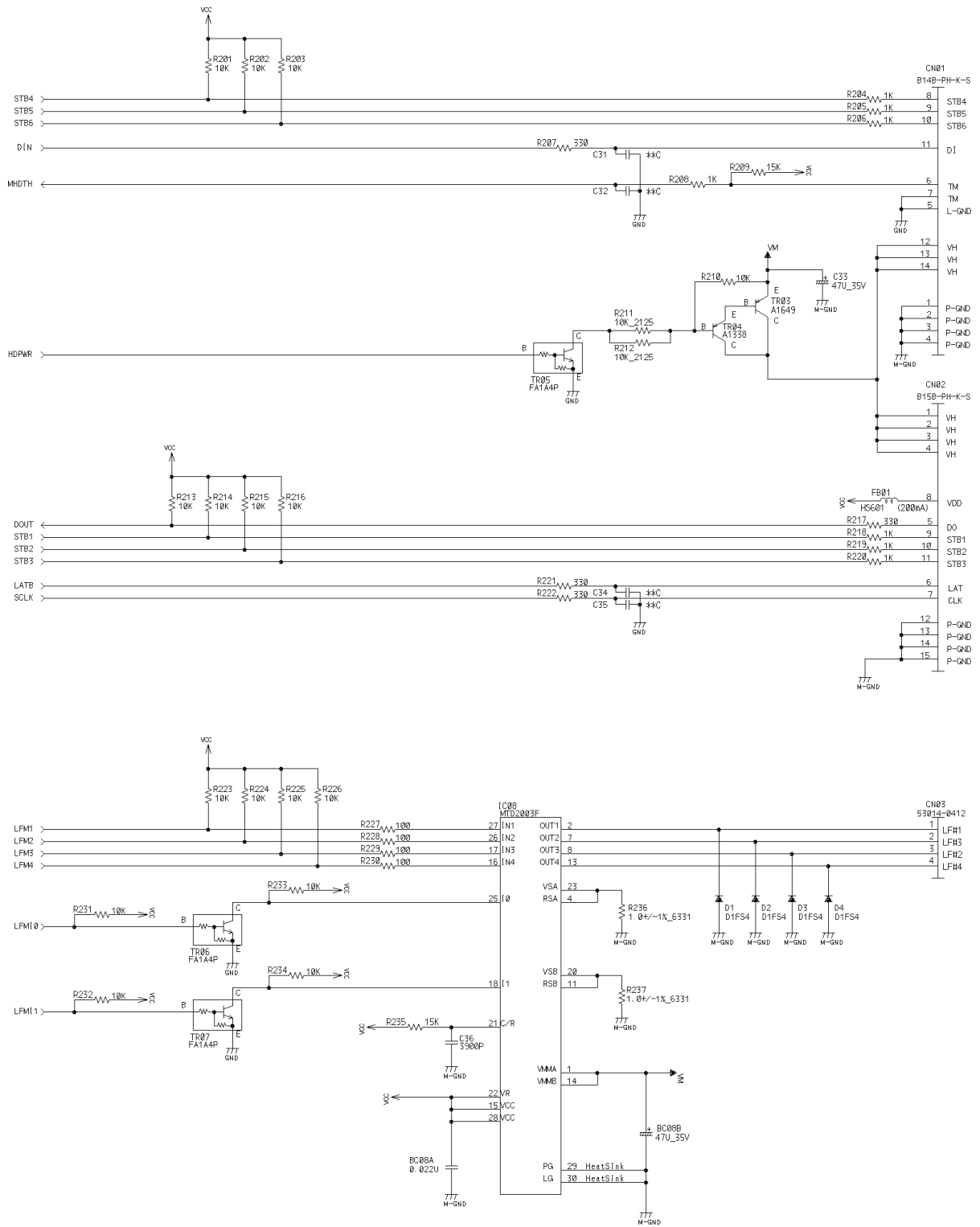
3-5-1. Circuit Diagram



Main Logic Board (1/5)



Main Logic Board (2/5)



Main Logic Board (3/5)

3-5-2. Parts List

Main Logic Board

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
C01		NPN	CERA.CAPA.CHIP1608 0.22UF 10V	1		
C02					NOT MOUNTED	
C03-06		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	4		
C07-09					NOT MOUNTED	
C11-19					NOT MOUNTED	
C21-22					NOT MOUNTED	
C31-32					NOT MOUNTED	
C33		NPN	CHEM. CAPA. 47UF 35V	1		
C34-35					NOT MOUNTED	
C36		NPN	CERA.CAPA.CHIP1608 3900PF 50V	1		
C41					NOT MOUNTED	
C42-43		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	2		
C44					NOT MOUNTED	
C45		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
C51		NPN	FILM CAPA. 0.1UF 50V	1		
C52		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
C53-54					NOT MOUNTED	
C55		NPN	CHEM. CAPA. 470UF 10V	1		
C56		NPN	CHEM. CAPA. 1000UF 35V	1		
C61		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	1		
BC01-03		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	3		
BC04-07		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	4		
BC08A		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
BC08B		NPN	CHEM. CAPA. 47UF 35V	1		
BC09		NPN	CHEM. CAPA. 47UF 35V	1		
BC10		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
BC12					NOT MOUNTED	
CN01		NPN	CONNECTOR B14B-PH-K-S	1		
CN02		NPN	CONNECTOR B15B-PH-K-S	1		
CN03		NPN	CONNECTOR 53014-0412	1		
CN04		NPN	CONNECTOR PHEC40R-R111	1		
CN05		NPN	CONNECTOR 5483-05A	1		
CN06		NPN	CONNECTOR 53014-0510	1		
CN08		NPN	CONNECTOR 53014-0310	1		
CN09		NPN	CONNECTOR 53014-0410	1		
CN10					NOT MOUNTED	
CN11		NPN	CONNECTOR 53520-0220	1		
D1-4		NPN	SCHOTTKY DIODE CHIP D1FS4*	4		
D5-6		NPN	DIODE CHIP D1F20-4063*	2		
DSW1		NPN	DIP SWITCH 210B008MS	1		
DSW2		NPN	DIP SWITCH 210B004MS	1		
FB01-05		NPN	CHIP BEADS IND. BK1608HS601*	5		
FB06-07					NOT MOUNTED	
FB08		NPN	CHIP BEADS IND. BK1608HS601*	1		
FB09-10		NPN	CHIP BEADS IND. BK2125HS470*	2		
IC01		NPN	IC-RESET M51953BFP*E2	1		
IC02		NPN	CPU HD6412350F20	1		
IC03		NPN	GATE ARRAY LZ9FG28-TSPA	1		
IC04		NPN	FLASH MEMORY 28F400BVE-85	1	T7 **	
IC05		NPN	FLASH MEMORY 28F400BVE-85	1	T7#SD *.*	
IC06-07		NPN	SRAM 431000AGZ-70LL*	2		
IC08		NPN	IC-MOTOR MTD2003F-4072	1		
IC09		NPN	IC-MOTOR TA8428K	1		
IC10		NPN	IC-LIN UPC393G2*T1	1		
IC11		NPN	IC-REG SI-8401L	1		
IC12					NOT MOUNTED	

Main Logic Board

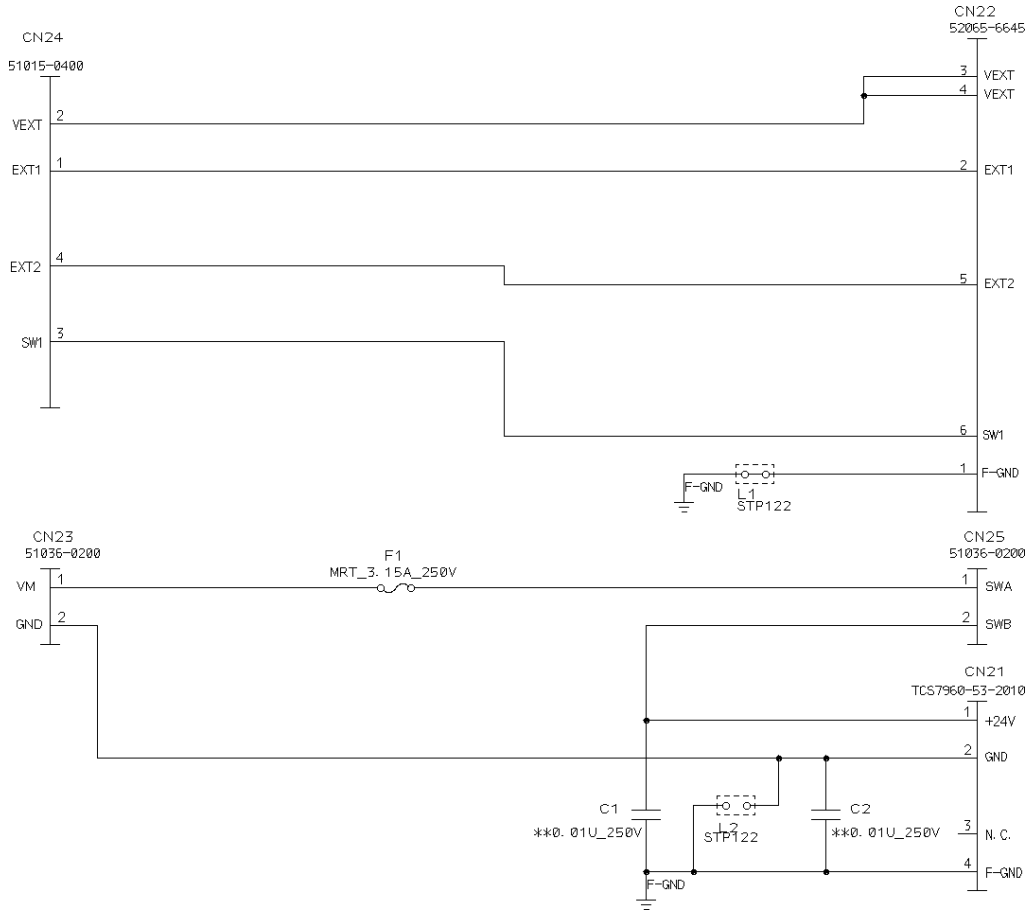
DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
JP1A		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
JP1B					NOT MOUNTED	
JP2					NOT MOUNTED	
LED1-2		NPN	LED CHIP LT1E40A*	2		
LED3		NPN	LED CHIP LT1D40A*	1		
R101		NPN	CHIP RESISTOR 1.5 KOHM 1/16W	1		
R102		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R103		NPN	CHIP RESISTOR 2.2 K-OHM 1/16W	1		
R104		NPN	CHIP RESISTOR 22 K-OHM 1/16W	1		
R105		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R106		NPN	CHIP RESISTOR 470 OHM 1/16W	1		
R107		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R108		NPN	CHIP RESISTOR 470 OHM 1/16W	1		
R109		NPN	CHIP RESISTOR 100 OHM 1/16W	1		
R116-119		NPN	CHIP RESISTOR 10 K-OHM 1/16W	4		
R120-121					NOT MOUNTED	
R122-124		NPN	CHIP RESISTOR 10 K-OHM 1/16W	3		
R125					NOT MOUNTED	
R126-127		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R128-130		NPN	CHIP RESISTOR 330 OHM 1/16W	3		
R131-134					NOT MOUNTED	
R135		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R136-138		NPN	CHIP RESISTOR 10 K-OHM 1/16W	3		
R139		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R140-141		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R142-145		NPN	CHIP RESISTOR 330 OHM 1/16W	4		
R146		NPN	CHIP RESISTOR 220 OHM 1/16W	1		
R147					NOT MOUNTED	
R148-153		NPN	CHIP RESISTOR 330 OHM 1/16W	6		
R154-158		NPN	CHIP RESISTOR 10 K-OHM 1/16W	5		
R159-161		NPN	CHIP RESISTOR 100 K-OHM 1/16W	3		
R163-164		NPN	CHIP RESISTOR 100 K-OHM 1/16W	2		
R165		NPN	CHIP RESISTOR 470 OHM 1/10W	1		
R166-170		NPN	CHIP RESISTOR 100 K-OHM 1/16W	5		
R171-176					NOT MOUNTED	
R177		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
R178		NPN	CHIP RESISTOR 100 OHM 1/16W	1		
R179		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
R180		NPN	CHIP RESISTOR 100 OHM 1/16W	1		
R181-185					NOT MOUNTED	
R201-203		NPN	CHIP RESISTOR 10 K-OHM 1/16W	3		
R204-206		NPN	CHIP RESISTOR 1 K-OHM 1/16W	3		
R207		NPN	CHIP RESISTOR 330 OHM 1/16W	1		
R208		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R209		NPN	CHIP RESISTOR 15 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 330 OHM 1/16W	1		
R218-220		NPN	CHIP RESISTOR 1 K-OHM 1/16W	3		
R221-222		NPN	CHIP RESISTOR 330 OHM 1/16W	2		
R223-226		NPN	CHIP RESISTOR 10 K-OHM 1/16W	4		
R227-230		NPN	CHIP RESISTOR 100 OHM 1/16W	4		
R231-234		NPN	CHIP RESISTOR 10 K-OHM 1/16W	4		
R235		NPN	CHIP RESISTOR 15 K-OHM 1/16W	1		
R236-237		NPN	CHIP RESISTOR 1.0 OHM 1W	2		

Main Logic Board

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
R301-305		NPN	CHIP RESISTOR 100 K-OHM 1/16W	5		
R306					NOT MOUNTED	
R307-308		NPN	CHIP RESISTOR 100 K-OHM 1/16W	2		
R310					NOT MOUNTED	
R311-312		NPN	CHIP RESISTOR 330 OHM 1/16W	2		
R313-314		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R315		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R316		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R317		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R318-319		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R320		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R321		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R322					NOT MOUNTED	
R323		NPN	CHIP RESISTOR 330 OHM 1/10W	1		
R324		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R325-326		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R327-328		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	2		
R329					NOT MOUNTED	
R330		NPN	CHIP RESISTOR 330 OHM 1/10W	1		
R401-402		NPN	CHIP RESISTOR 1 K-OHM 1/16W	2		
R403-404		NPN	CHIP RESISTOR 330 OHM 1/16W	2		
R405		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R406		NPN	CHIP RESISTOR 33 K-OHM 1/16W	1		
R407		NPN	CHIP RESISTOR 10 K-OHM 1/10W	1		
R408-410					NOT MOUNTED	
R411-413		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	3		
R414-416		NPN	CHIP RESISTOR 10 K-OHM 1/16W	3		
R417-418		NPN	CHIP RESISTOR 470 OHM 1/10W	2		
R451-453		NPN	CHIP RESISTOR 330 OHM 1/16W	3		
R454		NPN	CHIP RESISTOR 15 K-OHM 1/16W	1		
R455		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R456		NPN	CHIP RESISTOR 2.2 K-OHM 1/16W	1		
RA01-04		NPN	RESIS. ARRAY CHIP MNR14J221*	4		
RA05-09		NPN	RESIS. ARRAY CHIP MNR14J331*	5		
REG1		NPN	IC-REG UPC7824	1		
SW1		NPN	PUSH SWITCH SKHHAL	1		
TR01		NPN	CHIP TRANSISTOR 2SA1362GR*85R	1		
TR02		NPN	CHIP TRANSISTOR 2SC3875S-G*AL	1		
TR03		NPN	CHIP TRANSISTOR 2SA1649Z*	1		
TR04		NPN	CHIP TRANSISTOR 2SA1338-67*TA	1		
TR05-07		NPN	DIGITAL TRANSISTOR FA1A4P	3		
TR08-09		07320101	TRANSISTOR 2SD2010	2		
TR10		NPN	CHIP TRANSISTOR 2SC3875S-G*AL	1		
TR11		NPN	CHIP TRANSISTOR 2SA1362GR*85R	1		
TR12		NPN	DIGITAL TRANSISTOR FA1A4P	1		
VR1-2		NPN	RP RESISTOR RH0615C-47K	2		
XTAL		NPN	CERA. OSCILLATOR EFOMC2005T4*	1		
ZD1		NPN	ZENER DIODE CHIP HZU20B2TRF	1		
ZD2		NPN	ZENER DIODE RD7.5EB1T	1		

3-6. Sub-Board

3-6-1. Circuit Diagram



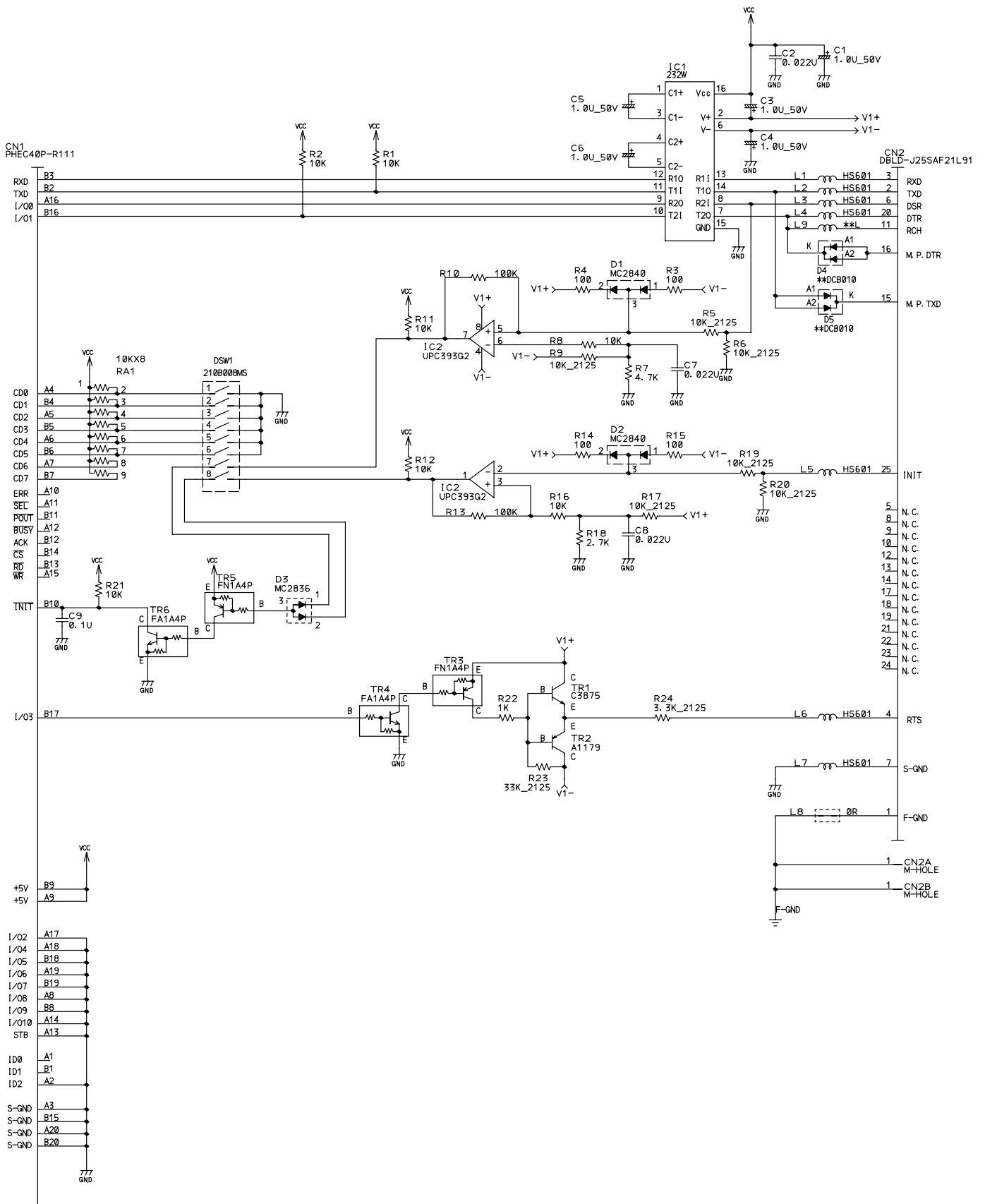
3-6-2. Parts List

Sub-Board

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
C1-2					NOT MOUNTED	
CN21		NPN	CONNECTOR TCS7960-53-2010	1		
CN22		NPN	CONNECTOR 52065-6645	1		
CN23		NPN	CABLE UNIT 2X60CC TSP8	1		
CN24		NPN	CABLE UNIT 4X60CC TSP8	1		
CN25		NPN	CABLE UNIT 2X125C TSP8	1		
F1		09991026	FUSE MRT3.15A-250V*	1		
L1-2		NPN	JUMPER WIRE 1/6W-L3.2	2		
-		NPN	SEESAW SWITCH SF-W1H1A14BB	1		
-		NPN	HEAT-SHRINK TUBE F2-3.0	2		

3-7. Serial Interface Board (25 pin)

3-7-1. Circuit Diagram



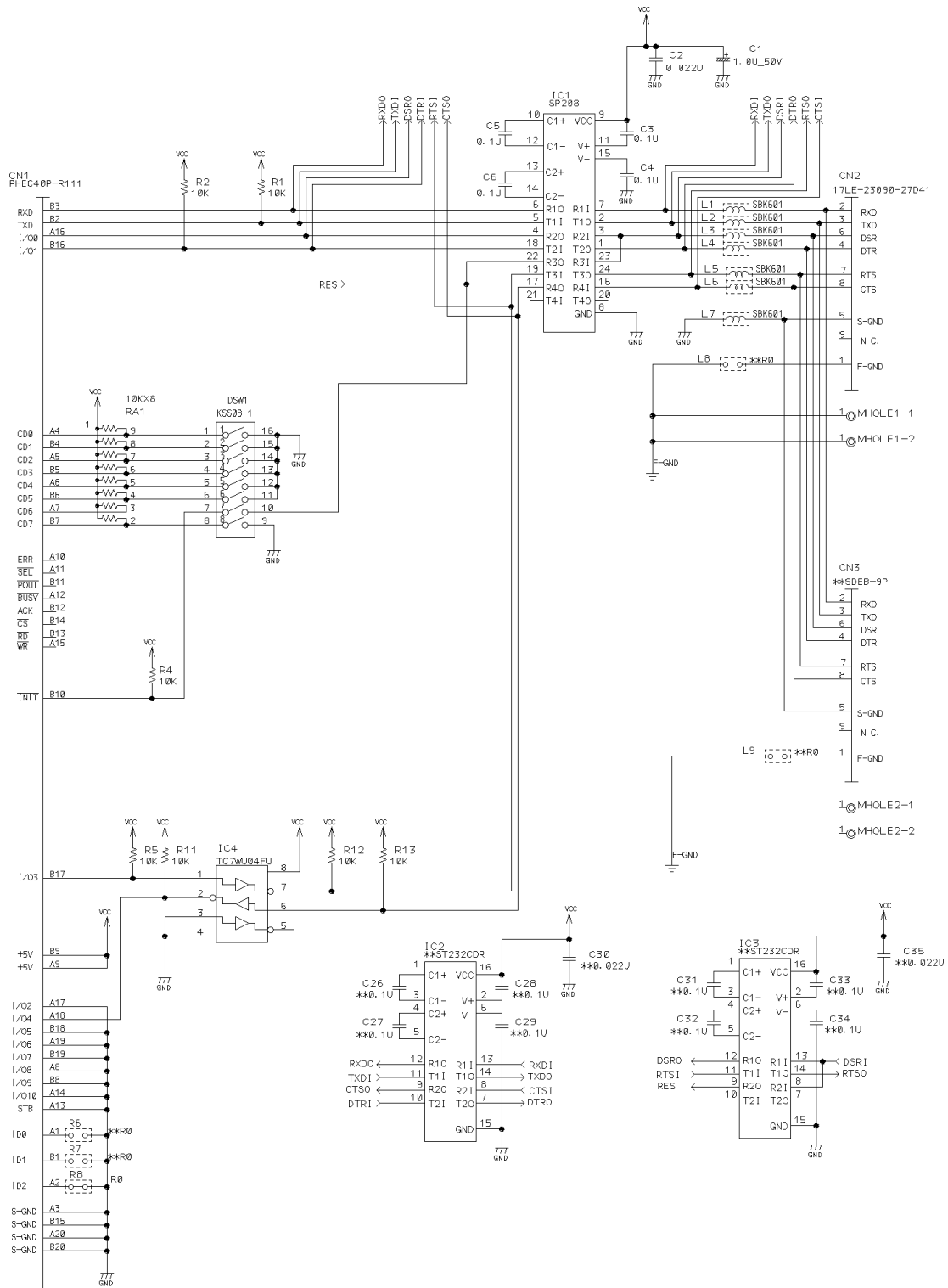
3-7-2. Parts List

Serial Interface Board (25 pin)

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 RESISTOR 2.7 KOHM 1/16W	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		

3-8. Serial Interface Board (9 pin)

3-8-1. Circuit Diagram



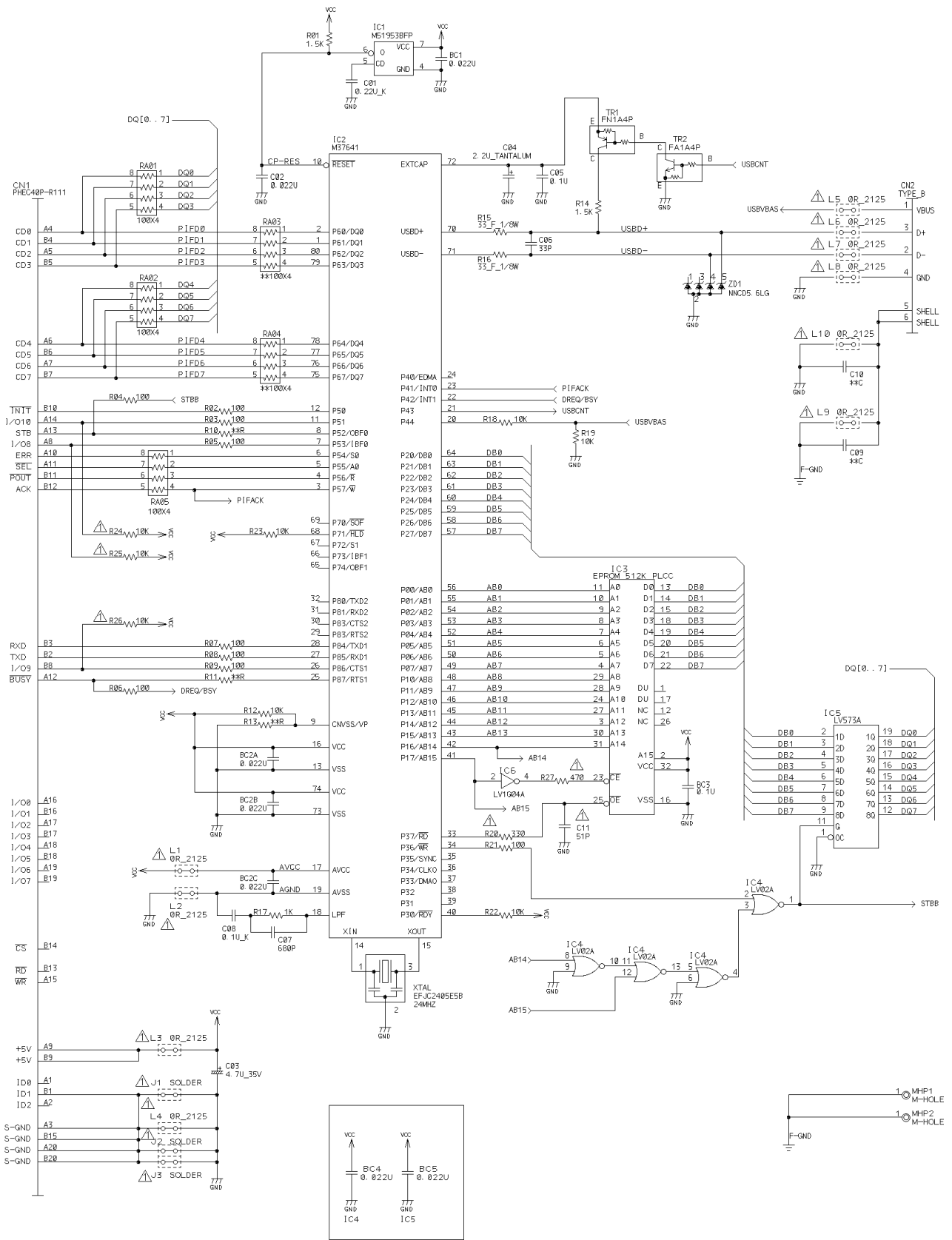
3-8-2. Parts List

Serial Interface Board (9 pin)

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	

3-9. USB Interface Board

3-9-1. Circuit Diagram



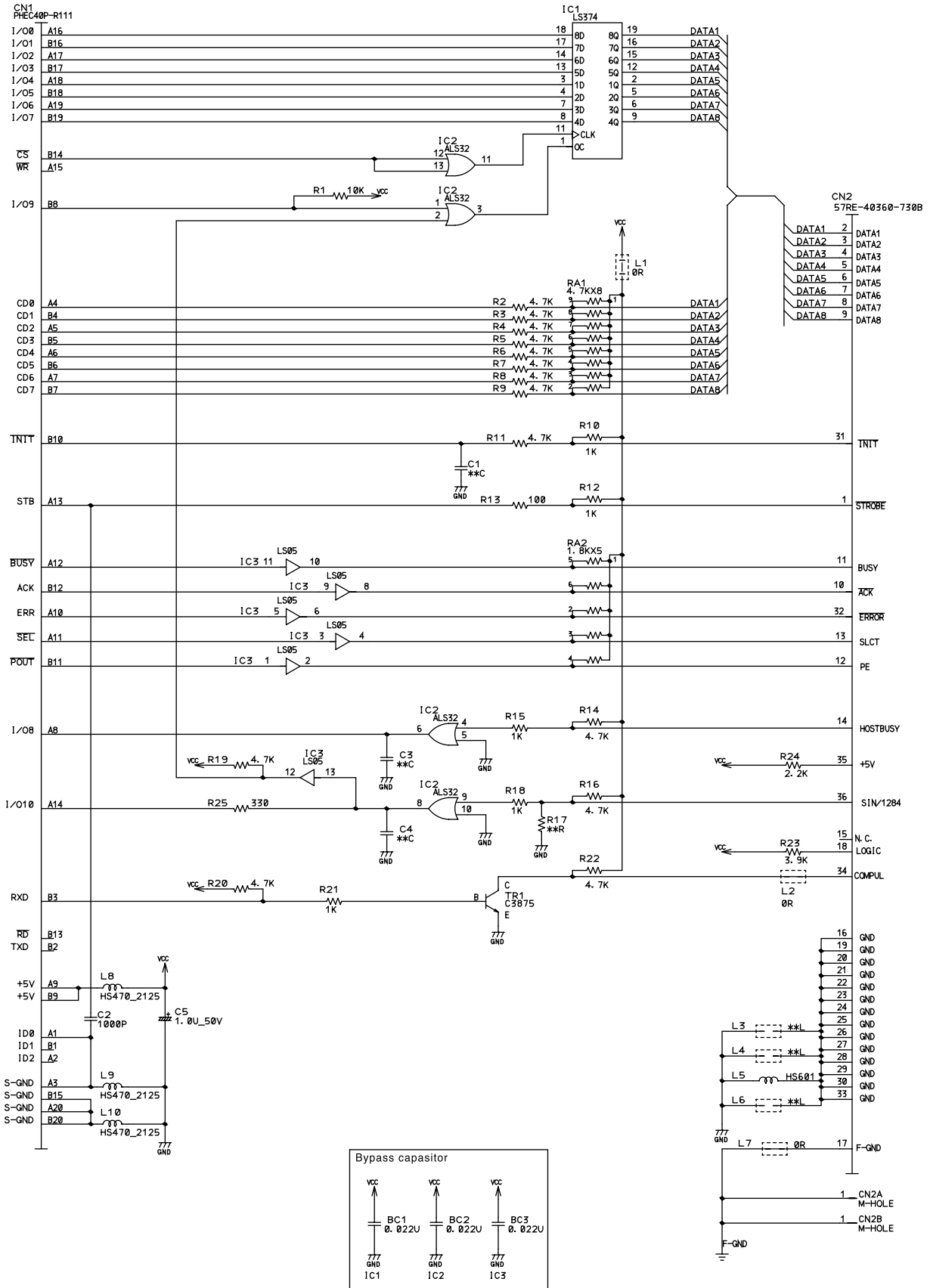
3-9-2. Parts List

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 25V	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 M37640MS-***FP	1		
IC3		NPN	IC SOCKET IC160-0324-300	1		
		NPN	EPROM 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 RESISTOR 1.5 KOHM 1/16W	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 RESISTOR 1.5 KOHM 1/16W	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 330 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		

3-10. Parallel Interface Board

3-10-1. Circuit Diagram



3-10-2. 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 57RE40360-730BD29	1		
IC1		08211030	TTL IC HD74LS374FP*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		
L3-4					NOT MOUNTED	
L5		09990754	CHIP BEADS IND. BK1608HS601*	1		S
L6					NOT MOUNTED	
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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