

THERMAL PRINTER

TSP600 Series

TECHNICAL MANUAL

[FIRST EDITION]

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INTRODUCTION

1

This manual describes the thermal printer TSP600 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.

2

- This manual is divided into the following sections:
 - Chapter 1 Parts Replacement and Adjustments
 - Chapter 2 Maintenance and Lubrication
 - Chapter 3 Parts List

3

- First edition : Jul. 2001

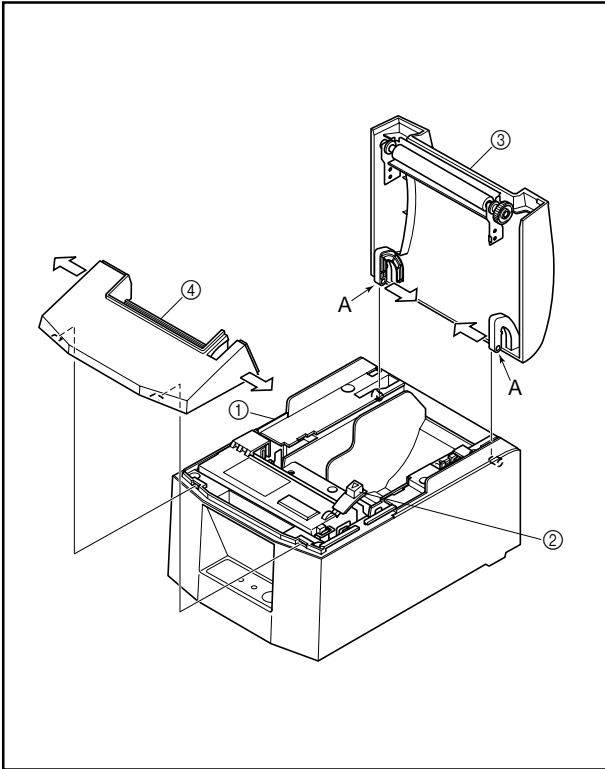
CHAPTER 1

PARTS REPLACEMENT

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

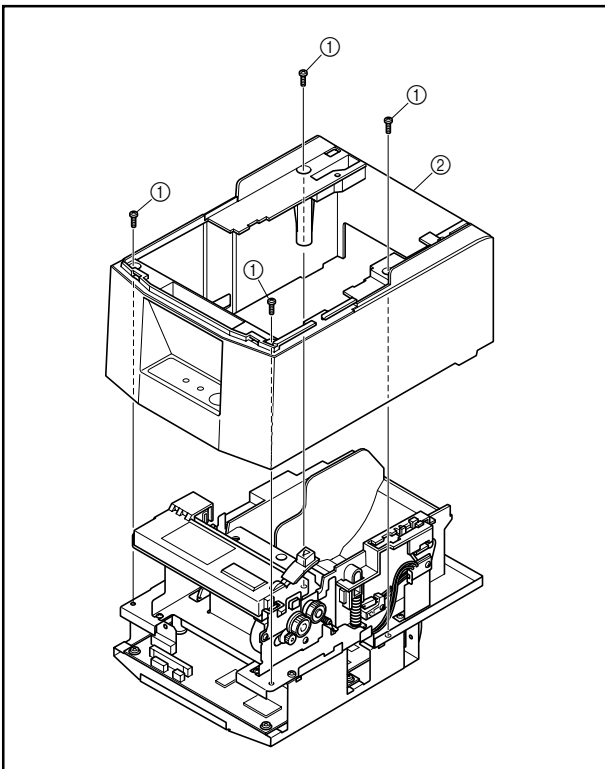
1. Disconnect the printer power cord plug from the wall outlet before servicing it.
2. Assembly is the reverse of disassembly unless otherwise specified.
3. After reassembly, coat the screw heads with locking sealant.
4. Lubrication information is not provided in this chapter. Refer to item 2 of chapter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

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1. Rear Cover Unit

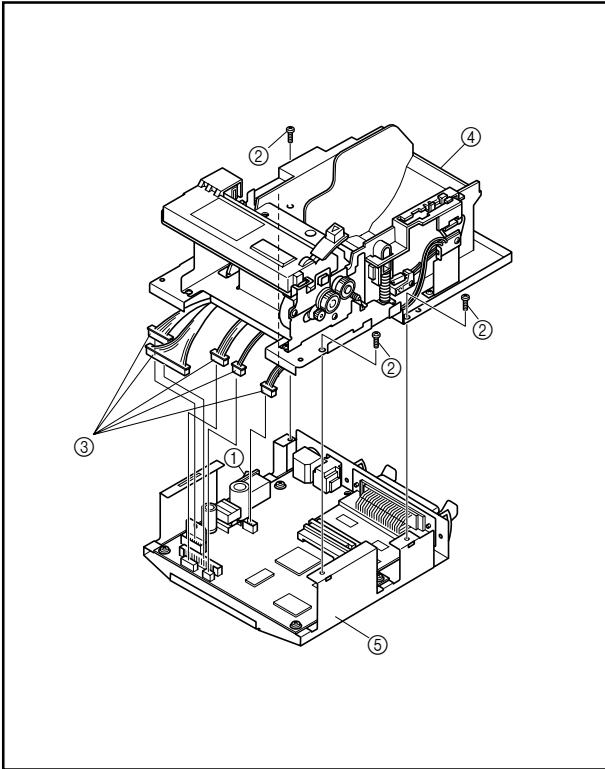
- (1) Turn off the power switch ①, disconnect the power cord from the wall outlet.
- (2) Push the cover open lever ② and open rear cover unit ③.
- (3) Allowing about 5mm of uniform slackening at points A (left/right) of the rear cover unit ③, along the arrow direction, remove it from case unit.
- (4) Remove front cover ④.



2. Case Unit

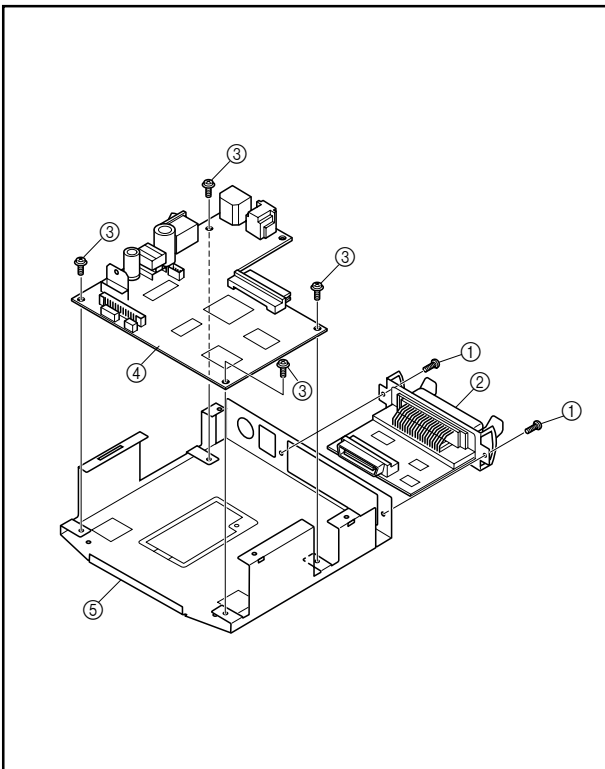
- (1) Turn off the power switch, disconnect the power cord from the wall outlet.
- (2) Remove the rear cover unit according to the procedure described in item 1.
- (3) Remove
 - Four screws ①
 - Case unit ②

PARTS REPLACEMENT



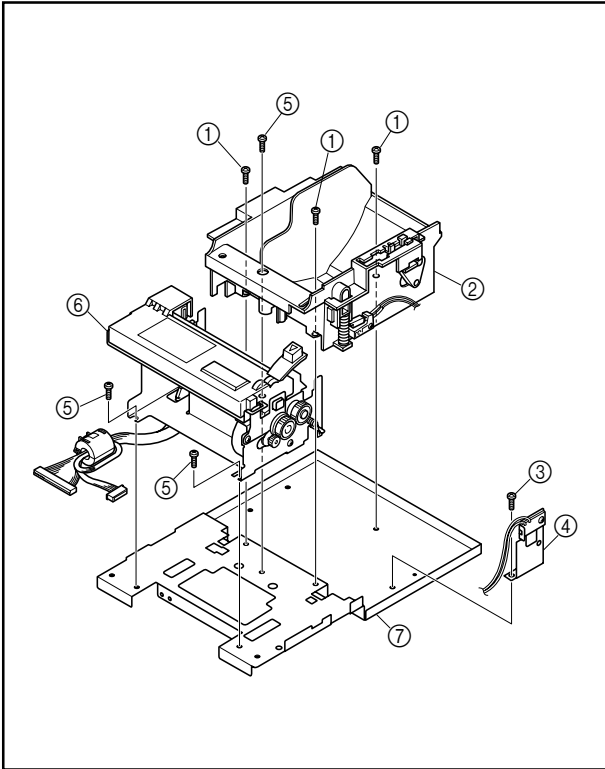
3. Board Chassis Unit

- (1) Turn off the power switch①, disconnect the power cord from the wall outlet.
- (2) Remove
 - Case unit according to the procedure described in item 2.
 - Three screws ②
 - Five connectors ③
 - Mechanism chassis unit ④
 - Board chassis unit ⑤



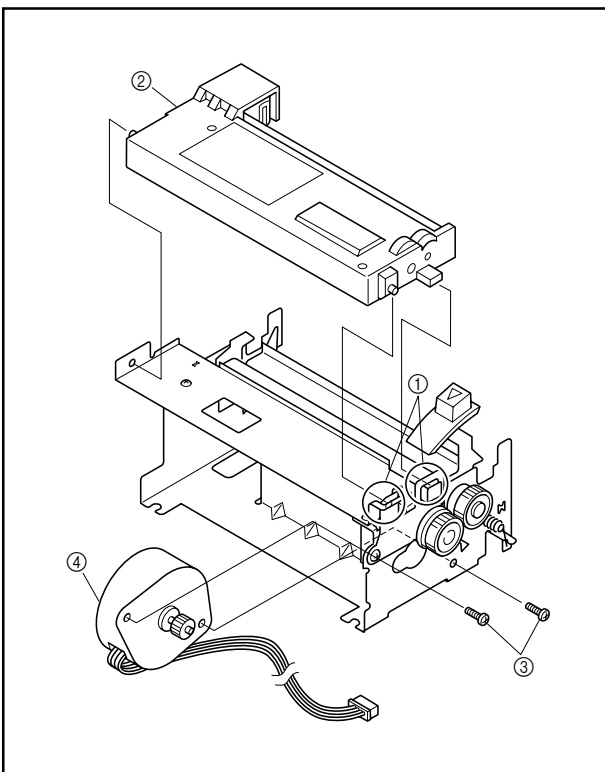
4. Main Logic Board

- (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
 - Four screws ③
 - Main logic board ④
 - Board chassis ⑤



5. Printer Mechanism

- (1) Turn off the power switch, disconnect the power cord from the wall outlet.
- (2) Remove
 - Mechanism shassis unit according to the procedure described in item 3.
 - Three screws ①
 - Paper stocker ②
 - Screw ③
 - NE lever unit ④
 - Three screws ⑤
 - Printer mechanism ⑥
 - Mechanism chassis ⑦



6. Motor Unit

- (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 5.
 - Release the two hooks ① and remove cutter unit ② (Auto cutter model only)
 - Two screws ③
 - Motor unit ④

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.

Product name	Manufacturer
Mobil 1	Mobil oil

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 PF roller bearing and platen	Mobil 1

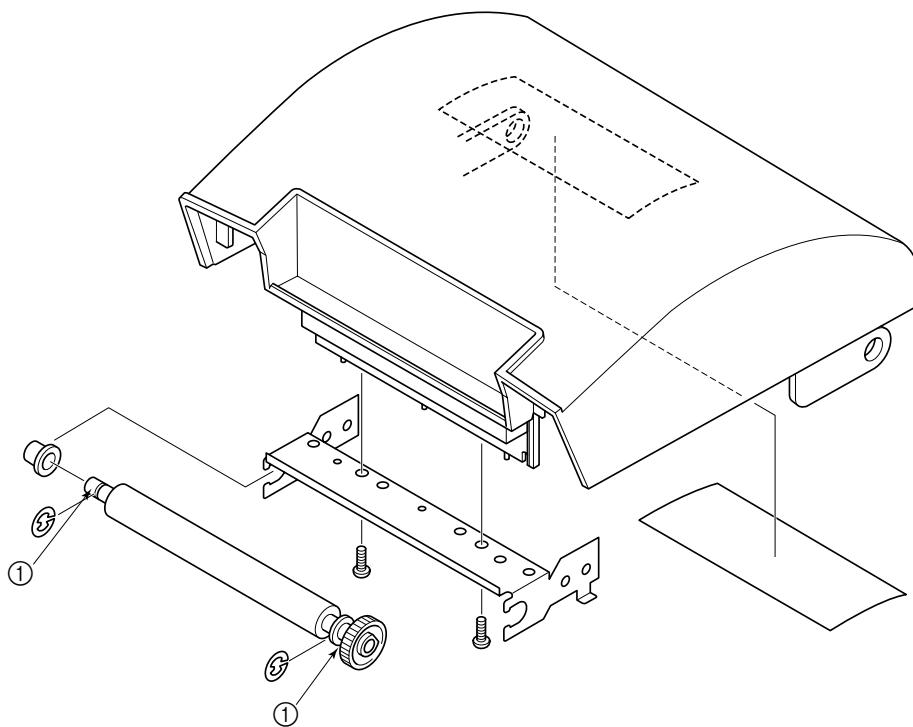


Fig. 2-1 Lubricated Area

CHAPTER 3

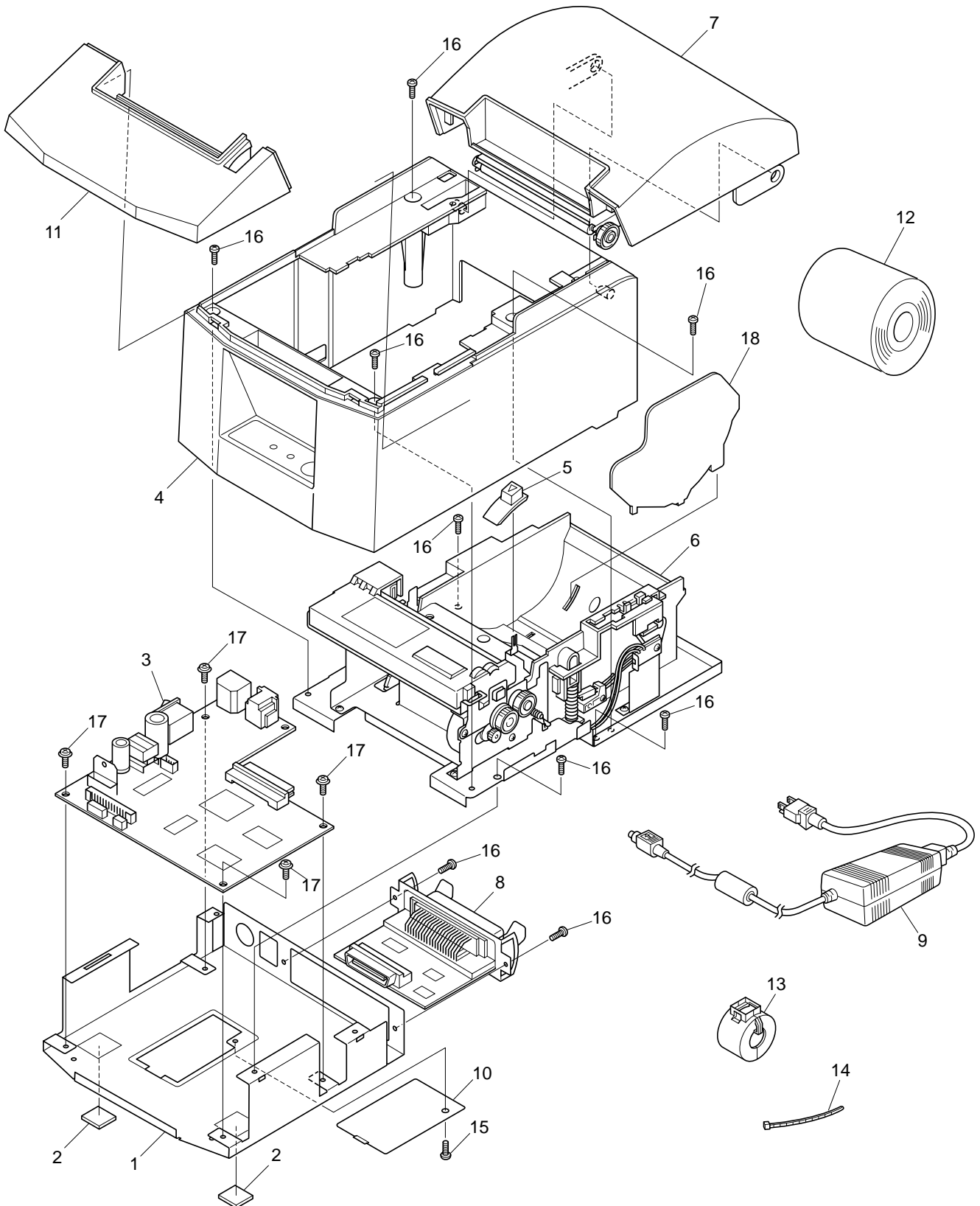
PARTS LIST

HOW TO USE PARTS LIST

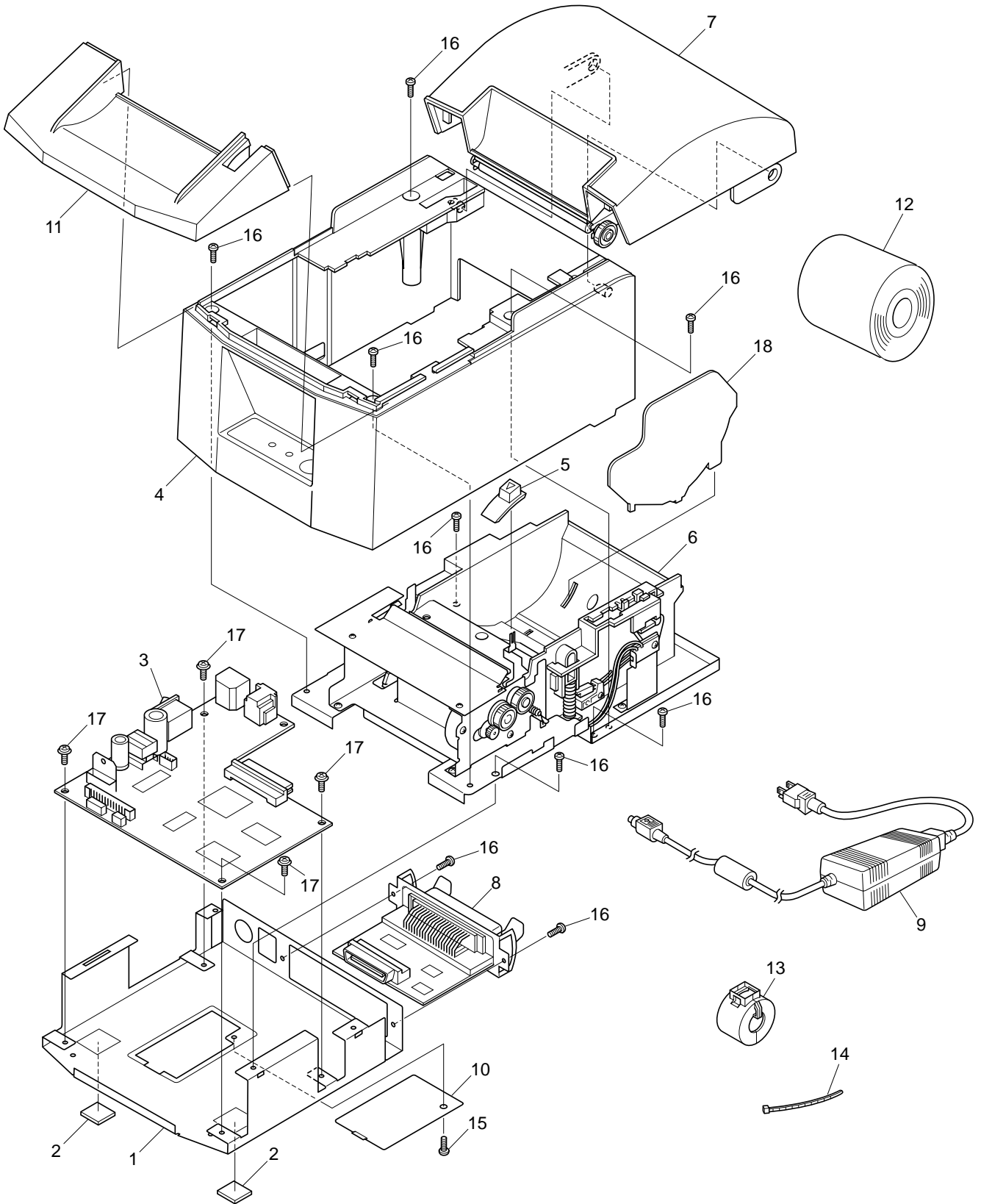
- (1) DRWG. NO.
This column shows the drawing number of the illustration.
- (2) REVISED EDITION MARK
This column shows a revision number.
- (3) PART NO.
Parts numbers must be notified when ordering replacement parts. Parts described as “NPN” have no parts number and are not in stock, i.e., unavailable.
- (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” 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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3-1. Printer Assembly
3-1-1. Disassembly Drawing
A. Auto Cutter Type



B. Tear Bar Type

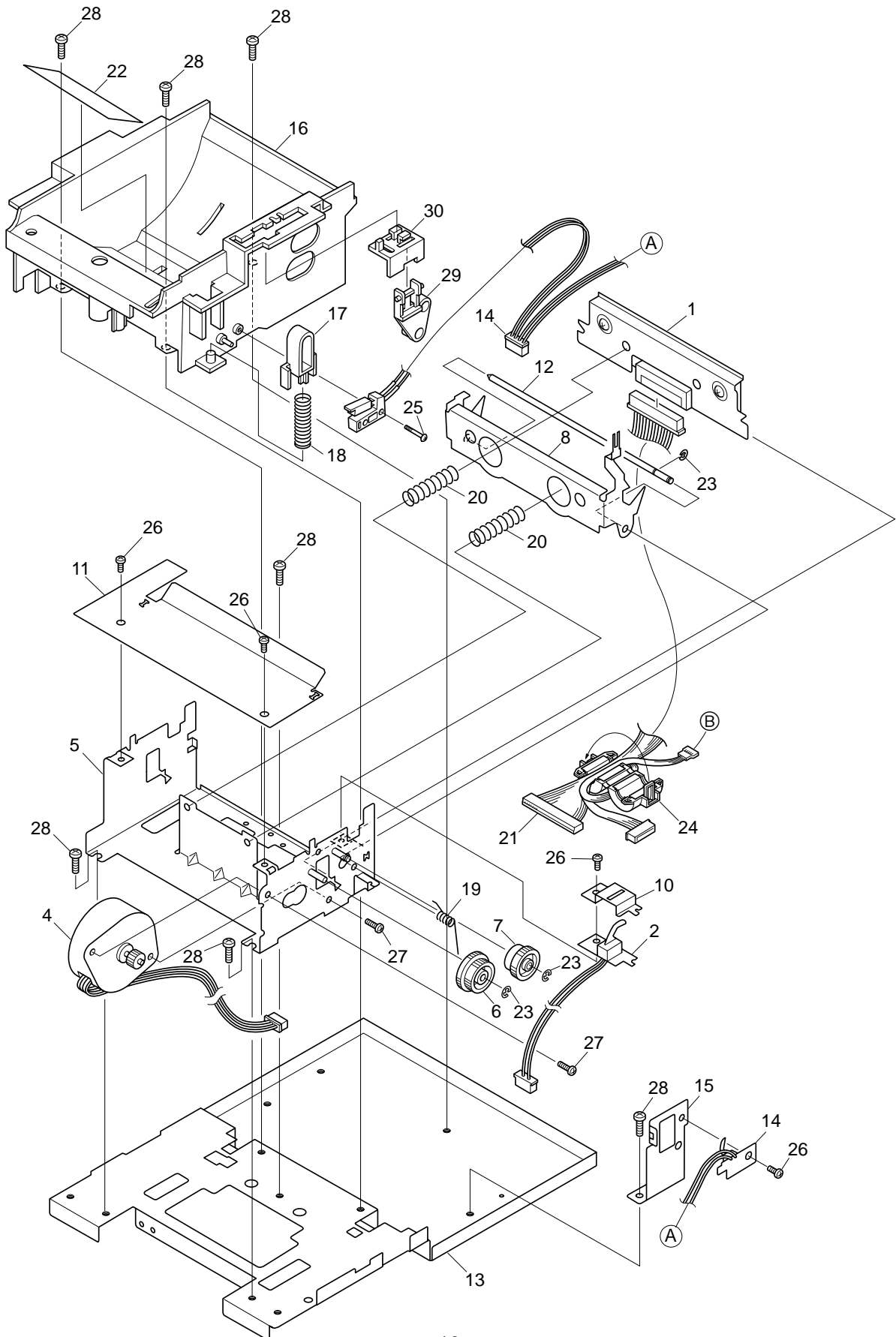


3-1-2. Parts List

Printer Assembly

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
1		NPN	BOARD CHASSIS TSP6	1		
2		30991230	RUBBER FOOT 12X12 TSP7	2		S
3		37477000	MAIN LOGIC BOARD UNIT TSP6	1		S
4		37470000	CASE UNIT TSP6	1	WHITE	S
		37470010	CASE UNIT TSP6GRY	1	GRAY	S
5		33400080	COVER OPEN LEVER TSP6	1	WHITE	S
		33400100	COVER OPEN LEVER TSP6GRY	1	GRAY	S
6		37473100	MECHANISM CHASSIS UNIT TSP64	1	AUTO CUTTER	S
		37473110	MECHANISM CHASSIS UNIT TSP61	1	TEAR BAR	S
7		37470300	REAR COVER UNIT TSP64	1	WHITE, AUTO CUTTER	S
		37470310	REAR COVER UNIT TSP61	1	WHITE, TEAR BAR	S
		37470320	REAR COVER UNIT TSP64GRY	1	GRAY, AUTO CUTTER	S
		37470330	REAR COVER UNIT TSP61GRY	1	GRAY, TEAR BAR	S
8		39607400	INTERFACE BOARD IFBD-HD04	1	SERIAL IF (25 PIN)	0
		39607430	INTERFACE BOARD IFBD-HN04	1	SERIAL IF (9 PIN)	0
		39607420	INTERFACE BOARD IFBD-HU04	1	SERIAL IF (USB)	0
		39607410	INTERFACE BOARD IFBD-HC04	1	PARALLEL IF	0
9		30781180	ADAPTER SET PS60-24A JP	1	OPTION	0
		30781190	ADAPTER SET PS60-24A US	1	OPTION	0
		30781200	ADAPTER SET PS60-24A EU	1	OPTION	0
		30781210	ADAPTER SET PS60-24A UK	1	OPTION	0
		30781220	ADAPTER SET PS60-24A AS	1	OPTION	0
10		NPN	SWITCH COVER TSP6	1		
11		33020400	FRONT COVER TSP6	1	WHITE, AUTO CUTTER	S
		33020420	FRONT COVER TSP61	1	WHITE, TEAR BAR	S
		33020440	FRONT COVER TSP6GRY	1	GRAY, AUTO CUTTER	S
		33020460	FRONT COVER TSP61GRY	1	GRAY, TEAR BAR	S
12		30970040	THERMAL ROLL PAPER 80X35D	1		S
13		NPN	FERRITE CORE K5BRC24X14X11	1	PARALLEL IF	
14		04991204	FASTENER T18S	1	PARALLEL IF	S
15		00930403	SCREW TAT 3-4 CT	1		S
16		00930609	SCREW TAT 3-6 CT	9		S
17		01903101	SCREW TAT 3-6 CT-FL	4		S
18		33910370	PAPER ROLL GAUIDE TMP6	1	OPTION	0
-		39590130	WALL BRACKET WB-T600	1	OPTION	0
		39590520	VERTICAL STAND VS-T600	1	OPTION	0

B. Tea Bar Type



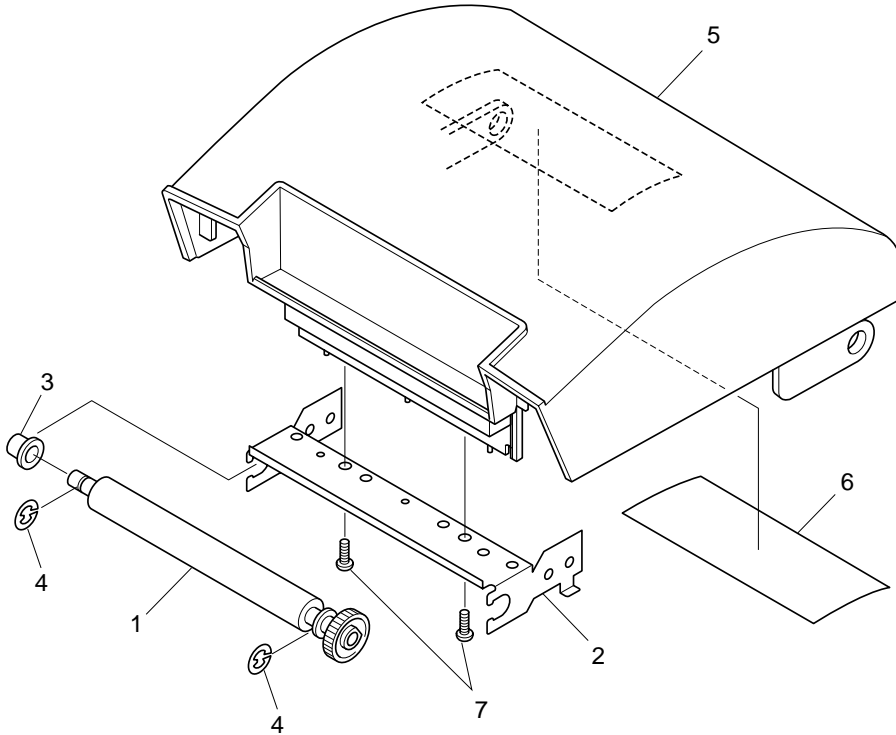
3-2-2. Parts List

Printer Mechanism

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
1		37489000	HEAD UNIT	1		S
2		37487000	PE SWITCH UNIT	1		S
3		37482100	CUTTER UNIT	1	AUTO CUTTER ONLY	S
4		37482000	MOTOR UNIT	1		S
5		NPN	FRAME UNIT	1		
6		33102270	GEAR 33X40X0.4	1		S
7		33102280	GEAR 22X37X0.4	1		S
8		NPN	OPEN LEVER	1		
9		NPN	CUTTER CLAMP	1	AUTO CUTTER ONLY	
10		NPN	SWITCH COVER	1		
11		NPN	CUTTER PLATE	1	AUTO CUTTER ONLY	
		32970050	TEAR BAR	1	TEAR BAR	S
12		NPN	OPEN LEVER STAY	1		
13		NPN	MECHANISM CHASSIS	1		
14		37487310	NE SWITCH ASSY	1		S
15		NPN	SWITCH PLATE	1		
16		NPN	PAPER STOCKER	1		
17		NPN	PUSH LEVER	1		
18		NPN	SPRING C075-070-0238	1		
19		NPN	OPEN LEVER SPRING	1		
20		NPN	SPRING C077-090-0225	2		
21		NPN	CABLE UNIT 15X160CC	1		
22		NPN	CAUTION SEAL	1		
23		04020010	STOP RING SE2.0	2		S
24		NPN	FERRITE CORE K5BRC16X16X8-M	1		
25		01902032	SCREW TAT 2-10 PT	1		S
26		00926503	SCREW TAT 2.6-5 CT	5	AUTOCUTTER	S
		00926503	SCREW TAT 2.6-5 CT	4	TEAR BAR	S
27		00630404	SCREW TR 3-4	2		S
28		00930609	SCREW TAT 3-6 CT	7		S
29		NPN	NE LEVER	1		
30		NPN	NE LEVER HOLDER	1		

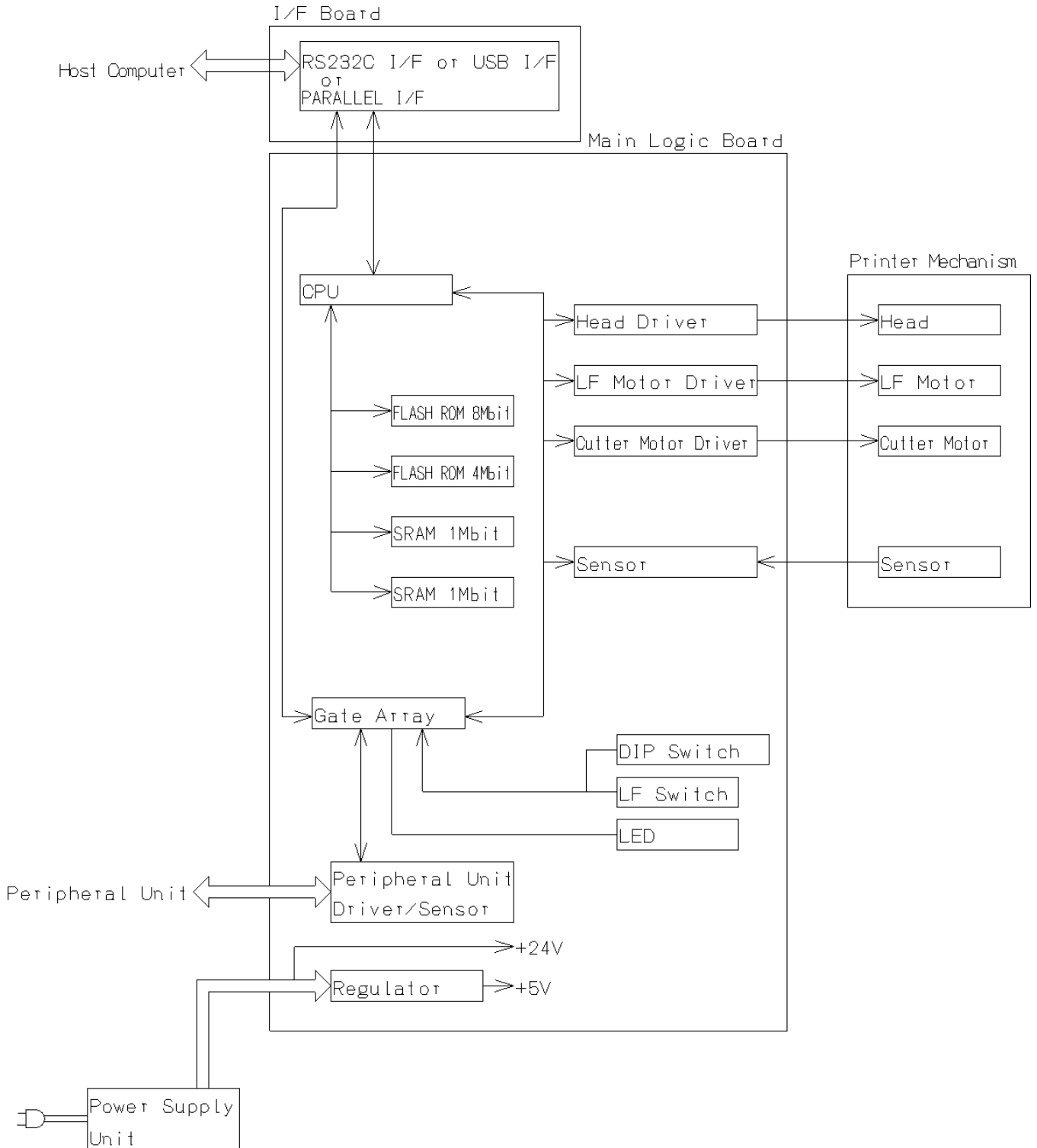
3-3. Sub-Assembly
3-3-1. Rear Cover Unit

7-



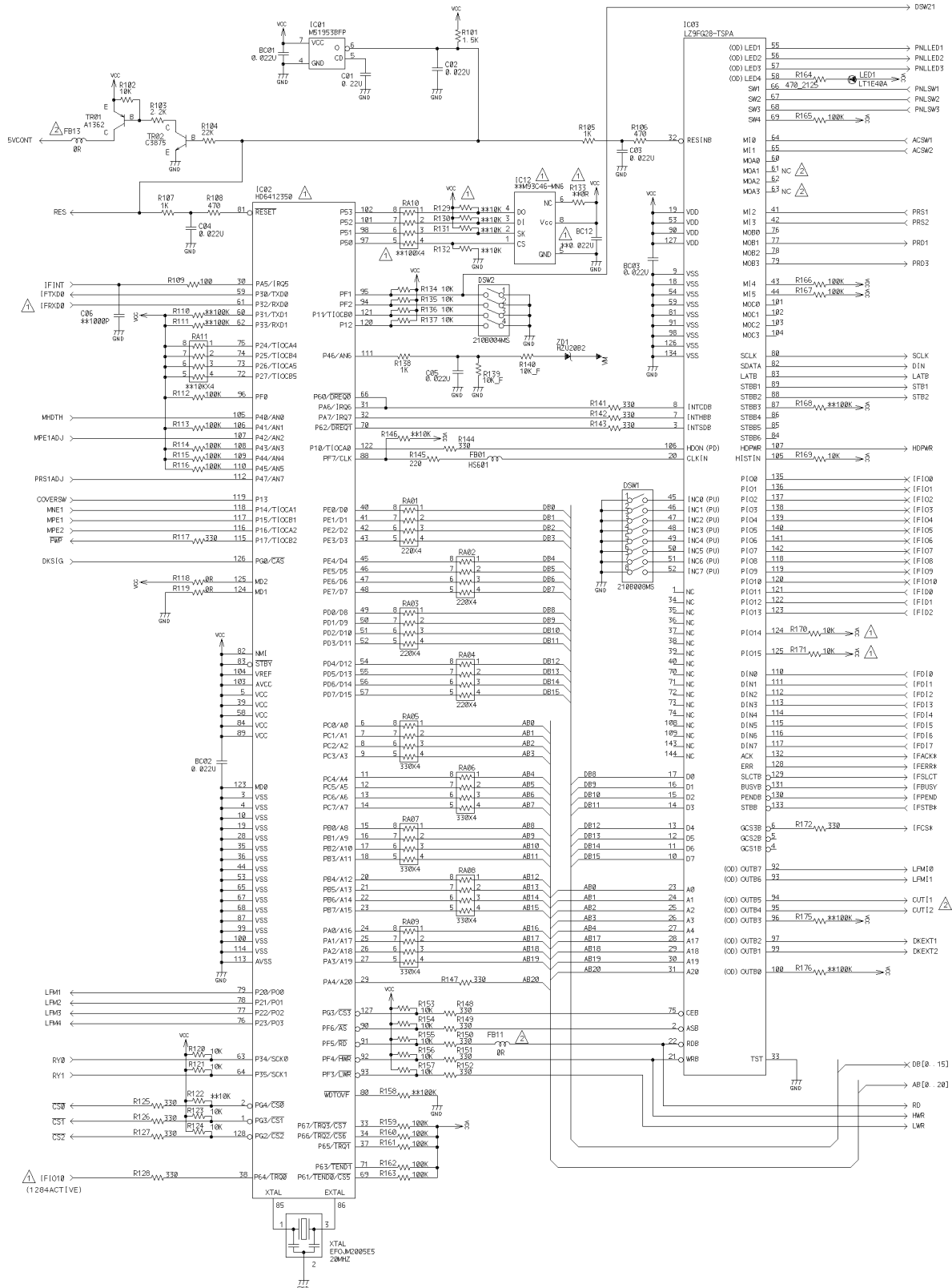
DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
7-1		37483300	PLATEN ASSY	1		S
7-2		NPN	PLATEN BRACKET	1		
7-3		NPN	PF ROLLER BEARING	1		
7-4		04020016	STOP RING SE4.0	2		S
7-5		NPN	REAR COVER	1	WHITE, AUTO CUTTER	
		NPN	REAR COVER	1	WHITE, TEAR BAR	
		NPN	REAR COVER	1	GRAY, AUTO CUTTER	
		NPN	REAR COVER	1	GRAY, TEAR BAR	
7-6		NPN	PAPER SET SEAL	1		
7-7		00930803	SCREW TAT 3-8 PT	2	AUTO CUTTER	S
		00930603	SCREW TAT 3-6 PT	2	TEAR BAR	S

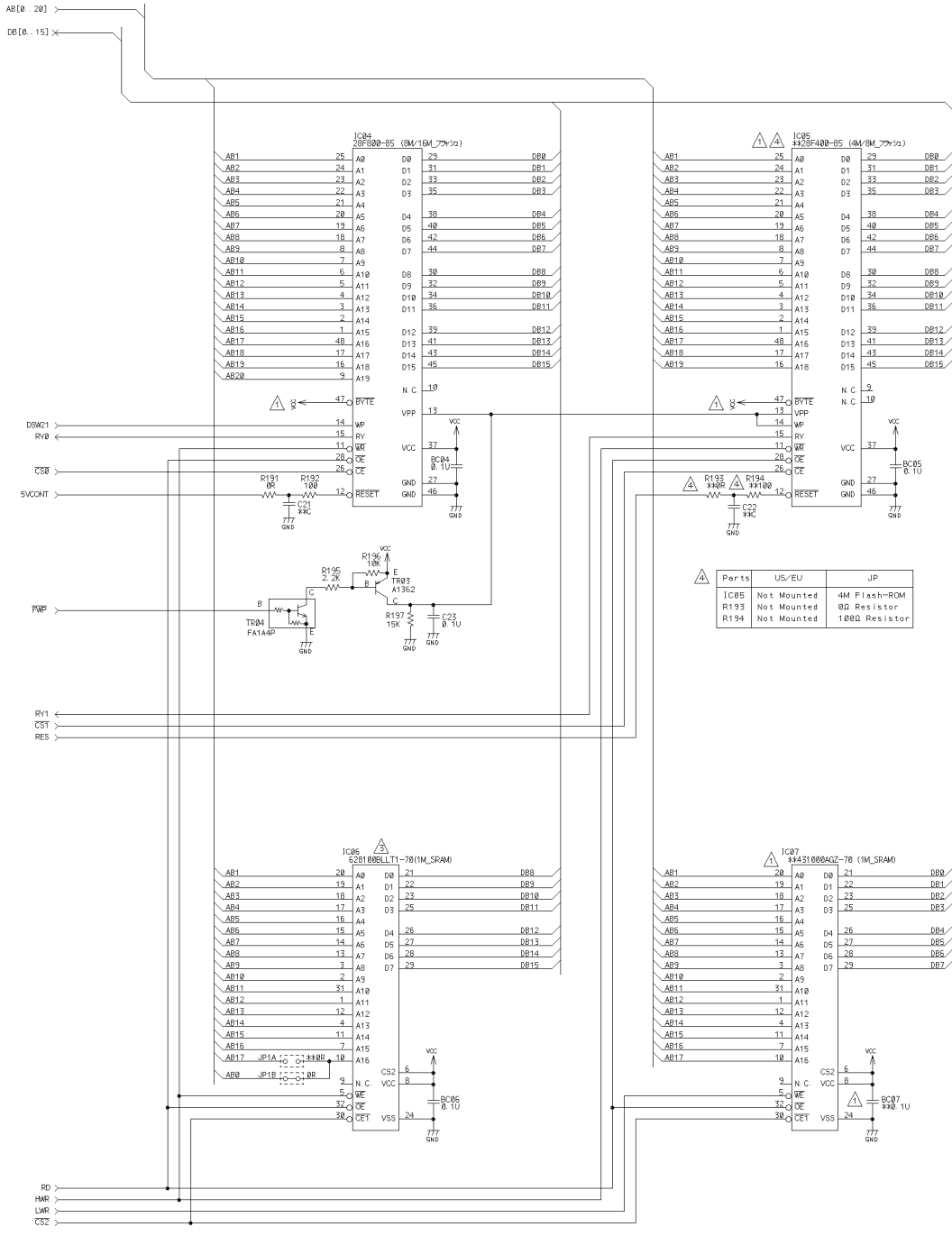
3-4. Block Diagram



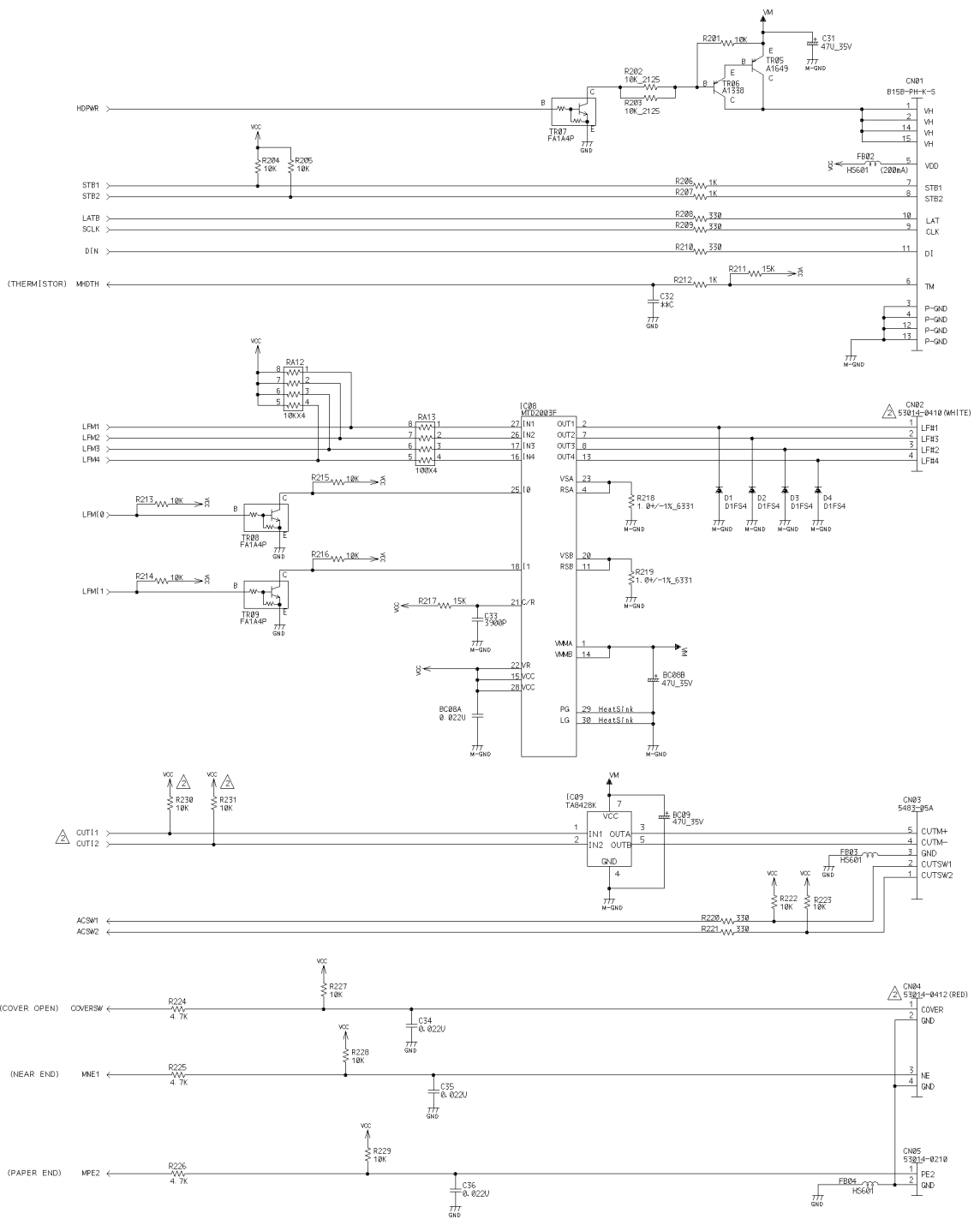
3-5. Main Logic Board

3-5-1. Circuit Diagram

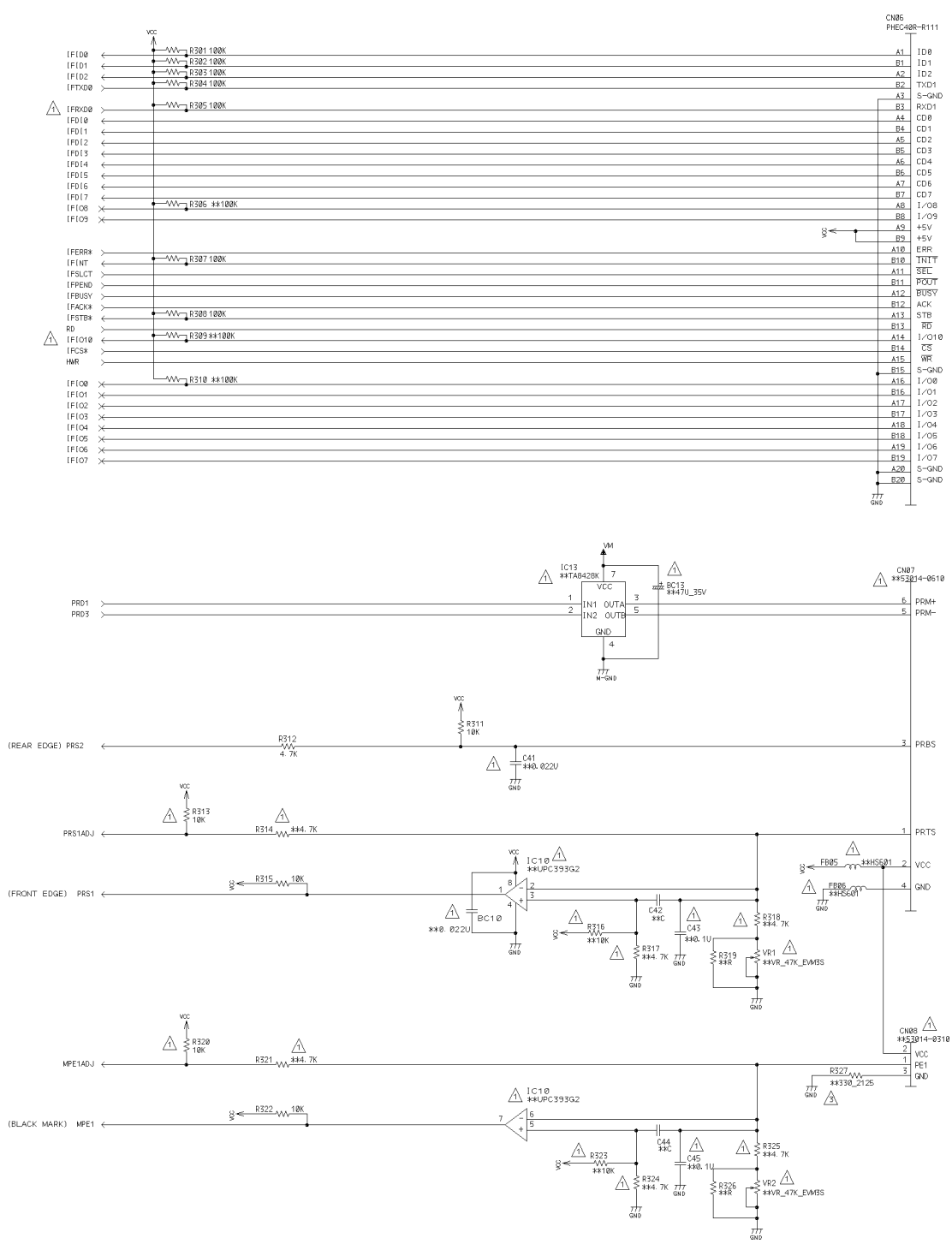




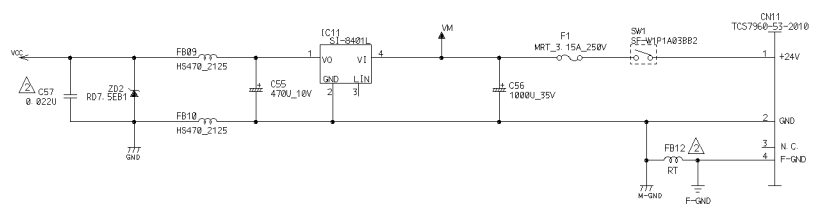
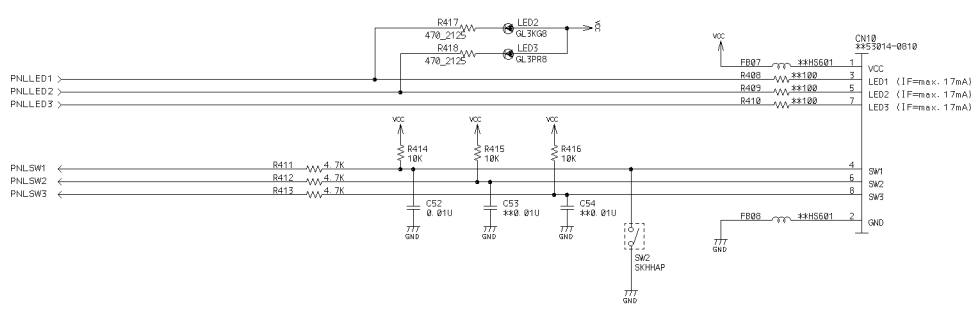
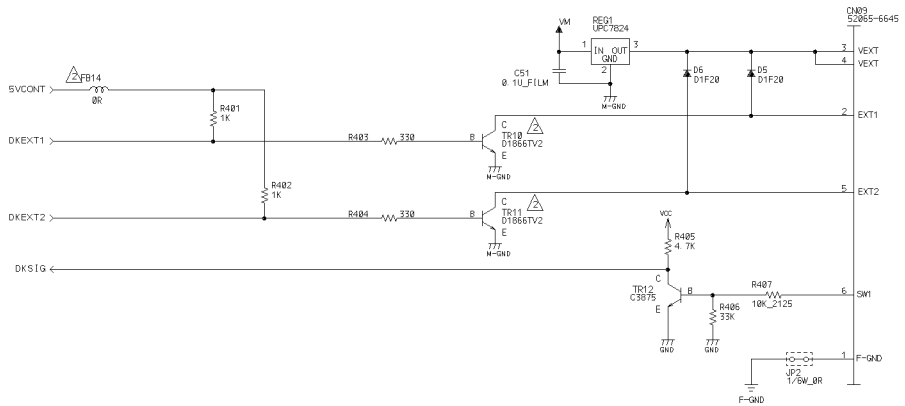
Main Logic Board (2/5)



Main Logic Board (3/5)



Main Logic Board (4/5)



Main Logic Board (5/5)

3-5-2. Parts List

Main Logic Board

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
BC01-03		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	3		
BC04-06		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	3		
BC07					NOT MOUNTED	
BC08A		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	1		
BC08B		NPN	CHEM. CAPA. 47UF 35V	1		
BC09		NPN	CHEM. CAPA. 47UF 35V	1		
BC10					NOT MOUNTED	
BC12-13					NOT MOUNTED	
C01		NPN	CERA.CAPA.CHIP1608 0.22UF 10V	1		
C02-05		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	4		
C06					NOT MOUNTED	
C21-22					NOT MOUNTED	
C23		NPN	CERA.CAPA.CHIP1608 0.1UF 25V	1		
C31		NPN	CHEM. CAPA. 47UF 35V	1		
C32					NOT MOUNTED	
C33		NPN	CERA.CAPA.CHIP1608 3900PF 50V	1		
C34-36		NPN	CERA.CAPA.CHIP1608 0.022UF 50V	3		
C41-45					NOT MOUNTED	
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		
C57		NPN	CERA.CAPA.CHIP1608 0.01UF 50V	1		
CN01		NPN	CONNECTOR B15B-PH-K-S	1		
CN02		NPN	CONNECTOR 53014-0410	1		
CN03		NPN	CONNECTOR 5483-05A	1		
CN04		NPN	CONNECTOR 53014-0412	1		
CN05		NPN	CONNECTOR 53014-0210	1		
CN06		NPN	CONNECTOR PHEC40R-R111	1		
CN07-08					NOT MOUNTED	
CN09		NPN	CONNECTOR 52065-6645	1		
CN10					NOT MOUNTED	
CN11		NPN	CONNECTOR TCS7960-53-2010	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		
F1		NPN	FUSE MRT3.15A-250V*	1		
FB01-04		NPN	CHIP BEADS IND. BK1608HS601*	4		
FB05-08					NOT MOUNTED	
FB09-10		NPN	CHIP BEADS IND. BK2125HS470*	2		
FB11		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
FB12		NPN	BEADS INDUCTOR RH035047RT-Y7	1		
FB13-14		NPN	CHIP RESISTOR 0 OHM 1/16W	2		
IC01		NPN	IC-RESET M51953BFP*E2	1		
IC02		NPN	CPU HD6412350F20	1		
IC03		NPN	GATE ARRAY LZ9FG28-TSPA	1		
IC04		NPN	FLASH MEMORY SEAL KEI-801	1		
		NPN	FLASH MEMORY 28F800BVE-BV85	1	T6.**	
IC05					NOT MOUNTED	
IC06		NPN	SRAM HY628100BLLT1-70*	1		
IC07					NOT MOUNTED	
IC08		NPN	IC-MOTOR MTD2003F-4072	1		
IC09		NPN	IC-MOTOR TA8428K	1		
IC10					NOT MOUNTED	

Main Logic Board

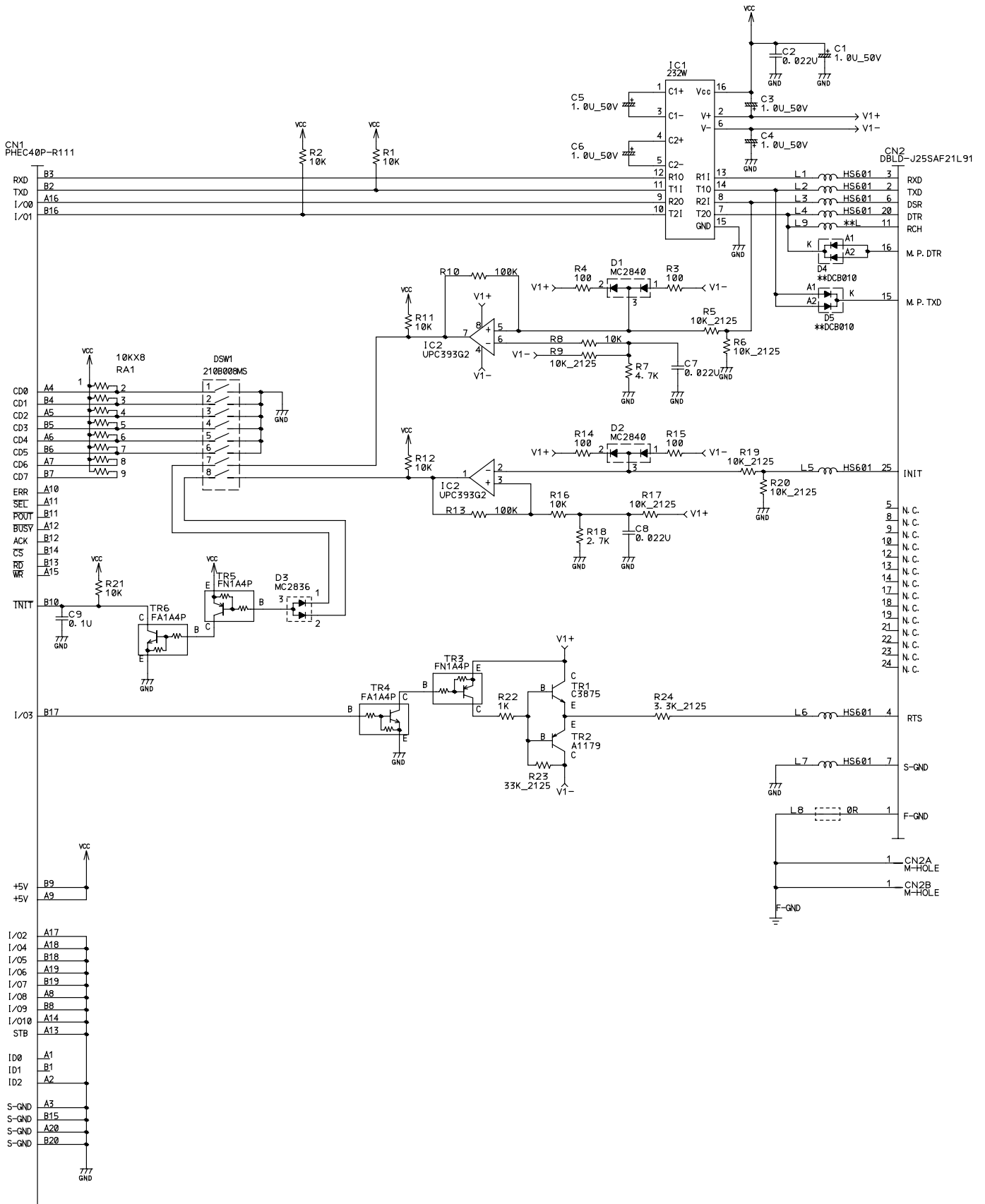
DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
IC11		NPN	IC-REG SI-8401L	1		
IC12-13					NOT MOUNTED	
JP1A					NOT MOUNTED	
JP1B		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
JP2		NPN	JUMPER WIRE 1/6W-L3.2	1		
LED1		NPN	LED CHIP LT1E40A*	1		
LED2		NPN	LED GL3KG8	1		
LED3		NPN	LED GL3PR8	1		
LED2-3		NPN	LED SPACER LH-3-8	2		
R101		NPN	CHIP RES1608 1.5 KOHM 1/16W 5%	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		
R110-111					NOT MOUNTED	
R112-116		NPN	CHIP RESISTOR 100 K-OHM 1/16W	5		
R117		NPN	CHIP RESISTOR 330 OHM 1/16W	1		
R118-119		NPN	CHIP RESISTOR 0 OHM 1/16W	2		
R120-121		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R122					NOT MOUNTED	
R123-124		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R125-128		NPN	CHIP RESISTOR 330 OHM 1/16W	4		
R129-133					NOT MOUNTED	
R134-137		NPN	CHIP RESISTOR 10 K-OHM 1/16W	4		
R138		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		
R139-140		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R141-144		NPN	CHIP RESISTOR 330 OHM 1/16W	4		
R145		NPN	CHIP RES1608 220 OHM 1/16W 5%	1		
R146					NOT MOUNTED	
R147-152		NPN	CHIP RESISTOR 330 OHM 1/16W	6		
R153-157		NPN	CHIP RESISTOR 10 K-OHM 1/16W	5		
R158					NOT MOUNTED	
R159-163		NPN	CHIP RESISTOR 100 K-OHM 1/16W	5		
R164		NPN	CHIP RESISTOR 470 OHM 1/10W	1		
R165-167		NPN	CHIP RESISTOR 100 K-OHM 1/16W	3		
R168					NOT MOUNTED	
R169-171		NPN	CHIP RESISTOR 10 K-OHM 1/16W	3		
R172		NPN	CHIP RESISTOR 330 OHM 1/16W	1		
R175-176					NOT MOUNTED	
R191		NPN	CHIP RESISTOR 0 OHM 1/16W	1		
R192		NPN	CHIP RESISTOR 100 OHM 1/16W	1		
R193-194					NOT MOUNTED	
R195		NPN	CHIP RESISTOR 2.2 K-OHM 1/16W	1		
R196		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R197		NPN	CHIP RESISTOR 15 K-OHM 1/16W	1		
R201		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R202-203		NPN	CHIP RESISTOR 10 K-OHM 1/10W	2		
R204-205		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R206-207		NPN	CHIP RESISTOR 1 K-OHM 1/16W	2		
R208-210		NPN	CHIP RESISTOR 330 OHM 1/16W	3		
R211		NPN	CHIP RESISTOR 15 K-OHM 1/16W	1		
R212		NPN	CHIP RESISTOR 1 K-OHM 1/16W	1		

Main Logic Board

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
R213-216		NPN	CHIP RESISTOR 10 K-OHM 1/16W	4		
R217		NPN	CHIP RESISTOR 15 K-OHM 1/16W	1		
R218-219		NPN	CHIP RESISTOR 1.0 OHM 1W	2		
R220-221		NPN	CHIP RESISTOR 330 OHM 1/16W	2		
R222-223		NPN	CHIP RESISTOR 10 K-OHM 1/16W	2		
R224-226		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	3		
R227-231		NPN	CHIP RESISTOR 10 K-OHM 1/16W	5		
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		
R309-310					NOT MOUNTED	
R311		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R312		NPN	CHIP RESISTOR 4.7 K-OHM 1/16W	1		
R313		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R314					NOT MOUNTED	
R315		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R316-319					NOT MOUNTED	
R320		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R321					NOT MOUNTED	
R322		NPN	CHIP RESISTOR 10 K-OHM 1/16W	1		
R323-327					NOT MOUNTED	
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		
RA01-04		NPN	RESIS. ARRAY CHIP MNR14J221*	4		
RA05-09		NPN	RESIS. ARRAY CHIP MNR14J331*	5		
RA10-11					NOT MOUNTED	
RA12		NPN	RESIS. ARRAY CHIP MNR14J103*	1		
RA13		NPN	RESIS. ARRAY CHIP MNR14J101*	1		
REG1		NPN	IC-REG UPC7824	1		
SW1		NPN	SEESAW SWITCH SF-W1P1A03BB	1		
SW2		NPN	PUSH SWITCH SKHHAP	1		
TR01		NPN	CHIP TRANSISTOR 2SA1362GR*85R	1		
TR02		NPN	CHIP TRANSISTOR 2SC3875S-G*AL	1		
TR03		NPN	CHIP TRANSISTOR 2SA1362GR*85R	1		
TR04		NPN	DIGITAL TRANSISTOR FA1A4P	1		
TR05		NPN	CHIP TRANSISTOR 2SA1649Z*	1		
TR06		NPN	CHIP TRANSISTOR 2SA1338-67*TA	1		
TR07-09		NPN	DIGITAL TRANSISTOR FA1A4P	3		
TR10-11		NPN	TRANSISTOR 2SD1866TV2*	2		
TR12		NPN	CHIP TRANSISTOR 2SC3875S-G*AL	1		
VR1-2					NOT MOUNTED	
XTAL		NPN	CERA. OSC CHIP EFOJM2005E5*	1		
ZD1		NPN	ZENER DIODE CHIP HZU20B2TRF	1		
ZD2		NPN	ZENER DIODE RD7.5EB1T	1		

3-6. Serial Interface Board (25 pin)

3-6-1. Circuit Diagram



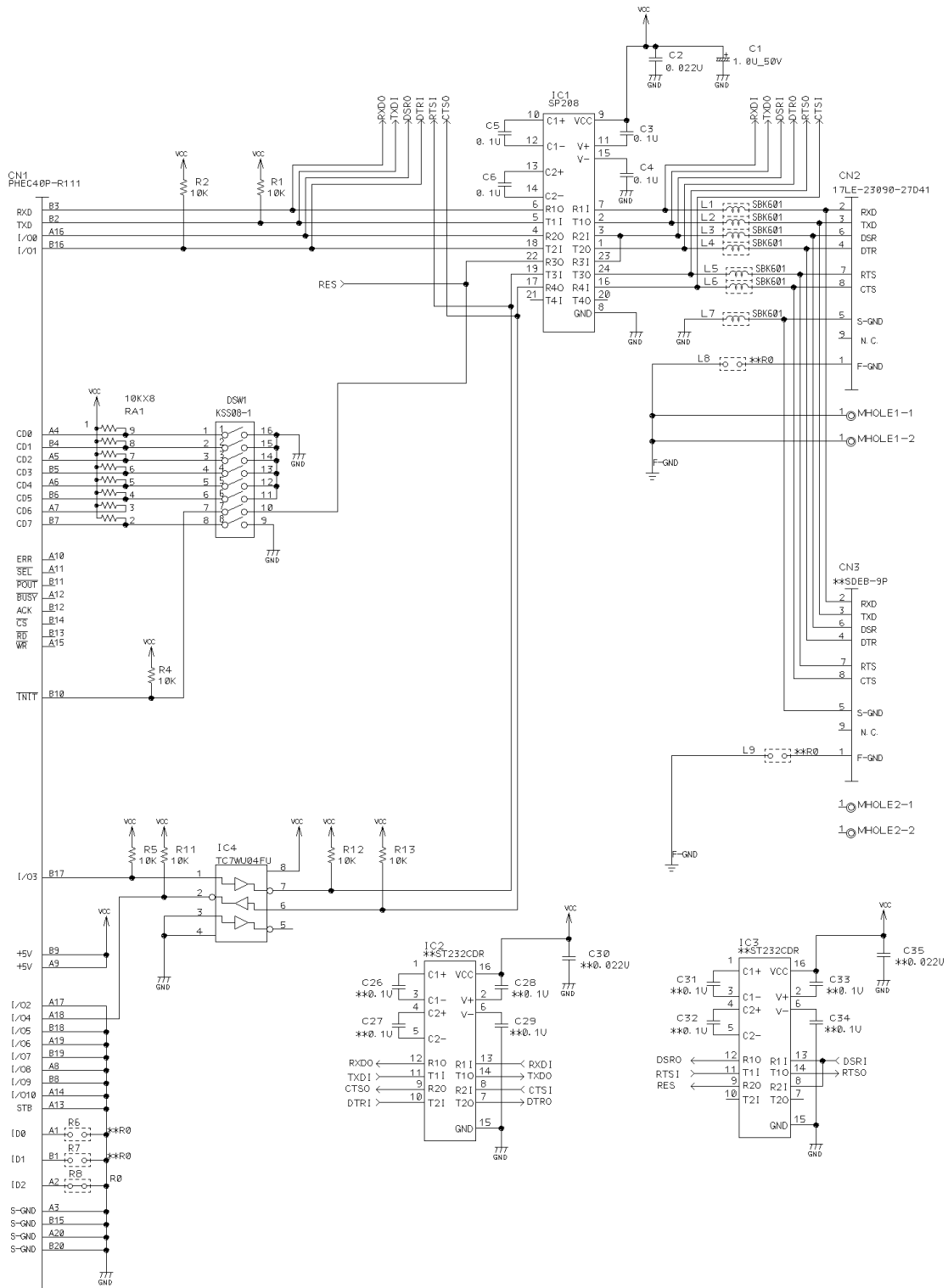
3-6-2. Parts List

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 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		

3-7. Serial Interface Board (9 pin)

3-7-1. Circuit Diagram



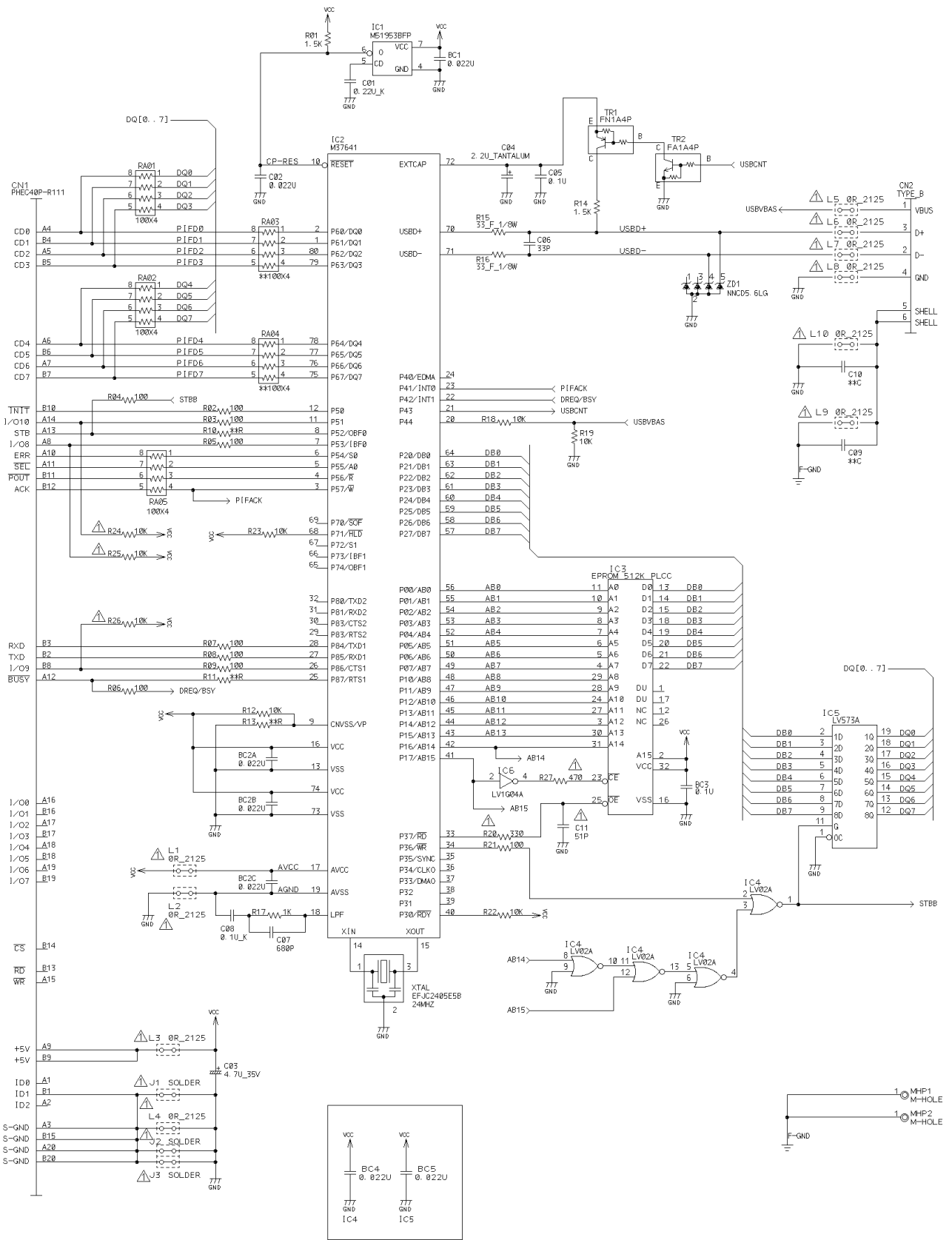
3-7-2. Parts List

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	

3-8. USB Interface Board

3-8-1. Circuit Diagram



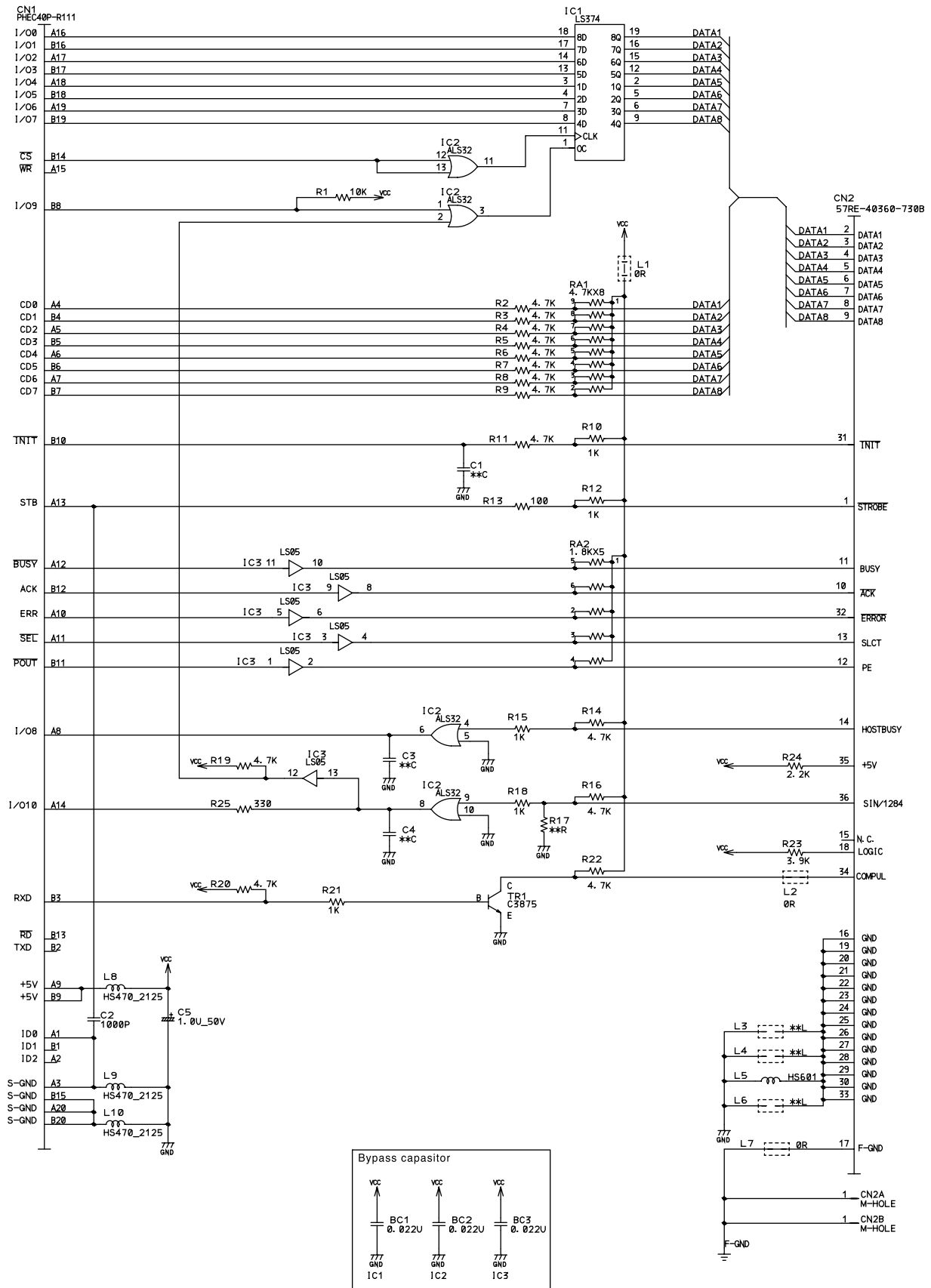
3-8-2. Parts List

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. CHIP 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 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		

3-9. Parallel Interface Board

3-9-1. Circuit Diagram



3-9-2. 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		
L3-6		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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