

SERVICE MANUAL

MULTIPLE COMPACT DISC
PLAYER

CDC-9230

interM

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MADE IN KOREA
NO: 9007979100

interM

■ KS88-SERIES MICROCONTROLLERS

Samsung's KS88 series of 8-bit single-chip CMOS microcontrollers offers a fast and efficient CPU, a wide range of integrated peripherals, and various mask-programmable ROM sizes. Among the major CPU features are:

- Efficient register-oriented architecture
- Selectable CPU clock sources
- Idle and Stop power-down mode release by interrupt
- Built-in basic timer with watchdog function

A sophisticated interrupt structure recognizes up to eight interrupt levels. Each level can have one or more interrupt sources and vectors. Fast interrupt processing (within a minimum of four CPU clocks) can be assigned to specific interrupt levels.

■ KS88C2416/P2416/C2432/P2432 MICROCONTROLLER

The KS88C2416/P2416/C2432/P2432 single-chip CMOS microcontroller are fabricated using the highly advanced CMOS process, based on Samsung's newest CPU architecture.

The KS88C2416 is a microcontroller with a 16-Kbyte mask-programmable ROM embedded.
The KS88C2432 is a microcontroller with a 32-Kbyte mask-programmable ROM embedded.

The KS88P2416 is a microcontroller with a 16-Kbyte one-time-programmable ROM embedded.
The KS88P2432 is a microcontroller with a 32-Kbyte one-time-programmable ROM embedded.

Using a proven modular design approach, Samsung engineers have successfully developed the KS88 C2416/P2416/C2432/P2432 by integrating the following peripheral modules with the powerful SAM8 core:

- Six programmable I/O ports, including five 8-bit ports and one 5-bit port, for a total of 45 pins.
- Eight bit-programmable pins for external interrupts.
- One 8-bit basic timer for oscillation stabilization and watchdog functions (system reset).
- Two 8-bit timer/counter and two 16-bit timer/counter with selectable operating modes.
- Watch timer for real time.
- 8-input A/D converter
- Serial I/O interface

The KS88C2416/P2416/C2432/P2432 is versatile microcontroller for camera, LCD and ADC application, etc. They are currently available in 80-pin TQFP and 80-pin QFP package.

■ OTP

The KS88P2416/P2432 are OTP (One Time Programmable) version of the KS88C2416/C2432 microcontroller. The KS88P2416 microcontroller has an on-chip 16-Kbyte one-time-programmable EPROM instead of a masked ROM. The KS88P2432 microcontroller has an on-chip 32-Kbyte one-time-programmable EPROM instead of a masked ROM. The KS88P2416 is comparable to the KS88C2416, both in function and in pin configuration. The KS88P2432 is comparable to the KS88C2432, both in function and in pin configuration.

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■ FEATURES

Memory

- ROM: 32-Kbyte (KS88C2432/P2432)
- ROM: 16-Kbyte (KS88C2416/P2416)
- RAM: 1056-Byte (KS88C2432/P2432, KS88C2424/P2424)
- RAM: 544-Byte (KS88C2416/P2416, KS88C2408/P2408)
- Data memory mapped I/O

Oscillation Sources

- Crystal, ceramic, RC (main)
- Crystal for subsystem clock
- Main system clock frequency 1-10 MHz (3 MHz at 1.8 V, 10 MHz at 2.7 V)
- Subsystem clock frequency: 32.768 kHz
- CPU clock divider (1/1, 1/2, 1/8, 1/16)

Two Power-Down Modes

- Idle (only CPU clock stops)
- Stop (System clock stops)

Interrupts

- 6 level 8 vector 8 internal interrupt
- 2 level 8 vector 8 external interrupt

45 I/O Pins

- 45 configurable I/O pins

Basic Timer

- Overflow signal makes a system reset
- Watchdog function

8-Bit Timer/Counter A

- Programmable 8-bit timer
- Interval, capture, PWM mode
- Match/capture, overflow interrupt

8-Bit Timer/Counter B

- Programmable 8-bit timer
- Carrier frequency generator

16-Bit Timer/Counter 0

- Programmable 16-bit timer
- Match interrupt generates

16-Bit Timer/Counter 1

- Programmable 16-bit timer
- Interval, capture, PWM mode
- Match/capture, overflow interrupt

- Real-time and interval time measurement
- Clock generation for LCD
- Four frequency outputs for buzzer sound

LCD Controller/Driver

- Maximum 16-digit LCD direct drive capability
- Display modes: static, 1/2 duty (1/2 bias)
- 1/3 duty (1/2 or 1/3 bias), 1/4 duty (1/3 bias)

A/D Converter

- Eight analog input channels
- 50 μ s conversion speed at 1 MHz f_{ADC} clock
- 10-bit conversion resolution

8-Bit Serial I/O Interface

- 8-bit transmit/receive mode
- 8-bit receive mode
- LSB-first/MSB-first transmission selectable
- Internal/external clock source

Voltage Booster

- LCD display voltage supply
- S/W control en/disable
- 3.0 V drive

Voltage Detector

- Programmable detection voltage (2.2V, 2.4V, 3.0V, 4.0V)
- En/Disable S/W selectable

Instruction Execution Times

- 400 ns at 10 MHz (main)
- 122 us at 32.768 kHz (subsystem)

Operating Temperature Range

- -40°C to 85°C

Operating Voltage Range

- 1.8V to 5.5V

Package Type

- 80-pin QFP
- 80-pin TQFP

KS88C2432's ROM version device

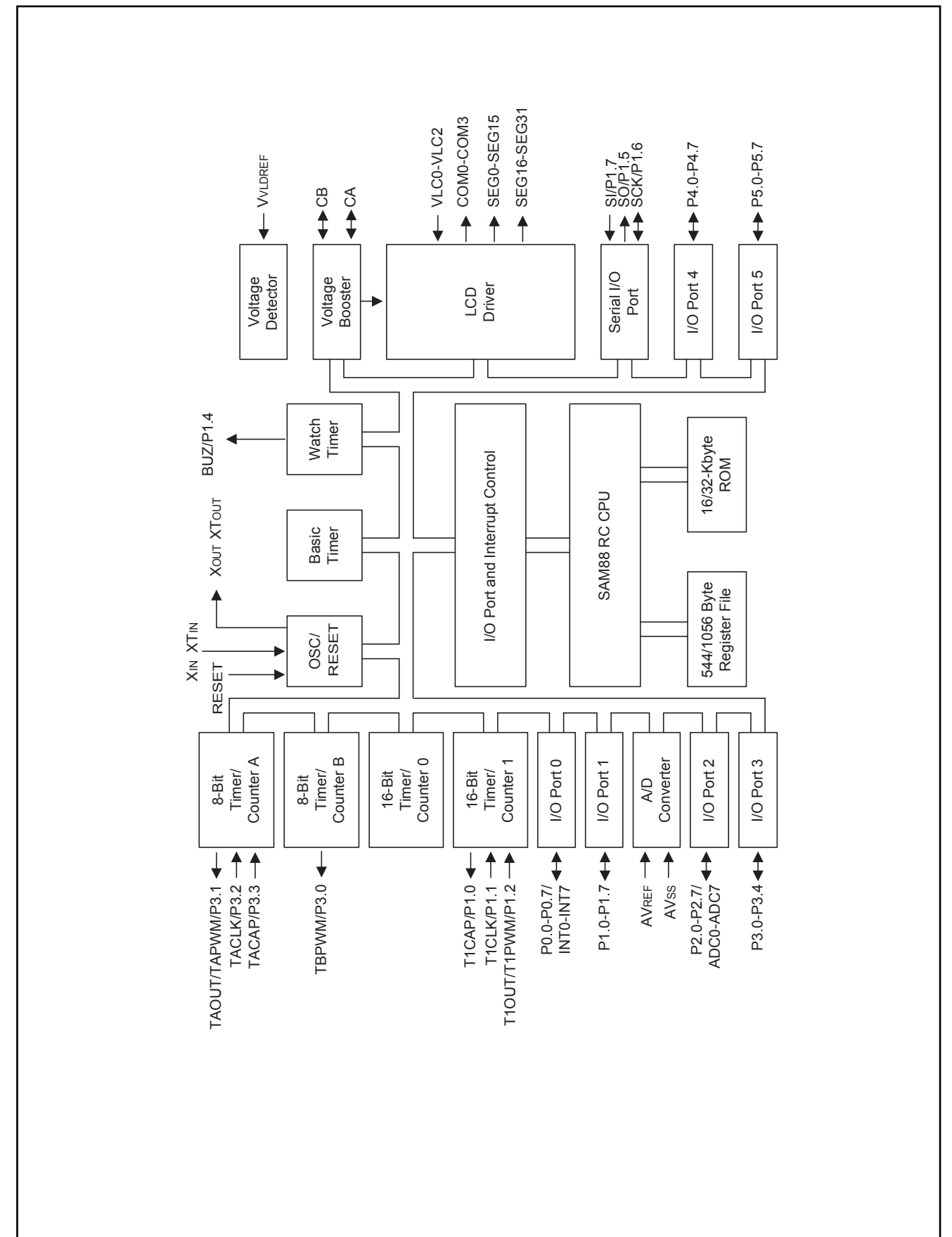
- KS88C2424 (ROM 24 Kbyte)

KS88C2432's ROM version device

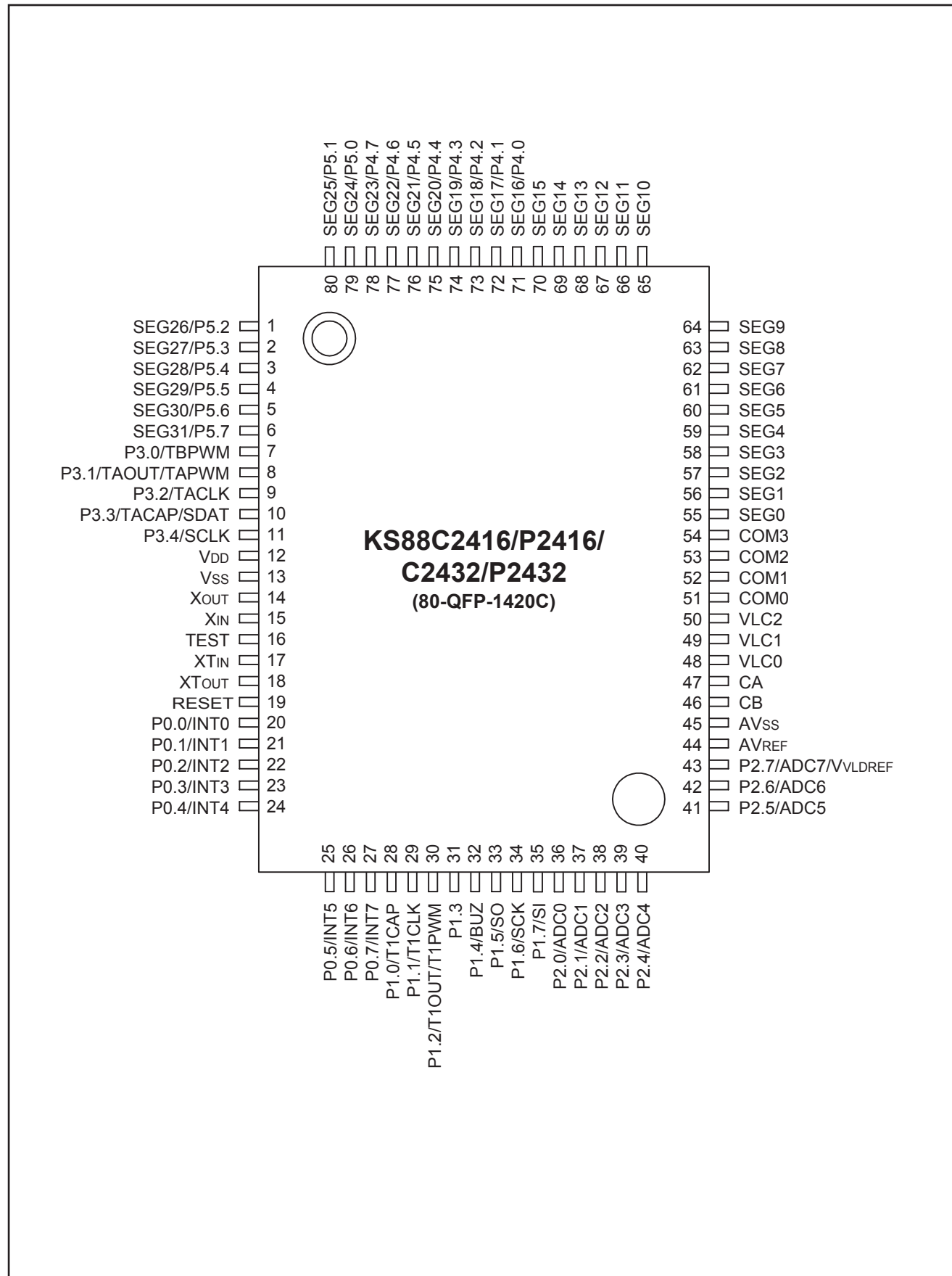
- KS88C2408 (ROM 8 Kbyte)

Watch Timer

■ BLOCK DIAGRAM



PIN ASSIGNMENT



SPECIFICATIONS

TYPICAL AUDIO PERFORMANCES

- Number of Channels2
- Frequency Range20Hz–20kHz±0.5dB
- Signal to Noise RatioMore than 90dB
- Dynamic RangeMore than 60dB
- Total Harmonic DistortionLess than 0.005% at 1kHz
- Wow and FlutterQuartz crystal precision
- Audio Output Level2 Volts RMS

OPTICAL READOUT SYSTEM

- LaserSemiconductor A1GaAs
- Wave Length760-800 nm
- Numerical Aperture0.45

SIGNAL FORMAT

- D/A Conversion1 bit (Bit stream Conversion)
- Digital Filter8 times oversampling

DISC

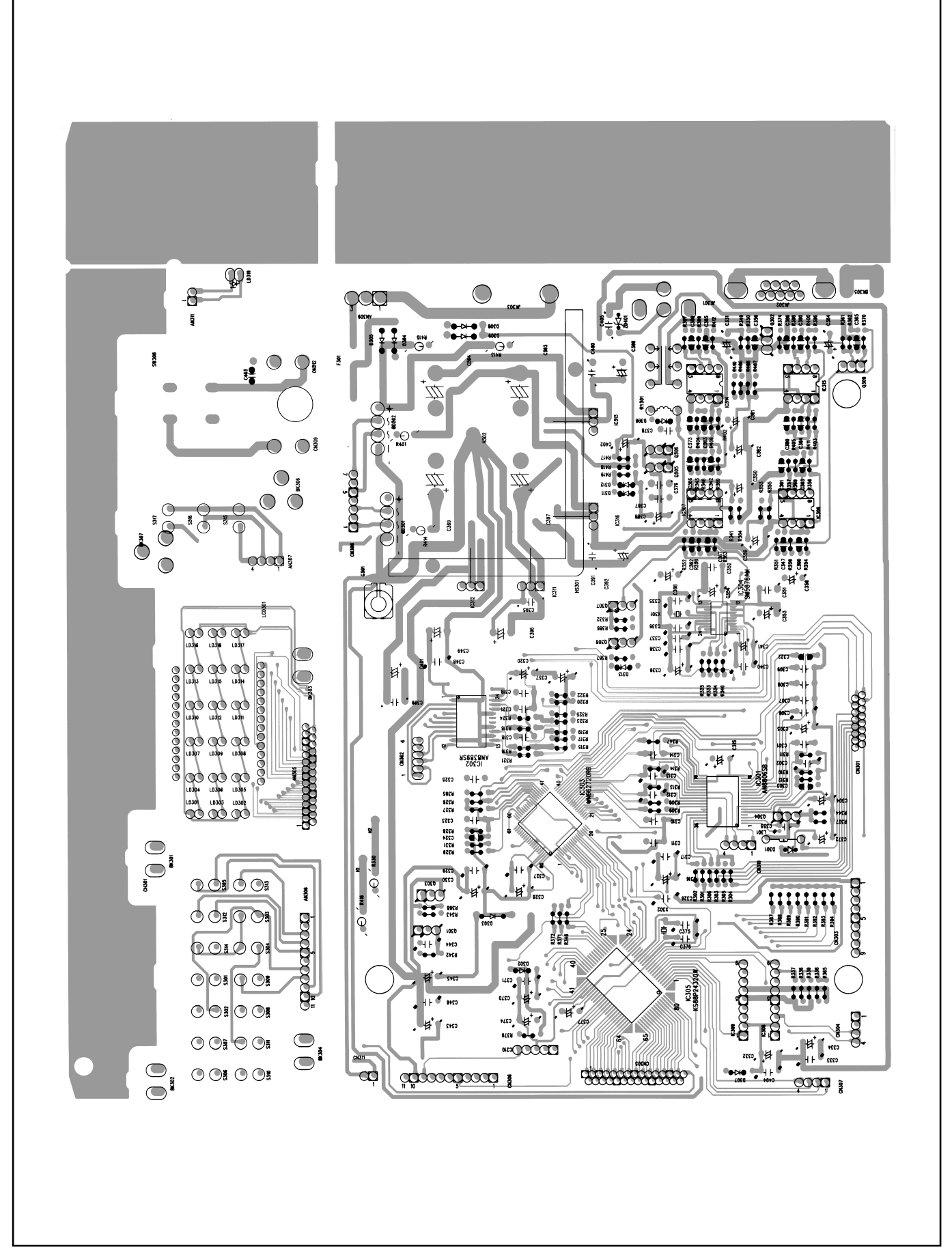
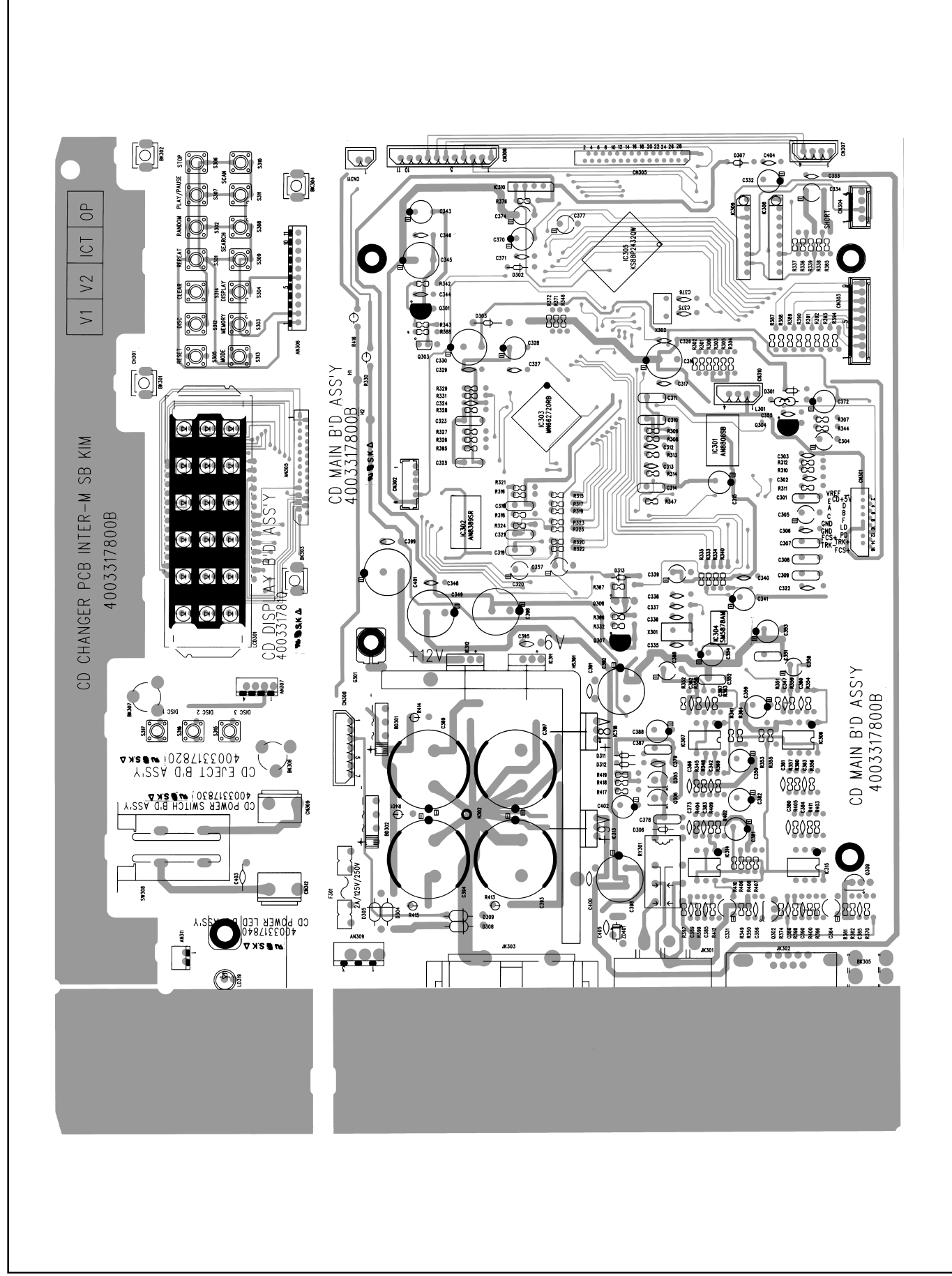
- Diameter120 mm/80 mm
- Thickness1.2 mm
- Rotation Speed500-200 rpm
- Playing Time (Theoretical)74 min. (stereo)
- Track Pitch1.6µm
- MaterialPlastic

GENERAL

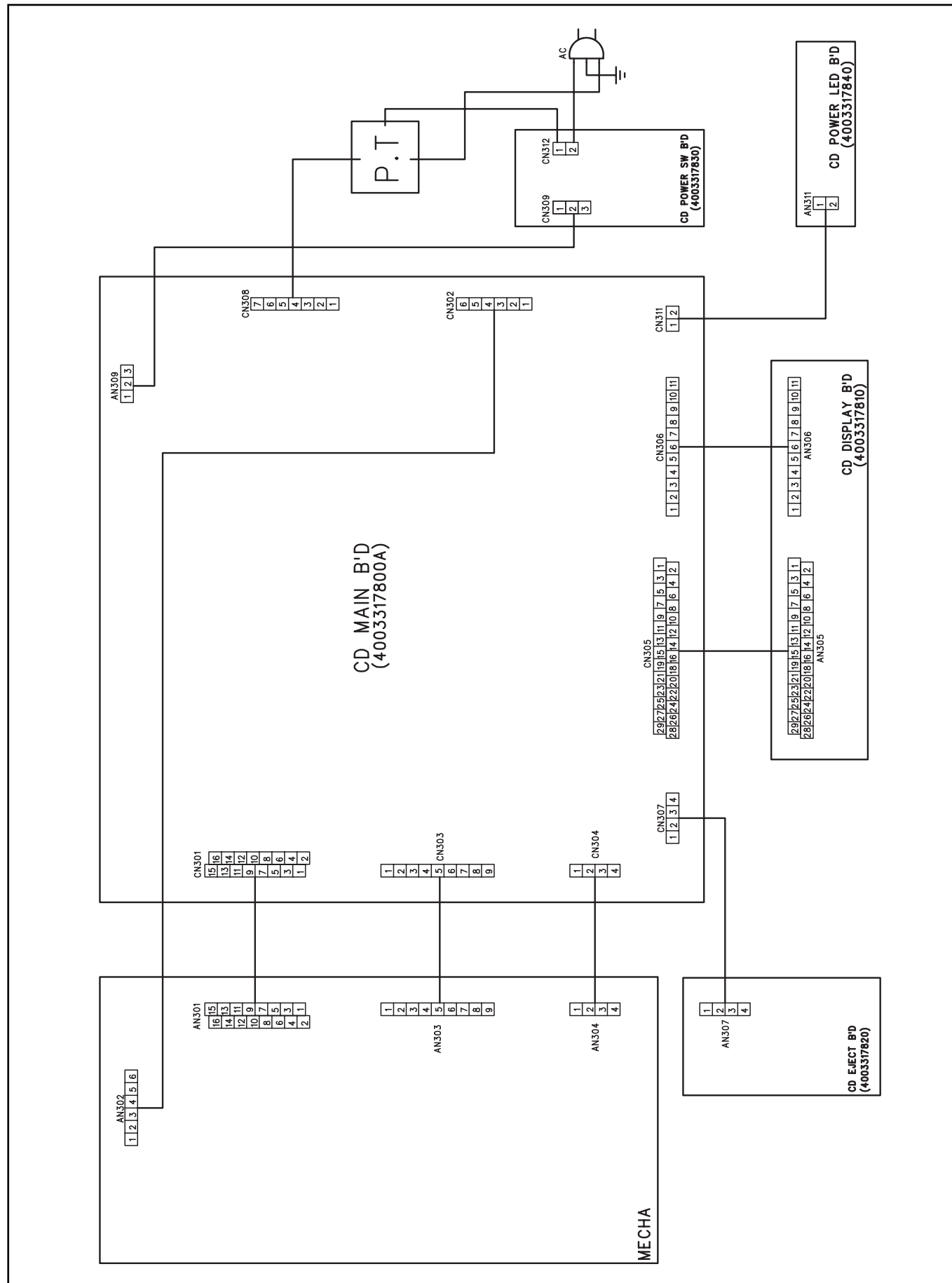
- Power SourceAC 110V–240V, 50/60Hz
- Power Consumption16W
- Weight6kg
- Dimensions482(W) × 88(H) × 280(D)mm

*Specifications and design subject to change without notice for improvements.

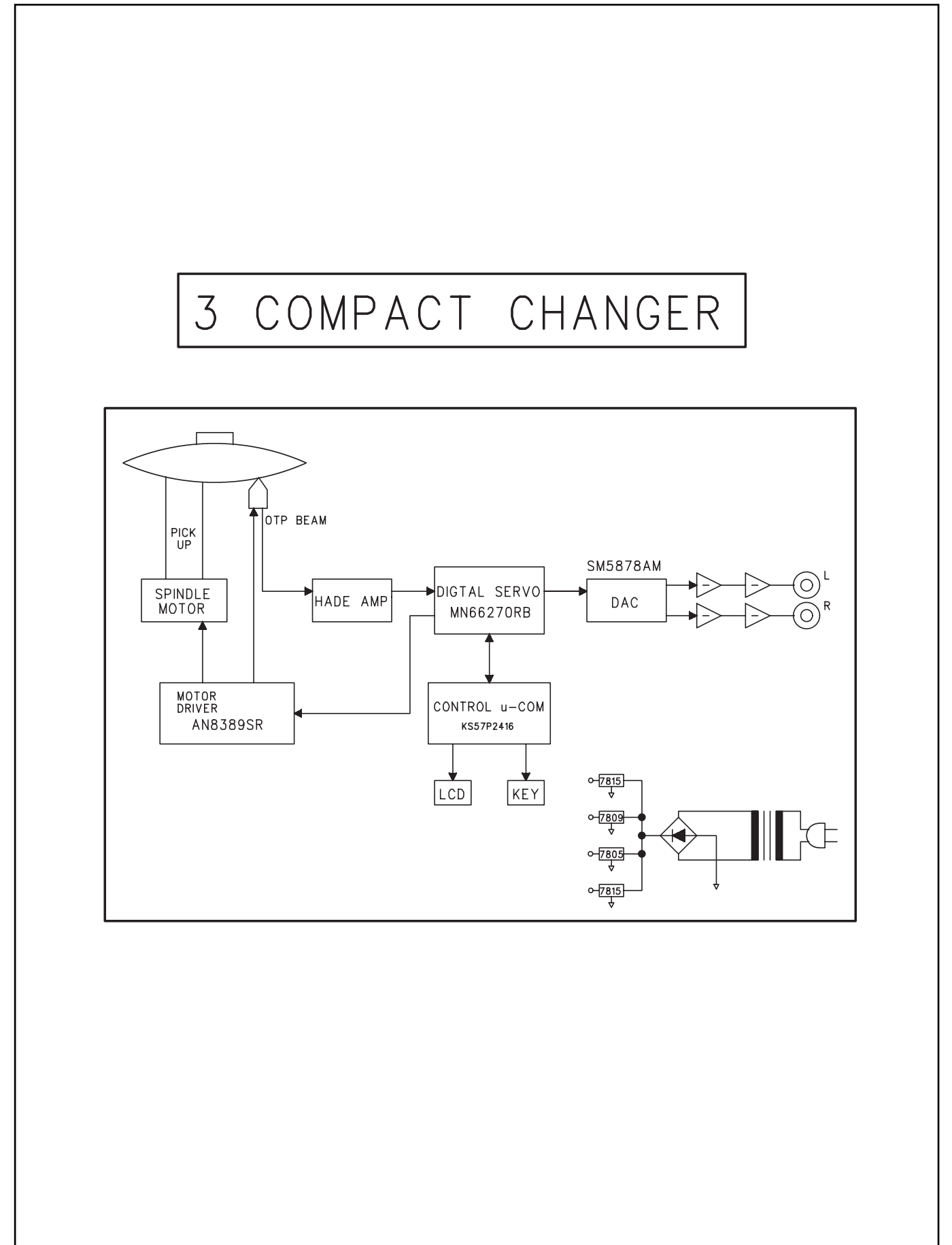
TOP AND BOTTOM VIEW OF P.C. BOARD



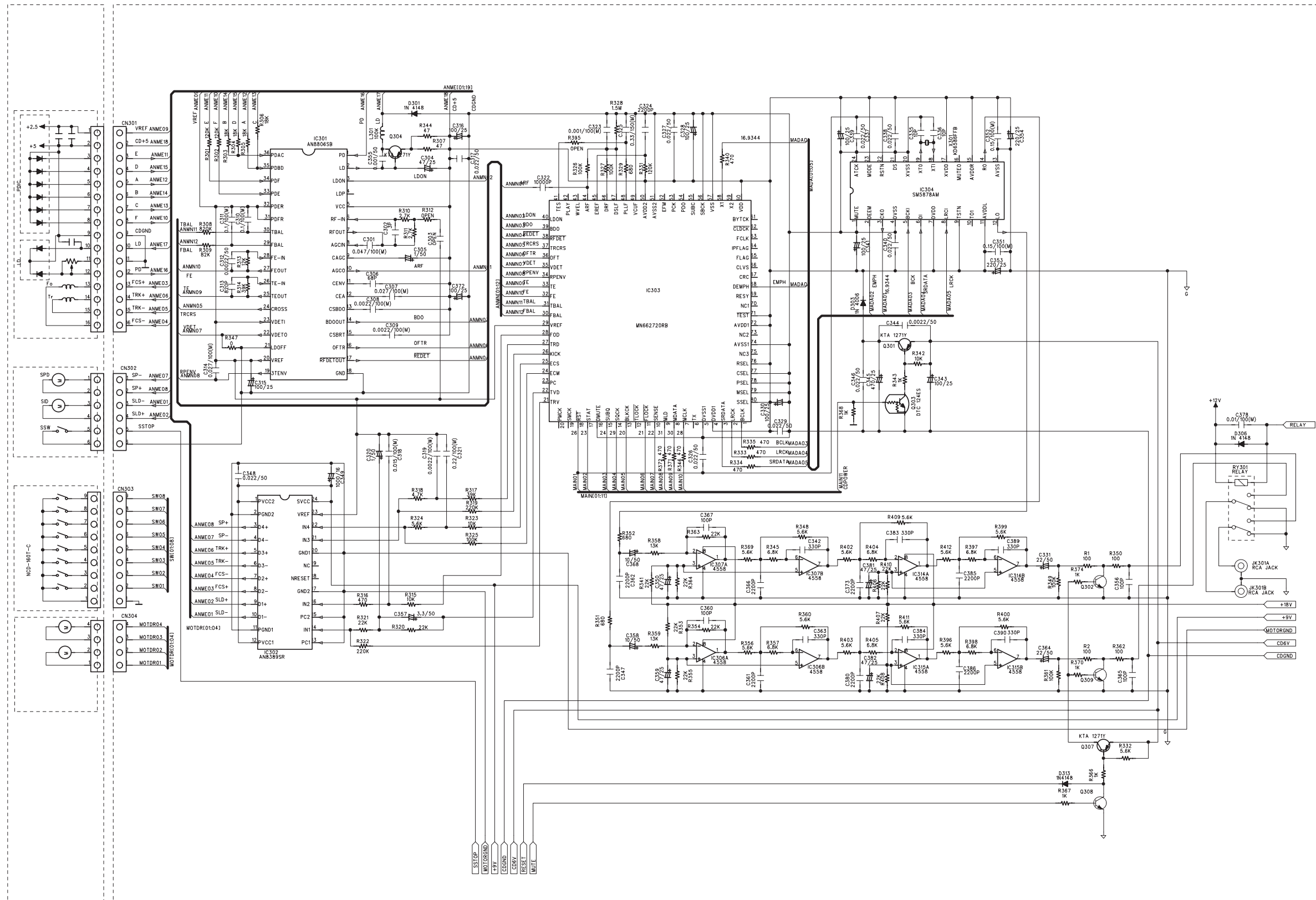
WIRING DIAGRAM

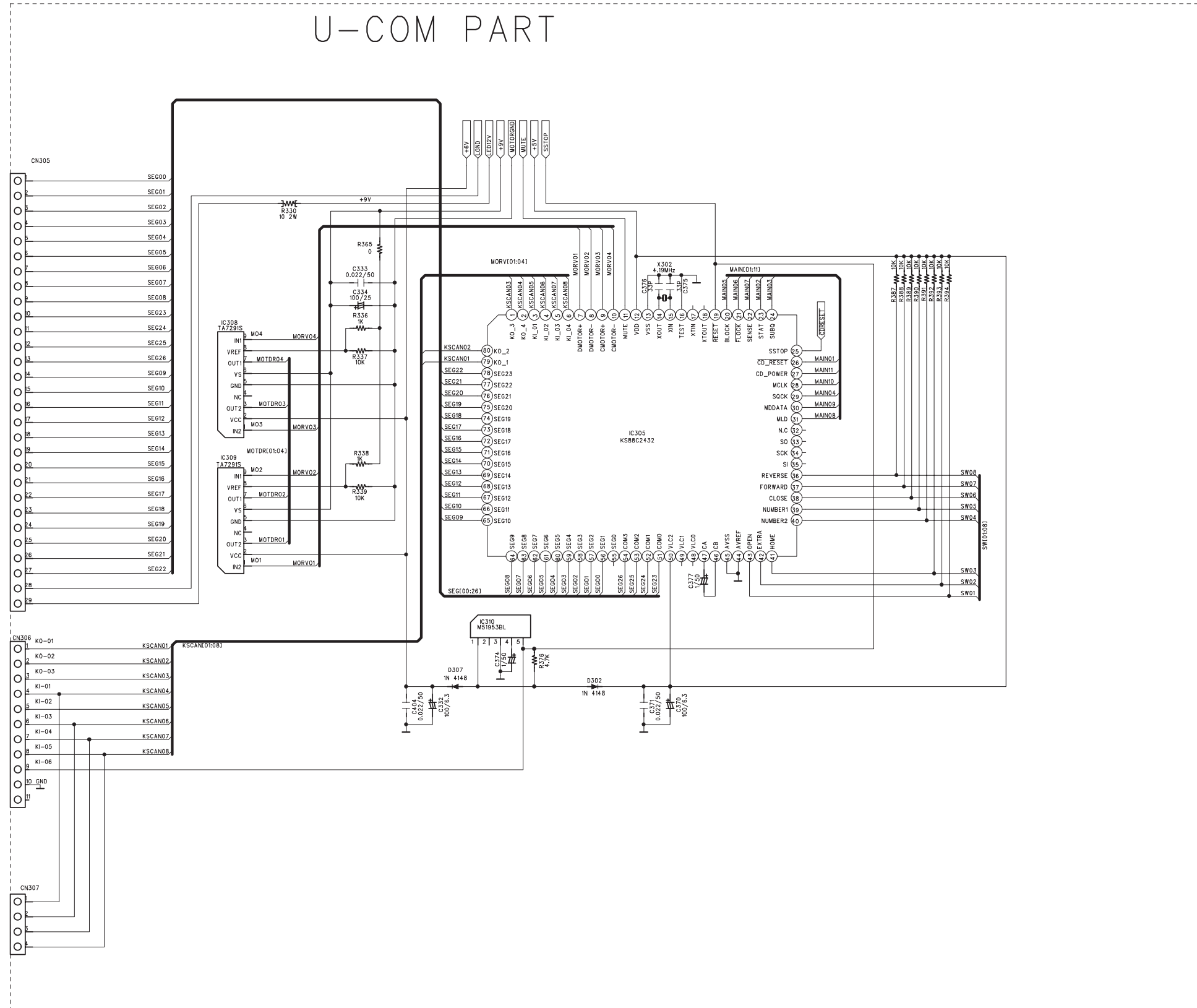
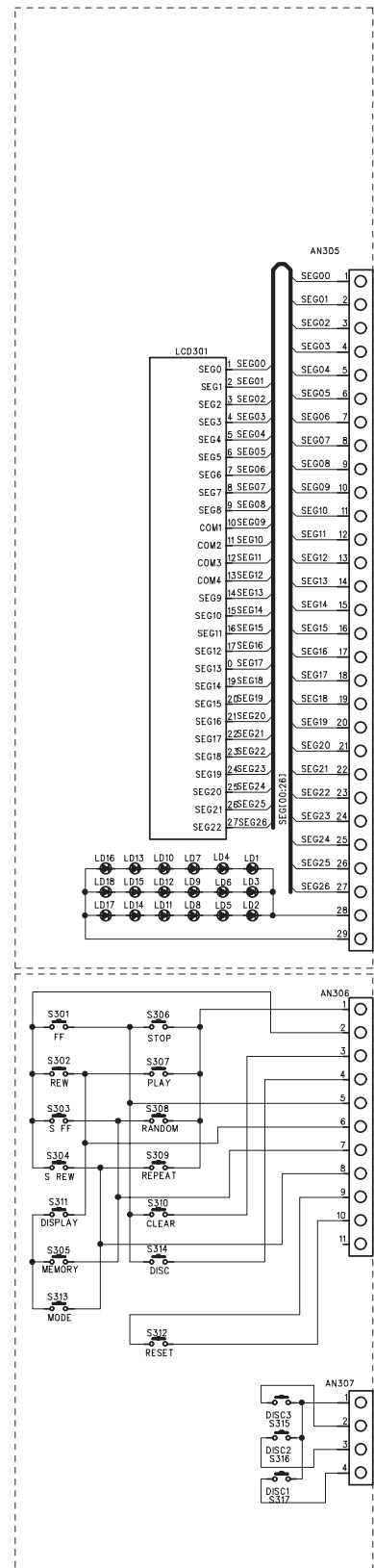


BLOCK DIAGRAM

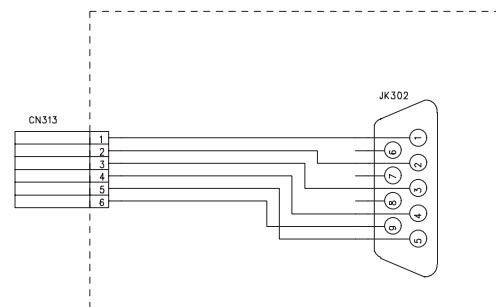
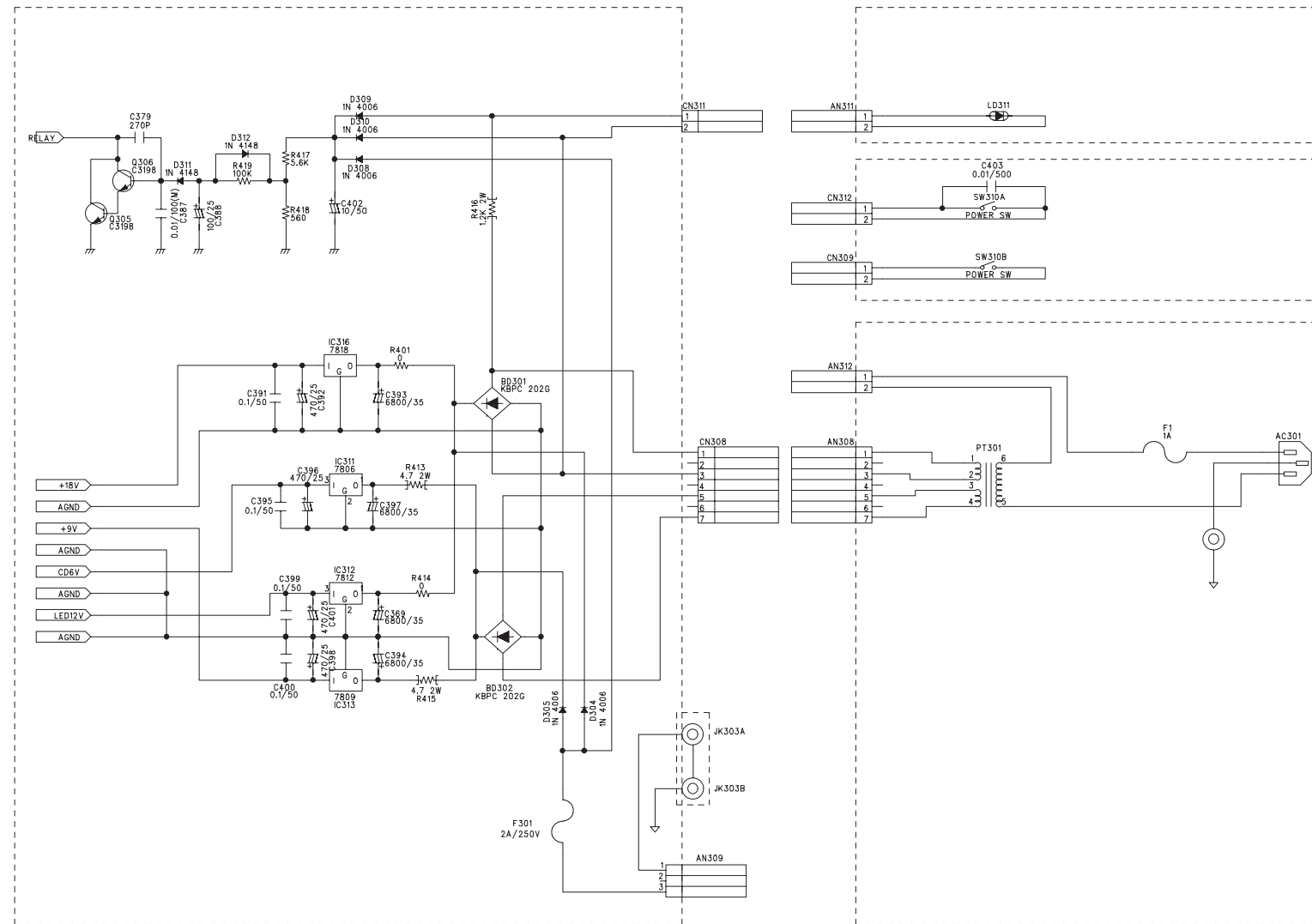


SIGNAL PROCESS PART

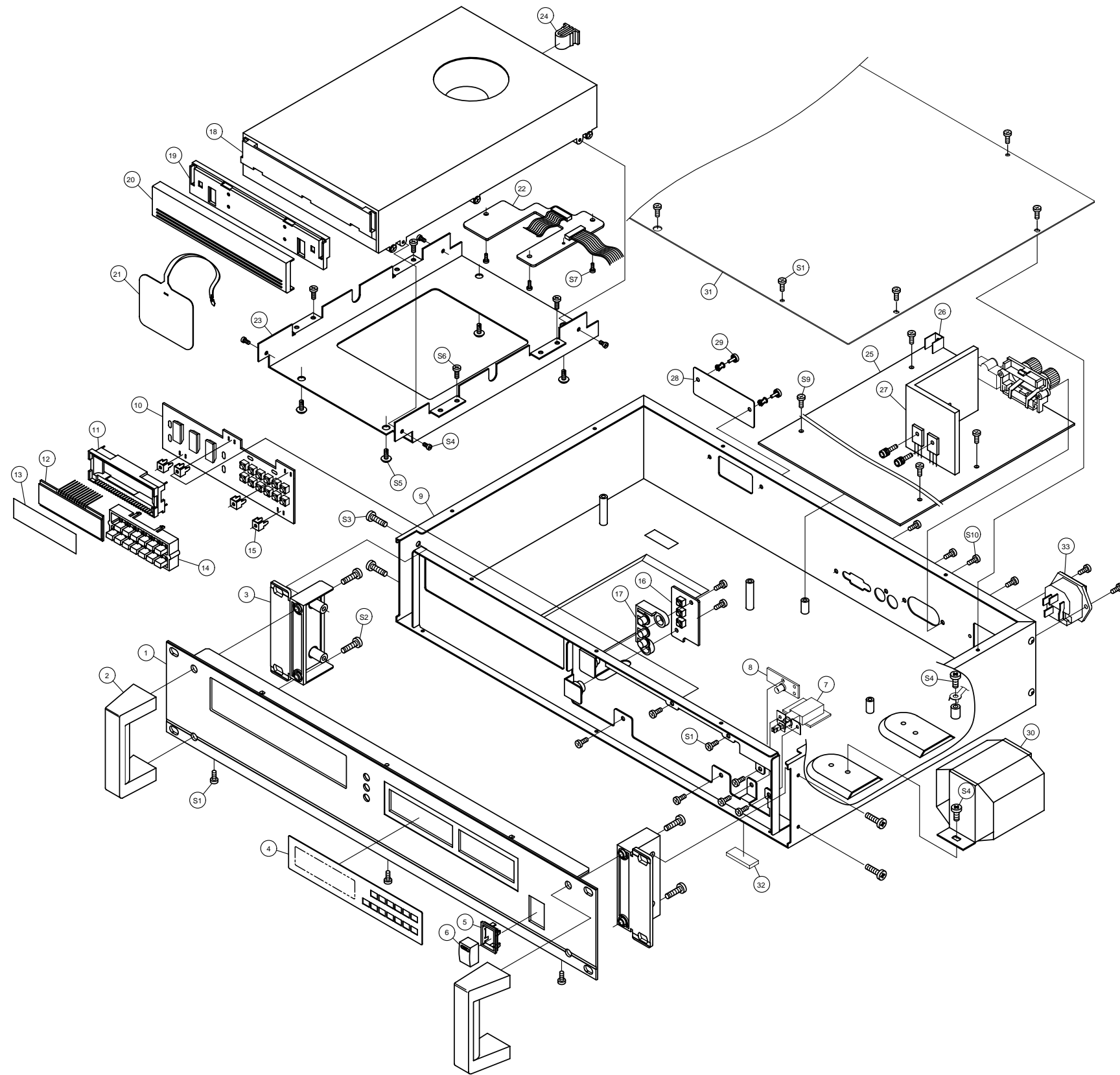




POWER PART



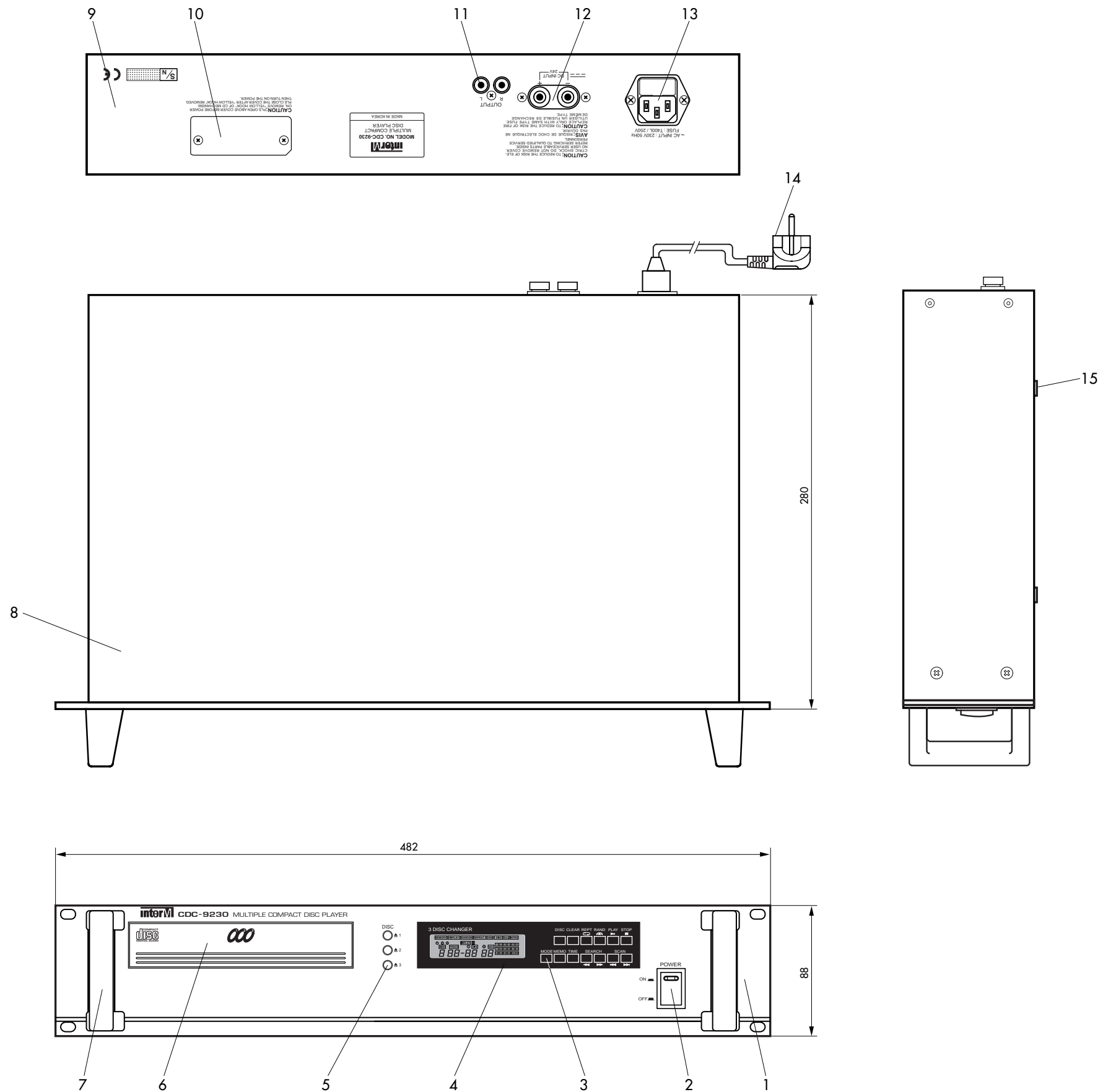
EXPLODED VIEW OF CABINET & CHASSIS/MECHANICAL PARTS LIST



CDC-9230 EXPLODED VIEW DWG PARTS, LIST

N0	PARTS NAME	PARTS NO	Q'TY	DESCRIPTION
1	FRONT PANEL	048602971611	1	
2	HANDLE	048603995220	2	
3	GUIDE HANDLE	8543994220	2	
4	CD INLAY	048575989211	1	
5	BEZEL PUSH	8523995510	1	
6	KNOB PUSH	8543987210	1	
7	POWER SW	4648099110	1	
8	SUB B'D	4005409900	1	
9	MAIN CHASSIS	046121678811	1	
10	CD DISPLAY B'D	4003317810	1	
11	LCD SUPPORT	8575990810	1	
12	LCD	2338170394	1	
13	FILTER	8545988310	1	
14	TACT KNOB	048545988911	1	
15	BRACKET PCB	6505936410	4	
16	EJECT SW B'D	4003317820	1	
17	TACT KNOB	048545989021	1	
18	CD MECHANISM	5708999310	1	
19	CD DOOR(IN)	8543986310	1	
20	CD DOOR	048543986214	1	
21	CD LOCK LABEL	8575988910	1	
22	CD SUB B'D		1	
23	BRACKET CD MECHA	6503973820	1	
24	LOCKER CORK	5708999310	1	
25	MAIN B'D	4003317800	1	
26	BRACKET PCB	6505968010	1	
27	TR HEAT SINK	7505297410	1	
28	TUNER HOLE COVER	8575992010	1	
29	SNAP RIVET	6538998810	2	
30	POWER TRANS	2828065100	1	
31	TOP COVER	046123694710	1	
32	FOOT	6735991210	4	
33	AC INLET	4448996710	1	
S1	SCREW #3BTC 3X6B	8109330063	19	
S2	SCREW #3BTC 4X18Y	8109340181	4	
S3	SCREW #2BTC 4X12B	8109240123	4	
S4	SCREW #3BTC 4X6B	8109340063	3	
S5	SCREW #2BTC 3X12Y	8109230121	4	
S6	SCREW #2BTC 2.6X8B	8109226087	4	
S7	SCREW 2BTC 2X5N	8109220054	3	
S8	SCREW BM 3X8N	8009130084	4	
S9	SCREW BM 3X6N	8009130064	4	
S10	SCREW #2BTC 3X8B	8109230083	6	

ASS'Y DRAWING



No.	Description	Part No	Q'ty	Remark
1	FRONT PANEL	048602971611	1	
2	PUSH KNOB	8543987210	1	
3	TACT KNOB	048545989021	1	
4	CD INLAY	048545988211	1	
5	TACT KNOB	048545988911	1	
6	CD DOOR	048543986215	1	
7	HANDLE(2SIZE)	048603995220	2	
8	TOP COVER	046123694710	1	
9	MAIN CHASSIS	046121678821	1	220V
		046121678822	1	230V
		046121678823	1	120V
		046121678824	1	240V
10	B.K.T	6503973810	1	
11	RCA JACK	4438194510	1	
12	DC TERMINAL 2P	4438094610	1	
13	AC INLET	4448996810	1	
14	AC CORD	4308997310	1	
15	RUBBER FOOT	6735991210	4	

NOTE