

SERVICE

MANUAL

COMPACT DISC

RECEIVER

ACR-60/120

interM

<http://www.inter-m.com>
MADE IN KOREA
NO: 9007978900

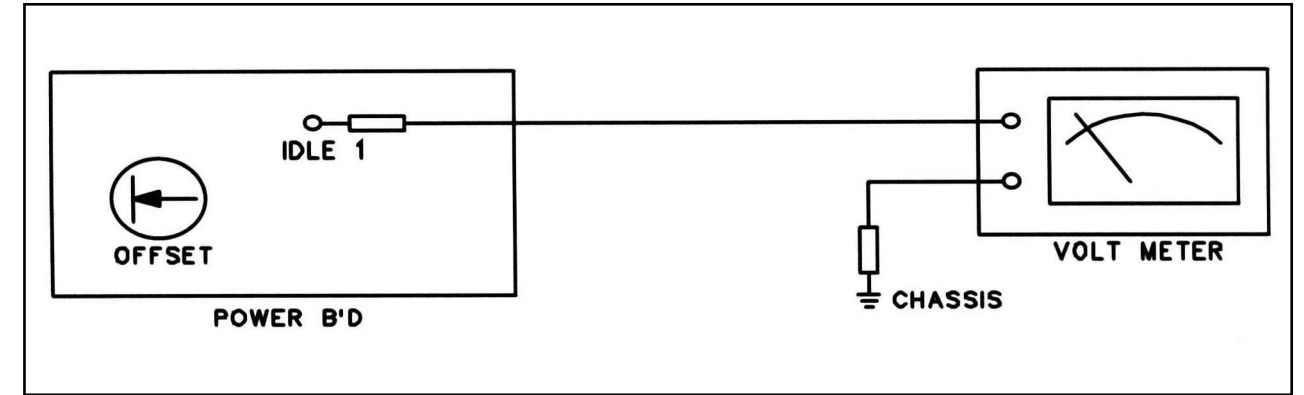
interM

ELECTRICAL ADJUSTMENT PROCEDURE

■ AMP SECTION

1. OFF SET VOLTAGE

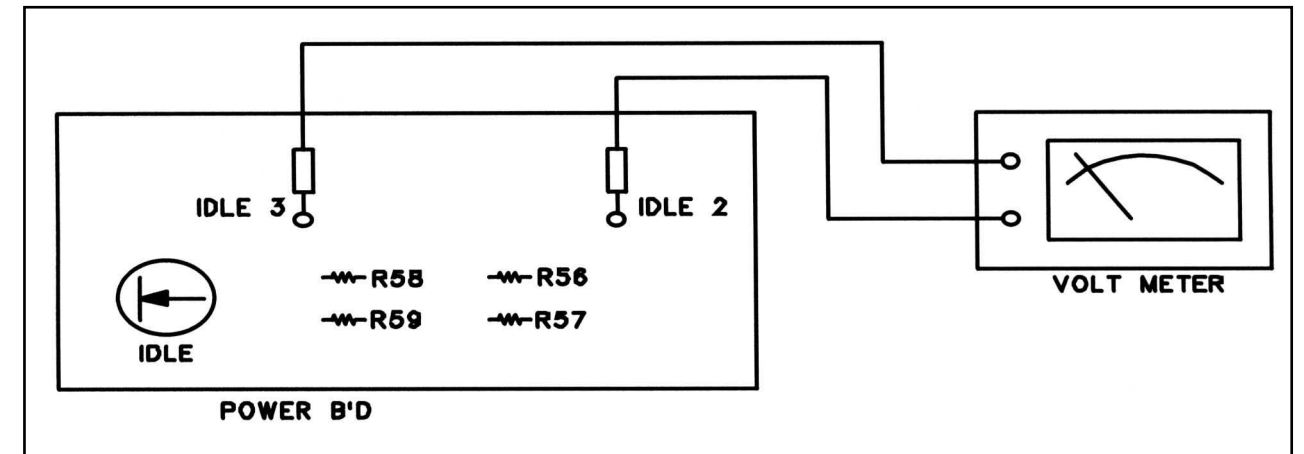
- A. Setting
Set the master volume controls minimum.
- B. Connection



- C. Adjustment
Control OFFSET until voltmeter is the "0" position.

2. IDLE CURRENT

- A. Setting
Set the master volume controls minimum.
- B. Connection



- C. Adjustment
Adjust IDLE so that the current through the R56, R57, R58, R59 become 10 milliamperes. When that voltage across the IDLE2 TO IDLE3 becomes 10 millivolt, the current becomes 10 milliamperes.

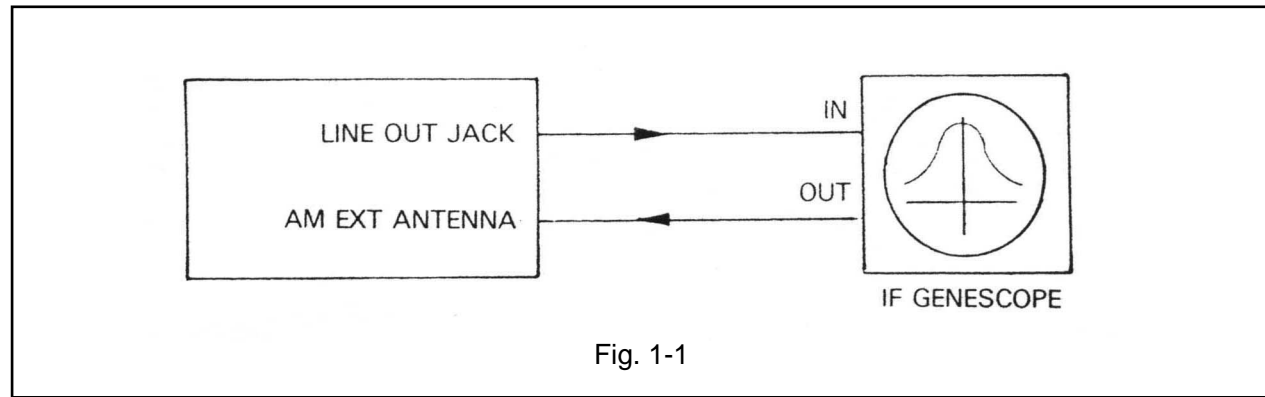
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■ AM SECTION

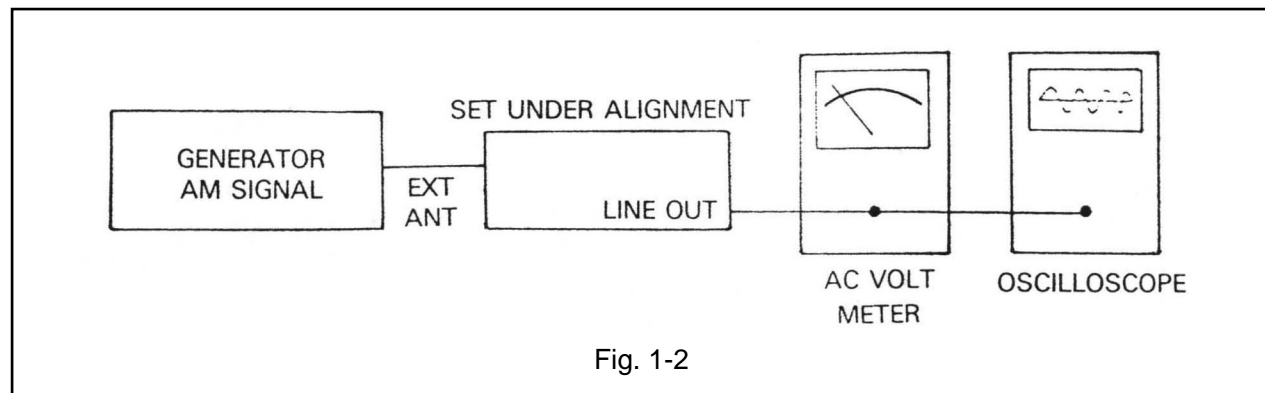
1. IF ALIGNMENT

- Set up the test equipment as Fig. 1-1 and set the genescope output level to 110dB (300mV).
- Adjust T603 so that the figure developed on the oscilloscope become laterally symmetrical with the axis of symmetry at 450kHz and it has a maximum amplitude as well.



2. RF TUNING ALIGNMENT

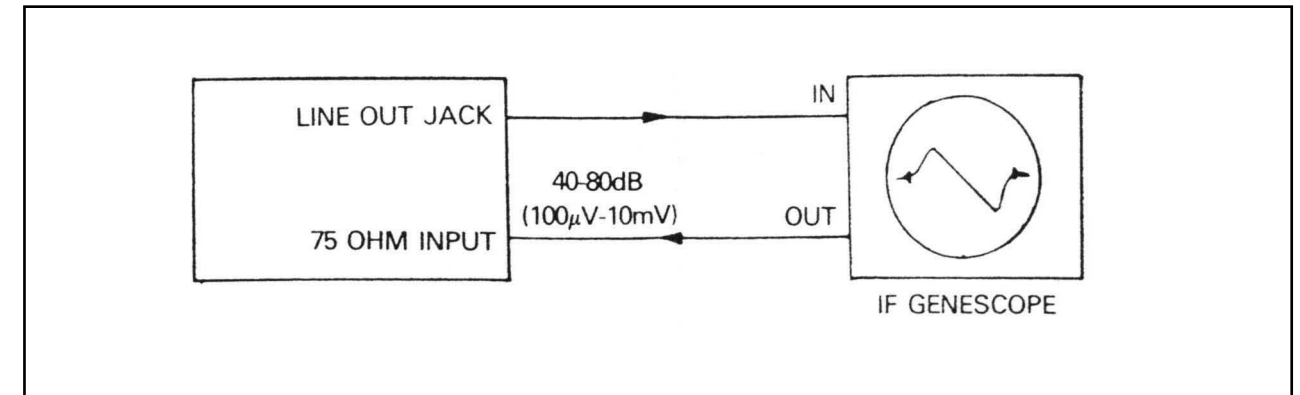
- Set up the test equipment as Fig. 1-2.
- Set AM SG to 30% modulation at 400Hz and 30-40dB output.
- Set the up and down switch of the frequency display to 603 (or 600) kHz.
Adjust AM SG to 603 (or 600) kHz, adjust T602 (RF) to maximize audio frequency output level.
- Set the up and down switch of the frequency display to 1404 (or 1400) kHz, adjust AM SG to 1404 (or 1400) kHz, and adjust AM trimmer capacitor C605 to maximize audio frequency output level.
- Repeat steps and so that output is maximized at the given frequencies.



■ FM SECTION

1. IF ALIGNMENT

- Set up the test equipment as Fig. 2-1.
- Adjust the cross T604 and T605 so that the S curve developed on the oscilloscope become point symmetry to the centry frequency poine of 10.7MHz with a maximum amplitude.
- If the genescope is not available, set the unit detuned and adjust the cross of T604, T605 so that noise output is maximized.



■ 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.

■ 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
- 1 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

Watch Timer

- 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
- 50µs 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

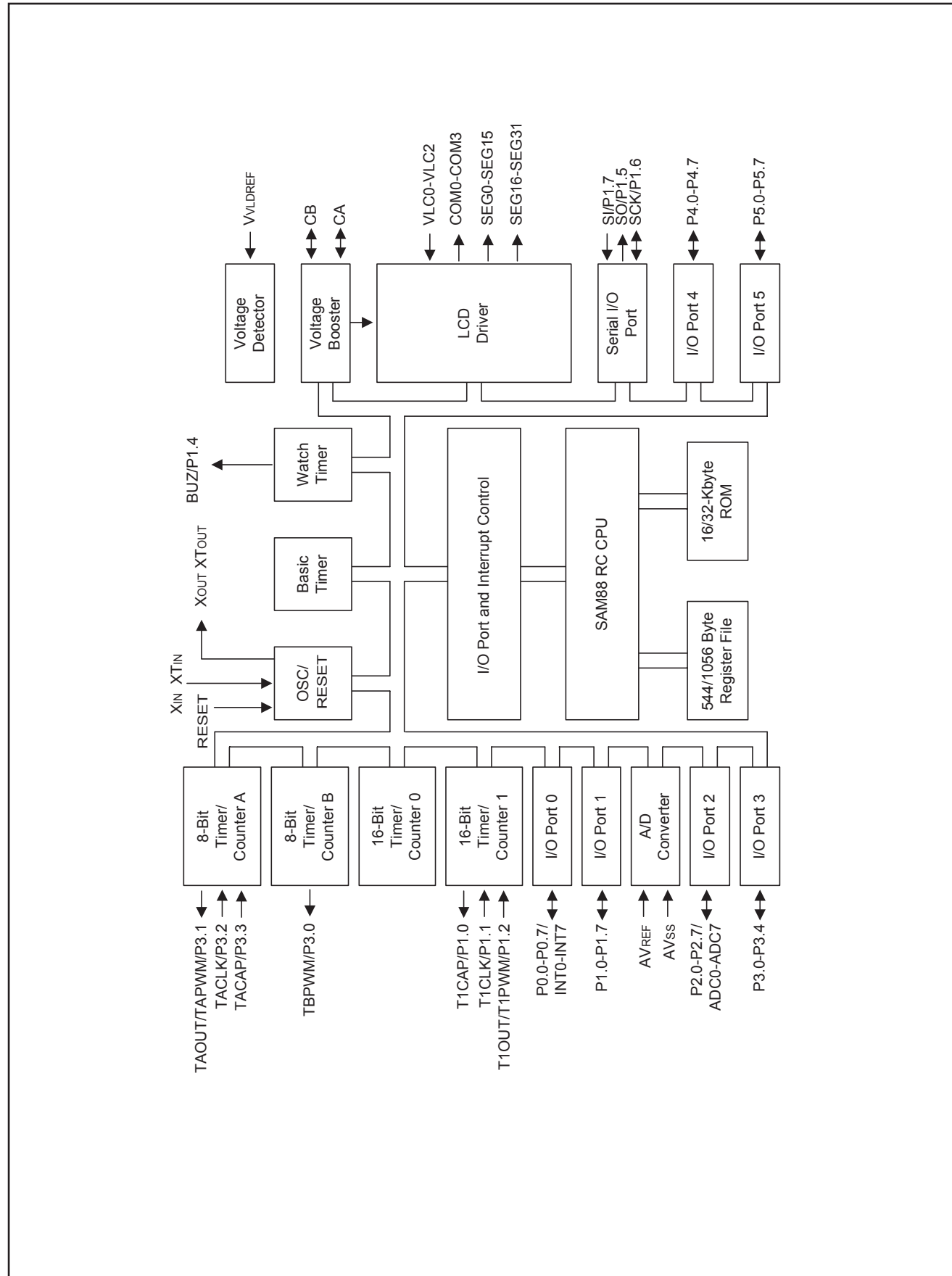
KS88C2432's ROM version device

- KS88C2424 (ROM 24 Kbyte)

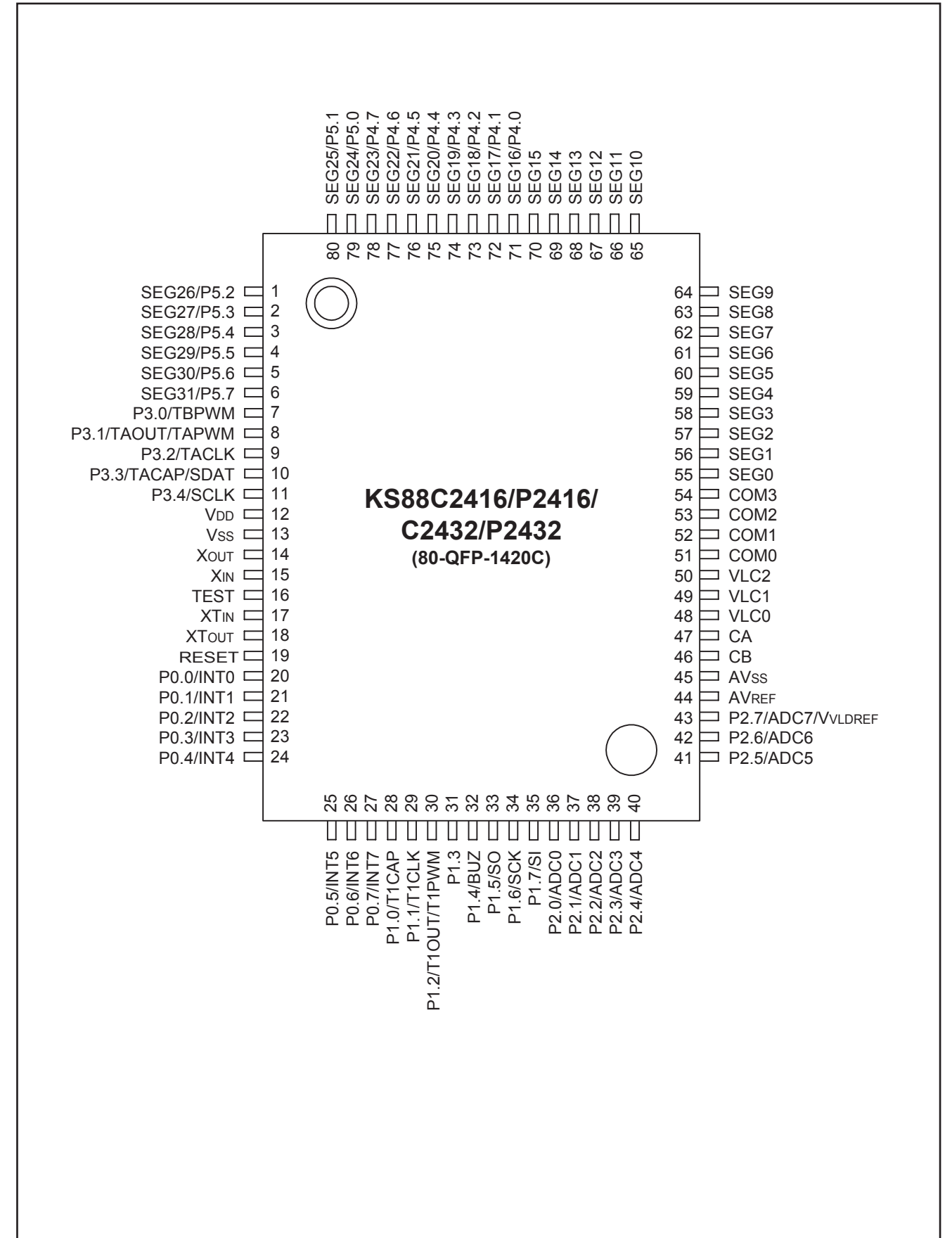
KS88C2432's ROM version device

- KS88C2408 (ROM 8 Kbyte)

■ BLOCK DIAGRAM



■ PIN ASSIGNMENT



SPECIFICATIONS

ELECTRICAL

- Rated Output Power (RMS).....ACR-60: 60W
ACR-120: 120W
- Speaker Output Impedance
ACR-6060W: 15.5V/4Ω, 25V/10.5Ω, 70V/82Ω, 100V/166Ω
ACR-120 120W: 22V/4Ω, 25V/5.2Ω, 70V/41Ω, 100V/83Ω
- Input Sensitivity/Impedance
MIC 1-3..... 1mV/600Ω
Aux..... 350mV/10kΩ
Amp In 1V/10kΩ
- Frequency Response (+1/-3dB)
MIC 1-3 100Hz-12kHz
Aux 60Hz-15kHz
Amp In.....60Hz-18kHz
- T.H.D.....Less than 1%
- S/N
MIC 1-3.....Better than 60dB
Aux.....Better than 75dB
- Tone Control
Bass (100Hz)±12dB
Treble (10kHz).....±12dB

TUNER SECTION

- Tuning Range.....FM: 87.5-108MHz
AM: 522-1620kHz
- Usable SensitivityFM: 2μV, AM: 12μV

COMPACT DISC SECTION

- Type.....3 CD Changer of Magazine Type
- Frequency Response (+1/-3dB).....20Hz-20kHz
- THDLess than 1%

GENERAL

- Power SourceAC 110V-240V, 50/60Hz
- Power ConsumptionACR-60: 85W
ACR-120: 120W
- Weight.....ACR-60: 13kg
ACR-120: 14.5kg
- Dimensions.....420(W) × 132(H) × 320(D)mm

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

ELECTRICAL PARTS LIST

Ref No.	Part No.	Description	Value
INPUT B'D (4005410210)			
AN501	4428594903	LA5268/LAB0640/2.5MM-03P	CN 3P
C501-502, C505-506, C509-510	3509102530-T	CAP CE B 0.001UF 50V J	0.001/50
C503, C507, C511	3509150130-T	CAP CE SL 15PF 50V J	15P
C504, C570	3529680-311-T	CAP CE SL 68PF 50V J AXIAL	68P
C508, C512	3509330130-T	CAP CE SL 33PF 50V J	33P
C514	3509509030-T	CAP CE SL 5PF 50V J	5P
C515-516	3609153120-T	CAP MA 0.015UF 100V J	0.015/100(M)
C517	3509223530-T	CAP CE F 0.022UF 50V Z	0.022/50
C518, C572	3509470130-T	CAP CE SL 47PF 50V J	47P
C519, C521	3609104120-T	CAP MA 0.1UF 100V J	0.1/100(M)
C520	3609103120-T	CAP MA 0.01UF 100V	0.01/100(M)
C522-523, C525-526, C528-529, C533-534	3409247971-T	CAP AF RSG 4.7UF 50V 5P	4.7/50
C524, C527, C530-532, C536-537	3409210971-T	CAP AF RSG 1UF 50V 5P	1/50
C535	3409222071-T	CAP AF RSG 22UF 50V 5P	22/50
C538-541, C543-544	3409247071-T	CAP AF RSG 47UF 50V 6P	47/50
C542	3409247041-T	CAP AF RSG 47UF 25V 5P	47/25
C571	3529330311-A	CAP CE SL 33PF 50V J AXIAL	33P
C573-577	3509103530-T	CAP CE F 0.01UF 50V Z	0.01/50
CN501, CN503-505, CN507	4428595002	LW5267/LWB0640/2.5MM-02P	CN 2P
CN502	4428595509	WAFER 9P CA-6210	CN 9P
CN506	4428594903	LA5268/LAB0640/2.5MM-03P	CN 3P
D501-503	2058304100	DIODE IN4148	1N 4148
D504	2058502056	DIODE ZENER UZ-5.6BW (5.4,5.8)	UZ 5.6BM
FB501-506	3908609990	EMI FILTER 1000PF	EMI 1000P
IC2-3, IC502-503	2118010432	IC NJM2068DD JRC	NJM 2068DD
IC501	2128740208	IC BXA 4240	BXA4240K
JK1	4438097320	BOARD PHONE JACK(ST) MPA-95	PHONE JACK
JK501-502	4438194510	RCA JACK BOARD 2P (24MM)	JACK 2P
JMP	1508400501	JUMP WIRE (0.5/52MM)	JUMP
Q501	2008606105-T	TR PNP KTA 1266Y	KTA 1266Y
Q502-505	2008606998-T	TR NPN KTD 1302 KEC ONLY	KTD 1302
R501-502, R508-509, R515-516, R522, R530, R548	3009103973	RES CF 10K 1/5W J N	10K
R503-504	3009821973	RES CF 820 1/5W J N	820
R505	3009683973	RES CF 68K 1/5W J N	68K
R506, R513, R520, R534-535	3009104973	RES CF 100K 1/5W J N	100K
R507, R514, R521, R524, R539	3009101973	RES CF 100 1/5W J N	100
R510-511, R517-518, R527, R536	3009102973	RES CF 1K 1/5W J N	1K
R512, R519	3009154973	RES CF 150K 1/5W J N	150K
R523	3009123973	RES CF 12K 1/5 J N (ACR-60)	12K (ACR-60)
R523	3009123973	RES CF 15K 1/5 J N (ACR-120)	15K (ACR-120)
R525	3009472973	RES CF 4.7K 1/5W J N	4.7K
R526	3009273973	RES CF 27K 1/5W J N	27K
R528	3009105973	RES CF 1M 1/5W J N	1M
R529	3009274973	RES CF 270K 1/5W J N	270K
R531, R541	3009123973	RES CF 12K 1/5W J N	12K
R532	3009822973	RES CF 8.2K 1/5W J N	8.2K
R533	3009153973	RES CF 15K 1/5W J N	15K
R537	3009202973	RES CF 2K 1/5W J N	2K
R538	3039561572-F	RES MO 560 2W J N	560 2W
R540	3009224973	RES CF 220K 1/5W J N	220K
R542, R547	3009473973	RES CF 47K 1/5W J N	47K
R543	3009225973	RES CF 2.2M 1/5W J N	2.2M

Ref No.	Part No.	Description	Value
R544	3009339373	RES CF 39K 15W J N	39K
R545	3009333973	RES CF 33K 1/5W J N	33K
R546	3009563973	RES CF 56K 1/5W J N	56K
R549	3009564973	RES CF 560K 1/5W J N	560K
R570-571	3009221973	RES CF 220 1/5W J N	220
VR501	3228074410	VR 09VSF30A103 10KA	10KA
XLR501-502, XLR504	4438193810	XLR JACK (F) 3P (E203A0040N)	XLR JACK
PRE POWER B'D (4005410200)			
AN1	4355886621	CON ASS'Y 5P	CON 5P
AN2-3, CON608	4428595003	LW5267/LWB0640/2.5MM-03P	CON 3P
CON601-602	3408222261	CAP RSA 2200UF 35V SNAP 18P	2200/35
C605-606	3409210141-T	CAP AF RSG 100UF 25V 6P	100/25
C607-608, C611, C613, C615	3509104530-T	CAP CE F 0.1UF 50V Z	0.1/50
C609	3419568265	CAP HE 6800UF 35V 20 PLUG	6800/35
C610, C614	3408247161	CAP RSA 470UF 35V SNAP 13P	470/35
C612, C616	3408233141	CAP RSA 330UF 25V SNAP 10P	330/35
CN601-602, CN604	4428595003	LW5267/LWB0640/2.5MM-03P	CON 3P
CN603, 605	4428595002	LW5267/LWB0640/2.5MM-02P	CON 2P
CN606	4428595008	LW5267/LWB0640/2.5MM-08P	CON 8P
CN607	4428595005	LW5267/LWB0640/2.5MM-05P	CON 5P
D601-602	2058100976	DIODE BRIDGE KBP202G/KBP203G	KBPC 202G
D605	2058100996	DIODE RECTIFIER LT1N4006(4007)	1N 4006
IC601	2118012005	IC KIA 7818 API KEC	7818
IC602	2118013005	IC KIA 7918 PI KEC	7918
IC603	2118011805	IC KIA 7812 API KEC	7812
IC604	2118011605	IC KIA 7809 API KEC	7809
IC605	2128611307	IC 7806 SAMSUNG	7806
PT	2828065700	TRANS POWER 120Version ACR-60(UL/CSA)	P.T (120Version)
PT	2828065710	TRANS POWER 220Version ACR-60(DOM)	P.T (220Version)
PT	2828065720	TRANS POWER 230Version ACR-60(EUROPE)	P.T (230Version)
PT	2828065730	TRANS POWER 240Version ACR-60(EUROPE)	P.T (240Version)
PT	2828065800	TRANS POWER 120Version ACR-120(UL/CSA)	P.T (120Version)
PT	2828065810	TRANS POWER 120Version ACR-120(DOM)	P.T (220Version)
PT	2828065820	TRANS POWER 120Version ACR-120(EUROPE)	P.T (230Version)
PT	2828065830	TRANS POWER 120Version ACR-120(EUROPE)	P.T (240Version)
R601-602, R609-610	3059100772	RES CE 10 5W JN	10 5W
R608, R612	3039100572-F	RES MO 10 2W J N	10 2W
R607	3059250783	RES CE 25 5W K T	25 5W
SW2	2423000999	SW POLY 50VX110 JX3K-T	POLY SW
POWER SW B'D & SPK SEL B'D (4005410320)			
AC1-2	4355770517	CON ASS'Y 1P (TERMINAL)	CON 1P
C617	3549472407	CAP SPARK KILLER 0.0047UF 400V	0.0047/400
CN501	4428595002	LW5267/LWB0640/2.5MM-02P	CON 2P
CON502	4428599003	WAFER YW025-03	CON 3P
SW1	4628988610	SW POWER SDDF3PATL011 (SP278)	POWER SW
SW600	4628984310	SW PUSH JPP-22-32H-01 JAEIL	SW
SW700	4648098410	SW PS-5-W7AV	SW
INLET B'D (4005410220)			
ACIN1	4308997310	AC CORD DOME 3-CORES	AC CORD
F601	5508412734	FUSE TS 20MM 2A/250V (UL/CSA) ACR-60	2A/250V (UL/CSA)
F601	5508112237	FUSE 51S 20MM 1A/250V (DOM) ACR-60	1A/250V (DOM)
F601	5508412234	FUSE TS 20MM 1A/250V (Europe) ACR-60	1A/250V (Europe)
F601	5508112937	FUSE 51S 20MM 3A/250V (UL/CSA) ACR-120	3A/250V (UL/CSA)
F601	5508222530	FUSE NB 31.8MM 1.5A/250V (DOM) ACR-120	1.5A/250V (DOM)
F601	5508412434	FUSE TS 20MM 1.25A/250V (Europe) ACR-120	1.25A/250V (Europe)
T1-4	4465998210	TERMINAL (250) PCB TAB	250T
TUNER B'D (4005412700)			
AN405, CON405	4355886621	CON ASS'Y 5P	CON 5P
C400, C402	3509473530-T	CAP CE F 0.047UF 50V Z	0.047/50
C401, C403, C405, C417-418, C428	3509223530-T	CAP CE F 0.022UF 50V Z	0.022/50
C404, C406, C416, C430	3409210971-T	CAP AF RSG 1UF 50V 5P	1/50

Ref No.	Part No.	Description	Value
C407, C412, C426	3409247041-T	CAP AF RSG 47UF 25V 5P	47/25
C408	3639274111-T	CAP ECQ-V 1H274JL2 0.27UF 50V	0.27/50
C409	3509221130-T	CAP CE SL 220PF 50V J	220P
C410	3409247971-T	CAP AF RSG 4.7UF 50V 5P	4.7/50
C411	3509104530-T	CAP CE F 0.1UF 50V Z	0.1/50
C413	3409247871-T	CAP AF RSG 0.47UF 50V 5P	0.47/50
C414	3419510401	CAP AF 0.1UF 5.5V (EFFCF5R5U104)	0.1/5.5
C415	3609473120-T	CAP MA 0.047UF 100V	0.047/100(M)
C419	3509102530-T	CAP CE B 0.001UF 50V J	0.001/50
C420	3409222871-T	CAP AF RSG 0.22UF 50V 5P	0.22/50
C421, C423	3509103530-T	CAP CE F 0.01UF 50V Z	0.01/50
C422	3409247071-T	CAP AF RSG 47UF 50V 6P	47/50
C424	3509330130-T	CAP CE SL 33PF 50V J	33P
C425	3509100130-T	CAP CE SL 10PF 50V D	10P
C427	3609333120-T	CAP MA 0.033UF 100V J	0.033/100(M)
C429	3609683120-T	CAP MA 0.068UF 100V J	0.068/100(M)
C431	3609223120-T	CAP MA 0.022UF 100V J	0.022/100(M)
CF400-401	3908011001	FILTER SK107M3-AO-20	10.7M
CON401	4428599004	WAFER YW025-04	CON 4P
CON402	4428598304	WAFER LW-0640-4P	CON 4P
CON403	4428598303	CONNECTOR WAFER LW-0640-3P	CON 3P
CON404	4678699300	70221-0253 26P	CON 26P
DD1	3938000900	AM TUNER PACK FA2-A98	AM TUNER
D400, D412	2058502082	DIODE ZENER UZ-8.2BM (7.9,8.5)	UZ 8.2BM
D401-405, D407-409, D411, D413-425	2058304100	DIODE IN4148	1N 4148
D406	2058500051	DIODE ZENER UZ-5.1B (4.8,5.4)	UZ 5.1B
D410, D426	2058502056	DIODE ZENER UZ-5.6BW (5.4,5.8)	UZ 5.6BM
FE2	3928110930	FRONT END FTC2-361V	FRONT END
IC400	2138013995	IC UPD1719G-014 12	D1719G-014
IC401	2168417994	IC LA 1145 (FM IF) SANYO	LA1145
JK1	4678699430	CNT PLUG 3P	3P
L2-3	2648399930	COIL PEAKING 0.33uH (PA-600RB)	0.33uH
L7-8	2648699980	COIL CHOCK COMMON MODE PA-608R	CHOCK
L9	2628099940	COIL FM DET	COIL
Q400	2008406103-T	TR NPN KTC 1923Y (KTC 3194)	KTC 1923Y
Q401	2008606999-T	TR KTC 3198BL	KTC 3198BL
Q402-403	2008606998-T	TR NPN KTD 1302 KEC ONLY	KTD 1302
Q404, Q409	2008606104-T	TR NPN KTC 3198Y	KTC 3198Y
Q414			
Q405-408, Q410, Q413	2008606105-T	TR PNP KTA 1266Y	KTA 1266Y
Q411	2018211100-T	FET N-CH 2SK 168D SANKYOELE	2SK 168D
Q412	2008606108-T	TR NPN KTC2240BL (KTC 3200BL)	KTC 2240BL
R400, R430, R432, R434, R444, R457	3009473973	RES CF 47K 1/5W J N	47K
R401	3009680973	RES CF 68 1/5W J N	68
R402, R440, R443	3009104973	RES CF 100K 1/5W J N	100K
R403	3009271973	RES CF 270 1/5W J N	270
R404, R446, R459	3009101973	RES CF 100 1/5W J N	100
R405, R442	3009332973	RES CF 3.3K 1/5W J N	3.3K
R406, R439, R463	3009561973	RES CF 560 1/5W J N	560
R407	3009471973	RES CF 470 1/5W J N	470
R408-409	3009331973	RES CF 330 1/5W J N	330
R410, R415, R417	3009103973	RES CF 10K 1/5W J N	10K
R411, R414	3009273973	RES CF 27K 1/5W J N	27K
R412, R462	3009563973	RES CF 56K 1/5W J N	56K
R413	3009183973	RES CF 18K 1/5W J N	18K
R416	3009302973	RES CF 3K 1/5W J N	3K
R418	3009752973	RES CF 7.5K 1/5W J N	7.5K
R419-420, R428-439, R436-437, R441, R450, R452, R454-455	3009103973	RES CF 10K 1/5W J N	10K
R421	3039101572-F	RES MO 100 2W J N	100 2W

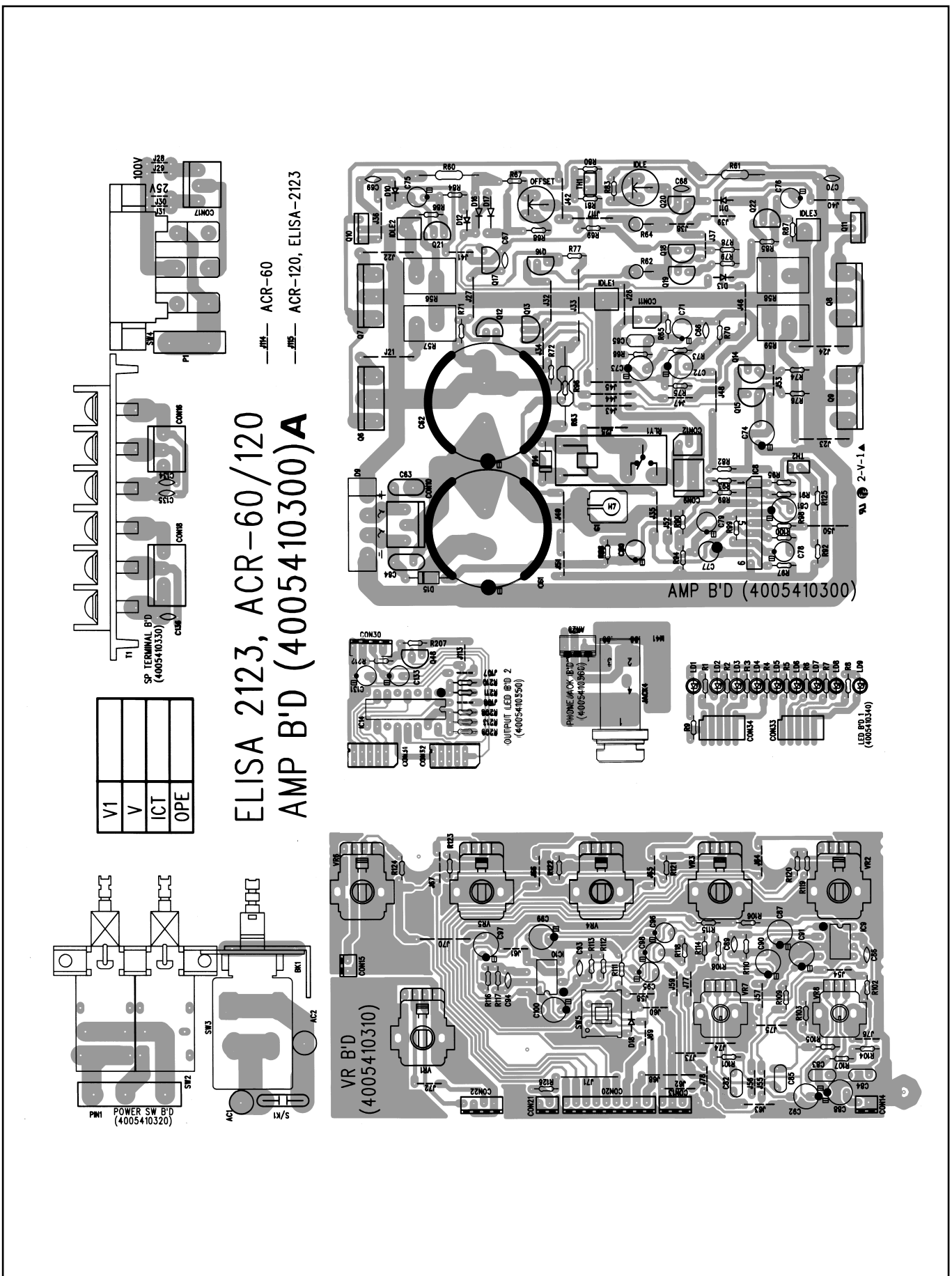
Ref No.	Part No.	Description	Value
R423, R431, R458	3009222973	RES CF 2.2K 1/5W J N	2.2K
R424	3009105973	RES CF 1M 1/5W J N	1M
R425	3009153973	RES CF 15K 1/5W J N	15K
R426	3009100973	RES CF 10 1/5W J N	10
R427, R461	3009682973	RES CF 6.8K 1/5W J N	6.8K
R433, R445, R453	3009472973	RES CF 4.7K 1/5W J N	4.7K
R435	3009272973	RES CF 2.7K 1/5W J N	2.7K
R439, R447, R449	3009102973	RES CF 1K 1/5W J N	1K
R448	3009151973	RES CF 150 1/5W J N	150
R451	3009152973	RES CF 1.5K 1/5W J N	1.5K
R460	3009683973	RES CF 68K 1/5W J N	68K
SW2	4628988610	SW POWER SDDF3PATL011 (SP278)	POWER SW
SVR400	3248347320	RES SEMI CS 47K 10/5	47KB
VR400	3228081010	VR RK11K114030713A (RO992)	10KA
X1	3908101050	CRYSTAL 4.5MHZ	4.5MHZ
PRE POWER B'D (4005410200)			
C61-62	3419533280	CAP AF 3300UF 63V 25 PLUG (ACR-60)	3300/63(ACR-60)
C61-62	3419547280	CAP AF HM 4700UF 63V 30 PLUG (ACR-120)	4700/63(ACR-120)
C65	3609102120-T	CAP MA 0.001UF 100V	0.001/100(M)
C66	3509470130-T	CAP CE SL 47PF 50V J	47P
C67, C69-70	3509101130-T	CAP CE SL 100PF 50V J	100P
C68	3509103530-T	CAP CE F 0.01UF 50V Z	0.01/50
C71	3409210971-T	CAP AF RSG 1UF 50V 5P	1/50
C72-74, C81	3409247071-T	CAP AF RSG 47UF 50V 6P	47/50
C75-76, C79-80	3409210071-T	CAP AF RSG 10UF 50V 5P	10/50
C77	3409233071-T	CAP AF RSG 33UF 50V 6P	33/50
C78	3409247871-T	CAP AF RSG 0.47UF 50V 5P	0.47/50
CON9,	4428596602	WAFER LW-1143-02P	CON 2P
CON11-12			
CON10	4428596603	LOCK WAFER LW-1143-03P	CON 3P
D9	2058100988	DIODE BRIDGE PBU 804	PBU 804
D10-13	2058304100	DIODE IN4148	1N 4148
D14-15	2058100996	DIODE RECTIFIER LT1N4006 (4007)	1N 4006
D16-17	2058010101	DIODE IN 60	1N 60
IC8	2118050410	IC TA7317P TOSHIBA	TA 7317P
IDLE1-3	4678699411	CNT PLUG 1P	IDLE
Q6-7	2028407109	TR NPN 2SD718-0 (BS) 2SC5197	2SD 718
Q8-9	2028107106	TR PNP 2SB688 (O)/2SA1940	2SB 688
Q10	2028407118	TR NPN 2SC 2238Y	2SC 2238Y
Q11	2028107115	TR PNP 2SA968Y	2SA 968Y
Q12-15, Q20	2008606108-T	TR NPN KTC2240BL (KTC 3200BL)	KTC 2240BL
Q16-17	2008206998-T	TR PNP 2SA 965Y (KTA 1023Y)	2SA 965Y
Q18-19	2008407970-T	TR NPN KTC 2SC 2235Y (KTC1027Y)	2SC 2235Y
Q21	2008606104-T	TR NPN KTC 3198Y	KTC 3198Y
Q22	2008606105-T	TR PNP KTA 1266Y	KTA 1266Y
R56-59	3059478783	RES CE 0.47 5W J T (ACR-60)	0.47/5W (ACR-60)
R56-59	3059278783	RES CE 0.27 5W J T (ACR-120)	0.27/5W (ACR-120)
R60-61	3039203473-F	RES MO 20K 1W JN	20K 1W
R62	3039103572-F	RES MO 10K 2W J N	10K 2W
R63	3039152572-F	RES MO 1.5K 2W J N	1.5K 2W
R64	3039271572-F	RES MO 270 2W J N	270 2W
R65	3009182973	RES CF 1.8K 1/5W J N	1.8K
R66	3009203973	RES CF 20K 1/5W J N	20K
R67	3009122973	RES CF 1.2K 1/5W J N	1.2K
R68, R86-87	3009152973	RES CF 1.5K 1/5W J N	1.5K
R69, R74-76	3009103973	RES CF 10K 1/5W J N	10K
R70, R95	3009473973	RES CF 47K 1/5W J N	47K
R71-72, R81	3009102973	RES CF 1K 1/5W J N	1K
R73	3009471973	RES CF 470 1/5W J N	470
R77	3009101973	RES CF 100 1/5W J N	100
R78-79	3009221973	RES CF 220 1/5W J N	220
R80	3009562973	RES CF 5.6K 1/5W J N	5.6K
R82	3009103973	RES CF 10K 1/5W J N (ACR-60)	10K (ACR-60)
R82	3009183973	RES CF 18K 1/5W J N (ACR-120)	18K (ACR-120)
R83	3009222973	RES CF 2.2K 1/5W J N	2.2K
R84-85	3009273973	RES CF 27K 1/5W J N (ACR-60)	27K (ACR-60)
R84-85	3009203973	RES CF 20K 1/5W J N (ACR-120)	20K (ACR-120)
R88, R96, R98	3009153973	RES CF 15K 1/5W J N	15K
R89, R91, R100	3009563973	RES CF 56K 1/5W J N	56K

Ref No.	Part No.	Description	Value
R90	3009302973	RES CF 3K 1/5W J N	3K
R92	3009153973	RES CF 15K 1/5W J N	15K
R93	3009104973	RES CF 100K 1/5W J N	100K
R94	3009563973	RES CF 56K 1/5W J N	56K
R97	3009224973	RES CF 220K 1/5W J N	220K
R99	3009333973	RES CF 33K 1/5W J N	33K
R125	3009471973	RES CF 470 1/5W J N	470
RLY1	5528009980	RELAY HR-311	HR-311
T6	4355877007	CONNECTOR ASS'Y 1P MA630	1P
TH1-2	2438209011	THERMISTOR YSG-503J L=100MM	330
VR10-11	3248347120	RES SEMI CS 470B 10/5	470B
VR B'D (4005410310)			
C82	3609102120-T	CAP MA 0.001UF 100V	0.001/100(M)
C83-84	3609103120-T	CAP MA 0.01UF 100V	0.01/100(M)
C85	3609152120-T	CAP MA 0.0015UF 100V J	0.0015/100(M)
C86	3509100130-T	CAP CE SL 10PF 50V D	10P
C87, C91, C99-100	3409247071-T	CAP AF RSG 47UF 50V 6P	47/50
C88, C92	3409233071-T	CAP AF RSG 33UF 50V 6P	33/50
C89	3509151130-T	CAP CE SL 150PF 50V J	150P
C90, C97	3409210071-T	CAP AF RSG 10UF 50V 5P	10/50
C93-94	3509509030-T	CAP CE SL 5PF 50V J	5P
C95	3409222071-T	CAP AF RSG 22UF 50V 5P	22/50
C96, C98	3409215971-T	CAP AF RSG 1.5UF 50V 5P	1.5/50
CON13	4355785400	CON ASS'Y 3P (VR PCB)	CON 3P
CON14-15, CON21, CON24	4355771017	CON ASS'Y (BLUE)	CON 2P
CON20	4355771222	CON ASS'Y 9P	CON 9P
CON22	4355770719	CON ASS'Y 4P	CON 4P
D18	2058304100	DIODE IN4148	1N 4148
IC9-10	2118010590	IC NJM4558D JRC	NUM 4558D
R101-102	3009392973	RES CF 3.9K 1/5W J N	3.9K
R103-104	3009133973	RES CF 13K 1/5W J N	13K
R105	3009183973	RES CF 18K 1/5W J N	18K
R106, R109, R111, R115	3009101973	RES CF 100 1/5W J N	100
R107	3009122973	RES CF 1.2K 1/5W J N	1.2K
R108	3009102973	RES CF 1K 1/5W J N	1K
R110	3009103973	RES CF 10K 1/5W J N	10K
R112	30092121973	RES CF 120 1/5W J N	120
R113, R117	3009473973	RES CF 47K 1/5W J N	47K
R114, R118	3009471973	RES CF 470 1/5W J N	470
R116	3009272973	RES CF 2.7K 1/5W J N	2.7K
R119-124, R126	3009123973	RES CF 12K 1/5W J N	12K
SW1	4618006510	SW VOL SELE SDJL4SBKP011 (SP087)	SW
VR1-8	3228074410	VR 09V5F30A103 10KA	10KA
OUTPUT LED B'D (4005410350)			
IC14	2118031207	IC KA2281 S.S	KA2281
C131	3409210971-T	CAP AF RSG 1UF 50V 5P	1/50
C163	3409233971-T	CAP AF RSG 3.3UF 50V 5P	3.3/50
CON30	4355770421	CON ASS'Y 4P	CON 4P
CON31-32	4428594010	WAFER 5532-10A J.MOLEX	CON 5P
R207, R212	3009104973	RES CF 100K 1/5W J N	100K
R208-209, R213	3009473973	RES CF 47K 1/5W J N	47K
R210	3009103973	RES CF 10K 1/5W J N (ACR-60)	10K (ACR-60)
R210	3009133973	RES CF 13K 1/5W J N (ACR-120)	13K (ACR-120)
R211	3009202973	RES CF 2K 1/5W J N (ACR-60)	2K (ACR-60)
R211	3009182973	RES CF 1.8K 1/5W J N (ACR-120)	1.8K (ACR-120)
Q48	2008606104-T	TR NPN KTC 3198Y	KTC 3198Y
LCD B'D (4005412600)			
CN402	4355887317	CON ASS'Y 4P	CON 4P
CN403	4355887114	CON ASS'Y 3P	CON 3P
CON 404	4355888203	CON ASS'Y 26P	CON 26P
D430-433	205830410		

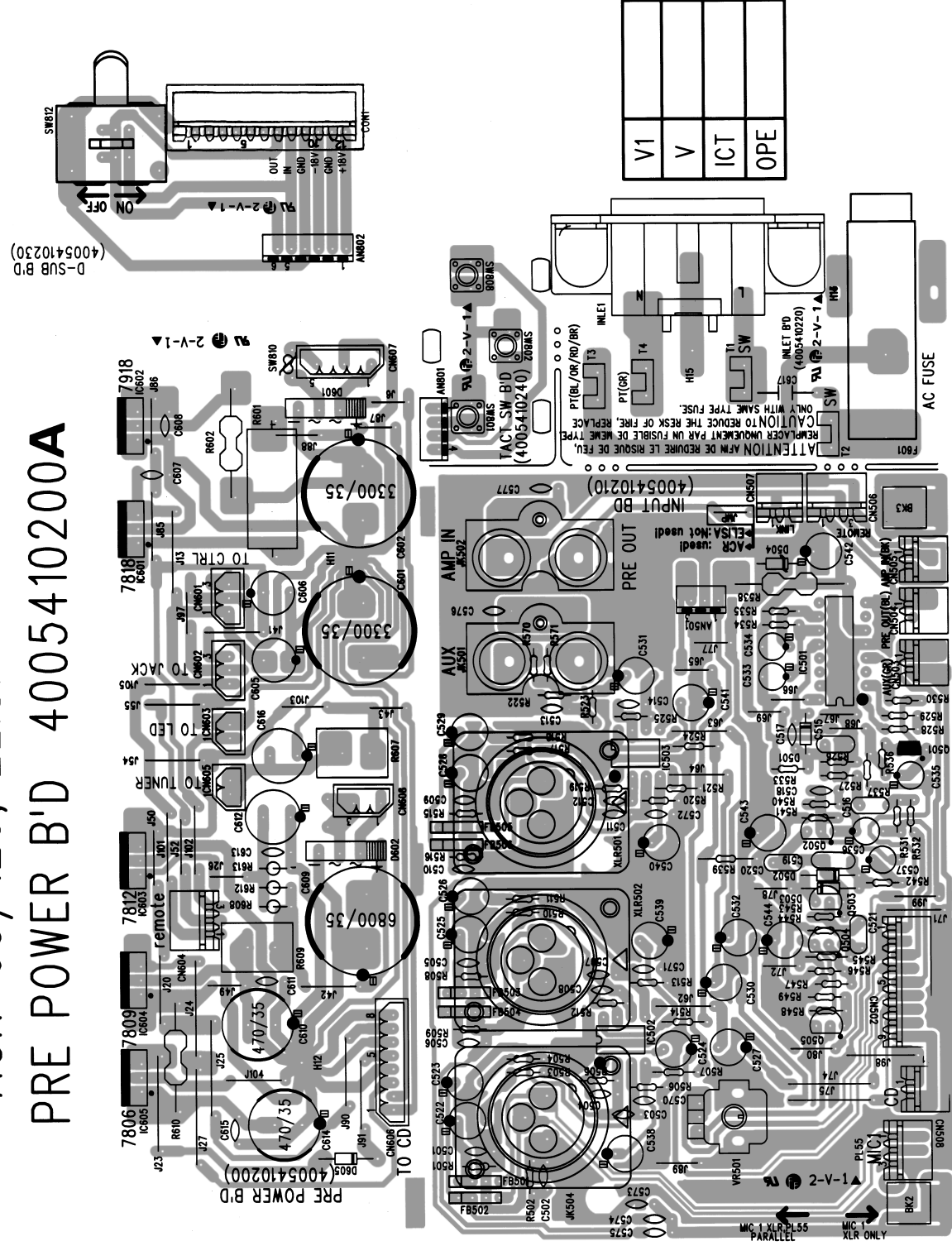
TOP AND BOTTOM VIEW OF P.C. BOARD

Ref No.	Part No.	Description	Value
CN305	4428536329	WAFER FMN-BTRK-29P/IMM.JST	CON 29P
CN306	4428595011	LW5267/LWB0640/2.5MM-11P	CON 11P
CN310	4428532204	WAFER S04B-EH/2.5MM/ANGLE.JST	CON 4P
D301-304	2058304100	DIODE IN4148	1N4148
IC301	2128000835	IC AN8806SB MATSUSHITA	AN8806SB
IC302	2128220435	IC AN8389SR MATSUSHITA	AN8389SB
IC303	2128514055	IC MN662720RB MATSUSHITA	MN662720RB
IC304	2128820535	IC SM5878AM NPC	SM5878AM
IC305	2128121007	IC CPU KS88P2432QW SAMSUNG	KS88P2432
IC306-307	2118010432	IC NJM2068DD JRC	NJM 2068DD
IC308-309	2118020710	IC TA7291S TOSHIBA	TA7291S
IC310	2138010979	IC M51953B MITSUBISHI	M51953BL
L301-302	2648099990	COIL INDUCTOR 10UH CDC-9300	100K
VR B'D (4005410310)			
Q301, Q304, Q307	2008606113-T	TR PNP KTA 1271(A1515) KEC	KTA 1271Y
Q302, Q305-306	2008606998-T	TR NPN KTD 1302 KEC ONLY	2SD 1302R
Q303	2008613954-T	TR DTC 124ES	DTC 124ES
R301-302, R331	3009124973	RES CF 120K 1/5W J N	120K
R303-306	3009183973	RES CF 18K 1/5W J N	18K
R308	3009824973	RES CF 820K 1/5W J N	820K
R307, R344, R373, R375	3009470973	RES CF 47 1/5W J N	47
R309	3009823973	RES CF 82K 1/5W J N	82K
R310-311	3009272973	RES CF 2.7K 1/5W J N	2.7K
R312	OPEN	OPEN	OPEN
R313	3009123973	RES CF 12K 1/5W J N	12K
R314, R317	3009393973	RES CF 39K 1/5W J N	39K
R315, R323, R332, R337, R339, R342, R366-367, R379-386	3009103973	RES CF 10K 1/5W J N	10K
R316, R333-335, R340, R346, R371-372	3009471973	RES CF 470 1/5W J N	470
R318, R376	3009472973	RES CF 4.7K 1/5W J N	4.7K
R319, R322	3009224973	RES CF 220K 1/5W J N	220K
R320-321, R341, R353, R355, R364	3009223973	RES CF 22K 1/5W J N	22K
R324, R348, R356, R360, R369	3009562973	RES CF 5.6K 1/5W J N	5.6K
R328	3009155973	RES CF 1.5M 1/5W J N	1.5M
R329, R351-352	3009681973	RES CF 680 1/5W J N	680
R330	3039100572-F	RES MO 10 2W J N	10 2W
R336, R338, R343, R368, R370, R374, R377-378	3009102973	RES CF 1K 1/5W J N	1K
R345, R357	3009682973	RES CF 6.8K 1/5W J N	6.8K
R347, R365	3009000973	RES CF 0 1/5W J N	0
R350, R362	3009101973	RES CF 100 1/5W J N	100
R354, R363	3009203973	RES CF 20K 1/5W J N	20K
R358-359	3009753973	RES CF 75K 1/5W J N	75K
R387	OPEN	OPEN	OPEN
R388	1508400501	JUMP WIRE (0.5/25M/M)	short
X301	3908101060	CRYSTAL 16.9344MHZ	KD6586FFB
X302	3908101080	CRYSTAL 4.19MHZ	4.19MHZ
CD DISPLAY B'D (4003484120)			
AN306	4353983802	CON ASS'Y 11P 90MM	CON 11P
AN305	4428536329	CON ASS'Y 4P 100MM	CON 4P
LD301-318	2308232222-T	SLR 34URF 25	LED
LC301	2338170394	LCD KXN29150DAN CD KEC	KXN2915DAN
S301	4628985710	TACT (5MM) SKHV10906A (KBW89)	REPEAT
S302	4628985710	TACT (5MM) SKHV10906A (KBW89)	CLEAR
S303	4628985710	TACT (5MM) SKHV10906A (KBW89)	MEMORY
S304	4628985710	TACT (5MM) SKHV10906A (KBW89)	DISPLAY
S305	4628985710	TACT (5MM) SKHV10906A (KBW89)	RESET

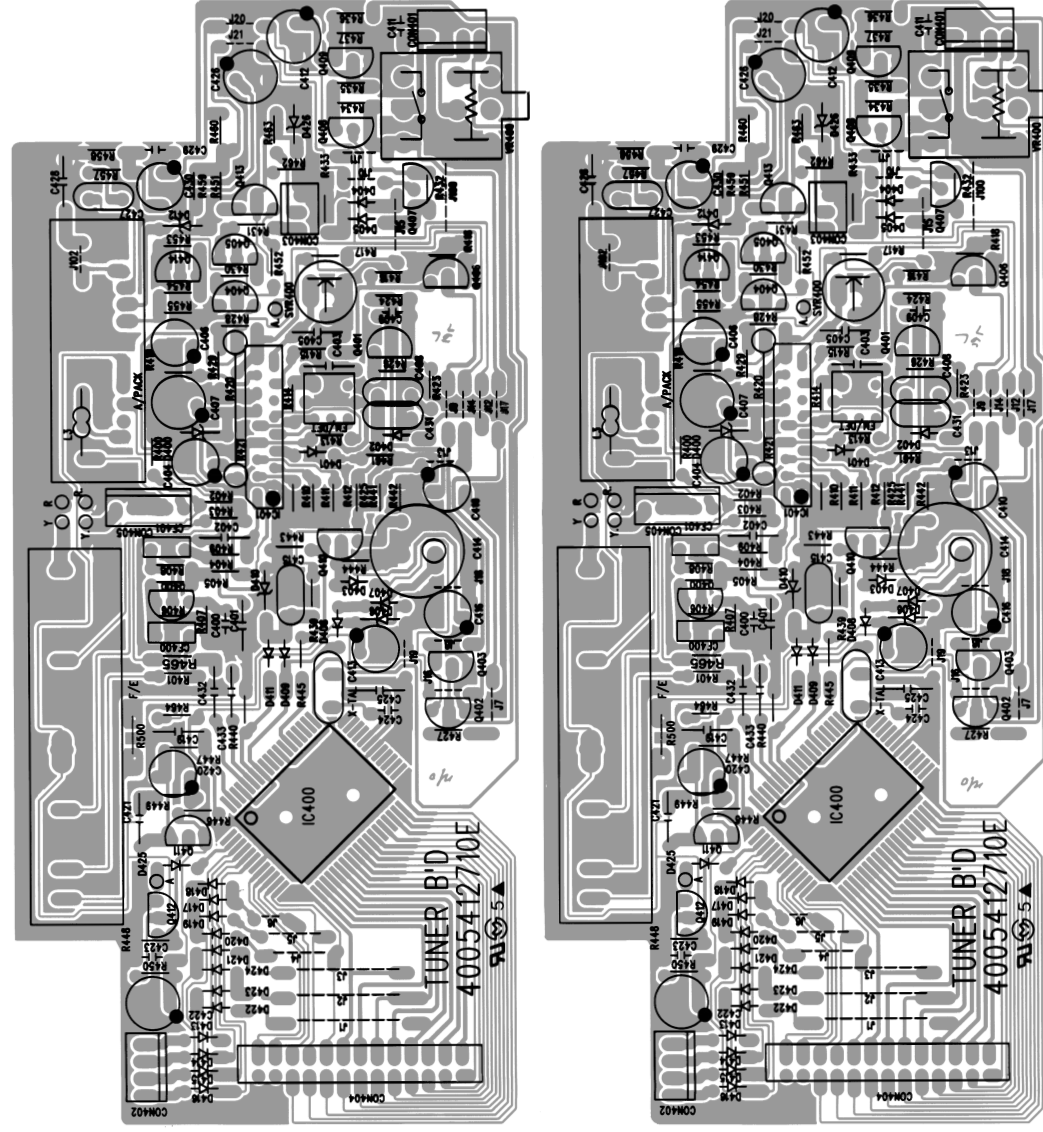
Ref No.	Part No.	Description	Value
S306	4628985710	TACT (5MM) SKHV10906A (KBW89)	STOP
S307	4628985710	TACT (5MM) SKHV10906A (KBW89)	PLAY
S308	4628985710	TACT (5MM) SKHV10906A (KBW89)	S-FF
S309	4628985710	TACT (5MM) SKHV10906A (KBW89)	S-REW
S310	4628985710	TACT (5MM) SKHV10906A (KBW89)	FF
S311	4628985710	TACT (5MM) SKHV10906A (KBW89)	REW
S312	4628985710	TACT (5MM) SKHV10906A (KBW89)	DISC
S313	4628985710	TACT (5MM) SKHV10906A (KBW89)	MODE
S314	4628985710	TACT (5MM) SKHV10906A (KBW89)	RANDOM
CD EJECT B'D (4003484110)			
AN307	4353981003	CON ASS'Y 4P 100MM	CON 4P
S315	4628985710	TACT (5MM) SKHV10906A (KBW89)	DISC1
S316	4628985710	TACT (5MM) SKHV10906A (KBW89)	DISC2
S317	4628985710	TACT (5MM) SKHV10906A (KBW89)	DISC3



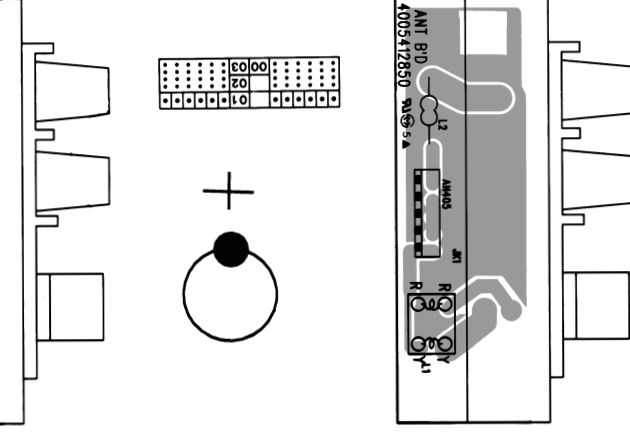
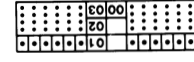
ACR-60/120, ELISA-2123 PRE POWER B'D 4005410200A



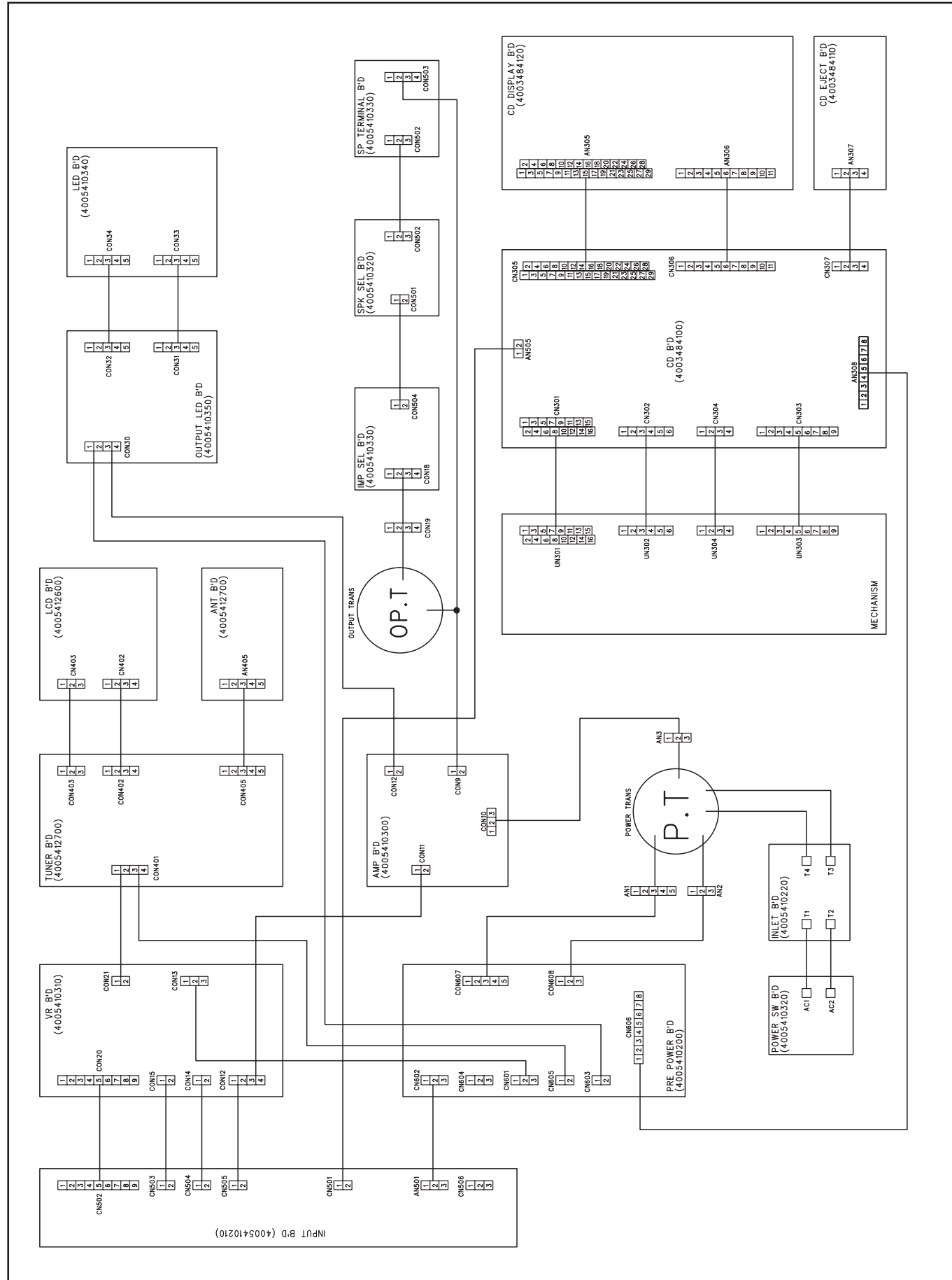
D-SUB B'D
(4005410230)



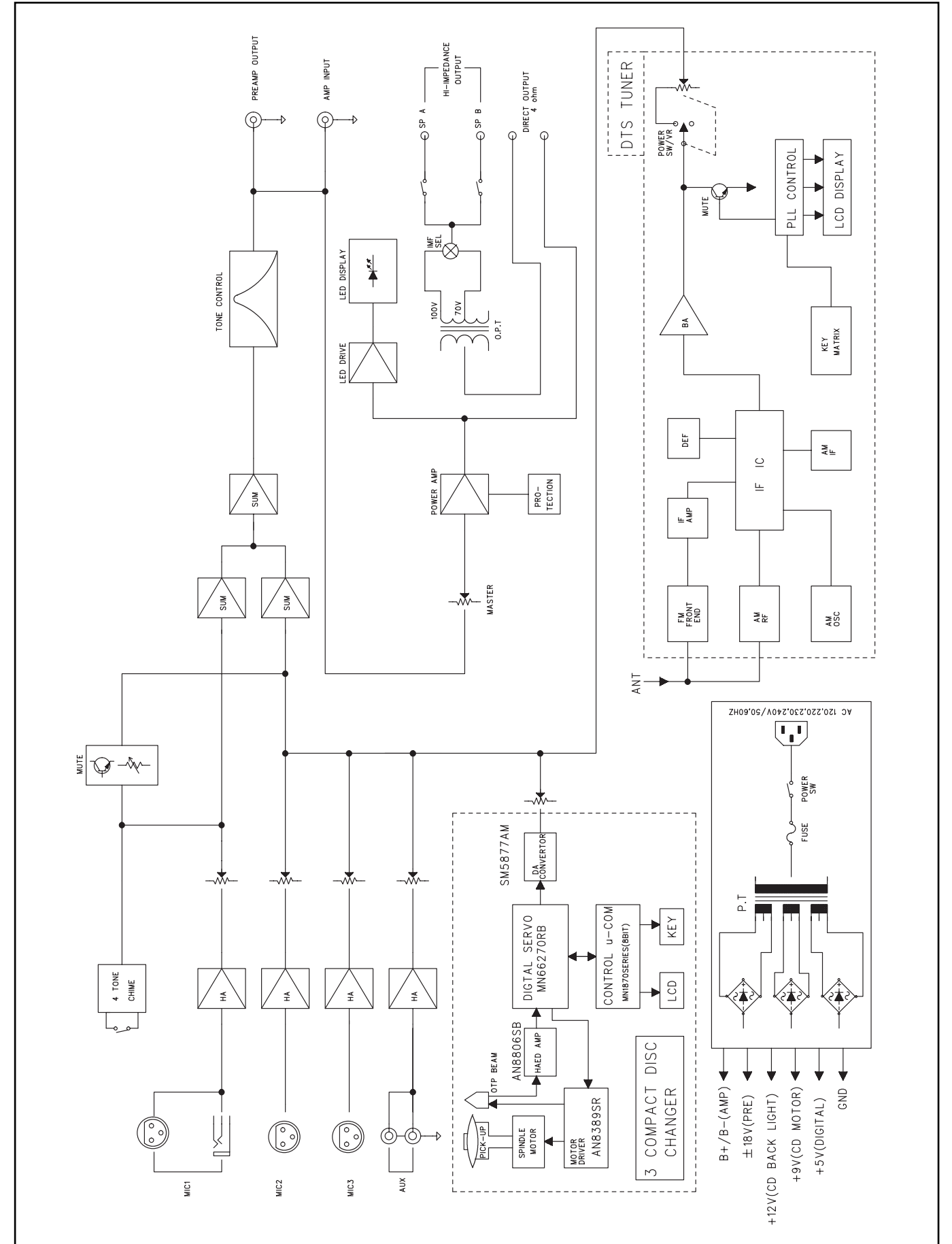
4005412710E
TUNER B'D
1996.12.16

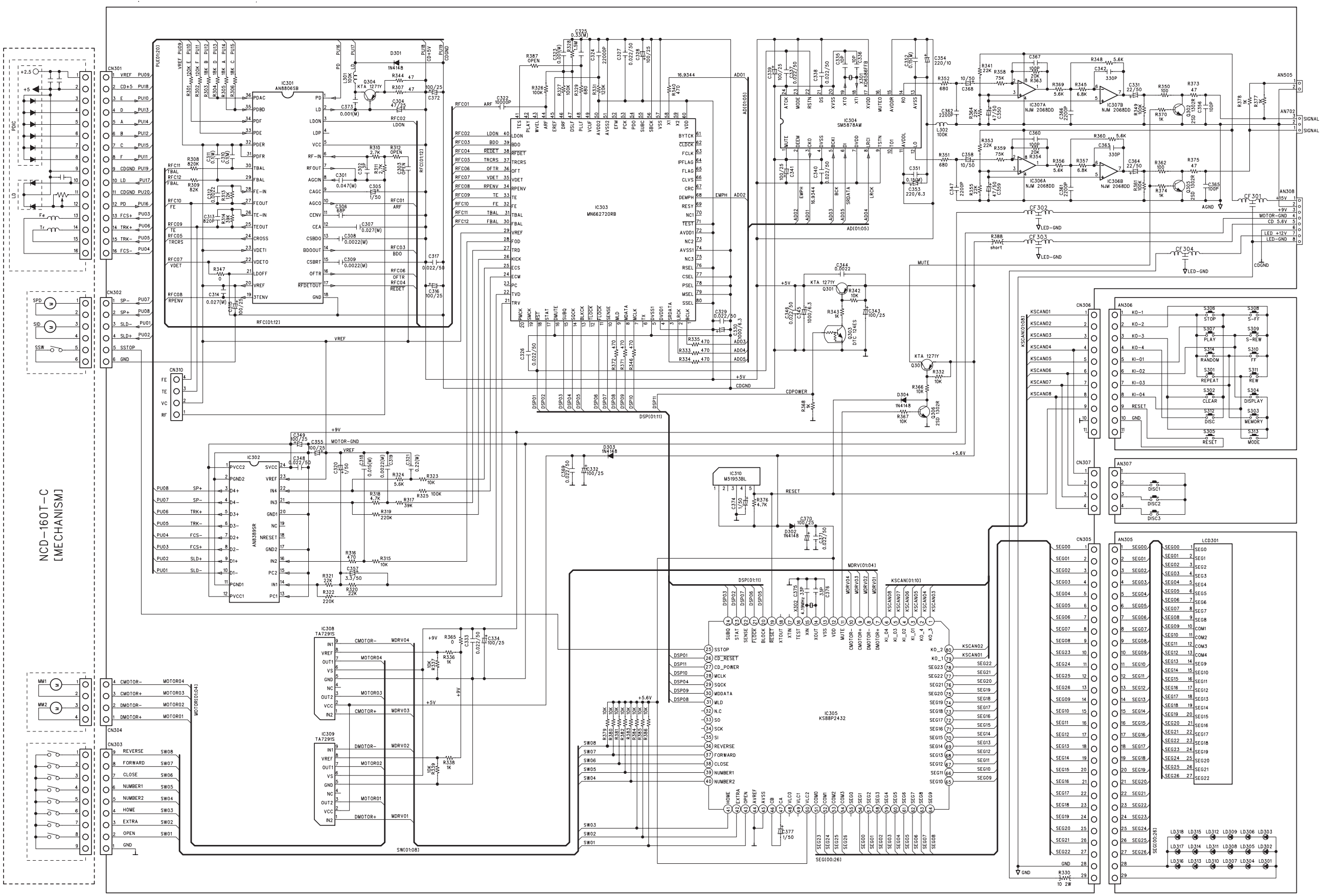


WIRING DIAGRAM

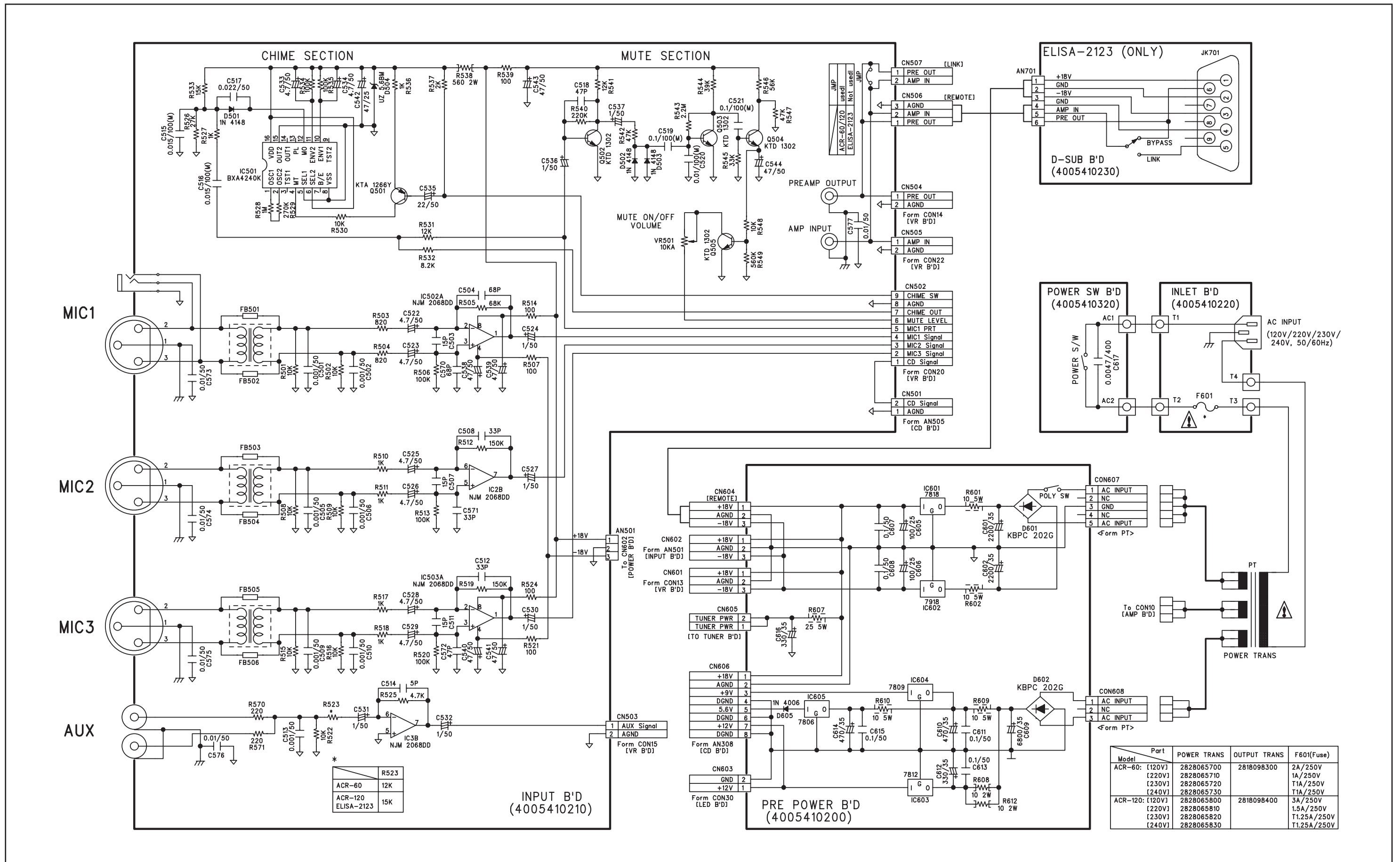


BLOCK DIAGRAM

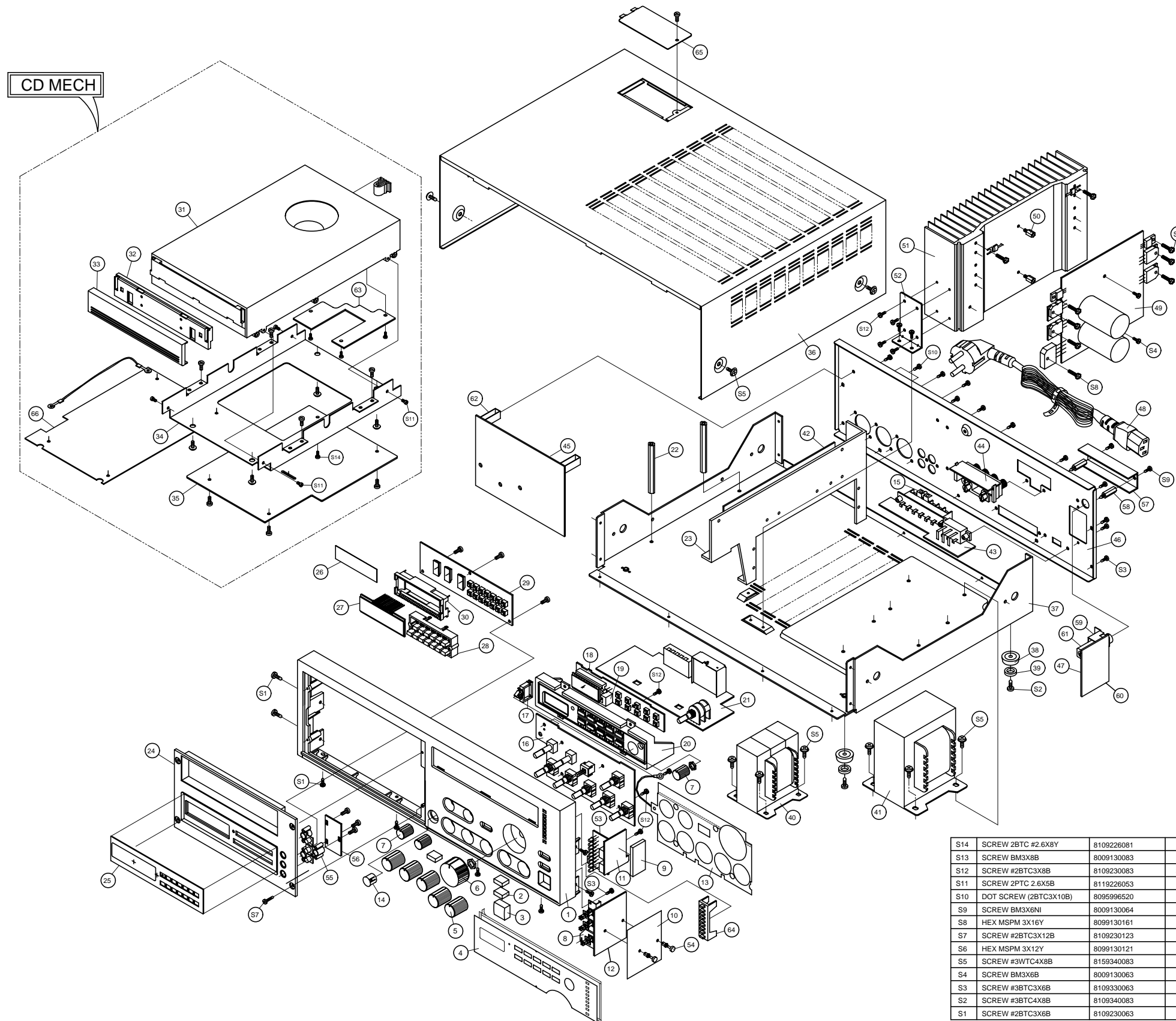




NCD-160T-C
[MECHANISM]



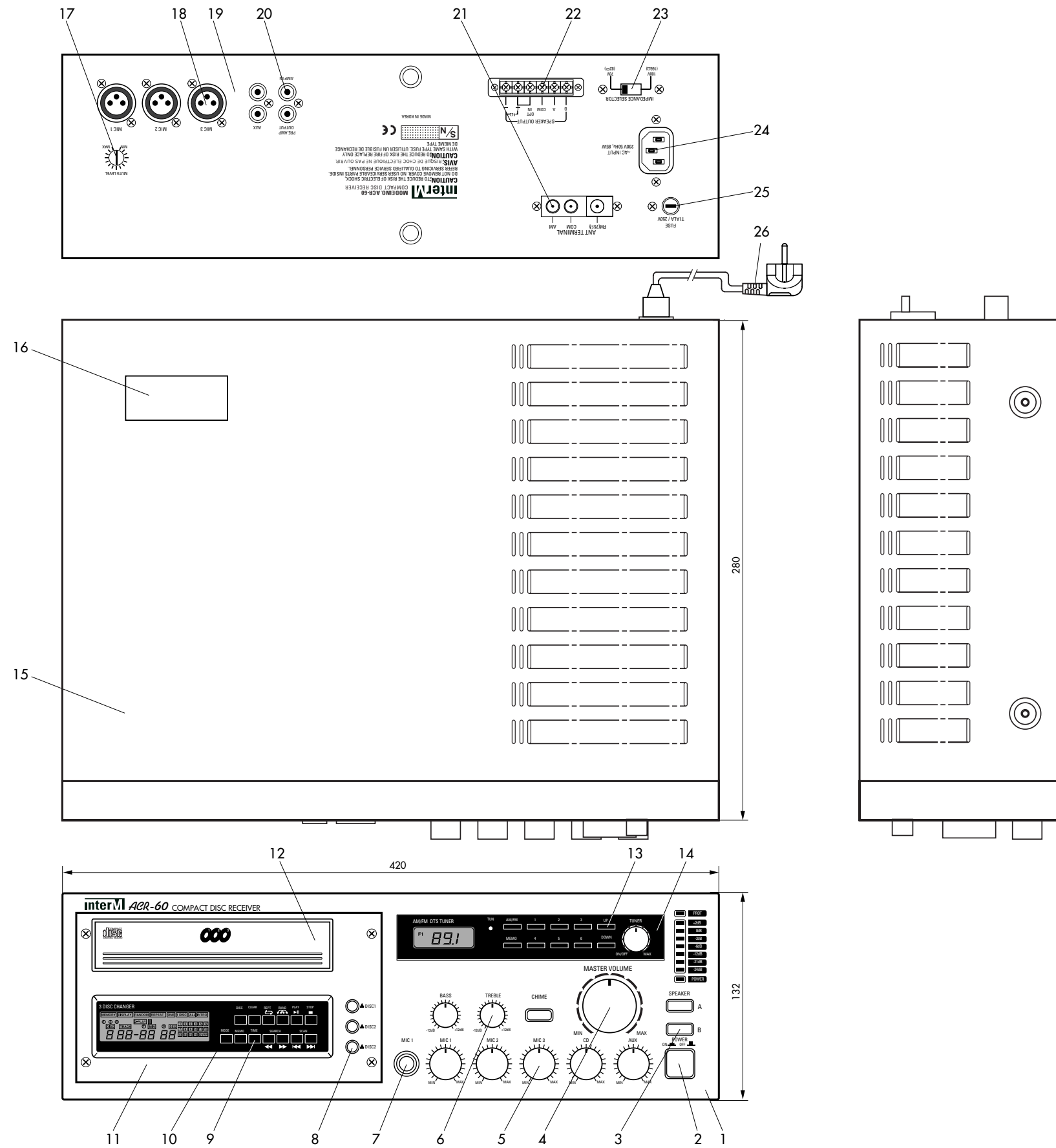
EXPLODED VIEW OF CABINET & CHASSIS/MECHANICAL PARTS LIST



66	SHIELD FENCE	6165168410	1	
65	BRACKET COVER	6505936610	1	
64	LENS LED	8545992710	1	
63	CONNECTOR PCB	4005409900	1	
62	BKT GND	6505955520	2	
61	FUSE HOLDER(SOCKET)	445899210(310)	1	
60	INLET B'D	4005410220	1	
59	BRACKET P/U B'	6505952110	1	
58	TERMINAL STUD	6535995820	2	
57	TERMINAL COVER	8575996530	1	
56	TACT SW B'D	4005410240	1	
55	TACT KNOB	048545991011	3	
54	RIVET NYLON	6538998810	2	
53	OUTPUT LED BD-1	4005410340	1	
52	HEAT SINK BKT	6505942010	1	
51	HEAT SINK	7502090110	1	
50	SUPPORTER	6535998020	2	
49	AMP B'D	4005410300	1	
48	AC CORD	4308999410	1	
47	AC INLET	4448599010	1	
46	BACK CHASSIS	046102980112	1	
45	INPUT B'D	4005410210	1	
44	SPEAKER SELECTOR	4628988310	1	
43	SP TERMINAL B'D	4005410330	1	
42	PRE POWER B'D	4005410200	1	
41	TRANS POWER	2828065820	1	
40	TRANS OUTPUT	2818098400	1	
39	FOOT FELT	6735994110	4	
38	FOOT	6335999510	4	
37	MAIN CHASSIS	6122691110	1	
36	TOP COVER	046122095720	1	
35	CD PCB	4005410810	1	
34	BRACKET CD MECH	6503973810	1	
33	CD DOOR(OUT)	048543986212	1	
32	CD DOOR(IN)	8543986310	1	
31	CD MECHANISM	5708999310	1	
30	LCD SUPPORT	8575990810	1	
29	TACT B'D	4005410820	1	
28	TACT KNOB(CD)	048545989021	1	
27	LCD KXN 29150 DAN	2338170394	1	
26	FILTER	8545988310	1	
25	INLAY(CD)	048575990911	1	
24	CD PACK	048522991611	1	
23	SUB HEAT SINK	7503093610	1	
22	STUD	6535993510	2	
21	TUNER B'D	4005412710	1	
20	PACK TUNER	048522995911	1	
19	LAMP SPONGE	6735989010	1	
18	TACK B'D	4005412600	1	
17	SIDE LOCKING SADDLE	6538997711	1	
16	VR B'D	4005410310	1	
15	SHORT BAR	4465998010	1	
14	BUSHING CAP	6538995703	1	
13	INSULATION SHEET	6163196210	1	
12	POWER SW B'D	4005410320	1	
11	OUTPUT LED BD-2	4005410350	1	
10	INSULATION PLATE	6735988920	1	
9	RUBBER SPONGE	6715997420	1	
8	PCB BKT	6505954610	1	
7	CONTROL KNOB	048543997011	3	
6	LEVEL KNOB	048543997311	1	
5	CONTROL KNOB	048543998313	5	
4	TUNER INLAY	048533998513	1	
3	KNOB PUSH	048543997210	1	
2	CHIME KNOB	048543997110	3	
1	FRONT PANEL	048521995111	1	
NO	PART NAME	PART NUMBER	QTY	REMARK

S14	SCREW 2BTC #2.6X8Y	8109226081	4	
S13	SCREW BM3X8B	8009130083	4	
S12	SCREW #2BTC3X8B	8109230083	37	
S11	SCREW 2PTC 2.6X5B	8119226053	4	
S10	DOT SCREW (2BTC3X10B)	8095996520	8	
S9	SCREW BM3X6NI	8009130064	2	
S8	HEX MSPM 3X16Y	8099130161	1	
S7	SCREW #2BTC3X12B	8109230123	8	
S6	HEX MSPM 3X12Y	8099130121	13	
S5	SCREW #3WTC4X8B	8159340083	12	
S4	SCREW BM3X6B	8009130063	13	
S3	SCREW #3BTC3X6B	8109330063	12	
S2	SCREW #3BTC4X8B	8109340083	4	
S1	SCREW #2BTC3X6B	8109230063	15	

ASS'Y DRAWING



No.	Description	Part No	Q'ty	Remark
1	FRONT PANEL	048521995111	1	ACR-60
		048521995112	1	ACR-120
2	PUSH KNOB	048543997210	1	
3	CHIME KNOB	048543997110	3	
4	LEVEL KNOB	048543997313	1	
5	CONTROL KNOB	048543998334	5	
6	CONTROL KNOB	048543997013	3	
7	PHONE JACK	4438097320	1	
8	TACT KNOB	048545991011	3	
9	TACT KNOB	048545989021	1	
10	CD INLAY	048575990911	1	
11	CD PACK	048522991611	1	
12	CD DOOR	048543986214	1	
13	TUNER PACK	048522995911	1	
14	TUNER INLAY	048533998513	1	
15	TOP COVER	046122095720	1	
16	COVER B.K.T	046505936612	1	
17	CONTROL KNOB	048543997011	1	
18	XLR JACK(F) 3P	4438193810	3	
19	BACK CHASSIS	046102980112	1	ACR-60 220V
		046102980101	1	ACR-60 230V
		046102980114	1	ACR-60 120V
		046102980115	1	ACR-60 240V
		046102980116	1	ACR-120 220V
		046102980102	1	ACR-120 230V
20	RCA JACK	046102980118	1	ACR-120 120V
		046102980119	1	ACR-120 240V
21	ANT. TERMINAL	4465998410	1	
22	SCREW TERMINAL 6P	4465997706	1	
23	SELECTOR SWITCH	4618001110	1	
24	AC INLET	4448599010	1	
25	SOCKET TERMINAL	4355934707	1	
26	AC CORD	4308999410	1	