

SERVICE MANUAL

RADIO RECEIVER

This Service Manual is the "Revision Publishing" and replaces "Simple Manual" (S/M Code No. 09-008-348-8T1).

SPECIFICATIONS

Power source	AC 230 V, 50 Hz
Output	280 mW (EIAJ)
Power consumption	4 W
Speaker	57 mm, 8 ohms
Frequency range	FM: 87.5 – 108 MHz (50 kHz steps) MW: 531 – 1,602 kHz (9 kHz steps) LW: 144 – 288 kHz (1 kHz steps)
Antennas	FM wire antenna Ferrite bar antennas for MW, LW
Maximum outside dimensions	124 (W) × 155.2 (H) × 105.5 (D) mm
Weight	Approx. 686 g

- Design and specifications are subject to change without notice.

ACCESSORIES/PACKAGE LIST

DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

REF. NO	PART NO.	KANRI NO.	DESCRIPTION
1	8A-RU3-905-010	IB,EZ(EGF)C	
1	8A-RU3-907-010	IB,EZ(PHNCZ)C	
1	8A-RU3-906-010	IB,EZ(SID)C	

ELECTRICAL MAIN PARTS LIST

DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
 If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

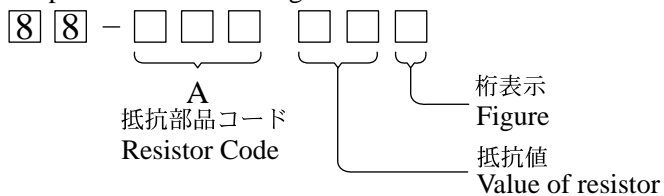
REF. NO	PART NO.	KANRI NO.	DESCRIPTION	REF. NO	PART NO.	KANRI NO.	DESCRIPTION
IC				SW403	S2-200-711-000		SW,SLIDE SK22F03G7
	8A-RU3-606-010	IC,TC9298F		SW404	S2-200-711-000		SW,SLIDE SK22F03G7
	8A-RU3-605-010	IC,TC9323F020		SW405	8A-RU6-615-010		SW,TACT PLATE LARGE
	8A-RUA-605-010	IC,CXA1619BS		T401	S8-539-390-750		IFT,AM OSC
	S7-172-340-1A0	LC72343G-9961		T403	S8-206-440-070		IFT,LW OSC
TRANSISTOR				TC401	8A-RU6-624-010		TRIMMER,30P GRN
	89-508-804-080	C-FET,2SK880Y		TC402	8A-RU6-624-010		TRIMMER,30P GRN
	87-026-230-080	CHIP-TR,DTA114YK		VR401	8A-RU6-616-010		VR,RTRY 50KA H
	89-327-126-080	73TR,2SC2712(Y)		WH401	S1-001-002-000		CONN,10P
	89-320-011-280	TR,2SC2001K		WH402	S1-101-002-000		CONN,11P
	87-026-214-080	TR,DTA114YS		X401	87-A70-091-010		VIB,XTAL 4.332MHZ CSA-309
	89-414-680-080	TR,2SD1468S		CPU C.B			
	89-318-155-080	TR,2SC1815 (0.4W)		C201	87-012-286-080		CAP, U 0.01-25
	86-NFZ-657-080	TR,2SC1923(O)		C203	87-012-286-080		CAP, U 0.01-25
	87-026-462-010	TR,2SC1740S		C204	87-010-404-010		CAP,E 4.7-50 M SME
	S7-805-000-020	TR,PE8050B,C,D		C206	87-012-274-080		CHIP CAP,U 1000P-50B
	S9-011-800-180	TR,2SK118R		C207	87-012-274-080		CHIP CAP,U 1000P-50B
	89-110-155-080	TR,2SA1015 (0.4W)		C208	87-012-274-080		CHIP CAP,U 1000P-50B
DIODE				C209	87-012-274-080		CHIP CAP,U 1000P-50B
	87-070-345-080	DIODE,IN4148		C231	87-A10-047-080		C-CAP,U 1-10 Z F
	87-A40-256-080	C-DIODE,RB441Q-40T-72		C232	87-012-284-080		CAP, U 6800P-50
	87-020-339-080	CHIP DIODE 1SS226		C233	87-012-165-080		CAP 3P
	87-001-913-080	ZENER UJZJ5-6B 5.6V, 1/2W		C234	87-A10-047-080		C-CAP,U 1-10 Z F
	87-017-567-080	DIODE,SVC342M-V		C235	87-012-188-080		C-CAP,U 47P-50 CH
	87-A40-226-080	DIODE,SVC251SPA		C236	87-012-188-080		C-CAP,U 47P-50 CH
	87-A40-138-080	ZENER,BZX55/C2V7		C239	87-012-274-080		CHIP CAP,U 1000P-50B
	87-A40-398-010	DIODE,1N4001		C242	87-012-286-080		CAP, U 0.01-25
	87-A40-041-010	ZENER,RD6.2B1ES		C244	87-015-975-010		220UF, 6.3V ELECTROLYTIC
	S0-100-221-200	ZENER,2.2V		C245	87-015-975-010		220UF, 6.3V ELECTROLYTIC
				C249	87-015-975-010		220UF, 6.3V ELECTROLYTIC
MAIN C.B				DP201	8A-RU3-604-010		LCD,AIW4229RDS
C404	87-010-560-040	CAP,E 10-50 GAS		L201	87-003-154-080		COIL,220UH
C409	87-010-560-040	CAP,E 10-50 GAS		LED201	S0-252-012-020		LED-G,KM2520SGT27 (GRN)
C427	87-010-404-010	CAP,E 4.7-50M SME		LED202	S0-252-012-020		LED-G,KM2520SGT27 (GRN)
C431	87-010-555-040	CAP,E 100-10 GAS		LED203	S0-252-012-020		LED-G,KM2520SGT27 (GRN)
C433	87-010-375-010	CAP,E 330-10 M SME		LED204	S0-252-012-020		LED-G,KM2520SGT27 (GRN)
C435	87-010-560-040	CAP,E 10-50 GAS		SW201	8A-RU6-615-010		SW,TACT PLATE LARGE
C436	87-010-491-040	CAP,E 0.22-50 GAS		SW202	8A-RU6-615-010		SW,TACT PLATE LARGE
C437	87-010-493-040	CAP,E 0.47-50 GAS		SW203	8A-RU6-615-010		SW,TACT PLATE LARGE
C438	87-010-560-040	CAP,E 10-50 GAS		SW204	8A-RU6-615-010		SW,TACT PLATE LARGE
C439	87-010-404-010	ELECT CAP 4.7MFD/50V		SW205	8A-RU6-615-010		SW,TACT PLATE LARGE
C463	87-010-237-010	CAP,E 1000-16 M SME		SW206	8A-RU6-615-010		SW,TACT PLATE LARGE
C464	87-010-380-010	CAP,E 47-16 M SME		SW207	8A-RU6-615-010		SW,TACT PLATE LARGE
C467	87-010-555-040	CAP,E 100-10 GAS		T231	S8-398-250-550		IFT,5.5MM
C468	87-010-555-010	CAP,E 100-10 M 5L SRE		X202	S6-045-000-000		CRYSTAL 4.500 MHZ
C478	87-010-560-040	CAP,E 10-50 GAS		PRESET C.B			
C502	87-010-555-040	CAP,E 100-10 GAS		SW301	8A-RU6-615-010		SW,TACT PLATE LARGE
C508	87-010-555-040	CAP,E 100-10 GAS		SW302	8A-RU6-615-010		SW,TACT PLATE LARGE
CF401	87-PC4-617-010	FLTR,SFE10.7MA5		SW303	8A-RU6-615-010		SW,TACT PLATE LARGE
CF403	8A-RH2-611-010	FLTR,SFU450 B		SW304	8A-RU6-615-010		SW,TACT PLATE LARGE
△ICP401	87-001-486-010	ICP-N15		SW305	8A-RU6-615-010		SW,TACT PLATE LARGE
L405	87-005-151-080	COIL,2.2UH		SW306	8A-RU6-615-010		SW,TACT PLATE LARGE
L406	8A-RU6-621-010	COIL,FM BPF 4T-4.5-0.8		SW307	S1-102-000-000		SW,TACT 4P 3.85MM
L407	S0-101-560-030	INDUCTOR,15uH		WH301	S0-901-202-000		CONN,9P
SW401	S2-200-711-000	SW,SLIDE SK22F03G7					
SW402	S2-200-711-000	SW,SLIDE SK22F03G7					

- Regarding connectors, they are not stocked as they are not the initial order items.
The connectors are available after they are supplied from connector manufacturers upon the order is received.

○チップ抵抗部品コード／CHIP RESISTOR PART CODE

チップ抵抗部品コードの成り立ち

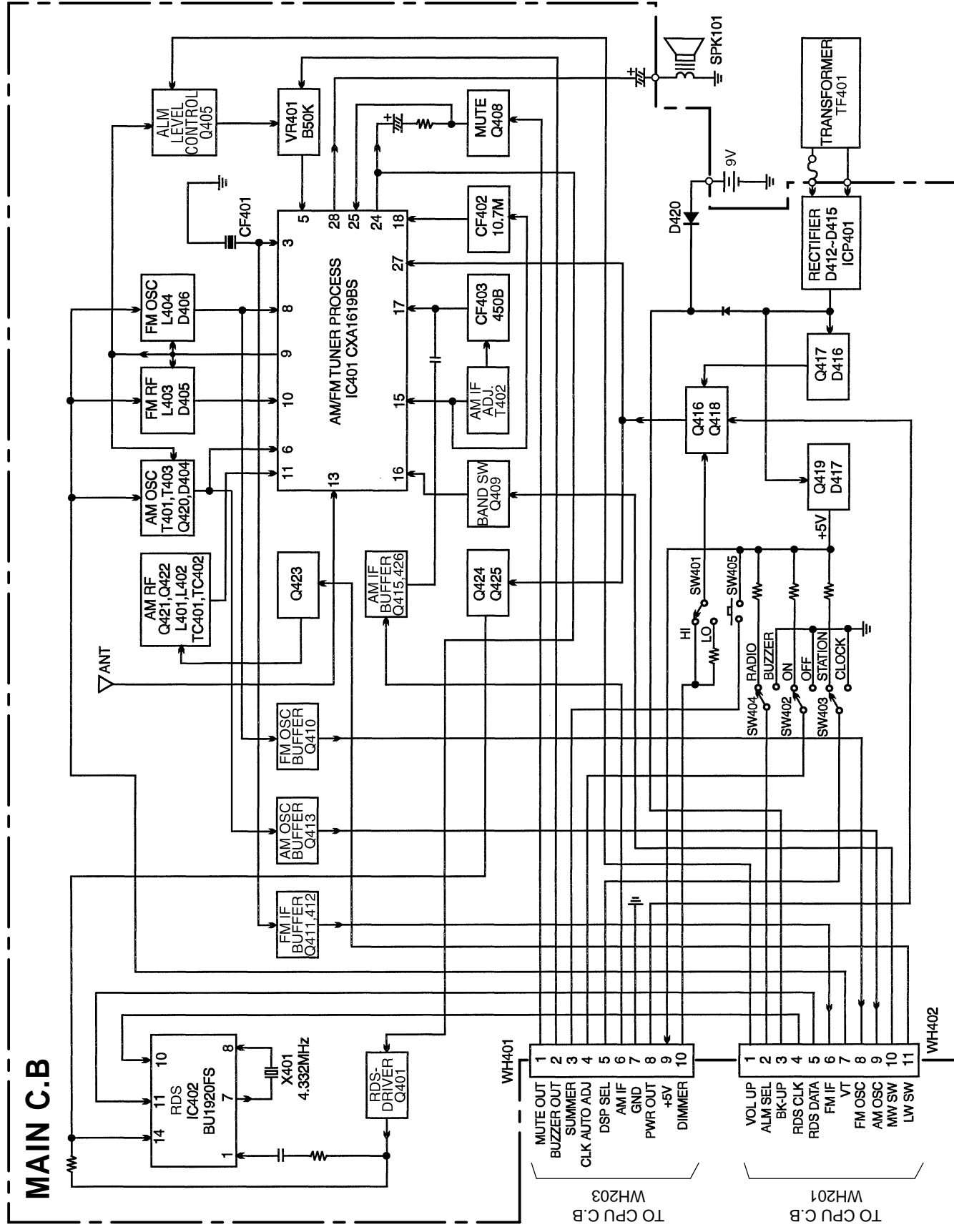
Chip Resistor Part Coding



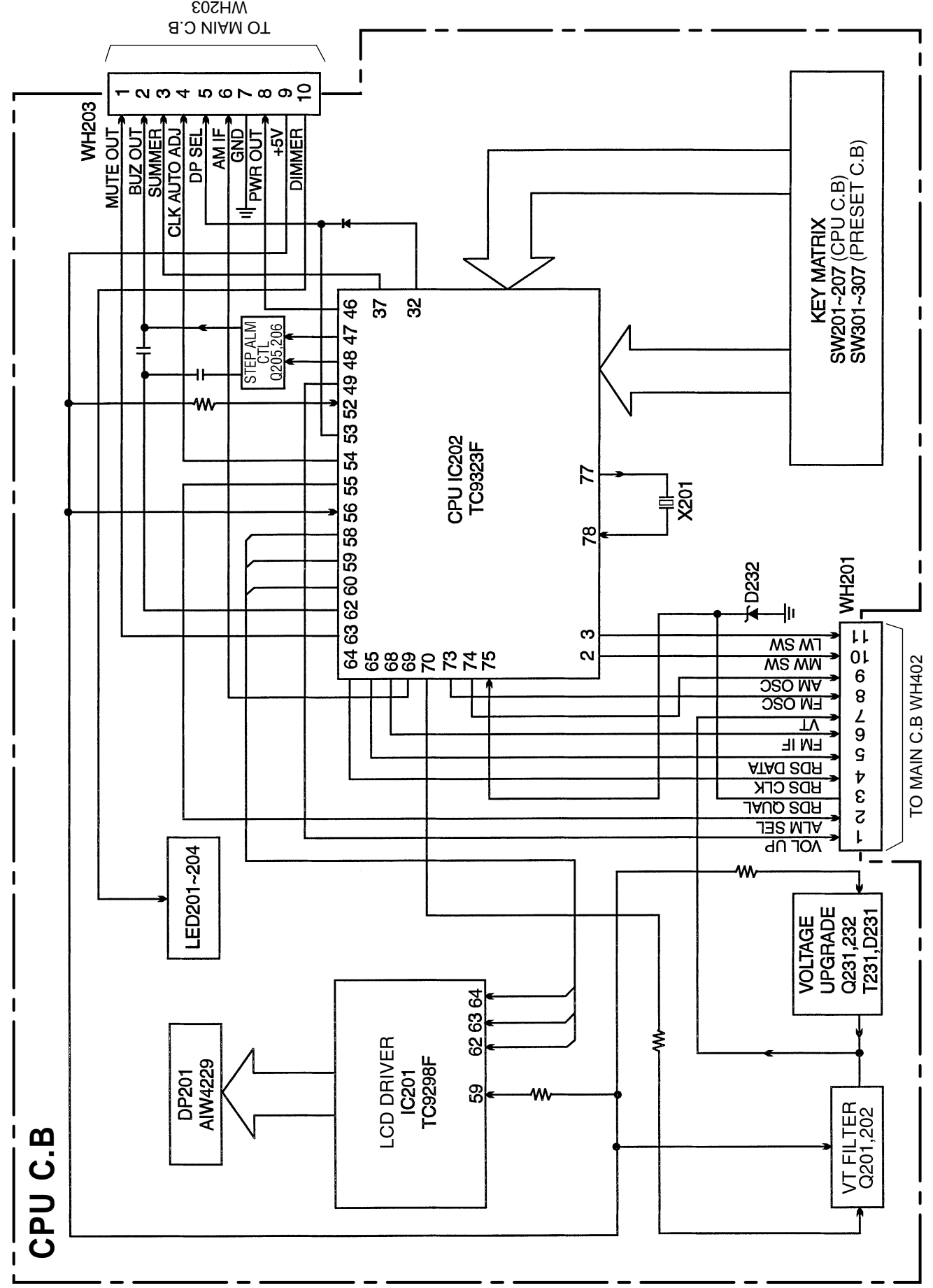
チップ抵抗
Chip resistor

容量 Wattage	種類 Type	許容誤差 Tolerance	記号 Symbol	寸法/Dimensions (mm)			抵抗コード : A Resistor Code : A	
				外形/Form	L	W		t
1/16W	1005	± 5%	CJ		1.0	0.5	0.35	104
1/16W	1608	± 5%	CJ		1.6	0.8	0.45	108
1/10W	2125	± 5%	CJ		2	1.25	0.45	118
1/8W	3216	± 5%	CJ		3.2	1.6	0.55	128

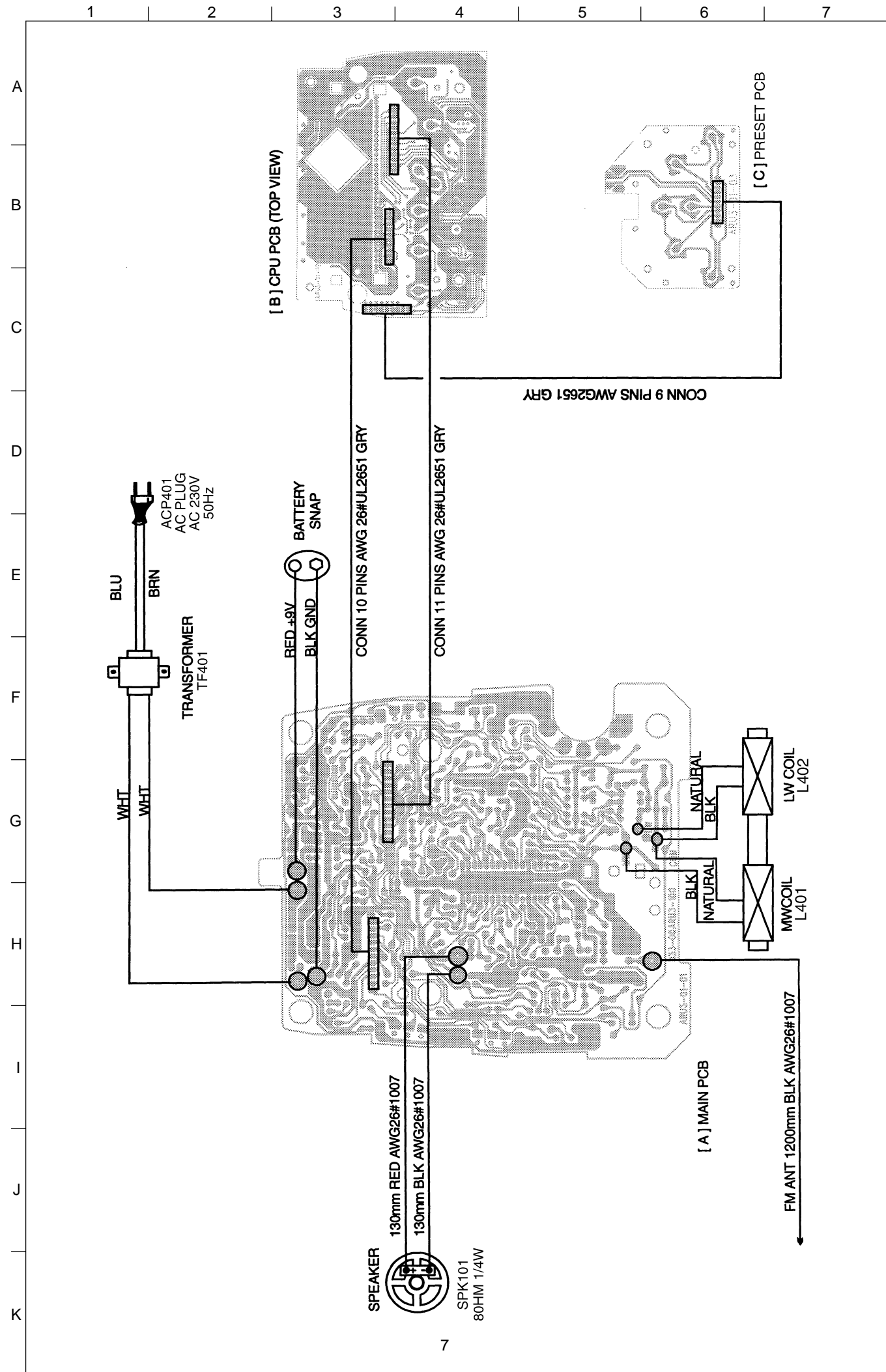
BLOCK DIAGRAM-1 (TUNER)



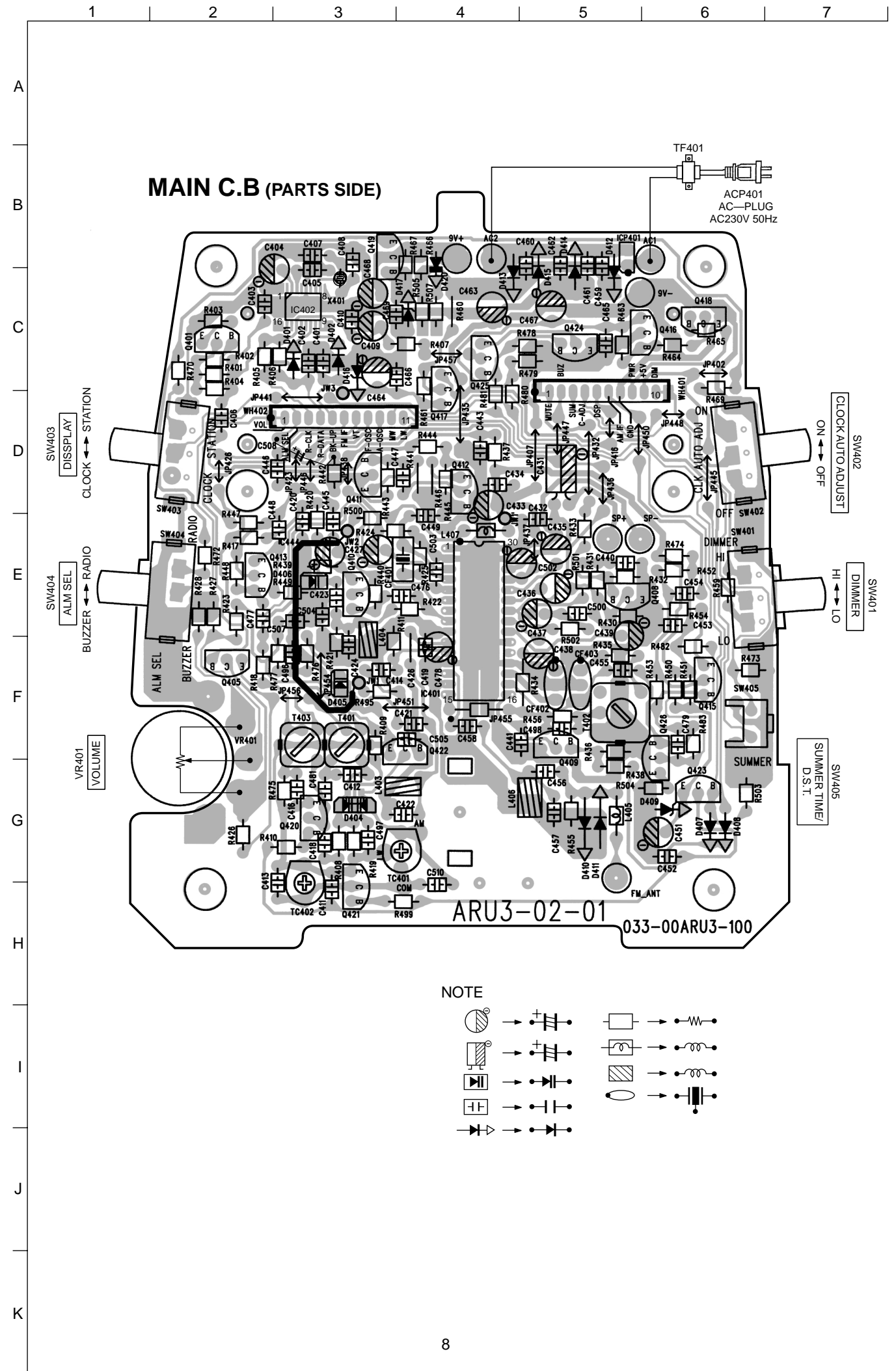
BLOCK DIAGRAM-2 (CPU)

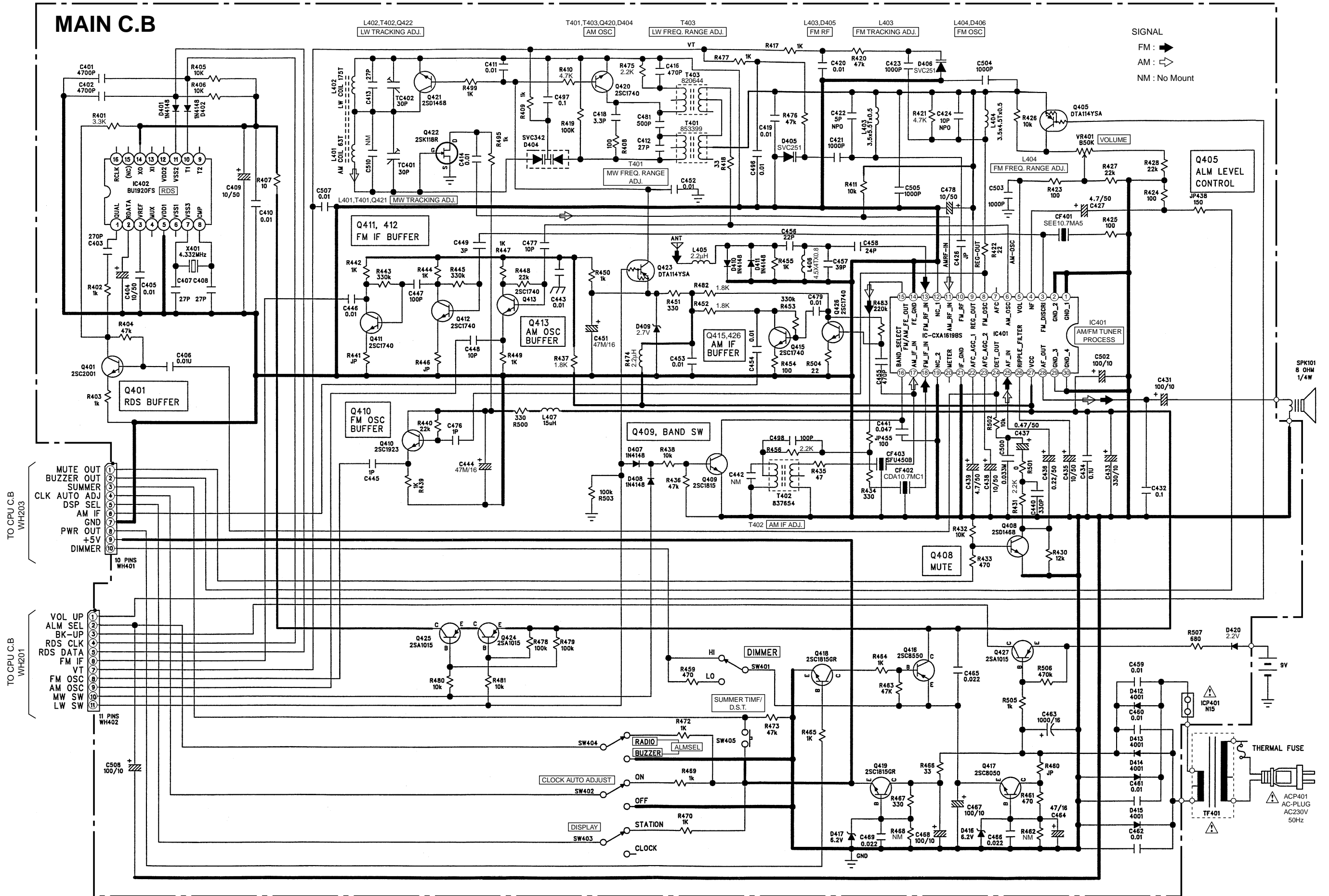


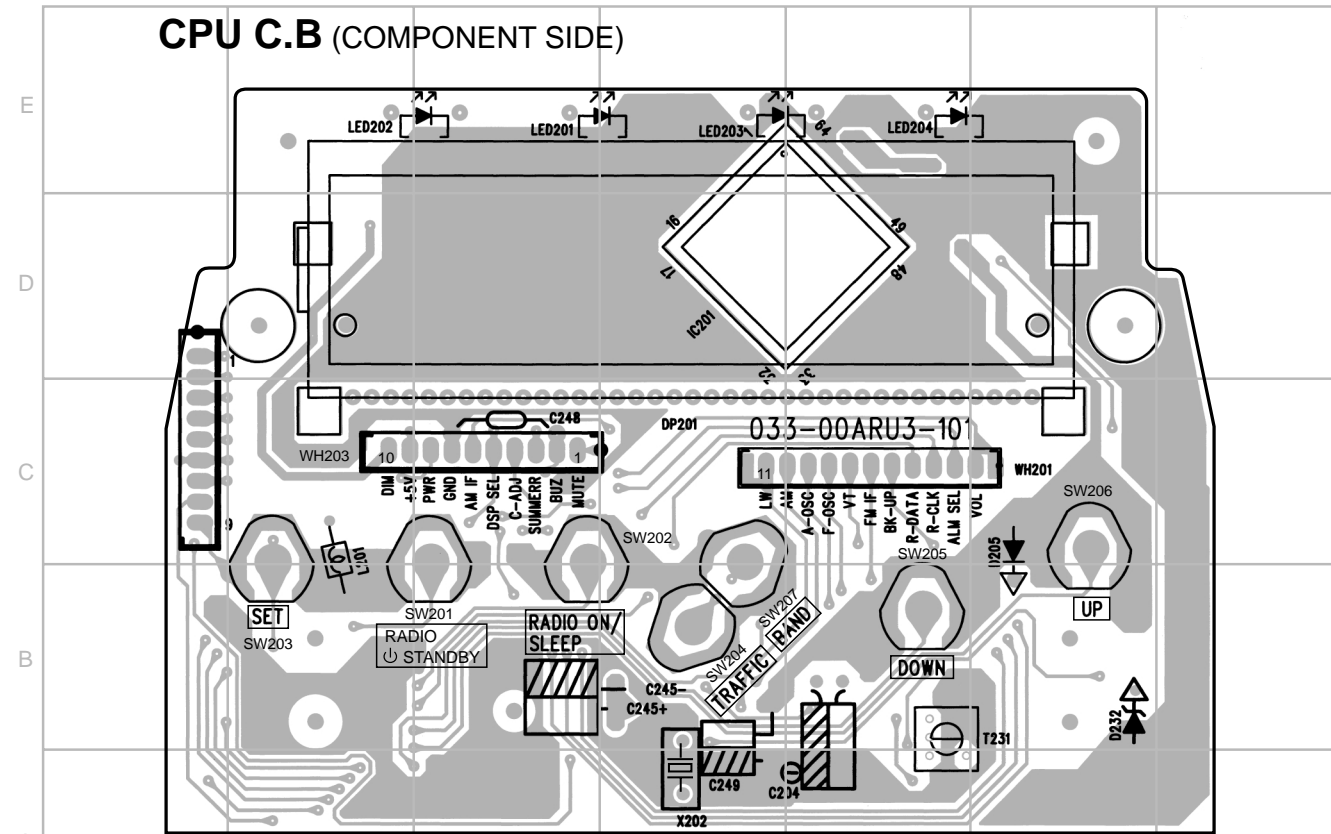
WIRING-1 (CONNECTION DIAGRAM)



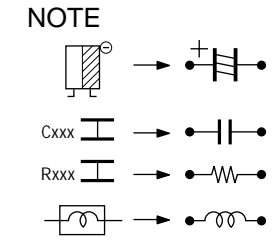
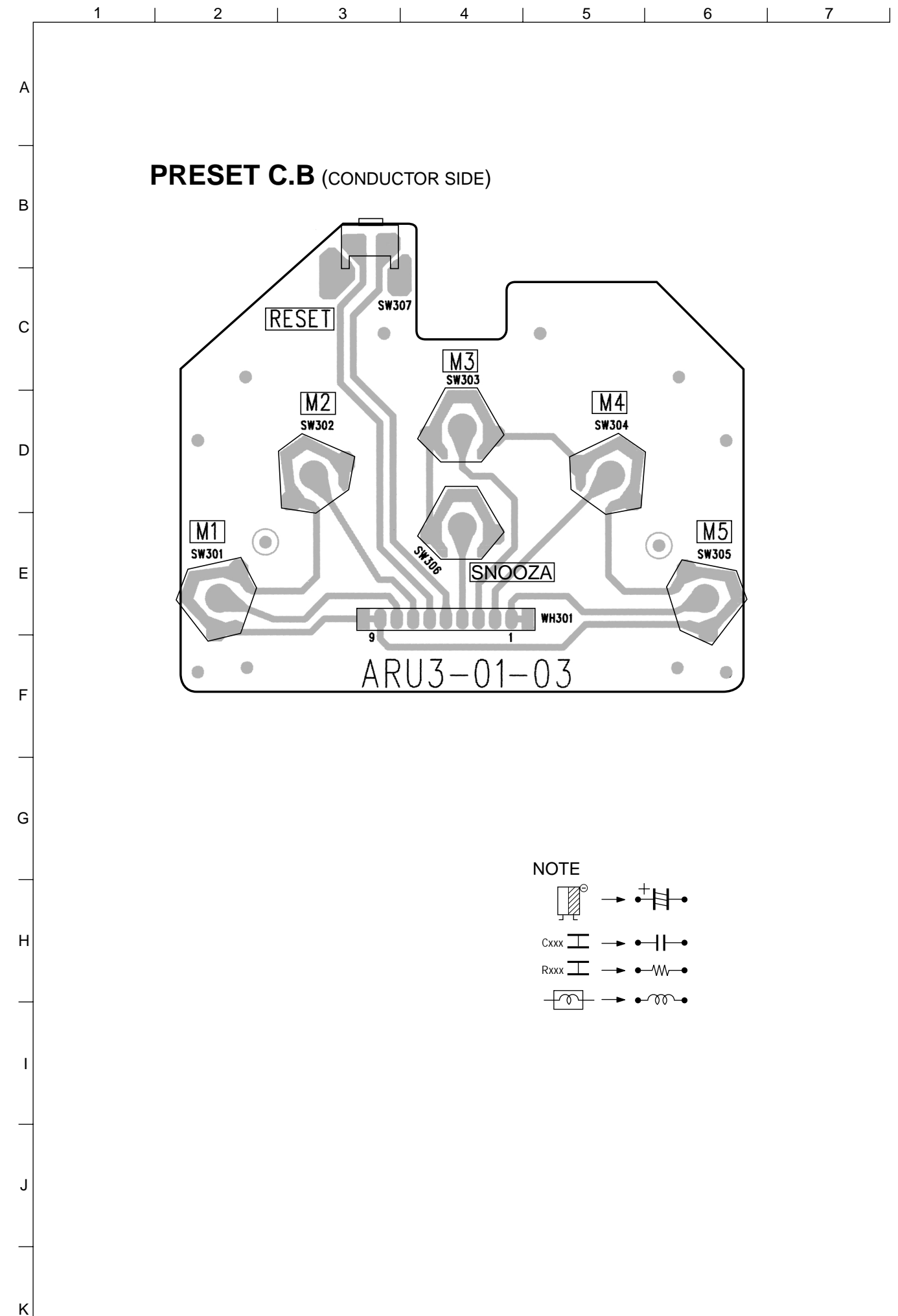
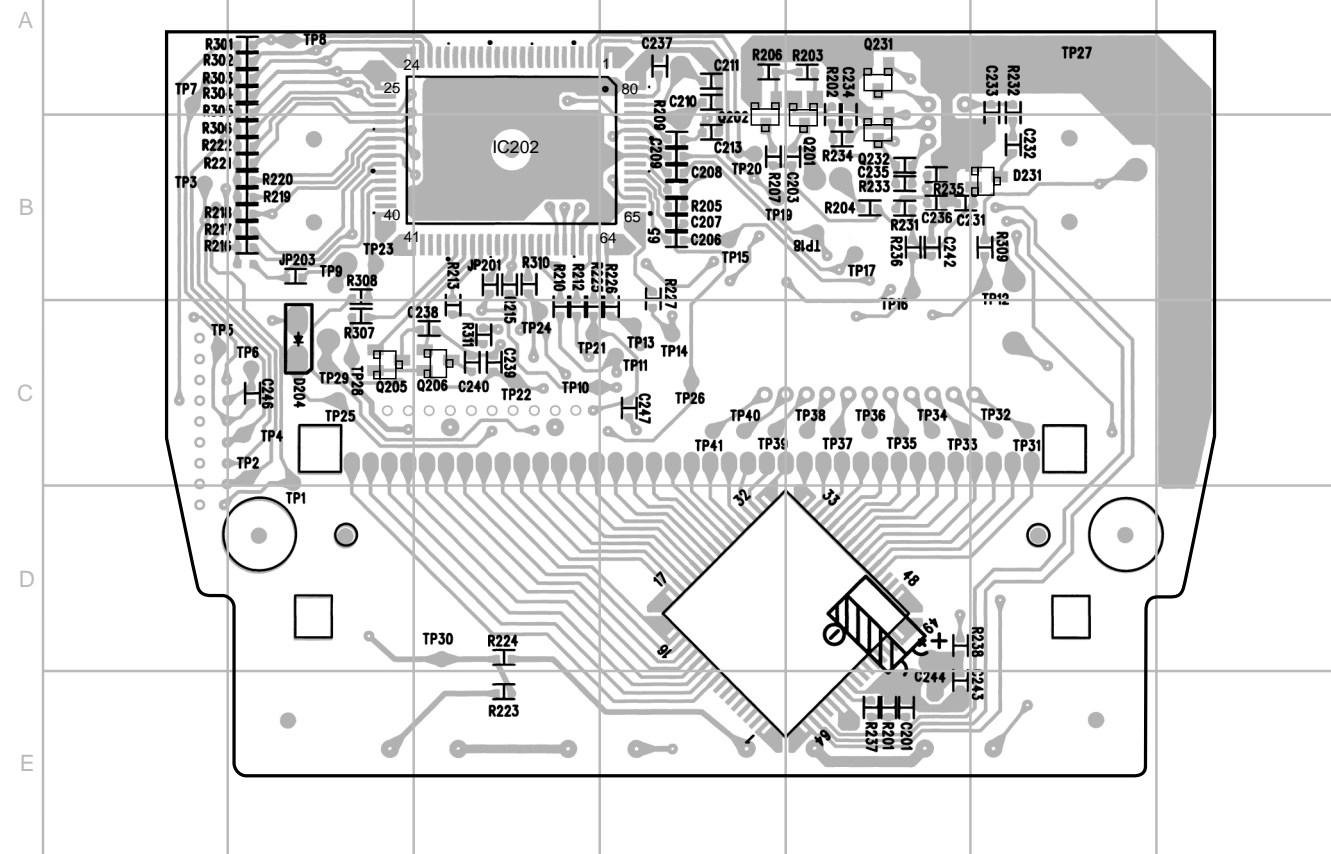
WIRING-2 (MAIN)

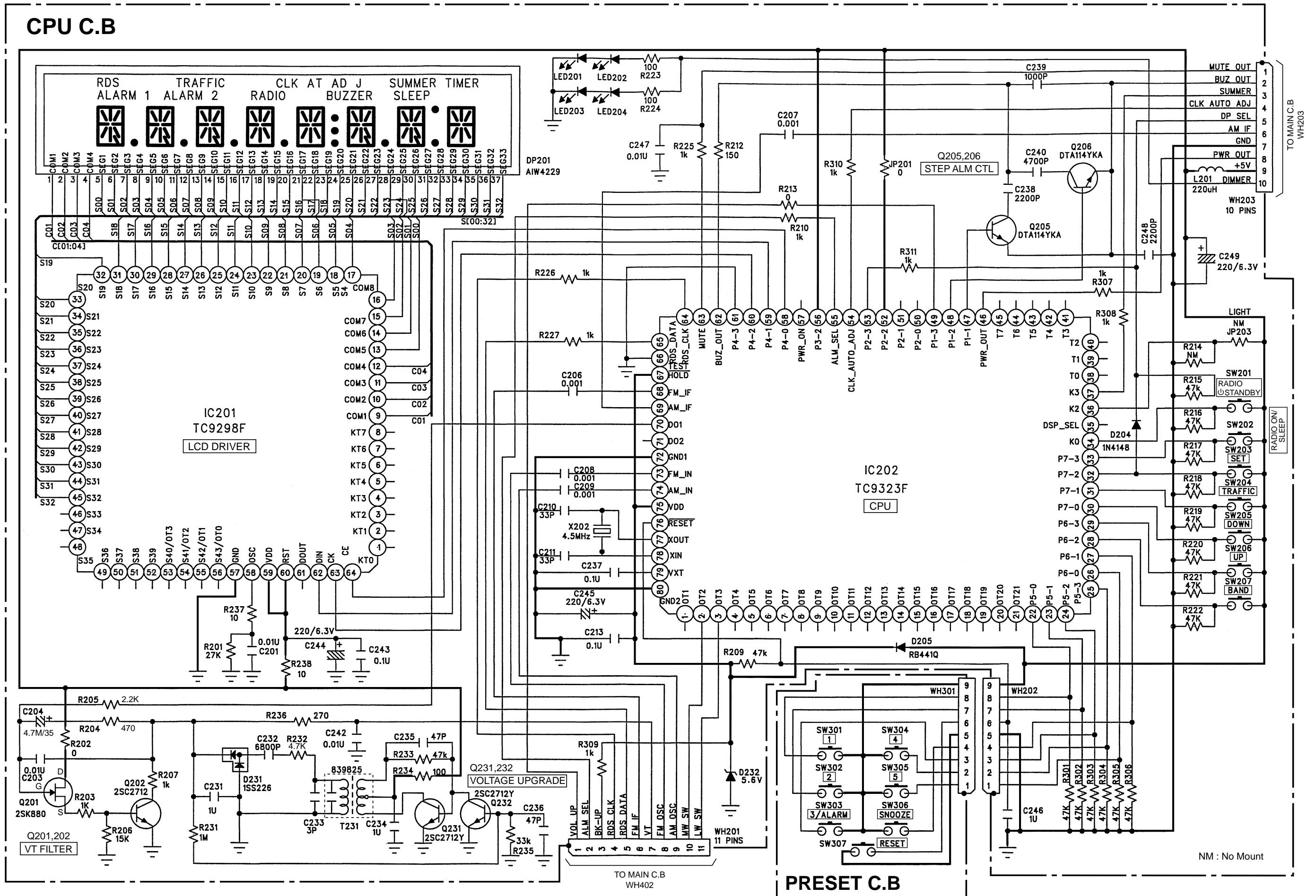


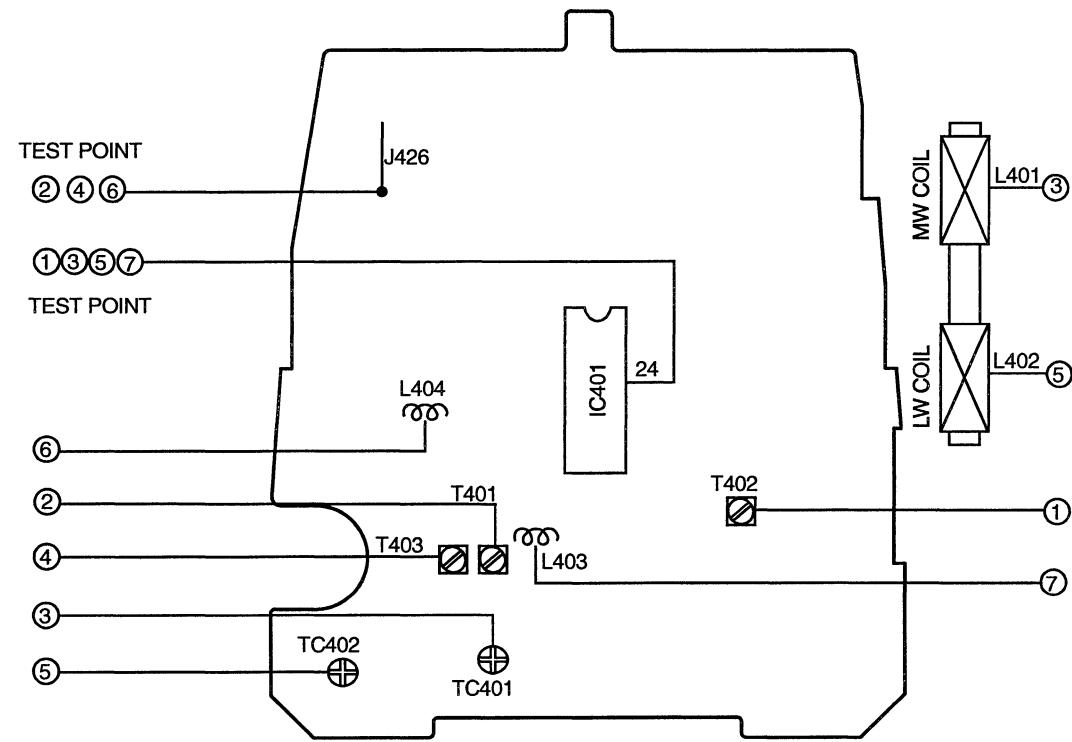




CPU C.B (CONDUCTOR SIDE)

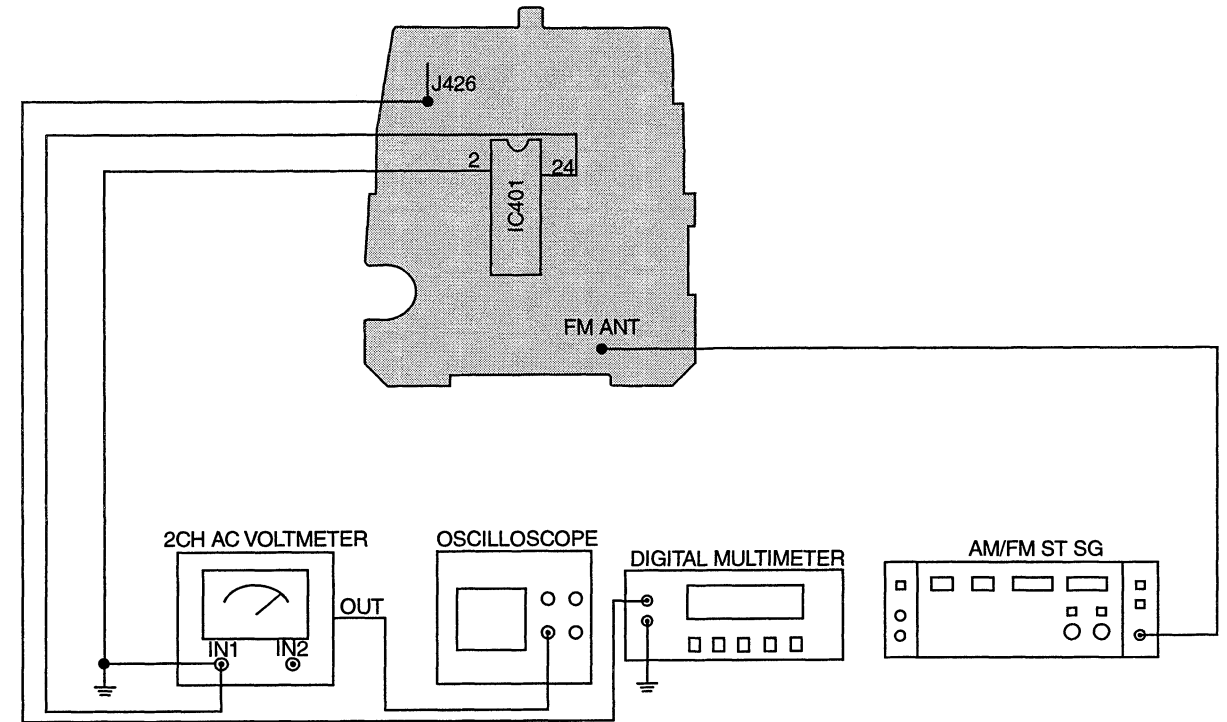




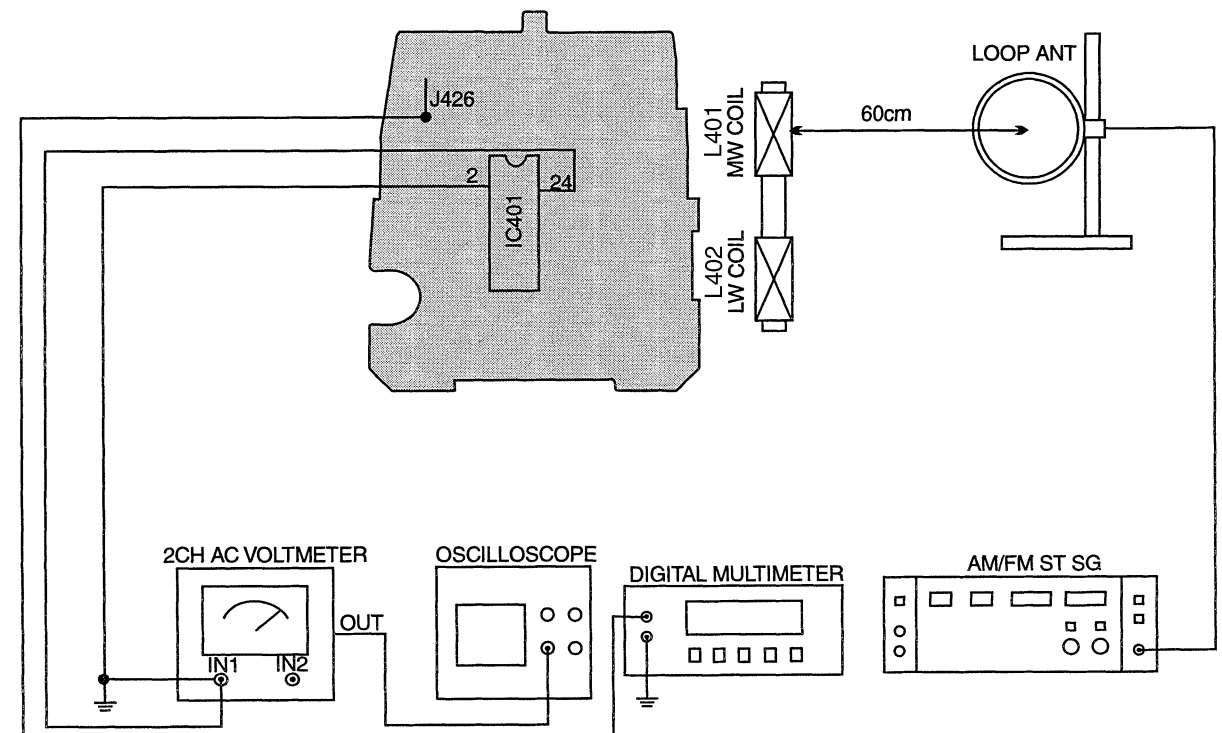


- | | |
|--|---|
| <p>1. AM IF Adjustment
Test point: IC401(CXA1619BS) 24 PIN
Adjustment location: T402
T402-----450 kHz</p> <p>2. MW Frequency Range Adjustment
Test point: J426
Adjustment location: T401
Set frequency to be 531 kHz
Adjust T401 so that voltage of that test point is $1.1V \pm 0.1V$</p> <p>3. MW Tracking Adjustment
Test point: IC401 (CXA1619BS) 24 PIN
Adjustment location: L401, TC401
L401-----603kHz waveform max.
TC401-----1404 kHz waveform max.</p> <p>4. LW Frequency Range Adjustment
Test point: J426
Adjustment location: T403
Set frequency to be 144kHz
Adjust T403 so that voltage of that test point is $1.5V \pm 0.1V$</p> | <p>5. LW Tracking Adjustmet
Test point: IC401 (CXA1619bs)24 PIN
Adjustment location: L402, TC402
L402-----189kHz Waveform max.
TC402-----288kHz Waveform max</p> <p>6. FM Frequency Range Adjustment
Test point: J426
Adjustment Location: L404
Set frequency to be 87.5MHz
Adjust L404 so that voltage of that test point is $3.0V \pm 0.1V$</p> <p>7. FM Tracking Adjustment
Test point: IC401 (CXA1619BS) 24PIN
Adjustment Location : L403
L403-----88MHz waveform max.</p> |
|--|---|

FM SECTION



AM SECTION



VOLTAGE CHART

TUNER & POWER AMP SECTION

TEST CONDITION : SET AM/FM TUNER ON ONE FREQUENCY

IC401 (CXA1619BS)

PIN'S NUMBER	1	2	3	4	5	6	7	8	9	10
AM	0	0	5.07	2.83	0.21	1.26	0.02	1.27	1.27	1.27
FM	0	0	4.58	2.81	0.29	1.26	0.07	1.25	1.26	1.26
BUZZER	0	0	4.58	2.81	0.28	1.26	0.10	1.26	1.26	1.26
PIN'S NUMBER	11	12	13	14	15	16	17	18	19	20
AM	1.26	0	0	0	0.21	0	0	0	0	0.33
FM	1.26	0	0.35	0	1.16	1.36	0	1.36	0	0
BUZZER	1.26	0	0.35	0	1.16	1.37	0	1.37	0	0
PIN'S NUMBER	21	22	23	24	25	26	27	28	29	30
AM	0	1.50	1.09	1.02	0	5.00	5.50	2.80	0	0
FM	0	1.70	0.93	0.84	0	5.00	5.50	2.80	0	0
BUZZER	0	1.30	1.20	1.02	0	5.00	5.50	2.82	0	0

IC402 (BU1920FS)

PIN'S NUMBER	1	2	3	4	5	6	7	8
FM.RDS	2.86	2.91	0	2.92	0	0	2.57	2.26
PIN'S NUMBER	9	10	11	12	13	14	15	16
FM.RDS	2.70	2.76	2.96	0	0	5.40	0	0

TRANSISTOR	Q405(DTA114YSA)			Q410(2SC1923)			Q411(2SC1740)			Q412(2SC1740)		
	E	C	B	E	C	B	E	C	B	E	C	B
FM	1.26	1.25	0	2.99	4.41	3.73	0	3.10	0.64	0	3.10	0.64
TRANSISTOR	Q424(2SA1015)			Q425(2SA1015)			Q401(2SC2001)			Q416(2SC8550)		
	E	C	B	E	C	B	E	C	B	E	C	B
FM	5.58	5.52	4.85	5.52	5.48	4.81	1.00	1.85	1.67	5.61	5.57	4.85
TRANSISTOR	Q417(2SC8050)			Q418(2SC1815GR)			Q419(2SC1815GR)					
	E	C	B	E	C	B	E	C	B			
FM	5.61	7.98	6.30	0	0	0.74	5.58	7.20	6.29			

TRANSISTOR	Q413(2SC1740)			Q421(2SD1468)			Q420(2SC1740)		
	E	C	B	E	C	B	E	C	B
AM	2.07	2.90	2.72	0	0	0.69	0	0	0.67
TRANSISTOR	Q426(2SC1740)			Q422(2SK118R)			Q415(2SC1740)		
	E	C	B	G	S	D	E	C	B
AM	0	2.13	0.72	0	0	3.90	0.16	2.72	0.79

TRANSISTOR	Q409(2SC1815)			Q423(DTA114YSA)		
	E	C	B	E	C	B
FM	0	1.37	0.02	2.94	2.88	0.27
AM	2.94	2.88	2.72	2.94	2.88	0.27

TRANSISTOR	Q201(2SK880)			Q202(2SC2712)			Q231(2SC2712Y)			Q232(2SC2712Y)		
	E	C	B	E	C	B	E	C	B	E	C	B
FM	5.38	0.69	0.37	0	0.64	4.60	0	0.63	4.26	0	0.16	0.63

CPU SECTION

IC201 (TC9298F)

PIN'S NUMBER	1	2	3	4	5	6	7	8	9	10	11	12
FM	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	2.65	2.65	2.65	2.65
PIN'S NUMBER	13	14	15	16	17	18	19	20	21	22	23	24
FM	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	2.65	2.65	2.65	2.65
PIN'S NUMBER	25	26	27	28	29	30	31	32	33	34	35	36
FM	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	2.65	2.65	2.65	2.65
PIN'S NUMBER	37	38	39	40	41	42	43	44	45	46	47	48
FM	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	2.65	2.65	2.65	2.65
PIN'S NUMBER	49	50	51	52	53	54	55	56	57	58	59	60
FM	0.68	0.68	0.68	0.68	0	0	0	0	0	2.44	5.38	5.38
PIN'S NUMBER	61	62	63	64								
FM	4.69	0	5.03	0								

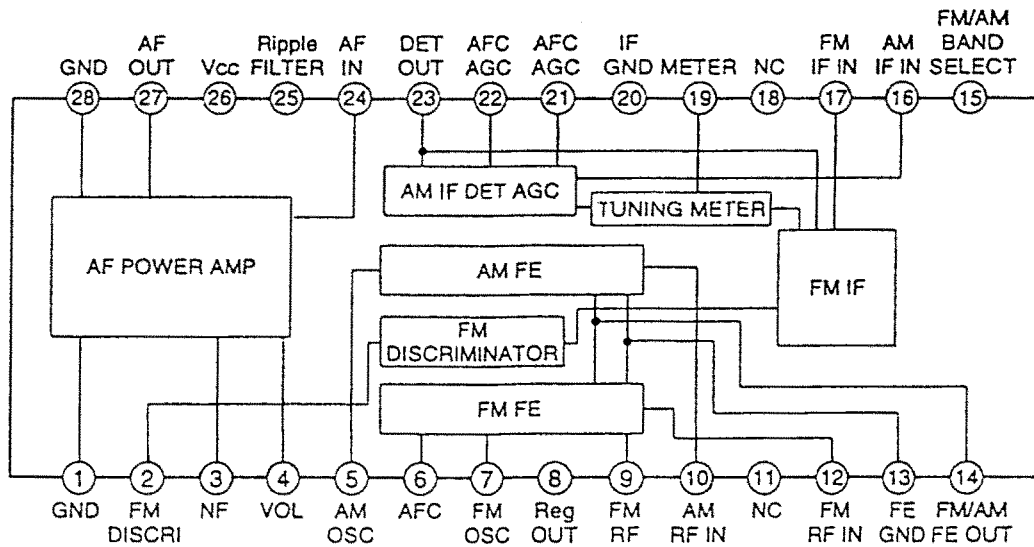
IC202 (TC9323F)

PIN'S NUMBER	1	2	3	4	5	6	7	8	9	10	11	12
FM	5.08	0.19	0.27	0	0	0	0	0	0	0	5.07	0
PIN'S NUMBER	13	14	15	16	17	18	19	20	21	22	23	24
FM	0	5.07	0	0	0	0	0	5.07	0	0	0	0
PIN'S NUMBER	25	26	27	28	29	30	31	32	33	34	35	36
FM	0	0	0	0	0	0	0	0	0	0	0	0
PIN'S NUMBER	37	38	39	40	41	42	43	44	45	46	47	48
FM	0	0	0	0	0	0	0	0	0	4.68	0	0
PIN'S NUMBER	49	50	51	52	53	54	55	56	57	58	59	60
FM	0.01	0	0	5.38	5.33	5.53	0	5.38	0.2	0	0	5.00
PIN'S NUMBER	61	62	63	64	65	66	67	68	69	70	71	72
FM	0	0	0	2.76	3.05	0	5.09	2.65	0	0.36	0	0
PIN'S NUMBER	73	74	75	76	77	78	79	80				
FM	2.79	0	5.09	5.04	1.46	1.33	2.99	0				

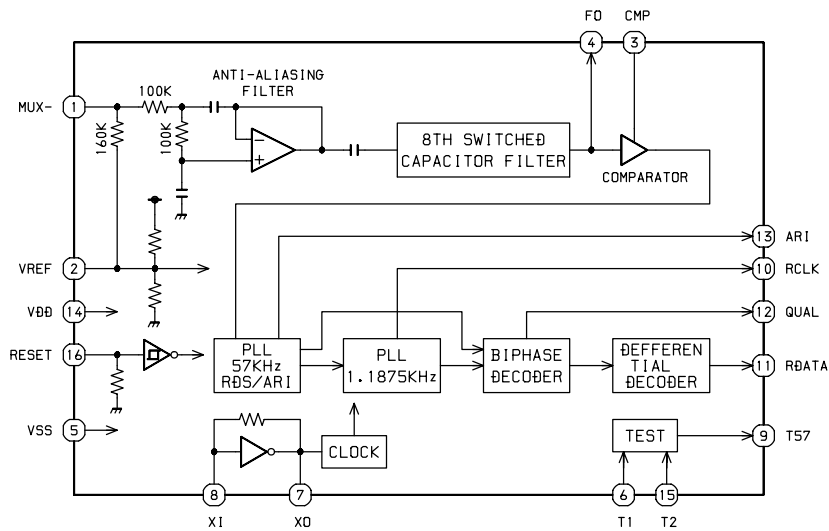
TRANSISTOR	Q205(DTA114YKA)			Q206(DTA114YKA)		
	E	C	B	E	C	B
BUZZER	0.21	0.21	4.88	0.21	0.21	4.88

IC BLOCK DIAGRAM

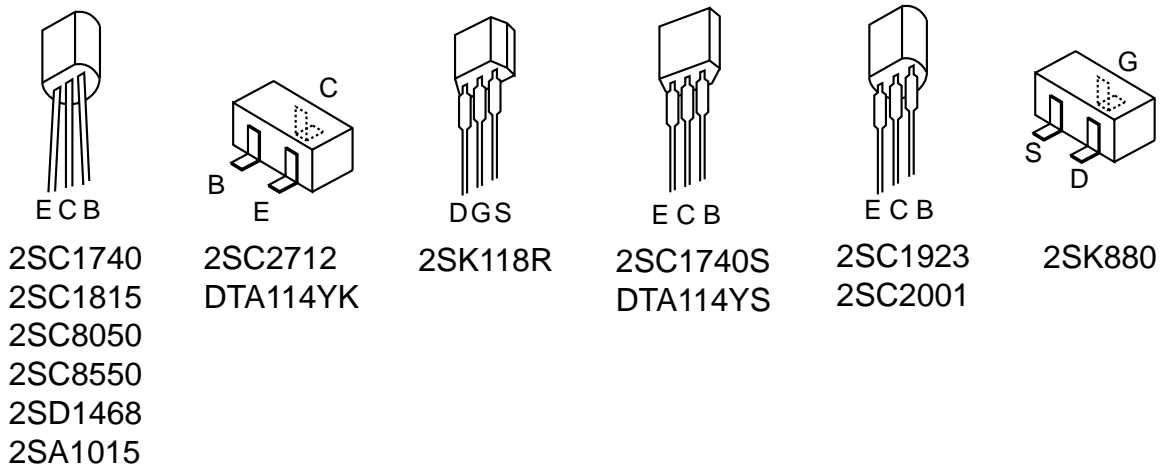
IC, CXA1619BS



IC, BU1920FS



TRANSISTOR ILLUSTRATION

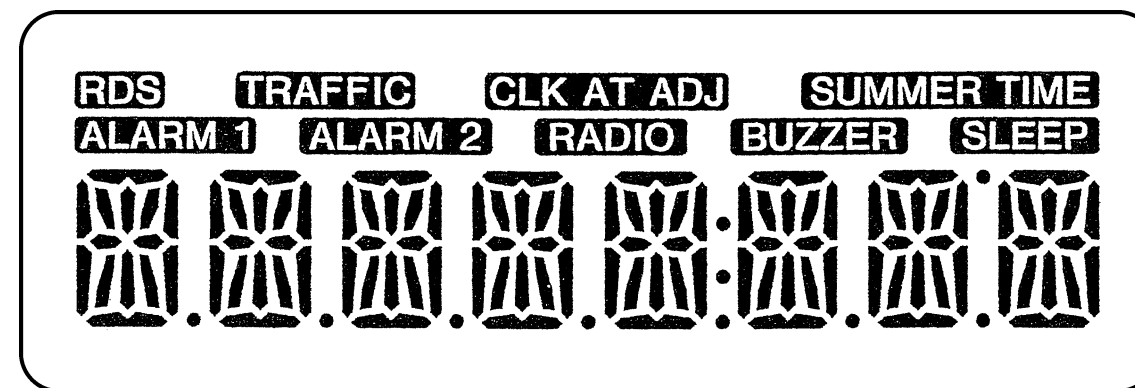


IC DESCRIPTION

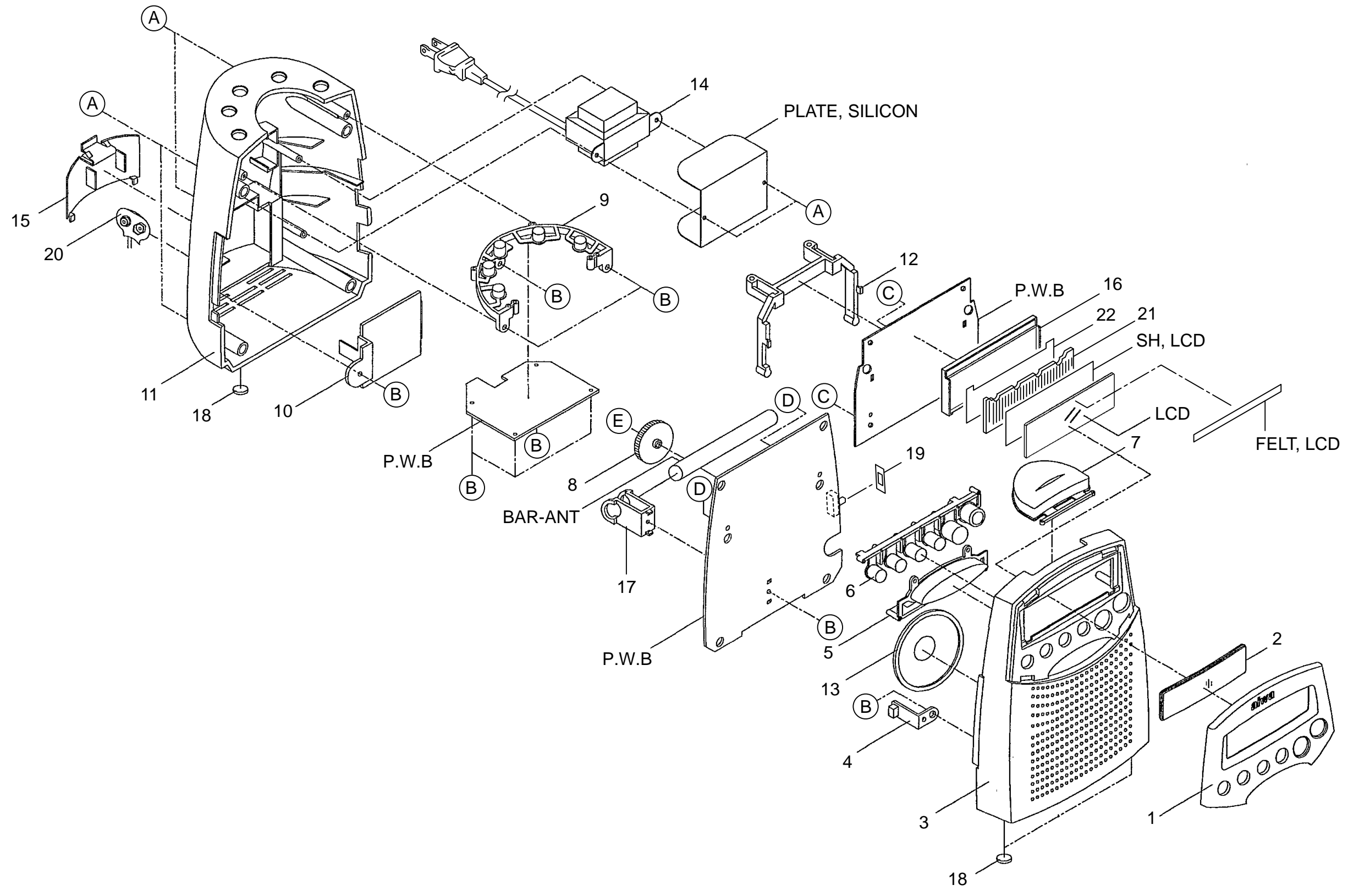
IC, TC9298F

Pin No.	Pin Name	I/O	Description
1-8	KT0-KT7	I/O	Key scan I/O pins.
9-12	COM1-COM4	O	Common signal output pins for LCD.
13-16	S0/COM5-S3/COM8	O	Segment output pins/common output pins.
17-52	S4-S39	O	Segment signal output pins for LCD.
53-56	S40/OT3-S43/OT0	O	Segment signal output pins for LCD/general-purpose output pins.
57	GND	—	Ground pin.
58	OSC	I	CR oscillator pin.
59	VDD	—	Power pin.
60	$\overline{\text{RST}}$	I	Reset input pin.
61	DOUT	O	Data output pin.
62	DIN	I	Data input pin.
63	CK	I	Clock input pin.
64	CE	I	Chip enable input pin.

Pin No.	Pin Name	I/O	Description
1-21	OT1-OT21	O	21-bit output ports.
22-33	P5-0-P7-3	I/O	12-bit (P5-0-P7-3) I/O ports.
34	K0	I	Key matrix input 4-bit input ports.
35	DSP_SEL	I	
36	K2	I	
37	K3	I	
38-45	T0-T7	O	Key matrix timing signal output ports.
46	PWR_OUT	I/O	4-bit I/O ports.
47	P1-1	I/O	
48	P1-2	I/O	
49	P1-3	I/O	
50	P2-0	I/O	8-bit I/O ports. Programmable as input or output bit by bit.
51-53	P2-1-P2-3	I/O	
54	CLK_AUTO_ADJ	I/O	
55	ALM_SEL	I/O	
56	P3-2	I/O	
57	PWR_ON	I/O	4-bit I/O ports. Programmable as input or output bit by bit.
58-61	P4-0-P4-3	I/O	
62	BUZ_OUT	O	
63	MUTE	O	1-bit output port. Normally, it is used as muting control signal output.
64	RDS_CLK	I	External interrupt input pins.
65	RDS_DATA	I	
66	TEST	I	Test mode control input pin. A "H" on this pin enables the test mode. A "L" enables a normal operation.
67	HOLD	I	Input pin to select or clear the hold state. Normally, it is used as radio mode selection signal input or battery detection signal input.
68	FM_IF	I	IF signal inputs to an IF counter that counts occurrences of the FM or AM band IF signal to detect an auto-stop.
69	AM_IF	I	
70, 71	DO1, DO2	O	PLL phase comparator output pins. Tristate output. If the divider output of the programmable counter is higher than the reference frequency, a high is output; if lower, a low is output; and if equal, the pins enter a high-impedance state.
72	GND	—	Ground pins.
73	FM_IN	I	Programmable counter input pin for the FM band.
74	AM_IN	I	Programmable counter input pin for the AM band.
75	VDD	—	Ground pins.
76	RESET	I	Device system reset signal input pin. A reset occurs while a low exists on RESET. A low to high transition on RESET causes the program to start running at address 0.
77	XOUT	O	Crystal oscillator pins. Connect a reference 4.5MHz crystal oscillator to the XIN and XOUT pins.
78	XIN	I	
79	VXT	—	Crystal oscillator power supply.
80	GND	—	Ground pins.



No	COM1	COM2	COM3	COM4
1	COM1	---	---	---
2	---	COM2	---	---
3	---	---	COM3	---
4	---	---	---	COM4
5	1f	1j	1e	RDS
6	1a	1g	1m	1l
7	1i	1h	1n	1d
8	1b	1k	1c	P1
9	2f	2j	2e	ALARM1
10	2a	2g	2m	2l
11	2i	2h	2n	2d
12	2b	2k	2c	P2
13	3f	3j	3e	TRAFFIC
14	3a	3g	3m	3l
15	3i	3h	3n	3d
16	3b	3k	3c	P3
17	4f	4j	4e	ALARM2
18	4a	4g	4m	4l
19	4i	4h	4n	4d
20	4b	4k	4c	P4
21	5f	5j	5e	CAA
22	5a	5g	5m	5l
23	5i	5h	5n	5d
24	5b	5k	5c	RADIO
25	---	P9	P8	P5
26	6f	6j	6e	BUZZER
27	6a	6g	6m	6l
28	6i	6h	6n	6d
29	6b	6k	6c	P6
30	7f	7j	7e	ST
31	7a	7g	7m	7l
32	7i	7h	7n	7d
33	7b	7k	7c	P7
34	8f	8j	8e	P10
35	8a	8g	8m	8l
36	8i	8h	8n	8d
37	8b	8k	8c	SLEEP



MECHANICAL PARTS LIST 1/1

DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
 If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

REF. NO	PART NO.	KANRI NO.	DESCRIPTION	REF. NO	PART NO.	KANRI NO.	DESCRIPTION
1	8A-RU3-003-010		PANEL,FRONT EZ	16	8A-RU3-201-010		HLDR,DIS
2	8A-RU3-013-010		WINDOW,LCD	17	8A-RU3-208-010		HLDR,BAR-ANT
3	8A-RU3-001-010		CABI,FRONT EZ	18	8A-RU3-209-010		FOOT,RUBBER
4	8A-RU3-008-010		BTN,SUMMER	19	8A-RU3-206-010		PLATE,SW COVER
5	8A-RU3-010-010		BTN,RDS	20	8A-RU3-615-010		SOCKET, 2P BATT 9V
6	8A-RU3-004-010		BTN,FUNCTION	21	8A-RU3-203-010		FLTR,LCD
7	8A-RU3-006-010		BTN,SNOOZE	22	8A-RU3-204-010		PLATE,LCD
8	8A-RU3-009-010		KNOB,RTRY VOL	A	87-751-099-410		VTZ+3-15 W/O SLOT
9	8A-RU3-005-010		BTN,PRESET	B	87-B10-156-010		VTZ+3-8
10	8A-RU4-006-010		COVER, BATTERY DOOR	C	87-743-073-410		UT2+2.6-6
11	8A-RU3-002-010		CABI,REAR EZ	D	87-B10-158-010		VTZ+3-6
12	8A-RU3-205-010		HLDR,PWB	E	87-263-531-310		SCREW V+1.7-5
13	S2-280-005-210		SPKR,2.25" 80HM 0.5W				
14	S1-8ZR-U21-400		PT,28WEI35/15 23V:8V				
15	8A-RU3-007-010		COVER, BACK				



COLOR NAME TABLE

Basic color symbol	Color	Basic color symbol	Color	Basic color symbol	Color
B	Black	C	Cream	D	Orange
G	Green	H	Gray	L	Blue
LT	Transparent Blue	N	Gold	P	Pink
R	Red	S	Silver	ST	Titan Silver
T	Brown	V	Violet	W	White
WT	Transparent White	Y	Yellow	YT	Transparent Yellow
LM	Metallic Blue	LL	Light Blue	GT	Transparent Green
LD	Dark Blue	DT	Transparent Orange	GM	Metallic Green
YM	Metallic Yellow	DM	Metallic Orange	PT	Transparent Pink

アイワ株式会社 〒110-8710 東京都台東区池之端1-2-11 ☎03(3827)3111 (代表)

AIWA CO.,LTD. 2-11, IKENOHATA 1-CHOME, TAITO-KU, TOKYO 110-8710, JAPAN TEL:03 (3827) 3111