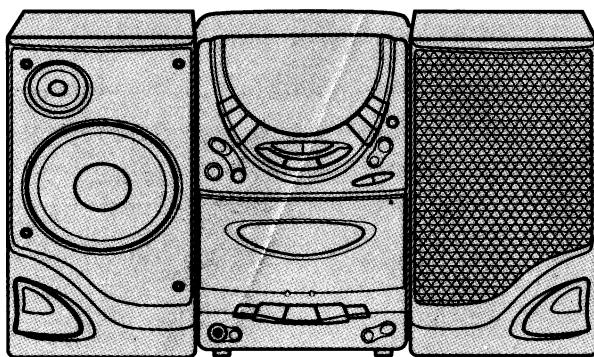




GoldStar

COMPACT DISC STEREO SYSTEM

SERVICE MANUAL



**MODEL : FFH-212AL
FE-212E**



GoldStar

TABLE OF CONTENTS

MODEL:FFH-212A/L(COMPACT DISC STEREO SYSTEM)

1. SPECIFICATIONS	3~4
2. SERVICE INSTRUCTIONS	5
3. ADJUSTMENTS	6~10
4. DESCRIPTION OF FUNCTIONS	11~15
5. WAVEFORM OF MAJOR CHECK POINTS	16
6. TROUBLESHOOTING	17~21
7. BLOCK DIAGRAM	22~24
7-1.BLOCK DIAGRAM(for AM/FM Tuner Band)	22
7-2.BLOCK DIAGRAM(for MW/FM/LW Tuner Band)	23
7-3.BLOCK DIAGRAM(for MW/FM/LW Tuner Band and FTZ)	24
8. SCHEMATIC DIAGRAM	25~31
8-1. FRONT & KEY CIRCUIT	25
8-2. AMP & DECK CIRCUIT(for All Area except FTZ)	26
8-3. AMP & DECK CIRCUIT(for FTZ)	27
8-4. TUNER CIRCUIT(for AM/FM Tuner Band)	28
8-5. TUNER CIRCUIT(for MW/FM/LW Tuner Band)	29
8-6. TUNER CIRCUIT(for MW/FM/LW Tuner Band and FTZ)	30
8-7. CDP CIRCUIT	31
9. WIRING DIAGRAM	32
10. PCB LAYOUT	33~34
10-1. MAIN P.C.BOARD(Components Side)	33
10-2. CDP P.C. BOARD(Components Side)	34
11. INTERNAL BLOCK DIAGRAM OF ICs	35~41
12. EXPLODED VIEW/PARTS LIST	42~44
12-1. CABINET	42
12-2. TAPE DECK MECHANISM	43
12-3. CDP MECHANISM	44
13. ELECTRICAL PARTS LIST	45~52

MODEL:FE-212E(SPEAKER SYSTEM)

1. SPECIFICATIONS	53
2. SCHEMATIC DIAGRAM	53
3. EXPLODED VIEW/PARTS LIST	54

SPECIFICATIONS

1. AMPLIFIER SECTION

① Output Power(6Ω, 2ch, THD 10%)	15W + 15W
② T.H.D	0.2%
③ Frequency Response(3dB down)	20Hz~30kHz
④ Signal-to-noise Ratio	85dB
⑤ Input Impedance	47kΩ
⑥ Input Sensitivity	400mV
⑦ Cross Talk 100Hz/1kHz/10kHz	50dB/50dB/40dB

2. TUNER SECTION

(1) FM

① Frequency Range(50kHz or 100kHz Step)	87.5MHz~108MHz
② Intermediate Frequency	10.7MHz
③ Sensitivity 98.1MHz	10dB
④ Signal-to-noise Ratio(Mono/Stereo)	65dB/60dB
⑤ Image Rejection 106.1MHz	65dB
⑥ IF Rejection 90.1MHz	80dB
⑦ Distortion(Mono/Stereo)	0.5%/0.8%
⑧ Frequency Response(-3dB)	40Hz~14kHz
⑨ Separation 100Hz/1kHz/10kHz	25dB/35dB/35dB

(2) AM(MW)

① Frequency Range[9(10)kHz Step]	522(530)kHz~1611(1720)kHz
② Intermediate Frequency	450kHz
③ Usable Sensitivity 1,008kHz	55dB
④ Image Rejection 1,404kHz	30dB
⑤ IF Rejection 603kHz	40dB
⑥ Selectivity 1,008kHz	35dB
⑦ Signal-to-noise Ratio 1,008kHz	35dB
⑧ Distortion 1,008kHz	1.5%
⑨ Frequency Response(-6dB)	80Hz~2,300Hz

(3) LW-OPTION

① Frequency Range	153kHz~290kHz
② Intermediate Frequency	450kHz
③ Usable Sensitivity	60dB
④ Image Rejection 254kHz	30dB
⑤ Selectivity 200kHz	30dB
⑥ Signal-to-noise Ratio 200kHz	35dB
⑦ Distortion 200kHz	2%

3. TAPE DECK

① Tape Speed	4.75cm/sec
② Wow Flutter	0.1%
③ Fast Forward & Rewind Time(C-60)	120sec
④ Frequency Response(Playback:5dB Range)	100Hz~10kHz
⑤ Signal-to-noise Ratio(Playback/Record)	50dB/45dB
⑥ Distortion(Playback/Record)	1%/1.5%
⑦ Cross Talk	60dB
⑧ Channel Separation	35dB
⑨ Erase Ratio	65dB

4. CDP

① Frequency Response(40Hz~20kHz)	$\pm 1\text{dB}$
② Signal-to-noise Ratio	75dB
③ Dynamic Range	68dB
④ T.H.D.	0.1%
⑤ Separation	50dB

5. GENERAL

① Power Requirement	Refer to the back panel of unit
② Power Consumption	60W
③ Dimension (Net:WXHxD)	160X230X240(mm)
④ Weight(Net)	5.5kg

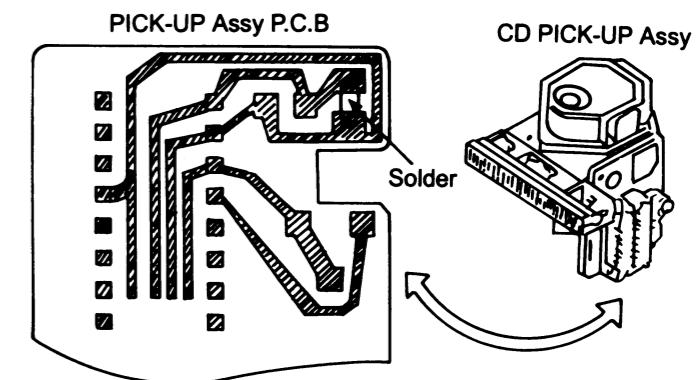
NOTE: Specifications are subject to change without notice in the course of product improvement.

SERVICE INSTRUCTIONS

PRECAUTION TO REPLACE OPTICAL BLOCK

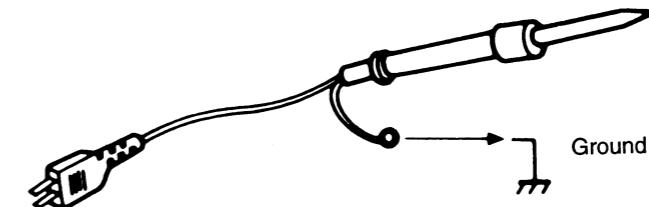
Body or clothes electrostatic potential could ruin laser diode in the optical block. Be sure ground body and workbench, and use care the clothes do not touch the diode.

- 1) After the connection, remove solder shown in right figure.



To prevent electrostatic breakdown, laser diode and ground are connected with solder.

NOTE : When removing solder, be sure to use a grounded solder-iron, to prevent electrostatic breakdown.



CAUTION FOR HANDLING THE OPTICAL PICK-UP

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body. So, when handling a pick-up, the procedure for grounding as follows is required to prevent damage caused by static electricity.

1. Grounding For Human Body.
Be sure to put on a wrist-strap for grounding (with impedance lower than $10^8 \Omega$) whose other end is grounded. The strap works to drain away the static electricity build-up on the human body.
2. Grounding For the Work Table.
Be sure to lay on the table a conductive sheet (with impedance lower than $10^8 \Omega$) such as a sheet of copper, which is grounded.
3. As static electricity build-up on clothes is not drained away, be careful not to let your clothes touch the pick-up.

ADJUSTMENTS

This set has been aligned at the factory and normally will not require further adjustment. As a result, it is not recommended that any attempt is made to modificate any circuit. If any parts are replaced or if anyone tampers with the adjustment, realignment may be necessary.

IMPORTANT

1. Check power-source voltage.
2. Set the function switch to band being aligned.
3. Turn volume control to minimum unless otherwise noted.
4. Keep the signal input as low as possible to avoid AGC and AFC action.

TEST & ADJUSTMENT POINT

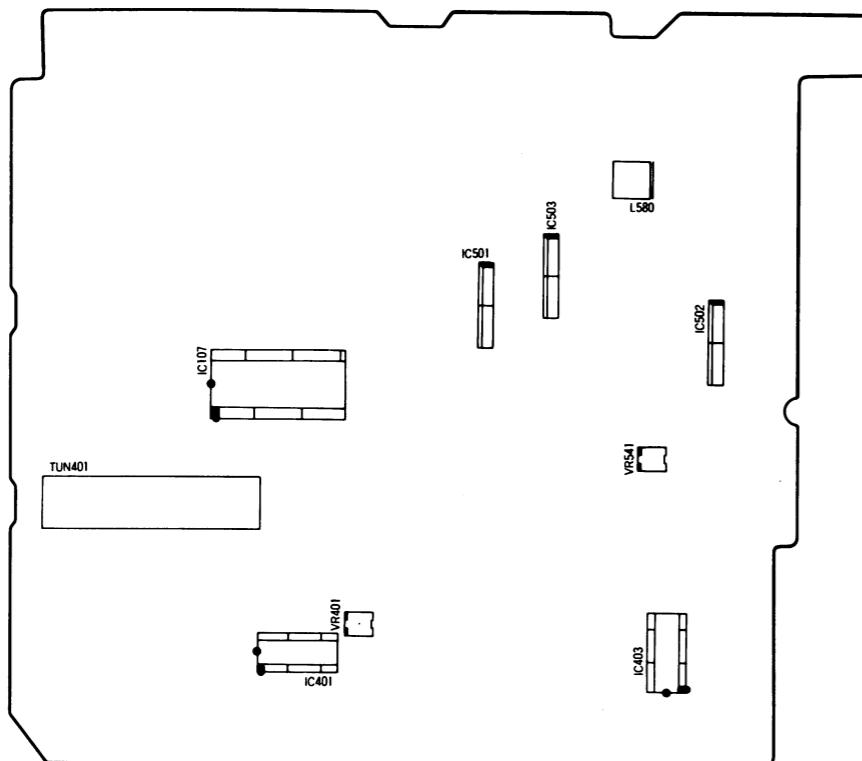


Figure 1. Main P.C. Board

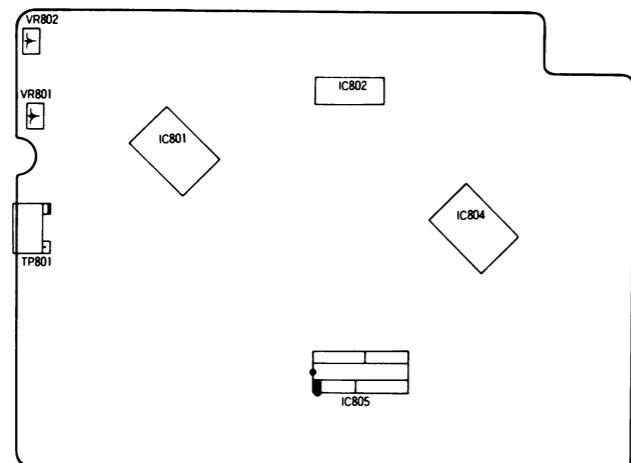


Figure 2. CD P.C. Board

TUNER ADJUSTMENT

1. FM STEREO BEACON SENSITIVITY ADJUSTMENT

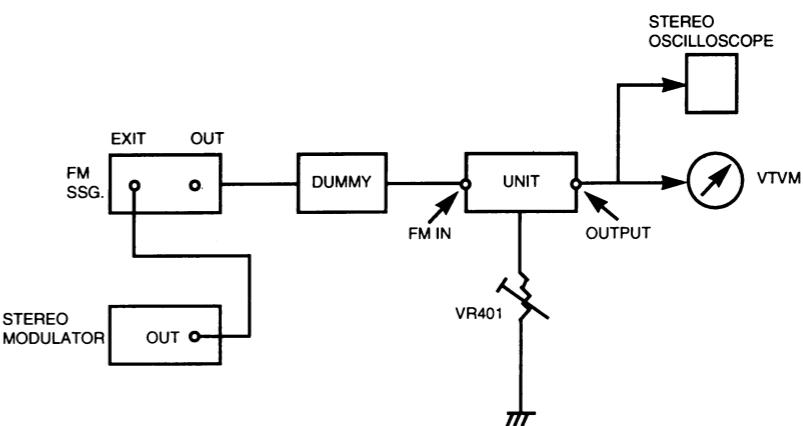


Figure 3. FM Stereo Beacon Sensitivity Adjustment Connection Diagram

Frequency	Test Point	Adjust for	Adjustment
98MHz	Pilot Display (on FIP)	25dB ±5dB	VR401

TAPE DECK ADJUSTMENTS

1. AZIMUTH ADJUSTMENT

Deck Mode	Test Tape	Test Point	Adjustment	Adjust for	Remark
Playback	MTT-114	Speaker Terminal	Head Screws	R/L Maximum	Forward:Lefthand Side Screw Reverse:Righthand Side Screw

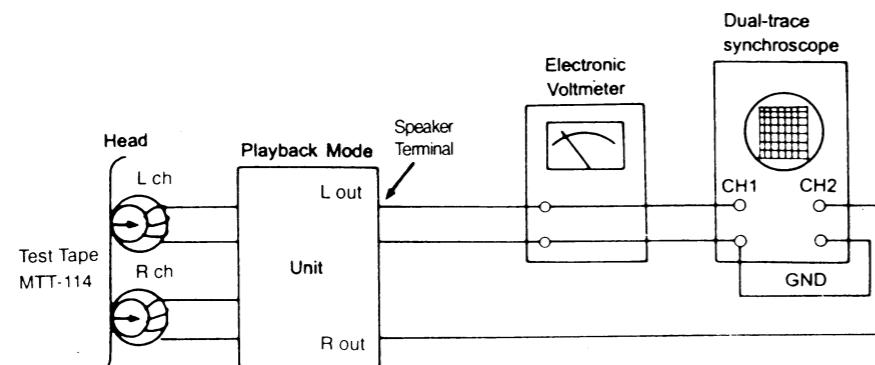


Figure 4. Azimuth Adjustment Connection Diagram

2. MOTOR SPEED ADJUSTMENT

Deck Mode	Test Tape	Test Point	Adjustment	Adjust for	Remark
Playback	MTT-111	Speaker Terminal	VR541	3kHz±45Hz	After adjusting in forward, confirm the specification in reverse mode.

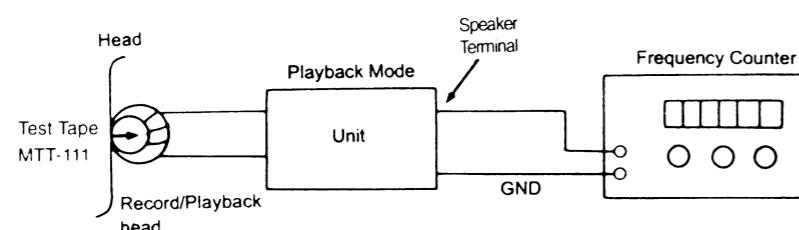


Figure 5. Motor Speed Adjustment Connection Diagram

3. RECORD BIAS ADJUSTMENT

Deck Mode	Test Tape	Test Point	Adjustment	Adjust for
Rec/Pause	MTT-5561	Erase Head Wire	L580	86kHz±5kHz

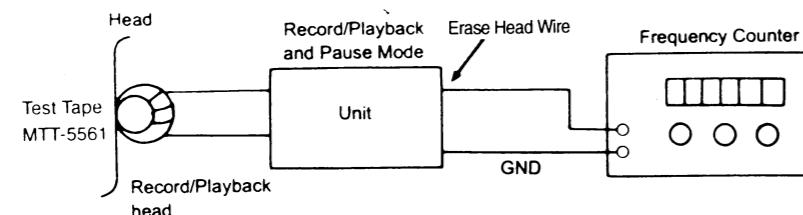


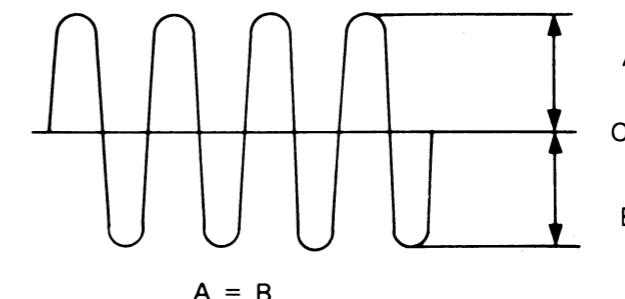
Figure 6. Record Bias Adjustment Connection Diagram

CDP ADJUSTMENTS

- Before adjusting, preset adjustment potentiometers VR801 and VR802 center.

2. TRACKING BALANCE ADJUSTMENT

- Connect the oscilloscope to TP801(Pin ⑤ -TEO) and TP801 (Pin ③ -Vref).
- Playback the 12th selection of the test disc(YEDS-18).
- Short-circuit TP801 (Pin ④ -TEI) and TP801 (Pin ③ -Vref).
- Adjust VR802 so that the amplitude above and below the zero DC line becomes equal (amplitude A=B)



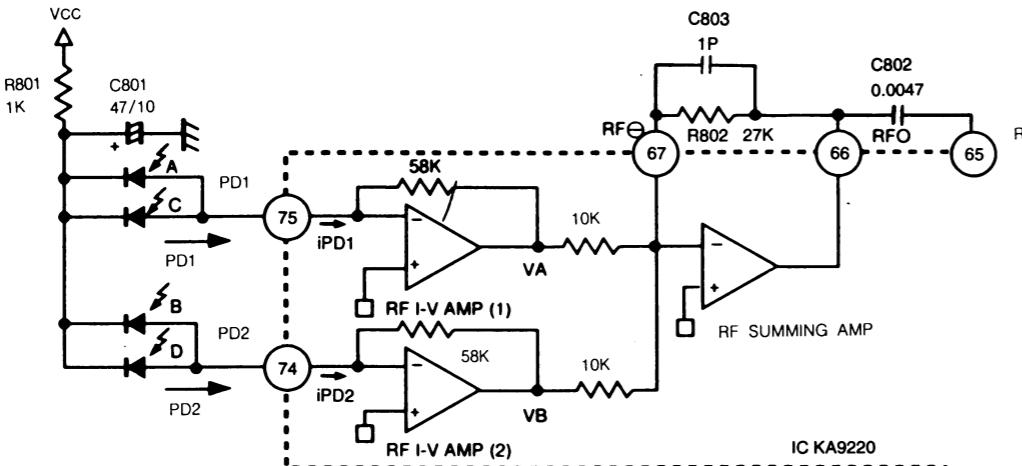
3. FOCUS OFFSET ADJUSTMENT (You have to use 10:1 prove)

- Connect oscilloscope to TP801(Pin ② -HF) and TP801(Pin ③ -Vref).
- Put a test disc into unit and playback the unit.
- Adjust VR801 so that eye pattern becomes clear and waveform (Vp-p) is maximum.
- Stop mode.
- Connect oscilloscope to TP801(Pin ① -FEO) and TP801(Pin ③ Vref).
- Confirm the oscilloscope reading
 - Less than 200mV —— OK
 - More than 200mV —— readjust VR801 200mV.

DESCRIPTION OF FUNCTIONS

1. RF AMPLIFIER

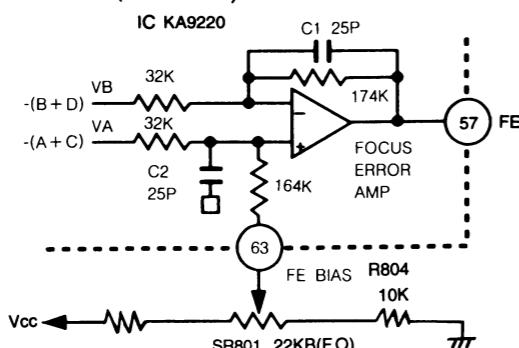
RF 1-V amplifiers (1) and (2) are converted to voltage from the signal current of pin photodiodes connected to PD1 and PD2 through the $58K\Omega$ equivalent resistance. Furthermore, it is added in the RF summing amplifier and $(A+B+C+D)$ is output at RFO. At this pin (RFO), the eye pattern can be checked.



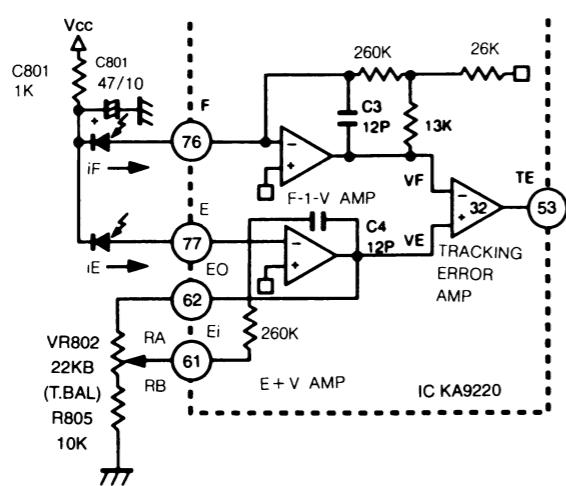
The RF amplifier output voltage (low-frequency) is $V_{RFO}=2.2 \times (V_A+V_B)=127.6\text{K}\Omega \times (iPD1+iPD2)$. (at RFO)

2. FOCUS ERROR AMPLIFIER

The Focus Error Amplifier is the difference between RF 1-V amplifier (1) output ($A+C$) and RF 1-V amplifier (2) output ($B+D$). The output becomes $(A+C-B-D)$.



3. TRACKING ERROR AMPLIFIER



E 1-V amplifier and F 1-V amplifier are converted to voltage from the signal current of pin photodiode connected: E and F. The E and F 1-V amplifiers output voltage is,

$$V_F = iF \times 403K\Omega, \text{ and}$$

The tracking error amplifier is the difference between the E 1-V amplifier output and the F 1-V amplifier output, this output is (E-F).

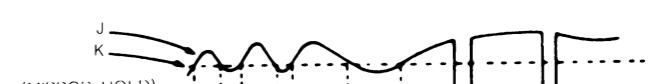
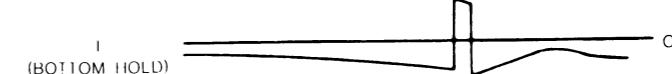
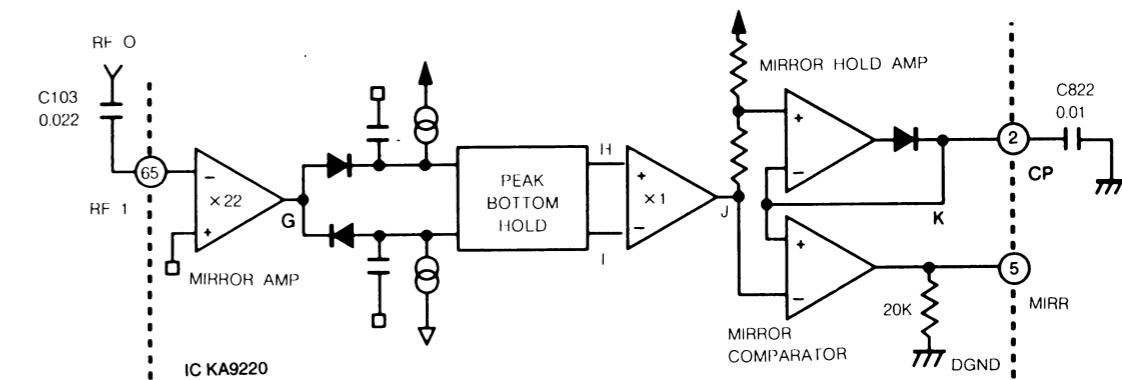
$$V_{TE} = (V_E - V_F) \times 3.2$$

$$= (iE - iF) \times 1290K\Omega$$

4. MIRROR CIRCUIT

This circuit, after amplifying the RFI signal, holds its bottom and peak. The peak hold is done with a time constant able to track down a 30kHz traverse and the bottom hold. This is done with a time constant able to track down envelope fluctuations in the revolving cycle.

With the differential amplification of these peak and bottom hold signals, H and I, the envelope signal J(demodulated to DC) is obtained. Two-thirds of the peak value of this signal J is held with a large time constant for the signal K. When K is compared with J, a mirror output is obtained. That is, the mirror output gives "L" on the disc track, "H" between tracks (mirror section) and also "H" in the defect detection. The time constant for the mirror hold must be sufficiently larger than that of the traverse signal.

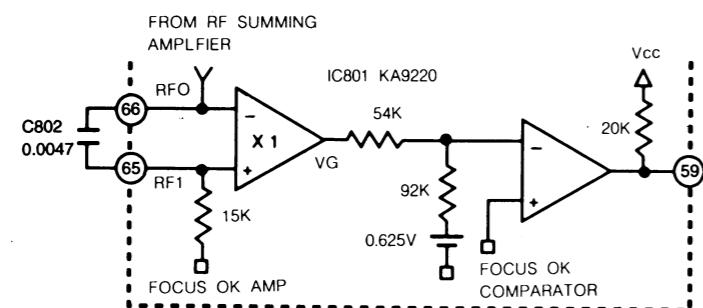


5. FOCUS OK CIRCUIT

The focus OK circuit generates a timing window to lock on the focus servo from a focus search status. Pin 65 will get the HPF (High Pass Filter) output from an RF signal from Pin 66 -the LPF (Low Pass Filter) output (opposite phase) for the focus OK amplifier output.

The focus OK amplifier output is inverted when $V_{RFI} - V_{RFO} = -0.37V$

C802 is for determining the time constants of HPF in the EFM comparator and mirror circuits as well as LPF in the focus OK amplifier. When $0.0022\mu\text{F}$ is selected for C802, fc (cut-off frequency)=1kHz, prevents the block error rate from degenerating as a damaged RF envelope results from the scratched disc, etc.

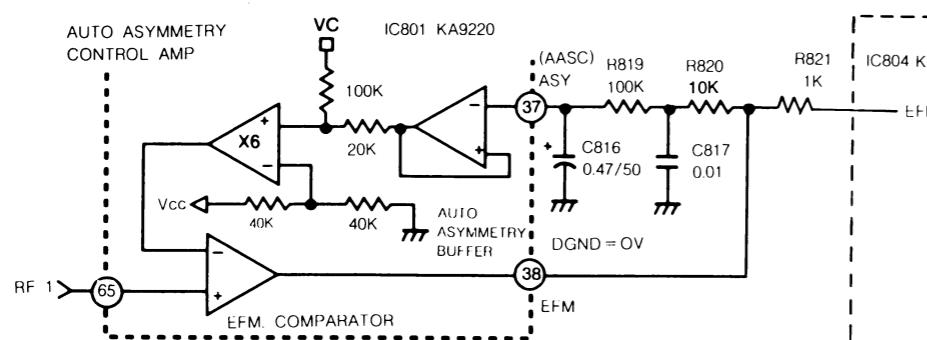


6. EFM COMPARATOR

The EFM comparator changes RF signal into a binary value. As the asymmetry generated due to variation in disc manufacturing cannot be eliminated by the AC coupling alone, the reference voltage of EFM comparator is controlled utilizing the fact that the generation probability of 1, 0 is 50% each in the binary EFM signals.

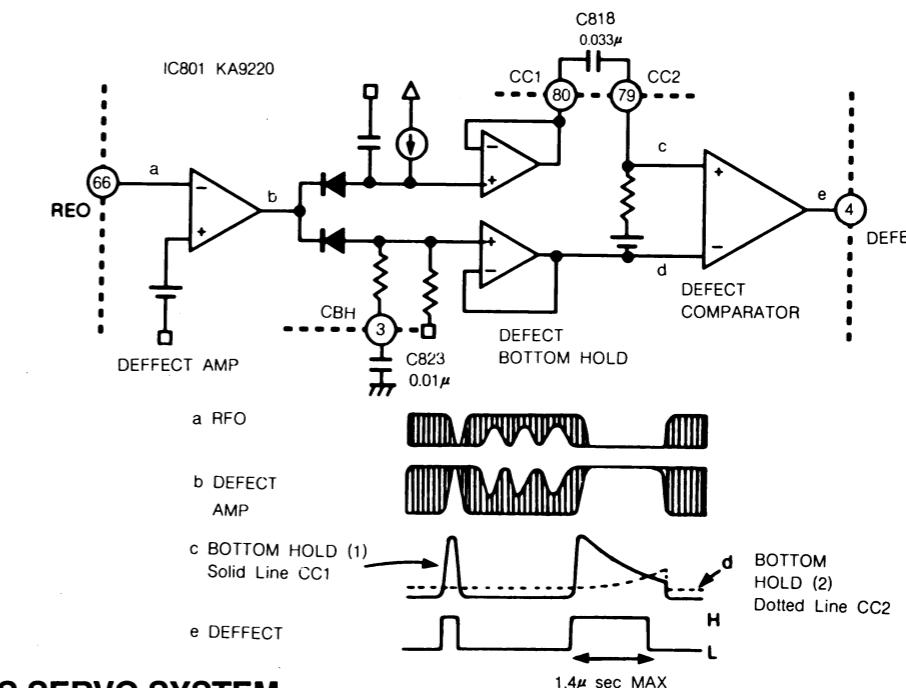
As this comparator is a current SW type, each of the H and L levels does not equal the power supply voltage, requiring feedback through a CMOS buffer.

R819, R820, C816 and C817 form a LPF to obtain $(V_{CC} + DGND)/2V$. When f_C (out-off frequency) is made more than 500Hz, the EFM low-frequency component leaks dably, degenerating the block error rate.



7. DEFECT CIRCUIT

The RFI signal bottom, after being inverted, is held with two time constants, one long and one short. The short time-constant bottom hold is done for a disc mirror defect more than 0.1m sec. The long time-constant bottom hold is done with the mirror level prior to the defect. By differentiating this with a capacitor coupling and shifting the level, both signals are compared to generate the mirror defect detection signal.



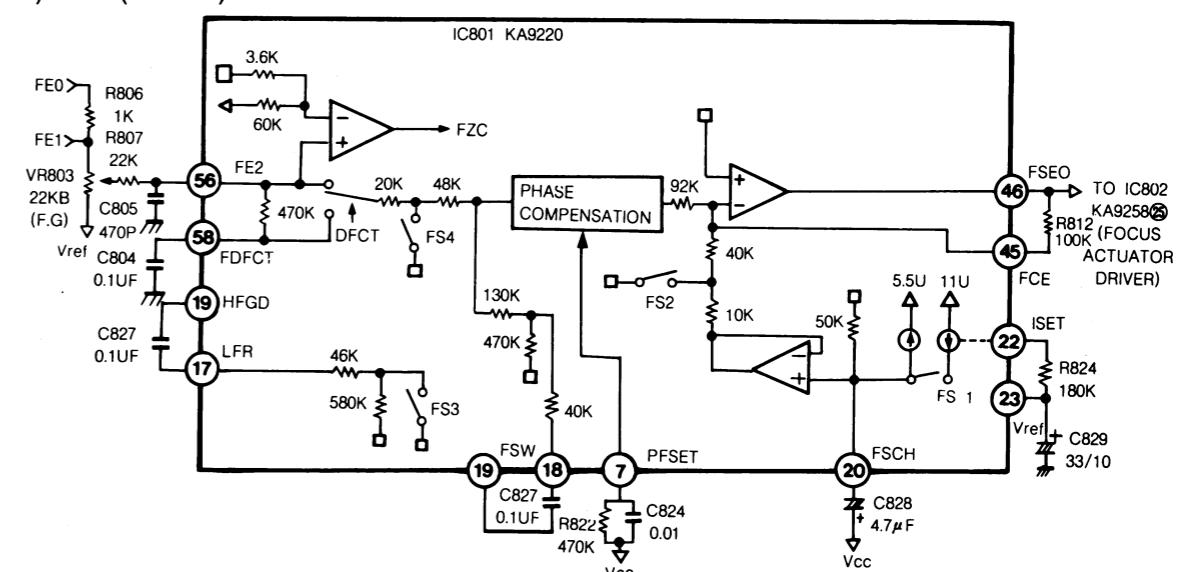
8. FOCUS SERVO SYSTEM

The below is a block diagram of the focus servo system. When FS3 is switched on, the high frequency gain can be reduced by forming a low frequency time constant through a capacitor connected across pins ⑯ and ⑰ and the internal resistor.

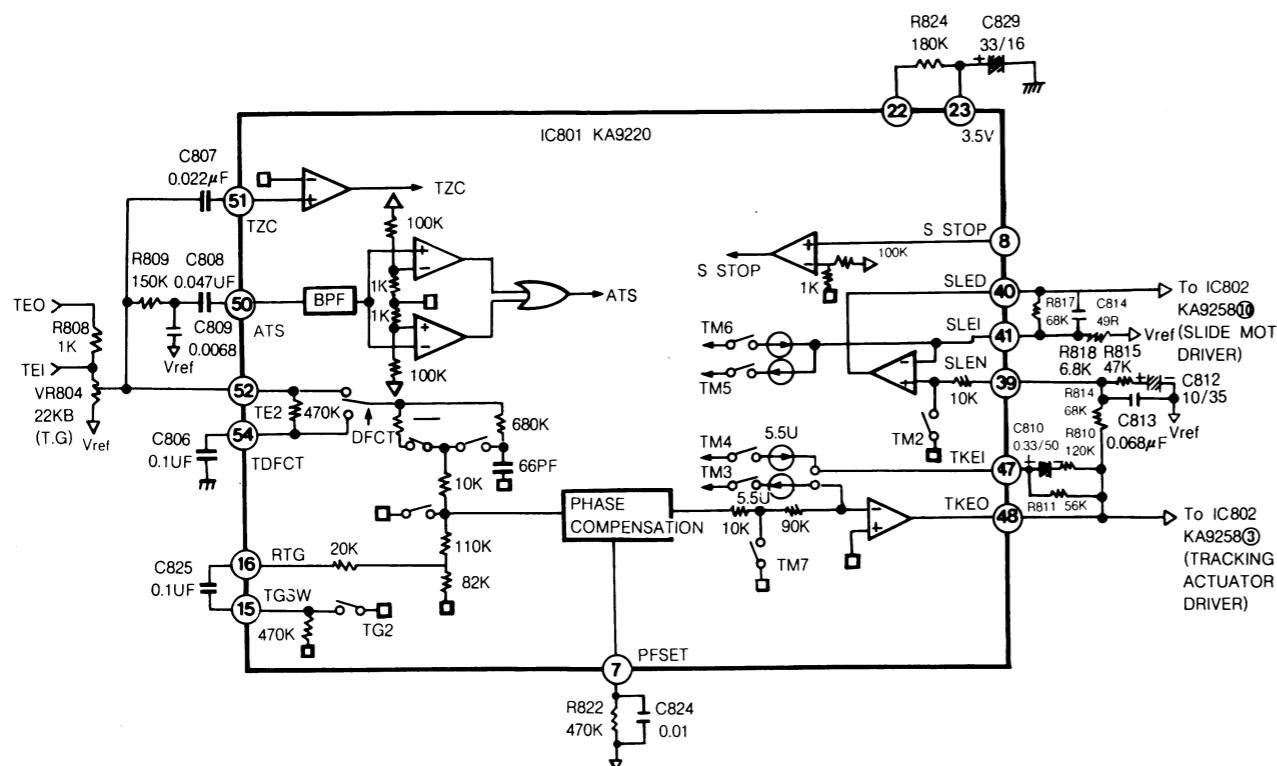
The capacitor across the pin ⑩ and GND has a time constant to raise the low frequency usually playback condition. The peak frequency of the focus phase compensation is inversely proportional to the resistor connected to pin ⑦ (about 1.2kHz when the resistor is 470KΩ).

The focus search peak becomes about ± 1.1 Vp-p with the above constant. The peak is inversely proportional to the resistor connected across the pins ⑫ and ⑬. However, when this resistor is varied, the peaks of track jump and sled kick also vary.

The FZC comparator invert inout is set to 2% of the difference between the reference voltage Vcc and VC(Pin 1): $2\% \times (Vcc - VC)$.



9. TRACKING SERVO SYSTEM



The above is a block diagram of the tracking sled servo system.

The capacitor across pins ⑯ and ⑰ has a time constant to lower the high frequency when TG2 is switched off. The tracking phase compensation peak frequency is inversely proportional to the resistor connected to pin ⑦ (about 1.2kHz when the resistor is 470KΩ).

For a tracking jump in the FWD or REV direction, TM3 and TM4 are set to ON. At this time, the peak voltage fed to the tracking coil is determined by the TM3 and TM4 current values and the feedback resistor from pin ⑯. That is:

$$\text{Track jump peak voltage} = \text{TM3(TM4) current value} \times \text{feedback resistor value}$$

The FWD or REV sled kick is done by setting TM5 or TM6 to ON. At this time, the peak voltage added to the sled motor is determined by the TM5 or TM6 current value and the feedback resistor from pin ⑪.

$$\text{Sled jump peak voltage} = \text{TM5 (TM6) current value} \times \text{feedback resistor value}$$

Each SW current value is determined by the resistor connected to pins ⑫ and ⑬.

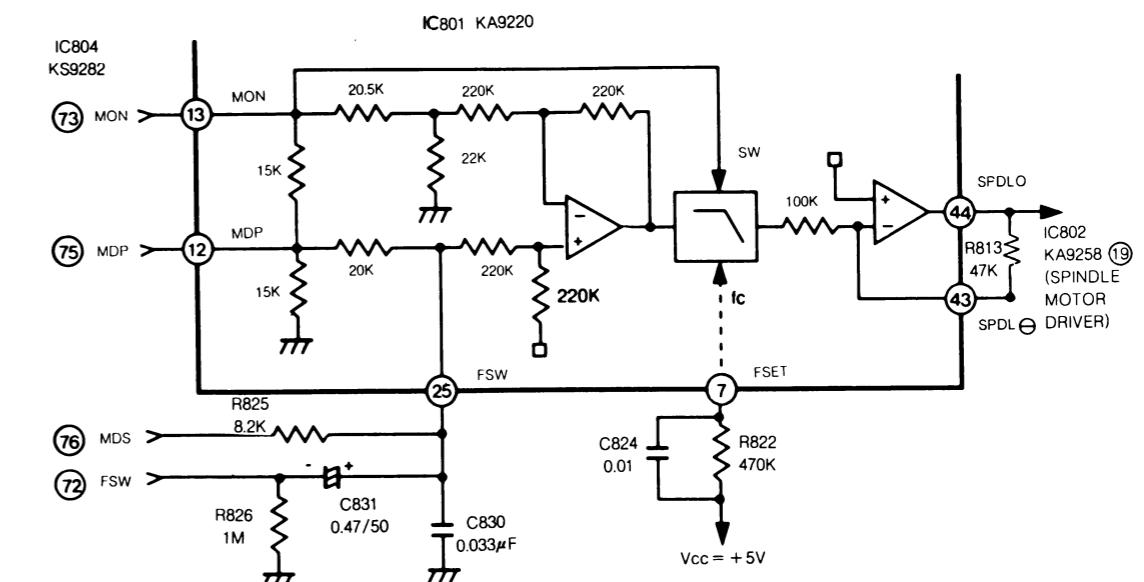
When the resistor is at about 120KΩ.

$$\text{TM3 or TM4 is } \pm 11\mu\text{A} \text{ and TM5 or TM6 is } \pm 22\mu\text{A.}$$

This current value is almost inversely proportional to the resistor, variable within a range of about 5 to 40μA for TM3.

S STOP is the ON/OFF detection signal for the limit SW of the sled motor's innermost circumference.

10. SPINDLE SERVO AND LPF



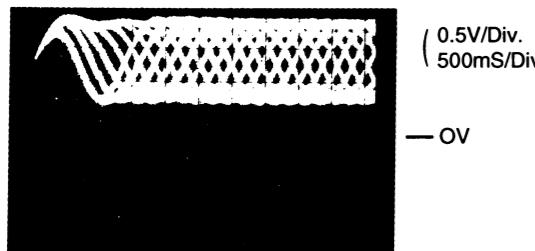
The 200Hz LPF is formed with 0.033F and 10KΩ connected to pin ⑮ and the secondary LPF is formed with the built-in LPF (fc up to 200Hz with 470KΩ for pin ⑦), and the carrier component of the CLV servo error signals MDS and MDP is eliminated.

In the CLV-S mode, FSW becomes L and the pin ⑮ LPF fc lowers, strengthening the filter further. With the pin ⑦ resistor connected to Vcc, fc does not vary with power supply voltage fluctuations.

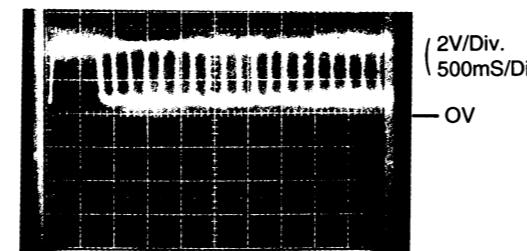
TROUBLESHOOTING

WAVEFORM OF MAJOR CHECK POINTS

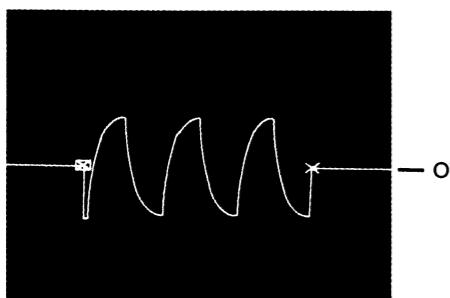
1. HF signal (RF signal) waveform
(test point TP801) during normal play



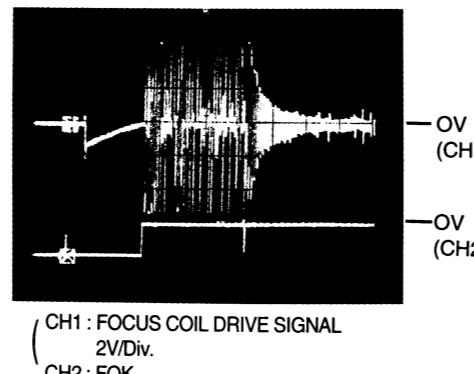
2. EFM signal (pin NO. ⑧ of IC801)
waveform during normal play



3. Focus coil drive waveform (pin NO. ⑩, ⑪ of IC802)
• When focus search failed or there
is no disc on the tray

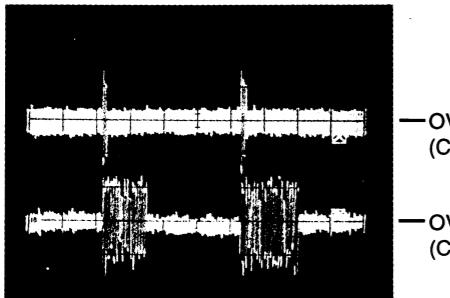


- Focus coil drive waveform (pin NO. ⑩, ⑪ of IC802) and FOK (pin NO. ⑯ of IC801)
when focus search is accomplished

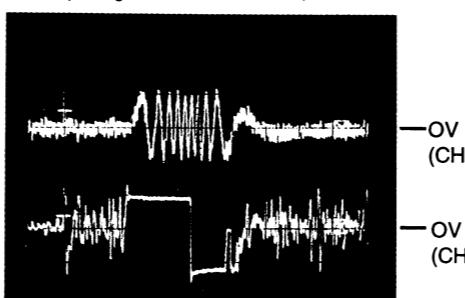


4. Tracking coil drive waveform (pin NO. ④ of IC802) and TEO during track traverse

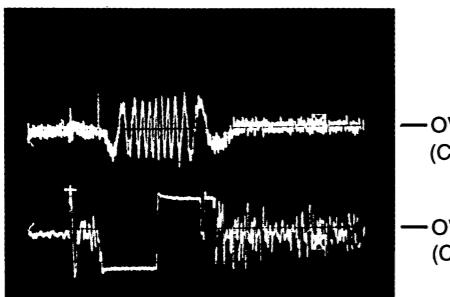
- (1) When time division is 20mS/div



- (2) When time division is 0.5mS/div.
(During forward track traverse)

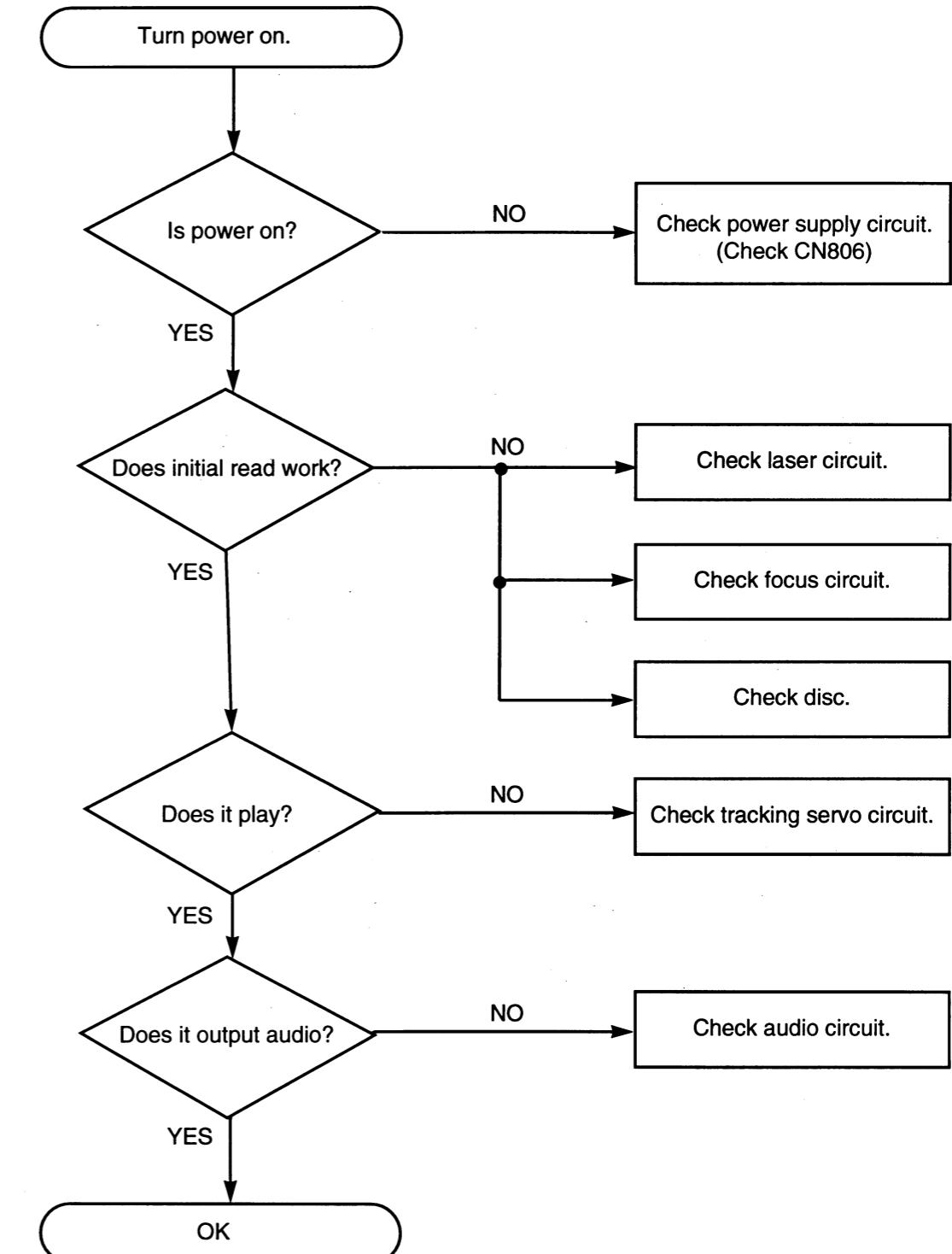
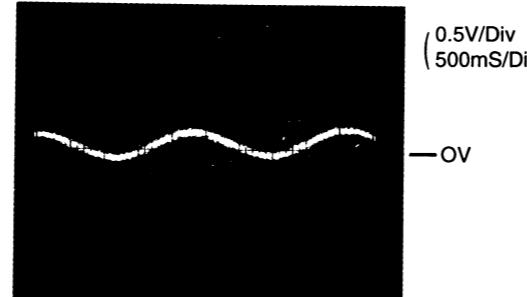


- (3) When time division is 0.5mS/div.
(During backward track traverse)

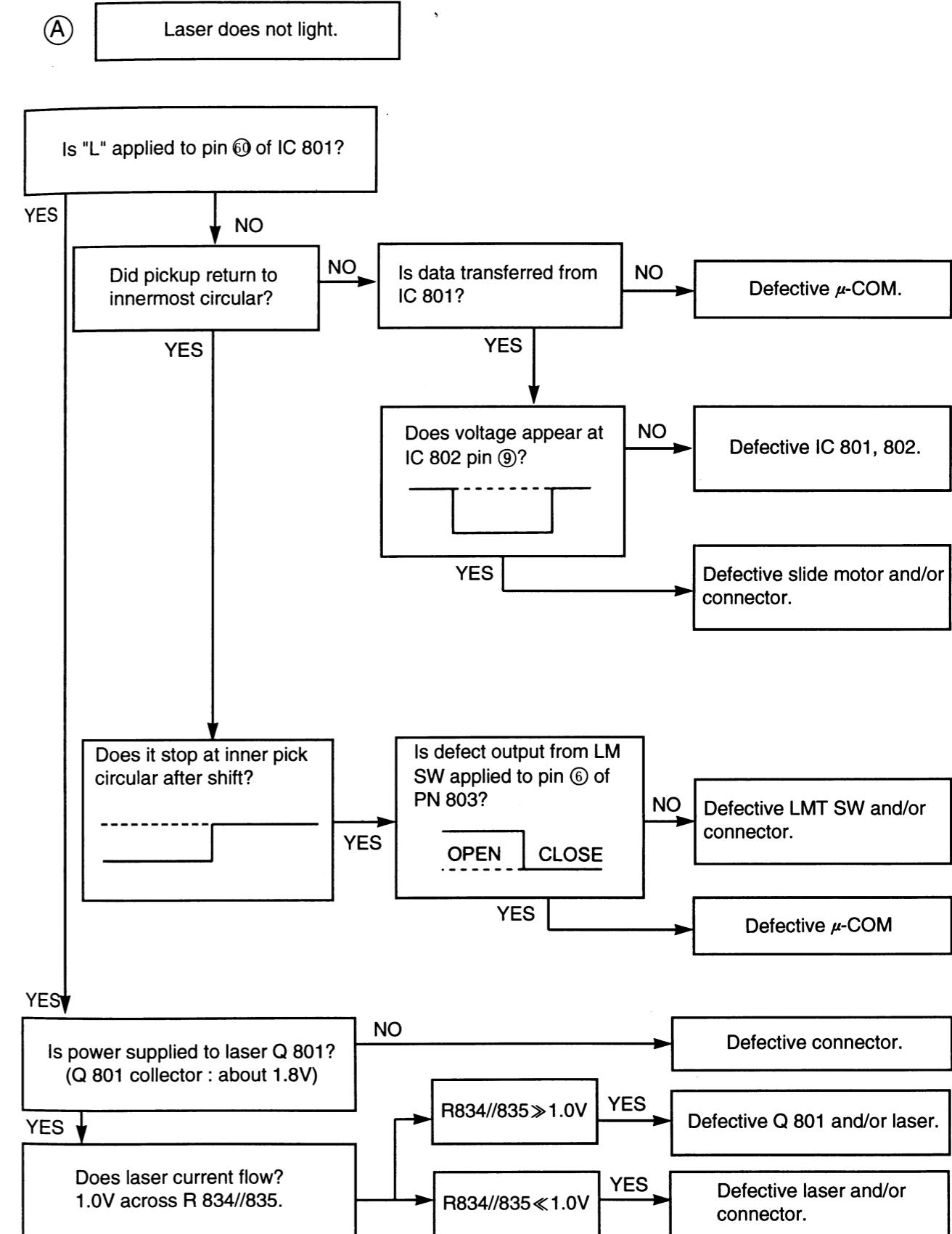
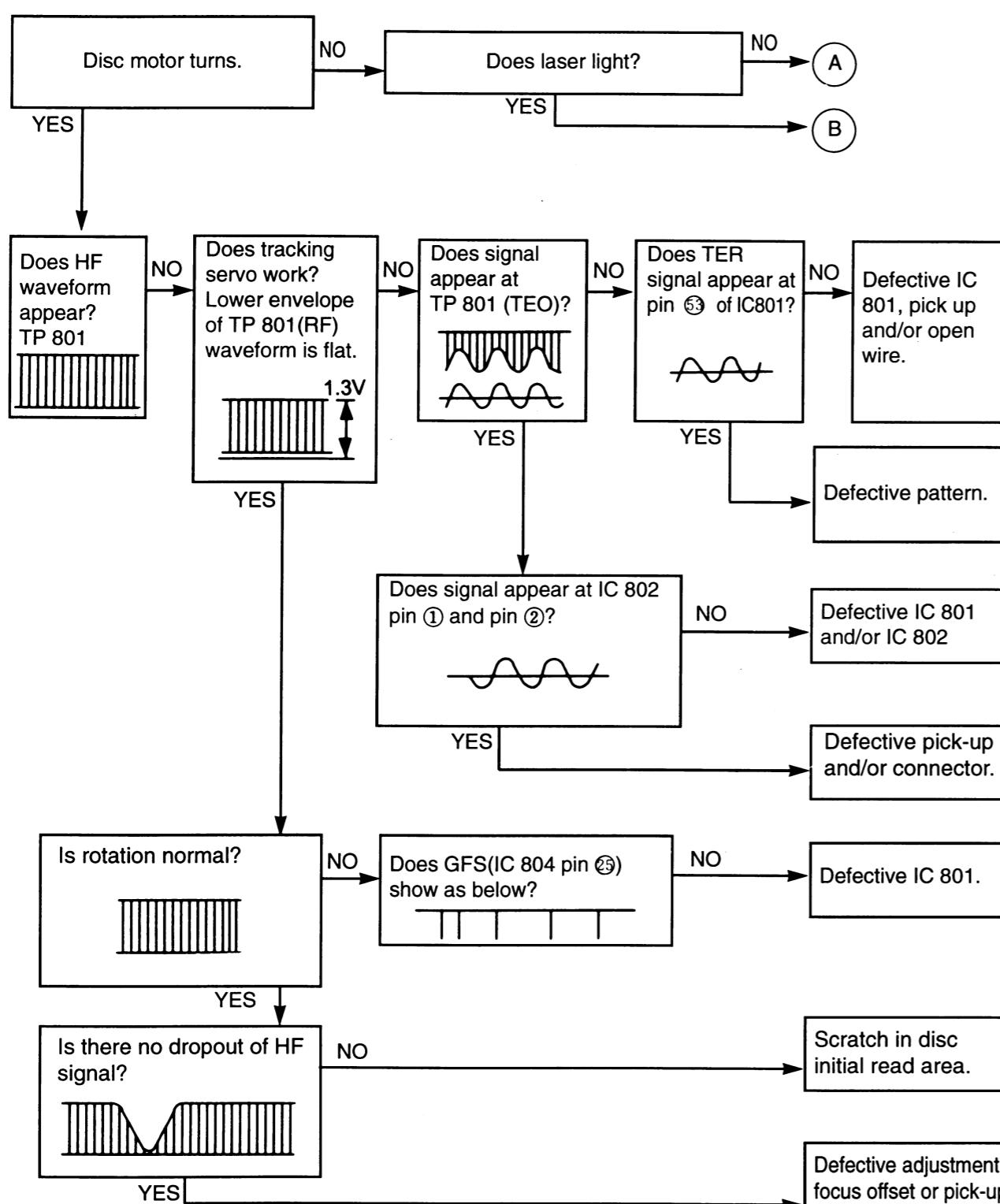


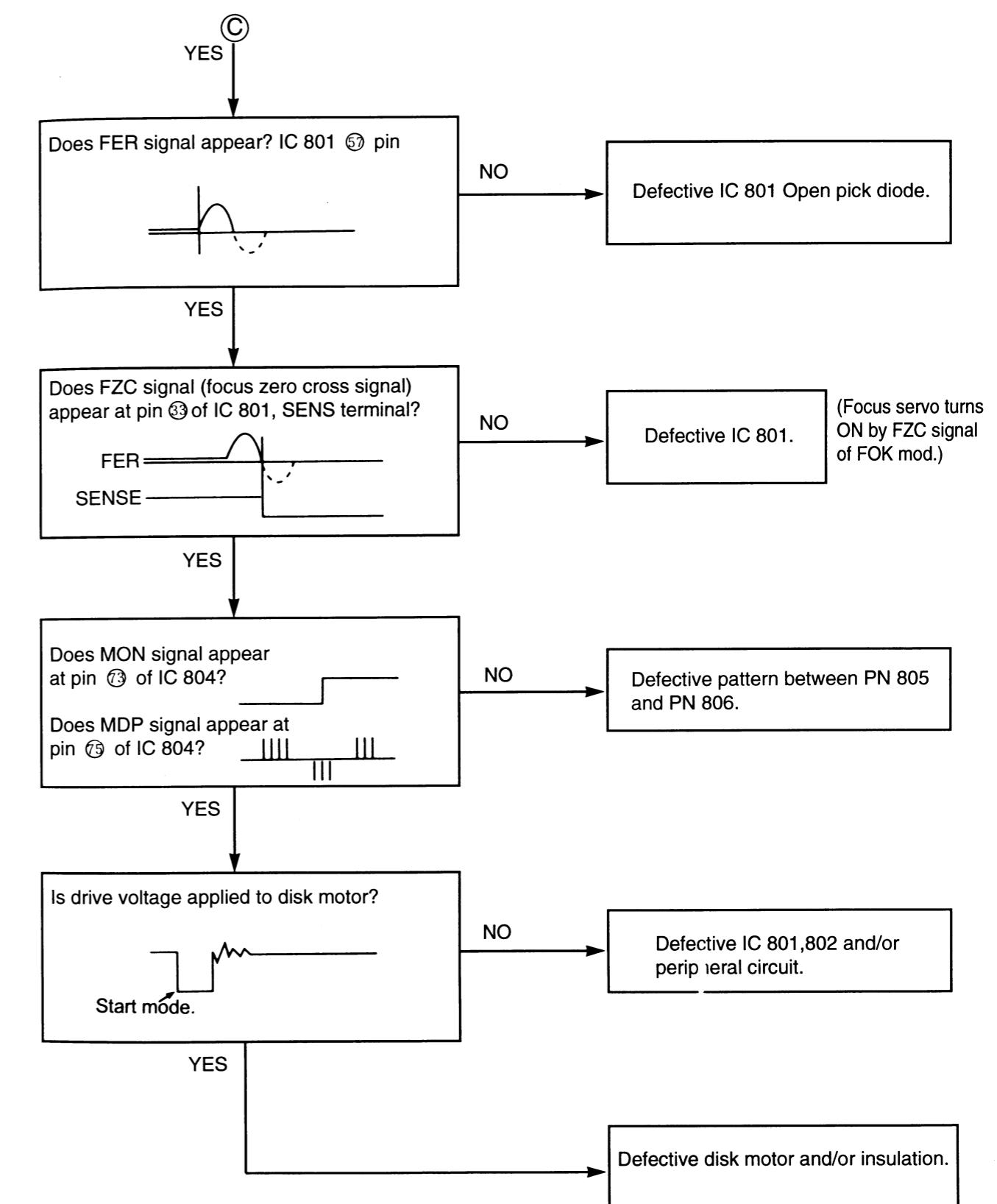
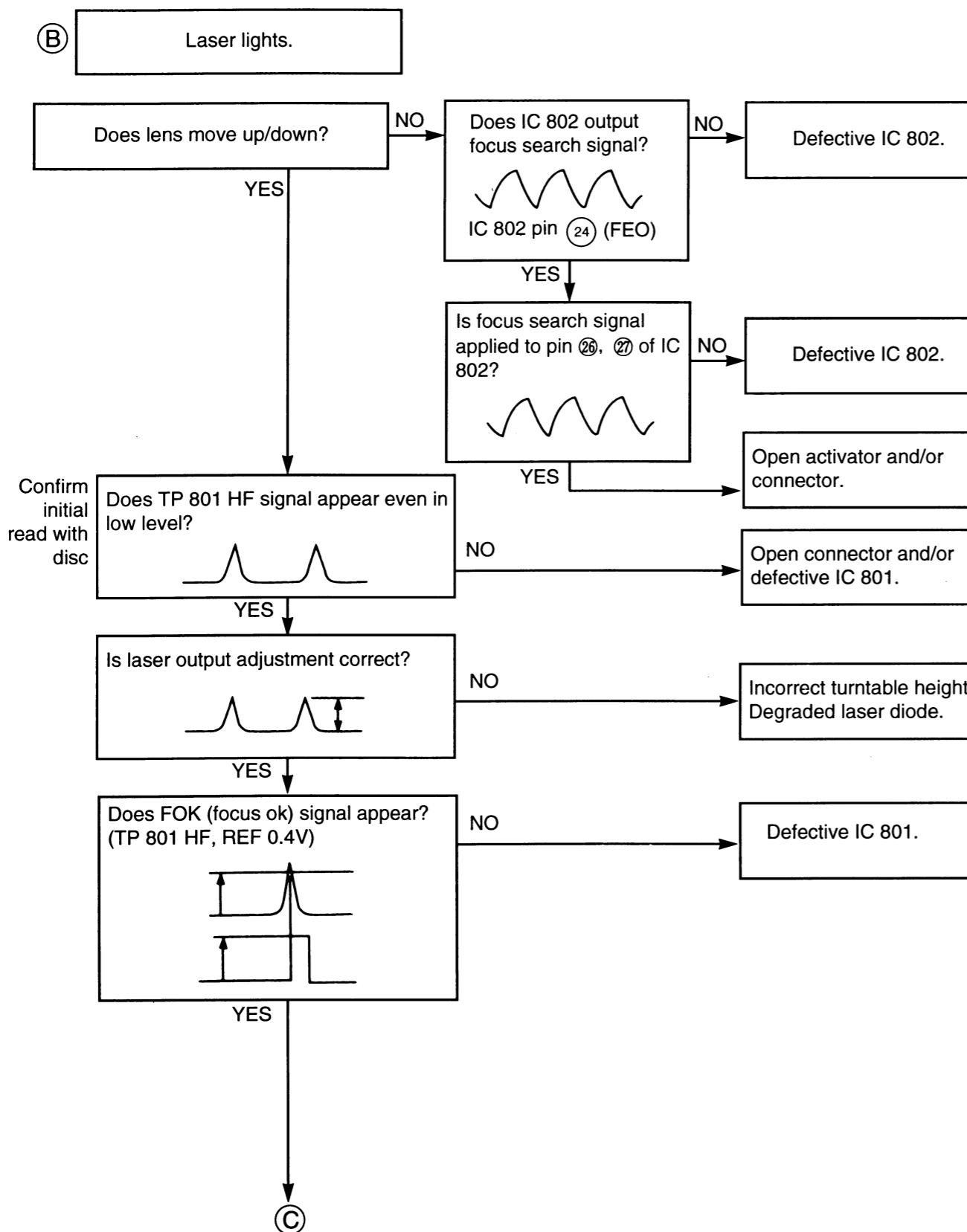
- (CH1 : TEO
1V/Div.
CH2 : TRACKING COIL DRIVE SIGNAL
2V/Div.)

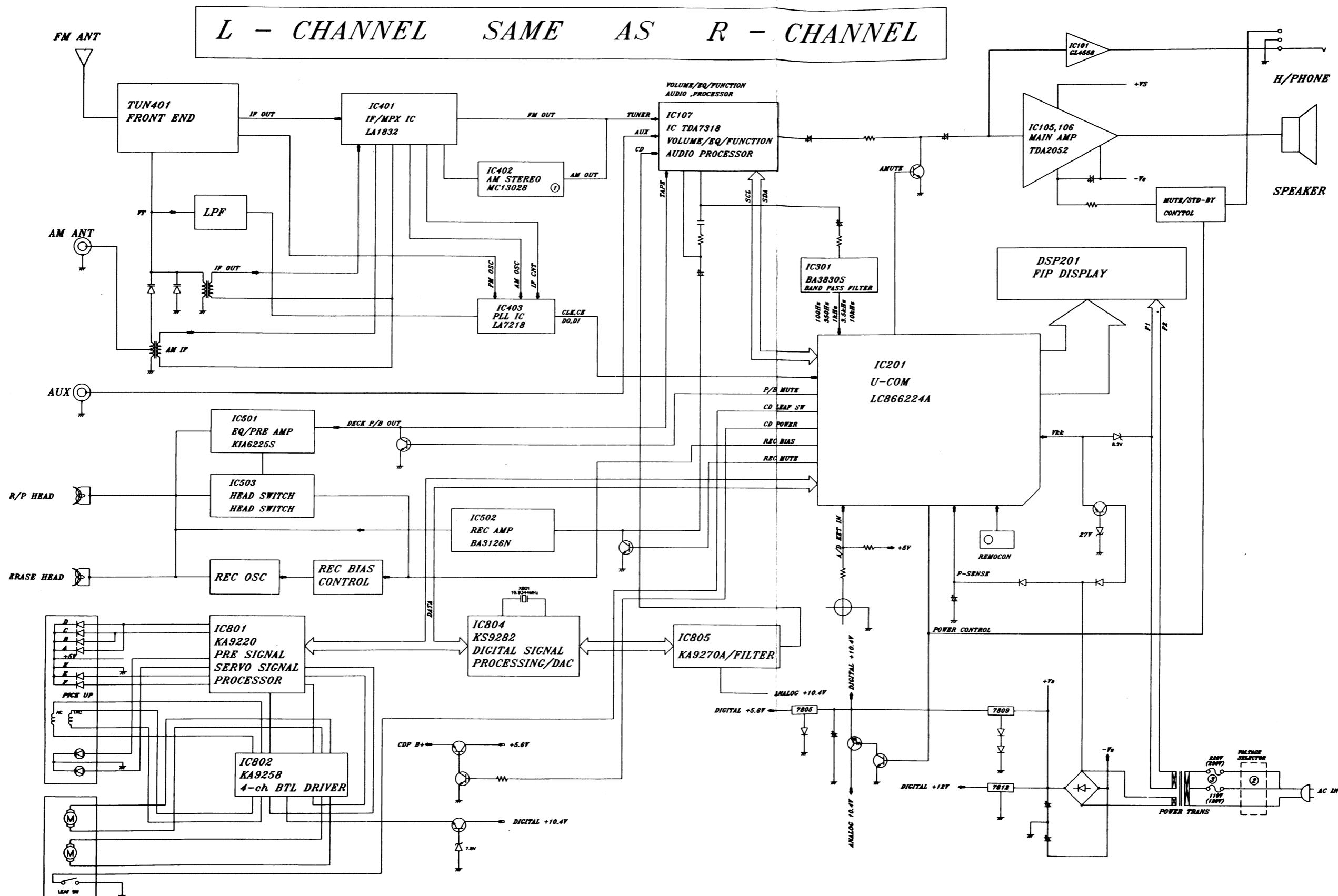
5. Feed motor drive waveform (pin NO. ⑩ of IC802) During normal play



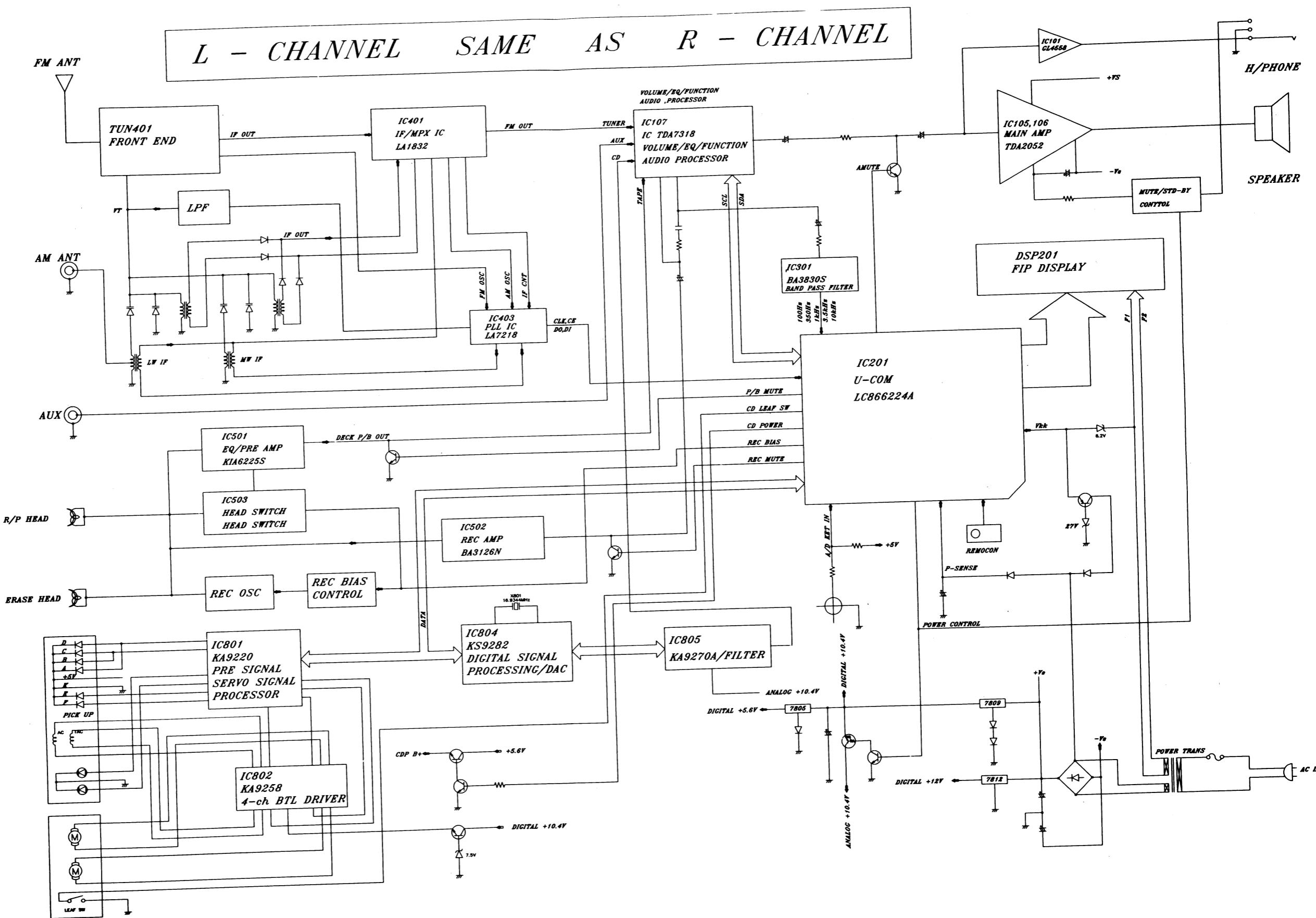
Fails to initial read



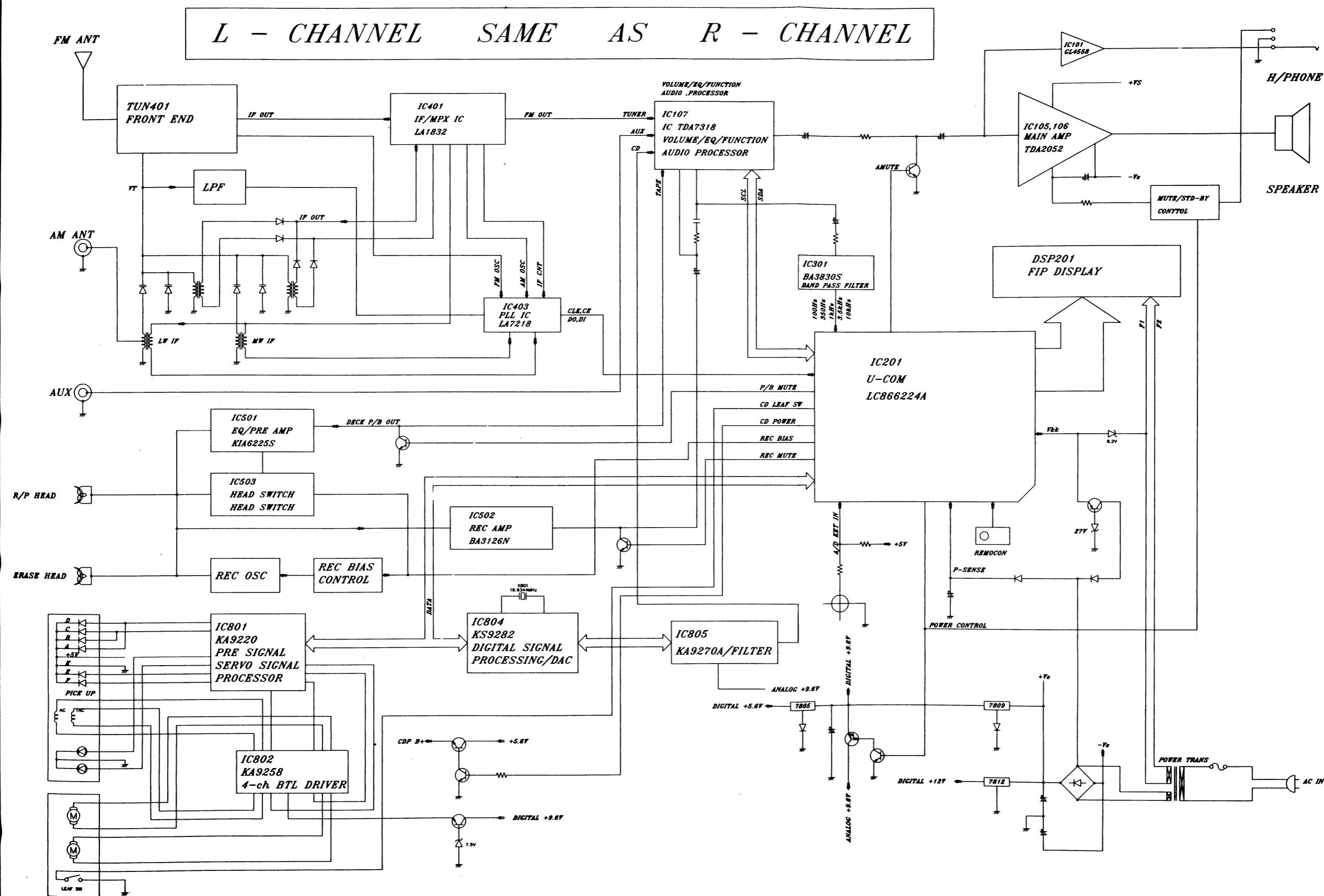


BLOCK DIAGRAM (for AM/FM Tuner Band)

BLOCK DIAGRAM (for MW/FM/LW Tuner Band)



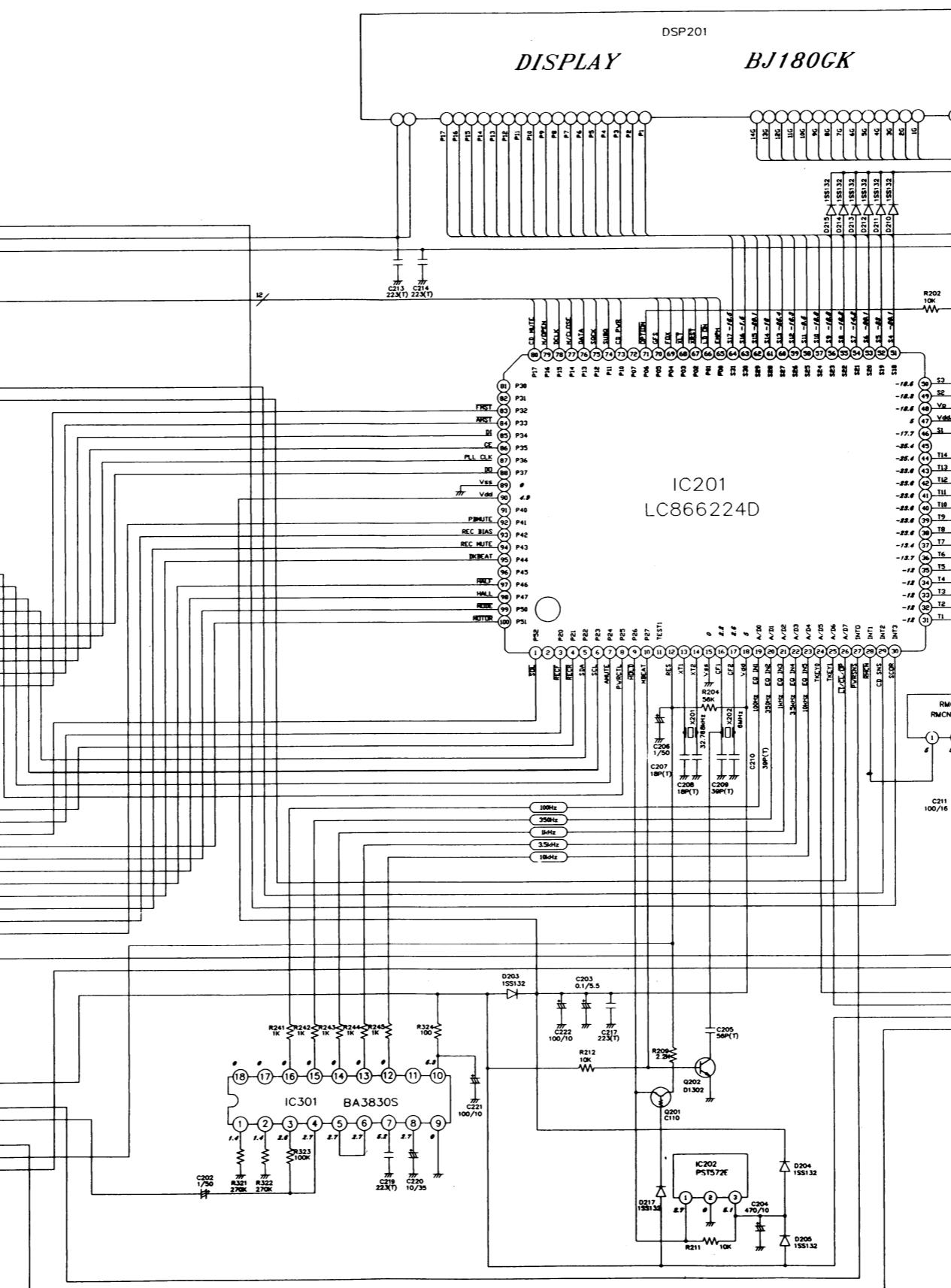
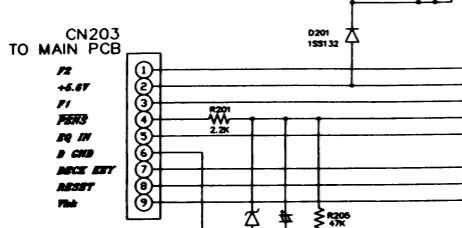
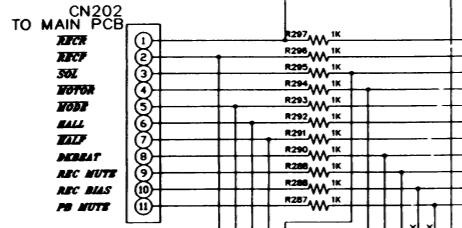
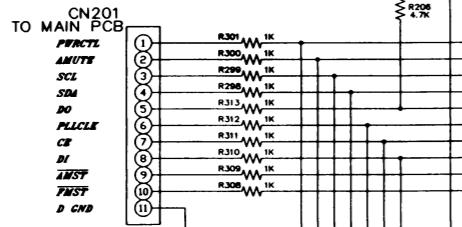
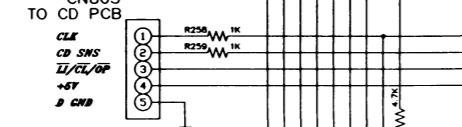
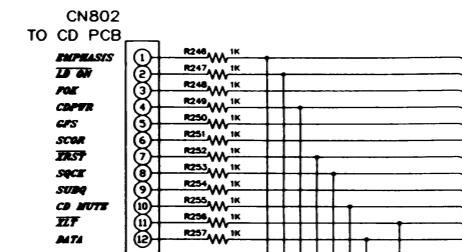
BLOCK DIAGRAM (for MW/FM/LW Tuner Band and FTZ)



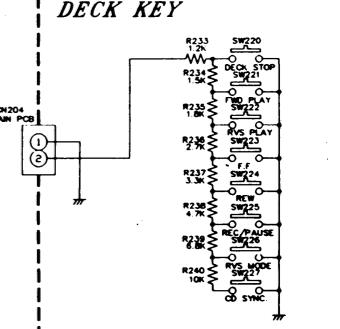
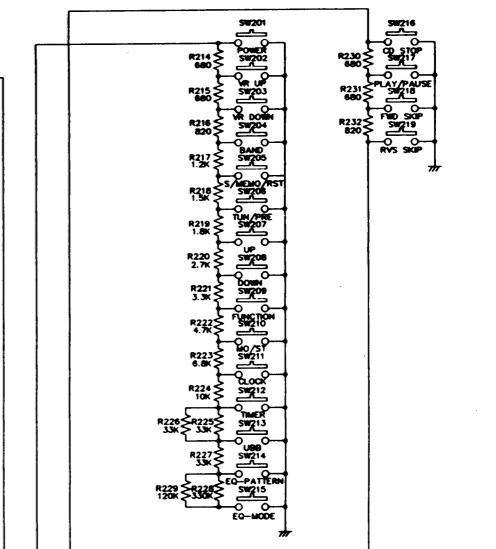
SCHEMATIC DIAGRAM

■ FRONT & KEY CIRCUIT

FRONT PWB



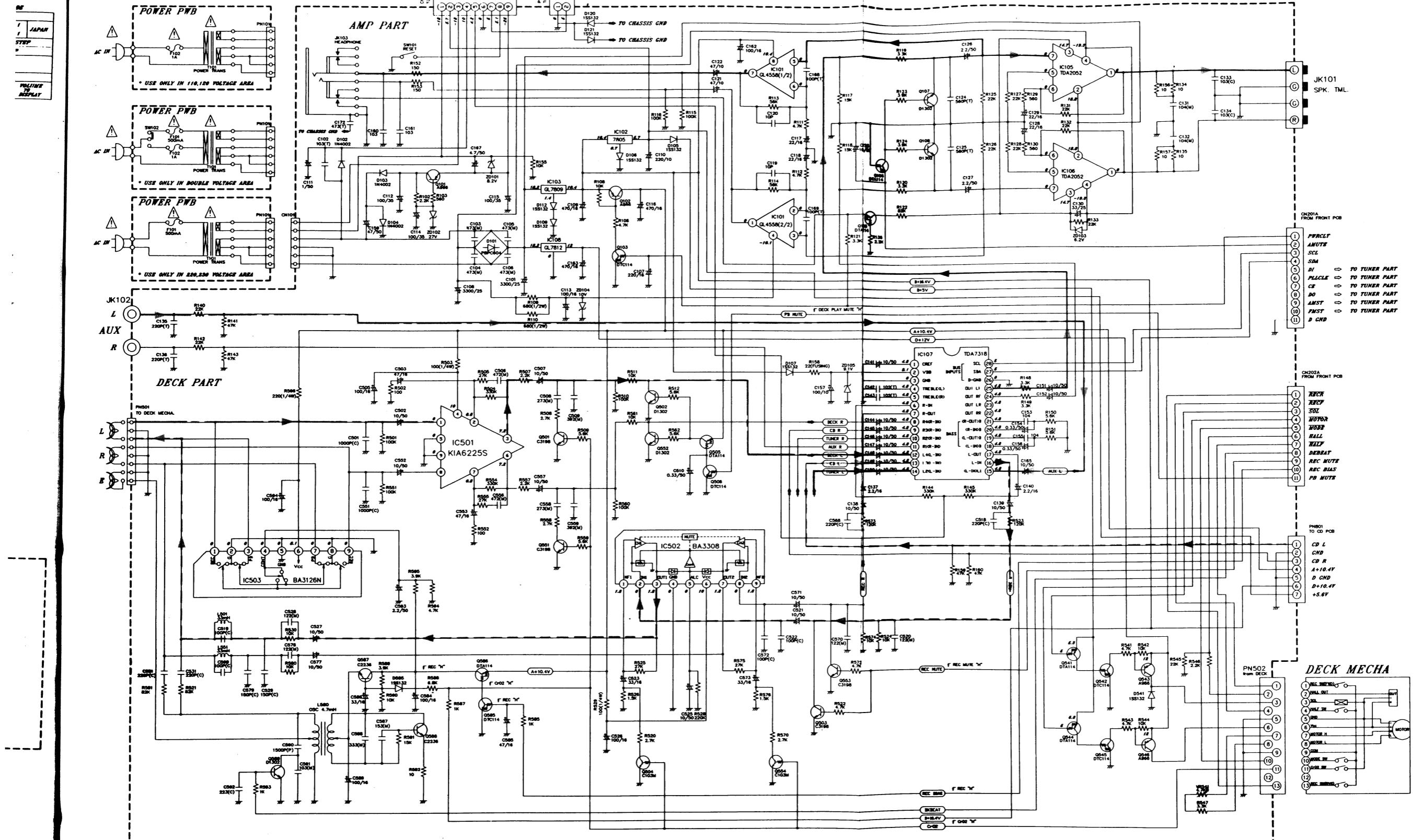
DIODE OPTION	
	1 : N/Diode 0 : S/O Diode
R205 49	AREA
R209 60	USA
R210 61	FM STEP
R210 61	FM 100HZ STEP
R211 62	COLON
R211 62	COLON BLINKING
R212 63	TIME
R212 63	12 HOUR
R213 64	DISPLAY
R213 64	24 HOUR
R214 65	AM STEREO
R214 65	AM MONO
R214 65	POLLUTION
R214 65	POLLUTION LAYER
R214 65	POLLUTION DISPLAY
R214 65	POLLUTION TO DISPLAY



* UNIT : V [VOLT]
 * CONDITION OF VOLTAGE CHECK
 a. FUNCTION : DECK (STOP STATE)
 b. EQ : FLAT
 c. UBB : OFF

NOTES:
 1. Resistance values are indicated in ohms unless otherwise specified (K=1,000, M=1,000,000).
 2. Capacitance values are shown in microfarads unless otherwise (P=MICRO-MICRO FARADS).
 3. Schematic diagram for this model are subject to change for improvement without prior notice.

■ AMP & DECK CIRCUIT(for All Area except FTZ)

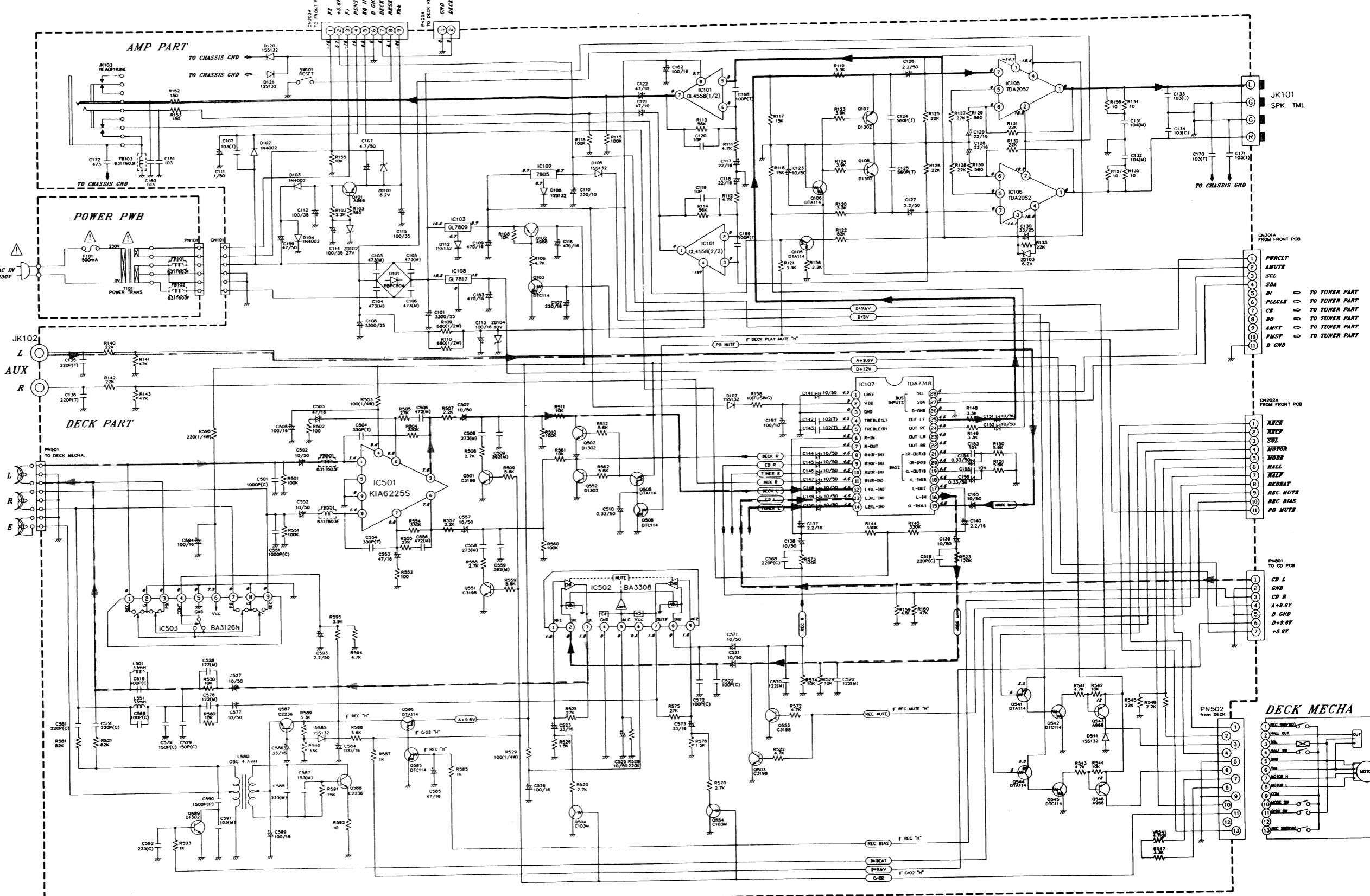


* UNIT : V [VOLT]
 * CONDITION OF VOLTAGE CHECK
 a. FUNCTION : DECK (STOP STATE)
 b. EQ : FLAT
 c. UBB : OFF

0,000).
 FARADS).
 notice.

NOTES:
 1. Resistance values are indicated in ohms unless otherwise specified (K=1,000, M=1,000,000).
 2. Capacitance values are shown in microfarads unless otherwise (P=MICRO-MICRO FARADS).
 3. Schematic diagram for this model are subject to change for improvement without prior notice.

■ AMP & DECK CIRCUIT(for FTZ)



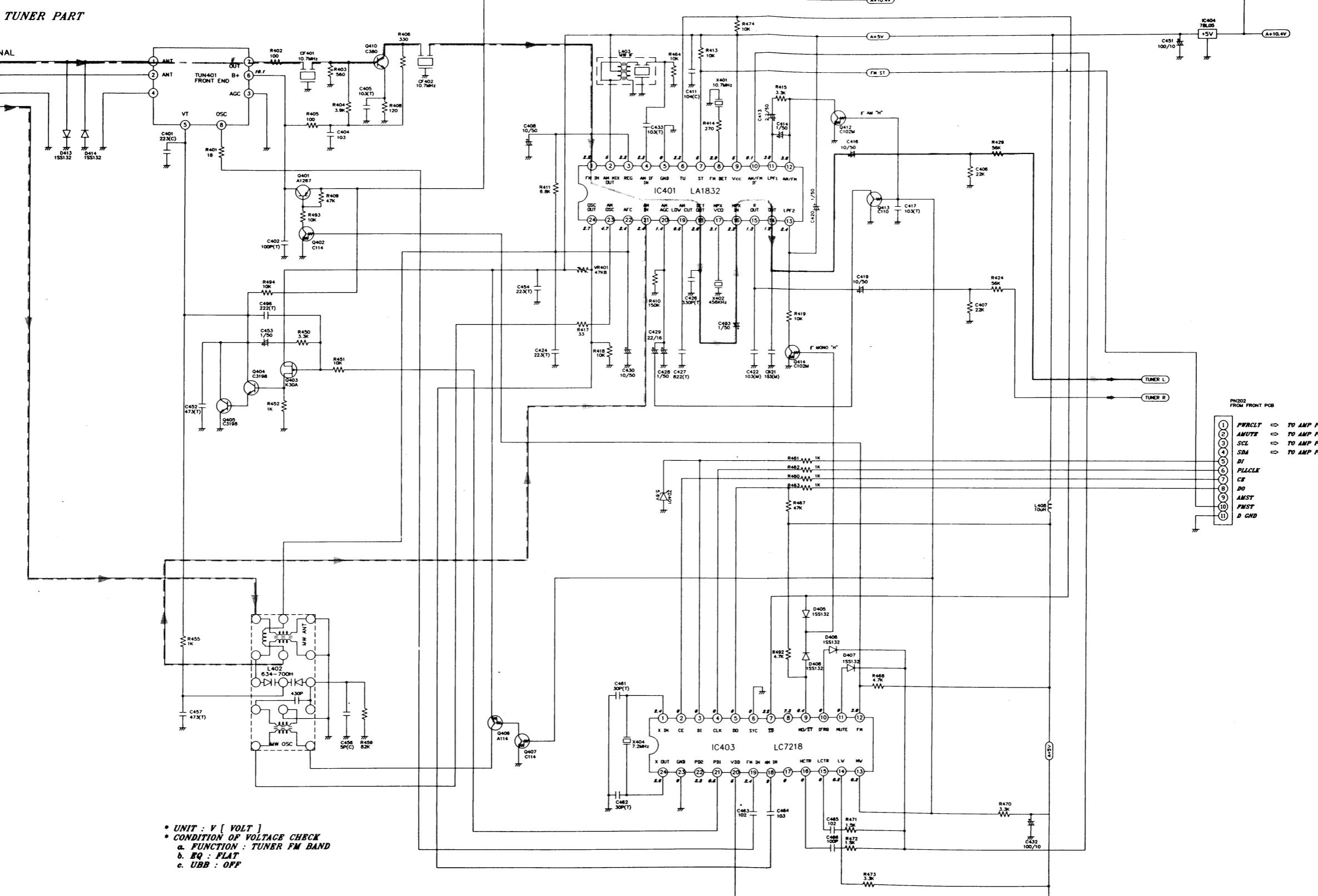
• UNIT : V [VOLT]
 • CONDITION OF VOLTAGE CHECK
 a. FUNCTION : DECK (STOP STATE)
 b. EQ : FLAT
 c. UBB : OFF

— : TUNER SIGNAL
 - - - - : TAPE RECORD SIGNAL
 - - - - : TAPE PLAY SIGNAL

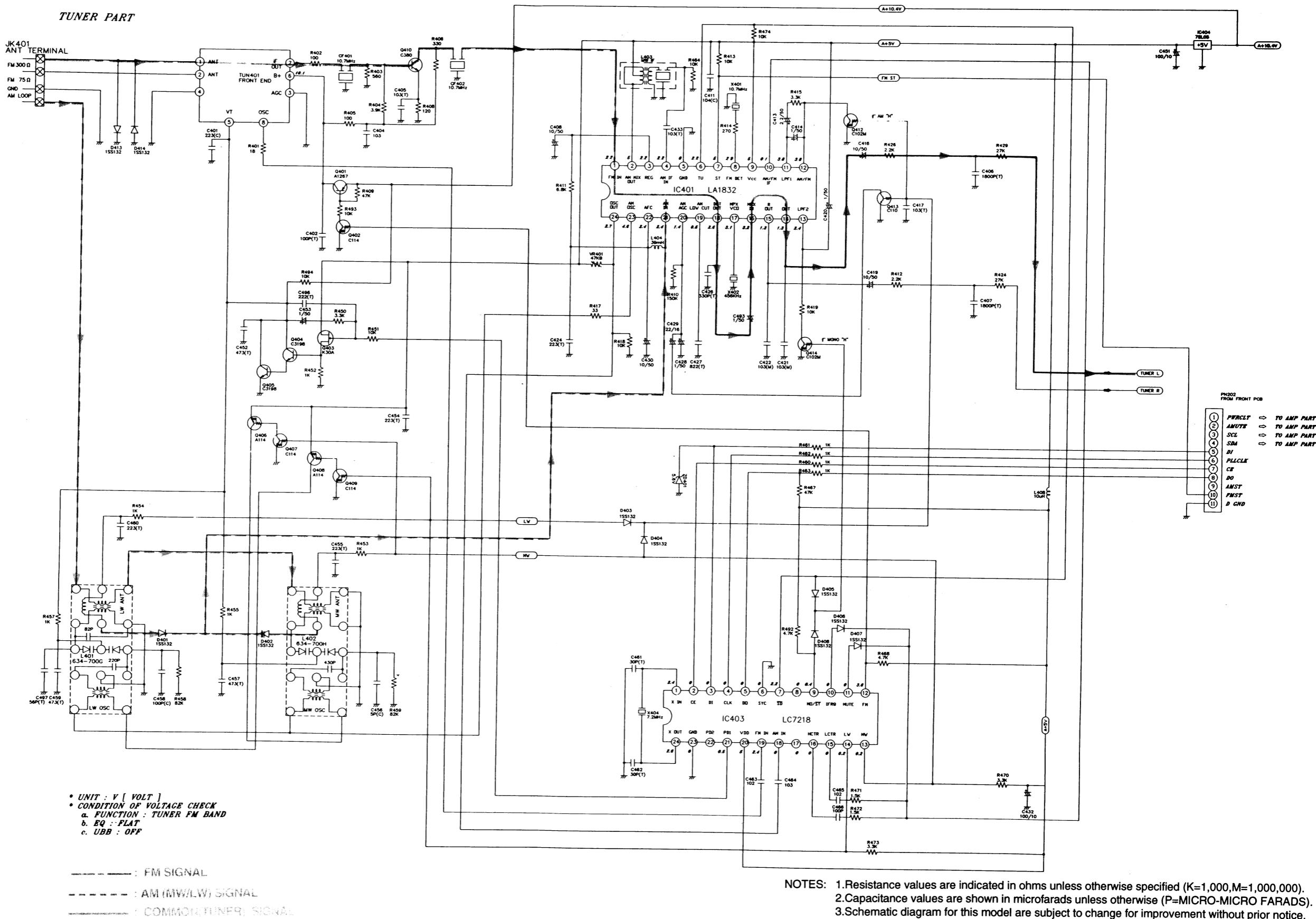
— : AUDIO SIGNAL
 - - - - : CDP SIGNAL
 - - - - : AUX SIGNAL

NOTES:
 1. Resistance values are indicated in ohms unless otherwise specified (K=1,000, M=1,000,000).
 2. Capacitance values are shown in microfarads unless otherwise (P=MICRO-MICRO FARADS).
 3. Schematic diagram for this model are subject to change for improvement without prior notice.

■ TUNER CIRCUIT(for Am/FM Tuner Band)

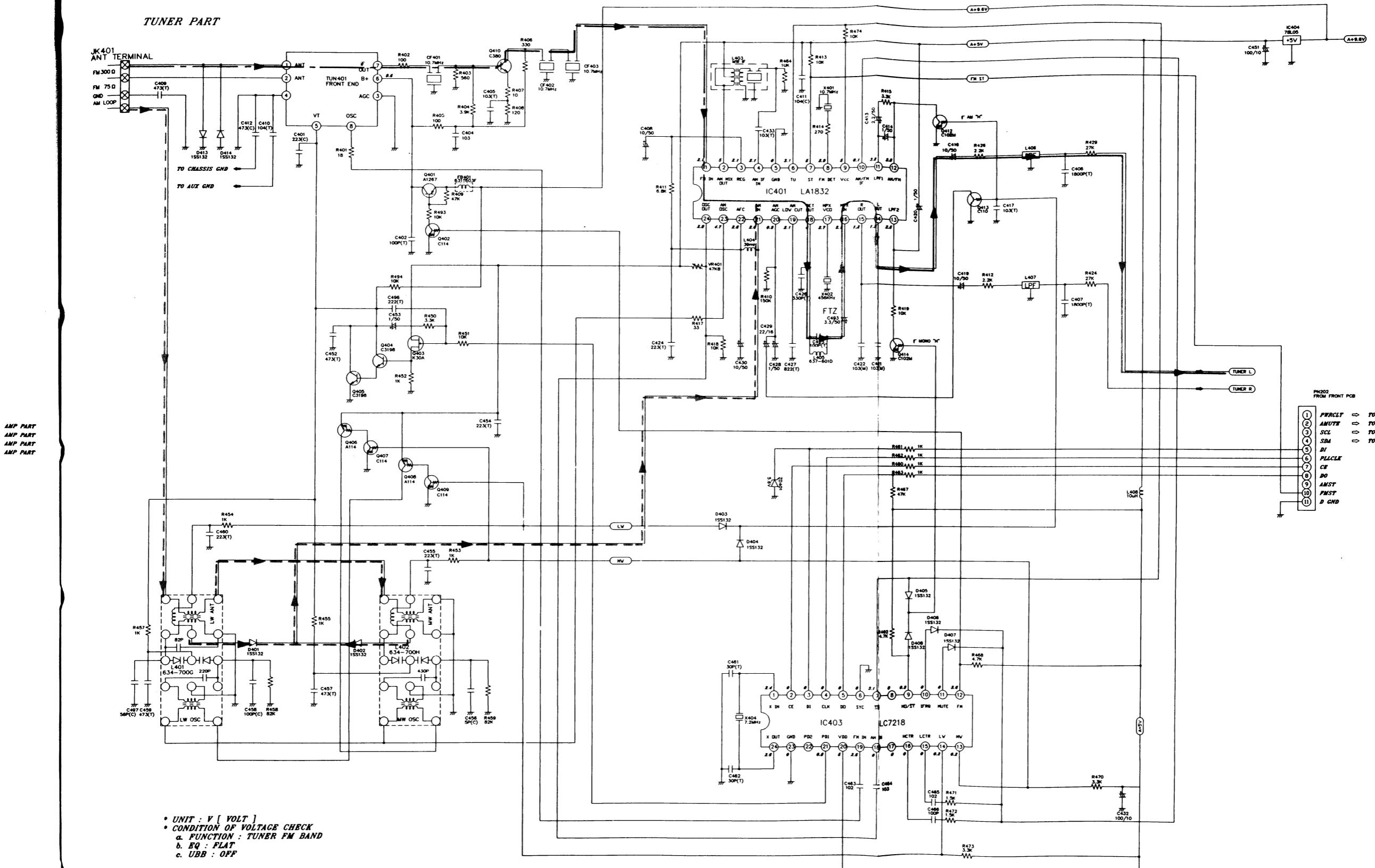


■ TUNER CIRCUIT(for MW/FM/LW Tuner Band)

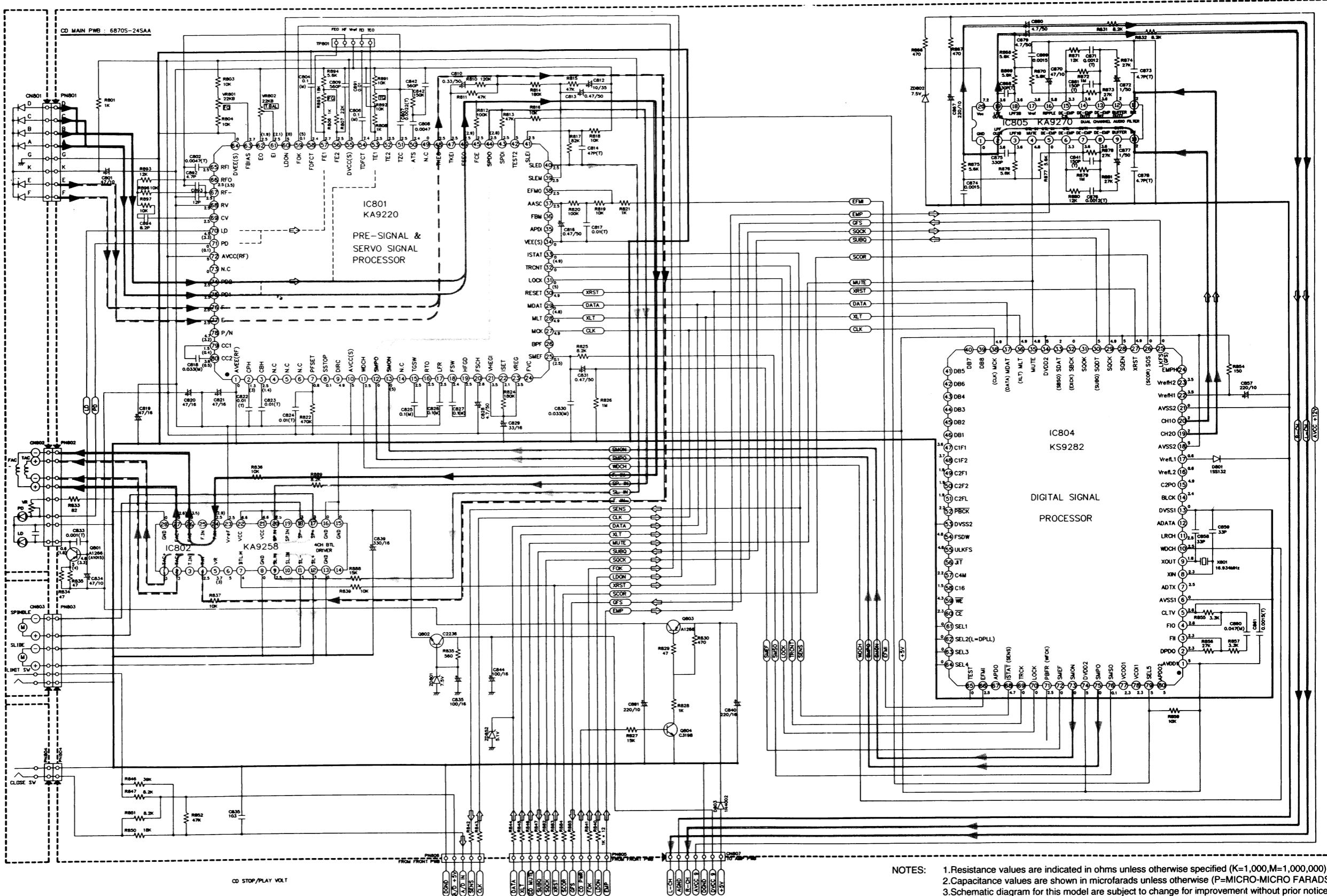


NOTES: 1. Resistance values are indicated in ohms unless otherwise specified ($K=1,000, M=1,000,000$).
2. Capacitance values are shown in microfarads unless otherwise ($P=MICRO-MICRO FARADS$).
3. Schematic diagram for this model are subject to change for improvement without prior notice.

■ TUNER CIRCUIT(for MW/FM/LW Tuner Band and FTZ)



■ CDP CIRCUIT

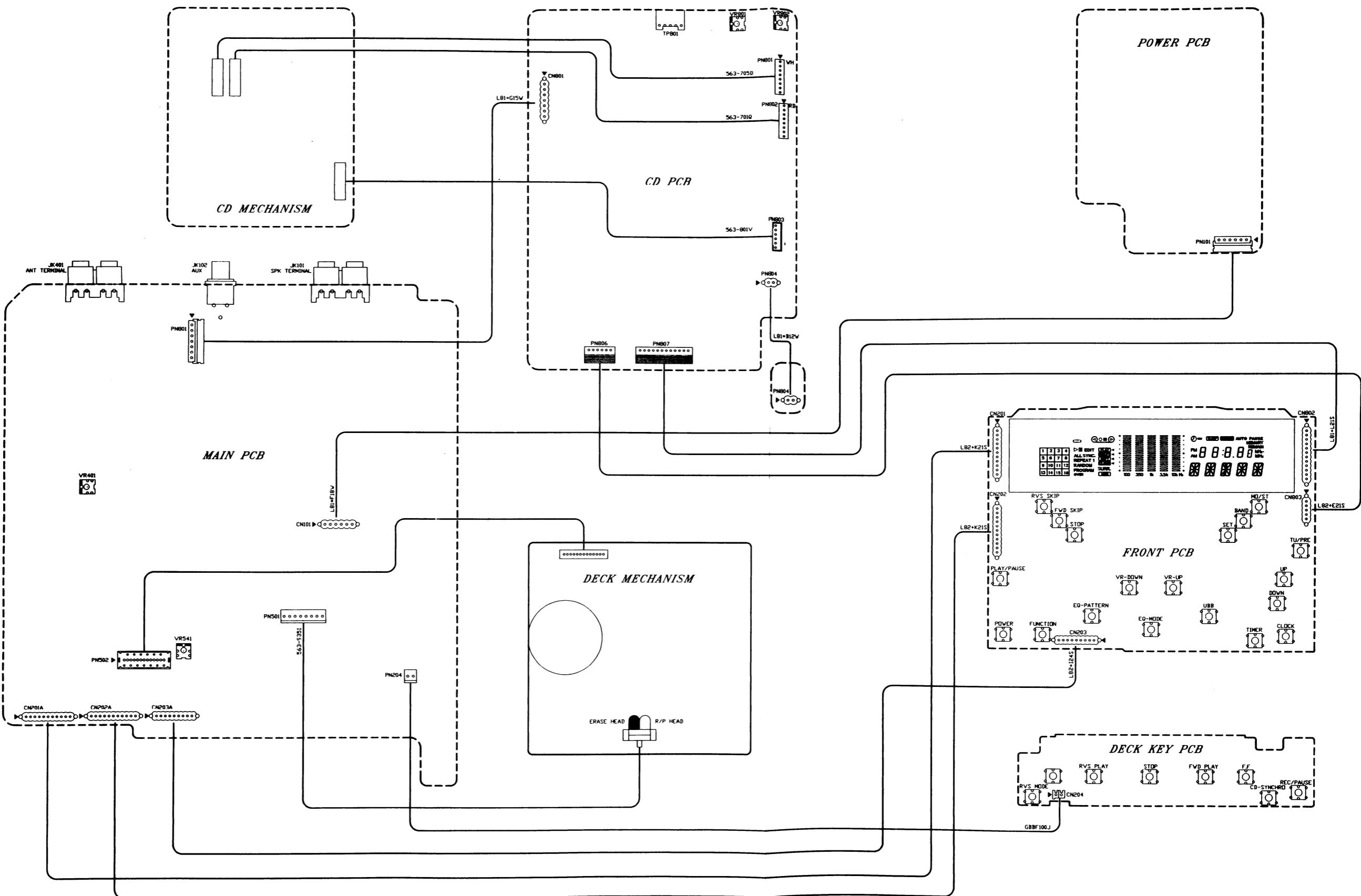


— : FOCUS SIGNAL

- - - : TRACKING SIGNAL

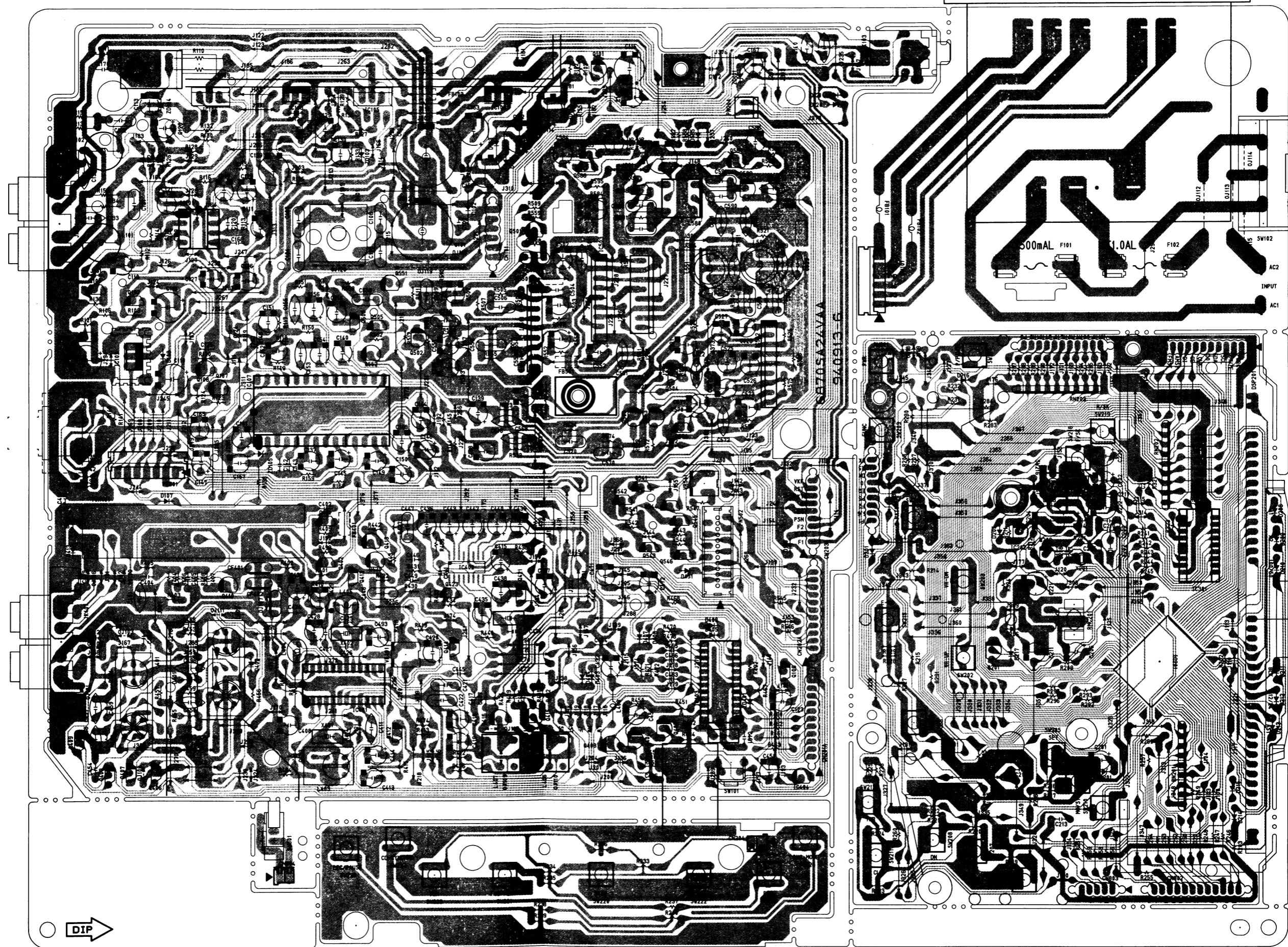
: CD AUDIO SIGNAL

WIRING DIAGRAM

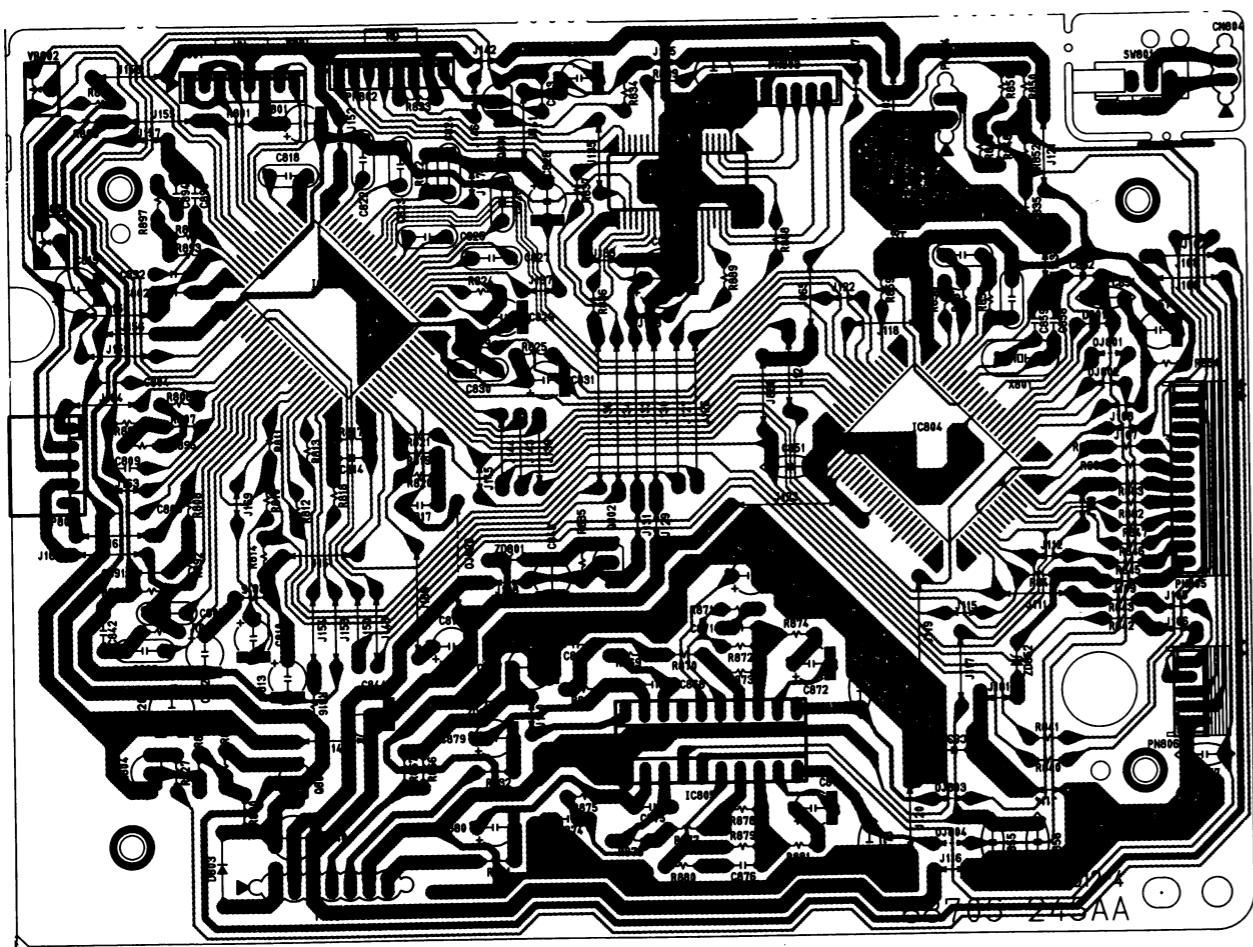


PCB LAYOUT

■ MAIN P.C. BOARD(Components Side)

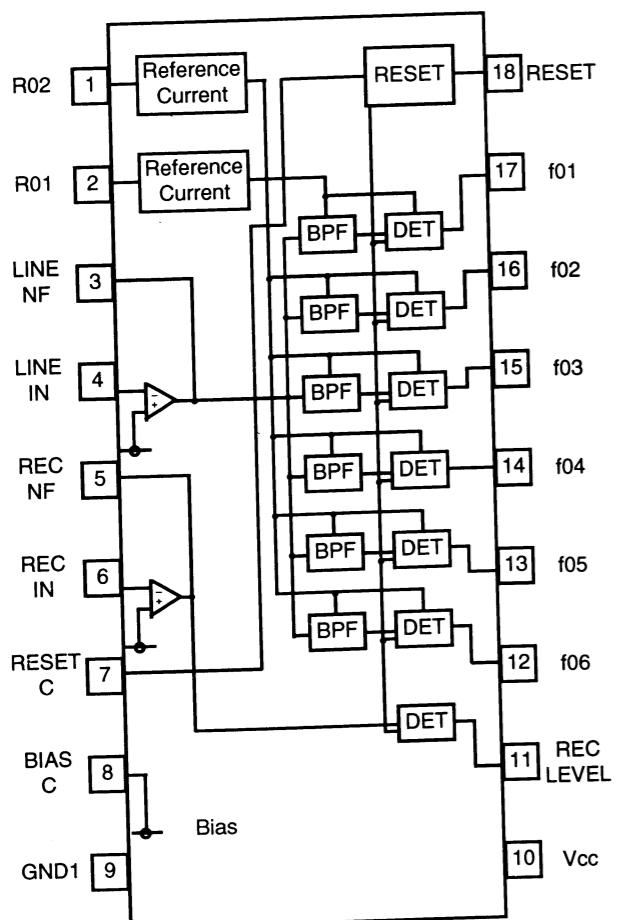


■ CDP P.C. BOARD(Components Side)

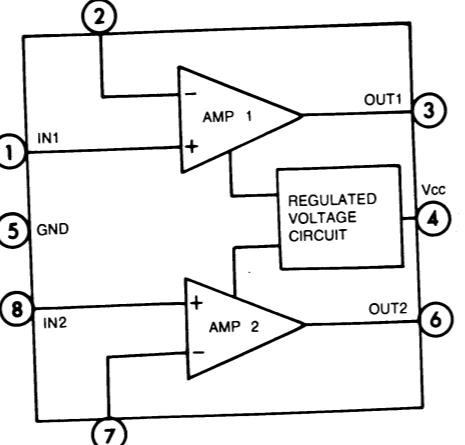


INTERNAL BLOCK DIAGRAM OF ICs

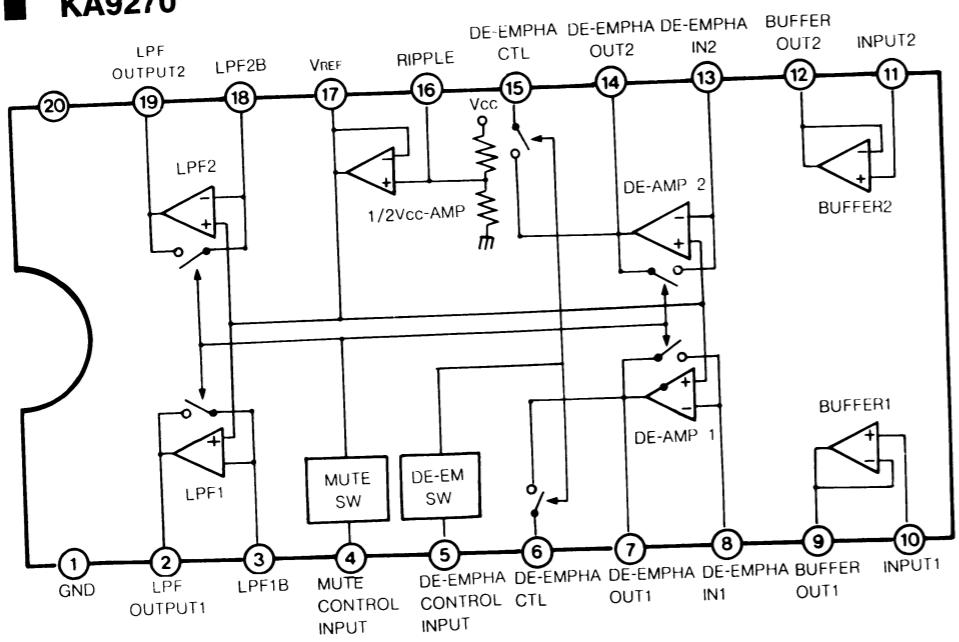
■ BA3830S



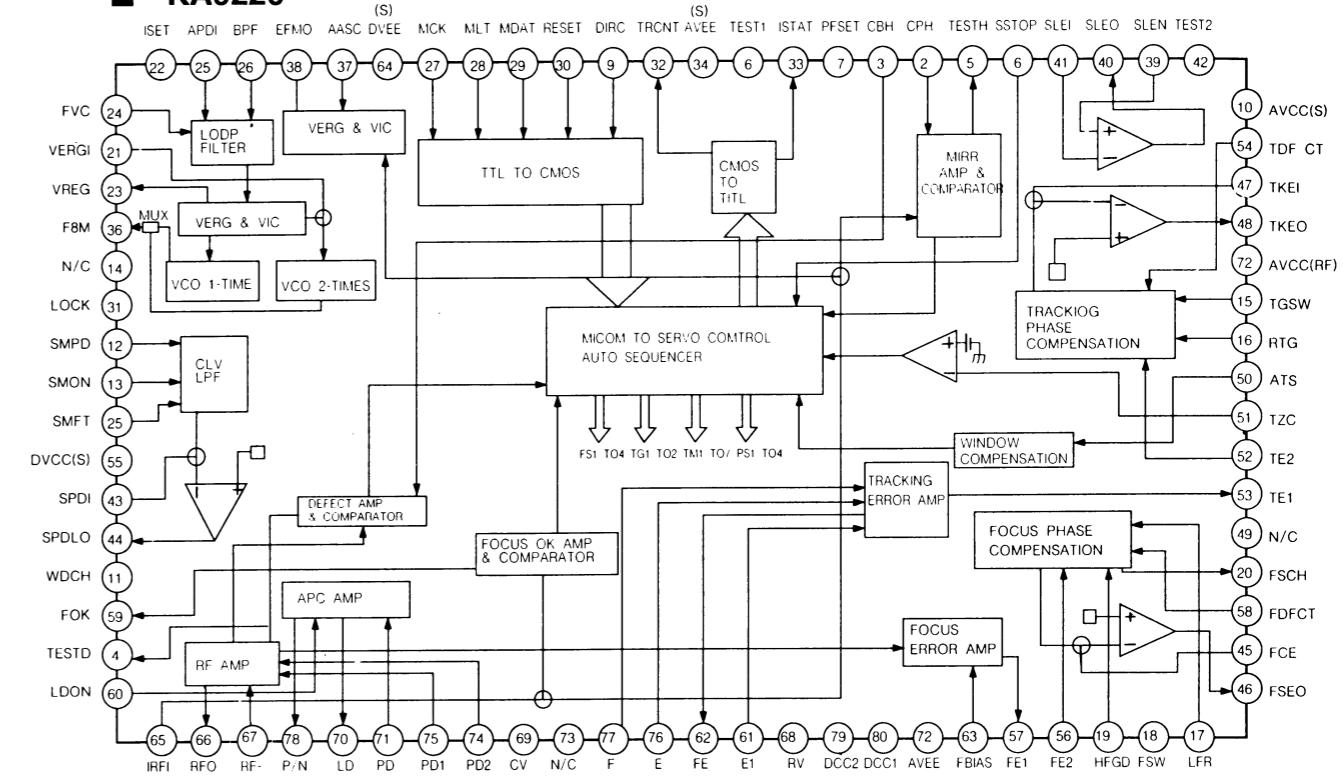
■ KIA6225S



■ KA9270



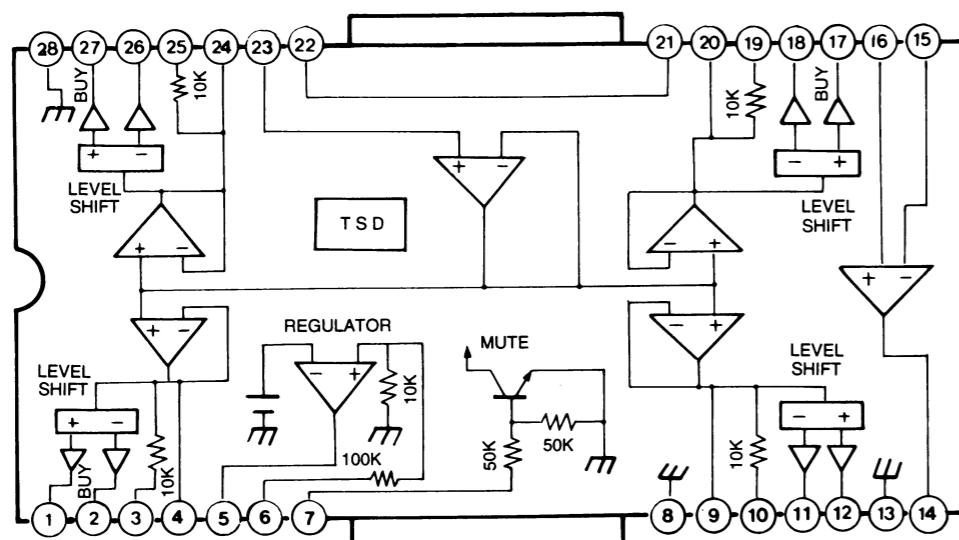
■ KA9220



PIN DESCRIPTION

Pin No.	System	Description
1	AVEE (R)	Analog negative power supply input pin for RF part
2	CPH	Capacitor connection pin of mirror hold.
3	CBH	Capacitor connection pin of defect bottom-hold
4	TESTD	Defect test pin
5	TESTM	Mirror test pin
6	Test1	Input pin for test
7	PFSET	Peak frequency setting pin for focus, tracking compensation and fc (cut off frequency) of CLV LPF.
8	SSTOP	Check the position pin of pick-up whether inside or not.
9	DIRC	Direct 1 Track Jump Control Pin
10	AVCC (S)	Analog positive power supply input pin for SERVO part.
11	WDCH	Auto-sequencer clock-input pin (Normal speed=88.2kHz, Double speed=176.4kHz)
12	SMPO	Connection pin of DSP SMPD
13	SMON	Connection pin of DSP SMON, spindle servo ON at "H"
14	N/C	No connection pin
15	TGSW	Providing time constant to change the high frequency tracking gain
16	RTG	Capacitor connection pin switch the tracking gain of high frequency
17	LFR	Capacitor connection pin to perform rising low bandwidth of focus servo loop
18	FSW	High frequency gain of focus servo loop can be changed by FS3 switch ON or OFF
19	HFGD	Reducing high frequency gain with capacitor connected between pin 18 and pin 19.
20	FSCH	Time constant external pin to generate focus search waveform
21	VREGI	External regulator voltage input pin for VCO
22	ISET	Determining the peak value of focus search, track jump and SLED kick
23	VREG	3.5V Regulator output pin
24	FVC	Pin connected external resistor to adjust free running frequency of VCO
25	SMEF	Providing an external LPF time constant of CLV SERVO Loop
26	BPF	Providing time constant for Loop filter of VCO
27	MCK	Clock input pin from micom
28	MLT	Latch input pin from micom
29	MDAT	Data input pin from micom
30	RESET	Reset input pin from micom, reset at "L"
31	LOCK	Pin for operation of the sled runaway prevention function at "L"
32	TRCNT	Track count output pin
33	ISTAT	Internal status output pin
34	AVEE (S)	Analog negative power supply input pin for SERVO part
35	APDI	Input pin of DSP phase comparison output (PHAS)
36	F8M	Output pin of analog VCO Normal speed=8.64MHz, Double speed=17.28MHz
37	AASC	Auto-Asymmetry control input pin
38	EFMO	EFM comparator output pin
39	SLEN	Non-inverting input pin of SLED SERVO amplifier
40	SLEO	Output pin of SLED SERVO amplifier
41	SLEI	Inverting input pin of SLED SERVO amplifier
42	TEST2	Test input pin to change speed mode Normal speed="H", Double speed="L"
43	SPDI	Inverting input pin of spindle servo amplifier
44	SPDLO	Spindle servo amplifier output pin
45	FCE	Inverting input pin of focus servo amplifier
46	FSEO	Output pin of focus servo amplifier
47	TKEI	Non-inverting input pin of tracking servo amplifier
48	TKEO	Output pin of tracking servo amplifier
49	N/C	No connection
50	ATS	Anti-shock input pin
51	TZC	Tracking Zero Crossing input pin
52	TE2	Tracking Error Servo input pin
53	TE1	Output pin of tracking Error Amplifier
54	TDFCT	Capacitor Connection pin for Defect Compensation of tracking servo
55	DVCC(S)	Digital positive power supply input pin for servo part
56	FE2	Focus error servo input pin
57	FE1	Output pin of focus error Amplifier
58	FDFCT	Capacitor connection pin for defect compensation of focus servo
59	FOK	Output pin of Focus ok comparator.
60	LDON	Laser diode ON/OFF control pin
61	E1	Feedback input pin of E I-V amplifier
62	EO	Output pin of E I-V Amplifier
63	FBIAS	Bias pin of non-inverting input of focus error amplifier
64	DVEE (S)	Digital negative power supply input pin for servo part
65	RFI	Output Signal of RF summing amplifier is inputted through capacitor
66	RFO	Output pin of RF summing amplifier
67	RF-	inverting input pin of RF summing amplifier
68	RV	Output pin of (AVCC+AVEE)/2 Voltage
69	CV	Bias input pin of Center Voltage buffer
70	LD	Output pin of APC amplifier
71	PD	Input pin of APC amplifier
72	AVCC(R)	Analog positive power supply input pin for RF part
73	N/C	No connection
74	PD2	Inverting input pin of RF I-V AMP2
75	PD1	Inverting input pin of RF I-V AMP1
76	F	Inverting input pin of FI-V AMP
77	E	Inverting input pin of E I-V AMP
78	P/N	Selecting P-sub/N-sub of Laser diode
79	DCC2	Defect bottom-hold output is inputted through capacitor
80	DCC1	Output pin of defect bottom-hold

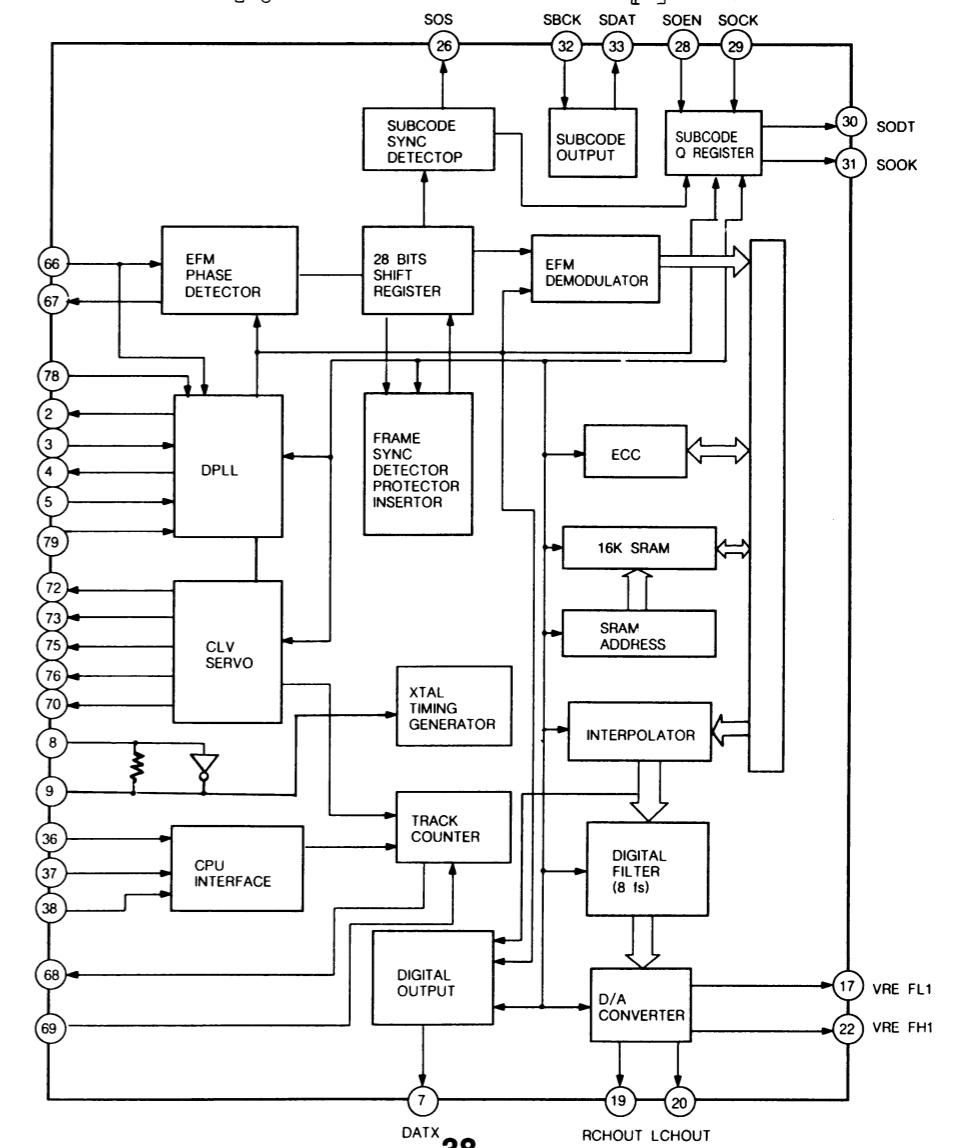
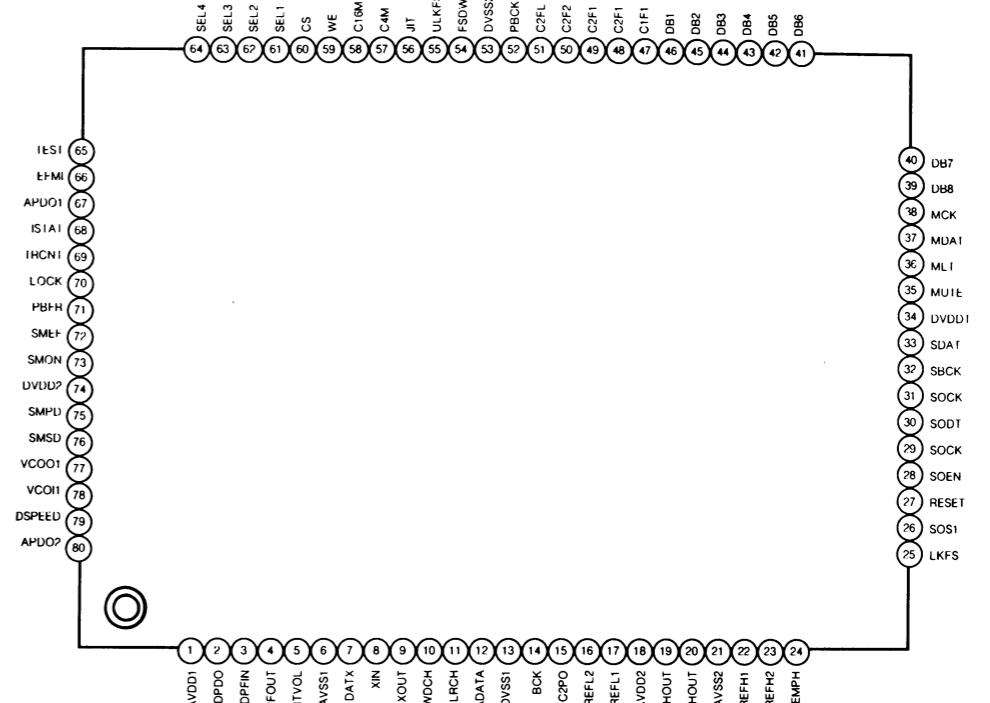
■ KA9258D



PIN DESCRIPTION

Pin No.	Symbol	I/O	Description
1	DO1.1	0	DRIVE OUTPUT
2	DO1.2	0	DRIVE OUTPUT
3	DI1.1	I	DRIVE INPUT
4	DI1.2	I	DRIVE INPUT
5	REG		REGULATOR
6	REO	0	REGULATOR OUTPUT
7	MUTE		MUTE
8	GND1		GROUND
9	DI2.1	I	DRIVE INPUT
10	DI2.2	I	DRIVE INPUT
11	DO2.1	0	DRIVE OUTPUT
12	DO2.2	0	DRIVE OUTPUT
13	GND2		GROUND
14	OPOUT	0	OPAMP OUTPUT
15	OPIN (-)	I	OPAMP OUTPUT (-)
16	OPIN (+)	I	OPAMP INPUT (+)
17	DO3.1	0	DRIVE OUTPUT
18	DO3.2	0	DRIVE OUTPUT
19	DI3.1	I	DRIVE INPUT
20	DI3.2	I	DRIVE INPUT
21	VCC1		SUPPLY VOLTAGE
22	VCC2		SUPPLY VOLTAGE
23	VREF		2.5V BIAS VOLTAGE
24	DI4.1	I	DRIVE INPUT
25	DI4.2	I	DRIVE INPUT
26	DO4.1	0	DRIVE OUTPUT
27	DO4.2	0	DRIVE OUTPUT
28	GND3		GROUND

■ KS9282

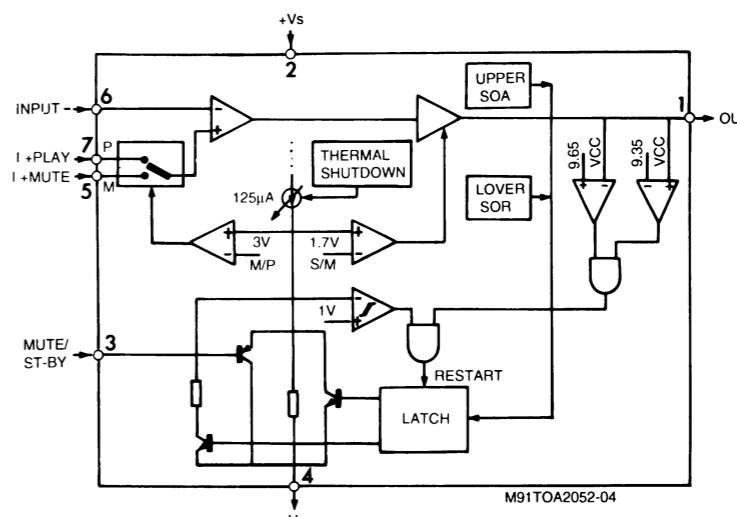
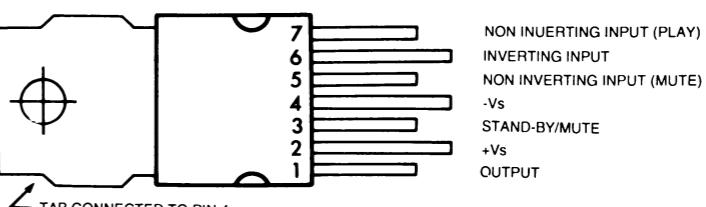


PIN DESCRIPTION

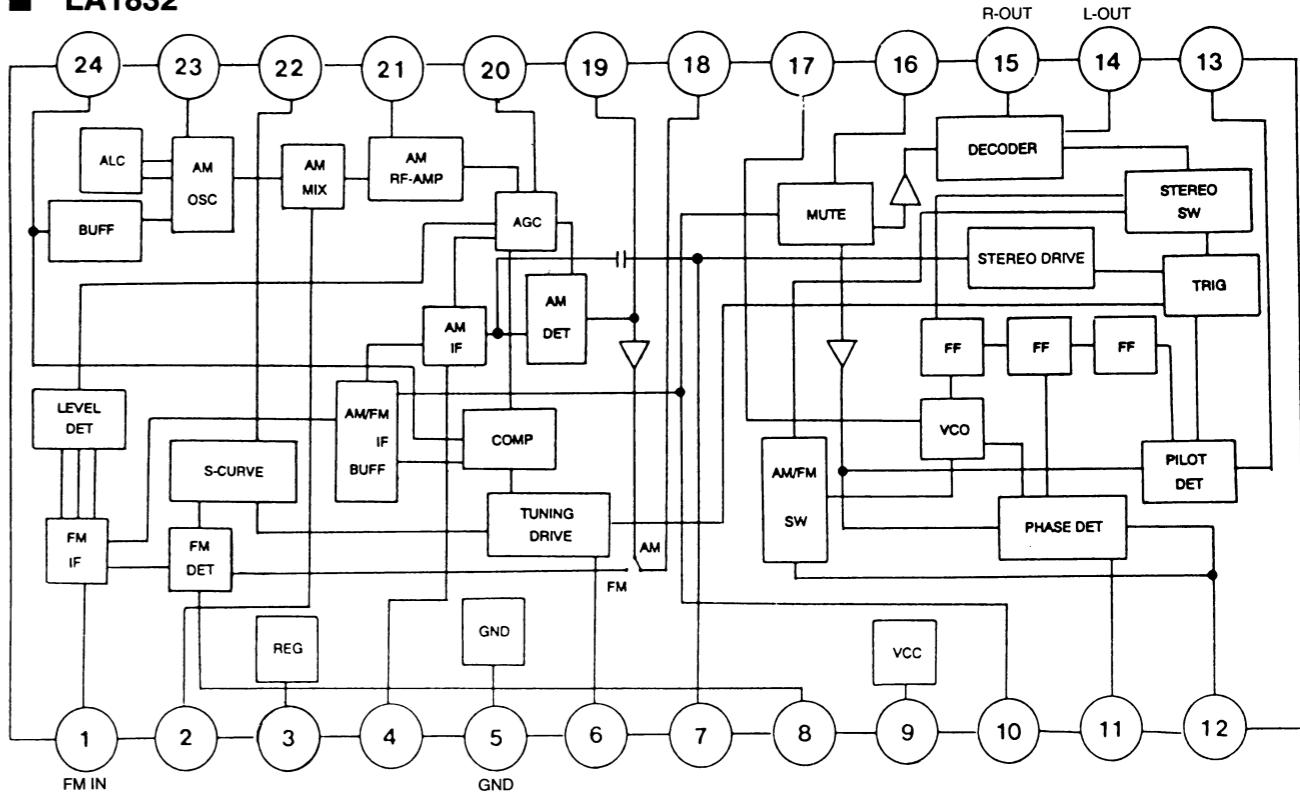
Pin No.	Symbol	I/O	Description
1	AVDD1		Analog Vcc1
2	D PDO	O	Charge pump output for master PLL
3	D PFIN	I	Filter input for master PLL
4	D PFOUT	O	Filter output for master PLL
5	CNTVOL	I	VCO control voltage for master PLL
6	AVSS1		Analog Ground 1
7	DATX	O	Digital audio output
8	XIN	I	X-tal oscillator input
9	XOUT	O	X-tal oscillator output
10	WDCH	O	Word clock of 48 bit/SLOT (Normal speed=88.2kHz, Double speed=176.4kHz)
11	LRCH	O	Channel clock of 48 bit/SLOT (Normal speed=44.1kHz, Double speed=88.2kHz)
12	ADATA	O	Serial audio data output of 48 bit/SLOT (MSB first)
13	DVSS1		Digital Ground 1
14	BCK	O	Audio data Bit clock for 48 bit/SLOT (Normal speed=2.1168kHz, Double speed=4.2336kHz)
15	C2PO	O	C2 pointer for output audio data
16	VREFL2	I	Input terminal 2 of reference voltage "L" (Floating)
17	VREFL1	I	Input terminal 1 of reference voltage "L" (GND Connection)
18	AVDD2		Analog VCC2
19	RCHOUT	O	Right-Channel audio output through D/A converter
20	LCHOUT	O	Left-channel audio output through D/A converter
21	AVSS2		Analog Ground 2
22	VREFH1	I	Input terminal 1 of reference voltage "H" (Vdd connection)
23	VREFH2	I	Input terminal 2 of reference voltage "H" (Floating)
24	EMPH	O	Emphasis/Non-Emphasis Output ("H": Emphasis)
25	LKFS	O	The Lock Status output of frame sync
26	SOS1	O	Output of subcode sync signal (S0+S1)
27	RESET	I	System reset at "L"
28	SQEN	I	SQCK I/O Control ("L": internal CK, "H": external CK)
29	SQCK	I/O	Clock for output Subcode-Q data
30	SQDT	O	Serial output of Subcode-Q data
31	SQOK	O	The CRC check result signal output of subcode-Q
32	SBCX	I	CLOCK for output subcode-Q data
33	SDAT	O	Subcode serial data output
34	DVdd1		Digital Vcc1
35	MUTE	I	Mute control Input ("H": Mute on)
36	MLT	I	Latch Signal Input from Micom
37	MDAT	I	Serial data Input from Micom
38	MCK	I	Serial Clock Input from Micom
39	DB8	I/O	SRAM data I/O Port 8 (MSB)
40	DB7	I/O	SRAM data I/O Port 7
41	DB6	I/O	SRAM data I/O Port 6
42	DB5	I/O	SRAM data I/O Port 5

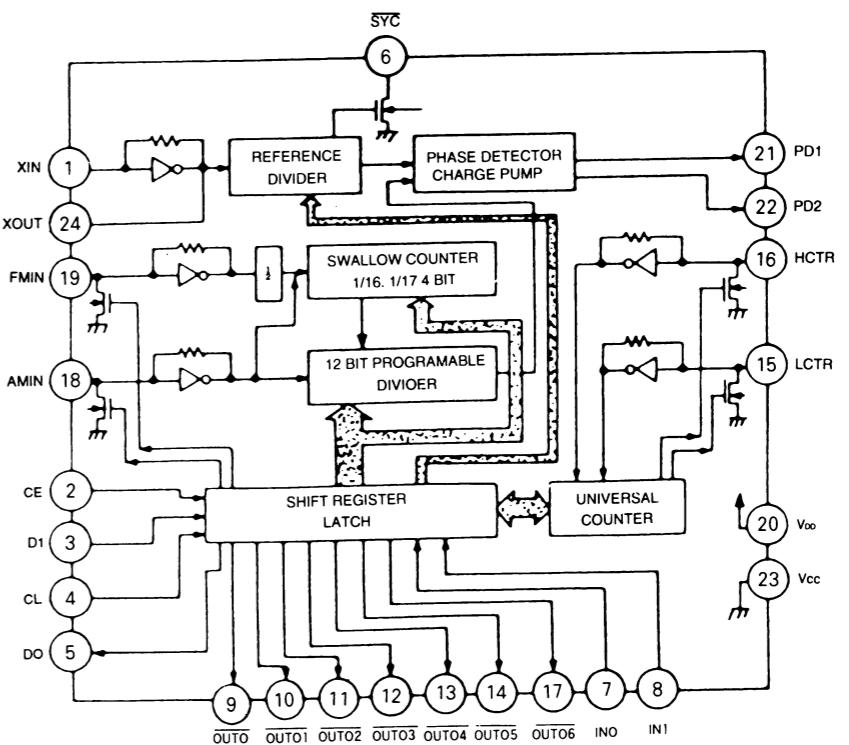
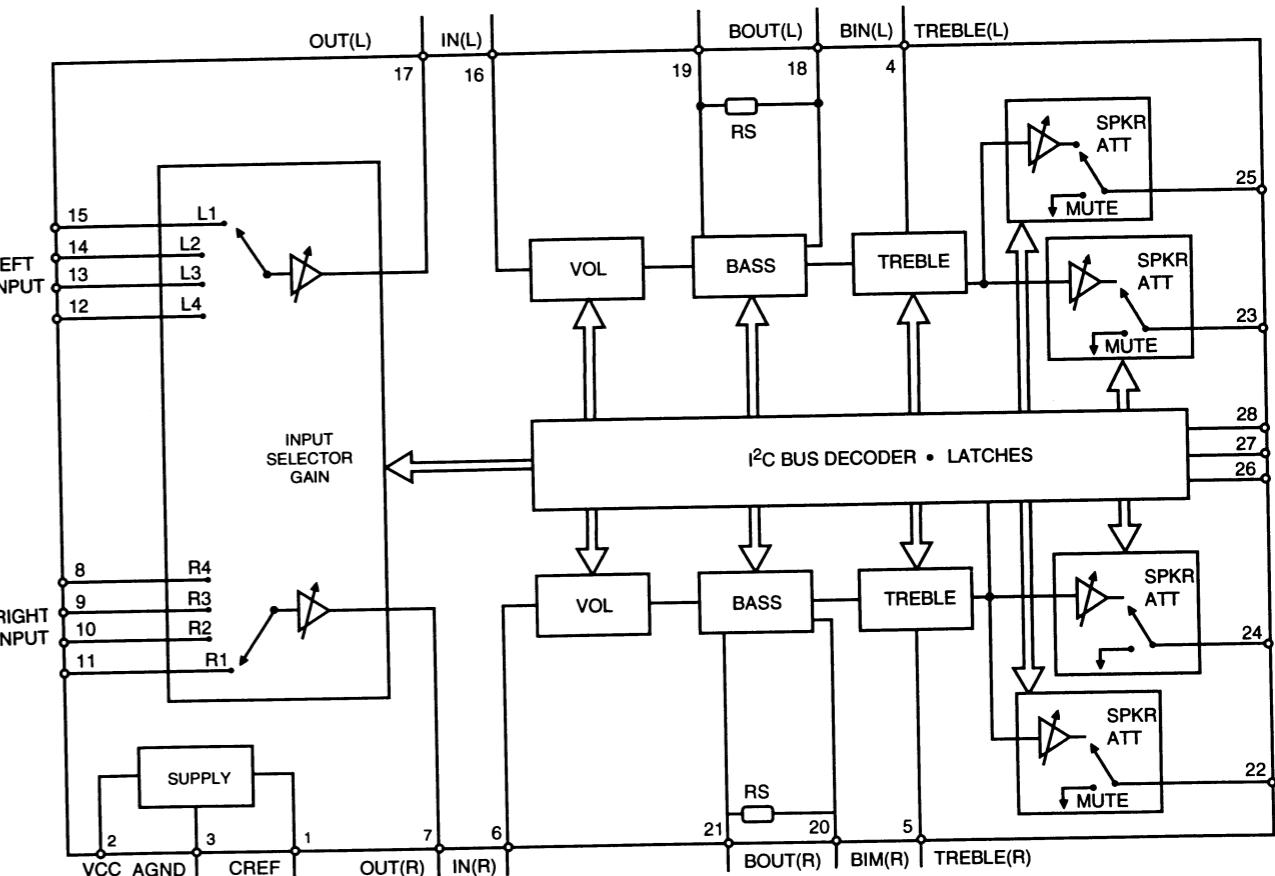
Pin No.	Symbol	I/O	Description
43	DB4	I/O	SRAM data I/O port 4
44	DB3	I/O	SRAM data I/O Port 3
45	DB2	I/O	SRAM data I/O PORT 2
46	DB1	I/O	SRAM data I/O Port 1 (LSB)
47	C1F1	I/O	Monitoring output for C1 error correction (RA1)
48	C1F2	I/O	Monitoring output for C1 error correction (RA2)
49	C2F1	I/O	Monitoring output for C2 error correction (RA3)
50	C2F2	I/O	Monitoring output for C2 error correction (RA4)
51	C2FL	I/O	C2 decoder flag (High: When the processing C2 code is impossible correction state) (RA5)
52	/PBCK	I/O	Output of VCO/2
53	DVss2		Digital Ground 2
54	FSDW	I/O	Unprotected frame sync (RA7)
55	ULKFS	I/O	Frame sync protection state (RA8)
56	/JIT	I/O	Display of either RAM overflow or underflow for ±4 frame Jitter margin (RA9)
57	C4M	I/O	Only monitoring signal (Normal playback: 4.2336MHz) (RA10)
58	C16M	I/O	16.9344MHz signal output (RA11)
59	/WE	I/O	Terminal for test
60	/CS	I/O	Terminal for test
61	SEL1	I	Mode Selection Terminal 1 (H: 33.8688MHz, L: 16.9344MHz)
62	SEL2	I	Mode Selection Terminal 2 (H: APLL L: DPLL)
63	SEL3	I	Mode Selection Terminal 3 (H: CDROM L: CDP)
64	SEL4	I	Mode Selection Terminal 4 (L: Internal SRAM)
65	TEST	I	Test Terminal (L=Normal operating state)
66	EFMI	I	EFM Signal input
67	APDO	O	Charge Pump output for analog PLL
68	/ISTAT	O	The internal status output
69	TRCNT	I	Tracking counter input signal
70	LOCK	O	Output signal of LKFS Condition sampled PBFR/16 (If LKFS is "H", Lock is "H". If the LKFS is sampled "L" at least 8 times by PBFR/16, Lock is "L")
71	PBFR	O	Write frame clock (Lock: 7.35kHz)
72	SMEF	O	LPF time constant control of the spindle servo error signal
73	SMON	O	ON/OFF control signal for spindle servo
74	DVdd2		Digital Vcc 2
75	SMPD	O	Spindle Motor drive (Rough control in the CLV-S mode Phase control in the CLV-P mode)
76	SMSD	O	Spindle Motor drive (Velocity control in the CLV-P mode)
77	VC001	O	Vco output signal (When the state is lock by means of PBFR, it is 8.643MHz)
78	VC011	I	VCO input signal
79	DSPEED	I	Double speed mode control (H: Normal Speed, L: Double Speed)
80	APD02	O	Analog PLL Charge Pump output for Double Speed mode

■ TDA2052



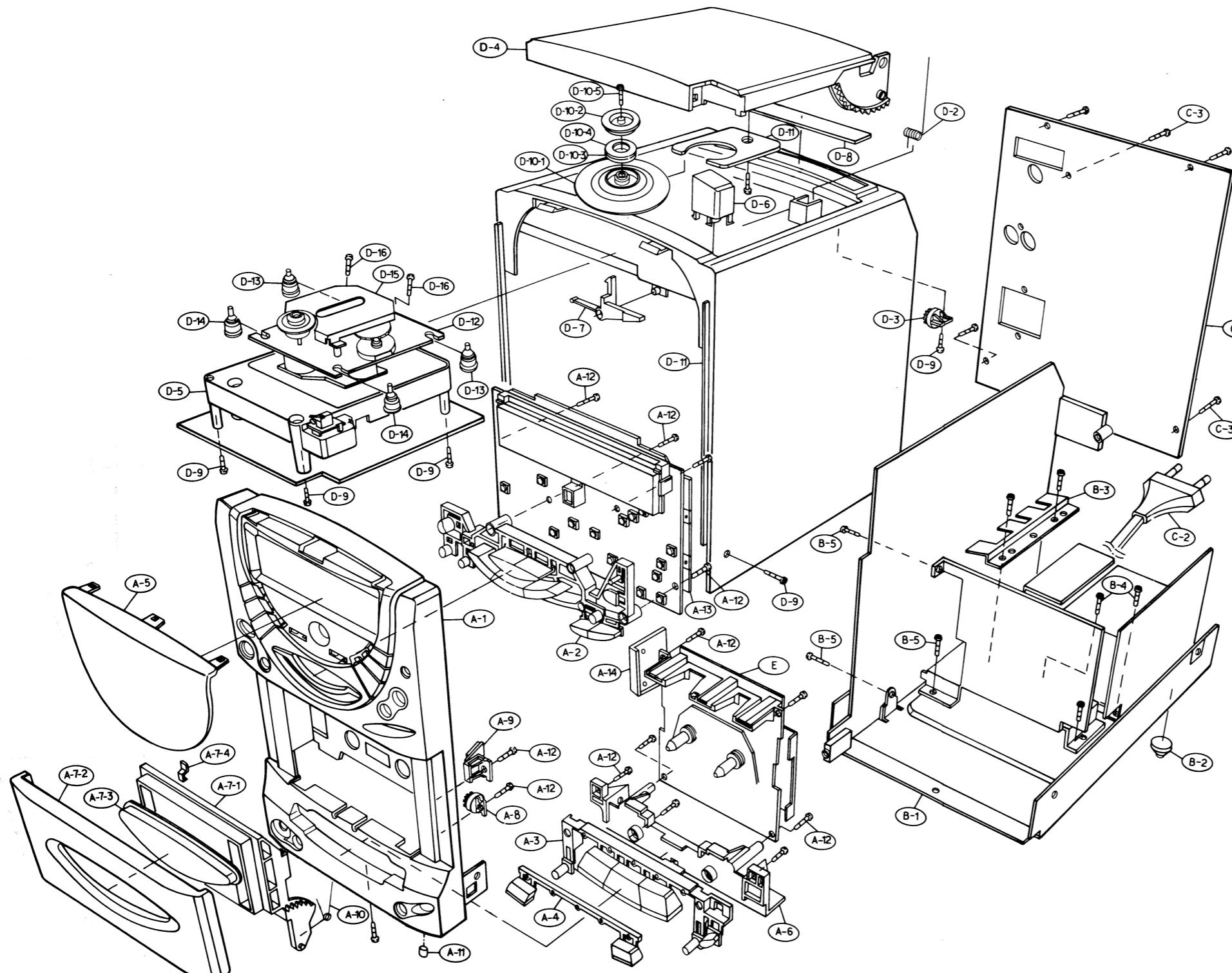
■ LA1832



FFH-212A/L**LC7218, LC7218M****TDA7318**

EXPLODED VIEW/PARTS LIST

■ CABINET



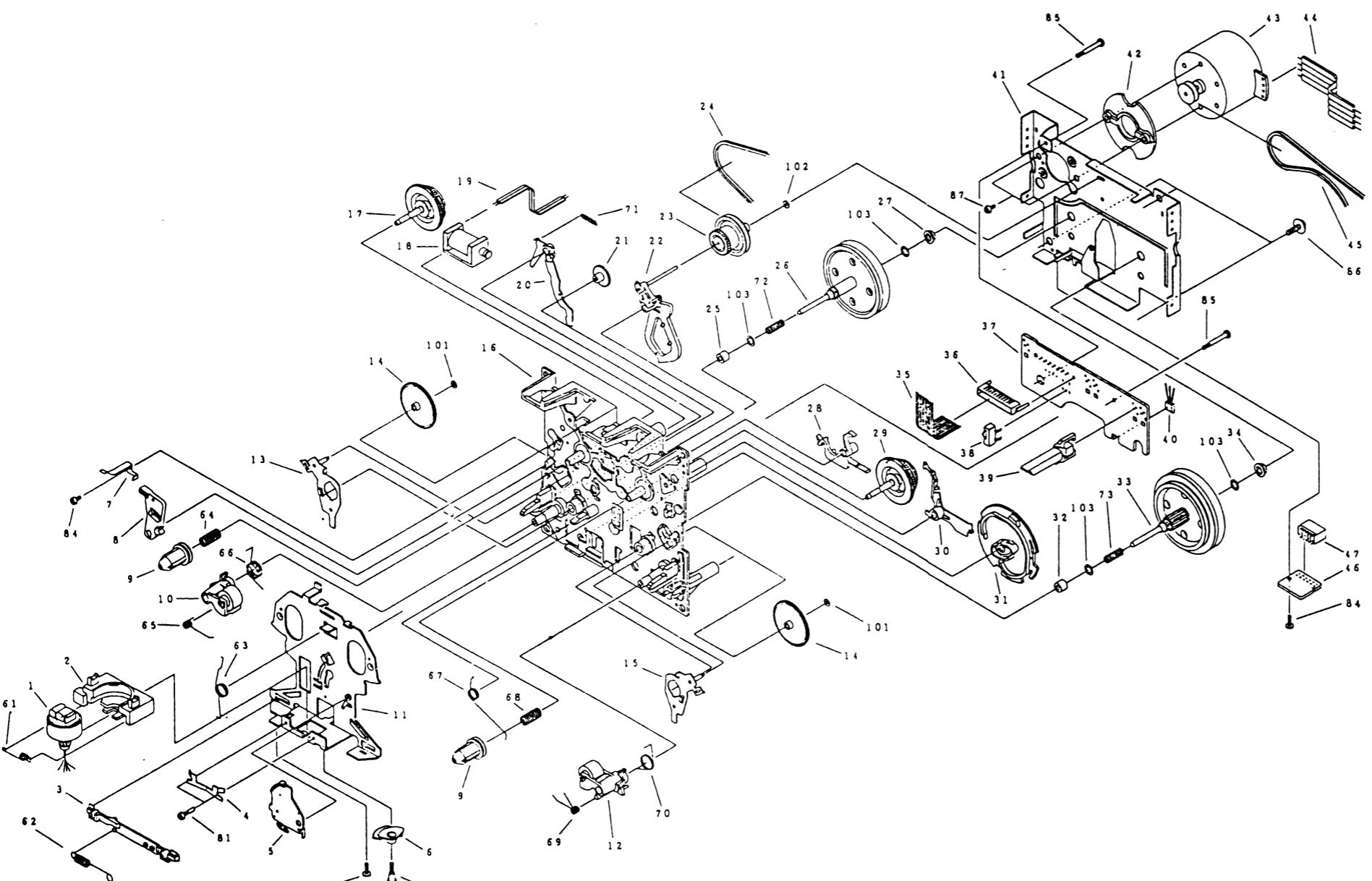
REF. NO.	PART NO.	DESCRIPTION	Q'TY
A	3721S-0213B	PANEL ASSEMBLY, FRONT	1
A-1	3720SE0213B	PANEL, FRONT	1
A-2	4940SE0213A	KNOB, FUNCTION	1
A-3	4940SE0214A	KNOB, DECK-A	1
A-4	4940SE0215A	KNOB, DECK-B	1
A-5	3790SE0212A	WINDOW, FIP FUNCTION	1
A-6	4930SE0214A	HOLDER, DECK	1
A-7	3581S-0213A	DOOR ASSEMBLY, CASSETTE	1
A-7-1	3580SE0213A	DOOR, CASSETTE	1
A-7-2	3550SE0212B	COVER, DOOR	1
A-7-3	3790SE0212A	WINDOW, FIP FUNCTION	1
A-7-4	442-211C	SPRING	2
A-8	4900S-0001C	DAMPER	1
A-9	384-535A	GUIDE, EJECT ASSEMBLY	1
A-10	442-085E	SPRING, DOOR	1
A-11	4766SE0212A	FELT, FOOT	2
A-12	353-025P	SCREW, TAPITIE 3 X 10	17
A-13	3550SE0213A	COVER, SHEET	1
A-14	4810SE0214A	BRACKET, SHIELD DECK	1
B	3141S-0212A	CHASSIS ASSEMBLY, MAIN	1
B-1	3140SE0212A	CHASSIS, MAIN	1
B-2	265-013B	FOOT, RUBBER	2
B-3	4810SE0212A	BRACKET, IC	1
B-4	1TRL0402018	SCREW, 4 X 6	4
B-5	1TRL0302016	SCREW, 3 X 6	4
C	3721S-0212C	PANEL ASSEMBLY, BACK	1
C-1	3720SE0212C	PANEL, BACK	1
C-2	681-003A	CORD, POWER	1
C-3	353-025C	SCREW, TAPITIE 3 X 10	8
D	3091S-0212B	CABINET ASSEMBLY, TOP	1
D-1	3090SE0212B	CABINET, TOP	1
D-2	442-287M	SPRING, EJECT	1
D-3	4900S-0001D	DAMPER	1
D-4	3580SE0212B	DOOR, CD	1
D-5	4930SE0212A	HOLDER, MD	1
D-6	4940SE0212A	KNOB, EJECT	1
D-7	353-630A	LEVER, EJECT	1
D-8	3858SE0212B	SHEET	1
D-9	353-025C	SCREW, TAPITIE 3 X 10	12
D-10	327-118B	CLAMPER ASSEMBLY	1
D-10-1	324-310A	HOLDER, CLAMPER	1
D-10-2	327-119A	CLAMPER	1
D-10-3	524-011A	MAGNET, CLAMPER	1
D-10-4	221-240C	COVER, MAGNET	1
D-10-5	353-025F	SCREW, TAPITIE 3 X 8	1
D-11	324-534A	HOLDER, CLAMPER	1
D-12	411-006C	MECHANISM ASSEMBLY, KSM-2101BAM	1
D-13	324-101A	HOLDER, BUSHING CD	2
D-14	447-070A	CUSHION, M/D	2
D-15	221-946A	COVER, MD	1
D-16	353-028A	SCREW, TAPITIE 2 X 6	5
E	419-005I	DECK MECHANISM, CRF444	1

REF. NO.	PART NO.	DESCRIPTION	Q'TY
AY1	3721SX0213A	PANEL ASSEMBLY, FRONT	1
AY2	3581SX0213A	DOOR ASSEMBLY, CASSETTE	1
AY3	3581SX0212A	DOOR ASSEMBLY, CD	1

NOTE : Ref. no. shows a group unit of assembly.

EXPLODED VIEW/PARTS LIST

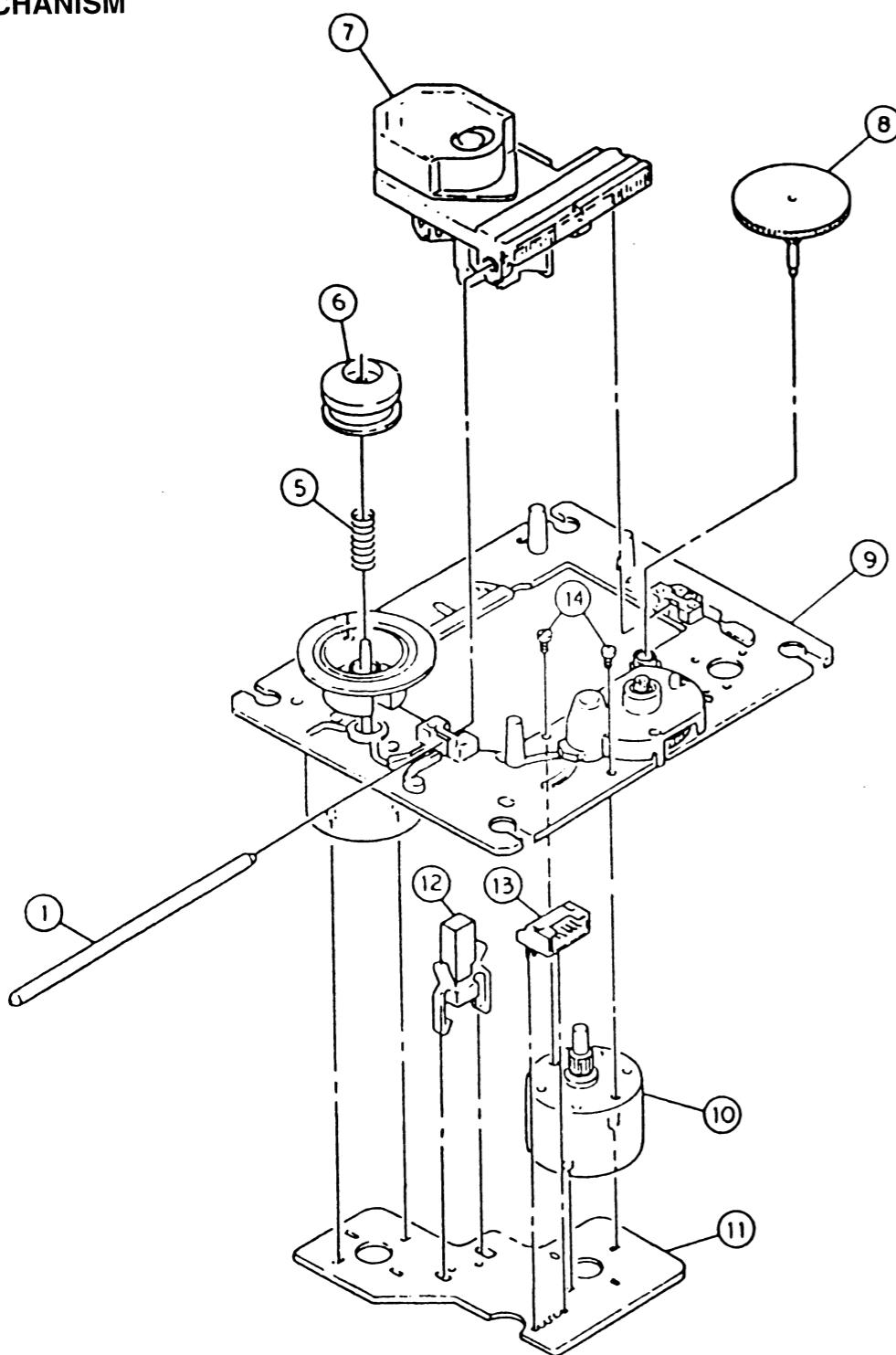
■ TAPE DECK MECHANISM



NO.	PART NAME	PART NO.	Q'TY
1	DECK MECHANISM, CRF444	419-005I	1
2	ASS'Y HOLDER HEAD	99P-3001	1
3	PLUME HEAD	99P-3002	1
4	LEVER HEAD	99P-3003	1
5	SPRING AZIMUTH	99P-3004	1
6	ASS'Y ARM ASSIST	99P-3005	1
7	GEAR ARM HEAD	99P-3006	1
8	SPRING CASSETTE	99P-3007	1
9	EJECT LOCK	99P-3008	1
10	CAP REEL	99P-3009	2
11	ASS'Y PINCH ARM L	99P-3010	1
12	CHASSIS HEAD	99P-3011	1
13	ASS'Y PINCH ARM R	99P-3012	1
14	ASS'Y ARM PLAY L	99P-3013	1
15	GEAR PLAY	99P-3014	2
16	ASS'Y ARM PLAY R	99P-3015	1
17	CHASSIS OS.	99P-3016	1
18	ASS'Y SUB REEL L	99P-3017	1
19	SOLENOID	99P-3018	1
20	WIRE	99P-3019	1
21	ARM RVS	99P-3020	1
22	GEAR FF	99P-3021	1
23	ASS'Y ARM FR	99P-3022	1
24	ASS'Y PULLEY FR	99P-3023	1
25	BELT FR	99P-3024	1
26	METAL	99P-3025	1
27	ASS'Y FLYWHEEL L	99P-3026	1
28	METAL	99P-3027	1
29	ARM BRAKE	99P-3028	1
30	ASS'Y SUB REEL R	99P-3029	1
31	ARM TRIGGER	99P-3030	1
32	GEAR CAM	99P-3031	1
33	METAL	99P-3032	1
34	ASS'Y FLYWHEEL R	99P-3033	1
35	METAL	99P-3034	1
36	WIRE(13P)	99P-3035	1
37	HOLDER WIRE	99P-3036	1
38	P.C. BOARD	99P-3037	1
39	SWITCH MODE	99P-3038	1
40	SWITCH (LEAF)	99P-3039	5
41	HALL IC.	99P-3040	1
42	BRACKET FW	99P-3041	1
43	SPACER	99P-3042	1
44	ASS'Y MOTOR	99P-3043	1
45	WIRE	99P-3044	1
46	BELT MAIN	99P-3045	1
47	P.C. BOARD	99P-3046	1
61	HOUSING	99P-3047	1
62	SPRING	99P-3051	1
63	SPRING	99P-3052	1
64	SPRING	99P-3053	1
65	SPRING	99P-3054	1
66	SPRING	99P-3055	1
67	SPRING	99P-3056	1
68	SPRING	99P-3057	1
69	SPRING	99P-3058	1
70	SPRING	99P-3059	1
71	SPRING	99P-3060	1
72	SPRING	99P-3061	1
73	SPRING	99P-3062	1
81	SCREW	99P-3063	1
82	SCREW	99P-3064	2
83	SCREW	99P-3065	1
84	SCREW	99P-3065	1
85	SCREW	99P-3067	2
86	SCREW	99P-3068	2
87	SCREW	99P-3069	3
101	SCREW	99P-3070	2
102	SCREW	99P-3071	2
103	SCREW	99P-3072	1
	WASHER	99P-3073	4

EXPLODED VIEW/PARTS LIST

■ CDP MECHANISM



REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
-	411-006C	CD KSM-2101 BAM	9	88A-0026	CHASSIS AY (MOTOR)
1	88A-0021	SLIDE SHAFT	10	88A-0027	MOTOR ASSY
5	881-0022	ARM CHECK SPRING	11	88A-0028	MOTOR PCB
6	88A-0023	CENTER RIM	12	88A-0029	LEAF SWITCH
7	88A-0024	PICK UP	13	88A-0030	CONNECTOR

ELECTRICAL PARTS LIST

NOTE: Parts marked with are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

S	LOCANO.	PART NO.(GS)	SPECIFICATION
ICs			
IC101	OIGS455800A	GL4558 OP AMP	
IC102	OIGS780500A	GL7805 REGULATOR	
IC103	OIKE780900C	KIA7809PI 9V 1A, KEC	
IC105	OISG205200A	TDA2052 PWR 20W, SGS-THOHSON	
IC106	OISG205200A	TDA2052 PWR 20W, SGS-THOHSON	
IC107	OISG731800B	TDA7318 DIP28 ELEC V/R, SGS-T	
IC108	OIGS781200C	GL7812 12V 1A REGULATOR, G/S	
IC201	OISA866224D	LC866224A-5679 TY FFH-212	
IC202	OIMT572009B	PST572E-2 TP 3.9V, MITSUMI	
IC301	OIRH383000A	BA3830S SPECT/ANALIZER, ROHM	
IC401	OISA183200A	LA1832 ST AM/FM IF+MPX IC	
IC403	OISA721800A	LCT218 PLL, SANYO	
IC404	OIKE780500A	KET7805 3SIP LIN	
IC501	OIKE622500A	KIA6225S (KIA7325P) KEC	
IC502	OIRH330800A	BA3308 DUAL EQ ALC ROHM (S)	
IC503	OIRH312600A	BA3126N HI-VOL HEAD S/W, ROHM/	
IC801	OISS922000A	KA9220 TY 80-QFP-1420C ASP	
IC802	OISS925800A	KA9258D-T1 4CH DRIVER, S/S	
IC804	OISS928200B	KS9282B TY DSP FOR CDP	
IC805	OISS927000B	KA9270 ST (DIP) AUDIO FILTER	
RMC201	OIRH676000A	RPM-676CBR-L SENSOR RMC, ROHMJ	

TRANSISTORS

Q101	OTR127309AA	KTA1273-TP-Y (KTA966A) KEC	
Q102	OTR127309AA	KTA1273-TP-Y (KTA966A) KEC	
Q103	OTR114009AE	DTC114TS-TP S/W ROHM	
Q105	OTR114009AA	DTA114ES ROHM	
Q106	OTR114009AA	DTA114ES ROHM	
Q107	OTR130209AA	KTD1302 MUTING TP, KEC	
Q108	OTR130209AA	KTD1302 MUTING TP, KEC	
Q201	OTR110009AE	KRC110M TP, KEC (KRC1210)	
Q202	OTR130209AA	KTD1302 MUTING TP, KEC	
Q401	OTR126709AB	KTA1267-Y MINI TP, KEC	
Q402	OTR114009AE	DTC114TS-TP S/W ROHM	
Q403	667T010C	KTK30A-Y TAPE TO-92 KEC (S)	
Q404	OTR319809AA	KTC3198-TP-Y (KTC1815) KEC	
Q405	OTR319809AA	KTC3198-TP-Y (KTC1815) KEC	
Q406	OTR114009AA	DTA114ES ROHM	
Q407	OTR114009AE	DTC114TS-TP S/W ROHM	
Q408	OTR114009AA	DTA114ES ROHM	
Q409	OTR114009AE	DTC114TS-TP S/W ROHM	
Q410	OTR319209AA	KTC3192-0 TP, KEC (KTC380TM-0)	
Q412	OTR102009AF	KRC102M TP, KEC (KRC1202)	
Q413	OTR110009AE	KRC110M TP, KEC (KRC1210)	
Q414	OTR102009AF	KRC102M TP, KEC (KRC1202)	
Q501	OTR319809AA	KTC3198-TP-Y (KTC1815) KEC	
Q502	OTR130209AA	KTD1302 MUTING TP, KEC	
Q503	OTR319809AA	KTC3198-TP-Y (KTC1815) KEC	

S	LOCANO.	PART NO.(GS)	SPECIFICATION
DIODES			
D101	ODD604000CA	PBPC604, BRIDGE, SILITEK	
D102	ODD400209DA	1N4002, RECT, ROHM, TP	
D103	ODD400209DA	1N4002, RECT, ROHM, TP	
D104	ODD400209DA	1N4002, RECT, ROHM, TP	
D105	ODD132009AA	ISS132 DETECT, SW TP	
D107	ODD132009AA	ISS132 DETECT, SW TP	
D108	ODD132009AA	ISS132 DETECT, SW TP	
D109	ODD132009AA	ISS132 DETECT, SW TP	
D112	ODD132009AA	ISS132 DETECT, SW TP	
D120	ODD132009AA	ISS132 DETECT, SW TP	
D121	ODD132009AA	ISS132 DETECT, SW TP	
D201	ODD132009AA	ISS132 DETECT, SW TP	
D203	ODD132009AA	ISS132 DETECT, SW TP	
D204	ODD132009AA	ISS132 DETECT, SW TP	
D205	ODD132009AA	ISS132 DETECT, SW TP	
D206	ODD132009AA	ISS132 DETECT, SW TP	
D209	ODD132009AA	ISS132 DETECT, SW TP	
D211	ODD132009AA	ISS132 DETECT, SW TP	
D212	ODD132009AA	ISS132 DETECT, SW TP	
D216	ODD132009AA	ISS132 DETECT, SW TP	
D217	ODD132009AA	ISS132 DETECT, SW TP	
D401	ODD132009AA	ISS132 DETECT, SW TP	
D402	ODD132009AA	ISS132 DETECT, SW TP	
D403	ODD132009AA	ISS132 DETECT, SW TP	
D404	ODD132009AA	ISS132 DETECT, SW TP	
D405	ODD132009AA	ISS132 DETECT, SW TP	

S	LOCANO.	PART NO.(GS)	SPECIFICATION
D406	ODD132009AA	1SS132 DETECT, SW TP	
D407	ODD132009AA	1SS132 DETECT, SW TP	
D408	ODD132009AA	1SS132 DETECT, SW TP	
D413	ODD132009AA	1SS132 DETECT, SW TP	
D414	ODD132009AA	1SS132 DETECT, SW TP	
D451	ODD132009AA	1SS132 DETECT, SW TP	
D585	ODD132009AA	1SS132 DETECT, SW TP	
D801	ODD132009AA	1SS132 DETECT, SW TP	
D803	ODD400209DA	1N4002, RECT, ROHM, TP	
ZENER DIODES			
ZD852	ODZ510009HA	MTZ5.1-B T-77 5.1V TP, ROHM/K	
ZD101	ODZ820009CC	MTZ8.2C-T-77 ROHM-K	
ZD102	ODZ270009CC	MTZ27D-T-77 ROHM-K	
ZD103	ODZ620009EA	MTZ6.2-B T-77 6.2V TP, ROHM/K	
ZD104	ODZ100009FA	MTZ10-C T-77 10V TP, ROHM/K	
ZD105	ODZ910009EE	MTZ9.1C-T-77 ROHM-K	
ZD201	ODZ510009HA	MTZ5.1-B T-77 5.1V TP, ROHM/K	
ZD401	ODZ560009FA	MTZ5.6-B T-77 5.6V TP, ROHM/K	
ZD801	ODZ750009DD	MTZ7.5C-T-77 ROHM-K	
ZD802	ODZ750009DD	MTZ7.5C-T-77 ROHM-K	
CAPACITORS			
C101	OCE3386H650	3300M SMS 25V M FM7.5	
C102	OCN1030F678	0.01M 16V M Y TA26	
C103	OQC4731N409	0.047U 100V J POLY TP	
C104	OQC4731N409	0.047U 100V J POLY TP	
C105	OQC4731N409	0.047U 100V J POLY TP	
C106	OQC4731N409	0.047U 100V J POLY TP	
C107	OCE2276F618	220M SMS 16V M FM5 TP(5)	
C108	OCE3386H650	3300M SMS 25V M FM7.5	
C109	OCE4776F630	470UF SMS 16V M FM5 BULK	
C110	OCE2276D618	220M SMS 10V M FM5 TP(5)	
C111	OCE1056K618	1.0M SMS 50V M FL TP(5)	
C112	OCE1076J618	100UF SMS 35V M FM(5) TP(5)	
C113	624T201J	ER-0511-100-16-M	
C114	OCE1076J618	100UF SMS 35V M FM(5) TP(5)	
C115	OCE1076J618	100UF SMS 35V M FM(5) TP(5)	
C116	OCE4776F630	470UF SMS 16V M FM5 BULK	
C117	OCE2266F618	22M SMS 16V M FM5 TP(5)	
C118	OCE2266F618	22M SMS 16V M FM5 TP(5)	
C119	OCX1000K408	10P 50V J SL TA26	
C120	OCX1000K408	10P 50V J SL TA26	
C121	OCE4766D618	47M SMS 10V M FL TP(5)	
C122	OCE4766D618	47M SMS 10V M FL TP(5)	
C123	OCE1066K618	10M SMS 50V M FM5 TP(5)	
C124	OCN5610K518	560P 50V K B TA26	
C125	OCN5610K518	560P 50V K B TA26	
C126	OCE2256K618	2.2M SMS 50V M FL TP(5)	
C127	OCE2256K618	2.2M SMS 50V M FL TF(5)	
C128	OCE2266F618	22M SMS 16V M FM5 TP(5)	
C129	OCE2266F618	22M SMS 16V M FM5 TP(5)	
C130	OCE3366H618	33M SMS 25V M FL TP(5)	
C131	OQC1041N409	0.1U 100V J POLY TP	
C132	OQC1041N409	0.1U 100V J POLY TP	
C133	OCX1030K515	0.01M 50V K B TS	
C134	OCX1030K515	0.01M 50V K B TS	

S	LOCANO.	PART NO.(GS)	SPECIFICATION

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S	LOCA.NO.	PART NO.(GS)	SPECIFICATION				
C404	OCN1030F678	0.01M 16V M Y TA26					
C405	OCN1030F678	0.01M 16V M Y TA26					
C406	OCN1820F668	1800P 16V M X TA26					
C407	OCN1820F668	1800P 16V M X TA26					
C408	OCE1066K618	10M SMS 50V M FM5 TP(5)					
C409	OCN4730K948	0.047UF 50V Z F TA26					
C410	OCN4730K948	0.047UF 50V Z F TA26					
C411	OCK1040K945	0.1UF 50V Z F TS					
C412	OCK4730K945	0.047U 50V Z F TS					
C413	OCE2256K618	2.2M SMS 50V M FL TP(5)					
C414	OCE1056K618	1.0M SMS 50V M FL TP(5)					
C416	OCE1066K618	10M SMS 50V M FM5 TP(5)					
C417	OCN1030F678	0.01M 16V M Y TA26					
C419	OCE1066K618	10M SMS 50V M FM5 TP(5)					
C420	OCE1056K618	1.0M SMS 50V M FL TP(5)					
C421	OCQ1031N409	0.01U 100V J POLY TP					
C422	OCQ1031N409	0.01U 100V J POLY TP					
C424	OCN2230H948	0.022UF 25V Z F TA26					
C426	OCN3310K518	330P 50V K B TA26					
C427	OCN8220F678	8200P 16V M Y TA26					
C428	OCE1056K618	1.0M SMS 50V M FL TP(5)					
C429	OCE2266F618	22M SMS 16V M FM5 TP(5)					
C430	OCE1066K618	10M SMS 50V M FM5 TP(5)					
C432	624T201I	ER-0511-100-10-M					
C433	OCN1030F678	0.01M 16V M Y TA26					
C451	624T201I	ER-0511-100-10-M					
C452	OCN4730K948	0.047UF 50V Z F TA26					
C453	OCE1056K618	1.0M SMS 50V M FL TP(5)					
C454	OCN2230H948	0.022UF 25V Z F TA26					
C455	OCN2230H948	0.022UF 25V Z F TA26					
C456	OCC0500K115	5P 50V D NPO TS					
C457	OCN4730K948	0.047UF 50V Z F TA26					
C458	OCC1010K405	100P 50V J SL TS					
C459	OCN4730K948	0.047UF 50V Z F TA26					
C460	OCN2230H948	0.022UF 25V Z F TA26					
C461	OCX3000K408	30P 50V J SL TA26					
C462	OCX3000K408	30P 50V J SL TA26					
C464	OCN1030F678	0.01M 16V M Y TA26					
C466	OCN1010K518	100P 50V K B TA26					
C466	OCN1020K518	1000P 50V K B TA26					
C493	OCE1056K618	1.0M SMS 50V M FL TP(5)					
C496	OCN2220F668	2200P 16V M X TA26					
C497	OCC5600K405	56P 50V J SL TP					
C501	OCK1020K945	1000P 50V Z F TS					
C502	OCE1066K618	10M SMS 50V M FM5 TP(5)					
C503	624T201H	ER-0511-47-16-M					
C505	624T201J	ER-0511-100-16-M					
C506	OCQ4721N409	0.0047U 100V J POLY TP					
C507	OCE1066K618	10M SMS 50V M FM5 TP(5)					
C508	OCQ2731N409	0.027U 100V J POLY TP					
C509	OCQ3921N409	0.0039U 100V J POLY TP					
C510	OCE3346K618	0.33M SMS 50V M FL TP(5)					
C518	OCC2210K405	220P 50V J SL TP					
C519	OCC1010K405	100P 50V J SL TS					
C520	OCQ1221N409	0.0012U 100V J POLY TP					
C521	OCE1066K618	10M SMS 50V M FM5 TP(5)					

S	LOCA.NO.	PART NO.(GS)	SPECIFICATION				
C522	OCC1010K405	100P 50V J SL TS					
C523	OCE3366F618	33M SMS 16V M FL TP(5)					
C525	OCE1066K618	10M SMS 50V M FM5 TP(5)					
C526	624T201J	ER-0511-100-16-M					
C527	OCE1066K618	10M SMS 50V M FM5 TP(5)					
C528	OCQ1221N409	0.0012U 100V J POLY TP					
C529	OCC1510K415	150P 50V J NPO TS					
C531	OCC2210K405	220P 50V J SL TP					
C551	OCK1020K945	1000P 50V Z F TS					
C552	OCE1066K618	10M SMS 50V M FM5 TP(5)					
C553	624T201H	ER-0511-47-16-M					
C556	OCQ4721N409	0.0047U 100V J POLY TP					
C557	OCE1066K618	10M SMS 50V M FM5 TP(5)					
C558	OCQ2731N409	0.027U 100V J POLY TP					
C559	OCQ3921N409	0.0039U 100V J POLY TP					
C568	OCC2210K405	220P 50V J SL TP					
C569	OCC1010K405	100P 50V J SL TS					
C570	OCQ1221N409	0.0012U 100V J POLY TP					
C571	OCE1066K618	10M SMS 50V M FM5 TP(5)					
C572	OCC1010K405	100P 50V J SL TS					
C573	OCE3366F618	33M SMS 16V M FL TP(5)					
C577	OCE1066K618	10M SMS 50V M FM5 TP(5)					
C578	OCQ1221N409	0.0012U 100V J POLY TP					
C579	OCC1510K415	150P 50V J NPO TS					
C581	OCC2210K405	220P 50V J SL TP					
C584	624T201J	ER-0511-100-16-M					
C585	624T201H	ER-0511-47-16-M					
C586	OCE3366F618	33M SMS 16V M FL TP(5)					
C587	OCQ1531N409	0.015U 100V J POLY TP					
C588	OCQ3331N409	0.033U 100V J POLY TP					
C589	624T201J	ER-0511-100-16-M					
C590	OCQ1521R449	1500PF 250V J PP TP					
C591	OCQ1031N409	0.01U 100V J POLY TP					
C592	OCK2230K945	0.022M 50V Z F TS					
C593	OCE2256K618	2.2M SMS 50V M FL TP(5)					
C594	624T201J	ER-0511-100-16-M					
C801	OCE4766F618	47M SMS 16V M FL TP(5)					
C802	OCN4720F668	4700P 16V M X TA26					
C804	OCN1040K948	0.1UF 50V Z F TA26					
C806	OCN1040K948	0.1UF 50V Z F TA26					
C807	OCQ2221N409	0.0022U 100V J POLY TP					
C808	OCQ4721N409	0.0047U 100V J POLY TP					
C809	OCN5610K518	560P 50V K B TA26					
C810	OCE3346K618	0.33M SMS 50V M FL TP(5)					
C812	OCE1066J618	10M SMS 35V M FL TP(5)					
C813	OCE4746K618	0.47M SMS 50V M FL TP(5)					
C814	OCX4700K408	47P 50V J SL TA26					
C816	OCE4746K618	0.47M SMS 50V M FL TP(5)					
C817	OCN1030F678	0.01M 16V M Y TA26					
C818	OCQ3331N409	0.033U 100V J POLY TP					
C819	OCE1076F618	100M SMS 16V M FM5 TP(5)					
C820	OCE1076F618	100M SMS 16V M FM5 TP(5)					
C821	OCE107						

S	LOCA.NO.	PART NO.(GS)	SPECIFICATION		
R217	ORN1201F408	1.2K 1/6W 1 TA26			
R218	ORN1501F408	1.5K 1/6W 1 TA26			
R219	ORN1801F408	1.8K 1/6W 1 TA26			
R220	ORN2701F408	2.70K 1/6W 1% TA26			
R221	ORN3301F408	3.3K 1/6W 1 TA26			
R222	ORN4701F408	4.7K 1/6W 1 TA26			
R223	ORN6801F408	6.8K 1/6W 1 TA26			
R224	ORN1002F408	10K 1/6W 1 TA26			
R225	ORN3302F408	33K 1/6W 1% TA26			
R226	ORN3302F408	33K 1/6W 1% TA26			
R227	ORN3302F408	33K 1/6W 1% TA26			
R228	ORN3303F408	330K 1/6W 1% TA26			
R229	ORN1203F408	120K 1/6W 1% TA26			
R230	ORN6800F408	680 1/6W 1 TA26			
R231	ORN6800F408	680 1/6W 1 TA26			
R232	ORN8200F408	820 1/6W 1 TA26			
R233	ORN1201F408	1.2K 1/6W 1 TA26			
R234	ORN1501F408	1.5K 1/6W 1 TA26			
R235	ORN1801F408	1.8K 1/6W 1 TA26			
R236	ORN2701F408	2.70K 1/6W 1% TA26			
R237	ORN3301F408	3.3K 1/6W 1 TA26			
R238	ORN4701F408	4.7K 1/6W 1 TA26			
R239	ORN6801F408	6.8K 1/6W 1 TA26			
R240	ORN1002F408	10K 1/6W 1 TA26			
R241	ORD1001F608	1.0K 1/6W 5 TA26			
R242	ORD1001F608	1.0K 1/6W 5 TA26			
R243	ORD1001F608	1.0K 1/6W 5 TA26			
R244	ORD1001F608	1.0K 1/6W 5 TA26			
R245	ORD1001F608	1.0K 1/6W 5 TA26			
R246	ORD1001G608	1.0K 1/4W 5 TA26			
R247	ORD1001G608	1.0K 1/4W 5 TA26			
R248	ORD1001G608	1.0K 1/4W 5 TA26			
R249	ORD1001G608	1.0K 1/4W 5 TA26			
R250	ORD1001G608	1.0K 1/4W 5 TA26			
R251	ORD1001F608	1.0K 1/6W 5 TA26			
R252	ORD1001G608	1.0K 1/4W 5 TA26			
R253	ORD1001G608	1.0K 1/4W 5 TA26			
R254	ORD1001G608	1.0K 1/4W 5 TA26			
R255	ORD1001F608	1.0K 1/6W 5 TA26			
R256	ORD1001G608	1.0K 1/4W 5 TA26			
R257	ORD1001F608	1.0K 1/6W 5 TA26			
R258	ORD1001G608	1.0K 1/4W 5 TA26			
R259	ORD1001G608	1.0K 1/4W 5 TA26			
R260	ORD1001F608	1.0K 1/6W 5 TA26			
R269	ORD4701G608	4.7K 1/4W 5 TA26			
R283	ORD4701F608	4.7K 1/6W 5 TA26			
R284	ORD4701F608	4.7K 1/6W 5 TA26			
R287	ORD1001F608	1.0K 1/6W 5 TA26			
R288	ORD1001F608	1.0K 1/6W 5 TA26			
R289	ORD1001F608	1.0K 1/6W 5 TA26			
R290	ORD1001F608	1.0K 1/6W 5 TA26			
R291	ORD1001F608	1.0K 1/6W 5 TA26			
R292	ORD1001F608	1.0K 1/6W 5 TA26			
R293	ORD1001F608	1.0K 1/6W 5 TA26			
R294	ORD1001F608	1.0K 1/6W 5 TA26			
R295	ORD1001F608	1.0K 1/6W 5 TA26			

S	LOCA.NO.	PART NO.(GS)	SPECIFICATION		
R296	ORD1001F608	1.0K 1/6W 5 TA26			
R297	ORD1001F608	1.0K 1/6W 5 TA26			
R298	ORD1001G608	1.0K 1/4W 5 TA26			
R299	ORD1001G608	1.0K 1/4W 5 TA26			
R300	ORD1001G608	1.0K 1/4W 5 TA26			
R301	ORD1001G608	1.0K 1/4W 5 TA26			
R308	ORD1001G608	1.0K 1/4W 5 TA26			
R309	ORD1001G608	1.0K 1/4W 5 TA26			
R310	ORD1001G608	1.0K 1/4W 5 TA26			
R311	ORD1001G608	1.0K 1/4W 5 TA26			
R312	ORD1001G608	1.0K 1/4W 5 TA26			
R313	ORD1001G608	1.0K 1/4W 5 TA26			
R321	ORD2703F608	270K 1/6W 5 TA26			
R322	ORD2703F608	270K 1/6W 5 TA26			
R323	ORD1003F608	100K 1/6W 5 TA26			
R324	ORD1000F608	100 1/6W 5 TA26			
R401	ORD0182F608	18 1/6W 5 TA26			
R402	ORD1000F608	100 1/6W 5 TA26			
R403	ORD5600F608	560 1/6W 5 TA26			
R404	ORD3901F608	3.9K 1/6W 5 TA26			
R405	ORD1000F608	100 1/6W 5 TA26			
R406	ORD3300F608	330 1/6W 5 TA26			
R408	ORD1200F608	120 1/6W 5 TA26			
R409	ORD4702F608	47K 1/6W 5 TA26			
R410	ORD1503F608	150K 1/6W 5 TA26			
R411	ORD6801G608	6.8K 1/4W 5 TA26			
R412	ORD2201F608	2.2K 1/6W 5 TA26			
R413	ORD1002F608	10K 1/6W 5 TA26			
R414	ORD2700F608	270 1/6W 5 TA26			
R415	ORD3301F608	3.3K 1/6W 5 TA26			
R417	ORD0332G608	33 1/4W 5 TA26			
R418	ORD1002F608	10K 1/6W 5 TA26			
R419	ORD1002F608	10K 1/6W 5 TA26			
R424	ORD2702F608	27K 1/6W 5 TA26			
R426	ORD2201F608	2.2K 1/6W 5 TA26			
R429	ORD2702F608	27K 1/6W 5 TA26			
R450	ORD3301F608	3.3K 1/6W 5 TA26			
R451	ORD1002F608	10K 1/6W 5 TA26			
R452	ORD1001F608	1.0K 1/6W 5 TA26			
R453	ORD1001F608	1.0K 1/6W 5 TA26			
R454	ORD1001F608	1.0K 1/6W 5 TA26			
R455	ORD1001F608	1.0K 1/6W 5 TA26			
R456	ORD2201F608	2.2K 1/6W 5 TA26			
R457	ORD3301F608	3.3K 1/6W 5 TA26			
R458	ORD1002F608	10K 1/6W 5 TA26			
R459	ORD8202F608	82K 1/6W 5 TA26			
R460	ORD1001G608	1.0K 1/4W 5 TA26			
R461	ORD1001G608	1.0K 1/4W 5 TA26			
R462	ORD1001G608	1.0K 1/4W 5 TA26			
R463	ORD1001G608	1.0K 1/4W 5 TA26			
R464	ORD1002F608	10K 1/6W 5 TA26			
R467	ORD4702F608	47K 1/6W 5 TA26			
R468	ORD4701F608	4.7K 1/6W 5 TA26			
R470	ORD3301F608	3.3K 1/6W 5 TA26			
R471	ORD1501F608	1.5K 1/6W 5 TA26			
R472	ORD1501F608	1.5K 1/6W 5 TA26			
R473	ORD3301F608	3.3K 1/6W 5 TA26			

S	LOCA.NO.	PART NO.(GS)	SPECIFICATION		
R474	ORD1002F608	10K 1/6W 5 TA26			
R492	ORD4701F608	4.7K 1/6W 5 TA26			
R493	ORD1002F608	10K 1/6W 5 TA26			
R494	ORD1002F608	10K 1/6W 5 TA26			
R501	ORD1003F608	100K 1/6W 5 TA26			
R502	ORD1000F608	100 1/6W 5 TA26			

S	LOCANO.	PART NO.(GS)	SPECIFICATION		
R857	ORD3301F608	3.3K 1/6W 5	TA26		
R859	ORD1002F608	10K 1/6W 5	TA26		
R866	ORD4700F608	470 1/6W 5	TA26		
R867	ORD4700F608	470 1/6W 5	TA26		
R868	ORD5601F608	5.6K 1/6W 5	TA26		
R869	ORD5601F608	5.6K 1/6W 5	TA26		
R870	ORD5601F608	5.6K 1/6W 5	TA26		
R871	ORD1202F608	12K 1/6W 5	TA26		
R872	ORD1004F608	1.0M 1/6W 5	TA26		
R873	ORD2702F608	27K 1/6W 5	TA26		
R874	ORD2702F608	27K 1/6W 5	TA26		
R875	ORD5601F608	5.6K 1/6W 5	TA26		
R876	ORD5601F608	5.6K 1/6W 5	TA26		
R877	ORD5601F608	5.6K 1/6W 5	TA26		
R878	ORD2702F608	27K 1/6W 5	TA26		
R879	ORD1004F608	1.0M 1/6W 5	TA26		
R880	ORD1202F608	12K 1/6W 5	TA26		
R881	ORD2702F608	27K 1/6W 5	TA26		
R882	ORD1001F608	1.0K 1/6W 5	TA26		
R883	ORD1001F608	1.0K 1/6W 5	TA26		
R884	ORD1001F608	1.0K 1/6W 5	TA26		
R885	ORD1001F608	1.0K 1/6W 5	TA26		
R888	ORD1502F608	15K 1/6W 5	TA26		
R889	ORD6801F608	6.8K 1/6W 5	TA26		
R891	ORD1002F608	10K 1/6W 5	TA26		
R892	ORD1002F608	10K 1/6W 5	TA26		
R893	ORD1202F608	12K 1/6W 5	TA26		
R894	ORD6801F608	6.8K 1/6W 5	TA26		
R895	ORD1802F608	18K 1/6W 5	TA26		
R896	ORD1002F608	10K 1/6W 5	TA26		
R897	ORD1002F608	10K 1/6W 5	TA26		

COILS

L401	634-700G	RBW07VB-K5008 LW RF OSC TOKO
L402	634-700H	RBW07VB-K5007 MW RF OSC TOKO
L403	644-040A	PCFMA-157, MW IF TOKO
L404	637N010A	RC-875 (0732-000-017) 393K
L408	OLA0102K018	10M K 2.3X3.4 L5 TP
L501	637-008A	R-9124X,33MH(CAP-CORE)
L551	637-008A	R-9124X,33MH(CAP-CORE)
L580	634-610C	OSC TAPE 10(4.7MH)

DISPLAY

DSP201	659-250N	BJ 180GK, DIGITRON, FUTABA
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FILTERS & CRYSTALS

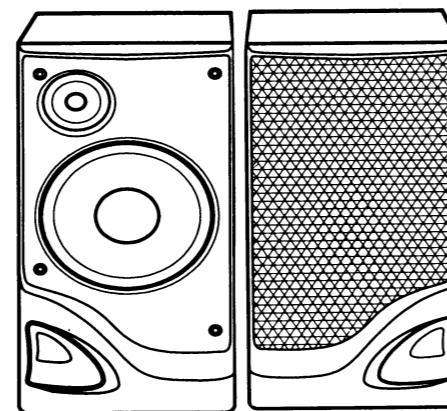
CF401	616-010B	SFE10.7MS3GH(RD) 180K (S)
CF402	616-010B	SFE10.7MS3GH(RD) 180K (S)
X201	617-602F	32.768KHZ KYOCERA (S)
X202	616-020P	CSA6.00MGU MURATA (S)
X401	616-021L	CDA10.7MG46-A, MURATA (S)

S	AL	LOCA.NO.	PART NO.(GS)	DESCRIPTION	SPECIFICATION	REMARKS
MISCELLANEOUS PARTS						
▲		OFT5000B513	FUSE TIME LAG	0.5A 250V 5.2X20 G SMK		
		3875S-5202K	MANUAL, OPERATION ASSY	FFH-212(STUHRINGER)		
		3890S-C055D	BOX	(F-212L BG2 STUHLINGEF)		
		632-218F	COIL ANTENNA	COIL ANT LOOP MW(W/O LABEL,LUG		
		6710S-A030A	REMOTE CONTROLLER	FFH-212L(G/S) DONG-DO		

S	AL	LOCA.NO.	PART NO.(GS)	DESCRIPTION	SPECIFICATION	REMARKS
▲			681-005A	CORD POWER	681-004F+B172 KDK	
			6871S-24SAA	PWB ASSY	FFH-212 CD MAIN PWB ASSY	
			6871S-24VAC	PWB ASSY	FFH-212L MAIN PWB ASSY	
			6871SA24VAC	PWB ASSY	FFH-212L AMP ASSY	
			6871SB24VAC	PWB ASSY	FFH-212L TUNER ASSY	
			6871SC24VAC	PWB ASSY	FFH-212L DECK ASSY	
			6871SD24VAC	PWB ASSY	FFH-212L FRONT ASSY	
			6871SE24VAC	PWB ASSY	FFH-212L POWER ASSY	
			6871SF24VAC	PWB ASSY	FFH-212L DECK KEY ASSY	

SPEAKER SYSTEM

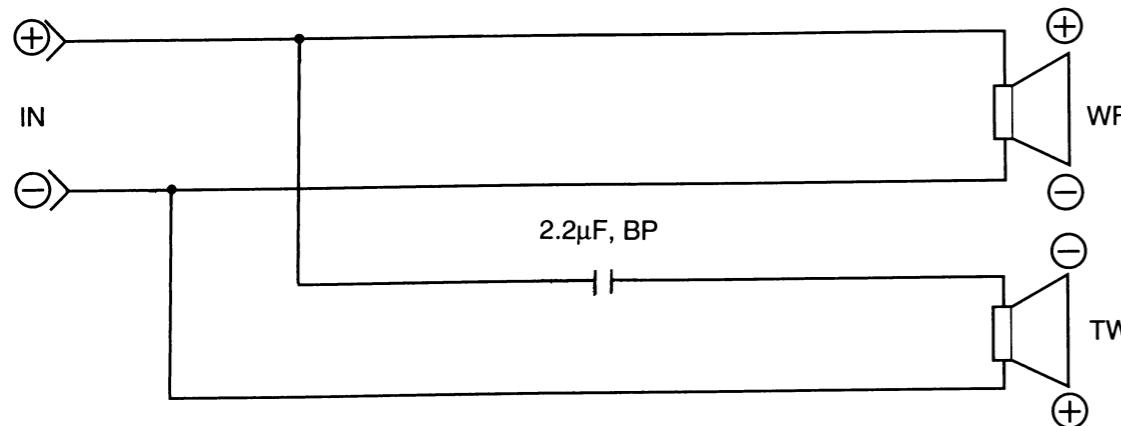
MODEL : FE-212E



SPECIFICATIONS

- TYPE : BASS REFLEX 2 WAY 2 SPEAKER SYSTEM
- SPEAKER UNITS : WOOFER 120mm(5"), TWEETER 60mm(2 1/2")
- IMPEDANCE : 6Ω
- FREQUENCY RANGE : 70Hz~20,000Hz
- S. P. L. : 84dB/W(1m)
- RATED INPUT POWER : 20W
- MAX. INPUT POWER : 40W
- DIMENSION [NET] : 153(W) X 240(H) X 229(D)mm
- [SHIPPED] : 380(W) X 298(H) X 305(D)mm
- WEIGHT [NET] : 2.2Kg
- [SHIPPED] : 4.5Kg (ONE PAIR WITH PACKING)

SCHEMATIC DIAGRAM



EXPLODED VIEW/PARTS LIST

NO.	DESCRIPTION	PART NO.	Q'TY
1	JERSEY NET ASS'Y	224M349A (LEFT)	1
		224M349B (RIGHT)	1
2	SCREW(3.5 X16)	353M050C	4
		258M090A (LEFT)	1
3	FRONT PANEL ASS'Y	258M090B (RIGHT)	1
		353M056A	6
5	TWEETER	541-264A	1
6	WOOFER	541-231C	1
7	CORD ASS'Y	564M033K	1
8	CABINET ASS'Y	211M243A (LEFT)	1
		211M243B (RIGHT)	1

