4. Terminal Functions

Pin No.	Symbol	I/O	Function
1	FOK	I	Focus OK input pin. Used for SENS output and servo auto sequencer.
2	FSW	--	Non connection
3	MON	O	Output for spindle motor ON / OFF control.
4	MDP	O	Output for spindle servo control.
5	MDS	O	Output for spindle servo control (Non connection).
6	LOCK	O	This terminal is "H" when the GFS signal sampled at 460Hz is "H". It turns "L" when the GFS signal turns out "L" 8 or more times in succession.
7	DFBK	O	Bit clock for digital filter is output when digital filter is on, L with digital filter off.
8, 9	—	--	Non connection
10	TEST	I	Test pin (Normally at 0V)
11	PDO	O	Output of charge pump for analog EFM PLL (Non connection).
12	Vss	--	GND
13	DFDL	O	When digital filter is on. 4Fs : Serial data of left and right channel is output in time division. (2's complements, MSB first) 8Fs : Serial data of left channel is output. (2's complements, MSB first) 'L' with digital filter off.
14	DFDR	O	When digital filter is on. 4Fs : Word clock is output (f = 8Fs) 8Fs : Serial data of right channel is output. (2's complements, MSB first) 'L' with digital filter off.
15	DFLR	O	L/R clock from digital filter is output. 'L' with digital filter off.
16	VPCO	--	Non connection
17	VCKI	I	Clock input from external VCO for vari-pitch control.fc = 16.9344MHz. (connected to GND)
18	FILO	O	Output from filter for masterPLL (Slave = Digital PLL)
19	FILI	I	Input to filter for master PLL.
20	PCO	O	Output of charge pump for master PLL.
21	AVss	--	Analog GND
22	CLTV	I	VCO control voltage for master PLL is input.
23	AV_{DD}	--	Analog power supply
24	RF	I	EFM signal input
25, 26, 28	TEST2, 3, 4	I	TEST pin (Connected to GND)
27	ASYO	O	EFM full-swing output
29	NC	--	Non connection
30	PSSL	I	Input used to switch the audio data output mode."L" for serial output,"H" for parallel output.
31, 32	—	--	Non connection
33	V_{DD}	--	Power supply
34~51	—	--	Non connection
52	VSS	--	GND
53	XTAI	I	Oscillation terminal
54	XTAO	O	Oscillation terminal
55	XTSL	I	Xtal selection input pin. "L" for 16,344MHz Xtal, "H" for 33.8688 MHz Xtal. (connected to GND)
56~58	—	--	Non connection
59	MD2	I	Digital-Out ON/OFF control. "H" for ON, "L" for OFF. (connected to GND)
60~62	—	--	Non connection
63	SCOR	O	Turns "H" when subcode Sync S0 or S1 is detected.
64	—	--	Non connection
65	EXCK	I	Clock input to output SBSO.
66	SQSO	O	Outputs 80-bit Sub Q and 16-bit PCM peak-level data.
67	SQCK	I	Clock input to output SQSO.
68	MUTE	I	"H" for muting, "L" for release.
69	SENS	O	SENS output to CPU.
70	XRST	I	System reset. "L" for resetting.
71	DATA	I	Inputs serial data from CPU.
72	XLAT	I	Latches serial data input from CPU at falling edge.
73	V_{DD}	--	Power supply(+ 5V)
74	CLOK	I	Inputs serial data transfer clock from CPU.
75	SEIN	I	Inputs SENSE from SSP.
76	CNIN	I	Inputs track jump count signal.
77	DATO	O	Outputs serial data to SSP.
78	XLTO	O	Outputs latch signal for serial data output from terminal 77.
79	CLKO	O	Outputs serial data transfer clock to SSP.
80	MIRR	I	Inputs mirror signal to be used in the mode of auto sequence when jumping 128 or more tracks.

■ CXA1372S (IC703) : RF SIGNAL PROCESSING SERVO AMPLIFIER

1.Outline

The CXA1372S is a bipolar IC developed for RF signal processing (focus OK, mirror, defect detection, EFM comparator) and servo control.

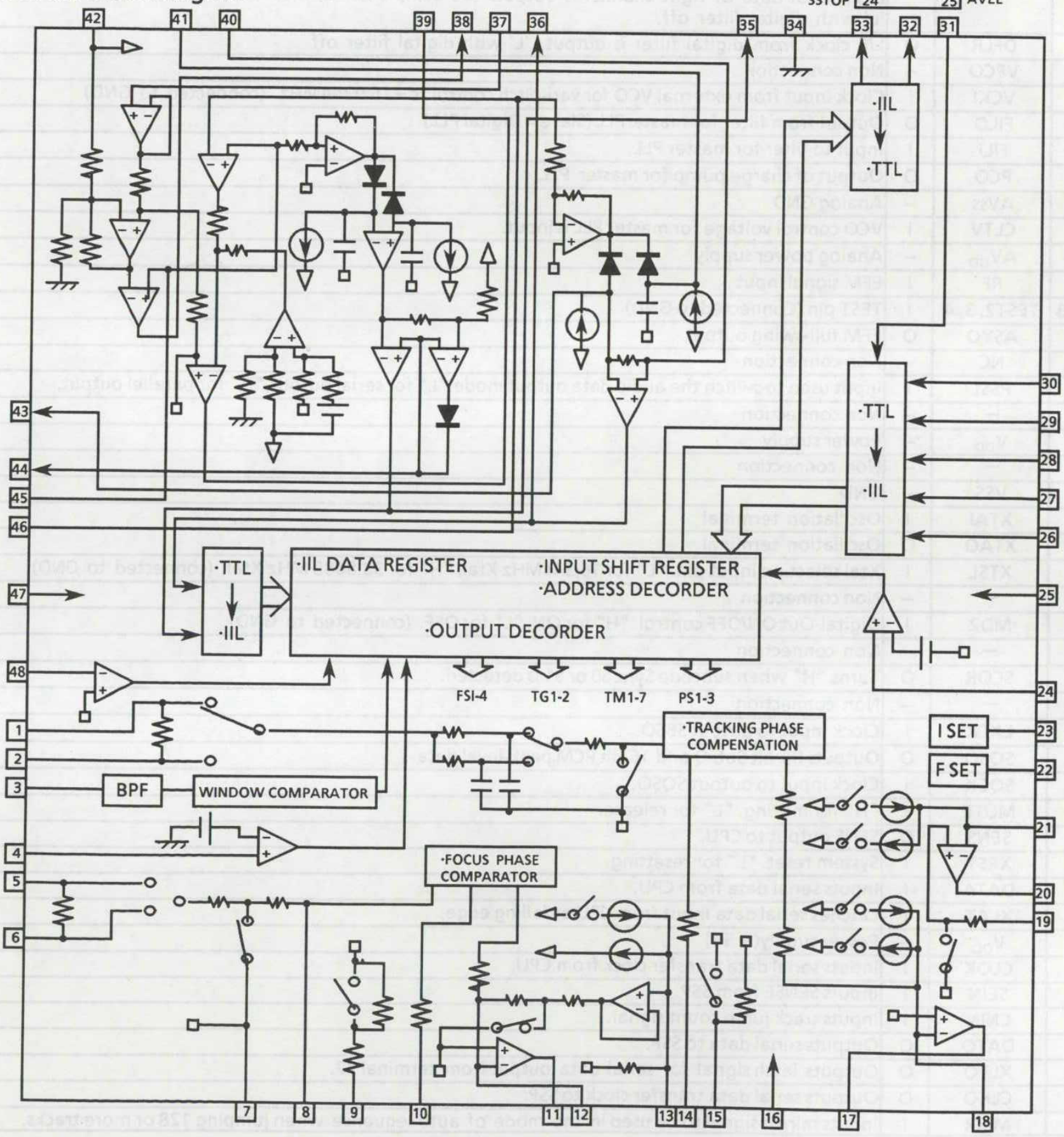
2.Functions

- Auto asymmetry control
- Focus OK detection circuit
- Mirror detection circuit
- Defects detection, counter measures circuit
- EFM comparator
- Focus servo control
- Tracking servo control
- Feed servo control

3.Terminal Layout

TE	1	48	TZC
TDFCT	2	47	DVEE
ATSC	3	46	RFO
FZC	4	45	RFI
FE	5	44	CP
FDFCT	6	43	CB
VC	7	42	DVCC
FGD	8	41	CC2
FS3	9	40	CC1
FLB	10	39	FOK
FEO	11	38	EFM
FE –	12	37	ASY
SRCH	13	36	DFCT
TGU	14	35	MIRR
TG2	15	34	DGND
AVCC	16	33	SENS
TAO	17	32	C.OUT
TA –	18	31	XRST
SL +	19	30	DATA
SLO	20	29	XLT
SL –	21	28	CLK
FSET	22	27	LOCK
ISET	23	26	DIRC
SSTOP	24	25	AVEE

4.Internal Block Diagram



5.Terminal Functions

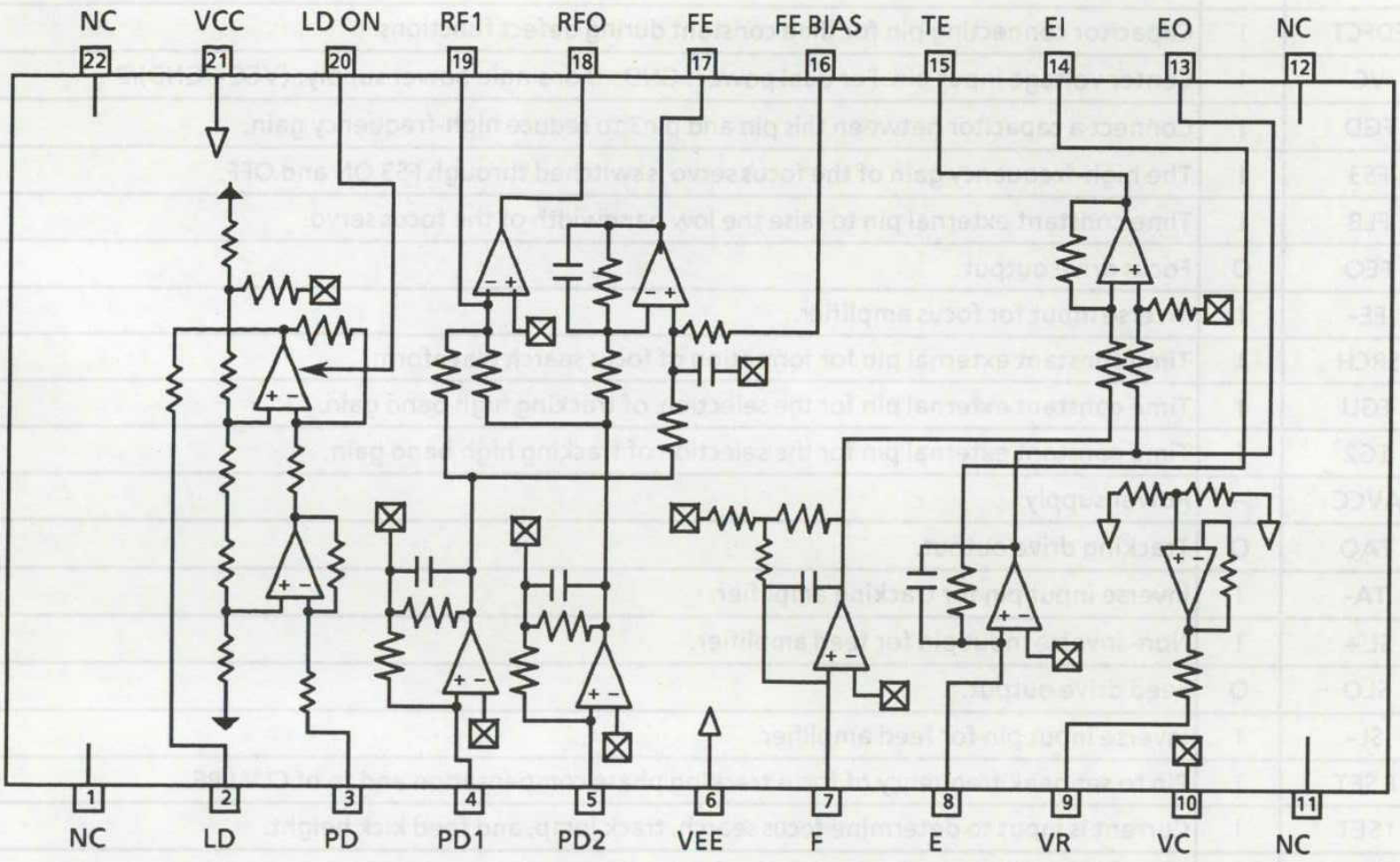
Pin No	Symbol	I/O	Function
1	TE	I	Input pin of tracking error amplifier.
2	TDFCT	I	Capacitor connecting pin for time constant during defects.
3	ATSC	I	Window comparator input pin for ATSC detection.
4	FZC	I	Pin for focus zero-cross comparator input.
5	FE	I	Input pin of focus error.
6	FDFCT	I	Capacitor connecting pin for time constant during defect functions.
7	VC	I	Center voltage input pin. For dual power: GND For single power supply: (VCC + GND)/2
8	FGD	I	Connect a capacitor between this pin and pin3 to reduce high-frequency gain.
9	FS3	I	The high-frequency gain of the focus servo is switched through FS3 ON and OFF.
10	FLB	I	Time constant external pin to raise the low bandwidth of the focus servo.
11	FEO	O	Focus drive output.
12	FE-	I	Inverse input for focus amplifier.
13	SRCH	I	Time constant external pin for formation of focus search waveform.
14	TGU	I	Time constant external pin for the selection of tracking high band gain.
15	TG2	I	Time constant external pin for the selection of tracking high band gain.
16	AVCC	--	Power supply
17	TAO	O	Tracking drive output.
18	TA-	I	Inverse input pin for tracking amplifier.
19	SL +	I	Non- inverse input pin for feed amplifier.
20	SLO	O	Feed drive output.
21	SL-	I	Inverse input pin for feed amplifier.
22	F SET	I	Pin to set peak frequency of focus tracking phase compensation and fo of CLV LPF.
23	I SET	I	Current is input to determine focus search, track jump, and feed kick height.
24	S STOP	I	Limit SW ON/OFF signal detection pin for disc inner periphery detection.
25	AVEE	--	– 5V
26	DIRC	I	Pin for one-track jump. Contains 47kΩpull-up resistor.
27	LOCK	I	At "L" feed runaway prevention circuit operate. Contains a 47kΩpull-up resistor.
28	CLK	I	Serial data transfer clock input from CPU.
29	XLT	I	Latch input from CPU.
30	DATA	I	Serial data input from CPU.
31	XRST	I	Reset input pin, reset at "L".
32	C.OUT	O	Track number count signal output.
33	SENS	O	Outputs FZC, AS, TZC and S STOP through command from CPU.
34	DGND	--	GND
35	MIRR	O	MIRR comparator output pin.
36	DFCT	O	Output pin of DEFECT comparator.
37	ASY	I	Input pin of auto asymmetry control.
38	EFM	O	Output pin of EFM comparator.
39	FOK	O	Output pin of FOK comparator.
40	CC1	I	Output pin of DEFECT bottom hold.
41	CC2	O	Input pin for the capacitance coupled output of DEFECT bottom hold.
42	DVCC	--	– 5V
43	CB	I	Connection pin of DEFECT bottom hold capacitor.
44	CP	I	Connecting pin of MIRR hold condenser. Non-inverted input pin of MIRR comparator.
45	RFI	I	Input pin with coupling capacitor where RF summing amplifier output is connected.
46	RFO	O	Output pin of RF summing amplifier and check point of eye pattern.
47	DVEE	--	– 5V
48	TZC	I	Input pin of tracking zero-cross comparator.

■ CXA1571S(IC702) : RF AMP FOR COMPACT DISC

1.Outline

The CXA1571S IC for compact disc 3-point method optical pickup output has following functions.
·RF amplifier · Focus error amp · Tracking error · APC circuit

2. Internal Block Diagram

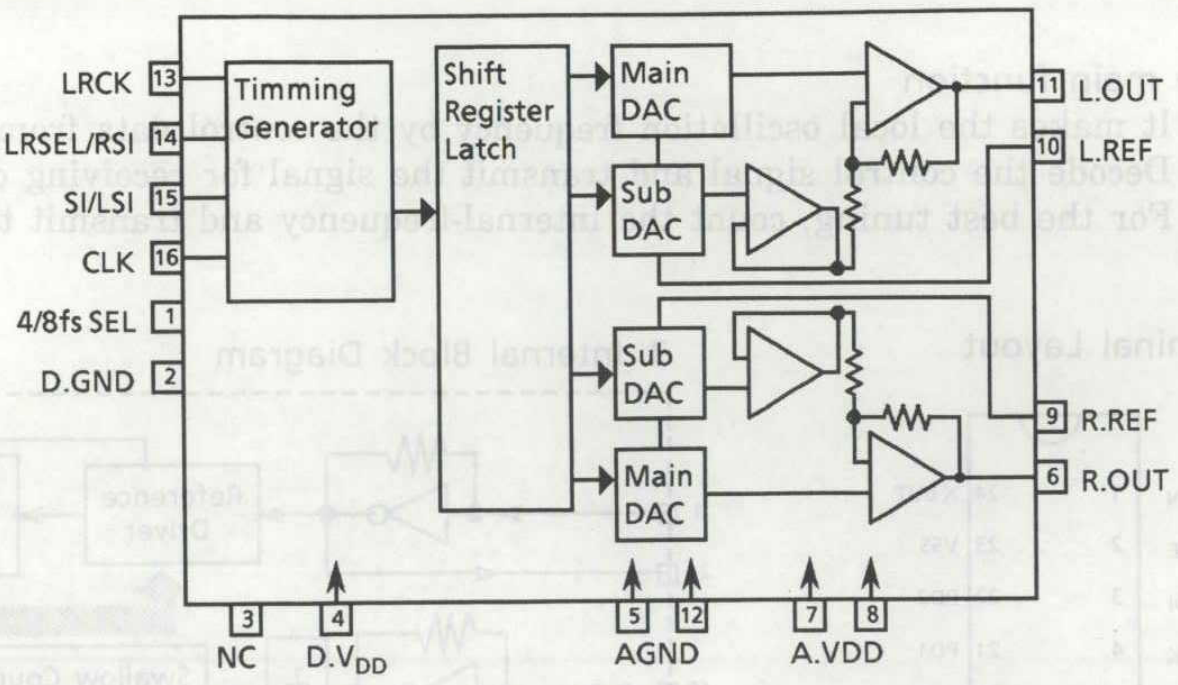


3. Terminal Functions

Pin No.	Symbol	I/O	Function
2	LD	O	APC amp output pin.
3	PD	I	APC amp input pin.
4 5	PD1 PD2	I I	RF I-V amp inverted input pins; they are connected to the A + C and B + D pins of the photodiode and receive current input.
7 8	F-IN E-IN	I I	F and E I-V amp inverted input pin; they are connected to Photodiodes F and E and receive current input.
9	VR	O	(VCC + VEE) / 2 DC voltage output pin.
10	VC	I	VC intermediate voltage input pin; when dual ± 5V power supplies are used, this pin is connected to GND; for a single + 5V power supply, it is connected to the VR pin.
13	EO	O	Monitor output pin for I-V amp E.
14	EI	I	Gain adjustment pin for I-V amp E.
15	TE	O	Tracking error amp output pin.
16	FE-BIAS	I	Bias adjustment pin for the mon-inverted side of the focus error amp.
17	FE	O	Focus error amp output pin.
18	RF O	O	RF amp output pin.
19	RF I	I	RF inverted side input pin; the resister connected between this pin and the RFO pin determines the gain of theRF amp.
20	LD-ON	I	This pin switches the APC amp on / off: on for VCC, off for ground.

■ UPD6376CX(IC751) : D / A Converter

1. Internal Block Diagram



2. Terminal Functions

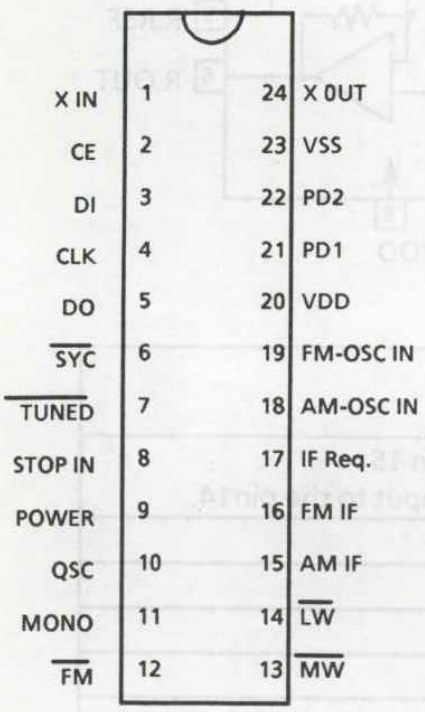
Pin No.	Symbol	I/O	Function
1	4/8FS SEL	I	"L" or "OPEN" : Left channel and Right channel data is input to the pin 15 "H" : Left channel data is input to the pin 15. Right channel data is input to the pin14.
2	D.GND	--	Ground terminal for the logic section.
3	NC	--	Non connection
4	D.VDD	--	Power supply for the logic section.
5	A.GND	--	Analog ground
6	R.OUT	O	Output terminal for the Right channel signal.
7	A.VDD	--	Power supply for the Analog section.
8	A.VDD	--	Power supply for the Analog section.
9	R.REF	I	Reference voltage terminal
10	L.REF	I	Reference voltage terminal
11	L.OUT	O	Output terminal for the Left channel signal.
12	A.GND	--	Analog ground
13	LRCK/WDCK	I	Pin 1 = "L" or "OPEN" : Input terminal of the signal which indicates which channel is input. Pin 1 = "H" : Word clock input for the input data.
14	LRSEL/RSI	I	Pin 1 = "L" or "OPEN" : When this terminal is "H" , input "L" of the LRCK indicates that Left channel is input to the pin 15. When this terminal is "L" , input "H" of the LRCK indicates that Left channel is input to the pin 15. Pin 1 = "H" : Input terminal for the Right channel signal.
15	SI/LSI	I	Pin 1 = "L"or OPEN : Input terminal for the Right and Left channels Pin 1 = "H": Serial data input terminal for the Left channel signal.
16	CLK	I	Clock input for reading the serial data.

■ LC7218 (IC102) : PLL Synthesizer

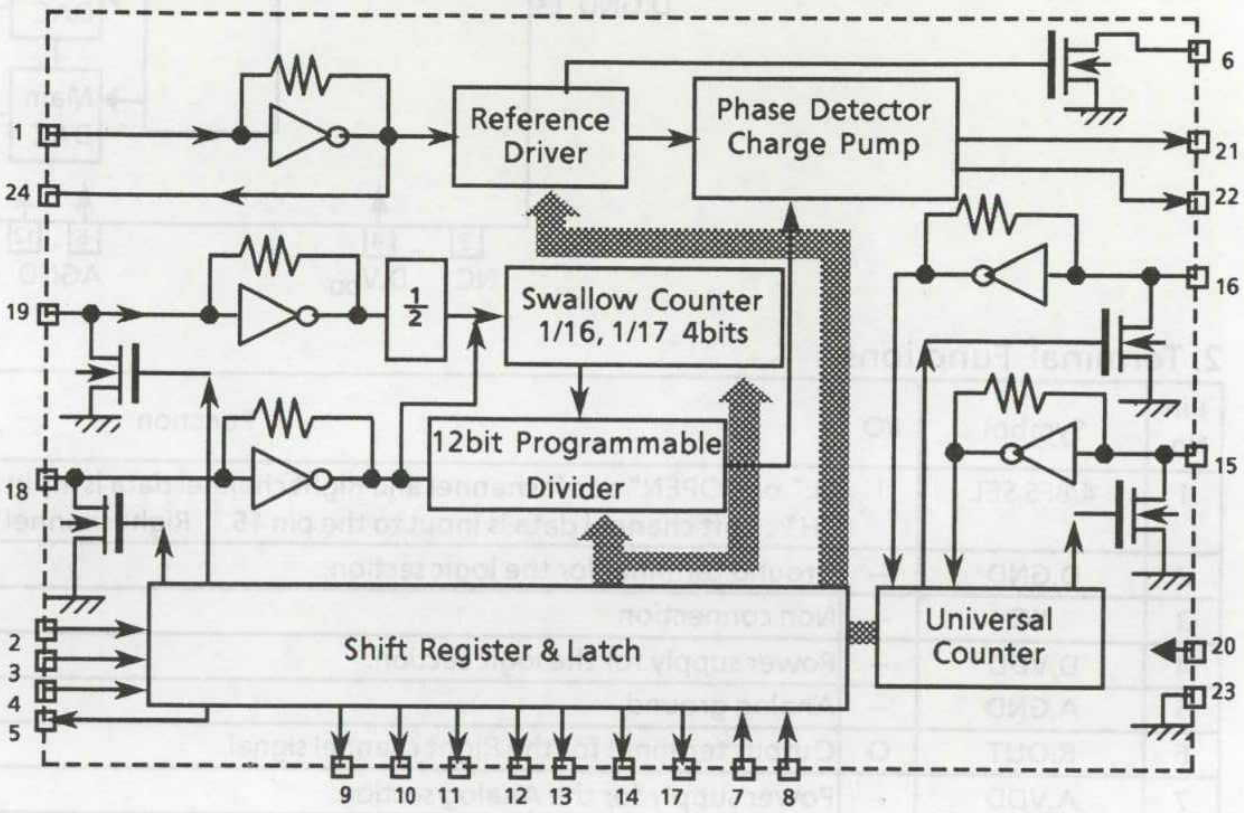
1. The main function

(1) It makes the local oscillation frequency by the control data from IC801.
(2) Decode the control signal and transmit the signal for receiving conditions.
(3) For the best tuning, count the internal-frequency and transmit the data to IC801.

2. Terminal Layout



3. Internal Block Diagram



4. Terminal Functions

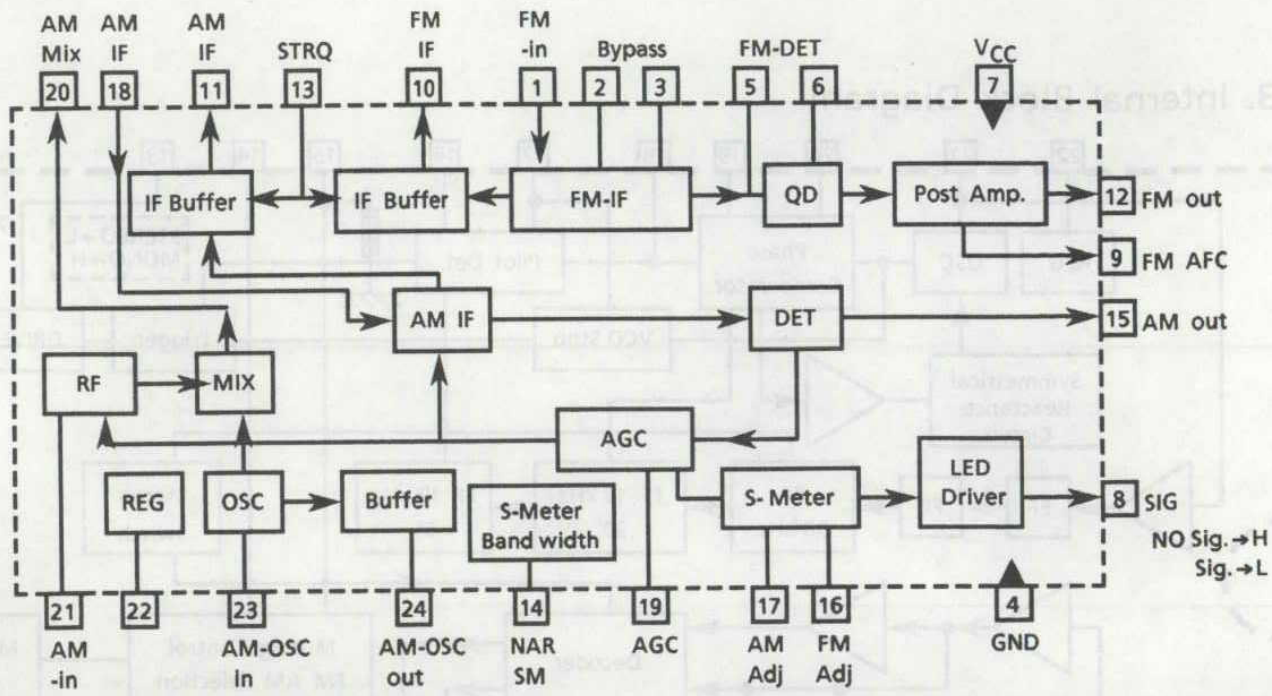
Pin No.	Symbol	I/O	Function
1,24	X in , X out	I/O	Crystal oscillator (7.2MHz).
2	CE	I	Fix the chip enable to "H" when inputting (DI) and outputting (DO) the serial data.
3	DI	I	Receive the control data from the controller (IC801).
4	CLK	I	This clock is used to synchronize data when transmitting the data of DI and DO.
5	DO	O	Transmit the data from LC7218 to the controller which is synchronized with CL.
6	SYC	--	Not used.
7	TUNED	I	Receive the tuned signal
8	STOP IN	--	Connected to ground .
9	POWER	O	Not used.
10	QSC	O	ON mode with " H " and OFF mode with " L ". (Not used)
11	MONO	O	It is "H" on FM-monaural, "L" on FM-Stereo.
12	FM	O	It is ''L'' on MW mode.
13	MW	O	It is ''L'' on FM mode.
14	LW	O	It is ''L'' on LW mode.
15	AM-IF	I	Universal counter input for AM-IF (Not used)
16	FM-IF	I	Universal counter input for FM-IF (Not used)
17	IF Req.	O	Output the "IF-signal request" when the pin-7 (TUNED) goes to "H". (Not used)
18	AM OSC IN	I	Input the local oscillator signal of AM.
19	FM OSC IN	I	Input the local oscillator signal of FM.
20	VDD	--	This is a terminal of power supply.
21	PD1	O	PLL charge pump output : When the local oscillator signal frequency is higher than the reference frequency high level signals will output. When it is lower than the reference frequency, low level signals will output. When it is same as reference frequency signals, it will be floating.
22	PD2	O	Not used.
23	VSS	--	Power supply. (Connected to ground)

■ LA1266A (IC104) : FM AM IF AMP & detector

1. The main function descriptions
   (1) Amplify and detect of FM intermodulation frequencies.
   (2) It has local oscillator and mixer for AM, and amplify the AM-IF signal.

2. Terminal Layout

3. Block Diagram



4. Pin Function Description

Pin No.	Symbol	I/O	Functions and Operations
1	FM in	I	This is an input terminal of FM IF Signal.
2,3	Bypass	--	Bypass of FM IF Amp.
4	GND	--	This is the device ground terminal.
5,6	FM DET	--	FM detect transformer.
7	V_{CC}	--	This is the power supply terminal.
8	SIG	O	Whe the set is tunning ,this terminal becomes "L".
9	FM AFC	O	This is an output terminal of voltage for FM - AFC(Auto frequency control).
10	FM IF	O	When the signal of IF REQ of IC102(LC7218) appear, the signal of FM IF output.
11	AM IF	O	When the signal of IF REQ of IC102(LC7218) appear, the signal of AM IF output.
12	FM out	O	FM detection output.
13	STRQ	I	The IF-signals come out from pin10 (FM-IF) or pin11 (AM-IF) while this terminal going to "High".
14	NAR SM	--	Control the Band-width of signal meter.
15	AM out	O	AM detection output.
16	FM Adj	--	For adjust the stop level (or mute level) of FM.
17	AM Adj	--	For adjust the stop level (or mute level) of AM.
18	AM-IF	I	Input of AM IF Signal.
19	AM-AGC	I	This is an AGC voltage Input terminal for AM.
20	AM-MIX	O	This is an output terminal for AM mixer.
21	AM-IN	I	This is an input terminal for AM RF Signal.
22	V.REF	--	Register value between pin9 and pin22 desides the frequency width of the input signal.
23	AM-OSC	--	This is a terminal of AM Local oscillation circuit.
24	AM-OSC out	O	AM Local Oscillation Signal output.

■ LA3401(IC105) : FM MPX Decorder

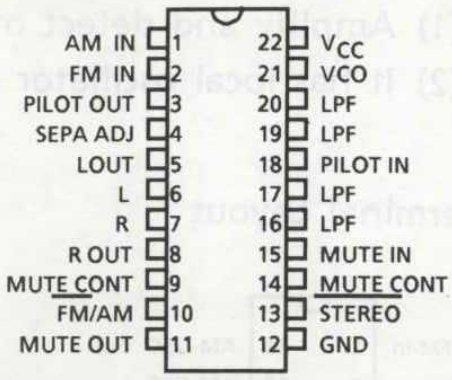
1. The main function

(1) Decord the FM Multiplex Signal (Stereo signal).

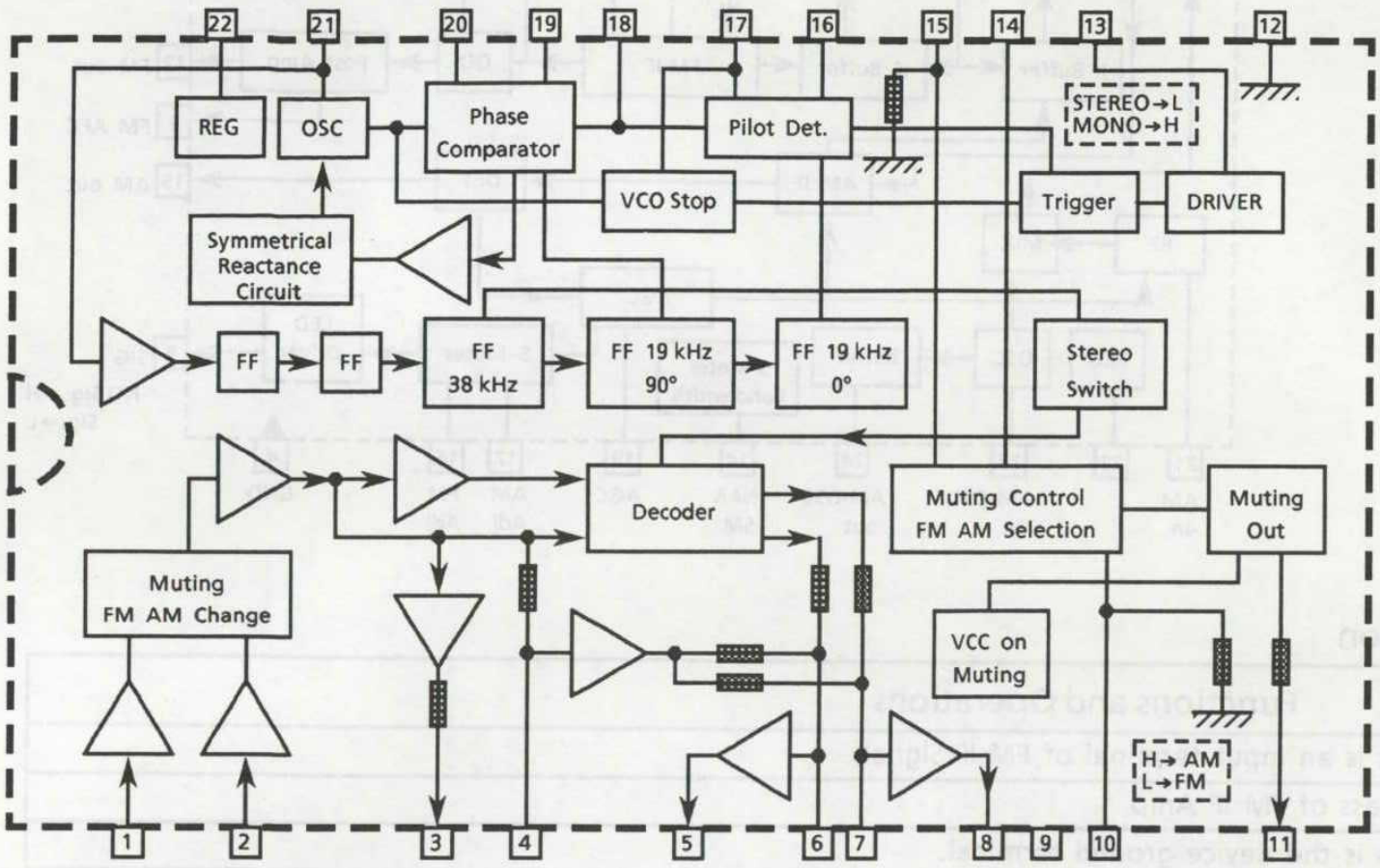
(2) When receiving FM Stereo Signal, it outputs the signal for indicator.

(3) AM/FM Audio Amplifier.

2. Terminal Layout



3. Internal Block Diagram

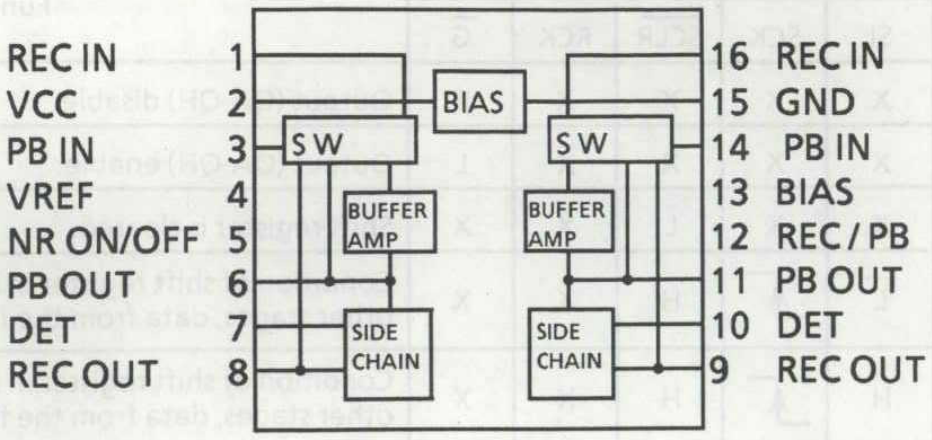


4. Terminal Functions

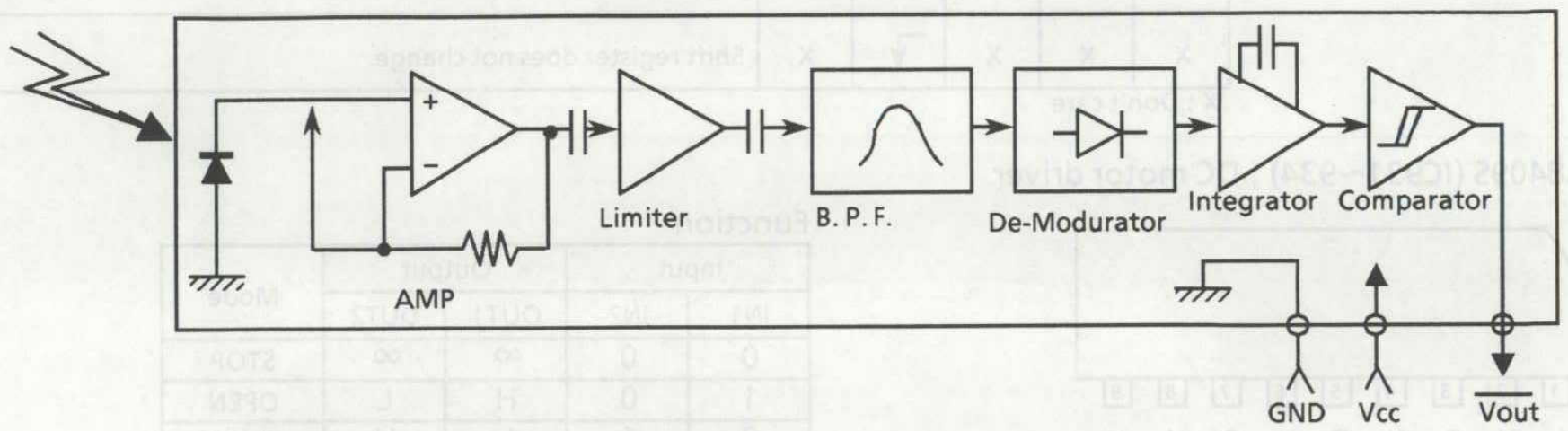
Pin No.	Symbol	I/O	Function
1	AM IN	I	This is an input terminal for AM detection signal.
2	FM IN	I	This is an input terminal for FM detection signal.
3	PILOT OUT	O	Output of MPX pilot signal (Connected to Pin18 via a capacitor).
4	SEPA. ADJ.	--	Separation adjustment.
5	L. OUT	O	Left channel signal output.
6	L	O	Input terminal of the Left channel Post AMP.
7	R	O	Input terminal of the right channel Post AMP.
8	R OUT	O	Right channel signal output
9	MUTE CONT	--	The mute time is controlled by the connected capacitor when turning the power switch on.
10	FM/AM	I	Change over the FM/AM input. "H" : AM, "L" : FM
11	MUTE OUT	---	Not use
12	GND	--	Ground terminal.
13	STEREO	O	Stereo indicator output. Stereo : "L", Mono : "H"
14	MUTE CONT	--	The mute time is controlled by the connected capacitor when changing over the FM/AM .
15	MUTE IN	I	Mute signal input. "H" : Mute on, "L" : Mute off.
16	LPF	--	Low pass filter of pilot detector.
17	LPF	--	While this terminal goes to "H", the VCO stop.
18	PILOT IN	I	PLL input.
19	LPF	--	Low-pass filter of PLL.
20	LPF	--	Low-pass filter of PLL.
21	VCO	I	Voltage controlled oscillator terminal.
22	V_{CC}	--	Power supply.

Internal Block Diagram of Other ICs

■ HA12136A (IC381) : Noise Reduction Amplifier



■ SPS-420-1 (IC804) : Remote control Module IC

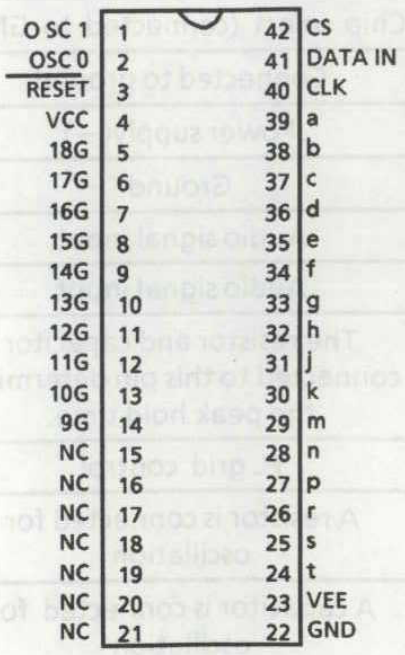


■ LB1639-CV (IC489) : Motor Driver

IN 1 (pin1)	IN 2 (pin4)	OUT 1 (pin8)	OUT 2 (pin5)	MOTOR
H	L	H	L	CLOCKWISE
L	H	L	H	COUNTER-CLOCKWISE
H	H	OFF	OFF	WAITING
L	L	OFF	OFF	WAITING

■ MSC7112-01SS (IC 802): FL Driver IC

1. Terminal Layout

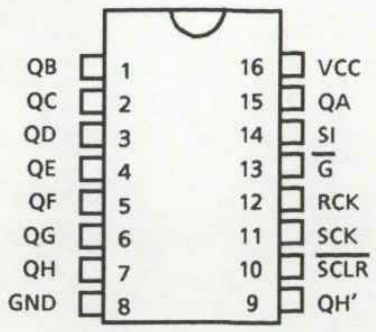


2. Terminal Functions

Pin No.	Symbol	I/O	Function
1 2	OCS 1 OSC 0	I O	Oscillation circuit is composed by connecting the resistor and capacitor.
3	RESET	I	Reset input for internal logic at turning the power on.
4	V_{DD}	--	Power supply
5~14	18G~9G	O	FL grid drive signal
15~21	NC	--	Non connection
22	V_{SS}	--	GND
23	V_{EE}	--	– 27V
24~39	t~a	O	FL anode drive signal
40	CLK	I	System clock for shift register
41	DATA IN	I	Indication data input
42	CS	I	Chip select

■ TC74HC595AP(IC909) : 8 Bit Shift Register

1. Terminal Layout

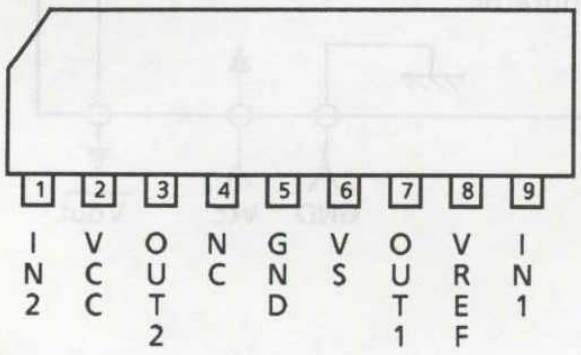


2. Function Table

Inputs					Functions
SI	SCK	$\overline{SCLR}$	RCK	$\overline{G}$	
X	X	X	X	H	Output (QA-QH) disable.
X	X	X	X	L	Output (QA-QH) enable.
X	X	L	X	X	Shift register is cleared.
L	↑	H	X	X	Condition of shift register in initial stage is "L". In the other stages, data from the former stage is stored.
H	↑	H	X	X	Condition of shift register in initial stage is "H". In the other stages, data from the former stage is stored.
X	↓	H	X	X	Shift register does not change.
X	X	X	↑	X	Shift register data is stored in the storage register.
X	X	X	↓	X	Shift register does not change.

X : Don't care

■ TA8409S (IC931~934) : DC motor driver



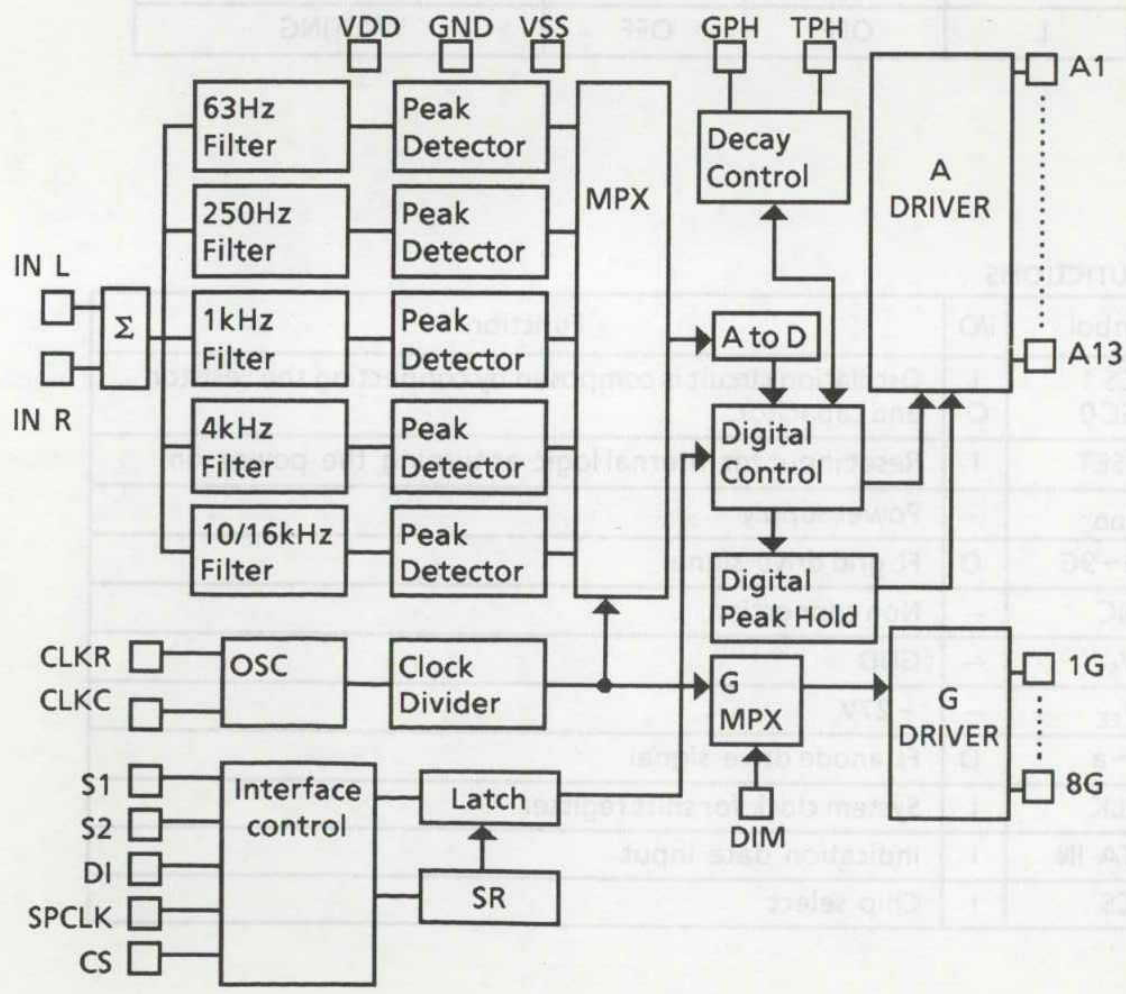
Function

Input		Output		Mode
IN1	IN2	OUT1	OUT2	
0	0	∞	∞	STOP
1	0	H	L	OPEN
0	1	L	H	CLOSE
1	1	L	L	BRAKE

∞ : High impedance

■ XR1095CP (IC803) : Display Driver

1. Internal Block Diagram



2. Terminal Functions

Pin No.	Symbol	Function
1~5, 9~16	T1~T13	FL anode control
17	CS	Chip select
18	SPCLK	Clock for data transmission
19	DI	Serial data input
20,21	S1, S2	Chip select (connected to GND)
22	DIM	Connected to ground
23	VSS	Power supply(−)
24	GND	Ground
25	R IN	Audio signal input
26	L IN	Audio signal input
27 28	GPH TPH	The resistor and capacitor connected to this pin determine the peak hold time.
31~38	1G~8G	FL grid control
40	CLKR	A resistor is connected for oscillation
41	CLKC	A capacitor is connected for oscillation
42	VDD	Power supply (+)

Internal Connection of the FL Display Tube

■ ELU0001-142

TERMINAL CONNECTION

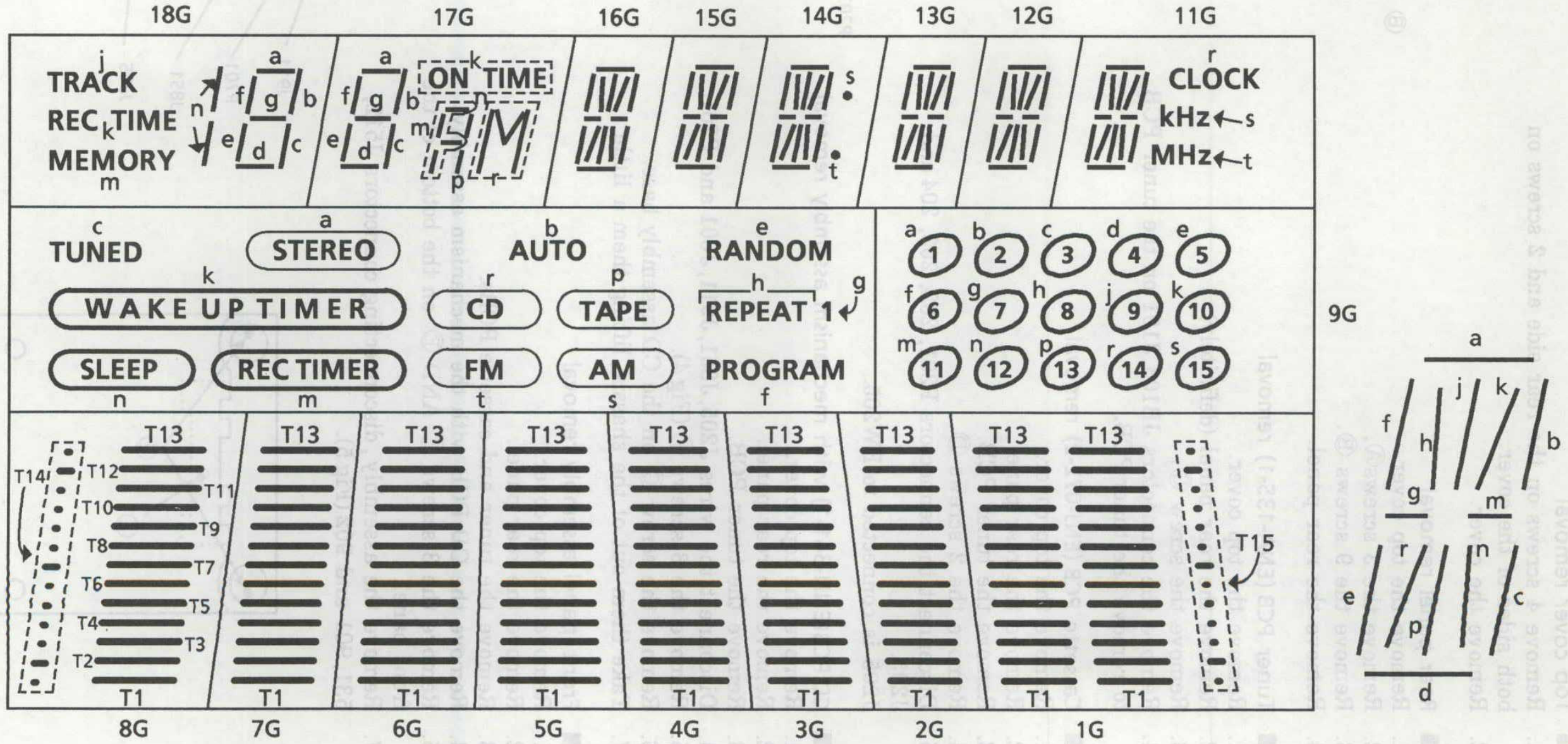
(UPPER)

TERMINAL NO.	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
ELECTRODE	F2	F2	F2	NP	P a	P b	NP	P c	P d	P e	P f	P g	P h	P j	P k	P m	P n	P p	P r	P s	P t	18G	17G	16G	15G	14G	13G	12G	11G	10G	9G	F2	F2	F2

(LOWER)

TERMINAL NO.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ELECTRODE	P T1	P T2	P T3	P T4	P T5	P T6	P T7	P T8	P T9	P T10	P T11	P T12	P T13	NP	F2	F2	F2	F1	F1	F1	NP	P T14	8G	7G	6G	5G	4G	3G	2G	1G	NP	NP	NP	P T15

Notes F : Filament G : Grid P : Anode NP : No PIN



Disassembly Procedures

■ Top cover removal
1. Remove 4 screws on the rear side and 2 screws on both sides of the cover.
2. Remove the cover.

■ Rear panel removal
1. Remove the top cover.
2. Remove the 3 screws Ⓐ.
3. Remove the 9 screws Ⓑ.
4. Remove the rear panel.

■ Tuner PCB (ENA-135-1) removal
1. Remove the top cover.
2. Remove the rear panel (definitely).
3. Remove the screw Ⓒ.
4. Remove the connectors JB103, J101 on the tuner PCB to remove the tuner PCB.

■ Cassette PCB (ENJ-072-2) removal
1. Remove the top cover.
2. Remove the rear panel.
3. Remove the tuner PCB.
4. Remove the 2 screws Ⓓ.
5. Disconnect the connectors P201, 202, 203, 204 and J205.
   J205 is connected to FW205.

■ CD PCB(ENN-341-1) with mechanism assembly removal.
1. Remove the top cover.
2. Remove the rear panel.
3. Remove the tuner PCB.
4. Disconnect the wires J205, J851, J911, J601 and P701.
5. Remove the 3 screws Ⓕ (Fig 4).
6. Remove the screw Ⓖ on the CD assembly base.
7. Take them out of the shassis, lifting them a little.

■ Front panel assembly removal
1. Remove the top cover.
2. Remove the rear panel.
3. Remove the tuner and cassette PCBs.
4. Remove the CD PCB with the mechanism assembly.
5. Remove the 3 screws Ⓔ AND Ⓔ' on the bottom of the front panel.
7. Remove the assembly, disconnecting connectors J512, 531, 901 and 902 (Fig 5).

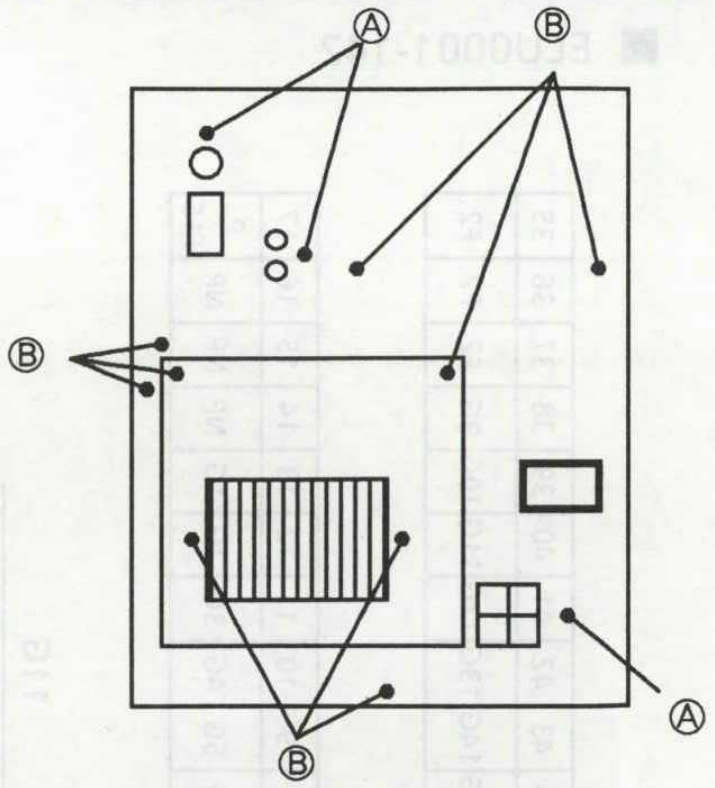


Fig 1 Rear view

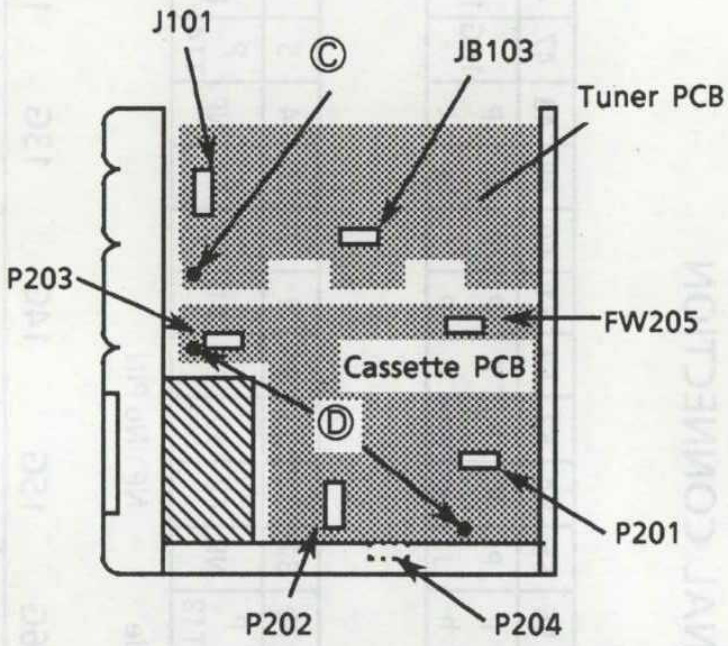


Fig 2 Right side view

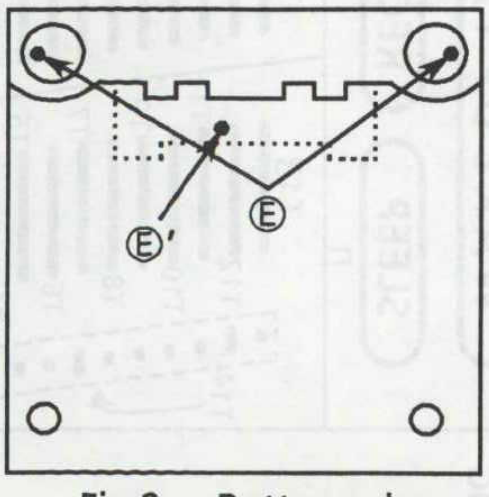


Fig 3 Bottom view

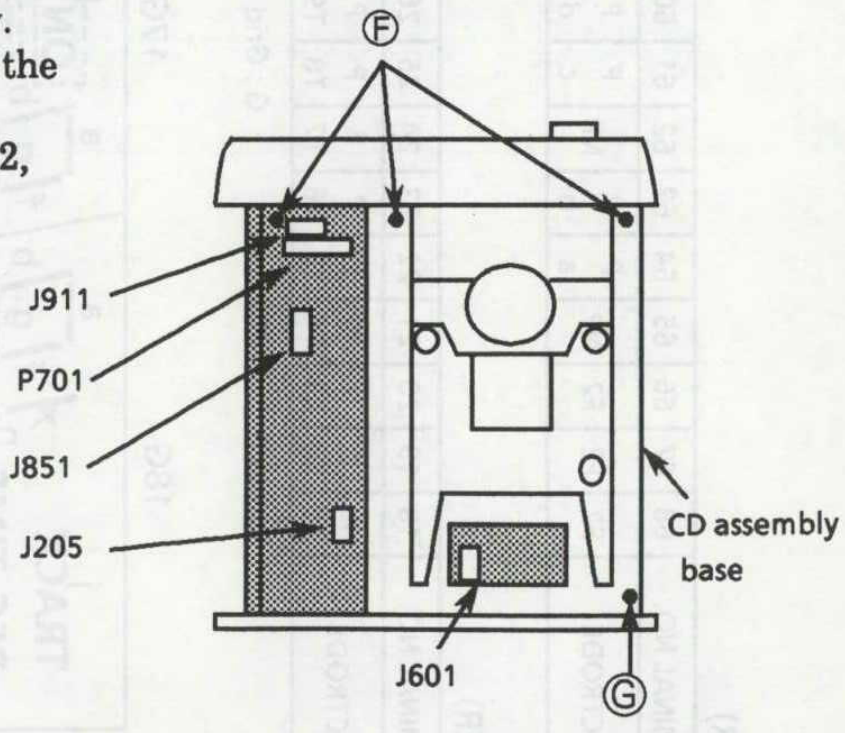


Fig 4 Top view

■ CD mechanism assembly removal

1. Remove the cd PCB with mechanism assembly.
2. Disconnect the connectors P602, P603.
3. Remove the 3 screws Ⓗ.
4. Disconnect the connector P601 under the mechanism, lifting the mechanism up.
5. Turn the screw Ⓘ located under the mechanism to remove the tray out of the loading mechanism.
6. Remove the screw Ⓙ to rmove the tray.
7. Remove the 2 screws Ⓚ to remove the clamp assembly.
8. Remove the screw Ⓛ located under the tray to take the cd mechanism assembly out.

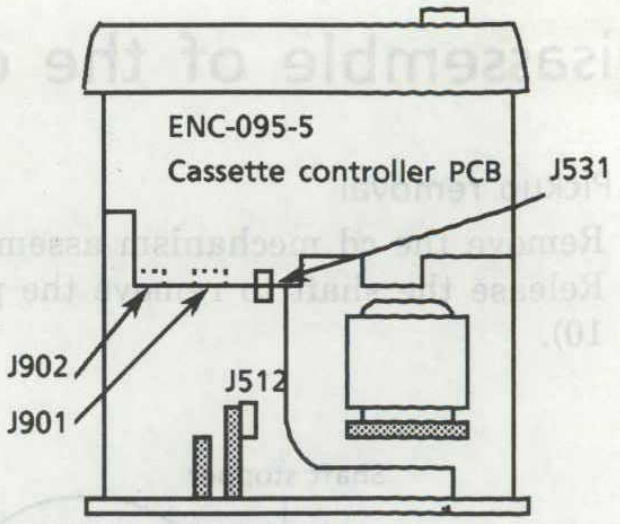


Fig 5

■ Cassette mechanism with the PCB (ENC-095-5) removal

1. Remove the top cover.
2. Remove the front panel assembly.
3. Disconnect the connectors P981, JB851 and J991.
4. Remove the 8 screws Ⓜ and Ⓝ.
5. Open the cassette doors to remove the mechanism.

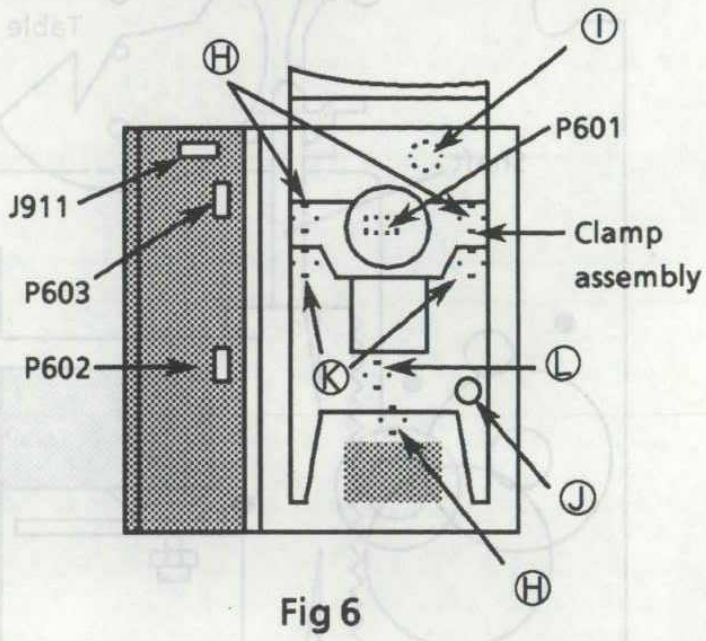


Fig 6

■ Cassette holder removal

1. Remove the front panel assembly.
2. Remove the cassette mechanism assembly.
3. Remove the spring hooked on the holder (Fig 7).
4. Remove the damper (Fig 9).
5. Remove the holder.

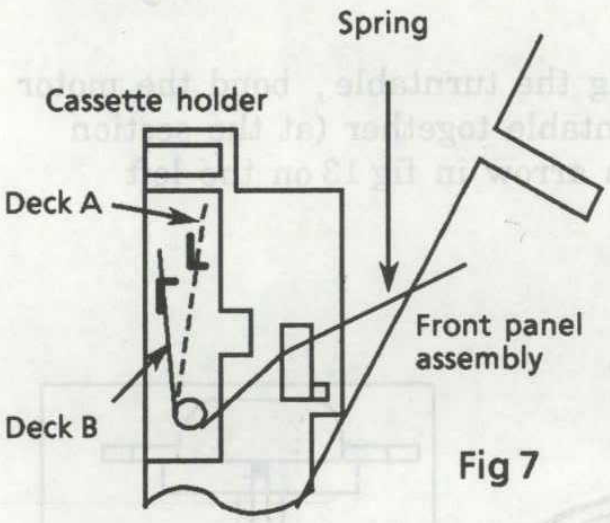
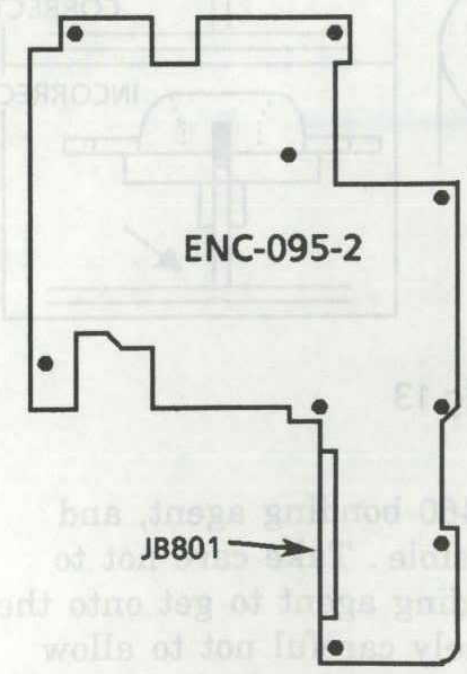


Fig 7



JA801 and JB801 are connected without wire.

Fig 8

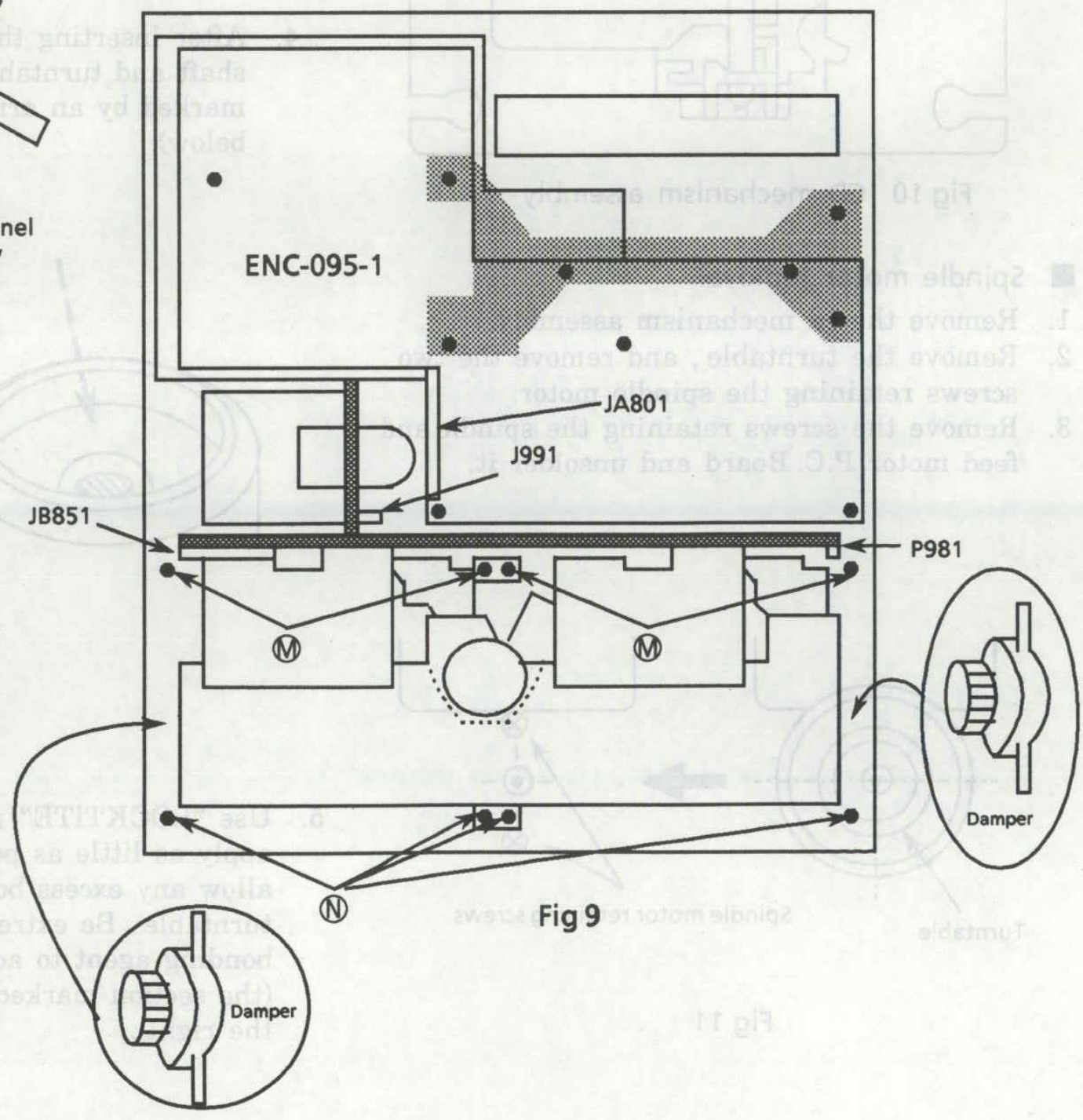


Fig 9

Disassemble of the cd mechanism assembly

■ Pickup removal

1. Remove the cd mechanism assembly.
2. Release the shaft to remove the pickup (Fig 10).

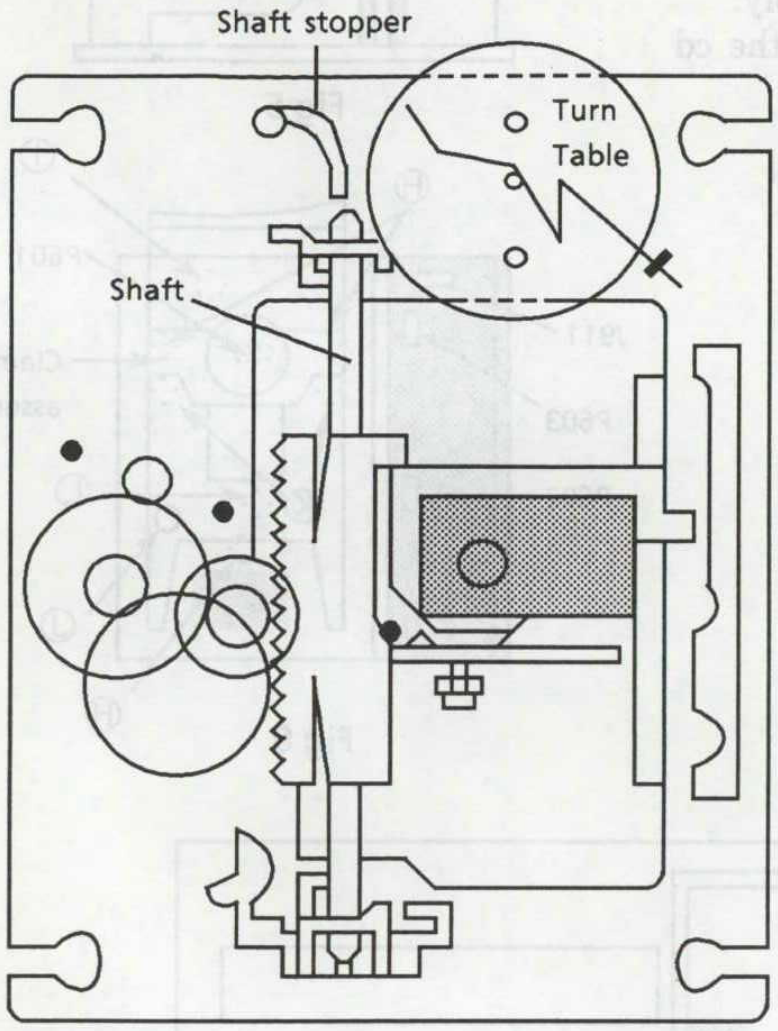


Fig 10 CD mechanism assembly

■ Spindle motor removal

1. Remove the cd mechanism assembly.
2. Remove the turntable, and remove the two screws retaining the spindle motor.
3. Remove the screws retaining the spindle and feed motor P.C. Board and unsolder it.

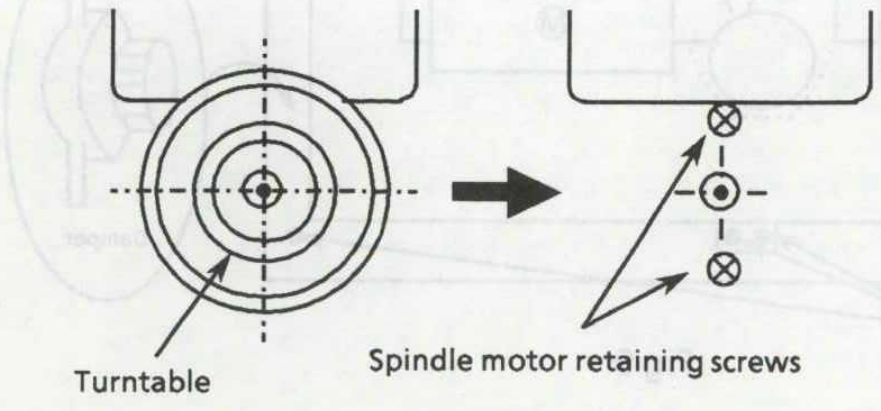


Fig 11

■ Spindle motor installation

1. Tighten the 2 screws to the same torque.
2. Fasten the spindle and feed motor P.C. board with the screw and solder.
3. Install the turntable. When installing, press straight down at the center of the turntable until the distance from the surface of the mechanism base to the turntable is exactly 19.4±0.1mm.

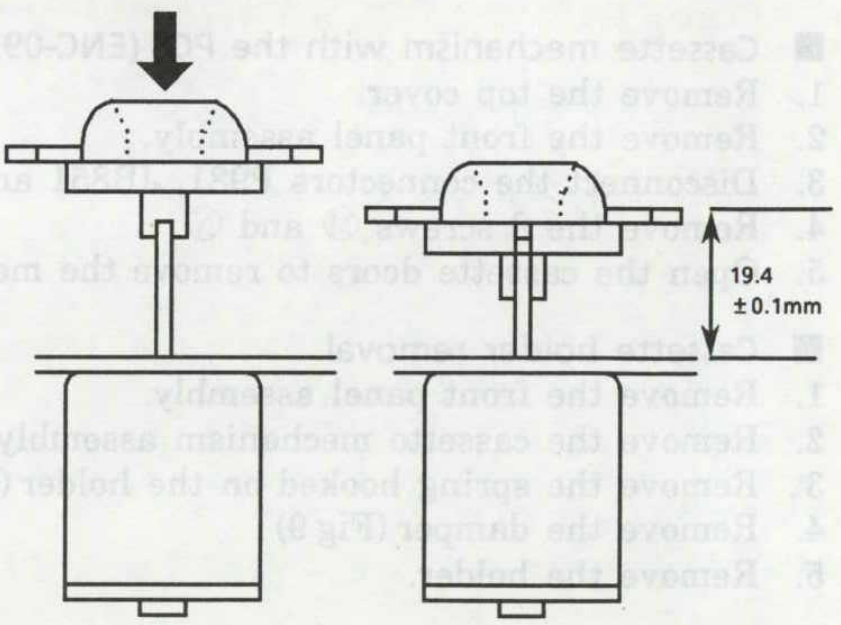


Fig 12

4. After inserting the turntable, bond the motor shaft and turntable together (at the section marked by an arrow in fig 13 on the left below).

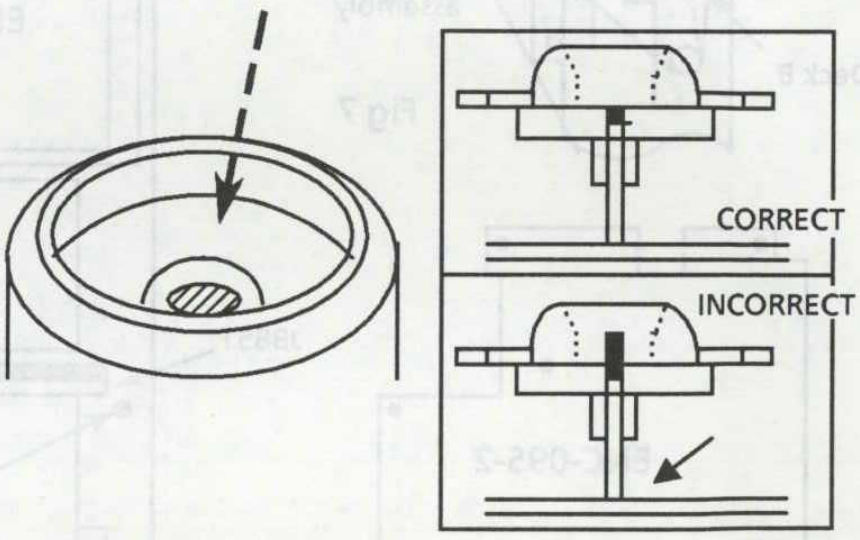


Fig 13

5. Use "LOCKTITE" #460 bonding agent, and apply as little as possible. Take care not to allow any excess bonding agent to get onto the turntable. Be extremely careful not to allow bonding agent to adhere to the motor bearings (the section marked by an allow in fig 13 on the right).

Disassemble of the cassette mechanism

■ Cassette controller PCB (ENC-095-5) removal

1. Remove the cassette mechanism assembly with the PCB.
2. Release the 8 hooks to remove the controller PCB (Fig 14).

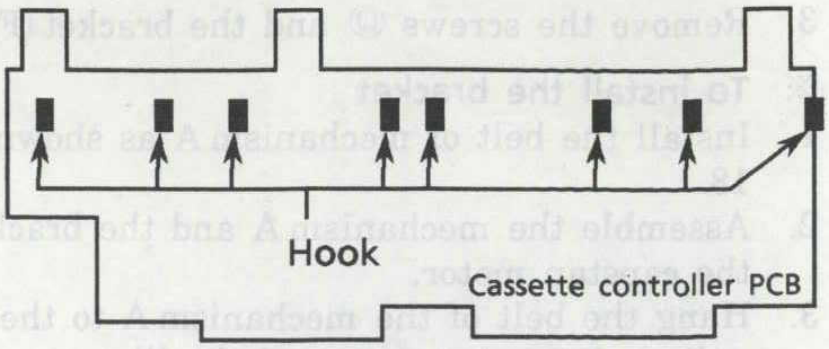


Fig 14

■ Head assembly removal

1. Remove the cassette mechanism assembly.
2. Unsolder the flexible wire (Fig 16).
3. Remove the 2 screws Ⓤ fixing the head assembly (Fig 21).

※ **Note**
The direction of the head is changed with the head gear. When servicing, install the head gear according to the direction of the head. Refer to fig 15.

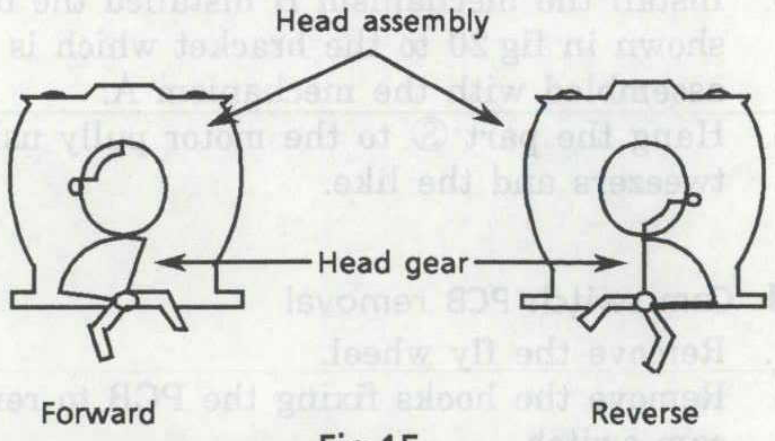


Fig 15

■ Pinch roller arm assembly removal

1. Release the return spring (Fig 21).
2. Release the hook holding the pinch roller arm assembly to remove the assembly (Fig 16).

■ Reel motor PCB removal

1. Remove the cassette mechanism assembly.
2. Remove the cassette controller PCB.
3. Remove the screw Ⓟ fixing the reel motor PCB.
4. Unsolder the reel motor PCB.
5. Remove the PCB.
   Be careful so that stress is not added to the terminals of the motor.

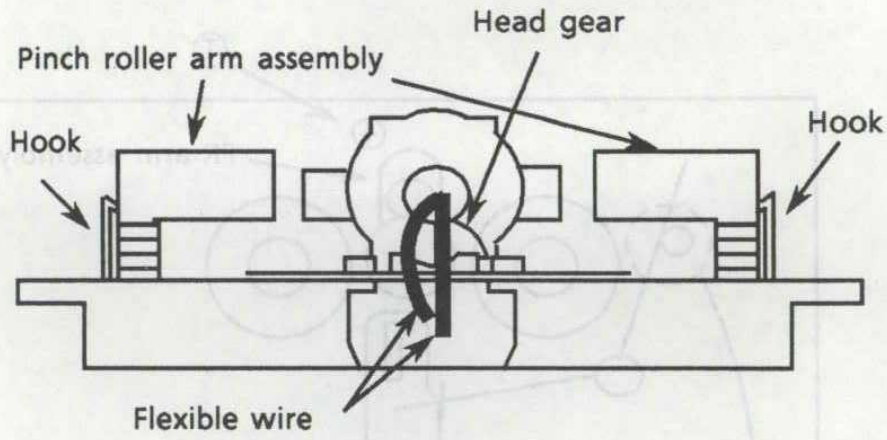


Fig 16

■ Capstan motor removal

1. Remove the cassette mechanism assembly.
2. Remove the reel motor PCBs.
3. Remove the 4 screws Ⓠ fixing the bracket (Fig 17).
4. Remove the motor with the bracket,
5. Remove the 2 screws fixing the motor and the bracket.

■ Reel motor removal

1. Remove the cassette mechanism assembly.
2. Remove the reel motor PCB.
3. Remove the FR arm assembly (Fig 21).
4. Remove the screw Ⓣ fixing the motor (Fig 21).
5. Remove the hooks fixing the motor to remove the motor.

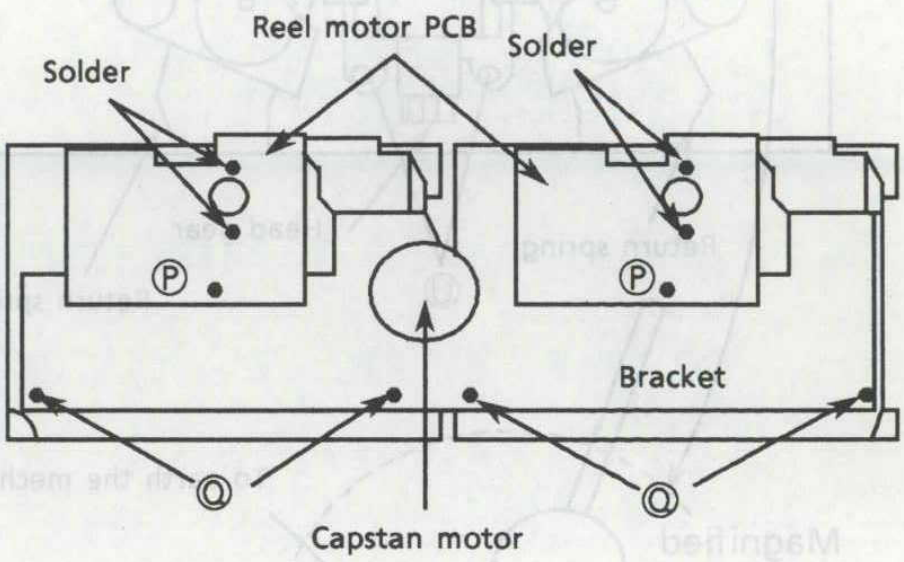


Fig 17

■ Fly wheel removal

1. Remove the cassette mechanism assembly.
2. Remove the reel motor PCB.
3. Remove the screws Ⓠ and the bracket (Fig 17).

※ **To install the bracket**

1. Install the belt of mechanism A as shown in fig 18.
2. Assemble the mechanism A and the bracket with the capstan motor.
3. Hang the belt of the mechanism A to the motor pully using a tweezers and the like.
4. Hang the part Ⓡ to the Idler pully.
5. Install the mechanism B installed the belt as shown in fig 20 to the bracket which is assembled with the mechanism A.
6. Hang the part Ⓢ to the motor pully using a tweezers and the like.

■ Cam switch PCB removal

1. Remove the fly wheel.
2. Remove the hooks fixing the PCB to remove the cam switch.
   When assembling the cam switch, install it so that the part Ⓥ meets the part Ⓦ (Fig 22).

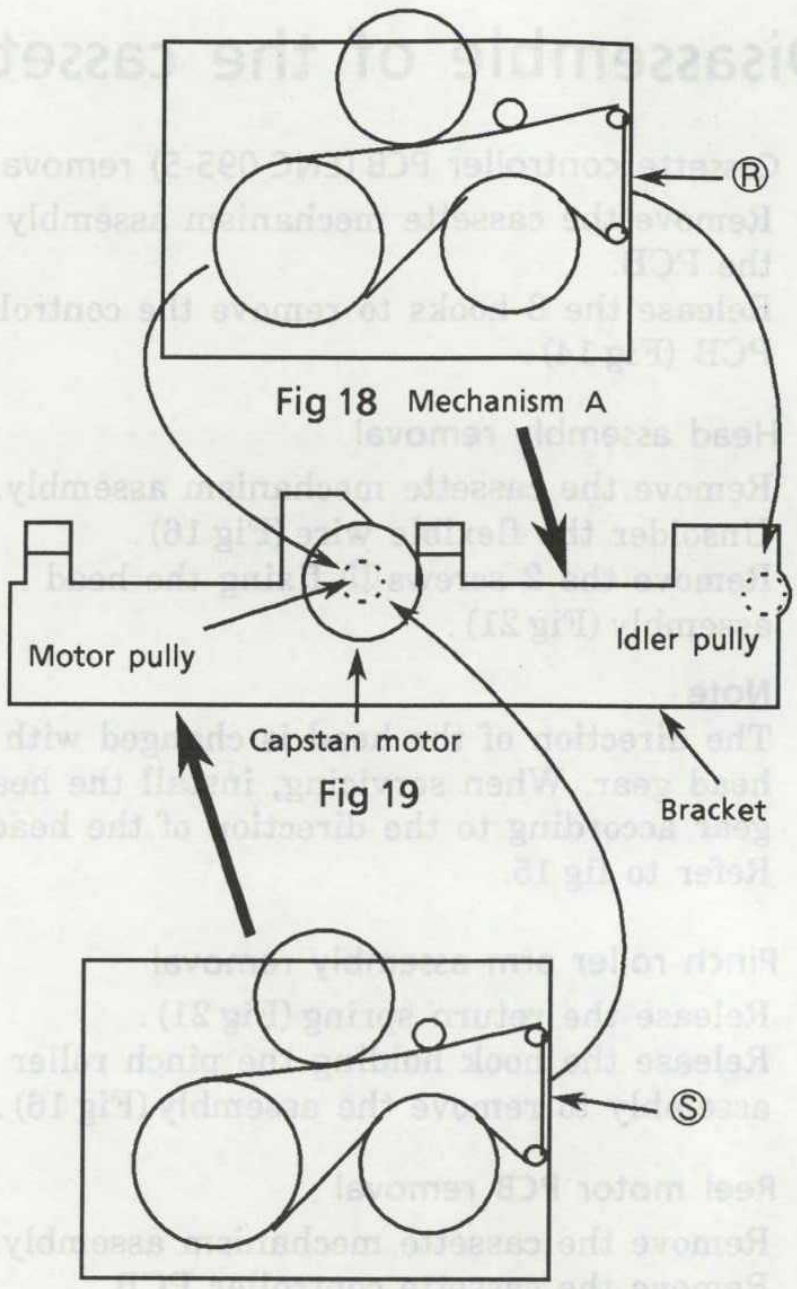


Fig 18 Mechanism A

Fig 19

Fig 20 Mechanism B

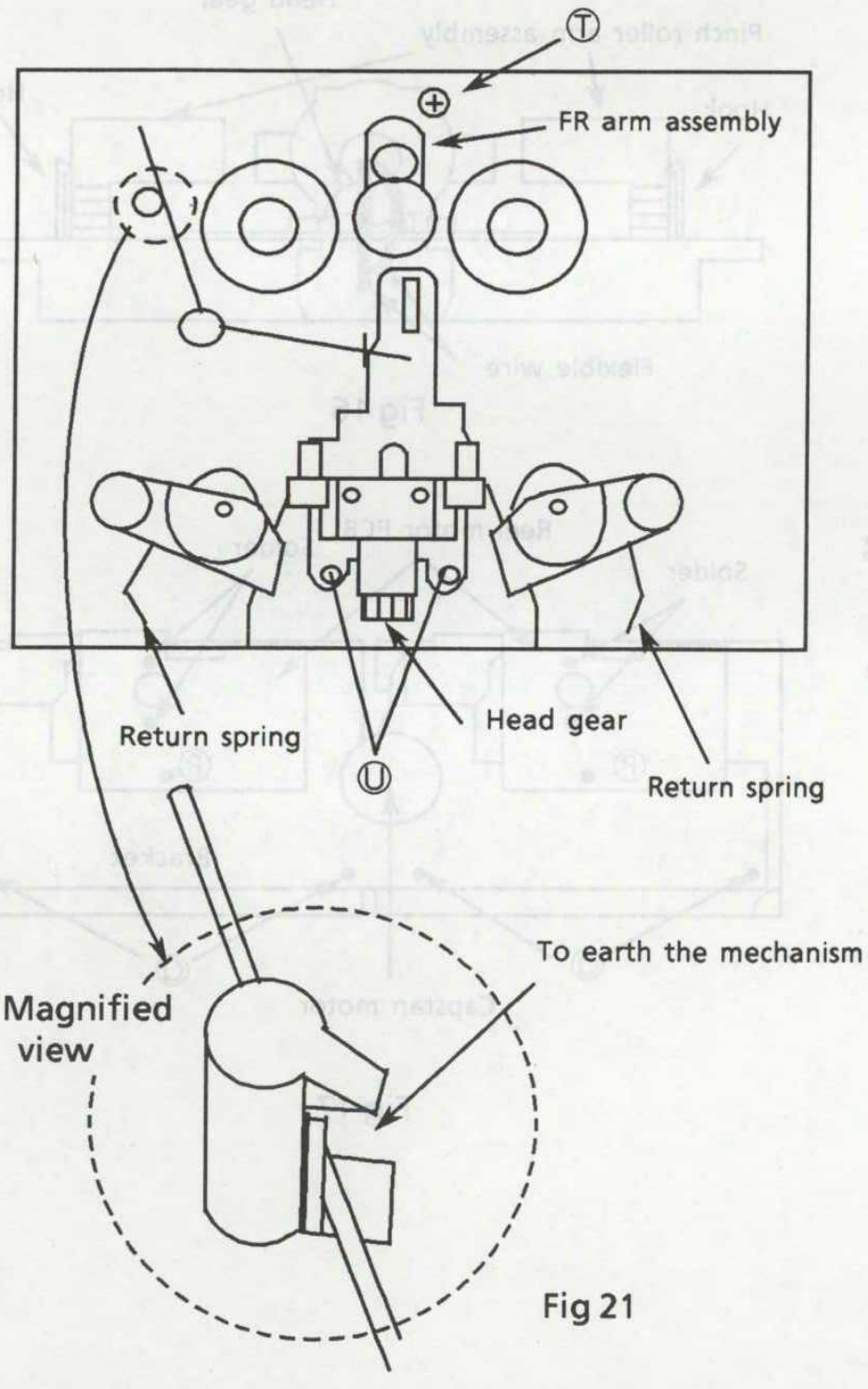


Fig 21

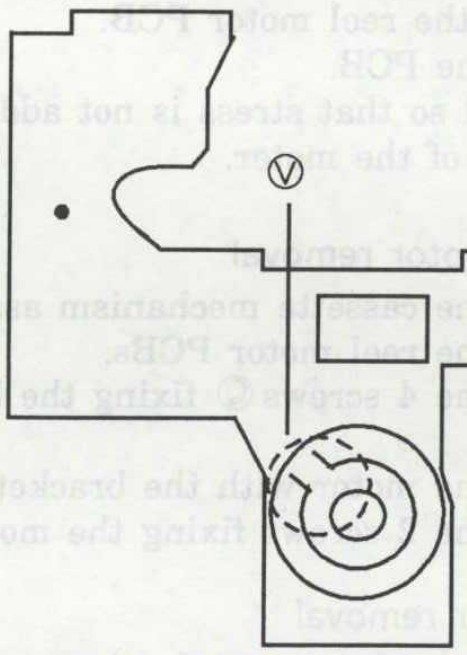
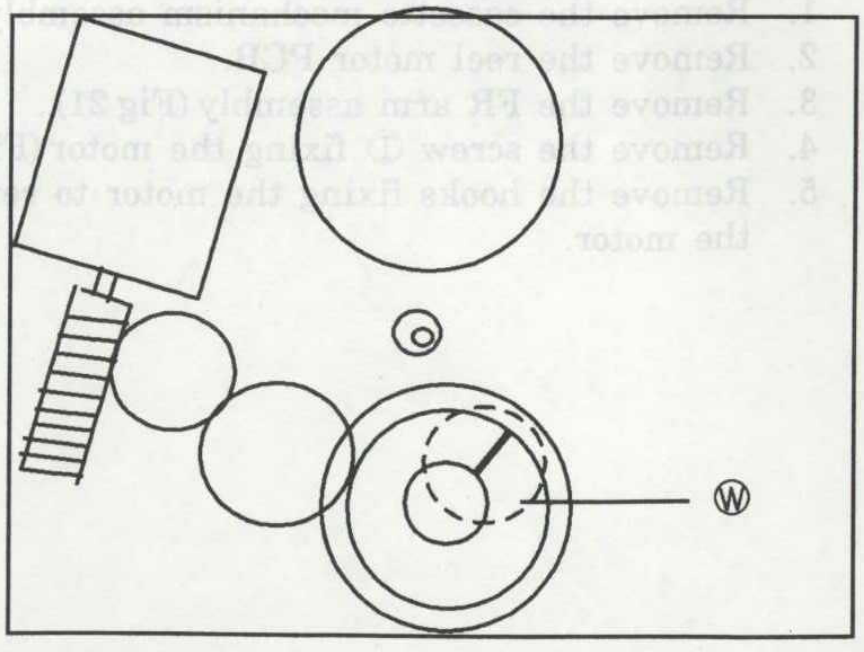


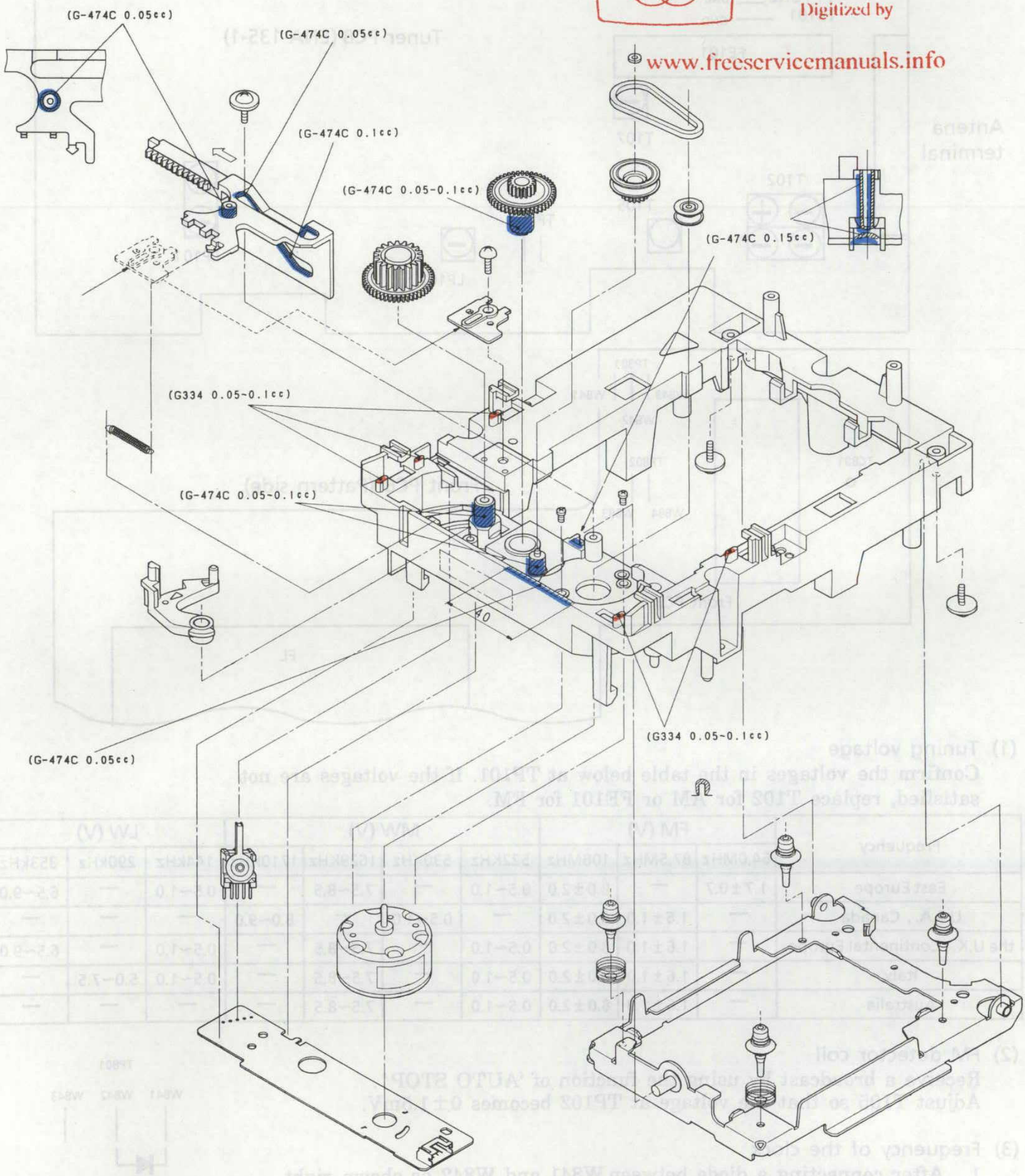
Fig 22



Application Points for Grease

Grease used

- G-334 (Shin-Etsu Chemical Co., Ltd.)
- G-474C (Kanto Chemical Co., Ltd.)



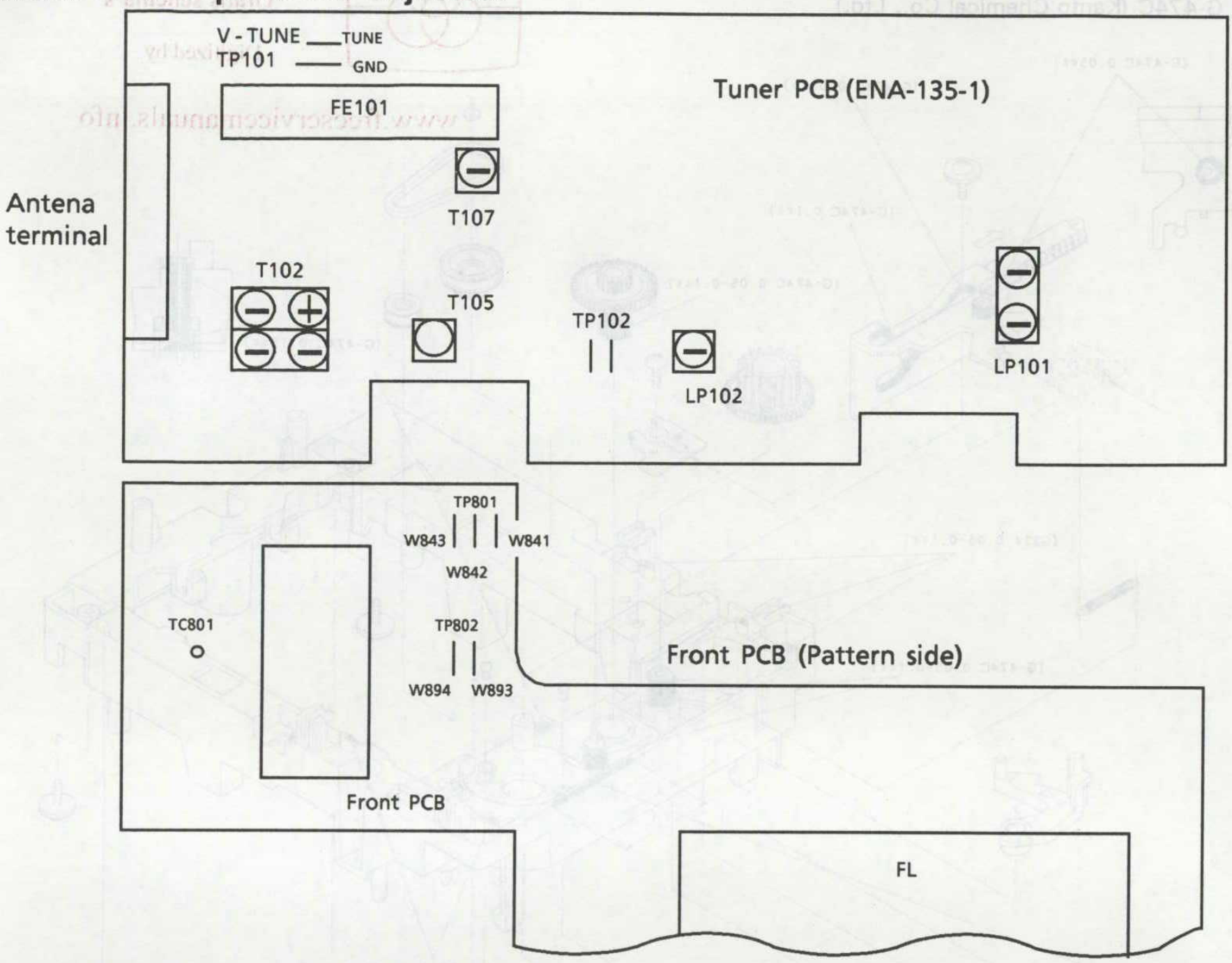
Grease part numbers

G-334: EBS0006-009B
G-474C: EBS0006-019B

Adjustment Procedures

■ Tuner section

Don't adjust the semi-fixed resistors and coils except below mentioned. If you have them out of the values previously adjusted by mistake, replace them. Service parts are adjusted.



(1) Tuning voltage

Confirm the voltages in the table below at TP101. If the voltages are not satisfied, replace T102 for AM or FE101 for FM.

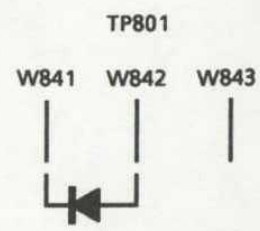
Frequency	FM (V)			MW (V)				LW (V)		
	64.0MHz	87.5MHz	108MHz	522KHz	530KHz	1629KHz	1710KHz	144kHz	290kHz	353kHz
East Europe	1.7±0.7	—	8.0±2.0	0.5~1.0	—	7.5~8.5	—	0.5~1.0	—	6.5~9.0
U.S.A., Canada	—	1.6±1.0	8.0±2.0	—	0.5~1.0	—	8.0~9.0	—	—	—
the U.K., Continental Europe	—	1.6±1.0	8.0±2.0	0.5~1.0	—	7.5~8.5	—	0.5~1.0	—	6.5~9.0
Italy	—	1.6±1.0	8.0±2.0	0.5~1.0	—	7.5~8.5	—	0.5~1.0	5.0~7.5	—
Australia	—	1.6±1.0	8.0±2.0	0.5~1.0	—	7.5~8.5	—	—	—	—

(2) FM detector coil

Receive a broadcast by using the function of 'AUTO STOP'.
Adjust T105 so that the voltage at TP102 becomes 0±1.5mV.

(3) Frequency of the clock

1. After connecting a diode between W841 and W842 as shown right, connect ac power cord into ac outlet.
2. Confirm that the display is off and remove the diode.
3. Connect a frequency counter between W843 and W842.
4. Adjust TC801 so that the frequency becomes 34952.5±0.15Hz.



Example 1SS133 1S2076
1SS119 1S2473

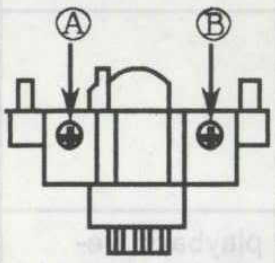
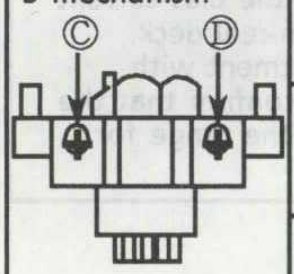
■ Deck section

(1) Measuring instruments for Adjustment

1. Audio frequency signal generator (which can generate a 0dBs output with a 600Ω load at 50Hz to20kHz.)
2. Attenuator (600 - ohm impedance)
3. Electronic voltmeter
4. Standard tapes
   VTT-703L(head azimuth adjustment)
   VTT-712 (tape speed , wow & flutter)
   VTT-724 (Reference level)
   TMT-6247 (Music scan)
   TMT-6237 (Music scan)
5. Recording standard tapes
   TMT-7046 (Normal : UR) , AC-513 (CrO2 : SA)
6. 600-ohm resistor for attenuator matching
7. Wow & Flutter meter with frequency counter
8. Distortion meter with band-pass filter
9. Torque gauge : CTG - N (cassette type)
10. C-120 tape (for checking the tape running)

(2) Adjustment and repairing for the mechanism

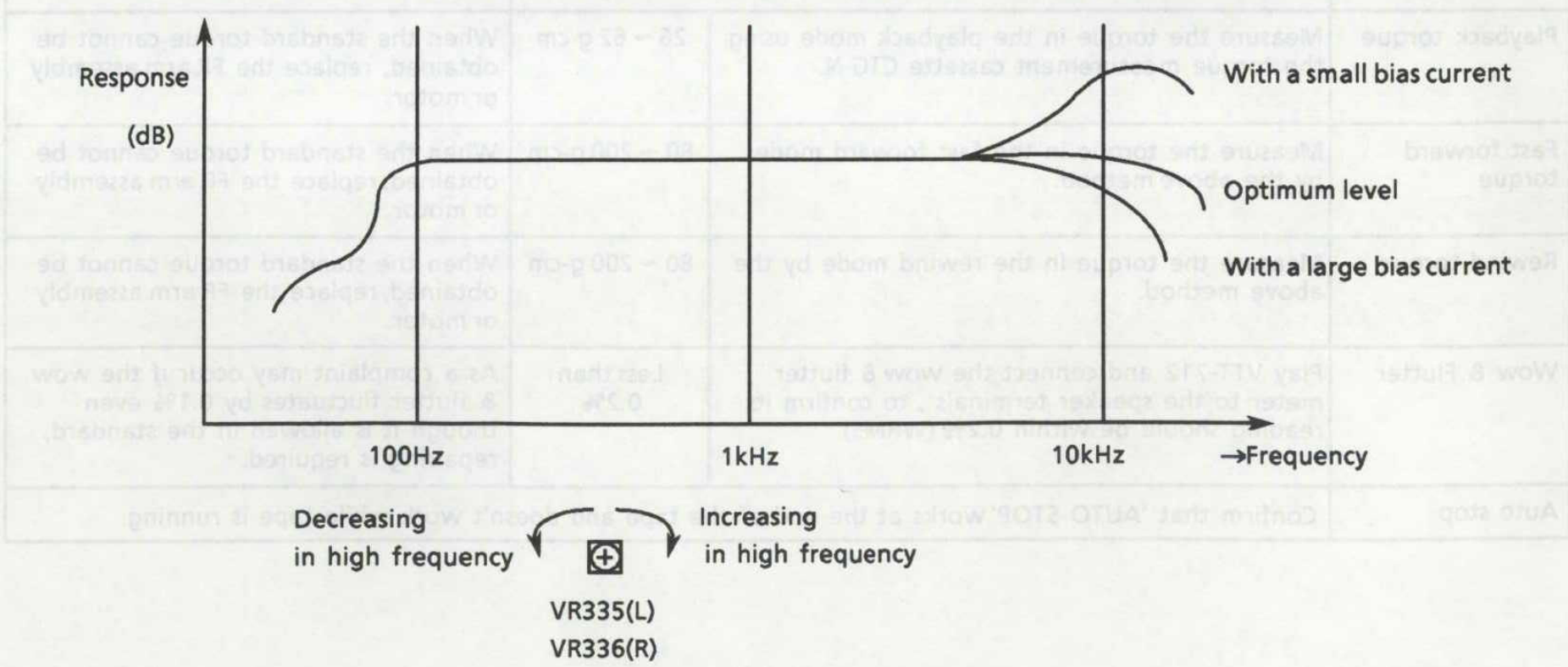
(Adjust and inspect the mechanism before adjusting the electronic circuit)

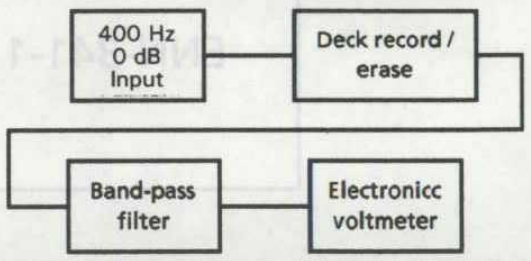
Item	Adjustment Method	Standard value	Remarks
Adjusting azimuth of Rec / Play head	1. Connect an electronic voltmeter to the speaker terminals. 2. Play VTT-703L		1) When the specified characteristic cannot be obtained because of head wear, cut wire, excessive magnetization, etc., replace the head and adjust the head azimuth. Also, perform the adjustment of the playback level, recording bias current, recording level, etc. 2) When there is the difference of more than 3 ~ 4 dB between left and right output levels, replace the head to avoid coomplaints.
A mechanism 	3. Adjust screw Ⓐ so that the indication of the voltmeter becomes maximum when PLAY (▶) is pressed.	Maximum	
	4. Adjust screw Ⓑ so that the indication of the voltmeter becomes maximum when PLAY (◀) is pressed.	Maximum	
	5. After making the adjustment,apply screw lock to prevent screws Ⓐ and Ⓑ coming loose .		
B mechanism 	6. Adjust screw Ⓒ so that the indication of the voltmeter becomes maximum when PLAY (▶) is pressed.	Maximum	
	7. Adjust screw Ⓓ so that the indication of the voltmeter becomes maximum when PLAY (◀) is pressed.	Maximum	
	8. After making the adjustment, apply screw lock to prevent screws Ⓒ and Ⓓ coming loose .		
Playback torque	Measure the torque in the playback mode using the torque measurement cassette CTG-N.	26 ~ 62 g-cm	When the standard torque cannot be obtained, replace the FR arm assembly or motor.
Fast forward torque	Measure the torque in the fast forward mode by the above method.	80 ~ 200 g-cm	When the standard torque cannot be obtained, replace the FR arm assembly or motor.
Rewind torque	Measure the torque in the rewind mode by the above method.	80 ~ 200 g-cm	When the standard torque cannot be obtained, replace the FR arm assembly or motor.
Wow & Flutter	Play VTT-712 and connect the wow & flutter meter to the speaker terminals , to confirm its reading should be within 0.2% (WRMS).	Less than 0.2%	As a complaint may occur if the wow & flutter fluctuates by 0.1% even though it is allowed in the standard, repairing is required.
Auto stop	Confirm that 'AUTO STOP' works at the end of the tape and doesn't work while tape is running.		

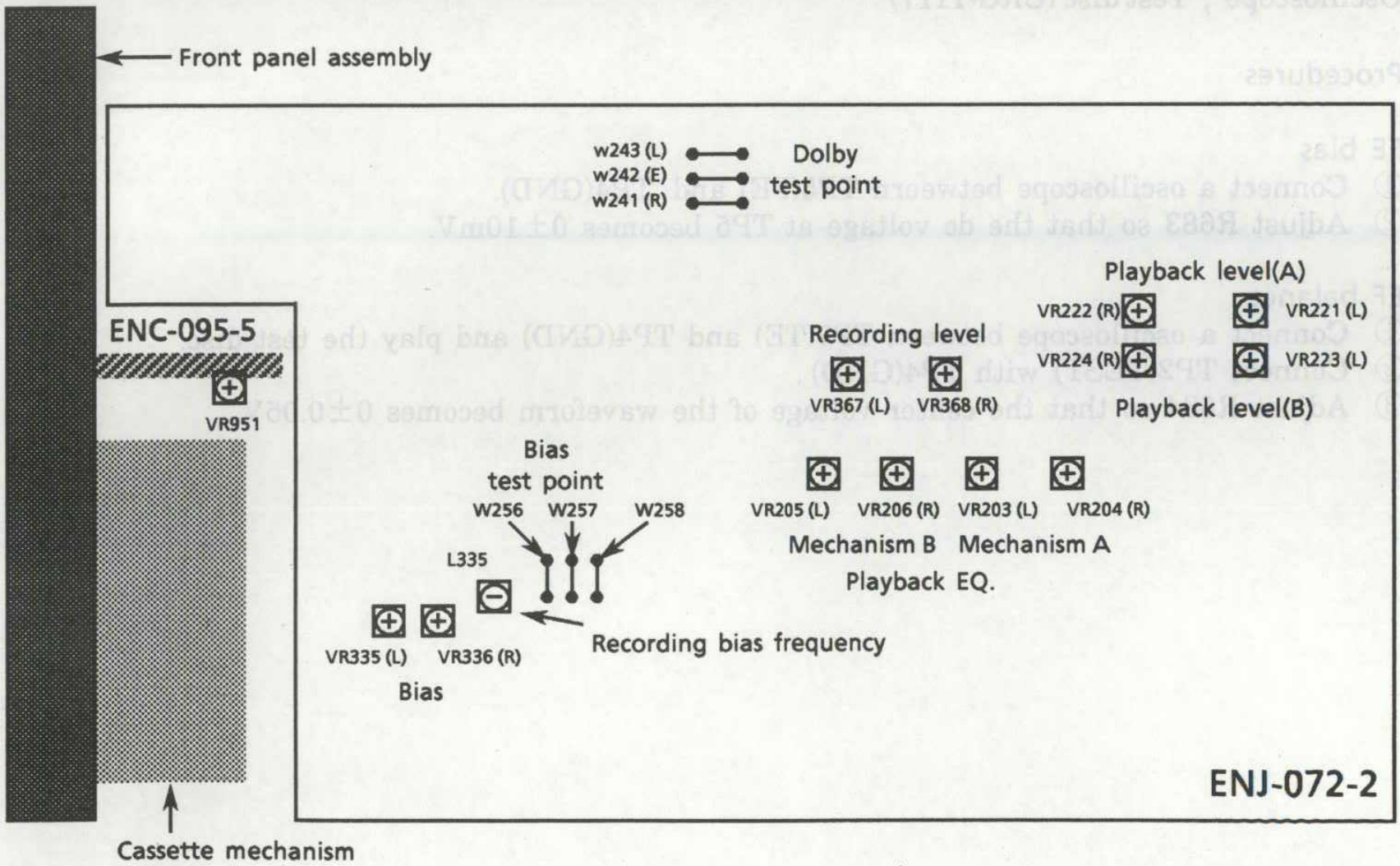
(3) Electrical Circuit Adjustments

Make the following adjustments after adjusting the head azimuth.
In principle, the adjustments should be made in the following sequence.
Set the NR switch to OFF.

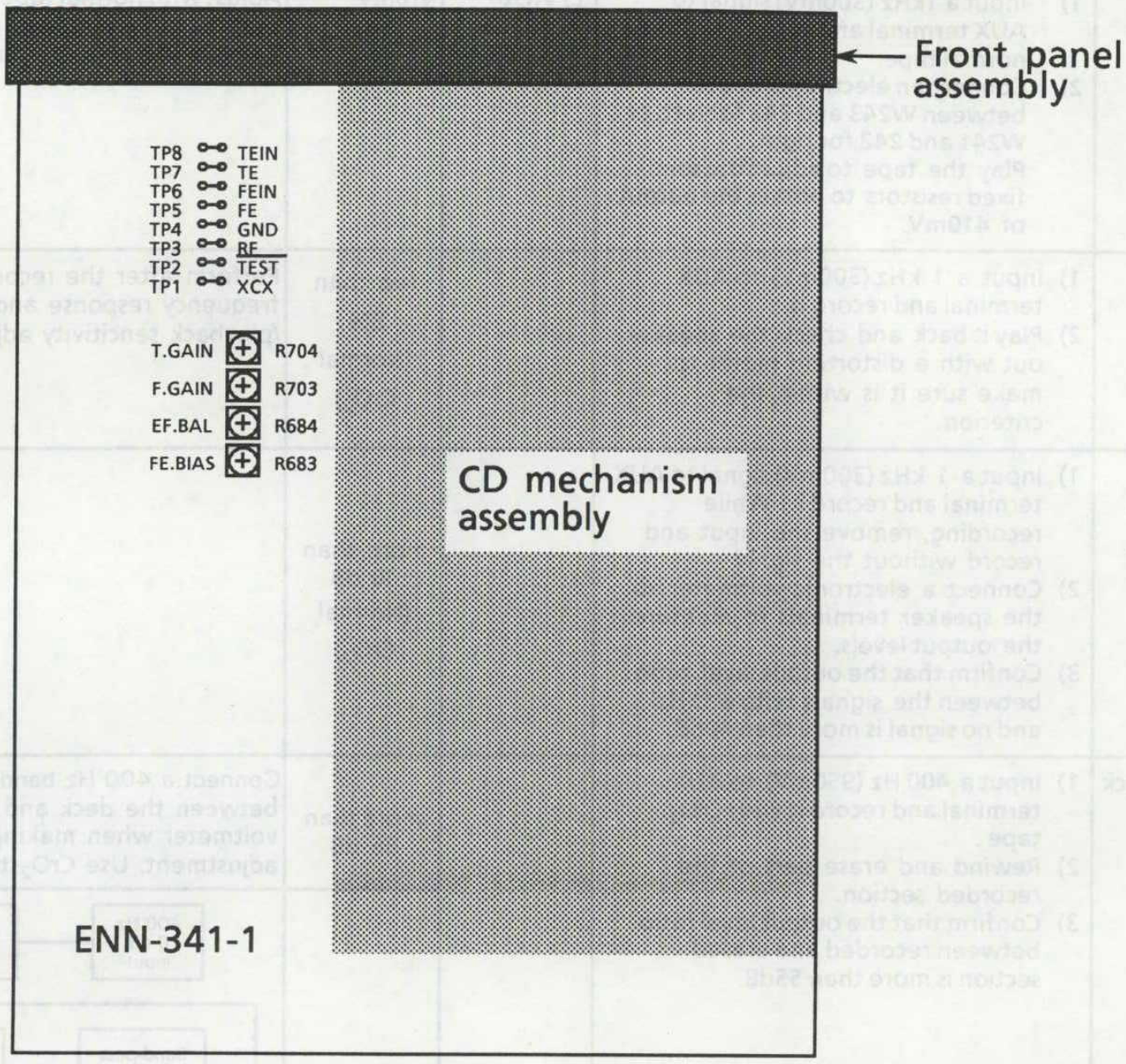
Item	Adjustment Method	Adjustment Location	Standard Value	Remarks
Motor speed	1. Connect a frequency counter to the speaker terminals and play VTT-712	Semi-fixed resistor on the main PC Board		Connect a wow & flutter meter with a built-in frequency counter to the speaker terminals.
	2. Adjust the semi-fixed resistor VR951.	VR951	3,000 ± 10 Hz	
Playback level	Connect an electronic voltmeter between W243 and W242 for left, or W241 and W242 for right. Play VTT-724 (1 kHz) to adjust the semi - fixed resistors.	A deck (L) VR221 (R) VR222 B deck (L) VR223 (R) VR224	410mV	The playback level varies when the head is replaced so should be adjusted. Use an electronic voltmeter with an impedance of 100 kΩ or more.
Playback frequency response	Play VTT-703L(10kHz , – 10dB) and adjust semi-fixed resistors so that the voltage at W243 (L) and W241 (R) becomes 200mV respectively.	A VR203 (L) VR204 (R) B VR205 (L) VR206 (R)	200mV	
Recording bias frequency	Connect a frequency counter between W256 and W257(E) , and adjust L335 during recording no signal with CrO_2.	L335	105 + 10kHz – 5kHz	
Record / play frequency response	Supply 63Hz / 1kHz / 12.5kHz , 30mV signals to AUX terminal. Record them with the NR switch off. While playing back , adjust VR335 and VR 336 so that the variation of output of 100Hz / 10kHz to the output of 1kHz satisfies the standard value .	(L)VR335 (R)VR336	0 ± 3 dB for 63Hz 0 ± 2dB for 12.5kHz	1) The recording and playback frequencies of a cassette deck are adjusted by adjusting the bias. This is because the frequency response depends more on the bias current than with an open-reel deck. 2) Perform the adjustment with normal tape and confirm that the values are within the range for CrO_2 tape.



Item	Adjustment Method	Adjustment Location	Standard Value	Remarks
Recording / Playback Sensitivity	1) Input a 1kHz (300mV) signal to AUX terminal and record it with a normal tape. 2) Connect an electric voltmeter between W243 and 242 for left, or W241 and 242 for right. Play the tape to adjust the semi-fixed resistors to obtain the output of 410mV.	(L) VR367 (R) VR368	410mV	Adjust with normal tape and make sure that the left / right level difference is 3.0dB or less with CrO_2 tape.
Recording / playback distortion	1) Input a 1 kHz (300mV) to AUX terminal and record it. 2) Play it back and check the speaker out with a distortion meter to make sure it is within the criterion.		less than 3% (Normal CrO_2)	Perform after the record / play frequency response and recording /playback sencitivity adjustments.
Recording / playback S/N ratio	1) Input a 1 kHz (300mV) signal to AUX terminal and record it. While recording, remove the input and record without the signal. 2) Connect a electronic voltmeter to the speaker terminals to measure the output levels. 3) Confirm that the output level ratio between the signals with a 1kHz and no signal is more than 40dB.		more than 40 dB (Normal CrO_2)	
Erase ratio check	1) Input a 400 Hz (950mV) to AUX terminal and record it with CrO_2 tape . 2) Rewind and erase part of the recorded section. 3) Confirm that the output level ratio between recorded and erased section is more than 55dB.		more than 55 dB	Connect a 400 Hz band-pass filter between the deck and electronic voltmeter when making the adjustment. Use CrO_2 tape.
				
Music scan	1) Confirm that scanning can be done with TMT-6247 at the end of the tape in FF scan mode, and at the head of the tape in REW scan. 2) Confirm that scanning can not be done with TMT-6237.			



■ CD section



(1) Adjustment measure

Oscilloscope , Test disc (CRG-1117)

(2) Procedures

1) FE bias

① Connect a oscilloscope betweern TP5(FE) and TP4(GND).
② Adjust R683 so that the dc voltage at TP5 becomes 0±10mV.

2) EF balance

① Connect a oscilloscope between TP7(TE) and TP4(GND) and play the test disc.
② Connect TP2(TEST) with TP4(GND).
③ Adjust R684 so that the center voltage of the waveform becomes 0±0.05V.

3) Gain adjustment

If the gain is out of adjustment, the symptoms below will appear.

● Gain too low

Focus gain	:	Focus is not obtained and disc does not rotate.
Tracking gain	:	Mechanical shock occurs easily and sound is interrupted. Or time counter display stops counting.

● Gain too high

Focus gain	:	Scratches (on the disc) easily interrupt play, and noise is increased during play.
Tracking gain	:	Since the follow-up ability of the pickup is too high, the pickup may oscillate and oscillating sound may output.

As described above, the focus and tracking gain adjustment are performed to satisfy mutually contradictory characteristics.
A simplified adjustment procedure is described below. However, since exact adjustment can not be performed prior to adjustments, note(or mark) the positions of the semi-fixed resistors.
If the positions after the adjustment are only different, return the VRs to their original position.

Focus gain adjustment

1. Connect an oscilloscope to TP 5(FE) and TP 4(GND).
2. Load the test disc and press the PLAY button.
3. Adjust R703 (F.GAIN ADJ.) so that the correct waveform as shown in figure 1 is obtain. (The dc offset may not occur.)

Tracking gain adjustment

1. Connect an oscilloscope to TP 7(TE) and TP 4(GND).
2. Load the test disc and press the PLAY button.
3. Adjust R704 (T.GAIN ADJ.) so that the correct waveform as shown in figure 2 is obtain.

Focus Gain Adjustment

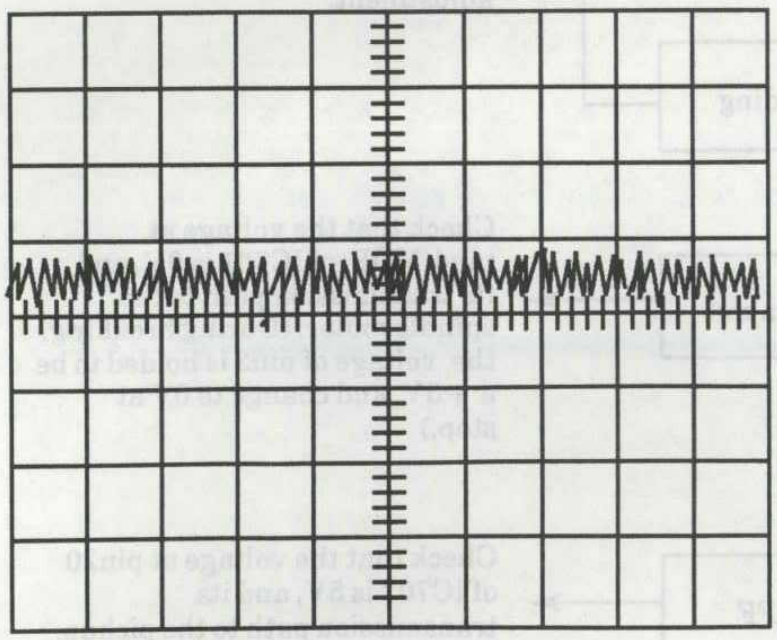


Figure 1

Tracking Gain Adjustment

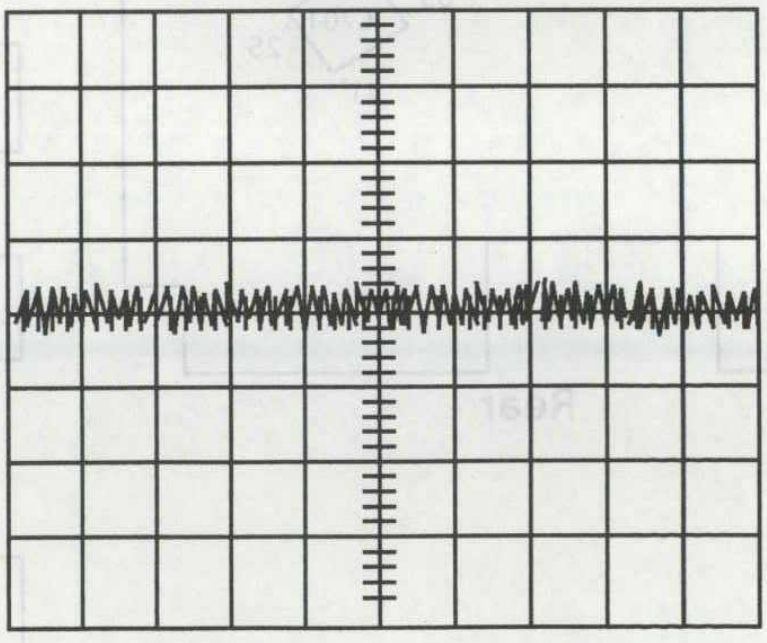
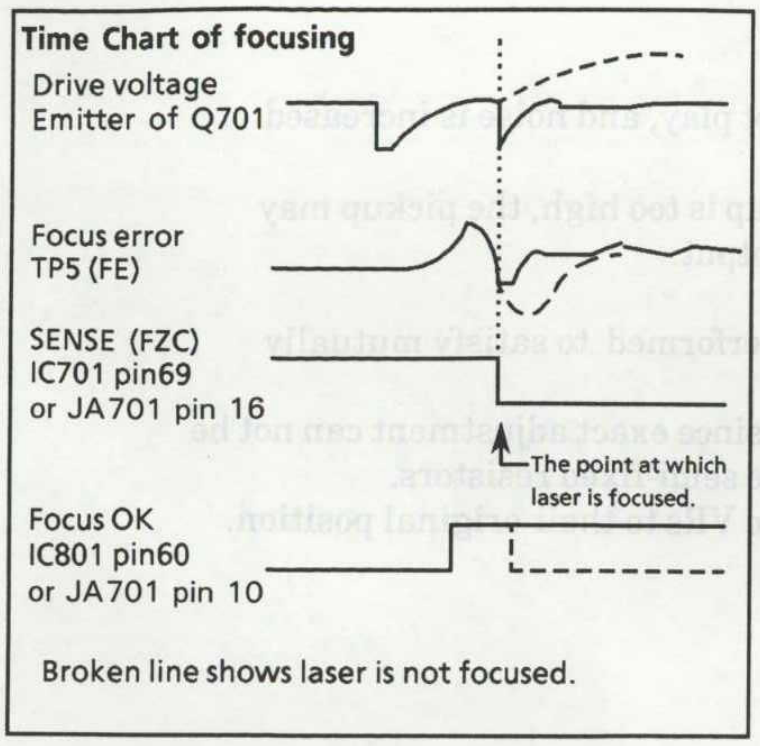
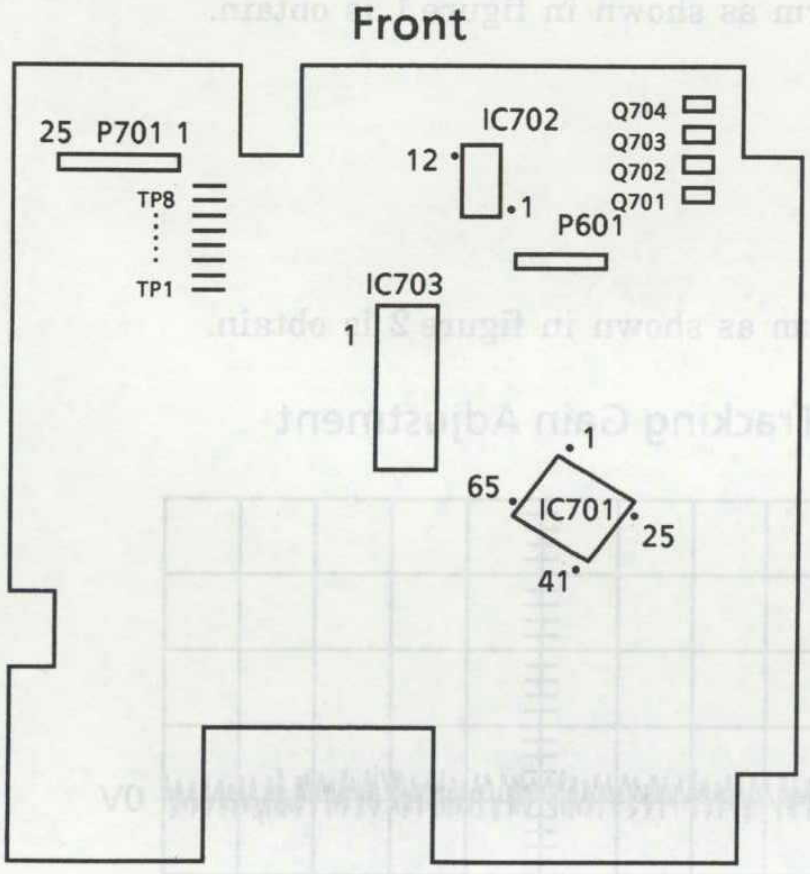
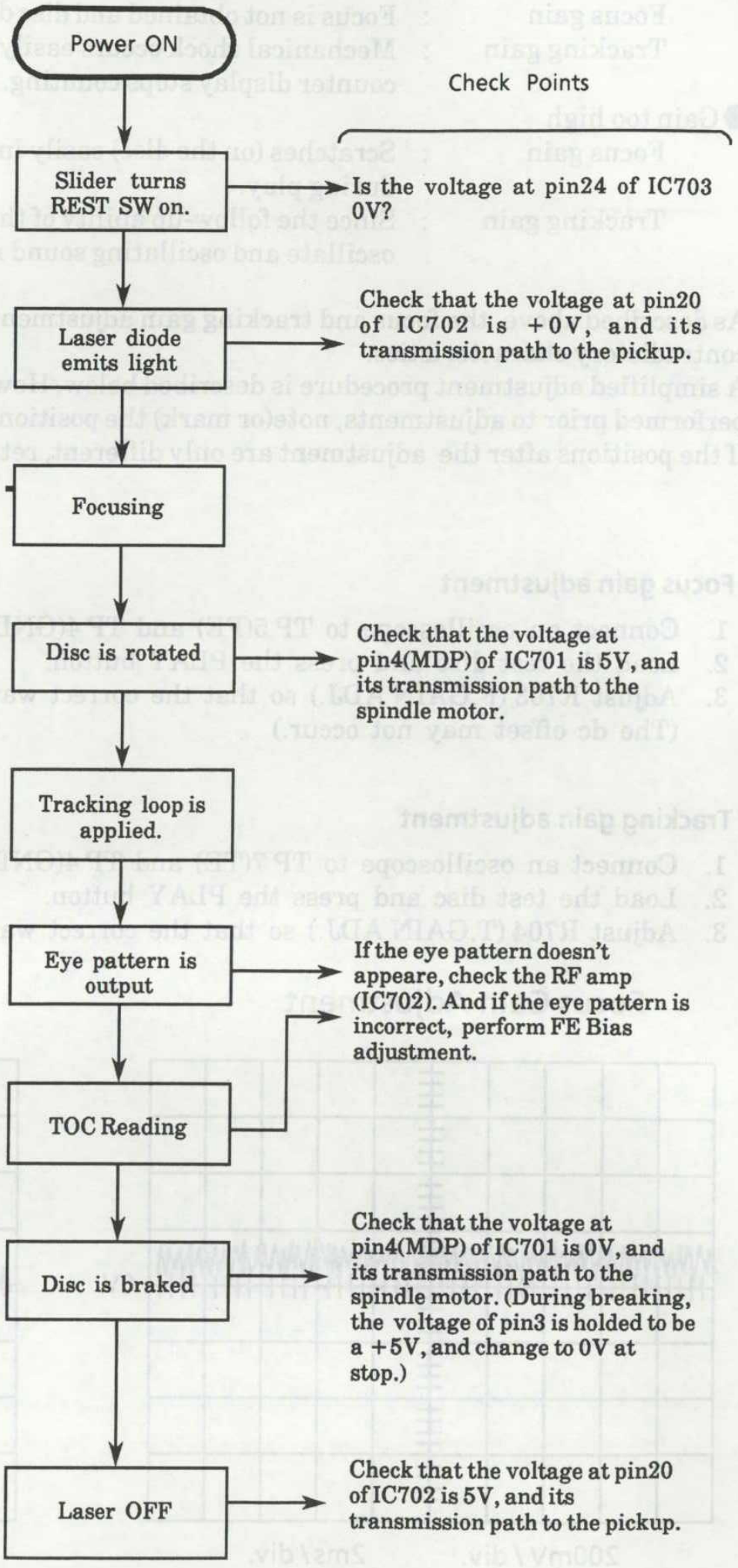


Figure 2

Flow of Functional Operation Until TOC is Read





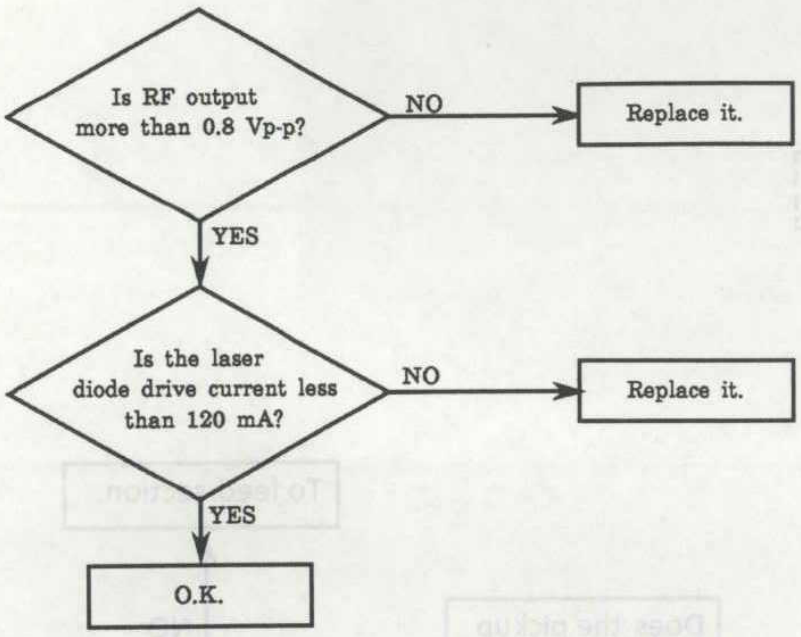


Maintenance of Laser Pickup

(1) Life of the laser diode

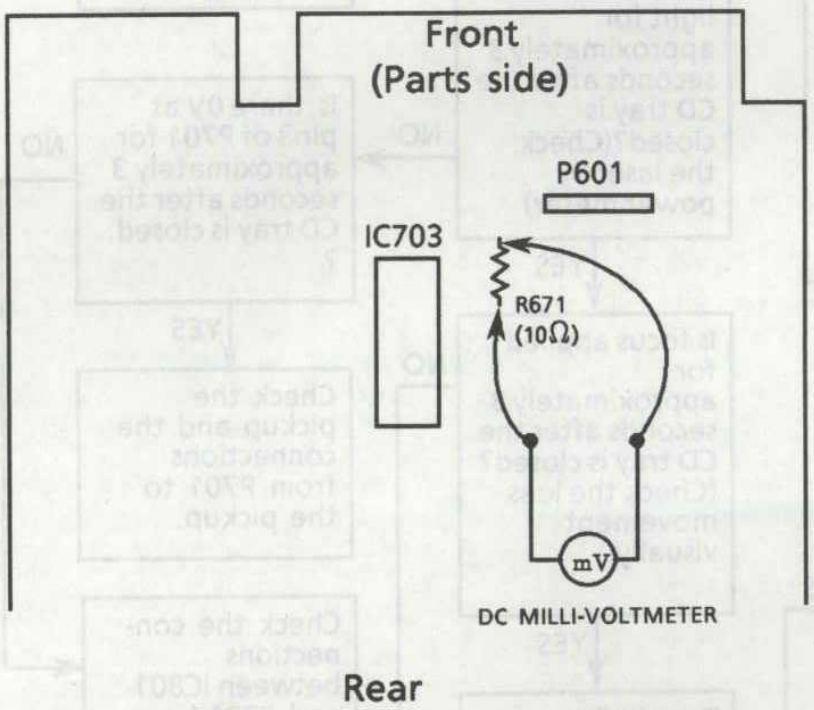
When the life of the laser diode has expired, the following symptoms will appear.

1. The level of RF output (EFM output: amplitude of eye pattern) will be low.
2. The drive current required by the laser diode will be increased.
   In such a case, check the life of the laser diode by the flowchart below



(2) Measurement of laser diode drive current

Measure the voltage across the resistor R671 by using a milli-voltmeter. When the voltage is more than 1.2V, it shows that the life of the laser diode has expired.



(3) Semi-fixed resistor on the APC PC board

The semi-fixed resistor on the APC printed circuit board which is attached to the pickup is used to adjust the laser power. Since this adjustment should be performed to match the characteristics of the whole optical block, do not touch the semi-fixed resistor.

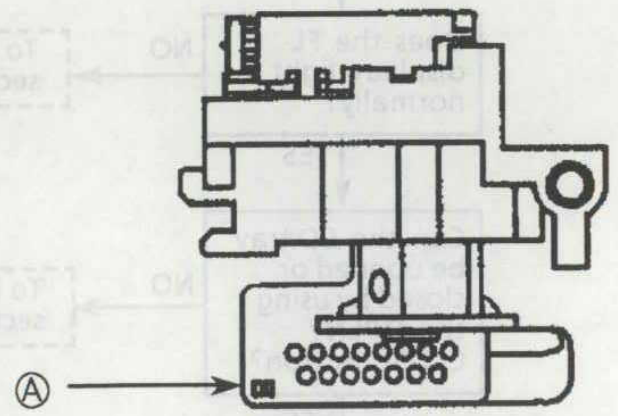
If the laser power is lower than the specified value, the laser diode is almost worn out, and the laser pickup should be replaced.

If the semi-fixed resistor is adjusted while the pickup is functioning normally, the laser pickup may be damaged due to excessive current.

Replacement of Laser Pickup

Before installing the pickup

Unsolder the part Ⓐ, which is used for countermeasure for static electricity.



Turn off the power switch and, disconnect the power cord from the ac outlet.

↓

Replace the pickup with a normal one. (Refer to "Pickup Removal" on the previous page)

↓

Plug the power cord in, and turn the power on. At this time, check that the laser emits for about 3 seconds and the objective lens moves up and down.
Note: Do not observe the laser beam directly.

↓

Play a disc, and when it starts rotating, short circuit between TP2(TEST) and GND.

↓

Adjust tracking gain.

↓

Adjust tracking offset.

↓

Disconnect TP2 (TEST) from GND.

↓

Check the eye-pattern at TP3(RF)

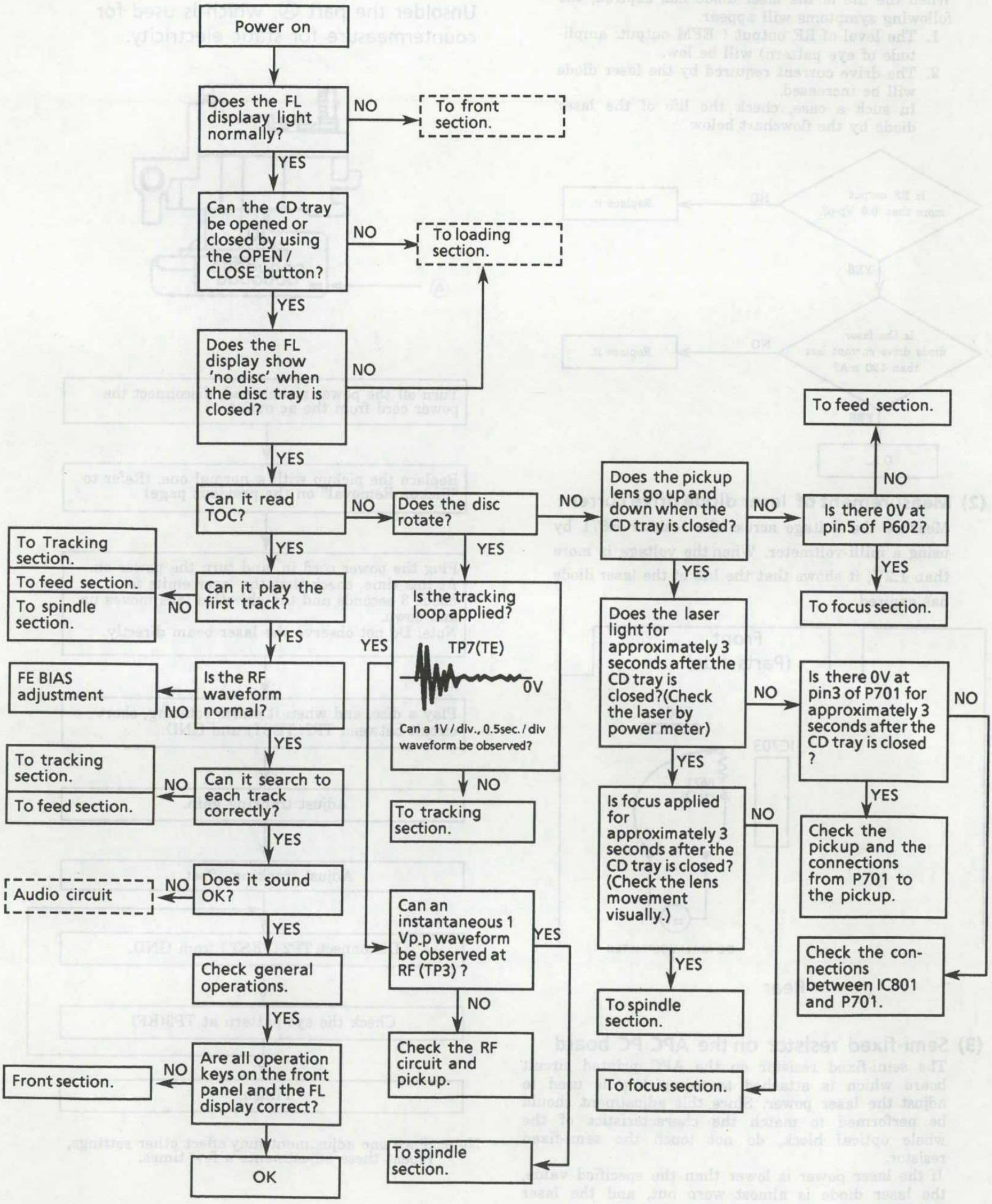
↓

Finish.

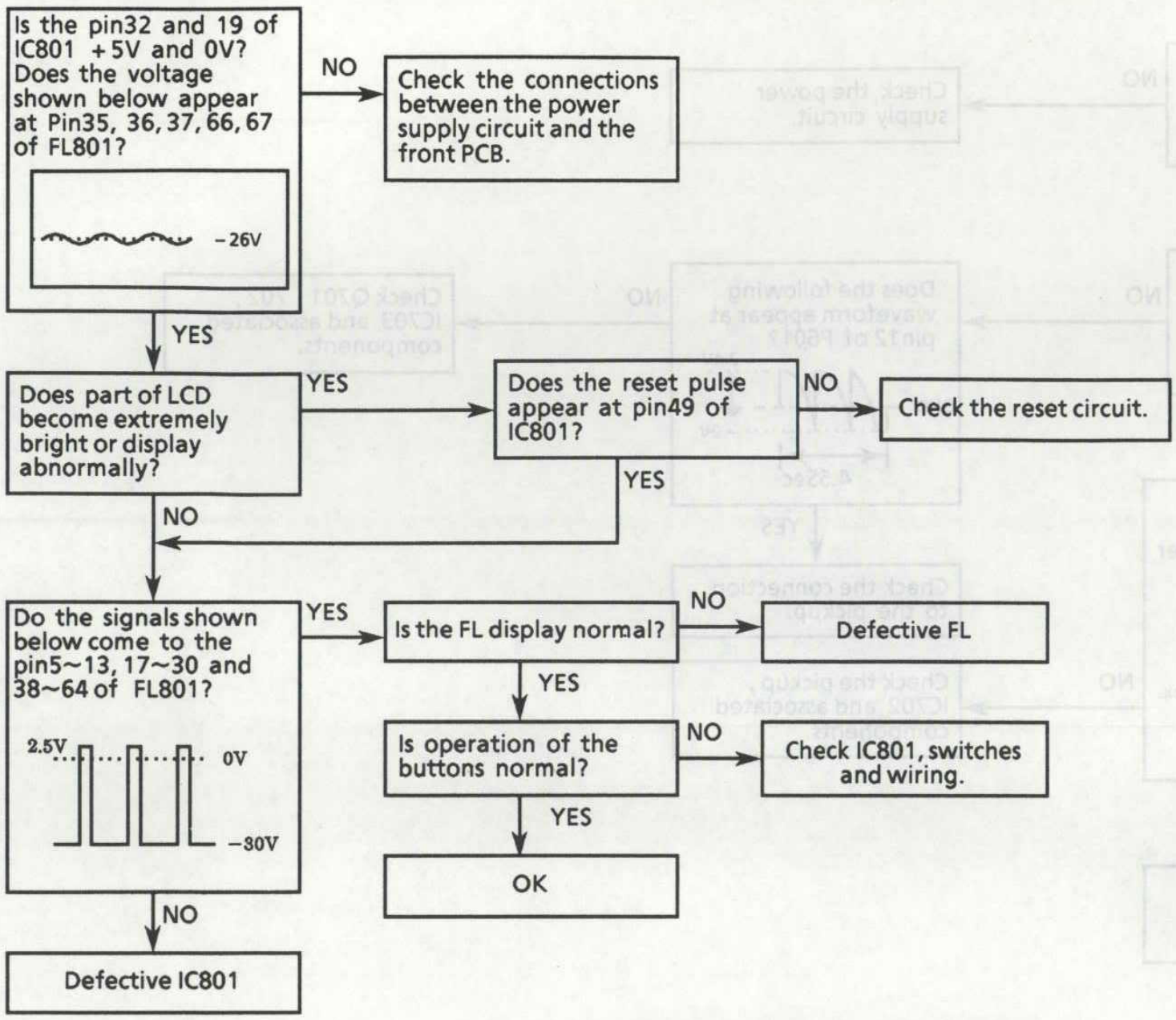
Note: Since one adjustment may affect other settings, repeat these adjustments a few times.

Troubleshooting

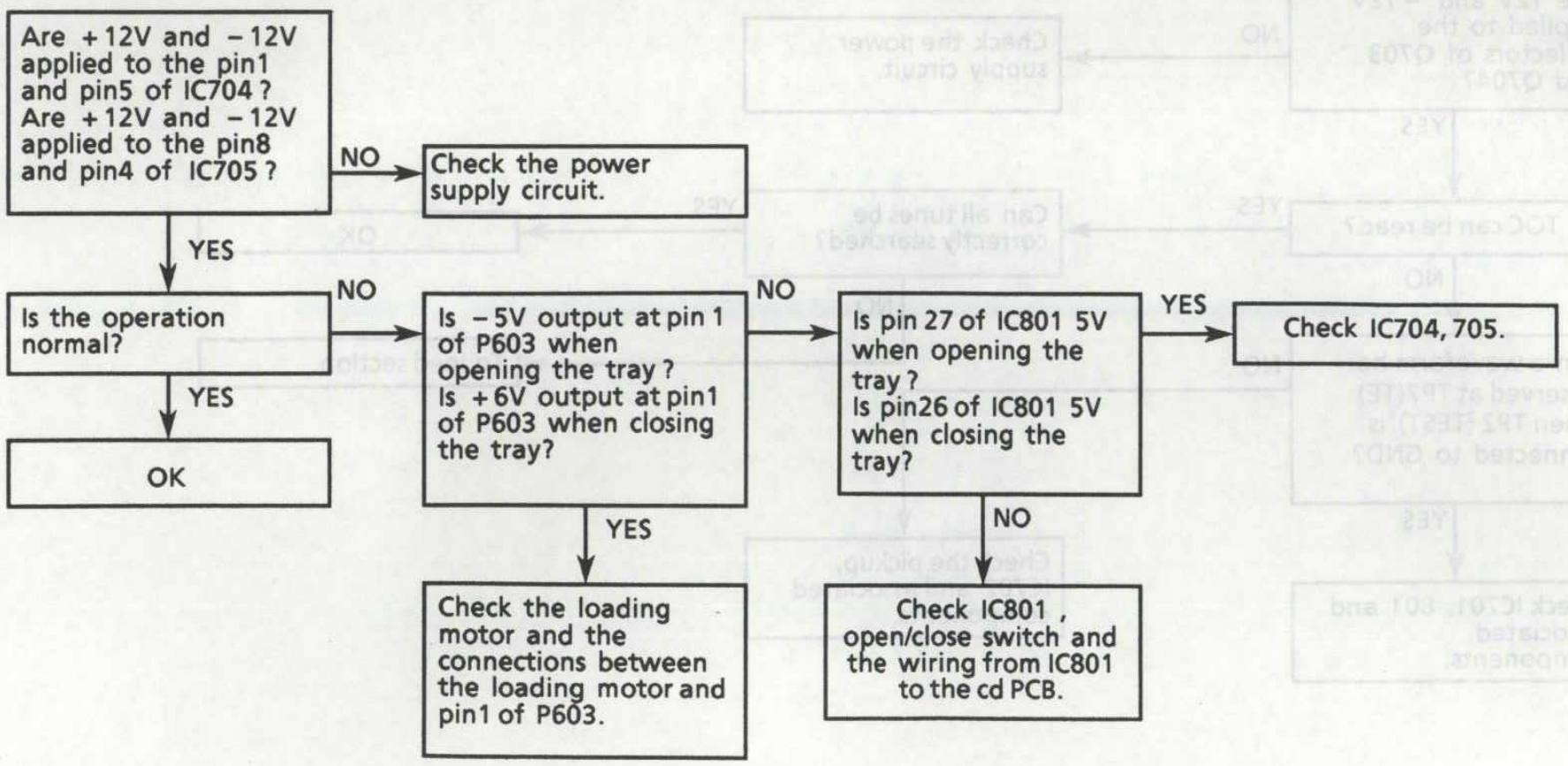
The following shows the status of the various circuits from turning on the power to the start of disc play .



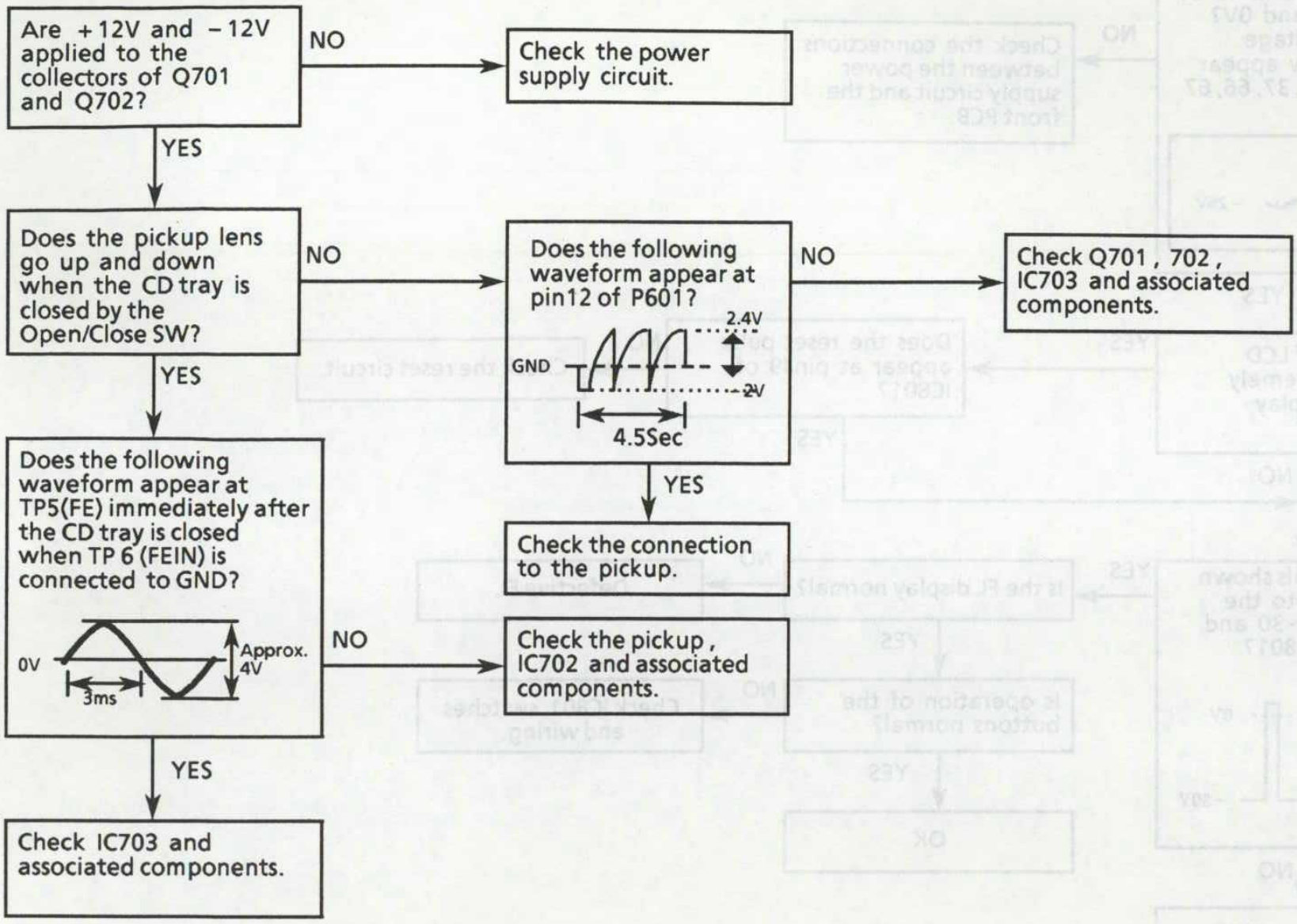
Front Section



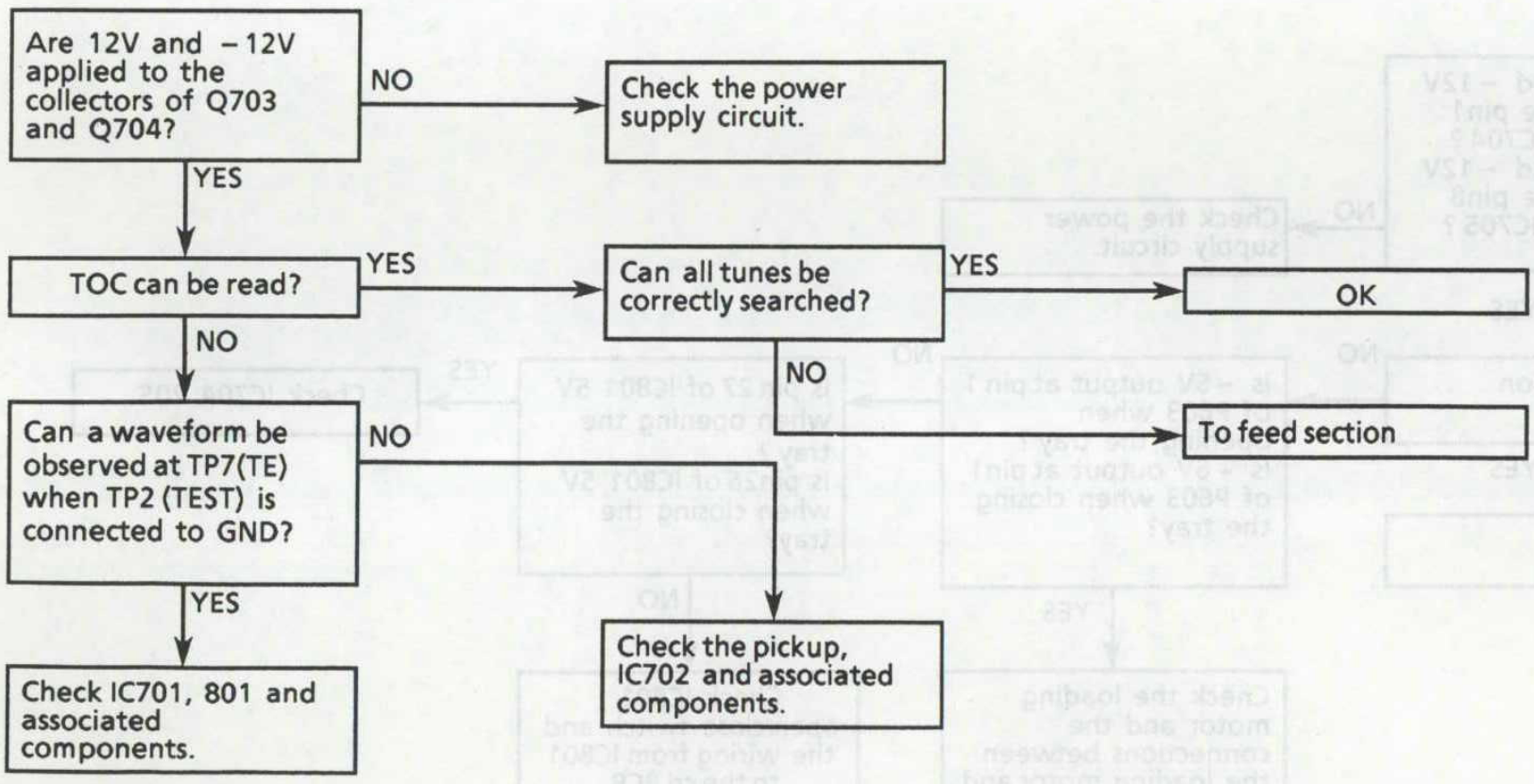
Loading section



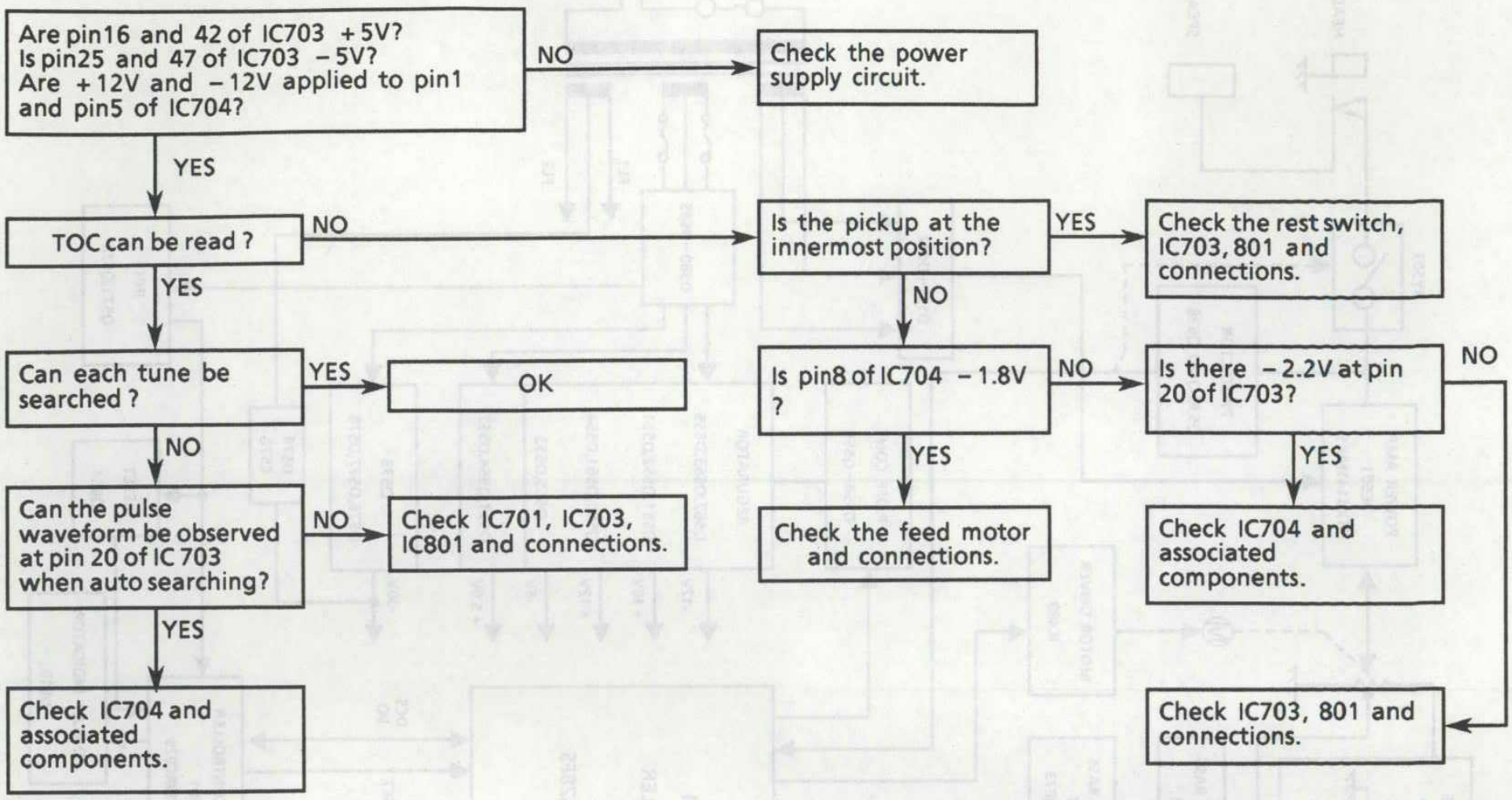
Focus section



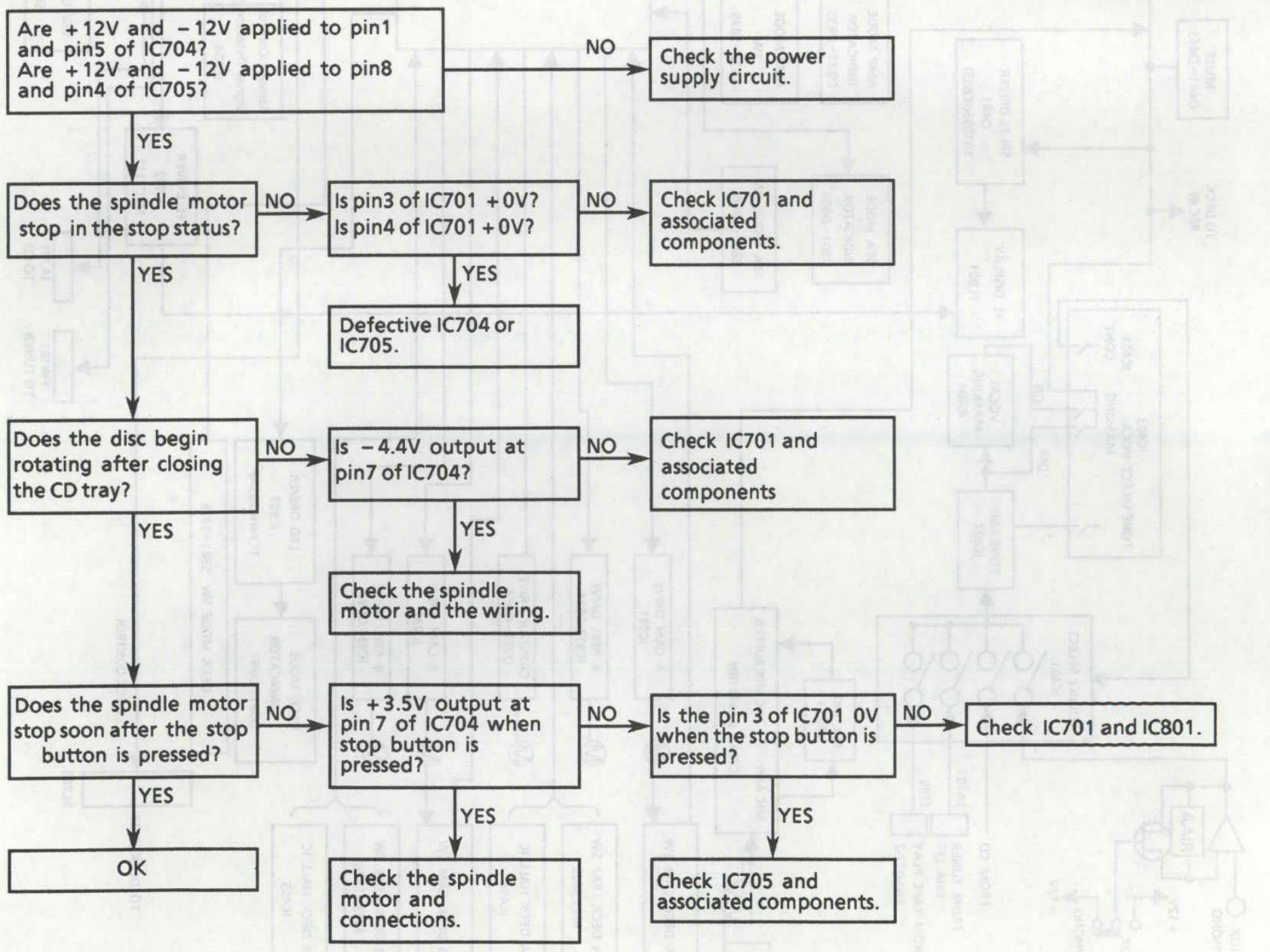
Tracking section

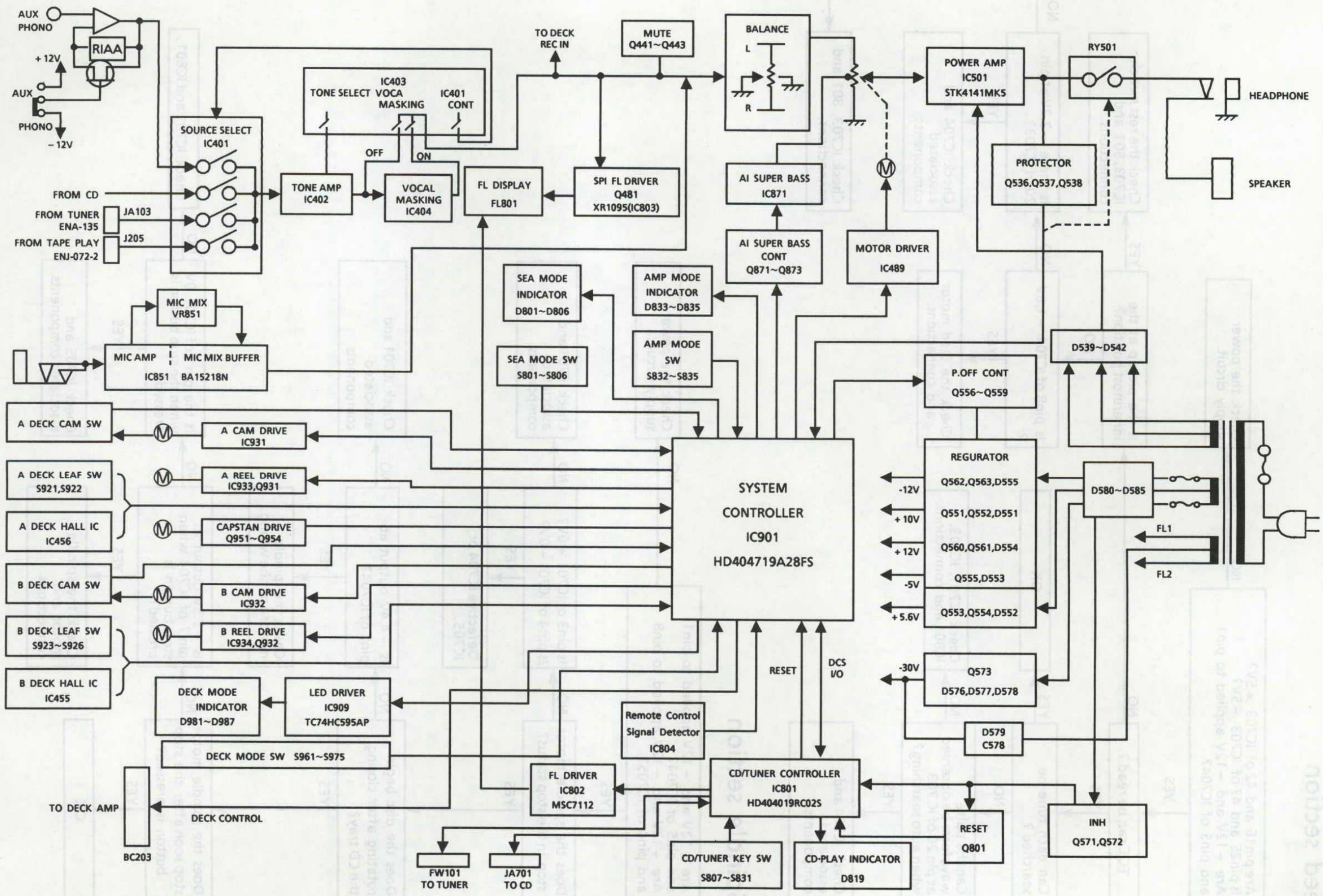


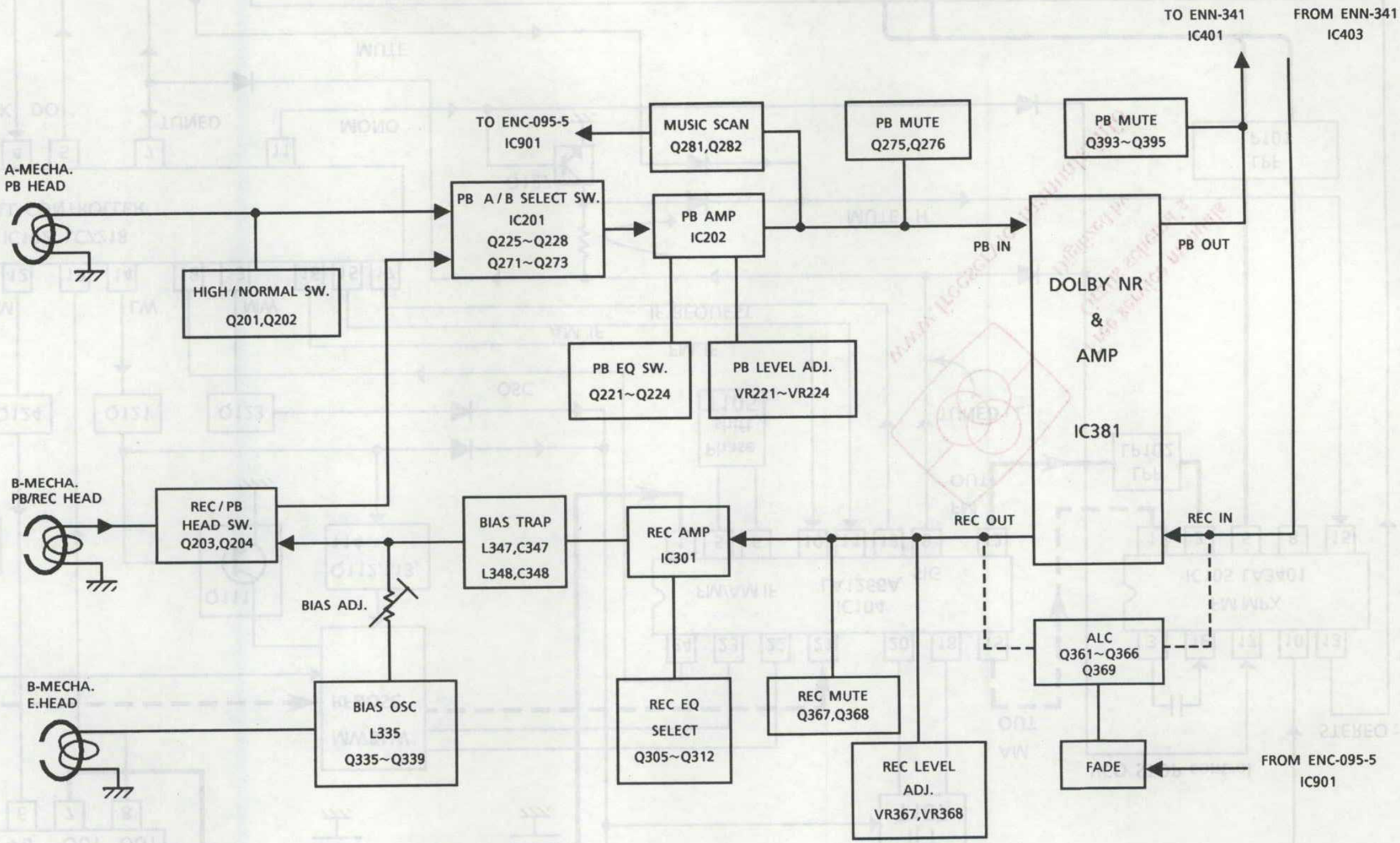
Feed section

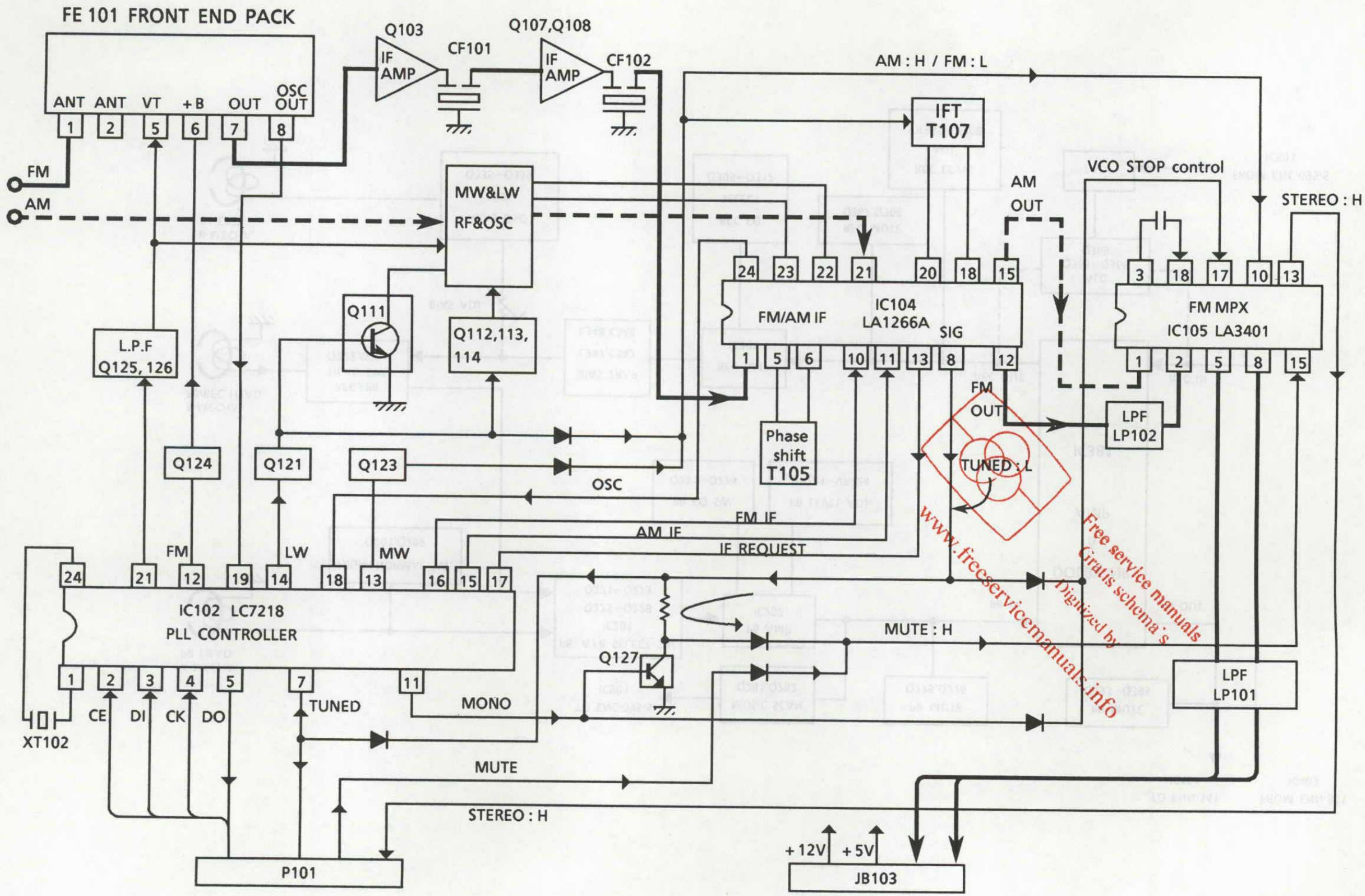


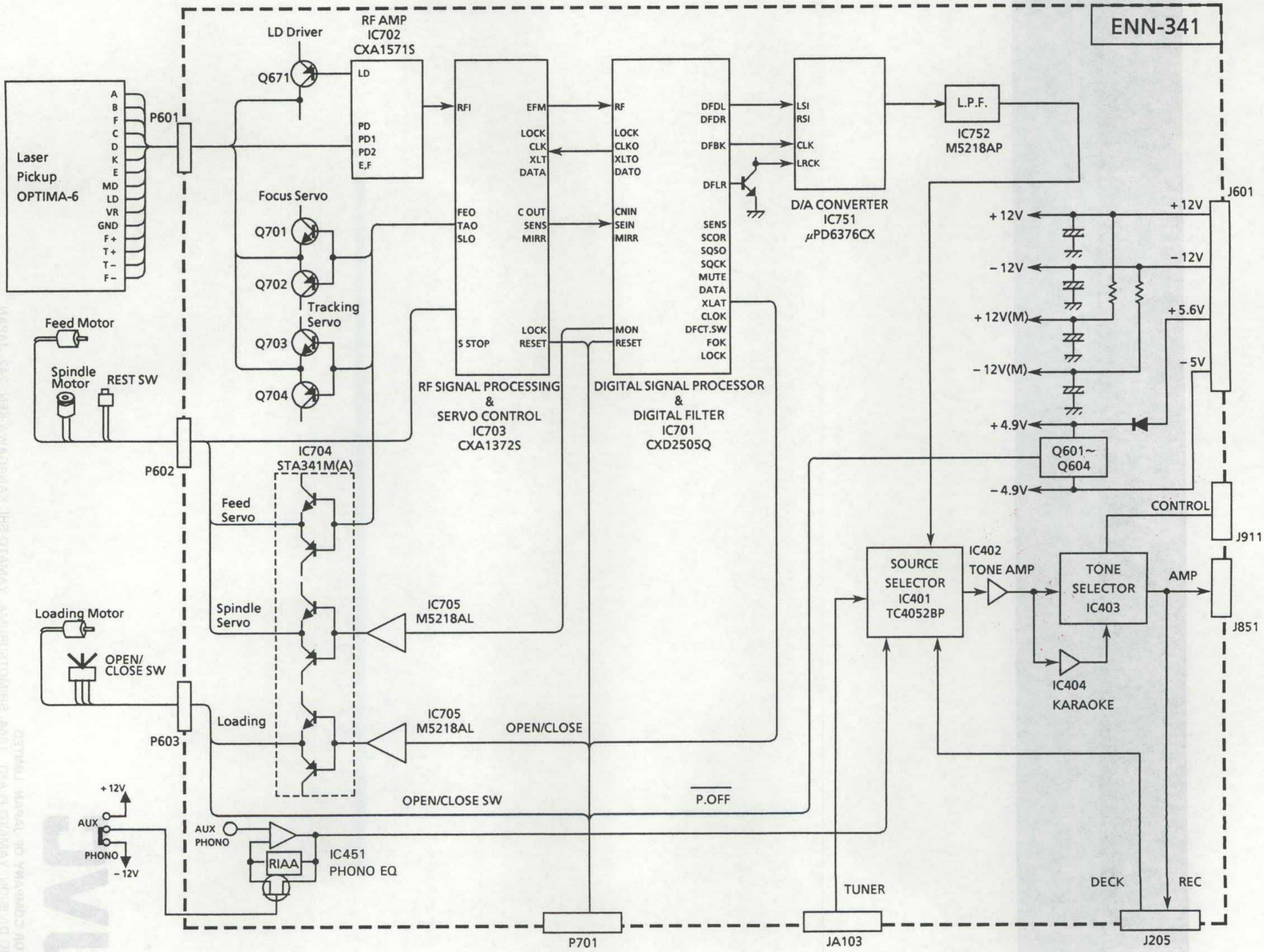
Spindle section



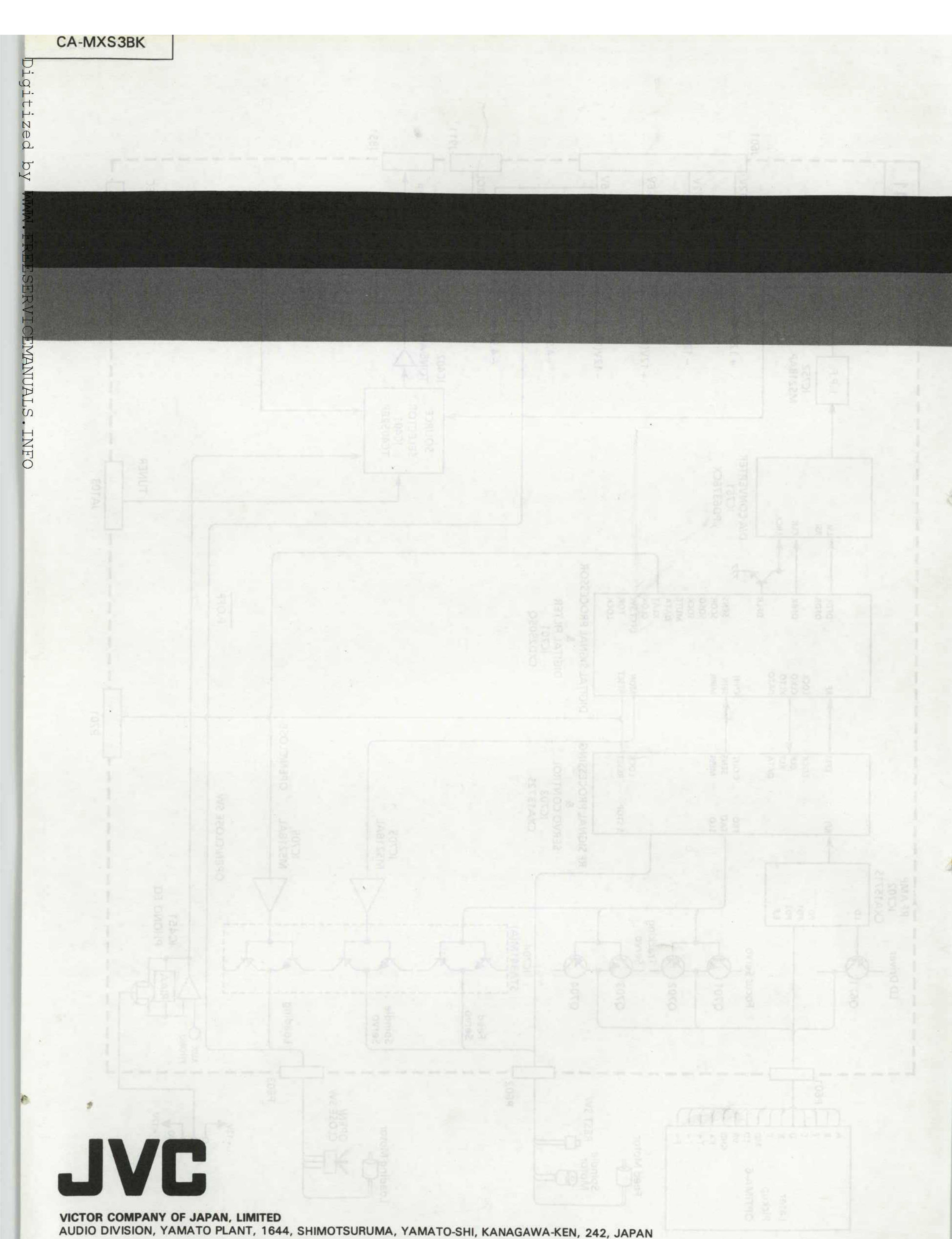








CA-MXS3BK



JVC

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PARTS LIST

Note : All printed circuit boards and its assemblies are not available as service parts.

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