

Philips Consumer Electronics

Technical Service Data

Service Solutions Group
Technical Publications Dept.
P.O. Box 555
401 East Old Andrew Johnson Hwy.
Jefferson City, TN 37760

Manual 1923

Model no.: FW890C
First Publish: 10-05-99
Rev. Date: 05-04-2001
Print Date: 5/4/2001

General Information

REFER TO SAFETY GUIDELINES

SAFETY NOTICE: ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

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GENERAL INFORMATION

PHILIPS



FW890P/37 Photograph

VERSION VARIATIONS

Type /Versions:	FW890P			FW898W
Features and Board used:	/21	/30	/37	/21
Aux. In	x	x	x	x
Line Out	x	x	x	x
Surround Out	x	x	x	x
Subwoofer Out	x	x	x	x
Digital Out	x	x	x	x
Matrix Surround				
CD Text				
Dolby B				
RDS				
News				
Dolby Prologic (DPL)	x	x	x	x
Karaoke Features	x	x	x	x
Voltage Selector	x			x
Low Power Standby / LED			x	
Tuner board - ECO5 Sys	x	x	x	x
Tuner board - Tuner 95				
Surround Loudspeakers	x	x	x	
Wireless Surround System (FB217W/21)				x

SPECIFICATIONS

GENERAL

AC Input voltage:	100V for /26
	110-127V/220-240V Switchable for /21/21M
	120V for /37
	220V for /33
	220-230V for /22/34
	230V for /25
	230-240V for /30

AC Input frequency: 50/60Hz
Power consumption: < 20W at Standby
< 170W at 1/8 rated power out
Clock accuracy: < 4 seconds per day
Dimension center unit: 265 x 310 x 390mm

TUNER

FM

Tuning range: 87.5-108MHz
65.81-74MHz for /34
Grid: 50kHz (& 30kHz for /34)
IF frequency: 10.7MHz \pm 25kHz
Aerial input: 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N: < 7 μ V
Selectivity at 600kHz bandwidth: > 50dB
Image rejection: > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz: < 3% [< 2%]
-3dB Limiting point: < 7 μ V
Crosstalk at RF=1mV, dev. 40kHz: > 18dB [> 26dB]

AM

Tuning range: 531-1602kHz
530-1700kHz for /21/21M/37
Grid: 9kHz
10kHz for /21/21M/37
IF frequency: 450kHz \pm 1kHz
Aerial input: Frame aerial
Sensitivity at 26dB S/N: < 4.0mV/M
Selectivity at 18kHz bandwidth: > 18dB
IF rejection: > 45dB
Image rejection: > 28dB
Distortion at RF=50mV, m=80%: < 5% [< 7%]

LW

Tuning range: 153-279kHz
Grid: 3kHz
IF frequency: 450kHz \pm 1kHz
Aerial input: Frame aerial
Sensitivity at 26dB S/N: [< 7.0mV/M]
Selectivity at 18kHz bandwidth: [> 24dB]
IF rejection: [> 26dB]
Image rejection: [> 35dB]
Distortion at RF=50mV, m=80%: [< 7%]

AMPLIFIER

Output power (6ohm, 1kHz, 10% THD)
L & R: 2 x 120W

Surround: 2 x 20W
Center: 40W

Frequency response within -3dB: 60Hz-16kHz
Dynamic Bass Boost: BEAT, PUNCH, BLAST, DBB OFF 1)
Dynamic Sound Effect (DSE): SURF, STROBE, PAN, HOLD
Digital Sound Control (DSC):
Optimal, Classic, Techno, Jazz, Rock, Vocal 1)
Virtual Environmental Control (VEC):
Hall, Disco, Concert, Club, Cinema, Arcade

Headphone output at 32 ohm: 15mW ± 2dB

Input sensitivity
Aux. in: 500mV ± 2dB at 1 kohm
Output sensitivity
Line out: 440mV ± 2dB at 22 kohm
Subwoofer out (max. vol.): 1.5V ± 2dB at 22 kohm
Surround out: 350mV ± 2dB at 22 kohm

CASSETTE RECORDER

Number of tracks: 2 x 2 stereo
Tape speed: 4.76 cm/sec ±2%
1.6 x 4.76 cm/sec
Wow and flutter: < 0.4% (DIN)
Fast-wind/Rewind time C60: 130 sec
Bias system: 75kHz ± 10kHz
Rec/Pb freq. response within 8dB: 80Hz - 12.5kHz
Signal to noise ratio (IEC I): > 44dB
Signal to noise ratio (IEC II): > 47dB

COMPACT DISC

Measurement done at output conn. of the CDC module.
Frequency response within ± 1.5dB: 20Hz - 20kHz
Output level (in Vrms): 550mV ± 1dB unloaded
Signal/Noise ratio (A-weighted): > 80dBA
Distortion at 1kHz: < 0.5%
Channel difference at 1kHz: < 1dB
Channel crosstalk at 1kHz: > 60dB
De-emphasis: 0 or 15/50 mS (Switched by subcode on the disc)

[...] Values indicated are for "Tuner 95 Board" only

1) Frequency response in each setting is software controlled.

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO ₂	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1M Ω)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

WARNING

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

Warning !

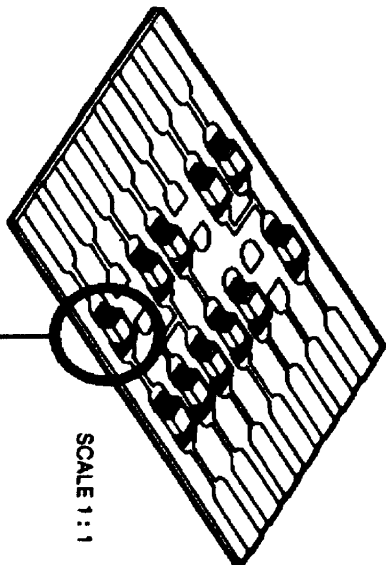
Invisible laser radiation when open. Avoid direct exposure to beam.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

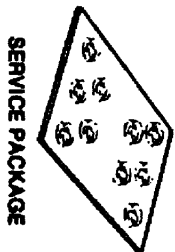
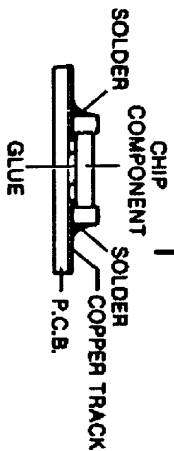
Handling Chip Components

HANDLING CHIP COMPONENTS

GENERAL

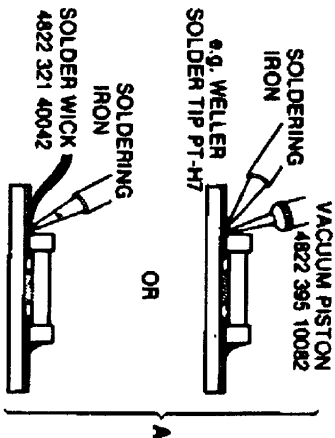


SCALE 1:1

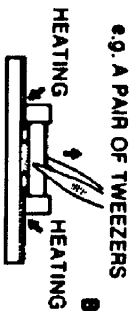


SERVICE PACKAGE

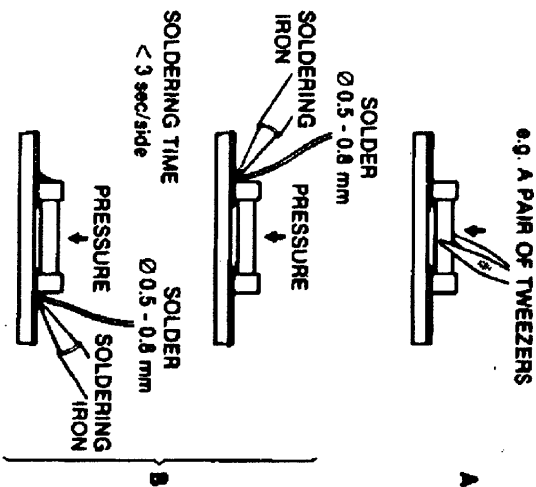
DISMOUNTING



OR

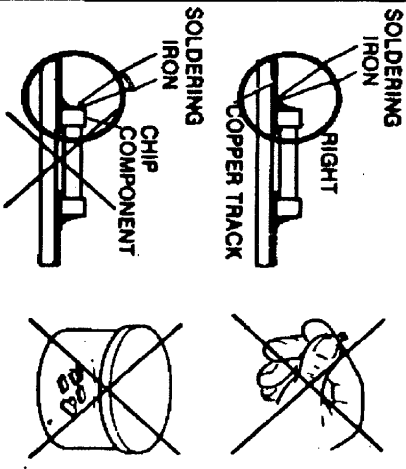


MOUNTING

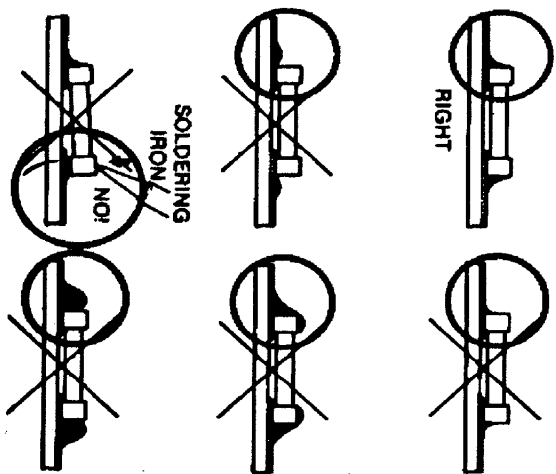


SOLDERING TIME < 3 sec/side

PRECAUTIONS



EXAMPLES



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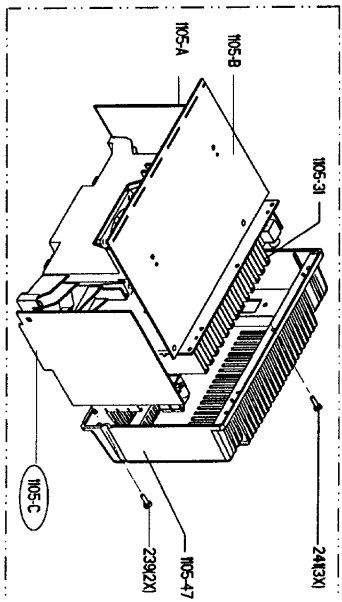
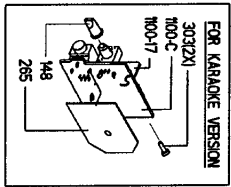
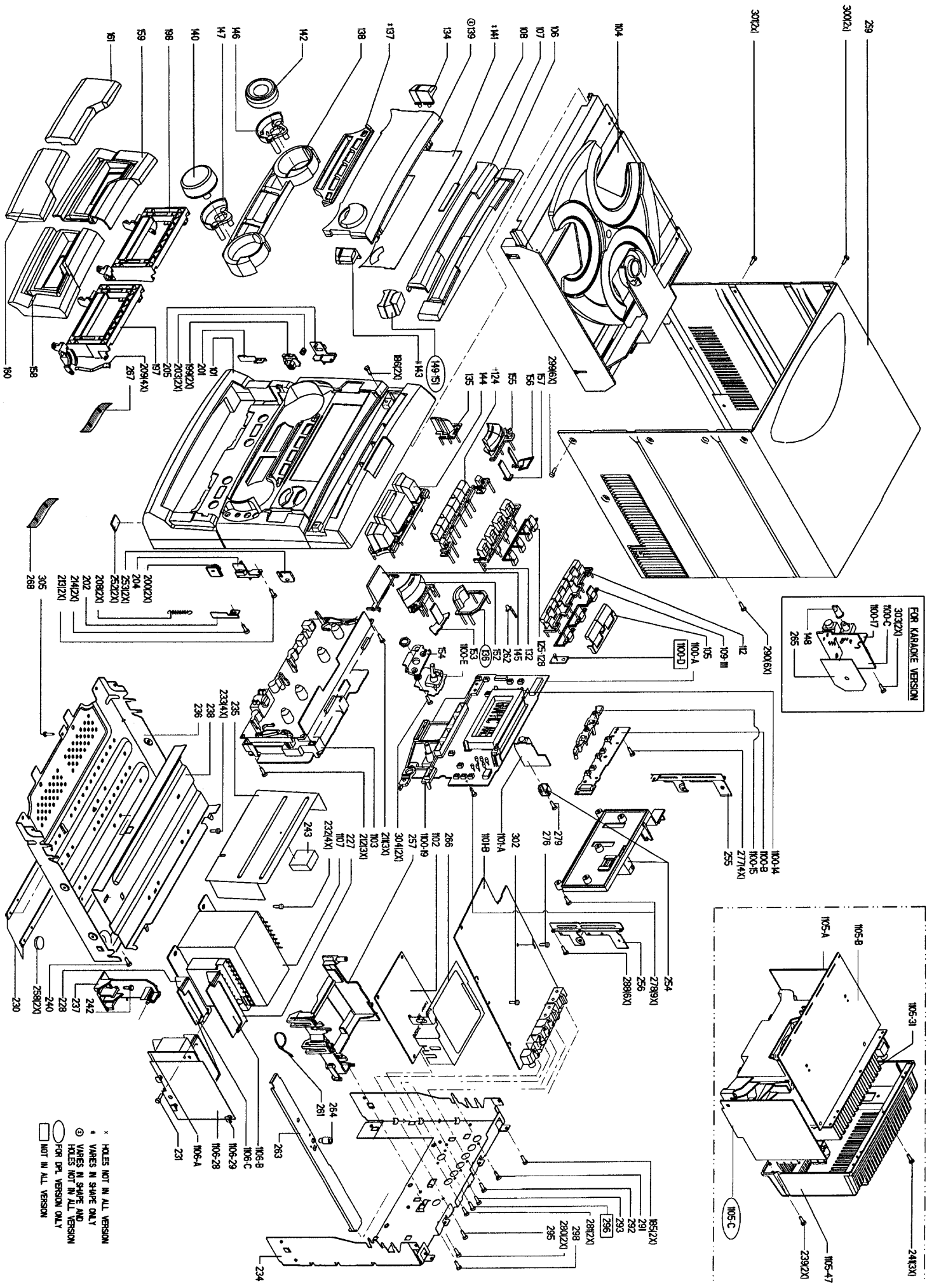
Mechanical Diagrams

REFER TO SAFETY GUIDELINES

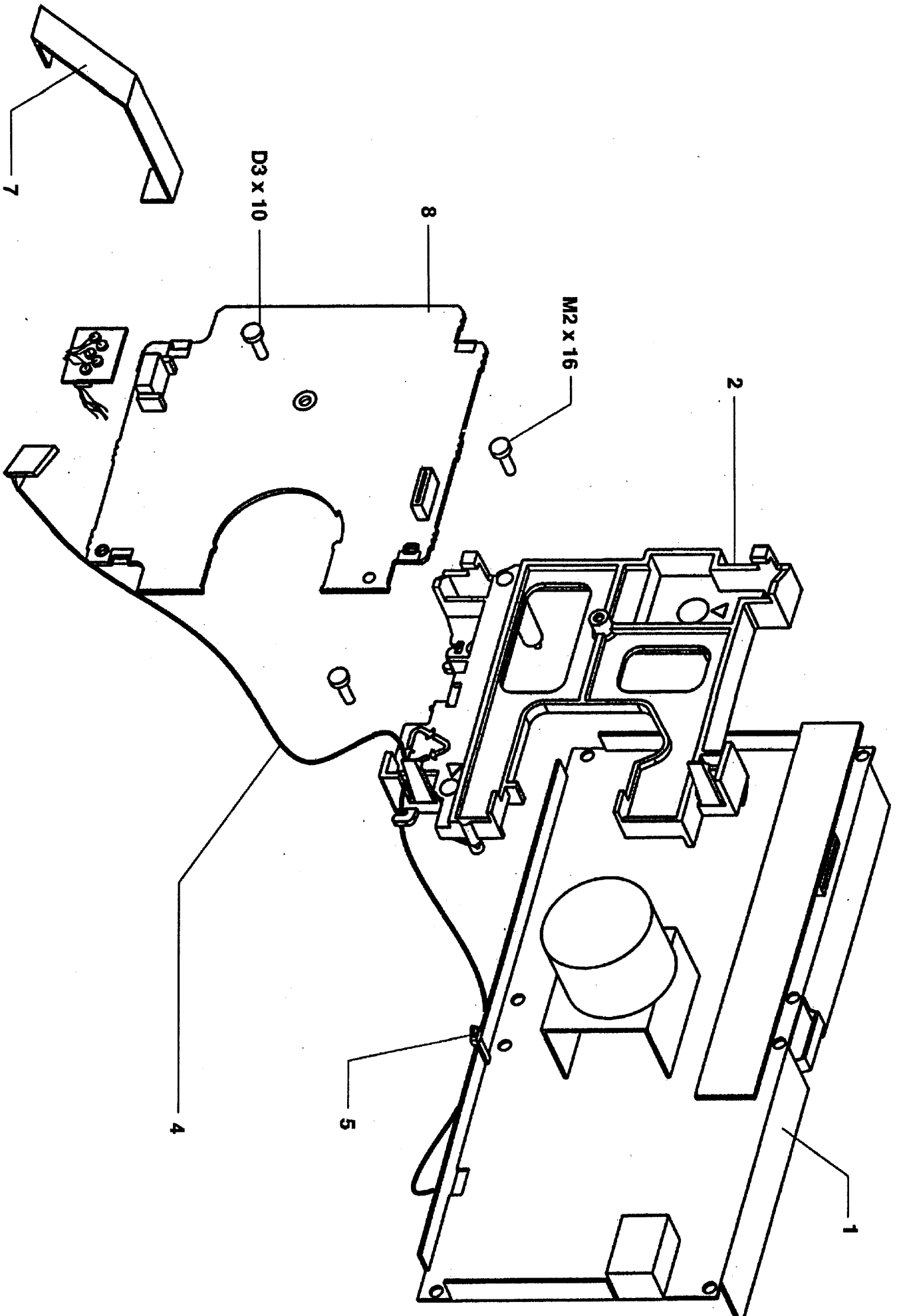
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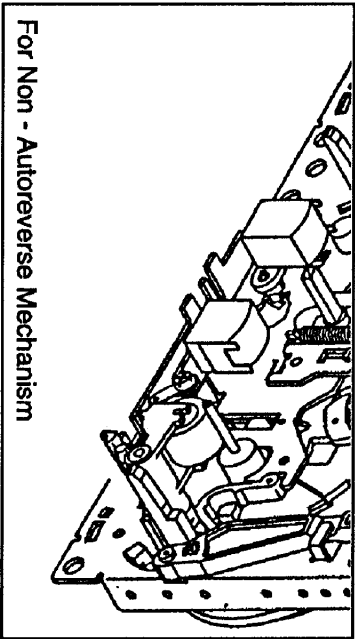
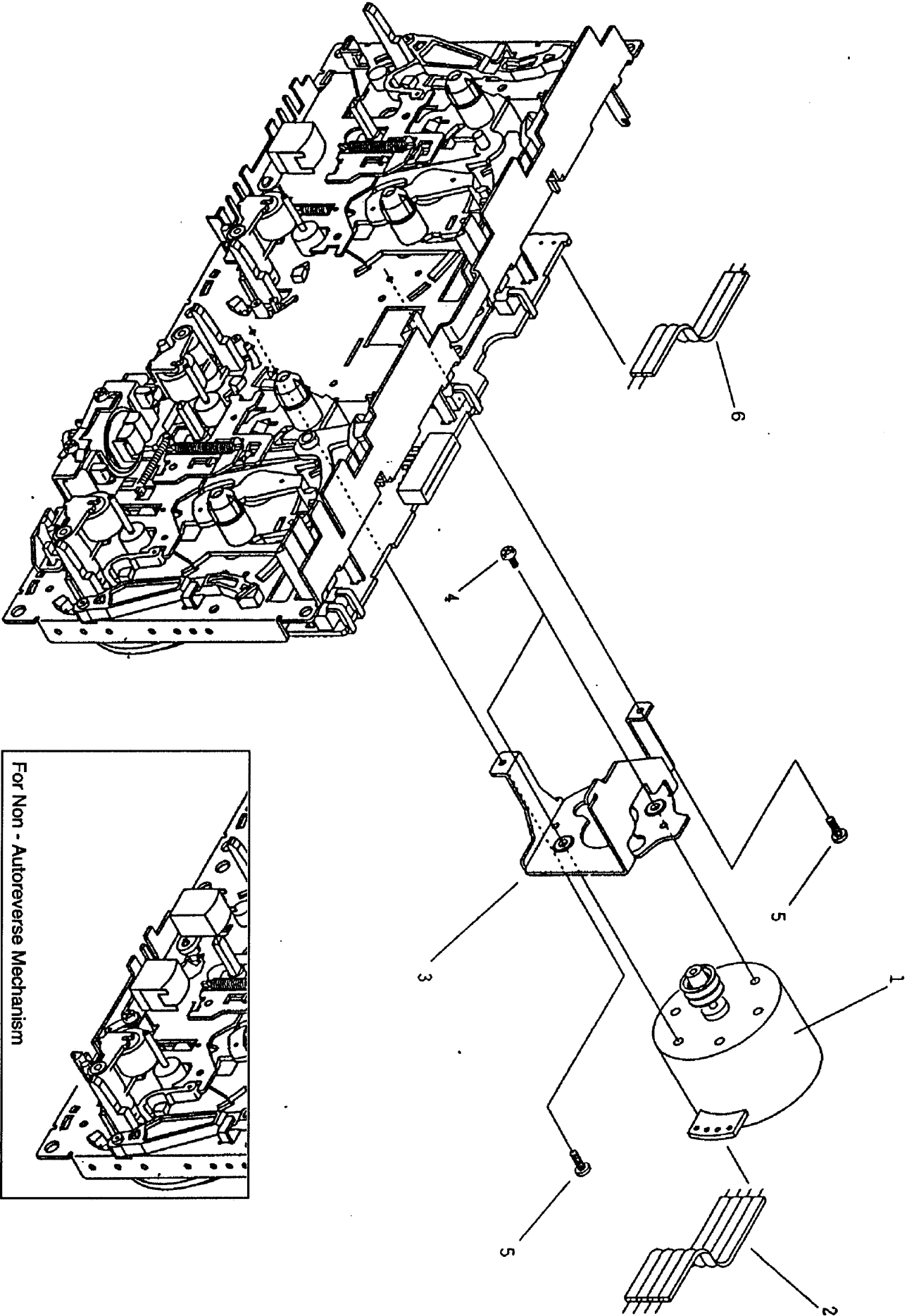
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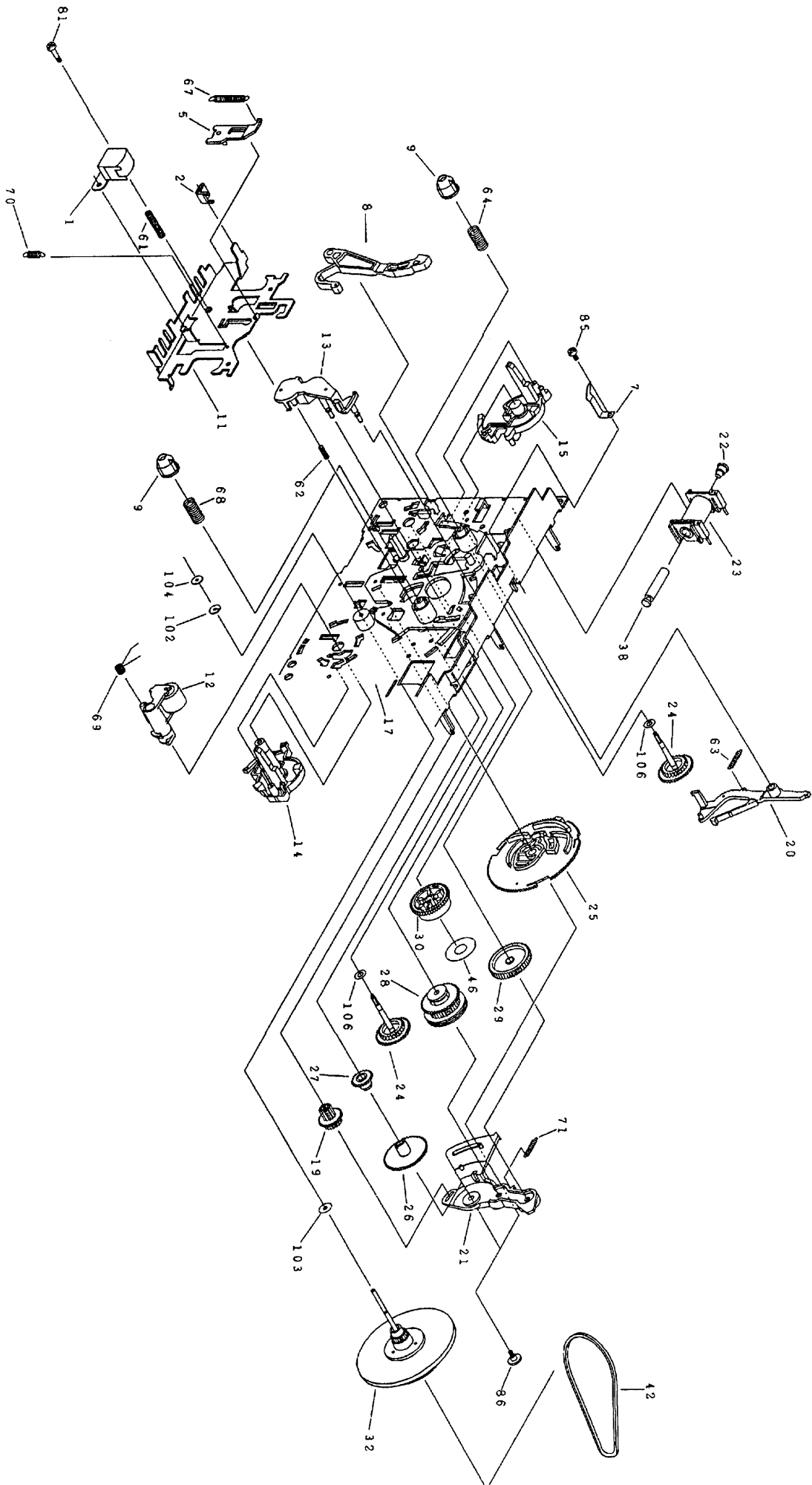
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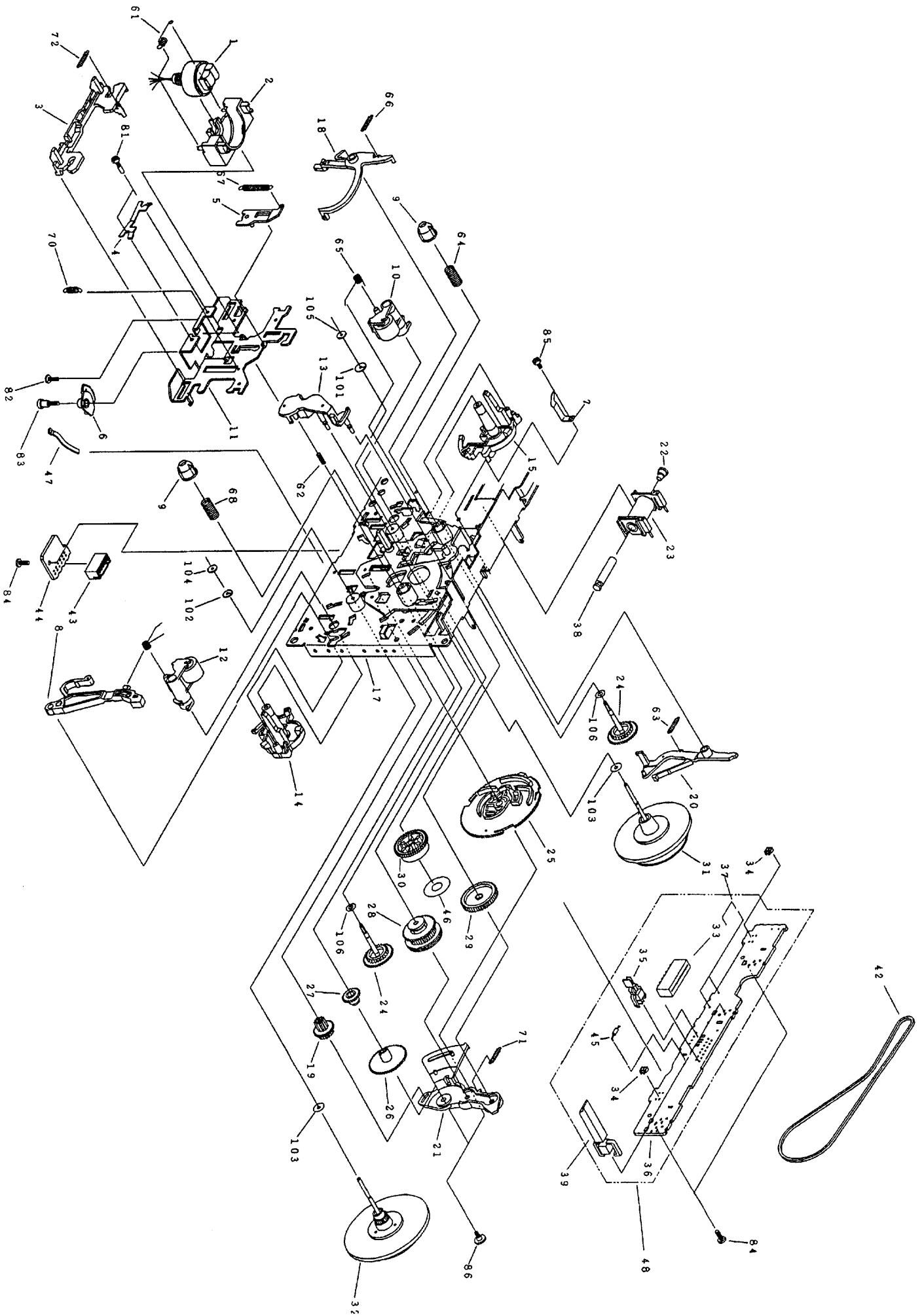


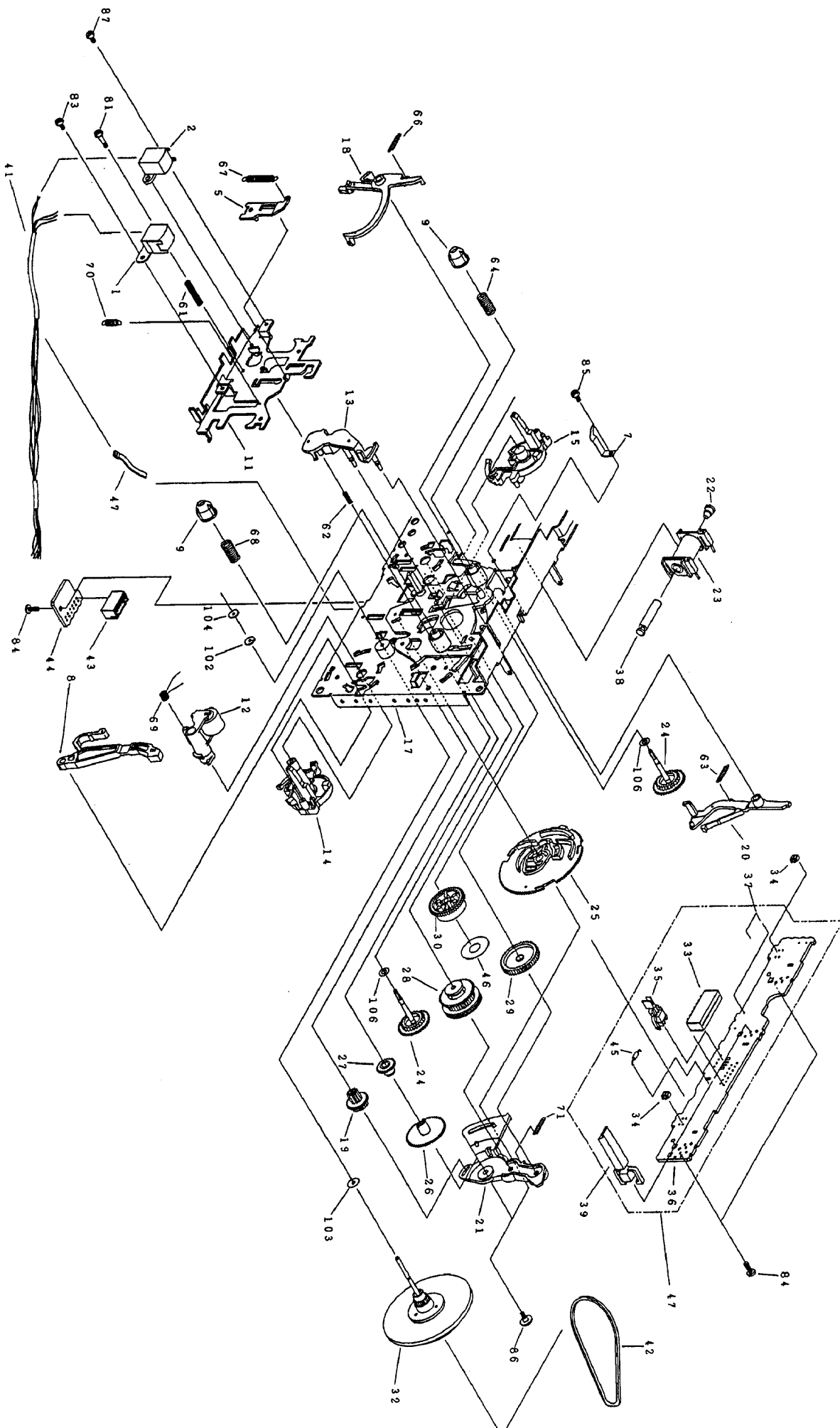
* HOLES NOT IN ALL VERSION
 † VARIES IN SHAPE ONLY
 ⊙ VARIES IN SHAPE AND HOLES NOT IN ALL VERSION
 □ FOR DPA VERSION ONLY
 ○ NOT IN ALL VERSION

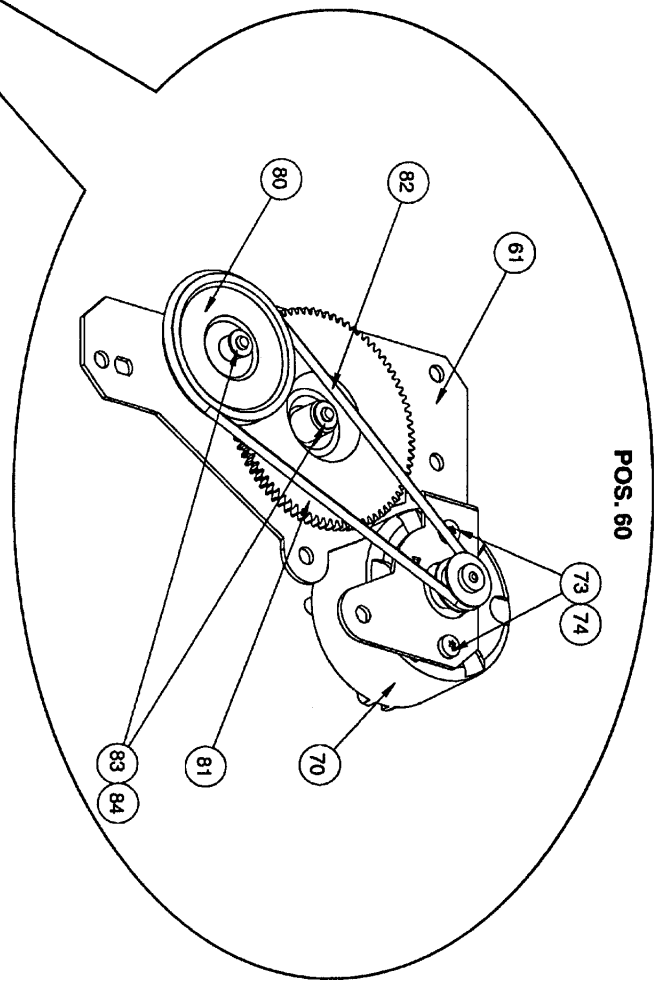
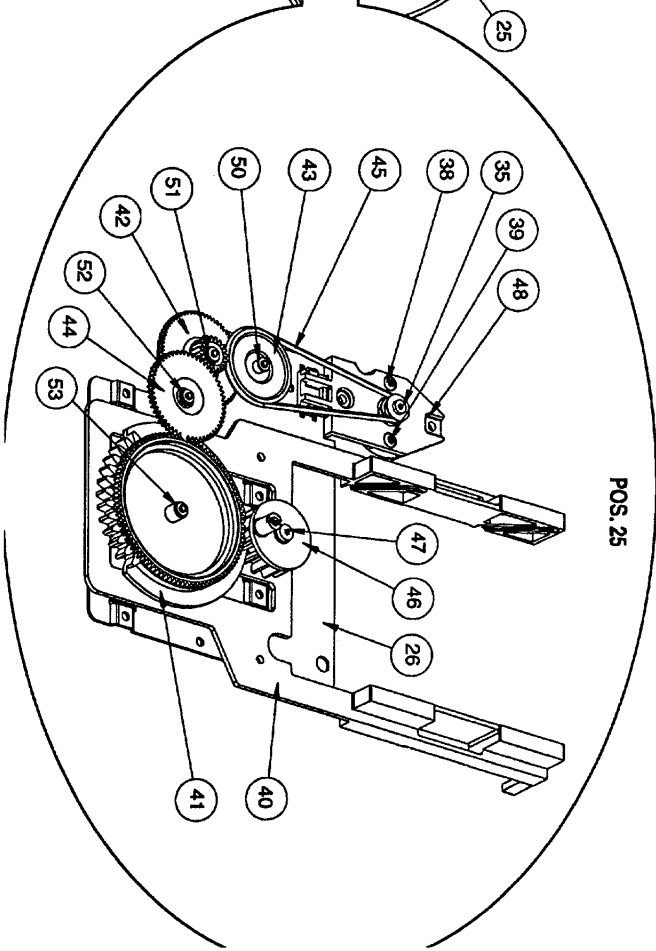
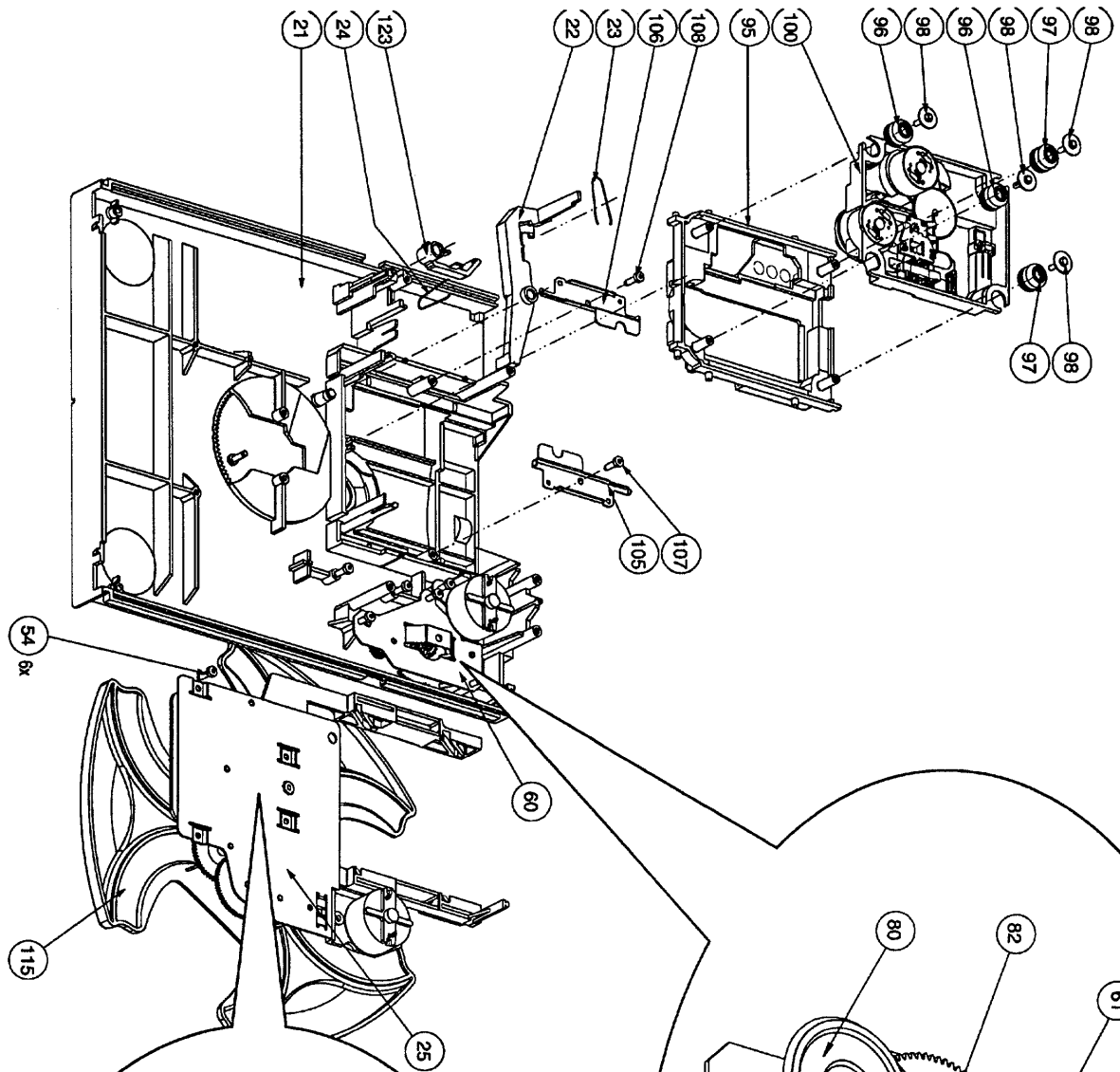


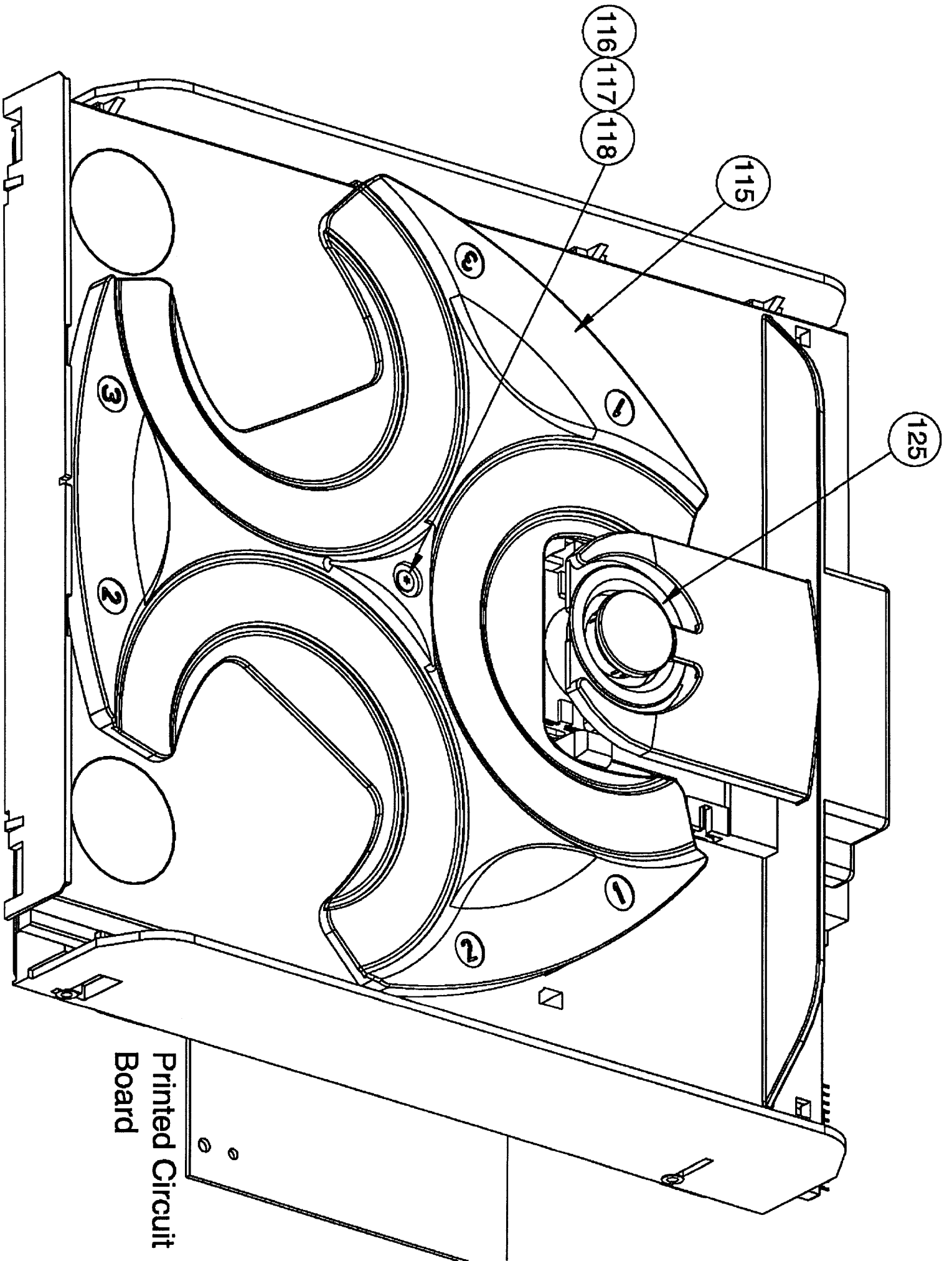


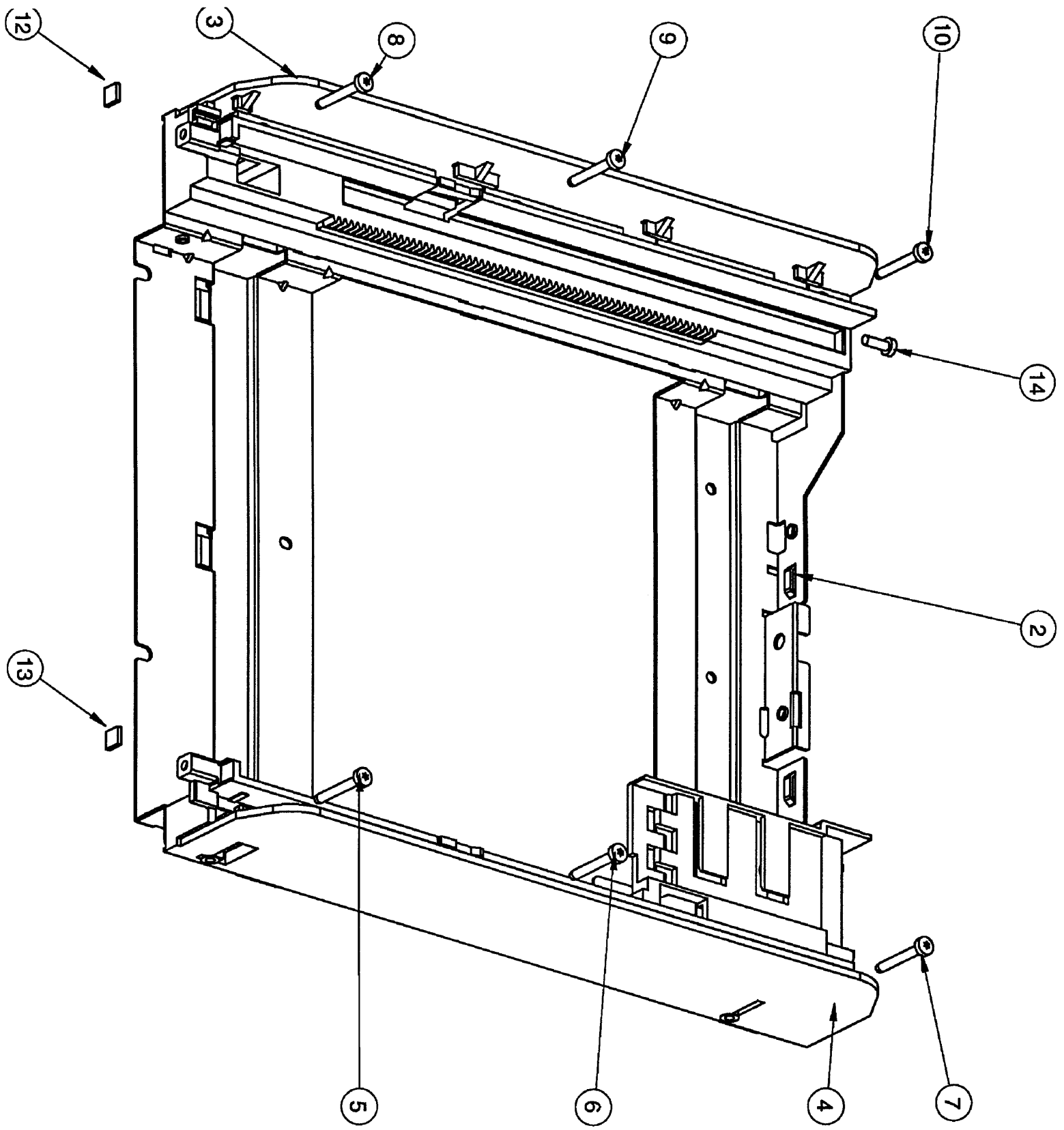


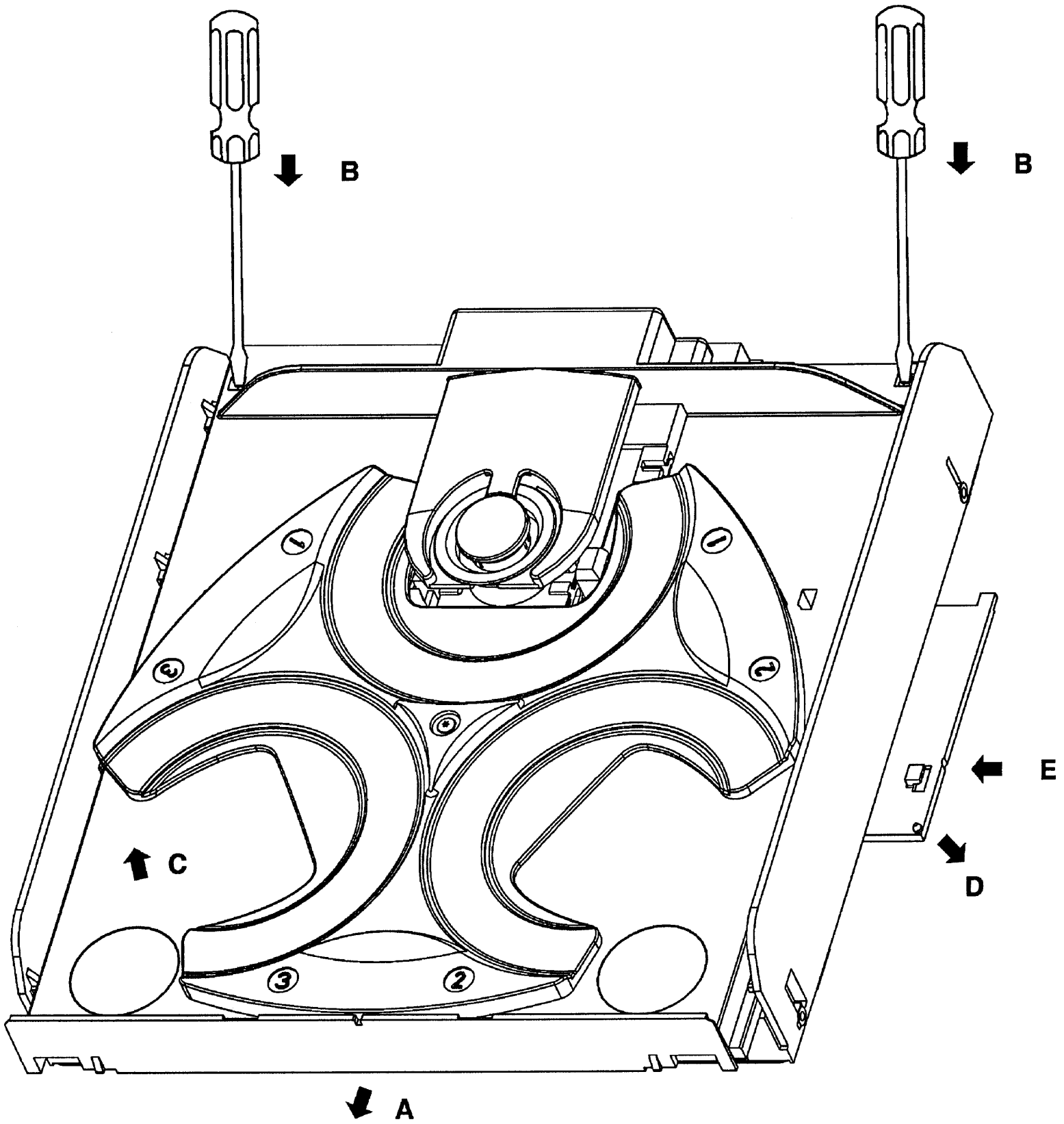


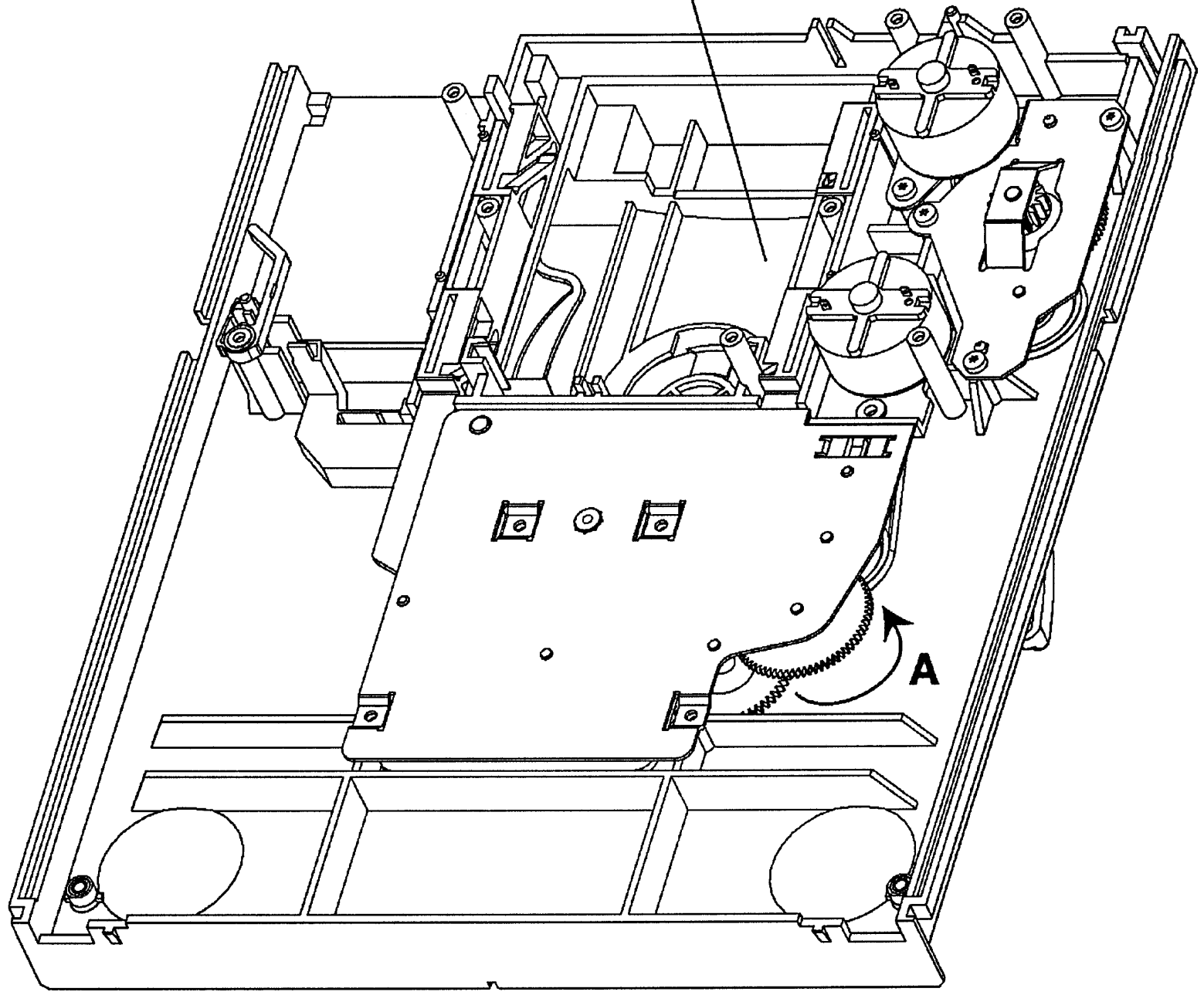
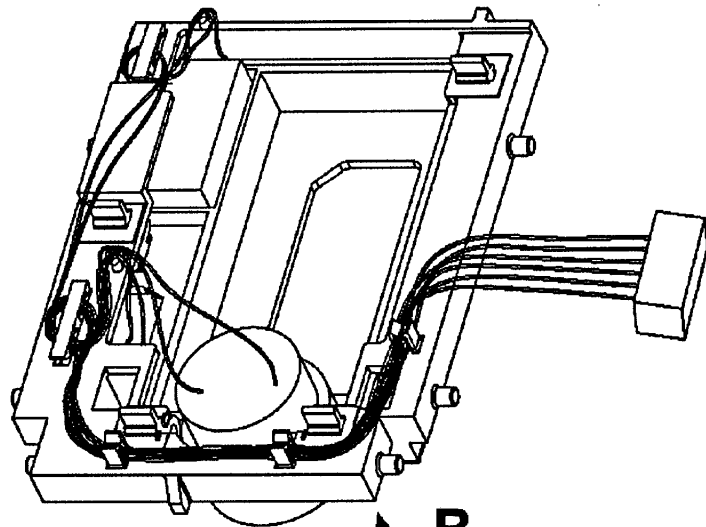


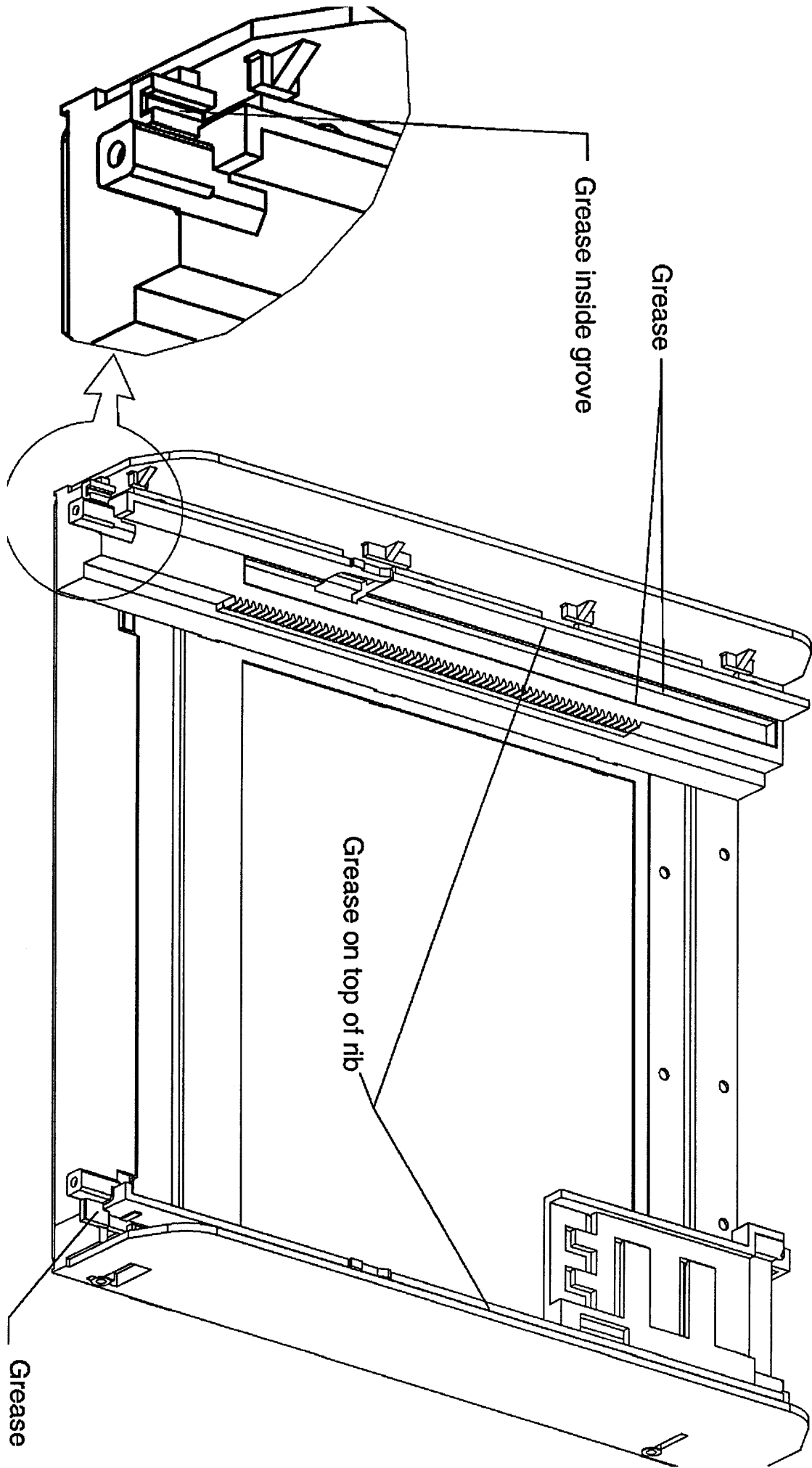










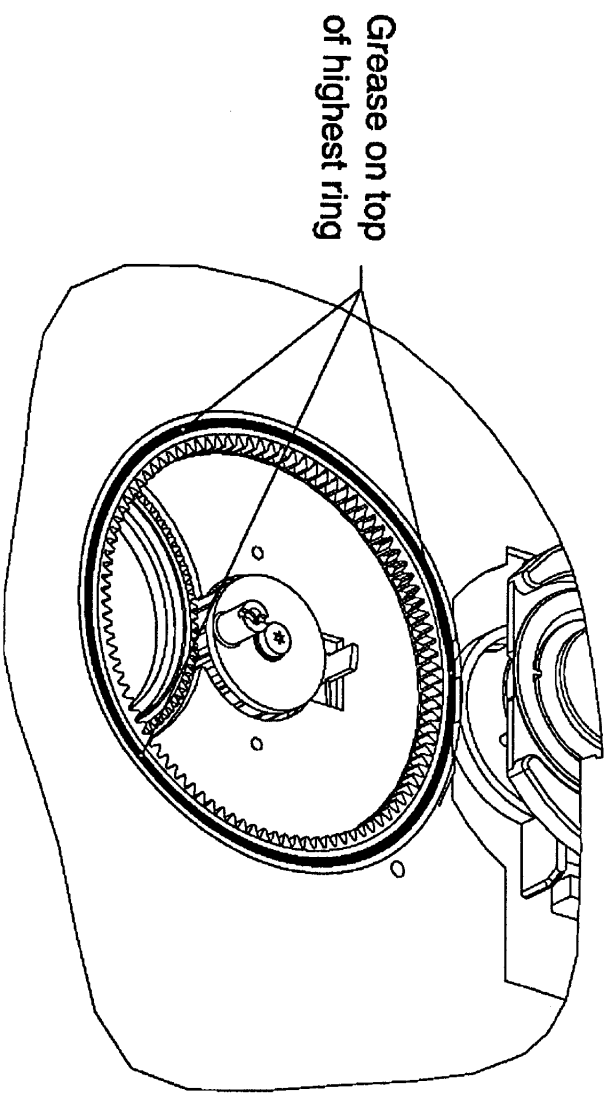
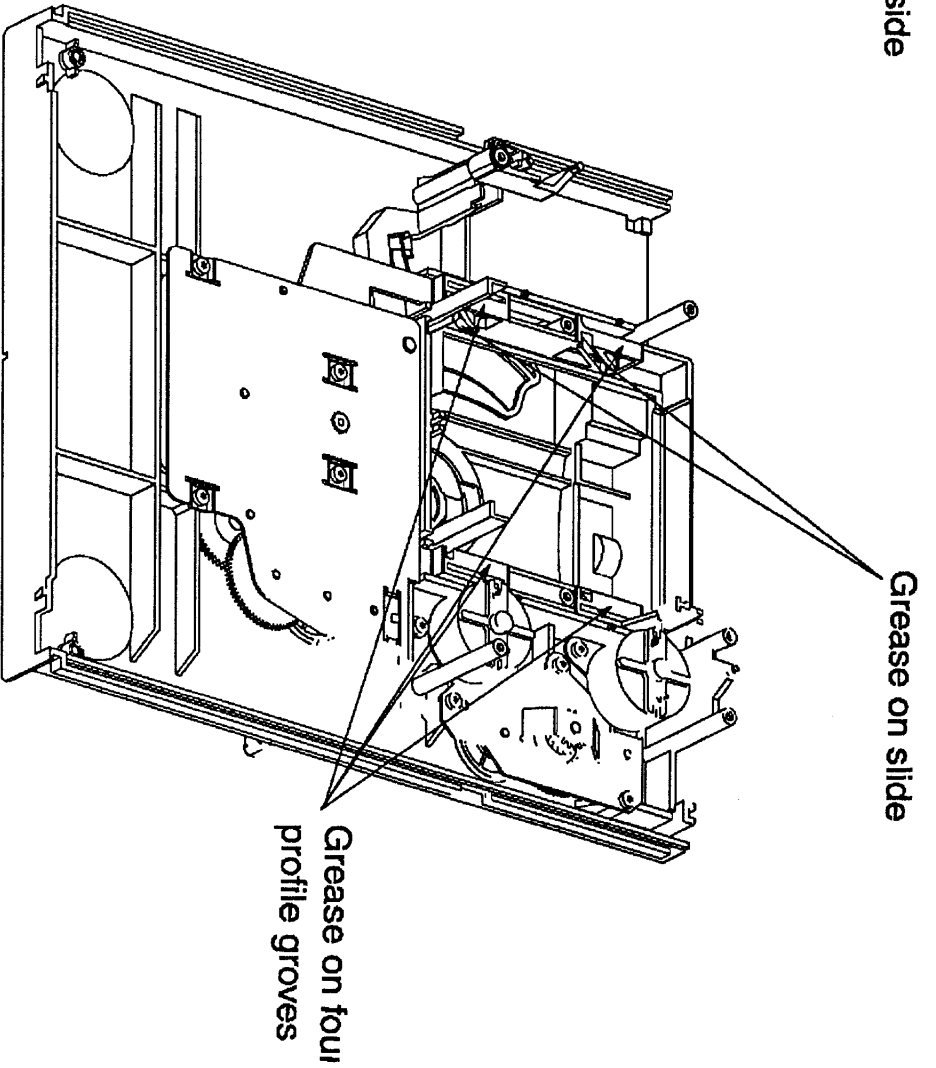
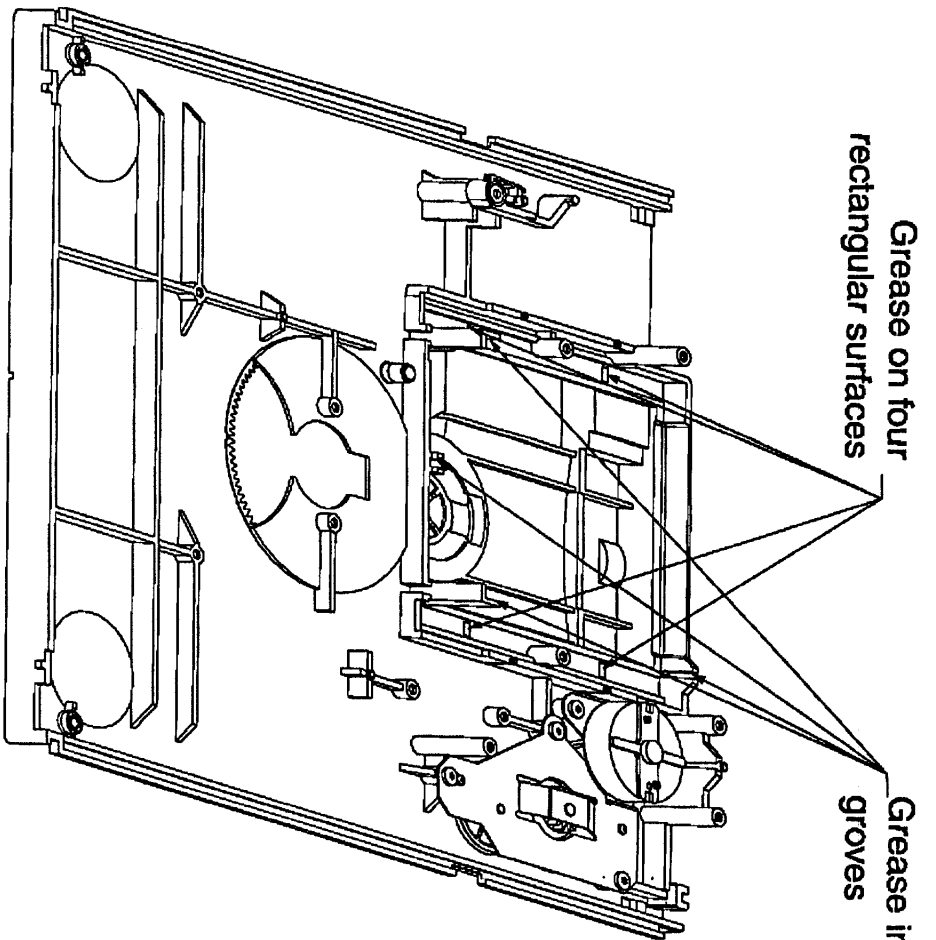


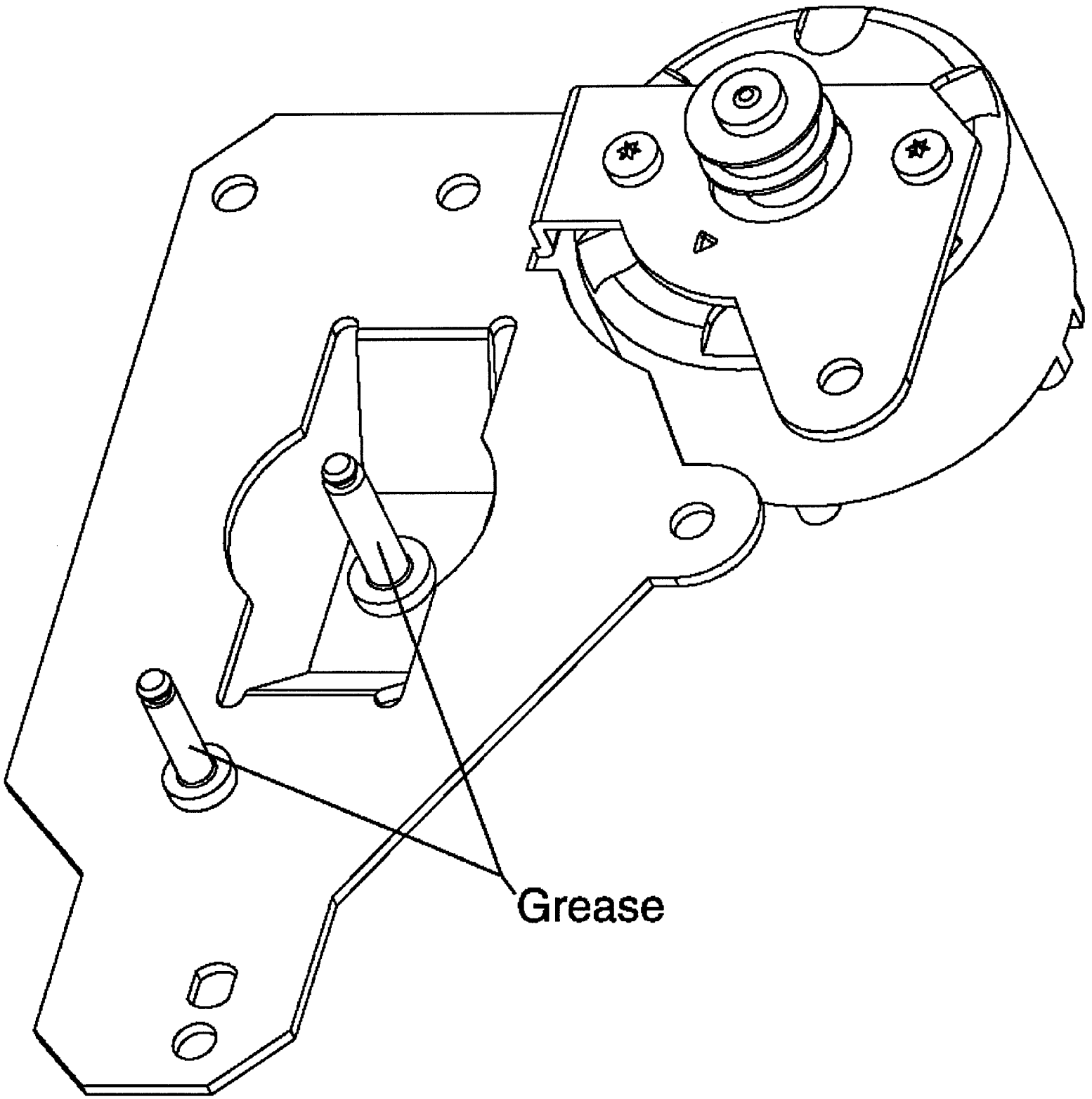
Grease inside groove

Grease

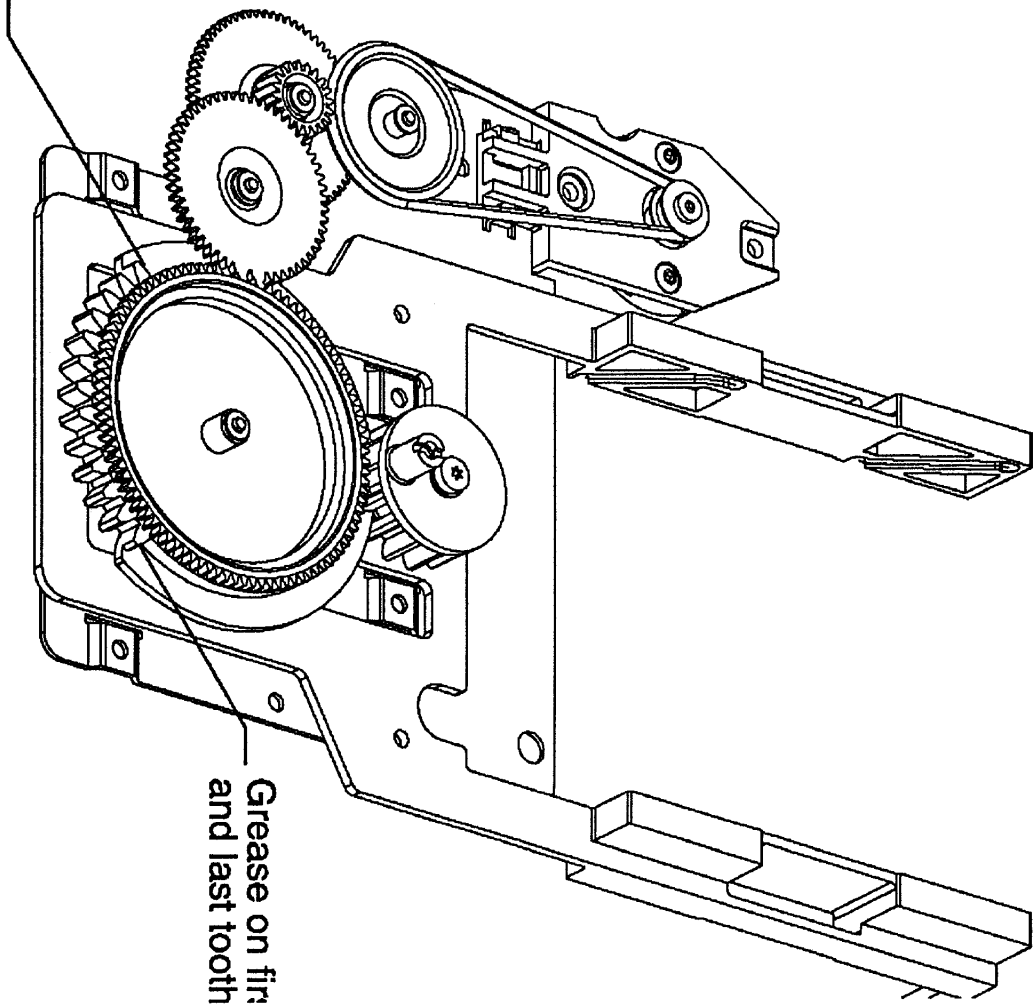
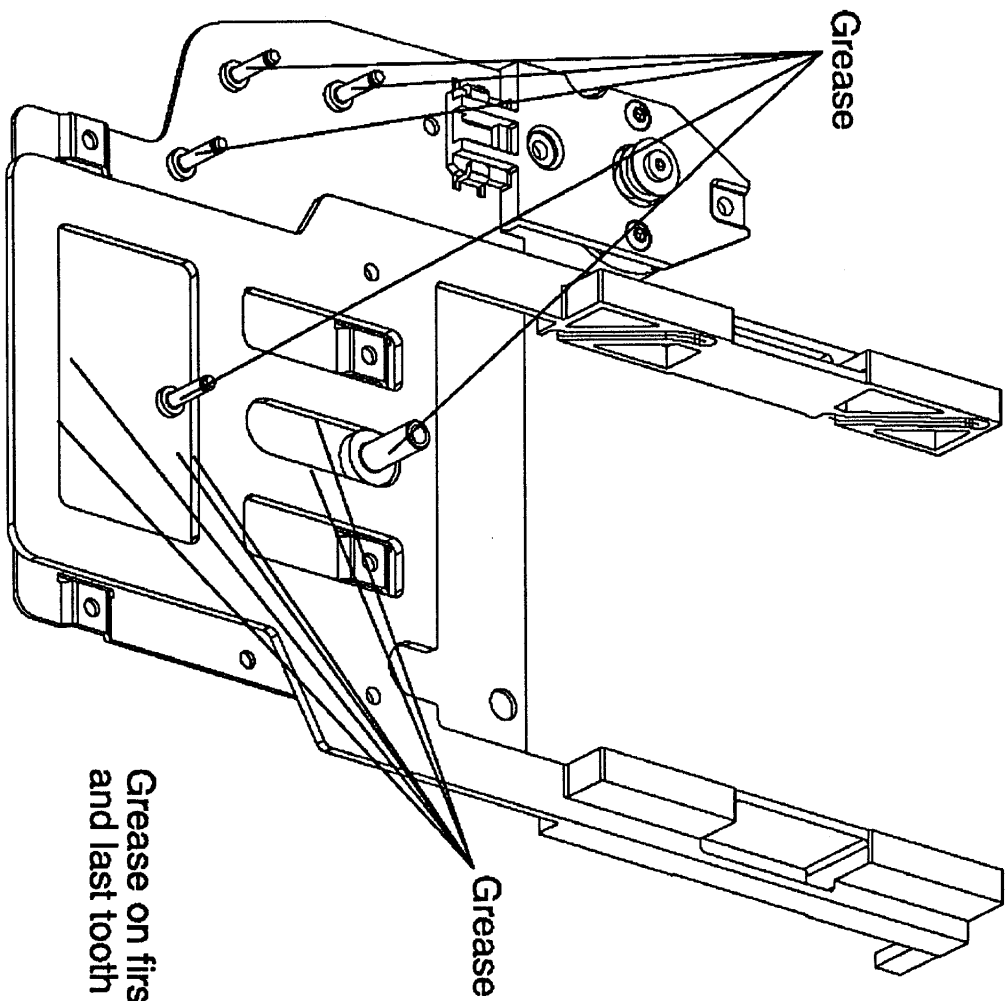
Grease on top of rib

Grease





Grease



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Mechanical Assembly

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DISASSEMBLY INSTRUCTIONS

Dismantling the Cassette Cover

Remove Cassette Door

Cassette Door

Dismantling the CDC Module and Front Panel

Note: Position (pos.) numbers below refer to the Cabinet Exploded View

- 1) Loosen the 16 screws to remove the Cabinet Rear (pos. 259) of the set:
 - 5 screws each on the left side and right side of the Cabinet Rear.
 - 6 screws at the back of the Cabinet Rear.
- 2) Slide out the CDC tray and remove the Cover CDC (pos. 106) as indicated.

Remove Cover CDC

- 3) Loosen 2 screws A and 2 screws B to remove the CDC Module (pos. 1104) as indicated.

Remove CDC Module

- 4) Remove 6 screws J as indicated to loosen the AF Board (pos. 1101-B) and 1 screw Q as indicated to loosen the Bar Tuner (pos. 263). (See Plate Rear and Power Module procedure and photos.)
- 5) Remove 1 screw (pos. 305) at the bottom to separate the Front Panel Assembly from the Plate Bottom (pos. 236).

Front CDC

Dismantling the Front Board

Front Board Disassembly

- 1) Remove 1 screw C as indicated to loosen the Headphone Board (pos. 1101-A).

Remove Headphone Board

- 2) Remove 2 screws D as indicated to loosen the Karaoke Board (pos. 1100-C) for sets with karaoke.

Remove Karaoke Board

- 3) Remove 5 screws E as indicated to loosen the Plate Front (pos. 254).
- 4) Remove 4 screws F as indicated to loosen the Front Board (pos. 1100-A).

Dismantling the ETF Module

- 1) Remove 6 screws (3 screws G and 3 screws H) as indicated to loosen the ETF6 Module (pos. 1103).

ETF Module Disassembly

Dismantling Plate Rear and Power Module

- 1) Remove 6 screws J as indicated to loosen the AF Board (pos. 1101-B) and 1 screw Q as indicated to loosen the Bar Tuner (pos. 263).

Power Module Disassembly

Top View

- 2) Remove 4 screws K and unlatch M1 as indicated to loosen the Tuner Board (pos. 1102).
- 3) Remove 3 screws L and 1 screw N (if obstructed) and unlatch M2 as indicated to take out the Plate Rear (pos. 234).
- 4) Remove 2 screws P as indicated to free the Power Module (pos. 1105) from the Bottom Plate assembly.

Repair Hints

- 1) The Jog Rotary Control (pos. 142) can be removed by inserting a strong string into the slot and pulling it out in the direction as indicated. See picture 1.

Picture 1

- 2) During re-assembly of the set, care should be taken to dress all the flex cable wires properly to prevent any damage caused by any sharp metal edges or any other metal parts. See picture 2.

Picture 2

- 3) Due to the short flex cable wires in the ETF Module, the PC board should be disconnected and reconnected on the reverse side of the tape mechanism to keep it electrically connected during repair. See picture 3

Picture 3

- 4) During repair, it is possible to disconnect the Tuner board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

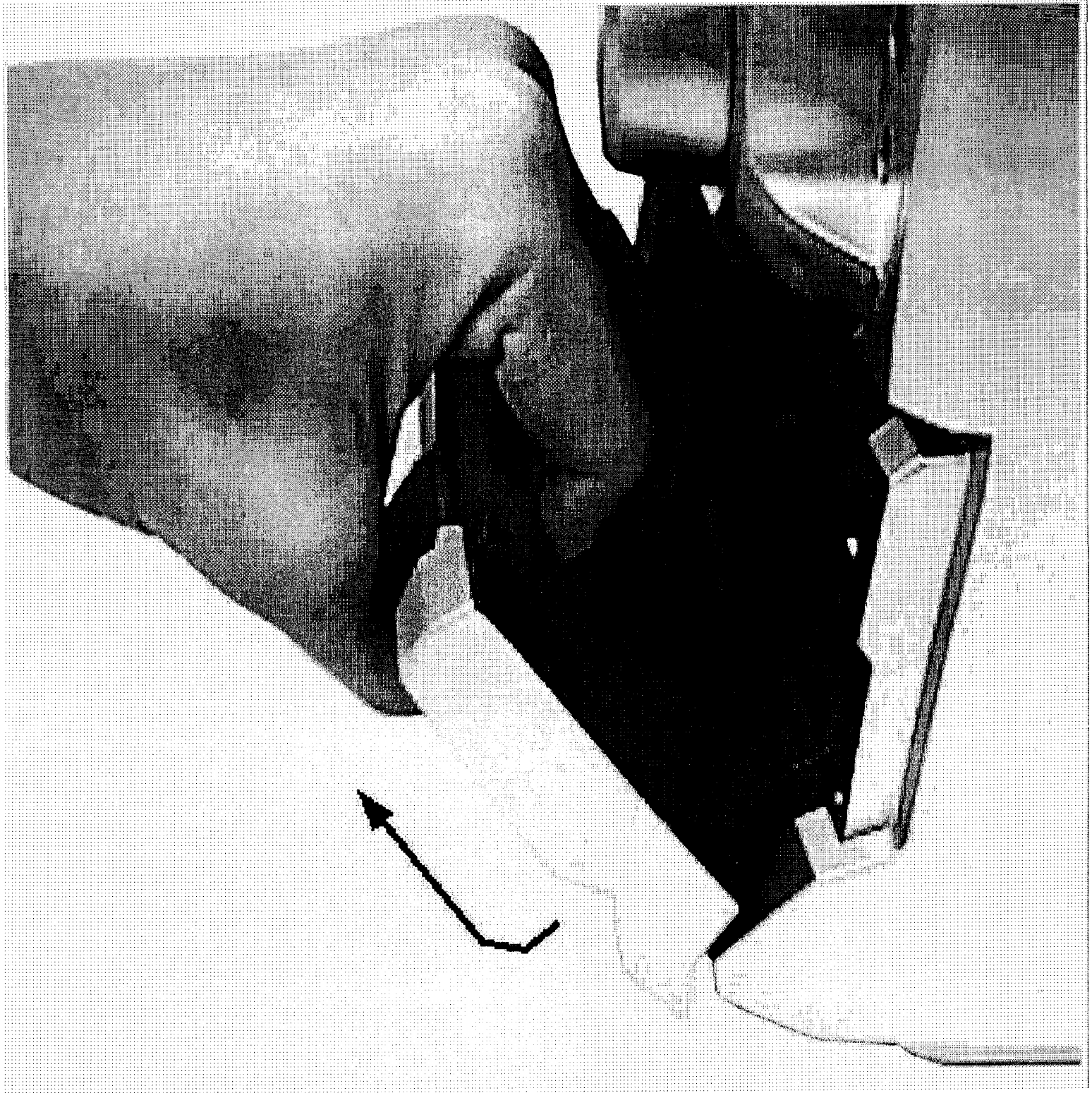
Service pos. A

Use an insulation sheet to prevent the AF board from being damaged or short-circuited to any metal parts.

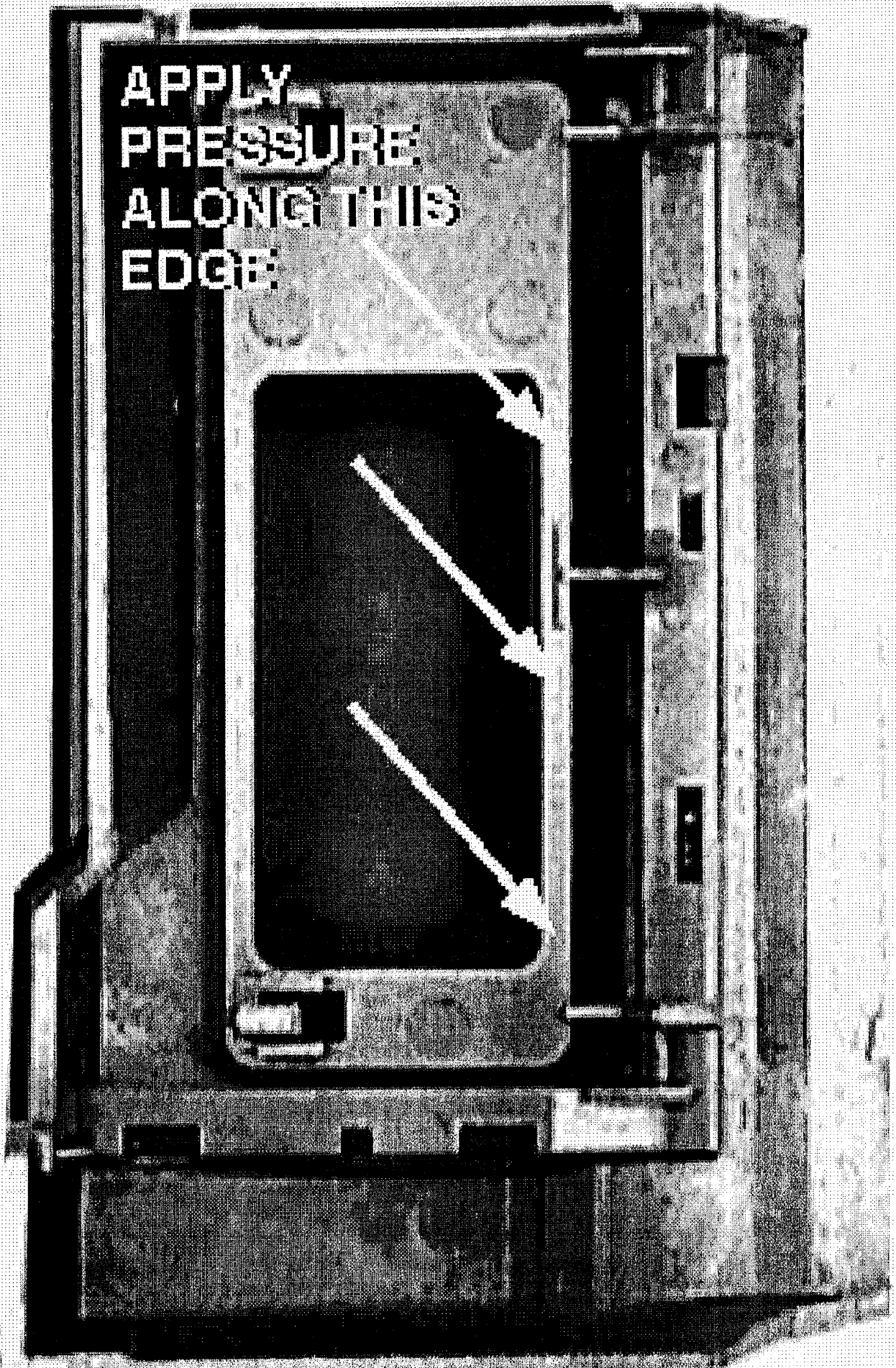
Service pos. B

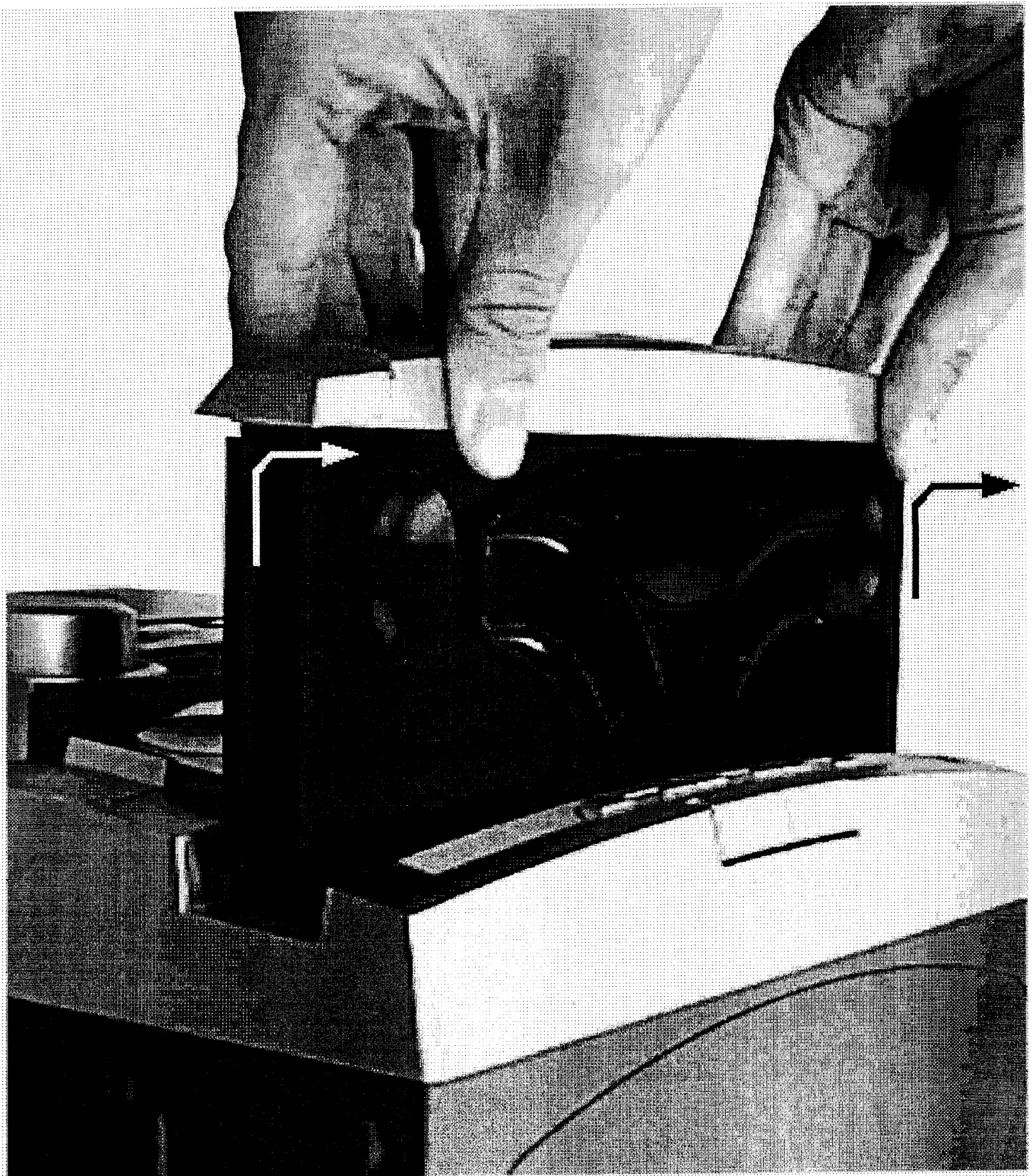
Use an insulation sheet to prevent the ETF board from being damaged or short-circuited to any metal parts.

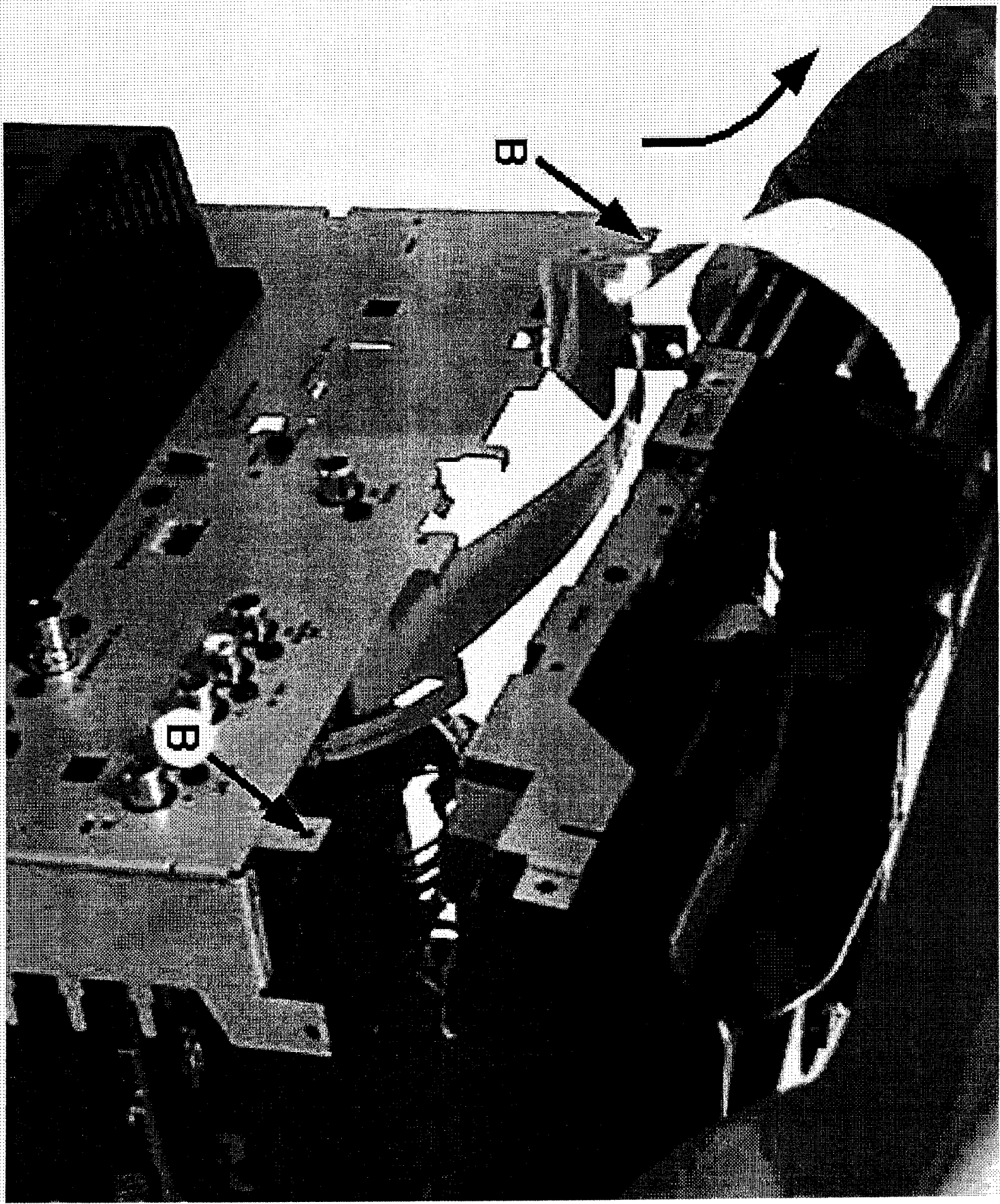
Service pos. C

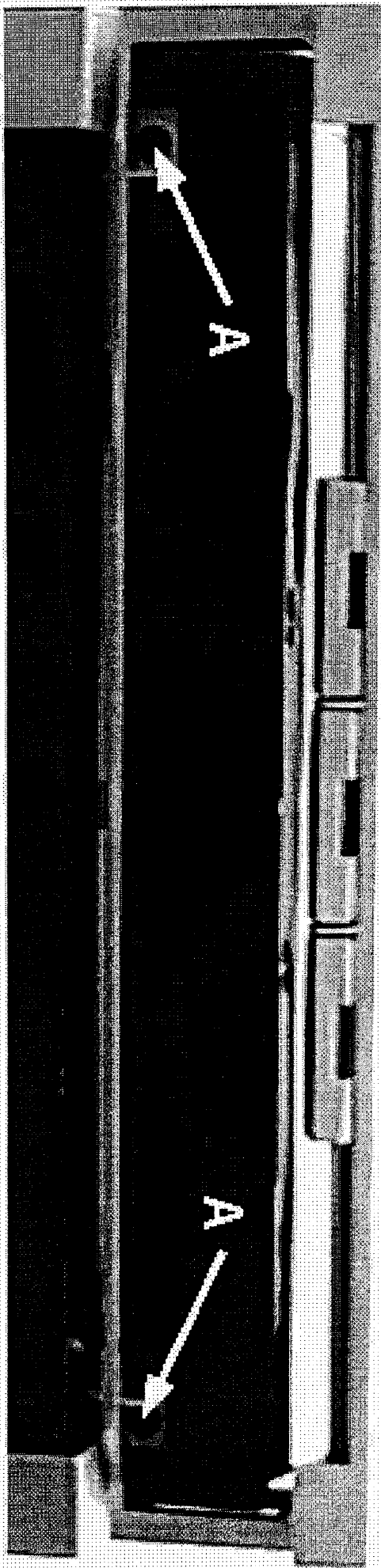


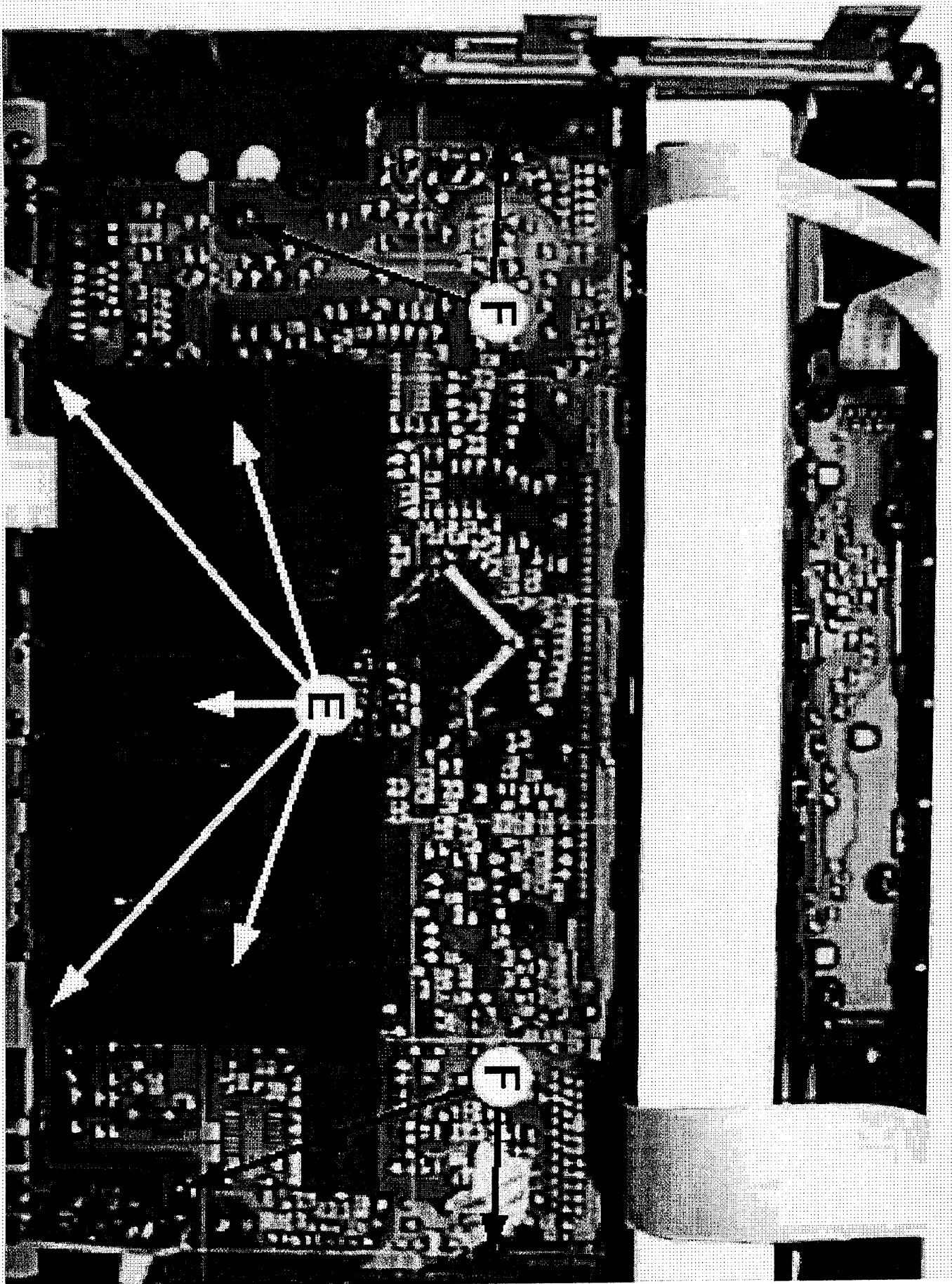
APPLY
PRESSURE
ALONG THIS
EDGE

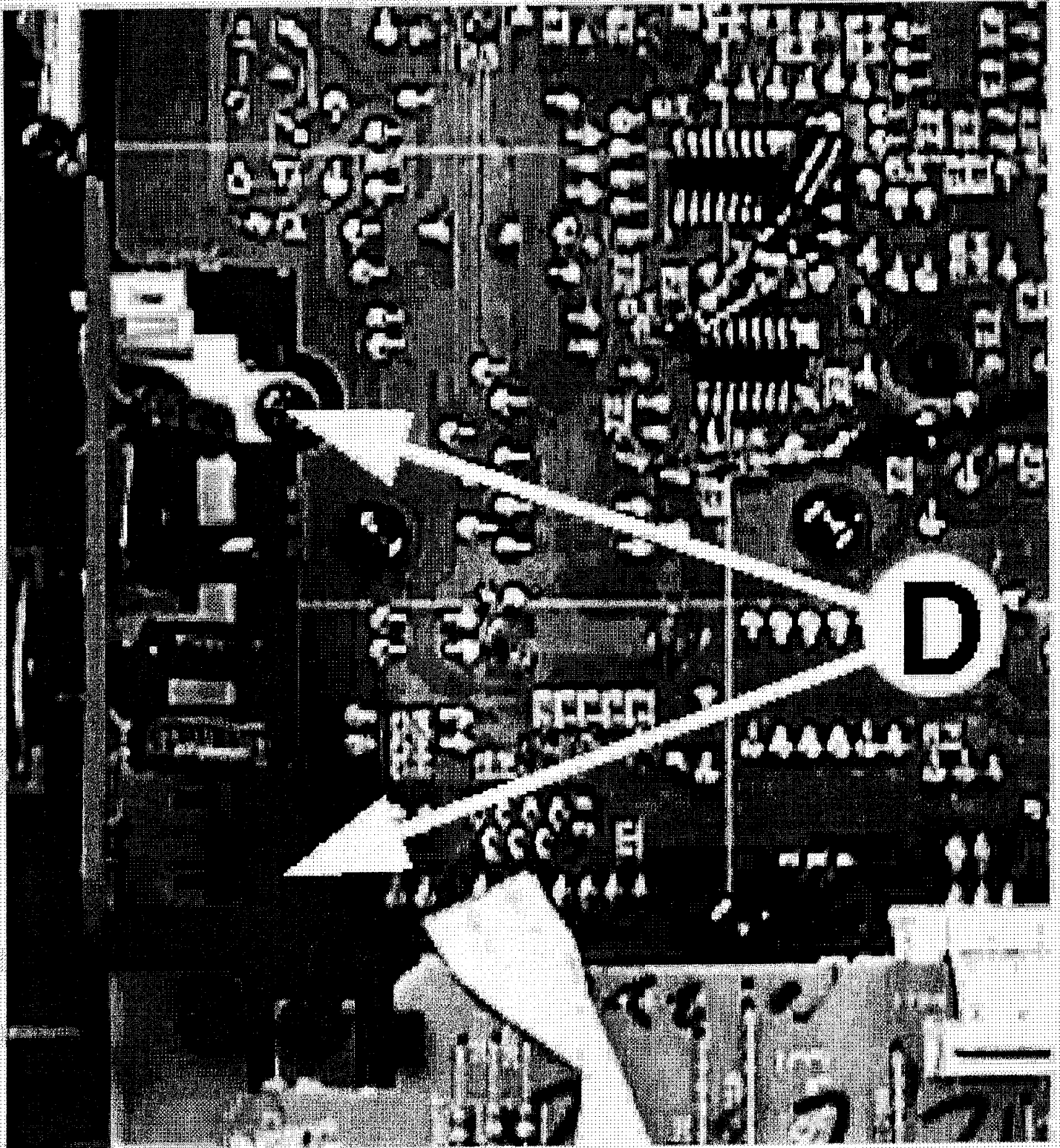


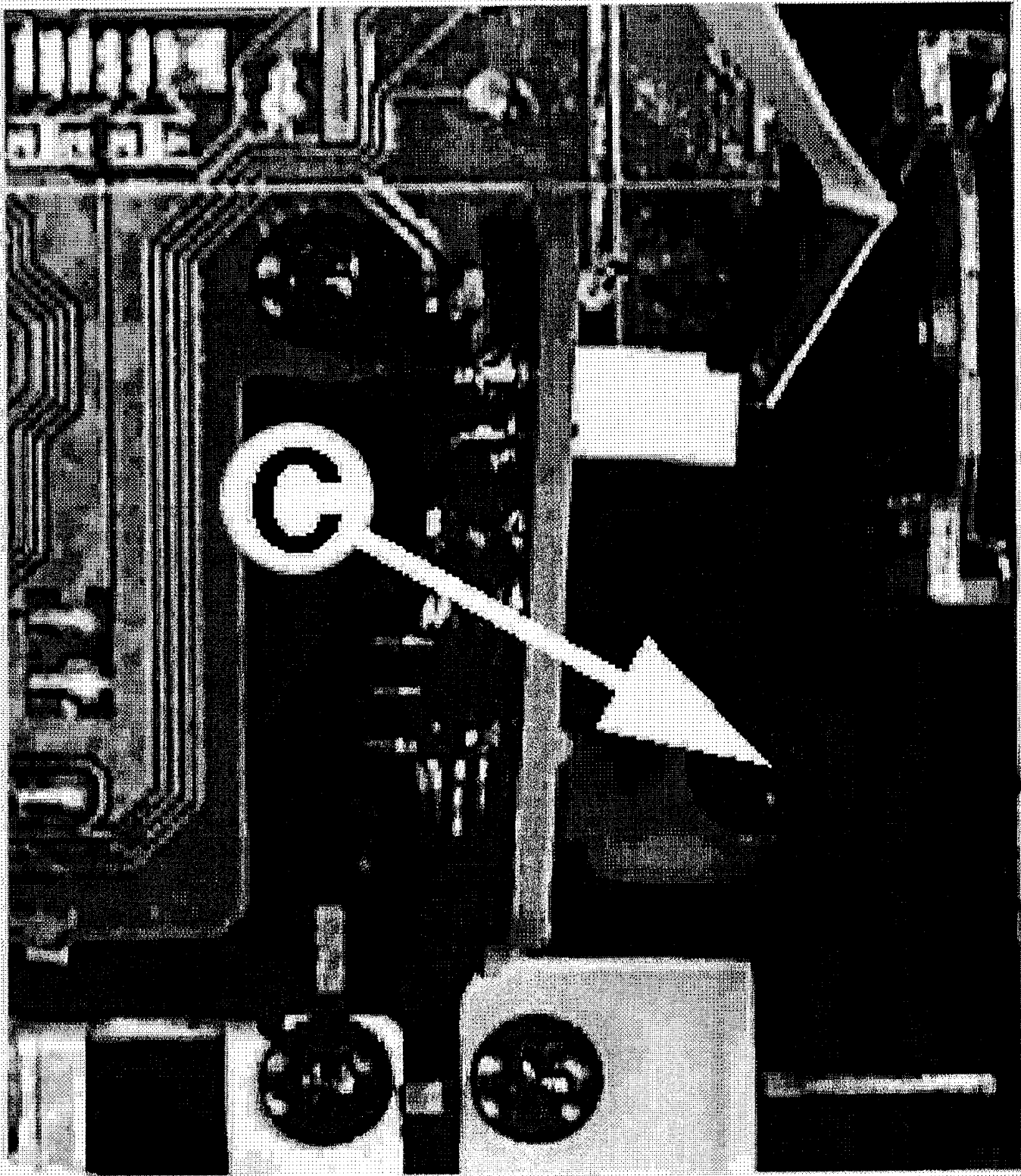


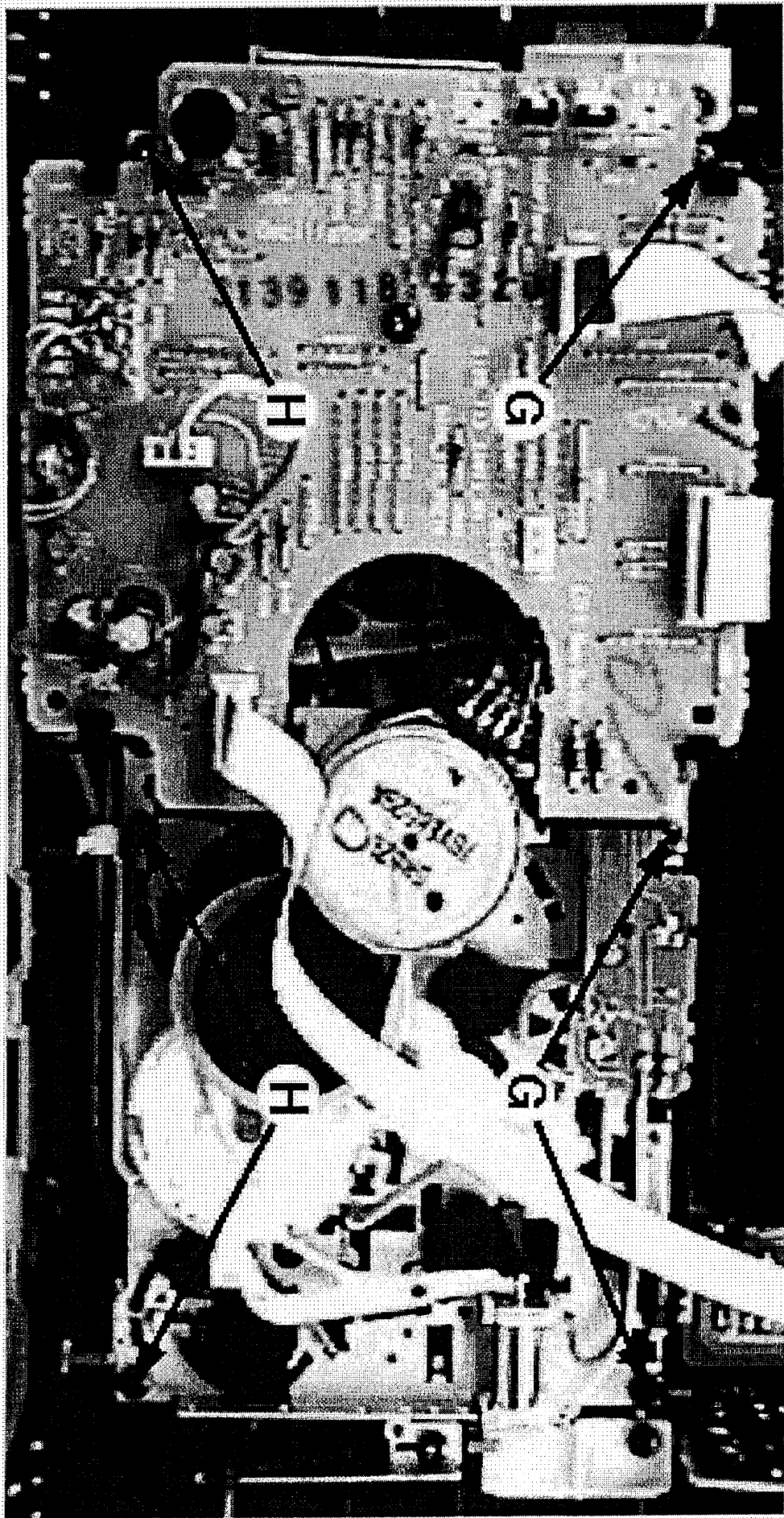


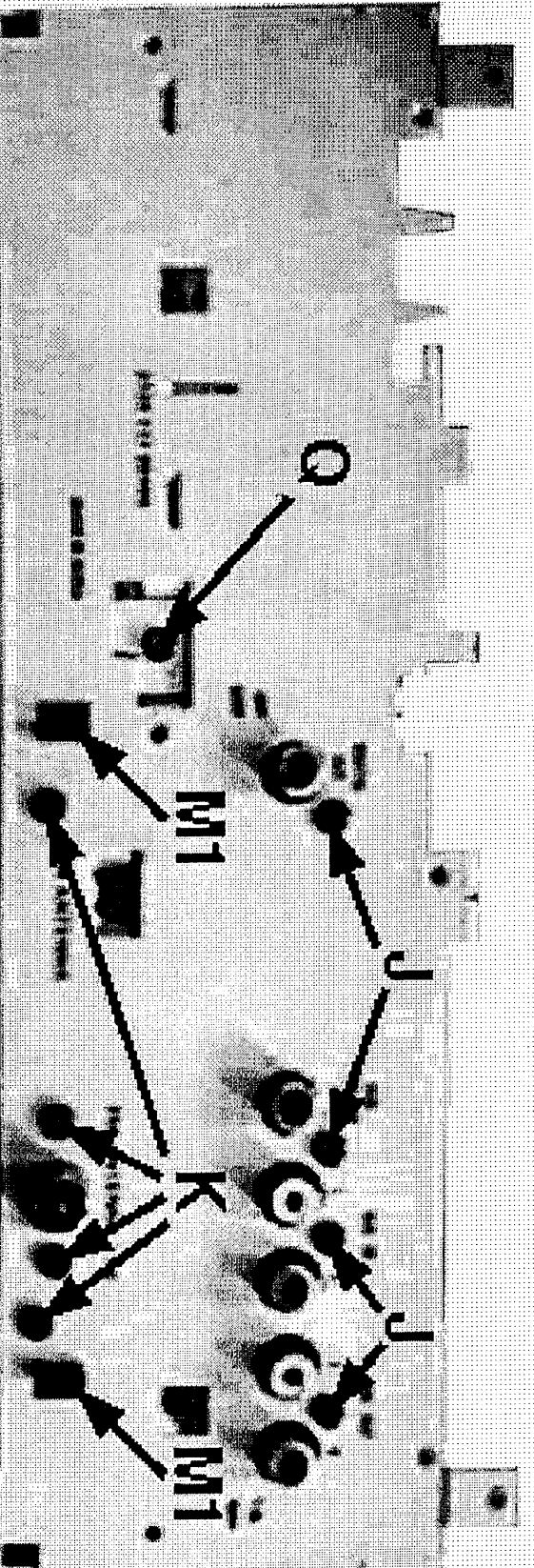
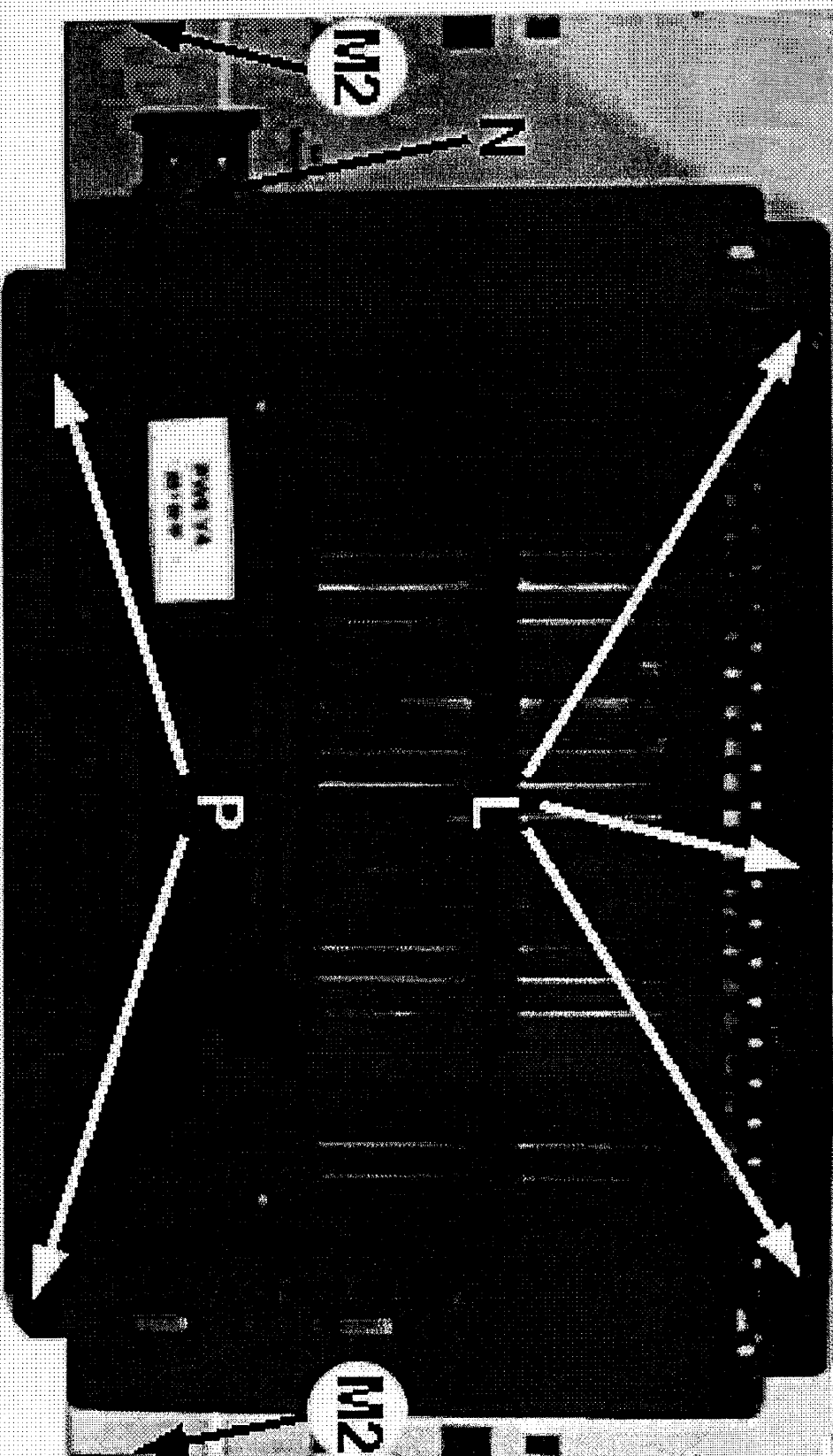


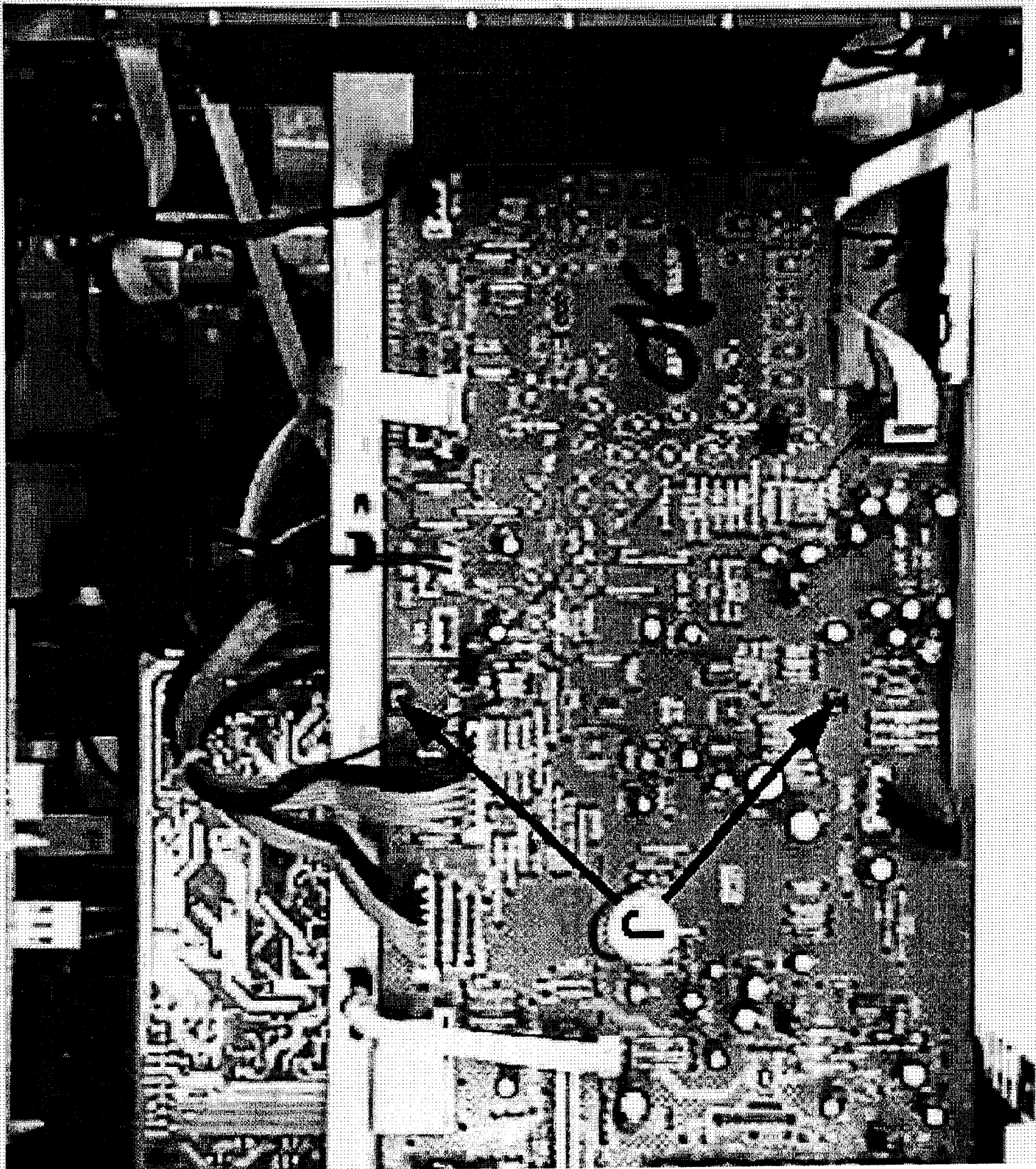


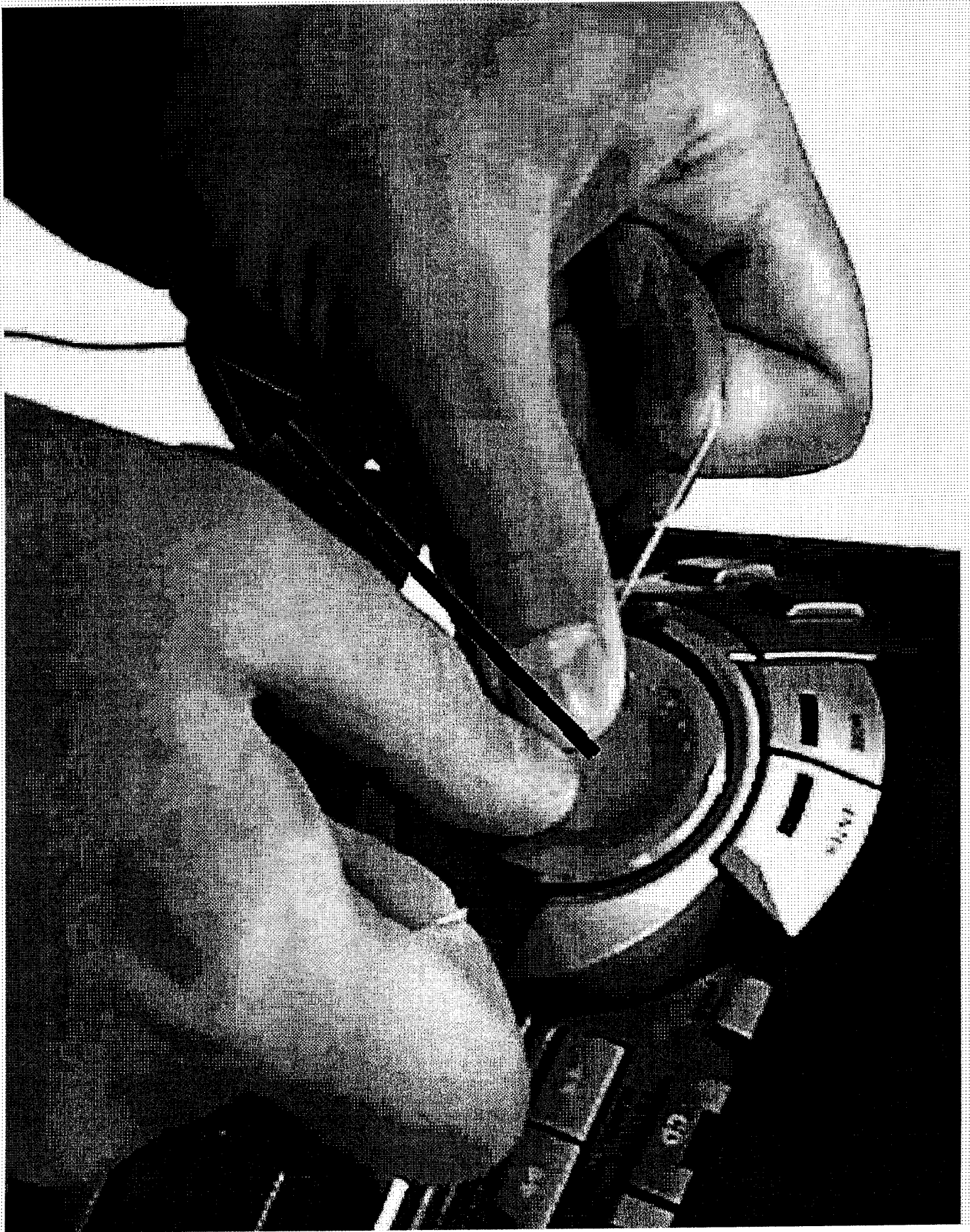








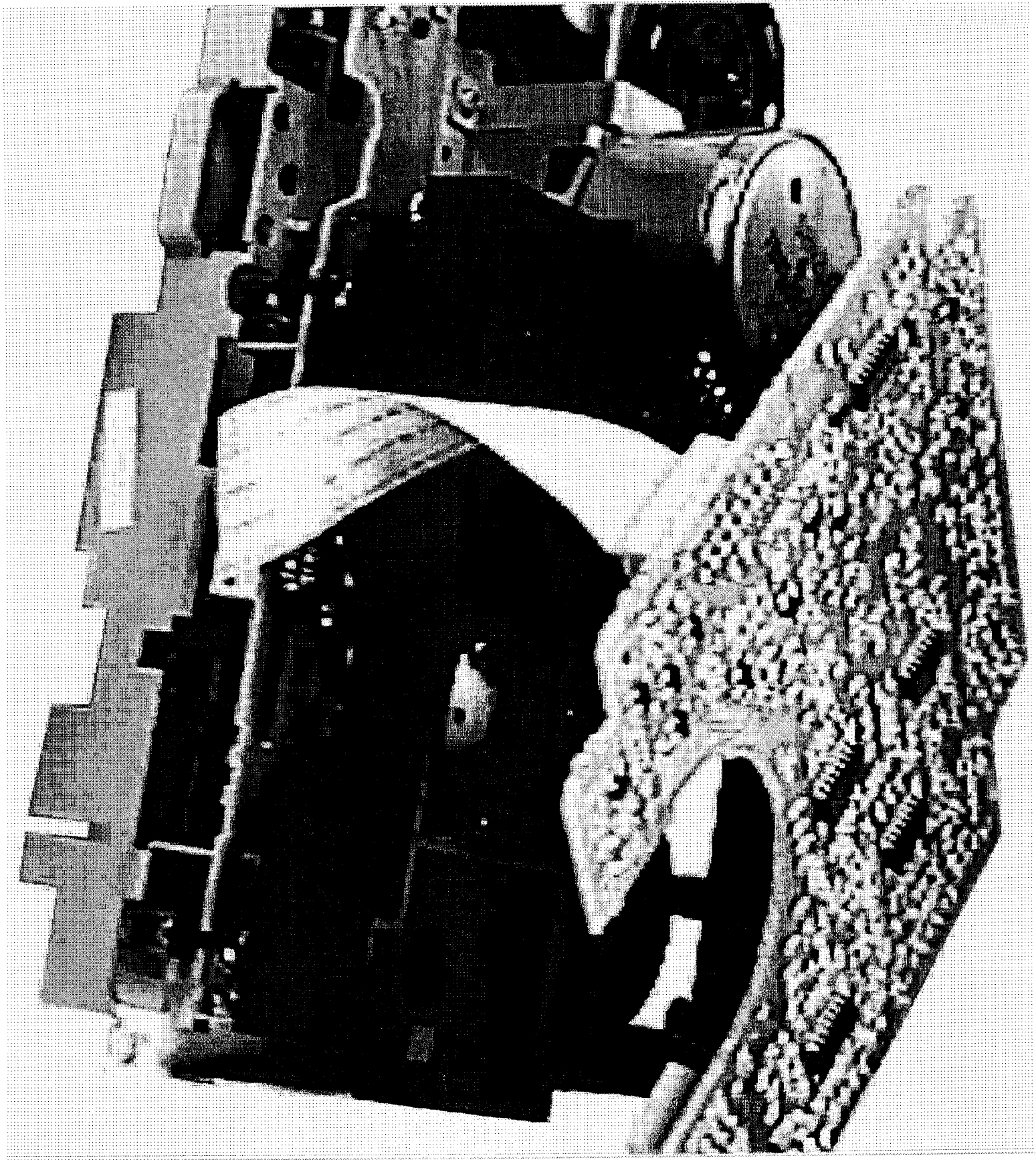


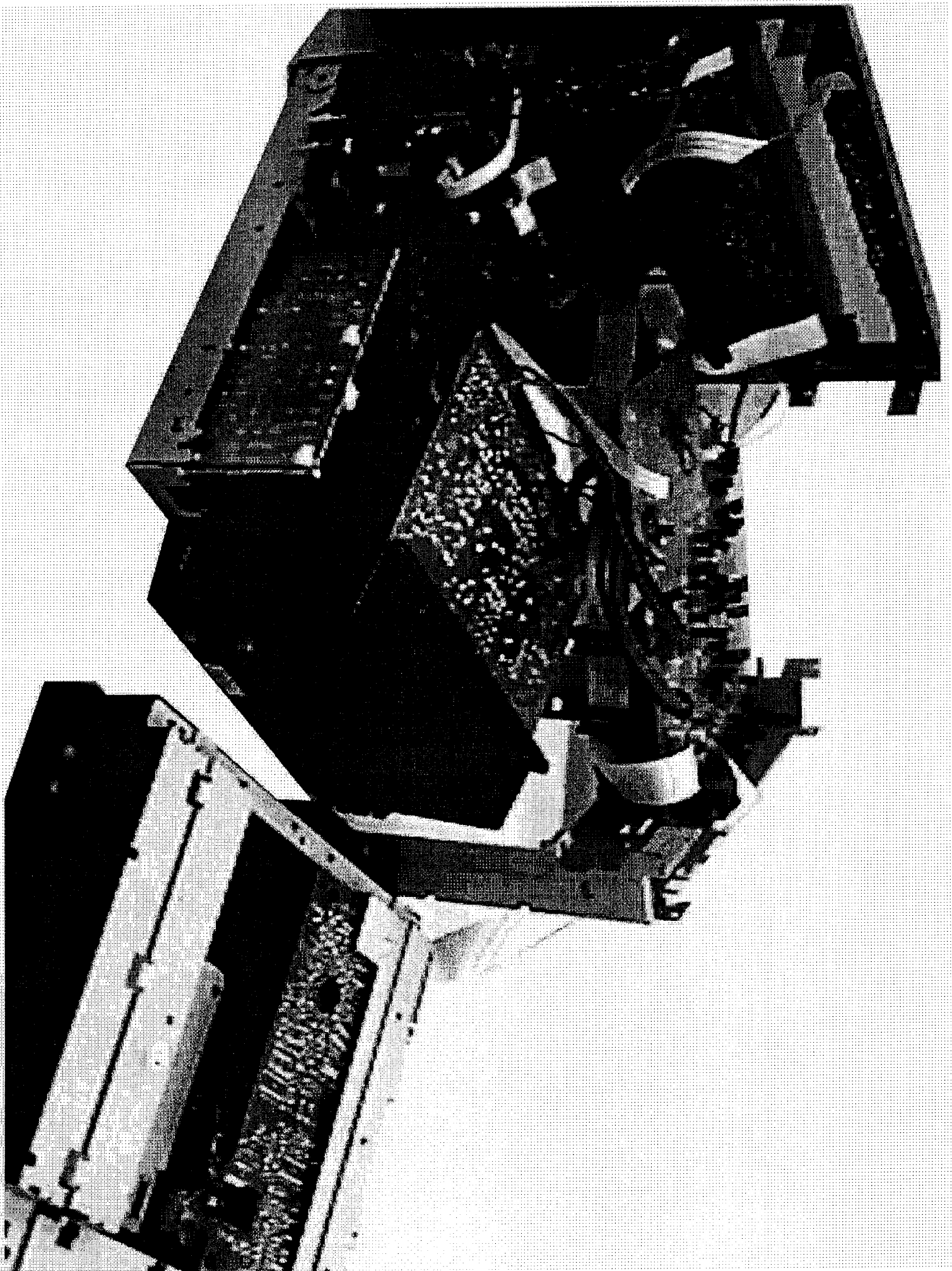


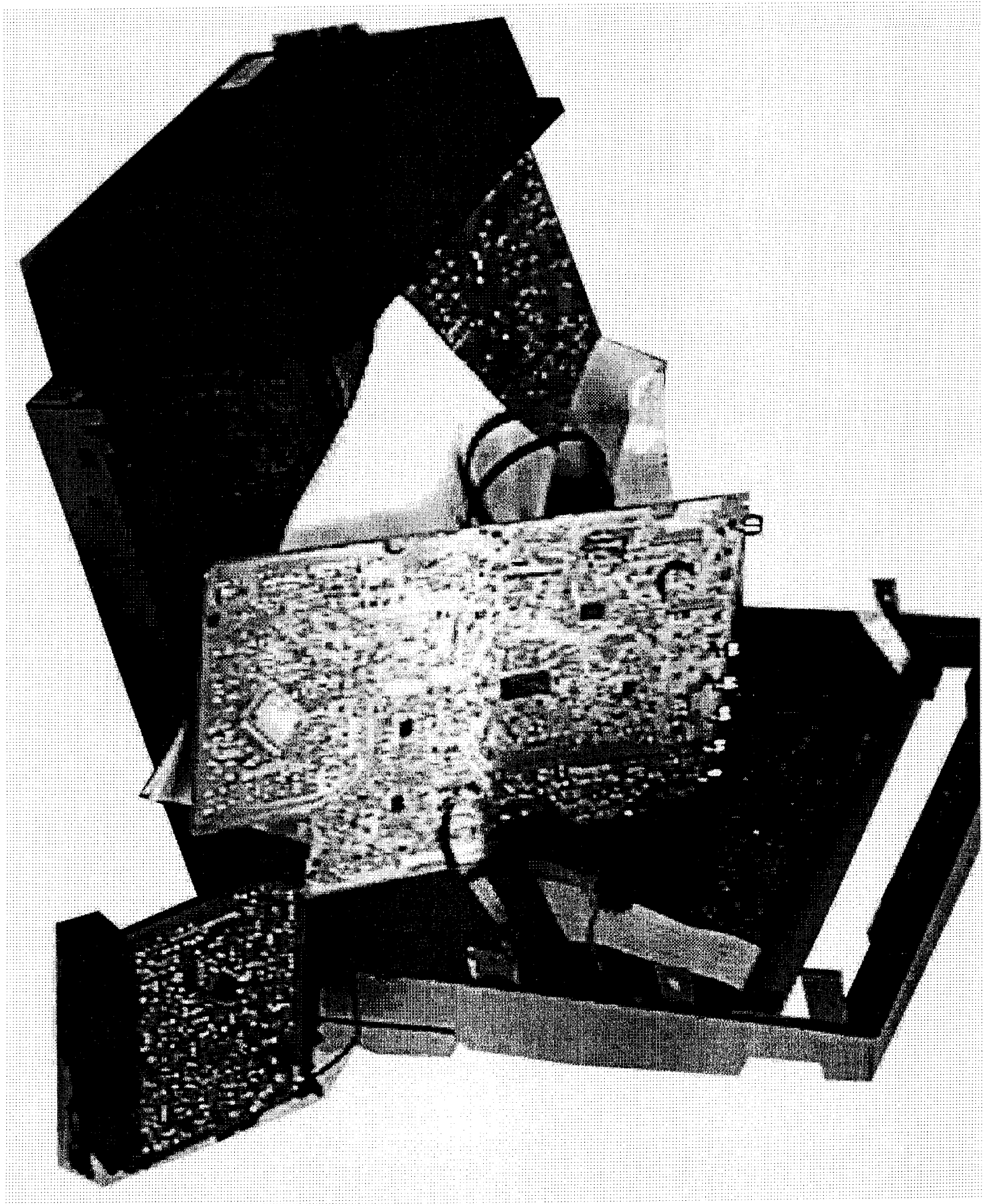


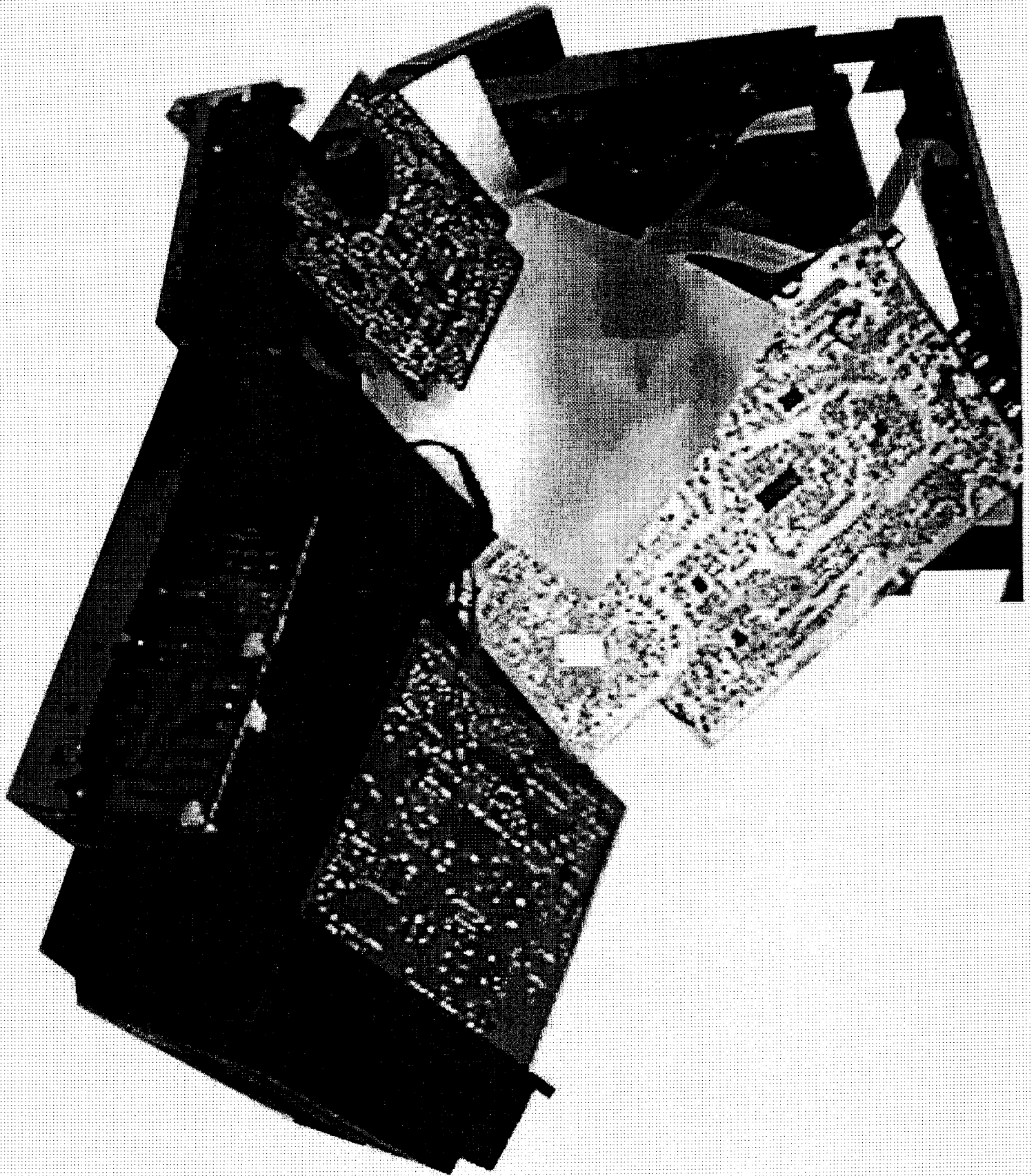
Flex Cable

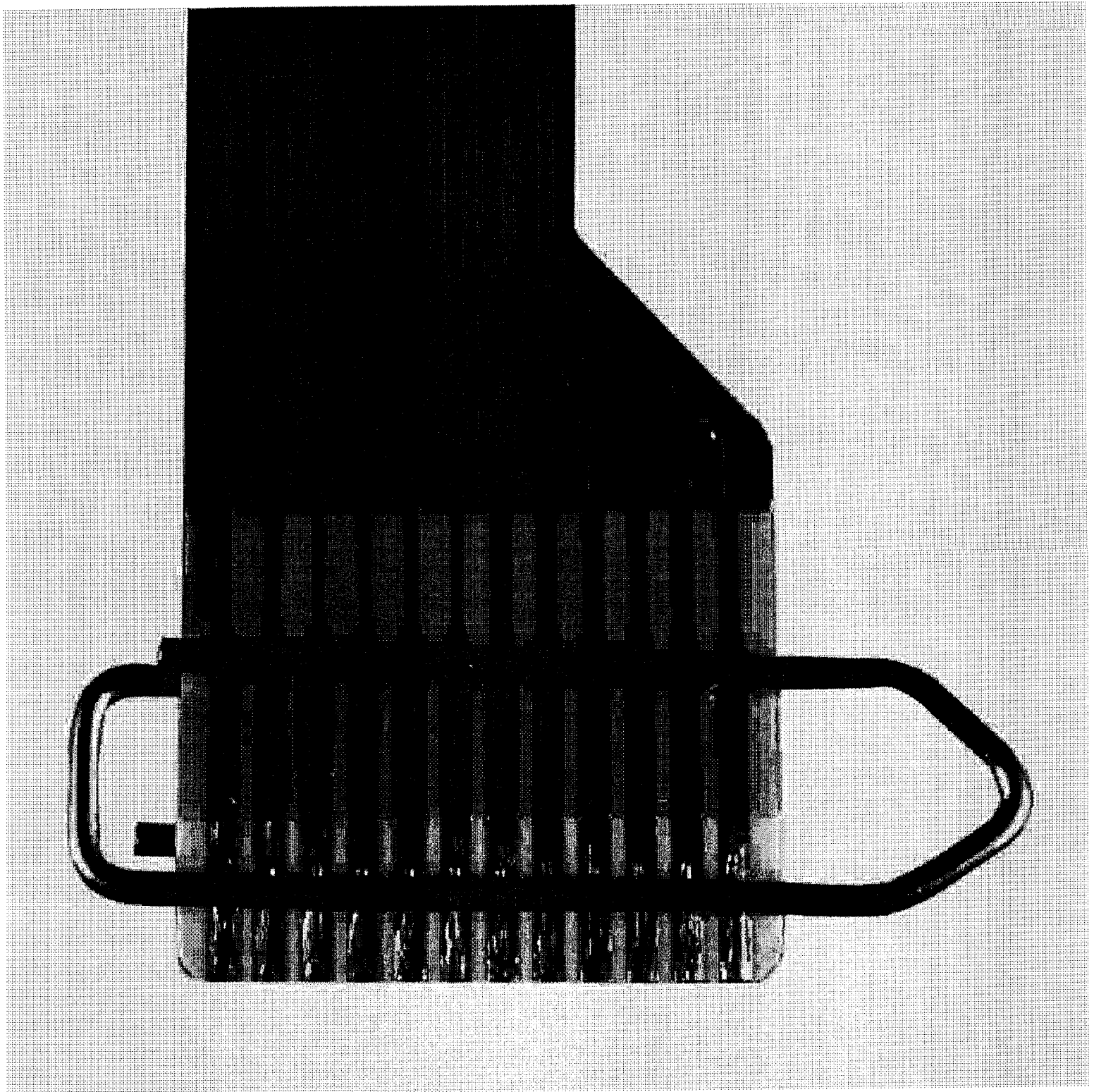
Sharp Edges

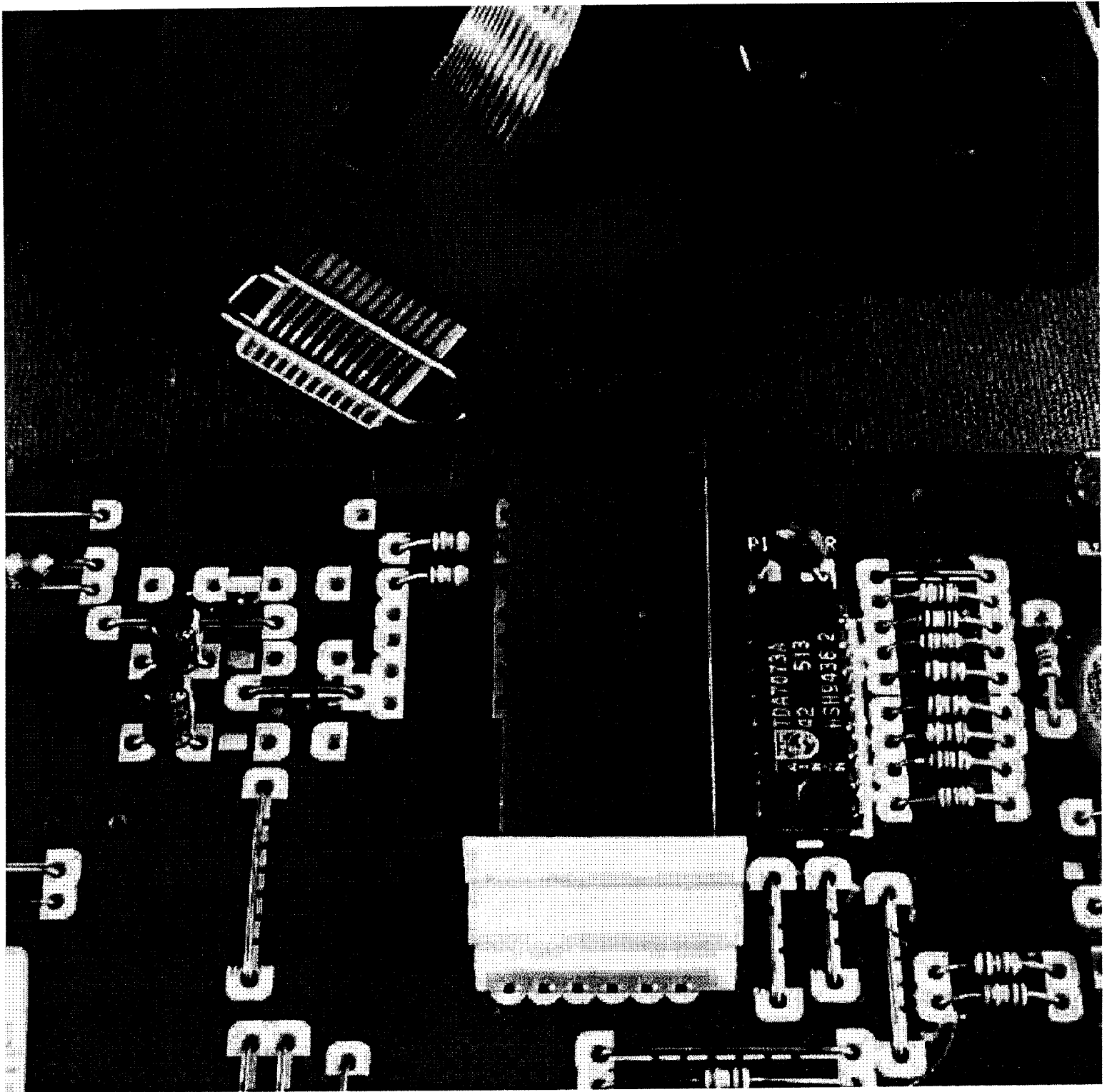




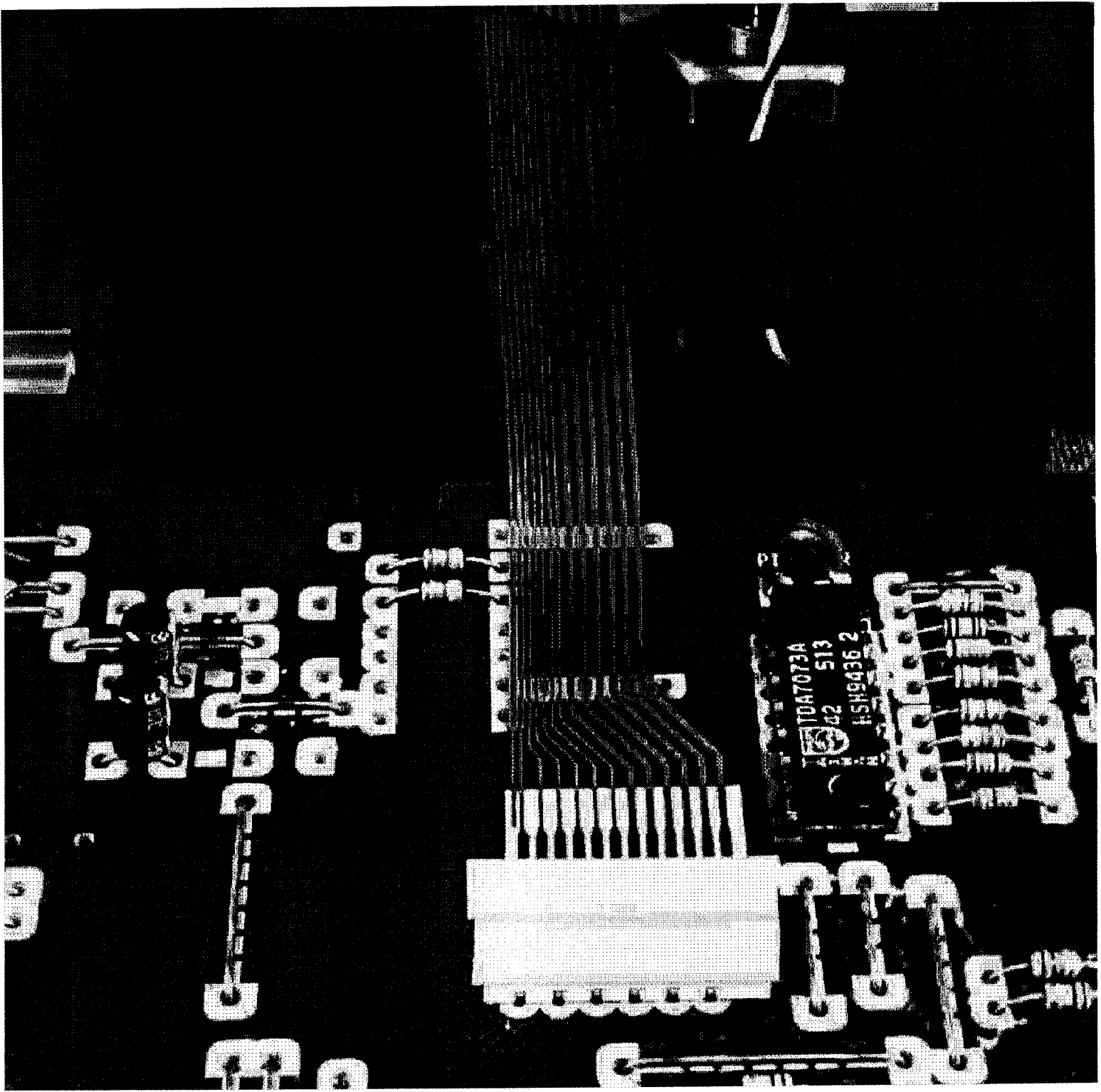


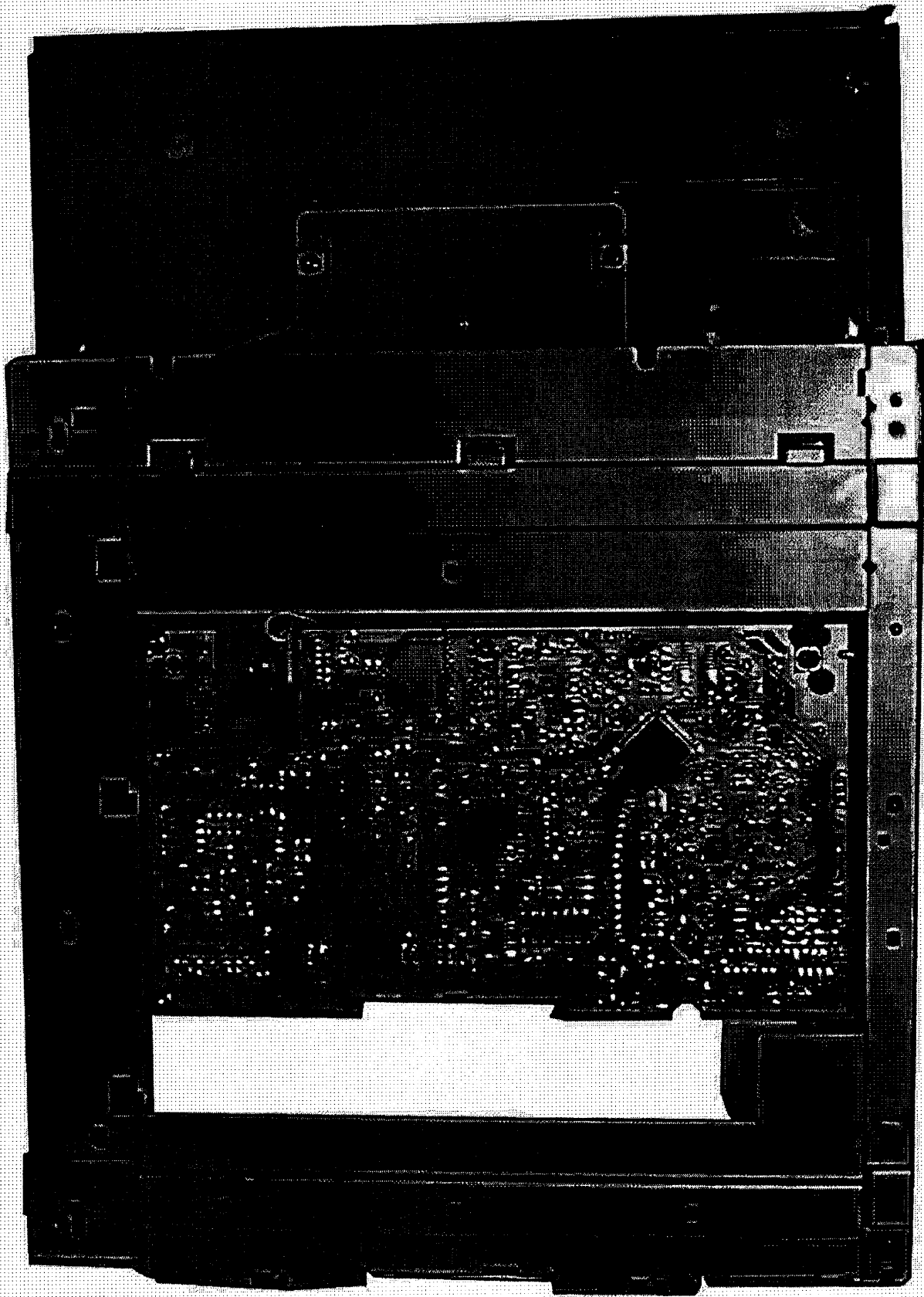


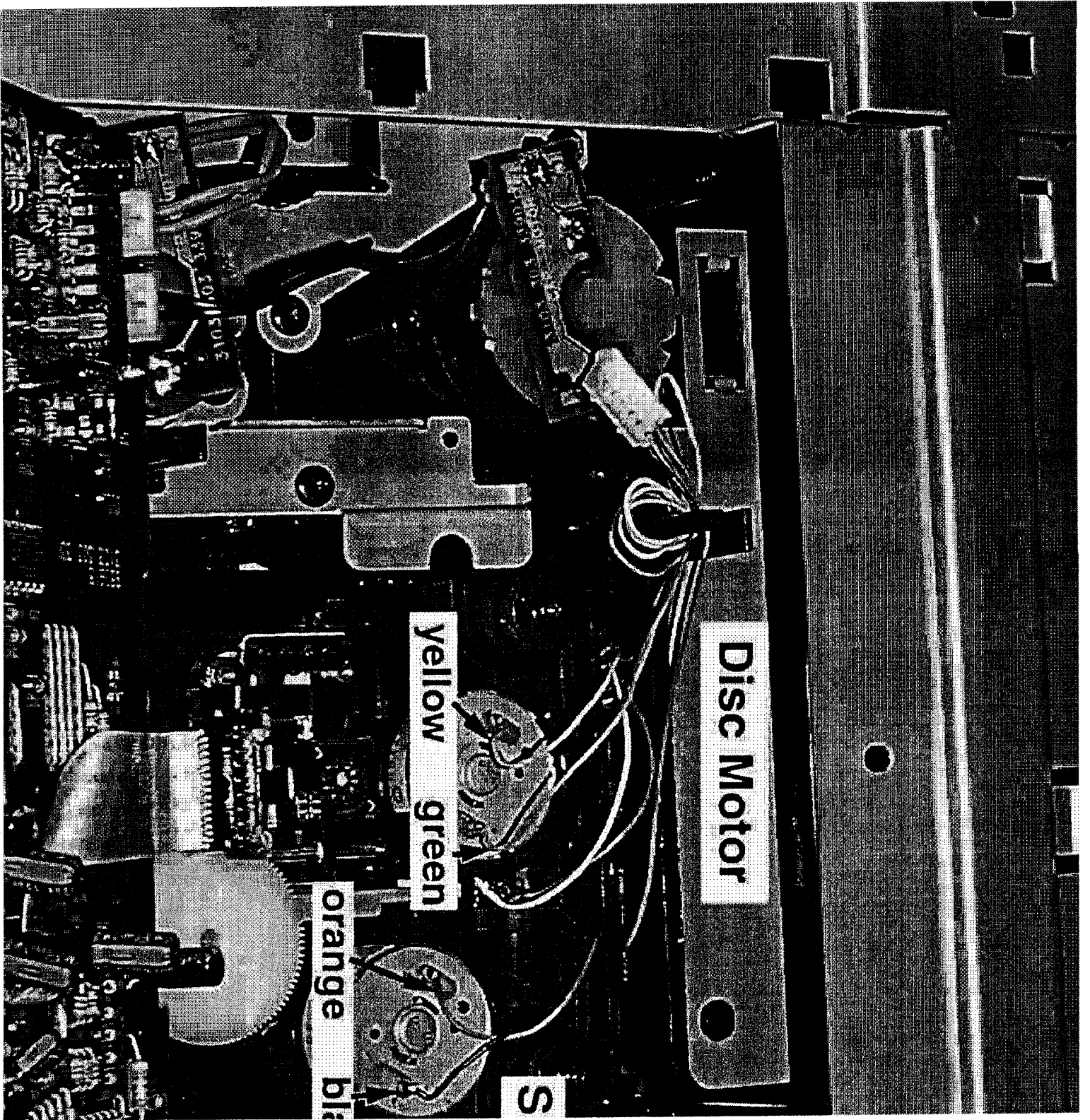


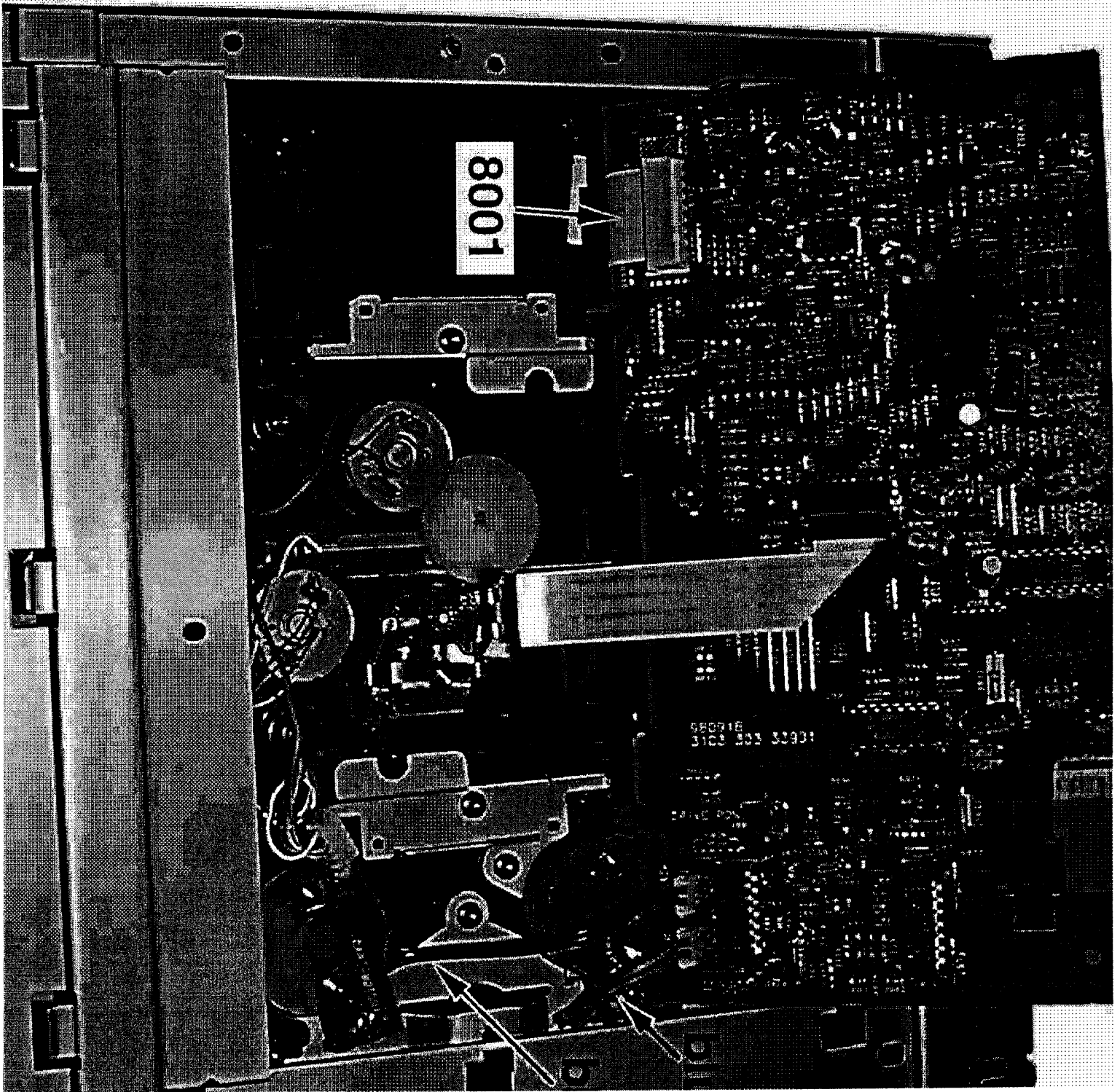


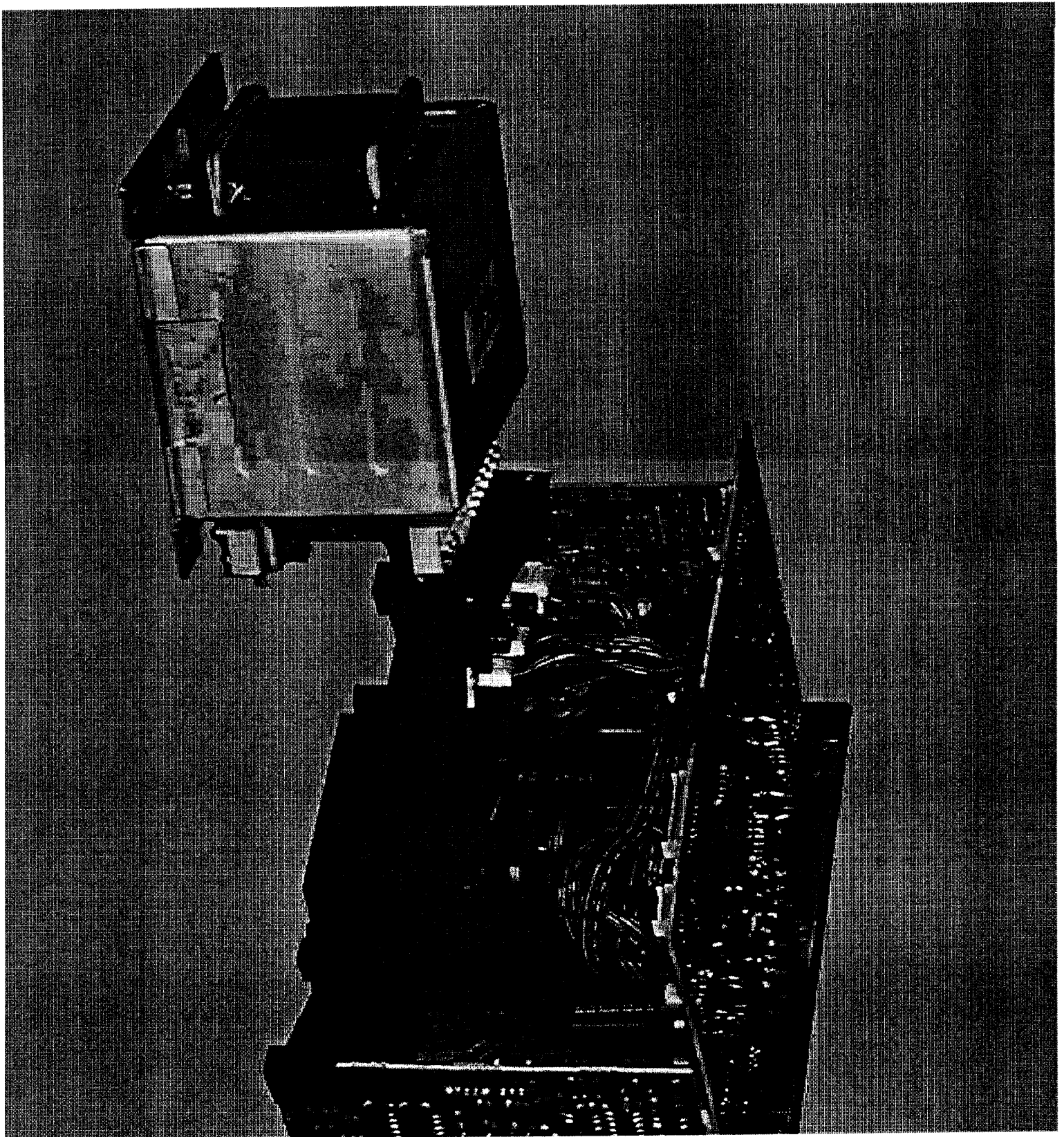
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Philips Consumer Electronics

Technical Service Data

Service Solutions Group
Technical Publications Dept.
P.O. Box 555
401 East Old Andrew Johnson Hwy.
Jefferson City, TN 37760

Manual 1923

Model no.: FW890C

First Publish: 10-05-99

Rev. Date: 05-04-2001

Print Date: 5/4/2001

Electrical Adjustments

REFER TO SAFETY GUIDELINES

SAFETY NOTICE: ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

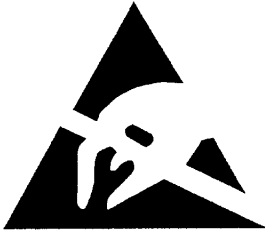
CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

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Adjustments

Safety Instructions:

WARNING



All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

**CLASS 1
LASER PRODUCT**

Invisible laser radiation when open. Avoid direct exposure to beam.

After servicing and before returning the unit to the customer, perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazards exist. The leakage current must not exceed 0.5mA.

Schematic Notes:

1. All resistor values are in ohms, and the value multiplier is often used to indicate decimal point location (e.g., 2K2 indicates 2.2K).
2. Resistor values with no multiplier may be indicated with either an "E" or "R" (e.g., 220E or 220R indicates 220 ohms).
3. All capacitor values are expressed in Microfarads (e.g., u = $\times 10^{-6}$), nanofarads (e.g., n = $\times 10^{-9}$), or picofarads (e.g., $\times 10^{-12}$).
4. Capacitor values may also use the value multiplier as the decimal point indication (e.g., 2p2 indicates 2.2pF.).
5. Voltages listed on schematics often use a comma to indicate the decimal point location as it is perceived as being "more visible."

Refer to individual schematic diagrams for all other component indications.

SERVICE AIDS:

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1M Ω)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

PC Board Location

Display Location of PC Boards

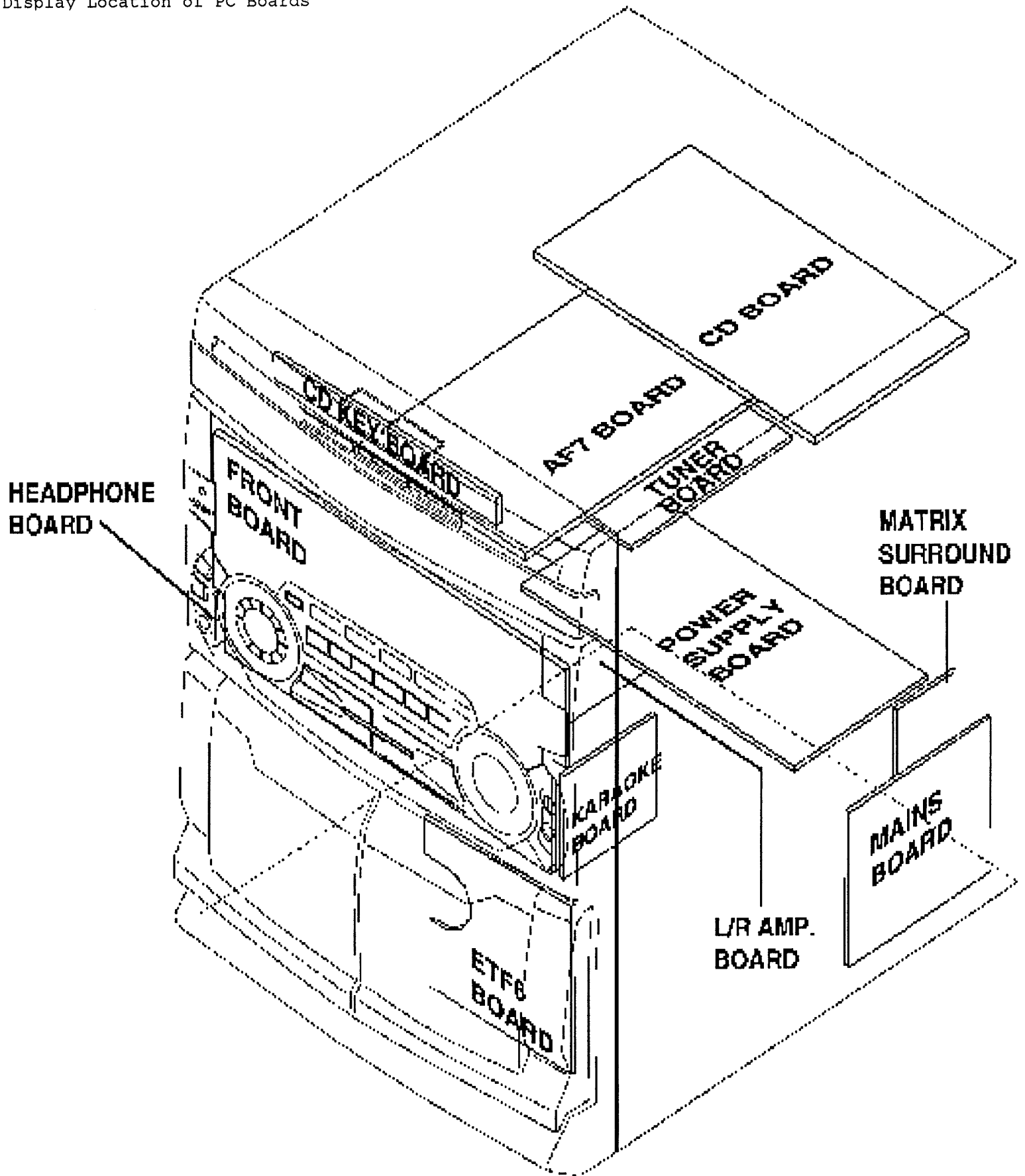
MEASUREMENT SETUPS

Display FM Tuner Measurement Setup

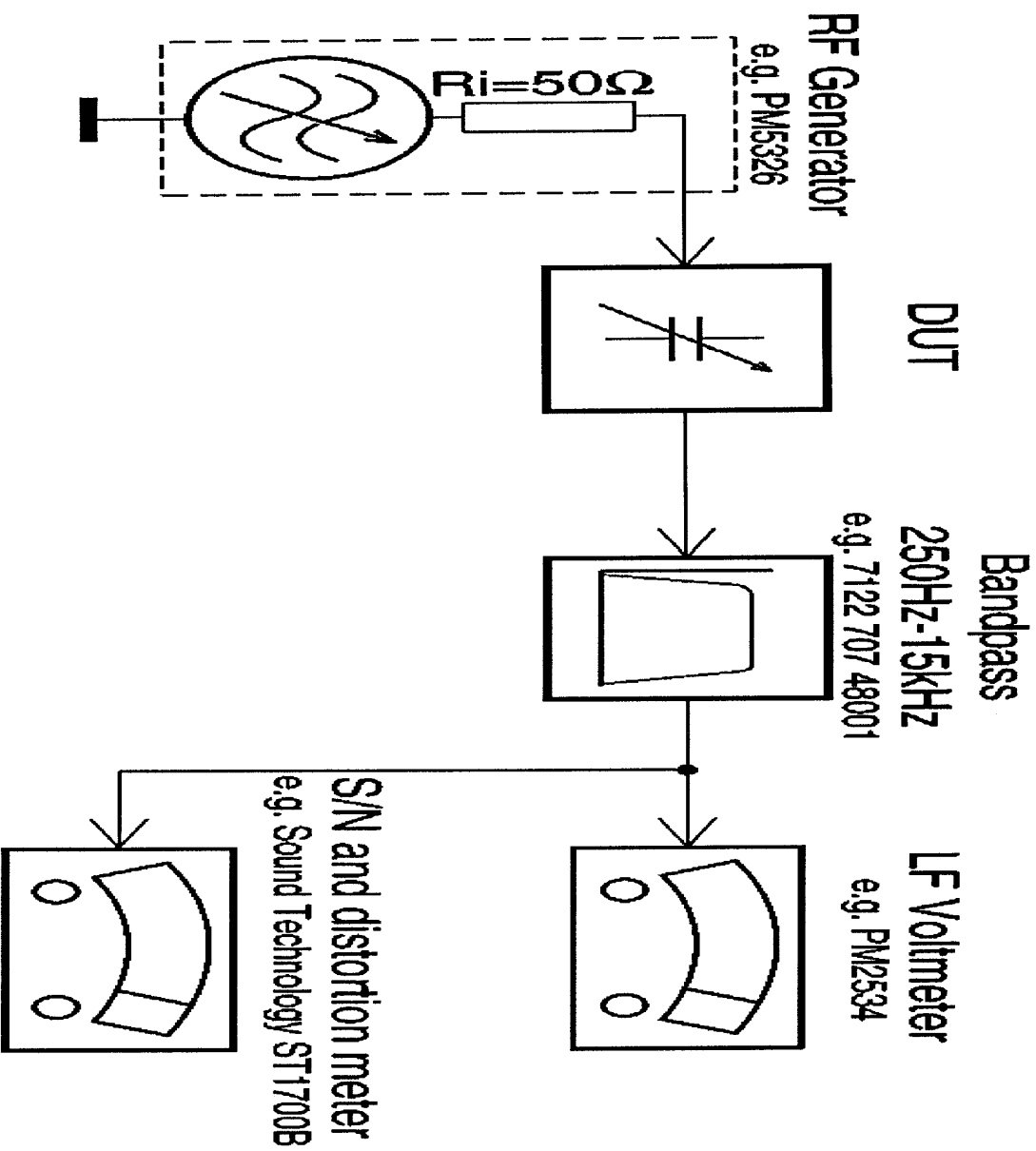
Display AM Tuner Measurement Setup

Display CD Measurement Setup

Display Location of PC Boards

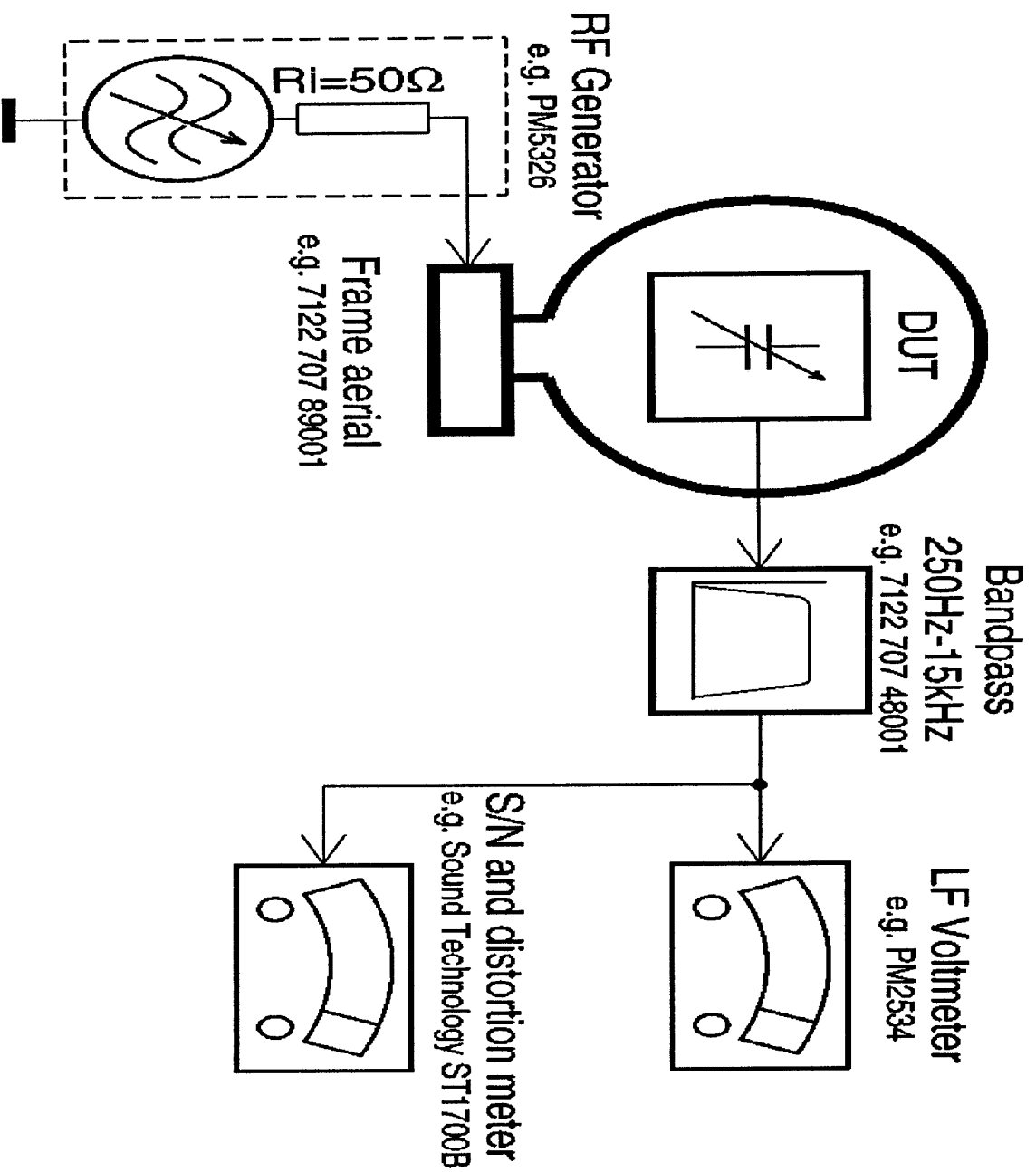


Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilotone (19kHz, 38kHz).

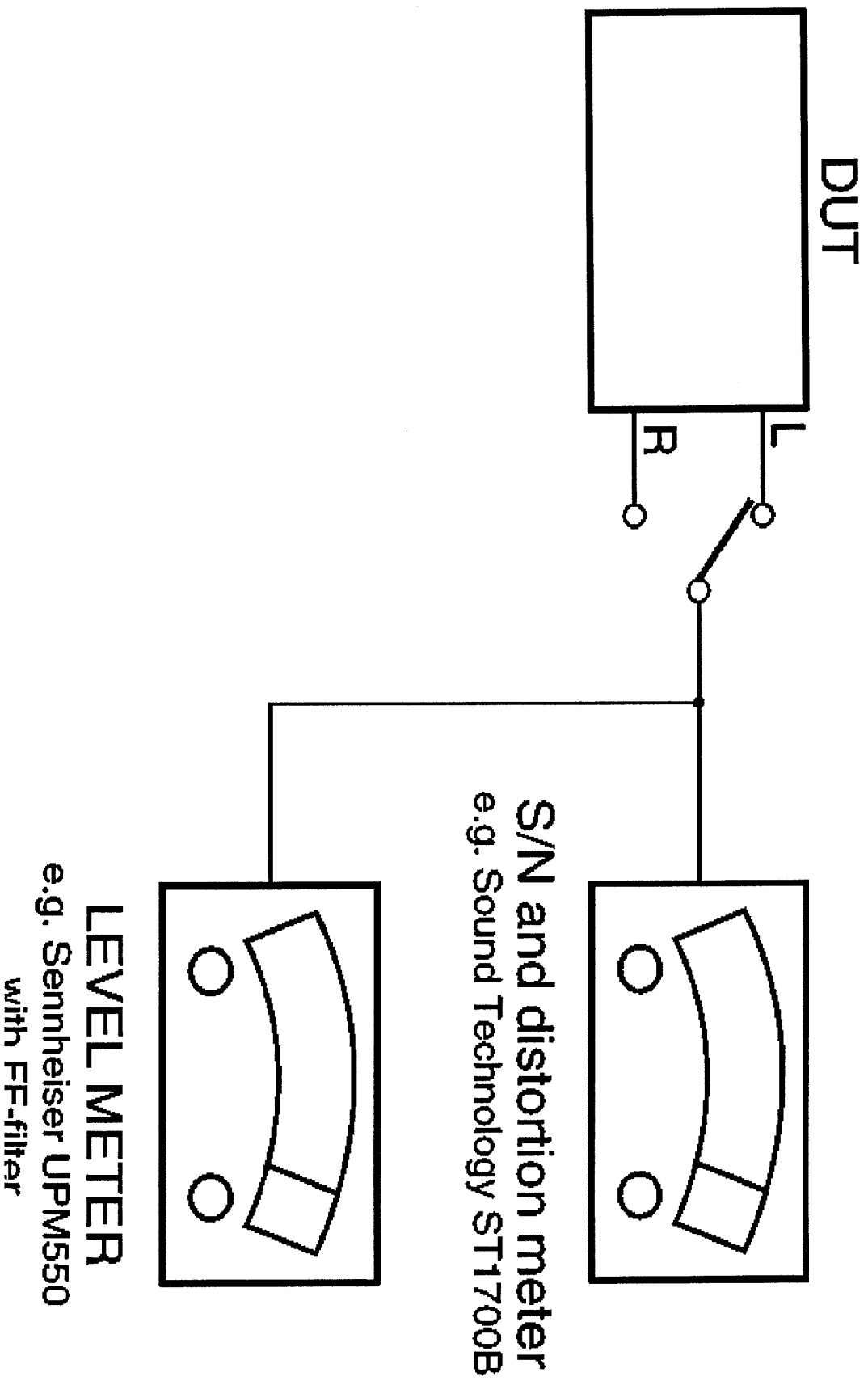
Tuner AM (MW, LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

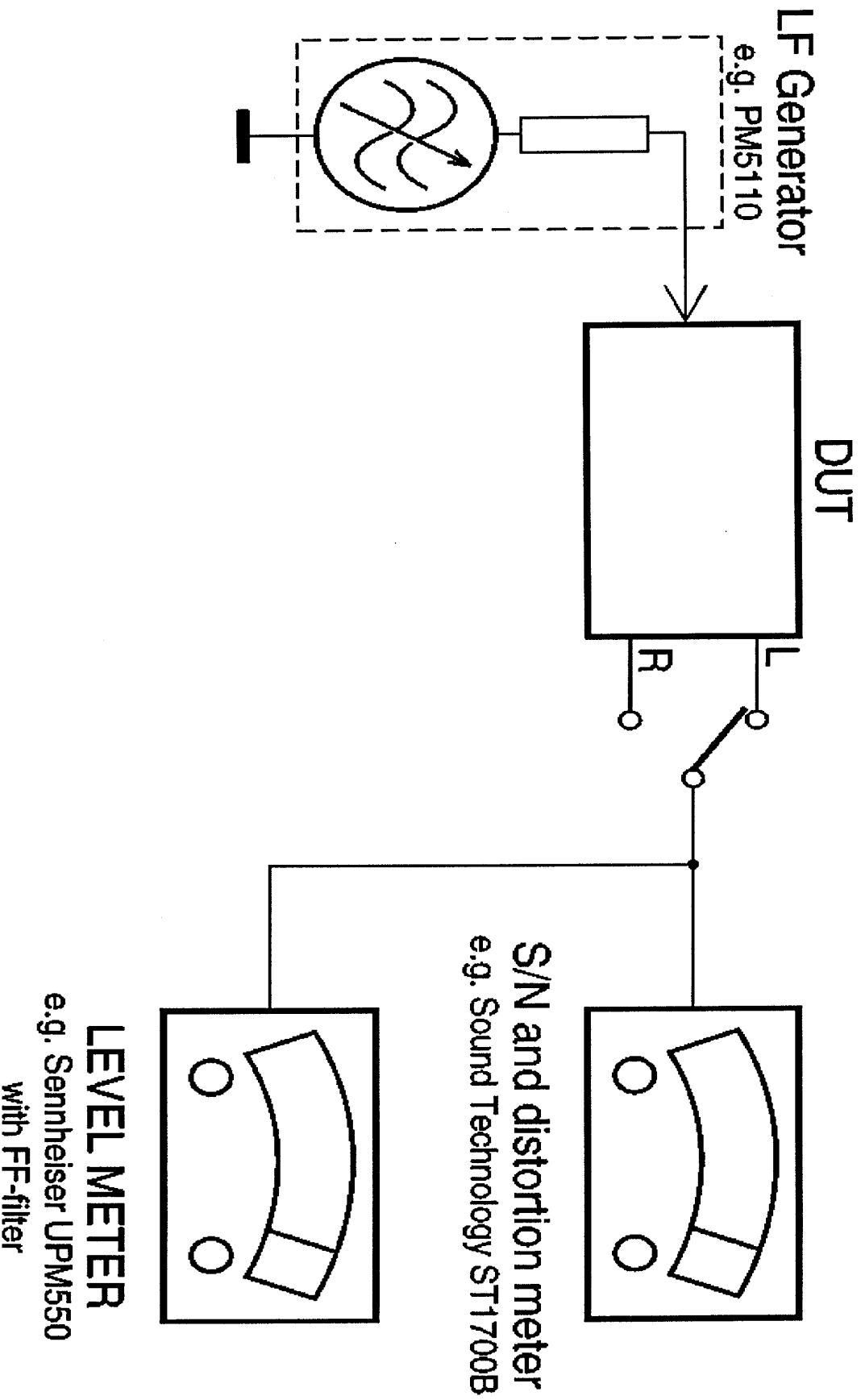
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



Recorder

Use Universal Test Cassette **CrO2** **SBC419** 4822 397 30069
or Universal Test Cassette **Fe** **SBC420** 4822 397 30071



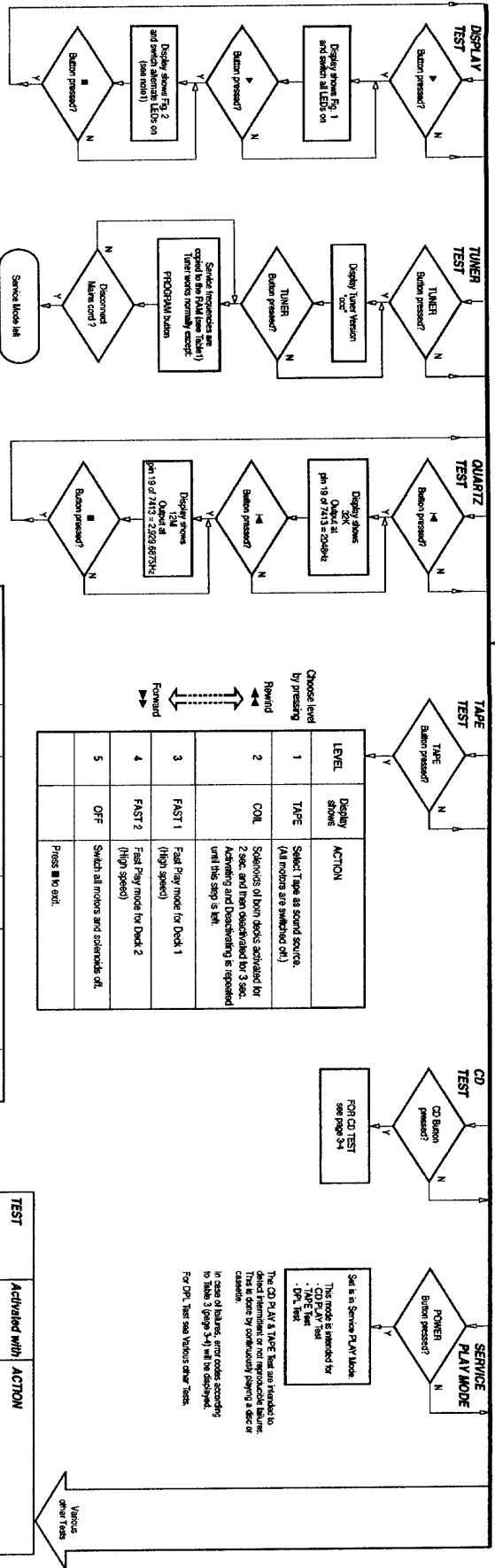


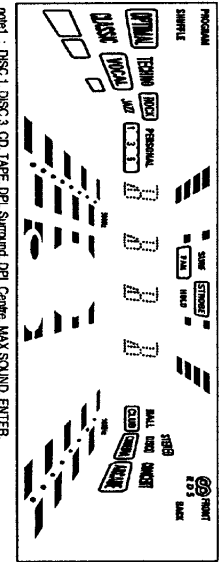
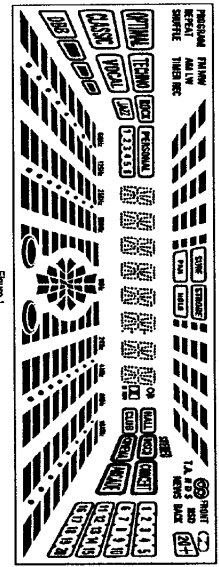
Table 1

PRESSET	Europe EUPR	East Europe Expanded-band EAS*	East Europe EAS*	USA USA	Oversea OSE*
1	87.5MHz	65.5MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531MHz	7MHz	531MHz	530MHz	531/530MHz
4	1820MHz	87.5MHz	1820MHz	1700MHz	1820/1700MHz
5	558MHz	531MHz	558MHz	550MHz	558/550MHz
6	1484MHz	1620MHz	1494MHz	1500MHz	1494/1500MHz
7	153MHz	558MHz	87.5MHz	39MHz	87.5MHz
8	273MHz	1434MHz	87.5MHz	87.5MHz	87.5MHz
9	198MHz	99MHz	87.5MHz	87.5MHz	87.5MHz
10	98MHz	7010MHz	87.5MHz	87.5MHz	87.5MHz
11	87.5MHz	65.5MHz	87.5MHz	87.5MHz	87.5MHz

Table 2

Keys activated	Display shows	Keys activated	Display shows	Keys activated	Display shows
No key pressed	-	RECORD *	12	■ (Edit Test)	26
Any Remote control key	RC	TAPE DUBBING *	13	▶▶	27
DISC CHANGE	1	W/OKE	14	▶▶	27
OPEN / CLOSE	2	ENTER	15	▶▶	28
DISC 1	3	PROGRAM	16	▶▶	29
DISC 2	4	CD	17	▶▶	30
DISC 3	5	TUNER	18	▶▶	31
STANDBY ON	6	TAPE	19	▶▶	32
CLOCK / TUNER	7	AUX	20	▶▶	33
DPL *	8	TAPE MODE *	21	▶▶	34
DOUBY B *	9	MAX SOUND	22	▶▶	35
RDS *	10	▶▶	23	▶▶	36
NEWS *	11	▶▶	24	▶▶	36

* Not for all versions.



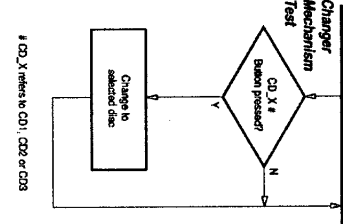
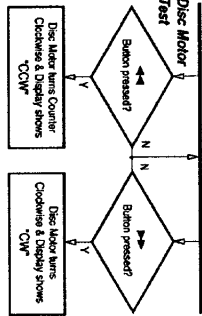
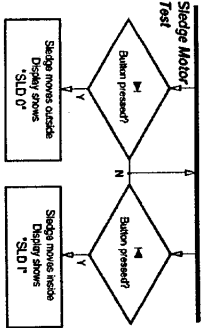
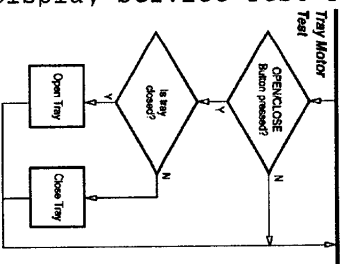
TEST	Activated with	ACTION
EEPROM TEST	▶▶	A test pattern will be sent to the EEPROM. "PASS" is displayed if the processor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT TEST	▶▶	Load default data. Display shows "NEW" for 1 second. Caution! All presets from the customer will be lost! All numbers according Table 2 are shown on the display.
KEY TEST	▶▶	Key numbers according Table 2 are shown on the display.
FAST CLOCK TEST	▶▶	The clock is switched to fast mode. "FAST" is displayed for 1 sec.
CLOCK/TUNER TEST	▶▶	Press CLOCK/TUNER again to reset the clock to normal. "NORMAL" is displayed for 1 sec.
AUX TEST	▶▶	The display shows "AUX1", "aux2", "AUX3", "aux4" and "AUX5", where "aux1", "aux2", "aux3" and "aux4" are the ADC value between 0 - 255 representing NTC, SA 1, SA 2, SA 3 and SA 4 lines respectively.
ADCC TEST	▶▶	The set will go to standby when temperature is too high (NTC line ADC value is below 75).
VOLUME TEST	▶▶	Rotary Volume knob Jog Switch. Display shows volume value for 2 seconds. Volume increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
DPL TEST	▶▶	The set enters into Pro-logic test mode. (only possible in Service Play Mode). The tone source switches between Left, Center, Right and their speakers. Pro-logic settings cannot be reset in this test.
LEAVE SERVICE TEST/PROGRAM	▶▶	Disconnect: means cord

Figure 1

model : DSC 1, DSC 3, CD, TAPE, DPL, Surround, DPL Centre, MAX SOUND, ENTER.

Figure 2

Display Service Test Program 2

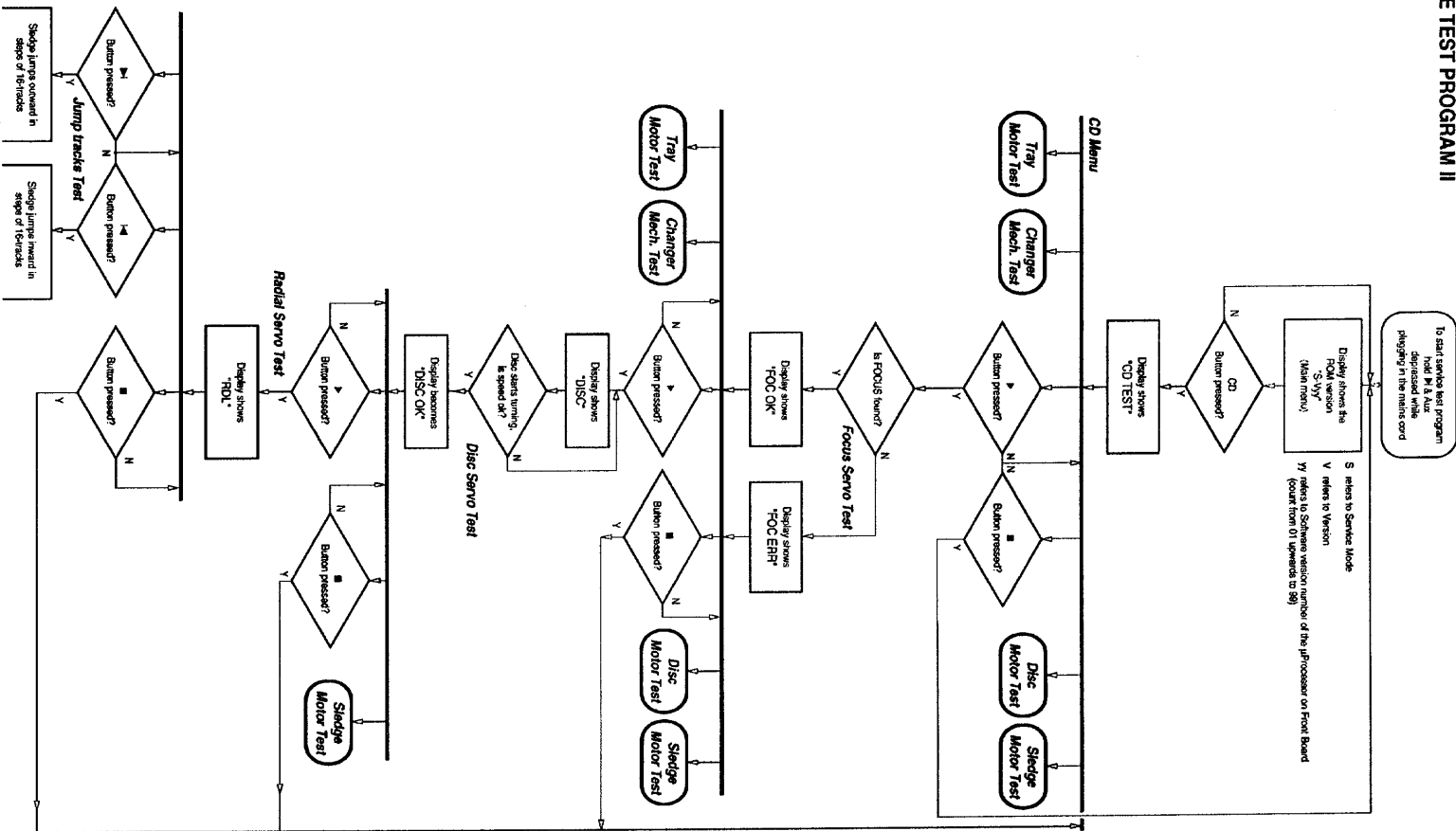


CD_X refers to CD1, CD2 or CD3

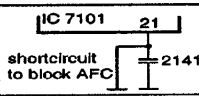
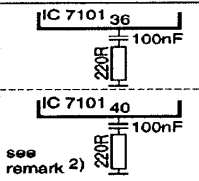
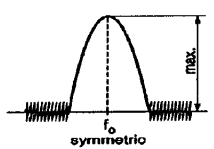
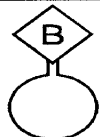
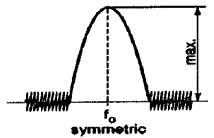
Error code	Type	Error Description
E1000	W	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	W	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	W	Sledge In Error The sledge did not reach its inner position (inner-switch is still closed) before approximately 5 Sec. have passed. Inner-switch or sledge motor problem.
E1003	W	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	W	Jump-off-track error Triggered in normal play when the jump destination could not be found within a certain time.
E1006	W	Subcode Error (no subcode within time) Triggered when a new subcode was missing for a certain time during play.
E1007	W	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	W	Turndial Motor Error Generated when the CD could not be reached 75% of speed during starting within a certain time. Disc motor problem.
E1020	F	Focus Search Error The focus point has not been found within a certain time.
E1070	W	The carousel switch is not open within a certain time. This can happen when after the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	W	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	W	The drawer could not enter the inside position is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close.
E2020*	F	Head Movement Error Deck 1 Generated if the head does not reach the selected position within a certain time.
E2021*	F	Head Movement Error Deck 2 Generated if the head does not reach the selected position within a certain time.

F = Fatal error & the set stop play function
 * For Logic set only.
 W = Warning
 Table 3

SERVICE TEST PROGRAM II



TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇ 1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123	8V ±0.2V	
			531kHz	check	1.1V ±0.4V	
FM IF						
FM	10.7MHz, 50mV continuous wave	◇ F		5119	◇ 2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇ A	108MHz	2155	◇ 4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇ A	98MHz	3142	◇ 3	152kHz ±1kHz ¹⁾
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	◇ C		5111	◇ 4	
		Δf=±15kHz V _{RF} = 3mV		5112		
AM AFC MW		◇ C		5114	◇ 2	0 ± 2 mV DC
		continuous wave V _{RF} = 10mV				
AM RF ³⁾						
MW ⁴⁾ FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	◇ B 	1494kHz	2106	◇ 4	
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		Δf = ±30kHz V _{RF} as low as possible	1500kHz		
	560kHz	560kHz	5102			

ECO5, descr. ool, 09/797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

- 1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)
- 2) RC network serves for damping the IF-filter while adjusting the other one.
- 3) For AM RF adjustments the original frame antenna has to be used !
- 4) MW has to be aligned before LW.

↑ Repeat

TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	1 or 2 LEFT RIGHT	frequency counter	3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	1 or 2 LEFT RIGHT	W&F-meter	check	≤0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	1 or 2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A	RECORD	5 or 6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV ± 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via 3 or 4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via 3 or 4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	THD-meter	check	≤3% *

SBC419A : 4822 397 30069
SBC420 : 4822 397 30071

For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure.
If distortion is too high, increase bias and re-measure

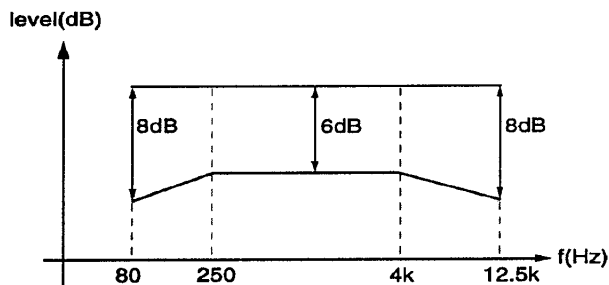


figure. 1

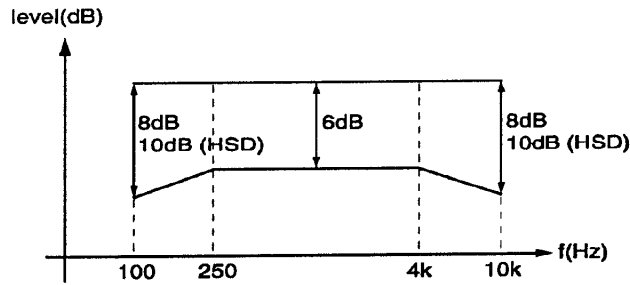


figure. 2

Recording

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
PRE-ADJUST BIAS AND BIAS-SYMMETRY						
DECK B	CrO ₂	RECORD	5 or 6 LEFT RIGHT	mV-meter	3773	995mV
	FERRO				3785 *	left = right
						check only
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via 3 or 4	CrO ₂	RECORD				
	RECORDED CASSETTE	PLAY	1 or 2 LEFT RIGHT	mV-meter	check only	limits see fig.2
Inject 1kHz 8.85mV via 3 or 4	CrO ₂	RECORD				
	RECORDED CASSETTE	PLAY	1 or 2 LEFT RIGHT	THD-meter	check only	≤3%
Remark: If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high increase bias and re-measure.						
ADJUST DOLBY RECORD LEVEL *						
Inject 400Hz 8.85mV via 3 or 4	CrO ₂	RECORD	9 or 10 LEFT RIGHT	mV-meter	3655 & 3556	420mV
	RECORDED CASSETTE	PLAY	7 or 8 LEFT RIGHT	mV-meter	check	170mV ± 1dB
Remark: If measured value is out, re-adjust record level up or down slightly to attain play level.						

* For Dolby version only

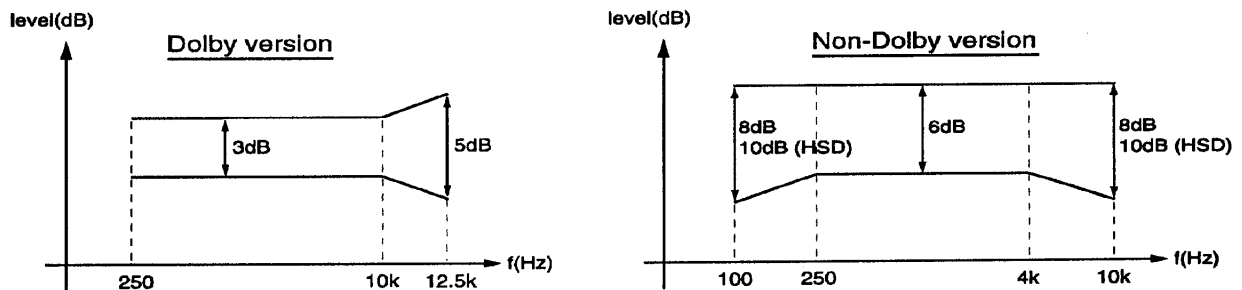


figure. 2

Philips Consumer Electronics

Technical Service Data

Service Solutions Group
Technical Publications Dept.
P.O. Box 555
401 East Old Andrew Johnson Hwy.
Jefferson City, TN 37760

Manual 1923

Model no.: FW890C

First Publish: 10-05-99

Rev. Date: 05-04-2001

Print Date: 5/4/2001

Training Information

REFER TO SAFETY GUIDELINES

SAFETY NOTICE: ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

Visit our World Wide Web Site at <http://www.magnavox.com>

Block Diagrams

Overall Block Diagram

EC05 Tuner Board Block Diagram

Tape Module Block Diagram

CDC Module Block Diagram

Power Module Block Diagram

AF7 Board Circuit Features

The AF7 Board consists of the following features:

- a. TDA7437 AUDIO PROCESSOR IC
TDA7437 audio processor IC (7511) includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting. Sound features such as DBB, DSC, and IS are controllable via I²C bus.
- b. MICROPHONE MIXING
The AF7 Board can provide simple karaoke (without echo) which caters for microphone mixing with additional microphone amplifier board.
- c. DOLBY PRO LOGIC (DPL)
Dolby Pro Logic (DPL) function is provided by IC M62460FP (7711). Delay circuit is also integrated into the same IC.
- d. LINE OUT
Line out cinch socket is included for connection to external devices such as amplifier, recorder, etc.
- e. SUB-WOOFER OUT
Sub-woofer cinch socket is included for connection to active sub-woofer speaker.
- f. INCREDIBLE SURROUND
Incredible surround effect using transistor circuit to create phase shifting and spatial effect.
- g. HEADPHONE AMPLIFIER
A headphone can be driven by op-amp NJM4556AM.
- h. CD STANDBY CONTROL
Control circuit that switches on the supply to CD servo IC, HF circuit, and the laser light pen in CD mode only.
- i. HEADPHONE SENSING
Headphone sense circuit is for switching off DPL modes when headphone is plugged in.
- j. ATTENUATION NETWORK

Attenuation network is provided at the output of the AF7 Board for interfacing with power modules.

k. **BASS AUTOMATIC LEVEL CONTROL (ALC)**

This circuit will defeat the bass effect if it senses that there is an excessive amount of bass frequencies present in the left and right audio channels. This will prevent excessive speaker excursions under high volume condition.

Cassette Circuit Description

General

1. **Playback Mode**

Signal from the playback head Deck A or Deck B is selected and fed through by Mode Selector IC7710 (HEF4952B). The signal is amplified by amplifier IC7720 (AN7318S) before feeding to IC7740 (HEF4952B) and out to the AF Board via connector 1701. For Dolby sets, the signal from IC7740 will pass through IC7630 (CXA1551M) for Dolby noise processing before going to connector 1701.

2. **Recording Mode**

Recording Signal is selected and fed through by Mode Selector IC7710 (HEF4952B) which is then amplified by amplifier IC7720 (AN7318S). The amplified output signal will pass through IC7730 (HEF4952B) for record equalization and back to IC7710 (HEF4952B) before being registered into the Rec./PB Head of Deck B. For Dolby sets the amplified signal will pass through IC7630 (CXA1551M) for Dolby noise processing, then be amplified to the right level by IC7640 (NJM4560M) before record equalization.

3. **Dubbing Mode**

In dubbing mode, the signal from the Deck A playback head is selected and fed through by Mode Selector IC7710 (HEF4952B), which is then equalized for playback mode by amplifier IC7720 (AN7318S) so that a flat response is obtained after the pre-amp. The equalized signal will then follow the same path as in the recording mode.

4. **Mode Selector**

The Mode Selector IC7710 (HEF4952B) caters for 4 input signals, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal, and Dubbing Signal.

5. **Amplifier PB/REC**

Amplifier IC7720 (AN7318S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. **Automatic Level Control (ALC)**

The ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762, 2763), and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. **Muting Circuit (For Non-Dolby only)**

Switch S4 of IC7740 (HEF4952B) is for the purpose of muting the output during recording mode. During recording mode, S4 is closed and shorted to ground.

8. **IC7740 (HEF4952B)**

The function of IC7740 (HEF4952B) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II)

during playback mode. It will automatically determine whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the recording mode.

9. IC7730 (HEF4952B)

The function of IC7730 (HEF4952B) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determine whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level

Bias Level uses a variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby only)

Bias Symm makes use of the variable resistor (3785) to equalize the bias current for the left and the right channels.

12. PB Switch

Playback Switch, which consists of the FETs 7785 (For Dolby only) and 7786 (J111), is for the purpose of providing a virtual ground for the Rec./PB Head (Deck B) during playback mode. During the playback mode, the FETs are turned on and pins 2 and 4 of connector 1720 are shorted to ground. During recording mode, the FETs are turned off to allow the oscillator signal to be superpositioned onto the recording signal for recording.

13. Muting Circuit

The muting circuit, which consists of transistors 7788, 7789, and 7790 (BC847B), is for the purpose of muting the output during recording mode.

14. Motor Speed

During high speed dubbing, a feedback signal from the uP through pin 03 of IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between high and low, thus changing the speed of the motor.

15. IC7610 (HEF4094BT)

IC7610 (HEF4094BT) is a Shift Register used for issuing the logic for CMOS switch ICs (HEF4952B) via 1A0, 2A1, and 2A2. It also issues logic to On/Off SOL_A, SOL_B, and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (for sets with Dolby B NR only)

16. IC7630 (CXA1551M)

IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the playback and recording signal. Noise Reduction ON/OFF is controlled by DOLBY, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/LOW for NR OFF/ON.

17. 19kHz Filter

The 19kHz filters 5631 and 5632 (LXD-210) in the Dolby circuit are for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the recording signal.

18. Level Adjust

The variable resistors 3635, 3636, 3641, and 3642 in the Dolby circuit are for adjusting the playback level of the Dolby reference (400Hz, 200nWb/m). Transistors 7631 and 7632 are ON to enable adjustment of 3641, 3642 during playback by Deck A. Transistors 7633, 7634, and 3635, 3636 are active for playback by Deck B.

19. Amplifier IC7640 (NJM4560M)

The Amplifiers 7640A and 7640B (NJM4560M) in the Dolby circuit are for the purpose of amplifying the recording signal.

NOTATIONS AND ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non Auto Reverse
FR	Auto Reverse on Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assembly
SD	Single Deck
SM	Single Motor

CONNECTOR ASSIGNMENTS

CONNECTOR 1701		INTERCONNECTION TO AF BOARD
1	REC-L	Record input left
2	REC-R	Record input right
3	GND A	AF ground
4	TAPE-L	Playback output left
5	+12V	DC supply (+12V) in
6	TAPE-R	Playback output right
7	-CMOS	Negative dc supply (-9V) for CMOS ICs
CONNECTOR 1703		INTERCONNECTION TO AF BOARD
1	GND M	Motor ground
2	+MOTOR	DC supply (+12V) for tape deck motor and solenoid
CONNECTOR 1706		INTERCONNECTION TO FRONT BOARD
1	AD2	Deck sensing switches output voltage / Deck A EOT
2	AD1	Deck sensing switches output voltage / Deck B EOT
3	+5	DC supply +5V for ADC network
4	GND P	Control and oscillator ground
5	CLK	HEF4094BT shift register clock line
6	DATA	HEF4094BT shift register data line
7	STROBE	HEF4094BT shift register strobe line
CONNECTOR 1710		DECK B HEADS CONNECTON (For ETF6... only)

1	B R/P HD L+	R/P head left channel positive
2	GND A	R/P head return ground
3	B R/P HD R+	R/P head right channel positive
4	ERASE HEAD	Erase head
5	GND A	Erase head ground

CONNECTOR 1720 DECK B HEADS CONNECTON (For ETF5... only)

1	B R/P HD L+	R/P head left channel positive
2	B R/P HD L-	R/P head left channel negative
3	B R/P HD R+	R/P head right channel positive
4	B R/P HD R-	R/P head right channel negative
5	ERASE HEAD	Erase head
6	GND A	Erase head ground

CONNECTOR 1730 DECK A HEAD CONNECTIONS (For Double Deck versions only)

1	A PB HD L+	PB head left channel positive
2	GND A	PB head return ground shield
3	A PB HD R+	PB head right channel positive

CONNECTOR 1740 DECK B CONTROL INTERFACE (For ETF5... Double Deck only)

1	REC REW	Record tab protection status switch (reverse) [open=on: close=off]
2	REC FWD	Record tab protection status switch (forward) [open=on: close=off]
3	CrO2	Chrome tape detection switch [open=Cr: close=Fe]
4	PHOTO B	Photo sensor output (tape movement indication)
5	SOL B	Solenoid supply
6	Vcc	Deck / Motor supply
7	MODE	Mode switch (head engagement) [open=off: close=engaged]
8	GND M	Deck / Motor ground
9	H	H pin for motor
10	L	L pin for motor

CONNECTOR 1750 DECK A CONTROL INTERFACE (For ETF5... Double Deck only)

1	CrO2	Chrome tape detection switch [open=Cr: close=Fe]
2	PHOTO A	Photo sensor output (tape movement indication)
3	SOL A	Solenoid supply
4	Vcc	Deck/Motor supply
5	MODE	Mode switch (head engagement) [open=off: close=engaged]
6	GND M	Deck/Motor ground

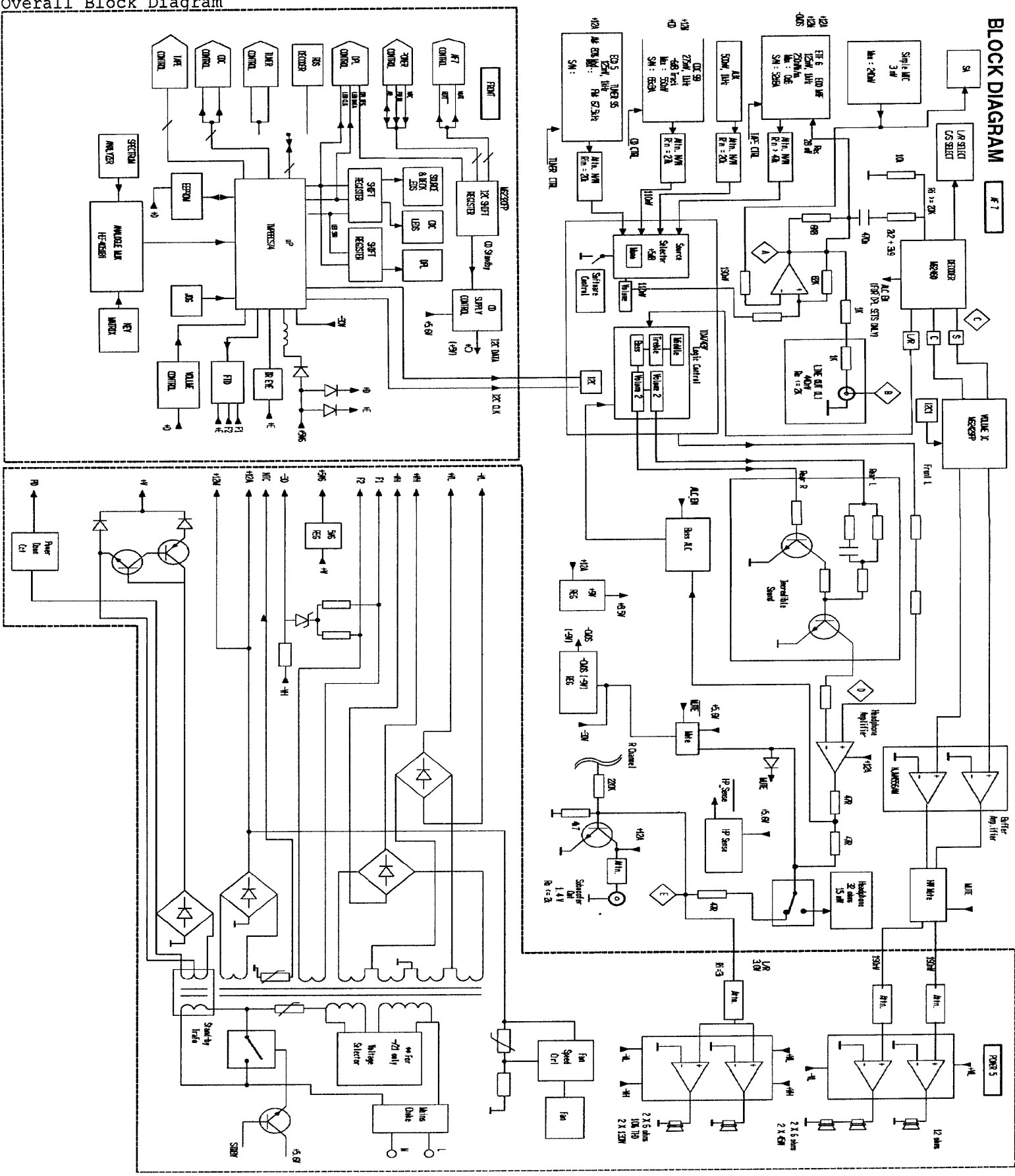
CONNECTOR 1760 DECK B CONTROL INTERFACE (For Single Deck only)

1	REC REW	Record tab protection status switch (reverse) [open=on: close=off]
2	REC FWD	Record tab protection status switch (forward) [open=on: close=off]
3	CrO2	Chrome tape detection switch [open=Cr: close=Fe]
4	PHOTO B	Photo sensor output (tape movement indication)
5	SOL B	Solenoid supply
6	Vcc	Deck / Motor supply
7	MODE	Mode switch (head engagement) [open=off: close=engaged]
8	GND M	Deck / Motor ground

CONNECTOR 1770

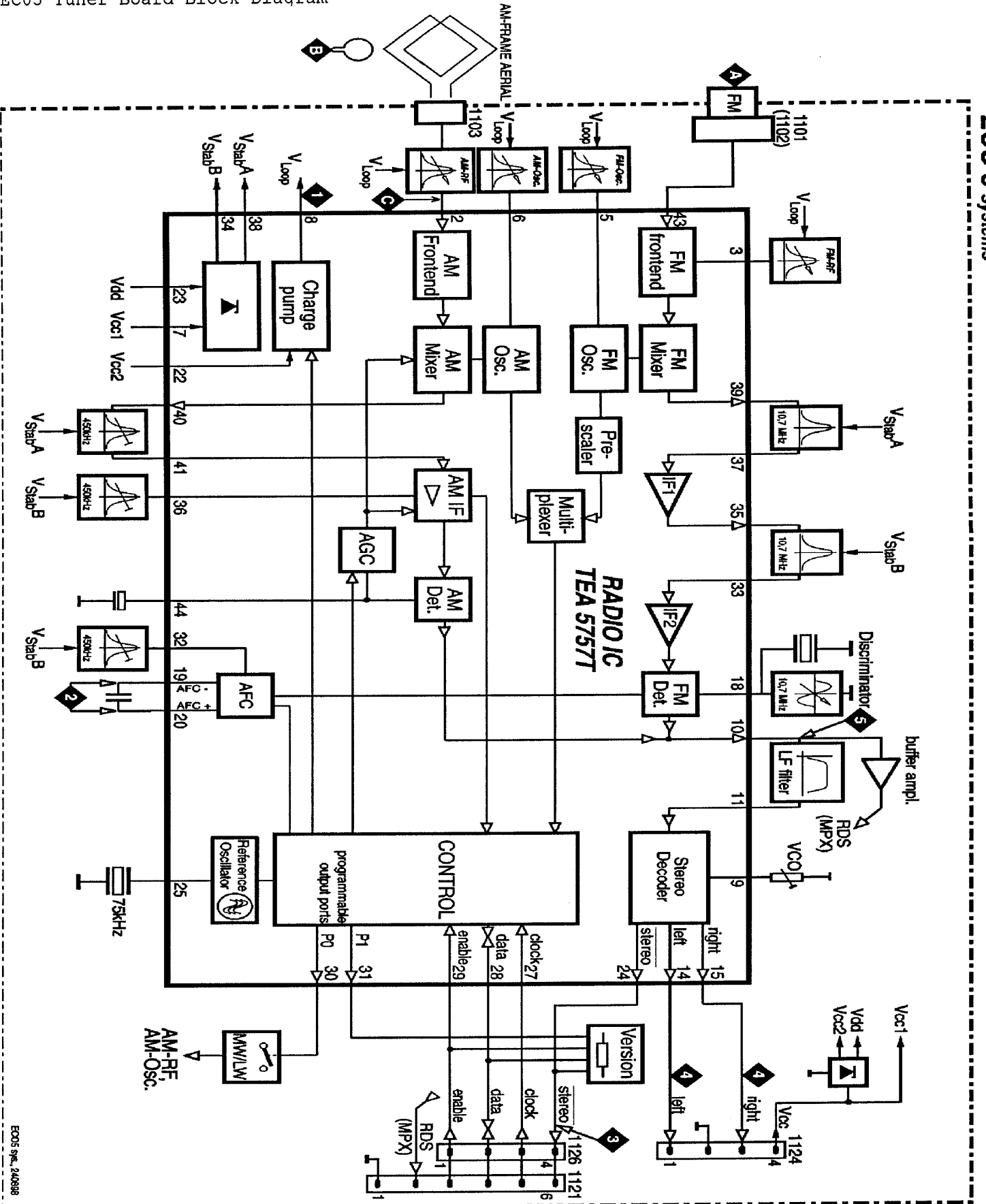
1	REC REW	Record tab protection status switch (reverse) [open=on: close=off]
2	REC FWD	Record tab protection status switch (forward) [open=on: close=off]
3	CrO2 B	Chrome tape detection switch deck B [open=Cr: close=Fe]
4	PHOTO B	Photo sensor output (tape movement indication)
5	SOL B	Solenoid supply for deck B
6	Vcc	Deck / Motor supply
7	MODE B	Mode switch (head engagement) [open=off: close=engaged]
8	GND M	Deck / Motor ground
9	L	L pin for motor
10	H	H pin for motor
11	CrO2 A	Chrome tape detection switch deck A [open=Cr: close=Fe]
12	SOL A	Solenoid supply for deck A
13	PHOTO A	Photo sensor output (tape movement indication)

BLOCK DIAGRAM



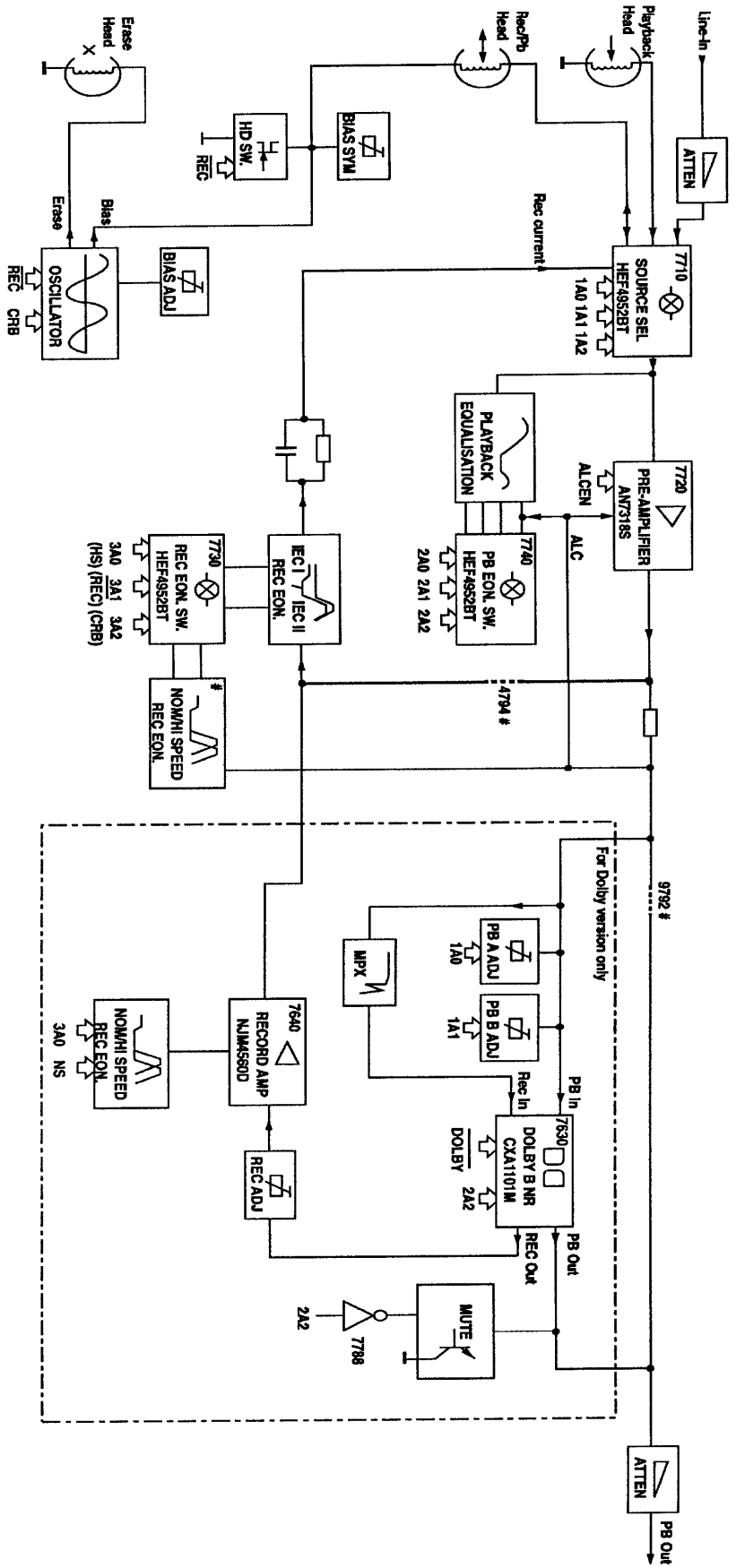
TUNER BOARD

ECO 5 systems



Tape Module Block Diagram

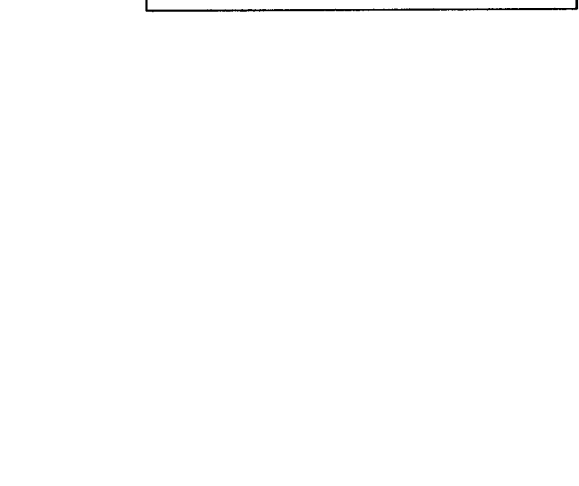
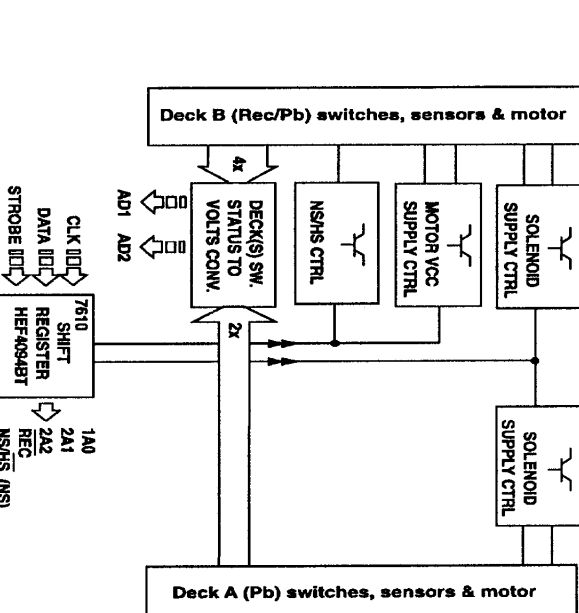
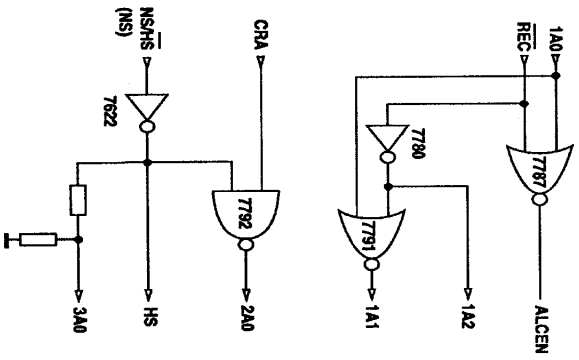
BLOCK DIAGRAM

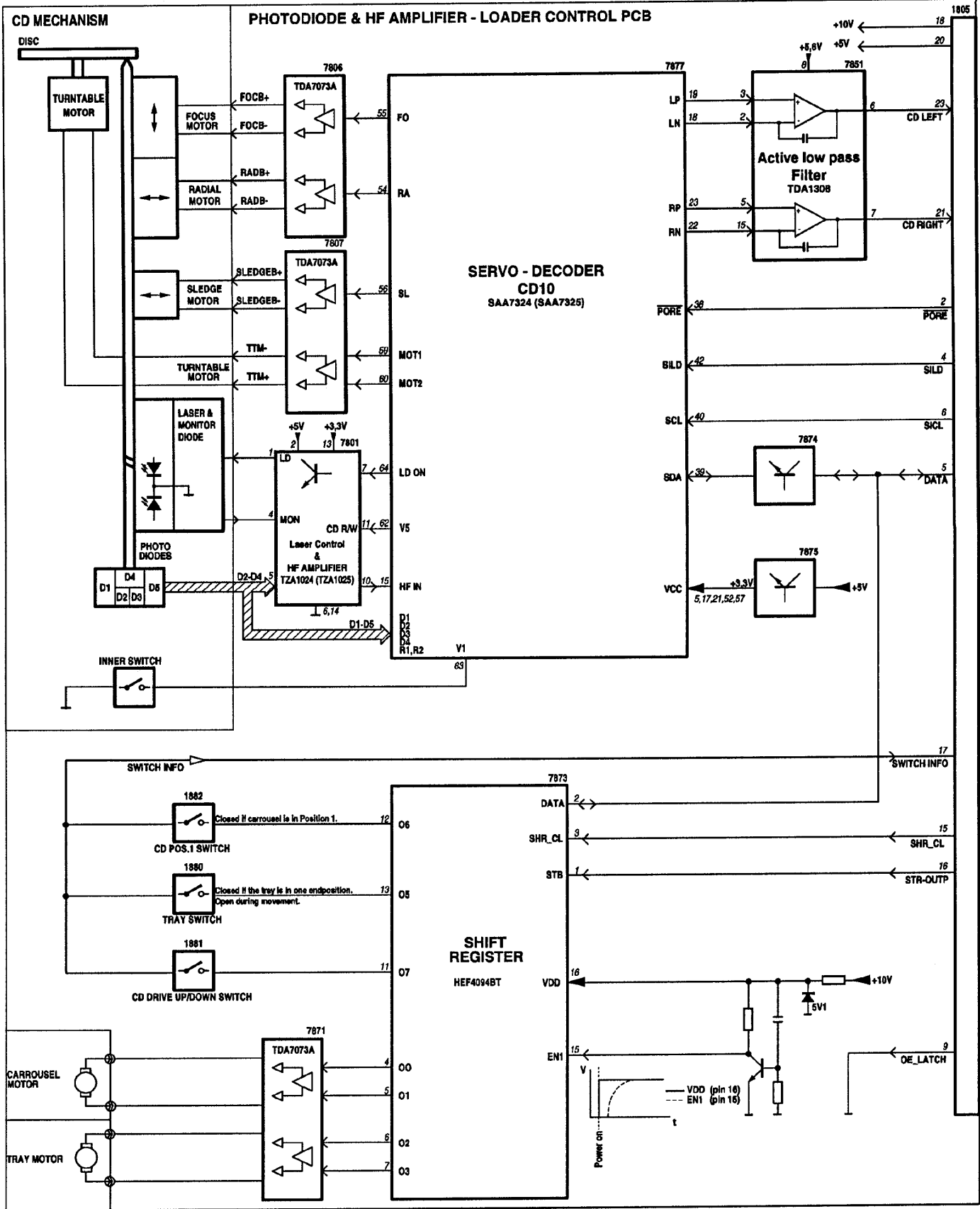


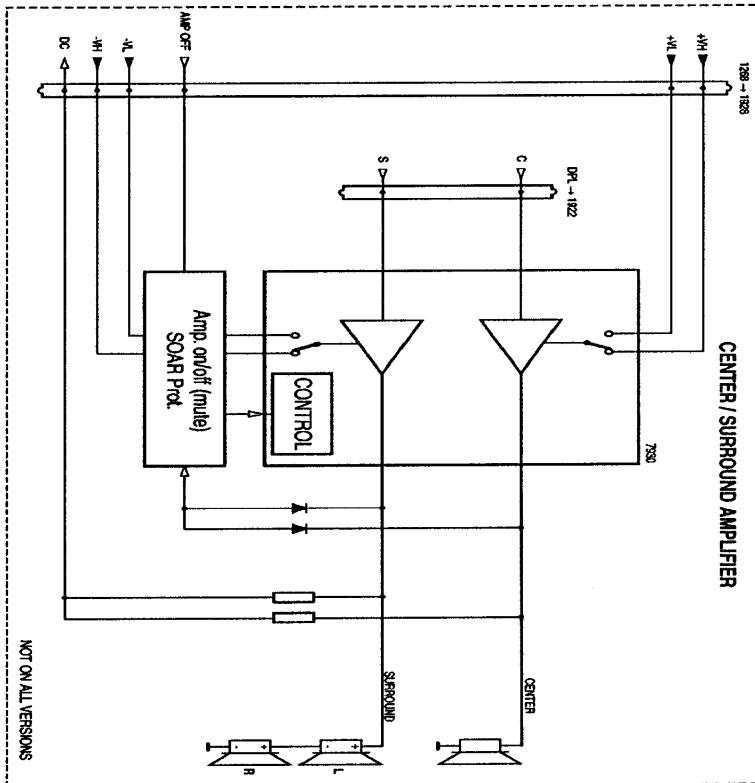
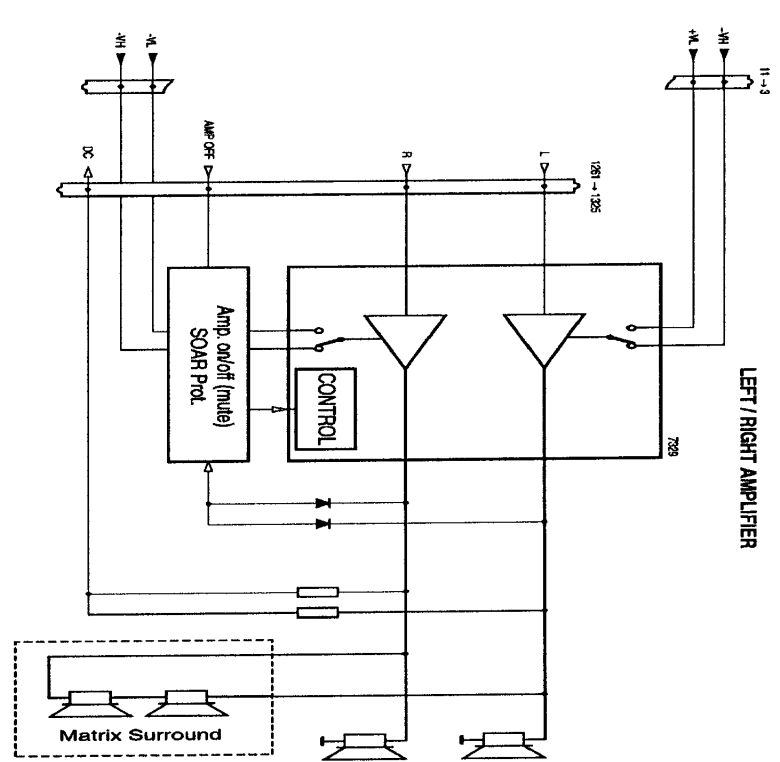
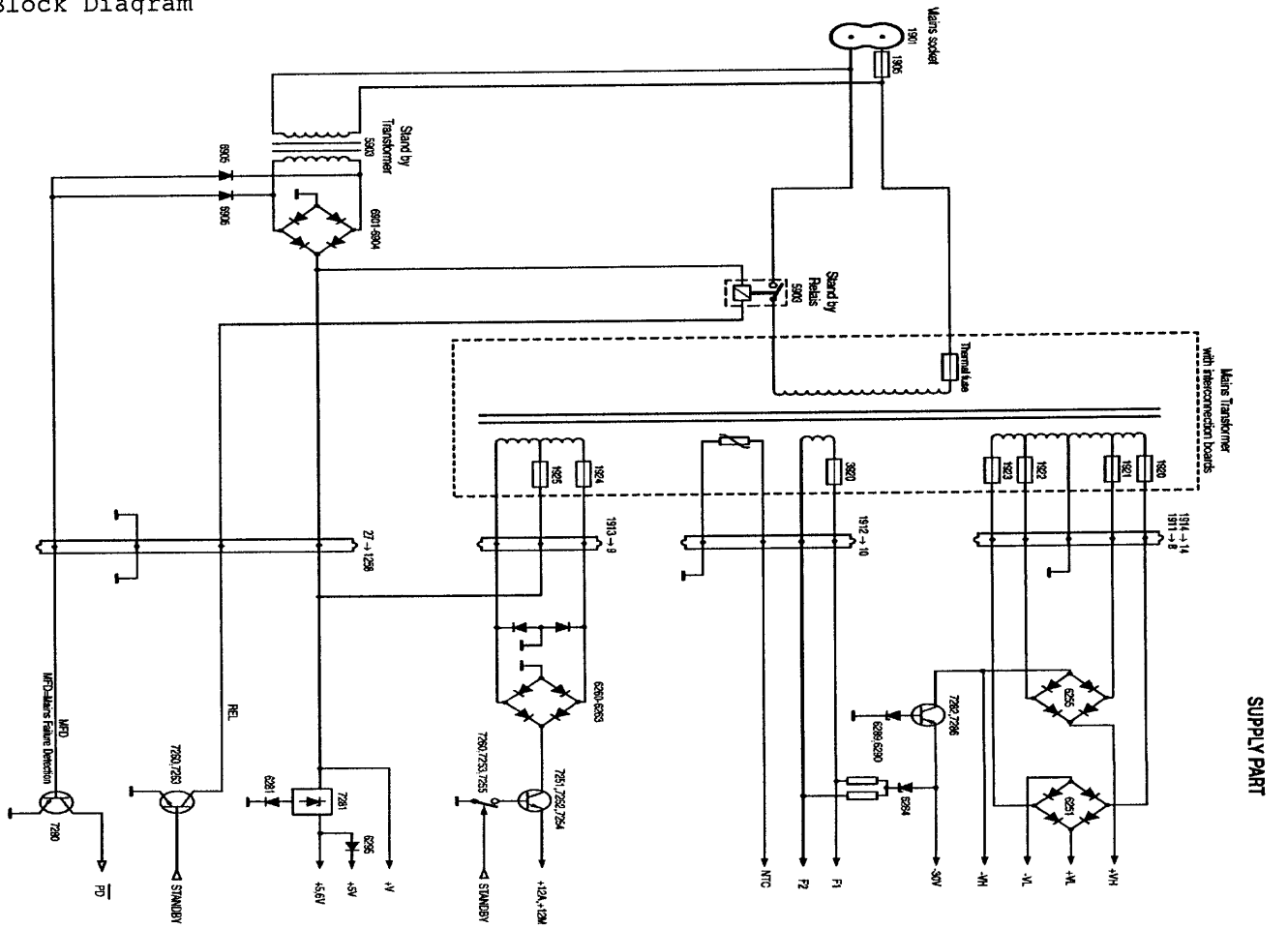
NOTE: # For Non-dolby version only
Only 1 channel is presented.

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers







Philips Consumer Electronics

Technical Service Data

Service Solutions Group
Technical Publications Dept.
P.O. Box 555
401 East Old Andrew Johnson Hwy.
Jefferson City, TN 37760

Manual 1923

Model no.: FW890C
First Publish: 10-05-99
Rev. Date: 05-04-2001
Print Date: 5/4/2001

Parts List

REFER TO SAFETY GUIDELINES

SAFETY NOTICE: ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

Visit our World Wide Web Site at <http://www.magnavox.com>

FRONT BOARD ELECTRICAL PARTS

FRONT BOARD ELECTRICAL PARTS		MISCELLANEOUS	
1399	Flex Connector 7P.	4822 267	10953
1401	Flex Connector 6P.	4822 265	11207
1402	Flex Connector 23P.	4822 265	11182
1405	Flex Connector 4P.	4822 267	10733
1407	Tact Switch.	4822 276	13775
1408	Tact Switch.	4822 276	13775
1410	Tact Switch.	4822 276	13775
1412	Tact Switch.	4822 276	13775
1413	Tact Switch.	4822 276	13775
1414	Tact Switch.	4822 276	13775
1415	Tact Switch.	4822 276	13775
1416	Tact Switch.	4822 276	13775
1417	Tact Switch.	4822 276	13775
1418	Tact Switch.	4822 276	13775
1419	Tact Switch.	4822 276	13775
1420	Tact Switch.	4822 276	13775
1421	Tact Switch.	4822 276	13775
1422	Tact Switch.	4822 276	13775
1423	Tact Switch.	4822 276	13775
1424	Tact Switch.	4822 276	13775
1425	Tact Switch.	4822 276	13775
1426	Tact Switch.	4822 276	13775
1427	Tact Switch.	4822 276	13775
1428	Tact Switch.	4822 276	13775
1429	Tact Switch.	4822 276	13775
1430	Tact Switch.	4822 276	13775
1431	Tact Switch.	4822 276	13775
1432	Tact Switch.	4822 276	13775
1433	Tact Switch.	4822 276	13775
1434	Tact Switch.	4822 276	13775
1435	Tact Switch.	4822 276	13775
1436	Tact Switch.	4822 276	13775
1437	Tact Switch.	4822 276	13775
1460	Rotary Encoder 24P.	4822 273	10371
1476	Rotary Encoder 24P.	4822 273	10365
1480	FTD Display.	4822 135	00272
1801	Headphone Socket.	4822 265	11529
1900	Flex Connector 6P.	4822 265	11207
1902	Tact Switch.	4822 276	13775
1903	Tact Switch.	4822 276	13775
1904	Tact Switch.	4822 276	13775
1905	Tact Switch.	4822 276	13775
1906	Tact Switch.	4822 276	13775
CAPACITORS			
2103	100pF 5% 50V.	5322 122	32531
2104	100pF 5% 50V.	5322 122	32531
2105	100pF 5% 50V.	5322 122	32531
2106	100pF 5% 50V.	5322 122	32531
2400	100pF 5% 50V.	5322 122	32531
2401	100pF 5% 50V.	5322 122	32531
2402	100pF 5% 50V.	5322 122	32531
2403	100pF 5% 50V.	5322 122	32531
2405	100pF 5% 50V.	5322 122	32531
2406	100pF 5% 50V.	5322 122	32531
2407	100pF 5% 50V.	5322 122	32531
2408	100pF 5% 50V.	5322 122	32531
2409	100pF 5% 50V.	5322 122	32531
2410	100pF 5% 50V.	5322 122	32531
2411	100pF 5% 50V.	5322 122	32531
2412	100pF 5% 50V.	5322 122	32531
2413	100pF 5% 50V.	5322 122	32531
2414	100pF 5% 50V.	5322 122	32531
2415	100pF 5% 50V.	5322 122	32531
2416	100pF 5% 50V.	5322 122	32531
2417	100pF 5% 50V.	5322 122	32531
2418	100pF 5% 50V.	5322 122	32531
2419	100pF 5% 50V.	5322 122	32531
2420	100pF 5% 50V.	5322 122	32531
2421	100pF 5% 50V.	5322 122	32531
2429	100pF 5% 50V.	5322 122	32531
2431	100pF 5% 50V.	5322 122	32531
2432	10nF 20% 50V.	4822 122	33177
2433	10nF 20% 50V.	4822 122	33177
2464	100nF 10% 25V.	4822 126	13196
2465	100nF 20% 25V.	4822 126	10002
2466	47uF 20% 16V.	4822 124	81286
2467	100nF 10% 25V.	4822 126	13196
2468	47uF 20% 16V.	4822 124	81286
2469	22pF 5% 50V.	5322 122	32658
2470	22pF 5% 50V.	5322 122	32658
2471	22pF 5% 50V.	5322 122	32658
2472	270pF 5% 50V.	4822 122	33216
2473	15pF 2% 63V.	4822 126	13486
2474	1uF 16V.	4822 126	13836
2475	1uF 16V.	4822 126	13836
2476	2,2nF 20% 50V.	4822 122	33175
2477	220nF 20% 25V.	4822 126	13061
2478	33nF 5% 50V.	4822 126	12105
2479	820pF 10% 63V.	4822 122	33806
2480	470nF +80/-20% 16V.	4822 126	13482
2481	47nF 20% 50V.	4822 122	33797
2482	220nF 20% 25V.	4822 126	13061
2483	1uF 16V.	4822 126	13836
2484	10nF 20% 50V.	4822 122	33177
2485	220nF 20% 25V.	4822 126	13061
2486	220nF 20% 25V.	4822 126	13061
2490	47nF 20% 50V.	4822 122	33797
2491	2,2nF 20% 50V.	4822 122	33175
2492	100nF 10% 25V.	4822 126	13196
2493	10nF 20% 50V.	4822 122	33177
2494	10nF 20% 50V.	4822 122	33177
2495	10nF 20% 50V.	4822 122	33177
2496	10nF 20% 50V.	4822 122	33177
2497	47uF 20% 16V.	4822 124	81286
2498	220nF +80/-20% 50V.	4822 126	13473
2499	100nF 10% 25V.	4822 126	13196
2500	220nF +80/-20% 50V.	4822 126	13473
2501	100nF 10% 25V.	4822 126	13196
2502	100nF 10% 25V.	4822 126	13196
2503	10pF 5% 63V.	5322 122	32448
2504	10pF 5% 63V.	5322 122	32448
2505	100pF 5% 50V.	5322 122	32531
2506	100pF 5% 50V.	5322 122	32531
2507	100pF 5% 50V.	5322 122	32531
2508	47nF 50V.	4822 126	12785
2509	47nF 10% 63V.	4822 126	13751
2600	100nF 10% 25V.	4822 126	13196
2601	100nF 10% 25V.	4822 126	13196
2701	100pF 5% 50V.	5322 122	32531
2702	100pF 5% 50V.	5322 122	32531
2703	100pF 5% 50V.	5322 122	32531
2801	220nF 20% 25V.	4822 126	13061
2803	470nF +80/-20% 16V.	4822 126	13482
2804	470nF +80/-20% 16V.	4822 126	13482
2806	10uF 20% 50V.	4822 124	41579
2809	1nF 10% 50V.	5322 122	34123
2810	1nF 10% 50V.	5322 122	34123
2814	47uF 20% 25V.	4822 124	40433
2817	100nF 10% 25V.	4822 126	13196
2821	22nF 10% 63V.	5322 122	32654
2827	47uF 20% 25V.	4822 124	40433
2900	100pF 5% 50V.	5322 122	32531
2901	100pF 5% 50V.	5322 122	32531
2902	100pF 5% 50V.	5322 122	32531
2903	100pF 5% 50V.	5322 122	32531
2904	47pF 1% 63V.	4822 126	13692
2905	47pF 1% 63V.	4822 126	13692
2906	47pF 1% 63V.	4822 126	13692
2907	47pF 1% 63V.	4822 126	13692
RESISTORS			
3100	1k 2% 0,25W.	4822 051	10102
3101	1k 2% 0,25W.	4822 051	10102
3102	1k 2% 0,25W.	4822 051	10102
3103	1k 1% 0,4W.	4822 050	11002
3104	10k 1% 0,1W.	4822 117	10833
3105	10k 1% 0,1W.	4822 117	10833
3106	10k 1% 0,1W.	4822 117	10833
3108	1k 2% 0,25W.	4822 051	10102
3109	1k 2% 0,25W.	4822 051	10102
3110	1k 2% 0,25W.	4822 051	10102
3111	1k 2% 0,25W.	4822 051	10102
3116	47k 1% 0,1W.	4822 117	10834
3117	47k 1% 0,1W.	4822 117	10834
3400	82k 1% 0,1W.	4822 117	11149
3401	82k 1% 0,1W.	4822 117	11149
3402	82k 1% 0,1W.	4822 117	11149
3403	82k 1% 0,1W.	4822 117	11149
3404	1k 2% 0,25W.	4822 051	10102
3405	1k 2% 0,25W.	4822 051	10102
3406	1k 2% 0,25W.	4822 051	10102
3407	1k 2% 0,25W.	4822 051	10102
3408	1k 2% 0,25W.	4822 051	10102
3409	1k 2% 0,25W.	4822 051	10102
3411	82k 1% 0,1W.	4822 117	11149
3412	82k 1% 0,1W.	4822 117	11149
3413	82k 1% 0,1W.	4822 117	11149
3414	OR Jumper 0805.	4822 051	20008
3415	OR Jumper 0805.	4822 051	20008
3420	82k 1% 0,1W.	4822 117	11149
3440	820R 1% 0,1W.	4822 117	11454
3441	560R 5% 0,1W.	4822 051	20561
3442	390R 5% 0,1W.	4822 051	20391
3443	270R 1% 0,1W.	4822 117	11504
3444	220R 1% 0,1W.	4822 117	11503
3445	150R 1% 0,1W.	4822 117	10353

3446	1k 1% 0,4W	4822 050 11002	3626	680k 5% 0,1W	4822 051 20684
3450	2k7 1% 0,1W	4822 117 12955	3627	1k5 1% 0,1W	4822 117 11139
3463	10k 1% 0,1W	4822 117 10833	3628	470k 5% 0,1W	4822 051 20474
3464	4k7 5% 0,1W	4822 051 20472	3629	47k 1% 0,1W	4822 117 10834
3465	2k7 1% 0,1W	4822 117 12955	3630	680k 5% 0,1W	4822 051 20684
3466	1k8 5% 0,1W	4822 051 20182	3631	1k5 1% 0,1W	4822 117 11139
3467	1k2 5% 0,1W	4822 051 20122	3632	470k 5% 0,1W	4822 051 20474
3468	820R 1% 0,1W	4822 117 11454	3633	47k 1% 0,1W	4822 117 10834
3469	560R 5% 0,1W	4822 051 20561	3634	10k 1% 0,1W	4822 117 10833
3470	390R 5% 0,1W	4822 051 20391	3638	100R 5% 0,1W	4822 051 20101
3471	270R 1% 0,1W	4822 117 11504	3639	10k 1% 0,1W	4822 117 10833
3472	220R 5% 0,5W	4822 116 83872	3640	1k 2% 0,25W	4822 051 10102
3473	150R 1% 0,1W	4822 117 10353	3641	1k 2% 0,25W	4822 051 10102
3474	1k 2% 0,25W	4822 051 10102	3643	100k 5% 0,1W	4822 051 20104
3480	2k7 1% 0,1W	4822 117 12955	3644	10k 1% 0,1W	4822 117 10833
3483	10k 1% 0,1W	4822 117 10833	3645	10k 1% 0,1W	4822 117 10833
3484	4k7 5% 0,1W	4822 051 20472	3656	1k 2% 0,25W	4822 051 10102
3485	2k7 1% 0,1W	4822 117 12955	3658	2k7 1% 0,1W	4822 117 12955
3486	1k8 5% 0,1W	4822 051 20182	3659	1k 2% 0,25W	4822 051 10102
3487	1k2 5% 0,1W	4822 051 20122	3660	470R 5% 0,1W	4822 051 20471
3488	820R 1% 0,1W	4822 117 11454	3660	8k2 5% 0,1W /37	4822 051 20822
3489	560R 5% 0,1W	4822 051 20561	3661	180R 1% 0,1W	4822 117 11448
3490	390R 5% 0,1W	4822 051 20391	3662	180R 1% 0,1W	4822 117 11448
3491	270R 1% 0,1W	4822 117 11504	3663	180R 1% 0,1W	4822 117 11448
3492	220R 1% 0,1W	4822 117 11503	3664	180R 1% 0,1W	4822 117 11448
3493	150R 5% 0,5W	4822 116 83868	3665	180R 1% 0,1W	4822 117 11448
3494	1k 1% 0,4W	4822 050 11002	3666	180R 1% 0,1W	4822 117 11448
3504	2k7 5% 0,5W	4822 116 52263	3667	150R 1% 0,1W	4822 117 10353
3563	1k 2% 0,25W	4822 051 10102	3668	1k 2% 0,25W	4822 051 10102
3564	1k 2% 0,25W	4822 051 10102	3669	56R 5% 0,1W	4822 051 20569
3565	1k 2% 0,25W	4822 051 10102	3670	150R 1% 0,1W	4822 117 10353
3566	1k 2% 0,25W	4822 051 10102	3671	56R 5% 0,1W	4822 051 20569
3567	1k 2% 0,25W	4822 051 10102	3672	1k 2% 0,25W	4822 051 10102
3568	1k 2% 0,25W	4822 051 10102	3673	180R 1% 0,1W	4822 117 11448
3569	1k 2% 0,25W	4822 051 10102	3674	180R 5% 0,5W	4822 116 52213
3570	1k 2% 0,25W	4822 051 10102	3675	180R 5% 0,5W	4822 116 52213
3571	1k 2% 0,25W	4822 051 10102	3676	220R 1% 0,1W	4822 117 11503
3572	1k 2% 0,25W	4822 051 10102	3677	220R 1% 0,1W	4822 117 11503
3573	1k 2% 0,25W	4822 051 10102	3678	220R 1% 0,1W	4822 117 11503
3574	1k 2% 0,25W	4822 051 10102	3679	220R 1% 0,1W	4822 117 11503
3575	1k 2% 0,25W	4822 051 10102	3680	1k 2% 0,25W	4822 051 10102
3576	1k 2% 0,25W	4822 051 10102	3681	1k 1% 0,4W	4822 050 11002
3577	1k 2% 0,25W	4822 051 10102	3682	330k 5% 0,5W	4822 116 52272
3578	1k 2% 0,25W	4822 051 10102	3683	220R 1% 0,1W	4822 117 11503
3579	1k 2% 0,25W	4822 051 10102	3684	220R 1% 0,1W	4822 117 11503
3580	1k 2% 0,25W	4822 051 10102	3686	10k 1% 0,1W	4822 117 10833
3581	1k 2% 0,25W	4822 051 10102	3700	100R 5% 0,1W	4822 051 20101
3582	1k 2% 0,25W	4822 051 10102	3701	100R 5% 0,1W	4822 051 20101
3583	1k 2% 0,25W	4822 051 10102	3702	10k 1% 0,1W	4822 117 10833
3584	1k 2% 0,25W	4822 051 10102	3703	10k 1% 0,1W	4822 117 10833
3585	1k 2% 0,25W	4822 051 10102	3704	10k 1% 0,1W	4822 117 10833
3586	1k 2% 0,25W	4822 051 10102	3705	1k 2% 0,25W	4822 051 10102
3587	1k 2% 0,25W	4822 051 10102	3706	1k 2% 0,25W	4822 051 10102
3588	1k 2% 0,25W	4822 051 10102	3707	1k 2% 0,25W	4822 051 10102
3589	1k 2% 0,25W	4822 051 10102	3708	10k 1% 0,1W	4822 117 10833
3590	1k 2% 0,25W	4822 051 10102	3709	10k 1% 0,1W	4822 117 10833
3591	1k 2% 0,25W	4822 051 10102	3710	220R 1% 0,1W	4822 117 11503
3592	1k 2% 0,25W	4822 051 10102	3803	100R 5% 0,1W	4822 051 20101
3593	1k 2% 0,25W	4822 051 10102	3805	1M 5% 0,1W	4822 051 20105
3594	1k 2% 0,25W	4822 051 10102	3807	3k9 5% 0,1W	4822 051 20392
3595	1k 2% 0,25W	4822 051 10102	3809	120R 5% 0,1W	4822 051 20121
3596	1k 2% 0,25W	4822 051 10102	3810	20kA POTM	4822 101 21204
3597	1k 2% 0,25W	4822 051 10102	3812	1M 5% 0,1W	4822 051 20105
3599	100k 5% 0,5W	4822 116 52234	3814	1k2 5% 0,1W	4822 051 20122
3600	1k 2% 0,25W	4822 051 10102	3816	560R 5% 0,1W	4822 051 20561
3601	1k 2% 0,25W	4822 051 10102	3842	100k 5% 0,1W	4822 051 20104
3602	1k 1% 0,4W	4822 050 11002	3845	OR Jumper 0805	4822 051 20008
3603	1M 5% 0,1W	4822 051 20105	3900	1k 2% 0,25W	4822 051 10102
3604	1k 2% 0,25W	4822 051 10102	3901	1k 2% 0,25W	4822 051 10102
3605	1k 2% 0,25W	4822 051 10102	3902	1k 2% 0,25W	4822 051 10102
3606	1k 2% 0,25W	4822 051 10102	3903	1k 2% 0,25W	4822 051 10102
3607	10k 1% 0,1W	4822 117 10833	3904	1k 2% 0,25W	4822 051 10102
3608	4k7 5% 0,1W	4822 051 20472	3905	1k 2% 0,25W	4822 051 10102
3609	1k 2% 0,25W	4822 051 10102	3906	1k 2% 0,25W	4822 051 10102
3610	1k 2% 0,25W	4822 051 10102	3907	1k 2% 0,25W	4822 051 10102
3611	10k 1% 0,1W	4822 117 10833	3908	1k 2% 0,25W	4822 051 10102
3612	10k 1% 0,1W	4822 117 10833	3909	470R 5% 0,1W	4822 051 20471
3613	1k 2% 0,25W	4822 051 10102	3910	470R 5% 0,1W	4822 051 20471
3614	1k 2% 0,25W	4822 051 10102	3911	470R 5% 0,1W	4822 051 20471
3615	1k 1% 0,4W	4822 050 11002	3912	470R 5% 0,1W	4822 051 20471
3616	1k 1% 0,4W	4822 050 11002	3913	470R 5% 0,5W	4822 116 83883
3618	680k 5% 0,1W	4822 051 20684	3914	470R 5% 0,5W	4822 116 83883
3619	1k5 1% 0,1W	4822 117 11139	3915	1k 2% 0,25W	4822 051 10102
3620	470k 5% 0,1W	4822 051 20474	3916	330R 5% 0,1W	4822 051 20331
3621	47k 1% 0,1W	4822 117 10834	3917	330R 5% 0,1W	4822 051 20331
3622	680k 5% 0,1W	4822 051 20684	3918	330R 5% 0,1W	4822 051 20331
3623	1k5 1% 0,1W	4822 117 11139	3919	10k 1% 0,1W	4822 117 10833
3624	470k 5% 0,1W	4822 051 20474	3920	4k7 5% 0,1W	4822 051 20472
3625	47k 1% 0,1W	4822 117 10834	3921	2k7 1% 0,1W	4822 117 12955

3922	1k8 5% 0,1W.	4822 051 20182	4810	OR Jumper 0805	4822 051 20008
3923	1k2 5% 0,1W.	4822 051 20122	4811	OR Jumper 0805	4822 051 20008
3924	47k 1% 0,1W.	4822 117 10834	4812	OR Jumper 0805	4822 051 20008
4401	OR Jumper 0805	4822 051 20008	4813	OR Jumper 0805	4822 051 20008
4402	OR Jumper 0805	4822 051 20008	4814	OR Jumper 0805	4822 051 20008
4403	OR Jumper 0805	4822 051 20008	4816	OR Jumper 0805	4822 051 20008
4404	OR Jumper 0805	4822 051 20008	4817	OR Jumper 0805	4822 051 20008
4405	OR Jumper 0805	4822 051 20008	4818	OR Jumper 0805	4822 051 20008
4406	OR Jumper 0805	4822 051 20008	4819	OR Jumper 0805	4822 051 20008
4407	OR Jumper 0805	4822 051 20008	4820	OR Jumper 0805	4822 051 20008
4408	OR Jumper 0805	4822 051 20008	4821	OR Jumper 0805	4822 051 20008
4409	OR Jumper 0805	4822 051 20008	4822	OR Jumper 0805	4822 051 20008
4410	OR Jumper 0805	4822 051 20008	4823	OR Jumper 0805	4822 051 20008
4411	OR Jumper 0805	4822 051 20008	4824	OR Jumper 0805	4822 051 20008
4412	OR Jumper 0805	4822 051 20008	4825	OR Jumper 0805	4822 051 20008
4413	OR Jumper 0805	4822 051 20008	4826	OR Jumper 0805	4822 051 20008
4414	OR Jumper 0805	4822 051 20008	4827	OR Jumper 0805	4822 051 20008
4415	OR Jumper 0805	4822 051 20008	4828	OR Jumper 0805	4822 051 20008
4416	OR Jumper 0805	4822 051 20008	4829	OR Jumper 0805	4822 051 20008
4417	OR Jumper 0805	4822 051 20008	4830	OR Jumper 0805	4822 051 20008
4418	OR Jumper 0805	4822 051 20008	4831	OR Jumper 0805	4822 051 20008
4419	OR Jumper 0805	4822 051 20008	4832	OR Jumper 0805	4822 051 20008
4420	OR Jumper 0805	4822 051 20008	4833	OR Jumper 0805	4822 051 20008
4421	OR Jumper 0805	4822 051 20008	4835	OR Jumper 0805	4822 051 20008
4422	OR Jumper 0805	4822 051 20008		COILS AND FILTERS	
4423	OR Jumper 0805	4822 051 20008	5400	Ceramic Resonator.	5322 242 73686
4424	OR Jumper 0805	4822 051 20008	5401	Crystal Resonator 32,768kHz.	4822 242 70938
4425	OR Jumper 0805	4822 051 20008	5403	Coil 2,2uH 5%.	4822 157 62552
4426	OR Jumper 0805	4822 051 20008	5404	Coil 2,2uH 5%.	4822 157 62552
4427	OR Jumper 0805	4822 051 20008	5405	Coil 100uH 5%.	4822 157 52333
4428	OR Jumper 0805	4822 051 20008	5406	Coil 100uH 5%.	4822 157 52333
4429	OR Jumper 0805	4822 051 20008	5408	Coil 10uH 10%.	4822 157 71593
4430	OR Jumper 0805	4822 051 20008	5409	Coil 10uH 10%.	4822 157 71593
4431	OR Jumper 0805	4822 051 20008	5410	Coil 100uH 5%.	4822 157 52333
4432	OR Jumper 0805	4822 051 20008	5801	Coil 2,2uH 5%.	4822 157 62552
4433	OR Jumper 0805	4822 051 20008		DIODES	
4434	OR Jumper 0805	4822 051 20008	6404	1N4003G.	4822 130 31878
4435	OR Jumper 0805	4822 051 20008	6405	1N4003G.	4822 130 31878
4436	OR Jumper 0805	4822 051 20008	6406	LTL-1CHPE.	4822 130 10792
4437	OR Jumper 0805	4822 051 20008	6420	1N4148	4822 130 30621
4438	OR Jumper 0805	4822 051 20008	6422	1N4148	4822 130 30621
4439	OR Jumper 0805	4822 051 20008	6423	1N4148	4822 130 30621
4440	OR Jumper 0805	4822 051 20008	6425	1N4148	4822 130 30621
4441	OR Jumper 0805	4822 051 20008	6426	1N4148	4822 130 30621
4442	OR Jumper 0805	4822 051 20008	6427	1N4003G.	4822 130 31878
4443	OR Jumper 0805	4822 051 20008	6428	LTL-1CHAE.	4822 130 11589
4444	OR Jumper 0805	4822 051 20008	6429	LTL-1CHAE.	4822 130 11589
4445	OR Jumper 0805	4822 051 20008	6430	LTL-1CHAE.	4822 130 11589
4446	OR Jumper 0805	4822 051 20008	6431	LTL-1CHAE.	4822 130 11589
4447	OR Jumper 0805	4822 051 20008	6432	LTL-1CHAE.	4822 130 11589
4448	OR Jumper 0805	4822 051 20008	6433	LTL-1CHAE.	4822 130 11589
4449	OR Jumper 0805	4822 051 20008	6434	LTL-1CHAE.	4822 130 11589
4450	OR Jumper 0805	4822 051 20008	6435	LTL-1CHAE.	4822 130 11589
4451	OR Jumper 0805	4822 051 20008	6436	LTL-1CHAE.	4822 130 11589
4452	OR Jumper 0805	4822 051 20008	6437	LTL-1CHAE.	4822 130 11589
4453	OR Jumper 0805	4822 051 20008	6438	LTL-1CHAE.	4822 130 11589
4454	OR Jumper 0805	4822 051 20008	6439	LTL-1CHAE.	4822 130 11589
4455	OR Jumper 0805	4822 051 20008	6440	LTL-1CHAE.	4822 130 11589
4456	OR Jumper 0805	4822 051 20008	6441	LTL-1CHAE.	4822 130 11589
4457	OR Jumper 0805	4822 051 20008	6442	LTL-1CHAE.	4822 130 11589
4458	OR Jumper 0805	4822 051 20008	6443	LTL-1CHPE.	4822 130 10792
4459	OR Jumper 0805	4822 051 20008	6444	LTL-1CHPE.	4822 130 10792
4460	OR Jumper 0805	4822 051 20008	6445	LTL-1CHPE.	4822 130 10792
4461	OR Jumper 0805	4822 051 20008	6446	LTL-1CHPE.	4822 130 10792
4462	OR Jumper 0805	4822 051 20008	6900	LTL-1CHGE.	4822 130 10791
4463	OR Jumper 0805	4822 051 20008	6901	LTL-1CHGE.	4822 130 10791
4464	OR Jumper 0805	4822 051 20008	6902	LTL-1CHGE.	4822 130 10791
4465	OR Jumper 0805	4822 051 20008		TRANSISTORS AND INTEGRATED CIRCUITS	
4466	OR Jumper 0805	4822 051 20008	7400	BC847B	4822 130 60511
4467	OR Jumper 0805	4822 051 20008	7401	BC847B	4822 130 60511
4468	OR Jumper 0805	4822 051 20008	7402	BC847B	4822 130 60511
4469	OR Jumper 0805	4822 051 20008	7403	BC847B	4822 130 60511
4470	OR Jumper 0805	4822 051 20008	7404	BC847B	4822 130 60511
4471	OR Jumper 0805	4822 051 20008	7406	BC847B	4822 130 60511
4472	OR Jumper 0805	4822 051 20008	7407	BC847B	4822 130 60511
4476	OR Jumper 0805	4822 051 20008	7408	BC847B	4822 130 60511
4477	OR Jumper 0805	4822 051 20008	7410	GP1U28XP	4822 130 10165
4478	OR Jumper 0805	4822 051 20008	7411	BC847B	4822 130 60511
4479	OR Jumper 0805	4822 051 20008	7412	BC847B	4822 130 60511
4800	OR Jumper 0805	4822 051 20008	7413	TMP88CU74YF - '870S51891'.	4822 209 17387
4801	OR Jumper 0805	4822 051 20008	7415	HEF4051BT.	5322 209 11446
4802	OR Jumper 0805	4822 051 20008	7416	M62320FP	4822 209 17345
4803	OR Jumper 0805	4822 051 20008	7417	ST24C01B6.	4822 209 31508
4804	OR Jumper 0805	4822 051 20008	7418	74HC4094D.	4822 209 15449
4805	OR Jumper 0805	4822 051 20008	7419	74HC4094D.	4822 209 15449
4806	OR Jumper 0805	4822 051 20008	7423	BC847B	4822 130 60511
4807	OR Jumper 0805	4822 051 20008	7805	BC847B	4822 130 60511
4808	OR Jumper 0805	4822 051 20008	7806	BC847B	4822 130 60511
4809	OR Jumper 0805	4822 051 20008			

EC05 TUNER BOARD ELECTRICAL PARTS
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S = Safety Part Be sure to use exact replacement part.

MISCELLANEOUS				3154	150R 5% 0,5W	4822	116	83868
1101	Antenna Socket 300R.	4822	267	3155	470R 5% 0,1W	4822	051	20471
1102	Antenna Socket Coax IEC 75R.	4822	267	3156	100k 5% 0,1W (for /21/30/33 only).	4822	051	20104
CAPACITORS				3157	100k 5% 0,5W (for East. Europe).	4822	116	52234
2101	100pF 5% 50V	5322	122	3158	470R 5% 0,5W	4822	116	83883
2101	47pF 1% 63V (for USA).	4822	126	3159	470R 5% 0,5W	4822	116	83883
2102	10nF 20% 50V	4822	122	3160	470R 5% 0,5W	4822	116	83883
2103	1nF 10% 50V.	5322	122	3161	470R 5% 0,5W	4822	116	83883
2104	100pF 10% 50V.	4822	122	3167	220R 1% 0,1W	4822	117	11503
2106	Trimmer 4-20pF (for LW version).	4822	125	3169	150k 5% 0,1W	4822	051	20154
2106	Trimmer 3-11pF 100V.	4822	125	3170	100k 5% 0,5W	4822	116	52234
2107	1uF 10% 63V.	4822	121	3171	330R 5% 0,5W	4822	116	52219
2108	100pF 5% 50V (for LW version).	5322	122	3176	1k 2% 0,25W (for RDS version).	4822	051	10102
2109	10pF 5% 50V (for LW version).	5322	122	3180	22k 5% 0,1W (for LW version).	4822	051	20223
2120	27pF 1% 63V (for LW version).	4822	126	4101	OR Jumper 0805 (for 2-Band only)	4822	051	20008
2120	22pF 5% 50V.	5322	122	4102	OR Jumper 0805 (for 2-Band only)	4822	051	20008
2122	3,3nF 10% 63V (for LW version).	4822	122	4103	OR Jumper 0805	4822	051	20008
2125	560pF 5% 400V.	4822	121	4104	OR Jumper 0805	4822	051	20008
2126	330pF 5% 50V	5322	122	4105	OR Jumper 0805	4822	051	20008
2127	220nF +80/-20% 50V	4822	126	4106	OR Jumper 0805	4822	051	20008
2128	10uF 20% 50V	4822	124	4108	OR Jumper 0805	4822	051	20008
2129	100uF 20% 10V.	4822	124	4111	OR Jumper 0805	4822	051	20008
2130	22nF +80/- 20% 25V.	4822	126	4120	OR Jumper 0805	4822	051	20008
2131	470nF 16V.	4822	122	4150	OR Jumper 1206	4822	051	10008
2132	470nF 16V.	4822	122	4151	OR Jumper 0805	4822	051	20008
2131	470nF +80/- 20% 16V.	4822	126	4152	OR Jumper 1206	4822	051	10008
2132	470nF +80/- 20% 16V.	4822	126	4153	OR Jumper 1206	4822	051	10008
2133	1uF 20% 63V.	4822	124	4154	OR Jumper 1206	4822	051	10008
2134	15nF 5% 63V.	4822	126	4155	OR Jumper 1206	4822	051	10008
2134	22nF 10% 63V (for USA)	5322	122	4156	OR Jumper 0805	4822	051	20008
2135	0,22uF 20% 63V	4822	124	4157	OR Jumper 1206	4822	051	10008
2136	15nF 5% 63V.	4822	126	4158	OR Jumper 1206	4822	051	10008
2136	22nF 10% 63V (for USA)	5322	122	4159	OR Jumper 1206	4822	051	10008
2137	0,22uF 20% 63V	4822	124	4162	OR Jumper 1206	4822	051	10008
2138	2,2uF 20% 50V.	4822	124	COILS AND FILTERS				
2139	50V 15pF 5%.	4822	126	5102	MW RF Coil	4822	157	71634
2140	470nF 5% 63V	4822	121	5103	LW RF Coil (for LW version).	4822	157	71635
2141	100nF 20% 25V.	4822	126	5109	Ceramic Filter 10,7MHz	4822	242	70665
2142	100nF 20% 25V.	4822	126	5110	Ceramic Filter 10,7MHz	4822	242	70665
2143	220nF +80/-20% 50V	4822	126	5111	AM-IF Filter 450kHz.	4822	158	60511
2144	1uF 20% 63V.	4822	124	5112	AM-IF Filter 450kHz.	4822	157	70302
2145	220pF 5% 50V	4822	122	5114	AM-IF Filter 450kHz.	4822	157	70302
2146	220pF 5% 50V	4822	122	5119	Discriminator 10,7MHz.	4822	157	11443
2147	220pF 5% 50V	4822	122	5120	Ceramic Disc. 10,7MG40K.	4822	242	82065
2148	22nF +80/- 20% 25V.	4822	126	5120	Ceramic Disc.10,7MG61KA-TF21	4822	242	10251
2149	22nF 10% 63V	5322	122	5121	Quartz 75kHz	4822	242	10261
2150	100nF 20% 63V.	4822	122	5122	Osc. Coil LW (for LW version).	4822	157	60517
2152	560pF 5% 63V (for East. Europe).	5322	116	5123	Osc. Coil MW	4822	157	60517
2152	33nF 5% 63V.	4822	126	5130	RF-Coil 1.5T	4822	156	30947
2153	12pF 2% 63V (for East. Europe)	4822	122	5131	RF-Coil 1.5T	4822	156	30947
2153	15pF 2% 63V.	4822	122	6103	DIODES			
2155	Trimmer 3-11pF 100V.	4822	125	6103	1N4148	4822	130	30621
2158	10pF 5% 50V (for LW version).	5322	122	6104	1N4148	4822	130	30621
2159	33pF 5% 50V.	5322	122	6105	HN1V02H-B.	4822	130	83075
2160	22nF 10% 63V	5322	122	6106	1N4148	4822	130	30621
2161	100nF 20% 25V.	4822	126	6107	BZX79-B11.	4822	130	34488
2163	100nF 20% 25V.	4822	126	6120	1N4148 (not for /21/30/33)	4822	130	30621
2164	470nF +80/- 20% 16V.	4822	126	6130	1SV228	4822	130	82833
2165	100nF 20% 25V.	4822	126	6131	1SV228	4822	130	82833
2166	1nF 10% 50V.	5322	122	TRANSISTORS AND INTEGRATED CIRCUITS				
2167	12pF 2% 63V.	4822	122	7101	TEA5757H/V1.	4822	209	90924
2168	82pF 1% 63V.	4822	126	7102	2SA838B.	4822	130	60093
RESISTORS				7103	BC858C (for RDS version)	4822	130	42513
3101	5k6 5% 0,1W (for East. Europe)	4822	051	7104	BC338-40 (for LW version).	5322	130	44779
3101	33k 5% 0,1W.	4822	051	7105	BC338-40 (for LW version).	5322	130	44779
3102	100k 5% 0,1W	4822	051	7109	BC858B (for LW version).	5322	130	41983
3103	18k 1% 0,1W.	4822	117	7111	BC848C	5322	130	42136
3104	180R 1% 0,1W	4822	117	7122	BC848C (for LW version).	5322	130	42136
3105	220R 5% 0,5W	4822	116	7124	BC848C (for LW version).	5322	130	42136
3108	2k2 1% 0,1W (for LW version).	4822	117	ETP6 TAPE MODULE EXPLODED VIEW PARTS				
3109	4k7 5% 0,1W (for LW version).	4822	051	ETP6 TAPE MODULE EXPLODED VIEW PARTS				
3110	47R 5% 0,5W.	4822	116	1	Autoreverse Mech. CWC44FR02.	4822	691	10673
3120	OR Jumper 0805	4822	051	1	Non-autoreverse Mech. CWC44FF01.	4822	691	10672
3123	4k7 5% 0,1W (for LW version).	4822	051	7	Flex Cable 13 pin 7,5 cm	4822	320	12245
3125	10k 1% 0,1W (for LW version).	4822	117	TAPE MECHANISM-MOTOR EXPLODED VIEW PARTS				
3128	2k2 1% 0,1W (for LW version).	4822	117	TAPE MECHANISM-MOTOR EXPLODED VIEW PARTS				
3132	47R 5% 0,5W.	4822	116	1	Motor Assembly	4822	361	11055
3134	22k 5% 0,1W.	4822	051	4	Screw M2,6 x 4	-		
3137	22k 5% 0,1W (for LW version).	4822	051	5	Screw M2 x 3	-		
3140	OR Jumper 0805, 5120=CDA10.7MG40K.	4822	051	TAPE MECHANISM A MECHANICAL PARTS				
3140	150R 1% 0,1W, 5120=CDA10.7MG61KA	4822	117	1	MS15RAA2N1	4822	249	10397
3141	56k 5% 0,1W.	4822	051	12	Pinch Arm Assembly Right	4822	402	10972
3142	Trimmer 100k 30% 0,1W.	4822	100	23	Coil Assembly.	4822	157	11498
3143	22k 5% 0,1W (for RDS version).	4822	051	32	Flywheel Assembly RV	4822	528	11244
3144	1k 2% 0,25W (for RDS version).	4822	051					
3145	2k2 1% 0,1W.	4822	117					
3146	22R 5% 0,1W.	4822	051					
3152	470R 5% 0,5W	4822	116					
3153	470R 5% 0,1W	4822	051					

42	Belt AF.	4822	358	10168	2730	27nF 10% 63V	4822	122	32541
69	Spring	4822	492	11542	2733	470pF 10% 63V.	5322	122	34099
102	Washer	4822	532	12931	2734	470pF 10% 63V.	5322	122	34099
103	Washer	4822	532	12932	2735	100nF 10% 25V.	4822	126	13196
104	Washer	4822	532	12933	2737	100nF 10% 25V.	4822	126	13196
					2738	100nF 10% 25V.	4822	126	13196
					2741	22nF +80/-20% 25V.	4822	126	11585
TAPE MECHANISM B (AUTOREVERSE) MECHANICAL PARTS									
	TAPE MECHANISM B (AUTOREVERSE) MECHANICAL PARTS				2742	22nF 10% 63V	5322	122	32654
	ICAL PARTS				2743	22nF 10% 63V	5322	122	32654
1	Rec./Pb Head Assembly.	4822	249	10552	2744	100nF 10% 25V.	4822	126	13196
10	Pinch Arm Assembly Left.	4822	402	10973	2760	100nF 10% 25V.	4822	126	13196
12	Pinch Arm Assembly Right	4822	402	10972	2761	220uF 20% 25V.	4822	124	22263
23	Coil Assembly.	4822	157	11498	2762	4,7uF 20% 63V.	4822	124	40246
31	Flywheel Assembly LV	4822	528	11211	2763	47uF 20% 25V	4822	124	40433
32	Flywheel Assembly RV	4822	528	11244	2765	47uF 20% 25V	4822	124	40433
33	Connector Socket 13pin	4822	267	10756	2769	470pF 10% 63V.	5322	122	34099
34	Photo Sensor	4822	130	10205	2770	470pF 10% 63V.	5322	122	34099
35	Mode Switch MSW-1722NCV.	4822	277	11531	2780	22uF 50V	4822	124	81151
39	Leaf Switch.	4822	278	90613	2781	10nF 20% 50V	4822	122	33177
42	Belt	4822	358	10169	2782	4,7nF 10% 63V.	5322	126	10223
45	680R 1% 0,4w	4822	050	16801	2784	15nF 10% 50V	4822	121	51305
65	Spring	4822	492	11546	2785	1uF 20% 63V.	4822	124	40242
69	Spring	4822	492	11542	2786	100pF 5% 50V	5322	122	32531
101	Washer	4822	532	12934	2787	33nF 5% 63V.	4822	126	12105
102	Washer	4822	532	12931		RESISTORS			
103	Washer	4822	532	12932	3601	2k2 1% 0,1W.	4822	117	11449
104	Washer	4822	532	12933	3602	27k 5% 0,1W.	4822	051	20273
105	Washer	4822	532	12935	3603	2k2 1% 0,1W.	4822	117	11449
					3604	56k 1% 0,1W.	4822	117	11148
					3605	2k2 1% 0,1W.	4822	117	11449
					3606	120k 5% 0,1W	4822	051	20124
					3607	2k2 5% 0,5W.	4822	116	52256
					3608	27k 5% 0,1W.	4822	051	20273
					3609	2k2 5% 0,5W.	4822	116	52256
					3610	120k 5% 0,1W	4822	051	20124
					3611	2k2 5% 0,5W.	4822	116	52256
					3612	56k 1% 0,1W.	4822	117	11148
					3613	27k 5% 0,1W.	4822	051	20273
					3614	27k 5% 0,1W.	4822	051	20273
					3616	10k 1% 0,1W.	4822	117	10833
					3618	10k 1% 0,1W.	4822	117	10833
					3620	Trimmer 4k7 30% 0,1W	5322	100	11542
					3623	100k 5% 0,1W	4822	051	20104
					3624	100k 5% 0,1W	4822	051	20104
					3625	1k 2% 0,25W.	4822	051	10102
					3626	1k 2% 0,25W.	4822	051	10102
					3628	100k 5% 0,1W	4822	051	20104
					3630	470R 5% 0,1W	4822	051	20471
					3672	4k7 5% 0,1W.	4822	051	20472
					3674	4k7 5% 0,5W.	4822	116	52283
					3676	47k 1% 0,1W.	4822	117	10834
					3678	47k 1% 0,1W.	4822	117	10834
					3679	47k 1% 0,1W.	4822	117	10834
					3680	47k 1% 0,1W.	4822	117	10834
					3685	100k 5% 0,5W	4822	116	52234
					3686	100k 5% 0,1W	4822	051	20104
					3701	220R 1% 0,1W	4822	117	11503
					3702	220R 1% 0,1W	4822	117	11503
					3703	220R 1% 0,1W	4822	117	11503
					3704	220R 1% 0,1W	4822	117	11503
					3705	220R 1% 0,1W	4822	117	11503
					3706	220R 1% 0,1W	4822	117	11503
					3707	100R 5% 0,1W	4822	051	20101
					3708	100R 5% 0,1W	4822	051	20101
					3709	6R8 5% 0,1W.	4822	051	20688
					3710	6R8 5% 0,1W.	4822	051	20688
					3711	150k 5% 0,1W	4822	051	20154
					3712	150k 5% 0,1W	4822	051	20154
					3713	10R 5% 0,1W.	4822	051	20109
					3714	10R 5% 0,1W.	4822	051	20109
					3715	1k8 5% 0,1W.	4822	051	20182
					3716	1k8 5% 0,1W.	4822	051	20182
					3717	2k2 1% 0,1W.	4822	117	11449
					3718	2k2 1% 0,1W.	4822	117	11449
					3719	4k7 5% 0,1W.	4822	051	20472
					3720	4k7 5% 0,1W.	4822	051	20472
					3721	5k6 5% 0,1W.	4822	051	20562
					3722	5k6 5% 0,1W.	4822	051	20562
					3723	12k 1% 0,1W (Autoreverse).	4822	117	11383
					3723	15k 5% 0,1W (Non-Autoreverse).	4822	051	20153
					3724	12k 1% 0,1W (Autoreverse).	4822	117	11383
					3724	15k 5% 0,1W (Non-Autoreverse).	4822	051	20153
					3725	10R 5% 0,1W.	4822	051	20109
					3726	10R 5% 0,1W.	4822	051	20109
					3727	5k6 5% 0,1W.	4822	051	20562
					3728	5k6 5% 0,1W.	4822	051	20562
					3729	2k7 1% 0,1W.	4822	117	12955
					3730	2k7 1% 0,1W.	4822	117	12955
					3731	6k8 1% 0,1W.	4822	117	11507

S = Safety Part Be sure to use exact replacement part.

3732	6k8 1% 0,1W	4822 117 11507	4736	OR Jumper 0805	4822 051 20008
3733	1k 2% 0,25W	4822 051 10102	4737	OR Jumper 0805	4822 051 20008
3734	1k 2% 0,25W	4822 051 10102	4738	OR Jumper 0805	4822 051 20008
3735	22k 5% 0,1W	4822 051 20223	4739	OR Jumper 0805	4822 051 20008
3736	22k 5% 0,1W	4822 051 20223	4740	OR Jumper 0805	4822 051 20008
3741	2k2 1% 0,1W	4822 117 11449	4741	OR Jumper 0805	4822 051 20008
3742	2k2 1% 0,1W	4822 117 11449	4742	OR Jumper 0805	4822 051 20008
3743	1k2 5% 0,1W (Autoreverse)	4822 051 20122	4781	680R 5% 0,1W	4822 051 20681
3743	1k 2% 0,25W (Non-Autoreverse)	4822 051 10102	4785	OR Jumper 0805	4822 051 20008
3744	1k2 5% 0,1W (Autoreverse)	4822 051 20122	4790	OR Jumper 0805	4822 051 20008
3744	1k 2% 0,25W (Non-Autoreverse)	4822 051 10102	4794	OR Jumper 0805	4822 051 20008
3745	3k3 5% 0,1W	4822 051 20332	4795	OR Jumper 0805	4822 051 20008
3746	3k3 5% 0,1W	4822 051 20332		COILS AND FILTERS	
3748	2k2 1% 0,1W	4822 117 11449	5701	Coil 2,2uH 5%	4822 157 11477
3749	47k 1% 0,1W	4822 117 10834	5703	Oscillator Coil 100kHz	4822 156 20946
3751	10k 1% 0,1W	4822 117 10833		DIODES	
3752	100k 5% 0,1W	4822 051 20104	6611	1N4003G	4822 130 31878
3753	100k 5% 0,1W	4822 051 20104	6612	1N4003G	4822 130 31878
3754	1M 5% 0,1W	4822 051 20105	6614	1N4148	4822 130 30621
3755	1M 5% 0,1W	4822 051 20105	6770	1N4148	4822 130 30621
3756	220k 1% 0,1W	4822 117 13579	6771	1N4148	4822 130 30621
3757	220k 1% 0,1W	4822 117 13579	6772	1N4148	4822 130 30621
3758	10k 1% 0,1W	4822 117 10833	6773	1N4148	4822 130 30621
3759	10k 1% 0,1W	4822 117 10833	6774	1N4148	4822 130 30621
3760	120R 5% 0,1W	4822 051 20121	6775	1N4148	4822 130 30621
3761	10k 5% 0,5W	4822 116 83864	6776	1N4148	4822 130 30621
3762	820R 1% 0,1W	4822 117 11454	6777	BZX79-BBV2	4822 130 34382
3763	150k 5% 0,1W	4822 051 20154	6778	1N4148	4822 130 30621
3764	220R 5% 0,5W	4822 116 83872	6782	1N4148	4822 130 30621
3765	39k 5% 0,1W	4822 051 20393	6785	1N4148	4822 130 30621
3766	4M7 5% 0,1W	4822 051 20475	6786	1N4148	4822 130 30621
3767	4M7 5% 0,1W	4822 051 20475		TRANSISTORS AND INTEGRATED CIRCUITS	
3768	10k 1% 0,1W	4822 117 10833	7610	HEF4094BT	5322 209 11306
3769	12k 1% 0,1W (Autoreverse)	4822 117 11383	7612	BC807-25	5322 130 60845
3769	8k2 5% 0,1W (Non-Autoreverse)	4822 051 20822	7613	BC807-25	5322 130 60845
3770	1k5 1% 0,1W	4822 117 11139	7614	BC807-25	5322 130 60845
3771	1k2 5% 0,1W	4822 051 20122	7616	BC857B	5322 130 60508
3772	4k7 5% 0,1W (Autoreverse)	4822 051 20472	7618	BC847B	4822 130 60511
3772	5k6 5% 0,1W (Non-Autoreverse)	4822 051 20562	7619	BC847B	4822 130 60511
3773	Trimmer 4k7 30% 0,1W	5322 100 11542	7620	BC847B	4822 130 60511
3774	10k 1% 0,1W (Autoreverse)	4822 117 10833	7622	BC847B	4822 130 60511
3774	8k2 5% 0,1W (Non-Autoreverse)	4822 051 20822	7623	BC847B	4822 130 60511
3775	4R7 5% 0,1W	4822 051 20478	7624	BC847B	4822 130 60511
3776	6k8 1% 0,1W	4822 117 11507	7710	HEF4952BT	4822 209 32919
3777	150R 1% 0,1W	4822 117 10353	7720	AN7318S	4822 209 32918
3778	6R8 5% 0,33W	4822 052 10688	7730	HEF4952BT	4822 209 32919
3779	330k 5% 0,1W	4822 051 20334	7740	HEF4952BT	4822 209 32919
3780	1M 5% 0,1W	4822 051 20105	7780	BC847B	4822 130 60511
3781	4M7 5% 0,1W	4822 051 20475	7781	BC817-25	4822 130 42804
3784	1k 2% 0,25W	4822 051 10102	7782	BC557B	4822 130 44568
3786	22k 5% 0,1W	4822 051 20223	7783	BC847B	4822 130 60511
3787	1M 5% 0,1W	4822 051 20105	7784	BC857B	5322 130 60508
3788	1M 5% 0,1W	4822 051 20105	7786	J111	4822 130 63494
3789	47k 1% 0,1W	4822 117 10834	7787	BC847B	4822 130 60511
4701	OR Jumper 0805	4822 051 20008	7791	BC847B	4822 130 60511
4702	OR Jumper 0805	4822 051 20008	7792	BC847B	4822 130 60511
4703	OR Jumper 0805	4822 051 20008		3CDC-99 MODULE MECHANICAL PARTS	
4704	OR Jumper 0805	4822 051 20008		3CDC-99 MODULE MECHANICAL PARTS	
4705	OR Jumper 0805	4822 051 20008		POLYLUB GLY801 (GREASE)	4822 390 10136
4706	OR Jumper 0805	4822 051 20008		GUIDE LEFT	4822 463 11008
4707	OR Jumper 0805	4822 051 20008	3	GUIDE RIGHT	4822 463 11009
4708	OR Jumper 0805	4822 051 20008	4	DRAWER	4822 441 11615
4709	OR Jumper 0805	4822 051 20008	21	BRACKET TUMBLER	4822 402 10088
4710	OR Jumper 0805	4822 051 20008	22	SCREW M2, 6X3, 5	4822 502 12548
4711	OR Jumper 0805	4822 051 20008	38	SCREW M2, 6X3, 5	4822 502 12548
4712	OR Jumper 0805	4822 051 20008	39	SLIDE	4822 463 11011
4713	OR Jumper 0805	4822 051 20008	40	CONTROL DISC	4822 522 10509
4714	OR Jumper 0805	4822 051 20008	41	GEAR WHEEL	4822 522 10492
4715	OR Jumper 0805	4822 051 20008	42	PULLEY	4822 528 10937
4716	OR Jumper 0805	4822 051 20008	43	IDLER WHEEL	4822 522 10493
4717	OR Jumper 0805	4822 051 20008	44	BELT	4822 358 10115
4718	OR Jumper 0805	4822 051 20008	45	ECCENTRIC GEAR WHEEL	4822 466 10735
4719	OR Jumper 0805	4822 051 20008	46	WASHER	4822 532 12364
4720	OR Jumper 0805	4822 051 20008	50	WASHER	4822 532 12364
4721	OR Jumper 0805	4822 051 20008	51	WASHER	4822 532 12364
4722	OR Jumper 0805	4822 051 20008	52	WASHER	4822 532 12364
4723	OR Jumper 0805	4822 051 20008	53	WASHER	4822 532 12364
4724	OR Jumper 0805	4822 051 20008	35	CAROUSEL MOTOR	4822 361 10753
4725	OR Jumper 0805	4822 051 20008	70	CAROUSEL MOTOR	4822 361 10753
4726	OR Jumper 0805	4822 051 20008	73	SCREW M2, 6X3, 5	4822 502 12548
4727	OR Jumper 0805	4822 051 20008	74	SCREW M2, 6X3, 5	4822 502 12548
4728	OR Jumper 0805	4822 051 20008	80	PULLEY	4822 528 10937
4729	OR Jumper 0805	4822 051 20008	81	GEAR DRAWER	4822 522 10494
4730	OR Jumper 0805	4822 051 20008	82	BELT	4822 358 10115
4731	OR Jumper 0805	4822 051 20008	83	WASHER	4822 532 12364
4732	OR Jumper 0805	4822 051 20008	84	WASHER	4822 532 12364
4733	OR Jumper 0805	4822 051 20008	95	SUPPORT	4822 404 10895
4734	OR Jumper 0805	4822 051 20008	96	SUSPENSION	4822 529 10431
4735	OR Jumper 0805	4822 051 20008	97	SUSPENSION	4822 529 10431

100	CD DRIVE VAM2201	4822 691 10772
115	CAROUSEL	4822 466 10736
117	BUSH DRAWER.	4822 532 12365
123	SWITCH BRACKET	4822 402 11237
125	DISC CLAMP	4822 401 11708

3CDC-99 MODULE ELECTRICAL PARTS

3CDC-99 MODULE ELECTRICAL PARTS		
MISCELLANEOUS		
1800	FLEX FOIL CONNECTOR 23PIN.	4822 265 11533
1805	FLEX FOIL CONNECTOR 15 PIN	4822 267 51322
1880	SWITCH	4822 276 13503
1881	SWITCH	4822 276 13503
1882	SWITCH	4822 276 13503
CAPACITORS		
2800	180pF 10% 50V.	4822 126 10053
2801	220pF 10% 50V.	4822 122 10466
2802	180pF 10% 50V.	4822 126 10053
2803	220pF 10% 50V.	4822 122 10466
2804	4,7uF 20% 63V.	4822 124 40246
2805	220pF 10% 50V.	4822 122 10466
2806	220pF 10% 50V.	4822 122 10466
2807	330pF 10% 50V.	4822 126 12787
2808	220pF 10% 50V.	4822 122 10466
2809	0,47uF 20% 50V	5322 124 41948
2810	180pF 10% 50V.	4822 126 10053
2811	220pF 10% 50V.	4822 122 10466
2814	47nF 20% 50V	4822 126 12785
2815	100nF 20% 50V.	4822 126 12882
2816	1,5nF 10% 16V.	4822 126 12878
2818	1,5nF 10% 16V.	4822 126 12878
2822	2,2nF 10% 16V.	4822 126 12339
2823	47pF 5% 50V.	4822 122 33848
2824	22nF 20% 50V	4822 126 11585
2825	47nF 20% 50V	4822 126 12785
2826	47uF 20% 16V	4822 124 80231
2828	47uF 20% 25V	4822 124 40433
2829	10uF 20% 25V	4822 124 21732
2830	47nF 20% 50V	4822 126 12785
2831	100pF 10% 50V.	4822 122 33195
2832	100pF 10% 50V.	4822 122 33195
2833	33pF 5% 50V.	4822 122 33069
2834	33pF 5% 50V.	4822 122 33069
2835	47nF 20% 50V	4822 126 12785
2837	47uF 20% 25V	4822 124 40433
2838	10uF 20% 50V	4822 124 41579
2839	47uF 20% 25V	4822 124 40433
2840	100nF 20% 50V.	4822 126 12882
2841	270pF 10% 50V.	4822 126 12702
2842	2,2nF 10% 16V.	4822 126 12339
2844	270pF 10% 50V.	4822 126 12702
2849	4,7uF 20% 63V.	4822 124 40246
2850	1nF 10% 50V.	4822 122 33197
2851	220uF 20% 16V.	4822 124 40196
2852	47nF 20% 50V	4822 126 12785
2853	22nF 20% 50V	4822 126 11585
2854	47nF 20% 50V	4822 126 12785
2855	470pF 10% 50V.	4822 122 33519
2856	47pF 5% 50V.	4822 122 33848
2857	10nF 20% 16V	4822 121 51387
2858	220uF 20% 16V.	4822 124 40196
2859	10nF 20% 16V	4822 121 51387
2860	10uF 20% 50V	4822 124 41579
2861	10uF 20% 50V	4822 124 41579
2862	220pF 10% 50V.	4822 122 10466
2863	220pF 10% 50V.	4822 122 10466
2864	22pF 5% 50V.	4822 122 33191
2865	22nF 20% 50V	4822 126 11585
2867	220pF 10% 50V.	4822 122 10466
2869	47nF 20% 50V	4822 126 12785
2872	47nF 20% 50V	4822 126 12785
2873	47uF 20% 25V	4822 124 12233
2875	22nF 20% 50V	4822 126 11585
2876	220uF 20% 16V.	4822 124 40196
2877	82pF 5% 50V.	4822 122 10319
2878	220pF 10% 50V.	4822 122 10466
2879	47nF 20% 50V	4822 126 12785
2882	220pF 10% 50V.	4822 122 10466
2884	4,7uF 20% 63V.	4822 124 40246
2885	4,7uF 20% 63V.	4822 124 40246
2887	100nF 20% 50V.	4822 126 12882
2888	4,7uF 20% 63V.	4822 124 40246
2891	1,8nF 10% 16V.	4822 122 10576
2892	4,7nF 20% 16V.	4822 126 11714
2893	220pF 10% 50V.	4822 122 10466
RESISTORS		
3700	470ohm 5% 0,16W.	4822 116 83883
3705	220ohm 5% 0,5W	4822 116 83872
3706	470ohm 5% 0,16W.	4822 116 83883

3707	470ohm 5% 0,16W.	4822 116 83883
3708	470ohm 5% 0,16W.	4822 116 83883
3709	10kohm 5% 0,5W	4822 116 83864
3711	10kohm 5% 0,5W	4822 116 83864
3712	10ohm 5% 0,5W	4822 116 52176
3713	22kohm 5% 0,5W	4822 116 52257
3714	10kohm 5% 0,5W	4822 116 83864
3715	100kohm 5% 0,5W.	4822 116 52234
3716	470ohm 5% 0,16W.	4822 116 83883
3718	4,7kohm 5% 0,5W.	4822 116 52283
3727	4,7kohm 5% 0,5W.	4822 116 52283
3728	4,7kohm 5% 0,5W.	4822 116 52283
3730	33kohm 5% 0,16W.	4822 116 52271
3731	10kohm 5% 0,5W	4822 116 83864
3740	22kohm 5% 0,5W	4822 116 52257
3741	22kohm 5% 0,5W	4822 116 52257
3742	22kohm 5% 0,5W	4822 116 52257
3743	22kohm 5% 0,5W	4822 116 52257
3744	10kohm 5% 0,5W	4822 116 83864
3746	10kohm 5% 0,5W	4822 116 83864
3750	1kohm 5% 0,2W.	4822 050 11002
3751	1kohm 5% 0,2W.	4822 050 11002
3800	56kohm 5% 0,5W	4822 116 52291
3801	10kohm 5% 0,5W	4822 116 83864
3802	56kohm 5% 0,5W	4822 116 52291
3803	10kohm 5% 0,5W	4822 116 83864
3805	10kohm 5% 0,5W	4822 116 83864
3806	10kohm 5% 0,5W	4822 116 83864
3807	10kohm 5% 0,5W	4822 116 83864
3808	10kohm 5% 0,5W	4822 116 83864
3809	270ohm 5% 0.16W.	4822 116 83876
3811	18kohm 5% 0,5W	4822 116 52251
3812	2,2ohm 5% 1W	4822 053 10228
3814	33ohm 5% 0,5W.	4822 116 52191
3815	4,7ohm 5% NFR.	4822 052 10478
3819	470ohm 5% 0,16W.	4822 116 83883
3820	4,7kohm 5% 0,5W.	4822 116 52283
3821	4,7kohm 5% 0,5W.	4822 116 52283
3822	1,8kohm 5% 0,16W	4822 116 52249
3823	1kohm 5% 0,2W.	4822 050 11002
3824	1kohm 5% 0,2W.	4822 050 11002
3825	1kohm 5% 0,2W.	4822 050 11002
3826	22kohm 5% 0,5W	4822 116 52257
3827	33kohm 5% 0,16W.	4822 116 52271
3828	22kohm 5% 0,5W	4822 116 52257
3831	22kohm 5% 0,5W	4822 116 52257
3832	10kohm 5% 0,5W	4822 116 83864
3833	22kohm 5% 0,5W.	4822 116 52257
3834	22kohm 5% 0,5W	4822 116 52257
3835	3,3ohm NFR25	4822 052 10338
3837	1kohm 5% 0,2W.	4822 050 11002
3838	1kohm 5% 0,2W.	4822 050 11002
3839	100kohm 5% 0,5W.	4822 116 52234
3840	100kohm 5% 0,5W.	4822 116 52234
3841	4,7kohm 5% 0,5W.	4822 116 52283
3842	47kohm 5% 0,16W.	4822 116 83884
3843	33kohm 5% 0,16W.	4822 116 52271
3844	4,7kohm 5% 0,5W.	4822 116 52283
3845	47kohm 5% 0,16W.	4822 116 83884
3846	33kohm 5% 0,16W.	4822 116 52271
3847	6,8kohm 5% 0,16W	4822 116 83961
3848	100kohm 5% 0,5W.	4822 116 52234
3849	100kohm 5% 0,5W.	4822 116 52234
3850	3,9kohm 5% 0,5W.	4822 116 52276
3851	3,3ohm NFR25	4822 052 10338
3852	2,2ohm 5% 0,33W.	4822 052 10228
3853	470ohm 5% 0,16W.	4822 116 83883
3854	100ohm 5% 0,5W	4822 116 52175
3855	100ohm 5% 0,5W	4822 116 52175
3857	33ohm 5% 0,5W.	4822 116 52191
3858	22kohm 5% 0,5W	4822 116 52257
3859	22kohm 5% 0,5W	4822 116 52257
3860	10kohm 5% 0,5W	4822 116 83864
3861	10kohm 5% 0,5W	4822 116 83864
3862	100ohm 5% 0,5W	4822 116 52175
3863	100ohm 5% 0,5W	4822 116 52175
3863	33ohm 5% 0,5W.	4822 116 52191
3864	100ohm 5% 0,5W	4822 116 52175
3866	10kohm 5% 0,5W	4822 116 83864
3867	150ohm 5% 0,5W	4822 116 83868
3869	4,7ohm 1% 0,6W	4822 050 24708
3870	100ohm 5% 0,5W	4822 116 52175
3871	10kohm 5% 0,5W	4822 116 83864
3872	10kohm 5% 0,5W	4822 116 83864
3873	470ohm 5% 0,16W.	4822 116 83883
3874	10kohm 5% 0,5W	4822 116 83864
3875	10kohm 5% 0,5W	4822 116 83864
3876	10kohm 5% 0,5W	4822 116 83864
3877	10kohm 5% 0,5W	4822 116 83864

S = Safety Part Be sure to use exact replacement part.

Table listing electronic components such as resistors (10kohm 5% 0,5W), capacitors (100ohm 5% 0,5W), and transformers (Standby Transformer for /37 only).

SUPPLY AND L/R AMPLIFIER BOARD ELECTRICAL PARTS

SUPPLY AND L/R AMPLIFIER BOARD ELECTRI...

ICAL PARTS

MISCELLANEOUS

Table listing various electrical parts including L/R Loudspeaker Socket, Matrix Surround Socket, capacitors (100nF 5% 250V), and resistors (100k 5% 0,5W).

POWER MODULE MECHANICAL PARTS

POWER MODULE MECHANICAL PARTS

Table listing mechanical parts for the power module: Rucksack - L/R and C/S, Rucksack - L/R, Rucksack - L/R and Matrix, DC Brushless Fan, Spacer 5mm.

MAINS BOARD ELECTRICAL PARTS

MAINS BOARD ELECTRICAL PARTS

Table listing electrical parts for the mains board: Mains Socket, Voltage selector, fuses (Fuse T5A 250V), connectors, capacitors (100uF 20% 63V), resistors (10M 5% 0,5W), coils and filters (400uH 3A).

S = Safety Part Be sure to use exact replacement part.

3265	100k 5% 0,5W	4822	116	52234	6262	1N5392	5322	130	80686
3266	680R 5% 0,5W	4822	116	52228	6263	1N5392	5322	130	80686
3267	3k9 5% 0,5W	4822	116	52276	6264	BZX79-B10	4822	130	61219
3268	10k 5% 0,5W	4822	116	83864	6270	1N4148	4822	130	30621
3270	0R33 5% 2W	4822	117	11342	6271	1N4148	4822	130	30621
3271	1k 1% 0,4W	4822	050	11002	6281	1N4003G	4822	130	31878
3272	3k3 5% 0,5W	4822	116	52269	6284	BZX79-B5V6	4822	130	34173
3272	2k7 5% 0,5W	4822	116	52263	6289	BZX79-B15	4822	130	34281
3273	15k 5% 0,5W	4822	116	52244	6290	BZX79-B15	4822	130	34281
3274	33k 5% 0,5W	4822	116	52271	6292	1N4148	4822	130	30621
3275	33k 5% 0,5W	4822	116	52271	6293	BZX79-B8V2	4822	130	34382
3278	2k2 5% 0,5W	4822	116	52256	6294	1N5392	5322	130	80686
3280	120k 5% 0,5W	4822	116	52239	6295	1N4148	4822	130	30621
3281	10k 5% 0,5W	4822	116	83864	6298	BZX79-B6V8	4822	130	34278
S 3282	47R 5% 0,33W	4822	052	10479	6299	1N4148	4822	130	30621
3285	3k3 5% 0,5W	4822	116	52269	6301	1N4148	4822	130	30621
3286	3k3 5% 0,5W	4822	116	52269	6302	BZX79-B3V3	5322	130	31504
3287	22k 5% 0,5W	4822	116	52257	6325	BZX79-B6V8	4822	130	34278
S 3288	47R 5% 0,33W	4822	052	10479	6326	BZX79-B6V8	4822	130	34278
S 3289	47R 5% 0,33W	4822	052	10479	6333	BZX79-B15	4822	130	34281
3290	NTC DC 5W 10k 5%	4822	117	12063	6334	BZX79-B15	4822	130	34281
3295	220R 5% 0,5W	4822	116	83872	6337	1N4148	4822	130	30621
3298	330R 5% 0,5W	4822	116	52219	6339	1N4148	4822	130	30621
3299	330R 5% 0,5W	4822	116	52219	6360	BZX79-B15	4822	130	34281
S 3300	5R6 5% 0,33W	4822	052	10568		TRANSISTORS AND INTEGRATED CIRCUITS			
3302	47k 5% 0,5W	4822	116	83884	7251	BDX53BFI	4822	130	10812
3304	47k 5% 0,5W	4822	116	83884	7252	BC547B	4822	130	40959
3305	22k 5% 0,5W	4822	116	52257	7253	BC547B	4822	130	40959
3306	39k 5% 0,5W	4822	116	83882	7255	BC547B	4822	130	40959
3309	33k 5% 0,5W	4822	116	52271	7260	BC547B	4822	130	40959
3312	10k 5% 0,5W	4822	116	83864	7263	BC547B	4822	130	40959
3313	1k 1% 0,4W	4822	050	11002	7265	BC556B	4822	130	41691
3315	56k 5% 0,5W	4822	116	52291	7266	BC557B	4822	130	44568
3316	47k 5% 0,5W	4822	116	83884	7268	BC547B	4822	130	40959
S 3317	10R 5% 0,33W	4822	052	10109	7280	BC547B	4822	130	40959
3321	10k 5% 0,5W	4822	116	83864	7281	L7805CP	4822	209	31841
3322	10k 5% 0,5W	4822	116	83864	7282	BC327-25	4822	130	41246
3323	100k 5% 0,5W	4822	116	52234	7286	BC327-25	4822	130	41246
3324	10k 5% 0,5W	4822	116	83864	7290	BC327-25	4822	130	41246
3325	1k2 5% 0,5W	4822	116	52207	7323	BC546B	4822	130	44461
3326	1k2 5% 0,5W	4822	116	52207	7324	BC546B	4822	130	44461
3327	56k 5% 0,5W	4822	116	52291	7325	BC547B	4822	130	40959
3328	56k 5% 0,5W	4822	116	52291	7326	BC547B	4822	130	40959
3329	560R 5% 0,5W	4822	116	52226	7327	BC546B	4822	130	44461
3330	560R 5% 0,5W	4822	116	52226	7329	STK411-230R	4822	209	17384
3331	56k 5% 0,5W	4822	116	52291	7350	BC556B	4822	130	41691
3332	56k 5% 0,5W	4822	116	52291		CENTER/SURROUND AMP BOARD ELECTRICAL PARTS			
S 3333	47R 5% 0,33W	4822	052	10479		CENTER/SURROUND AMP BOARD ELECTRICAL PARTS			
S 3334	47R 5% 0,33W	4822	052	10479		MISCELLANEOUS			
3335	1k2 5% 0,5W	4822	116	52207	1921	Center Speaker Socket	4822	265	10464
3336	1k2 5% 0,5W	4822	116	52207	1925	Surround Speaker Socket	4822	265	10912
3337	1k 1% 0,4W	4822	050	11002		CAPACITORS			
3338	1k 1% 0,4W	4822	050	11002	2923	2,2uF 20% 50V	4822	124	41576
S 3339	0R1 5% 3W	4822	113	80633	2924	2,2uF 20% 50V	4822	124	41576
S 3340	0R1 5% 3W	4822	113	80633	2925	3,3nF 5% 50V	4822	122	33532
3345	100k 5% 0,5W	4822	116	52234	2926	3,3nF 5% 50V	4822	122	33532
3346	10k 5% 0,5W	4822	116	83864	2927	220pF 10% 100V	5322	122	32334
3347	33k 5% 0,5W	4822	116	52271	2928	220pF 10% 100V	5322	122	32334
3348	220R 5% 0,5W	4822	116	83872	2929	470pF 10% 100V	5322	122	32311
3350	1k 1% 0,4W	4822	050	11002	2930	470pF 10% 100V	5322	122	32311
3351	100k 5% 0,5W	4822	116	52234	2931	4,7nF 10% 100V	5322	122	32261
3352	100k 5% 0,5W	4822	116	52234	2932	47nF 30% 50V	4822	122	33449
3353	22k 5% 0,5W	4822	116	52257	2933	22uF 50V	4822	124	81151
3355	6k8 5%	4822	116	83961	2934	22uF 50V	4822	124	81151
3356	6k8 5%	4822	116	83961	2936	47nF 50V	4822	126	12785
S 3358	1k 1% 0,4W	4822	050	11002	2937	4,7pF 10% 50V	4822	122	10465
S 3363	4R7 5% 1W	4822	053	10478	2938	4,7pF 10% 50V	4822	122	10465
S 3364	4R7 5% 1W	4822	053	10478	2939	10uF 20% 50V	4822	124	41579
3365	100k 5% 0,5W	4822	116	52234	2940	22uF 50V	4822	124	81151
3366	100k 5% 0,5W	4822	116	52234	2944	22uF 50V	4822	124	81151
3367	82k 5% 0,5W	4822	116	52304	2945	22uF 50V	4822	124	81151
3368	82k 5% 0,5W	4822	116	52304	2946	10uF 20% 50V	4822	124	41579
3369	47k 5% 0,5W	4822	116	83884	2950	47nF 30% 50V	4822	122	33449
3370	47k 5% 0,5W	4822	116	83884	2951	47nF 30% 50V	4822	122	33449
3383	10k 5% 0,5W	4822	116	83864	2952	220uF 20% 10V	4822	124	40181
3384	10k 5% 0,5W	4822	116	83864	2953	47nF 30% 50V	4822	122	33449
S 3385	1R 5% 0,33W	4822	052	10108	2954	47nF 30% 50V	4822	122	33449
3387	10k 5% 0,5W	4822	116	83864	2955	4,7nF 10% 100V	5322	122	32261
3388	10k 5% 0,5W	4822	116	83864	2956	4,7nF 10% 100V	5322	122	32261
	COILS AND FILTERS				2957	2,2uF 20% 50V	4822	124	41576
5321	IND FXD BEAD EMI	4822	157	70599		RESISTORS			
5322	IND FXD BEAD EMI	4822	157	70599	3921	470R 5% 0,5W	4822	116	83883
	DIODES				3922	470R 5% 0,5W	4822	116	83883
S 6251	GBU8D	4822	130	11139	3925	100k 5% 0,5W	4822	116	52234
S 6251	GBU4D	4822	130	83302	3926	100k 5% 0,5W	4822	116	52234
6252	1N5392	5322	130	80686	3927	56k 5% 0,5W	4822	116	52291
S 6255	GBU8D	4822	130	11139	3928	56k 5% 0,5W	4822	116	52291
6260	1N5392	5322	130	80686					
6261	1N5392	5322	130	80686					

S = Safety Part Be sure to use exact replacement part.

3929	470R 5% 0,5W	4822 116 83883	2539	100pF 5% 50V	5322 122 32531
3930	470R 5% 0,5W	4822 116 83883	2540	47uF 20% 25V	4822 124 40433
3931	56k 5% 0,5W	4822 116 52291	2541	1uF 20% 63V	4822 124 40242
3932	56k 5% 0,5W	4822 116 52291	2542	1uF 20% 63V	4822 124 40242
S 3933	47R 5% 0,33W	4822 052 10479	2543	2,2nF 20% 50V	4822 122 33175
S 3934	47R 5% 0,33W	4822 052 10479	2544	2,2nF 20% 50V	4822 122 33175
3935	3k3 5% 0,5W	4822 116 52269	2545	100nF 20% 25V	4822 126 10002
3936	3k3 5% 0,5W	4822 116 52269	2546	47uF 20% 50V	4822 124 41751
3937	1k8 5% 0,5W	4822 116 52249	2547	10pF 5% 63V	5322 122 32448
3938	1k8 5% 0,5W	4822 116 52249	2548	10pF 5% 63V	5322 122 32448
S 3940	OR22 5% 1W	4822 117 11744	2549	4,7uF 20% 100V	4822 124 40769
S 3941	OR22 5% 1W	4822 117 11744	2550	4,7uF 20% 100V	4822 124 40769
3945	100k 5% 0,5W	4822 116 52234	2551	100nF 10% 25V	4822 126 13196
3946	10k 5% 0,5W	4822 116 83864	2552	47uF 20% 50V	4822 124 41751
3947	33k 5% 0,5W	4822 116 52271	2553	15pF 2% 63V	4822 126 13486
3948	220R 5% 0,5W	4822 116 83872	2560	470nF 20% 50V	5322 124 41948
S 3963	4R7 5% 1W	4822 053 10478	2563	0,22uF 20% 63V	4822 124 40746
S 3964	4R7 5% 1W	4822 053 10478	2564	0,22uF 20% 63V	4822 124 40746
3965	150k 5% 0,5W	4822 116 52245	2571	220nF 5% 63V	4822 121 42408
3966	150k 5% 0,5W	4822 116 52245	2572	220nF 5% 63V	4822 121 42408
3967	47k 5% 0,5W	4822 116 83884	2573	470nF 5% 63V	4822 121 51252
3968	47k 5% 0,5W	4822 116 83884	2574	470nF 5% 63V	4822 121 51252
3969	47k 5% 0,5W	4822 116 83884	2575	1uF 10% 63V	4822 121 51319
3970	47k 5% 0,5W	4822 116 83884	2576	1uF 10% 63V	4822 121 51319
3978	1k 1% 0,4W	4822 050 11002	2577	2,2nF 20% 50V	4822 122 33175
3979	10k 5% 0,5W	4822 116 83864	2578	2,2nF 20% 50V	4822 122 33175
3980	100k 5% 0,5W	4822 116 52234	2579	1nF 10% 50V	5322 122 34123
3981	10k 5% 0,5W	4822 116 83864	2580	1nF 10% 50V	5322 122 34123
3982	100k 5% 0,5W	4822 116 52234	2581	2,2nF 20% 50V	4822 122 33175
3983	470R 5% 0,5W	4822 116 83883	2582	100uF 20% 25V	4822 124 81029
3984	100k 5% 0,5W	4822 116 52234	2583	100uF 20% 25V	4822 124 81029
3993	100k 5% 0,5W	4822 116 52234	2591	220uF 20% 25V	4822 124 22263
3994	100k 5% 0,5W	4822 116 52234	2592	220uF 20% 25V	4822 124 22263
	COILS AND FILTERS		2593	47uF 20% 25V	4822 124 40433
5921	COIL 18,5 TURNS	4822 157 62255	2594	47uF 20% 25V	4822 124 40433
5922	COIL 18,5 TURNS	4822 157 62255	2595	470pF 10% 63V	5322 122 34099
	DIODES		2596	470pF 10% 63V	5322 122 34099
6921	1N4148	4822 130 30621	2597	220pF 5% 63V	4822 122 33575
6939	1N4148	4822 130 30621	2598	220pF 5% 63V	4822 122 33575
6941	BZX79-B39	4822 130 34145	2599	47uF 20% 50V	4822 124 41751
6942	BZX79-B39	4822 130 34145	2601	33nF 5% 50V	4822 126 12105
	TRANSISTORS AND INTEGRATED CIRCUITS		2602	33nF 5% 50V	4822 126 12105
7923	BC547B	4822 130 40959	2603	3,3nF 10% 63V	4822 122 33891
7924	BC547B	4822 130 40959	2604	3,3nF 10% 63V	4822 122 33891
7925	BC547B	4822 130 40959	2605	470pF 10% 63V	5322 122 34099
7927	BC547B	4822 130 40959	2606	470pF 10% 63V	5322 122 34099
7930	STk47-040B	4822 209 16166	2607	100nF 10% 25V	4822 126 13196
7931	BC547B	4822 130 40959	2608	100nF 10% 25V	4822 126 13196
7932	BC557B	4822 130 44568	2609	470nF 5% 63V	4822 121 51252
			2610	470nF 5% 63V	4822 121 51252
			2611	1,8nF 10% 63V	4822 126 10847
			2612	1,8nF 10% 63V	4822 126 10847
			2613	1nF 10% 50V	5322 122 34123
			2614	1nF 10% 50V	5322 122 34123
			2615	220pF 5% 63V	4822 122 33575
			2616	220pF 5% 63V	4822 122 33575
			2617	470pF 10% 63V	5322 122 34099
			2618	470pF 10% 63V	5322 122 34099
			2619	4,7uF 20% 100V	4822 124 40769
			2620	4,7uF 20% 100V	4822 124 40769
			2621	100uF 20% 25V	4822 124 81029
			2623	1uF 16V	4822 126 13836
			2624	1uF 16V	4822 126 13836
			2625	220pF 5% 63V	4822 122 33575
			2626	220pF 5% 63V	4822 122 33575
			2631	4,7uF 20% 100V	4822 124 40769
			2632	4,7uF 20% 100V	4822 124 40769
			2633	470pF 10% 63V	5322 122 34099
			2634	470pF 10% 63V	5322 122 34099
			2635	100pF 5% 50V	5322 122 32531
			2636	100pF 5% 50V	5322 122 32531
			2637	47pF 1% 63V	4822 126 13692
			2638	47pF 1% 63V	4822 126 13692
			2639	22nF 20% 50V	4822 122 33809
			2640	47uF 20% 25V	4822 124 40433
			2641	100uF 20% 25V	4822 124 81029
			2647	22uF 50V	4822 124 81151
			2648	22uF 50V	4822 124 81151
			2649	100pF 5% 50V	5322 122 32531
			2650	100pF 5% 50V	5322 122 32531
			2651	22nF 20% 50V	4822 122 33809
			2652	22nF 20% 50V	4822 122 33809
			2655	4,7uF 20% 100V	4822 124 40769
			2656	100pF 5% 50V	5322 122 32531
			2657	1uF 16V	4822 126 13836
			2658	220pF 5% 63V	4822 122 33575
			2661	1uF 20% 63V	4822 124 40242
			2662	1nF 10% 50V	5322 122 34123
			2663	10pF 5% 63V	5322 122 32448

S = Safety Part Be sure to use exact replacement part.

2664	1uF 20% 63V.	4822	124	40242	2782	22nF 20% 50V	4822	122	33809
2665	10uF 20% 50V	4822	124	41579	2783	100pF 5% 50V	5322	122	32531
2666	100uF 20% 25V.	4822	124	81029	2784	100pF 5% 50V	5322	122	32531
2668	470pF 10% 63V.	5322	122	34099	2785	1nF 5% 50V	5322	126	10511
2669	100nF 20% 25V.	4822	126	10002	2786	1nF 5% 50V	5322	126	10511
2670	100nF 20% 25V.	4822	126	10002	2787	1nF 5% 50V	5322	126	10511
2671	100nF 20% 25V.	4822	126	10002	2788	1nF 5% 50V	5322	126	10511
2672	100nF 20% 25V.	4822	126	10002	2789	1nF 5% 50V	5322	126	10511
2673	22nF 20% 50V	4822	122	33809	2790	10uF 20% 50V	4822	124	41579
2674	22nF 20% 50V	4822	122	33809	2792	100pF 5% 50V	5322	122	32531
2675	470nF 20% 50V.	5322	124	41948	2796	100pF 5% 50V	5322	122	32531
2676	470nF 20% 50V.	5322	124	41948	2865	100pF 5% 50V	5322	122	32531
2677	10nF 20% 50V	4822	122	33808	2866	47nF 20% 50V	4822	122	33797
2678	100nF 10% 25V.	4822	126	13196	2867	47nF 20% 50V	4822	122	33797
2681	100nF 10% 25V.	4822	126	13196	2868	100nF 10% 25V.	4822	126	13196
2682	10nF 20% 50V	4822	122	33808	2869	1uF 16V.	4822	126	13836
2691	22nF 20% 50V	4822	122	33809	2870	1uF 16V.	4822	126	13836
2692	22nF 20% 50V	4822	122	33809	2871	22nF 10% 63V	5322	122	32654
2693	22nF 20% 50V	4822	122	33809	2872	4,7nF 10% 63V.	5322	126	10223
2694	100nF 20% 25V.	4822	126	10002	2873	4,7nF 10% 63V.	5322	126	10223
2711	100nF 5% 63V	5322	121	42386	2874	22nF 10% 63V	5322	122	32654
2712	100nF 5% 63V	5322	121	42386	2876	470uF 20% 16V.	4822	124	80791
2713	100nF 5% 63V	5322	121	42386		RESISTORS			
2714	100nF 5% 63V	5322	121	42386	3511	1k 2% 0,25W.	4822	051	10102
2715	680pF 10% 63V.	4822	122	32535	3512	1k 2% 0,25W.	4822	051	10102
2716	680pF 10% 63V.	4822	122	32535	3513	3k9 5% 0,5W.	4822	116	52276
2717	10uF 20% 50V	4822	124	41579	3514	3k9 5% 0,5W.	4822	116	52276
2718	10uF 20% 50V	4822	124	41579	3515	2k7 1% 0,1W.	4822	117	12955
2719	100nF 10% 25V.	4822	126	13196	3516	2k7 1% 0,1W.	4822	117	12955
2720	22nF 20% 50V	4822	122	33809	3517	1k 2% 0,25W.	4822	051	10102
2721	22nF 20% 50V	4822	122	33809	3518	1k 2% 0,25W.	4822	051	10102
2722	100nF 10% 25V.	4822	126	13196	3519	33k 5% 0,1W.	4822	051	20333
2723	100nF 10% 25V.	4822	126	13196	3520	33k 5% 0,1W.	4822	051	20333
2724	47nF 10% 63V	4822	126	13751	3521	18k 1% 0,1W.	4822	117	10965
2725	47nF 10% 63V	4822	126	13751	3522	18k 1% 0,1W.	4822	117	10965
2726	100nF 10% 25V.	4822	126	13196	3525	1k 2% 0,25W.	4822	051	10102
2727	220nF 5% 63V	4822	121	42408	3526	1k 2% 0,25W.	4822	051	10102
2728	220nF 5% 63V	4822	121	42408	3527	1k 2% 0,25W.	4822	051	10102
2729	4,7uF 20% 100V	4822	124	40769	3528	1k 2% 0,25W.	4822	051	10102
2730	4,7uF 20% 100V	4822	124	40769	3529	2k2 1% 0,1W.	4822	117	11449
2731	220nF 5% 63V	4822	121	42408	3530	2k2 1% 0,1W.	4822	117	11449
2732	220nF 5% 63V	4822	121	42408	3531	2k2 1% 0,1W.	4822	117	11449
2733	47nF 10% 63V	4822	126	13751	3532	2k2 1% 0,1W.	4822	117	11449
2734	4,7nF 10% 63V.	5322	126	10223	3533	100k 5% 0,5W	4822	116	52234
2735	680nF 5% 63V	5322	121	42498	3534	100k 5% 0,5W	4822	051	20104
2737	220pF 5% 63V	4822	122	33575	3535	120k 5% 0,1W	4822	051	20124
2738	100nF 10% 25V.	4822	126	13196	3536	120k 5% 0,1W	4822	051	20124
2739	100nF 10% 25V.	4822	126	13196	3537	33k 5% 0,1W.	4822	051	20333
2740	1,8nF 10% 63V.	4822	126	10847	3538	33k 5% 0,1W.	4822	051	20333
2741	10nF 20% 50V	4822	122	33808	3539	47R 5% 0,5W.	4822	116	52195
2742	68nF 10% 50V	4822	121	10684	3540	10k 1% 0,1W.	4822	117	10833
2743	100nF 5% 63V	5322	121	42386	3541	1k 2% 0,25W.	4822	051	10102
2744	100nF 5% 63V	5322	121	42386	3542	1k 2% 0,25W.	4822	051	10102
2745	68nF 10% 50V	4822	121	10684	3545	22k 5% 0,1W.	4822	051	20223
2746	1,8nF 10% 63V.	4822	126	10847	3546	22k 5% 0,1W.	4822	051	20223
2747	10nF 20% 50V	4822	122	33808	3547	1k5 1% 0,1W.	4822	117	11139
2748	1uF 20% 63V.	4822	124	40242	3548	1k5 1% 0,1W.	4822	117	11139
2749	100uF 20% 10V.	4822	124	41584	3549	5k6 5% 0,1W.	4822	051	20562
2750	22uF 50V	4822	124	81151	3550	47k 1% 0,1W.	4822	117	10834
2751	10uF 20% 50V	4822	124	41579	3551	150k 5% 0,1W	4822	051	20154
2752	10uF 20% 50V	4822	124	41579	3552	150k 5% 0,1W	4822	051	20154
2753	220nF 20% 25V.	4822	126	13061	3553	330k 5% 0,1W	4822	051	20334
2754	27pF 1% 63V.	4822	126	13691	3554	150R 1% 0,1W	4822	117	10353
2755	27pF 1% 63V.	4822	126	13691	3555	390R 5% 0,1W	4822	051	20391
2756	22uF 50V	4822	124	81151	3556	1k2 5% 0,1W.	4822	051	20122
2757	22uF 50V	4822	124	81151	3557	82k 1% 0,1W.	4822	117	11149
2758	470uF 20% 10V.	4822	124	80195	3558	2M2 5% 0,25W	4822	053	20225
2759	100nF 10% 25V.	4822	126	13196	3559	2M2 5% 0,1W.	4822	051	20225
2760	10nF 20% 50V	4822	122	33808	3560	4M7 5% 0,1W.	4822	051	20475
2761	2,2nF 20% 50V.	4822	122	33175	3561	1k2 5% 0,1W.	4822	051	20122
2762	100uF 20% 10V.	4822	124	41584	3562	1k2 5% 0,1W.	4822	051	20122
2763	4,7nF 10% 63V.	5322	126	10223	3563	2k2 1% 0,1W.	4822	117	11449
2765	100uF 20% 25V.	4822	124	81029	3564	2k2 1% 0,1W.	4822	117	11449
2766	220uF 20% 16V.	4822	124	40196	3565	4k7 5% 0,1W.	4822	051	20472
2767	10uF 20% 50V	4822	124	41579	3566	4k7 5% 0,1W.	4822	051	20472
2768	4,7nF 10% 63V.	5322	126	10223	3569	4k7 5% 0,1W.	4822	051	20472
2769	10uF 20% 50V	4822	124	41579	3570	4k7 5% 0,1W.	4822	051	20472
2770	47uF 20% 25V	4822	124	40433	3571	4k7 5% 0,1W.	4822	051	20472
2771	47uF 20% 50V	4822	124	41751	3572	4k7 5% 0,1W.	4822	051	20472
2772	47uF 20% 50V	4822	124	41751	3573	4k7 5% 0,1W.	4822	051	20472
2773	4,7uF 20% 100V	4822	124	40769	3574	4k7 5% 0,1W.	4822	117	11503
2774	4,7uF 20% 100V	4822	124	40769	3575	220R 1% 0,1W	4822	116	83872
2775	470pF 10% 63V.	5322	122	34099	3576	220R 5% 0,5W	4822	051	20471
2776	470pF 10% 63V.	5322	122	34099	3577	470R 5% 0,1W	4822	051	20471
2777	470pF 10% 63V.	5322	122	34099	3578	470R 5% 0,1W	4822	051	20471
2778	470pF 10% 63V.	5322	122	34099	3579	4R7 5% 0,33W	4822	052	10478
2779	4,7uF 20% 100V	4822	124	40769	3580	2k7 1% 0,1W.	4822	117	12955
2780	4,7uF 20% 100V	4822	124	40769	3581	2k2 1% 0,1W.	4822	117	11449
2781	22nF 20% 50V	4822	122	33809	3582	2k2 1% 0,1W.	4822	117	11449

3583	220R 1% 0,1W	4822 117 11503	3681	22R 5% 0,33W	4822 052 10229
3584	220R 1% 0,1W	4822 117 11503	3682	1k 2% 0,25W	4822 051 10102
3585	47k 1% 0,1W	4822 117 10834	3683	470R 5% 0,1W	4822 051 20471
3586	47k 1% 0,1W	4822 117 10834	3684	3k9 5% 0,1W	4822 051 20392
3587	150k 5% 0,1W	4822 051 20154	3686	12k 1% 0,1W	4822 117 11383
3588	150k 5% 0,1W	4822 051 20154	3687	12k 1% 0,1W	4822 117 11383
3589	2k2 1% 0,1W	4822 117 11449	3688	12k 1% 0,1W	4822 117 11383
3590	2k2 1% 0,1W	4822 117 11449	3689	12k 1% 0,1W	4822 117 11383
3591	22k 5% 0,1W	4822 051 20223	3690	10R 5% 0,1W	4822 051 20109
3592	22k 5% 0,1W	4822 051 20223	3691	10R 5% 0,1W	4822 051 20109
3593	27k 5% 0,5W	4822 116 52264	3692	10k 1% 0,1W	4822 117 10833
3594	27k 5% 0,1W	4822 051 20273	3693	5k6 5% 0,1W	4822 051 20562
3595	33k 5% 0,1W	4822 051 20333	3693	2k2 1% 0,1W	4822 117 11449
3596	47k 1% 0,1W	4822 117 10834	3694	5k6 5% 0,1W	4822 051 20562
3597	1M 5% 0,1W	4822 051 20105	3695	2R2 5% 0,5W	4822 116 81154
3598	4M7 5% 0,1W	4822 051 20475	3696	2k2 1% 0,1W	4822 117 11449
3599	100R 5% 0,5W	4822 116 52175	3697	470R 5% 0,5W	4822 116 83883
3601	3k3 5% 0,1W	4822 051 20332	3698	470R 5% 0,5W	4822 116 83883
3602	3k3 5% 0,1W	4822 051 20332	3699	1k 1% 0,4W	4822 050 11002
3603	680k 5% 0,1W	4822 051 20684	3711	820R 1% 0,1W	4822 117 11454
3604	680k 5% 0,1W	4822 051 20684	3712	820R 1% 0,1W	4822 117 11454
3605	220k 1% 0,1W	4822 117 13579	3713	10k 1% 0,1W	4822 117 10833
3606	220k 1% 0,1W	4822 117 13579	3714	10k 1% 0,1W	4822 117 10833
3607	10k 5% 0,5W	4822 116 83864	3715	27k 5% 0,1W	4822 051 20273
3608	10k 5% 0,5W	4822 116 83864	3716	27k 5% 0,1W	4822 051 20273
3609	10k 1% 0,1W	4822 117 10833	3717	15k 5% 0,1W	4822 051 20153
3610	10k 1% 0,1W	4822 117 10833	3718	15k 5% 0,1W	4822 051 20153
3611	5k6 5% 0,1W	4822 051 20562	3719	47k 1% 0,1W	4822 117 10834
3612	5k6 5% 0,1W	4822 051 20562	3720	47k 1% 0,1W	4822 117 10834
3613	5k6 5% 0,1W	4822 051 20562	3721	6k8 1% 0,1W	4822 117 11507
3614	5k6 5% 0,1W	4822 051 20562	3722	6k8 1% 0,1W	4822 117 11507
3615	5k6 5% 0,1W	4822 051 20562	3723	2M2 5% 0,1W	4822 051 20225
3616	5k6 5% 0,1W	4822 051 20562	3724	100k 5% 0,1W	4822 051 20104
3617	8k2 5% 0,1W	4822 051 20822	3725	220k 1% 0,1W	4822 117 13579
3618	8k2 5% 0,1W	4822 051 20822	3726	330k 5% 0,1W	4822 051 20334
3619	8k2 5% 0,1W	4822 051 20822	3727	22k 5% 0,1W	4822 051 20223
3620	8k2 5% 0,1W	4822 051 20822	3728	2k2 1% 0,1W	4822 117 11449
3621	8k2 5% 0,1W	4822 051 20822	3729	47k 1% 0,1W	4822 117 10834
3622	8k2 5% 0,1W	4822 051 20822	3732	22k 5% 0,1W	4822 051 20223
3623	47k 1% 0,1W	4822 117 10834	3733	10k 1% 0,1W	4822 117 10833
3624	47k 1% 0,1W	4822 117 10834	3734	1k 2% 0,25W	4822 051 10102
3625	1k 2% 0,25W	4822 051 10102	3735	1k 2% 0,25W	4822 051 10102
3626	1k 2% 0,25W	4822 051 10102	3736	47k 1% 0,1W	4822 117 10834
3627	220R 1% 0,1W	4822 117 11503	3738	2k7 1% 0,1W	4822 117 12955
3628	220R 1% 0,1W	4822 117 11503	3739	1k 1% 0,4W	4822 050 11002
3629	820R 1% 0,1W	4822 117 11454	3740	1k 2% 0,25W	4822 051 10102
3631	820R 1% 0,1W	4822 117 11454	3741	1k 2% 0,25W	4822 051 10102
3632	820R 5% 0,5W	4822 116 52231	3742	1k 2% 0,25W	4822 051 10102
3633	5k6 5% 0,1W	4822 051 20562	3745	220k 5% 0,5W	4822 116 83874
3634	5k6 5% 0,1W	4822 051 20562	3746	1k 1% 0,4W	4822 050 11002
3635	10k 1% 0,1W	4822 117 10833	3748	220k 1% 0,1W	4822 117 13579
3636	10k 1% 0,1W	4822 117 10833	3751	100R 5% 0,1W	4822 051 20101
3637	47k 1% 0,1W	4822 117 10834	3752	4k7 5% 0,5W	4822 116 52283
3638	47k 1% 0,1W	4822 117 10834	3753	4k7 5% 0,1W	4822 051 20472
3639	10k 1% 0,1W	4822 117 10833	3754	1M 5% 0,1W	4822 051 20105
3640	10k 1% 0,1W	4822 117 10833	3755	10k 1% 0,1W	4822 117 10833
3641	10R 5% 0,33W	4822 052 10109	3756	10k 1% 0,1W	4822 117 10833
3642	4k7 5% 0,1W	4822 051 20472	3757	100k 5% 0,1W	4822 051 20104
3643	4k7 5% 0,1W	4822 051 20472	3758	100k 5% 0,1W	4822 051 20104
3645	47R 5% 0,1W	4822 051 20479	3759	27k 5% 0,1W	4822 051 20273
3646	47R 5% 0,1W	4822 051 20479	3760	27k 5% 0,1W	4822 051 20273
3647	47R 5% 0,1W	4822 051 20479	3761	10k 1% 0,1W	4822 117 10833
3648	47R 5% 0,1W	4822 051 20479	3762	10k 1% 0,1W	4822 117 10833
3649	47R 5% 0,1W	4822 051 20479	3763	3k9 5% 0,1W	4822 051 20392
3650	47R 5% 0,1W	4822 051 20479	3764	3k9 5% 0,1W	4822 051 20392
3651	3k9 5% 0,1W	4822 051 20392	3765	1k 2% 0,25W	4822 051 10102
3652	3k9 5% 0,1W	4822 051 20392	3772	1k 1% 0,4W	4822 050 11002
3655	10k 5% 0,5W	4822 116 83864	3773	1k 1% 0,4W	4822 050 11002
3656	10k 1% 0,1W	4822 117 10833	3774	1k 2% 0,25W	4822 051 10102
3657	1k 2% 0,25W	4822 051 10102	3775	1k 2% 0,25W	4822 051 10102
3658	5k6 5% 0,1W	4822 051 20562	4515	OR Jumper 0805	4822 051 20008
3660	4k7 5% 0,1W	4822 051 20472	4516	OR Jumper 0805	4822 051 20008
3661	4M7 5% 0,25W	4822 053 20475	4517	OR Jumper 0805	4822 051 20008
3662	1k 2% 0,25W	4822 051 10102	4518	OR Jumper 0805	4822 051 20008
3663	1k 2% 0,25W	4822 051 10102	4519	OR Jumper 0805	4822 051 20008
3665	15k 5% 0,1W	4822 051 20153	4520	OR Jumper 0805	4822 051 20008
3666	5k6 5% 0,1W	4822 051 20562	4521	OR Jumper 0805	4822 051 20008
3667	5k6 5% 0,1W	4822 051 20562	4522	OR Jumper 0805	4822 051 20008
3668	5k6 5% 0,1W	4822 051 20562	4523	OR Jumper 0805	4822 051 20008
3671	220k 1% 0,1W	4822 117 13579	4524	OR Jumper 0805	4822 051 20008
3672	220k 1% 0,1W	4822 117 13579	4525	OR Jumper 0805	4822 051 20008
3673	2k7 1% 0,1W	4822 117 12955	4526	OR Jumper 0805	4822 051 20008
3674	330k 5% 0,1W	4822 051 20334	4527	OR Jumper 0805	4822 051 20008
3675	3k9 5% 0,1W	4822 051 20392	4528	OR Jumper 0805	4822 051 20008
3676	100R 5% 0,1W	4822 051 20101	4529	OR Jumper 0805	4822 051 20008
3677	470R 5% 0,1W	4822 051 20471	4530	OR Jumper 0805	4822 051 20008
3678	220k 1% 0,1W	4822 117 13579	4531	OR Jumper 0805	4822 051 20008
3679	390R 5% 0,1W	4822 051 20391	4532	OR Jumper 0805	4822 051 20008
3680	470R 5% 0,1W	4822 051 20471	4533	OR Jumper 0805	4822 051 20008

S = Safety Part Be sure to use exact replacement part.

4534	OR Jumper 0805	4822 051 20008	4716	OR Jumper 0805	4822 051 20008
4535	OR Jumper 0805	4822 051 20008		COILS AND FILTERS	
4536	OR Jumper 0805	4822 051 20008	5511	Coil 2,2uH 5%	4822 157 62552
4537	OR Jumper 0805	4822 051 20008	5523	Coil 2,2uH 5%	4822 157 62552
4538	OR Jumper 0805	4822 051 20008	5531	Coil 2,2uH 5%	4822 157 62552
4540	OR Jumper 0805	4822 051 20008	5532	Coil 2,2uH 5%	4822 157 62552
4541	OR Jumper 0805	4822 051 20008	5611	Coil 2,2uH 5%	4822 157 62552
4542	OR Jumper 0805	4822 051 20008	5711	Ceramic Resonator	4822 242 72527
4543	OR Jumper 0805	4822 051 20008	5712	Coil 2,2uH 5%	4822 157 62552
4544	OR Jumper 0805	4822 051 20008		DIODES	
4545	OR Jumper 0805	4822 051 20008	6511	BZX79-C9V1	4822 130 30862
4546	OR Jumper 0805	4822 051 20008	6512	BZX79-C9V1	4822 130 30862
4547	OR Jumper 0805	4822 051 20008	6514	1N4003G	4822 130 31878
4548	OR Jumper 0805	4822 051 20008	6515	1N4148	4822 130 30621
4549	OR Jumper 0805	4822 051 20008	6516	1N4148	4822 130 30621
4550	OR Jumper 0805	4822 051 20008	6517	1N4148	4822 130 30621
4552	OR Jumper 0805	4822 051 20008	6531	1N4148	4822 130 30621
4553	OR Jumper 0805	4822 051 20008	6711	BZX79-C5V6	4822 130 34173
4554	OR Jumper 0805	4822 051 20008		TRANSISTORS AND INTEGRATED CIRCUITS	
4555	OR Jumper 0805	4822 051 20008	7511	TDA7437T	4822 209 17386
4556	OR Jumper 0805	4822 051 20008	7512	NJM4560M	4822 209 83357
4557	OR Jumper 0805	4822 051 20008	7513	NJM4560M	4822 209 83357
4558	OR Jumper 0805	4822 051 20008	7515	NJM4556AM	4822 209 31378
4559	OR Jumper 0805	4822 051 20008	7521	BC847B	4822 130 60511
4560	OR Jumper 0805	4822 051 20008	7522	BC847B	4822 130 60511
4561	OR Jumper 0805	4822 051 20008	7523	BC847B	4822 130 60511
4562	OR Jumper 0805	4822 051 20008	7524	BC847B	4822 130 60511
4563	OR Jumper 0805	4822 051 20008	7525	BC547B	4822 130 40959
4564	OR Jumper 0805	4822 051 20008	7526	BC857B	5322 130 60508
4565	OR Jumper 0805	4822 051 20008	7527	BC847B	4822 130 60511
4566	OR Jumper 0805	4822 051 20008	7528	BC847B	4822 130 60511
4567	OR Jumper 0805	4822 051 20008	7529	BC857B	5322 130 60508
4568	OR Jumper 0805	4822 051 20008	7531	BC847B	4822 130 60511
4569	OR Jumper 0805	4822 051 20008	7532	BC847B	4822 130 60511
4570	OR Jumper 0805	4822 051 20008	7533	BC847B	4822 130 60511
4571	OR Jumper 0805	4822 051 20008	7534	BC847B	4822 130 60511
4572	OR Jumper 0805	4822 051 20008	7535	BC817-25	4822 130 42804
4573	OR Jumper 0805	4822 051 20008	7536	BC817-25	4822 130 42804
4574	OR Jumper 0805	4822 051 20008	7537	BC847B	4822 130 60511
4575	OR Jumper 0805	4822 051 20008	7538	BC847B	4822 130 60511
4576	OR Jumper 0805	4822 051 20008	7539	BC857B	5322 130 60508
4577	OR Jumper 0805	4822 051 20008	7541	BC847B	4822 130 60511
4579	OR Jumper 0805	4822 051 20008	7542	BC847B	4822 130 60511
4580	OR Jumper 0805	4822 051 20008	7543	BC817-25	4822 130 42804
4581	OR Jumper 0805	4822 051 20008	7551	M62320FP	4822 209 17345
4582	OR Jumper 0805	4822 051 20008	7552	BC327-25	4822 130 41246
4583	OR Jumper 0805	4822 051 20008	7553	BC847B	4822 130 60511
4584	OR Jumper 0805	4822 051 20008	7711	M62460FP	4822 209 17347
4585	OR Jumper 0805	4822 051 20008	7712	M62429FP	4822 209 17349
4586	OR Jumper 0805	4822 051 20008	7713	BC847B	4822 130 60511
4587	OR Jumper 0805	4822 051 20008	7714	BC847B	4822 130 60511
4588	OR Jumper 0805	4822 051 20008	7715	BC847B	4822 130 60511
4589	OR Jumper 0805	4822 051 20008	7716	BC847B	4822 130 60511
4590	OR Jumper 0805	4822 051 20008	7717	NJM4556AM	4822 209 31378
4591	OR Jumper 0805	4822 051 20008			
4592	OR Jumper 0805	4822 051 20008			
4593	OR Jumper 0805	4822 051 20008			
4594	OR Jumper 0805	4822 051 20008			
4595	OR Jumper 0805	4822 051 20008			
4596	OR Jumper 0805	4822 051 20008			
4597	OR Jumper 0805	4822 051 20008			
4598	OR Jumper 0805	4822 051 20008			
4599	OR Jumper 0805	4822 051 20008			
4600	OR Jumper 0805	4822 051 20008			
4601	OR Jumper 0805	4822 051 20008			
4602	OR Jumper 0805	4822 051 20008			
4603	OR Jumper 0805	4822 051 20008			
4604	OR Jumper 0805	4822 051 20008			
4605	OR Jumper 0805	4822 051 20008			
4606	OR Jumper 0805	4822 051 20008			
4607	OR Jumper 0805	4822 051 20008			
4609	OR Jumper 0805	4822 051 20008			
4610	OR Jumper 0805	4822 051 20008			
4611	OR Jumper 0805	4822 051 20008			
4612	OR Jumper 0805	4822 051 20008			
4613	OR Jumper 0805	4822 051 20008			
4614	OR Jumper 0805	4822 051 20008			
4615	OR Jumper 0805	4822 051 20008			
4618	OR Jumper 0805	4822 051 20008			
4619	OR Jumper 0805	4822 051 20008			
4620	OR Jumper 0805	4822 051 20008			
4621	OR Jumper 0805	4822 051 20008			
4622	OR Jumper 0805	4822 051 20008			
4623	OR Jumper 0805	4822 051 20008			
4624	OR Jumper 0805	4822 051 20008			
4625	OR Jumper 0805	4822 051 20008			
4627	OR Jumper 0805	4822 051 20008			
4629	OR Jumper 0805	4822 051 20008			
4715	OR Jumper 0805	4822 051 20008			
				MAIN UNIT MECHANICAL AND ACCESSORIES PARTS	
				MAIN UNIT MECHANICAL AND ACCESSORIES PARTS	
			101	Cabinet Front	4822 459 05298
			105	Button CDC Open/Close	4822 410 12461
			106	Cover Tray CDC	4822 442 01845
			107	Cover Tray Orn	4822 442 01846
			108	Badge Philips	4822 454 13035
			112	Button Set CDC Sel	4822 410 12462
			124	Button Set Ctrl	4822 410 12463
			132	Button Set S-Sel	4822 410 12464
			134	Button Set Stdbby/Timer	4822 410 12465
			135	Button Set Dubbing/Rec	4822 410 12466
			136	Button Set DPL	4822 410 12539
			137	Cover Orn Control	4822 442 01847
			138	Cover Orn SNP	4822 442 01848
			139	Window Display	4822 450 10703
			139	Window Display /FW898W/21	4822 450 10696
			140	Knob Volume Rotary	4822 410 12467
			142	Jog Rotary	4822 410 12468
			143	Cover RDS/NEWS	4822 442 01923
			144	Button Set SNP	4822 410 12541
			148	Knob Karaoke	4822 410 12472
			152	Button Set Max	4822 410 12473
			155	Button Set Ent/More	4822 410 12474
			158	Cover Cassette Right	4822 442 01849
			159	Cover Cassette Left	4822 443 11281
			160	Lens Cassette Right	4822 442 01918
			161	Lens Cassette Left	4822 442 01919
			197	Door Cassette Right	4822 443 10488
			198	Door Cassette Left	4822 443 10487
			199	Push-Catch	4822 402 10621
			200	Damper Assembly	4822 529 10322
			203	Spring Compression	4822 492 11344

204	Bracket Right	4822 402 11246
205	Bracket Left	4822 402 11245
208	Spring Tension	4822 492 11345
209	Spring Cassette	4822 492 42787
252	Foot Rubber	4822 462 40683
254	Plate Front	4822 466 12197
258	Foot Rubber	4822 462 40683
259	Cabinet Rear	4822 426 10807
349	Center Speaker (nor for FW898W/21)	4822 445 10865
349	Surround Speaker (not for FW898W/21)	4822 445 10866
350	LS Pair To Left	4822 445 10867
350	LS Pair To Right	4822 445 10868
351	FM Aerial	4822 303 50063
351	FM Aerial /37	4822 320 11094
356	Remote Control	4822 219 10685
384	AM Frame Aerial	4822 303 50082
S 385	Mains Cord /21	4822 321 10249
S 385	Mains Cord /30	4822 321 10954
S 385	Mains Cord /37	4822 321 11466
387	Instruction For Use	4822 736 17111
387	Instruction For Use /37	4822 736 17117
S 1107	Mains Transformer	4822 146 11193
S 1107	Mains Transformer /37	4822 146 11177
1200	Flex Cable BD 23P 560mm	4822 320 12651
1201	Flex Cable BD 19P 400mm	4822 320 12661
1202	Flex Cable BD 6P 150mm	4822 320 12653
1204	Flex Cable AD 6P 340mm Folded	4822 320 12713
1205	Flex Cable AD 7P 180mm	4822 320 12752
1206	Flex Cable AD 7P 220mm	4822 320 12654

LEFT/RIGHT LOUDSPEAKER BOX BREAKDOWN

LEFT/RIGHT LOUDSPEAKER BOX BREAKDOWN		
8" PSEUDO Woofer	4822 240 10399	
Tweeter 2,5"	4822 240 10401	
Plug Wiring w/Piezo Assembly	4822 248 10011	
Grommet	4822 325 50229	
Cloth Frame Assembly Left	4822 458 10694	
Cloth Frame Assembly Right	4822 458 10695	

SURROUND BOX BREAKDOWN

SURROUND BOX BREAKDOWN		
Speaker 4" 6R 20W (not for FW898W/21)	4822 240 10389	

MAIN UNIT SCREWS

MAIN UNIT SCREWS		
185	D3 x 10	-
186	D3 x 10	-
211	D3 x 12	-
212	D3 x 12	-
213	D3 x 12	-
214	D3 x 12	-
231	D3 x 10	-
232	M3 x 10	-
233	M3 x 6	-
239	M3 x 10	-
240	D3 x 12	-
241	M3 x 10	-
242	M3 x 10	-
276	D3 x 12	-
277	D3 x 12	-
278	D3 x 12	-
279	M3 x 12	-
280	D3 x 12	-
281	D3 x 12	-
288	D3 x 10	-
290	M3 x 10	-
291	D3 x 12	-
292	D3 x 12	-
293	D3 x 12	-
295	D3 x 12	-
298	M3 x 10	-
299	M3 x 10	-
300	M3 x 10	-
301	M3 x 10	-
302	M3 x 16	-
303	D3 x 12	-
304	D3 x 12	-
305	M3 x 6	-

Philips Consumer Electronics

Technical Service Data

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Safety Notes

REFER TO SAFETY GUIDELINES

SAFETY NOTICE: ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

Visit our World Wide Web Site at <http://www.magnavox.com>

GENERAL SAFETY NOTES

IMPORTANT SAFETY NOTICE

Proper service and repair is important to the safe, reliable operation of all Philips Consumer Electronics Company** equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various **CAUTIONS** and **NOTICES** which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these **CAUTIONS** and **NOTICES ARE NOT EXHAUSTIVE**. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

** Hereafter throughout this manual, Philips Consumer Electronics Company will be referred to as Philips.

WARNING

Critical components having special safety characteristics are identified with a **▲** or "**S**" by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol **▲** on the schematics or exploded views. Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards. Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design. Servicer assumes all liability.

* Broken Line _____

SAFETY CHECKS

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous servicer may have left an unsafe condition, which could be unknowingly passed on to Your customer. Be sure to check all of the following:

FIRE AND SHOCK HAZARD


IMPLOSION

X-RADIATION

LEAKAGE CURRENT COLD CHECK

LEAKAGE CURRENT HOT CHECK

FIRE AND SHOCK HAZARD

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and from the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barriers, covers, strain reliefs, and other hardware have been installed in accordance with the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation (including the ac cord). Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout, lead length, and dress.
5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with an 'S' by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol  on the schematic diagrams and /or exploded views.
7. When servicing any unit, always use a separate isolation transformer for the chassis. Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord (one wide pin on the plug). Defeating this safety feature may create a potential hazard to the servicer and the user. Extension cords which do not incorporate the polarizing feature should never be used.
9. After reassembly of the unit, always perform an ac leakage test or resistance test from the line cord to all exposed metal parts of the cabinet. Also, check all metal control shafts (with knobs removed), antenna terminals, handles, screws, etc., to be sure the unit may be safely operated without danger of electrical shock.

* **Broken line** _____

IMPLOSION

1. All picture tubes used in current model receivers are equipped with an integral implosion system. Care should always be used, and safety glasses worn, whenever handling any picture tube. Avoid scratching or otherwise damaging the picture tube during installation.
2. Use only replacement tubes specified by the manufacturer.

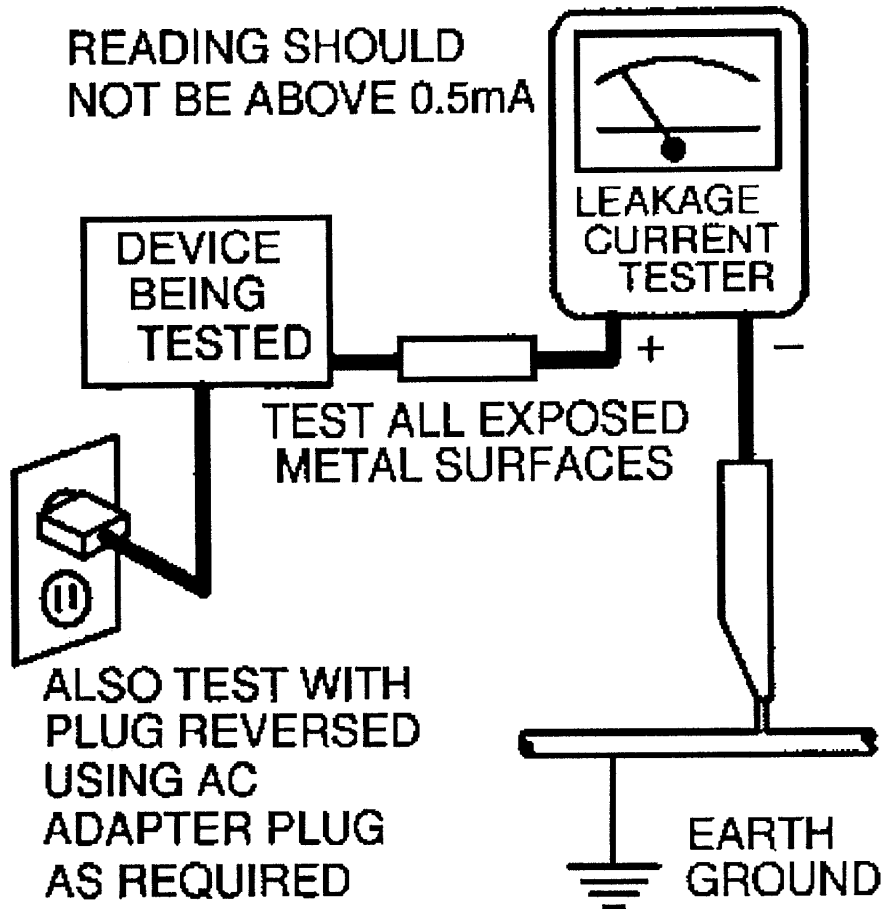
jumper from the ac line cord.

LEAKAGE CURRENT HOT CHECK

1. Do not use an isolation transformer for this test. Plug the completely reassembled receiver directly into the ac outlet.
2. Connect a **1.5k, 10W resistor** paralleled by a **0.15uF. capacitor** between each exposed metallic cabinet part and a **good earth ground** such as a water pipe, as shown below.
3. Use an ac voltmeter with at least 5000 ohms/volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5milliamp. If a measurement is outside of the specified limits, there is a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. **Repeat the above procedure with the ac plug reversed.** (Note: An ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

OR

With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. **(Do not use an isolation transformer during this test.)** Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1410, (50.7). **With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinet, screw heads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milliamp. Reverse the instrument power cord plug in the outlet and repeat the test. See graphic below.**



PICTURE TUBE REPLACEMENT

The primary source of X-radiation in this television receiver is the picture tube. The picture tube utilized in this chassis is specially constructed to limit X-radiation emissions. For continued X-radiation protection, the replacement tube must be the same type as the original, including suffix letter, or a Philips approved type.

PARTS REPLACEMENT

Many electrical and mechanical parts in Philips television sets have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the Philips recommended replacement part shown in this service manual may create shock, fire, or other hazards

TV SAFETY NOTES

SAFETY CHECKS

Power Supply-This receiver is designed for operation on 120 Volts, 60Hz alternating current (ac) only. Never connect to a supply having a different frequency or voltage.

IMPORTANT NOTICE

This device employs many circuits, components, and mechanical parts designed for protection against fire, shock and RF interference. For continued safety any servicing should be performed by qualified personnel and exact replacement parts should be used. Under no circumstances should the original design be altered.

PRODUCT SAFETY GUIDELINES FOR ALL PRODUCTS

CAUTION: Do not modify any circuit. Service work should be performed only after you are thoroughly familiar with all of the following safety checks. Risk of potential hazards and injury to the user increases if safety checks are not adhered to.

USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

PREVENTION OF ELECTROSTATIC DISCHARGE (ESD)

Some semiconductor solid state devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices, Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "antistatic (ESD protected)" can generate an electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION : Be sure no power is applied to the chassis or circuit and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your feet from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device.)

NOTE to CATV system Installer:

This reminder is provided to call the CATV system installer's attention to article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.