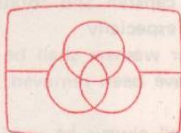


AIWA®

S/M Code No. 85-023

DATE OF ISSUE 5/1985

SERVICE MANUAL


**STEREO CASSETTE
DECK**Free service manuals
Gratis schema's

Digitized by

www.freescvicmanuals.info**MODEL NO.****AD-F620,
S20****TYPE. HB,ES,EB,KB,GB,ZS,ZB
UB (AD-S20)**

SPECIFICATIONS

Type	Stereo cassette deck	Outputs	LINE OUT standard output level: 0.41 V (0 VU); Suitable load impedance: over 50 k-ohms; Headphones: 8 ohms
Track format	4 tracks 2 channels	Dimensions	420 (W) × 110 (H) × 299.5 (D) mm
Power supply	AD-F620E, Z AC 220 V 50 Hz AD-620K, G AC 240 V 50 Hz AD-S20U AC 120 V 60 Hz AD-F620H AC 120 V/220 V/240 V switchable, 50/60 Hz	Weight	4.2 kg (9.2 lbs.)
Power consumption	18 W	Accessories	Stereo pin cord 2
Frequency response	METAL tape: 20—18,000 Hz CrO₂ position tape: 20—17,000 Hz NORMAL tape: 20—16,000 Hz		
Signal-to-noise ratio	75 dB (METAL tape DOLBY C NR ON)		
Wow and flutter	According to DIN 45 500 0.15% 0.055% (WRMS)		
Tape speed	4.8 cm/sec. (1-7/8 ips)		
Rewind time	90 sec. (C-60)		
Fast forward time	90 sec. (C-60)		
Recording system	AC bias (frequency 85 kHz)		
Erase system	AC erase		
Motor	DC Servomotor		
Head	Recording, playback head, DX combination head		
Inputs	LINE IN maximum input sensitivity: 50 mV (over 50 k-ohms)		

- Design and specifications are subject to change without notice.
- Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.
- Dolby and the  symbol are trademarks of Dolby Laboratories Licensing Corporation.

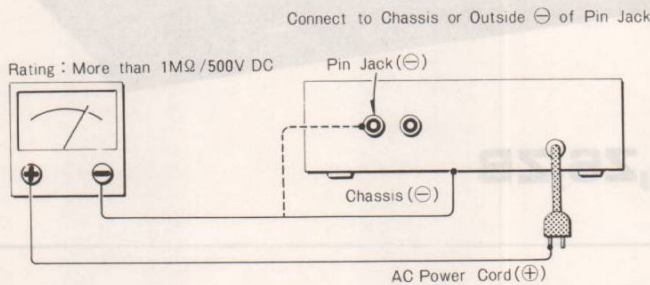
Follow the instructions carefully, which will allow the user to optimise the products' performance and give many years of service.

1. No scratch and melting shall be made to covered lead-wires of an a.c. primary circuit including mains leads.
2. No illegibility shall be given to the specification plate, the caution labels, the fuse labels and others.
3. When, on pattern sides of circuit boards, additional repair-parts have been made up, the parts shall be firmly glued to circuit boards or other components, unless the parts can be attached firmly.
4. The following matters shall be maintained as they are, when repairing.
 - 1) Soldering of lead-wire ends
 - * Care should be taken of the space distance in an a.c. primary circuit as well as soldering.
 - 2) Wiring and holding of lead-wires with wire-clips and binders
 - 3) Materials of lead-wires
 - * e.g.: For UL models, lead-wires to be used shall be approved or accepted by the UL.
 - 4) Location of all kinds of insulators
 - 5) Setting of voltage selector switch
 - * Set the Voltage Selector Switch to 240V, 220V, or 120V, According to your Local Voltage.
5. After repaired, the insulation resistance or leakage current shall be measured with 500 ± 5V D.C and shall be not less than 1MΩ.

6. General instructions for mechanism repair

- 1) The heads, capstan and pinch roller shall be cleaned of good quality alcohol after repaired, because dirty heads shall cause distorted sounds while dirty capstan and pinch roller shall occur wow/flutter and take-up fault.
- 2) Lubricants been stained the surfaces of transmitting portion of the belts, idlers, capstan and pinch roller shall be removed, because slippery and faulty tape travel shall be caused.
- 3) When oiling, only one or two drops shall be applied so as not to run over and be dispersed. Note should be taken of the metal fitting for the capstan and rotating portions of the idlers and pinch roller, especially.
- 4) E-rings and poly slider washers shall be replaced with new ones, if once those have been removed. – No re-utilization due to unreliability.
- 5) Regular spare-parts shall always be used for repair, because using irregular parts and tampering with the products shall cause deterioration, malfunction and damage.

Measuring Point



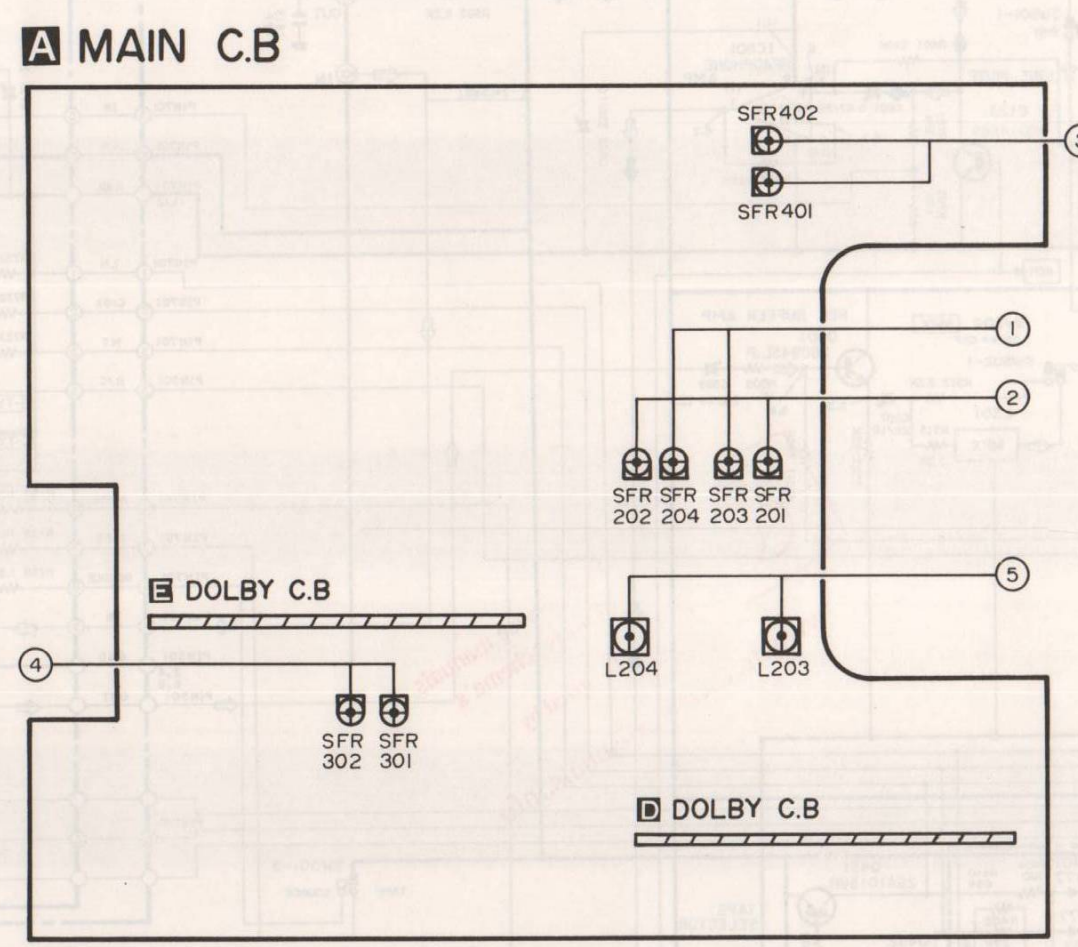
ELECTRICAL MAIN PARTS LIST

+++ mark denotes a component of assembled part which part code is represented by a previously stated component.
*-mark means less required items and availabilities may be limited.

CAPACITORS No mark, U, UF: µF P, PF : pF
COILS MMH: mH UH : µH
FUSE MMA: mA

Table with columns: Ref. No., Part No., Description, Ref. No., Part No., Description, Ref. No., Part No., Description, Ref. No., Part No., Description. Includes sections for IC, TRANSISTOR, MAIN CIRCUIT BOARD SECTION, FRONT CIRCUIT BOARD SECTION, POWER/SWITCH CIRCUIT BOARD SECTION, DECK CIRCUIT BOARD SECTION, MISCELLANEOUS, and KEY CIRCUIT BOARD SECTION.

ADJUSTMENT



Practical Service Figure

- Pinch roller pressure: 300 ± 60 g (2.94 ± 0.59 N)
Take-up torque: 40 ± 10 g·cm (0.39 ± 0.098 mN·m)
FF & REW torque: 130 ± 30 g·cm (1.27 ± 0.29 mN·m)
Counter indication: 0 ± 2 digit (C-60)
error:
PB output: 560 mV ± 1 dB
REC/PB distortion: Less than 2% (NORMAL)
Playback noise: Less than 3.5 mV (NORMAL DOLBY-NR OFF) Less than 1.2 mV (METAL, CrO2, DOLBY-NR C)
REC/PB SN ratio: More than 40/48/50 (Unweighted) (NORMAL DOLBY-NR OFF/B/C)
Erasing ratio: (125 Hz) More than 60 dB
Bias frequency: 85 kHz
Test tape: METAL TTA-119MP, NORMAL TTA-119J, CrO2 TTA-119G

Note; Combination Circuit Board
The parts on the electrical parts list which are indicated by an asterisk (*) are supplied as one single combined circuit board. Therefore, they will not be supplied separately. If this becomes necessary, please order the entire circuit board.

Combination circuit board 82-101-601
PCB-A 82-101-602
PCB-B 82-101-603
PCB-C 82-101-604
PCB-F 82-101-605

Safety component symbol
This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

C-MOS IC handling precaution
The C-MOS IC's construction makes this part susceptible to damage by static electricity and so take sufficient care in regard to following articles.

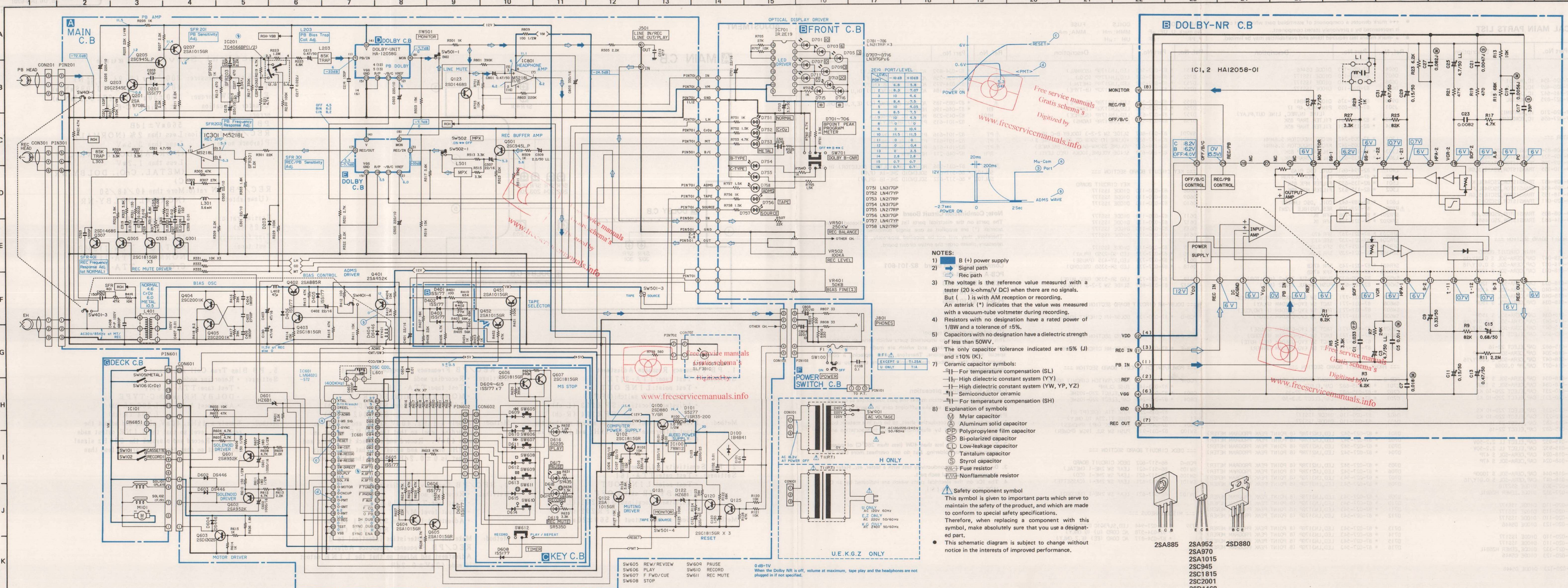
1. PB Frequency Response Adjustment
Settings: • Test tape: TTA-317E
• Test point: LINE OUT
• DOLBY NR switch: OFF
• Adjustment locations: SFR 203 (L-ch) SFR 204 (R-ch)
Method: Playback the test tape, then adjust so that the output difference between 1 kHz and 10 kHz is 0 ± 0.5 dB

2. PB Sensitivity Adjustment
Settings: • Test tape: TTA-161
• Test point: LINE OUT
• DOLBY NR switch: OFF
• Adjustment locations: SFR 201 (L-ch) SFR 202 (R-ch)
Method: Adjust so that output is 560 ± 20 mV.

3. REC/PB Frequency Response Adjustment
Settings: • Recording mode
• Test tape: TTA-119J
• MONITOR switch: SOURCE
• Adjustment locations: SFR 401 (L-ch) SFR 402 (R-ch)
Method: Supply a 1 kHz, 40 mV signal and adjust the recording level so that the LINE output is made 40 mV. Record and playback the 1 kHz and 10 kHz signals and adjust so that the 10 kHz output is 0 ± 0.2 dB based on the 1 kHz output.

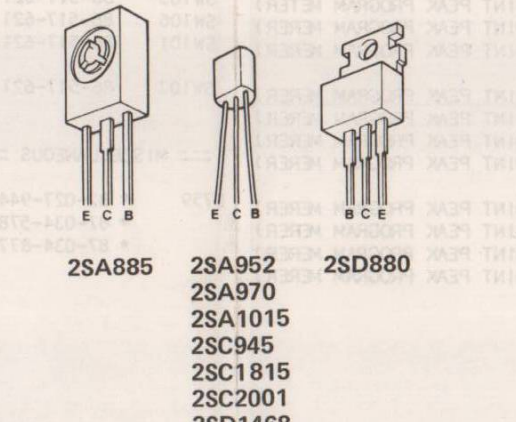
4. REC/PB Sensitivity Adjustment
Settings: • Recording mode
• Test tape: TTA-119J
• Output level: MAX
• Adjustment locations: SFR 301 (L-ch) SFR 302 (R-ch)
Method: Make the characteristics identical to 3. REC/PB Frequency Response Adjustment. Adjustment and adjust so that the LINE output is made 40 mV ± 0.2 dB.

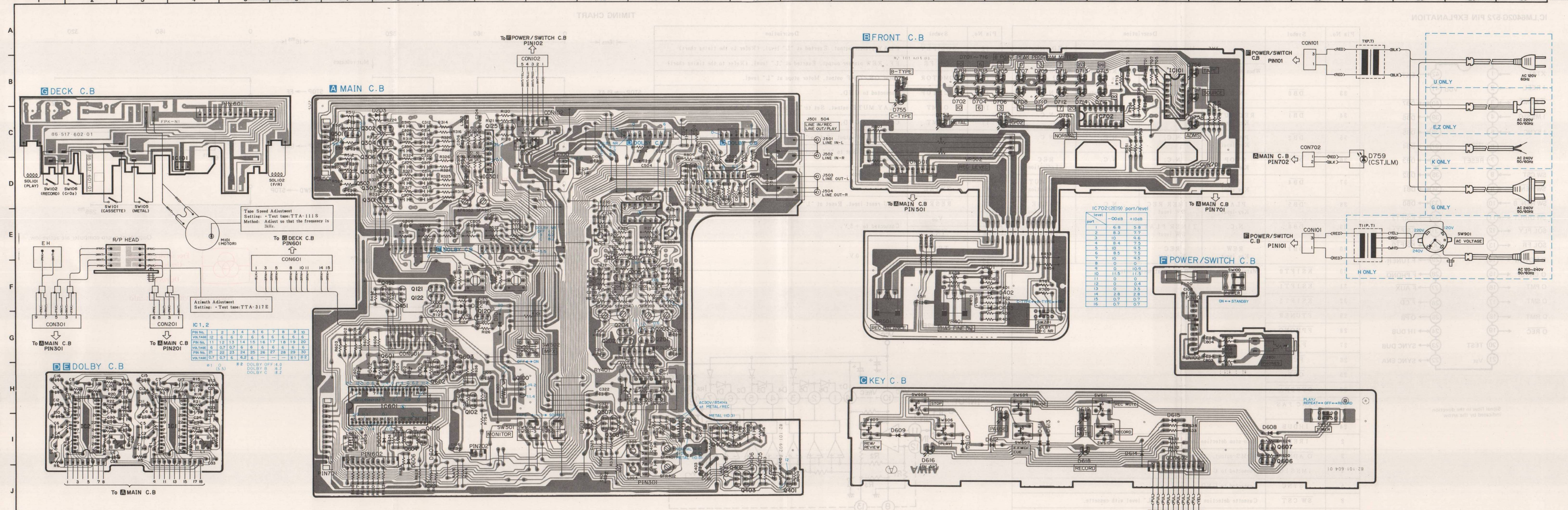
5. PB Bias Trap Coil Adjustment
Settings: • Recording mode
• Test tape: TTA-119MP
• DOLBY NR switch: C-TYPE
• Adjustment locations: L 203 (L-ch) L 204 (R-ch)
Method: Supply a 1 kHz, 40 mV signal and adjust the recording level so that the LINE output made 40 mV. Record and playback the 300 Hz signal and adjust so that the output are in less than 54 mV.



SW605 REW/REVIEW SW606 PLAY SW607 FWD/CUE SW608 STOP SW609 PAUSE SW610 RECORD SW611 REC MUTE

0 dB=TV
 When the Dolby NR is off, volume at maximum, tape play and the headphones are not plugged in if not specified.





Tape Speed Adjustment
 Settings: • Test tape: TTA-111 S
 Method: Adjust so that the frequency is 3kHz.

Asimuth Adjustment
 Settings: • Test tape: TTA-317 E

IC 1, 2

PIN No.	1	2	3	4	5	6	7	8	9	10
VOLTAGE	12	6	6	0	6	6	6	6	6	6
PIN No.	11	12	13	14	15	16	17	18	19	20
VOLTAGE	6	0.7	0.7	6	6	6	6	6	6	6
PIN No.	21	22	23	24	25	26	27	28	29	30
VOLTAGE	0.7	0.7	6	6.2	6	—	—	—	—	—

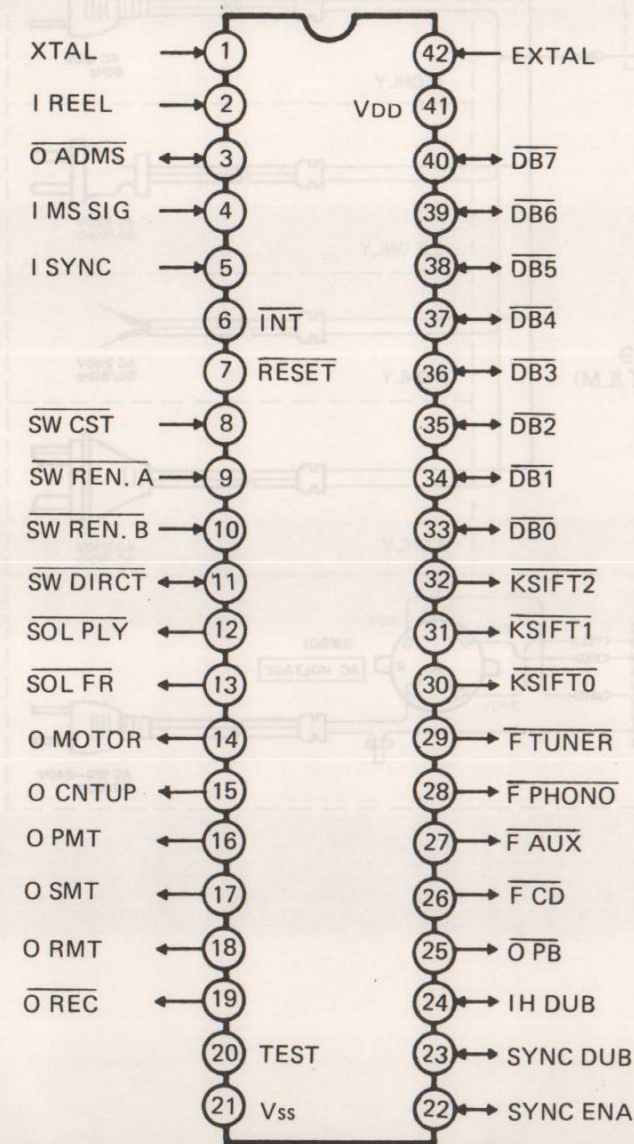
*1 0 (5.5) *2 DOLBY OFF 4.8
 DOLBY B 6.2
 DOLBY C 8.2

IC702 (2E19) port/level

port	-00dB	+10dB
1	6.8	5.8
2	8.3	7.7
3	10	9.6
4	8.4	7.5
5	10	9.5
6	8.5	7.5
7	10	9.5
8	0	0
9	0	10.9
10	11.5	11.5
11	0	0
12	0	0.4
13	0	3.5
14	2.8	2.8
15	0.7	0.7
16	0.7	0.7

- NOTES (1) [Pattern] Earth pattern [Pattern] Others pattern
 (2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals. An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.

IC, LM6402G-572 PIN EXPLANATION

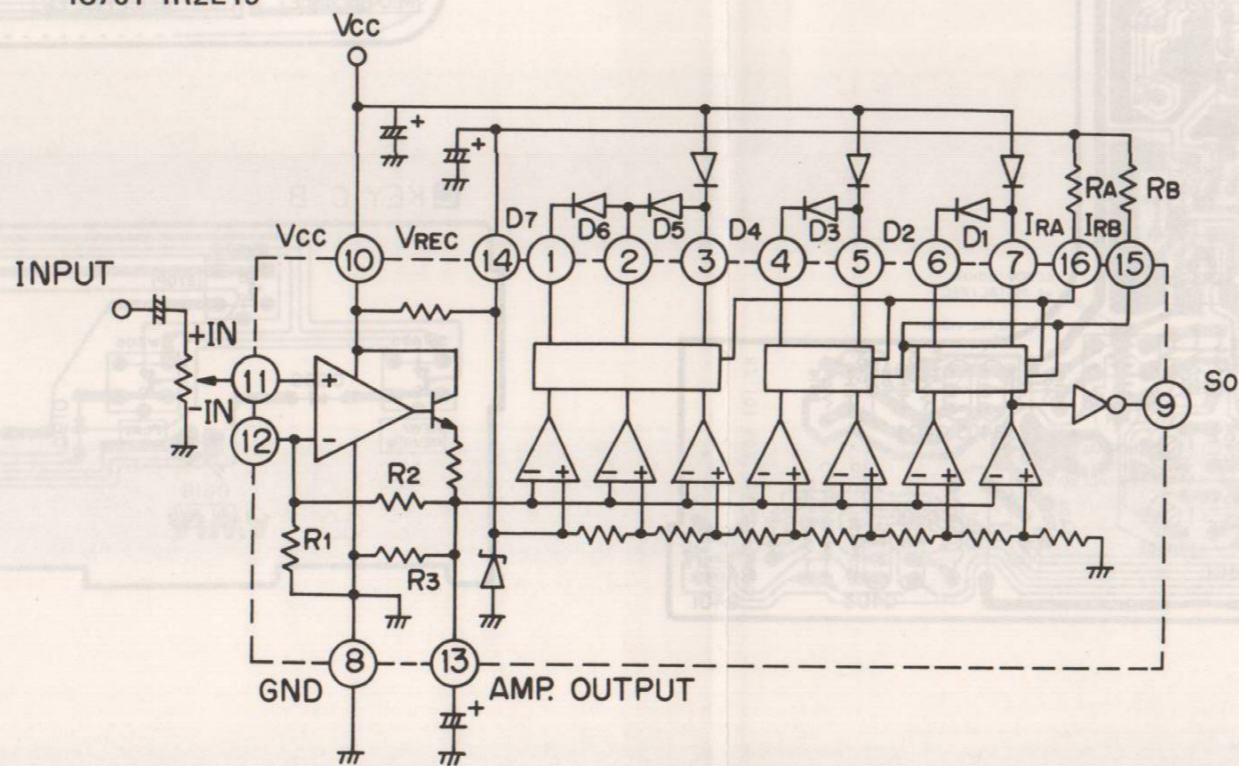


Signal flow in the direction indicated by the arrow

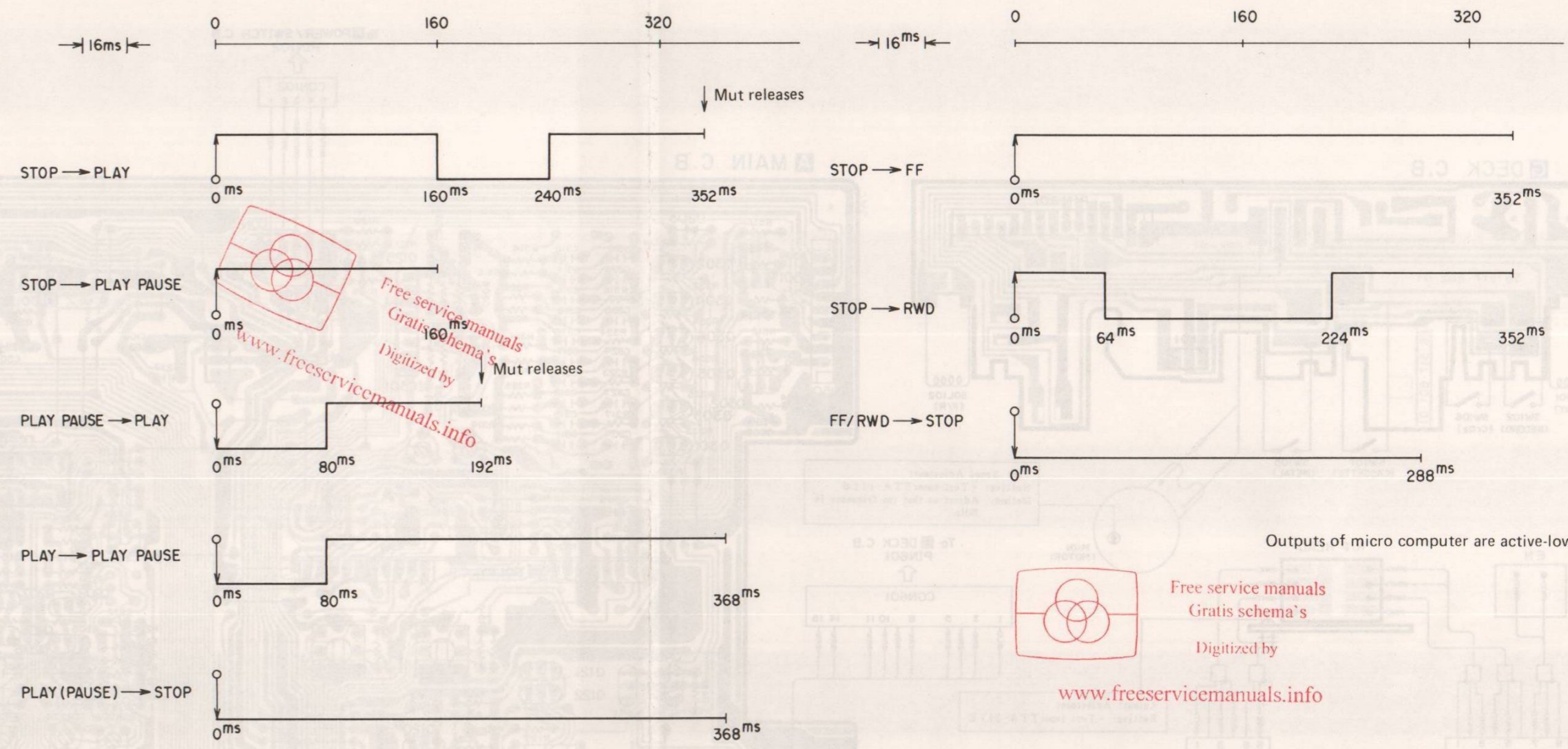
Pin No.	Symbol	Description			
		When $\overline{KSIFT0}$ is "L"	When $\overline{KSIFT1}$ is "L"	When $\overline{KSIFT2}$ is "L"	LED indication output(ON at "L")
		Matrix key input			LED indication output(ON at "L")
33	$\overline{DB0}$	N.C.	N.C.	"L" by Diode	N.C.
34	$\overline{DB1}$	REC MUTE Key input	N.C.	N.C.	N.C.
35	$\overline{DB2}$	PAUSE Key input	N.C.	N.C.	N.C.
36	$\overline{DB3}$	STOP Key input	N.C.	N.C.	REC Indication
37	$\overline{DB4}$	FF Key input	N.C.	N.C.	REC MUTE Indication
38	$\overline{DB5}$	PLAY Key input	TIMER REC SW input	N.C.	PAUSE Indication
39	$\overline{DB6}$	N.C.	TIMER PLAY SW input	N.C.	PLAY Indication
40	$\overline{DB7}$	REW Key input	REC Key input	N.C.	N.C.
30	$\overline{KSIFT0}$	Matrix key input/indication output sector output.			
31	$\overline{KSIFT1}$				
32	$\overline{KSIFT2}$				
29	\overline{FTUNER}				
28	\overline{FPHONO}				
27	\overline{FAUX}				
26	\overline{FCD}				
25	\overline{OPB}	Connected to GND.			
22	\overline{DUBENA}				
23	$\overline{SYNC PAS}$				
24	\overline{IHDUB}				
2	I REEL	Auto-stop detection input			
3	$\overline{O ADMS}$	ADMS output. Outputs "L" for 2 sec at reset.			
4	I M SIG	Connected to GND.			
5	I SYNC	Connected to GND.			
8	$\overline{SW CST}$	Cassette detection input. Set to "L" level with cassette.			
9	$\overline{SW REN.A}$	REC prevention input. REC enabled at "L" level.			
10	$\overline{SW REN.B}$	Connected to GND.			
11	$\overline{SW DIRCT}$				

Pin No.	Symbol	Description
12	$\overline{SOL PLY}$	PLAY plunger output. Exerted at "L" level. (Refer to the timing chart)
13	$\overline{SOL FR}$	FF. REW plunger output. Exerted at "L" level. (Refer to the timing chart)
14	OMOTOR	Motor ON/OFF output. Motor stops at "L" level.
15	OCNTUP	Connected to GND.
16	OPMT	PLAY MUTE output. Set to "L" level in the PLAY mode only.
17	OSMT	Connected to GND.
18	ORMT	REC MUTE output. Set to "L" level in the REC/PLAY modes only.
19	\overline{OREC}	REC output. Set to "L" level in the REC-PLAY, REC-PLAY-PAUSE modes only.
1	XTAL	MPU clock input.
42	EXTAL	
7	\overline{RESET}	MPU reset input. Reset at "L" level.
41	V_{DD}	Connected to +5 V.
6	\overline{INT}	Connected to 0 V.
20	TEST	Connected to 0 V.
21	V_{SS}	Connected to 0 V.

IC701 IR2E19



TIMING CHART



Outputs of micro computer are active-low.

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DISASSEMBLY INSTRUCTIONS

1. Removing Steel Cabinet

1) Remove the 6 screws.

2. Removing Mechanism

- 1) Remove the 4 screws and open the cassette lid.
- 2) Lift up the mechanism in the direction of the arrow.
(See Figure-1)

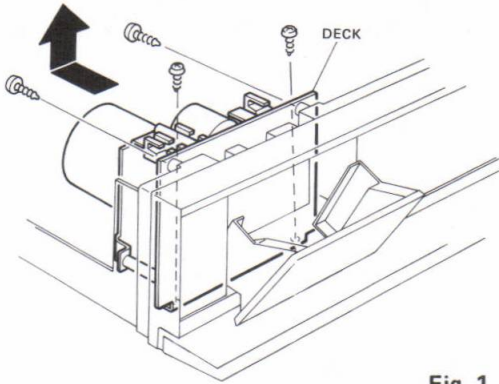


Fig. 1

3. Removing Front Cabinet

- 1) Removing the 8 screws.
- 2) Detach the front cabinet in the direction of the arrow.
(See Figure-2)

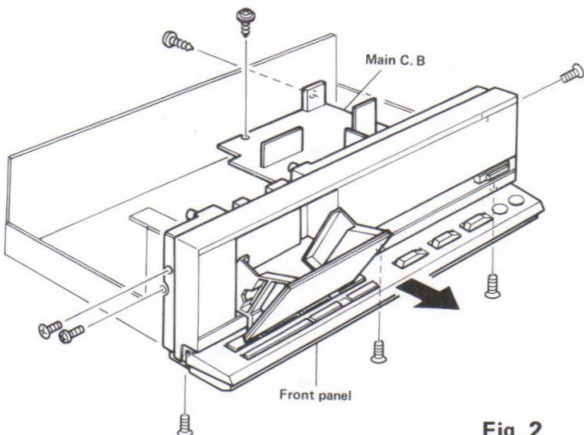


Fig. 2

4. Removing Circuit Boards

- 1) Remove the 3 screws and detach the bottom cabinet.
(See Figure-3)

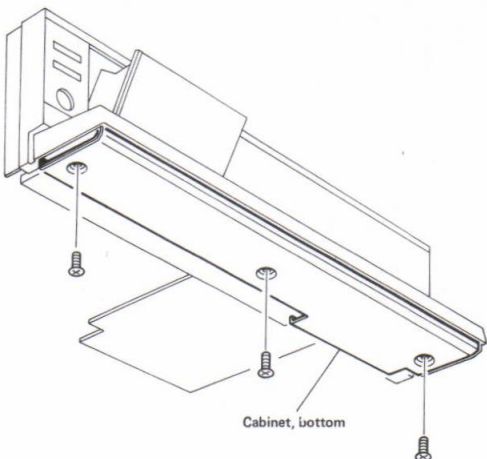


Fig. 3

- 2) Remove the 2 screws and 3 knobs. (See Figure-4)

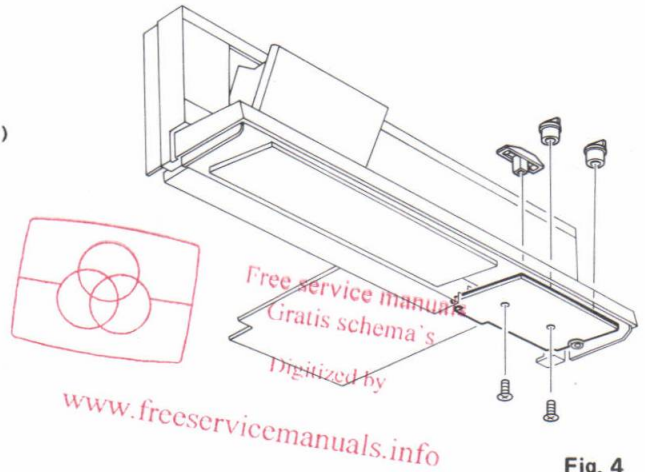


Fig. 4

- 3) Unfix the Front P.C.B. by loosening 5 plastic holders. (See Figure-5)

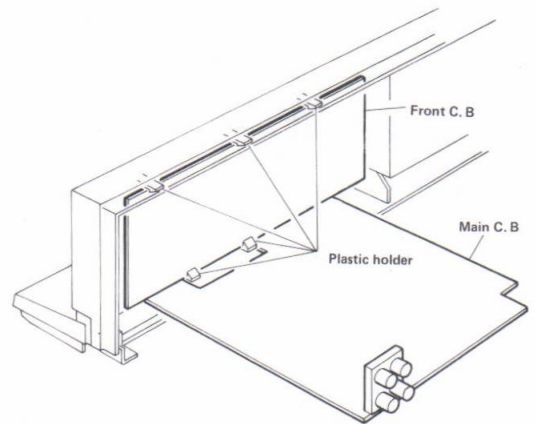
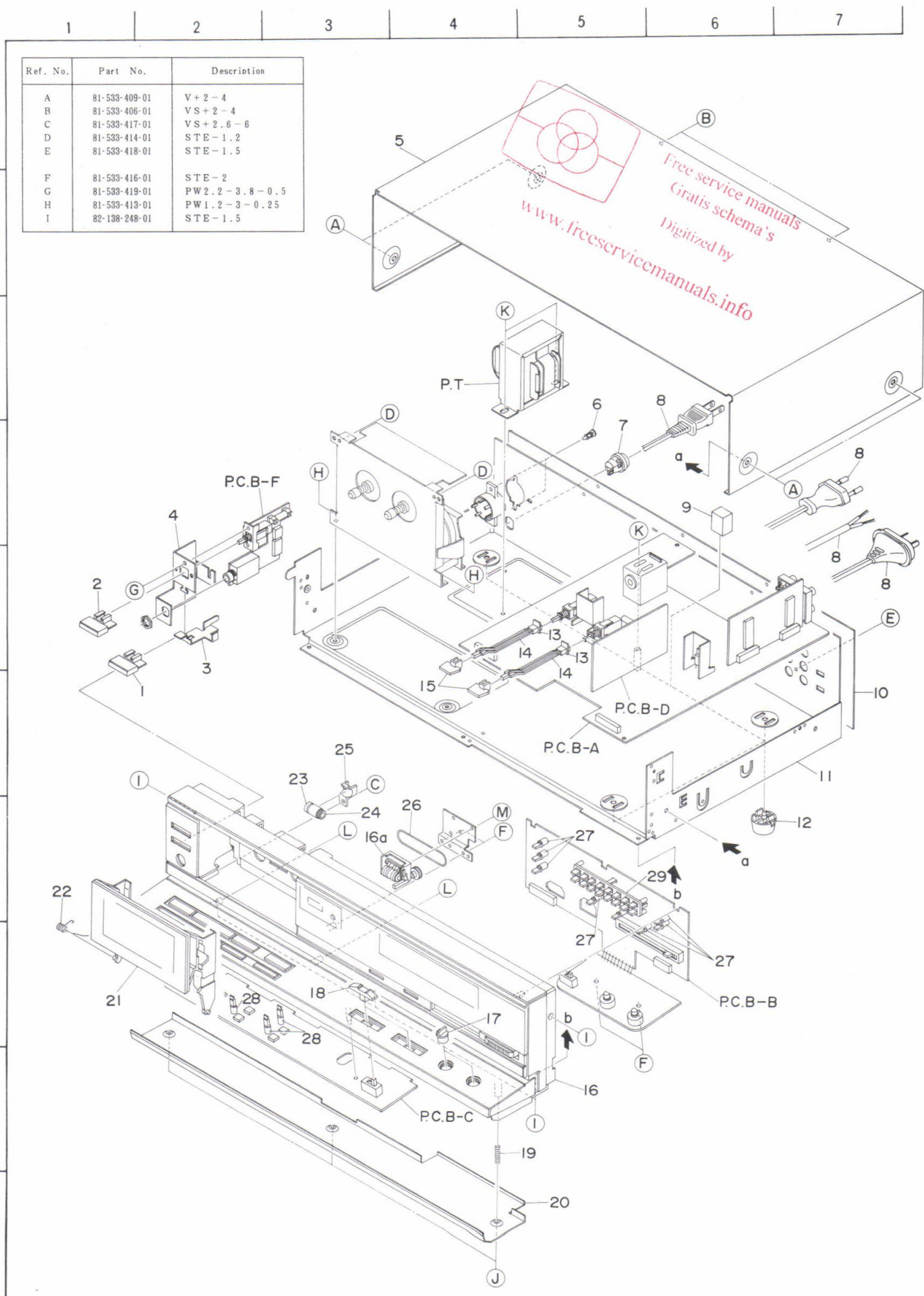


Fig. 5

EXPLODED VIEW - I

Ref. No.	Part No.	Description
A	81-533-409-01	V+2-4
B	81-533-406-01	VS+2-4
C	81-533-417-01	VS+2.6-6
D	81-533-414-01	STE-1.2
E	81-533-418-01	STE-1.5
F	81-533-416-01	STE-2
G	81-533-419-01	PW2.2-3.8-0.5
H	81-533-413-01	PW1.2-3-0.25
I	82-138-248-01	STE-1.5



- * mark in this part list shows exclusive part.
- ★-mark means less required items availabilities may be limited.
- No availability part is marked with — in Part No. list.
- [S]=SILVER, [B]=BLACK

MECHANICAL PARTS LIST

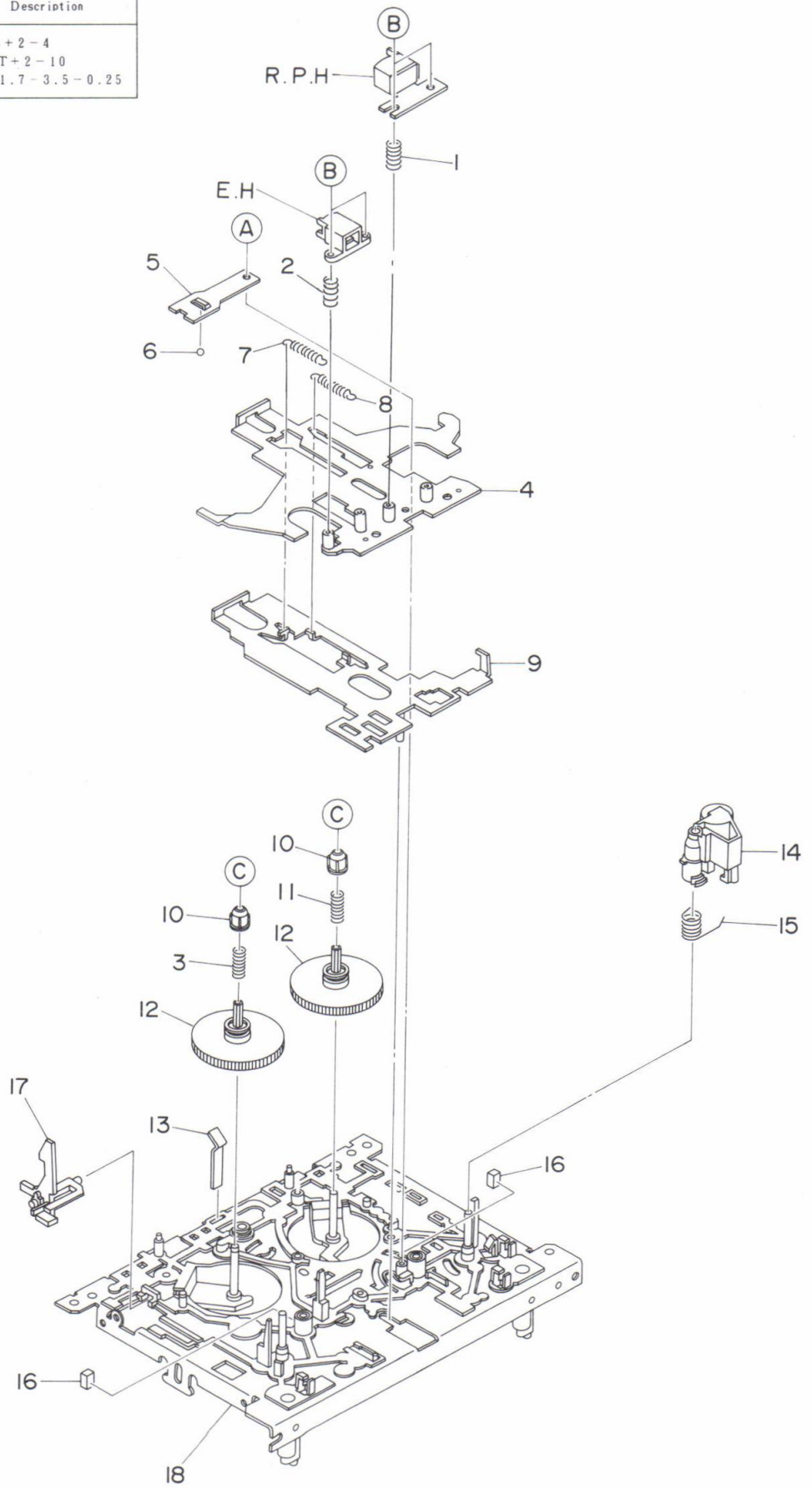
Part No. changed to	Ref. No.	Part No.	Description	Common Model	Q'ty
	1-1	★82-134-022	KNOB, POWER SL	AD-F350	1
	1-2	★82-188-012	KNOB, POWER	AD-F990	1
	1-3	—	LEVER, EJECT		1
	1-4	—	HOLDER, POWER		1
	1-5	★82-100-028	STEEL CABINET [S]	AD-F640	1
		★82-199-012	STEEL CABINET [B]	AD-R550	1
	1-6	★87-085-090	NYLON RIVET 3-6.5 (H only)		2
	1-7	★87-085-184	CORD BUSHING (H, S 20U only)		1
		★87-085-185	CORD BUSHING (E, K, G, Z only)		1
	1-8	★87-034-958	AC POWER CORD (H only)		1
		★87-034-578	AC POWER CORD (S 20U only)		1
		★87-034-877	AC POWER CORD (E, Z only)		1
		★87-034-975	AC POWER CORD (K only)		1
		★87-034-892	AC POWER CORD (G only)		1
	1-9	—	G CUSHION, CIRCUIT BOARD		1
	1-10	★82-101-009	JACK PLATE (H only)	※	1
		★82-101-010	JACK PLATE (S 20U only)	※	1
		★82-101-011	JACK PLATE (E only)	※	1
		★82-101-012	JACK PLATE (K only)	※	1
		★82-101-014	JACK PLATE (G only)	※	1
		★82-101-013	JACK PLATE (Z only)	※	1
	1-11	—	AMP. CHASSIS Ass'y (H only)		1
		—	AMP. CHASSIS Ass'y (EXCEPT H)		1
	1-12	★87-055-055	FOOT		3
	1-13	★82-385-383	STOPPER, LOD		2
	1-14	★82-186-214	LOD, DOLBY		2
	1-15	★82-100-016	PUSH-BUTTON TS	AD-F640	2
	1-16	★82-101-001	FRONT CABINET Ass'y [S]	※	1
		★82-101-015	FRONT CABINET Ass'y [B]	※	1
	16 a	★87-040-181	COUNTER		1
	1-17	82-100-015	KNOB, BIAS	AD-F640	2
	1-18	82-100-014	SLIDE KNOB, TIMER	AD-F640	2
	1-19	★82-100-208	C-SPRING, EARTH B	AD-F640	1
	1-20	—	BOTTOM CABINET		1
	1-21	82-101-007	CASSETTE BOX Ass'y (EXCEPT S 20U)	※	1
		82-101-020	CASSETTE BOX-U Ass'y (S 20U only)	※	1
	1-22	★82-100-209	T-SPRING, EJECT	AD-F640	1
	1-23	★82-175-207	SHAFT BEARING, OIL-DAMP		1
	1-24	★82-534-264	GEAR, OIL-DAMP		1
	1-25	★82-683-212	HOLDER, OIL-DAMP 2		1
	1-26	82-304-247	RUBBER BELT, COUNTER		1
	1-27	—	COLLAR, LED B		8
	1-28	—	COLLAR, LED BF		4
	1-29	—	GUIDE, LED S		1

EXPLODED VIEW-2

1 2 3 4 5 6 7

Ref. No.	Part No.	Description
A	87-351-033-21	VT.+2-4
B	87-067-218-01	VTT+2-10
C	87-081-808-01	PW1.7-3.5-0.25

A
B
C
D
E
F
G
H
I
J



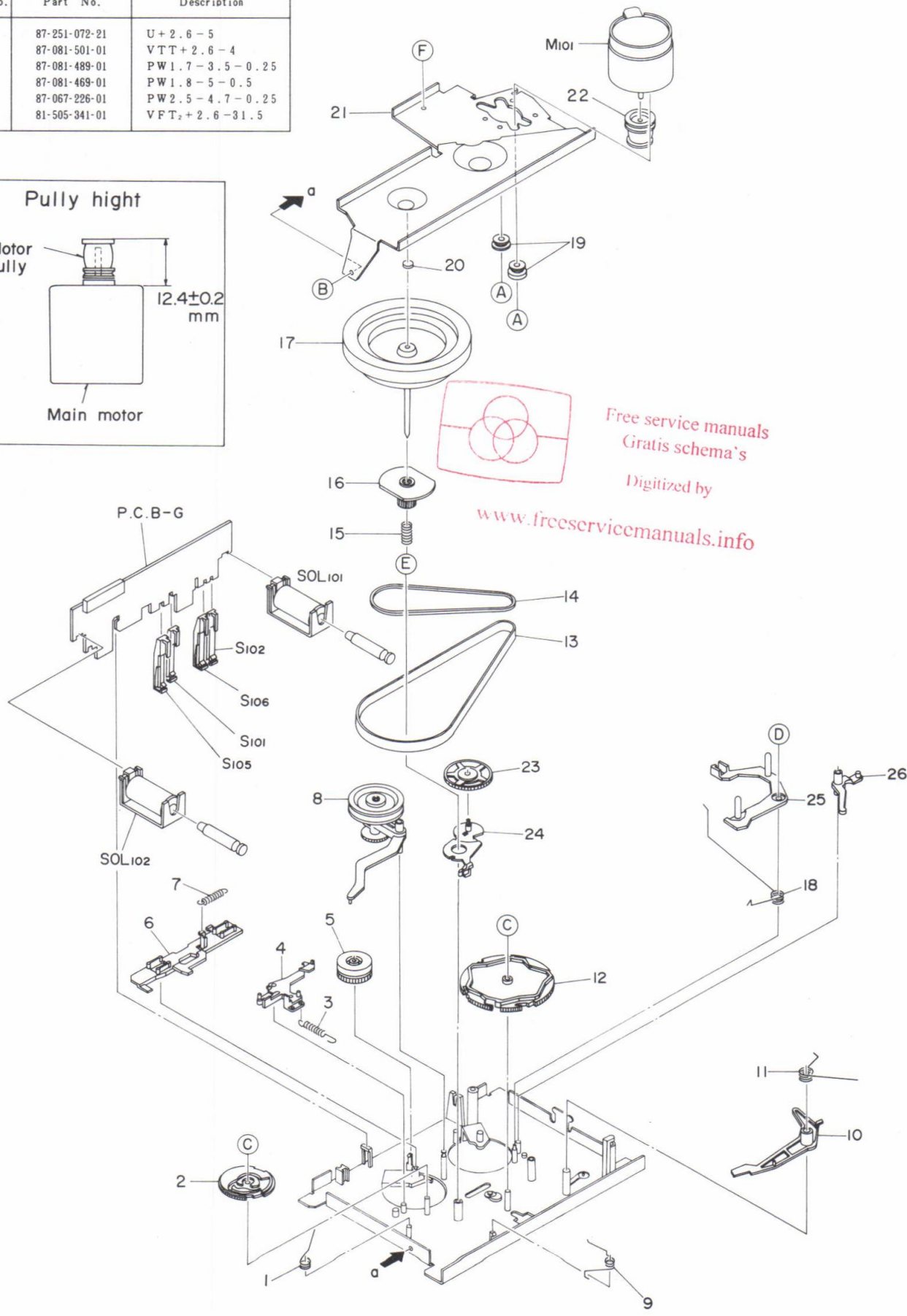
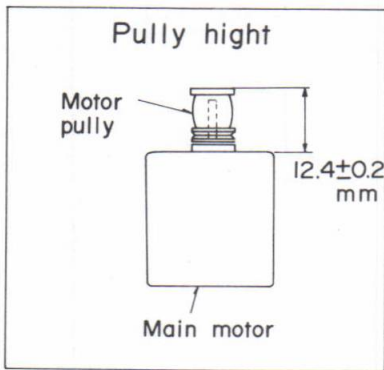
Part No. changed to	Ref. No.	Part No.	Description	Common Model	Q'ty
	2-1	★86-519-211	C-SPRING, HEAD		1
	2-2	★86-519-236	C-SPRING, EH		1
	2-3	★86-519-220	C-SPRING, REEL PLATFORM 3H		1
	2-4	★86-519-221	ACTUATING CHASSIS S		1
	2-5	★86-517-275	P-SPRING, ACTUATING CHASSIS		1
	2-6	★87-073-008	STEEL BALL 2.5		1
	2-7	★86-519-230	E-SPRING, LEVER MOVEMENT		1
	2-8	★86-517-283	E-SPRING, ACTUATING CHASSIS		1
	2-9	★86-519-215	LEVER MOVEMENT SINGLE Ass'y		1
	2-10	86-517-236	STOPPER, REEL PLATFORM		2
	2-11	★86-517-234	C-SPRING, REEL PLATFORM S		1
	2-12	86-517-235	REEL PLATFORM		2
	2-13	★86-517-276	P-SPRING, CASSETTE		1
	2-14	86-517-363	PINCH LEVER F Ass'y 2		1
	2-15	★86-519-210	T-SPRING, PINCH LEVER F		1
	2-16	—	CUSHION, ACTUATING CHASSIS		2
	2-17	★86-517-256	LEVER, EJECT		1
	2-18	—	OUTSERT S Ass'y		1

EXPLODED VIEW-3

1 2 3 4 5 6 7

Ref. No.	Part No.	Description
A	87-251-072-21	U+2.6-5
B	87-081-501-01	VTT+2.6-4
C	87-081-489-01	PW1.7-3.5-0.25
D	87-081-469-01	PW1.8-5-0.5
E	87-067-226-01	PW2.5-4.7-0.25
F	81-505-341-01	VFT ₂ +2.6-31.5

A
B
C
D
E
F
G
H
I
J



Part No. changed to	Ref. No.	Part No.	Description	Common Model	Q'ty
	3-1	★86-517-278	T-SPRING, FR CAM		1
	3-2	86-517-215	GEAR, FR CAM C		1
	3-3	★86-517-346	E-SPRING, TRIGGER LEVER FR		1
	3-4	★86-517-257	TRIGGER LEVER FR		1
	3-5	86-517-238	GEAR, FF		1
	3-6	★86-517-254	LEVER, SLIDE BRAKE		1
	3-7	★86-517-284	E-SPRING, SLIDE BRAKE		1
	3-8	86-517-239	FR PULLEY A Ass'y		1
	3-9	★86-519-222	T-SPRING, MAIN LEVER		1
	3-10	★86-517-252	TRIGGER LEVER, PLAY-A		1
	3-11	★86-517-280	T-SPRING, TRIGGER LEVER PLAY		1
	3-12	86-519-202	GEAR, MAIN CAM S		1
	3-13	86-519-240	MAIN BELT S. B		1
	3-14	86-517-295	BELT FR		1
	3-15	★86-517-323	C-SPRING, FLYWHEEL DC F		1
	3-16	86-517-317	GEAR, FLYWHEEL DC F		1
	3-17	86-517-314	FLYWHEEL DC F Ass'y		1
	3-18	★86-517-332	T-SPRING, LEVER SWITCH		1
	3-19	★86-513-441	COLLAR		2
	3-20	★86-517-348	FLYWHEEL BEARING		1
	3-21	—	MOTOR HOLDER DC		1
	3-22	86-517-292	MOTOR PULLEY		1
	3-23	86-519-203	GEAR PLAY S Ass'y		1
	3-24	★86-519-208	LEVER, MAIN GEAR		1
	3-25	★86-517-255	LEVER, SWITCH		1
	3-26	★86-517-253	TRIGGER LEVER, PLAY-B		1

ACCESSORIES/PACKAGE LIST

Part No. changed to	Ref. No.	Part No.	Description	Common Model	Q'ty
	1	★82-101-904	INSTRUCTION BOOKLET	※	1
	2	★87-032-845	SIEMENS PLUG (HB only)		1
	3	★87-034-978	CONNECTION CORD CW-254 BSK		2

AIWA Co., Ltd. Tokyo Japan