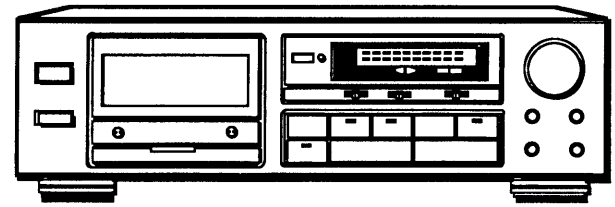
S/M Code No.90 – 099 DATE OF ISSUE 12/1990 – T

AIWA®

AD-F500
AD-R505

SERVICE MANUAL



STEREO CASSETTE DECK

- BASIC TAPE MECHANISM : α – 14
- TYPE. H,E,K,Z (F500)
  H,U,C,E,K,Z (R505)

AIWA Co., Ltd.

Tokyo Japan

Printed in Japan

SPECIFICATIONS

AD-R505

Type	Stereo cassette tape deck
Track format	4 tracks, 2 channels
Power supply	AD-R505E, Z AC 220 V, 50 Hz AD-R505K AC 240V, 50 Hz AD-R505H AC 110–120 V/220–240 V switchable, 50/60 Hz AD-R505U, C AC 120 V, 60 Hz
Power consumption	12 W
Frequency response	METAL tape: 20–18,000 Hz CrO_2 tape: 20–17,000 Hz NORMAL tape: 20–16,000 Hz
Signal-to-noise ratio	73 dB (METAL tape DOLBY C NR ON above 5 kHz)
Wow and flutter	0.065% (WRMS) 0.18% (according to DIN 45500)
Tape speed	4.8 cm/sec. ($1\frac{7}{8}$ ips)
Recording system	AC bias (frequency 85 kHz)
Erase system	AC erase
Motor	DC servomotor (1)
Heads	Record/playback head (1) Erase head (1) (Double-gap ferite head)
Inputs	REC/LINE IN maximum input sensitivity: 50 mV (47 kΩ) DIN max sensitivity (Z model only): 0.1 mV/kΩ (3.3 kΩ)
Outputs	PLAY/LINE OUT standard output level: 350 mV (0 VU); suitable load impedance: over 47 kΩ DIN standard level (Z model only): 0.3 V (0 VU) PHONES: 0.14 mW (32Ω)
Dimensions	430(W) × 133(H) × 269(D) mm
Weight	3.9 kg

AD-F500

Type	Stereo cassette tape deck
Track format	4 tracks, 2 channels
Power supply	AD-F500E, Z AC 220 V, 50 Hz AD-F500K AC 240V, 50 Hz AD-F500H AC 110–120 V/220–240 V switchable, 50/60 Hz
Power consumption	12 W
Frequency response	METAL tape: 20–20,000 Hz CrO_2 tape: 20–18,000 Hz NORMAL tape: 20–17,000 Hz
Signal-to-noise ratio	73 dB (METAL tape DOLBY C NR ON above 5 kHz)
Wow and flutter	0.048% (WRMS) 0.12% (according to DIN 45500)
Tape speed	4.8 cm/sec. ($1\frac{7}{8}$ ips)
Recording system	AC bias (frequency 85 kHz)
Erase system	AC erase
Motor	DC servomotor (1) DC motor (1)
Heads	Record/playback head (1) (PC-OCC super DX head) Erase head (1) (Double-gap ferite head)
Inputs	REC/LINE IN maximum input sensitivity: 50 mV (47 kΩ) DIN max sensitivity (Z model only): 0.1 mV/kΩ (3.3 kΩ)
Outputs	PLAY/LINE OUT standard output level: 350 mV (0 VU); suitable load impedance: over 47 kΩ DIN standard level (Z model only): 0.3 V (0 VU) PHONES: 0.14 mW (32Ω)
Dimensions	430(W) × 133(H) × 269(D) mm
Weight	4.2 kg

• Design and specifications are subject to change without notice.

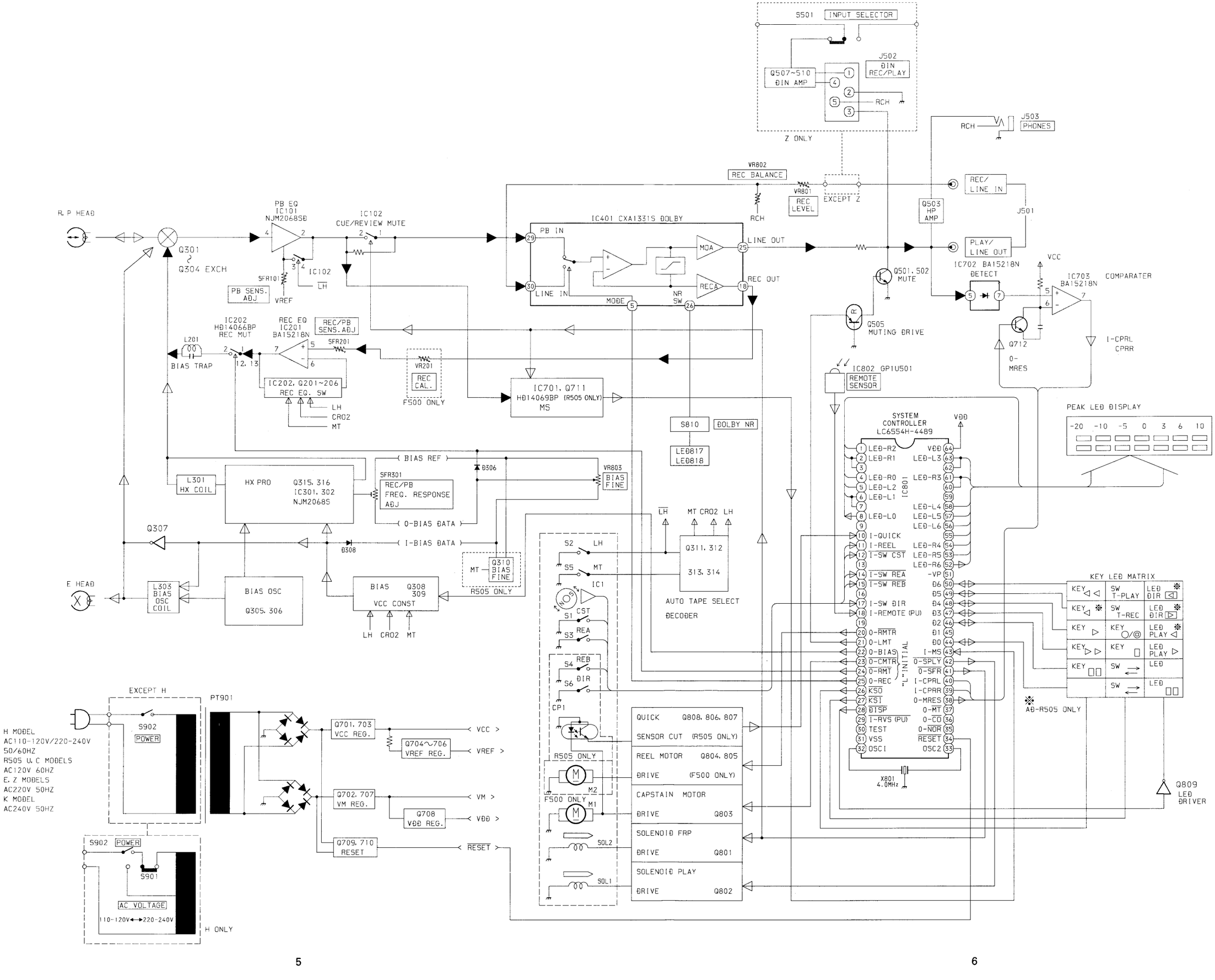
- Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.
- "Dolby", the double-D symbol, DD and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

ELECTRICAL MAIN PARTS LIST

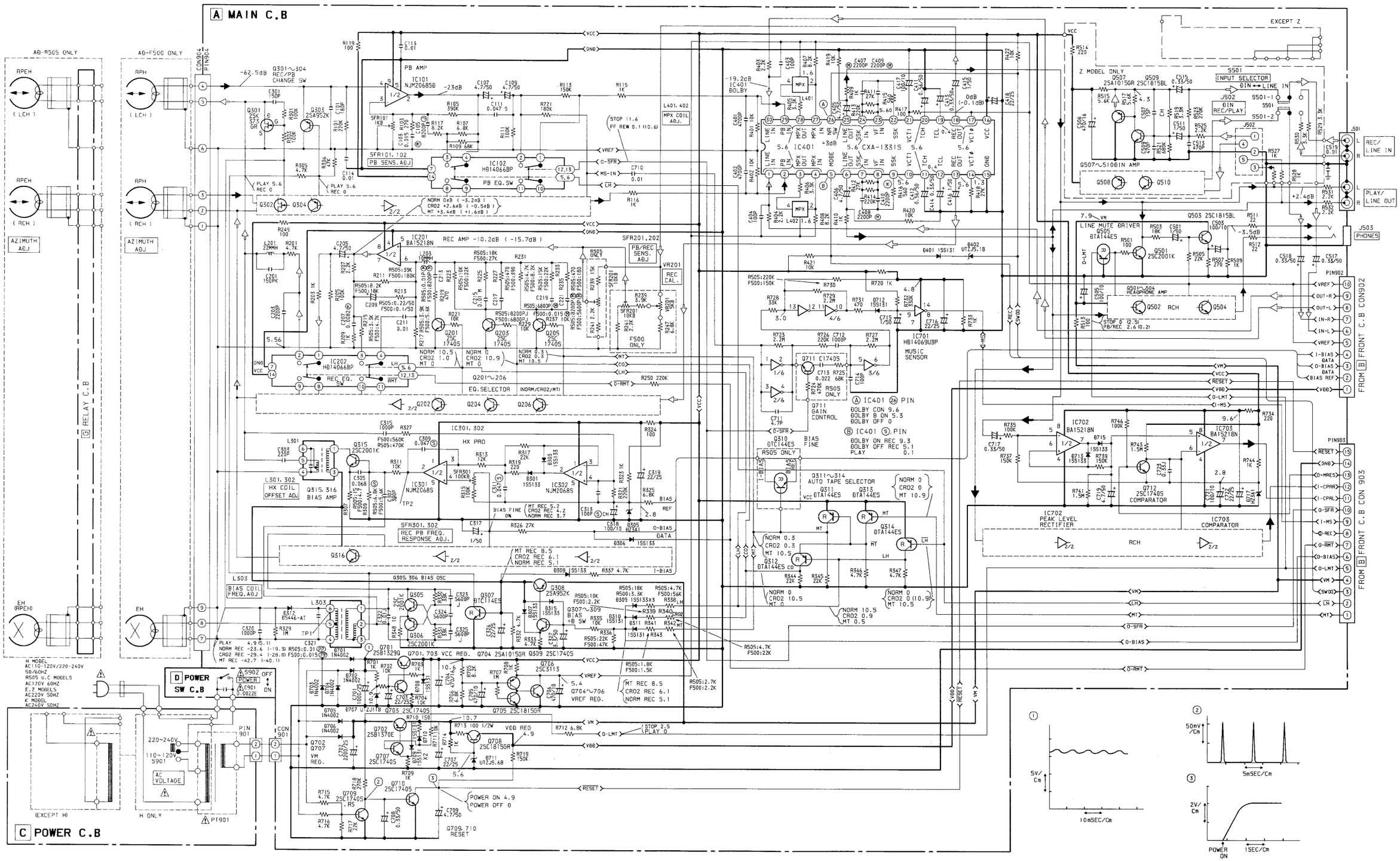
REF. NO.	PART NO.	DESCRIPTION
===IC===		
	87-001-440-019	IC, BA15218N
	87-001-983-010	IC, CXA1331 S
	87-001-533-010	IC, GP1U501(REMOTE SENSOR)
	87-001-198-019	IC, HD14066BP
	87-020-312-019	IC, HD14069UBP
	80-DS4-619-010	IC, LC6554H-4489
	87-020-758-019	IC, NJM2068SD
	87-020-680-019	IC, NJM2068S
===TRANSISTOR===		
	89-503-735-019	FET, 2SK373GR
	89-110-155-019	TRANSISTOR, 2SA1015GR
	89-112-965-019	TRANSISTOR, 2SA1296GR
	87-026-463-019	TRANSISTOR, 2SA933S RS
	89-109-521-019	TRANSISTOR, 2SA952K
	89-213-292-019	TRANSISTOR, 2SB1329Q
	89-213-702-019	TRANSISTOR, 2SB1370E
	87-026-462-019	TRANSISTOR, 2SC1740S RS
	89-318-156-019	TRANSISTOR, 2SC1815BL
	89-318-155-019	TRANSISTOR, 2SC1815GR
	89-320-011-019	TRANSISTOR, 2SC2001K
	89-331-130-019	TRANSISTOR, 2SC3113
	87-026-214-019	TRANSISTOR, DTA114YS
	87-026-219-019	TRANSISTOR, DTA144ES
	87-026-245-019	TRANSISTOR, DTC114ES
	87-026-218-019	TRANSISTOR, DTC144ES
===DIODE===		
	87-001-783-019	DIODE, 1N4002-T
	87-001-559-019	DIODE, 1SS131
	87-020-465-019	DIODE, 1SS133
	87-020-123-019	DIODE, DS446-AT
	87-027-301-019	DIODE, ZENER HZ3A1
	87-002-219-010	DIODE, ZENER UTZJ11B
	87-001-912-019	DIODE, ZENER UTZJ5.1B
	87-001-913-019	DIODE, ZENER UTZJ5.6B
===MAIN CIRCUIT BOARD SECTION===		
C101	*87-018-122-019	CAP, CERA-SOL U 180P-50 B
C102	*87-018-122-019	CAP, CERA-SOL U 180P-50 B
C107	*87-010-404-019	CAP, ELECT 4.7-50 SME
C108	*87-010-404-019	CAP, ELECT 4.7-50 SME
C109	*87-010-404-019	CAP, ELECT 4.7-50 SME
C110	*87-010-404-019	CAP, ELECT 4.7-50 SME
C113	*87-018-134-019	CAP, CERA-SOL U 0.01-16 Y
C114	*87-018-134-019	CAP, CERA-SOL U 0.01-16 Y
C201	*87-018-121-019	CAP, CERA-SOL U 150P-50 B
C202	*87-018-121-019	CAP, CERA-SOL U 150P-50 B
C203	*87-018-132-019	CAP, CERA-SOL U 2200P-16 X
C204	*87-018-132-019	CAP, CERA-SOL U 2200P-16 X
C205	*87-010-404-019	CAP, ELECT 4.7-50 SME
C206	*87-010-404-019	CAP, ELECT 4.7-50 SME
C209	*87-010-544-019	CAP, ELECT 0.1-50V(F500)
C209	*87-010-545-019	CAP, ELECT 0.22-50 SME(R505)
C210	*87-010-544-019	CAP, ELECT 0.1-50V(F500)
C210	*87-010-545-019	CAP, ELECT 0.22-50 SME(R505)
C211	*87-018-134-019	CAP, CERA-SOL U 0.01-16 Y
C212	*87-018-134-019	CAP, CERA-SOL U 0.01-16 Y
C301	*87-018-121-019	CAP, CERA-SOL U 150P-50 B
C302	*87-018-121-019	CAP, CERA-SOL U 150P-50 B
C303	*87-018-123-019	CAP, CERA-SOL U 220P-50 B
C304	*87-018-123-019	CAP, CERA-SOL U 220P-50 B
C307	*87-018-126-019	CAP, CERA-SOL U 390P-50 B
C308	*87-018-126-019	CAP, CERA-SOL U 390P-50 B
C315	*87-018-131-019	CAP, CERA-SOL U 1000P-50 B
C316	*87-018-131-019	CAP, CERA-SOL U 1000P-50 B
C317	*87-010-401-019	CAP, ELECT 1-50 SME
C318	*87-010-263-019	CAP, ELECT 100-10
C319	*87-010-382-019	CAP, ELECT 22-25 SME
C320	*87-018-131-019	CAP, CERA-SOL U 1000P-50 B
C324	*87-018-201-019	CAP, CERA-SOL U 5600P-16 X
C326	*87-010-382-019	CAP, ELECT 22-25 SME
C327	*87-010-403-019	CAP, ELECT 3.3-50 SME
C401	*87-018-133-019	CAP, CERA-SOL U 4700P-16 X
C402	*87-018-133-019	CAP, CERA-SOL U 4700P-16 X
C403	*87-018-119-019	CAP, CERA-SOL U 100P-50 B
C404	*87-018-119-019	CAP, CERA-SOL U 100P-50 B
C405	*87-010-404-019	CAP, ELECT 4.7-50 SME
C406	*87-010-404-019	CAP, ELECT 4.7-50 SME
C411	*87-010-826-019	CAP, ELECT 0.56-50 VX
C412	*87-010-826-019	CAP, ELECT 0.56-50 VX
C413	*87-010-546-019	CAP, ELECT 0.33-50 SME
C414	*87-010-546-019	CAP, ELECT 0.33-50 SME
C415	*87-010-401-019	CAP, ELECT 1-50 SME
C416	*87-010-401-019	CAP, ELECT 1-50 SME
C417	*87-010-263-019	CAP, ELECT 100-10
C418	*87-010-382-019	CAP, ELECT 22-25 SME
C501	*87-010-401-019	CAP, ELECT 1-50 SME
C502	*87-010-401-019	CAP, ELECT 1-50 SME
C503	*87-010-263-019	CAP, ELECT 100-10
C504	*87-010-263-019	CAP, ELECT 100-10
C505	*87-010-263-019	CAP, ELECT 100-10
C506	*87-010-235-019	CAP, ELECT 470-16 SME(Z)
C507	*87-018-149-019	CAP, CERA-SOL U 15P-50 CH(Z)
C508	*87-018-149-019	CAP, CERA-SOL U 15P-50 CH(Z)
C509	*87-018-127-019	CAP, CERA-SOL U 470P-50 B(Z)
C510	*87-018-127-019	CAP, CERA-SOL U 470P-50 B(Z)
C511	*87-010-401-019	CAP, ELECT 1-50 SME(Z)
C512	*87-010-401-019	CAP, ELECT 1-50 SME(Z)
C513	*87-018-127-019	CAP, CERA-SOL U 470P-50 B(Z)
C514	*87-018-127-019	CAP, CERA-SOL U 470P-50 B(Z)
C515	*87-010-546-019	CAP, ELECT 0.33-50 SME(Z)
C516	*87-010-546-019	CAP, ELECT 0.33-50 SME(Z)
C517	*87-010-546-019	CAP, ELECT 0.33-50 SME
C518	*87-010-546-019	CAP, ELECT 0.33-50 SME
C519	*87-018-134-019	CAP, CERA-SOL U 0.01-16 Y
C701	*87-010-388-019	CAP, ELECT 1000-25 SME
C702	*87-010-389-019	CAP, ELECT 2200-25V SME
C703	*87-010-382-019	CAP, ELECT 22-25 SME
C704	*87-010-235-019	CAP, ELECT 470-16 SME
C705	*87-010-221-019	CAP, ELECT 470-10
C706	*87-010-221-019	CAP, ELECT 470-10
C707	*87-010-382-019	CAP, ELECT 22-25 SME
C708	*87-010-546-019	CAP, ELECT 0.33-50 SME
C709	*87-010-404-019	CAP, ELECT 4.7-50 SME
C710	*87-018-134-019	CAP, CERA-SOL U 0.01-16 Y
C711	*87-018-100-019	CAP, CERA-SOL U 4.7P-50 SL
C712	*87-018-131-019	CAP, CERA-SOL U 1000P-50 B
C713	*87-018-205-019	CAP, CERA-SOL U 0.022-25 F(R505)
C714	*87-018-119-019	CAP, CERA-SOL U 100P-50 B
C715	*87-010-401-019	CAP, ELECT 1-50 SME
C716	*87-010-382-019	CAP, ELECT 22-25 SME
C717	*87-010-546-019	CAP, ELECT 0.33-50 SME
C718	*87-010-546-019	CAP, ELECT 0.33-50 SME
C719	*87-010-404-019	CAP, ELECT 4.7-50 SME
C720	*87-010-404-019	CAP, ELECT 4.7-50 SME
C721	*87-010-263-019	CAP, ELECT 100-10
C722	*87-010-382-019	CAP, ELECT 22-25 SME
J501	87-049-868-019	JACK, PIN 4P(REC/LINE IN) (PLAY/LINE OUT)
J502	87-009-026-019	JACK, DIN 5P(DIN REC↔PLAY)(Z)
J503	87-009-043-019	JACK, 6.3(PHONES)
L201	*82-231-622-010	COIL, 22MMH-J
L202	*82-231-622-010	COIL, 22MMH-J
L203	*82-194-634-010	COIL, 10MMH

REF. NO.	PART NO.	DESCRIPTION
L204	*82-194-634-010	COIL, 10MMH
L301	*80-DS6-618-010	COIL, HX 85K-6(F500)
L301	*80-DS4-618-010	COIL, HX85K-4(R505)
L302	*80-DS6-618-010	COIL, HX 85K-6(F500)
L302	*80-DS4-618-010	COIL, HX85K-4(R505)
L303	*80-DS6-617-010	COIL, OSC 85K-6(F500)
L303	*80-DS4-617-010	COIL, OSC 84K-4(R505)
L401	*80-DS4-620-010	FILTER, DOLBY 85K
L402	*80-DS4-620-010	FILTER, DOLBY 85K
S501	87-031-752-019	SLIDE SW(INPUT SELECTOR)(Z)
SFR101	*87-024-168-019	SFR, 1K
SFR102	*87-024-168-019	SFR, 1K
SFR201	*87-024-172-019	SFR, 10K
SFR202	*87-024-172-019	SFR, 10K
SFR301	*87-024-176-019	SFR, 100K
SFR302	*87-024-176-019	SFR, 100K
VR201	*80-DS5-615-019	VOLUME, 5KB×2(REC CALIBRATION) (F500)
		===FRONT CIRCUIT BOARD SECTION===
C801	*87-010-235-019	CAP, ELECT 470-16 SME
C802	*87-018-205-019	CAP, CERA-SOL U 0.022-25 F
C803	*87-010-235-019	CAP, ELECT 470-16 SME
C804	*87-018-205-019	CAP, CERA-SOL U 0.022-25 F
C805	*87-015-682-019	CAP, ELECT 22-16 7L(R505)
C806	*87-015-696-019	CAP, ELECT 2.2-50 7L(R505)
C807	*87-010-382-019	CAP, ELECT 22-25 SME
C808	*87-018-131-019	CAP, CERA-SOL U 1000P-50 B
LED801	82-238-621-019	LED, SLB-25MG 70F120(- ∞)
LED802	82-238-621-019	LED, SLB-25MG 70F120(- ∞)
LED803	82-238-621-019	LED, SLB-25MG 70F120(-20)
LED804	82-238-621-019	LED, SLB-25MG 70F120(-20)
LED805	82-238-621-019	LED, SLB-25MG 70F120(-10)
LED806	82-238-621-019	LED, SLB-25MG 70F120(-10)
LED807	82-238-621-019	LED, SLB-25MG 70F120(-5)
LED808	82-238-621-019	LED, SLB-25MG 70F120(-5)
LED809	82-238-621-019	LED, SLB-25MG 70F120(0)
LED810	82-238-621-019	LED, SLB-25MG 70F120(0)
LED811	82-238-622-019	LED, SLB-25VR 70F120(□□ 3)
LED812	82-238-622-019	LED, SLB-25VR 70F120(□□ 3)
LED813	82-238-622-019	LED, SLB-25VR 70F120(6)
LED814	82-238-622-019	LED, SLB-25VR 70F120(6)
LED815	82-238-622-019	LED, SLB-25VR 70F120(10)
LED816	82-238-622-019	LED, SLB-25VR 70F120(10)
LED817	80-DW1-631-019	LED, SLB55 MG70F120(DOLBY NR B)
LED818	80-DW1-632-019	LED, SLB55 VR70F120(DOLBY NR C)
LED819	80-DW1-631-019	LED, SLB55 MG70F120(◀)(R505)
LED820	80-DW1-631-019	LED, SLB55 MG70F120(▶)(R505)
LED821	82-234-606-019	LED, SLZ381C50 G L105(◀REV)(R505)
LED822	82-234-606-019	LED, SLZ381C50 G L105(FWD▶)(R505) (▶PLAY)(F500)
LED823	82-234-620-019	LED, SLZ981C50 R L105 (●REC/⊙REC MUTE)
LED824	82-234-607-019	LED, SLZ481C50 Y L105(❚❚PAUSE)
R877	87-025-468-019	RES, NF 1.5 1/4W
S801	87-036-170-019	TACT SW(◀◀MS)
S802	87-036-170-019	TACT SW(◀REV)(R505)
S803	87-036-170-019	TACT SW(FWD▶)(R505 (▶PLAY)(F500)
S804	87-036-170-019	TACT SW(MS▶▶)
S805	87-036-170-019	TACT SW(❚❚PAUSE)
S806	87-036-170-019	TACT SW(●REC/⊙REC MUTE)
S807	87-036-170-019	TACT SW(■STOP)
S808	87-036-208-019	SLIDE SW(TIMER)
S809	87-036-208-019	SLIDE SW(REVERSE MODE)(R505)
S810	87-036-135-019	SLIDE SW(DOLBY NR)
VR801	84-794-621-019	VR, 50KA(REC LEVEL)
VR802	84-794-622-019	VR, 200KW(REC BALANCE)
VR803	80-DS4-616-019	VR, 10KB(BIAS FINE)
X801	*87-030-167-019	RESONATER, CERAMIC CST 4.0MHZ
		===POWER CIRCUIT BOARD SECTION===
⚠PT901	80-DS4-613-019	POWER TRANSFORMER E (E, Z)
⚠PT901	80-DS4-611-019	POWER TRANSFORMER H (H)
⚠PT901	80-DS4-614-019	POWER TRANSFORMER K (K)
⚠PT901	80-DS4-612-019	POWER TRANSFORMER U, C(R505 U, C)
⚠S901	87-031-780-019	SLIDE SW(AC VOLTAGE)(H)
		===POWER SW CIRCUIT BOARD SECTION===
⚠C901	87-019-113-019	CAP, FILM 0.0022E
⚠S902	87-036-184-019	PUSH SW(POWER)
		===DECK CIRCUIT BOARD SECTION===
M1	87-045-296-019	MOTOR, EG-530 AD, 2B(R505)
M1	87-045-312-019	MOTOR, MMI652LK(F500)
M2	87-045-301-019	MOTOR, MMN-6FILBOK(F500)
S1	87-036-109-010	PUSH SW(CST)
S2	87-036-110-010	PUSH SW(CrO_2)
S3	87-036-110-010	PUSH SW(RE-A)
S4	87-036-109-010	PUSH SW(RE-B)(R505)
S5	87-036-109-010	PUSH SW(MT)
S6	87-036-109-010	PUSH SW(DIR)(R505)
SOL1	86-535-611-210	SOLENOID, X-3 PL(PLAY)
SOL2	86-535-612-210	SOLENOID, X-3 FR(F/R)
		===SENSOR CIRCUIT BOARD SECTION(R505 ONLY)===
CP1	87-001-367-019	PHOTO SENSOR SP1-315-CD
		===RELAY CIRCUIT BOARD SECTION(R505 ONLY)===
		===MISCELLANEOUS===
⚠	87-034-749-019	AC CORD <H> W/PLUG(H)
⚠	82-187-797-019	AC CORD <E> (E, Z)
⚠	87-034-583-019	AC CORD ASSY U (R505 U, C)
⚠	82-187-796-019	AC CORD <BS> (K)
⚠	87-085-185-010	BUSHING, AC CORD E (E, Z)
⚠	87-085-184-010	BUSHING, AC CORD D (H, R505 U, C)
⚠	87-085-189-010	BUSHING, CORD U (K)
C1	*87-010-381-019	CAP, ELECT 330-16V SME
EH	*87-046-196-019	E HEAD(F500)
RPEH	87-046-350-019	R.P.E HEAD(R505)
PH	87-046-343-019	R.P HEAD(F500)

BLOCK DIAGRAM



SCHEMATIC DIAGRAM – 1



A MAIN C.B

J501 REC/LINE IN (L R) PLAY/LINE OUT (L R)

S501 INPUT SELECTOR LINE IN ↔ DIN — Z ONLY

J501 DIN REC/PLAY

EXCEPT Z

Z ONLY

R505 ONLY

F500 ONLY

IC401 IC701 IC102 IC201 IC202 IC302 IC702 IC703

L401 L402 L201 L202 L203 L204 L301 L302 L303

SFR101 SFR102 SFR201 SFR202 SFR301 SFR302

TP1 TP2 TP3

VR201 REC CALIBRATION F500 ONLY

J503 PHONENS

PIN902 PIN903 PIN904

CON901 PIN901 FROM C POWER C.B

CON902 To B FRONT C.B

CON903 To B FRONT C.B

CON904 PIN904 FROM HEAD

AD-R505 ONLY

G RELAY C.B

RPEH AZIMUTH ADJ

BLK BLU YEL WHT BRN RED

WHT PNK PNK WHT WHT PNK

GRY BRN BLK

CON904 To A MAIN C.B PIN904

AD-F500 ONLY

EH RPH AZIMUTH ADJ

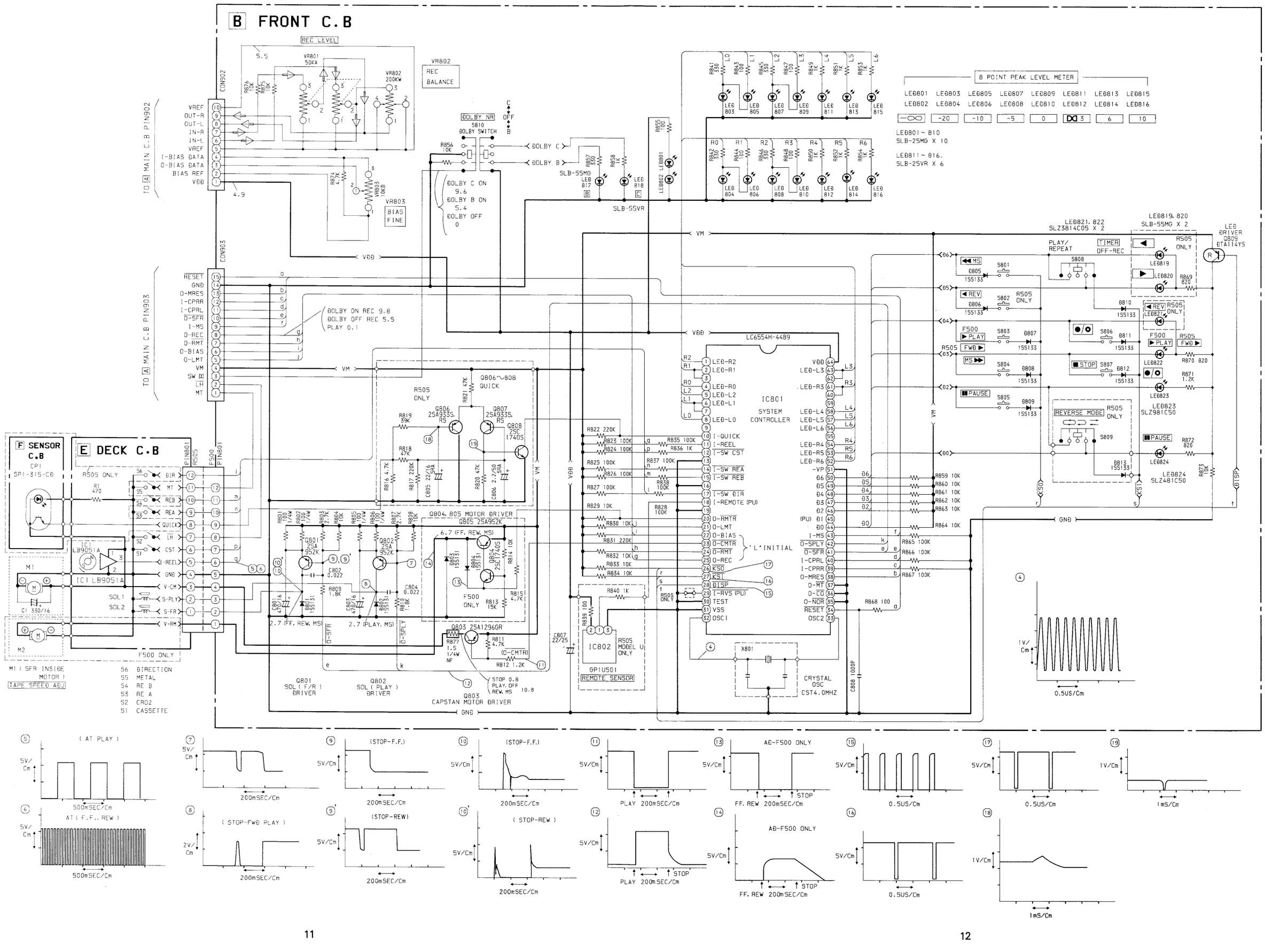
PNK WHT PNK WHT PNK WHT

BLK BRN GRY

CON904 To A MAIN C.B PIN904

GRAPHIC SYMBOLS PRINTED CIRCUIT BOARD OF ELECT. CAP. ARE DESIGNED AS NEGATIVE POLE.

（プリント基板内のケミコンの極性表示はθ表示です。）


B FRONT C.B
REC LEVEL
VR801 50KA
VR802 200KW
VR802 REC BALANCE
VR803 BIAS FINE
CON902
TO A MAIN C.B PIN902
VREF
OUT-R
OUT-L
IN-R
IN-L
VREF
I-BIAS DATA
O-BIAS DATA
BIAS REF
VDD
4.9
DOLBY NR
S810 DOLBY SWITCH
DOLBY C
DOLBY B
DOLBY C ON 9.6
DOLBY B ON 5.4
DOLBY OFF 0
SLB-55MG
SLB-55VR
8 POINT PEAK LEVEL METER
LED801 LED803 LED805 LED807 LED809 LED811 LED813 LED815
LED802 LED804 LED806 LED808 LED810 LED812 LED814 LED816
-∞ -20 -10 -5 0 DOLBY 3 6 10
LED801~810 SLB-25MG X 10
LED811~816. SLB-25VR X 6
CON903
TO A MAIN C.B PIN903
RESET
GND
O-MRES
I-CPRR
I-CPRL
O-SFR
I-MS
O-REC
O-RMT
O-BIAS
O-LMT
VM
SW DD
LH
MT
DOLBY ON REC 9.8
DOLBY OFF REC 5.5
PLAY 0.1
VDD
LC6554H-4489
IC801
SYSTEM CONTROLLER
I-QUICK
I-REEL
I-SW CST
I-SW REA
I-SW REB
I-SW DIR
I-REMOTE (PU)
O-RMTR
O-LMT
O-BIAS
O-CMTR
O-RMT
O-REC
KSO
KSI
DISP
I-RVS (PU)
TEST
VSS
OSCI
OSCO
-VP
I-MS
O-SPLY
O-SFR
I-CPRL
I-CPRR
O-MRES
O-MT
O-CO
O-NOR
RESET
OSC2
L'INITIAL
R505 ONLY
R505 MODEL U ONLY
IC802
GP1U501
REMOTE SENSOR
X801
CRYSTAL OSC CST4.0MHZ
C808 1000P
LED819, 820 SLB-55MG X 2
LED821, 822 SLZ3814C05 X 2
LED DRIVER DTA114YS
PLAY/ REPEAT
TIMER OFF-REC
REVERSE MODE
LED823 SLZ981C50
LED824 SLZ481C50
F SENSOR C.B
CP1 SPI-315-CB
E DECK C.B
R505 ONLY
PIN801
R505
F500
PIN801
DIR
MT
REB
REA
QUICK
LH
CST
I-REEL
GND
V-CM
S-PLY
S-FR
V-RM
IC1 LB9051A
M1
M2
C1 330/16
F500 ONLY
M1 (SFR INSIDE MOTOR)
TAPE SPEED ADJ
S6 DIRECTION
S5 METAL
S4 RE B
S3 RE A
S2 CRO2
S1 CASSETTE
Q806~808 QUICK
Q806 2SA933S R5
Q807 2SA933S R5
Q808 2SC 17405
Q804, 805 MOTOR DRIVER
Q805 2SA952K
Q801 2SA 952K
Q802 2SA 952K
Q803 2SA1296GR
6.7 (FF, REW, MS)
2.7 (FF, REW, MS)
2.7 (PLAY, MS)
F500 ONLY
Q801 SOL (F/R) DRIVER
Q802 SOL (PLAY) DRIVER
Q803 CAPSTAN MOTOR DRIVER
STOP 0.8
PLAY, OFF
REW, MS 10.8
GND

5
(AT PLAY)
5V/Cm
500mSEC/Cm
6
AT (F.F., REW)
5V/Cm
500mSEC/Cm

7
5V/Cm
200mSEC/Cm
8
(STOP-FWD PLAY)
2V/Cm
200mSEC/Cm

9
(STOP-F.F.)
5V/Cm
200mSEC/Cm
9'
(STOP-REW)
5V/Cm
200mSEC/Cm

10
(STOP-F.F.)
5V/Cm
200mSEC/Cm
10'
(STOP-REW)
5V/Cm
200mSEC/Cm

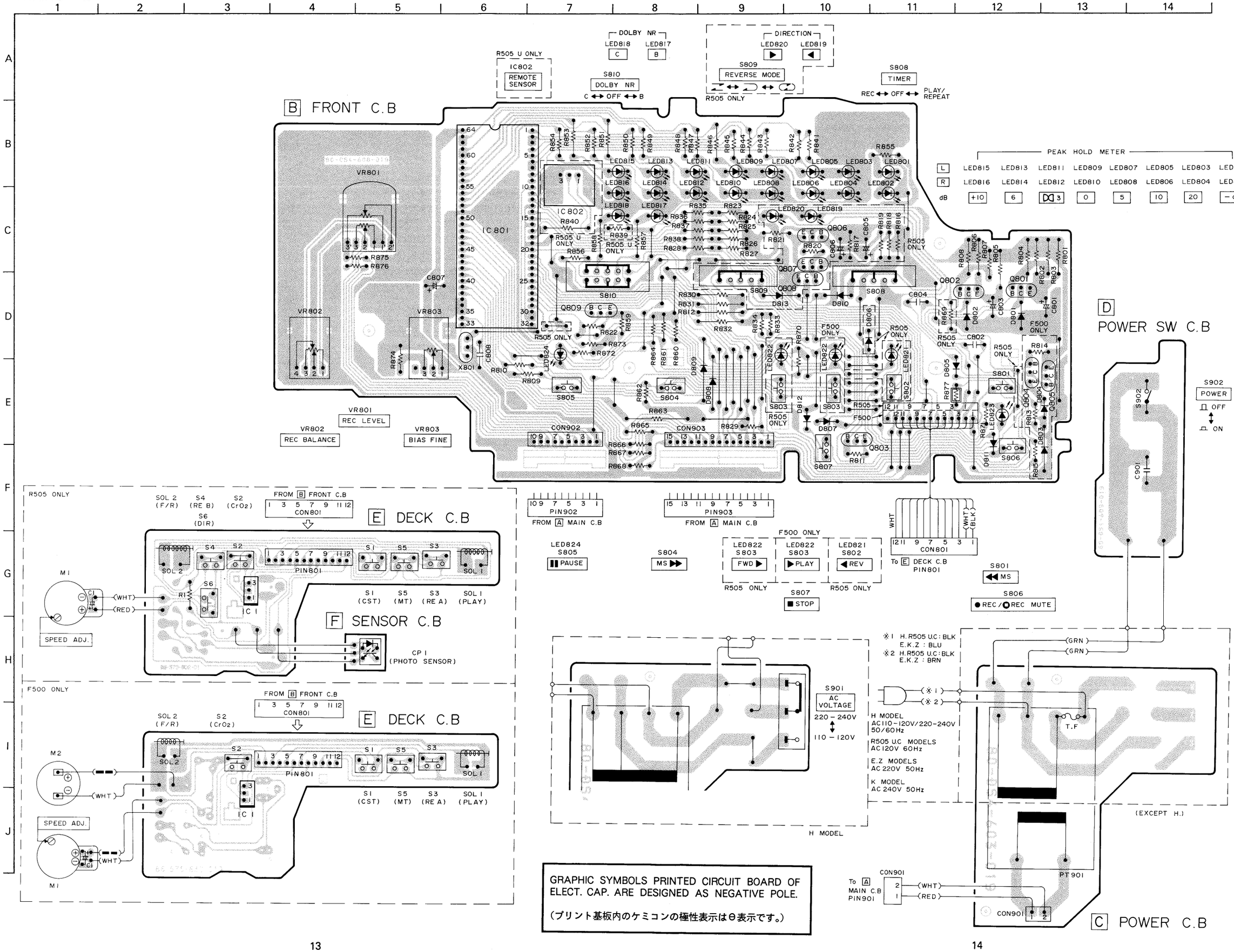
11
5V/Cm
PLAY 200mSEC/Cm
12
5V/Cm
PLAY 200mSEC/Cm
STOP

13
AD-F500 ONLY
5V/Cm
FF, REW 200mSEC/Cm
STOP
14
AD-F500 ONLY
5V/Cm
FF, REW 200mSEC/Cm
STOP

15
5V/Cm
0.5US/Cm
16
5V/Cm
0.5US/Cm

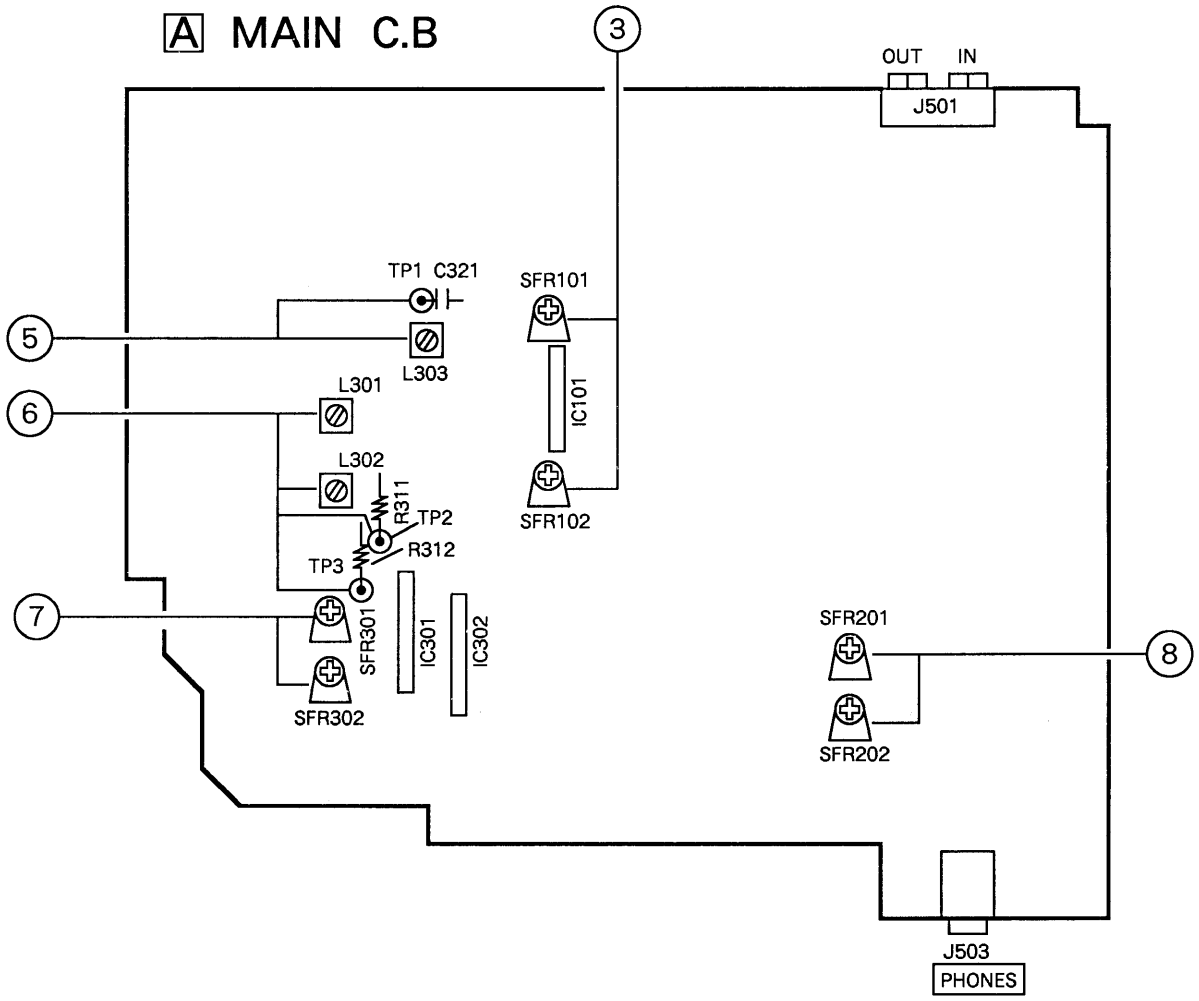
17
5V/Cm
0.5US/Cm
19
1V/Cm
1mS/Cm
18
1V/Cm
1mS/Cm

4
1V/Cm
0.5US/Cm



GRAPHIC SYMBOLS PRINTED CIRCUIT BOARD OF ELECT. CAP. ARE DESIGNED AS NEGATIVE POLE.

(プリント基板内のケミコンの極性表示はθ表示です。)



Initial Settings

1. REC LEVEL : MAX
2. BIAS FINE : Center click position
3. REC BALANCE : Center click position
4. REC CALIBRATION : Center click position
5. DOLBY NR SW : OFF
6. TIMER SW : OFF

1. Tape Speed Adjustment
   Settings : • Test tape : TTA – 100 (TTA – 111S)
   • Test point : LINE OUT jack
   • Adjustment Location : SFR inside motor
   Method : Play back the test tape, adjust for 3000Hz.

2. Head Azimuth Adjustment
   Settings : • Test tape : TTS – 310 (TTA – 317E, SCC – 1429)
   • Test point : LINE OUT jack
   • Adjustment Location : Head azimuth adjustment screw
   Method : Play back the 10kHz signal of the test tape and adjust so that the output becomes maximum.

3. PB Sensitivity Adjustment
   Settings : • Test tape : TTS – 200 (TTA – 161, TCC – 130)
   • Test point : LINE OUT jack
   • Adjustment Location : SFR101 (L ch)
   SFR102 (R ch)
   Method : Play back the test tape and adjust so that the output level is 500mV + 10mV,– 0mV.

4. PB Frequency Response Check
   Settings : • Test tape : TTS – 310 (TTA – 317E, SCC – 1429)
   • Test point : LINE OUT jack
   Method : Play back the 315Hz and 10kHz signals of the test tape and check the output of the 10kHz signal is 0dB ± 2.5dB with respect to that of the 315Hz signal.

5. Bias Frequency Adjustment
   Settings : • Test tape : TTA – 620 (TTA – 119MP)
   • Test point : TP1
   • Adjustment Location : L303
   Method : Set to the record mode and adjust so that the frequency counter reads 85kHz ± 0.2kHz.

6. HX Offset Adjustment

Settings : • Test tape : TTA – 620 (TTA – 119MP)
• Test point : TP2 (L ch), TP3 (R ch)
• Adjustment Location : L301 (L ch)
L302 (R ch)

Method : Set to the record mode and adjust so the bias voltage leaking to the test point is minimum level.

7. REC/PB Frequency Response Adjustment

Settings : • Test tape : TTA – 600 (TTA – 119K)
• Test point : LINE OUT jack
• Input signal : 1kHz/10kHz (LINE IN)
• Adjustment Location : SFR301 (L ch)
SFR302 (R ch)

Method : Apply a 1kHz signal and adjust attenuator so that the output level at the LINE OUT jack is 35mV.
Record and play back the 1kHz and 10kHz signals and adjust so that the output of the 10kHz signal is – 0.5dB + 0dB, – 0.5dB with respect to that of the 1kHz signal.

8. REC/PB Sensitivity Adjustment

Settings : • Test tape : TTA – 600 (TTA – 119K)
• Test point : LINE OUT jack
• Adjustment Location : SFR201 (L ch)
SFR202 (R ch)

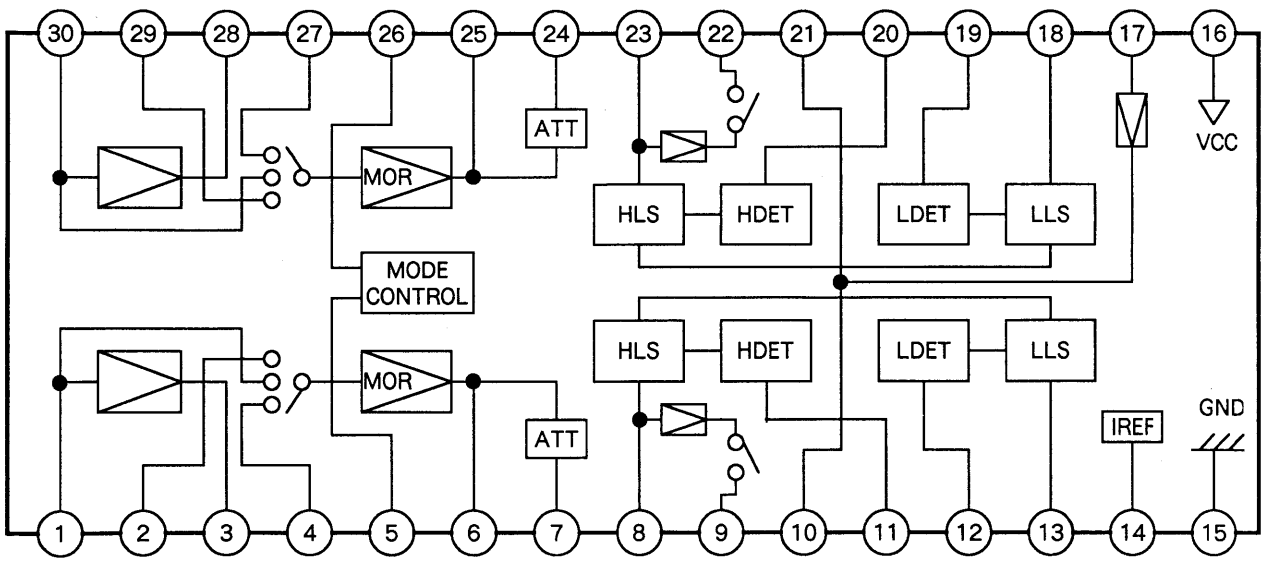
Method : Apply a 1kHz signal and adjust attenuator so that the output level at the LINE OUT jack is 35mV.
Record and play back the 1kHz signal and adjust so that the output is – 0.5dB ± 0.5dB.

PRACTICAL SERVICE FIGURE

PB output level :	500mV ± 40mV (LINE OUT)
REC/PB output level :	350mV ± 2.0dB (LINE OUT)
Distortion (REC/PB) :	Less than 2.0 % (NORM., CrO2, MT)
Erasing ratio :	More than 60dB
Crosstalk :	More than 60dB
Channel separation :	More than 35dB
Noise (PB) :	Less than 4.3/1.6/1.2mV (DOLBY OFF/B/C NORM.)
	Less than 2.9/1.3/1.0mV (DOLBY OFF/B/C CrO2, MT)
PB/REC S/N ratio : (LINEAR)	More than 34/44/47dB (DOLBY OFF/B/C NORM.)
	More than 40/46/48dB (DOLBY OFF/B/C CrO2)
	More than 40/47/48dB (DOLBY OFF/B/C MT)
Recording bias frequency :	85kHz
Tape speed :	3000Hz ± 1.5 %
Wow & flutter (W.RMS) :	Less than 0.08 % (R505)
	Less than 0.055 % (F500)
Take – up torque :	30~55g-cm
F.F & REW torque :	120 ± 30g-cm
Back tension :	2~5g-cm
Test tape :	NORMAL : TTA – 600 (TTA – 119K)
	CrO2 : TTA – 610 (TTA – 119H)
	METAL : TTA – 620 (TTA – 119MP)

IC BLOCK DIAGRAM

IC,CXA1331S



IC DESCRIPTION

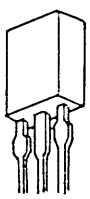
IC, LC6554H-4489

Pin No.	Pin Name	I/O	Description
1	LED-R2	O	Level meter LED display output (Rch -5 dB). active "H"
2, 3	LED-R1	O	Level meter LED display output (Rch -10 dB). active "H"
4	LED-R0	O	Level meter LED display output (Rch -20 dB). active "H"
5	LED-L2	O	Level meter LED display output (Lch -5 dB). active "H"
6, 7	LED-L1	O	Level meter LED display output (Lch -10 dB). active "H"
8	LED-L0	O	Level meter LED display output (Lch -20 dB). active "H"
9	NC	-	Not used.
10	I-QUICK	I	QUICK reverse detection input. "H" input during quick reverse. (AD-R505 only).
11	I-REEL	I	Reel path detection input.
12	I-$\overline{\text{SW CST}}$	I	Cassette detection switch. "L" when a cassette is loaded.
13	I-$\overline{\text{SW CO}}$	I	CrO_2 hole detection switch. "H" when cassette uses CrO_2 tape. (Connected to GND)
14	I-$\overline{\text{SW REA}}$	I	Erasure prevention detection switch for side A. "L" when side A is recordable.
15	I-$\overline{\text{SW REB}}$	I	Erasure prevention detection switch for side B. "L" when side B is recordable.
16	I-$\overline{\text{SW MT}}$	I	Metal hole detection switch. "H" when cassette used metal tape. (Connected to GND)
17	I-$\overline{\text{SW DIR}}$	I	Direction detection switch. "L" for side A.
18	I-REMOTE	I	Remote control input.
19	I-KRES	I	Counter reset input. (Connected to GND)
20	O-$\overline{\text{RMTR}}$	O	Reel motor control output. "L" when reel motor is rotating.
21	O-LMT	O	Line mute output. "H" during muting. "L" in REV mode during recording.
22	O-BIAS	O	Bias oscillator control output. "L" in REV mode.
23	O-$\overline{\text{CMTR}}$	O	Capstan motor control output. "L" when capstan motor is rotating and the power is on for AUTO SENSOR/QUICK SENSOR.
24	O-$\overline{\text{RMT}}$	O	REC mute control output. "L" during muting. All "L" in other than REC PLAY mode.
25	O-REC	O	DOLBY IC record switch. "H" when recording.
26	$\overline{\text{KS0}}$	O	DATA0 - DATA6 KEY SCAN Output.
27	$\overline{\text{KS1}}$	O	
28	$\overline{\text{DISP}}$	O	DATA0 - DATA6 LED scan output.
29	I-$\overline{\text{RVS}}$	I	REVERSE mode input. "L" during REVERSE mode.
30	TEST	-	CPU test terminal. Connected to GND.
31	VSS	-	Connected to GND.
32	OSC1	-	4 MHz clock oscillator terminal.
33	OSC2	-	
34	$\overline{\text{RESET}}$	-	CPU reset terminal.
35	O-$\overline{\text{NOR}}$	O	Output for display indicating normal tapes. (Connected to GND)
36	O-$\overline{\text{CO}}$	O	Output for display indicating CrO_2 tapes. (Connected to GND)

Pin No.	Pin Name	I/O	Description		
37	O-$\overline{MT}$	O	Output for display indicating metal tapes. (Connected to GND)		
38	O-MRES	O	Output for 8-point peak meter.		
39	I-CPRR	I	Right channel peak meter input.		
40	I-CPRL	I	Left channel peak meter input.		
41	O-$\overline{SFRP}$	O	F/R solenoid control output. "L" when solenoid bar is drawn into coil.		
42	O-$\overline{SPLY}$	O	PLAY solenoid control output. "L" when solenoid bar is drawn into coil.		
43	I-MS	I	Music sensor detect input. "L" when music sensor is on.		
44	D0	O	$\overline{KS0}$	$\overline{KS1}$	$\overline{DISP}$
			———	SW ⇄ (AD-R505 only)	LED PAUSE
45	D1	O	———	———	———
46	D2	O	KEY PAUSE	SW ↻ (AD-R505 only)	LED REC/RMT
47	D3	O	KEY ▷▷	KEY STOP	LED PLAY-FWD
48	D4	O	KEY ▷	KEY REC/RMT	LED PLAY-REV (AD-R505 only)
49	D5	O	KEY ◁(AD-R505 only)	SW TIMER REC	LED ▷▷ (AD-R505 only)
50	D6	O	KEY◁◁	SW TIMER PLAY	LED ◁◁ (AD-R505 only)
51	-VP	-	Makes plate voltage connection for flourescent .		
52	LED-R6	O	Level meter LED display output (Rch +10 dB). active "H"		
53	LED-R5	O	Level meter LED display output (Rch +6 dB). active "H"		
54	LED-R4	O	Level meter LED display output (Rch +3 dB). active "H"		
55	NC	-	Not used.		
56	LED-L6	O	Level meter LED display output (Lch +10 dB). active "H"		
57	LED-L5	O	Level meter LED display output (Lch +6dB). active "H"		
58	LED-L4	O	Level meter LED display output (Lch +3dB). active "H"		
59	NC	-	Not used.		
60, 61	LED-R3	O	Level meter LED display output (Rch 0 dB). active "H"		
62, 63	LED-L3	O	Level meter LED display output (Lch 0 dB). active "H"		
64	VDD	-	CPU power supply terminal. (+5 V)		

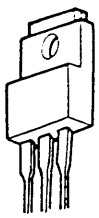
E C B

2SA1015
2SA1296
2SC1815
2SC2001



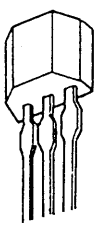
B C E

2SB1329



B C E

2SB1370
2SC3113



B C E

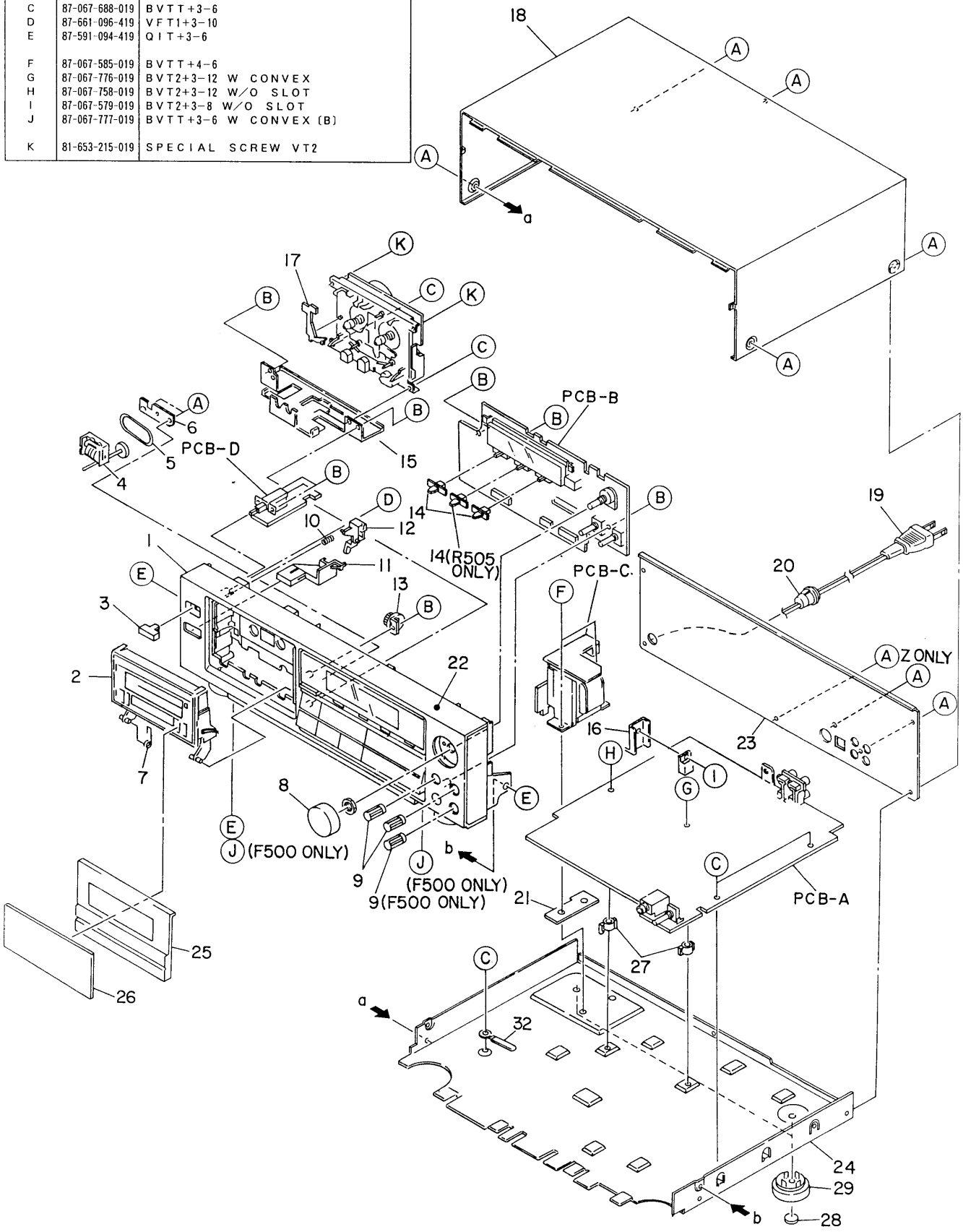
2SA952
2SC1740
DTA114
DTA144
DTC114
DTC144

S G D

2SK373

EXPLODED VIEW – 1

REF. NO.	PART NO.	DESCRIPTION
A	87-067-660-019	BVT2+3-8 W/O SLOT (B)
B	87-067-703-019	BVT2+3-10 W/O SLOT
C	87-067-688-019	BVTT+3-6
D	87-661-096-419	VFT1+3-10
E	87-591-094-419	QIT+3-6
F	87-067-585-019	BVTT+4-6
G	87-067-776-019	BVT2+3-12 W CONVEX
H	87-067-758-019	BVT2+3-12 W/O SLOT
I	87-067-579-019	BVT2+3-8 W/O SLOT
J	87-067-777-019	BVTT+3-6 W CONVEX (B)
K	81-653-215-019	SPECIAL SCREW VT2

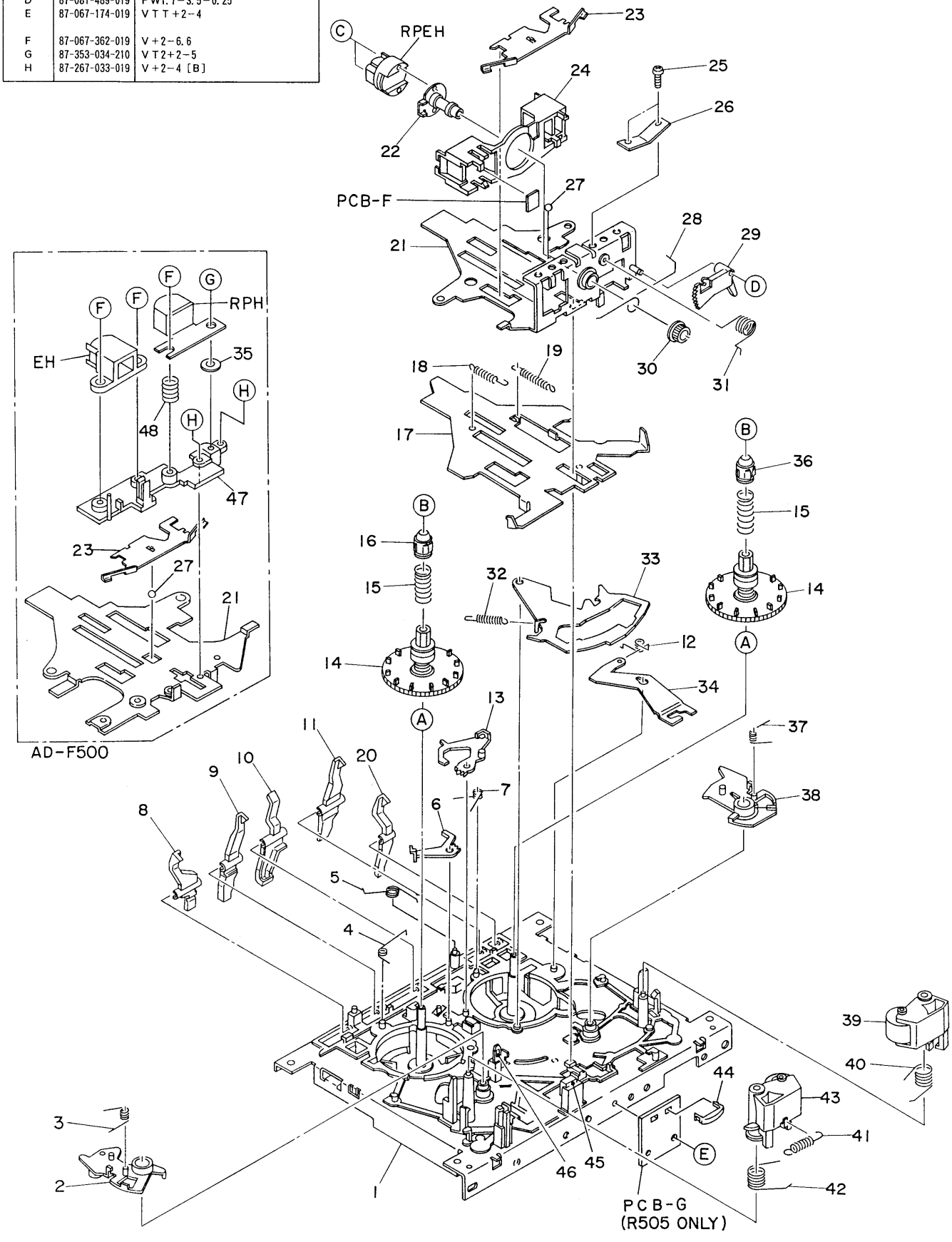


MECHANICAL PARTS LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	1-1	★09-047-626-010	FRONT CABINET ASSY (R505 H, C, E, K, Z)	※	1
	1-1	★09-047-627-010	FRONT CABINET ASSY (R505 U)	※	1
	1-1	★09-047-625-010	FRONT CABINET ASSY (F500)	※	1
	1-2	★09-047-508-010	CASSETTE BOX ASSY (EXCEPT U)	※	1
	1-2	★09-047-509-010	CASSETTE BOX ASSY (U)	※	1
	1-3	★84-721-023-010	BUTTON, POWER		1
	1-4	★87-040-199-010	COUNTER		1
	1-5	80-DS4-202-010	BELT, SQ 0.8-199.6	※	1
	1-6	★82-205-208-010	HOLDER, COUNTER		1
	1-7	★80-DS3-202-019	T-SPRING, EJECT 1		1
	1-8	★82-235-014-119	KNOB, REC		1
	1-9	★80-DS3-007-019	KNOB, BIAS		2(R505) 3(F500)
	1-10	★80-DS3-209-019	C-SPRING, EJECT		1
	1-11	★84-793-011-010	BUTTON, EJECT		1
	1-12	★80-DS3-203-019	LEVER, EJECT		1
	1-13	★87-063-143-010	DAMPER, OIL 75		1
	1-14	★80-DW1-012-019	KNOB, SLIDE		3(R505) 2(F500)
	1-15	★80-DS3-204-019	PLATE, SHIELD		1
	1-16	---	HEAT SINK		1
	1-17	★82-235-204-010	LEVER, PROTECT		1
	1-18	★80-DS3-002-019	CABINET, STEEL		1
	1-19	★87-034-749-019	CORD, AC (H)		1
	1-19	★87-034-583-019	CORD, AC (R505 U, C)		1
	1-19	★82-187-797-019	CORD, AC (E, Z)		1
	1-19	★82-187-796-019	CORD, AC (K)		1
	1-20	★87-085-184-010	BUSHING, AC CORD (R505 H, U, C, F500 H)		1
	1-20	★87-085-185-010	BUSHING, AC CORD (E, Z)		1
	1-20	★87-085-189-010	BUSHING, AC CORD (K)		1
	1-21	★80-DW1-209-019	PLATE, PT		1
	1-22	★80-DS6-002-110	PANEL, CABINET 6 (F500)	※	1
	1-23	★80-DS4-014-019	PANEL, REAR (R505 H)	※	1
	1-23	★80-DS4-008-019	PANEL, REAR (R505 U)	※	1
	1-23	★80-DS4-009-019	PANEL, REAR (R505 C)	※	1
	1-23	★80-DS4-010-019	PANEL, REAR (R505 E)	※	1
	1-23	★80-DS4-011-019	PANEL, REAR (R505 K)	※	1
	1-23	★80-DS4-013-019	PANEL, REAR (R505 Z)	※	1
	1-23	★80-DS6-013-019	PANEL, REAR (F500 H)	※	1
	1-23	★80-DS6-009-019	PANEL, REAR (F500 E)	※	1
	1-23	★80-DS6-010-019	PANEL, REAR (F500 K)	※	1
	1-23	★80-DS6-012-019	PANEL, REAR (F500 Z)	※	1
	1-24	---	CHASSIS, MAIN		1
	1-25	★80-DS3-003-019	PANEL, CASSETTE		1
	1-26	★80-DS3-008-010	WINDOW, CASSETTE (R505)		1
	1-26	★80-DS5-005-010	WINDOW, CASSETTE 5 (F500)		1
	1-27	★80-DS3-205-010	HOLDER, P.C.B 5.6		2
	1-28	★80-DS3-206-019	CUSHION, G DIA 15-1		2
	1-29	★80-DS3-014-119	FOOT, REAR ST		2

EXPLODED VIEW – 2

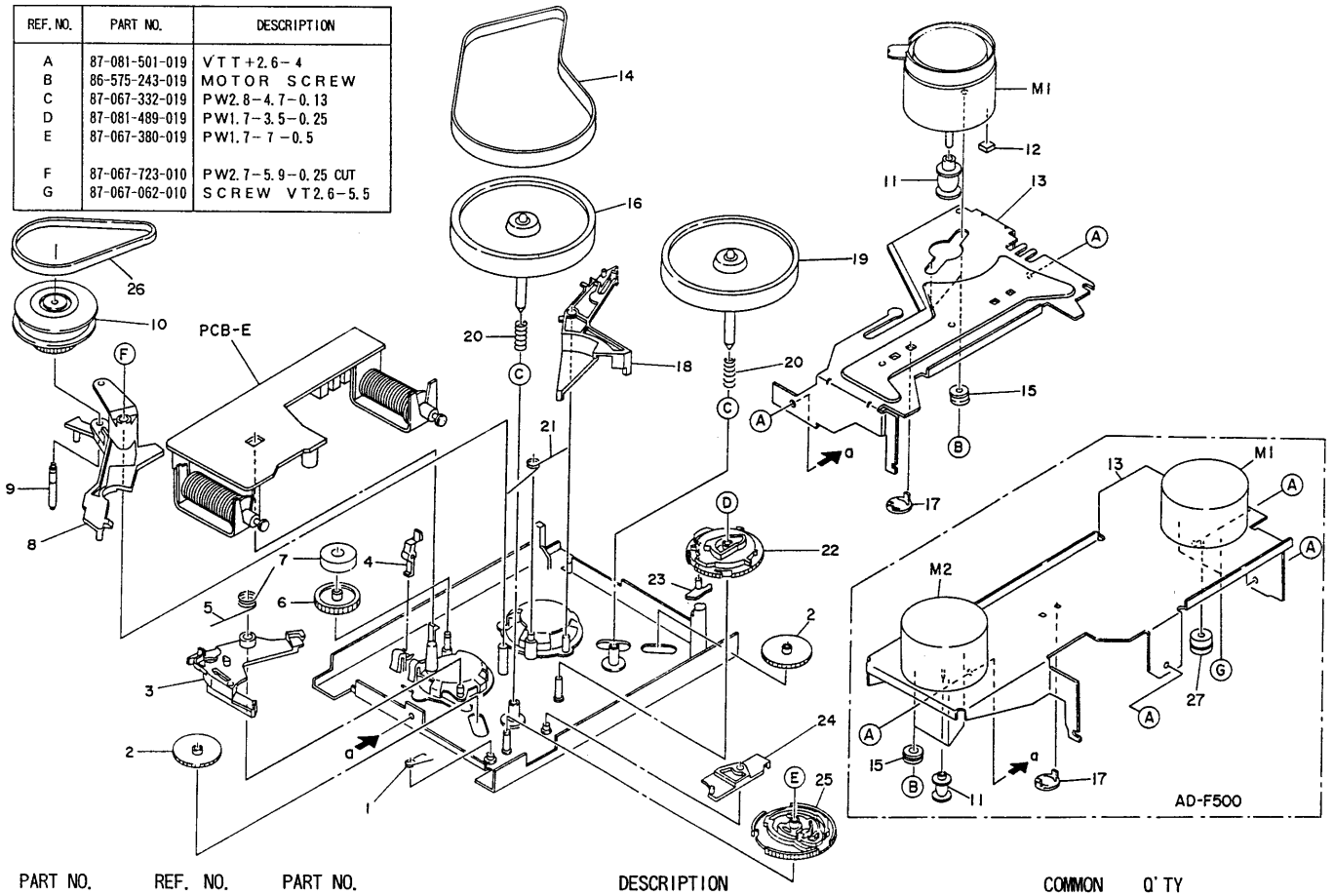
REF. NO.	PART NO.	DESCRIPTION
A	87-067-470-019	PW4.1-6.9-0.13
B	86-524-418-019	VFT2+1.4-5
C	87-067-177-019	V+1.6-5.5
D	87-081-489-019	PW1.7-3.5-0.25
E	87-067-174-019	VTT+2-4
F	87-067-362-019	V+2-6.6
G	87-353-034-210	VT2+2-5
H	87-267-033-019	V+2-4 [B]



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	2-1	★86-575-217-410	MECHANISM CHASSIS ASSY (R505)		1
	2-1	★86-575-264-010	MECHANISM S CHASSIS ASSY (F500)		1
	2-2	★86-535-239-110	LEVER,PLAY R (R505)		1
	2-3	★86-535-283-019	T-SPRING,PLAY GEAR R (R505)		1
	2-4	★86-535-371-019	T-SPRING,BRAKE R		1
	2-5	★86-575-225-019	T-SPRING,CASSETTE		1
	2-6	★86-535-252-210	LEVER,BRAKE R		1
	2-7	★86-535-370-019	T-SPRING,BRAKE F		1
	2-8	★86-535-247-210	LEVER,REC GUARD A		1
	2-9	★86-535-250-010	LEVER,METAL		1
	2-10	★86-535-249-210	LEVER,CASSETTE SENSOR		1
	2-11	★86-535-254-110	LEVER,CR		1
	2-12	★86-535-277-010	T-SPRING,D SW (R505)		1
	2-13	★86-535-251-010	LEVER,BRAKE F		1
	2-14	86-535-240-510	REEL TABLE R ASSY		2
	2-15	★86-535-293-019	C-SPRING,REEL TABLE		2
	2-16	★86-524-218-199	STOPPER,REEL TABLE S		1
	2-17	★86-535-215-310	SLIDE PLATE ASSY (R505)		1
	2-17	★86-535-385-210	SLIDE S PLATE ASSY (F500)		1
	2-18	★86-575-227-010	E-SPRING,LEVER SLIDE		1
	2-19	★86-535-286-010	E-SPRING,OPERATION (F500)		1
	2-19	★86-575-226-010	E-SPRING,CHASSIS HEAD (R505)		1
	2-20	★86-535-248-310	LEVER,REC GUARD B (R505)		1
	2-21	★86-575-209-110	CHASSIS,HEAD S (R505)		1
	2-21	★86-535-311-410	CHASSIS,HEAD S (F500)		1
	2-22	★86-575-207-110	HOUSING HEAD ASSY (R505)		1
	2-23	★86-535-289-110	P-SPRING,HEAD CHASSIS		1
	2-24	★86-575-214-110	GUIDE,TAPE (R505)		1
	2-25	★86-575-235-019	SCREW,S AZIMUTH (R505)		2
	2-26	★86-524-300-119	P-SPRING,AZIMUTH (R505)		1
	2-27	★87-073-018-010	BALL,STEEL 1.588		1
	2-28	★86-575-240-010	T-SPRING,GUIDE (R505)		1
	2-29	★86-535-246-210	GEAR,SEGMENT (R505)		1
	2-30	★86-575-206-010	GEAR,HEAD FR (R505)		1
	2-31	★86-535-290-010	T-SPRING,SEGMENT GEAR (R505)		1
	2-32	★86-535-284-010	E-SPRING,DIRECTION LEVER (R505)		1
	2-33	★86-535-218-210	LEVER DIRECTION ASSY (R505)		1
	2-34	★86-575-278-010	LEVER,PLAY SW (R505)		1
	2-35	★86-535-387-010	MYLAR,W 2.3-5-0.188 (F500)		1
	2-36	★86-524-233-119	STOPPER,REEL TABLE T		1
	2-37	★86-535-282-019	T-SPRING,PLAY GEAR F		1
	2-38	★86-535-238-210	LEVER,PLAY F		1
	2-39	86-535-226-210	PINCH LEVER F ASSY		1
	2-40	★86-575-222-110	T-SPRING,PINCH F (R505)		1
	2-40	★86-535-312-010	T-SPRING,PINCH S (F500)		1
	2-41	★86-535-287-119	E-SPRING,PINCH (R505)		1
	2-42	★86-575-223-110	T-SPRING,PINCH R (R505)		1
	2-43	86-535-228-310	PINCH LEVER R ASSY (R505)		1
	2-44	★86-575-234-010	HOLDER,WIRE (R505)		1
	2-45	★86-535-353-019	FELT,SQ 5-4-2		1
	2-46	★86-517-353-019	SHEET,QUICK (R505)		1
	2-47	★86-535-314-110	BASE,HEAD (F500)		1
	2-48	★86-535-359-010	C-SPRING,AZIMUTH S (F500)		1

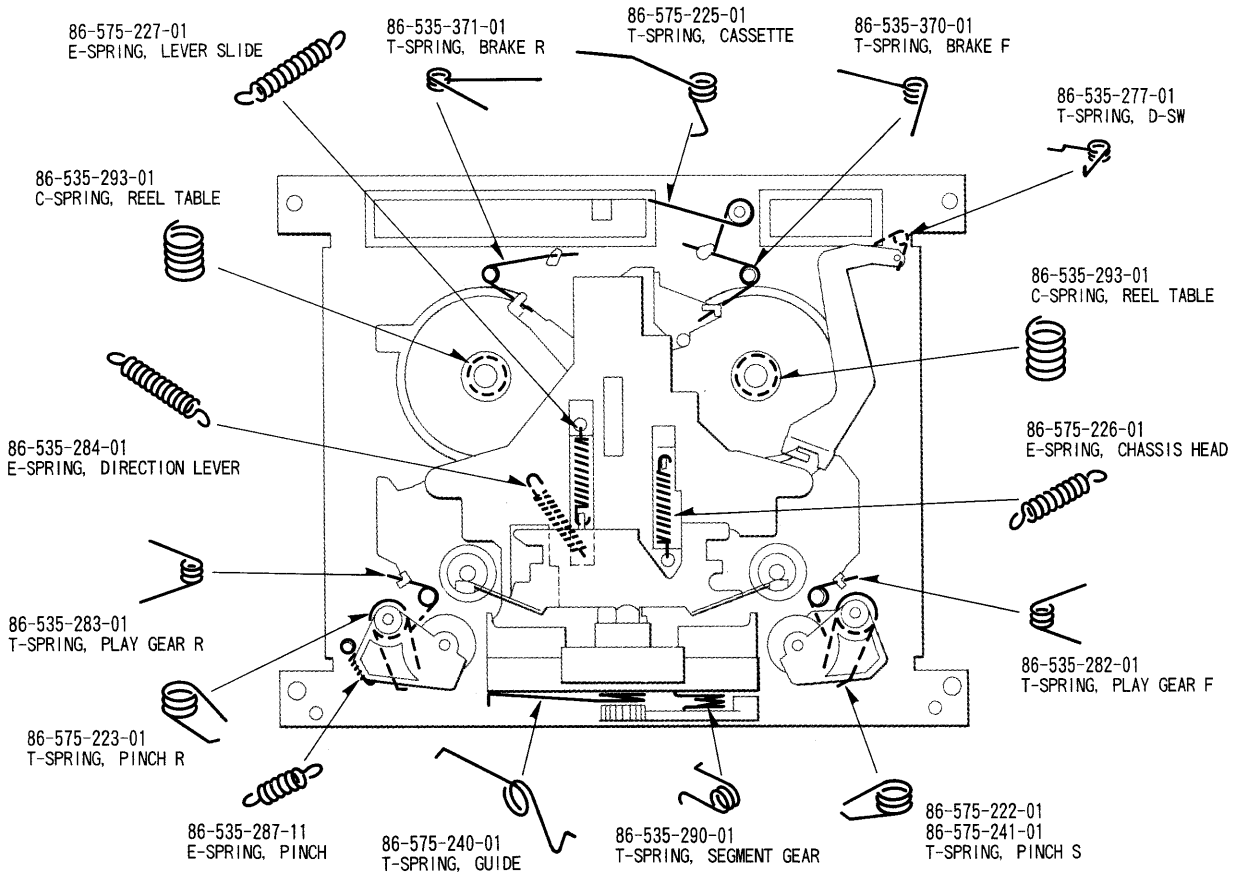
EXPLODED VIEW – 3

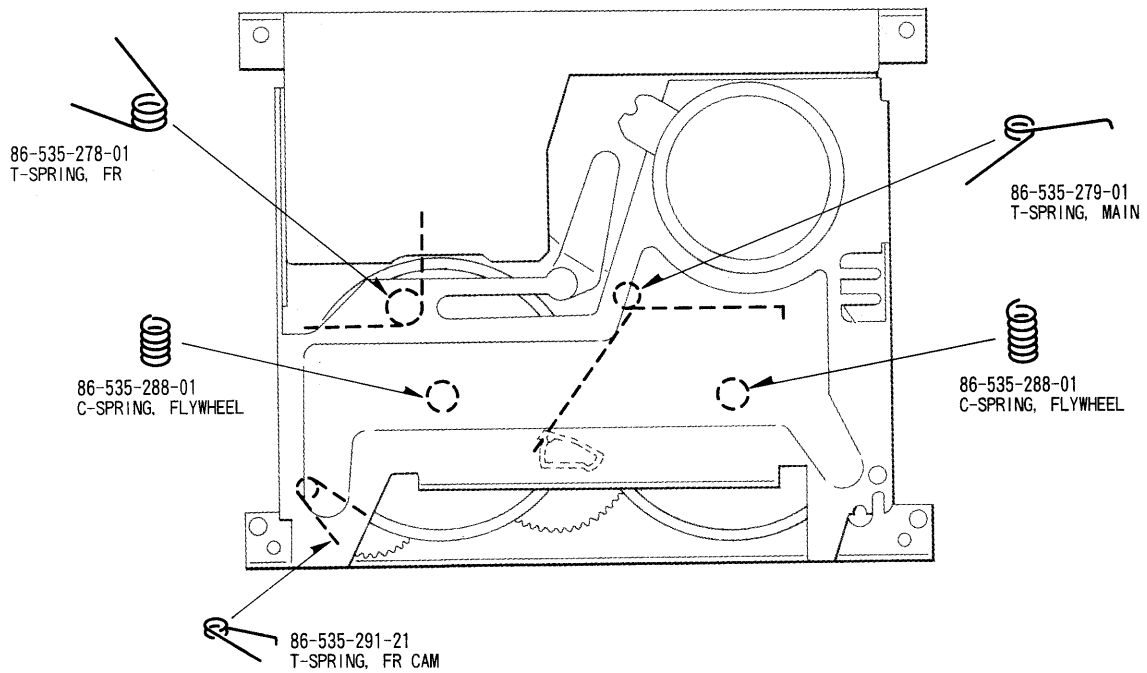
REF. NO.	PART NO.	DESCRIPTION
A	87-081-501-019	VTT+2.6-4
B	86-575-243-019	MOTOR SCREW
C	87-067-332-019	PW2.8-4.7-0.13
D	87-081-489-019	PW1.7-3.5-0.25
E	87-067-380-019	PW1.7-7-0.5
F	87-067-723-010	PW2.7-5.9-0.25 CUT
G	87-067-062-010	SCREW VT2.6-5.5



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	3-1	★86-535-291-210	T-SPRING,FR CAM		1
	3-2	★86-535-259-310	GEAR,PLAY (R505)		2
	3-2	★86-575-221-210	GEAR,PLAY (F500)		1
	3-3	★86-535-230-310	LEVER,TRIGGER FR		1
	3-4	★86-535-253-110	LEVER,RELAY (R505)		1
	3-5	★86-535-278-019	T-SPRING,FR		1
	3-6	★86-575-220-010	GEAR,IDLER		1
	3-7	★86-535-614-010	RING,MAGNET		1
	3-8	★86-535-233-210	LEVER,FR		1
	3-9	★86-535-235-010	SHAFT,FR		1
	3-10	★86-535-301-310	SLIP DISK ASSY (R505)		1
	3-11	★86-535-389-110	PULLEY,MOTOR C		1
	3-12	★86-575-261-110	CUSHION,G 5.5-1.5 (R505)		1
	3-13	★86-575-218-210	HOLDER,MOTOR (R505)		1
	3-13	★86-575-265-110	HOLDER,MOTOR 2M (F500)		1
	3-14	86-575-224-110	BELT,2 (R505)		1
	3-14	86-575-276-010	BELT,MAIN 2M (F500)		1
	3-15	★86-575-242-010	CUSHION,G DIAL 3.7-9-3.2		2(R505) 3(F500)
	3-16	★86-575-226-010	FLYWHEEL 2M ASSY (F500)		1
	3-16	★86-575-203-110	FLYWHEEL F ASSY (R505)		1
	3-17	★86-535-255-010	RETAINER,FLYWHEEL		1
	3-18	★86-535-231-310	LEVER,TRIGGER PLAY		1
	3-19	★86-575-201-110	FLYWHEEL R ASSY (R505)		1
	3-20	★86-535-288-019	C-SPRING,FLYWHEEL		2
	3-21	★86-535-279-010	T-SPRING,MAIN		1
	3-22	★86-535-260-310	CAM,MAIN		1
	3-23	★86-535-308-110	LEVER,CHANGE (R505)		1
	3-24	★86-575-229-210	LEVER,PAUSE B (R505)		1
	3-24	★86-535-223-310	LEVER,PAUSE B (F500)		1
	3-25	★86-535-261-410	CAM,FRP		1
	3-26	★86-575-277-010	BELT,FR 2M (R505)		1
	3-27	★86-575-275-010	PULLEY,FR MOTOR		1

SPRING APPLICATION POSITION





■ ACCESSORIES/PACKAGE LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	1	★ 80-DS4-905-019	INSTRUCTION BOOKLET, EX (R505)	※	1
	1	★ 80-DS6-905-019	INSTRUCTION BOOKLET, EX (F500)	※	1
	2	★ 87-034-786-019	CORD PIN,189-0760		1
	3	★ 87-032-845-019	PLUG,CONVERSION (HJ)		1