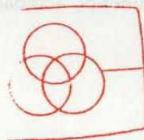


# AIWA® SERVICE MANUAL

S/M Code No. 85-015  
DATE OF ISSUE 4/1985

## STEREO CASSETTE DECK



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MODEL NO.

# FX-R80



## TYPE. HB, UB, EB, KB, ZB

### SPECIFICATIONS

Type	Stereo cassette tape deck	Tape speed	4.8 cm/sec. (1-7/8 ips)
Track format	4 tracks 2 channels	Rewind time	90 sec. (C-60)
Power supply		Fast forward time	90 sec. (C-60)
FX-R80U	AC 120 V, 60 Hz	Recording system	AC bias (frequency 85 kHz)
FX-R80K	AC 240 V, 50/60 Hz	Erase system	AC erase
FX-R80E, Z	AC 220 V, 50/60 Hz	Motor	DC Servomotor, DC motor
FX-R80H	AC 120 V/220 V ~ 240 V switchable, 50/60 Hz	Heads	Record/playback head × 1 Erase head × 1
Power consumption	15 W	Inputs	LINE IN maximum input sensitivity: 50 mV (over 50 kΩ)
Frequency response	METAL tape: 20–17,000 Hz CrO <sub>2</sub> position tape: 20–16,000 Hz LH tape: 20–15,000 Hz	Outputs	LINE OUT standard output level: 280 mV (0 VU); suitable load impedance: over 50 kΩ
Signal-to-noise ratio	73 dB (METAL tape DOLBY C NR ON)	Dimensions	330 (W) × 107 (H) × 230 (D) mm
Wow and flutter	0,065% (WRMS)	Weight	3.1 kg

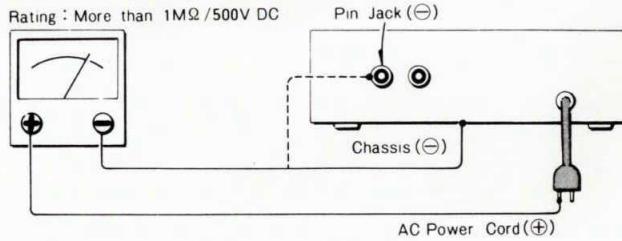
- Design and specifications are subject to change without notice.

## 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  $500 \pm 5V$  D.C and shall be not less than  $1M\Omega$ .

### Measuring Point

Connect to Chassis or Outside  $\ominus$  of Pin Jack



### • ONE-POINT ADVICE

To remove the mechanism easily, push the illustrated position by which the azimuth adjusting screw may be caught.

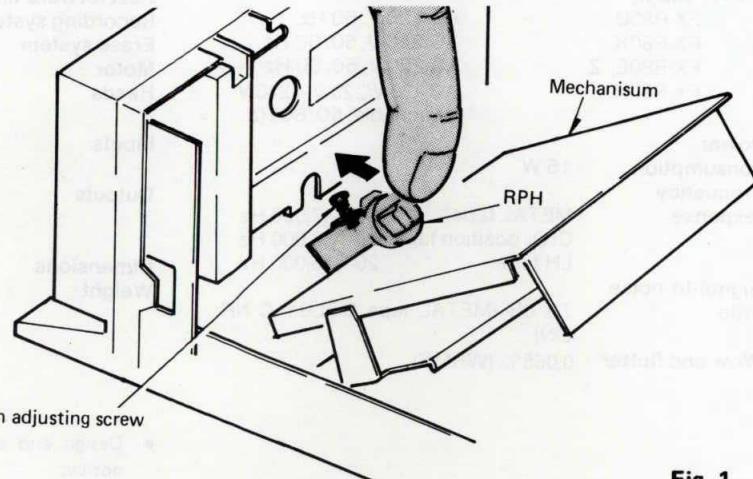


Fig. 1

## 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.

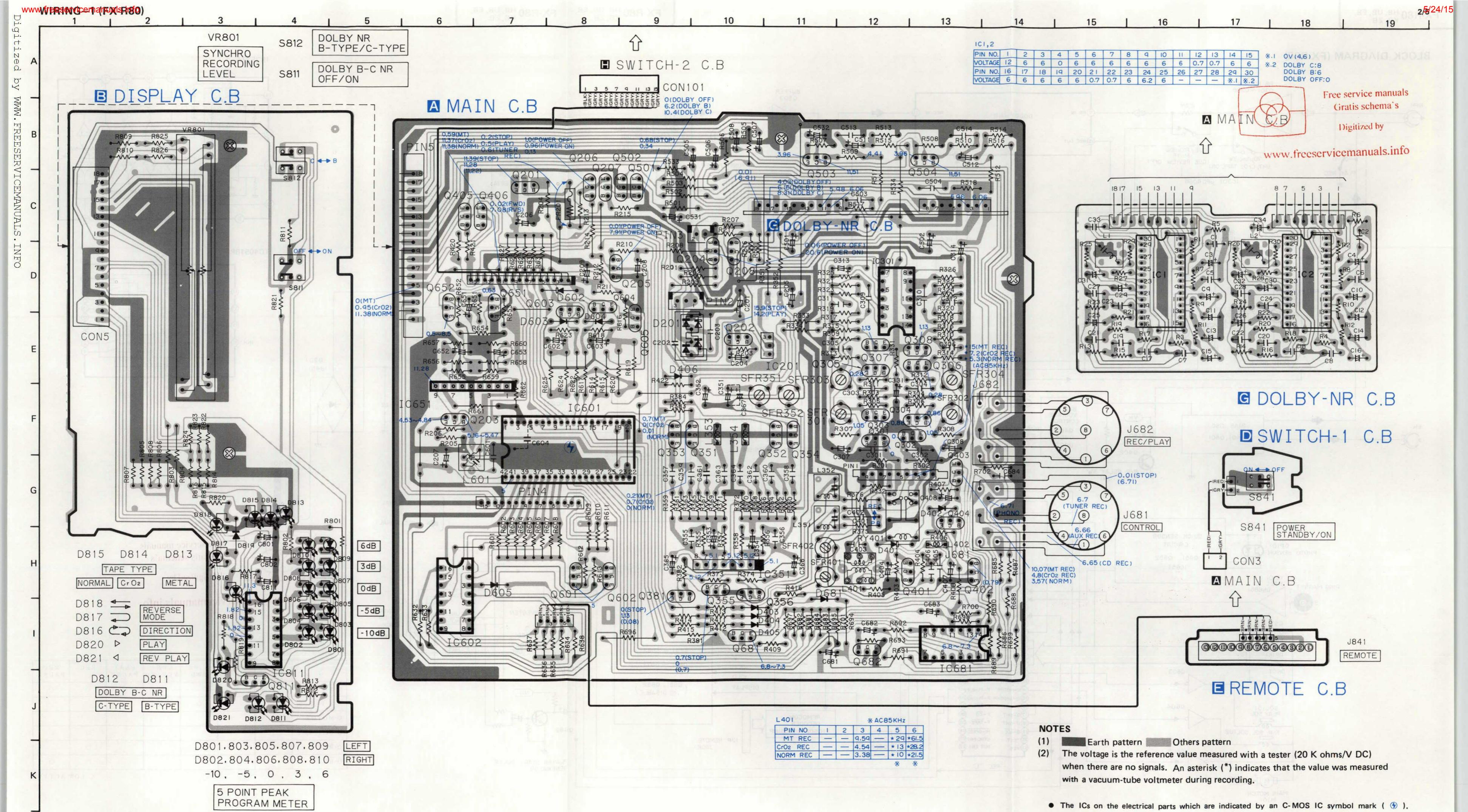
CAPACITORS  
No mark, U, UF:  $\mu$ F  
P, PF : pF

COILS  
MMH: mH  
UH :  $\mu$ H

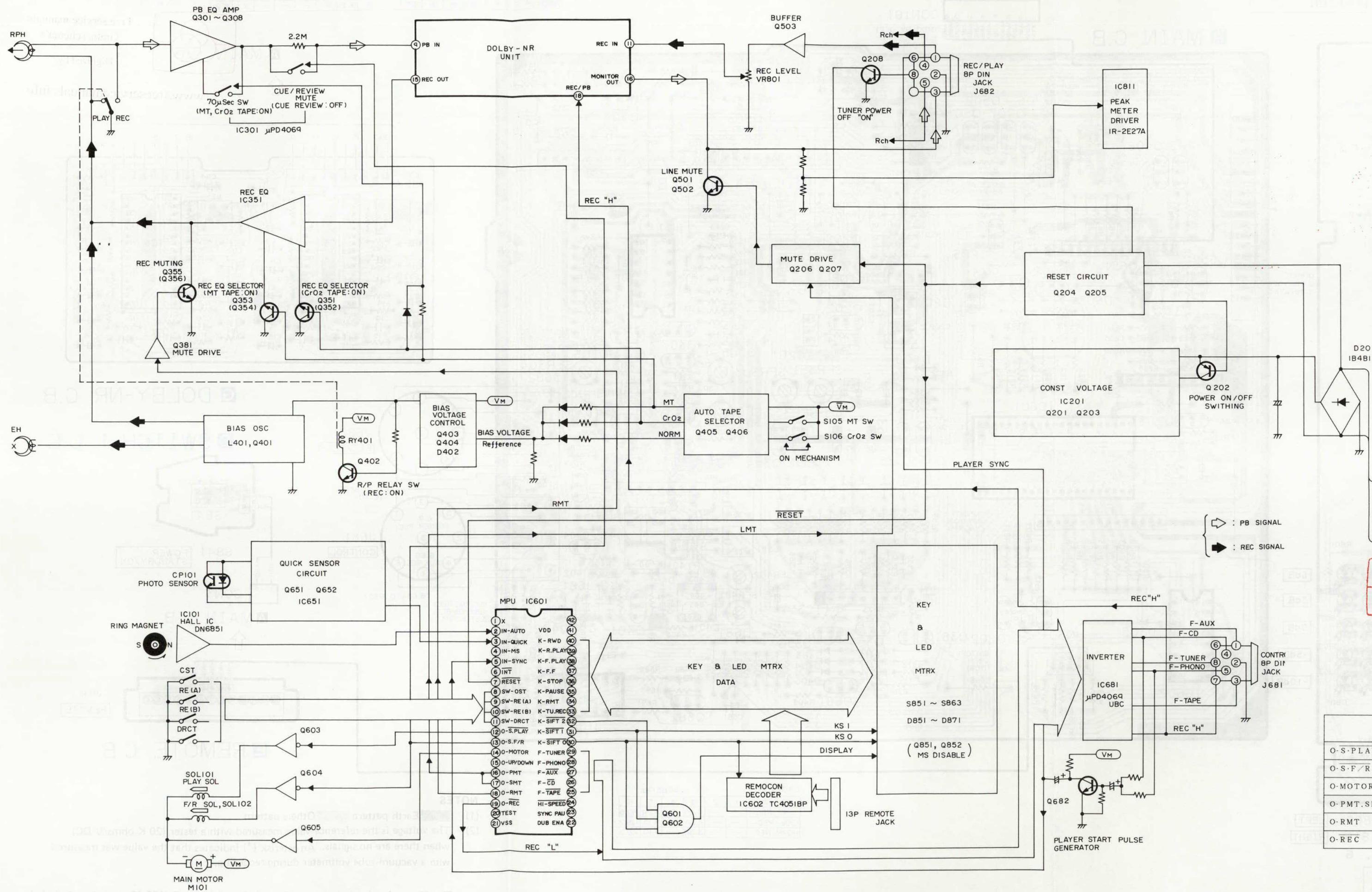
FUSE  
MMA: mA

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	Ref. No.	Part No.	Description								
<b>*** IC ***</b>																			
87-020-454	IC, DN6851		L351	* 82-135-631	FILTER TRAP 85K	D868	* 87-020-168	LED SLP177B (TUNER)	APT901	82-143-612	POWER TRANSFORMER (U) (U ONLY)								
87-020-028	IC, IR-2E27A		L352	* 82-135-631	FILTER TRAP 85K	D869	* 87-020-168	LED SLP177B (PHONO)	APT901	82-143-613	POWER TRANSFORMER (E) (E,Z ONLY)								
87-020-261	IC, LA6358S		L353	* 87-005-242	MICRO INDUCTOR 5.6MMH	D870	* 87-020-168	LED SLP177B (AUX)	APT901	82-143-614	POWER TRANSFORMER (K) (K ONLY)								
87-020-454	IC, LM6402G-572		L354	* 87-005-242	MICRO INDUCTOR 5.6MMH	D871	* 87-020-168	LED SLP177B (CD)	AS901	87-031-853	ROTARY SW AC 120-230 (AC VOLTAGE) (H ONLY)								
87-020-080	IC, L78N12		L401	* 82-194-632	COIL ,OSC BIAS	S851	87-031-893	TACT SW QVDO4M (REWIND $\blacktriangleleft$ )											
87-027-895	IC, M5218L		L402	* 87-005-214	MICRO INDUCTOR 330UH	S852	87-031-893	TACT SW QVDO4M (REV PLAY $\blacktriangleleft$ )											
87-020-039	IC, TC4051BP		L601	* 82-189-642	COIL ,OSC LM6400	S853	87-031-893	TACT SW QVDO4M (PLAY $\triangleright$ )											
87-027-554	IC, UPD4066		RY401	* 87-045-237	RELAY ,G5A-237P 12VDC	S854	87-031-893	TACT SW QVDO4M (F.FWD $\triangleright$ )											
87-027-538	IC, UPD4069		SFR301	* 87-021-739	SFR 2.2K	S855	87-031-893	TACT SW QVDO4M (STOP)											
			SFR302	* 87-021-739	SFR 2.2K	S856	87-031-893	TACT SW QVDO4M (PAUSE)											
			SFR303	* 87-021-738	SFR 1K	S857	87-031-893	TACT SW QVDO4M (REC MUTE)											
			SFR304	* 87-021-738	SFR 1K	S858	87-031-893	TACT SW QVDO4M (TUNER)											
<b>*** TRANSISTOR ***</b>																			
89-109-521	TRANSISTOR, 2SA952K		SFR351	* 87-021-741	SFR 4.7K	S859	87-031-893	TACT SW QVDO4M (PHONO)											
89-109-706	TRANSISTOR, 2SA970BL		SFR352	* 87-021-741	SFR 4.7K	S860	87-031-893	TACT SW QVDO4M (AUX)											
89-110-155	TRANSISTOR, 2SA1015,GR		SFR401	* 87-021-746	SFR 100K	S861	87-031-893	TACT SW QVDO4M (CD)											
89-318-155	TRANSISTOR, 2SC1815,GR		SFR402	* 87-021-746	SFR 100K	S862	87-031-928	SLIDE SW SSS-313 (TIMER)											
89-320-011	TRANSISTOR, 2SC2001K		S863	87-031-724	SLIDE SW 2-2-3 SSS (REVERSE MODE)														
89-322-406	TRANSISTOR, 2SC2240,BL		<b>*** DISPLAY CIRCUIT BOARD SECTION ***</b>																
89-309-456	TRANSISTOR, 2SC945L,P		PCB-B	*	DISPLAY CIRCUIT BOARD	<b>*** SWITCH-1 CIRCUIT BOARD SECTION ***</b>													
89-413-023	TRANSISTOR, 2SD1302ST		D801	* 87-020-163	LED GL-9NG23 (-10)	PCB-D	*	SWITCH-1 CIRCUIT BOARD											
89-408-805	TRANSISTOR, 2SD880,GR		D802	* 87-020-163	LED GL-9NG23 (-10)	S841	87-031-787	PUSH SW, R232 2-2 NS (POWER STANDBY/ON)											
<b>*** MAIN CIRCUIT BOARD SECTION ***</b>			D803	* 87-020-163	LED GL-9NG23 (-5)	<b>*** REMOTE CIRCUIT BOARD SECTION ***</b>													
PCB-A	*	MAIN CIRCUIT BOARD	D804	* 87-020-163	LED GL-9NG23 (-5)	PCB-E	*	REMOTE CIRCUIT BOARD											
C202	* 89-663-815	CAP, CERA-SOL ,0.01	D805	* 87-020-163	LED GL-9NG23 (0)	J841	82-137-609	CONNECTOR SOCKET 13P (REMOTE)											
C203	* 89-663-815	CAP, CERA-SOL ,0.01	D806	* 87-020-163	LED GL-9NG23 (0)	<b>*** TERMINAL CIRCUIT BOARD SECTION ***</b>													
C204	* 87-010-231	CAP, ELECT 220-10V(KS)	D807	* 87-027-984	LED GL-9PR23 (3)	PCB-F	*	TERMINAL CIRCUIT BOARD (E,K,Z ONLY)											
C205	* 87-010-232	CAP, ELECT 220-16V(KS)	D808	* 87-027-984	LED GL-9PR23 (3)	<b>*** DOLBY NR CIRCUIT BOARD SECTION ***</b>													
C301	* 87-018-039	CAP, CERA-SOL S 390P	D809	* 87-027-984	LED GL-9PR23 (6)	PCB-G	*	DOLBY NR CIRCUIT BOARD SECTION											
C302	* 87-018-039	CAP, CERA-SOL S 390P	D810	* 87-027-984	LED GL-9PR23 (6)	D816	* 87-027-984	LED GL-9PR23 (C)											
C303	* 87-018-040	CAP, CERA-SOL S 470P	D811	* 87-020-163	LED GL-9NG23 (B-TYPE)	D817	* 87-027-984	LED GL-9PR23 (C)											
C304	* 87-018-040	CAP, CERA-SOL S 470P	D812	* 87-027-984	LED GL-9PR23 (C-TYPE)	D818	* 87-027-984	LED GL-9PR23 (C)											
C309	* 87-018-039	CAP, CERA-SOL S 390P	D813	* 87-027-984	LED GL-9PR23 (METAL)	D819	87-020-110	DIODE ISS177											
C310	* 87-018-039	CAP, CERA-SOL S 390P	D814	* 87-020-173	LED GL-9HY23 (CO)	<b>*** SWITCH-2 CIRCUIT BOARD SECTION ***</b>													
C401	* 87-018-034	CAP, CERA-SOL S 150P	D815	* 87-020-163	LED GL-9NG23 (NORMAL)	PCB-H	*	SWITCH-2 CIRCUIT BOARD											
C402	* 87-018-034	CAP, CERA-SOL S 150P	D820	* 87-027-773	LED, GL-9NG4 (DIRECTION,PLAY)	S101	86-517-621	LEAF SW 2ME-1 (CAST)											
C403	* 87-014-071	CAP, PP 3900P	D821	* 87-027-773	LED, GL-9NG4 (DIRECTION,REV PLAY)	S102	86-517-621	LEAF SW 2ME-1 (ENA,A)											
C405	* 87-018-137	CAP, CERA-SOL S 3300P	S811	87-031-692	PUSH SW 2-2-2 (DOLBY B-C NR ON/OFF)	S103	86-517-621	LEAF SW 2ME-1 (ENA,B)											
C501	* 87-010-231	CAP, ELECT 220-10V(KS)	S812	87-031-692	PUSH SW 2-2-2 (DOLBY NR B-TYPE/C-TYPE)	S104	87-031-874	LEAF SW,PAUSE (91BN) (DIRECTION)											
C502	* 87-010-231	CAP, ELECT 220-10V(KS)	VR801	82-197-634	SLIDE VR 10KAX2 CCT (SYNC RECORD LEVEL)	S105	86-517-621	LEAF SW 2ME-1 (MT)											
C503	* 87-018-044	CAP, CERA-SOL S 1000P				S106	86-517-621	LEAF SW 2ME-1 (CO)											
C504	* 87-018-044	CAP, CERA-SOL S 1000P				SOL101	* 86-517-611	SOLENOID 2ME-1A											
C513	* 87-018-039	CAP, CERA-SOL S 390P	<b>*** KEY SWITCH CIRCUIT BOARD SECTION ***</b>																
C514	* 87-018-039	CAP, CERA-SOL S 390P	PCB-C	*	KEY SWITCH CIRCUIT BOARD	SOL102	* 86-517-612	SOLENOID 2ME-1B											
C601	* 87-018-044	CAP, CERA-SOL S 1000P	D851	87-020-110	DIODE ISS177	<b>*** SENSOR CIRCUIT BOARD SECTION ***</b>													

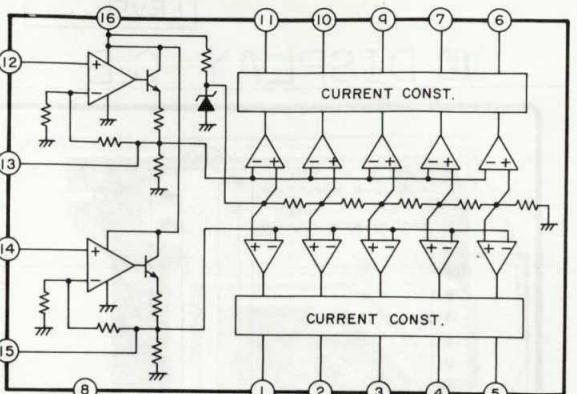




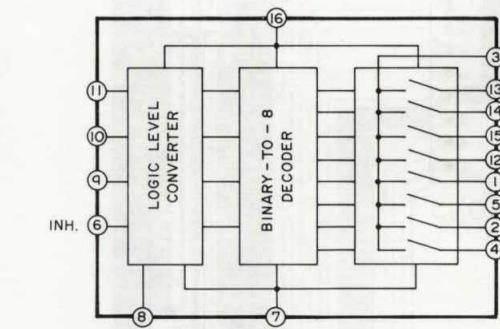
## BLOCK DIAGRAM (FX-R80)



IR2E27A



TC4051BP



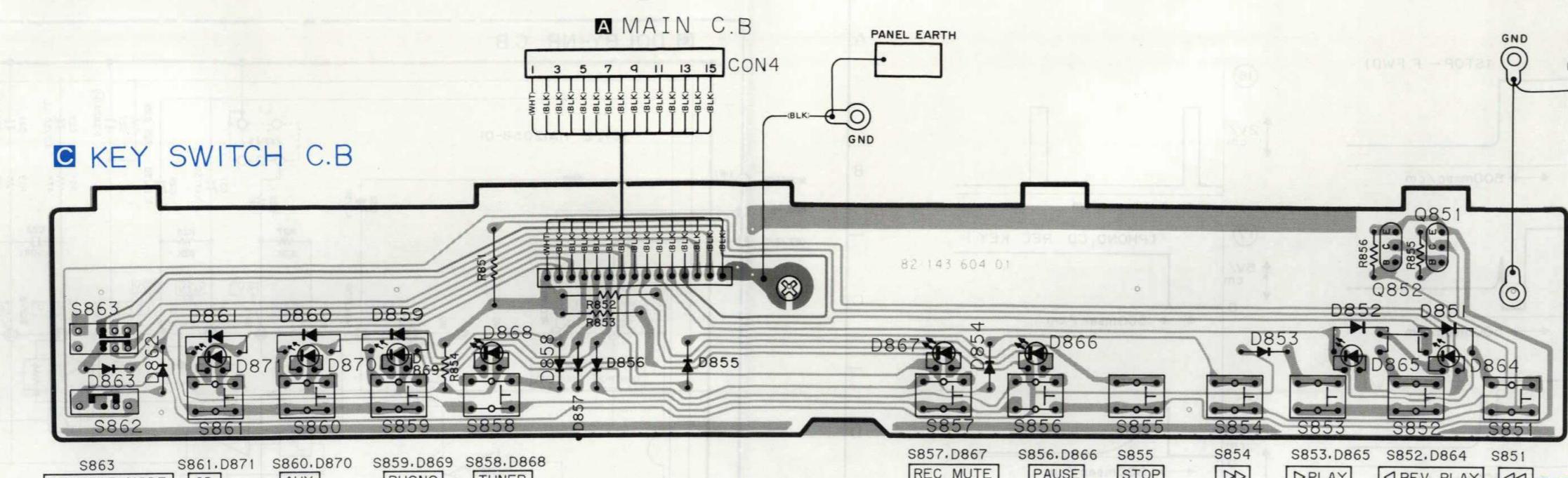
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	STOP	PLAY	F.F / RWD	CUE / REVIEW	PLAY PAUSE	REC	REC PAUSE
O-S-PLAY		○		○	○	○	○
O-S-F/R			○	○			
O-MOTOR	○						
O-PMT.SMT		○		○		○	○
O-RMT			○	○		○	
O-REC			○	○		○	○

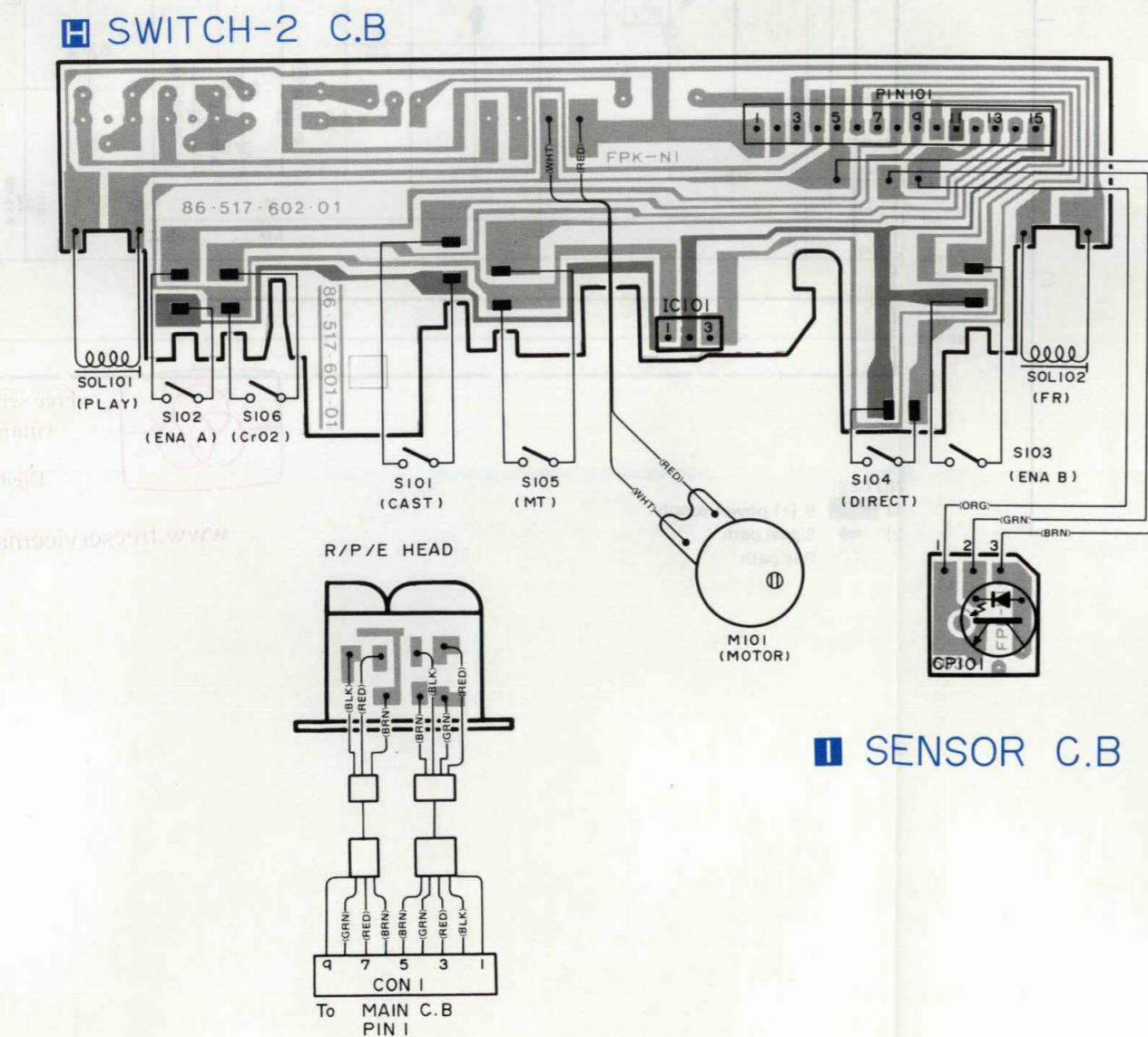
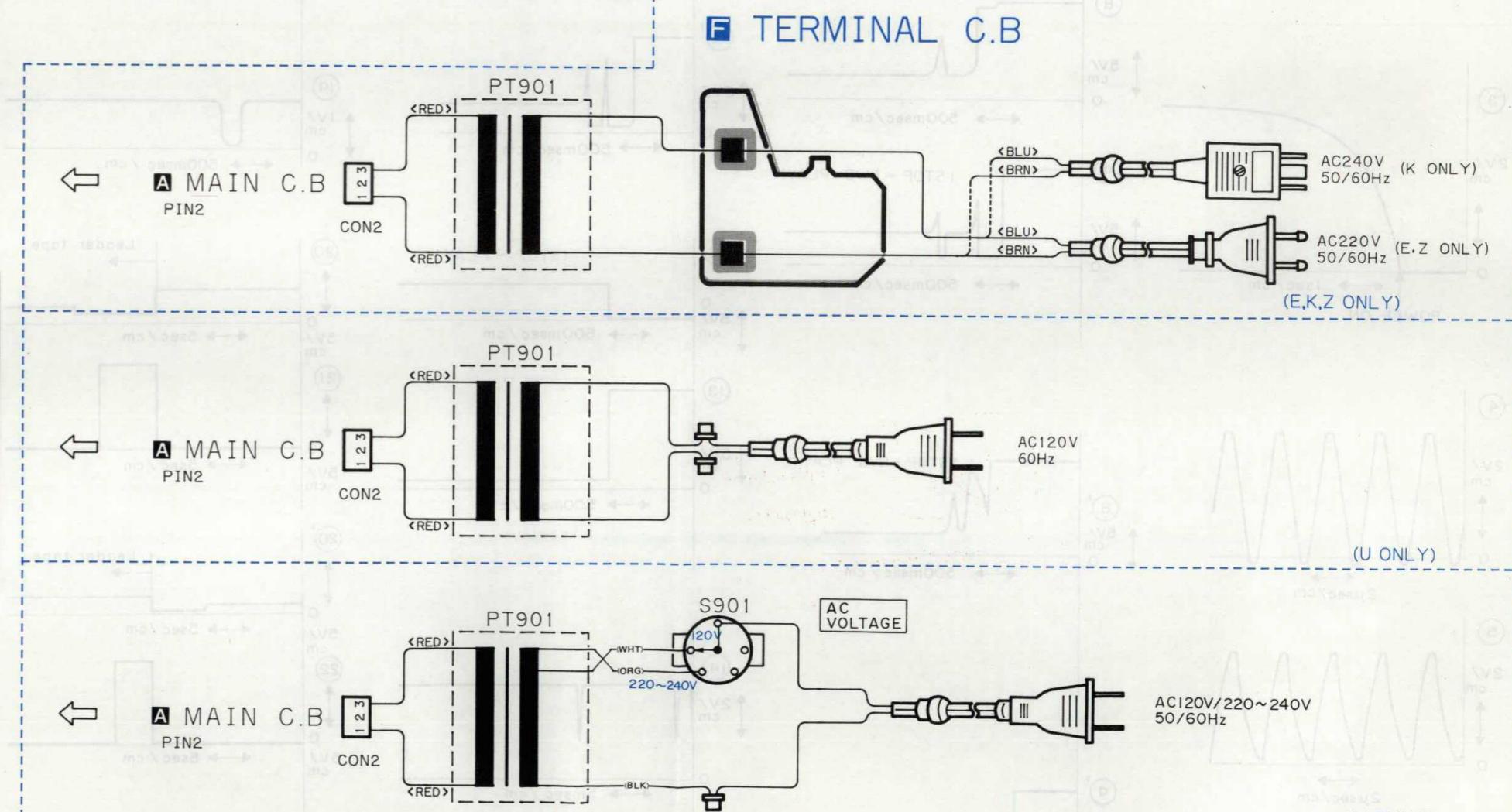
O: LOW ACTIVE

**NOTES**

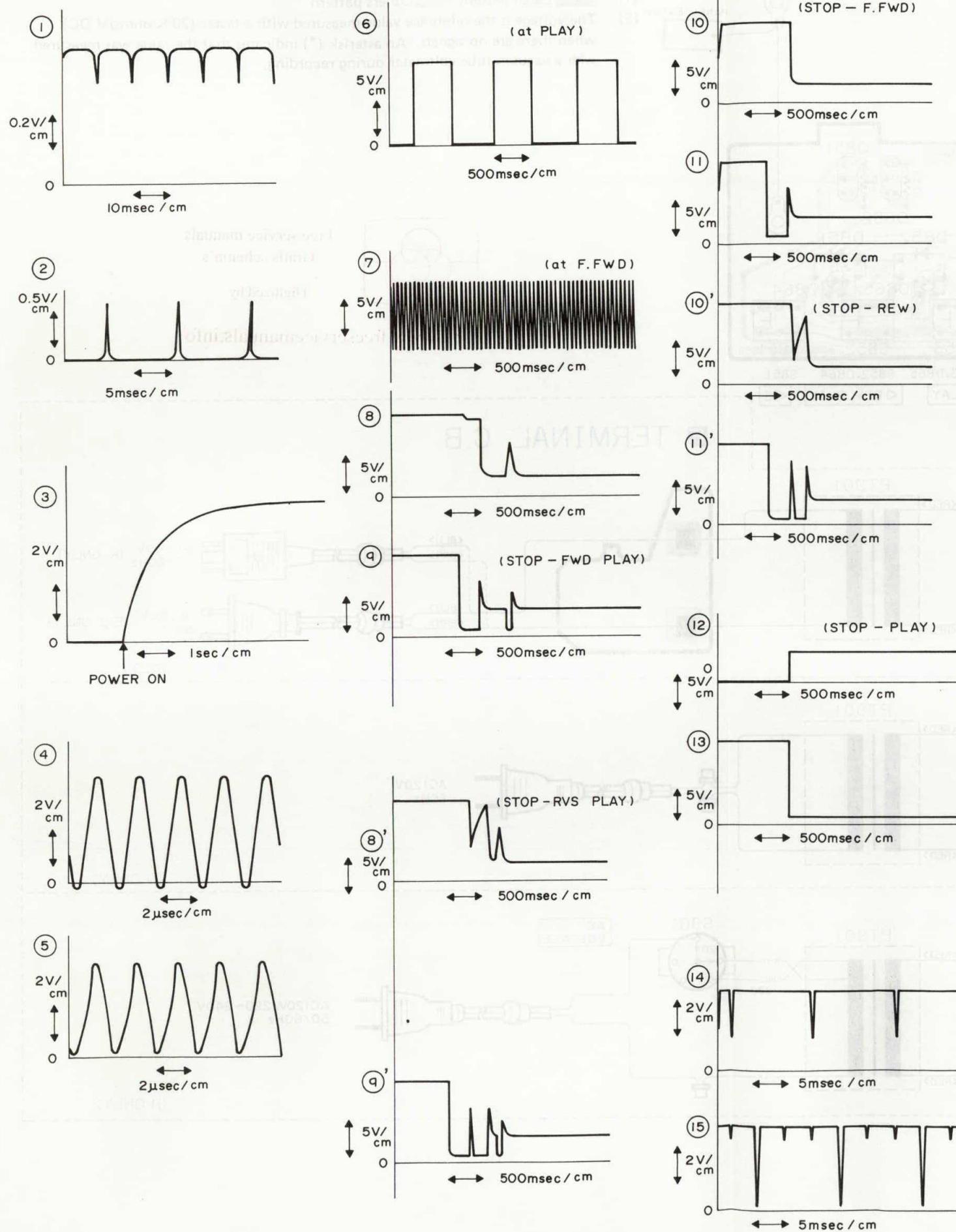
- (1) Earth pattern Others pattern  
 (2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals. An asterisk (\*) indicates that the value was measured with a vacuum-tube voltmeter during recording.

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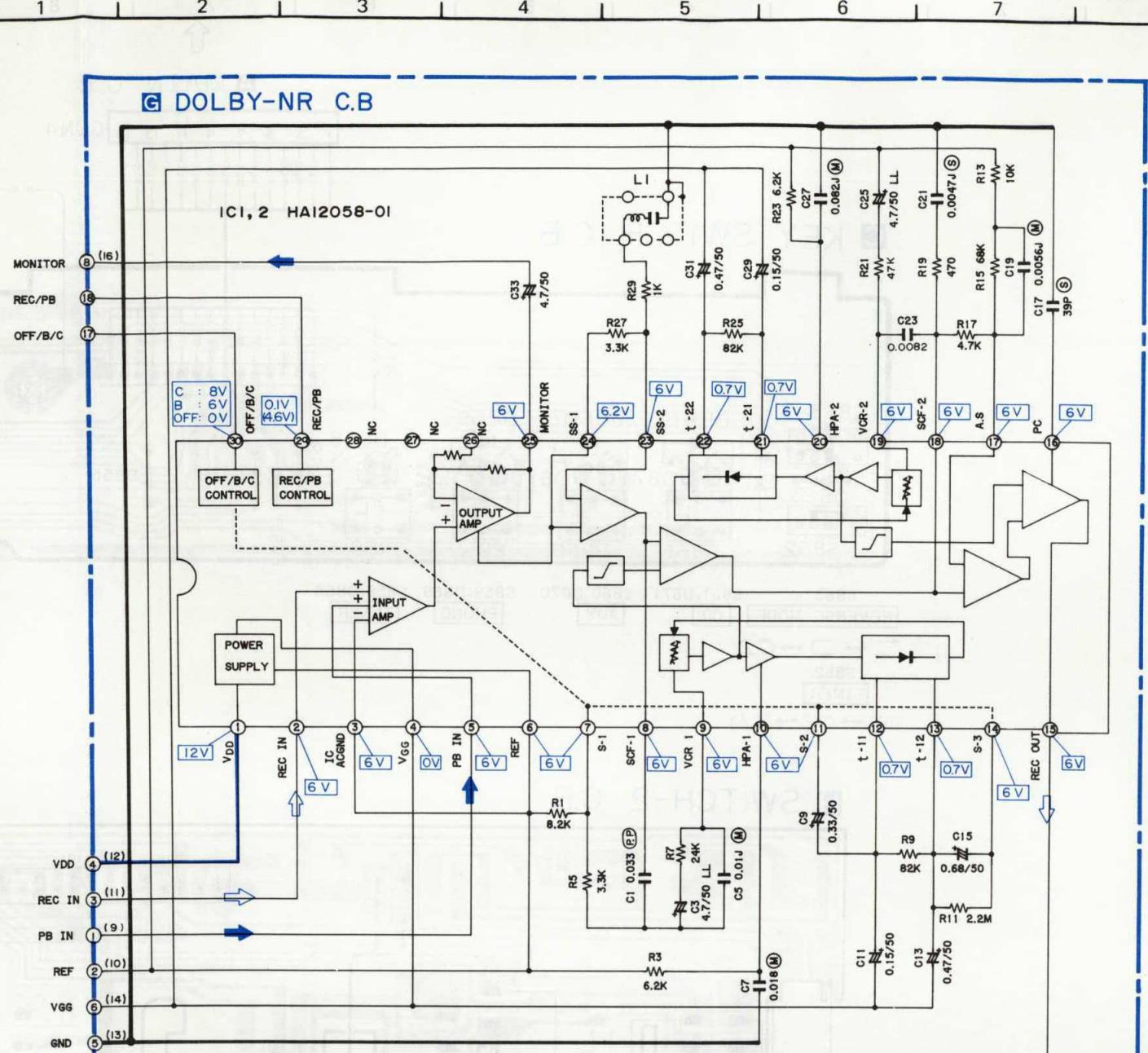
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**I SENSOR C.B**

WAVEFORMS (FX-R80)



SCHEMATIC DIAGRAM-2 (FX-R80)



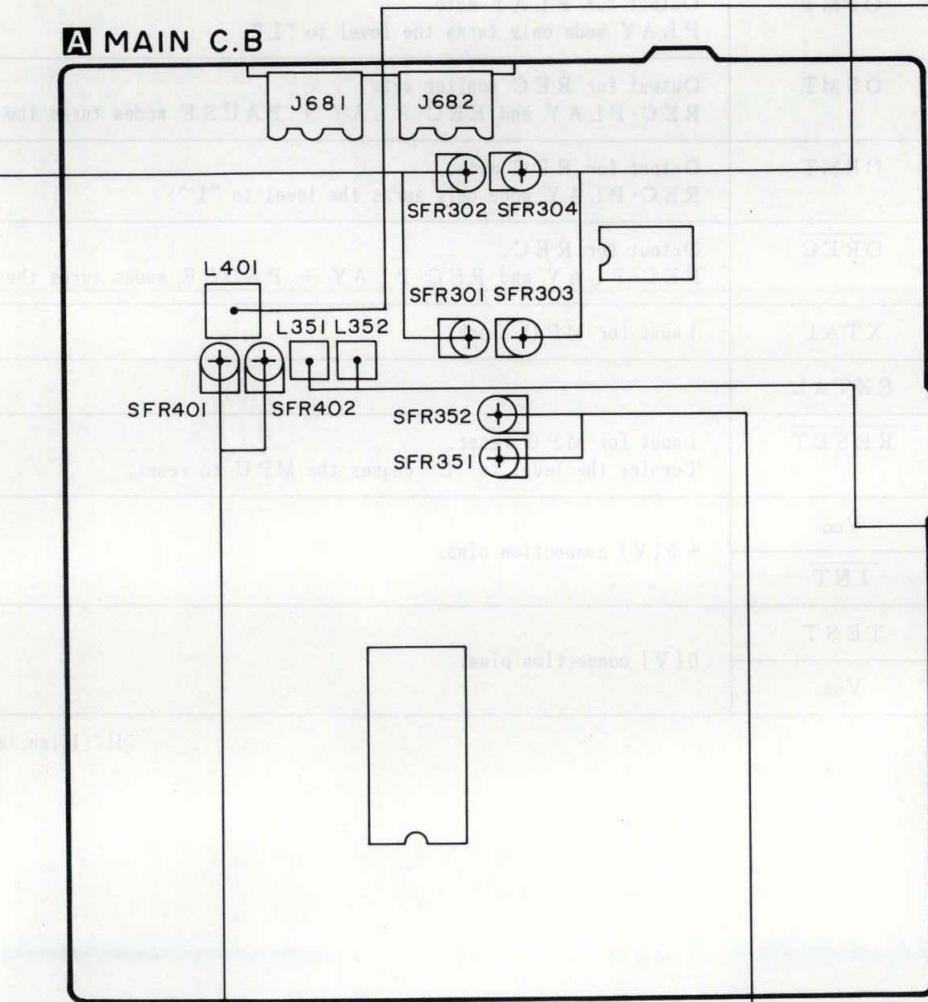
## ADJUSTMENT (FX-R80)

1. PB Sensitivity Adjustment  
Settings: • Test tape: TTA- 161  
• Test point: DIN output connector  
• Dolby NR SW: OFF  
• Adjustment location: SFR 301 (Lch)  
SFR 302 (Rch)

Method: Play back the test tape, then adjust so that the output is  $395\text{mV} \pm 0.25\text{dB}$ .

2. PB Frequency Response Adjustment  
Settings: • Test tape: TTA- 317 E  
• Test point: DIN output connector  
• Dolby NR SW: OFF  
• Adjustment location: SFR 303 (Lch)  
SFR 304 (Rch)

Method: Play back the test tape, then adjust so that the output difference between 1kHz and 10kHz is  $+1\text{dB} \pm 0.25\text{dB}$ .



## 3. REC PB Frequency Response Adjustment

Settings: • Test tape: TTA- 119 J  
• Test point: DIN output connector  
• Dolby NR SW: OFF  
• Adjustment location: SFR 401 (Lch)  
SFR 402 (Rch)

Method: Set in the REC mode and adjust the ATT so that the 1kHz signal output is  $280\text{mV}$ . Record the 1kHz & 10kHz signals, then play back the recorded tape and adjust so that the output difference between 1kHz and 10kHz is  $0\text{dB} \pm 0.2\text{dB}$ .

## 4. REC/PB Sensitivity Adjustment

Settings: • Test tape: TTA- 119 J  
• Test point: DIN output connector  
• Dolby NR SW: OFF  
• Adjustment location: SFR 351 (Lch)  
SFR 352 (Rch)

Method: Set in the REC mode and adjust the ATT so that the output is  $280\text{mV}$ . Record the 1kHz signal, then play back the recorded tape and adjust so that the output is  $280\text{mV} \pm 0.4\text{dB}$ .

## 7. Bias OSC Frequency Adjustment

Settings: • Test point: TP 1  
• Adjustment location: L 401

Method: Adjust so that the frequency at test point becomes 8.5kHz.

## 5. Tape Speed Adjustment

Settings: • Test tape: TTA- 111 S  
• Test point: DIN output connector

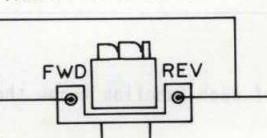
Method: Adjust so that the frequency is 3000Hz.

## 8. Bias Trap Coil Adjustment

Settings: • Adjustment location: L 351 (Lch)  
L 352 (Rch)

Method: Adjust L 351, 353 for minimum leakage.

## REC/PB/E HEAD



## 6. Head Azimuth Adjustment

Settings: • Test tape: TTA- 317 E  
• Test point: DIN output connector  
• Adjustment location: REC - PB - E head azimuth adjustment screw

Method: Make adjustment in each of the PLAY and REV PLAY.

## Practical Service Figure

Pinch roller pressure:  $290 \pm 7\text{g}$

Take-up torque:  $40 \pm 10\text{ g-cm}$

FF & rewind torque:  $130 \pm 30\text{ g-cm}$

Back tension:  $4 \pm 1\text{ g-cm}$  (FWD./REV.)

PB output:  $395\text{mV} \pm 1\text{dB}$  (TTA- 161)

REC/PB output:  $0\text{VU} (280\text{mV}) \pm 1.5\text{dB}$

REC/PB distortion: Less than 2.5% (METAL)

Less than 2.5% ( $\text{CrO}_2$ )

Less than 2% (NORMAL)

Less than  $3.0\text{mV}$

(NORMAL DOLBY-NR OFF)

Less than  $2.0 / 1.5\text{mV}$

(METAL,  $\text{CrO}_2$ , DOLBY-NR B/C 1kHz, 0VU)

REC/PB SN ratio: More than  $42\text{dB}$

(METAL,  $\text{CrO}_2$ , DOLBY-NR OFF)

More than  $40\text{dB}$

(NORMAL, DOLBY-NR OFF)

More than  $47 / 48\text{dB}$

(METAL,  $\text{CrO}_2$ , DOLBY-NR B/C)

More than  $45 / 46\text{dB}$

(NORMAL, DOLBY-NR B/C)

More than  $60\text{dB}$

Erasing ratio:  $(125\text{Hz})$

Bias frequency:

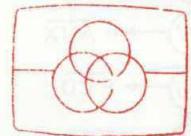
Test tape:

8.5kHz

METAL TTA- 119 MX

NORMAL TTA- 119 J

$\text{CrO}_2$  TTA- 119 G



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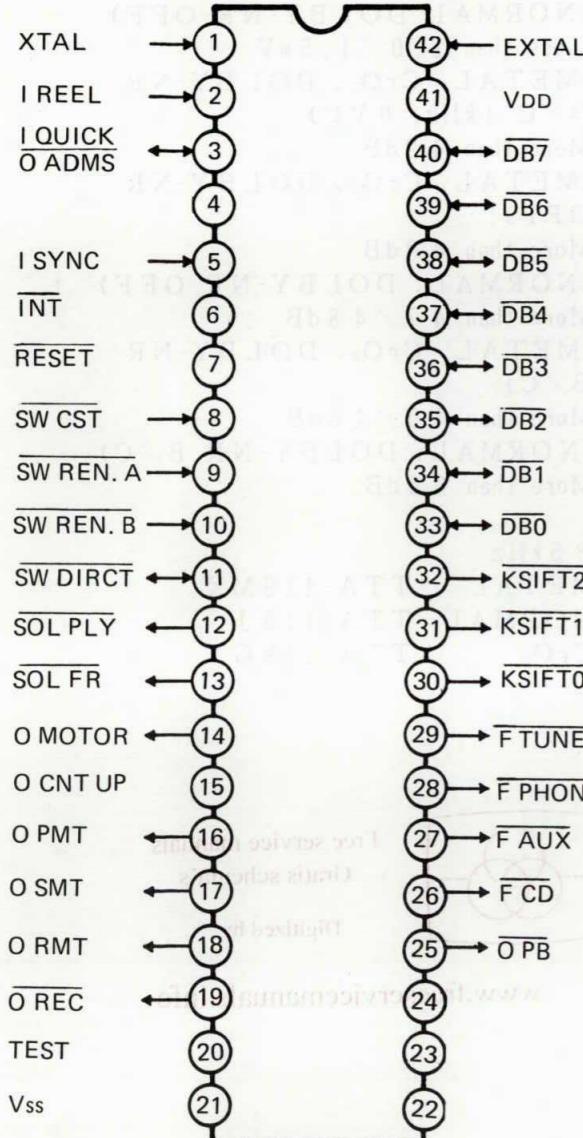
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## DESCRIPTION OF IC TERMINAL

## 1. IC, LM6402G-572

## 1-1 Terminal name



Signal flow in the direction indicated by the arrow.

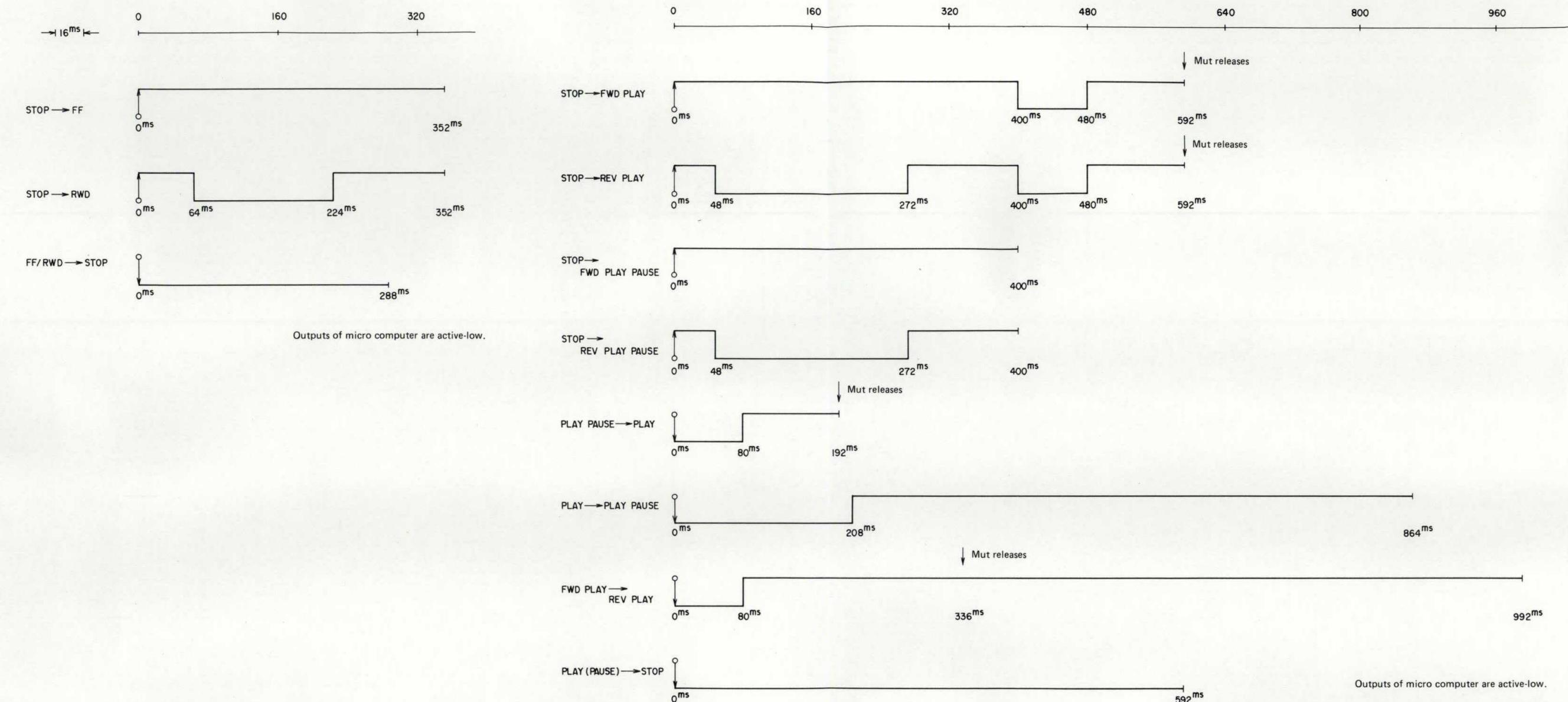
## 1-2 Description of IC terminal

Pin No.	Symbol	Description			
		Matrix key input			
		KSIFT0 : "L"	KSIFT1 : "L"	KSIFT2 : "L"	KSIFT0,1,2 : "H"
33	DB 0	TUNER REC key input	CD REC key input	One Way switch input	CD REC display
34	DB 1	REC MUTE key input	AUX REC key input		AUX REC display
35	DB 2	PAUSE key input	PHONO REC key input		PHONO REC display
36	DB 3	STOP key input	RVS Mode (↔) switch input	N.C.	TUNER REC display
37	DB 4	FF key input	RVS Mode (↔) switch input	N.C.	REC MUTE display
38	DB 5	FWD PLAY key input	Timer REC switch input		PAUSE display
39	DB 6	RVS PLAY key input	Timer PLAY switch input		FWD PLAY display
40	DB 7	RWD key input			RVS PLAY display
30	KSIFT0	Input for matrix key.	KSIFT0		Waveform at pins
31	KSIFT1	Output for display assortment.	KSIFT1		
32	KSIFT2		KSIFT2		
29	FTUNER	REC-PLAY and REC-PLAY + PAUSE modes of each function turns the level to "L".			
28	FPHONO	REC-PLAY and REC-PLAY + PAUSE modes of each function turns the level to "L".			
27	FAUX	REC-PLAY and REC-PLAY + PAUSE modes of each function turns the level to "L".			
26	FCD	REC-PLAY and REC-PLAY + PAUSE modes of each function turns the level to "L".			
25	OPB	PLAYBACK state turns the level to "L".			
2	I REEL	Input for auto-stop detection.			
3	I QUICK OADMS	Input for tape-end sensor. Output for ADMS. Resetting operation turns the level to "L" for two seconds.			
5	ISYNC	Input for synchronous REC of PHONO/CD. Turning the level to "L" sets up REC mode. Turning the level to "H" sets up REC + PAUSE mode.			
8	SW CST	Input for cassette tape detection. Installing a cassette tape turns the level to "L".			
9	SW REN.A	Input for erasing protection of forward side. Turning the level to "L" enables to set up REC mode.			
10	SW REN.B	Input for erasing protection of reverse side. Turning the level to "L" enables to set up REC mode.			
11	SW DIRCT	Input and output for direction detection of head. Turning the level to "L" sets the head to direction of forward side.			
12	SOL PLY	Output for PLAY solenoid. Turning the level to "L" causes the solenoid to energize. (Refer to timing chart)			

Pin No.	Symbol	Description	
13	SOL FR	Output for FF/RWD solenoid. Turning the level to "L" causes the solenoid to energize. (Refer to timing chart)	
14	OMOTOR	Output for motor on/off. Turning the level to "L" causes the motor to stop.	
15	OCNTUP	Output for electronic tape-counter up/down. Turning the level to "L" controls down-count. Turning the level to "H" controls up-count.	
16	OPMT	Output for PLAY mute. PLAY mode only turns the level to "L".	
17	OSMT	Output for REC monitor mute. REC-PLAY and REC-PLAY + PAUSE modes turns the level to "L".	
18	ORMT	Output for REC mute. REC-PLAY mode only turns the level to "L".	
19	OREC	Output for REC. REC-PLAY and REC-PLAY + PAUSE modes turns the level to "L".	
1	XTAL	Input for MPU clock.	
42	EXTAL		
7	RESET	Input for MPU reset. Turning the level to "L" causes the MPU to reset.	
41	Vdd	+5[V] connection pins.	
6	INT		
20	TEST	0[V] connection pins.	
21	Vss		

"H": High level, "L": Low level

## TIMING CHART (FX-R80)



MEMO

## EXPLODED VIEW - I

1

2

3

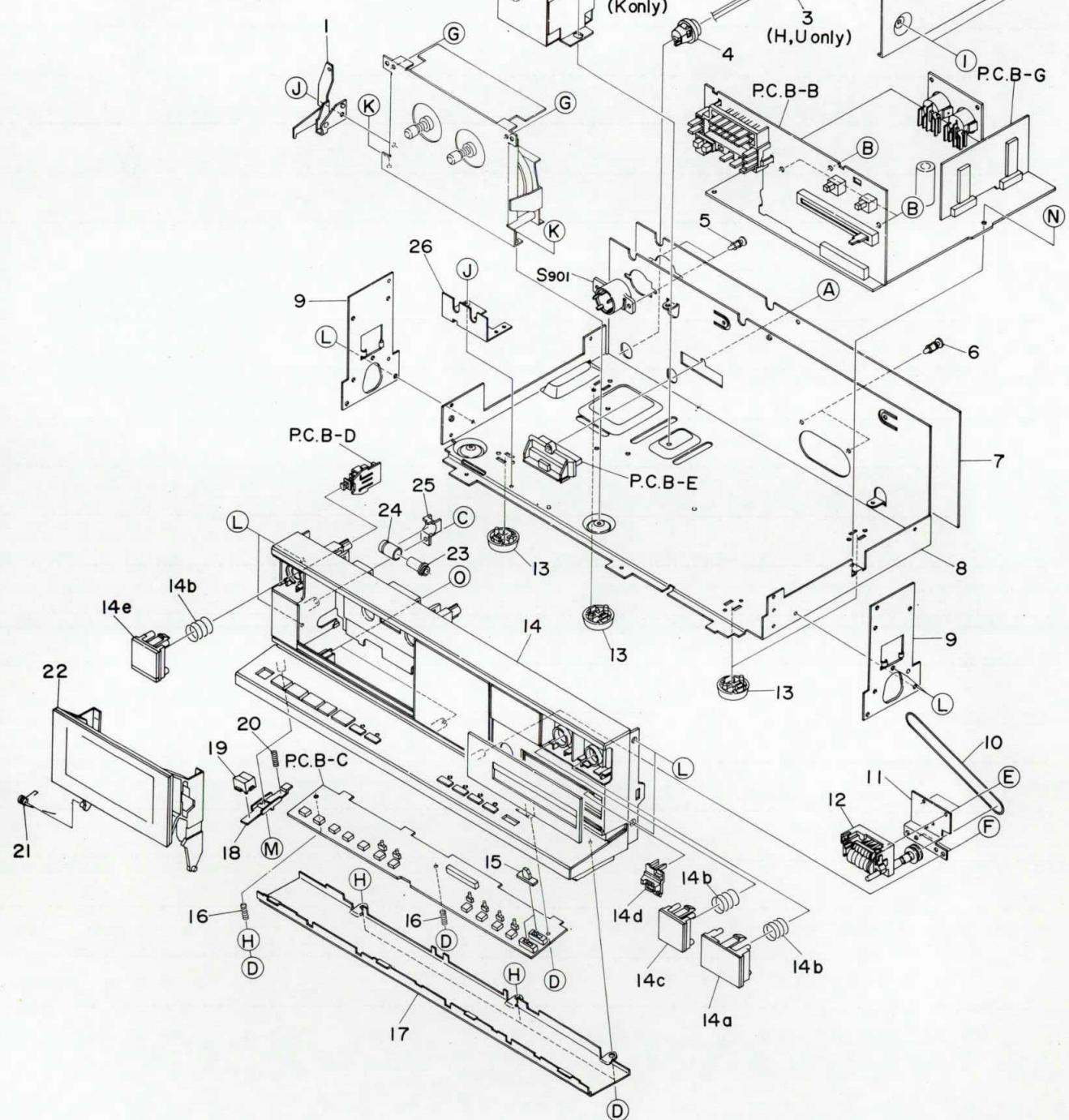
4

5

6

7

Ref. No.	Part No.	Description
A	87-351-095-21	V T <sub>1</sub> + 3 - 8
B	87-356-096-21	V T <sub>1</sub> + 3 - 10
C	87-341-075-21	U T <sub>1</sub> + 2 . 6 - 10
D	87-341-095-21	U T <sub>1</sub> + 3 - 8
E	87-321-074-21	Q T <sub>1</sub> + 2 . 6 - 8
F	87-321-095-21	Q T <sub>1</sub> + 3 - 8
G	87-353-074-21	V T <sub>2</sub> + 2 . 6 - 8
H	87-450-414-01	L B - 4
I	87-348-095-01	U T <sub>2</sub> + 3 - 8
J	87-081-481-01	V T T + 3 - 5
K	87-067-054-01	V T T + 3 - 6
L	87-081-531-01	Q T T + 3 - 6
M	87-511-094-21	V F T <sub>1</sub> + 3 - 6
N	87-513-094-21	V F T <sub>2</sub> + 3 - 6
O	87-512-095-21	V F T <sub>2</sub> + 3 - 8

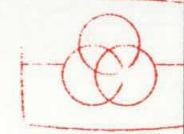


## PARTS LIST

## MECHANICAL PARTS LIST

- \* 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.

Part No. changed to	Ref. No.	Part No.	Description	Common Model	Q'ty
	1-1	★82-143-202	LEVER EJECT Ass'y	*	1
	1-2	★82-143-020	STEEL CABINET B	*	1
	1-3	★87-034-992	AC POWER CORD (H only)		1
		★87-034-578	AC POWER CORD (U only)		1
		★82-788-674	AC POWER CORD (E, Z only)		1
		★87-034-708	AC POWER CORD (K only)		1
	1-4	★87-085-184	CORD BUSHING (H, U only)		1
		★87-085-185	CORD BUSHING (E, K, Z only)		1
	1-5	★87-085-090	NYLON RIVET 3-6.5 (H only)		2
	1-6	★87-085-102	NYLON RIVET 3.5-5.5		2
	1-7	—	JACK PLATE (H only)		1
		—	JACK PLATE (U only)		1
		—	JACK PLATE (E only)		1
		—	JACK PLATE (K only)		1
		—	JACK PLATE (Z only)		1
	1-8	—	AMP. CHASSIS (H only)		1
		—	AMP. CHASSIS (U, E, K, Z only)		1
	1-9	—	HOLDER, SIDE L		2
	1-10	82-143-207	COUNTER BELT	*	1
	1-11	—	HOLDER, COUNTER A		1
	1-12	★87-040-181	COUNTER		
	1-13	★87-055-057	FOOT B		
	1-14	★82-143-016	FRONT CABINET B Ass'y		
14a	★82-136-011	BUTTON B C M Ass'y		*	1
14b	★82-798-209	C-SPRING, POWER			4
14c	★82-136-009	BUTTON DOLBY M Ass'y			
14d	★82-798-015	KNOB, VOLUME		MX-90	1
14e	★81-740-050	PUSH-KEY POWER B Ass'y			1
	1-15	★82-142-015	SLIDE KNOB		2
	1-16	★82-197-218	C-SPRING, FRONT EARTH	FX-90	2
	1-17	★82-198-028	BOTTOM CABINET		1
	1-18	★82-146-209	LEVER-A, EJECT (H only)		1
		★82-198-203	LEVER, EJECT A (U, E, K, Z only)		1
	1-19	★82-136-022	KNOB, EJECT A		1
	1-20	★82-197-211	C-SPRING, EJECT	FX-90	1
	1-21	★82-197-207	T-SPRING, EJECT	FX-90	1
	1-22	82-143-012	CASSETTE BOX Ass'y	*	1
	1-23	★82-534-264	GEAR, OIL-DAMP		1
	1-24	★82-197-221	SHAFT BEARING, OIL-DAMP	FX-90	1
	1-25	—	HOLDER, OIL-DAMP		1
	1-26	—	SHIELD PLATE, HEAD		1



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## EXPLDED VIEW-2

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A

Ref. No.	Part No.	Description
A	87-251-036-21	U + 2 - 8
B	87-351-033-21	V T <sub>1</sub> + 2 - 4
C	87-067-177-01	V + 1 . 6 - 5 . 5
D	87-081-504-01	V T T + 2 . 6 - 10
E	87-067-217-01	V F T <sub>2</sub> + 2 - 6
F	87-081-808-01	P W 1 . 7 - 3 . 5 - 0 . 25
G	87-067-105-01	P W 3 . 4 - 8 - 0 . 5 C

B

C

D

E

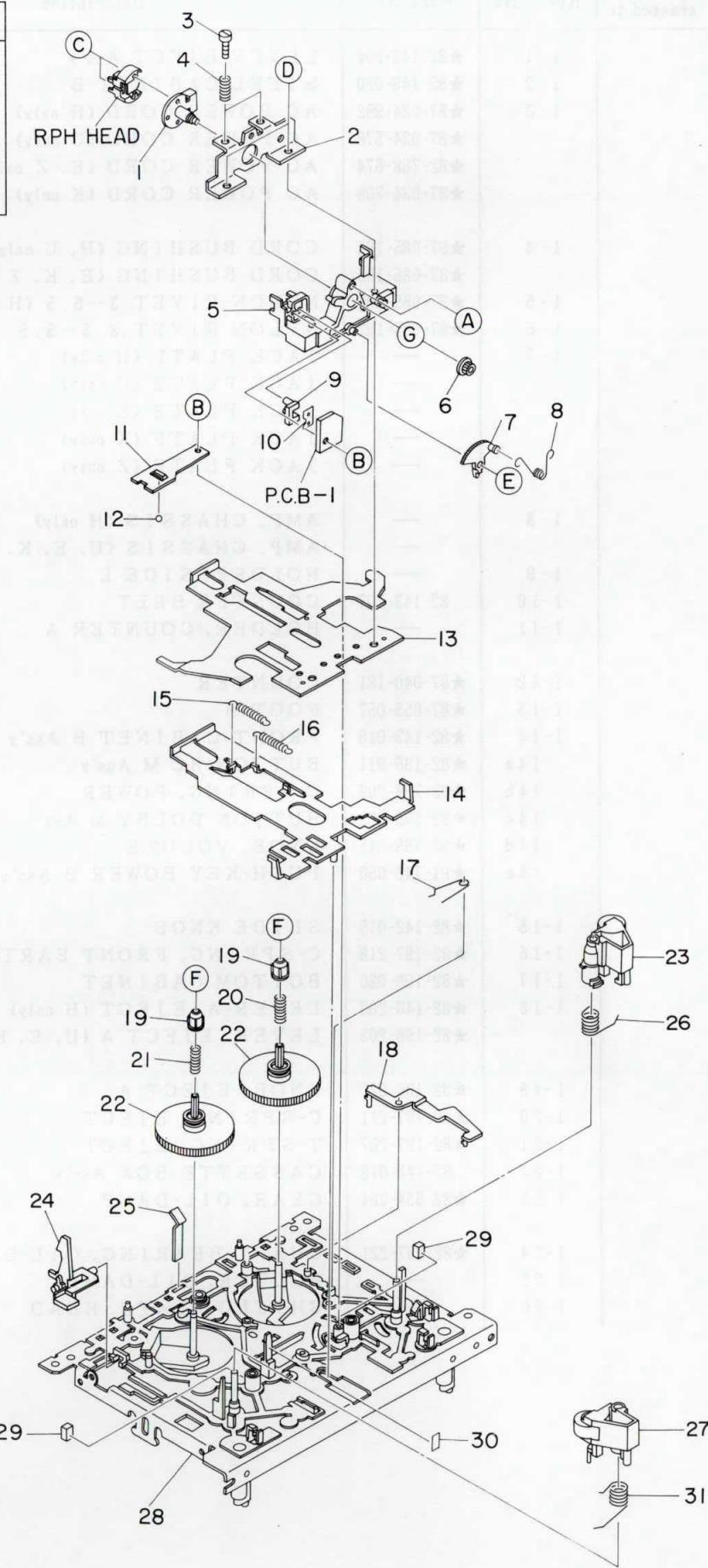
F

G

H

I

J

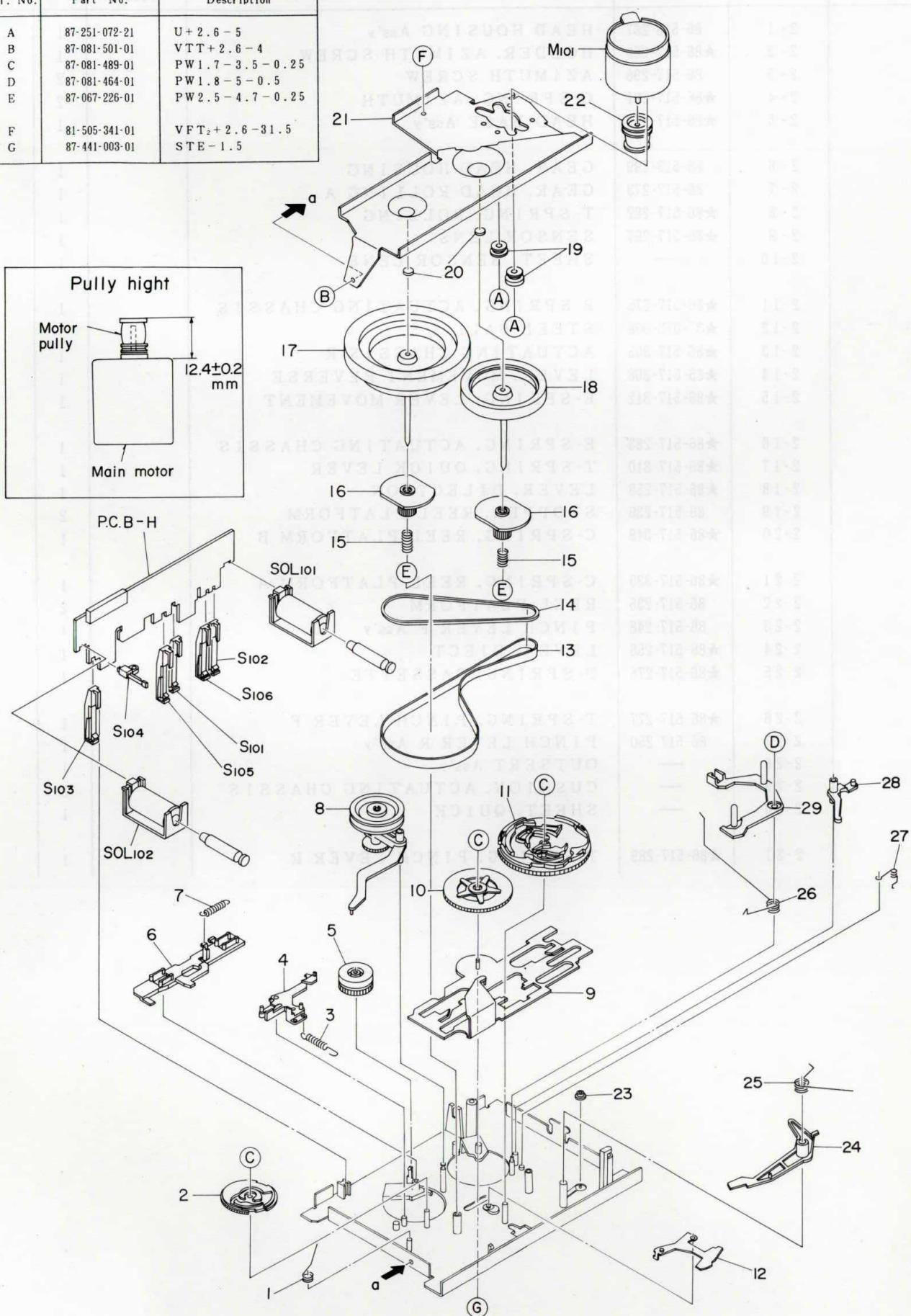
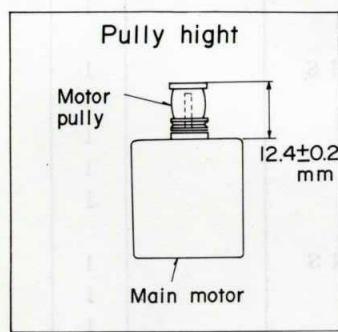


Part No. changed to	Ref. No.	Part No.	Description	Common Model	Q'ty
2-1	86-513-267	HEAD HOUSING Ass'y			1
2-2	★86-517-268	HOLDER, AZIMUTH SCREW			1
2-3	86-517-296	AZIMUTH SCREW			2
2-4	★86-517-291	C-SPRING, AZIMUTH			2
2-5	★86-517-269	HEAD BASE Ass'y			1
2-6	86-513-299	GEAR, HEAD HOUSING			1
2-7	86-517-273	GEAR, HEAD ROLLING A			1
2-8	★86-517-282	T-SPRING, ROLLING			1
2-9	★86-517-297	SENSOR LENS			1
2-10	—	SHEET, SENSOR LENS			1
2-11	★86-517-275	P-SPRING, ACTUATING CHASSIS			1
2-12	★87-073-008	STEEL BALL 2.5			1
2-13	★86-517-305	ACTUATING CHASSIS R			1
2-14	★86-517-308	LEVER, MOVEMENT REVERSE			1
2-15	★86-517-312	E-SPRING, LEVER MOVEMENT			1
2-16	★86-517-283	E-SPRING, ACTUATING CHASSIS			1
2-17	★86-517-310	T-SPRING, QUICK LEVER			1
2-18	★86-517-258	LEVER, DILECTION			1
2-19	86-517-236	STOPPER, REEL PLATFORM			2
2-20	★86-517-349	C-SPRING, REEL PLATFORM B			1
2-21	★86-517-333	C-SPRING, REEL PLATFORM A			1
2-22	86-517-235	REEL PLATFORM			2
2-23	86-517-248	PINCH LEVER F Ass'y			1
2-24	★86-517-256	LEVER, EJECT			1
2-25	★86-517-276	P-SPRING, CASSETTE			1
2-26	★86-517-277	T-SPRING, PINCH LEVER F			1
2-27	86-517-250	PINCH LEVER R Ass'y			1
2-28	—	OUTSERT Ass'y			1
2-29	—	CUSHION, ACTUATING CHASSIS			2
2-30	—	SHEET, QUICK			1
2-31	★86-517-289	T-SPRING, PINCH LEVER R			1

## EXPLODED VIEW-3

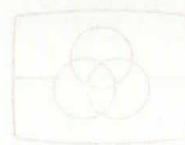
1 2 3 4 5 6 7

Ref. No.	Part No.	Description
A	87-251-072-21	U + 2.6 - 5
B	87-081-501-01	V T T + 2.6 - 4
C	87-081-489-01	P W 1.7 - 3.5 - 0.25
D	87-081-464-01	P W 1.8 - 5 - 0.5
E	87-067-226-01	P W 2.5 - 4.7 - 0.25
F	81-505-341-01	V F T <sub>2</sub> + 2.6 - 31.5
G	87-441-003-01	S T E - 1.5



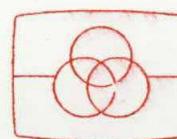
## ACCESSIONS PACKAGE LIST

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	★86-517-263	SLIDE PLATE R Ass'y		1
	3-10	86-517-225	GEAR PLAY R Ass'y		1
	3-11	86-517-336	GEAR MAIN CAM R Ass'y		1
	3-12	★86-517-306	LEVER QUICK Ass'y		1
	3-13	86-517-355	MAIN BELT R A		1
	3-14	86-517-295	BELT FR		1
	3-15	★86-517-323	C-SPRING, FLYWHEEL DC F		2
	3-16	86-517-317	GEAR, FLYWHEEL DC F		2
	3-17	86-517-314	FLYWHEEL DC F Ass'y		1
	3-18	86-517-318	FLYWHEEL DC R Ass'y		1
	3-19	★86-513-441	COLLAR		2
	3-20	★86-517-348	FLYWHEEL BEARING		2
	3-21	—	MOTOR HOLDER DC		1
	3-22	86-517-351	MOTOR PULLEY B		1
	3-23	★86-517-345	COLLAR, SLIDE PLATE R		1
	3-24	★86-517-252	TRIGGER LEVER PLAY-A		1
	3-25	★86-517-280	T-SPRING, TRIGGER LEVER PLAY		1
	3-26	★86-517-332	T-SPRING, LEVER SWITCH		1
	3-27	★86-517-281	T-SPRING, SLIDE LEVER R		1
	3-28	★86-517-253	TRIGGER LEVER PLAY-B		1
	3-29	★86-517-255	SWITCH LEVER		1



## ■ ACCESSORIES/PACKAGE LIST

Part No. changed to	Ref. No.	Part No.	Description	Common Model	Q'ty
	1	★82-143-901	INSTRUCTION BOOKLET		※ 1



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