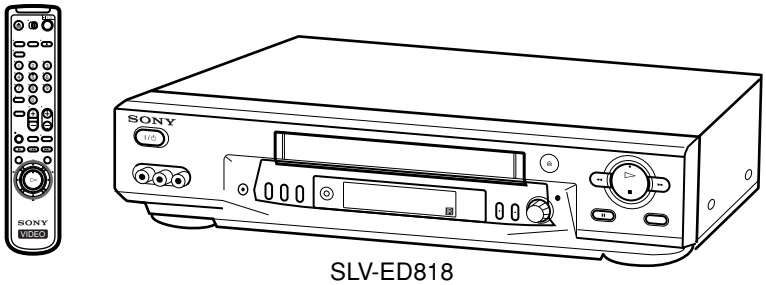
SLV-ED115/ED215/ED313/ED515/ED616/ED815/ED817/ED818/ED915/ED919/EZ111/EZ212/EZ414/EZ715/EZ717

RMT-V309/V311/V311A/V311B/V311C/V311D/V311E

SERVICE MANUAL



SLV-ED818

Australian Model

SLV-EZ111AZ/EZ212AZ/EZ414AZ/EZ715AS/EZ717AS

E Model

SLV-ED115PS/ED215PS/ED515PS/ED815PS//ED817PS/ED915PS

Hong Kong Model

SLV-ED919MI

ME Model

SLV-ED313ME/ED313MJ/ED313SG/ED616ME/ED616MJ/ED616SG/ED818ME/ED818SG

New Zealand Model

SLV-EZ715NZ/EZ717NZ

Thai Model

SLV-ED215TH/ED815TH/ED817TH/ED915TH

S MECHANISM

Hi-Fi

G-CODE

- **Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENTS VI for MECHANICAL ADJUSTMENTS. (9-921-647-11)**

* The abbreviations of ED115/ED215/ED313/ED515/ED616/ED815/ED817/ED818/ED915/ED919/EZ111/EZ212/EZ414/EZ715 and EZ717 contained in this service manual are indicated when these models are common to all their corresponding models as given below.

Abbreviated model name	ED115	ED215	ED313	ED515	ED616	ED815	ED817	ED818	ED915	ED919	EZ111	EZ212	EZ414	EZ715	EZ717
All model names SLV-	ED115PS	ED215PS ED215TH	ED313ME ED313MJ ED313SG	ED515PS	ED616ME ED616MJ ED616SG	ED815PS ED815TH	ED817PS ED817TH	ED818ME ED818SG	ED915PS ED915TH	ED919MI	EZ111AZ	EZ212AZ	EZ414AZ	EZ715AS EZ715NZ	EZ717AS EZ717NZ

VHS VIDEO CASSETTE RECORDER

SONY

SPECIFICATIONS

System

Color system
ED115/ED215/ED313/ED515/ED616/ED815/ED817/ED818/ED915/ED919:
PAL, MESECAM, NTSC 3.58, NTSC 4.43 (Others)
EZ111/EZ212/EZ414/EZ715/EZ717:
PAL, NTSC 4.43 (AS,AZ,NZ)
TV system
ED115/ED215/ED313/ED515/ED616/ED815/ED817/ED818/ED915:
B/G, D/K, I
ED919:
B/G, D/K, I, M
EZ111/EZ212/EZ414/EZ715/EZ717:
B/G
Channel coverage
ED115/ED215/ED313/ED515/ED616/ED815/ED817/ED818/ED915:
B/G: VHF E2 to E12/UHF E21 to E69/CATV S01 to S05, S1 to S41
D/K: VHF R1 to R12/UHF R21 to R69
I: VHF SA4 to SA13/UHF B21 to B69/CATV S01 to S05, S1 to S41
ED919MI:
M: VHF A2 to A13/UHF A14 to A69/CATV A-8 to A-1, A to W, W+1 to W+ 84
EZ111/EZ212/EZ414/EZ715AS (COUNTRY is set to AUS),
EZ717AS:
VHF AS0 to AS12, AS5A, AS9A
UHF AS28 to AS69
CATV S01 to S05, S1 to S41
EZ111/EZ212/EZ414/EZ715NZ (COUNTRY is set to NZ),
EZ717NZ:
VHF NZ1 to NZ11
UHF E21 to E69
CATV S01 to S05, S1 to S41
RF output signal
ED115/ED215/ED313/ED515/ED616/ED815/ED817/ED818/ED915/ED919/EZ715NZ/EZ717NZ:
UHF channels 21 to 69
EZ111/EZ212/EZ414/EZ715AS/EZ717AS:
UHF channels 28 to 69
Aerial out
75-ohm asymmetrical aerial socket

Inputs and outputs

LINE-1 IN
VIDEO IN, phono jack (1)
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO IN (MONO), phono jack (1) (ED115/ED215/ED313/ED515/ED616/EZ111/EZ212/EZ414)
AUDIO IN, phono jack (2) (ED815/ED817/ED818/ED915/ED919/EZ717)
Input level: 327 mVrms
Input impedance: more than 47 kilohms
LINE-2 IN (ED515/ED616/ED818/ED915/ED919/EZ715/EZ717)
VIDEO IN, phono jack (1)
Input signal: 1Vp-p, 75 ohms, unbalanced, sync negative
AUDIO IN (MONO), phono jack (2) (ED515/ED616)
AUDIO IN, phono jack (2) (ED818/ED915/ED919/EZ715/EZ717)
Input level: 327mVrms
Input impedane: more than 47 kilohms
LINE-1 OUT
VIDEO OUT, phono jack (1)
Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO OUT (MONO), phono jack (1) (ED115/ED215/ED313/EZ111/EZ212)
AUDIO OUT (MONO), phono jack (2) (ED515/ED616/EZ414)
AUDIO OUT, phono jack (2) (ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)
Standard output: 327 mVrms
Load impedance: 47 kilohms
Output impedance: less than 10 kilohms

General

Power requirements
110 - 240 V AC, 50/60 Hz (ED115/ED215/ED313/ED515/ED616/ED815/ED817/ED818/ED915/ED919) (Others)
220-240 V AC, 50 Hz (EZ111/EZ212/EZ414/EZ715/EZ717)
Power consumption
13W (ED115/ED215/ED313/EZ111/EZ212/EZ414)
14W (ED515/ED616/ED815/ED817/ED818)
16W (ED915/ED919/EZ715/EZ717)
Operating temperature
5 ˚C to 40 ˚C
Storage temperature
–20 ˚C to 60 ˚C
Dimensions
Approx. 430 × 97 × 288 mm (w/h/d) including projecting parts and controls
Mass
Approx. 4.1 kg:

Supplied accessories

Remote commander (1)
R6 (size AA) batteries (2)
Aerial cable (1)
Plug adaptor (1) (ED313: ME, MJ/ED616: ME, MJ/ED818: ME)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

• **Feature Difference**

SLV- / FEATURE	ED115 PS	ED215 PS, TH	ED313 SG, ME, MJ	ED515 PS	ED616 SG, ME, MJ	ED815 PS	ED817 TH	ED818 SG, ME	ED915 PS, TH	ED919 MI
HEAD/CH	2/2	2/2	2/2	2/2	4/4	4/4	4/6	4/6	4/6	4/6
NTSC (3.58) (REC/PB)	○/○	○/○	○/○	○/○	○/○	○/○	○/○	○/○	○/○	○/○
(4.43) (REC/PB)	○/○	○/○	○/○	○/○	○/○	○/○	○/○	○/○	○/○	○/○
ME-SECAM (REC/PB)	○/○	○/○	○/○	○/○	○/○	○/○	○/○	○/○	○/○	○/○
REC (NTSC) (SP/EP)	○	○	○	○	○	○	○	○	○	○
(PAL) (SP/LP)	○	○	○	○	○	○	○	○	○	○
RCA REAR LINE INPUT	2pin (B.Y)	2pin (B.Y)	2pin (B.Y)	2pin (B.Y)	2pin (B.Y)	3pin (R.W.Y)	3pin (R.W.Y)	3pin (R.W.Y)	3pin (R.W.Y)	3pin (R.W.Y)
RCA REAR LINE OUTPUT	2pin (B.Y)	2pin (B.Y)	2pin (B.Y)	3pin (B.B.Y)	3pin (B.B.Y)	3pin (R.W.Y)	3pin (R.W.Y)	3pin (R.W.Y)	3pin (R.W.Y)	3pin (R.W.Y)
RCA FRONT LINE INPUT	×	×	×	×	3pin (Y.B.B)	3pin (Y.B.B)	×	×	3pin (Y.W.R)	3pin (Y.W.R)
MODULATOR SYSTEM	G/K/I	G/K/I	G/K/I	G/K/I	G/K/I	G/K/I	G/K/I	G/K/I	G/K/I	G/K/I/M
REMOTE COMMANDER RMT-	V311	V311	V311	V311	V311B	V311	V311A	V311B	V311A	V311C

SLV- / FEATURE	EZ111 AZ	EZ212 AZ	EZ414 AZ	EZ715 AS, NZ	EZ717 AS, NZ
HEAD/CH	2/2	2/2	4/4	4/6	4/6
NTSC (3.58) (REC/PB)	×/×	×/×	×/×	×/×	○/○
(4.43) (REC/PB)	×/○	×/○	×/○	×/○	○/○
ME-SECAM (REC/PB)	×/×	×/×	×/×	×/×	×/×
REC (NTSC) (SP/EP)	×	×	×	×	○
(PAL) (SP/LP)	○	○	○	○	○
RCA REAR LINE INPUT	2pin (B.Y)	2pin (B.Y)	2pin (B.Y)	3pin (R.W.Y)	3pin (R.W.Y)
RCA REAR LINE OUTPUT	2pin (B.Y)	2pin (B.Y)	3pin (B.B.Y)	3pin (R.W.Y)	3pin (R.W.Y)
RCA FRONT LINE INPUT	×	×	×	3pin (Y.W.R)	3pin (Y.W.R)
MODULATOR SYSTEM	G	G	G	G	G
REMOTE COMMANDER RMT-	V311E	V311D	V311D	V311E	V309

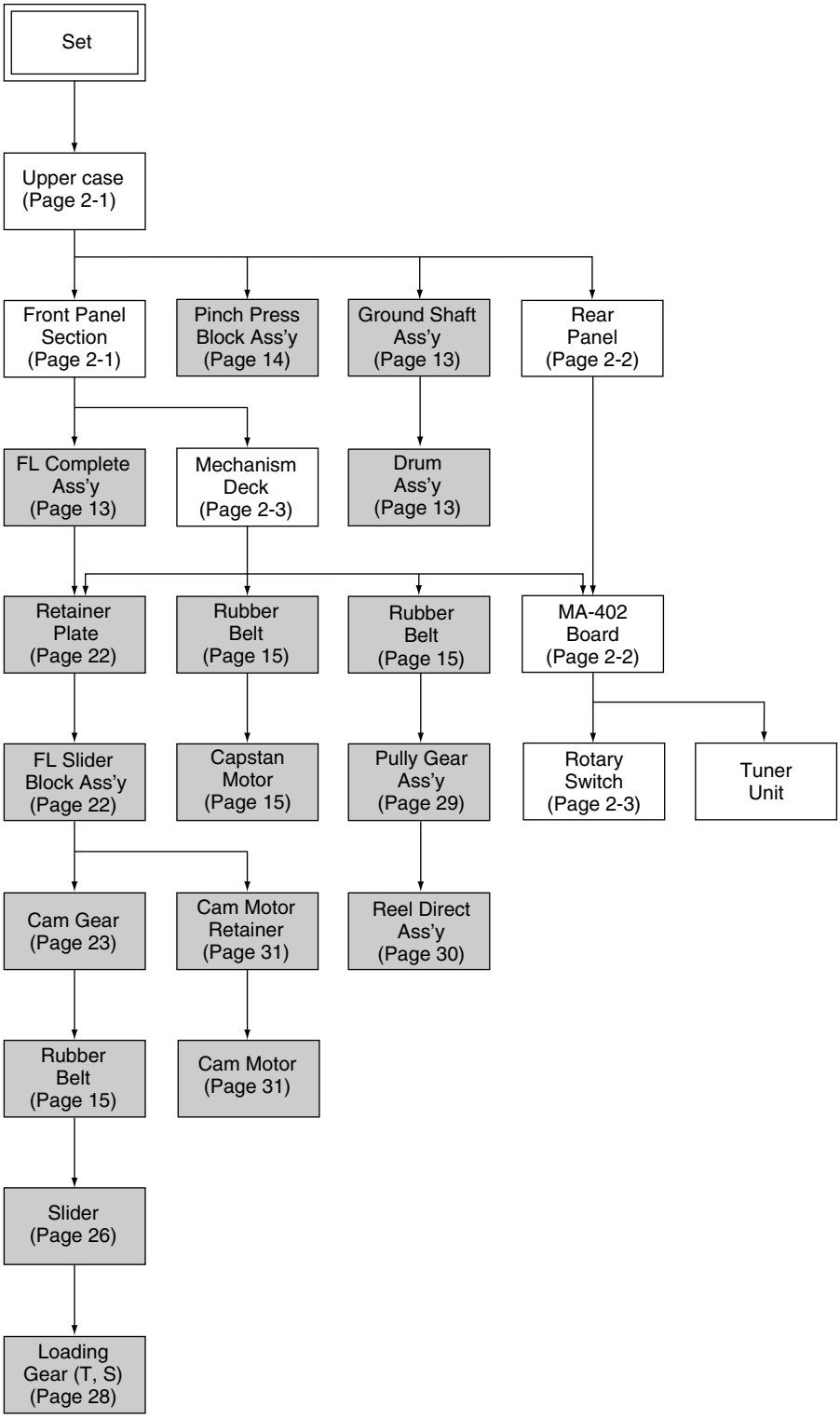
TABLE OF CONTENTS

SERVICE NOTE

1. DISASSEMBLY

• This set can be disassembled in the order shown below.

Note: Pages in ▭ indicated pages in the SERVICE MANUAL.
Pages in ▭ indicated pages in the VHS MECHANICAL ADJUSTMENT MANUAL VI.



SECTION 1
GENERAL

This section is extracted from SLV-ED919MI Instruction Manual. (3-065-580-11)

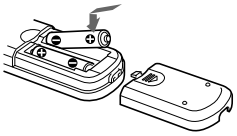
Step 2

Setting up the remote commander

Inserting the batteries

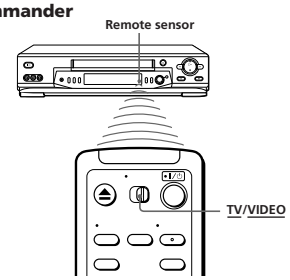
Insert two R6 (size AA) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.

Insert the negative (–) end first, then push in and down until the positive (+) end clicks into position.



Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV. If the TV does not have the R symbol near the remote sensor, this remote commander will not operate the TV.



To operate	Set TV/VIDEO to
the VCR	VIDEO and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

Notes

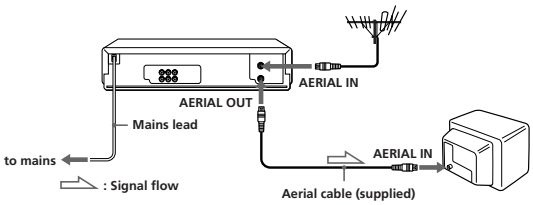
- The TV/VIDEO button selects the TV's input source (either aerial in or line in). The button does not control this VCR.
- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

Step 3

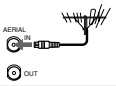
Connecting the VCR

Connect the aerial to your VCR and TV as shown below to watch TV programmes and VCR pictures on your TV. In addition, if your TV has audio/video (A/V) input jacks, we recommend you connect the VCR to your TV using an audio/video cable to get a better picture and sound.

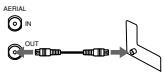
Connecting the aerial



1 Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of the VCR.



2 Connect AERIAL OUT of the VCR and the aerial input of your TV using the supplied aerial cable.



3 Connect the mains lead to the mains.

If the 3-pin plug does not fit into the mains outlet, detach the plug by loosening the screw, then use the 2-pin plug inside.

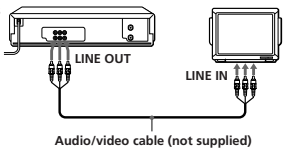
Additional connections

Note

- To play a tape in stereo, you must use either one of the connections shown below.

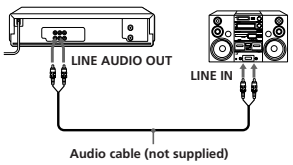
To a TV that has audio/video input jacks

This additional connection improves picture and sound quality. Connect the TV as shown on the right.



To a stereo system

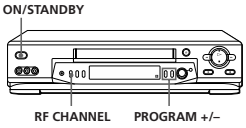
You can improve sound quality by connecting a stereo system as shown on the right.



Step 4

Tuning your TV to the VCR

If you have connected your VCR to the TV using the audio/video cable, skip this step.



1 

Press I/⏻ ON/STANDBY to turn on the VCR.

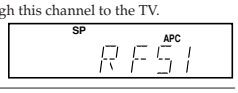
2 

Press RF CHANNEL on the VCR.

The factory-preset RF channel flashes in the display window for about three seconds.

Press RF CHANNEL again while the RF channel is flashing.

The VCR signal is output through this channel to the TV.



3 Turn on your TV and select a programme position for the VCR picture.

This channel will now be referred to as the video channel.

Some TVs reserve a programme position, such as "0", for a VCR. In this case, select the reserved programme position for the VCR picture. Refer to your TV's instruction manual for details.

4 

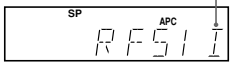
Press RF CHANNEL.

The TV system indicator appears in the display window.

Press PROGRAM +/– to select the correct TV system.

If your TV colour system and TV system are		Select
PAL	I	I
	D/K	K
	B/G	G
NTSC	M	M

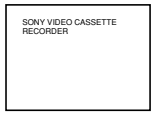
Selected TV system



5

Tune the TV to the same channel as shown in the display window so that the picture on the right appears on the TV screen.

Refer to your TV manual for tuning instructions.



If you select the wrong TV system in step 4, the picture may not appear. Select the appropriate TV system and tune the TV again.

If the picture does not appear clearly, see "To obtain a clear picture from the VCR" below.

6

Press RF CHANNEL.

You have now tuned your TV to the VCR. From now on, whenever you want to play a tape, set the TV to the video channel.

To obtain a clear picture from the VCR

If the picture does not appear clearly in step 5 above, first go to step 6 to finish this procedure once. Then start from step 2. After pressing RF CHANNEL twice in step 2 to display the RF channel, press PROGRAM +/– so that another RF channel appears. Then tune the TV to the new RF channel until a clear picture appears.

To set another RF channel number on the VCR, select a channel number that does not receive a broadcast signal in your area and is clear of interference from other channels.

If you cannot obtain a clear picture after performing this procedure, we recommend you connect the VCR and TV using the audio/video cable (see "To a TV that has audio/video input jacks" on page 7). If the same symptom persists, consult your nearest Sony dealer.

Note

- If you set the wrong TV system, you may have no sound or sound may be distorted (noisy sound).

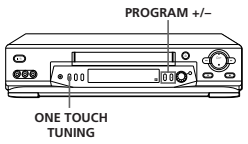
Step 5

Presetting channels

First, we recommend that you preset the receivable channels in your area using the One Touch Tuning function or AUTO PRESET in the TUNER PRESET menu. Then, if some channels cannot be preset automatically, set them manually. If there are any unwanted channels among the preset ones, you can disable the channels.

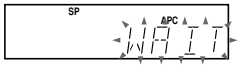
If you live in the area where various TV systems coexist, and have channels that do not match the TV system you selected in automatic presetting, reset the TV system for those channels (see "Resetting the TV system" on page 15). If the channels do not match the TV system, the sound may be distorted or noisy, or the colour TV programme may become black and white, etc.

Presetting all receivable channels using the One Touch Tuning function



Press and hold ONE TOUCH TUNING on the VCR for more than three seconds.

The VCR starts presetting the channels.



The WAIT indicator goes off when all receivable channels are preset.

To check if the channels are preset correctly

Set the TV to the video channel and press PROGRAM +/– on the VCR. If the TV screen changes to a different programme each time you press PROGRAM +/–, the channels are preset correctly.

If the sound is distorted or noisy, the VCR is set to a TV system different from your area's system. Select the correct TV system and preset channels using the TUNER PRESET menu as shown on the next page.

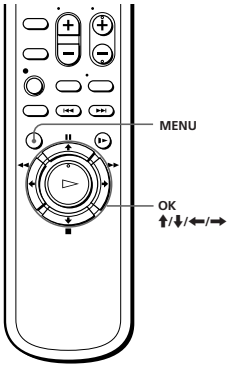
Tip

- To stop the One Touch Tuning function, press ONE TOUCH TUNING or ■ STOP on the VCR during the setting.

Presetting all receivable channels automatically

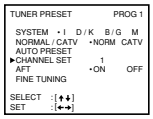
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.



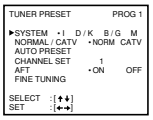
1

Press MENU, then press ↑/↓ to move the cursor (▶) to TUNER PRESET and press OK.



2

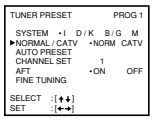
Press ↑/↓/←/→ to move the cursor (▶) to SYSTEM, then select B/G, D/K, I or M, whichever is applicable in your area. If SYSTEM is set to the wrong position, the sound will be distorted or noisy.



3

Press ↑/↓/←/→ to move the cursor (▶) to NORMAL/CATV, then select NORM.

To preset CATV channels, select CATV.



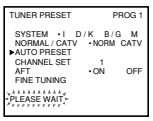
continued

Step 5: Presetting channels (continued)

4

Press ↑/↓ to move the cursor (▶) to AUTO PRESET, then press OK.

All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.



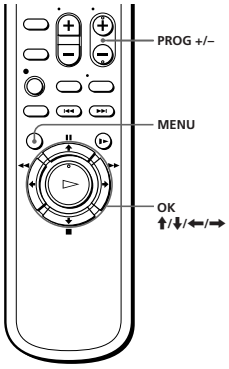
Notes

- Picture might disappear for a few seconds during One Touch Tuning and auto presetting functions. This is for tuning procedure, and not a malfunction.
- The channel numbers in the CHANNEL SET column may not be the same as those in your area. This is because this VCR's channel search system is based on the fixed TV system that has the widest channel coverage. If necessary, apply your local channel numbers to the programme positions (see "Presetting channels manually" on page 13).
- If the received channel is on cable TV, "C" appears on the left of the channel in step 4 in most areas. However, this will not be applied in some areas (see pages 17 to 24 for reference).

Presetting channels manually

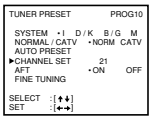
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.



1 MENU

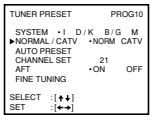
Press MENU, then press ↑/↓ to move the cursor (▶) to TUNER PRESET and press OK.



2

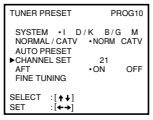
Press ↑/↓/←/→ to move the cursor (▶) to NORMAL/CATV, then select NORM.

To preset CATV channels, select CATV.



3

Press ↑/↓ to move the cursor (▶) to CHANNEL SET.



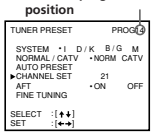
continued

Step 5: Presetting channels (continued)

4 • PROG

Press PROG +/– to select the programme position.

Selected programme position



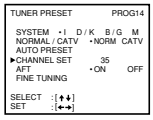
5

Press ➡ repeatedly until the channel you want is displayed.

Pressing ⬅ goes back to the previous channels.

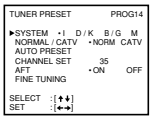
The channels are scanned in the order shown on page 17 to 24.

If you know the number of the channel you want, press the programme number buttons. For example, for channel 5, first press "0" and then press "5".



6

If the TV sound is distorted or noisy, press ↑/↓/←/→ to move the cursor (▶) to SYSTEM, then select B/G, D/K, I or M, whichever is applicable in your area.



7

To allocate another channel to another programme position, repeat steps 4 and 5.

8

Press OK.

Disabling unwanted programme positions

After presetting channels, you can disable unused programme positions. The disabled positions will be skipped later when you press the PROG +/– buttons.

1 In step 5 on page 14, press programme number button "0" twice to display the number "0" beside CHANNEL SET.

2 Press OK.

Resetting the TV system (only for areas where various TV systems coexist)

If the sound is distorted or noisy, or the colour TV programme becomes black and white, etc., that channel may not be matched to the proper TV system. In this case, try the following steps.

1 Press PROG +/– or programme number buttons to select the programme position that has the channel with above described conditions.

2 Press MENU, then select TUNER PRESET and press OK.

3 Select SYSTEM and select the TV system on which you can obtain the best sound and picture.

4 Repeat steps 2 and 3 for other positions you want to reset the TV system to.

5 Press OK.

continued

Step 5: Presetting channels (continued)

If the picture is not clear

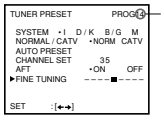
Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture is not clear, you may also use the manual tuning function.

1 Press PROG +/– to select the programme number for which you cannot obtain a clear picture.

2 Press MENU, then select TUNER PRESET and press OK.

3 Select FINE TUNING.

The fine tuning meter appears.



Selected programme position

4 Press ⬅/➡ to get a clearer picture, then press OK.

Note that the AFT (Auto Fine Tuning) setting switches to OFF.

Notes

- The menu disappears automatically if you do not proceed for more than a few minutes.
- The channel numbers in the CHANNEL SET column may not be the same as those in your area. This is because this VCR's channel search system is based on the fixed TV system that has the widest channel coverage. If necessary, apply your local channel numbers to the programme positions (see "Presetting channels manually" on page 13).

Channel numbers in the CHANNEL SET field and the corresponding channels

TV system	B/G				
Country	Western Europe	Australia	New Zealand	Morocco	Indonesia
Channel number in the CHANNEL SET column	Corresponding channels				
1		AS0	1		1A
2	E2				
3	E3	1	2		2A
4	E4	2	3		3A
5	E5	6	4	M6	4A
6	E6	7	5		5A
7	E7	8	6	M7	6A
8	E8	9	7	M8	7A
9	E9	9A	8	M9	8A
10	E10	10	9	M10	9A
11	E11	11	10		10A
12	E12		11		11A
13					
14					
15		3			
16		4			
17					
18					
19					
20					
21	E21				
22	E22				
23	E23				
24	E24				
25	E25				
26	E26				
27	E27				
28	E28	28			
29	E29	29			
30	E30	30			
31	E31	31, 32			

continued

Step 5: Presetting channels (continued)

TV system	B/G				
Country	Western Europe	Australia	New Zealand	Morocco	Indonesia
Channel number in the CHANNEL SET column	Corresponding channels				
32	E32	33			
33	E33	34			
34	E34	35			
35	E35	36			
36	E36	37			
37	E37	38			
38	E38	39, 40			
39	E39	41			
40	E40	42			
41	E41	43			
42	E42	44			
43	E43	45			
44	E44	46			
45	E45	47, 48			
46	E46	49			
47	E47	50			
48	E48	51			
49	E49	52			
50	E50	53			
51	E51	54			
52	E52	55, 56			
53	E53	57			
54	E54	58			
55	E55	59			
56	E56	60			
57	E57	61			
58	E58	62			
59	E59	63, 64			
60	E60	65			
61	E61	66			
62	E62	67			
63	E63	68			

TV system	B/G				
Country	Western Europe	Australia	New Zealand	Morocco	Indonesia
Channel number in the CHANNEL SET column	Corresponding channels				
64	E64	69			
65	E65				
66	E66				
67	E67				
68	E68				
69	E69				
70					
C1	S1	5			
C2	S2				
C3	S3				
C4	S4				
C5	S5				
C6	S6	5A			
C7	S7				
C8	S8				
C9	S9			M4	
C10	S10			M5	
C11	S11				
C12	S12				
C13	S13				
C14	S14				
C15	S15				
C16	S16				
C17	S17				
C18	S18				
C19	S19				
C20	S20				
C21	S21				
C22	S22				
C23	S23				
C24	S24				
C25	S25				
C26	S26				

continued

Step 5: Presetting channels (continued)

TV system	B/G				
Country	Western Europe	Australia	New Zealand	Morocco	Indonesia
Channel number in the CHANNEL SET column	Corresponding channels				
C27	S27				
C28	S28				
C29	S29				
C30	S30				
C31	S31				
C32	S32				
C33	S33				
C34	S34				
C35	S35				
C36	S36				
C37	S37				
C38	S38				
C39	S39				
C40	S40				
C41	S41				
C42	S01				
C43	S02				
C44	S03				
C45	S04				
C46	S05				

TV system	D/K		I			M	
Country	East Europe	China	UK/Hong Kong	Ireland	South Africa	U.S.A.	Japan
Channel number in the CHANNEL SET column	Corresponding channels						
1				A			
2	R1	1					
3		2		B		2, C2	
4		3		C		3	
5	R6	7		D	4	7	J-5
6	R7	8		E	5	8	J-6
7						9	J-7
8							
9						12	J-10
10						13	J-11
11						J	J-12
12	R12			J	10	K	S1
13	R2						
14	R3	4				5	
15	R4	5					
16	R5						
17	R8	9		F	6	10	J-8
18	R9	10		G	7	11	J-9
19	R10	11		H	8		
20	R11	12		I	9		
21	R21	13	B21		21	14, W+29, W+30	J13
22	R22	14	B22		22	15, 16, W+31	J14, J15
23	R23	15	B23		23	17, W+32	J16
24	R24	16	B24		24	18, W+33, W+34	J17
25	R25	17	B25		25	19, 20, W+35	J18, J19
26	R26	18	B26		26	21, W+36	J20
27	R27	19	B27		27	22, W+37, W+38	J21
28	R28	20	B28		28	23, 24, W+39	J22, J23
29	R29	21	B29		29	25, W+40	J24
30	R30	22	B30		30	26, W+41, W+42	J25
31	R31	23	B31		31	27, 28, W+43	J26, J27

continued

Step 5: Presetting channels (continued)

TV system	D/K		I			M	
Country	East Europe	China	UK/Hong Kong	Ireland	South Africa	U.S.A.	Japan
Channel number in the CHANNEL SET column	Corresponding channels						
32	R32	24	B32		32	29, W+44	J28
33	R33		B33		33	30, W+45, W+46	J29
34	R34		B34		34	31, 32, W+47	J30, J31
35	R35		B35		35	33, W+48	J32
36	R36		B36		36	34, W+49, W+50	J33
37	R37		B37		37	35, 36, W+51	J34, J35
38	R38	25	B38		38	37, W+52	J36
39	R39	26	B39		39	38, W+53, W+54	J37
40	R40	27	B40		40	39, 40, W+55	J38, J39
41	R41	28	B41		41	41, W+56	J40
42	R42	29	B42		42	42, W+57, W+58	J41
43	R43	30	B43		43	43, 44, W+59	J42, J43
44	R44	31	B44		44	45, W+60	J44
45	R45	32	B45		45	46, W+61, W+62	J45
46	R46	33	B46		46	47, 48, W+63	J46, J47
47	R47	34	B47		47	49, W+64	J48
48	R48	35	B48		48	50, W+65, W+66	J49
49	R49	36	B49		49	51, 52, W+67	J50, J51
50	R50	37	B50		50	53, W+68	J52
51	R51	38	B51		51	54, W+69, W+70	J53
52	R52	39	B52		52	55, 56, W+71	J54, J55
53	R53	40	B53		53	57, W+72	J56
54	R54	41	B54		54	58, W+73, W+74	J57
55	R55	42	B55		55	59, 60, W+75	J58, J59
56	R56	43	B56		56	61, W+76	J60
57	R57	44	B57		57	62, W+77, W+78	J61
58	R58	45	B58		58	63, 64, W+79	J62
59	R59	46	B59		59	65, W+80	
60	R60	47	B60		60	66, W+81, W+82	
61		48	B61		61	67, 68, W+83	
62		49	B62		62	69, W+84	

TV system	D/K		I			M	
Country	East Europe	China	UK/Hong Kong	Ireland	South Africa	U.S.A.	Japan
Channel number in the CHANNEL SET column	Corresponding channels						
63		50	B63		63	70	
64		51	B64		64	71, 72	
65		52	B65		65	73	
66		53	B66		66	74	
67		54	B67		67	75, 76	
68		55	B68		68	77	
69		56	B69		69	78	
70		57				79	
C1						A-2, A-3	J-3, M1
C2						A-1	M2
C3						A	M3
C4						B	M4
C5						C	M5
C6						D	M6
C7						E, F	M7, M8
C8						G	M9
C9						H	M10
C10		6				I	J-4
C11					11	L, M	S2
C12					(12)	N	S3
C13					13	O	S4, S5
C14						P	S6
C15						Q	S7
C16						R	S8
C17						S, T	S9, S10
C18						U	S11
C19						V	S12
C20						W	S13
C21						W+1, W+2	S14, S15
C22						W+3	S16
C23						W+4	S17

continued

Step 5: Presetting channels (continued)

TV system	D/K		I			M	
Country	East Europe	China	UK/Hong Kong	Ireland	South Africa	U.S.A.	Japan
Channel number in the CHANNEL SET column	Corresponding channels						
C24						W+5, W+6	S18, S19
C25						W+7	S20
C26						W+8	S21
C27						W+9, W+10	S22, S23
C28						W+11	S24
C29						W+12	S25
C30						W+13, W+14	S26, S27
C31						W+15	S28
C32						W+16	S29
C33						W+17, W+18	S30, S31
C34						W+19	S32
C35						W+20	S33
C36						W+21, W+22	S34, S35
C37						W+23	S36
C38						W+24	S37
C39						W+25, W+26	S38, S39
C40						W+27	S40
C41						W+28	S41
C42						4, 4A	
C43							
C44						6	
C45						A-5	J-1
C46						A-4	J-2

Notes

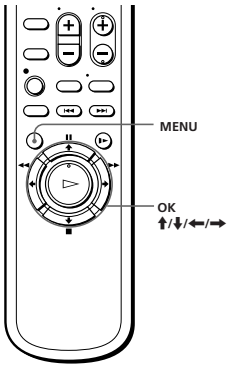
- There may be a case that the same area channel may appear repeatedly as the other channel number in the CHANNEL SET column.
- The shadow in the table shows the adjustable RF output channel range.

Step 6

Setting up the G-CODE system

The G-CODE system is a feature included in Sony VCRs that simplifies programming the VCR to make timer recordings. To use the G-CODE system, each programme position needs to be matched with its G-CODE guide channel. To get the guide channel numbers, look in the programme guide for your area that features G-CODE numbers.

If you want to record satellite broadcast using the G-CODE system, see page 27.



Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

Setting the guide channels

1 MENU

Press MENU, then press ↑/↓ to move the cursor (▶) to SET UP CH AND G-CODE and press OK.

The preset channels are displayed on the screen.

SET UP CH AND G-CODE

	PROG	CH	GUIDE	CH
▶	1	3	–	----
	2	9	–	----
	3	12	–	----
	4	27	–	----
	5	56	–	----

SELECT :[↑/↓]
MOVE PROG :[→]
ERASE PROG :[CLEAR]

2

Press ↑/↓ to move the cursor (▶) to the row on which you want to set the guide channel.

To display other pages for programme positions 6 to 50, press ↑/↓ repeatedly.

SET UP CH AND G-CODE

	PROG	CH	GUIDE	CH
	1	3	–	----
	2	9	–	----
▶	3	12	–	----
	4	27	–	----
	5	56	–	----

SELECT :[↑/↓]
MOVE PROG :[→]
ERASE PROG :[CLEAR]

continued

Step 6: Setting up the G-CODE system (continued)

3

Press ➡ twice to select the guide channel column.

SET UP CH AND G-CODE

	PROG	CH	GUIDE	CH
	1	3	–	----
	2	9	–	----
▶	3	12	–	----
	4	27	–	----
	5	56	–	----

SELECT GUIDE CH :[↑/↓]
CONFIRM :[←/→]

4

Press ↑/↓ to select the guide channel number assigned in the programme guide.

SET UP CH AND G-CODE

	PROG	CH	GUIDE	CH
	1	3	–	----
	2	9	–	----
▶	3	12	–	5
	4	27	–	----
	5	56	–	----

SELECT GUIDE CH :[↑/↓]
CONFIRM :[←/→]

5

Press ⬅/➡ to confirm the setting.

SET UP CH AND G-CODE

	PROG	CH	GUIDE	CH
	1	3	–	----
	2	9	–	----
▶	3	12	–	6
	4	27	–	----
	5	56	–	----

SELECT :[↑/↓]
MOVE PROG :[→]
ERASE PROG :[CLEAR]

6

To set the guide channel of another station, repeat steps 2 to 5.

If you want to change the programme positions of the stations, proceed to step 2 of "Step 7: Changing/disabling programme positions" on page 28.

7

Press OK.

Setting up the G-CODE system for satellite broadcasts (if applicable)

When your satellite tuner is connected via the AERIAL IN connector, first you have to set the programme position for each satellite channel using the TUNER PRESET menu. Then set the guide channel number for each satellite channel using the SET UP CH AND G-CODE menu.

If your satellite tuner is connected via the LINE-1 IN jacks, you do not have to set programme positions nor guide channel numbers for satellite channels. Skip the following operations.

1 Turn on the satellite tuner.

2 Press MENU, then select TUNER PRESET and press OK.

3 Press PROG +/– to select a programme position you want to use for watching a satellite channel.

4 Select CHANNEL SET, then press ➡ to tune the VCR to the satellite tuner.

The channel number displayed in the CHANNEL SET column is used for receiving all satellite broadcasts from the satellite tuner.

TUNER PRESET PROG 6

	SYSTEM	•I	D / K B / G M
	NORMAL / CATV		•NORM CATV
	AUTO PRESET		
▶	CHANNEL SET	30	
	AFT	•ON	OFF
	FINE TUNING		

SELECT :[↑/↓]
SET :[←/→]

5 Press PROG +/– to select another programme position for another satellite channel, and press the programme number buttons to enter the same channel number as the one displayed in step 4.

Repeat this step for all satellite channels.

6 Set the guide channel number for each programme position assigned to the satellite channel by following the procedures on page 25.

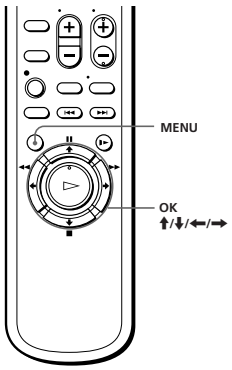
Notes

- The G-CODE system used in this VCR is for Singapore, Malaysia, Hong Kong, Macau, etc. and cannot be used in areas such as U.S.A, Canada, Japan, Korea, Taiwan and U.K.
- The menu disappears automatically if you do not proceed for more than a few minutes.
- If you inadvertently entered a guide channel number, press ↑/↓ repeatedly to reset the "GUIDE CH" column to "---." "---" appears between 1 and 255.
- The VCR does not allow you to enter the guide channel number if the same number has been set.
- If you use a satellite tuner connected via the LINE-1 IN jacks, you do not have to set up the G-CODE guide channels. Just record a satellite programme using the G-CODE number, and the VCR automatically records the programme from the LINE-1 IN jacks.
- When you record a satellite broadcast using the G-CODE number, you need to select the desired channel on the satellite tuner manually.

Step 7

Changing/ disabling programme positions

After setting the channels and G-CODE guide channels, you can change the programme positions as you like. If any programme positions are unused or unwanted, you can disable them.



Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

Changing programme positions

e.g. Moving the programme position from 3 to 1.

1 MENU

Press MENU, then press ↑/↓ to move the cursor (▶) to SET UP CH AND G-CODE and press OK.

SET UP CH AND G-CODE

	PROG	CH	GUIDE	CH
▶	1	3	–	16
	2	9	–	2
	3	12	–	6
	4	27	–	12
	5	56	–	----

SELECT :[↑/↓]
MOVE PROG :[→]
ERASE PROG :[CLEAR]

2

Press ↑/↓ to move the cursor (▶) to the row on which you want to change the programme position, then press ➡.

To display other pages for programme positions 6 to 50, press ↑/↓ repeatedly.

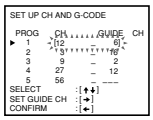
SET UP CH AND G-CODE

	PROG	CH	GUIDE	CH
	1	3	–	16
	2	9	–	2
▶	3	12	–	6
	4	27	–	12
	5	56	–	----

SELECT :[↑/↓]
SET GUIDE CH :[→]
CONFIRM :[←]

3 Press ↑/↓ until the selected channel and guide channel row moves to the desired programme position.

The selected channel and guide channel are inserted at the new programme position and the intermediate channels are displaced to fill the gap.



4 Press ← to confirm the setting.

5 To change the programme position of another station, repeat steps 2 to 4.

6 Press OK.

Getting Started

continued

Step 7: Changing/disabling programme positions (continued)

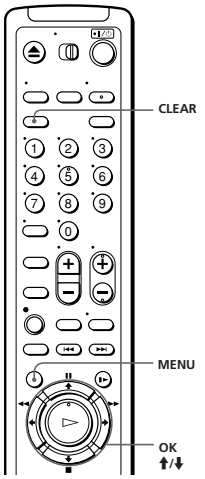
Disabling unwanted programme positions

Note

- Be sure to select the programme position you want to disable correctly. If you disable a programme position by mistake, you need to reset that channel manually.

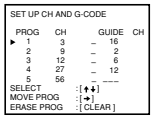
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.



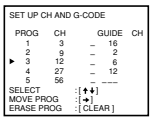
1 MENU

Press MENU, then press ↑/↓ to move the cursor (▶) to SET UP CH AND G-CODE and press OK.



2 Press ↑/↓ to move the cursor (▶) to the row on which you want to disable a channel.

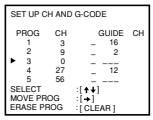
To display other pages for programme positions 6 to 50, press ↑/↓ repeatedly.



3 CLEAR

Press CLEAR.

The selected row will be cleared as shown on the right.



4 Repeat steps 2 and 3 for any other programme positions you want to disable.

5 Press OK.

Getting Started

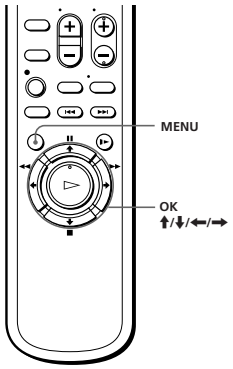
Step 8

Setting the clock

You must set the time and date on the VCR to be able to use the timer recording features properly.

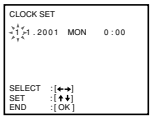
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.



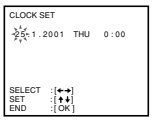
1 MENU

Press MENU, then press ↑/↓ to move the cursor (▶) to CLOCK SET and press OK.

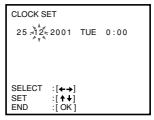


2 Press ↑/↓ to set the date.

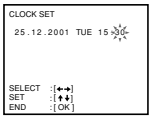
The day of the week is set automatically.



3 Press ➡ to select the month and set the month using ↑/↓.



4 Set the year, hour and minute in sequence, using → to select the item to be set, and ↑/↓ to select the digits.



5 Press OK to start the clock.

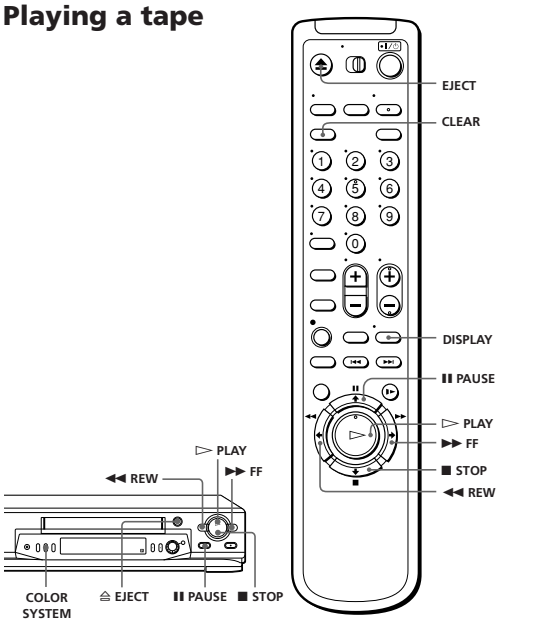
Tip

- To change the digits when setting, press ← to return to the item to be changed, and select the digits using ↑/↓.

Note

- The menu disappears automatically if you do not proceed for more than a few minutes.

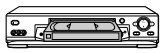
Playing a tape



1 Turn on your TV and set it to the video channel.

2 Insert a tape.

The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.



3 Press ▷ PLAY.

When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	❚❚ PAUSE
Resume play after pause	❚❚ PAUSE or ▷ PLAY
Fast-forward the tape	▶▶ FF during stop
Rewind the tape	◀◀ REW during stop
Eject the tape	⏏ EJECT

To set the colour system

If streaks appear during playback, press COLOR SYSTEM on the VCR to conform to the system that the tape was recorded in. (Normally, the colour system is correctly set whenever the tape is inserted.)

If your tape was recorded in	Press COLOR SYSTEM until the indication below appears in the display window.
PAL	PAL
MESECAM	PAL
NTSC	NTSC

To play an NTSC-recorded tape

Set NTSC PB in the SET UP MENU according to the colour system of your TV. For details, see page 65.

If your TV is	Set NTSC PB to
PAL	ON PAL TV
NTSC 4.43	4.43
NTSC 3.58	3.58

continued

Playing a tape (continued)

To use the time counter

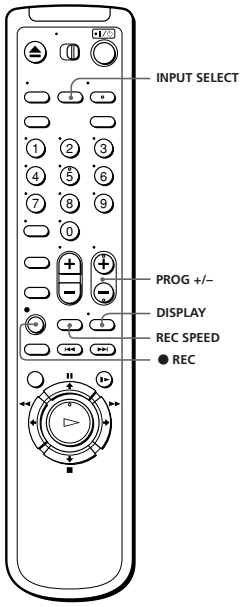
At the point on the tape that you want to find later, press CLEAR. The counter in the display window resets to "0:00:00." Search for the point afterwards by referring to the counter.

To display the counter on the TV screen, press DISPLAY. Press DISPLAY again and the counter will disappear from the TV screen.

Notes

- When you play back a tape recorded in the PAL or MESECAM colour system, streaks may appear even if the colour system setting is set to AUTO. If so, select the colour system PAL or MESECAM in the PAL/MESECAM option of the SET UP MENU (see page 65 for details).
- The counter resets to "0:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This is due to the difference between the counting cycles of the two colour systems.
- Depending on your TV, the following may occur while playing an NTSC-recorded tape:
  - the picture is black and white
  - the picture shakes
  - no picture appears on the TV screen
  - black streaks appear horizontally on the TV screen
  - the colour density increases or decreases.
- Tapes recorded in the LP mode of other NTSC system VCRs can be played back on this VCR, but the picture quality cannot be guaranteed.
- While setting the menu on the TV screen, you cannot use the ▷ PLAY, ❚❚ PAUSE, ▶▶ FF, ◀◀ REW or ■ STOP buttons. These buttons are used for menu operations.

Recording TV programmes



1 Turn on your TV and set it to the video channel.

2 Insert a tape with its safety tab in place.

3 • PROG

Press PROG +/– to select the programme position you want to record.

continued

Tips

- To select a programme position, you can use the programme number buttons on the remote commander. For two-digit numbers, press the –/–– (ten's digit) button followed by the programme number buttons.
- You can select a video source from the LINE-1 IN or LINE-2 IN jacks. Press INPUT SELECT or PROG +/– to display "L1" or "L2" in the display window.
- The display appears on the TV screen indicating information about the tape, but the information will not be recorded on the tape.
- If you do not want to watch TV while recording, you can turn off the TV.
- You can have the VCR stop recording automatically after starting at a specified time. For details, see "Setting the recording duration time" on page 58.

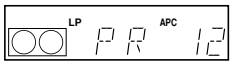
Notes

- The display does not appear during still (pause) mode or slow-motion playback.
- It may take up to one minute for the VCR to calculate and display the remaining tape length after you press DISPLAY.
- The remaining tape length does not appear while playing or recording in the NTSC system.

4 REC SPEED

Press REC SPEED to select the tape speed (SP or LP for the PAL colour system, and SP or EP for the NTSC colour system).

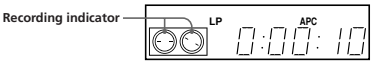
LP (Long Play) provides recording time twice as long as SP (Standard Play). EP (Extended Play) provides recording time three times as long as SP. However, SP produces better picture and audio quality.



5 ●REC

Press ● REC to start recording.

The recording indicator lights up red in the display window.



To stop recording

Press ■ STOP.

To check the remaining tape length

Press DISPLAY. The white bar indicates the approximate length of tape remaining.

To watch another TV programme while recording

1 If the TV is connected to the VCR using an audio/video cable, set the TV to TV input. If the TV is connected to the VCR using only the aerial cable, skip this step.

2 Select another programme position on the TV.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on the tape again, cover the tab hole with adhesive tape.

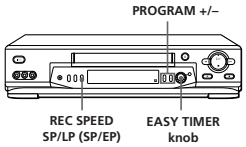
Recording TV programmes using the Easy Timer function

The Easy Timer function allows you to make a timer recording of a programme without turning on your TV. Set the recording timer to record only one programme that will be broadcast within the next 24 hours using the EASY TIMER knob. If the VCR clock has not been set, you can also set the clock before setting the timer recording.

Setting the Easy Timer

Before you start...

- Insert a tape with its safety tab in place. Make sure the tape is longer than the recording time.

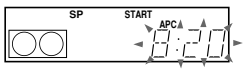


1 EASY TIMER

Push the EASY TIMER knob.

The START indicator appears in the display window.

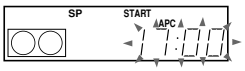
If the clock has not been set, "–:– –" appears. Go to step 2 in "Setting or changing the Easy Clock" on page 42.



2 EASY TIMER

Set the recording start time by turning the EASY TIMER knob clockwise or counterclockwise to increase or decrease the time by 15 minutes.

To increase or decrease the time by one minute, press PROGRAM +/–.



3 EASY TIMER

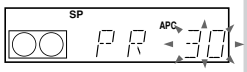
Push the EASY TIMER knob to confirm the start time setting.

The STOP indicator appears.

4 EASY TIMER

Set the recording stop time in the same way as in step 2, then push the EASY TIMER knob.

A programme number flashes.



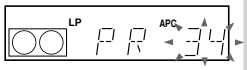
5 EASY TIMER

REC SPEED SP/LP

(SP/EP)

Turn the EASY TIMER knob clockwise or counterclockwise to select the programme you want to record.

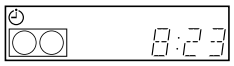
To select the tape speed, press REC SPEED.



6 EASY TIMER

Push the EASY TIMER knob to confirm the setting.

The ⏲ indicator appears in the display window and the VCR stands by for recording.



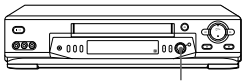
Basic Operations

continued

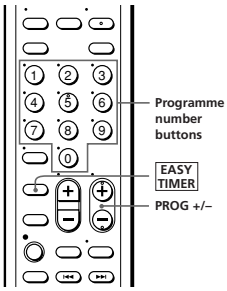
Recording TV programmes using the Easy Timer function (continued)

Setting or changing the Easy Clock

When "–:– –" is displayed in the display window, the VCR clock has not been set. You need to set the clock using the Easy Clock function before setting the timer. You can also change the current time using the Easy Clock function.



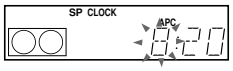
EASY TIMER knob



1 EASY TIMER

- When "–:– –" is displayed in the display window, push the EASY TIMER knob.
- To change the clock setting, push and hold the EASY TIMER knob on the VCR for more than three seconds.

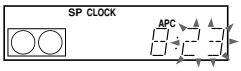
The CLOCK indicator and the current clock setting appear in the display window.



2 EASY TIMER

Set the current time using the EASY TIMER knob.

1 Turn the EASY TIMER knob clockwise or counterclockwise to enter the current hour.
2 Push the EASY TIMER knob to confirm the hour setting.
3 Turn the EASY TIMER knob to increase or decrease the minutes setting by a minute at a time.

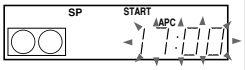


3 EASY TIMER

Push the EASY TIMER knob to finish setting the clock.

The VCR enters the timer recording setting mode.

To continue the Easy Timer setting, go to step 2 in "Setting the Easy Timer" on page 40.



To quit the Easy Timer setting mode without changing any settings, push the EASY TIMER knob repeatedly until the ⏲ indicator appears in the display window.

To set the timer and clock setting using the remote commander

You can also use the remote commander to set the Easy Timer and Easy Clock. The operations on the VCR and the remote commander correspond as follows:

To	Do this on the VCR	Do this on the remote commander
Confirm the setting and go to the next setting	Push the EASY TIMER knob	Press EASY TIMER
Change the time by 15 minutes (in START/STOP mode)	Turn the EASY TIMER knob or hold PROGRAM +/– down	Hold PROG +/– down
Change the time by one minute (in START/STOP mode)	Press PROGRAM +/–	Press PROG +/–
Select the programme	Turn the EASY TIMER knob or press PROGRAM +/–	Press PROG +/– or INPUT SELECT
Change the hour/minute by one hour/minute (in CLOCK mode)	Turn the EASY TIMER knob or press PROGRAM +/–	Press PROG +/–

You can also use the programme number buttons to set the clock, start and stop times, and the programme you want to record. Just press the programme number buttons to enter the hours and minutes. For example:

- To set the clock to "8:20", press 0, 8, EASY TIMER, 2, 0 and EASY TIMER in sequence.
- To set the start or stop time to "8:20", press 0, 8, 2, 0 and EASY TIMER in sequence.

If you make a mistake, re-enter the correct digits before pressing EASY TIMER.

Basic Operations

continued

Recording TV programmes using the Easy Timer function (continued)

To stop recording

To stop the VCR while recording, press ■ STOP.

To check or change the timer setting

Push the EASY TIMER knob repeatedly until the setting you want to check or change flashes. Then re-enter the new setting, if necessary. If you do not want to change any of the settings, push the EASY TIMER knob repeatedly until the ⏲ indicator appears in the display window.

You can also change the timer setting using the TIMER SET/CHECK menu. For details, see page 59.

To cancel the timer setting

To cancel the Easy Timer setting while entering a setting, press CLEAR on the remote commander or press PROGRAM + and – on the VCR at the same time.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press I/⏻. The ⏲ indicator turns off and the VCR switches on. Remember to press I/⏻ to reset the VCR to the timer recording standby mode after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV programme.

To watch the recorded programme right after recording with the Easy Timer

The SEARCH MODE indicator starts flashing when the VCR finishes the Easy Timer recording. To watch the recorded programme, push the EASY TIMER knob. The VCR turns on, starts searching, then automatically starts playback from the beginning of the recording. For details, see page 51.

Tips

- To record from a source connected to the LINE-1 IN or LINE-2 IN jacks, press INPUT SELECT or PROG +/– or turn the EASY TIMER knob to display "L1" or "L2" in the display window.
- To record NTSC signals, set the tape speed to SP or EP. To record in the EP mode, set the tape speed to "LP" in the display window.

Notes

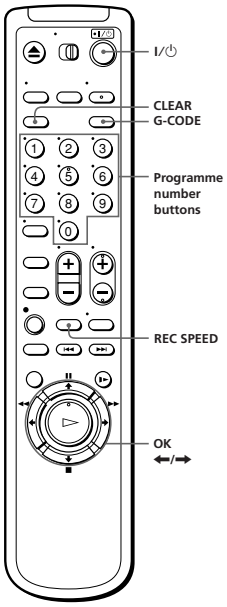
- You cannot set the Easy Timer if eight programmes have already been set.
- You can set the timer for only one programme using the Easy Timer function. If you want to set the timer for other programmes, use the G-CODE system or the TIMER SET/CHECK menu. For details, see pages 46 and 49.
- You cannot set the date using the Easy Timer function. Set the date using the CLOCK SET menu if you want to set the timer with the G-CODE system or the TIMER SET/CHECK menu. For details, see page 32.
- The 🕘 indicator flashes in the display window when you complete the setting with no tape inserted.

Recording TV programmes using the G-CODE system

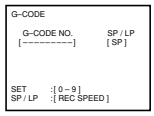
Just enter the G-CODE number, listed in the TV programme guide, for the programme you want to record. The date, times and programme position of that programme are set automatically. You can preset up to eight programmes at a time.

Before you start…

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.

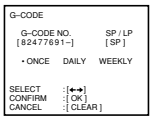


1 G-CODE — Press G-CODE.

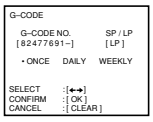


2 1 2 3 4 5 6 7 8 9 0 — Press the programme number buttons to enter the G-CODE number for the programme you want to record.

If you make a mistake, press CLEAR and re-enter the correct number.

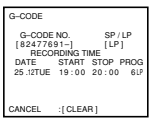


3 REC SPEED — Press REC SPEED to select SP or LP.



4 PLAY ▷ OK — Select ONCE, DAILY or WEEKLY by using ◀/▶, then press OK:

To record	Select
Only once	ONCE
Everyday Monday to Friday	DAILY
Once a week	WEEKLY



The date, start and stop times, programme position, and tape speed appear on the TV screen.

If the information is not correct, press CLEAR to cancel the setting.

5 To enter another setting, repeat steps 1 to 4.

6 I/⏻ — Press I/⏻ to turn off the VCR.

The 🕘 indicator appears in the display window and the VCR stands by for recording.

To stop recording

To stop the VCR while recording, press ■ STOP.

continued

To record satellite broadcasts

If you connect the satellite tuner and the VCR, you can record satellite programmes using the G-CODE number when available.

1. Turn on the satellite tuner.
2. On the satellite tuner, select the satellite programme for which you wish to make a timer setting.
3. Repeat the steps described on pages 46 and 47.
4. Keep the satellite tuner turned on until the VCR finishes recording the satellite programme for which you have made a timer setting.

Tips

- To cancel the procedure, press G-CODE before you press OK.
- To record NTSC signals, set the tape speed to SP or EP. To record in the EP mode, set the tape speed to "LP".

Notes

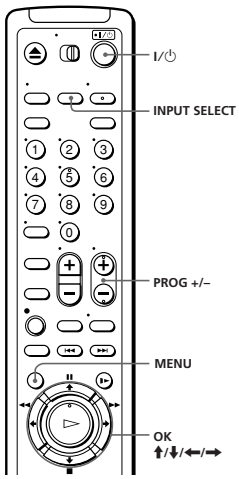
- The G-CODE system used in this VCR is for Singapore, Malaysia, Hong Kong, Macau, etc. and cannot be used in areas such as U.S.A., Canada, Japan, Korea, Taiwan, and U.K.
- The 🕘 indicator flashes in the display window when you press I/⏻ with no tape inserted.

Setting the timer manually

You can preset up to eight programmes at a time.

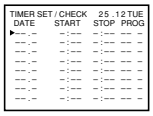
Before you start...

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.



1 MENU

Press MENU and select TIMER SET/CHECK, then press OK.



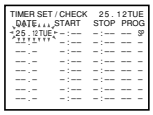
2

Set the date, start and stop times, programme position, and tape speed:

1 Press ➡ to select each item in turn.

2 Press ↑/↓ to set each item.

To correct a setting, press ← to return to that setting and reset it.



continued

Setting the timer manually (continued)

To record the same programme every day or the same day every week, press ↓ while the date is flashing. For details, see "Daily/weekly recording" below.

To record from a source connected to the LINE-1 IN or LINE-2 IN jacks; press INPUT SELECT or PROG +/– to display "L1" or "L2" in the "PROG" position.

3

Press ➡ to confirm the setting.

The cursor (▶) appears at the beginning of the line. To enter another setting, move the cursor to the next line and repeat step 2.

4

Press OK.

5

Press I/⏻ to turn off the VCR.

The ⏻ indicator appears in the display window and the VCR stands by for recording.

To record from other equipment, leave the connected equipment switched on.

To stop recording

To stop the VCR while recording, press ■ STOP.

Daily/weekly recording

In step 2 above, press ↓ to select the recording pattern. Each time you press ↓, the indication changes as shown below. Press ↑ to change the indication in reverse order.

the current date → SUN-SAT (Sunday to Saturday) → MON-SAT (Monday to Saturday) → MON-FRI (Monday to Friday) → EVERY SAT ..... → EVERY MON → EVERY SUN → 1 month later → (dates count down) → the current date

Tips

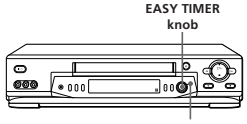
- To set the programme position, you can also use the PROG +/– or programme number buttons.
- To set the tape speed, you can also use the REC SPEED button.
- To record NTSC signals, set the tape speed to SP or EP. To record in the EP mode, set the tape speed to "LP".

Note

- The ⏻ indicator flashes in the display window when you press I/⏻ with no tape inserted.

Searching for the beginning of an Easy Timer recorded programme

If you record a programme using the Easy Timer function, you can easily find the beginning of the recording with the SEARCH MODE function. The SEARCH MODE indicator flashes when the VCR finishes making an Easy Timer recording.



Push the EASY TIMER knob.

The VCR turns on, rewinds to the beginning of the recorded programme and starts playback automatically. The SEARCH MODE indicator turns off.

Tip

- You can start the SEARCH MODE function after the flashing of the SEARCH MODE indicator has been stopped. The flashing stops when you turn on the VCR and press the SEARCH MODE button (Do not press any button at this point, otherwise this SEARCH MODE function will be cancelled). To start the SEARCH MODE function, press the SEARCH MODE button repeatedly until the SEARCH MODE indicator flashes. Push the EASY TIMER knob. The VCR rewinds and starts playback automatically.
  If you continue to press the SEARCH MODE button while the SEARCH MODE indicator is flashing, you can enter other search operations (For details, see the following pages). Each press of the SEARCH MODE button changes the search operations as follows:

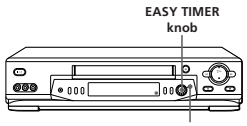
→ REMAIN → BLANK → INDEX → TIME → Off →

Note

- This SEARCH MODE function will be cancelled (the SEARCH MODE indicator turns off) if:
  – The VCR starts recording other programmes.
  – You press the ▷ PLAY, ▶▶ FF, ◀◀ REW or ⏏ EJECT button while the VCR is on.

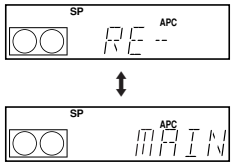
Searching for the current position on a tape

This feature enables you to find the current position on a tape as well as the remaining time of the tape.



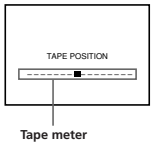
1 Press SEARCH MODE repeatedly until the REMAIN indicator appears in the display window as shown on the right.

The SEARCH MODE indicator lights up.



2 Push the EASY TIMER knob to display the tape meter on the TV screen.

The SEARCH MODE indicator turns off. A cursor (■) indicates the current position on the tape.



"REMAIN" and the remaining time of the tape appear in the display window in the following order:

RE- → MAIN → 0:15 (remaining time of the tape)

To stop the Search function

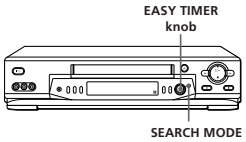
Press ■ STOP.

Notes

- To display the remaining time correctly, you may have to select the TAPE LENGTH in the SET UP MENU according to the type of the tape that you are using. For details, see page 65.
- In step 2, the VCR automatically rewinds and fast-forwards the tape only if you press the SEARCH MODE button right after you insert a tape. This is so that the VCR can measure the current position on the tape.
- You cannot use this function during any recording mode.

Searching using the Blank Search function

This feature enables you to find a blank section on your tape.



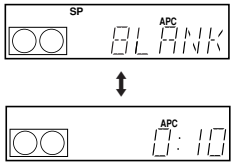
1 Press SEARCH MODE repeatedly until the BLANK indicator appears in the display window.

The SEARCH MODE indicator lights up.

2 Push the EASY TIMER knob on the VCR.

The SEARCH MODE indicator turns off. The VCR fast-forwards to the end of the tape. Then, the VCR rewinds the tape to the last recorded programme. After a few seconds, the VCR starts playback and stops at the beginning of the blank section.

"BLANK" and the remaining time of the blank section appear alternately in the display window for about one minute.

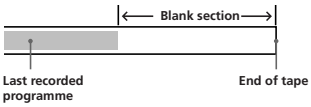


To stop searching

To stop the VCR while searching for a blank section, press ■ STOP.

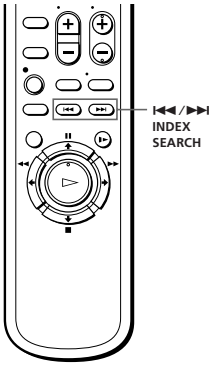
Notes

- To display the remaining time correctly, you may have to select the TAPE LENGTH in the SET UP MENU according to the type of the tape that you are using. For details, see page 65.
- In step 2, "FULL" will appear in the display window for about one minute, if:
  - there is no blank section available on the tape.
  - the remaining time of a blank section is less than one minute.
- The VCR can only detect the blank section between the end of the tape and the end of the last recorded programme.



Searching using the index function

The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 99 index signals ahead of or behind the current position. You can either use the INDEX SEARCH buttons on the remote commander or the SEARCH MODE button and EASY TIMER knob on the VCR.

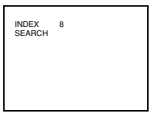


Using the INDEX SEARCH buttons on the remote commander

1 Insert an indexed tape into the VCR.

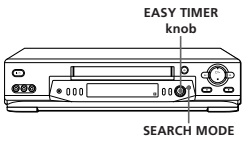
2 Press I◀◀ / ▶▶I INDEX SEARCH repeatedly to specify how many index signals ahead or behind you want to search:

- To search ahead, press ▶▶I INDEX SEARCH.
- To search backwards, press I◀◀ INDEX SEARCH.

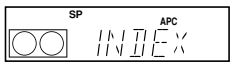


The VCR starts searching and the index number on the TV screen counts down to zero. Playback starts from the point about five seconds ahead of the specified index mark.

Using the SEARCH MODE button and EASY TIMER knob on the VCR

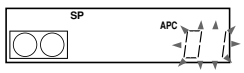


1 Press SEARCH MODE on the VCR repeatedly until "INDEX" appears in the display window (the SEARCH MODE indicator lights up).



2 Turn the EASY TIMER knob to specify how many index signals ahead or behind you want to search:

- To search ahead, turn the EASY TIMER knob clockwise.
- To search backwards, turn the EASY TIMER knob counterclockwise.



3 Push the EASY TIMER knob.

The VCR starts searching. Playback starts (the SEARCH MODE indicator turns off) from the point about five seconds ahead of the specified index mark.

To stop searching

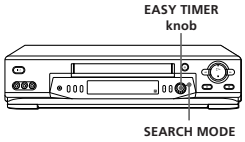
Press ■ STOP.

Note

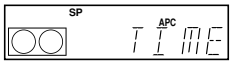
- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the channel during recording pause.

Searching using the Time Search function

You can easily find a specific point on a tape by using the Time Search function. For example, you can find a recorded section 15 minutes ahead of or behind the current position of a tape by using the Time Search function.



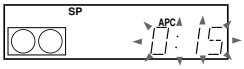
1 Press SEARCH MODE repeatedly until "TIME" appears in the display window (the SEARCH MODE indicator lights up).



2 Turn the EASY TIMER knob clockwise or counterclockwise to set the length of time you want the VCR to fast-forward or rewind the tape. Each turn on the knob increases or decreases the duration by 15 minutes.

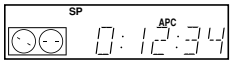
For example, if you want to watch a recorded section 15 minutes ahead of the current position, turn the EASY TIMER knob once clockwise.

To change the time by one minute, press PROGRAM +/–.



3 Push the EASY TIMER knob.

The VCR starts searching and the tape counter starts counting until it reaches the specified point.



The VCR starts playback automatically when the tape counter reaches the specified point (the SEARCH MODE indicator turns off).

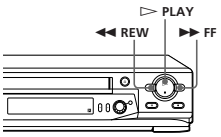
To stop searching

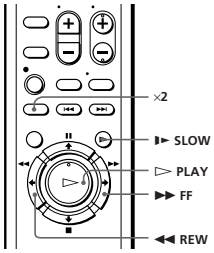
Press ■ STOP.

Tip

- The VCR can search up to three hours ahead of or behind the current position of a tape.

Playing/searching at various speeds





Playback options	Operation
View the picture during fast-forward or rewind	During fast-forward, hold down ▶▶ FF. During rewind, hold down ◀◀ REW.
Play at high speed	• During playback, press ▶▶ FF or ◀◀ REW on the remote commander. • During playback, hold down ▶▶ FF or ◀◀ REW. When you release the button, normal playback resumes.
Play at twice the normal speed	During playback or pause, press ×2.
Play in slow motion	During playback or pause, press ▮▶ SLOW.
Play frame by frame	During pause, press ▶▶ FF or ◀◀ REW on the remote commander. Hold down the button to play one frame each second.
Rewind and start play	While the tape is stopped, hold down ◀◀ REW on the VCR and press ▷ PLAY on the VCR.

To resume normal playback

Press ▷ PLAY.

Tips

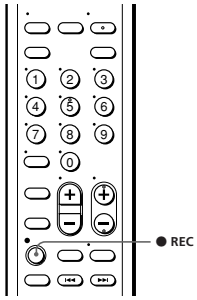
- Adjust the picture using TRACKING +/– on the VCR if:
  – streaks appear while playing in slow motion.
  – the picture shakes during pause.
  To set tracking to the centre position, press both buttons (+/–) at the same time.
- If noise appears during pause or frame-by-frame playback, first switch to the slow motion playback, then adjust the picture using TRACKING +/– on the VCR.

Notes

- The playback sound is muted during these operations.
- In LP or EP mode, noise may appear or there may be no colour.
- The picture may show noise when playing at high speed in reverse.
- On-screen symbols may shake while playing or searching at various speeds.

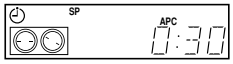
Setting the recording duration time

After you have started recording in the normal way, you can have the VCR stop recording automatically after a specified duration.



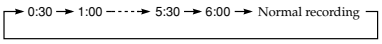
1 While recording, press ● REC.

The ◴ indicator appears in the display window.



2 Press ● REC repeatedly to set the duration.

Each press advances the time in increments of 30 minutes.



The tape counter decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press ● REC repeatedly to set to the new duration.

To cancel the duration

Press ● REC repeatedly until the ◴ indicator turns off and the VCR returns to normal recording mode.

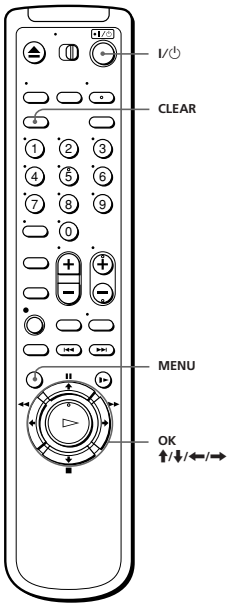
To stop recording

To stop the VCR while recording, press ■ STOP.

Checking/ changing/ cancelling timer settings

Before you start...

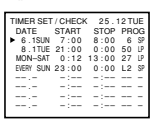
- Turn on your TV and set it to the video channel.



1 Press I/⏻ to turn on the VCR.

2 Press MENU, then select TIMER SET/CHECK and press OK:

- If you want to change or cancel a setting, go on to the next step.
- If you do not need to change or cancel the settings, press OK, then turn off the VCR to return to recording standby.



continued

Checking/changing/cancelling timer settings (continued)

3 Press ↑/↓ to select the setting you want to change or cancel:

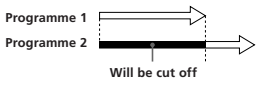
- To change the setting, press ←/→ to select the item you want to change, and press ↑/↓ to reset it. Then, press → repeatedly until the cursor (▶) appears at the beginning of the line.
- To cancel the setting, press CLEAR.

4 Press OK.

If any timer settings remain, turn off the VCR to return to recording standby.

When the timer settings overlap

The programme that starts first has priority and the second programme starts recording only after the first programme has finished. If the programmes start at the same time, the programme listed first in the menu has priority.



Recording stereo and bilingual programmes

In the ZWEITON (German stereo) system

This VCR automatically receives and records stereo and bilingual programmes based on the ZWEITON system. When a stereo or bilingual programme is received, the STEREO indicator appears in the display window.

To select bilingual sound while recording

Press AUDIO MONITOR to select the sound you want.

To listen to	On-screen display	Display window
Main	MAIN	STEREO
Sub	SUB	STEREO
Main and sub	MAIN/SUB	STEREO

In the NICAM system

This VCR receives and records stereo and bilingual programmes based on the NICAM system (the NICAM indicator appears). When a stereo or bilingual programme is received, the STEREO indicator appears in the display window.

To record a NICAM programme, HIFI AUDIO in the SET UP MENU should be set to NICAM (initial setting). To check the menu setting, see page 65.

To select the sound while recording

Press AUDIO MONITOR to select the sound you want.

Stereo programme

To listen to	On-screen display	Display window
Stereo	STEREO	STEREO
Standard sound*	No indicator	No indicator

* Usually the mixed sound of left and right channels (monaural)

continued

Bilingual programme

To listen to	On-screen display	Display window
Main	MAIN	STEREO
Sub	SUB	STEREO
Main and sub	MAIN/SUB	STEREO
Standard sound*	No indicator	No indicator

* Usually the main sound (monaural)

Selecting the sound during playback

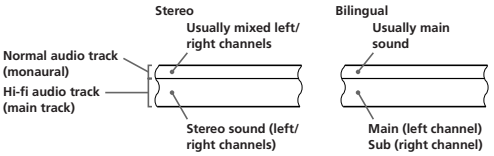
Press AUDIO MONITOR to select the sound you want.

To listen to	On-screen display	Display window
Stereo/main and sub (left and right channels)	STEREO	STEREO
Left channel/main	L CH	STEREO
Right channel/sub	R CH	STEREO
Standard sound*	No indicator	No indicator

* The mixed sound of left and right channels (monaural)

How sound is recorded on a video tape

The VCR records sounds onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.



Notes

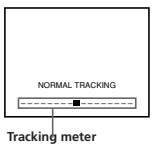
- To play a tape in stereo, you must use the AUDIO OUT connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that AUDIO MIX in the SET UP MENU is set to OFF.
- If HIFI AUDIO is set to STD, the standard sound will be recorded on both the hi-fi and normal audio tracks. Pressing AUDIO MONITOR will not change the sound.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the ⊠ indicator flashes in the display window, then turns off), distortion may occur if the tape was recorded in poor condition. If so, manually adjust the tracking.

Press the TRACKING +/– buttons on the VCR to display the tracking meter. The distortion should disappear as you press one of the two buttons (the ⊠ indicator lights up). To resume automatic tracking adjustment, eject the tape and reinsert it.

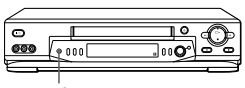


Tracking meter

About the R² (Reality Regenerator) function

The R² function automatically adjusts the picture to the most suitable quality during playback.

When playback starts, the R² function activates and the R² button lights up.



R²

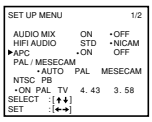
Each press of the button changes the effect and indication in the display window as follows:

REAL (status of playback started) → SOFT → DYNA (dynamic)

continued

About the Adaptive Picture Control (APC) function

The Adaptive Picture Control (APC) function automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON in the SET UP MENU (The APC indicator lights up in the display window).



APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

APC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

To deactivate the APC function

Press MENU and select SET UP MENU, then set APC to OFF. The APC indicator in the display window turns off.

Tip

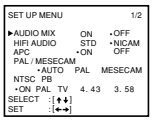
- To set the tracking to the centre position, press the TRACKING + and – buttons at the same time.

Note

- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyses the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press ● REC to have the VCR analyse the tape (the APC indicator flashes rapidly). After the APC indicator stops flashing, press ❚❚ PAUSE to start recording immediately. If you press ❚❚ PAUSE before the APC indicator stops flashing, the APC function is cancelled.

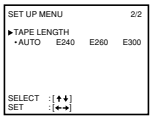
Changing menu options

1 Press MENU, then select SET UP MENU.



2 Press ↑/↓ to select the option to change, then press ←/→ to change the setting.

The SET UP MENU has 2 pages. To select page 2, press ↓ repeatedly until page 2 appears. To select page 1 press ↑ repeatedly until page 1 appears.



3 Press OK to return to the original screen.

Menu choices

Initial settings are indicated in bold print.

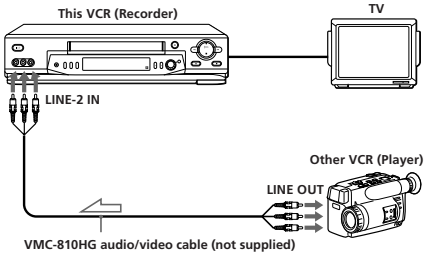
Menu option	Set this option to
AUDIO MIX	ON to listen to the hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function. **OFF** to listen to hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button.
HIFI AUDIO	STD to record standard sound on the hi-fi audio track. **NICAM** to record NICAM broadcasts on the hi-fi audio track. For details, see page 61.
APC	**ON** to switch on the APC (Adaptive Picture Control) function and improve picture quality. OFF to switch off APC.
PAL/MESECAM	**AUTO** to have the VCR automatically select the colour system for recording and playback. If the picture has no colour or unusual colours, set to PAL or MESECAM according to your local colour system.
NTSC PB	**ON PAL TV** to play back an NTSC-recorded tape on a PAL TV. 4.43 or 3.58 according to the colour system of your NTSC TV. For details, see page 35.
TAPE LENGTH	**AUTO** to have the VCR automatically select the tape length. For E240, E260 or E300 tapes, set it according to the tape type that you are using to display the remaining time correctly.

Note

- You may not be able to display the remaining time correctly for an NTSC tape using the TAPE LENGTH menu.

Connecting to a VCR or stereo system

How to connect to record on this VCR



: Signal flow

How to connect to a stereo system

Connect LINE-2 IN AUDIO on this VCR to the audio output jacks on the stereo system, using the RK-C510HG audio cable (not supplied).

Tips

- If the other VCR is a monaural type and connected to this VCR's LINE-2 IN jacks, connect the audio plug to the AUDIO L (white) jack. The sound is recorded on both right and left channels. When connecting to the AUDIO R (red) jack, the sound is recorded only on the right channel.
- You can also use the LINE-1 IN jacks instead. If the other VCR is a monaural type, the sound is recorded only on the channel whose jack is connected to the audio plug. To record on both right and left channels, connect the audio plugs to the AUDIO R/L jacks using a VMC-910HG audio/video cable (not supplied).

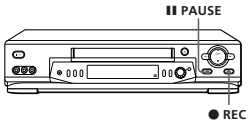
Notes

- Make sure you connect the plugs to the jacks of the same colour.
- If you connect this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.

Operation (when recording on this VCR)

Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT or PROG +/– to display "L1" or "L2" in the display window.
- Press REC SPEED to select the tape speed (SP or LP for the PAL system, and SP or EP for the NTSC system).



1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.

2 Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press ❚❚ PAUSE.

3 Press ● REC on this VCR and set it to recording pause.

4 To start editing, press the ❚❚ PAUSE buttons on both VCRs at the same time.

To stop editing

Press the ■ STOP buttons on both VCRs.

Tips

- To edit more precisely, press the ❚❚ PAUSE buttons on the VCRs to release pause.
- To cut out unwanted scenes while editing, press ❚❚ PAUSE on this VCR when an unwanted scene begins. When it ends, press ❚❚ PAUSE again to resume recording.

Note

- If you start recording following the procedure above, the VCR will not start recording with the APC function. To record a tape with the APC function, press ● REC again during recording pause in step 3 so that the VCR analyses the tape. Then when you start recording in step 4, press ❚❚ PAUSE after the APC indicator stops flashing. If you press ❚❚ PAUSE before the APC indicator stops flashing, the APC function is cancelled.

Sapphire tape cleaner

The unit incorporates a sapphire tape cleaner which cleans a video tape when it is loaded. This cleaner can prevent the video heads from contamination by removing dust or mold from a tape with its sapphire edge.

Head Condition Sensor

The Head Condition Sensor checks the condition of the video heads. If the heads are dirty, a message will instruct you to insert a video head cleaning cassette.

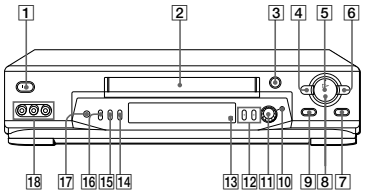
The VCR may temporarily switch to a different head and resume playback. To switch the heads, press ▷ PLAY while the "PUSH [PLAY] TO RESUME TEMPORARILY" message appears on the screen. Although playback will resume, the sound will be monaural. You may have to manually adjust the tracking to get a better picture (see "Adjusting the picture" on page 63). When playback is finished, be sure to clean the heads with a video head cleaning cassette.

Be sure to use the Sony T-25CLD, T-25CLW or E-25CLDR video head cleaning cassette. If these cleaning cassettes are not available in your area, have the heads cleaned at your nearest Sony service facility (a standard service charge will be required).

Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

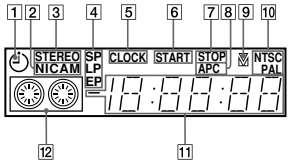
Front panel



1 I/⏻ ON/STANDBY switch (8)
2 Tape compartment
3 ⏏ EJECT button (35)
4 ◀◀ REW (rewind) button (35, 57)
5 ▷ PLAY button (35)
6 ▶▶ FF (fast-forward) button (35, 57)
7 ● REC (record) button (38)
8 ■ STOP button (35)
9 ❚❚ PAUSE button (35)
10 SEARCH MODE button/indicator (51, 52, 53, 55, 56)
11 EASY TIMER knob (40, 51, 52, 53, 55, 56)
12 PROGRAM/TRACKING +/– buttons (8, 63)
13 Remote sensor (5)
14 REC SPEED SP (Standard Play)/LP (Long Play)/EP (Extended Play) button (38)
15 COLOR SYSTEM button (35)
16 ONE TOUCH TUNING/RF (Radio Frequency) CHANNEL button (8, 10)
17 R² (Reality Regenerator) button (63)
18 LINE-2 IN VIDEO/AUDIO L/R jacks (66)

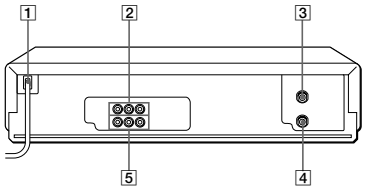
continued

Display window



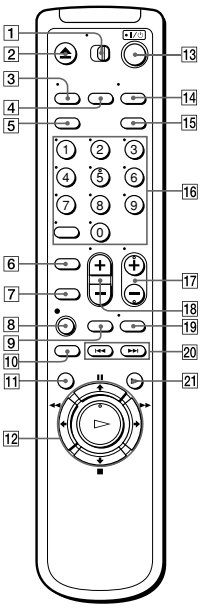
1 Timer indicator (41)
2 NICAM indicator (61)
3 STEREO indicator (61)
4 Tape speed indicator (38)
5 CLOCK indicator (42)
6 START indicator (40)
7 STOP indicator (40)
8 APC (Adaptive Picture Control) indicator (64)
9 Tracking indicator (63)
10 Colour system indicator (35)
11 Time counter/clock/line/programme/TV system indicator (8, 36, 37, 42, 67)
12 Tape/recording indicator (38)

Rear panel



1 Mains lead (6)
2 LINE-1 IN AUDIO R/L/VIDEO jacks (66)
3 AERIAL IN connector (6)
4 AERIAL OUT connector (6)
5 LINE OUT AUDIO R/L/VIDEO jacks (7)

Remote commander

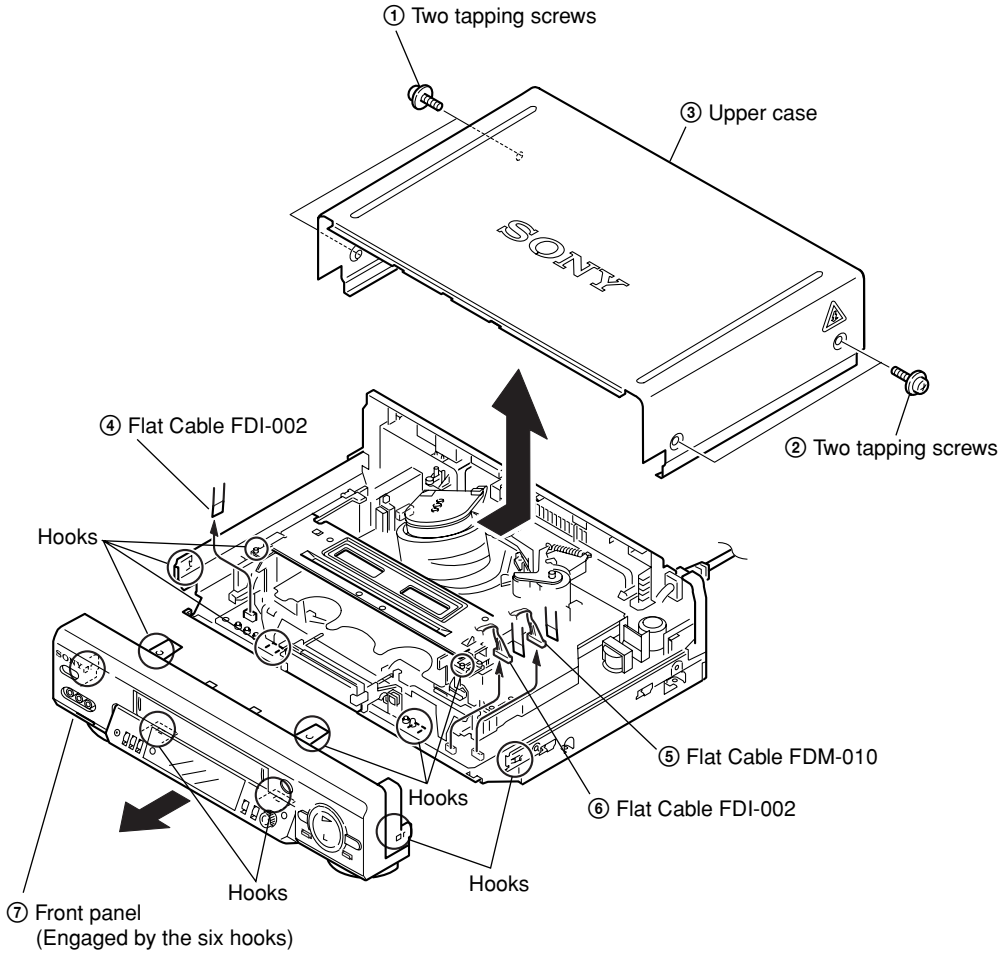


1 TV/VIDEO remote control switch (5)
2 ⏏ EJECT button (35)
3 TV/VIDEO button *(for TV)* (5)
4 INPUT SELECT button (39, 50)
5 CLEAR button (36, 47, 60)
6 EASY TIMER button (43)
7 R² (Reality Regenerator) button (63)
8 ● REC button (38, 58)
9 REC SPEED button (38)
10 ×2 button (57)
11 MENU button (11, 65)
12 Tape/menu operation buttons
❚❚ PAUSE/↑ button (35)
■ STOP/↓ button (35)
◀◀ REW (rewind)/← button (35, 57)
▶▶ FF (fast-forward)/→ button (35, 57)
▷ PLAY/OK button (35)
13 I/⏻ (on/standby) switch (47)
14 AUDIO MONITOR button (61)
15 G-CODE button (46)
16 Programme number /–/–– (ten's digit) buttons (39, 43, 47)
17 PROG (programme) +/– buttons (37)
18 VOL (volume) +/– buttons *(for TV)*
19 DISPLAY button (38)
20 ⏮/⏭ INDEX SEARCH buttons (54)
21 ▮► SLOW button (57)

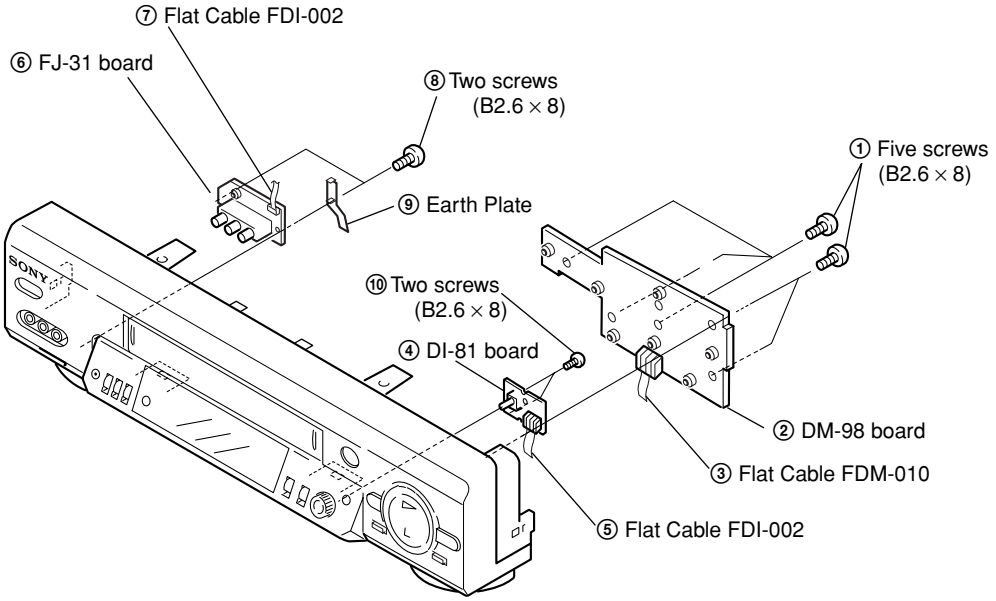
SECTION 2
DISASSEMBLY

NOTE: Follow the disassembly procedure in the numerical order given.

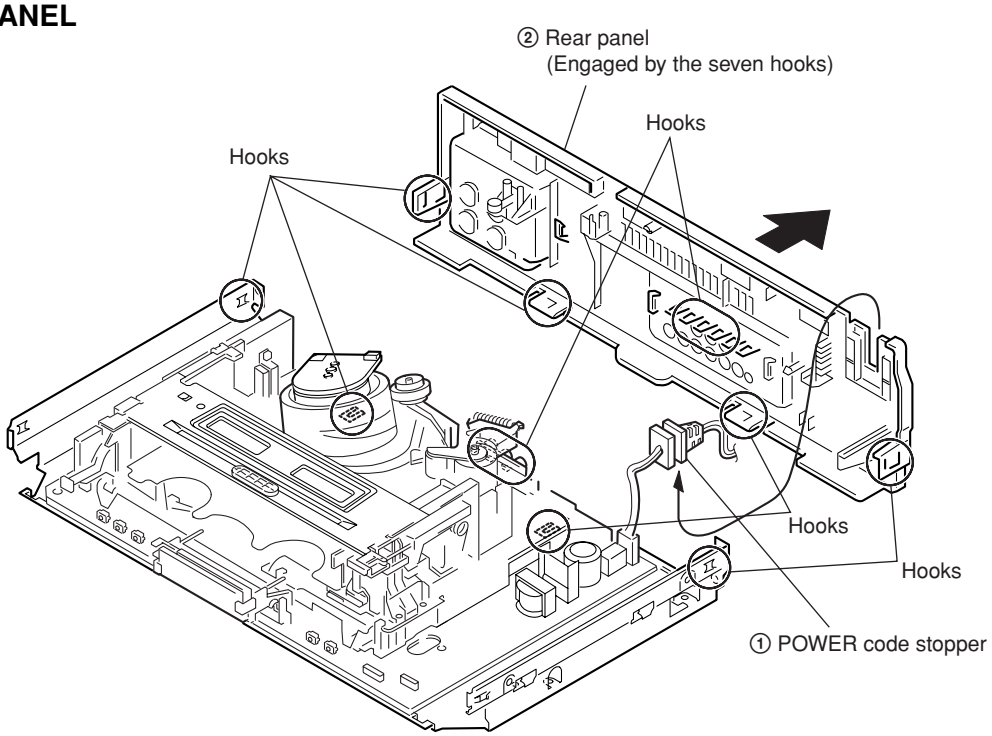
2-1. CASE, FRONT PANEL BLOCK ASSEMBLY



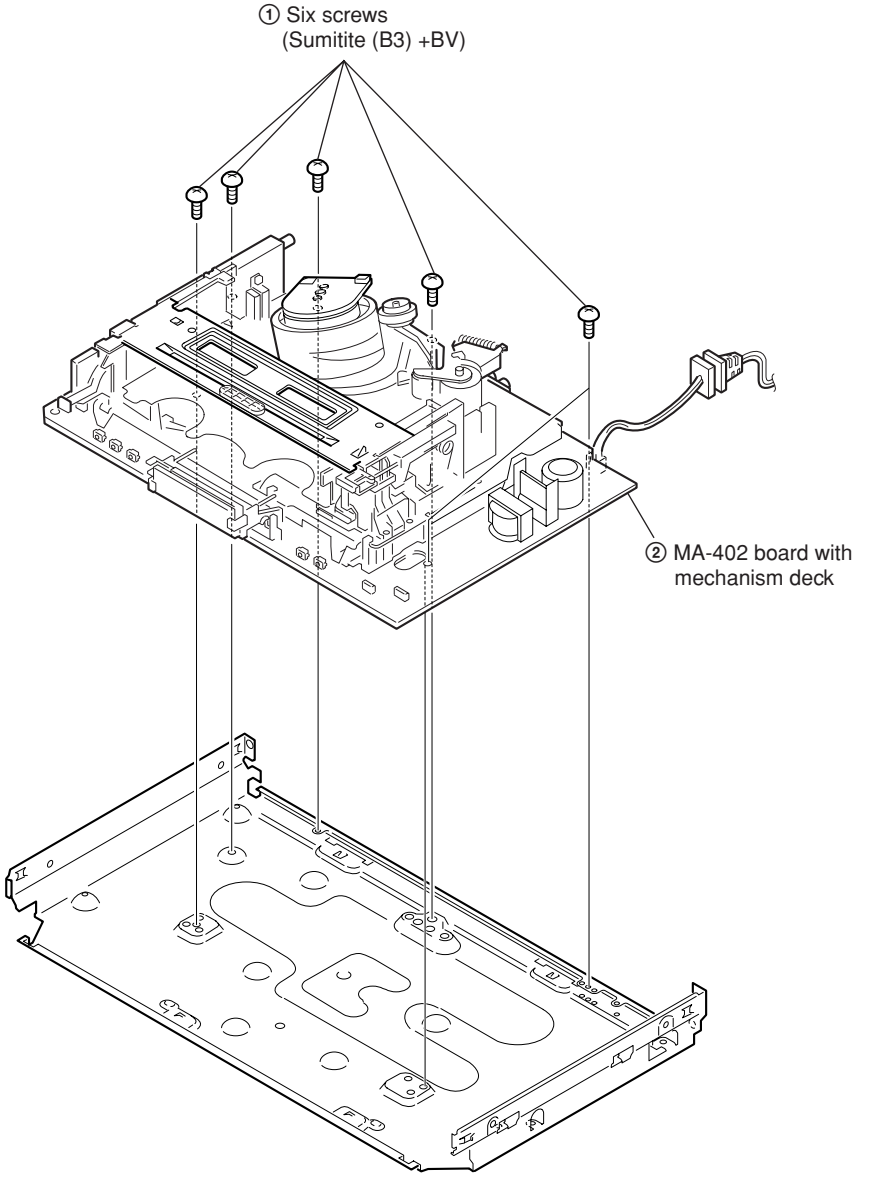
2-2. DM-98 BOARD, DI-81 BOARD, FJ-31 BOARD



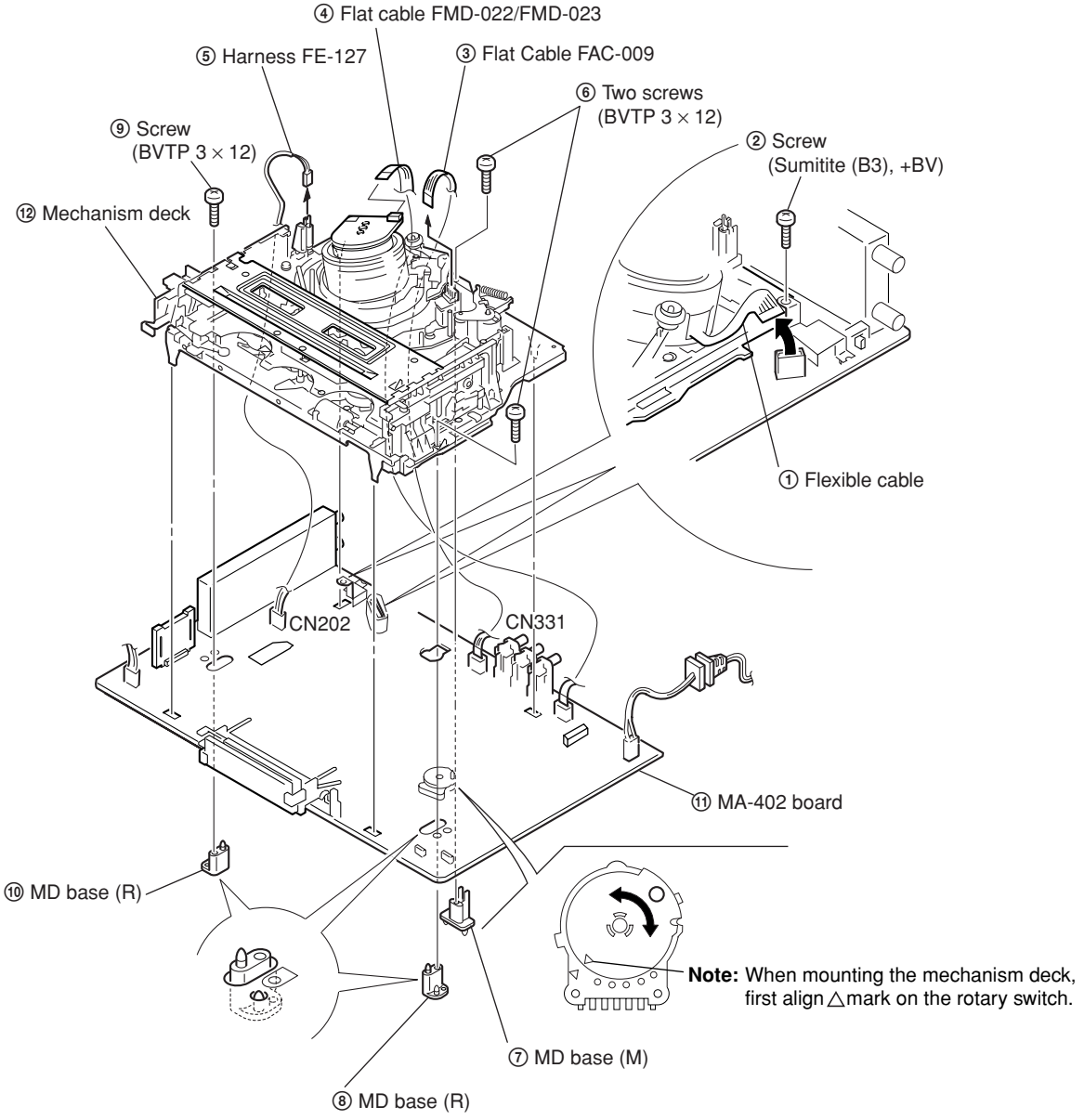
2-3. REAR PANEL



2-4. MA-402 BOARD



2-5. MECHANISM DECK



2-6. INTERNAL VIEWS

Drum assembly (M901) (DZH-89D-R)
1-772-360-11 (ED115/ED215/ED313/EZ111/EZ212)
Drum assembly (M901) (DZH-0D1A-R)
1-796-012-11 (ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)
Drum assembly (M901) (DZH-0D0A-R)
1-796-011-11 (ED515/ED616/EZ414)

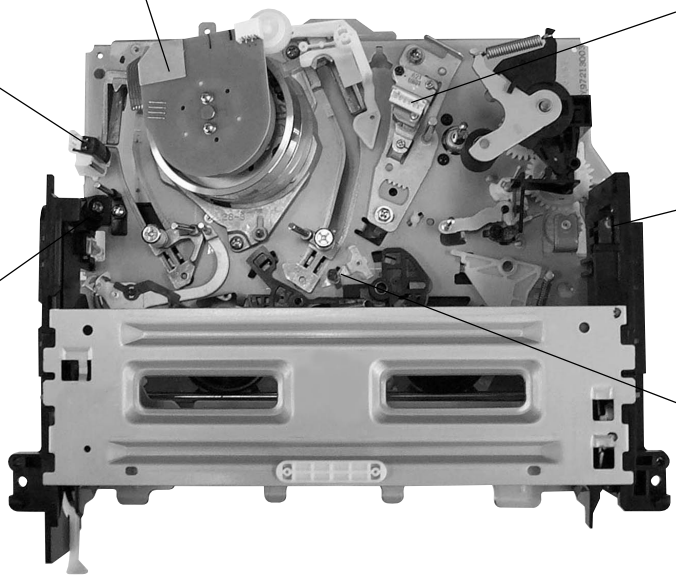
ACE head assembly
A-6775-791-A

FE head
1-500-471-11

Q001
Tape end sensor
8-729-043-84

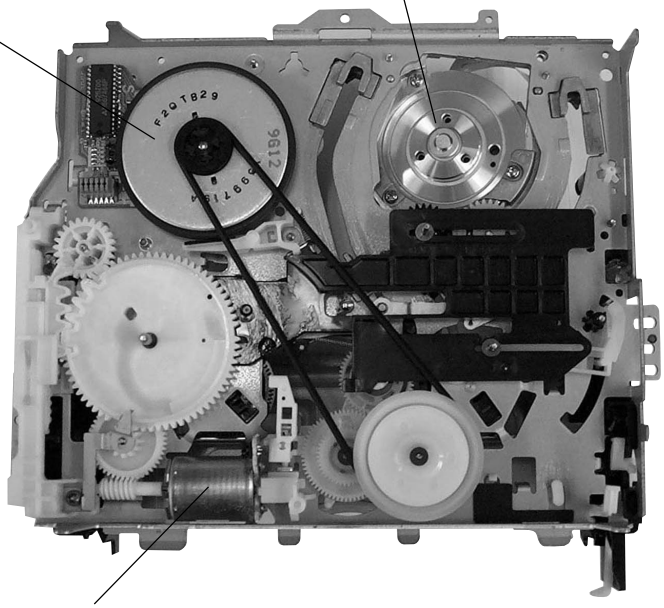
Q002
Tape top sensor
8-729-043-84

D001
Tape top/end LED
8-719-048-26



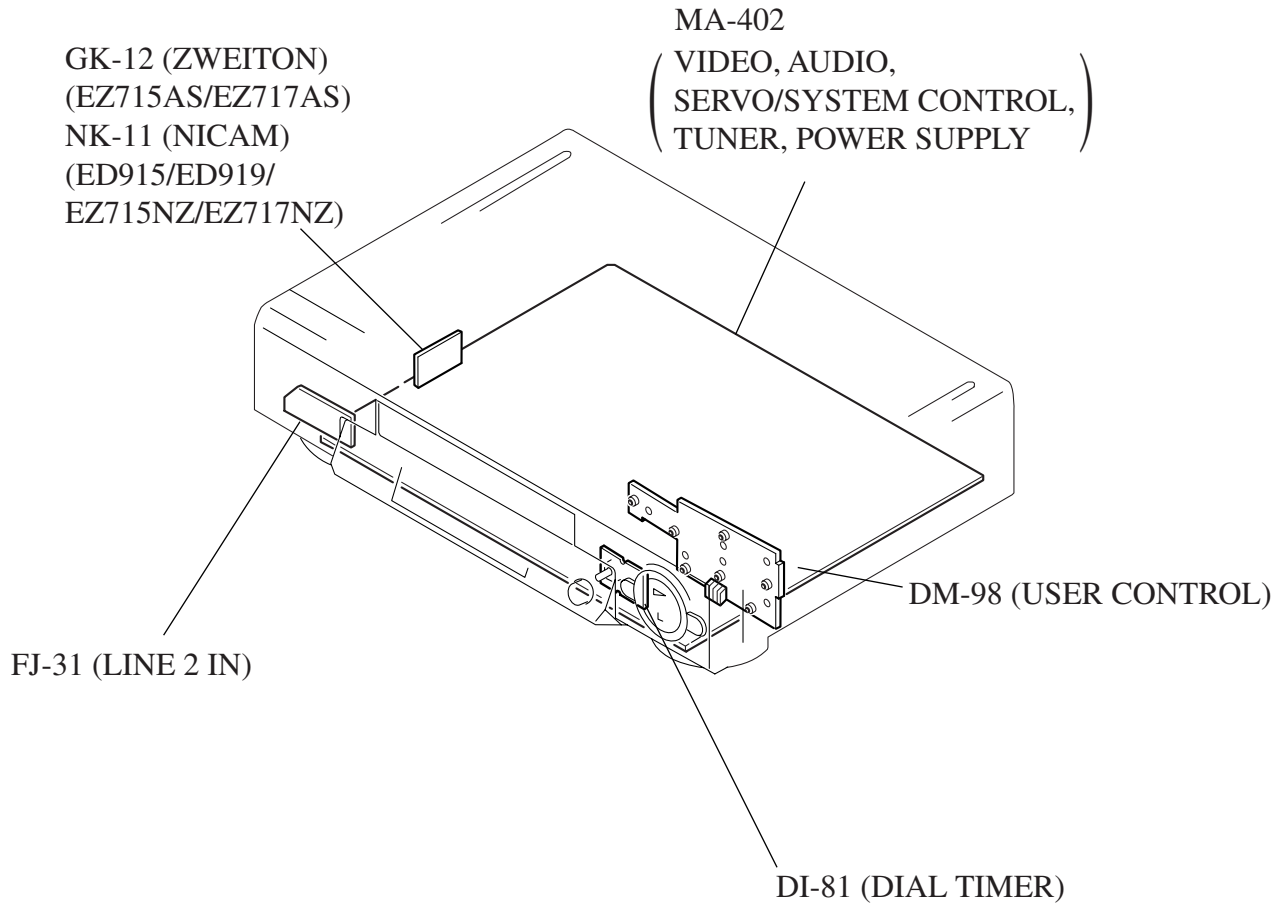
Drum assembly (M901) (DZH-89D-R)
1-772-360-11 (ED115/ED215/ED313/EZ111/EZ212)
Drum assembly (M901) (DZH-0D1A-R)
1-796-012-11 (ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)
Drum assembly (M901) (DZH-0D0A-R)
1-796-011-11 (ED515/ED616/EZ414)

M902
Capstan motor
1-763-572-11



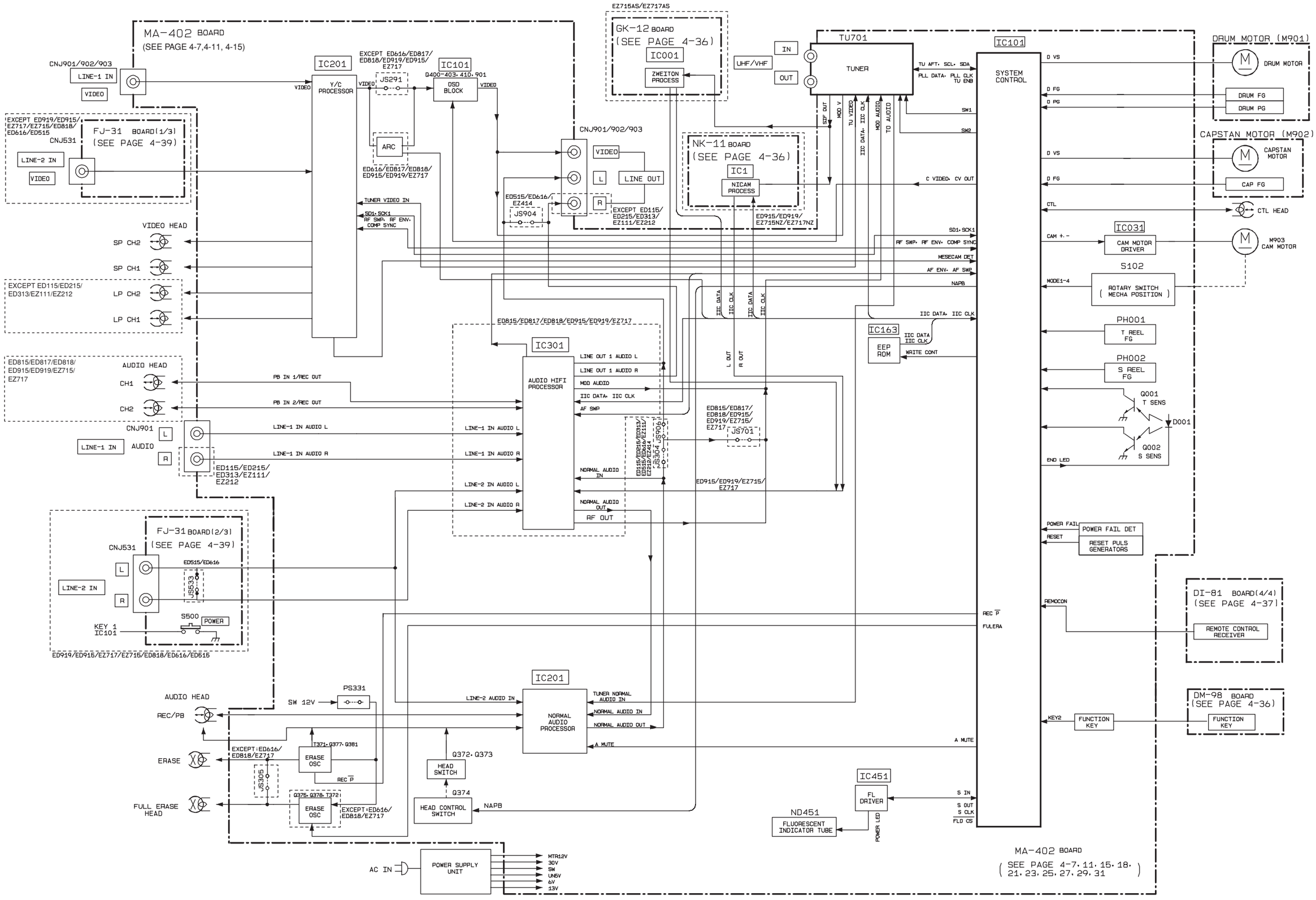
M903
Cam motor assembly
X-3950-970-1

2-7. CIRCUIT BOARDS LOCATION

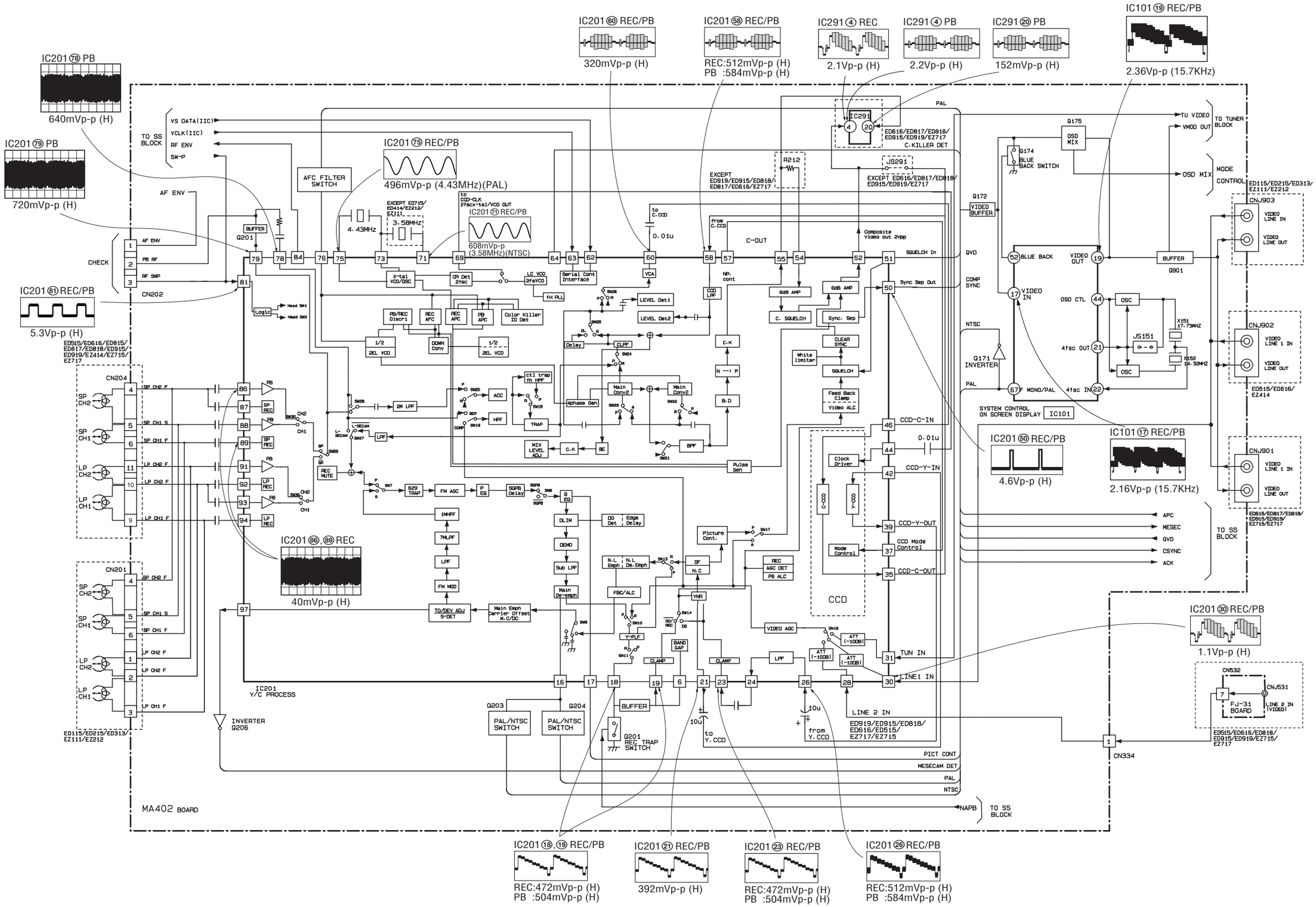


SECTION 3
BLOCK DIAGRAMS

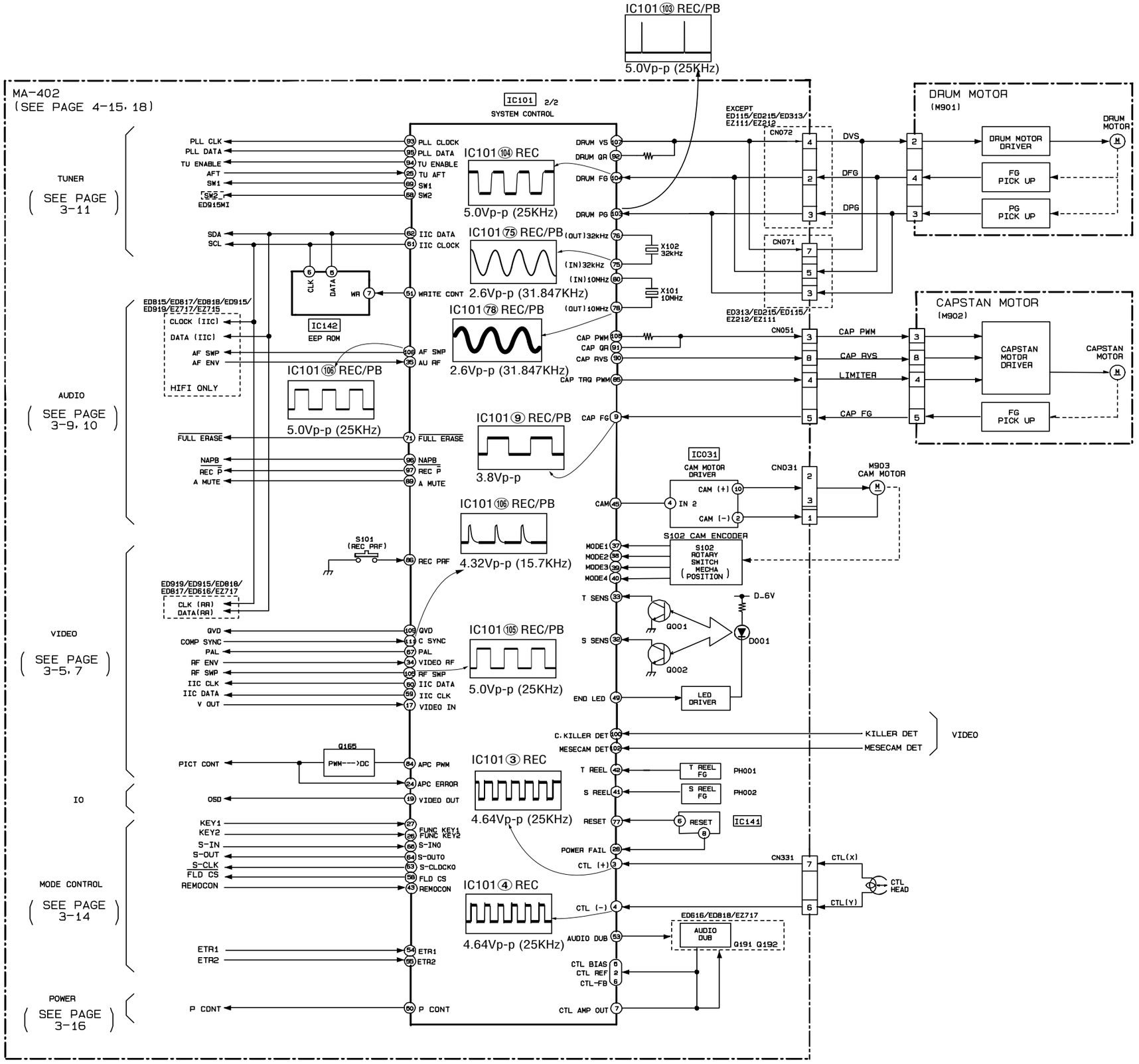
3-1. OVERALL BLOCK DIAGRAM



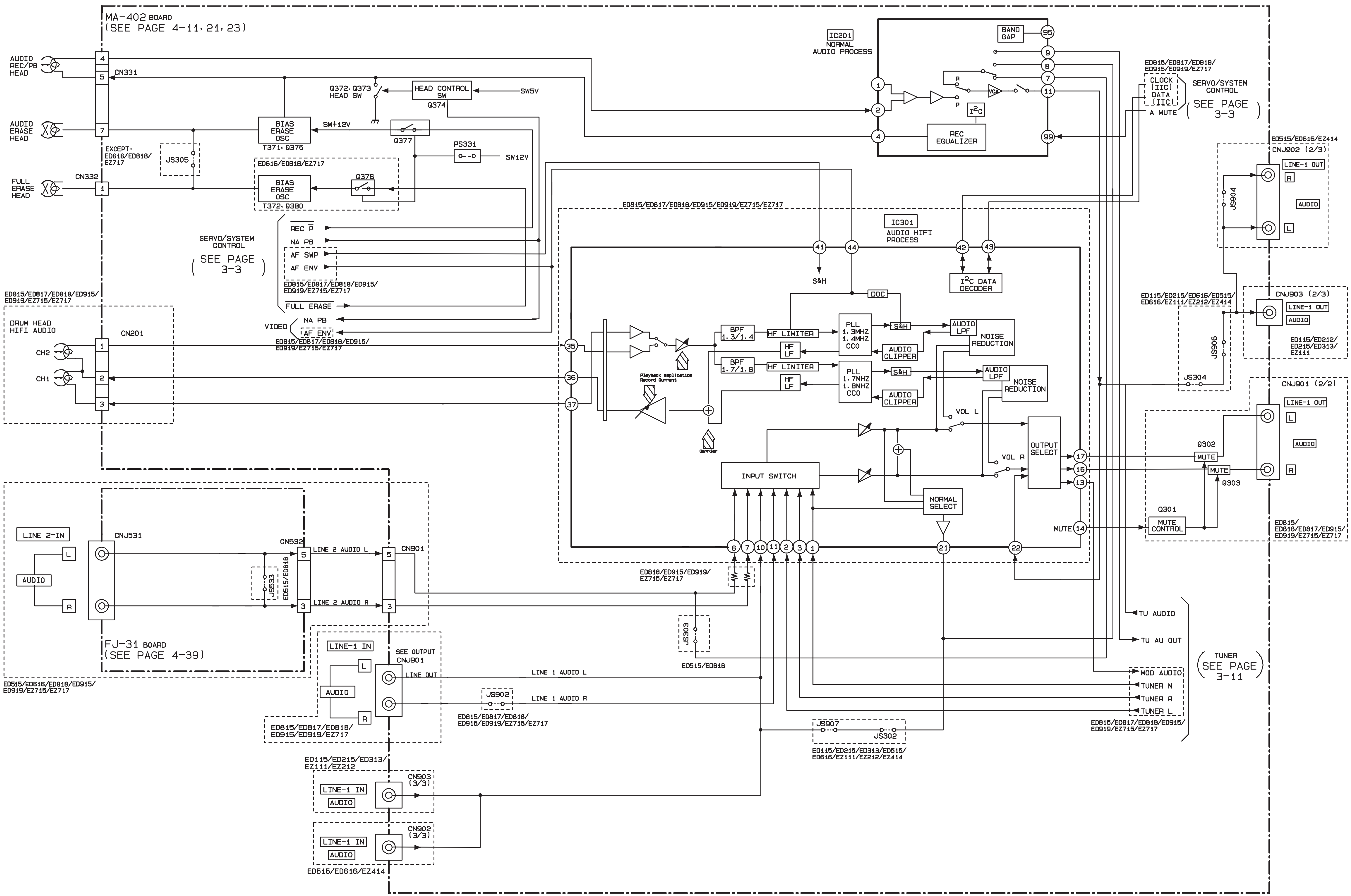
3-2. VIDEO BLOCK DIAGRAM



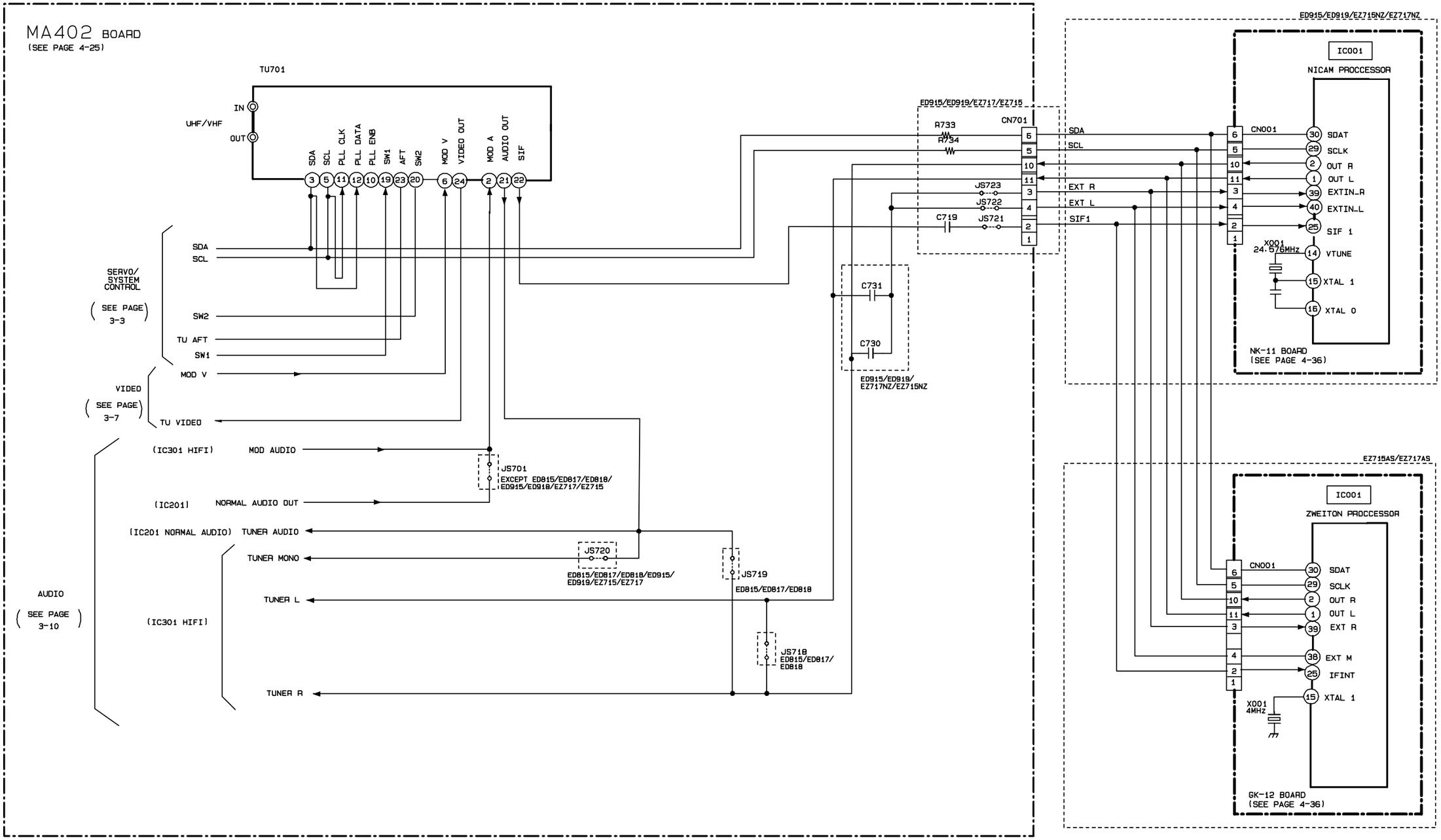
3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM



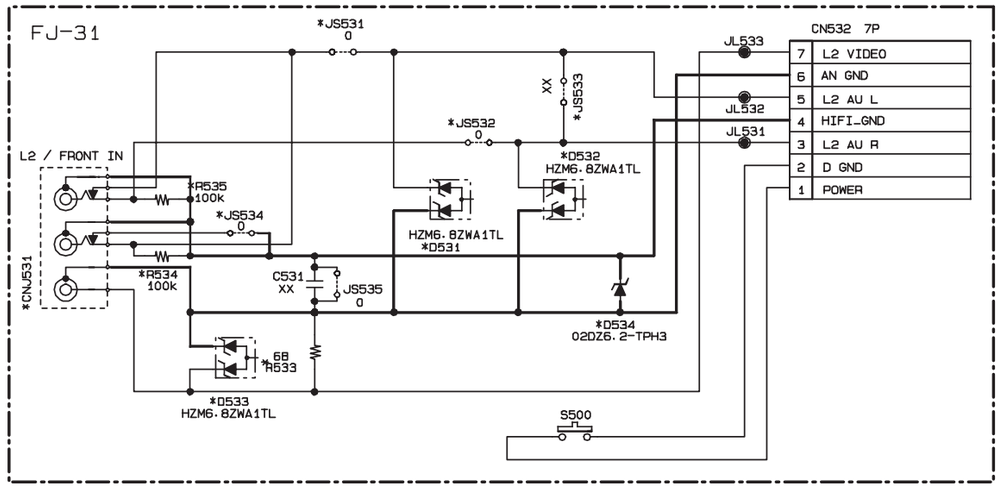
3-4. AUDIO BLOCK DIAGRAM

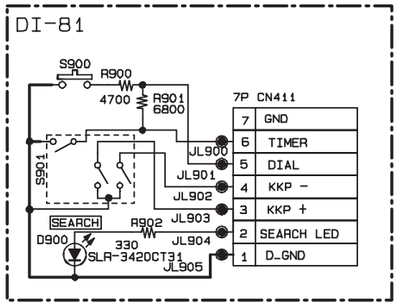


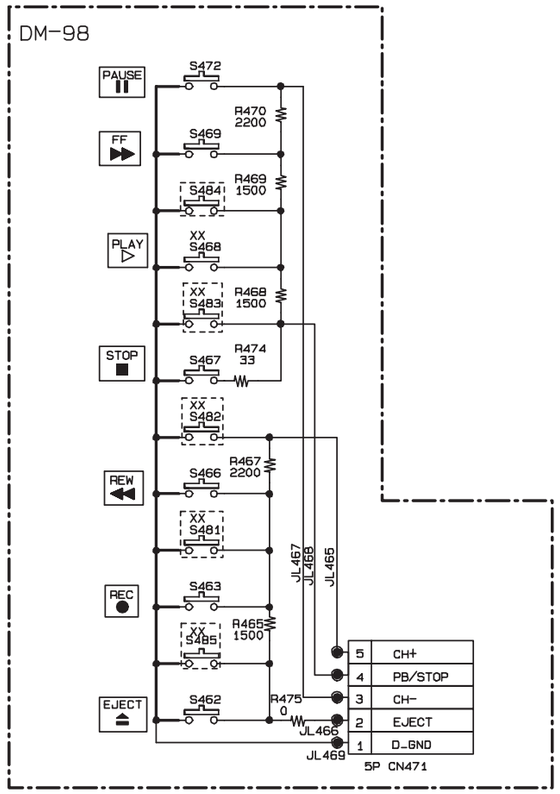
3-5. TUNER BLOCK DIAGRAM

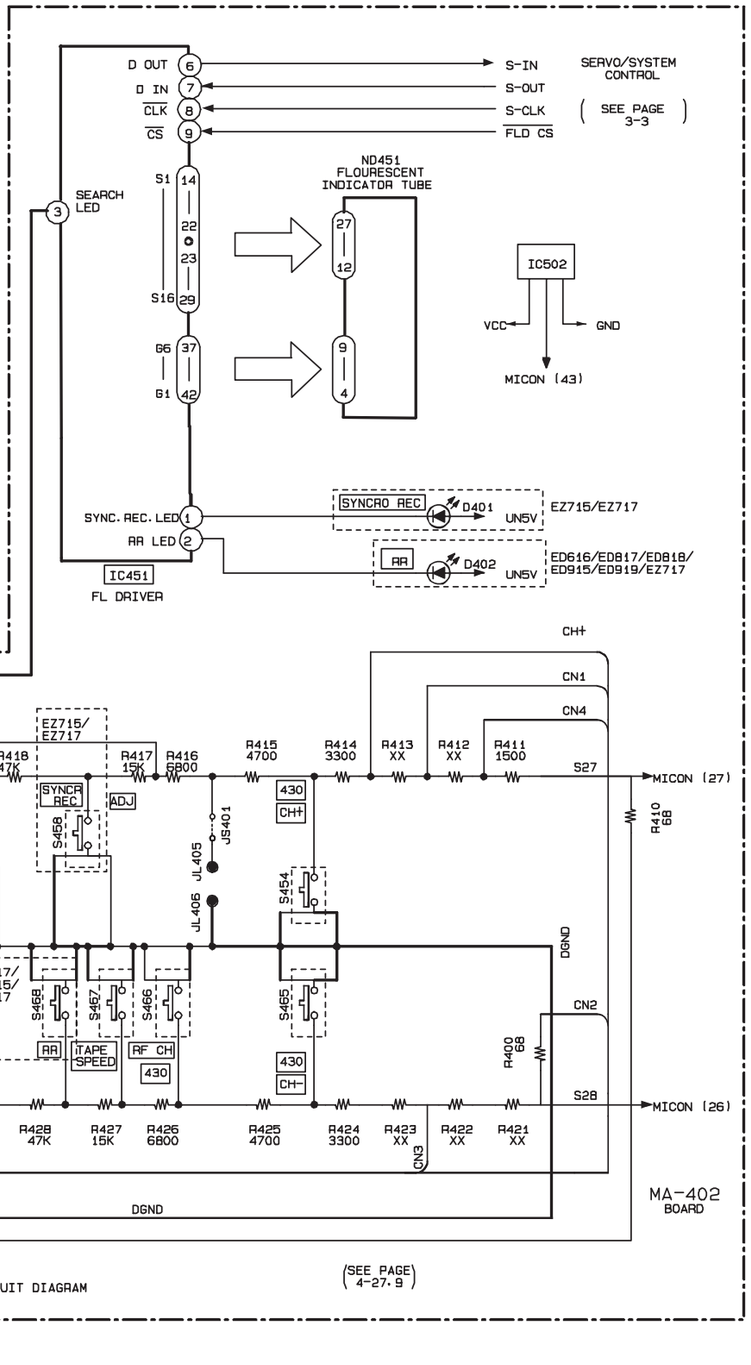


3-6. MODE CONTROL BLOCK DIAGRAM

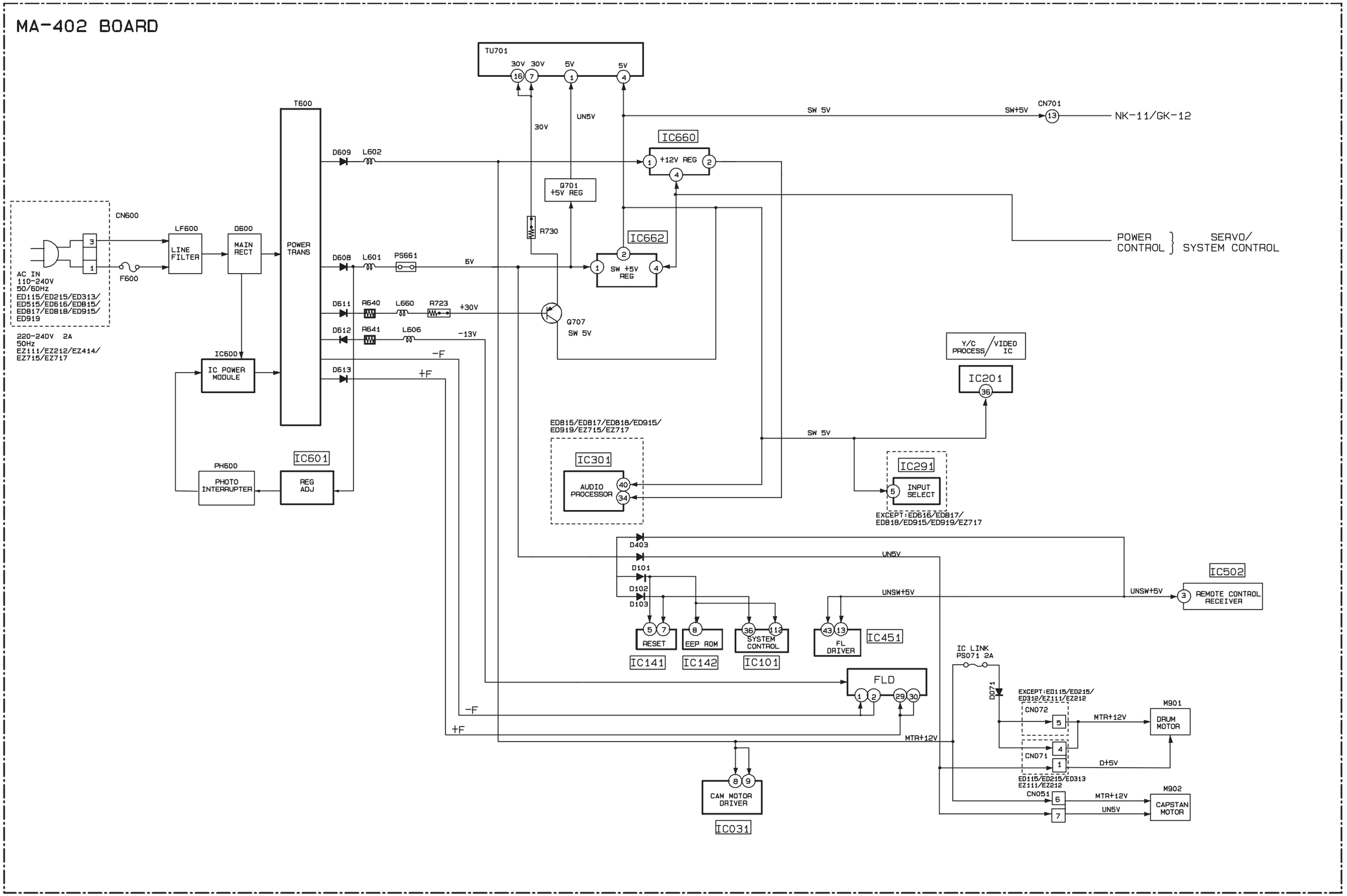








3-7. POWER BLOCK DIAGRAM

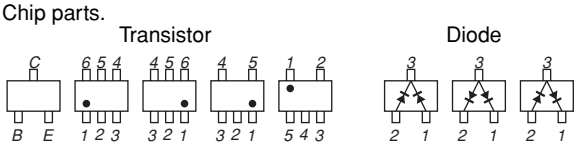


SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

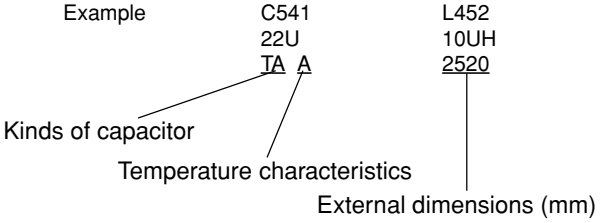
(For printed wiring boards)

- ▒ : Pattern from the side which enables seeing.
  (The other layers' patterns are not indicated.)
- Through hole is omitted.
- Circled numbers refer to waveforms.
- There are few cases that the part printed on diagram isn't mounted in this model.
- Chip parts.



(For schematic diagrams)

- All capacitors are in μF unless otherwise noted. pF : μμF. 50V or less are not indicated except for electrolytics and tantalums.
- Chip resistors are 1/10W unless otherwise noted.
  kΩ=1000Ω, MΩ=1000kΩ.
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, Because it is damaged by the heat.
- Some chip part will be indicated as follows.

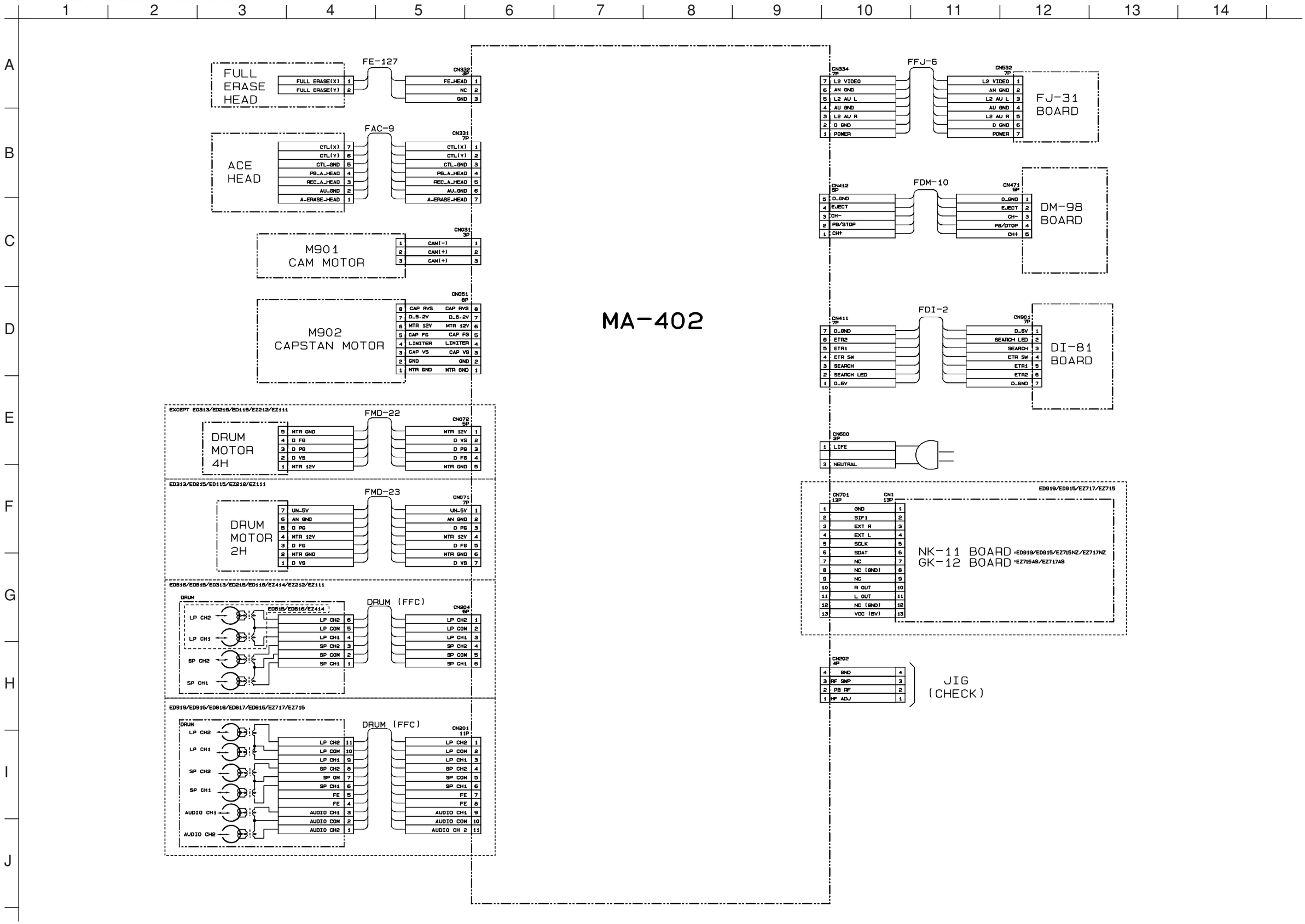


- Constants of resistors, capacitors, ICs and etc with XX indicate that they are not used.
  In such cases, the unused circuits may be indicated.
- Parts with ★ differ according to the model/destination.
  Refer to the mount table for each function.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Signal name
  XEDIT → $\overline{\text{EDIT}}$ PB/XREC → PB/$\overline{\text{REC}}$
- : non flammable resistor
- : fusible resistor
- : panel designation
- △ : internal component.
- B + : B+ Line.
- B – : B– Line.
- Circled numbers refer to waveforms.
- Readings are taken with a color-bar signal input.
- Voltage are dc between ground and measurement points.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.
- : adjustment for repair.
- Circled numbers refer to waveforms.

When indicating parts by reference number, please include the board name.

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

4-1. FRAME SCHEMATIC DIAGRAM



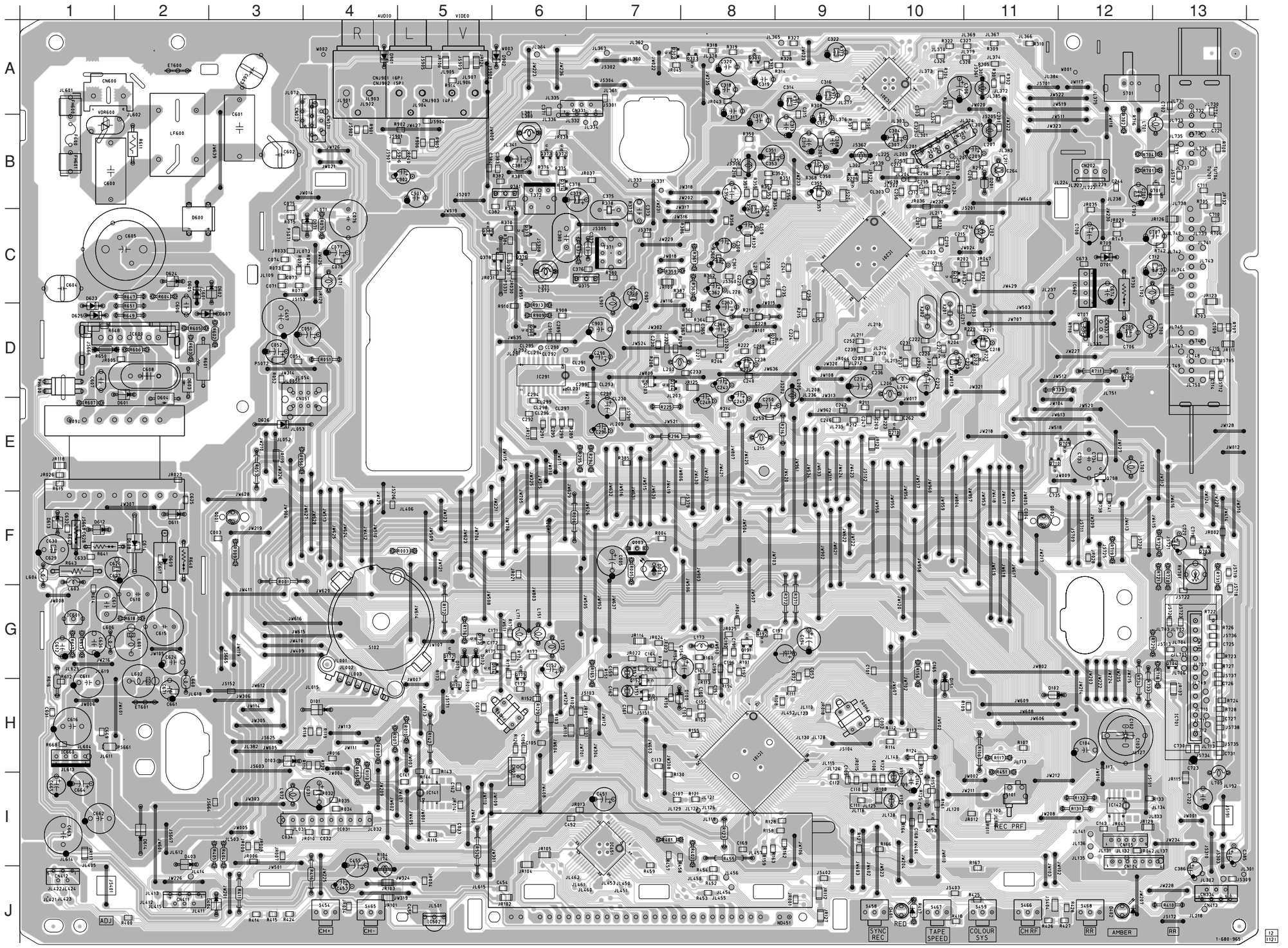
4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

MA-402 (VIDEO, AUDIO, I/O, SERVO/SYSTEM CONTROL, TUNER, MODE CONTROL, POWER SUPPLY) PRINTED WIRING BOARD

— Ref. No. MA-402 Board:1,000 Series —

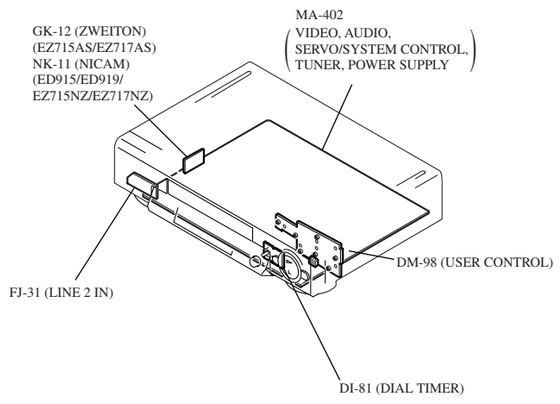
There are few cases that the part printed on this diagram isn't mounted in this model.

MA-402 Board



MA-402 BOARD

CN031	H-6	IC141	I-5
CN051	E-3	IC142	I-12
CN071	B-4	IC201	C-10
CN072	B-3	IC291	D-6
CN104	I-12	IC301	A-10
CN105	I-12	IC451	I-7
CN201	B-10	IC502	J-5
CN202	B-12	IC600	D-2
CN204	B-10	IC601	G-1
CN331	A-6	IC660	H-1
CN332	D-12	IC662	C-12
CN334	J-13	IC701	H-13
CN411	J-2		
CN412	J-1	Q001	F-3
CN413	J-13	Q002	F-11
CN600	A-1	Q003	F-7
CN701	G-13	Q151	H-7
		Q152	H-7
D001	F-7	Q153	I-10
D071	C-4	Q171	H-5
D100	H-8	Q172	G-5
D101	H-4	Q173	G-5
D102	H-11	Q174	G-5
D103	H-3	Q175	G-6
D151	H-10	Q191	G-8
D171	G-5	Q192	G-8
D172	G-5	Q201	C-10
D201	B-11	Q202	D-11
D401	J-10	Q203	D-7
D402	J-12	Q204	D-7
D403	I-2	Q206	B-9
D404	J-3	Q210	E-10
D600	C-2	Q211	D-8
D601	E-2	Q301	A-8
D602	C-3	Q302	A-7
D603	D-2	Q303	A-8
D604	E-2	Q372	B-6
D605	C-2	Q373	B-6
D607	D-3	Q374	B-6
D608	F-2	Q375	C-6
D609	F-2	Q376	C-6
D611	F-2	Q377	C-6
D612	F-1	Q378	C-5
D613	F-1	Q380	C-5
D614	I-2	Q381	B-6
D623	C-1	Q701	B-13
D624	C-2	Q703	F-13
D625	D-1	Q704	G-13
D626	E-3	Q706	D-12
D701	C-12	Q707	D-12
D901	A-4	Q708	E-12
D902	A-6	Q709	E-12
		Q710	E-11
IC031	I-4	Q901	D-6
IC101	H-8		



MA-402 (VIDEO, AUDIO) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

• **See page 4-5 for printed wiring board.**

MA-402 BOARD(1/8)

XX MARK:NO MOUNT
NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

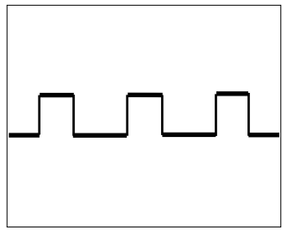
IC201
HA118217F

VIDEO REC/PB AMP
VIDEO INPUT SELECT
Y/C PROCESS
NORMAL AUDIO PROCESS

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨

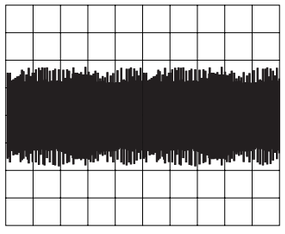
MA-402 BOARD (1/8)
(VIDEO, AUDIO BLOCK)

❶ IC201 ㉛ REC/PB



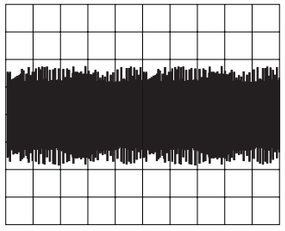
5.3 Vp-p (H)

❷ IC201 ㊱, ㊴ REC



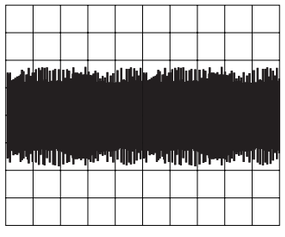
40 mVp-p (H)

❸ IC201 ㉙ PB



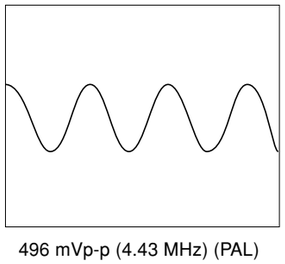
720 mVp-p (H)

❹ IC201 ㉘ PB



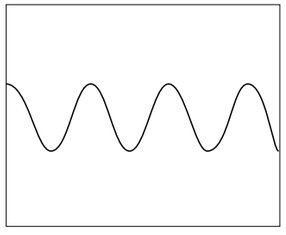
640 mVp-p (H)

❺ IC201 ㉕ REC/PB



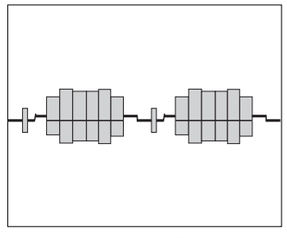
496 mVp-p (4.43 MHz) (PAL)

❻ IC201 ㉑ REC/PB



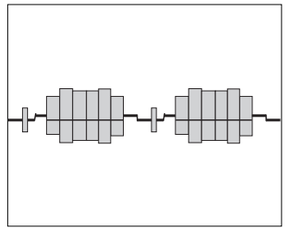
608 mVp-p (3.58 MHz) (NTSC)

❼ IC201 ㊵ REC/PB



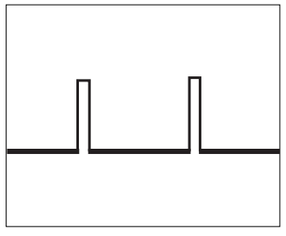
320 mVp-p (H)

❽ IC201 ㊽ REC/PB



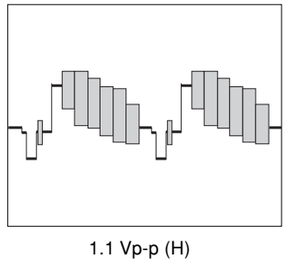
REC: 512 mVp-p (H)
PB : 584 mVp-p (H)

❾ IC201 ㊿ REC/PB



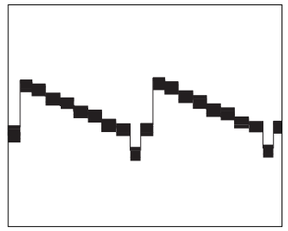
4.6 Vp-p (H)

❿ IC201 ㉚ REC/PB



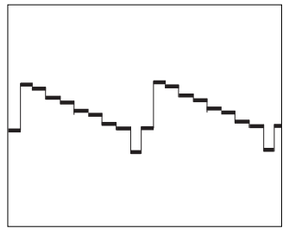
1.1 Vp-p (H)

⓫ IC201 ㉖ REC/PB



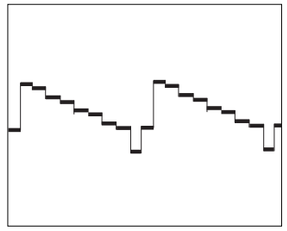
REC: 512 mVp-p (H)
PB : 584 mVp-p (H)

⓬ IC201 ⑱, ⑲, ㉓ REC/PB



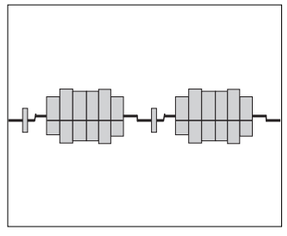
REC: 472 mVp-p (H)
PB : 504 mVp-p (H)

⓭ IC201 ㉑ REC/PB



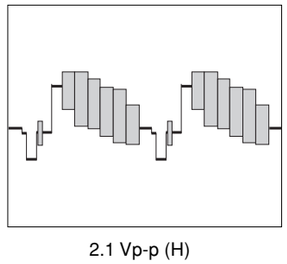
392 mVp-p (H)

⓮ IC291 ⑳ PB



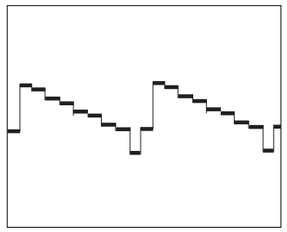
152 mVp-p (H)

⓯ IC291 ④, ⑱ REC



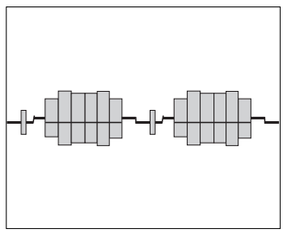
2.1 Vp-p (H)

⓰ IC291 ⑱ PB



1.9 Vp-p (H)

⓱ IC291 ④ PB



2.2 Vp-p (H)

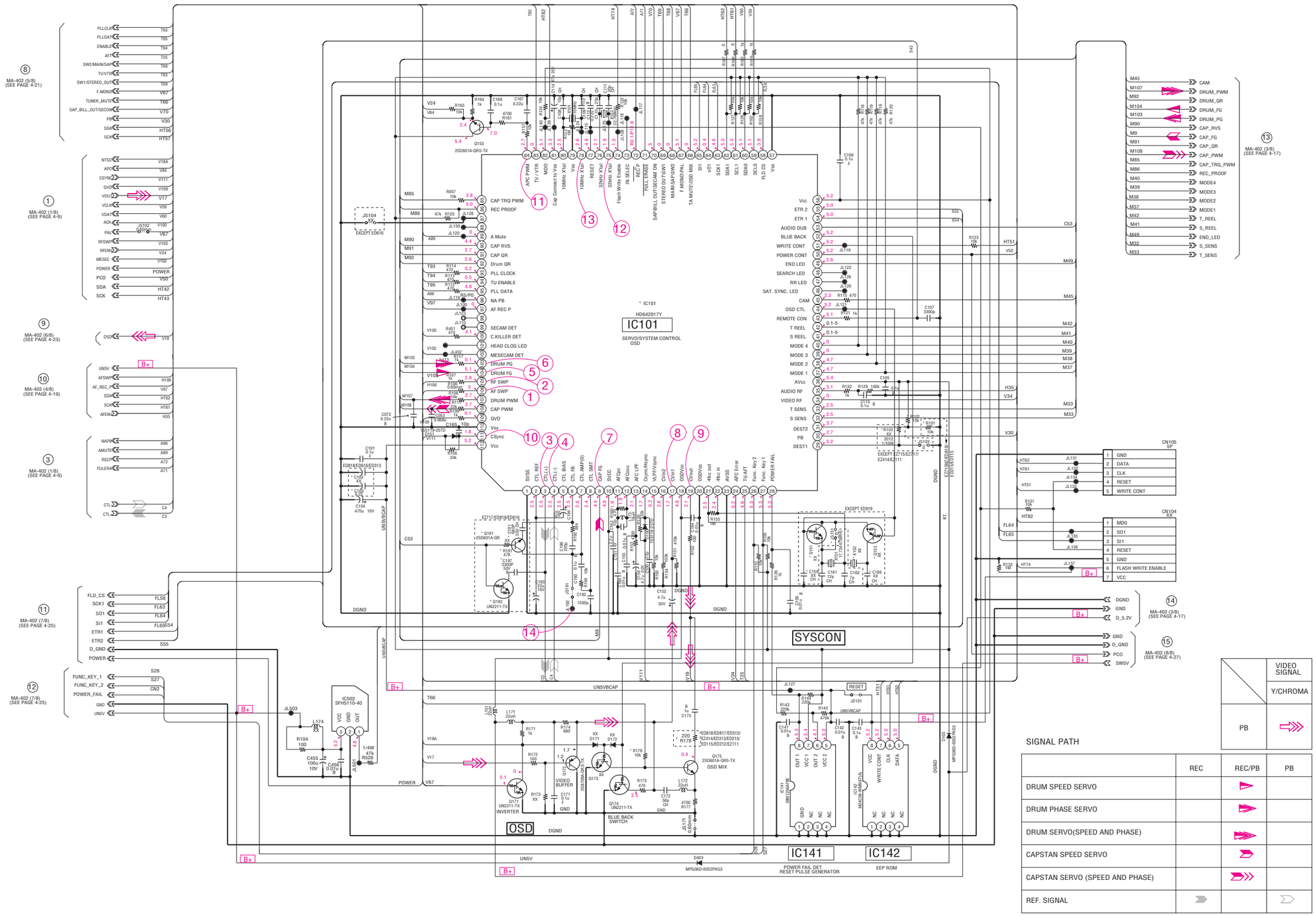
MA-402 (SYSTEM CONTROL) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

• **See page 4-5 for printed wiring board.**

MA-402 BOARD(2/8)

XX MARK:NO MOUNT
NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE



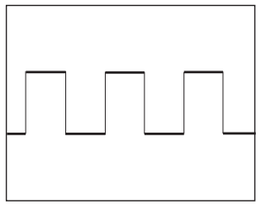
	VIDEO SIGNAL
	Y/CHROMA
PB	

SIGNAL PATH

	REC	REC/PB	PB
DRUM SPEED SERVO			
DRUM PHASE SERVO			
DRUM SERVO(SPEED AND PHASE)			
CAPSTAN SPEED SERVO			
CAPSTAN SERVO (SPEED AND PHASE)			
REF. SIGNAL			

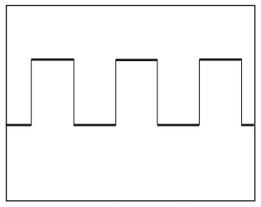
MA-402 BOARD (2/8)
(SYSTEM CONTROL)

❶ IC101 ⑯ REC/PB



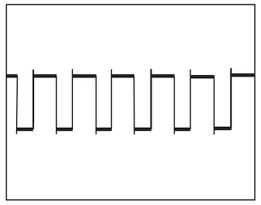
5.0 Vp-p (25Hz)

❷ IC101 ⑮ REC/PB



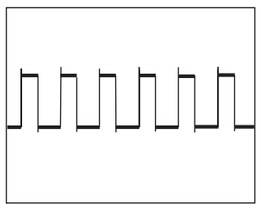
5.0 Vp-p (25Hz)

❸ IC101 ③ REC



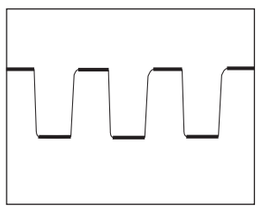
4.64 Vp-p (25Hz)

❹ IC101 ④ REC



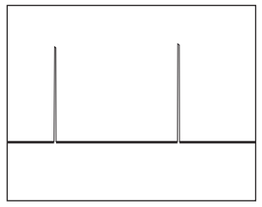
4.64 Vp-p (25Hz)

❺ IC101 ⑭ REC



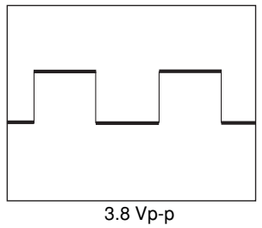
5.0 Vp-p (25Hz)

❻ IC101 ⑬ REC/PB



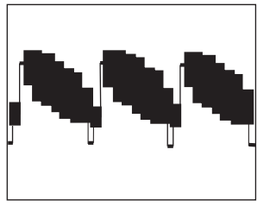
5.0 Vp-p (25Hz)

❼ IC101 ⑨ REC/PB



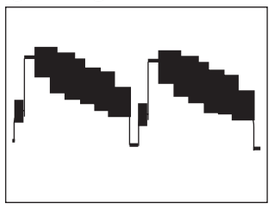
3.8 Vp-p

❽ IC101 ⑰ REC/PB



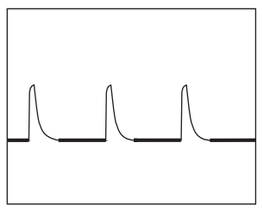
2.36 Vp-p (15.7 KHz)

❾ IC101 ⑲ REC/PB



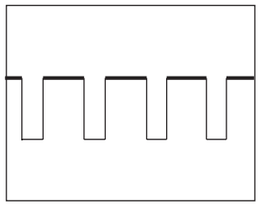
2.16 Vp-p (15.7 KHz)

❿ IC101 ⑪ REC/PB



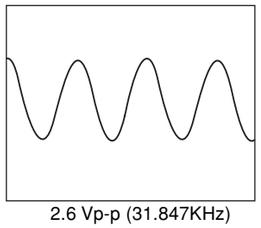
4.32 Vp-p (15.7 KHz)

⓫ IC101 ⑧④ REC/PB



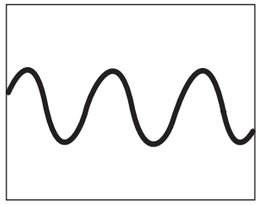
5.0 Vp-p (25Hz)

⓬ IC101 ⑦⑤ REC/PB



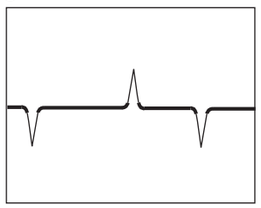
2.6 Vp-p (31.847KHz)

⓭ IC101 ⑦⑧ REC/PB



4.3 Vp-p (10 MHz)

⓮ JL 192 PB



4.64 Vp-p (25 Hz)

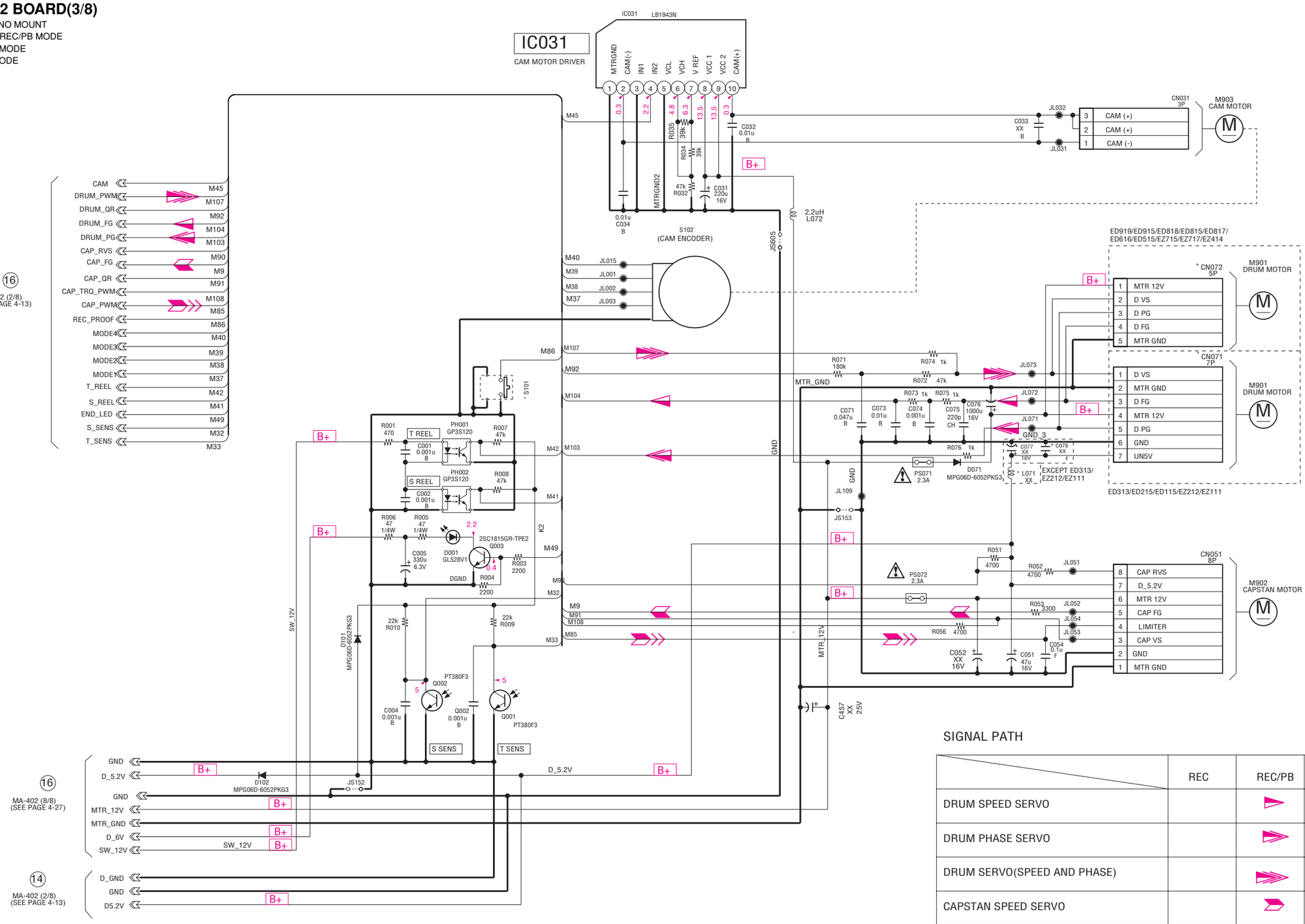
MA-402 (SERVO CONTROL) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

• **See page 4-5 for printed wiring board.**

MA-402 BOARD(3/8)

XX MARK:NO MOUNT
NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE



Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SIGNAL PATH

	REC	REC/PB	PB
DRUM SPEED SERVO		▶	
DRUM PHASE SERVO		▶	
DRUM SERVO(SPEED AND PHASE)		▶	
CAPSTAN SPEED SERVO		▶	
CAPSTAN SERVO (SPEED AND PHASE)		▶	

MA-402 (Hi-Fi AUDIO) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

• See page 4-5 for printed wiring board.

MA-402 BOARD(4/8)

XX MARK:NO MOUNT
NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

ED815/ED817/ED818/ED915/ED919/EZ715/EZ717

IC301
HI-FI AUDIO PROCESS
* IC301 TDA9605H/N2,557

DCFBR EMPHR DCR DETR VREF IREF GND DETL DCL EMPHL DCFBL

Vcc 12V
PB IN2
REC OUT
PB IN1
HM SW
Vss D
Vcc 5V
AF SWP
SDA
SCL
AF ENV

TU M TU L TU R L3 L L3 R L2 L L2 R L1 L R L1 L

NA IN
NA OUT
L2 OUT R
L2 OUT L
MUTE
L1 OUT R
L1 OUT L
MUTE
MUTE
RF OUT
ALC

AUDIO CH2 HC35
AUDIO REC HC36
AUDIO CH1 HC37
AF ENV AFENV
AF_REC_P
AFSWP
SDA
SCK
AFENV
UN5V
HIFI_GND
SW12V
SW5V

(6) MA 402 (1/8) (SEE PAGE 4-9)
(10) MA 402 (2/8) (SEE PAGE 4-13)
(17) MA 402 (8/8) (SEE PAGE 4-27)
(18) MA 402 (6/8) (SEE PAGE 4-23)
(19) MA 402 (5/8) (SEE PAGE 4-21)

BIAS_GND HA22 NA IN
HA21 NA OUT
HIFI_GND
HA17 AUDIO R OUT
HA16 AUDIO L OUT
HA11 L1 AUDIO R
HA10 L1 AUDIO L
HA7 L2 AUDIO R
HA6 L2 AUDIO L
HT13 RF OUT
HT3 TU AUDIO R
HT2 TU AUDIO L
HT1 TU AUDIO MOD

Q301 2SA1162Y-TE85L MUTE CONTROL
Q302 2SC2712Y-TE85L MUTE
Q303 2SC2712Y-TE85L MUTE

SIGNAL PATH

	AUDIO SIGNAL
REC	⇒
PB	⇨

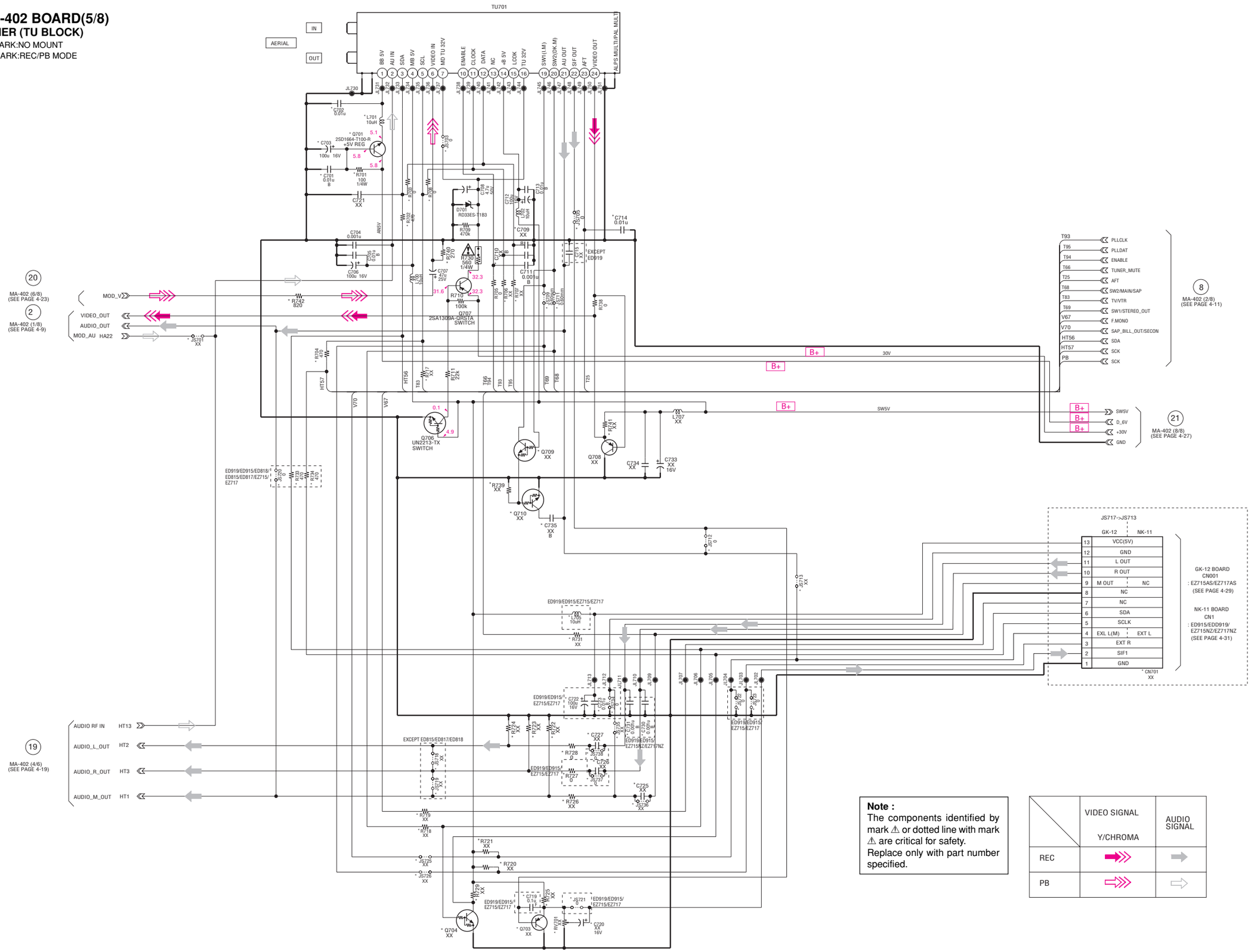
MA-402 (TUNER) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

• **See page 4-5 for printed wiring board.**

MA-402 BOARD(5/8)
TUNER (TU BLOCK)

XX MARK:NO MOUNT
NO MARK:REC/PB MODE



Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

	VIDEO SIGNAL Y/CHROMA	AUDIO SIGNAL
REC	➡	➡
PB	⇨	⇨

MA-402 (I/O) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

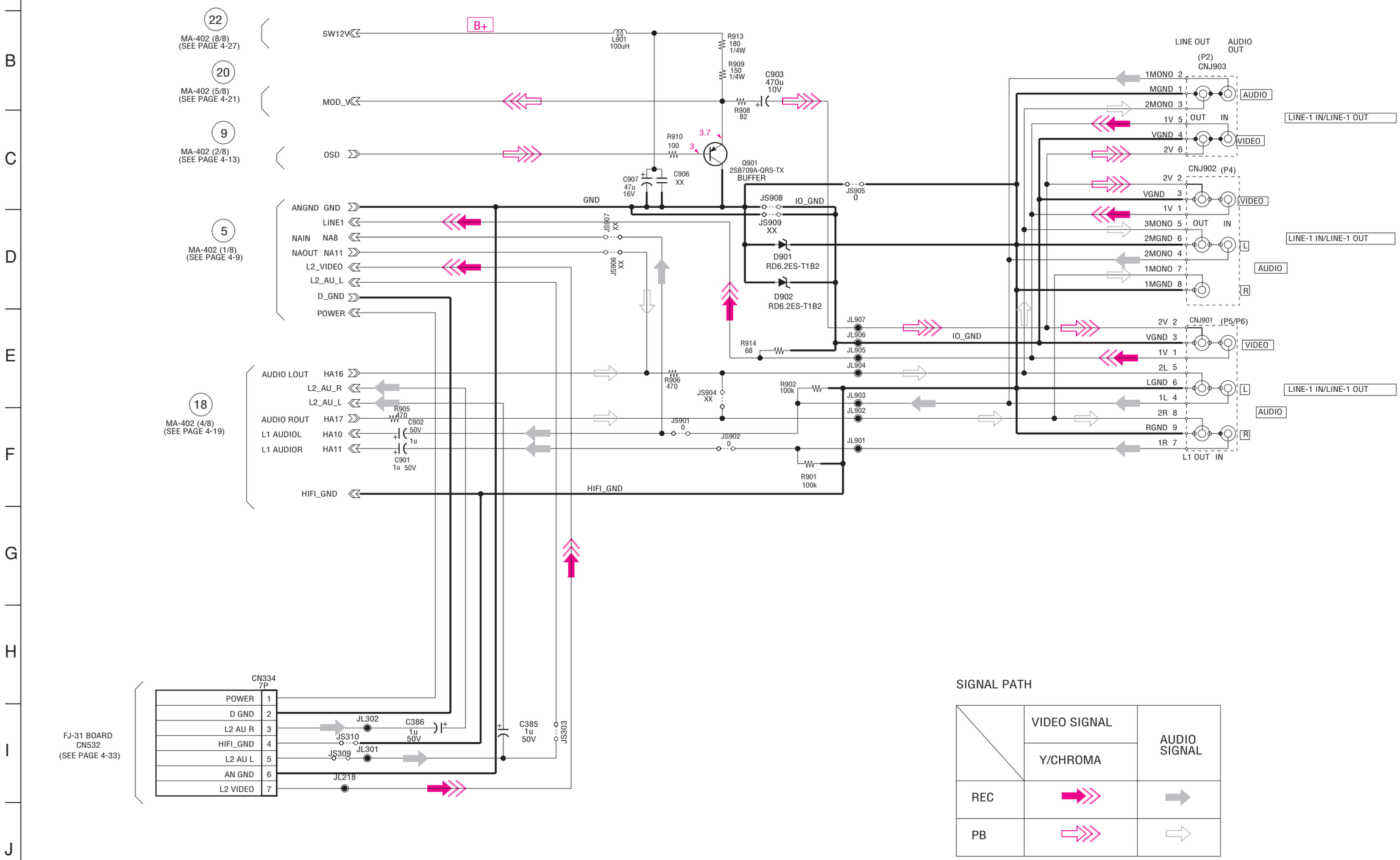
• **See page 4-5 for printed wiring board.**

MA-402 BOARD(6/8)

DISPLAY CONTROL(FRONT BLOCK)

XX MARK:NO MOUNT

NO MARK:REC/PB MODE



SIGNAL PATH

	VIDEO SIGNAL Y/CHROMA	AUDIO SIGNAL
REC	➡	→
PB	⇨	⇨

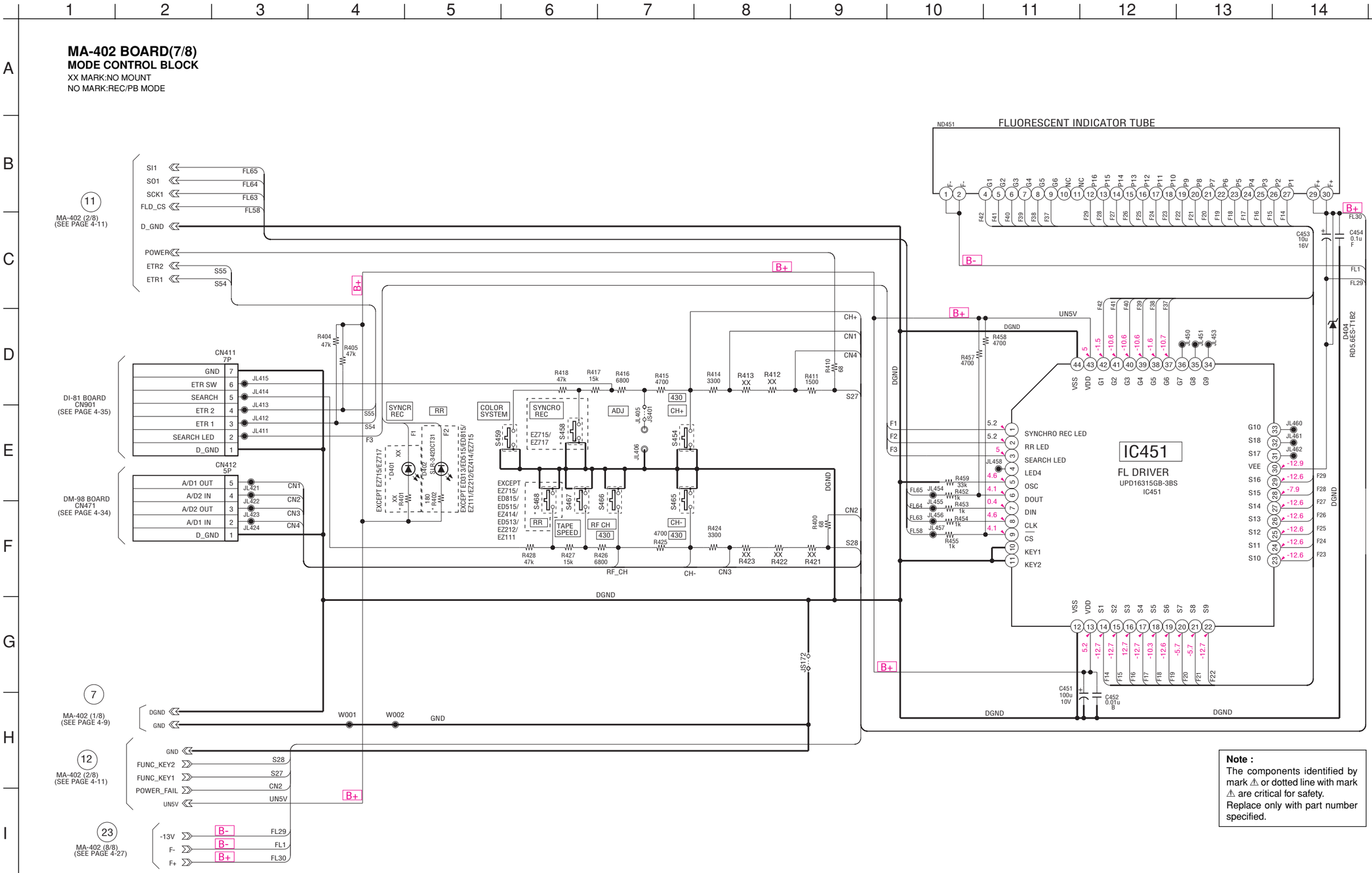
MA-402 (MODE CONTROL) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

• **See page 4-5 for printed wiring board.**

MA-402 BOARD(7/8)
MODE CONTROL BLOCK

XX MARK:NO MOUNT
NO MARK:REC/PB MODE



Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MA-402 (POWER SUPPLY) SCHEMATIC DIAGRAM

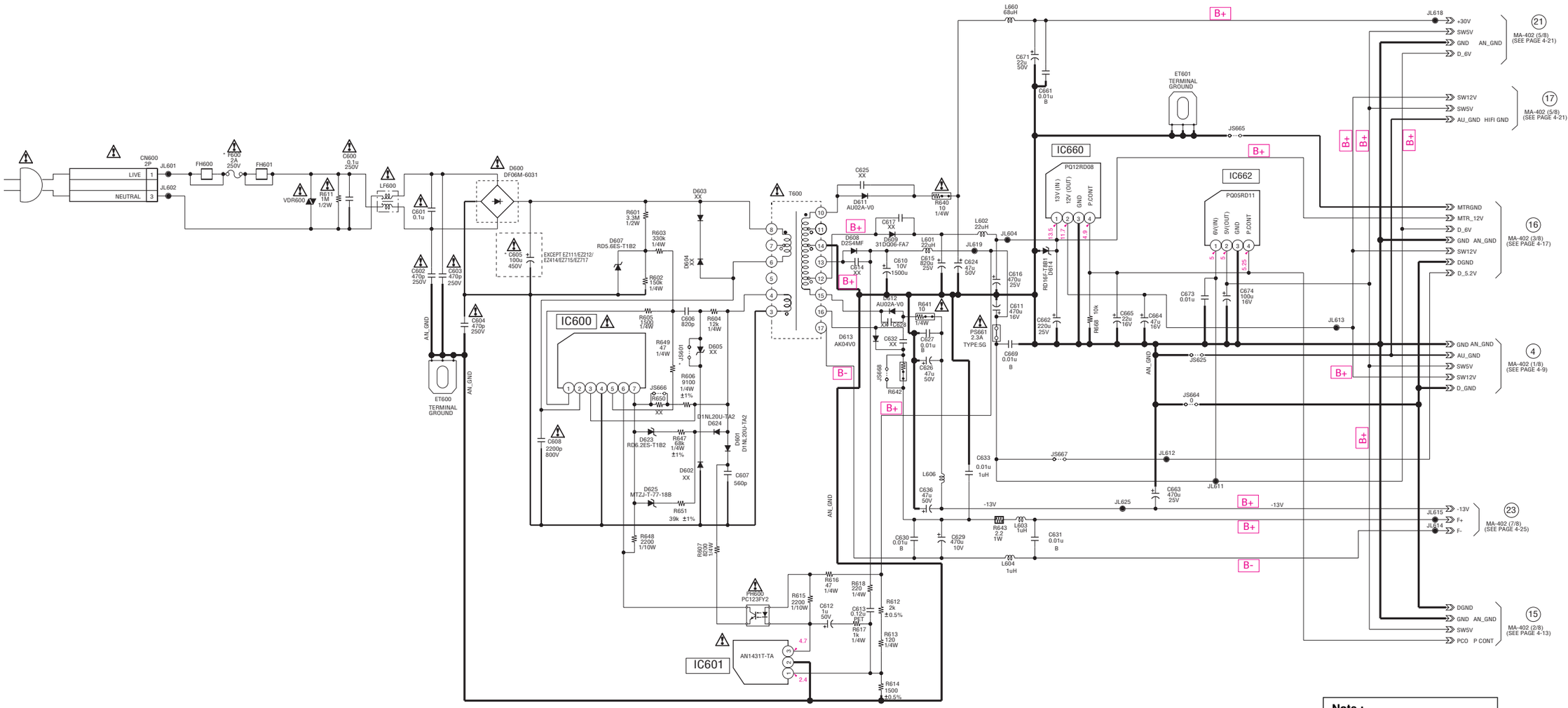
– Ref. No: MA-402 Board; 1000 series –

• **See page 4-5 for printed wiring board.**

MA-402 BOARD(8/8)

XX MARK:NO MOUNT

NO MARK:REC/PB MODE

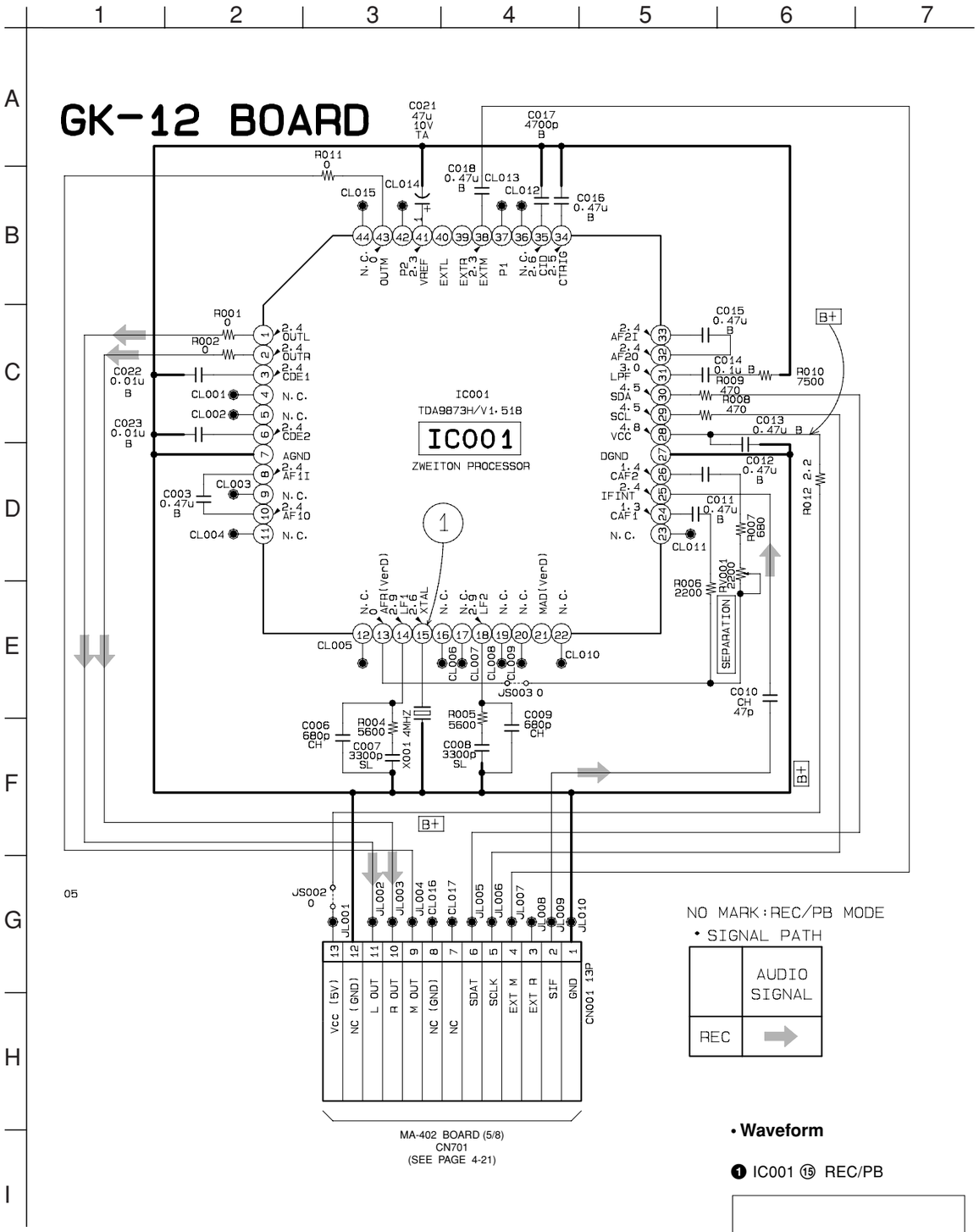


Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

GK-12 (ZWEITON) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: GK-12 board; 2,000 series –

– SLV-EZ715AS/EZ717AS –



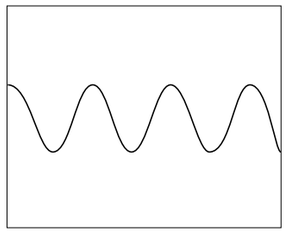
NO MARK:REC/PB MODE

• SIGNAL PATH

	AUDIO SIGNAL
REC	→

• Waveform

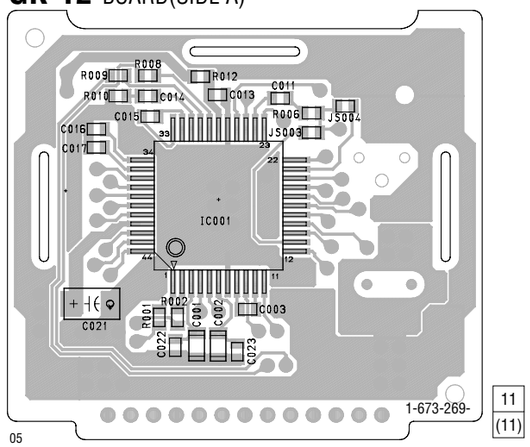
❶ IC001 ⑮ REC/PB



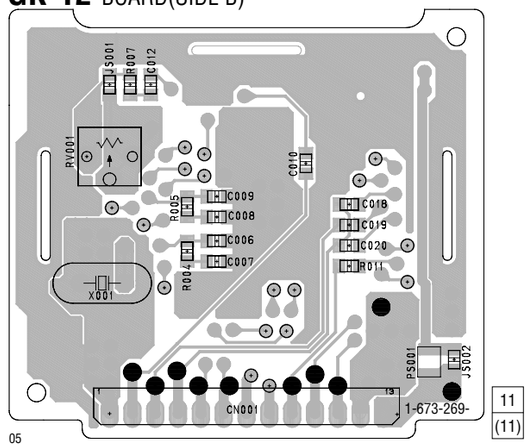
148 mVp-p (4 MHz)

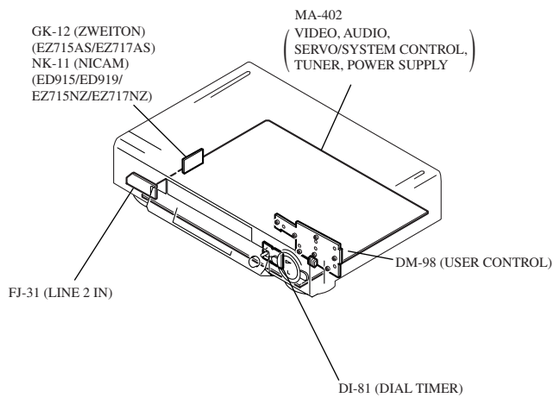
There are few cases that the part isn't mounted in this model is printed on this diagram.

GK-12 BOARD(SIDE A)



GK-12 BOARD(SIDE B)

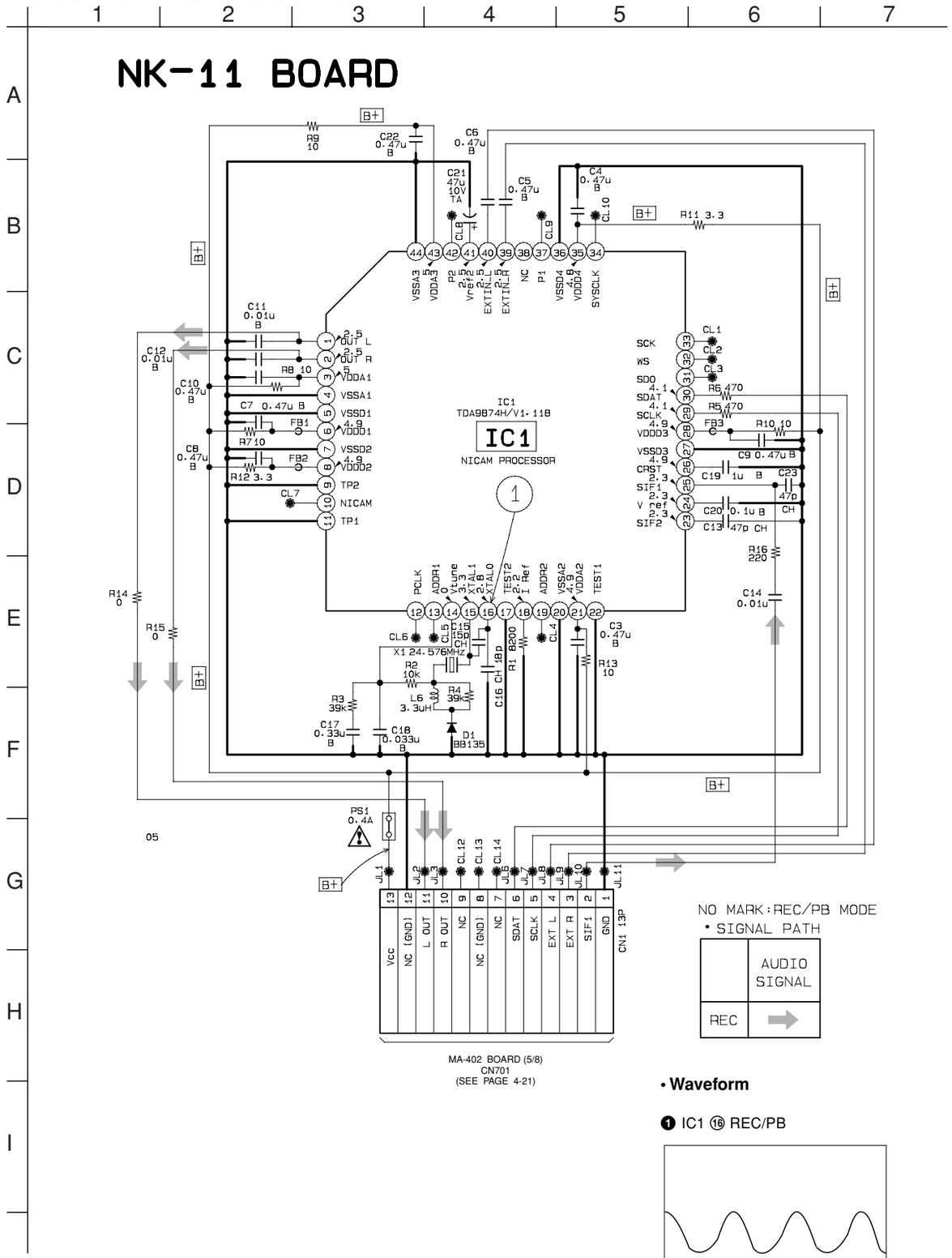




NK-11 (NICAM) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

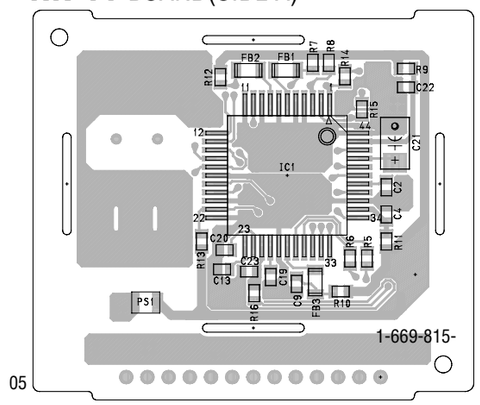
– Ref. No.: NK-11 board; 3,000 series –

– SLV-ED915/ED919/EZ715NZ/EZ717NZ –

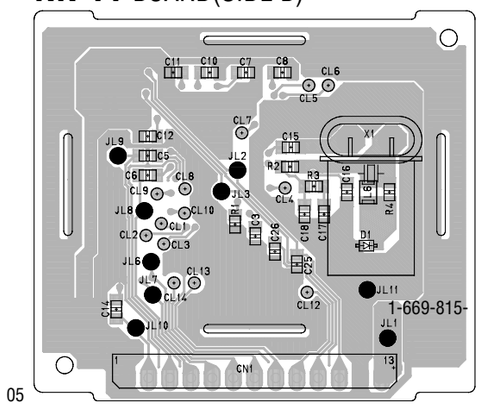


There are few cases that the part isn't mounted in this model is printed on this diagram.

NK-11 BOARD(SIDE A)

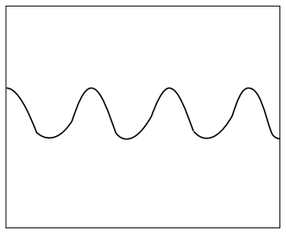


NK-11 BOARD(SIDE B)



• **Waveform**

❶ IC1 ⑯ REC/PB



740 mVp-p (24.576 MHz)

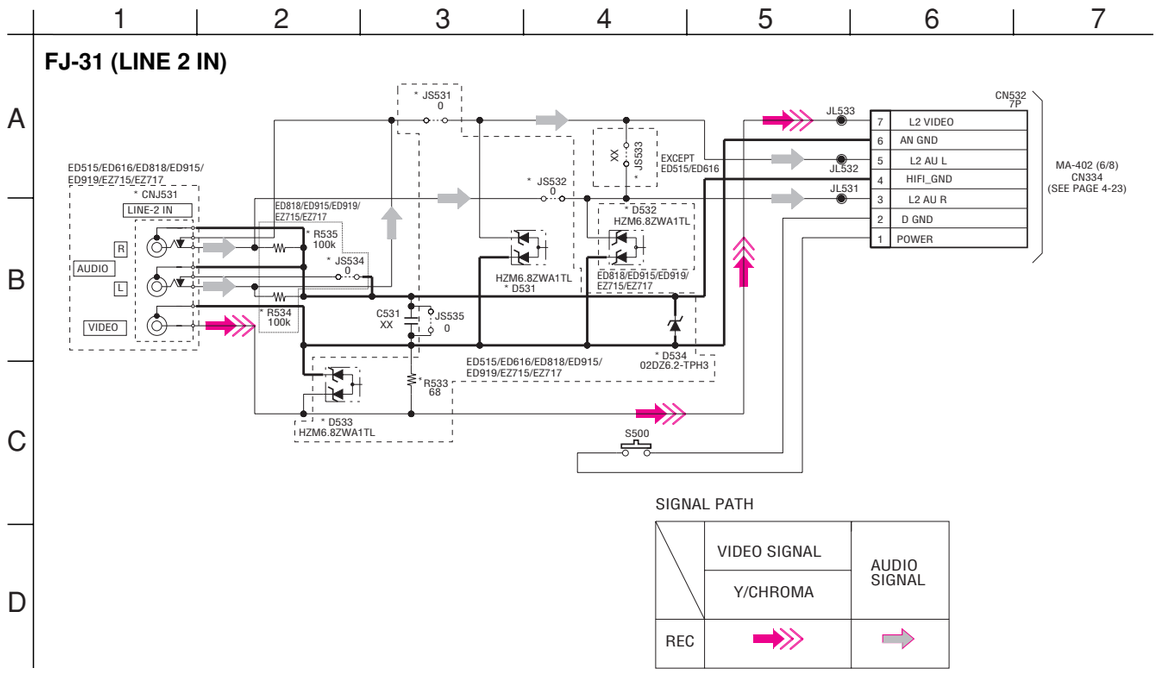
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

FJ-31 (LINE 2 IN) AND DM-98 (FUNCTION) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

— Ref. No. FJ-31 Board:1,000 Series —

— Ref. No. DM-98 Board:2,000 Series —

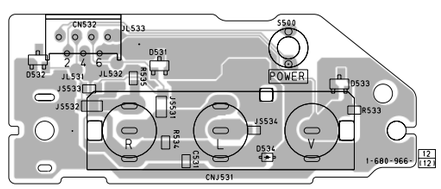
FJ-31 (LINE 2 IN)



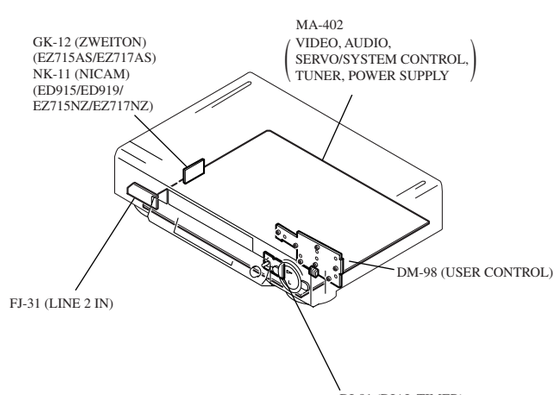
SIGNAL PATH

	VIDEO SIGNAL Y/CHROMA	AUDIO SIGNAL
REC	➡	➡

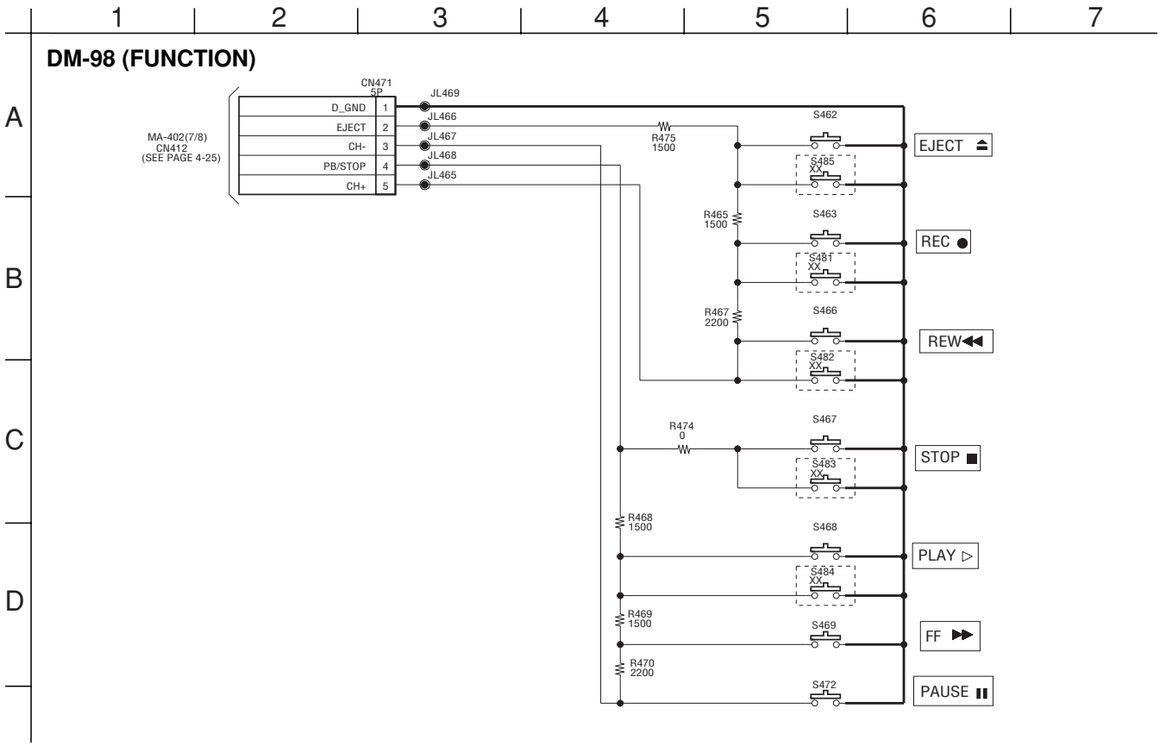
FJ-31 BOARD



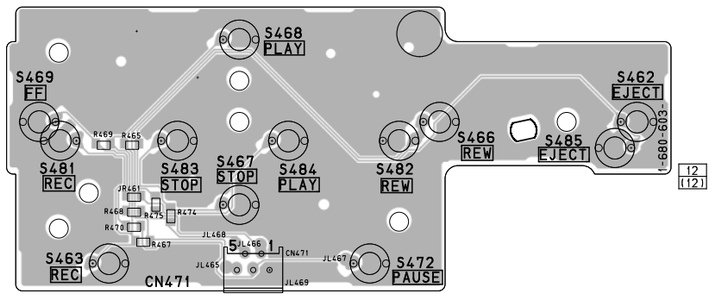
There are few cases that the part printed on this diagram isn't mounted in this model.



DM-98 (FUNCTION)



DM-98 BOARD

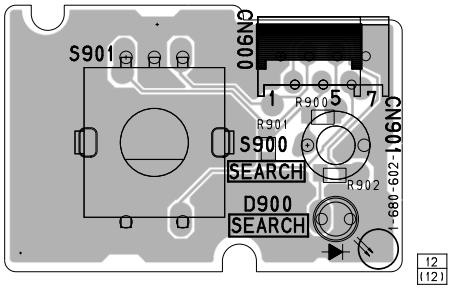


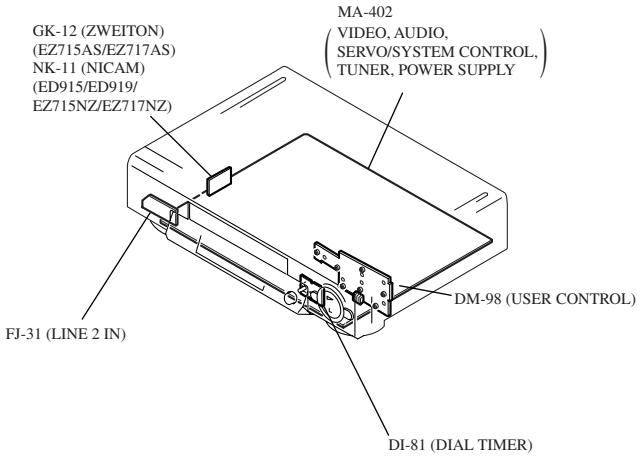
DI-81 (DIAL TIMER) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

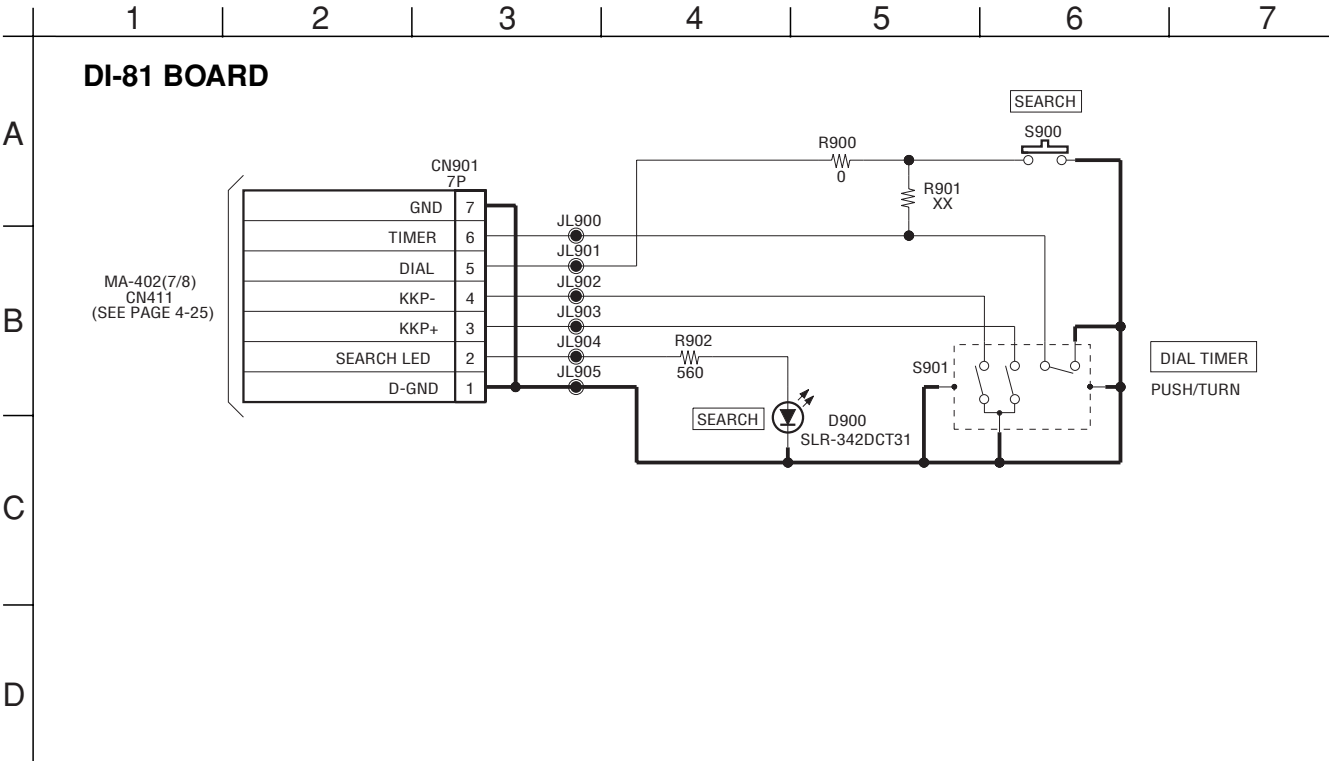
— Ref. No. DI-81 Board:2,000 Series —

DI-81 BOARD

There are few cases that the part printed on this diagram isn't mounted in this model.







5-1. SYSTEM CONTROL – VIDEO BLOCK INTERFACE (MA-402 BOARD IC101)

Signal	Pin No.	I/O	STOP/ FF/REW	TAPE THREADING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	x 2	CUE	REVIEW	RECORD	REC • PAUSE
RF SWP	MA-402 IC101⑯⑤	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	MA-402 IC101⑯⑨	O	L	L	L	*2	*3	*3	*3	*3	*3	*3	*3
C SYNC	MA-402 IC101⑯①	I	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4

*1 25 Hz pulse with 50% duty cycle. Synchronized with rotation of drum.
*2 Normal PB "L". V period "H" pulse when x1.
*3 V period "H" pulse.
*4 Composite sync signal (positive polarity).

5-2. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE (MA-402 BOARD IC101)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	x 2	CUE	REVIEW	RECORD	REC • PAUSE
CAP QR	MA-402 IC101⑨①	O	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	*2	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z
DRUM PG	MA-402 IC101⑩④	I	*3	*1	*1	*4	*4	*1	*1	*1	*1	*1	*1	*1	*1
DRUM FG	MA-402 IC101⑩③	I	*3	*6	*6	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6
CAP FG	MA-402 IC101⑨	I	H/L	*5	*5	*4	*4	*5	H/L	*5	*5	*5	*5	*5	H/L
CAP PWM	MA-402 IC101⑩⑧	O	*7	*7	*7	*7	*7	*8	*7	*7	*8	*8	*8	*8	*7
DRUM PWM	MA-402 IC101⑩⑦	O	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9

*1. 25 Hz (PAL), 30 Hz (NTSC) pulse.
*2. Pulse at tape running.
*3. "L" when drum rotation stop.
*4. Unstable period pulse.
*5. Pulse of period in proportion to tape speed.
*6. 300 Hz (PAL), 360 Hz (NTSC) pulse.
*7. Pulse at tape running.
*8. Approx. 2 msec period "H" or "L" pulse.
*9. Approx. 1.5 msec period "H" or "L" pulse.

5-3. SYSTEM CONTROL – MECHANISM BLOCK INTERFACE (MA-402 BOARD IC101)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREAD-ING	TAPE UNTHREAD-ING	STOP	FF	REW	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC • PAUSE
CAM	MA-402 IC101㊺	O	Hi-Z	H	L	H	L	H	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
MODE 1	MA-402 IC101㊲	I	H	L	L	*1	*1	L	H	H	H	H	H	H	H	L	H	H
MODE 2	MA-402 IC101㊳	I	H	L	L	*1	*1	L	H	H	H	H	H	L	L	L	L	L
MODE 3	MA-402 IC101㊴	I	L	L	L	*1	*1	L	L	L	L	L	L	L	L	H	L	L
MODE 4	MA-402 IC101㊵	I	L	H	H	*1	*1	H	H	H	H	H	H	L	L	L	L	L
REC PRF	MA-402 IC101㊱	I	H	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
T REEL	MA-402 IC101㊷	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
S RELL	MA-402 IC101㊶	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
END-LED	MA-402 IC101㊾	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP PVS	MA-402 IC101㊿	I	L			H	L	H/L	H	L	H	H	H	H	H	L	H	H
T SENS	MA-402 IC101㉝	I	*4	*4	*4	*6	*6	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
S SENS	MA-402 IC101㉜	I	*4	*4	*4	*6	*6	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6

*1. Uncertainty.
*2. “L” when erasing protection tab is bent, “H” when not bent.
*3. Pulse of period in proportion to reel rotating speed.
*4. Approx.2 msec period “H” pulse.
*5. Pulse at tape running.
*6. Normally “L”. 2 msec period “H” pulse when tape top or tape end is detected.
*7. When transition to UNLOADING direction: L.
When Transition to LOADING direction: H.
When CAM motor is stopped: Hi-Z.

5-4. SYSTEM CONTROL – AUDIO BLOCK INTERFACE (MA-402 BOARD IC101)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC • PAUSE
AU RF	MA-402 IC101㉟	O	AF RF envelope signal input terminal for automatic tracking.										
A MUTE	MA-402 IC101㊽	O (O.D)	Hi-Z	Hi-Z	Hi-Z	Hi-Z	H	H	H	H	H	H	H
AF SWP	MA-402 IC101⑯	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
$\overline{\text{FULL ERASE}}$	MA-402 IC101㉑	O (O.D)	H	H	H	H	H	H	H	H	H	L	H
REC P	MA-402 IC101㉒	O	L	L	L	L	L	L	L	L	L	H	L
NAPB	MA-402 IC101㊻	O	L	L	L	L	L	L	L	L	L	H	L

*1. 25Hz (PAL), 30Hz (NTSC) 50% duty pulse approx. 5 msec delayed from RF SW P.

5-5. SERVO/SYSTEM CONTROL, OSD MICROPROCESSOR PIN FUNCTION (MA-402 BOARD IC101)

Pin No.	Pin Name	I/O	Function
1	VSS (SERVO)	–	Servo ground
2	AN GND	–	Analog ground
3	CTL(+)	I/O	CTL Head signal input/output (REC mode)
4	CTL (–)	I/O	CTL Head signal input/output (REC mode)
5	CTL-BIAS	I	CTL amp. control signal input (gain set)
6	CTL-FB	I	CTL amp. control signal input (gain set)
7	CTL-AMP(O)	O	CTL amp. control signal input (for check)
8	CTL-SMT	I	CTL amp. control signal input (gain set)
9	CAP FG	I	Capstan FG schmitt input
10	VCC (SERVO)	–	Power supply unswitch 5V
11	AFC PC	I/O	AFC oscillation signal
12	AFC OSC	I/O	AFC oscillation signal
13	AFCLPF	I/O	AFC LPF signal
14	HSYNC	I/O	Horizontal sync signal
15	VSYNC	I	V sync signal input
16	C V IN 2	I	Composite video signal input 2
17	C V IN 1	I	Composite video signal input 1
18	OSDVSS		Power supply OSD 5V
19	VIDEO OUT (CV OUT)	O	Composite video signal output
20	OSD VSS	–	OSD ground
21	4FSC OUT	O	OSC 4fsc oscillator terminal signal output
22	4Ffsc IN	I	OSC 4fsc oscillator terminal signal input
23	AVSS	–	Analog ground
24	APC Error	I	APC error voltage signal input
25	TU AFT	I	Auto tuning signal input
26	FUNCTION Key 2	I	Function key analog voltage signal input 2
27	FUNCTION Key 1	I	Function key analog voltage signal input 2
28	POWER FAIL	I	Power failure detect signal input
29	DEST 1	I	Destination set signal input 1
30	PB	–	Not used
31	DEST 2	I	Destination set signal input 2
32	T SENS	I	Take up end sensor signal input
33	S SENS	I	Supply end sensor signal input
34	VIDEO RF	I	Video RF envelope signal
35	AUDIO RF	I	Audio RF envelope signal
36	AVCC	–	Analog power supply
37	MODE1	I	Mechanism Section CAM encoder data input 1
38	MODE2	I	Mechanism Section CAM encoder data input 2
39	MODE3	I	Mechanism Section CAM encoder data input 3
40	MODE4	I	Mechanism Section CAM encoder data input 4
41	S REEL	I	S side reel FG input
42	T REEL	I	T side reel FG input
43	REMOCON	I	Remote Control (SIRCS) signal input
44	CTL-OSD	I/O	CTL amp. signal input/output (OSD)
45	CAM	O	CAM motor signal output
46	SAT SYNC LED	–	Not used
47	RR LED	–	Not used
48	SEARCH LED	–	Not used
49	END LED	O	Top/end LED on/off control signal output
50	POWER CONT	O	Power supply control signal output
51	WRITE CONT	O	EEP ROM write timing control signal output
52	BLUE BACK	O	OSD block control output
53	AUDIO DUB	O	To 'on' the audio dub filter
54	ETR 1	I	Easy Timer knob pulse 1 signal input
55	ETR 2	I	Easy Timer knob pulse 2 signal input
56	VCC	I	Power supply

Pin No.	Pin Name	I/O	Function
57	VSS	–	Ground
58	FLD VSS	–	FLD ground
59	SCL0	I/O	Clock signal input/output
60	SDA0	I/O	Data input/output for IIC
61	SCL1	I/O	Clock input/output for IIC bus interface
62	SDA1	I/O	Data input/output for IIC bus interface
63	SCK1	I/O	SCI clock input/output
64	SO1	O	Serial communication data signal output
65	SI1	I	Serial communication data signal input
66	OSD MIX	O	To 'on/off' mesecam filter
67	PAL	O	To control the de-emphasise
68	SW2	O	Tuner system control 2 signal output
69	SW1	O	Tuner system control 2 signal output
70	SECAM ON	–	Not used (only for secam model)
71	$\overline{\text{FULL ERASE}}$	O	Full erase head on/off control signal
72	$\overline{\text{REC P}}$	O	"L" : output when REC pause
73	IN SELECT	O	Line-input selection control signal output
74	FLASH WRITE ENABLE	I	Enables flash write
75	32KHZ (OUT)	O	Timer clock terminal (32khz) output
76	32KHZ (IN)	I	Timer clock terminal (32khz) input
77	RESET	I	Reset signal output
78	10MHZ (IN)	I	System clock terminal (10MHz) input
79	VSS	–	Ground
80	10MHZ (OUT)	O	System clock terminal (10MHz) input
81	CAP CONNET TO VSS	–	Smoothing capacitor connection
82	MDO	I	Sets operating mode
83	TV/VTR	–	Not used
84	APC PWM	O	APC PWM signal output
85	CAP TRQ PWM	O	Capstan TRQ PWM signal output
86	REC PROOF	I	Erasing protection tab. Cassette in detection signal input
87	NIL	–	Not used
88	NIL	–	Not used
89	A MUTE	O	"H" : audio mute signal output
90	CAP RVS	O	Capstan reverse control signal "H": when reverse
91	CAP QR	O	Capstan step driving signal output
92	DRUM QR	O	Drum motor step driving signal output
93	PLL CLOCK	O	Tuner PLL clock signal output
94	TU ENABLE	O	Tuner PLL chip select signal output
95	PLL DATA	O	Tuner PLL data signal output
96	NA PB	O	Normal audio PB signal output
97	AF REC P	O	"L": output when Hi-Fi audio REC pause (not used)
98	EX CTL	–	Not used
99	SECAM DET	–	Not used
100	C. KILLER DET	I	To detect type of color system
101	HEAD CLOG LED	–	Not used
102	MESECAM DET	I	To detect mesecam signal
103	DRUM PG	I	Drum FG schmitt amp. input
104	DRUM FG	I	Drum FG schmitt amp. put
105	RF SWP	O	RF switching pulse signal output
106	AF SWP	O	AF switching pulse signal output
107	DRUM PWM	O	Drum motor error signal output
108	CAP PWM	O	Capstan error signal output
109	QVD	O	Quasi VD pulse signal output
110	VSS	–	Ground
111	CSYNC	I	Composite sync signal input
112	VCC	–	Power supply unswitch 5V

5-6. NICAM PROCESSOR PIN FUNCTION (NK-11 BOARD IC1)

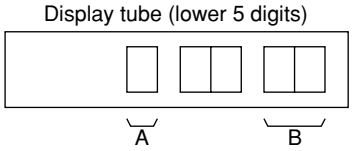
Pin. No.	Pin Name	I/O	Function
1	OUT L	O	Analog signal output left
2	OUT R	O	Analog signal output right
3	VDD A1	–	Analog power supply 5V; DAC circuitry
4	VSS A1	–	Analog ground; DAC circuitry
5	VSS D1	–	Digital ground; DAC circuitry
6	VDD D1	–	Digital power supply 5V; DAC circuitry
7	VSS D2	–	Digital ground; DSP part
8	VDD D2	–	Digital power supply 5V; DSP part
9	TP2	I	Additional test pin 2; connected to ground for normal operation
10	N.C.	–	Not used
11	TP1	I	Additional test pin 1; connected to ground for normal operation
12	N.C.	–	Not used
13	N.C.	–	Not used
14	V TUNE	O	Tuning voltage output for crystal oscillator
15	XTAL I	I	Crystal oscillator input
16	XTAL O	O	Crystal oscillator output
17	TEST2	I	Test pin 2; connected to ground for normal operation
18	I REF	I	Resistor for reference current generation; front end circuitry
19	N.C.	–	Not used
20	VSS A2	–	Analog ground; analog front end circuitry
21	VDD A2	–	Analog power supply 5V; analog front end circuitry
22	TEST1	I	Test pin 1; connected to ground for normal operation
23	SIF2	I	Sound IF input 2
24	V REF1	I	Reference voltage; analog front end circuitry
25	SIF1	I	Sound IF input 1
26	C RST		Capacitor for power-on reset
27	VSS D3	–	Digital ground; front end circuitry
28	VDD D3	–	Digital power supply 5V; front end circuitry
29	SCL	I	Serial communication clock signal input
30	SDA	I	Serial communication data signal input
31	N.C.	–	Not used
32	N.C.	–	Not used
33	N.C.	–	Not used
34	N.C.	–	Not used
35	VDD D4	–	Digital power supply 5V; demodulator circuitry
36	VSS D4	–	Digital ground; demodulator circuitry
37	N.C.	–	Not used
38	N.C.	–	Not used
39	EXTI R	I	External audio input right channel
40	EXTI L	I	External audio input left channel
41	V REF2	I	Analog reference voltage digital-to-analog converter and operational amplifiers
42	N.C.	–	Not used
43	VDD A3	–	Analog power supply 5V; operational amplifiers
44	VSS A3	–	Analog ground; operational amplifiers

5-7. ZWEITON PROCESSOR PIN FUNCTION (GK-12 BOARD IC001)

Pin. No.	Pin Name	I/O	Function
1	OUT L	O	Audio left signal output
2	OUT R	O	Audio right signal output
3	CDE1	–	De-emphasis 1 capacitor
4	N.C.	–	Not used
5	N.C.	–	Not used
6	CDE2	–	De-emphasis 2 capacitor
7	A GND	–	Analog ground
8	AF1 I	I	Audio 1 signal input
9	N.C.	–	Not used
10	AF1 O	O	Audio 1 signal output
11	N.C.	–	Not used
12	N.C.	–	Not used
13	AFR	I	AF 1/2 signal return
14	LF1	–	Loop filter 1
15	XTAL	I	4MHz reference input
16	N.C.	–	Not used
17	N.C.	–	Not used
18	LF2	–	Loop filter 2
19	N.C.	–	Not used
20	N.C.	–	Not used
21	MAD	I	Programmable address bit (module address)
22	N.C.	–	Not used
23	N.C.	–	Not used
24	CAF1	O	AF1 capacitor
25	IF INT	I	IF intercarrier input
26	CAF2	O	AF2 capacitor
27	D GND	–	Digital ground
28	VCC	–	Power supply 5V
29	SCL	I	Serial communication clock input
30	SDA	I/O	Serial communication data input and output
31	LPF	–	Pilot loop filter
32	AF2 O	O	Audio 2 signal output
33	AF2 I	I	Audio 2 signal input
34	CTR IG	–	Trigger capacitor
35	CID	–	Identification capacitor
36	N.C.	–	Not used
37	P1	O	Output port 1
38	EXT M	I	External audio input monaural channel
39	EXTI R	I	External audio input right channel
40	EXTI L	I	External audio input left channel
41	V REF	I	Analog reference voltage digital-to-analog converter and operational amplifiers
42	P2	O	Output port 2
43	OUT M	O	Audio monaural signal output
44	N.C.	–	Not used

SECTION 6
ERROR CODE

This set displays an error code, and a mode code in case of error on the display tube, if the operation stopped by error. The following provides description concerned.



A: Error code ..... Table 6-1
B: Mode code in case of error ..... Table 6-2

These codes are displayed at lower 5-digit positions of display tube.
In this case, " : " between digits is not displayed.

Table 6-1. Error Codes

Code	Description
0	NO ERROR
1	CAM ENCODER ERROR, LOAD DIRECTION
2	CAM ENCODER ERROR, UNLOAD DIRECTION
3	T REEL ERROR
4	S REEL ERROR
5	CAPSTAN ERROR
6	DRUM ERROR
7	INITIALIZE ERROR
8	CASSETTE UNLOADING ERROR
9	RESERVED

Table 6-2. Mode Codes in Case of Error

Code	Description
0	EJECT (POWER ON)
1	EJECT (POWER OFF)
2	UNLOAD STOP
3	STOP (POWER ON)
4	POWER OFF (CASSETTE IN)
5	F. FWD
6	REW
7	LOW SPEED F. FWD
8	LOW SPEED REW
9	STANDBY
10	REC
11	REC (VISS)
12	REC PAUSE
13	PLAY
14	A. DUB
15	A. DUB PAUSE
16	CUE
17	REV
18	STILL (MECHA FWD)
19	FWD FRAME BY FRAME (FWD SLOW)
20	STILL (MECHA RVS)
21	RVS FRAME BY FRAME (RVS SLOW)

SECTION 7
ADJUSTMENTS

During the adjustment, see the Parts Arrangement Diagram for Adjustments on Page 7-6.

7-1. MECHANICAL ADJUSTMENTS

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT VI.

7-2. ELECTRICAL ADJUSTMENTS

2-1. PRE-ADJUSTMENT PREPARATIONS

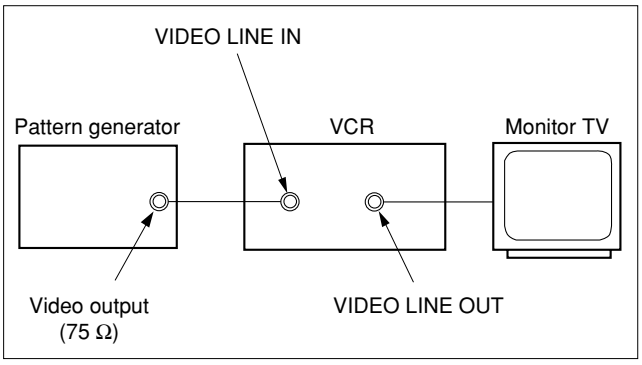
Necessary items and indications for total adjustment of electric circuit of this machine will be described in this chapter.

2-1-1. Instruments to be Used

1) Color TV
2) Oscilloscope 1 or 2 phenomena, band more than 30 MHz, delay mode, as provided.
3) NTSC pattern generator
4) PAL pattern generator
5) Digital voltmeter
6) Audio level meter
7) Audio noise meter
8) Audio generator
9) Attenuator
10) Alignment tape
    Part Code: 8-192-605-36 KRV-51P (PAL)
    Part Code: 8-192-605-32 KRV-51N2 (NTSC)

2-1-2. Connection

Unless otherwise specified, connect and adjust the measuring



instruments as shown in the following diagram.

Fig. 7-2-1

2-1-3. Set-up of Adjustment

In this adjustment, PAL or NTSC pattern generator is connected with LINE input signal terminal. When checking with tuner, connected AERIAL terminal. Check that the amplitudes of video signal SYNC signal, of picture portions, and of burst signals are flat at approximately 0.3, 0.7 and 0.3 V, respectively, and that the level ratio of the burst signal and "red" signal are 0.30: 0.66. Fig. 7-2-2. shows video signals (color bars) used in adjusting the video section.

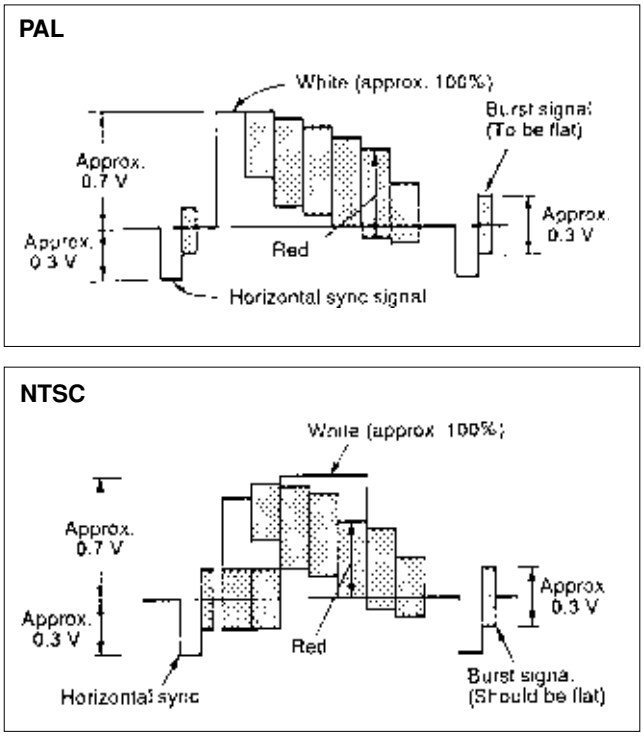


Fig. 7-2-2

2-1-4. Alingment Tapes [Alignment Tape (KRV-51N2/KRV-51P)]

	Mode	Time	Video signal	Audio signal (HiFi/Normal)
1	SP	Seven minutes	Color bar	400 Hz
2	SP	Three minutes	Monoscope	
3	EP	Seven minutes	Color bar	
4	EP	Three minutes	Monoscope	

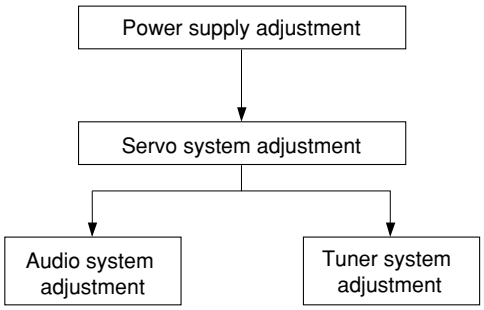
2-1-5. Specified I/O Level and Impedance

Input/output terminal

Video inputs	LINE IN : phono jack
	1 Vp-p, 75 Ω, unbalanced, sync negative
Audio inputs	LINE IN : phono jacks
	47 kW, –7.5 dBs (0 dBs = 0.775 Vrms)
	More than 10 kW, –4 dBs
Video outputs	LINE OUT : phono jack
	1 Vp-p, 75 Ω, unbalanced, sync negative
Audio outputs	LINE OUT : phono jacks
	–7.5 dBs at load impedance 47 kΩ
	Output impedance : less than 10 Ω

2-1-6. Adjusting Sequence

Make the electrical adjustment in the following sequence.



2-2. POWER SUPPLY ADJUSTMENT

2-2-1. Power Supply Check

Mode	E-E
Measuring Instrument	Digital voltmeter
+F, –F check	
Measurement Point	Between JL 615 (IF) and JL 614 (-F)
Specified Value	3.0 ± 1.0 V
–13 V check	
Measurement Point	JL 625
Specified Value	–11.0 ± 1.5 V
+6 V check	
Measurement Point	JL 611
Specified Value	5.95 ± 0.3 V
+13 V check	
Measurement Point	JL 604
Specified Value	13.5 ± 1.0 V
+38 V check	
Measurement Point	JL 618
Specified Value	32.0 ± 4.0 V

Checking Method:

1) Confirm that each voltage meets its specified value.

2-3. SERVO SYSTEM ADJUSTMENT

2-3-1. RF Switching Position Adjustment (MA-402 BOARD)

Purpose:

Adjust the interval between A ch and B ch of tape playback output.
Improve the interchangeability with other tapes and sets.
When it is out of order, the interval appears on the screen, the screen is disturbed.

Mode	PB
Signal	Alignment tape SP mode color bar
Measurement Point	CH1: Pin ② of CN202 CH2: Pin ③ of CN202 (RF SWP)
Measuring Instrument	Oscilloscope
Specified Value	6.5 ± 0.5 H (416 ± 32 µsec) PAL 6.5 ± 0.5 H (410 ± 32 µsec) NTSC

Adjusting Method:

1) Connect MA-402 board JS401 to the GND for about 1 second to activate the RF switching position adjustment mode.
2) Check appear “A P” on FL display.
3) Using the channel + and – buttons, adjust to 6.5 ± 0.5 H.
4) Press the pause button.

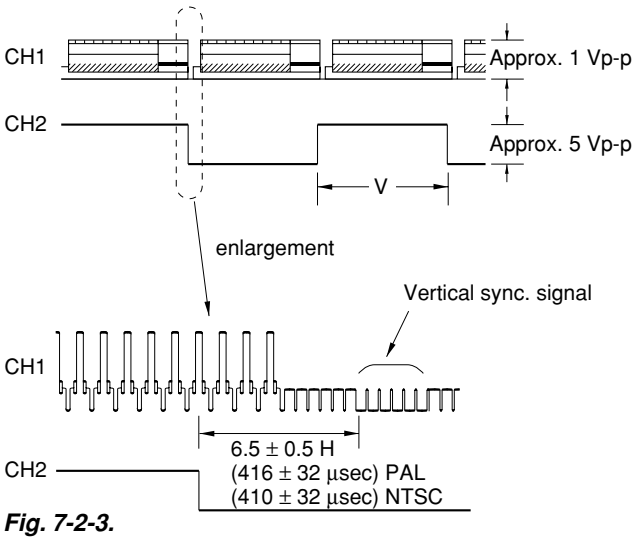


Fig. 7-2-3.

2-4. AUDIO SYSTEM ADJUSTMENTS

• Adjust both Lch and Rch.

[Connection]

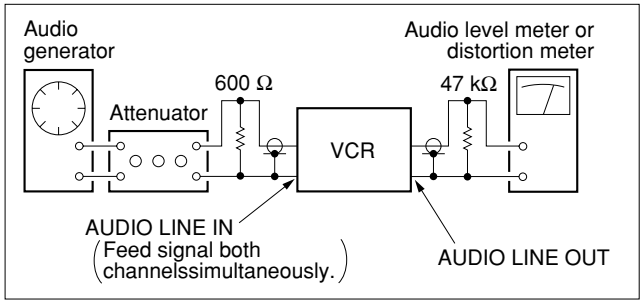


Fig. 7-2-4.

2-4-1. Hi-Fi Audio System Adjustment (SLV-ED815/ED817/ED818/ED915/EZ715/EZ717)

• Set switches and knobs to the following positions to make adjustment unless otherwise specified.
INPUT SELECT switch ..... LINE
AUDIO MONITOR ..... STEREO

[Adjustment Sequence]

1. **AF Switching Position Adjustment**
2. **Frequency Response Check**
3. **Overall Level Characteristic and Distortion Factor Check**
4. **Overall S/N Check**

1. AF Switching Position Adjustment (MA-402 BOARD)

Purpose:

Adjust the interval between A CH and B CH of tape playback output. Improve the interchangeability with other tapes and sets.
When it is out of order, noisy sound is increased and big noise is heard.

Mode	PB
Signal	Alignment tape SP mode color bar
Measurement point	CH1: Pin ③ of CN202 CH2: Pin ① of CN202
Measuring Instrument	Oscilloscope
Specified Value	Fig. 7-2-5

Adjusting Method:

1) Connect MA-402 board JS401 to the GND for about 1 second to activate the RF switching position adjustment mode.
2) Press the PLAY button to activate the AF switching position adjustment mode.
3) Check appear "A H" on FL display.
4) Using the channels + and – buttons, minimize a chipped portion. At this time, confirm that a noisy sound is not heard.
5) Press the pause button.

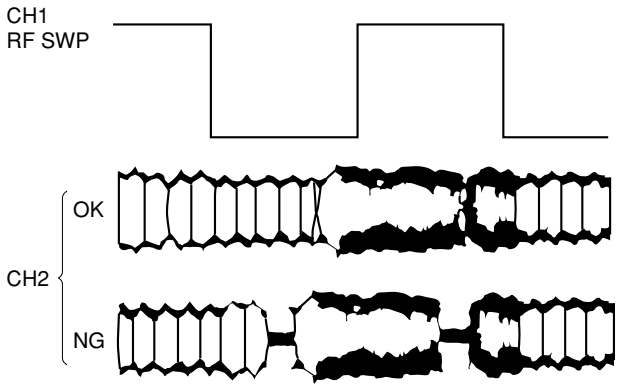


Fig. 7-2-5.

2. Frequency Response Check

Purpose:

Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP, LP mode)
Signal	400 Hz, –17.5 dBs 20 Hz, –17.5 dBs 20 kHz, –17.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	0 ± 2 dB

Note: Tape path adjustment must have been completed.

Confirmation Method:

1) Supply a signal of 400 Hz, –17.5 dBs to both L and R channels of Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate –17.5 dBs.
4) Make recording.
5) Set an audio line input signal to 20 Hz and make recording.
6) Set an audio line input signal to 20 kHz and make recording.
7) Playback a recorded portion, and measure output levels at 400 Hz and 20 Hz and 20 kHz.
8) Confirm that the 20 Hz and 20 kHz playback output level within a range of the 400 Hz playback output level 0 ± 2 dB.

3. Overall Level Characteristic and Distortion Factor Check

Purpose:

Check the record level, play level, and distortion factor against the reference input.

Mode	REC and PB (SP mode)
Signal	400 Hz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter and distortion factor meter
Specified value	Playback level: –7.5 ± 2.0 dBs Distortion factor: 1% or less

Confirmation Method:

1) Supply an audio signal of 400 Hz, –7.5 dBs simultaneously to both L and R channels of Audio Line Input.
2) Make recording
3) Play back a recorded portion.
4) Confirm that a playback level is –7.5 ±2.0 dBs.
5) Confirm that a distortion factor is within 1%.

4. Overall S/N Check

Purpose:

Confirm that the S/N is within the specification.

Mode	REC and PB (SP mode)
Signal	Short
Measurement point	Audio output terminal
Measurement equipment	Audio noise meter
Specified value	–67.5 dBs or less

Confirmation Method:

1) Connect both L and R channels of audio line input to the GND.
2) Start recording.
3) Play the recorded part to confirm that the noise is below –67.5 dBs.

2-4-2. Normal Audio System Adjustment

- Make adjustment in the SP mode, unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

[Adjustment Sequence]

1. **ACE Head Adjustment**
2. **E-E Output Level Check**
3. **Frequency Response Check**
4. **Overall Level Characteristic and Distortion Factor Check**
5. **Overall S/N Check**

1. ACE Head Adjustment

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT VI.

2. E-E Output Level Check (SLV-ED115/ED215/ED313/ED515/ED616/ EZ111/EZ212/EZ414)

Purpose:

Confirm that the output level against the reference input is within the specification.

Mode	E-E
Signal	L, R: 400 Hz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	–7.5 ± 2.0 dBs

Confirmation Method:

1) Simultaneously input a signal of 400 Hz, –7.5 dBs to both L and R channels of Audio Line Input.
2) Confirm that the audio output level is –7.5 ± 3.0 dBs. (This level only can appear with mono models)

3. Frequency Response Check

Purpose:

Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP mode)
Signal	400 Hz, –17.5 dBs 7 kHz, –17.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	0 ± 4 dB

Tape path adjustment must have been completed.

Confirmation Method:

1) Supply a signal of 400 Hz, –17.5 dBs to both L and R channels of Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate –17.5 dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7 kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
7) Confirm that the 7 kHz playback output level within a range of the 400 Hz playback output level 0 ± 4 dB.

4. Overall Level Characteristic and Distortion Factor Check

Purpose:

Check the record level, play level, and distortion factor against the reference input.

Mode	REC and PB (SP mode)
Signal	400 Hz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter and distortion factor meter
Specified value	Playback level: –7.5 ± 4.0 dBs Distortion factor: 4% or less

Confirmation Method:

1) Supply an audio signal of 400 Hz, –7.5 dBs simultaneously to both L and R channels of Audio Line Input.
2) Make recording
3) Play back a recorded portion.
4) Confirm that a playback level is –7.5 ± 4.0 dBs. (mono audio)
5) Confirm that a distortion factor is less than 4%.

5. Overall S/N Check

Purpose:

Confirm that the S/N is within the specification.

Mode	REC and PB (SP mode)
Signal	Short
Measurement point	Audio output terminal
Measurement equipment	Audio noise meter
Specified value	–46.0 dBs or less

Confirmation Method:

1) Connect both L and R channels of audio line input to the GND.
2) Start recording.
3) Play the recorded part to confirm that the noise is below –46.0 dBs.

2-5. TUNER SYSTEM ADJUSTMENT

[Connection]

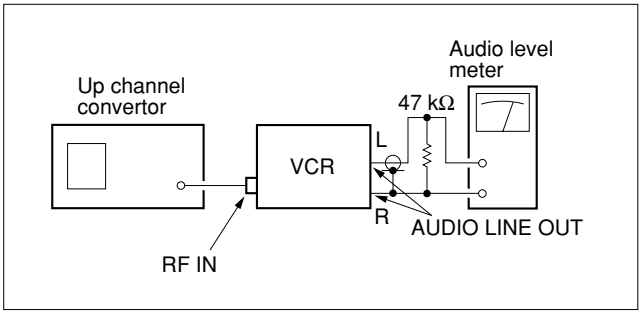


Fig. 7-2-6

2-5-1. Separation Adjustment (SLV-EZ715AS/EZ717AS)

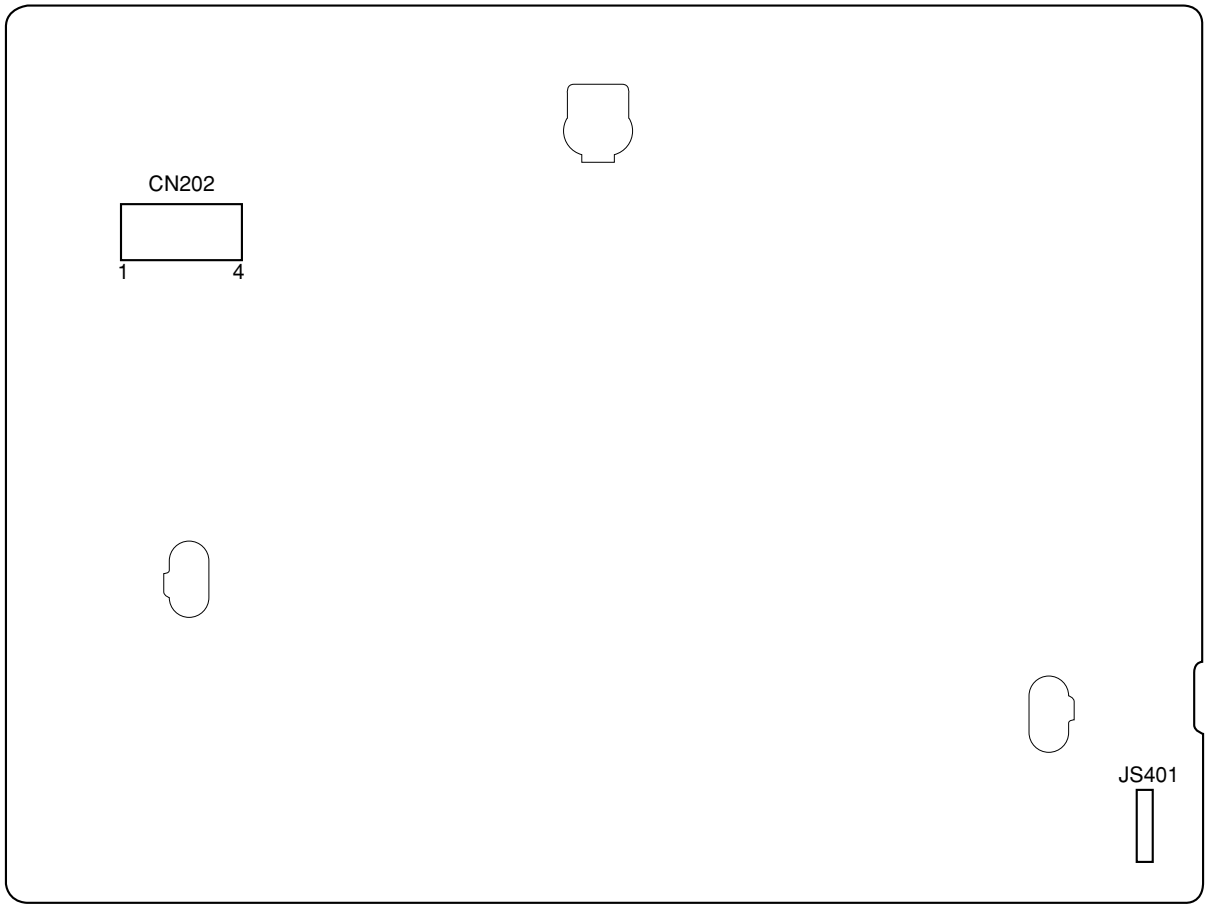
Purpose:

Mixed audio signal separate Lch and Rch.

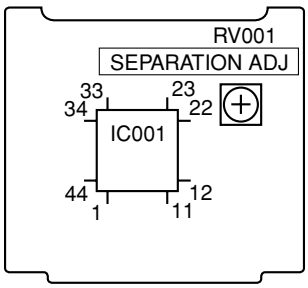
Mode	E-E
Signal	VIDEO: color bar (White 100% modulation) AUDIO: L NONE R 1 kHz 60% modulation ELECTRIC FIELD: 60–80 dBs/75 Ω Term
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Adjusting Element	RV001 (GK-12 Board)
Specified value	minimum

2-6. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENTS

MA-402 BOARD (Side A)



GK-12 BOARD (Side A)



SECTION 8
REPAIR PARTS LIST

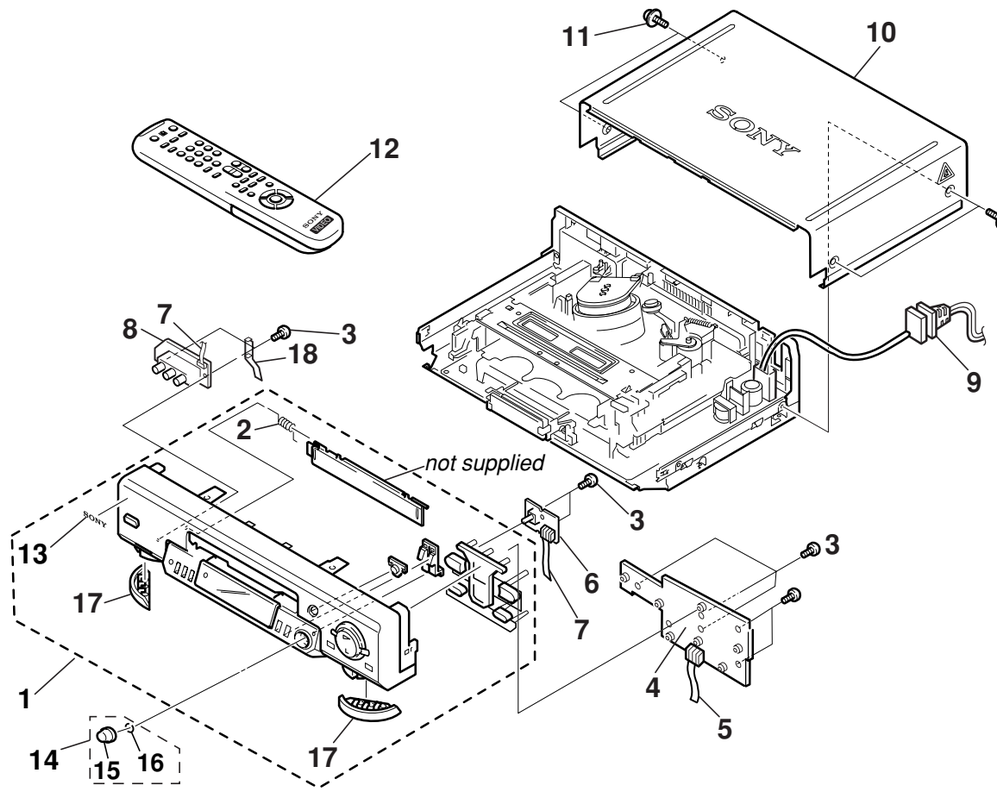
8-1. EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

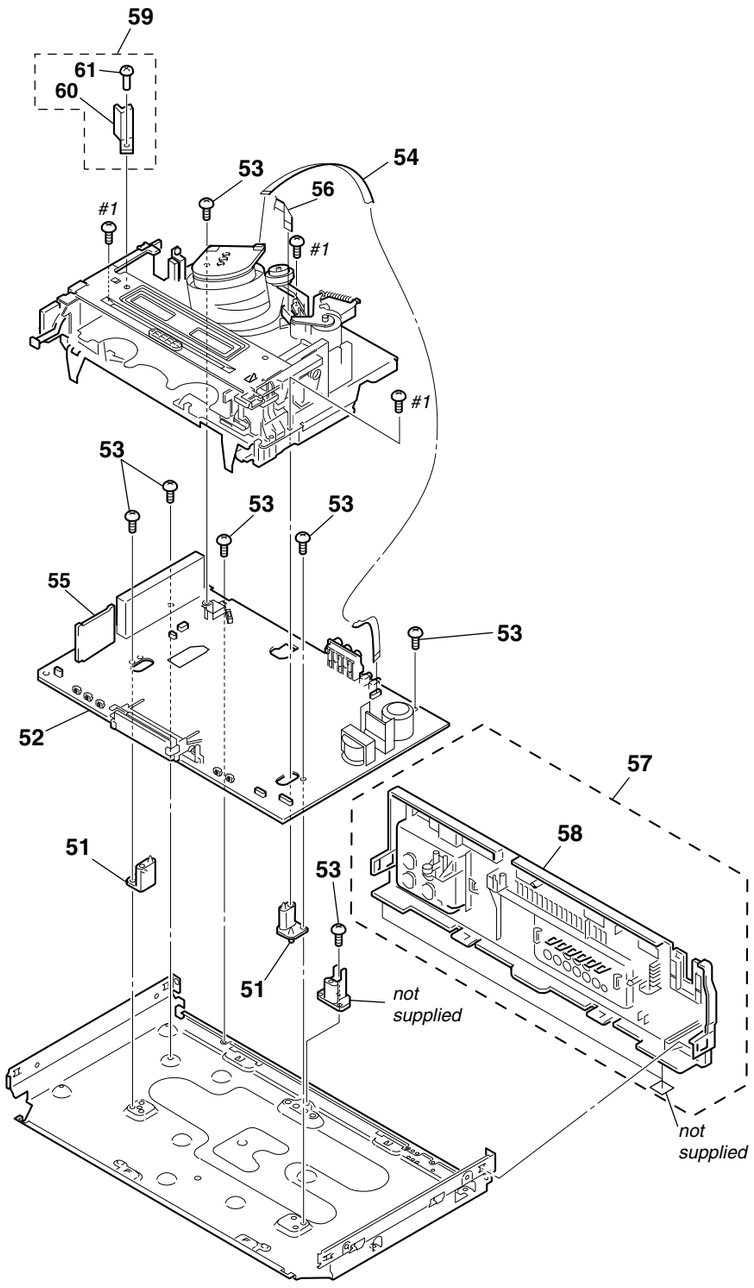
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

8-1-1. FRONT PANEL AND UPPER CASE SECTION



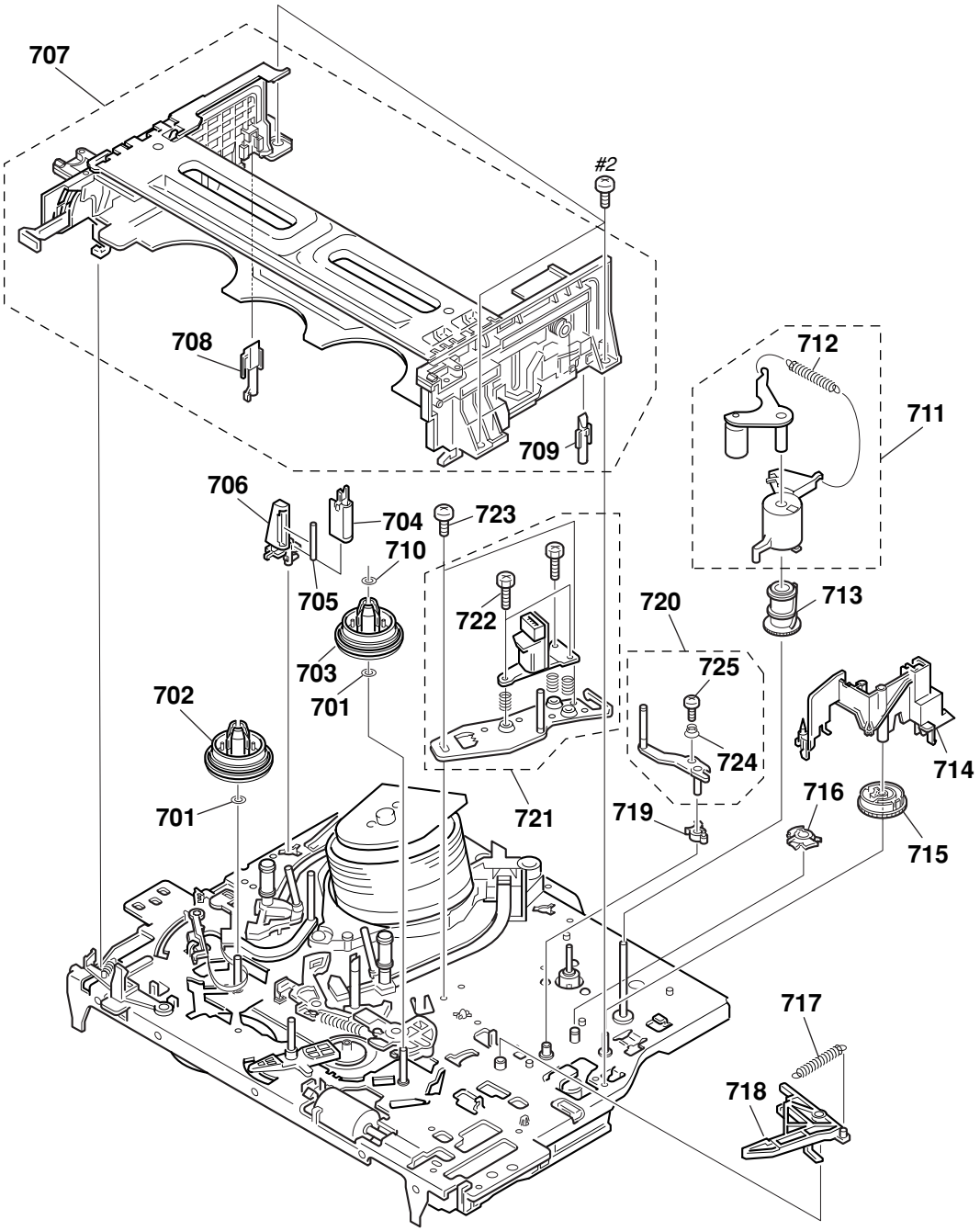
Ref. No.	Part No.	Description	Remarks
1	X-3951-336-1	PANEL ASSY, FRONT (EZ414)	
1	X-3951-337-1	PANEL ASSY, FRONT (EZ212)	
1	X-3951-338-1	PANEL ASSY, FRONT (EZ111)	
1	X-3951-346-1	PANEL ASSY, FRONT (ED515)	
1	X-3951-347-1	PANEL ASSY, FRONT (ED215)	
1	X-3951-348-1	PANEL ASSY, FRONT (ED115)	
1	X-3951-349-1	PANEL ASSY, FRONT (ED818)	
1	X-3951-350-1	PANEL ASSY, FRONT (ED616: ME, SG)	
1	X-3951-351-1	PANEL ASSY, FRONT (ED616 MJ)	
1	X-3951-352-1	PANEL ASSY, FRONT (ED313: ME, SG)	
1	X-3951-353-1	PANEL ASSY, FRONT (ED313 MJ)	
1	X-3951-354-1	PANEL ASSY, FRONT (EZ717)	
1	X-3951-355-1	PANEL ASSY, FRONT (EZ715)	
1	X-3951-362-1	PANEL ASSY, FRONT (ED915)	
1	X-3951-363-1	PANEL ASSY, FRONT (ED919)	
1	X-3951-364-1	PANEL ASSY, FRONT (ED817)	
1	X-3951-365-1	PANEL ASSY, FRONT (ED815)	
2	3-953-432-01	SPRING (GE), FL	
3	4-921-277-41	SCREW (B2.6 x 8), TAPPING, BIND	
* 4	A-6713-876-A	DM-098 COMPLETE PWB	
5	1-757-552-12	FLAT CABLE FDM-010	
* 6	A-6713-877-A	DI-081 COPLETE PWB	
7	1-757-553-11	FLAT CABLE FDI-002	
* 8	A-6713-870-A	FJ-031 COMPLETE PWB (ED115/ED215/ED313/ED815/ED817/EZ111/EZ212/EZ414)	
* 8	A-6713-878-A	FJ-031 COMPLETE PWB (ED515/ED616/EZ715/EZ717)	
* 8	A-6713-889-A	FJ-031 COMPLETE PWB (ED818/ED915/ED919)	
⚠ 9	1-757-665-11	CORD, POWER (ED115/ED215/ED313/ED515/ED616/ED815/ED817/ED818/ED915/ED919)	
⚠ 9	1-777-855-51	CORD, POWER (EZ111/EZ212/EZ414/EZ715/EZ717)	
10	3-064-641-41	CASE, UPPER (ED215/ED515/ED616: ME, SG/ED815/ED817/ED818: ME, SG/ED915/ED919/EZ715/EZ717)	
10	3-064-641-71	CASE, UPPER (ED115/ED313: ME, SG)	
10	3-064-651-01	CASE, UPPER (ED313 MJ)	
10	3-064-651-11	CASE, UPPER (ED616 MJ)	
11	3-710-901-11	SCREW, TAPPING (ED115/ED313/EZ111/EZ212/EZ414)	
11	3-710-901-61	SCREW, TAPPING (ED215/ED515/ED616/ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)	
12	1-476-473-11	COMMANDER, STANDARD (RMT V-309) (EZ717)	
12	1-476-475-11	COMMANDER, STANDARD (RMT V-311) (ED115/ED215/ED313/ED515/ED815)	
12	1-476-475-21	COMMANDER, STANDARD (RMT V-311A)	
12	1-476-475-31	COMMANDER, STANDARD (RMT V-311B) (ED616/ED818)	
12	1-476-175-41	COMMANDER, STANDARD (RMT V-311C) (ED919)	
12	1-476-475-51	COMMANDER, STANDARD (RMT V-311D) (EZ212/EZ414)	
12	1-476-475-61	COMMANDER, STANDARD (RMT V-311E) (EZ111/EZ715)	
13	3-943-995-01	EMBLEM (NO.5), SONY (ED115/ED313/EZ111/EZ212/EZ414)	
13	3-943-995-31	EMBLEM (NO.5), SONY (ED215/ED515/ED616/ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)	
14	X-3951-233-1	KNOB ASSY, ETR (ED215/ED515/ED616: ME, SG/ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)	
14	X-3951-232-1	KNOB ASSY, ETR (ED115/ED313: ME, SG/EZ111/EZ212/EZ414)	
14	X-3951-464-1	KNOB ASSY, ETR (ED313 MJ)	
14	X-3951-465-1	KNOB ASSY, ETR (ED616 MJ)	
15	3-065-547-31	KNOB, ETR (ED115/ED313: ME, SG/EZ111/EZ212/EZ414)	
16	3-055-077-1	SPRING, ETR (P5)	
17	3-057-164-01	INSULATOR (ED115/ED313/EZ111/EZ212/EZ414)	
17	3-057-164-11	INSULATOR (ED215/ED515/ED616/ED815/ED817/ED8185/ED915/ED919/EZ717/EZ715)	
18	3-057-165-01	PLATE, EARTH	

8-1-2. CHASSIS SECTION



Ref. No.	Part No.	Description	Remarks
51	3-959-383-01	BASE (R), MD	
* 52	A-6713-865-A	MA-402 COMPLETE PWB (ED818)	
* 52	A-6713-866-A	MA-402 COMPLETE PWB (ED919)	
* 52	A-6713-868-A	MA-402 COMPLETE PWB (EZ715AS)	
* 52	A-6713-869-A	MA-402 COMPLETE PWB (ED815)	
* 52	A-6713-873-A	MA-402 COMPLETE PWB (ED817)	
* 52	A-6713-874-A	MA-402 COMPLETE PWB (ED915)	
* 52	A-6713-885-A	MA-402 COMPLETE PWB (ED115/ED215)	
* 52	A-6713-886-A	MA-402 COMPLETE PWB (ED313: ME, SG)	
* 52	A-6713-888-A	MA-402 COMPLETE PWB (ED515)	
* 52	A-6713-890-A	MA-402 COMPLETE PWB (ED616: ME, SG)	
* 52	A-6713-891-A	MA-402 COMPLETE PWB (EZ111)	
* 52	A-6713-892-A	MA-402 COMPLETE PWB (EZ414)	
* 52	A-6713-893-A	MA-402 COMPLETE PWB (EZ212)	
* 52	A-6794-816-A	MA-402 COMPLETE PWB (ED313 MJ)	
* 52	A-6794-817-A	MA-402 COMPLETE PWB (ED616 MJ)	
53	3-970-605-21	SUMITITE (B3), +BV	
54	1-757-690-11	CABLE, FLAT (FMD-022) (ED515/ED616/ED815/ED817/ED818/ED915/ ED919/EZ414/EZ715/EZ717)	
54	1-757-691-11	CABLE, FLAT (FMD-023) (ED115/ED215/ED313/EZ111/EZ212)	
* 55	A-6713-875-A	NK-11 BOARD, COMPLETE (ED915/ED919/ED715NZ/EZ717NZ)	
* 55	A-6713-872-Z	GK-12 BOARD, COMPLETE (EZ715AS/EZ717AS)	
56	1-757-551-11	CABLE, FLAT (FAC-009)	
57	X-3951-402-1	PANEL ASSY, REAR (ED919/ED915/ED815/ED817/ED818/EZ715/ EZ717)	
57	X-3951-403-1	PANEL ASSY, REAR (ED515/ED616: ME, SG/EZ414)	
57	X-3951-404-1	PANEL ASSY, REAR (ED115/ED215/ED313: ME, SG/EZ111/EZ212)	
57	X-3951-405-1	PANEL ASSY, REAR (ED616 MJ)	
57	X-3951-406-1	PANEL ASSY, REAR (ED313 MJ)	
58	3-064-638-01	PANEL, REAR (ED919/ED915/ED815/ED817/ED818/EZ715/ EZ717)	
58	3-064-638-11	PANEL, REAR (ED515/ED616/EZ414)	
58	3-064-638-21	PANEL, REAR (ED115/ED215/ED313/EZ111/EZ212)	
59	X-3950-969-1	TC(N17S) ASSY (SL) (ED115/ED215/ED313/ED515/ED616/ED815/ ED817/ED818/ED915/ED919/EZ717AS)	
60	3-063-782-01	TC(N17S) HOLDER (SL) (ED115/ED215/ED313/ED515/ED616/ED815/ ED817/ED818/ED915/ED919/EZ717AS)	
61	3-342-512-21	SCREW (B1.7 X 3.5), TAPPING (ED115/ED215/ED313/ED515/ED616/ED815/ ED817/ED818/ED915/ED919/EZ717AS)	
#1	7-685-648-79	SCREW + BVTP 3 X 12 TYPE 2 IT-3	

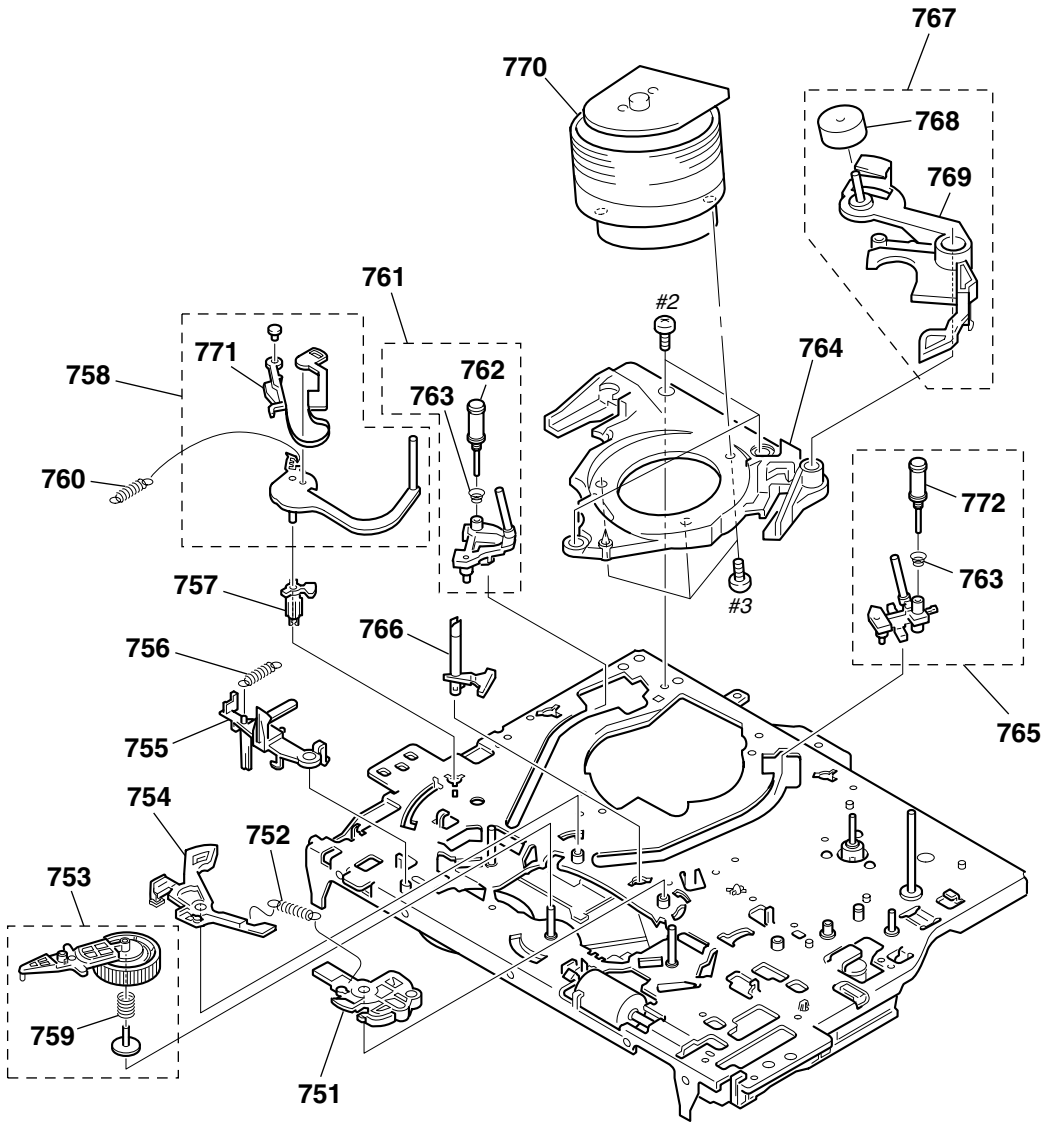
8-1-3. MECHANISM DECK SECTION-1



Ref. No.	Part No.	Description	Remarks
701	3-977-509-01	WASHER, THRUST	
702	3-977-507-01	TABLE, REEL (S)	
703	3-977-508-01	TABLE, REEL (T)	
704	1-500-471-11	HEAD, FE	
705	3-977-495-01	SHAFT, TG2	
706	3-977-494-01	HOLDER, FEH	
707	A-6776-359-C	FL, COMPLETE ASSY (SL)	
708	3-977-535-01	PLATE, LUMINOUS (END SENSOR)	
709	3-977-536-01	PLATE, LUMINOUS (TOP SENSOR)	
710	3-977-443-01	WASHER, STOPPER	
711	A-6759-863-B	PRESS BLOCK ASSY, PINCH	
712	3-958-455-01	SPRING (PINCH), TENSION	
713	3-977-447-01	GEAR, ELEVATOR	

Ref. No.	Part No.	Description	Remarks
714	3-063-773-02	OPENER, LID (SL)	
715	3-977-441-03	GEAR, PINCH PRESSING	
716	3-977-445-02	GEAR, TG8 ARM DRIVING	
717	3-062-763-01	SPRING, EXTENSION (RVS BRAKE)	
718	X-3950-964-1	ARM ASSY, RVS BRAKE (SL)	
719	3-063-756-01	GEAR, TG8 ARM H/R	
720	X-3947-590-1	TG8 ASSY	
721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK) FFC	
722	3-974-556-11	+ HEXA TT 2.6 x 9 (TAPER)	
723	3-979-508-01	SCREW + HEXA TP SW 3 x 8	
724	3-059-958-01	SPRING, TG8	
725	3-051-300-03	LOCK ACE SCREW	
#2	7-685-646-79	SCREW + BVTP 3 x 8 TYPE2	

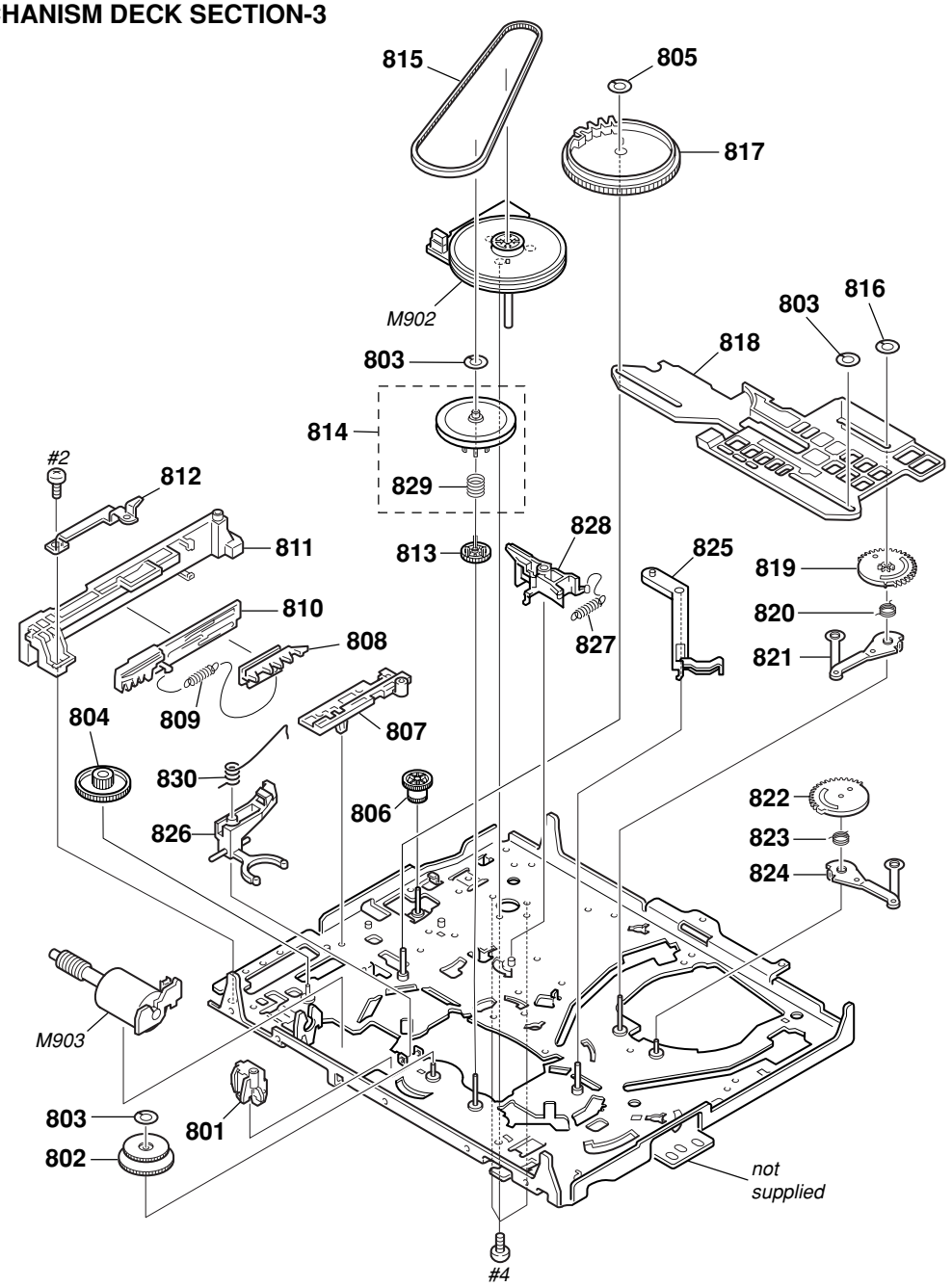
8-1-4. MECHANISM DECK SECTION-2



Ref. No.	Part No.	Description	Remarks
751	X-3949-363-1	BRAKE ASSY, MAIN (T)	
752	3-053-882-01	SPRING, TENS (MAIN BRAKE)	
753	X-3947-573-1	ARM ASSY, PENDULUM	
754	X-3951-005-1	BRAKE ASSY, MAIN (S)	
755	3-063-772-01	LEVER, REC PROOF (SL)	
756	3-976-767-01	SPRING, TENS. (REC PROOF)	
757	3-977-487-01	BOSS, TG1 FULCRUM	
758	X-3950-966-1	TG1 ASSY (SL)	
759	3-063-958-01	SPRING,COMP (SL PEND)	
760	3-977-488-01	SPRING, EXTENSION (POWER TENSION)	
761	A-6775-922-A	SHUTTLE (S) BLOCK ASSY	
762	X-3949-910-2	G. ROLLER ASSY	
763	3-965-178-01	SPRING	
764	3-062-687-01	BASE DRUM, K (UPPER MOTOR)	
765	A-6750-328-E	SHUTTLE (T) BLOCK ASSY	

Ref. No.	Part No.	Description	Remarks
766	3-977-501-01	PLATE, LUMINOUS	
767	A-6746-074-G	ROLLER BLOCK ASSY, HC	
768	X-3947-255-1	ROLLER ASSY, HC	
769	3-975-724-07	ARM, HC	
770	1-772-360-11	DRUM ASSY DZH-89D-R (ED115/ED215/ED313/EZ111/EZ212)	
770	1-796-012-11	DRUM ASSY DZH-0D1A-R (ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)	
770	1-796-011-11	DRUM ASSY DZH-0D0A-R (ED515/ED616/EZ414)	
771	X-3950-968-1	BAND, ASSY TG1 (SL)	
772	X-3948-050-1	ROLLER ASSY GUIDE	
#2	7-685-646-79	SCREW + BVTP 3 x 8 TYPE 2	
#3	7-682-647-09	SCREW + P3 x 6	

8-1-5. MECHANISM DECK SECTION-3



Ref. No.	Part No.	Description	Remarks
801	3-977-437-01	RETAINER, CAM MOTOR	
802	X-3949-364-1	ASSY, REEL DIRECT SELECT (B)	
803	3-977-443-01	WASHER, STOPPER	
804	3-063-785-01	WORM - WHEEL (SL)	
805	3-056-952-11	WASHER, STOPPER	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-02	PLATE, LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3947-365-1	GEAR, ASSY, PULLEY (B)	
815	3-977-510-01	BELT RUBBER	
816	3-056-824-01	WASHER, STOPPER	
817	3-063-439-01	GEAR, CAM	

Ref. No.	Part No.	Description	Remarks
818	3-063-768-01	SLIDER (SL)	
819	3-063-757-01	GEAR, LOADING (T) H/R	
820	3-977-456-03	SPRING, TORSION (LOAD T)	
821	X-3948-132-2	LEVER ASSY, LOADING (T)	
822	3-063-783-01	GEAR, LOADING (S) H/R	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3948-131-1	LEVER ASSY LOADING (S)	
825	3-977-489-01	ARM, TG1 DRIVING	
826	3-063-777-01	BASE DIRECT SELECT (SL)	
827	3-977-467-02	SPRING, CAP BRAKE	
828	X-3950-965-1	BRAKE ASSY, CAPSTAN (SL)	
829	3-063-823-01	SPRING, COMP (LIMITTER LOW K)	
830	3-063-778-02	SPRING TOR. (BASE, D. S SL)	
M902	1-763-572-11	MOTOR, DC	
M903	X-3950-970-1	MOTOR ASSY, CAM (SL)	
#2	7-685-646-79	SCREW + BVTP 3 x 8 TYPE 2 IT-3	
#4	7-685-133-19	SCREW + P2.6 x 6 TYPE2 NON-SLIT	

8-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
	A-6713-877-A	DI-081 BOARD COMPLETE			
		**********			
		<CONNECTOR>			
CN901	1-695-368-31	CONNECTOR, FFC/FPC 7P			
CN901	1-784-449-11	CONNECTOR, FFC/FPC 7P			
		<DIODE>			
D900	8-719-056-06	DIODE SLR-342DCT31			
		<RESISTOR>			
R900	1-216-295-00	SHORT	0		
R902	1-216-043-91	RES-CHIP	560	5%	1/10W
		<SWITCH>			
S900	1-762-196-21	SWITCH, TACT			
S901	1-418-059-22	ENCODER, ROTARY			

	A-6713-876-A	DM-098 BOARD COMPLETE			
		**********			
		<CONNECTOR>			
CN471	1-770-514-31	CONNECTOR, FFC/FPC 5P			
CN471	1-784-447-11	CONNECTOR, FFC/FPC 5P			
		<CHIP CONDUCTOR>			
JR461	1-216-295-00	SHORT	0		
		<RESISTOR>			
R465	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R467	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R468	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R469	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R470	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R474	1-216-295-00	SHORT	0		
R475	1-216-295-00	SHORT	0		

Ref. No.	Part No.	Description	Remarks
		<SWITCH>	
S462	1-762-196-21	SWITCH, TACT (⏏ EJECT)	
S463	1-762-196-21	SWITCH, TACT (● REC)	
S466	1-762-196-21	SWITCH, TACT (◀◀ REW)	
S467	1-762-196-21	SWITCH, TACT (■ STOP)	
S468	1-762-196-21	SWITCH, TACT (▶ PLAY)	
S469	1-762-196-21	SWITCH, TACT (▶▶ FF)	
S472	1-762-196-21	SWITCH, TACT (❚❚ PAUSE)	

	A-6713-870-A	FJ-031 BOARD COMPLETE (ED115/ED215/ED313/EZ111/EZ212/EZ414)	
	A-6713-878-A	FJ-031 BOARD COMPLETE (ED818/ED915/ED919/EZ715/EZ717)	
	A-6713-889-A	FJ-031 BOARD COMPLETE (ED515/ED616)	
		**********	
		<CONNECTOR>	
CN532	1-695-368-31	CONNECTOR, FFC/FPC 7P	
CN532	1-784-449-11	CONNECTOR, FFC/FPC 7P	
		<JACK>	
CNJ531	1-770-021-11	JACK, PIN 3P (ED515/ED616/ED818/ED915/ED919/EZ715/EZ717)	
		<DIODE>	
D531	8-719-071-15	DIODE HZM6.8ZWA1TL (ED515/ED616/ED818/ED915/ED919/EZ715/EZ717)	
D532	8-719-071-15	DIODE HZM6.8ZWA1TL (ED515/ED616/ED818/ED915/ED919/EZ715/EZ717)	
D533	8-719-071-15	DIODE HZM6.8ZWA1TL (ED515/ED616/ED818/ED915/ED919/EZ715/EZ717)	
D534	8-719-017-09	DIODE 02DZ6.2-TPH3 (ED515/ED616/ED818/ED915/ED919/EZ715/EZ717)	
		<JUMPER SELECTOR>	
JS531	1-216-296-00	SHORT 0 (ED515/ED616/ED818/ED915/ED919/EZ715/EZ717)	
JS532	1-216-296-00	SHORT 0 (ED515/ED616/ED818/ED915/ED919/EZ715/EZ717)	
JS534	1-216-295-00	SHORT 0	

Ref. No.	Part No.	Description			Remarks
		<RESISTOR>			
R533	1-216-021-00	RES-CHIP	68	5%	1/10W (ED515/ED616/ED818/ED915/ED919/EZ715/EZ717)
R534	1-216-097-11	RES-CHIP	100K	5%	1/10W (ED515/ED616/ED818/ED915/ED919/EZ715/EZ717)
R535	1-216-097-11	RES-CHIP	100K	5%	1/10W (ED515/ED616/ED818/ED915/ED919/EZ715/EZ717)
		<SWITCH>			
S500	1-762-196-21	SWITCH, TACT			

	A-6713-872-A	GK-12 BOARD COMPLETE (EZ715AS/EZ717AS) **********			
		<CAPACITOR>			
C003	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C006	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C007	1-164-699-11	CERAMIC CHIP	0.0033uF	5.00%	50V
C008	1-164-699-11	CERAMIC CHIP	0.0033uF	5.00%	50V
C009	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C010	1-163-243-11	CERAMIC CHIP	47PF	5.00%	50V
C011	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C012	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C013	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C014	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C015	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C016	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C017	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C018	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C022	1-163-021-91	CERAMIC CHIP	0.01uF	10.00%	50V
C023	1-163-021-91	CERAMIC CHIP	0.01uF	10.00%	50V
		< CONNECTOR >			
* CN001	1-691-183-11	CONNECTOR (BOARD TO BOARD) 13P			
		< IC >			
IC001	8-759-579-30	IC TDA9873H/V1, 518			
		< JUMPER RESISTOR >			
JS002	1-216-295-00	METAL CHIP	0	5%	1/10W
JS003	1-216-295-00	METAL CHIP	0	5%	1/10W
		< RESISTOR >			
R001	1-216-295-00	METAL CHIP	0	5%	1/10W
R002	1-216-295-00	METAL CHIP	0	5%	1/10W
R004	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R005	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R006	1-216-057-00	METAL CHIP	2.2K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R007	1-216-045-00	METAL CHIP	680	5%	1/10W
R008	1-216-041-00	METAL CHIP	470	5%	1/10W
R009	1-216-041-00	METAL CHIP	470	5%	1/10W
R010	1-208-803-11	METAL CHIP	7.5K	0.5%	1/10W
R011	1-216-295-00	METAL CHIP	0	5%	1/10W
R012	1-216-298-00	METAL CHIP	2.2	5%	1/10W
		< VARIABLE RESISTOR >			
RV001	1-241-783-11	RES, ADJ, CARBON 2.2K			
		< VIBRATOR >			
X001	1-781-353-11	VIBRATOR, CRYSTAL (4MHz)			

	A-6713-865-A	MA-402 BOARD COMPLETE	(ED818)		
	A-6713-866-A	MA-402 BOARD COMPLETE	(ED919)		
	A-6713-867-A	MA-402 BOARD COMPLETE	(EZ717NZ)		
	A-6713-868-A	MA-402 BOARD COMPLETE	(EZ715AS)		
	A-6713-869-A	MA-402 BOARD COMPLETE	(ED815)		
	A-6713-871-A	MA-402 BOARD COMPLETE	(EZ717AS)		
	A-6713-873-A	MA-402 BOARD COMPLETE	(ED817)		
	A-6713-874-A	MA-402 BOARD COMPLETE	(ED915)		
	A-6713-879-A	MA-402 BOARD COMPLETE	(EZ715NZ)		
	A-6713-885-A	MA-402 BOARD COMPLETE	(ED115/ED215)		
	A-6713-886-A	MA-402 BOARD COMPLETE	(ED313: ME, SG)		
	A-6713-888-A	MA-402 BOARD COMPLETE	(ED515)		
	A-6713-890-A	MA-402 BOARD COMPLETE	(ED616: ME, SG)		
	A-6713-891-A	MA-402 BOARD COMPLETE	(EZ111)		
	A-6713-892-A	MA-402 BOARD COMPLETE	(EZ414)		
	A-6713-893-A	MA-402 BOARD COMPLETE	(EZ212)		
	A-6794-816-A	MA-402 BOARD COMPLETE	(ED313)		
	A-6794-817-A	MA-402 BOARD COMPLETE	(ED616)		
		**********			
	3-064-645-01	HOLDER, FL			
	3-065-718-01	SINK, HEAT			
	3-960-273-11	SPACER, TOP END			
	3-960-274-01	SPACER, LED			
		<CAPACITOR>			
C001	1-163-009-11	CERAMIC CHIP	0.001uF	10.00%	50V
C002	1-163-009-11	CERAMIC CHIP	0.001uF	10.00%	50V
C003	1-163-009-11	CERAMIC CHIP	0.001uF	10.00%	50V
C004	1-163-009-11	CERAMIC CHIP	0.001uF	10.00%	50V
C005	1-128-057-11	ELECT	330uF	20.00%	6.3V
C006	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C007	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V (EZ111/EZ212/ED313)
C008	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C009	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C010	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C011	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C012	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C013	1-163-243-11	CERAMIC CHIP	47PF	5.00%	50V
C014	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C015	1-163-231-11	CERAMIC CHIP	15PF	5.00%	50V

MA-402

Ref. No.	Part No.	Description			Remarks
C016	1-163-233-11	CERAMIC CHIP	18PF	5.00% 50V	
C017	1-110-501-11	CERAMIC CHIP	0.33uF	10.00% 16V	
C018	1-163-989-11	CERAMIC CHIP	0.033uF	10.00% 25V	
C019	1-109-982-11	CERAMIC CHIP	1uF	10.00% 10V	
C020	1-164-004-11	CERAMIC CHIP	0.1uF	10.00% 25V	
C021	1-113-642-11	TANTAL. CHIP	47uF	10.00% 10V	
C022	1-107-823-11	CERAMIC CHIP	0.47uF	10.00% 16V	
C023	1-163-243-11	CERAMIC CHIP	47PF	5.00% 50V	
C031	1-128-499-11	ELECT	220uF	20.00% 16V	
C032	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C034	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C051	1-124-589-11	ELECT	47uF	20.00% 16V	
C053	1-164-344-11	CERAMIC CHIP	0.068uF	10.00% 25V	
C054	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C071	1-163-809-11	CERAMIC CHIP	0.047uF	10.00% 25V	
C072	1-164-489-11	CERAMIC CHIP	0.22uF	10.00% 16V	
C073	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C074	1-163-009-11	CERAMIC CHIP	0.001uF	10.00% 50V	
C075	1-163-259-91	CERAMIC CHIP	220PF	5.00% 50V	
C076	1-126-941-11	ELECT	470uF	20.00% 25V	
C078	1-163-038-00	CERAMIC CHIP	0.1uF	25V	(EZ111/EZ212/ED313)
C100	1-163-235-11	CERAMIC CHIP	22PF	5.00% 50V	
C101	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C102	1-127-890-11	DOUBLE LAYER	0.47F	5.5V	(ED313/ED616/ED818)
C103	1-104-905-11	CAPACITOR	0.22F	5.5V	(EXCEPT ED313/ED616/ED818)
C104	1-126-935-11	ELECT	470uF	20.00% 10V	
C105	1-164-004-11	CERAMIC CHIP	0.1uF	10.00% 25V	
C106	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C107	1-164-182-11	CERAMIC CHIP	0.0033uF	10.00% 50V	
C108	1-163-231-11	CERAMIC CHIP	15PF	5.00% 50V	
C109	1-163-231-11	CERAMIC CHIP	15PF	5.00% 50V	
C110	1-163-234-11	CERAMIC CHIP	20PF	5.00% 50V	
C111	1-163-234-11	CERAMIC CHIP	20PF	5.00% 50V	
C112	1-164-489-11	CERAMIC CHIP	0.22uF	10.00% 16V	
C113	1-164-004-11	CERAMIC CHIP	0.1uF	10.00% 25V	
C114	1-104-664-11	ELECT	47uF	20.00% 25V	
C141	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C142	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C143	1-164-004-11	CERAMIC CHIP	0.1uF	10.00% 25V	
C151	1-164-505-11	CERAMIC CHIP	2.2uF	16V	
C152	1-126-163-11	ELECT	4.7uF	20.00% 50V	
C154	1-126-163-11	ELECT	4.7uF	20.00% 50V	
C155	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C159	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	(ED919)
C160	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C161	1-163-096-00	CERAMIC CHIP	13PF	5.00% 50V	
C162	1-163-096-00	CERAMIC CHIP	13PF	5.00% 50V	
C163	1-163-229-11	CERAMIC CHIP	12PF	5.00% 50V	
C164	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C165	1-163-227-11	CERAMIC CHIP	10PF	0.50PF 50V	
C166	1-163-229-11	CERAMIC CHIP	12PF	5.00% 50V	(ED919)
C167	1-164-489-11	CERAMIC CHIP	0.22uF	10.00% 16V	
C168	1-164-004-11	CERAMIC CHIP	0.1uF	10.00% 25V	
C169	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C171	1-163-038-00	CERAMIC CHIP	0.1uF	25V	

Ref. No.	Part No.	Description			Remarks
C172	1-163-245-11	CERAMIC CHIP	56PF	5.00% 50V	
C191	1-163-137-00	CERAMIC CHIP	680PF	5.00% 50V	(ED616/ED818/EZ717)
C192	1-163-145-00	CERAMIC CHIP	0.0015uF	5.00% 50V	
C193	1-164-004-11	CERAMIC CHIP	0.1uF	10.00% 25V	
C194	1-124-589-11	ELECT	47uF	20.00% 16V	
C195	1-124-234-00	ELECT	22uF	20.00% 16V	
C196	1-163-145-00	CERAMIC CHIP	0.0015uF	5.00% 50V	
C197	1-164-182-11	CERAMIC CHIP	0.0033uF	10.00% 50V	(ED616/ED818/EZ717)
C201	1-164-505-11	CERAMIC CHIP	2.2uF	16V	
C202	1-163-017-00	CERAMIC CHIP	0.0047uF	10.00% 50V	(EXCEPT ED115/ED215/ED313)
C202	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	(ED115/ED215/ED313)
C203	1-164-161-11	CERAMIC CHIP	0.0022uF	10.00% 50V	(EXCEPT ED115/ED215/ED313)
C203	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	(ED115/ED215/ED313)
C204	1-164-161-11	CERAMIC CHIP	0.0022uF	10.00% 50V	(EXCEPT ED115/ED215/ED313)
C204	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	(ED115/ED215/ED313)
C205	1-163-017-00	CERAMIC CHIP	0.0047uF	10.00% 50V	(EXCEPT ED115/ED215/ED313)
C205	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	(ED115/ED215/ED313)
C206	1-163-989-11	CERAMIC CHIP	0.033uF	10.00% 25V	
C207	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C208	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C209	1-126-162-11	ELECT	3.3uF	20.00% 50V	
C210	1-163-243-11	CERAMIC CHIP	47PF	5.00% 50V	(ED115/ED215/ED313/EZ111/EZ212)
C211	1-163-243-11	CERAMIC CHIP	47PF	5.00% 50V	(ED115/ED215/ED313/EZ111/EZ212)
C212	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	(ED115/ED215/ED313/EZ111/EZ212)
C213	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	(ED115/ED215/ED313/EZ111/EZ212)
C214	1-163-235-11	CERAMIC CHIP	22PF	5.00% 50V	
C215	1-164-232-11	CERAMIC CHIP	0.01uF	10.00% 50V	
C216	1-109-982-11	CERAMIC CHIP	1uF	10.00% 10V	
C217	1-163-017-00	CERAMIC CHIP	0.0047uF	10.00% 50V	
C218	1-124-257-00	ELECT	2.2uF	20.00% 50V	
C219	1-163-275-11	CERAMIC CHIP	0.001uF	5.00% 50V	
C220	1-107-823-11	CERAMIC CHIP	0.47uF	10.00% 16V	
C221	1-163-037-11	CERAMIC CHIP	0.022uF	10.00% 50V	
C222	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C223	1-126-163-11	ELECT	4.7uF	20.00% 50V	
C224	1-109-982-11	CERAMIC CHIP	1uF	10.00% 10V	(EXCEPT ED115/ED215/ED313/ED815/EZ414)
C225	1-164-505-11	CERAMIC CHIP	2.2uF	16V	
C226	1-163-089-00	CERAMIC CHIP	6PF	0.50PF 50V	
C227	1-163-255-11	CERAMIC CHIP	150PF	5.00% 50V	
C228	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C229	1-126-163-11	ELECT	4.7uF	20.00% 50V	
C230	1-163-235-11	CERAMIC CHIP	22PF	5.00% 50V	(ED515/ED815/EZ715)
C230	1-163-233-11	CERAMIC CHIP	18PF	5.00% 50V	(ED115/ED215/ED313/EZ111/EZ212)
C230	1-163-227-11	CERAMIC CHIP	10PF	0.50PF 50V	(ED616/ED817/ED818//ED915/ED919/EZ717)
C231	1-163-037-11	CERAMIC CHIP	0.022uF	10.00% 50V	

Ref. No.	Part No.	Description			Remarks
C232	1-163-237-11	CERAMIC CHIP	27PF	5.00%	50V
					(ED515/ED815/EZ414/EZ715)
C232	1-163-231-11	CERAMIC CHIP	15PF	5.00%	50V
					(ED616/ED817/ED818/ED915/ED919/EZ717)
C232	1-163-227-11	CERAMIC CHIP	10PF	0.50PF	50V
					(ED115/ED215/ED313/EZ111/EZ212)
C233	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C234	1-124-589-11	ELECT	47uF	20.00%	16V
C235	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C236	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C237	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C238	1-126-157-11	ELECT	10uF	20.00%	16V
C239	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C240	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C241	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C242	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C243	1-126-162-11	ELECT	3.3uF	20.00%	50V
C244	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C245	1-126-157-11	ELECT	10uF	20.00%	16V
C246	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C247	1-164-489-11	CERAMIC CHIP	0.22uF	10.00%	16V
C248	1-124-257-00	ELECT	2.2uF	20.00%	50V
C249	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C250	1-124-589-11	ELECT	47uF	20.00%	16V
C251	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C252	1-163-263-11	CERAMIC CHIP	330PF	5.00%	50V
C253	1-109-982-11	CERAMIC CHIP	1uF	10.00%	10V
C254	1-163-017-00	CERAMIC CHIP	0.0047uF	10.00%	50V
		(EXCEPT ED115/ED215/ED313/EZ111/EZ212)			
C255	1-164-161-11	CERAMIC CHIP	0.0022uF	10.00%	50V
		(EXCEPT ED115/ED215/ED313/EZ111/EZ212)			
C256	1-164-161-11	CERAMIC CHIP	0.0022uF	10.00%	50V
		(EXCEPT ED115/ED215/ED313/EZ111/EZ212)			
C257	1-163-017-00	CERAMIC CHIP	0.0047uF	10.00%	50V
		(EXCEPT ED115/ED215/ED313/EZ111/EZ212)			
C258	1-109-982-11	CERAMIC CHIP	1uF	10.00%	10V
C262	1-163-243-11	CERAMIC CHIP	47PF	5.00%	50V
		(EXCEPT ED115/ED215/ED313/EZ111/EZ212)			
C263	1-163-243-11	CERAMIC CHIP	47PF	5.00%	50V
					(ED115/ED215/ED313/EZ111/EZ212)
C264	1-163-263-11	CERAMIC CHIP	330PF	5.00%	50V
		(EXCEPT ED115/ED215/ED313/ED817/EZ111/			
					EZ212/EZ414)
C289	1-164-004-11	CERAMIC CHIP	0.1uF	10.00%	25V
		(ED616/ED817/ED818/ED915/ED919/EZ717)			
C290	1-126-163-11	ELECT	4.7uF	20.00%	50V
		(ED616/ED817/ED818/ED915/ED919/EZ717)			
C291	1-164-489-11	CERAMIC CHIP	0.22uF	10.00%	16V
		(ED616/ED817/ED818/ED915/ED919/EZ717)			
C292	1-164-505-11	CERAMIC CHIP	2.2uF		16V
		(ED616/ED817/ED818/ED915/ED919/EZ717)			
C294	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
		(ED616/ED817/ED818/ED915/ED919/EZ717)			
C295	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
		(ED616/ED817/ED818/ED915/ED919/EZ717)			
C296	1-126-157-11	ELECT	10uF	20.00%	16V
		(ED616/ED817/ED818/ED915/ED919/EZ717)			
C298	1-126-163-11	ELECT	4.7uF	20.00%	50V
		(ED616/ED817/ED818/ED915/ED919/EZ717)			
C299	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
		(ED616/ED817/ED818/ED915/ED919/EZ717)			
C303	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C304	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V

Ref. No.	Part No.	Description			Remarks
C307	1-124-589-11	ELECT	47uF	20.00%	16V
C308	1-126-964-11	ELECT	10uF	20.00%	50V
C309	1-163-020-00	CERAMIC CHIP	0.0082uF	10.00%	50V
C310	1-104-664-11	ELECT	47uF	20.00%	25V
C311	1-126-964-11	ELECT	10uF	20.00%	50V
C312	1-124-257-00	ELECT	2.2uF	20.00%	50V
C313	1-126-964-11	ELECT	10uF	20.00%	50V
C314	1-104-664-11	ELECT	47uF	20.00%	25V
C315	1-163-020-00	CERAMIC CHIP	0.0082uF	10.00%	50V
C316	1-126-964-11	ELECT	10uF	20.00%	50V
C317	1-126-160-11	ELECT	1uF	20.00%	50V
C318	1-126-964-11	ELECT	10uF	20.00%	50V
C319	1-126-964-11	ELECT	10uF	20.00%	50V
C320	1-126-964-11	ELECT	10uF	20.00%	50V
C322	1-126-964-11	ELECT	10uF	20.00%	50V
C323	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C324	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C326	1-164-489-11	CERAMIC CHIP	0.22uF	10.00%	16V
C327	1-164-489-11	CERAMIC CHIP	0.22uF	10.00%	16V
C328	1-164-489-11	CERAMIC CHIP	0.22uF	10.00%	16V
C350	1-126-157-11	ELECT	10uF	20.00%	16V
C351	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C352	1-163-037-11	CERAMIC CHIP	0.022uF	10.00%	50V
C354	1-124-234-00	ELECT	22uF	20.00%	16V
C355	1-126-157-11	ELECT	10uF	20.00%	16V
C356	1-163-011-11	CERAMIC CHIP	0.0015uF	10.00%	50V
C357	1-163-011-11	CERAMIC CHIP	0.0015uF	10.00%	50V
C358	1-126-163-11	ELECT	4.7uF	20.00%	50V
C359	1-126-157-11	ELECT	10uF	20.00%	16V
C360	1-126-160-11	ELECT	1uF	20.00%	50V
					(ED515/ED616)
C361	1-126-160-11	ELECT	1uF	20.00%	50V
C362	1-126-160-11	ELECT	1uF	20.00%	50V
C363	1-124-234-00	ELECT	22uF	20.00%	16V
C364	1-126-163-11	ELECT	4.7uF	20.00%	50V
C365	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C371	1-163-009-11	CERAMIC CHIP	0.001uF	10.00%	50V
C373	1-137-505-11	MYLAR	220PF	5.00%	50V
C375	1-104-696-11	FILM	0.015uF	5.00%	100V
					(EXCEPT ED616/ED818/EZ717)
C375	1-137-612-11	FILM	0.0068uF	5.00%	100V
					(ED616/ED818/EZ717)
C376	1-163-011-11	CERAMIC CHIP	0.0015uF	10.00%	50V
C377	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C378	1-124-589-11	ELECT	47uF	20.00%	16V
C379	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C380	1-104-697-11	FILM	0.047uF	5.00%	100V
					(ED616/ED818/EZ717)
C381	1-124-589-11	ELECT	47uF	20.00%	16V
					(ED616/ED818/EZ717)
C382	1-163-011-11	CERAMIC CHIP	0.0015uF	10.00%	50V
					(ED616/ED818/EZ717)
C383	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
					(ED616/ED818/EZ717)
C384	1-163-011-11	CERAMIC CHIP	0.0015uF	10.00%	50V
					(ED616/ED818/EZ717)
C385	1-126-160-11	ELECT	1uF	20.00%	50V
					(ED818/ED915/ED919/EZ715/EZ717)
C386	1-126-160-11	ELECT	1uF	20.00%	50V
					(ED818/ED915/ED919/EZ715/EZ717)
C451	1-124-584-00	ELECT	100uF	20.00%	10V
C452	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V

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Ref. No.	Part No.	Description			Remarks
C453	1-126-157-11	ELECT	10uF	20.00%	16V
C454	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C455	1-124-584-00	ELECT	100uF	20.00%	10V
C456	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C457	1-126-941-11	ELECT	470uF	20.00%	25V
⚠C600	1-104-705-11	MYLAR	0.1uF	20.00%	250V
⚠C601	1-104-705-11	MYLAR	0.1uF	20.00%	250V
⚠C602	1-113-900-11	CERAMIC	470PF	10.00%	250V
⚠C603	1-113-900-11	CERAMIC	470PF	10.00%	250V
⚠C604	1-113-900-11	CERAMIC	470PF	10.00%	250V
⚠C605	1-107-405-11	ELECT(BLOCK)	68uF	20.00%	400V
C606	1-130-470-00	MYLAR	820PF	5.00%	50V
C607	1-107-737-11	MYLAR	560PF	5.00%	50V
⚠C608	1-131-974-11	FILM	2200PF	5%	800V
C610	1-137-921-11	ELECT	1500uF	20%	10V
C611	1-126-935-11	ELECT	470uF	20.00%	16V
C612	1-126-960-11	ELECT	1uF	20.00%	50V
C613	1-130-496-00	MYLAR	0.12uF	5.00%	50V
C615	1-131-976-21	ELECT	820uF	20%	25V
C616	1-126-941-11	ELECT	470uF	20.00%	25V
C624	1-126-967-11	ELECT	47uF	20.00%	50V
C626	1-126-967-11	ELECT	47uF	20.00%	50V
C627	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C629	1-135-372-31	ELECT	470uF	20%	10V
C630	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C631	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C633	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C636	1-126-967-11	ELECT	47uF	20.00%	50V
C661	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C662	1-104-666-11	ELECT	220uF	20.00%	25V
C663	1-126-941-11	ELECT	470uF	20.00%	25V
C664	1-124-589-11	ELECT	47uF	20.00%	16V
C665	1-124-234-00	ELECT	22uF	20.00%	16V
C669	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C671	1-126-965-11	ELECT	22uF	20.00%	50V
C673	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C674	1-126-933-11	ELECT	100uF	20.00%	16V
C701	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C702	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C703	1-126-933-11	ELECT	100uF	20.00%	16V
C704	1-163-009-11	CERAMIC CHIP	0.001uF	10.00%	50V
C705	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C706	1-126-933-11	ELECT	100uF	20.00%	16V
C707	1-104-664-11	ELECT	47uF	20.00%	25V
C708	1-126-163-11	ELECT	4.7uF	20.00%	50V
C712	1-126-933-11	ELECT	100uF	20.00%	16V
C713	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C714	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V
C715	1-163-037-11	CERAMIC CHIP	0.022uF	10.00%	50V (ED919)
C719	1-163-038-00	CERAMIC CHIP	0.1uF		25V (ED915/ED919/EZ715/EZ717)
C722	1-126-933-11	ELECT	100uF	20.00%	16V (ED915/ED919/EZ715/EZ717)
C723	1-164-232-11	CERAMIC CHIP	0.01uF	10.00%	50V (ED915/ED919/EZ715/EZ717)
C730	1-163-009-11	CERAMIC CHIP	0.001uF	10.00%	50V (ED919/EZ715/EZ717)

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
C731	1-163-009-11	CERAMIC CHIP	0.001uF	10.00%	50V (ED919/EZ715/EZ717)
C901	1-126-160-11	ELECT	1uF	20.00%	50V (ED815/ED817/ ED818/ED915/ED919/ED715/ED717)
C902	1-126-160-11	ELECT	1uF	20.00%	50V (ED815/ED817/ ED818/ED915/ED919/ED715/ED717)
C903	1-126-935-11	ELECT	470uF	20.00%	10V
C907	1-124-589-11	ELECT	47uF	20.00%	16V
		<CONNECTOR>			
CN001	1-750-152-11	PIN, CONNECTOR 13P			
* CN031	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P			
CN051	1-794-861-11	CONNECTOR, BOARD TO BOARD 8P			
CN071	1-766-980-71	CONNECTOR, FFC/FPC 7P (ED115/ED215/ED313/EZ111/EZ212)			
CN072	1-784-484-11	CONNECTOR, FFC/FPC 5P (EXCEPT ED115/ED215/ED313/EZ111/EZ212)			
CN201	1-784-490-11	CONNECTOR, FFC/FPC 11P (ED818/ED915/ED919/EZ715/EZ717)			
* CN202	1-560-892-00	PIN, CONNECTOR 4P			
CN204	1-784-485-11	CONNECTOR, FFC/FPC 6P (EXCEPT ED818/ED915/ED919/EZ715/EZ717)			
CN331	1-784-486-11	CONNECTOR, FFC/FPC 7P			
CN332	1-506-468-11	PIN, CONNECTOR 3P			
CN334	1-766-980-71	CONNECTOR, FFC/FPC 7P			
CN334	1-784-486-11	CONNECTOR, FFC/FPC 7P			
CN411	1-784-486-11	CONNECTOR, FFC/FPC 7P			
CN412	1-766-978-31	CONNECTOR, FFC/FPC 5P			
CN412	1-784-484-11	CONNECTOR, FFC/FPC 5P			
⚠*CN600	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P			
		<JACK>			
CNJ901	1-793-001-21	JACK, PIN (6P) (ED815/ED817/ ED818/ED915/ED919/EZ715/EZ717)			
CNJ902	1-779-012-21	JACK, PIN 5P (ED515/ED616/EZ414)			
CNJ903	1-779-010-11	JACK, PIN 4P (ED115/ED215/ ED313/ EZ111/EZ212)			
		<DIODE>			
D001	8-719-048-26	DIODE GL528V1			
D071	8-719-200-82	DIODE MPG06D-6052PKG3			
D100	8-719-911-19	DIODE 1SS119-25TD			
D101	8-719-200-82	DIODE MPG06D-6052PKG3			
D102	8-719-200-82	DIODE MPG06D-6052PKG3			
D103	8-719-200-82	DIODE MPG06D-6052PKG3			
D151	8-719-911-19	DIODE 1SS119-25TD			
D401	8-719-059-98	DIODE SLR-342VCT31 (EZ715/EZ717)			
D402	8-719-056-06	DIODE SLR-342DCT31 (ED616/ED817/ ED818/ED915/ED919/EZ717)			
D403	8-719-200-82	DIODE MPG06D-6052PKG3			
D404	8-719-109-89	DIODE RD5.6ES-T1B2			
⚠D600	8-719-051-93	DIODE DF06M-6031			
D601	8-719-063-70	DIODE D1NL20U-TA2			
D607	8-719-109-89	DIODE RD5.6ES-T1B2			
D608	8-719-022-97	DIODE D2S4MF			

Ref. No.	Part No.	Description	Remarks
D609	8-719-083-43	DIODE 31DQ06-FA7	
D611	8-719-313-17	DIODE AU02A-V0	
D612	8-719-313-17	DIODE AU02A-V0	
D613	8-719-043-76	DIODE AK04V0	
D614	8-719-160-64	DIODE RD16F-T8B1	
D623	8-719-109-93	DIODE RD6.2ES-T1B2	
D624	8-719-063-70	DIODE D1NL20U-TA2	
D625	8-719-110-49	DIODE MTZJ-T-77-18B	
D701	8-719-150-92	DIODE RD33ES-T1B3	
D901	8-719-109-93	DIODE RD6.2ES-T1B2	
D902	8-719-109-93	DIODE RD6.2ES-T1B2	
		<GROUND TERMINAL>	
ET600	1-537-771-21	TERMINAL BOARD, GROUND	
ET601	1-537-771-21	TERMINAL BOARD, GROUND	
		<FUSE>	
⚠F600	1-532-203-00	FUSE	
		<FERRITE BEAD>	
FB001	1-543-813-21	FERRITE 0uH	
FB002	1-543-813-21	FERRITE 0uH	
FB003	1-543-813-21	FERRITE 0uH	
		<FUSE HOLDER>	
FH600	1-533-217-31	HOLDER, FUSE	
FH601	1-533-217-31	HOLDER, FUSE	
		<IC>	
IC001	8-759-526-43	IC TDA9874H/V1,118	
IC031	8-759-645-07	IC LB1943N	
IC101	8-759-831-27	IC HD6432197Y-PAL (ED115/ED215/ED313/ED515/ ED616/ED815/ED817/ED818/ED915/EZ715)	
IC101	8-759-831-28	IC HD6432197Y-PALG (EXCEPT ED115/ED215/ED313/ED515/ ED616/ED815/ED817/ED818/ED915/EZ715)	
IC141	8-759-580-62	IC MM1256AFBE	
IC142	8-759-575-71	IC M24C04-WMN6T	
IC201	8-759-589-31	IC HA118217F	
IC291	8-759-566-07	IC LA7277M-TLM (ED616/ED817/ ED818/ED915/ED919/EZ717)	
IC301	8-759-638-56	IC TDA9605H/N2,557	
IC451	8-759-643-83	IC UPD16315GB-3BS	
IC502	8-749-015-48	IC RPM6940	
⚠IC600	8-749-018-38	IC MA8910	
⚠IC601	8-759-420-19	IC AN1431T-TA	
IC660	8-759-438-18	IC PQ12RD08	
IC662	8-759-471-81	IC PQ05RD11	
		<CHIP CONDUCTOR>	
JR001	1-216-295-00	SHORT 0	
JR002	1-216-295-00	SHORT 0	
JR003	1-216-295-00	SHORT 0	

Ref. No.	Part No.	Description	Remarks
JR004	1-216-295-00	SHORT 0	
JR005	1-216-295-00	SHORT 0	
JR006	1-216-295-00	SHORT 0	
JR007	1-216-295-00	SHORT 0	
JR008	1-216-295-00	SHORT 0	
JR009	1-216-295-00	SHORT 0	
JR010	1-216-295-00	SHORT 0	
JR011	1-216-295-00	SHORT 0	
JR012	1-216-295-00	SHORT 0	
JR013	1-216-295-00	SHORT 0	
JR014	1-216-295-00	SHORT 0	
JR015	1-216-295-00	SHORT 0	
JR016	1-216-295-00	SHORT 0	
JR017	1-216-295-00	SHORT 0	
JR018	1-216-295-00	SHORT 0	
JR019	1-216-295-00	SHORT 0	
JR020	1-216-295-00	SHORT 0	
JR021	1-216-295-00	SHORT 0	
JR022	1-216-295-00	SHORT 0	
JR023	1-216-295-00	SHORT 0	
JR024	1-216-295-00	SHORT 0	
JR025	1-216-295-00	SHORT 0	
JR026	1-216-295-00	SHORT 0	
JR028	1-216-295-00	SHORT 0	
JR029	1-216-295-00	SHORT 0	
JR030	1-216-295-00	SHORT 0	
JR031	1-216-295-00	SHORT 0	
JR032	1-216-295-00	SHORT 0	
JR033	1-216-295-00	SHORT 0	
JR034	1-216-295-00	SHORT 0	
JR035	1-216-295-00	SHORT 0	
JR036	1-216-295-00	SHORT 0	
JR037	1-216-295-00	SHORT 0	
JR038	1-216-295-00	SHORT 0	
JR039	1-216-295-00	SHORT 0	
JR040	1-216-295-00	SHORT 0	
JR041	1-216-295-00	SHORT 0	
JR042	1-216-295-00	SHORT 0	
JR043	1-216-295-00	SHORT 0	
JR044	1-216-295-00	SHORT 0	
JR045	1-216-295-00	SHORT 0	
JR046	1-216-295-00	SHORT 0	
JR047	1-216-295-00	SHORT 0	
JR101	1-216-296-00	SHORT 0	
JR102	1-216-296-00	SHORT 0	
JR103	1-216-296-00	SHORT 0	
JR104	1-216-296-00	SHORT 0	
JR105	1-216-296-00	SHORT 0	
JR106	1-216-296-00	SHORT 0	
JR107	1-216-296-00	SHORT 0	
JR108	1-216-296-00	SHORT 0	
JR109	1-216-296-00	SHORT 0	
JR110	1-216-296-00	SHORT 0	
JR111	1-216-296-00	SHORT 0	
JR112	1-216-296-00	SHORT 0	
JR113	1-216-296-00	SHORT 0	
JR114	1-216-296-00	SHORT 0	

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description		Remarks
JR115	1-216-296-00	SHORT	0	
JR116	1-216-296-00	SHORT	0	
JR117	1-216-296-00	SHORT	0	
JR118	1-216-296-00	SHORT	0	
JR119	1-216-296-00	SHORT	0	
JR120	1-216-296-00	SHORT	0	
JR121	1-216-296-00	SHORT	0	
JR122	1-216-296-00	SHORT	0	
JR123	1-216-296-00	SHORT	0	
JR124	1-216-296-00	SHORT	0	
JR125	1-216-296-00	SHORT	0	
JR126	1-216-296-00	SHORT	0	
JR127	1-216-296-00	SHORT	0	
JR128	1-216-296-00	SHORT	0	
JR129	1-216-296-00	SHORT	0	
JR130	1-216-296-00	SHORT	0	
JR131	1-216-296-00	SHORT	0	
JR132	1-216-296-00	SHORT	0	
		<JUMPER SELECTOR>		
JS103	1-216-295-00	SHORT	0 (EXCEPT EZ111/EZ414/EZ715/EZ717)	
JS151	1-216-295-00	SHORT	0	
JS152	1-216-295-00	SHORT	0	
JS203	1-216-296-00	SHORT	0	
JS204	1-216-296-00	SHORT	0	
JS291	1-216-296-00	SHORT	0 (ED115/ED215/ED313/ED515/ED815/EZ111/EZ212/EZ414/EZ715)	
JS309	1-216-295-00	SHORT	0	
JS379	1-216-296-00	SHORT	0	
JS664	1-216-295-00	SHORT	0	
JS703	1-216-295-00	SHORT	0	
JS705	1-216-295-00	SHORT	0	
JS718	1-216-295-00	SHORT	0 (ED815/ED817/ED818)	
JS719	1-216-295-00	SHORT	0 (ED815/ED817/ED818)	
JS720	1-216-296-00	SHORT	0 (ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)	
JS721	1-216-295-00	SHORT	0 (ED915/ED919/EZ715/EZ717)	
JS722	1-216-295-00	SHORT	0 (ED915/ED919/EZ715/EZ717)	
JS723	1-216-295-00	SHORT	0 (ED915/ED919/EZ715/EZ717)	
JS734	1-216-295-00	SHORT	0 (ED915/ED919/EZ715/EZ717)	
JS737	1-216-295-00	SHORT	0 (ED915/ED919/EZ715/EZ717)	
JS738	1-216-295-00	SHORT	0 (ED915/ED919/EZ715/EZ717)	
JS901	1-216-295-00	SHORT	0	
JS902	1-216-295-00	SHORT	0 (ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)	
JS904	1-216-295-00	SHORT	0 (ED515/ED616/EZ414)	
JS905	1-216-296-00	SHORT	0	
JS906	1-216-295-00	SHORT	0 (ED115/ED215/ED313/ED515/ED616/EZ111/EZ212/EZ414)	

Ref. No.	Part No.	Description		Remarks
		<COIL>		
L006	1-412-945-11	INDUCTOR	3.3uH	
L071	1-414-185-51	INDUCTOR	22uH (ED313/EZ111/EZ212)	
L072	1-414-179-51	INDUCTOR	2.2uH	
L151	1-414-185-51	INDUCTOR	22uH	
L171	1-414-185-51	INDUCTOR	22uH	
L172	1-414-185-51	INDUCTOR	22uH	
L173	1-410-509-11	INDUCTOR	10uH	
L202	1-414-856-51	INDUCTOR	10uH	
L203	1-414-857-51	INDUCTOR	100uH (EXCEPT ED115/ED215/ED313/EZ111/EZ212)	
L203	1-410-520-11	INDUCTOR	82uH (ED115/ED215/ED313/EZ111/EZ21)	
L204	1-410-510-11	INDUCTOR	12uH	
L205	1-414-856-51	INDUCTOR	10uH	
L206	1-414-856-51	INDUCTOR	10uH	
L207	1-414-856-51	INDUCTOR	10uH	
L211	1-414-193-51	INDUCTOR	220uH (EXCEPT ED115/ED215/ED313/ED817/EZ111/EZ212/EZ414)	
L214	1-414-856-51	INDUCTOR	10uH	
L215	1-414-187-51	INDUCTOR	47uH	
L372	1-414-857-51	INDUCTOR	100uH	
L381	1-414-857-51	INDUCTOR	100uH (ED616/ED818/ED915)	
L601	1-403-588-11	INDUCTOR	22uH	
L602	1-403-588-11	INDUCTOR	22uH	
L603	1-414-142-11	INDUCTOR	1uH	
L604	1-414-142-11	INDUCTOR	1uH	
L606	1-414-142-11	INDUCTOR	1uH	
L660	1-410-519-11	INDUCTOR	68uH	
L700	1-414-856-51	INDUCTOR	10uH	
L701	1-414-856-51	INDUCTOR	10uH	
L702	1-414-856-51	INDUCTOR	10uH	
L705	1-414-856-51	INDUCTOR	10uH (ED915/ED919/EZ715/EZ717)	
L901	1-414-857-51	INDUCTOR	100uH	
		<FILTER>		
⚠LF600	1-416-929-11	FILTER, LINE		
		<FLOURESCENT TUBE INDICATOR>		
ND451	1-517-734-11	TUBE, FLUORESCENT INDICATOR		
		<PHOTO COUPLER>		
PH001	8-749-013-23	PHOTO INTERRUPTER GP3S120		
PH002	8-749-013-23	PHOTO INTERRUPTER GP3S120		
⚠PH600	8-749-010-64	PHOTO COUPLER PC123FY2		
		<IC LINK>		
⚠PS071	1-576-384-21	LINK, IC		
⚠PS072	1-576-384-21	LINK, IC		
⚠PS331	1-533-586-51	LINK, IC		
⚠PS661	1-576-384-21	LINK, IC		

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
		<TRANSISTOR>			
Q001	8-729-043-84	TRANSISTOR PT380F3			
Q002	8-729-043-84	TRANSISTOR PT380F3			
Q003	8-729-281-53	TRANSISTOR 2SC1815GR-TPE2			
Q151	8-729-421-22	TRANSISTOR UN2211-TX			(ED919)
Q152	8-729-424-08	TRANSISTOR UN2111-TX			(ED919)
Q153	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX			
Q171	8-729-421-22	TRANSISTOR UN2211-TX			
Q172	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX			
Q174	8-729-421-22	TRANSISTOR UN2211-TX			
Q191	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX			(ED616/ED818/EZ717)
Q192	8-729-421-22	TRANSISTOR UN2211-TX			(ED616/ED818/EZ717)
Q201	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX			
Q202	8-729-421-19	TRANSISTOR UN2213-TX			
Q203	8-729-421-19	TRANSISTOR UN2213-TX			
Q204	8-729-421-19	TRANSISTOR UN2213-TX			
Q206	8-729-421-19	TRANSISTOR UN2213-TX			
Q210	8-729-421-19	TRANSISTOR UN2213-TX			
Q211	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX			
Q301	8-729-216-21	TRANSISTOR 2SA1162Y-TE85L			
Q302	8-729-230-49	TRANSISTOR 2SC2712Y-TE85L			
Q303	8-729-230-49	TRANSISTOR 2SC2712Y-TE85L			
Q372	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX			
Q373	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX			
Q374	8-729-424-18	TRANSISTOR UN2113-TX			
Q375	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q			
Q376	8-729-900-51	TRANSISTOR UN2115-QRS(TX)			
Q377	8-729-421-19	TRANSISTOR UN2213-TX			
Q378	8-729-421-19	TRANSISTOR UN2213-TX			(ED616/ED818/ED915)
Q380	8-729-900-51	TRANSISTOR UN2115-QRS(TX)			(ED616/ED818/ED915)
Q381	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q			(ED616/ED818/ED915)
Q701	8-729-106-68	TRANSISTOR 2SD1664-T100-R			
Q706	8-729-421-19	TRANSISTOR UN2213-TX			
Q707	8-729-119-76	TRANSISTOR 2SA1309A-QRSTA			
Q901	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX			
		<RESISTOR>			
R001	1-249-413-11	CARBON	470	5%	1/4W
R002	1-216-073-00	RES-CHIP	10K	5%	1/10W
R003	1-249-421-11	CARBON	2.2K	5%	1/4W
R004	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R005	1-249-401-11	CARBON	47	5%	1/4W
R006	1-249-401-11	CARBON	47	5%	1/4W
R007	1-249-437-11	CARBON	47K	5%	1/4W
R008	1-249-437-11	CARBON	47K	5%	1/4W
R009	1-249-433-11	CARBON	22K	5%	1/4W
R010	1-249-433-11	CARBON	22K	5%	1/4W
R011	1-216-304-11	RES-CHIP	3.3	5%	1/10W
R012	1-216-304-11	RES-CHIP	3.3	5%	1/10W
R013	1-216-001-00	RES-CHIP	10	5%	1/10W
R014	1-216-295-00	SHORT	0		
R015	1-216-295-00	SHORT	0		
R016	1-216-033-00	RES-CHIP	220	5%	1/10W
R032	1-216-089-00	RES-CHIP	47K	5%	1/10W
R034	1-216-689-11	RES-CHIP	39K	5%	1/10W
R035	1-216-689-11	RES-CHIP	39K	5%	1/10W
R051	1-249-425-11	CARBON	4.7K	5%	1/4W
R052	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R053	1-247-843-11	CARBON	3.3K	5%	1/4W
R056	1-249-425-11	CARBON	4.7K	5%	1/4W
R057	1-216-073-00	RES-CHIP	10K	5%	1/10W
R071	1-216-103-00	RES-CHIP	180K	5%	1/10W
R072	1-216-089-00	RES-CHIP	47K	5%	1/10W
R073	1-216-049-00	RES-CHIP	1K	5%	1/10W
R074	1-216-049-00	RES-CHIP	1K	5%	1/10W
R075	1-216-049-00	RES-CHIP	1K	5%	1/10W
R076	1-249-417-11	CARBON	1K	5%	1/4W
R100	1-216-085-00	RES-CHIP	33K	5%	1/10W
R101	1-216-073-00	RES-CHIP	10K	5%	1/10W (ED115/ED215/ED818/EZ715NZ)
R101	1-216-077-91	RES-CHIP	15K	5%	1/10W (EZ717/ED919)
R101	1-216-069-00	RES-CHIP	6.8K	5%	1/10W (ED815/EZ715AS)
R102	1-216-073-00	RES-CHIP	10K	5%	1/10W
R103	1-216-073-00	RES-CHIP	10K	5%	1/10W (EZ414/EZ715/EZ717)
R104	1-247-807-31	CARBON	100	5%	1/4W
R105	1-249-429-11	CARBON	10K	5%	1/4W
R107	1-216-049-00	RES-CHIP	1K	5%	1/10W
R108	1-216-073-00	RES-CHIP	10K	5%	1/10W
R109	1-216-049-00	RES-CHIP	1K	5%	1/10W
R110	1-249-429-11	CARBON	10K	5%	1/4W
R111	1-216-081-00	RES-CHIP	22K	5%	1/10W
R112	1-216-041-00	RES-CHIP	470	5%	1/10W
R113	1-216-041-00	RES-CHIP	470	5%	1/10W
R114	1-216-041-00	RES-CHIP	470	5%	1/10W
R115	1-216-041-00	RES-CHIP	470	5%	1/10W
R116	1-216-089-00	RES-CHIP	47K	5%	1/10W
R117	1-249-417-11	CARBON	1K	5%	1/4W
R118	1-216-089-00	RES-CHIP	47K	5%	1/10W
R119	1-216-089-00	RES-CHIP	47K	5%	1/10W
R120	1-216-089-00	RES-CHIP	47K	5%	1/10W
R121	1-216-049-00	RES-CHIP	1K	5%	1/10W
R122	1-216-121-11	RES-CHIP	1M	5%	1/10W
R123	1-249-429-11	CARBON	10K	5%	1/4W
R124	1-249-429-11	CARBON	10K	5%	1/4W
R125	1-249-437-11	CARBON	47K	5%	1/4W
R126	1-216-049-00	RES-CHIP	1K	5%	1/10W
R127	1-216-073-00	RES-CHIP	10K	5%	1/10W
R128	1-216-073-00	RES-CHIP	10K	5%	1/10W
R129	1-249-441-11	CARBON	100K	5%	1/4W
R130	1-216-049-00	RES-CHIP	1K	5%	1/10W
R131	1-249-429-11	CARBON	10K	5%	1/4W
R132	1-249-429-11	CARBON	10K	5%	1/4W
R133	1-216-121-11	RES-CHIP	1M	5%	1/10W
R142	1-247-887-00	CARBON	220K	5%	1/4W
R143	1-216-113-00	RES-CHIP	470K	5%	1/10W
R144	1-216-105-91	RES-CHIP	220K	5%	1/10W
R151	1-216-113-00	RES-CHIP	470K	5%	1/10W
R152	1-216-025-11	RES-CHIP	100	5%	1/10W
R153	1-216-073-00	RES-CHIP	10K	5%	1/10W
R154	1-216-097-11	RES-CHIP	100K	5%	1/10W
R155	1-216-121-11	RES-CHIP	1M	5%	1/10W
R156	1-249-435-11	CARBON	33K	5%	1/4W
R157	1-216-073-00	RES-CHIP	10K	5%	1/10W

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Ref. No.	Part No.	Description			Remarks
R158	1-216-073-00	RES-CHIP	10K	5%	1/10W
R159	1-216-049-00	RES-CHIP	1K	5%	1/10W
R160	1-216-041-00	RES-CHIP	470	5%	1/10W
R161	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R162	1-216-073-00	RES-CHIP	10K	5%	1/10W
R163	1-216-049-00	RES-CHIP	1K	5%	1/10W
R164	1-216-049-00	RES-CHIP	1K	5%	1/10W
R165	1-249-429-11	CARBON	10K	5%	1/4W
R166	1-216-295-00	SHORT	0		
R167	1-216-295-00	SHORT	0		
R171	1-216-049-00	RES-CHIP	1K	5%	1/10W
R172	1-247-807-31	CARBON	100	5%	1/4W
R174	1-216-045-00	RES-CHIP	680	5%	1/10W
R175	1-216-041-00	RES-CHIP	470	5%	1/10W
R177	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R178	1-216-295-00	SHORT	0		(ED115/ED215/ED313/ED515/ED616/ ED815/ED817/ED818/ED915/ED919/EZ414)
R191	1-216-089-00	RES-CHIP	47K	5%	1/10W (ED616/ED818/EZ717)
R192	1-216-073-00	RES-CHIP	10K	5%	1/10W
R193	1-216-073-00	RES-CHIP	10K	5%	1/10W
R194	1-216-073-00	RES-CHIP	10K	5%	1/10W
R201	1-216-049-00	RES-CHIP	1K	5%	1/10W
R202	1-216-041-00	RES-CHIP	470	5%	1/10W (EXCEPT ED115/ED215/ED313/EZ111/EZ212)
R202	1-216-033-00	RES-CHIP	220	5%	1/10W (ED115/ED215/ED313/EZ111/EZ212)
R204	1-216-083-00	RES-CHIP	27K	5%	1/10W
R205	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
R206	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R207	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R208	1-216-069-00	RES-CHIP	6.8K	5%	1/10W (EZ414/ED515/ED815/EZ717)
R208	1-216-077-91	RES-CHIP	15K	5%	1/10W (ED115/ED215/ED313/EZ111/EZ212)
R208	1-216-073-00	RES-CHIP	10K	5%	1/10W (ED616/ED817/ED818/ED915/ED919)
R209	1-216-069-00	RES-CHIP	6.8K	5%	1/10W (ED515/ED815/EZ414/EZ717)
R209	1-216-049-00	RES-CHIP	1K	5%	1/10W (EXCEPT ED515/ED815/EZ414/EZ717)
R211	1-216-295-00	SHORT	0		(ED616/ED817/ED818/ED915/ED919)
R212	1-216-063-91	RES-CHIP	3.9K	5%	1/10W (ED115/ED215/ED313/ED515/ ED815/EZ111/EZ212/EZ414/EZ717)
R214	1-216-025-11	RES-CHIP	100	5%	1/10W (ED515/ED616/ ED817/ED818/ED915/ED919/EZ717)
R215	1-216-025-11	RES-CHIP	100	5%	1/10W
R216	1-247-807-31	CARBON	100	5%	1/4W
R217	1-216-041-00	RES-CHIP	470	5%	1/10W (ED915/EZ111/EZ212/EZ414/EZ717)
R218	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R219	1-259-880-11	CARBON	2.2M	5%	1/4W
R222	1-216-033-00	RES-CHIP	220	5%	1/10W
R223	1-216-033-00	RES-CHIP	220	5%	1/10W
R224	1-216-049-00	RES-CHIP	1K	5%	1/10W
R225	1-249-417-11	CARBON	1K	5%	1/4W
R226	1-216-099-00	RES-CHIP	120K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R227	1-216-049-00	RES-CHIP	1K	5%	1/10W
R228	1-216-049-00	RES-CHIP	1K	5%	1/10W
R289	1-216-049-00	RES-CHIP	1K	5%	1/10W (ED616/ED817/ED818/ED915/ED919)
R291	1-208-806-11	METAL CHIP	10K	0.5%	1/10W (ED616/ED817/ED818/ED915/ED919)
R294	1-247-807-31	CARBON	100	5%	1/4W (ED616/ED817/ED818/ED915/ED919)
R295	1-247-807-31	CARBON	100	5%	1/4W (ED616/ED817/ED818/ED915/ED919)
R296	1-249-428-11	CARBON	8.2K	5%	1/4W (ED616/ED817/ED818/ED915/ED919)
R299	1-216-071-00	RES-CHIP	8.2K	5%	1/10W (ED616/ED817/ED818/ED915/ED919)
R301	1-216-073-00	RES-CHIP	10K	5%	1/10W
R302	1-216-079-00	RES-CHIP	18K	5%	1/10W
R304	1-216-049-00	RES-CHIP	1K	5%	1/10W
R305	1-216-049-00	RES-CHIP	1K	5%	1/10W
R306	1-216-083-00	RES-CHIP	27K	5%	1/10W
R307	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R308	1-208-820-11	METAL CHIP	39K	0.5%	1/10W
R309	1-216-041-00	RES-CHIP	470	5%	1/10W
R310	1-216-041-00	RES-CHIP	470	5%	1/10W
R311	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R312	1-216-083-00	RES-CHIP	27K	5%	1/10W
R313	1-216-133-00	RES-CHIP	3.3M	5%	1/10W
R314	1-216-073-00	RES-CHIP	10K	5%	1/10W
R317	1-216-061-00	RES-CHIP	3.3K	5%	1/10W
R318	1-216-049-00	RES-CHIP	1K	5%	1/10W
R319	1-216-049-00	RES-CHIP	1K	5%	1/10W
R322	1-216-295-00	SHORT	0		
R327	1-216-041-00	RES-CHIP	470	5%	1/10W
R328	1-216-041-00	RES-CHIP	470	5%	1/10W
R329	1-216-041-00	RES-CHIP	470	5%	1/10W
R350	1-216-073-00	RES-CHIP	10K	5%	1/10W
R351	1-216-061-00	RES-CHIP	3.3K	5%	1/10W
R352	1-216-101-00	RES-CHIP	150K	5%	1/10W
R353	1-216-025-11	RES-CHIP	100	5%	1/10W
R354	1-216-085-00	RES-CHIP	33K	5%	1/10W
R355	1-216-079-00	RES-CHIP	18K	5%	1/10W
R356	1-216-083-00	RES-CHIP	27K	5%	1/10W
R357	1-216-295-00	SHORT	0		
R358	1-216-077-91	RES-CHIP	15K	5%	1/10W (ED515/ED616)
R359	1-249-437-11	CARBON	47K	5%	1/4W (ED515/ED616)
R360	1-216-077-91	RES-CHIP	15K	5%	1/10W
R361	1-249-437-11	CARBON	47K	5%	1/4W
R362	1-216-077-91	RES-CHIP	15K	5%	1/10W
R363	1-249-437-11	CARBON	47K	5%	1/4W
R364	1-216-295-00	SHORT	0		
R365	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R366	1-216-041-00	RES-CHIP	470	5%	1/10W
R368	1-216-125-00	RES-CHIP	1.5M	5%	1/10W
R370	1-216-089-00	RES-CHIP	47K	5%	1/10W
R371	1-249-411-11	CARBON	330	5%	1/4W
R372	1-249-411-11	CARBON	330	5%	1/4W
R375	1-216-073-00	RES-CHIP	10K	5%	1/10W
R376	1-216-073-00	RES-CHIP	10K	5%	1/10W
R378	1-216-073-00	RES-CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R379	1-249-433-11	CARBON	22K	5%	1/4W
R380	1-216-308-00	RES-CHIP	4.7	5%	1/10W (EXCEPT ED616/ED818/ED915)
R380	1-216-005-00	RES-CHIP	15	5%	1/10W (ED616/ED818/ED915)
R382	1-216-081-00	RES-CHIP	22K	5%	1/10W (ED616/ED818/ED915)
R383	1-216-001-00	RES-CHIP	10	5%	1/10W (ED616/ED818/ED915)
R384	1-216-089-00	RES-CHIP	47K	5%	1/10W (ED616/ED818/ED915)
R385	1-216-057-00	RES-CHIP	2.2K	5%	1/10W (ED515/ED616)
R386	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R387	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R400	1-216-021-00	RES-CHIP	68	5%	1/10W
R401	1-249-410-11	CARBON	270	5%	1/4W (EZ715/EZ717)
R402	1-249-408-11	CARBON	180	5%	1/4W (ED115/ED215/ED616/ ED817/ED818/ED915/ED919/EZ717)
R404	1-249-437-11	CARBON	47K	5%	1/4W
R405	1-249-437-11	CARBON	47K	5%	1/4W
R410	1-249-403-11	CARBON	68	5%	1/4W
R411	1-249-419-11	CARBON	1.5K	5%	1/4W
R414	1-216-061-00	RES-CHIP	3.3K	5%	1/10W
R415	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R416	1-249-427-11	CARBON	6.8K	5%	1/4W
R417	1-249-431-11	CARBON	15K	5%	1/4W
R418	1-216-089-00	RES-CHIP	47K	5%	1/10W
R424	1-216-061-00	RES-CHIP	3.3K	5%	1/10W
R425	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R426	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
R427	1-216-077-91	RES-CHIP	15K	5%	1/10W
R428	1-216-089-00	RES-CHIP	47K	5%	1/10W
R451	1-249-413-11	CARBON	470	5%	1/4W
R452	1-216-049-00	RES-CHIP	1K	5%	1/10W
R453	1-216-049-00	RES-CHIP	1K	5%	1/10W
R454	1-216-049-00	RES-CHIP	1K	5%	1/10W
R455	1-249-417-11	CARBON	1K	5%	1/4W
R457	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R458	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R459	1-216-085-00	RES-CHIP	33K	5%	1/10W
R526	1-249-437-11	CARBON	47K	5%	1/4W
R601	1-214-949-21	METAL	3.3M	1%	1/2W
R602	1-247-883-00	CARBON	150K	5%	1/4W
R603	1-247-891-00	CARBON	330K	5%	1/4W
R604	1-249-430-11	CARBON	12K	5%	1/4W
R605	1-249-419-11	CARBON	1.5K	5%	1/4W
R606	1-215-444-00	METAL	9.1K	1%	1/4W
R607	1-249-428-11	CARBON	8.2K	5%	1/4W
⚠R611	1-260-364-11	CARBON	1M	5%	1/2W
R612	1-208-789-11	METAL CHIP	2K	0.5%	1/10W
R613	1-249-406-11	CARBON	120	5%	1/4W
R614	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W
R615	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R616	1-249-401-11	CARBON	47	5%	1/4W
R617	1-249-417-11	CARBON	1K	5%	1/4W
R618	1-249-409-11	CARBON	220	5%	1/4W

Ref. No.	Part No.	Description			Remarks
⚠R640	1-219-153-11	FUSIBLE	10	5%	1/4W
⚠R641	1-219-153-11	FUSIBLE	10	5%	1/4W
R643	1-216-353-00	METAL OXIDE	2.2	5%	1W
R647	1-215-465-00	METAL	68K	1%	1/4W
R648	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R649	1-249-401-11	CARBON	47	5%	1/4W
R651	1-215-459-00	METAL	39K	1%	1/4W
R668	1-216-073-00	RES-CHIP	10K	5%	1/10W
R701	1-247-807-31	CARBON	100	5%	1/4W
R702	1-249-413-11	CARBON	470	5%	1/4W
R703	1-216-295-00	SHORT	0		
R704	1-249-413-11	CARBON	470	5%	1/4W
R708	1-216-295-00	SHORT	0		
R709	1-216-113-00	RES-CHIP	470K	5%	1/10W
R710	1-216-097-11	RES-CHIP	100K	5%	1/10W
R711	1-249-433-11	CARBON	22K	5%	1/4W
R727	1-216-295-00	SHORT	0		(ED915/ED919/EZ715/EZ717)
R728	1-216-295-00	SHORT	0		
⚠R730	1-240-307-81	FUSIBLE	560	5%	1/4W
R733	1-249-413-11	CARBON	470	5%	1/4W (ED915/ED919/EZ715/EZ717)
R734	1-249-413-11	CARBON	470	5%	1/4W (ED915/ED919/EZ715/EZ717)
R738	1-216-295-00	SHORT	0		
R740	1-216-035-00	RES-CHIP	270	5%	1/10W (ED815/ED817/ ED818/ED915/ED919/EZ715/EZ717)
R742	1-216-047-91	RES-CHIP	820	5%	1/10W
R901	1-216-097-11	RES-CHIP	100K	5%	1/10W (ED815/ED817/ ED818/ED915/ED919/EZ715/EZ717)
R902	1-216-097-11	RES-CHIP	100K	5%	1/10W (ED815/ED817/ ED818/ED915/ED919/EZ715/EZ717)
R905	1-216-041-00	RES-CHIP	470	5%	1/10W (ED815/ED817/ ED818/ED915/ED919/EZ715/EZ717)
R906	1-216-041-00	RES-CHIP	470	5%	1/10W
R908	1-216-023-00	RES-CHIP	82	5%	1/10W
R909	1-249-407-11	CARBON	150	5%	1/4W
R910	1-216-025-11	RES-CHIP	100	5%	1/10W
R913	1-249-408-11	CARBON	180	5%	1/4W
R914	1-216-021-00	RES-CHIP	68	5%	1/10W

<SWITCH>

S101	1-571-958-11	SWITCH, PUSH (1 KEY)	
S102	1-771-155-11	SWITCH, ROTARY	
S454	1-771-574-21	SWITCH, TACTILE	
S458	1-771-574-21	SWITCH, TACTILE	(EZ715/EZ717)
S459	1-771-574-21	SWITCH, TACTILE	
S465	1-771-574-21	SWITCH, TACTILE	
S466	1-771-574-21	SWITCH, TACTILE	
S467	1-771-574-21	SWITCH, TACTILE	
S468	1-771-574-21	SWITCH, TACTILE	(ED115/ED215/ ED616/ED817/ED818/ED915/ED919/EZ717)

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
		<TRANSFORMER>	
T371	1-423-414-11	TRANSFORMER, BIAS OSCILLATION	
T372	1-423-415-11	TRANSFORMER, BIAS OSCILLATION	(ED616/ED818/ED915)
⚠T600	1-435-790-11	TRANSFORMER, CONVERTER	
		<TUNER>	
TU701	1-693-544-11	TUNER, (BTF-3MG403)	(EXCEPT ED919)
TU701	1-693-543-11	TUNER (BTF-3MG412)	(ED919)
		<VARISTOR>	
⚠VDR600	1-801-267-31	VARISTOR TNR10V431K660	
		<CRYSTAL>	
X001	1-767-897-12	VIBRATOR, CRYSTAL 24.576 MHz	
X101	1-767-855-11	VIBRATOR, CRYSTAL 10MHz	
X102	1-579-463-11	VIBRATOR, CRYSTAL 32.768 KHz	
X151	1-767-856-11	VIBRATOR, CRYSTAL 17.734475 MHz	
X152	1-767-857-11	VIBRATOR, CRYSTAL 14.31818 MHz	(ED919)
X201	1-760-708-11	VIBRATOR, CRYSSTAL 4.433619 MHZ	
X202	*1-760-709-11	VIBRATOR, CRYSTAL 3579.545 KHz	(EXCEPT EZ111/EZ212/EZ414)

A-6713-875-A NK-11 BOARD COMPLETE
(ED915/ED919/EZ715NZ/EZ717NZ)
****

< CAPACITOR >

C003	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C004	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C005	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C006	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C007	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C008	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C009	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C010	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C011	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C012	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C013	1-163-243-11	CERAMIC CHIP	47PF	5.00%	50V
C014	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C015	1-163-231-11	CERAMIC CHIP	15PF	5.00%	50V
C016	1-163-233-11	CERAMIC CHIP	18PF	5.00%	50V
C017	1-110-501-11	CERAMIC CHIP	0.33uF	10.00%	16V
C018	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C019	1-109-982-11	CERAMIC CHIP	1uF	10.00%	10V
C020	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C021	1-113-642-11	TANTALUM CHIP	47uF	10.00%	10V
C022	1-107-823-11	CERAMIC CHIP	0.47uF	10.00%	16V
C023	1-163-243-11	CERAMIC CHIP	47PF	5.00%	50V

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
		< CONNECTOR >	
* CN001	1-691-183-11	CONNECTOR (BOARD TO BOARD) 13P	
		< DIODE >	
D001	8-719-066-72	DIODE BB135	
		< FERRITE BEAD >	
FB001	1-543-813-21	FERRITE 0uH	
FB002	1-543-813-21	FERRITE 0uH	
FB003	1-543-813-21	FERRITE 0uH	
		< IC >	
IC001	8-759-526-43	IC TDA9874H/V1, 118	
		< COIL >	
L006	1-412-945-11	INDUCTOR 3.3uH	
		< IC LINK >	
⚠PS001	1-576-122-21	LINK, IC (0.4A)	
		< RESISTOR >	
R001	1-216-071-00	METAL CHIP 8.2K	5% 1/10W
R002	1-216-073-00	METAL CHIP 10K	5% 1/10W
R003	1-216-689-11	METAL CHIP 39K	0.5% 1/10W
R004	1-216-689-11	METAL CHIP 39K	0.5% 1/10W
R005	1-216-041-00	METAL CHIP 470	5% 1/10W
R006	1-216-041-00	METAL CHIP 470	5% 1/10W
R007	1-216-001-00	METAL CHIP 10	5% 1/10W
R008	1-216-001-00	METAL CHIP 10	5% 1/10W
R009	1-216-001-00	METAL CHIP 10	5% 1/10W
R010	1-216-001-00	METAL CHIP 10	5% 1/10W
R011	1-216-304-11	METAL CHIP 3.3	5% 1/10W
R012	1-216-304-11	METAL CHIP 3.3	5% 1/10W
R013	1-216-001-00	METAL CHIP 10	5% 1/10W
R014	1-216-295-00	METAL CHIP 0	5% 1/10W
R015	1-216-295-00	METAL CHIP 0	5% 1/10W
R016	1-216-033-00	METAL CHIP 220	5% 1/10W
		< VIBRATOR >	
X001	1-767-897-12	VIBRATOR, CRYSTAL 24.576MHz	

MISCELLANEOUS
****

1-757-665-11	CORD, POWER	(EXCEPT EZ111/EZ212/EZ414/EZ715/EZ717)
1-777-855-51	CORD, POWER	(EZ111/EZ212/EZ414/EZ715/EZ717)
1-757-690-11	FLAT CABLE FMD-022	(EXCEPT EZ115/ED215/ED313/EZ111/EZ212)
1-757-691-11	FLAT CABLE FMD-023	(ED115/ED215/ED313/EZ111/EZ212)
1-757-551-11	FLAT CABLE FAC-009	

Ref. No.	Part No.	Description	Remarks
	1-757-552-12	FLAT CABLE FDM-010	
	1-757-553-11	FLAT CABLE FDI-002	
	1-500-471-11	FE HEAD	
	A-6759-620-A	HEAD BLOCK ASSY, ACE	
	1-763-572-11	MOTOR, DC	
	X-3950-970-1	MOTOR ASSY, CAM (SL)	
	1-772-360-11	DRUM ASSY, DZH-89D-R	(ED115/ED215/ED313/EZ111/EZ212)
	1-796-012-11	DRUM ASSY, DZH-0D1A-R	(ED815/ED817/ED818/ ED915/ED919/EZ715/EZ717)
	1-796-011-11	DRUM ASSY, DZH-0D0A-R	(ED515/ED616/EZ414)

ACESSORIES
****

	1-696-593-31	CORD, CONNECTION (PAL)	
	3-065-583-11	MANUAL, INSTRUCTION	(ED115/ED215/ED313)
	3-065-581-11	MANUAL, INSTRUCTION	(ED515/ED616/ED815/ED817/ED818/ED915)
	3-065-580-11	MANUAL, INSTRUCTION	(ED919)
	3-065-579-11	MANUAL, INSTRUCTION	(EZ111/EZ715)
	3-065-578-11	MANUAL, INSTRUCTION	(EZ212/EZ414/EZ717)
	1-476-475-11	COMMANDER, STANDARD (RMT-V311)	(ED115/ED215/ED313/ED515/ED815)
	1-476-475-21	COMMANDER, STANDARD (RMT-V311A)	(ED817/ED915)
	1-476-475-21	COMMANDER, STANDARD (RMT-V311E)	(EZ111)
	1-476-475-41	COMMANDER, STANDARD (RMT-V311C)	(ED919)
	1-476-475-31	COMMANDER, STANDARD (RMT-V311B)	(ED616/ED818)
	1-476-475-61	COMMANDER, STANDARD (RMT-V311E)	(EZ715)
	1-476-475-51	COMMANDER, STANDARD (RMT-V311D)	(EZ212/EZ414)
	1-476-473-11	COMMANDER, STANDARD (RMT-V309)	(EZ717)
	1-569-008-21	ADAPTOR, CONVERSION 2P	(ED313/ED616/ED818)
	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P	(ED919)

HARDWARE LIST
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	7-682-647-09	SCREW +PS 3X6	
#1	7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3	
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2	
#3	7-682-647-09	SCREW +P 3X6	
#4	7-685-133-19	SCREW +P 2.6X6 TYPE2 NON-SLIT	
	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
	3-979-112-01	SCREW SW(+)BVTP 3X10	(ED115/ED215/ED313/ED515/ED616/ ED815/ED817/ED818/ED915/ED919/EZ717)
	3-342-512-21	SCREW (B1.7X3.5), TAPPING	(ED115/ED215/ED313/ED515/ ED616/ED817/ED818/ED915/ED919/EZ717)

9-921-787-11

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