SL-F35
RMT-231

SERVICE MANUAL

West Germany Model

This model is almost the same as the SL-F30PS: Gray model previously produced. Therefore, see the SL-F30PS service manual for the information not contained in this service manual.

● PARTS LIST (The difference between SL-F30PS: Gray model and SL-F35.)

Page on SL-F30PS Service Manual	No.	SL-F30PS Gray Model Part No.	SL-F35 Part No.	Description
86	1	X-3687-504-1	X-3940-084-1	CASE ASSY, UPPER
	6	X-3687-506-1	X-3940-085-1	PANEL ASSY, FRONT
	7	*3-687-501-01	*3-940-255-01	LABEL, MODEL NUMBER
87	59	3-684-103-11	3-684-103-31	KNOB, TRACK CONTROL
	62	3-684-270-11	3-684-270-21	BUTTON, SELECTION, INPUT
111	—	A-6765-639-A	A-6765-713-A	COMMANDER ASSY RMT-231
	—	*3-687-586-01	*3-940-351-01	INDIVIDUAL CARTON
	—	3-760-103-41 3-760-103-51	3-752-445-41	MANUAL, INSTRUCTION
167	1	A-6765-639-A	A-6765-713-A	COMMANDER ASSY RMT-231
	2	2-383-130-21	2-383-130-71	CASE (UPPER), COMMANDER
	11	2-387-123-01	2-387-123-11	CASE (LOWER), COMMANDER

● Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering theses items.

Beta VIDEO CASSETTE RECORDER

SONY®

MICROFILM

9-972-998-11

Sony Corporation
Home Video Group

English
90G0818-1
Printed in Japan

Published by Customer Relations and Service Group

SL-F30PS
RMT-231

SERVICE MANUAL

West Germany Model

September, 1984

711B2 CHASSIS

This manual contains the adjustment manual.

SPECIFICATIONS

System

Video recording system
Rotary two-head helical scanning
Video signal: CCIR standards, PAL and DDR SECAM colour
Aerial input: 75-ohm, asymmetrical aerial socket
Channel coverage
VHF: Western European channels E2-U20
UHF: Western European channels E21-E68
(Up to 30 programmes can be preset.)
RF output signal
UHF channels E30 to E39 (variable)
75 ohms, unbalanced

Video

Input: VIDEO IN: BNC connector
1.0 V $^{+1.0}_{-0.5}$ V (p-p)
75 ohms, unbalanced, sync negative
Output: VIDEO OUT: BNC connector
1.0 V (p-p) ±0.1 V (p-p)
75 ohms, unbalanced, sync negative
Horizontal resolution
260 lines
Signal-to-noise ratio
Colour: Better than 40 dB
B/W: Better than 43 dB

Audio

Input: AUDIO IN: phono jack
47 kilohms, −10 dBs
(0 dBs = 0.775 V rms)
Output: AUDIO OUT: phono jack
Load impedance less than 10 kilohms
−10 dBs with 47 kilohms load, unbalanced
Frequency response
50 Hz to 10 kHz
Signal-to-noise ratio
40 dB
Audio distortion
Less than 4 % at 400 Hz

Tape transport

Tape speed: 18.73 mm/sec.
Maximum recording time
2 hours 10 min. (with Sony L-500 cassette)
3 hours 15 min. (with L-750)
Fast forward/rewind time
Within 5 min. (with L-500)

Timer

Clock: Crystal lock
Time indication: 24-hour cycle
Timer setting: Only for recording
1 event/3 weeks, adjustable for any day or for all 7 days of the week

Beta
VIDEO CASSETTE RECORDER
SONY®

MICROFILM

Consumer VIDEO

Accessories supplied

75-ohm coaxial cable for recorder to TV connection (1)
Remote Commander RMT-231 with two IEC designation R6 batteries (1)
RF channel adjustment tool (1)

Design and specifications subject to change without notice.

Note

Appliance conforms with EEC Directive 76/889 regarding interference suppression.

General

Power requirements
220 V ac ±10%, 50/60 Hz
Power consumption
38 W
Storage temperature
−20°C to +65°C (−4°F to +149°F)
Operating temperature
5°C to 40°C (41°F to 104°F)
Dimensions Approx. 430 × 80 × 382 mm (w/h/d) (17 × 3¼ × 15⅛ inches) including projecting parts and controls
Weight Approx. 8.2 kg (17 lbs 14 oz) net

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 SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS 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. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

TABLE OF CONTENTS

SECTION 1
GENERAL

1-1. PRECAUTIONS

On safety

- This unit operates on 220 V ac, 50/60 Hz.
- Should any solid object or liquid fall into the cabinet, turn off the unit and have it checked by qualified personnel before operating it any further.
- To disconnect the mains lead (ac power cord), pull it out by the plug. Never pull the lead itself.
- The unit is not disconnected from the mains (ac power source) as long as it is connected to the mains outlet, even if the unit itself has been turned off.

On installation

- Allow adequate air circulation to prevent internal heat build-up. Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation grille.
- Do not install the unit near heat sources such as radiators or air ducts or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- The unit is designed for operation in a horizontal position. Do not install it in an inclined position.
- Keep the unit and cassette tapes away from equipment with strong magnets, such as a microwave oven, large loudspeakers, etc.

On operation

- When the unit is not to be used for a long period, turn the unit off to conserve energy and to extend the useful life of your unit.
- Remove and store video cassettes after recording or playback. Always store the cassette in its case to keep the tape away from dust.

On cleaning

Clean the cabinet, panel and controls with a dry soft cloth. Do not use a moistened cloth or any type of solvent, such as alcohol or benzine, which might damage the finish.

On repacking

Do not throw away the carton and packing materials. They make an ideal container in which to transport the unit. When shipping the unit to another location, repack it as illustrated on the carton.

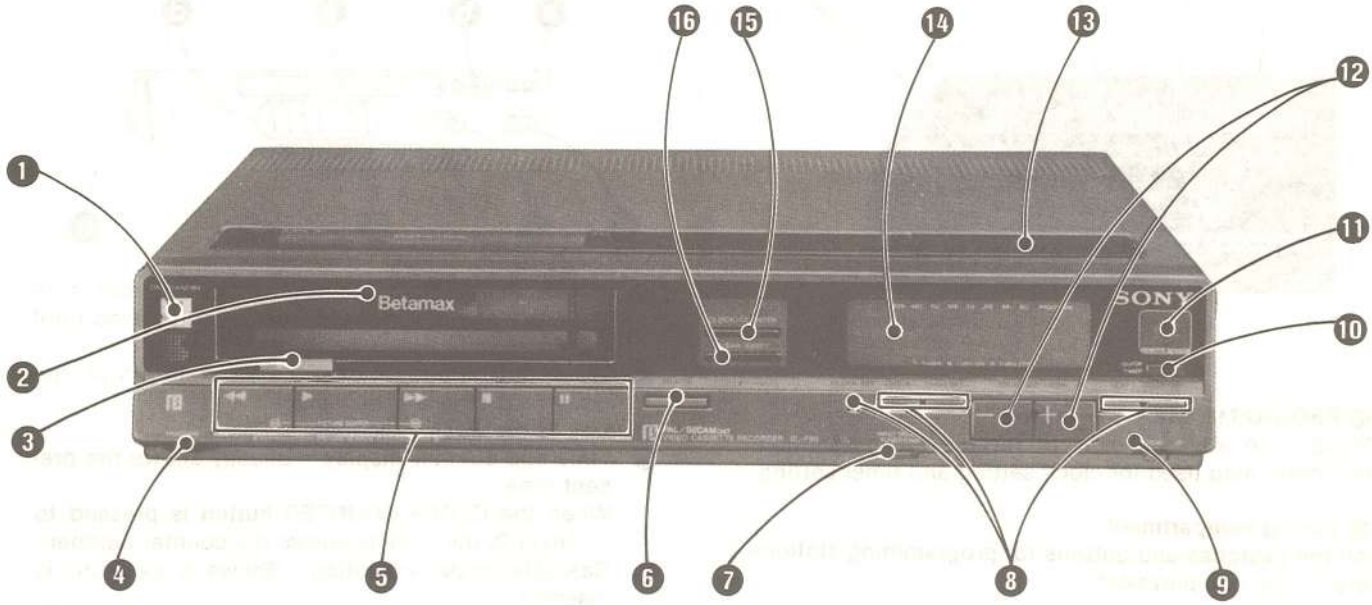
On colour broadcasting systems

This machine is designed to record and play back using the PAL and DDR SECAM colour systems. Recording and playback of video sources based on other colour systems cannot be guaranteed.

If you have any questions about this unit, contact your Sony dealer.

1-2. LOCATION AND FUNCTION OF CONTROLS

Front



❶ ON/STANDBY button and lamp
Press to turn on the unit. The lamp will light up. Press again to turn it off.
The timer section will continue to operate and the time will be displayed even if the ON/STANDBY button is off.

❷ Cassette compartment
Insert a cassette after turning on the recorder. The ⊡ indication appears on the display window when a cassette is inside.

❸ ⏏ EJECT button
Press to remove the cassette. This button does not function when the recorder is turned off.

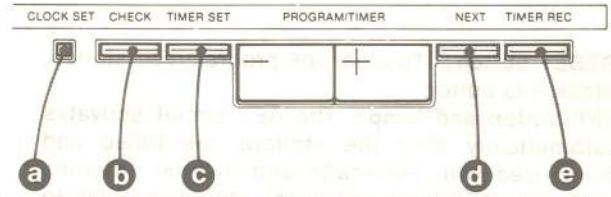
❹ TRACKING control
If streaks or snow appear during the playback of a tape recorded on another recorder, turn this knob to obtain the best possible picture.

❺ Function buttons
◀◀ REW button : Press to rewind the tape. Also used for the reverse picture search, skip scan and auto play operation.
▶ PLAY button : Press to play the tape back. Also used for auto play operation.
▶▶ FF button : Press to advance the tape rapidly. Also used for the forward picture search and skip scan operation.
■ STOP button : Press to stop the tape.
❚❚ PAUSE button : Press to stop the tape for a moment during recording or playback. A still picture will be seen during playback. Press again to release the pause mode.

❻ RECORD button
Press to start recording.

❼ INPUT SELECT button
Press to select the programme to be recorded.
LINE : for recording signals connected to the VIDEO IN and AUDIO IN jacks.
TUNER : for recording TV programmes.

❽ Buttons for clock and timer setting

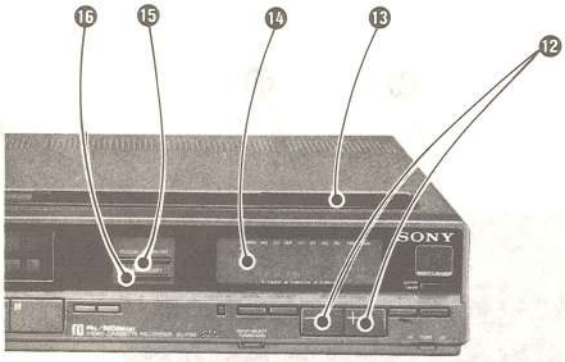


ⓐ **CLOCK SET button :** Press to initiate clock setting.
ⓑ **CHECK button :** Press to check timer settings.
ⓒ **TIMER SET button :** Press to initiate setting of timer recording, to change the preset item or to erase the timer setting.
ⓓ **NEXT button :** Press to advance to the next item to be set during clock or timer setting.
ⓔ **TIMER REC ON/OFF button :** Press to activate timer recording. Press it again to deactivate timer recording or quick timer recording in timer standby mode or while recording.

❾ TONE selector
Normally, set to HIGH. If the high frequencies of playback sound seem exaggerated, set to LOW.

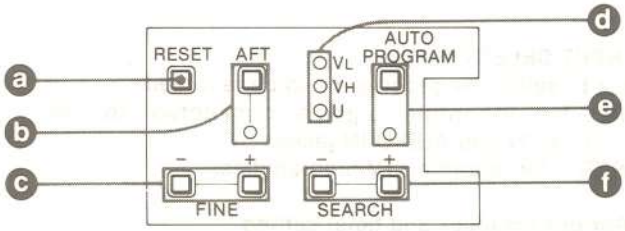
❿ QUICK TIMER button
Press to set the recording duration up to 4 hours in units of 30 minutes.

⓫ REMOTE SENSOR
Detects the remote control signal transmitted from the supplied Remote Commander.



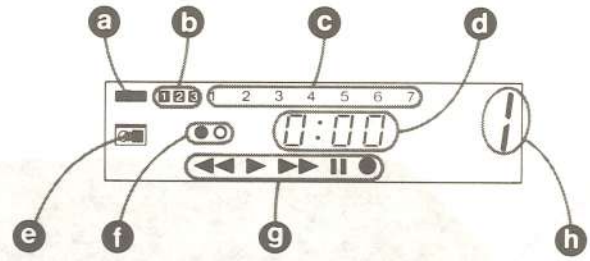
⑫ PROGRAM/TIMER + /– button
Press + to advance or – to reverse the programme numbers. Also used for clock setting and timer setting.

⑬ Tuning compartment
All the switches and buttons for programming stations are in this compartment.



ⓐ **RESET button:** To clear the programmed station, press this button.
ⓑ **AFT button and lamp:** The AFT circuit activates automatically after the stations are tuned and memorized with automatic and manual programming. The AFT lamp will illuminate. If you wish to restore the AFT on the channel which has been fine-tuned manually with the FINE buttons, press the AFT button.
ⓒ **FINE + and – buttons:** Press to fine tune the station.
ⓓ **Tuning indicator:** Indicates the approximate position of the tuned station within the tuning band scanned.
ⓔ **AUTO PROGRAM (automatic programming) button and lamp:** To preset the receivable stations automatically, press this button. The corresponding lamp blinks during automatic and manual programming.
ⓕ **SEARCH + and – buttons:** Press to tune in a station. Press the – button to get a station of lower frequency and the + button to get a station of higher frequency.

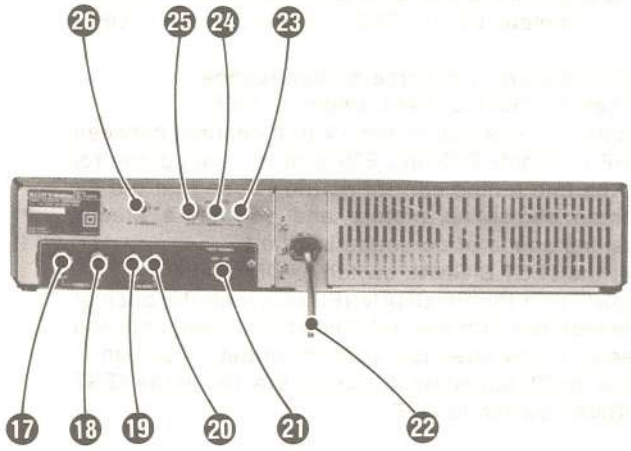
⑭ Display window



ⓐ **TIMER REC indication:** Shows the recorder is in the timer standby mode. It remains displayed until the timer recording is finished.
ⓑ **Week indication:** Shows the week in which the timer recording will take place.
ⓒ **Day of the week indication**
ⓓ **Time and counter display:** Usually shows the present time.
When the CLOCK/COUNTER button is pressed to COUNTER, the display shows the counter number.
ⓔ **Cassette-inside indication:** Shows a cassette is inserted.
ⓕ **Turn-on and turn-off setting indications:** The "●" mark shows the display is the turn-on time of the timer recording and the "○" mark shows the turn-off time.
ⓖ **Tape operation mode indications:** Show the engaged tape operation mode: ◀◀ (rewind), ▶ (playback), ▶▶ (fast-forward), ❚❚ (pause) or ● (recording).
ⓗ **Programme number:** Shows the programme number selected with the PROGRAM/TIMER + and – buttons.
When the INPUT SELECT button is pressed to LINE to record signals from the VIDEO IN and AUDIO IN jacks, the indication will change to "AU".

⑮ CLOCK/COUNTER button
Press to set the display to the tape counter. To reset to clock, press it again.

⑯ CLEAR/RESET button
Press to set the tape counter reading to "0000" when the tape counter is displayed. Also used for changing the timer setting or erasing the memory of the timer setting.



⑰ VIDEO OUT jack (BNC type)
Connect to the video input of another video cassette recorder or a video monitor.

⑱ VIDEO IN jack (BNC type)
Connect to the video output of a camera, another video cassette recorder, etc.

⑲ AUDIO OUT jack (phono type)
Connect to the audio input of a video monitor or video cassette recorder.

⑳ AUDIO IN jack (phono type)
Connect to the audio output of a camera or another video cassette recorder.

㉑ TEST SIGNAL switch
Set to ON to obtain the test pattern for adjusting the TV so that it can receive the signal from the recorder.

㉒ AC mains lead

㉓ AERIAL IN socket
Connect the aerial cable.

㉔ DX/LOCAL switch
Normally set this switch to DX. If the TV signal is very strong, set the switch to LOCAL.

㉕ AERIAL OUT socket
Connect the aerial input of the TV receiver using the supplied cable.

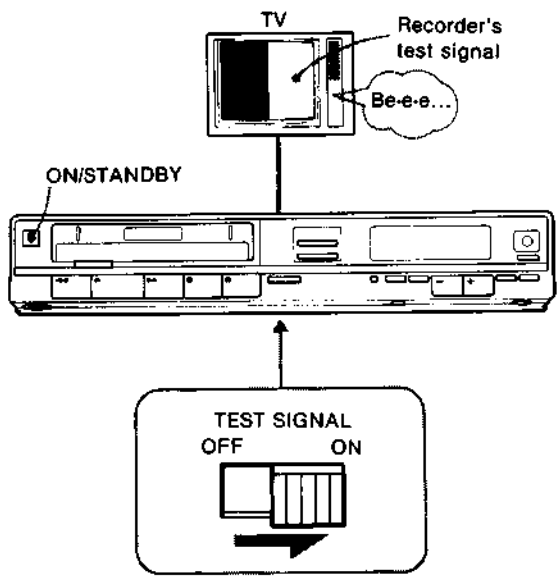
㉖ RF CHANNEL screw
If there is interference on the factory-preset channel for RF output and the signal of this recorder cannot be displayed clearly on the TV screen, adjust this screw with the supplied screwdriver.

1-3. ADJUSTING THE TV

One of the television programme positions must be adjusted to receive the signal from the recorder.
Note that the adjustment is not necessary, however, when the recorder is connected to the video/audio inputs on the TV receiver/monitor.

1 After making the connections, press the ON/STANDBY button.
2 Make sure that the recorder is in the stop mode.
3 Set the TEST SIGNAL switch located at the rear of the recorder to ON. The test signal is transmitted on a channel between UHF channels E30 and E39.
4 Turn on the TV and select a programme position which is not being used to receive a TV station. Tune the channel until you see a clear black and white pattern on the TV screen and you hear a continuous tone. This is the recorder's test signal.

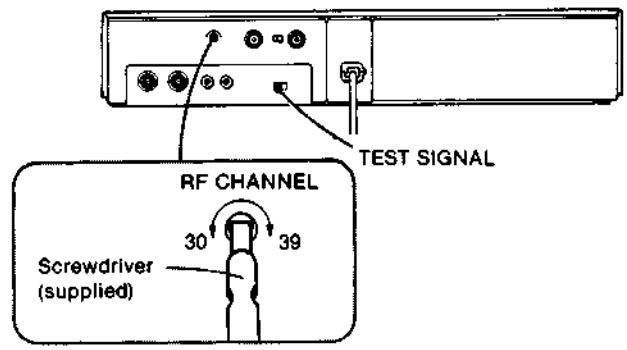
—If you are not sure how to adjust your TV, please refer to the TV's instruction manual or consult your dealer.



Whenever you use the video recorder, you should set the TV to the programme position selected in this adjustment.

If the test picture is free of disturbance, the TV adjustment is complete. Set the TEST SIGNAL switch to OFF.

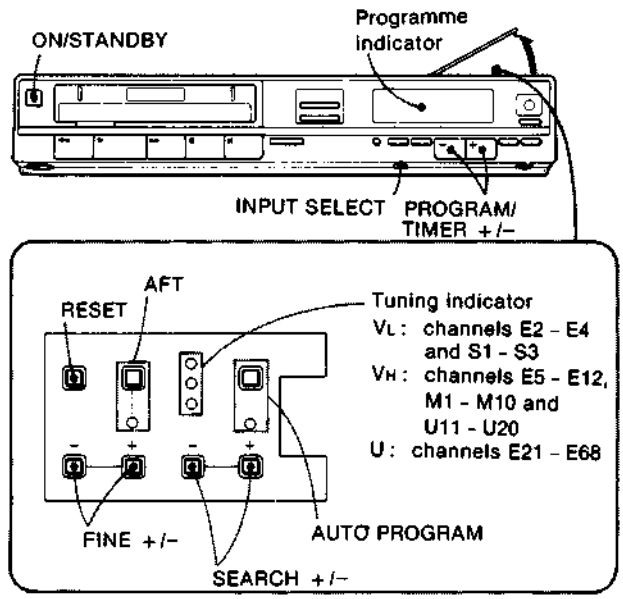
If the test picture is not free of disturbance
1 Reset the TEST SIGNAL switch to OFF.
2 Adjust the channel of the TV to a channel between UHF channels E30 and E39 with the tuning control or the fine tuning control on the TV, so that the TV screen shows no picture and so that a steady rustling sound or no sound is heard.
3 Set the TEST SIGNAL switch to ON again.
4 Slowly turn the RF CHANNEL screw on the back of the recorder with the supplied screwdriver, until you see an undistorted test pattern on the TV screen.
5 Now the TV adjustment is complete. Reset the TEST SIGNAL switch to OFF.



1-4. TV STATION PROGRAMMING

Automatic and manual programming are available. Automatic programming automatically presets up to 30 receivable stations from the lowest frequency to the highest. Manual programming is useful for presetting selected stations in any desired sequence.

To start programming, turn on the recorder by pressing the ON/STANDBY button and set the INPUT SELECT switch to TUNER.



AUTOMATIC PROGRAMMING

Press the AUTO PROGRAM button. Up to 30 receivable stations will be preset one by one from programme position 1. When no more stations can be located, programme number "1" will light on the programme indicator and automatic programming will stop.

MANUAL PROGRAMMING

1 Press the + or – PROGRAM/TIMER button to select the programme position.
  + for a higher-numbered programme position
  – for a lower-numbered programme position

2 Press the + SEARCH button to locate a station with higher frequency and the – SEARCH button to locate a station with lower frequency. The tuning indicator will light to show the current tuning band. When a station has been received, the search will stop. Press the + or – SEARCH button again, until the desired station is received.

Repeat these steps for all desired stations.

FINE TUNING OF A WEAK STATION

If the picture on a particular programme position is not acceptable, keep the + or – FINE button pressed until the picture becomes clearer. When either of the FINE buttons is pressed, the AFT of the selected station is deactivated and the AFT lamp goes off. To view this particular station, keep the AFT deactivated. (Do not press the AFT button.)
When other memorized stations are selected, the AFT automatically activates.

ELIMINATING NOISE ON UNUSED PROGRAMME POSITIONS

Simply press the RESET button. The annoying noise will be eliminated.

1-5. CLOCK SETTING

When you connect the mains lead to a mains outlet, the clock indicates "0 : 00" with the two dots blinking.

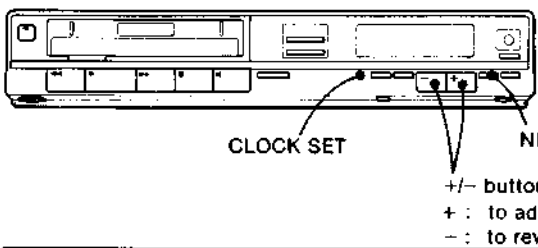
Example : To set the clock to 7 : 35 p.m. (19 : 35) on Tuesday *

***Time indication**

AM				PM					
12 : 00 (midnight)	1 : 00		11 : 00	12 : 00 (noon)	1 : 00	2 : 00		10 : 00	11 : 00
↓	↓		↓	↓	↓	↓		↓	↓
0:00	1:00		11:00	12:00	13:00	14:00		22:00	23:00

Day indication

Mo (Monday)	Tu (Tuesday)	We (Wednes-day)	Th (Thursday)	Fr (Friday)	Sa (Saturday)	Su (Sunday)
↓	↓	↓	↓	↓	↓	↓
1	2	3	4	5	6	7



1 Press CLOCK SET.	0:00
2 Set the day by pressing + or –.	0:00
3 Press NEXT and set the hour by pressing + or –.	19:00
4 Press NEXT and set the minute by pressing + or –.	19:35
5 With an announced time signal, press NEXT. The clock now starts operating, showing the correct time. The dots of the colon alternately blink every 30 seconds.	19:35

NEXT button
Each time the NEXT button is pressed, the item to be set blinks to let you know the setting order.

+/– buttons
The + and – PROGRAM/TIMER buttons can be pressed in two ways.

When you hold a button down, the digits will advance continuously until the button is released.

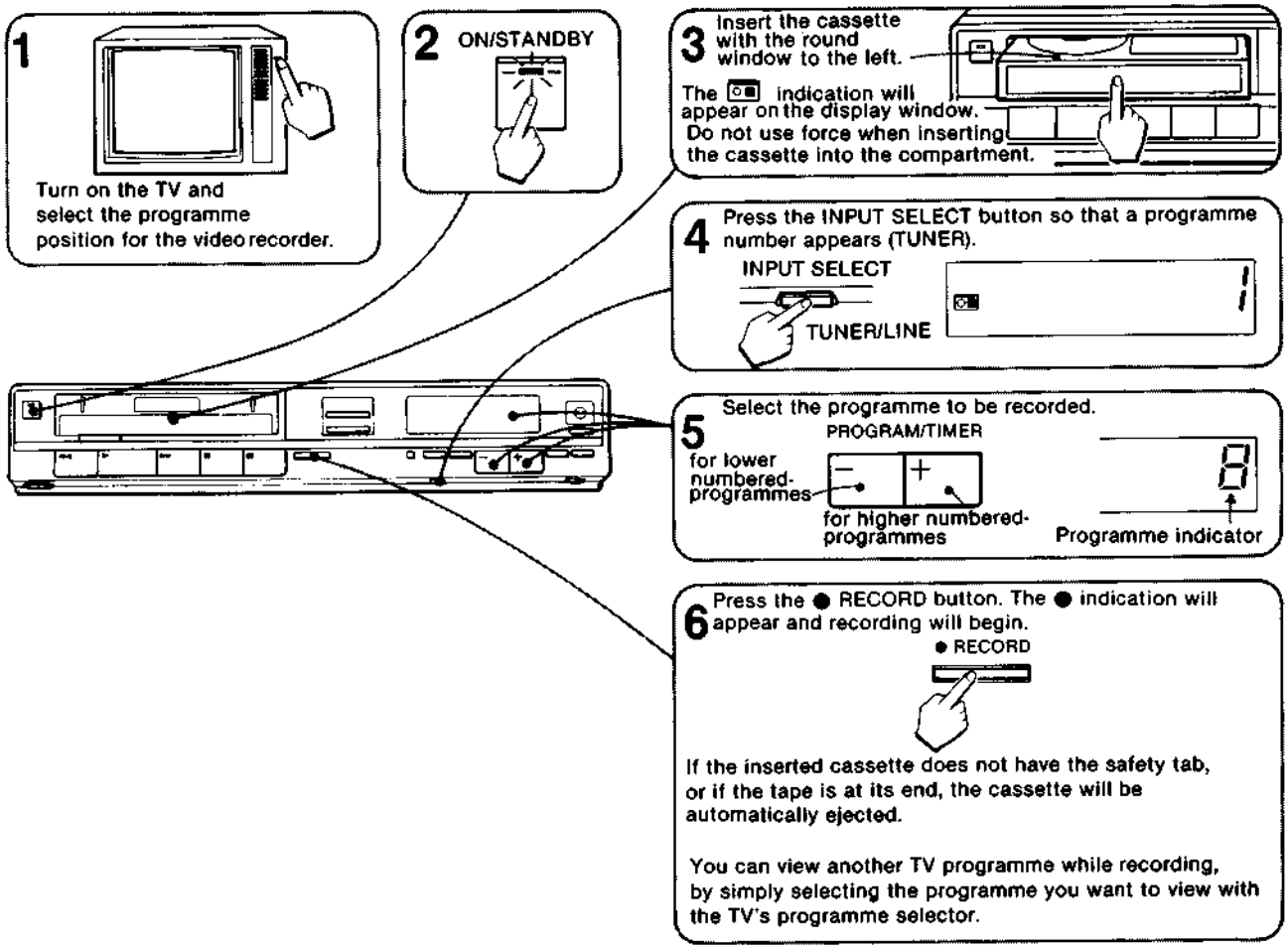
When you press and immediately release a button, the digits will advance by one.

To change the actual clock setting
Press the CLOCK SET button and repeat the clock setting procedure from step 1.

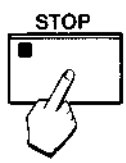
Note
If you have pressed the CLOCK SET button inadvertently, press the NEXT button enough times until the dots of the colon blink.

When power has been interrupted, the time indication reverts to "0 : 00", showing that the clock must be reset.

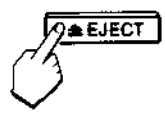
1-6. TV PROGRAMME RECORDING



To stop recording



To eject the cassette
Press after stopping the recording.



When the tape reaches the end during recording, it will be automatically rewound.

Note
The recorder can be automatically turned on by inserting a cassette without pressing the ON/STANDBY button.

CAUTION

Television programmes, films, video tapes and other materials may be copyrighted.
Unauthorized recording of such material may be contrary to the provision of the copyright laws.

TO STOP RECORDING MOMENTARILY

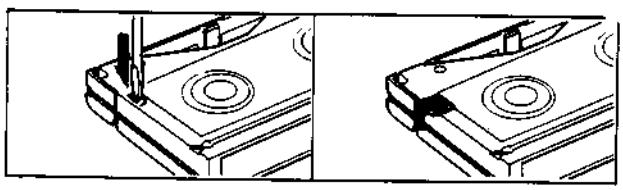
Press the ⏸ button. The ⏸ indicator will appear on the display window. The TV programme can be seen on the TV, but the picture will not be recorded.
To resume recording, press the ⏸ button again.
To protect the video heads and the tape, the pause mode will be automatically released after about 8 minutes and recording will stop.

TO KEEP A RECORDED PROGRAMME FROM BEING ACCIDENTALLY ERASED

When a new recording is made on a previously recorded cassette, the previous recording will be automatically erased.

To avoid erasing a recording
Break off the safety tab using a screwdriver or similar object.

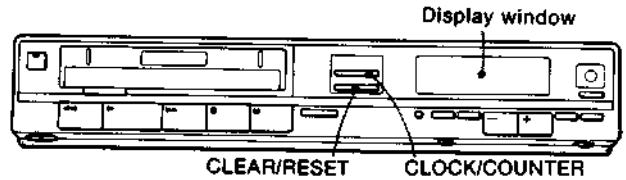
To re-record on a cassette which has had the safety tab removed
Cover the slot with a piece of plastic tape.



If you activate the RECORD button or the TIMER REC ON/OFF button with a cassette with its safety tab removed inserted, the cassette will be automatically ejected.

TO INDEX A RECORDED PROGRAMME USING THE TAPE COUNTER

Turn on the recorder and press the CLOCK/COUNTER button to display the counter reading in the display window.
To return the display to the present time, press the CLOCK/COUNTER button again.



Before starting recording or playback, press the CLEAR/RESET button to set the counter to "0000".
By noting the counter reading at the desired point, you can easily find that point later by referring to the counter.

Notes
- The counter reading is automatically reset to zero when a cassette is newly inserted.
- While the recorder is off, the display shows the present time, regardless of the CLOCK/COUNTER button setting.
- The counter reading will be retained in the memory even after the recorder is turned off, as long as the cassette is in the cassette compartment.
- The tape counter does not operate when a blank, unrecorded tape is played.

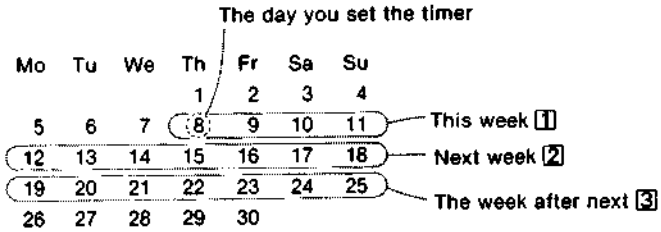
AUTOMATIC STOP

When the tape counter is displayed, rewinding stops at the tape counter's "0000" position. To rewind the tape further, press the ◀◀ button again.
When the current time is displayed, rewinding stops at the beginning of the tape.

1-7. TIMER-ACTIVATED RECORDING

Using the built-in timer, you can make one recording any day or every day, either this week, next week or the week after next.

Possible days for recording



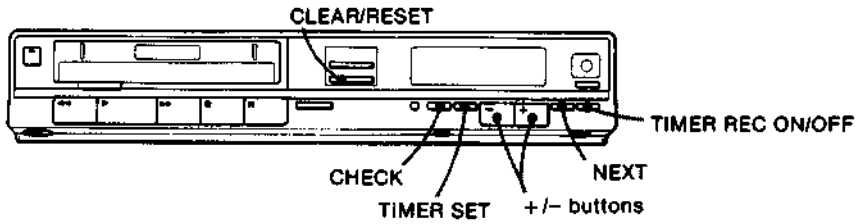
Check before setting the timer

- Is the clock set to the correct day and correct time? Timer setting can only be made after the clock has been set.
- Is a cassette inserted in the recorder?
- Is the cassette long enough to record the programmes?
- Does the cassette have a safety tab on the bottom?

Note: The timer cannot be set during recording or playback.

TO SET THE TIMER

Example: To record a PROGRAM 2 broadcast from 9:00 AM to 11:25 AM on Friday next week.



1 Press TIMER SET. (If the recorder is off, it will be turned on automatically.)	Week indication 0:00 Turn-on indication
2 Set the week by pressing + or –. Week indication changes : 1 → 2 → 3	0:00
3 Press NEXT and set the turn-on day by pressing + or –. Day indication changes : 1234567 (everyday) → 1 → 2 →...7	0:00
4 Pess NEXT and set the turn-on hour by pressing + or –.	9:00
5 Press NEXT and set the minute by pressing + or –. (To set to 00 minutes, there is no need to press + or –.)	9:00

6 Press NEXT and set the turn-off hour and minute with + or – as in turn-on time setting.	11:25 Turn-off indication
7 Press NEXT and select the programme to be recorded with + or –. To record the signals from the equipment connected to the VIDEO IN and AUDIO IN jacks, press INPUT SELECT so that "AU" indication appears.	11:25 2
8 Press NEXT. The display reverts to the current time.	Current time
9 Press TIMER REC ON/OFF. The TIMER REC indication appears and the recorder is turned off.	TIMER REC indication Current time

At the preset turn-on time, recording will start automatically and will stop at the preset turn-off time.

Note
If the inserted cassette is at its end or does not have the safety tab, the cassette will be automatically ejected when the TIMER REC ON/OFF button is pressed.

ONCE THE TIMER REC INDICATION HAS DISPLAYED, NO FUNCTION OF THE RECORDER CAN BE ACTIVATED, except for checking the timer setting.
To operate the recorder after setting the timer for recording, press the TIMER REC ON/OFF buton so that the TIMER REC indication goes off. To reactivate the timer recording standby mode, be sure to press the TIMER REC ON/OFF button again.

WHILE SETTING TIMER

To change the preset item
Press the CLEAR/RESET button and repeat the timer setting procedure from step 2.

To record to the end of the tape
Set the turn-off time to a time after the tape will reach its end.

BEFORE OR DURING TIMER RECORDING

To check the timer settings
Press the CHECK button. Each time the CHECK button is pressed, the display will change to the preset turn-on time, the turn-off time, then the current time.
During actual timer recording, only the turn-off time can be checked.

To change the settings
1 Press the TIMER REC ON/OFF button so that the TIMER REC indication goes off.
2 Press the CHECK button.
3 Press the CLEAR/RESET button.
4 Repeat the timer setting procedure on page 13 from step 2.

To erase the timer setting
1 Press the TIMER REC ON/OFF button so that the TIMER REC indication goes off.
2 Press the CHECK button.
3 Press the TIMER SET button. The setting will be erased from the memory.

Note: When the TIMER REC indication is displayed, the timer setting cannot be erased.

If the tape reaches the end during timer recording
The recording will stop and the tape will be rewound to the beginning. Then after about a second, the recorder will be turned off.

To stop the on-going timer recording
Press the TIMER REC ON/OFF button so that the TIMER REC indication goes off. The unit will be turned off automatically after about a second.

When a power interruption occurs
If the clock shows "0:00" and the dots blink, all the timer settings have been erased. Reset the clock time and the timer settings.

AFTER TIMER RECORDING

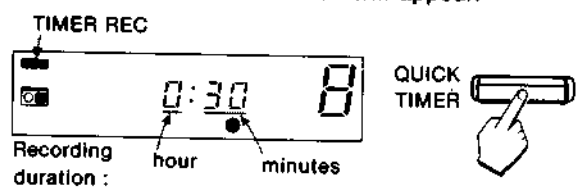
When a timer recording is finished, the programming (except the everyday setting) will be deleted automatically.

QUICK TIMER RECORDING

—To set the recording duration and to turn off the unit automatically

During recording, you can set the recording duration for up to 4 hours in units of 30 minutes by pressing the QUICK TIMER button. After the preset time has elapsed, recording stops and the recorder is turned off automatically.

1 Start recording.
2 Press the QUICK TIMER button to set the recording duration.
The TIMER REC indication will appear.



Each time you press the QUICK TIMER button, the indication changes :

0 : 30 → 1 : 00 → 1 : 30 → 2 : 00 → ... 3 : 30 → 4 : 00

As the recording continues, the duration indication decreases minute by minute to 0:00 and the recording stops. The recorder is turned off automatically.

Note
When the TIMER REC indication is displayed, no function of the recorder can be activated.

To extend the recording duration
The on-going recording duration can be extended simply by pressing the QUICK TIMER button.
The duration will be extended in units of 30 minutes with each pressing.
Example: When 2:25 is indicated,
2:25 → 2:30 → 3:00 ...

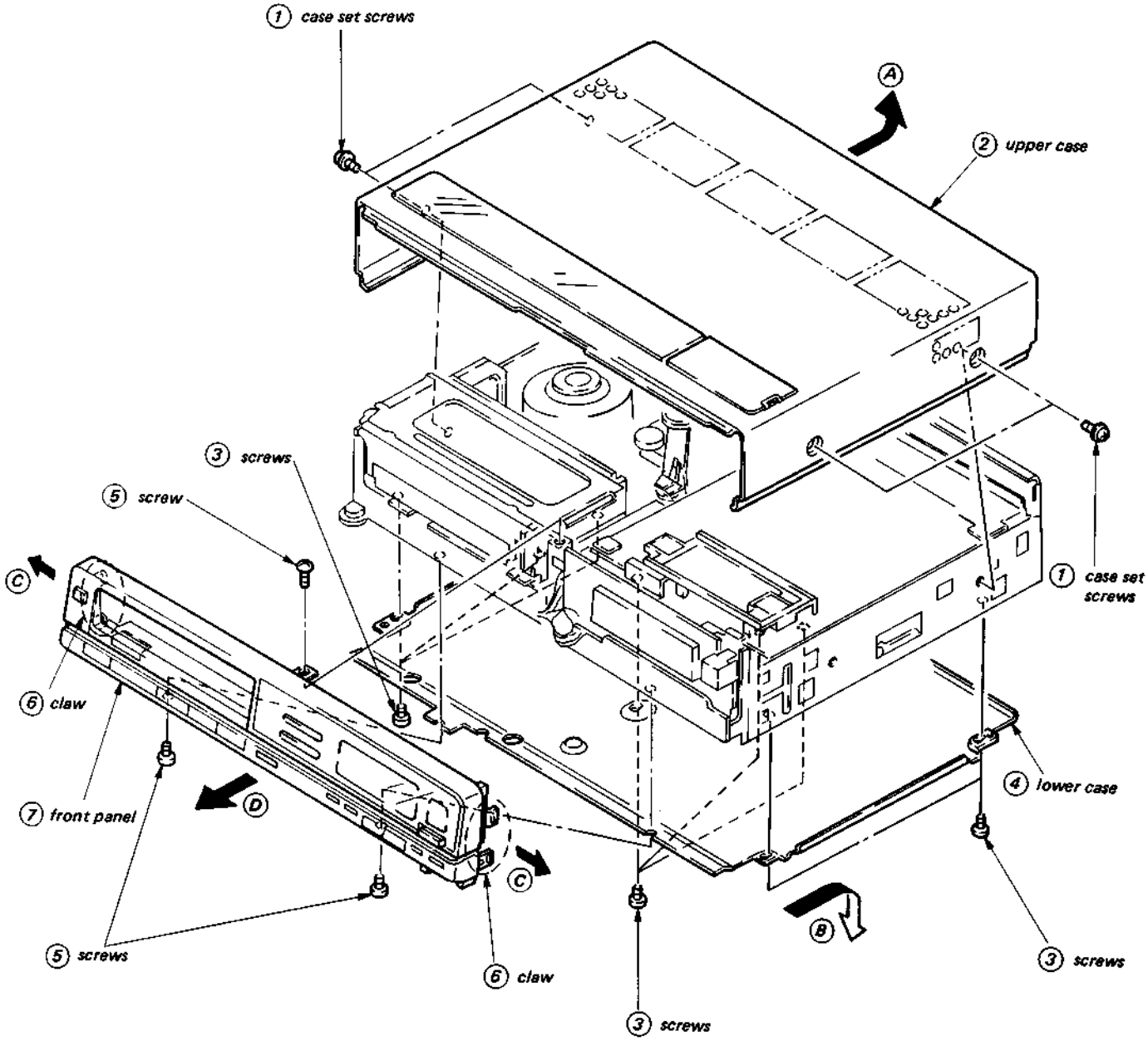
To cancel the quick timer function
Press the TIMER REC ON/OFF button so that the TIMER REC indication goes off. The recorder will be turned off automatically after about a second.

SECTION 2
DISASSEMBLY

2-1. DISASSEMBLY OF CABINET

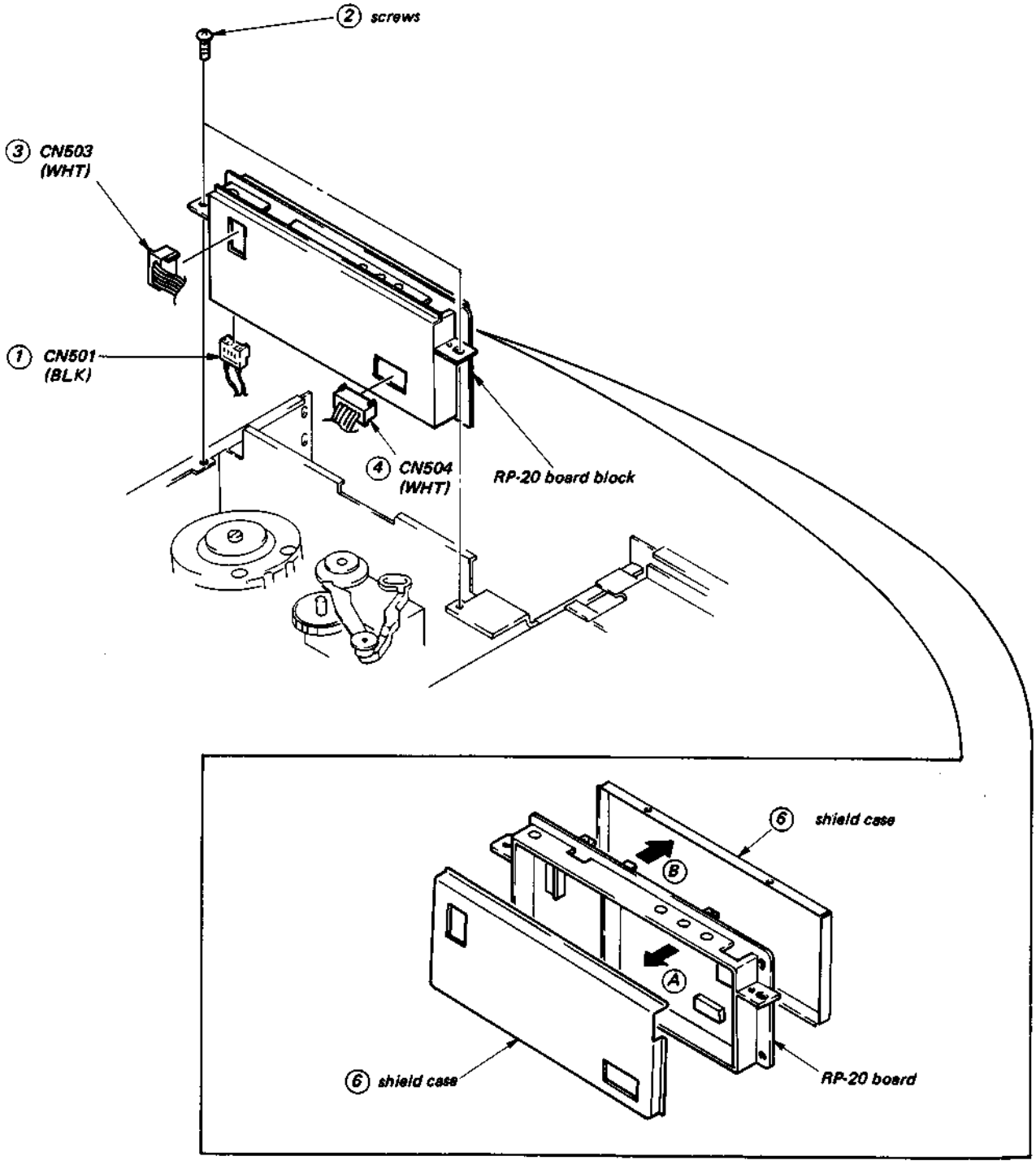
1) Remove the four case set screws (1).
2) Remove the upper case (2) in the direction shown by the arrow (A).
3) Loosen the eight screws (BVTP3 x 8) (3).
4) Remove the lower case (4) in the direction shown by the arrow (B).
5) Remove the three screws (BVTP3 x 8) (5).
6) Remove the two claws (6) in the direction shown by the arrow (C), then remove the front panel (7) in the direction shown by the arrow (D).

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



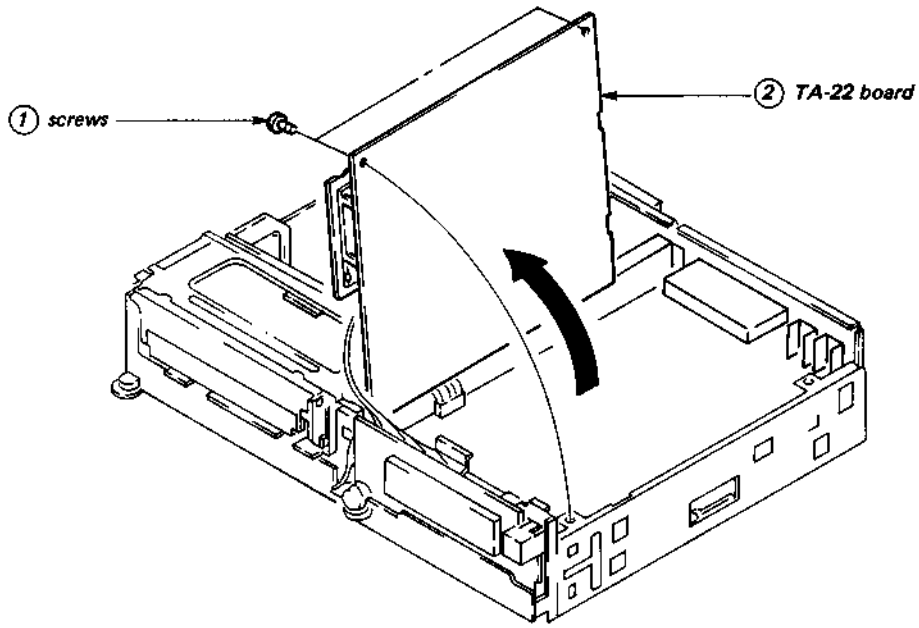
2-2. REMOVAL OF THE RP-20 BOARD

1) Pull out the connector CN501 ①.
2) Remove the two screws (BVTP3 x 8) ②.
3) Pull out the three connectors (CN503, CN504) ③, ④.
4) Remove the two shield cases ⑥ in the direction shown by the arrows Ⓐ and Ⓑ.



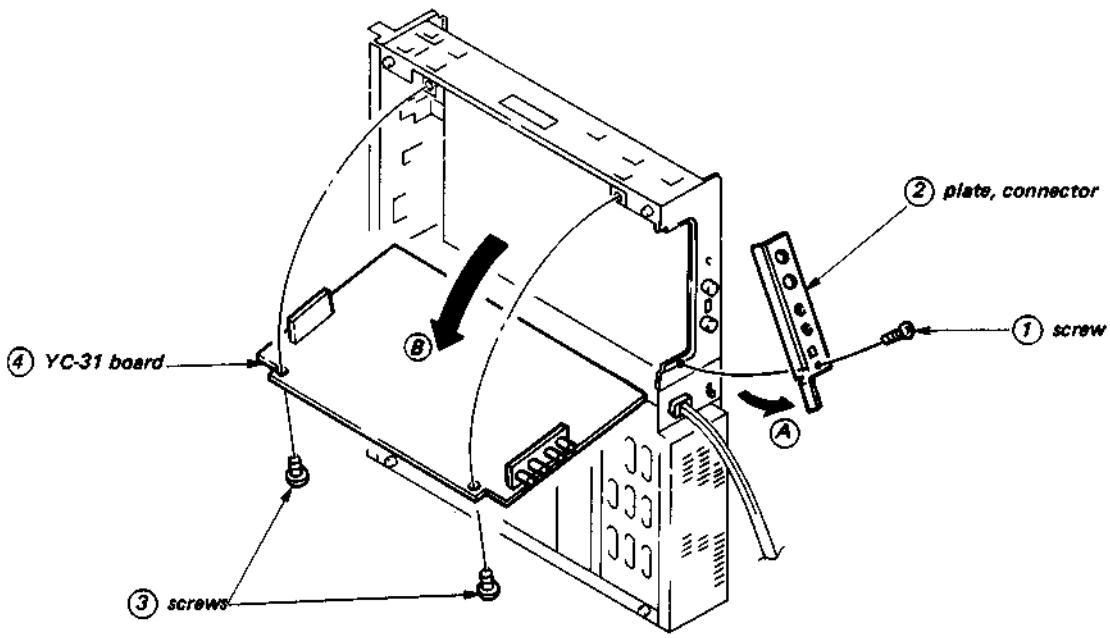
2-3. REMOVAL OF THE TA-22 BOARD

1) Remove the two screws (BVTP3 x 8) ①.
2) Remove the TA-22 board ② in the direction shown by the arrow.



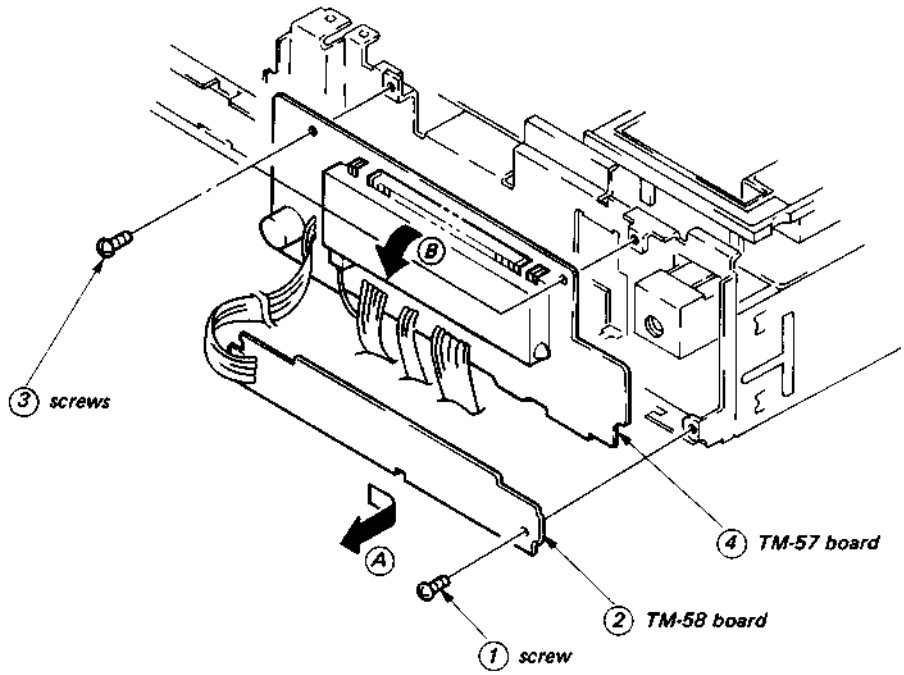
2-4. REMOVAL OF THE YC-31 BOARD

1) Stand the set with the left side panel on the bottom.
2) Remove the screw (BVTP3 x 8) ①.
3) Remove the plate, connector ② in the direction shown by the arrow Ⓐ.
4) Remove the two screws (BVTP3 x 8) ③.
5) Remove the YC-31 board ④ in the direction shown by the arrow Ⓑ.



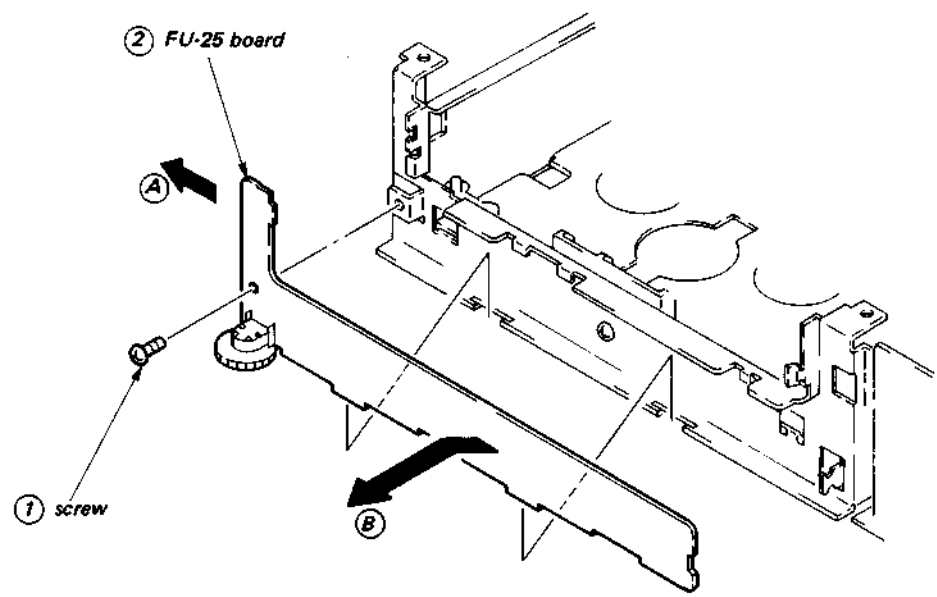
2-5. REMOVAL OF THE TIMER BLOCK

1) Remove the screw (BVTP3 x 8) ①.
2) Remove the TM-58 board ② in the direction shown by the arrow Ⓐ.
3) Remove the two screws (BVTP3 x 8) ③.
4) Remove the TM-57 board ④ in the direction shown by the arrow Ⓑ.



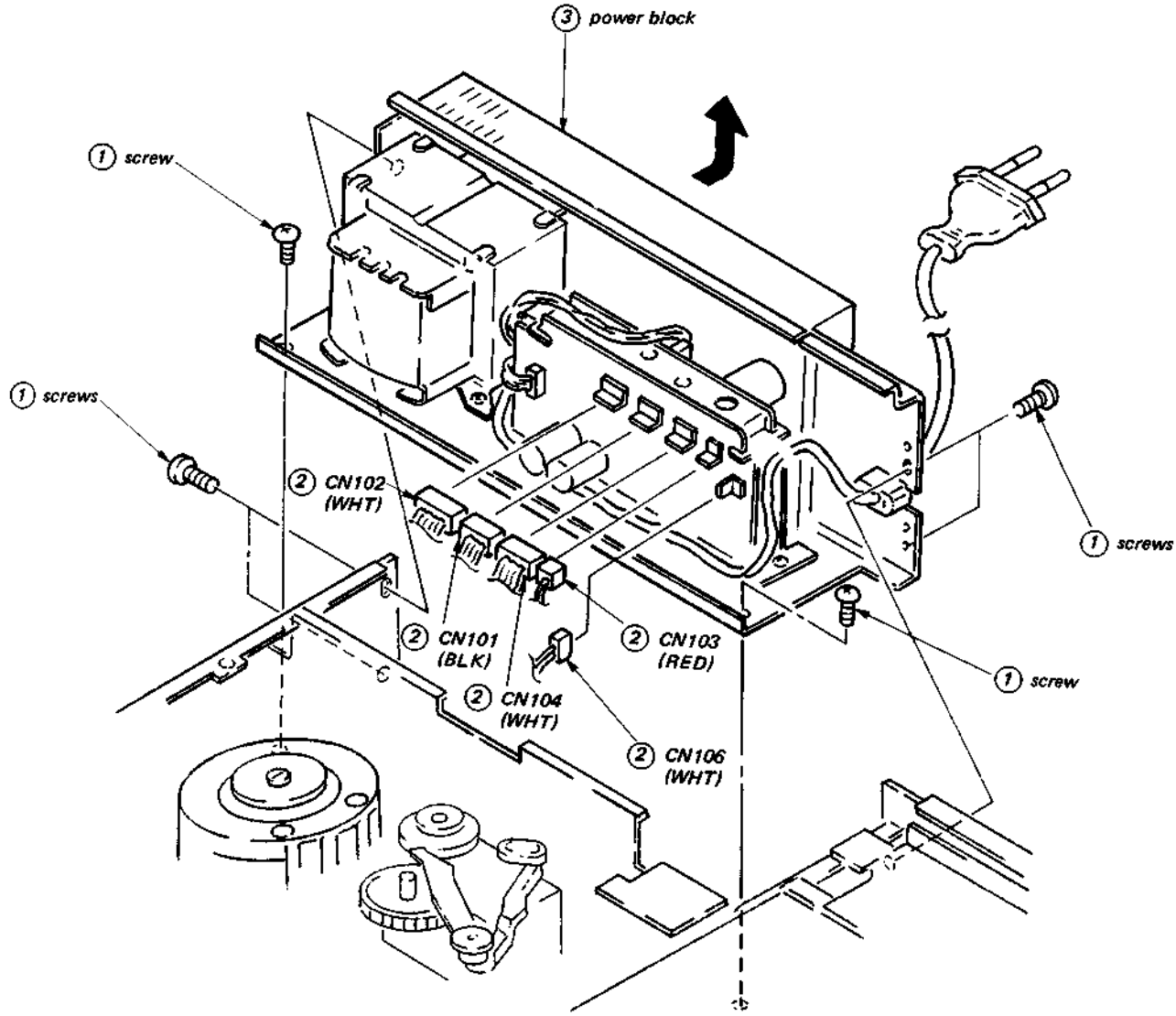
2-6. REMOVAL OF THE FU-25 BOARD

1) Remove the screw (BVTP3 x 8) ①.
2) Remove the FU-25 board ② in the direction shown by the arrow Ⓐ, then remove in the direction shown by the arrow Ⓑ.



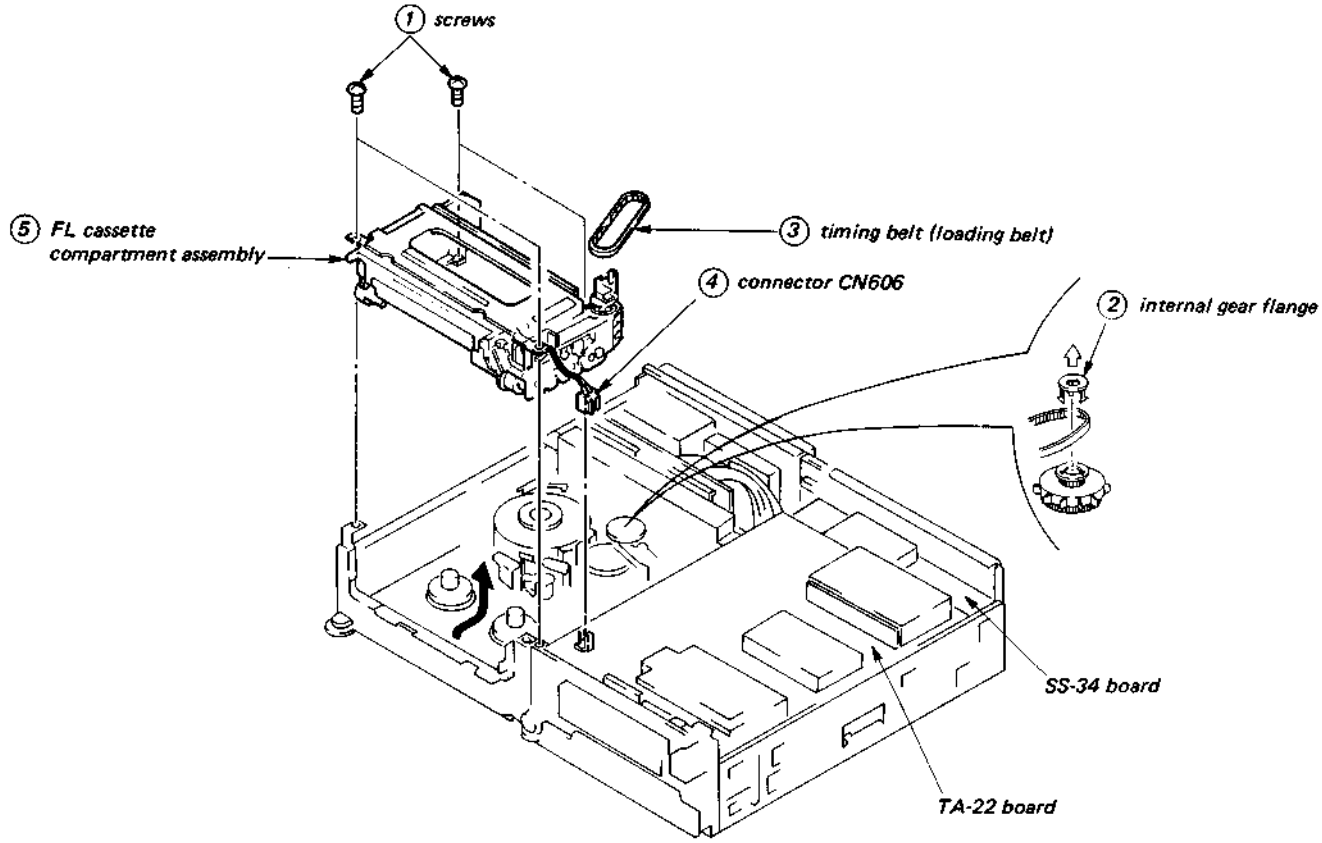
2-7. REMOVAL OF THE POWER BLOCK

1) Remove the six screws (BVTP3 x 8) ①.
2) Pull out the five connectors (CN101, CN102, CN103, CN104, CN106) ②.
3) Remove the power block ③ in the direction shown by the arrow.



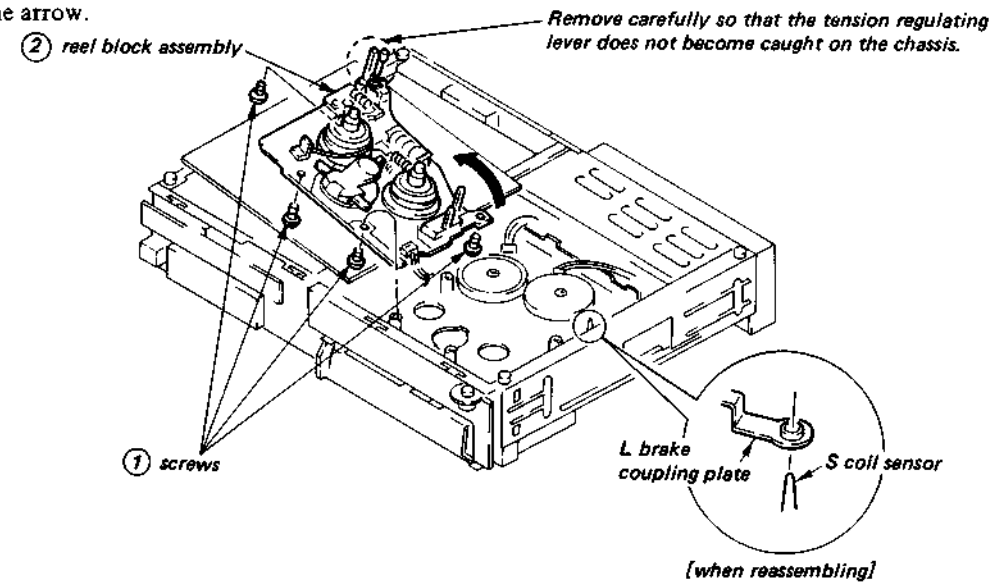
2-8. REMOVAL OF THE FL CASSETTE COMPARTMENT ASSEMBLY

1) Remove the four screws (BVTP3 x 8) ①.
2) Remove the internal gear flange ②.
3) Remove the timing belt (loading belt) ③.
4) Pull out the connector CN606 ④, on the SS-34 board.
5) Remove the FL cassette compartment assembly in the direction shown by the arrow.



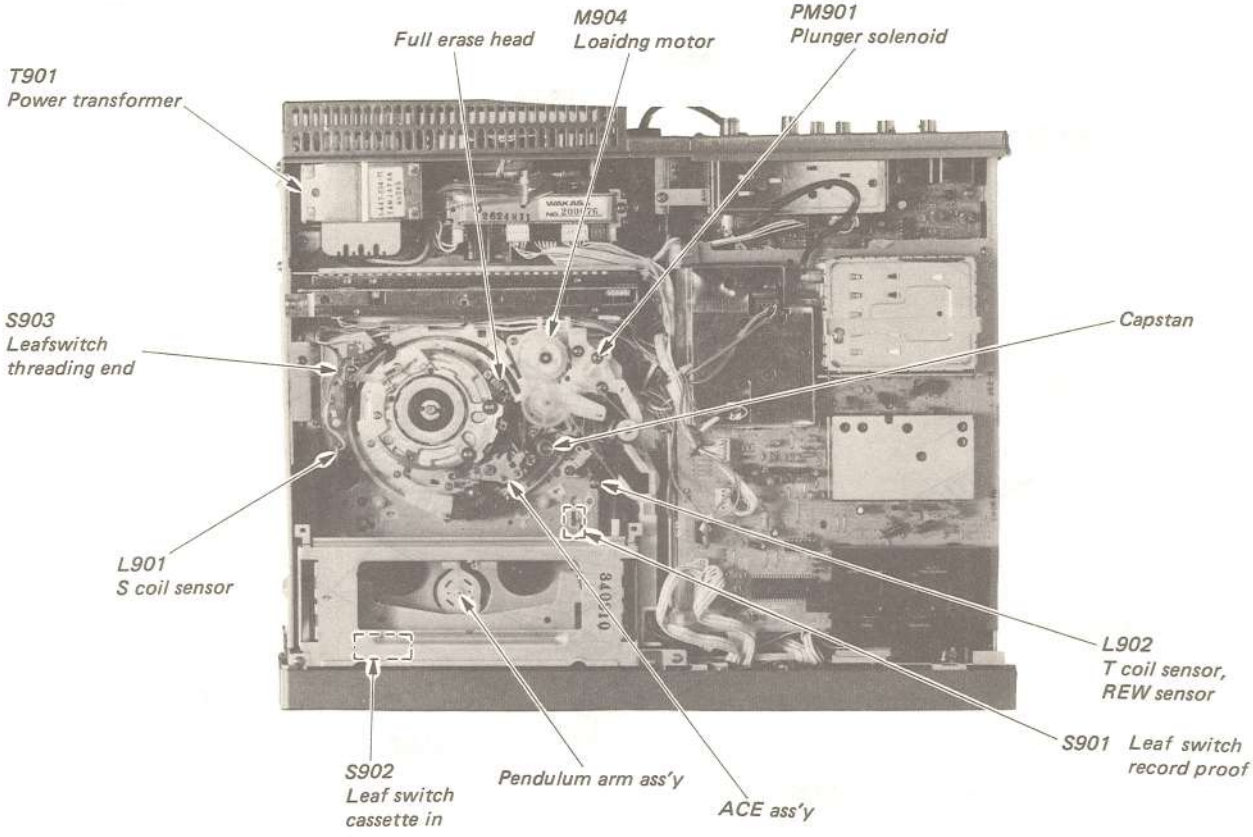
2-9. REMOVAL OF THE REEL BLOCK ASSEMBLY

1) Remove the four screws (BVTP3 x 8) ①.
2) Remove the reel block assembly ② in the direction shown by the arrow.

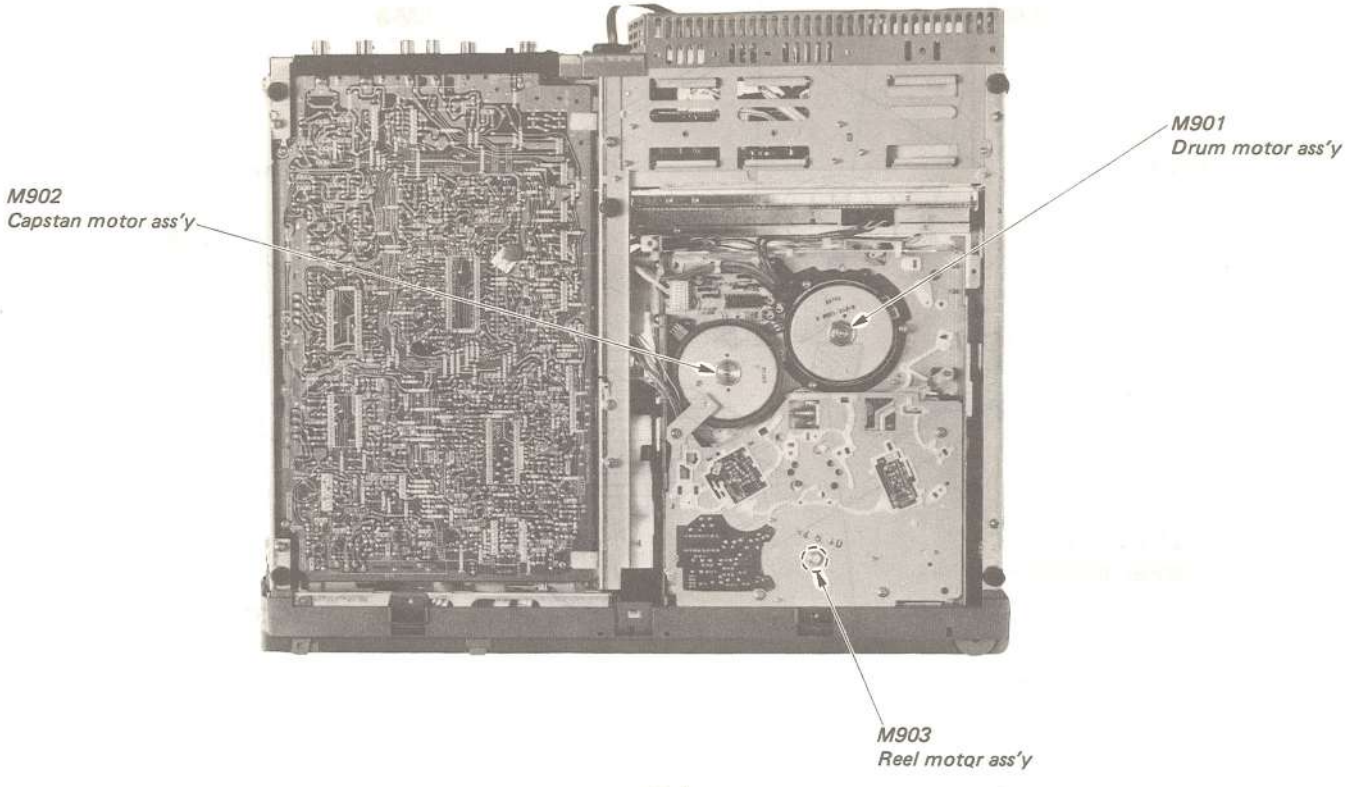


2-10. INTERNAL VIEW

— Top Side —

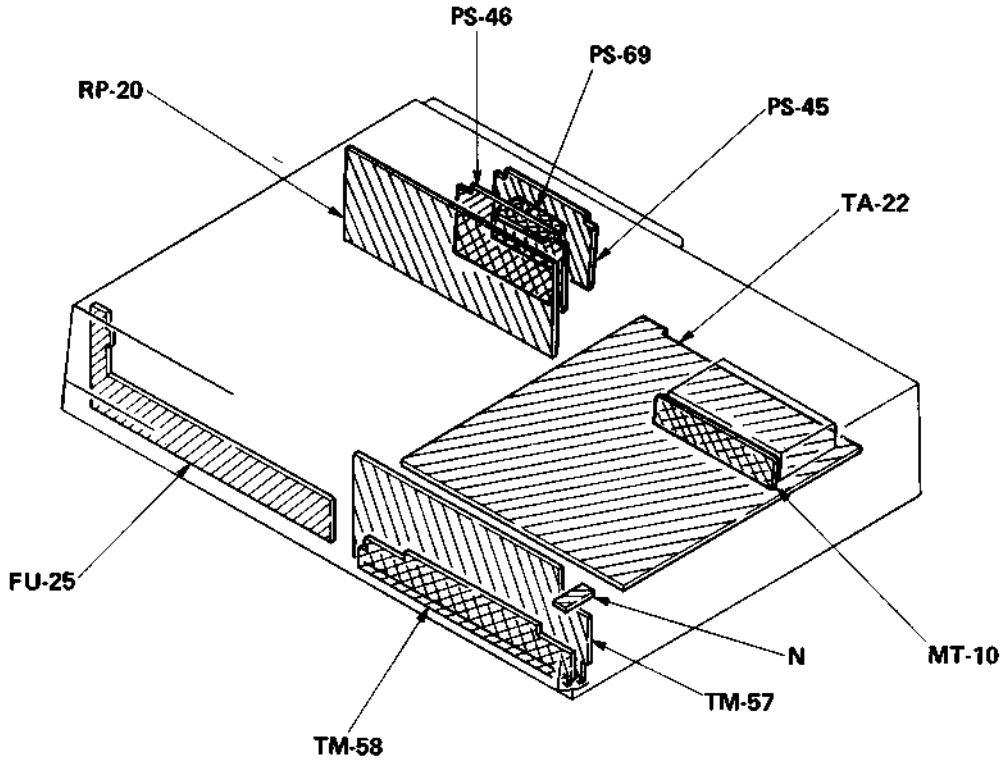


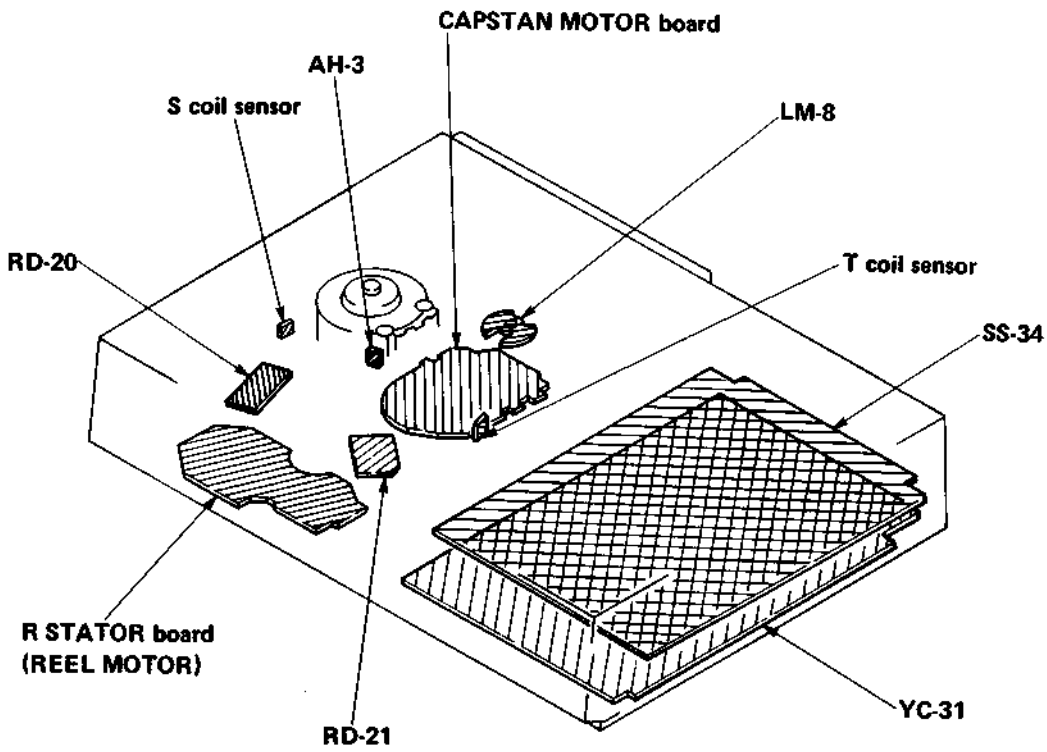
— Bottom Side —



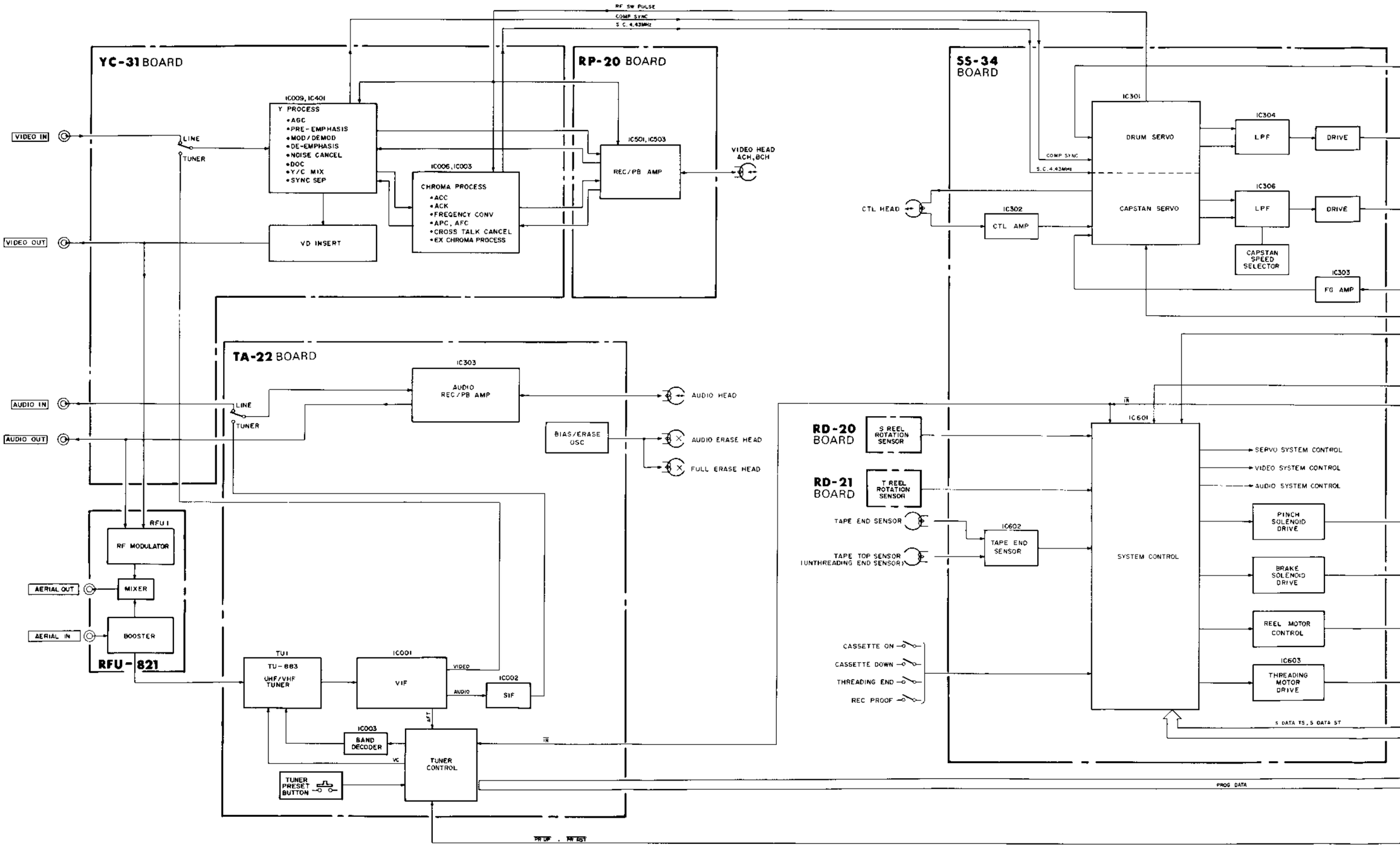
SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION





3-2. OVERALL BLOCK DIAGRAM



RF SW PULSE
COMP SYNC
S.C. 4.43MHz

RP-20 BOARD

IC501, IC503
REC/PB AMP
VIDEO HEAD ACH, BCH

SS-34 BOARD

IC301
DRUM SERVO
CAPSTAN SERVO
IC304
LPF
DRIVE
IC306
LPF
DRIVE
CAPSTAN SPEED SELECTOR
IC303
FG AMP
IC302
CTL AMP
CTL HEAD
COMP SYNC
S.C. 4.43MHz

DRUM
DRUM MOTOR
PG COIL A, B, S
CAPSTAN MOTOR
FG

FU-25 BOARD

TRACKING
FUNCTION BUTTON
POWER

AUDIO HEAD
BIAS/ERASE OSC
AUDIO ERASE HEAD
FULL ERASE HEAD

RD-20 BOARD
S REEL ROTATION SENSOR

RD-21 BOARD
T REEL ROTATION SENSOR

TAPE END SENSOR
TAPE TOP SENSOR (UNTHREADING END SENSOR)
IC602
TAPE END SENSOR

CASSETTE ON
CASSETTE DOWN
THREADING END
REC PROOF

IR
IC601
SYSTEM CONTROL

SERVO SYSTEM CONTROL
VIDEO SYSTEM CONTROL
AUDIO SYSTEM CONTROL
PINCH SOLENOID DRIVE
BRAKE SOLENOID DRIVE
REEL MOTOR CONTROL
IC603
THREADING MOTOR DRIVE

PINCH SOLENOID
BRAKE SOLENOID
REEL MOTOR
THREADING MOTOR

S DATA TS, S DATA ST
PROG DATA

REMOTE CONTROL RECEIVER

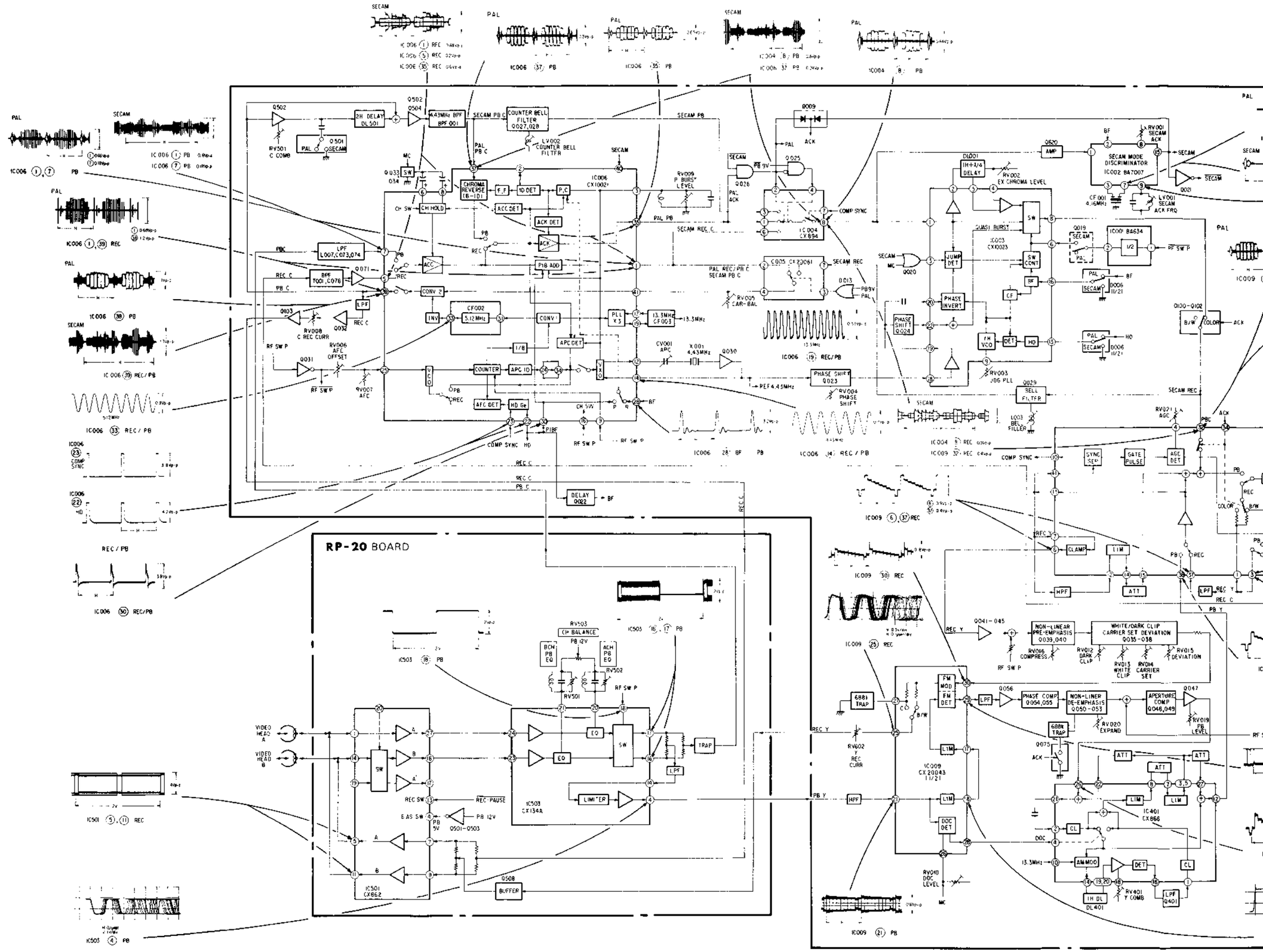
TM-57, 58 BOARD

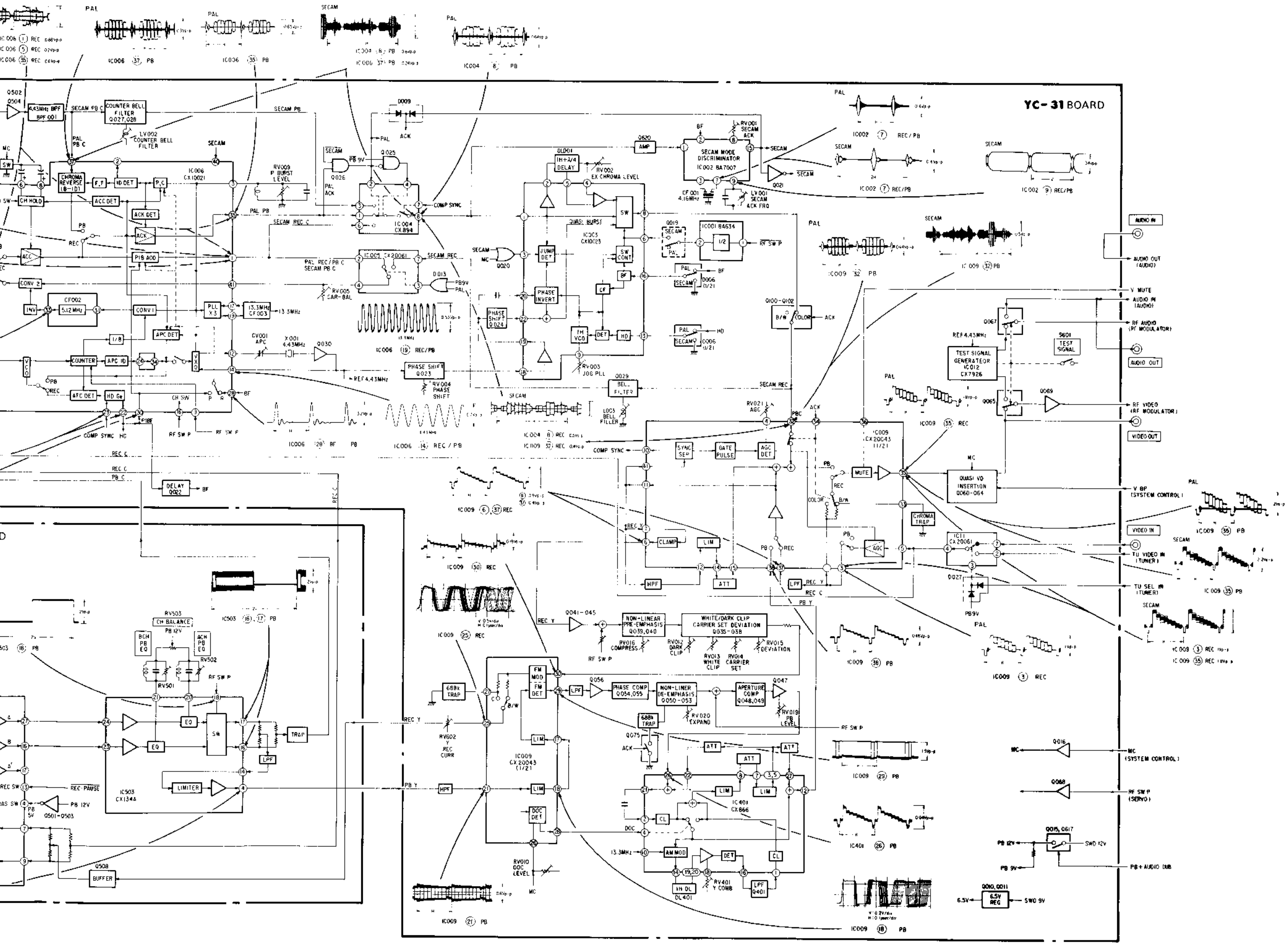
IC1
TIMER
•CLOCK
•TIMER
•COUNTER
•FUNCTION INDICATOR
TIMER SET BUTTON
FLUORESCENT DISPLAY

PWR ON

PS-45, 46, 69 BOARD
IC001
SWD 12V
SWD 9V
POWER SUPPLY
AC IN

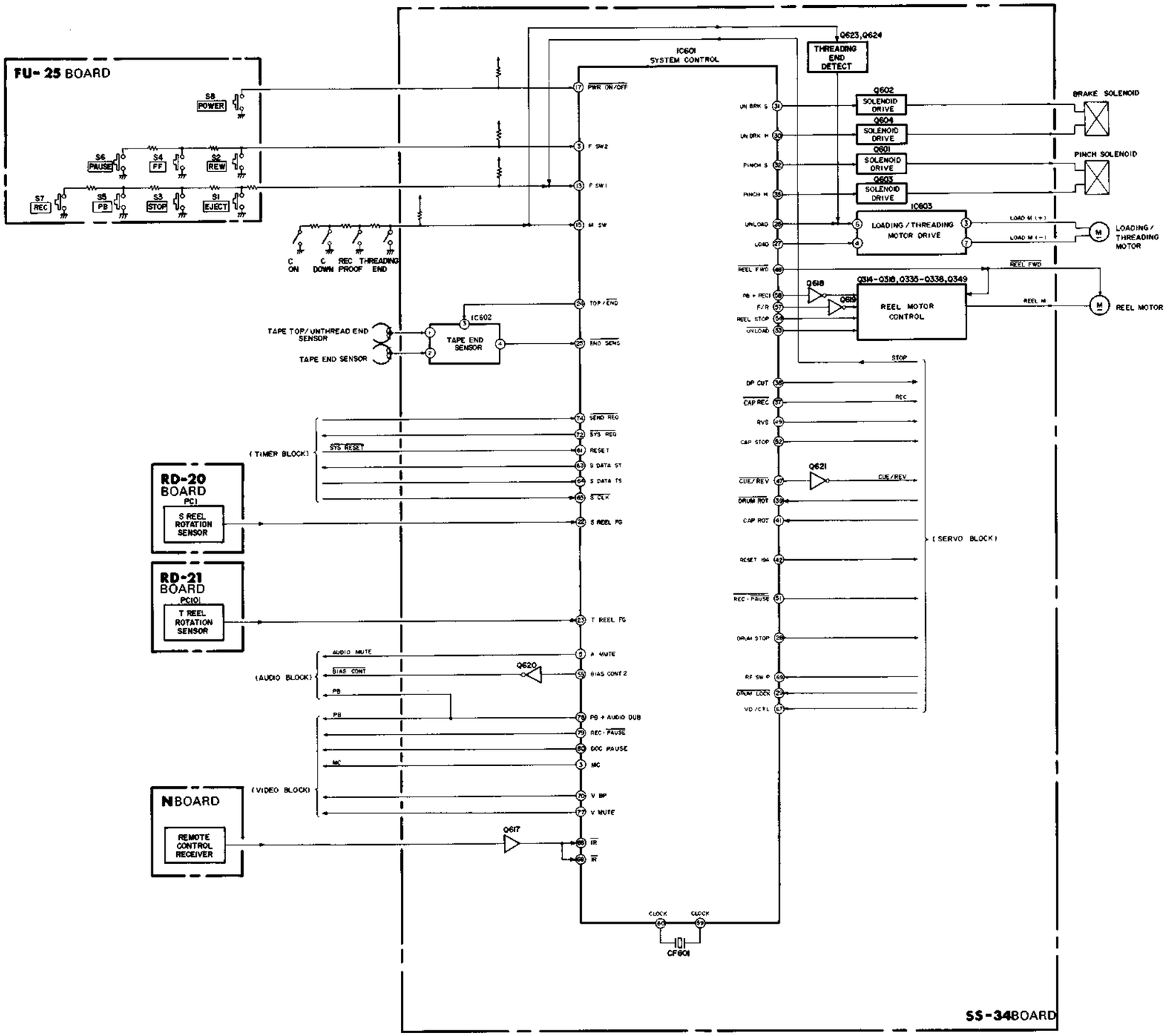
3-3. VIDEO BLOCK DIAGRAM





YC-31 BOARD
COUNTER BELL FILTER Q027,028
4.43MHz BPF BPF 001
LV002 COUNTER BELL FILTER
CHROMA REVERSE (1B-1D1)
ACC DET
ACK DET
P/B ADD
CONV 2
CONV 1
CF002 5.12MHz
PLL X3
13.3MHz CF003
APC DET
COUNTER
APC ID
AFC DET
HD Ge
DELAY Q022
IC006 CX10021
RV009 P. BURST LEVEL
CV001 APC
X001 4.43MHz
IC004 CX894
IC005 CX20061
RV005 CAR-BAL
PHASE SHIFT Q023
RV004 PHASE SHIFT
DL001 1H+1/4 DELAY
RV002 EX CHROMA LEVEL
IC003 CX10023
JUMP DET
PHASE INVERT
PHASE SHIFT Q024
RV003 JOG PLL
Q029 BEL. FILTER
LC03 BELL FILLER
SECAM MODE DISCRIMINATOR IC002 BA7007
RV001 SECAM ACK
LV001 SECAM ACK FRQ
CF 001 4.16MHz
IC001 BA634
IC009 CX20043 (1/21)
SYNC SEP
GATE PULSE
AGC DET
MUTE
CHROMA TRAP
IC11 CX20061
QUASI VD INSERTION Q060-064
TEST SIGNAL GENERATOR IC012 CX7926
S601 TEST SIGNAL
AUDIO IN
AUDIO OUT (AUDIO)
V. MUTE
RF AUDIO (RF MODULATOR)
RF VIDEO (RF MODULATOR)
VIDEO OUT
VIDEO IN
TU VIDEO IN (TUNER)
TU SEL IN (TUNER)
V BP (SYSTEM CONTROL)
MC (SYSTEM CONTROL)
RF SW P (SERVO)
Q015, Q017
SWD 12V
PB+AUDIO DUB
Q010, Q011 6.5V REG
SWD 9V
NON-LINEAR PRE-EMPHASIS Q039,040
WHITE/DARK CLIP CARRIER SET DEVIATION Q035-038
RV016 COMPRESS
RV012 DARK CLIP
RV013 WHITE CLIP
RV014 CARRIER SET
RV015 DEVIATION
PHASE COMP Q054,055
NON-LINER DE-EMPHASIS Q050-053
RV020 EXPAND
APERTURE COMP Q048,049
RV019 PB LEVEL
FM MOD
FM DET
DOC DET
RV010 DOC LEVEL
688k TRAP
RV602 Y REC CURR
IC401 CX866
AM MOD
1H DL DL401
RV401 Y COMB
LPF Q401
CH BALANCE
RV503
RV501
RV502
IC503 CX134A
LIMITER
TRAP
BUFFER
Q508
Q501-Q503
REC-PAUSE

3-4. SYSTEM CONTROL BLOCK DIAGRAM



3-5. SYSTEM CONTROL INTERFACE

[SYSTEM CONTROL-VIDEO BLOCK INTERFACE]

SIGNAL	I/O	IC601 Pin No.	STOP	FF	REW	PB	PB PAUSE	PICTURE SEARCH		REC OR TIMER REC	REC PAUSE	WAIT PAUSE	FR SEARCH	
								CUE	REV				CUE	REV
PAUSE	O	①	L	L	L	L	H	L	L	L	H	*2	L	L
MC	O	③	L	L	L	L	H	H	H	L	L	L	H	H
VBP	O	⑦⓪	H	H	H	H	H	H	H	H	H	H	H	H
A'HEAD *1	O	⑦⑥	L	L	L	L	L	L	L	L	L	L	L	L
V MUTE	O	⑦⑦	L	L	L	L	L	L	L	L	L	L	L	L
PB + AUDIO DUB	O	⑦⑧	L	L	L	H	H	H	H	L	L	L	H	H
REC · $\overline{P}$	O	⑦⑨	L	L	L	L	L	L	L	H	L	L	L	L
DOC PAUSE *1	O	⑧⓪	L	L	L	L	L	L	L	L	L	L	L	L

*1 : NOT USED
*2 : T = 2(SEC),
50% duty ratio pulse

[SYSTEM CONTROL-SERVO BLOCK INTERFACE]

SIGNAL	I/O	IC601 Pin No.	STOP	FF	REW	PB	PB PAUSE	PICTURE SEARCH		REC OR TIMER REC	REC PAUSE	WAIT PAUSE	FR SEARCH	
								CUE	REV				CUE	REV
S REEL FG	I	㉒	H/L	FG	FG	FG	H/L	FG	FG	FG	H/L	H/L	FG	FG
T REEL FG	I	㉓	H/L	FG	FG	FG	H/L	FG	FG	FG	H/L	H/L	FG	FG
DRUM STOP	O	㉘	H	L	L	L	L	L	L	L	L	H	L	L
$\overline{\text{DRUM LOCK}}$	I	㉙	L	H	H	H	H	H	H	H	H	L	H	H
$\overline{\text{BRK ADJ}}$ *1	O	㉟	H	H	H	H	H	H	H	H	H	H	H	H
REC	O	㊲	L	L	L	L	L	L	L	H	H	L	L	L
DP CUT	O	㊳	L	L	L	L	L	H	H	L	L	L	H	H
DRUM ROT	I	㊴	L	H	H	H	H	H	H	H	H	L	H	H
CAP ROT	I	㊶	L	L	L	H	H	H	H	H	H	L	L	L
RESET 194	O	㊷	L	L	L	L	L	L	L	L	L	L	L	L
CAP CUT	O	㊸	L	L	L	L	L	L	L	L	L	L	L	L
PB + REC 2 *1	O	㊹	L	L	L	H	H	L	L	H	H	L	L	L
$\overline{\text{BIAS CONT 1}}$ *1	O	㊺	L	L	L	L	L	L	L	H	H	L	L	L
$\overline{\text{CUE/REV}}$	O	㊼	H	H	H	H	H	L	L	H	H	H	H	H
$\overline{\text{CAP RVS}}$	O	㊾	H	H	H	H	H	H	L	H	H	H	H	H
WITHN/$\overline{\text{N.LESS}}$	I	㊿	H	H	H	H	H	H	H	H	H	H	H	H
$\overline{\text{REC·P}}$	O	⑤①	H	H	H	H	H	H	H	L	H	H	H	H
CAP STOP	O	⑤②	H	H	H	L	L	L	L	L	L	H	H	H
$\overline{\text{PAUSE}}$	O	⑤⑥	H	H	H	H	L	H	H	H	L	*2	H	H
VD/CTL	I	⑥⑦	L	PB CTL	PB CTL	PB CTL	L	PB CTL	PB CTL	VD	L	L	PB CTL	PB CTL
RF SW P	I	⑥⑨	H/L	RF SWP	RF SWP	RF SWP	RF SWP	RF SWP	RF SWP	RF SWP	RF SWP	H/L	RF SWP	RF SWP
NOISE P *1	I	⑦⑤	L	L	L	L	L	L	L	L	L	L	L	L

*1 : NOT USED
*2 : T=2(SEC),
50% duty ratio pulse

[SYSTEM CONTROL-REEL MOTOR BLOCK INTERFACE]

SIGNAL	I/O	IC601 Pin No.	EJECTED	LOADING	THREADING	STOP	UN-THREADING	UN-LOADING	FF	REW	PB	PB PAUSE	PICTURE SEARCH		REC	REC PAUSE	FR SEARCH	
													CUE	REV			CUE	REV
$\overline{\text{CUE/REV}}$	O	㊼	H	H	H	H	H	H	H	H	H	H	L	L	H	H	H	H
$\overline{\text{REEL FWD}}$	O	㊽	L	L	L	L	H	L	L	H	L	L	L	H	L	L	L	H
REEL STOP	O	㊹	H	H	L	H	L	H	L	L	L	H	L	L	L	H	L	L
F/R	O	㊼	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H
PB + REC 1	O	㊽	L	L	L	L	L	L	L	L	H	H	L	L	H	H	L	L
$\overline{\text{UNLOAD}}$	O	㊸	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H

[SYSTEM CONTROL-MECHANISM BLOCK INTERFACE]

SIGNAL	I/O	IC601 Pin No.	EJECTED	LOADING	THREADING	STOP	UN-THREADING	UN-LOADING	FF	REW	PB	PB PAUSE	PICTURE SEARCH		REC	REC PAUSE	FR SEARCH	
													CUE	REV			CUE	REV
M SW *1	I	⑮	5V	3V	1V (2V)	0V	1V (2V)	3V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V
TOP/$\overline{\text{END}}$	O	㉔	L	L	L	L	H	H	L	H	L	L	L	H	L	L	L	H
$\overline{\text{END SENS}}$	I	㉕	H	H/L	H/L	H	H	L	H	H	H	H	H	H	H	H	H	H
UNLOAD	O	㉖	L	L	L	L	H	H	L	L	L	L	L	L	L	L	L	L
LOAD	O	㉗	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L
UNBRK (H)	O	㉚	L	L	L	L	L	L	H	H	H	H	H	H	H	H	H	H
UNBRK (S)	O	㉛	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
PINCH (S)	O	㉜	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
PINCH (H)	O	㉟	L	H	L	L	L	H	L	L	H	L	H	H	H	H	L	L

*1 ( ) : THE SAFTY TAB OF THE CASSETTE IS BROKEN

[SYSTEM CONTROL-AUDIO BLOCK INTERFACE]

SIGNAL	I/O	IC601 Pin No.	MODE												
			STOP	FF	REW	PB	PB-PAUSE	PICTURE SEARCH		REC OR TIMER REC	REC-PAUSE	WAIT PAUSE	FR SEARCH	
								CUE	REV				CUE	REV
AUDIO DUB *1	O	④	L	L	L	L	L	L	L	L	L	L	L	L
A MUTE	O	⑤	L	L	L	L	H	H	H	L	L	L	H	H
BIAS CONT 2	O	㊺	L	L	L	L	L	L	L	H	L	L	L	L
PB + AUDIO DUB	O	㊽	L	L	L	H	H	H	H	L	L	L	H	H

*1 NOT USED

[SYSTEM CONTROL-ITS PERIPHERAL CIRCUIT INTERFACE]

SIGNAL	I/O	IC601 Pin No.	MODE								
			USUAL	PRESSED BUTTON							
				EJECT	STOP	PB	REC		REW	FF	PAUSE	POWER
F SW 1	I	⑬	5V	0V	1V	2V	3V		–	–	–	–
F SW 2	I	⑭	5V	–	–	–	–		0V	1V	2V	–
V HOLD *1	I	⑯	0V – 5V *2	–	–	–	–		–	–	–	–
$\overline{\text{POWER ON/OFF}}$	I	⑰	5V	–	–	–	–		–	–	–	0V
$\overline{\text{IR}}$	I	⑯, ⑱	5V	–	–	–	–		–	–	–	–

*1 : NOT USED
*2 : BY V HOLD VR

[SYSTEM CONTROL-TIMER BLOCK DIAGRAM]

SIGNAL	I/O	IC601 Pin No.	MODE
			USUAL
S DATA ST	O	⑬	L
S DATA TS	I	⑭	L
$\overline{\text{S CLK}}$	I	⑮	H
$\overline{\text{SYS REQ}}$	O	⑫	H
$\overline{\text{SEND REQ}}$	I	⑭	H

[TIMER-TUNER INTERFACE (1)]

SIGNAL	I/O	IC001 Pin No.	FL DISPLAY INDICATION		
			PROG. No.	AU	BLANK
P00	I	①	*1	L	L
P01	I	②	*1	L	L
P02	I	③	*1	L	L
P03	I	④	*1	L	L
P10	I	⑤	*1	L	L
P11	I	⑥	*1	L	L
$\overline{\text{PR RESET}}$	O	⑱	H	H	H
$\overline{\text{PR UP}}$	O	⑲	H	H	H
PR LOCK	O	⑳	L	L	L
TU SEL	O	⑪	H	L	L

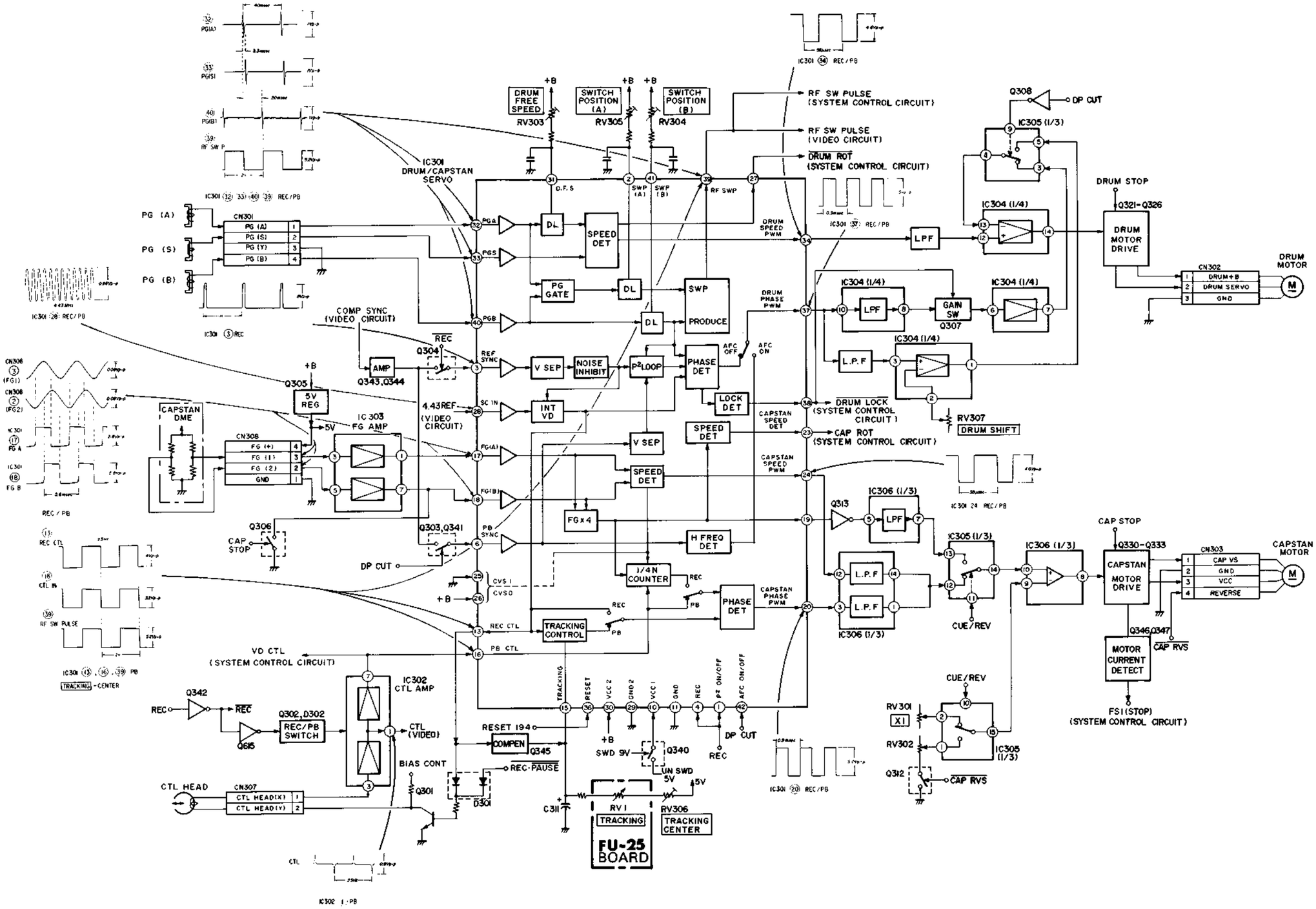
*1 REFER TO "TIMER–TUNER INTERFACE (2)".

[TIMER-TUNER INTERFACE (2)]

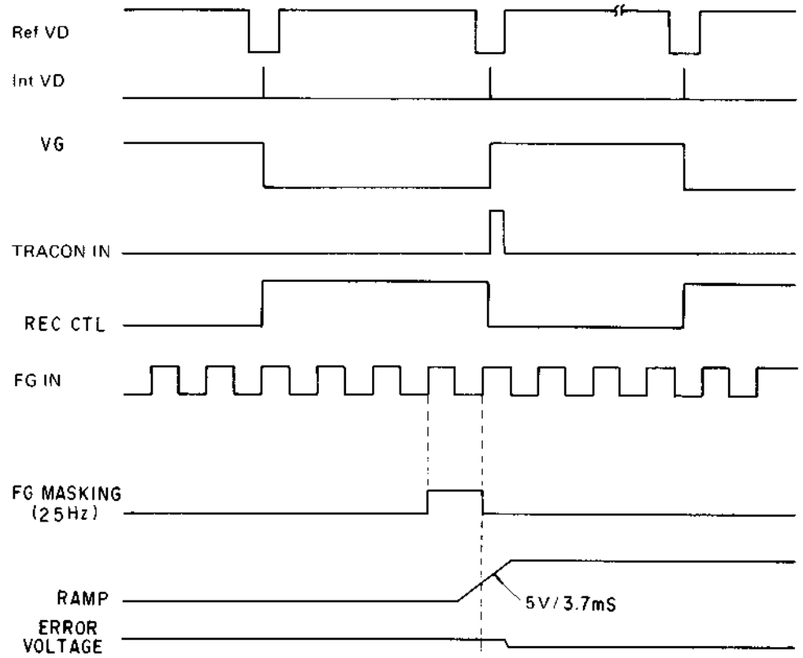
	IC101 INPUT						IC101 OUTPUT (INDICATION)			IC101 INPUT							IC101 OUTPUT (INDICATION)	
PROG. No.	P11	P10	P03	P02	P01	P00	10 digit	1 digit	PROG. No.	P11	P10	P03	P02	P01	P00	10 digit	1 digit
1	H	H	L	L	L	H		1	18*2	L	H	H	L	L	L	1	8
2	H	H	L	L	H	L		2	19*2	L	H	H	L	L	H	1	9
3	H	H	L	L	H	H		3	20*2	H	L	L	L	L	L	2	0
4	H	H	L	H	L	L		4	21*2	H	L	L	L	L	H	2	1
5	H	H	L	H	L	H		5	22*2	H	L	L	L	H	L	2	2
6	H	H	L	H	H	L		6	23*2	H	L	L	L	H	H	2	3
7	H	H	L	H	H	H		7	24*2	H	L	L	H	L	L	2	4
8	H	H	H	L	L	L		8	25*2	H	L	L	H	L	H	2	5
9	H	H	H	L	L	H		9	26*2	H	L	L	H	H	L	2	6
10	L	H	L	L	L	L	1	0	27*2	H	L	L	H	H	H	2	7
11	L	H	L	L	L	H	1	1	28*2	H	L	H	L	L	L	2	8
12	L	H	L	L	H	L	1	2	29*2	H	L	H	L	L	H	2	9
13*2	L	H	L	L	H	H	1	3	0*2	H	H	L	L	L	L		0
14*2	L	H	L	H	L	L	1	4	LINE	L	L	H	H	L	L	A	U
15*2	L	H	L	H	L	H	1	5	BLANK	H	H	H	H	H	H		
16*2	L	H	L	H	H	L	1	6	1–*2	L	H	H	H	H	H	1	
17*2	L	H	L	H	H	H	1	7	2–*2	H	L	H	H	H	H	2	

*2 NOT USED

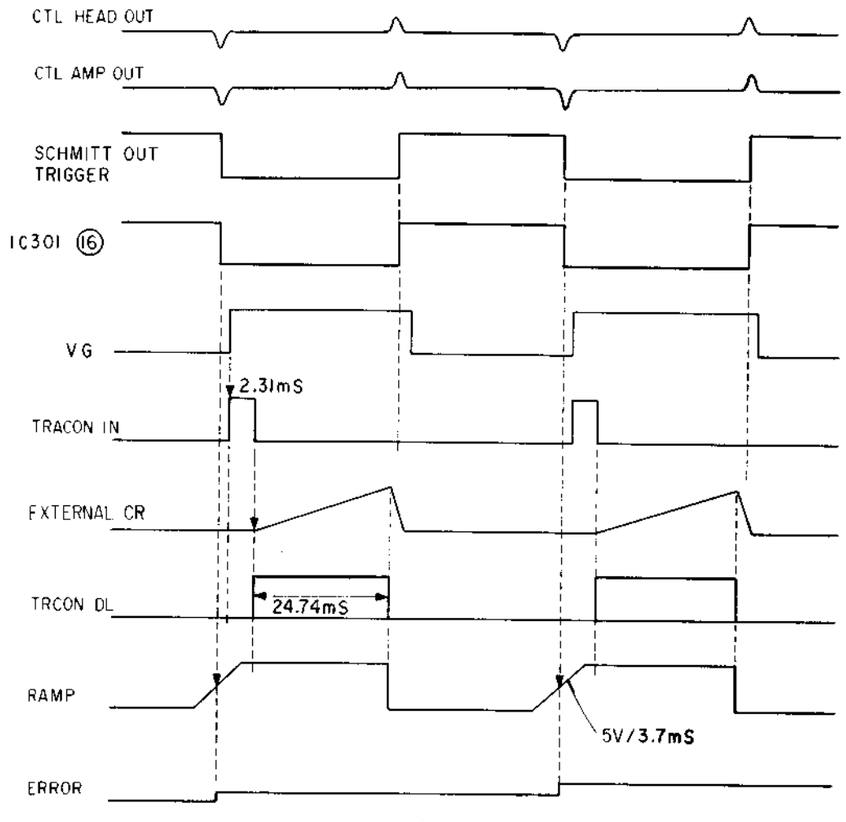
3-6. SERVO BLOCK DIAGRAM



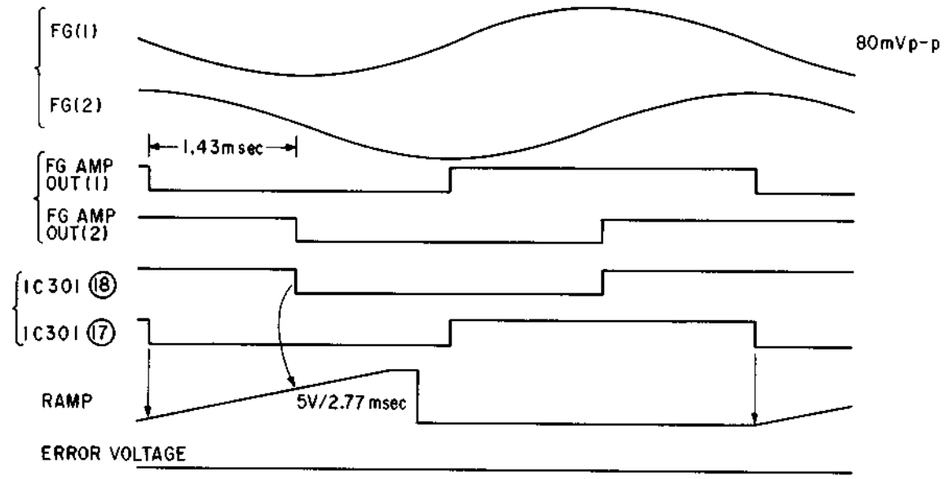
3-7. CAPSTAN PHASE SYSTEM TIMING CHART (REC)



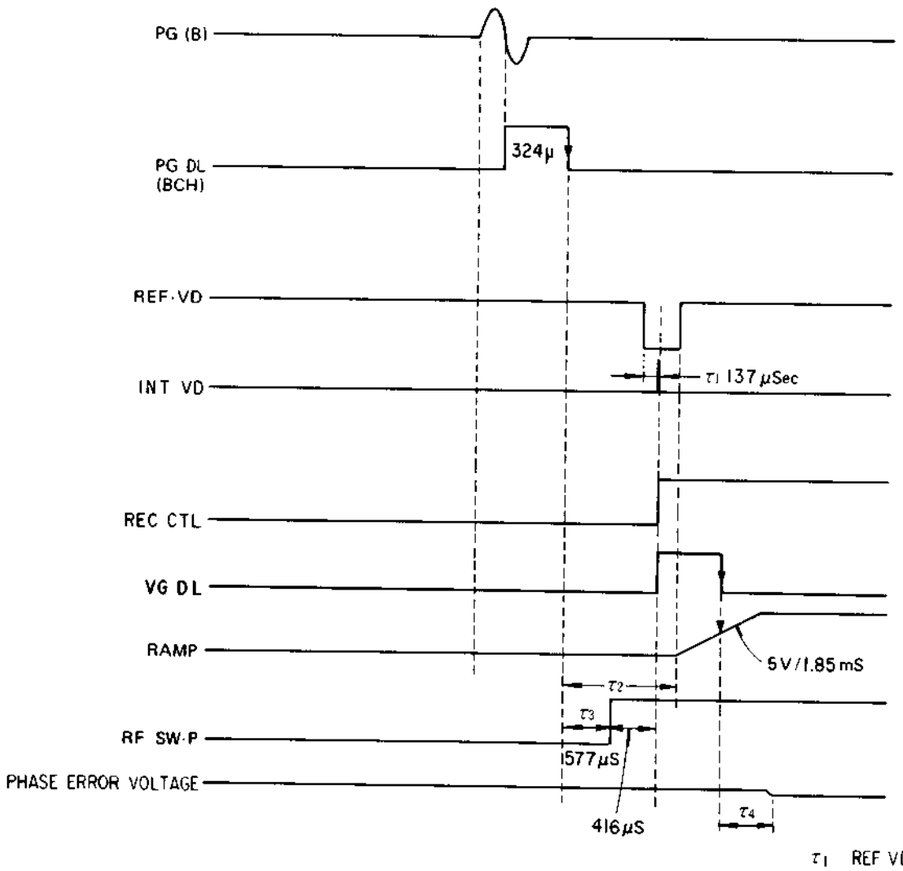
3-8. CAPSTAN PHASE SYSTEM TIMING CHART (PB)



3-9. CAPSTAN SPEED SYSTEM TIMING CHART

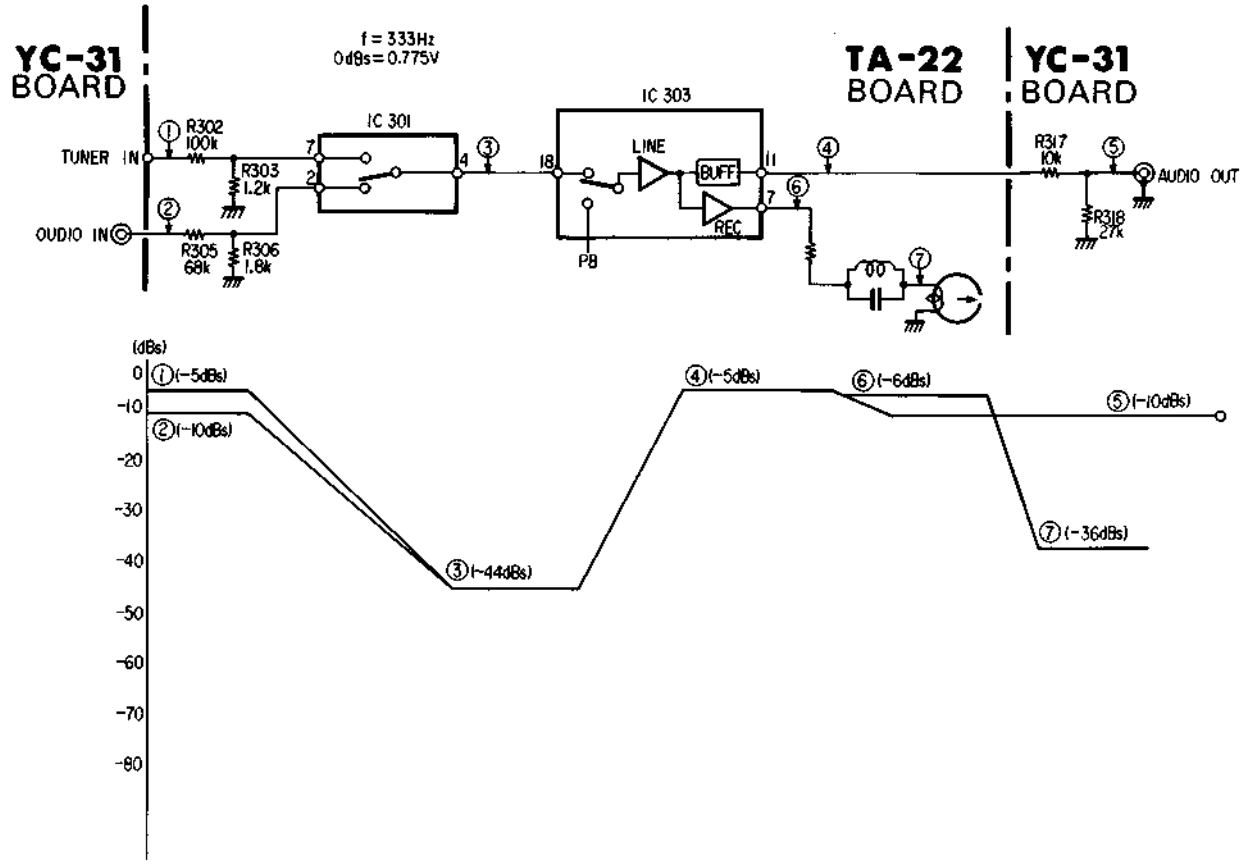


3-10. DRUM PHASE SYSTEM TIMING CHART

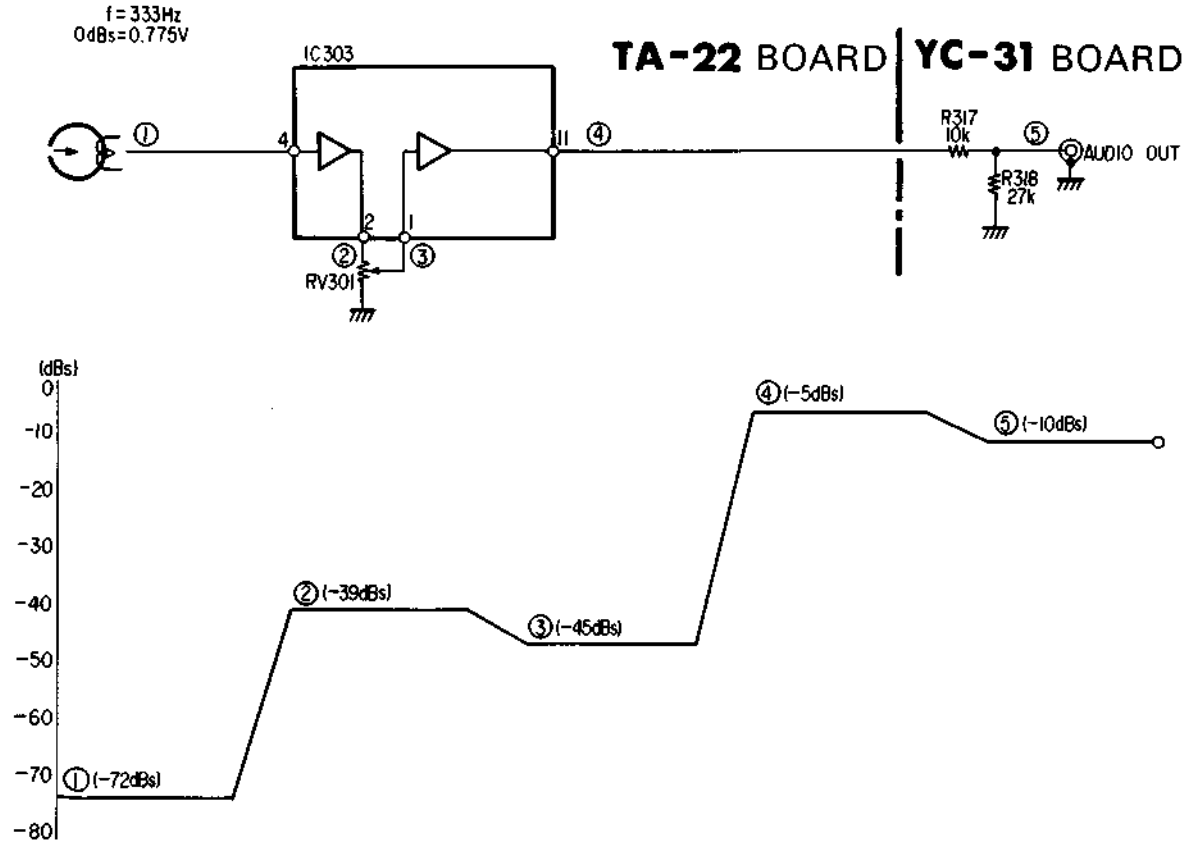


τ_1 REF VD DETECTION DELAY TIME
$\tau_{2,3}$ DIGITAL DL
τ_4 DATA EXCHANGE TIME

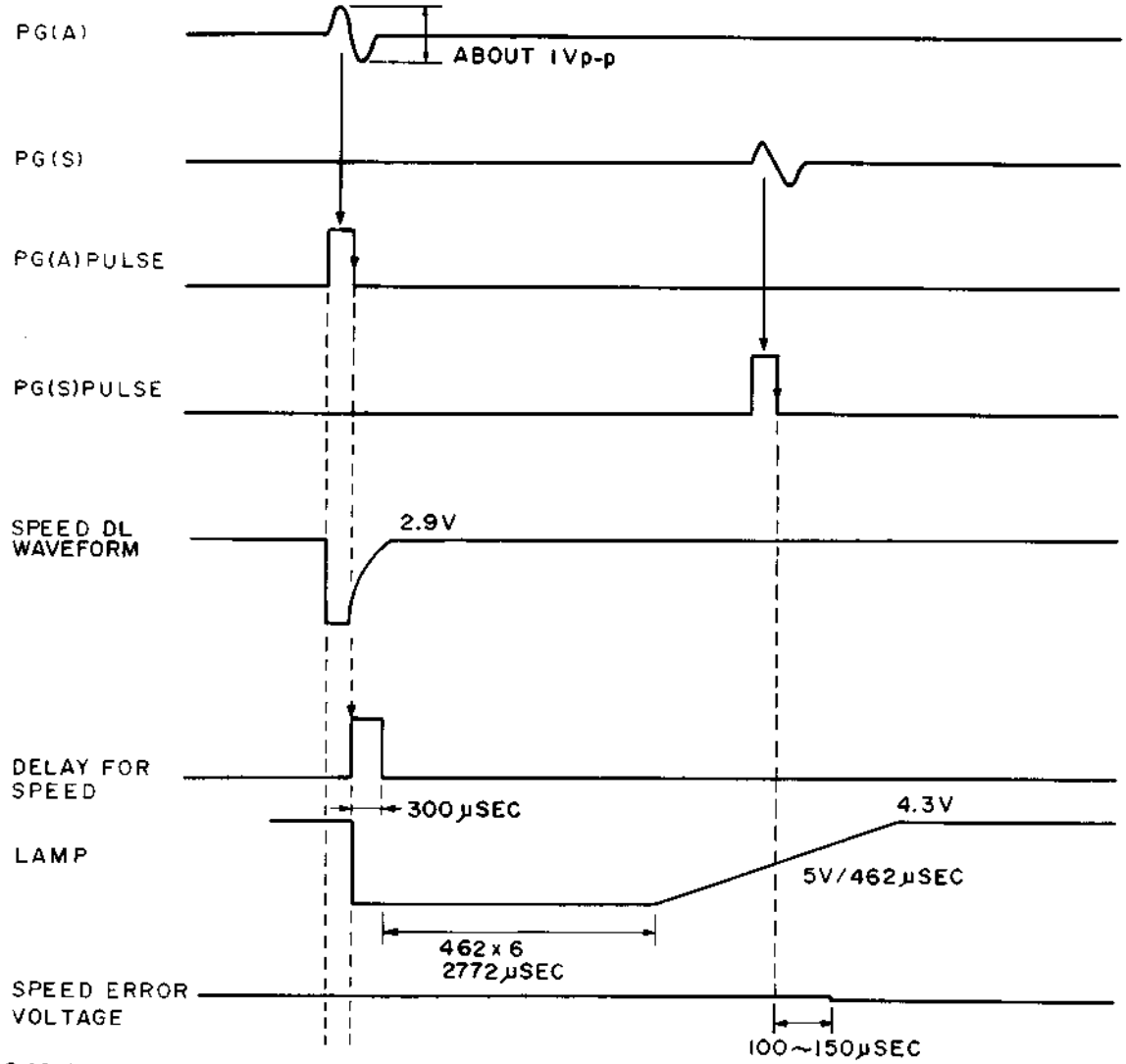
3-13. AUDIO LEVEL DIAGRAM (REC)



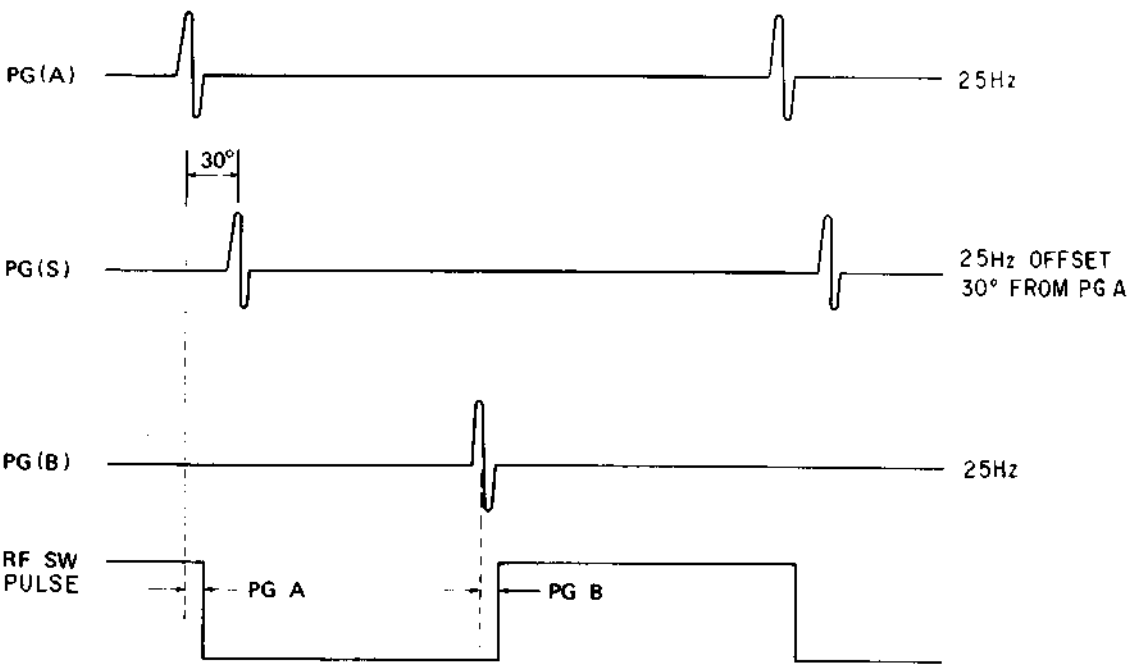
3-14. AUDIO LEVEL DIAGRAM (PB)



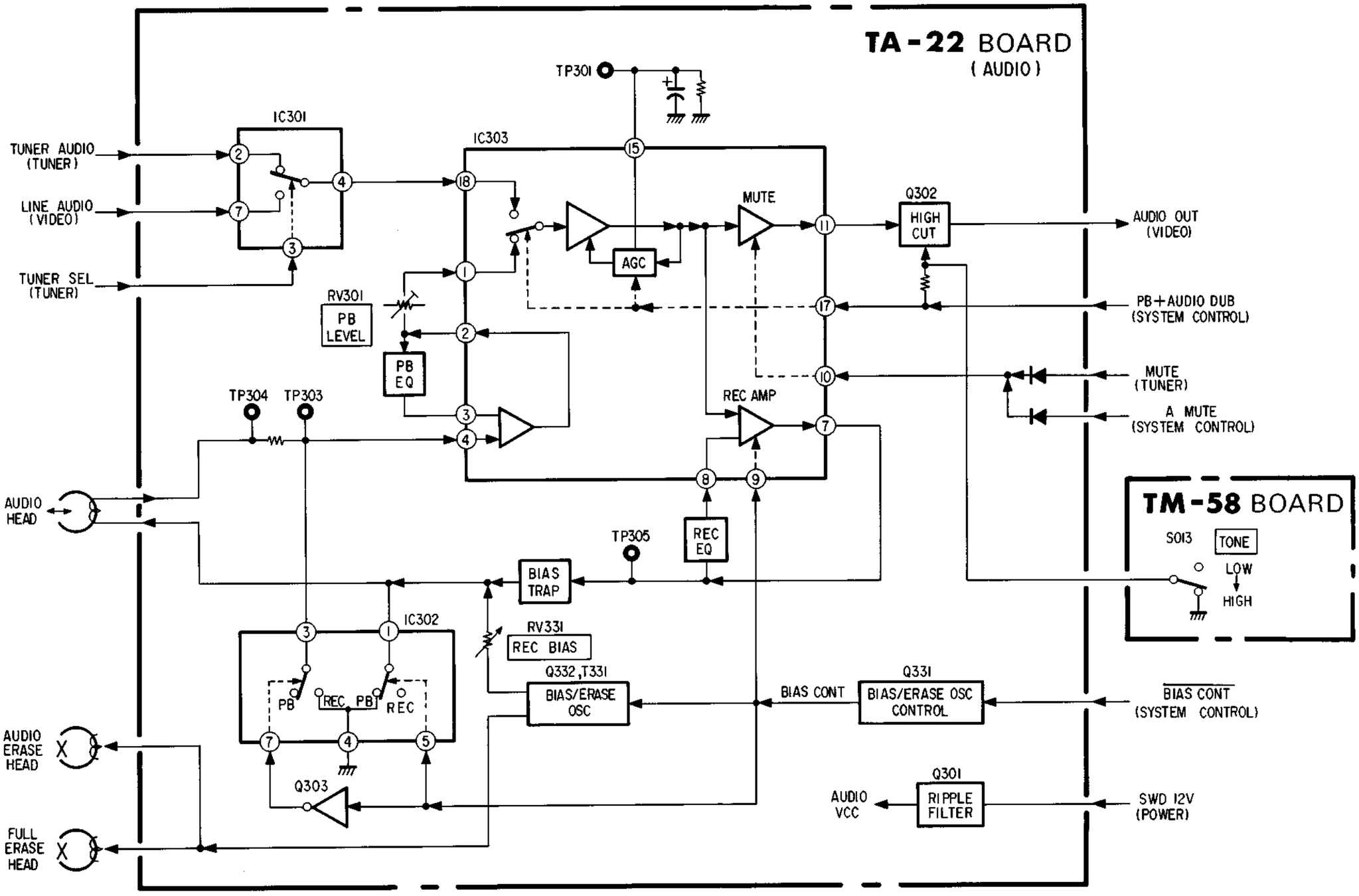
3-11. DRUM SPEED SYSTEM TIMING CHART



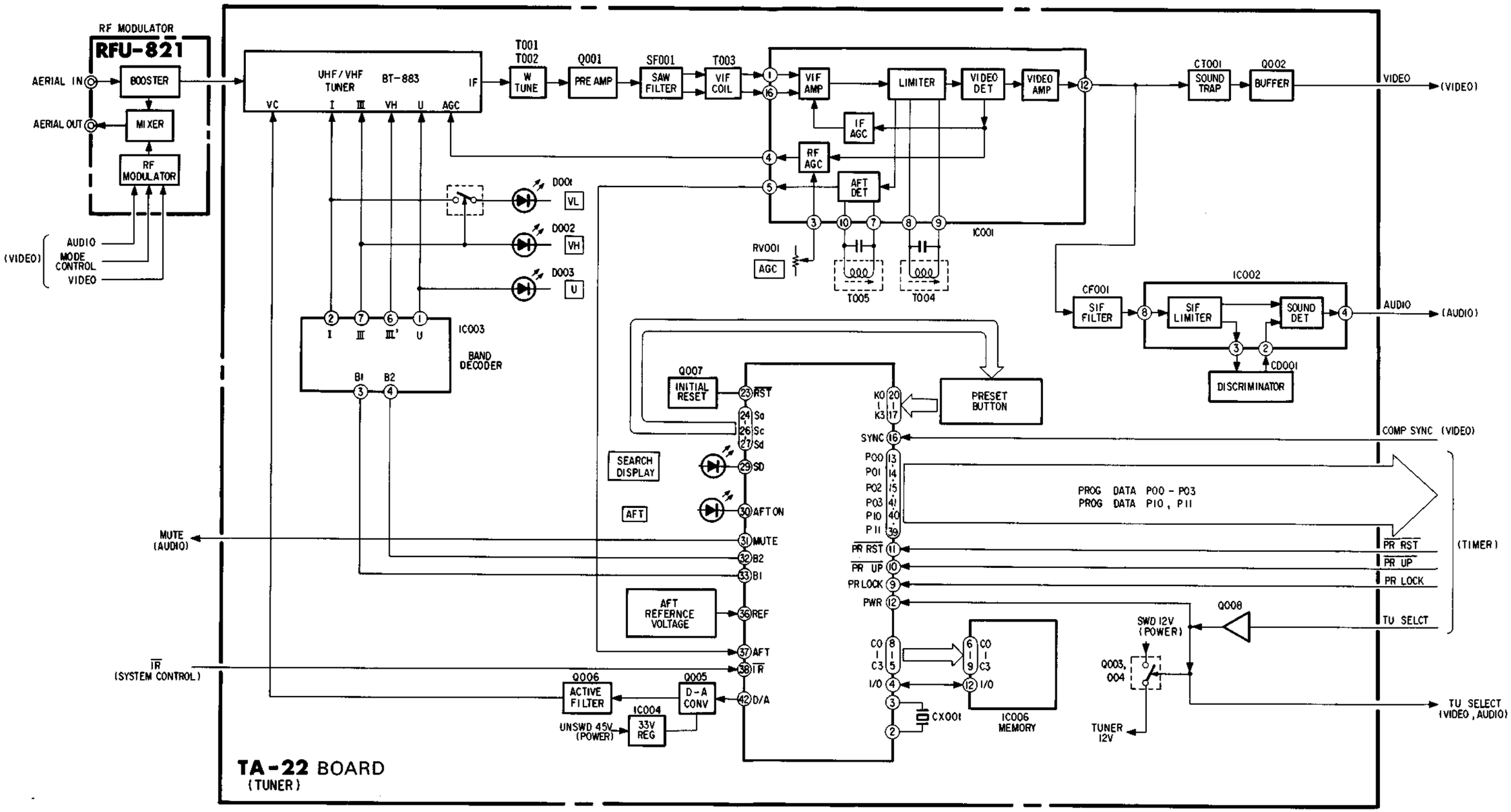
3-12. PG SIGNAL TIMING CHART



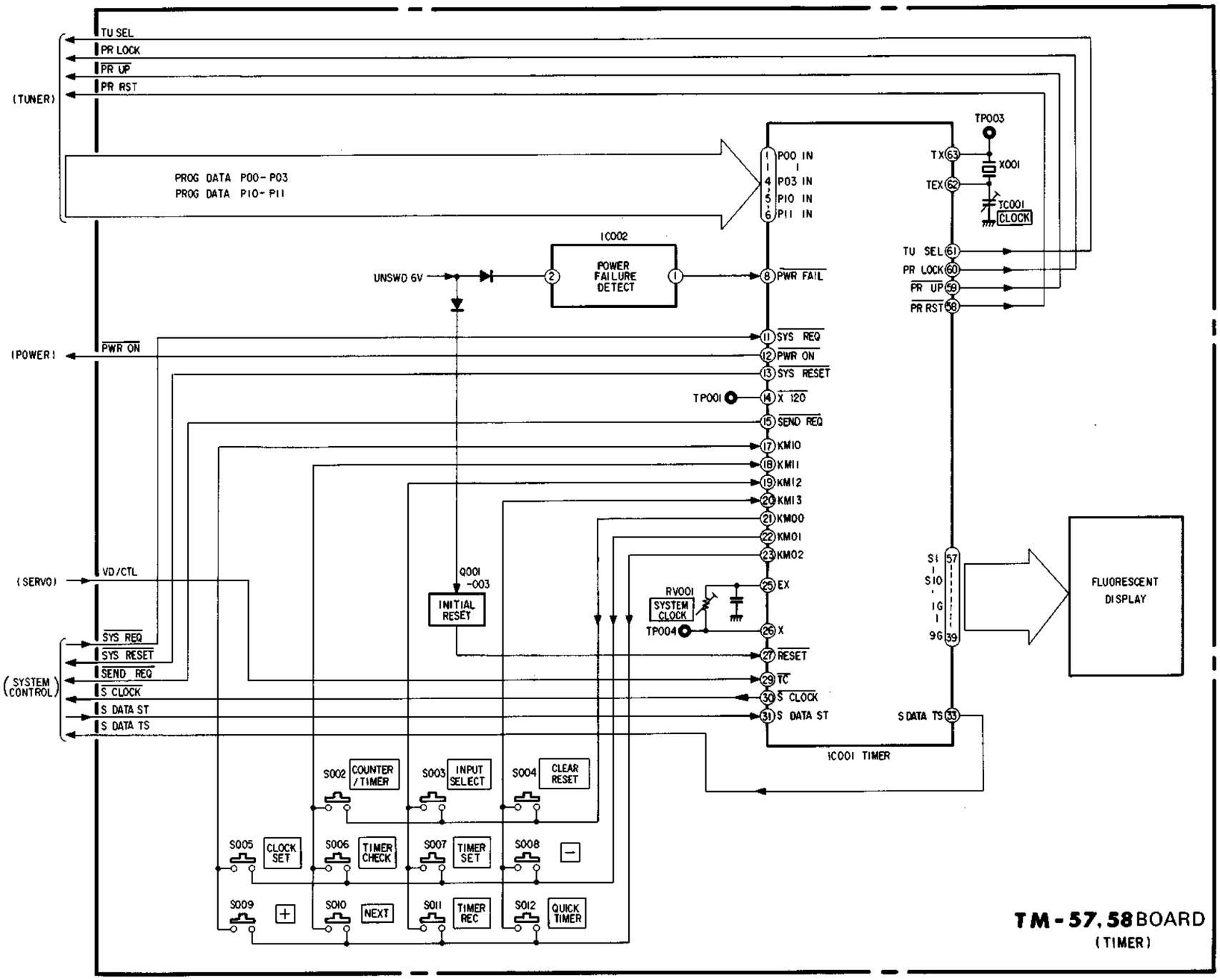
3-15. AUDIO BLOCK DIAGRAM



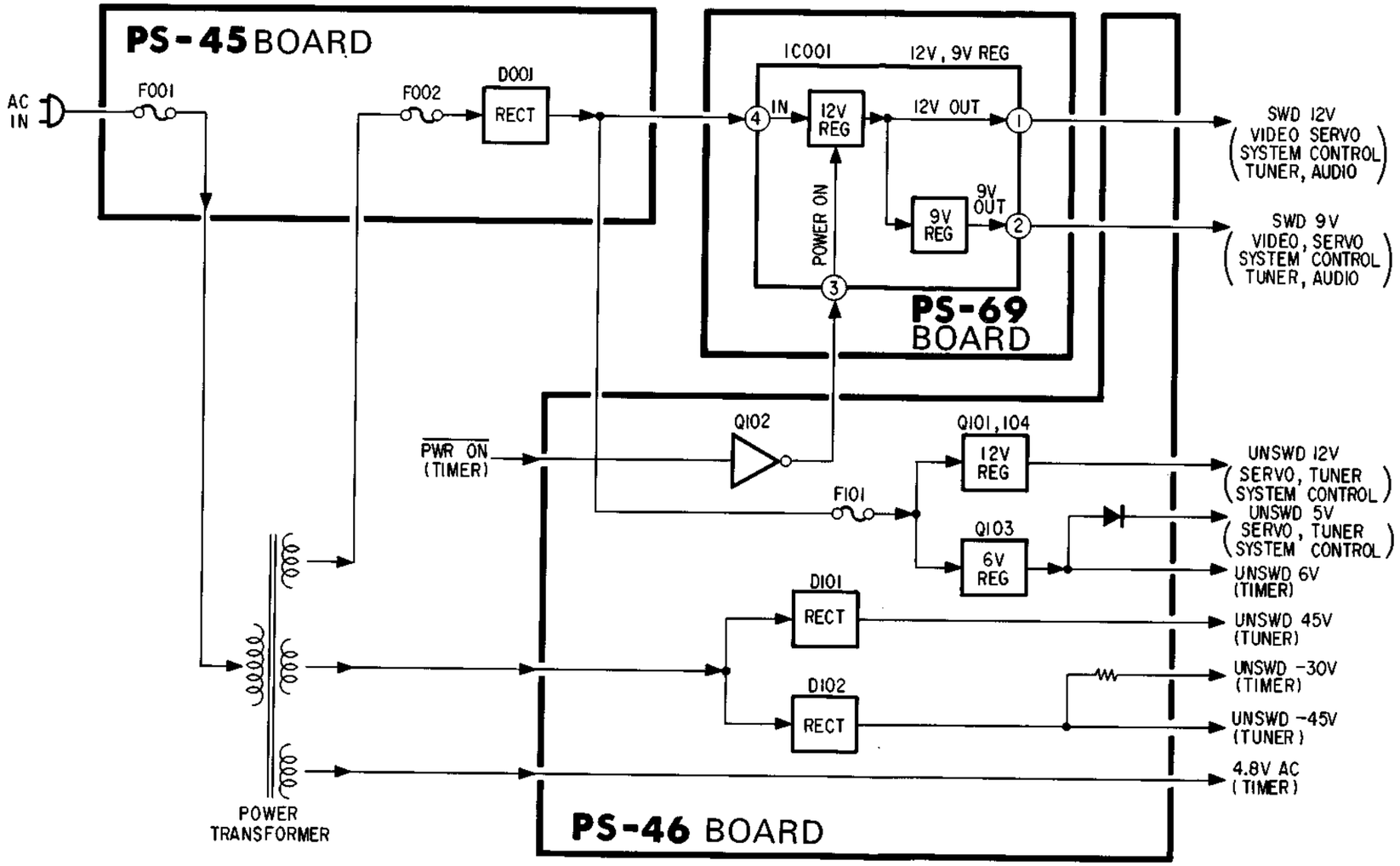
3-16. TUNER BLOCK DIAGRAM



3-17. TIMER BLOCK DIAGRAM

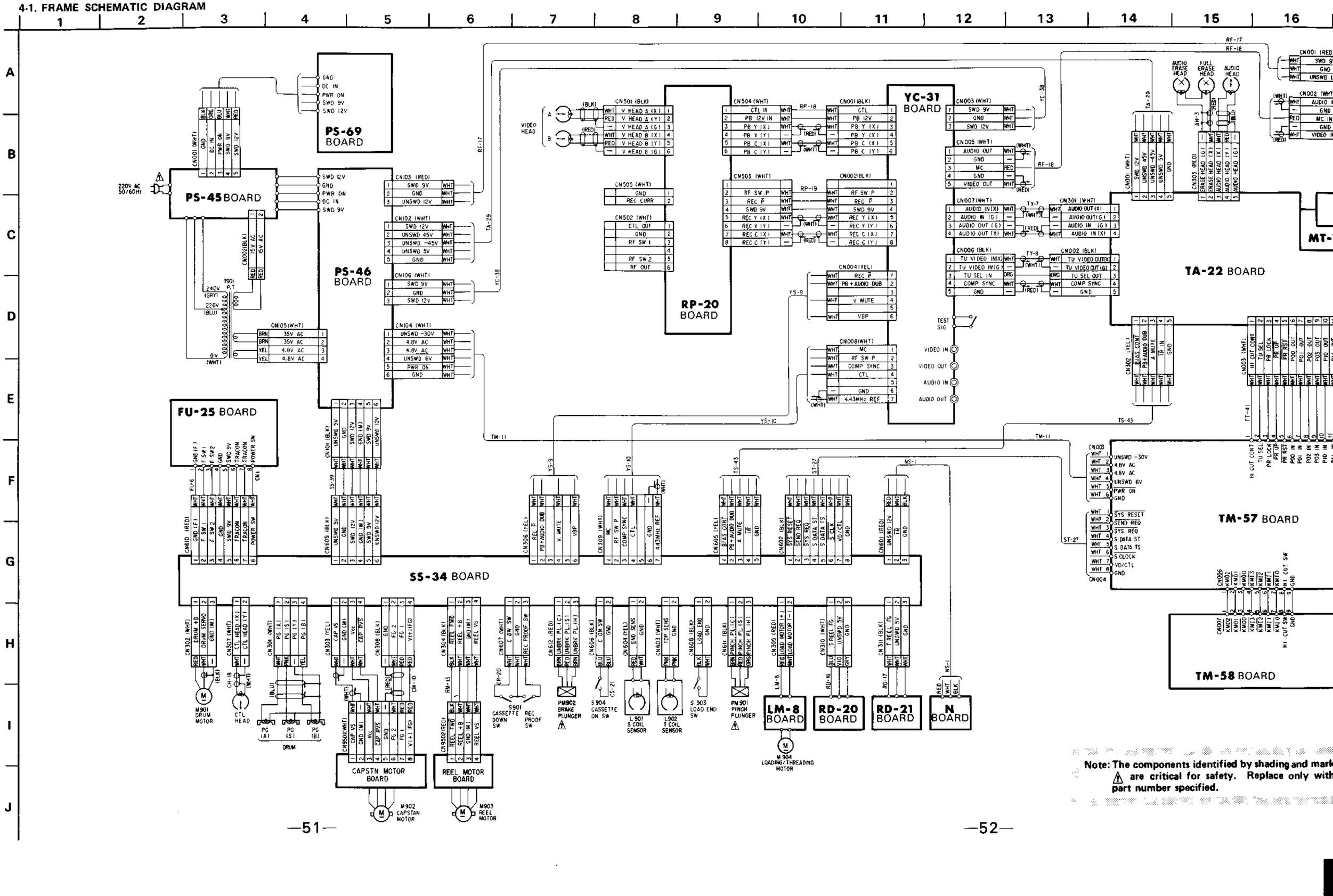


3-18. POWER BLOCK DIAGRAM

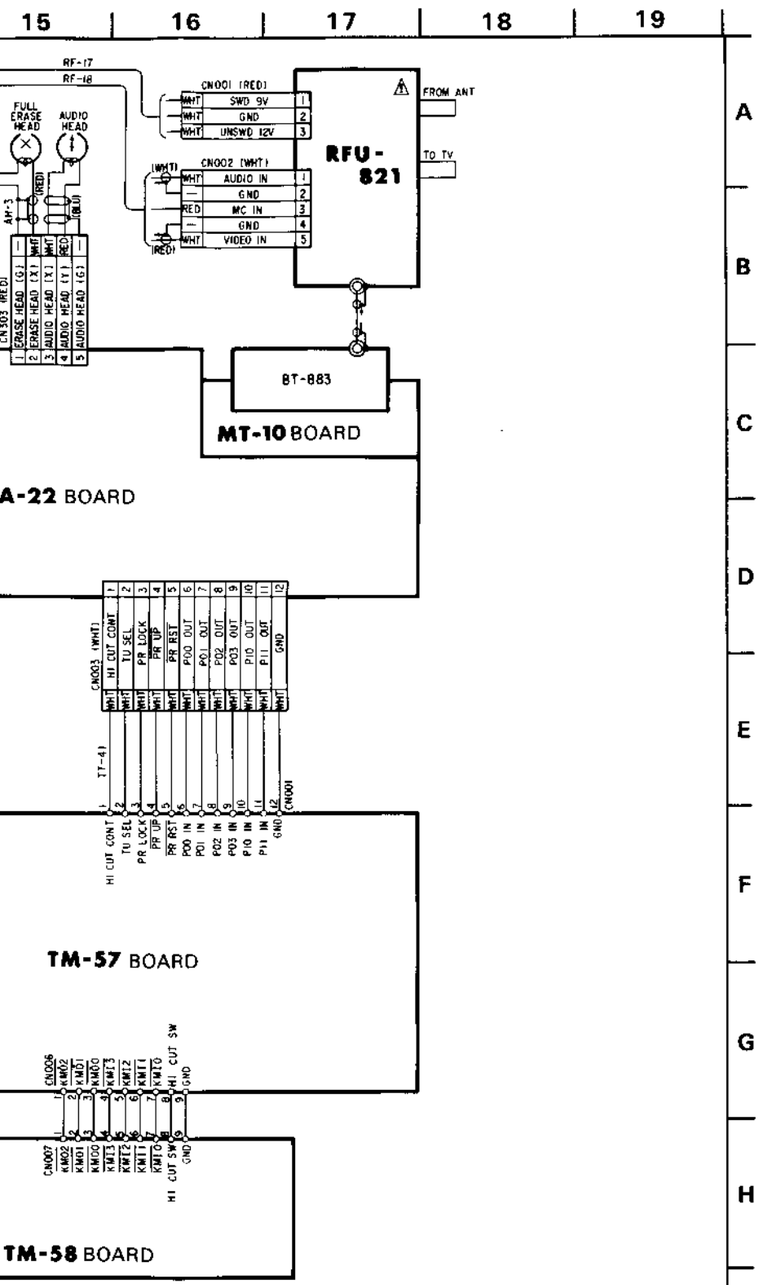


SECTION 4
SCHEMATIC DIAGRAM AND PRINTED WIRING BOARDS

4-1. FRAME SCHEMATIC DIAGRAM



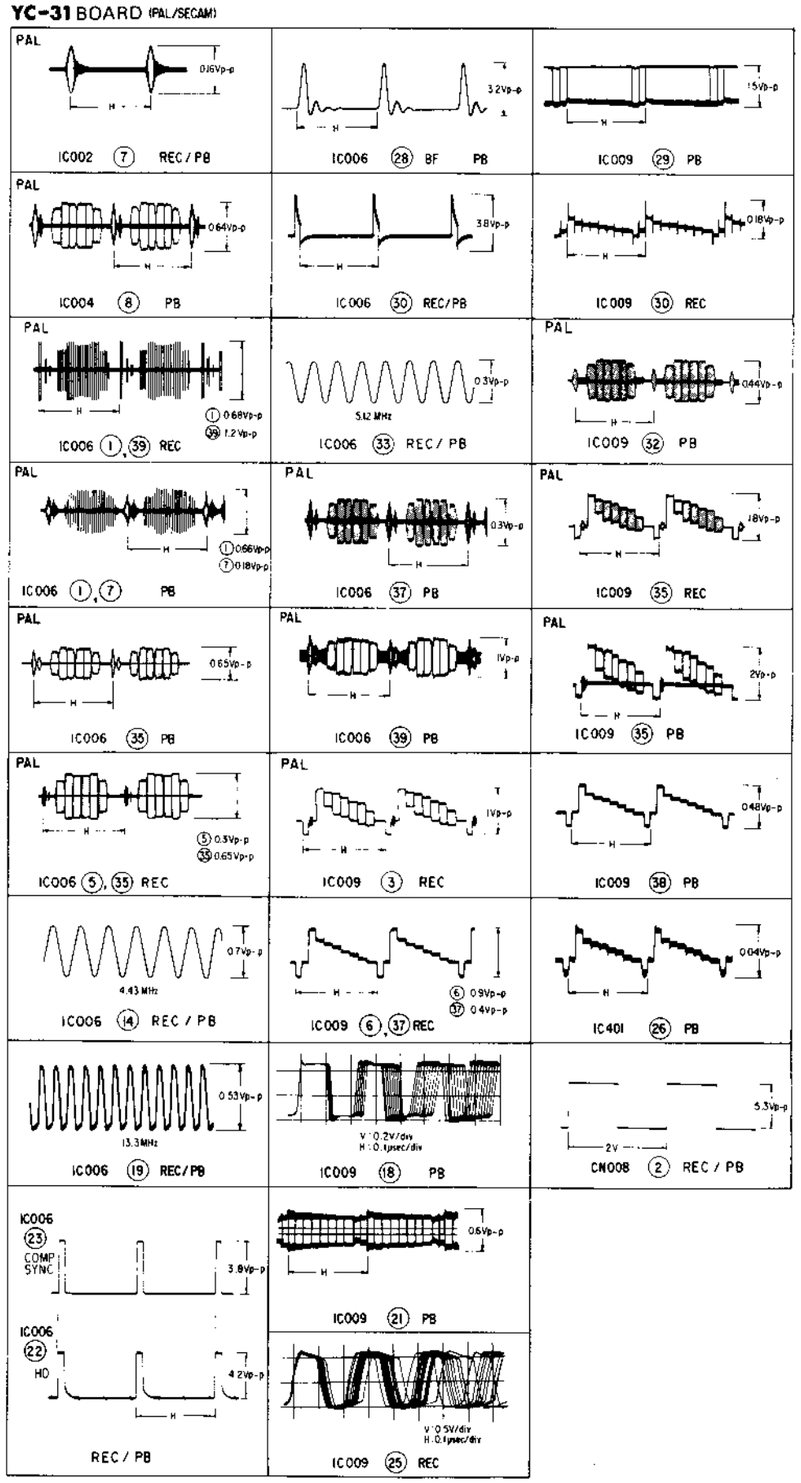
Note: The components identified by shading and mark
⚠ are critical for safety. Replace only with
part number specified.



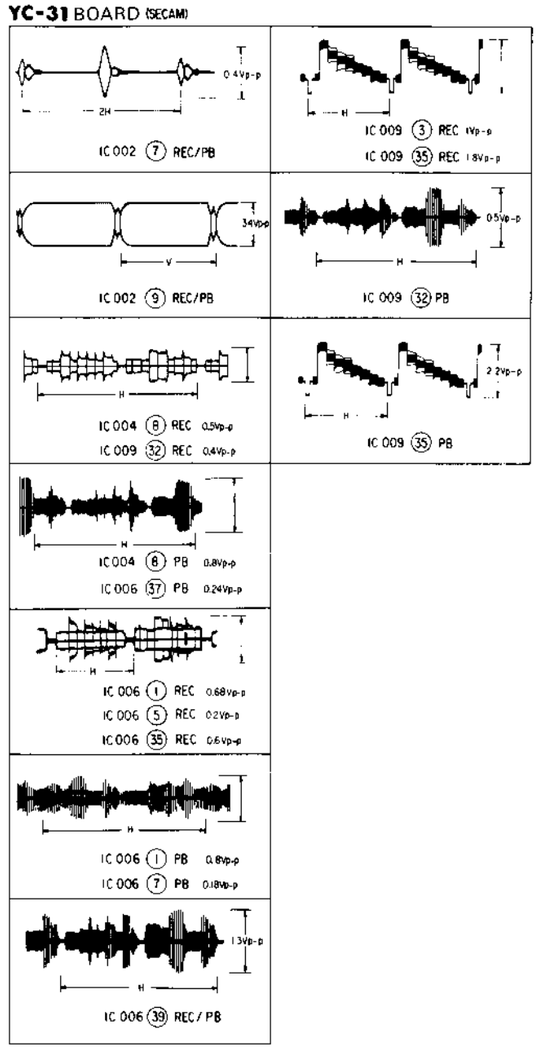
identified by shading and mark
or safety. Replace only with
ified.

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

YC-31 BOARD (PAL/SECAM)



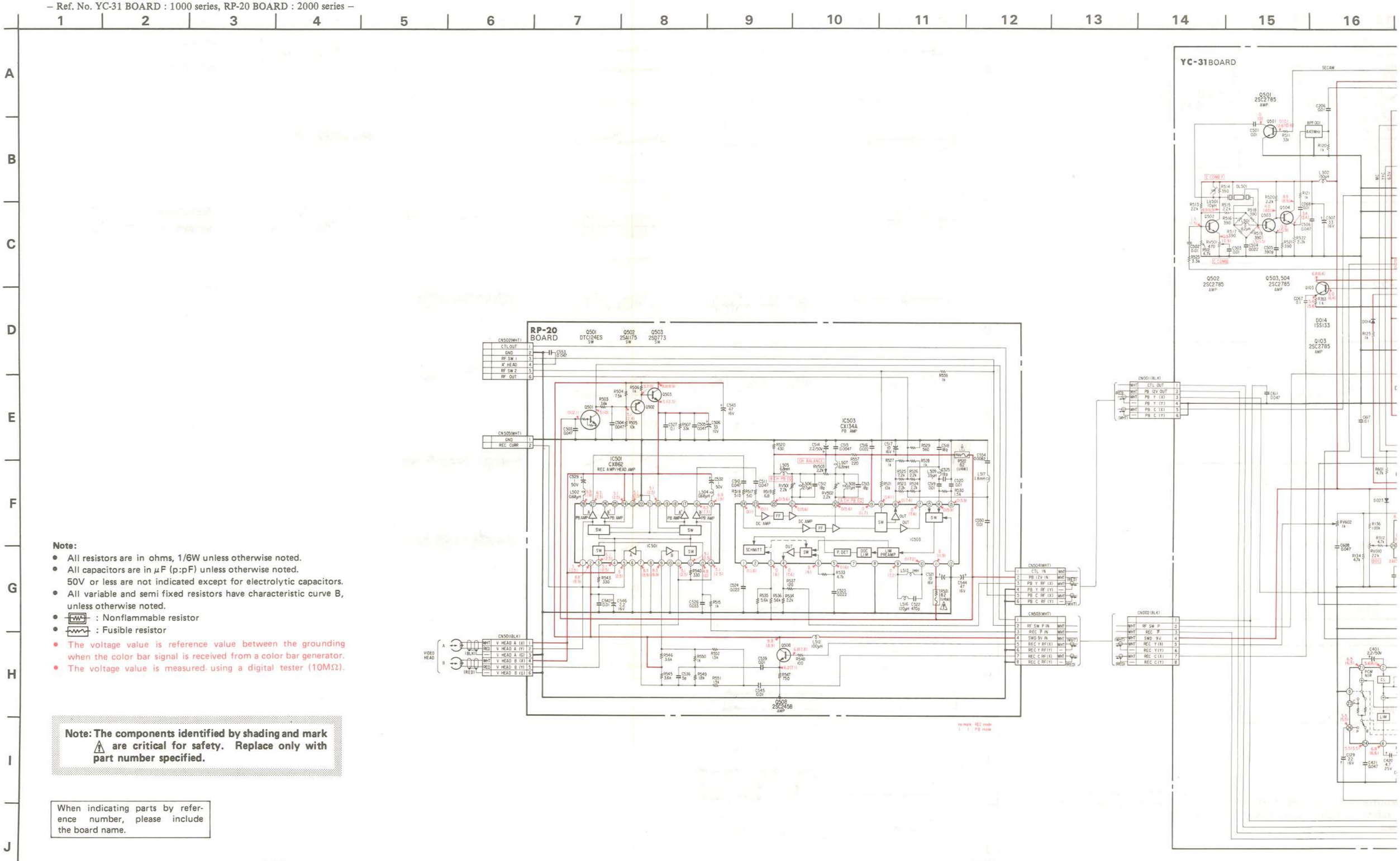
YC-31 BOARD (SECAM)



RP-20 BOARD

4-2. YC-31 (Y, CHROMA SIGNAL PROCESS), RP-20 (VIDEO SIGNAL, REC/PB AMP) SCHEMATIC DIAGRAM

– Ref. No. YC-31 BOARD : 1000 series, RP-20 BOARD : 2000 series –



Note:

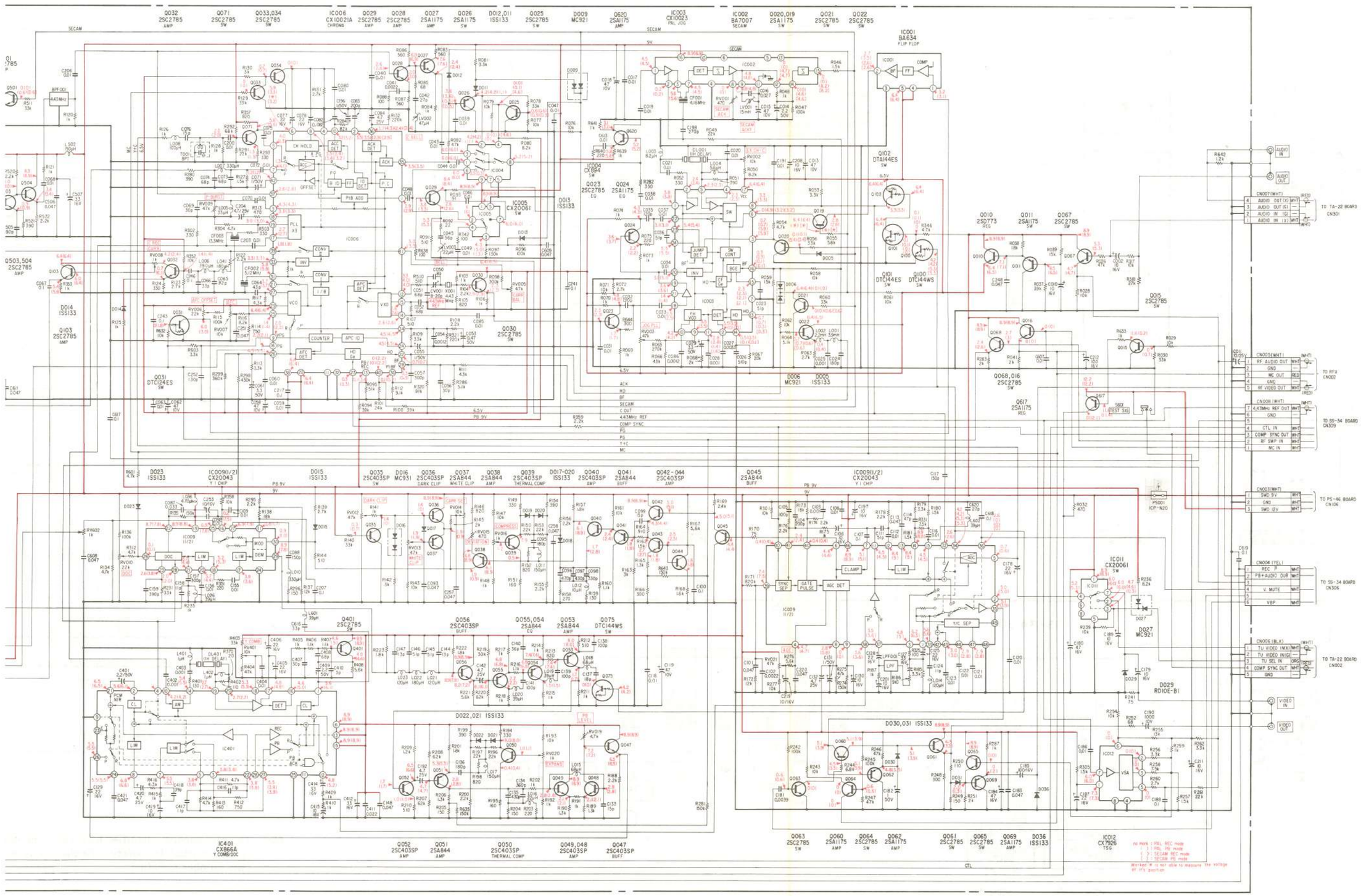
- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- : Nonflammable resistor
- : Fusible resistor
- The voltage value is reference value between the grounding when the color bar signal is received from a color bar generator.
- The voltage value is measured using a digital tester (10MΩ).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

5 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

A B C D E F G H I J



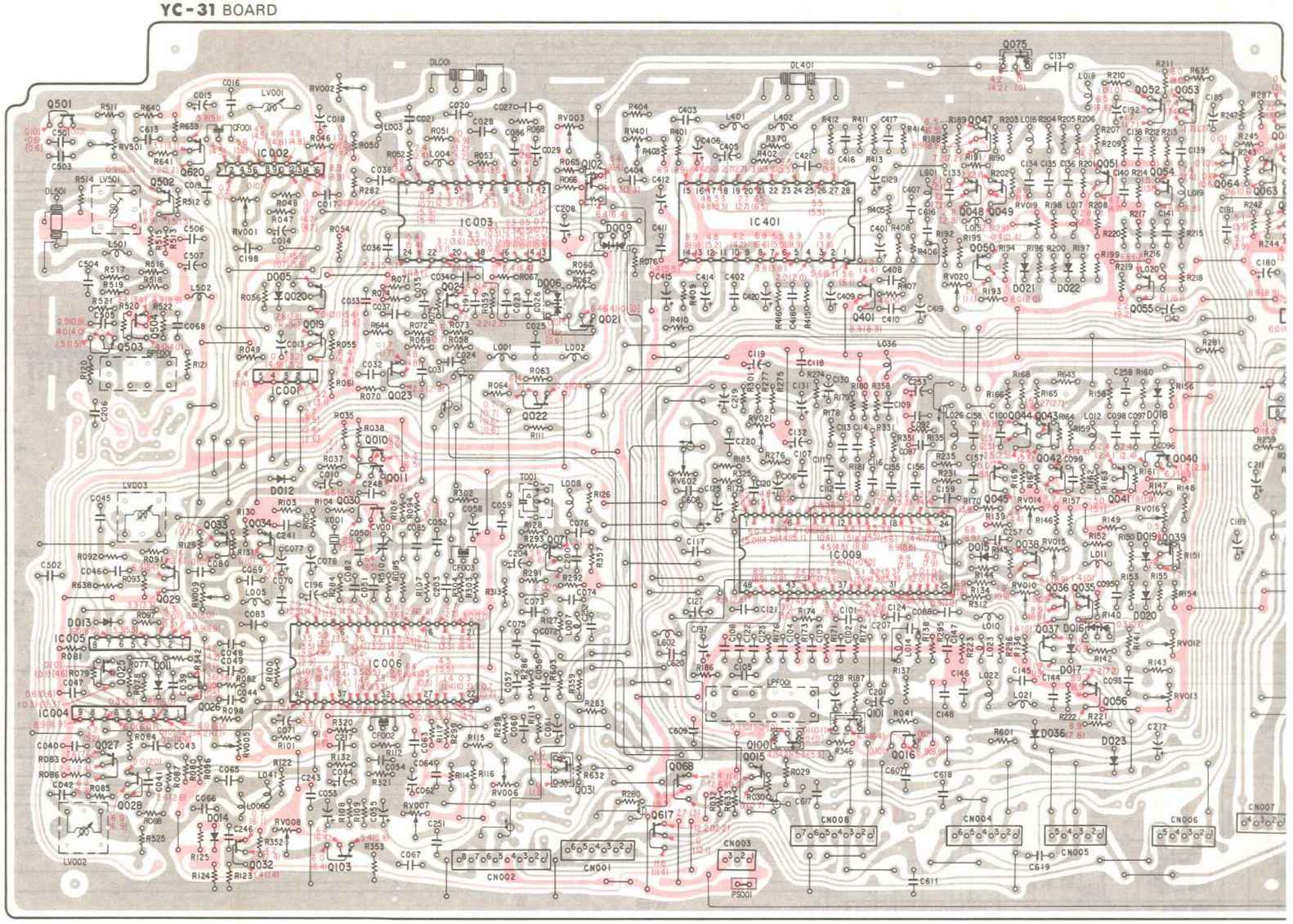
YC-31 (Y, CHROMA SIGNAL PROCESS), RP-20 (VIDEO SIGNAL, REC/PB AMP) PRINTED WIRING BOARDS

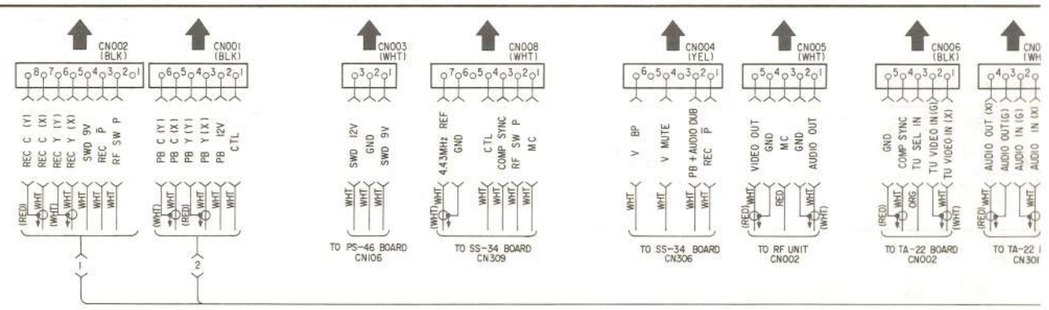
– Ref. No. YC-31 BOARD : 1000 series, RP-20 BOARD : 2000 series –

Q , IC	D	ADJ
Q75		RV002
Q52,Q53	D31	LV001
Q69		RV003
Q1, IC501		RV401
Q47		RV501
Q64,Q65		
Q63,Q62		
IC002		
Q51,Q54		
Q2,Q48,Q49		
IC502		RV001
IC003		LV501
Q60,Q61	D30	RV019
IC401	D9	
Q50	D21,D22	
Q55		RV020
Q20, Q401	D5, D29	
Q24	D6	
IC011		
Q21		
Q4		
Q3,Q19	D27	
IC001		
Q23	D18	
IC012		
Q44,Q43		RV021
Q10, Q45,Q40		
Q11, Q42,Q41		RV602
Q12		RV014
Q30		LV003
		RV016
Q33,Q34		CV001
IC009	D19	RV015
Q71,Q38,Q69	D15	
Q29		
Q35	D20	RV009
Q36,Q67		RV010
Q13		
IC005	D16	
Q37	D17	RV012
Q25		
Q26	D11	RV013
IC004		
Q56		
Q1,Q0	D36	
Q16	D23	RV005
Q27,Q31,Q15		
Q28,Q68		RV006
		RV007
		LV002
Q17, Q3,Q32	D14	RV008

Q , IC	D	ADJ

YC-31 BOARD



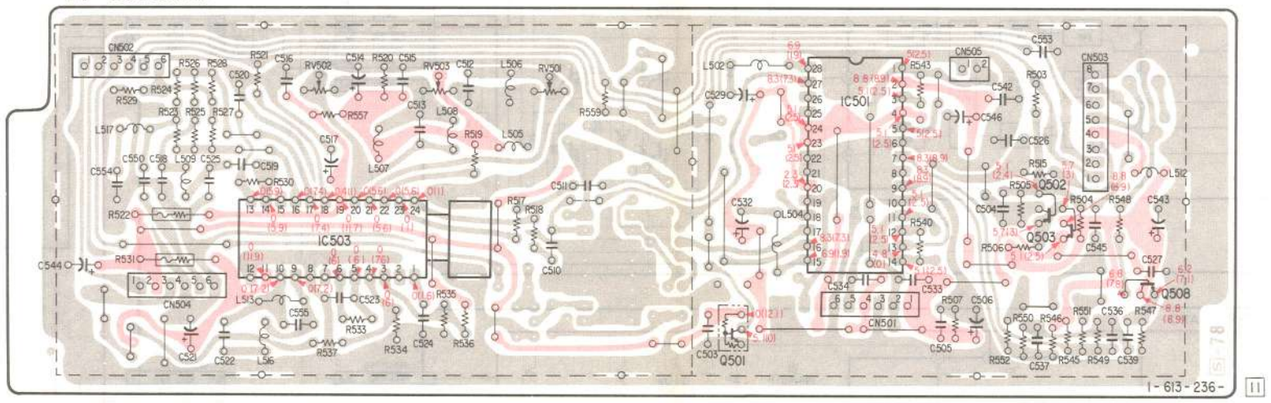


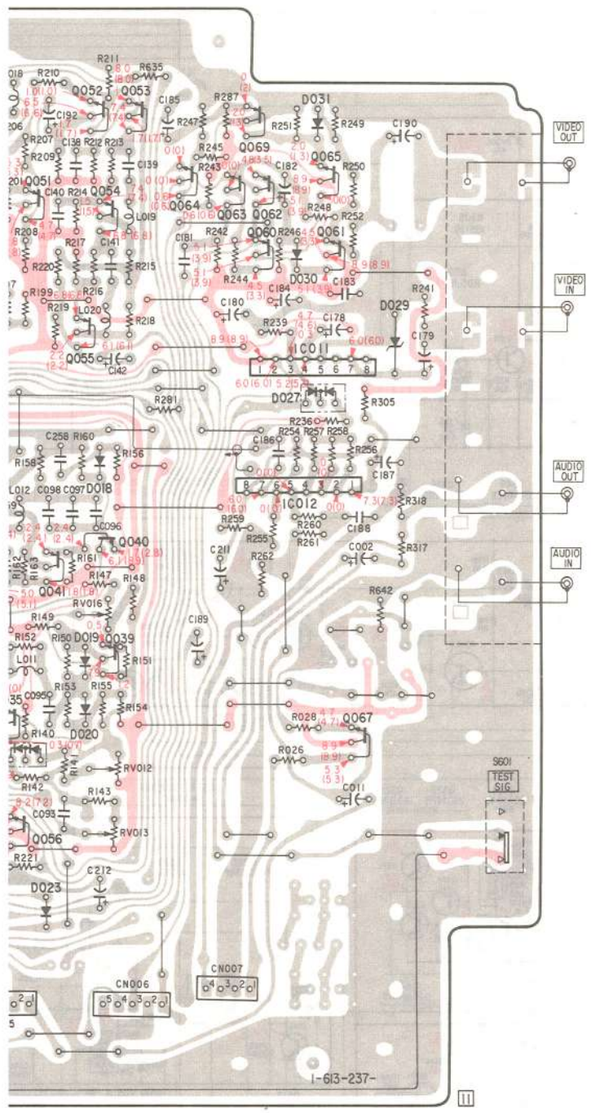
15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

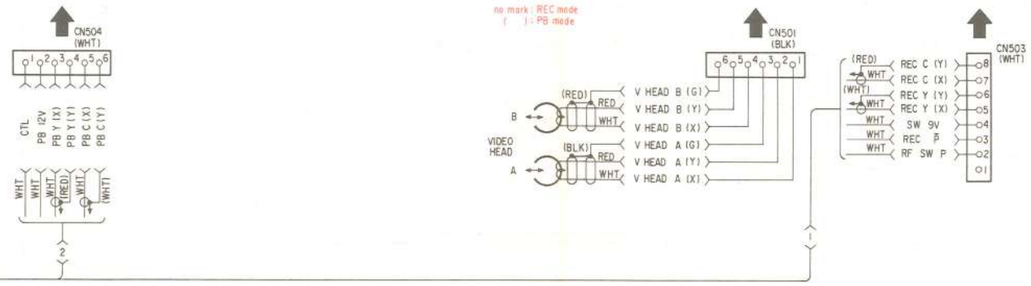
A B C D E F G H I J

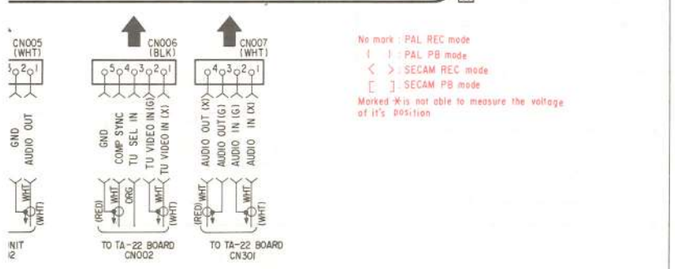
Q IC	IC503			IC501	502 503	508	Q IC
ADJ TP	RV502	RV503	RV501	501			ADJ TP

RP-20 BOARD









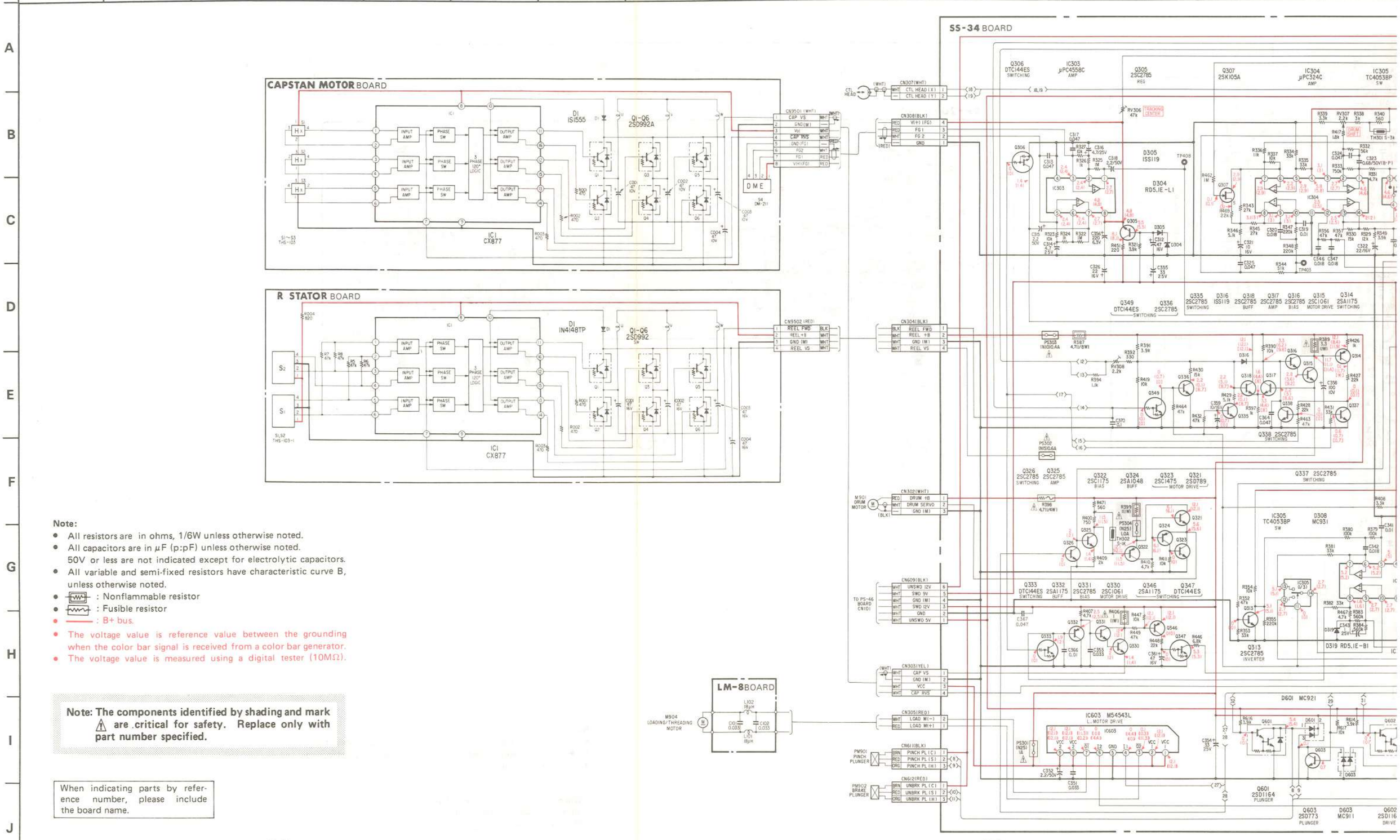
No mark : PAL REC mode
( ) : PAL PB mode
< > : SECAM REC mode
[ ] : SECAM PB mode
Marked * is not able to measure the voltage of it's position

Note:
- ● ○— : indicates a lead wire mounted on the component side.
- ● ●— : indicates a lead wire mounted on the printed side.
- ● : soldering side
- ● : B+ pattern

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

4-3. SS-34 (SYSTEM CONTROL, SERVO), RD-20 (ROTATION DETECTOR), RD-21 (ROTATION DETECTOR), LM-8 (LOADING MOTOR), FU-25 (FUNCTION, TRACKING CONTROL), N (INFRARED AMP), CAPSTAN MOTOR (CAPSTAN MOTOR), R. S

– Ref. No. SS-34, RD-20, RD-21 BOARD : 4000 series, LM-8 BOARD : 9000 series, FU-25 BOARD : 8000 series, N BOARD : 8300 series, CAPSTAN MOTOR BOARD : 8200 series, R. STATOR BOARD : 8100 series –



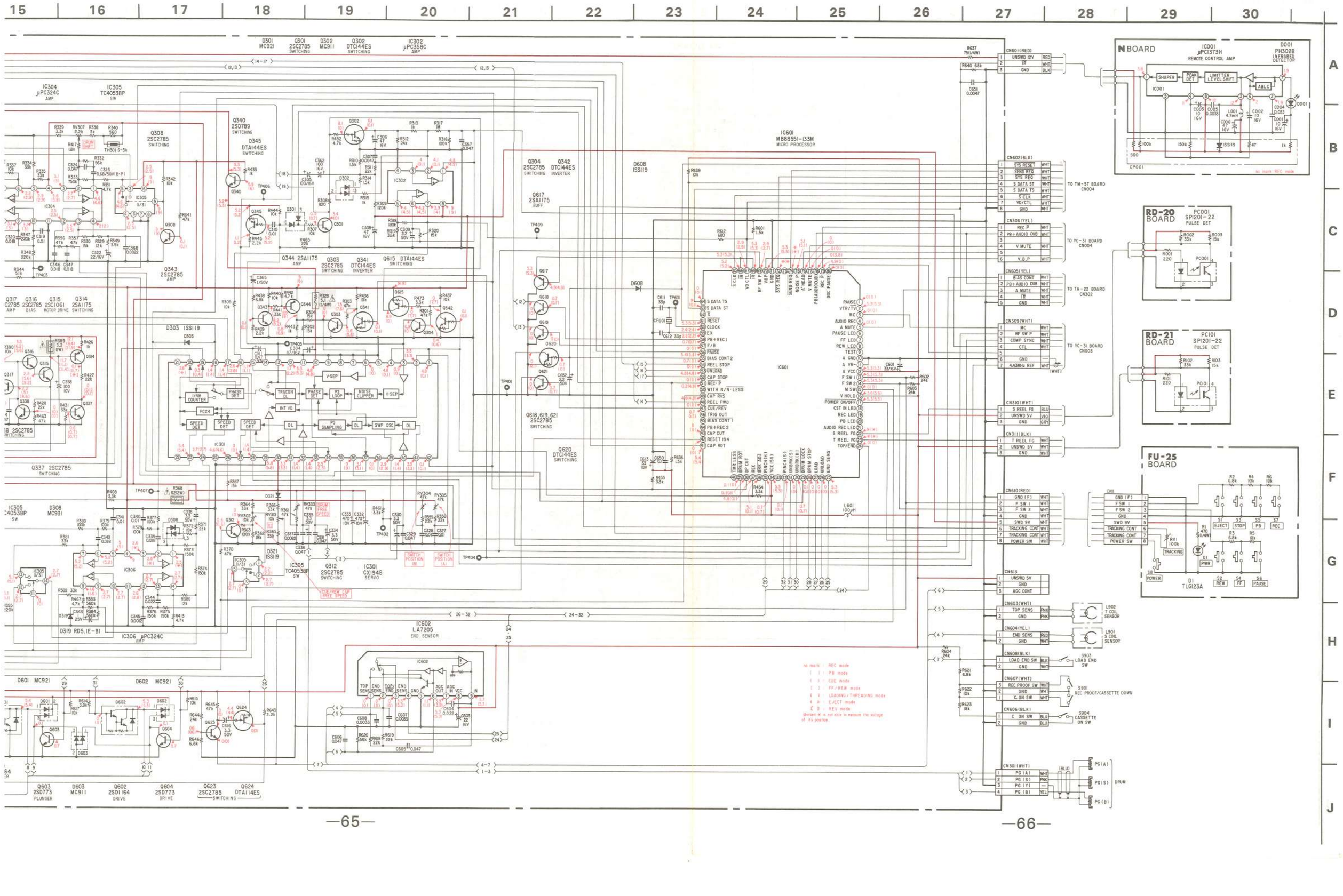
Note:

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in µF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- : Nonflammable resistor
- : Fusible resistor
- ——— : B+ bus.
- The voltage value is reference value between the grounding when the color bar signal is received from a color bar generator.
- The voltage value is measured using a digital tester (10MΩ).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

CAPSTAN MOTOR), R. STATOR (REEL MOTOR) SCHEMATIC DIAGRAM



SS-34 (SYSTEM CONTROL, SERVO), RD-20 (ROTATION DETECTOR), RD-21 (ROTATION DETECTOR), LM-8 (LOADING MOTOR), FU-25 (FUNCTION, TRACKING CONTROL), N (INFRARED AMP), CAPSTAN MOTOR (CAPSTAN MOTOR), R. STATO

– Ref. No. SS–34, RD-20, RD-21 BOARD : 4000 series, LM-8 BOARD : 9000 series, FU-25 BOARD : 8000 series, N BOARD : 8300 series, CAPSTAN MOTOR BOARD : 8200 series, R, STATOR BOARD : 8100 series –

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

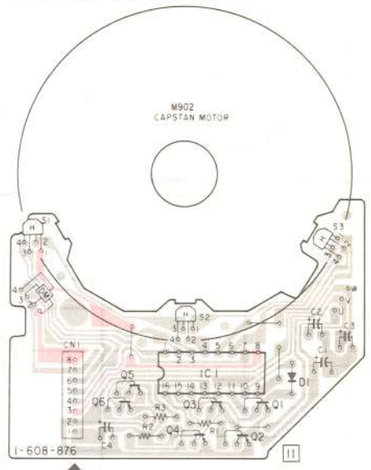
A B C D E F G H I J

Note:

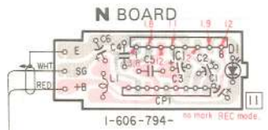
- ● ○— : indicates a lead wire mounted on the component side.
- ● ●— : indicates a lead wire mounted on the printed side.
- ● : soldering side
- ● : B+ pattern
- ● : component side

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

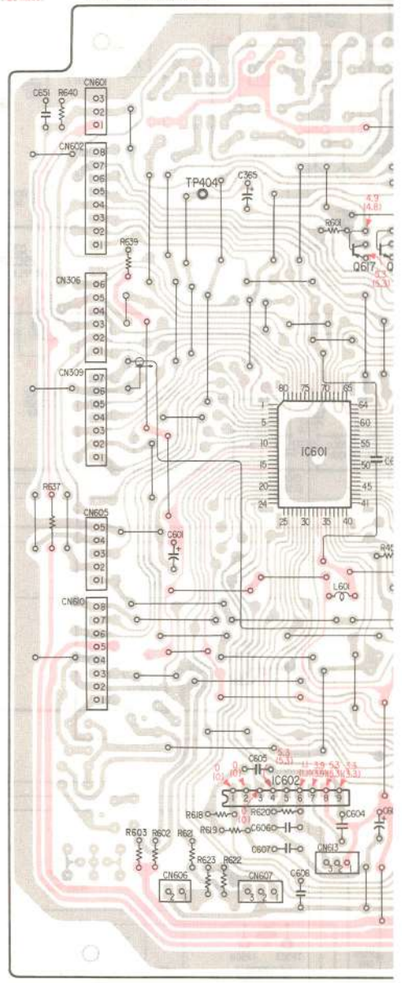
CAPSTAN MOTOR BOARD



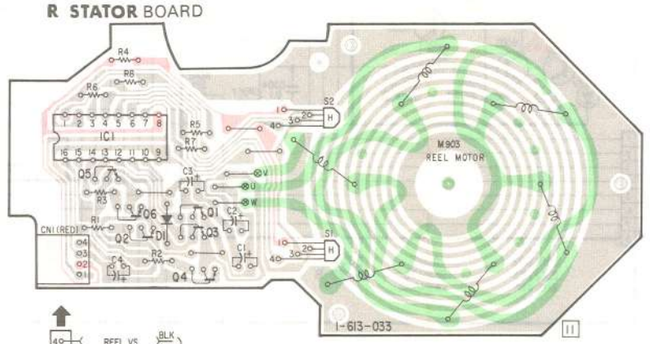
N BOARD



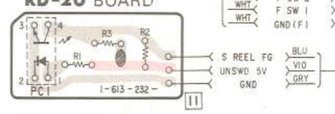
SS-34 BOARD



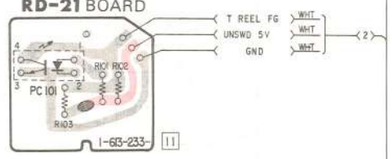
R STATOR BOARD



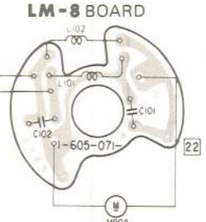
RD-20 BOARD



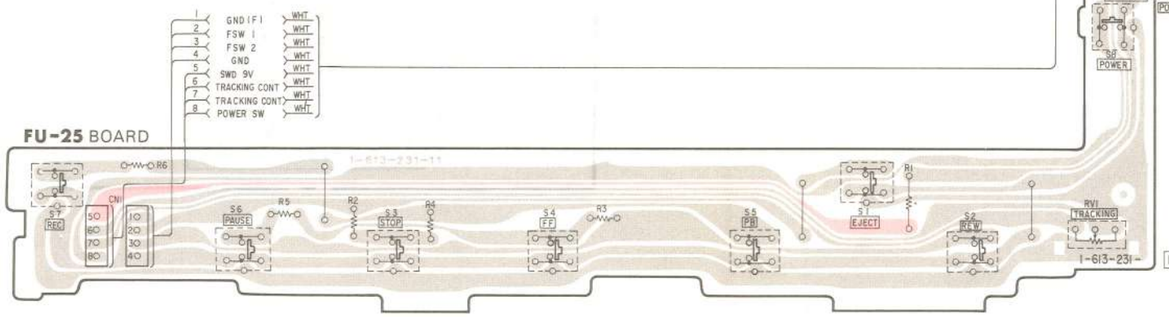
RD-21 BOARD



LM-8 BOARD



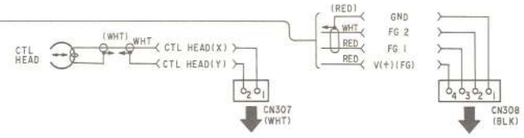
FU-25 BOARD



TAN MOTOR), R. STATOR (REEL MOTOR) PRINTED WIRING BOARDS

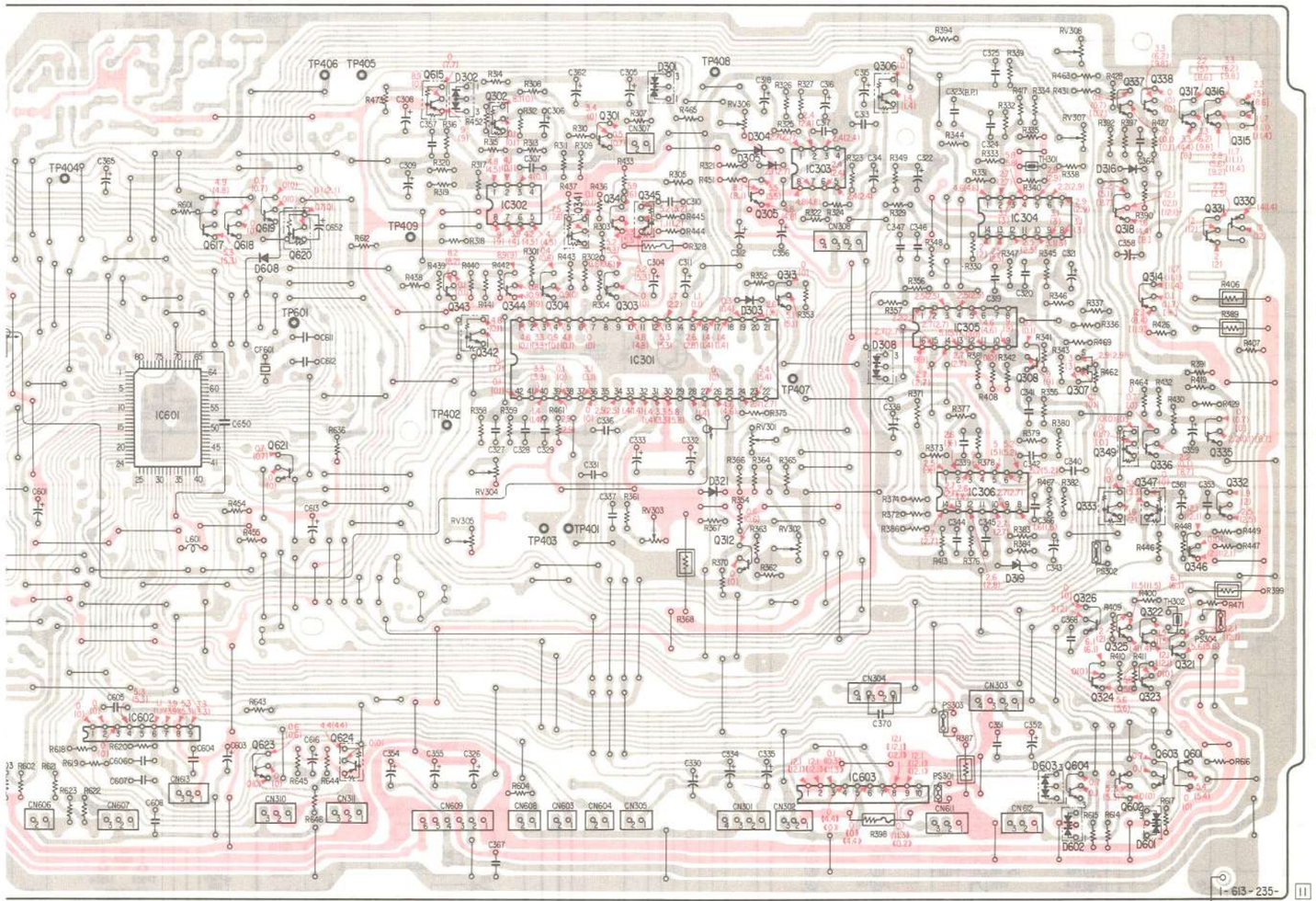
15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

A B C D E F G H I J

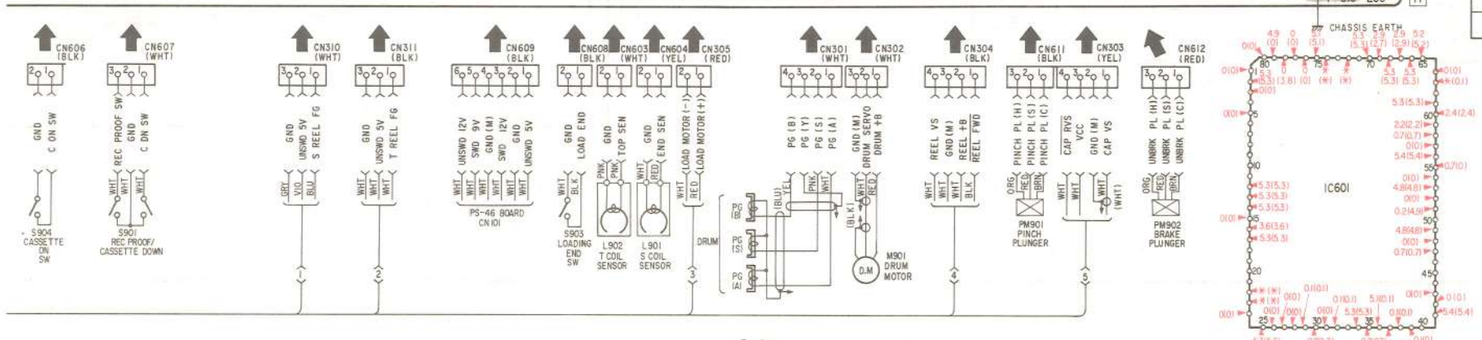


no mark : REC mode
( ) : PB mode
( ) : CUE mode
( ) : FF/REW mode
[ ] : LOADING/THREADING mode
< > : EJECT mode
[ ] : REV mode
Marked * is not able to measure the voltage at its position.

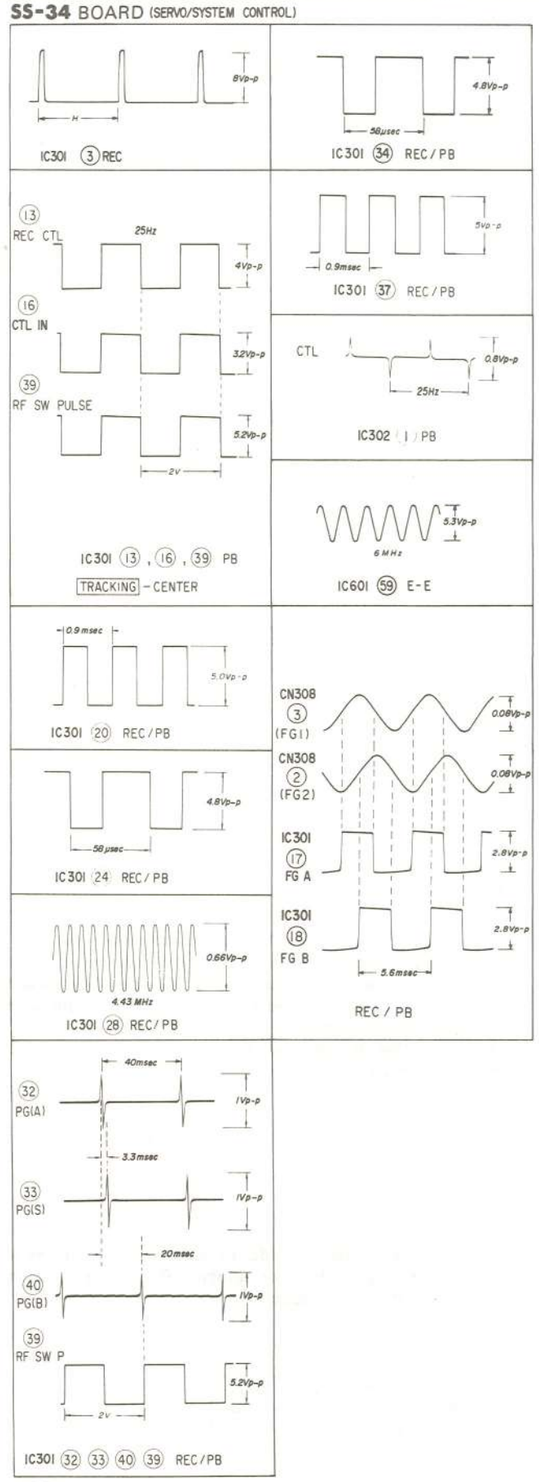
4 BOARD



Q, IC	D	ADJ,TP
306 615 337,338 317,316 302,301,315	301 302	RV308 TP408 TP406,TP405 RV306 RV307
IC303 305 IC302,345 619,620,C304 617,618,318,330 341,331	304,316 305	TP404 TP409
313 304,303 343,344,314 342 IC305 308,307 IC301	608 303 308	TP601 TP407
IC601 335 349,336 621 IC306 333,332 347 346 312	321 319	TP402 RV301 RV304 TP401 TP403 RV303 RV305 RV302
326,322 325 321 323 324 IC602 623,624 603,601 604,602 IC603	603 601 602	
Q, IC	D	ADJ,TP

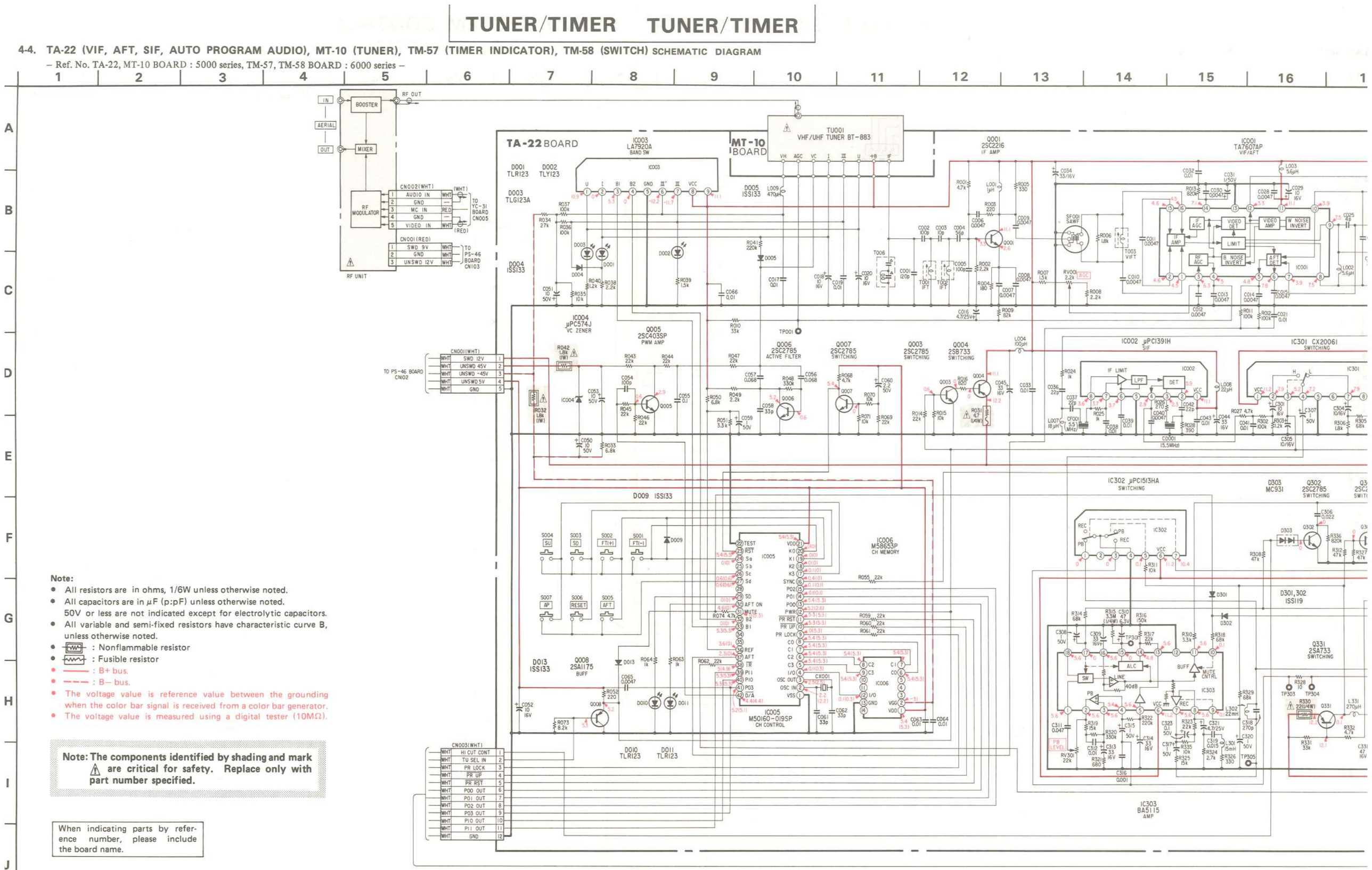


SS-34 BOARD (SERVO/SYSTEM CONTROL)



4-4. TA-22 (VIF, AFT, SIF, AUTO PROGRAM AUDIO), MT-10 (TUNER), TM-57 (TIMER INDICATOR), TM-58 (SWITCH) SCHEMATIC DIAGRAM

– Ref. No. TA-22, MT-10 BOARD : 5000 series, TM-57, TM-58 BOARD : 6000 series –

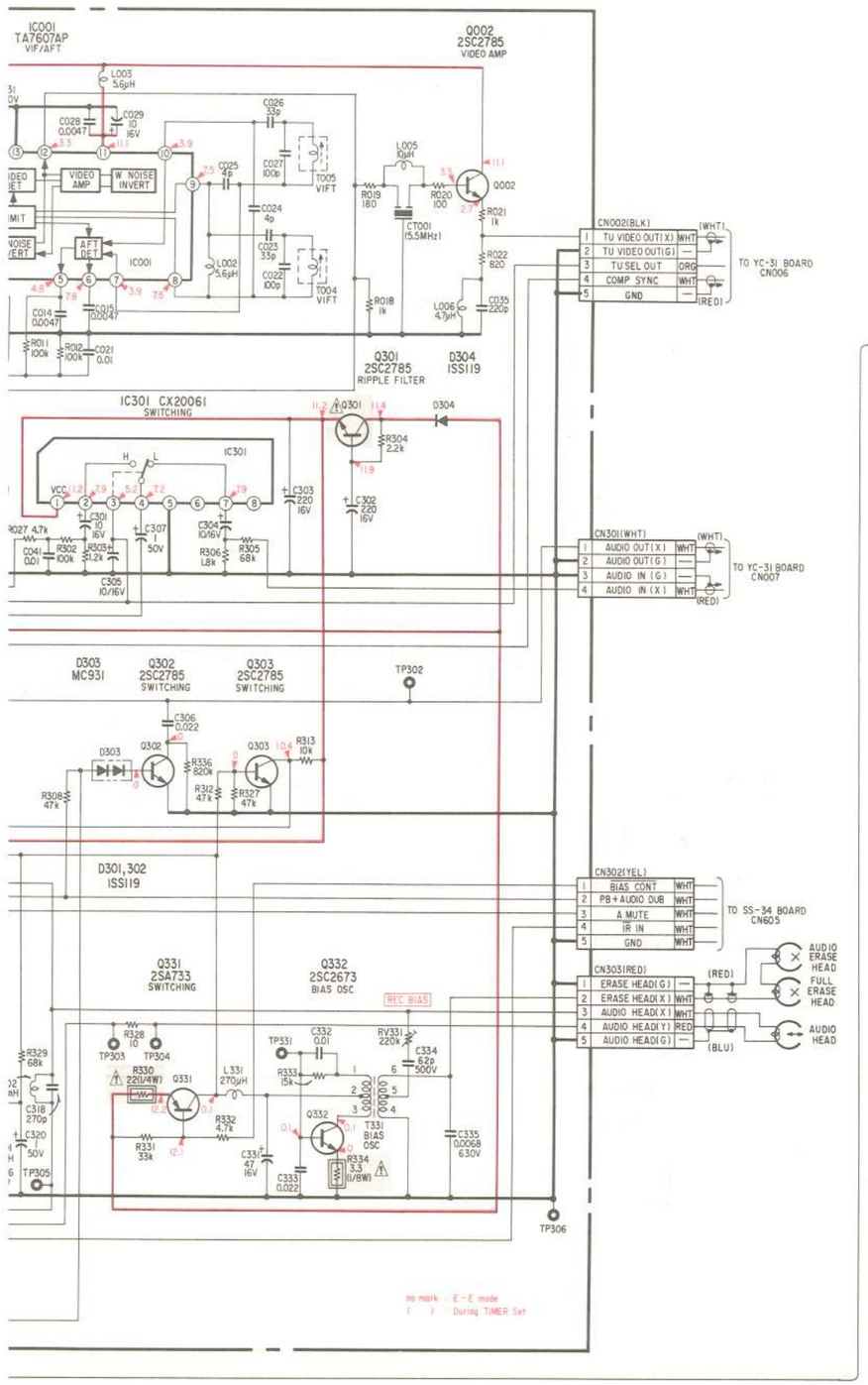


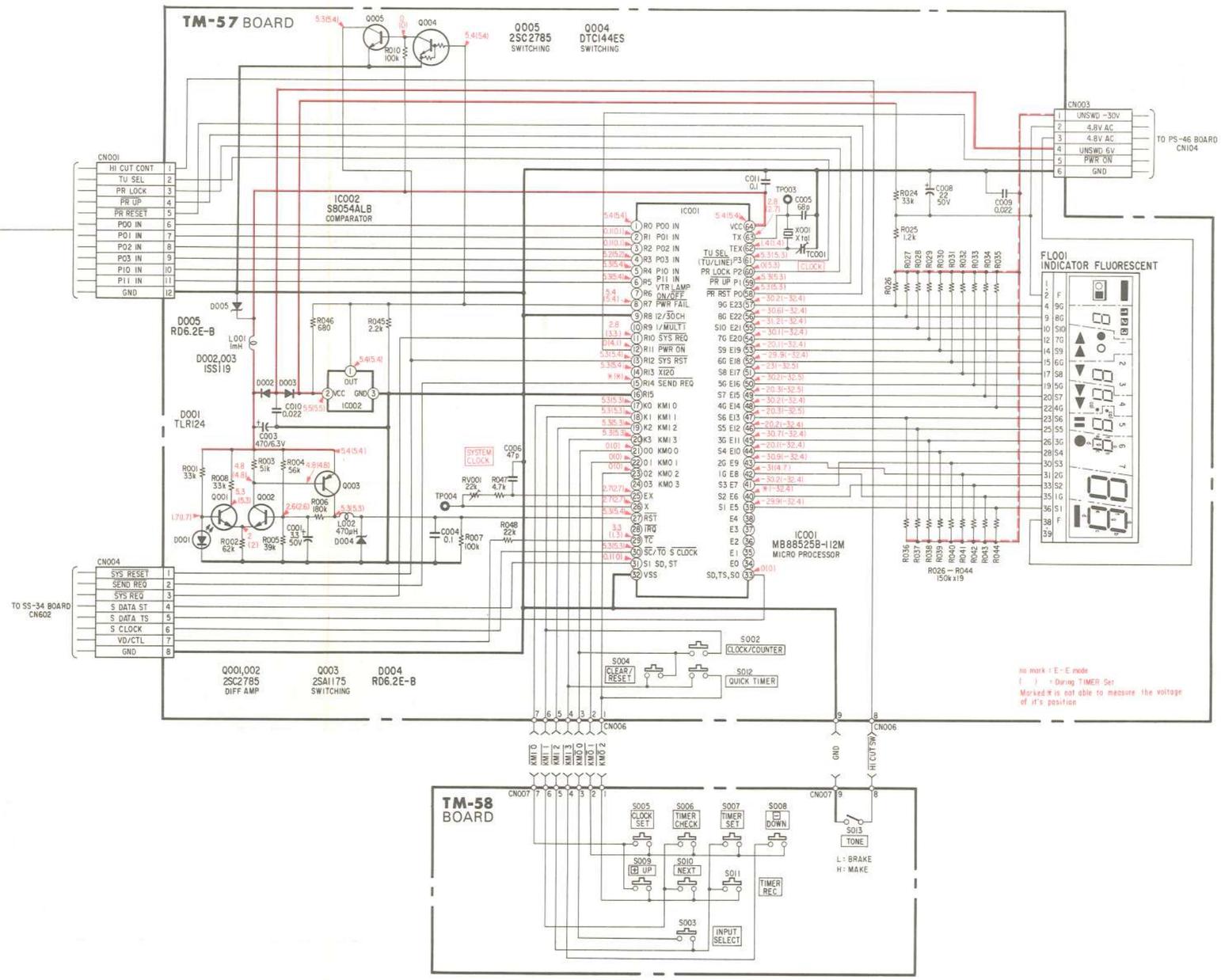
Note:

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in µF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- : Nonflammable resistor
- : Fusible resistor
- ——— : B+ bus.
- – – – : B– bus.
- The voltage value is reference value between the grounding when the color bar signal is received from a color bar generator.
- The voltage value is measured using a digital tester (10MΩ).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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


IC001 TA7607AP VIF/AFT
Q002 2SC2785 VIDEO AMP
VIDEO AMP
W NOISE INVERT
AFT DET
VIFT
Q301 2SC2785 RIPPLE FILTER
D304 ISS119
IC301 CX20061 SWITCHING
CN002(BLK)
TU VIDEO OUT(X)
TU VIDEO OUT(G)
TU SEL OUT
COMP SYNC
GND
TO YC-31 BOARD CN006
CN301(WHT)
AUDIO OUT(X)
AUDIO OUT(G)
AUDIO IN (G)
AUDIO IN (X)
TO YC-31 BOARD CN007
D303 MC931
Q302 2SC2785 SWITCHING
Q303 2SC2785 SWITCHING
TP302
D301,302 ISS119
CN302(YEL)
BIAS CONT
PB+AUDIO DUB
A MUTE
IR IN
GND
TO SS-34 BOARD CN605
Q331 2SA733 SWITCHING
Q332 2SC2673 BIAS OSC
REC BIAS
CN303(RED)
ERASE HEAD(G)
ERASE HEAD(X)
AUDIO HEAD(X)
AUDIO HEAD(Y)
AUDIO HEAD(G)
AUDIO ERASE HEAD
FULL ERASE HEAD
AUDIO HEAD
TP306
no mark : E-E mode
( ) : During TIMER Set

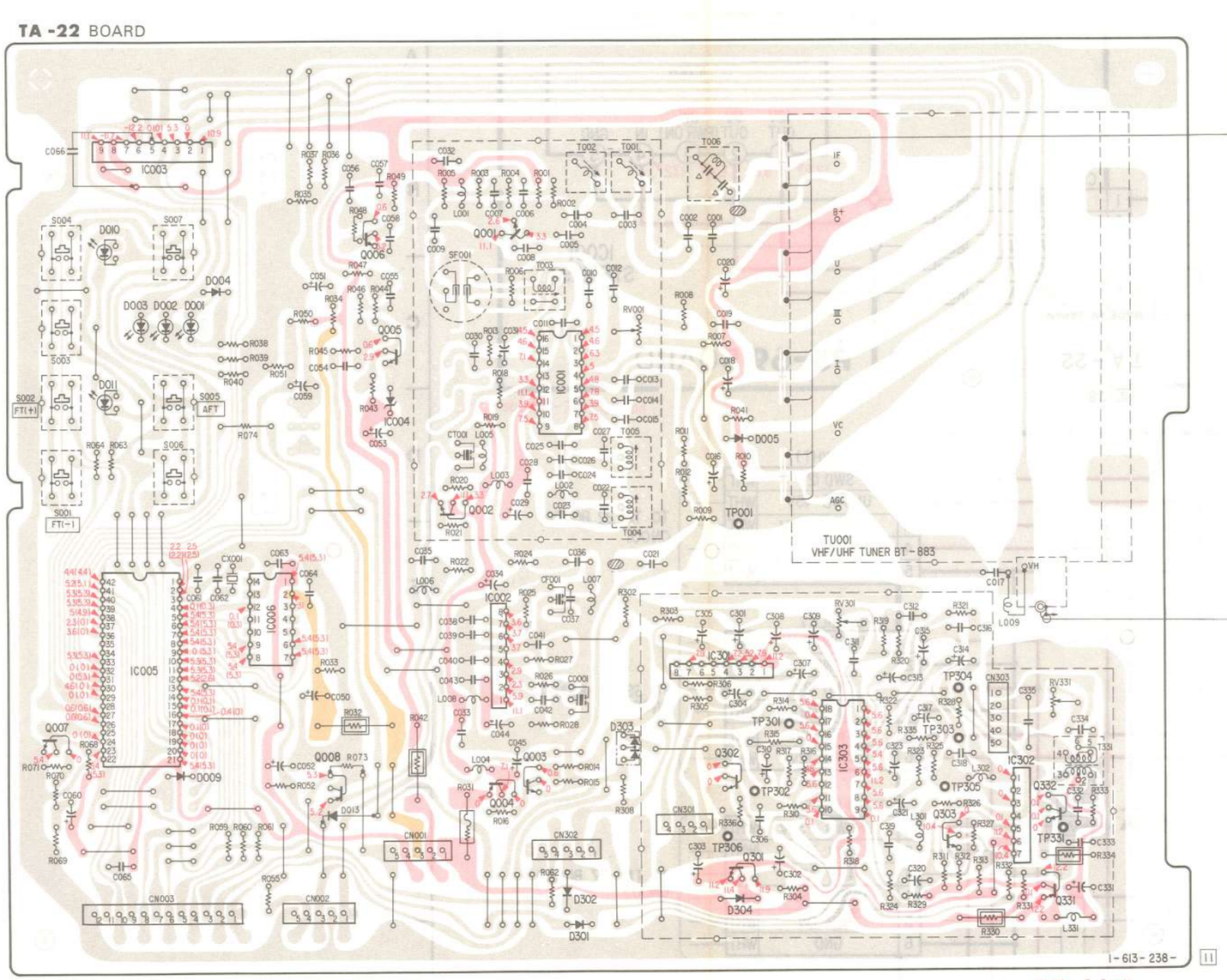

TM-57 BOARD
Q005 2SC2785 SWITCHING
Q004 DTC144ES SWITCHING
IC002 S8054ALB COMPARATOR
D005 RD6.2E-B
D002,003 ISS119
D001 TLR124
Q001,002 2SC2785 DIFF AMP
Q003 2SA1175 SWITCHING
D004 RD6.2E-B
IC001 MB88525B-112M MICRO PROCESSOR
CN001
CN003
TO PS-46 BOARD CN104
FL001 INDICATOR FLUORESCENT
CN004
TO SS-34 BOARD CN602
S002 CLOCK/COUNTER
S004 CLEAR/RESET
S012 QUICK TIMER
CN006
CN007
TM-58 BOARD
S005 CLOCK SET
S006 TIMER CHECK
S007 TIMER SET
S008 DOWN
S009 UP
S010 NEXT
S011 TIMER REC.
S003 INPUT SELECT
S013 TONE
L: BRAKE
H: MAKE
no mark : E-E mode
( ) : During TIMER Set
Marked * is not able to measure the voltage of it's position

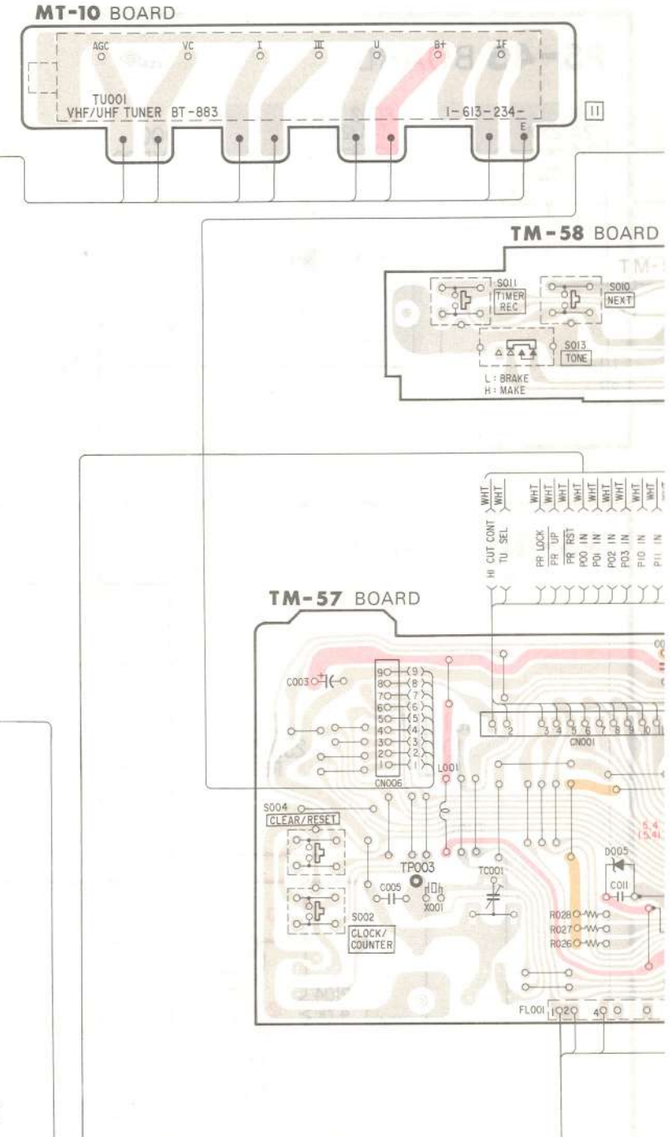
TA-22 (VIF, AFT, SIF, AUTO PROGRAM AUDIO), MT-10 (TUNER), TM-57 (TIMER INDICATOR), TM-58 (SWITCH) PRINTED WIRING BOARDS

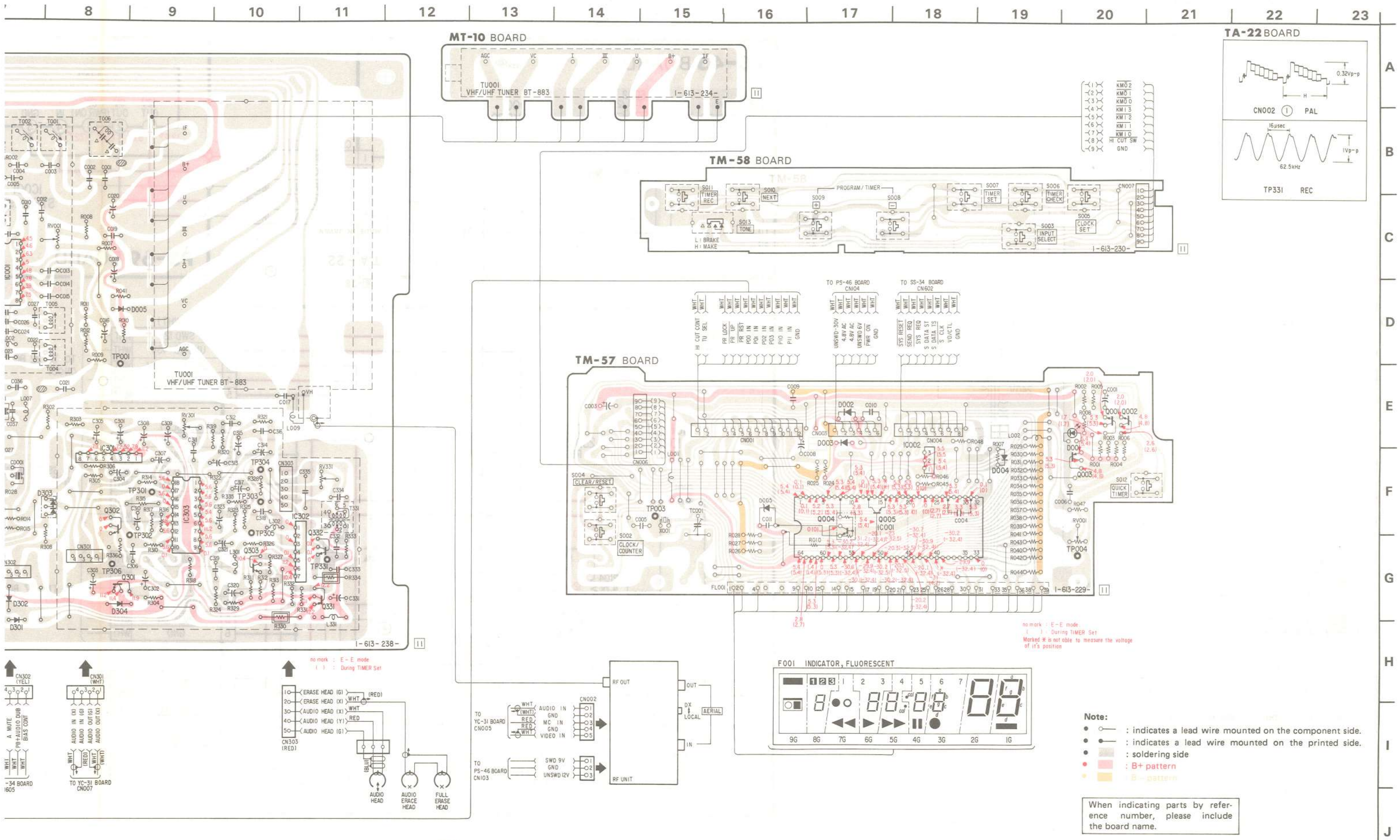
– Ref. No. TA-22, MT-10 BOARD : 5000 series, TM-57, TM-58 BOARD : 6000 series –

Q, IC	D	ADJ, TP
IC003		
001		
006	010	
	004	
	003,002,001	RV001
005		
IC001		
IC004		
	011	
	005	
002		TP001
		RV301
IC006		
IC002		
IC005		TP304
IC301		RV331
		TP301
007		TP303
IC303	303	
332		
003,302	009	TP305
008,004,IC302		TP302
303	013	
		TP331
		TP306
301, 331	302	
	304	
	301	

Q, IC	D	ADJ, TP







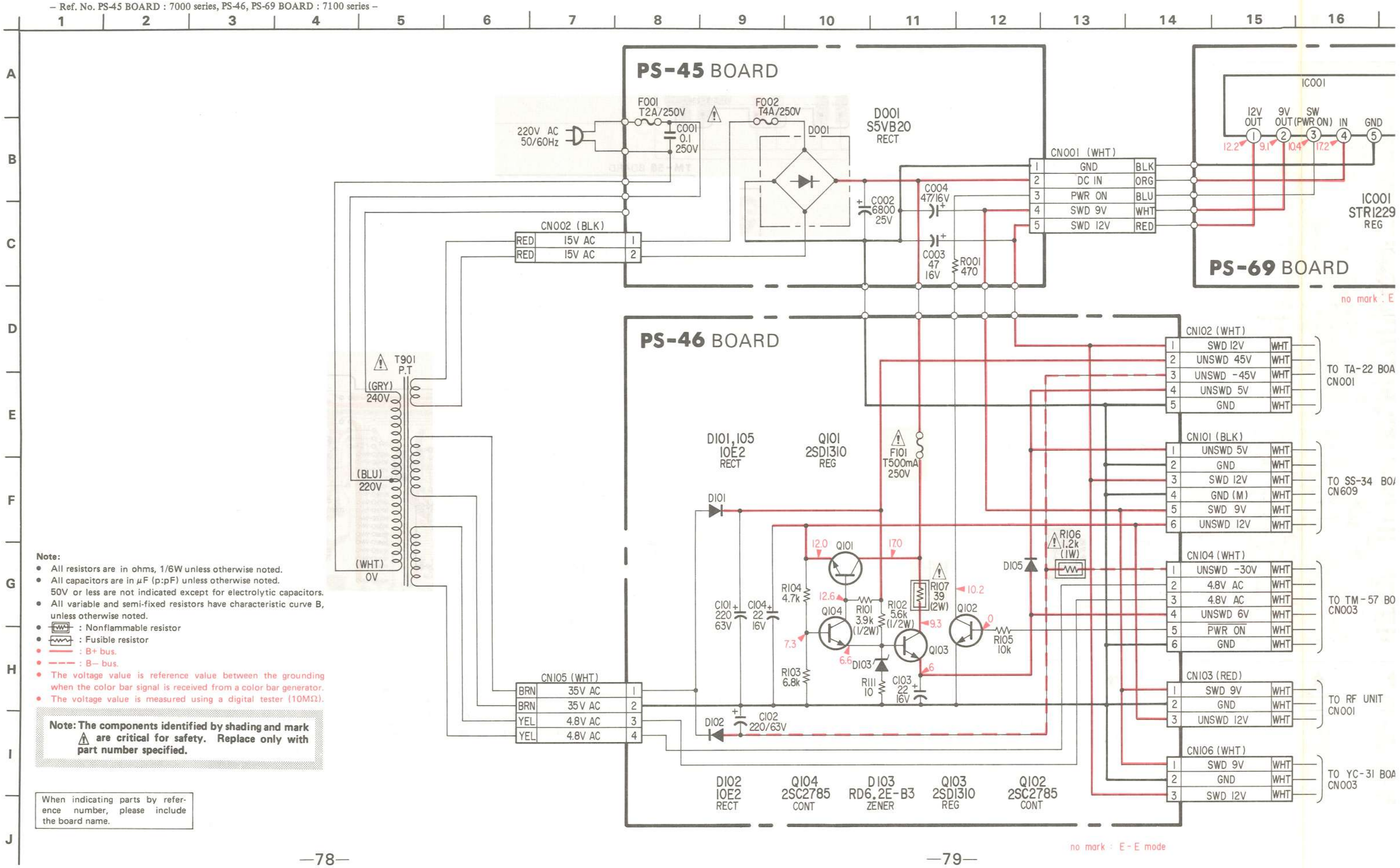
Note:

- : indicates a lead wire mounted on the component side.
- : indicates a lead wire mounted on the printed side.
- : soldering side
- : B+ pattern
- : B- pattern

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

4-5. PS-45 (POWER SUPPLY), PS-46 (POWER), PS-69 SCHEMATIC DIAGRAM

– Ref. No. PS-45 BOARD : 7000 series, PS-46, PS-69 BOARD : 7100 series –

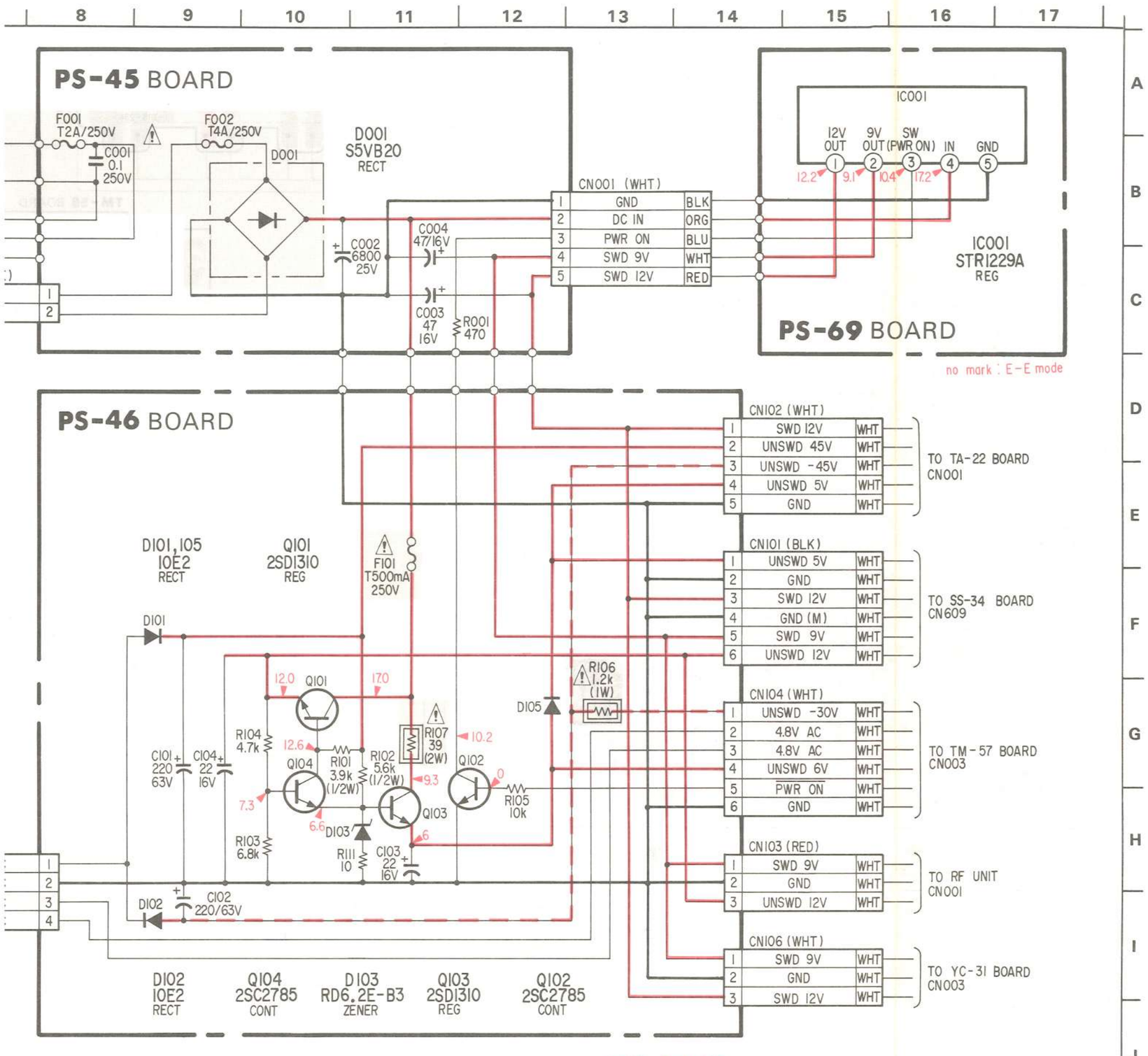


Note:

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- : Nonflammable resistor
- : Fusible resistor
- ——— : B+ bus.
- – – – : B– bus.
- The voltage value is reference value between the grounding when the color bar signal is received from a color bar generator.
- The voltage value is measured using a digital tester (10MΩ).

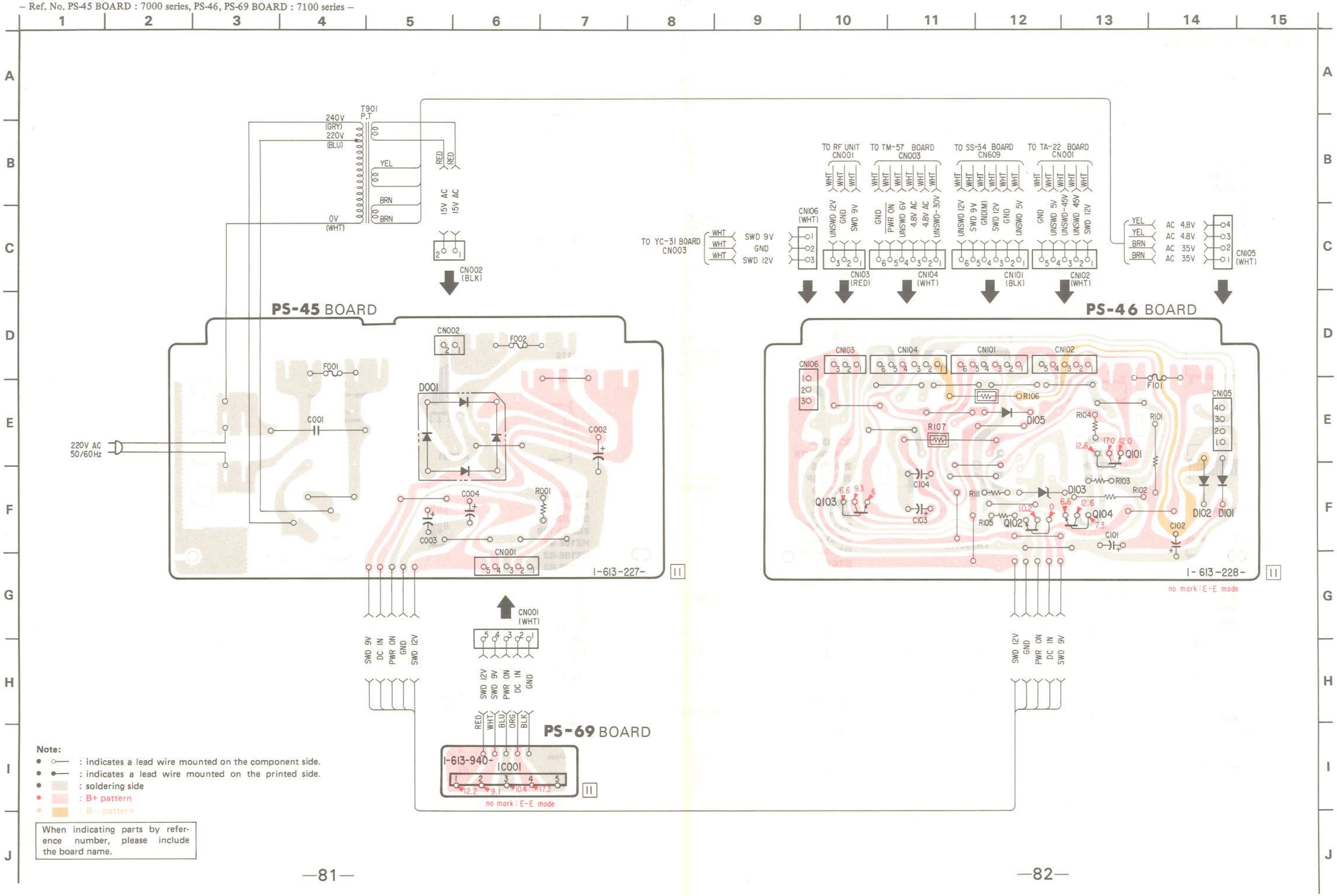
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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


8 9 10 11 12 13 14 15 16 17
A B C D E F G H I J
PS-45 BOARD
F001 T2A/250V
F002 T4A/250V
C001 0.1 250V
D001 S5VB20 RECT
C002 6800 25V
C004 47/16V
C003 47 16V
R001 470
CN001 (WHT)
1 GND BLK
2 DC IN ORG
3 PWR ON BLU
4 SWD 9V WHT
5 SWD 12V RED
IC001
12V OUT 9V OUT SW (PWR ON) IN GND
12.2 9.1 10.4 17.2
IC001 STR1229A REG
PS-69 BOARD
no mark : E-E mode
PS-46 BOARD
CN102 (WHT)
1 SWD 12V WHT
2 UNSWD 45V WHT
3 UNSWD -45V WHT
4 UNSWD 5V WHT
5 GND WHT
TO TA-22 BOARD CN001
D101,105 10E2 RECT
Q101 2SD1310 REG
F101 T500mA 250V
D101
CN101 (BLK)
1 UNSWD 5V WHT
2 GND WHT
3 SWD 12V WHT
4 GND (M) WHT
5 SWD 9V WHT
6 UNSWD 12V WHT
TO SS-34 BOARD CN609
12.0 Q101 17.0
R106 1.2k (1W)
D105
CN104 (WHT)
1 UNSWD -30V WHT
2 4.8V AC WHT
3 4.8V AC WHT
4 UNSWD 6V WHT
5 PWR ON WHT
6 GND WHT
TO TM-57 BOARD CN003
R104 4.7k
12.6
R101 3.9k (1/2W)
R102 5.6k (1/2W)
R107 39 (2W)
10.2
9.3
Q102
0
R105 10k
C101 220 63V
C104 22 16V
Q104
7.3
Q103
6.6
D103
6
R103 6.8k
R111 10
C103 22 16V
CN103 (RED)
1 SWD 9V WHT
2 GND WHT
3 UNSWD 12V WHT
TO RF UNIT CN001
D102
C102 220/63V
CN106 (WHT)
1 SWD 9V WHT
2 GND WHT
3 SWD 12V WHT
TO YC-31 BOARD CN003
D102 10E2 RECT
Q104 2SC2785 CONT
D103 RD6.2E-B3 ZENER
Q103 2SD1310 REG
Q102 2SC2785 CONT
no mark : E-E mode

PS-45 (POWER SUPPLY), PS-46 (POWER), PS-69 PRINTED WIRING BOARDS

– Ref. No. PS-45 BOARD : 7000 series, PS-46, PS-69 BOARD : 7100 series –



Note:

- ● ○— : indicates a lead wire mounted on the component side.
- ● ●— : indicates a lead wire mounted on the printed side.
- ● : soldering side
- ● : B+ pattern
- ● : B– pattern

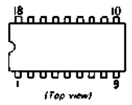
When indicating parts by reference number, please include the board name.

4-6. SEMICONDUCTORS

BA634

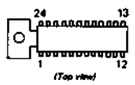
BA4558
HA17558
LM358P
NJM4558D
μPC358C
μPC4558C

BA5115

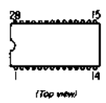


BA7007

CX134A

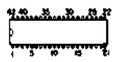


CX862
CX866A
CX866B

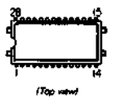


CX894
LA7205

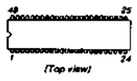
CX10021A-P
CX10021A-NP
CX1021B-P
CX1021B-NP
CX194B-0
CX194B-5
M50160-019SP



CX10023



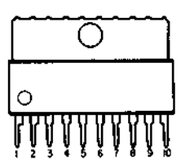
CX20043



CX20061
CX7926
μPC1373HA
μPC1391H

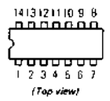
HZT33-02
μPC574J

L81640N

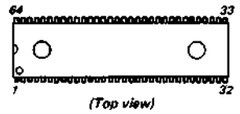


M54543L

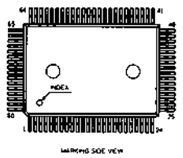
M58653P
MB3614
μPC324C



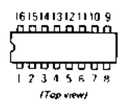
MB88525B-112M



MB88551-133M



TA7607AP



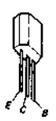
μPC1513HA

2SA733-K
2SA733-P
2SA844-C
2SA844-D
2SA844-E
2SC1740S

2SA772
2SB739
2SC1474
2SC1475-13
2SC1475-14
2SC1475-15
2SD788
2SD789

2SA933S
2SA1048-GR
2SA1115
2SC403SP
2SC2458
2SC2603
2SD1310
DTA114ES
DTA144ES
DTA144WS
DTC124ES
DTC144ES
DTC144WS

2SA1026



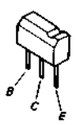
2SA1150
2SA1175
2SC2785

2SB733
2SD773
2SD774

2SC1061
2SC1826
2SC1827
2SD313HP

2SC2216
2SC2717

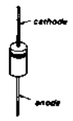
2SC2673



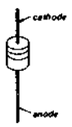
2SD1164

2SK107-1
2SK107-2
2SK107-3
2SK105A

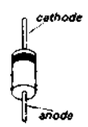
10E2
ERB12-02RK



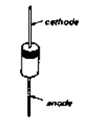
1SS119
1SS133
1SS148



EQA02-06E
EQA02-09D
EQA02-10A
EQA02-10B
HZ10E-B1
HZ10E-B2
HZ10E-B3
HZ6.2E-B3
RD10E-B1
RD10E-B2
RD10E-B3
RD5.1E-B1
RD5.1E-L1
RD5.1E-L2
RD5.1E-L3
RD6.2E-B3

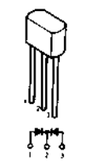


GP08D



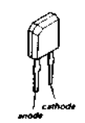
MC911

MC921

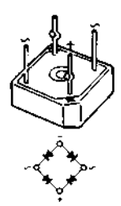


MC931

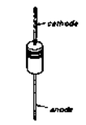
PH302B



S5VB10
S5VB20



SIB01-02

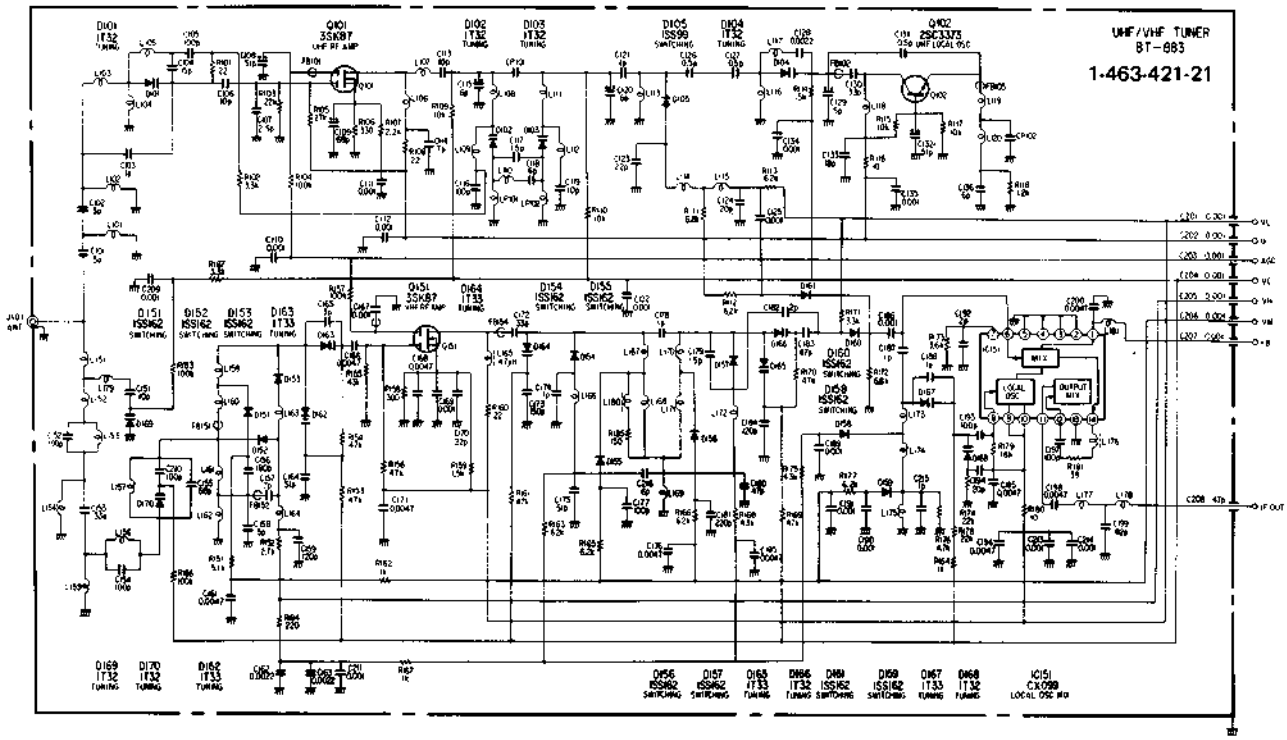


SPI201-22

TLG123A
TLR123
TLR124
TLY123

4-7. UHF AND VHF TUNER SCHEMATIC DIAGRAM

– BT-883 tuner –



Note: Tuner reference numbers are not included in the Electrical Parts List.

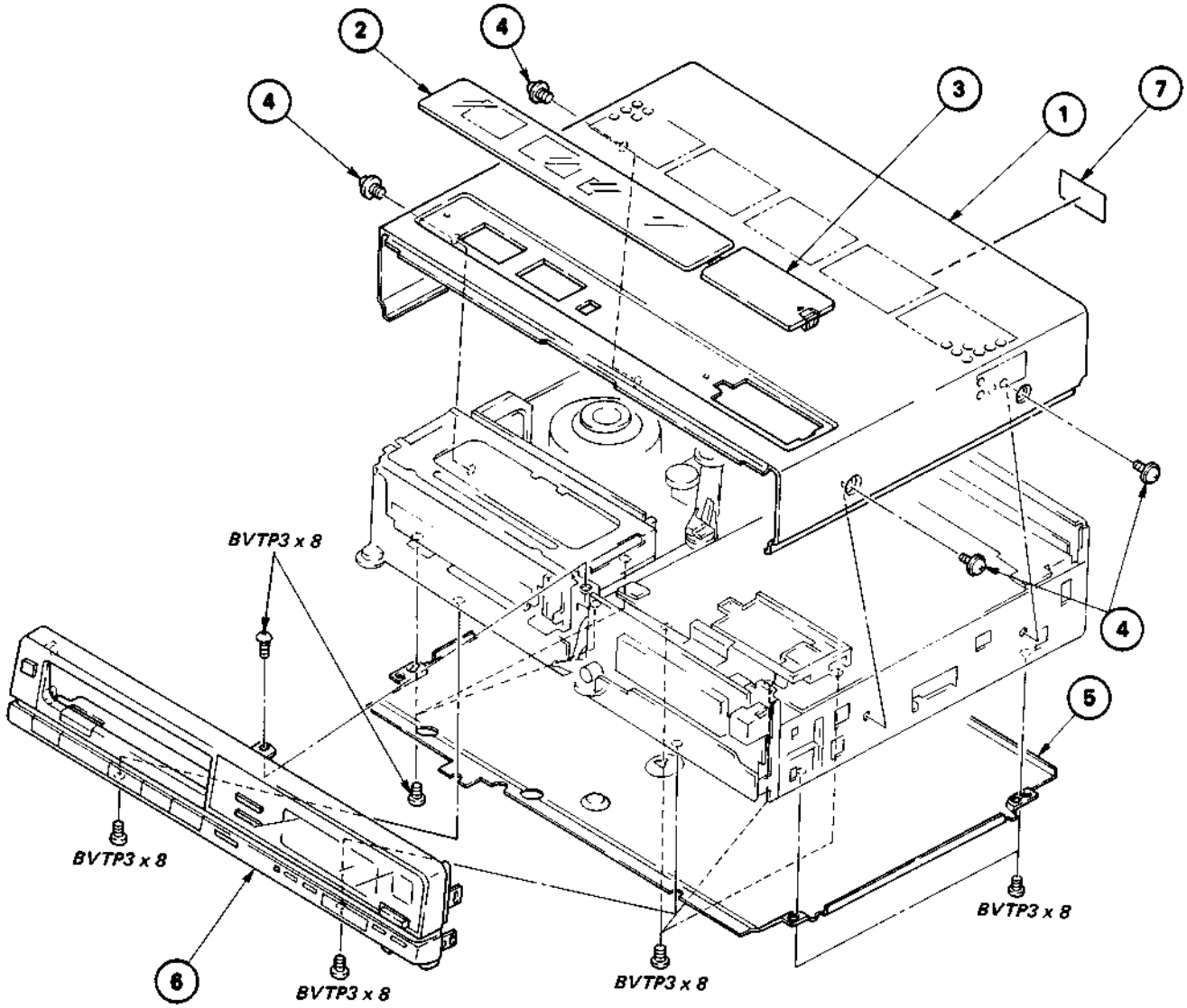
SECTION 5
EXPLODED VIEWS

NOTE:

- Itmes with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- 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.

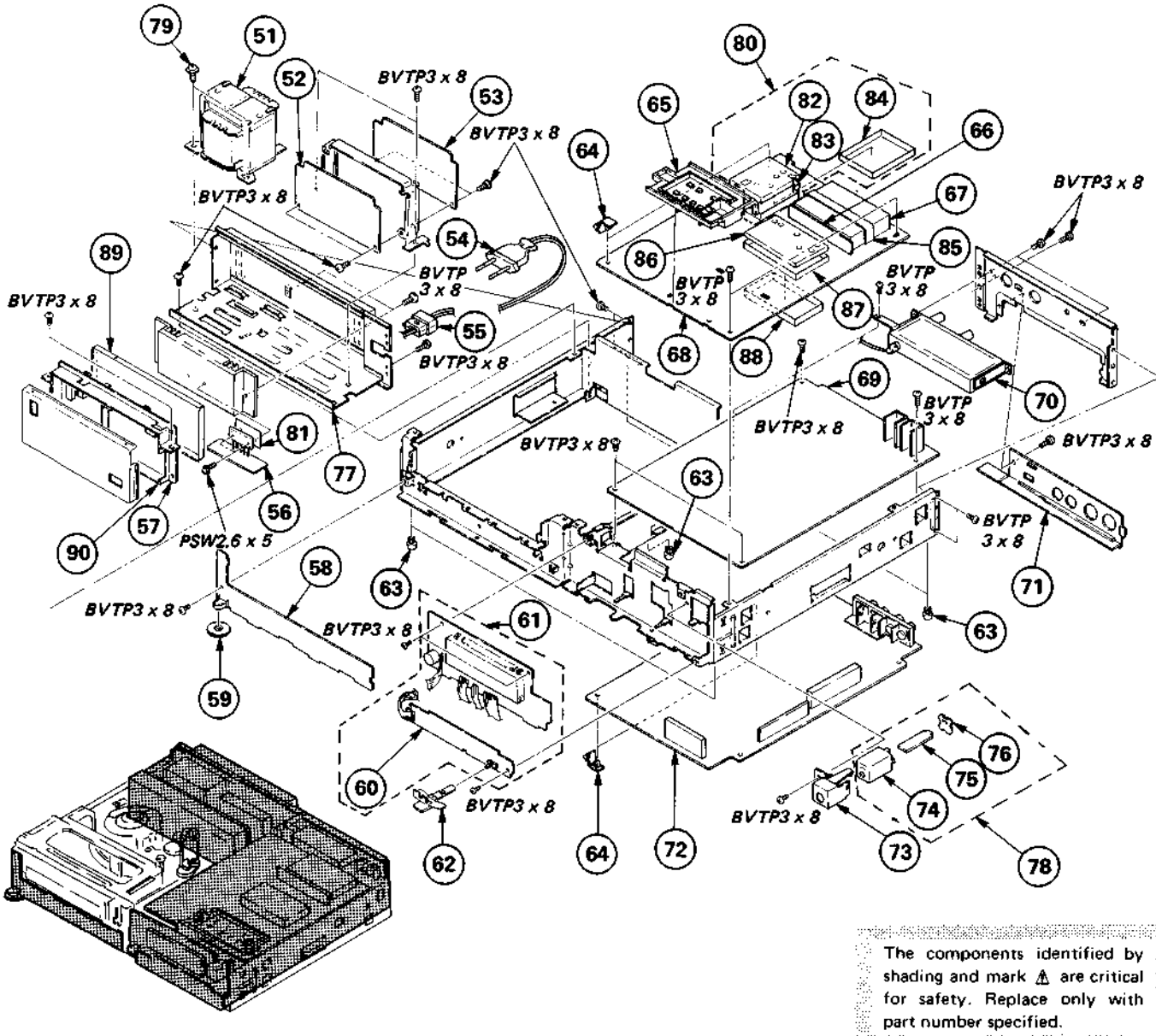
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

5-1. FRONT PANEL AND CABINET ASSEMBLIES



No.	Part No.	Description	Remark
1	X-3687-504-1	CASE ASSY, UPPER (GRAY)	2
	X-3687-517-1	CASE ASSY, UPPER (RED)	2
	X-3687-519-1	CASE ASSY, UPPER (WHITE)	2
	X-3687-521-1	CASE ASSY, UPPER (SILVER)	2
2	3-684-184-01	PLATE, TRANSPARENT	
3	X-3684-146-1	LID ASSY, PRESET	
4	4-886-821-01	SCREW, M3 CASE (GRAY MODEL)	
	4-886-821-11	SCREW, M3 CASE (SILVER, WHITE, RED MODEL)	
5	*X-3684-133-1	PLATE ASSY, BOTTOM	
6	X-3687-506-1	PANEL ASSY, FRONT (GRAY)	
	X-3687-518-1	PANEL ASSY, FRONT (RED)	
	X-3687-520-1	PANEL ASSY, FRONT (WHITE)	
	X-3687-522-1	PANEL ASSY, FRONT (SILVER)	
7	*3-687-501-01	LABEL, MODEL NUMBER	

5-2. TUNER, TIMER AND POWER ASSEMBLIES

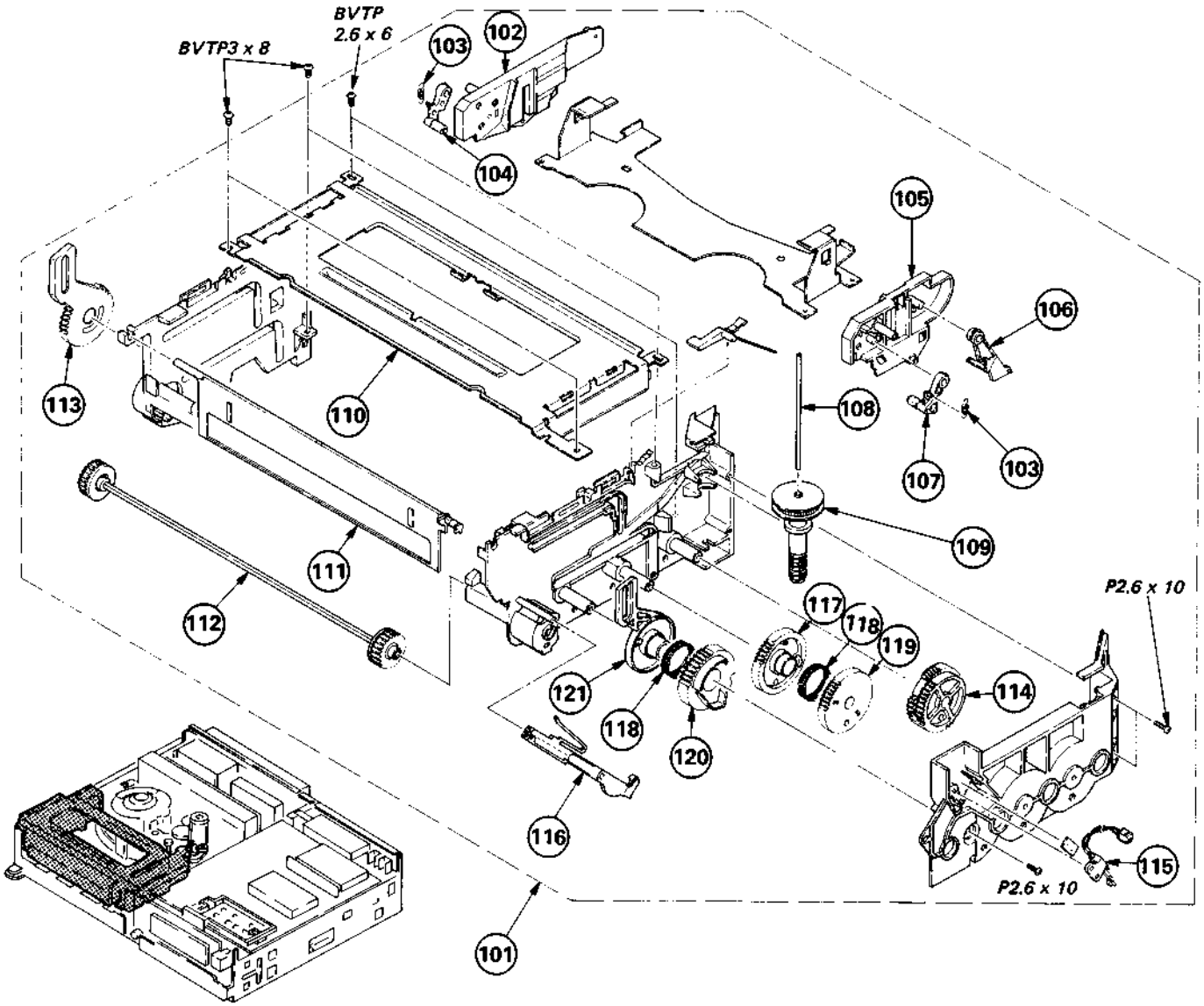


The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remark
51	⚠1-447-894-11	TRANSFORMER, POWER (T901)	
52	*1-613-228-11	PS-46 BOARD	
53	*1-613-227-11	PS-45 BOARD	
54	⚠1-551-908-41	CORD, POWER	
55	⚠3-703-244-02	BUSHING, CORD	
56	*1-613-940-11	PS-69 BOARD	
57	*A-6711-565-A	RP-20 BOARD, COMPLETE	
58	*1-613-231-11	FU-25 BOARD	
59	3-684-103-11	KNOB, TRACK CONTROL	
60	*1-613-230-11	TM-58 BOARD	
61	*A-6707-464-A	TM BOARD, COMPLETE	60
62	3-684-270-11	BUTTON, SELECTION, INPUT	
63	3-670-155-11	LEG	
64	*3-701-832-00	HINGE, CIRCUIT BOARD	
65	X-3687-501-1	COVER ASSY, PRESET	
66	*1-613-234-11	MT-10 BOARD	
67	⚠1-463-421-21	TUNER, ET (BT-883)(TU001)	
68	*A-6721-205-A	TA-22 BOARD, COMPLETE	66, 67, 80, 85-88
69	*A-6715-239-A	SS-34 BOARD, COMPLETE	
70	⚠1-464-388-11	BOOSTER MIXER, RF MODULATOR (RFU-821)	

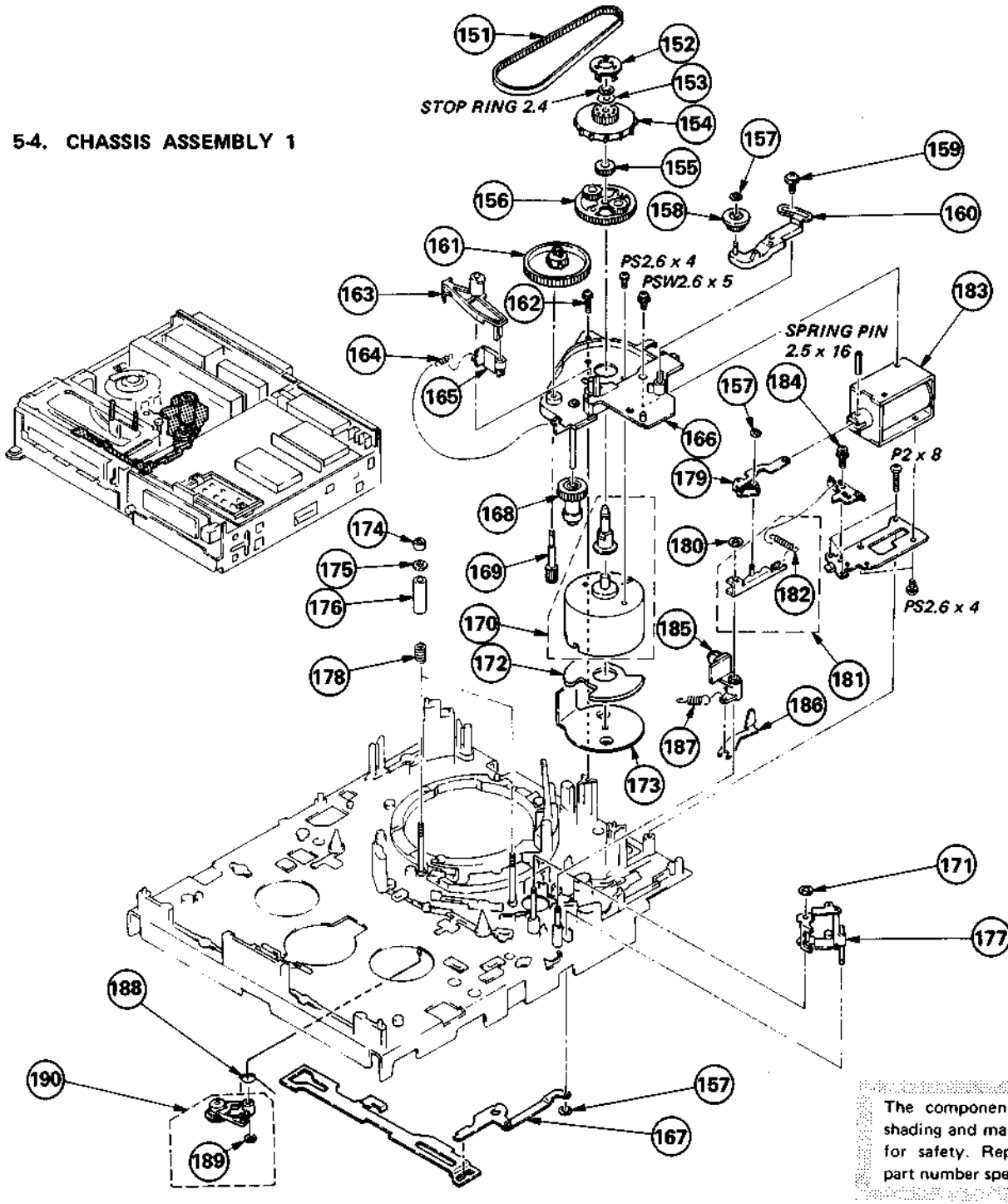
No.	Part No.	Description	Remark
71	*3-687-535-01	PLATE, CONNECTOR	
72	*A-6711-566-A	YC-31 BOARD, COMPLETE	
73	*3-684-182-01	FRAME, FITTING, RAY CATCHER	
74	*4-342-117-00	CASE, SHIELD (MAIN), R	
75	*1-606-794-00	N BOARD	
76	*4-342-118-00	LID, SHIELD CASE, R	
77	X-3687-502-1	FRAME ASSY, POWER	
78	A-6734-213-A	CATCHER BLOCK ASSY, RAY	74-76
79	4-886-821-11	SCREW, M3 CASE	
80	*X-3687-527-1	LID ASSY, BOTTOM, SHIELD CASE, AU	82-84
81	3-681-112-00	SHEET, RADIATION	
82	*3-687-550-01	CASE (UPPER LID), SHIELD, AU	
83	*3-687-558-01	CASE (MAIN), SHIELD, AU	
84	*3-687-559-01	CASE (BOTTOM LID), SHIELD, AU	
85	*3-662-383-00	BAND, RETAINER, TUNER	
86	*3-687-523-01	LID UPPER, SHILD CASE, TU	
87	*3-687-525-01	CASE, (MAIN), SHILD, TU	
88	*3-687-524-01	LID, BOTTOM, SHILD CASE, TU	
89	*3-687-522-01	LID, BOTTOM, SHIELD CASE, RP	
90	*3-687-533-01	CASE (MAIN), SHIELD, RP	

5-3. FRONT LOADING ASSEMBLY



No.	Part No.	Description	Remark
101	A-6751-186-A	LOADING BLOCK ASSY, FRONT	102-121
102	*X-3684-117-1	PLATE ASSY, SIDE, BASE (LEFT)	
103	3-684-258-01	SPRING, TENSION	
104	X-3684-125-1	RETAINER (LEFT) ASSY, CASSETTE	
105	*X-3684-118-1	PLATE ASSY, SIDE, RIGHT	
106	*3-684-108-01	ARM, LID OPEN	
107	X-3684-124-1	RETAINER (RIGHT) ASSY, CASSETTE	
108	3-679-123-00	SHAFT, GEAR, WORM	
109	3-684-164-01	GEAR, WORM	
110	*3-684-195-01	PLATE, TOP	
111	3-684-168-01	DOOR	
112	X-3684-116-1	SHAFT ASSY, MIDWAY GEAR	
113	*3-684-166-01	ARM (LEFT), DRIVING	
114	X-3684-123-1	GEAR ASSY, DRIVING	
115	1-554-840-11	SWITCH, LEAF (CASSETTE ON)(S904)	
116	3-684-162-01	ARM, SWITCHING, DOOR	
117	3-684-111-01	GEAR (B), LIMITER	
118	3-684-115-01	SPRING	
119	3-684-109-01	GEAR (A), LIMITER	
120	3-684-163-01	GEAR, DRIVING ARM	
121	3-684-165-01	ARM (RIGHT), DRIVING	

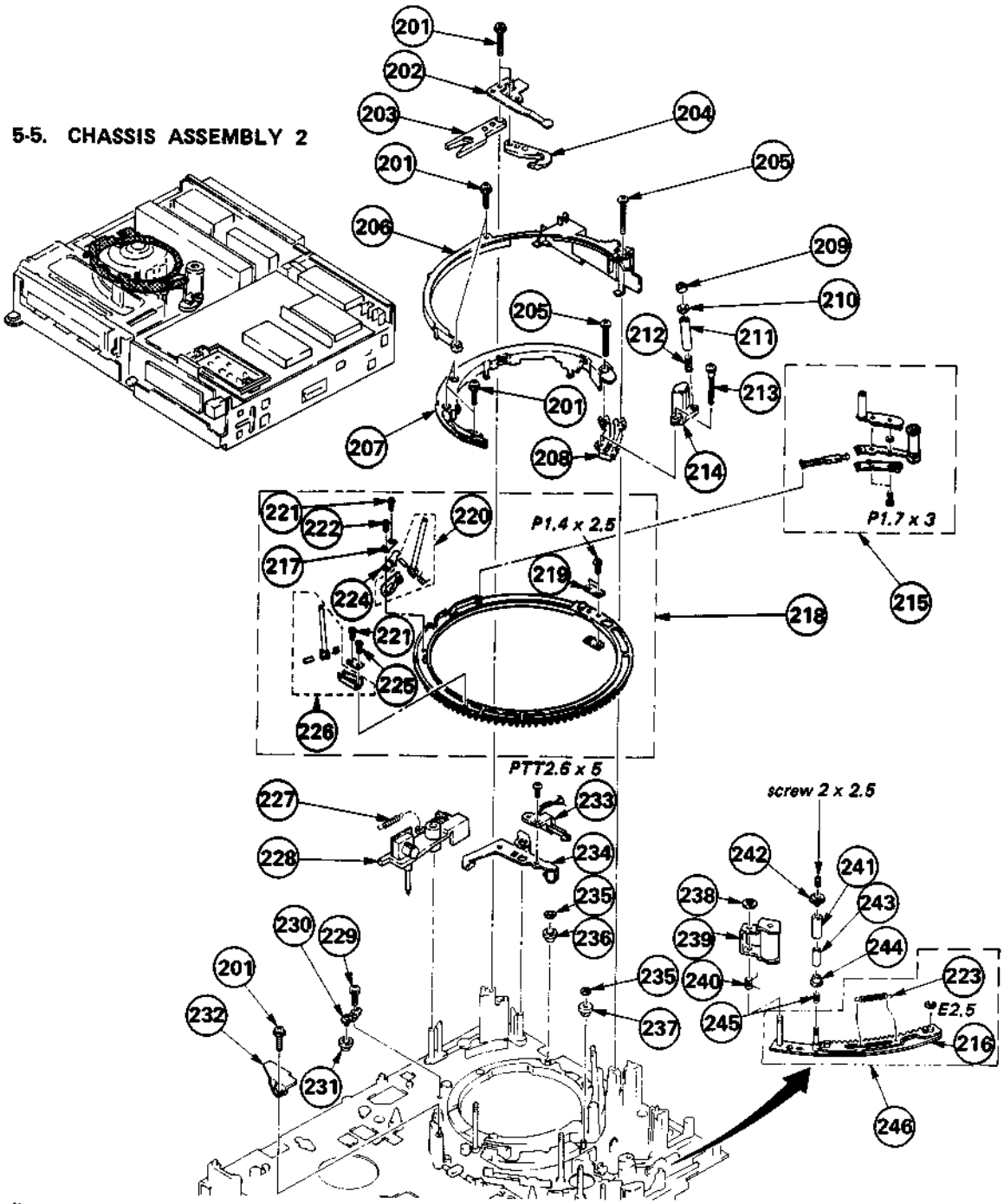
5-4. CHASSIS ASSEMBLY 1



The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

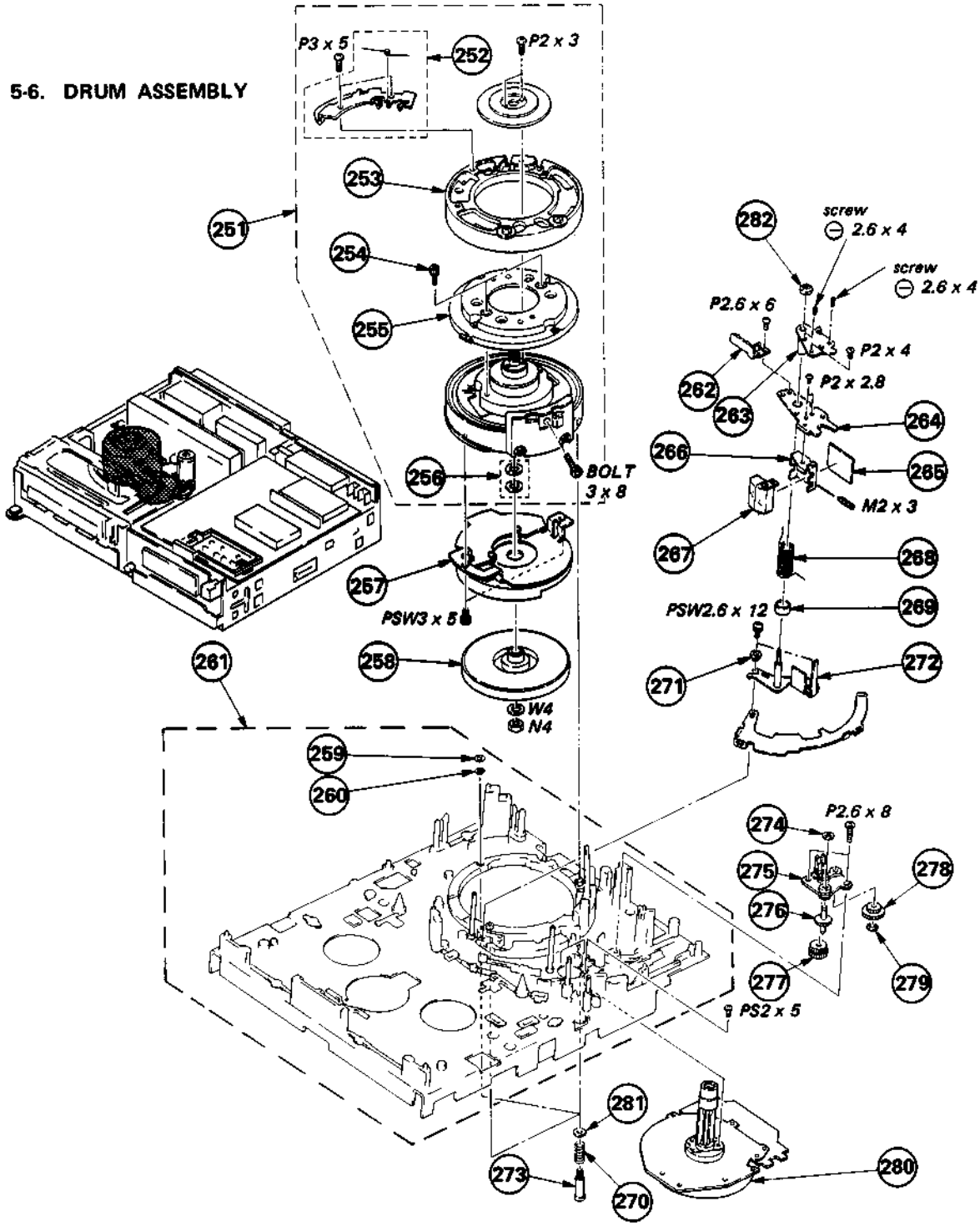
No.	Part No.	Description	Remark
151	3-684-264-01	BELT, TIMING	
152	3-684-152-01	FLANGE, INTERNAL GEAR	
153	3-683-454-01	WASHER, POLYETHYLENE	
154	3-684-178-01	GEAR, INTERNAL	
155	3-679-104-05	GEAR	
156	X-3679-111-0	CARRIER ASSY	
157	3-669-465-00	WASHER (1.5), STOPPER	
158	3-684-151-01	GEAR	
159	3-681-231-00	SCREW (+PW 2.6X8), TAPPING	
160	X-3684-119-1	ARM ASSY, GEAR	
161	3-679-115-00	GEAR (LARGE), LOADING	
162	3-669-480-11	+ PTPWH 2	
163	3-684-167-01	ARM, STOPPER	
164	3-684-227-01	SPRING, TENSION	
165	3-684-116-01	LIMITER, STOPPER	
166	X-3684-129-1	CHASSIS ASSY, PLANET GEAR	
167	*X-3684-114-1	LEVER ASSY, COMMUNICATION	
168	X-3669-321-0	GEAR (C) ASSY	
169	3-679-114-00	GEAR (SMALL), LOADING	
170	X-3679-268-1	MOTOR ASSY, L (LOADING/THREADING)(M904)	
171	3-669-596-00	WASHER (2.3), STOPPER	
172	*1-605-071-00	LM-8 BOARD	
173	*3-669-613-00	INSULATOR, L MOTOR	
174	3-669-318-00	NUT, ADJUSTMENT, GUIDE	
175	3-684-135-01	WASHER (UPPER), GUIDE, #7, 8	
176	3-684-133-01	SLEEVE, GUIDE, #7, 8	
177	X-3684-113-1	ARM ASSY, PINCH PRESS	
178	3-684-290-01	SPRING, COMPRESSION	
179	X-3684-109-1	ARM ASSY, PINCH SOLENOID	
180	3-669-595-00	WASHER (2), STOPPER	
181	*X-3684-112-1	ARM ASSY, PINCH LIMITER	182
182	3-515-170-00	SPRING, TENSION	
183	⚠1-454-349-41	SOLENOID, PLUNGER (PINCH)(PM901)	
184	3-669-607-00	+PSW (SMALL ROUND) 2.6	
185	1-464-329-11	SENSOR, T COIL (L902)	
186	*3-684-119-01	LINK, TAKE-UP SENSOR	
187	3-684-157-04	SPRING (T SENSOR), TENSION	
188	3-681-154-00	SPRING, TORSION	
189	3-701-436-11	WASHER, 1.6	
190	X-3687-503-1	ARM ASSY, REVIEW BRAKE	189

5-5. CHASSIS ASSEMBLY 2



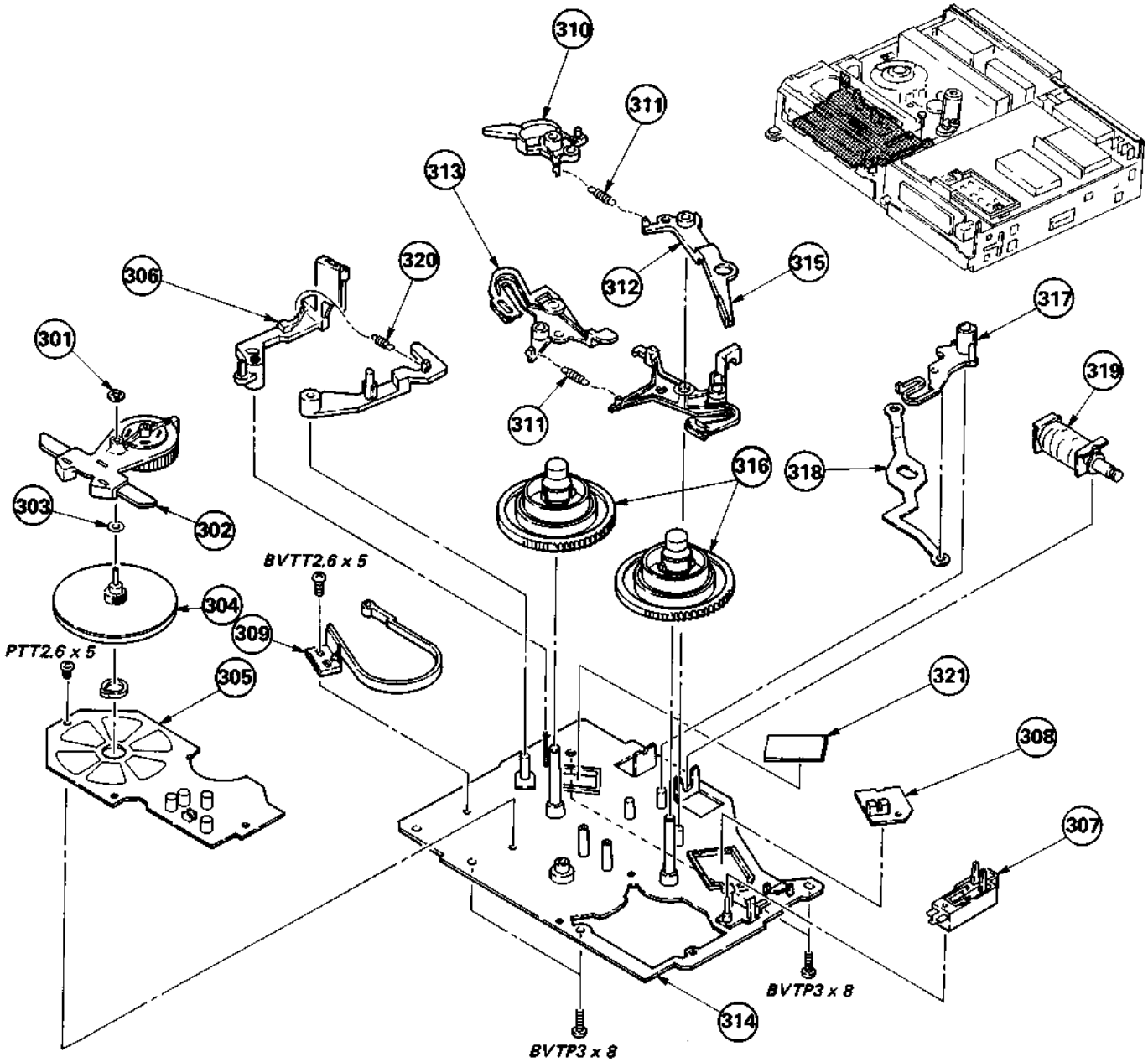
No.	Part No.	Description	Remark
201	3-669-480-11	+ PTPWH 2	
202	*3-684-158-01	PLATE, GROUND, TAPE GUIDE	
203	*3-669-618-00	PLATE (2), ADJUST	
204	*3-672-507-00	PLATE (3-1), ADJUSTMENT	
205	3-669-466-21	SCREW (M 2.6)	
206	3-684-217-01	GUIDE (2), SHUTTLE	
207	*3-679-290-00	GUIDE (1-YA), SHUTTLE	
208	*X-3679-263-1	BASE ASSY, SLANT	
209	3-669-446-00	NUT, GUIDE, NO. 6	
210	3-679-910-00	FLANGE (S), GUIDE, NUMBER 6	
211	3-669-445-00	SPACER, GUIDE, NO. 6	
212	3-669-615-00	SPRING, COMPRESSION	
213	3-669-606-00	SCREW (2.6)	
214	8-825-508-10	HEAD, FE (FULL ERASE HEAD)	
215	A-6750-158-B	SHUTTLE (2) BLOCK ASSY	
216	*X-3679-265-1	SLIDER ASSY (2), T	
217	*3-669-472-02	RETAINER, SPRING, LEAF	
218	X-3679-150-0	RING (YA) ASSY, S LOADING	217, 219-222, 224-226
219	*3-669-616-00	RETAINER	
220	*X-3669-430-0	HOLDER BLOCK ASSY, #3 GUIDE	
221	3-669-478-00	SCREW (1X3), TAPPING	
222	3-669-479-11	SCREW (1.4X3.5), TAPPING	
223	3-549-014-00	SPRING, TENSION	
224	3-672-583-00	SPRING	
225	3-672-586-00	SCREW (1.4X3), TAPPING	
226	*X-3669-429-0	HOLDER BLOCK ASSY, #2 GUIDE	
227	3-684-161-01	SPRING (S SENSOR), TENSION	
228	1-464-330-11	SENSOR, S COIL (L901)	
229	3-669-607-31	+PSW (SMALL ROUND) (2.6)	
230	*X-3669-329-0	PLATE ASSY, ADJUSTMENT	
231	3-669-360-00	ROLLER, RING	
232	3-669-476-04	PLATE, GUIDE	
233	1-554-840-11	SWITCH, LEAF (THREADING END) (S903)	
234	*X-3684-130-1	ARM ASSY, LOCK	
235	3-669-465-00	WASHER (1.5), STOPPER	
236	3-669-630-00	ROLLER (C), RING	
237	3-669-597-00	ROLLER (B), RING	
238	3-669-596-00	WASHER (2.3), STOPPER	
239	X-3679-264-1	ARM ASSY, PINCH ROLLER	
240	3-683-441-01	SPRING	
241	3-676-649-11	ROLLER (#9), GUIDE	
242	3-676-650-00	FLANGE (UPPER) (#9), GUIDE	
243	3-672-559-00	SLEEVE, GUIDE	
244	3-672-558-00	FLANGE (LOWER) (#9), GUIDE	
245	3-669-452-00	SPRING, COMPRESSION	
246	A-6750-165-A	GEAR ASSY, SLIDER	216, 223

5-6. DRUM ASSEMBLY



No.	Part No.	Description	Remark
251	A-6050-201-A	DRUM ASSY (DSH-40A-R)	252-256
252	A-6760-066-B	SPRING ASSY, TAPE RETAINER	
253	A-6760-138-A	DRUM ASSY, UPPER	
254	3-669-157-00	BOLT (WASHER)(2.6X8)	
255	A-6762-136-A	DISK ASSY	
256	X-3669-105-0	SPACE BLOCK ASSY	
257	X-2621-204-2	STATOR ASSY, D	
258	X-2621-202-0	ROTOR ASSY, D	
259	3-669-646-00	SPACER, DRUM	
260	3-669-646-11	SPACER, DRUM	
261	*X-3687-505-1	CHASSIS ASSY, MECHANICAL	259, 260
262	3-684-140-01	PROTECTOR	
263	*X-3684-111-7	PLATE ASSY, ADJUSTMENT, ACE	
264	*3-684-132-01	BRACKET, ACE	
265	*1-612-506-11	AH-3 BOARD	
266	*3-684-228-01	CASE, SHIELD, ACE	
267	8-825-579-10	HEAD, ACE EPS262-2102	
268	3-684-136-01	SPRING, TORSION	
269	3-684-137-01	SPACER, SPRING	
270	3-429-123-00	SPRING	
271	3-684-247-01	BUSHING, ACE	
272	*X-3684-110-4	CHASSIS ASSY, ACE (AUDIO ERASE, CTL, AUDIO REC/PB)	
273	3-669-302-00	SCREW, FITTING	
274	3-669-595-00	WASHER (2), STOPPER	
275	X-3679-147-0	CHASSIS (B) ASSY, DRIVE GEAR	
276	X-3684-166-1	GEAR (F) ASSY (C)	
277	3-669-338-00	GEAR (E)	
278	3-669-337-00	GEAR (D)	
279	3-669-465-00	WASHER (1.5), STOPPER	
280	8-838-080-01	MOTOR, DC(BHF-19088)(CAPSTAN MOTOR)(M902)	
281	3-669-600-11	WASHER, FLAT (3.5)	
282	*3-684-246-02	NUT, ADJUSTMENT, HEIGHT, ACE	

5-7. REEL BLOCK ASSEMBLY



No.	Part No.	Description	Remark
301	3-669-595-00	WASHER (2), STOPPER	
302	A-6759-074-A	ARM BLOCK ASSY, PENDULUM	
303	3-679-318-00	WASHER, PENDULUM ARM	
304	X-2622-201-0	ROTOR ASSY, R	
305	*A-4910-049-A	R STATOR BOARD,COMPLETE(REEL MOTOR)(M903)	
306	X-3684-121-1	LEVER ASSY, TENSION REGULATOR	
307	1-554-839-11	SWITCH, LEAF (2 GANG)(S901) (REC PROOF/CASSETTE DOWN)	
308	*1-613-233-11	RD-21 BOARD	
309	X-3679-120-0	BAND ASSY, TENSION REGULATOR	
310	3-684-192-01	ARM, BRAKE, SUPPLY SOFT	
311	3-684-235-01	SPRING, TENSION	
312	X-3684-137-1	BRAKE ASSY, T SOFT	
313	X-3684-107-1	BRAKE ASSY, SUPPLY	
314	*X-3684-131-1	CHASSIS ASSY, SUB	
315	X-3684-108-1	BRAKE ASSY, TAKE-UP	
316	X-3684-106-1	TABLE ASSY, REEL	
317	3-684-193-01	ARM, PENDULUM STOPPER	
318	*3-684-183-01	LINK, L	
319	⚠1-454-371-31	SOLENOID, PLUNGER (BRAKE)(PM902)	
320	3-679-151-00	SPRING, TENSION	
321	*1-613-232-11	RD-20 BOARD	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

5-8. HARDWARE LIST

SCREW

7-621-770-67	SCREW +P 2.6X6
7-621-759-35	+PSW, 2.6X5
7-621-759-85	+PSW, 2.6X12
7-627-551-28	SCREW, PRECISION +P 1.4X2.5
7-627-552-38	SCREW, PRECISION +P 1.7X3
7-627-553-18	SCREW, PRECISION +P 2X2
7-627-553-47	SCREW, PRECISION +P 2X4
7-628-253-15	SCREW +PS 2X5
7-628-253-95	SCREW +PS 2.6X4
7-628-254-15	SCREW +PS 2.6X6
7-685-134-14	SCREW +P 2.6X8 TYPE2 NON-SLIT
7-685-135-14	SCREW +P 2.6X10 TYPE2 NON-SLIT
7-685-645-71	SCREW +BVTP 3X6 TYPE2 IT-3
7-685-645-81	SCREW +BVTP 3X6 TYPE2
7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3
7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3
7-685-646-81	SCREW +BVTP 3X8 TYPE2
7-685-646-89	SCREW +BVTP 3X8 TYPE2
7-685-790-04	SCREW +PTT 2.6X4 (S)
7-685-791-04	SCREW +PTT 2.6X5 (S)
7-685-791-04	SCREW +BVTT 2.6X5 (S)

SET-SCREW

7-621-710-25	SET-SCREW, SLOT 2X3 CONE POINT
7-621-731-08	SET-SCT, HEX. 2X2.5, FLAT POINT
7-621-732-08	SET-SCT, HEX. 2X3 FLAT POINT
7-683-174-21	SET-SCREW, SLOT 3X4 CONE POINT

RING

7-624-118-01	RING, RETAINING E-2.5
7-624-190-61	STOP RING 2.4, TYPE-CS

TAPPING

7-685-105-14	TPG +P 2X8, TYPE 2, NON-SLIT

R STATOR | **TM**

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

- 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.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

Ref.No	Part No.	Description				Remark
	*A-4910-049-A	R STATOR BOARD, COMPLETE (REEL MOTOR) **********				
	*1-560-460-00	PIN, CONNECTOR 4P				
		CAPACITOR				
C1	1-123-821-00	ELECT	47MF	20%	16V	
C2	1-123-821-00	ELECT	47MF	20%	16V	
C3	1-123-821-00	ELECT	47MF	20%	16V	
C4	1-123-821-00	ELECT	47MF	20%	16V	
		DIODE				
D1	8-719-941-48	DIODE 1N4148TP				
		IC				
IC1	8-759-108-77	IC CX877				
		TRANSISTOR				
Q1	8-729-100-01	TRANSISTOR 2SD992-N				
Q2	8-729-100-01	TRANSISTOR 2SD992-N				
Q3	8-729-100-01	TRANSISTOR 2SD992-N				
Q4	8-729-100-01	TRANSISTOR 2SD992-N				
Q5	8-729-100-01	TRANSISTOR 2SD992-N				
Q6	8-729-100-01	TRANSISTOR 2SD992-N				
		RESISTOR				
R1	1-247-823-00	CARBON	470	5%	1/6W	
R2	1-247-823-00	CARBON	470	5%	1/6W	
R3	1-247-823-00	CARBON	470	5%	1/6W	
R4	1-247-829-00	CARBON	820	5%	1/6W	
R5	1-247-871-00	CARBON	47K	5%	1/6W	
R6	1-247-871-00	CARBON	47K	5%	1/6W	
R7	1-247-871-00	CARBON	47K	5%	1/6W	
R8	1-247-871-00	CARBON	47K	5%	1/6W	
		DIODE				
S1	8-719-810-31	DIODE THS103-1				
S2	8-719-810-31	DIODE THS103-1				
	*A-6707-464-A	TM BOARD, COMPLETE **********				
		CAPACITOR				
C001	1-123-382-00	ELECT	3.3MF	20%	50V	
C003	1-123-298-00	ELECT	470MF	20%	6.3V	
C004	1-161-773-00	CERAMIC	0.1MF	20%	25V	
C005	1-102-525-00	CERAMIC	68PF	5%	50V	
C006	1-102-852-00	CERAMIC	47PF	5%	50V	
C008	1-123-357-00	ELECT	22MF	20%	50V	
C009	1-161-055-00	CERAMIC	0.022MF	10%	50V	
C010	1-161-055-00	CERAMIC	0.022MF	10%	50V	
C011	1-161-773-00	CERAMIC	0.1MF	20%	25V	
		DIODE				
D001	8-719-812-31	DIODE TLR123				
D002	8-719-911-19	DIODE 1SS119				
D003	8-719-911-19	DIODE 1SS119				
D004	8-719-162-07	DIODE RD6.2E-B				
D005	8-719-162-07	DIODE RD6.2E-B				
		FLUORESCENT INDICATOR				
FL001	1-519-322-11	INDICATOR, FLUORESCENT				
		IC				
IC001	8-759-911-09	IC MB88525B-112M				
IC002	8-759-913-41	IC S-8054ALB				
		COIL				
L001	1-407-492-00	MICRO INDUCTOR 1MMH				
L002	1-407-177-XX	MICRO INDUCTOR 470UH				
		TRANSISTOR				
Q001	8-729-245-83	TRANSISTOR 2SC2458				
Q002	8-729-245-83	TRANSISTOR 2SC2458				
Q003	8-729-204-83	TRANSISTOR 2SA1048-GR				
Q004	8-729-900-89	TRANSISTOR DTC144ES				
Q005	8-729-245-83	TRANSISTOR 2SC2458				
		RESISTOR				
R001	1-247-867-00	CARBON	33K	5%	1/6W	
R002	1-247-874-00	CARBON	62K	5%	1/6W	
R003	1-247-872-00	CARBON	51K	5%	1/6W	
R004	1-247-873-00	CARBON	56K	5%	1/6W	
R005	1-247-869-00	CARBON	39K	5%	1/6W	
R006	1-247-885-00	CARBON	180K	5%	1/6W	
R007	1-247-879-00	CARBON	100K	5%	1/6W	
R008	1-247-867-00	CARBON	33K	5%	1/6W	
R010	1-247-879-00	CARBON	100K	5%	1/6W	
R024	1-247-867-00	CARBON	33K	5%	1/6W	
R025	1-247-833-00	CARBON	1.2K	5%	1/6W	
R026	1-247-883-00	CARBON	150K	5%	1/6W	
R027	1-247-883-00	CARBON	150K	5%	1/6W	
R028	1-247-883-00	CARBON	150K	5%	1/6W	
R029	1-247-883-00	CARBON	150K	5%	1/6W	
R030	1-247-883-00	CARBON	150K	5%	1/6W	
R031	1-247-883-00	CARBON	150K	5%	1/6W	
R032	1-247-883-00	CARBON	150K	5%	1/6W	
R033	1-247-883-00	CARBON	150K	5%	1/6W	
R034	1-247-883-00	CARBON	150K	5%	1/6W	
R035	1-247-883-00	CARBON	150K	5%	1/6W	
R036	1-247-883-00	CARBON	150K	5%	1/6W	
R037	1-247-883-00	CARBON	150K	5%	1/6W	
R038	1-247-883-00	CARBON	150K	5%	1/6W	
R039	1-247-883-00	CARBON	150K	5%	1/6W	

Ref.No	Part No.	Description				Remark
R040	1-247-883-00	CARBON	150K	5%	1/6W	
R041	1-247-883-00	CARBON	150K	5%	1/6W	
R042	1-247-883-00	CARBON	150K	5%	1/6W	
R043	1-247-883-00	CARBON	150K	5%	1/6W	
R044	1-247-883-00	CARBON	150K	5%	1/6W	
R045	1-247-839-00	CARBON	2.2K	5%	1/6W	
R046	1-247-827-00	CARBON	680	5%	1/6W	
R047	1-247-847-00	CARBON	4.7K	5%	1/6W	
R048	1-247-863-00	CARBON	22K	5%	1/6W	
		VARIABLE RESISTOR				
RV001	1-228-749-00	RES, ADJ, CARBON 22K				
		SWITCH				
S002	1-554-174-00	SWITCH, KEY BOARD				
S004	1-554-174-00	SWITCH, KEY BOARD				
S012	1-554-174-00	SWITCH, KEY BOARD				
		CERAMIC TRIMMER				
TC001	1-141-022-21	CAP, TRIMMER, CERAMIC				
		CRYSTAL				
X001	1-567-098-00	VIBRATOR, CRYSTAL				
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	*1-613-230-11	TM-58 BOARD **********				
		SWITCH				
S003	1-554-174-00	SWITCH, KEY BOARD				
S005	1-554-174-00	SWITCH, KEY BOARD				
S006	1-554-174-00	SWITCH, KEY BOARD				
S007	1-554-174-00	SWITCH, KEY BOARD				
S008	1-554-174-00	SWITCH, KEY BOARD				
S009	1-554-174-00	SWITCH, KEY BOARD				
S010	1-554-174-00	SWITCH, KEY BOARD				
S011	1-554-174-00	SWITCH, KEY BOARD				
S013	1-554-837-11	SWITCH, SLIDE				
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	*A-6711-565-A	RP-20 BOARD, COMPLETE **********				
	*3-687-522-01	LID, BOTTOM, SHIELD CASE, RP				
	*3-687-533-01	CASE (MAIN), SHIELD, RP				
	3-703-150-11	CLAMP				
		CAPACITOR				
C503	1-161-059-00	CERAMIC	0.047MF	20%	25V	
C504	1-161-059-00	CERAMIC	0.047MF	20%	25V	
C505	1-161-059-00	CERAMIC	0.047MF	20%	25V	
C506	1-123-318-00	ELECT	33MF	20%	10V	
C510	1-161-059-00	CERAMIC	0.047MF	20%	25V	

Ref.No	Part No.	Description				Remark
C511	1-161-059-00	CERAMIC	0.047MF	20%	25V	
C512	1-102-953-00	CERAMIC	18PF	5%	50V	
C513	1-102-953-00	CERAMIC	18PF	5%	50V	
C514	1-123-381-00	ELECT	2.2MF	20%	50V	
C515	1-161-047-00	CERAMIC	0.0047MF	10%	25V	
C516	1-161-055-00	CERAMIC	0.022MF	10%	25V	
C517	1-123-356-00	ELECT	10MF	20%	16V	
C518	1-102-953-00	CERAMIC	18PF	5%	50V	
C519	1-161-032-00	CERAMIC	0.01MF	20%	25V	
C520	1-161-032-00	CERAMIC	0.01MF	20%	25V	
C521	1-123-356-00	ELECT	10MF	20%	16V	
C522	1-102-114-00	CERAMIC	470PF	10%	50V	
C523	1-161-055-00	CERAMIC	0.022MF	10%	25V	
C524	1-161-055-00	CERAMIC	0.022MF	10%	25V	
C525	1-102-953-00	CERAMIC	18PF	5%	50V	
C526	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C527	1-161-773-00	CERAMIC	0.1MF	20%	25V	
C529	1-123-380-00	ELECT	1MF	20%	50V	
C532	1-123-380-00	ELECT	1MF	20%	50V	
C536	1-102-942-00	CERAMIC	5PF	0.5PF	50V	
C539	1-161-032-00	CERAMIC	0.01MF	20%	25V	
C542	1-161-032-00	CERAMIC	0.01MF	20%	25V	
C543	1-123-332-00	ELECT	47MF	20%	16V	
C544	1-123-332-00	ELECT	47MF	20%	16V	
C545	1-161-032-00	CERAMIC	0.01MF	20%	25V	
C546	1-131-500-51	TANTALUM	2.2MF	20%	16V	
C550	1-161-032-00	CERAMIC	0.01MF	20%	25V	
C553	1-161-059-00	CERAMIC	0.047MF	20%	25V	
C554	1-102-128-00	CERAMIC	0.0082MF	10%	50V	
		CONNECTOR				
CN501	*1-508-848-00	PIN, CONNECTOR 6P				
CN502	*1-564-031-00	PIN, CONNECTOR 6P				
CN503	*1-508-846-00	PIN, CONNECTOR 8P				
CN504	*1-508-845-00	PIN, CONNECTOR 6P				
CN505	*1-564-027-00	PIN, CONNECTOR 2P				
		IC				
IC501	8-758-620-00	IC CX862				
IC503	8-751-340-00	IC CX134A				
		COIL				
L502	1-408-030-00	MICRO INDUCTOR 0.68UH				
L504	1-408-030-00	MICRO INDUCTOR 0.68UH				
L505	1-408-158-00	MICRO INDUCTOR 6.8MMH				
L506	1-408-414-00	MICRO INDUCTOR 27UH				
L507	1-408-158-00	MICRO INDUCTOR 6.8MMH				
L508	1-408-414-00	MICRO INDUCTOR 27UH				
L509	1-408-417-00	MICRO INDUCTOR 47UH				
L512	1-408-454-00	MICRO INDUCTOR 100UH				
L513	1-407-717-00	MICRO INDUCTOR 1MMH				
L516	1-408-422-00	MICRO INDUCTOR 120UH				
L517	1-407-495-00	MICRO INDUCTOR 1.8MMH				

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

RP-20 YC-31

Ref.No	Part No.	Description				Remark
		TRANSISTOR				
Q501	8-729-900-36	TRANSISTOR DTC124ES				
Q502	8-729-204-83	TRANSISTOR 2SA1048-GR				
Q503	8-729-177-43	TRANSISTOR 2SD774				
Q508	8-729-245-83	TRANSISTOR 2SC2458				
		RESISTOR				
R503	1-247-844-00	CARBON	3.6K	5%	1/6W	
R504	1-247-852-00	CARBON	7.5K	5%	1/6W	
R505	1-247-855-00	CARBON	10K	5%	1/6W	
R506	1-247-831-00	CARBON	1K	5%	1/6W	
R507	1-247-867-00	CARBON	33K	5%	1/6W	
R515	1-247-831-00	CARBON	1K	5%	1/6W	
R517	1-247-824-00	CARBON	510	5%	1/6W	
R518	1-247-824-00	CARBON	510	5%	1/6W	
R519	1-247-779-00	CARBON	6.8	5%	1/6W	
R520	1-247-822-00	CARBON	430	5%	1/6W	
R521	1-247-855-00	CARBON	10K	5%	1/6W	
R522 ⚠	1-212-855-00	FUSIBLE	8.2	5%	1/4W	F
R523	1-247-839-00	CARBON	2.2K	5%	1/6W	
R524	1-247-839-00	CARBON	2.2K	5%	1/6W	
R525	1-247-839-00	CARBON	2.2K	5%	1/6W	
R526	1-247-839-00	CARBON	2.2K	5%	1/6W	
R527	1-247-831-00	CARBON	1K	5%	1/6W	
R528	1-247-831-00	CARBON	1K	5%	1/6W	
R529	1-247-825-00	CARBON	560	5%	1/6W	
R530	1-247-835-00	CARBON	1.5K	5%	1/6W	
R531 ⚠	1-212-855-00	FUSIBLE	8.2	5%	1/4W	F
R533	1-247-847-00	CARBON	4.7K	5%	1/6W	
R534	1-247-839-00	CARBON	2.2K	5%	1/6W	
R535	1-247-849-00	CARBON	5.6K	5%	1/6W	
R536	1-247-849-00	CARBON	5.6K	5%	1/6W	
R537	1-247-809-00	CARBON	120	5%	1/6W	
R540	1-247-819-00	CARBON	330	5%	1/6W	
R543	1-247-819-00	CARBON	330	5%	1/6W	
R545	1-247-844-00	CARBON	3.6K	5%	1/6W	
R546	1-247-844-00	CARBON	3.6K	5%	1/6W	
R547	1-247-828-00	CARBON	750	5%	1/6W	
R548	1-247-807-00	CARBON	100	5%	1/6W	
R549	1-247-831-00	CARBON	1K	5%	1/6W	
R550	1-247-831-00	CARBON	1K	5%	1/6W	
R551	1-247-835-00	CARBON	1.5K	5%	1/6W	
R552	1-247-835-00	CARBON	1.5K	5%	1/6W	
R557	1-247-815-00	CARBON	220	5%	1/6W	
R559	1-247-831-00	CARBON	1K	5%	1/6W	
		VARIABLE RESISTOR				
RV501	1-228-920-00	RES, ADJ, CARBON 2.2K				
RV502	1-228-920-00	RES, ADJ, CARBON 2.2K				
RV503	1-228-920-00	RES, ADJ, CARBON 2.2K				

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Ref.No	Part No.	Description			Remark
	*A-6711-566-A	YC-31 BOARD, COMPLETE			
		**********			
	*1-536-870-11	TERMINAL BOARD, CONTROL PANEL			
		BAND PASS FILTER			
BPF001	1-235-098-00	FILTER, BAND PASS			
		CAPACITOR			
C002	1-123-356-00	ELECT	10MF	20%	16V
C010	1-123-356-00	ELECT	10MF	20%	16V
C011	1-123-356-00	ELECT	10MF	20%	25V
C013	1-123-306-00	ELECT	47MF	20%	10V
C014	1-123-381-00	ELECT	2.2MF	20%	50V
C015	1-123-306-00	ELECT	47MF	20%	10V
C016	1-108-589-00	MYLAR	0.027MF	5%	50V
C017	1-101-004-00	CERAMIC	0.01MF		50V
C018	1-123-306-00	ELECT	47MF	20%	10V
C019	1-101-004-00	CERAMIC	0.01MF		50V
C020	1-101-004-00	CERAMIC	0.01MF		50V
C021	1-101-004-00	CERAMIC	0.01MF		50V
C023	1-101-882-00	CERAMIC	51PF	5%	50V
C024	1-130-047-00	FILM	180PF	5%	50V
C025	1-106-172-00	MYLAR	0.001MF	5%	50V
C026	1-101-059-00	CERAMIC	510PF	5%	50V
C027	1-161-045-00	CERAMIC	0.0033MF	10%	25V
C028	1-106-172-00	MYLAR	0.001MF	5%	50V
C029	1-123-382-00	ELECT	3.3MF	20%	50V
C031	1-101-004-00	CERAMIC	0.01MF		50V
C032	1-102-816-00	CERAMIC	120PF	5%	50V
C033	1-101-004-00	CERAMIC	0.01MF		50V
C034	1-101-004-00	CERAMIC	0.01MF		50V
C035	1-102-816-00	CERAMIC	120PF	5%	50V
C036	1-101-882-00	CERAMIC	51PF	5%	50V
C037	1-101-004-00	CERAMIC	0.01MF		50V
C038	1-101-004-00	CERAMIC	0.01MF		50V
C039	1-101-004-00	CERAMIC	0.01MF		50V
C040	1-101-004-00	CERAMIC	0.01MF		50V
C041	1-161-043-00	CERAMIC	0.0022MF	10%	25V
C042	1-102-516-00	CERAMIC	27PF	5%	50V
C043	1-101-004-00	CERAMIC	0.01MF		50V
C044	1-101-004-00	CERAMIC	0.01MF		50V
C045	1-102-523-00	CERAMIC	56PF	5%	50V
C046	1-101-004-00	CERAMIC	0.01MF		50V
C047	1-101-004-00	CERAMIC	0.01MF		50V
C048	1-101-004-00	CERAMIC	0.01MF		50V
C049	1-101-004-00	CERAMIC	0.01MF		50V
C050	1-102-865-00	CERAMIC	8PF	0.5PF	50V
C051	1-102-525-00	CERAMIC	68PF	5%	50V
C052	1-102-525-00	CERAMIC	68PF	5%	50V
C053	1-123-379-00	ELECT	0.47MF	20%	50V
C054	1-161-002-00	CERAMIC	0.0012MF	10%	25V
C055	1-123-380-00	ELECT	1MF	20%	50V

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

Ref.No	Part No.	Description			Remark
C056	1-102-962-00	CERAMIC	30PF	5%	50V
C057	1-102-981-00	CERAMIC	300PF	5%	50V
C058	1-123-306-00	ELECT	47MF	20%	10V
C059	1-101-004-00	CERAMIC	0.01MF		50V
C060	1-108-579-00	MYLAR	0.01MF	5%	50V
C061	1-123-382-00	ELECT	3.3MF	20%	50V
C062	1-123-306-00	ELECT	47MF	20%	10V
C063	1-101-004-00	CERAMIC	0.01MF		50V
C064	1-102-521-00	CERAMIC	43PF	5%	50V
C065	1-102-527-00	CERAMIC	82PF	5%	50V
C066	1-102-518-00	CERAMIC	33PF	5%	50V
C067	1-161-025-00	CERAMIC	0.1MF	10%	25V
C068	1-101-004-00	CERAMIC	0.01MF		50V
C069	1-102-962-00	CERAMIC	30PF	5%	50V
C070	1-101-004-00	CERAMIC	0.01MF		50V
C071	1-123-380-00	ELECT	1MF	20%	50V
C072	1-101-004-00	CERAMIC	0.01MF		50V
C073	1-102-525-00	CERAMIC	68PF	5%	50V
C074	1-102-525-00	CERAMIC	68PF	5%	50V
C075	1-101-004-00	CERAMIC	0.01MF		50V
C076	1-102-951-00	CERAMIC	15PF	5%	50V
C077	1-123-330-00	ELECT	22MF	20%	16V
C078	1-123-330-00	ELECT	22MF	20%	16V
C080	1-101-004-00	CERAMIC	0.01MF		50V
C082	1-161-024-00	CERAMIC	0.082MF	10%	25V
C083	1-102-977-00	CERAMIC	200PF	5%	50V
C084	1-123-369-00	ELECT	4.7MF	20%	25V
C085	1-101-004-00	CERAMIC	0.01MF		50V
C086	1-108-557-00	MYLAR	0.0012MF	5%	50V
C087	1-161-057-00	CERAMIC	0.033MF	10%	25V
C088	1-101-361-00	CERAMIC	150PF	5%	50V
C092	1-101-004-00	CERAMIC	0.01MF		50V
C093	1-101-006-00	CERAMIC	0.047MF		50V
C095	1-102-976-00	CERAMIC	180PF	5%	50V
C096	1-102-824-00	CERAMIC	470PF	5%	50V
C097	1-102-823-00	CERAMIC	430PF	5%	50V
C098	1-102-820-00	CERAMIC	330PF	5%	50V
C099	1-102-851-00	CERAMIC	15PF	5%	50V
C100	1-161-025-00	CERAMIC	0.1MF	10%	25V
C101	1-108-595-00	MYLAR	0.047MF	5%	50V
C102	1-161-043-00	CERAMIC	0.0022MF	10%	25V
C103	1-106-172-00	MYLAR	0.001MF	5%	50V
C104	1-102-977-00	CERAMIC	200PF	5%	50V
C105	1-102-973-00	CERAMIC	100PF	5%	50V
C106	1-123-356-00	ELECT	10MF	20%	16V
C107	1-161-025-00	CERAMIC	0.1MF	10%	25V
C108	1-101-004-00	CERAMIC	0.01MF		50V
C109	1-101-004-00	CERAMIC	0.01MF		50V
C111	1-101-882-00	CERAMIC	51PF	5%	50V
C112	1-101-004-00	CERAMIC	0.01MF		50V
C113	1-101-006-00	CERAMIC	0.047MF		50V
C114	1-101-880-00	CERAMIC	47PF	5%	50V
C116	1-101-004-00	CERAMIC	0.01MF		50V
C117	1-101-361-00	CERAMIC	150PF	5%	50V
C118	1-101-004-00	CERAMIC	0.01MF		50V
C119	1-123-306-00	ELECT	47MF	20%	10V
C120	1-101-004-00	CERAMIC	0.01MF		50V
C121	1-101-004-00	CERAMIC	0.01MF		50V
C122	1-101-004-00	CERAMIC	0.01MF		50V
C123	1-101-004-00	CERAMIC	0.01MF		50V
C124	1-102-948-00	CERAMIC	11PF	5%	50V
C125	1-123-330-00	ELECT	22MF	20%	16V
C127	1-123-318-00	ELECT	33MF	20%	16V
C128	1-123-330-00	ELECT	22MF	20%	16V
C129	1-123-330-00	ELECT	22MF	20%	16V
C130	1-123-356-00	ELECT	10MF	20%	16V
C131	1-123-380-00	ELECT	1MF	20%	50V
C132	1-123-369-00	ELECT	4.7MF	20%	25V
C133	1-102-851-00	CERAMIC	15PF	5%	50V
C134	1-102-821-00	CERAMIC	360PF	5%	50V
C135	1-102-823-00	CERAMIC	430PF	5%	50V
C136	1-102-976-00	CERAMIC	180PF	5%	50V
C137	1-102-513-00	CERAMIC	18PF	5%	50V
C138	1-102-529-00	CERAMIC	100PF	5%	50V
C139	1-102-530-00	CERAMIC	120PF	5%	50V
C140	1-102-519-00	CERAMIC	36PF	5%	50V
C141	1-102-529-00	CERAMIC	100PF	5%	50V
C142	1-123-369-00	ELECT	4.7MF	20%	25V
C144	1-102-511-00	CERAMIC	13PF	5%	50V
C145	1-102-522-00	CERAMIC	51PF	5%	50V
C146	1-102-522-00	CERAMIC	51PF	5%	50V
C147	1-102-511-00	CERAMIC	13PF	5%	50V
C148	1-101-006-00	CERAMIC	0.047MF		50V
C155	1-101-004-00	CERAMIC	0.01MF		50V
C156	1-101-004-00	CERAMIC	0.01MF		50V
C157	1-102-981-00	CERAMIC	300PF	5%	50V
C158	1-102-948-00	CERAMIC	11PF	5%	50V
C159	1-102-822-00	CERAMIC	390PF	5%	50V
C178	1-123-330-00	ELECT	22MF	20%	16V
C179	1-123-356-00	ELECT	10MF	20%	16V
C180	1-123-332-00	ELECT	47MF	20%	16V
C181	1-106-186-00	MYLAR	0.0039MF	5%	50V
C182	1-123-380-00	ELECT	1MF	20%	50V
C183	1-101-006-00	CERAMIC	0.047MF		50V
C184	1-123-332-00	ELECT	47MF	20%	16V
C185	1-123-333-00	ELECT	100MF	20%	16V
C186	1-101-004-00	CERAMIC	0.01MF		50V
C187	1-123-330-00	ELECT	22MF	20%	16V
C188	1-161-025-00	CERAMIC	0.1MF	10%	25V
C189	1-123-356-00	ELECT	10MF	20%	16V
C190	1-123-311-00	ELECT	1000MF	20%	10V
C191	1-101-004-00	CERAMIC	0.01MF		50V
C192	1-123-369-00	ELECT	4.7MF	20%	25V
C196	1-123-380-00	ELECT	1MF	20%	50V
C197	1-123-356-00	ELECT	10MF	20%	16V
C198	1-102-980-00	CERAMIC	270PF	5%	50V

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

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Ref.No	Part No.	Description			Remark
C200	1-101-004-00	CERAMIC	0.01MF		50V
C201	1-123-356-00	ELECT	10MF	20%	16V
C203	1-101-004-00	CERAMIC	0.01MF		50V
C204	1-123-369-00	ELECT	4.7MF	20%	25V
C206	1-101-004-00	CERAMIC	0.01MF		50V
C207	1-161-025-00	CERAMIC	0.1MF	10%	25V
C208	1-123-356-00	ELECT	10MF	20%	16V
C211	1-123-356-00	ELECT	10MF	20%	16V
C212	1-123-333-00	ELECT	100MF	20%	16V
C217	1-161-025-00	CERAMIC	0.1MF	10%	25V
C219	1-123-356-00	ELECT	10MF	20%	16V
C220	1-161-059-00	CERAMIC	0.047MF	10%	25V
C241	1-161-025-00	CERAMIC	0.1MF	10%	25V
C243	1-161-025-00	CERAMIC	0.1MF	10%	25V
C246	1-161-025-00	CERAMIC	0.1MF	10%	25V
C248	1-161-059-00	CERAMIC	0.047MF	10%	25V
C251	1-161-059-00	CERAMIC	0.047MF	10%	25V
C252	1-101-081-00	CERAMIC	130PF	5%	50V
C253	1-123-356-00	ELECT	10MF	20%	16V
C257	1-161-059-00	CERAMIC	0.047MF	10%	25V
C258	1-161-059-00	CERAMIC	0.047MF	10%	25V
C401	1-123-381-00	ELECT	2.2MF	20%	50V
C402	1-101-001-00	CERAMIC	0.001MF		50V
C403	1-101-001-00	CERAMIC	0.001MF		50V
C404	1-101-004-00	CERAMIC	0.01MF		50V
C405	1-123-330-00	ELECT	22MF	20%	16V
C406	1-123-330-00	ELECT	22MF	20%	16V
C407	1-102-962-00	CERAMIC	30PF	5%	50V
C408	1-101-888-00	CERAMIC	68PF	5%	50V
C409	1-123-381-00	ELECT	2.2MF	20%	50V
C410	1-102-936-00	CERAMIC	3PF	0.25PF	50V
C411	1-101-005-00	CERAMIC	0.022MF		50V
C412	1-123-318-00	ELECT	33MF	20%	16V
C414	1-123-318-00	ELECT	33MF	20%	16V
C415	1-123-356-00	ELECT	10MF	20%	16V
C416	1-102-948-00	CERAMIC	11PF	5%	50V
C417	1-102-948-00	CERAMIC	11PF	5%	50V
C418	1-102-965-00	CERAMIC	39PF	5%	50V
C419	1-123-356-00	ELECT	10MF	20%	16V
C420	1-123-369-00	ELECT	4.7MF	20%	25V
C421	1-101-006-00	CERAMIC	0.047MF		50V
C501	1-101-004-00	CERAMIC	0.01MF		50V
C502	1-101-004-00	CERAMIC	0.01MF		50V
C503	1-101-004-00	CERAMIC	0.01MF		50V
C504	1-101-005-00	CERAMIC	0.022MF		50V
C505	1-102-822-00	CERAMIC	390PF	5%	50V
C506	1-101-006-00	CERAMIC	0.047MF		50V
C507	1-123-318-00	ELECT	33MF	20%	16V
C607	1-101-004-00	CERAMIC	0.01MF		50V
C608	1-161-059-00	CERAMIC	0.047MF	10%	25V
C609	1-101-006-00	CERAMIC	0.047MF		50V
C611	1-101-006-00	CERAMIC	0.047MF		50V
C613	1-101-004-00	CERAMIC	0.01MF		50V

Ref.No	Part No.	Description			Remark
C616	1-101-518-00	CERAMIC	33PF	5%	50V
C617	1-161-025-00	CERAMIC	0.1MF	10%	25V
C618	1-161-025-00	CERAMIC	0.1MF	10%	25V
C619	1-161-025-00	CERAMIC	0.1MF	10%	25V
C620	1-102-516-00	CERAMIC	27PF	5%	50V
		FILTER			
CF001	1-527-998-00	FILTER, CERAMIC			
CF002	1-527-875-00	FILTER, CERAMIC			
CF003	1-527-849-00	FILTER, CERAMIC			
		CONNECTOR			
CN001	*1-560-894-00	PIN, CONNECTOR 6P			
CN002	*1-560-896-00	PIN, CONNECTOR 8P			
CN003	*1-560-891-00	PIN, CONNECTOR 3P			
CN004	*1-560-894-00	PIN, CONNECTOR 6P			
CN005	*1-560-893-00	PIN, CONNECTOR 5P			
CN006	*1-560-893-00	PIN, CONNECTOR 5P			
CN007	*1-560-892-00	PIN, CONNECTOR 4P			
CN008	*1-560-895-00	PIN, CONNECTOR 7P			
		TRIMMER			
CV001	1-141-275-00	CAP, TRIMMER			
		DIODE			
D005	8-719-911-19	DIODE 1SS119			
D006	8-719-000-06	DIODE MC921			
D009	8-719-000-06	DIODE MC921			
D011	8-719-911-19	DIODE 1SS119			
D012	8-719-911-19	DIODE 1SS119			
D013	8-719-911-19	DIODE 1SS119			
D014	8-719-911-19	DIODE 1SS119			
D015	8-719-911-19	DIODE 1SS119			
D016	8-719-000-12	DIODE MC931			
D017	8-719-911-19	DIODE 1SS119			
D018	8-719-911-19	DIODE 1SS119			
D019	8-719-911-19	DIODE 1SS119			
D020	8-719-911-19	DIODE 1SS119			
D021	8-719-911-19	DIODE 1SS119			
D022	8-719-911-19	DIODE 1SS119			
D023	8-719-911-19	DIODE 1SS119			
D027	8-719-000-06	DIODE MC921			
D029	8-719-100-57	DIODE RD10E-B2			
D030	8-719-911-19	DIODE 1SS119			
D031	8-719-911-19	DIODE 1SS119			
D036	8-719-911-19	DIODE 1SS119			
		DELAY LINE			
DL001	1-415-313-00	DELAY LINE (1H)			
DL001	1-415-313-00	DELAY LINE (1H)			
DL401	1-415-352-11	DELAY LINE, 1H			
DL501	1-415-282-00	DELAY LINE			
DL501	1-415-282-00	DELAY LINE			

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

Ref.No	Part No.	Description	Remark
		IC	
IC001	8-759-909-20	IC BA634	
IC002	8-759-904-95	IC BA7007	
IC003	8-759-202-47	IC CX10023	
IC004	8-759-208-94	IC CX894	
IC005	8-752-006-10	IC CX20061	
IC006	8-759-202-00	IC CX10021A-NP	
IC009	8-759-101-62	IC CX20043	
IC011	8-752-006-10	IC CX20061	
IC012	8-759-979-26	IC CX7926	
IC401	8-758-662-00	IC CX-8668	
		COIL	
L001	1-407-499-00	MICRO INDUCTOR 3.9MMH	
L002	1-407-496-00	MICRO INDUCTOR 2.2MMH	
L003	1-408-408-00	MICRO INDUCTOR 8.2UH	
L004	1-408-406-00	MICRO INDUCTOR 5.6UH	
L005	1-408-415-00	MICRO INDUCTOR 33UH	
L006	1-408-428-00	MICRO INDUCTOR 390UH	
L007	1-408-427-00	MICRO INDUCTOR 330UH	
L008	1-408-421-00	MICRO INDUCTOR 100UH	
L010	1-408-427-00	MICRO INDUCTOR 330UH	
L011	1-408-423-00	MICRO INDUCTOR 150UH	
L012	1-408-409-00	MICRO INDUCTOR 10UH	
L014	1-408-422-00	MICRO INDUCTOR 120UH	
L015	1-408-419-00	MICRO INDUCTOR 68UH	
L016	1-408-413-00	MICRO INDUCTOR 22UH	
L017	1-408-423-00	MICRO INDUCTOR 150UH	
L018	1-408-419-00	MICRO INDUCTOR 68UH	
L019	1-408-416-00	MICRO INDUCTOR 39UH	
L020	1-408-416-00	MICRO INDUCTOR 39UH	
L021	1-408-422-00	MICRO INDUCTOR 120UH	
L022	1-408-424-00	MICRO INDUCTOR 180UH	
L023	1-408-422-00	MICRO INDUCTOR 120UH	
L026	1-408-416-00	MICRO INDUCTOR 39UH	
L036	1-408-429-00	MICRO INDUCTOR 470UH	
L041	1-408-424-00	MICRO INDUCTOR 180UH	
L401	1-408-397-00	MICRO INDUCTOR 1UH	
L402	1-408-397-00	MICRO INDUCTOR 1UH	
L501	1-408-408-00	MICRO INDUCTOR 8.2UH	
L502	1-408-423-00	MICRO INDUCTOR 150UH	
L601	1-408-416-00	MICRO INDUCTOR 39UH	
L602	1-408-416-00	MICRO INDUCTOR 39UH	
		LOW PASS FILTER	
LPF001	1-235-097-00	FILTER, LOW PASS	
		VARIABLE COIL	
LV001	1-407-291-00	MICRO INDUCTOR 15MMH	
LV002	1-407-573-00	COIL, VARIABLE 47UH	
LV003	1-407-571-00	COIL, VARIABLE 22UH	
LV501	1-407-569-00	COIL, VARIABLE 10UH	

Ref.No	Part No.	Description	Remark
		IC LINK	
PS001 ⚠	1-532-685-00	LINK, IC 0.8A	
		TRANSISTOR	
Q010	8-729-177-43	TRANSISTOR 2SD774	
Q011	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q015	8-729-245-83	TRANSISTOR 2SC2458	
Q016	8-729-245-83	TRANSISTOR 2SC2458	
Q019	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q020	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q021	8-729-245-83	TRANSISTOR 2SC2458	
Q022	8-729-245-83	TRANSISTOR 2SC2458	
Q023	8-729-245-83	TRANSISTOR 2SC2458	
Q024	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q025	8-729-245-83	TRANSISTOR 2SC2458	
Q026	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q027	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q028	8-729-245-83	TRANSISTOR 2SC2458	
Q029	8-729-245-83	TRANSISTOR 2SC2458	
Q030	8-729-245-83	TRANSISTOR 2SC2458	
Q031	8-729-900-36	TRANSISTOR DTC124ES	
Q032	8-729-245-83	TRANSISTOR 2SC2458	
Q033	8-729-245-83	TRANSISTOR 2SC2458	
Q034	8-729-245-83	TRANSISTOR 2SC2458	
Q035	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q036	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q037	8-729-384-46	TRANSISTOR 2SA844-C	
Q038	8-729-384-46	TRANSISTOR 2SA844-C	
Q039	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q040	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q041	8-729-384-46	TRANSISTOR 2SA844-C	
Q042	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q043	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q044	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q045	8-729-384-46	TRANSISTOR 2SA844-C	
Q047	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q048	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q049	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q050	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q051	8-729-384-46	TRANSISTOR 2SA844-C	
Q052	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q053	8-729-384-46	TRANSISTOR 2SA844-C	
Q054	8-729-384-46	TRANSISTOR 2SA844-C	
Q055	8-729-384-46	TRANSISTOR 2SA844-C	
Q056	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q060	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q061	8-729-245-83	TRANSISTOR 2SC2458	
Q062	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q063	8-729-245-83	TRANSISTOR 2SC2458	
Q064	8-729-245-83	TRANSISTOR 2SC2458	
Q065	8-729-245-83	TRANSISTOR 2SC2458	
Q067	8-729-245-83	TRANSISTOR 2SC2458	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

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Ref.No	Part No.	Description	Remark
Q068	8-729-245-83	TRANSISTOR 2SC2458	
Q069	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q071	8-729-245-83	TRANSISTOR 2SC2458	
Q075	8-729-900-85	TRANSISTOR DTC144WS	
Q100	8-729-900-85	TRANSISTOR DTC144WS	
Q101	8-729-900-89	TRANSISTOR DTC144ES	
Q102	8-729-900-65	TRANSISTOR DTA144ES	
Q103	8-729-245-83	TRANSISTOR 2SC2458	
Q401	8-729-245-83	TRANSISTOR 2SC2458	
Q501	8-729-245-83	TRANSISTOR 2SC2458	
Q502	8-729-245-83	TRANSISTOR 2SC2458	
Q503	8-729-245-83	TRANSISTOR 2SC2458	
Q504	8-729-245-83	TRANSISTOR 2SC2458	
Q617	8-729-205-02	TRANSISTOR 2SA1150	
Q620	8-729-204-83	TRANSISTOR 2SA1048-GR	

RESISTOR

Ref.No	Part No.	Description				Remark
R026	1-247-871-00	CARBON	47K	5%	1/6W	
R028	1-247-855-00	CARBON	10K	5%	1/6W	
R029	1-247-855-00	CARBON	10K	5%	1/6W	
R030	1-247-867-00	CARBON	33K	5%	1/6W	
R032	1-247-823-00	CARBON	470	5%	1/6W	
R035	1-247-859-00	CARBON	15K	5%	1/6W	
R037	1-247-869-00	CARBON	39K	5%	1/6W	
R038	1-247-837-00	CARBON	1.8K	5%	1/6W	
R041	1-247-838-00	CARBON	2K	5%	1/6W	
R046	1-247-835-00	CARBON	1.5K	5%	1/6W	
R047	1-247-879-00	CARBON	100K	5%	1/6W	
R048	1-247-831-00	CARBON	1K	5%	1/6W	
R049	1-247-863-00	CARBON	22K	5%	1/6W	
R050	1-247-853-00	CARBON	8.2K	5%	1/6W	
R051	1-247-821-00	CARBON	390	5%	1/6W	
R052	1-247-819-00	CARBON	330	5%	1/6W	
R053	1-247-843-00	CARBON	3.3K	5%	1/6W	
R054	1-247-847-00	CARBON	4.7K	5%	1/6W	
R055	1-247-849-00	CARBON	5.6K	5%	1/6W	
R056	1-247-867-00	CARBON	33K	5%	1/6W	
R058	1-247-855-00	CARBON	10K	5%	1/6W	
R059	1-247-859-00	CARBON	15K	5%	1/6W	
R060	1-247-867-00	CARBON	33K	5%	1/6W	
R061	1-247-855-00	CARBON	10K	5%	1/6W	
R062	1-247-855-00	CARBON	10K	5%	1/6W	
R063	1-247-841-00	CARBON	2.7K	5%	1/6W	
R064	1-247-848-00	CARBON	5.1K	5%	1/6W	
R065	1-247-889-00	CARBON	270K	5%	1/6W	
R066	1-247-870-00	CARBON	43K	5%	1/6W	
R067	1-247-862-00	CARBON	20K	5%	1/6W	
R068	1-247-838-00	CARBON	2K	5%	1/6W	
R069	1-247-831-00	CARBON	1K	5%	1/6W	
R070	1-247-831-00	CARBON	1K	5%	1/6W	
R071	1-247-855-00	CARBON	10K	5%	1/6W	
R072	1-247-841-00	CARBON	2.7K	5%	1/6W	
R073	1-247-831-00	CARBON	1K	5%	1/6W	
R074	1-247-831-00	CARBON	1K	5%	1/6W	
R075	1-247-815-00	CARBON	220	5%	1/6W	
R076	1-247-855-00	CARBON	10K	5%	1/6W	
R077	1-247-855-00	CARBON	10K	5%	1/6W	
R078	1-247-867-00	CARBON	33K	5%	1/6W	
R079	1-247-855-00	CARBON	10K	5%	1/6W	
R080	1-247-853-00	CARBON	8.2K	5%	1/6W	
R081	1-247-843-00	CARBON	3.3K	5%	1/6W	
R082	1-247-871-00	CARBON	47K	5%	1/6W	
R083	1-247-825-00	CARBON	560	5%	1/6W	
R084	1-247-831-00	CARBON	1K	5%	1/6W	
R085	1-247-803-00	CARBON	68	5%	1/6W	
R086	1-247-825-00	CARBON	560	5%	1/6W	
R087	1-247-825-00	CARBON	560	5%	1/6W	
R088	1-247-807-00	CARBON	100	5%	1/6W	
R091	1-247-824-00	CARBON	510	5%	1/6W	
R092	1-247-791-00	CARBON	22	5%	1/6W	
R093	1-247-806-00	CARBON	91	5%	1/6W	
R094	1-247-869-00	CARBON	39K	5%	1/6W	
R095	1-247-872-00	CARBON	51K	5%	1/6W	
R096	1-247-879-00	CARBON	100K	5%	1/6W	
R097	1-247-882-00	CARBON	130K	5%	1/6W	
R098	1-247-890-00	CARBON	300K	5%	1/6W	
R100	1-247-869-00	CARBON	39K	5%	1/6W	
R101	1-247-864-00	CARBON	24K	5%	1/6W	
R103	1-247-831-00	CARBON	1K	5%	1/6W	
R104	1-247-839-00	CARBON	2.2K	5%	1/6W	
R105	1-247-829-00	CARBON	820	5%	1/6W	
R106	1-247-831-00	CARBON	1K	5%	1/6W	
R107	1-247-824-00	CARBON	510	5%	1/6W	
R108	1-247-843-00	CARBON	3.3K	5%	1/6W	
R109	1-247-867-00	CARBON	33K	5%	1/6W	
R111	1-247-846-00	CARBON	4.3K	5%	1/6W	
R112	1-247-854-00	CARBON	9.1K	5%	1/6W	
R113	1-247-843-00	CARBON	3.3K	5%	1/6W	
R114	1-247-828-00	CARBON	750	5%	1/6W	
R115	1-247-879-00	CARBON	100K	5%	1/6W	
R116	1-247-853-00	CARBON	8.2K	5%	1/6W	
R117	1-247-846-00	CARBON	4.3K	5%	1/6W	
R120	1-247-831-00	CARBON	1K	5%	1/6W	
R121	1-247-831-00	CARBON	1K	5%	1/6W	
R122	1-247-839-00	CARBON	2.2K	5%	1/6W	
R123	1-247-841-00	CARBON	2.7K	5%	1/6W	
R124	1-247-819-00	CARBON	330	5%	1/6W	
R125	1-247-831-00	CARBON	1K	5%	1/6W	
R126	1-247-831-00	CARBON	1K	5%	1/6W	
R127	1-247-835-00	CARBON	1.5K	5%	1/6W	
R128	1-247-831-00	CARBON	1K	5%	1/6W	
R129	1-247-867-00	CARBON	33K	5%	1/6W	
R130	1-247-842-00	CARBON	3K	5%	1/6W	
R131	1-247-841-00	CARBON	2.7K	5%	1/6W	
R132	1-247-887-00	CARBON	220K	5%	1/6W	
R134	1-247-847-00	CARBON	4.7K	5%	1/6W	

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

Ref.No	Part No.	Description				Remark
R135	1-247-883-00	CARBON	150K	5%	1/6W	
R136	1-247-879-00	CARBON	100K	5%	1/6W	
R137	1-247-857-00	CARBON	12K	5%	1/6W	
R138	1-247-861-00	CARBON	18K	5%	1/6W	
R139	1-247-841-00	CARBON	2.7K	5%	1/6W	
R140	1-247-867-00	CARBON	33K	5%	1/6W	
R141	1-247-831-00	CARBON	1K	5%	1/6W	
R142	1-247-842-00	CARBON	3K	5%	1/6W	
R143	1-247-855-00	CARBON	10K	5%	1/6W	
R144	1-247-824-00	CARBON	510	5%	1/6W	
R145	1-247-838-00	CARBON	2K	5%	1/6W	
R146	1-247-829-00	CARBON	820	5%	1/6W	
R147	1-247-855-00	CARBON	10K	5%	1/6W	
R148	1-247-831-00	CARBON	1K	5%	1/6W	
R149	1-247-819-00	CARBON	330	5%	1/6W	
R150	1-247-863-00	CARBON	22K	5%	1/6W	
R151	1-247-812-00	CARBON	160	5%	1/6W	
R152	1-247-829-00	CARBON	820	5%	1/6W	
R153	1-247-863-00	CARBON	22K	5%	1/6W	
R154	1-247-821-00	CARBON	390	5%	1/6W	
R155	1-247-839-00	CARBON	2.2K	5%	1/6W	
R156	1-247-839-00	CARBON	2.2K	5%	1/6W	
R157	1-247-837-00	CARBON	1.8K	5%	1/6W	
R158	1-247-817-00	CARBON	270	5%	1/6W	
R159	1-247-810-00	CARBON	130	5%	1/6W	
R160	1-247-832-00	CARBON	1.1K	5%	1/6W	
R161	1-247-855-00	CARBON	10K	5%	1/6W	
R162	1-247-835-00	CARBON	1.5K	5%	1/6W	
R163	1-247-842-00	CARBON	3K	5%	1/6W	
R164	1-247-830-00	CARBON	910	5%	1/6W	
R165	1-247-834-00	CARBON	1.3K	5%	1/6W	
R166	1-247-818-00	CARBON	300	5%	1/6W	
R167	1-247-849-00	CARBON	5.6K	5%	1/6W	
R168	1-247-836-00	CARBON	1.6K	5%	1/6W	
R169	1-247-840-00	CARBON	2.4K	5%	1/6W	
R170	1-247-804-00	CARBON	75	5%	1/6W	
R171	1-247-901-00	CARBON	820K	5%	1/6W	
R172	1-247-857-00	CARBON	12K	5%	1/6W	
R173	1-247-861-00	CARBON	18K	5%	1/6W	
R174	1-247-839-00	CARBON	2.2K	5%	1/6W	
R175	1-247-831-00	CARBON	1K	5%	1/6W	
R176	1-247-839-00	CARBON	2.2K	5%	1/6W	
R178	1-247-839-00	CARBON	2.2K	5%	1/6W	
R179	1-247-843-00	CARBON	3.3K	5%	1/6W	
R180	1-247-835-00	CARBON	1.5K	5%	1/6W	
R181	1-247-835-00	CARBON	1.5K	5%	1/6W	
R185	1-247-843-00	CARBON	3.3K	5%	1/6W	
R186	1-247-830-00	CARBON	910	5%	1/6W	
R187	1-247-831-00	CARBON	1K	5%	1/6W	
R188	1-247-839-00	CARBON	2.2K	5%	1/6W	
R189	1-247-834-00	CARBON	1.3K	5%	1/6W	
R190	1-247-834-00	CARBON	1.3K	5%	1/6W	
R191	1-247-831-00	CARBON	1K	5%	1/6W	

Ref.No	Part No.	Description				Remark
R192	1-247-831-00	CARBON	1K	5%	1/6W	
R193	1-247-855-00	CARBON	10K	5%	1/6W	
R194	1-247-819-00	CARBON	330	5%	1/6W	
R195	1-247-812-00	CARBON	160	5%	1/6W	
R196	1-247-863-00	CARBON	22K	5%	1/6W	
R197	1-247-863-00	CARBON	22K	5%	1/6W	
R198	1-247-829-00	CARBON	820	5%	1/6W	
R199	1-247-821-00	CARBON	390	5%	1/6W	
R200	1-247-839-00	CARBON	2.2K	5%	1/6W	
R201	1-247-837-00	CARBON	1.8K	5%	1/6W	
R202	1-247-831-00	CARBON	1K	5%	1/6W	
R203	1-247-815-00	CARBON	220	5%	1/6W	
R204	1-247-811-00	CARBON	150	5%	1/6W	
R205	1-247-811-00	CARBON	150	5%	1/6W	
R206	1-247-834-00	CARBON	1.3K	5%	1/6W	
R207	1-247-874-00	CARBON	62K	5%	1/6W	
R208	1-247-874-00	CARBON	62K	5%	1/6W	
R209	1-247-833-00	CARBON	1.2K	5%	1/6W	
R210	1-247-824-00	CARBON	510	5%	1/6W	
R211	1-247-831-00	CARBON	1K	5%	1/6W	
R212	1-247-824-00	CARBON	510	5%	1/6W	
R213	1-247-829-00	CARBON	820	5%	1/6W	
R214	1-247-831-00	CARBON	1K	5%	1/6W	
R215	1-247-831-00	CARBON	1K	5%	1/6W	
R216	1-247-832-00	CARBON	1.1K	5%	1/6W	
R217	1-247-831-00	CARBON	1K	5%	1/6W	
R218	1-247-831-00	CARBON	1K	5%	1/6W	
R219	1-247-866-00	CARBON	30K	5%	1/6W	
R220	1-247-874-00	CARBON	62K	5%	1/6W	
R221	1-247-849-00	CARBON	5.6K	5%	1/6W	
R222	1-247-837-00	CARBON	1.8K	5%	1/6W	
R223	1-247-837-00	CARBON	1.8K	5%	1/6W	
R231	1-247-867-00	CARBON	33K	5%	1/6W	
R235	1-247-831-00	CARBON	1K	5%	1/6W	
R236	1-247-853-00	CARBON	8.2K	5%	1/6W	
R239	1-247-855-00	CARBON	10K	5%	1/6W	
R241	1-247-804-00	CARBON	75	5%	1/6W	
R242	1-247-879-00	CARBON	100K	5%	1/6W	
R243	1-247-855-00	CARBON	10K	5%	1/6W	
R244	1-247-851-00	CARBON	6.8K	5%	1/6W	
R245	1-247-879-00	CARBON	100K	5%	1/6W	
R246	1-247-871-00	CARBON	47K	5%	1/6W	
R247	1-247-871-00	CARBON	47K	5%	1/6W	
R248	1-247-818-00	CARBON	300	5%	1/6W	
R249	1-247-811-00	CARBON	150	5%	1/6W	
R250	1-247-808-00	CARBON	110	5%	1/6W	
R251	1-247-838-00	CARBON	2K	5%	1/6W	
R252	1-247-803-00	CARBON	68	5%	1/6W	
R254	1-247-855-00	CARBON	10K	5%	1/6W	
R255	1-247-858-00	CARBON	13K	5%	1/6W	
R256	1-247-843-00	CARBON	3.3K	5%	1/6W	
R257	1-247-835-00	CARBON	1.5K	5%	1/6W	
R258	1-247-852-00	CARBON	7.5K	5%	1/6W	

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

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Ref.No	Part No.	Description				Remark
R259	1-247-831-00	CARBON	1K	5%	1/6W	
R260	1-247-841-00	CARBON	2.7K	5%	1/6W	
R261	1-247-863-00	CARBON	22K	5%	1/6W	
R262	1-247-843-00	CARBON	3.3K	5%	1/6W	
R274	1-247-883-00	CARBON	150K	5%	1/6W	
R275	1-247-871-00	CARBON	47K	5%	1/6W	
R276	1-247-849-00	CARBON	5.6K	5%	1/6W	
R277	1-247-855-00	CARBON	10K	5%	1/6W	
R280	1-247-821-00	CARBON	390	5%	1/6W	
R281	1-247-883-00	CARBON	150K	5%	1/6W	
R282	1-247-819-00	CARBON	330	5%	1/6W	
R283	1-247-838-00	CARBON	2K	5%	1/6W	
R284	1-247-877-00	CARBON	82K	5%	1/6W	
R286	1-247-848-00	CARBON	5.1K	5%	1/6W	
R287	1-247-831-00	CARBON	1K	5%	1/6W	
R291	1-247-863-00	CARBON	22K	5%	1/6W	
R292	1-247-875-00	CARBON	68K	5%	1/6W	
R293	1-247-819-00	CARBON	330	5%	1/6W	
R295	1-247-839-00	CARBON	2.2K	5%	1/6W	
R296	1-247-811-00	CARBON	150	5%	1/6W	
R298	1-247-894-00	CARBON	430K	5%	1/6W	
R299	1-247-892-00	CARBON	360K	5%	1/6W	
R301	1-247-855-00	CARBON	10K	5%	1/6W	
R302	1-247-819-00	CARBON	330	5%	1/6W	
R303	1-247-819-00	CARBON	330	5%	1/6W	
R304	1-247-847-00	CARBON	4.7K	5%	1/6W	
R305	1-247-835-00	CARBON	1.5K	5%	1/6W	
R312	1-247-847-00	CARBON	4.7K	5%	1/6W	
R313	1-247-823-00	CARBON	470	5%	1/6W	
R317	1-247-855-00	CARBON	10K	5%	1/6W	
R318	1-247-865-00	CARBON	27K	5%	1/6W	
R320	1-247-878-00	CARBON	91K	5%	1/6W	
R321	1-247-887-00	CARBON	220K	5%	1/6W	
R325	1-247-807-00	CARBON	100	5%	1/6W	
R331	1-247-852-00	CARBON	7.5K	5%	1/6W	
R342	1-247-807-00	CARBON	100	5%	1/6W	
R346	1-247-847-00	CARBON	4.7K	5%	1/6W	
R351	1-247-815-00	CARBON	220	5%	1/6W	
R352	1-247-855-00	CARBON	10K	5%	1/6W	
R353	1-247-831-00	CARBON	1K	5%	1/6W	
R357	1-247-829-00	CARBON	820	5%	1/6W	
R358	1-247-855-00	CARBON	10K	5%	1/6W	
R359	1-247-839-00	CARBON	2.2K	5%	1/6W	
R370	1-247-790-00	CARBON	20	5%	1/6W	
R401	1-247-810-00	CARBON	130	5%	1/6W	
R402	1-247-808-00	CARBON	110	5%	1/6W	
R403	1-247-867-00	CARBON	33K	5%	1/6W	
R404	1-247-871-00	CARBON	47K	5%	1/6W	
R405	1-247-831-00	CARBON	1K	5%	1/6W	
R406	1-247-832-00	CARBON	1.1K	5%	1/6W	
R407	1-247-832-00	CARBON	1.1K	5%	1/6W	
R408	1-247-849-00	CARBON	5.6K	5%	1/6W	
R409	1-247-831-00	CARBON	1K	5%	1/6W	

Ref.No	Part No.	Description				Remark
R410	1-247-831-00	CARBON	1K	5%	1/6W	
R411	1-247-847-00	CARBON	4.7K	5%	1/6W	
R412	1-247-828-00	CARBON	750	5%	1/6W	
R413	1-247-812-00	CARBON	160	5%	1/6W	
R414	1-247-847-00	CARBON	4.7K	5%	1/6W	
R415	1-247-831-00	CARBON	1K	5%	1/6W	
R416	1-247-846-00	CARBON	4.3K	5%	1/6W	
R510	1-247-824-00	CARBON	510	5%	1/6W	
R511	1-247-867-00	CARBON	33K	5%	1/6W	
R512	1-247-847-00	CARBON	4.7K	5%	1/6W	
R513	1-247-863-00	CARBON	22K	5%	1/6W	
R514	1-247-821-00	CARBON	390	5%	1/6W	
R515	1-247-839-00	CARBON	2.2K	5%	1/6W	
R516	1-247-821-00	CARBON	390	5%	1/6W	
R517	1-247-821-00	CARBON	390	5%	1/6W	
R518	1-247-821-00	CARBON	390	5%	1/6W	
R519	1-247-821-00	CARBON	390	5%	1/6W	
R520	1-247-839-00	CARBON	2.2K	5%	1/6W	
R521	1-247-821-00	CARBON	390	5%	1/6W	
R522	1-247-839-00	CARBON	2.2K	5%	1/6W	
R525	1-247-843-00	CARBON	3.3K	5%	1/6W	
R601	1-247-847-00	CARBON	4.7K	5%	1/6W	
R603	1-247-843-00	CARBON	3.3K	5%	1/6W	
R632	1-247-855-00	CARBON	10K	5%	1/6W	
R633	1-247-831-00	CARBON	1K	5%	1/6W	
R635	1-247-883-00	CARBON	150K	5%	1/6W	
R638	1-247-807-00	CARBON	100	5%	1/6W	
R639	1-247-831-00	CARBON	1K	5%	1/6W	
R640	1-247-815-00	CARBON	220	5%	1/6W	
R641	1-247-831-00	CARBON	1K	5%	1/6W	
R644	1-247-818-00	CARBON	300	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-989-00	RES, ADJ, METAL GLAZE 470
RV002	1-228-748-00	RES, ADJ, CARBON 10K
RV003	1-228-750-00	RES, ADJ, CARBON 47K
RV005	1-228-750-00	RES, ADJ, CARBON 47K
RV006	1-228-749-00	RES, ADJ, CARBON 22K
RV007	1-228-748-00	RES, ADJ, CARBON 10K
RV008	1-228-745-00	RES, ADJ, CARBON 1K
RV009	1-228-996-00	RES, ADJ, METAL GLAZE 47K
RV010	1-228-749-00	RES, ADJ, CARBON 22K
RV012	1-228-750-00	RES, ADJ, CARBON 47K
RV013	1-228-750-00	RES, ADJ, CARBON 47K
RV014	1-228-748-00	RES, ADJ, CARBON 10K
RV015	1-228-989-00	RES, ADJ, METAL GLAZE 470
RV016	1-228-745-00	RES, ADJ, CARBON 1K
RV017	1-228-753-00	RES, ADJ, CARBON 470K
RV019	1-228-993-00	RES, ADJ, METAL GLAZE 4.7K
RV020	1-228-745-00	RES, ADJ, CARBON 1K
RV021	1-228-750-00	RES, ADJ, CARBON 47K
RV401	1-228-994-00	RES, ADJ, METAL GLAZE 10K
RV501	1-228-989-00	RES, ADJ, METAL GLAZE 470

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

Ref.No	Part No.	Description			Remark
RV602	1-228-990-00	RES, ADJ, METAL GLAZE 1K			
		SWITCH			
S601	1-553-725-21	SWITCH, SLIDE			
		TRANSFORMER			
T001	1-426-093-00	COIL, REC C BPT			
		CRYSTAL			
X001	1-527-345-00	CRYSTAL, OSC			
**********					
	*A-6715-239-A	SS-34 BOARD, COMPLETE **********			
	*3-681-170-00	HEAT SINK, S			
	7-621-770-87	SCREW +B 2.6X5			
		CAPACITOR			
C304	1-123-332-00	ELECT	47MF	20%	16V
C305	1-123-333-00	ELECT	100MF	20%	16V
C306	1-123-332-00	ELECT	47MF	20%	16V
C307	1-130-479-00	MYLAR	0.0047MF	5%	50V
C308	1-123-332-00	ELECT	47MF	20%	16V
C309	1-123-381-00	ELECT	2.2MF	20%	50V
C310	1-161-013-00	CERAMIC	0.01MF	10%	25V
C311	1-127-477-51	ELECT(SOLID)	0.47MF	5%	25V
C312	1-123-332-00	ELECT	47MF	20%	16V
C313	1-161-059-00	CERAMIC	0.047MF	10%	25V
C314	1-131-357-00	TANTALUM	4.7MF	20%	25V
C315	1-123-381-00	ELECT	2.2MF	20%	50V
C316	1-131-357-00	TANTALUM	4.7MF	20%	25V
C317	1-161-059-00	CERAMIC	0.047MF	10%	25V
C318	1-123-381-00	ELECT	2.2MF	20%	50V
C319	1-161-013-00	CERAMIC	0.01MF	10%	25V
C320	1-161-054-00	CERAMIC	0.018MF	10%	25V
C321	1-123-356-00	ELECT	10MF	20%	16V
C322	1-123-330-00	ELECT	22MF	20%	16V
C323	1-124-429-00	ELECT	0.68MF	20%	50V
C324	1-161-059-00	CERAMIC	0.047MF	10%	25V
C325	1-161-059-00	CERAMIC	0.047MF	10%	25V
C326	1-123-330-00	ELECT	22MF	20%	16V
C327	1-130-483-00	MYLAR	0.01MF	5%	50V
C328	1-130-483-00	MYLAR	0.01MF	5%	50V
C329	1-161-059-00	CERAMIC	0.047MF	10%	25V
C330	1-123-382-00	ELECT	3.3MF	20%	50V
C331	1-161-059-00	CERAMIC	0.047MF	10%	25V
C332	1-123-310-00	ELECT	470MF	20%	10V
C333	1-123-310-00	ELECT	470MF	20%	10V
C334	1-123-382-00	ELECT	3.3MF	20%	50V
C335	1-123-382-00	ELECT	3.3MF	20%	50V
C336	1-161-059-00	CERAMIC	0.047MF	10%	25V

Ref.No	Part No.	Description			Remark
C337	1-130-482-00	MYLAR	0.0082MF	5%	50V
C338	1-123-382-00	ELECT	3.3MF	20%	50V
C339	1-161-054-00	CERAMIC	0.018MF	10%	25V
C340	1-161-013-00	CERAMIC	0.01MF	10%	25V
C341	1-161-013-00	CERAMIC	0.01MF	10%	25V
C342	1-161-054-00	CERAMIC	0.018MF	10%	25V
C343	1-127-479-51	ELECT(SOLID)	1MF	5%	25V
C344	1-161-055-00	CERAMIC	0.022MF	10%	25V
C345	1-161-002-00	CERAMIC	0.0012MF	10%	25V
C346	1-161-054-00	CERAMIC	0.018MF	10%	25V
C347	1-161-054-00	CERAMIC	0.018MF	10%	25V
C351	1-161-057-00	CERAMIC	0.033MF	10%	25V
C352	1-123-381-00	ELECT	2.2MF	20%	50V
C353	1-161-057-00	CERAMIC	0.033MF	10%	25V
C354	1-123-331-00	ELECT	33MF	20%	25V
C355	1-123-331-00	ELECT	33MF	20%	25V
C356	1-123-308-00	ELECT	220MF	20%	6.3V
C357	1-161-059-00	CERAMIC	0.047MF	10%	25V
C358	1-123-333-00	ELECT	100MF	20%	16V
C359	1-123-617-00	ELECT	10MF	20%	16V
C361	1-123-821-00	ELECT	47MF	20%	16V
C362	1-123-333-00	ELECT	100MF	20%	16V
C364	1-161-059-00	CERAMIC	0.047MF	10%	25V
C365	1-123-380-00	ELECT	1MF	20%	50V
C366	1-161-013-00	CERAMIC	0.01MF	10%	25V
C367	1-161-059-00	CERAMIC	0.047MF	10%	25V
C368	1-161-043-00	CERAMIC	0.0022MF	10%	50V
C370	1-161-063-00	CERAMIC	0.1MF	20%	25V
C601	1-123-318-00	ELECT	33MF	20%	16V
C603	1-123-330-00	ELECT	22MF	20%	16V
C604	1-161-055-00	CERAMIC	0.022MF	10%	25V
C605	1-161-059-00	CERAMIC	0.047MF	10%	25V
C606	1-161-059-00	CERAMIC	0.047MF	10%	25V
C607	1-129-794-00	FILM	0.0033MF	5%	100V
C608	1-129-794-00	FILM	0.0033MF	5%	100V
C611	1-102-518-00	CERAMIC	33PF	5%	50V
C612	1-102-518-00	CERAMIC	33PF	5%	50V
C613	1-123-318-00	ELECT	33MF	20%	10V
C616	1-123-382-00	ELECT	3.3MF	20%	50V
C650	1-161-773-00	CERAMIC	0.1MF	20%	25V
C651	1-161-047-00	CERAMIC	0.0047MF	10%	25V
C652	1-123-381-00	ELECT	2.2MF	20%	50V
		FILTER			
CF601	1-527-992-11	OSCILLATOR, CERAMIC			
		CONNECTOR			
CN301	*1-560-892-00	PIN, CONNECTOR 4P			
CN302	*1-560-466-00	PIN, CONNECTOR 3P			
CN303	*1-560-892-00	PIN, CONNECTOR 4P			
CN304	*1-560-892-00	PIN, CONNECTOR 4P			
CN305	*1-560-890-00	PIN, CONNECTOR 2P			

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

Ref.No	Part No.	Description	Remark
CN306	*1-560-894-00	PIN, CONNECTOR 6P	
CN307	*1-560-890-00	PIN, CONNECTOR 2P	
CN308	*1-560-892-00	PIN, CONNECTOR 4P	
CN309	*1-560-895-00	PIN, CONNECTOR 7P	
CN310	*1-560-891-00	PIN, CONNECTOR 3P	
CN311	*1-560-891-00	PIN, CONNECTOR 3P	
CN601	*1-560-891-00	PIN, CONNECTOR 3P	
CN602	*1-560-896-00	PIN, CONNECTOR 8P	
CN603	*1-560-890-00	PIN, CONNECTOR 2P	
CN604	*1-560-890-00	PIN, CONNECTOR 2P	
CN605	*1-560-893-00	PIN, CONNECTOR 5P	
CN606	*1-560-890-00	PIN, CONNECTOR 2P	
CN607	*1-560-891-00	PIN, CONNECTOR 3P	
CN608	*1-560-890-00	PIN, CONNECTOR 2P	
CN609	*1-560-894-00	PIN, CONNECTOR 6P	
CN610	*1-560-896-00	PIN, CONNECTOR 8P	
CN611	*1-560-891-00	PIN, CONNECTOR 3P	
CN612	*1-560-891-00	PIN, CONNECTOR 3P	
CN613	*1-560-466-00	PIN, CONNECTOR 3P	
		DIODE	
D301	8-719-000-06	DIODE MC921	
D302	8-719-000-04	DIODE MC911	
D303	8-719-911-19	DIODE 1SS119	
D304	8-719-101-50	DIODE RD5.1E-L2	
D305	8-719-911-19	DIODE 1SS119	
D308	8-719-000-12	DIODE MC931	
D316	8-719-911-19	DIODE 1SS119	
D319	8-719-100-29	DIODE RD5.1E-B1	
D321	8-719-911-19	DIODE 1SS119	
D601	8-719-000-06	DIODE MC921	
D602	8-719-000-06	DIODE MC921	
D603	8-719-000-04	DIODE MC911	
D608	8-719-911-19	DIODE 1SS119	
		IC	
IC301	8-751-941-05	IC CX1948-5	
IC302	8-759-135-80	IC UPC358C	
IC303	8-759-145-58	IC UPC4558C	
IC304	8-759-132-40	IC UPC324C	
IC305	8-759-240-53	IC TC4053BP	
IC306	8-759-132-40	IC UPC324C	
IC601	8-759-911-08	IC MB88551-133M	
IC602	8-759-800-72	IC LA7205	
IC603	8-759-600-24	IC M54543L	
		COIL	
L601	1-408-421-00	MICRO INDUCTOR 100UH	
		IC LINK	
PS301⚠	1-532-637-00	LINK, IC 1A	
PS302⚠	1-532-679-00	LINK, IC 0.6A	
PS303⚠	1-532-605-00	LINK, IC 0.4A	
PS304⚠	1-532-637-00	LINK, IC 1A	
		TRANSISTOR	
Q301	8-729-245-83	TRANSISTOR 2SC2458	
Q302	8-729-900-89	TRANSISTOR DTC144ES	
Q303	8-729-245-83	TRANSISTOR 2SC2458	
Q304	8-729-245-83	TRANSISTOR 2SC2458	
Q305	8-729-245-83	TRANSISTOR 2SC2458	
Q306	8-729-900-89	TRANSISTOR DTC144ES	
Q307	8-729-200-20	TRANSISTOR 2SK107-2	
Q308	8-729-245-83	TRANSISTOR 2SC2458	
Q312	8-729-245-83	TRANSISTOR 2SC2458	
Q313	8-729-245-83	TRANSISTOR 2SC2458	
Q314	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q315	8-729-316-16	TRANSISTOR 2SC1061	
Q316	8-729-245-83	TRANSISTOR 2SC2458	
Q317	8-729-245-83	TRANSISTOR 2SC2458	
Q318	8-729-245-83	TRANSISTOR 2SC2458	
Q321	8-729-177-43	TRANSISTOR 2SD774	
Q322	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q323	8-729-805-13	TRANSISTOR 2SC1475-13	
Q324	8-729-117-52	TRANSISTOR 2SA1175	
Q325	8-729-245-83	TRANSISTOR 2SC2458	
Q326	8-729-245-83	TRANSISTOR 2SC2458	
Q330	8-729-316-16	TRANSISTOR 2SC1061	
Q331	8-729-245-83	TRANSISTOR 2SC2458	
Q332	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q333	8-729-900-89	TRANSISTOR DTC144ES	
Q335	8-729-245-83	TRANSISTOR 2SC2458	
Q336	8-729-245-83	TRANSISTOR 2SC2458	
Q337	8-729-245-83	TRANSISTOR 2SC2458	
Q338	8-729-245-83	TRANSISTOR 2SC2458	
Q340	8-729-177-43	TRANSISTOR 2SD774	
Q341	8-729-900-89	TRANSISTOR DTC144ES	
Q342	8-729-900-89	TRANSISTOR DTC144ES	
Q343	8-729-245-83	TRANSISTOR 2SC2458	
Q344	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q345	8-729-900-65	TRANSISTOR DTA144ES	
Q346	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q347	8-729-900-89	TRANSISTOR DTC144ES	
Q349	8-729-900-89	TRANSISTOR DTC144ES	
Q601	8-729-116-42	TRANSISTOR 2SD1164	
Q602	8-729-116-42	TRANSISTOR 2SD1164	
Q603	8-729-177-43	TRANSISTOR 2SD774	
Q604	8-729-177-43	TRANSISTOR 2SD774	
Q615	8-729-900-69	TRANSISTOR DTA144WS	
Q617	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q618	8-729-245-83	TRANSISTOR 2SC2458	
Q619	8-729-245-83	TRANSISTOR 2SC2458	
Q620	8-729-900-89	TRANSISTOR DTC144ES	
Q621	8-729-245-83	TRANSISTOR 2SC2458	
Q623	8-729-245-83	TRANSISTOR 2SC2458	
Q624	8-729-900-61	TRANSISTOR DTA114ES	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

RESISTOR

Ref.No	Part No.	Description				Remark
R301	1-247-871-00	CARBON	47K	5%	1/6W	
R302	1-247-859-00	CARBON	15K	5%	1/6W	
R303	1-247-871-00	CARBON	47K	5%	1/6W	
R304	1-247-859-00	CARBON	15K	5%	1/6W	
R305	1-247-855-00	CARBON	10K	5%	1/6W	
R307	1-247-855-00	CARBON	10K	5%	1/6W	
R308	1-247-829-00	CARBON	820	5%	1/6W	
R309	1-247-881-00	CARBON	120K	5%	1/6W	
R310	1-247-835-00	CARBON	1.5K	5%	1/6W	
R311	1-247-863-00	CARBON	22K	5%	1/6W	
R312	1-247-864-00	CARBON	24K	5%	1/6W	
R313	1-247-831-00	CARBON	1K	5%	1/6W	
R314	1-247-835-00	CARBON	1.5K	5%	1/6W	
R315	1-247-831-00	CARBON	1K	5%	1/6W	
R316	1-247-879-00	CARBON	100K	5%	1/6W	
R317	1-247-903-00	CARBON	1M	5%	1/6W	
R318	1-247-885-00	CARBON	180K	5%	1/6W	
R319	1-247-844-00	CARBON	3.6K	5%	1/6W	
R320	1-247-859-00	CARBON	15K	5%	1/6W	
R321	1-247-845-00	CARBON	3.9K	5%	1/6W	
R322	1-247-903-00	CARBON	1M	5%	1/6W	
R323	1-247-855-00	CARBON	10K	5%	1/6W	
R324	1-247-831-00	CARBON	1K	5%	1/6W	
R325	1-247-903-00	CARBON	1M	5%	1/6W	
R326	1-247-831-00	CARBON	1K	5%	1/6W	
R327	1-247-855-00	CARBON	10K	5%	1/6W	
R328 ⚠	1-212-850-00	FUSIBLE	5.1	5%	1/4W	F
R329	1-247-857-00	CARBON	12K	5%	1/6W	
R330	1-247-859-00	CARBON	15K	5%	1/6W	
R331	1-247-847-00	CARBON	4.7K	5%	1/6W	
R332	1-247-873-00	CARBON	56K	5%	1/6W	
R333	1-247-900-00	CARBON	750K	5%	1/6W	
R334	1-247-867-00	CARBON	33K	5%	1/6W	
R335	1-247-867-00	CARBON	33K	5%	1/6W	
R336	1-247-856-00	CARBON	11K	5%	1/6W	
R337	1-247-855-00	CARBON	10K	5%	1/6W	
R338	1-247-842-00	CARBON	3K	5%	1/6W	
R339	1-247-843-00	CARBON	3.3K	5%	1/6W	
R340	1-247-825-00	CARBON	560	5%	1/6W	
R341	1-247-871-00	CARBON	47K	5%	1/6W	
R342	1-247-855-00	CARBON	10K	5%	1/6W	
R343	1-247-865-00	CARBON	27K	5%	1/6W	
R344	1-247-872-00	CARBON	51K	5%	1/6W	
R346	1-247-848-00	CARBON	5.1K	5%	1/6W	
R347	1-247-887-00	CARBON	220K	5%	1/6W	
R348	1-247-887-00	CARBON	220K	5%	1/6W	
R349	1-247-845-00	CARBON	3.9K	5%	1/6W	
R352	1-247-871-00	CARBON	47K	5%	1/6W	
R353	1-247-867-00	CARBON	33K	5%	1/6W	
R354	1-247-855-00	CARBON	10K	5%	1/6W	
R355	1-247-887-00	CARBON	220K	5%	1/6W	
R356	1-247-871-00	CARBON	47K	5%	1/6W	
R357	1-247-871-00	CARBON	47K	5%	1/6W	
R358	1-247-863-00	CARBON	22K	5%	1/6W	
R359	1-247-863-00	CARBON	22K	5%	1/6W	
R361	1-247-871-00	CARBON	47K	5%	1/6W	
R362	1-247-861-00	CARBON	18K	5%	1/6W	
R363	1-247-879-00	CARBON	100K	5%	1/6W	
R364	1-247-867-00	CARBON	33K	5%	1/6W	
R365	1-247-867-00	CARBON	33K	5%	1/6W	
R366	1-247-867-00	CARBON	33K	5%	1/6W	
R367	1-247-859-00	CARBON	15K	5%	1/6W	
R368 ⚠	1-206-482-00	METAL OXIDE	62	5%	2W	F
R370	1-247-871-00	CARBON	47K	5%	1/6W	
R371	1-247-867-00	CARBON	33K	5%	1/6W	
R372	1-247-855-00	CARBON	10K	5%	1/6W	
R373	1-247-883-00	CARBON	150K	5%	1/6W	
R374	1-247-883-00	CARBON	150K	5%	1/6W	
R375	1-247-883-00	CARBON	150K	5%	1/6W	
R376	1-247-883-00	CARBON	150K	5%	1/6W	
R377	1-247-879-00	CARBON	100K	5%	1/6W	
R378	1-247-879-00	CARBON	100K	5%	1/6W	
R379	1-247-879-00	CARBON	100K	5%	1/6W	
R380	1-247-879-00	CARBON	100K	5%	1/6W	
R381	1-247-867-00	CARBON	33K	5%	1/6W	
R382	1-247-867-00	CARBON	33K	5%	1/6W	
R383	1-247-897-00	CARBON	560K	5%	1/6W	
R384	1-247-897-00	CARBON	560K	5%	1/6W	
R386	1-247-857-00	CARBON	12K	5%	1/6W	
R387	1-246-981-00	CARBON	4.7	5%	1/8W	F
R389 ⚠	1-212-366-00	METAL OXIDE	3.3	5%	1W	F
R390	1-247-855-00	CARBON	10K	5%	1/6W	
R391	1-247-845-00	CARBON	3.9K	5%	1/6W	
R392	1-247-819-00	CARBON	330	5%	1/6W	
R394	1-247-832-00	CARBON	1.1K	5%	1/6W	
R397	1-247-831-00	CARBON	1K	5%	1/6W	
R398 ⚠	1-212-849-00	FUSIBLE	4.7	5%	1/4W	F
R399 ⚠	1-212-360-00	METAL OXIDE	1	5%	1W	F
R400	1-247-828-00	CARBON	750	5%	1/6W	
R406 ⚠	1-212-360-00	METAL OXIDE	1	5%	1W	F
R407	1-247-847-00	CARBON	4.7K	5%	1/6W	
R408	1-247-843-00	CARBON	3.3K	5%	1/6W	
R409	1-247-838-00	CARBON	2K	5%	1/6W	
R410	1-247-847-00	CARBON	4.7K	5%	1/6W	
R411	1-247-855-00	CARBON	10K	5%	1/6W	
R413	1-247-847-00	CARBON	4.7K	5%	1/6W	
R417	1-247-837-00	CARBON	1.8K	5%	1/6W	
R419	1-247-855-00	CARBON	10K	5%	1/6W	
R426	1-247-831-00	CARBON	1K	5%	1/6W	
R427	1-247-863-00	CARBON	22K	5%	1/6W	
R428	1-247-863-00	CARBON	22K	5%	1/6W	
R429	1-247-848-00	CARBON	5.1K	5%	1/6W	
R430	1-247-859-00	CARBON	15K	5%	1/6W	
R431	1-247-867-00	CARBON	33K	5%	1/6W	

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

SS-34 FU-25

Ref.No	Part No.	Description				Remark
R432	1-247-871-00	CARBON	47K	5%	1/6W	
R433	1-247-831-00	CARBON	1K	5%	1/6W	
R436	1-247-855-00	CARBON	10K	5%	1/6W	
R437	1-247-855-00	CARBON	10K	5%	1/6W	
R438	1-247-851-00	CARBON	6.8K	5%	1/6W	
R439	1-247-839-00	CARBON	2.2K	5%	1/6W	
R440	1-247-855-00	CARBON	10K	5%	1/6W	
R441	1-247-867-00	CARBON	33K	5%	1/6W	
R442	1-247-847-00	CARBON	4.7K	5%	1/6W	
R443	1-247-831-00	CARBON	1K	5%	1/6W	
R444	1-247-855-00	CARBON	10K	5%	1/6W	
R445	1-247-839-00	CARBON	2.2K	5%	1/6W	
R446	1-247-851-00	CARBON	6.8K	5%	1/6W	
R447	1-247-855-00	CARBON	10K	5%	1/6W	
R448	1-247-863-00	CARBON	22K	5%	1/6W	
R449	1-247-871-00	CARBON	47K	5%	1/6W	
R451	1-247-815-00	CARBON	220	5%	1/6W	
R452	1-247-847-00	CARBON	4.7K	5%	1/6W	
R454	1-247-843-00	CARBON	3.3K	5%	1/6W	
R455	1-247-843-00	CARBON	3.3K	5%	1/6W	
R461	1-247-843-00	CARBON	3.3K	5%	1/6W	
R462	1-247-903-00	CARBON	1M	5%	1/6W	
R463	1-247-871-00	CARBON	47K	5%	1/6W	
R464	1-247-871-00	CARBON	47K	5%	1/6W	
R465	1-247-863-00	CARBON	22K	5%	1/6W	
R467	1-247-847-00	CARBON	4.7K	5%	1/6W	
R469	1-247-863-00	CARBON	22K	5%	1/6W	
R471	1-247-825-00	CARBON	560	5%	1/6W	
R473	1-247-843-00	CARBON	3.3K	5%	1/6W	
R601	1-247-835-00	CARBON	1.5K	5%	1/6W	
R602	1-247-864-00	CARBON	24K	5%	1/6W	
R603	1-247-864-00	CARBON	24K	5%	1/6W	
R604	1-247-864-00	CARBON	24K	5%	1/6W	
R612	1-247-827-00	CARBON	680	5%	1/6W	
R614	1-247-845-00	CARBON	3.9K	5%	1/6W	
R615	1-247-855-00	CARBON	10K	5%	1/6W	
R616	1-247-845-00	CARBON	3.9K	5%	1/6W	
R617	1-247-855-00	CARBON	10K	5%	1/6W	
R618	1-247-863-00	CARBON	22K	5%	1/6W	
R619	1-247-863-00	CARBON	22K	5%	1/6W	
R620	1-247-873-00	CARBON	56K	5%	1/6W	
R621	1-247-851-00	CARBON	6.8K	5%	1/6W	
R622	1-247-855-00	CARBON	10K	5%	1/6W	
R623	1-247-861-00	CARBON	18K	5%	1/6W	
R636	1-247-835-00	CARBON	1.5K	5%	1/6W	
R637	1-247-104-00	CARBON	75	5%	1/4W	
R639	1-247-855-00	CARBON	10K	5%	1/6W	
R640	1-247-875-00	CARBON	68K	5%	1/6W	
R643	1-247-839-00	CARBON	2.2K	5%	1/6W	
R644	1-247-864-00	CARBON	24K	5%	1/6W	
R645	1-247-871-00	CARBON	47K	5%	1/6W	
R646	1-247-851-00	CARBON	6.8K	5%	1/6W	

Ref.No	Part No.	Description	Remark
		VARIABLE RESISTOR	
RV301	1-228-994-00	RES, ADJ, METAL GLAZE 10K	
RV302	1-228-994-00	RES, ADJ, METAL GLAZE 10K	
RV303	1-228-996-00	RES, ADJ, METAL GLAZE 47K	
RV304	1-228-750-00	RES, ADJ, CARBON 47K	
RV305	1-228-750-00	RES, ADJ, CARBON 47K	
RV306	1-228-750-00	RES, ADJ, CARBON 47K	
RV307	1-228-991-00	RES, ADJ, METAL GLAZE 2.2K	
RV308	1-228-991-00	RES, ADJ, METAL GLAZE 2.2K	
		THERMISTOR	
TH301	1-800-200-00	THERMISTOR S-3K	
TH302	1-800-198-XX	THERMISTOR S-1K	
		LEAD PIN	
TP401	*3-846-049-11	PIN, LEAD	
TP402	*3-846-049-11	PIN, LEAD	
TP403	*3-846-049-11	PIN, LEAD	
TP404	*3-846-049-11	PIN, LEAD	
TP405	*3-846-049-11	PIN, LEAD	
TP406	*3-846-049-11	PIN, LEAD	
TP407	*3-846-049-11	PIN, LEAD	
TP408	*3-846-049-11	PIN, LEAD	
TP409	*3-846-049-11	PIN, LEAD	
TP601	*3-846-049-11	PIN, LEAD	
**********			
	*1-613-231-11	FU-25 BOARD **********	
	*3-674-372-00	HOLDER (A), LED	
		DIODE	
D001	8-719-812-33	DIODE TLG123A	
		RESISTOR	
R001	1-246-465-25	CARBON 470 5% 1/4W	
R002	1-247-851-00	CARBON 6.8K 5% 1/6W	
R003	1-247-851-00	CARBON 6.8K 5% 1/6W	
R004	1-247-855-00	CARBON 10K 5% 1/6W	
R005	1-247-855-00	CARBON 10K 5% 1/6W	
R006	1-247-861-00	CARBON 18K 5% 1/6W	
		VARIABLE RESISTOR	
RV001	1-230-421-11	RES, VAR, CARBON 100K	
		SWITCH	
S001	1-554-174-00	SWITCH, KEY BOARD	
S002	1-554-174-00	SWITCH, KEY BOARD	
S003	1-554-174-00	SWITCH, KEY BOARD	
S004	1-554-174-00	SWITCH, KEY BOARD	
S005	1-554-174-00	SWITCH, KEY BOARD	

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

Ref.No	Part No.	Description			Remark
S006	1-554-174-00	SWITCH, KEY BOARD			
S007	1-554-174-00	SWITCH, KEY BOARD			
S008	1-554-174-00	SWITCH, KEY BOARD			
**********					
	*A-6721-205-A	TA-22 BOARD, COMPLETE			
		**********			
	*1-556-934-31	CABLE, PIN			
	*3-662-227-00	HOLDER (R-3), LED			
	*3-662-383-00	BAND, RETAINER, TUNER			
	*3-674-390-00	HOLDER (B), LED			
	*3-687-523-01	LID, UPPER, SHIELD CASE, TU			
	*3-687-524-01	LID, BOTTOM, SHIELD CAES, TU			
	*3-687-525-01	CASE (MAIN), SHIELD, TU			
	*3-687-550-01	CASE (UPPER LID), SHIELD, AU			
	*3-687-558-01	CASE (MAIN), SHIELD, AU			
	*3-687-559-01	CASE (BOTTOM LID), SHIELD, AU			
	*4-336-029-00	PLATE, SHIELD			
		CAPACITOR			
C001	1-102-530-00	CERAMIC	120PF	5%	50V
C002	1-102-529-00	CERAMIC	100PF	5%	50V
C003	1-102-508-00	CERAMIC	10PF	0.5PF	50V
C004	1-102-523-00	CERAMIC	56PF	5%	50V
C005	1-102-529-00	CERAMIC	100PF	5%	50V
C006	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C007	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C008	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C009	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C010	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C011	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C012	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C013	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C014	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C015	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C016	1-123-369-00	ELECT	4.7MF	20%	25V
C017	1-161-032-00	CERAMIC	0.01MF	20%	25V
C018	1-123-356-00	ELECT	10MF	20%	16V
C019	1-161-032-00	CERAMIC	0.01MF	20%	25V
C020	1-123-356-00	ELECT	10MF	20%	16V
C021	1-102-129-00	CERAMIC	0.01MF	10%	50V
C022	1-102-529-00	CERAMIC	100PF	5%	50V
C023	1-102-518-00	CERAMIC	33PF	5%	50V
C024	1-102-504-00	CERAMIC	4PF	0.25PF	50V
C025	1-102-504-00	CERAMIC	4PF	0.25PF	50V
C026	1-102-518-00	CERAMIC	33PF	5%	50V
C027	1-102-529-00	CERAMIC	100PF	5%	50V
C028	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C029	1-123-356-00	ELECT	10MF	20%	16V
C030	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C031	1-123-380-00	ELECT	1MF	20%	50V
C032	1-101-004-00	CERAMIC	0.01MF		50V

Ref.No	Part No.	Description			Remark
C033	1-101-004-00	CERAMIC	0.01MF		50V
C034	1-123-318-00	ELECT	33MF	20%	16V
C035	1-102-978-00	CERAMIC	220PF	5%	50V
C036	1-102-959-00	CERAMIC	22PF	5%	50V
C037	1-102-959-00	CERAMIC	22PF	5%	50V
C038	1-101-004-00	CERAMIC	0.01MF		50V
C039	1-101-004-00	CERAMIC	0.01MF		50V
C040	1-161-030-00	CERAMIC	0.0047MF	20%	25V
C041	1-161-032-00	CERAMIC	0.01MF	20%	25V
C042	1-102-959-00	CERAMIC	22PF	5%	50V
C043	1-101-004-00	CERAMIC	0.01MF		50V
C044	1-123-318-00	ELECT	33MF	20%	16V
C045	1-123-318-00	ELECT	33MF	20%	16V
C050	1-123-356-00	ELECT	10MF	20%	50V
C051	1-123-356-00	ELECT	10MF	20%	50V
C052	1-123-356-00	ELECT	10MF	20%	16V
C053	1-123-356-00	ELECT	10MF	20%	50V
C054	1-102-973-00	CERAMIC	100PF	5%	50V
C055	1-130-495-51	MYLAR	0.1MF	5%	50V
C056	1-130-493-51	MYLAR	0.068MF	5%	50V
C057	1-130-493-51	MYLAR	0.068MF	5%	50V
C058	1-102-963-00	CERAMIC	33PF	5%	50V
C059	1-123-380-00	ELECT	1MF	20%	50V
C060	1-123-381-00	ELECT	2.2MF	20%	50V
C061	1-102-518-00	CERAMIC	33PF	5%	50V
C062	1-102-518-00	CERAMIC	33PF	5%	50V
C063	1-101-004-00	CERAMIC	0.01MF		50V
C064	1-101-004-00	CERAMIC	0.01MF		50V
C065	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C066	1-101-004-00	CERAMIC	0.01MF		50V
C301	1-123-356-00	ELECT	10MF	20%	16V
C302	1-123-321-51	ELECT	220MF	20%	16V
C303	1-123-321-51	ELECT	220MF	20%	16V
C304	1-123-356-00	ELECT	10MF	20%	16V
C305	1-123-356-00	ELECT	10MF	20%	16V
C306	1-130-487-00	MYLAR	0.022MF	5%	50V
C307	1-123-380-00	ELECT	1MF	20%	50V
C308	1-123-380-00	ELECT	1MF	20%	50V
C309	1-123-318-00	ELECT	33MF	20%	16V
C310	1-123-306-00	ELECT	47MF	20%	6.3V
C311	1-130-491-51	MYLAR	0.047MF	5%	50V
C312	1-130-483-00	MYLAR	0.01MF	5%	50V
C313	1-123-318-00	ELECT	33MF	20%	16V
C314	1-123-318-00	ELECT	33MF	20%	16V
C315	1-123-380-00	ELECT	1MF	20%	50V
C316	1-130-471-00	MYLAR	0.001MF	5%	50V
C317	1-123-380-00	ELECT	1MF	20%	50V
C318	1-102-111-00	CERAMIC	270PF	10%	50V
C319	1-130-485-51	MYLAR	0.015MF	5%	50V
C320	1-123-380-00	ELECT	1MF	20%	50V
C321	1-123-369-00	ELECT	4.7MF	20%	25V
C323	1-123-607-00	ELECT	0.1MF	20%	50V
C331	1-123-332-00	ELECT	47MF	20%	16V

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

TA-22

Ref.No	Part No.	Description			Remark
C332	1-161-013-00	CERAMIC	0.01MF	10%	25V
C333	1-161-055-00	CERAMIC	0.022MF	10%	25V
C334	1-107-166-00	MICA	62PF	5%	500V
C335	1-129-712-00	FILM	0.0068MF	10%	630V
		CERAMIC DISCRIMINATOR			
CD001	1-404-380-00	DISCRIMINATOR, CERAMIC 5.5MHZ			
		FILTER			
CF001	1-527-263-00	CERAMIC FILTER (5.5MHZ)			
		CONNECTOR			
CN001	*1-560-893-00	PIN, CONNECTOR 5P			
CN002	*1-560-893-00	PIN, CONNECTOR 5P			
CN003	*1-560-900-00	PIN, CONNECTOR 12P			
CN301	*1-508-797-00	PIN, CONNECTOR 4P			
CN302	*1-560-893-00	PIN, CONNECTOR 5P			
CN303	*1-508-743-00	PIN, CONNECTOR 5P			
		TRIMMER			
CT001	1-404-134-00	TRAP, CERAMIC (5.5MHZ)			
		CERAMIC			
CX001	1-527-822-00	OSCILLATOR, CERAMIC			
		DIODE			
D001	8-719-812-31	DIODE TLR123			
D002	8-719-812-32	DIODE TLY123			
D003	8-719-812-33	DIODE TLG123A			
D004	8-719-911-19	DIODE 1SS119			
D005	8-719-911-19	DIODE 1SS119			
D009	8-719-911-19	DIODE 1SS119			
D010	8-719-812-31	DIODE TLR123			
D011	8-719-812-31	DIODE TLR123			
D013	8-719-911-19	DIODE 1SS119			
D301	8-719-911-19	DIODE 1SS119			
D302	8-719-911-19	DIODE 1SS119			
D303	8-719-000-12	DIODE MC931			
D304	8-719-911-19	DIODE 1SS119			
		IC			
IC001	8-759-276-07	IC TA7607AP			
IC002	8-759-193-91	IC UPC1391H			
IC003	8-759-800-12	IC LA7920			
IC004	8-759-157-40	IC UPC574J			
IC005	8-759-602-05	IC M50160-019SP			
IC006	8-759-600-66	IC M58653P			
IC301	8-752-006-10	IC CX20061			
IC302	8-759-101-73	IC UPC1513HA			
IC303	8-759-911-23	IC BA5115			

Ref.No	Part No.	Description			Remark
		COIL			
L001	1-408-591-00	MICRO INDUCTOR 1UH			
L002	1-408-600-00	MICRO INDUCTOR 5.6UH			
L003	1-408-600-00	MICRO INDUCTOR 5.6UH			
L004	1-408-615-00	MICRO INDUCTOR 100UH			
L005	1-408-603-00	MICRO INDUCTOR 10UH			
L006	1-408-599-00	MICRO INDUCTOR 4.7UH			
L007	1-408-606-00	MICRO INDUCTOR 18UH			
L008	1-408-607-00	MICRO INDUCTOR 22UH			
L009	1-407-177-XX	MICRO INDUCTOR 470UH			
L301	1-407-963-00	MICRO INDUCTOR 15MMH			
L302	1-408-221-00	MICRO INDUCTOR 22MMH			
L331	1-407-710-00	MICRO INDUCTOR 270UH			
		TRANSISTOR			
Q001	8-729-203-28	TRANSISTOR 2SC2216			
Q002	8-729-245-83	TRANSISTOR 2SC2458			
Q003	8-729-245-83	TRANSISTOR 2SC2458			
Q004	8-729-113-32	TRANSISTOR 2SB733			
Q005	8-729-603-50	TRANSISTOR 2SC403SP			
Q006	8-729-245-83	TRANSISTOR 2SC2458			
Q007	8-729-245-83	TRANSISTOR 2SC2458			
Q008	8-729-204-83	TRANSISTOR 2SA1048-GR			
Q301 ⚠	8-729-178-54	TRANSISTOR 2SC2785			
Q302	8-729-245-83	TRANSISTOR 2SC2458			
Q303	8-729-245-83	TRANSISTOR 2SC2458			
Q331	8-729-173-37	TRANSISTOR 2SA733-P			
Q332	8-729-967-32	TRANSISTOR 2SC2673			
		RESISTOR			
R001	1-247-847-00	CARBON	4.7K	5%	1/6W
R002	1-247-839-00	CARBON	2.2K	5%	1/6W
R003	1-247-815-00	CARBON	220	5%	1/6W
R004	1-247-813-00	CARBON	180	5%	1/6W
R005	1-247-819-00	CARBON	330	5%	1/6W
R006	1-247-837-00	CARBON	1.8K	5%	1/6W
R007	1-247-835-00	CARBON	1.5K	5%	1/6W
R008	1-247-839-00	CARBON	2.2K	5%	1/6W
R009	1-247-877-00	CARBON	82K	5%	1/6W
R010	1-247-867-00	CARBON	33K	5%	1/6W
R011	1-247-879-00	CARBON	100K	5%	1/6W
R012	1-247-879-00	CARBON	100K	5%	1/6W
R013	1-247-901-00	CARBON	820K	5%	1/6W
R014	1-247-863-00	CARBON	22K	5%	1/6W
R015	1-247-855-00	CARBON	10K	5%	1/6W
R016	1-247-829-00	CARBON	820	5%	1/6W
R018	1-247-831-00	CARBON	1K	5%	1/6W
R019	1-247-813-00	CARBON	180	5%	1/6W
R020	1-247-807-00	CARBON	100	5%	1/6W
R021	1-247-831-00	CARBON	1K	5%	1/6W
R022	1-247-829-00	CARBON	820	5%	1/6W
R024	1-247-831-00	CARBON	1K	5%	1/6W

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

Ref.No	Part No.	Description				Remark
R025	1-247-831-00	CARBON	1K	5%	1/6W	
R026	1-247-817-00	CARBON	270	5%	1/6W	
R027	1-247-847-00	CARBON	4.7K	5%	1/6W	
R028	1-247-821-00	CARBON	390	5%	1/6W	
R031 ⚠	1-212-849-00	FUSIBLE	4.7	5%	1/4W	F
R032 ⚠	1-213-146-00	METAL OXIDE	1.8K	5%	1W	F
R033	1-247-851-00	CARBON	6.8K	5%	1/6W	
R034	1-247-865-00	CARBON	27K	5%	1/6W	
R035	1-247-855-00	CARBON	10K	5%	1/6W	
R036	1-247-879-00	CARBON	100K	5%	1/6W	
R037	1-247-879-00	CARBON	100K	5%	1/6W	
R038	1-247-839-00	CARBON	2.2K	5%	1/6W	
R039	1-247-835-00	CARBON	1.5K	5%	1/6W	
R040	1-247-833-00	CARBON	1.2K	5%	1/6W	
R041	1-247-887-00	CARBON	220K	5%	1/6W	
R042 ⚠	1-213-146-00	METAL OXIDE	1.8K	5%	1W	F
R043	1-247-863-00	CARBON	22K	5%	1/6W	
R044	1-247-863-00	CARBON	22K	5%	1/6W	
R045	1-247-863-00	CARBON	22K	5%	1/6W	
R046	1-247-863-00	CARBON	22K	5%	1/6W	
R047	1-247-863-00	CARBON	22K	5%	1/6W	
R048	1-247-891-00	CARBON	330K	5%	1/6W	
R049	1-247-839-00	CARBON	2.2K	5%	1/6W	
R050	1-247-851-00	CARBON	6.8K	5%	1/6W	
R051	1-247-843-00	CARBON	3.3K	5%	1/6W	
R052	1-247-815-00	CARBON	220	5%	1/6W	
R055	1-247-863-00	CARBON	22K	5%	1/6W	
R059	1-247-863-00	CARBON	22K	5%	1/6W	
R060	1-247-863-00	CARBON	22K	5%	1/6W	
R061	1-247-863-00	CARBON	22K	5%	1/6W	
R062	1-247-863-00	CARBON	22K	5%	1/6W	
R063	1-247-831-00	CARBON	1K	5%	1/6W	
R064	1-247-831-00	CARBON	1K	5%	1/6W	
R068	1-247-847-00	CARBON	4.7K	5%	1/6W	
R069	1-247-863-00	CARBON	22K	5%	1/6W	
R070	1-247-855-00	CARBON	10K	5%	1/6W	
R071	1-247-855-00	CARBON	10K	5%	1/6W	
R073	1-247-853-00	CARBON	8.2K	5%	1/6W	
R074	1-247-847-00	CARBON	4.7K	5%	1/6W	
R302	1-247-879-00	CARBON	100K	5%	1/6W	
R303	1-247-833-00	CARBON	1.2K	5%	1/6W	
R304	1-247-839-00	CARBON	2.2K	5%	1/6W	
R305	1-247-875-00	CARBON	68K	5%	1/6W	
R306	1-247-837-00	CARBON	1.8K	5%	1/6W	
R308	1-247-871-00	CARBON	47K	5%	1/6W	
R310	1-247-843-00	CARBON	3.3K	5%	1/6W	
R311	1-247-855-00	CARBON	10K	5%	1/6W	
R312	1-247-871-00	CARBON	47K	5%	1/6W	
R313	1-247-855-00	CARBON	10K	5%	1/6W	
R314	1-247-875-00	CARBON	68K	5%	1/6W	
R315	1-210-825-00	SOLID	3.3M	5%	1/4W	
R316	1-247-883-00	CARBON	150K	5%	1/6W	
R317	1-247-863-00	CARBON	22K	5%	1/6W	
R318	1-247-875-00	CARBON	68K	5%	1/6W	
R319	1-247-859-00	CARBON	15K	5%	1/6W	
R320	1-247-891-00	CARBON	330K	5%	1/6W	
R321	1-247-827-00	CARBON	680	5%	1/6W	
R322	1-247-887-00	CARBON	220K	5%	1/6W	
R323	1-247-863-00	CARBON	22K	5%	1/6W	
R324	1-247-841-00	CARBON	2.7K	5%	1/6W	
R325	1-247-859-00	CARBON	15K	5%	1/6W	
R326	1-247-819-00	CARBON	330	5%	1/6W	
R327	1-247-871-00	CARBON	47K	5%	1/6W	
R328	1-247-783-00	CARBON	10	5%	1/6W	
R329	1-247-875-00	CARBON	68K	5%	1/6W	
R330 ⚠	1-246-873-11	CARBON	22	5%	1/4W	F
R331	1-247-867-00	CARBON	33K	5%	1/6W	
R332	1-247-847-00	CARBON	4.7K	5%	1/6W	
R333	1-247-859-00	CARBON	15K	5%	1/6W	
R334 ⚠	1-247-771-00	CARBON	3.3	5%	1/8W	F
R335	1-247-855-00	CARBON	10K	5%	1/6W	
R336	1-247-901-00	CARBON	820K	5%	1/6W	

BARIABLE RESISTOR

RV001	1-228-746-00	RES, ADJ, CARBON 2.2K
RV301	1-228-749-00	RES, ADJ, CARBON 22K
RV331	1-228-998-00	RES, ADJ, METAL GLAZE 220K

SWITCH

S001	1-553-997-00	SWITCH, KEY BOARD
S002	1-553-997-00	SWITCH, KEY BOARD
S003	1-553-997-00	SWITCH, KEY BOARD
S004	1-553-997-00	SWITCH, KEY BOARD
S005	1-553-997-00	SWITCH, KEY BOARD
S006	1-553-997-00	SWITCH, KEY BOARD
S007	1-553-997-00	SWITCH, KEY BOARD

FILTER

SF001	1-404-433-00	SAWF

TRANSFORMER

T001	1-404-476-00	COIL, IF
T002	1-404-476-00	COIL, IF
T003	1-404-428-00	VIFT
T004	1-404-427-00	VIFT
T005	1-404-427-00	VIFT
T331	1-433-275-00	TRANSFORMER, BIAS OSCILLATOR

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*1-613-234-11 MT-10 BOARD
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TUNER

TU001 ⚠	1-463-421-21	TUNER, ET (BT-883)

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

AH-3 | RD-21 | RD-20 | N | PS-45 | PS-46

Ref.No	Part No.	Description			Remark
	*1-612-506-11	AH-3 BOARD			
		**********			
**********					
	*1-613-233-11	RD-21 BOARD			
		**********			
		DIODE			
PC101	8-719-913-41	DIODE SPI201-22			
		RESISTOR			
R101	1-247-815-00	CARBON	220	5% 1/6W	
R102	1-247-867-00	CARBON	33K	5% 1/6W	
R103	1-247-859-00	CARBON	15K	5% 1/6W	
**********					
	*1-613-232-11	RD-20 BOARD			
		**********			
		DIODE			
PC001	8-719-913-41	DIODE SPI201-22			
		RESISTOR			
R001	1-247-815-00	CARBON	220	5% 1/6W	
R002	1-247-867-00	CARBON	33K	5% 1/6W	
R003	1-247-859-00	CARBON	15K	5% 1/6W	
**********					
	*1-606-794-00	N BOARD			
		********			
		CAPACITOR			
C001	1-123-617-00	ELECT	10MF	20% 16V	
C002	1-123-617-00	ELECT	10MF	20% 16V	
C003	1-123-617-00	ELECT	10MF	20% 16V	
C004	1-161-057-00	CERAMIC	0.033MF	10% 25V	
C005	1-106-184-00	MYLAR	0.0033MF	5% 50V	
C006	1-123-821-00	ELECT	47MF	20% 16V	
		DIODE			
D001	8-719-110-32	DIODE PH302B			
		IC			
IC001	8-759-102-84	IC UPC1373HA			
		COIL			
L001	1-404-310-00	COIL			
**********					

Ref.No	Part No.	Description			Remark
	*1-613-227-11	PS-45 BOARD			
		**********			
	1-533-162-00	HOLDER, FUSE			
		CAPACITOR			
C001	⚠1-130-710-00	FILM	0.1MF	20% 250V	
C002	1-125-349-00	ELECT(BLOCK)	6800MF	20% 25V	
C003	1-123-332-00	ELECT	47MF	20% 16V	
C004	1-123-332-00	ELECT	47MF	20% 16V	
		CONNECTOR			
CN001	*1-560-893-00	PIN, CONNECTOR 5P			
CN002	*1-560-890-00	PIN, CONNECTOR 2P			
		DIODE			
D001	⚠8-719-505-20	DIODE S5VB20			
		FUSE			
F001	⚠1-532-203-11	FUSE, TIME-LAG T2A 250V			
F002	⚠1-532-350-11	FUSE, TIME-LAG T4A 250V			
		RESISTOR			
R001	1-247-823-00	CARBON	470	5% 1/6W	
**********					
	*1-613-228-11	PS-46 BOARD			
		**********			
	1-533-162-00	HOLDER, FUSE			
	*3-660-552-00	HEAT SINK			
	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3			
		CAPACITOR			
C101	1-123-375-00	ELECT	220MF	20% 63V	
C102	1-123-375-00	ELECT	220MF	20% 63V	
C103	1-123-330-00	ELECT	22MF	20% 16V	
C104	1-123-330-00	ELECT	22MF	20% 16V	
		CONNECTOR			
CN101	*1-560-894-00	PIN, CONNECTOR 6P			
CN102	*1-560-893-00	PIN, CONNECTOR 5P			
CN103	*1-560-891-00	PIN, CONNECTOR 3P			
CN104	*1-560-894-00	PIN, CONNECTOR 6P			
CN105	*1-560-892-00	PIN, CONNECTOR 4P			
CN106	*1-560-891-00	PIN, CONNECTOR 3P			
		DIODE			
D101	8-719-200-02	DIODE 10E-2			
D102	8-719-200-02	DIODE 10E-2			
D103	8-719-100-39	DIODE RD6.2E-B3			
D105	8-719-200-02	DIODE 10E-2			

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

Ref.No	Part No.	Description	Remark
		FUSE	
F101	⚠1-532-279-11	FUSE, TIME-LAG T500mA 250V	
		TRANSISTOR	
Q101	8-729-316-16	TRANSISTOR 2SC1061	
Q102	8-729-245-83	TRANSISTOR 2SC2458	
Q103	8-729-316-16	TRANSISTOR 2SC1061	
Q104	8-729-178-54	TRANSISTOR 2SC2785	
		RESISTOR	
R101	1-244-887-51	CARBON 3.9K 5% 1/2W	
R102	1-244-891-51	CARBON 5.6K 5% 1/2W	
R103	1-247-851-00	CARBON 6.8K 5% 1/6W	
R104	1-247-847-00	CARBON 4.7K 5% 1/6W	
R105	1-247-855-00	CARBON 10K 5% 1/6W	
R106	⚠1-213-144-00	METAL OXIDE 1.2K 5% 1W	F
R107	⚠1-206-477-00	METAL OXIDE 39 5% 2W	F
R111	1-247-783-00	CARBON 10 5% 1/6W	
		**********	
	*1-613-940-11	PS-69 BOARD **********	
		IC	
IC001	8-749-912-28	IC STR1229A	
		**********	
	*1-605-071-00	LM-8 BOARD **********	
		CAPACITOR	
C101	1-161-057-00	CERAMIC 0.033MF 10% 50V	
C102	1-161-057-00	CERAMIC 0.033MF 10% 50V	
		COIL	
L101	1-408-120-00	MICRO INDUCTOR 18UH	
L102	1-408-120-00	MICRO INDUCTOR 18UH	
		**********	

Ref.No	Part No.	Description	Remark
		MISCELLANEOUS **********	
	X-3684-110-4	CHASSIS ASSY, ACE	
	*8-825-579-10	HEAD, ACE EPS262-2102	
	⚠1-464-388-11	BOOSTER MIXER, RF MODULATOR (RFU-821)	
	⚠1-551-908-41	CORD, POWER	
	8-825-508-10	HEAD, FE (FULL ERASE HEAD)	
L901	1-464-330-11	SENSOR, S COIL	
L902	1-464-329-11	SENSOR, T COIL	
M902	8-838-080-01	MOTOR, DC (BHF-19088)(CAPSTAN MOTOR)	
M903	*A-4910-049-A	R STATOR BOARD, COMPLETE (REEL MOTOR)	
M904	X-3679-268-1	MOTOR ASSY, L (LOADING/THREADING)	
PM901	⚠1-454-349-41	SOLENOID, PLUNGER (PINCH)	
PM902	⚠1-464-371-31	SOLENOID, PLUNGER (BRAKE)	
S901	1-554-839-11	SWITCH, LEAF (2 GANG) (REC PROOF/CASSETTE DOWN)	
S903	1-554-840-11	SWITCH, LEAF (THREADING END)	
S904	1-554-840-11	SWITCH, LEAF (CASSETTE ON)	
T901	⚠1-447-894-11	TRANSFORMER, POWER	
		**********	

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
A-6765-566-A	COMMANDER ASSY RMT-231/SILVER	
A-6765-639-A	COMMANDER ASSY RMT-231/GRAY	
A-6765-641-A	COMMANDER ASSY RMT-231/RED	
1-556-893-00	CORD ASSY, COAXIAL	
3-656-301-00	SCREWDRIVER, CONTROL	
*3-677-503-00	SHEET, PROTECTION	
3-681-287-01	LID, ACCESSORY CASE	
3-684-259-01	CASE, ACCESSORY	
*3-687-580-01	CUSHION (UPPER)	
*3-687-581-01	CUSHION (LOWER)	
*3-687-586-01	INDIVIDUAL CARTON (GRAY MODEL)	
*3-687-586-11	INDIVIDUAL CARTON (SILVER MODEL)	
*3-687-586-21	INDIVIDUAL CARTON (WHITE MODEL)	
*3-687-586-31	INDIVIDUAL CARTON (RED MODEL)	
3-701-630-00	BAG, POLYETHYLENE	
3-760-103-41	MANUAL, INSTRUCTION (ENGLISH/GERMAN)	
3-760-103-51	MANUAL, INSTRUCTION (DUTCH)	

****

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

SECTION 7
ADJUSTMENT

TABLE OF CONTENS

Section	*Title*	*Page*

4. TAPE PATH ADJUSTMENT

5. ELECTRICAL ALIGNMENT

1. PREPARATION FOR MECHANICAL SECTION CHECK, ADJUSTMENT AND REPLACEMENT

1-1. DISASSEMBLY OF CABINET

1) Remove the four case set screws (1).
2) Remove the upper case (2) in the direction shown by the arrow (A).
3) Loosen the eight screws (BVTP3 x 8) (3).
4) Remove the lower case (4) in the direction shown by the arrow (B).
5) Remove the three screws (BVTP3 x 8) (5).
6) Remove the two claws (6) in the direction shown by the arrow (C), then remove the front panel (7) in the direction shown by the arrow (D).

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

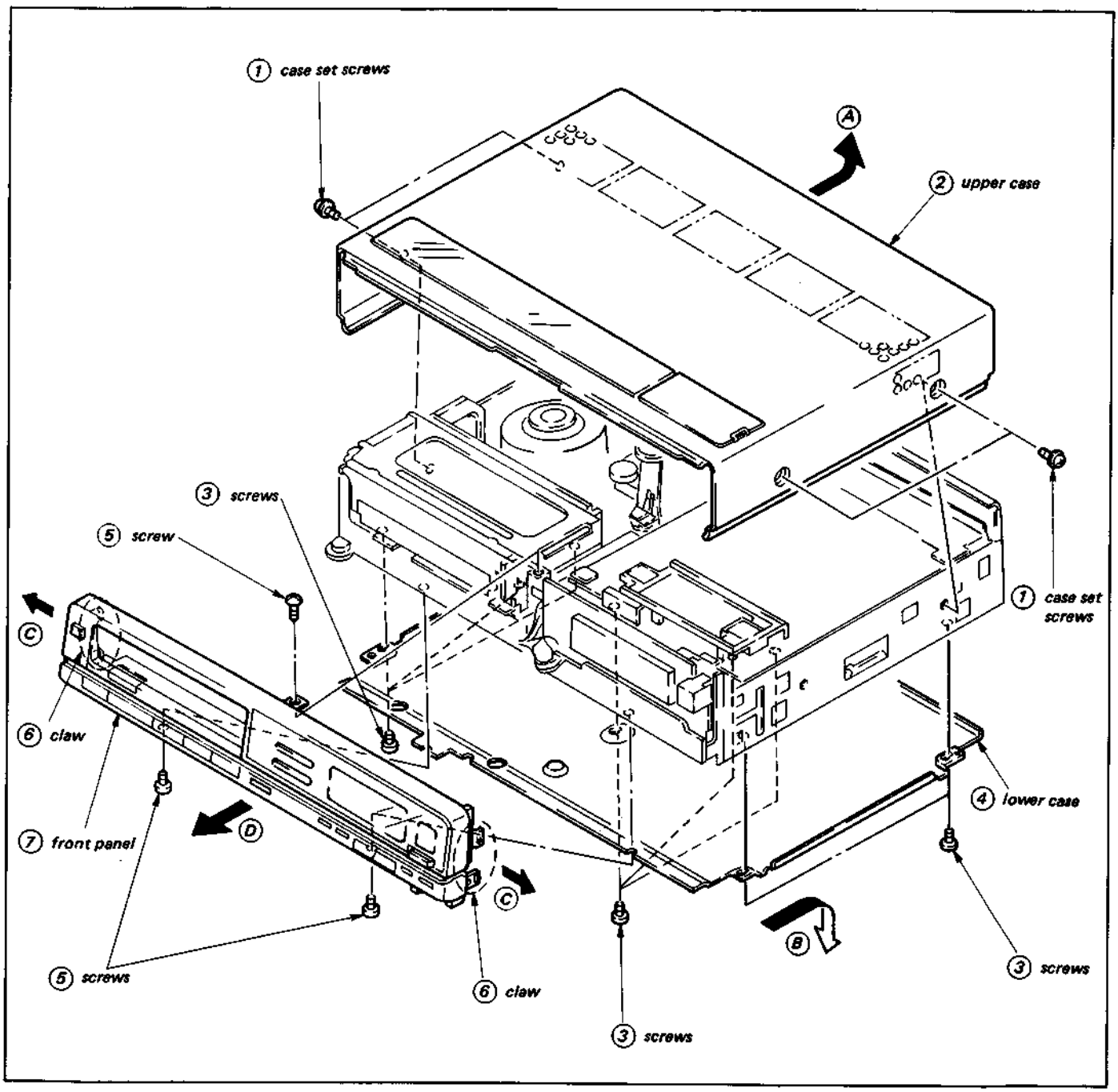


Fig. 1-1. Disassembly of Cabinet

1-2. REMOVAL OF THE RP-20 BOARD

1) Pull out the connector CN501 ①.
2) Remove the two screws (BVTP3 x 8) ②.
3) Pull out the three connectors (CN503, CN504) ③, ④.
4) Remove the two shield cases ⑥ in the direction shown by the arrows Ⓐ and Ⓑ.

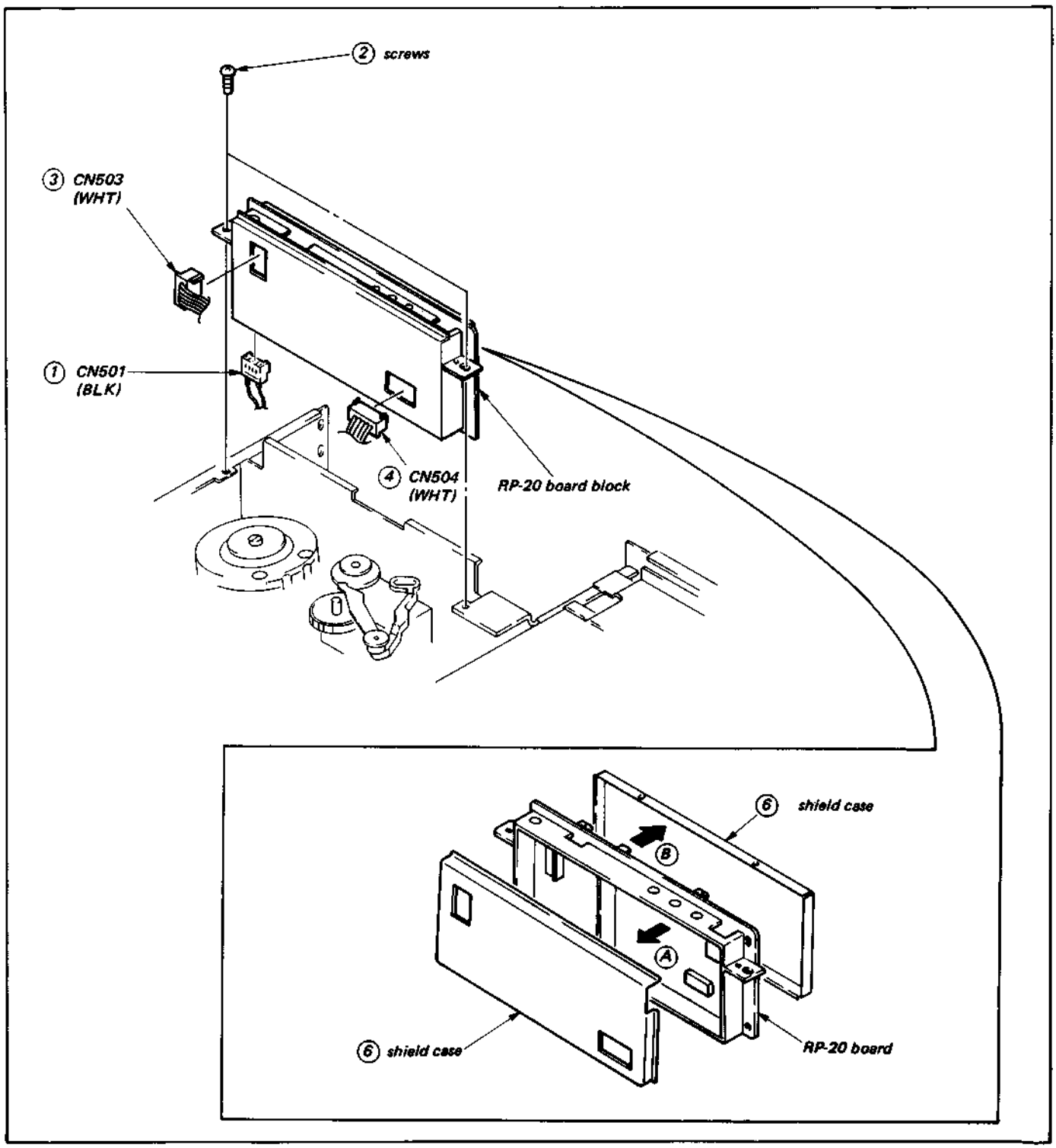


Fig. 1-2. Removal of the RP-20 Board

1-3. REMOVAL OF THE TA-22 BOARD

1) Remove the two screws (BVTP3 x 8) ①.
2) Remove the TA-22 board ② in the direction shown by the arrow.

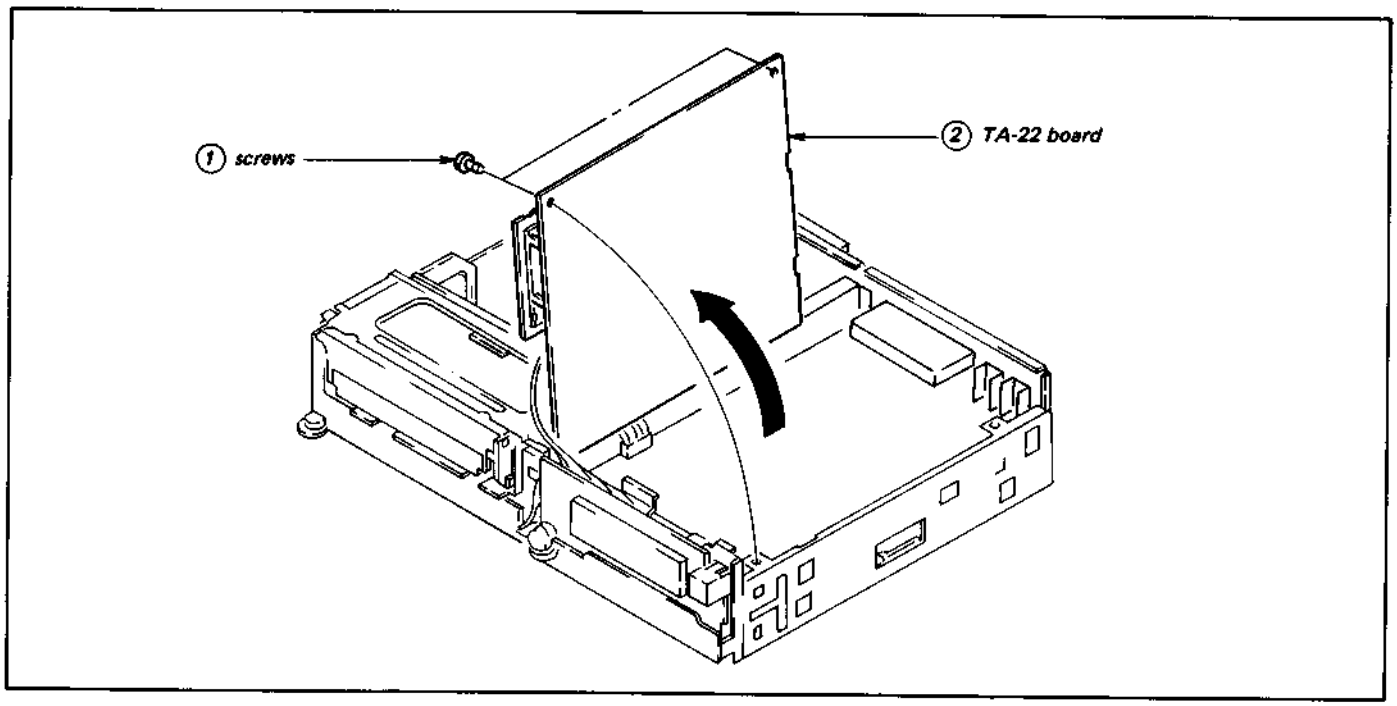


Fig. 1-3. Removal of the TA-22 Board

1-4. REMOVAL OF THE YC-31 BOARD

1) Stand the set with the left side panel on the bottom.
2) Remove the screw (BVTP3 x 8) ①.
3) Remove the plate, connector ② in the direction shown by the arrow Ⓐ.
4) Remove the two screws (BVTP3 x 8) ③.
5) Remove the YC-31 board ④ in the direction shown by the arrow Ⓑ.

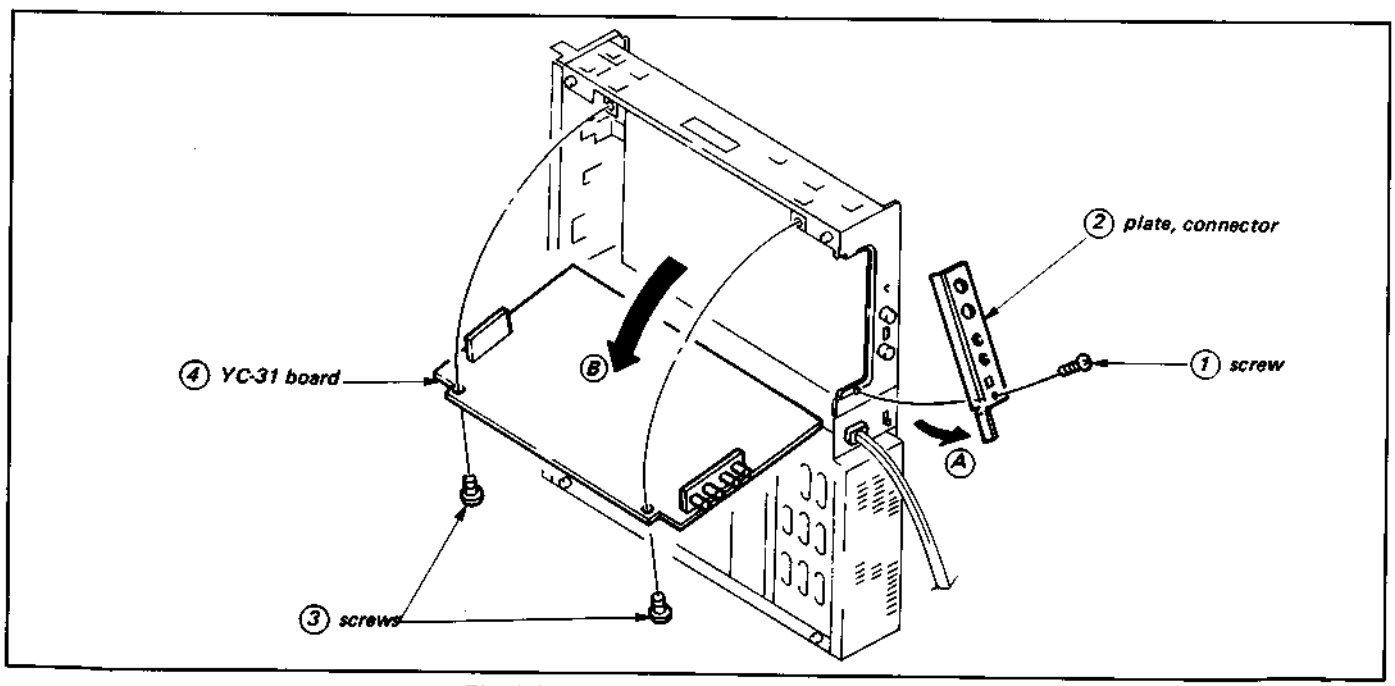


Fig. 1-4. Removal of the YC-31 Board

1-5. REMOVAL OF THE POWER BLOCK

1) Remove the six screws (BVTP3 x 8) ①.
2) Pull out the five connectors (CN101, CN102, CN103, CN104, CN106) ②.
3) Remove the power block ③ in the direction shown by the arrow.

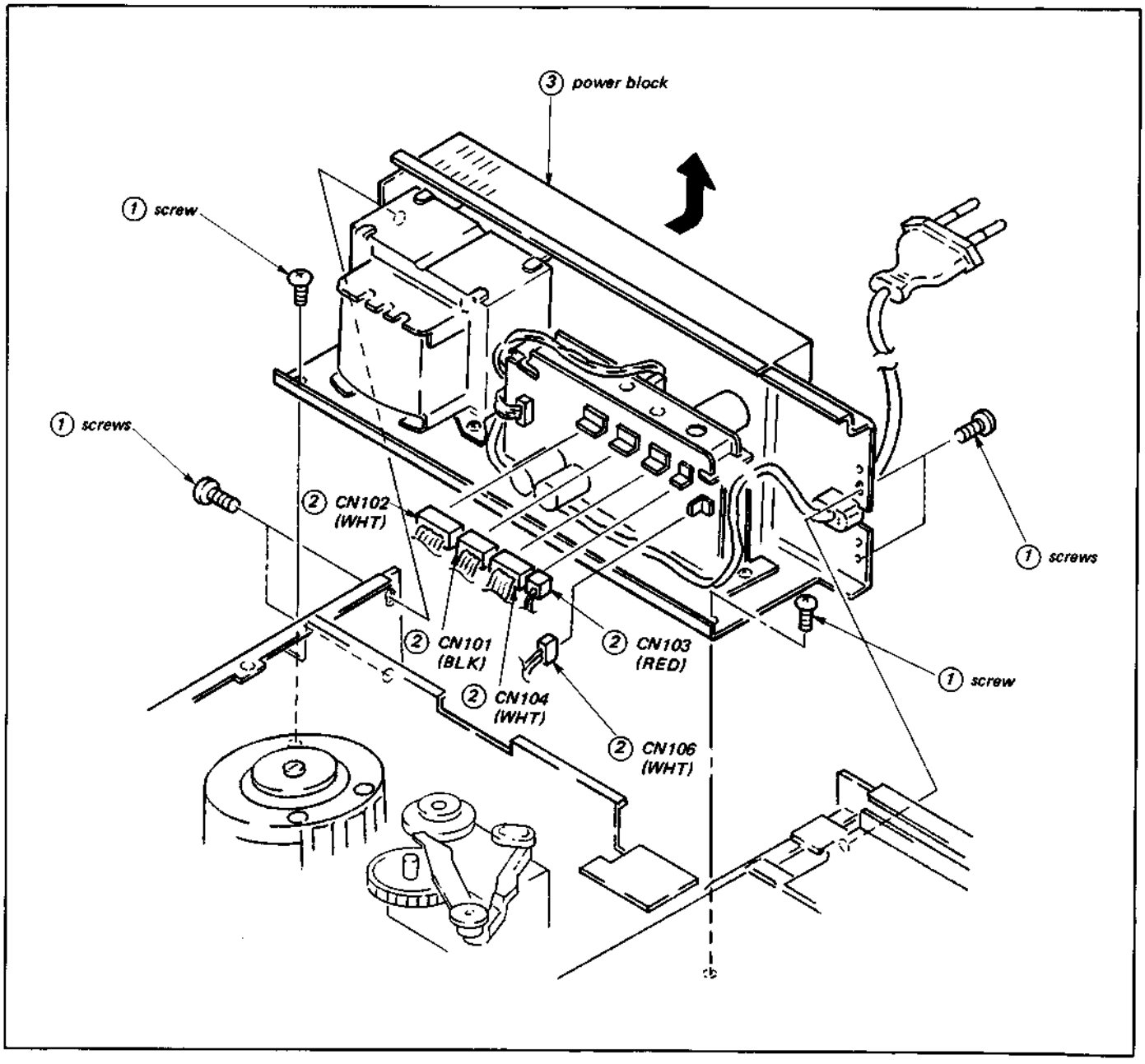


Fig. 1-5. Removal of the Power Block

1-6. OPERATION OF THE UNIT WITH THE FL CASSETTE COMPARTMENT REMOVED

1-6-1. How to Put the Unit into Threading Completed Mode when the FL Cassette Compartment is Removed

1) Connect ordinary screwdriver to short the leaf switch (cassette-on switch).

Note:

Be careful that the ordinary screwdriver do not touch any other parts (use tape or other insulation).

2) Press the cassette-down switch and leave it pressed in. When the power button is turned ON, threading starts.

※ Refer to 3-6 for instructions on how to remove the FL cassette compartment.

[How to EJECT in this condition]

- Press the EJECT button. When unthreading is completed and the internal gear starts to turn, turn the power OFF.

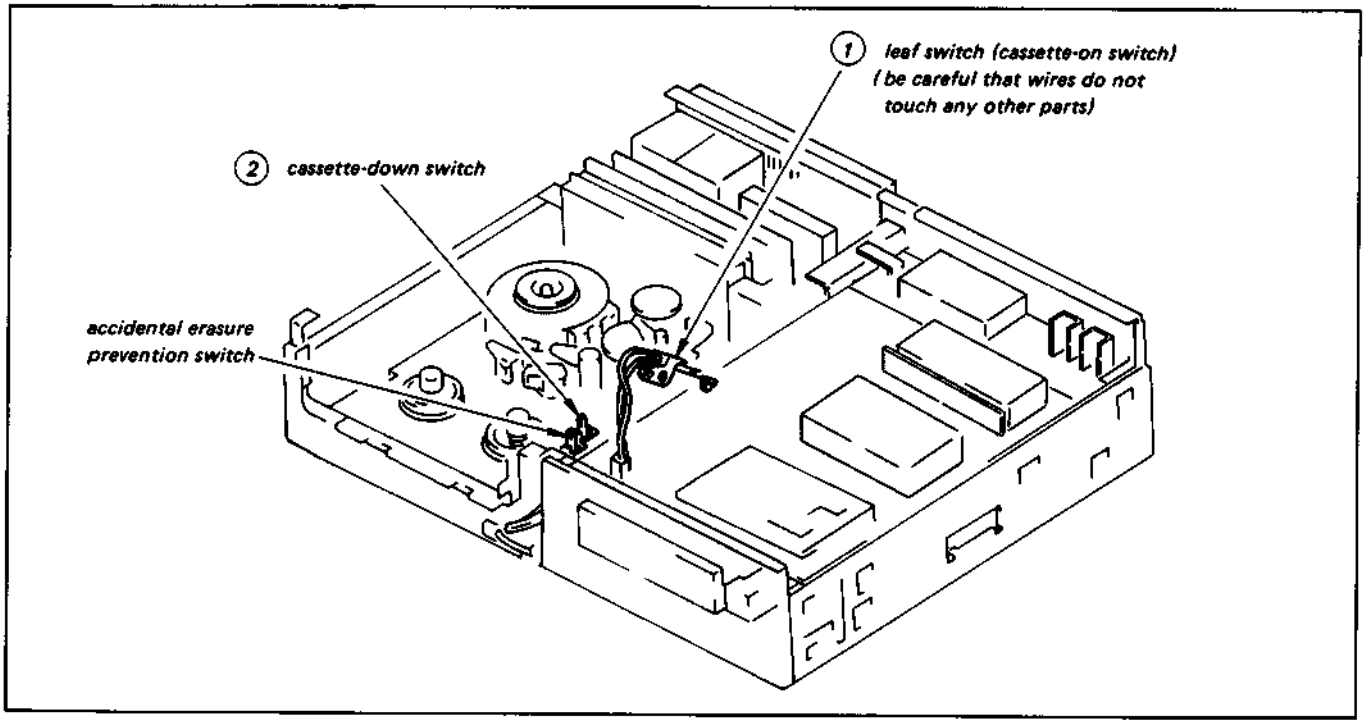


Fig. 1-6. How to thread the tape when the FL cassette compartment has been removed

1-6-2. Playback Without Cassette Installed

Complete threading by the procedure described in 1-6-1, then press the playback button.

1-6-3. How to Put in Recording Mode Without Cassette Installed

1. Thread by the procedure in 1-6-1 then ress the accidental erasure prevention switch shown in Fig. 1-7.
2. With the accidental erasure prevention switch pressed down, press the recording button.

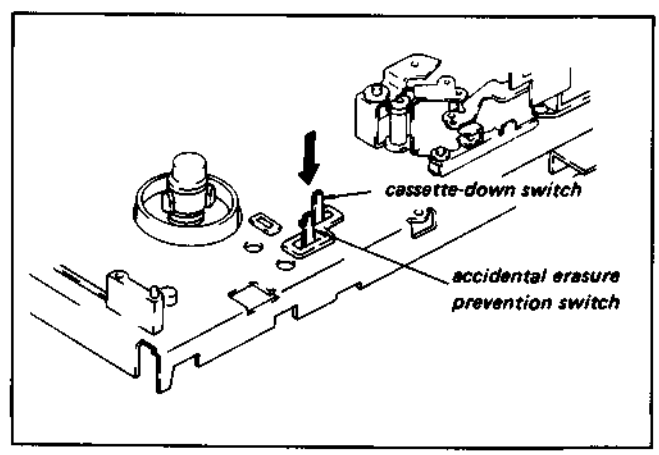


Fig. 1-7. How to put the recorder in recording mode with the FL cassette compartment removed

1-7. HOW TO LOAD, THREAD, UNLOAD AND UNTHREAD WITH THE POWER OFF

1-7-1. Manual Loading and Unloading

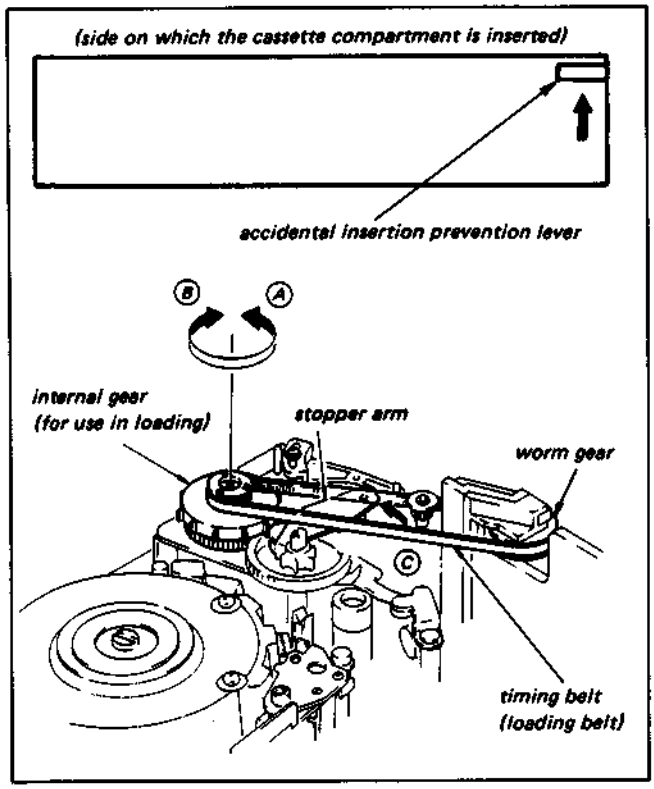


Fig. 1-8. Manual loading and unloading

1) Release the right accidental insertion prevention lever inside the cassette compartment, then press the stopper arm in the direction of arrow (C) and release the internal gear stop.
2) Turn the internal gear manually in the direction of arrow (A) until loading is completed.
3) To unload, turn the internal gear in the direction of arrow (B).

Note:
When the loading belt has been removed, load and unload by turning the worm gear manually.

1-7-2. Manual Threading and Unthreading

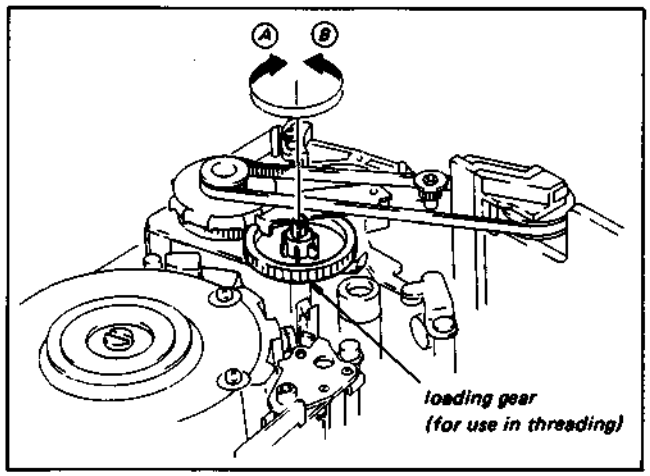


Fig. 1-9. Manual threading and unthreading

1) Turn the loading gear in the direction of arrow (A) until loading is completed.
2) To unthread, turn the loading gear in the direction of arrow (B).

Note:
Always turn the loading gear sideways by hand. Never use a screwdriver or other tool.

1-8. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref.No.	Name	Part Code	Carved Jig No.	Use and Remarks
J-1	Torque Measurement Tape	J-6080-003-C	SL-0003C	forward torque and back tension measurement
J-2	Parallel Plate	J-6086-570-A	SL-0657	audio/CTL head lateral adjustment capstan shaft vertical adjustment
J-3	Dental Mirror (handle) Dental Mirror (mirror)	J-6080-029-A J 6080 030 1	SL-5052	tape path and tape traveling adjustment check
J-4	Alignment Tape (KR5-2H)	8-969-995-52	—	tracking, overall adjustment of picture quality, etc.
J-5	Cleaning Fluid	Y-2031-001-0	—	
J-6	Thickness Gauge	9-911-053-00		
J-7	Chamois Cloth	2-034-697-00	—	cleaning
J-8	Head Demagnetizer	widely available	—	demagnetization of video head and audio head
J-9	Cleaning Cassette Tape	8-888-004-00	—	video head cleaning
J-10	Dihedral Adjustment Screw	J-6080-013-A	SL-0013	video dihedral adjustment

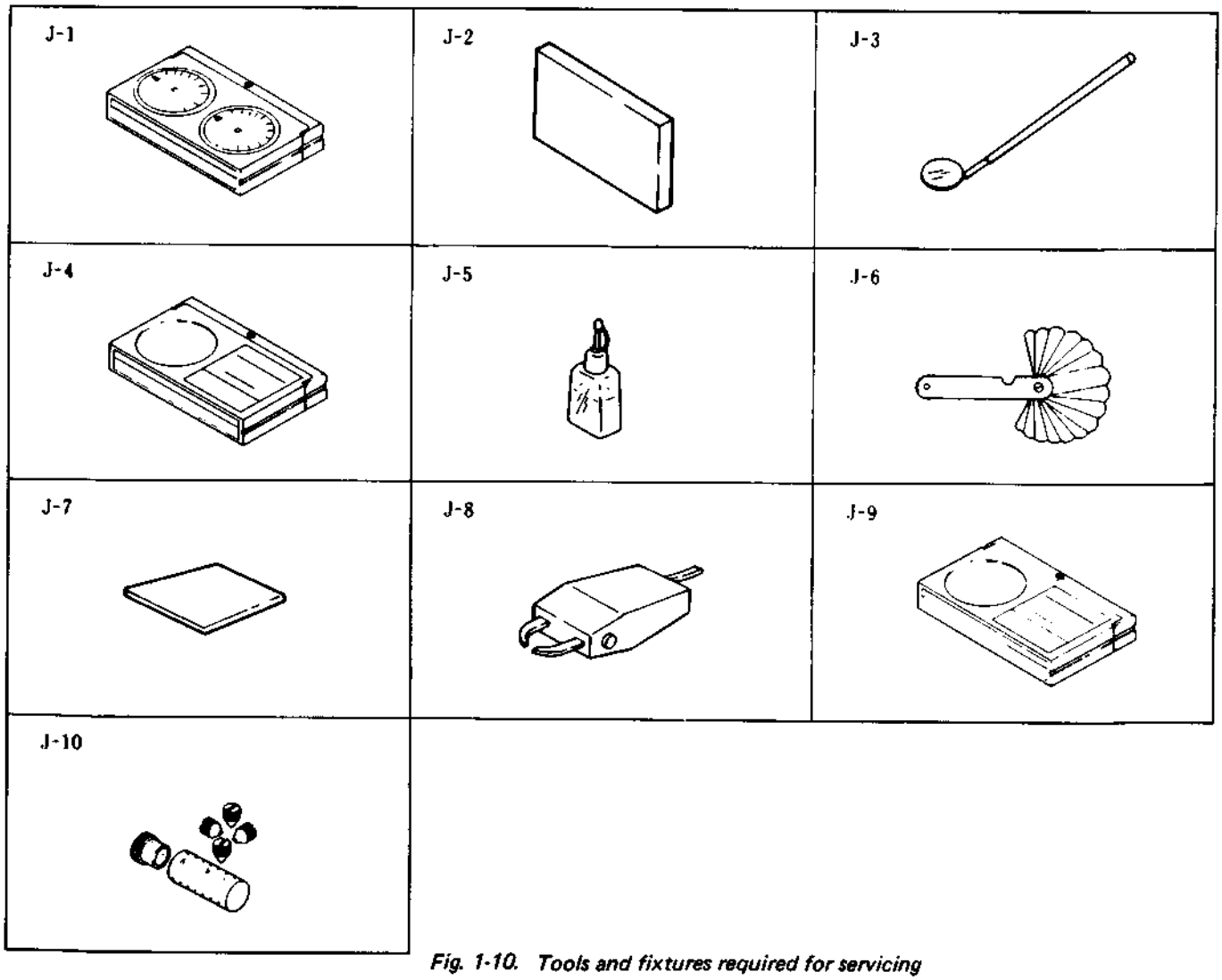


Fig. 1-10. Tools and fixtures required for servicing

2. PERIODIC CHECK AND MAINTENANCE

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

2-1. POST-REPAIR MAINTENANCE

The following must be done after every repair regardless of how many hours the user has operated the machine.

2-1-1. Cleaning of Rotating Head Disk Assembly

1) Press a chamois cloth (Jig Ref. No. J-7) which has been dipped in cleaning fluid (Jig Ref. No. J-5) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a right angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-1-2. Cleaning of the Tape Movement System

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in in cleaning fluid.

2-1-3. Cleaning the Drive System

1) Clean the driving parts with a cloth that has been dipped in cleaning fluid.

parts requiring cleaning

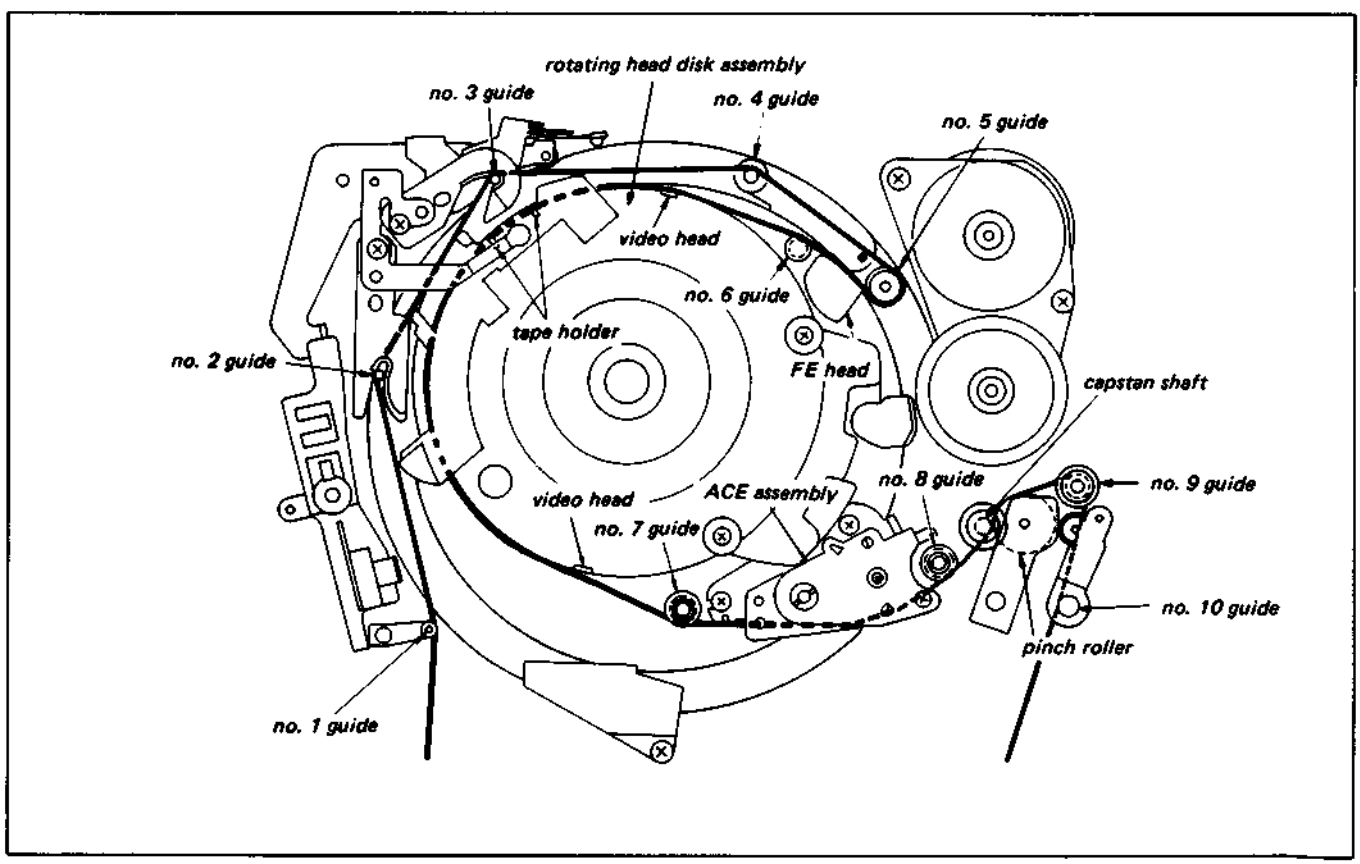


Fig. 2-1. Parts requiring cleaning

2-2. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, accoring to user's operating hours.

	Maintenance & Check	Replacement Part No.	Operating Hours (H) 500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Transportation System	Cleaning of tape transportation system	——	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE ass'y	——	○	○	○	○	○	○	○	○	○	○	
	Cleaning & degaussing of video disk ass'y	——	○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Driving System	Loading belt (synchro belt)	3-684-264-01	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	This cleaning must be done whenever a repair is made.
	Cleaning of iron core and opening of solenoid	——	–	–	–	○	–	–	–	○	–	–	Wipe iron core and opening of solenoid with dry cloth.
Performance Confirmation	Abnormal sound		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension		–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to 3-13. Specified value: adjust to 31 – 35 g·cm (When measured with torque cassette tape)
	Confirmation of brake system		–	☆	–	☆	–	☆	–	☆	–	☆	
	Confirmation of record & playback functions		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 80 ± 5 g·cm (SL-0003C)

○ Cleaning ★ Replacement ☆ Confirmation

Note:
On overhaul
When overhauling the unit, replace parts as indicated in the above table.

3. CHECK, ADJUSTMENT AND REPLACEMENT PROCEDURES

3-1. REPLACEMENT OF ROTATING HEAD DISK ASSEMBLY

3-1-1. Removal of the Rotating Head Disk Assembly (Fig. 3-1)

1) Remove the two screws that hold the damper assembly in place, then remove the damper assembly.
2) Use a hexagonal wrench to remove the hexagonal socket bolt that holds the upper drum assembly in place, then remove the upper drum assembly.
   Note:
   Turn the upper drum to remove, being careful not to move the adjusting plate. Movement of the adjusting plate will have a great effect on the tape path, so caution is required.
3) Unsolder the rotating head disk relay plate (4 red and white leads).
4) Remove the two hexagonal socket bolts holding rotating head disk assembly (5) in place, then remove the rotating head disk assembly.
   Note:
   Be careful not to touch the head tip with the hand or bang anything against it.

3-1-2. Mounting of the Rotating Head Disk Assembly (Fig. 3-1)

1) Insert rotating head disk (5) in place, being careful of the direction so that the red and white leads are in the right places.
2) Tighten hexagonal socket bolt (4) and solder the lead wires.

Note:
Be careful to solder the lead wires correctly and not to break any wires.

3) Attach the upper drum, being careful (as during removal) not to move the adjusting plate. While pressing the two points that determine the height, tighten hexagonal socket bolt (2).
   Note:
   When inserting the upper drum, be careful that it does not touch the head tip.

Note:
When replacing the rotating drum head, it can happen that the rotating head disk assembly will be hard to remove. In such a case, remove it using the method explained below (Fig. 3-2).

1) Remove the hexagonal socket bolts that hold the rotating head disk assembly in place.
2) When the head disk is jammed on tight and is hard to remove, screw the hexagonal socket bolts removed in step (1) into the threaded holes removed from the original holes by 90°. Tighten them a little at a time.

The head disk will be lifted up by the two screws and will come off easily.

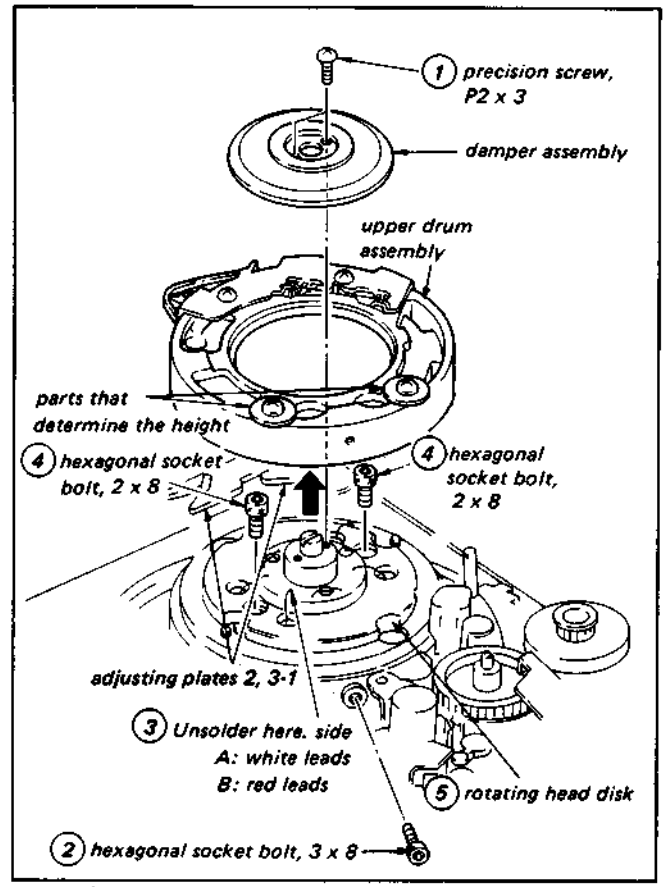


Fig. 3-1. Removal of the rotating head disk assembly I

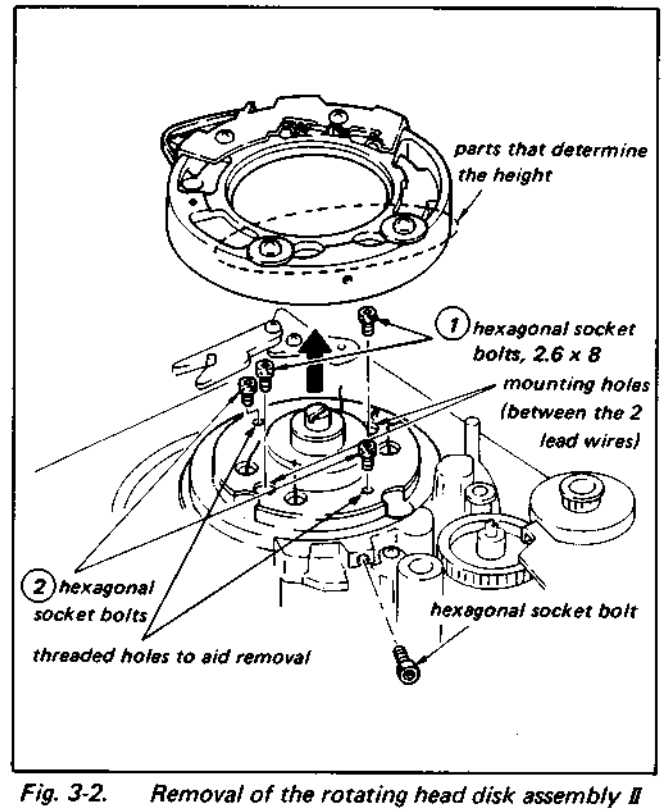


Fig. 3-2. Removal of the rotating head disk assembly II

3-2. VIDEO HEAD DIHEDRAL CHECK AND ADJUSTMENT

This adjustment is generally unnecessary, but it is sometimes necessary when the video head disk is replaced. (The video head disk used for maintenance has been precision adjusted at the factory using a microscope and almost never needs to be readjusted.)

When judging whether the video head dihedral angle is correct, the alignment tape is played back. When this is done the tracking control knob must be in the centering position. If the check is done with this knob in other than the center click position (if the tracking is off-center), even if the dihedral angle is correct the picture will be reproduced as if it were off.

Before this adjustment is performed, the ACE assembly position adjustment (refer to the section where the tape path adjustment is described) must be completed.

[Method of checking]

With the tracking control knob set to the center click position, play back the monoscope section of the alignment tape. Check to see if any of the vertical monoscope lines immediately below the switching pulse are reproduced double. If not, the dihedral angle is correct and does not have to be adjustment. If so, perform the adjustment as explained below.

[Method of adjustment]

1) As shown in Fig. 3-3, screw two dihedral angle adjustment screws (Jig Ref. No. J-10) into the adjustment screw holes on the side on which the red lead wires from the video head are connected, until the top of the screw is level with the video head disk. (If they are not screwed in far enough, the video head disk will not turn past the point where the top of the adjustment screw strikes the upper drum. Conversely, if it is screwed in too far, the head base will be moved, throwing the video head dihedral angle way off.)
   Note:
   The side on which the white lead wires are connected is the reference side and must not be moved.
2) Screw one of the two adjustment screws in a little bit farther until resistance is felt. Beyond this point, turning the screw still farther will move the video head, adjusting the dihedral angle.
3) With the adjustment screws in place, play the monoscope signal section of the alignment tape and see how the lines are reproduced. If the vertical lines are split apart more than before, turn the screw which was screwed in more tightly counterclockwise to loosen it, then adjust by tightening the other screw.
4) After the adjustment is completed, remove the adjustment screws and play the tape again to reconfirm that the adjustment is correct.

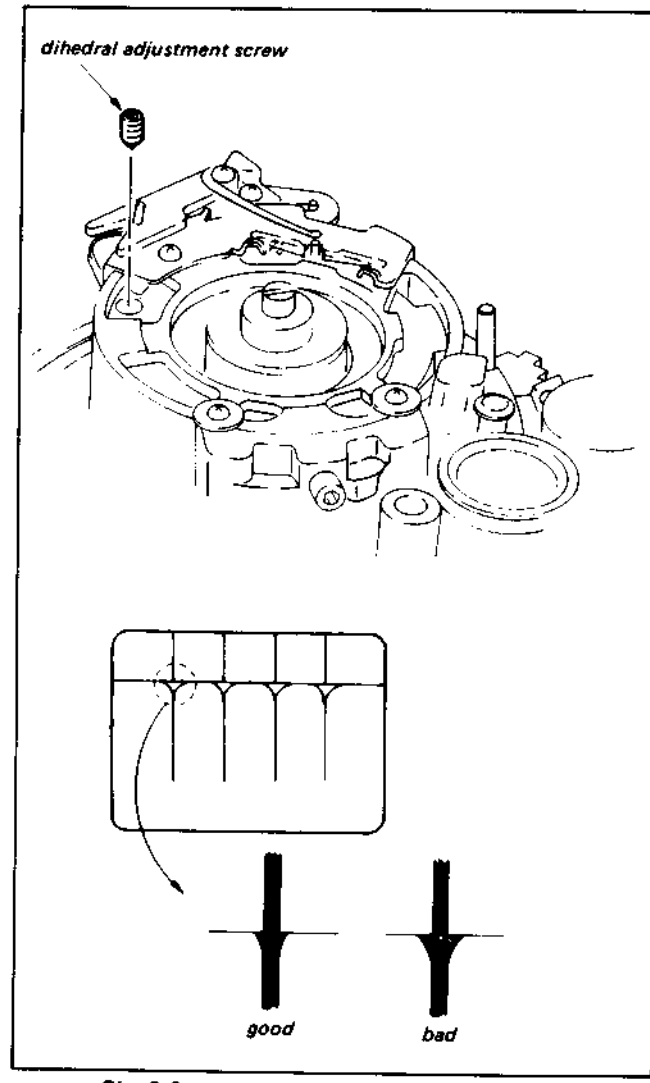


Fig. 3-3. Video head dihedral adjustment

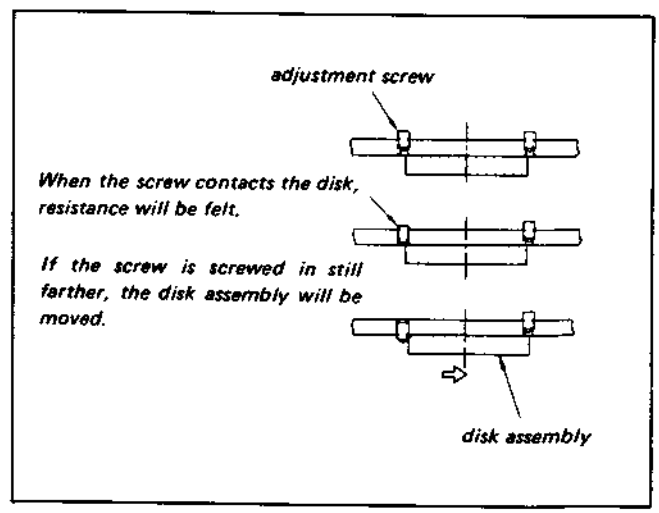


Fig. 3-4.

3-3. REPLACEMENT AND ADJUSTMENT OF THE DRUM ASSEMBLY

3-3-1. Replacement of the Drum Assembly

1) Measure gap (A) between adjusting plate 2 and the upperdrum holder section and record the measurement.
Note:
The position where the adjusting plate is mounted has a large effect on the tape path, so this measurement must be performed.
2) Measure gap (B) between adjusting plate 3-1 and the upper drum holder section, and record the measurement.
Note:
The position where the adjusting plate is mounted has a large effect on the tape path, so this measurement must be performed.
3) Remove the screws shown in Fig. 3-5, then remove the tape guide ground plate and adjusting plates 2 and 3-1.
4) Remove the 3 connectors from the rear of the chassis as shown in Fig. 3-6.
5) Remove the 3 drum mounting screws from the rear of the chassis, then remove the main body of the drum assembly. After the replacement has been completed, adjust the drum path.

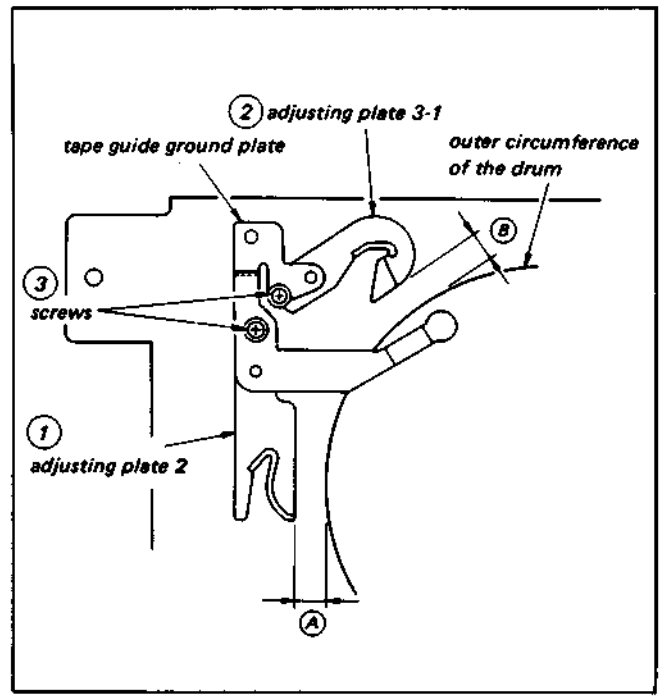


Fig. 3-5. Measurement of the position of adjusting plates 2 and 3-1

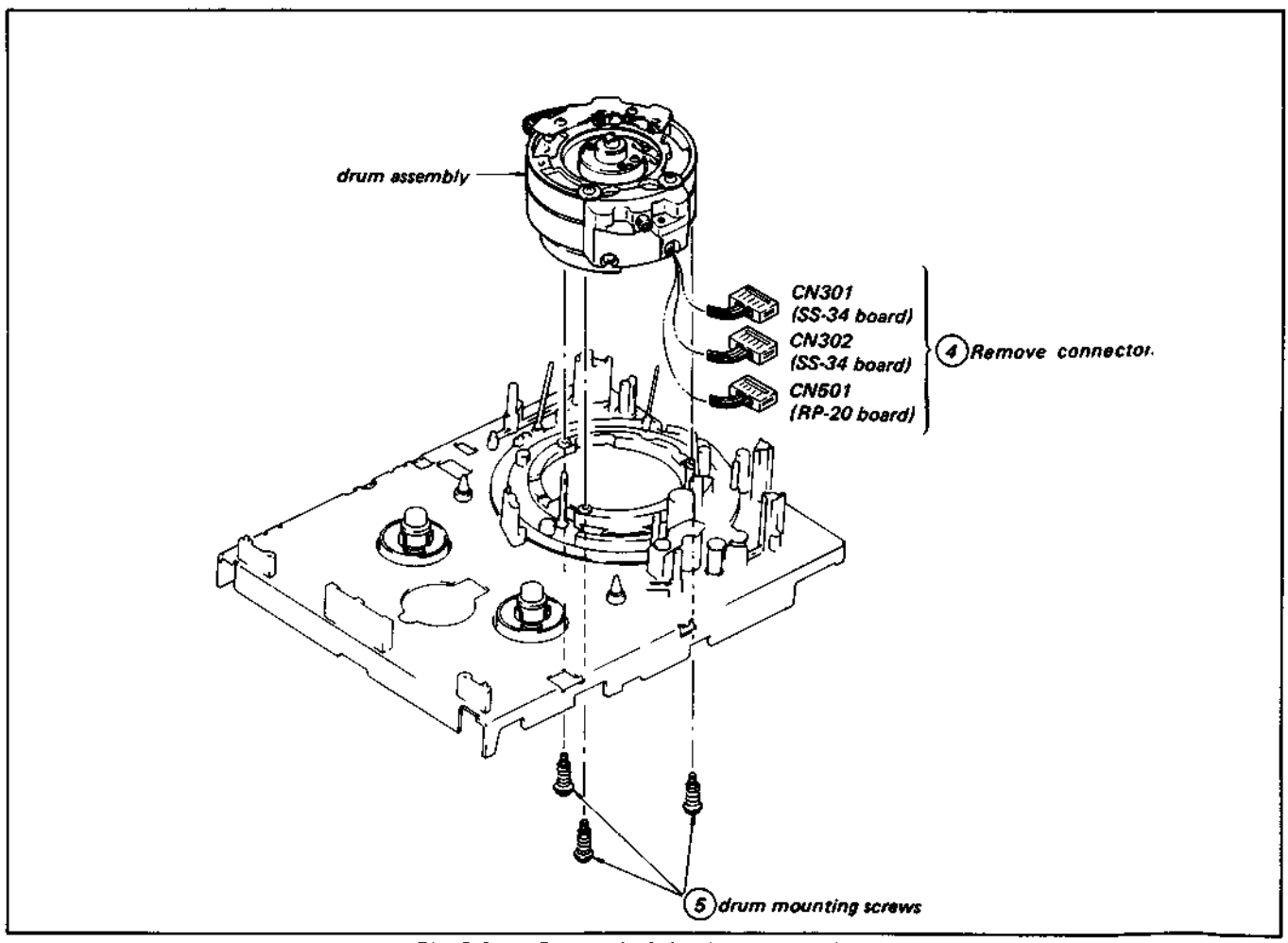


Fig. 3-6. Removal of the drum assembly

3-3-2. Adjustment of the Motor Gap when Replacing the Drum Assembly

After replacing the drum assembly, adjust the gap between the motor rotor and the coil to 0.3 mm to 0.6 mm (Fig. 3-7).

[Procedure]

1) When re-assembling the drum, use the spacers which were removed to produce a gap of between 0.3 mm and 0.6 mm. Measure the gap using the gauge that comes with the drum for assembly and maintenance use. One side of the gauge is 0.3 mm and the other side is 0.6 mm. If the gap is adjusted correctly, the 0.3 mm side should fit in and the 0.6 mm side should not.
2) If this fails to give the correct gap width, do not use the spacers which were removed: instead, use a combination of the 4 0.3 mm accessory spacers to obtain the correct width.

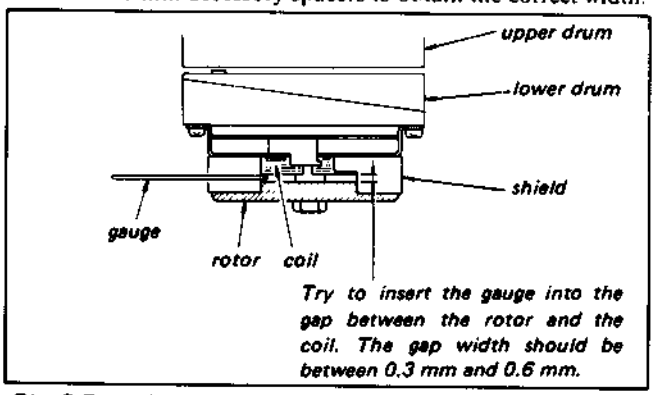


Fig. 3-7. Checking the motor gap width after replacing the drum assembly

Removal of the stator and rotor when replacing the drum

1) Remove the nut and washer.
2) Remove the rotor from the stator.
3) Remove the 2 screws, then remove the stator from the main body of the drum.

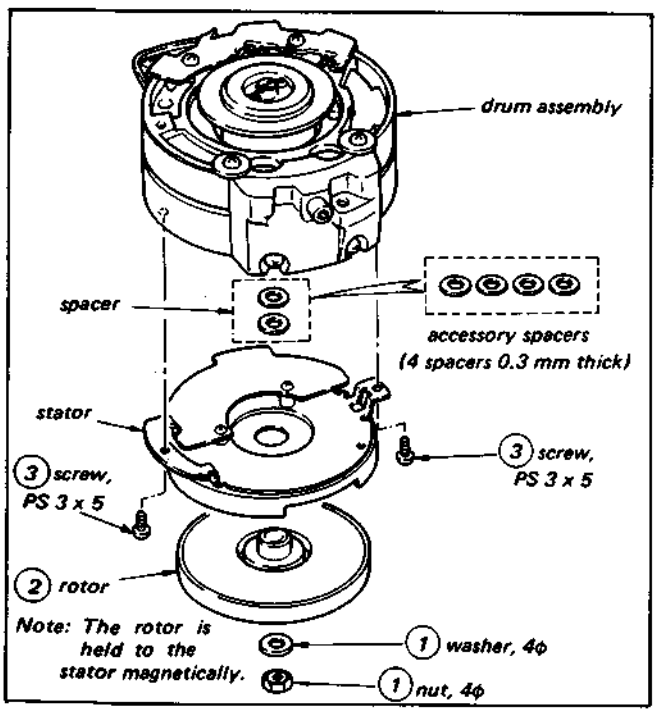


Fig. 3-8. Removal of the stator and rotor when replacing the drum

3-4. REPLACEMENT OF THE CAPSTAN MOTOR

3-4-1. Removal of the Capstan Motor (Fig. 3-9)

- Remove the three screws (1) then remove the capstan motor from the rear of the mechanical chassis.

Note:
When the capstan motor has been removed or replaced, check the tape path once.

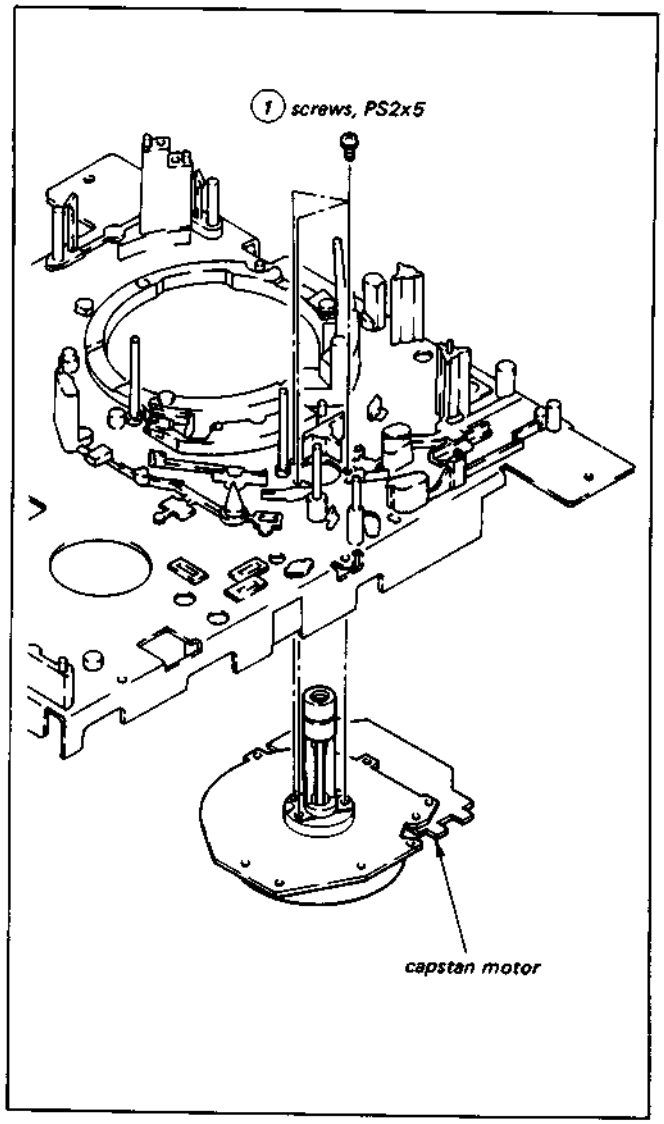


Fig. 3-9 Removal of the capstan motor

3-5. REMOVAL OF THE S COIL SENSOR (Fig. 3-10)

1) Remove the spring.
2) Remove the claw in the direction of arrow (A), then pull the S coil sensor out.
3) Pull out the connector from CN604 on SS-34 board.

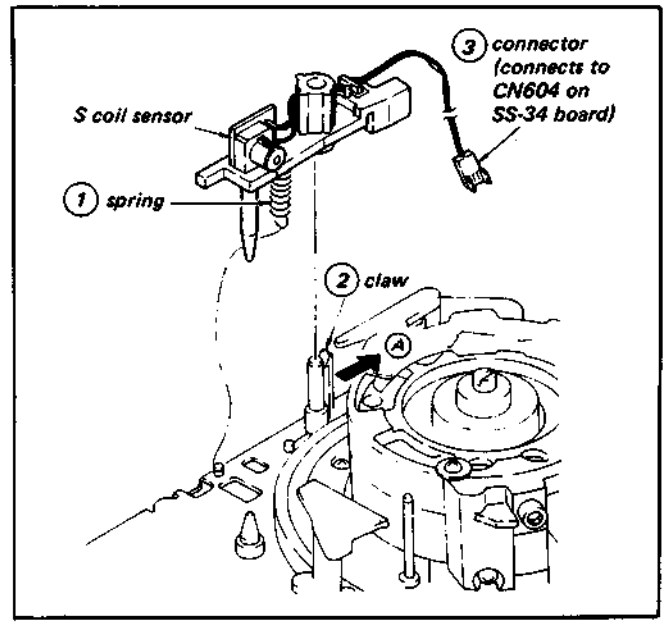


Fig. 3-10. Removal of the S coil sensor

3-6. REMOVAL OF THE FL CASSETTE COMPARTMENT ASSEMBLY (Fig. 3-11)

1) Remove the four screws (BVTP3 x 8) (1).
2) Remove the internal gear flange (2).
3) Remove the timing belt (loading belt) (3).
4) Pull out the connector CN606 (4), on the SS-34 board.
5) Remove the FL cassette compartment assembly in the direction shown by the arrow.

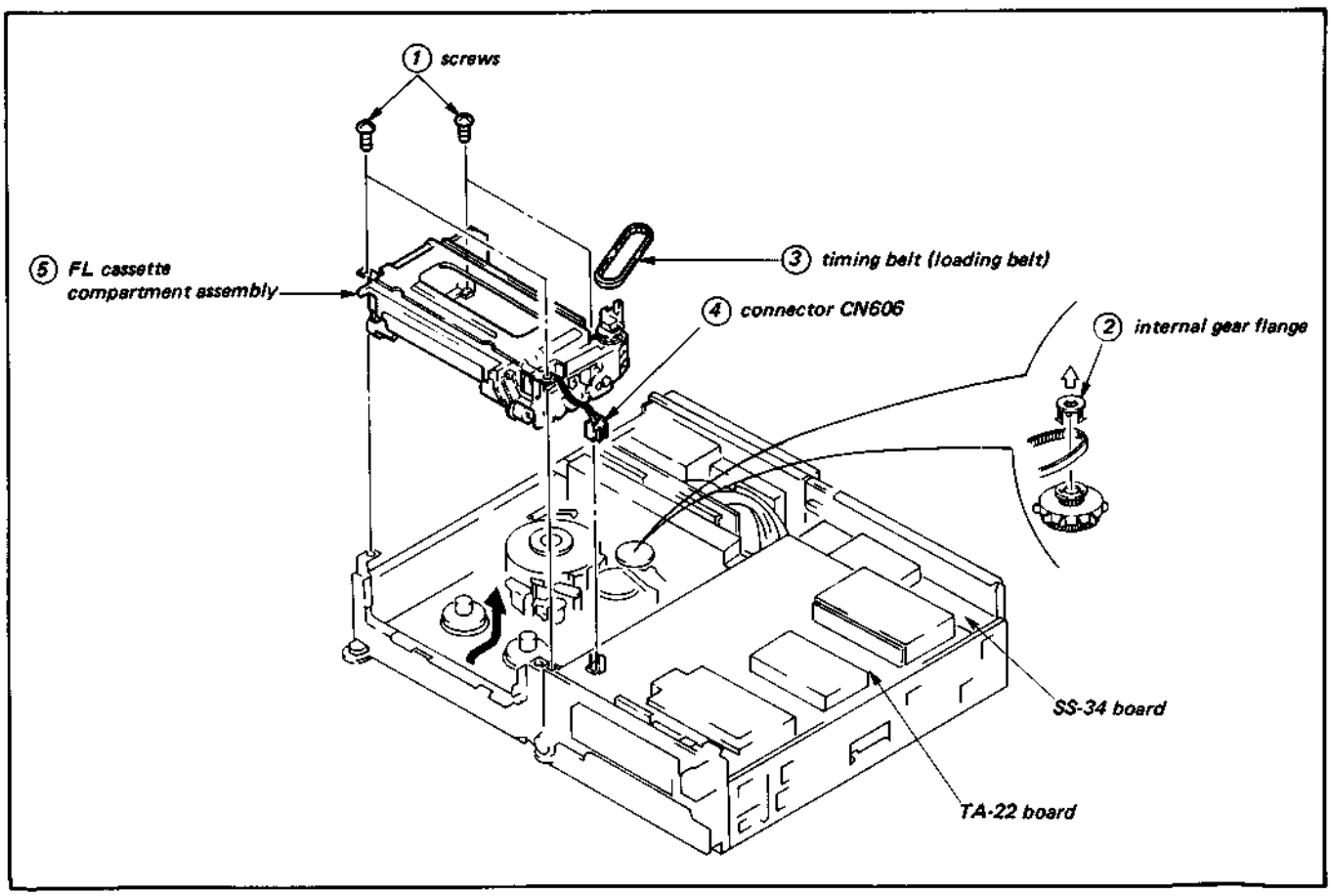


Fig. 3-11. Removal of the FL cassette compartment assembly

3-7. ADJUSTMENT OF THE FL CASSETTE COMPARTMENT

3-7-1. Adjustment of the Position of the Right Gear of the FL Cassette Compartment Assembly

In the FL cassette compartment assembly, the cassette holder must always move parallel to the mechanical chassis. The gear system is used to control the amount by which the cassette holder advances so that this will be the case. Consequently, if the gears in this section slip out of mesh, the next time the unit is assembled the gear mesh must be adjusted to the correct position; otherwise the cassette will not feed properly.

[Adjustment of the gear positions]

1) Get a positioning rod about 200 mm long and 1.5 mm in diameter ready.
2) While passing the positioning rod through the combination of the drive arm right and cassette ON cam, fit the latter on the right side plate. Similarly, fit the drive arm left onto the left side plate.
3) Similarly, while passing the positioning rod through the worm wheel, fit the latter onto the right side plate.
4) Similarly, while passing the positioning rod through the combination of the limiter gear and cassette OFF cam, fit the latter onto the right side plate.

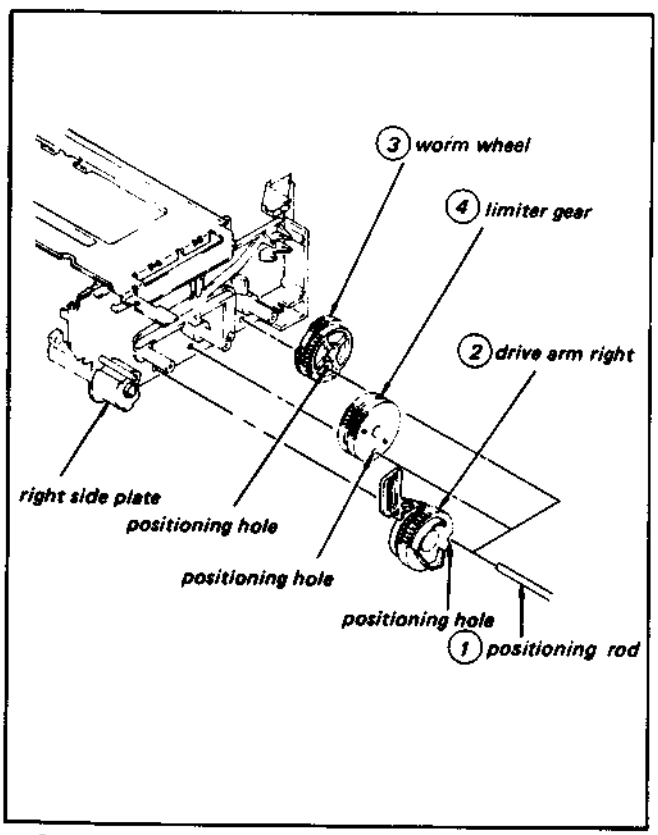


Fig. 3-12. Positioning of the FL cassette compartment gears

3-7-2. Cassette ON Switch Operation Check and Adjustment

[Method of checking]

When inserting a cassette into the FL cassette compartment assembly, confirm that, as the cassette is inserted, the leafswitch comes ON when the center of the drive roller is 8 to 13 mm from the end of the guide groove, as shown in Fig. 3-13.

[Method of adjustment]

Bend the tip of the cassette ON switch in the direction of the arrow.

Adjust so that the cassette ON switch comes ON when the above distance is 8 to 13 mm, and finally tighten the screw.

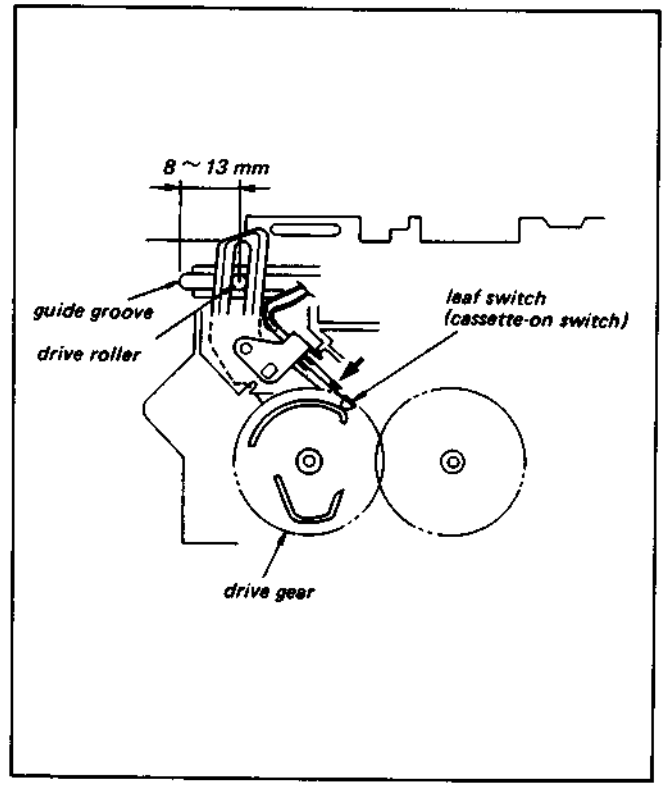


Fig. 3-13. Cassette ON switch operation check and adjustment

3-7-3. Checking and Adjustment of the Cassette Door Assembly

[Method of checking]

With the door opening and closing arm returned all the way in the direction of arrow Ⓐ , check to make sure that the door is vertical.

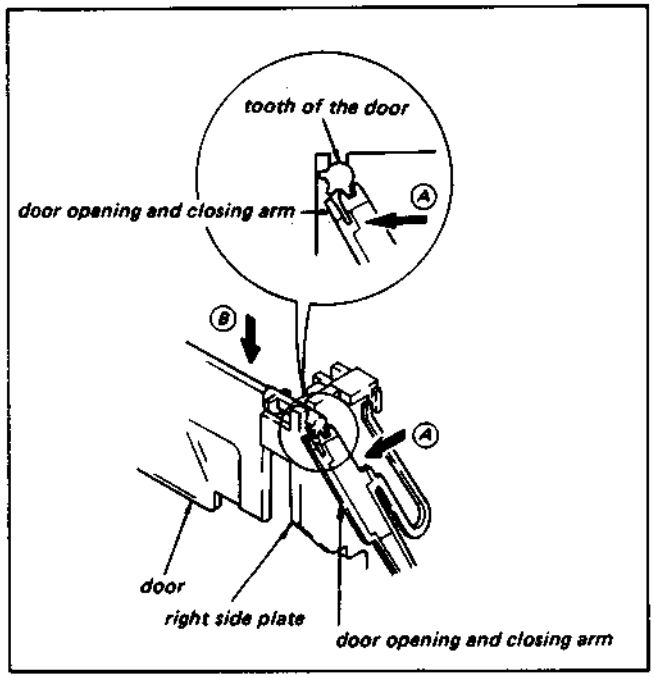


Fig. 3-14. Adjustment of the position of the cassette door assembly

[Method of adjustment]

check to make sure that the door opening and closing rack plate has returned all the way. Then, close the door together in the drection of arrow Ⓑ so that it is vertical, and mesh the gears.

3-7-4. Mounting the FL Cassette Compartment Assembly (Fig. 3-15)

1) Hook the two holes of the FL cassette compartment assembly onto the mechanical chassis, then place the compartment in the specified position on the chassis.
2) Loosely tighten the 4 mounting screws of the FL cassette compartment assembly. Move the FL cassette compartment assembly forward and backward with respect to the mechanical chassis, set it in the correct position, then tighten the mounting screws all the way.
3) Connect the timing belt (loading belt) between the threading motor and the worm gear, then hold it in place with the internal gear flange.
4) Press the tension roller arm in the direction of the arrow to adjust the tension of the timing belt (loading belt), then fix it in place with the arm fixing screw.
5) Insert the harness sticking out from the FL cassette compartment into connector CN606 on SS-34 board.

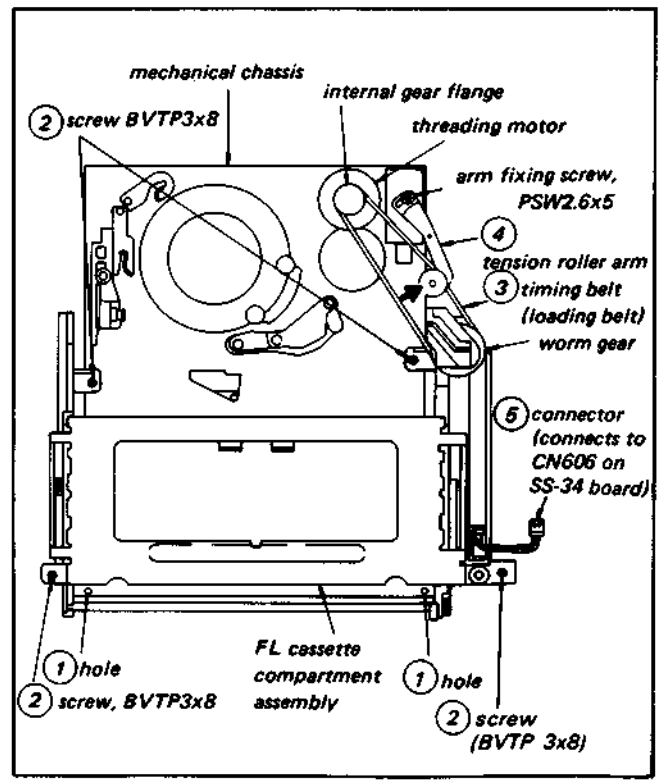


Fig. 3-15. Mounting the FL cassette compartment assembly

3-8. REMOVAL OF THE No. 2 AND No. 3 GUIDES

3-8-1. Removal of the No. 2 Guide

1) Remove the 1×3 tap-in screw.
2) Remove the 1.4×3 tap-in screw.
3) Remove the No. 2 guide assembly.

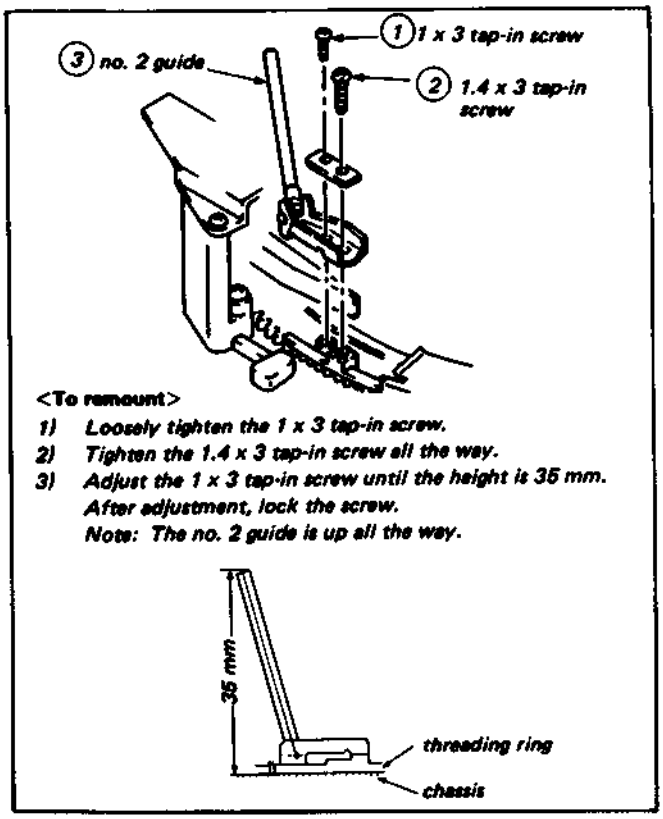


Fig. 3-16. Removal of the no. 2 guide

3-8-2. Removal of the No. 3 Guide

1) Remove the 1×3 tap-in screw.
2) Remove the 1.4×3.5 tap-in screw.
3) Remove the limiter spring.
4) Remove the No. 3 guide assembly.

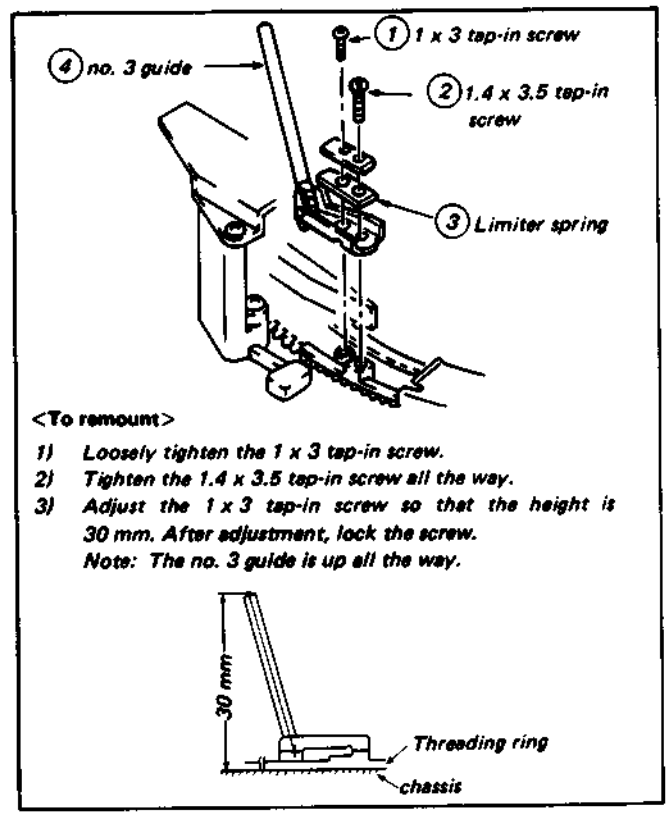


Fig. 3-17. Removal of the no. 3 guide

3-9. REPLACEMENT AND ADJUSTMENT OF THE S THREADING RING

3-9-1. Perparation to Remove the S Therading Ring Removal of the ACE Assembly, FE Head and Threading Motor (Fig. 3-18)

1) Remove the cross-recessed head screw.
2) Remove the No. 6 guide nut.
3) Remove the No. 6 washer.
4) Remove the No. 6 guide spacer.
5) Remove the compression coil spring.
6) Remove the 2 guide adjustment screws, then remove the ACE assembly and the FE head.

Note:
Since the ACE assembly and the FE head are connected by a lead wire, be careful when removing them. It is not necessary to remove the compression coil spring below the ACE assembly, but be careful not to use it.

7) Remove the 3 screws, then remove the threading motor assembly by pulling it up and out.

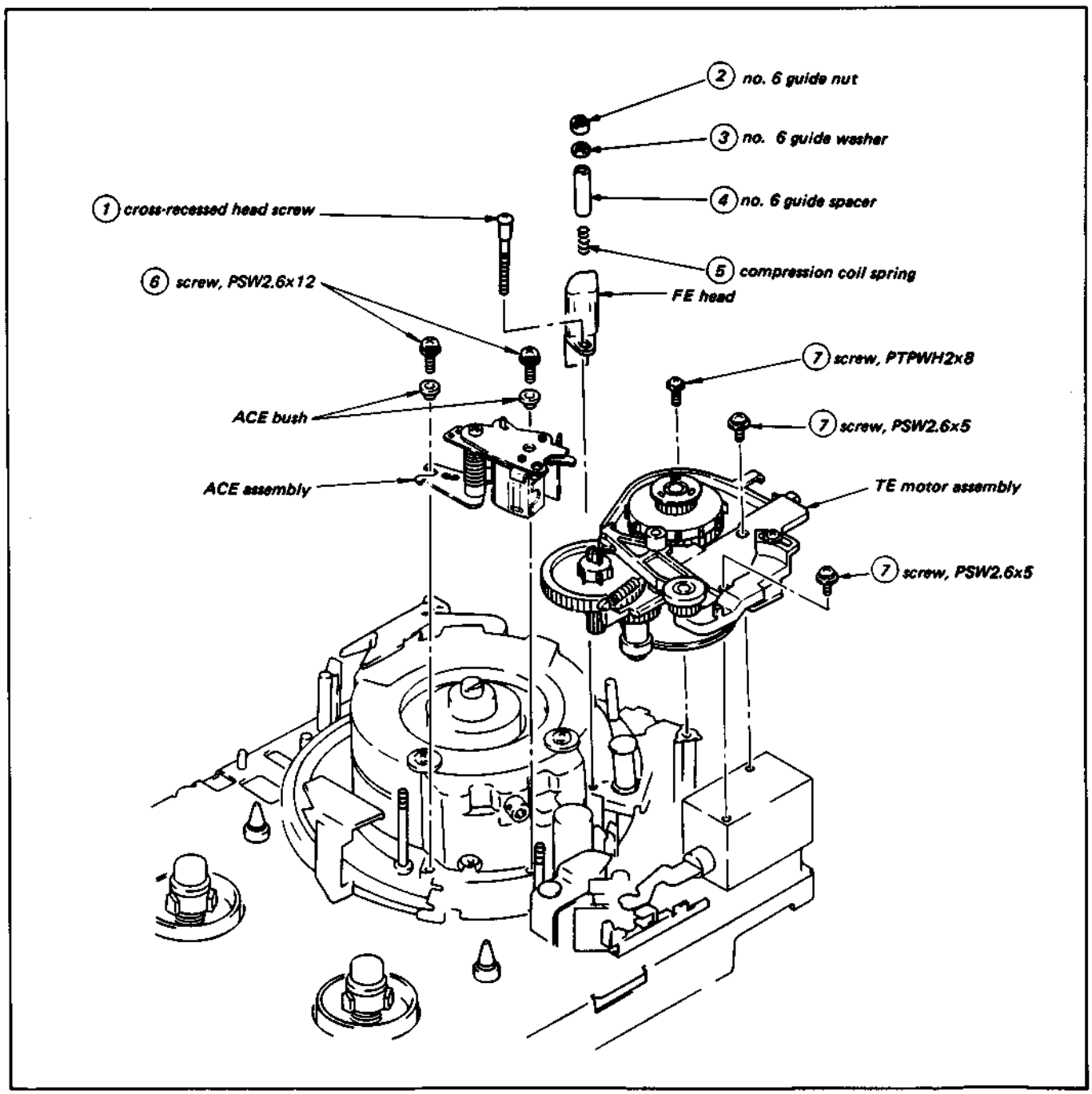


Fig. 3-18. Removal of the ACE assembly, FE head and TE motor assembly.

Removal of Miscellaneous Parts (Fig. 3-19)

Proceeding in the same manner as in replacement of the drum assembly, measure the width of the gap between the upper drum and the adjusting plates (Fig. 3-5).

1) Remove the screw, then remove the tape guide ground plate and adjusting plates 1 and 2.
2) Remove the two screws, then remove the tape holder assembly.
3) Remove the screw, then remove the guide plate.
4) Remove the 2 PTPWH2×8 screws and the M2.6 screw, then remove shuttle guide 2.
5) Remove the 3 PTPWH2×8 screws and the M2.6 screw. Then remove the 2 claws holding shuttle guide 1-YA in place, and finally remove shuttle guide 1-YA.
6) Remove the slant base assembly.
7) Remove the BVTT2.6×6 screw, then remove the pinch liner link.

Note:

After removing the guide plate, do not thread or unthread a tape with the shuttle guide mounted.

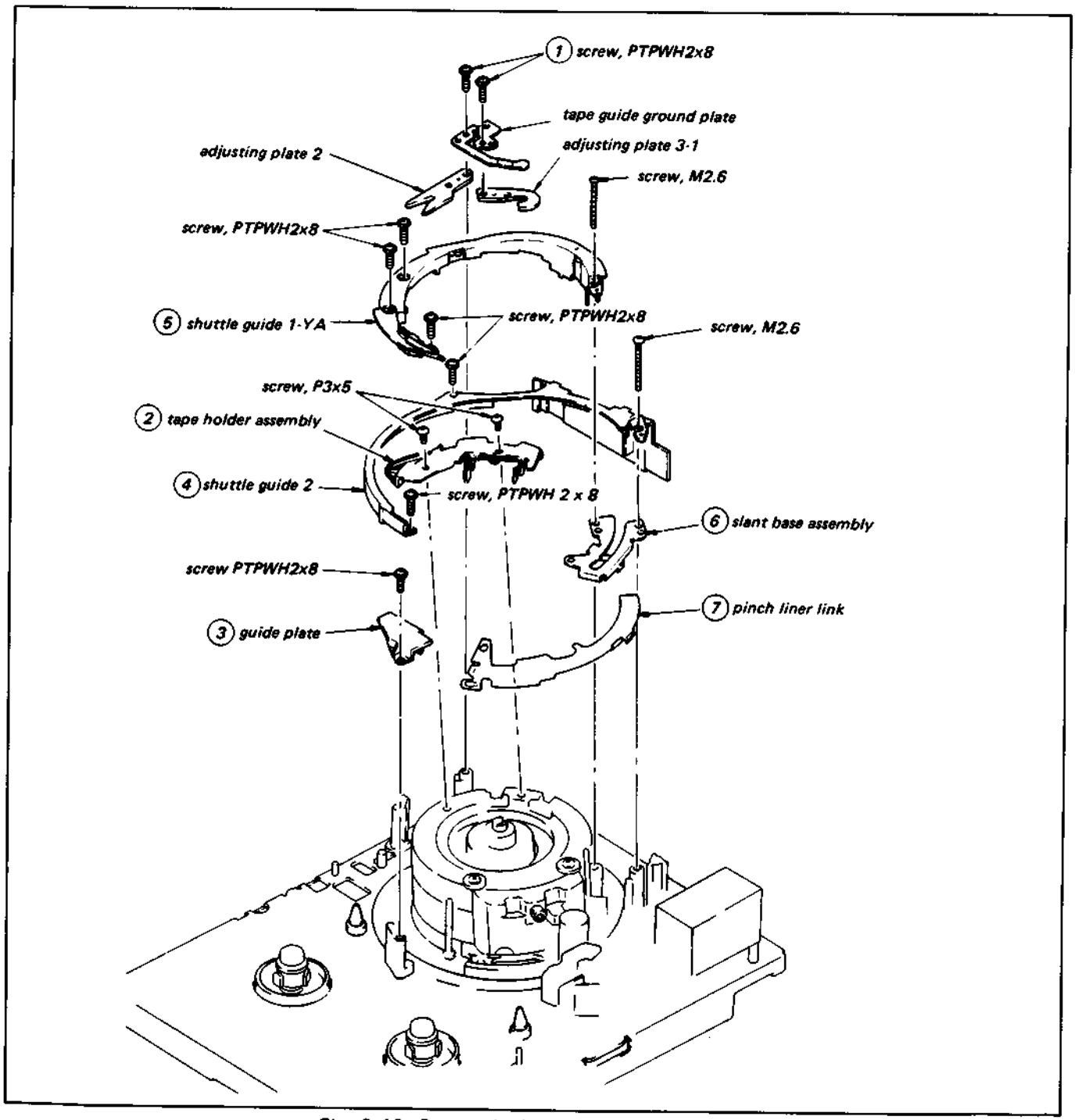


Fig. 3-19. Removal of miscellaneous parts

3-9-2. Removal of the S Threading Ring (Fig. 3-20)

1) Turn the stop washer and remove the ring roller (B) and (C).
2) Remove the screw. then remove the ring roller adjustment plate.
3) Remove the S threading ring.

Note:
Once a stop washer has been removed, do not use it again.

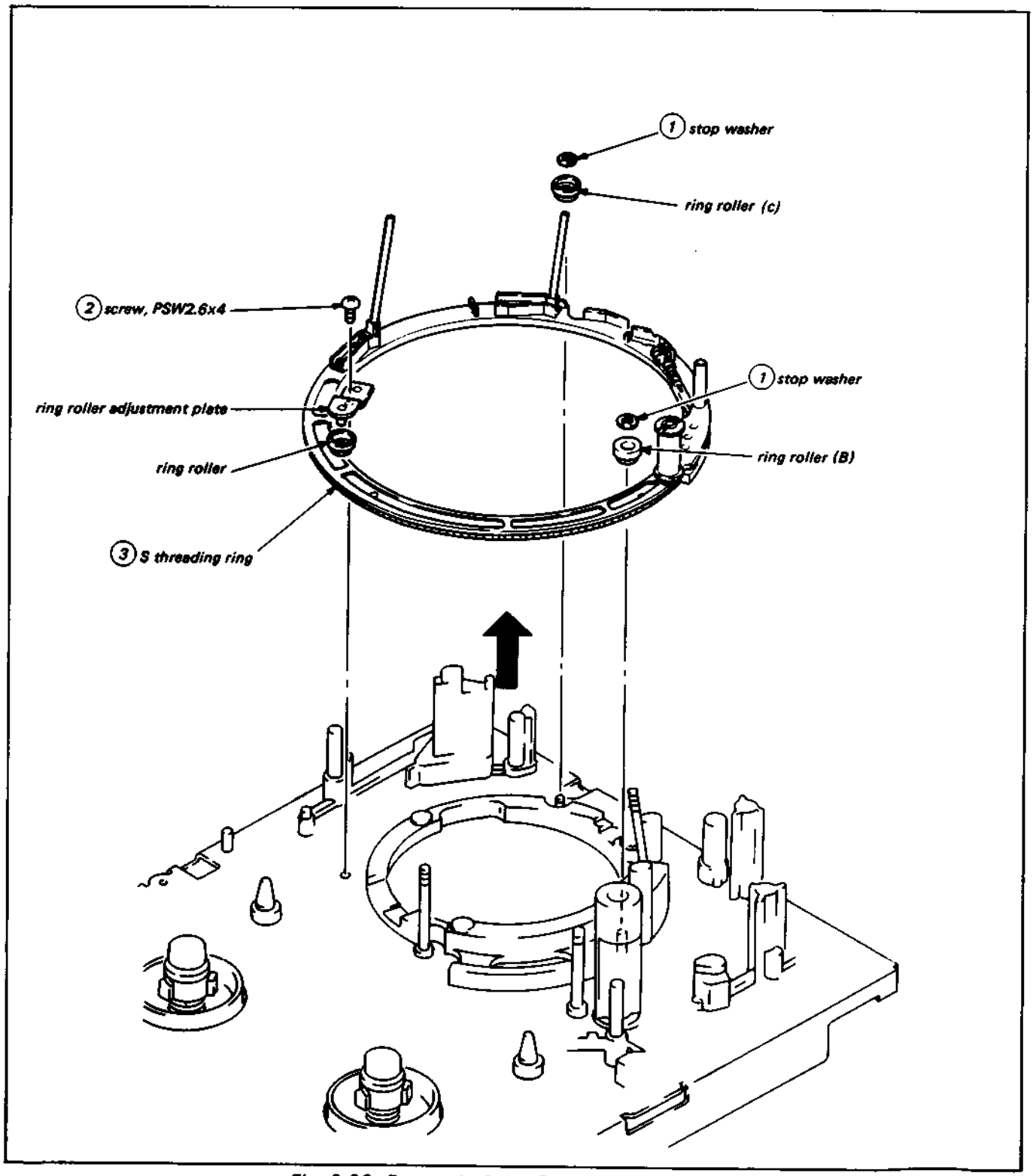


Fig. 3-20. Removal of the S threading ring

3-9-3. S Threading Ring Mounting and Position Adjustment (Fig. 3-21)

1) Set the slider gear assembly in the unthreading completed position.
   (Slider gear assembly set so that it is up against part T slider stop mold.)
2) In this condition, fit the threading ring into place, match the chassis hole (3φ) of part (A) with the S threading ring hole (1.5φ), and mesh with the drive gear teeth.
3) Attach ring roller (B) and fix in place with a stop washer.
4) Attach the ring roller, and fix in place with the adjustment plate.
   Note:
   After replacement and mounting are completed, adjust the ACE assembly as explained in the section on tape path adjustment.

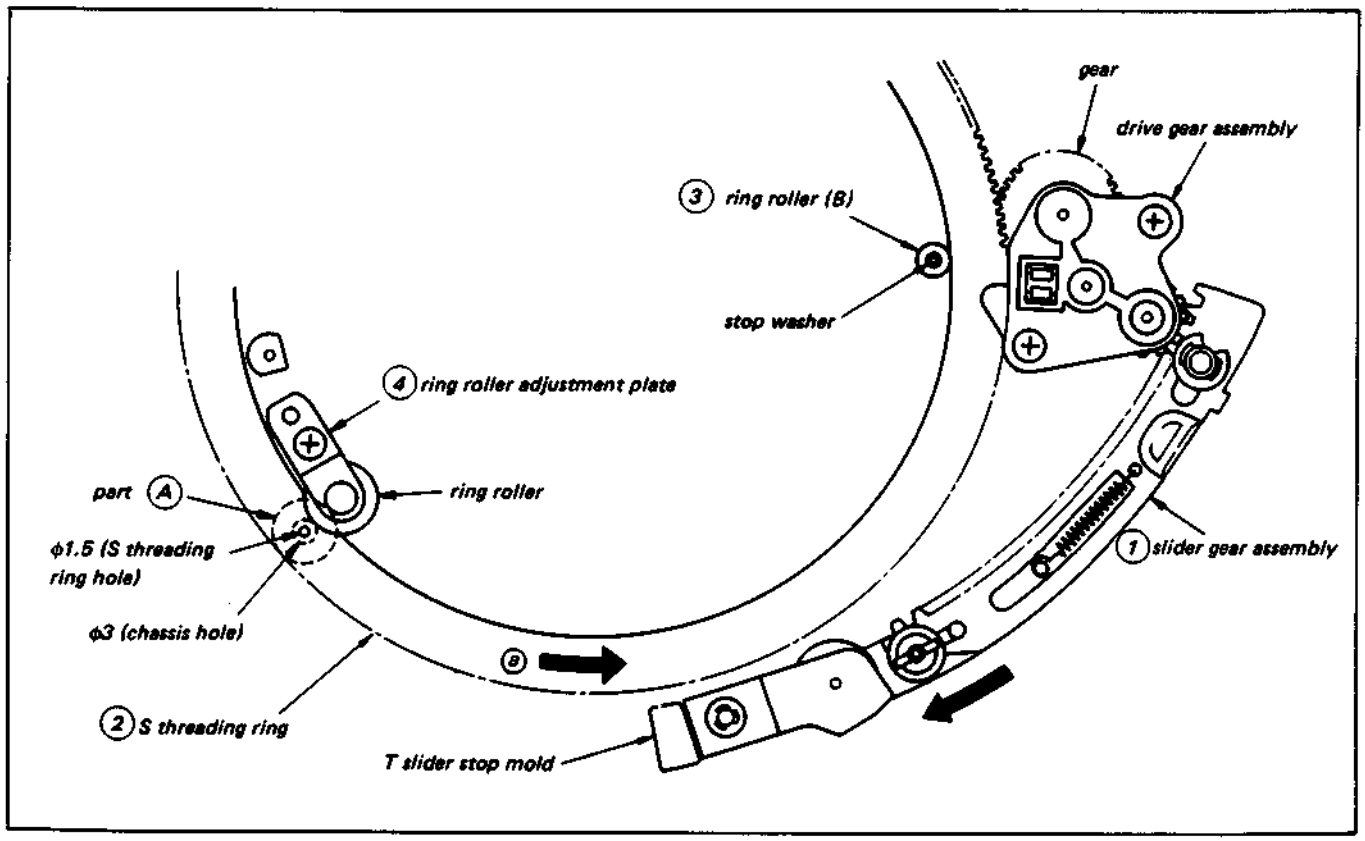


Fig. 3-21. S threading ring position adjustment

3-10. PINCH SNAP-FIT LIMITER GAP CHECK AND ADJUSTMENT

[Method of checking]

1) Set in the threading completed condition.
2) With the plunger pushed in all the way, confirm that the thickness of the pinch snap-fit limiter gap is 0.4 mm to 0.6 mm. If it is not, adjust as explained under [method of adjustment] below.

[Method of adjustment]

1) With the pinch solenoid in the absorbed condition (when the plunger is pushed in all the way), loosen the adjustment screw.
2) Press the pinch limiter adjustment plate in the direction of arrow (a) with an ordinary screwdriver, as in section (A) in the diagram, and adjust until the thickness of the gap in 0.4 mm to 0.6 mm.
   Tighten the adjustment screw and then lock it to fix everything in place.

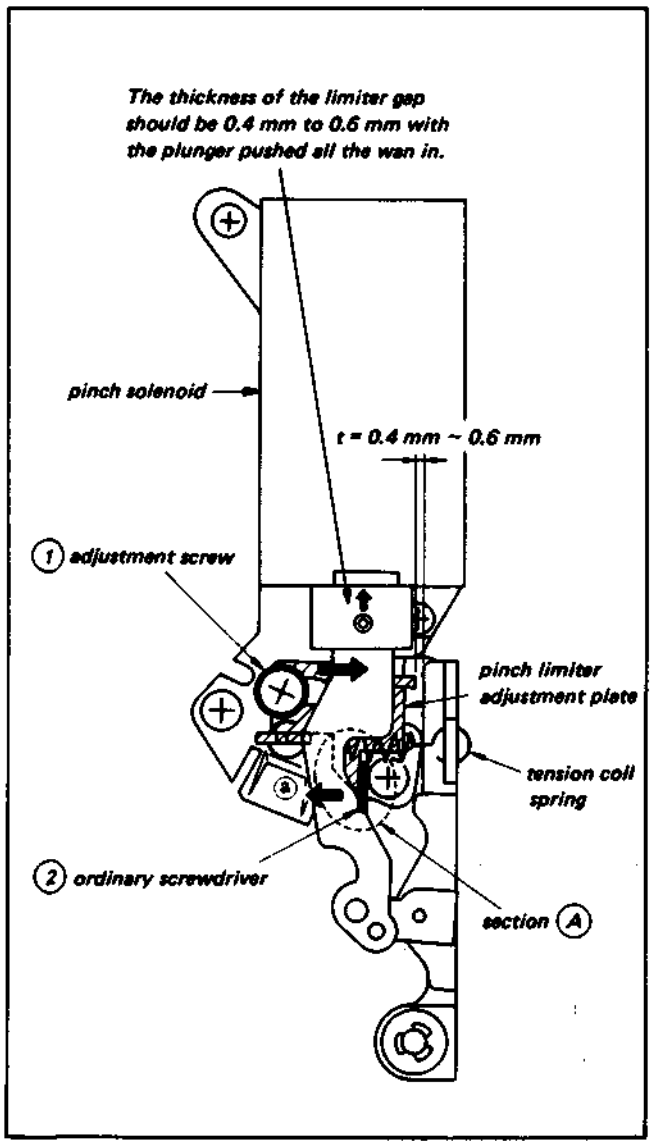


Fig. 3-22. Pinch snap-fit limiter gap adjustment plate

3-11. THREADING END SWITCH AND T COIL SENSOR

3-11-1. Threading End Switch (TE Switch) Position Check and Adjustment

[Method of checking]

Turn the S threading ring manually. Check to make sure that. when the lock roller moves from above the straight line part of the notch in the ring (Fig. 3-23 section (A)) to 1/3 of the way down it and back. the TE switch turns ON and OFF.
If the lock roller has to move outside of this range before the switch will turn ON and OFF, adjust as explained below.

[Method of adjustment]

1) Set the lock roller between the top of the notch in the S threading ring and 1/3 of the way down it. turn the TE switch in the direction of the arrow and. when the switch turns ON, fix the TE switch in place.
2) When the adjustment is completed, repeat the check as described above [method of checking].

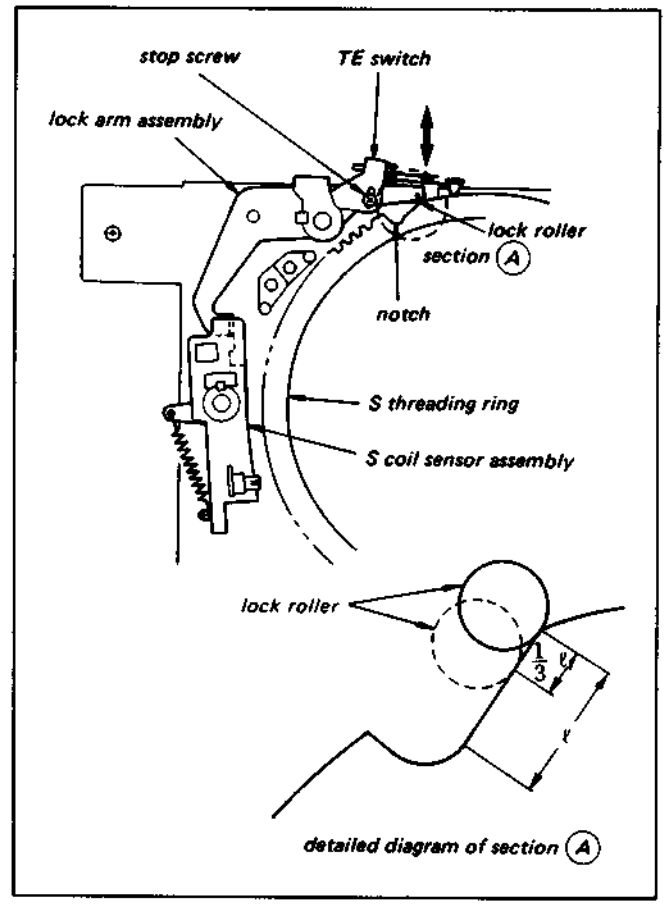


Fig. 3-23. TE switch position adjustment

[Removal]

1) Remove the tension coil spring that is attached to the S coil sensor assembly. then remove the S coil sensor.
2) Remove the lock arm assembly in te direction of arrow (A)

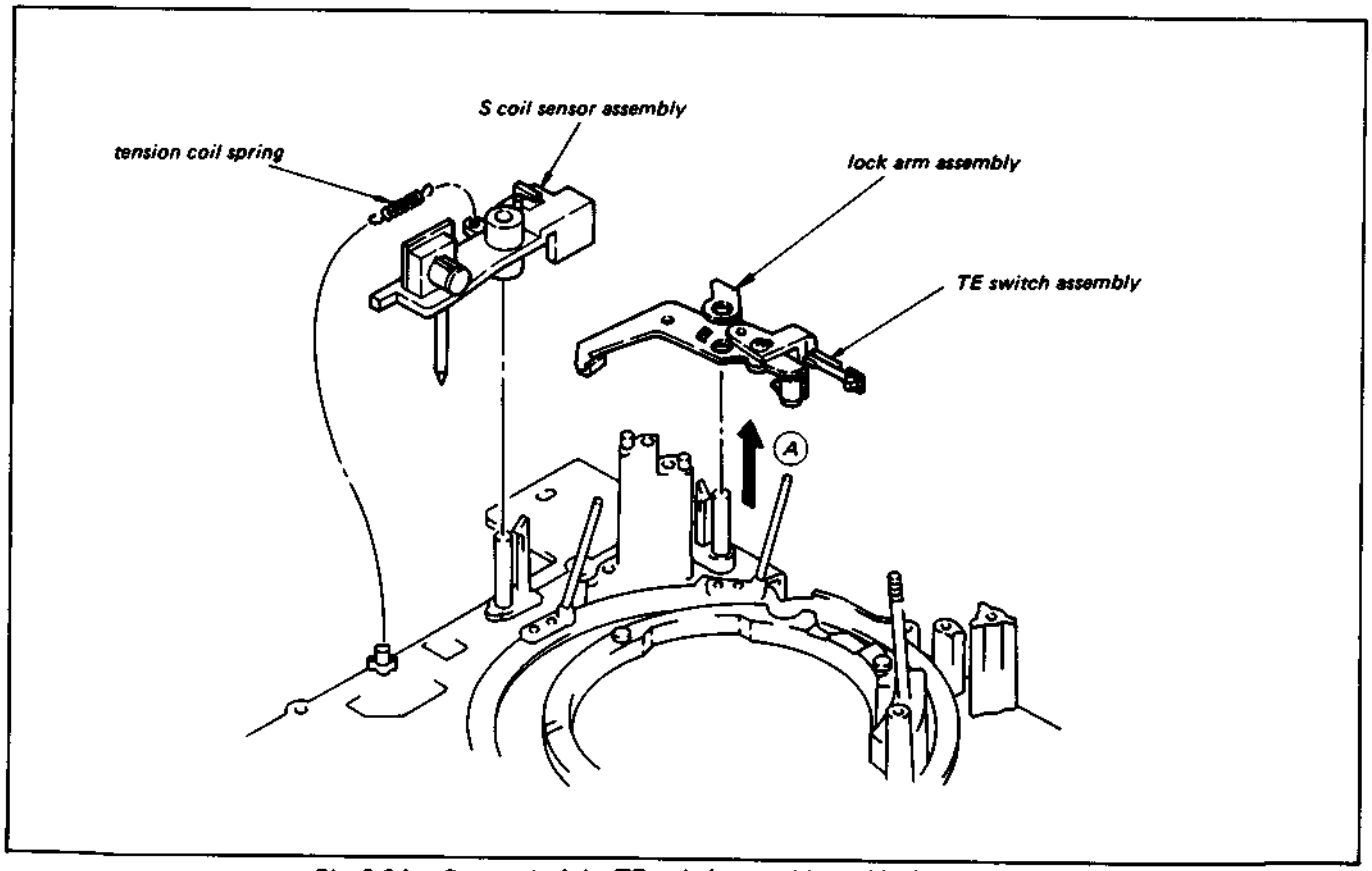


Fig. 3-24. Removal of the TE switch assembly and lock arm assembly

3-11-2. T Coil Sensor Mounting and Operation Check

[Method of checking]

Confirm that T coil sensor link (1) is pressed and T coil sensor (2) moves in the direction of arrow (B) when the T slider gear assembly is moved in the direction of arrow (A).

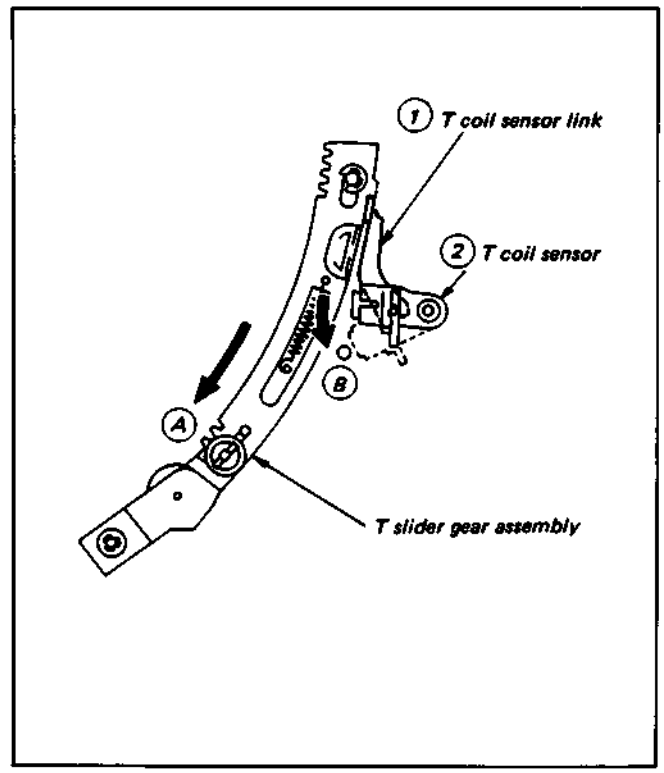


Fig. 3-25. T coil sensor operation check.

[Method of mounting]

1) Place T coil sensor link in the prescribed position.
2) Match up the T coil sensor hole with the chassis shaft (A) and insert. Place so that it engages with T coil sensor link.
3) Hook the tension coil spring on the T coil sensor and chassis claw.

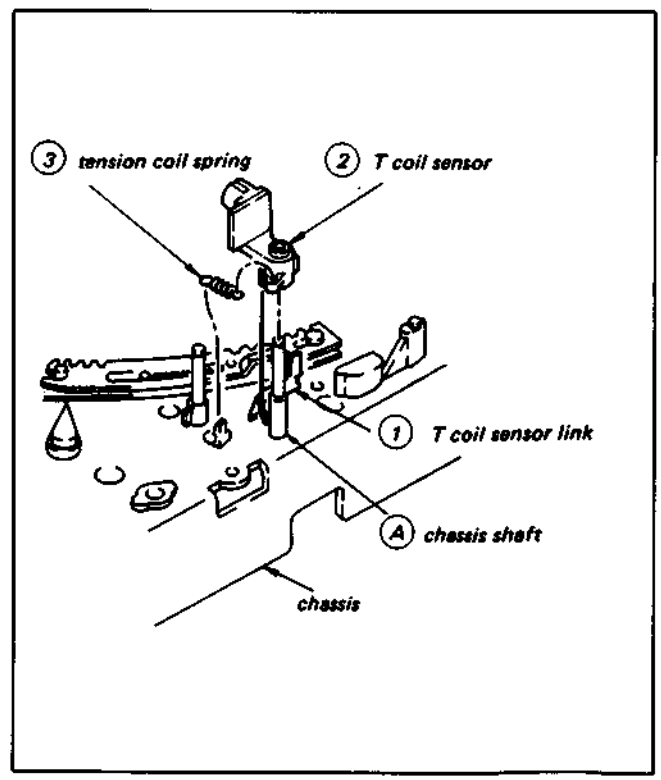


Fig. 3-26 T coil sensor link and T coil sensor mounting.

3-12. REMOVAL AND ADJUSTMENT OF THE REEL BLOCK ASSEMBLY

3-12-1. Removal of the Reel Block Assembly

1) Remove the four screws (BVTP3 x 8) ①.
2) Remove the reel block assembly ② in the direction shown by the arrow.

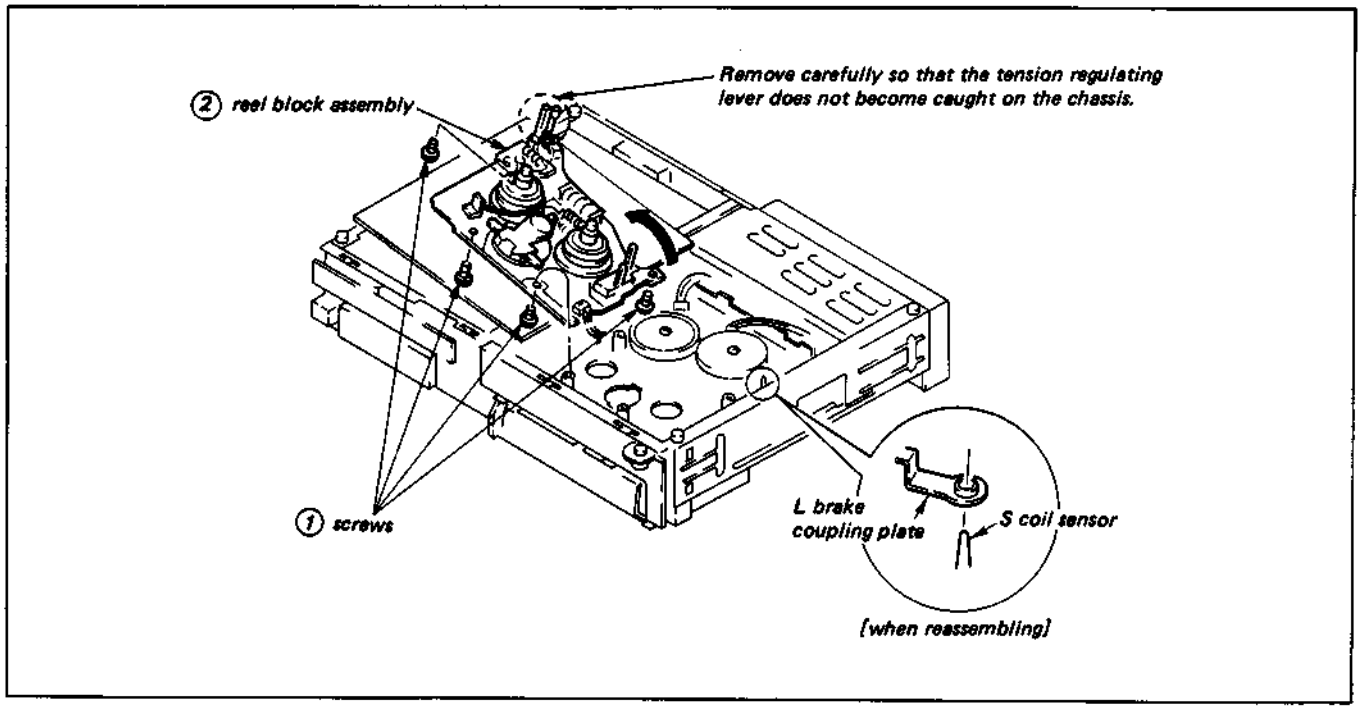


Fig. 3-27 Removal of the reel block assembly

3-12-2. Adjustment of the Position of the Tension Regulating Lever

[Method of adjustment]

1) Put the unit in playback mode.
2) Loosen the adjustment spring until the tape guide pin of the tension regulating lever assembly is positioned to the outside of the outer circumference of shuttle guide 2, as shown in Fig. 3-28. Then adjust by moving the tension regulating band assembly in the direction of arrow Ⓐ.
3) After adjustment, tighten the adjustment screw, being careful that the tension regulating band assembly does not move.

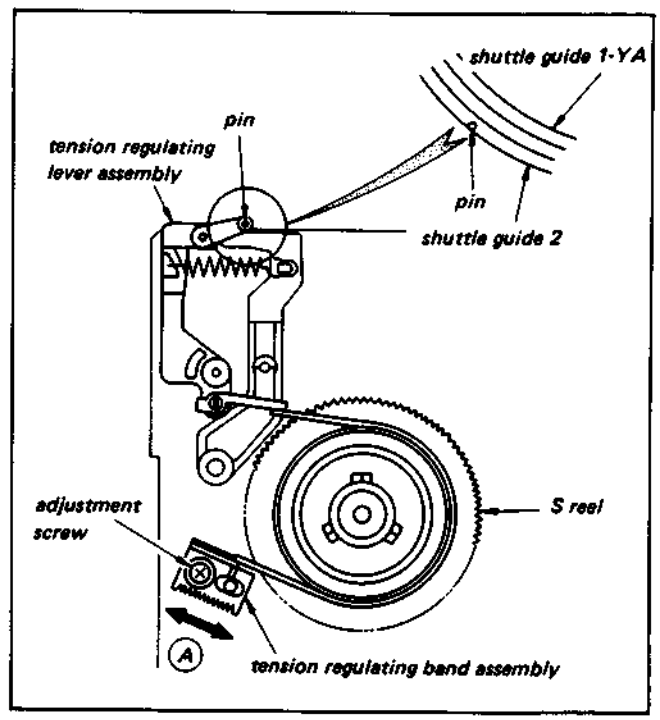


Fig. 3-28 Adjustment of the position of the tension regulating lever

3-13. ADJUSTMENT OF THE FORWARD AND BACK TENSION

[Method of measurement]

1) Insert the torque cassette (SL-0003C) and put the unit in playback mode.
2) Read the value on the meter on the S reel side after the needle has gone around about once.

   The correct value is 31 g·cm – 35 g·cm

Notes:

i) The set must be perfectly level during this measurement.

ii) After the measurement, the tape can become slack when the stop button is pressed. If this happens set the unit is forward mode to take up the slack before removing the tape.

[Method of adjustment]

Move the position of the tension coil spring that is hooked on the tension regulating lever assembly in the direction of arrow Ⓐ until the measured value falls within the correct range.

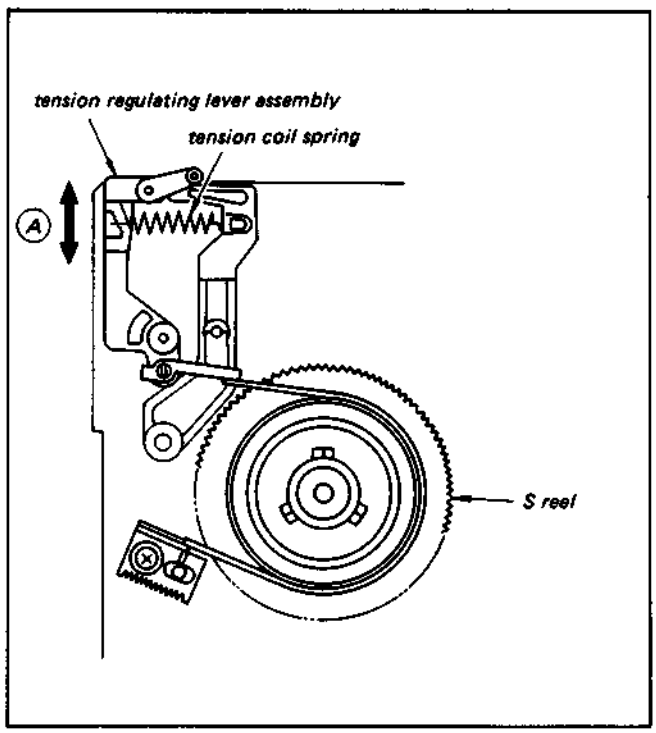


Fig. 3-29 Adjustment of the back tension

3-14. ADJUSTMENT OF THE FORWARD TORQUE

[Method of measurement]

1) Insert the torque cassette (SL-0003C) and start to record a telecast.
2) Read the value on the meter on the T reel side after the needle has gone around about once. The correct range is 80g·cm ± 5g·cm.

[Method of adjustment]

1) Remove the front panel.
2) Turn potentiometer RV308 on SS-34 board to adjust the torque until its value falls within the correct range.

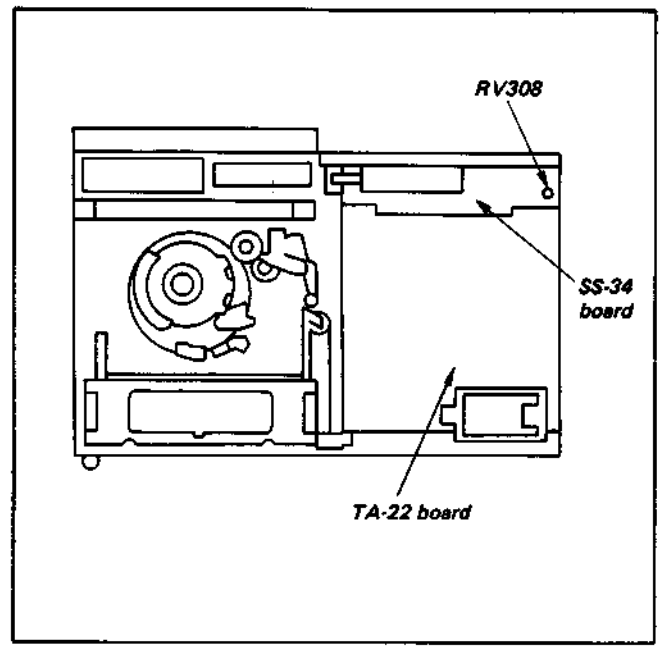


Fig. 3-30. Adjustment of the forward torque

Note:

When the forward torque is weakened during the measurement the tape can become slack, in which case the set will go into emergency stop mode. In such a case, the only switches that will work are the cassette eject switch and the power switch. It is necessary to temporarily remove the cassette, or to turn the power OFF and back ON.

4. TAPE PATH ADJUSTMENT

4-1. TRACKING ADJUSTMENT

This adjustment has a large effect on the picture quality in each mode and on the interchangeability of tapes, so it should be done carefully.

4-1-1. Preparation for adjustment
4-1-2. Adjustment on the entrance side
4-1-3. Adjustment on the exit side

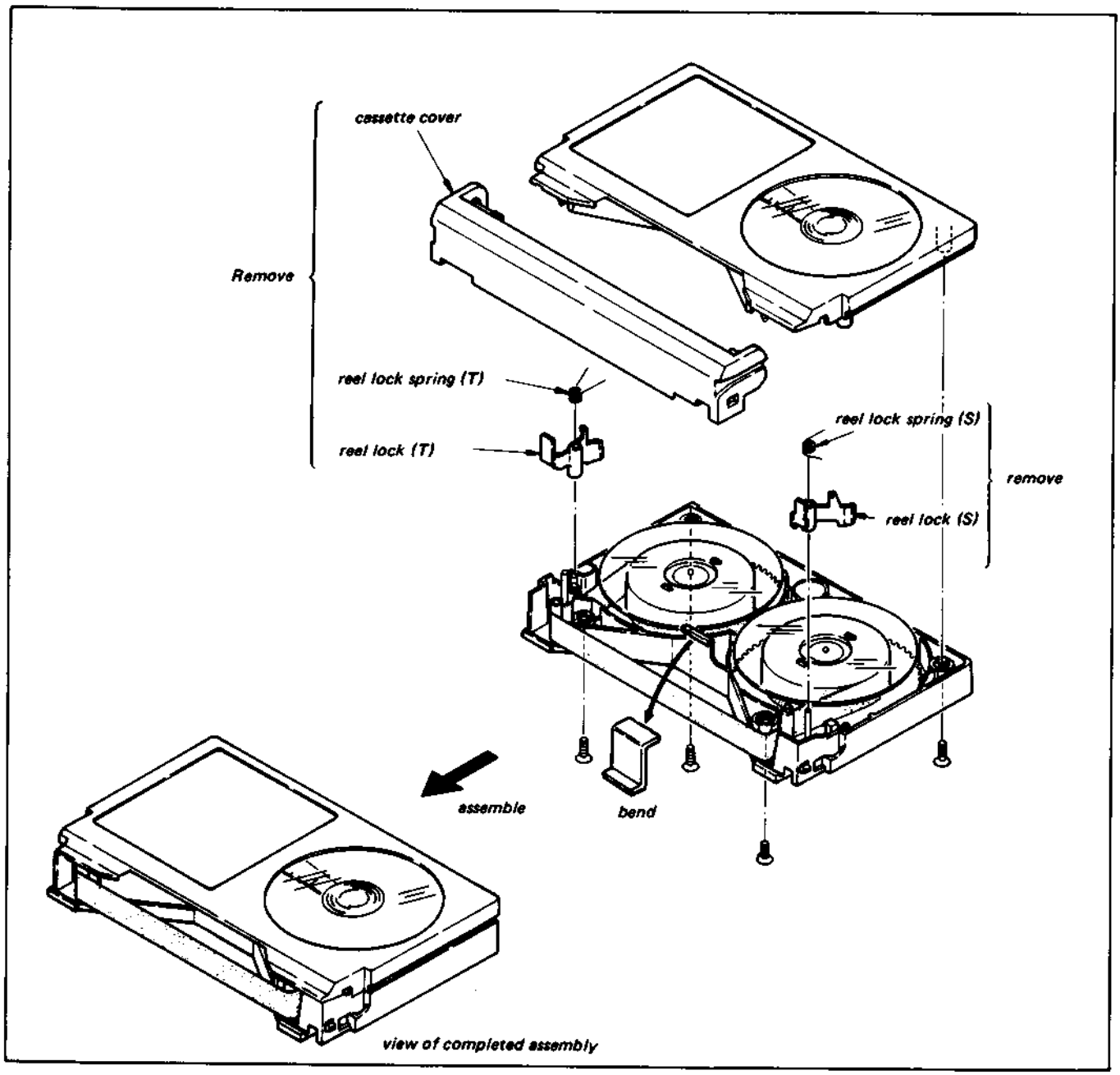


Fig. 4-1.

4-1-1. Preparation for Adjustment

1) Remove the cassette cover of the alignment tape in accordance with Fig. 4-1.
2) Clean the surface contacted by traveling tape (tape guide, drum tape trailing surface capstan shaft pich roller, ACE FE head surface) with a chamois cloth dipped in methanol.
3) Connect the oscilloscope as follows:
   Channel 1: Pin ⑥ of CN502 (RP-20 board)
   External trigger: Pin ③ of CN502 (RP-20 board)
4) Play back the 1 kHz signal on the traking section of the alignment tape.
5) Confirm that the oscilloscope radio frequency output waveform is flat and that the amplitude is a maximum. (Turn the tracking knob right and left to increase and decrease the amplitude while the waveform remains flat.) When the amplitude of the waveform is a maximum, confirm that the fluctuations and contact of the radio frequency output waveform meet the standards given in Fig. 4-2. If they do not, go through the procedure given in step 6).
6) If the entrance waveform cannot be made flat, as shown in Fig. 4-3 (a), by turning the tracking knob, go through the "entrance side adjustment" described in 4-1-2; if the exit waveform shown in Fig. 4-3 (b) cannot be made flat, go through the "exit side adjustment" in 4-1-3.

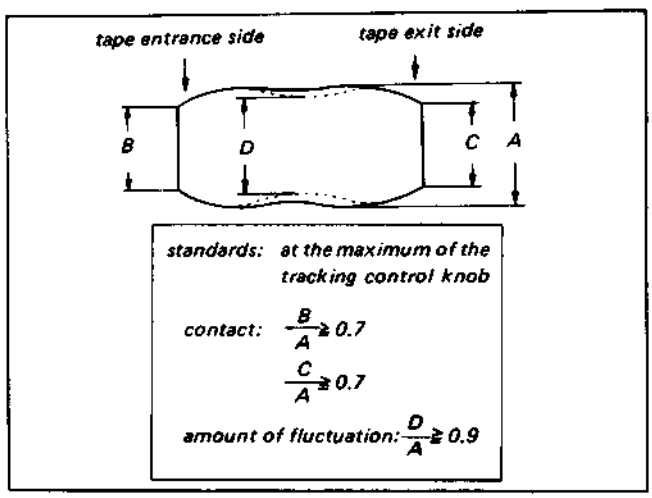


Fig. 4-2.

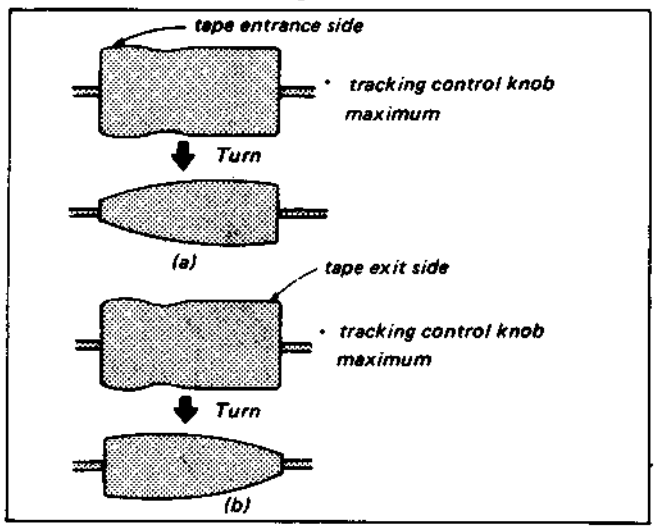


Fig. 4-3.

4-1-2. Entrance Side Adjustment

Whenever the entrance side adjustment is performed, the exit side adjustment must also be performed. The various tape guides and adjustment positions are shown in Fig. 4-5.

1) Turn the No. 6 guide counterclockwise to free the movement of the tape as it enters the drum.
2) Turn the tracking control knob to the right until the amplitude of the waveform is about 60% of its maximum.
3) Loosen No. 5 guide lock screw ① and turn the No. 5 guide until the entrance waveform sticks up a little above fall, as shown in the figure below. Then tighten the No. 5 guide lock screw (Fig. 4-6).
   Note:
   After tightening No.5 guide lock screw ①, confirm that it is as in the figure below.

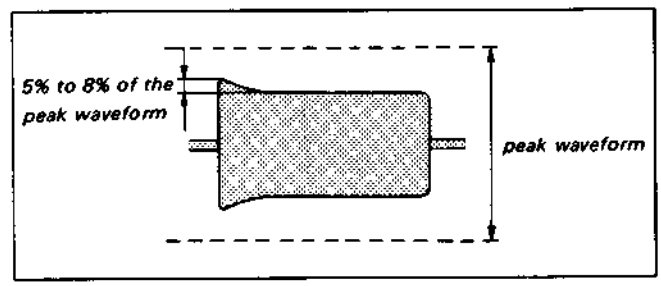


Fig. 4-4.

4) Next, lower the No. 6 guide until the waveform is flat.
5) Press the tape down between the No. 4 and No. 5 guide with a finger to lower the entrance side radio frequency waveform, then let go and confirm that the waveform returns to what it was before.
6) In this condition, check the clearance and curl of the No. 5 guide. If there are clearance and curl, adjust as explained in subsequent sections.

Note:
The tape tension between the No. 3, No. 4 and No. 5 guides must be balanced. If it is not, adjust the tilt of the No. 3 and No. 5 guides.
If the waveform cannot be made to look as shown in Fig. 4-4, or if when the tape is pressed and released on the entrance side it takes time for the waveform to return to what it was before, or if it does not return to what it was before, adjust according to the instructions given below.

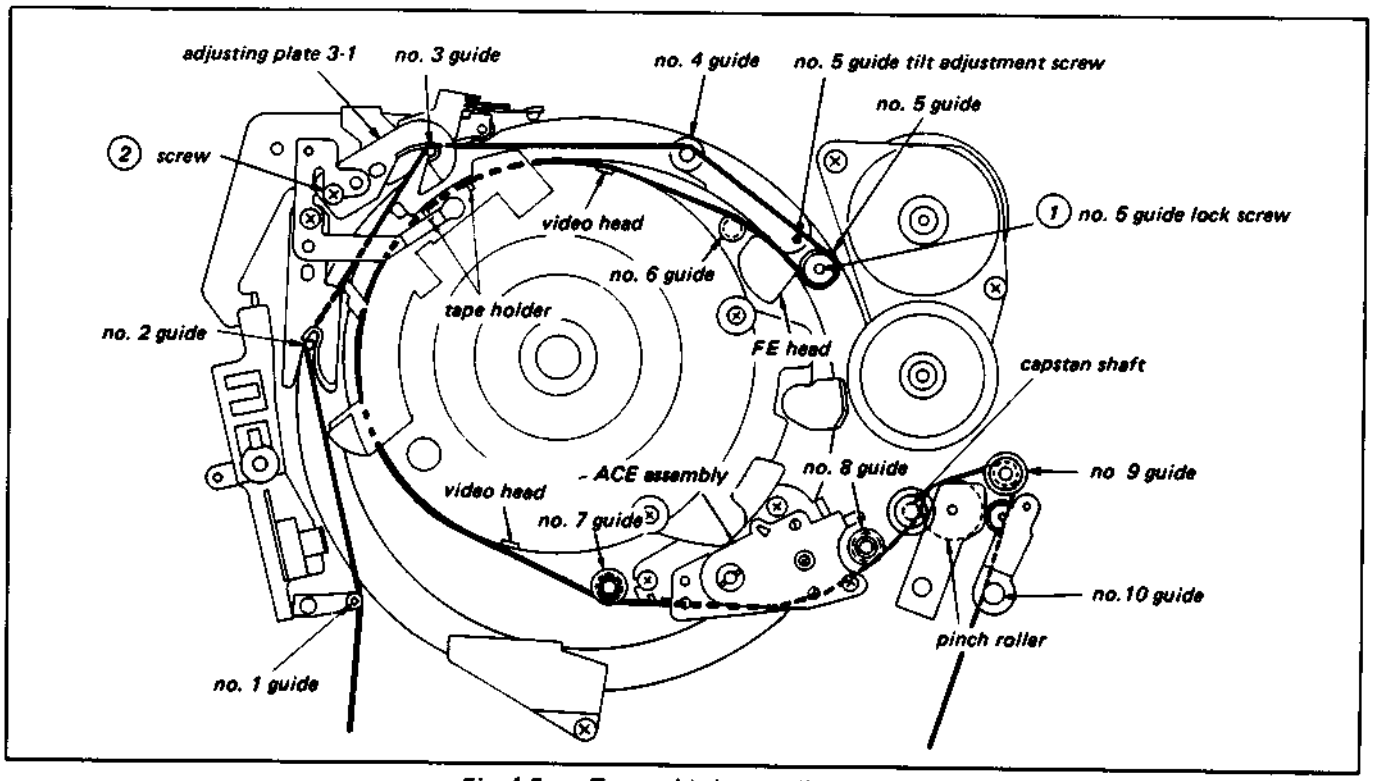


Fig. 4-5. Tape guide layout diagram

[What to do when the waveform entrance output will not rise]

1) Check to see if the up-down tension between the No. 3, No. 4 and No. 5 guides is uniform. If it is not, adjust the tilt of the No. 3 and No. 5 guides.
   Note:
   The lower flange of the No. 4 guide must not protrude.
2) Raise the lower flange of the No. 4 guide to raise the entrance output.
   Note:
   It is sufficient to raise the lower flange of the No. 4 guide to 0.4 mm from its lowest position (within a rotation angle of 360°).
3) If the operation performed in step 2) fails to raise the waveform output, turn the No. 5 guide tilt adjustment screw slightly to the left, and the entrance output should rise.

[What to do when the waveform entrance output will not drop]

1) Remove the adjusting plate 3-1 of the No. 3 guide from the drum. Just before the lower tension of the tape becomes slack, tighten screw ②.
2) If the tape is in contact with the lower flange of the No. 4 guide, lower the flange. If the tape is sticking up from the lower flange, adjust the tilt of the No. 5 guide so that the tape does not stick up from the lower flange of the No. 4 guide.

[What to do when there is a clearance in the No. 5 guide]

Turn the No. 4 guide counterclockwise to run the tape upward and eliminate the clearance in the No. 5 guide.

Note:
At this time make sure that a large curl is not produced below the No. 4 guide.

[What to do when there is a curl]

1) When there is a gap below the No. 4 guide: Just before the lower tension on the tape becomes slack, move adjusting plate 3-1 of the No. 3 guide to the outside.
2) When there is not a gap below the No. 4 guide (when there is a curl below the No. 4 guide):
   i) Check to see if the No. 4 guide has been raised up too high. If it has been raised up too high, turn the adjusting plate clockwise to lower the No. 4 guide.
   ii) If the curl still has not been removed after i), tighten the No. 5 guide tilt adjustment screw in the clockwise direction until the curl is removed.

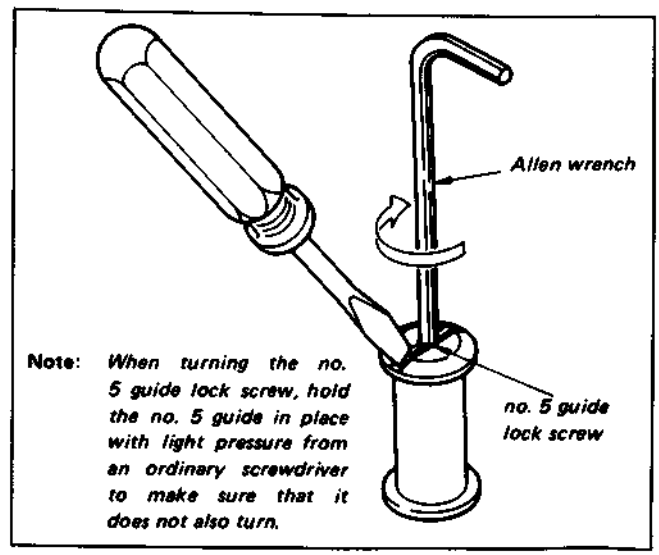


Fig. 4-6

4-1-3. Exit Side Adjustment

1) Connect the oscilloscope to pin ⑥ of CN502 (RP-20 board). Connect the external trigger to pin ③ of CN502.
2) Play the tracking section of the alignment tape. Adjust the tracking knob to reduce the amplitude of the radio frequency output waveform to 60% of its maximum level.
3) Watch the radio frequency output waveform when the No. 7 and No. 8 guides are raised (by turning the respective guide nuts counterclockwise) to let the tape run free. This waveform is called to exit free waveform.

   Note:

   Be careful not to raise the guides too far. They should be raised only about 0.2 to 0.3mm.

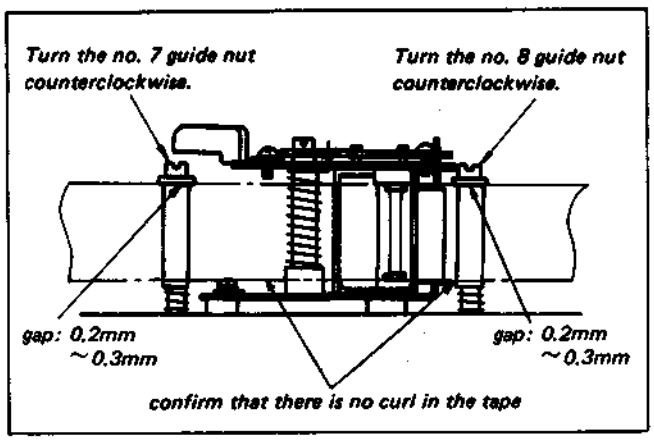


Fig. 4-7.

4) At this time, confirm that the exit free waveform is within the range shown in Fig. 4-8(a) and (b).
   - If it is outside of this range, adjust according to the procedure in 4-3.

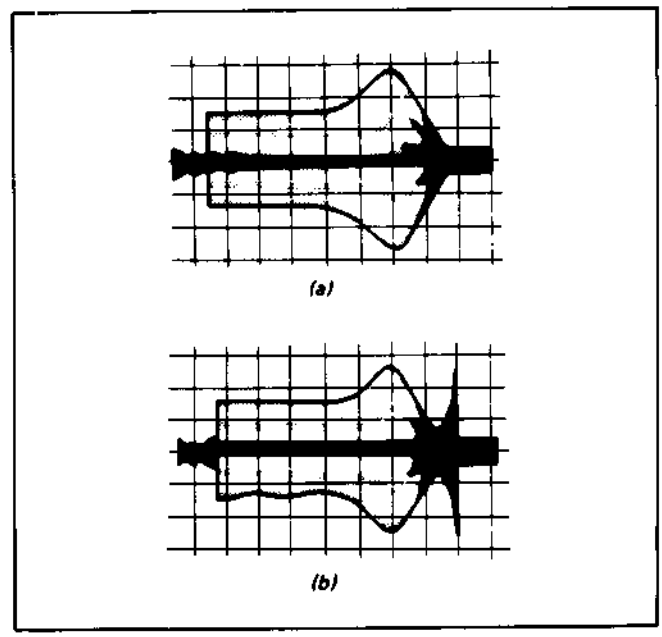


Fig. 4-8.

5) Turn the No. 7 guide nut clockwise until the waveform is flat.
6) Turn the No. 8 guide nut clockwise until the No. 8 guide is lined up with the tape (just before the waveform starts to change lower the guide until there is no curl).
7) During playback, confirm that no curl occurs in the No. 7 guide or the No. 8 guide.
8) During review confirm that no curl or clearance occurs in the No. 8 guide. If there is a curl or clearance, adjust using the No. 9 guide. After adjustment, lock the guide nut.

4-2. ADJUSTMENTS AFTER REPLACEMENT OF THE ACE ASSEMBLY

After removal or replacement of the ACE assembly perform the adjustments listed below.

4-2-1. Exit side tracking adjustment
4-2-2. CTL head (ACE assembly) position adjustment
4-2-3. Audio head (ACE assembly) azimuth adjustment
4-2-4. Audio head (ACE assembly) height adjustment

4-2-1. Exit Side Tracking Adjustment

1) Set the parallel plate (SL-0657 in the list of fixtures and tools) up against the unit as shown in Fig. 4-9, and turn the tilt adjustment screw to adjust the audio head vertically.

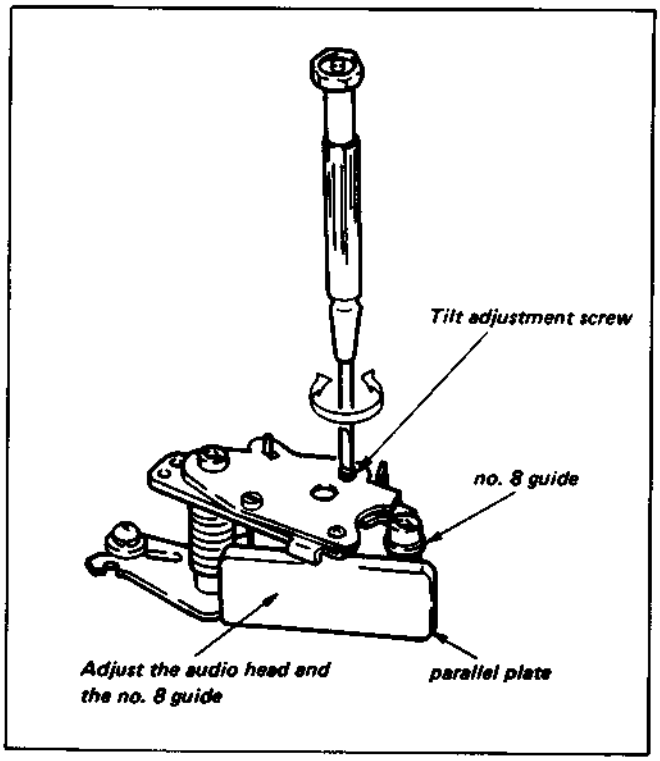


Fig. 4-9.

2) Connect the oscilloscope to pin ⑥ of connector CN502 (RP-20 board). Connect the external trigger to pin ③ of CN502.

3) Play the tracking section of the alignment tape. Adjust the tracking knob until the radio frequency output waveform amplitude is reduced to about 60% of its maximum level. maximum level.

4) Raise the No. 7 and No. 8 guides (turn the respective guide nuts counterclockwise) and observe the radio frequency exit free waveform when the tape runs free.

Note:

Be careful not to raise the guide too far. Raise it about 0.2 to 0.3 mm.

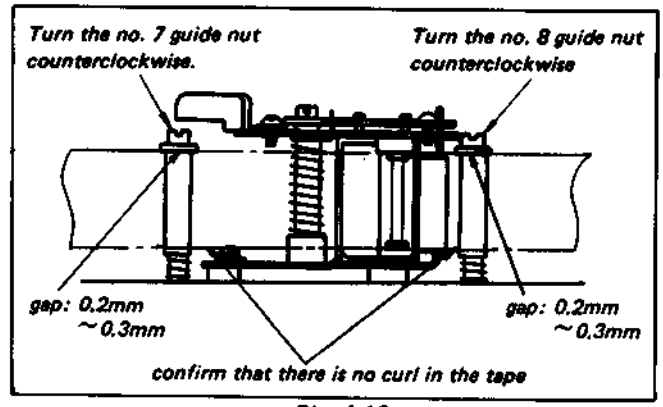


Fig. 4-10.

5) At this time. confirm that the exit free waveform is within the range shown in Fig. 4-11(a) and (b).

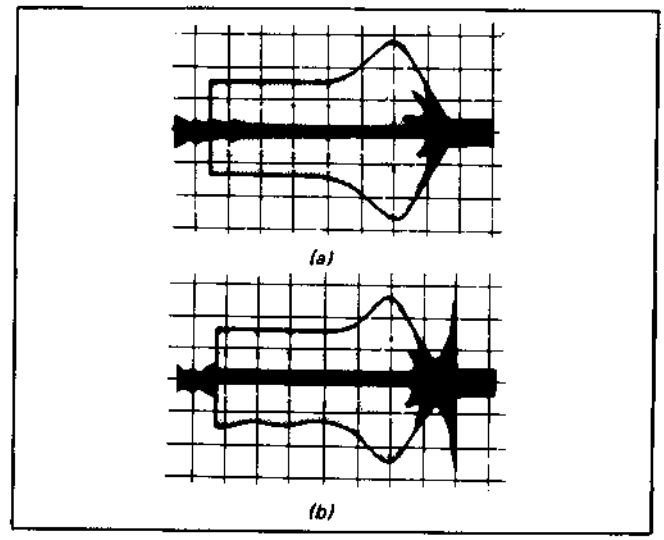


Fig. 4-11.

[When the waveform is outside this range]

- When the waveform is outside this range and has the form shown in Fig.4-12. turn the tilt adjutment screw clokwise to adjust until the waveform is whthin the required range.

Note:

Complete the adjustment by turning the adjustment screw in the direction of tightening (clockwise).

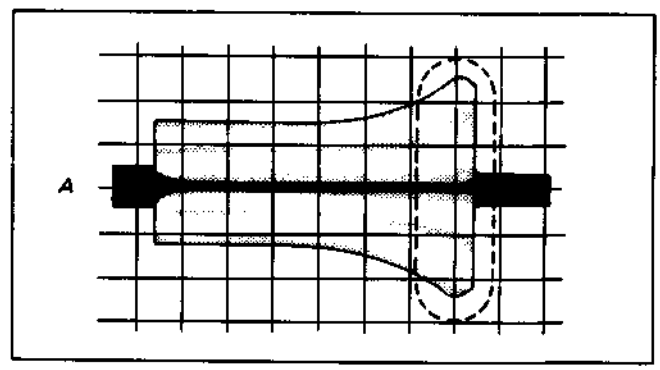


Fig. 4-12.

- When the exit free waveform is outside of the required range and has the form shown in Fig. 4-13, turn the tilt adjustment screw counterclockwise to produce waveform A (Fig. 4-12), then turn it clockwise to bring the waveform within the required range.

Note:

Finish the adjustment by turning the adjustment screw in the direction of tightening (clockwise).

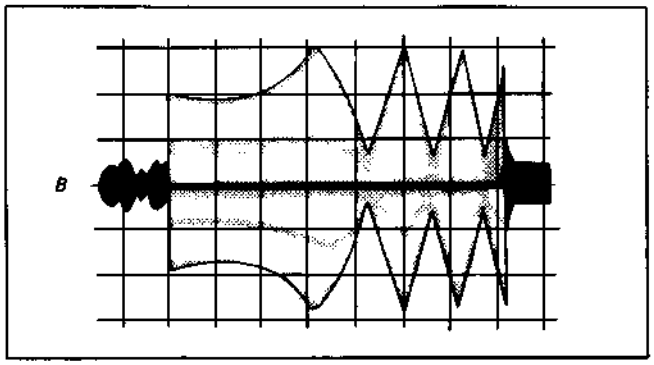


Fig. 4-13.

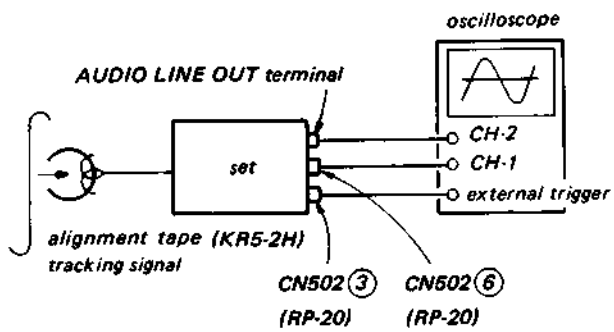
6) Turn the No. 7 guide nut clockwise to flatten the waveform.
7) Turn the No. 8 guide nut clockwise to line the No. 8 guide up with the tape (lower it so that there is no curl just before the waveform starts to change).
8) If the radio frequency waveform is as shown in Fig. 4-12 on the exit side, repeat the adjustment.

4-2-2. CTL Head (ACE Assembly) Position Adjustment

This adjustment includes the mechanical CTL head mounting position adjustment and the electrical tracking control center adjustment. The tracking control center adjustment is to be performed first, followed by the mechanical adjustment of the head mounting position.

[Connections]

1) Playback



[Method of adjustment]

1) Play the tracking signal section of the alignment tape.
2) Turn the tracking control knob clockwise or counterclockwise to the center click position. Confirm that the amplitude of the radio frequency output signal is at its maximum level. Also confirm that the audio signal 0 level position occurs at the location of the channel B waveform. If the necessary standards are not met follow the procedure in 3).

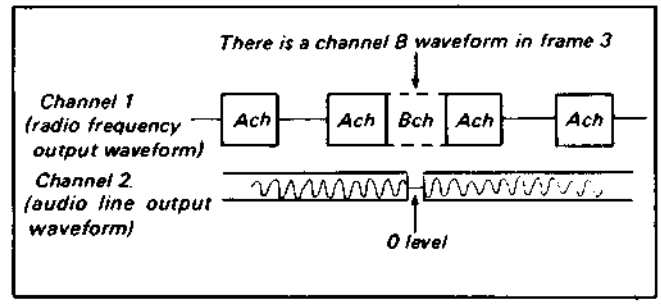


Fig. 4-14.

3) Tracking center adjustment
Refer to electrical adjustment 3) in section 5-3-2.
4) CTL head position adjustment
   a. Set the tracking control knob at the center click position.
   b. **Loosen the 2 ACE assembly position adjustment** screws, then use a tool such as an ordinary screwdriver **to slide the ACE assembly to where the radio** frequency output waveform amplitude becomes a maximum.
   c. Play the color bar signal on the alignment tape and check the picture quality.
   d. Tighten the position adjustment screws, then lock them.

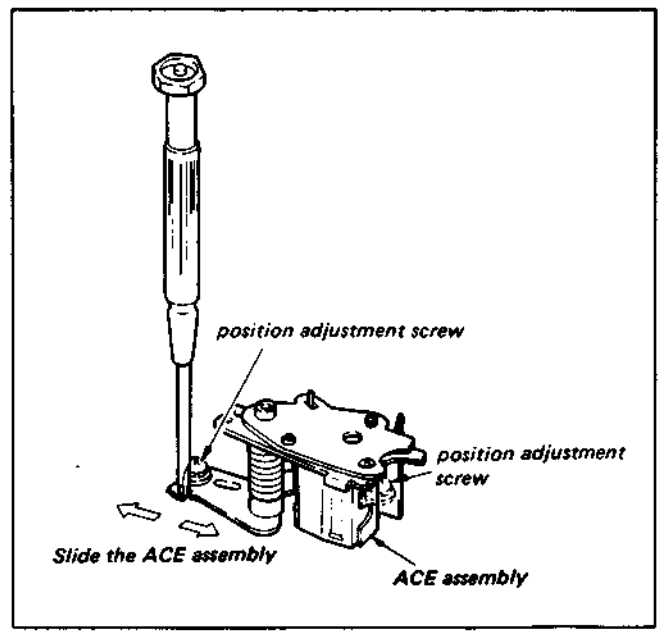
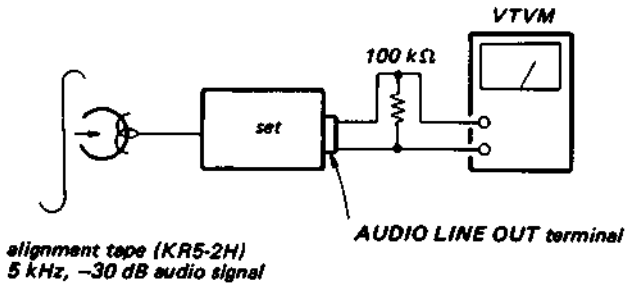


Fig. 4-15.

4-2-3. Audio head (ACE Assembly) Azimuth Adjustment

[Connections]

1) Playback



[Method of adjustment]

1) Play the 5kHz. –30dB audio signal section (RF sweep section) of the alignment tape.
2) Adjust the azimuth adjustment screw until the output level (VTVM indication) is a maximum.
   Note:
   Complete the adjustment by turning the adjustment screw in the direction of tightening (clockwise).
3) After adjustment, lock the adjustment screw.

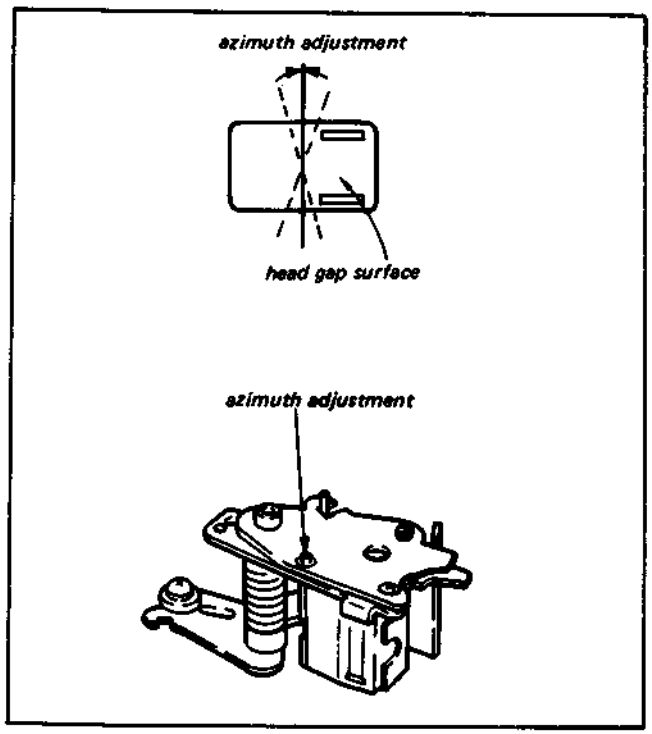


Fig. 4-16.

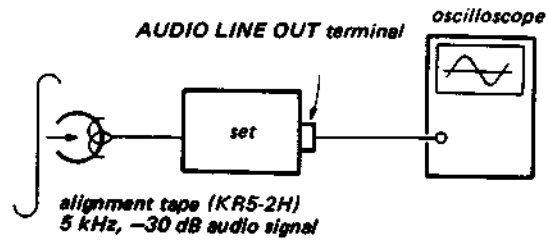
4-2-4. Audio Head (ACE Assembly) Height Adjustment

[Condition]

This adjustment must only be performed after the exit side tracking adjustment has been completed.

[Connections]

1) Playback



[Method of adjustment]

1) Play the 5kHz. –30dB audio signal section (RF sweep section) of the alignment tape.
2) Adjust the height adjustment nut so that the amplitude of the audio line output waveform (5 kHz) becomes a maximum.

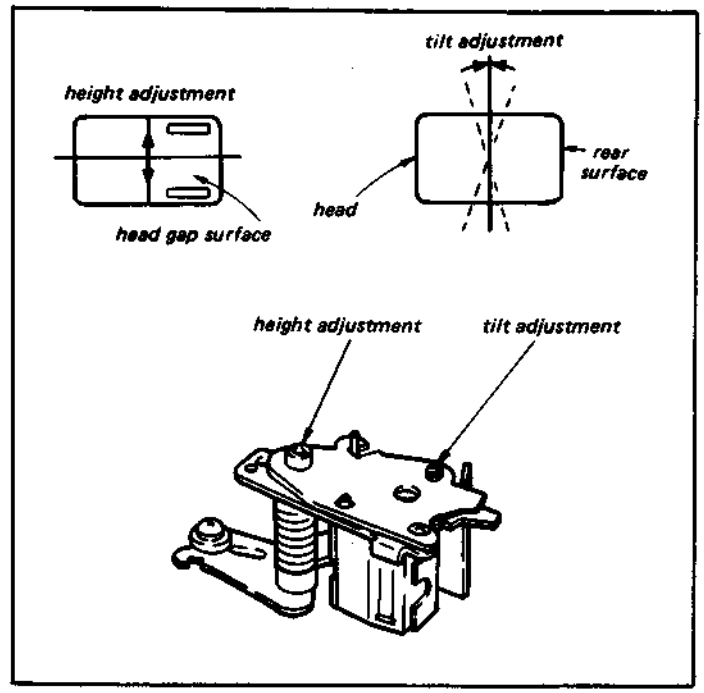


Fig. 4-17.

4-3. HOW TO INSPECT THE TAPE TRAVELING WHEN ADJUSTING THE TAPE PATH

Adjust and check the tape path using the alignment tape following the adjustment guide, then check the tape travel using the procedure below.

1) Get one L-830 reel ready (these are widely available commercially). Remove the cassette cover referring to Fig. 4-1 of the adjustment guide.
2) Run the L-830 tape in playback mode and check the following points.
   i) Entrance side
   Confirm that the tape contacts the upper flange of the No. 5 and No. 6 guides and the lower flange of the No. 4 guide, and is not damaged or bent. (Some tape curl is allowed but the tape must not be creased.) (Fig. 4-18)
   ii) Exit side
   Confirm that the tape does not contact the upper flange of the No. 7 guide or the No. 8 guide, or the upper or lower flange of the No. 10 guide, and is not scratched. (Some tape curl is allowed but the tape must not be creased.) (Fig. 4-19)
   iii) If the tape was found to not be running correctly in step ii), readjust the tape path using the alignment tape, following the adjustment guide.
   If the tape is not running correctly on the entrance side, refer to section 4-1-2 of the adjustment guide.
   If the tape is not running correctly on the exit side, refer to section 4-1-3 of the adjustment guide.

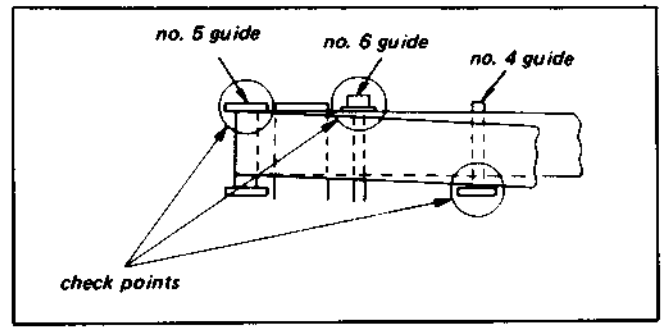


Fig. 4-18.

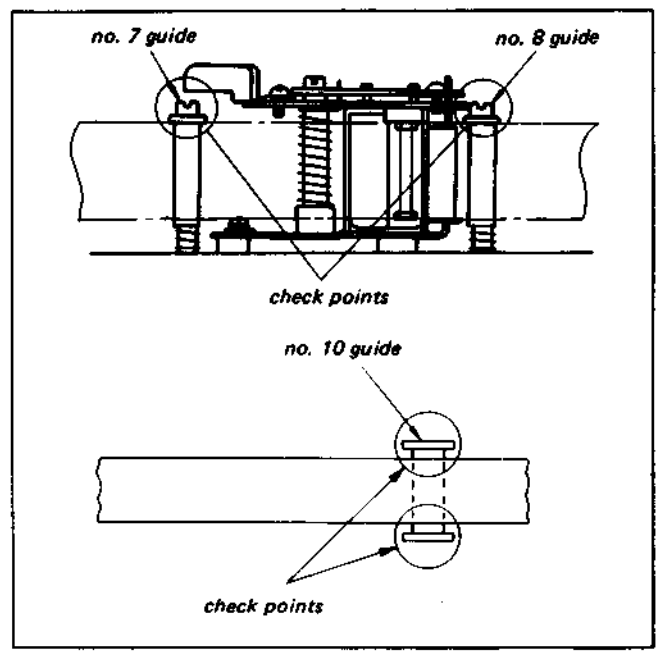


Fig. 4-19.

5. ELECTRICAL ALIGNMENT

All the electrical alignment can be performed by using the equipment mentioned below, the alignment tape, and the PAL colour bar signal (100%).

[Equipment Required]

(1) PAL Colour Monitor TV
(2) Oscilloscope, Dual-trace, Bandwidth . . . more than 10 MHz with delay mode
(3) Frequency Counter
(4) PAL Colour-Bar Generator
(5) Digital voltmeter
(6) Audio Signal Generator
(7) Audio level meter (VTVM)
(8) Attenuator
(9) Alignment Tape, type: KR5-2H, Code No. 8-969-995-52
(10) Alignment Tool (Adjusting screwdriver for semi-fixed resistors and coils)
Jig No. SL-0001, Code No. J-6080-001-A

[Setup for Alignment]

The antenna should be connected correctly to the antenna input terminal of the videocassette recorder.
It is important that the video output signal satisfies the specification because the telecast signal received by the incorporated tuner of the videocassette recorder is utilized as the adjustment signal of the machine. The incorporated tuner should be set to the channel with the best reception. The video signal should be checked with an oscilloscope connected to VIDEO OUT (BNC connector). Verify that the sync signal amplitude is approx. 0.3 Vp-p and the video signal amplitude is approx. 0.7 Vp-p at peak. Adjust the fine tuning while observing the signal and the TV screen so that the burst signal amplitude becomes approx. 0.3V ± 0.1 Vp-p. Also confirm that there is not spikes observed at the sync signal portion. (See Fig. 5-1.)
The video (colour bar) signal for the alignment is shown in Fig. 5-1.

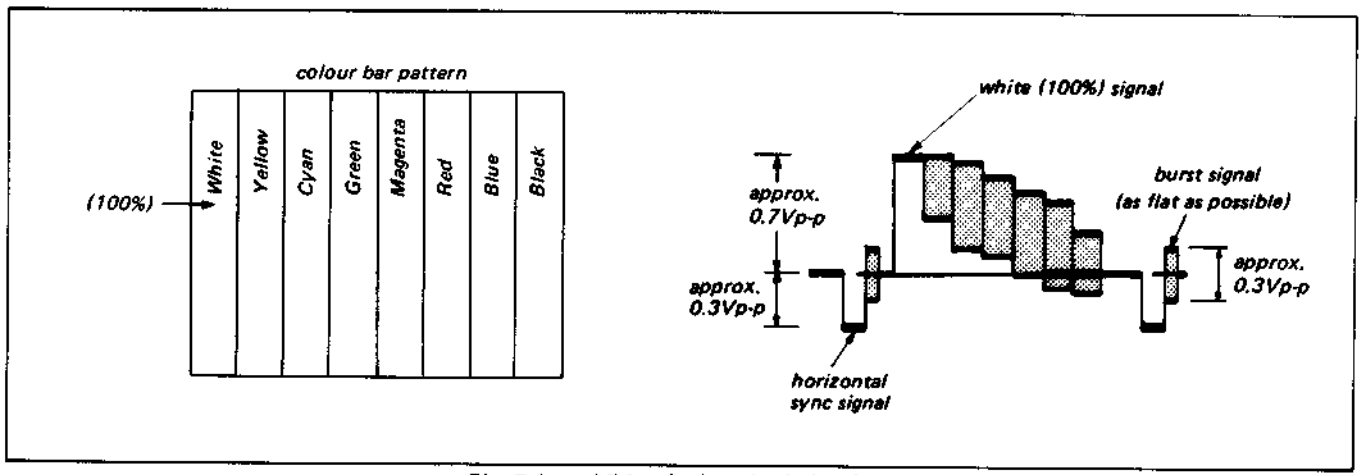


Fig. 5-1. Video (colour-bar) signal

[Alignment Tape]

KR5-2H

	Video signal	Audio signal	Playing time	Use for
1.	Colour bars	3 kHz – 5 dB	5 min	General performance, tape speed checks, switching position adjustment.
2.	Monoscope	333 Hz – 25 dB	5 min	Video head dihedral, audio level adjustment.
3.	RF sweep	5 kHz – 25 dB	5 min	Video, audio frequency characteristics, audio azimuth adjustment marker: 1, 2, 3.58, 4.5, 5.2 MHz
4.	Tracking 1 MHz (CH-B) *1 (Channel B is inserted in every 3 frames.)	1 kHz – 5 dB *2 (Signal is dropped out in the positions where channel B is inserted.)	5 min	Tracking, Audio height adjustments CTL Position check (Check if *1 and *2 are the same position.)

[Alignment Tool for Semi-fixed Variable Resistors and Coils]
Semi-fixed variable resistors and inductances should be adjusted with the alignment tool exclusively prepared for the adjustment of the components. A common screwdriver is too large for adjusting the components from the conductor side of a printed circuit board.

The metal blade of the alignment tool is used for variable resistors and trimmer capacitors and the plastic tip is used for variable inductances.

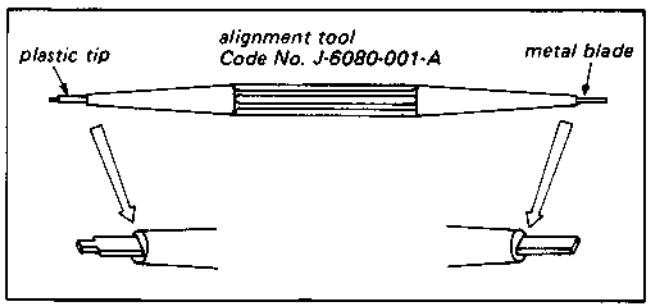


Fig. 5-2. Alignment tool

[Required levels and Impedances of Input and Output]

Video

Input VIDEO IN: BNC connector

$1\ \text{Vp-p}\ {}^{+1.0}_{-0.5}\ \text{Vp-p}$

75Ω unbalanced, sync negative

VIDEO OUT: BNC connector

1 Vp-p ± 0.1 Vp-p

75Ω unbalanced, sync negative

Audio

Input AUDIO IN: phono jack

47 kΩ, −10 dBs

(0 dBs = 0.775V rms)

Output AUDIO OUT: phono jack

Load impedance less than 10 kΩ

−10 dBs with 47 kΩ load unbalanced

[Colour Bar Signal]
The 100% colour bar signal recorded on the Alignment tape is shown in Fig. 5-3.

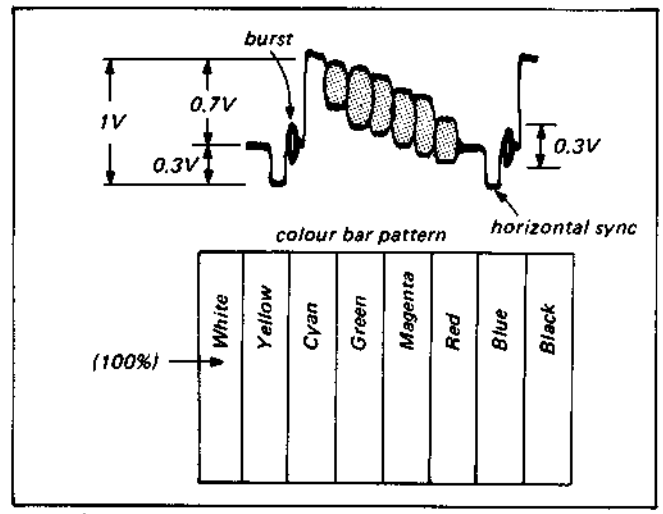
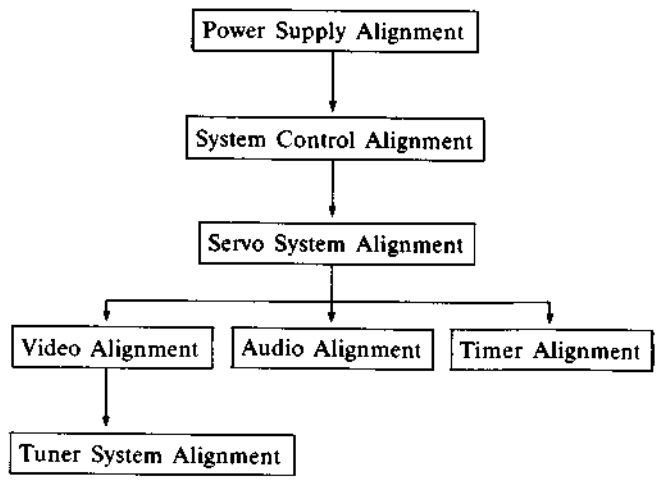


Fig. 5-3. Colour bar signal recorded on the alignment tape

[Adjustment procedure]
Adjust in the order given below.



5-1. POWER SUPPLY CHECK (PS-46 Board)

Measure in E-E mode (power supply switch ON).

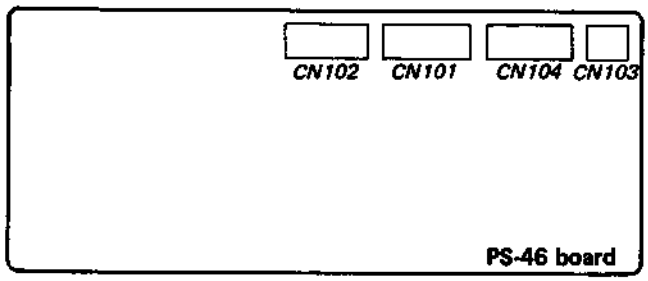


Fig. 5-4. Component layout

1. UN 12V Check
   Pin ⑥ of CN101 shall be 12 ± 0.5V
2. SW 12V Check
   Pin ③ of CN101 shall be 12.2 ± 0.2V
3. SW 9V Check
   Pin ⑤ of CN101 shall be 9.0 ± 0.2V
4. UN 5V Check
   Pin ① of CN101 shall be 5.1 ± 0.5V
5. UN 45V Check
   Pin ② of CN102 shall be 44 ± 3V
6. UN −45V Check
   Pin ③ of CN102 shall be −44 ± 3V

5-2. SYSTEM CONTROL CHECK (SS-34 Board)

1. **Clock Frequency Check**
   Mode: E-E
   Signal: None
   Frequency counter: Pin ⑥⓪ of IC601
   Check: f: 6 MHz

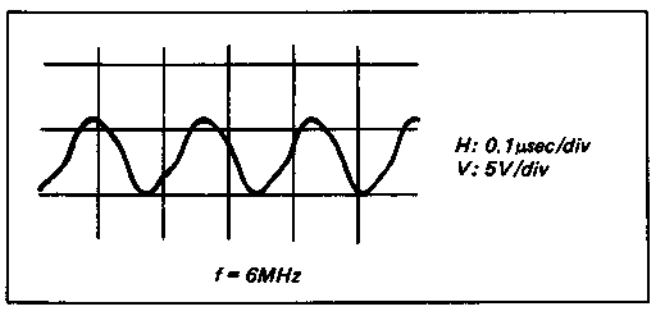


Fig. 5-5.

5-3. SERVO SYSTEM ALIGNMENT

Alignment Sequence
1. Drum servo system alignment
2. Capstan servo system alignment

5-3-1. Drum Servo System Alignment

1) Drum Free Speed Adjustment (SS-34 Board)
   Mode: Playback
   Signal: Alignment tape colour bar, or monoscope
   Oscilloscope: CH-1 TP405 (Pin ⑬ of IC301)
   CH-2 TP402 (Pin ㊴ of IC301)

[Alignment method]
Adjust to 553 μsec ± 10 μsec with RV303.

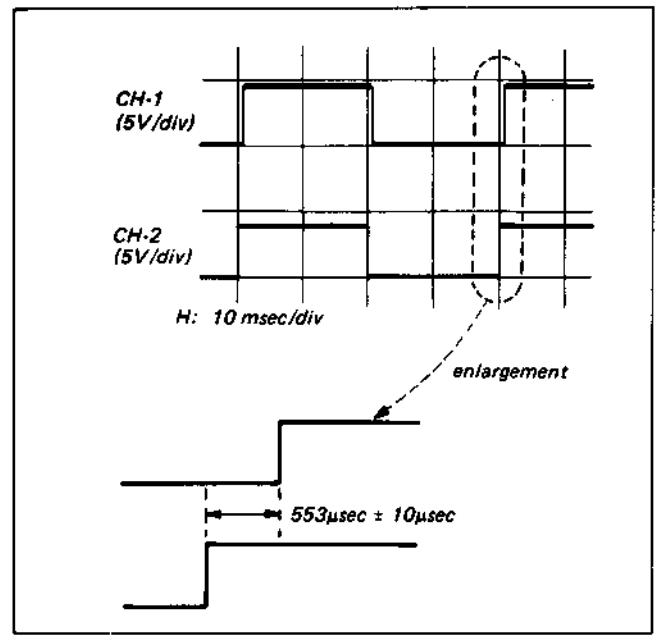


Fig. 5-6. Drum free speed adjustment

2) RF Switching Position Adjustment (SS-34 Board)
   Mode: Playback
   Signal: Alignment tape colour bar or monoscope
   Oscilloscope: CH-1 TP402 (Pin ㊴ of IC301)
   CH-2 Pin ㊵ of IC301

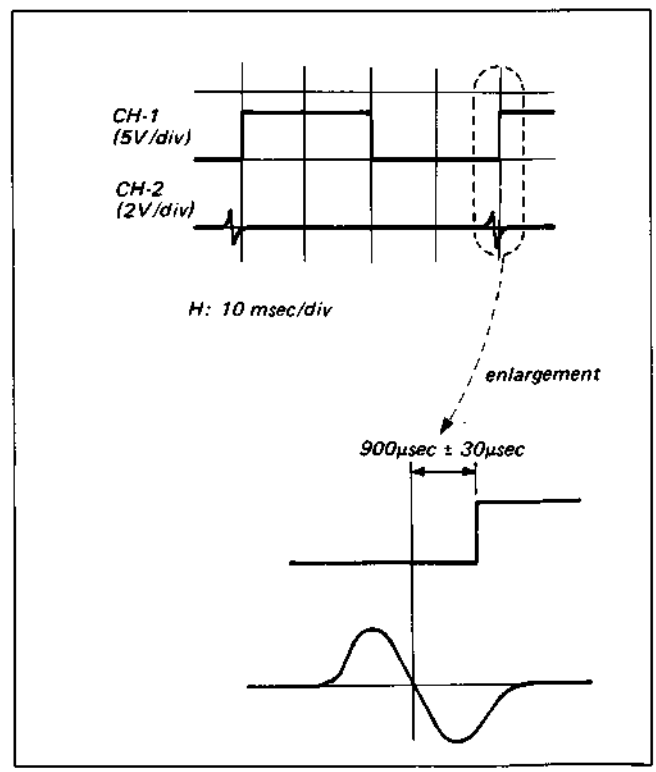


Fig. 5-7. RF switching position adjustment (1)

[Adjustment method]

i) Adjust to 900 μsec ± 30 μsec with RV304(See Fig. 5-7.)
ii) Change connection of CH-2 only to Pin ㉜ of IC301.
iii) Adjust to 900 μsec ± 30 μsec with RV305 (See Fig. 5-8.)

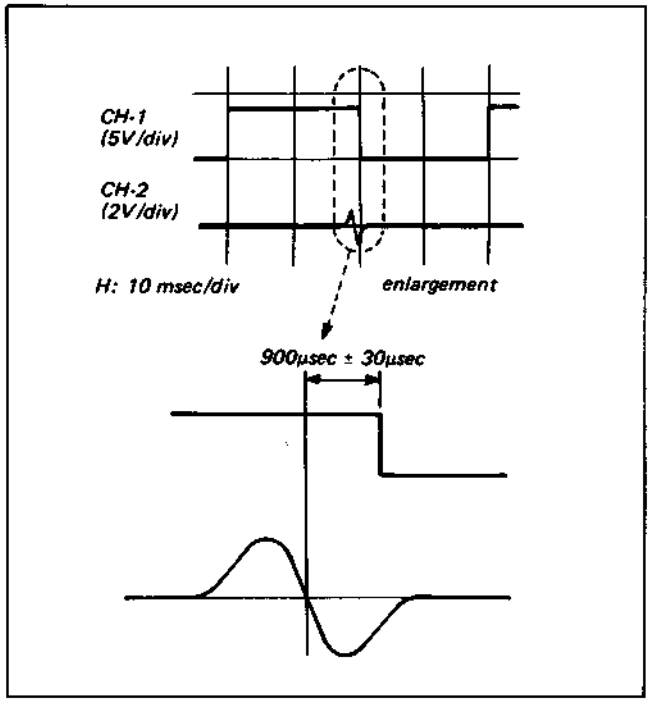


Fig. 5-8. RF switching position adjustment (2)

3) PICTURE SEARCH, f_H Adjustment (SS-34 Board)
Mode: PICTURE SEARCH (FWD)
Signal: Alignment tape colour bar or monoscope
Frequency counter: Pin ③ of CN309 (TP404)

[Adjustment method]

Adjust to 64 μsec ± 0.3 μsec with RV307.

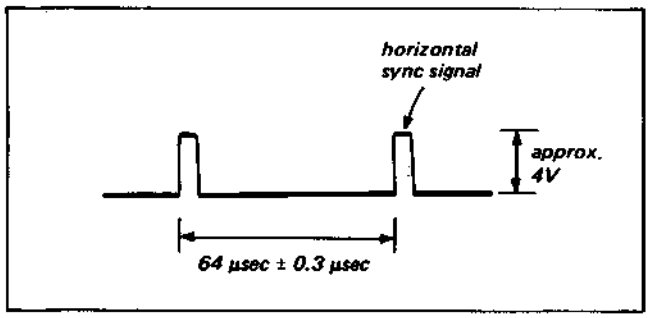


Fig. 5-9. PICTURE SEARCH, drum free speed adjustment

5-3-2. Capstan Servo System Alignment

1) Capstan Free Speed Adjustment (SS-34 Board)
Mode: playback
Signal: Alignment tape colour bar or monoscope
Oscilloscope: TP407 (Pin ⑳ of IC301)

[Adjustment method]

Adjust the duty (ratio for A and B) to 50% ± 5% with the RV301.

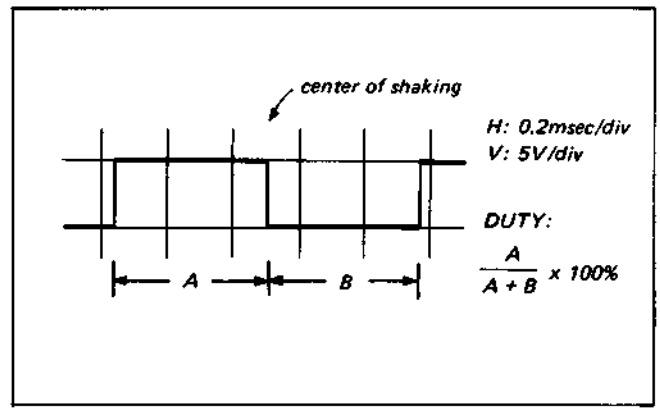


Fig. 5-10. Capstan free speed adjustment

2) PICTURE SEARCH, Capstan Free Speed Adjustment (SS-34 Board)
Mode: PICTURE SEARCH (FWD)
Signal: Alignment tape colour bar or monoscope

[Adjustment method]

i) Set up the picture search (forward) mode and adjust with RV302 so that the progression of noise bars becomes as slow as possible.
ii) Set up the picture search (reverse) mode and check that noise bars do not progress very quickly.

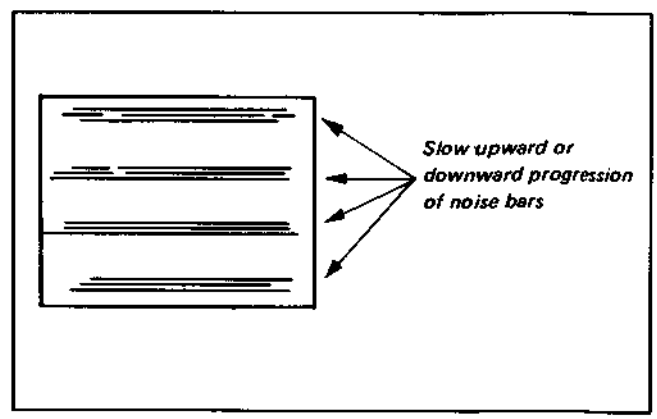


Fig. 5-11. PICTURE SEARCH, capstan free speed adjustment

3) Tracking Center Adjustment (SS-34 Board)

Mode: Playback
Signal: Alignment tape colour bar, or monoscope
Oscilloscope: CH-1 TP405 (Pin ⑬ of IC301)
CH-2 TP406 (Pin ⑮ of IC301)

[Adjustment method]

i) Set the TRACKING knob to the center click position.
ii) Adjust to 7.05 msec ± 0.05 msec with RV306.(See Fig. 5-12.)

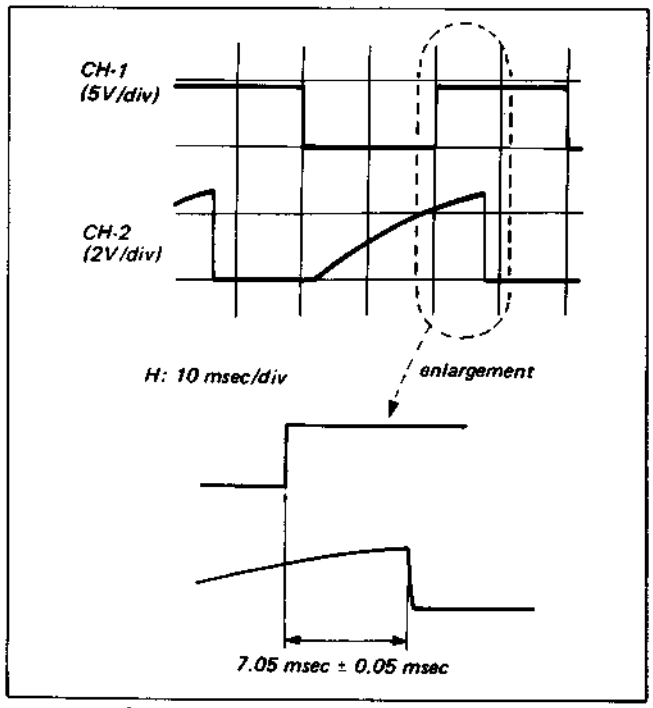


Fig. 5-12. Tracking center adjustment

5-4. PAL VIDEO SYSTEM ALIGNMENT

As a rule, first the playback system is aligned with an alignment tape to check that it operates normally, then the recording system is aligned.

The alignment sequence is shown below. The Y signal and chroma signal systems are aligned for both playback and recording systems.

Colour video signal supplied by the PAL colour bar generator is used as video input signal for video system alignment in the record mode. Check that the sync and colour burst signals conform to the specifications designated in "Set-up for Alignment" in Fig. 5-1.

5-4-1. Playback System Alignment

1. Playback frequency characteristic adjustment
2. Expand adjustment
3. Playback video level adjustment
4. Y-comb adjustment
5. Dropout compensator adjustment
6. AFC adjustment
7. AFC offset adjustment
8. 4.43MHz REF adjustment
9. Chroma comb filter adjustment
10. Carrier balance adjustment
11. JOG PLL adjustment
12. JOG exchange chroma level adjustment

5-4-2. Record System Alignment

1. Sync AGC adjustment
2. Compress adjustment
3. Carrier set adjustment
4. Deviation adjustment
5. Dark clip and white clip adjustment
6. Y record current adjustment
7. Pilot burst signal level adjustment
8. Chroma record current adjustment

5-4-1. Playback System Alignment

1) Playback Frequency Characteristic Adjustment (RP-20 Board)
   - Adjust both the A and B channels.
   - The B channel indicated by ( ).

   Mode: Playback
   Signal: Alignment tape RF sweep
   Oscilloscope: Pin ⑥ of CN502
   External trigger: Pin ③ of CN502

[Adjustment method]

i) Turn tracking knob to maximum output.
ii) Adjust RV503 to make the 2MHz amplitude of A and B channels equal. (See Fig. 5-16)
iii) Set the trigger slope to –(+).
iv) Adjust the 5.2MHz amplitude to 1/2 – 2/3 of the 2MHz amplitude with RV502 (RV501).

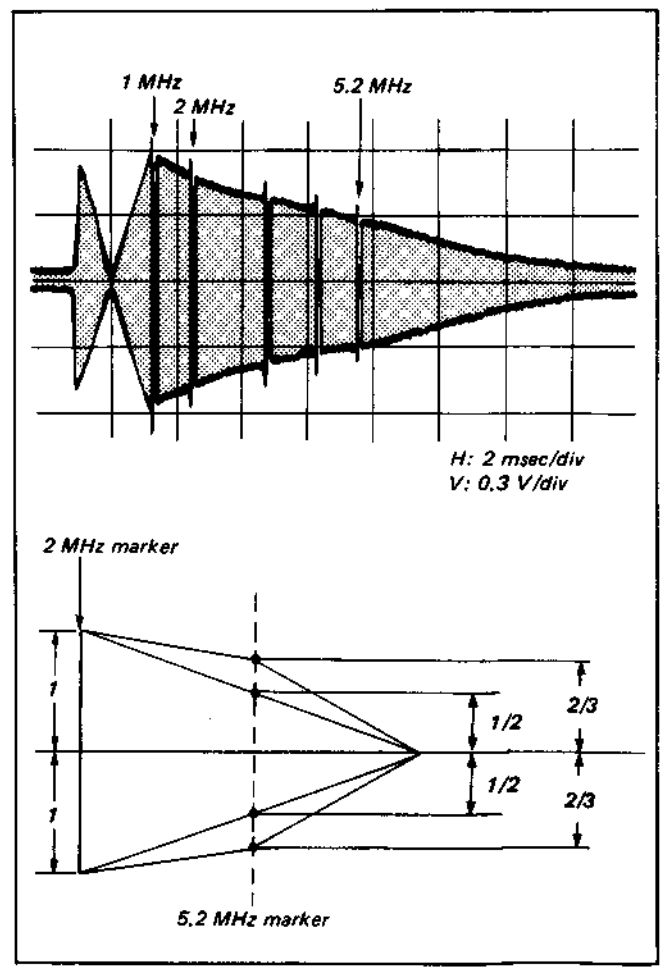


Fig. 5-16. Playback amplifier frequency characteristic adjustment

2) Expand Adjustment (YC-31 Board)
   Mode: Playback
   Signal: Colour bar
   Digital voltmeter: See Fig. 5-17.

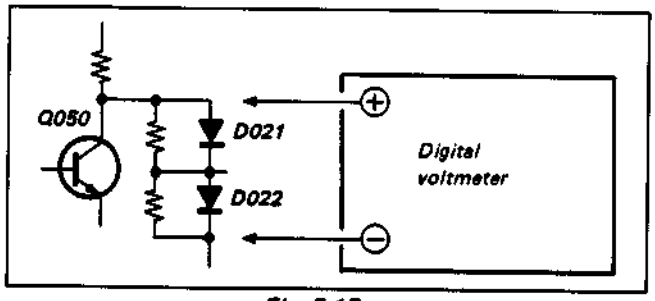


Fig. 5-17.

[Adjustment method]

i) Adjust to 0.45 ± 0.01 Vdc with RV020.

3) Playback Video Level Adjustment (YC-31 Board)

Mode: Playback
Signal: Alignment tape colour bar
Oscilloscope: VIDEO OUT (75Ω terminated) on YC-31 Board

[Adjusment method]

i) Adjust to 1.0V ± 0.05Vp-p with RV019 on YC-31 Board.

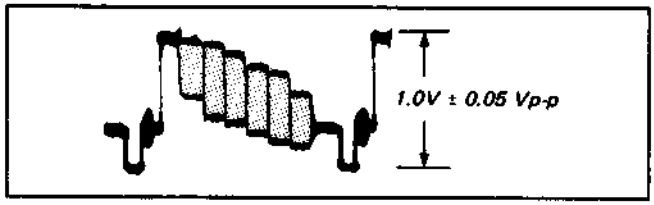


Fig. 5-18. Playback video level adjustment

4) Y-Comb Adjustment (YC-31 Board)

Mode: Playback
Signal: Colour bar
Oscilloscope: Pin ⑧ of IC401 (Attach 100kΩ resistor to tip of probe (10:1)).

[Adjustment method]

i) Adjust RV401 for minimum output.

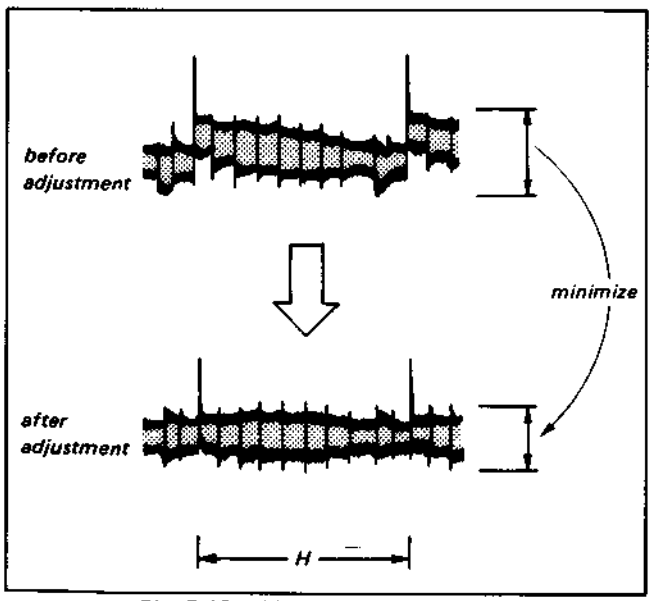


Fig. 5-19. Y-comb adjustment

5) Dropout Compensator Threshold Adjustment (YC-31 Board)

Mode: Playback
Signal: A recorded tape with dropouts

[Adjustment method]

i) Turn RV010 fully clockwise (↻) as seen from the pattern side. In this state, dropouts appear on the monitor screen.
ii) Slowly turn RV010 counterclockwise (↺) and set to make the dropouts disappear.
iii) Rewind the tape and verify that the dropouts described in (i) above have disappeared.

6) AFC Adjustment (YC-31 Board)

Mode: E-E
Signal: Colour bar
Oscilloscope: Pin ㉖ of IC006

[Adjustment method]

i) Adjust to 4.50Vdc ± 0.01 Vdc with RV007.

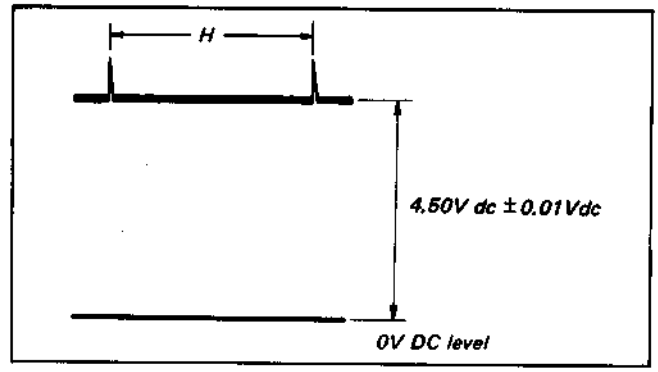


Fig. 5-20. AFC adjustment

7) AFC Offset Adjustment (YC-31 Board)

Mode: Record
Signal: Colour bar
Oscilloscope: Pin ㉖ of IC006

[Adjustment method]

i) Adjust RV006 so that the fluctuation of DC level is minimum.
ii) After this adjustment, check the AFC adjustment.

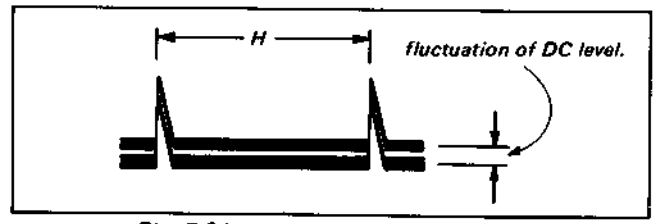


Fig. 5-21. AFC offest adjustment

8) 4.43MHz REF. adjustment (YC-31 Board)

Mode: PB
Signal: Colour bar
Frequency counter: Pin ⑭ of IC006

[Adjustment method]

i) Adjust to 4.433619MHz ± 5 Hz with CV001.

9) Chroma Comb Filter Adjustment (YC-31 Board)
Mode: Playback
Signal: Alignment tape colour bar
Adjust while observing the monitor TV screen.

[Adjustment method]
i) Minimize beats with RV501 and LV501.

10) Carrier Balance Adjustment (YC-31 Board)
Mode: Playback
Signal: Alignment tape colour bar
Adjust while observing the monitor TV screen.

[Adjustment method]
i) Minimize beats with RV005.

11) JOG PLL Adjustment (YC-31 Board)
Mode: E-E
Signal: Colour bar
Oscilloscope: Pin ⑩ of IC003

[Adjustment method]
Adjust to 20μsec ±1μsec with RV003. (See Fig. 5-28.)

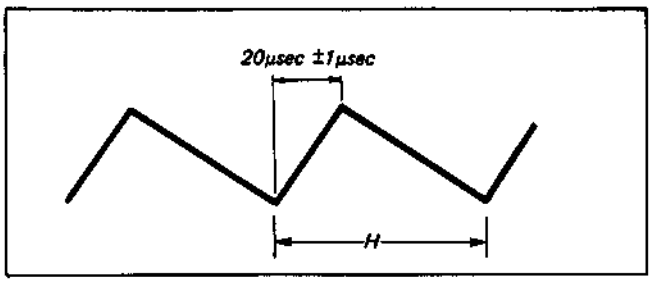


Fig. 5-22. JOG PLL adjustment

12) JOG Exchange Chroma level Adjustment (YC-31 Board)
Mode: PB - PAUSE (STILL)
Signal: colour bar
Oscilloscope: Pin ⑧ of IC003

[Adjustment method]
i) Adjust RV002 so that the fluctuation of level is minimum.

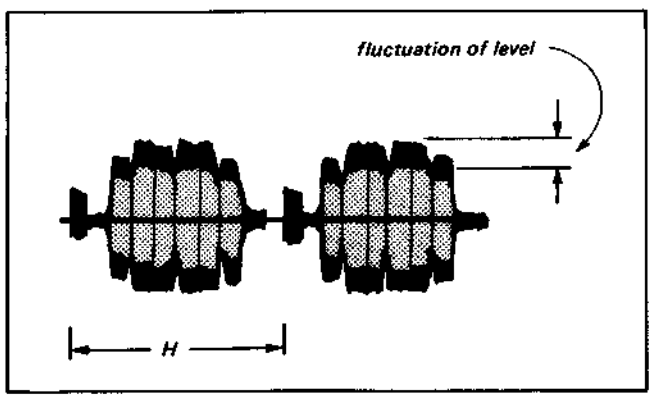


Fig. 5-23. JOG EXCH. C. level adjustment

5-4-2. Record System Alignment

1) Sync AGC Adjustment (YC-31 Board)
Mode: E-E
Oscilloscope: VIDEO OUT (75Ω terminated)
Signal: Colour bar (V : S = 7 : 3)

[Adjustment method]
i) Adjust to 1.0V ±0.05Vp-p with RV021.

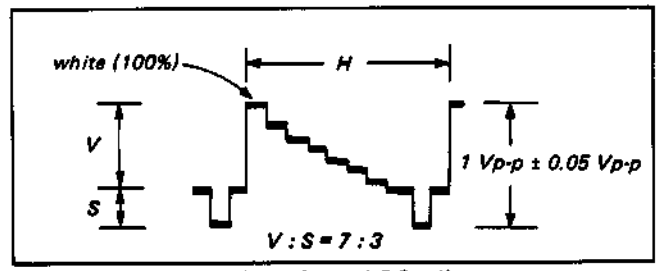


Fig. 5-24. Sync AGC adjustment

2) Compress Adjustment (YC-31 Board)
Mode: E-E
Signal: None
Digital voltmeter: See Fig. 5-25.

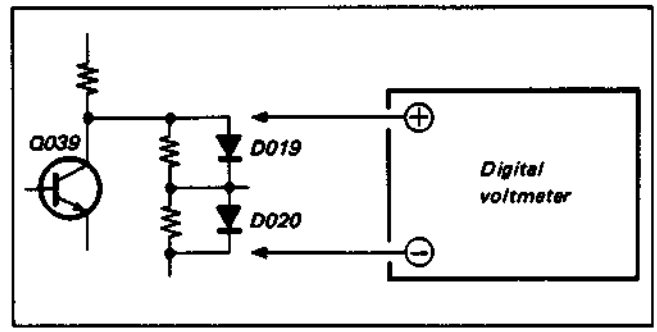


Fig. 5-25.

[Adjustment method]
i) Adjust to 0.3V ± 0.01 Vdc with RV016.

3) Carrier Set Adjustment (YC-31 Board)
Mode: E-E
Signal: None
Frequency counter: Pin ㉕ of IC009

[Adjustment method]
1) Adjust to 3.8MHz ±0.04MHz with RV014.

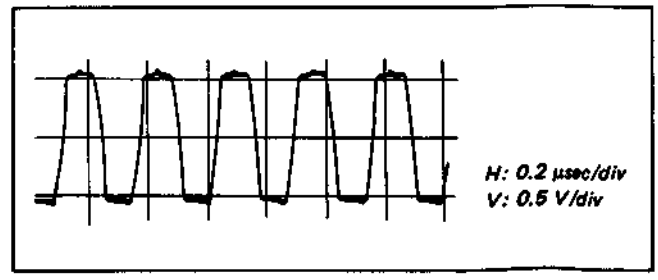


Fig. 5-26. Carrier set adjustment

4) Deviation Adjustment (YC-31 Board)

- The playback system adjustment and the carrier set adjustment in Paragraph 3) above must be completed before making this adjustment.

Mode: Self-recording and playback
Signal: Colour bar
Oscilloscope: Collector of Q038, VIDEO OUT (75Ω terminated)

[Adjustment method]

i) Supply the colour bar signal and set up E-E mode.
ii) Connect the oscilloscope to Collector of Q038.
iii) Adjust the Y signal level to 0.4Vp-p with RV015.
iv) Set up RECORD mode.
v) Playback the recorded section of the tape.
vi) Connect the oscilloscope to VIDEO OUT.
vii) Check that the video signal level is 1.0 Vp-p ± 0.05 Vp-p, if the level is outside of this range, repeat Steps iv) through vi) above adjusting with RV015 until the standard value is obtained.

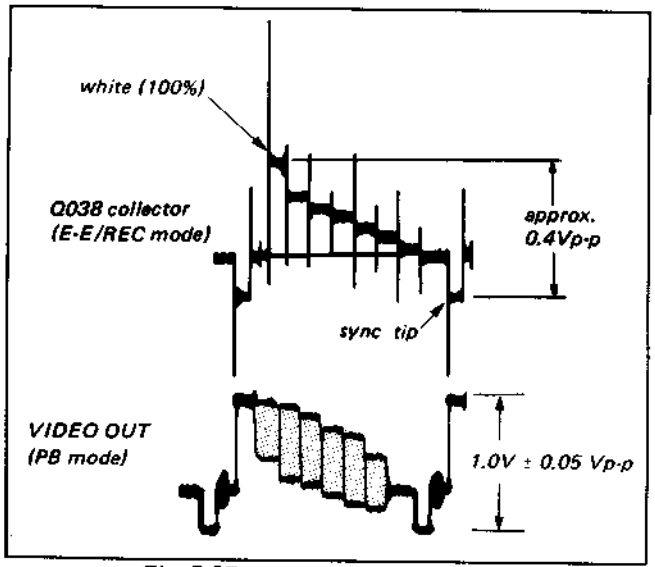


Fig. 5-27. Deviation adjustment

5) Dark Clip and White Clip Adjustment (YC-31 Board)

Mode: E-E
Signal: None
Frequency counter: Pin ㉕ of IC009

[Adjustment method]

i) Connect a jumper wire between the base of Q041 and ground.
ii) Adjust to 2.82MHz ±0.1MHz with RV012.
iii) Remove the jumper wire.
iv) Connect a jumper wire between the base of Q041 and the 9V line (collector of Q042).
v) Adjust to 6.66MHz ±0.1MHz with RV013.
vi) Remove the jumper wire.

6) Y Record Current Adjustment(YC-31Board)

Mode: Record
Signal: Colour bar
Oscilloscope: Pin ⑤ of CN002

[Adjustment method]

i) Adjust to 450mV ±20mVp-p with RV602.

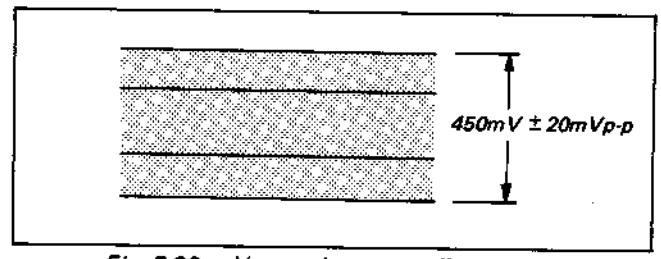


Fig. 5-28. Y record current adjustment

7) Pilot Burst Signal Level Adjustment (YC-31 Board)

Mode: E-E
Signal: Colour bar
Oscilloscope: Pin ① of IC006

[Adjustment method]

i) Align the pilot burst signal with the chroma signal level using RV009.

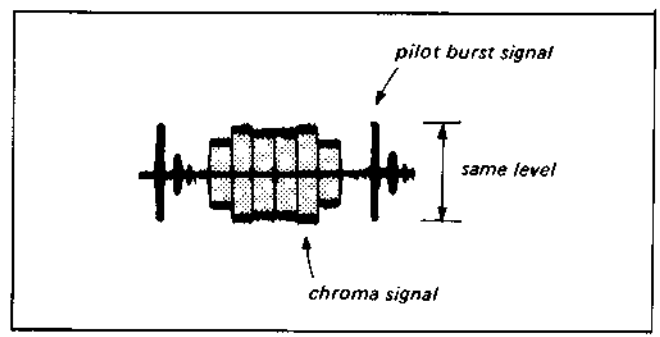


Fig. 5-29. Pilot burst signal level adjustment

8) Chroma Record Current Adjustment (YC-31 Board)

Mode: E-E
Signal: Colour bar
Oscilloscope: Pin ⑦ of CN002

[Adjustment method]

i) Adjust to 180mV ±10mVp-p with RV008.

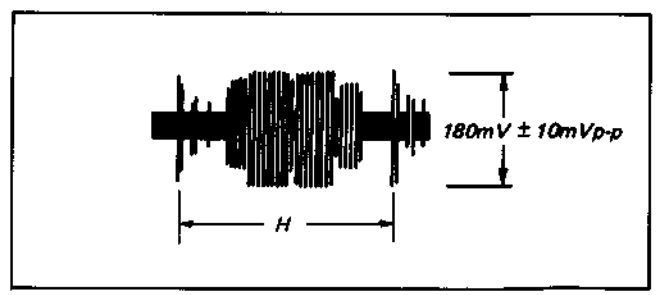


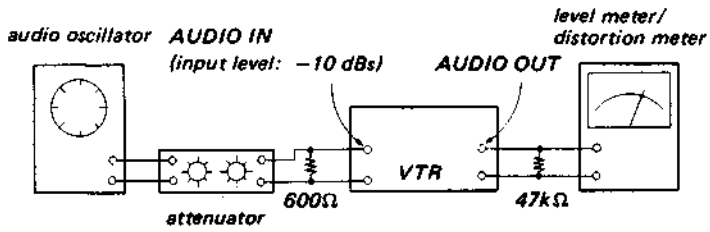
Fig. 5-30. Chroma record current adjustment

5-5. AUDIO SYSTEM ADJUSTMENT (TA-22 Board)

Use a Dynamicron tape for adjustments.

[Connection of Related Equipment]

Note: Set the INPUT SELECT switch to LINE.
Set the TONE switch to HIGH.



[Adjustment method]

1. ACE head adjustment... See "Mechanical Adjustment"
2. Playback frequency characteristic check
3. Playback output level adjustment
4. Bias oscillator check
5. Record bias adjustment
6. Record level check
7. Overall frequency characteristic check
8. Overall S/N check
9. Overall distortion check

1. ACE Head Adjustment

Refer to "Mechanical Adjustment"

2. Playback Frequency Characteristic Check

(1) Play back 333 Hz and 5 kHz from the alignment tape and check that the level difference between 333Hz and 5kHz is within 0dB ±1 dB.

3. Playback Output Level Adjustment

(1) Play back 333 Hz from the alignment tape and adjust so that the output level is −30 dBs ± 0.5 dB with RV301.

4. Bias Oscillator Check

(1) Set the input signal level to zero and set up the RECORD mode.

(2) Connect a frequency counter to Pin ② of CN303. The reading should be 65kHz ±6.5kHz.

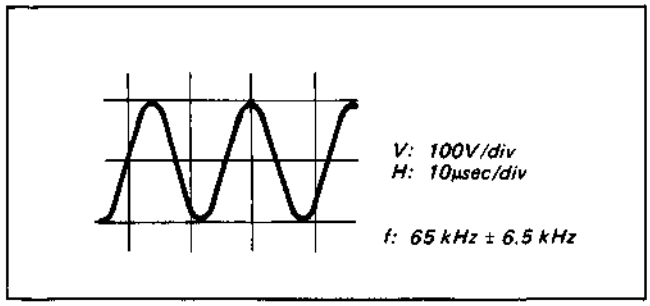


Fig. 5-31. Bias oscillator check

5. Record Bias Adjustment

Check that "Playback frequency characteristic check has been made.

(1) Connect TP301 and TP306 (GND) with a jumper wire so as to turn off the AGC operation.

(2) Supply a 333 Hz signal.

(3) Set up the E-E mode and adjust the oscillator output level so that the level meter reading is −30 dBs.

(4) Record signals.

(5) Supply a frequency of 7 kHz and perform Steps (3) and (4) above.

(6) Play back the recorded section of the tape and check that the output level at 7 kHz is ±1 dB relative to the output level at 333 Hz. If the level is outside this range, repeat Steps (2) through (5) adjusting with RV331 until the standard is met.

(7) Remove the jumper wire after making the adjustment.

6. Record Level Check

(1) Supply a 333Hz signal at −10dBs.

(2) Set up the E-E mode.

(3) Check that the output level is −10dBs ±3dB.

(4) Record signals.

(5) Play back the recorded section of the tape and check that the output level is −9dBs ±3dB.

7. Overall Frequency Characteristic Check

(1) Connect TP301 and TP306 (GND) with a jumper wire so as to turn off the AGC operation.

(2) Connect a 333 Hz signal.

(3) Set up the E-E mode and adjust the oscillator output level so that the level meter reading is −30 dBs.

(4) Record signals.

(5) Change the frequency to 50 Hz, 100 Hz, 7 kHz and 10 kHz and repeat Steps (3) and (4).

(6) Play back the recorded section of the tape and verify that the level is within the specification.

Standard values: With reference to the 333 Hz playback output level.

50 Hz $^{+2.5}_{-10}$ dB

100 Hz $^{+2.5}_{-3}$ dB

7 kHz $^{+2.5}_{-2.5}$ dB

10 kHz $^{+2.5}_{-6}$ dB

(7) If the specified values cannot be attained, perform 5 again. "Record Bias Adjustment".

(8) Remove the jumper wire after making the adjustment.

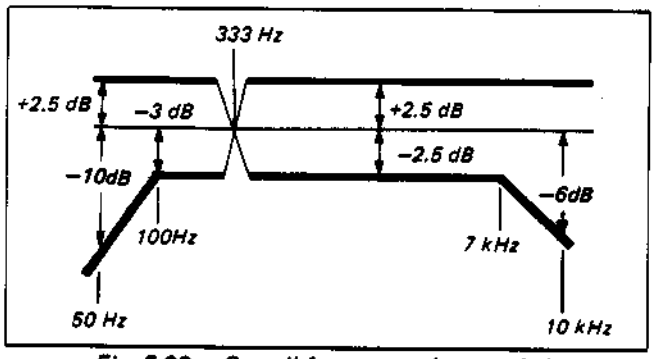


Fig. 5-32. Overall frequency characteristic

8. Overall S/N Check

(1) Supply a 333 Hz signal at −10 dBs.
(2) Record signals.
(3) Set the input signal level to zero and record signals.
(4) Play back the recorded section of the tape and check that the output level difference is greater than 38 dB.

9. Overall Distortion Check

(1) Supply a 333 Hz signal at −10 dBs.
(2) Record signals.
(3) Play back the recorded section of the tape and verify that the distortion is below 4%.

5-6. TUNER SYSTEM ADJUSTMENT (TA-22 Board)

1) Tuner AGC Adjustment

(1) Set the DX/LOCAL switch on the rear panel to DX.
(2) Input RF signals (West germany model: 52dBμ /75Ω terminated, other models: 55dBμ/75Ω terminated) from a colour bar generator, etc.
(3) Connect a digital voltmeter to TP001 (Pin ④ of IC001).
(4) Adjust RV001 to 7.2V ± 0.1V dc.

2) AFT Adjustment

(1) Input RF signals, and press FINE + or FINE − button finely for the best picture quality, while watching the monitor screen.
(2) Connect a digital voltmeter to pin ⑤ of IC001.
(3) Adjust T005 to 6V dc.
(4) Press AFT button to turn on the AFT operation, receive each channel and check to make sure that there is no beat or picture disturbance.

5-7. TIMER SYSTEM ADJUSTMENT (TM-57 Board)

1) Clock Adjustment

(1) Connect a frequency counter to pin ⑥③ of IC001.
(2) Adjust oscillation period (T) with TC001 so the value will be as follows.

$T = (30.51750 + 0.000015 \times Cp)\mu sec \pm 0.0001\mu sec$

Cp: Probe capacity (PF) of the frequency counter

2) System Clock Adjustment

(1) Connect a frequency counter to pin ② of IC001.
(2) Adjust oscillation frequency (f) to the following value with RV001.

$f = (2.60 - 0.0041 \times Cp)MHz \pm 0.05MHz$

Cp: Probe capacity (PF) of the frequency counter

5-8. SECAM VIDEO SYSTEM ALIGNMENT

- Make this adjustment after aligning the PAL video system.
- For this adjustment, use the equipment listed below in conjtinction with an alignment tape and SECAM colour bar signals.

[Equipment Required]

(1) SECAM Colour Monitor TV
(2) Oscilloscope, Dual-trace, Bandwidth . . . more than 10 MHz with delay mode
(3) SECAM Colour-Bar Generator
(4) Alignment Tape, Type: KR5-1J, Code No. 8-969-996-03

[Setup for Alignment]

In this alignment, video signals obtained from the pattern generator will be used as alignment signals. Therefore, the video output signals should be within the specifications. Verify video signals by connecting an oscilloscope to VIDEO OUT connector (75Ω terminated). Check that the video signals are flat when the amplitude of the horizontal sync signal is about 0.3 Vp-p, the amplitude of the video portion is about 0.7 Vp-p, and the amplitude of the burst signal is about 0.3 Vp-p.
The video signal (colour-bar signal) used in this alignment is shown in Fig. 5-33.

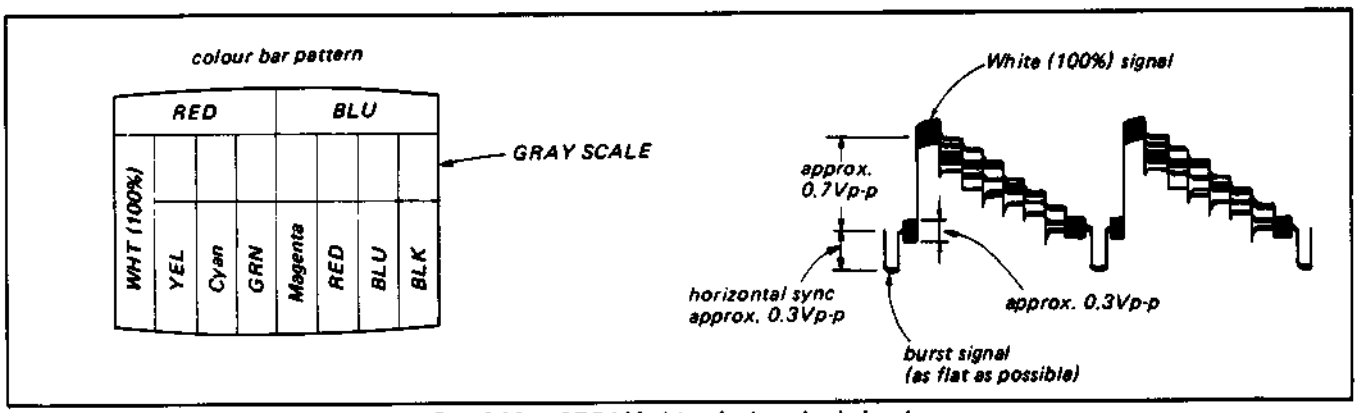


Fig. 5-33. SECAM video (colour bar) signal

[Alignment Tape]
KR5-1J

	Video signal	Audio signal	Playing time	Use for
1.	Colour bars	3 kHz – 5 dB	5 min	General performance, tape speed checks, switching position adjustment.
2.	Monoscope	333 Hz – 25 dB	5 min	Video head dihedral, audio level adjustment.
3.	RF sweep	5 kHz – 25 dB	5 min	Video, audio frequency characteristics, audio azimuth adjustment marker: 1, 2, 3.58, 4.5, 5.2 MHz
4.	Tracking 1 MHz (CH-A) *1 (Channel B is inserted in every 3 frames.)	1 kHz – 5 dB *2 (Signal is dropped out in the positions where channel B is inserted.)	5 min	Tracking, Audio height adjustments CTL Position check (Check if *1 and *2 are the same position.)

[Colour Bar Signal]
The 100% colour bar signal recorded on the Alignment tape is shown in Fig. 5-34.

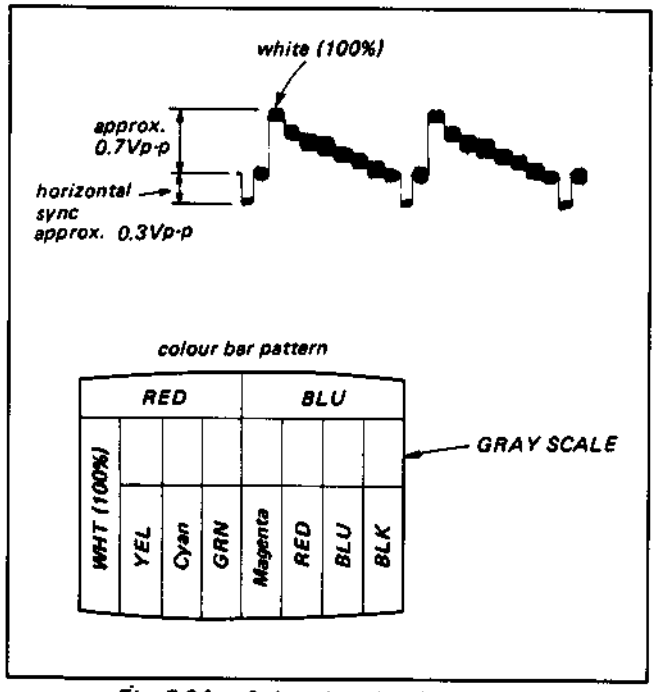


Fig. 5-34. Colour bar signal recorded on the alignment tape

1) Bell Filter Adjustment (YC-31 Board)
Mode: E-E
Signal: SECAM colour bar
Oscilloscope: Pin ⑦ of CN002

[Adjustment method]
i) Adjust LV003 until the waveform is flat.

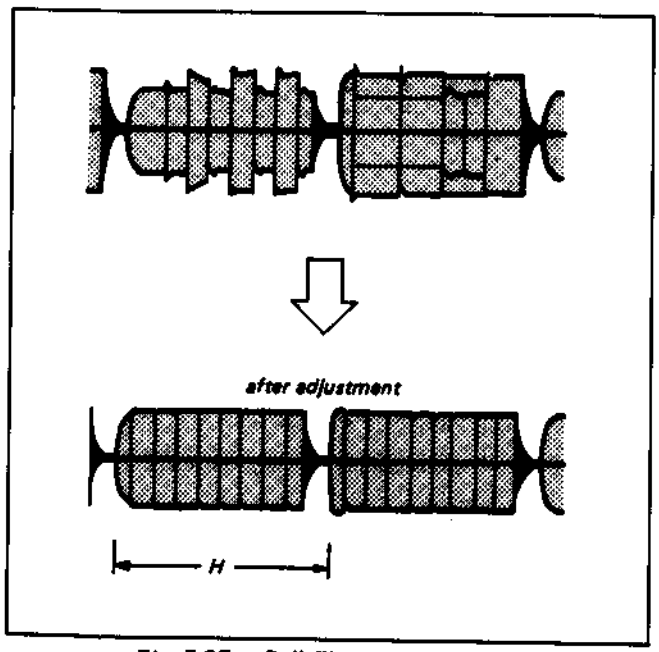


Fig. 5-35. Bell filter adjustment

2) SECAM ACK Adjustment (YC-31 Board)
Mode: E-E
Signal: SECAM colour bar
Oscilloscope: Pin ⑨ of IC002

[Adjustment method]
i) Adjust LV001 until the amplitude is a maximum.
ii) Adjust RV001 to 4.0V ±0.2Vp-p.

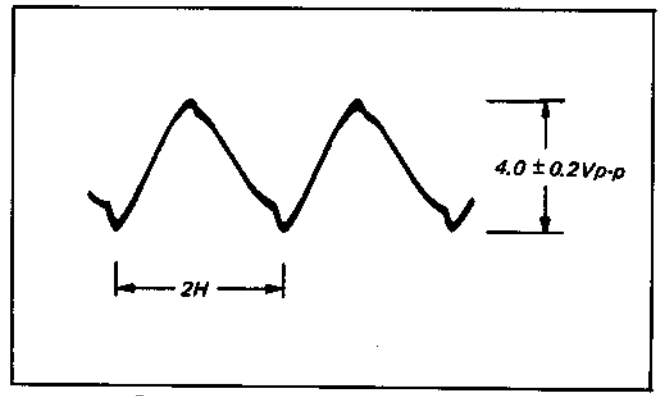
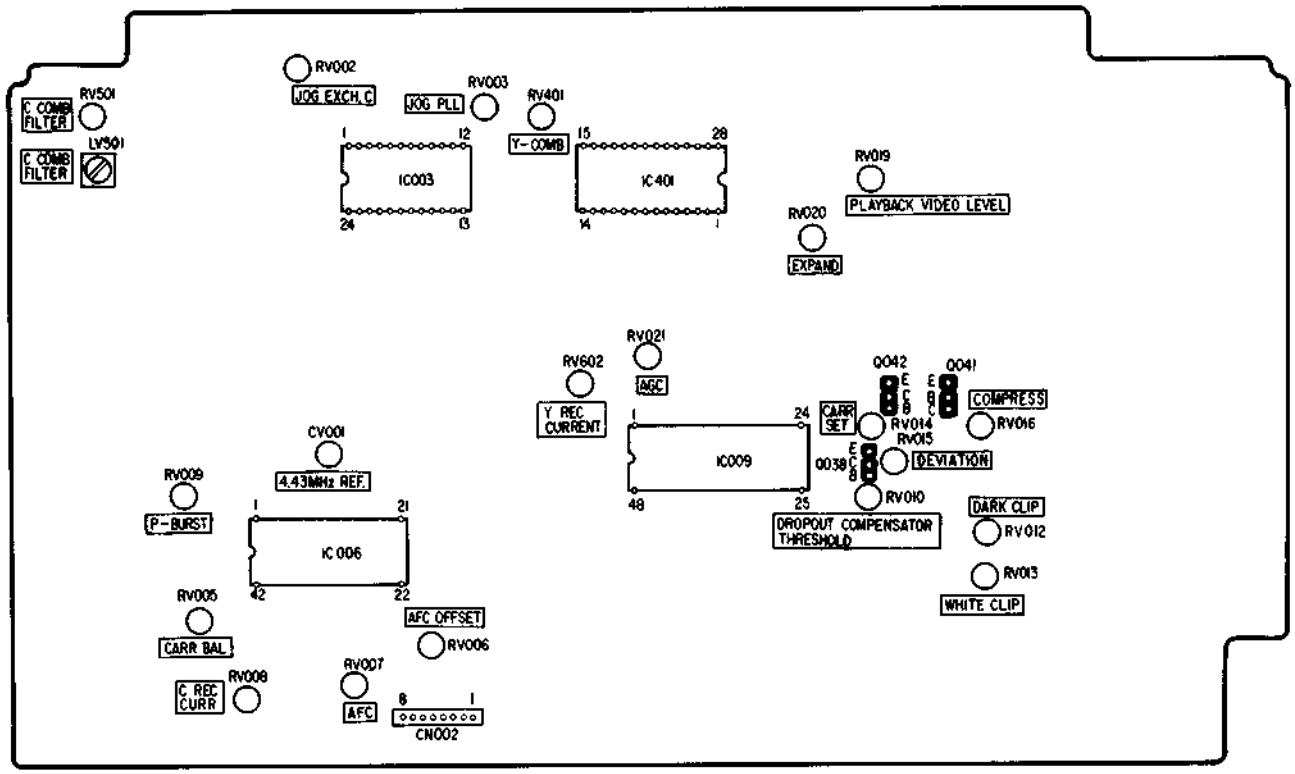


Fig. 5-36. SECAM ACK adjustment

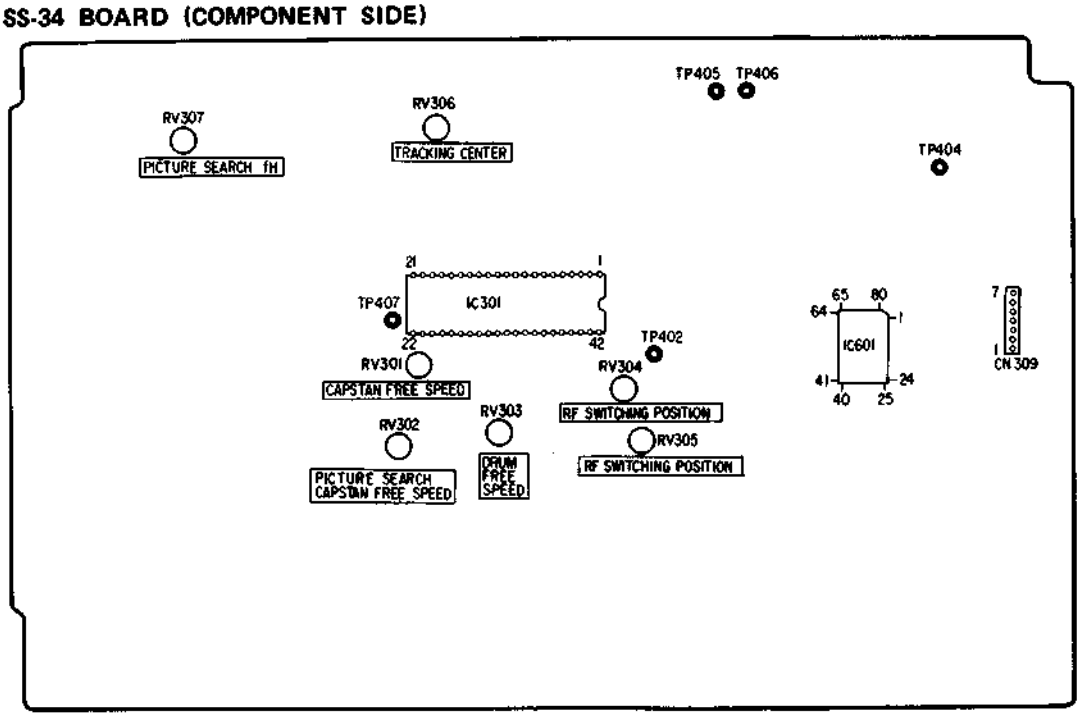
3) Counter Bell Filter Adjustment (YC-31 Board)
Mode: Self-recording and playback
Signal: SECAM colour bar
Adjust while observing the monitor TV screen.

[Adjustment method]
i) Record SECAM colour bar signals.
ii) Playback the recorded signals.
iii) While observing the monitor TV screen, adjust LV002. until the border between the red and blue areas is at its cleanest (minimum beats).

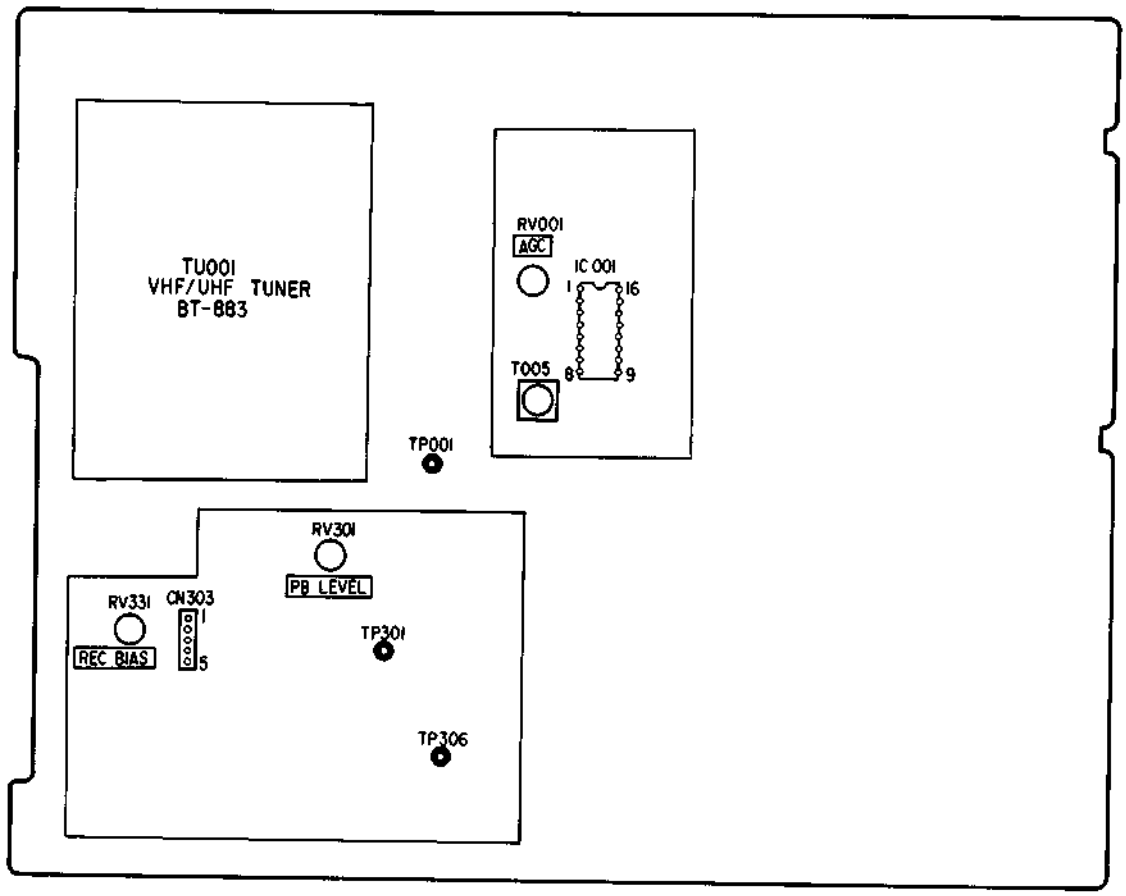
YC-31 BOARD (CONDUCTOR SIDE)



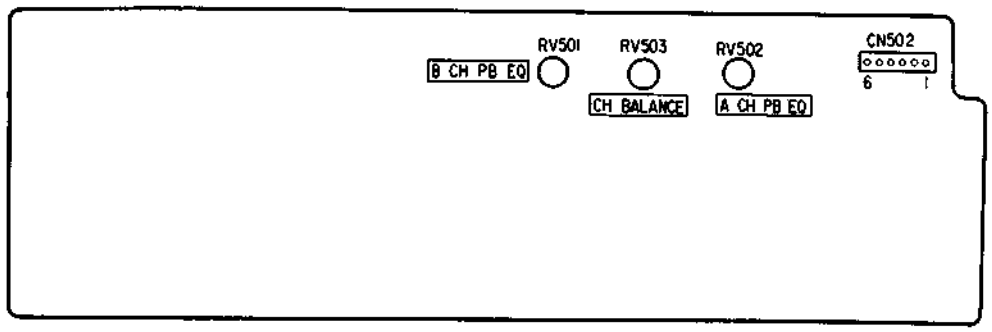
SS-34 BOARD (COMPONENT SIDE)



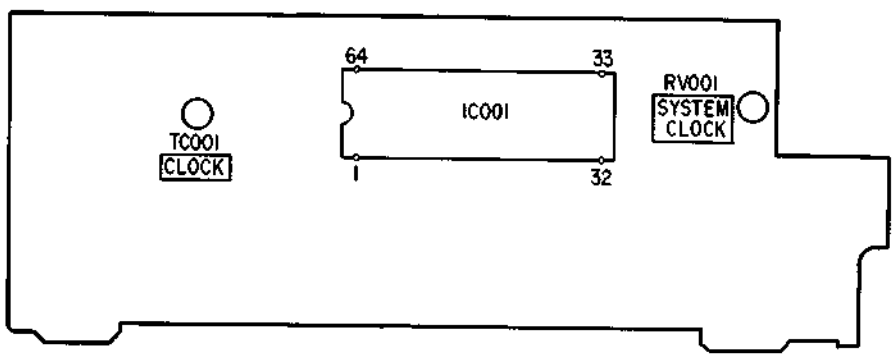
TA-22 BOARD (COMPONENT SIDE)



RP-20 BOARD (COMPONENT SIDE)



TM-57 BOARD (COMPONENT SIDE)



RMT-231

SERVICE MANUAL

SPECIFICATIONS

Remote Commander RMT-231

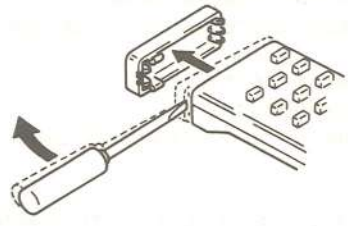
Remote control system
Infrared control

Power requirements
3V dc, 2 IEC designation R6 batteries (size AA)

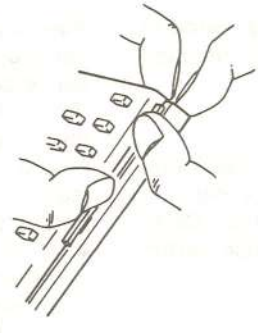
Dimensions Approx. 45 × 20 × 175 mm (w/h/d) (1 3/4 × 3/4 × 7 inches) incl. projecting parts and controls

Weight Approx. 105 g (3.7 oz) incl. batteries

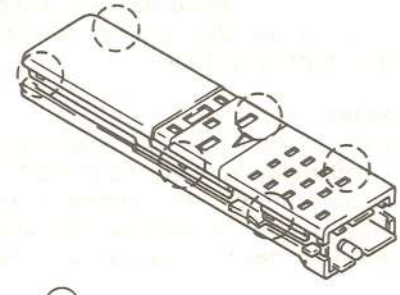
Disassembly



① Remove the front panel by prying up with a screwdriver.



② While pulling the lower case outward, lift the upper case and free the claw.



③ Free all 6 claws similarly.

REMOTE COMMANDER

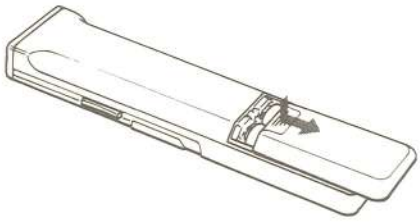
SONY®

1. REMOTE CONTROL OPERATION

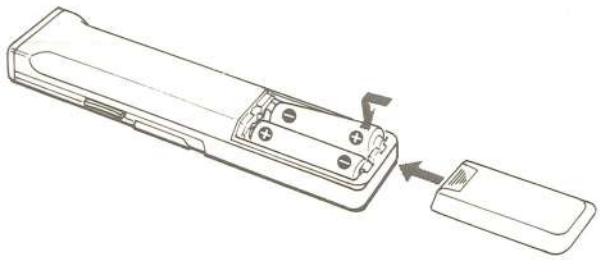
You can control almost all the functions of this video cassette recorder from your armchair using the supplied Remote Commander.

BATTERY INSERTION

1 Open the lid.



2 Insert two IEC designation R6 batterries with correct polarity.



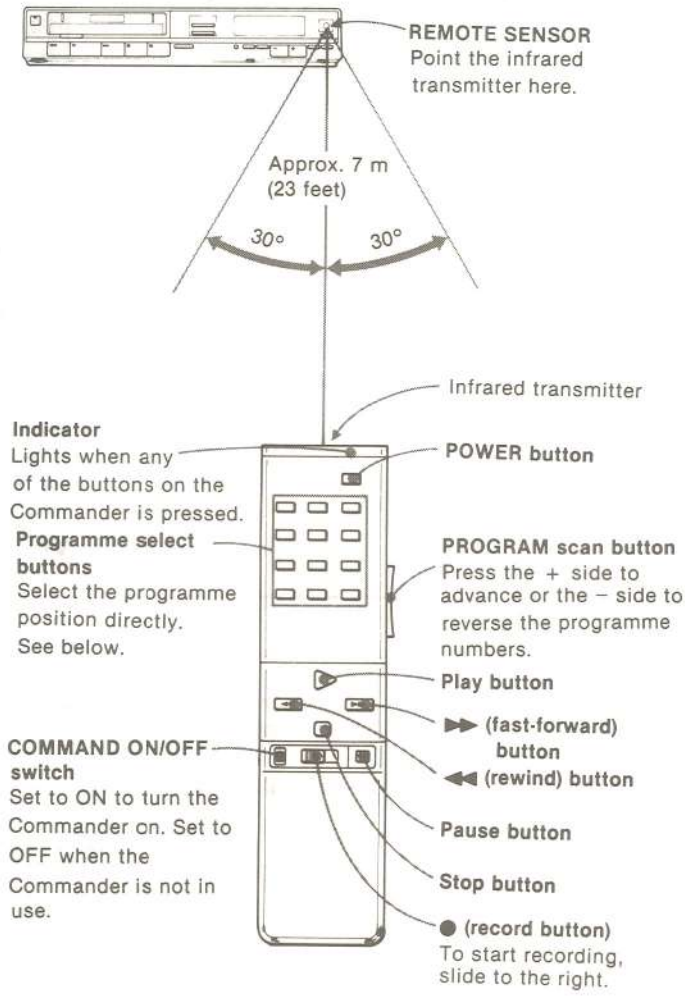
3 Close the lid firmly.

Battery life
In normal operation, batteries will last for about six months. If the range of the Remote Commander becomes noticeably short, replace the batteries with new ones. When the batteries are exhausted, the remote function indicator will not light when the buttons on the Commander are pressed.

If the Commander is not to be used for a long period of time, remove the batteries to avoid possible damage from battery leakage.

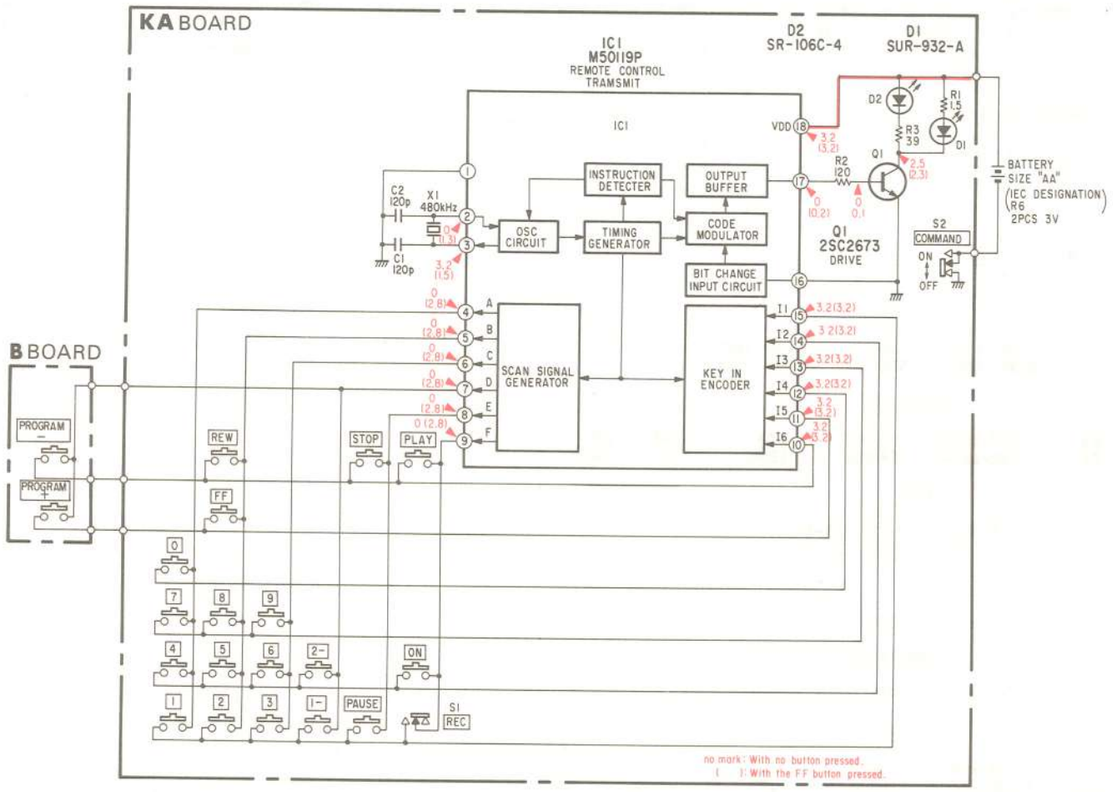
Notes
- There should be no obstacles between the Commander and the REMOTE SENSOR of the recorder.
- The shorter the distance between the Commander and the recorder, the wider the angle within which the recorder can be controlled.

OPERATION



How to press the programme select buttons
For programmes 1 through 9, press the corresponding single-digit button.
For 10 through 19, press "1-" for the tens-digit and then the corresponding single-digit button.
For 20 through 29, press "2-" and then the corresponding single-digit button.
For 30, press "0".
- If your do not press a single-digit button within several seconds after pressing "1-" or "2-", the previous programme position will be recalled.

2. SCHEMATIC DIAGRAM



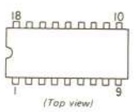
Note:

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- ——— : B+ bus.
- The voltage value is measured using a digital tester (10MΩ).

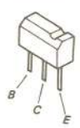
When indicating parts by reference number, please include the board name.

SEMICONDUCTORS

M50119P



2SC2673

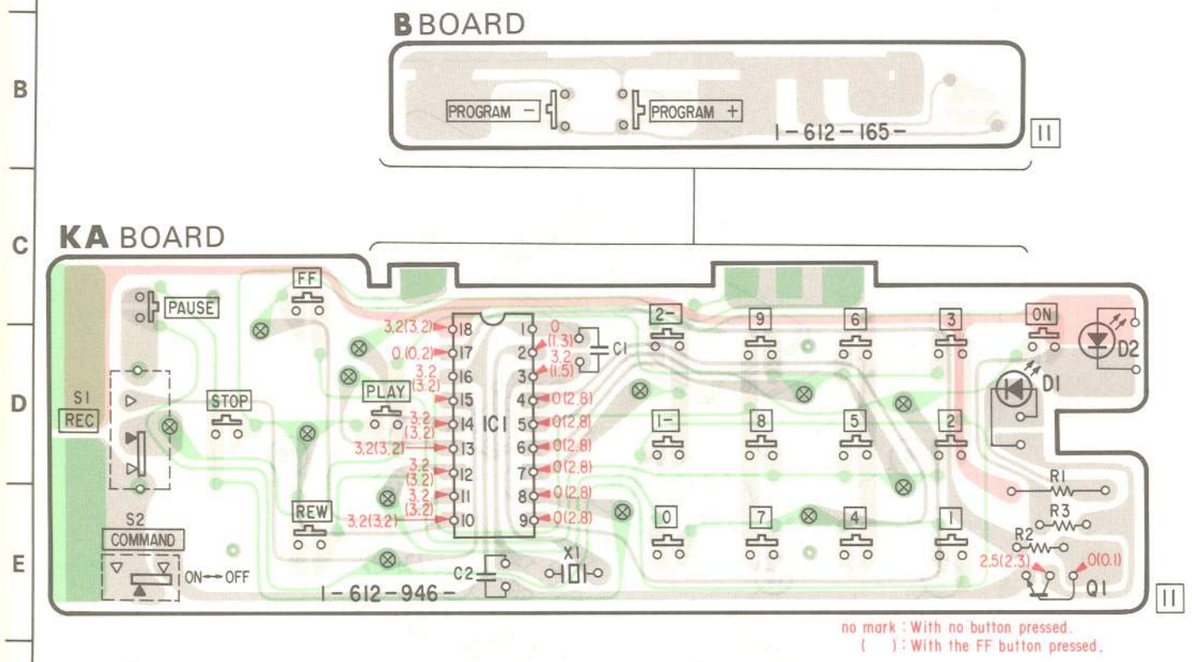


SLR932A

SR106C

3. PRINTED WIRING BOARDS

— Conductor Side —



Note:

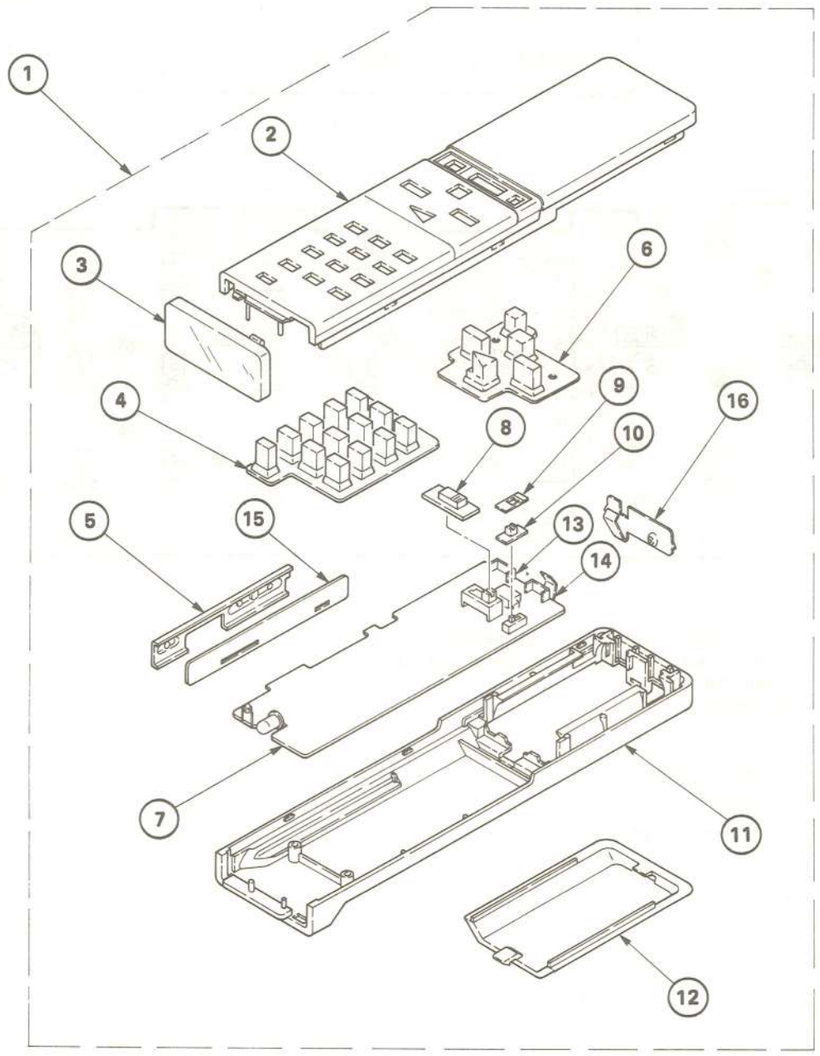
- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- : soldering side
- : B+ pattern
- : component side
- : conductor side (inner)

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

4. EXPLODED VIEW

NOTE:

- Itmes with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- 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.



No.	ParT No.	Description	Remark
1	A-6765-566-A	COMMANDER ASSY (RMT-231/SILVER)	2-16
	A-6765-639-A	COMMANDER ASSY (RMT-231/GRAY)	2-16
	A-6765-641-A	COMMANDER ASSY (RMT-231/RED)	2-16
2	2-383-130-11	CASE (UPPER), COMMANDER (SILVER)	
	2-383-130-21	CASE (UPPER), COMMANDER (GRAY)	
	2-383-130-41	CASE (UPPER), COMMANDER (RED)	
3	2-387-107-01	PANEL, COMMANDER (FRONT)	
4	2-383-128-01	RUBBER (A), CONTACT	
5	2-389-303-01	RUBBER (B), CONTACT	
6	2-383-129-01	RUBBER (C), CONTACT	
7	*1-612-946-11	KA BOARD	
8	2-387-101-01	BUTTON, RECORDING	
9	2-387-113-11	PLATE, COLOR	
10	2-383-127-01	BUTTON, SLIDE	
11	2-387-123-01	CASE (LOWER), COMMANDER (GRAY, SILVER)	
	2-387-123-21	CASE (LOWER), COMMANDER (RED)	
12	2-387-105-01	COVER, BATTERY (GRAY, SILVER)	
	2-387-105-21	COVER, BATTERY (RED)	
13	2-387-104-01	TERMINAL (B), BATTERY	
14	2-387-103-01	TERMINAL (A), BATTERY	
15	*1-612-165-11	B BOARD	
16	4-350-925-00	TERMINAL (C), BATTERY	

KA B

5. ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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

- 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.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS

- MF : μF, PF : μμF

COILS

- MMH : mH, UH : μH

Ref.No	Part No.	Description			Remark
	*1-612-946-11	KA BOARD *********			
	2-387-103-01	TERMINAL (A), BATTERY			
	2-387-104-01	TERMINAL (B), BATTERY			
		CAPACITOR			
C1	1-102-107-00	CERAMIC	120PF	10% 50V	
C2	1-102-107-00	CERAMIC	120PF	10% 50V	
		DIODE			
D1	8-719-912-39	DIODE SLR-932A			
D2	8-719-100-06	DIODE SR106C			
		IC			
IC1	8-759-600-07	IC M50119P			
		TRANSISTOR			
Q1	8-729-967-32	TRANSISTOR 2SC2673			
		RESISTOR			
R1	1-246-405-25	CARBON	1.5	5% 1/4W	
R2	1-246-772-00	CARBON	120	5% 1/8W	
R3	1-246-766-00	CARBON	39	5% 1/8W	
		SWITCH			
S1	1-554-364-00	SWITCH, SLIDE			
S2	1-553-977-00	SWITCH, SLIDE			
		CRYSTAL			
X1	1-527-476-00	OSCILLATOR, CERAMIC			
	*1-612-165-11	B BOARD ********			