SL-2410/2415

SERVICE MANUAL

US Model
SL-2410
SL-2415

Canadian Model
SL-2410

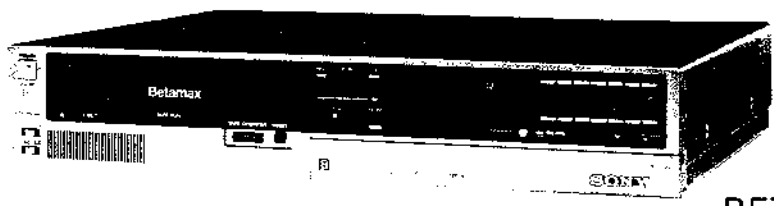


Photo : SL-2410

BETA III/II RECORD
BETA III/II/I PLAYBACK

711B CHASSIS

August, 1983

SPECIFICATIONS

Refer to separate adjustment manual, part number 9-972-257-81.

System

Video recording system	Rotary two-head helical scanning
Video signal	EIA standards, NTSC color
Channel coverage	VHF channels 2 - 13 UHF channels 14 - 83 CATV mid-band channels A-2, A-1, A—I super-band channels J—W
VHF output signal	Channel 3 or 4 (selectable) 75 ohms, unbalanced
Antenna	75-ohm external antenna terminal for VHF 300-ohm external antenna terminals for UHF

Video

Input	VIDEO IN : phono-type connector 1.0 V (p-p), 75 ohms, unbalanced, sync negative
Output	VIDEO OUT : phono-type connector 1.0 V (p-p), 75 ohms, unbalanced, sync negative
Signal-to-noise ratio	Better than 45 dB

Audio

Input	AUDIO IN : phono-type connector more than 47 k ohms, −10 dBs (0 dBs = 0.775 V rms) MIC : mini jack −60 dBs, suitable for microphone with 600-ohm impedance
Output	AUDIO OUT : phono-type connector Less than 10 k ohms, −10 dBs (100 k ohms load), unbalanced
Frequency response	Ⅱ : 50 - 12,000 Hz Ⅲ : 50 - 9,000 Hz
Signal-to-noise ratio	Better than 40 dB

Tape transport

Tape speed	Ⅰ : 4.0 cm/sec. (playback only) Ⅱ : 2.0 cm/sec. Ⅲ : 1.33 cm/sec.
Maximum recording time	Ⅱ : 3 hours 20 min. Ⅲ : 5 hours (with Sony L-830 cassette)
Fast forward time	Under 4 min. (L-500)
Rewind time	Under 4 min. (L-500)

Timer

Clock	Synchronized with the power frequency
Time indication	12-hour cycle
Timer setting	Only for recording 4 events/3 weeks max.

General

Power requirements	120 V ac ±10%, 60 Hz ±0.5%
Power consumption	45 W
Operating temperature	5°C to 40°C (41°F to 104°F)
Storage temperature	−20°C to +65°C (−4°F to +149°F)
Dimensions	Approx. 430 × 80 × 385 mm (w/h/d) (17 × 3¼ × 15¼ inches) incl. projecting parts and controls
Weight	Approx. 9.6 kg (21 lb 3 oz)

— Continued on next page —

Beta
Ⅱ VIDEOCASSETTE RECORDER
SONY

MICROFILM

Consumer VIDEO

Accessories supplied

Betamax video cassette tape (1)
EAC-25 external antenna connector (300-ohm to 75-ohm matching transformer) (1)
75-ohm coaxial cable with F-type connectors 2 m (6 feet) long (1)
300-ohm twin lead 2 m (6 feet) long (1)
Remote Commander RMT-316 with two size AA batteries (1)
Channel indicating segments (1 set)

Optional accessories

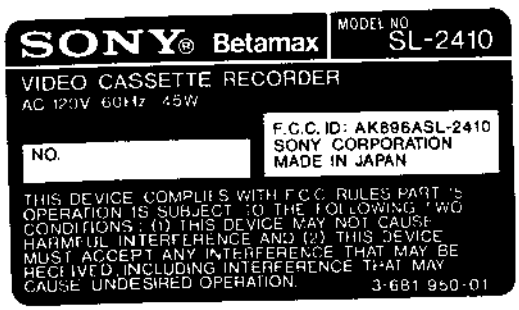
Betamax video cassette tape L-250, L-500, L-750, L-830, etc.
Video head cleaning cassette L-25CL
Color video camera HVC-2000, HVC-2200, HVC-2400, HVC-2500, HVC-2800
AC adaptor for the camera HVA-220
Cassette auto changer AG-500

Design and specifications subject to change without notice.

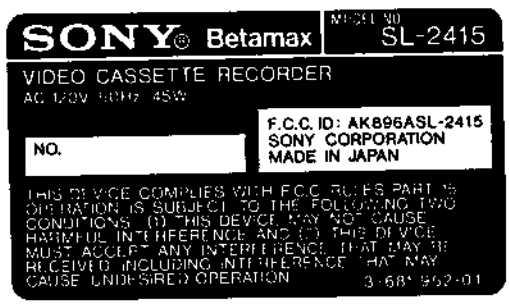
MODEL IDENTIFICATION

– Specification Label –

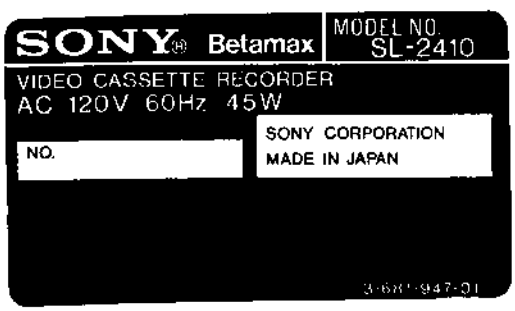
SL-2410 US Model



SL-2415 US Model



SL-2410 Canadian Model



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.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UN TRAME ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY. LES RÉGLAGES DU CIRCUIT QUI SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT SONT IDENTIFIÉS DANS CE MANUEL. SUIVRE LES PROCÉDURES QUAND LES COMPOSANTS CRITIQUES SONT REMPLACÉS OU LE FONCTIONNEMENT IMPROPRE EST SUSPECTÉ.

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 line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

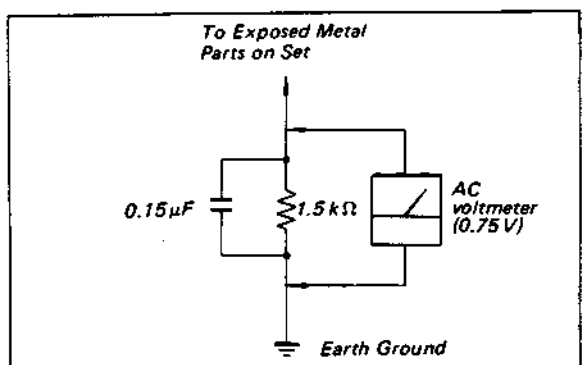


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

TABLE OF CONTENTS

SECTION 1
GENERAL

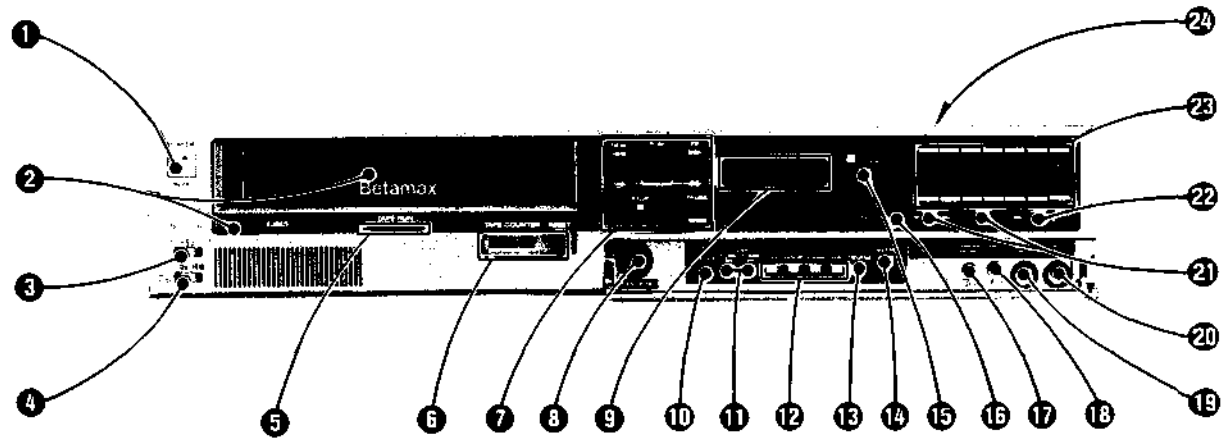
1-1. FEATURE

- Slim, easy-to-handle videocassette recorder, with a thickness of 8 cm
- Front loading
  Can be set at any place.
- Automatic rewind
  Automatically rewound at tape end in the REC and PB modes.
- Batascan/Bata SkipScan
  Can be quickly picture-searched during PB, FF and REW.
- Can be operated using a wireless remote controller.
- When the unit enters the REC mode with the broken safety tab of a cassette, the cassette is automatically unloaded.
- Automatic cassette change
  By using the optional Sony AG-500 cassette auto changer, up to four cassettes can be recorded, playback or rewound automatically.
- This video cassette recorder receives 107 channels including 25 CATV channels A-2, A-1 and A through W.
- The built-in timer permits automatic recording of up to 4 preselected programs even when you are not at home.
- The built-in clock will make a "Cuckoo" sound on the hour.
- CONFIRMATION button
  Each time you press, the turn-on and turn-off time of your settings will be announced. Your timer setting with the earlier turn-on time will be announced first.

TABLE OF ANNOUNCEMENTS

Announcement you hear	when...
Beep. No cassette is inside.	You have pressed the RECORD or TIMER REC button when a cassette is not inserted.
Beep. The safety tab on the cassette is missing.	You have pressed the RECORD or TIMER REC button when the inserted cassette does not have its safety tab.
Beep. Programs A and B* overlap. (* whichever programs that overlap)	You have pressed the TIMER REC button when the presettings of your timer-activated recordings overlap.
Beep. Timer set-up is incomplete.	You have pressed TIMER REC button when the timer is not preset completely.
Beep. The machine is in the timer-record mode.	You have pressed POWER button when the TIMER REC button is depressed.
Ding, dong. Timer set-up is complete.	You have pressed the TIMER REC button after presetting the timer.
Ding, dong. First* timer set-up is for Monday* of this week,* on-time 2:30 a.m.*, off-time 3:35 a.m.* See flashing channel. * They will be announced all according to the week, day and time of your presettings.	You have pressed the CONFIRMATION button after setting the timer.
Ding, dong. Timer-recording has started.	A timer-activated recording has begun.
Ding, dong. Timer-recording has ended.	A timer-activated recording has ended.
Cuckoo, cuckoo.	On the hour.

1-2. LOCATION AND FUNCTION OF CONTROLS



❶ POWER switch and lamp
Press to turn the power on. The lamp lights up.
To turn the unit off, press the switch again.
The timer section will continue to operate and the time will be displayed even if the power switch is off, as long as the ac power cord is plugged into a working outlet.

❷ Cassette compartment and ⏏ EJECT button
After turning on the recorder, insert a cassette to be recorded or played back. To remove the cassette, press the ⏏ EJECT button.

❸ VOICE VOLUME selector
Adjust the volume of the announcements with this selector.
LOUD : For loud announcements.
SOFT : For quiet announcements.
OFF : For cutting off announcements.

❹ RECORD MODE selector
Select either Ⅱ or Ⅲ to set the recording speed. In playback, Ⅰ, Ⅱ or Ⅲ mode is automatically selected.

❺ TAPE RUN indicator
Indicates the tape movement of the running tape.

❻ TAPE COUNTER and RESET button
The TAPE COUNTER provides a numerical reference point while recording, which can be used to index a recorded cassette.
To reset the counter to zero, press the RESET button.

❼ Function buttons
Control tape transport. See page 15.

❽ TRACKING control
The center detent position provides the correct tracking for the cassettes recorded on this recorder.
If streaks or snow appear in the playback of a cassette which has been recorded on another video cassette recorder, turn this knob to obtain the best possible picture.

❾ Time display window
Normally the actual time is displayed here. While the timer is being set, the setting time and day are displayed.

❿ CLOCK button
Use this button in present time setting.

⓫ TURN ON/OFF buttons
Use these buttons in turn-on or turn-off time setting.

⓬ DAY, HOUR, 10 MIN, MIN buttons
Use these buttons in turn-on day and time or turn-off time settings while pressing the TURN ON or OFF button.

⓭ PROGRAM button
Press to select a program position A, B, C or D to be programed.

⓮ TIMER REC button
Press for timer-activated recording. While the timer is in operation, "TIMER REC" indication will light in the display window.

⓯ REMOTE SENSOR
Detects the infrared transmitting signal from the supplied Remote Commander RMT-316.

⓰ CONFIRMATION button
Each press on this button informs you of a timer recording setting, starting from the program that turns on the earliest.

⓱ CAMERA PAUSE jack (special mini type)
To start or stop the tape on the camera, connect the Sony HVA-220 ac adaptor to this jack.

⓲ MIC (microphone) jack (mini type)
Connect a microphone or the MIC OUT plug of the ac adaptor here for audio recording. When a microphone is connected, neither the sound from the AUDIO IN jack nor the sound of a TV program can be recorded.

⓳ AUDIO IN jack (phono type)
This jack accepts audio signals. Connect it to the line output of a piece of audio equipment, such as an amplifier, tape recorder, etc., or to the audio output of another video recorder or a camera. Plug the AUDIO OUT plug of the ac adapter in here. When a plug is inserted in this jack, the signal from the TV tuner cannot be recorded.

⑳ **VIDEO IN jack (phono type)**
This jack accepts video signals from a camera, another video recorder, etc. When the plug is inserted in this jack, the signal from the TV tuner cannot be recorded.

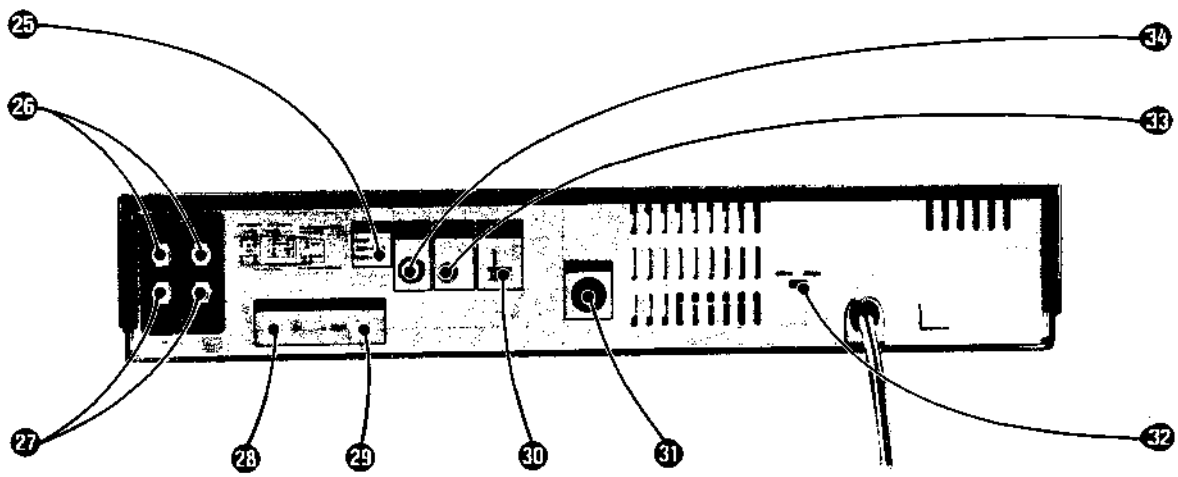
㉑ **RECORD switch and lamp**
Slide to the right to start recording. While a recording is being made, the lamp is lit.

㉒ **PROGRAM SELECT button and VTR lamp**
To view a TV program selected by a channel select button on the recorder or to monitor the picture being recorded, press this button so that the VTR indicator lights up. When the ▶ PLAY button on the recorder is pressed, the unit is automatically set in this mode. To view a TV program in the usual manner, press this switch so that the indicator goes off. When the recorder is turned off, the recorder is automatically set in this mode.

㉓ **Channel select buttons and indicators**
Select the channel to be recorded or to be viewed with these buttons. The selected channel number will light.

㉔ **Tuning compartment**
All the switches and buttons for channel presetting are in this compartment.

Rear



㉕ **RF UNIT selector**
Select the output channel at the VHF OUT terminal. Set the switch to 3ch or 4ch, whichever is not active in your area.

㉖ **UHF IN terminals**
Connect a UHF TV antenna here.

㉗ **UHF OUT terminals**
Connect to the UHF antenna terminals of the TV receiver to be able to view UHF TV programs even when the recorder is turned off.

㉘ **VHF IN terminal**
Connect a VHF TV antenna or CATV cable here.

㉙ **VHF OUT terminal**
Connect to the VHF antenna terminal of the TV receiver. The signal of a VTR program (converted to channel 3 or 4), the VHF TV signal and the CATV signal will be supplied to the TV receiver.

㉚ **CAPTIONS/PCM switch**
Normally set to the right position. For receiving captioned TV programs or for PCM recording and playback, set this switch to the left position.

㉛ **CHANGER connector**
Connect the optional Sony AG-500 cassette auto changer to this connector.

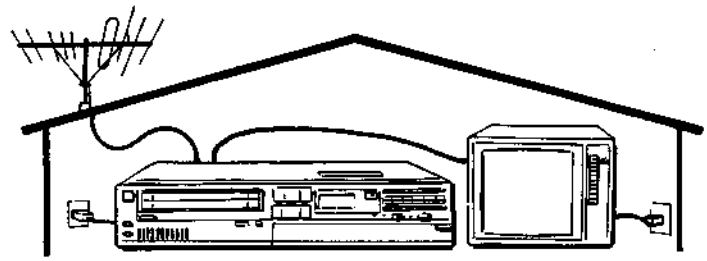
㉜ **Frequency select switch**
When you use this recorder in a 50 Hz area, set the switch to 50 Hz.

㉝ **AUDIO OUT jack (phono type)**
This jack provides the audio signals from this recorder.
Connect it to the line input of an audio equipment, such as an amplifier, tape recorder, etc., or to the audio input of another video recorder or a video monitor.

㉞ **VIDEO OUT jack (phono type)**
This jack provides the video signal from this recorder.
Connect it to the video input of another video recorder or a video monitor.

1-3. ANTENNA CONNECTIONS

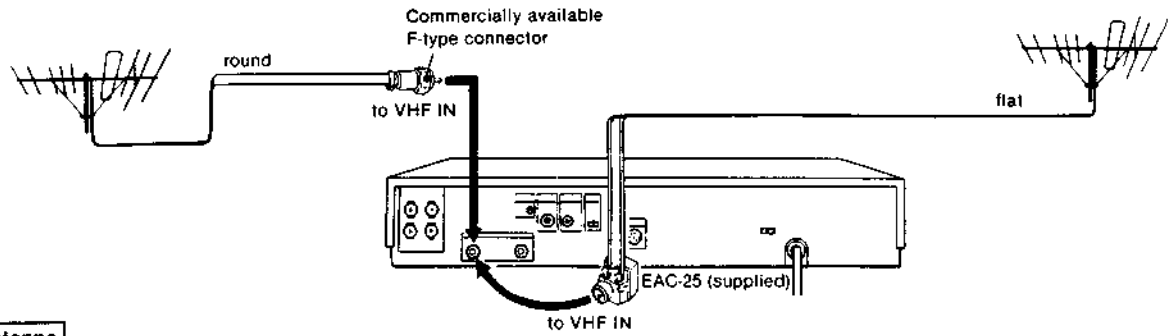
Disconnect the TV antenna cables from the TV receiver and connect them to the recorder.



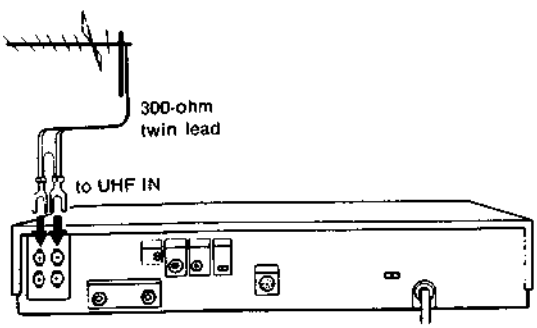
VHF antenna

If the cable is a round 75-ohm coaxial cable

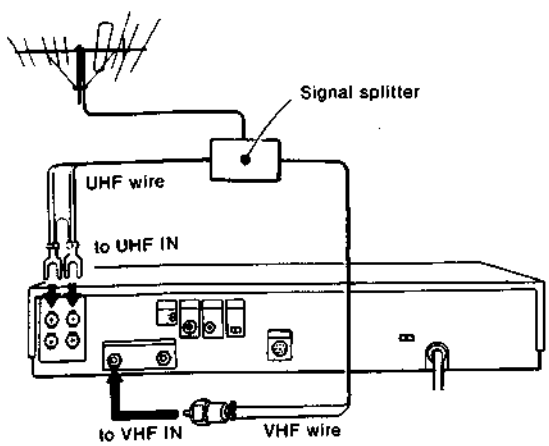
If the cable is a flat 300-ohm twin lead



UHF antenna

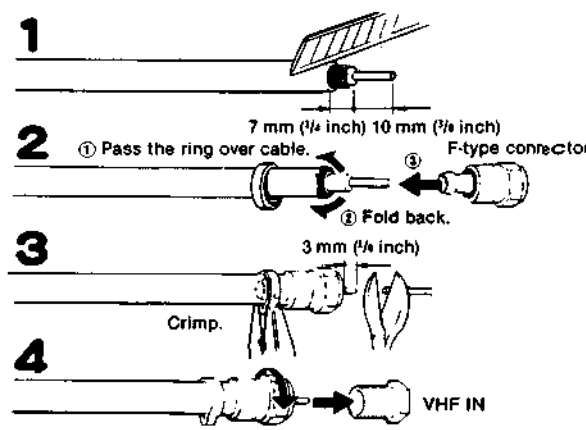


Combination VHF/UHF antenna

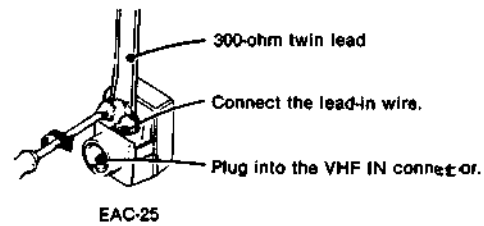


Most combination antennas are equipped with a signal splitter. If you need a splitter or a complete antenna system, see your Sony dealer or a qualified technician.

How to attach an F-type connector



How to attach an EAC-25 external antenna connector

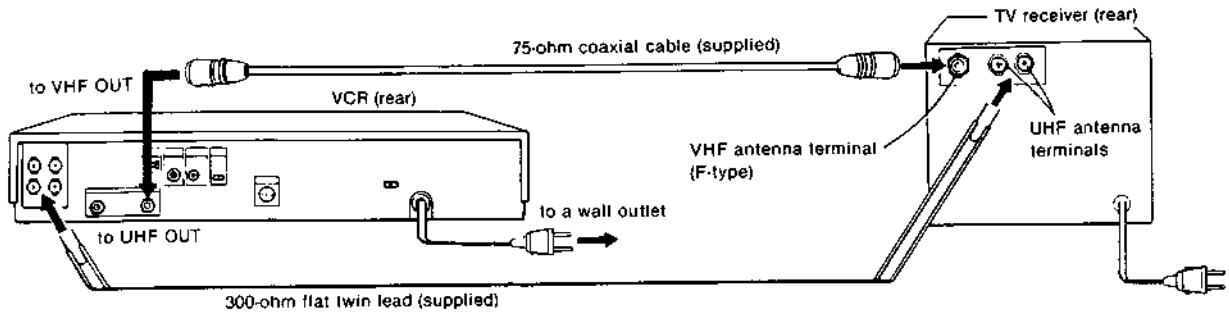


1-4. CONNECTING THE TV RECEIVER

Connecting a conventional TV receiver
Once the connections shown below have been made, the TV antenna signals, as well as the signal from the recorder, will be fed to the TV and you can view TV programs in the usual way.

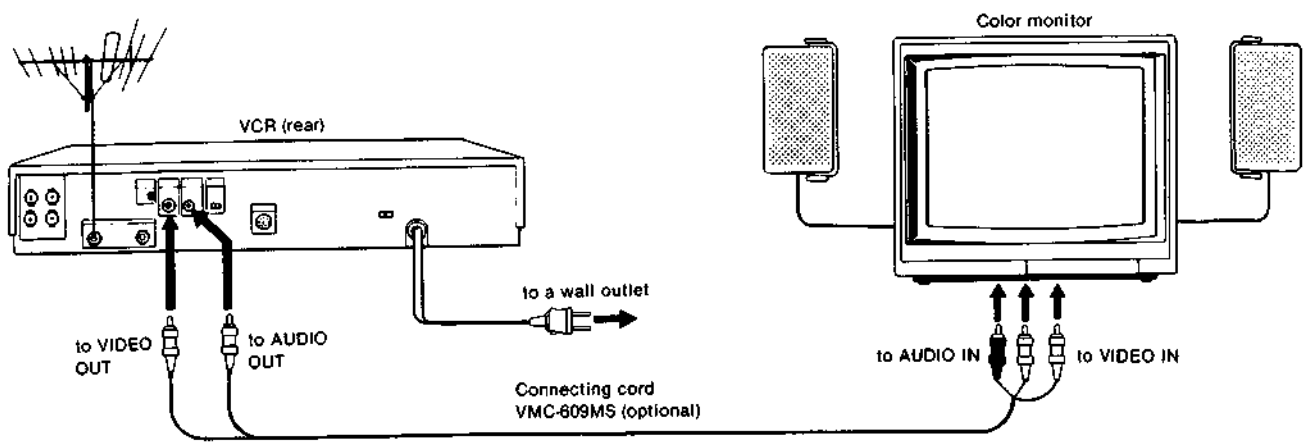
● Use an optional RFC-8 extension cable, 8 m (25 ft) long, if the supplied 75-ohm coaxial cable is not long enough.

Caution
Connections between the recorder VHF OUT connector and the antenna terminals of a TV receiver should be made only as shown in these instructions. Failure to do so may result in operation that violates the regulations of the Federal Communications Commission regarding the use and operation of rf devices.
Never connect the output of the recorder to an antenna or make simultaneous (parallel) antenna and recorder connections at the antenna terminals of your receiver.



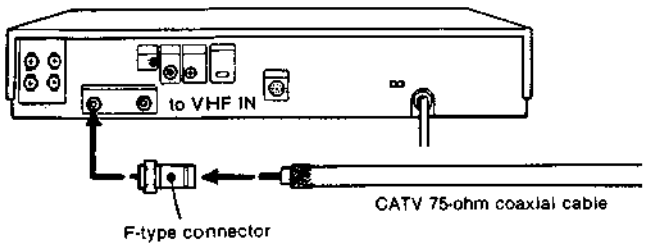
Connecting a color monitor
To obtain a better-quality picture, connect a color monitor, such as the Sony Profeel Trinitron Component TV, instead of a conventional TV receiver.

If you use a component TV tuner together with the monitor, connect the recorder and the TV tuner in the same way as in the case of the recorder and the conventional TV receiver described above.
For details on the connection of the TV tuner and the monitor, refer to the instruction manual of the TV tuner.



1-5. CATV CABLE CONNECTION

This video cassette recorder receives 107 channels including 25 CATV channels A-2, A-1 and A through W.
Connect the CATV coaxial cable to the VHF IN jack on the recorder.



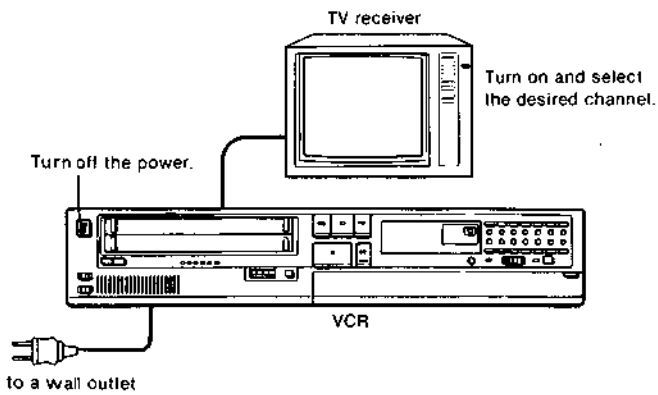
We recommend that you consult your cable company to make sure that the cable is properly connected. (Pay cable TV systems may use scrambled or encoded signals and may require special decoders.)

Note to CATV system installer in the U.S.A :

This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

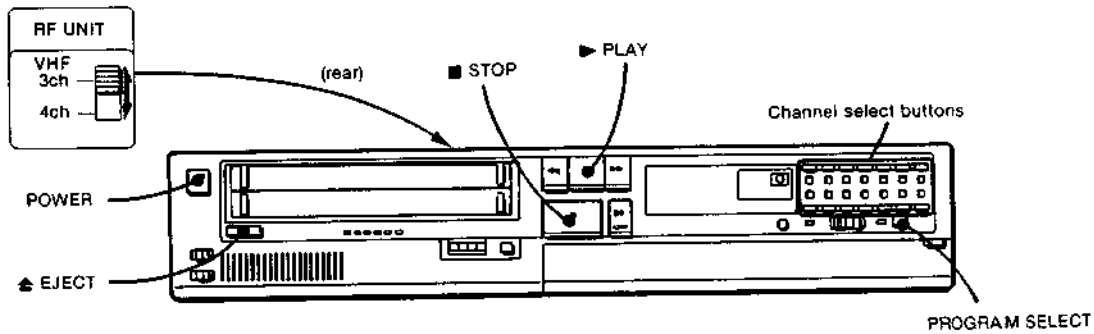
1-6. WATCHING TELEVISION

You can watch television in the usual way with the recorder connected.



1-7. ADJUSTING THE TV

Adjust your TV receiver to receive the signal from your recorder.
When you have connected a color monitor, the following adjustment is not necessary.



If you do not have a recorded video cassette tape

If you have a recorded video cassette tape

❶ Set the RF UNIT channel selector located at the rear of the recorder to 3CH or 4CH whichever channel is not active in your area.
❷ Push in the POWER switch. The lamp lights.

❸ Press the PROGRAM SELECT button to turn the VTR lamp on.
❹ Select an active channel in your area with a channel select button on the recorder.

❸ Insert the cassette with the round window to the left.
❹ Press the ▶ button.

❺ Turn on the TV.
❻ Set the TV receiver to either VHF channel 3 or 4 to agree with the setting of the RF UNIT channel selector.
The TV program selected on the recorder or the tape program will be displayed on the TV screen. If a picture does not appear on the TV screen or if the display is not clear, fine-tune the channel on the TV.
● For details about TV channel adjustment, see the instruction manual of the TV receiver.

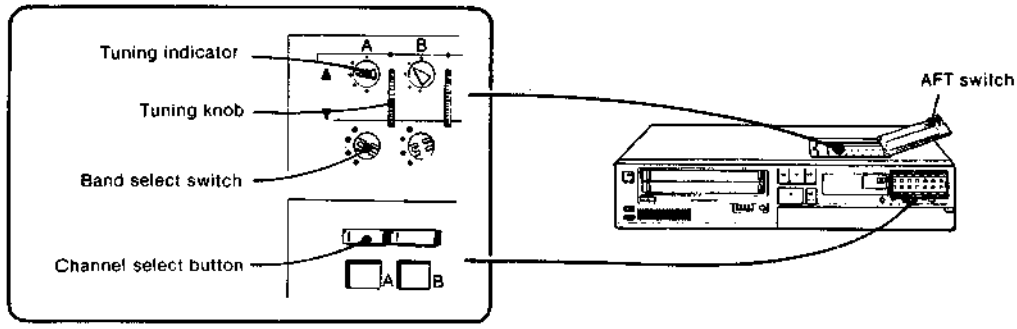
Check!
Check that the program displayed on the screen changes when a different channel select button on the recorder is selected.
If the program does not change, repeat the preceding steps.

Check!
Check that the display on the screen changes when you stop the tape by pressing the ■ button on the recorder. (To eject the cassette, press the ⏏ button.)
If the program does not change, repeat the preceding steps.

Now your TV receiver is tuned to the recorder. Whenever you use the video recorder, you should set the TV to the channel which you have chosen above.

1-8. TO SET UP AND FINE-TUNE THE CHANNELS IN YOUR AREA

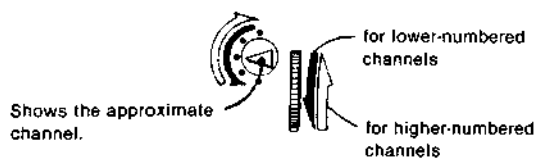
The channel select buttons are pre-adjusted at the factory to VHF channels 2 through 13 and to two UHF channels. These pre-adjusted channels may be set up to receive any available VHF/UHF or CATV channels in your area. To set up and fine-tune channels, open the tuning compartment on the top of the recorder and proceed as follows :



❶ Turn the recorder and the TV receiver on.
❷ Make sure that the TV receiver is set to the correct channel for the video recorder.
❸ Press the PROGRAM SELECT button to turn the VTR lamp on.
❹ Push the recorder channel select button to be preset. The associated channel indicator will light.
❺ Set the band select switch associated with the pushed button to one of these positions : VL, M, VH•S or U. Use a screwdriver if necessary.

To tune in UHF channels 14 through 83 : U
To tune in VHF channels 7 through 13 and CATV super-band channels J through W : VH • S
To tune in CATV mid-band channels A-2, A-1, and A through I : M
To tune in VHF channels 2 through 6 : VL

❻ Tune by turning the corresponding tuning knob, watching the TV screen until the picture of the desired channel is clearly displayed and the sound is clear.



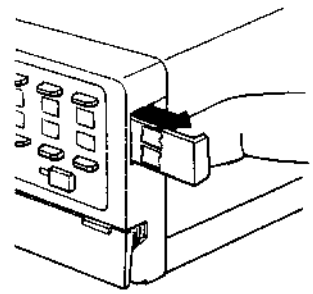
To identify the channels, consult a newspaper, TV program guide or another TV set. If you have any problem on CATV channel presetting, consult the CATV company in your area.

❼ Repeat steps ❹, ❺ and ❻ for the other channel select buttons.
❽ When all stations have been set up as desired, check that the AFT switch is set to ON.

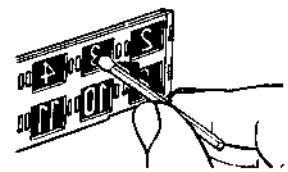
To replace the channel indicating segments

Channel indicating segments are supplied for identification of the preset channels. Insert the segments as follows :

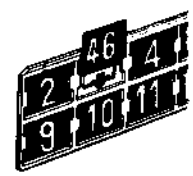
❶ Pull out the channel indication plate.



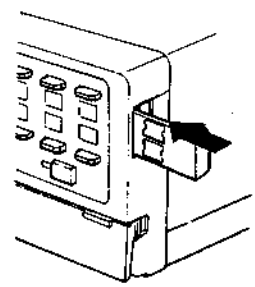
❷ Press the segment out from the rear.



❸ Pick out the appropriate segments for the channels preset and insert them into the plate.



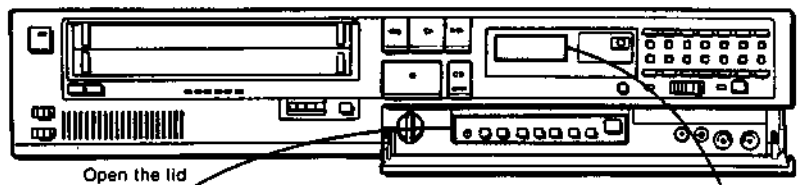
❹ Replace the plate.



1-9. SETTING THE CLOCK

When you connect the ac power cord to a wall outlet, the clock indicates, "12:00 AM(SU)" and blinks to show that it must be set.
To set the clock to **8:35 a.m. Monday**, for example, proceed as follows :

This clock will make a "cuckoo" sound on the hour.



Steps Indications will change consecutively each time you press the buttons.	Time Display
1 Press, and keep depressed, CLOCK button until step 6. CLOCK	The indications will stop blinking.
2 Set the day of the week. DAY	Day indications (SU through SA) will light in sequence.
3 Set the hour digit(s). HOUR	PM 12:00...noon AM 12:00...midnight
4 Set the tens of minutes digit. 10 MIN	
5 Set the minutes digit. MIN	
6 With the time signal release CLOCK button. The moment you release, the clock will start. CLOCK	The correct time will be shown. The upper dot blinks for the first half of each minute, and the lower dot for the second half.

The DAY, HOUR, 10 MIN and MIN 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.

When a power interruption occurs
If a power interruption of more than approximately 5 minutes has occurred, the time indication "12:00 AM(SU)" will blink. Set the clock again.
If the power interruption was about or less than 5 minutes, only the dots will blink and the displayed time will remain correct. Press CLOCK button to stop the blinking.

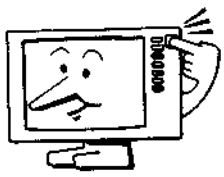
1-10. HOW TO RECORD TV PROGRAMS

Caution

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

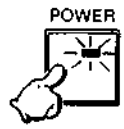
Also, use of this recorder with cable television transmission may require authorization from the cable television transmitter and/or program owner.

1

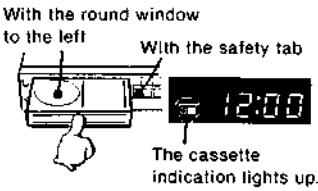


Turn on the TV and select the channel for the video recorder.

2 Turn on POWER switch

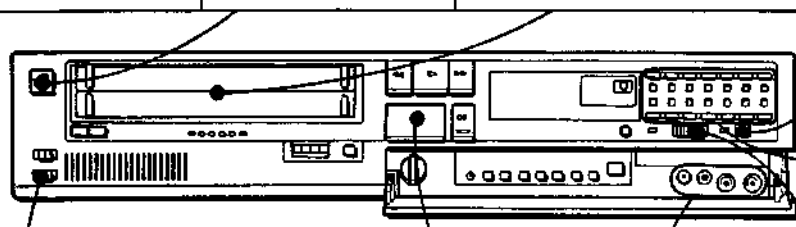


3 Insert a cassette.



4 Press PROGRAM SELECT button

The lamp should light up.



Nothing should be connected to the CAMERA PAUSE, MIC, AUDIO IN and VIDEO IN jacks.

5 Select the channel to be recorded.

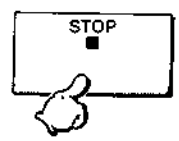
RECORD MODE selector
Set to either ▯II or ▯III

Recording time available in each mode

Cassette used	▯II	▯III
L-125	30 min.	45 min.
L-250	1 hr	1 hr. 30 min.
L-500	2 hr.	3 hr
L-750	3 hr.	4 hr. 30 min.
L-830	3 hr. 20 min.	5 hr.

7

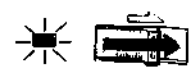
To stop recording, press STOP button.



When the tape reaches its end, it will be rewound to the beginning.

To eject the cassette, press the ▲ button.

6 Slide to the right.



Recording will begin
If a cassette is not inserted or the inserted cassette has its safety tab removed, there will be an announcement, and the inseted cassette will automatically be ejected.

RECORDING ONE TV PROGRAM WHILE VIEWING ANOTHER

You can record a TV program selected on the recorder while viewing another TV program.

❶ Start recording the desired TV program following the above procedures.

❷ Press the PROGRAM SELECT button so that the VTR lamp goes off.

❸ Select the channel you want to view on the TV.

To stop the tape momentarily

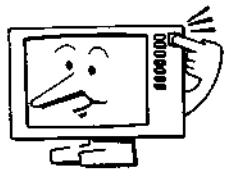
Press the ▮▮ PAUSE button. The lamp on the button will blink. The TV program can be seen on the TV, but the picture will not be recorded.

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 resume.

1-11. HOW TO PLAYBACK A RECORDED TAPE

1 Turn on the TV and select the channel for the video recorder.



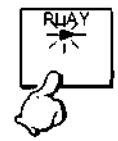
2 Turn on POWER switch

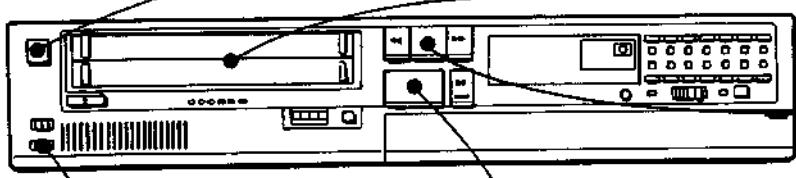
3 Insert a cassette.

With the round window to the left

The cassette indication lights up.

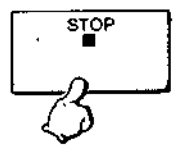
4 Press PLAY button.





During playback, the ▯I , ▯II or ▯III mode is automatically selected depending on which mode the tape to be played back was recorded in.

To stop playing

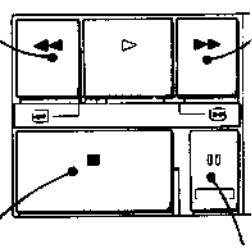


To eject the cassette, press the ⏏ button.

USE OF FUNCTION BUTTONS

◀◀ REW (rewind) button
Press to rewind the tape.
Use also for the backward Betascan operation.

▶▶ FF (fast forward) button
Press to advance the tape rapidly.
Use also for the forward Betascan operation.



■ STOP button
Press to stop the tape.
The tape will be automatically rewound to the beginning when it reaches the end during recording or playback.

II PAUSE button
Press to stop the tape for a moment during playback.
The lamp above the button will light.
A freeze picture will be seen on the TV screen.
To resume playback, press the button again. The pause mode will be automatically released after about 8 minutes, as in the record mode.

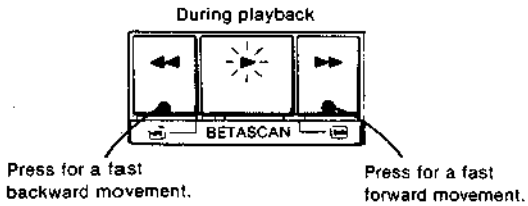
TO KEEP A RECORDED PROGRAM FROM BEING ACCIDENTALLY ERASED

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.

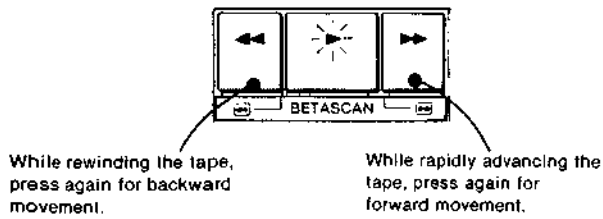
To re-record on a cassette which has had its safety tab removed
Cover the hole with a piece of plastic tape.

BETASCAN .. **Viewing the picture at a fast speed to find a particular scene**

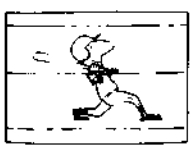


At the desired point, release the button.
The normal playback will resume.

BETA SKIPSCAN .. **Viewing the picture momentarily during rewind or fast-forward**



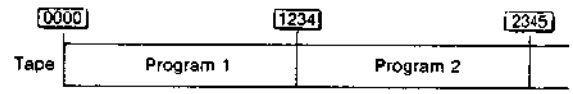
At the desired point, release the button. The normal rewind/fast forward mode will resume.



Streaks will appear and sound will be muted during Betascan or Beta SkipScan operation.

USING THE TAPE COUNTER

Before starting recording or playback, press the RESET button so that the TAPE COUNTER indicates "0000". The counter numbers change as the tape moves.
Write down the counter readings at the desired points on the tape. You can easily find these points later by referring to the TAPE COUNTER.



[0000] Program 1- Soccer game
[1234] Program 2- Tennis game
[2345]

1-12. TIMER-ACTIVATED RECORDING

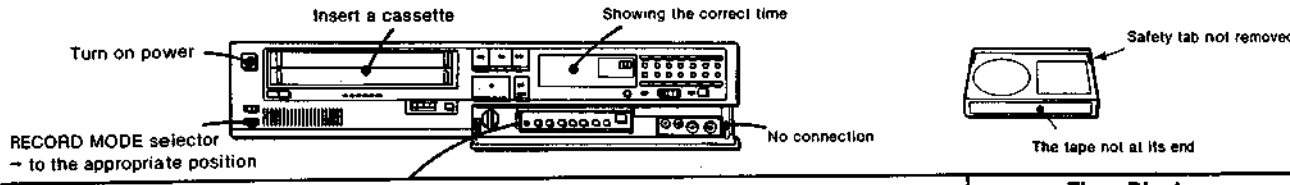
The built-in timer permits automatic recording of up to 4 preselected programs, even when you are not at home. The timer can be set to operate anytime between the day you preset the programs and the 3rd or (if the day of presetting is Saturday) the 2nd Saturday from that day.

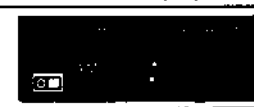
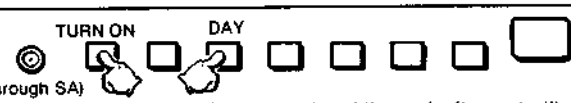
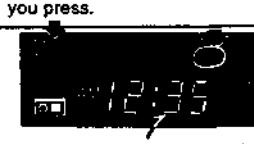
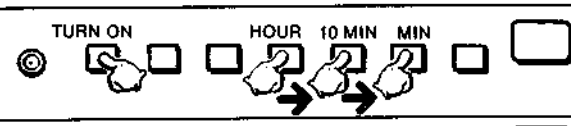
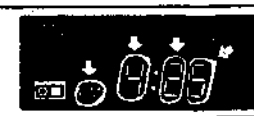
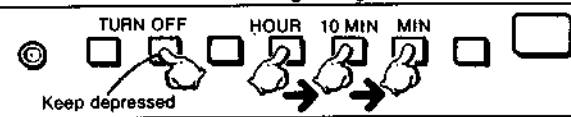
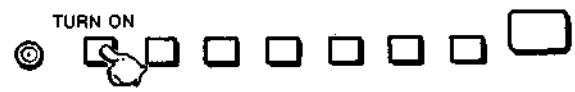
Suppose you want to make a recording on Friday of next week from 4:25 p.m. to 5:30 p.m. in program position B.

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	⑥	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

The day you set the timer

Possible days for recording.



Steps	Time Display
1 Press, and keep depressed, TURN ON button until Step 4. 	
2 Press PROGRAM button to choose a program position (A, B, C or D). 	 Program indication will change in alphabetical order each time you press.
3 Set the turn-on day.  Day indications for this week (SU through SA) will light first, all at once, then in sequence. Day indications for next week and the week after next will follow consecutively with the indications "NEXT WEEK" and "WEEK AFTER NEXT".	 Present time
4 Set the turn-on time 	
5 Set the turn-off time 	
6 Select the channel to be recorded.  While pressing the TURN ON button, press the button of the desired channel.	
7 Press TIMER REC button  With the announcement that the timer is set properly, the "TIMER REC" indication will light up and the present time will be shown again. The power of the VCR will be turned off, but at the preset turn-on and -off time, recording will begin and stop automatically. You will hear an announcement at both the start and the end of the recording. To set timer-recordings on other program positions, release TIMER REC button, turn POWER on, and repeat steps 1 through 7.	 Lights up Present time
 If a cassette was not inserted or the inserted cassette had its safety tab removed, there will be an announcement and the cassette indication will blink. Power will not be turned off as it should and the inserted cassette will be ejected automatically.	

ONCE THE TIMER REC LAMP HAS LIT UP, NO FUNCTION OF THE RECORDER CAN BE ACTIVATED, except the confirmation announcements. To turn on the power again for the usual manual operations, release TIMER REC button. This does "not" affect the memory of the timer. As long as you press it again, timer recording will be made exactly as preset.

When the timer-activated recording is finished

1. Press TIMER REC button to release it.
2. Press POWER button and rewind the tape by pressing the REW button.
3. Press EJECT button and take out the cassette.

The memorized turn-on and -off time of each program in the timer will be erased one by one after each recording. Only, if you have set the timer to record everyday, memory will not be erased unless you preset a new program on the same program position.

To check the timer setting

Using the CONFIRMATION button

Press the CONFIRMATION button. Each time you press, the turn-on and -off time of your settings will be announced. Your timer setting with the earlier turn-on time will be announced first.

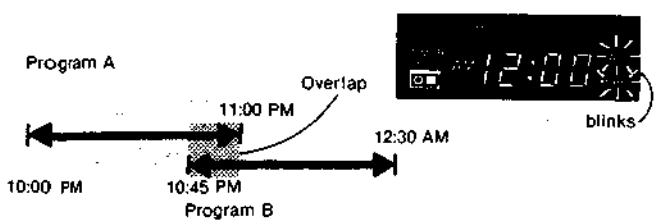
You can adjust the volume of the announcements.
OFF : for cutting off the voice
SOFT : for a low voice
LOUD : for a louder voice

Checking the timer without the announcement

1. Release TIMER REC button and turn on POWER.
2. While pressing the TURN ON button, consecutively press PROGRAM button until the alphabetical indication of the program you'd like to check is lit. The time shown then is the turn-on time of that program.
3. Press TURN OFF button. The turn off time will be shown.
4. Repeat steps 1 and 2 for checking the timer settings of other programs.

When the presettings of your timer-activated recordings overlap

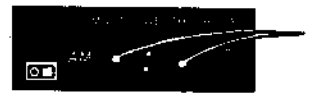
There will be an announcement to inform you of the overlap.
The program indications of the overlapping programs and the error indication "ERR" will blink. Check the settings and erase one of them.



Even if there is an overlap, recording will be made. In this case, the first recording will be made until the recording of the following program begins. This means that the recording preset for the earlier time will be cut off in the middle.

To erase the setting of a program

1. Release TIMER REC button.
2. Turn power on.
3. While pressing the TURN ON button, press PROGRAM button consecutively until the program indication and the turn-on time of whichever program you would like to erase is displayed.
4. Without releasing the TURN ON button, press TURN OFF button. The timer setting will be erased.



More about timer recording

To make a recording everyday at the same time

Set the turn-on day so that day indications (SU through SA) are lit all at once.

If you wish to skip a day's recording, release TIMER REC button for just that day. Press it again and recordings for the following days will be made.

To record to the end of the tape

There are two ways.

—Set the timer so that the turn-on and -off time coincide.

—Erase any previous timer setting made, and set only the turn-on time.
When the CONFIRMATION button is pressed, only the turn-on time will be announced.

At the end of the tape the power of the recorder will be turned off. In timer-activated recordings, tape will not be rewound automatically.

When a power interruption occurs before or during timer recording

If a power interruption of more than approximately 5 minutes has occurred,

the time indication "12:00 AM(SU)" will blink. This means that the memory of the timer has been completely erased.
Set the clock and the timer again. In this case, the recording which had been in process will not resume.

If, after a power interruption, the clock still shows the correct time with the two dots blinking,

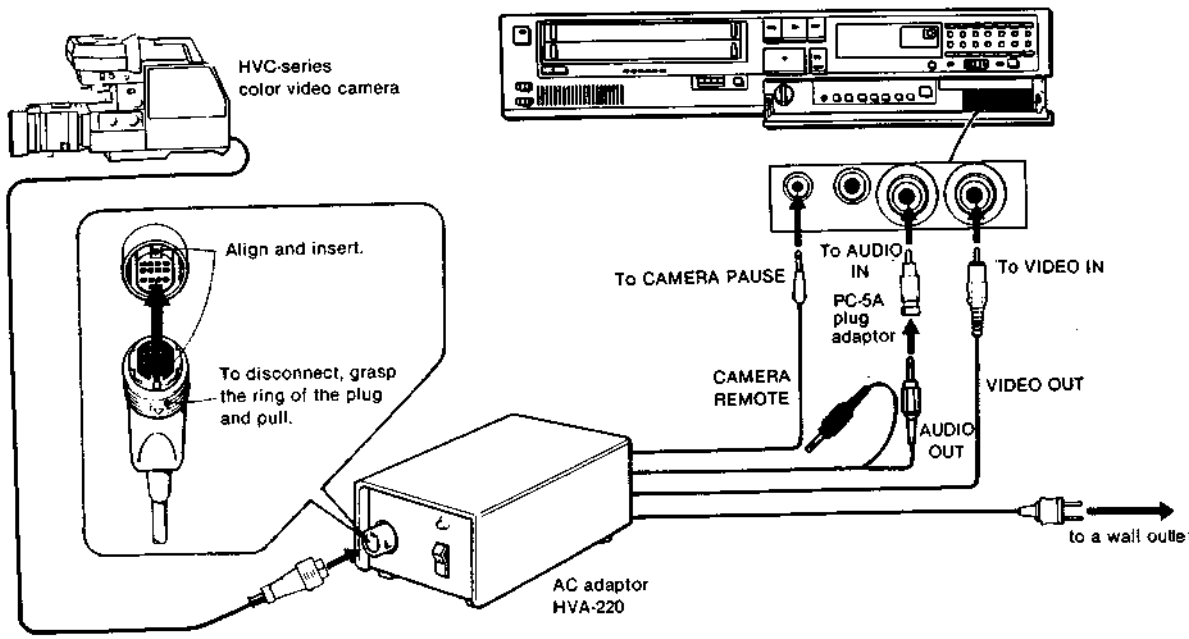
the interruption was less than or nearly 5 minutes. In this case, the memory of the timer is retained and recording will be made. All you have to do is to press the CLOCK button to stop the blinking. The recording which had been in process before the interruption will resume.

1-13. CAMERA RECORDING

... For producing your own programs

CONNECTIONS

- The camera must conform to American TV (EIA) standards.
- The use of a Sony HVA-220 ac adaptor is required.



To record the sound from a microphone

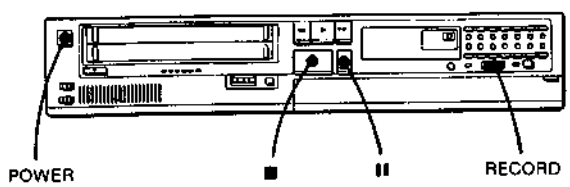
Plug a microphone into the MIC jack. If the microphone has a phone type plug, use a Sony PC-1A plug adaptor.

- When both the MIC and AUDIO IN jacks are connected, the sound from the microphone will be recorded.

To record the sound from other audio sources

Connect an audio source, such as a tape recorder, into the AUDIO IN jack.

OPERATION



❶ Press the POWER switch to turn on the recorder and insert a cassette.
❷ Turn on the power switch on the ac adaptor.
❸ Make the necessary adjustments on the camera. See the instruction manual furnished with the camera.
❹ Slide the RECORD switch to the right. Recording will begin.

- If a camera with a tape run/stop button is used, you can momentarily stop recording and restart it using that button.
- If any other camera is used, use the II button on the recorder or the PAUSE button on the remote control unit to stop the recording momentarily and restart it.

To stop recording, press the ■ button.

To view the picture being recorded on the TV screen

❶ Turn the connected TV on.
❷ Select the channel for the video recorder on the TV.
❸ Press the PROGRAM SELECT button so that the VTR lamp lights up.

The picture being recorded will appear on the TV screen.

- If acoustic feedback (a whistle-like sound) is heard when the microphone sound is recorded, turn the microphone (or the camera, if the microphone is built into the camera) away from the TV or turn down the TV volume.

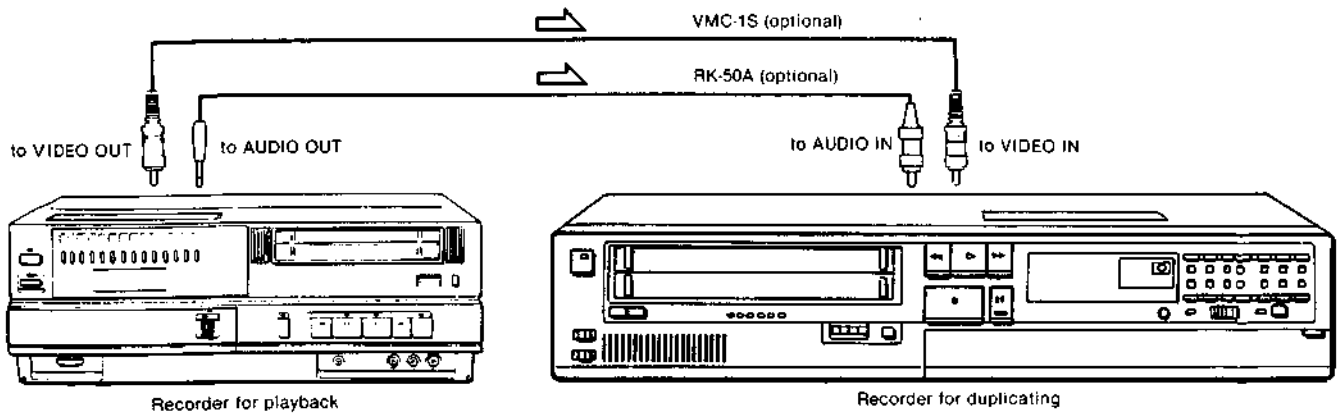
1-14. CLOSED CAPTION RECORDING AND PLAYBACK

This video cassette recorder has the capability of recording and playing back closed caption television programs for the hearing-impaired, when connected to a decoder unit or TV receiver designed to receive closed caption signals.
For playback, the CAPTIONS/PCM switch located at the rear of the recorder must be set to the left position.
Connection between the recorder and the decoder unit will depend on the unit you purchase. See the instruction manual supplied with the decoder.

1-15. TAPE COPY

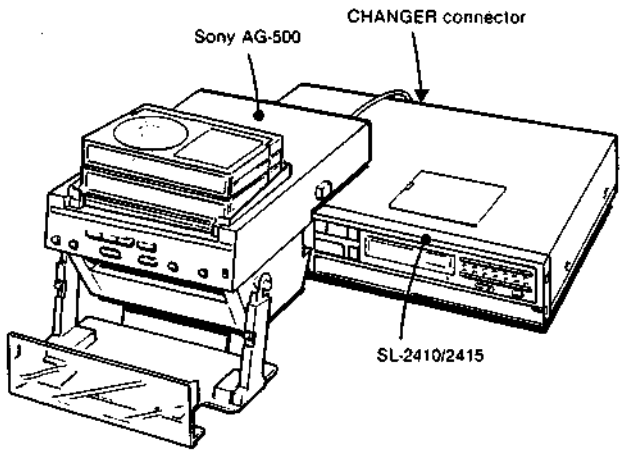
CAUTION
Television programs, films, video tapes and other materials may be copyrighted. Unauthorized duplication of such material may be contrary to the provisions of the copyright laws.

To duplicate a tape you will need two video recorders ; one is to play back the original tape and the other is to duplicate.



1-16. AUTOMATIC CASSETTE CHANGE

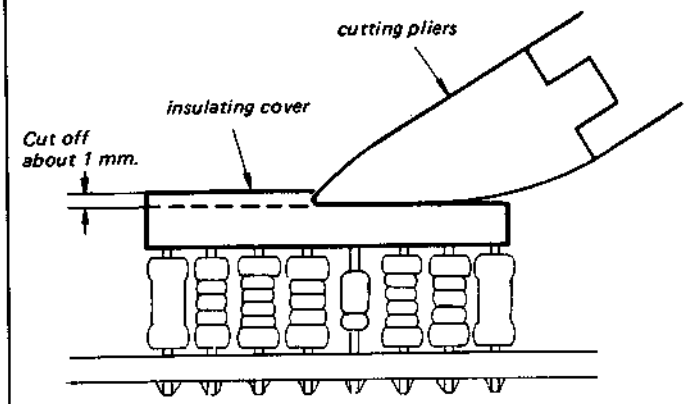
By using the optional Sony AG-500 cassette auto changer, up to four cassettes can be recorded, played back or rewound automatically.
Using the timer built into the recorder, you can record a long program on four consecutive cassettes or four different programs on four separate cassettes, all without your being there.



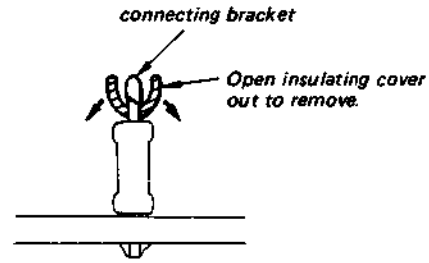
1-17. PCM RECORDING AND PLAYBACK

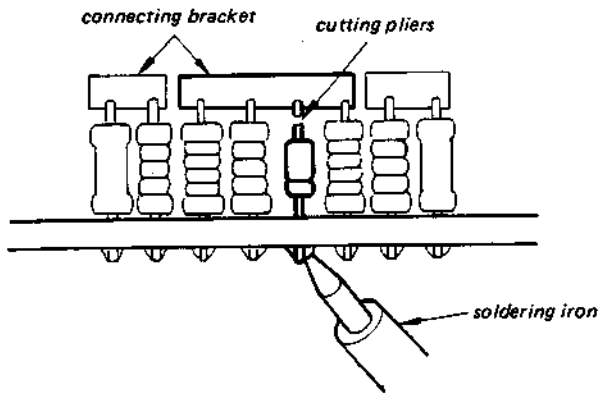
By connecting a PCM digital audio processor (Sony PCM-F1, etc.) you can enjoy hi-fi sound reproduction with a wide dynamic range, minimal distortion and a flat frequency response.
For playback, the CAPTIONS/PCM switch at the rear of the recorder must be set to the left position.
Connection between the recorder and the PCM digital audio processor will depend on the unit used. Follow the instruction manual of the digital audio processor.

REPAIR METHOD FOR HYBRID CIRCUIT BLOCK

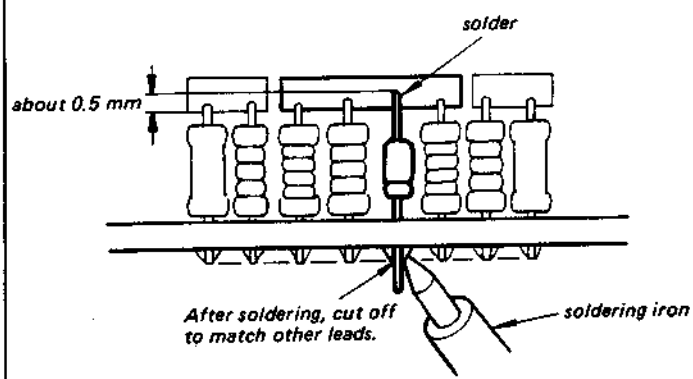


Using a cutting pliers, cut off the upper portion of the insulating cover about 1 mm, exposing the top of the connecting brackets.

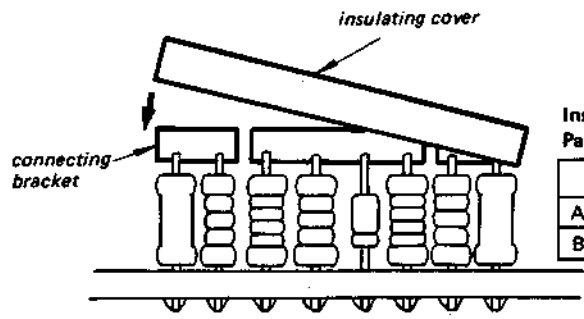




Cut off the lead of the defective part with cutting pliers. Remove solder and take out the defective part.



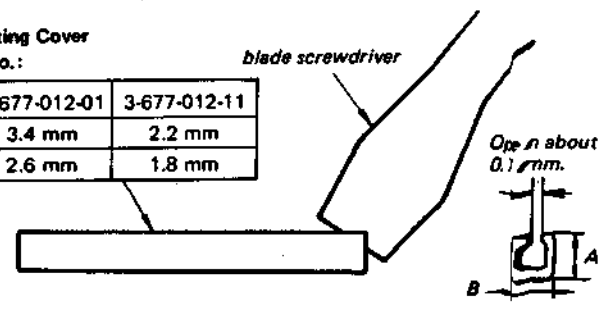
Insert the new part on the board and solder the lead to the board. Cut off the lead on the connecting bracket side so that it overlaps by about 0.5 mm, and solder to the connecting bracket.



Open the insulating cover groove about 0.7 mm and place over the connecting brackets, positioning one end first.

Insulating Cover Part No.:

	3-677-012-01	3-677-012-11
A	3.4 mm	2.2 mm
B	2.6 mm	1.8 mm



Handling Precautions for MOS ICs

Generally, the insulation resistance of the oxide layer in MOS IC structures is very high, and the oxide layer is very thin. Because of this, it is possible that the static voltages usually present on clothes and the human body will be enough to generate a potential difference across the insulator, high enough to cause a breakdown of the insulating layer.

The following precautions should be taken while handling these ICs.

(Particular care should be taken under conditions of low humidity.)

Precautions in Replacing MOS ICs

1. Store new ICs by inserting them into a urethane-polyester cushion (which is somewhat conductive), or wrapping it in aluminum foil, so that all the pins are at the same potential.
   (The ICs should be stored in that manner until mounted on the circuit board.)

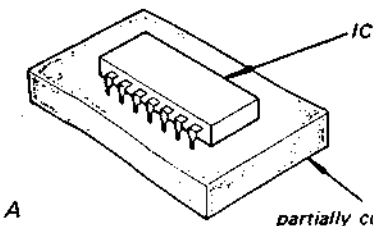


Fig. A

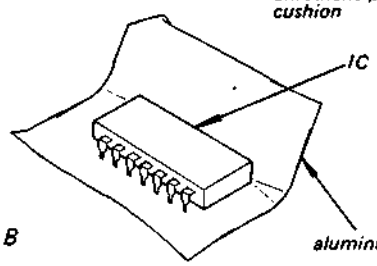


Fig. B

2. Check the soldering iron for possible power-line leakage current. Make sure that there is no leakage path by connecting an ohmmeter to the tip of the soldering iron and the plug as shown in Fig. C. If there is a leakage path, use some other soldering iron.

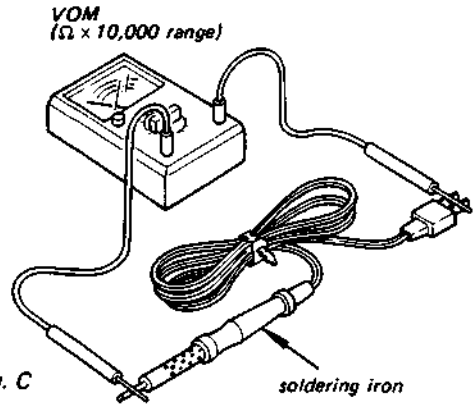


Fig. C

3. Equalize any potential difference between the clothes, the tools in use, the work bench, the set being worked on, and the packaged IC by touching them all in succession with the hands or a conductive wire or tool.
4. The following are effective methods for handling ICs that remove the potential difference across the oxide layer.
   - Use a paper clip modified by soldering in a wire braid insert.

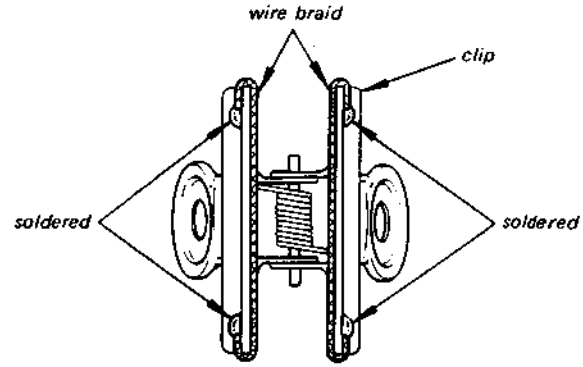


Fig. D Make sure that there is no solder on the inside.

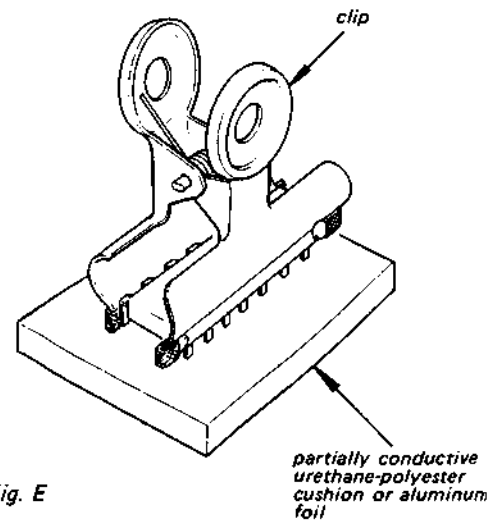


Fig. E

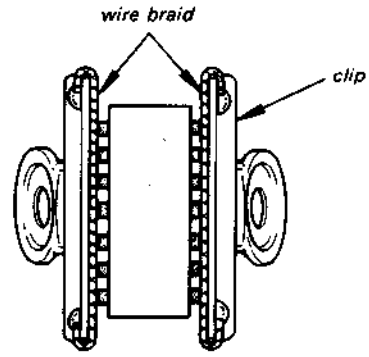


Fig. F Make sure that all the pins are in contact with the wire braid (all the pins will then be at the same potential.).

- Take a short length of fine bare wire and wind it around the IC so that it shorts all the pins of the IC, while it is still in the urethane-polyester cushion or aluminum foil. This ensures that all the pins are at the same potential.

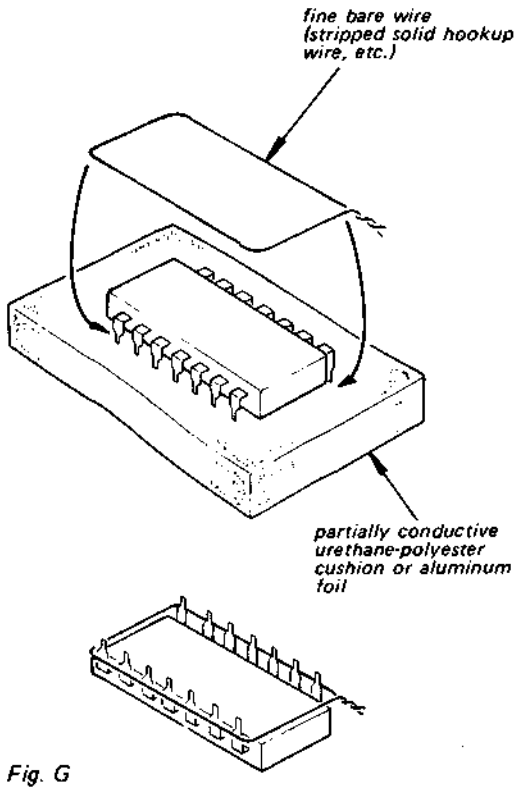


Fig. G

- When it is necessary to handle the IC with the fingers, do not touch any pin, and hold the IC at the ends of its plastic-package case as shown in Fig. H.

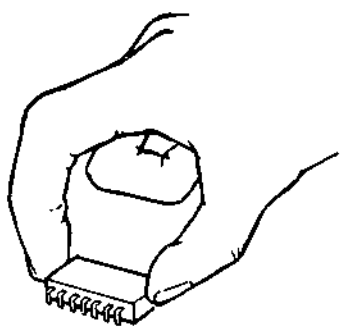


Fig. H

5. Method of Mounting
Insert the IC while holding it with the modified clip, and solder all the pins with the clip still shorting the pins. (Similarly, solder all the pins while the bare shorting wire is still wound around them.). Remove the clip or the bare shorting wire only after all the pins have been soldered.

Precaution while Checking C-MOS ICs

The C-MOS ICs (Complementary MOS) are MOS ICs that have their output sections made up of N-channel and P-channel push-pull stages to increase their speed of operation. If the output terminal of these ICs comes into contact with B+ or B– voltage, then the FET which is ON at that time will either become shorted or open.

This is valid for all the output sections that are connected together by the interconnections. Even the circuits that are physically separated (and not on the same board) can be destroyed simultaneously.

Example:

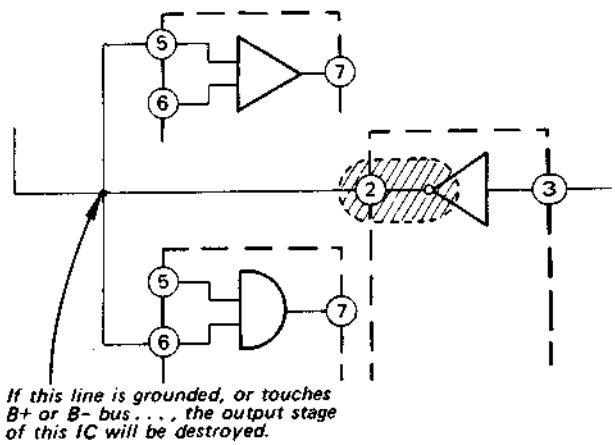


Fig. I

SECTION 2
DISASSEMBLY AND REPLACEMENT

2-1. CABINET ASSEMBLY REMOVAL

❶. Remove the four case set screws.

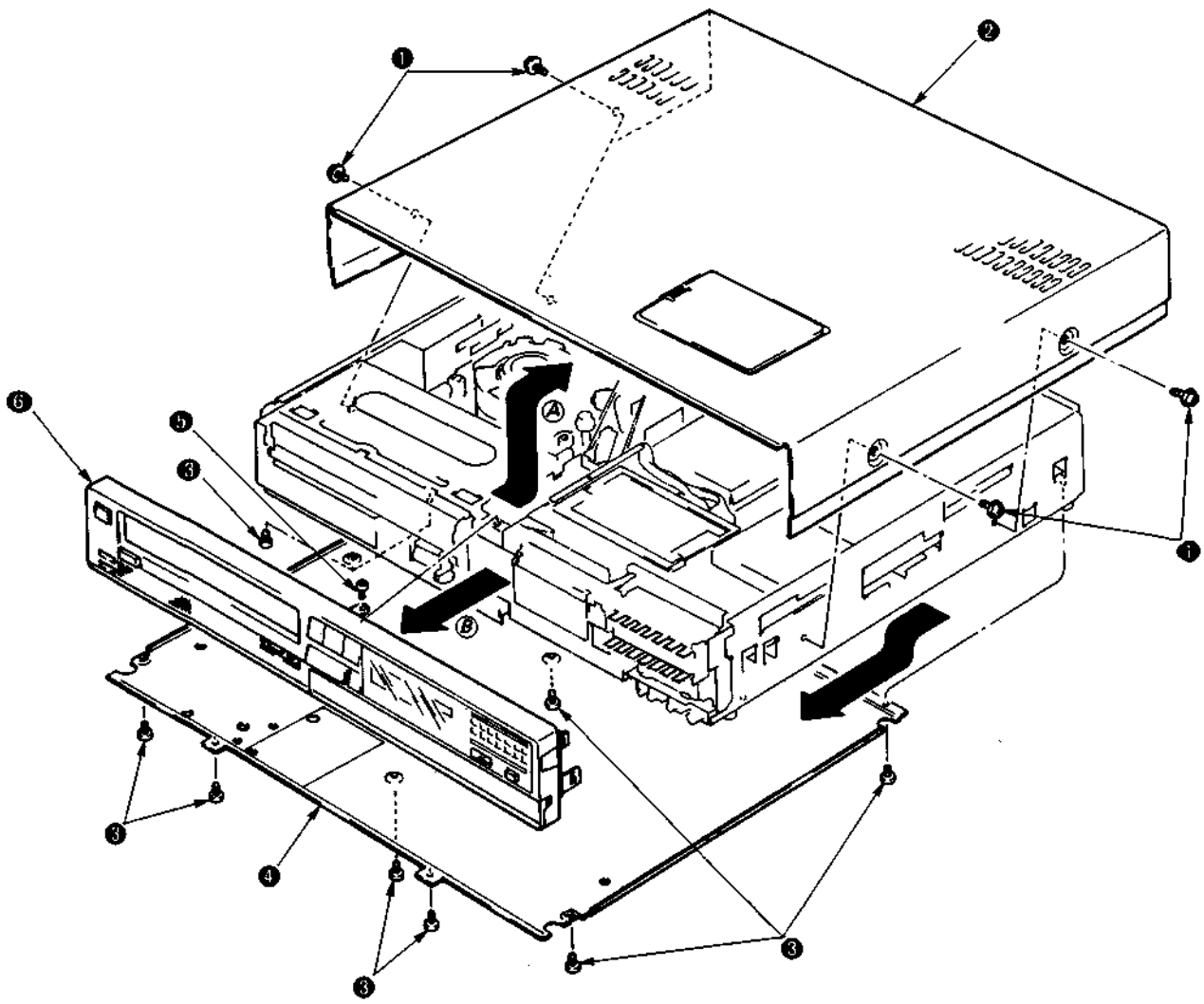
❷. Remove the upper case in the direction of the arrow Ⓐ .

❸. Remove the ten screws (BVTT2.6 x 8).

❹. Remove the plate bottom.

❺. Remove the screw (BVTT2.6 x 8).

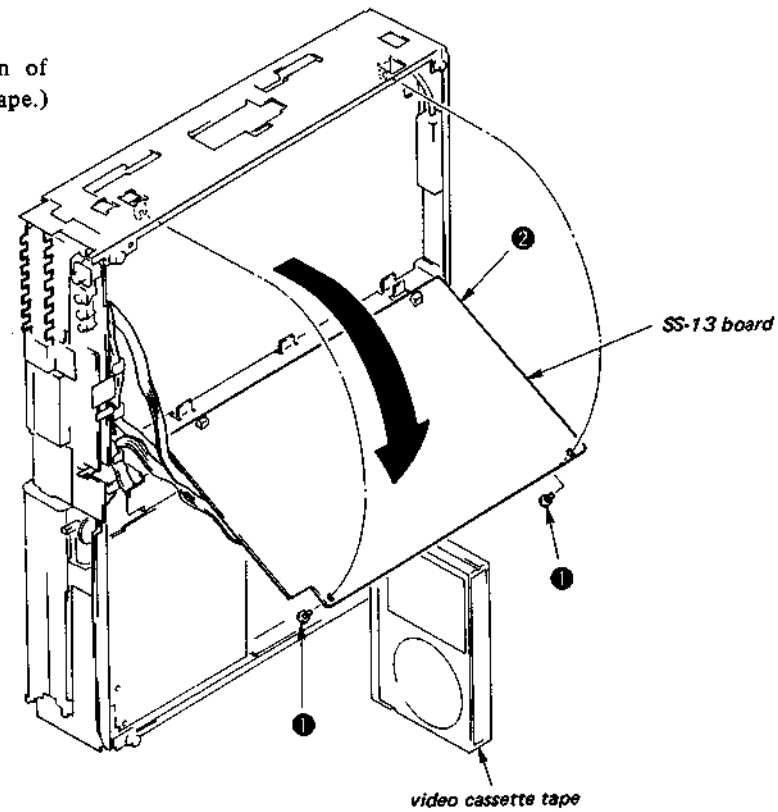
❻. Remove the front panel ass'y in the direction of the arrow Ⓑ .



2-2. SS-13 BOARD REMOVAL

❶. Remove the two screws (BVTT2.6 x 6).

❷. Remove the SS-13 board in the direction of the arrow. (Supported using a video cassette tape.)

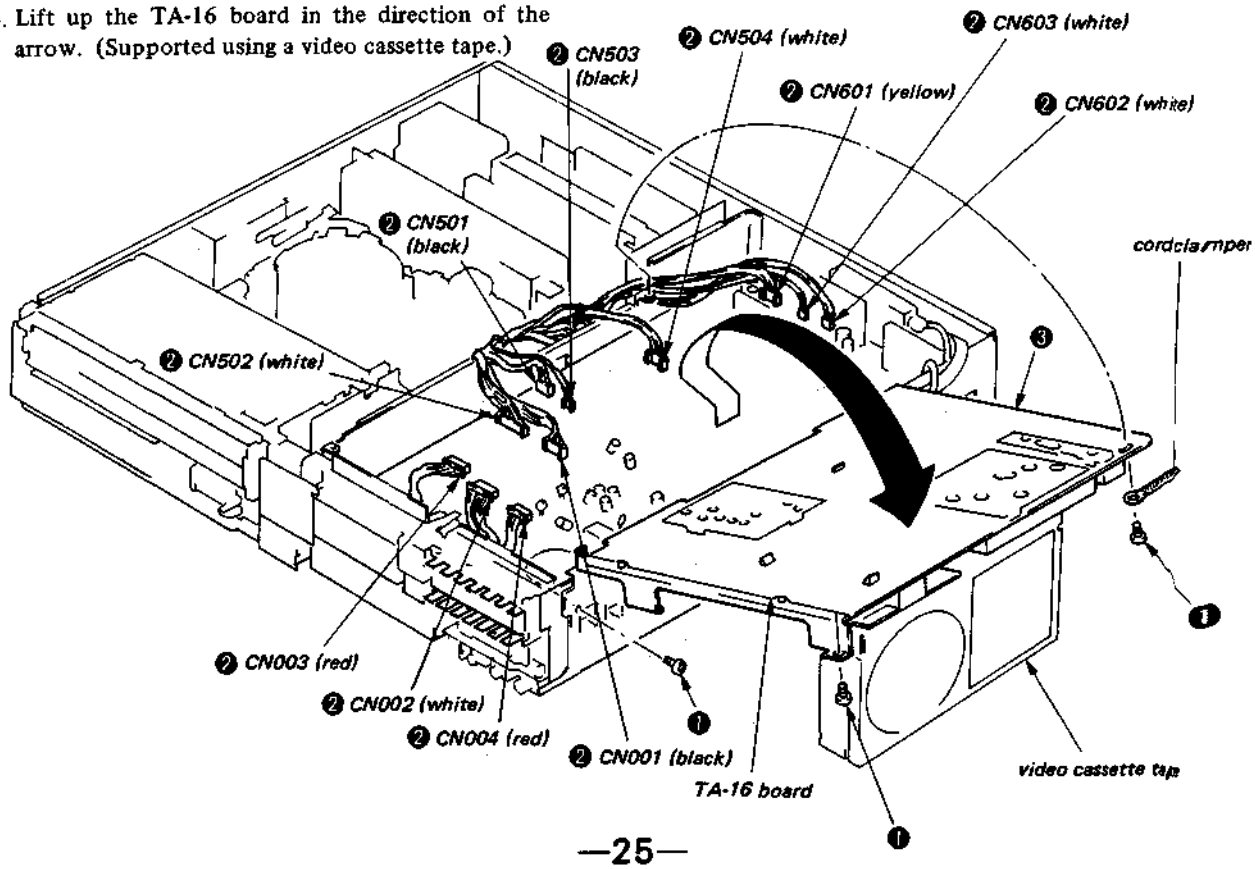


2-3. TA-16 BOARD REMOVAL

❶. Remove the three screws (BVTT2.6 x 6).

❷. Pull out the eleven connectors.

❸. Lift up the TA-16 board in the direction of the arrow. (Supported using a video cassette tape.)

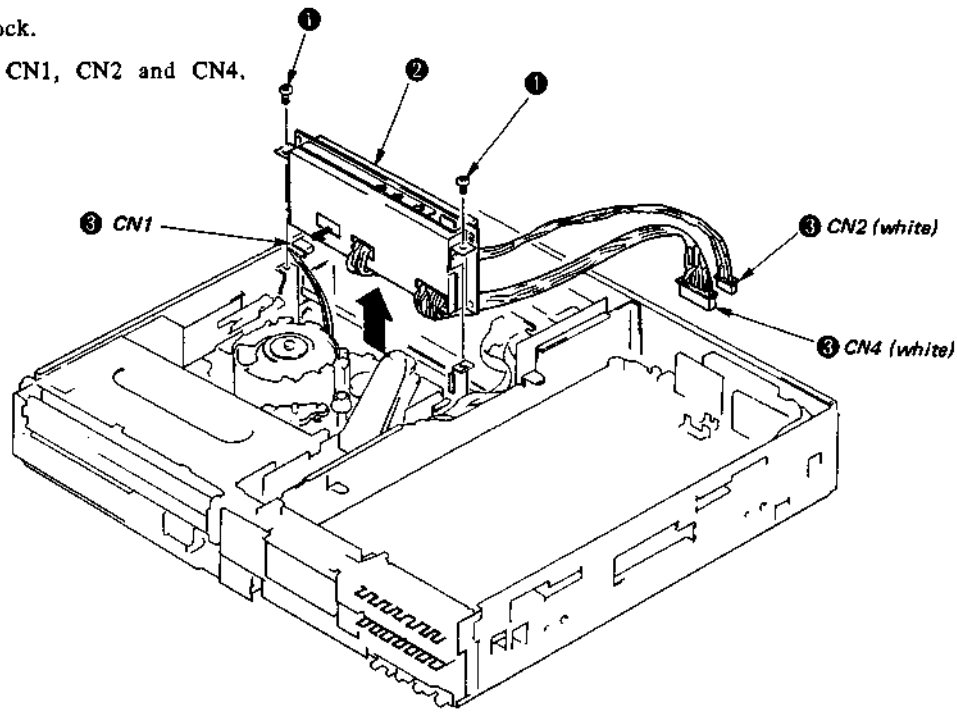


2-4. RP-8 BOARD REMOVAL

❶. Remove the two screws. (BVTT2.6 x 6)

❷. Remove the RP-8 board block.

❸. Pull out the connectors. CN1, CN2 and CN4.



2-5. POWER BLOCK REMOVAL

❶. Remove the screw. (BVTT2.6 x 6)

❷. Remove the CI-5 board.

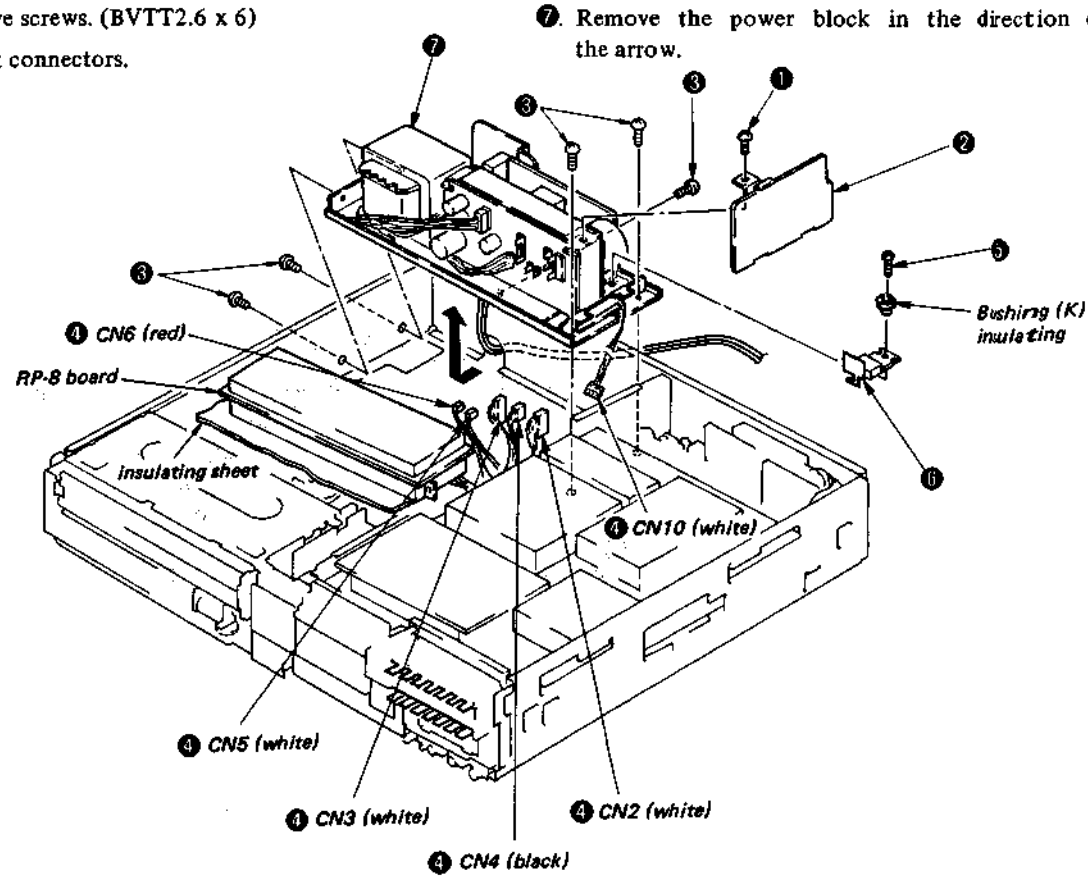
❸. Remove the five screws. (BVTT2.6 x 6)

❹. Pull out the six connectors.

❺. Remove the screws. (BVTT2.6 x 8)

❻. Remove the PS-29 board.

❼. Remove the power block in the direction of the arrow.



2-6. TIMER BLOCK REMOVAL

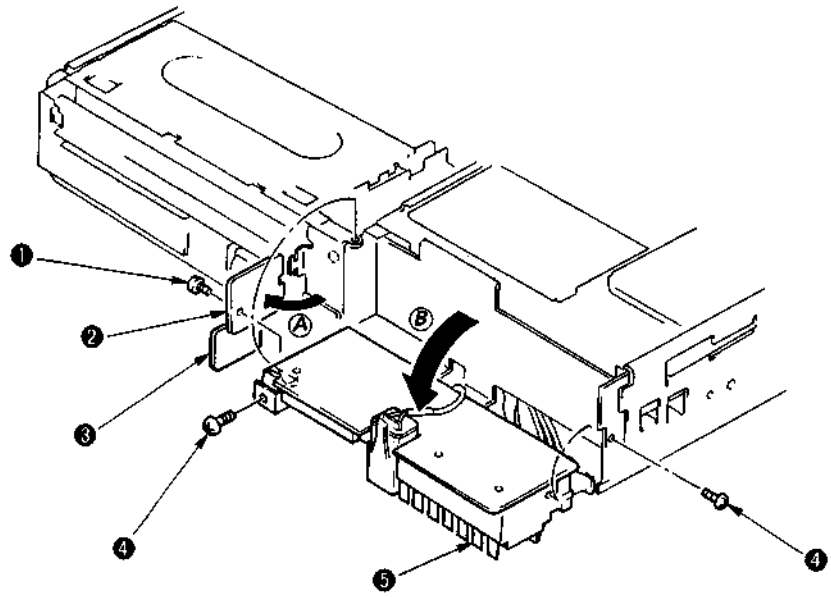
❶. Remove the screw (PTP2.6 x 8).

❷. Remove the FS-19 board in the direction of the arrow Ⓐ .

❸. Remove the FS-29 board.

❹. Remove the two screws (BVTT2.6 x 6).

❺. Remove the TIMER BLOCK in the direction of the arrow Ⓑ .



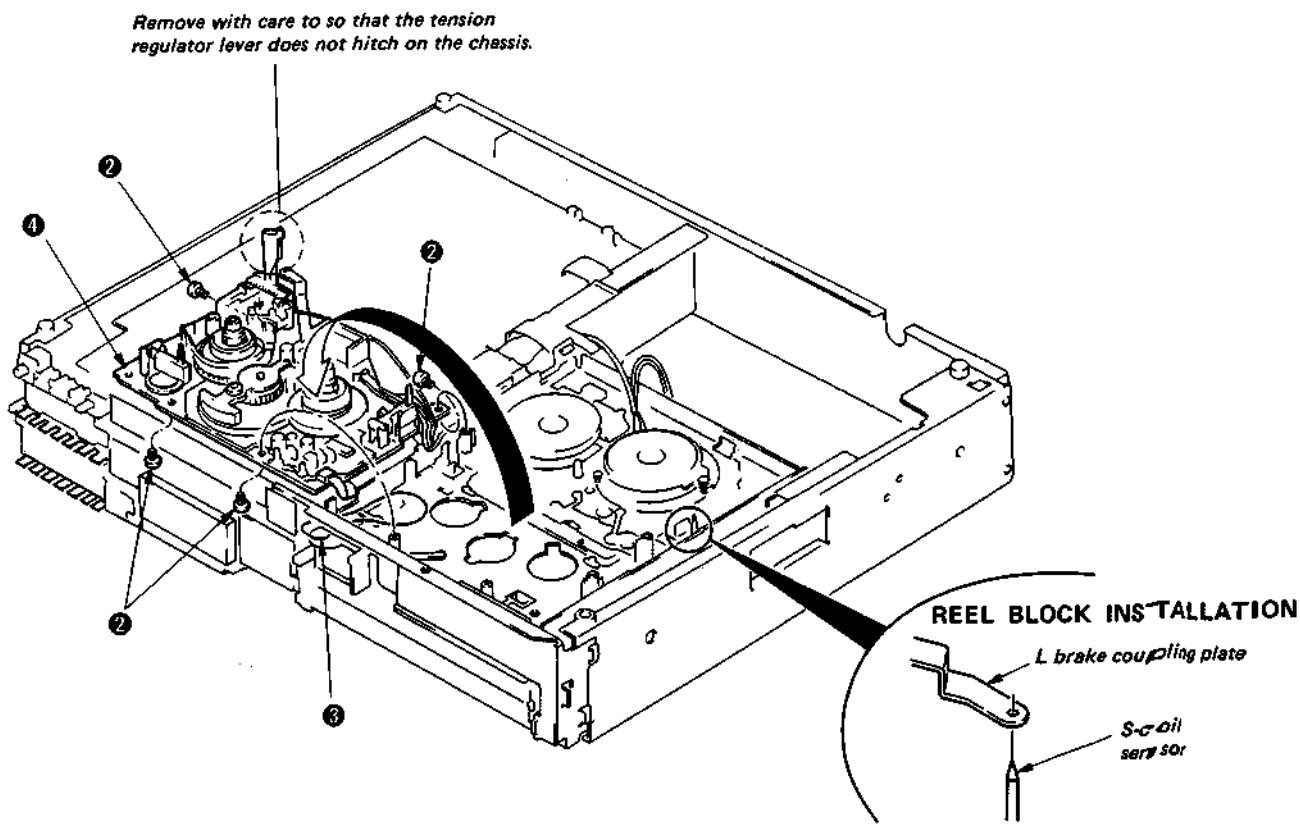
2-7. REEL BLOCK REMOVAL

❶. Turn the upper panel upside down.

❷. Remove the four screws (TA, B2.6 x 8).

❸. Remove the counter belt.

❹. Remove the reel ass'y



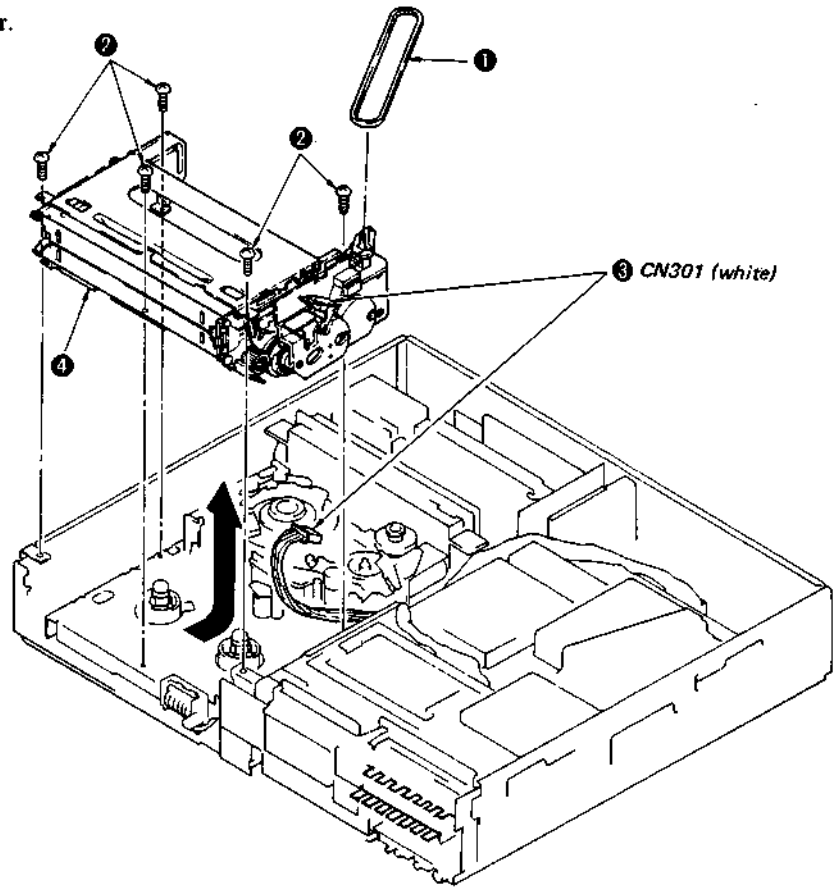
2-8. FL CASSETTE COMPARTMENT ASSY REMOVAL

❶. Remove the synchro belt.

❷. Remove the five screws (BVTT2.6 x 6)

❸. Pull out the connector.

❹. Remove the FL cassette compartment ass'y in the direction of the arrow.



2-9. LOADING AND THREADING MOTORS REMOVAL

❶. Remove the synchro belt.

❷. Remove the screw (PSW2.6 x 5).

❸. Remove the screw (PSW, small 2.6).

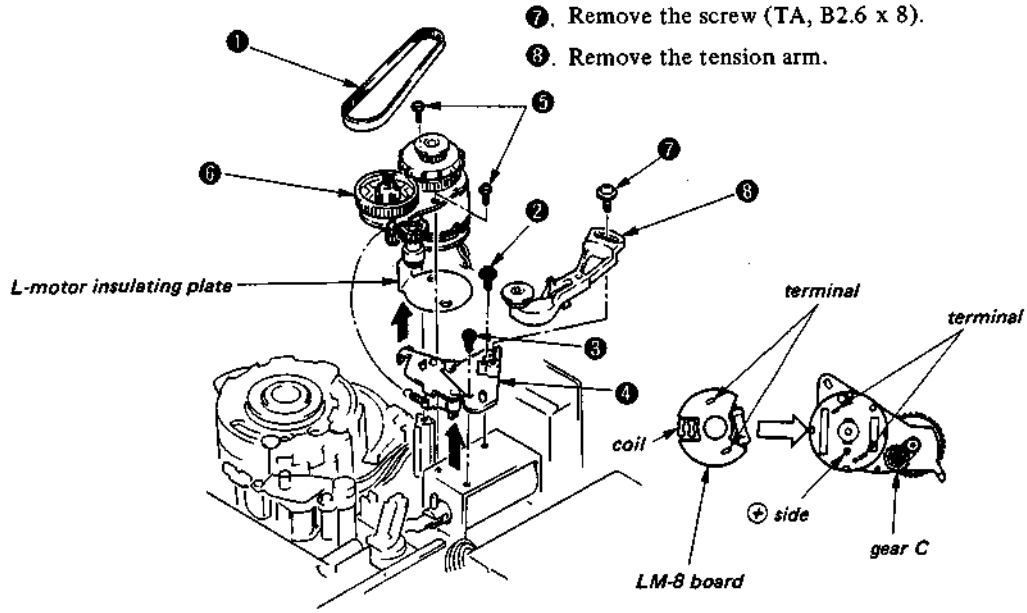
❹. Remove the stopper arm block.

❺. Remove the two screws (PTPWH2).

❻. Remove the loading motor block.

❼. Remove the screw (TA, B2.6 x 8).

❽. Remove the tension arm.

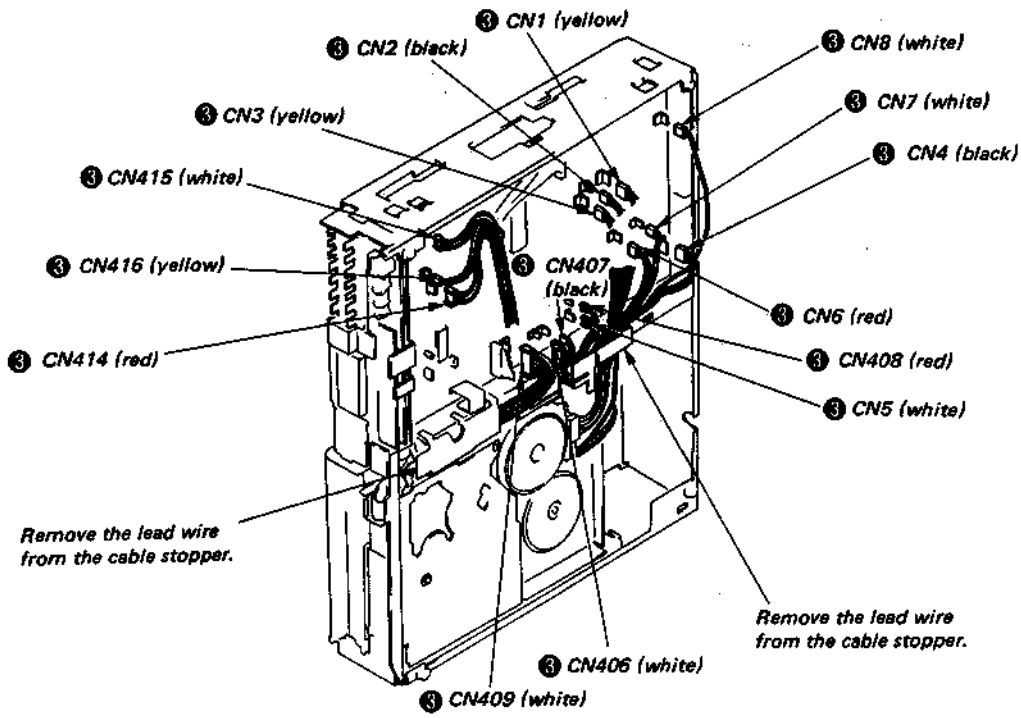


2-10. MECHANICAL CHASSIS BLOCK REMOVAL (1)

❶. Place the main unit with a left side panel on the bottom.

❷. Disconnect the connector from SS-13 board.

❸. Remove the connector and then remove the lead wires from the cable stopper or harness stopper.



2-11. MECHANICAL CHASSIS BLOCK REMOVAL (2)

❶. Remove the screw (BVTT2.6 x 6).

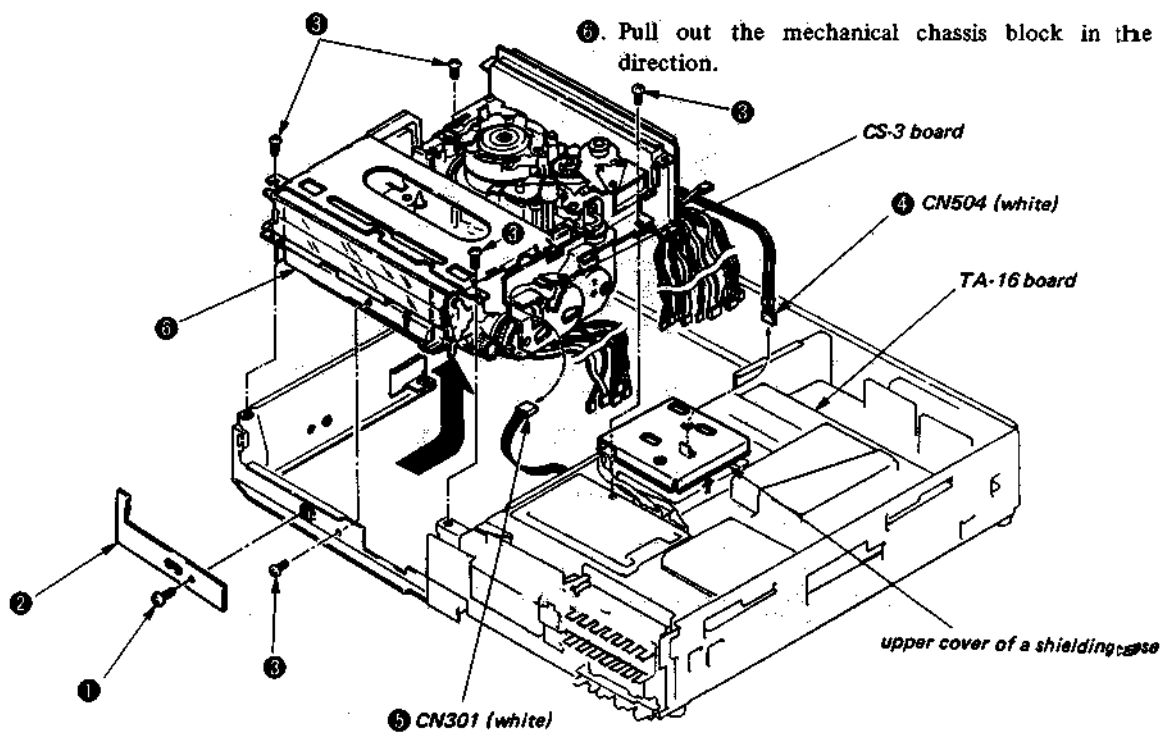
❷. Remove the FS-28 board.

❸. Remove the five screws (BVTT2.6 x 6).

❹. Remove the upper cover of a shielding case on the TA-16 board and pull out the connector CN504.

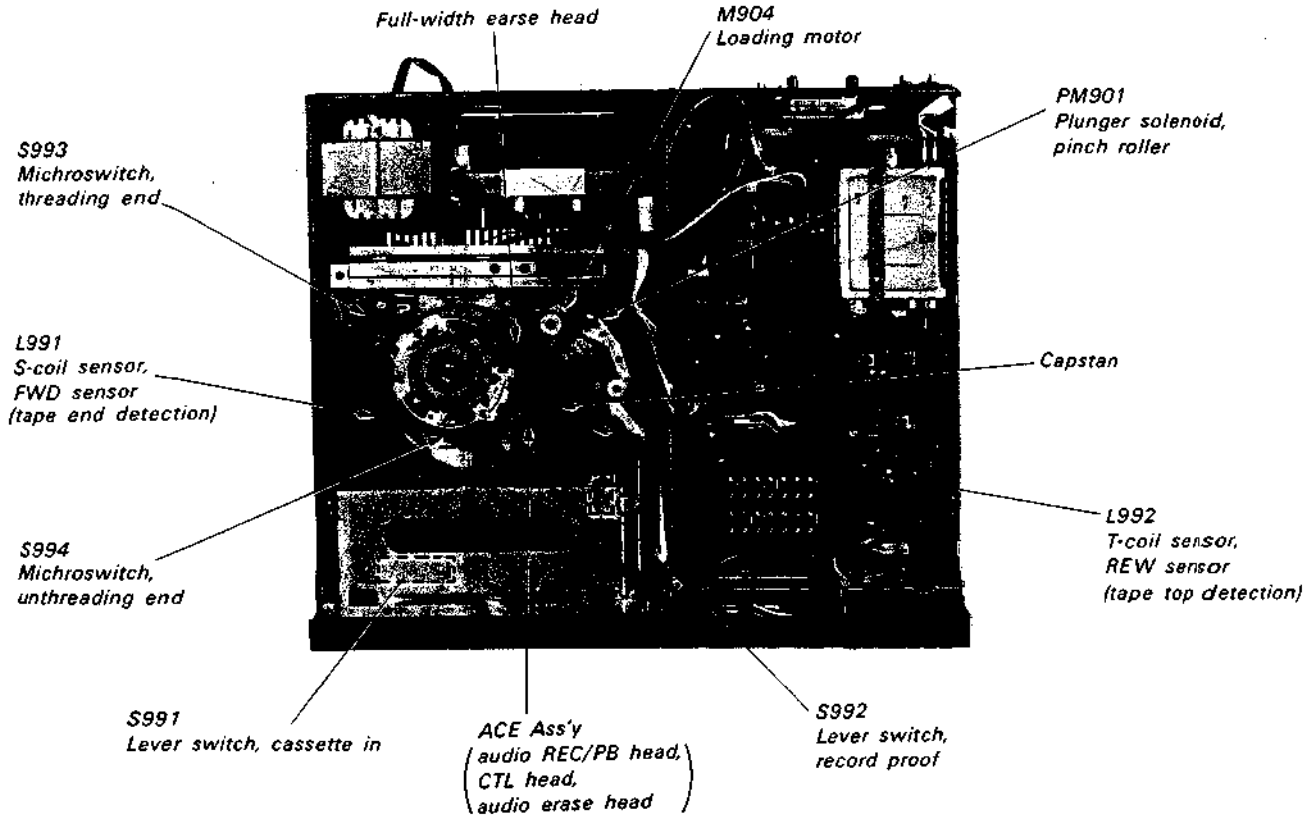
❺. Disconnect the connector CN301 from CS-3 board.

❻. Pull out the mechanical chassis block in the direction.

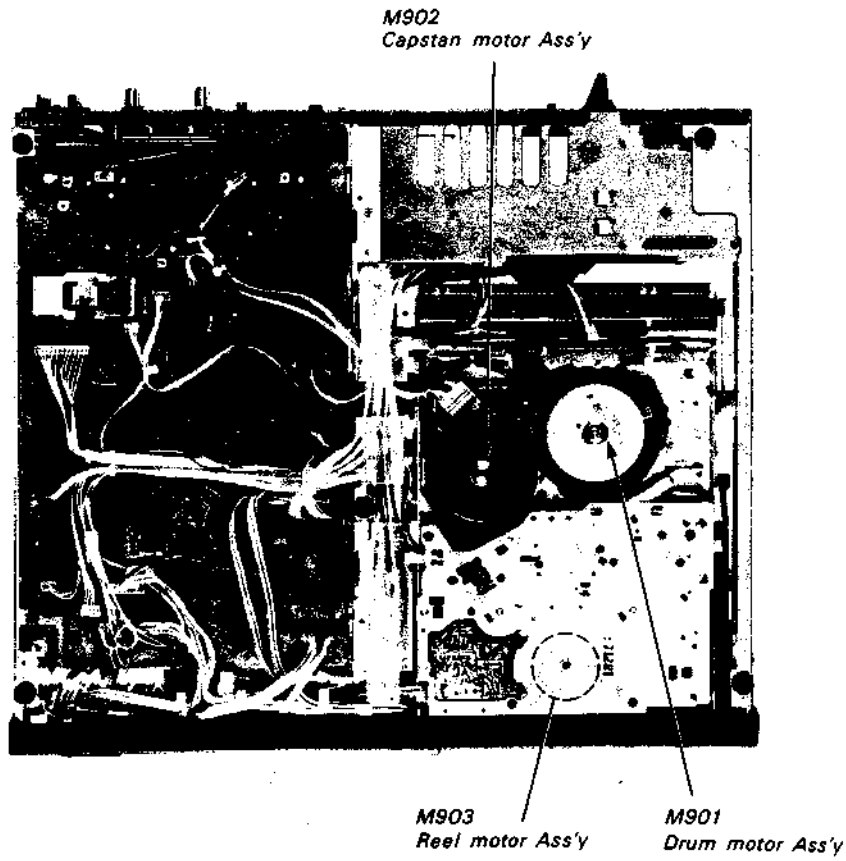


2-12. INTERNAL VIEWS

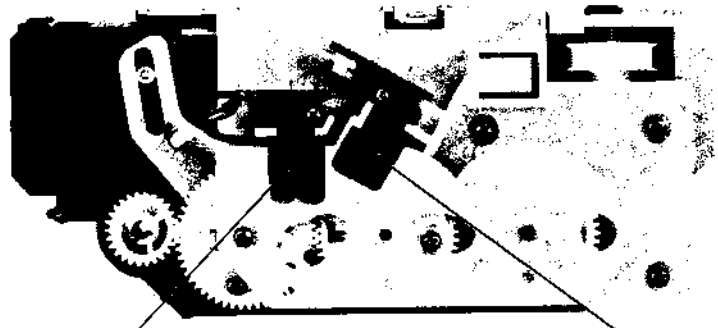
—Top side—



—Bottom side—



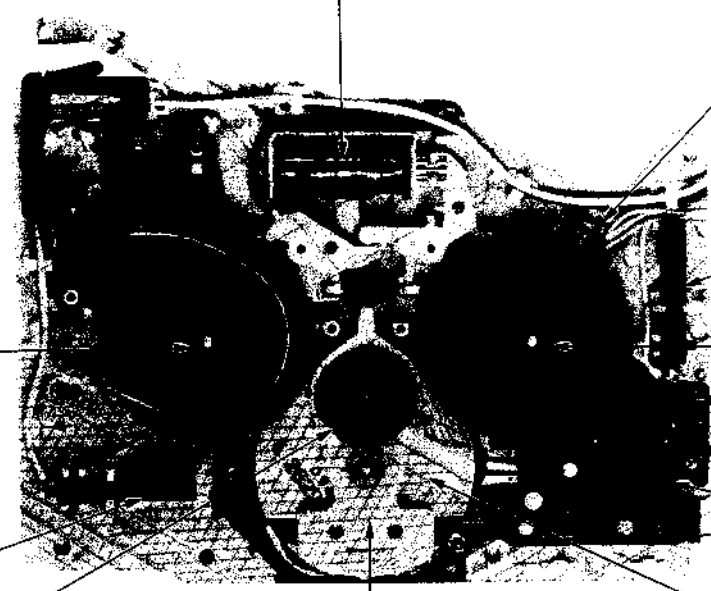
—FL (Front Loading) cassette compartment Ass'y—



S302
Lever switch, cassette ON

S301
Lever switch, cassette OFF

—Reel driving block—



PM902
plunger solenoid, brake

RD-5 board
(Take-up reel rotating detection)

S992
Lever switch,
record proof

Table, Supply reel

Table, take-up reel

Reel motor board

S991
Lever switch,
cassette in

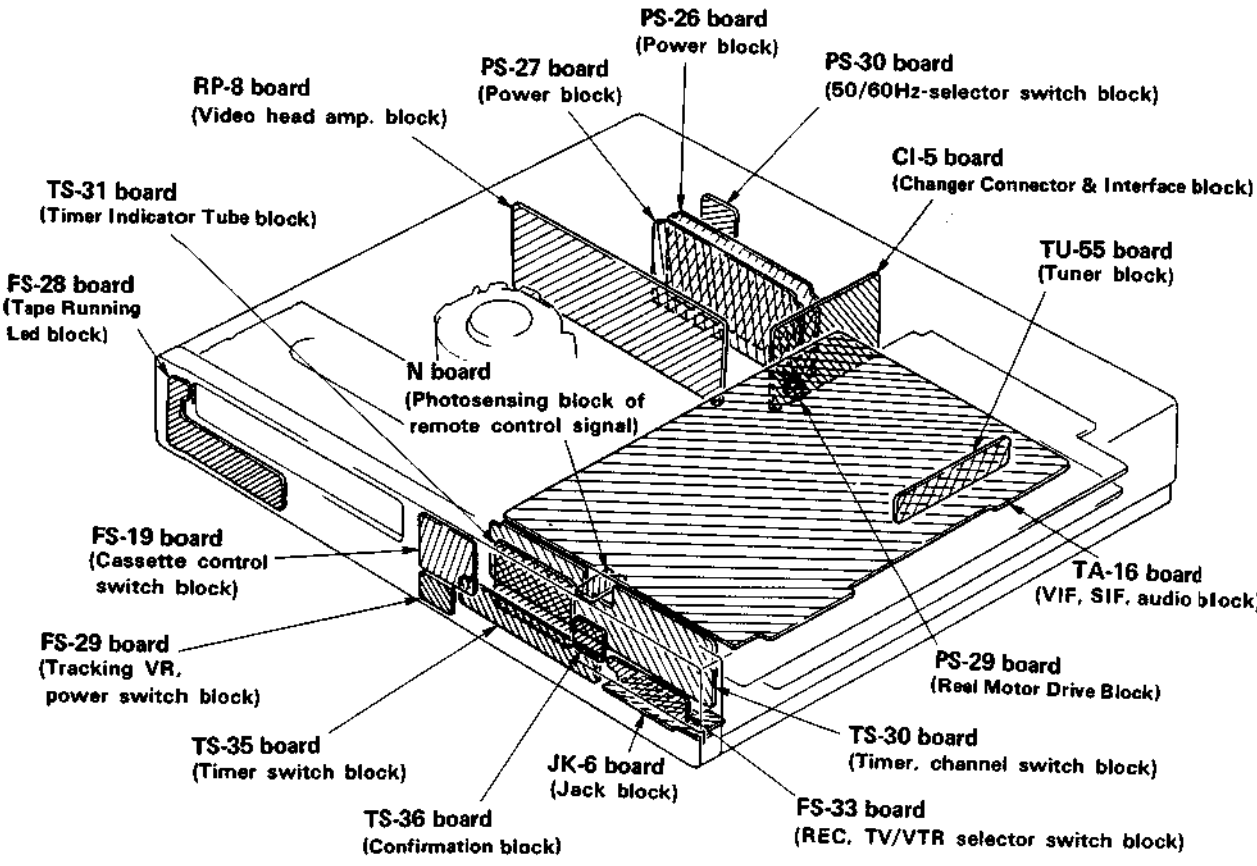
Pendulum gear

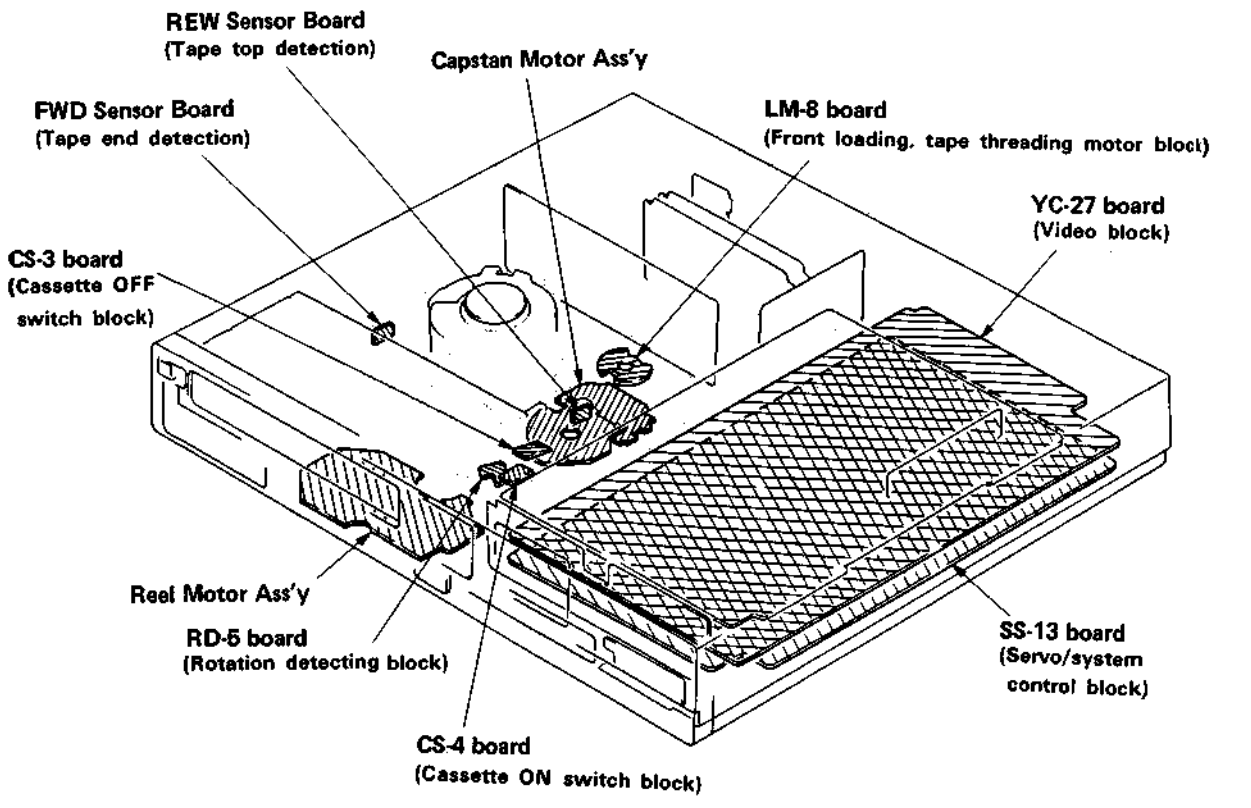
Pendulum arm

Reel motor Ass'y

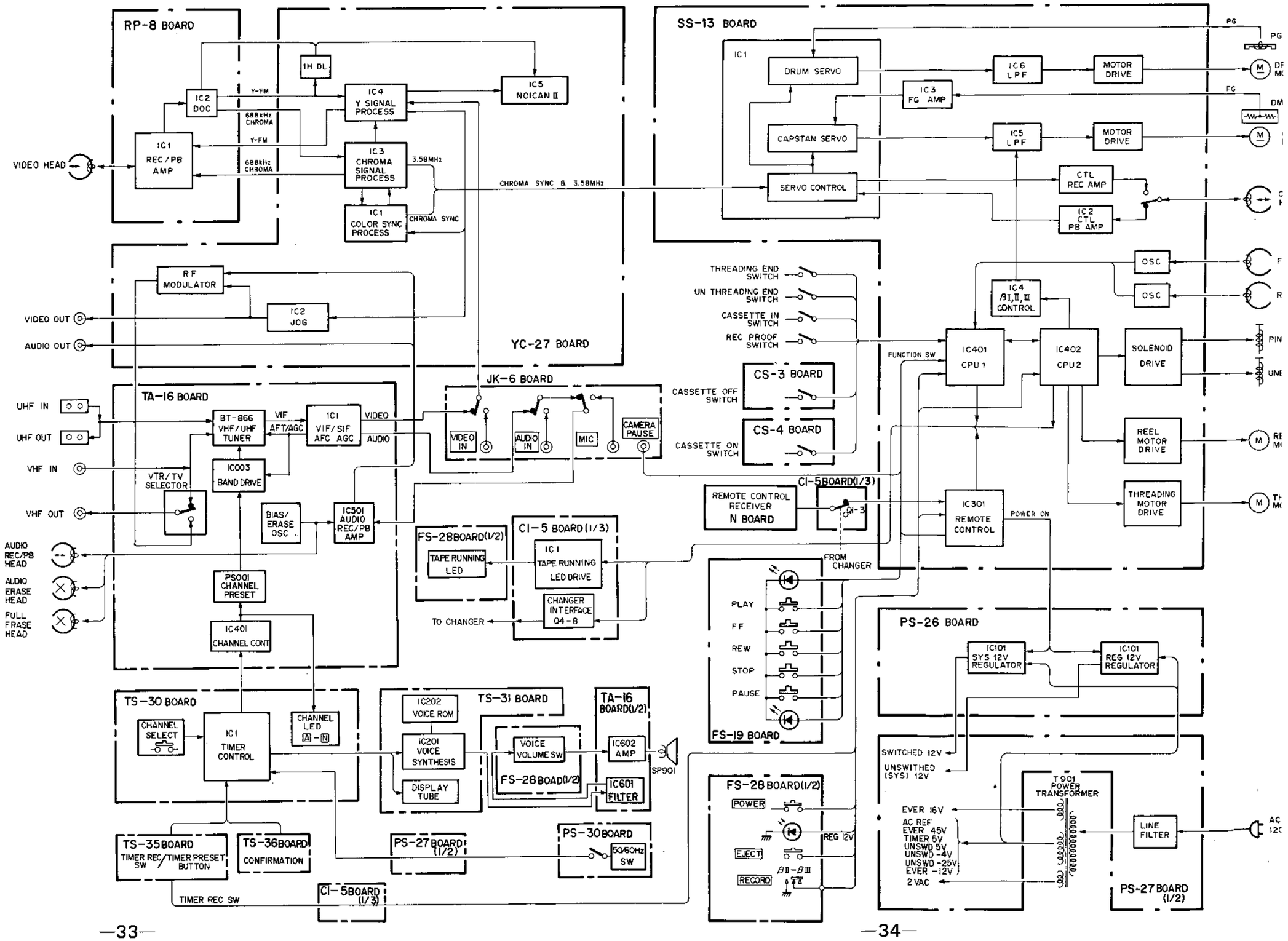
SECTION 3
DIAGRAMS

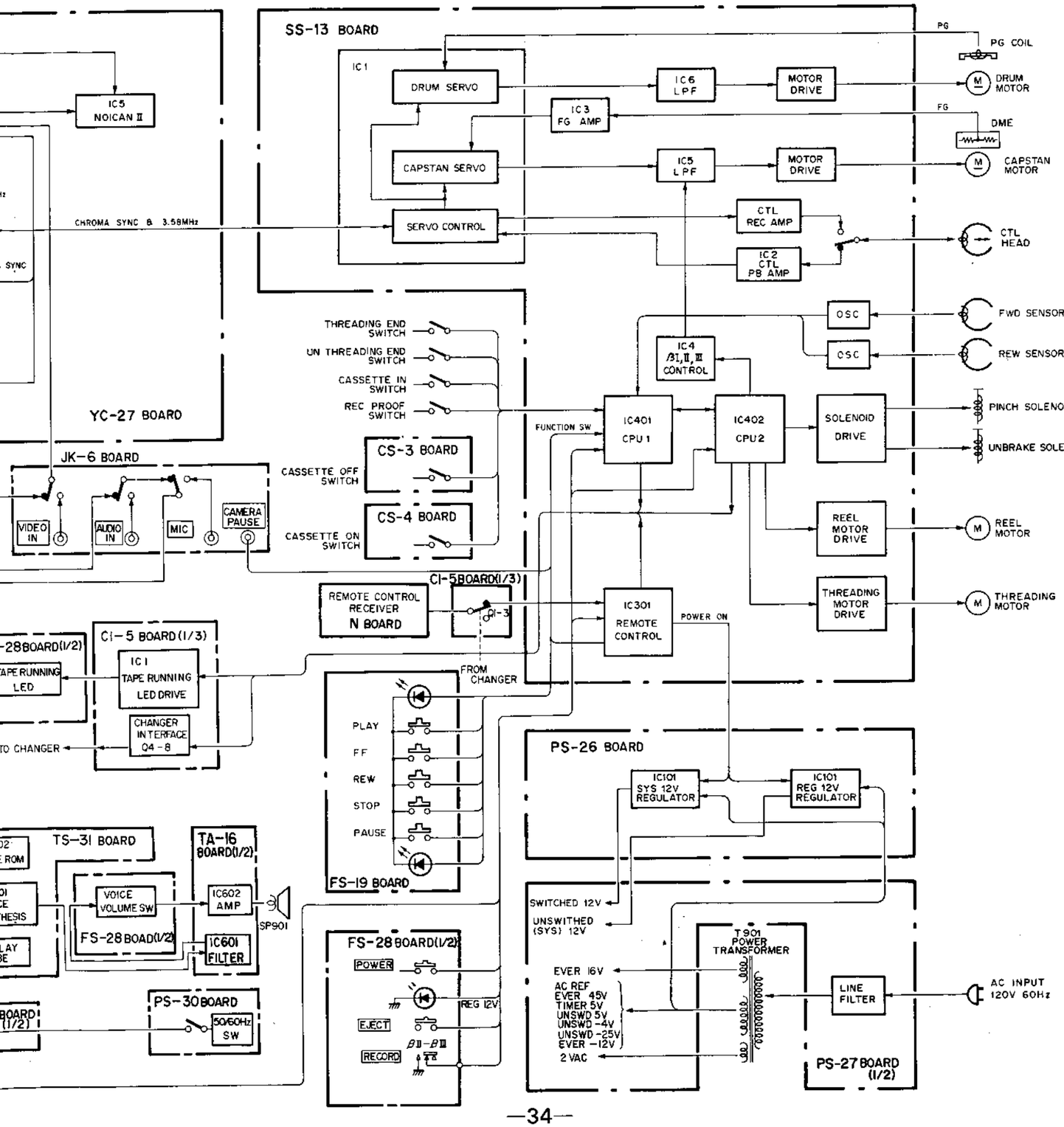
3-1. CIRCUIT BOARDS LOCATION



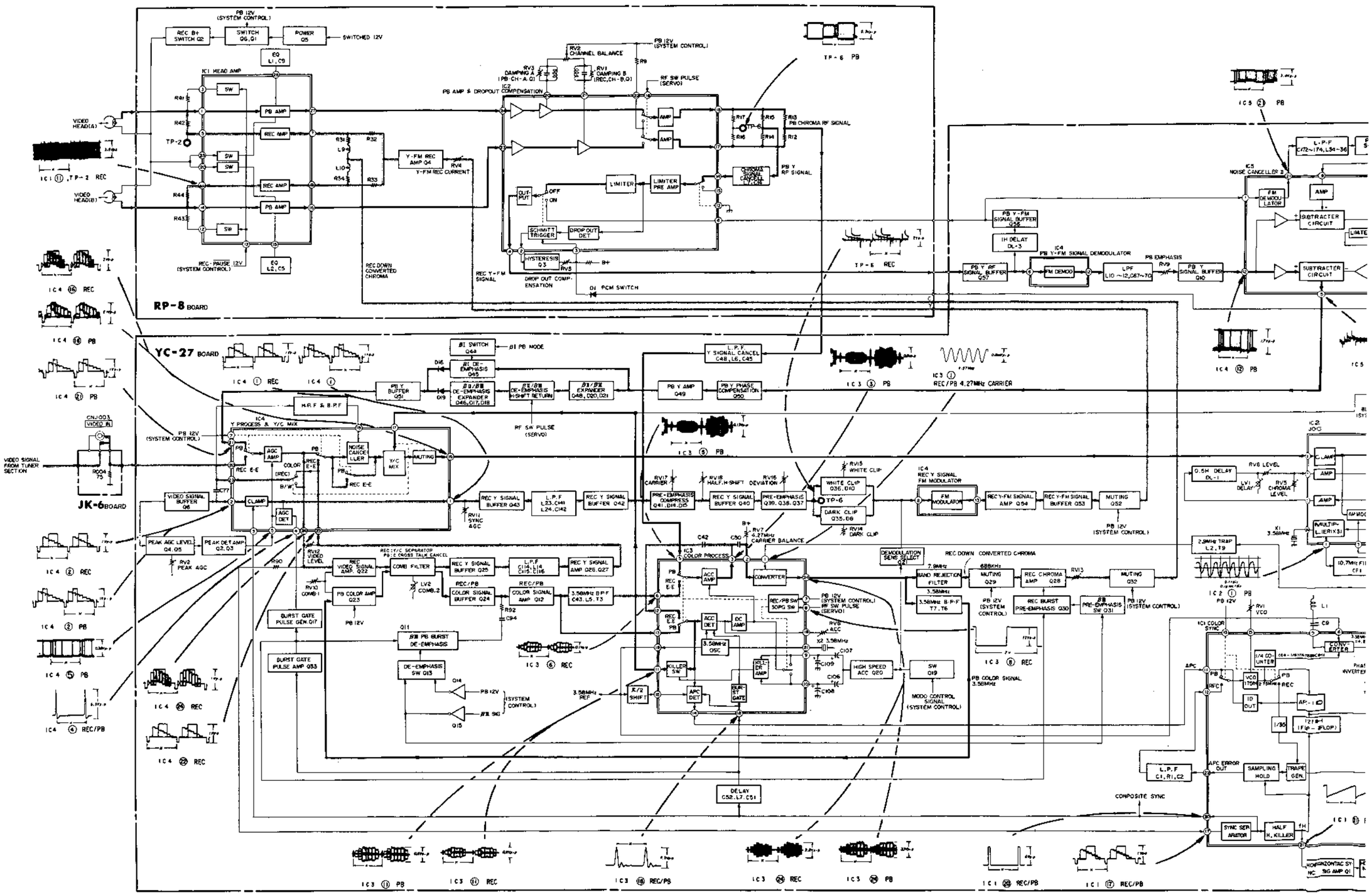


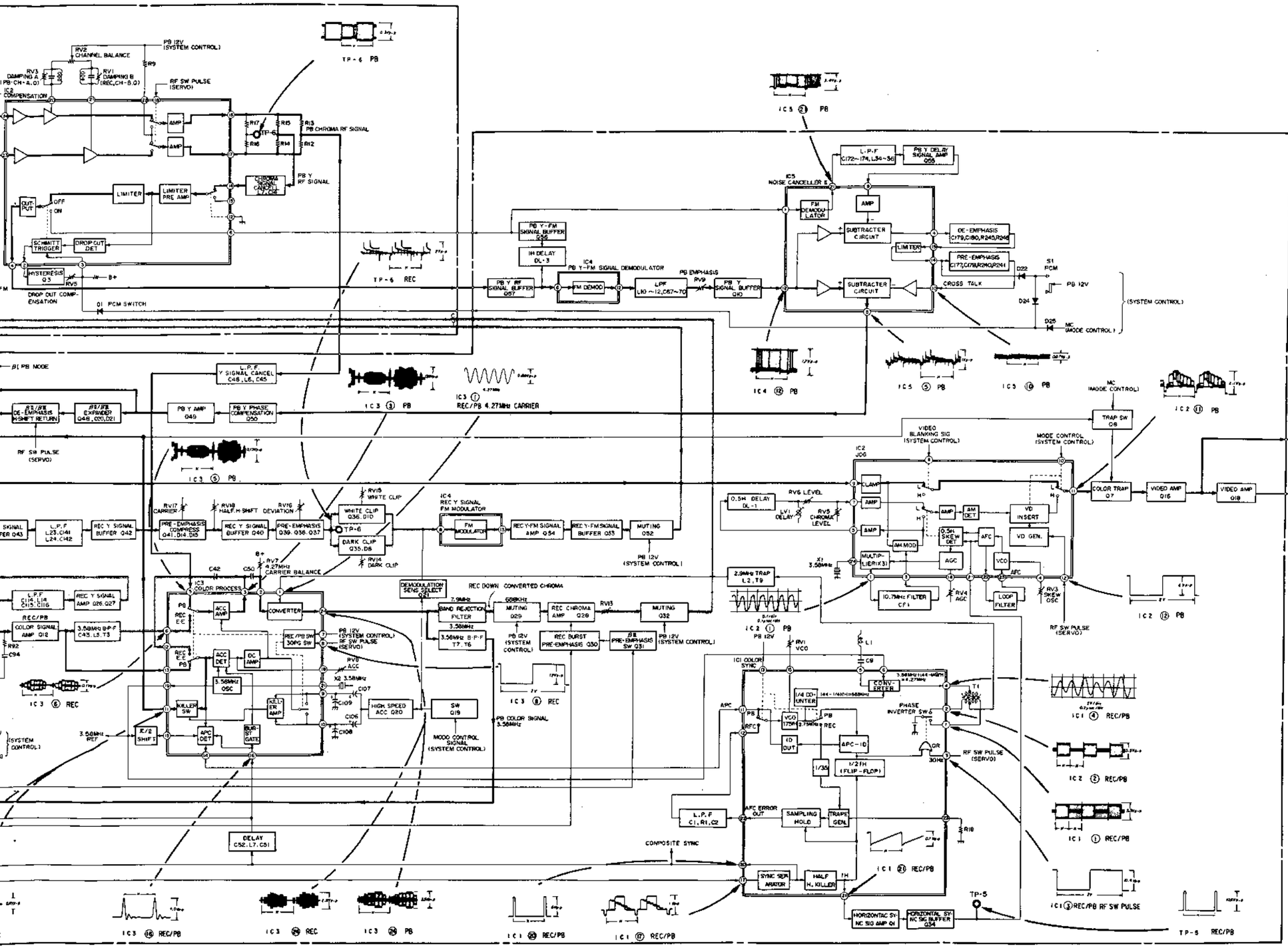
3-2. OVERALL BLOCK DIAGRAM




SS-13 BOARD
IC1
DRUM SERVO
IC6 LPF
MOTOR DRIVE
PG
PG COIL
DRUM MOTOR
IC3 FG AMP
FG
DME
CAPSTAN SERVO
IC5 LPF
MOTOR DRIVE
CAPSTAN MOTOR
SERVO CONTROL
CTL REC AMP
IC2 CTL PB AMP
CTL HEAD
OSC
FWD SENSOR
OSC
REW SENSOR
IC4 B1,II,III CONTROL
IC5 NOICAN II
CHROMA SYNC & 3.58MHz
YC-27 BOARD
THREADING END SWITCH
UN THREADING END SWITCH
CASSETTE IN SWITCH
REC PROOF SWITCH
FUNCTION SW
IC401 CPU 1
IC402 CPU2
SOLENOID DRIVE
PINCH SOLENOID
UNBRAKE SOLENOID
JK-6 BOARD
CS-3 BOARD
CASSETTE OFF SWITCH
CS-4 BOARD
CASSETTE ON SWITCH
VIDEO IN
AUDIO IN
MIC
CAMERA PAUSE
CI-5BOARD(1/3)
REMOTE CONTROL RECEIVER N BOARD
CI-3
IC301 REMOTE CONTROL
POWER ON
REEL MOTOR DRIVE
REEL MOTOR
THREADING MOTOR DRIVE
THREADING MOTOR
CI-5 BOARD (1/3)
IC1 TAPE RUNNING LED DRIVE
CHANGER INTERFACE 04-8
TAPE RUNNING LED
TO CHANGER
FROM CHANGER
PLAY
FF
REW
STOP
PAUSE
FS-19 BOARD
PS-26 BOARD
IC101 SYS 12V REGULATOR
IC101 REG 12V REGULATOR
TS-31 BOARD
TA-16 BOARD(1/2)
VOICE VOLUME SW
IC602 AMP
SP901
FS-28 BOAD(1/2)
IC601 FILTER
SWITCHED 12V
UNSWITHED (SYS) 12V
T901 POWER TRANSFORMER
EVER 16V
AC REF
EVER 45V
TIMER 5V
UNSWD 5V
UNSWD -4V
UNSWD -25V
EVER -12V
2 VAC
LINE FILTER
AC INPUT 120V 60Hz
PS-30 BOARD
50/60Hz SW
FS-28 BOARD(1/2)
POWER
REG 12V
EJECT
RECORD
PS-27 BOARD (1/2)

3-3. VIDEO SYSTEM BLOCK DIAGRAM



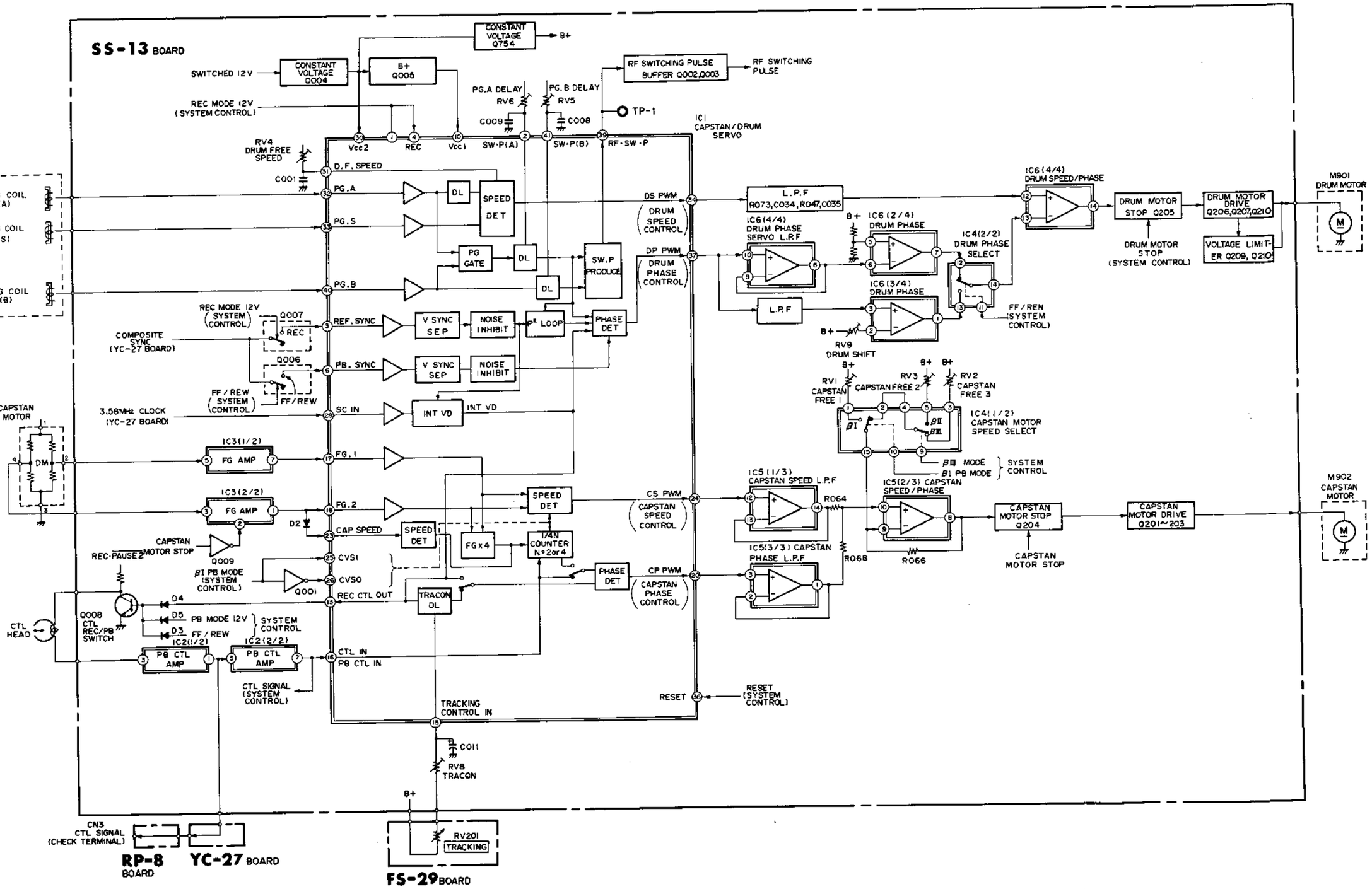


· Main signal channel

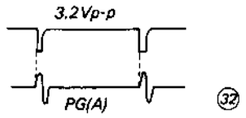
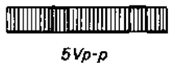
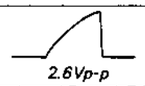
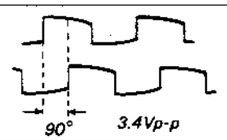
RECORD

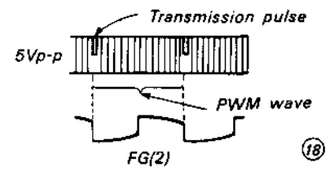
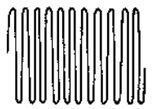
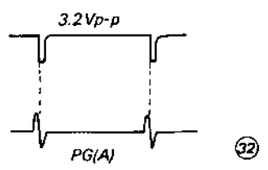
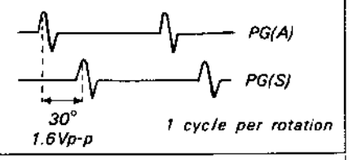
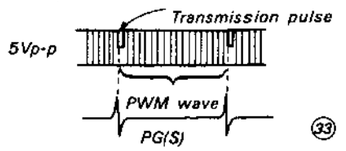
PLAYBACK

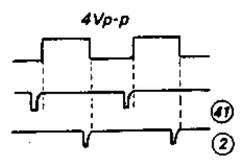
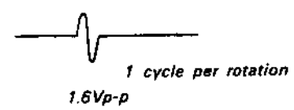
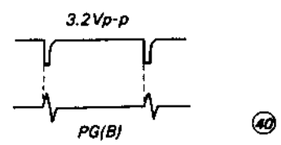
3-4. SERVO SYSTEM BLOCK DIAGRAM



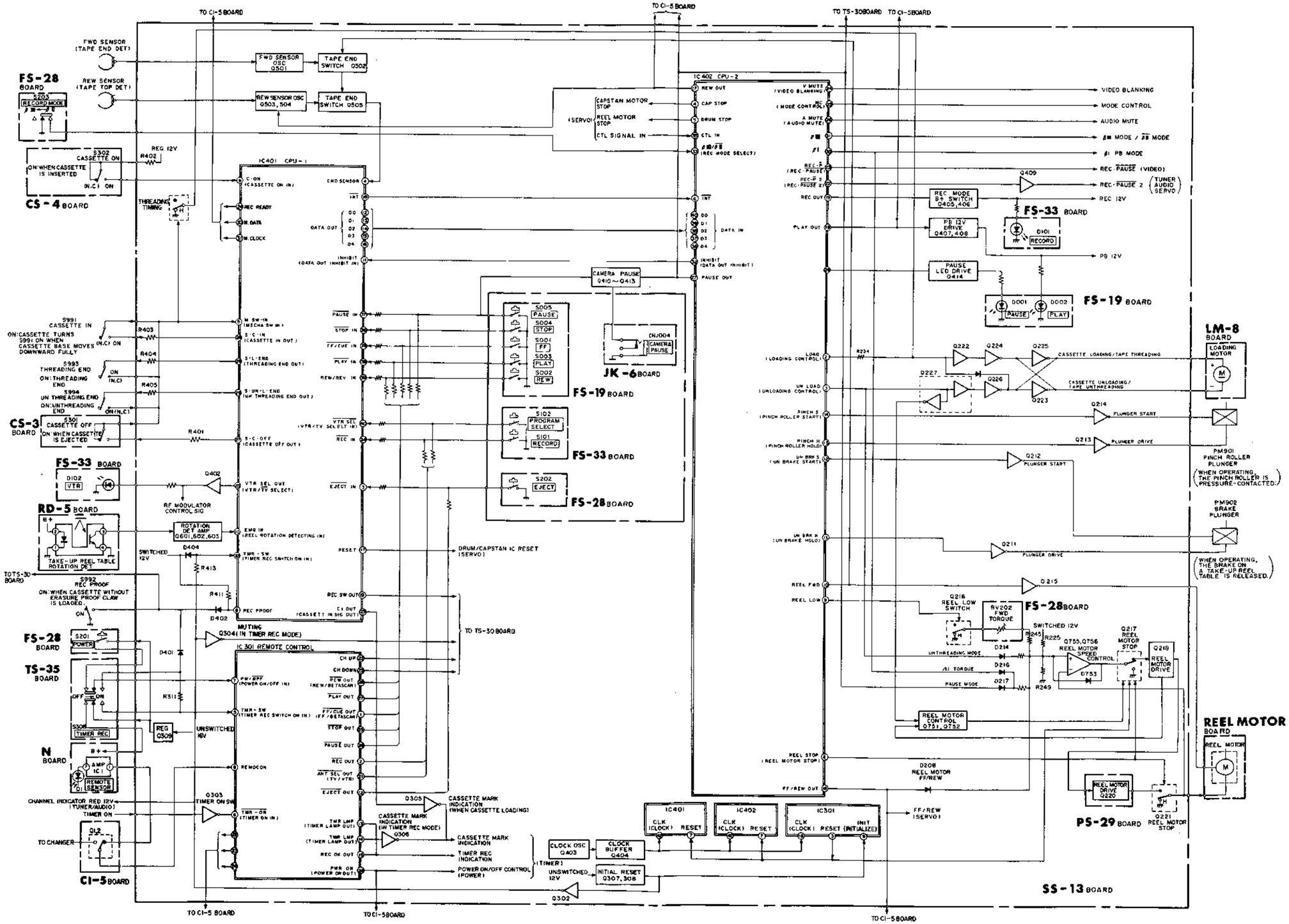
IC 1 **Digital servo IC (SS-13 Board)**

Terminal No.	I/O	Function and operation	Signal
1	Input	Changing-over signal in the REC mode	H: REC mode
2	Input	Time constant of RF switching pulse position	
3	Input	Composite signal input from the input video signal in the BETASCAN mode. In the BETASCAN mode (42-pin terminal "H") inside IC, the input controls the drum phase output to obtain the BETASCAN.	
4	Input	Input signal in the REC mode	H: REC mode
5	Input	Connected to GND.	
6	Input	Composite signal input from the PB video signal in the picture search mode. In the picture search mode (42-pin terminal "H") inside IC, the input controls the drum phase output to obtain the picture search.	
7	Input	Connected to B + power supply.	
8	Input	Connected to GND.	
9	Input	Connected to GND.	
10		Connected to B + power supply.	
11		Connected to GND.	
12	Output	Not used.	
13	Output	During REC, a composite signal from the input video signal is fed to a 3-pin terminal, and an REC CTL signal is generated and output using the vertical SYNC signal inside IC.	
14	Input	Connected to GND.	
15	Input	Tracking control time constant. During PB inside IC, the tracking control mono-multi output is a reference signal of the capstan phase servo.	
16	Input	PB CTL signal input in the PB mode. During PB, the input is a comparison signal of the capstan phase servo.	
17 18	Input Input	FG signal input from a capstan. During REC, the input is a comparison signal of the capstan phase servo. During REC and PB, the input is a capstan speed servo signal.	
19	Output	Not used.	
20	Output	Capstan phase servo output	PWM wave 5Vp-p
21	Output	Not used.	
22	Output	Not used.	
23	Output	Capstan speed detecting	Goes "H" when a capstan motor starts rotating.

24	Output	Capstan speed servo output	
25	Input	Capstan speed changing-over input	H: βI L: βII, βIII
26	Input	Capstan speed changing-over input	L: βI H: βII, βIII
27	Output	Not used.	
28	Input	3.58 MHz-signal input from crystal oscillation. During PB, the input is a reference signal (INT VD) of the drum phase servo by counting down the 3.58 MHz-signal.	
29		Connected to GND	
30		Connected to B + power supply	
31	Input	Drum speed PG (A) time constant	
32 33	Input Input	PG(A) signal input from rotation of a drum PG(S) signal input from rotation of a drum During REC and PB, the input is a drum speed servo signal.	
34	Output	Drum speed servo output	
35		Connected to GND.	
36	Input	Reset input A pulse is input when the power switch is turned "ON".	 : During power ON
37	Output	Drum phase servo output	PWM wave 5Vp-p
38	Output	Not used.	

39	Output	RF switching pulse output	
40	Input	PG(B) signal input from rotation of a drum During REC and PB. the input is a comparison signal of the drum phase servo.	
41	Input	Time constant of RF switching pulse position	
42	Input	"H" is input in the BETASCAN mode. A AFC circuit inside IC goes high. (f_H deviation compensating) The drum phase output from a 37-pin terminal is controlled by input of a 6-pin terminal.	H: BETASCAN mode

3-5. SYSTEM CONTROL BLOCK DIAGRAM (1)



3-6. SYSTEM CONTROL BLOCK DIAGRAM (2)

Flow of signal

Operation of the system control requires that.

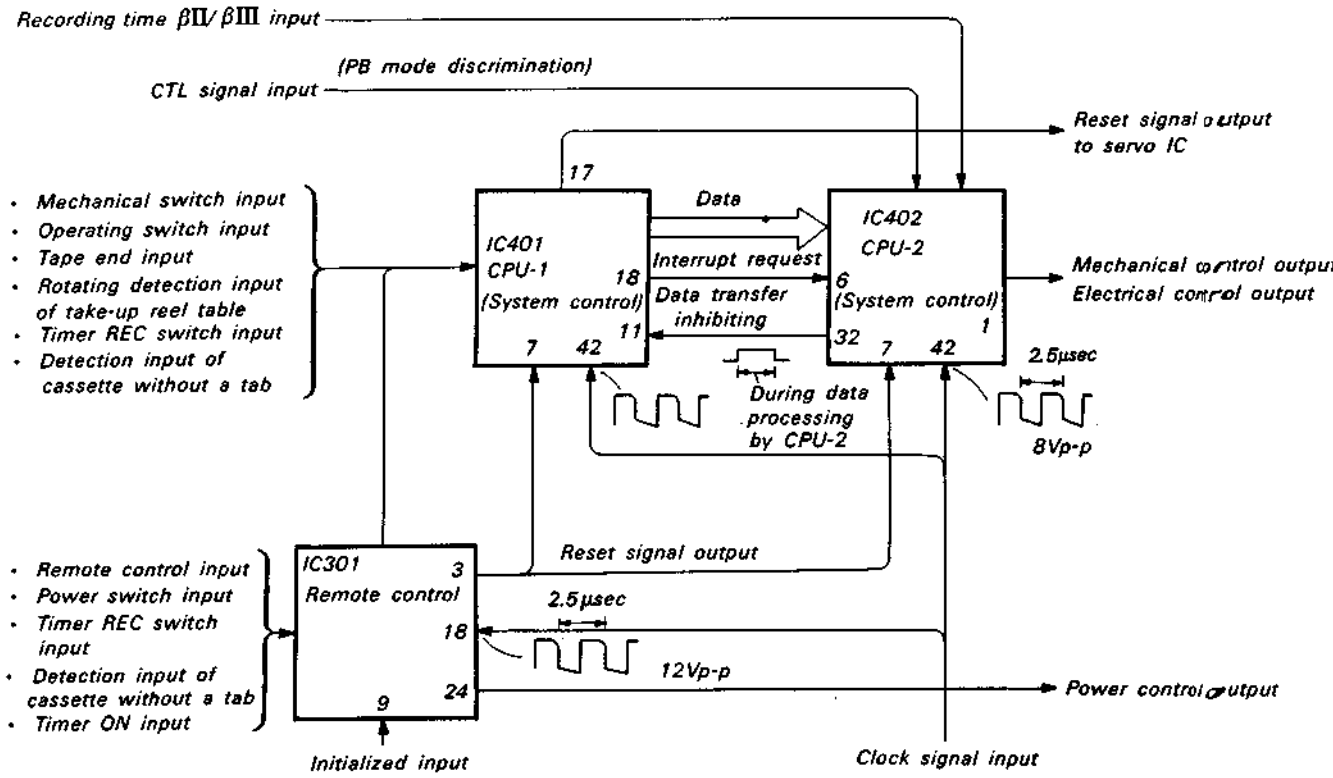
During power OFF

- Power supply is fed to the power terminals (⑲ . ⑳) of a remote control IC (IC301).
- A clock signal is add to the clock input terminal (⑱) of a remote control IC (IC301).
- The initialized input terminal (⑨) of a remote control IC (IC301) is "L" in level. (The input terminal is initialized using a pulse ⎍ during connection of a power code.)
- Under the condition described above. power supply, IC401 and IC402 are controlled by the input signal of a remote control IC.

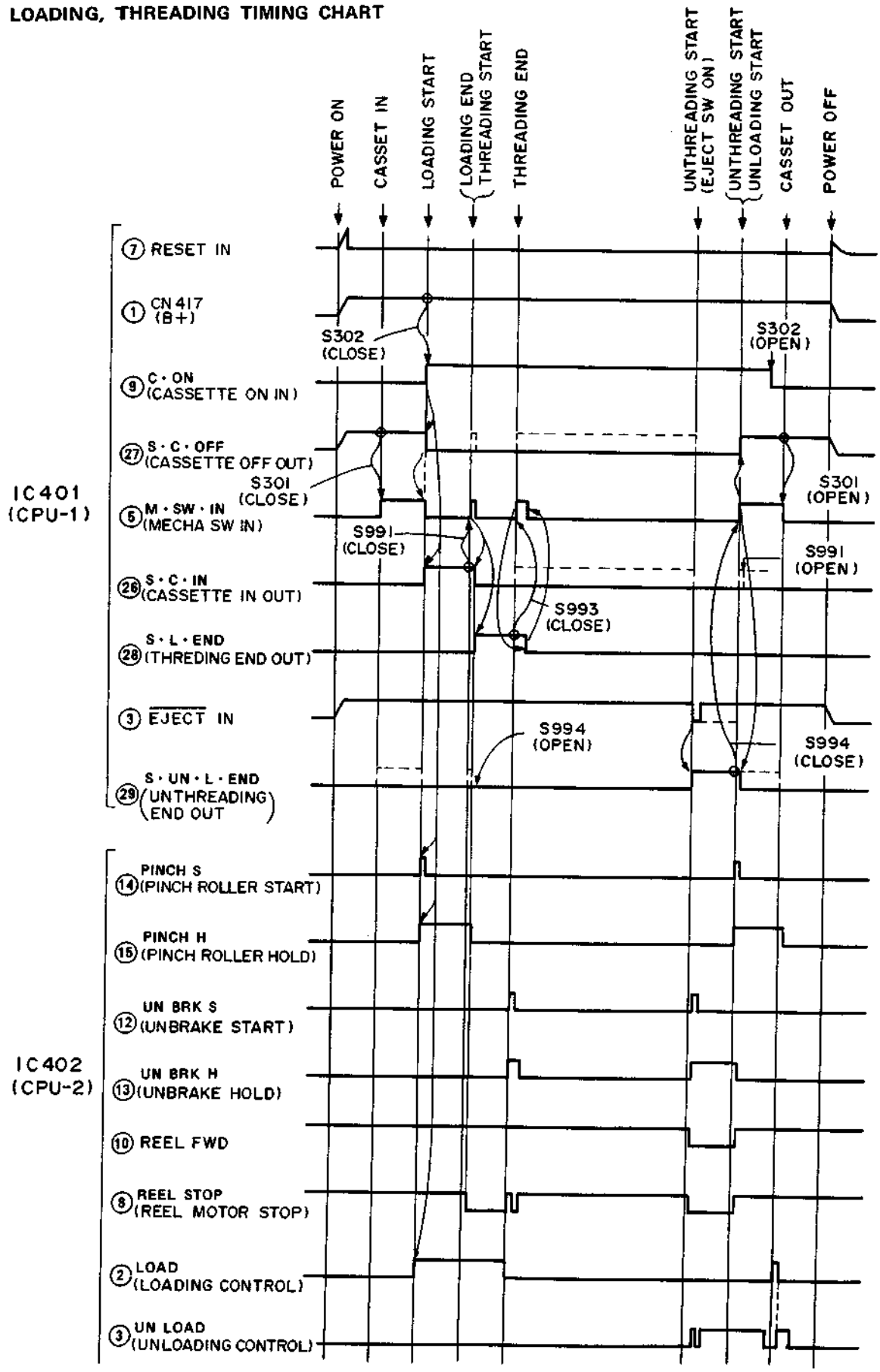
During power ON

- Power supply is fed to the power terminals (⑳ . ㉑) of system control ICs (IC401, IC402).
- A clock signal is added to the clock input terminal (㊷) of system control ICs (IC401, IC402).
- The reset input terminal (⑦) of system control ICs (IC401, IC402) is "L" in level. (The input terminal is reset using a pulse ⎍ through IC301 during power ON.)
- The interrupt request input terminal (⑥) of a system control IC (IC402) is high in level and each pressing of an operating switch causes the input of a negative pulse (⎴).
- The data transfer inhibiting output terminal (㉜) of a system control IC (IC402) is low in level and IC401 is in the data output mode.
- Under the condition described above. an interrupt request pulse and data are fed from IC401 to IC402 according to each input. and then each control output is fed from IC402.
- Data transmission of CPU-1 (IC401) to CPU-2 (IC402)

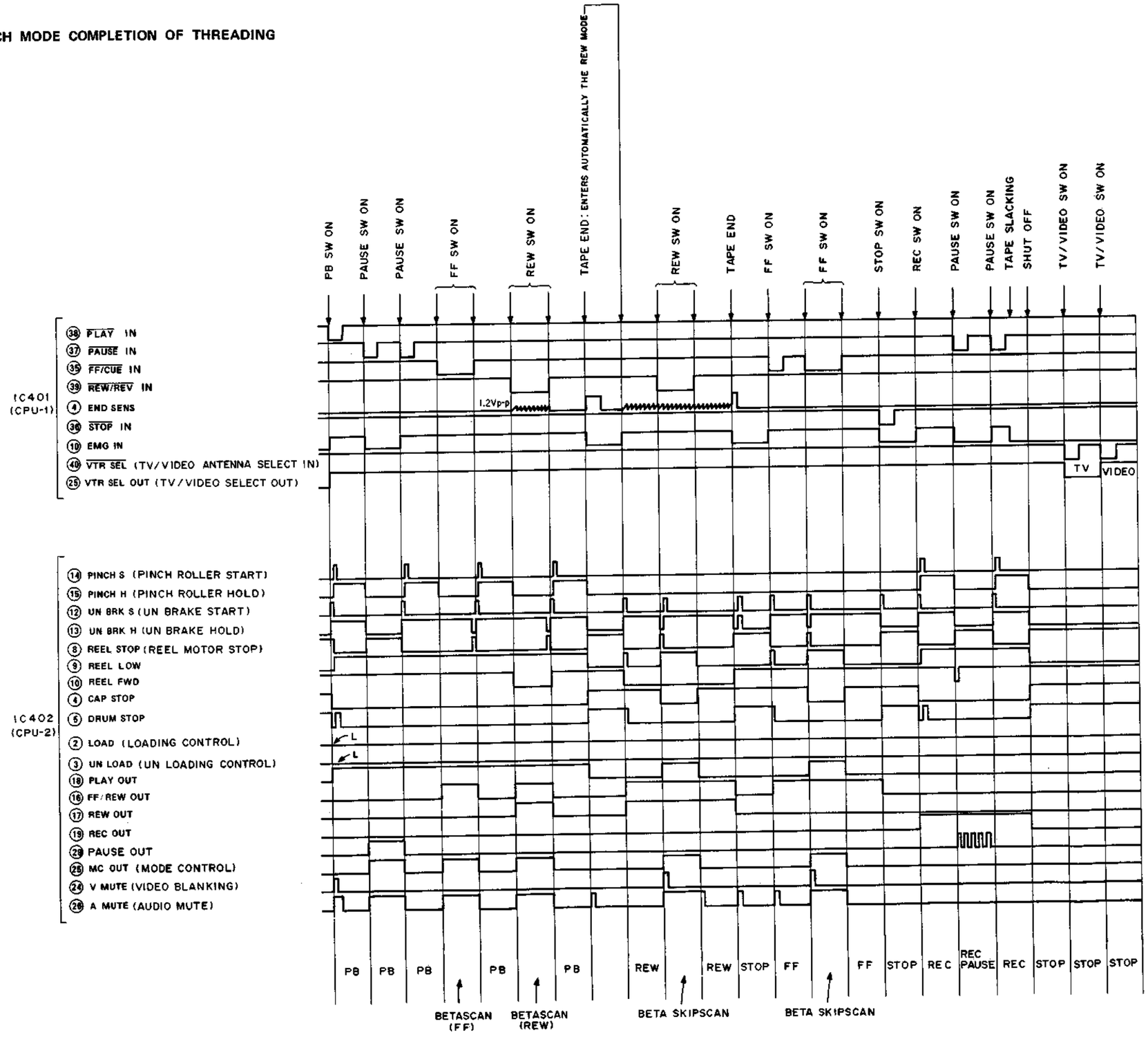
Mode \ Data	Data input terminal of IC402				
	㊵	㊴	㊳	㊲	㊱
PB	L	H	H	H	H
REC	L	L	L	H	H
FF	L	L	H	H	H
REW	H	L	H	H	H
BETASCAN (▶▶)	L	H	L	H	H
BETASCAN (◀◀)	H	H	L	H	H
STOP	H	H	L	L	H
PB PAUSE	H	H	H	H	H
REC PAUSE	H	L	L	H	H
Front loading	L	L	H	L	H
Threading	H	L	H	L	H
Unthreading	H	H	H	L	H
Unloading	L	H	H	L	H
BETA SKIPSCAN (When an FF button is pressed in the FF mode)	L	H	L	H	H
BETA SKIPSCAN (When a REW button is pressed in the REW mode)	H	H	L	H	H



3-7. LOADING, THREADING TIMING CHART



3-8. TIMING CHART IN EACH MODE COMPLETION OF THREADING



• Input/output terminal of remote control IC (IC301)

Terminal No.	Designation	Meaning	I/O	Function and operation	Signal
1	$\overline{\text{FF/CUE}}$	FF/BETASCAN mode	Output	Output when sensing the FF/BETASCAN signal from a remote controller.	
2	$\overline{\text{REC}}$	REC mode	Output	Output when sensing the REC signal from a remote controller. Outputs "L" for one second at the set time of a timer in the timer REC mode.	
3	RESET	Reset	Output	Outputs a pulse every time the power switch is turned ON/OFF.	
4	Vdd	Power terminal	—	Grounding	
5	TMR-SW	Timer REC mode	Input	When a TIMER REC switch is turned ON, "H" is input. Input of a 7-pin terminal is active-low.	
6	$\overline{\text{TMR-ON}}$	Timer ON	Input	Inputs "L" at the set time of a timer in the TIMER REC mode.	
7	PWR/$\overline{\text{RPF}}$	Power ON/OFF	Input	ON/OFF signal input using a power switch. Cassette tab signal input during TIMER REC switch ON ("L": tab provided, "H": tab not provided). When input of a 5-pin terminal is "L", active-high, and when "H", active-low.	: Active-high input during power switch ON. : Active-low input during TIMER REC.
8	REMOCON	Remote control	Input	Remote control serial data input from the sensing block	Serial data
9	INIT	Initializing	Input	Initializes the inside of IC during connection of a power cord.	
10	N • C	———	—	Not used.	
11	———	———	—	Not used.	
12	$\overline{\text{EJECT}}$	Unloading of cassette without a tab	Output	Output when a TIMER REC switch is turned "ON" with the cassette without a tab loaded (7-pin terminal "H").	
13	TMR-LMP	Cassette display	Output	Output when a TIMER REC switch is turned "ON".	
14	TMR-LMP	Cassette display	Output	Output when a TIMER REC switch is turned "ON".	: When a cassette and tab are not provided
15	REC OK	REC OK display	Output	Output when a TIMER REC switch is turned "ON".	
16	———	———	—	Not used.	
17	———	———	—	Not used.	
18	CLK IN	External clock	Input	400 kHz-clock signal input	
19	———	———	—	Connected to Vss.	
20	Vss	Power terminal	—	B + power supply 12V	
21	$\overline{\text{ANT SEL}}$	Video/TV antenna selecting	Output	Output when sensing the VTR/TV antenna changing-over signal.	
22	———	———	—	Not used.	
23	———	———	—	Not used.	
24	PWR ON	Power ON	Output	When input of a power switch, TIMER REC switch and timer is turned ON, the power output is turned ON/OFF.	: Power ON : Power OFF
25	$\overline{\text{STOP}}$	STOP mode	Output	Output when sensing the stop signal from a remote controller. Output for one second during power OFF.	
26	$\overline{\text{PAUSE}}$	PAUSE mode	Output	Output when sensing the pause signal from a remote controller.	
27	$\overline{\text{PLAY}}$	PB mode	Output	Output when sensing the PB signal from a remote controller.	
28	$\overline{\text{REW/REV}}$	REW/BETASCAN mode	Output	Output when sensing the REW/BETASCAN signal from a remote controller.	

• Input/output terminal of system control IC (IC401)

Terminal No.	Designation	Meaning	I/O	Function and operation	Signal
1	———	———	—	Not used.	
2	———	———	—		
3	$\overline{\text{EJECT}}$	Cassette ejecting	Input	Input when a cassette eject button is pressed. Input when a TIMER REC switch is turned "ON" with the cassette without a tab loaded.	
4	END SENS	Tape end	Input "H"=more than 8.5V "L"=less than 4.0V	Input at tape end. Goes "L" when the tape is running in the FWD directionand goes "H" at tape end. Inputs a sawtooth wave (5 μsec) when the tape is running in the reverse direction. Goes "H" to enter the STOP mode at tape top.	: Tape end : Tape top 5μsec 1.2Vp-p
5	M • SW IN	Mechanical switch	Input	During loading, threading, unloading and unthreading, CPU-1 enters each mode by using a mechanical switch.	
6	TEST			Not used.	
7	RESET	Reset	Input	Inputs to initialize CPU-1. A pulse is input every time the power switch is turned ON/OFF.	
8	REC PROOF	Record proof	Input	Goes "H" when the cassette without a tab is loaded. At that time, the cassette is ejected when a REC switch is turned ON.	H: cassette without a tab L: cassette with a tab
9	C • ON	Cassette ON	Input	Cassette ON is input to CPU-1 during insertion of a cassette.	
10	EMG IN	T-reel rotation	Input	EMG IN is input to CPU-1 during rotation of a T-reel (take-up reel) table. Enters the STOP mode when the EMG input goes from "H" to "L" during PB and REC. At that time, no switch except the EJECT switch is put to use.	H: when rotating L: when not rotating
11	INHIBIT	Data output inhibiting	Input	CPU-2 goes "H" during processing of data. At that time, input to inhibit output of the new data from CPU-1.	H: new data output inhibiting
12	D0	Data	Output	Fed to CPU-2, as data, according to input of an operating switch, mechanical switch, tape end, and defect detection.	Parallel data
13	D1	Data	Output		
14	D2	Data	Output		
15	D3	Data	Output		
16	D4	Data	Output		
17	RESET	Reset	Output	A reset pulse is output to reset the servo IC (IC1) every time the power switch is turned ON.	
18	$\overline{\text{INT}}$	Interrupt request	Output	The moment the data is output to CPU-2, an interrupt request pulse is output to store the data into CPU-2.	
19	———	———	—	Not used.	
20	TEST			Connected to B + 12V.	
21	Vss	Power terminal		B + 12V	
22	KEY SENSE			Not used.	
23	CI-OUT	Cassette IN display	Output	Output to display the cassette mark during cassette loading.	H: during cassette loading
24	———	———	—	Not used.	

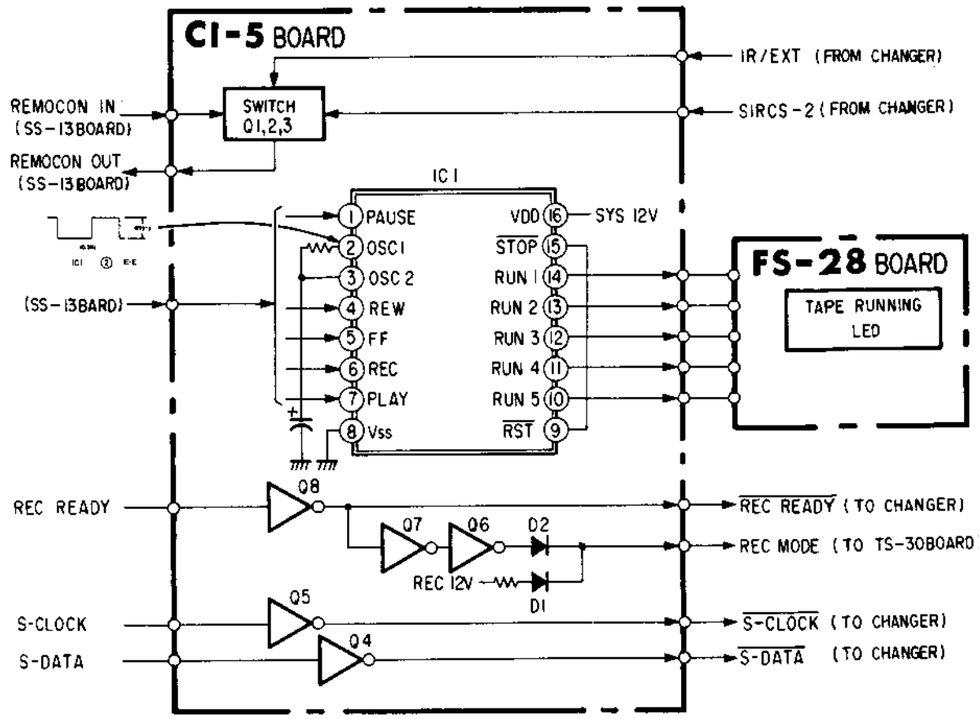
25	VTR SEL OUT	TV/videoselecting	Output	Output to change-over the antenna of an RF modulator to TV side or video side. "H" is automatically output in the PB mode. Output is inverted every time a TV/VTR switch or commander switch is pressed.	H: VTR side L: TV side
26	S·C·IN	Output for Cassette IN reading	Output	Output to inform CPU-1 that loading is completed. When loading is completed, a cassette IN switch (S991) is pressed by the cassette to store into a 5-pin terminal.	
27	S·C·OFF	Output for Cassette OFF reading	Output	Output to inform CPU-1 that unloading is completed and the cassette is unthreaded. During unthreading, a cassette OFF switch (S301) is turned ON by the cam to store into a 5-pin terminal.	
28	S·L·END	Output for threading end reading	Output	Output to inform CPU-1 that threading is completed. During end of threading, a threading end switch (S993) is turned ON to store into a 5-pin terminal.	
29	S·UN·L·END	Output for unthreading end reading	Output	Output to inform CPU-1 that unthreading is completed. During end of unthreading, an unthreading end switch (S994) is turned ON to store into a 5-pin terminal.	
30	———	———	——	Not used.	
31	———	———	——	Not used.	
32	———	———	——	Not used.	
33	TMR·SW	TIMER REC mode	Input	Goes "H" when a TIMER REC switch is turned ON. Input to inform CPU-1 that the unit is in the TIMER REC mode.	L: when not in the TIMER REC mode H: when in the TIMER REC mode
34	$\overline{\text{REC}}$	REC mode	Input	Input when pressing a REC switch and sensing the REC signal from a remote controller.	
35	$\overline{\text{FF/CUE}}$	FF/BETASCAN mode	Input	Input when pressing a FF/BETASCAN switch and sensing the FF/BETASCAN signal from a remote controller.	
36	$\overline{\text{STOP}}$	STOP mode	Input	Input when pressing a stop switch and sensing the stop signal from a remote controller.	
37	$\overline{\text{PAUSE}}$	PAUSE mode	Input	Input when pressing a pause switch and sensing the pause signal from a remote controller.	
38	$\overline{\text{PLAY}}$	PB mode	Input	Input when pressing a PB switch and sensing the PB signal from a remote controller.	
39	$\overline{\text{REW/REV}}$	REW/BETASCAN mode	Input	Input when pressing REW/BETASCAN switch and sensing the REW/BETASCAN signal from a remote controller.	
40	$\overline{\text{VTR SEL}}$	VTR/TV antenna selecting	Input	Input when pressing a VTR/TV switch and sensing the VTR/TV signal from a remote controller.	
41	Vcc	Power terminal		Grounding side	
42	CLK	Clock	Input	External clock signal input	400kHz

· **Input/output terminal of system control IC (IC402)**

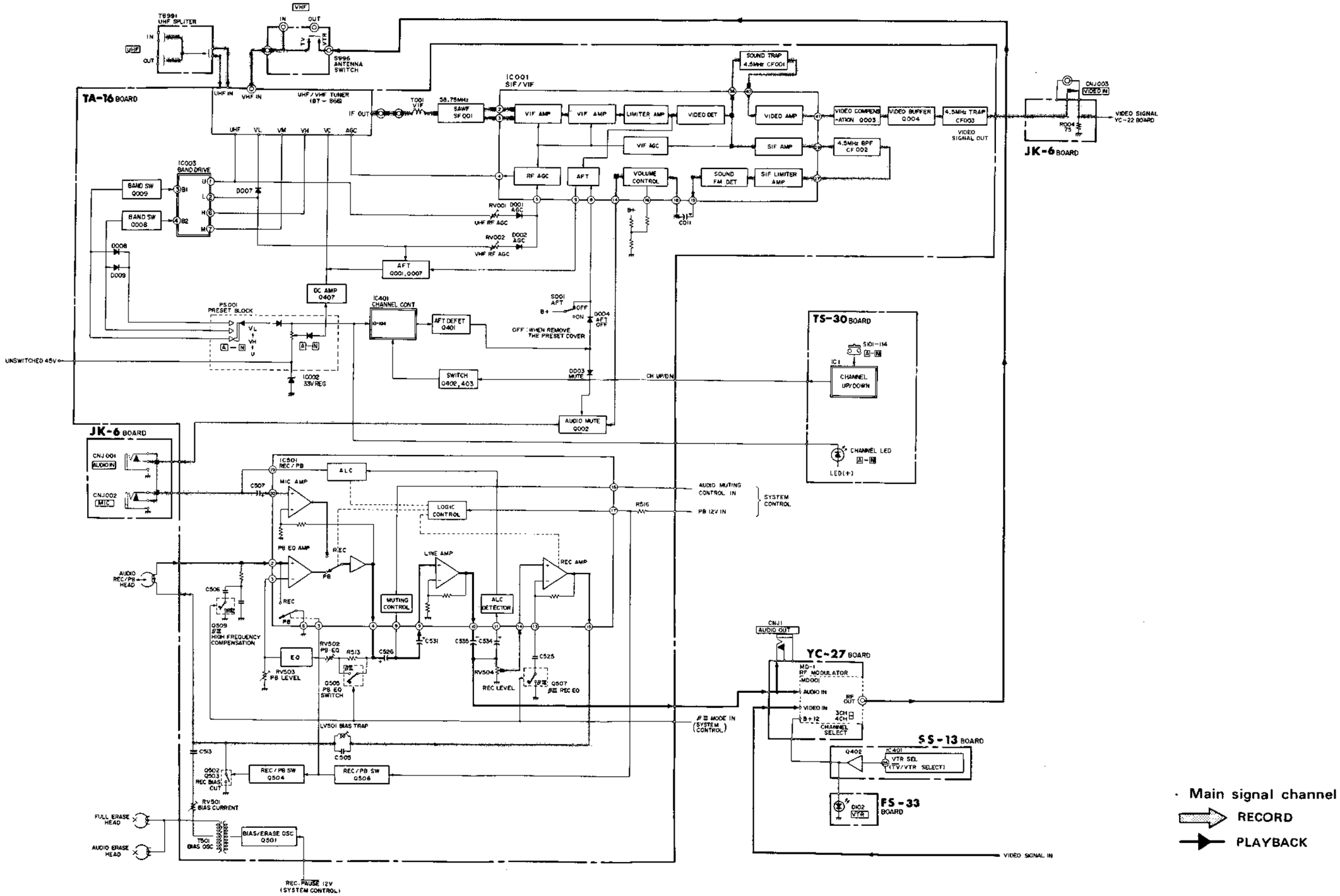
Terminal No.	Designation	Meaning	I/O	Function and operation	Signal
1	———	———	——	Not used.	
2	LOAD	Loading	Output	Output to perform loading and threading.	
3	UN LOAD	Unloading	Output	Output to perform unloading and unthreading.	
4	CAP STOP	Capstan motor stop	Output	Output to stop the capstan motor.	
5	DRUM STOP	Drum motor stop	Output	Output to stop the drum motor.	
6	$\overline{INT}$	Interrupt request	Input	An interrupt request pulse is input the moment the data is fed from CPU-1. The data from CPU-1 is stored into CPU-2.	
7	RESET	Reset	Input	Input to initialize CPU-2. A pulse is input every time the power switch is turned ON/OFF.	
8	REEL STOP	Reel motor stop	Output	Output to stop the reel motor.	
9	REEL LOW	Reel Low	Output	Output to speed down the reel motor.	
10	REEL FWD	Reel rotation in the FWD direction	Output	Output to change over the rotational direction of a reel.	H: FWD direction L: Reverse direction
11	———	———	——	Not used.	
12	UN BRK S	Brake canceling and plunger starting	Output	Output to start the plunger to release the brake of a take-up reel.	
13	UN BRK H	Brake canceling and plunger holding	Output	Output to hold the brake plunger.	
14	PINCH S	Pinch roller plunger starting	Output	During loading (unloading) and threading (unthreading), changes over the drive of a loading motor. Output to start the plunger to pressure-contact a pinch roller.	
15	PINCH H	Pinch roller plunger	Output	Output to hold the pinch roller plunger.	
16	FF/REW OUT	FF/REW mode	Output	Output when entering the FF, REW, BETASCAN, and BETA SKIPSCAN modes.	
17	REW OUT	REW mode	Output	Output when entering the REW and BETASCAN (REW) modes.	
18	PLAY OUT	PB mode	Output	Output when entering the PB, BETASCAN, BETA SKIPSCAN and PB PAUSE modes.	
19	REC OUT	REC mode	Output	Output when entering the REC and REC PAUSE modes.	
20	TEST			Connected to B + 12V.	
21	Vss	Power terminal		B + 12V	
22	——— REC · P 2	——— REC · PAUSE 2	—— Output	Not used..... FORMER Output when entering the REC · PAUSE mode.... NEW	——— H: REC mode L: REC · PAUSE mode

23	REC · $\overline{P}$	REC · PAUSE	Output	Output when entering the REC · PAUSE mode.	H: REC mode L: REC · PAUSE mode
24	V MUTE	Video muting	Output	Video signal muting output	
25	MC	Mode control	Output	Output when entering the BETASCAN, PB · PAUSE and BETA SKIPSCAN modes.	
26	A MUTE	Audio muting	Output	Audio signal muting output	
27	PAUSE OUT	PAUSE	Output	Output when entering the PUASE mode.	
28	N.C				
29	PAUSE LMP	PAUSE display	Output	Display-output when entering the PAUSE mode.	: PB · PAUSE : REC · PAUSE
30	βI	βI PB mode	Output	Output when playing back the βI tape.	
31	βIII	βIII mode	Output	βIII/βII mode selecting output	H: βIII mode L: βII mode
32	INHIBIT	Data transfer inhibiting	Output	Output to inhibit the data transfer by informing CPU-1 that CPU-2 is in data processing.	
33	βIII/$\overline{βII}$	REC time changing-over	Input	Input to change over the REC time	H: REC in the βIII mode L. REC in the βII mode
34	βI CANCEL	βI PB inhibiting	Input	Input to inhibit PB in the βI mode.	H: βI PB inhibiting L: Inhibit canceling
35	CTL IN	CTL signal	Input	A CTL signal is input in the PB mode. The video muting (V MUTE) output goes "H" when no CTL signal is input. PB mode discrimination.	
36	D4	Data	Input	Data input from CPU-1	Parallel data
37	D3	Data	Input		
38	D2	Data	Input		
39	D1	Data	Input		
40	D0	Data	Input		
41	Vcc	Power terminal		Grounding side	
42	CLK	Clock	Input	External clock signal input	400kHz

3-9. CHANGER CIRCUIT INTERFACE & TAPE RUNNING LED



3-10. TUNER/AUDIO BLOCK DIAGRAM

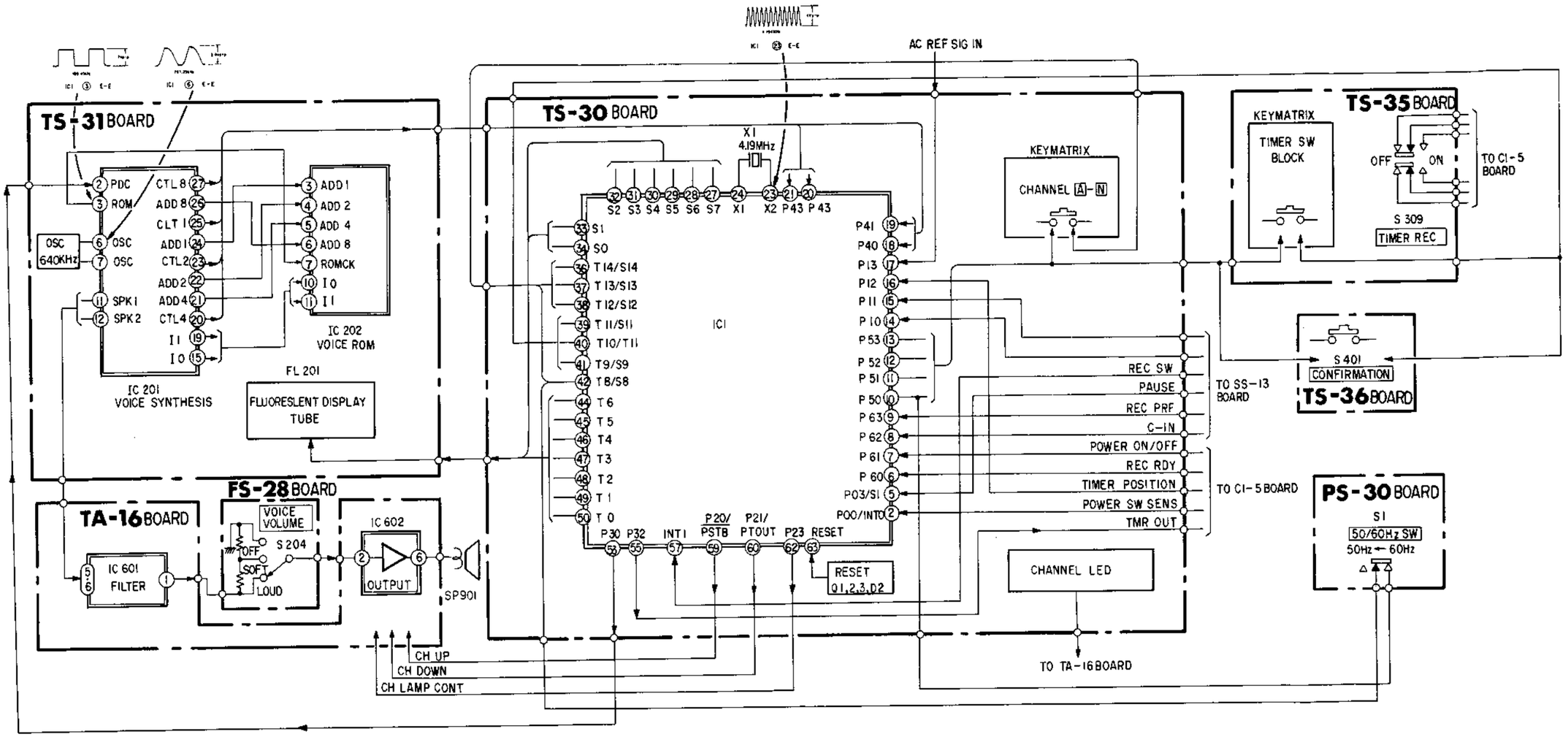


· Main signal channel

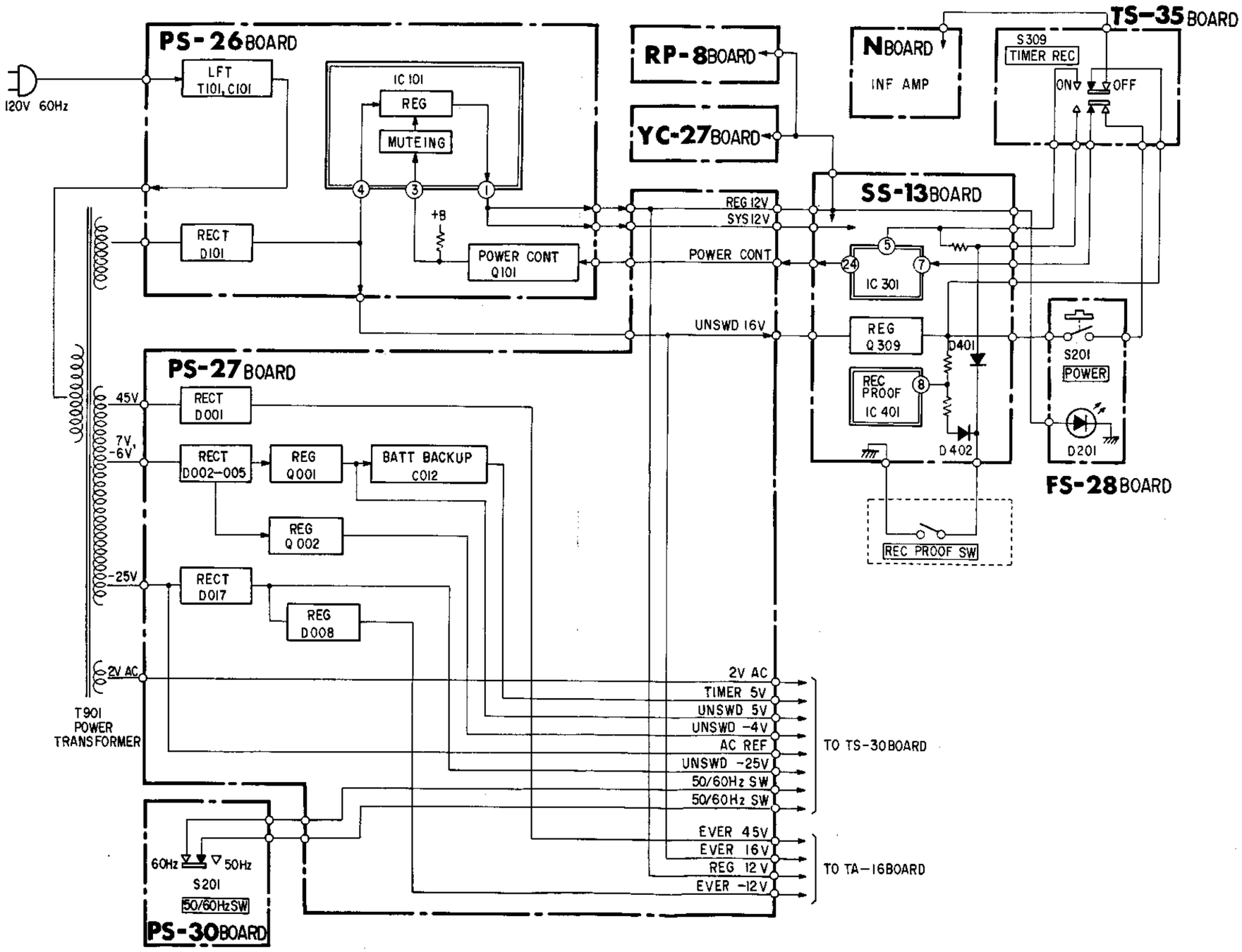
⇨ RECORD

→ PLAYBACK

3-11. TIMER, VOICE SYNTHESIS BLOCK DIAGRAM



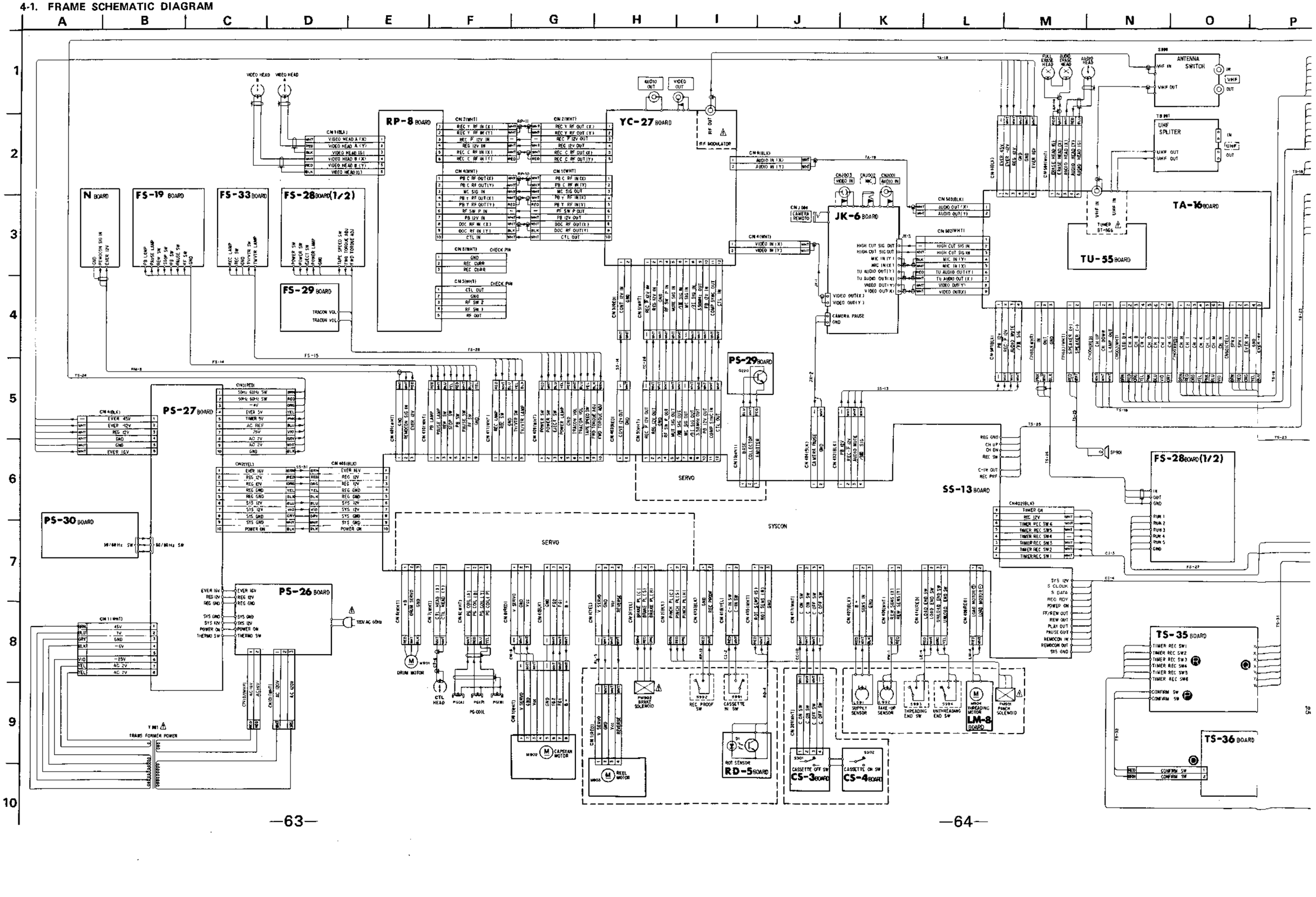
3-12. POWER SUPPLY BLOCK DIAGRAM

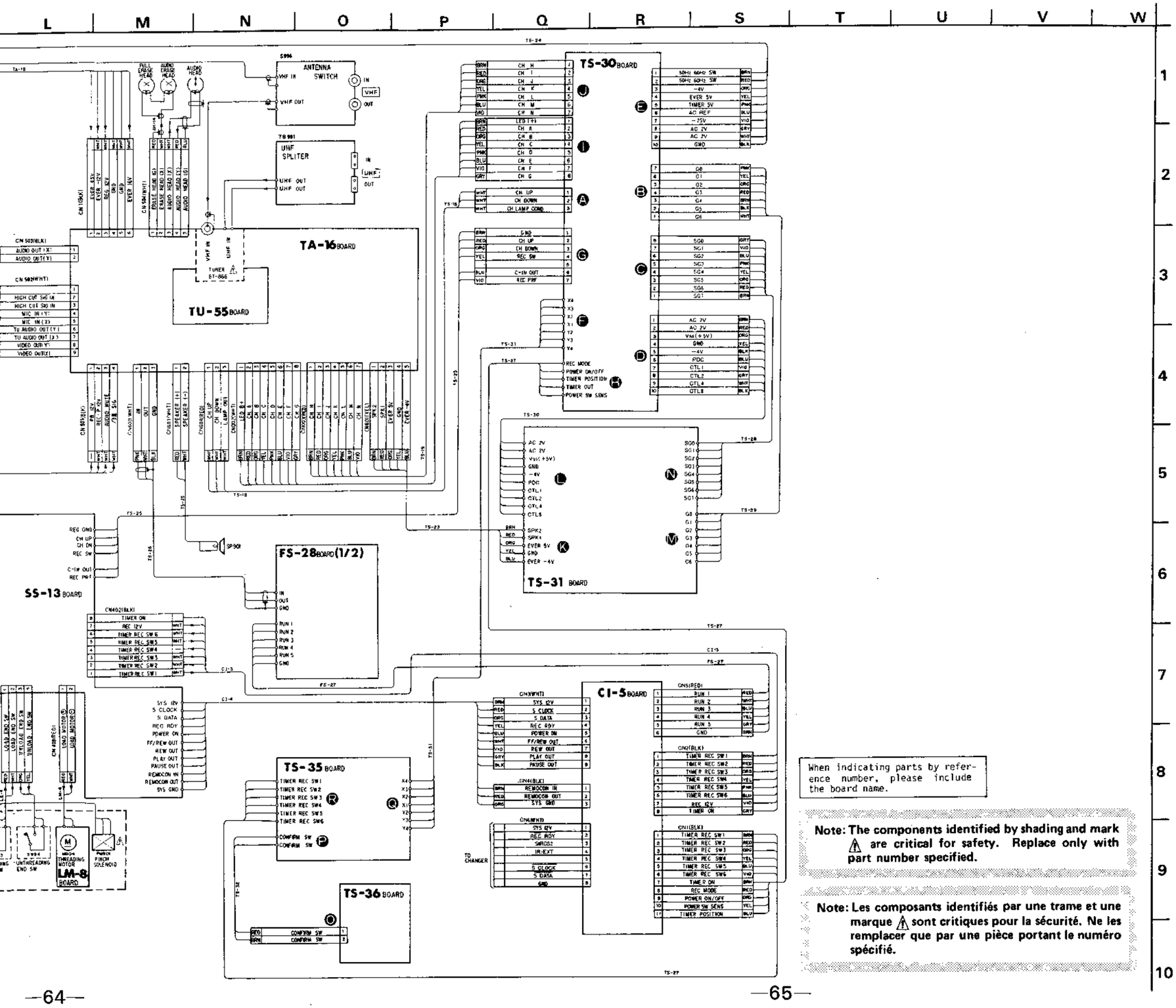


SECTION 4
SCHEMATIC DIAGRAM and PRINTED WIRING BOARDS

FRAME FRAME

4-1. FRAME SCHEMATIC DIAGRAM





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

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

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

WAVEFORM

YC-27 BOARD

IC1 ① REC/PB	IC2 ⑫ PB	IC3 ㉔ REC
IC2 ② REC/PB	IC3 ① REC/PB 4.27MHz CARRIER	IC3 ㉔ PB
IC1 ③ REC/PB RF SW PULSE	IC3 ③ PB	IC4 ① REC
IC1 ④ REC/PB	IC3 ⑤ PB	IC4 ① PB
IC1 ⑰ REC/PB	IC3 ⑥ REC	IC4 ② REC
IC1 ⑳ REC/PB	IC3 ⑧ REC	IC4 ② PB
IC1 ㉑ REC/PB	IC3 ⑪ REC	IC4 ④ REC/
IC2 ① PB	IC3 ⑪ PB	IC4 ⑥ PB
IC2 ⑪ PB	IC3 ⑯ REC/PB	IC4 ⑫ PB

T U V W

1 2 3 4 5 6 7 8 9 10

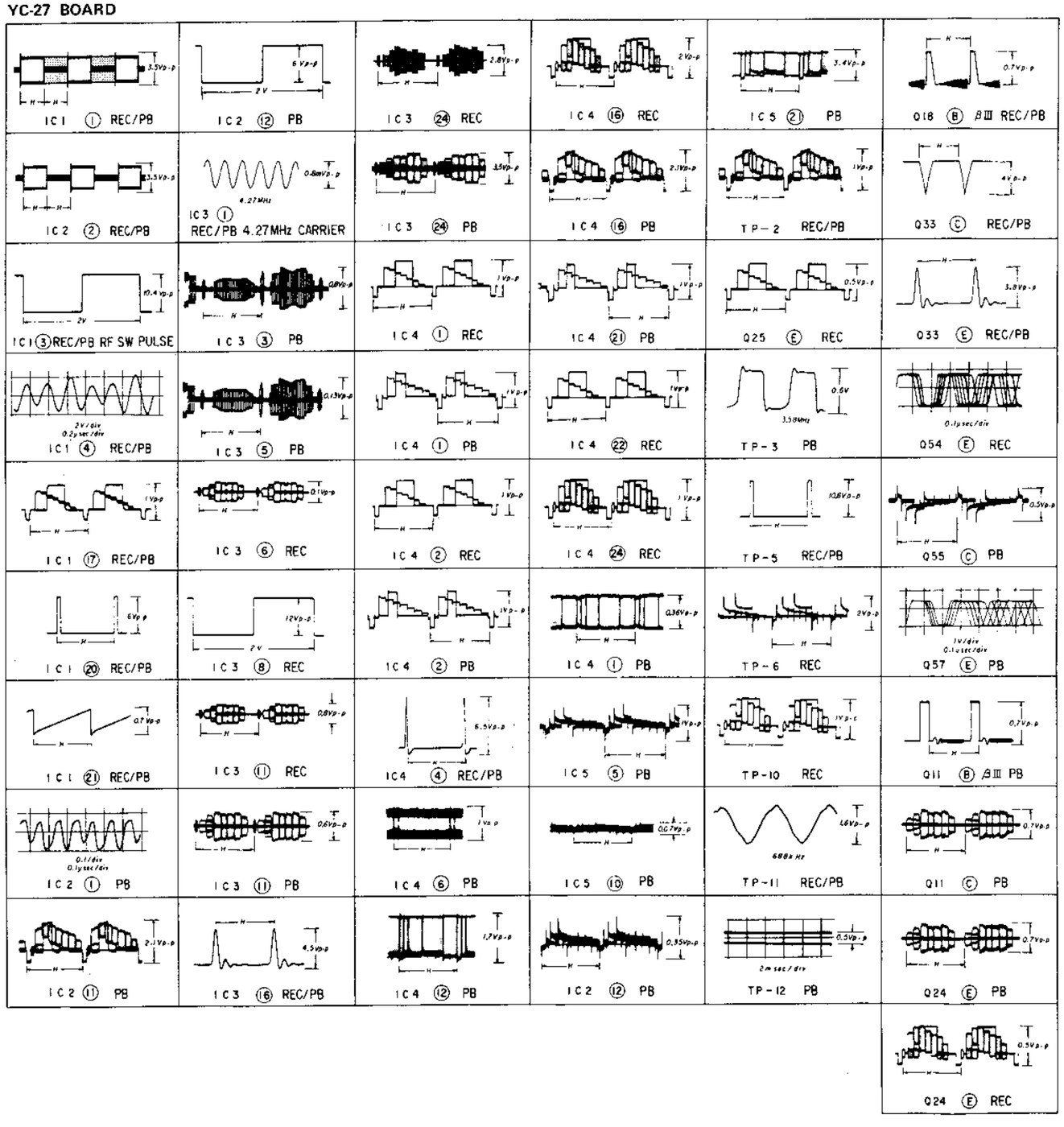
When indicating parts by reference number, please include the board name.

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

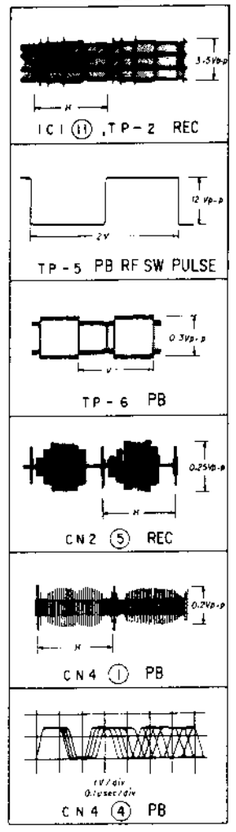
Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

WAVEFORM

YC-27 BOARD



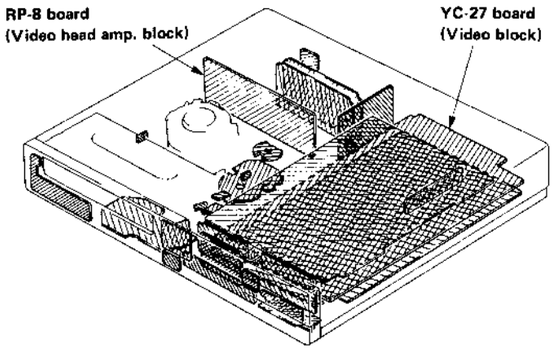
RP-8 BOARD



YC-27 (Y & CHROMA SIGNALS RECORD/PLAYBACK PROCESS), RP-8 (PB DOWN-CONVERTED CHROMA, Y-FM SIGNAL, RECORD/PLAYBACK) SCHEMATIC DIAGRAM

– Ref. No. YC-27 BOARD : 1,000 series, RP-8 BOARD : 2,000 series –

CIRCUIT BOARDS LOCATION

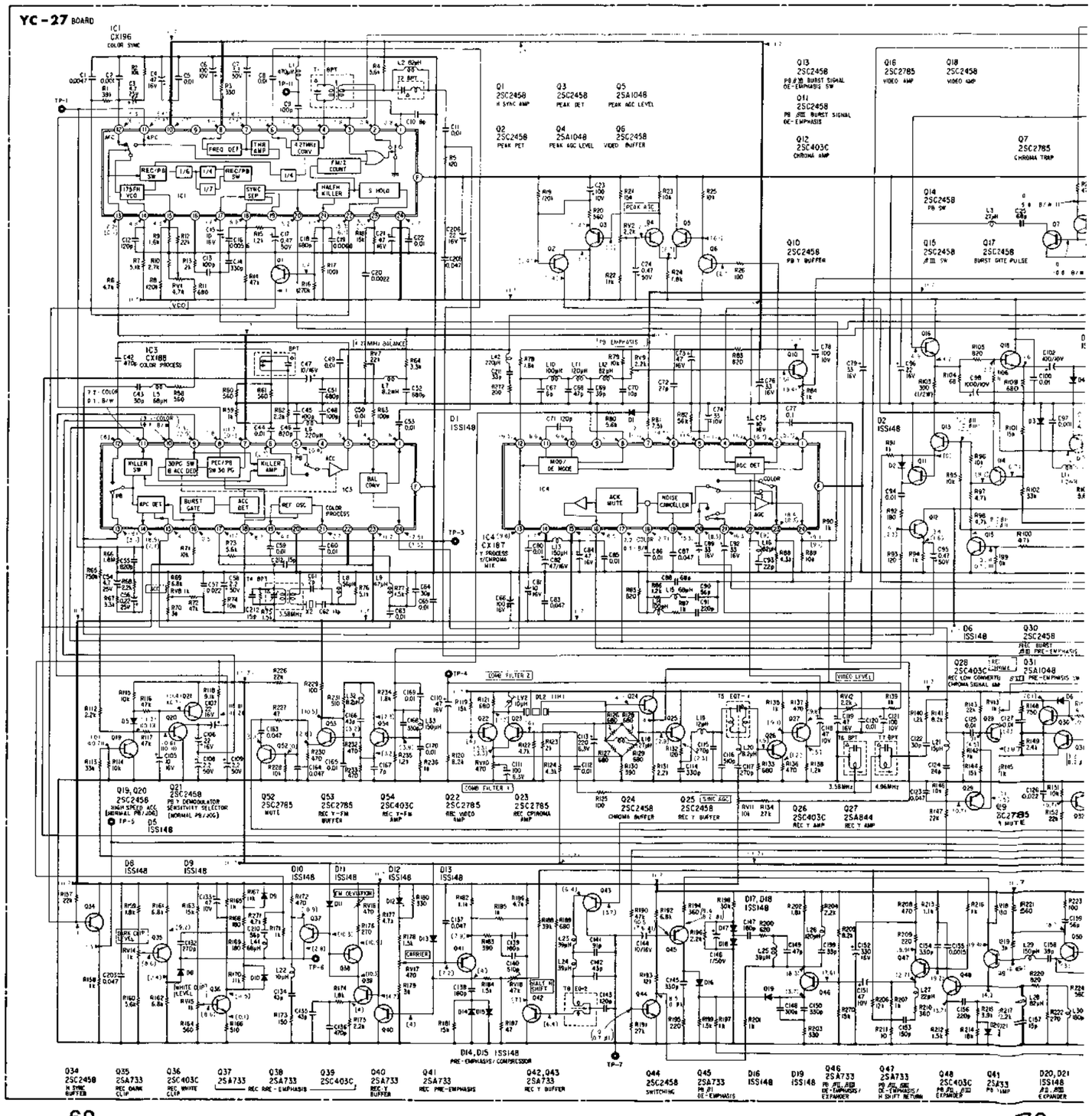


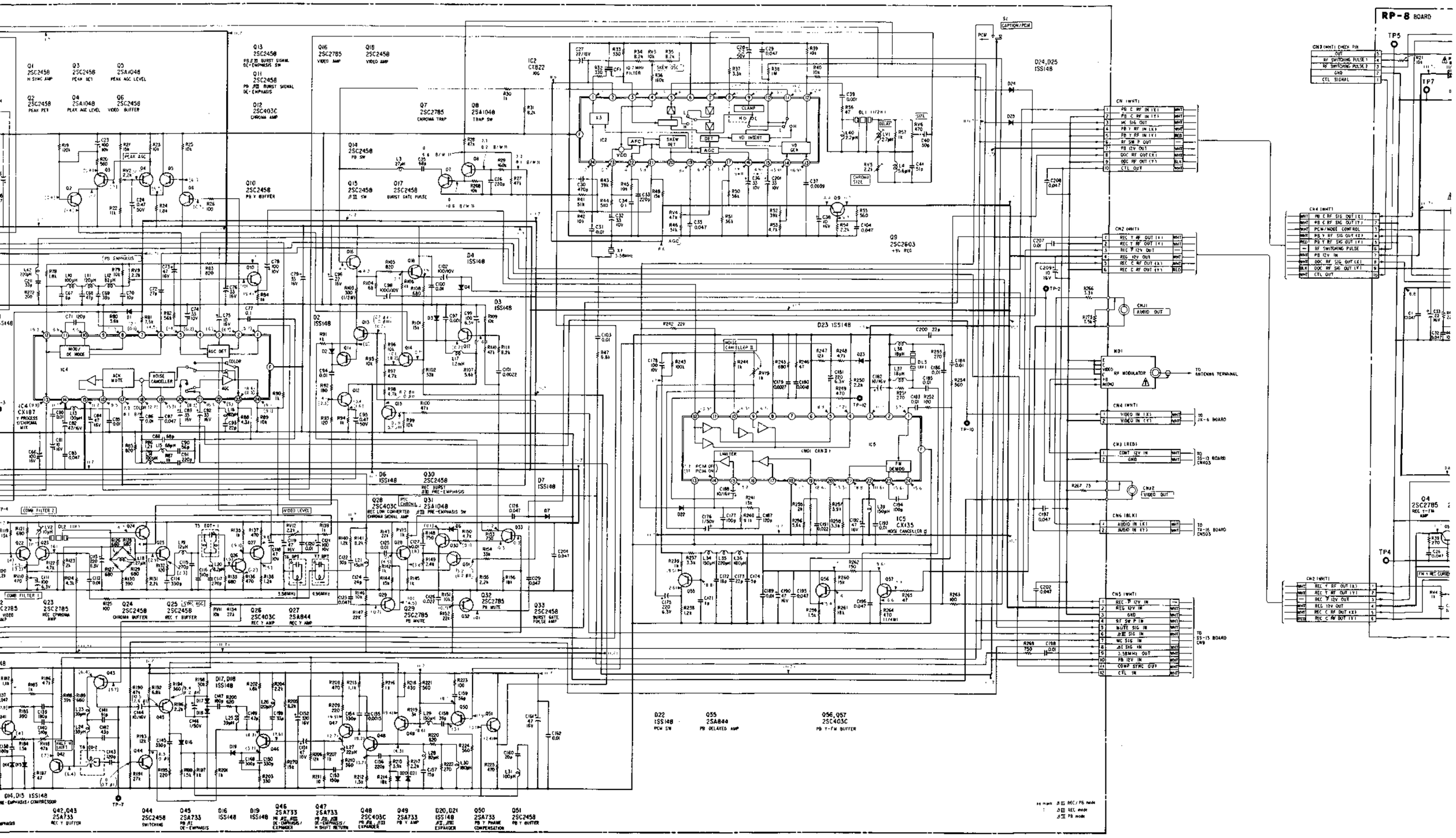
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- 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.
- ▭ : panel designation.
- ⏦ : Nonflammable resistor
- ⏦ : Fusible resistor
- ▭ : adjustment for repair.
- ——: B+ bus.
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.
- All voltages are dc measured with a VOM (10 MΩ).

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

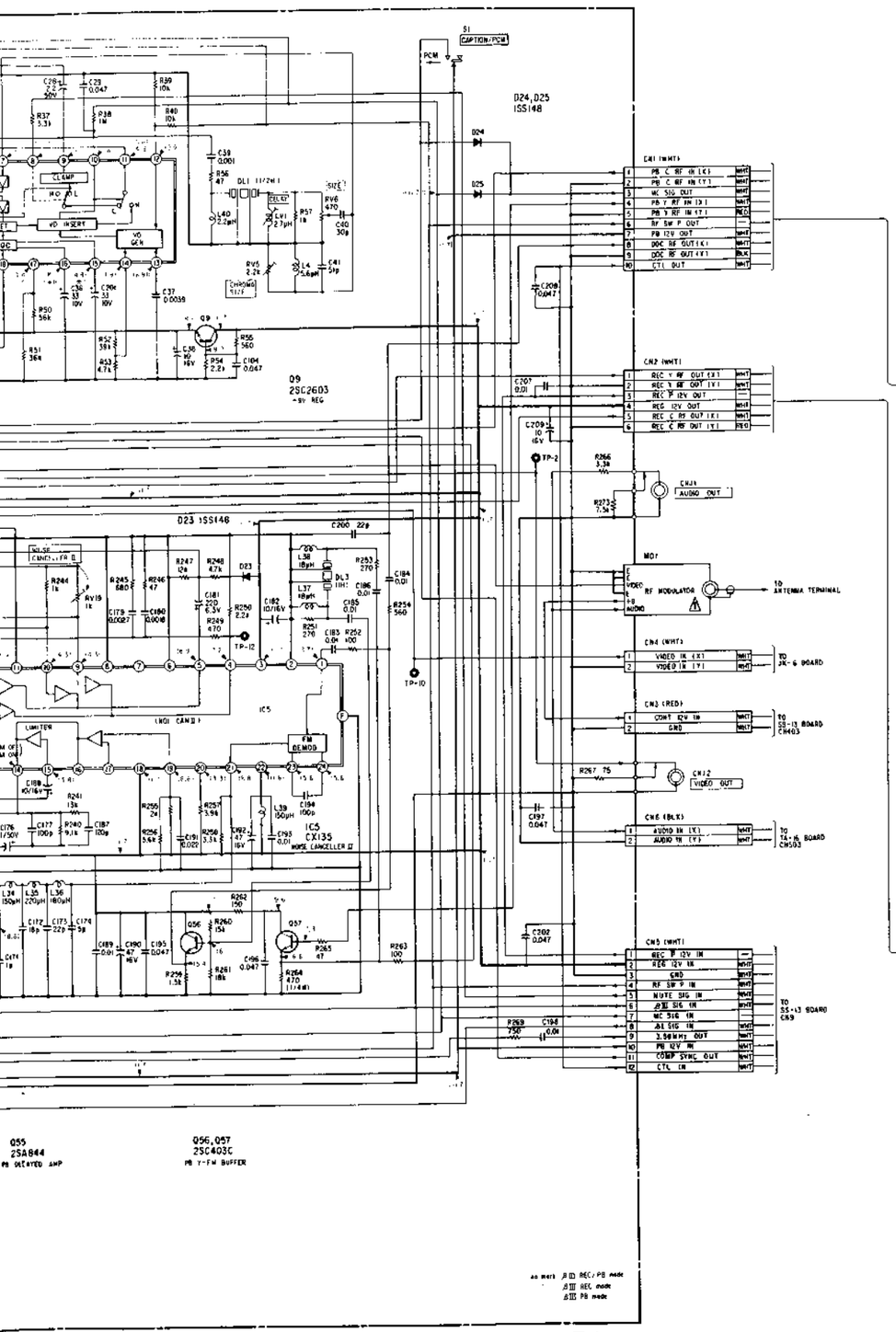


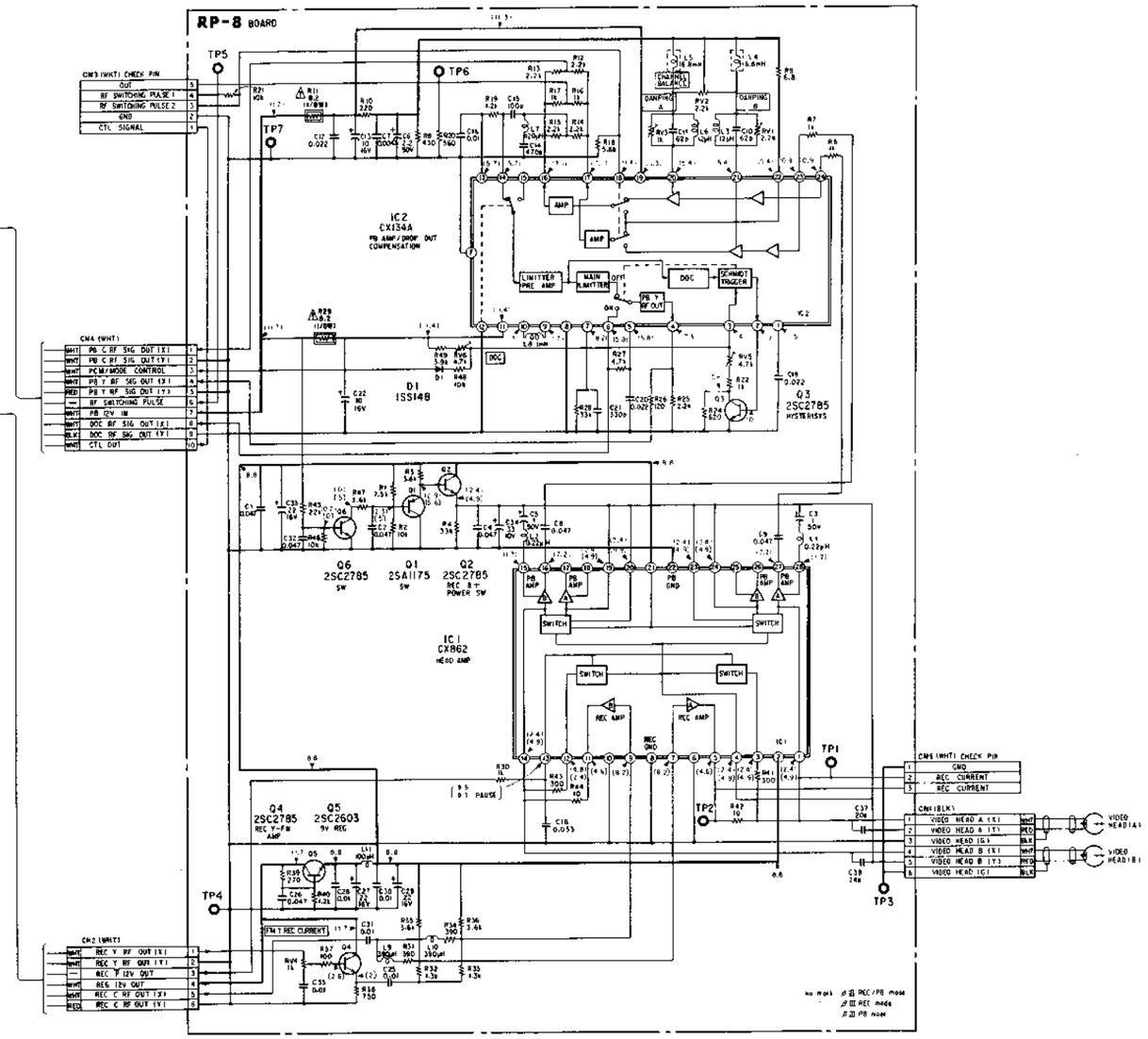

L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
A1
RP-8 BOARD
TP5
TP7
TP4
IC2 CX822
IC4 CX187 Y PROCESS /CHROMA MIX
IC5 CX135 NOISE CANCELLER II
D24,D25 1SS148
D23 1SS148
Q9 2SC2603
CN1 (WHT)
CN2 (WHT)
CN3 (RED)
CN4 (WHT)
CN5 (WHT)
CN6 (BLK)
MD1 RF MODULATOR
TO ANTENNA TERMINAL
CNJ1 AUDIO OUT
CNJ2 VIDEO OUT
TO JX-6 BOARD
TO SS-13 BOARD CN403
TO TR-16 BOARD CN503
TO SS-13 BOARD CN9
TP-2
TP-7
TP-10
TP-12
D22 1SS148 PCM SW
Q55 2SA844 PB DELAYED AMP
Q56,Q57 2SC403C PB Y-FM BUFFER
D14,D15 1SS148
Q42,Q43 2SA733 REC Y BUFFER
Q44 2SC2458 SWITCHING
Q45 2SA733
D16 1SS148
D19 1SS148
Q46 2SA733
Q47 2SA733
Q48 2SC403C
Q49 2SA733 PB Y AMP
D20,D21 1SS148 EXPANDER
Q50 2SA733 PB Y PHASE COMPENSATION
Q51 2SC2458 PB Y BUFFER
Q23 2SC2785 REC CHROMA AMP
Q24 2SC2458 CHROMA BUFFER
Q25 2SC2458 REC Y BUFFER
Q26 2SC403C REC Y AMP
Q27 2SA844 REC Y AMP
Q29 2SC2785 PB MUTE
Q32 2SC2785 PB MUTE
Q33 2SC2458 BURST GATE PULSE AMP
Q28 2SC403C REC LOW CONVERTED CHROMA SIGNAL AMP
Q31 2SA1048
Q30 2SC2458
D6 1SS148
D7 1SS148
Q1 2SC2458 H SYNC AMP
Q2 2SC2458 PEAK DET
Q3 2SC2458 PEAK DET
Q4 2SA1048 PEAK AGC LEVEL
Q5 2SA1048 PEAK AGC LEVEL
Q6 2SC2458 VIDEO BUFFER
Q10 2SC2458 PB Y BUFFER
Q11 2SC2458
Q12 2SC403C CHROMA AMP
Q13 2SC2458
Q14 2SC2458 PB SW
Q15 2SC2458
Q16 2SC2785 VIDEO AMP
Q17 2SC2458 BURST GATE PULSE
Q18 2SC2458 VIDEO AMP
Q7 2SC2785 CHROMA TRAP
Q8 2SA1048 TRAP SW
D2 1SS148
D3 1SS148
D4 1SS148

T U V W X Y Z A1 B1 C1 D1 E1 F1 G1 H1 I1

1 2 3 4 5 6 7 8 9 10

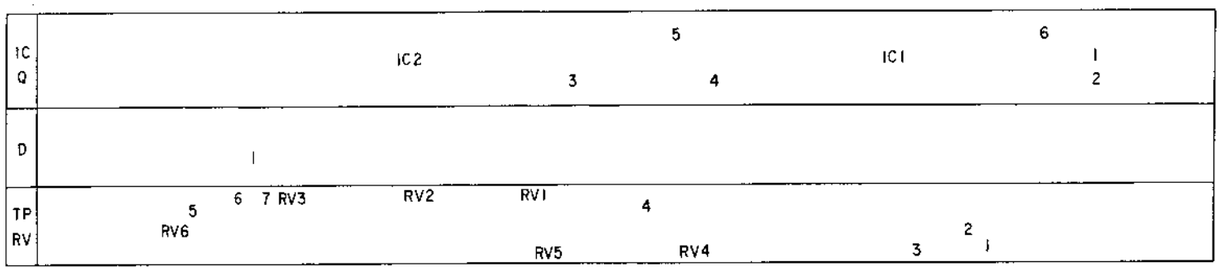
RP-8 BOARD

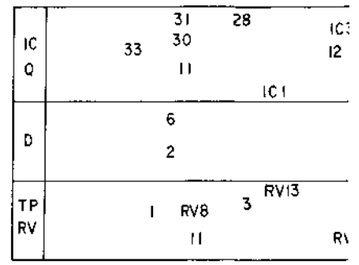




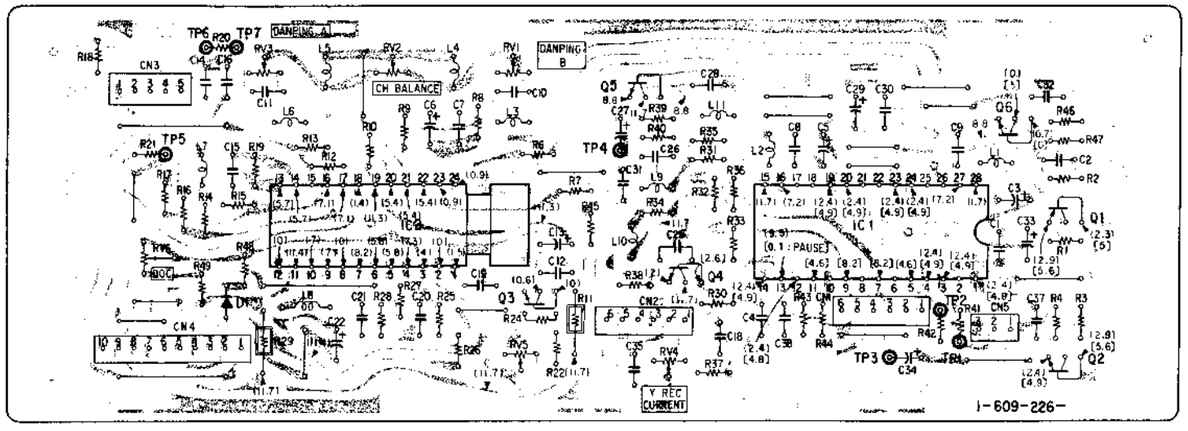
YC-27 (Y & CHROMA SIGNALS RECORD/PLAYBACK PROCESS), RP-8 (DOWN-CONVERTED CHROMA, Y-FM SIGNAL, RECORD/PLAYBACK) PRINTED WIRING BOARDS

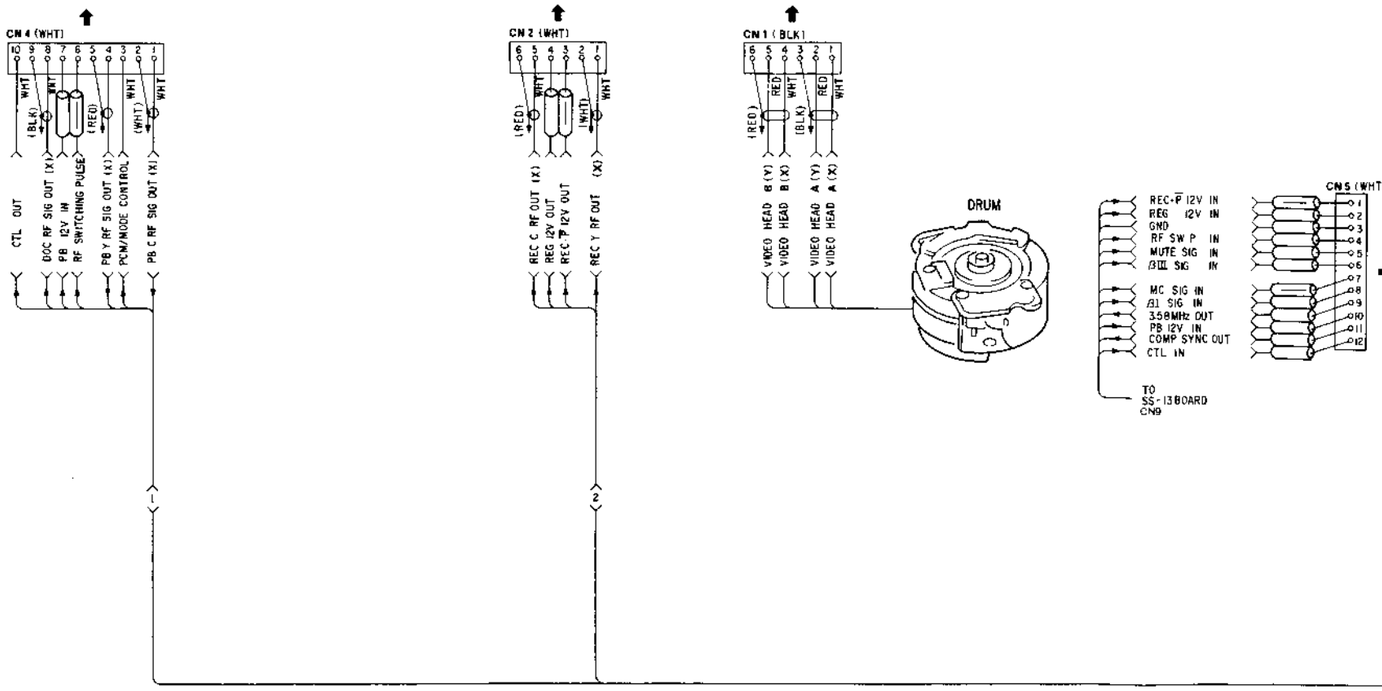
– Ref No. YC-27 BOARD : 1,000 series, RP-8 BOARD : 2,000 series –



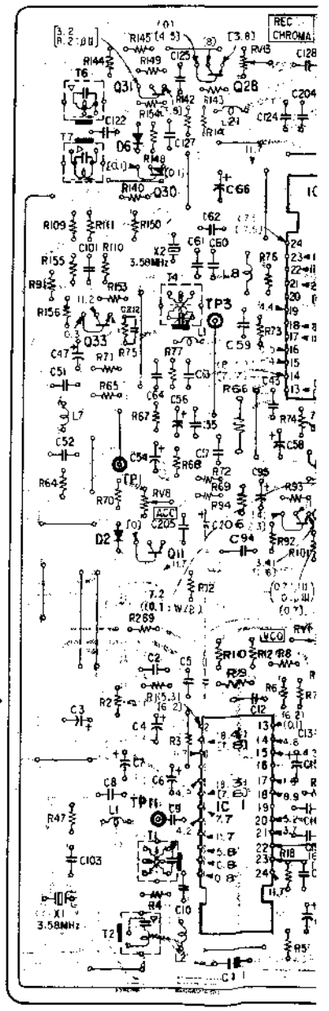


【RP-8 BOARD】





【YC-27 BOARD】

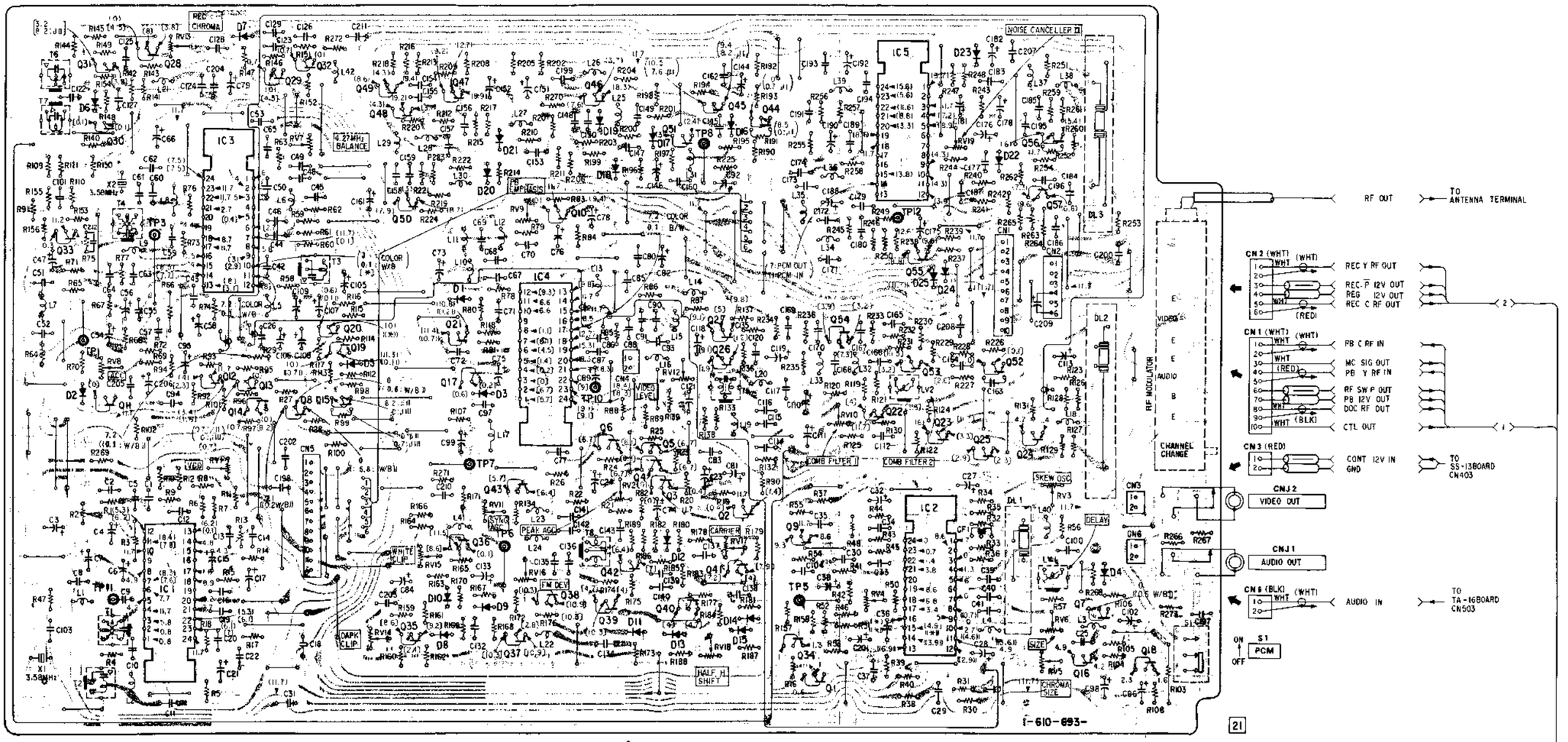


When indicating parts by reference number, please include the board name.

M N O P Q R S T U V W X Y Z A1 B1 C

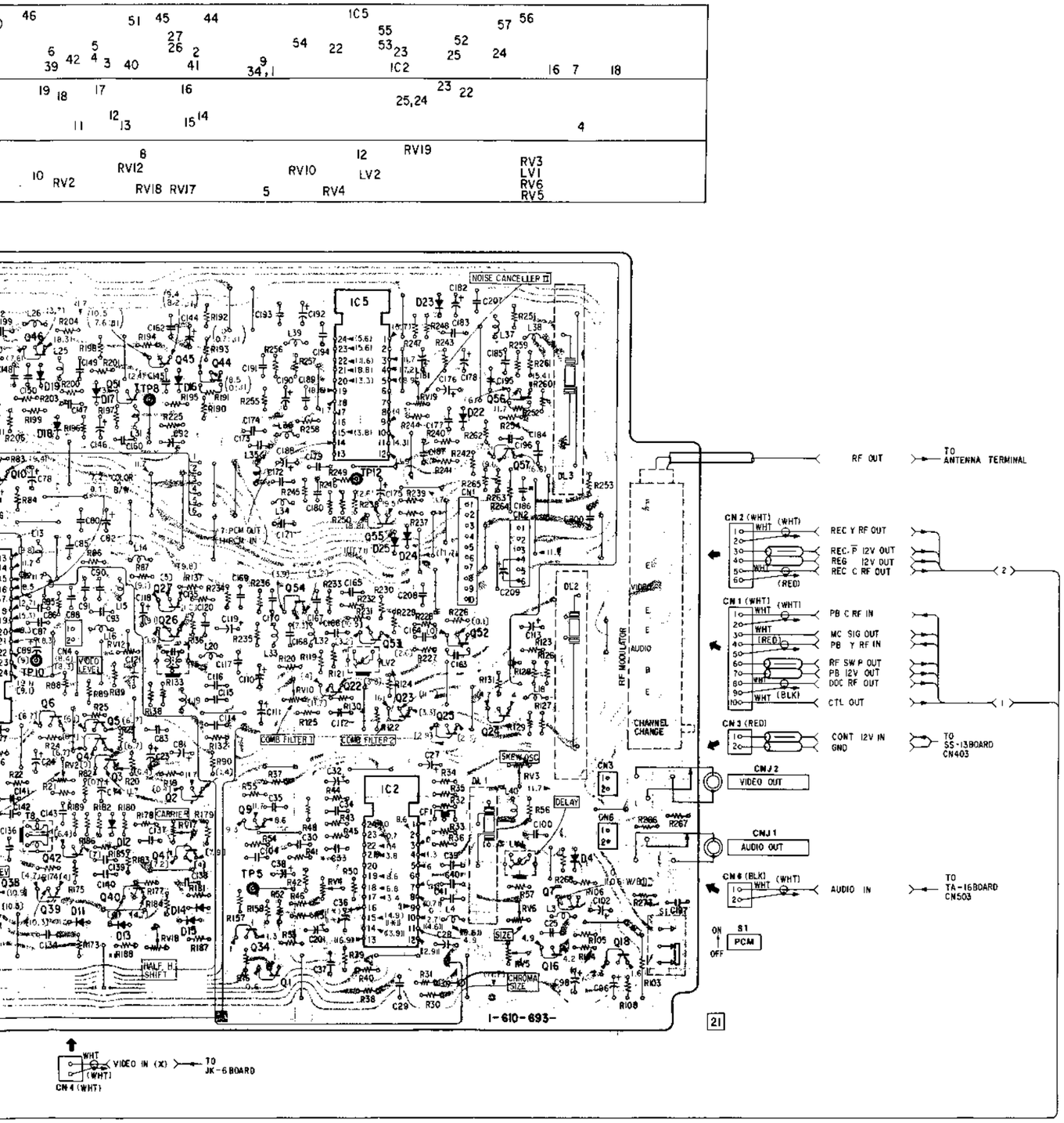
IC	31 28 IC3 29 32 49 48 47 10 46 51 45 44 IC5 57 56
Q	33 30 12 13 14 8 20,19 15 50 21 17 IC4 43 6 42 5 4 3 40 27 26 2 54 22 55 53 23 52 25 24 11 IC1 35 36 37 38 39 41 9 34,1 IC2 16 7 18
D	6 7 5 1 20 21 3 9 19 18 17 16 23 22 2 8 10 11 12 13 15 14 25,24 4
TP RV	1 RV8 3 RV13 RV7 RV9 8 RV12 12 RV19 11 RV1 RV14 RV15 7 RV11 6 RV16 10 RV2 RV18 RV17 RV10 LV2 5 RV4 RV3 LV1 RV6 RV5

[YC-27 BOARD]



T U V W X Y Z A1 B1 C1 D1

1 2 3 4 5 6 7 8 9 10



SERVO, SYSTEM CONTROL SERVO, SYSTEM CONTROL

FS-19 (CASSETTE CONTROL SWITCH), FS-28 (TAPE RUNNING LED, POWER SWITCH), FS-29 (TRACKING VOLUME), FS-33 (REC, TV/VTR SELECT SWITCH), PS-29 (REEL MOTOR DRIVE), CS-3 (CASSETTE OFF SWITCH), CS-4 (CASSETTE ON SWITCH), C

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P

– Ref. No. FS-19 BOARD : 4,000 series, FS-28 BOARD: 4,200 series, FS-29 BOARD : 4,300 series, FS-33 BOARD : 4,100 series, PS-29 BOARD : 3,000 series, CS-3 BOARD : 9,300 series, CS-4 BOARD : 9,300 series, CI-5 BOARD : 4,400 s

1 2 3 4 5 6 7 8 9 10

CI-5 BOARD

RD-5 BOARD

CS-3 BOARD

CS-4 BOARD

SS-13 BOARD

FS-19 BOARD

FS-28 BOARD

FS-29 BOARD

FS-33 BOARD

TS-35 BOARD (2/2)

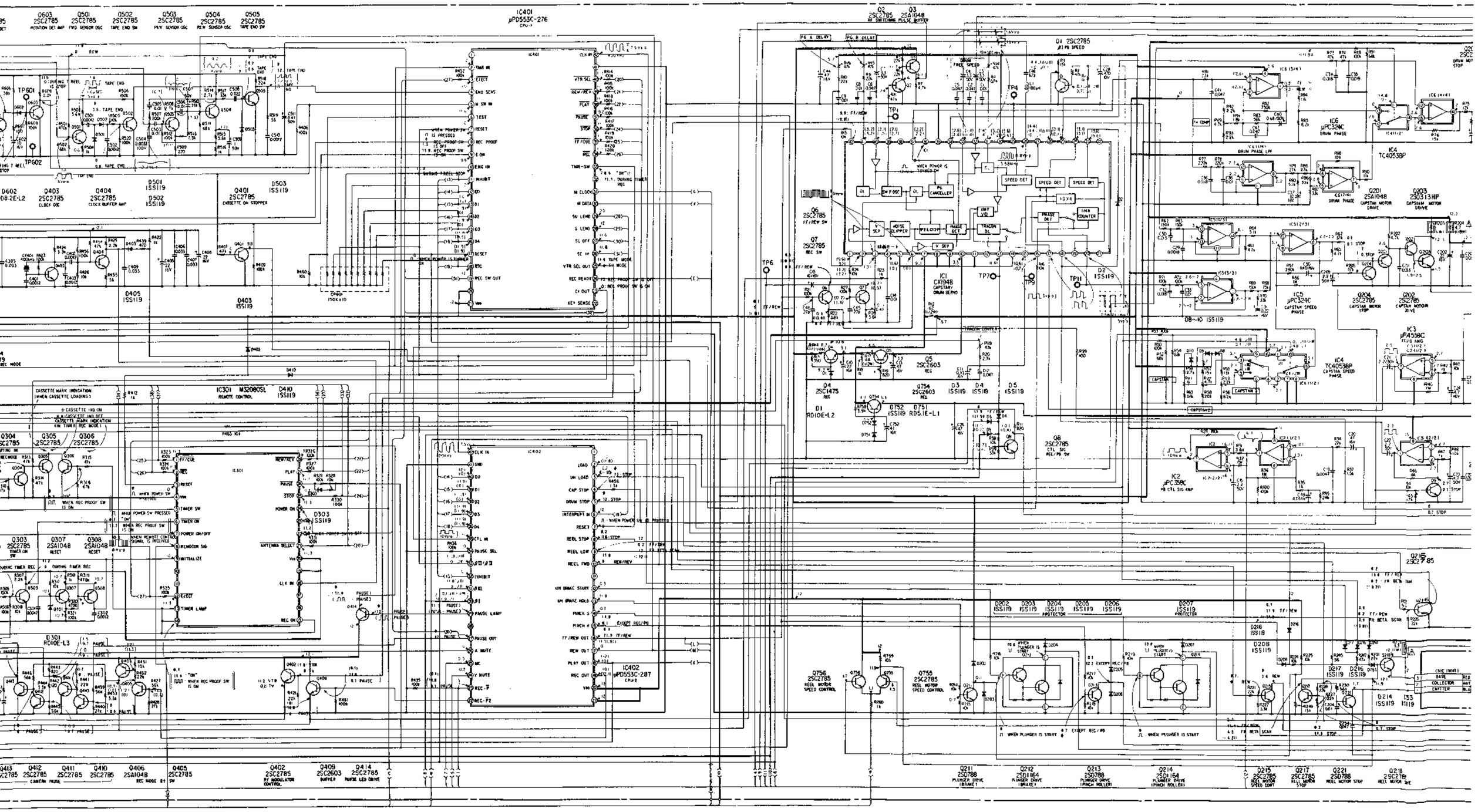
N BOARD

JK-6 BOARD (1/2)

R DRIVE), CS-3 (CASSETTE OFF SWITCH), CS-4 (CASSETTE ON SWITCH), CI-5 (CHANGER INTERFACE), N (REMOTE CONTROL SIGNAL SENSOR), RD-5 (ROTATION DETECTOR), SS-13 (SERVO/SYSTEM CONTROL), LM-8 (NOISE FILTER), JK-6 (CAMERA R

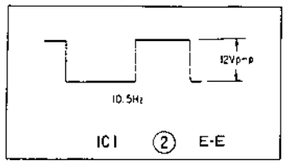
L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A1	B1

RD : 3,000 series, CS-3 BOARD : 9,300 series, CS-4 BOARD : 9,300 series, CI-5 BOARD : 4,400 series, N BOARD : 9,600 series, RD-5 BOARD : 9,200 series, SS-13 BOARD : 3,000 series, LM-8 BOARD : 9,100 series, JK-6 BOARD: 9,000 series, REEL MOTOR BOARD : 5,000 series, CAPSTAN MOTOR BOARD : 5,100 series –

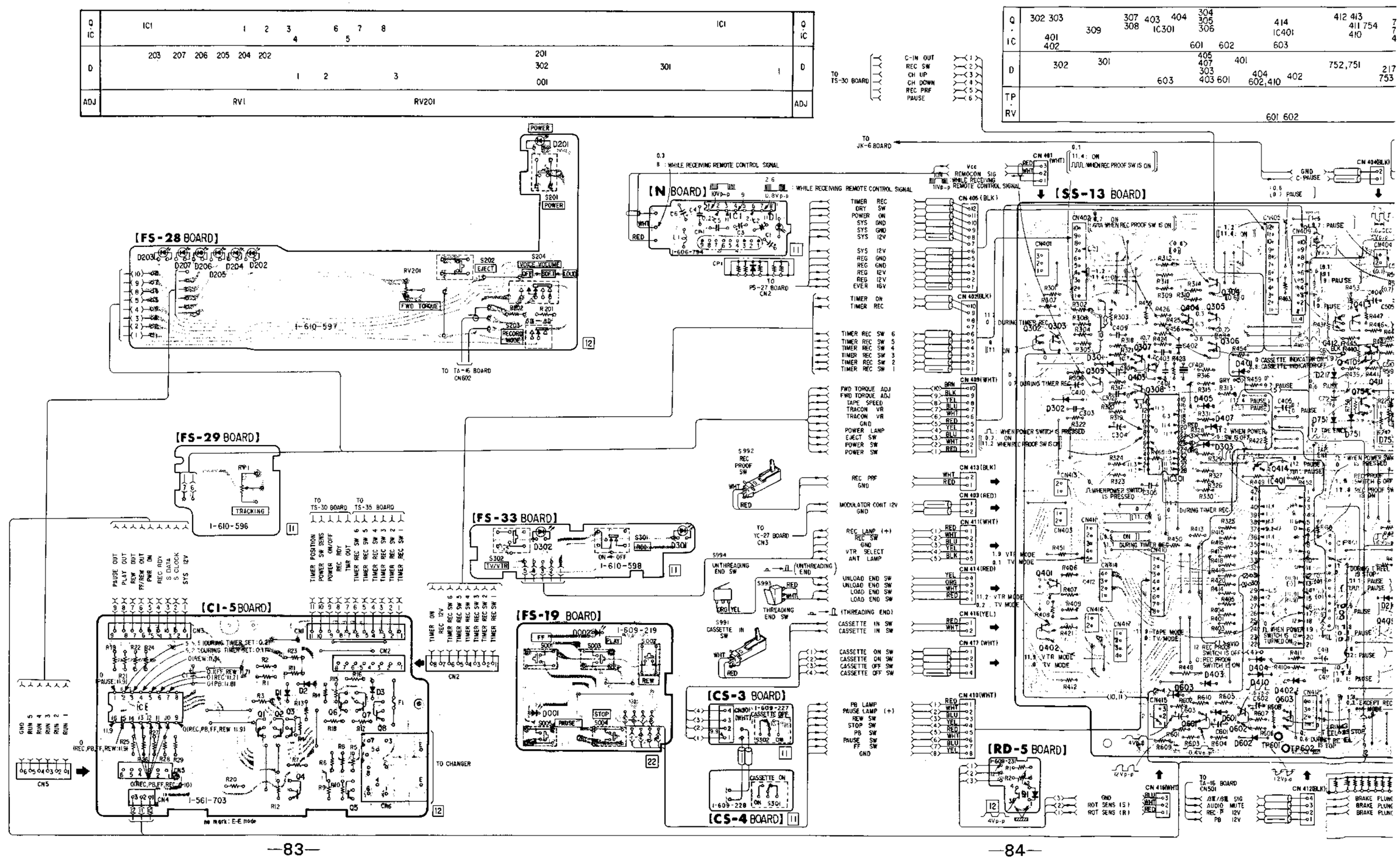


When indicating parts by reference number, please include the board name.

CI-5 BOARD



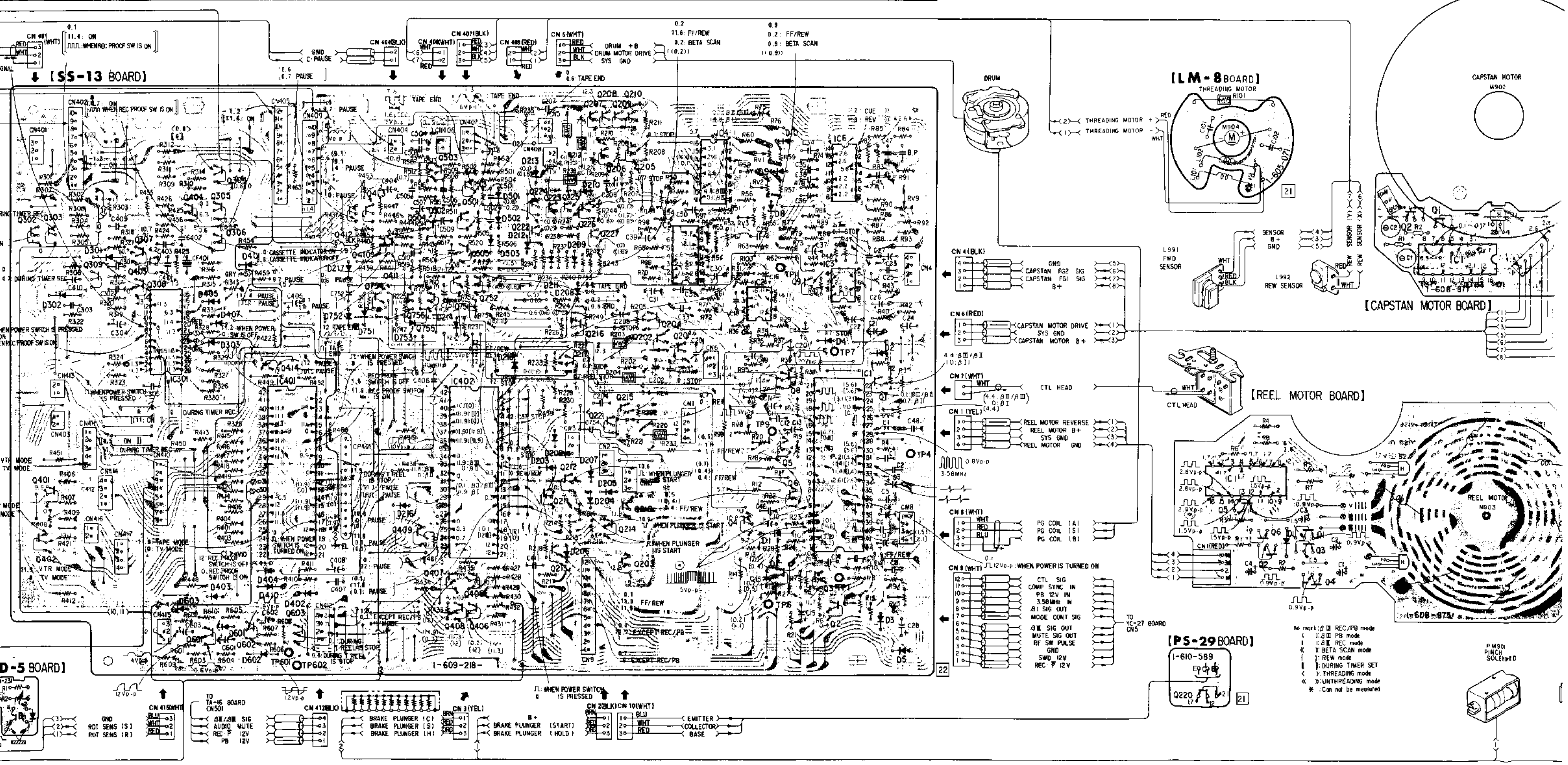
FS-19 (CASSETTE CONTROL SWITCH), FS-28 (TAPE RUNNING LED, POWER SWITCH), FS-29 (TRACKING VOLUME), FS-33 (REC, TV/VTR SELECT SWITCH), PS-29 (REEL MOTOR DRIVE), CS-3 (CASSETTE OFF SWITCH), CS-4 (CASSETTE ON SWITCH)



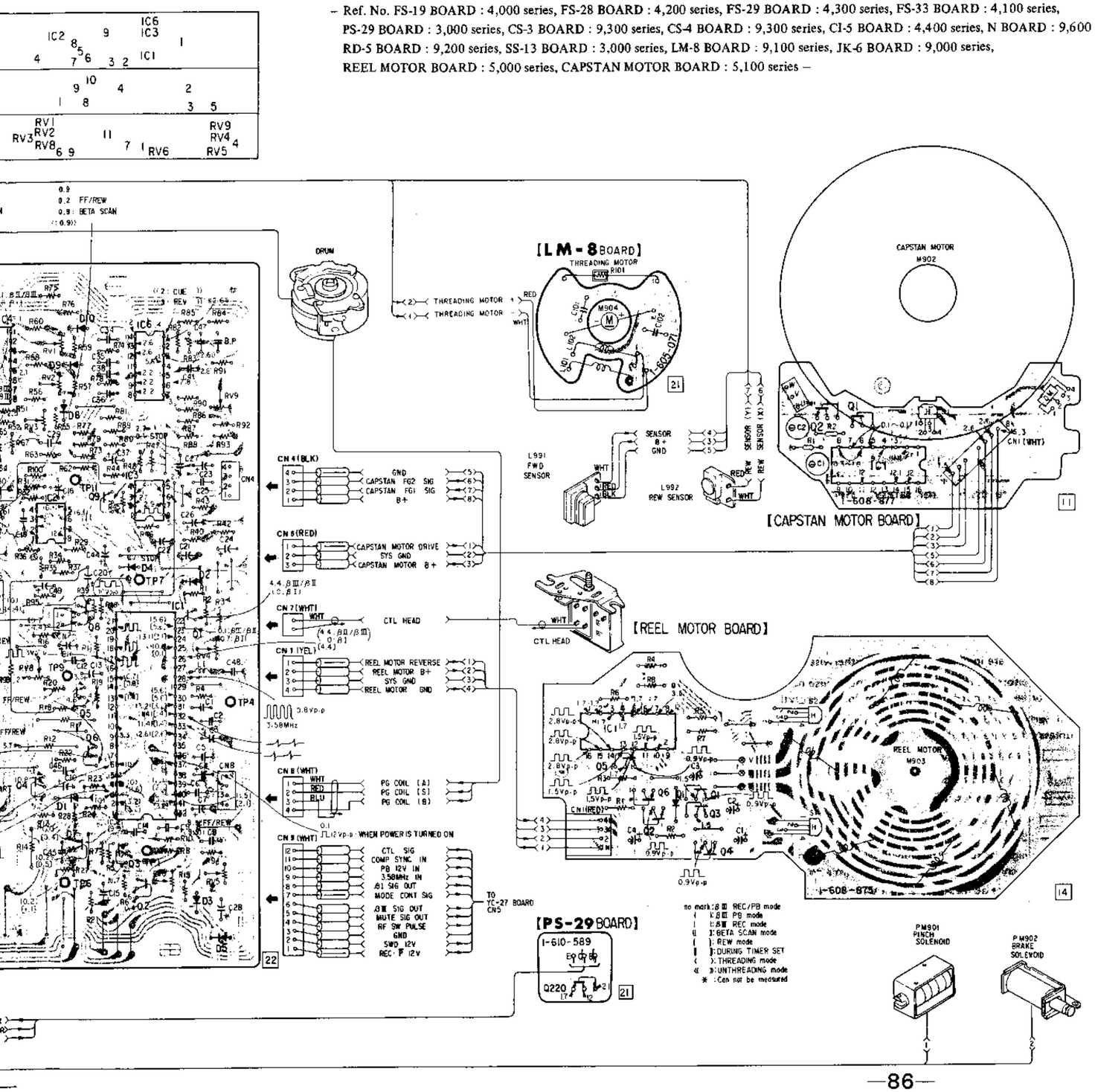
IVE), CS-3 (CASSETTE OFF SWITCH), CS-4 (CASSETTE ON SWITCH), CI-5 (CHANGER INTERFACE), N (REMOTE CONTROL SIGNAL SENSOR), RD-5 (ROTATION DETECTOR), SS-13 (SERVO/SYSTEM CONTROL), LM-8 (NOISE FILTER), JK-6 (CAMERA REMOT

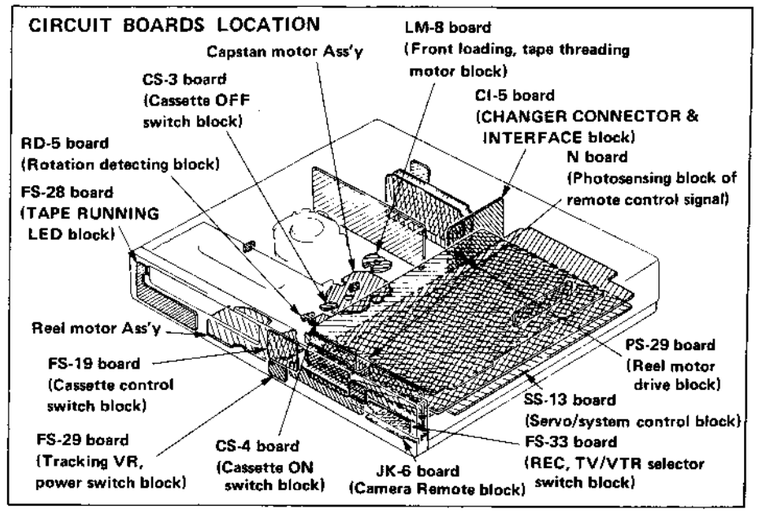
	M	N	O	P	Q	R	S	T	U	V
Q	302 303 309	307 308 403 IC301 404 304 305 306	414 IC401	412 413 411 754 410	755 756 409 503 504 505 501 502 751 752 IC402	224 223 225 222 226 216 211 217	207,208,209,210 206 227 205 204 202 201 IC5	IC4 IC2 8 5	9 IC6 IC3	
C	401 402	601	602 603		407 405 408 406	211 217 213 212	221 215 214 218 203	4 7 6	3 2 IC1	
D	302 301	603 405 407 303 403 601	401 404 602,410 402	752,751	217 753 216 503,214,502 501	213 211 212 218 202 210 209 208 203 206	207 204 205	9 10 1 8	4	2 3 5
TP / RV			601 602					RV1 RV3 RV2 RV8 6 9	11 7 RV6	RV9 RV4 RV5 4

– Ref. No. FS-19 BOARD : 4,000 series, FS-28 BOARD : 4,200 series, FS-29 BOARD : 4,300 series, FS-33 BOARD : 4,
PS-29 BOARD : 3,000 series, CS-3 BOARD : 9,300 series, CS-4 BOARD : 9,300 series, CI-5 BOARD : 4,400 series, N B
RD-5 BOARD : 9,200 series, SS-13 BOARD : 3,000 series, LM-8 BOARD : 9,100 series, JK-6 BOARD : 9,000 series,
REEL MOTOR BOARD : 5,000 series, CAPSTAN MOTOR BOARD : 5,100 series –



– Ref. No. FS-19 BOARD : 4,000 series, FS-28 BOARD : 4,200 series, FS-29 BOARD : 4,300 series, FS-33 BOARD : 4,100 series, PS-29 BOARD : 3,000 series, CS-3 BOARD : 9,300 series, CS-4 BOARD : 9,300 series, CI-5 BOARD : 4,400 series, N BOARD : 9,600 series, RD-5 BOARD : 9,200 series, SS-13 BOARD : 3,000 series, LM-8 BOARD : 9,100 series, JK-6 BOARD : 9,000 series, REEL MOTOR BOARD : 5,000 series, CAPSTAN MOTOR BOARD : 5,100 series –





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

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- 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.
- ▭ : panel designation.
- : Nonflammable resistor
- : Fusible resistor
- ▭ : adjustment for repair.
- —— : B+ bus.
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.
- All voltages are dc measured with a VOM (10MΩ).

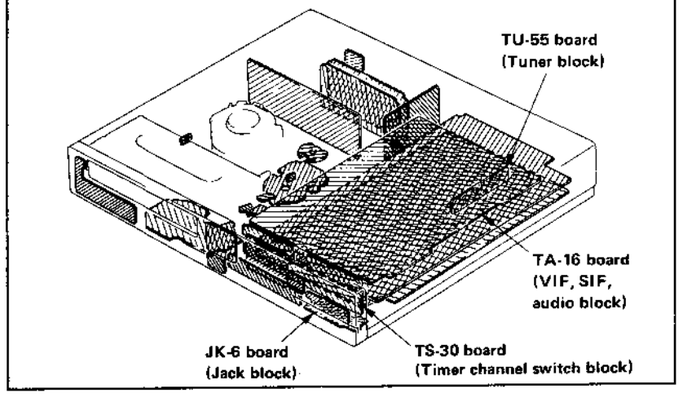
When indicating parts by reference number, please include the board name.

TUNER , AUDIO TUNER , AUDIO

TA-16 (VIF, SIF, AFT, AGC), TU-55 (TUNER), JK-6 (JACK), TS-30 (TIMER CHANNEL SWITCH) SCHEMATIC DIAGRAM

– Ref. No. TA-16 BOARD : 6,000 series, TU-55 BOARD : 6,000 series, JK-6 BOARD : 9,000 series, TS-30 BOARD : 8,000 series –

CIRCUIT BOARDS LOCATION

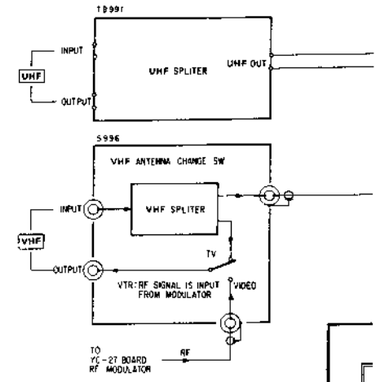


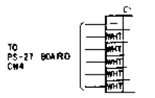
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

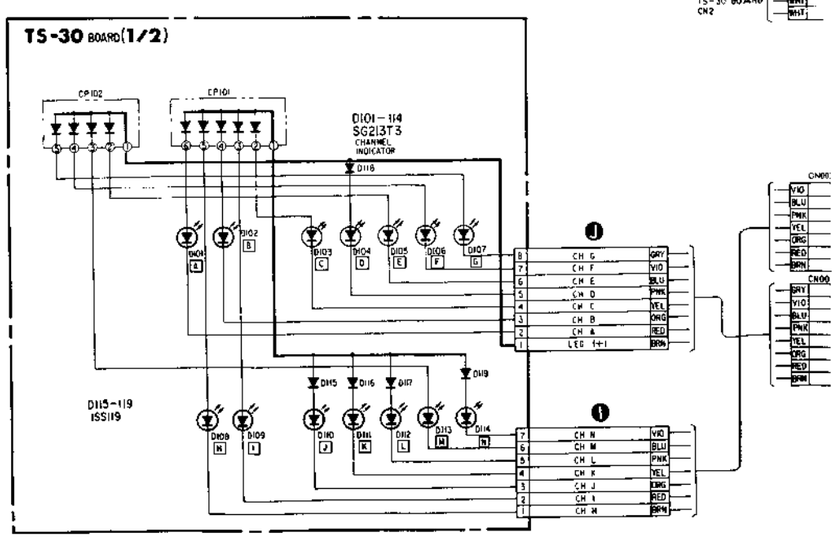
Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- 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.
- ▭ : panel designation.
- ⏦ : Nonflammable resistor
- ⏦ : Fusible resistor
- ▭ : adjustment for repair.
- ——— : B+ bus.
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.
- All voltages are dc measured with a VOM (10MΩ).

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







H I J K L M N O P Q R S T U V W X

TA-16 BOARD

TU-55 BOARD

IC001 CX885B VHF/BIF

IC501 LA7046 REC/PB

IC401 μPC1363C BAND SELECTER AFT

IC601 μPC4558C AUDIO CONTROL

IC003 LA7920

Q001 2SC2785 AFT

Q002 2SC2785 AF MUTE

Q003 2SC2785 PHASE COMP

Q004 2SA1048 BUFFER

Q007 2SK43-3 AFT

Q008 2SA1048 BAND VL SW

Q009 2SA1048 BAND VH SW

Q501 2SD774 REC/PB BIAS OSC

Q502,Q503 2SC945 REC BIAS CUT

Q504 2SA1048 PB SW

Q505 2SA1048 PB EQ SW

Q506 2SC2785 HIGH FREQENCY COMPENSATION

Q507 2SC2785 REC EQ

Q510 2SC2785 AGC

Q401 2SA1048 DEFECT

Q402 2SC2785 SW

Q403 2SC2785 SW

Q404 2SC2785 12V REG

Q405 2SC2785 SW

Q406 2SA1048 LED (B+) REG

Q407 2SC2785 33V REG

Q408 2SC2785 SW

D001 ISS119

D002 ISS119

D003,004 ISS119

D007 ISS119

D008,009 ISS119

D401 ISS119

D402 RD13E-B1 12V REG

D501 ISS119

D502 ISS119

IC002 μPC574J 33V REG

D101~114 SG213T3 CHANNEL INDICATOR

P5001 PRESET BLOCK

TP501 TP503 TP504 TP505 TP506

TB991 UHF SPLITER

5996 VHF ANTENNA CHANGE SW

VHF SPLITER

VTR RF SIGNAL IS INPUT FROM MODULATOR

TO YC-27 BOARD RF MODULATOR

TO PS-27 BOARD CN4

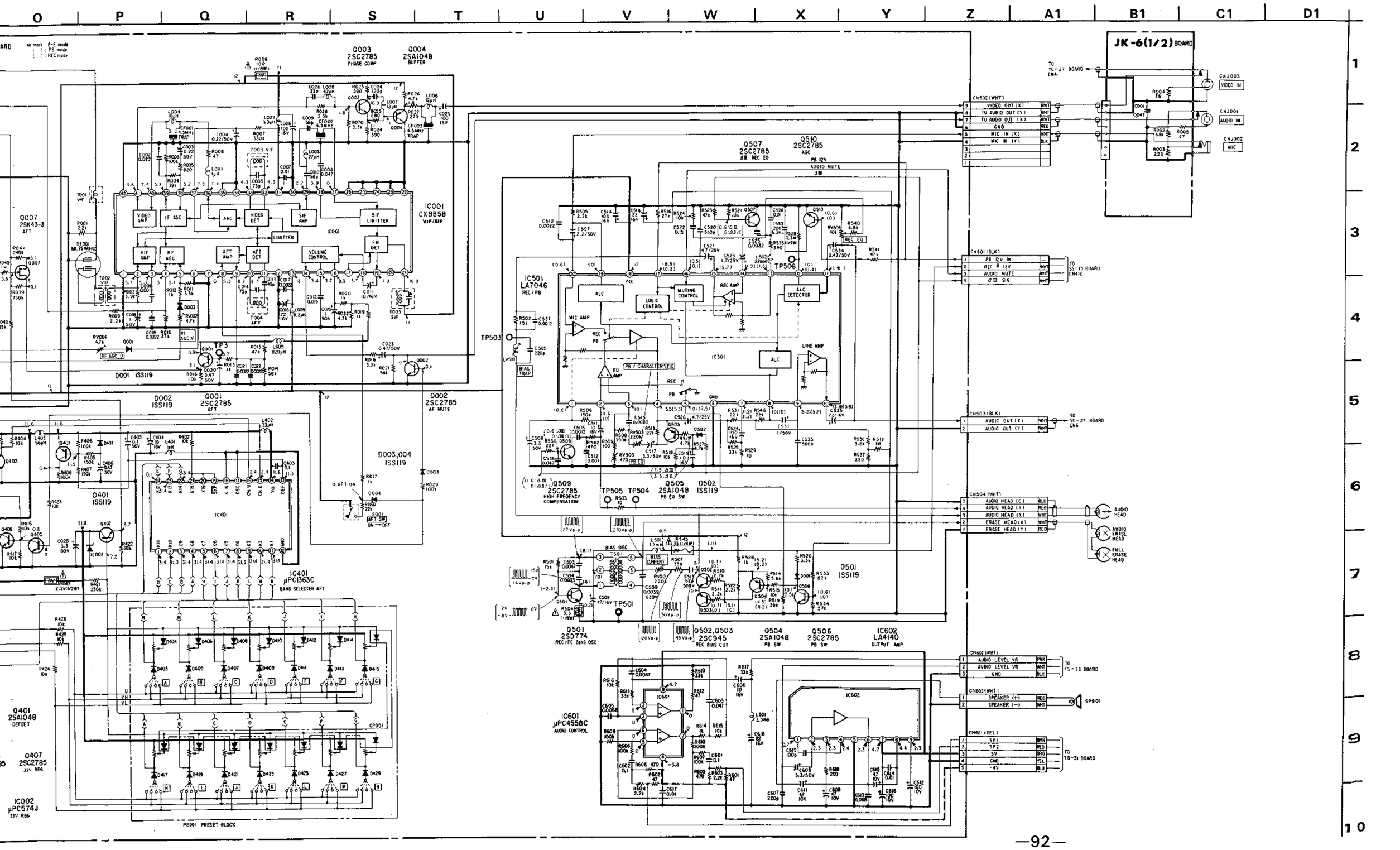
TO PS-30 BOARD CN2

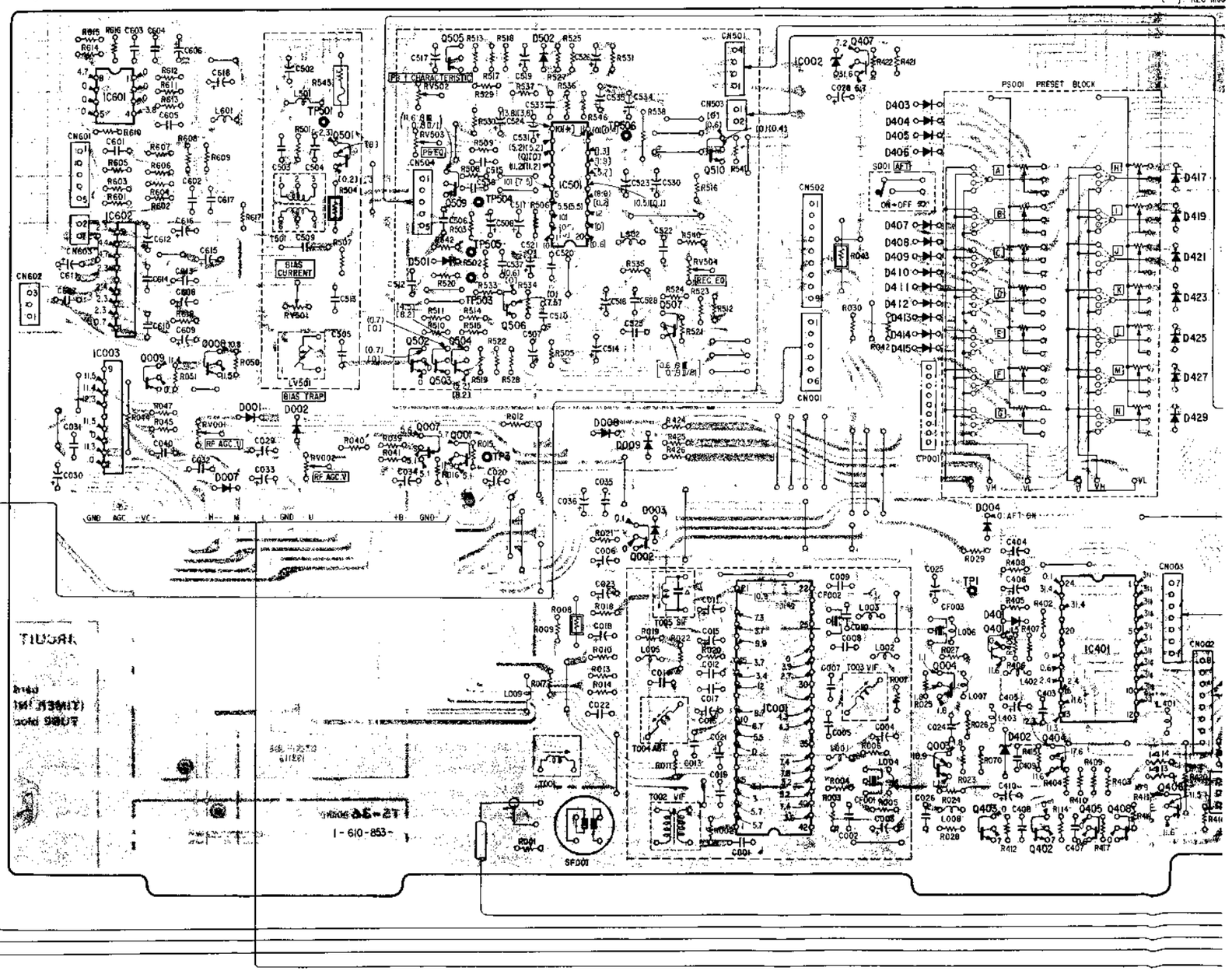
CN001 (BLK)

CN004 (RED)

CN003 (RED)

CN002 (WHT)


O P Q R S T U V W X Y Z A1 B1 C1 D1
1 2 3 4 5 6 7 8 9 10
Q0003 2SC2785 PHASE COMP
Q0004 2SA1048 BUFFER
IC0001 CX885B VIF/SIF
Q0007 2SK43-3 AFT
D0001 ISS119
D0002 ISS119
Q0001 2SC2785 AFT
Q0002 2SC2785 AF MUTE
D0003,004 ISS119
D0401 ISS119
IC401 μPC1363C BAND SELECTER AFT
Q0401 2SA1048 DEFEET
Q0407 2SC2785 33V REG
IC002 μPC574J 33V REG
PS001 PRESET BLOCK
IC501 LA7046 REC/PB
Q507 2SC2785 AF REC EQ
Q510 2SC2785 AGC
TP503
TP506
TP505 TP504
Q505 2SA1048 PB EQ SW
D0502 ISS119
Q0509 2SC2785 HIGH FREQENCY COMPENSATION
TP501
D501 ISS119
Q501 2SD774 REC/PB BIAS OSC
Q502,Q503 2SC945 REC BIAS CUT
Q504 2SA1048 PB SW
Q506 2SC2785 PB SW
IC602 LA4140 OUTPUT AMP
IC601 μPC4558C AUDIO CONTROL
JK-6(1/2) BOARD
CNJ003 VIDEO IN
CNJ004 AUDIO IN
CNJ002 MIC
CN502 (WHT) VIDEO OUT (X) TV AUDIO OUT (Y) TV AUDIO OUT (X) GND MIC IN (X) MIC IN (Y)
CN501 (BLK) PB 12V IN REC P 12V AUDIO MUTE AV III SIG
TO SS-13 BOARD CN432
CN503 (BLK) AUDIO OUT (X) AUDIO OUT (Y)
TO YC-27 BOARD CN6
CN504 (WHT) AUDIO HEAD (G) AUDIO HEAD (Y) AUDIO HEAD (X) ERASE HEAD (X) ERASE HEAD (Y)
AUDIO HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
CN502 (WHT) AUDIO LEVEL VR AUDIO LEVEL VR GND
TO FS-28 BOARD
CN603 (WHT) SPEAKER (+) SPEAKER (−)
SP901
CN601 (YEL) SP1 SP2 5V GND -4V
TO TS-31 BOARD

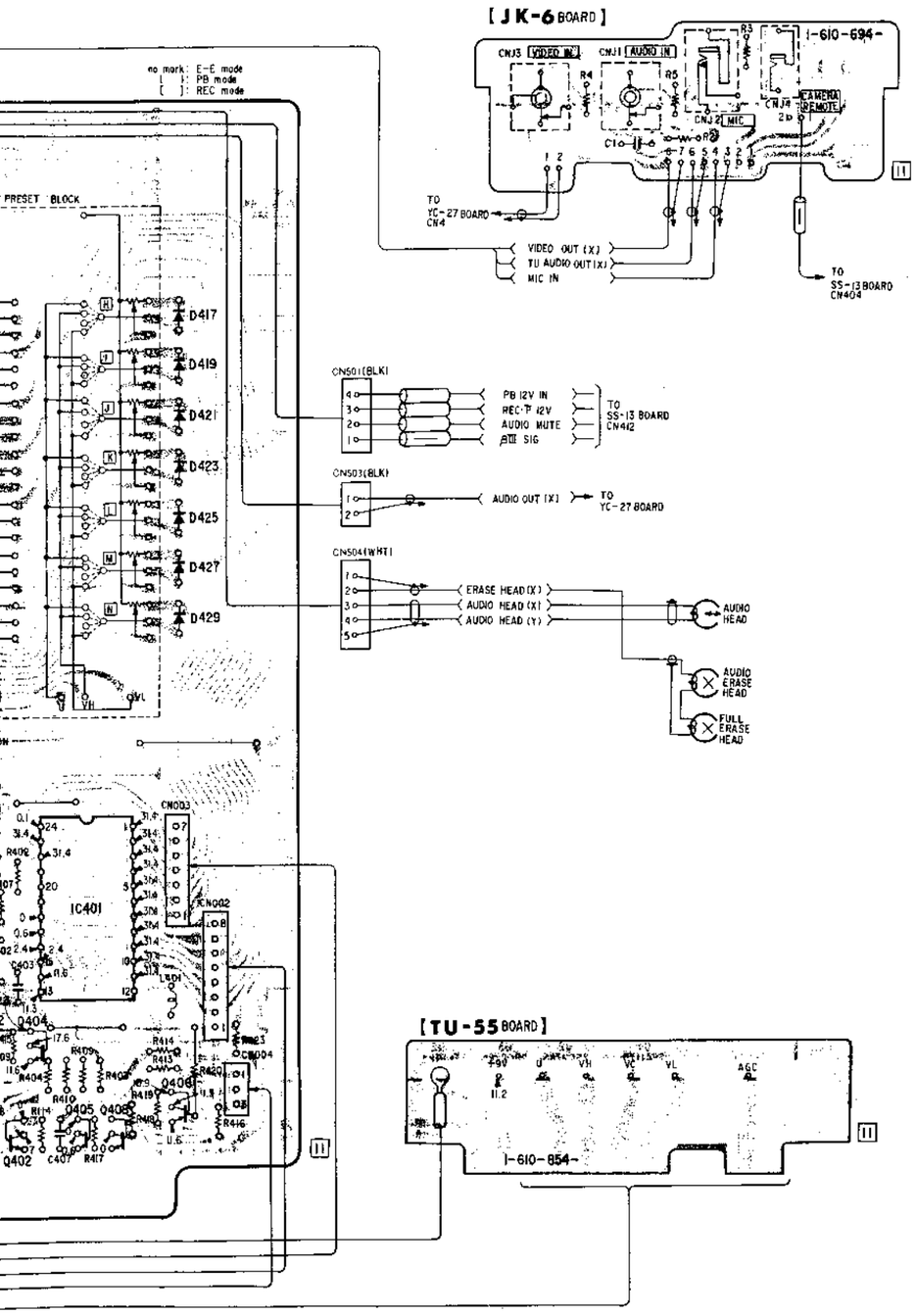


TA-16 (VIF, SIF, AFT, AGC), TU-55 (TUNER), JK-6 (JACK) PRINTED WIRING BOARDS

– Ref. No. TA-16 BOARD : 6,000 series, TU-55 BOARD : 6,000 series, JK-6 BOARD : 9,000 series –

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

O P Q R S T U V W X Y



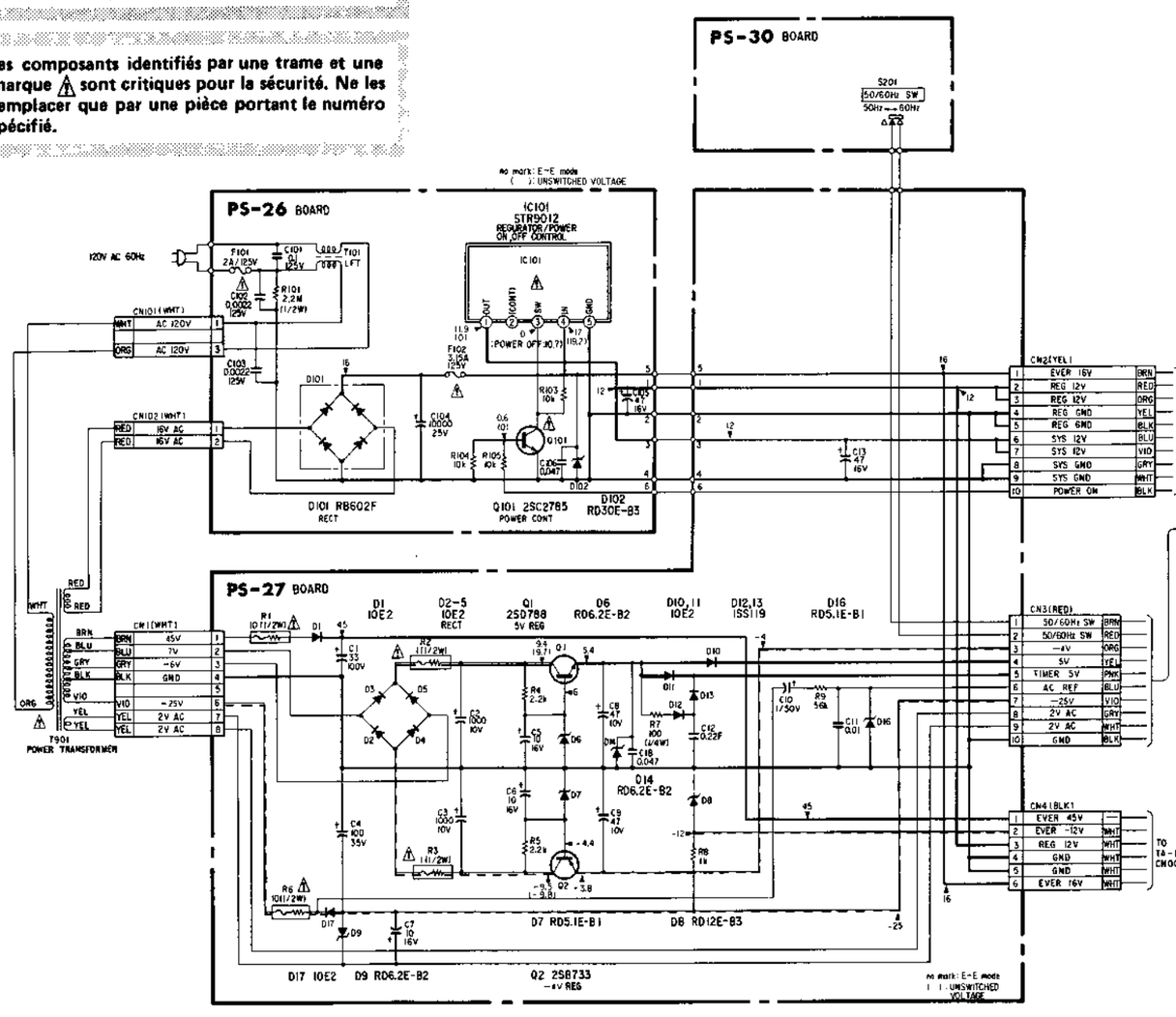
IC, Q	D	TP, ADJ
505 407 IC2	502	
	403 404 405 406	RV502
IC601		
501 509 510 IC501	417	501 506 RV503
	407 408 419 409 421 410 411 501 412 423 413	504 505 RV504 503 RV501
IC602 506 507	414 425 415	
502,503,504	427	LV501
008 009	429	
IC003	1 2	RV1 3
7 1	8 9 7	RV2
2	3 4	
401		
IC401	401	
4		
IC1		
404 3	402	
406 402,405 403 408		
IC, Q	D	TP, ADJ

PS-26 (POWER SUPPLY), PS-27 (POWER SUPPLY), PS-30 (50Hz/60Hz SELECT SWITCH), TS-30 (TIMER, CHANNEL SWITCH), TS-31 (TIMER, VOICE SYNTHESIS), TS-35 (TIMER SWITCH), TS-36 (CONFIRMATION) SCHEMATIC DIAGRAM

– Ref. No. PS-26 BOARD : 7,100 series, PS-27 BOARD : 7,000 series, PS-30 BOARD : 7,200 series, TS-30 BOARD : 8,000 series, TS-31 BOARD : 8,200 series, TS-35 BOARD : 8,300 series, TS-36 BOARD : 8,400 series –

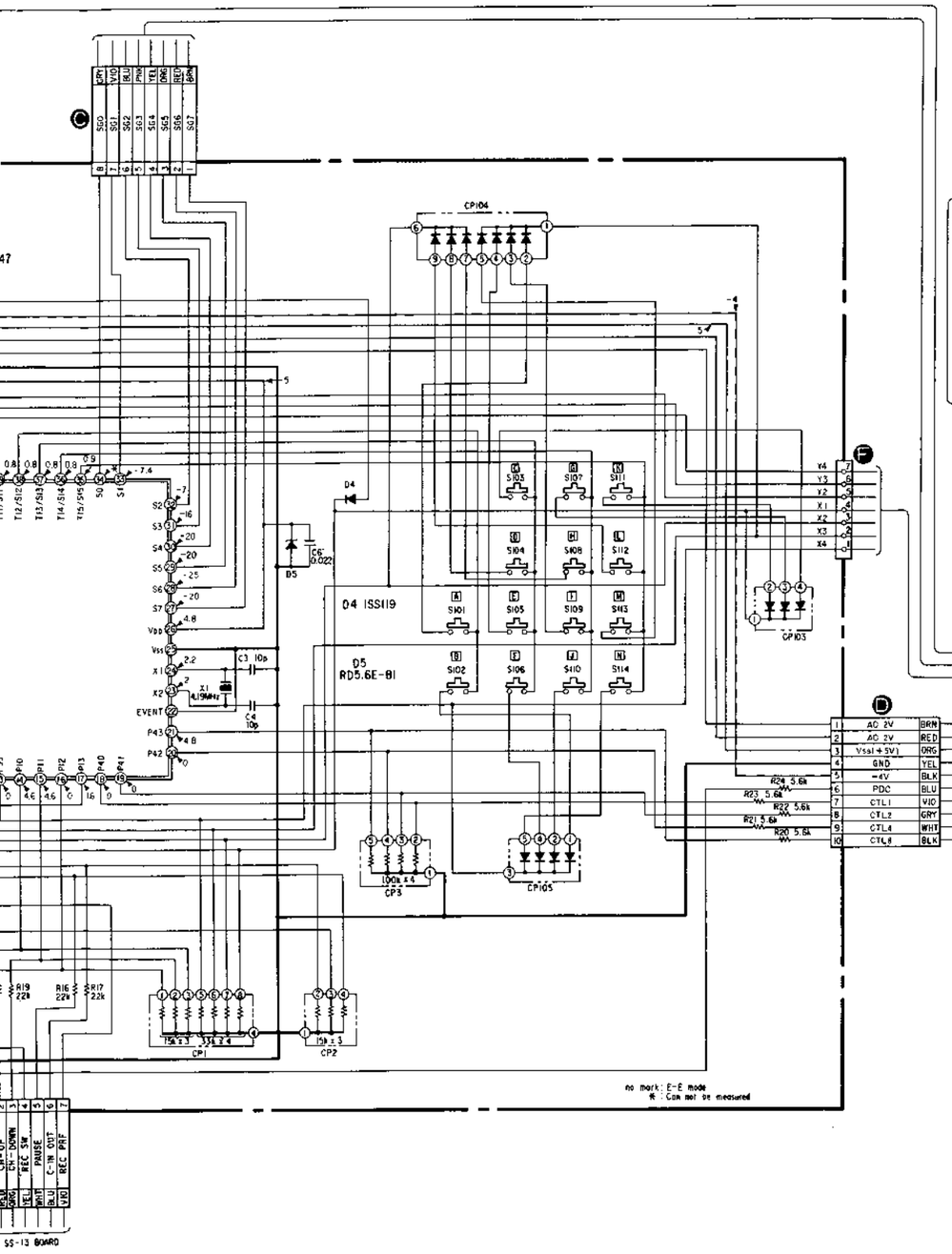
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

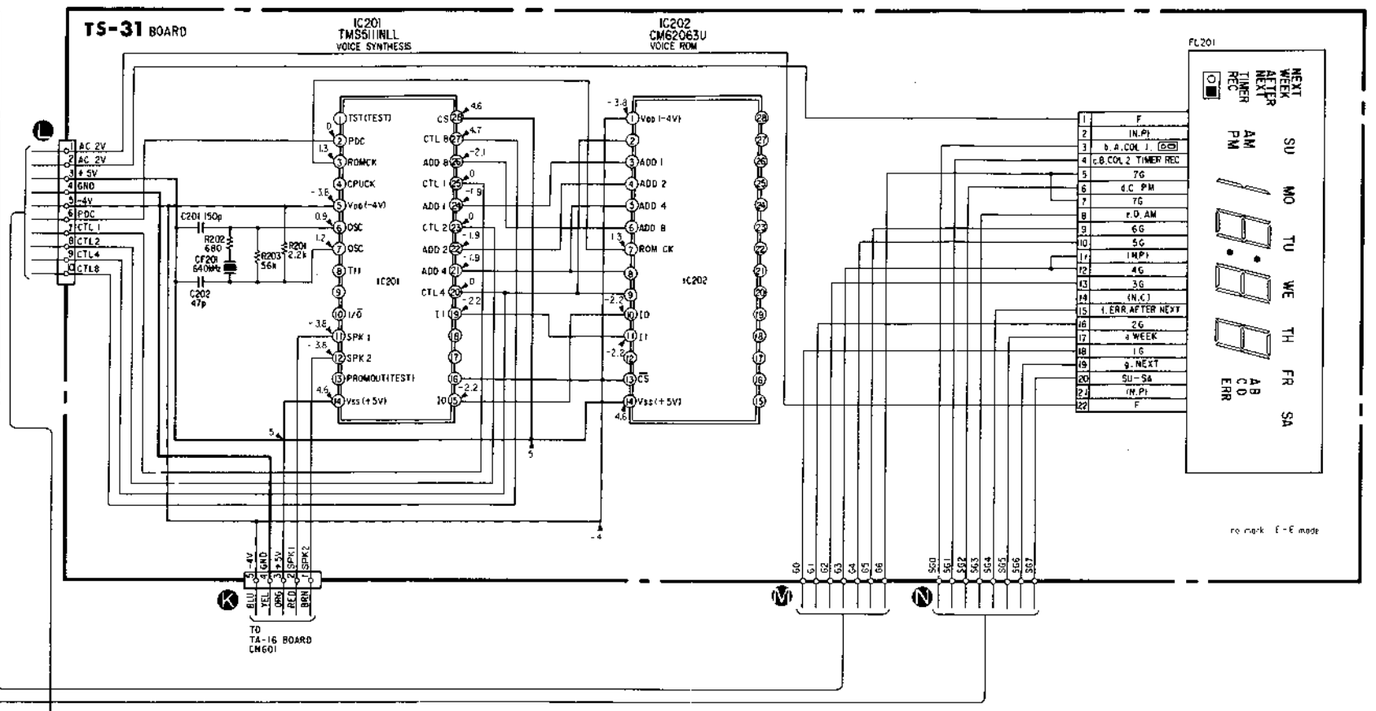
Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

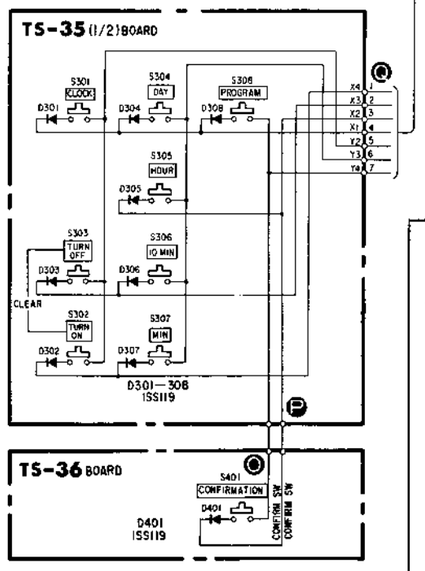


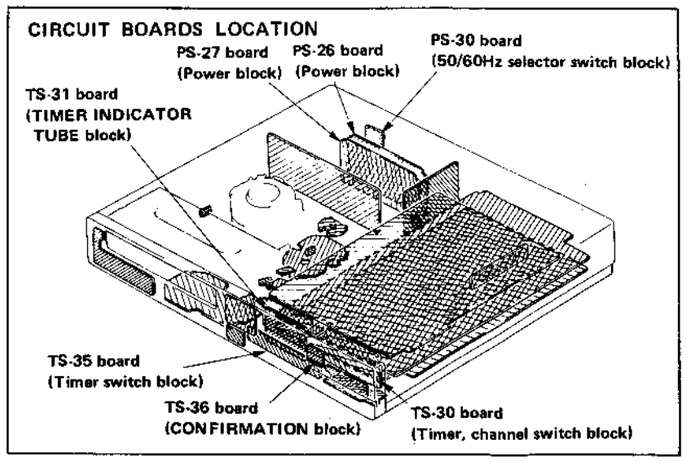
- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
-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

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

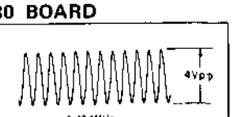




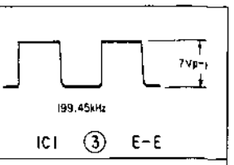




TS-30 BOARD

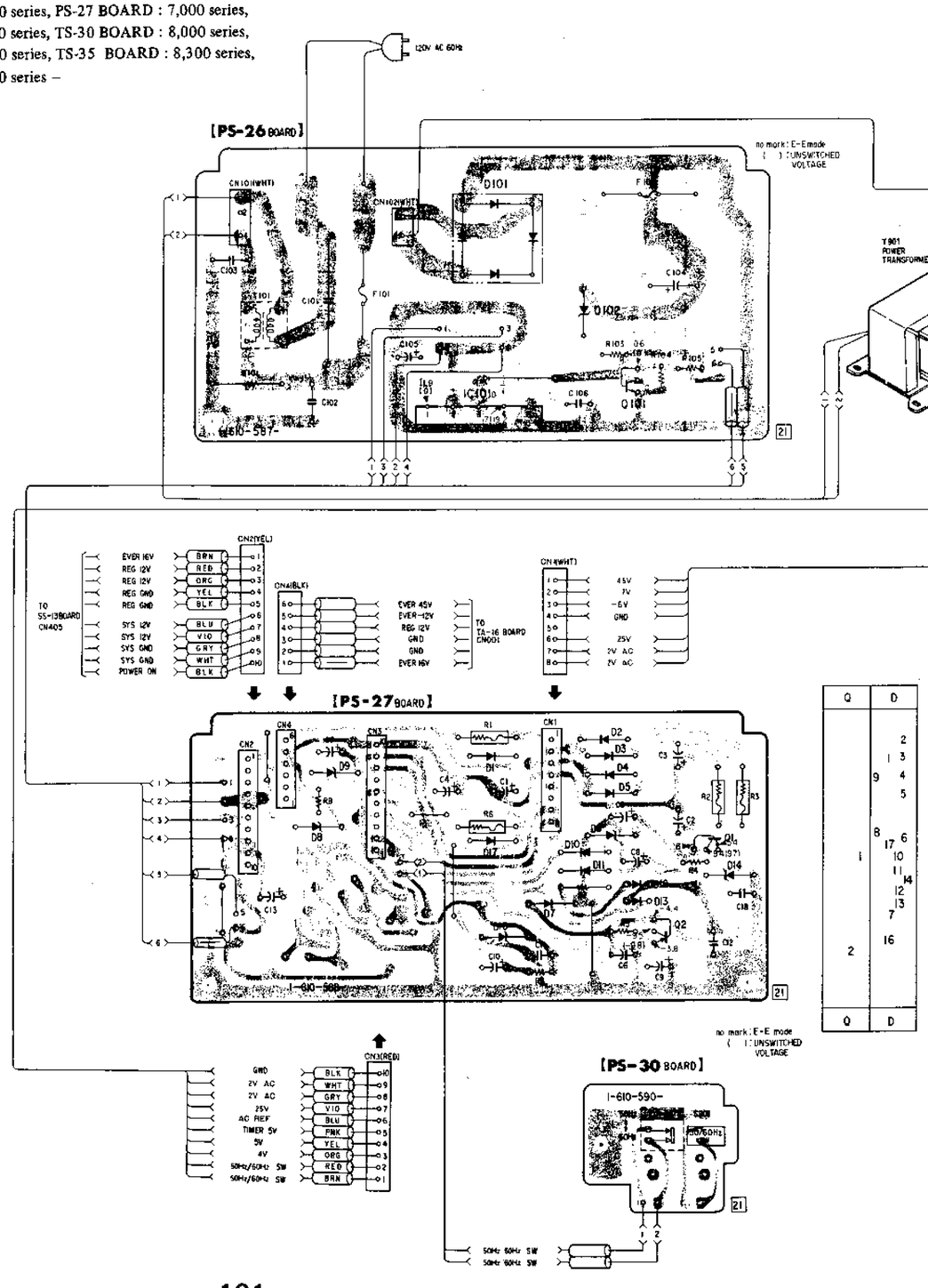


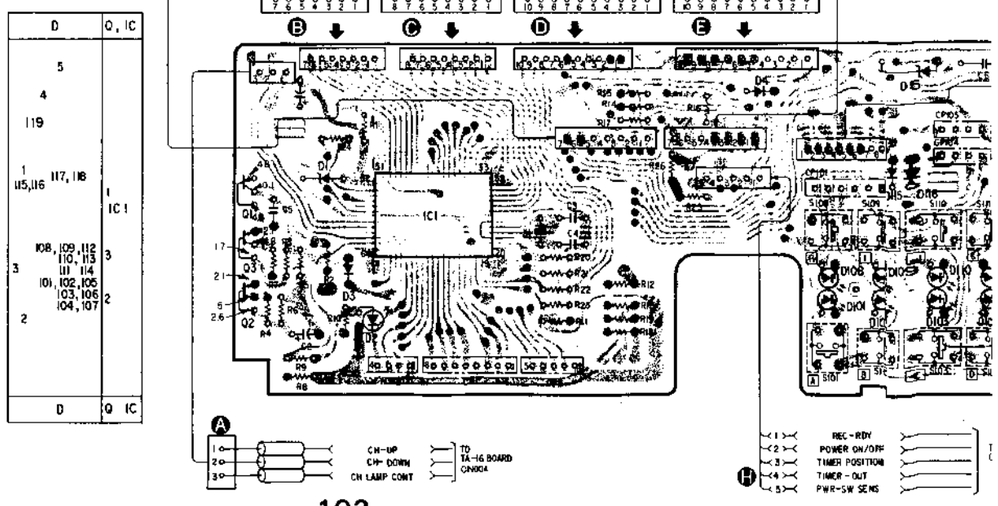
TS-31 BOARD



PS-26 (POWER SUPPLY), PS-27 (POWER SUPPLY), PS-30 (50Hz/60Hz SELECT SWITCH), TS-30 (TIMER, CHANNEL SWITCH), TS-31 (TIMER, VOICE SYNTHESIS), TS-35 (TIMER SWITCH), TS-36 (CONFIRMATION) PRINTED WIRING BOARDS

– Ref. No. PS-26 BOARD : 7,100 series, PS-27 BOARD : 7,000 series,
PS-30 BOARD : 7,200 series, TS-30 BOARD : 8,000 series,
TS-31 BOARD : 8,200 series, TS-35 BOARD : 8,300 series,
TS-36 BOARD : 8,400 series –





POWER SUPPLY, TIMER

EL SWITCH), TS-31 (TIMER, VOICE SYNTHESIS), TS-35 (TIMER SWITCH), TS-36 (CONFIRMATION) PRINTED WIRING BOARDS

H I J K L M N O P Q R S T U V W

1 2 3 4 5 6 7 8 9 10

[TS-35 BOARD]

[TS-31 BOARD]

[TS-36 BOARD]

[TS-30 BOARD]

FL-201

IC 1

TO CI-5 BOARD

TO TA-16 BOARD CN2

TO TA-16 BOARD CN3

TO TA-16 BOARD CN604

TO SS-13 BOARD

TO CI-5 BOARD

TO TA-16 BOARD CN601

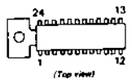
no mark: E-E mode
( ): UNSWITCHED VOLTAGE

no mark: E-E mode
* : Can not be measured

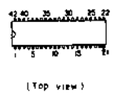
When indicating parts by reference number, please include the board name.

4-3. SEMICONDUCTORS

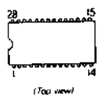
CX134A
CX135
CX187
CX188
CX196
CX822



CX194B-0
CX194B-1
CX194B-5
CX885B
μPD553C-276
μPD553C-287



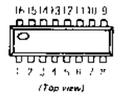
CX862



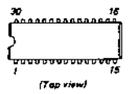
LA4140
LA7920

LA7046

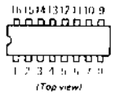
MB8791



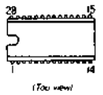
M32080SP



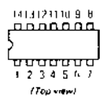
TC4053BP



TMS5111NLL
CM62059U



μPC324C



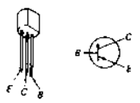
μPC358C
μPC4558C

μPC574J

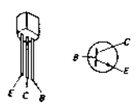
μPC1363C

μPC1373H

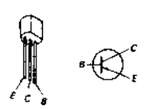
2SA733
2SA844
2SA925



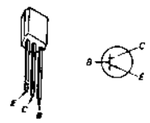
2SC945P
2SC1815



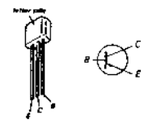
2SA772
2SB739
2SB740



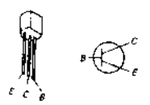
2SA1048-GR
2SA1115



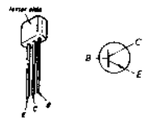
2SA1175



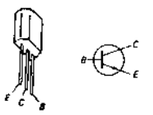
2SC1474
2SC1475
2SD788
2SD789



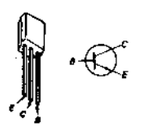
2SC2785



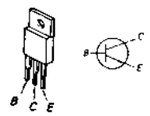
2SC403C



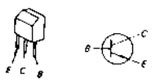
2SC403SP
2SC2458
2SC2603



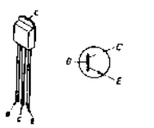
2SC1061
2SD313HP



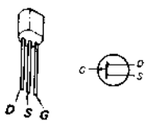
2SD773
2SD774



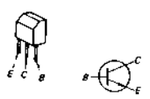
2SD1164



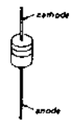
2SK43-3



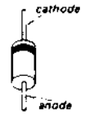
2SB733



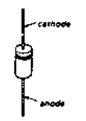
1SS119
1SS148



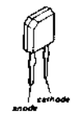
1SS133
RD10E-L2
RD10E-L3
RD12E-B3
RD13E-B1
RD13E-B2
RD13E-B3
RD30E-B1
RD30E-B2
RD30E-B3
RD5.1E-B1
RD5.1E-L1
RD5.6E-B1
RD5.6E-B2
RD5.6E-B3
RD6.2E-B2
RD6.2E-B3
RD7.5E-B1
RD8.2E-L2
RD9.1E-B3
RD9.1E-L3



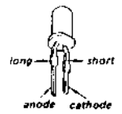
10E2



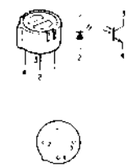
PH302B



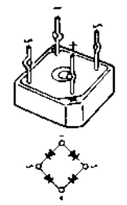
TLG123A
TLR123
TLY123



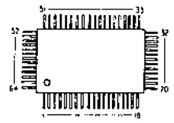
GP-2S02A
GP-2S02B
GP-2S02C



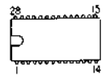
RB602F



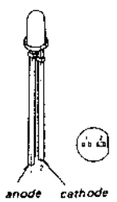
μPD7519G-547



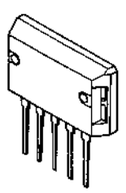
CM62063U



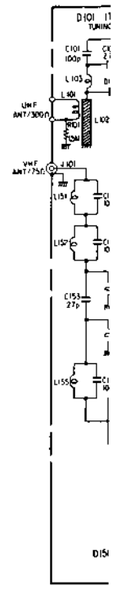
SG213T



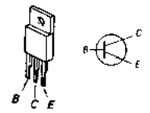
STR9012



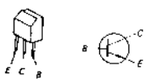
4-4. UHF
– B1



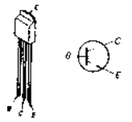
2SC1061
2SD313HP



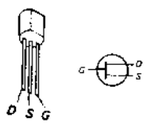
2SD773
2SD774



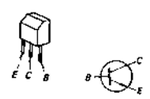
2SD1164



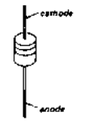
2SK43-3



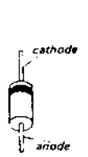
2SB733



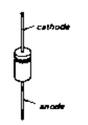
1SS119
1SS148



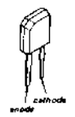
1SS133
RD10E-L2
RD10E-L3
RD12E-B3
RD13E-B1
RD13E-B2
RD13E-B3
RD30E-B1
RD30E-B2
RD30E-B3
RD5.1E-B1
RD5.1E-L1
RD5.6E-B1
RD5.6E-B2
RD5.6E-B3
RD6.2E-B2
RD6.2E-B3
RD7.5E-B1
RD8.2E-L2
RD9.1E-B3
RD9.1E-L3



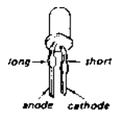
10E2



PH302B

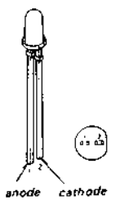


TLG123A
TLR123
TLY123

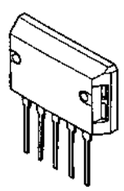


GP-2S02A
GP-2S02B
GP-2S02C

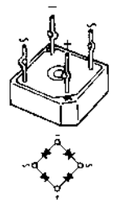
SG213T



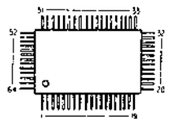
STR9012



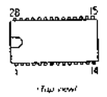
RB602F



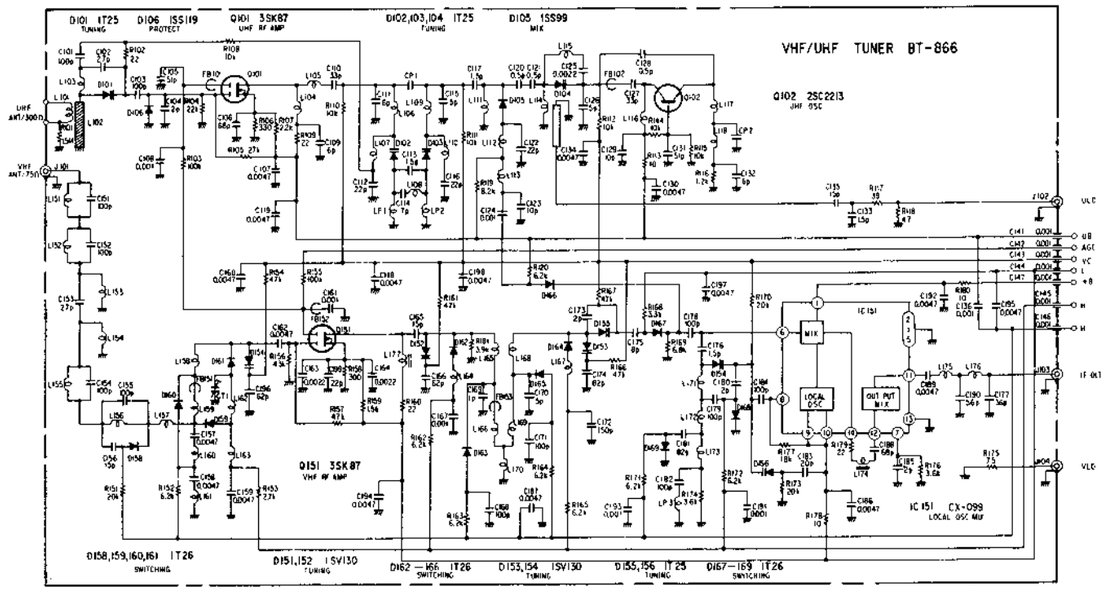
μPD7519G-547



CM62063U



4-4. UHF/VHF TUNER SCHEMATIC DIAGRAM
– BT-866 –



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

SECTION 5
EXPLODED VIEWS

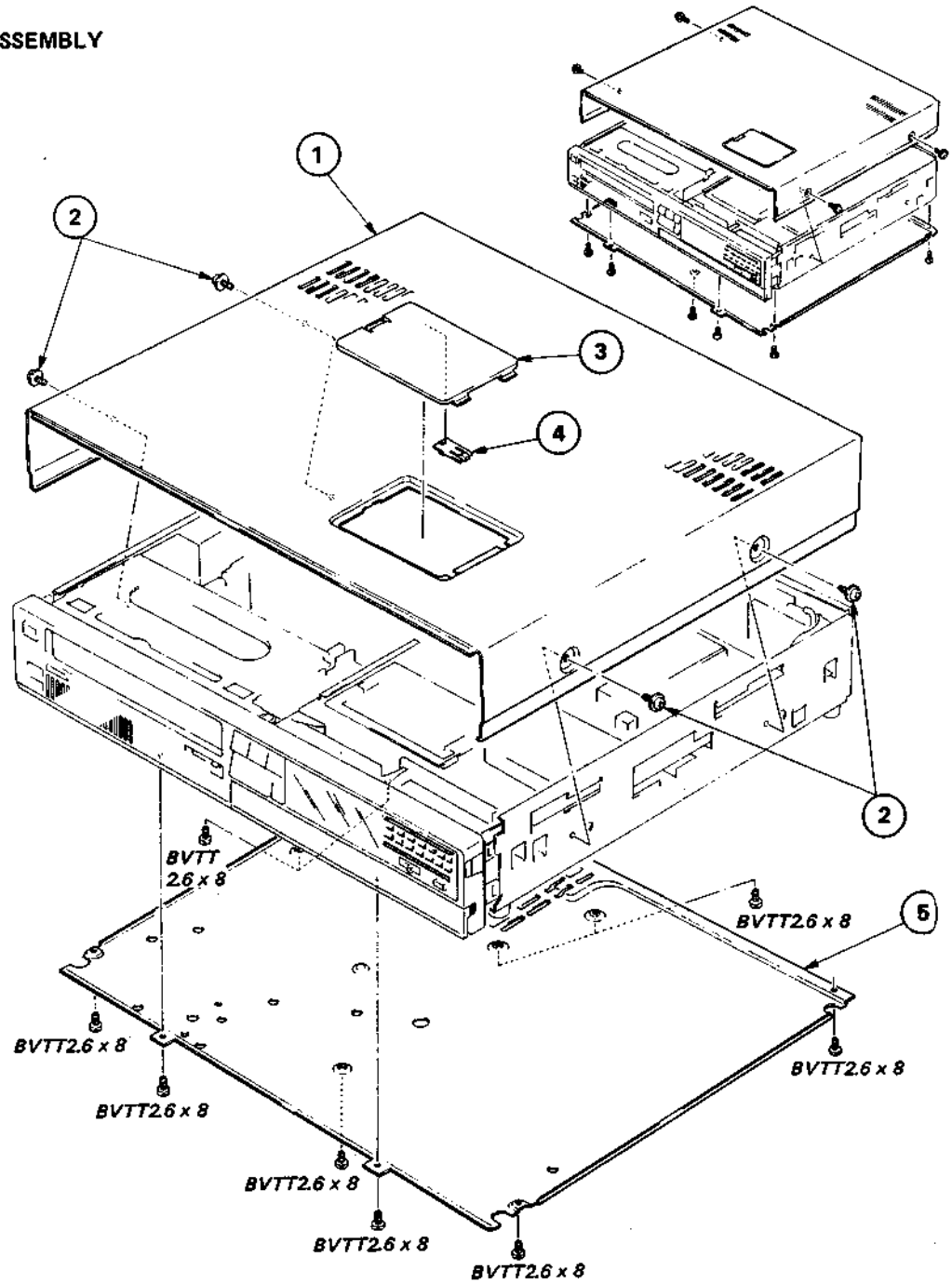
NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

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

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

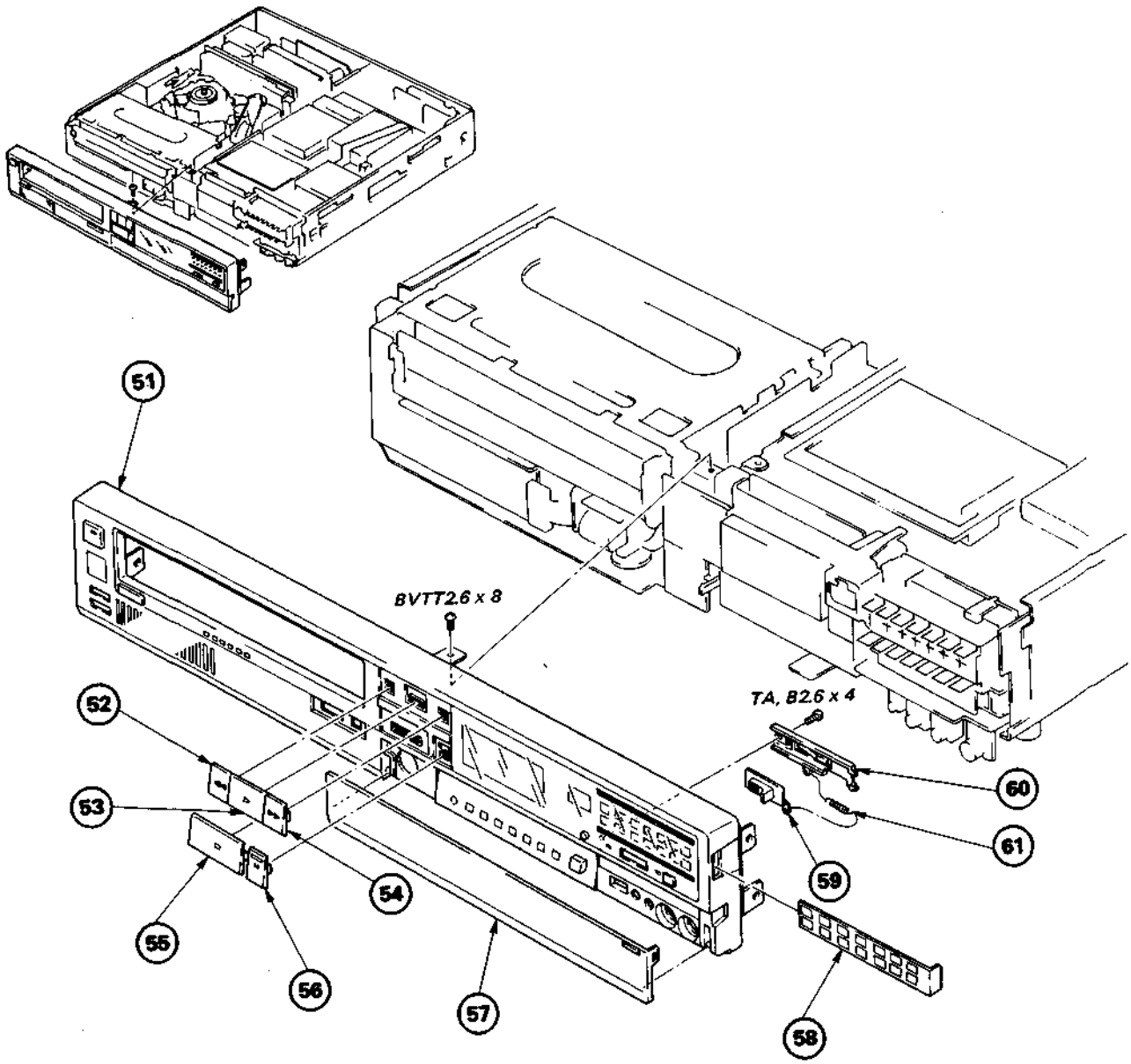
Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-1. CABINET ASSEMBLY



No.	Part No.	Description	Remark
1	X-3681-914-0	CASE ASSY (SL-2410 USA MODEL)	
	X-3679-133-4	CASE ASSY (SL-2410 CANADIAN MODEL)	
	X-3681-927-0	CASE ASSY (SL-2415 USA MODEL)	
2	4-847-802-11	SCREW, CASE STOPPER	
3	X-3681-917-0	LID ASSY, PRESET (SL-2410 USA MODEL)	
	X-3679-157-3	LID ASSY, PRESET (SL-2410 CANADIAN MODEL)	
	X-3681-925-0	LID ASSY, PRESET (SL-2415 USA MODEL)	
4	3-679-148-00	BUTTON, SELECTION, AFT	
5	X-3679-131-0	PLATE ASSY, BOTTON	

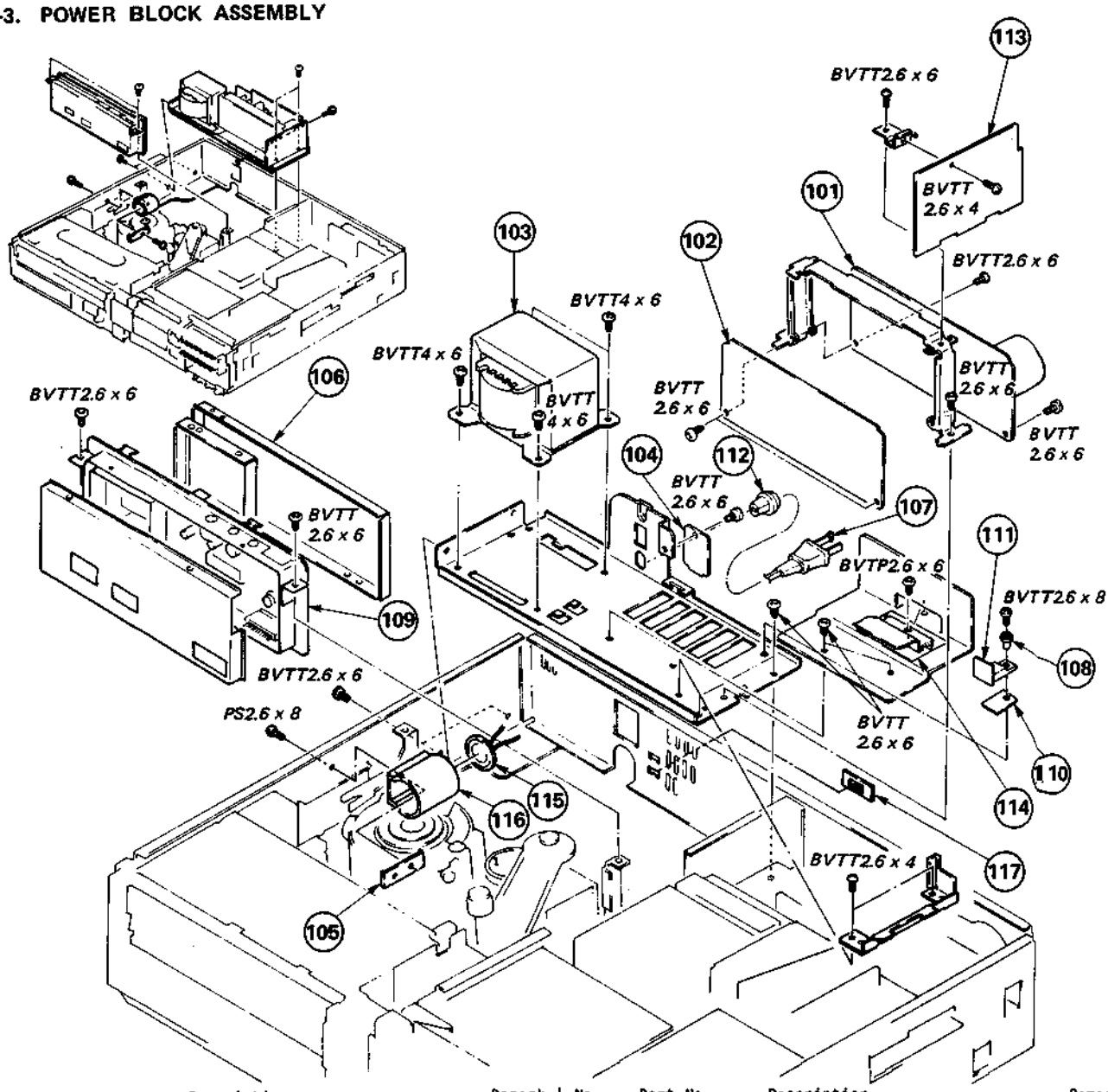
5-2. FRONT PANEL ASSEMBLY



No.	Part No.	Description	Remark
51	X-3681-916-0	PANEL ASSY, FRONT(SL-2410 USA MODEL)	
	X-3681-910-0	PANEL ASSY, FRONT(SL-2410 CANADIAN MODEL)	
	X-3681-918-0	PANEL ASSY, FRONT(SL-2415 USA MODEL)	
52	3-681-930-21	BUTTON	
53	X-3681-913-0	BUTTON ASSY, PLAY	
54	3-681-930-31	BUTTON	
55	3-681-931-11	BUTTON, STOP	
56	X-3681-912-0	BUTTON ASSY, PAUSE	

No.	Part No.	Description	Remark
57	X-3681-915-0	DOOR ASSY, TIMER (SL-2410 USA MODEL)	
	X-3681-911-0	DOOR ASSY, TIMER (SL-2410 CANADIAN MODEL)	
	X-3681-919-0	DOOR ASSY, TIMER (SL-2415 USA MODEL)	
58	3-681-949-01	HOLDER, DIAL SCALE (SL-2410 USA MODEL)	
	3-681-949-02	HOLDER, DIAL SCALE (SL-2410 CANADIAN MODEL SL-2415 USA MODEL)	
59	3-681-926-00	BUTTON, RECORDING	
60	3-681-927-00	SPRING	
61	3-489-099-11	SPRING, TENSION	

5-3. POWER BLOCK ASSEMBLY



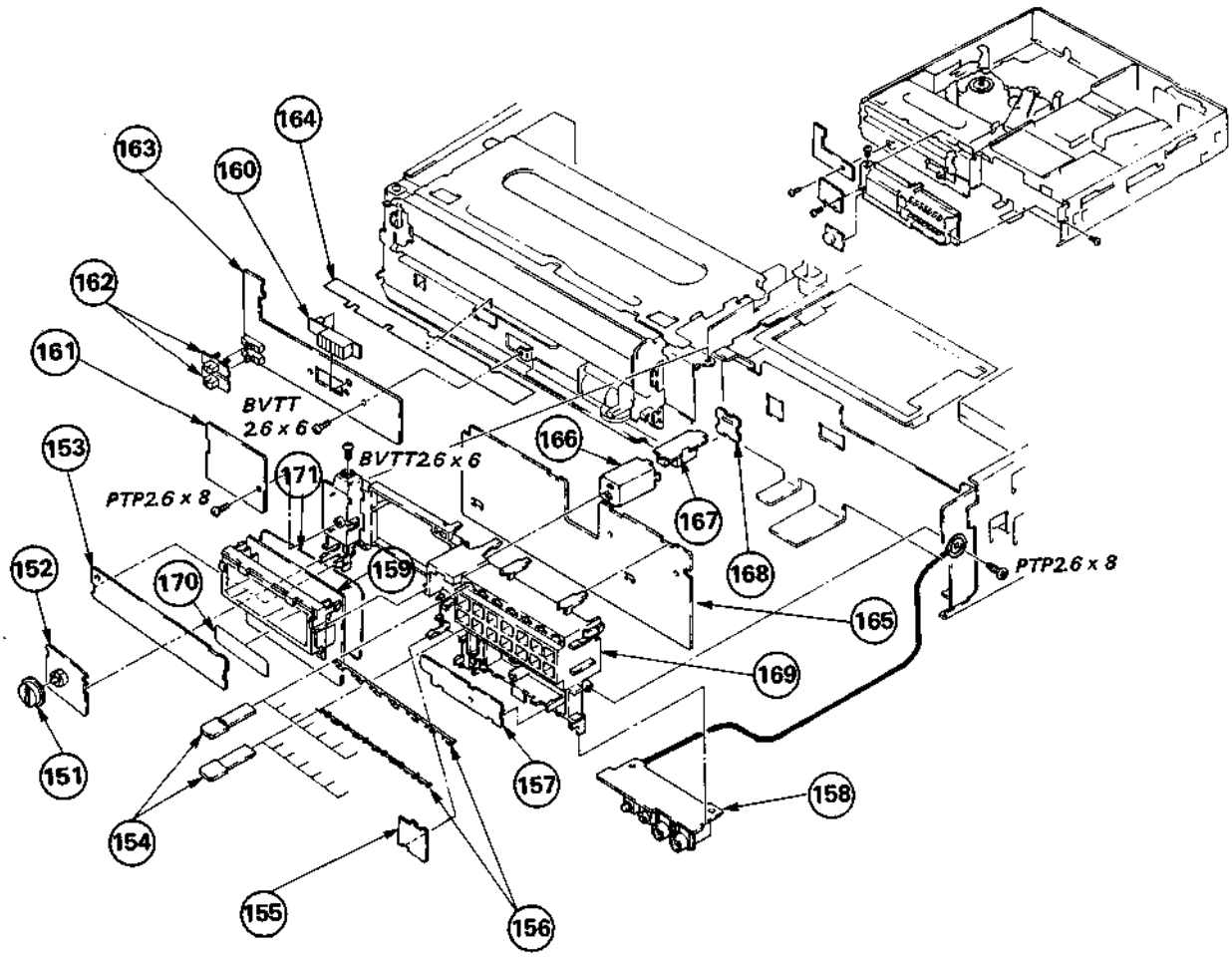
No.	Part No.	Description	Remark
101	♣:1-610-587-00	PS-26 BOARD	
102	♣:1-610-588-00	PS-27 BOARD	
103	⚠1-447-676-00	TRANSFORMER, POWER T901	
104	♣:1-610-590-00	PS-30 BOARD	
105	♣:3-681-908-00	BRACKET, SPEAKER	
106	♣:3-679-241-00	CASE (LOWER), SHIELD, RP-55	
107	⚠1-551-964-00	CORD, POWER	
108	2-832-007-00	BUSHING (K), INSULATING	
109	♣:A-6728-710-A	RP-8 BOARD, COMPLETE	

No.	Part No.	Description	Remark
110	3-701-754-00	PLATE, INSULATING	
111	♣:1-610-589-00	PS-29 BOARD	
112	⚠2-231-019-00	CLAMPER, CORD	
113	♣:1-610-595-00	CI-5 BOARD	
114	3-681-112-00	SHEET, RADIATION	
115	8-927-137-00	SPEAKER UNIT (030F010) SP901	
116	3-681-915-00	HOLDER, SPEAKER	
117	♣:3-679-292-00	COVER, SELECTION, FREQUENCY	

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

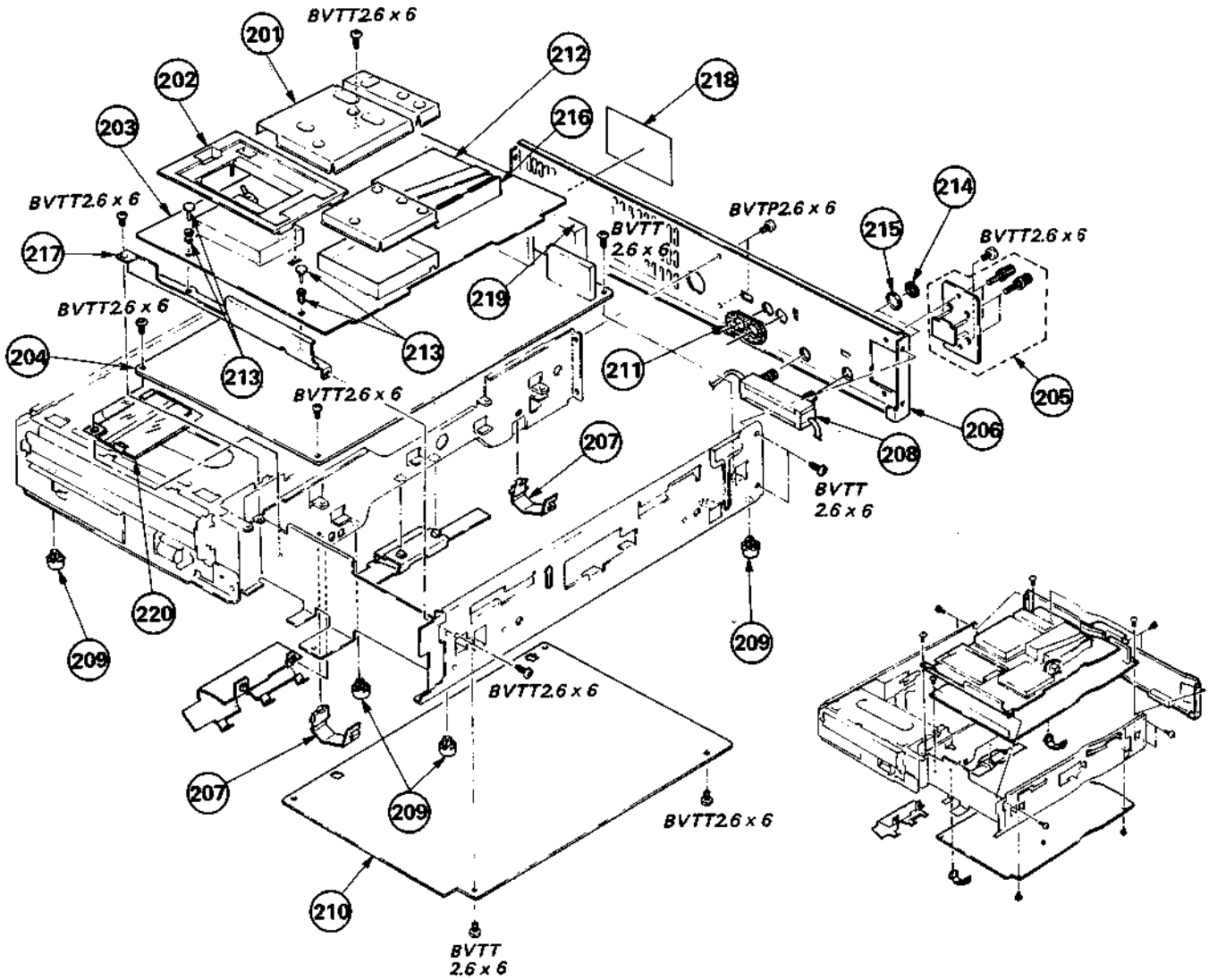
5-4. TIMER FRAME ASSEMBLY



No.	Part No.	Description	Remark
151	3-681-902-00	KNOB, TRACK CONTROL	
152	♣:1-610-596-00	FS-29 BOARD	
153	♣:1-610-857-00	TS-35 BOARD	
154	3-681-901-00	BUTTON, CHANNEL	
155	♣:1-610-858-00	TS-36 BOARD	
156	♣:2-291-025-00	SPRING, LEAF	
157	♣:1-610-598-00	FS-33 BOARD	
158	♣:1-610-694-00	JK-6 BOARD	
159	♣:1-610-856-00	TS-31 BOARD	
160	3-681-943-00	HOLDER LAMP (6)	

No.	Part No.	Description	Remark
161	♣:1-609-219-00	FS-19 BOARD	
162	3-681-914-00	BUTTON, SELECTION	
163	♣:1-610-597-00	FS-28 BOARD	
164	3-681-924-00	PLATE, BLIND	
165	♣:A-6728-810-A	TS-30 BOARD, COMPLETE	
166	♣:4-342-117-00	CASE, SHIELD (MAIN), R	
167	♣:1-606-794-00	N BOARD	
168	♣:4-342-118-00	LID, SHIELD CASE, R	
169	♣:3-681-955-00	BRACKET, TT	
170	3-681-945-00	SHEET PROTECTION (B)	
171	3-681-944-00	SHEET PROTECTION (A)	

5-5. FRAME ASSEMBLY



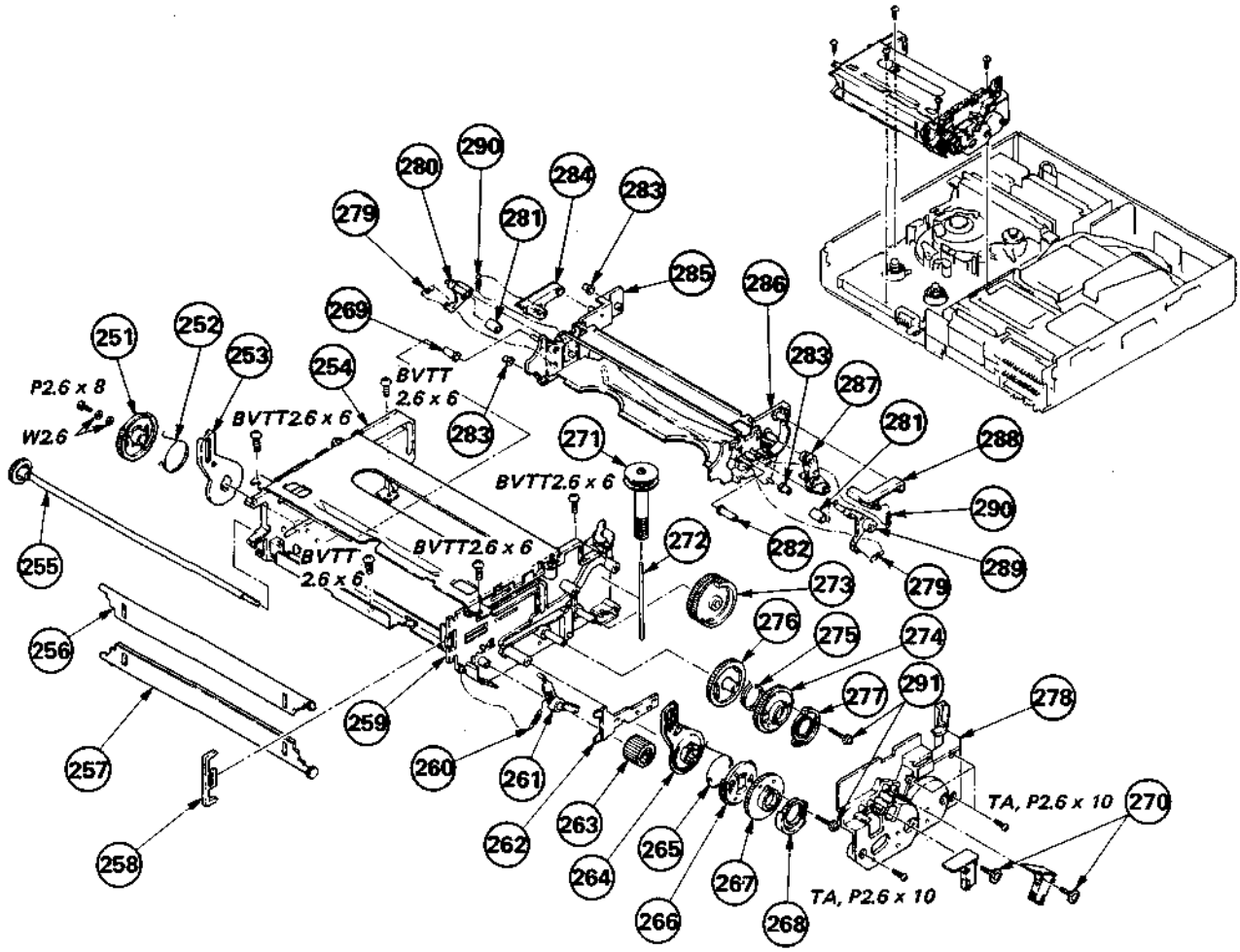
No.	Part No.	Description	Remark
201	♣:3-679-238-00	CASE (UPPER), SHIELD, AU-44	
202	3-679-302-00	COVER, PRESET	
203	♣:A-6721-183-A	TA-16 BOARD, COMPLETE	
204	♣:A-6711-467-A	YC-27 BOARD, COMPLETE	
205	1-417-092-00	DISTRIBUTOR, ANTENNA (UHF) TB991	
206	3-681-951-00	PANEL, REAR	
207	♣:3-679-229-00	HINGE, SS	
208	1-554-372-21	SWITCH, ANTENNA CHANGE S996	
209	3-670-155-00	LEG	
210	♣:A-6717-333-A	SS-13 (B-299) BOARD, COMPLETE	

No.	Part No.	Description	Remark
211	♣:3-681-940-00	PLATE, BLIND, JACK	
212	⚠1-463-399-00	TUNER (BT-866)	
213	♣:4-812-134-11	RIVET NYLON, 3.5	
214	♣:3-679-280-00	NUT, HEXAGON	
215	♣:3-679-281-00	SPACER, FLAT	
217	3-681-946-00	BRACKET, TA	
218	♣:3-681-950-00	LABEL, MODEL NUMBER (SL-2410U SA MODEL)	
	♣:3-681-947-00	LABEL, MODEL NUMBER (SL-2410C ANADIAN MODEL)	
	♣:3-681-952-00	LABEL, MODEL NUMBER (SL-2415U SA MODEL)	
219	⚠1-464-266-00	RF UNIT, COLOR (RFU-702) MOD	
220	♣:X-3679-188-0	PLATE ASSY, SHIELD, YC	

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

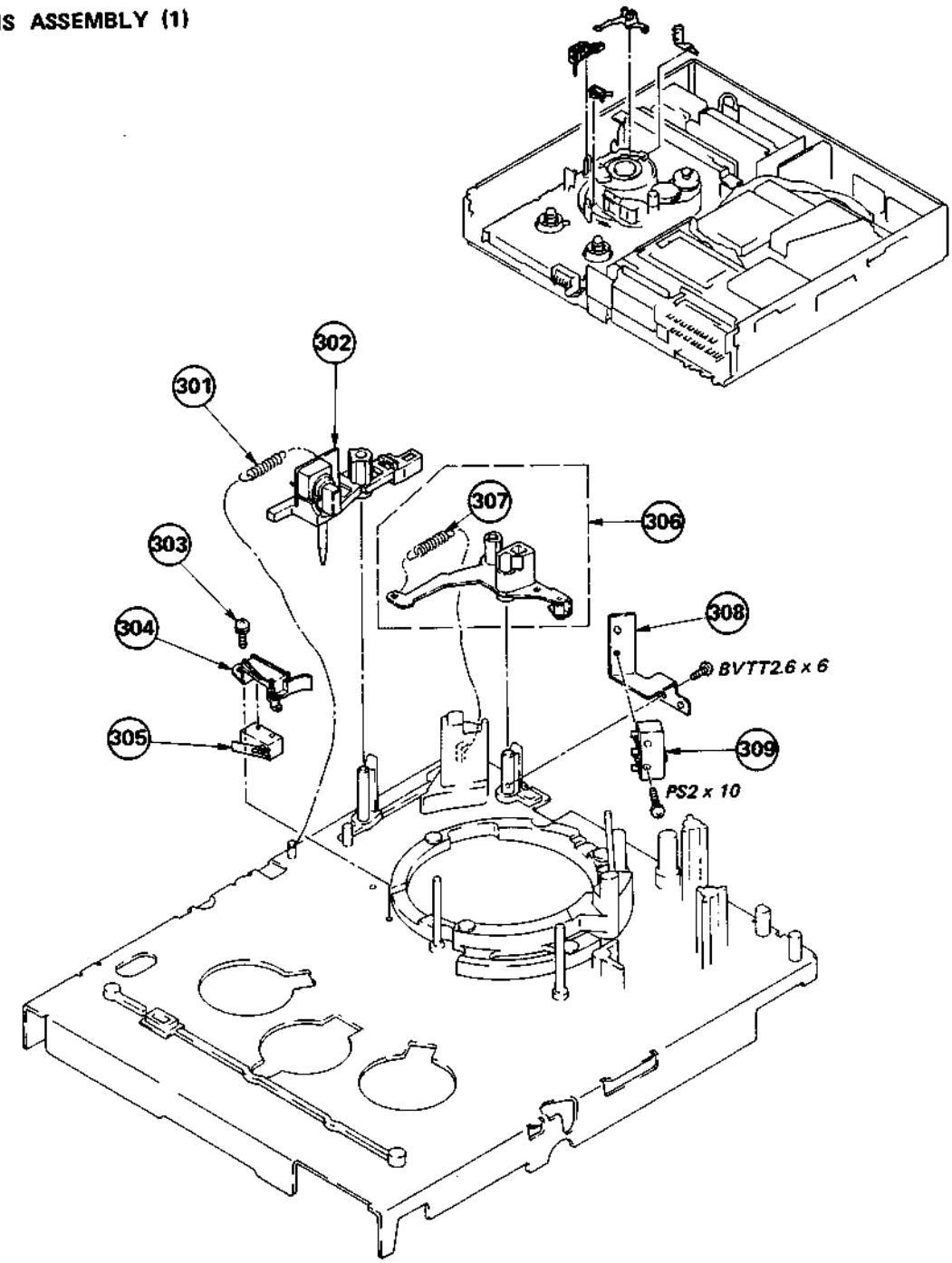
5-6. FRONT LOADING ASSEMBLY



No.	Part No.	Description	Remark
251	3-679-226-00	GEAR (LEFT), ARM, DRIVING	
252	3-679-145-00	SPRING (LEFT)	
253	3-679-220-00	ARM (LEFT), DRIVING	
254	♣:3-679-266-00	PLATE, SIDE, LEFT	
255	X-3679-105-0	SHAFT ASSY, GEAR, MIDWAY	
256	3-679-222-00	DOOR, UPPER	
257	3-679-223-00	DOOR, LOWER	
258	3-679-137-00	HOLDER, OUTER DOOR	
259	♣:3-679-265-00	PLATE, SIDE, RIGHT	
260	3-679-189-00	SPRING, TENSION	
261	3-679-134-00	ARM, SWITCHING, DOOR	
262	3-679-221-00	PLATE, RACK, SWITCHING, DOOR	
263	3-679-126-00	GEAR (RIGHT), MIDWAY	
264	3-679-219-00	ARM (RIGHT), DRIVING	
265	3-679-144-00	SPRING (RIGHT)	
266	3-679-225-00	GEAR (RIGHT), ARM, DRIVING	
267	3-679-125-00	GEAR, DRIVING	
268	3-679-138-00	CAM (CASSETTE ON)	
269	3-679-316-00	ROLLER (LEFT), DRIVING	
270	3-669-480-00	+ PTPWH 2	
271	3-679-215-00	GEAR, WORM	

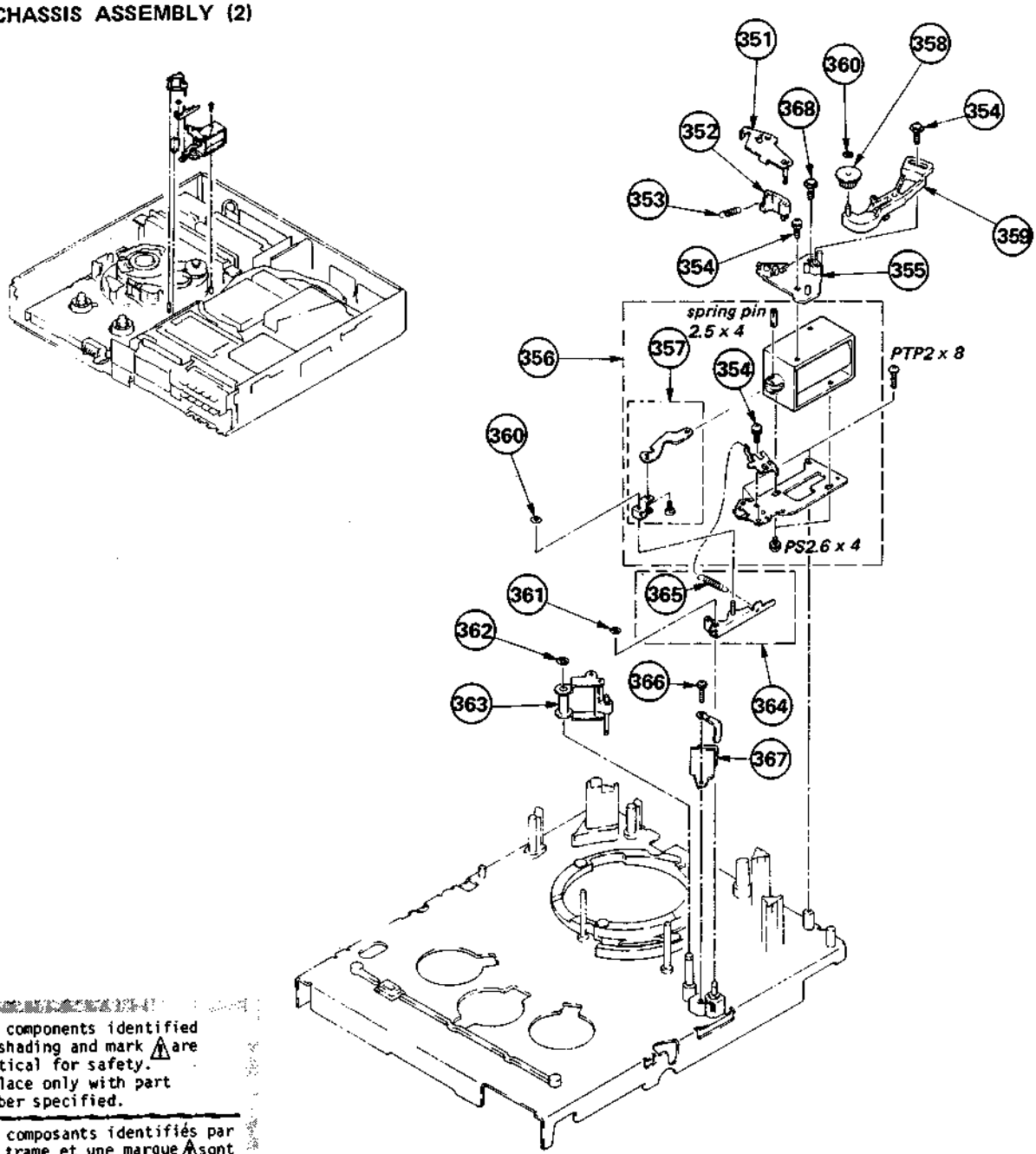
No.	Part No.	Description	Remark
272	3-679-123-00	SHAFT, GEAR, WORM	
273	3-679-216-00	WHEEL, WORM	
274	3-679-218-00	GEAR (B), LIMITER	
275	3-679-139-00	SPRING	
276	3-679-217-04	GEAR (A), LIMITER	
277	3-679-124-00	CAM (CASSETTE OFF)	
278	♣:3-679-214-00	HOLDER, GEAR, WORM	
279	3-679-288-00	SPRING, TENSION	
280	3-679-130-00	LEVER (LEFT), RETAINER, CASSETTE	
281	3-679-135-00	RUBBER, RETAINER, CASSETTE	
282	3-679-128-00	ROLLER (RIGHT), DRIVING	
283	3-679-143-00	ROLLER	
284	3-679-132-00	LEVER (LEFT), PREVENTION	
285	♣:X-3679-107-0	PLATE ASSY, SIDE, BASE LEFT	
286	♣:X-3679-106-0	PLATE ASSY, SIDE, BASE RIGHT	
287	3-679-133-00	ARM, LID OPEN	
288	3-679-131-00	LEVER (RIGHT), PREVENTION	
289	3-679-129-00	LEVER(RIGHT), RETAINER, CASSETTE	
290	3-679-188-00	SPRING, TENSION	
291	3-669-480-11	+ PTPWH 2	

5-7. CHASSIS ASSEMBLY (1)



No.	Part No.	Description	Remark
301	3-679-164-00	SPRING, TENSION	
302	1-464-249-00	SENSOR, S COIL L991	
303	3-669-607-31	+PSW (SMALL ROUND) (2.6)	
304	♦:3-669-355-00	HOLDER, SWITCH, ULE	
305	1-553-718-00	SWITCH, MICRO S994	
306	X-3679-149-0	ARM (B) ASSY, LOCK	307
307	3-679-323-00	SPRING, TENSION	
308	♦:3-672-542-00	BRACKET, SWITCH, LE	
309	1-553-539-00	SWITCH, MICRO S993	

5-8. CHASSIS ASSEMBLY (2)

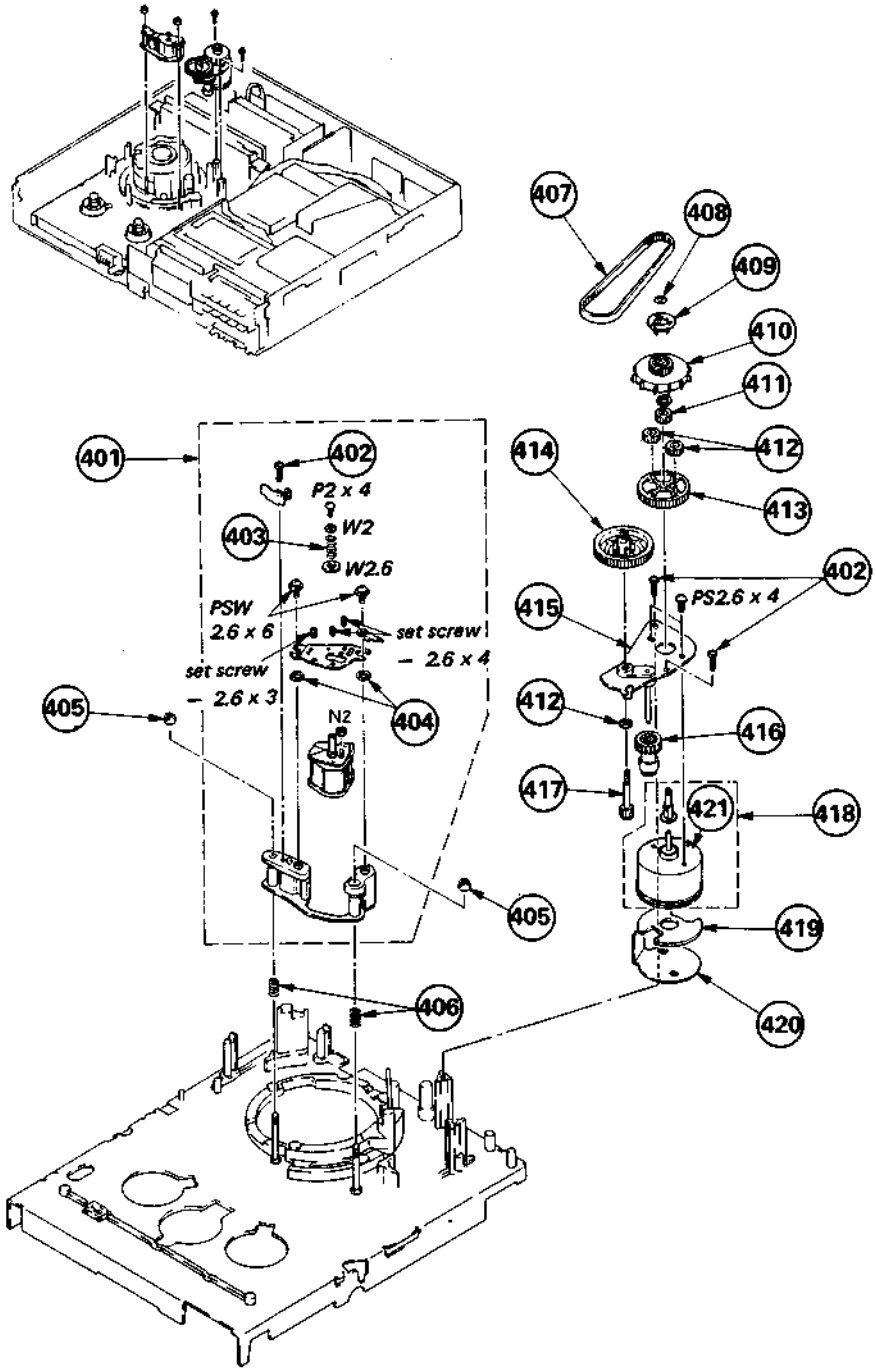


The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	Remark
351	♦:X-3679-123-0	ARM ASSY, STOPPER	
352	♦:3-679-251-00	LIMITER, STOPPER	
353	3-508-108-XX	SPRING, TENSION	
354	3-681-231-00	SCREW (+PW2.6X8), TAPPING	
355	♦:3-679-117-05	CHASSIS, ARM, STOPPER	
356	⚠A-6749-080-A	SOLENOID BLOCK ASSY (PINCH)	357,354
357	X-3679-152-0	ARM (B) ASSY, PINCH SOLENOID	
358	3-679-307-00	GEAR, TENSION	
359	♦:X-3679-145-0	ARM ASSY, CAR, TENSION	
360	3-669-465-00	WASHER (1.5), STOPPER	
361	3-669-595-00	WASHER (2), STOPPER	
362	3-669-596-00	WASHER (2.3), STOPPER	
363	♦:X-3679-108-0	ARM ASSY, PRESS, PINCH	
364	♦:X-3669-379-0	ARM (P) ASSY, PINCH LIMITER	365
365	3-465-159-XX	SPRING, TENSION	
366	3-669-480-11	+ PTPWH 2	
367	1-464-250-00	SENSOR, T COIL L992	
368	3-681-231-00	SCREW (+PW 2.6X8), TAPPING	

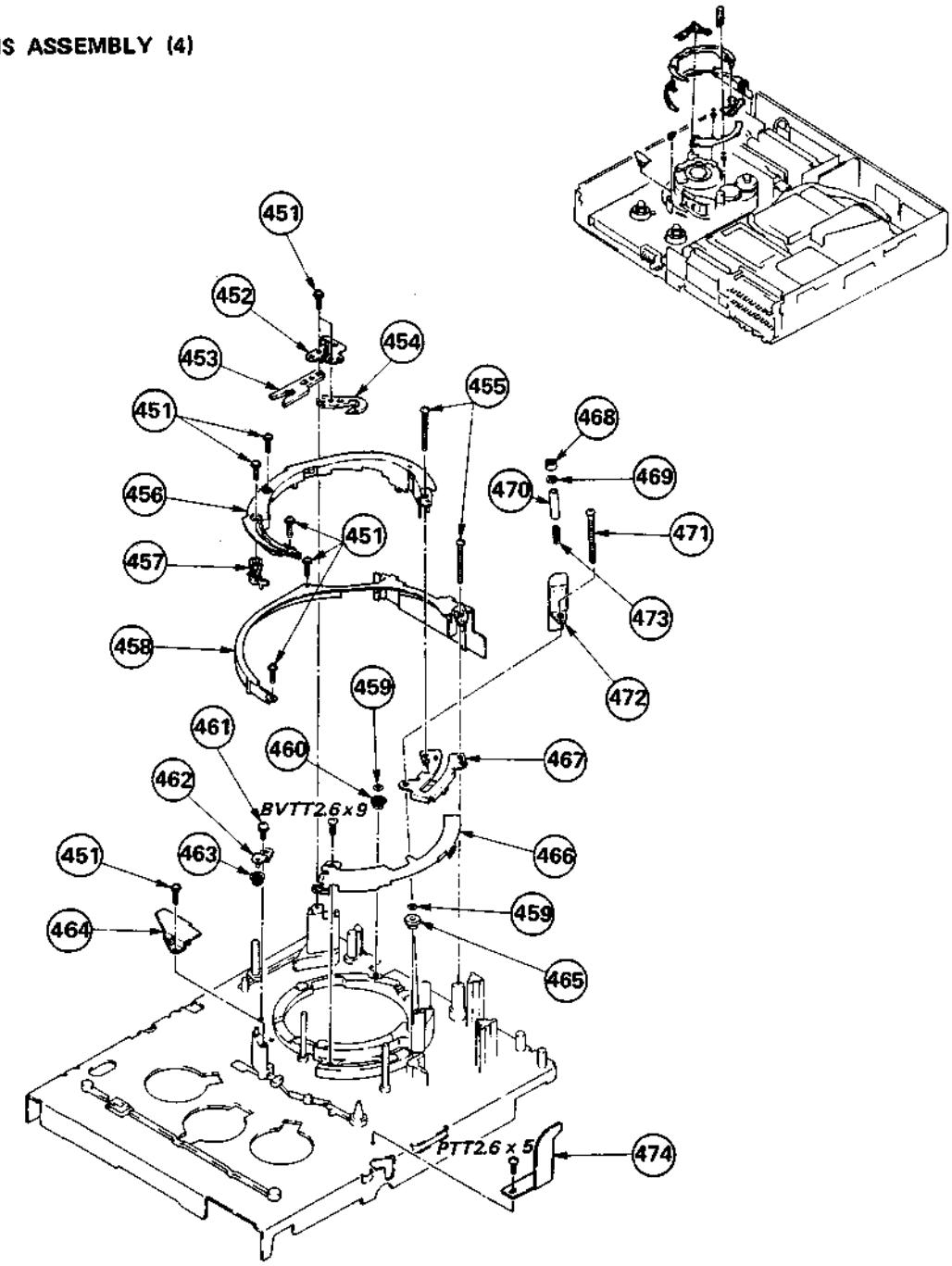
5-9. CHASSIS ASSEMBLY (3)



No.	Part No.	Description	Remark
401	A-6761-056-A	ACE ASSY (AUDIO, AUDIO ERASE, CTL)	402,403,404
402	3-669-480-21	+ PTPWH 2	
403	♳:3-669-316-00	SPRING, COMPRESSION	
404	3-669-598-00	WASHER, CTL	
405	3-669-318-00	NUT, ADJUSTMENT, GUIDE	
406	3-669-317-00	SPRING, COMPRESSION	
407	3-679-119-00	BELT, SYNCHRO	
408	3-669-596-00	WASHER (2.3), STOPPER	
409	3-679-140-00	FLANGE, GEAR, INTERNAL	
410	3-679-101-00	GEAR, INTERNAL	

No.	Part No.	Description	Remark
411	3-679-104-00	GEAR	
412	3-701-439-11	WASHER	
413	X-3679-111-0	CARRIER ASSY	
414	3-679-115-00	GEAR (LARGE), LOADING	
415	♳:X-3679-112-0	CHASSIS ASSY, GEAR, PLANET	
416	X-3669-321-0	GEAR (C) ASSY	
417	3-679-114-00	GEAR (SMALL), LOADING	
418	A-6737-118-A	MOTOR ASSY, L (LOADING MOTOR)	421
419	♳:1-605-071-00	LM-8 BOARD	
420	♳:3-669-613-00	INSULATOR, L MOTOR	
421	1-541-163-00	MOTOR M904	

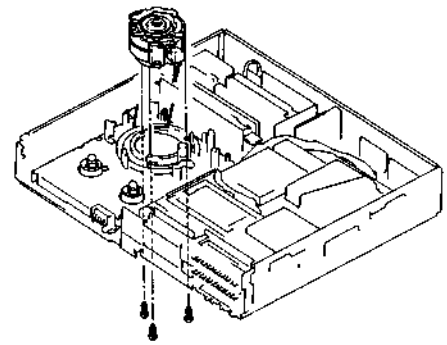
5-10. CHASSIS ASSEMBLY (4)

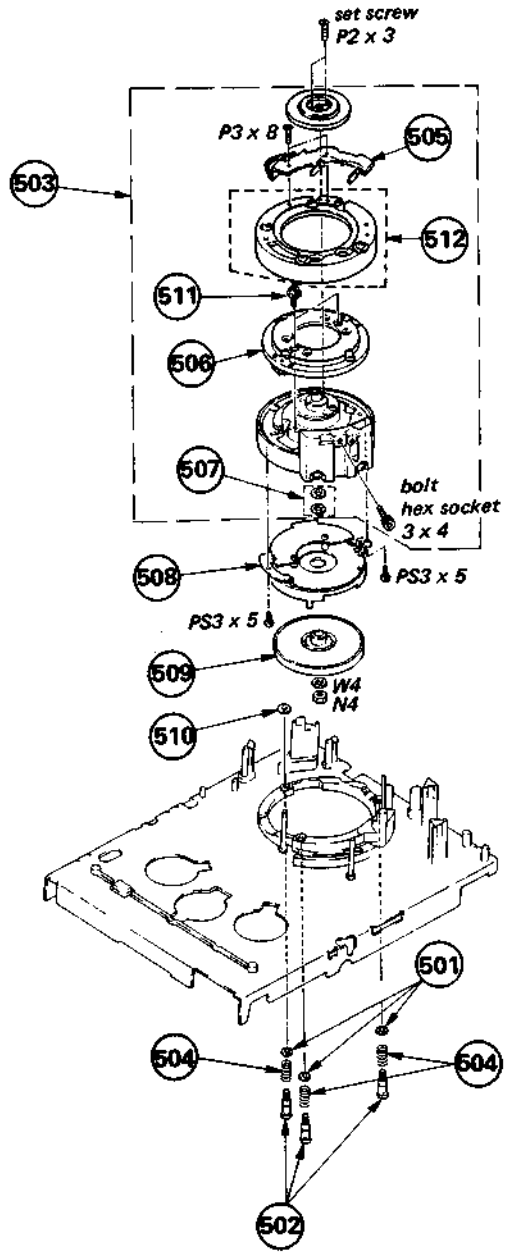


No.	Part No.	Description	Remark
451	3-669-480-11	+ PTPWH 2	
452	♦:3-672-540-00	PLATE, GROUND, TAPE GUIDE	
453	♦:3-669-618-00	PLATE (2), ADJUST	
454	♦:3-672-507-00	PLATE (3-1), ADJUSTMENT	
455	3-669-466-00	SCREW (M 2.6)	
456	♦:3-679-290-00	GUIDE (1-YA), SHUTTLE	
457	X-3669-327-0	ARM ASSY, SWITCH, ULE	
458	♦:3-669-585-00	GUIDE (2), SHUTTLE	
459	3-669-465-00	WASHER (1.5), STOPPER	
460	3-669-630-00	ROLLER (C), RING	
461	3-669-607-31	+PSW (SMALL ROUND) (2.6)	
462	♦:X-3669-329-0	PLATE ASSY, ADJUSTMENT	

No.	Part No.	Description	Remark
463	3-669-360-00	ROLLER, RING	
464	♦:3-669-476-04	PLATE, GUIDE	
465	3-669-597-00	ROLLER (B), RING	
466	♦:3-669-477-00	LINER, LINK, PIN	
467	♦:X-3669-313-0	BASE ASSY, SLANT	
468	3-669-446-00	NUT, GUIDE, NO. 6	
469	3-669-447-00	FLANGE, GUIDE, NO. 6	
470	3-669-445-00	SPACER, GUIDE, NO. 6	
471	3-669-606-00	SCREW (2.6)	
472	8-825-508-10	HEAD, FE (FULL ERASE)	
473	3-669-615-00	SPRING, COMPRESSION	
474	♦:3-679-163-00	PLATE, LID OPEN	

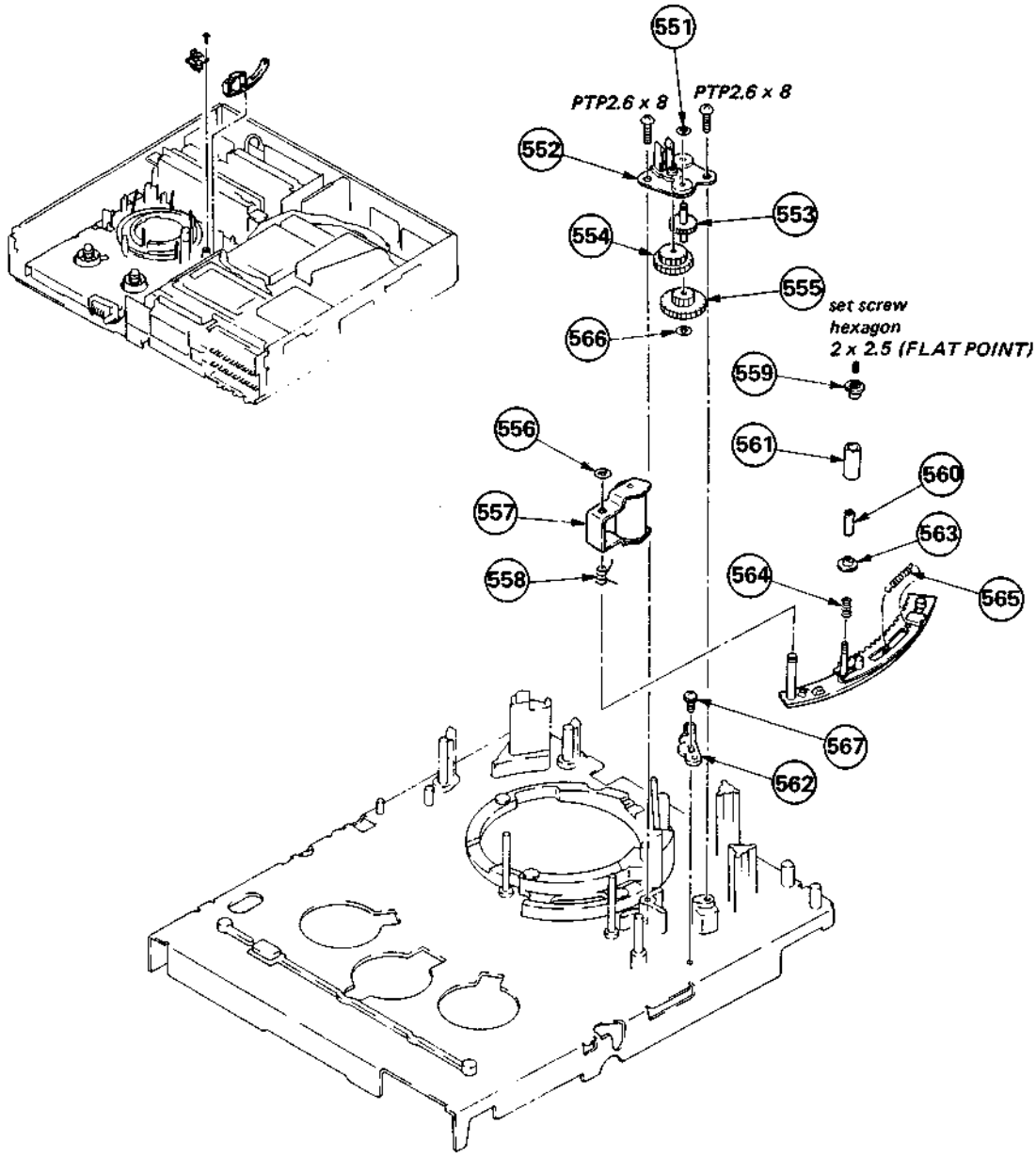
5-11. DRUM ASSEMBLY





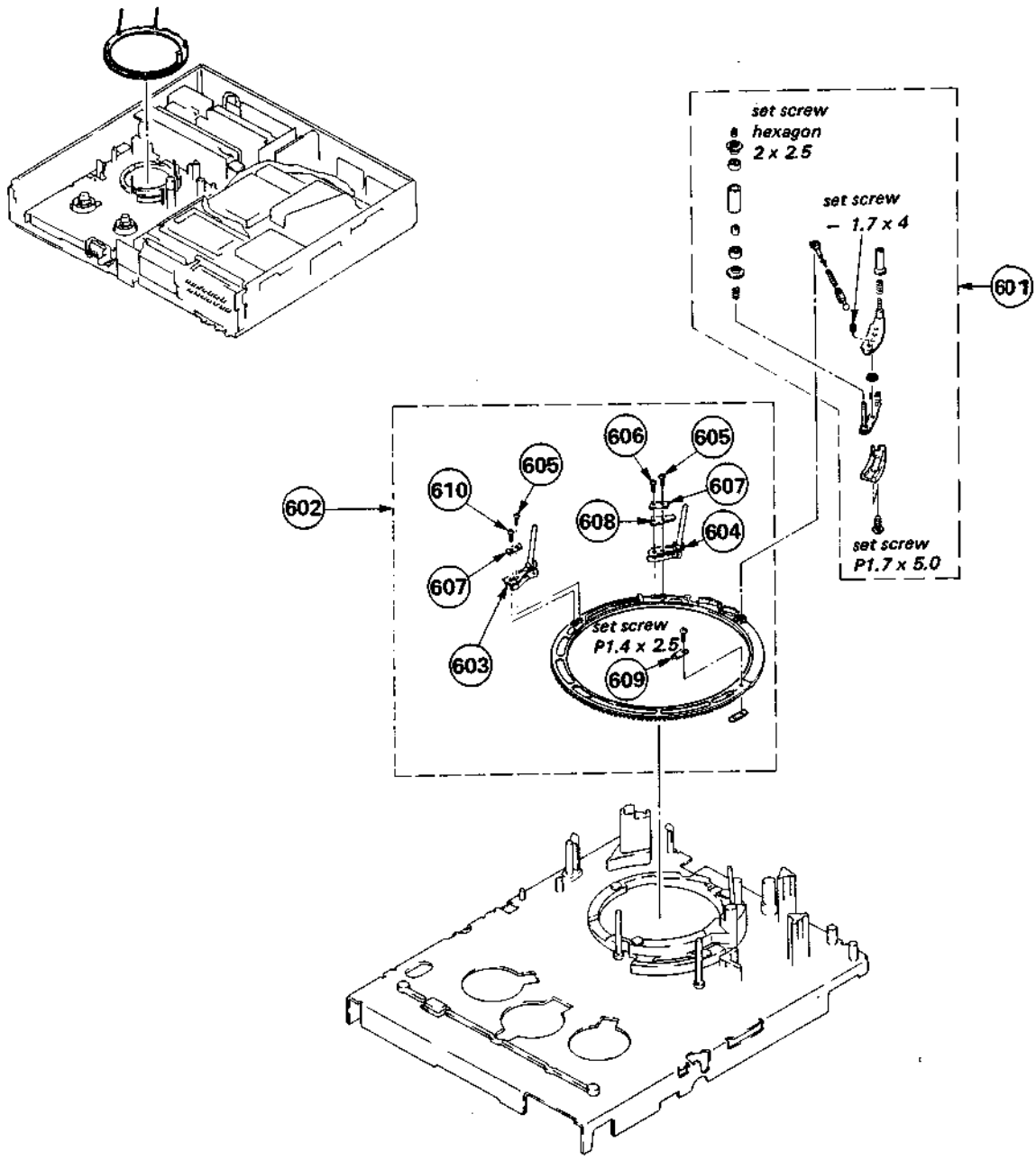
No.	Part No.	Description	Remark
501	3-669-600-11	WASHER, FLAT (3.5)	
502	3-669-302-00	SCREW, FITTING	
503	A-6050-176-A	DRUM ASSY (DSH-338-R)505,506,507,511,512	
504	3-429-123-00	SPRING	
505	A-6760-066-B	SPRING ASSY, TAPE RETAINER	
506	A-6762-115-A	DISK ASSY	
507	X-3669-105-0	SPACER BLOCK ASSY	
508	X-2621-204-2	STATOR ASSY, D	
509	X-2621-202-0	ROTOR ASSY, D	
510	♣:3-669-646-00	SPACER, DRUM (T0.05)	
	♣:3-669-646-11	SPACER, DRUM (T0.075)	
511	3-669-157-00	BOLT (WASHER) (2.6X8)	
512	A-6760-123-B	DRUM SUB ASSY, UPPER	

5-12. CHASSIS ASSEMBLY (5)



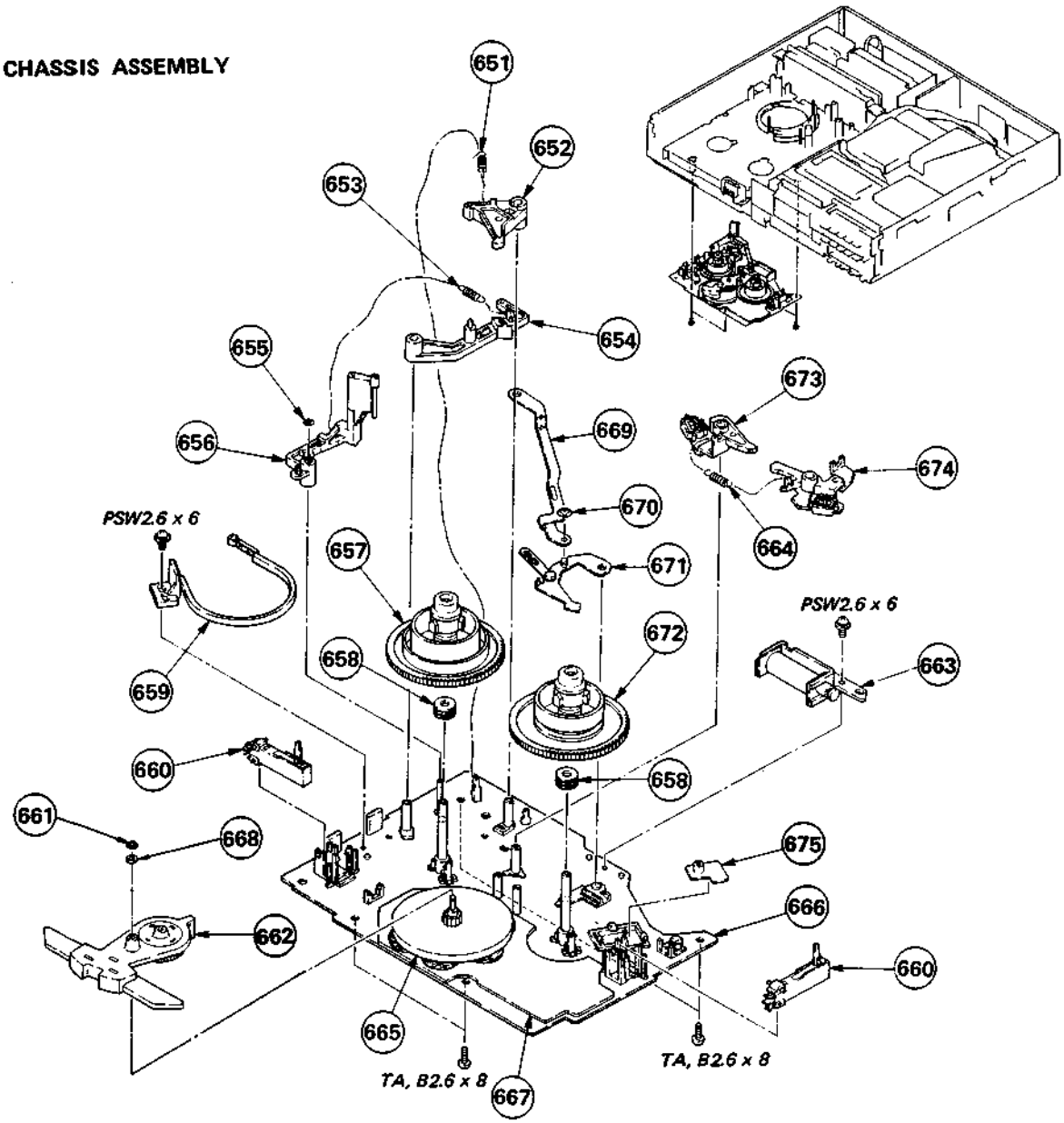
No.	Part No.	Description	Remark
551	3-669-465-00	WASHER (1.5), STOPPER	
552	X-3679-147-0	CHASSIS (B) ASSY, DRIVE GEAR	
553	X-3679-148-0	GEAR (F) ASSY (B)	
554	3-669-338-00	GEAR (E)	
555	3-669-337-00	GEAR (D)	
556	3-669-596-00	WASHER (2.3), STOPPER	
557	X-3669-307-6	ARM ASSY, PINCH ROLLER	
558	3-669-444-00	SPRING, TORSION	
559	3-676-650-00	FLANGE (UPPER)(#9), GUIDE	
560	3-672-559-00	SLEEVE, GUIDE	
561	3-676-649-00	ROLLER (#9), GUIDE	
562	♣:3-679-165-00	STOPPER, SLIDER	
563	3-672-558-00	FLANGE (LOWER)(#9), GUIDE	
564	3-669-452-00	SPRING, COMPRESSION	
565	3-549-014-00	SPRING, TENSION	
566	3-669-595-00	WASHER (2), STOPPER	
567	♣:3-669-613-00	INSULATOR, L MOTOR	

5-13. CHASSIS ASSEMBLY (6)



No.	Part No.	Description	Remark
601	A-6750-108-B	SHUTTLE BLOCK ASSY, THREADING	
602	X-3679-150-0	RING (YA) ASSY, S LOADING 603-610	
603	♣:X-3669-429-0	HOLDER BLOCK ASSY, #2 GUIDE	
604	♣:X-3669-430-0	HOLDER BLOCK ASSY, #3 GUIDE	
605	3-669-478-00	SCREW (1X3), TAPPING	
606	3-669-479-11	SCREW (1.4X3.5), TAPPING	
607	♣:3-669-472-02	RETAINER, SPRING, LEAF	
608	3-672-583-00	SPRING	
609	♣:3-669-616-00	RETAINER	
610	3-672-586-00	SCREW (1.4X3), TAPPING	

5-14. REEL CHASSIS ASSEMBLY



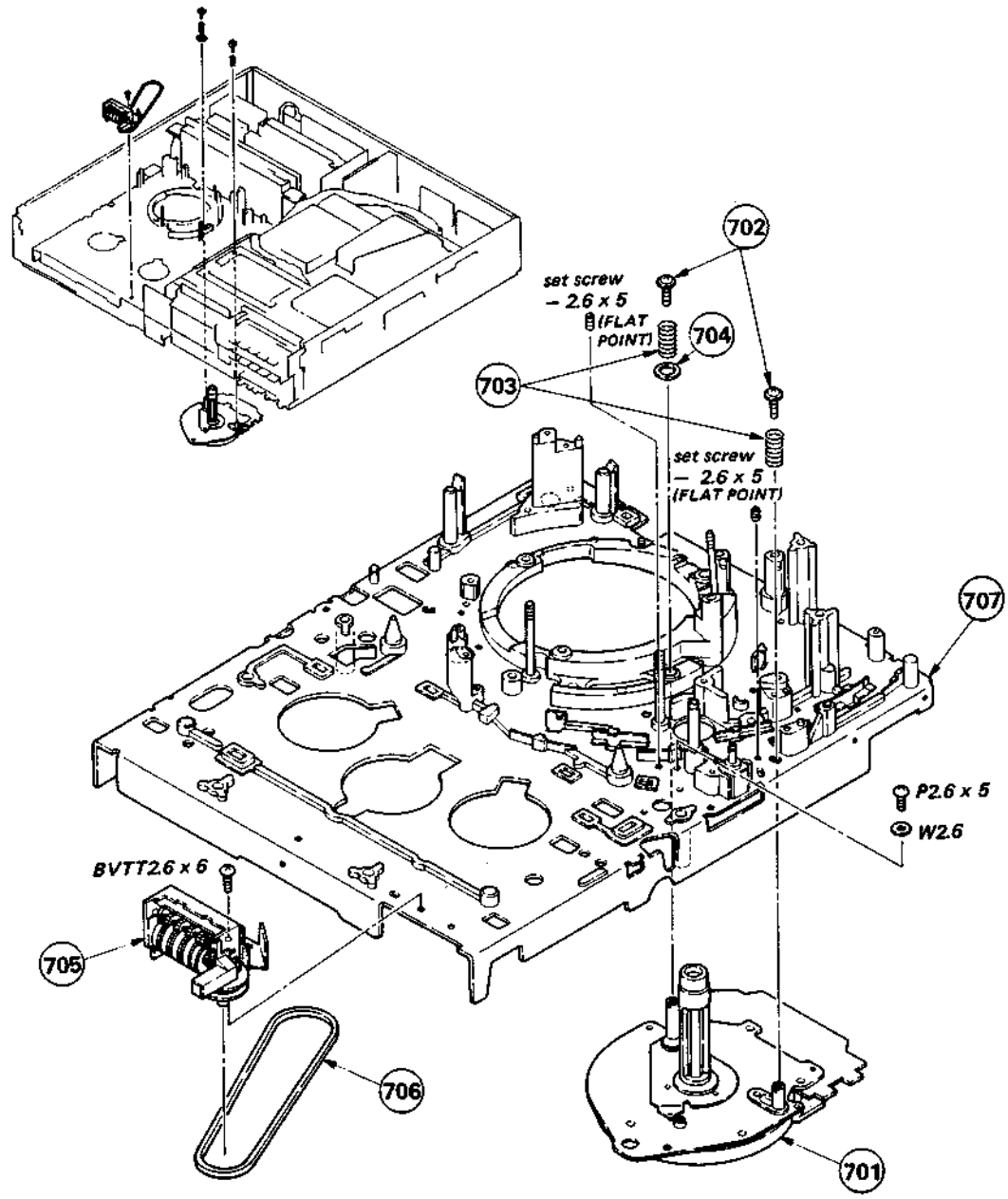
No.	Part No.	Description	Remark
651	3-679-156-00	SPRING, TENSION	
652	♣:3-679-231-00	LEVER, BRAKE, SOFT	
653	3-679-151-00	SPRING, TENSION	
654	♣:3-679-230-00	LEVER, FUNCTION	
655	3-669-465-00	WASHER (1.5), STOPPER	
656	X-3679-122-0	LEVER ASSY, TENSION REGULATOR	
657	X-3679-115-0	TABLE ASSY, REEL, S	
658	3-646-185-00	BEARING	
659	X-3679-120-0	BAND ASSY, TENSION REGULATOR	
660	1-554-374-00	SWITCH, LEVER S991, S992	
661	3-669-595-00	WASHER (2), STOPPER	
662	A-6759-074-H	ARM BLOCK ASSY, PENDULUM	
663	⚠:1-454-348-00	SOLENOID, BRAKE PLUNGER PM902	
664	3-679-190-00	SPRING, TENSION	

No.	Part No.	Description	Remark
665	X-2622-201-3	ROTOR ASSY, R (REEL MOTOR)	
666	♣:X-3679-130-0	CHASSIS ASSY, SUB	
667	♣:A-4910-021-A	R STATOR BOARD, COMPLETE (REEL MOTOR)	
668	3-679-318-00	WASHER, PENDULUM ARM	
669	♣:3-679-168-00	JOINT, BRAKE, L	
670	3-669-596-00	WASHER (2.3), STOPPER	
671	X-3679-119-0	ARM ASSY, STOPPER, PENDULUM	
672	X-3679-116-0	TABLE ASSY, REEL, T	
673	X-3679-117-0	BRAKE ASSY, S	
674	X-3679-118-0	BRAKE ASSY, T	
675	♣:1-609-231-00	RD-5 BOARD	

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-15. CHASSIS ASSEMBLY (7)



No.	Part No.	Description	Remark
701	8-838-042-01	MOTOR, DC (BHF-1907A)(CAPSTAN MOTOR)M902	
702	3-669-633-00	SCREW, + PW2	
703	3-679-359-00	SPRING, COMPRESSION	
704	3-669-697-00	SPACER, CAPSTAN	
705	1-548-571-00	COUNTER, TAPE (MIDDLE TYPE)	
706	3-679-171-00	BELT, COUNTER	
707	&:X-3679-132-0	CHASSIS ASSY, MECHANICAL	

HARDWARE LIST

SCREW

7-621-759-35	+PSW, 2.6X5
7-621-759-45	+PSW, 2.6X6
7-685-531-19	SCREW +BTP 2.6X4 TYPE2 N-S
7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S
7-685-880-01	SCREW +BVTT 4X6 (S)
7-685-860-01	SCREW +BVTT 2.6X4 (S)
7-685-862-01	SCREW +BVTT 2.6X6 (S)
7-685-862-09	SCREW +BVTT 2.6X6 (S)
7-685-863-01	SCREW +BVTT 2.6X8 (S)
7-685-135-11	SCREW +P 2.6X10 TYPE2 NON-SLIT
7-621-259-32	SCREW +P 2.6X5
7-621-259-35	SCREW +P 2.6X5
7-685-132-29	SCREW +P 2.6X5 TYPE2 SLIT
7-621-259-45	SCREW +P 2.6X6
7-685-134-11	SCREW +P 2.6X8 TYPE2 NON-SLIT
7-628-253-45	SCREW +PS 2X10
7-628-253-95	SCREW +PS 2.6X4
7-685-791-01	SCREW +PTT 2.6X5 (S)
7-627-551-08	SCREW, PRECISION +P 1.4X1.6
7-627-551-28	SCREW, PRECISION +P 1.4X2.5

SET-SCREW

7-621-712-26	SET-SCREW, SLOT 2.6X3FLAT POINT
7-621-712-35	SET-SCREW, SLOT 2.6X4CONE POINT
7-621-712-46	SET-SCREW, SLOT 2.6X5FLAT POINT
7-621-731-08	SET-SCT, HEX. 2X2.5, FLAT POINT
7-621-714-26	SET-SCREW, SLOT 1.7X4 FLAT POINT

SPRING PIN

7-626-302-31	SPRING PIN, 2.5X14

NUT

7-622-205-05	N 2, TYPE 2

TAPPING PIN

7-685-105-11	TPG +P 2X8, TYPE 2, NON-SLIT

WASHER

7-688-002-11	W 2.6, MIDDLE
7-688-004-01	W 4, SMALL

SECTION 6
ELECTRICAL PARTS LIST

YC-27

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- ⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.
- Items marked " ♣ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

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

Ref.No.	Part No.	Description			Remark
	♣:A-6711-467-A	YC-27 BOARD, COMPLETE **********			
	♣:1-560-890-00	PIN, CONNECTOR 2P			
	♣:3-655-214-00	CLIP, CABLE			
	♣:3-661-659-00	CASE (MAIN), SHIELD			
	♣:3-671-251-00	CASE (REAR PLATE), SHIELD			
		CAPACITOR			
C001	1-161-068-00	CERAMIC	0.0047MF	20%	50V
C002	1-102-074-00	CERAMIC	0.001MF	10%	50V
C003	1-123-328-00	ELECT	4.7MF	20%	25V
C004	1-123-332-00	ELECT	47MF	20%	16V
C005	1-161-070-00	CERAMIC	0.01MF	20%	50V
C006	1-123-307-00	ELECT	100MF	20%	10V
C007	1-123-354-00	ELECT	3.3MF	20%	50V
C008	1-161-070-00	CERAMIC	0.01MF	20%	50V
C009	1-102-973-00	CERAMIC	100PF	5%	50V
C010	1-102-945-00	CERAMIC	8PF	1PF	50V
C011	1-161-070-00	CERAMIC	0.01MF	20%	50V
C012	1-102-499-00	CERAMIC	120PF	5%	50V
C013	1-102-973-00	CERAMIC	100PF	5%	50V
C014	1-102-820-00	CERAMIC	330PF	5%	50V
C015	1-123-356-00	ELECT	10MF	20%	16V
C016	1-161-010-00	CERAMIC	0.0056MF	10%	25V
C017	1-123-379-00	ELECT	0.47MF	20%	50V
C018	1-102-116-00	CERAMIC	680PF	10%	50V
C019	1-130-514-00	MYLAR	0.0068MF	10%	50V
C020	1-130-508-00	MYLAR	0.0022MF	10%	50V
C021	1-123-332-00	ELECT	47MF	20%	16V
C022	1-161-013-00	CERAMIC	0.01MF	10%	25V
C023	1-123-307-00	ELECT	100MF	20%	10V
C024	1-123-379-00	ELECT	0.47MF	20%	50V
C025	1-101-888-00	CERAMIC	68PF	5%	50V
C026	1-102-110-00	CERAMIC	220PF	10%	50V
C027	1-123-330-00	ELECT	22MF	20%	16V
C028	1-123-381-00	ELECT	2.2MF	20%	50V
C029	1-161-021-00	CERAMIC	0.047MF	10%	25V
C030	1-102-114-00	CERAMIC	470PF	10%	50V
C031	1-161-013-00	CERAMIC	0.01MF	10%	25V
C032	1-123-305-00	ELECT	33MF	20%	10V
C033	1-102-978-00	CERAMIC	220PF	5%	50V
C034	1-130-495-00	MYLAR	0.1MF	5%	50V
C035	1-161-021-00	CERAMIC	0.047MF	10%	25V
C036	1-123-305-00	ELECT	33MF	20%	10V
C037	1-130-489-00	MYLAR	0.033MF	5%	50V
C038	1-123-356-00	ELECT	10MF	20%	16V
C039	1-102-074-00	CERAMIC	0.001MF	10%	50V
C040	1-102-962-00	CERAMIC	30PF	5%	50V
C041	1-101-882-00	CERAMIC	51PF	5%	50V
C042	1-102-114-00	CERAMIC	470PF	10%	50V
C043	1-102-962-00	CERAMIC	30PF	5%	50V
C044	1-161-013-00	CERAMIC	0.01MF	10%	25V
C045	1-102-973-00	CERAMIC	100PF	5%	50V
C046	1-102-117-00	CERAMIC	820PF	10%	50V
C047	1-123-356-00	ELECT	10MF	20%	16V
C048	1-102-973-00	CERAMIC	100PF	5%	50V
C049	1-161-013-00	CERAMIC	0.01MF	10%	25V
C050	1-161-013-00	CERAMIC	0.01MF	10%	25V
C051	1-102-116-00	CERAMIC	680PF	10%	50V
C052	1-102-116-00	CERAMIC	680PF	10%	50V
C053	1-161-070-00	CERAMIC	0.01MF	20%	50V
C054	1-123-328-00	ELECT	4.7MF	20%	25V
C055	1-102-117-00	CERAMIC	820PF	10%	50V
C056	1-131-404-00	ELECT(SOLID)	0.22MF	10%	25V
C057	1-161-072-00	CERAMIC	0.022MF	20%	50V
C058	1-123-381-00	ELECT	2.2MF	20%	50V
C059	1-161-070-00	CERAMIC	0.01MF	20%	50V
C060	1-161-070-00	CERAMIC	0.01MF	20%	50V
C061	1-102-935-00	CERAMIC	2PF	0.25PF	50V
C062	1-102-748-00	CERAMIC	11PF	5%	50V
C063	1-161-070-00	CERAMIC	0.01MF	20%	50V
C064	1-102-962-00	CERAMIC	30PF	5%	50V
C065	1-161-070-00	CERAMIC	0.01MF	20%	50V
C066	1-123-333-00	ELECT	100MF	20%	16V
C067	1-102-808-00	CERAMIC	6PF	1PF	50V
C068	1-101-880-00	CERAMIC	47PF	5%	50V
C069	1-102-965-00	CERAMIC	39PF	5%	50V
C070	1-102-947-00	CERAMIC	10PF	5%	50V
C071	1-102-530-00	CERAMIC	120PF	5%	50V
C072	1-102-961-00	CERAMIC	27PF	5%	50V
C073	1-123-332-00	ELECT	47MF	20%	16V
C074	1-123-305-00	ELECT	33MF	20%	10V
C075	1-123-356-00	ELECT	10MF	20%	16V
C076	1-123-318-00	ELECT	33MF	20%	16V
C077	1-161-025-00	CERAMIC	0.1MF	10%	25V
C078	1-123-307-00	ELECT	100MF	20%	10V
C079	1-123-318-00	ELECT	33MF	20%	16V
C080	1-161-013-00	CERAMIC	0.01MF	10%	25V
C081	1-123-356-00	ELECT	10MF	20%	16V
C082	1-123-332-00	ELECT	47MF	20%	16V
C083	1-161-021-00	CERAMIC	0.047MF	10%	25V
C084	1-123-332-00	ELECT	47MF	20%	16V
C085	1-161-070-00	CERAMIC	0.01MF	20%	50V
C086	1-161-070-00	CERAMIC	0.01MF	20%	50V
C087	1-161-021-00	CERAMIC	0.047MF	10%	25V
C088	1-101-888-00	CERAMIC	68PF	5%	50V
C089	1-123-318-00	ELECT	33MF	20%	16V
C090	1-101-884-00	CERAMIC	56PF	5%	50V
C091	1-102-110-00	CERAMIC	220PF	10%	50V
C092	1-123-318-00	ELECT	33MF	20%	16V
C093	1-102-959-00	CERAMIC	22PF	5%	50V
C094	1-161-013-00	CERAMIC	0.01MF	10%	25V
C095	1-123-379-00	ELECT	0.47MF	20%	50V
C096	1-123-330-00	ELECT	22MF	20%	16V
C097	1-161-039-00	CERAMIC	0.001MF	10%	25V
C098	1-123-656-00	ELECT	1000MF	20%	10V

YC-27

Ref.No.	Part No.	Description			Remark
C099	1-123-295-00	ELECT	100MF	20%	6.3V
C100	1-161-070-00	CERAMIC	0.01MF	20%	50V
C101	1-161-005-00	CERAMIC	0.0022MF	10%	25V
C102	1-123-307-00	ELECT	100MF	20%	10V
C103	1-161-070-00	CERAMIC	0.01MF	20%	50V
C104	1-161-021-00	CERAMIC	0.047MF	10%	25V
C105	1-123-356-00	ELECT	10MF	20%	16V
C106	1-123-330-00	ELECT	22MF	20%	16V
C107	1-123-330-00	ELECT	22MF	20%	16V
C108	1-123-381-00	ELECT	2.2MF	20%	50V
C109	1-123-381-00	ELECT	2.2MF	20%	50V
C110	1-123-332-00	ELECT	47MF	20%	16V
C111	1-123-295-00	ELECT	100MF	20%	6.3V
C112	1-161-070-00	CERAMIC	0.01MF	20%	50V
C113	1-123-296-00	ELECT	220MF	20%	6.3V
C114	1-102-820-00	CERAMIC	330PF	5%	50V
C115	1-102-980-00	CERAMIC	270PF	5%	50V
C116	1-101-059-00	CERAMIC	510PF	5%	50V
C117	1-102-980-00	CERAMIC	270PF	5%	50V
C118	1-123-306-00	ELECT	47MF	20%	10V
C119	1-123-332-00	ELECT	47MF	20%	16V
C120	1-161-013-00	CERAMIC	0.01MF	10%	25V
C121	1-123-307-00	ELECT	100MF	20%	10V
C122	1-102-962-00	CERAMIC	30PF	5%	50V
C123	1-161-021-00	CERAMIC	0.047MF	10%	25V
C124	1-102-960-00	CERAMIC	24PF	5%	50V
C125	1-161-013-00	CERAMIC	0.01MF	10%	25V
C126	1-161-072-00	CERAMIC	0.022MF	20%	50V
C127	1-161-013-00	CERAMIC	0.01MF	10%	25V
C128	1-161-021-00	CERAMIC	0.047MF	10%	25V
C129	1-161-021-00	CERAMIC	0.047MF	10%	25V
C132	1-102-980-00	CERAMIC	270PF	5%	50V
C133	1-123-306-00	ELECT	47MF	20%	10V
C134	1-102-823-00	CERAMIC	43PF	5%	50V
C135	1-102-823-00	CERAMIC	43PF	5%	50V
C136	1-102-824-00	CERAMIC	470PF	5%	50V
C137	1-161-021-00	CERAMIC	0.047MF	10%	25V
C138	1-102-976-00	CERAMIC	180PF	5%	50V
C139	1-102-976-00	CERAMIC	180PF	5%	50V
C140	1-101-059-00	CERAMIC	510PF	5%	50V
C141	1-102-972-00	CERAMIC	91PF	5%	50V
C142	1-102-966-00	CERAMIC	43PF	5%	50V
C143	1-102-816-00	CERAMIC	120PF	5%	50V
C144	1-123-356-00	ELECT	10MF	20%	16V
C145	1-102-112-00	CERAMIC	330PF	10%	50V
C146	1-123-380-00	ELECT	1MF	20%	50V
C147	1-102-976-00	CERAMIC	180PF	5%	50V
C148	1-102-980-00	CERAMIC	270PF	5%	50V
C149	1-101-880-00	CERAMIC	47PF	5%	50V
C150	1-102-820-00	CERAMIC	330PF	5%	50V
C151	1-123-306-00	ELECT	47MF	20%	10V
C152	1-124-145-00	ELECT	330MF	20%	16V
C153	1-101-361-00	CERAMIC	150PF	5%	50V
C154	1-102-820-00	CERAMIC	330PF	5%	50V
C155	1-130-473-00	MYLAR	0.0015MF	5%	50V
C156	1-102-978-00	CERAMIC	220PF	5%	50V
C157	1-102-951-00	CERAMIC	15PF	5%	50V
C158	1-102-965-00	CERAMIC	39PF	5%	50V
C159	1-101-884-00	CERAMIC	56PF	5%	50V
C160	1-102-953-00	CERAMIC	18PF	5%	50V
C161	1-123-332-00	ELECT	47MF	20%	16V
C162	1-161-070-00	CERAMIC	0.01MF	20%	50V
C163	1-161-036-00	CERAMIC	0.047MF	20%	25V
C164	1-161-036-00	CERAMIC	0.047MF	20%	25V
C165	1-161-070-00	CERAMIC	0.01MF	20%	50V
C166	1-102-966-00	CERAMIC	43PF	5%	50V
C167	1-102-809-00	CERAMIC	7PF	1PF	50V
C168	1-102-112-00	CERAMIC	330PF	10%	50V
C169	1-161-013-00	CERAMIC	0.01MF	10%	25V
C170	1-161-013-00	CERAMIC	0.01MF	10%	25V
C171	1-102-934-00	CERAMIC	1PF	0.25PF	50V
C172	1-102-953-00	CERAMIC	18PF	5%	50V
C173	1-102-959-00	CERAMIC	22PF	5%	50V
C174	1-102-807-00	CERAMIC	5PF	1PF	50V
C175	1-123-296-00	ELECT	220MF	20%	6.3V
C176	1-123-380-00	ELECT	1MF	20%	50V
C177	1-102-973-00	CERAMIC	100PF	5%	50V
C178	1-123-307-00	ELECT	100MF	20%	10V
C179	1-161-006-00	CERAMIC	0.0027MF	10%	25V
C180	1-161-004-00	CERAMIC	0.0018MF	10%	25V
C181	1-123-296-00	ELECT	220MF	20%	6.3V
C182	1-123-356-00	ELECT	10MF	20%	16V
C183	1-161-013-00	CERAMIC	0.01MF	10%	25V
C184	1-161-013-00	CERAMIC	0.01MF	10%	25V
C185	1-161-013-00	CERAMIC	0.01MF	10%	25V
C186	1-161-013-00	CERAMIC	0.01MF	10%	25V
C187	1-102-816-00	CERAMIC	120PF	5%	50V
C188	1-123-356-00	ELECT	10MF	20%	16V
C189	1-161-070-00	CERAMIC	0.01MF	20%	50V
C190	1-123-332-00	ELECT	47MF	20%	16V
C191	1-161-072-00	CERAMIC	0.022MF	20%	50V
C192	1-123-332-00	ELECT	47MF	20%	16V
C193	1-161-070-00	CERAMIC	0.01MF	20%	50V
C194	1-102-529-00	CERAMIC	100PF	5%	50V
C195	1-161-036-00	CERAMIC	0.047MF	20%	25V
C196	1-161-036-00	CERAMIC	0.047MF	20%	25V
C197	1-161-036-00	CERAMIC	0.047MF	20%	25V
C198	1-161-070-00	CERAMIC	0.01MF	20%	50V
C199	1-102-963-00	CERAMIC	33PF	5%	50V
C200	1-102-959-00	CERAMIC	22PF	5%	50V
C201	1-123-305-00	ELECT	33MF	20%	10V
C202	1-161-021-00	CERAMIC	0.047MF	10%	25V
C203	1-161-021-00	CERAMIC	0.047MF	10%	25V
C204	1-161-021-00	CERAMIC	0.047MF	10%	25V
C205	1-161-021-00	CERAMIC	0.047MF	10%	25V
C206	1-123-330-00	ELECT	22MF	20%	16V

Ref.No.	Part No.	Description			Remark
C207	1-161-013-00	CERAMIC	0.01MF	10%	25V
C208	1-161-021-00	CERAMIC	0.047MF	10%	25V
C209	1-123-356-00	ELECT	10MF	20%	16V
C210	1-101-884-00	CERAMIC	56PF	5%	50V
C211	1-102-963-00	CERAMIC	33PF	5%	50V
C212	1-102-851-00	CERAMIC	15PF	5%	50V
		FILTER			
CF001	1-527-823-00	FILTER, CERAMIC			
		CONNECTOR			
CN001♣	1-560-898-00	PIN, CONNECTOR 10P			
CN002♣	1-560-894-00	PIN, CONNECTOR 6P			
CN003♣	1-560-890-00	PIN, CONNECTOR 2P			
CN004♣	1-560-890-00	PIN, CONNECTOR 2P			
CN005♣	1-560-900-00	PIN, CONNECTOR 12P			
CN006♣	1-560-890-00	PIN, CONNECTOR 2P			
		JACK			
CNJ001	1-507-892-00	JACK, PIN 1P			
CNJ002	1-507-588-32	PIN JACK, 1P			
		DIODE			
D001	=>8-719-911-19	DIODE 1SS119			
D002	=>8-719-911-19	DIODE 1SS119			
D003	=>8-719-911-19	DIODE 1SS119			
D004	=>8-719-911-19	DIODE 1SS119			
D005	=>8-719-911-19	DIODE 1SS119			
D006	=>8-719-911-19	DIODE 1SS119			
D007	=>8-719-911-19	DIODE 1SS119			
D008	=>8-719-911-19	DIODE 1SS119			
D009	=>8-719-911-19	DIODE 1SS119			
D010	=>8-719-911-19	DIODE 1SS119			
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	=>8-719-911-19	DIODE 1SS119			
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			
D024	=>8-719-911-19	DIODE 1SS119			
D025	=>8-719-911-19	DIODE 1SS119			
		DELAY LINE			
DL001	1-415-283-00	DELAY LINE (1/2H)			
DL002	1-415-065-00	DELAY LINE			

Ref.No.	Part No.	Description	Remark
DL003	1-415-159-00	DELAY LINE (1H)	
		IC	
IC001	8-751-960-00	IC CX196	
IC002	8-758-220-00	IC CX822	
IC003	8-751-880-00	IC CX188	
IC004	- - -	IC CX187	
IC005	8-751-350-00	IC CX135	
		COIL	
L001	1-408-623-00	MICRO INDUCTOR 470UH	
L002	1-408-614-00	MICRO INDUCTOR 82UH	
L003	1-408-608-00	MICRO INDUCTOR 27UH	
L004	1-408-600-00	MICRO INDUCTOR 5.6UH	
L005	1-408-613-00	MICRO INDUCTOR 68UH	
L006	1-408-619-00	MICRO INDUCTOR 220UH	
L007	1-407-503-00	MICRO INDUCTOR 8.2MMH	
L008	1-407-747-11	MICRO INDUCTOR 56UH	
L009	1-408-611-00	MICRO INDUCTOR 47UH	
L010	1-408-615-00	MICRO INDUCTOR 100UH	
L011	1-408-616-00	MICRO INDUCTOR 120UH	
L012	1-408-614-00	MICRO INDUCTOR 82UH	
L013	1-408-617-00	MICRO INDUCTOR 150UH	
L014	1-408-615-00	MICRO INDUCTOR 100UH	
L015	1-408-613-00	MICRO INDUCTOR 68UH	
L016	1-408-614-00	MICRO INDUCTOR 82UH	
L017	1-407-718-00	MICRO INDUCTOR 1.2MMH	
L018	1-408-608-00	MICRO INDUCTOR 27UH	
L019	1-408-604-00	MICRO INDUCTOR 12UH	
L020	1-408-602-00	MICRO INDUCTOR 8.2UH	
L021	1-408-605-00	MICRO INDUCTOR 15UH	
L022	1-408-603-00	MICRO INDUCTOR 10UH	
L023	1-408-610-00	MICRO INDUCTOR 39UH	
L024	1-408-610-00	MICRO INDUCTOR 39UH	
L025	1-408-610-00	MICRO INDUCTOR 39UH	
L026	1-408-616-00	MICRO INDUCTOR 120UH	
L027	1-408-607-00	MICRO INDUCTOR 22UH	
L028	1-408-614-00	MICRO INDUCTOR 82UH	
L029	1-408-617-00	MICRO INDUCTOR 150UH	
L030	1-408-618-00	MICRO INDUCTOR 180UH	
L031	1-408-615-00	MICRO INDUCTOR 100UH	
L032	1-408-602-00	MICRO INDUCTOR 8.2UH	
L033	1-408-617-00	MICRO INDUCTOR 150UH	
L034	1-408-617-00	MICRO INDUCTOR 150UH	
L035	1-408-619-00	MICRO INDUCTOR 220UH	
L036	1-408-618-00	MICRO INDUCTOR 180UH	
L037	1-408-606-00	MICRO INDUCTOR 18UH	
L038	1-408-606-00	MICRO INDUCTOR 18UH	
L039	1-408-617-00	MICRO INDUCTOR 150UH	
L040	1-408-401-00	MICRO INDUCTOR 2.2UH	
L041	1-408-613-00	MICRO INDUCTOR 68UH	
L042	1-408-619-00	MICRO INDUCTOR 220UH	

YC-27

Ref.No.	Part No.	Description	Remark
		VARIABLE RESISTOR	
LV001	1-408-522-00	COIL, VARIABLE	
LV002	1-408-512-00	COIL (VARIABLE)	
		RF UNIT	
MD001⚠	1-464-266-00	RF UNIT, COLOR	
		TRANSISTOR	
Q001	8-729-245-83	TRANSISTOR 2SC2458	
Q002	8-729-245-83	TRANSISTOR 2SC2458	
Q003	8-729-245-83	TRANSISTOR 2SC2458	
Q004	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q005	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q006	8-729-245-83	TRANSISTOR 2SC2458	
Q007	8-729-178-54	TRANSISTOR 2SC2785	
Q008	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q009	=>8-729-178-54	TRANSISTOR 2SC2785	
Q010	8-729-245-83	TRANSISTOR 2SC2458	
Q011	8-729-245-83	TRANSISTOR 2SC2458	
Q012	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q013	8-729-245-83	TRANSISTOR 2SC2458	
Q014	8-729-245-83	TRANSISTOR 2SC2458	
Q015	8-729-245-83	TRANSISTOR 2SC2458	
Q016	8-729-178-55	TRANSISTOR 2SC2785-E	
Q017	8-729-245-83	TRANSISTOR 2SC2458	
Q018	8-729-245-83	TRANSISTOR 2SC2458	
Q019	8-729-245-83	TRANSISTOR 2SC2458	
Q020	8-729-245-83	TRANSISTOR 2SC2458	
Q021	8-729-245-83	TRANSISTOR 2SC2458	
Q022	8-729-178-54	TRANSISTOR 2SC2785	
Q023	8-729-178-54	TRANSISTOR 2SC2785	
Q024	8-729-245-83	TRANSISTOR 2SC2458	
Q025	8-729-245-83	TRANSISTOR 2SC2458	
Q026	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q027	8-729-384-48	TRANSISTOR 2SA844	
Q028	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q029	8-729-178-54	TRANSISTOR 2SC2785	
Q030	8-729-245-83	TRANSISTOR 2SC2458	
Q031	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q032	8-729-178-54	TRANSISTOR 2SC2785	
Q033	8-729-245-83	TRANSISTOR 2SC2458	
Q034	8-729-245-83	TRANSISTOR 2SC2458	
Q035	=>8-729-204-83	TRANSISTOR 2SA1048-GR	
Q036	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q037	8-729-173-37	TRANSISTOR 2SA733-P	
Q038	8-729-173-37	TRANSISTOR 2SA733-P	
Q039	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q040	8-729-173-37	TRANSISTOR 2SA733-P	
Q041	8-729-173-37	TRANSISTOR 2SA733-P	
Q042	8-729-173-37	TRANSISTOR 2SA733-P	
Q043	8-729-173-37	TRANSISTOR 2SA733-P	
Q044	8-729-245-83	TRANSISTOR 2SC2458	
Q045	8-729-173-37	TRANSISTOR 2SA733-P	
Q046	8-729-173-37	TRANSISTOR 2SA733-P	
Q047	8-729-173-37	TRANSISTOR 2SA733-P	
Q048	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q049	8-729-173-37	TRANSISTOR 2SA733-P	
Q050	8-729-173-37	TRANSISTOR 2SA733-P	
Q051	8-729-245-83	TRANSISTOR 2SC2458	
Q052	8-729-178-54	TRANSISTOR 2SC2785	
Q053	8-729-178-54	TRANSISTOR 2SC2785	
Q054	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q055	8-729-384-48	TRANSISTOR 2SA844	
Q056	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q057	=>8-729-603-50	TRANSISTOR 2SC403SP	
		RESISTOR	
R001	1-247-869-00	CARBON 39K 5% 1/6W	
R002	1-247-855-00	CARBON 10K 5% 1/6W	
R003	1-246-461-00	CARBON 330 5% 1/4W	
R004	1-247-849-00	CARBON 5.6K 5% 1/6W	
R005	1-247-809-00	CARBON 120 5% 1/6W	
R006	1-247-847-00	CARBON 4.7K 5% 1/6W	
R007	1-247-848-00	CARBON 5.1K 5% 1/6W	
R008	1-247-881-00	CARBON 120K 5% 1/6W	
R009	1-247-836-00	CARBON 1.6K 5% 1/6W	
R010	1-247-841-00	CARBON 2.7K 5% 1/6W	
R011	1-247-827-00	CARBON 680 5% 1/6W	
R012	1-247-863-00	CARBON 22K 5% 1/6W	
R013	1-247-838-00	CARBON 2K 5% 1/6W	
R014	1-247-871-00	CARBON 47K 5% 1/6W	
R015	1-247-833-00	CARBON 1.2K 5% 1/6W	
R016	1-247-889-00	CARBON 270K 5% 1/6W	
R017	1-247-879-00	CARBON 100K 5% 1/6W	
R018	1-247-859-00	CARBON 15K 5% 1/6W	
R019	1-247-881-00	CARBON 120K 5% 1/6W	
R020	1-247-825-00	CARBON 560 5% 1/6W	
R021	1-247-859-00	CARBON 15K 5% 1/6W	
R022	1-247-856-00	CARBON 11K 5% 1/6W	
R023	1-247-855-00	CARBON 10K 5% 1/6W	
R024	1-247-837-00	CARBON 1.8K 5% 1/6W	
R025	1-247-855-00	CARBON 10K 5% 1/6W	
R026	1-247-807-00	CARBON 100 5% 1/6W	
R027	1-247-871-00	CARBON 47K 5% 1/6W	
R028	1-247-871-00	CARBON 47K 5% 1/6W	
R029	1-247-884-00	CARBON 160K 5% 1/6W	
R030	1-247-831-00	CARBON 1K 5% 1/6W	
R031	1-247-853-00	CARBON 8.2K 5% 1/6W	
R032	1-247-819-00	CARBON 330 5% 1/6W	
R033	1-247-819-00	CARBON 330 5% 1/6W	
R034	1-247-853-00	CARBON 8.2K 5% 1/6W	
R035	1-247-853-00	CARBON 8.2K 5% 1/6W	
R036	1-247-884-00	CARBON 160K 5% 1/6W	
R037	1-247-843-00	CARBON 3.3K 5% 1/6W	
R038	1-247-903-00	CARBON 1M 5% 1/6W	

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description				Remark
RO39	1-247-855-00	CARBON	10K	5%	1/6W	
RO40	1-247-855-00	CARBON	10K	5%	1/6W	
RO41	1-247-872-00	CARBON	51K	5%	1/6W	
RO42	1-247-855-00	CARBON	10K	5%	1/6W	
RO43	1-247-869-00	CARBON	39K	5%	1/6W	
RO44	1-247-824-00	CARBON	510	5%	1/6W	
RO45	1-247-855-00	CARBON	10K	5%	1/6W	
RO46	1-247-872-00	CARBON	51K	5%	1/6W	
RO47	1-247-851-00	CARBON	6.8K	5%	1/6W	
RO48	1-247-859-00	CARBON	15K	5%	1/6W	
RO50	1-247-873-00	CARBON	56K	5%	1/6W	
RO51	1-247-868-00	CARBON	36K	5%	1/6W	
RO52	1-247-863-00	CARBON	22K	5%	1/6W	
RO53	1-247-865-00	CARBON	27K	5%	1/6W	
RO54	1-247-839-00	CARBON	2.2K	5%	1/6W	
RO55	1-247-825-00	CARBON	560	5%	1/6W	
RO56	1-247-799-00	CARBON	47	5%	1/6W	
RO57	1-247-831-00	CARBON	1K	5%	1/6W	
RO58	1-247-825-00	CARBON	560	5%	1/6W	
RO59	1-247-831-00	CARBON	1K	5%	1/6W	
RO60	1-247-825-00	CARBON	560	5%	1/6W	
RO61	1-247-825-00	CARBON	560	5%	1/6W	
RO62	1-247-839-00	CARBON	2.2K	5%	1/6W	
RO63	1-247-879-00	CARBON	100K	5%	1/6W	
RO64	1-247-843-00	CARBON	3.3K	5%	1/6W	
RO65	1-247-900-00	CARBON	750K	5%	1/6W	
RO66	1-210-819-00	SOLID	1.8M	5%	1/4W	
RO67	1-247-843-00	CARBON	3.3K	5%	1/6W	
RO68	1-247-839-00	CARBON	2.2K	5%	1/6W	
RO69	1-247-851-00	CARBON	6.8K	5%	1/6W	
RO70	1-247-842-00	CARBON	3K	5%	1/6W	
RO71	1-247-855-00	CARBON	10K	5%	1/6W	
RO72	1-247-871-00	CARBON	47K	5%	1/6W	
RO73	1-247-849-00	CARBON	5.6K	5%	1/6W	
RO74	1-247-855-00	CARBON	10K	5%	1/6W	
RO75	1-247-835-00	CARBON	1.5K	5%	1/6W	
RO76	1-247-848-00	CARBON	5.1K	5%	1/6W	
RO77	1-247-835-00	CARBON	1.5K	5%	1/6W	
RO78	1-247-837-00	CARBON	1.8K	5%	1/6W	
RO79	1-247-855-00	CARBON	10K	5%	1/6W	
RO80	1-247-849-00	CARBON	5.6K	5%	1/6W	
RO81	1-247-852-00	CARBON	7.5K	5%	1/6W	
RO82	1-247-873-00	CARBON	56K	5%	1/6W	
RO83	1-247-829-00	CARBON	820	5%	1/6W	
RO84	1-247-831-00	CARBON	1K	5%	1/6W	
RO85	1-247-829-00	CARBON	820	5%	1/6W	
RO86	1-247-833-00	CARBON	1.2K	5%	1/6W	
RO87	1-247-831-00	CARBON	1K	5%	1/6W	
RO88	1-247-846-00	CARBON	4.3K	5%	1/6W	
RO89	1-247-855-00	CARBON	10K	5%	1/6W	
RO90	1-247-831-00	CARBON	1K	5%	1/6W	
RO91	1-247-831-00	CARBON	1K	5%	1/6W	
RO92	1-247-813-00	CARBON	180	5%	1/6W	

Ref.No.	Part No.	Description				Remark
RO93	1-247-809-00	CARBON	120	5%	1/6W	
RO94	1-247-831-00	CARBON	1K	5%	1/6W	
RO95	1-247-855-00	CARBON	10K	5%	1/6W	
RO96	1-247-855-00	CARBON	10K	5%	1/6W	
RO97	1-247-847-00	CARBON	4.7K	5%	1/6W	
RO98	1-247-847-00	CARBON	4.7K	5%	1/6W	
RO99	1-247-855-00	CARBON	10K	5%	1/6W	
R100	1-247-871-00	CARBON	47K	5%	1/6W	
R101	1-247-859-00	CARBON	15K	5%	1/6W	
R102	1-247-867-00	CARBON	33K	5%	1/6W	
R103	1-244-860-51	CARBON	300	5%	1/2W	
R104	1-247-803-00	CARBON	68	5%	1/6W	
R105	1-247-829-00	CARBON	820	5%	1/6W	
R106	1-247-831-00	CARBON	1K	5%	1/6W	
R107	1-247-849-00	CARBON	5.6K	5%	1/6W	
R108	1-247-827-00	CARBON	680	5%	1/6W	
R109	1-247-855-00	CARBON	10K	5%	1/6W	
R110	1-247-871-00	CARBON	47K	5%	1/6W	
R111	1-247-853-00	CARBON	8.2K	5%	1/6W	
R112	1-247-839-00	CARBON	2.2K	5%	1/6W	
R113	1-247-867-00	CARBON	33K	5%	1/6W	
R114	1-247-855-00	CARBON	10K	5%	1/6W	
R115	1-247-855-00	CARBON	10K	5%	1/6W	
R116	1-247-871-00	CARBON	47K	5%	1/6W	
R117	1-247-871-00	CARBON	47K	5%	1/6W	
R118	1-247-854-00	CARBON	9.1K	5%	1/6W	
R119	1-247-859-00	CARBON	15K	5%	1/6W	
R120	1-247-853-00	CARBON	8.2K	5%	1/6W	
R121	1-247-827-00	CARBON	680	5%	1/6W	
R122	1-247-847-00	CARBON	4.7K	5%	1/6W	
R123	1-247-838-00	CARBON	2K	5%	1/6W	
R124	1-247-846-00	CARBON	4.3K	5%	1/6W	
R125	1-247-807-00	CARBON	100	5%	1/6W	
R126	1-247-827-00	CARBON	680	5%	1/6W	
R127	1-247-827-00	CARBON	680	5%	1/6W	
R128	1-247-827-00	CARBON	680	5%	1/6W	
R129	1-247-827-00	CARBON	680	5%	1/6W	
R130	1-247-821-00	CARBON	390	5%	1/6W	
R131	1-247-839-00	CARBON	2.2K	5%	1/6W	
R132	1-247-809-00	CARBON	120	5%	1/6W	
R133	1-247-827-00	CARBON	680	5%	1/6W	
R134	1-247-865-00	CARBON	27K	5%	1/6W	
R135	1-247-831-00	CARBON	1K	5%	1/6W	
R136	1-247-823-00	CARBON	470	5%	1/6W	
R137	1-247-823-00	CARBON	470	5%	1/6W	
R138	1-247-833-00	CARBON	1.2K	5%	1/6W	
R139	1-247-831-00	CARBON	1K	5%	1/6W	
R140	1-247-833-00	CARBON	1.2K	5%	1/6W	
R141	1-247-839-00	CARBON	2.2K	5%	1/6W	
R142	1-247-831-00	CARBON	1K	5%	1/6W	
R143	1-247-863-00	CARBON	22K	5%	1/6W	
R144	1-247-859-00	CARBON	15K	5%	1/6W	
R145	1-247-831-00	CARBON	1K	5%	1/6W	

YC-27

Ref.No.	Part No.	Description				Remark
R146	1-247-855-00	CARBON	10K	5%	1/6W	
R147	1-247-863-00	CARBON	22K	5%	1/6W	
R148	1-247-828-00	CARBON	750	5%	1/6W	
R149	1-247-840-00	CARBON	2.4K	5%	1/6W	
R150	1-247-847-00	CARBON	4.7K	5%	1/6W	
R151	1-247-855-00	CARBON	10K	5%	1/6W	
R152	1-247-863-00	CARBON	22K	5%	1/6W	
R153	1-247-828-00	CARBON	750	5%	1/6W	
R154	1-247-867-00	CARBON	33K	5%	1/6W	
R155	1-247-839-00	CARBON	2.2K	5%	1/6W	
R156	1-247-861-00	CARBON	18K	5%	1/6W	
R157	1-247-863-00	CARBON	22K	5%	1/6W	
R158	1-247-831-00	CARBON	1K	5%	1/6W	
R159	1-247-837-00	CARBON	1.8K	5%	1/6W	
R160	1-247-849-00	CARBON	5.6K	5%	1/6W	
R161	1-247-851-00	CARBON	6.8K	5%	1/6W	
R162	1-247-851-00	CARBON	6.8K	5%	1/6W	
R163	1-247-859-00	CARBON	15K	5%	1/6W	
R164	1-247-825-00	CARBON	560	5%	1/6W	
R165	1-247-831-00	CARBON	1K	5%	1/6W	
R166	1-247-824-00	CARBON	510	5%	1/6W	
R167	1-247-856-00	CARBON	11K	5%	1/6W	
R168	1-247-813-00	CARBON	180	5%	1/6W	
R169	1-247-813-00	CARBON	180	5%	1/6W	
R170	1-247-856-00	CARBON	11K	5%	1/6W	
R171	1-247-831-00	CARBON	1K	5%	1/6W	
R172	1-247-823-00	CARBON	470	5%	1/6W	
R173	1-247-811-00	CARBON	150	5%	1/6W	
R174	1-247-837-00	CARBON	1.8K	5%	1/6W	
R175	1-247-839-00	CARBON	2.2K	5%	1/6W	
R176	1-247-817-00	CARBON	270	5%	1/6W	
R177	1-247-847-00	CARBON	4.7K	5%	1/6W	
R178	1-247-835-00	CARBON	1.5K	5%	1/6W	
R179	1-247-842-00	CARBON	3K	5%	1/6W	
R180	1-247-819-00	CARBON	330	5%	1/6W	
R181	1-247-859-00	CARBON	15K	5%	1/6W	
R182	1-247-832-00	CARBON	1.1K	5%	1/6W	
R183	1-247-821-00	CARBON	390	5%	1/6W	
R184	1-247-835-00	CARBON	1.5K	5%	1/6W	
R185	1-247-831-00	CARBON	1K	5%	1/6W	
R186	1-247-847-00	CARBON	4.7K	5%	1/6W	
R187	1-247-799-00	CARBON	47	5%	1/6W	
R188	1-247-869-00	CARBON	39K	5%	1/6W	
R189	1-247-827-00	CARBON	680	5%	1/6W	
R190	1-247-871-00	CARBON	47K	5%	1/6W	
R191	1-247-865-00	CARBON	27K	5%	1/6W	
R192	1-247-851-00	CARBON	6.8K	5%	1/6W	
R193	1-247-857-00	CARBON	12K	5%	1/6W	
R194	1-247-820-00	CARBON	360	5%	1/6W	
R195	1-247-815-00	CARBON	220	5%	1/6W	
R196	1-247-839-00	CARBON	2.2K	5%	1/6W	
R197	1-247-831-00	CARBON	1K	5%	1/6W	
R198	1-247-866-00	CARBON	30K	5%	1/6W	

Ref.No.	Part No.	Description				Remark
R199	1-247-835-00	CARBON	1.5K	5%	1/6W	
R200	1-247-826-00	CARBON	620	5%	1/6W	
R201	1-247-831-00	CARBON	1K	5%	1/6W	
R202	1-247-837-00	CARBON	1.8K	5%	1/6W	
R203	1-247-819-00	CARBON	330	5%	1/6W	
R204	1-247-839-00	CARBON	2.2K	5%	1/6W	
R205	1-247-853-00	CARBON	8.2K	5%	1/6W	
R206	1-247-857-00	CARBON	12K	5%	1/6W	
R207	1-247-831-00	CARBON	1K	5%	1/6W	
R208	1-247-823-00	CARBON	470	5%	1/6W	
R209	1-247-815-00	CARBON	220	5%	1/6W	
R210	1-247-820-00	CARBON	360	5%	1/6W	
R211	1-247-783-00	CARBON	10	5%	1/6W	
R212	1-247-835-00	CARBON	1.5K	5%	1/6W	
R213	1-247-832-00	CARBON	1.1K	5%	1/6W	
R214	1-247-861-00	CARBON	18K	5%	1/6W	
R215	1-247-845-00	CARBON	3.9K	5%	1/6W	
R216	1-247-831-00	CARBON	1K	5%	1/6W	
R217	1-247-839-00	CARBON	2.2K	5%	1/6W	
R218	1-247-822-00	CARBON	430	5%	1/6W	
R219	1-247-842-00	CARBON	3K	5%	1/6W	
R220	1-247-829-00	CARBON	820	5%	1/6W	
R221	1-247-825-00	CARBON	560	5%	1/6W	
R222	1-247-817-00	CARBON	270	5%	1/6W	
R223	1-247-807-00	CARBON	100	5%	1/6W	
R224	1-247-825-00	CARBON	560	5%	1/6W	
R225	1-247-823-00	CARBON	470	5%	1/6W	
R226	1-247-863-00	CARBON	22K	5%	1/6W	
R227	1-247-799-00	CARBON	47	5%	1/6W	
R228	1-247-855-00	CARBON	10K	5%	1/6W	
R229	1-247-807-00	CARBON	100	5%	1/6W	
R230	1-247-823-00	CARBON	470	5%	1/6W	
R231	1-247-824-00	CARBON	510	5%	1/6W	
R232	1-247-823-00	CARBON	470	5%	1/6W	
R233	1-247-823-00	CARBON	470	5%	1/6W	
R234	1-247-837-00	CARBON	1.8K	5%	1/6W	
R235	1-247-833-00	CARBON	1.2K	5%	1/6W	
R236	1-247-831-00	CARBON	1K	5%	1/6W	
R237	1-247-843-00	CARBON	3.3K	5%	1/6W	
R238	1-247-833-00	CARBON	1.2K	5%	1/6W	
R239	1-247-831-00	CARBON	1K	5%	1/6W	
R240	1-247-854-00	CARBON	9.1K	5%	1/6W	
R241	1-247-858-00	CARBON	13K	5%	1/6W	
R242	1-247-863-00	CARBON	22K	5%	1/6W	
R243	1-247-879-00	CARBON	100K	5%	1/6W	
R244	1-247-831-00	CARBON	1K	5%	1/6W	
R245	1-247-827-00	CARBON	680	5%	1/6W	
R246	1-247-799-00	CARBON	47	5%	1/6W	
R247	1-247-857-00	CARBON	12K	5%	1/6W	
R248	1-247-847-00	CARBON	4.7K	5%	1/6W	
R249	1-247-823-00	CARBON	470	5%	1/6W	
R250	1-247-839-00	CARBON	2.2K	5%	1/6W	
R251	1-247-817-00	CARBON	270	5%	1/6W	

Ref.No.	Part No.	Description				Remark
R252	1-247-807-00	CARBON	100	5%	1/6W	
R253	1-247-817-00	CARBON	270	5%	1/6W	
R254	1-247-825-00	CARBON	560	5%	1/6W	
R255	1-247-838-00	CARBON	2K	5%	1/6W	
R256	1-247-849-00	CARBON	5.6K	5%	1/6W	
R257	1-247-845-00	CARBON	3.9K	5%	1/6W	
R258	1-247-843-00	CARBON	3.3K	5%	1/6W	
R259	1-247-835-00	CARBON	1.5K	5%	1/6W	
R260	1-247-859-00	CARBON	15K	5%	1/6W	
R261	1-247-861-00	CARBON	18K	5%	1/6W	
R262	1-247-811-00	CARBON	150	5%	1/6W	
R263	1-247-807-00	CARBON	100	5%	1/6W	
R264	1-246-465-00	CARBON	470	5%	1/4W	
R265	1-247-799-00	CARBON	47	5%	1/6W	
R266	1-247-843-00	CARBON	3.3K	5%	1/6W	
R267	1-247-804-00	CARBON	75	5%	1/6W	
R268	1-247-855-00	CARBON	10K	5%	1/6W	
R269	1-247-828-00	CARBON	750	5%	1/6W	
R270	1-247-859-00	CARBON	15K	5%	1/6W	
R271	1-247-847-00	CARBON	4.7K	5%	1/6W	
R272	1-247-815-00	CARBON	220	5%	1/6W	
R273	1-247-852-00	CARBON	7.5K	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-747-00	RES, ADJ, CARBON	4.7K
RV002	1-228-746-00	RES, ADJ, CARBON	2.2K
RV003	1-228-748-00	RES, ADJ, CARBON	10K
RV004	1-228-750-00	RES, ADJ, CARBON	47K
RV005	1-228-746-00	RES, ADJ, CARBON	2.2K
RV006	1-228-744-00	RES, ADJ, CARBON	470
RV007	1-228-749-00	RES, ADJ, CARBON	22K
RV008	1-228-745-00	RES, ADJ, CARBON	1K
RV009	1-228-746-00	RES, ADJ, CARBON	2.2K
RV010	1-228-744-00	RES, ADJ, CARBON	470
RV011	1-228-748-00	RES, ADJ, CARBON	10K
RV012	1-228-746-00	RES, ADJ, CARBON	2.2K
RV013	1-228-745-00	RES, ADJ, CARBON	1K
RV014	1-228-745-00	RES, ADJ, CARBON	1K
RV015	1-228-745-00	RES, ADJ, CARBON	1K
RV016	1-228-744-00	RES, ADJ, CARBON	470
RV017	1-228-744-00	RES, ADJ, CARBON	470
RV018	1-228-750-00	RES, ADJ, CARBON	47K
RV019	1-228-745-00	RES, ADJ, CARBON	1K

SWITCH

S001	1-553-725-21	SWITCH, SLIDE

TRANSFORMER

T001	1-426-083-00	TRANSFORMER, BAND PASS
T002	1-426-082-00	TRANSFORMER, BAND PASS
T003	1-426-081-00	TRANSFORMER, BAND PASS
T004	1-426-078-00	TRANSFORME, VAST AMP
T005	1-426-076-00	TRANSFORMER, EQUALIZER (1)
T006	1-426-080-00	TRANSFORMER, BAND PASS
T007	1-426-079-00	TRANSFORMER, BAND PASS
T008	1-426-077-00	TRANSFORMER, EQUALIZER (2)

CRYSTAL

X001	1-527-396-00	CRYSTAL, OSC
X002	1-567-126-00	VIBRATOR, CRYSTAL

****

♣: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	1-161-019-00	CERAMIC	0.033MF	10%	25V
C005	1-108-567-00	MYLAR	0.0033MF	5%	50V
C006	1-123-821-00	ELECT	47MF	20%	16V

DIODE

D001	8-719-110-32	DIODE PH302B

IC

IC001	8-759-113-73	IC UPC1373H

COIL

L001	1-404-310-00	COIL

****

CS-3 BOARD
****

CONNECTOR

CN301	♣:1-564-029-00	PIN, CONNECTOR 4P

SWITCH

S301	1-554-241-00	SWITCH, LEVER

****

CS-4 BOARD
****

SWITCH

S302	1-554-241-00	SWITCH, LEVER

LM-8 RD-5 RP-8

Ref.No.	Part No.	Description			Remark
♣:	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			
		RESISTOR			
R101	⚠ 1-206-479-00	METAL OXIDE	47 5%	2W	F
**********					
♣:	1-609-231-00	RD-5 BOARD **********			
		DIODE			
D001	8-719-921-03	DIODE GP-2S02B			
		RESISTOR			
R001	1-247-887-00	CARBON	220K 5%	1/6W	
R002	1-247-831-00	CARBON	1K 5%	1/6W	
**********					
♣:	A-6728-710-A	RP-8 BOARD, COMPLETE **********			
♣:	3-679-178-00	CASE (INNER), SHIELD, RP-66			
♣:	3-679-179-00	CASE (LOWER), SHIELD, RP-66			
♣:	3-679-240-00	CASE (UPPER), SHIELD, RP-55			
♣:	3-682-665-00	CASE (MAIN), SHIELD, RP-55			
		CAPACITOR			
C001	1-161-021-00	CERAMIC	0.047MF	10%	25V
C002	1-161-021-00	CERAMIC	0.047MF	10%	25V
C003	1-123-380-00	ELECT	1MF	20%	50V
C004	1-161-021-00	CERAMIC	0.047MF	10%	25V
C005	1-123-380-00	ELECT	1MF	20%	50V
C006	1-123-381-00	ELECT	2.2MF	20%	50V
C007	1-161-009-00	CERAMIC	0.0047MF	10%	25V
C008	1-161-021-00	CERAMIC	0.047MF	10%	25V
C009	1-161-021-00	CERAMIC	0.047MF	10%	25V
C010	1-101-886-00	CERAMIC	62PF	5%	50V
C011	1-101-886-00	CERAMIC	62PF	5%	50V
C012	1-161-017-00	CERAMIC	0.022MF	10%	25V
C013	1-123-356-00	ELECT	10MF	20%	16V
C014	1-102-114-00	CERAMIC	470PF	10%	50V
C015	1-102-973-00	CERAMIC	100PF	5%	50V
C016	1-161-013-00	CERAMIC	0.01MF	10%	25V
C018	1-161-019-00	CERAMIC	0.033MF	10%	25V
C019	1-161-017-00	CERAMIC	0.022MF	10%	25V
C020	1-161-017-00	CERAMIC	0.022MF	10%	25V
C021	1-102-112-00	CERAMIC	330PF	10%	50V
C022	1-131-371-00	TANTALUM	10MF	20%	16V
C025	1-161-013-00	CERAMIC	0.01MF	10%	25V
C026	1-161-021-00	CERAMIC	0.047MF	10%	25V
C027	1-123-330-00	ELECT	22MF	20%	16V
C028	1-161-013-00	CERAMIC	0.01MF	10%	25V
C029	1-123-330-00	ELECT	22MF	20%	16V
C030	1-161-013-00	CERAMIC	0.01MF	10%	25V
C031	1-161-013-00	CERAMIC	0.01MF	10%	25V
C032	1-161-021-00	CERAMIC	0.047MF	10%	25V
C033	1-123-330-00	ELECT	22MF	20%	16V
C034	1-123-305-00	ELECT	33MF	20%	10V
C035	1-161-013-00	CERAMIC	0.01MF	10%	25V
C037	1-102-958-00	CERAMIC	20PF	5%	50V
C038	1-102-960-00	CERAMIC	24PF	5%	50V
		CONNECTOR			
CN001	♣: 1-508-845-00	PIN, CONNECTOR 6P			
CN002	♣: 1-508-845-00	PIN, CONNECTOR 6P			
CN003	♣: 1-564-030-00	PIN, CONNECTOR 5P			
CN004	♣: 1-508-744-00	PIN, CONNECTOR 10P			
CN005	♣: 1-564-028-00	PIN, CONNECTOR 3P			
		DIODE			
D001	=>8-719-911-19	DIODE 1SS119			
		IC			
IC001	8-758-620-00	IC CX862			
IC002	8-759-601-34	IC CX134A			
		COIL			
L001	1-408-877-00	MICRO INDUCTOR 0.22UH			
L002	1-408-877-00	MICRO INDUCTOR 0.22UH			
L003	1-408-604-00	MICRO INDUCTOR 12UH			
L004	1-408-158-00	MICRO INDUCTOR 6.8MMH			
L005	1-408-158-00	MICRO INDUCTOR 6.8MMH			
L006	1-408-604-00	MICRO INDUCTOR 12UH			
L007	1-408-616-00	MICRO INDUCTOR 120UH			
L008	1-407-717-00	MICRO INDUCTOR 1MMH			
L009	1-408-622-00	MICRO INDUCTOR 390UH			
L010	1-408-622-00	MICRO INDUCTOR 390UH			
L011	1-408-615-00	MICRO INDUCTOR 100UH			
		TRANSISTOR			
Q001	=>8-729-204-83	TRANSISTOR 2SA1048-GR			
Q002	8-729-178-54	TRANSISTOR 2SC2785			
Q003	8-729-178-54	TRANSISTOR 2SC2785			
Q004	8-729-178-54	TRANSISTOR 2SC2785			
Q005	8-729-606-32	TRANSISTOR 2SC2603			
Q006	8-729-178-54	TRANSISTOR 2SC2785			

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description				Remark
		RESISTOR				
R001	1-247-852-00	CARBON	7.5K	5%	1/6W	
R002	1-247-855-00	CARBON	10K	5%	1/6W	
R003	1-247-844-00	CARBON	3.6K	5%	1/6W	
R004	1-247-867-00	CARBON	33K	5%	1/6W	
R006	1-247-831-00	CARBON	1K	5%	1/6W	
R007	1-247-831-00	CARBON	1K	5%	1/6W	
R008	1-247-822-00	CARBON	430	5%	1/6W	
R009	1-247-779-00	CARBON	6.8	5%	1/6W	
R010	1-247-815-00	CARBON	220	5%	1/6W	
R011 ⚠	1-247-028-00	CARBON	8.2	5%	1/8W	F
R012	1-247-839-00	CARBON	2.2K	5%	1/6W	
R013	1-247-839-00	CARBON	2.2K	5%	1/6W	
R014	1-247-839-00	CARBON	2.2K	5%	1/6W	
R015	1-247-839-00	CARBON	2.2K	5%	1/6W	
R016	1-247-831-00	CARBON	1K	5%	1/6W	
R017	1-247-831-00	CARBON	1K	5%	1/6W	
R018	1-247-849-00	CARBON	5.6K	5%	1/6W	
R019	1-247-833-00	CARBON	1.2K	5%	1/6W	
R020	1-247-825-00	CARBON	560	5%	1/6W	
R021	1-247-855-00	CARBON	10K	5%	1/6W	
R022	1-247-831-00	CARBON	1K	5%	1/6W	
R024	1-247-826-00	CARBON	620	5%	1/6W	
R025	1-247-839-00	CARBON	2.2K	5%	1/6W	
R026	1-247-809-00	CARBON	120	5%	1/6W	
R027	1-247-847-00	CARBON	4.7K	5%	1/6W	
R028	1-247-867-00	CARBON	33K	5%	1/6W	
R029 ⚠	1-247-028-00	CARBON	8.2	5%	1/8W	F
R030	1-247-831-00	CARBON	1K	5%	1/6W	
R031	1-247-821-00	CARBON	390	5%	1/6W	
R032	1-247-834-00	CARBON	1.3K	5%	1/6W	
R033	1-247-834-00	CARBON	1.3K	5%	1/6W	
R034	1-247-821-00	CARBON	390	5%	1/6W	
R035	1-247-844-00	CARBON	3.6K	5%	1/6W	
R036	1-247-844-00	CARBON	3.6K	5%	1/6W	
R037	1-247-807-00	CARBON	100	5%	1/6W	
R038	1-247-828-00	CARBON	750	5%	1/6W	
R039	1-247-817-00	CARBON	270	5%	1/6W	
R040	1-247-833-00	CARBON	1.2K	5%	1/6W	
R041	1-247-818-00	CARBON	300	5%	1/6W	
R042	1-247-783-00	CARBON	10	5%	1/6W	
R043	1-247-818-00	CARBON	300	5%	1/6W	
R044	1-247-783-00	CARBON	10	5%	1/6W	
R045	1-247-863-00	CARBON	22K	5%	1/6W	
R046	1-247-855-00	CARBON	10K	5%	1/6W	
R047	1-247-844-00	CARBON	3.6K	5%	1/6W	
R048	1-247-855-00	CARBON	10K	5%	1/6W	
R049	1-247-845-00	CARBON	3.9K	5%	1/6W	
		VARIABLE RESISTOR				
RV001	1-228-920-00	RES, ADJ, CARBON 2.2K				
RV002	1-228-920-00	RES, ADJ, CARBON 2.2K				

Ref.No.	Part No.	Description	Remark
RV003	1-228-919-00	RES, ADJ, CARBON 1K	
RV004	1-228-919-00	RES, ADJ, CARBON 1K	
RV005	1-228-921-00	RES, ADJ, CARBON 4.7K	
RV006	1-228-747-00	RES, ADJ, CARBON 4.7K	

****

♣:1-610-596-00 FS-29 BOARD
****

VARIABLE RESISTOR

RV001 1-228-918-00 RES, VAR, CARBON 100K

****

♣:1-610-597-00 FS-28 BOARD
****

3-681-943-00 HOLDER, 6 GANG

DIODE

D201 8-719-812-33 DIODE TLG123A
D202 8-719-812-33 DIODE TLG123A
D203 8-719-812-33 DIODE TLG123A
D204 8-719-812-33 DIODE TLG123A
D205 8-719-812-33 DIODE TLG123A
D206 8-719-812-33 DIODE TLG123A
D207 8-719-812-33 DIODE TLG123A

RESISTOR

R201 1-247-863-00 CARBON 22K 5% 1/6W
R202 1-247-863-00 CARBON 22K 5% 1/6W

VARIABLE RESISTOR

RV201 1-230-066-00 RES, ADJ, CARBON 4.7K

SWITCH

S201 1-553-997-00 SWITCH, KEY BOARD
S202 1-553-997-00 SWITCH, KEY BOARD
S203 1-553-716-00 SWITCH, SLIDE
S204 1-553-754-00 SWITCH, SLIDE

****

♣:1-610-598-00 FS-33 BOARD
****

DIODE

D301 8-719-812-31 DIODE TLR123
D302 8-719-812-32 DIODE TLY123

SWITCH

S301 1-553-997-00 SWITCH, KEY BOARD
S302 1-553-997-00 SWITCH, KEY BOARD

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

TS-30 TS-31

Ref.No.	Part No.	Description				Remark
	♦:A-6728-810-A	TS-30 BOARD, COMPLETE				
		**********				
		CAPACITOR				
C001	1-123-354-00	ELECT	3.3MF	20%	50V	
C002	1-123-351-00	ELECT	0.47MF	20%	50V	
C003	1-102-508-00	CERAMIC	10PF	0.5PF	50V	
C004	1-102-508-00	CERAMIC	10PF	0.5PF	50V	
C005	1-161-023-00	CERAMIC	0.068MF	10%	25V	
C006	1-161-494-00	CERAMIC	0.022MF	30%	25V	
		DIODE				
D001	8-719-101-74	DIODE RD9.1E-L3				
D002	8-719-812-31	DIODE TLR123				
D003	8-719-911-19	DIODE 1SS119				
D004	8-719-911-19	DIODE 1SS119				
D005	=>8-719-100-35	DIODE RD5.6E-B2				
D101	8-719-104-45	DIODE SG213T				
D102	8-719-104-45	DIODE SG213T				
D103	8-719-104-45	DIODE SG213T				
D104	8-719-104-45	DIODE SG213T				
D105	8-719-104-45	DIODE SG213T				
D106	8-719-104-45	DIODE SG213T				
D107	8-719-104-45	DIODE SG213T				
D108	8-719-104-45	DIODE SG213T				
D109	8-719-104-45	DIODE SG213T				
D110	8-719-104-45	DIODE SG213T				
D111	8-719-104-45	DIODE SG213T				
D112	8-719-104-45	DIODE SG213T				
D113	8-719-104-45	DIODE SG213T				
D114	8-719-104-45	DIODE SG213T				
D115	8-719-911-19	DIODE 1SS119				
D116	8-719-911-19	DIODE 1SS119				
D117	8-719-911-19	DIODE 1SS119				
D118	8-719-911-19	DIODE 1SS119				
D119	8-719-911-19	DIODE 1SS119				
		IC				
IC001	8-759-101-75	IC UPD7519G-547				
		TRANSISTOR				
Q001	=>8-729-204-83	TRANSISTOR 2SA1048-GR				
Q002	=>8-729-245-83	TRANSISTOR 2SC2458				
Q003	=>8-729-245-83	TRANSISTOR 2SC2458				
		RESISTOR				
R001	1-247-875-00	CARBON	68K	5%	1/6W	
R002	1-247-867-00	CARBON	33K	5%	1/6W	
R003	1-247-903-00	CARBON	1M	5%	1/6W	
R004	1-247-867-00	CARBON	33K	5%	1/6W	
R005	1-247-879-00	CARBON	100K	5%	1/6W	
R006	1-247-869-00	CARBON	39K	5%	1/6W	
R007	1-247-872-00	CARBON	51K	5%	1/6W	
R008	1-247-874-00	CARBON	62K	5%	1/6W	
R009	1-247-863-00	CARBON	22K	5%	1/6W	
R010	1-247-867-00	CARBON	33K	5%	1/6W	
R011	1-247-859-00	CARBON	15K	5%	1/6W	
R012	1-247-863-00	CARBON	22K	5%	1/6W	
R013	1-247-863-00	CARBON	22K	5%	1/6W	
R014	1-247-863-00	CARBON	22K	5%	1/6W	
R015	1-247-863-00	CARBON	22K	5%	1/6W	
R016	1-247-863-00	CARBON	22K	5%	1/6W	
R017	1-247-863-00	CARBON	22K	5%	1/6W	
R018	1-247-863-00	CARBON	22K	5%	1/6W	
R019	1-247-863-00	CARBON	22K	5%	1/6W	
R020	1-247-849-00	CARBON	5.6K	5%	1/6W	
R021	1-247-849-00	CARBON	5.6K	5%	1/6W	
R022	1-247-849-00	CARBON	5.6K	5%	1/6W	
R023	1-247-849-00	CARBON	5.6K	5%	1/6W	
R024	1-247-849-00	CARBON	5.6K	5%	1/6W	
R025	1-247-863-00	CARBON	22K	5%	1/6W	
R026	1-247-859-00	CARBON	15K	5%	1/6W	
		SWITCH				
S101	1-554-303-00	SWITCH, KEY BOARD				
S102	1-554-303-00	SWITCH, KEY BOARD				
S103	1-554-303-00	SWITCH, KEY BOARD				
S104	1-554-303-00	SWITCH, KEY BOARD				
S105	1-554-303-00	SWITCH, KEY BOARD				
S106	1-554-303-00	SWITCH, KEY BOARD				
S107	1-554-303-00	SWITCH, KEY BOARD				
S108	1-554-303-00	SWITCH, KEY BOARD				
S109	1-554-303-00	SWITCH, KEY BOARD				
S110	1-554-303-00	SWITCH, KEY BOARD				
S111	1-554-303-00	SWITCH, KEY BOARD				
S112	1-554-303-00	SWITCH, KEY BOARD				
S113	1-554-303-00	SWITCH, KEY BOARD				
S114	1-554-303-00	SWITCH, KEY BOARD				
		CRYSTAL				
X001	1-567-121-00	VIBRATOR, CRYSTAL				
		**********				
	♦:1-610-856-00	TS-31 BOARD				
		**********				
	3-681-945-00	SHEET (A), PROTECTION				
		CAPACITOR				
C201	1-101-361-00	CERAMIC	150PF	5%	50V	
C202	1-102-852-00	CERAMIC	47PF	5%	50V	
		FILTER				
CF201	1-567-127-00	OSCILLATOR, CERAMIC				

Ref.No.	Part No.	Description				Remark
		INDICATOR TUBE				
FL201	1-519-302-00	INDICATOR TUBE, FLUORESCENT				
		IC				
IC201	8-759-902-08	IC TMS5111NLL				
IC202	8-759-902-07	IC CM62063U				
		RESISTOR				
R201	1-247-839-00	CARBON	2.2K	5%	1/6W	
R202	1-247-827-00	CARBON	680	5%	1/6W	
R203	1-247-873-00	CARBON	56K	5%	1/6W	
**********						
♣	1-610-857-00	TS-35 BOARD **********				
		DIODE				
D301	8-719-911-19	DIODE 1SS119				
D302	8-719-911-19	DIODE 1SS119				
D303	8-719-911-19	DIODE 1SS119				
D304	8-719-911-19	DIODE 1SS119				
D305	8-719-911-19	DIODE 1SS119				
D306	8-719-911-19	DIODE 1SS119				
D307	8-719-911-19	DIODE 1SS119				
D308	8-719-911-19	DIODE 1SS119				
		SWITCH				
S301	1-553-997-00	SWITCH, KEY BOARD				
S302	1-553-997-00	SWITCH, KEY BOARD				
S303	1-553-997-00	SWITCH, KEY BOARD				
S304	1-553-997-00	SWITCH, KEY BOARD				
S305	1-553-997-00	SWITCH, KEY BOARD				
S306	1-553-997-00	SWITCH, KEY BOARD				
S307	1-553-997-00	SWITCH, KEY BOARD				
S308	1-553-997-00	SWITCH, KEY BOARD				
S309	1-554-375-00	SWITCH, PUSH				
**********						
♣	1-610-858-00	TS-36 BOARD **********				
		DIODE				
D401	8-719-911-19	DIODE 1SS119				
		SWITCH				
S401	1-553-997-00	SWITCH, KEY BOARD				

Ref.No.	Part No.	Description				Remark
♣	A-6717-333-A	SS-13 (B-299) BOARD, COMPLETE **********				
♣	1-560-891-00	PIN, CONNECTOR 3P				
♣	1-560-892-00	PIN, CONNECTOR 4P				
♣	3-655-214-00	CLIP, CABLE				
♣	3-679-172-00	HEAT SINK, SS				
	7-682-149-01	SCREW +P 3X10				
		CAPACITOR				
C001	1-130-483-00	MYLAR	0.01MF	5%	50V	
C002	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C003	1-123-354-00	ELECT	3.3MF	20%	50V	
C004	1-123-354-00	ELECT	3.3MF	20%	50V	
C005	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C006	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C007	1-123-354-00	ELECT	3.3MF	20%	50V	
C008	1-130-483-00	MYLAR	0.01MF	5%	50V	
C009	1-130-483-00	MYLAR	0.01MF	5%	50V	
C010	1-123-330-00	ELECT	22MF	20%	16V	
C011	1-127-469-00	ELECT(SOLID)	0.33MF	5%	16V	
C012	1-130-491-00	MYLAR	0.047MF	5%	50V	
C013	1-123-332-00	ELECT	47MF	20%	16V	
C014	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C015	1-123-356-00	ELECT	10MF	20%	16V	
C016	1-123-381-00	ELECT	2.2MF	20%	50V	
C019	1-130-479-00	MYLAR	0.0047MF	5%	50V	
C020	1-123-332-00	ELECT	47MF	20%	16V	
C021	1-123-381-00	ELECT	2.2MF	20%	50V	
C022	1-123-381-00	ELECT	2.2MF	20%	50V	
C023	1-131-369-00	TANTALUM	4.7MF	10%	16V	
C024	1-131-369-00	TANTALUM	4.7MF	10%	16V	
C025	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C026	1-123-332-00	ELECT	47MF	20%	16V	
C027	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C028	1-123-310-00	ELECT	470MF	20%	10V	
C029	1-161-004-00	CERAMIC	0.0018MF	10%	25V	
C030	1-108-582-00	MYLAR	0.013MF	5%	50V	
C031	1-131-398-00	ELECT(SOLID)	0.22MF	10%	16V	
C032	1-161-016-00	CERAMIC	0.018MF	10%	25V	
C033	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C034	1-161-016-00	CERAMIC	0.018MF	10%	25V	
C035	1-161-016-00	CERAMIC	0.018MF	10%	25V	
C036	1-161-016-00	CERAMIC	0.018MF	10%	25V	
C037	1-123-356-00	ELECT	10MF	20%	16V	
C038	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C039	1-123-356-00	ELECT	10MF	20%	16V	
C040	1-124-429-00	ELECT	0.68MF	20%	50V	
C041	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C044	1-123-332-00	ELECT	47MF	20%	16V	
C045	1-102-961-00	CERAMIC	27PF	5%	50V	
C046	1-102-961-00	CERAMIC	27PF	5%	50V	

SS-13

Ref.No.	Part No.	Description				Remark
C047	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C048	1-101-886-00	CERAMIC	62PF	5%	50V	
C049	1-123-332-00	ELECT	47MF	20%	16V	
C050	1-127-437-51	ELECT(SOLID)	0.47MF	10%	16V	
C201	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C202	1-123-330-00	ELECT	22MF	20%	16V	
C203	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C204	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C205	1-123-381-00	ELECT	2.2MF	20%	50V	
C206	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C207	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C301	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C302	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C303	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C304	1-123-356-00	ELECT	10MF	20%	16V	
C305	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C401	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C402	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C403	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C404	1-123-380-00	ELECT	1MF	20%	50V	
C405	1-123-330-00	ELECT	22MF	20%	16V	
C406	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C407	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C408	1-123-330-00	ELECT	22MF	20%	16V	
C409	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C410	1-123-356-00	ELECT	10MF	20%	25V	
C411	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C501	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C502	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C503	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C504	1-129-794-00	FILM	0.0033MF	5%	100V	
C505	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C506	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C507	1-123-380-00	ELECT	1MF	20%	50V	
C508	1-161-017-00	CERAMIC	0.022MF	10%	25V	
C509	1-123-380-00	ELECT	1MF	20%	50V	
C510	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C511	1-123-379-00	ELECT	0.47MF	20%	50V	
C601	1-123-380-00	ELECT	1MF	20%	50V	
C602	1-123-356-00	ELECT	10MF	20%	16V	
C603	1-123-380-00	ELECT	1MF	20%	50V	
C751	1-123-333-00	ELECT	100MF	20%	16V	
C752	1-123-332-00	ELECT	47MF	20%	16V	
C754	1-161-021-00	CERAMIC	0.047MF	10%	25V	

FILTER

CF401	1-527-532-00	OSCILLATOR, CERAMIC

CONNECTOR

CN001♣	1-560-892-00	PIN, CONNECTOR 4P
CN002♣	1-560-891-00	PIN, CONNECTOR 3P
CN003♣	1-560-891-00	PIN, CONNECTOR 3P
CN004♣	1-560-892-00	PIN, CONNECTOR 4P
CN005	1-560-466-00	PIN, CONNECTOR 3P
CN006♣	1-560-891-00	PIN, CONNECTOR 3P
CN007♣	1-560-890-00	PIN, CONNECTOR 2P
CN008♣	1-560-892-00	PIN, CONNECTOR 4P
CN009♣	1-560-900-00	PIN, CONNECTOR 12P
CN010♣	1-560-891-00	PIN, CONNECTOR 3P
CN401♣	1-560-891-00	PIN, CONNECTOR 3P
CN402♣	1-560-898-00	PIN, CONNECTOR 10P
CN403♣	1-560-890-00	PIN, CONNECTOR 2P
CN404♣	1-560-890-00	PIN, CONNECTOR 2P
CN405♣	1-560-898-00	PIN, CONNECTOR 10P
CN406♣	1-560-890-00	PIN, CONNECTOR 2P
CN407♣	1-560-891-00	PIN, CONNECTOR 3P
CN408♣	1-560-890-00	PIN, CONNECTOR 2P
CN409♣	1-560-898-00	PIN, CONNECTOR 10P
CN410♣	1-560-896-00	PIN, CONNECTOR 8P
CN411♣	1-560-893-00	PIN, CONNECTOR 5P
CN412♣	1-560-892-00	PIN, CONNECTOR 4P
CN412♣	1-560-892-00	PIN, CONNECTOR 4P
CN413♣	1-560-890-00	PIN, CONNECTOR 2P
CN414♣	1-560-892-00	PIN, CONNECTOR 4P
CN415♣	1-560-891-00	PIN, CONNECTOR 3P
CN416♣	1-560-890-00	PIN, CONNECTOR 2P
CN417♣	1-560-892-00	PIN, CONNECTOR 4P

COMPOSITION CIRCUIT BLOCK

CP401	1-231-613-00	COMPOSITION CIRCUIT BLOCK

DIODE

D001	8-719-101-76	DIODE RD10E-L2
D002	8-719-911-19	DIODE 1SS119
D003	8-719-911-19	DIODE 1SS119
D004	8-719-911-19	DIODE 1SS119
D005	8-719-911-19	DIODE 1SS119
D008	8-719-911-19	DIODE 1SS119
D009	8-719-911-19	DIODE 1SS119
D010	8-719-911-19	DIODE 1SS119
D202	8-719-911-19	DIODE 1SS119
D203	8-719-911-19	DIODE 1SS119
D204	8-719-911-19	DIODE 1SS119
D205	8-719-911-19	DIODE 1SS119
D206	8-719-911-19	DIODE 1SS119
D207	8-719-911-19	DIODE 1SS119
D208	8-719-911-19	DIODE 1SS119
D209	8-719-911-19	DIODE 1SS119
D210	8-719-911-19	DIODE 1SS119
D211	8-719-911-19	DIODE 1SS119
D212	8-719-911-19	DIODE 1SS119
D213	8-719-911-19	DIODE 1SS119
D214	8-719-911-19	DIODE 1SS119
D216	8-719-911-19	DIODE 1SS119
D217	8-719-911-19	DIODE 1SS119

Ref.No.	Part No.	Description	Remark
D218	8-719-911-19	DIODE 1SS119	
D301	8-719-101-77	DIODE RD10E-L3	
D302 ⚠	8-719-100-66	DIODE RD12E-B3	
D303	8-719-911-19	DIODE 1SS119	
D401	8-719-911-19	DIODE 1SS119	
D402	8-719-911-19	DIODE 1SS119	
D403	8-719-911-19	DIODE 1SS119	
D404	8-719-911-19	DIODE 1SS119	
D405	8-719-911-19	DIODE 1SS119	
D407	8-719-911-19	DIODE 1SS119	
D410	8-719-911-19	DIODE 1SS119	
D501	8-719-911-19	DIODE 1SS119	
D502	8-719-911-19	DIODE 1SS119	
D503	8-719-911-19	DIODE 1SS119	
D601	8-719-911-19	DIODE 1SS119	
D602	8-719-101-70	DIODE RD8.2E-L2	
D603	8-719-911-19	DIODE 1SS119	
D751	8-719-101-49	DIODE RD5.1E-L1	
D752	8-719-911-19	DIODE 1SS119	
D753	8-719-911-19	DIODE 1SS119	
		IC	
IC001	- - -	IC CX-1948-0	
IC002	8-759-135-80	IC UPC358C	
IC003	8-759-145-58	IC UPC4558C	
IC004	8-759-240-53	IC TC4053BP	
IC005	8-759-132-40	IC UPC324C	
IC006	8-759-132-40	IC UPC324C	
IC301	8-759-907-28	IC M32080SL	
IC401	8-759-101-66	IC UPD553C-276	
IC402	8-759-101-68	IC UPD553C-287	
		COIL	
L001	1-408-615-00	MICRO INDUCTOR 100UH	
		TRANSISTOR	
Q001	=>8-729-245-83	TRANSISTOR 2SC2458	
Q002	=>8-729-245-83	TRANSISTOR 2SC2458	
Q003	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q004	=>8-729-177-43	TRANSISTOR 2SD774	
Q005	8-729-606-32	TRANSISTOR 2SC2603	
Q006	=>8-729-245-83	TRANSISTOR 2SC2458	
Q007	=>8-729-245-83	TRANSISTOR 2SC2458	
Q008	=>8-729-245-83	TRANSISTOR 2SC2458	
Q009	=>8-729-245-83	TRANSISTOR 2SC2458	
Q201	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q202	=>8-729-245-83	TRANSISTOR 2SC2458	
Q203	8-729-316-16	TRANSISTOR 2SC1061	
Q204	=>8-729-245-83	TRANSISTOR 2SC2458	
Q205	=>8-729-245-83	TRANSISTOR 2SC2458	
Q206	=>8-729-245-83	TRANSISTOR 2SC2458	
Q207	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q208	=>8-729-177-43	TRANSISTOR 2SD774	

Ref.No.	Part No.	Description	Remark
Q209	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q210	=>8-729-177-43	TRANSISTOR 2SD774	
Q211	=>8-729-177-32	TRANSISTOR 2SD773	
Q212	8-729-116-42	TRANSISTOR 2SD1164	
Q213	=>8-729-177-32	TRANSISTOR 2SD773	
Q214	8-729-116-42	TRANSISTOR 2SD1164	
Q215	=>8-729-245-83	TRANSISTOR 2SC2458	
Q216	=>8-729-245-83	TRANSISTOR 2SC2458	
Q217	=>8-729-245-83	TRANSISTOR 2SC2458	
Q218	=>8-729-245-83	TRANSISTOR 2SC2458	
Q221	=>8-729-177-32	TRANSISTOR 2SD773	
Q222	=>8-729-245-83	TRANSISTOR 2SC2458	
Q223	8-729-374-02	TRANSISTOR 2SB740	
Q224	=>8-729-177-43	TRANSISTOR 2SD774	
Q225	8-729-374-02	TRANSISTOR 2SB740	
Q226	=>8-729-177-43	TRANSISTOR 2SD774	
Q227	=>8-729-245-83	TRANSISTOR 2SC2458	
Q302	=>8-729-245-83	TRANSISTOR 2SC2458	
Q303	=>8-729-245-83	TRANSISTOR 2SC2458	
Q304	=>8-729-245-83	TRANSISTOR 2SC2458	
Q305	=>8-729-245-83	TRANSISTOR 2SC2458	
Q306	=>8-729-245-83	TRANSISTOR 2SC2458	
Q307	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q308	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q309 ⚠	8-729-177-32	TRANSISTOR 2SD773	
Q401	=>8-729-245-83	TRANSISTOR 2SC2458	
Q402	=>8-729-245-83	TRANSISTOR 2SC2458	
Q403	=>8-729-245-83	TRANSISTOR 2SC2458	
Q404	=>8-729-245-83	TRANSISTOR 2SC2458	
Q405	=>8-729-245-83	TRANSISTOR 2SC2458	
Q406	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q407	=>8-729-245-83	TRANSISTOR 2SC2458	
Q408	8-729-374-02	TRANSISTOR 2SB740	
Q409	8-729-606-32	TRANSISTOR 2SC2603	
Q410	=>8-729-245-83	TRANSISTOR 2SC2458	
Q411	=>8-729-245-83	TRANSISTOR 2SC2458	
Q412	=>8-729-245-83	TRANSISTOR 2SC2458	
Q413	=>8-729-245-83	TRANSISTOR 2SC2458	
Q414	=>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	
Q505	=>8-729-245-83	TRANSISTOR 2SC2458	
Q601	=>8-729-245-83	TRANSISTOR 2SC2458	
Q602	=>8-729-245-83	TRANSISTOR 2SC2458	
Q603	=>8-729-245-83	TRANSISTOR 2SC2458	
Q751	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q752	=>8-729-245-83	TRANSISTOR 2SC2458	
Q754	8-729-606-32	TRANSISTOR 2SC2603	
Q755	=>8-729-245-83	TRANSISTOR 2SC2458	
Q756	=>8-729-245-83	TRANSISTOR 2SC2458	

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SS-13

RESISTOR

Ref.No.	Part No.	Description				Remark
R001	1-247-831-00	CARBON	1K	5%	1/6W	
R002	1-247-871-00	CARBON	47K	5%	1/6W	
R003	1-247-859-00	CARBON	15K	5%	1/6W	
R004	1-247-851-00	CARBON	6.8K	5%	1/6W	
R005	1-247-863-00	CARBON	22K	5%	1/6W	
R006	1-247-863-00	CARBON	22K	5%	1/6W	
R007	1-247-847-00	CARBON	4.7K	5%	1/6W	
R008	1-247-871-00	CARBON	47K	5%	1/6W	
R009	1-247-863-00	CARBON	22K	5%	1/6W	
R010	1-247-863-00	CARBON	22K	5%	1/6W	
R011	1-247-829-00	CARBON	820	5%	1/6W	
R012	1-244-844-00	CARBON	62	5%	1/2W	
R013	1-247-821-00	CARBON	390	5%	1/6W	
R014	⚠1-212-855-00	FUSIBLE	8.2	5%	1/4W	F
R015	1-247-855-00	CARBON	10K	5%	1/6W	
R016	1-247-855-00	CARBON	10K	5%	1/6W	
R017	1-244-845-51	CARBON	68	5%	1/2W	
R018	1-247-831-00	CARBON	1K	5%	1/6W	
R019	1-247-829-00	CARBON	820	5%	1/6W	
R020	1-247-841-00	CARBON	2.7K	5%	1/6W	
R021	1-247-879-00	CARBON	100K	5%	1/6W	
R022	1-247-844-00	CARBON	3.6K	5%	1/6W	
R023	1-247-831-00	CARBON	1K	5%	1/6W	
R024	1-247-855-00	CARBON	10K	5%	1/6W	
R027	1-247-879-00	CARBON	100K	5%	1/6W	
R028	1-247-844-00	CARBON	3.6K	5%	1/6W	
R029	1-247-886-00	CARBON	180K	5%	1/6W	
R031	1-247-844-00	CARBON	3.6K	5%	1/6W	
R032	1-247-859-00	CARBON	15K	5%	1/6W	
R034	1-247-863-00	CARBON	22K	5%	1/6W	
R035	1-247-831-00	CARBON	1K	5%	1/6W	
R036	1-247-903-00	CARBON	1M	5%	1/6W	
R037	1-247-835-00	CARBON	1.5K	5%	1/6W	
R038	1-247-855-00	CARBON	10K	5%	1/6W	
R039	1-247-867-00	CARBON	33K	5%	1/6W	
R040	1-247-903-00	CARBON	1M	5%	1/6W	
R042	1-247-831-00	CARBON	1K	5%	1/6W	
R043	1-247-855-00	CARBON	10K	5%	1/6W	
R044	1-247-879-00	CARBON	100K	5%	1/6W	
R045	1-247-871-00	CARBON	47K	5%	1/6W	
R046	1-247-903-00	CARBON	1M	5%	1/6W	
R047	1-247-831-00	CARBON	1K	5%	1/6W	
R048	1-247-855-00	CARBON	10K	5%	1/6W	
R049	1-247-879-00	CARBON	100K	5%	1/6W	
R050	1-247-879-00	CARBON	100K	5%	1/6W	
R051	1-247-875-00	CARBON	68K	5%	1/6W	
R052	1-247-875-00	CARBON	68K	5%	1/6W	
R053	1-247-879-00	CARBON	100K	5%	1/6W	
R054	1-247-875-00	CARBON	68K	5%	1/6W	
R055	1-247-858-00	CARBON	13K	5%	1/6W	
R056	1-247-853-00	CARBON	8.2K	5%	1/6W	
R057	1-214-160-00	METAL	15K	1%	1/4W	
R058	1-247-862-00	CARBON	20K	5%	1/6W	
R059	1-247-841-00	CARBON	2.7K	5%	1/6W	
R060	1-247-844-00	CARBON	3.6K	5%	1/6W	
R061	1-247-847-00	CARBON	4.7K	5%	1/6W	
R062	1-247-883-00	CARBON	150K	5%	1/6W	
R063	1-247-883-00	CARBON	150K	5%	1/6W	
R064	1-247-848-00	CARBON	5.1K	5%	1/6W	
R065	1-247-847-00	CARBON	4.7K	5%	1/6W	
R066	1-247-903-00	CARBON	1M	5%	1/6W	
R067	1-247-867-00	CARBON	33K	5%	1/6W	
R068	1-247-876-00	CARBON	75K	5%	1/6W	
R069	1-247-883-00	CARBON	150K	5%	1/6W	
R070	1-247-867-00	CARBON	33K	5%	1/6W	
R071	1-247-879-00	CARBON	100K	5%	1/6W	
R072	1-247-879-00	CARBON	100K	5%	1/6W	
R073	1-247-871-00	CARBON	47K	5%	1/6W	
R074	1-247-871-00	CARBON	47K	5%	1/6W	
R075	1-247-857-00	CARBON	12K	5%	1/6W	
R076	1-247-859-00	CARBON	15K	5%	1/6W	
R077	1-247-887-00	CARBON	220K	5%	1/6W	
R078	1-247-887-00	CARBON	220K	5%	1/6W	
R079	1-247-865-00	CARBON	27K	5%	1/6W	
R080	1-247-848-00	CARBON	5.1K	5%	1/6W	
R081	1-247-867-00	CARBON	33K	5%	1/6W	
R082	1-247-900-00	CARBON	750K	5%	1/6W	
R083	1-247-873-00	CARBON	56K	5%	1/6W	
R084	1-247-856-00	CARBON	11K	5%	1/6W	
R085	1-247-853-00	CARBON	8.2K	5%	1/6W	
R086	1-247-867-00	CARBON	33K	5%	1/6W	
R087	1-247-867-00	CARBON	33K	5%	1/6W	
R088	1-247-855-00	CARBON	10K	5%	1/6W	
R089	1-247-865-00	CARBON	27K	5%	1/6W	
R090	1-247-856-00	CARBON	11K	5%	1/6W	
R091	1-247-837-00	CARBON	1.8K	5%	1/6W	
R092	1-247-839-00	CARBON	2.2K	5%	1/6W	
R093	1-247-839-00	CARBON	2.2K	5%	1/6W	
R095	1-247-864-00	CARBON	24K	5%	1/6W	
R097	1-247-893-00	CARBON	390K	5%	1/6W	
R098	1-247-849-00	CARBON	5.6K	5%	1/6W	
R099	1-247-879-00	CARBON	100K	5%	1/6W	
R100	1-247-879-00	CARBON	100K	5%	1/6W	
R202	1-247-847-00	CARBON	4.7K	5%	1/6W	
R203	⚠1-212-360-00	METAL OXIDE	1	5%	1W	F
R204	⚠1-246-981-00	CARBON	4.7	5%	1/8W	F
R205	1-247-871-00	CARBON	47K	5%	1/6W	
R206	1-247-855-00	CARBON	10K	5%	1/6W	
R207	1-247-871-00	CARBON	47K	5%	1/6W	
R208	1-247-867-00	CARBON	33K	5%	1/6W	
R209	1-214-132-00	METAL	1K	1%	1/4W	
R210	1-247-838-00	CARBON	2K	5%	1/6W	
R211	1-247-847-00	CARBON	4.7K	5%	1/6W	
R212	⚠1-212-360-00	METAL OXIDE	1	5%	1W	F

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SS-13

Ref.No.	Part No.	Description				Remark
R213	⚠1-246-981-00	CARBON	4.7	5%	1/8W	F
R214	1-247-855-00	CARBON	10K	5%	1/6W	
R215	1-247-855-00	CARBON	10K	5%	1/6W	
R216	1-247-855-00	CARBON	10K	5%	1/6W	
R217	1-247-855-00	CARBON	10K	5%	1/6W	
R218	1-247-855-00	CARBON	10K	5%	1/6W	
R219	1-247-855-00	CARBON	10K	5%	1/6W	
R220	⚠1-246-981-00	CARBON	4.7	5%	1/8W	F
R221	1-247-863-00	CARBON	22K	5%	1/6W	
R222	1-247-843-00	CARBON	3.3K	5%	1/6W	
R223	1-247-849-00	CARBON	5.6K	5%	1/6W	
R224	1-247-855-00	CARBON	10K	5%	1/6W	
R225	1-247-855-00	CARBON	10K	5%	1/6W	
R226	1-247-863-00	CARBON	22K	5%	1/6W	
R227	1-247-863-00	CARBON	22K	5%	1/6W	
R228	1-247-863-00	CARBON	22K	5%	1/6W	
R230	1-247-849-00	CARBON	5.6K	5%	1/6W	
R231	1-247-863-00	CARBON	22K	5%	1/6W	
R233	⚠1-212-366-00	METAL OXIDE	3.3	5%	1W	F
R234	1-247-863-00	CARBON	22K	5%	1/6W	
R235	1-247-863-00	CARBON	22K	5%	1/6W	
R236	1-247-831-00	CARBON	1K	5%	1/6W	
R237	1-247-849-00	CARBON	5.6K	5%	1/6W	
R238	1-247-831-00	CARBON	1K	5%	1/6W	
R239	⚠1-212-360-00	METAL OXIDE	1	5%	1W	F
R240	1-247-849-00	CARBON	5.6K	5%	1/6W	
R241	1-247-831-00	CARBON	1K	5%	1/6W	
R242	1-247-831-00	CARBON	1K	5%	1/6W	
R243	1-247-863-00	CARBON	22K	5%	1/6W	
R244	1-247-863-00	CARBON	22K	5%	1/6W	
R245	1-247-801-00	CARBON	56	5%	1/6W	
R247	1-247-871-00	CARBON	47K	5%	1/6W	
R249	1-247-858-00	CARBON	13K	5%	1/6W	
R301	1-247-839-00	CARBON	2.2K	5%	1/6W	
R302	1-247-855-00	CARBON	10K	5%	1/6W	
R303	1-247-837-00	CARBON	1.8K	5%	1/6W	
R304	1-247-879-00	CARBON	100K	5%	1/6W	
R305	1-247-879-00	CARBON	100K	5%	1/6W	
R306	1-247-879-00	CARBON	100K	5%	1/6W	
R307	1-247-839-00	CARBON	2.2K	5%	1/6W	
R308	1-247-855-00	CARBON	10K	5%	1/6W	
R309	1-247-871-00	CARBON	47K	5%	1/6W	
R310	1-247-871-00	CARBON	47K	5%	1/6W	
R311	1-247-837-00	CARBON	1.8K	5%	1/6W	
R312	1-247-839-00	CARBON	2.2K	5%	1/6W	
R313	1-247-871-00	CARBON	47K	5%	1/6W	
R314	1-247-871-00	CARBON	47K	5%	1/6W	
R315	1-247-871-00	CARBON	47K	5%	1/6W	
R316	1-247-871-00	CARBON	47K	5%	1/6W	
R317	1-247-855-00	CARBON	10K	5%	1/6W	
R318	1-247-831-00	CARBON	1K	5%	1/6W	
R319	1-247-895-00	CARBON	470K	5%	1/6W	
R320	1-247-895-00	CARBON	470K	5%	1/6W	

Ref.No.	Part No.	Description				Remark
R321	1-247-879-00	CARBON	100K	5%	1/6W	
R322	1-247-837-00	CARBON	1.8K	5%	1/6W	
R323	1-247-879-00	CARBON	100K	5%	1/6W	
R324	1-247-879-00	CARBON	100K	5%	1/6W	
R325	1-247-879-00	CARBON	100K	5%	1/6W	
R326	1-247-879-00	CARBON	100K	5%	1/6W	
R327	1-247-879-00	CARBON	100K	5%	1/6W	
R328	1-247-855-00	CARBON	10K	5%	1/6W	
R329	1-247-879-00	CARBON	100K	5%	1/6W	
R330	1-247-879-00	CARBON	100K	5%	1/6W	
R331	1-247-879-00	CARBON	100K	5%	1/6W	
R401	1-247-831-00	CARBON	1K	5%	1/6W	
R402	1-247-863-00	CARBON	22K	5%	1/6W	
R403	1-247-831-00	CARBON	1K	5%	1/6W	
R404	1-247-831-00	CARBON	1K	5%	1/6W	
R405	1-247-831-00	CARBON	1K	5%	1/6W	
R406	1-247-879-00	CARBON	100K	5%	1/6W	
R407	1-247-871-00	CARBON	47K	5%	1/6W	
R409	1-247-879-00	CARBON	100K	5%	1/6W	
R410	1-247-855-00	CARBON	10K	5%	1/6W	
R411	1-247-879-00	CARBON	100K	5%	1/6W	
R412	1-247-831-00	CARBON	1K	5%	1/6W	
R413	1-247-879-00	CARBON	100K	5%	1/6W	
R414	1-247-879-00	CARBON	100K	5%	1/6W	
R415	1-247-879-00	CARBON	100K	5%	1/6W	
R416	1-247-879-00	CARBON	100K	5%	1/6W	
R417	1-247-879-00	CARBON	100K	5%	1/6W	
R418	1-247-879-00	CARBON	100K	5%	1/6W	
R419	1-247-879-00	CARBON	100K	5%	1/6W	
R420	1-247-879-00	CARBON	100K	5%	1/6W	
R421	1-247-863-00	CARBON	22K	5%	1/6W	
R422	1-247-831-00	CARBON	1K	5%	1/6W	
R423	1-247-879-00	CARBON	100K	5%	1/6W	
R424	1-247-843-00	CARBON	3.3K	5%	1/6W	
R425	1-247-839-00	CARBON	2.2K	5%	1/6W	
R426	1-247-855-00	CARBON	10K	5%	1/6W	
R427	1-247-873-00	CARBON	56K	5%	1/6W	
R428	1-247-865-00	CARBON	27K	5%	1/6W	
R429	1-247-873-00	CARBON	56K	5%	1/6W	
R430	1-247-865-00	CARBON	27K	5%	1/6W	
R431	1-247-855-00	CARBON	10K	5%	1/6W	
R432	1-247-863-00	CARBON	22K	5%	1/6W	
R433	1-247-855-00	CARBON	10K	5%	1/6W	
R434	1-247-849-00	CARBON	5.6K	5%	1/6W	
R435	1-247-879-00	CARBON	100K	5%	1/6W	
R436	1-247-879-00	CARBON	100K	5%	1/6W	
R437	1-246-468-00	CARBON	620	5%	1/4W	
R438	1-247-879-00	CARBON	100K	5%	1/6W	
R439	1-247-873-00	CARBON	56K	5%	1/6W	
R440	1-247-865-00	CARBON	27K	5%	1/6W	
R441	1-247-863-00	CARBON	22K	5%	1/6W	
R442	1-247-809-00	CARBON	120	5%	1/6W	
R443	1-247-829-00	CARBON	820	5%	1/6W	

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SS-13 FS-19 TU-55 JK-6

Ref.No.	Part No.	Description				Remark
R444	1-247-843-00	CARBON	3.3K	5%	1/6W	
R445	1-247-849-00	CARBON	5.6K	5%	1/6W	
R446	1-247-873-00	CARBON	56K	5%	1/6W	
R447	1-247-807-00	CARBON	100	5%	1/6W	
R448	1-246-468-00	CARBON	620	5%	1/4W	
R449	1-246-468-00	CARBON	620	5%	1/4W	
R450	1-246-470-00	CARBON	750	5%	1/4W	
R451	1-246-468-00	CARBON	620	5%	1/4W	
R452	1-247-879-00	CARBON	100K	5%	1/6W	
R453	1-247-843-00	CARBON	3.3K	5%	1/6W	
R454	1-247-871-00	CARBON	47K	5%	1/6W	
R455	1-247-801-00	CARBON	56	5%	1/6W	
R456	1-247-879-00	CARBON	100K	5%	1/6W	
R458	1-247-835-00	CARBON	1.5K	5%	1/6W	
R459	1-247-823-00	CARBON	470	5%	1/6W	
R460	1-247-855-00	CARBON	10K	5%	1/6W	
R461	1-247-879-00	CARBON	100K	5%	1/6W	
R462	1-247-849-00	CARBON	5.6K	5%	1/6W	
R463	1-247-855-00	CARBON	10K	5%	1/6W	
R465	1-247-855-00	CARBON	10K	5%	1/6W	
R501	1-247-895-00	CARBON	470K	5%	1/6W	
R502	1-247-875-00	CARBON	68K	5%	1/6W	
R503	1-247-849-00	CARBON	5.6K	5%	1/6W	
R504	1-247-831-00	CARBON	1K	5%	1/6W	
R505	1-247-855-00	CARBON	10K	5%	1/6W	
R506	1-247-879-00	CARBON	100K	5%	1/6W	
R507	1-247-886-00	CARBON	200K	5%	1/6W	
R508	1-247-841-00	CARBON	2.7K	5%	1/6W	
R509	1-247-815-00	CARBON	220	5%	1/6W	
R510	1-247-869-00	CARBON	39K	5%	1/6W	
R511	1-247-875-00	CARBON	68K	5%	1/6W	
R512	1-247-879-00	CARBON	100K	5%	1/6W	
R513	1-247-852-00	CARBON	7.5K	5%	1/6W	
R514	1-247-841-00	CARBON	2.7K	5%	1/6W	
R515	1-247-849-00	CARBON	5.6K	5%	1/6W	
R516	1-247-831-00	CARBON	1K	5%	1/6W	
R517	1-247-867-00	CARBON	33K	5%	1/6W	
R518	1-247-863-00	CARBON	22K	5%	1/6W	
R519	1-247-801-00	CARBON	56	5%	1/6W	
R520	1-247-879-00	CARBON	100K	5%	1/6W	
R601	1-247-903-00	CARBON	1M	5%	1/6W	
R602	1-247-879-00	CARBON	100K	5%	1/6W	
R603	1-247-863-00	CARBON	22K	5%	1/6W	
R604	1-247-855-00	CARBON	10K	5%	1/6W	
R605	1-247-895-00	CARBON	470K	5%	1/6W	
R606	1-247-869-00	CARBON	39K	5%	1/6W	
R607	1-247-807-00	CARBON	100	5%	1/6W	
R608	1-247-879-00	CARBON	100K	5%	1/6W	
R609	1-247-839-00	CARBON	2.2K	5%	1/6W	
R610	1-247-831-00	CARBON	1K	5%	1/6W	
R751	1-247-831-00	CARBON	1K	5%	1/6W	
R752	1-247-863-00	CARBON	22K	5%	1/6W	
R753	1-247-871-00	CARBON	47K	5%	1/6W	
R754	1-247-863-00	CARBON	22K	5%	1/6W	
R755	1-247-863-00	CARBON	22K	5%	1/6W	
R758	1-247-845-00	CARBON	3.9K	5%	1/6W	
R759	1-247-855-00	CARBON	10K	5%	1/6W	
R760	1-247-831-00	CARBON	1K	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-990-00	RES, ADJ, METAL GLAZE 1K
RV002	1-228-993-00	RES, ADJ, METAL GLAZE 4.7K
RV003	1-228-991-00	RES, ADJ, METAL GLAZE 2.2K
RV004	1-228-996-00	RES, ADJ, METAL GLAZE 47K
RV005	1-228-750-00	RES, ADJ, CARBON 47K
RV006	1-228-750-00	RES, ADJ, CARBON 47K
RV008	1-228-750-00	RES, ADJ, CARBON 47K
RV009	1-228-747-00	RES, ADJ, CARBON 4.7K

****

♦:1-609-219-00 FS-19 BOARD
****

DIODE

D001	8-719-812-32	DIODE TLY123
D002	8-719-812-33	DIODE TLG123A

SWITCH

S001	1-553-766-00	SWITCH, KEY BOARD
S002	1-553-766-00	SWITCH, KEY BOARD
S003	1-553-766-00	SWITCH, KEY BOARD
S004	1-553-766-00	SWITCH, KEY BOARD
S005	1-553-766-00	SWITCH, KEY BOARD

****

♦:1-610-854-00 TU-55 BOARD
****

⚠1-463-399-00 TUNER (BT-866)

****

♦:1-610-694-00 JK-6 BOARD
****

CAPACITOR

C001	1-161-021-00	CERAMIC	0.047MF	10%	25V

JACK

CNJ001	1-507-892-00	JACK, PIN 1P
CNJ002	1-507-841-00	JACK, MINIATURE
CNJ003	1-507-588-32	JACK, PIN, 1P
CNJ004	1-507-840-00	JACK, MINIATURE

RESISTOR

R002	1-247-875-00	CARBON	68K	5%	1/6W
R003	1-247-815-00	CARBON	220	5%	1/6W

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description				Remark
R004	1-247-804-00	CARBON	75	5%	1/6W	
R005	1-247-799-00	CARBON	47	5%	1/6W	

****

★:1-610-587-00 PS-26 BOARD
****

1-533-162-00 HOLDER, FUSE

CAPACITOR

C101	⚠1-130-680-00	FILM	0.1MF	20%	125V	
C102	⚠1-161-747-00	CERAMIC	2200PF	20%	125V	
C103	⚠1-161-747-00	CERAMIC	2200PF	20%	125V	
C104	1-125-298-00	ELECT(BLOCK)	10000MF	20%	25V	
C105	1-123-332-00	ELECT	47MF	20%	16V	
C106	1-161-021-00	CERAMIC	0.047MF	10%	25V	

CONNECTOR

CN101	1-564-321-00	PIN, CONNECTOR 2P	
CN102	1-564-320-00	PIN, CONNECTOR 2P	

DIODE

D101	⚠8-719-300-67	DIODE RB602F	
D102	8-719-100-98	DIODE RD30E-B3	

FUSE

F101	⚠1-532-591-00	FUSE, GLASS TUBE 2A 125V	
F102	⚠1-532-557-00	FUSE, GLASS TUBE 3.15A 125V	

IC

IC101	⚠8-749-990-12	IC STR9012	

TRANSISTOR

Q101	⚠8-729-178-54	TRANSISTOR 2SC2785	

RESISTOR

R101	⚠1-202-723-00	SOLID	2.2M	10%	1/2W	
R103	1-247-855-00	CARBON	10K	5%	1/6W	
R104	1-247-855-00	CARBON	10K	5%	1/6W	
R105	1-247-855-00	CARBON	10K	5%	1/6W	

TRANSFORMER

T101	⚠1-421-357-31	TRANSFORMER, LINE FILTER	

****

★:1-610-588-00 PS-27 BOARD
****

CAPACITOR

C001	1-123-388-00	ELECT	100MF	20%	100V	
C003	1-123-311-00	ELECT	1000MF	20%	10V	
C004	1-123-345-00	ELECT	100MF	20%	35V	
C005	1-123-356-00	ELECT	10MF	20%	16V	
C006	1-123-356-00	ELECT	10MF	20%	16V	
C007	1-123-356-00	ELECT	10MF	20%	16V	
C008	1-123-306-00	ELECT	47MF	20%	10V	
C009	1-123-306-00	ELECT	47MF	20%	10V	
C010	1-123-380-00	ELECT	1MF	20%	50V	
C011	1-161-070-00	CERAMIC	0.01MF	20%	50V	
C012	1-125-347-00	DOUBLE LAYER	0.22F		5V	
C013	1-123-332-00	ELECT	47MF	20%	16V	
C018	1-161-021-00	CERAMIC	0.047MF	10%	25V	

CONNECTOR

CN001	★:1-560-896-00	PIN, CONNECTOR 8P
CN002	★:1-560-898-00	PIN, CONNECTOR 10P
CN003	★:1-560-898-00	PIN, CONNECTOR 10P
CN004	★:1-560-894-00	PIN, CONNECTOR 6P

DIODE

D001	8-719-200-02	DIODE 10E2
D002	8-719-200-02	DIODE 10E2
D003	8-719-200-02	DIODE 10E2
D004	8-719-200-02	DIODE 10E2
D005	8-719-200-02	DIODE 10E2
D006	8-719-100-38	DIODE RD6.2E-B2
D007	8-719-100-29	DIODE RD5.1E-B1
D008	8-719-100-66	DIODE RD12E-B3
D009	8-719-100-38	DIODE RD6.2E-B2
D010	8-719-200-02	DIODE 10E2
D011	8-719-200-02	DIODE 10E2
D012	8-719-911-19	DIODE 1SS119
D013	8-719-911-19	DIODE 1SS119
D014	8-719-100-38	DIODE RD6.2E-B2
D016	8-719-100-29	DIODE RD5.1E-B1
D017	8-719-200-02	DIODE 10E2

TRANSISTOR

Q001	=>8-729-177-32	TRANSISTOR 2SD773
Q002	8-729-113-32	TRANSISTOR 2SB733

RESISTOR

R001	⚠1-212-958-00	FUSIBLE	10	5%	1/2W	F
R002	⚠1-212-934-00	FUSIBLE	1	5%	1/2W	F
R003	⚠1-212-934-00	FUSIBLE	1	5%	1/2W	F
R004	1-247-839-00	CARBON	2.2K	5%	1/6W	
R005	1-247-839-00	CARBON	2.2K	5%	1/6W	
R006	⚠1-212-958-00	FUSIBLE	10	5%	1/2W	F
R007	1-246-449-00	CARBON	100	5%	1/4W	
R008	1-247-831-00	CARBON	1K	5%	1/6W	
R009	1-247-873-00	CARBON	56K	5%	1/6W	

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

PS-29 PS-30 CI-5 TA-16

Ref.No.	Part No.	Description	Remark
	♣:1-610-589-00	PS-29 BOARD	
		**********	
		TRANSISTOR	
Q220	=>8-729-316-16	TRANSISTOR 2SC1061	
**********			
	♣:1-610-590-00	PS-30 BOARD	
		**********	
		SWITCH	
S201	1-554-377-00	SWITCH, SLIDE	
**********			
	♣:1-610-595-00	CI-5 BOARD	
		**********	
	7-685-860-01	SCREW +BVTT 2.6X4 (S)	
		CAPACITOR	
C001	1-123-380-00	ELECT 1MF 20% 50V	
		CONNECTOR	
CN001	♣:1-560-899-00	PIN, CONNECTOR 11P	
CN002	♣:1-560-896-00	PIN, CONNECTOR 8P	
CN003	♣:1-560-897-00	PIN, CONNECTOR 9P	
CN004	♣:1-560-891-00	PIN, CONNECTOR 3P	
CN005	♣:1-560-894-00	PIN, CONNECTOR 6P	
CN006	1-561-703-00	CONNECTOR, DIN 8P	
		DIODE	
D001	8-719-911-19	DIODE 1SS119	
D002	8-719-911-19	DIODE 1SS119	
D003	8-719-911-19	DIODE 1SS119	
		FUSE	
F001	⚠1-532-624-00	FUSE, GLASS TUBE 0.5A 125V	
		IC	
IC001	8-759-906-95	IC MB8791	
		TRANSISTOR	
Q001	=>8-729-245-83	TRANSISTOR 2SC2458	
Q002	=>8-729-245-83	TRANSISTOR 2SC2458	
Q003	=>8-729-245-83	TRANSISTOR 2SC2458	
Q004	=>8-729-245-83	TRANSISTOR 2SC2458	
Q005	=>8-729-245-83	TRANSISTOR 2SC2458	
Q006	=>8-729-245-83	TRANSISTOR 2SC2458	
Q007	=>8-729-245-83	TRANSISTOR 2SC2458	
Q008	=>8-729-204-83	TRANSISTOR 2SA1048-GR	

Ref.No.	Part No.	Description			Remark
		RESISTOR			
R001	1-247-855-00	CARBON	10K	5% 1/6W	
R002	1-247-855-00	CARBON	10K	5% 1/6W	
R003	1-247-855-00	CARBON	10K	5% 1/6W	
R004	1-247-855-00	CARBON	10K	5% 1/6W	
R005	1-247-867-00	CARBON	33K	5% 1/6W	
R006	1-247-867-00	CARBON	33K	5% 1/6W	
R007	1-247-855-00	CARBON	10K	5% 1/6W	
R008	1-247-855-00	CARBON	10K	5% 1/6W	
R009	1-247-855-00	CARBON	10K	5% 1/6W	
R010	1-247-855-00	CARBON	10K	5% 1/6W	
R011	1-247-867-00	CARBON	33K	5% 1/6W	
R012	1-247-879-00	CARBON	100K	5% 1/6W	
R013	1-247-863-00	CARBON	22K	5% 1/6W	
R014	1-247-867-00	CARBON	33K	5% 1/6W	
R015	1-247-879-00	CARBON	100K	5% 1/6W	
R016	1-247-862-00	CARBON	20K	5% 1/6W	
R017	1-247-867-00	CARBON	33K	5% 1/6W	
R018	1-247-867-00	CARBON	33K	5% 1/6W	
R019	1-247-855-00	CARBON	10K	5% 1/6W	
R020	1-247-873-00	CARBON	56K	5% 1/6W	
R021	1-247-855-00	CARBON	10K	5% 1/6W	
R022	1-247-855-00	CARBON	10K	5% 1/6W	
R023	1-247-855-00	CARBON	10K	5% 1/6W	
R024	1-247-855-00	CARBON	10K	5% 1/6W	
R025	1-247-829-00	CARBON	820	5% 1/6W	
R026	1-247-831-00	CARBON	1K	5% 1/6W	
R027	1-247-831-00	CARBON	1K	5% 1/6W	
R028	1-247-831-00	CARBON	1K	5% 1/6W	
R029	1-247-831-00	CARBON	1K	5% 1/6W	
**********					
	♣;A-6721-183-A	TA-16 BOARD COMPLETE			
		**********			
		CAPACITOR			
C001	1-102-074-00	CERAMIC	0.001MF	10% 50V	
C002	1-130-487-00	FILM	0.022MF	5% 50V	
C003	1-123-608-00	ELECT	0.22MF	20% 50V	
C004	1-123-608-00	ELECT	0.22MF	20% 50V	
C005	1-102-526-00	CERAMIC	75PF	5% 50V	
C006	1-123-333-00	ELECT	100MF	20% 16V	
C007	1-101-004-00	CERAMIC	0.01MF	50V	
C008	1-161-021-00	CERAMIC	0.047MF	10% 25V	
C009	1-102-523-00	CERAMIC	56PF	5% 50V	
C010	1-101-884-00	CERAMIC	56PF	5% 50V	
C011	1-123-356-00	ELECT	10MF	20% 16V	
C012	1-130-485-00	FILM	0.015MF	5% 50V	
C013	1-102-851-00	CERAMIC	15PF	5% 50V	
C014	1-102-495-00	CERAMIC	75PF	5% 50V	
C015	1-123-380-00	ELECT	1MF	20% 50V	

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description			Remark
C016	1-123-330-00	ELECT	22MF	20%	16V
C017	1-102-121-00	CERAMIC	0.00-2MF	10%	50V
C018	1-123-380-00	ELECT	1MF	20%	50V
C019	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C020	1-123-379-00	ELECT	0.4MF	20%	50V
C021	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C022	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C023	1-123-379-00	ELECT	0.47MF	20%	50V
C024	1-102-816-00	CERAMIC	120PF	5%	50V
C025	1-123-333-00	ELECT	100MF	20%	16V
C026	1-102-514-00	CERAMIC	22PF	5%	50V
C028	1-123-382-00	ELECT	3.3MF	20%	100V
C029	1-123-330-00	ELECT	22MF	20%	16V
C030	1-123-330-00	ELECT	22MF	20%	16V
C031	1-130-528-51	FILM	0.1MF	10%	50V
C032	1-130-516-51	FILM	0.01MF	10%	50V
C033	1-123-330-00	ELECT	22MF	20%	16V
C034	1-123-318-00	ELECT	33MF	20%	16V
C035	1-161-036-00	CERAMIC	0.047MF	20%	25V
C036	1-123-330-00	ELECT	22MF	20%	16V
C040	1-130-516-51	EILM	0.01MF	10%	50V
C403	1-130-528-51	FILM	0.1MF	10%	50V
C404	1-123-356-00	ELECT	10MF	20%	16V
C405	1-123-607-00	ELECT	0.1MF	20%	50V
C406	1-123-379-00	ELECT	0.47MF	20%	50V
C407	1-102-074-00	CERAMIC	0.001MF	10%	50V
C408	1-102-074-00	CERAMIC	0.001MF	10%	50V
C409	1-101-004-00	CERAMIC	0.01MF		50V
C410	1-123-332-00	ELECT	47MF	20%	16V
C502	1-123-332-00	ELECT	47MF	20%	16V
C503	1-130-479-00	FILM	0.0047MF	5%	50V
C504	1-130-477-00	FILM	0.0033MF	5%	50V
C505	1-102-110-00	CERAMIC	220PF	10%	50V
C506	1-130-472-00	FILM	0.0012MF	5%	50V
C507	1-123-381-00	ELECT	2.2MF	20%	50V
C508	1-123-382-00	ELECT	3.3MF	20%	50V
C509	1-136-051-00	FILM	0.0039MF	10%	630V
C510	1-130-475-00	FILM	0.0022MF	5%	50V
C511	1-123-356-00	ELECT	10MF	20%	16V
C512	1-130-471-00	FILM	0.001MF	5%	50V
C513	1-107-166-00	MIKA	62PF	5%	500V
C514	1-123-333-00	ELECT	100MF	20%	16V
C515	1-130-477-00	FILM	0.0033MF	5%	50V
C517	1-123-382-00	ELECT	3.3MF	20%	50V
C518	1-123-330-00	ELECT	22MF	20%	16V

Ref.No.	Part No.	Description			Remark
C519	1-123-356-00	ELECT	10MF	20%	16V
C520	1-101-059-00	CERAMIC	510PF	5%	50V
C521	1-123-328-00	ELECT	4.7MF	20%	25V
C522	1-130-497-00	FILM	0.15MF	5%	50V
C523	1-123-328-00	ELECT	4.7MF	20%	25V
C524	1-123-333-00	ELECT	100MF	20%	16V
C525	1-130-482-00	FILM	0.0082MF	5%	50V
C526	1-123-328-00	ELECT	4.7MF	20%	25V
C528	1-130-516-51	FILM	0.01MF	10%	50V
C530	1-123-296-00	ELECT	220MF	20%	6.3V
C531	1-123-380-00	ELECT	1MF	20%	50V
C533	1-130-468-00	FILM	560PF	5%	50V
C534	1-123-379-00	ELECT	0.47MF	20%	50V
C535	1-123-330-00	ELECT	22MF	20%	16V
C536	1-161-021-00	CERAMIC	0.047MF	10%	25V
C537	1-130-472-00	FILM	0.0012MF	5%	50V
C601	1-161-025-00	CERAMIC	0.1MF	10%	25V
C602	1-161-025-00	CERAMIC	0.1MF	10%	25V
C603	1-101-006-00	CERAMIC	0.047MF		50V
C604	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C605	1-102-127-00	CERAMIC	0.0068MF	10%	50V
C606	1-123-356-00	ELECT	10MF	20%	16V
C607	1-102-110-00	CERAMIC	220PF	10%	50V
C608	1-123-306-00	ELECT	47MF	20%	10V
C609	1-123-382-00	ELECT	3.3MF	20%	50V
C610	1-102-106-00	CERAMIC	100PF	10%	50V
C611	1-123-306-00	ELECT	47MF	20%	10V
C612	1-123-307-00	ELECT	100MF	20%	10V
C613	1-130-493-51	FILM	0.068MF	5%	50V
C614	1-130-516-51	FILM	0.01MF	10%	50V
C615	1-123-306-00	ELECT	47MF	20%	10V
C616	1-123-307-00	ELECT	100MF	20%	10V
C617	1-101-004-00	CERAMIC	0.01MF		50V
C618	1-123-330-00	ELECT	22MF	20%	16V

FILTER

CF001	1-409-332-00	CERAMIC TRAP (4.5MHZ)
CF002	1-527-260-00	FILTER, CERAMIC (4.5MHZ)
CF003	1-409-332-00	CERAMIC TRAP (4.5MHZ)

CONNECTOR

CN001	1-560-894-00	PIN, CONNECTOR 6P
CN002	1-560-896-00	PIN, CONNECTOR 8P
CN003	1-560-895-00	PIN, CONNECTOR 7P
CN004	1-560-891-31	PIN, CONNECTOR 3P
CN501	1-560-892-21	PIN, CONNECTOR 4P
CN502	1-560-897-00	PIN, CONNECTOR 9P
CN503	1-560-890-21	PIN, CONNECTOR 2P

TA-16

Ref.No.	Part No.	Description	Remark
CN504	♦:1-560-893-00	PIN, CONNECTOR 5P	
CN601	♦:1-560-893-41	PIN, CONNECTOR 5P	
CN602	♦:1-560-891-00	PIN, CONNECTOR 3P	
CN603	♦:1-560-890-00	PIN, CONNECTOR 2P	
		DIODE	
D001	8-719-911-19	DIODE 1SS119	
D002	8-719-911-19	DIODE 1SS119	
D003	8-719-911-19	DIODE 1SS119	
D004	8-719-911-19	DIODE 1SS119	
D007	8-719-911-19	DIODE 1SS119	
D008	8-719-911-19	DIODE 1SS119	
D009	8-719-911-19	DIODE 1SS119	
D401	8-719-911-19	DIODE 1SS119	
D402	⚠ 8-719-100-67	DIODE RD13E-B1	
D403	8-719-911-19	DIODE 1SS119	
D404	8-719-911-19	DIODE 1SS119	
D405	8-719-911-19	DIODE 1SS119	
D406	8-719-911-19	DIODE 1SS119	
D407	8-719-911-19	DIODE 1SS119	
D408	8-719-911-19	DIODE 1SS119	
D409	8-719-911-19	DIODE 1SS119	
D410	8-719-911-19	DIODE 1SS119	
D411	8-719-911-19	DIODE 1SS119	
D412	8-719-911-19	DIODE 1SS119	
D413	8-719-911-19	DIODE 1SS119	
D414	8-719-911-19	DIODE 1SS119	
D415	8-719-911-19	DIODE 1SS119	
D417	8-719-911-19	DIODE 1SS119	
D419	8-719-911-19	DIODE 1SS119	
D421	8-719-911-19	DIODE 1SS119	
D423	8-719-100-67	DIODE RD13E-B1	
D425	8-719-911-19	DIODE 1SS119	
D427	8-719-911-19	DIODE 1SS119	
D429	8-719-911-19	DIODE 1SS119	
D501	8-719-911-19	DIODE 1SS119	
D502	8-719-911-19	DIODE 1SS119	
		IC	
IC001	8-758-852-00	IC CX885B	
IC002	8-759-157-40	IC UPC574J	
IC401	8-759-113-63	IC UPC1363C	
IC003	8-759-800-12	IC LA7920	
IC501	8-759-800-46	IC LA7046	
IC601	8-759-145-58	IC UPC4558C	
IC602	8-759-841-40	IC LA4140	
		COIL	
L001	1-408-591-31	MICRO INDUCTOR 1UH	
L002	1-408-597-00	MICRO INDUCTOR 3.3UH	
L003	1-408-608-11	MICRO INDUCTOR 2.7UH	
L004	1-408-603-11	MICRO INDUCTOR 10UH	
L005	1-408-602-11	MICRO INDUCTOR 8.2UH	
L006	1-408-604-11	MICRO INDUCTOR 12UH	
L007	1-408-606-11	MICRO INDUCTOR 18UH	
L008	1-408-611-11	MICRO INDUCTOR 47UH	
L009	1-407-716-00	MICRO INDUCTOR 820UH	
L401	1-408-609-00	MICRO INDUCTOR 1UH	
L402	1-408-609-00	MICRO INDUCTOR 33UH	
L403	1-408-612-00	MICRO INDUCTOR 56UH	
L501	1-407-718-00	MICRO INDUCTOR 1.2UH	
L502	1-407-508-00	MICRO INDUCTOR 22MMH	
L601	1-407-498-00	MICRO INDUCTOR 3.3MMH	
		VARIABLE COIL	
LV501	1-408-523-00	COIL, VARIABLE	
		VOLUME BLOCK	
PS001	1-230-125-12	VOLUME BLOCK, PRESET 14	
		TRANSISTOR	
Q001	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q002	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q003	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q004	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q007	8-769-193-09	TRANSISTOR 2SK43-3	
Q008	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q009	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q401	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q402	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q403	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q404	⚠ 8-729-178-54	TRANSISTOR 2SC2785	
Q405	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q406	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q407	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q408	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q501	8-729-177-42	TRANSISTOR 2SD774	
Q502	8-729-194-57	TRANSISTOR 2SC945-P	
Q503	8-729-194-57	TRANSISTOR 2SC945-P	
Q504	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q505	8-729-204-83	TRANSISTOR 2SC2458-GR	
Q506	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q507	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q509	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q510	+8-729-245-83	TRANSISTOR 2SC2458-GR	
		RESISTOR	
R001	1-247-839-00	CARBON 2.2K 5% 1/6W	
R002	1-247-845-00	CARBON 3.9K 5% 1/6W	

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description				Remark
R003	1-247-879-00	CARBON	100K	5%	1/6W	
R004	1-247-869-00	CARBON	39K	5%	1/6W	
R005	1-247-829-00	CARBON	820	5%	1/6W	
R006	1-247-799-00	CARBON	47	5%	1/6W	
R007	1-247-891-00	CARBON	330K	5%	1/6W	
R008	⚠1-247-783-00	CARBON	100	5%	1/6W	F
R009	1-247-839-00	CARBON	2.2K	5%	1/6W	
R010	1-247-865-00	CARBON	27K	5%	1/6W	
R011	1-247-843-00	CARBON	3.3K	5%	1/6W	
R012	1-247-831-00	CARBON	1.0K	5%	1/6W	
R013	1-247-871-00	CARBON	47K	5%	1/6W	
R014	1-247-873-00	CARBON	56K	5%	1/6W	
R015	1-247-831-00	CARBON	1.0K	5%	1/6W	
R016	1-247-855-00	CARBON	10K	5%	1/6W	
R017	1-247-831-00	CARBON	1.0K	5%	1/6W	
R018	1-247-843-00	CARBON	3.3K	5%	1/6W	
R019	1-247-831-00	CARBON	1.0K	5%	1/6W	
R020	1-247-831-00	CARBON	1.0K	5%	1/6W	
R021	1-247-873-00	CARBON	56K	5%	1/6W	
R022	1-247-847-00	CARBON	4.7K	5%	1/6W	
R023	1-247-821-00	CARBON	390	5%	1/6W	
R024	1-247-821-00	CARBON	390	5%	1/6W	
R025	1-247-827-00	CARBON	680	5%	1/6W	
R026	1-247-847-00	CARBON	4.7K	5%	1/6W	
R027	1-247-817-00	CARBON	270	5%	1/6W	
R028	1-247-843-00	CARBON	3.3K	5%	1/6W	
R029	1-247-879-00	CARBON	100K	5%	1/6W	
R030	1-247-863-00	CARBON	22K	5%	1/6W	
R039	1-247-900-00	CARBON	750L	5%	1/6W	
R040	1-247-903-00	CARBON	1.0M	5%	1/6W	
R041	1-247-888-00	CARBON	240K	5%	1/6W	
R042	1-247-869-00	CARBON	39K	5%	1/6W	
R043	⚠1-247-819-00	CARBON	2.2K	5%	1/6W	F
R044	1-202-735-00	SOLID	22M	10%	1/2W	
R045	1-247-879-00	CARBON	100K	5%	1/6W	
R047	1-247-879-00	CARBON	100K	5%	1/6W	
R050	1-247-871-00	CARBON	47K	5%	1/6W	
R051	1-247-871-00	CARBON	47K	5%	1/6W	
R070	1-247-843-00	CARBON	3.3K	5%	1/6W	
R402	1-247-855-00	CARBON	10K	5%	1/6W	
R403	1-247-855-00	CARBON	10K	5%	1/6W	
R404	1-247-855-00	CARBON	10K	5%	1/6W	
R405	1-247-863-00	CARBON	150K	5%	1/6W	
R406	1-247-879-00	CARBON	100K	5%	1/6W	
R407	1-247-881-00	CARBON	120K	5%	1/6W	
R408	1-247-879-00	CARBON	100K	5%	1/6W	
R409	1-247-855-00	CARBON	10K	5%	1/6W	

Ref.No.	Part No.	Description				Remark
R410	1-247-855-00	CARBON	10K	5%	1/6W	
R411	1-247-855-00	CARBON	10K	5%	1/6W	
R412	1-247-855-00	CARBON	10K	5%	1/6W	
R413	1-247-855-00	CARBON	10K	5%	1/6W	
R414	1-247-855-00	CARBON	10K	5%	1/6W	
R415	1-247-847-00	CARBON	4.7K	5%	1/6W	
R416	1-247-855-00	CARBON	10K	5%	1/6W	
R417	1-247-855-00	CARBON	10K	5%	1/6W	
R418	1-247-855-00	CARBON	10K	5%	1/6W	
R419	1-247-855-00	CARBON	10K	5%	1/6W	
R420	1-244-864-51	CARBON	430	5%	1/2W	
R421	1-247-891-00	CARBON	330K	5%	1/6W	
R422	1-247-875-00	CARBON	68K	5%	1/6W	
R423	1-247-855-00	CARBON	10K	5%	1/6W	
R424	1-247-855-00	CARBON	10K	5%	1/6W	
R425	1-247-855-00	CARBON	10K	5%	1/6W	
R426	1-247-855-00	CARBON	10K	5%	1/6W	
R501	1-247-859-00	CARBON	15K	5%	1/6W	
R502	1-247-859-00	CARBON	15K	5%	1/6W	
R503	1-247-783-00	CARBON	10	5%	1/6W	
R504	⚠1-246-980-00	CARBON	3.3	5%	1/8W	F
R505	1-247-839-00	CARBON	2.2K	5%	1/6W	
R506	1-247-883-00	CARBON	150K	5%	1/6W	
R507	1-247-867-00	CARBON	33K	5%	1/6W	
R508	1-247-893-00	CARBON	390K	5%	1/6W	
R509	1-247-807-00	CARBON	100	5%	1/6W	
R510	1-247-839-00	CARBON	2.2K	5%	1/6W	
R511	1-247-839-00	CARBON	2.2K	5%	1/6W	
R512	1-247-903-00	CARBON	1.0M	5%	1/6W	
R513	1-247-863-00	CARBON	22K	5%	1/6W	
R514	1-247-849-00	CARBON	5.6K	5%	1/6W	
R515	1-247-855-00	CARBON	10K	5%	1/6W	
R516	1-247-865-00	CARBON	27K	5%	1/6W	
R517	1-247-847-00	CARBON	4.7K	5%	1/6W	
R518	1-247-855-00	CARBON	10K	5%	1/6W	
R519	1-247-869-00	CARBON	39K	5%	1/6W	
R520	1-247-843-00	CARBON	3.3K	5%	1/6W	
R521	1-247-855-00	CARBON	10K	5%	1/6W	
R522	1-247-839-00	CARBON	2.2K	5%	1/6W	
R523	1-247-871-00	CARBON	47K	5%	1/6W	
R524	1-247-855-00	CARBON	10K	5%	1/6W	
R525	1-247-867-00	CARBON	33K	5%	1/6W	
R527	1-247-847-00	CARBON	4.7K	5%	1/6W	
R528	1-247-831-00	CARBON	1.0K	5%	1/6W	
R529	1-247-783-00	CARBON	10	5%	1/6W	
R530	1-247-863-00	CARBON	22K	5%	1/6W	

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

TA-16

Ref.No.	Part No.	Description				Remark
R531	1-247-863-00	CARBON	22K	5%	1/6W	
R532	1-247-871-00	CARBON	47K	5%	1/6W	
R533	1-247-877-00	CARBON	82K	5%	1/6W	
R534	1-247-865-00	CARBON	27K	5%	1/6W	
R535	1-247-821-00	CARBON	390	5%	1/6W	
R536	1-247-844-00	CARBON	3.6K	5%	1/6W	
R537	1-247-815-00	CARBON	220	5%	1/6W	
R538	1-210-825-00	SOLID	3.3M	5%	1/4W	
R540	1-247-851-00	CARBON	6.8K	5%	1/6W	
R541	1-247-871-00	CARBON	47K	5%	1/6W	
R542	1-247-823-00	CARBON	47K	5%	1/6W	
R545 ⚠	1-212-869-00	FUSE	33	5%	1/4W	F
R546	1-247-863-00	CARBON	22K	5%	1/6W	
R601	1-247-799-00	CARBON	47	5%	1/6W	
R602	1-247-799-00	CARBON	47	5%	1/6W	
R603	1-247-839-00	CARBON	2.2K	5%	1/6W	
R604	1-247-839-00	CARBON	2.2K	5%	1/6W	
R605	1-247-823-00	CARBON	470	5%	1/6W	
R606	1-247-823-00	CARBON	470	5%	1/6W	
R607	1-247-879-00	CARBON	100K	5%	1/6W	
R608	1-247-879-00	CARBON	100K	5%	1/6W	
R609	1-247-879-00	CARBON	100K	5%	1/6W	
R610	1-247-879-00	CARBON	100K	5%	1/6W	
R611	1-247-867-00	CARBON	33K	5%	1/6W	
R612	1-247-799-00	CARBON	47	5%	1/6W	
R613	1-247-867-00	CARBON	33K	5%	1/6W	
R614	1-247-831-00	CARBON	1.0K	5%	1/6W	
R615	1-247-855-00	CARBON	10K	5%	1/6W	
R616	1-247-855-00	CARBON	10K	5%	1/6W	
R617	1-247-867-00	CARBON	33K	5%	1/6W	
R618	1-247-814-00	CARBON	200	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-747-00	RES, ADJ, CARBON 4.7K
RV002	1-228-747-00	RES, ADJ, CARBON 4.7K
RV501	1-224-256-XX	RES, ADJ, METAL GLAZE 220K
RV502	1-228-752-00	RES, ADJ, CARBON 220K
RV503	1-228-744-00	RES, ADJ, CARBON 470
RV504	1-228-744-00	RES, ADJ, CARBON 10K

SWITCH

S001	1-554-373-00	SWITCH, LEVER (AFT)

FILTER

SFD01	1-404-227-51	SAWF

TRANSFORMER

T001	1-404-153-00	VIFT
T002	1-404-321-00	VIFT
T003	1-404-352-00	VIFT
T004	1-404-352-00	VIFT
T005	1-404-411-00	SIF
T501	1-433-237-00	TRANSFORMER, OSCILLATOR

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

****

MISCELLANEOUS
****

Ref.No.	Part No.	Description	Remark
♣	A-4910-021-A	R STATOR BOARD, COMPLETE (REEL MOTOR)	
	A-6761-056-A	ACE ASSY (AUDIO, AUDIO ERASE, CTL)	
	A-6765-128-A	COMMANDER ASSY (F)	
	X-2622-201-0	ROTOR ASSY, R (REEL MOTOR)	
	1-548-571-00	COUNTER, TAPE (MIDDLE TYPE)	
	1-551-644-41	CORD, CONNECTION	
⚠	1-551-964-00	CORD, POWER	
	8-825-508-10	HEAD, FE (FULL ERASE)	
	8-838-042-01	MOTOR, DC (BHF-1907A) (CAPSTAN MOTOR)	
L991	1-464-249-00	SENSOR, S COIL	
L992	1-464-250-00	SENSOR, T COIL	
M901	X-2621-202-2	ROTOR ASSY, D (DRUM MOTOR)	
	X-2621-204-2	STATOR ASSY, D (DRUM MOTOR)	
M904	A-6737-118-A	MOTOR ASSY, L (LOADING MOTOR)	
	1-541-163-00	MOTOR (LOADING MOTOR)	
MD001 ⚠	1-464-266-00	RF UNIT, COLOR (RFU-702)	
PM901 ⚠	A-6749-080-A	SOLENOID BLOCK ASSY (PINCH)	
⚠	1-454-349-00	SOLENOID, PLUNGER (PINCH)	
PM902 ⚠	1-454-348-00	SOLENOID, BRAKE PLUNGER	
S991	1-554-374-00	SWITCH, LEVER (CASSETTE IN)	
S992	1-554-374-00	SWITCH, LEVER (REC PROOF)	
S993	1-553-539-00	SWITCH, MICRO (THREADING END)	
S994	1-553-718-00	SWITCH, MICRO (UNTHREADING END)	
S996	1-554-372-21	SWITCH, ANTENNA CHANGE	
SP901	8-927-137-00	SPEAKER UNIT (03OF010)	
T901 ⚠	1-447-676-00	TRANSFORMER, POWER	
TB991	1-417-092-00	DISTRIBUTOR, ANTENNA (UHF)	

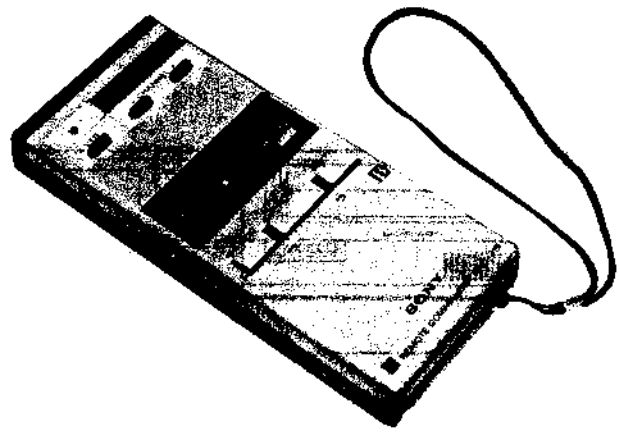
****

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
A-6765-128-A	COMMANDER ASSY (F), RMT-316	
1-513-379-00	CONVERTER (EAC-25)	
1-551-644-41	CORD, CONNECTION	
1-556-971-00	WIRE ASSY, FEEDER	
3-671-402-00	INDICATOR, ACCESSORY	
3-671-873-03	CASE, ACCESSORY (SL-2410, SL-2415 US MODEL)	
3-671-873-04	CASE, ACCESSORY (SL2410 CANADIAN MODEL)	
3-674-317-00	LID, ACCESSORY CASE	
3-677-503-00	SHEET, PROTECTION	
3-679-326-00	CUSHION (UPPER)	
3-679-327-00	CUSHION (LOWER)	
3-681-963-00	INDIVIDUAL CARTON (SL-2410 US MODEL, CANADIAN MODEL)	
3-681-970-00	INDIVIDUAL CARTON (SL-2415 US MODEL)	
3-701-622-00	BAG, POLYETHYLENE	
3-701-630-00	BAG, POLYETHYLENE	
3-773-471-31	MANUAL, INSTRUCTION (SL-2410 CANADIAN MODEL)	
3-795-581-21	INSTRUCTION (SL-2410, SL-2415 US MODEL)	
4-491-335-21	CARD, WARRANTY (SL-2410, SL-2415 US MODEL)	
X-3793-021-0	PARTNER SHIP ASSY (SL-2410, SL-2415 US MODEL)	

RMT-316

SERVICE MANUAL

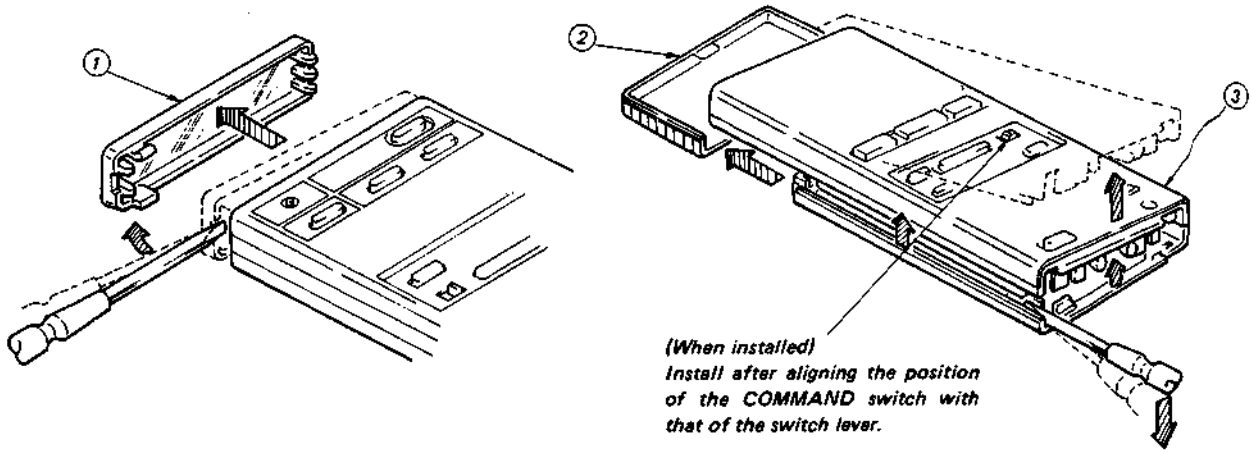


August, 1983

SPECIFICATIONS

Remote control system	Infrared control
Power requirements	3 V dc, 2 size AA batteries (IEC designation R6)
Dimensions	Approx. 65 × 20 × 153 mm (w/h/d) ($2^5/_8 \times {}^{13}/_{16} \times 6^1/_8$ inches)
Weight	Approx. 140 g (5 oz) incl. batteries

DISASSEMBLY



REMOTE COMMANDER

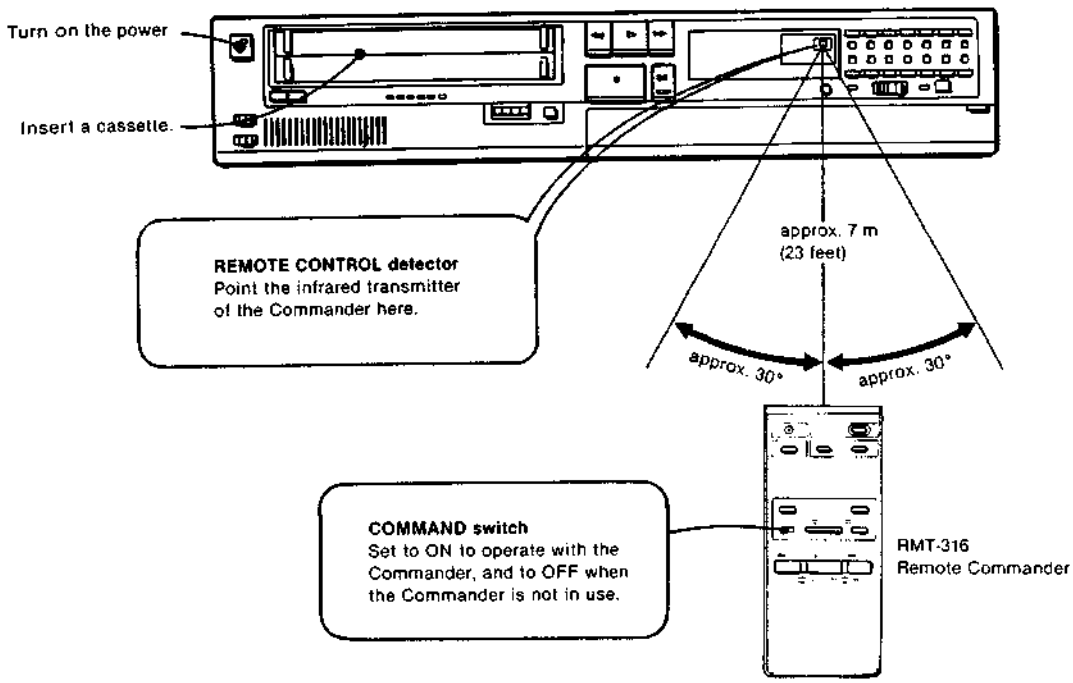
SONY®

1-1. FEATURE

This unit is a wireless remote control commander used for operating Sony's VTR SL-2410/2415 freely at a distant place.

1-2. REMOTE CONTROL OPERATION

You can control almost all of the functions of the video cassette recorder from your armchair using the supplied RMT-316 Remote Commander.

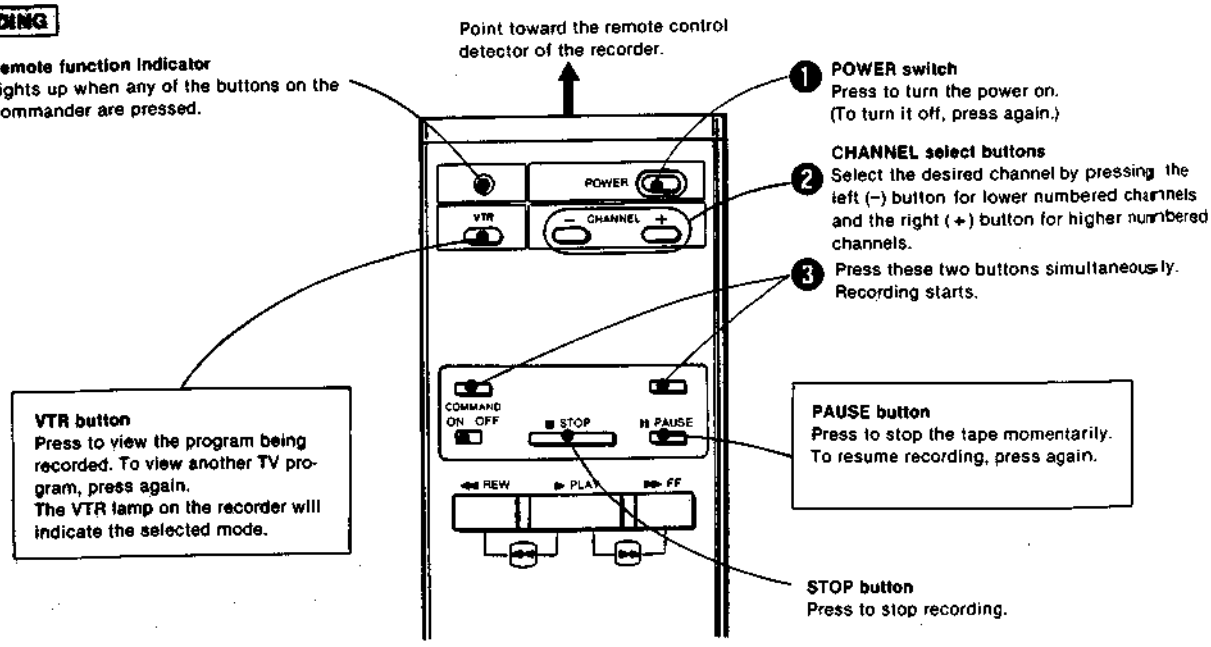


- There should be no obstacles between the Commander and the remote control detector of the recorder.
- The shorter the distance between the Commander and the recorder, the wider the angle within which the recorder can be controlled.

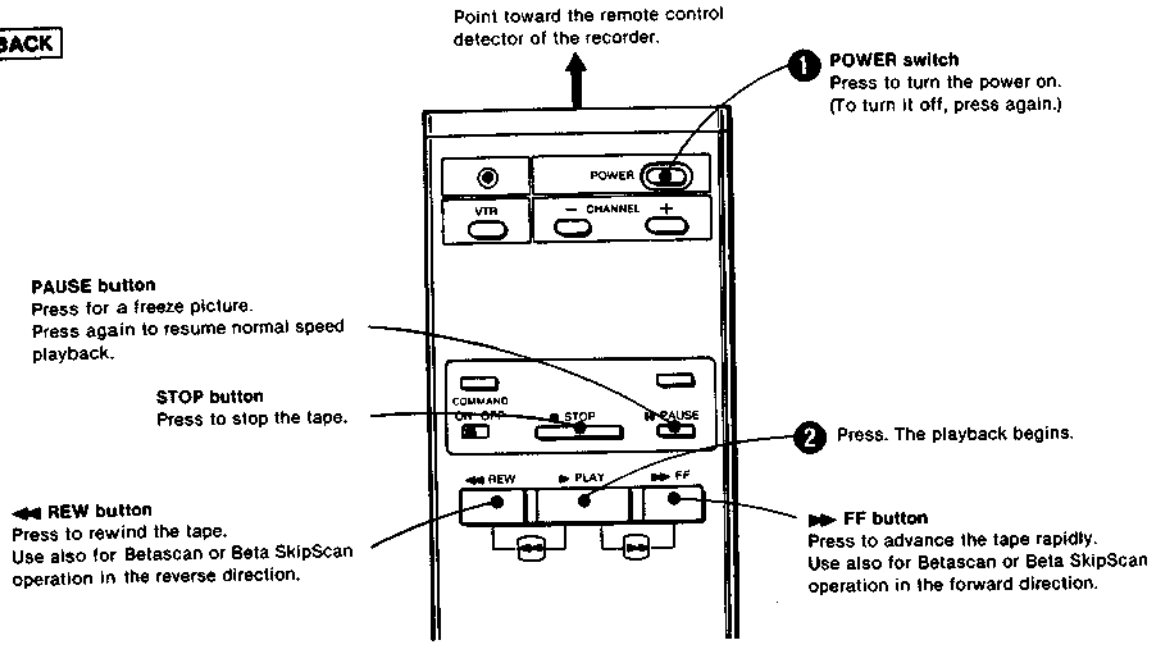
Notes on the Commander

- Avoid dropping foreign objects into the cabinet, particularly when replacing batteries.
- Keep the unit away from extremely hot or humid places.
- Avoid mechanical shock to the unit.

RECORDING



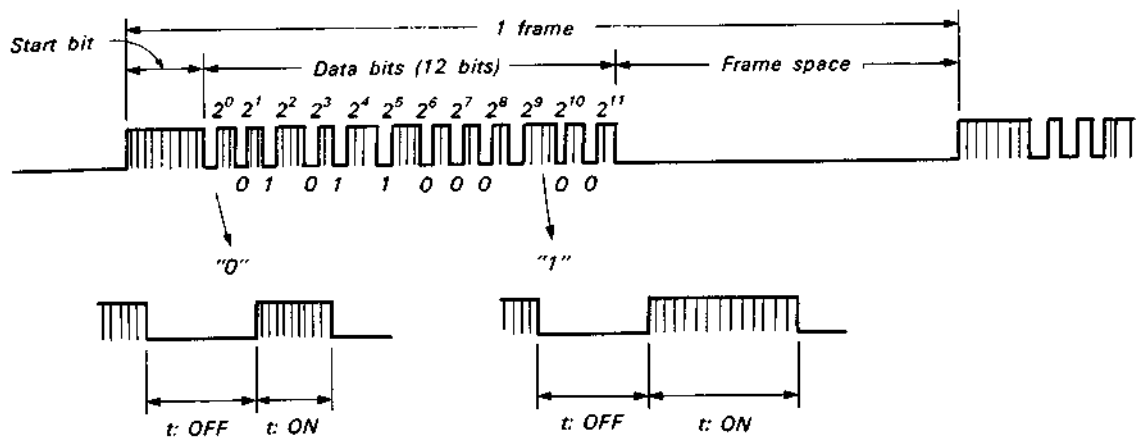
PLAYBACK



1-3. REMOTE CONTROL SIGNAL

As shown in the figure below, one frame of the signal consists of a start bit and data bits (12 bits), which are periodically repeated.
"0" and "1" of each data bit are discriminated by a length of t: ON time.
The example shown below gives 001011000100 if read from the position of a bit 2^0.

The time definition is shown in the table below.



		Time	Deviation
Start bit		2.4 ms	± 0.1 ms
Data "0"	t: OFF	0.6 ms	± 0.1 ms
	t: ON	0.6 ms	± 0.1 ms
Data "1"	t: OFF	0.6 ms	± 0.1 ms
	t: ON	1.2 ms	± 0.1 ms
1 frame		45 ms	± 0.1 ms
Carrier		40 kHz	± 200 Hz

Assignment table of remote control code

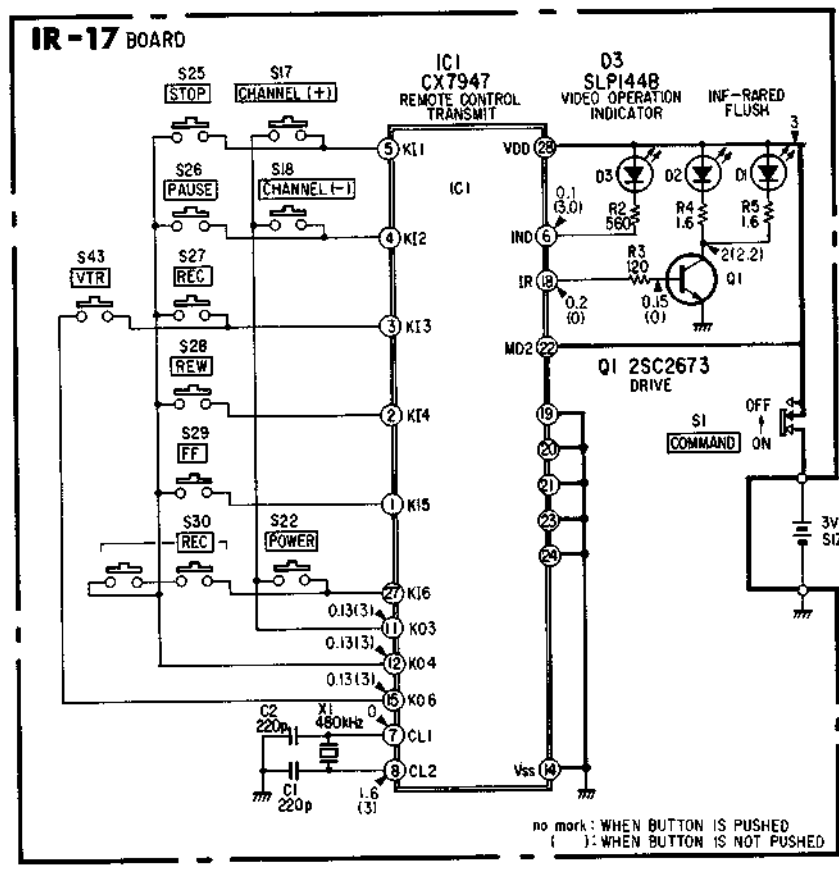
SW No.	Input signal	Data code							Category code				
		2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^8	2^9	2^{10}	2^{11}
17	CHANNEL UP	0	0	0	0	1	0	0	0	1	0	0	0
18	CHANNEL DOWN	1	0	0	0	1	0	0	0	1	0	0	0
22	POWER	1	0	1	0	1	0	0	0	1	0	0	0
25	STOP ■	0	0	0	1	1	0	0	0	1	0	0	0
26	PAUSE ▮▮	1	0	0	1	1	0	0	0	1	0	0	0
27	PB ▶	0	1	0	1	1	0	0	0	1	0	0	0
28	REW ◀◀	1	1	0	1	1	0	0	0	1	0	0	0
29	FF ▶▶	0	0	1	1	1	0	0	0	1	0	0	0
30	REC ●	1	0	1	1	1	0	0	0	1	0	0	0
43	TV/VTR	0	1	0	1	0	1	0	0	1	0	0	0

Voltage value of IC1 **Unit: V**

	5	4	3	2	1	27
Channel Up	0.13					
Channel Down		0.13				
POWER						0.13
STOP ■	0.13					
PAUSE ▮▮		0.13				
PB ▶			0.13			
REW ◀◀				0.13		
FF ▶▶					0.13	
REC ●						0.13
TV/VTR			0.13			

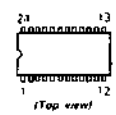
(The voltage value is 0V, unless otherwise specified.)

2. DIAGRAMS



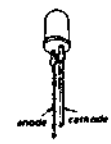
- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.

CX7947

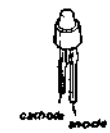


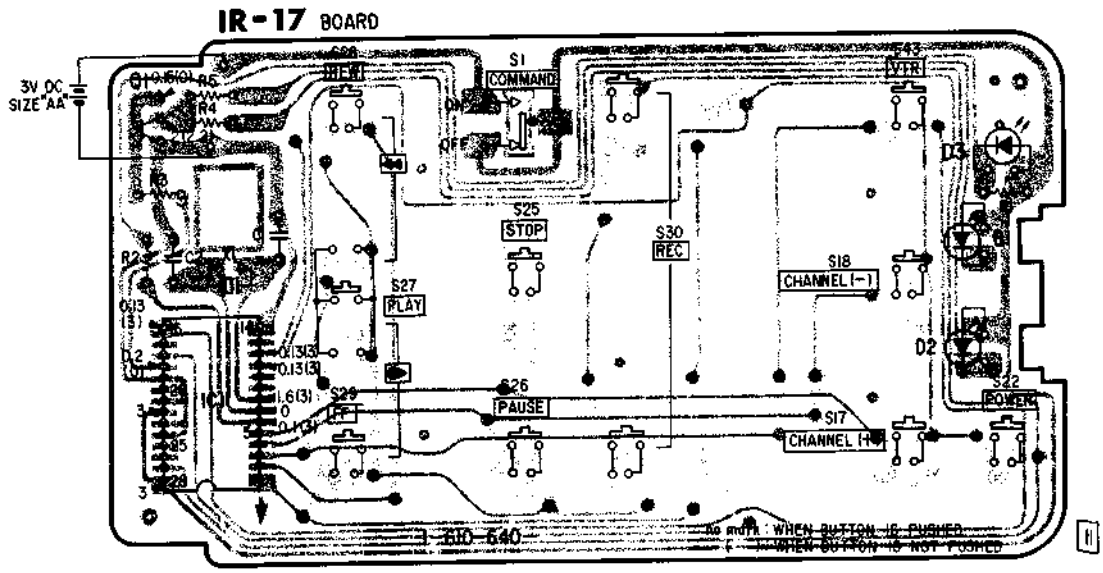
2SC2673

SE303AX



SLP144B



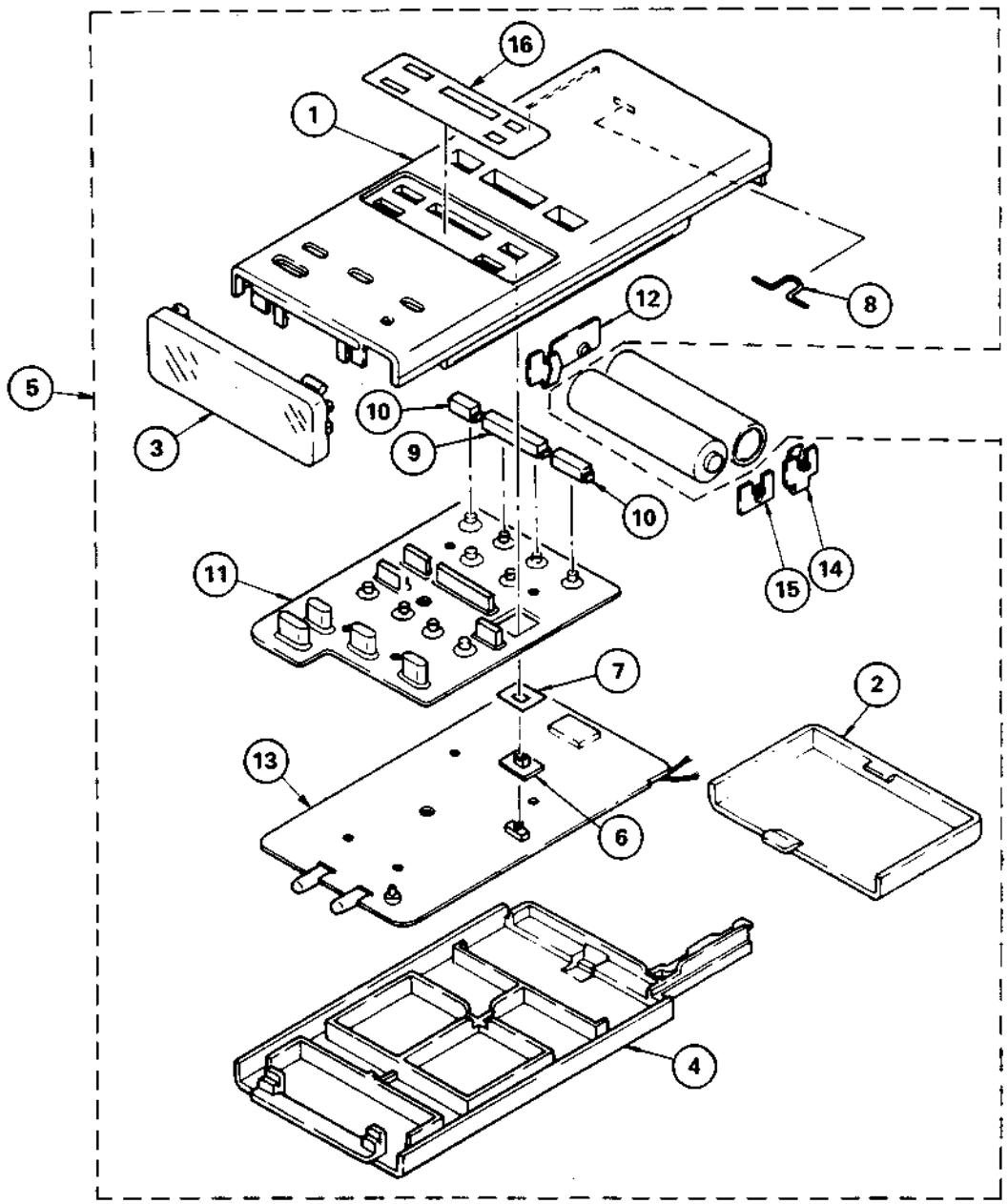


3. EXPLODED VIEWS

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

NOTE:
- Items 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.



No.	Part No.	Description	Remark
1	X-2290-609-0	CASING ASSY (F)	
2	2-290-606-00	COVER, BATTERY	
3	2-290-608-00	PLATE, FROSTED	
4	2-290-611-00	CASE, LOWER	
5	A-6765-128-A	COMMANDER ASSY (F), RMT-316	1-4,6-16
6	2-290-628-00	KNOB, SLIDE	
7	2-290-629-00	PLATE, COLOR	
8	♣:2-290-630-00	STOPPER, HOLDER	
9	2-290-632-00	PUSH BUTTON (L)	
10	2-290-633-00	PUSH BUTTON (M)	
11	2-290-645-00	RUBBER (C), CONTACT	
12	4-350-925-00	TERMINAL (C), BATTERY	
13	♣:1-610-640-00	IR-17 BOARD	
14	2-290-601-00	TERMINAL (A), BATTERY	
15	2-290-602-00	TERMINAL (B), BATTERY	
16	2-290-627-11	LABEL (B)	

4. ELECTRICAL PARTS LIST

NOTE:

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

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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

- =>: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.
- Items marked " ♣ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

Ref.No.	Part No.	Description			Remark
♣	1-610-640-00	IR-17 BOARD **********			
	2-290-601-00	TERMINAL (A), BATTERY			
	2-290-602-00	TERMINAL (B), BATTERY			
		CAPACITOR			
C1	1-102-110-00	CERAMIC	220PF	10% 50V	
C2	1-102-110-00	CERAMIC	220PF	10% 50V	
		DIODE			
D1	=>8-719-107-82	DIODE SE303AY			
D2	=>8-719-107-82	DIODE SE303AY			
D3	8-719-901-44	DIODE SLP144B			
		IC			
IC1	8-759-902-22	IC CX7947			
		TRANSISTOR			
Q1	8-729-967-32	TRANSISTOR 2SC2673			
		RESISTOR			
R2	1-247-825-00	CARBON	560	5% 1/6W	
R3	1-247-809-00	CARBON	120	5% 1/6W	
R4	1-246-406-00	CARBON	1.6	5% 1/4W	
R5	1-246-406-00	CARBON	1.6	5% 1/4W	
		SWITCH			
SW1	1-553-977-31	SWITCH, SLIDE			
		CRYSTAL			
X1	1-527-476-00	OSCILLATOR, CERAMIC			

****

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
3-701-622-00	BAG, POLYETHYLENE	
4-352-958-00	STRAP, HAND	

SL-2410/2415

SONY
SERVICE MANUAL

US Model
Canadian Model
PX Model

February, 1984

SUPPLEMENT-2

Subject: Circuit Operation

Except for the timer reservation, tuning, and speech synthesis circuits, the circuit configuration of SL-2410/2415 is nearly the same as that of SL-2400. Refer to the circuit and instruction manual for SL-2400 for circuits other than these three. (SL-2400 SERIES OPERATION MANUAL PART NO. 9-972-230-31)

MICROFILM

Consumer
VIDEO

TABLE OF CONTENTS

1. GENERAL

Model SL-2410/2415 has been designed based on the SL-2400 and both models have a large number of circuit configurations in common. The timer reservation, tuning, and speech synthesis circuits of SL-2410/2415 have large differences from those of SL-2400.

Except for these three circuits, the circuit configurations of these two models are nearly the same.
The descriptions in this manual center on the timer reservation, tuning, and speech synthesis circuits of SL-2410/2415.

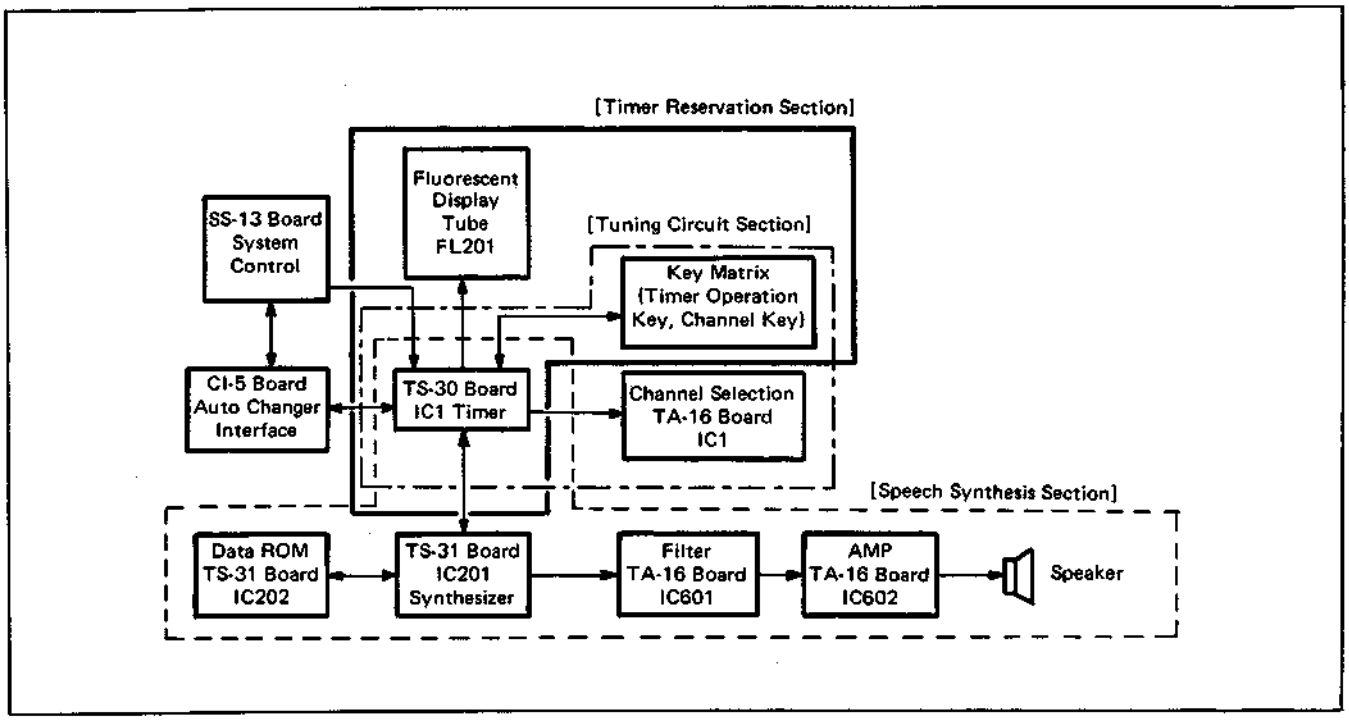


Fig. 1-1 Block Diagram

2. TIMER RESERVATION SECTION

2-1. Power Supplies

IC1 on the TS-30 Board is a C-MOS IC and is driven by a single 5V. As the timer +B power supply, +5V is fed to pins (26) and (58) of IC1.
The fluorescent display tube is directly driven by the output of IC1, and −25V is fed to pin (51) for biasing.
The IC for the speech synthesis circuit on the TS-31 Board connected to the timer reservation IC operates on 9V.

As the timer reservation and speech synthesis ICs process signals bidirectionally through the I/O ports, data cannot be transferred if the drive voltages differ. The 9V power is obtained by providing a −4V line for the speech synthesis IC using +5V as reference and combining the +5 and −4V power supplies.

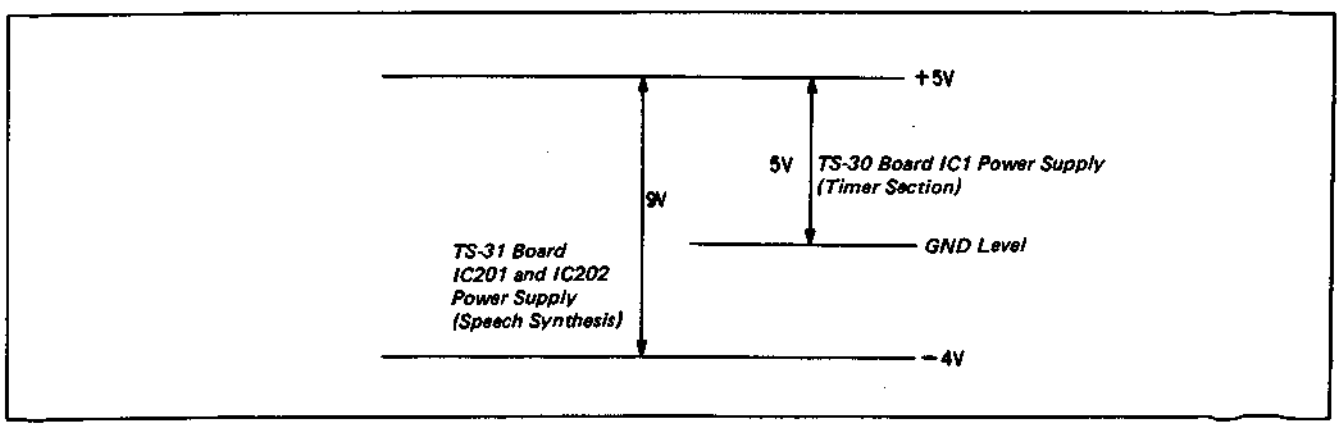


Fig. 2-1 Power Supply

Using this power supply configuration, signals are exchanged between IC1 on the TS-30 Board and ICs 201 and 202 on the TS-31 Board.
The high level (+5V) output from IC1 on the TS-30 Board corresponds to the 9V input for IC201 on the TS-31 Board.
The power for the timer is a +5V line, divided into two systems, TIMER +5V and EVER +5V. The TIMER +5V line is the power line for memory back-up in case of a power failure.
This is because the power consumption of ICs 201 and 202 on the TS-31 Board for speech synthesis is large, and IC1 on the TS-30 Board only is backed up in case of a power failure.

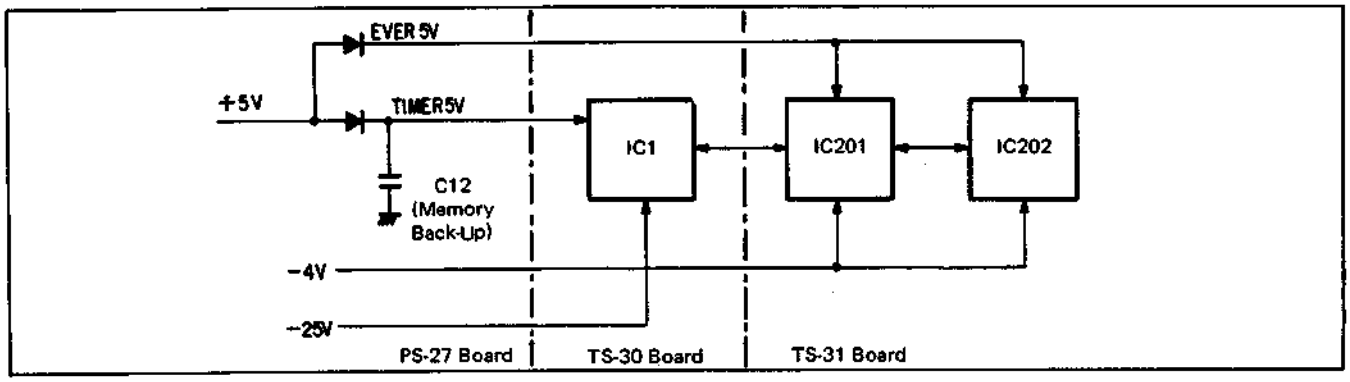


Fig. 2-2 Power Supply Block Diagram

2-2. IC μPD7519G for Timer Control

The input and output signals for IC1 (μPD7519G) on the TS-30 Board, which forms the core of the timer reservation circuit, are described next.
μPD7519G is driven by a quartz oscillator at a fundamental clock frequency of 4.19MHz. Power supply frequency synchronization is used as the clock. In a power failure, the internal 4.19MHz clock takes over. The back-up time for a power failure is approximately five minutes.

Input Signals

Pin No.	Signal Name	Function	Signal Condition
②	POWER SW SENS	Detects when POWER SW is pressed	(While POWER SW is pressed)
⑤	PAUSE	Detects PAUSE condition	(PAUSE)
⑥	REC READY (REC MODE)	Detects REC condition	(REC)
⑦	POWER ON/OFF	Detects when power is supplied to the set	(POWER ON)
⑧	CASSETTE IN	Detects when cassette is loaded	(Cassette is loaded)
⑨	REC PROOF	Detects when cassette tab is present	(No cassette click)
⑩ ⑪ ⑫ ⑬	Key Matrix Input		
⑭	$\overline{\text{CH UP}}$	CHANNEL UP input by remote control	
⑮	$\overline{\text{CH DOWN}}$	CHANNEL DOWN input by remote control	
⑯	TMR POSITION	Detects when the TIMER REC SW is pressed	(TIMER REC SW ON)
⑰	AC REF	AC reference input (reference clock input)	(50/60Hz)
⑰	REC SW	Detects when REC SW is pressed	(REC SW ON)
⑬	RESET		

Output Signals

Pin No.	Signal Name	Function	Signal Condition
⑱ ⑲ ⑳ ㉑	CTL1 CTL2 CTL4 CTL8	Speech synthesis control signals (4 bits)	
㉗ – ㉞	Display Segment Output		
㉟ – ㊷	Key Matrix Output		
㊹ – ㊿	Display Grid Output		
㊸	PDC	Speech synthesis data transfer clock	
㊺	TIMER OUT	Timer ON output	(Timer ON)
㊾	CH-UP	CHANNEL UP output	
㊿	CH-DOWN	CHANNEL DOWN output	
㊷	CH LAMP CONT	Channel display control output	(Channel Lamp ON)

Table 2-1 Functions of IC1 Input and Output Signals

2-3. Reset Circuit

The timer reset circuit operates when plugging the AC plug into a socket. The reset circuit comprises Q1, Q2, Q3 and D2 on the TS-30 Board.

A current flows in D2 through R10 when 5V is fed to the timer +B power supply, generating a voltage of approximately 1.7V on the anode side of D2. D2 is an LED, and its VF (forward voltage) is approximately 1.7V and is stable.

The base voltage of Q3 is held at approximately 1.7V. This holds the Q3 emitter voltage at approximately 1.1V. C2 is fed with the Q2 base voltage, and there is a delay needed for voltage to rise. Q2 cuts off when the Q2 base voltage reaches approximately 1.7V, and Q3 switches on. Q1 base current flows when Q3 switches on, and the Q1 collector voltage becomes approximately 5V.

The Q2 base voltage is divided in R4 and R6 and finally rises to approximately 2.6V. The Q2 emitter voltage also increases to cut off Q3 as the Q3 emitter voltage finally rises above approximately 1.1V. Q1 is switched OFF, and the Q1 collector voltage suddenly drops. Thus, one reset pulse is output from the Q1 collector.

C5 connected across the output side is for noise suppression.

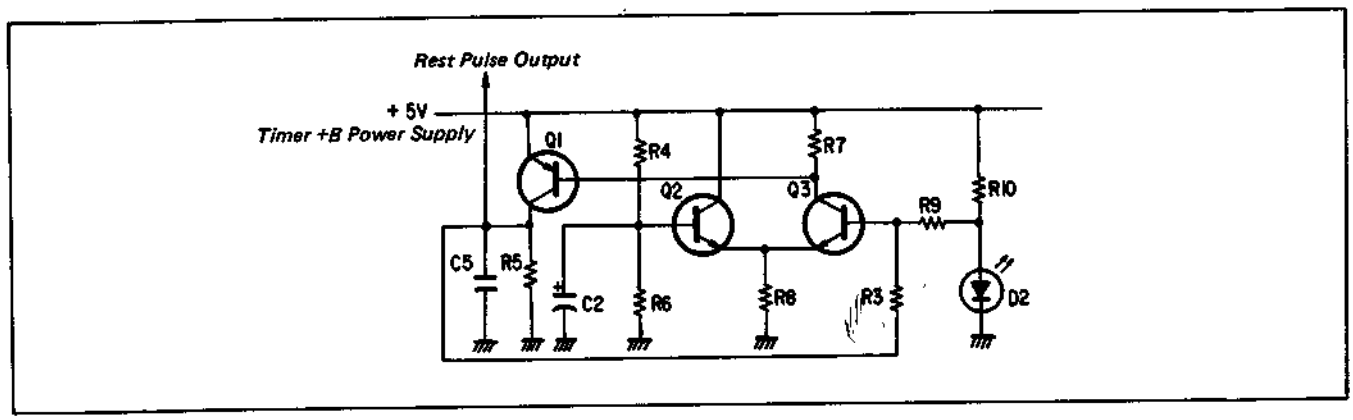


Fig. 2-3 Reset Circuit

3. TUNING CIRCUIT

Channel is selected by remote control or by directly operating the channel buttons on the main unit. The two tuning systems differ in the microcomputer input system. When tuning directly with the channel buttons on the video deck, IC1 on the TS-30 Board detects which of the 14 keys has been pressed by scanning keys A to N in the key matrix.

IC1 outputs a tuning signal to IC401 on the TA-16 Board for channel selection when a key between A and N is pressed. This tuning method differs from the conventional method.

Instead of directly designating the channel when a key is pressed, channel selection is performed using CHANNEL UP and DOWN pulses.

The tuning circuit in SL-2410/2415 consists of IC401 (μPC1363C) on the TA-16 Board, and the CHANNEL UP and DOWN terminals of IC401 are used for channel selection.

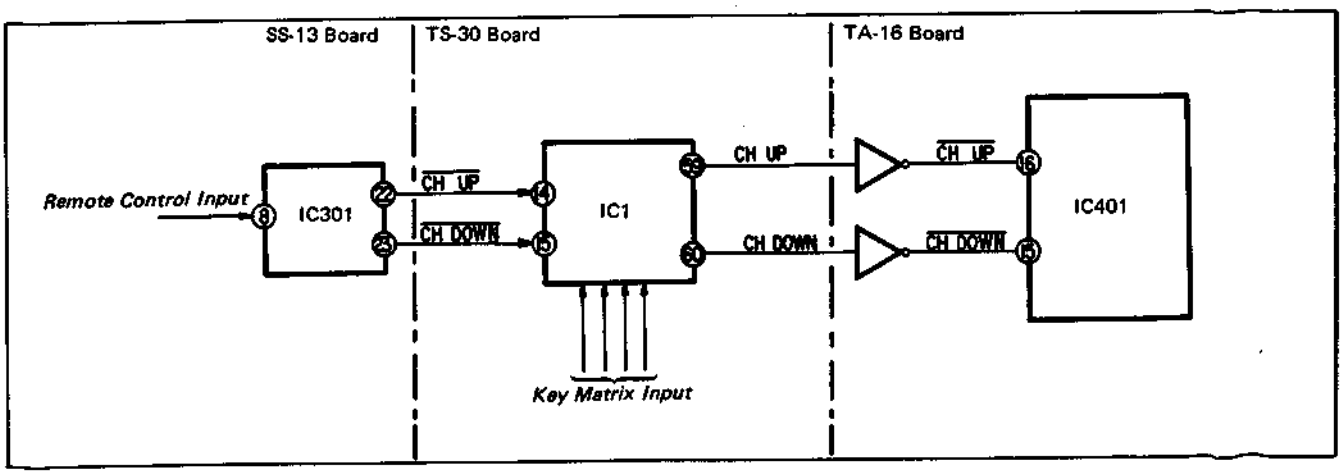


Fig. 3-1 Tuning Section Block Diagram

(1) Initialization of the channel memory when the power is switched on (preset to Channel A).
Initialization is performed by changing the levels of both pins (15) and (16) from "H" to "L", and to "H" again. Channel A is preset.

Or SL-2410/2415, setting once returns to Channel A no matter which channel key is pressed, and the designated channel is set. The following signals are input to pins (16) ($\overline{\text{CH UP}}$, channel up input) and (15) ($\overline{\text{CH DOWN}}$, channel down input) of IC401 on the TA-16 Board).

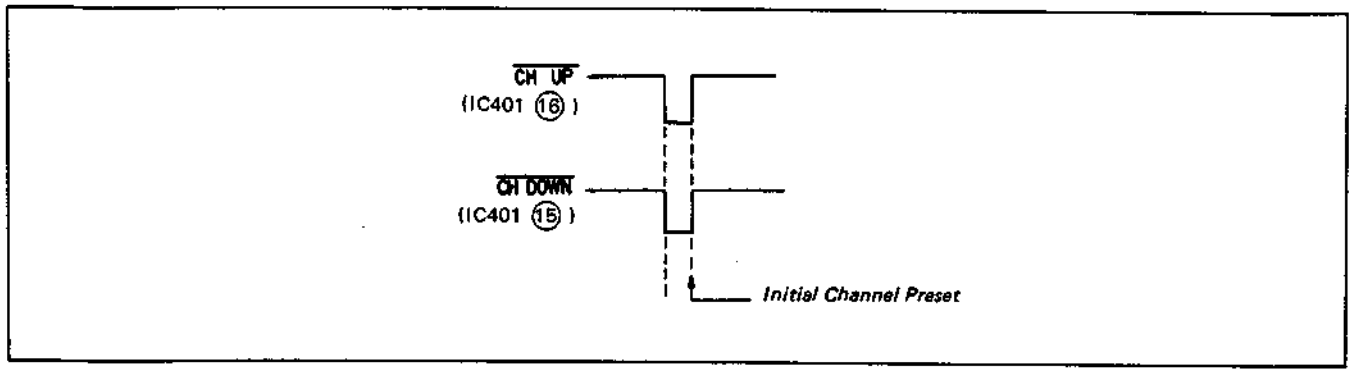


Fig. 3-2 Initialization Timing Chart

(2) Tuning when a channel key between A and N is pressed:
When a channel key between A and N is pressed, Channel A is first reset, and pulses of number corresponding to the designated channel are sent (taking Channel A as zero, Channel C will be two pulses).

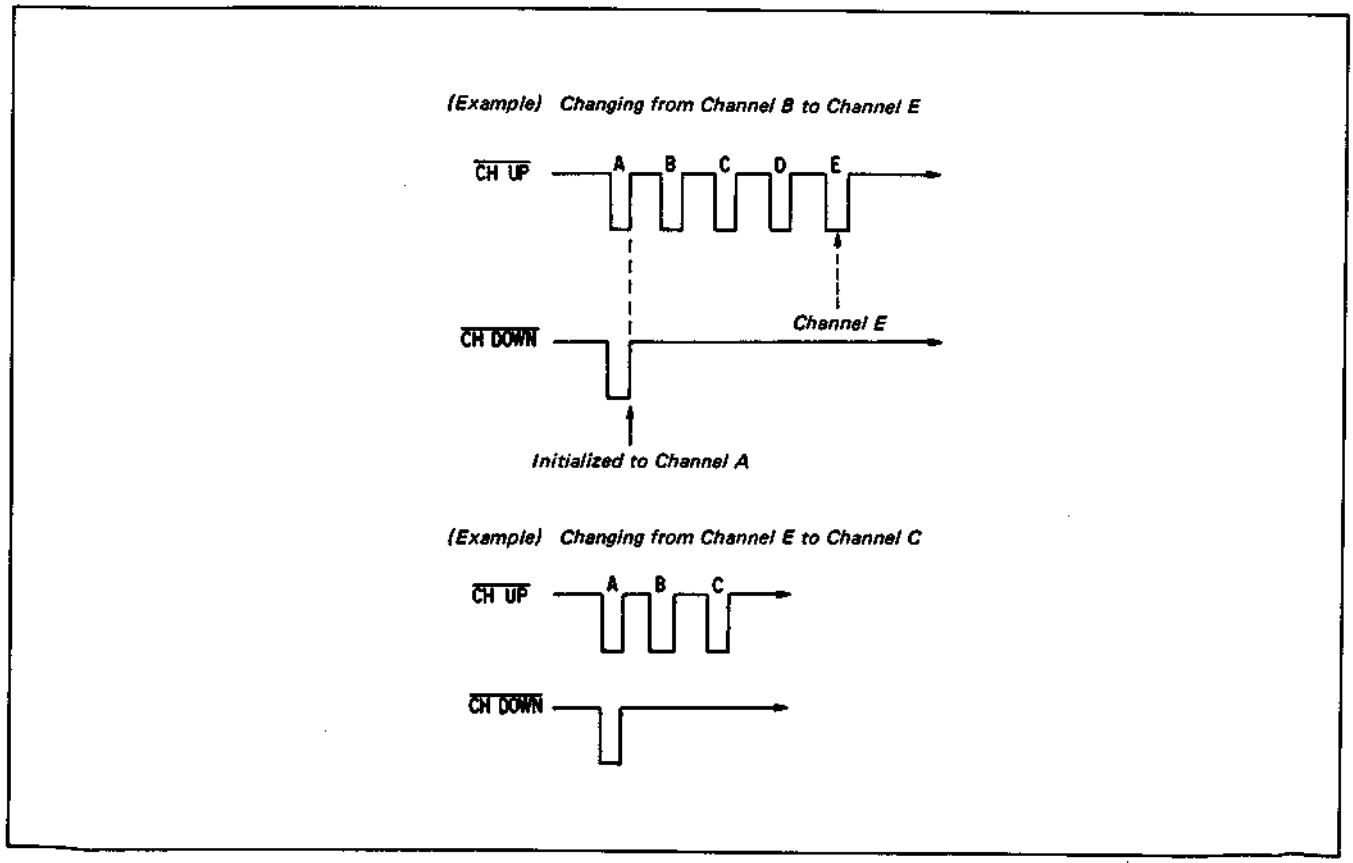


Fig. 3-3 Tuning Timing Chart

(3) When UP/DOWN is input from remote control

$\overline{\text{CH UP}}$ and $\overline{\text{CH DOWN}}$ signals from the SS-13 Board are input to pins (14) and (15) of IC1 on the TS-30 Board. IC1 processes these signals and translates them for output as described here:

As an example, assume that the video channel is set to Channel 3 (C). When the remote control unit sends a CHANNEL UP signal, IC1 decides the result as 3 + 1 = 4.

The signal output from IC1 then returns the channel to Channel 1 (A) (initialization) and three CHANNEL UP pulses are output; the result is the same as if the Channel 4 (D) key on the video main unit had been pressed.

The entire process may seem redundant. However, returning the channel to the initial state ensures that it operates accurately even when the first pulses are mis-counted, providing protection against mis-selection due to external noise.

The output format is the same when tuning directly or by remote control. Setting returns once to the initial Channel A and pulses corresponding to the designated channel are output.

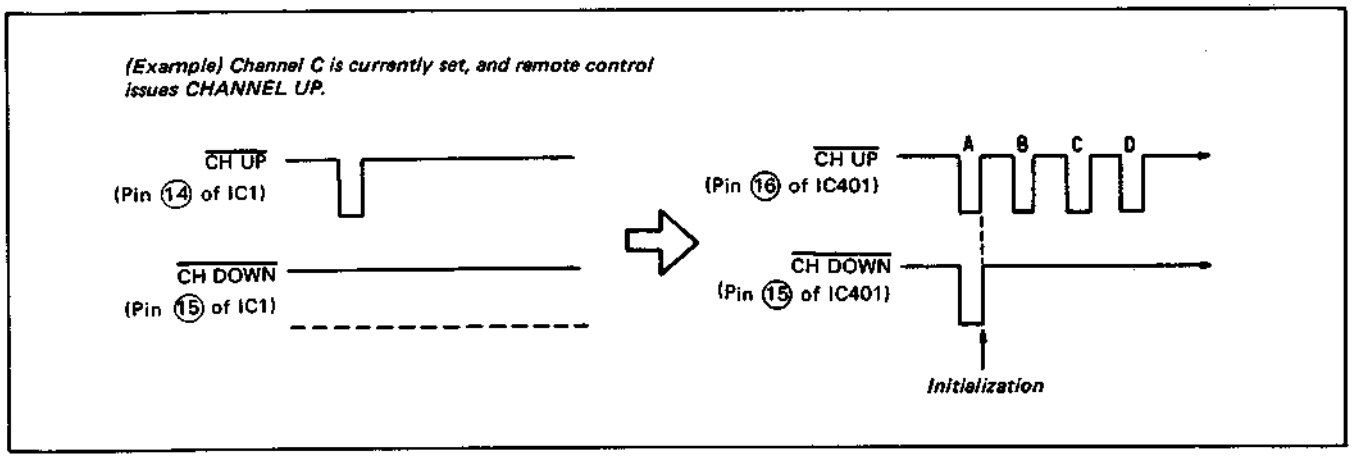


Fig. 3-4 Remote Control Tuning Timing Chart

4. TUNER

SL-2410/2415 uses a BT-866 tuner which can receive both CATV mid- and super-bands. LA7920 (IC003) selects the tuner receiving band. The tIC, μPC1363C (IC401), permits channel selection by remote control.

4-1. Signal System

The signal system of SL-2410/2415 is the same as that of SL-2400 except that the tuner has been changed to BT-866.

4-2. Channel Selection

UIC401 μPD1363C changes the channel. This IC selects channels by making the corresponding pin (Example: Pin (4) when tuning Channel (A) "L" by the channel selection signals (CH UP and CH DN) sent IC1 on the TS-30 Board.

4-3. Band Selection

The band selection switch is inside the preset block PS-001A. This switch outputs three signals, VL, VH, and U. These three signals are converted into two signals, B1 and B2 in Q008 and Q009 and are input to IC003. IC003 produces four band selection signals, L, M, H, and U, for the BT-866 tuner. (See Table 4-1 and Fig. 4-1.)

Signal / Receiving Band	VL	VH	U	B1	B2	L	M	H	U
VL	L	H	H	H	L	H	L	L	L
M	H	H	H	L	L	H	H	L	L
VH-S	H	L	H	L	H	H	H	H	L
U	H	H	L	H	H	L	L	L	H

Table 4-1

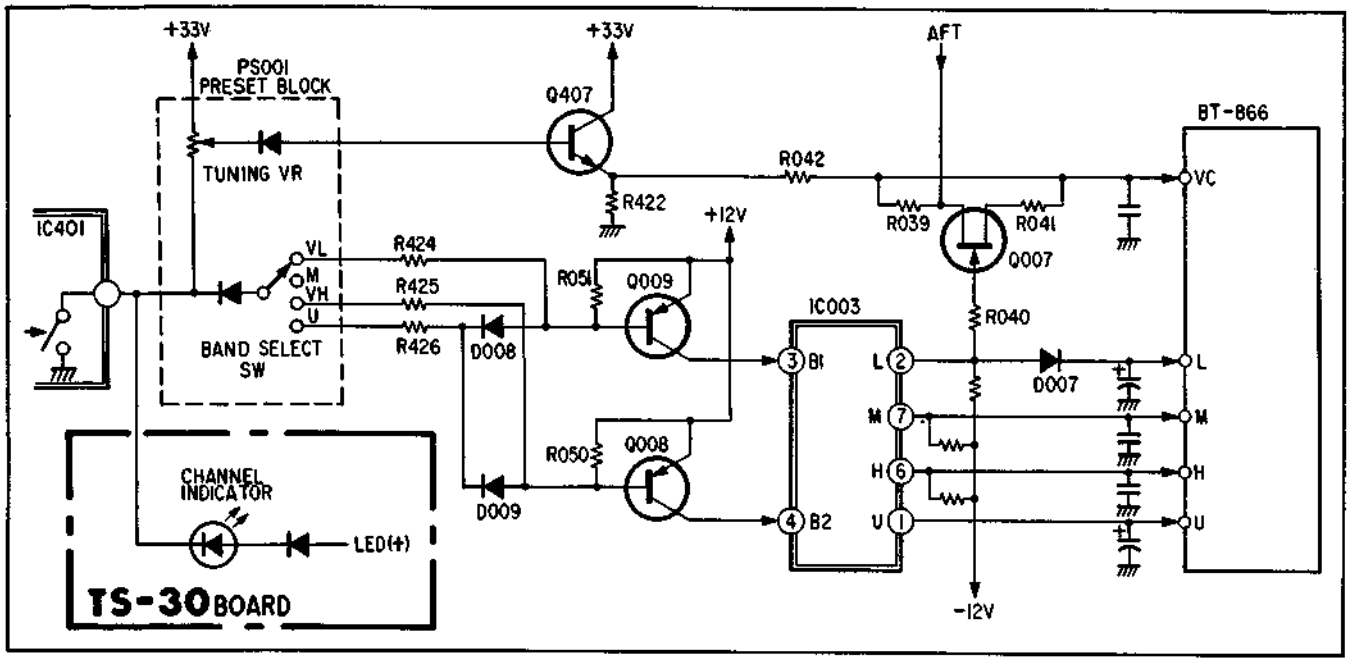


Fig. 4-1

4-4. Defeat Signal

A defeat signal is output from pin (13) of IC004 when AFT defeat and speech signal muting is selected for the channel.

Pin (13) (defeat) of IC401 is normally "H". However, the level changes to "L" during channel selection. This switches Q401 on, and the level at Q401 collector changes to "H". Then this voltage is input to pin (8) of IC001 through D004 and R017 to stop the AFT operation.

This voltage is applied to the Q002 base through R029 and D003 to switch on Q002 for speech signal muting. The voltage is also input to Q405 base through R423 to extinguish channel display.

R405 and C406 connected to Q401 base switch on Q401 for speech muting and other functions during the rise of EVER power.

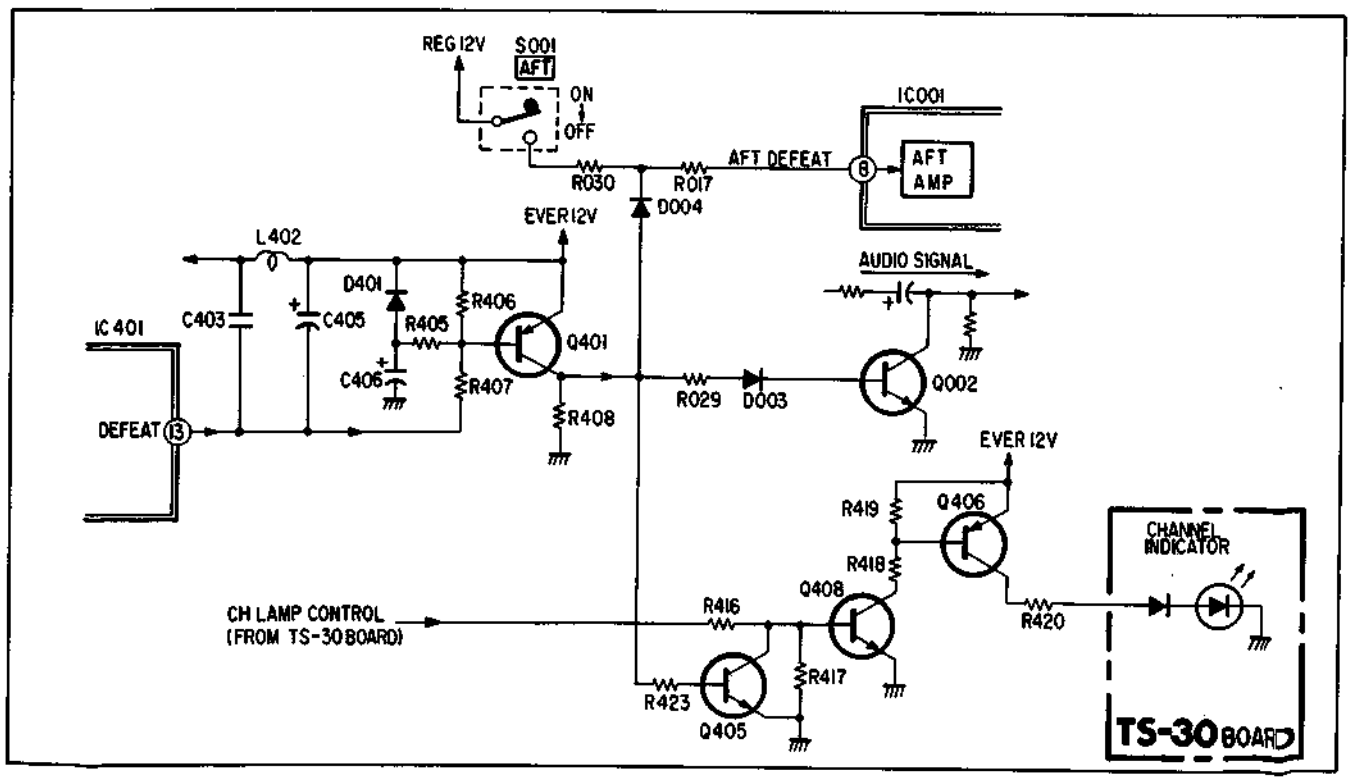


Fig. 4-2

5. SPEECH SYNTHESIS CIRCUIT

5-1. Speech Synthesis Circuit Configuration

The speech synthesis circuit is composed of IC1 on the TS-30 Board, IC201 (synthesizer) and IC202 (speech data ROM) on the TS-31 Board, and IC601 (filter) and IC602 (power amplifier) on the TA-16 Board.

IC1 on the TS-30 Board controls when the corresponding words are output. IC201 has a five-line control bus; PDS (processor data clock), CTTL1, CTL2, CTL4, and CTL8. Lines CTL1, 2, 4 and 8 are a bi-directional bus which transfers command (instruction) signals and data between the control side (IC1 on TS-30 Board) and IC201. The PDC clock synchronizes signal and data transfer.

Commands from IC1 to IC201 are transferred in a four-bit pattern on the four line CTL bus with PDS pulses. IC201 is clocked at 640kHz by ceramic oscillator CF201, and a signal multiplied by ¼ in IC201 is transferred to IC202 as the ROM clock.

ICs 201 and 202 are connected by a four-line address/data bus, ADD1, ADD2, ADD4, and ADD8, and Iφ and I1, which are control-lines.

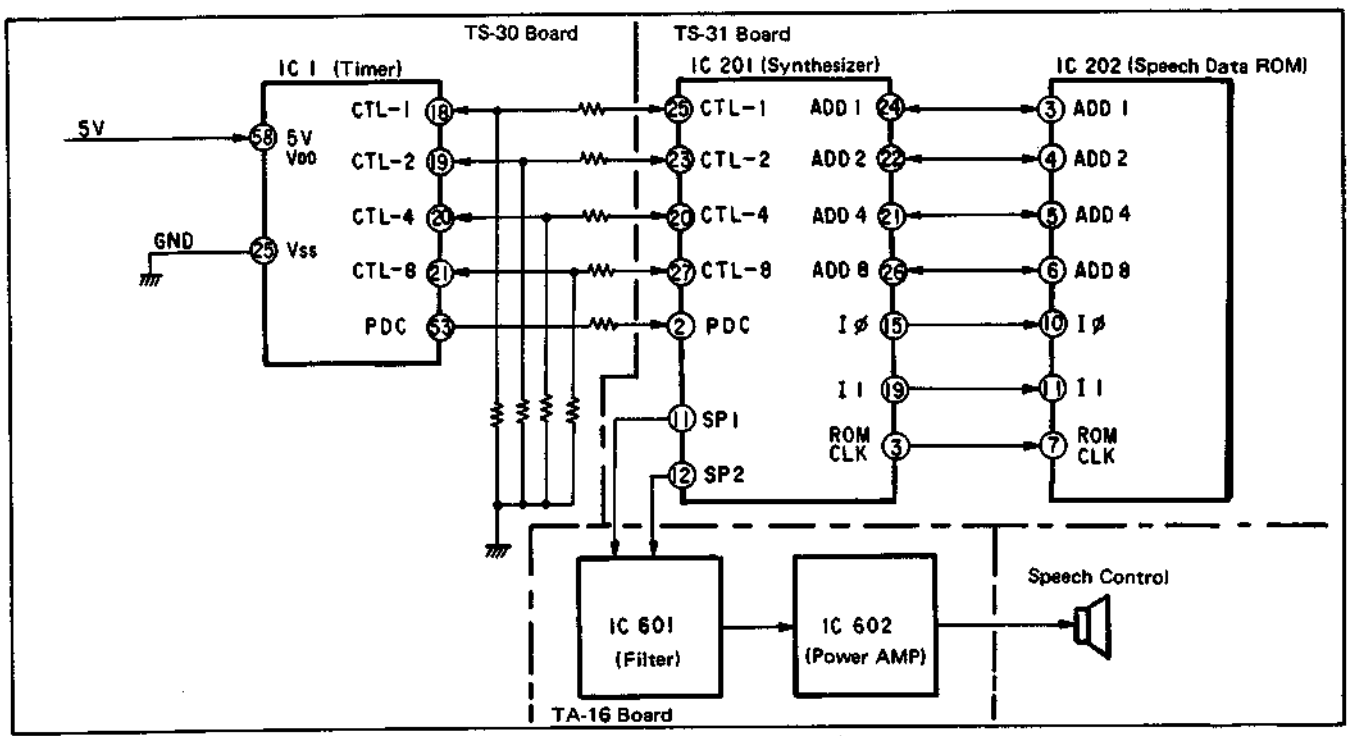


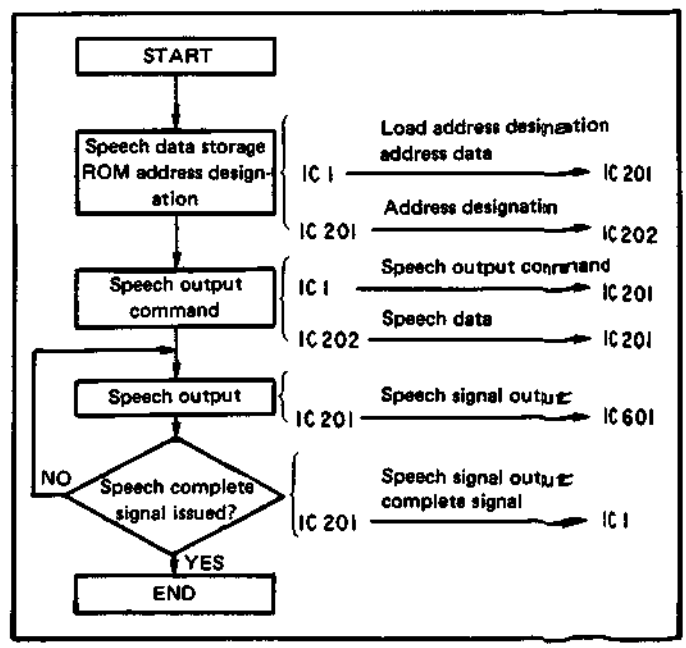
Fig. 5-1 Speech Synthesis Block

5-2. Description of Basic Functions

The controller IC1 decides which words are output when external keys are pressed for speech output. Instructions are then given to IC201 to retrieve the corresponding words from the relevant address in IC202, which is the speech data storage ROM.

The controller IC1 transfers the speech output commands to IC201. On receiving these speech output commands, IC201 gets the designated speech data from IC202 and translates it into speech signals for output. After the speech signals are output, IC201 sends a speech signal output complete signal to controller IC1. This completes one program.

Speech signals output on pins (11) and (12) of IC201 are fed to the TA-16 Board and drive the speaker after being shaped in IC601 (filter), passing through the VOICE VOLUME selector on the FS-28 Board and after being amplified by IC602 (power AMP).



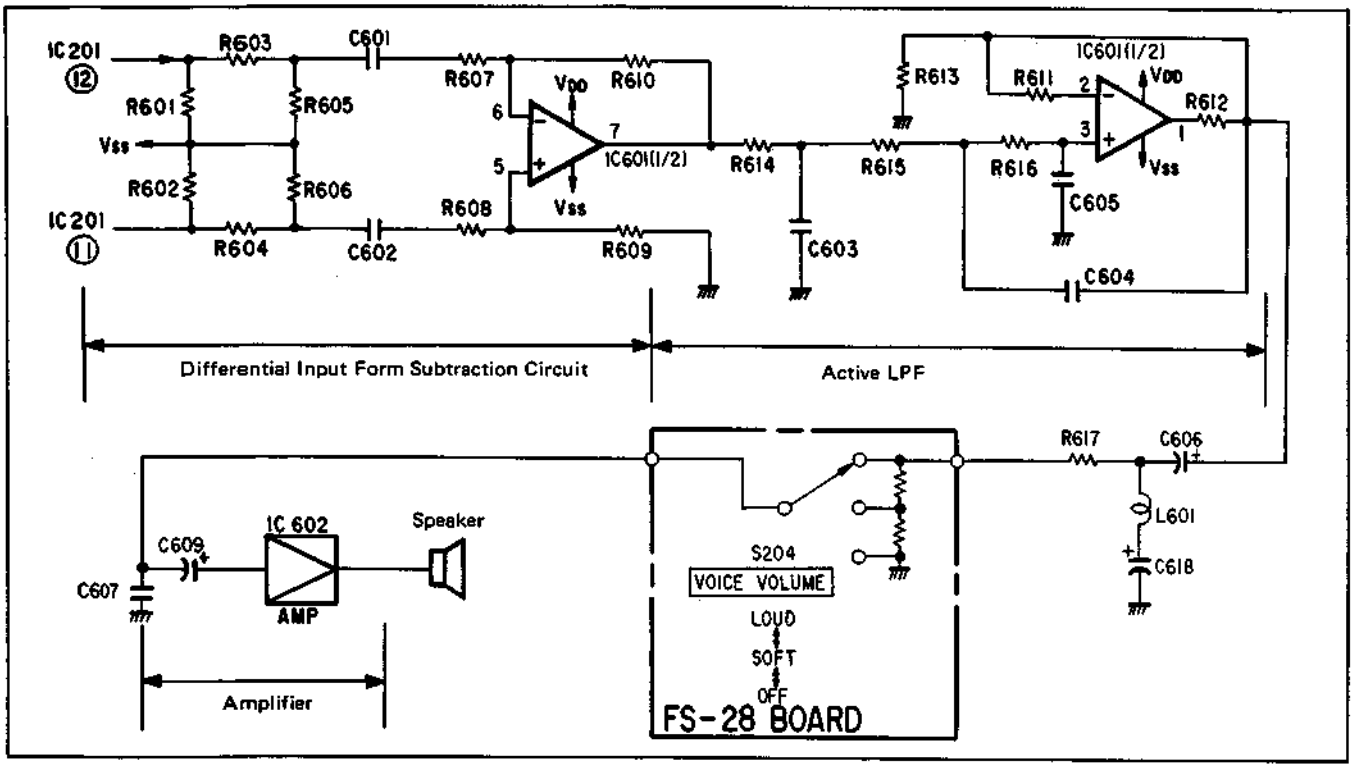


Fig. 5-3 Speech Output Circuit

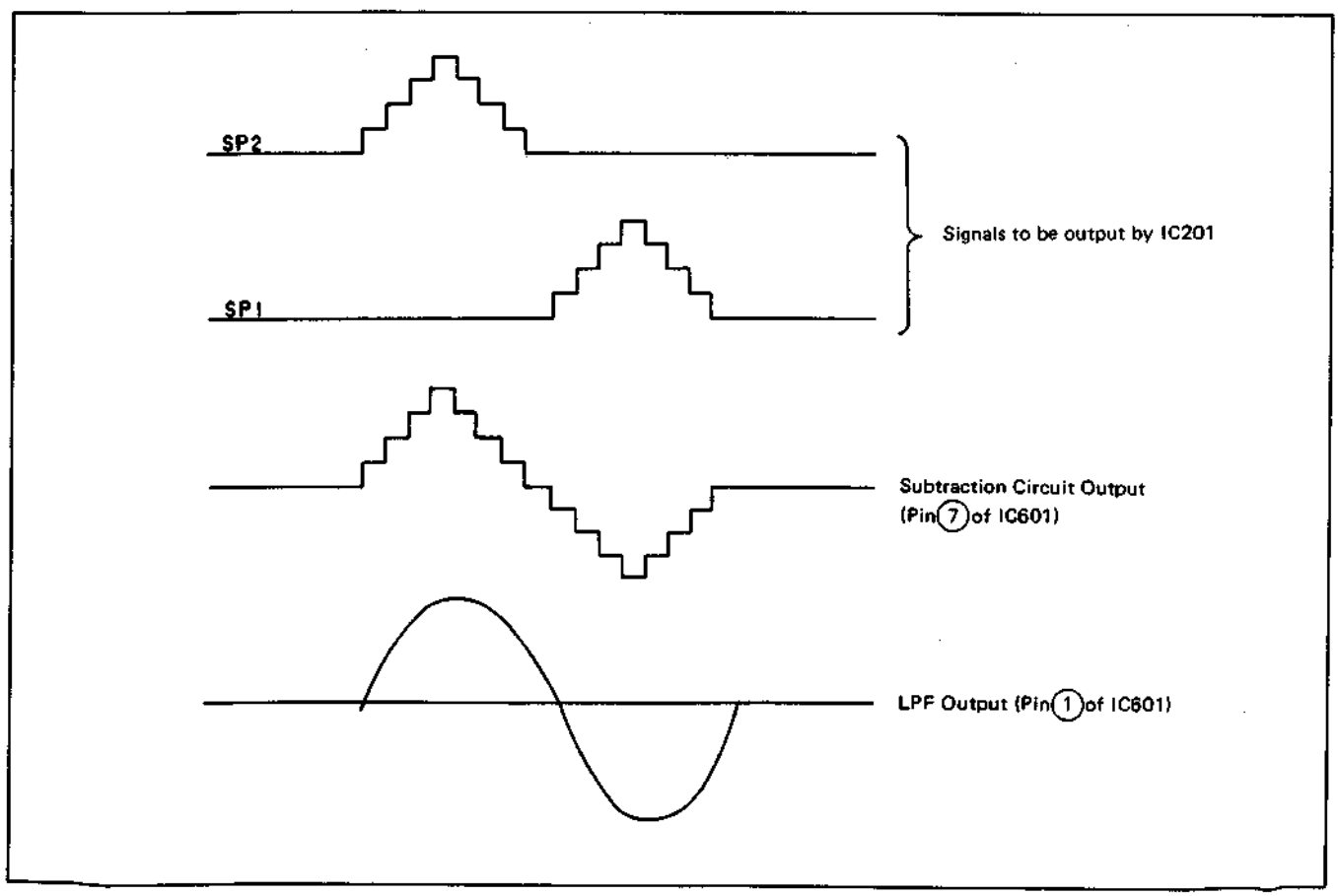


Fig. 5-4

6. TAPE RUNNING INDICATION

IC1 (MB8791) on the CI-5 Board indicates that the tape is running.

This IC has an oscillator circuit on pins (2) and (3) and demultiplies this output inside the IC to sequentially light LEDs connected to pins (10) through (14) to indicate that the tape is running. The LED lighting and extinction sequence for indicating the tape running direction and LED lighting and extinction speed for indicating the tape running speed have to be changed depending on the VTR operating mode. For this purpose, the system control circuit inputs PLAY, REC, FF, REW, and PAUSE signals into IC1.

7. INTERFACE CIRCUIT FOR CHANGER

SL-2410/2415 incorporates a changer. A circuit to mutually exchange control signals with the changer is mounted on the CI-5 Board.

7-1. Changer Power Supply (Pin (1) of CN6)

SYS 12V is supplied to the changer through the fuse F1.

7-2. REC·READY Signal (Pin (2) of CN6)

This signal is mutually exchanged between the VTR and the changer. When the VTR is ready to record (a tape whose safety tab is not broken is inserted and the VTR is in the stop state), the system control block (pin (24) of IC401 on the SS-13 Board) outputs a $\overline{\text{REC·READY}}$ signal ("L"). This signal is inverted in Q8 on the CI-5 Board and is output to the changer as a REC·READY signal ("H"). When the tape has to be changed by the changer during recording in the timer mode when the tape runs out, the changer side changes the REC·READY output to "H". (Pin (24) of IC401 ($\overline{\text{REC·READY}}$) in the system control block is "H" and Q8 is switched off.) This output is input to pin (6) of the timer IC1 on the TS-30 Board after passing through Q7, Q6, and D2, to notify that timer recording can be continued.

7-3. SIRCS 2 Signal (Pin (3) of CN6) and IR/$\overline{\text{EXT}}$ Signal (Pin (4) of CN6)

The SIRCs 2 signal controls VTR operations from the changer side. The command codes of this signal are exactly the same as the remote control command codes.

The SIRCS2 signal from the changer is input to pin (8) of IC301 in the system control block through Q3. The remote control signals are also input from the infrared photodetector section (N Board) to pin (8) of IC301 through Q1 and Q2. For this reason, the changer side forcibly changes the level of pin (4) of CN6 (IR/$\overline{\text{EXT}}$) to "L" to kill the remote control signal when the changer side outputs a control signal so that two control signals do not complete.

7-4. $\overline{\text{S CLOCK}}$ Signal (Pin (6) of CN6) and $\overline{\text{S DATA}}$ Signal (Pin (7) of CN6)

$\overline{\text{S CLOCK}}$ and $\overline{\text{S DATA}}$ signals are sent by the VTR to the changer side to notify VTR operation status.

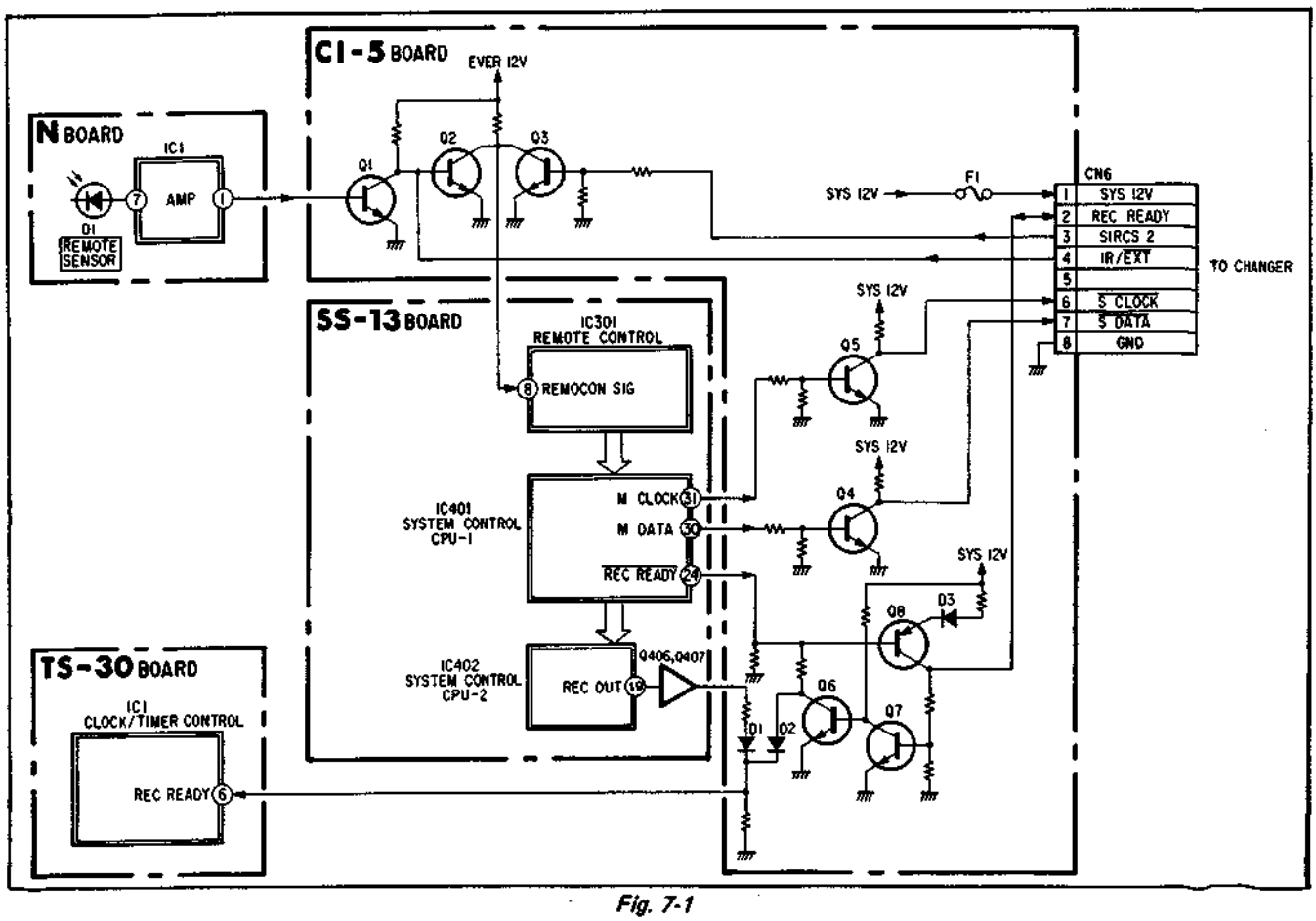


Fig. 7-1

8. POWER SUPPLY CIRCUIT

The power supply circuit is composed of the PS-26, PS-27, and PS-30 Boards .

1. REG 12V, SYS 12V, and EVER 16V
   The 16V AC output of power supply transformer T601 is rectified by D101 and fed through regulator IC101. IC101 is controlled by a POWER ON signal from the system control block. When the POWER ON signal (pin ⑩ of CN2) changes to "H", Q101 turns on and changes pin ③ of IC101 to "L". Then IC101 operates to output REG 12V and SYS 12V.
   The rectified output of D101 is output as EVER 16V.
2. EVER 5V and TIMER 5V
   Power transformer T601 outputs 7V and −6V which is rectified by D3 and D5, respectively, and is regulated by Q1 to obtain EVER 5V through D10. Normally, TIMER 5V is the Q1 output obtained through D11. During a short power failure, the voltage stored in C12 is supplied through D13.
3. −4V (EVER)
   Power supply transformer T601 outputs 7V and −6V and this is recitified by D2 and D4, respectively, and −4V (EVER) is obtained after regulation by Q2.
4. EVER 45V
   The 45V output of the power supply transformer T601 is rectified by D1.
5. −25V (EVER) and EVER −12V
   −25V (EVER) is obtained by rectifying the −25V output of the power supply transformer T601 by D17. EVER −12V is obtained by dropping the voltage of −25V (EVER) to −12V using Zener diode D8.
6. AC REFERENCE Signal
   The AC REFERENCE signal is obtained by shaping the −25V output of power supply transformer T601 with D16.
7. 2V AC
   The 2V AC output of power supply transformer T601 is directly supplied to the filament of the fluorescent display tube of the timer.

English
84 B0482-1
Printed in Japan
© 1984

SL-2410/2415

ADJUSTMENT MANUAL

US Model
SL-2410
SL-2415

Canadian Model
SL-2410

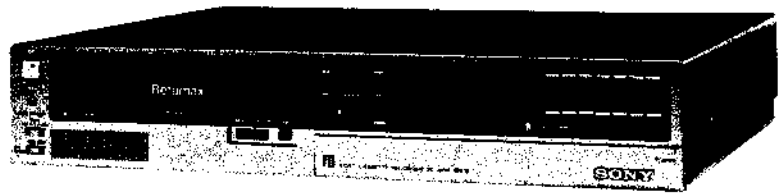


Photo : SL-2410

August, 1983

711B CHASSIS

File this adjustment manual with the service manual.

Beta
VIDEO CASSETTE RECORDER
SONY

MICROFILM

Consumer
VIDEO

TABLE OF CONTENTS

SECTION 1
PREPARATION FOR MECHANICAL SECTION CHECK, ADJUSTMENT AND REPLACEMENT

1-1. CABINET ASSEMBLY REMOVAL

1. Remove the four case set screws.
2. Remove the upper case in the direction of the arrow Ⓐ.
3. Remove the ten screws (BVTT2.6x8).
4. Remove the plate bottom.
5. Remove the screw (BVTT2.6x8).
6. Remove the front panel ass'y in the direction of the arrow Ⓑ.

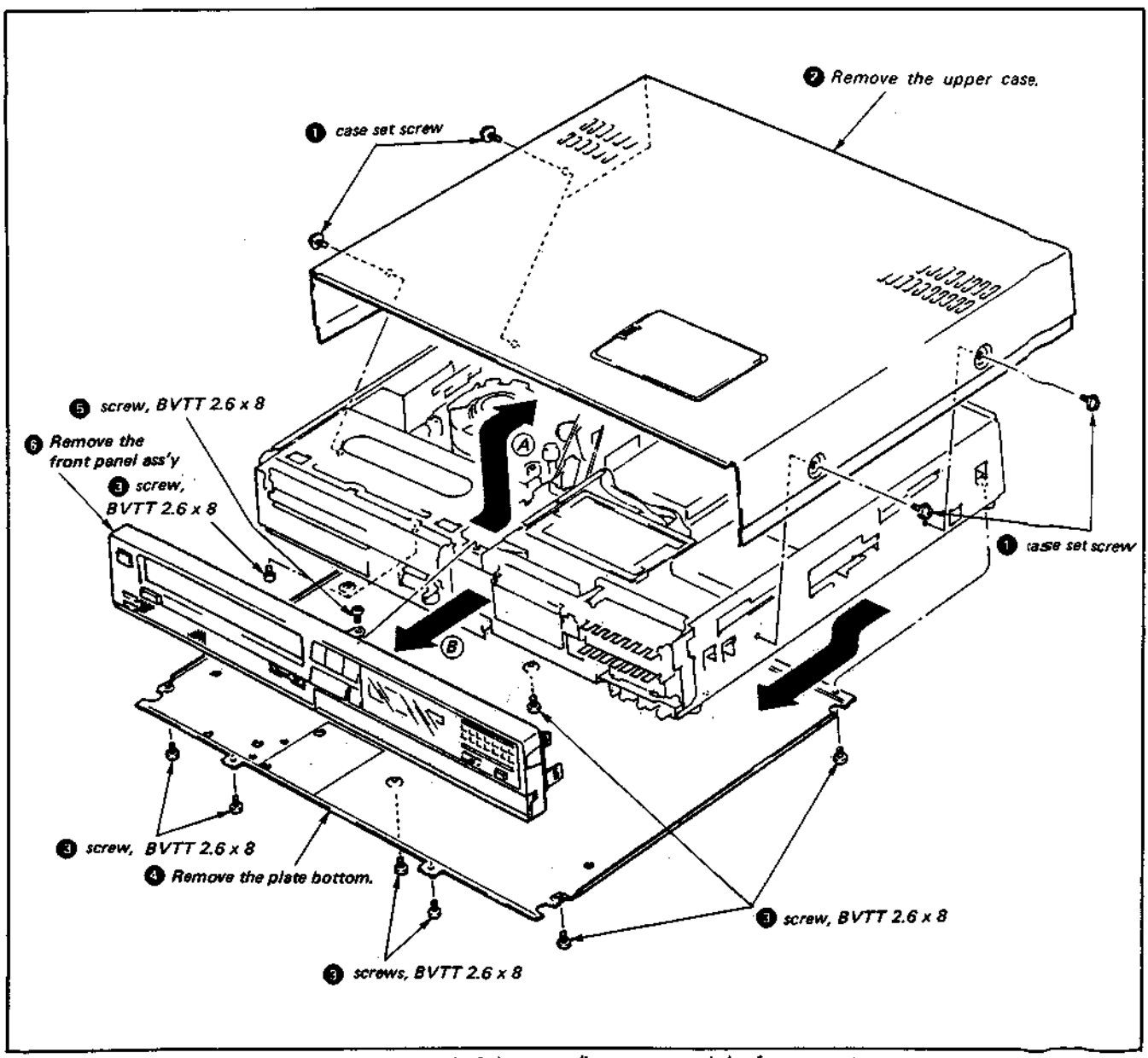


Fig. 1-1. Removal of the upper/lower case and the front Panel

1-2. RP-8 BOARD REMOVAL

❶ Remove the two screws (BVTT2.6x6).
❷ Remove the RP-8 board block.
❸ Pull out the three connectors.

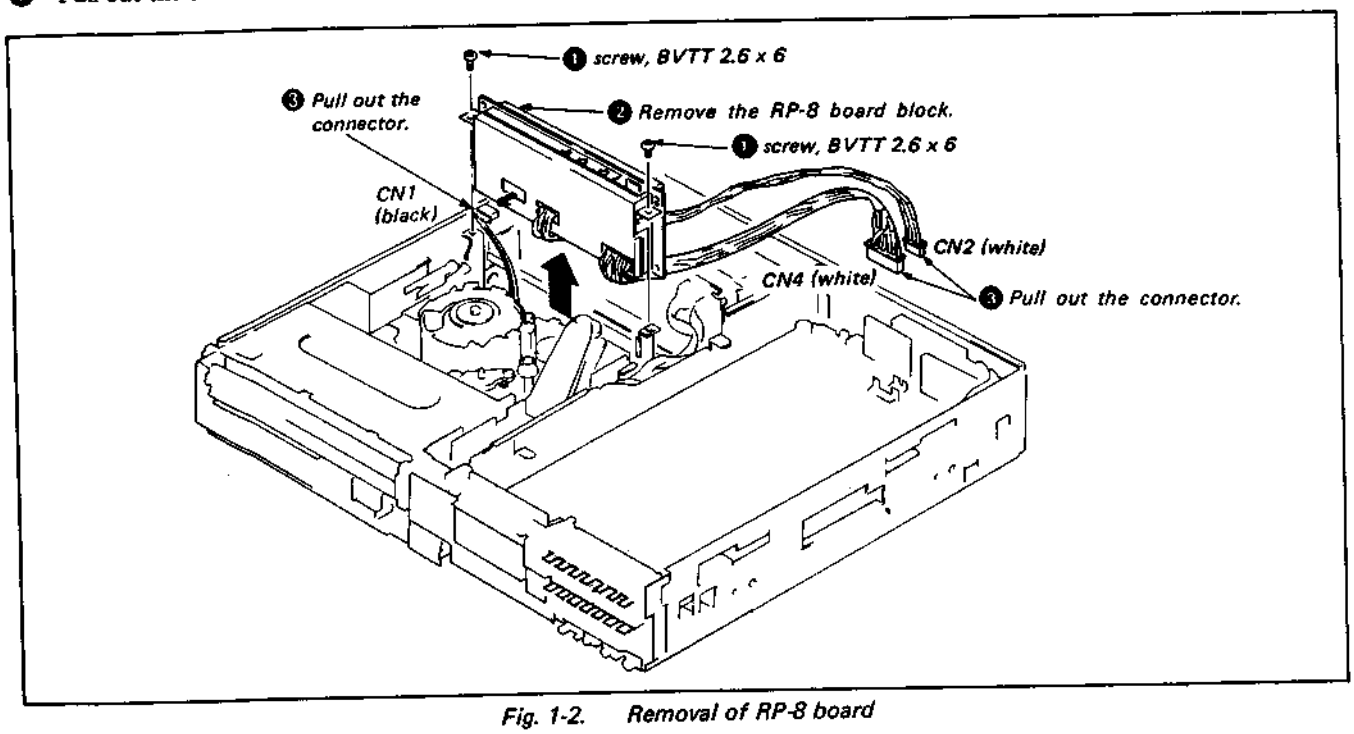


Fig. 1-2. Removal of RP-8 board

1-3. TA-16 BOARD REMOVAL

❶ Remove the three screws (BVTT2.6x6).
❷ Pull out the eleven connectors.
❸ Lift up the TA-16 board in the direction of the arrow.
(Supported using a video cassette tape.)

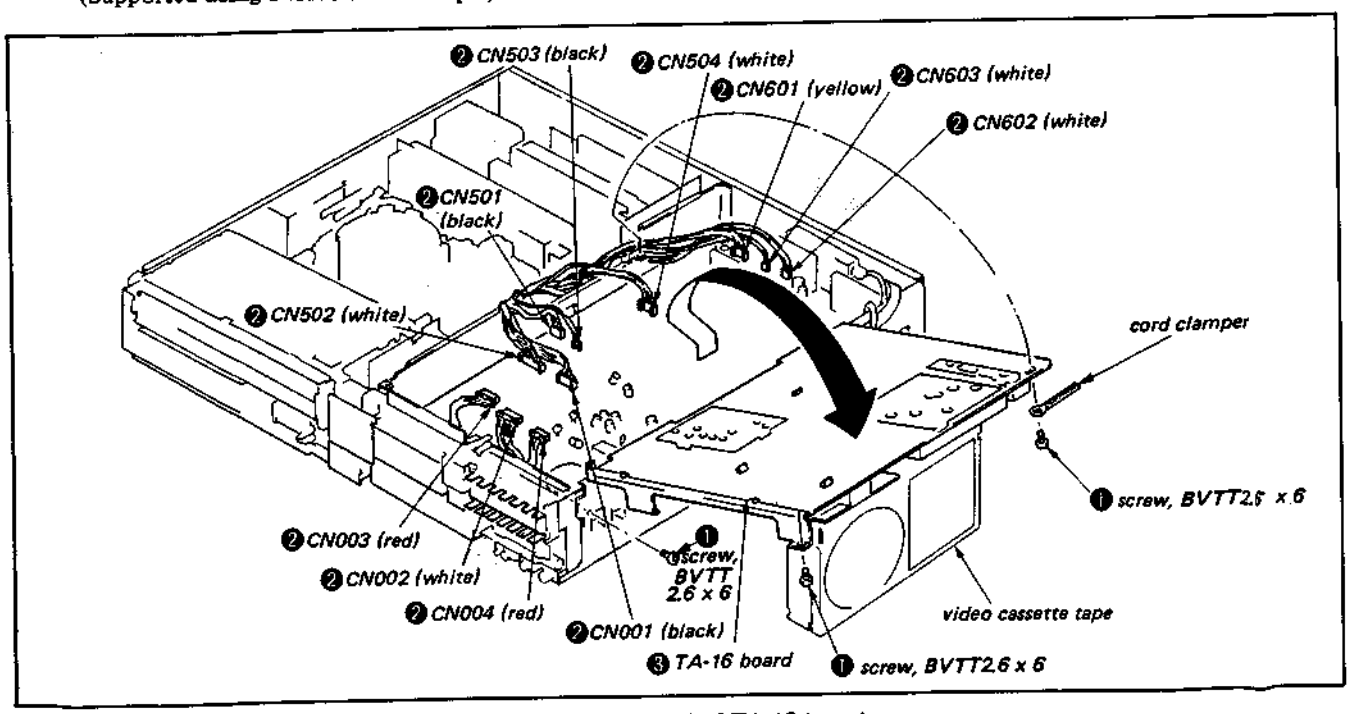


Fig. 1-3. Removal of TA-16 board

1-4. SS-13 BOARD REMOVAL

❶ Remove the two screws. (BVTT2.6 x 6)

❷ Remove the SS-13 board in the direction of the arrow. (Supported using a video cassette tape.)

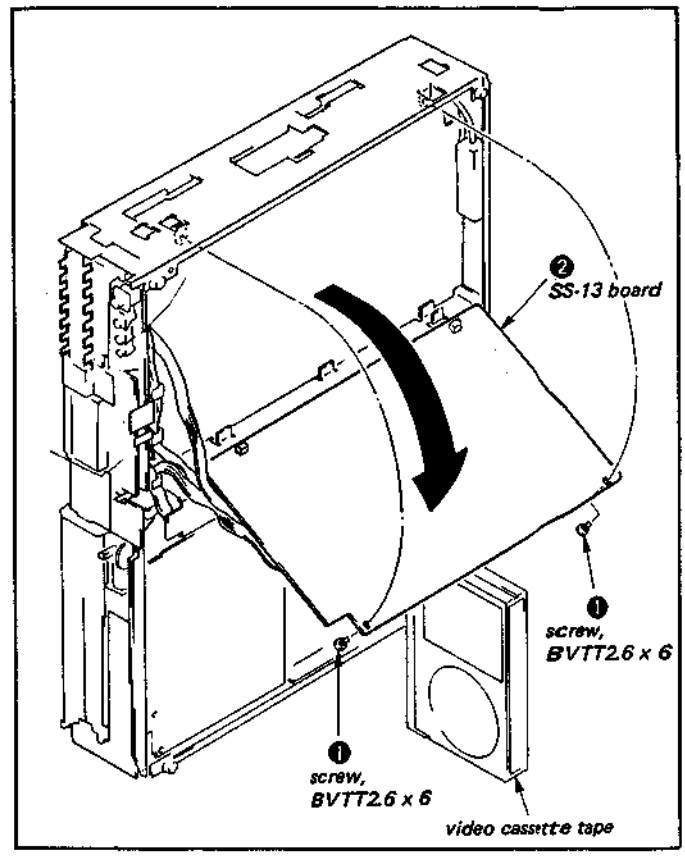


Fig. 1-4. Opening of SS-13 board

1-5. POWER BLOCK REMOVAL

❶ Remove the screw. (BVTT2.6 x 6).

❷ Remove the CI-5 board.

❸ Remove the five screws. (BVTT2.6 x 6)

❹ Pull out the six connectors.

❺ Remove the screw. (BVTT2.6 x 8)

❻ Remove the PS-29 board.

❼ Remove the power block in the direction of the arrow.

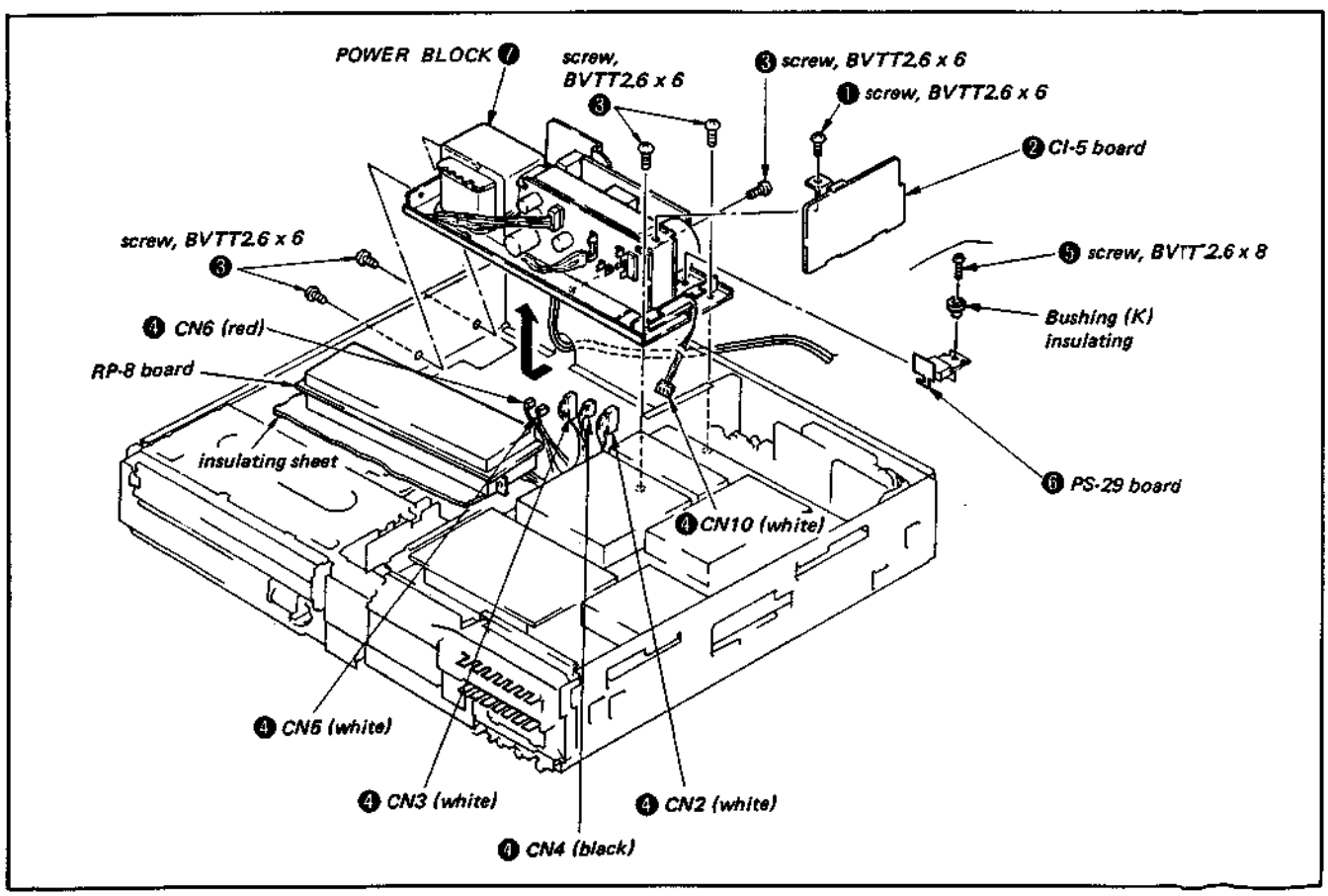


Fig. 1-5. Removal of power block

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

❶ Connect jumper wires to short pin 1 of the CN301 connector on CS-3 board to pin 2, and pin 3 to pin 4.

Note:

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

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

* Refer to section 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.

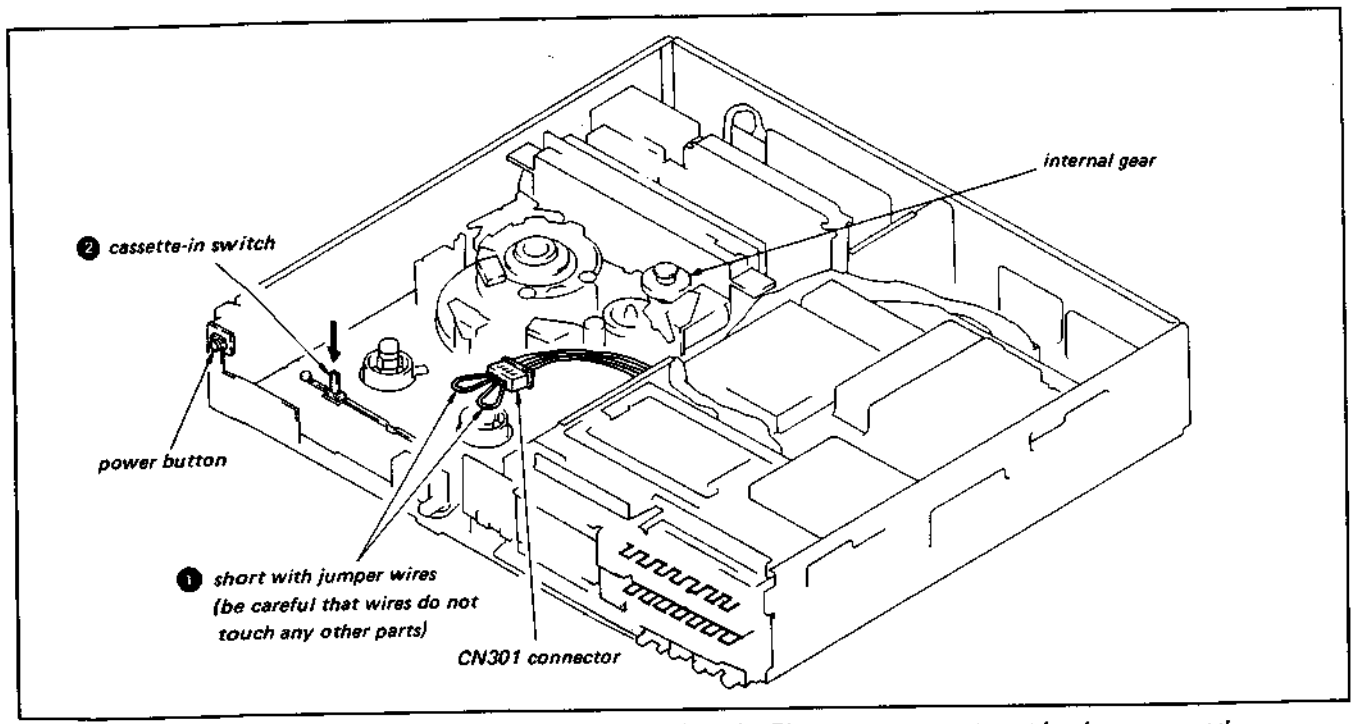


Fig. 1-6. How to thread the tape when the FL cassette compartment has been removed

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 press the accidental erasure prevention switch shown in Fig. 1-7.
2. With the accidental erasure prevention switch pressed down, press the recording button.

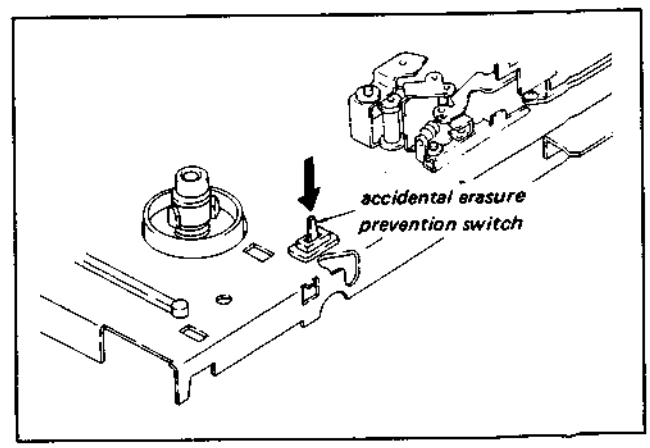


Fig. 1-7. How to put the recorder in recording mode with the FL cassette compartment removed

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

1-7-1. Manual Loading and Unloading

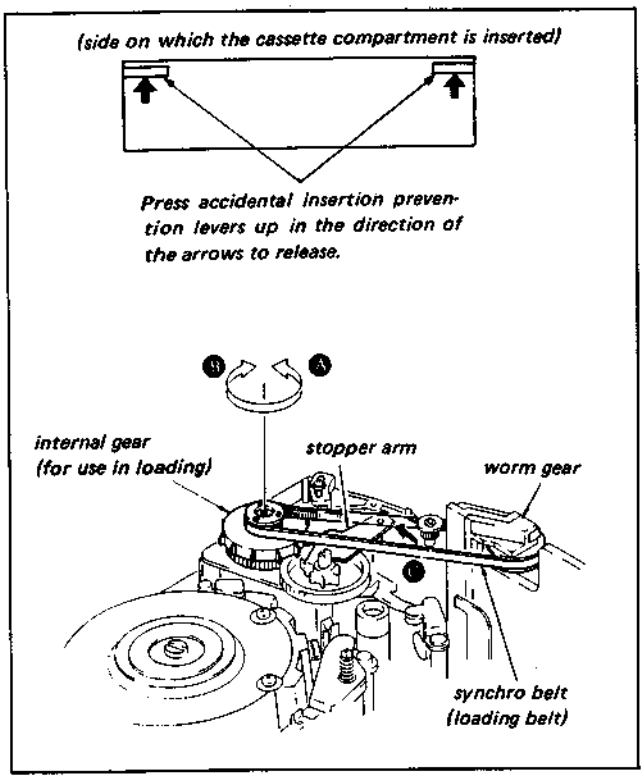


Fig. 1-8. Manual loading and unloading

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

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

1-7-2. Manual Threading and Unthreading

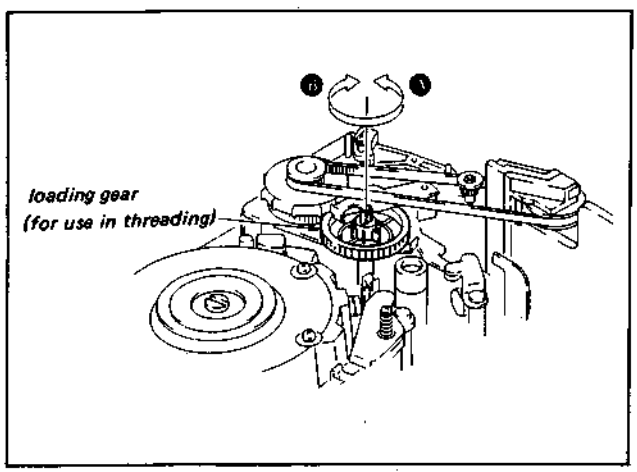


Fig. 1-9. Manual threading and unthreading

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

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

1-8. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref. No.	Name	Part No.	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-6086-750-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 (KR5-1M)	8-969-995-82	——	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-6080-013-1	SL-0013	video dihedral adjustment
J-11	Sector Type Gauge (50g)	7-732-050-20		soft braking measurement
J-12	Reel Table Tension Gauge	J-6080-011-A	SL-0011	torque measurement

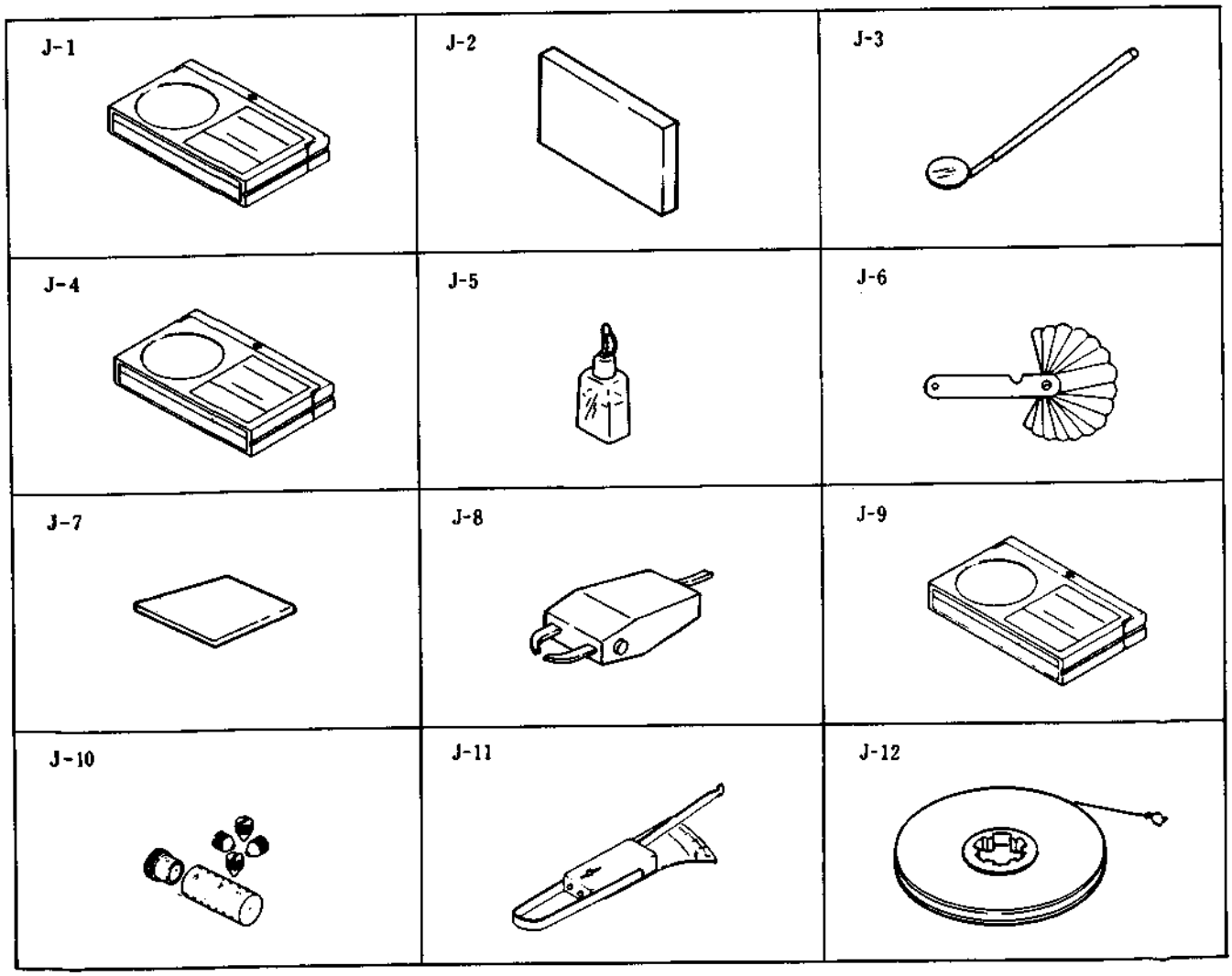


Fig. 1-10. Tools and fixtures required for servicing

SECTION 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 Transportation 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 cleaning fluid.

2-1-3. Cleaning of the Drive System

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

parts requiring cleaning

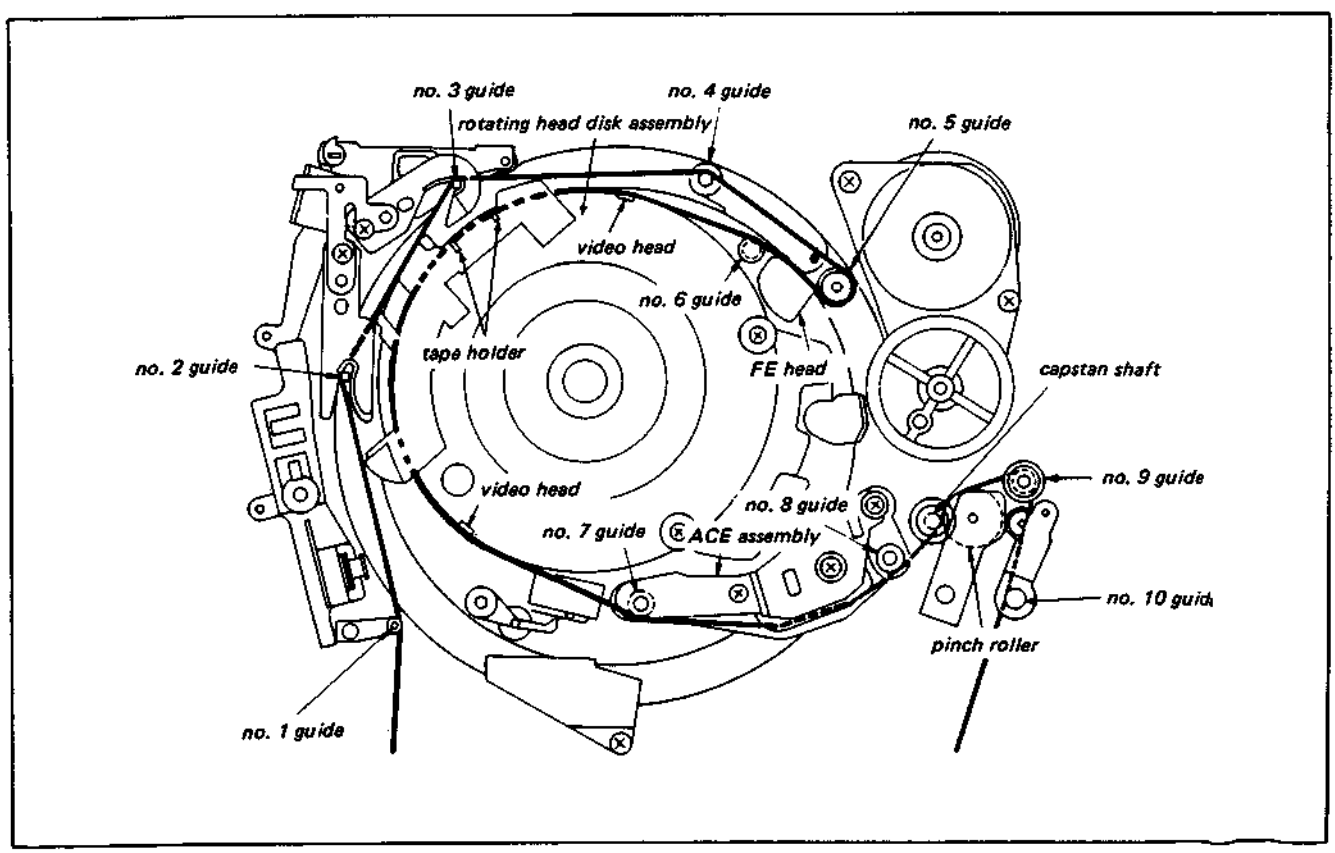


Fig. 2-1. Parts requiring cleaning

2-2. PERIODIC CHECK ITEMS

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

	Maintenance & Check	Replacement Part No.	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Trans-portation 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)	3-679-119-00	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	• 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		–	☆	–	☆	–	☆	–	☆	–	☆	Specified value: adjust to 30 g·cm ±5 g·cm
	Confirmation of brake system		–	☆	–	☆	–	☆	–	☆	–	☆	
	Confirmation of record & playback functions		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 80 g·cm ±5 g·cm (SL-0003C)

○ Cleaning ★ Replacement ☆ Confirmation

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

SECTION 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)

❶ Remove the two screws that hold the damper assembly in place, then remove the damper assembly.

❷ Use an Allen 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 adjust plate. Movement of the adjust plate will have a great effect on the tape path, so caution is required.

❸ Unsolder the rotating head disk relay plate (4 red and white leads).

❹ Remove the two hexagonal socket bolts holding rotating head disk assembly ❺ in place, then remove the rotating head disk assembly.

Note:
Be careful not to touch the head tip with the hand or hit anything against it.

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

1) Insert rotating head disk ❺ in place, being careful of the direction so that the red and white leads are in the right places.

2) Tighten hexagonal socket bolt ❹ 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 adjust plate. While pressing the two points that determine the height, tighten hexagonal socket bolt ❷.

Note:
When inserting the upper drum, be careful that it does not touch the head tip.

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

❶ Remove the hexagonal socket bolts, that hold the rotating head disk assembly in place.

❷ When the head disk is jammed on tight and is hard to remove, screw the hexagonal socket bolts removed in step ❶ into the threaded holes 90° away from the original holes. Tighten them a little at a time.

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

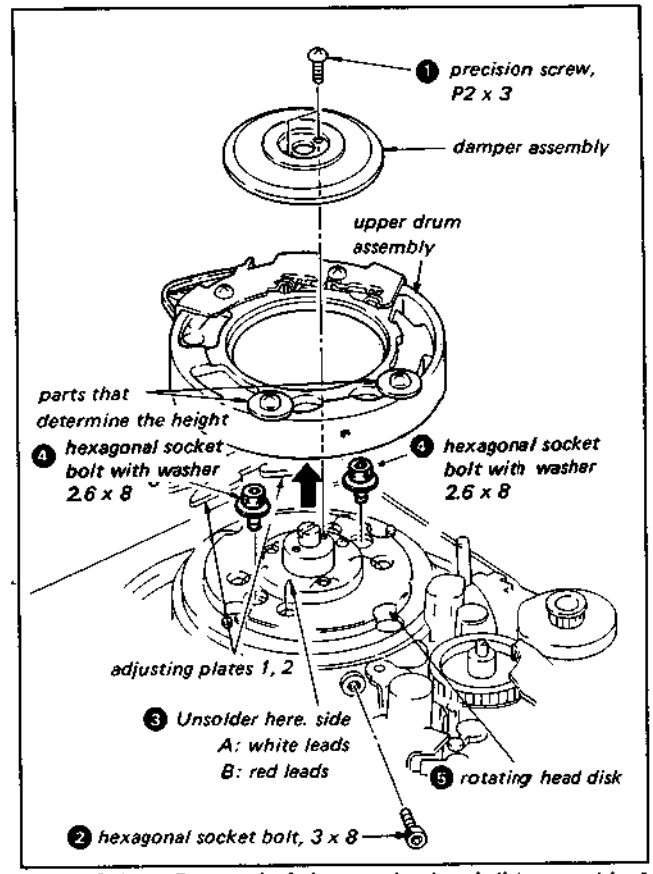


Fig. 3-1. Removal of the rotating head disk assembly I

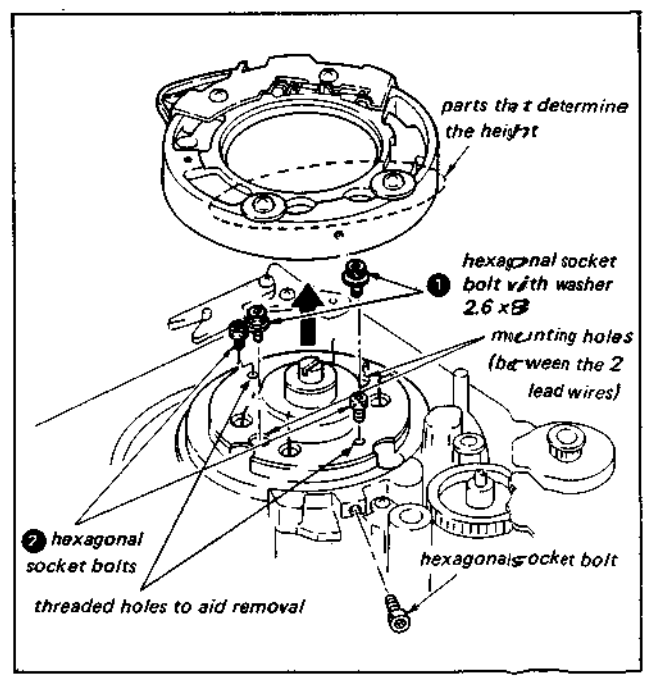


Fig. 3-2. Removal of the rotating head disk assembly II

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 hone the tracking control knob must be in the center 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 βII 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 βII 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.

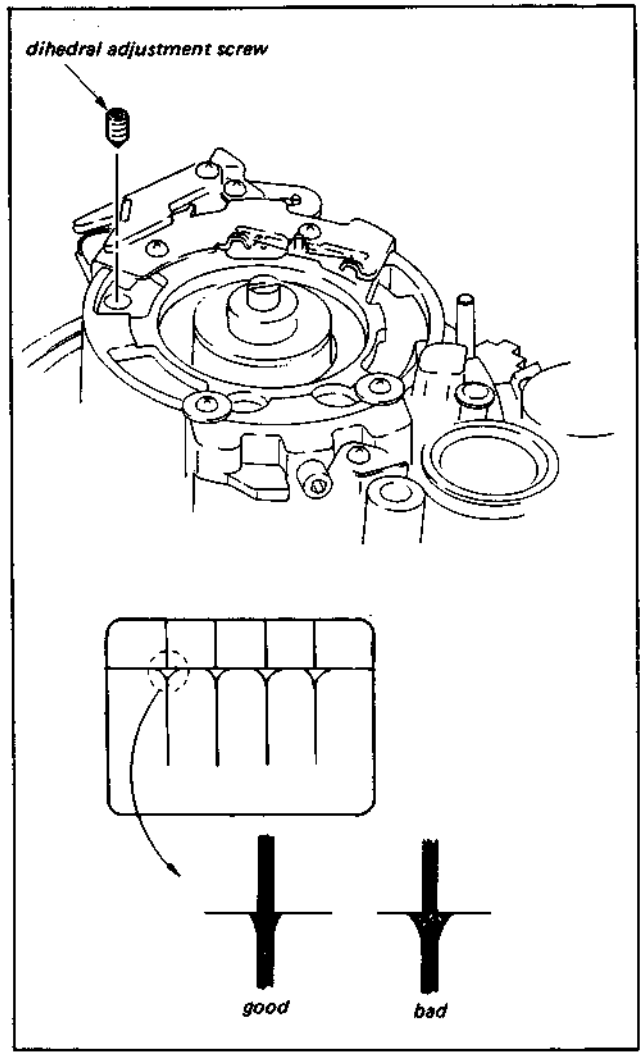


Fig. 3-3. Video head dihedral adjustment

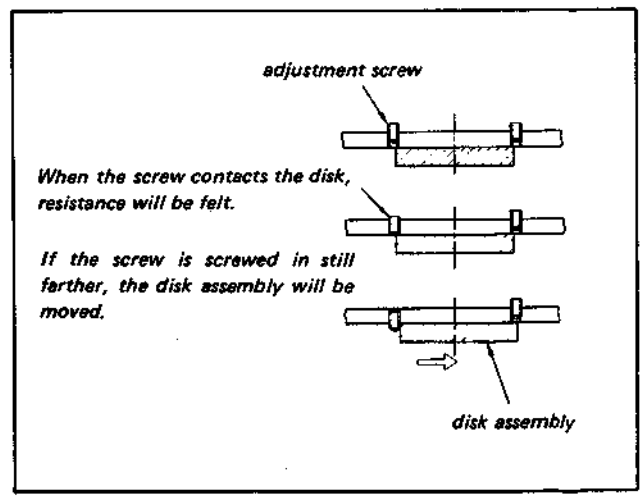


Fig. 3-4.

3-3. REPLACEMENT AND ADJUSTMENT OF THE DRUM ASSEMBLY

3-3-1. Replacement of the Drum Assembly

❶ Measure gap Ⓐ between adjust plate 1 and the upper drum holder section, and record the measurement.
Note:
The position where the adjust plate is mounted has a large effect on the tape path, so this measurement must be performed.

❷ Measure gap Ⓑ between adjust plate 2 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.

❸ Remove the screws shown in Fig. 3-5, then remove the tape guide ground plate and adjust plates 1 and 2.

❹ Remove the 3 connectors from the rear of the chassis as shown in Fig. 3-6.

❺ 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.

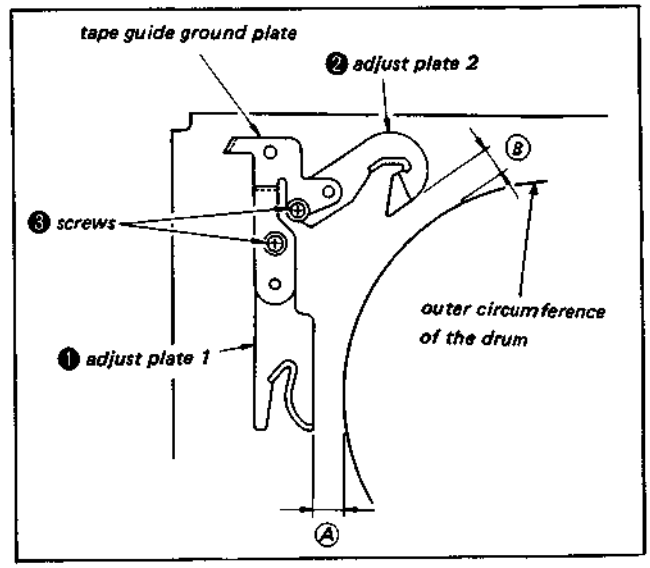


Fig. 3-5. Position measurement of adjust plates 1 and 2

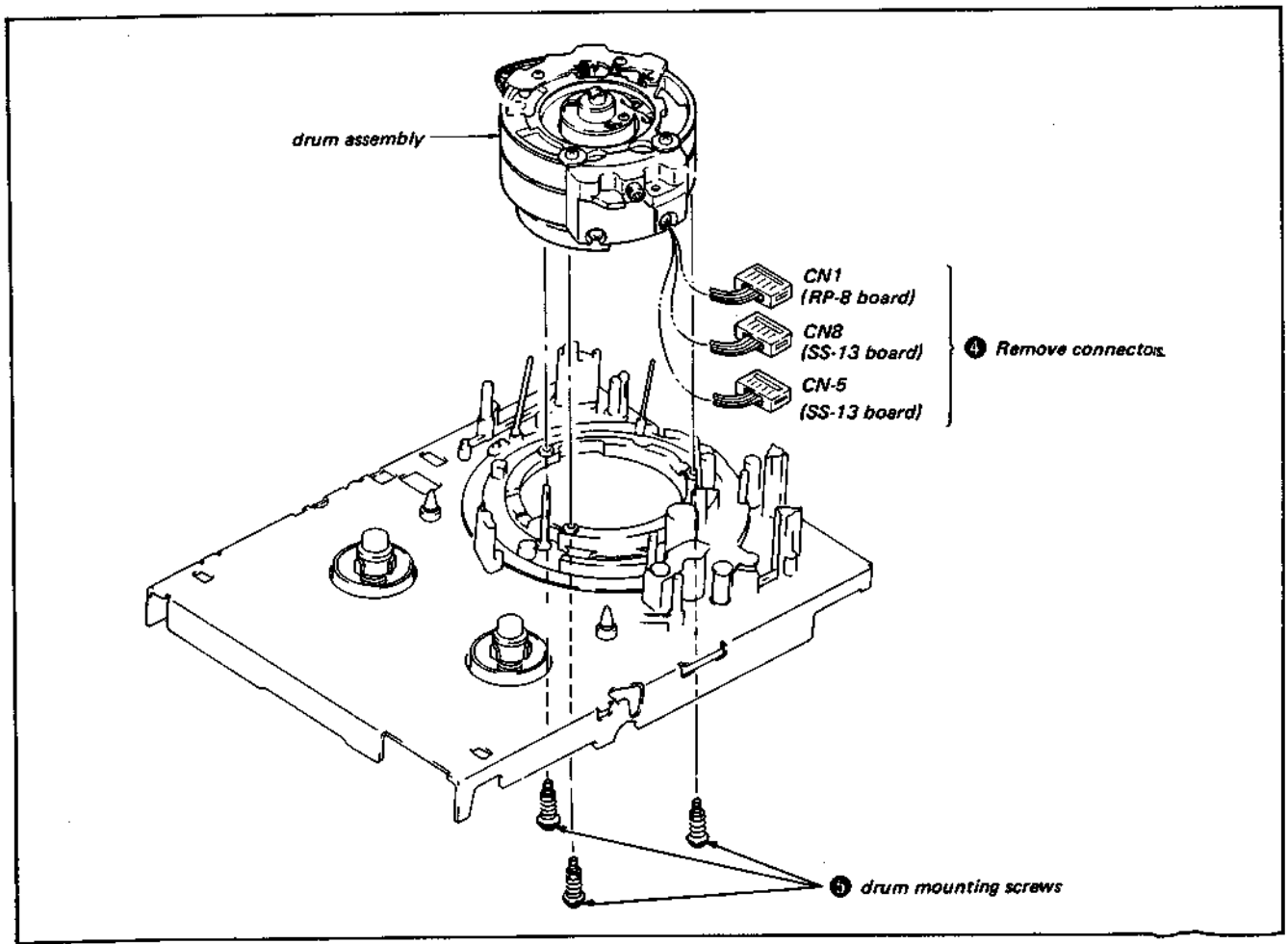


Fig. 3-6. Removal of the drum assembly

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 four 0.3mm accessory spacers to obtain the correct width.

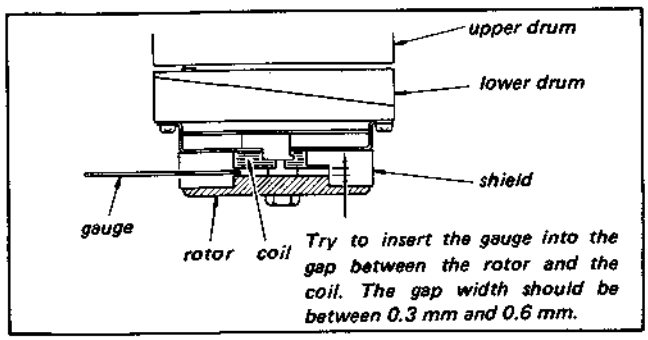


Fig. 3-7. Checking the motor gap width after replacing the drum assembly

Removal of the stator and rotor when replacing the drum

❶ Remove the nut and washer.
❷ Remove the rotor from the stator.
❸ Remove the 2 screws, then remove the stator from the main body of the drum.

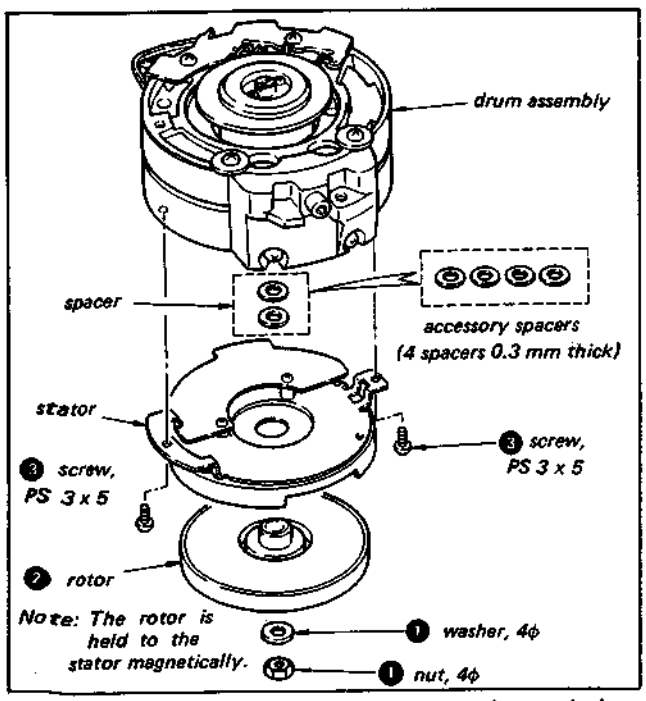


Fig. 3-8. Removal of the stator and rotor when replacing the drum

3-4. REPLACEMENT OF THE CAPSTAN MOTOR

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

- Remove screws ❶, ❷ and ❸, then remove the capstan motor from the rear of the mechanical chassis.

Note:
After replacing the capstan motor, adjust the tape path as explained in section 4-3.

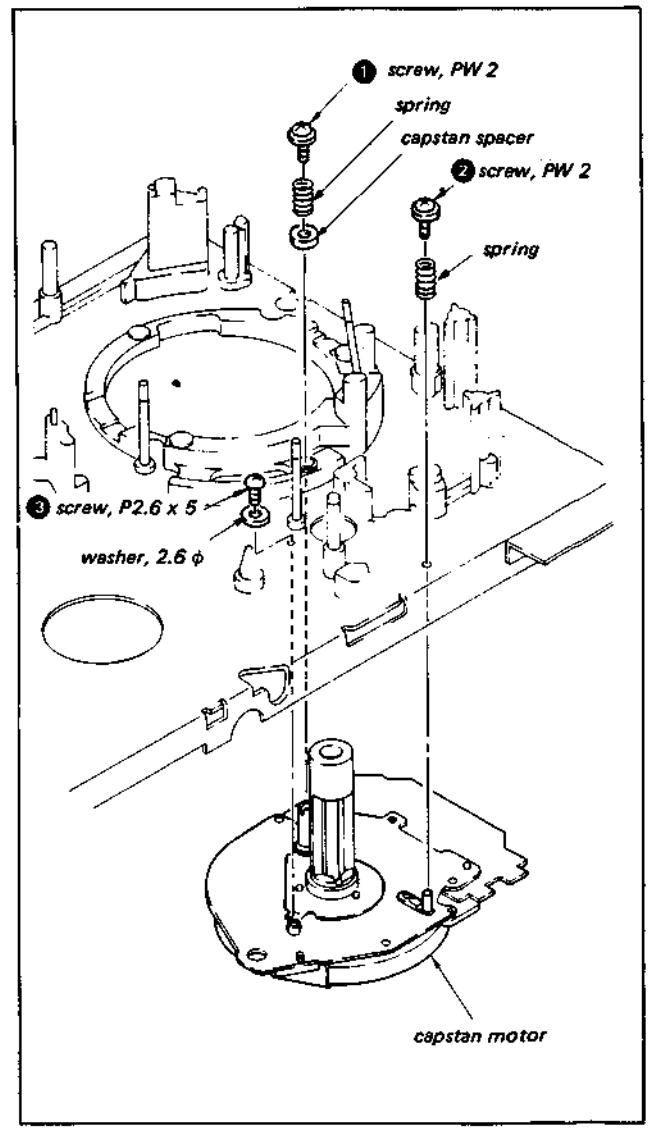


Fig. 3-9 Removal of the capstan motor

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

❶ Remove the spring.
❷ Remove the claw in the direction of arrow Ⓐ, then pull the S coil sensor out.
❸ Unplug the connector from CN407 on SS-13 board.

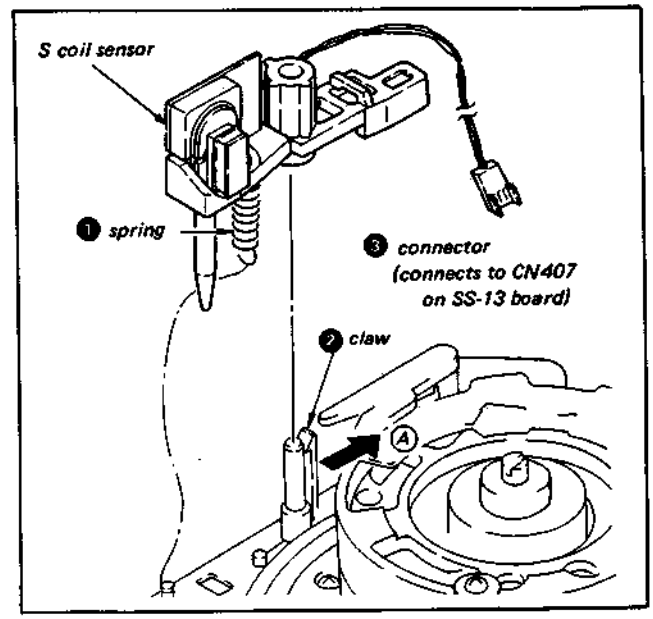


Fig. 3-10. Removal of the S coil sensor

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

❶ Pull the internal gear flange out.
❷ Remove the synchro belt.
❸ Remove the 5 screws (BVTT2.6×6).
❹ Pull connector CN417 (white) out.
❺ Remove the FL cassette compartment section in the direction of arrow Ⓐ.

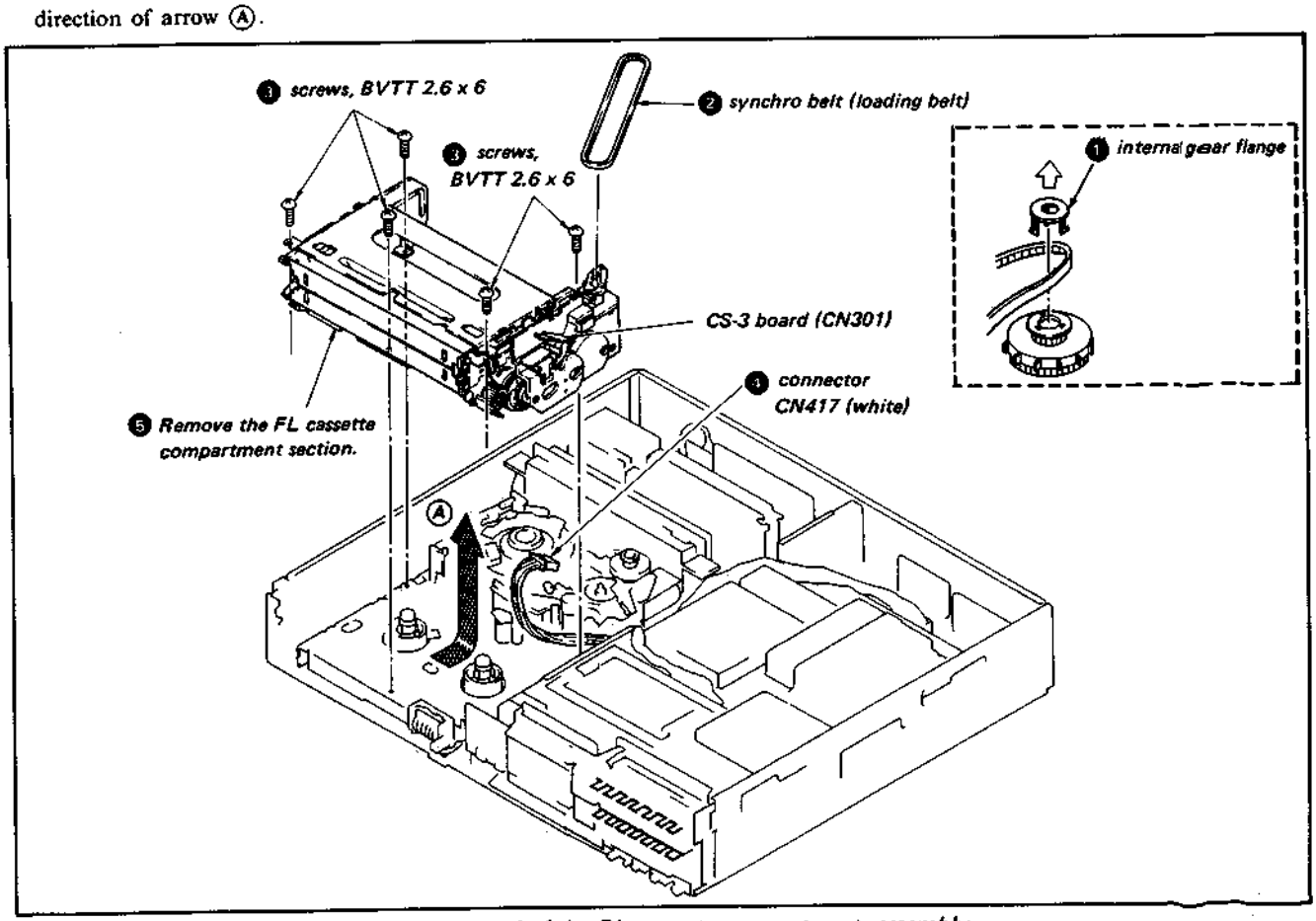


Fig. 3-11. Removal of the FL cassette compartment assembly

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. Prepare a positioning rod about 200 mm long and 1.5 mm in diameter.
2. While passing the positioning rod through the combination of the drive arm right and cassette ON cam, fit it 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 it onto the right side plate. plate.

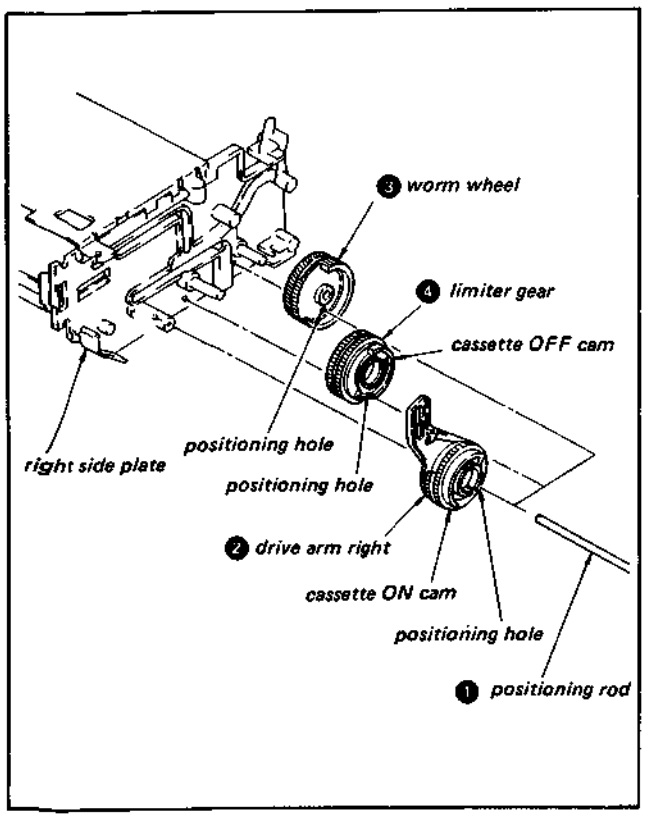


Fig. 3-12. Positioning of the FL cassette compartment gears

3-7-2. Cassette OFF 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 microswitch comes ON when the center of the drive roller is 0 to 5 mm from the end of the guide groove, as shown in Fig. 3-13. (The switch lever will be restored to its original position, making a clicking sound.)

[Method of adjustment]

Loosen the screw that holds the cassette OFF cam attached to limiter gear A in place, move the cassette OFF cam in the direction of the arrow, adjust so that the cassette OFF switch comes ON when the above distance is 0 to 5 mm, and finally tighten the screw.

* When the cassette ON switch and cassette OFF switch operate, the threading motor comes ON.

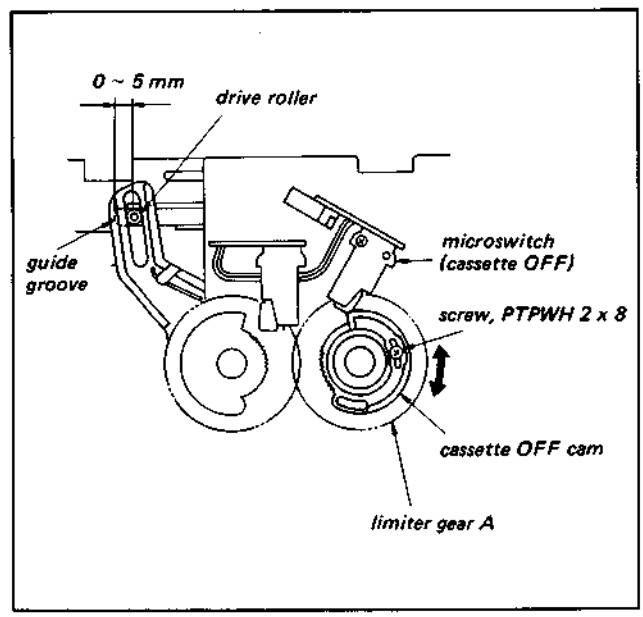


Fig. 3-13. Cassette OFF switch operation check and adjustment

3-7-3. 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 microswitch comes ON when the center of the drive roller is 10 to 12 mm from the end of the guide groove, as shown in Fig. 3-14. (A clicking sound can be heard after the switch is pressed.)

[Method of adjustment]

Loosen the screw that holds the cassette ON cam attached to the drive gear in place, then move the cassette ON cam in the direction of the arrow.

Adjust so that the cassette ON switch comes ON when the above distance is 10 to 12 mm, and finally tighten the screw.

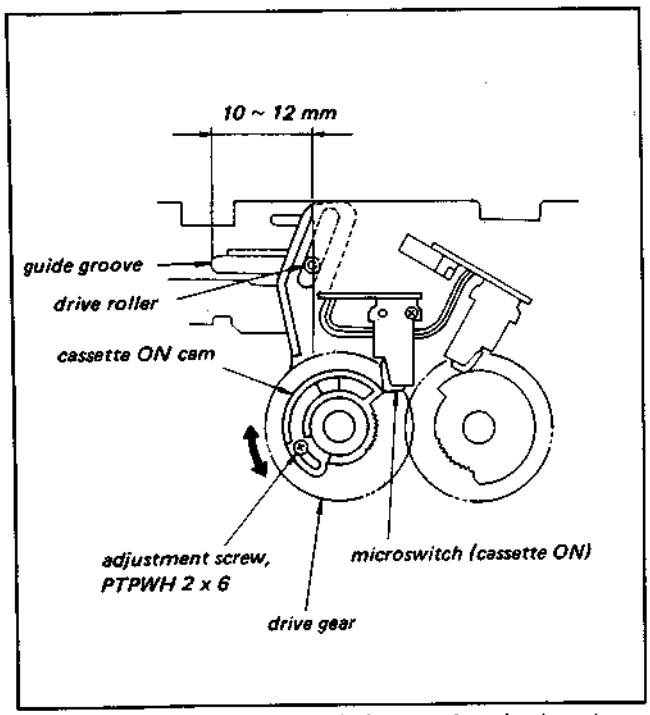


Fig. 3-14. Cassette ON switch operation check and adjustment

3-7-4. 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 ❶, check to make sure that the upper and lower doors are vertical.

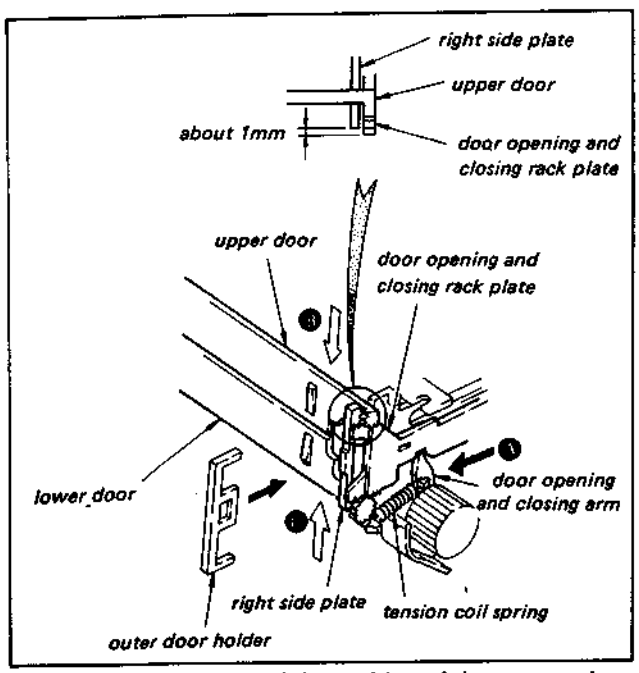


Fig. 3-15. Adjustment of the position of the cassette door assembly

[Method of adjustment]

Check to make sure that the door opening and closing rack plate has returned all the way. Then, with the tip of the door opening and closing rack plate and the tip of the right side plate about 1 mm apart, close the upper and lower doors together in the directions of arrows ❶ and ❷ so that they are vertical, and mesh the gears. Fit the outer door holder onto the right side plate, and fix the upper and lower doors in place.

3-7-5. Mounting the FL Cassette Compartment Assembly (Fig. 3-16)

❶ Hook the two claws of the FL cassette compartment assembly onto the mechanical chassis, then place the compartment in the specified position on the chassis.

❷ Loosely tighten the 5 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.

❸ Connect the synchro belt (loading belt) between the threading motor and the worm gear, then hold it in place with the internal gear flange.

❹ Press the tension roller arm in the direction of the arrow to adjust the tension of the synchro belt (loading belt), then fix it in place with the arm fixing screw.

❺ Insert the harness sticking out from the main body into connector CN301 on CS-3 board.

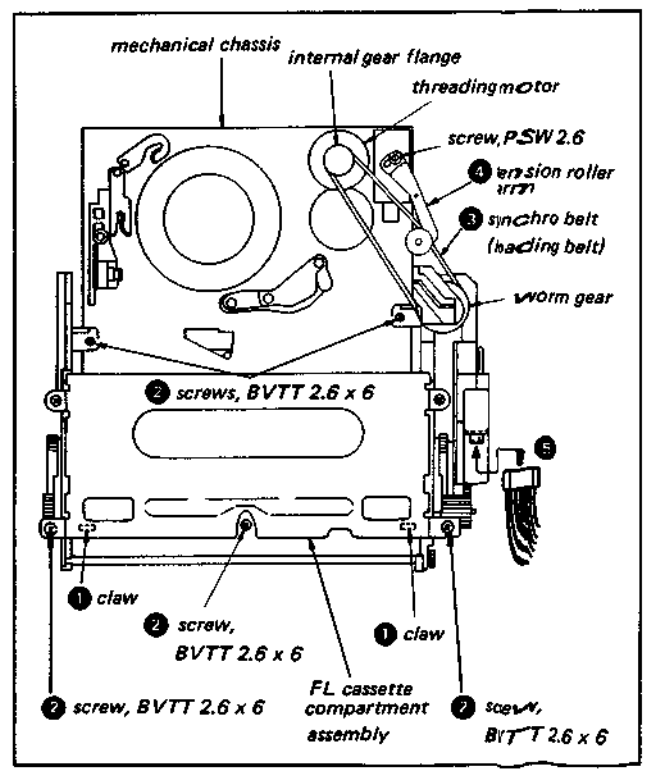


Fig. 3-16. Mounting the FL cassette compartment assembly

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

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

❶ Remove the 1x3 tapping screw.
❷ Remove the 1.4x3.5 tapping screw.
❸ Remove the No. 2 guide assembly.

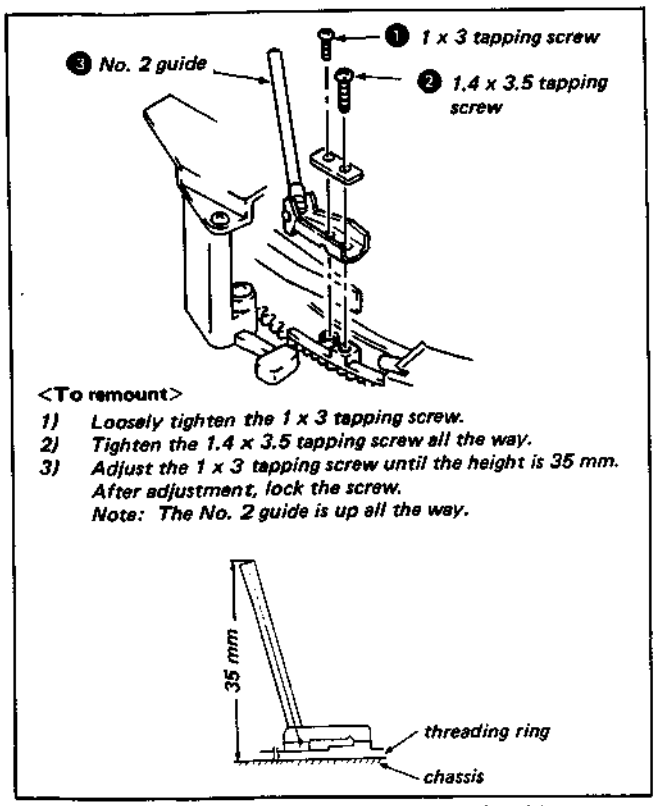


Fig. 3-17. Removal of the no. 2 guide

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

❶ Remove the 1x3 tapping screw.
❷ Remove the 1.4x3.5 tapping screw.
❸ Remove the No. 3 guide assembly.

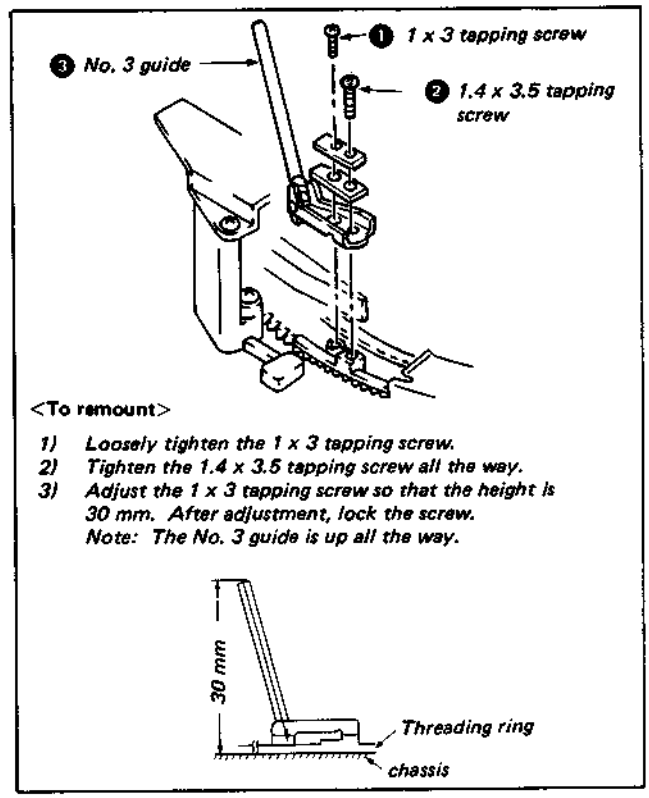


Fig. 3-18. Removal of the no. 3 guide

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

3-9-1. Preparation to Remove the S Threading Ring Removal of the ACE Assembly, FE Head and Threading Motor (Fig. 3-19)

❶ Remove the cross-recessed head screw.
❷ Remove the No. 6 guide nut.
❸ Remove the No. 6 washer.
❹ Remove the No. 6 guide spacer.
❺ Remove the compression coil spring.
❻ Remove the 2 guide adjustment nuts, 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 lose it.

❼ Remove the two PSW2.6 screws, then remove the stopper arm section.
❽ Remove the 2 screws, then remove the threading motor assembly by pulling it up and out.

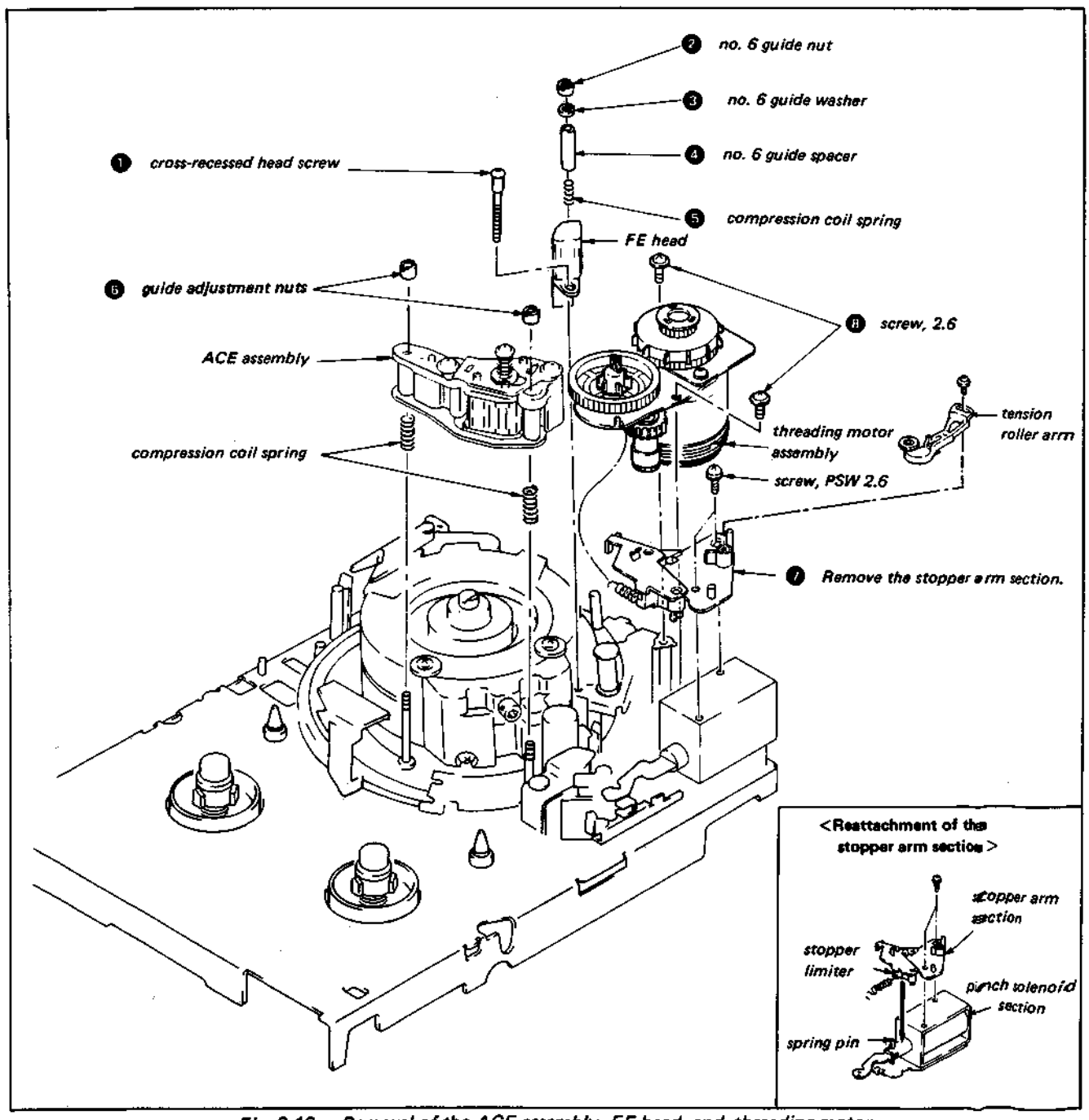


Fig. 3-19. Removal of the ACE assembly, FE head and threading motor.

Removal of Miscellaneous Parts (Fig. 3-20)

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

1. Remove the screw, then remove the tape guide ground plate and adjust 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 2.6×24 screw, then remove shuttle guide II.
5. Remove the 3 PTPWH2×8 screws and the 2.6×24 screw. Then remove the 2 claws holding shuttle guide I in place, and finally remove shuttle guide I.
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.

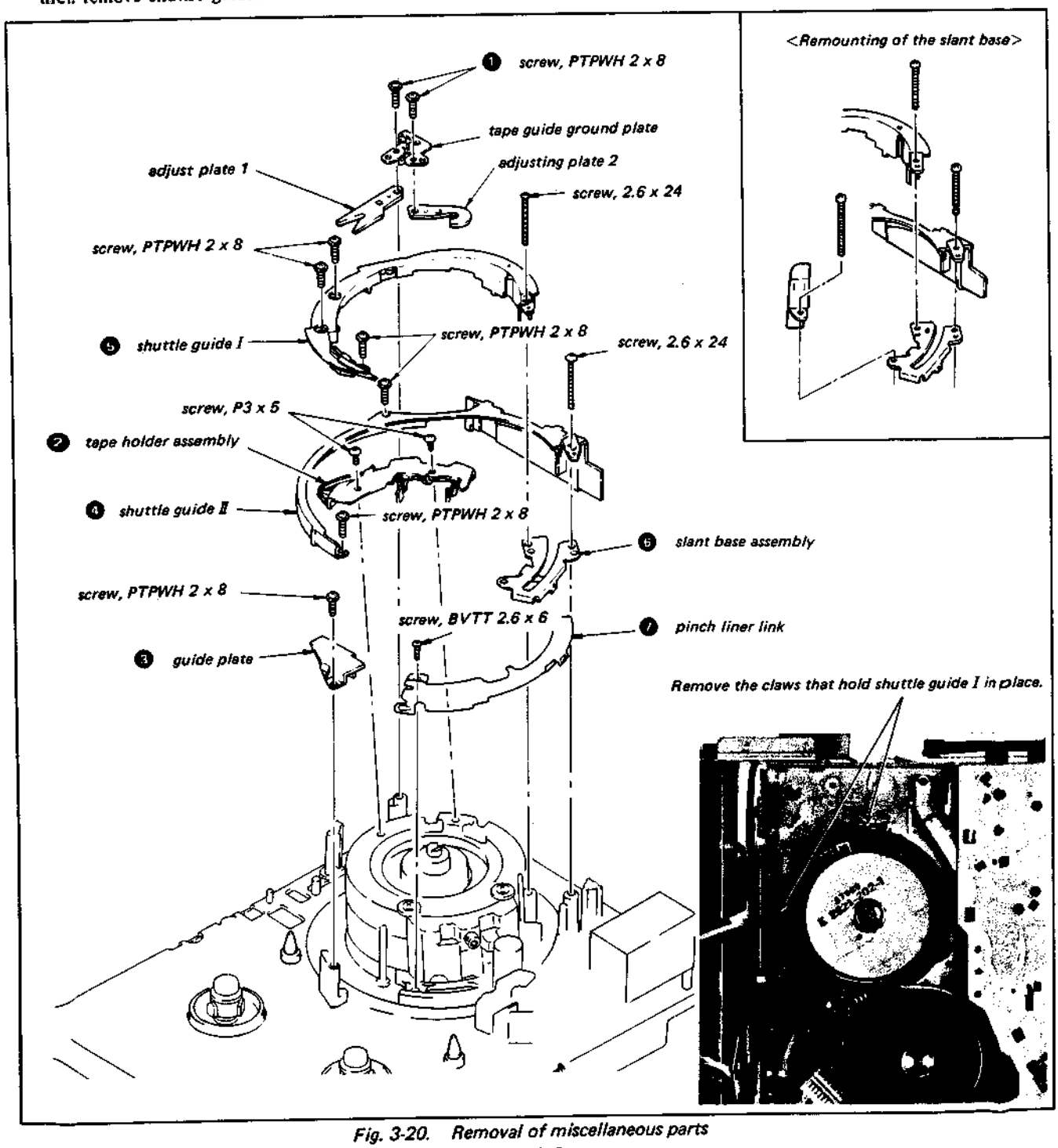


Fig. 3-20. Removal of miscellaneous parts

3-9-2. Removal of the S Threading Ring (Fig. 3-21)

❶ Remove the tension coil spring from the lock arm assembly (refer to Fig. 3-26 in section 3-11-1).
❷ Remove the washer and remove the ring roller (B).
❸ Remove the group of parts in the unthreading end switch (for instructions on assembly and disassembly, refer to section 3-11-2 and Fig. 3-30).
❹ Remove the screw, then remove the ring roller adjustment plate.
❺ Remove the S threading ring.

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

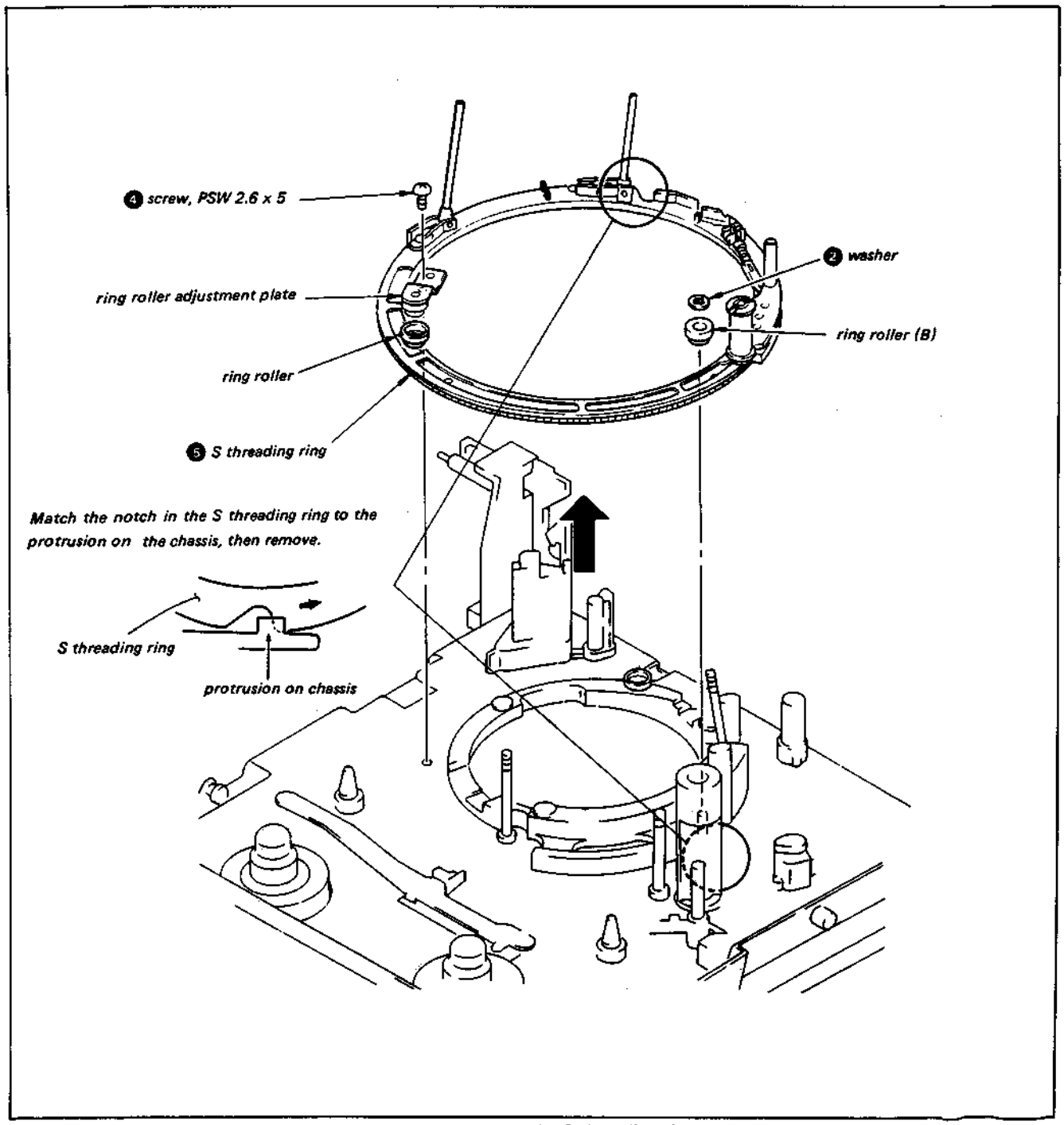


Fig. 3-21. Removal of the S threading ring

3-9-3. Slider-Stopper Mounting Check (Fig. 3-22)

❶ Confirm that the parts of the drive gear are fixed in place.

❷ Loosen the screw, insert a spacer of thickness 0.2 mm between the slider gear assembly and the slider stopper, and tighten the screw while pressing down in the direction of both arrows Ⓐ and Ⓑ.

Note:

It is absolutely necessary to press down in the direction of arrow (A) in order to eliminate play. When the screw is tightened, the slide stopper tends to turn in the direction of arrow (a), so it should be held in place with a blade screwdriver while tightening the screw.

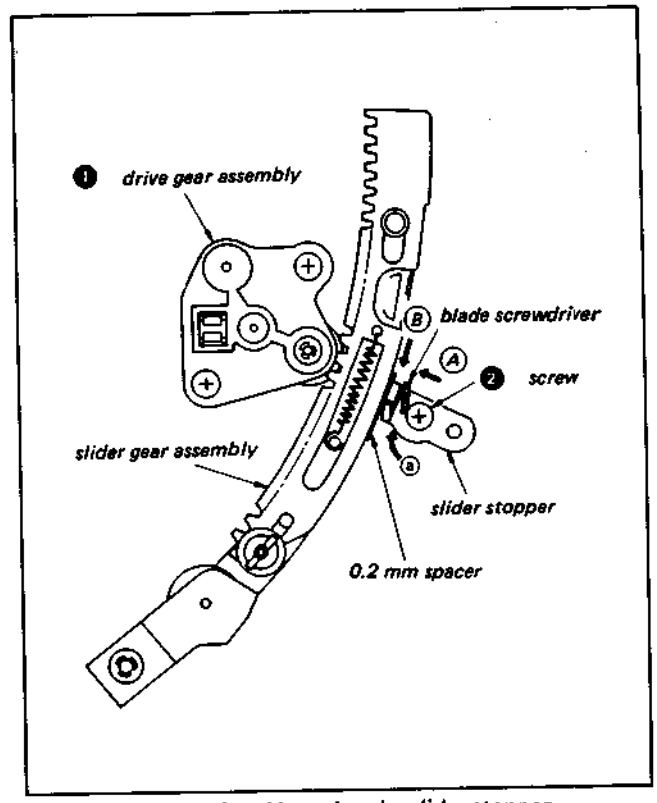


Fig. 3-22. Mounting the slider-stopper

3-9-4. S Threading Ring Mounting and Position Adjustment (Fig. 3-23)

❶ Set the slider gear assembly in the unthreading completed position.
(Insert a spacer of thickness 0.5 mm between the slider stopper and slider gear, and set so that it is up against section Ⓐ.)

❷ In this condition, fit the threading ring into place, match the chassis hole (3ϕ) of section Ⓑ with the S threading ring hole (1.5ϕ), and mesh with the drive gear teeth.

❸ Attach ring roller (B) and fix in place with a washer.

❹ 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.

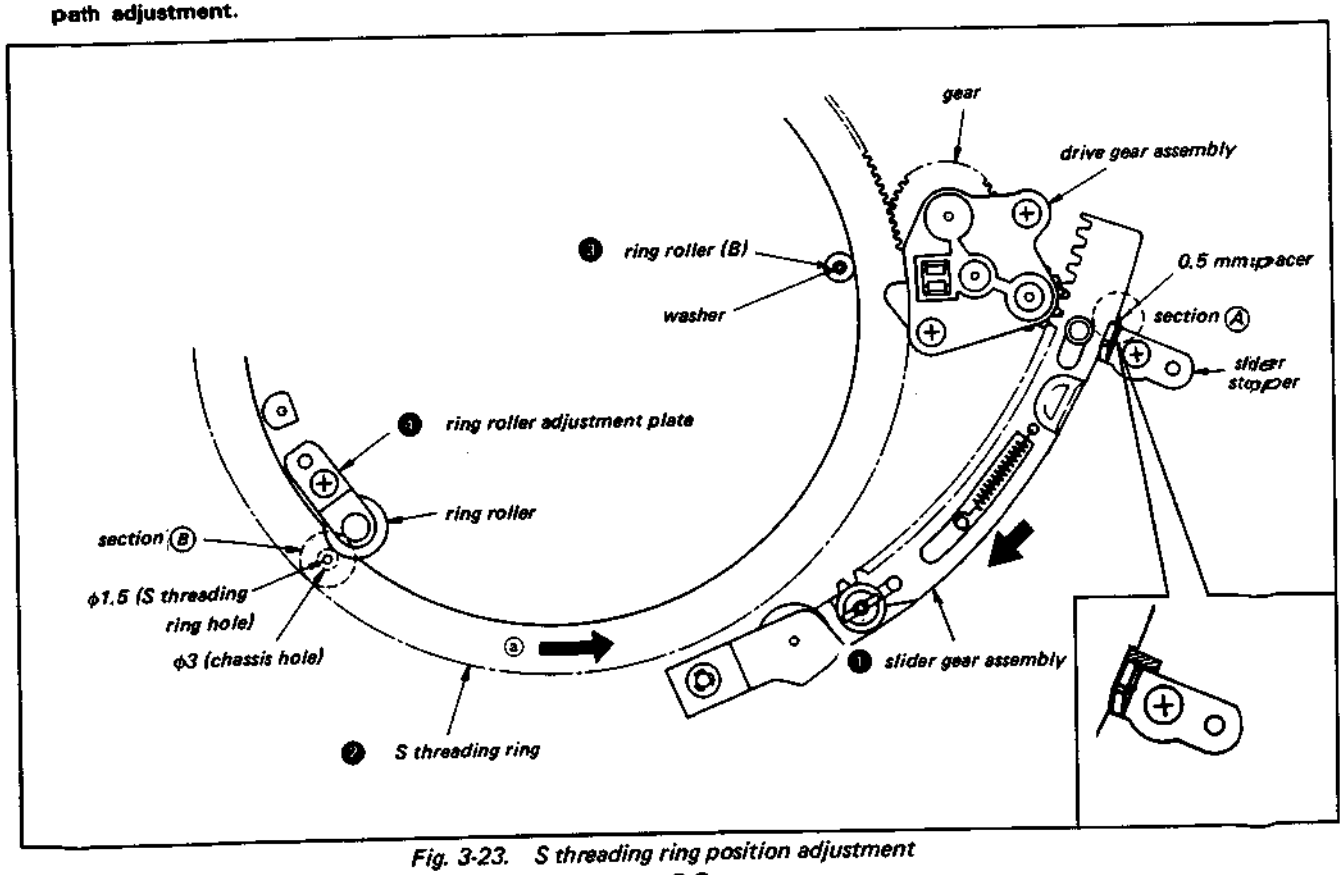


Fig. 3-23. S threading ring position adjustment

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]

❶ With the pinch solenoid in the absorbed condition (when the plunger is pushed in all the way), loosen the adjustment screw.

❷ Press the pinch limiter adjustment plate in the direction of arrow ⓐ with a blade screwdriver, as in section Ⓐ in the diagram, and adjust until the thickness of the gap is 0.4 mm to 0.6 mm.
Tighten the adjustment screw and then lock it to fix everything in place.

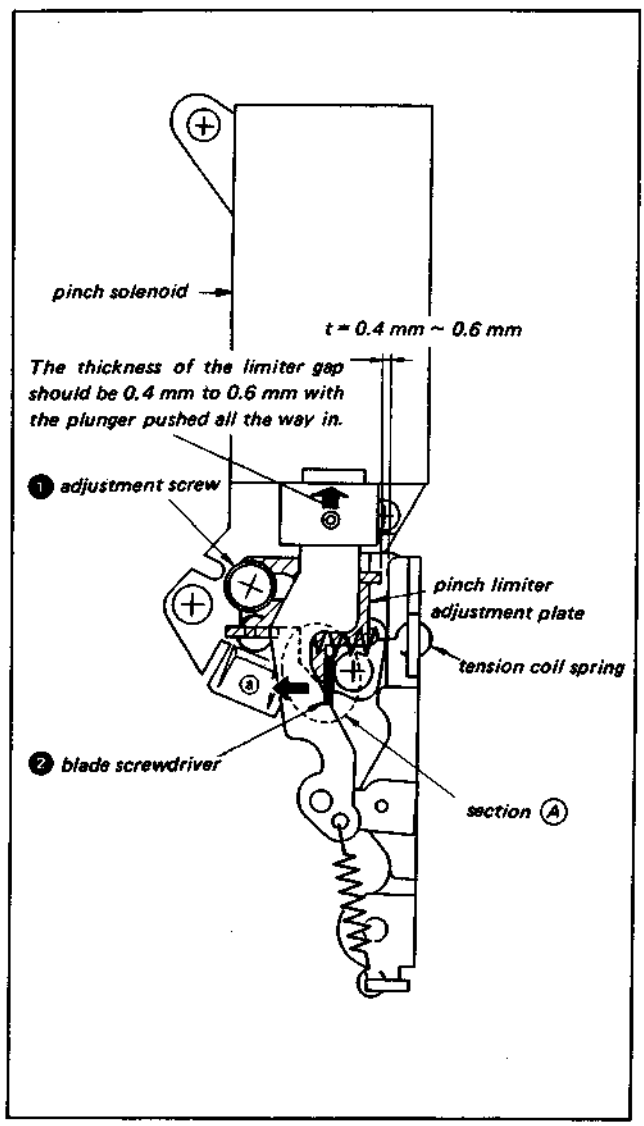


Fig. 3-24. Pinch snap-fit limiter gap adjustment plate

3-11. MICROSWITCH POSITION CHECK AND ADJUSTMENT

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. 3-25 section Ⓐ) to 2/3 of the way down it and back, the TE switch turns ON and OFF. This can be confirmed from the clicking sound.
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 at 2/3 of the way from the top of the notch in the S threading ring, turn the cam shaft in the direction of the arrow with a blade screwdriver and, when the switch turns ON (with a clicking sound), fix the cam shaft in place.
2) When the adjustment is completed, repeat the check as described under [method of checking].

[Removal]

❶ Remove the tension coil spring that is attached to the lock arm assembly.
❷ Remove the screw, then remove the TE switch assembly.
❸ Press the claws holding the main chassis assembly in place in the direction of arrow Ⓐ to release the lock, then remove the lock arm assembly.

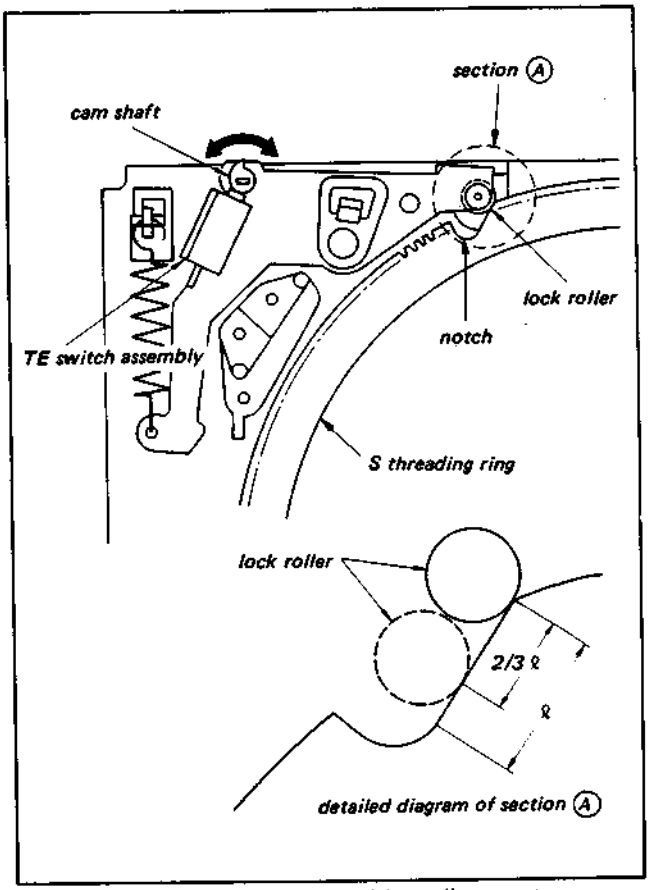


Fig. 3-25. TE switch position adjustment

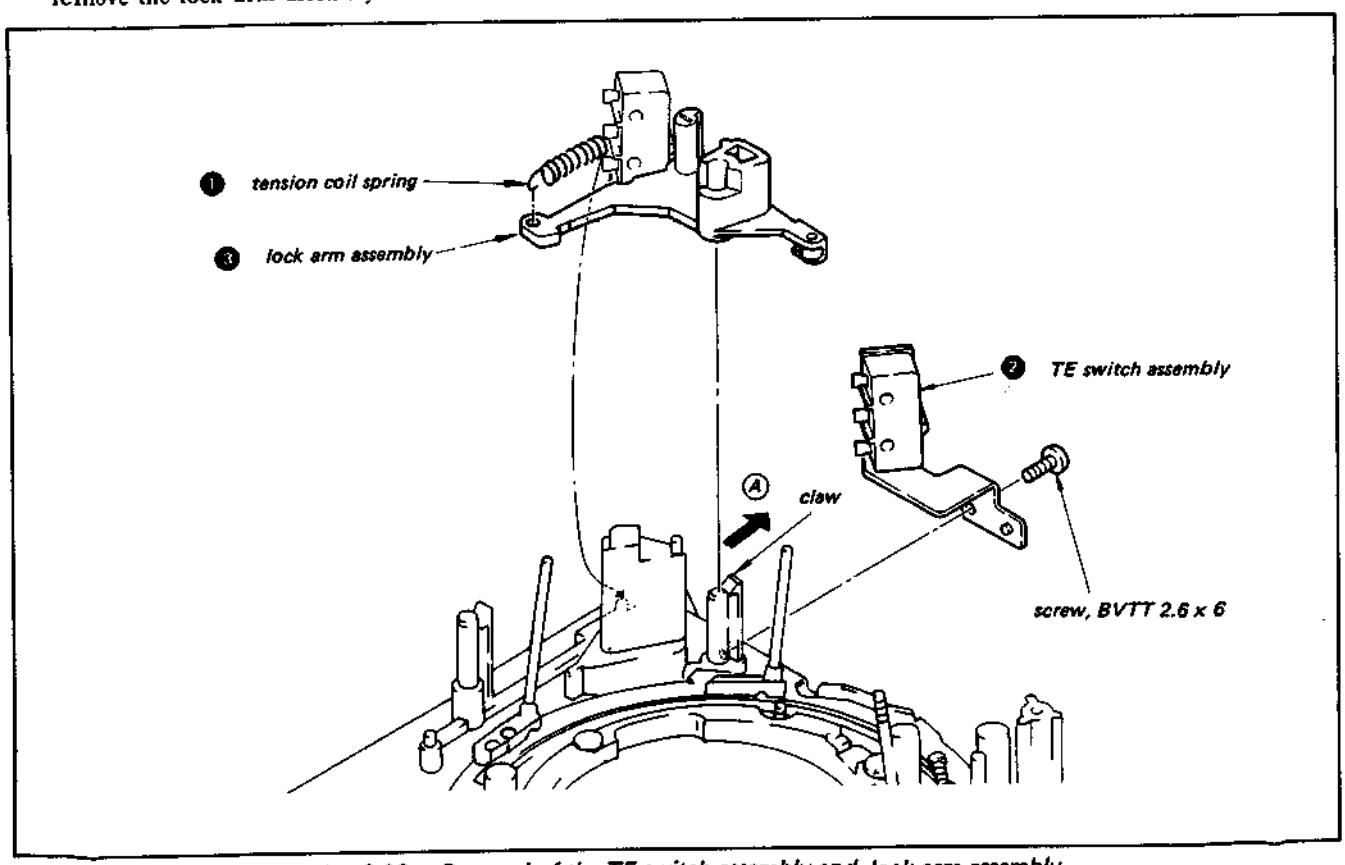


Fig. 3-26. Removal of the TE switch assembly and lock arm assembly

3-11-2. Unthreading End Switch (UTE Switch) Position Check and Adjustment

[Method of checking]

Turn the S threading ring manually until the UTE switch roller of the UTE switch arm assembly drops into the UTE switch arm groove. Confirm that when a ϕ1.2 pin is inserted into section Ⓐ in Fig. 3-27, the switch comes ON, and that when a ϕ0.6 pin is inserted the switch does not come ON.

[Method of adjustment]

1) If the switch fails to come ON when a ϕ1.2 pin is inserted, loosen small screw ❶ and adjust by turning a little at a time in the direction of arrow Ⓑ.
2) If the switch comes ON when a ϕ0.6 pin is inserted, it is possible that the actuator is bent as shown in Fig. 3-28. Check it and straighten it out if necessary.

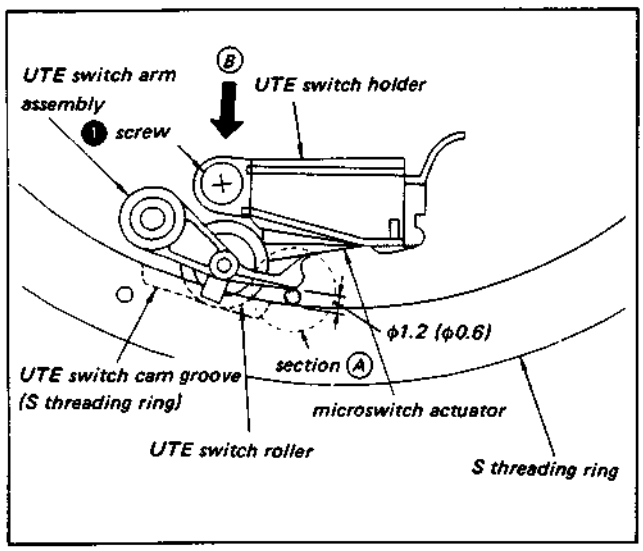


Fig. 3-27. UTE switch position adjustment

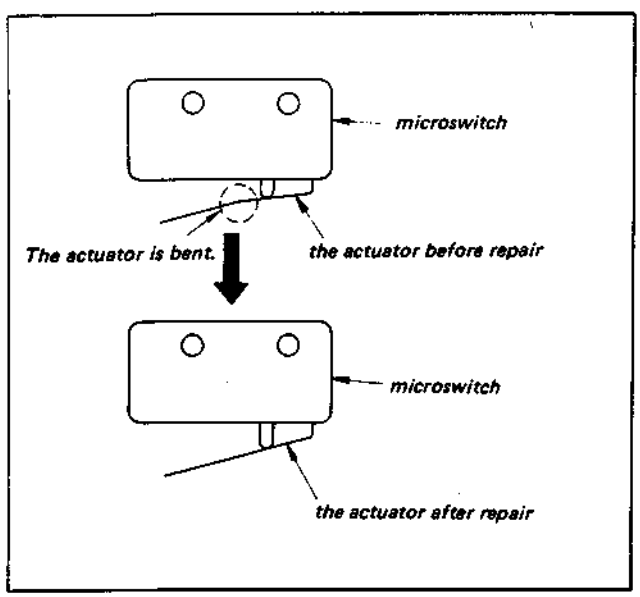


Fig. 3-28. Repair of the actuator

Note:

The ϕ1.2 and ϕ0.6 pins must be inserted in the right place, as shown in Fig. 3-29. (As shown in Fig. 3-29, depending on where the pin is inserted, because of the structure of the assembly, even if it enters at 1.2 mm the gap can be less than 1.2 mm farther in).

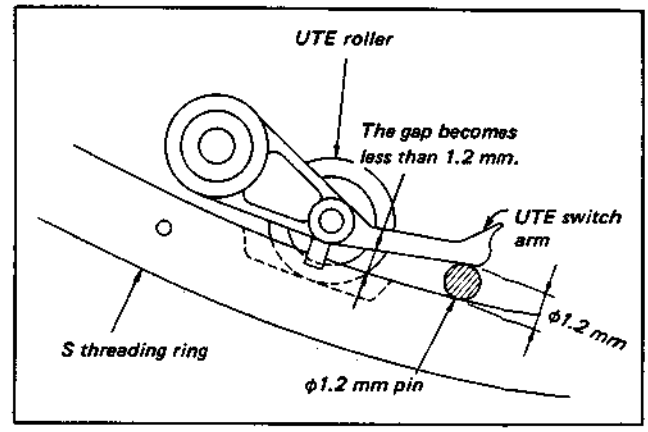


Fig. 3-29. Position of the pin when checking

[How to remove]

❶ Remove the screw, as shown in Fig. 3-30.
❷ Remove the claw of the switch from the chassis, and then remove the main body of the switch while holding the actuator in the ON position.

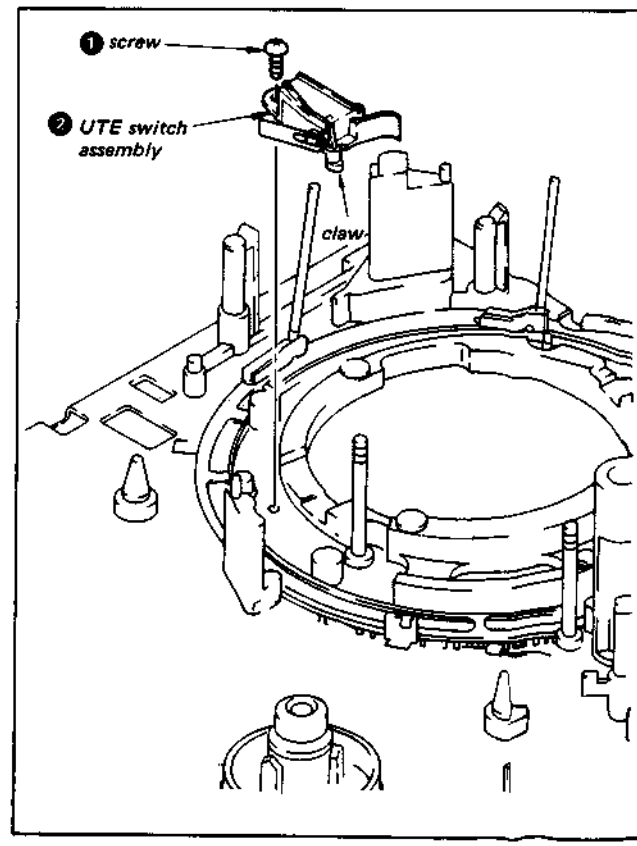


Fig. 3-30. Removal of the UTE switch

3-12. REMOVAL AND ADJUSTMENT OF THE REEL MOTOR SECTION

3-12-1. Removal of the Reel Motor Section

❶ Turn the unit so that the top surface of the main body faces down.
❷ Remove the four B2.6x8 tapping screws.
❸ Remove the counter belt.
❹ Remove the reel block.

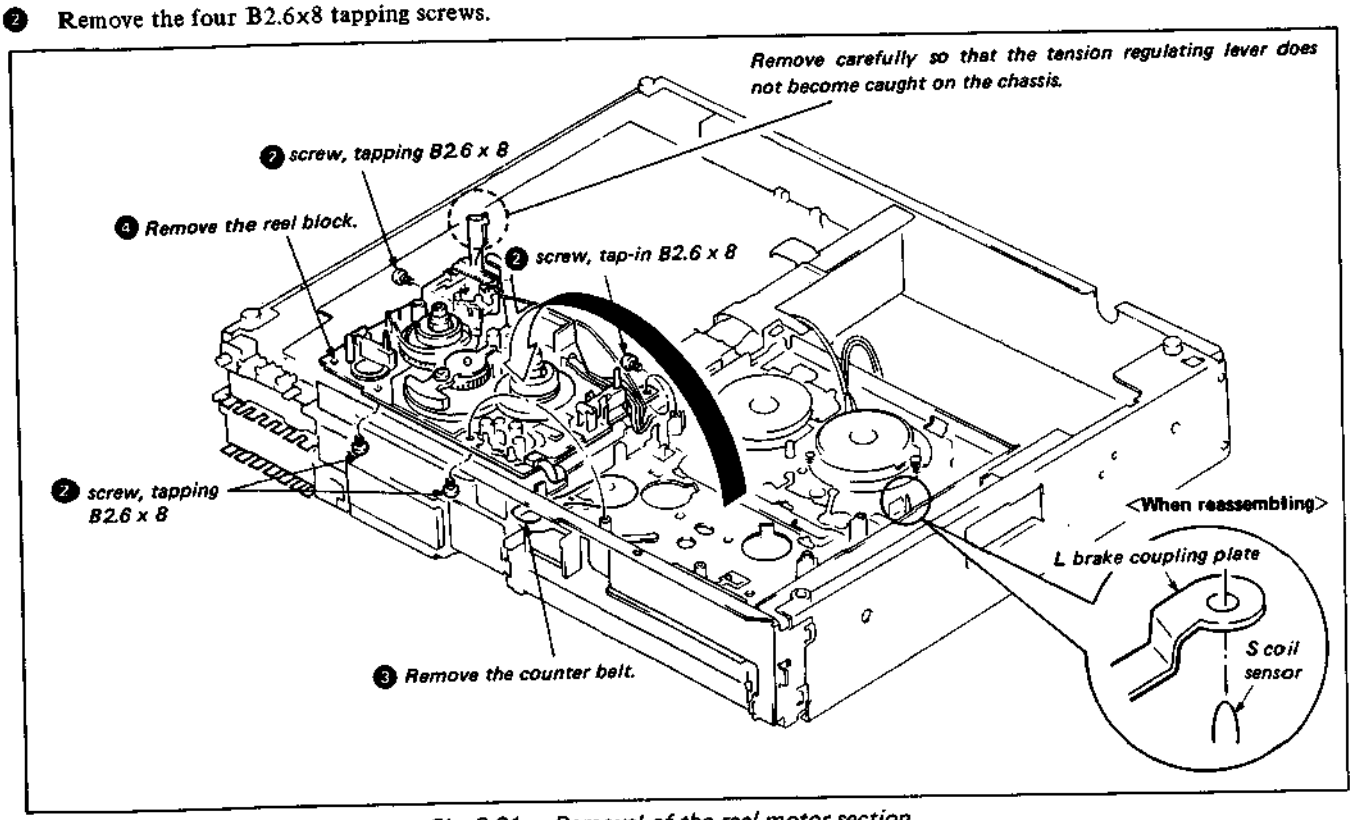


Fig. 3-31. Removal of the reel motor section

3-12-2. Adjustment of the Brake Plunger

1) Loosen the brake plunger fixing screw.
2) More the brake plunger in the direction of the arrow, and tighten the fixing screw just enough so that the plunger can move through a stroke of 2 mm.

Note:
The plunger should be 2 mm away from contact with the T brake.

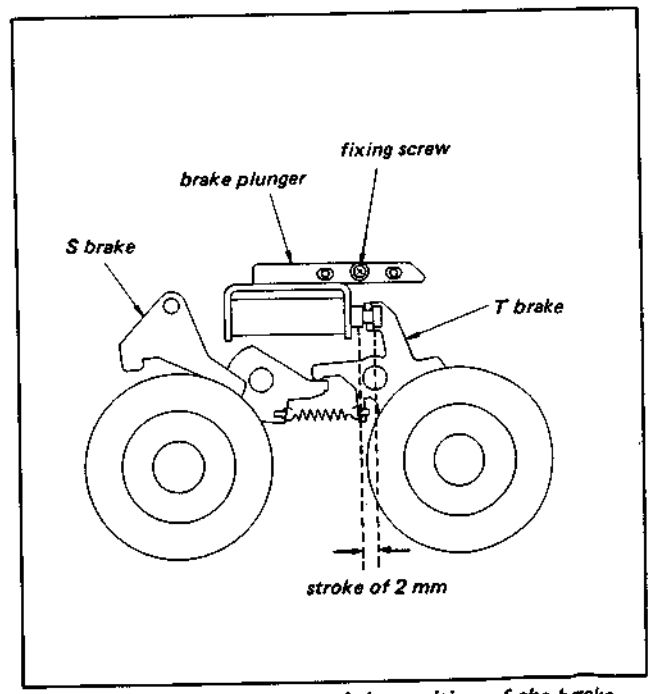


Fig. 3-32. Adjustment of the position of the brake plunger

3-12-3. Adjustment of the Soft Brake

[Method of checking]

1) Remove the cassette compartment section, and put the unit in the threaded state without a cassette.
2) As shown in Fig. 3-33, set a tension gauge (SL-0011) on the S reel table.
3) Set the unit in fast forward mode (free the S reel table), and pull the sector type gauge slowly.
4) Confirm that the reading of the sector type gauge is 8g.

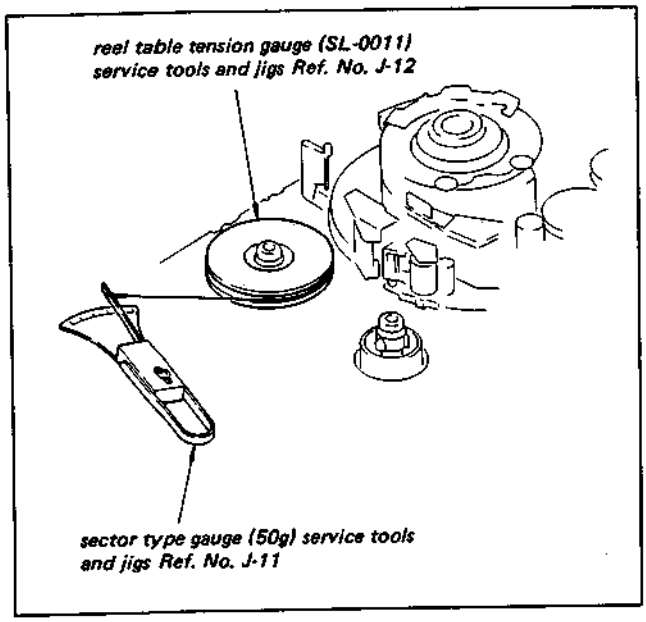


Fig. 3-33. How to check the soft brake

[Method of adjustment]

1) Adjust the position of the soft brake lever tension coil spring.

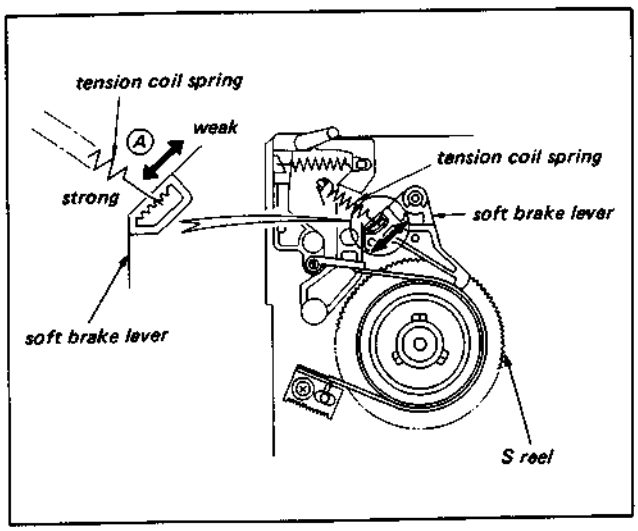


Fig. 3-34. Adjustment of the soft brake

3-12-4. 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. 3-35. 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.

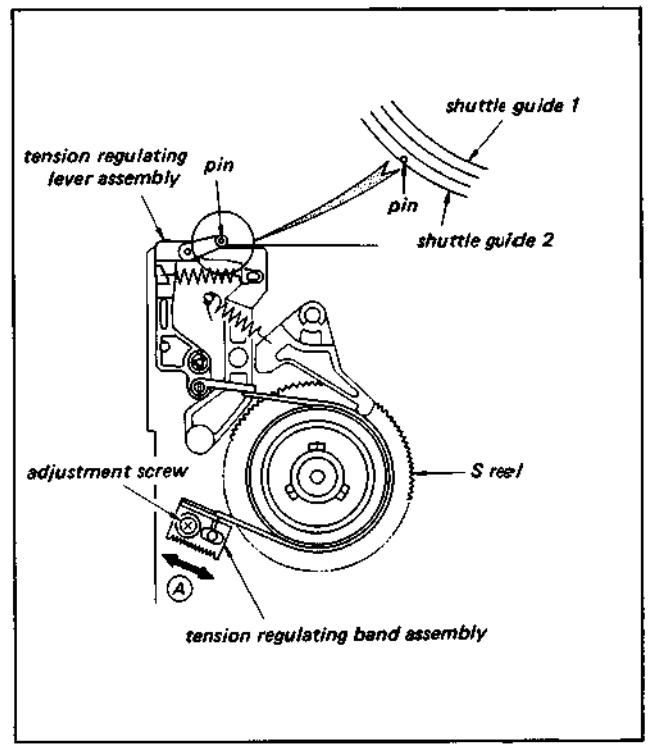


Fig. 3-35. Adjustment of the position of the tension regulating lever

3-13. ADJUSTMENT OF THE FORWARD AND BACK TENSION

Use a torque cassette (SL-0003C) for SL-2410/2415 forward and back tension measurement.

[Method of measurement]

1) Connect TP601 and TP602 on both sides of R608 on the SS-13 board to short them and stop the rotation detection.
2) Insert the torque cassette (SL-0003C) and put the unit in playback mode.
3) Read the value on the meter on the S reel side after the needle has gone around about once.
   The correct value is 30 g · cm ± 5 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 in 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.

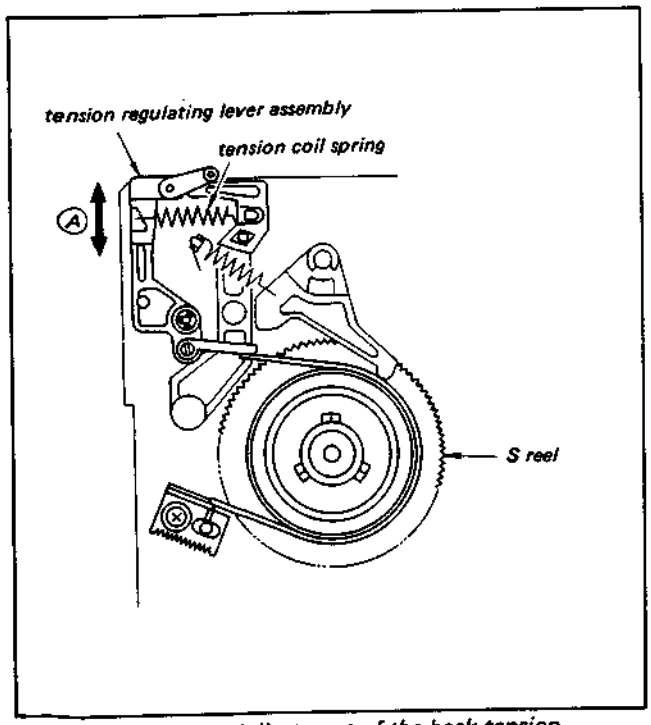


Fig. 3-36. Adjustment of the back tension

3-14. ADJUSTMENT OF THE FORWARD TORQUE

Use a torque cassette (SL-0003C) for SL-2410/2415 forward torque measurement.

[Method of measurement]

1) Connect TP601 and TP602, on both ends of R608, to short them and stop the rotation detection.
2) Insert the torque cassette (SL-0003C) and start to record a TV broadcast in βII mode.
3) Read the value on the meter on the T reel side after the needle has gone around about once. The correct range is 80 g · cm ± 5 g · cm.

[Method of adjustment]

1) Remove the front panel.
2) Turn variable resistor RV201 on FS-28 board to adjust the torque until its value falls within the correct range.

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.

SECTION 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

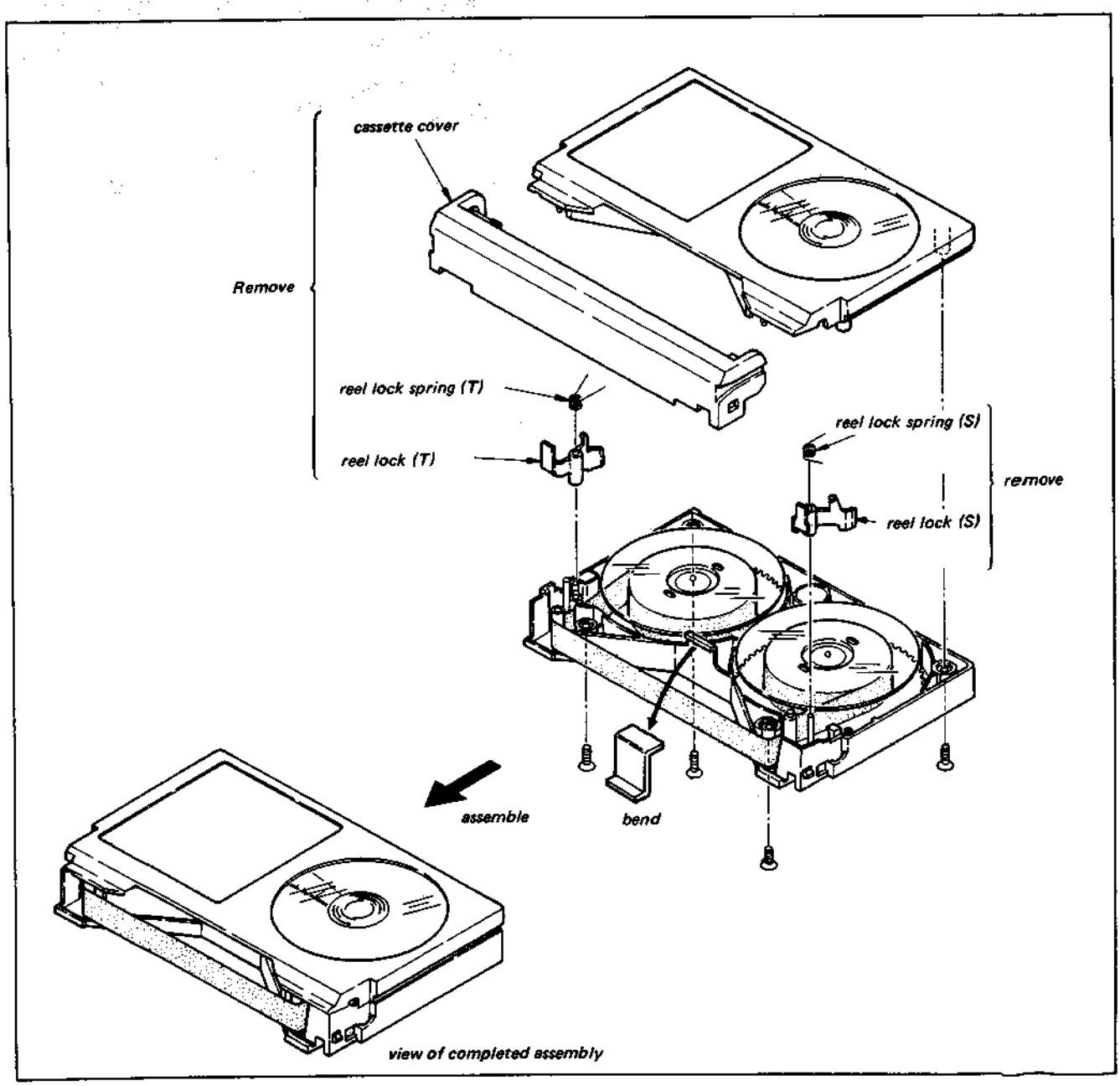


Fig. 4-1.

4-1-1. Preparation for Adjustment

1) Remove the cassette cover of the alignment tape in accordance with Fig. 4-1.
2) Clean the surfaces contacted by the traveling tape (tape guide, drum tape traveling surface, capstan shaft. pinch roller, ACE.FE head surface) with a chamois cloth dipped in methanol.
3) Connect the oscilloscope as follows:
   channel 1: CN3-pin ⑤ (RP-8 board)
   external trigger: CN3-pin ③ (RP-8 board)
4) Play back the 1 kHz signal on the tracking section of the alignment tape.
5) Confirm that the oscilloscope RF output waveform is flat and that the amplitude is 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 maximum, confirm that the fluctuations and contact of the RF 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.

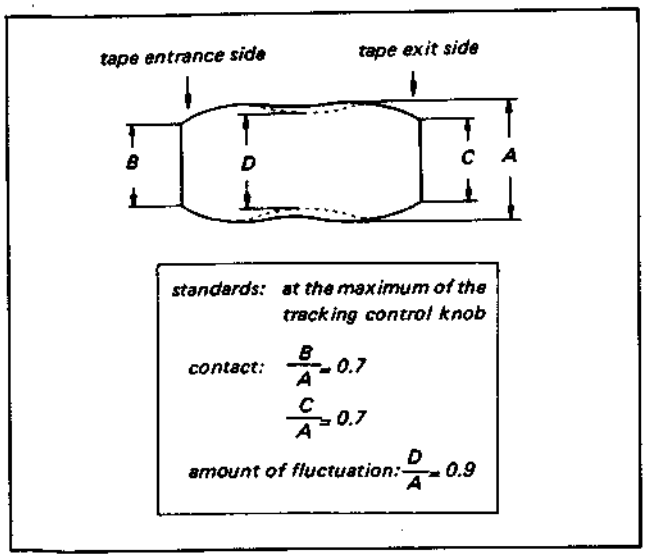
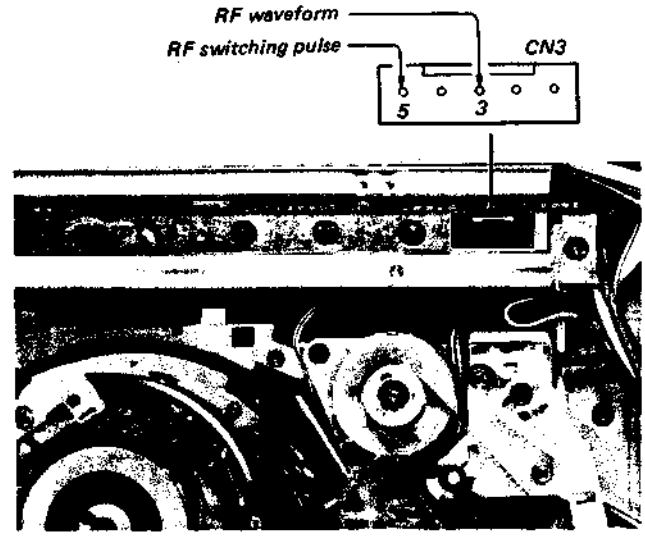


Fig. 4-2.



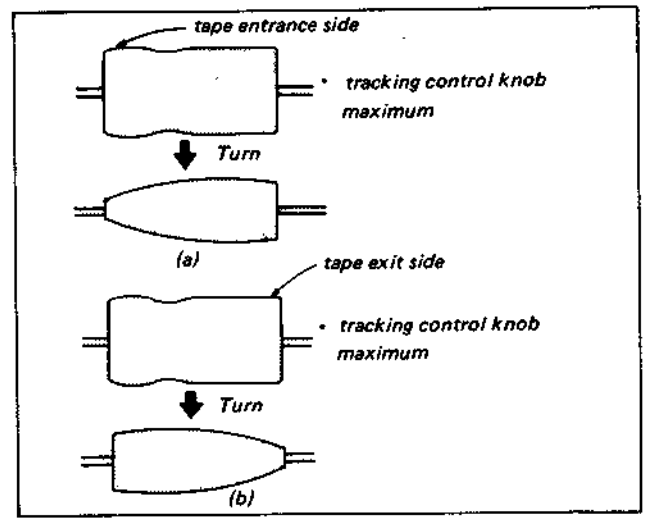


Fig. 4-3.

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 until the amplitude of the waveform is about 60% of its maximum.
3) Loosen No. 5 guide lock screw ❶ and turn the No. 5 guide until the entrance waveform sticks up a little above flat, 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 ❶, confirm that it is as in the figure below.

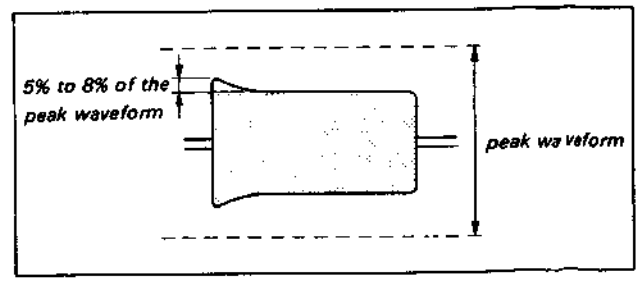


Fig. 4-4.

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 entrace side RF waveform, then let go and confirm that the waveform returns to what it was before.
6) In this condition, check space and curl of the No. 5 guide. If there are space 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.

[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 adjust plate of the No. 3 guide from the drum. Just before the lower tension of the tape becomes slack, tighten screw ❷.
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 space at the No. 5 guide]

Turn the No. 4 guide counterclockwise to run the tape upward and eliminate the space at the No. 5 guide.
Note:
At this time make sure that a large curl is not produced below the No. 4 guide.

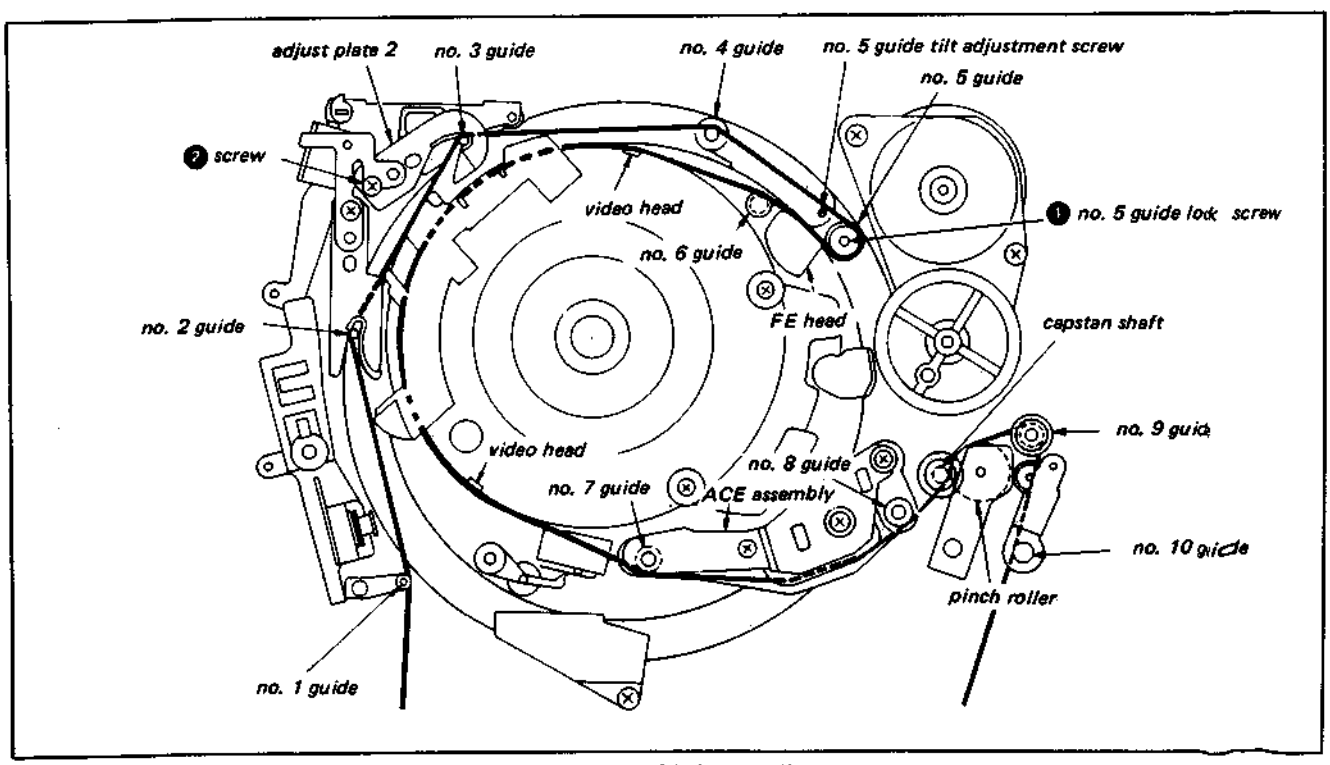


Fig. 4-5. Tape guide layout diagram

[What to do when there is curl]

1) When there is a gap below the No. 4 guide: Just before the lower tension on the tape becomes slack, move adjust plate 2 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 adjust 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.

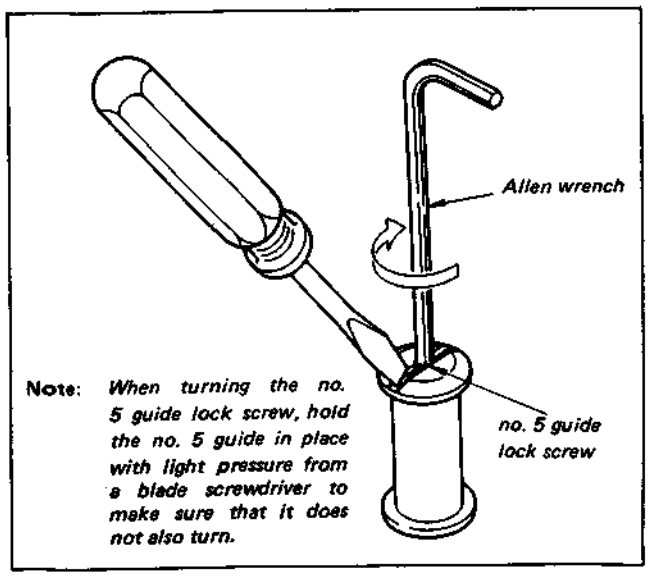


Fig. 4-6.

4-1-3. Exit Side Adjustment

1) Connect the oscilloscope to pin ⑤ on connector CN3 (on RP-8 board). Connect the external trigger to pin ③ on CN3.
2) Play the tracking section of the alignment tape. Adjust the tracking knob to reduce the amplitude of the RF output waveform to 60% of its maximum level.
3) Watch the RF 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 the exit free waveform.

   Note:

   Be careful not to raise the guides too far. They should be raised only about 0.3 to 0.5 mm, and the tape should not contact the lower flange of the ACE head.

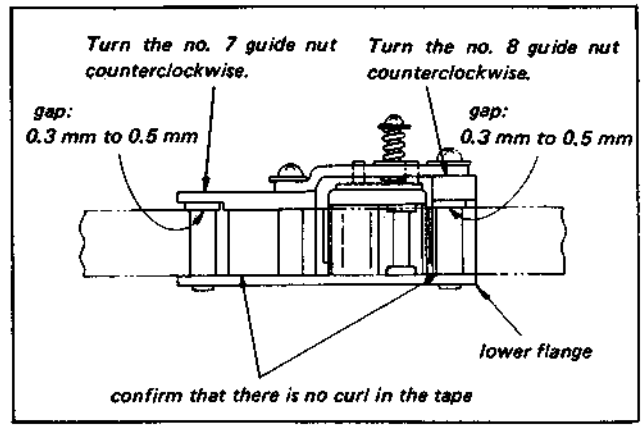


Fig. 4-7.

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.

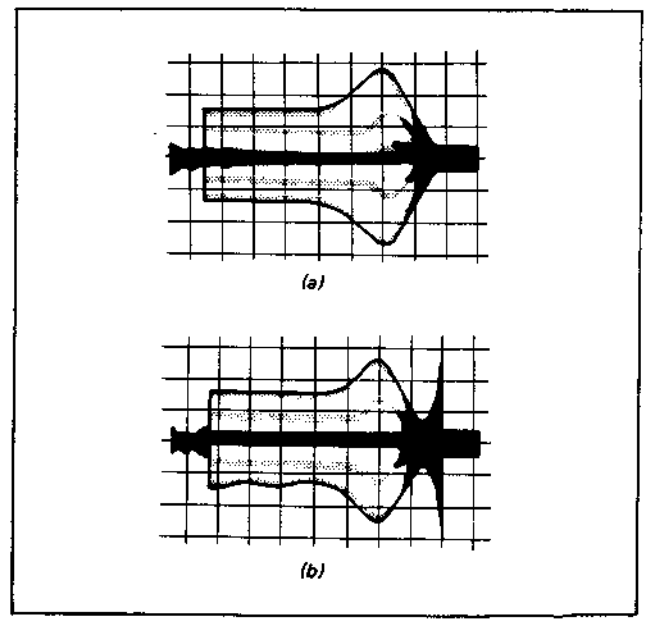


Fig. 4-8.

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 at the No. 7 guide or the No. 8 guide.
8) During rewind, confirm that no curl or space occurs at the No. 8 guide. If there is a curl or space, 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) up against the unit as shown in Fig. 4-9, and turn the tilt adjustment screw to adjust the audio head vertically.

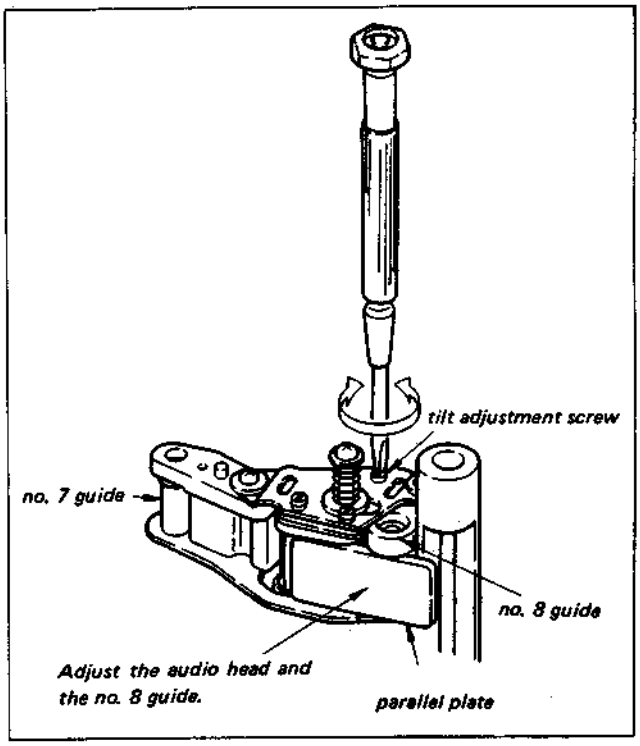


Fig. 4-9.

2) Connect the oscilloscope to pin ⑤ of connector CN3 (on RP-8 board). Connect the external trigger to pin ③ of CN3.
3) Play the tracking section of the alignment tape. Adjust the tracking knob until the RF output waveform amplitude is reduced to about 60% of its maximum level.
4) Raise the No. 7 and No. 8 guides (turn the respective guide nuts counterclockwise) and observe the RF exit free waveform when the tape runs free.

Note:

Be careful not to raise the guide too far. Raise it about 0.3 to 0.5 mm, and be careful that the tape does not contact the lower flange of the ACE head.

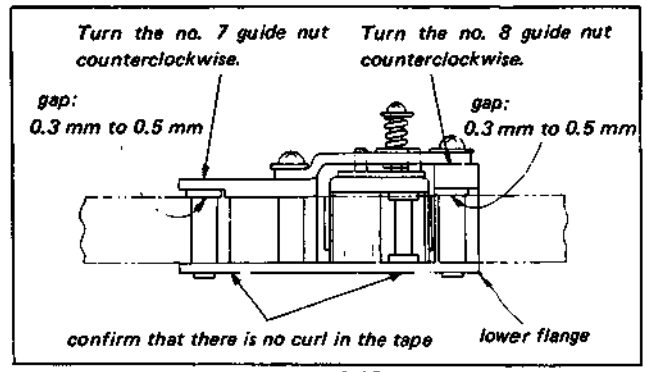


Fig. 4-10.

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

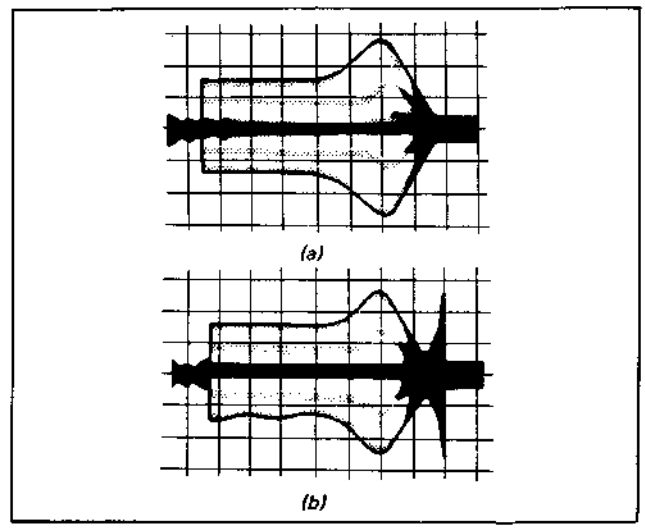


Fig. 4-11.

[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 adjustment screw counterclockwise to adjust until the waveform is within the required range.

Note:

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

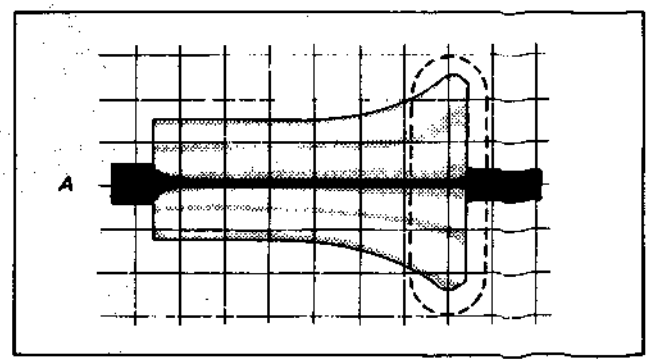


Fig. 4-12.

- 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 tightening direction (clockwise).

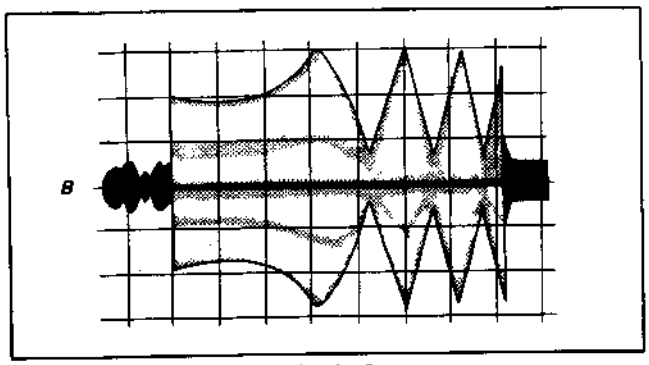
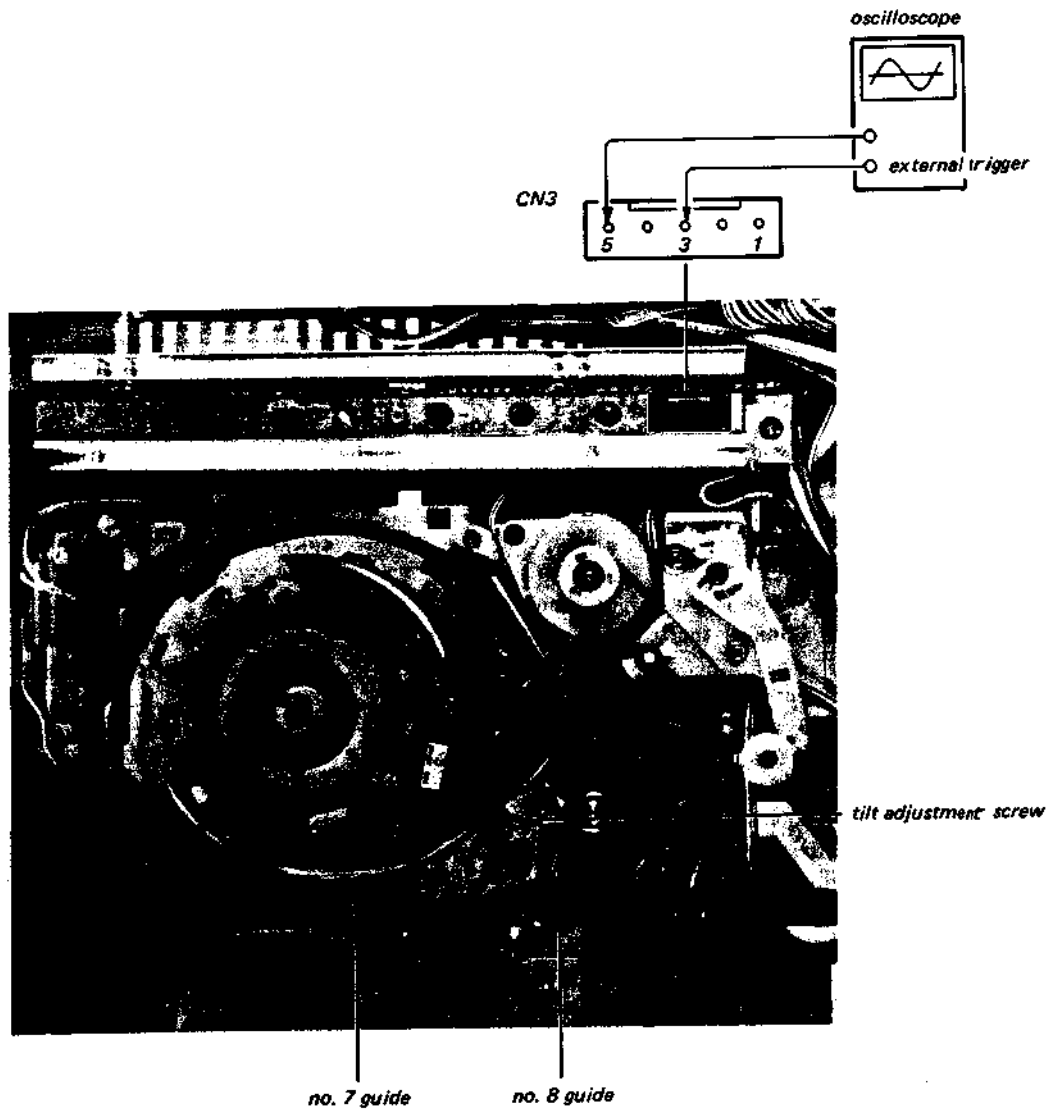


Fig. 4-13.

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 RF output waveform is as shown in Fig. 4-12 on the exit side, repeat the adjustment.

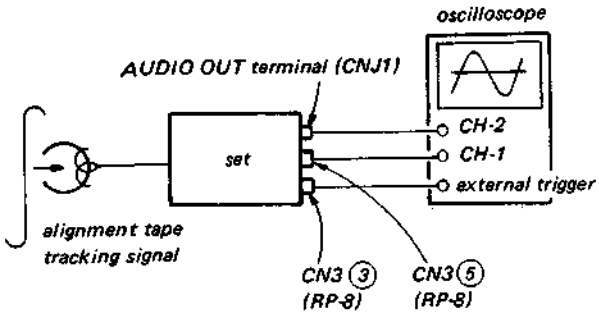
[Adjustment Location]



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.

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 RF output waveform 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).

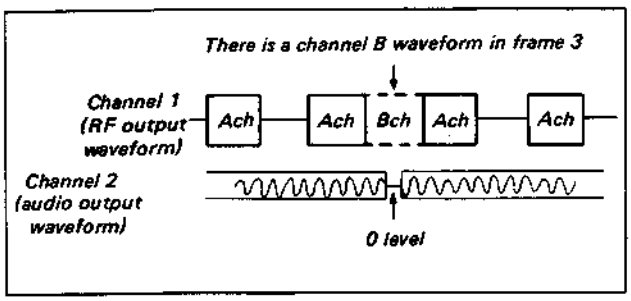


Fig. 4-14.

3) Tracking center adjustment
   Refer to electrical adjustment 2 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 a tool such as a blade screwdriver to slide the ACE assembly to where the RF output waveform amplitude becomes 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.

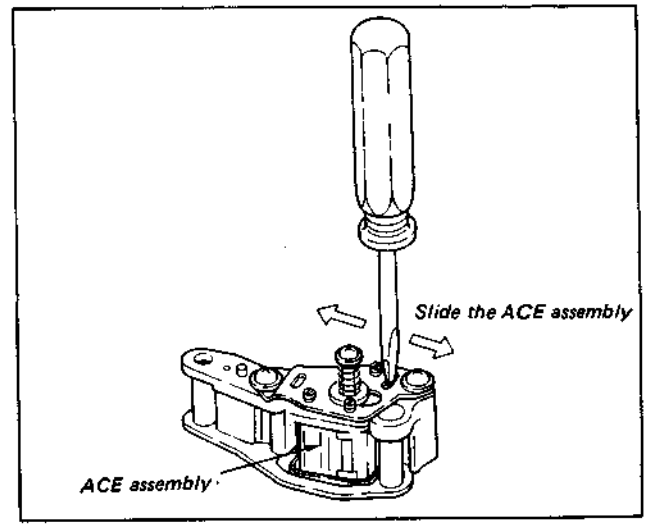
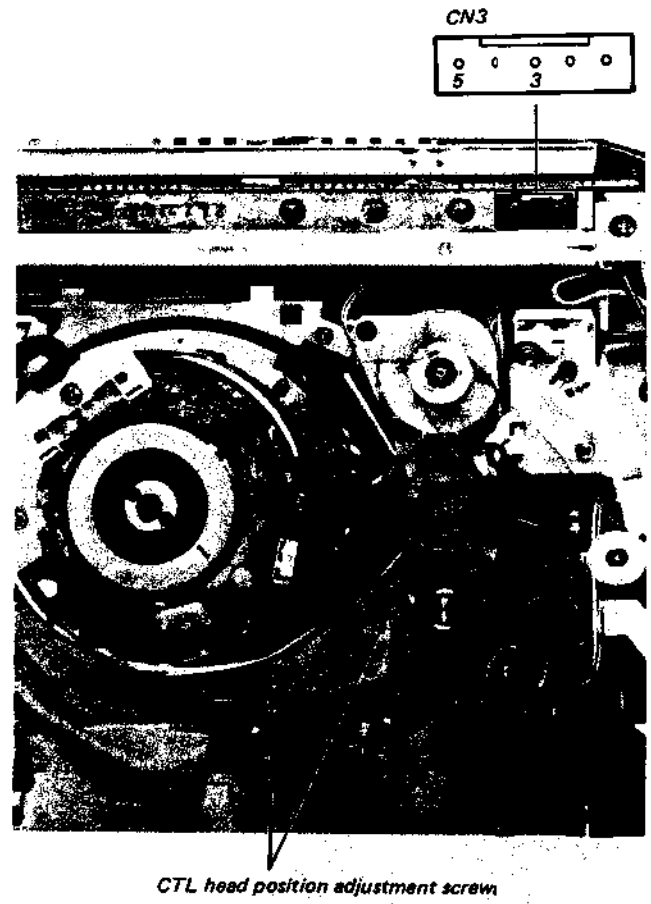


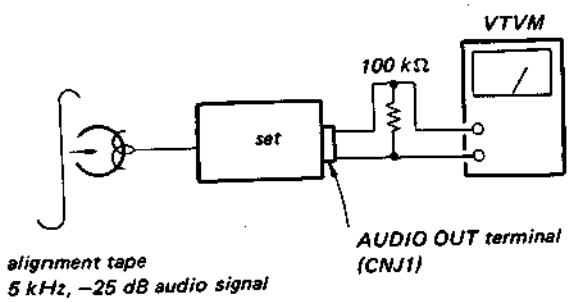
Fig. 4-15.

[Adjustment Location]



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

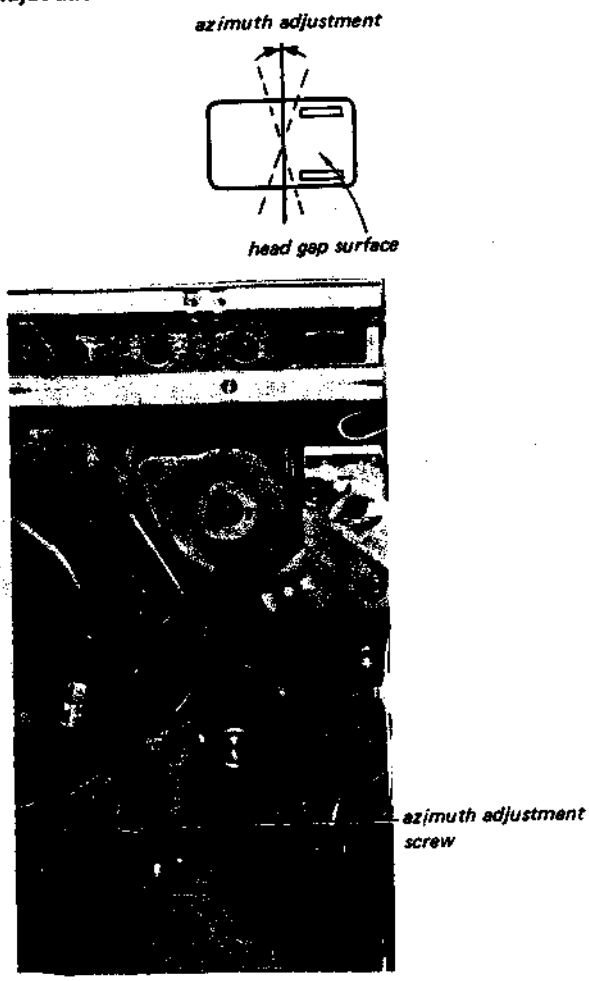
Playback



[Method of adjustment]

1) Play the 5 kHz, −25 dB audio signal section of the alignment tape.
2) Adjust the azimuth adjustment screw until the output level (VTVM indication) is maximum.
   Note:
   Complete the adjustment by turning the adjustment screw in the tightening direction (clockwise).
3) After adjustment, lock the adjustment screw.

[Adjustment Location]

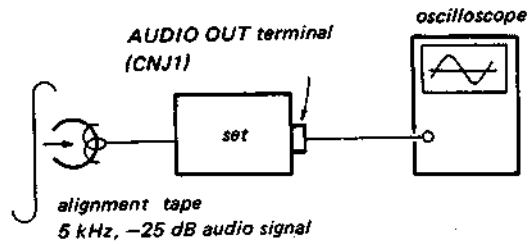


4-2-4. Audio Head (ACE Assembly) Height Adjustment

[Condition]

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

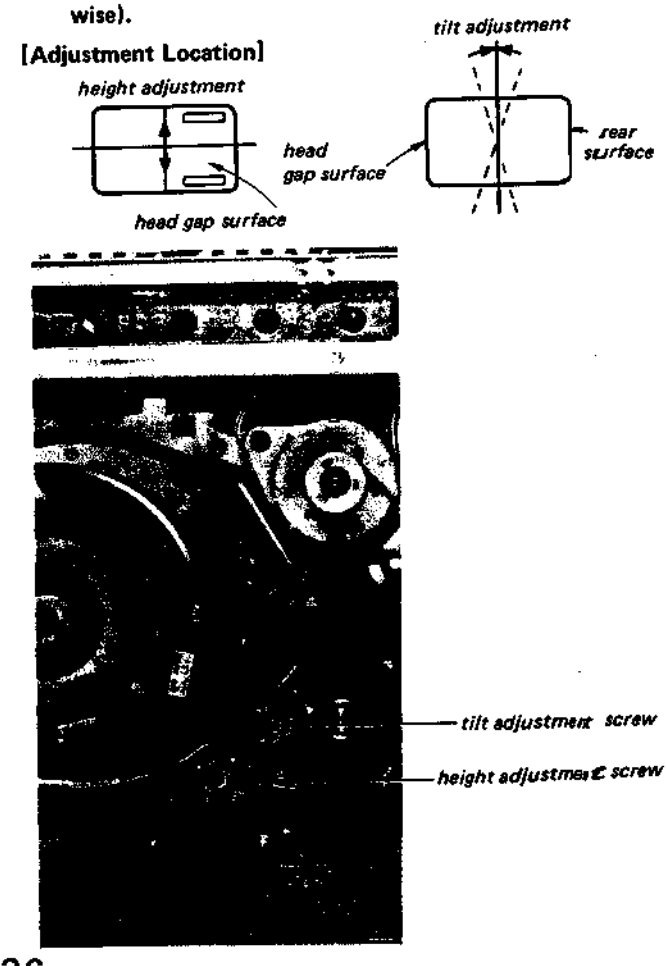
Playback



[Method of adjustment]

1) Play the 5 kHz, −25 dB audio signal section of the alignment tape.
2) Adjust the height adjustment screw and the tilt adjustment screw so that the amplitude of the audio line output waveform (5 kHz) becomes maximum.
   Note:
   Both of these adjustment screws must be turned in the same direction and at the same angle, and not more than ±30°. Complete the adjustment by turning the adjustment screws in the tightening direction (clockwise).

[Adjustment Location]



4-3. ADJUSTMENTS AFTER REPLACEMENT OF THE CAPSTAN MOTOR

When the capstan motor has been removed or replaced, perform the following adjustments.

4-3-1. Capstan shaft vertical adjustment

4-3-2. Exit side tracking adjustment

4-3-1. Capstan Shaft Vertical Adjustment

1) Set the parallel plate (SL-0657) up against the No. 10 guide vertically, as shown in Fig. 4-16.
2) Loosen the mounting screw, then turn the adjustment screw until the capstan motor shaft is vertical.
   until the capstan motor shaft is vertical.
3) After the adjustment, tighten the mounting screw.

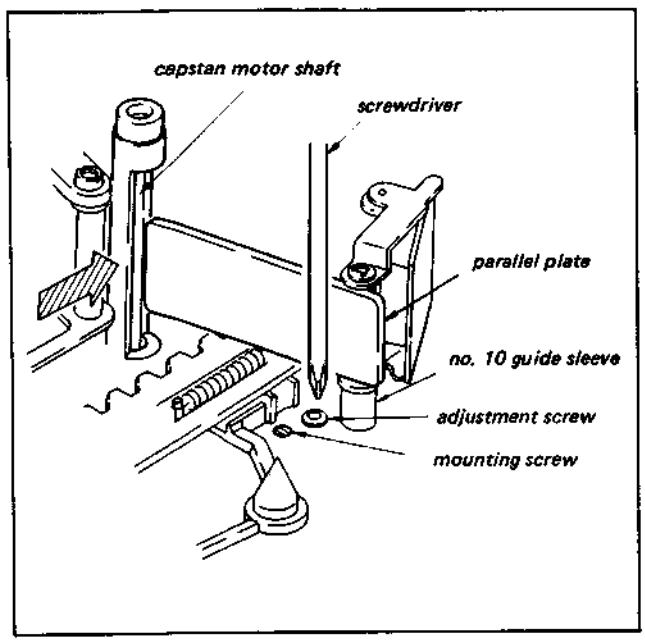


Fig. 4-16.

4-3-2. Exit Side Tracking Adjustment

1) Connect an oscilloscope to pin ⑤ of connector CN3 on RP-8 board. Then connect the external trigger to pin ③ of CN3.
2) Play the tracking section of the alignment tape. Adjust the tracking knob until the amplitude of the RF output waveform is reduced to about 60% of its maximum level.
3) Raise the No. 7 and No. 8 guides (turn the respective guide nuts counterclockwise) to free the running of the tape, and observe the RF exit free waveform.
   Note:
   Be careful not to raise the guides too far. Raise them about 0.3 to 0.5mm. Make sure that the tape does not touch the lower flange of the ACE head.

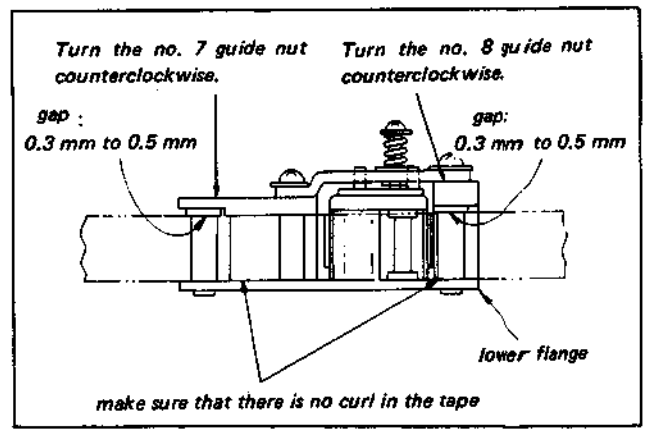


Fig. 4-17.

4) At this time, confirm that the exit free waveform is within the range shown Fig. 4-18(a) and (b).

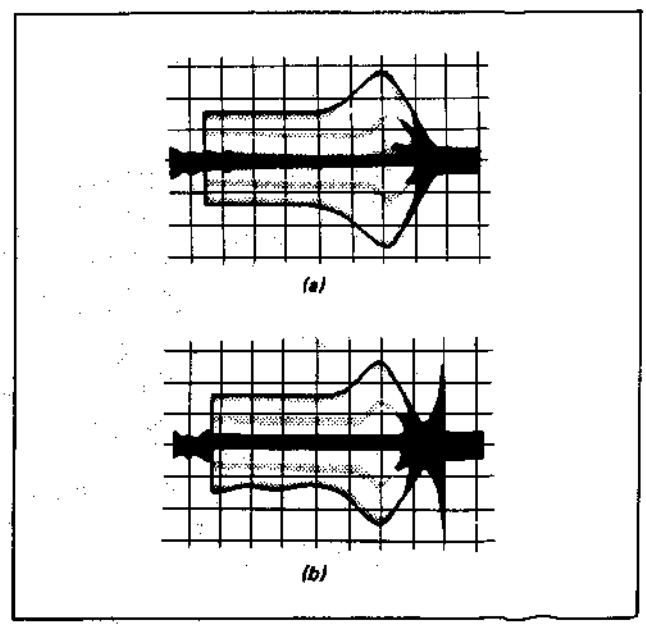


Fig. 4-18.

[When the waveform is out of range]

- When the exit free waveform is out of the correct range, and is in the form shown in Fig. 4-19, adjust as follows.
  Loosen the capstan mounting screw, then turn the adjustment screw counterclockwise until the waveform falls within the range shown in Fig. 4-18(a) and (b).
  Note:
  When turning the adjustment screw, wait (10 to 15 seconds) until the waveform becomes stable before adjusting further.
  Complete the adjustment by turning the adjustment screw in the tightening direction (clockwise).

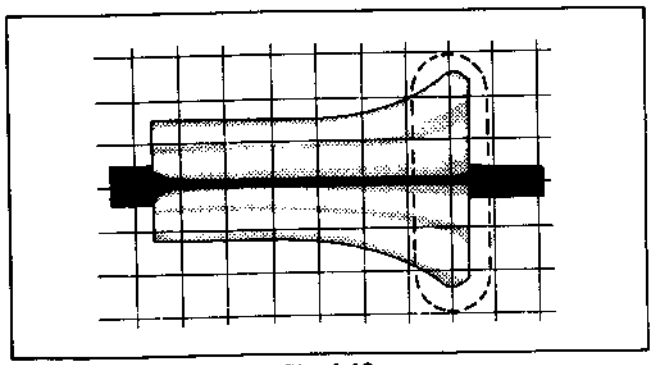


Fig. 4-19.

- If the exit waveform is outside of its correct range and has the form shown in Fig. 4-20, adjust as follows. Loosen the capstan mounting screw, then turn the adjustment screw clockwise until the waveform is brought within the range shown in Fig. 4-18(a) and (b).

Note:
When turning the adjustment screw, wait (10 to 15 seconds) until the waveform becomes stable before adjusting further. Complete the adjustment by turning the adjustment screw in the tightening direction (clockwise).

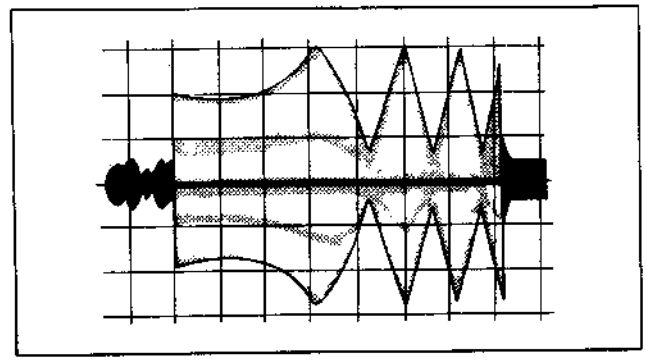
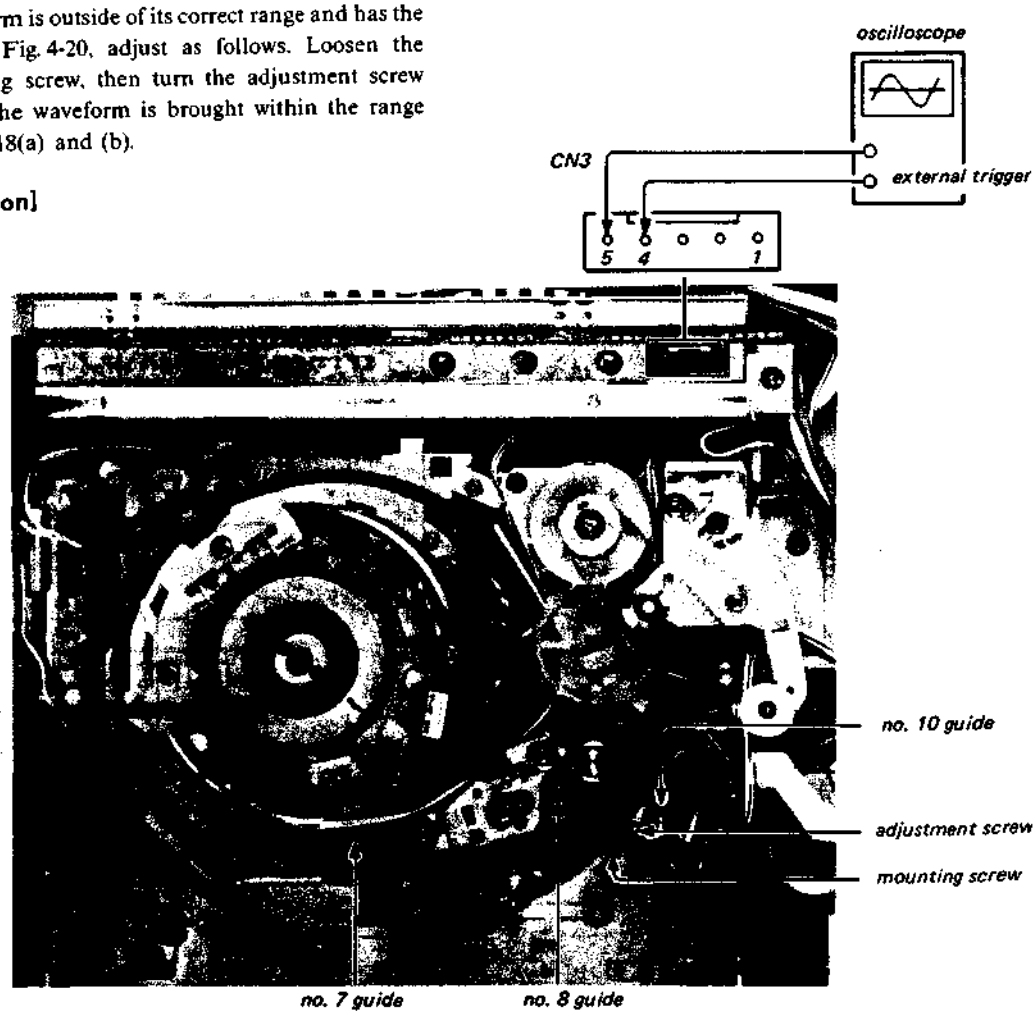


Fig. 4-20.

5) Tighten the mounting screw.
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 until there is no curl just before the waveform changes.)
8) If the exit waveform rises, use the No. 7 guide to flatten it and then line the No. 8 guide up again.

[Adjustment Location]



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

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

1) Prepare one L-830 reel. Remove the cassette cover referring to Fig. 4-1 of the adjustment manual.
   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 does not contact the upper flange of the No. 4 guide or the No. 6 guide, and is not damaged. (Some tape curl is allowed but the tape must not be creased.) (Fig. 4-21)
   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. 4-22)
   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 manual.
      If the tape is not running correctly on the entrance side, refer to section 4-1-2 of the adjustment manual. If the tape is not running correctly on the exit side, refer to section 4-1-3 of the adjustment manual.

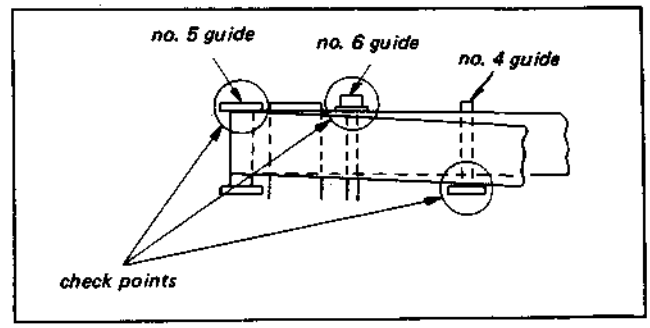


Fig. 4-21.

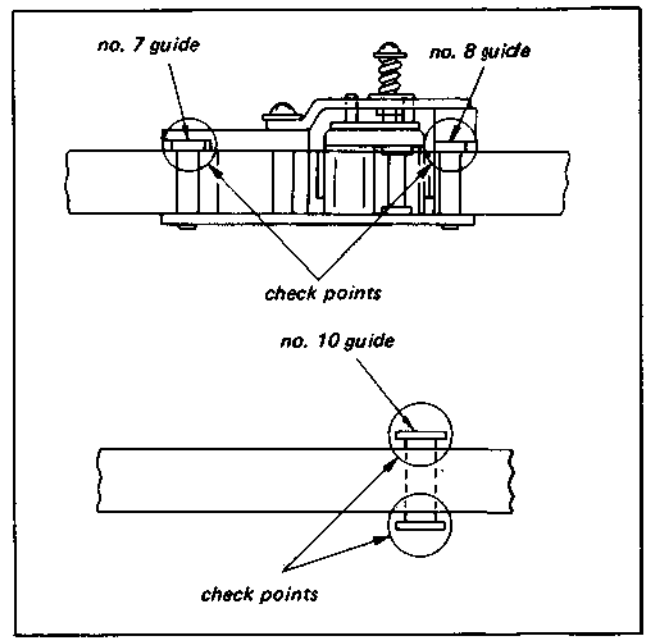


Fig. 4-22.

SECTION 5
ELECTRICAL ADJUSTMENTS

All of the instructions needed to adjust the electrical circuits in this set are given in this section.

[Instruments and tools needed]

(1) Color TV
(2) Single or double-trace oscilloscope, 15 MHz band or above, with delay mode
(3) Frequency counter (4 digits or more)
(4) NTSC pattern generator
(5) Digital voltmeter
(6) Multitester (20 kΩ/V)
(7) Audio generator
(8) Attenuator
(9) Distortion meter
(10) Alignment tape (KR5-1M) Part No.: (8-969-995-82)
(11) Adjustment screwdriver (for use in adjusting semi-fixed resistors and coils) Part No.: 7-700-733-01

[Setup for adjustments]

For these adjustments connect the NTSC pattern generator to the SL-2410/2415 VHF antenna terminal, and use the output of the pattern generator as the RF input signal. This RF signal is processed by the internal tuner in the VTR and the IF circuit. The video output signal from the IF circuit must satisfy the specifications shown in the diagram below. Connec the oscilloscope to TP2 on YC-27 board to check the video output signal.

The items to be checked are the following:

(1) The amplitude of the horizontal sync signal must be about 0.3Vp-p.
(2) The amplitude of the video signal must be about 0.7 Vp-p.
(3) The amplitude of the burst signal must be about 0.3 Vp-p. The video (color bar) signal used in the adjustments is shown in Fig. 5-1.

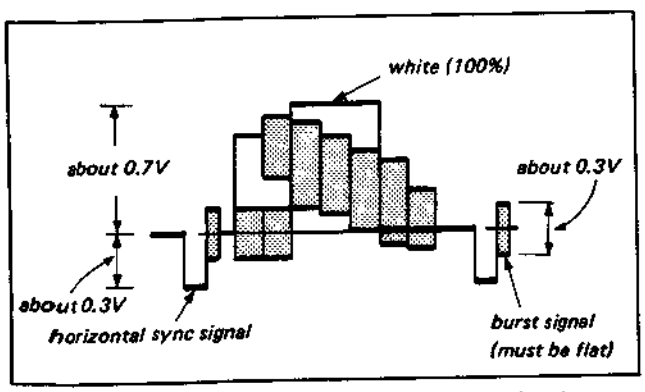


Fig. 5-1. Pattern generator color bar signal

contents of the KR5-1M alignment tape

	mode	video signal	audio signal	time
1	βII	Color Bar	3kHz −5dB	4 minutes each
2		Monoscope	333Hz −25dB	
3		RF sweep	5kHz −25dB	
4		Tracking	1kHz −5dB	
5	βIII	Color Bar	3kHz −5dB	
6		Monoscope	5kHz −25dB	

[On the color bar signal]

The 75% color bar signal recorded on the alignment tape is shown in Fig. 5-3.

Note:

Measured at TP2 on YC-27 board. (75Ω terminated)

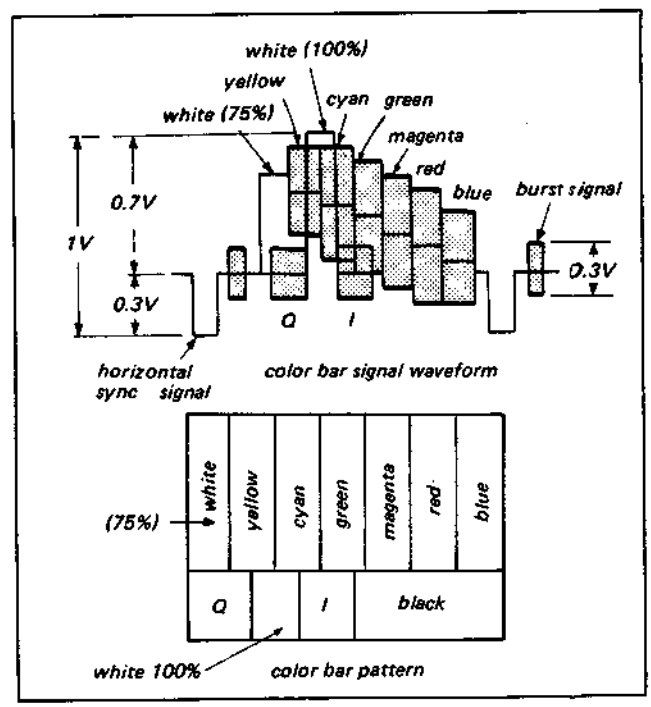


Fig. 5-2. Color bar signal an the alignment tape

[Method of terminating in 75Ω]

To terminate the video output terminal (YC-27 board, TP2), do as shown in Fig. 5-3.

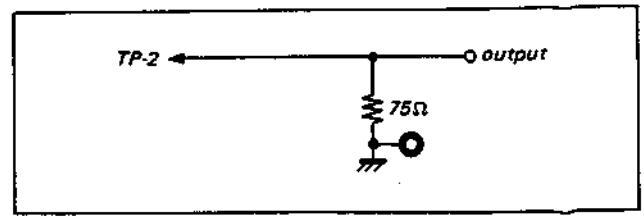


Fig. 5-3. 75Ω termination

VR Adjustment Jig Screwdriver

Please use a special jig screwdriver for printed circuit board variable VR and inductance adjustment. A regular screwdriver is too large and difficult to use when adjusting the VRs from the printed pattern side, so the jig screwdriver shown in Fig. 5-4 has been prepared. The metal end of the screwdriver is for VR and trimmer capacitor adjustment.

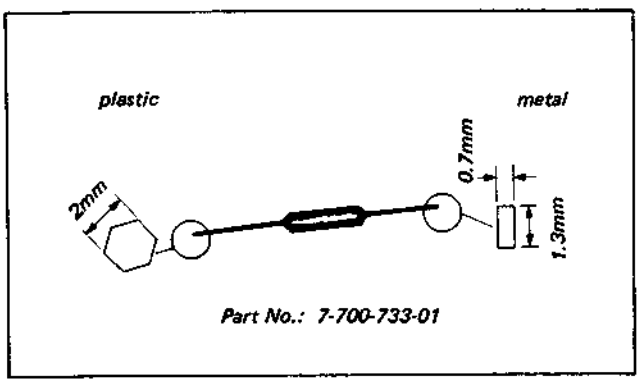


Fig. 5-4. Adjustment Jig screwdriver

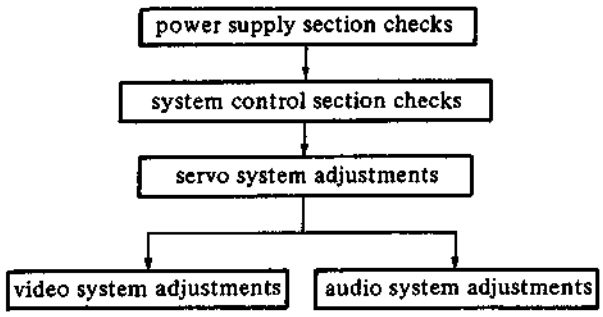
[Standard input/output levels and impedances]

Input and output terminals

Video input:	pin jack input signal: 1Vp-p ±0.5Vp-p, 75Ω unbalanced, negative sync
Video output:	pin jack output signal: 1Vp-p ±0.5Vp-p, 75Ω unbalanced, negative sync
Audio input:	pin jack input level: −10 dBs (0 dBs = 0.775 Vrms) input impedance: 47 kΩ or higher
Audio output:	pin jack output: −10dBs (0.25Vrms) at 100 kΩ negative load load impedance: 10 kΩ or higher
Microphone input:	mini jack −60 dBs. for low impedance use

[Adjustment procedure]

Adjust according to the procedure described below.



5-1. POWER SUPPLY SECTION CHECKS

Perform these measurements in E-E mode.

1. Unregulated Switch 16V Check (PS-27 Board)
The voltage between pin ① of CN2 and pin ⑤ on the ground side should be 19V ± 3V.

2. Unregulated Switch 45V Check (PS-27 Board)
The voltage between pin ① of CN4 and pin ④ on the ground side should be 50V ± 5V.

3. Unregulated Switch −12V Check (PS-27 Board)
The voltage between pin ② of CN4 and pin ④ on the ground side should be −12.0V ± 1.5V.

4. Switched (REG) 12V (PS-27 Board)
The voltage between pin ② of CN2 and pin ⑤ on the ground side should be 12V ± 0.15V.

5. Switched (System) 12V (PS-27 Board)
The voltage between pin ⑥ of CN2 and pin ⑨ on the ground side should be 12V ± 0.15V.

5-2. SYSTEM CONTROL SECTION CHECKS (SS-13 board)

Perform these measurements in E-E mode.

1. Clock Oscillator Frequency Check
Measure at the external clock input pin of the system control IC (pin ㊷ of ICs 401 and 402) on SS-13 board.

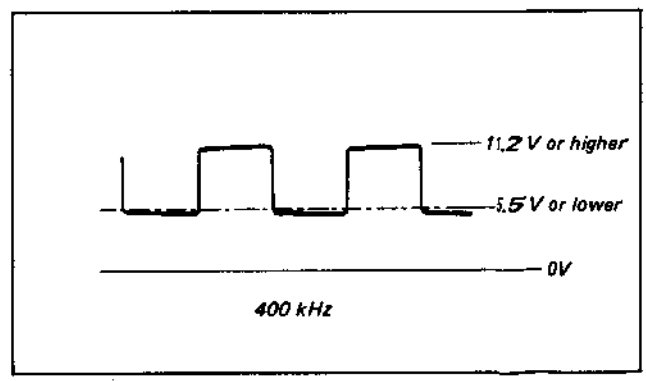


Fig. 5-5. Clock oscillation frequency check

5-3. SERVO SYSTEM ADJUSTMENTS

[Adjustment procedure]

5-3-1. Drum Servo System

1. Voltage checks
2. Clock check
3. Drum free speed adjustment
4. RF switching position adjustment
5. Drum f_H correction adjustment

5-3-2. Capstan Servo System

1. Capstan free speed adjustment
2. Tracking center adjustment

5-3-1. Drum Servo System Adjustments (SS-13 board)

1. Voltage checks

IC1 pin ㉚ ..... 5.7V ± 0.3V

IC1 pin ⑦ ..... 8.95V ± 0.3V

IC1 pin ⑩ ..... 3.4V ± 0.3V

2. Clock check

Measure the waveform at pin ㉘ of the servo IC (IC1).

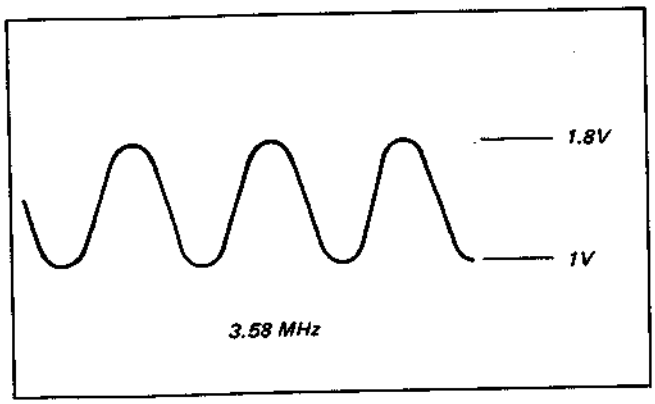
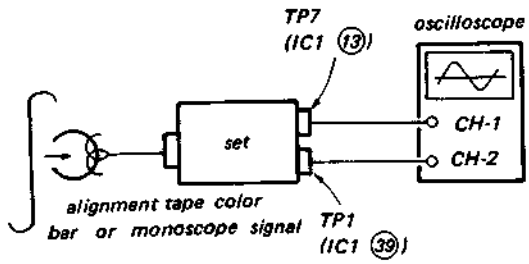


Fig. 5-6. Clock check

3. Drum free speed adjustment (SS-13 board)

Mode: Playback



[Method of adjustment]

1) Play the color bar signal or the monoscope signal on the alignment tape.
2) Adjust to 350 μsec ± 10 μsec using RV4. (See Fig. 5-7.)

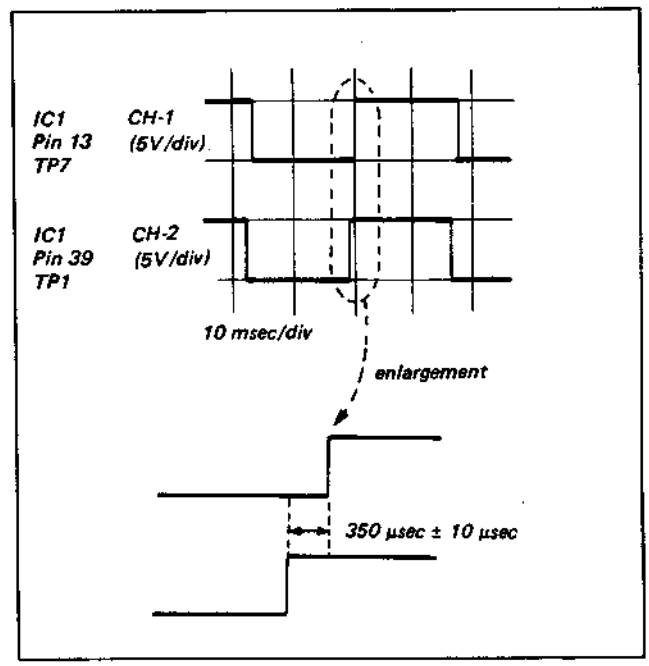
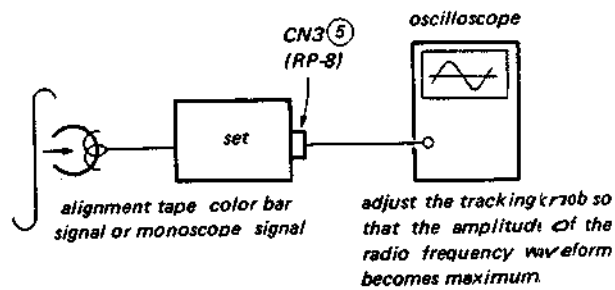


Fig. 5-7. Drum free speed adjustment

4-1. RF switching position adjustment 1 (RP-8 board)

Mode: Playback

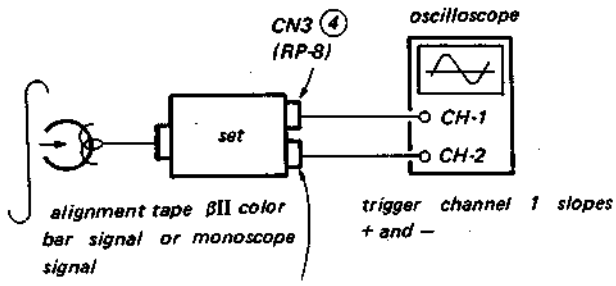


[Method of adjustment]

1) Play the color bar signal or the monoscope signal on the alignment tape and adjust the tracking knob so that the amplitude of the RF waveform pin ⑤ of CN3 becomes maximum.

4-2. RF switching position adjustment 2 (RP-8, SS-13 boards)

Mode: Playback



[Method of adjustment]

1) Set the trigger slope of the oscilloscope to +.
2) Adjust RV6 (PG.A) (on SS-13 board) so that the time from the falling edge of the channel 1 waveform to the vertical sync signal on channel 2 becomes 7H ± 1H lines.

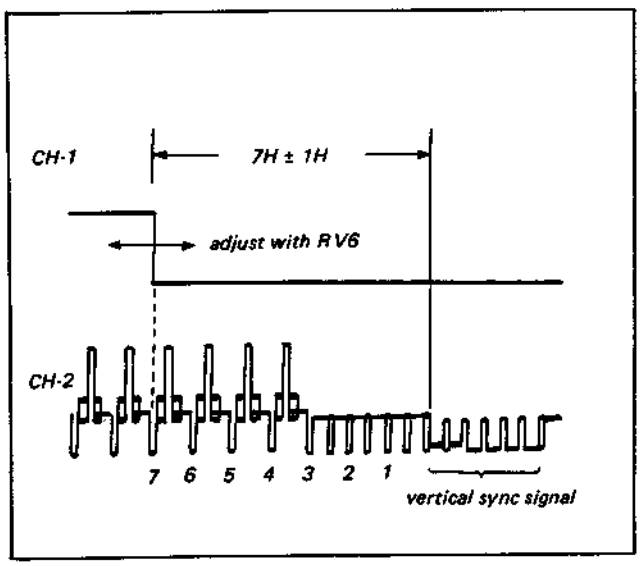


Fig. 5-8. RF switching position adjustment

3) Set the oscilloscope trigger slope to –.
4) Adjust RV5 (PG.B) (on SS-13 board) so that the time between the rising edge of the channel 1 waveform and the vertical sync signal on channel 2 becomes 7H ± 1H lines.

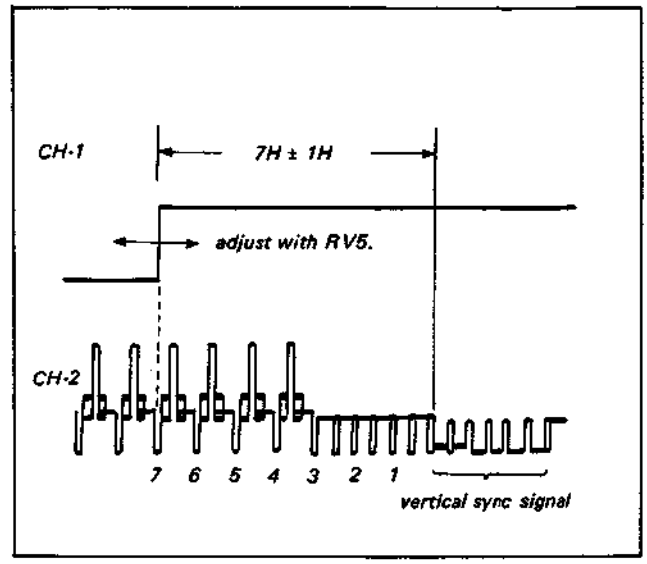
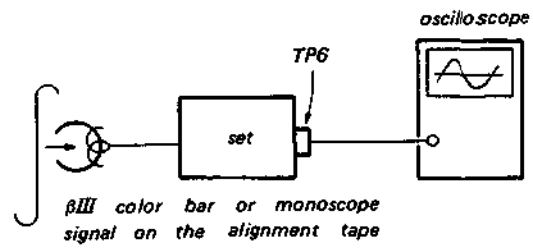


Fig. 5-9. RF switching position adjustment

5. Drum f_H correction adjustment (SS-13 board)

Mode: Picture search



[Method of adjustment]

1) Run the set in picture search mode over the βIII color bar signal or the monoscope signal section of the alignment tape.
2) While running the picture search (◀◀: REVIEW), adjust RV9 so that the interval shown in the diagram below becomes 63.62 μsec ± 0.1 μsec.

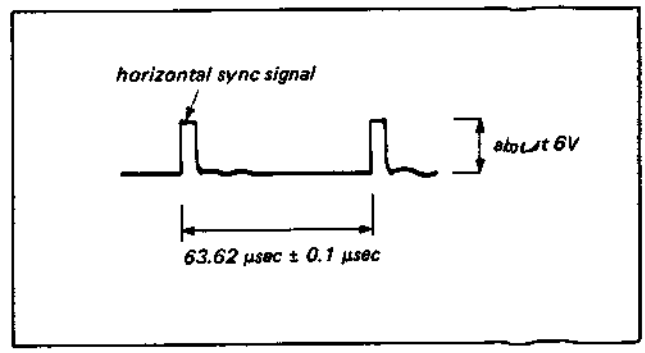
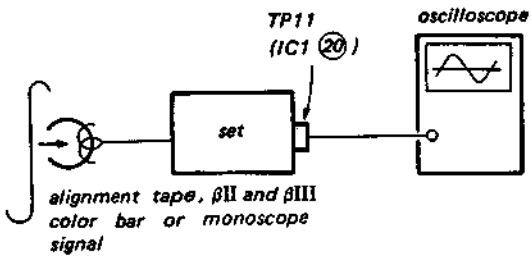


Fig. 5-10. Drum f_H correction adjustment

5-3-2. Capstan Servo System Adjustment (SS-13 board)

1. Capstan free speed adjustment

Mode: Playback



[Method of adjustment]

• βII mode

1) Play the βII color bar signal or the monoscope signal on the alignment tape.
2) Adjust RV3 so that the duty ratio of the waveform on the oscilloscope becomes 50%.
   After adjustment, check the FG signal period at pin ⑰ of IC1.

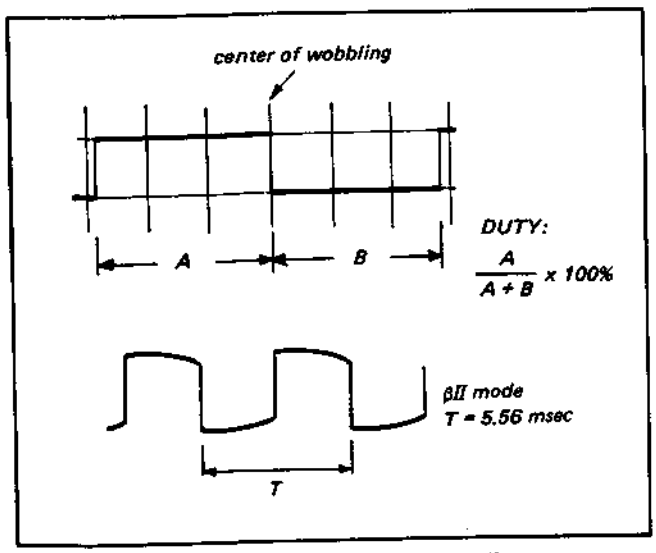


Fig. 5-11. βII capstan free speed adjustment

• βIII mode

3) Play the βIII color bar signal or monoscope signal on the alignment tape.
4) Adjust RV2 so that the duty ratio of the waveform on the oscilloscope becomes 50%.
   After adjustment, check the FG signal period at pin ⑰ of IC1.

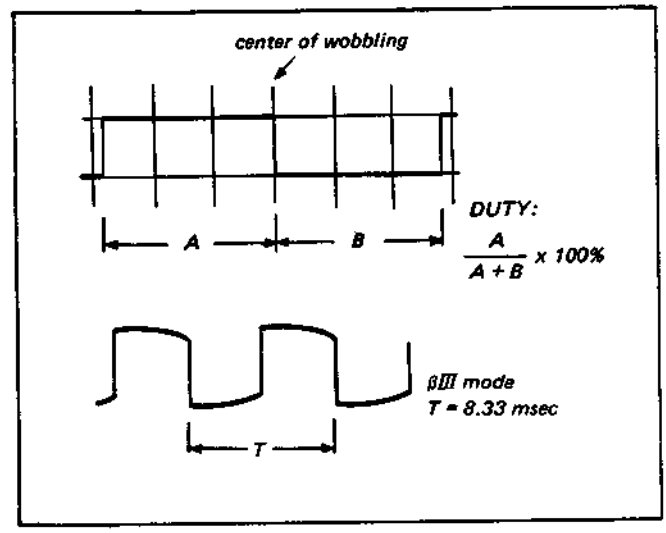


Fig. 5-12-1. βIII capstan free speed adjustment

• βI mode

5) Load a blank tape and set the unit to the REC mode. Make a connection between pin ㉑ (12V) and pin ㉚ (βI MODE OUT), of IC402, and set the unit to the βI REC mode.
6) Adjust RV1 so that the duty ratio of the waveform on the oscilloscope becomes 50%.
   After adjustment, check the FG signal period at pin ⑰ of IC1.

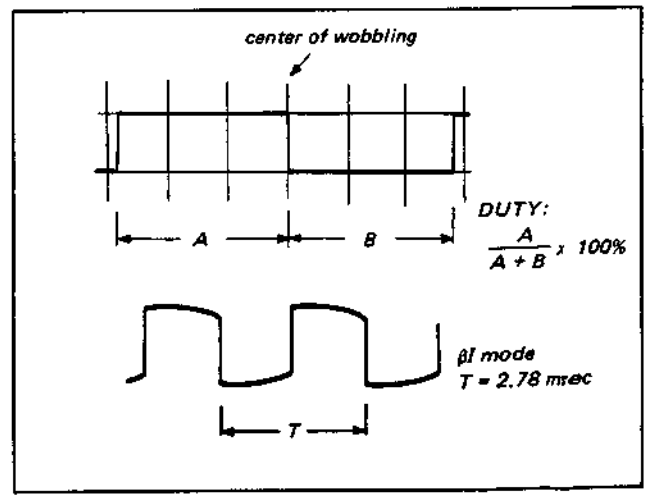
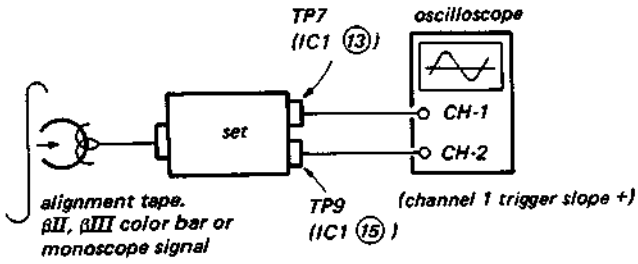


Fig. 5-12-2. βI capstan free speed adjustment

2. Tracking center adjustment (SS-13 board)

Mode: Playback



[Method of adjustment]

1) The tracking knob must be set to the center click position.
2) Adjust RV8 until the interval shown in the diagram below becomes 860 μsec ± 50 μsec. (See Fig. 5-13.)

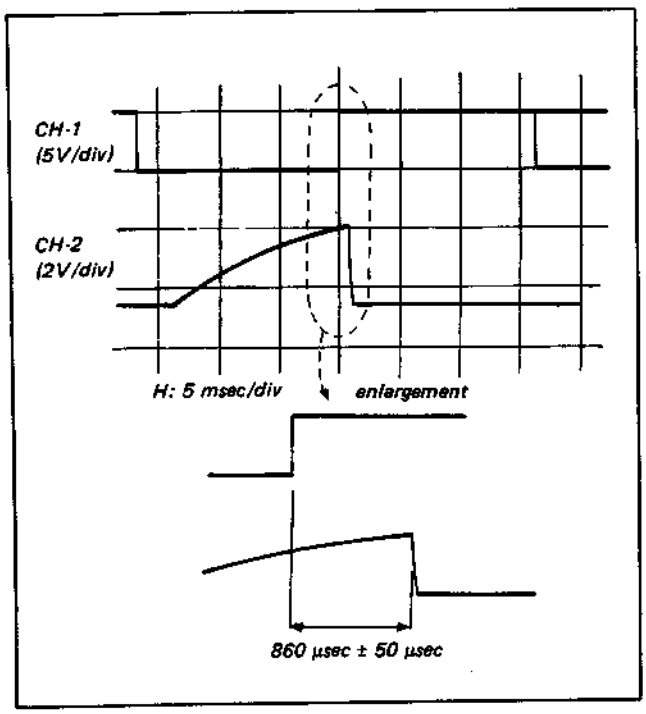


Fig. 5-13. Tracking center adjustment

5-4. VIDEO SYSTEM ADJUSTMENTS

As a rule the playback system is adjusted using the alignment tape. When it has been confirmed that the playback system is normal, the recording system is adjusted.

The order in which the adjustments are performed is given below. Both Y signal system adjustments and chroma signal system adjustments are necessary for both the playback system and the recording system.

The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Confirm that the sync signal and the color burst signal meet the standards specified under "setup at the time of adjustment".

Playback system

1. Playback frequency response adjustment
2. Dropout compensation sensitivity adjustment
3. Playback emphasis adjustment
4. Noise canceler II adjustment
5. 3.58 MHz oscillation frequency adjustment
6. VCO free frequency adjustment (AFC circuit)
7. Skew oscillation adjustment (0.5_H correction circuit)
8. AGC adjustment (0.5_H correction circuit)
9. Delay level adjustment (0.5_H correction circuit)
10. Delay phase adjustment (0.5_H correction circuit)
11. Delay color signal level adjustment (0.5_H correction circuit)

Recording system

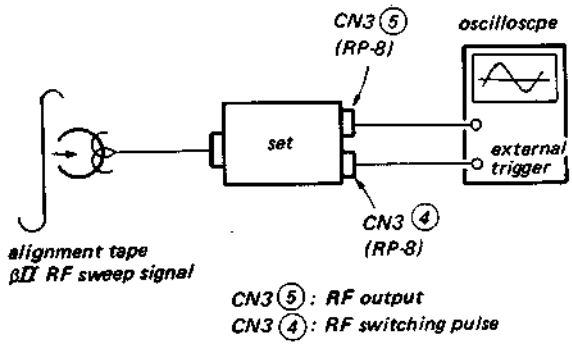
12. Peak AGC and sync AGC adjustments
13. Comb filter adjustment
14. Sync tip carrier frequency setting and FM deviation adjustment
15. 1/2 f_H shift adjustment
16. 4.27 MHz balance adjustment
17. ACC adjustment (automatic color amplitude)
18. White clip adjustment
19. Black clip adjustment
20. Luminance FM recording current adjustment
21. Color recording current adjustment

5-4-1. Playback system

1. Playback Frequency Response Adjustment (RP-8 board)

- Adjust both A CH and B CH.
- B CH is indicated by ( ).

Mode: Playback



[Method of adjustment]

(1) Adjust the tracking knob until the output level becomes maximum.
(2) Set the oscilloscope trigger slope to – (+).
(3) Adjust RV3 (RV1) until the RF waveform is flat in the range of 2 MHz to 4.5 MHz, and so that it drops slightly at 5.1 MHz. (See Fig. 5-14)
(4) Adjust with RV2 so that B CH level is the same as A CH.

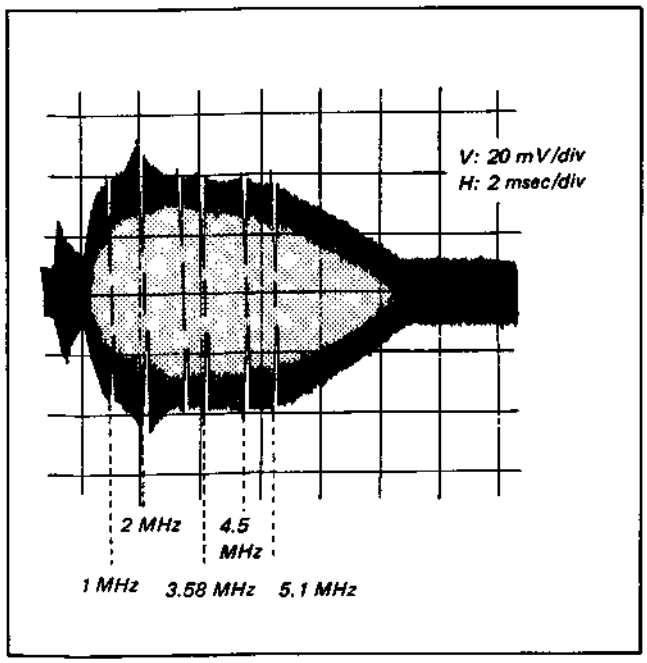
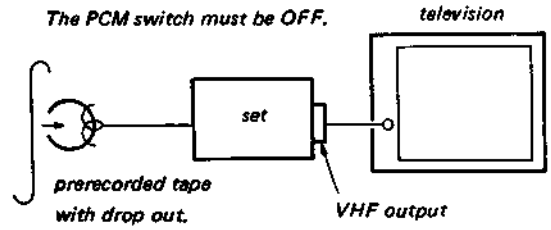


Fig. 5-14. Playback frequency response adjustment

2. Dropout Compensation Sensitivity Adjustment (RP-8 board)

Mode: Playback

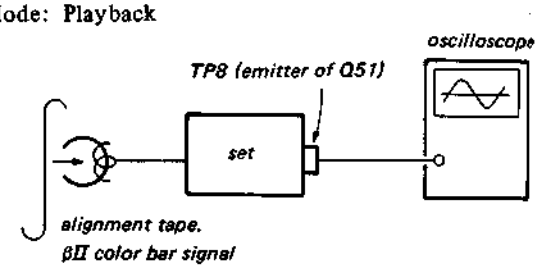


[Method of adjustment]

1) Turn RV5 fully counterclockwise as seen from the pattern side. (↶)
Dropout will appear on the monitor TV.
2) Turn RV5 clockwise slowly (↷) and set it at the point at which the dropouts can no longer be seen.
3) Rewind the tape and play it again. Confirm that the dropouts are being compensated for on the section on which many dropouts were seen in step 1).

3. Playback Emphasis Adjustment

Mode: Playback



[Method of adjustment]

1) Play the color bar signal on the alignment tape.
2) Adjust the tracking knob to the position at which the tracking is best.
3) Adjust RV9 until the amplitude shown in the diagram below is 1.15 Vp-p.

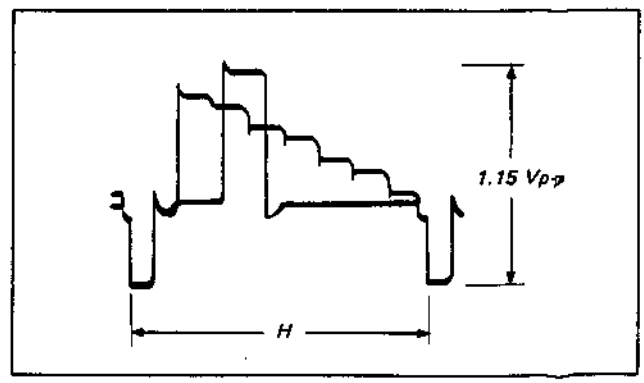


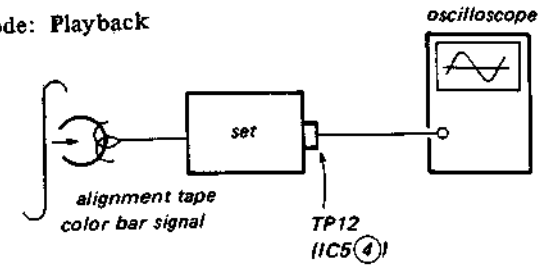
Fig. 5-15. Playback emphasis adjustment

4. Noise Canceler II Adjustment

Note:

After this adjustment is completed. do the "playback emphasis adjustment" in section 3. then repeat the noise canceler II adjustment.

Mode: Playback



[Method of adjustment]

1) Play the color bar signal on the alignment tape.
2) Adjust RV19 until the output becomes minimum. (See Fig. 5-16.)

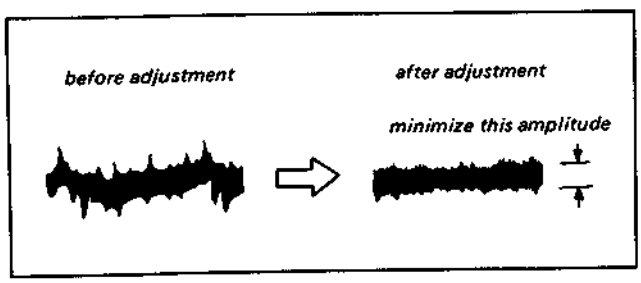
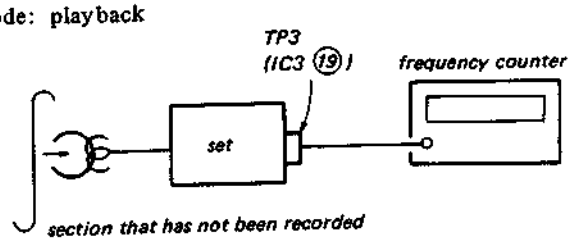


Fig. 5-16. Noise canceler II adjustment

5. 3.58MHz Oscillation Frequency Adjustment (YC-27 board)

Mode: playback



[Method of adjustment]

1) Play a tape on which nothing has been recorded (or alternatively ground the junction of C45 and C46 to cut the color signal out).
2) Adjust T4 until the frequency becomes 3579545 Hz ± 5 Hz.

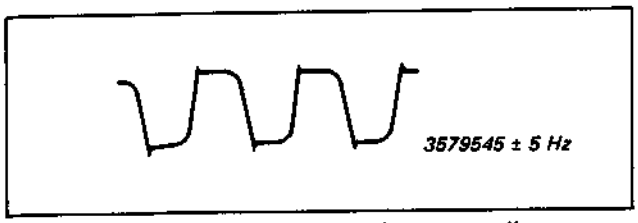
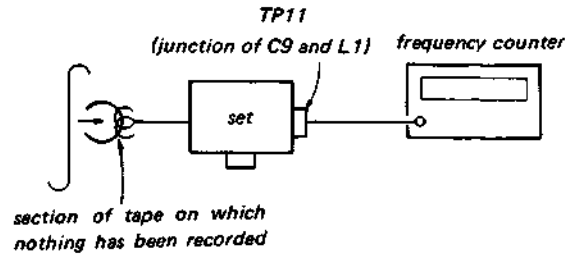


Fig. 5-17. 3.58MHz oscillation frequency adjustment

6. VCO Free Frequency Adjustment (AFC Circuit) (YC-27 board)

Mode: Playback

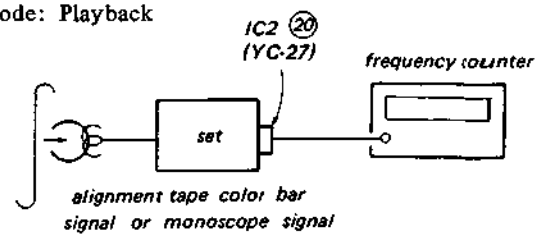


[Method of adjustment]

1) Play a tape on which nothing has been recorded (or alternatively ground the junction of C45 and C46 to cut the reproduced color signal out).
2) Adjust RV1 until the frequency becomes 688.374 kHz ± 1.3 kHz.

7. Skew Oscillation Adjustment (0.5H Correction Circuit) (YC-27 board)

Mode: Playback



[Method adjustment]

1) Connect a lead wire between the emitter of Q9 (the 9V power supply line) and pin ㉑ of IC2.
2) Play the color bar signal or the monoscope signal on the alignment tape.
3) Adjust RV3 until the reading on the frequency counter becomes 16.3 kHz ± 100 Hz.

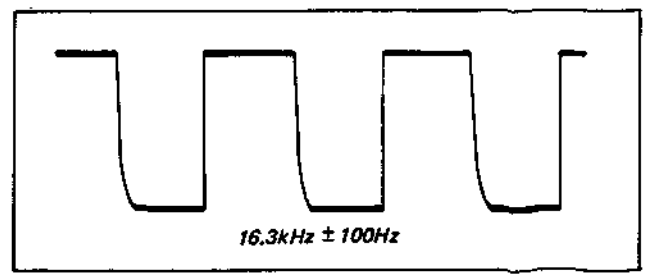
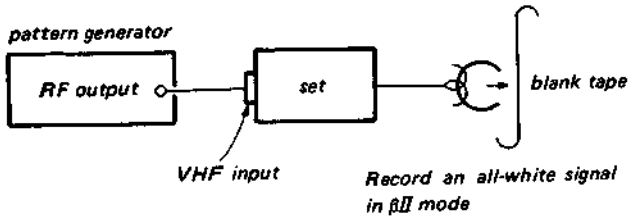


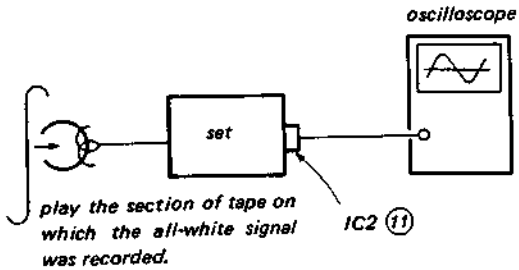
Fig. 5-18. Skew oscillation adjustment

8. AGC Adjustment (0.5H Correction Circuit) (YC-27 board)

Mode: Recording



Mode: Playback



[Method of adjustment]

1) Record an all-white signal in βII mode to produce a tape with all white recorded on it.
2) Play back the section of tape on which the all-white signal was recorded.
3) Adjust RV4 until the difference in levels of the amplitude shown in the diagram below, with and without a 1 MΩ resistor connected between the collector of Q9 (the 12V power supply line) and pin ⑩ of IC2 becomes minimum (0.02V or less).

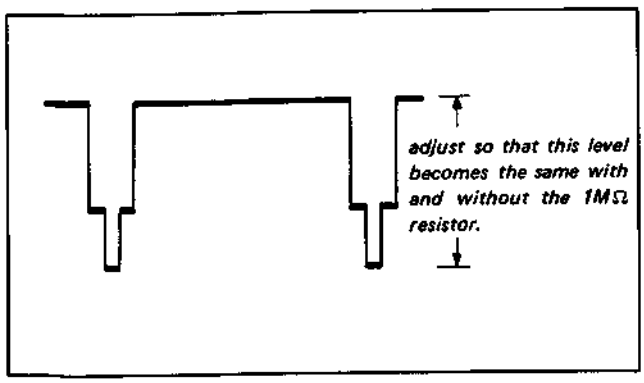


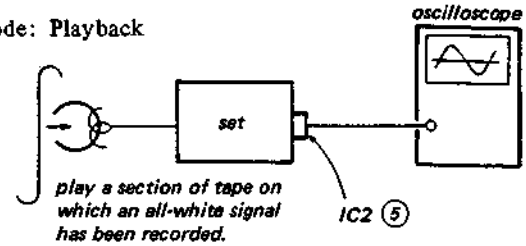
Fig. 5-19. AGC adjustment

9. Delay Level Adjustment (0.5H Correction Circuit) (YC-27 board)

[Condition]

Adjustments 9 through 11 must be done twice, in the order 9 – 10 – 11 – 9 – 10 – 11.

Mode: Playback



[Method of adjustment]

1) Connect a 1 MΩ resistor between the collector of Q9 (the 12V power supply line) and pin ⑩ of IC2.
2) Connect pin ㉑ of IC2 to ground.
3) Play a section of tape on which an all-white signalh as been recorded.
4) Measure the level both with and without a 51kΩ resistor connected between the emitter of Q9 (the 9V power supply line) and pin ⑳ of IC2.
5) Adjust RV6 so that the level measured without the 51kΩ resistor in the circuit is 125%, and 100% with the resistor in the circuit. A convenient way to do this is by adjusting the V knob on the oscilloscope so that the peak value at the V. SYNC position is 4 scale divisions; then with the resistor removed it should be 5 scale divisions. (See Fig. 5-20.)

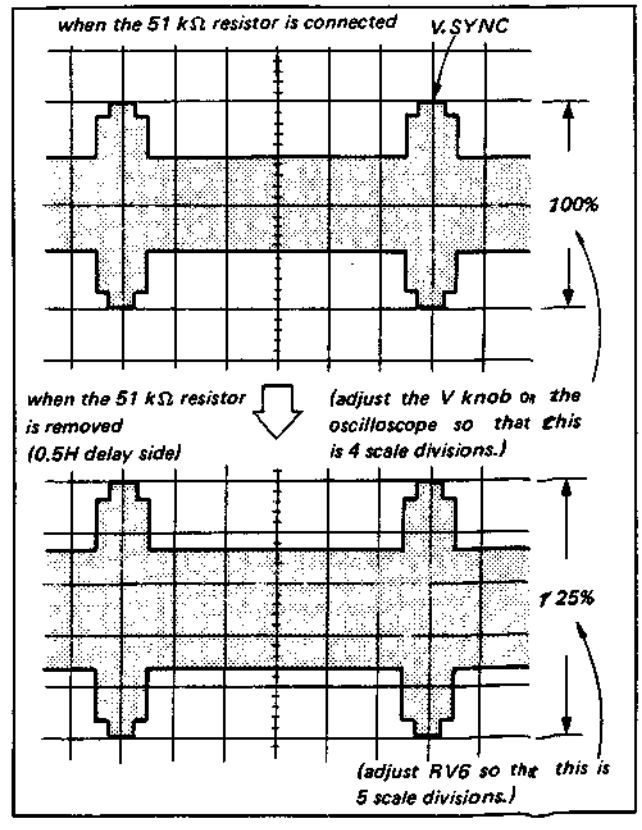


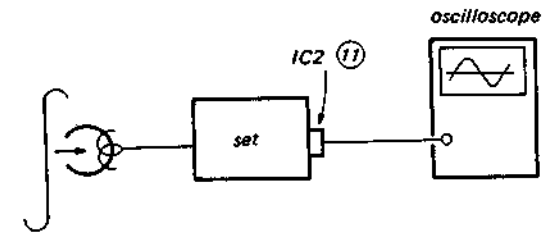
Fig. 5-20. Delay level adjustment

10. Delay Phase Adjustment (0.5H Correction Circuit) (YC-27 board)

[Condition]

Adjustments 9 through 11 must be done twice, in the order 9 — 10 — 11 — 9 — 10 — 11.

Mode: Playback



play a section of tape on which an all-white signal has been recorded.

[Method of adjustment]

1) Connect a 1 MΩ resistor between the collector of Q9 (12V power supply line) and pin (10) of IC2.
2) Connect pin (21) of IC2 to ground.
3) Play a section of tape on which an all-white signal has been recorded.
4) Adjust LV1 so that the fuzziness due to the horizontal sync signal that appears in the central part of the waveform becomes minimum.

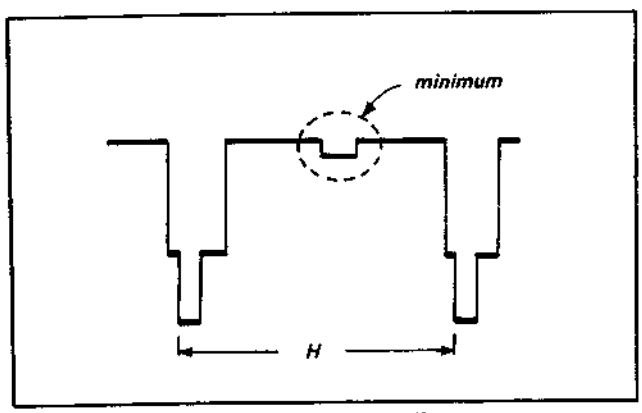


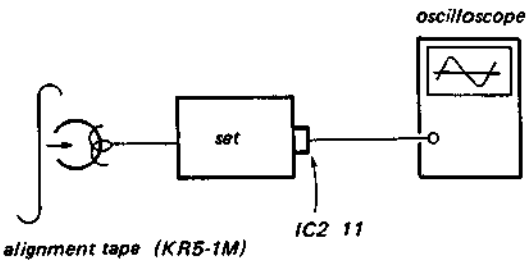
Fig. 5-21. Delay phase adjustment

11. Delay Color Signal Level Adjustment (0.5H Correction Circuit)

[Condition]

Adjustments 9 through 11 must be done twice, in the order 9 — 10 — 11 — 9 — 10 — 11.

Mode: Playback



alignment tape (KR5-1M)
βII color bar signal

[Method of adjustment]

1) Connect a 1 MΩ resistor between the collector of Q9 (the 12V power supply line) and pin (10) of IC2. of IC2.
2) Connect pin (21) of IC2 to ground.
3) Play the βII color bar signal on the alignment tape.
4) Connect a 51 kΩ resistor between the emitter of Q9 (the 9V power supply line) and pin (20) of IC2, and measure the level of the color signal with and without this resistor in the circuit. Then adjust RV5 so that the difference between the two levels becomes minimum.

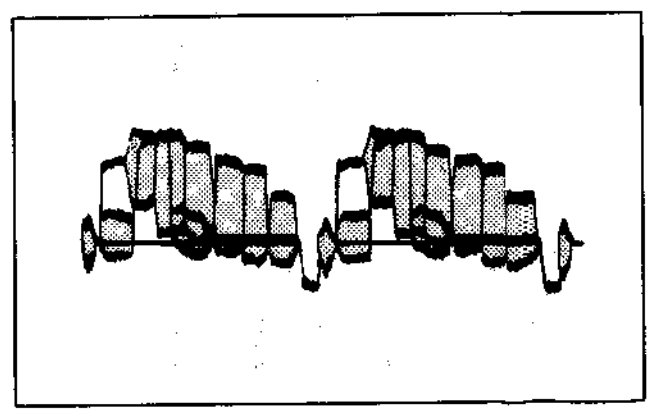
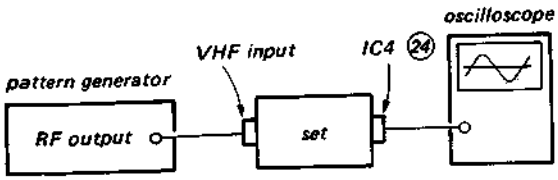


Fig. 5-22. Delay color signal level

5-4-2. Recording system

12. Peak AGC and Sync AGC Adjustments (YC-27 board)

Mode: E-E



[Method of adjustment]

1) Supply a color bar signal with the chrominance signal removed (in other words a black-and-white signal) from the pattern generator.
2) Turn RV11 counterclockwise until the level is maximum.
3) Adjust RV2 (peak AGC) until the level becomes 1.06Vp-p ± 0.04Vp-p.
4) Adjust RV11 (sync AGC) until the level becomes 1.02Vp-p ± 0.04Vp-p. (See Fig. 5-23.)

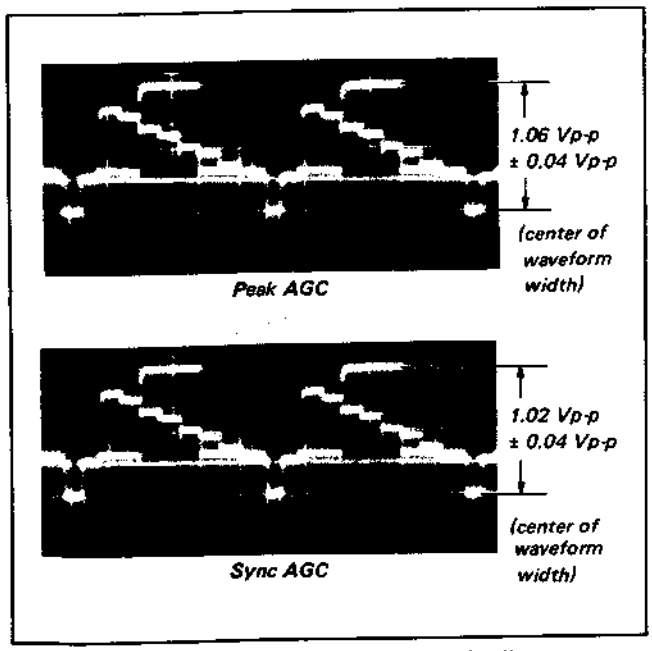
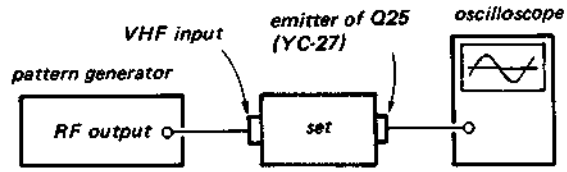


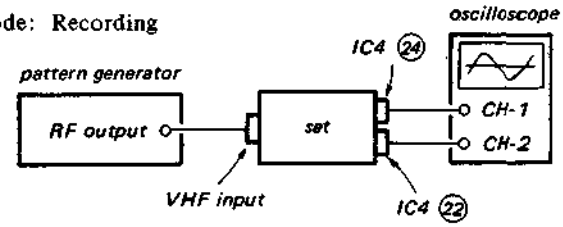
Fig. 5-23. Peak AGC and sync AGC adjustments

13. Comb Filter Adjustment (YC-27 board)

Mode: Recording



Mode: Recording



[Method of adjustment]

1) Input a color bar signal and put the set in recording mode.
2) Connect the oscilloscope to the emitter of Q25 and then adjust LV2 and RV10 alternately until the chrominance signal is minimum. (See Fig. 5-24.)

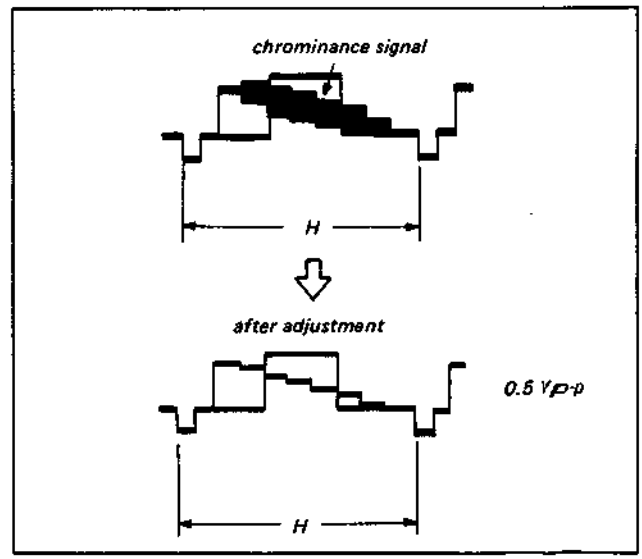


Fig. 5-24. Comb filter adjustment

3) Adjust RV12 until the video signal levels at pin (24) of IC4 and pin (22) of IC4 are equal (video amplitude adjustment).

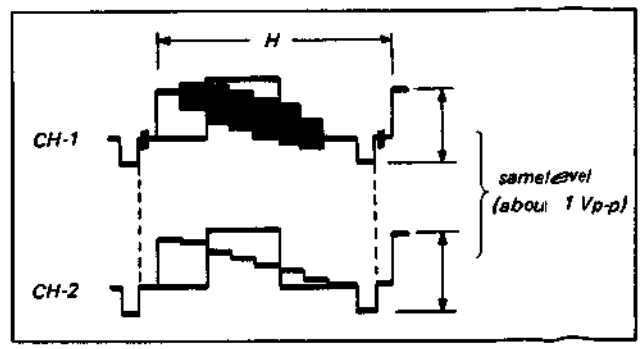
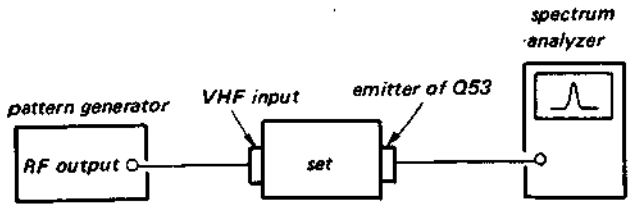


Fig. 5-25. Comb filter adjustment

14. Sync Tip Carrier Frequency Setting and FM Deviation Adjustment (YC-27 board)

Mode: E-E



[Method of adjustment]

1) Supply a color bar signal, and put the set into E-E (direct picture) mode.
2) Observe the frequency distribution, and adjust RV17 and RV16 alternately until the sync tip carrier frequency and FM deviation fall within their respective specifications.

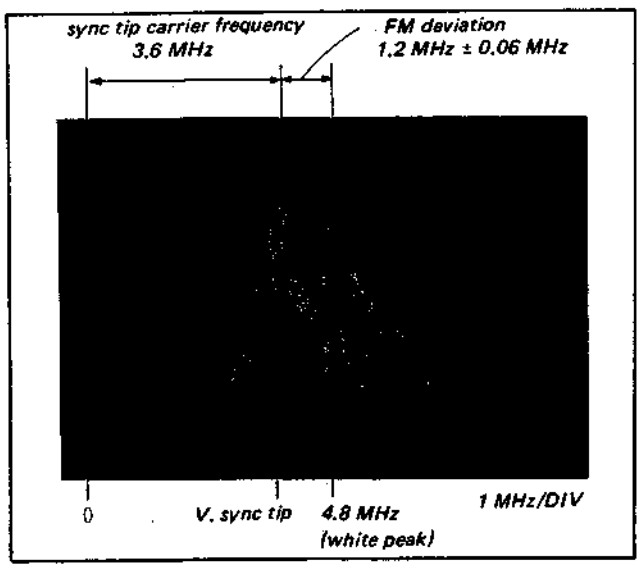
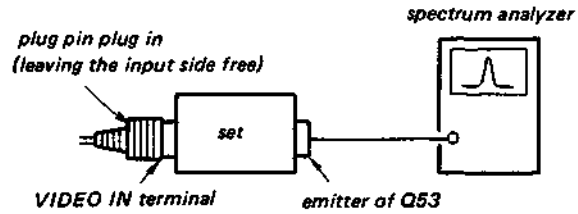


Fig. 5-26. Sync tip carrier frequency setting and FM deviation adjustment

15. 1/2 f_H Shift Adjustment (YC-27 board)

Mode: Recording



[Method of adjustment]

1) Plug a pin plug into the video input terminal (leaving the input side of the plug free),and put the set into recording mode without any signal input.
2) Adjust RV18 until the shift of the FM wave is 7.87 kHz ± 2 kHz. (See Fig. 5-27.)

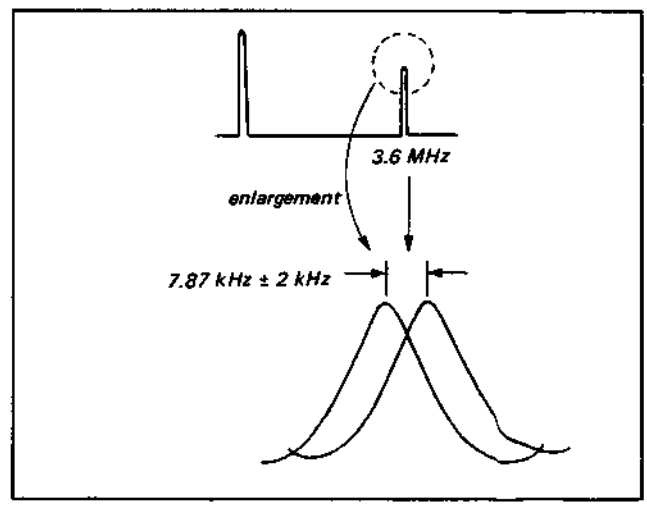
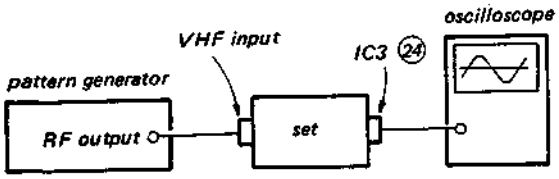


Fig. 5-27. ½f_H shift adjustment

16. 4.27 MHz Balance Adjustment (YC-27 board)

Mode: E-E



[Method of adjustment]

1) Supply a color bar signal, and put the set into E-E (direct picture) mode.
2) Adjust RV7 until the amplitude of the 4.27 MHz component is minimum. (See Fig. 5-28.)

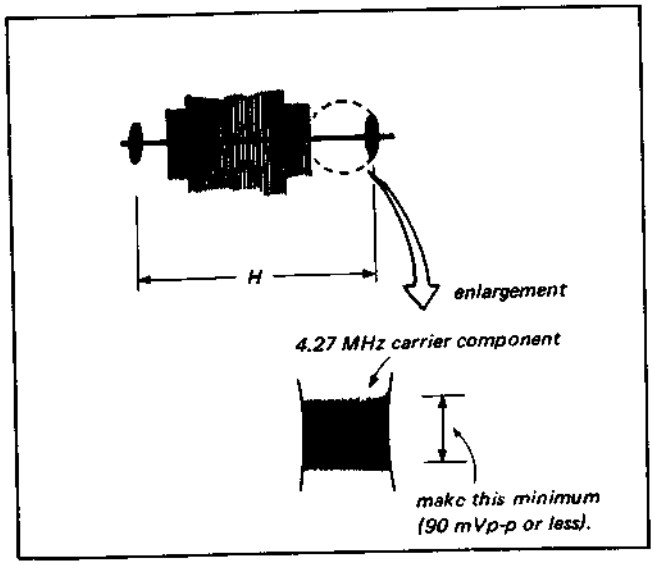
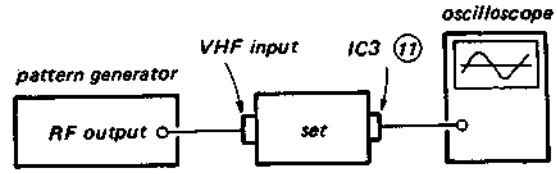


Fig. 5-28. 4.27MHz balance adjustment

17. ACC Adjustment (YC-27 board)

Mode: E-E



[Method of adjustment]

1) Supply a color bar signal, and put the set into E-E (direct picture) mode.
2) Adjust RV8 until the chrominance level is 0.85 Vp-p ± 0.05 Vp-p. (See Fig. 5-29.)

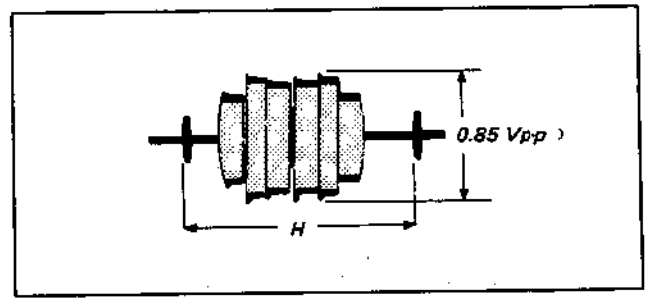
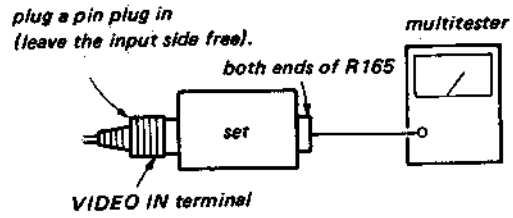


Fig. 5-29. ACC adjustment

18. White Clip Adjustment (YC-27 board)

Mode: E-E

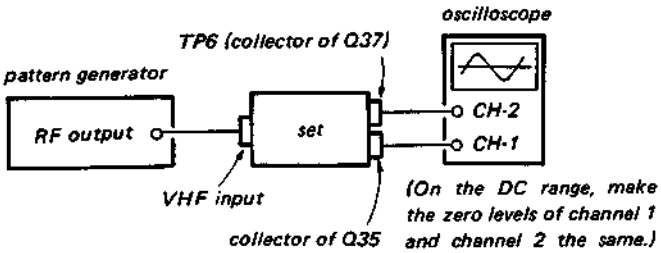


[Method of adjustment]

1) Plug a pin plug in to the video input terminal (leave the input side of the plug free), so that there is no signal input.
2) Adjust RV15 so that the voltage at both ends of R165 is 0.20V ± 0.05V.

19. Black Clip Adjustment (YC-27 board)

Mode: E-E



[Method of adjustment]

1) Put the oscilloscope on the DC range, and make zero levels of channel 1 and channel 2 equal to each other.
2) Supply a color bar signal, and put the set into E-E (direct picture) mode.
3) Adjust RV14 so that the potential at the tip of horizontal sync signal in the waveform on channel 2 equals the DC potential on channel 1 (the tip of the sync signal should be within ±50 mV). (See Fig. 5-30.)

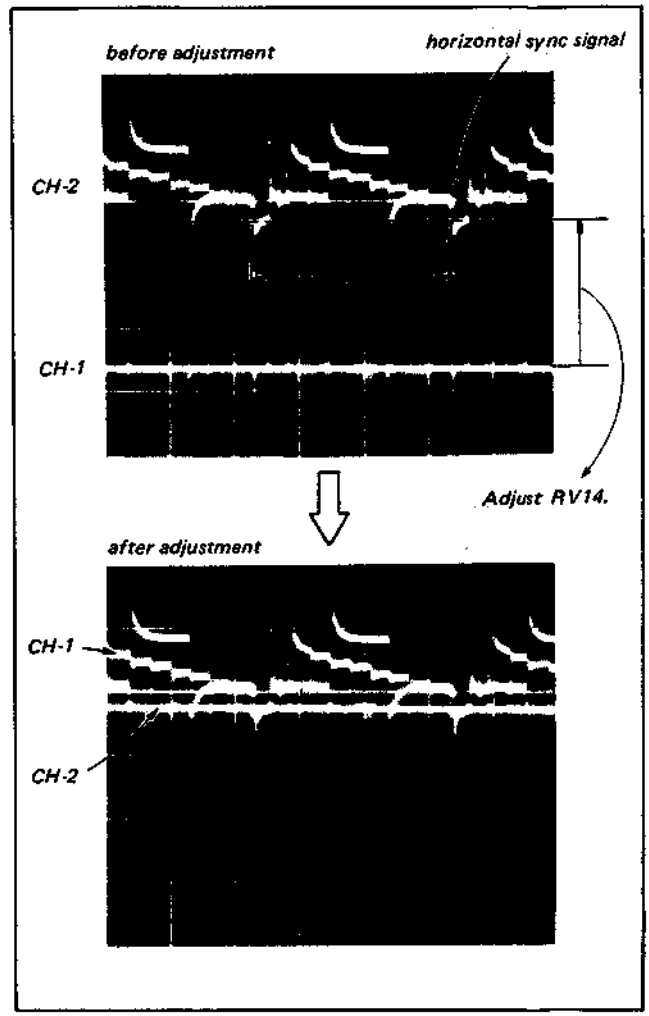
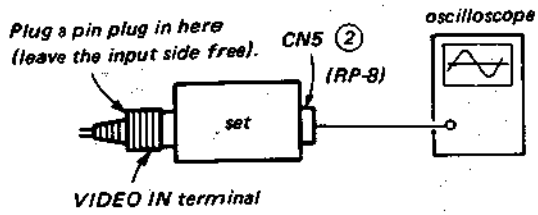


Fig. 5-30. Black clip adjustment

20. Luminance FM Recording Current Adjustment (RP-8 board)

Mode: Recording



[Method of adjustment]

1) Plug a pin plug in to the video input terminal (leaving the input side of the plug free) so that there is no input signal. and put the set into recording mode.
2) Adjust RV4 until the amplitude is 3.0Vp-p ± 0.1Vp-p. (See Fig. 5-31.)

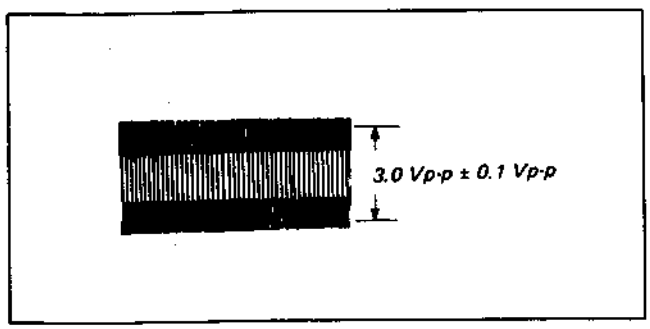
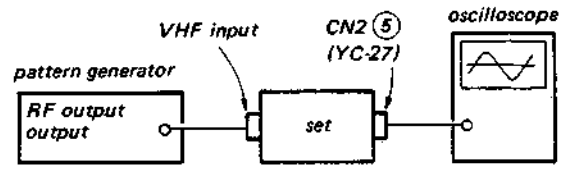


Fig. 5-31. Luminance FM recording current adjustment

21. Color Recording Current Adjustment (YC-27 board)

Mode: E-E



[Method of adjustment]

1) Supply a color bar signal and put the set in E-E (direct picture) mode.
2) Adjust RV13 until the amplitude is 230mVp-p ± 10mVp-p. (See Fig. 5-32.)

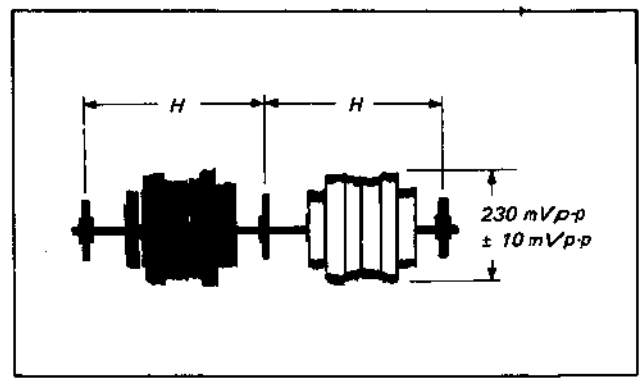


Fig. 5-32. Color recording current adjustment

5-5. AUDIO SYSTEM ADJUSTMENTS

Use a dynamicron tape to perform these adjustments.

Sequence of adjustments

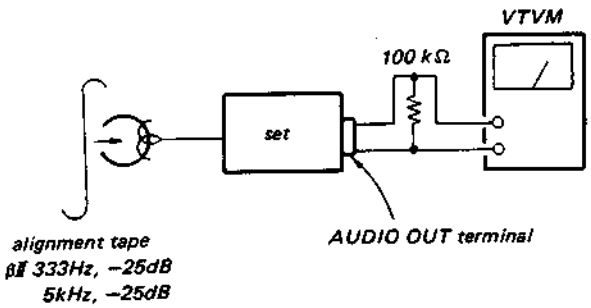
1. ACE head adjustment... refer to the description in mechanical section adjustments.
2. Playback frequency response adjustments
3. Playback output level adjustment
4. Bias trap adjustment
5. Sound recording bias adjustment
6. Sound recording level adjustment
7. Overall level check
8. Overall distortion rate check
9. Overall signal-to-noise ratio check

1. ACE Head Adjustment

Refer to the description in mechanical section adjustments.

2. Playback Frequency Response Adjustment (TA-16 board)

Mode: Playback

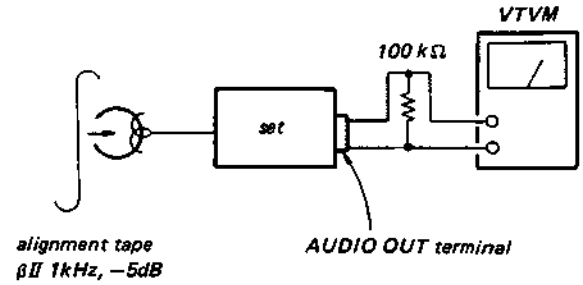


[Method of adjustment]

1) Play the 333 Hz and 5 kHz βII audio signal sections on the alignment tape and measure the respective output levels.
2) Adjust RV502 so that the output level at 5 kHz is within 0 ± 1 dB of the output level at 333 Hz.

3. Playback Output Level Adjustment (TA-16 board)

Mode: Playback

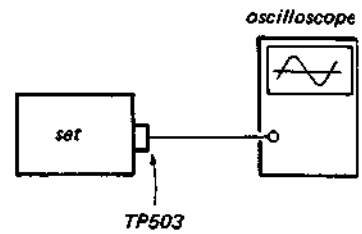


[Method of adjustment]

1) Play the βII 1 kHz audio signal section on the alignment tape and measure the output level.
2) Adjust RV503 until the output level becomes −10dB (0.25V) $^{+4}_{-4}$dB.

4. Bias Trap Adjustment (TA-16 board)

Mode: Recording



[Method of adjustment]

1) Put the set in recording mode with no signal input.
2) Adjust LV501 until the bias leak waveform is minimum, 1.2Vp-p or less. (See Fig. 5-33.)

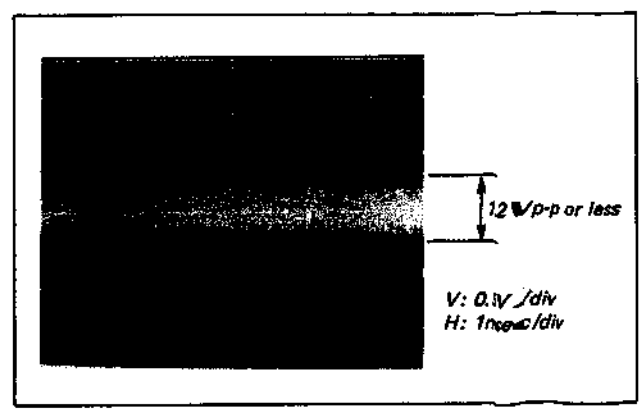
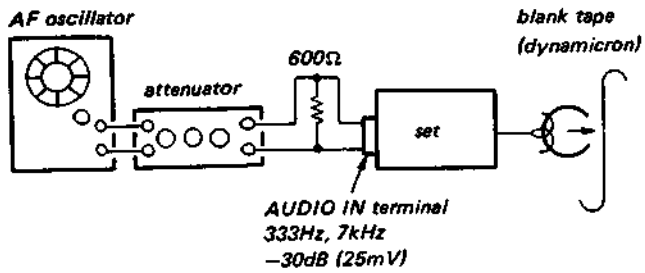


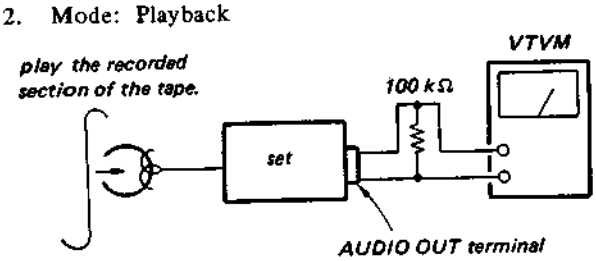
Fig. 5-33. Bias trap adjustment

5. Sound Recording Bias Adjustment (TA-16 board)

1. Mode: Recording (βIII mode)



2. Mode: Playback

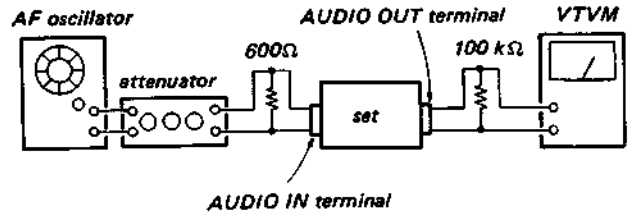


[Method of adjustment]

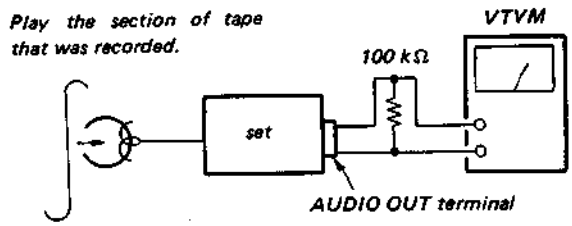
1) Short the two ends of R538 (TP506 and TP507) together to cut the AGC operation OFF.
2) Apply 333 Hz and 7 kHz, −30 dB (25 mV) signals to the audio input terminal and record them in βIII mode.
3) Play back the recorded section of tape and measure the respective output levels at 333 Hz and 7 kHz.
4) Confirm that the output level at 7 kHz is within ±1.5 dB of the output level at 333 Hz.
5) If the condition in step 4) is not satisfied, repeat steps 2) through 4). If the output level at 7 kHz is too high, turn RV501 clockwise. If the output level at 7 kHz is too low, turn RV501 counterclockwise.

6. Sound Recording Level Adjustment (TA-16 board)

1. Mode: Recording



2. Mode: Playback

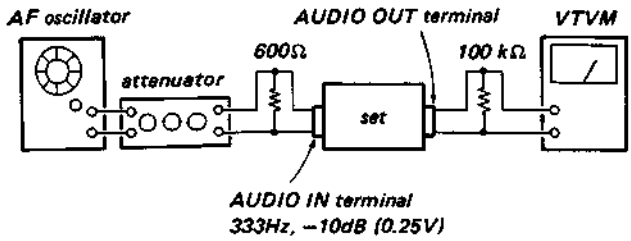


[Method of adjustment]

1) Short both ends of R538 (TP506 and TP507) together to cut the AGC OFF.
2) Input a 333 Hz signal, and adjust the attenuator so that the output level at the audio line output terminal in E-E mode becomes −10 dB (0.25V).
3) Record the 333 Hz signal.
4) Play the recorded section of tape back, and measure the level at the audio line output. It should be −10 dB (0.25V) ± 1 dB.
5) If the level measured in step 4) is outside of the correct range, repeat steps 2) through 4). If the output level is too high, turn RV504 clockwise. If the output level is too low, turn RV504 counterclockwise.

7. Overall Level Check

Mode: Recording/playback (βIII)



[Method of measurement]

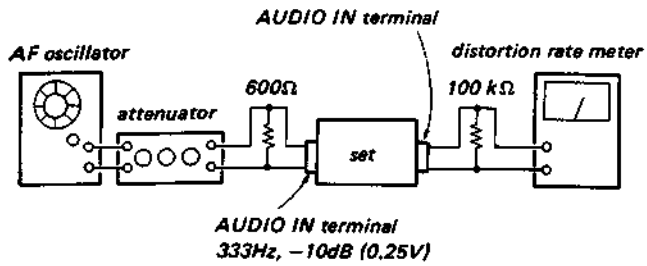
1) Apply a 333 Hz, −10 dB (0.25V) signal to the audio input terminal and record it in βIII mode.
2) Play the recorded section of tape back and measure the output level at the audio line output.
3) Confirm that the output level is −10dB (0.25V) $^{+4}_{-4}$ dB.

8. Overall Distortion Rate Check

[Condition]

Set the sound quality switch on high.

Mode: Recording/playback

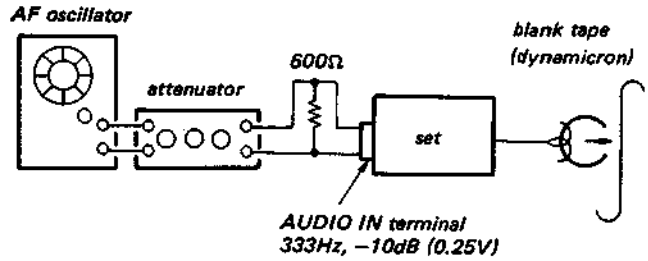


[Method of measurement]

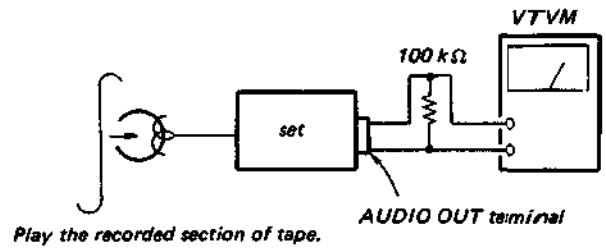
1) Apply a 333 Hz, −10 dB (0.25V) signal to the audio input terminal and record it in βIII mode.
2) Play the recorded section of tape back and measure the distortion rate at the audio line output terminal.
3) Confirm that the distortion rate is 4% or less.

9. Overall Signal-to-noise Ratio Check

1. Mode: Recording/playback



2. Mode: Playback



[Method of adjustment]

1) Apply a 333 Hz −10 dB (0.25V) signal to the audio input terminal and record it in βIII mode.
2) Next, connect a pin plug to the audio input terminal, leaving the input side of the pin plug open. That is to say, the recording is now done with no input signal.
3) Play the sections of tape recorded in steps 1) and 2) back and measure the respective output levels.
   Confirm that the difference between the signal level obtained from the section recorded in step 1) and the noise level obtained from the section recorded in step 2) is 33 dB or more.

5-6. TUNER BLOCK SYSTEM ADJUSTMENTS

1. Tuner AGC Adjustment (TA-16 board)

Note:
The UHF adjustment locations are given in parentheses.

1) At maximum contrast, receive any TV broadcast signal.
2) Turn RV2 (RV1) clockwise until snow noise can be seen on the TV monitor screen.
3) Turn RV2 (RV1) counterclockwise slowly and adjust to the point where the snow noise just disappears.
4) Receive all of the channels and confirm that there is no beat due to cross-modulation, breakdown of the picture or snow noise.

2. AFT Adjustment (TA-16 board)

1) Receive any TV broadcast signal.
2) Turn the AFT switch OFF (with the preset cover removed).
3) Turn the preset potentiometer until a 920 kHz beat can be seen, then turn it counterclockwise slowly and leave it set at the point where the 920 kHz beat just disappears.
4) Turn the AFT switch ON (press the AFT switch lever).
5) Connect an oscilloscope to TP3 and adjust T004 so that the DC level becomes 5.0V. Confirm that there is no disappearance of color or 920 kHz beat.
6) Next, turn the AFT switch back OFF (with the preset cover removed) and turn the preset potentiometer until the picture quality just starts to deteriorate. Leave it set at that point.
7) Turn the AFT switch ON and OFF repeatedly to check the AFT operation.
8) Return the preset potentiometer to the position where it was set in step 3.