



TVR-14 BG
MODEL TVR-14 VP



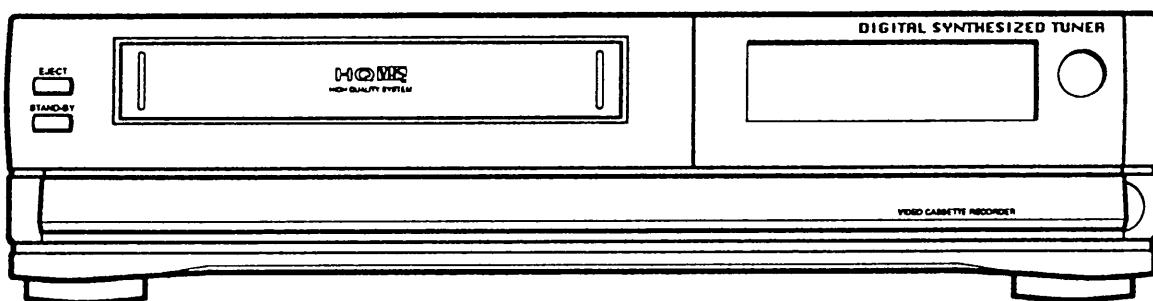
ATTENTION!! AMENDMENT

**PLEASE DISREGARD PAGES
31,32,33,34,35 AND
48,49,50**

HQ

Video cassette recorders bearing the "HQ" mark incorporate VHS high quality technology. Note that there is interchangeability with former VHS video cassette recorder.

Video Cassette Recorder



SERVICE MANUAL

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INTRODUCTION

This manual provides service information for our VHS Video Player. It describes the principles and adjustments of mechanical and electrical operation for this model.

Service procedures given herein cover only field maintenance services. Adjustments which require high-level instruments, jigs, and techniques are excluded since they should be performed at the factory.

Due to design modifications, the servicing procedures and data given in this manual are subject to possible change without prior notice.

IMPORTANT SAFETY PRECAUTION

Prior to shipment from the factory, our products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

PRECAUTIONS DURING SERVICING

1. Parts identified by the symbol are critical for safety. Replace only with parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation. These must also be replaced only with specified replacements.
Examples: RF converters, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially:
 - Wires covered with PVC tubing
 - Double insulated wires
 - High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
 - Insulation tape
 - PVC tubing
 - Spacers
 - Insulation sheets for transistors
5. When replacing AC primary side components (transformers, power cords, etc.), wrap ends of wires securely on the terminals before soldering.
6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. When a power cord has been replaced, check that force (maximum applied force should be 20-30 lbs.) in any direction will not loosen it.
9. Also check areas surrounding repaired locations.
10. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside of unit.

SAFETY CHECK AFTER SERVICING

1. **Insulation resistance test**
Confirm specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, video and output terminals, etc.).
2. **Dielectric strength test**
Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio output terminals, etc.).
3. **Clearance distance**
When replacing primary circuit components, confirm specified clearance distance.

ELECTRICAL ADJUSTMENT

PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

Required Test Equipment

1. Oscilloscope: Wide-band, Dual-trace W/EXT TRIG 40 MHz
2. Frequency counter (7 digits or higher)
3. Color Monitor Television
4. Test tape: TPS-1, 2, 3, 6
5. Audio Noise Metre or Distortion Metre
6. Test Signal Generator LCG 399A (PAL) or LGC-404 (PAL/SECAM)
7. Wave form monitor
8. Vector Scope

Alignment Tape Contents

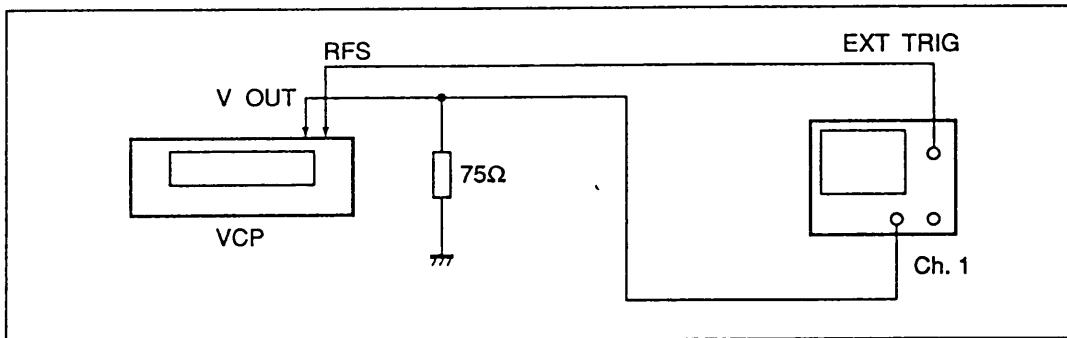
Ref No.	Video Signal	Audio Signal	Applications
TNS-2	Centre Cross	1 kHz (-20 dB) 6 kHz (-20 dB)	● Audio Frequency Response ● Skew Check
TNS-6	Digital Pattern	3 kHz (-20 dB)	● Resolution Check ● Wow and Flutter Checks ● Picture Quality Check
TNS-3	Colour Bar	1 kHz (-10 dB)	● Y-level Adjustment ● C-level Adjustment ● Audio Level Check
TNS-1	Stairstep	6 kHz (-10 dB)	● Tracking Volume Preset ● Audio Azimuth

TEST POINT

TEST POINT	DESCRIPTION	PART NO.
TP-A	VIDEO OUT	21 PIN CONNECTOR
TP-B	CTL	J259
TP-C	RFS	J216
TP-D	GND	J297
TP-E	PB ENV	—
TP-H	SYNC TIP LEVEL	—
	WHITE PEAK LEVEL	—
	REC C	—
	REC Y	—

1. SWITCHING POSITION ADJUSTMENT (PG-1, PG-2)

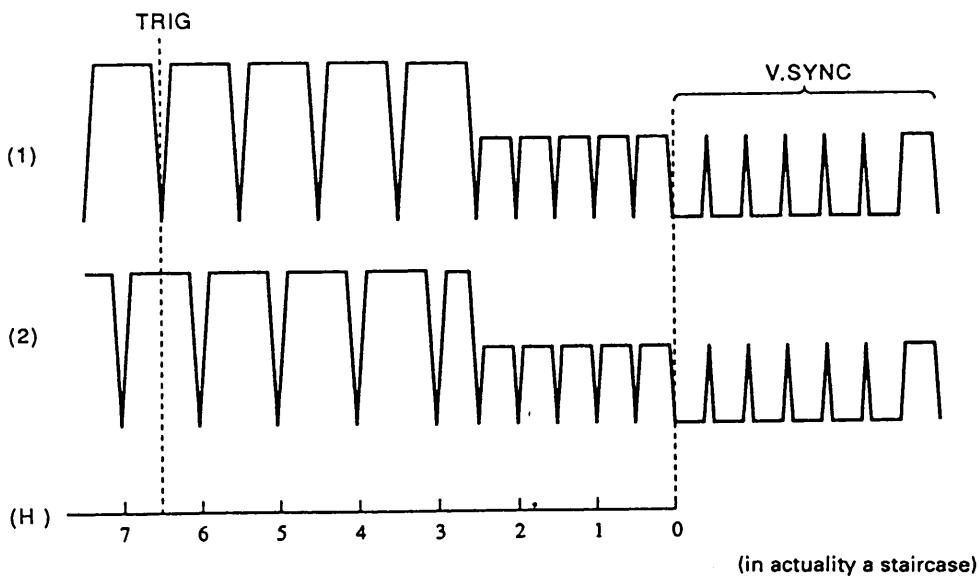
Specified Tape TNS-1 (A: 6 kHz V: Stairsteps)
Specified Measuring Equipment Oscilloscope (Dual-Trace W/EXT TRIG 40 MHz)
Connections Oscilloscope Ch. 1 probe to VIDEO OUT
 Oscilloscope EXT TRIG probe core to TP-C
 Oscilloscope EXT TRIG probe GND to TP-D



Adjustments

- (1) When setting the SLOPE polarity of the oscilloscope to plus (+), adjust R529 so that the trigger point position of the oscilloscope comes to a position 6.5 H from the V SYNC leading edge.
- (2) When setting the SLOPE polarity of the oscilloscope to minus (-), adjust R519 so that the trigger point position of the oscilloscope comes to a position $6.5 \pm 1.5\text{H}$ from the V SYNC leading edge.

VHS SPECIFICATION $6.5 \pm 1.5 \text{ H}$



Whether waveform (1) or (2) is present, adjust to 6.5H .

2. AUDIO AZIMUTH ADJUSTMENT

Specified Tape

TPS-1 (A: 6 kHz V: Stairstep)

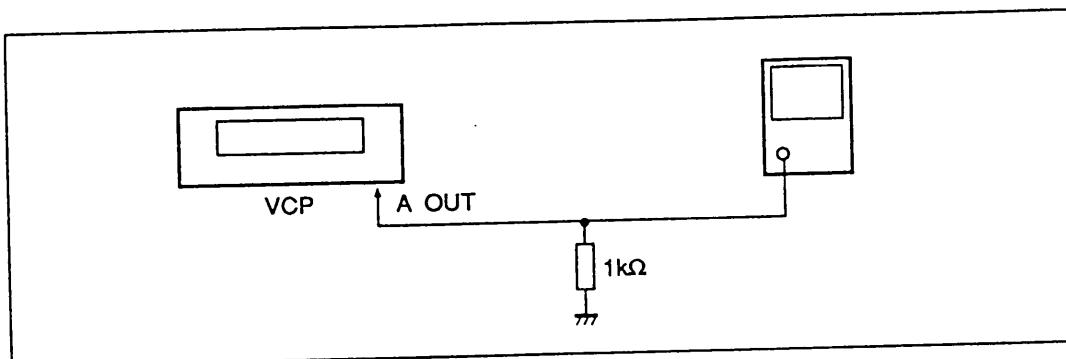
Specified Measuring

AUDIO NOISE METRE (MN-445A, or equivalent)

Equipment

Connections

AUDIO OUT: AUDIO NOISE METRE (w/1 kΩ load)



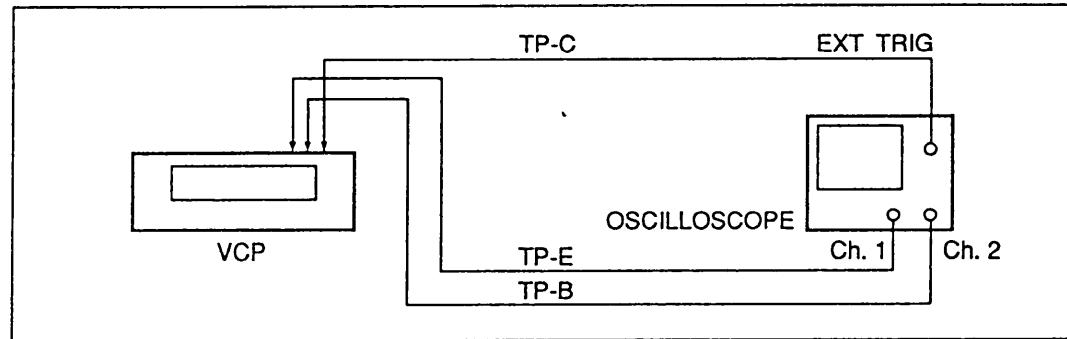
Adjustments

Adjust the AUDIO HEAD AZIMUTH screw so the AUDIO OUT 6k output level is maximum with the TPS-1 in the playback mode (refer to diagram of deck adjustment locations for AUDIO HEAD AZIMUTH screw position). Affix thread lock after adjusting. If, after completion of x-value adjustment, the AUDIO HEAD AZIMUTH is readjusted, readjust x-value as well.

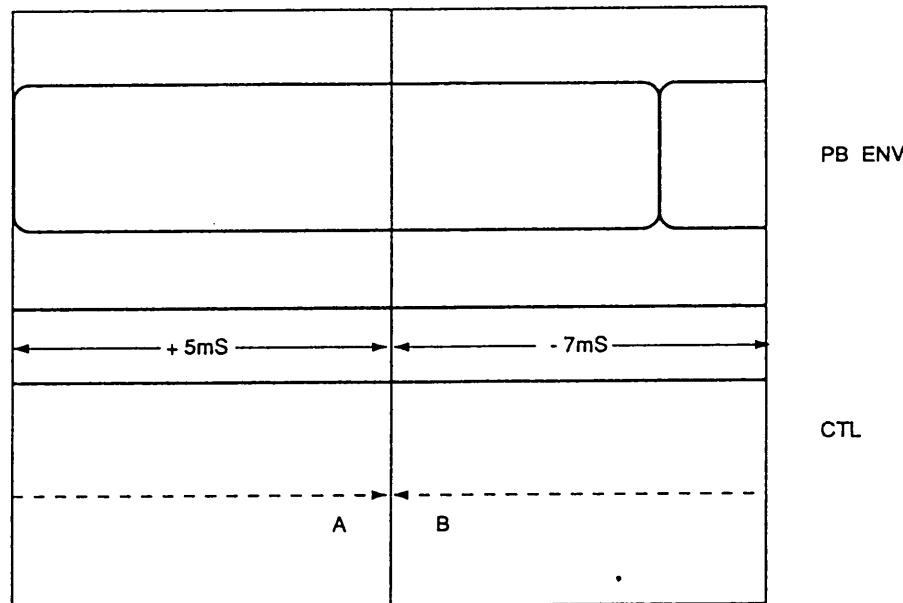
Precautionary Items

3. X-VALUE ADJUSTMENT

Specified Tape	TPS-1 (A: 6 kHz V: Stairstep)
Specified Measuring Equipment	Oscilloscope (Dual-Trace W/EXT TRIG 40 MHz)
Connections	Oscilloscope Ch. 1 probe to TP-E Oscilloscope Ch. 2 probe to TP-B Oscilloscope EXT TRIG probe core to TP-C Oscilloscope EXT TRIG probe GND to TP-D

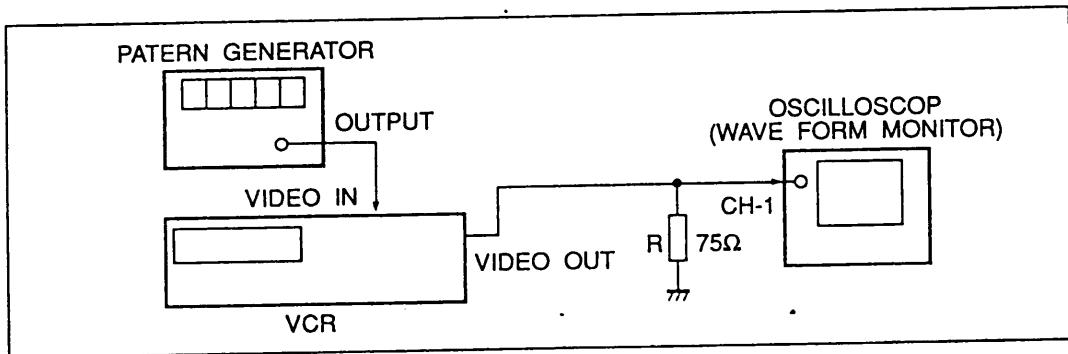


Adjustments At tracking V.R. set the x-value screw so that envelope output levels are balanced when the CTL pulse is moved from the preset position to +5 ms/-6 ms (return tracking V.R. to centre after adjustment is finished).



4. Y AGC LEVEL ADJUSTMENT

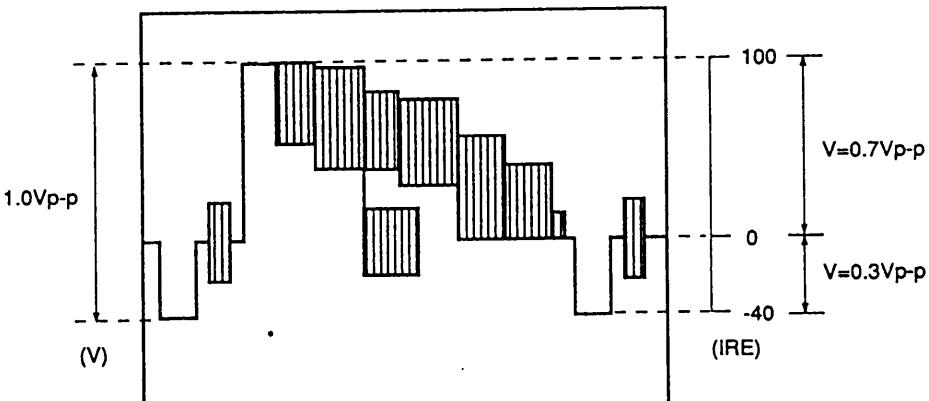
Connections



Mode	E-E
Test Signal	VIDEO IN/Color Bar (PAL)
Specified Measuring	Oscilloscope (Waveform monitor)
Equipment	Patern generator (PAL)
Check Point	VIDEO OUT(terminate at 75Ω)
Adjustments Confirmation	(1) Confirm that the VIDEO OUT brightness signal level (SYNC CHIP – WHITE PEAK) is within 1.0Vp-p.
Precautionary Items	* When confirming, it is not sufficient only to check that the SYNC CHIP – WHITE PEAK is output up to 1.0Vp-p. Consider the waveform linearity, and confirm that the output of the video/synchronization (V/S ratio) is 7:3, i.e., V = 0.7V (IRE = 100)/S = 0.3V (IRE = 40).

Waveform

Adjustment Value = 1.0Vp-p

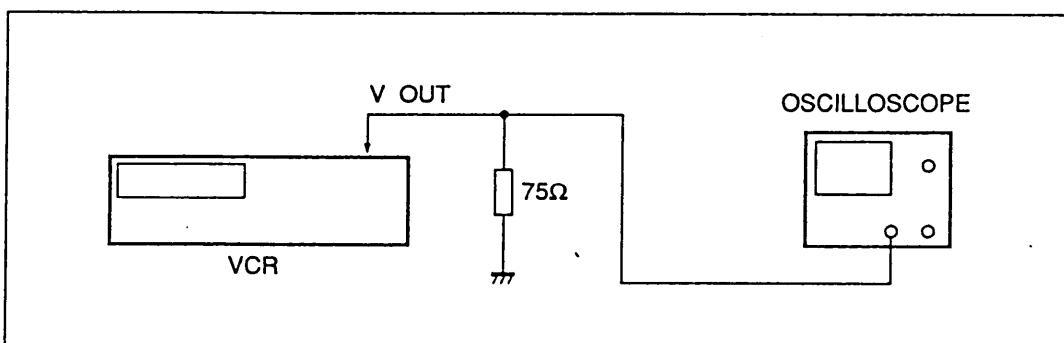


Oscilloscope Setting

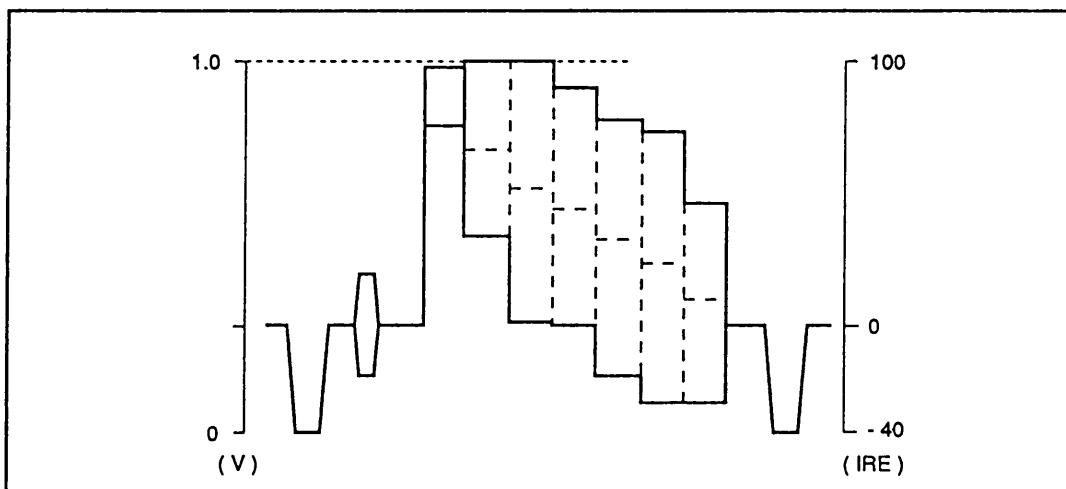
TIME/DIV : 10μs
 VERT MODE : CH-1
 VOLTS/DIV : 0.2V (CH-1)

5. PB Y LEVEL ADJUSTMENT

Specified Measuring Equipment	TPS-3 (A: 1KHz V: EBU Colour Bar) Oscilloscope (Dual-Trace W/EXT TRIG 40MHz)
Connections	VIDEO OUT: Oscilloscope (W/75Ω load)

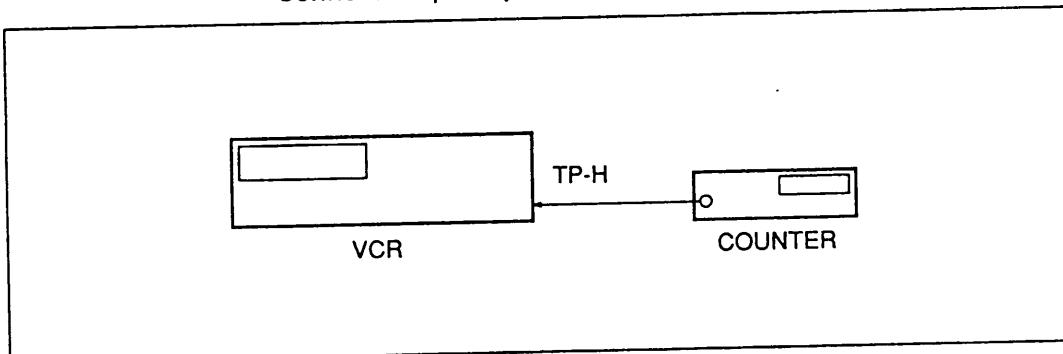


Adjustments At PCB PB Y LEVEL ADJ. V.R., set VIDEO OUT output level to 1.0 ± 0.1 Vp-p.



6. SYNC TIP LEVEL ADJUSTMENTS (CARRIER)

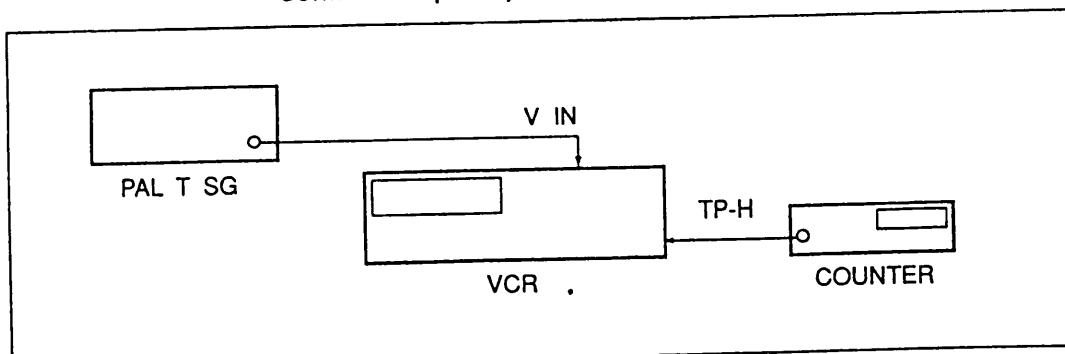
Measurement Tape	REC Mode (Blank Tape T-120 TDK, Victor: Normal)
Specified Measurement Equipment	PAL SIGNAL GENERATOR (LCG-399A or 404 Type Leader Electronics or equivalent)
Test Signal	NO SIGNAL
Connections	VIDEO IN: N.C. VIDEO OUT: N.C. Connect frequency counter probe core to TP-H. Connect frequency counter probe GND to TP-Z.



Adjustments	At PCB SYNC TIP LEVEL ADJ. V.R. set test pin TP-H frequency to 3.8 ± 0.1 MHz.
Precautionary Items	When adjusting VIDEO IN without any signal, set to 3.8 ± 0.1 MHz. Verify that the TV tuner is not receiving any broadcast at this time. It is helpful to calibrate the oscilloscope probe using the frequency counter probe.

7. WHITE PEAK LEVEL ADJUSTMENT (DEVIATION)

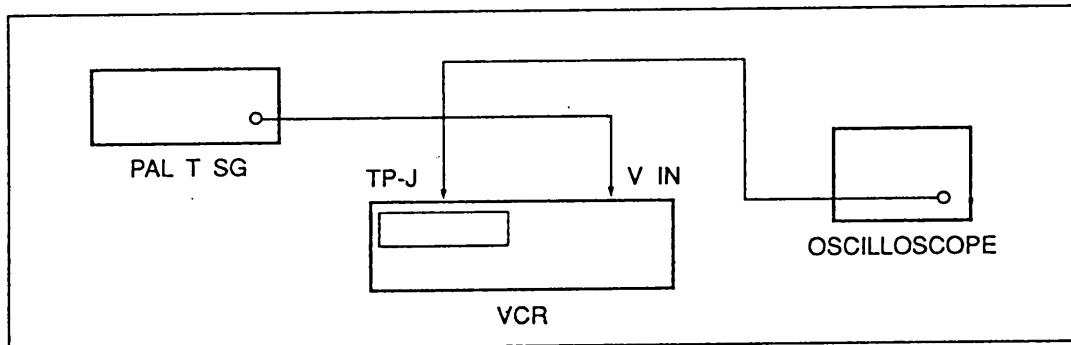
Measurement Tape	REC Mode (Blank Tape T-120 TDK, Victor: Normal)
Specified Measurement Equipment	PAL SIGNAL GENERATOR (LCG-399A or 404 Type Leader Electronics or equivalent) Frequency Counter (LCD-825 Type Leader Electronics or equivalent)
Test Signal	White Raster 100% (Refer to Test Signal Chart)
Connections	VIDEO IN: TEST SIGNAL GENERATOR VIDEO OUT: N.C. Connect frequency counter probe core to TP-H. Connect frequency counter probe GND to TP-Z.



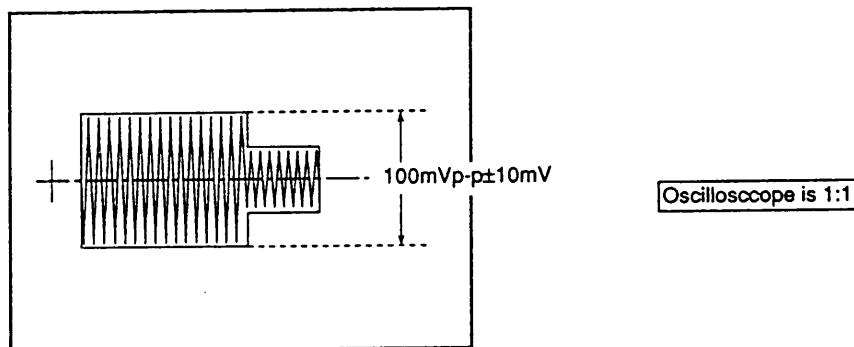
Adjustments	At PCB WHITE PEAK LEVEL ADJ. V.R., set test pin TP-H to 4.55 ± 0.05 MHz.
Precautionary Items	White and yellow portions will become whitish if the self-recording and playback of the colour bar is carried out with the white peak level over 4.2MHz. Adjust SYNC TIP LEVEL V.R. and WHITE PEAK LEVEL to their respective frequencies by turn balancing them against each other.

8. REC C LEVEL ADJUSTMENT

Measurement Tape REC Mode (Blank Tape T-120 TDK, Victor: Normal)
Specified Measurement PAL SIGNAL GENERATOR (LCG-309A or 404 Type Leader Electronics or equivalent). Oscilloscope (40MHz W/EXT TRIG)
Equipment EBU Colour Bar (Refer to Test Signal Chart)
Test Signal VIDEO IN: TEST SIGNAL GENERATOR
Connections VIDEO OUT: N.C.
Connect oscilloscope probe to deck head amp TP-J (connect probe earth to the head amp shield case).



Adjustments Completely cut Y level by rotating PCB REC Y LEVEL ADJ. V.R. REC Y level semi-fixed V.R. as far as possible in a clockwise direction.
At PCB REC C LEVEL ADJ. V.R. set TP-J output waveform to 100mVp-p ±10mVp-p.



9. REC Y LEVEL ADJUSTMENT

Measurement Tape

REC Mode (Blank Tape T-120 TDK, Victor: Normal)

Specified Measurement Equipment

PAL SIGNAL GENERATOR (LCG-399A Type Leader Electronics or equivalent)

Oscilloscope (40MHz W/EXT TRIG)

Test Signal

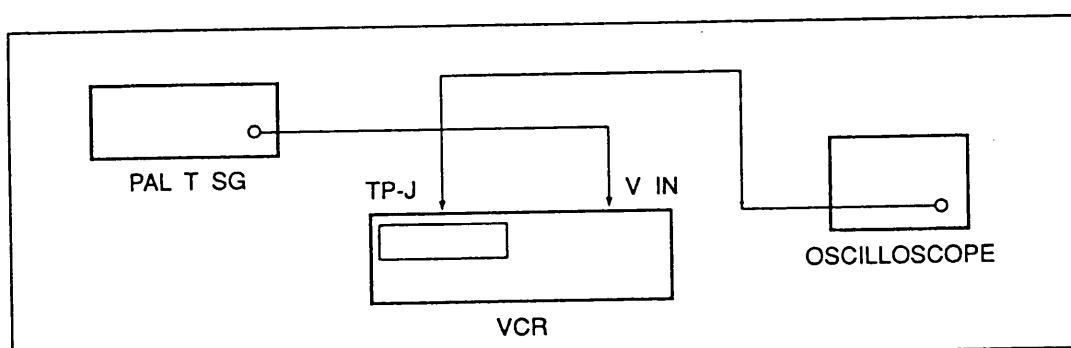
EBU Colour Bar (Refer to Test Signal Chart)

Connections

VIDEO IN: TEST SIGNAL GENERATOR

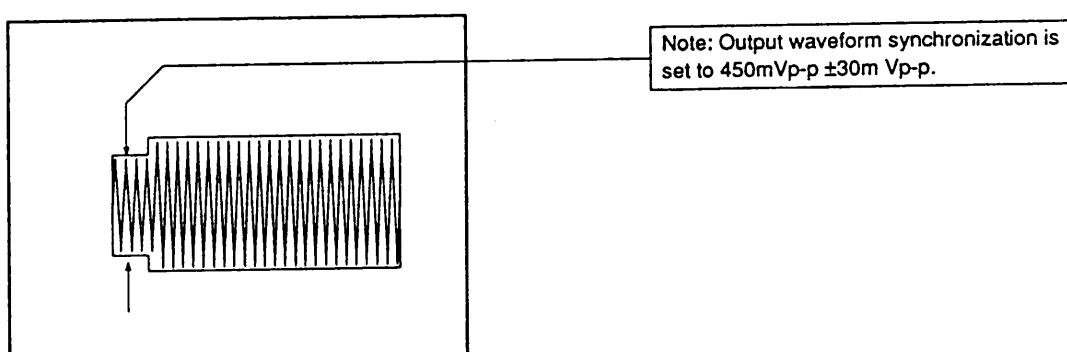
VIDEO OUT: N.C.

Connect oscilloscope probe to deck head amp TP-J (connect probe earth to the head amp shield case).



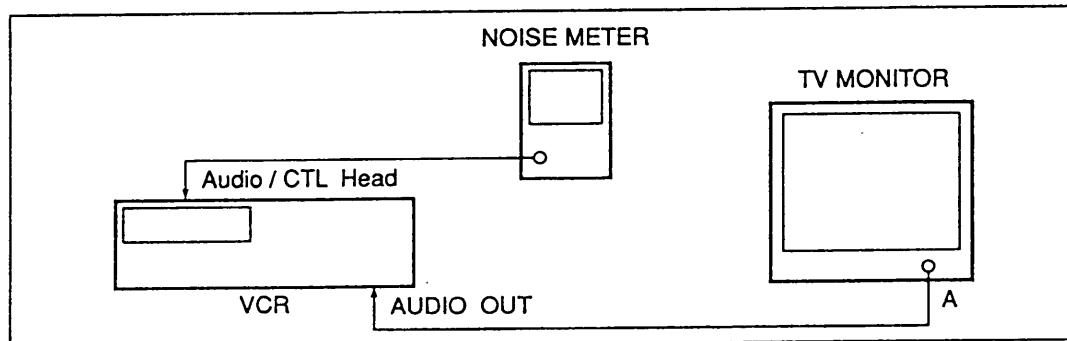
Adjustments

At PCB REC Y LEVEL ADJ. V.R. set TP-J output waveform to $450 \pm 30\text{mVp-p}$.



10. BIAS LEVEL ADJUSTMENT

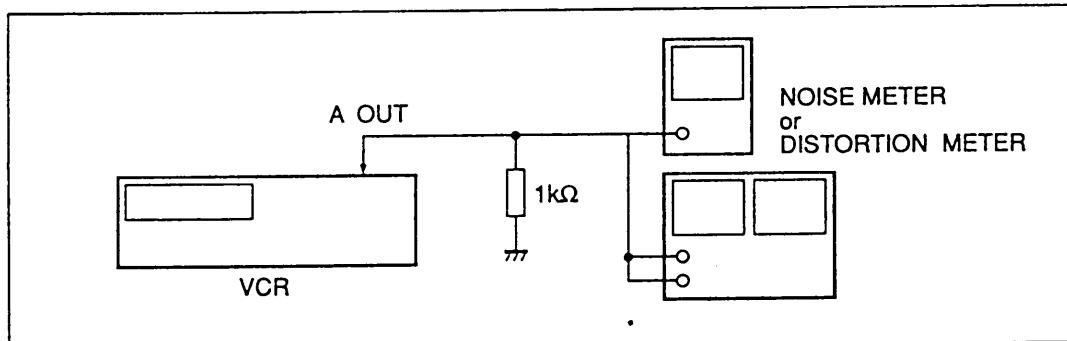
Measurement Tape	REC Mode (Blank Tape T-120 TDK, Victor: Normal)
Specified Measurement	AUDIO NOISE METRE (MN-445A or Equivalent).
Equipment	
Connections	VIDEO IN: N.C. VIDEO OUT: N.C. VIDEO IN: N.C. VIDEO OUT: Connect to TV monitor, etc. Connect audio noise meter probe core to AUDIO/CTL Head lower side pin. Connect audio noise meter probe earth to AUDIO/CTL Head upper side pin.



Adjustments	At PCB BIAS LEVEL ADJ. V.R set voltage between Audio/CTL Head lower pin terminals at 3.5 ± 0.5 mV.
Precautionary Items	Adjust very carefully, as carrying out self-recording and playback of the audio signal results in a drop in output and greater distortion.

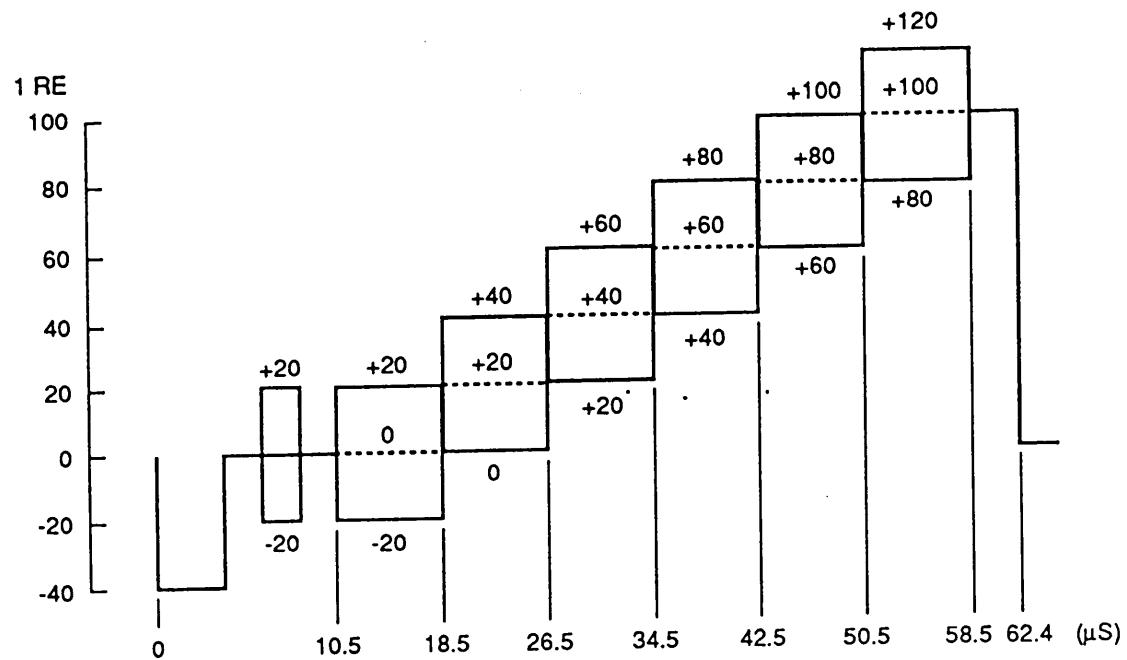
11. AUDIO OUTPUT LEVEL ADJUSTMENT

Specified Tape	TPS-3 (A: 1kHz V: EBU Colour Bar) PLAY Mode
Specified Measurement	AUDIO NOISE METER (MN-445A or Equivalent).
Equipment	
Connections	VIDEO OUT: to either noise meter or distortion meter



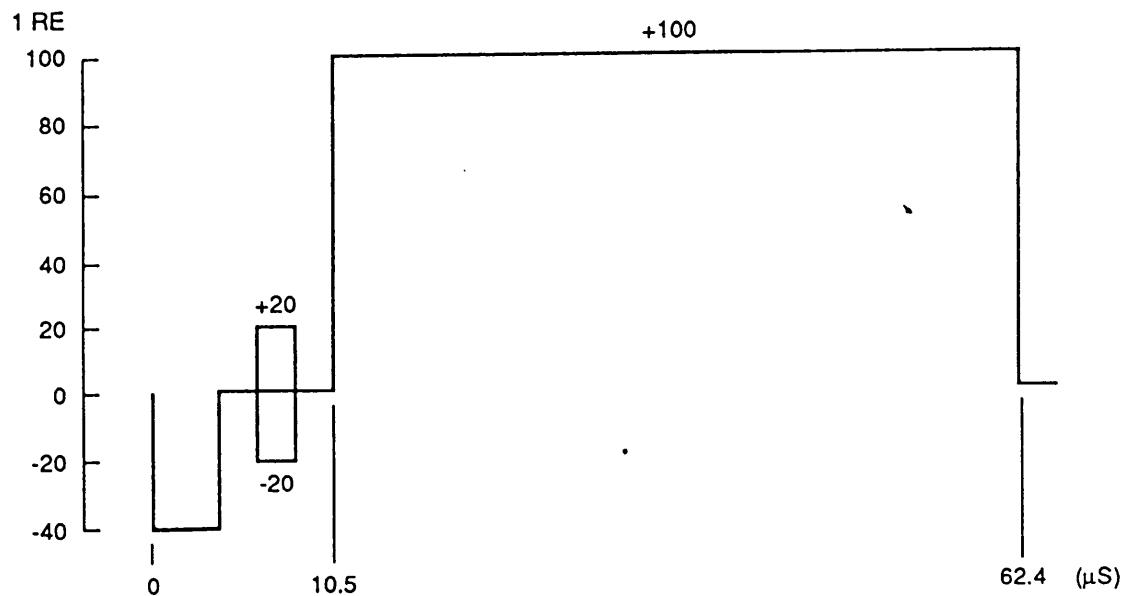
Adjustments	At PCB AUDIO output level ADJ. V.R set so that the 1kHz level at 1kΩ load is 200mVrms. At the same time, verify that distortion is within 3%.
Precautionary Items	No noise, oscillation, etc. in audio output waveform.

MODULATION 5 STEPS



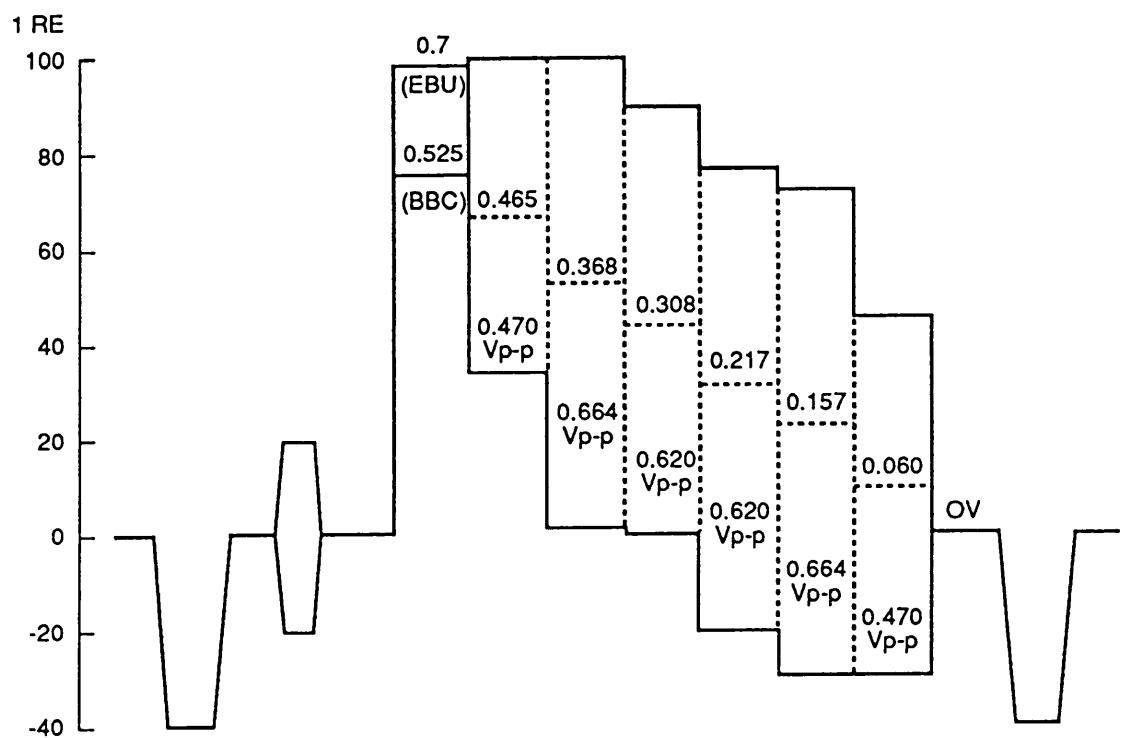
Modulation 5 Steps (Dotted Lines are the Y Level & 5 Steps)

WHITE RASTER

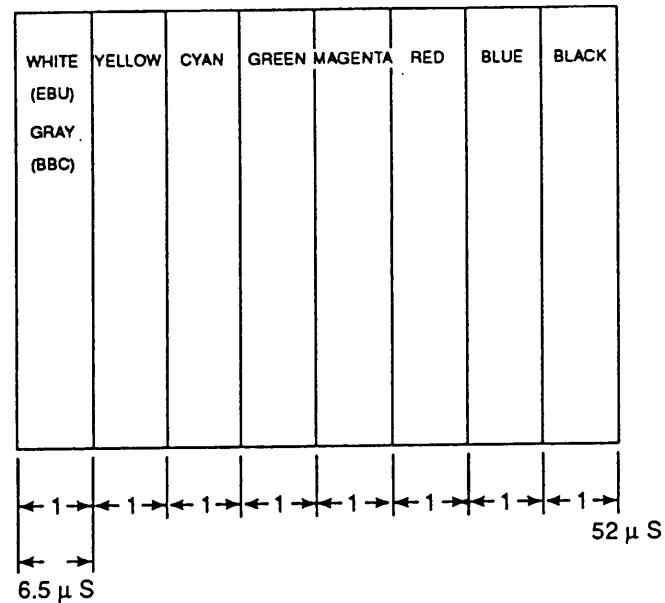


White & Roster

EBU, BBC COLOUR BAR



COLOUR BAR PICTURE

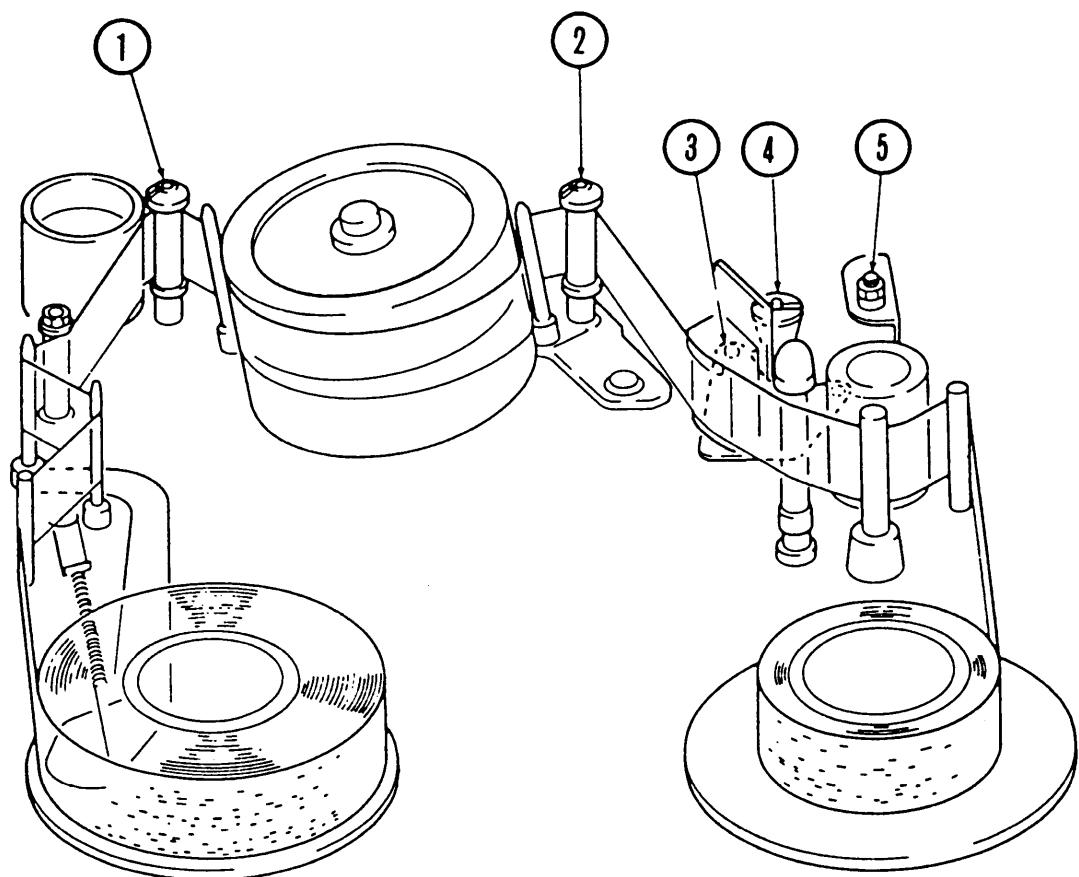


MECHANICAL ADJUSTMENT

TEST POINTS AND ALIGNMENT

DECK adjustment points

- ① ENVELOPE entrance adjustment screw
- ② ENVELOPE exit adjustment screw
- ③ AUDIO AZIMUTH adjustment screw
- ④ AUDIO/CTL HEAD adjustment screw
- ⑤ X-Value adjustment screw



ADJUSTMENT PROCEDURES

1. ADJUSTMENT OF THE BT TORQUE (Fig. 1)

Bend the portion marked *, by using a pair of pincers or the like, toward the direction indicated by an arrow to adjust the BT torque.

Bent toward direction Ⓐ : BT torque goes up.

Bent toward direction Ⓑ : BT torque goes down.

Caution : Do not damage the main chassis with the pincers.

Do not over-bend the portion marked *.

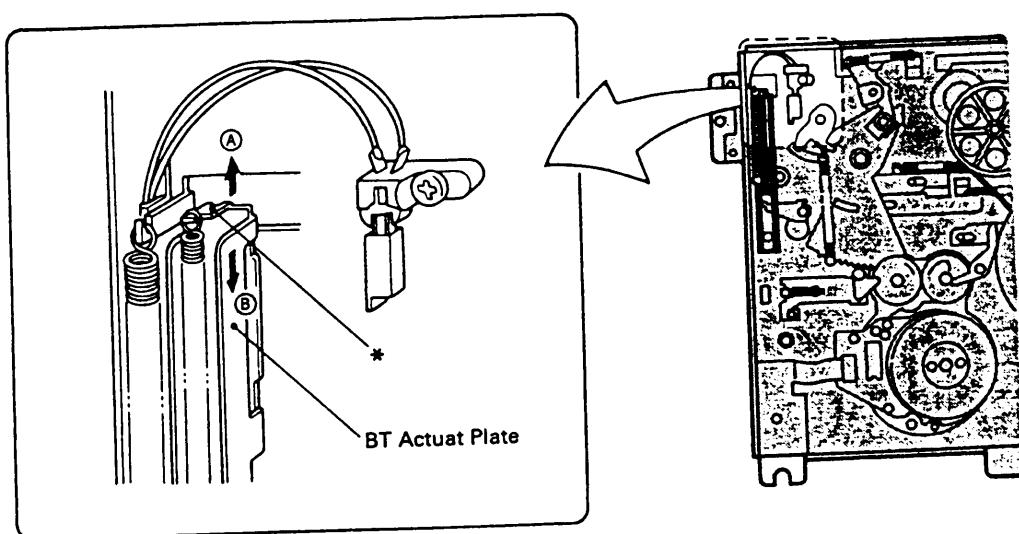


Fig. 1

2. ADJUSTMENT OF THE BT TORQUE IN THE PLAY MODE (Fig. 2)

Rotate the loading motor by finger and transfer to play mode while in eject status.

Next insert a screwdriver or the like into the BT band assembly's square groove and bend in direction of arrow so that BT arm assembly end is in the center of the Ⓜ half punch as shown in the figure.

Bend in right direction: BT torque goes up (toward protruding part).

Bend in left direction: BT torque goes down (away from protruding part).

Caution: Take care to not damage the chassis during work. A slight bend angle is favorable because the square groove will not return to its original shape if bent to an extreme angle. Refrain from using too much force.

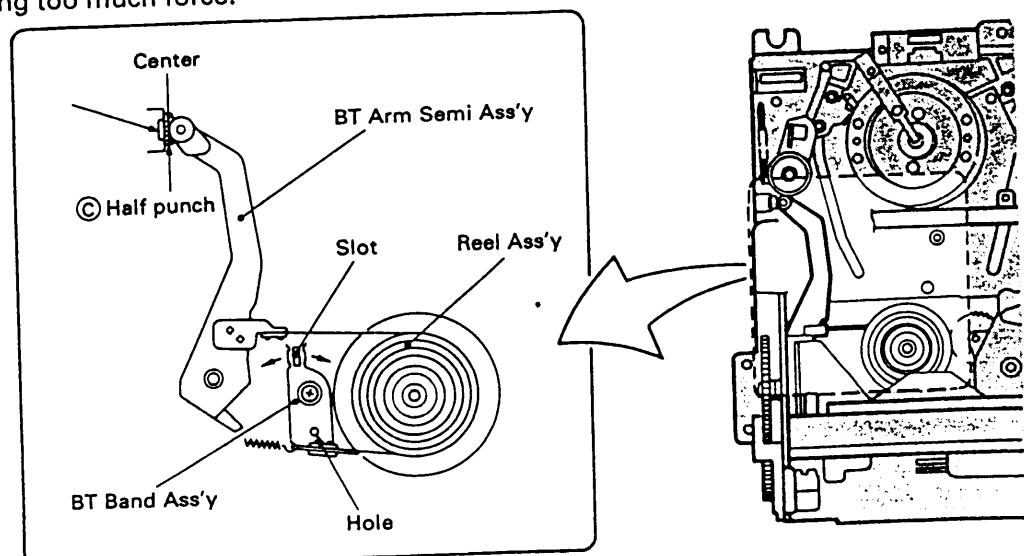


Fig. 2

3. REEL DISK HEIGHT

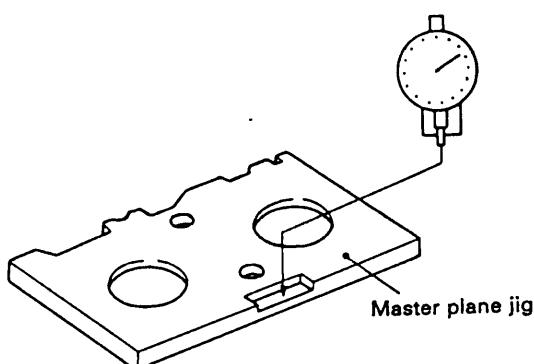


Fig. 3-1 Master plane jig setting

- Remove the front loading parts and set the master plane jig as indicated in Fig. 3-1.

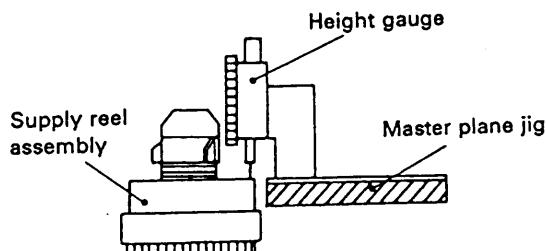


Fig. 3-2 Reel height adjustment

- Set dial gauge on the master plane.
- Check reel assembly height measure at two places 90° apart (± 0.2 mm) Fig. 3-2.

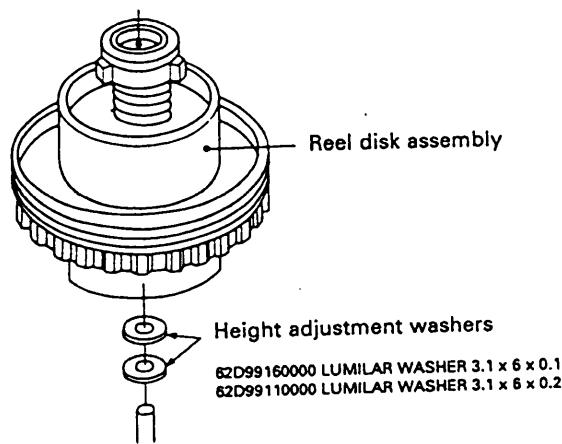


Fig. 3-3 Washers for height adjustment

- If it is necessary to adjust the height, add or subtract the required number of height adjustment washers as shown in Fig. 3-3.

- After reassembling, confirm a small amount of mechanical play between reel disk and slit washer.

4. GUIDE POLE HEIGHT ADJUSTMENT

- Set the master plane jig as shown in Fig. 3-1.

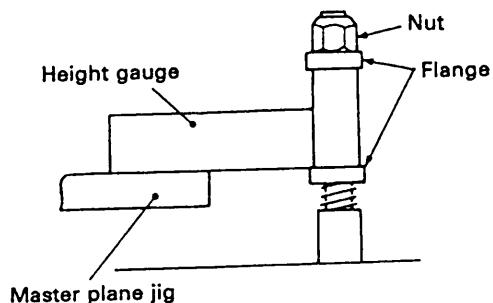


Fig. 4 Guide pole height adjustment

- Set the height gauge on the master plane jig as shown in Fig. 4.
- For each guide pole, check the height of the upper face of the lower flange. If necessary, carefully adjust by turning the nut.
- If guide pole height has been adjusted, the checks and adjustments described in the following pages are required.

5. AUDIO/CTL HEAD

5-A Tape transport adjustment

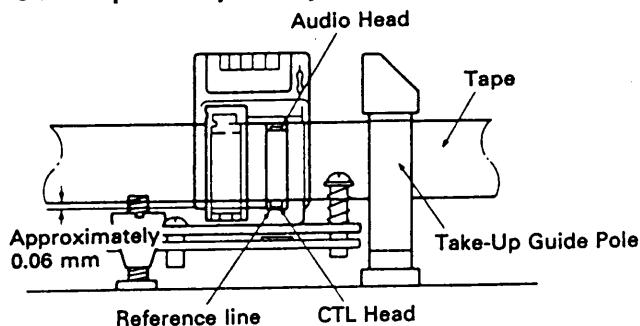


Fig. 5-1 Audio/CTL Head adjustment

- Employ self-recording tape and set for PLAY mode.
- Turn screw © (Fig. 5-2) and adjust for smooth transport at the take-up guide pole.

5-B Audio/CTL Head height and azimuth

- Connect oscilloscope to the audio out.
- Play the test tape (8 kHz and stairstep signals) and measure the audio output level.
- Turn nut ®, and screws ® and © in succession by small and equal increments at a time and adjust for maximum audio output level. With reference to nut ®, adjust azimuth with screws ® and © so that small tape wrinkles are not produced at the guide pole, but at the same time, audio output is at maximum and level fluctuations, minimum. It is suggested that you first turn nut ® by a small amount, then turn screws ® and © by an equal amount and set for maximum output.
- Carefully and evenly adjust nut ®, and screws ® and © to align the Audio/CTL Head height with the tape as shown in Fig. 5-1.

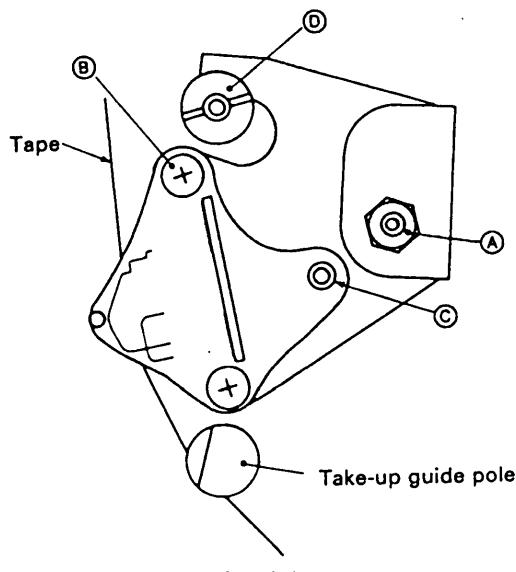


Fig. 5-2

6. TAPE TRANSPORT SYSTEM CHECKS AND ADJUSTMENT

The tape transport system has been precisely aligned at the factory and normally does not require readjustment. The following steps are therefore necessary only in cases of severe usage or when replacing parts affecting the tape transport system.

6-A Tape transport check

- Employ self-recording tape and operate the machine between PLAY and STOP modes several times.
- During PLAY mode, observe tape at the input and output portions (A and B in Fig. 6-1) of the head drum lead. Confirm that the tape slips neither upward nor downward with respect to the lead as shown in Fig. 6-2.

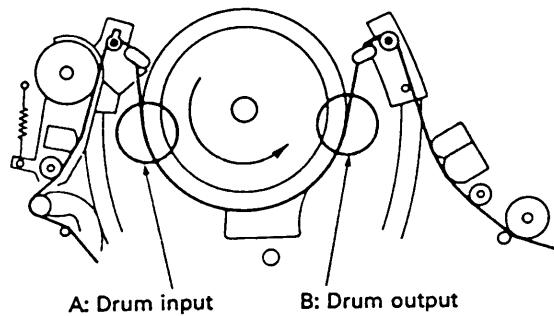


Fig. 6-1 Tape transport check

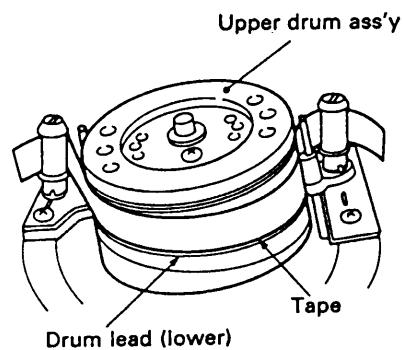
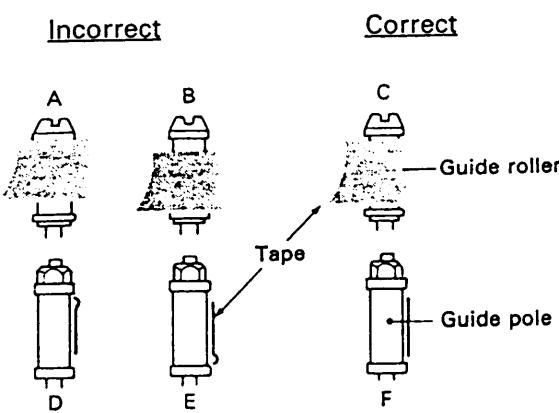


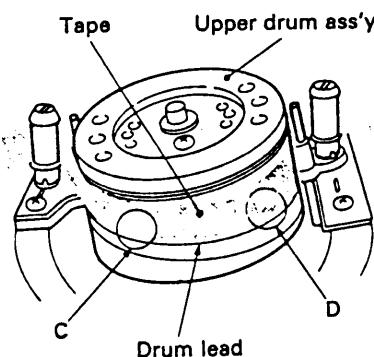
Fig. 6-2 Drum lead check - 1

NOTES:

- Slips upward : sound is produced by contact between tips of rotating heads and edge of tape.
- Slips downward : tape curls or wrinkles from contacting lead face (sound may also be produced).
- During loading, play and unloading, observe the tape at the supply guide rollers and poles, and take-up guide rollers. Confirm absence of curling, wrinkling, etc., as shown in Fig. 6-3.

**Fig. 6-3 Guide roller and guide pole**

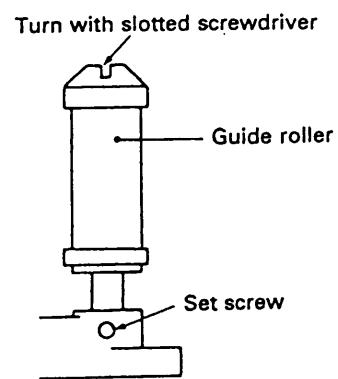
- Observe the tape as it wraps around the drum during loading and as it separates from the drum during unloading. Confirm absence of damage to the tape at points C and D as shown in Fig. 6-4 and absence of contact noise between head tips and tape edge.

**Fig. 6-4 Drum lead check - 2**

- If defects are noted during the above checks, perform the following adjustments 6-B, 6-C.

6-B Guide roller height adjustment

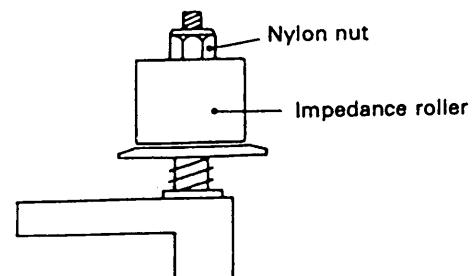
- Slightly loosen set screws of the supply and take-up guide rollers as shown in Fig. 6-5.
- Employ self-recording tape and set for PLAY mode.
- With a slotted screwdriver, slightly turn the supply guide roller (do not turn more than 180 at a time) and adjust so that at the drum input, the tape travels smoothly in the drum lead without slipping upwards or downwards.
- Similarly, adjust the take-up guide roller for the drum output.

**Fig. 6-5 Guide roller height adjustment****NOTES:**

- Loosen the set screws only enough to allow the guide rollers to be turned. If excessively loose, tape motion may turn the rollers inadvertently.
- Turn the rollers carefully to avoid damage to the tape.

6-C Adjustment of the impedance roller

While tape is running in the reverse direction: Adjust the height of the nylon nut so that the tape guide flange does not interfere with the bottom edge of the tape.

**Fig. 6-6 Supply guide pole height adjustment**

6-D Tape transport check at the take-up guide pole

Generally no adjustment will be necessary for the take-up guide pole. However, adjustments or checks will be needed when replacing the Audio/CTL Head or parts affecting the tape transport system after a long periods of operation.

- a) Employ a self-recording tape and set for PLAY mode.
 - b) Turn Audio/CTL Head screw © as shown in Fig. 6-7 and adjust for smooth transport at the take-up guide pole as shown by F of Fig. 6-3.

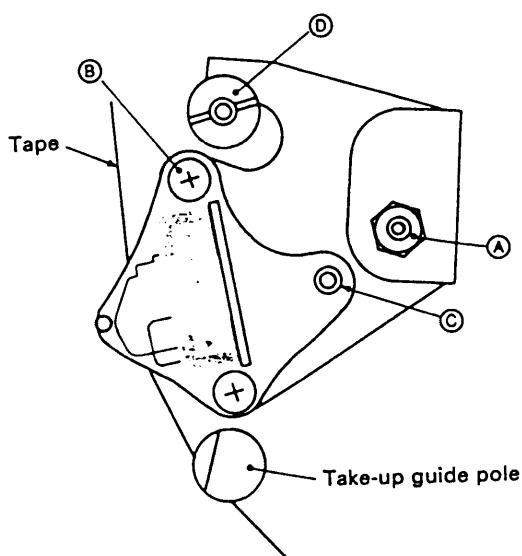


Fig. 6-7 Take-up guide pole.

7. INTERCHANGEABILITY ADJUSTMENT

Before using alignment tape, employ self-recording tape and confirm correct tape transport.

7-A PRELIMINARY CHECKS

1. Check sequence 1

- a) Connect oscilloscope to TP-E. At this time, trigger the oscilloscope externally with the signal (RF SWITCHING PULSE) from TP-C.
 - b) Play stairstep portion of the alignment tape.
 - c) Turn the Tracking control and adjust for maximum FM output at DECK TERMINAL TP-E.

Set the Tracking control to centre click position and confirm that nearly maximum output is obtained.

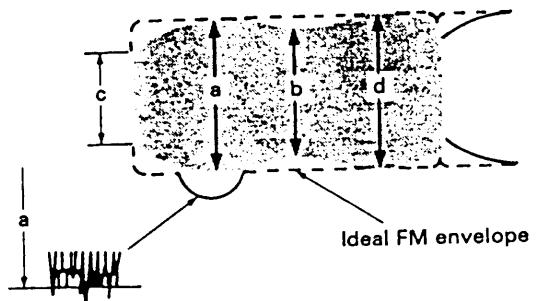


Fig. 7-1 FM waveform (max. output)

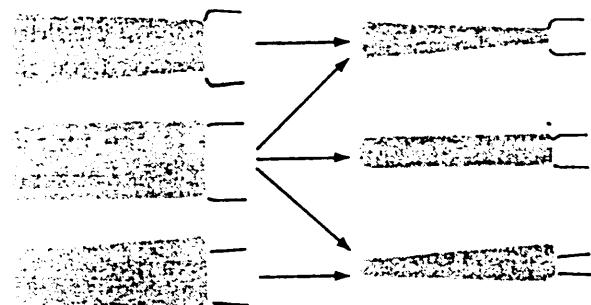


Fig. 7-2 Normal waveform examples

- d) Refer to Fig. 7-1. Read the level of portion (a) of the waveform. If the waveform is serrated at point (a), read the value at the most uniform serrations as shown above in Fig. 7-2.
 - e) As shown by the broken lines, read the FM

waveform value at point (b) and confirm that:

$$\frac{b}{a} \geq 0.65 \text{ or } 20 \log \frac{b}{a} \geq -3 \text{ dB}$$

- f) Read the values at points (c) and (d) [drum input and output] and confirm that:

$$\frac{c}{a} \geq 0.75 \text{ and } \frac{d}{a} \geq 0.75 (\geq -6 \text{ dB})$$

NOTES:

- Read minimum levels for (b), (c), and (d).
- If above checks yield normal results, proceed to section 7-B.
- If defects are noted, perform preliminary adjustments in section II.

2. Check sequence 2

- a) Observe the FM waveform as in the previous section (I-A) and turn the Tracking control. The waveform variation should be nearly parallel as shown in Fig. 7-2.
- b) If the waveform varies as shown in Fig. 7-3, adjustment is required.



Fig. 7-3 Incorrect waveform examples

7-B PRELIMINARY ADJUSTMENTS

- Loosen the set screws of the supply guide roller and take-up guide roller. If the guide rollers turn freely, slightly tighten the set screws.
- Connect oscilloscope to TP-E. Trigger the oscilloscope externally with a signal from TP-C.
- Play the alignment tape (stairstep signal).

1. Drum input

- a) Observe oscilloscope display and adjust the Tracking control for maximum FM output.
- b) Refer to Fig. 7-4 Examples of incorrect waveform are shown by A. Use a slotted screwdriver to adjust the supply guide roller so that the rising portion (drum input portion) on the waveform becomes flat as shown by B.

NOTES:

- If the guide roller turns freely, tighten the set screw slightly.
- Be sure to adjust the guide roller only by small increments at a time in order to avoid damaging the alignment tape. In addition to observing the waveform, confirm absence of tape slippage or curling at the drum lead and guide poles.
- At the supply guide pole, if the tape separates from the guide or wrinkling occurs, adjust the guide pole height.

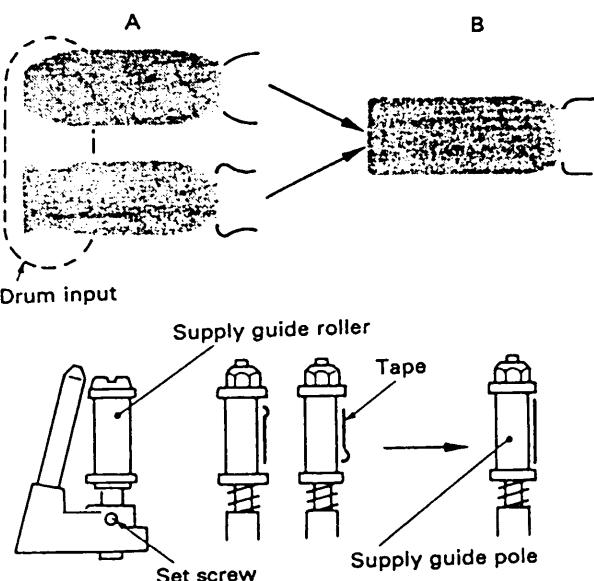


Fig. 7-4 Drum input adjustment

2. Drum output

- a) In the same manner as for the drum input, turn the take-up guide roller to adjust the falling portion (drum output portion) of the FM waveform. Incorrect examples are shown by C in Fig. 7-5, while D indicates the correct adjustment.
- b) If the tape separates from the guide or wrinkling occurs at the take-up guide pole, adjust by turning screw © of the Audio/CTL Head as shown in Fig. 7-6.

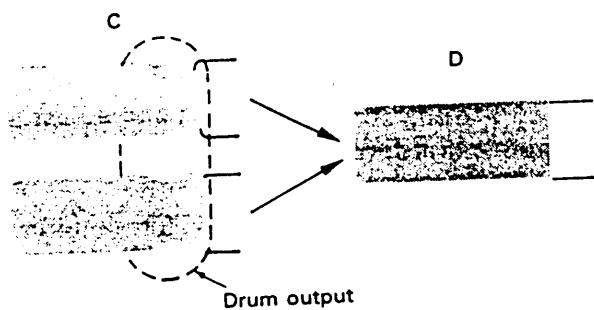


Fig. 7-5 Drum output adjustment

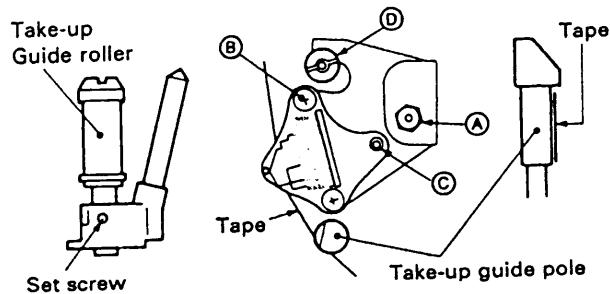


Fig. 7-6 Take-up guide pole

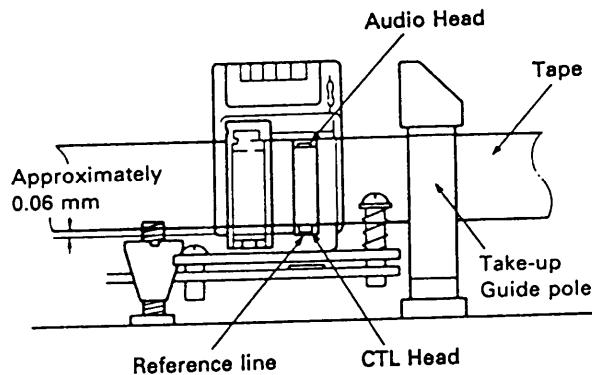


Fig. 7-7 Audio/CTL Head height

- c) Carefully and evenly adjust screws ⑧ and ⑨, and nut ⑩ to align the Audio/CTL Head height with the tape as shown in Fig. 7-7.

NOTES:

- Fine adjustment is not required at this time. It is sufficient that the tape is engaged with the guide pole and that the servo operates properly (control signal picked up).
- If the tape separates from the take-up guide pole or wrinkling occurs, screw ⑨ (Fig. 7-7) has been turned excessively with respect to nut ⑩ and screw ⑧ causing the Audio/CTL Head to incline forward or backward. Use care to adjust screws ⑧ and ⑨, and nut ⑩ evenly and observe that small wrinkles are not produced at the take-up guide pole.

7-C INTERCHANGEABILITY FINE ADJUSTMENT

- a) Connect oscilloscope to TP-E.
Observe the FM waveform and adjust the Tracking control for minimum FM output level.

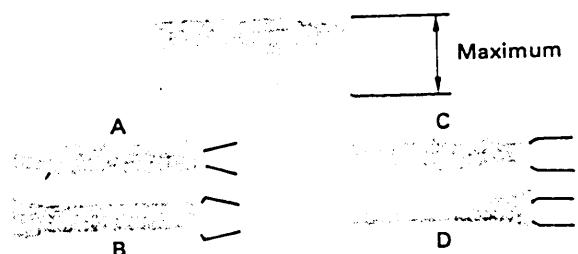


Fig. 7-8 Minimum FM output (incorrect examples)

- b) If there are waveforms as shown by A or B in Fig. 7-8, carefully adjust the supply guide roller height so that the waveform appears as shown by E, F, or G in Fig. 7-9. At this time, if the waveform fluctuates, adjust to the point of minimum fluctuation.

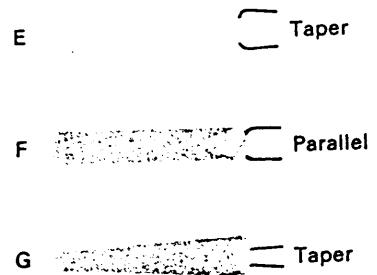


Fig. 7-9 Minimum FM output (correct examples)

- c) If the FM waveform appears as shown by C or D in Fig. 7-8, carefully adjust the take-up guide roller height to obtain a waveform such as shown by E, F, or G in Fig. 7-9. At this time, if the waveform fluctuates, adjust to the point of minimum fluctuation.
- d) Vary the Tracking control from maximum to minimum FM output.
Perform fine adjustment of supply and take-up guide rollers so that waveform variation appears as shown by E, F, or G of Fig. 7-9.

7-D AUDIO/CTL HEAD HEIGHT, AZIMUTH AND INCLINATION

See section 5-B (page MA-4), Audio/CTL Head height and azimuth.

7-E SET SCREW TIGHTENING

- a) Check for maximum FM output waveform, maximum audio out, and absence of tape wrinkling or other transport irregularities, then secure the guide rollers.
Perform in STOP mode.
- b) Since the guide rollers are easily moved, use care when securing.
- c) After tightening the set screws, again perform interchangeability final check.

7-F INTERCHANGEABILITY FINAL CHECK

- a) Confirm section 7-1, (page MA-6), Preliminary checks.

7-G: SERVO CIRCUIT ADJUSTMENT

- a) Head switching position (see page EA-3).
- b) Normal tracking preset (see page EA-4).

7-H: FINAL CHECKS

- a) Confirm Section 7-1 (page MA-6), Preliminary Checks.

8. PERIODIC MAINTENANCE

The following procedures are recommended for maintaining optimum performance and reliability of this video cassette player.

I. CLEANING

For cleaning, use a lint-free cloth or gauze dampened with alcohol.

A. Tape transport system

1. The following components should be cleaned after every 500 hours of use.

- Impedance Roller
- Tension Pole
- Supply Slide Post
- Supply Guide Roller
- Take-Up Slide Post
- Take-Up Guide Roller
- Video Head & Drum System
- Drum Ground
- Drum Motor Shaft
- Audio/CTL Head
- Pinch Roller
- Capstan
- Reverse Guide Pole
- Full Erase Head

2. Since the above parts come in direct contact with video tape, they tend to collect dust particles. If allowed to accumulate, dust may lead to damage to the video tape and above parts.
3. After cleaning with alcohol, allow the parts to dry thoroughly before using a cassette tape.

NOTE:

When cleaning the two video heads on the upper drum, do not clean them with a vertical stroke.

Use only a gentle back and forth motion in the direction of the tape path.

Use care since they are easily damaged.

When cleaning video heads, Audio/CTL Head, and Full Erase Head use a lint-free cloth dampened with alcohol.

B. Reel drive system

1. The following components should be cleaned after every 1000 hours of use.

TOP

- Take-Up Reel
- Supply Soft Brake
- Supply Brake
- Take-Up Brake

BOTTOM

- Capstan Motor Pulley
- Drive Belt
- Main Belt
- Loading Belt
- Capstan Flywheel
- Intermediate Pulley
- Loading Motor Pulley
- Eject Pulley
- Worm Pulley
- Clutch Ass'y

2. The above revolving parts are of rubber or come in direct contact with rubber parts. Rubber dust can accumulate and interfere with proper operation.
3. Avoid using excessive alcohol when cleaning rubber parts.

II. LUBRICATION

The following components should be lubricated with oil after every 2000 hours of use.

- Shaft of the take-up reel
- Shaft of the supply reel

After cleaning above shafts with alcohol, lubricate these shafts with one or two drops of oil.
Do not overlubricate.

III. SERVICE SCHEDULE FOR MAIN COMPONENTS

The following chart lists the parts which should receive periodic servicing at the recommended intervals.

Name	Periodic Service Schedule (operating hours)					Part No.
	1000	2000	3000	4000	5000	
Cylinder Ass'y	○	●	○	●	○	62D80596450A
Drive Belt		●		●		62D80590917
Clutch Ass'y		●		●		62D805909302
Capstan Motor Ass'y		●		●		62D805907302
Main Belt		●		●		62D80590710
Loading Belt		●		●		62D80591106
Back Tension Band Ass'y		●	·	●		62D805908302
Drum Earth Bracket		●		●		62D80590102
Front Loading Clutch Ass'y		●		●		62D805916305
Supply Soft Brake Ass'y		●		●		62D805910304
Supply Brake		●		●		62D80591019
Take-Up Brake		●		●		62D80591019
Audio/CTL Head			●			62D62041506
Pinch Roller			●			62D62041503
Loading Motor Ass'y			●			62D805911301
Supply Reel Ass'y			●			62D805905301
Take-Up Reel Ass'y			●			62D805905301
Full Erase Head			●			62D62041530

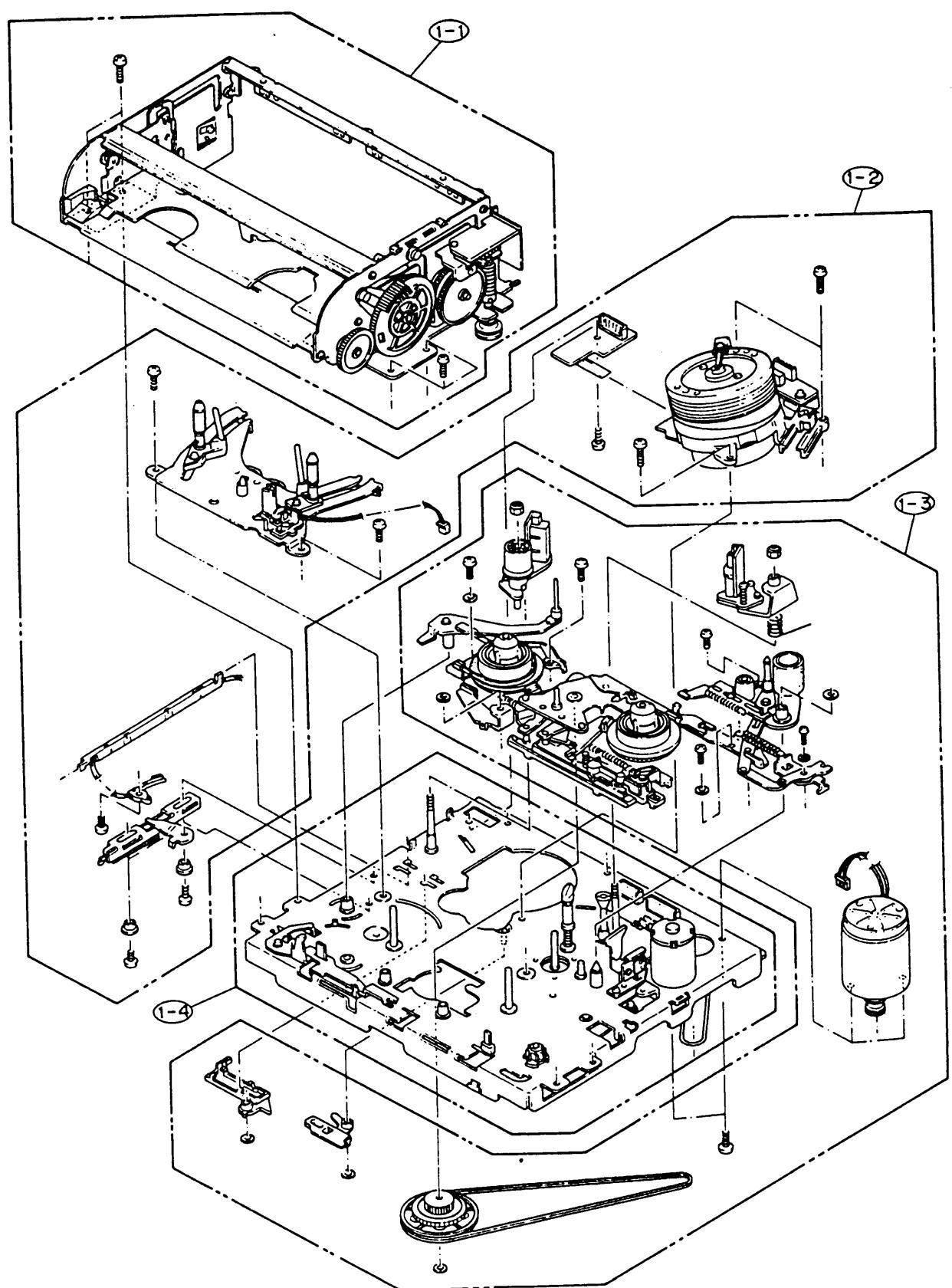
Fig. 26 Standard service periods

- Check and replace if necessary
- Replace

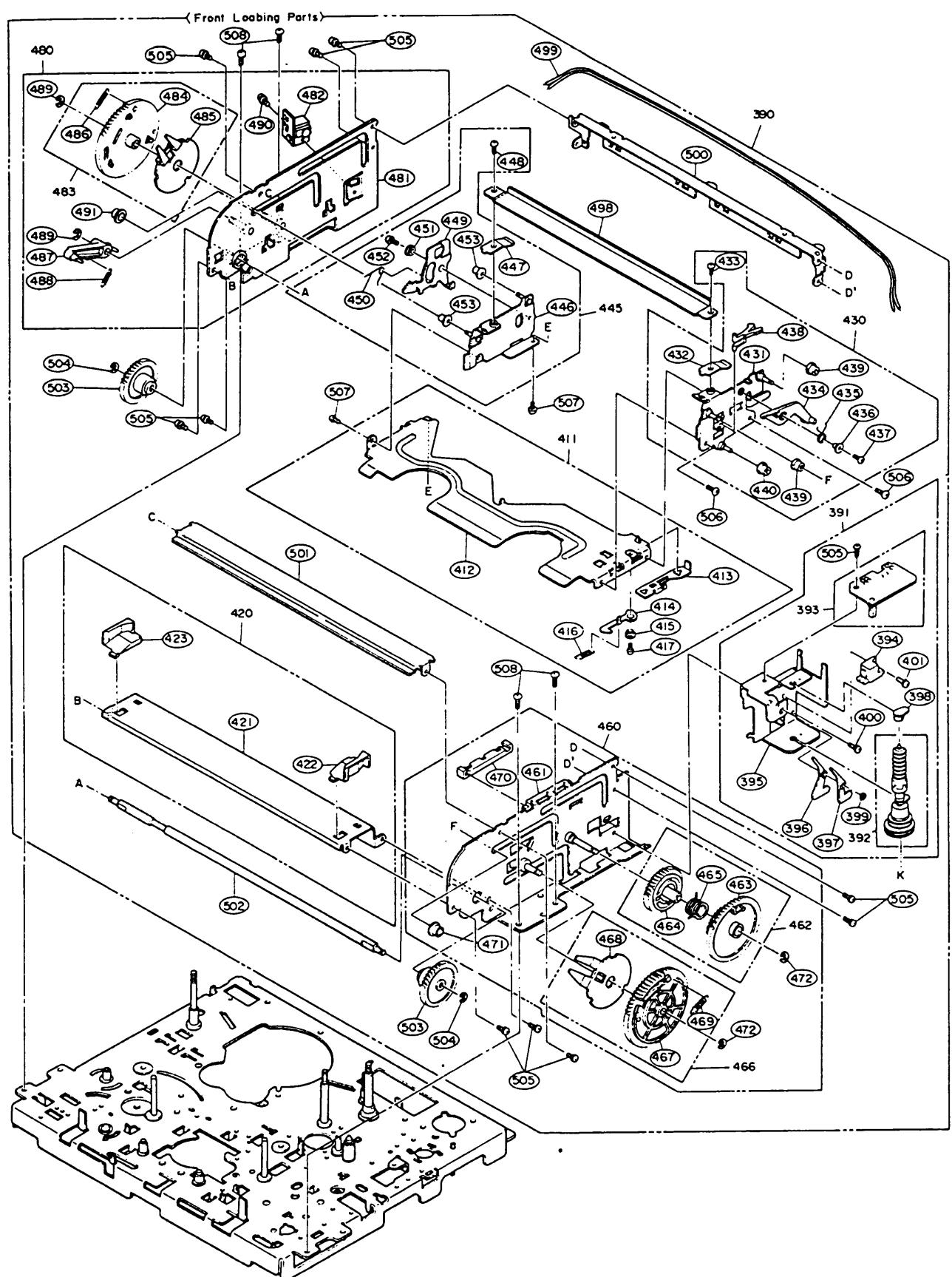
NOTE:

Cleaning, lubrication, and replacement of the belts should be undertaken every 2 years even if the unit is not used frequently.

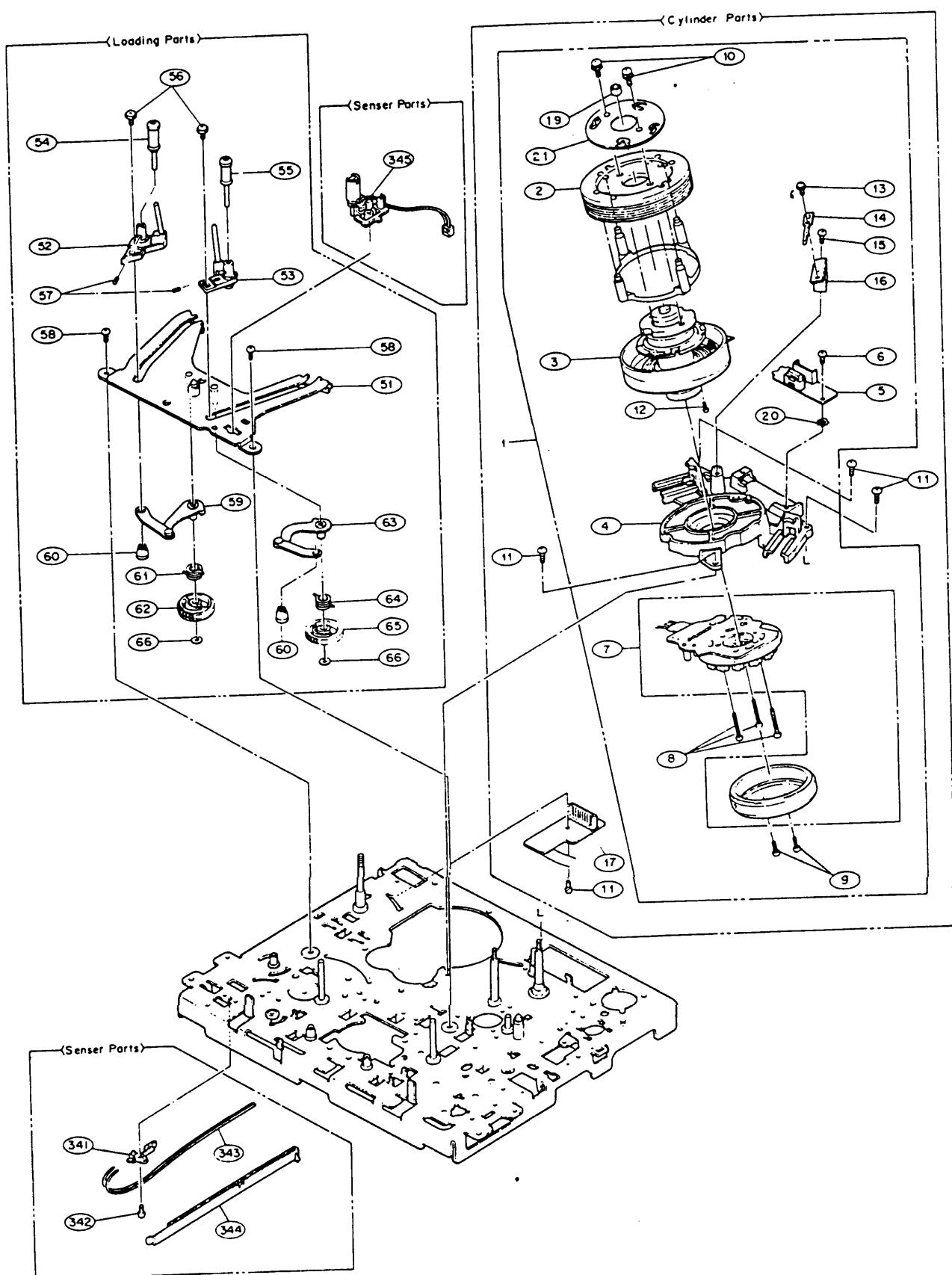
CASSETTE DECK EXPLODED VIEW-GENERAL



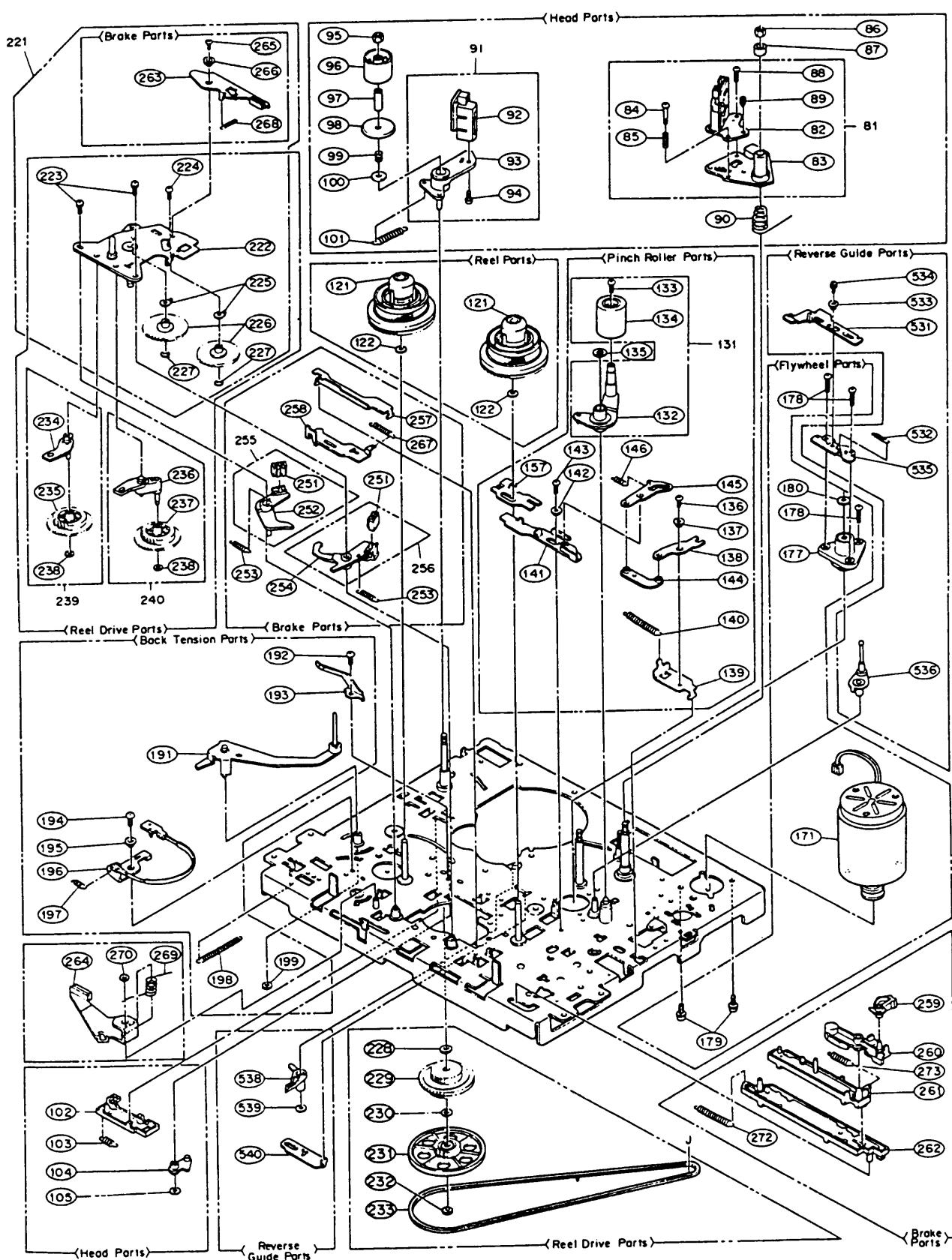
<1-1>



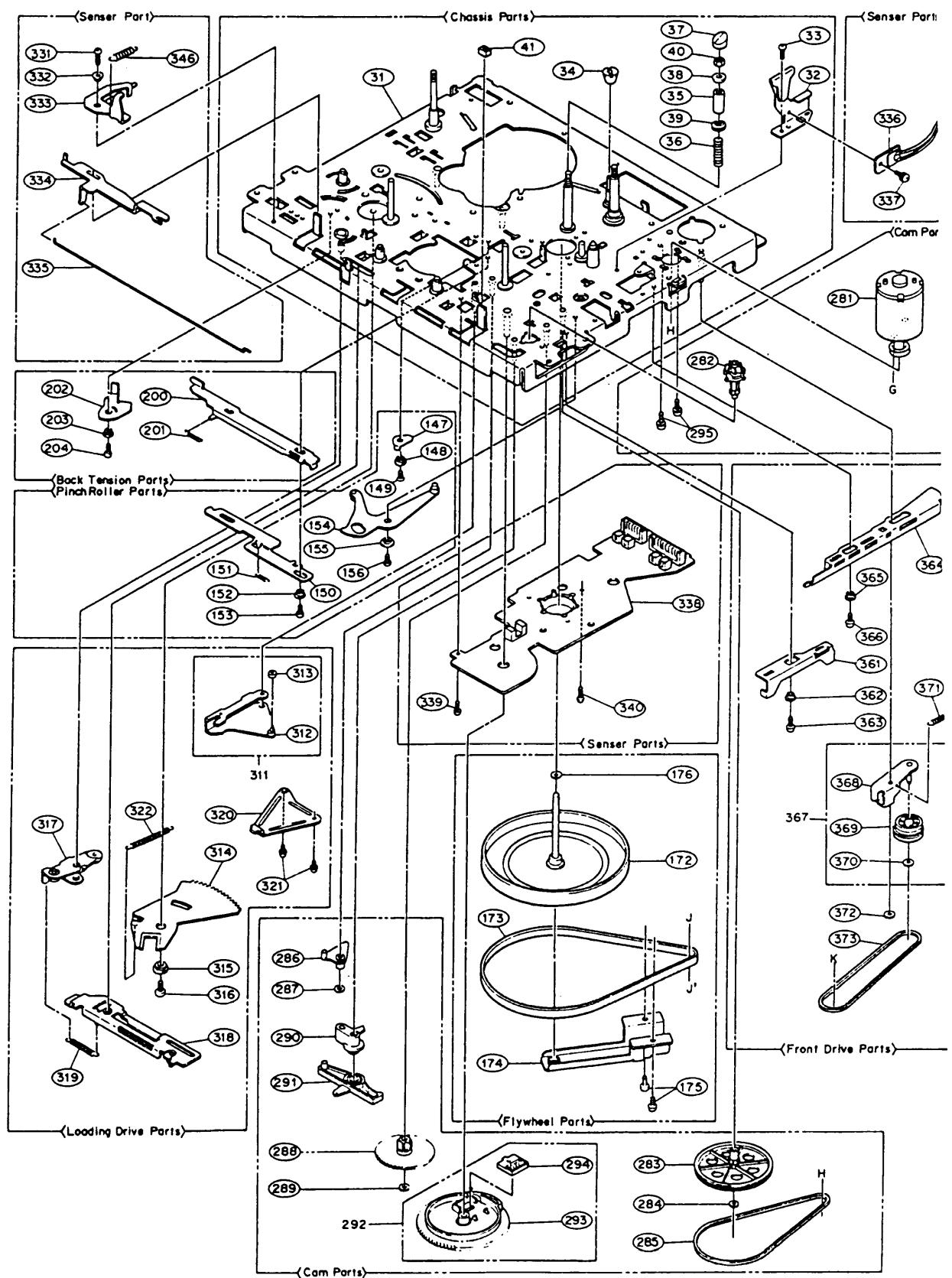
<1-2>



<1-3>



<1-4>



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Ref. No.	TN Part No.	ST Part No.	Description
1	8059-64-50A	62D80596450A	CYLINDER ASS'Y
2	8059-01-64	62D80590164	UPPER DRUM
3	8059-01-315	62D805901315	LOWER DRUM ASS'Y
4	8059-01-01	62D80590101	CYLINDER MOUNT
5	8059-01-316	62D805901316	VIDEO OUT PCB ASS'Y
6	9973-00-00	62D99730000	W TAMS SCREW 2.6X6
7	6004-03-24	62D60040324	MOTOR TM85
8	9055-00-00	62D90550000	SCREW 2.6X20
9	9098-00-00	62D90980000	TAMS SCREW 2.6X6
10	9999-20-35	62D99992035	COLLAR SCREW
11	9205-00-00	62D92050000	C TAPPING SCREW 3X10
12	9552-00-00	62D95520000	SCREW (FOR CAMERA) 2X5 (NO.1)
13	9665-00-00	62D96650000	CAP SCREW 2.6X3
14	8059-01-54	62D80590154	DRAM EARTH FLAT SPRING
15	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
16	8059-01-02	62D80590102	DRAM EARTH BRACKET
17	8059-01-347	62D805901347	DM PCB C ASS'Y
18	9192-00-00	62D91920000C	TAPPING SCREW 2.6X5
19	8059-01-26	62D80590126	DRAM EARTH
20	9715-00-00	62D97150000	WASHER 2.6
21	8000-01-45	62D80000145	UPPER DRUM BASE
22	8000-01-46	62D80000146	POST
23	8059-01-71	62D80590171	CONNECTOR BRACKET
32	8059-02-301	62D80590230	OPEN ANGLE ASS'Y
33	9191-00-00	62D91910000	C TAPPING SCREW 2.6X4
34	8059-02-29	62D80590229	TRACKING ADJUSTER
35	8000-03-14	62D80000314	TAPE GUIDE
36	8059-02-26	62D80590226	TAPE GUIDE SPRING
37	8000-03-19	62D80000319	GUIDE CAP
38	8000-03-28A	62D80000328A	TAPE GUIDE FLANGE (C)
39	8000-03-29	62D80000329	TAPE GUIDE FLANGE (D)
40	9453-00-00	62D94530000	NUT 3.0
41	8059-02-23	62D80590223	DAMPER RUBBER
51	8059-03-501	62D805903501	LOADING BASE SEMI ASS'Y
52	8059-03-04	62D80590304	LOADING BLOCK (L)
53	8059-03-05	62D80590305	LOADING BLOCK (R)
54	8000-03-37	62D80000337	ROLLER POST ST
55	8000-03-37	62D80000337	ROLLER POST ST
56	9665-00-00	62D96650000	CUP SCREW 2.6X3
57	9C17-20-273	62D9C1720273	SCREW (FOR) CAMERA 2X2.7MM
58	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
59	8059-03-502	62D805903502	LOADING PLATE (L) SEMI ASS'Y
60	8059-03-14	62D80590314	LOADING BOSS
61	8059-03-08	62D80590308	LOADING GEAR SPRING (L)
62	8059-03-06	62D80590306	T LOADING GEAR (L)
63	8059-03-503	62D805903503	LOADING PLATE (R) SEMI ASS'Y

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Ref. No.	TN Part No.	ST Part No.	Description
64	8059-03-09	62D80590309	LOADING GEAR SPRING (R)
65	8059-03-07	62D80590307	T LOADING GEAR (R)
66	9884-00-00	62D98840000	P WASHER CUT 2.6X6X0.5
67	8059-03-301	62D805903301	LOADING BASE ASS'Y
68	8059-03-302	62D805903302	LOADING GEAR (L) ASS'Y
69	8059-03-303	62D805903303	LOADING GEAR (R) ASS'Y
81	8059-04-308	62D805904308	HEAD BASE ASS'Y
82	6204-15-06	62D62041506	ACE HEAD HV225211
83	8059-04-502	62D805904502	HEAD BASE SEMI ASS'Y
84	8000-06-26	62D80000626	AZIMUTH SPRING SCREW
85	8000-06-04	62D80000604	AZIMUTH SPRING
86	9953-00-00	62D99530000	NYLON NUT M3
88	9705-00-00	62D97050000	LONG LOCK SCREW 2.6X7
89	9999-20-25	62D99992025	SCREW 3X6 (SHARP TYPE)
90	8059-04-15	62D80590415	HEAD SPRING
91	8059-04-302	62D805904302	FE PLATE ASS'Y
92	6204-15-03	62D62041503	FE HEAD HV113006
93	8059-04-04	62D80590404	FE PLATE
94	9114-00-00	62D91140000	FLANGE BIND SCREW 2X3
95	9953-00-00	62D99530000	NYLON NUT M3
96	9953-00-00	62D99530000	IMPEDANCE ROLLER
97	8059-04-06	62D80590406	IMPEDANCE ROLLER SLEEVE
98	8059-04-07	62D80590407	TAPE GUIDE FLANGE (A)
99	8059-04-09	62D80590409	TAPE GUIDE FLANGE SPRING
100	9337-00-00	62D93370000	PLANE WASHER 3X8X0.5
101	8059-04-08	62D80590408	FE PLATE SPRING
102	8059-04-10	62D80590410	FE SLIDE PLATE
103	8059-04-12	62D80590412	FE ACTUATE SPRING
104	8059-04-11	62D80590411	FE ACTUATE LEVER
105	9876-00-00	62D98760000	P WASHER CUT 2.1X5X0.5
121	8059-05-301	62D805905301	REEL ASS'Y
122	9912-00-00	62D99120000	R WASHER 3.1X6X0.5
131	8059-06-301	62D805906301	PINCH ROLLER ARM ASS'Y
132	8059-06-501	62D805906501	PINCH ROLLER ARM SEMI ASS'Y
133	9038-00-00	62D90380000	SCREW 2.6X4
134	8000-09-22	62D80000922	PINCH ROLLER (A)
135	9999-03-11	62D99990311	P WASHER CUT 5X8X0.5
136	9096-00-00	62D90960000	TAMS SCREW 2.6X4
137	8059-06-18	62D80590618	COLLAR
138	8059-06-05	62D80590605	P ACTUATE ANGLE
139	8059-06-19	62D80590619	P ANGLE HOLDER
140	8059-06-20	62D80590620	P ROLLER SPRING
141	8059-06-24	62D80590624	P SLIDE PLATE A
142	8059-06-18	62D80590618	COLLAR
143	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
144	8059-06-06	62D80590606	JOINT PLATE

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Ref. No.	TN Part No.	ST Part No.	Description
145	8059-06-04	62D80590604	P ACTUATE ARM
146	8059-06-09	62D80590609	P ACTUATE ARM SPRING
147	8059-06-12	62D80590612	P CLANK
148	8059-06-13	62D80590613	P CLANK COLLAR
149	9999-18-10	62D99991810	C TAPPING FH SCREW (FOR CAMERA) 2.6X4
150	8059-06-10	62D80590610	P SLIDER
151	8059-06-23	62D80590623	P SLIDER SPRING
152	8059-06-11	62D80590611	P SLIDER COLLAR
153	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
154	8059-06-502	62D805906502	P CAM LEVER SEMI ASS'Y
155	8059-06-17	62D80590617	P CAM LEVER COLLAR
156	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
157	8059-06-25	62D80590625	P SLIDE PLATE B
171	8059-07-302	62D805907302	CAPSTAN MOTOR ASS'Y
172	8059-07-14	62D80590714	FLYWHEEL CAPSTAN
173	8059-07-10	62D80590710	MAIN BELT
174	8059-07-303	62D805907303	FL ANGLE ASS'Y
175	9202-00-00	62D92020000	C TAPPING SCREW 3X5
176	9912-00-00	62D99120000	R WASHER 3.1X6X0.5
177	8059-07-301	62D805907301	METAL HOUSING ASS'Y
178	9195-00-00	62D91950000	C TAPPING SCREW 2.6X8
179	9105-00-00	62D91050000	TAMS SCREW 3X4
180	9999-06-03	62D99990603	NYLON WASHER 2.92X5X0.5
191	8059-08-501	62D805908501	BT ARM SEMI ASS'Y
192	9191-00-00	62D91910000	C TAPPING SCREW 2.6X4
193	8059-08-09	62D80590809	BACK TENSION SUPPORT
194	9191-00-00	62D91910000	C TAPPING SCREW 2.6X4
195	8059-08-15	62D80590815	BAND HOLDER COLLAR
196	8059-08-302	62D805908302	BT BAND ASS'Y
197	8059-08-17	62D80590817	BAND HOLDER SPRING
198	8059-08-13	62D80590813	BACK TENSION SPRING
199	9999-03-15	62D99990315	P WASHER CUT 2.1X4X0.5
200	8059-08-10	62D80590810	BT CHANGE PLATE
202	8059-08-23	62D80590823	BT RETURN LEVER
203	8059-06-18	62D80590618	COLLAR
204	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
205	8059-08-19	62D80590819	BT ACTUATE PLATE
206	8059-08-18	62D80590818	BT ACTUATE LEVER
207	8059-08-21	62D80590821	BT ACTUATE PLATE COLLAR
208	8059-08-20	62D80590820	BT ACTUATE PLATE SPRING
209	8059-06-18	62D80590618	COLLAR
210	9840-00-00	62D98400000	S TAPPING SCREW (FOR CAMERA) 2.6X3.5
211	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
221	8059-09-316	62D805909316	SUB PLATE ASS'Y
222	8059-09-501	62D805909501	SUB PLATE SEMI ASS'Y
223	9077-00-00	62D90770000	TAMS SCREW 2X4

CASSETTE DECK MECHANISM 59226

Ref. No.	TN Part No.	ST Part No.	Description
224	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
225	8000-10-25	62D80001025	WAVE WASHER
226	8059-09-06A	62D80590906A	REEL DRIVE GEAR
227	9500-00-00	62D95000000	E RING S 1.5
228	9853-00-00	62D98530000	NYLON WASHER 3.1X6X0.3
229	8059-09-310	62D805909310	CLUTCH ASS'Y
230	9999-06-04	62D99990604	NYLON WASHER 2.98X6X0.3
231	8059-09-301	62D805909301	MIDDLE PULLEY ASS'Y
232	9884-00-00	62D98840000	P WASHER CUT 2.6X6X0.5
233	8059-09-17	62D80590917	DRIVE BELT
234	8059-09-303	62D805909303	P GEAR ARM ASS'Y
235	8059-09-20A	62D80590920A	PLAY GEAR
236	8059-09-304	62D805909304	RF GEAR ARM ASS'Y
237	8059-09-22A	62D80590922A	FF GEAR
238	9743-00-00	62D97430000	P WASHER CUT 1.6X3.8X0.3
239	8059-09-314	62D805909314	P GEAR ASS'Y
240	8059-09-315	62D805909315	RF GEAR ASS'Y
251	8059-10-19	62D80591019	BRAKE SHOE
252	8059-10-01	62D80591001	S BRAKE SHOE
253	8059-10-02	62D80591002	BRAKE ARM SPRING
254	8059-10-03	62D80591003	T BRAKE ARM
255	8059-10-301	62D805910301	S BRAKE ARM ASS'Y
256	8059-10-302	62D805910302	T BRAKE ARM ASS'Y
257	8059-10-16	62D80591016	BRAKE LIFTER
258	8059-10-17	62D80591017	L BRAKE ACTUATOR
259	8059-10-14	62D80591014	TRIGGER HOOK
260	8059-10-13	62D80591013	TRIGGER LEVER
261	8059-10-11	62D80591011	BRAKE PLATE
262	8059-10-09	62D80591009	BRAKE ACTUATE BASE
263	8059-10-303	62D805910303	T SOFT BRAKE ASS'Y
264	8059-10-304	62D805910304	S SOFT BRAKE ASS'Y
265	9974-00-00	62D99740000	SL FH SCREW (FOR CAMERA) 2X3
266	8059-10-07	62D80591007	T SOFT BRAKE ARM COLLAR
267	8059-10-18	62D80591018	L BRAKE ACTUATOR SPRING
268	8059-10-06	62D80591006	T SOFT BRAKE ARM SPRING
269	8059-10-22	62D80591022	S SOFT BRAKE SPRING
270	9876-00-00	62D98760000	P WASHER CUT 2.1X5X0.5
271	8059-10-23	62D80591023	TRIGGER LEVER SPRING
272	8059-10-10	62D80591010	BRAKE ACTUATE BASE SPRING
273	8059-10-12	62D80591012	BRAKE PLATE SPRING
281	8059-11-301	62D805911301	LM ASS'Y
282	8059-11-302	62D805911302	TRIGGER BEARING ASS'Y
283	8059-11-03	62D80591103	LOADING PULLEY
284	9743-00-00	62D97430000	P WASHER CUT 1.6X3.8X0.3
285	8059-11-06	62D80591106	LOADING BELT
286	8059-11-12	62D80591112	SEARCH ARM (B)

CASSETTE DECK MECHANISM 59226

Ref. No.	TN Part No.	ST Part No.	Description
287	9884-00-00	62D98840000	P WASHER CUT 2.6X6X0.5
288	8059-11-04	62D80591104	LOADING GEAR
289	9876-00-00	62D98760000	P WASHER CUT 2.1X5X0.5
290	8059-11-13	62D80591113	BRAKE ACTUATE ARM
291	8059-11-14	62D80591114	EJECT ARM
293	8059-11-01	62D80591101	LOADING CAM
294	8059-11-02	62D80591102	S BRUSH
295	9105-00-00	62D91050000	TAMS SCREW 3X4
296	9999-03-10	62D99990310	P WASHER CUT 2.6X8X0.5
312	8059-12-501	62D805912501	LOADING LEVER SEMI ASS'Y
313	8059-12-13	62D80591213	CAM ROLLER
314	8059-12-09	62D80591209	L GEAR PLATE
315	8059-12-10	62D80591210	L GEAR PLATE COLLAR
316	9203-00-00	62D92030000	C TAPPING SCREW 3X6
317	8059-12-502	62D805912502	LOADING ACTUATE LEVER SEMI ASS'Y
318	8059-12-503	62D805912503	LOADING ACTUATOR SEMI ASS'Y
319	8059-12-05	62D80591205	LOADING ACTUATOR SPRING
320	8059-12-11	62D80591211	LOADING LEVER REINFORCE PLATE
321	9078-00-00	62D90780000	TAMS SCREW 2X5
322	8059-12-12	62D80591212	L GEAR PLATE SPRING
331	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
332	8059-06-18	62D80590618	COLLAR
333	8059-13-06	62D80591306	REC LEVER
334	8059-13-07	62D80591307	REC ACTUATOR
335	8059-13-11	62D80591311	REC ACTUATE SPOKE
336	6808-08-04	62D68080804	DEW SENSOR EYH-S10R
337	9096-00-00	62D90960000	TAMS SCREW 2.6X4
338	8059-13-302	62D805913302	BASE PLATE ASS'Y
339	9803-00-00	62D98030000	S TAPPING SCREW (FOR CAMERA) 2.6X5
340	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
341	6401-01-177	62D640101177	LEAF SWITCH MCV-00321MVDO
342	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
343	8059-13-08	62D80591308	WIRE
344	8059-13-10	62D80591310	WIRE HOLDER
345	8059-13-303	62D805913303	LAMP ASS'Y
346	8059-13-14	62D80591314	REC LEVER SPRING
348	6808-08-03	62D68080803	REEL SENSOR
361	8059-15-08	62D80591508	EJECT ACTUATOR
362	8059-06-18	62D80590618	COLLAR
363	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
364	8059-15-07	62D80591507	L BRAKE PLATE
365	8059-06-18	62D80590618	COLLAR
366	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
367	8059-15-303	62D805915303	E IDLER ARM ASS'Y
368	8059-15-502	62D805915502	E IDLER ARM SEMI ASS'Y
369	8059-15-15	62D80591515	EJECT PULLEY

CASSETTE DECK MECHANISM 59226

Ref. No.	TN Part No.	ST Part No.	Description
370	9743-00-00	62D97430000	P WASHER CUT 1.6X3.8X0.3
371	8059-15-11	62D80591511	IDLER ARM SPRING
372	9876-00-00	62D98760000	P WASHER CUT 2.1X5X0.5
373	8059-15-06	62D80591506	FL BELT
390	8059-16-337	62D805916337	FRONT LOADING ASS'Y
391	8059-16-318	62D805916318	C LOAD BRACKET ASS'Y
392	8059-16-319	62D805916319	F LOADING CLUTCH ASS'Y
393	8059-16-333	62D805916333	FL PCB ASS'Y
394	8059-16-316	62D805916316	SENSOR PCB RM ASS'Y
395	8059-16-506	62D805916506	C LOAD BRACKET SEMI ASS'Y
396	8059-16-34	62D80591634	IN SW LEVER
397	8059-16-33	62D80591633	S SW LEVER
398	8059-16-06	62D80591606	F WORM BEARING (A)
399	9743-00-00	62D97430000	P WASHER CUT 1.6X3.8X0.3
400	9096-00-00	62D90960000	TAMS SCREW 2.6X4
401	9078-00-00	62D90780000	TAMS SCREW 2X5
411	8059-16-306	62D805916306	CASSETTE HOLDER ASS'Y
412	8000-22-03	62D80002203	CASSETTE HOLDER
413	8000-22-13	62D80002213	SLIDE PLATE
414	8000-22-12	62D80002212	C LOCK PLATE (A)
415	8059-06-18	62D80590618	COLLAR
416	8059-16-29	62D80591629	LOCK SPRING
417	9968-00-00	62D99680000	SL SCREW (FOR CAMERA) 2.6X3
420	8059-16-307	62D805916307	FRONT ANGLE ASS'Y
421	8059-16-18	62D80591618	FRONT ANGLE
422	8059-16-25	62D80591625	TAPE GUIDE (R)
423	8059-16-24	62D80591624	TAPE GUIDE (L)
430	8059-16-308	62D805916308	SIDE PLATE (R) ASS'Y
431	8059-16-502	62D805916502	SIDE PLATE (R) SEMI ASS'Y
432	8059-16-28	62D80591628	CASSETTE PUSH PLATE
433	9833-00-00	62D98330000	SCREW (FOR CAMERA) 2.3X2
434	8000-22-25	62D80002225	OPEN LEVER
435	8000-22-44	62D80002244	OPEN LEVER SPRING
436	8000-22-42	62D80002242	OPEN LEVER COLLAR
437	9967-00-00	62D99670000	SL SCREW (FOR CAMERA) 2X4
438	8000-22-16	62D80002216	LOCK RELEASE LEVER
439	8000-22-75	62D80002275	GUIDE ROLLER
440	8000-22-23	62D80002223	GUIDE ROLLER
445	8059-16-309	62D805916309	SIDE PLATE (L) ASS'Y
446	8059-16-503	62D805916503	SIDE PLATE (L) SEMI ASS'Y
447	8059-16-28	62D80591628	CASSETTE PUSH PLATE
448	9833-00-00	62D98330000	SCREW (FOR CAMERA) 2.3X2
449	8000-22-66	62D80002266	C LOCK PLATE (L)
450	8059-16-30	62D80591630	LOCK PLATE SPRING (L)
451	8000-19-63	62D80001963	LOCK PLATE COLLAR
452	9966-00-00	62D99660000	SL SCREW (FOR CAMERA) 2X2.5

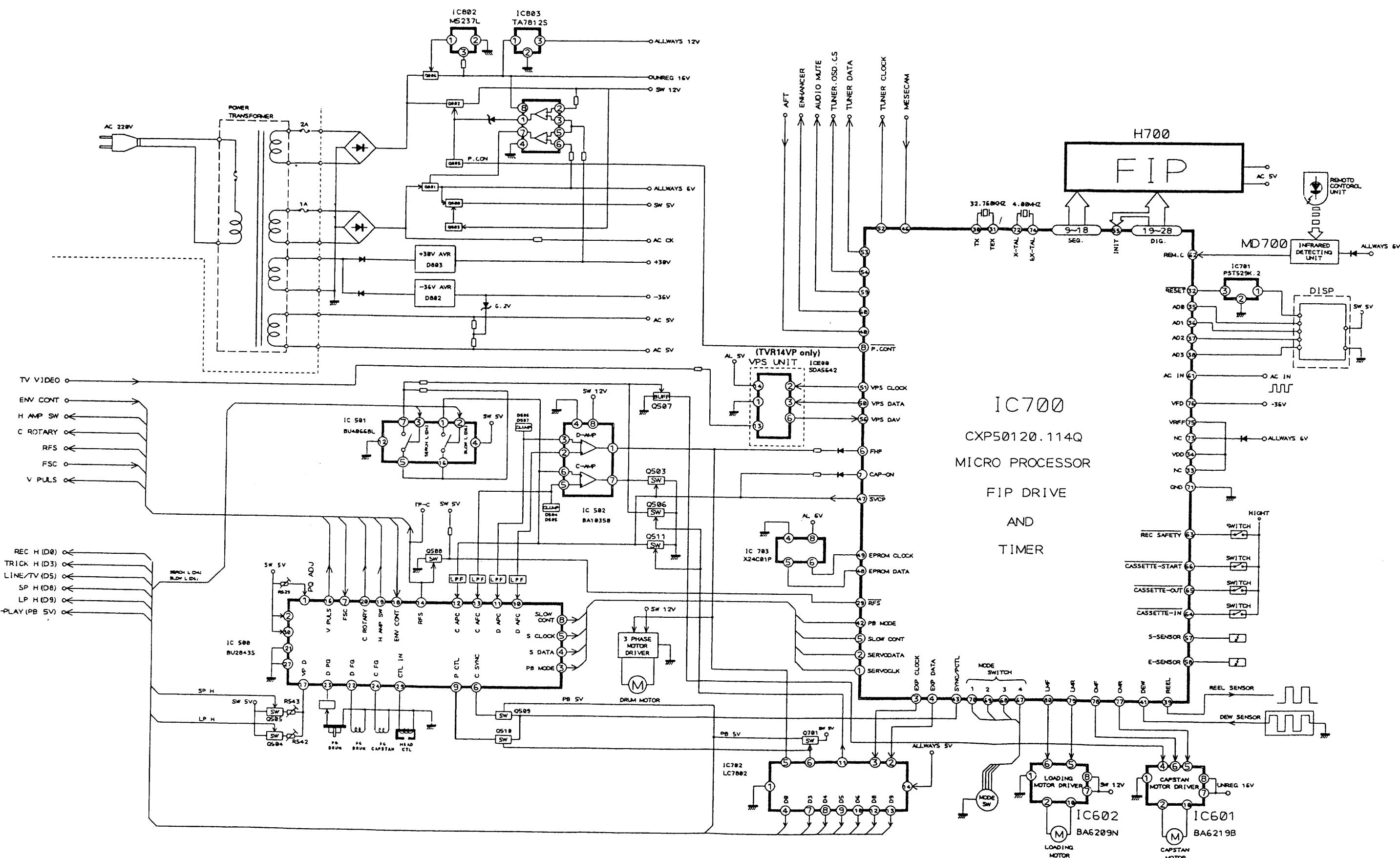
CASSETTE DECK MECHANISM 59226

Ref. No.	TN Part No.	ST Part No.	Description
453	8000-22-75	62D80002275	GUIDE ROLLER
460	8059-16-339	62D805916339	FRAME (R) ASS'Y
461	8059-16-507	62D805916507	FRAME (R) SEMI ASS'Y
462	8059-16-321	62D805916321	WORM WHEEL ASS'Y
463	8059-16-36	62D80591636	WORM WHEEL
464	8059-16-45	62D80591645	FRiction GEAR
465	8059-16-31	62D80591631	FRiction SPRING
466	8059-16-312	62D805916312	LIFT GEAR (R) ASS'Y
467	8000-22-15	62D80002215	LIFT GEAR (R)
468	8000-22-11	62D80002211	LIFT ARM
469	8000-22-45	62D80002245	LP SPRING
470	8000-22-26	62D80002226	OPEN LEVER GUIDE
471	8000-22-24	62D80002224	GUIDE SLEEVE
472	9504-00-00	62D95040000	E RING S2.5
480	8059-16-338	62D805916338	FRAME (L) ASS'Y
481	8059-16-508	62D805916508	FRAME (L) SEMI ASS'Y
482	8059-16-301	62D805916301	SENSOR PCB (LM) ASS'Y
483	8059-16-314	62D805916314	LIFT GEAR (L) ASS'Y
484	8000-22-14	62D80002214	LIFT GEAR L
485	8000-22-11	62D80002211	LIFT ARM
486	8000-22-45	62D80002245	LP SPRING
487	8059-16-67	62D80591667	LIFT LEVER
488	8059-16-68	62D80591668	LIFT LEVER SPRING
489	9504-00-00	62D95040000	E RING S2.5
490	9504-00-00	62D95040000	TAMS SCREW 2.6X7
491	8000-22-24	62D80002224	GUIDE SLEEVE
498	8000-22-65	62D80002265	TOP STAY
499	8059-16-19	62D80591619	END SENSOR WIRE
500	8059-16-09	62D80591609	REAR ANGLE
501	8059-16-66	62D80591666	UPPER PLATE
502	8059-16-60	62D80591660	SYNCHRONIZE SHAFT
503	8059-16-17	62D80591617	SYNCHRONIZE GEAR (A)
504	9504-00-00	62D95040000	E RING S2.5
505	9096-00-00	62D90960000	TAMS SCREW 2.6X4
506	9556-00-00	62D95560000	SCREW (FOR CAMERA) 2.6X3
507	9991-00-00	62D99910000	SCREW (FOR CAMERA) 2.3X2.5 (NO.3)
508	9192-00-00	62D91920000	C TAPPING SCREW 2.6X5
509	8059-16-72	62D80591672	DAMPER MAT
531	8059-17-03	62D80591703	RG SLIDE PLATE
532	8059-17-11	62D80591711	RG SLIDE SPRING
533	8059-17-10	62D80591710	RG SLIDE PLATE COLLAR
534	9077-00-00	62D90770000	TAMS SCREW 2X4
535	8059-17-09	62D80591709	RG SLIDE BASE
536	8059-17-502	62D805917502	RG ARM SEMI ASS'Y
537	9884-00-00	62D98840000	P WASHER CUT 2.6X6X0.5
538	8059-17-01	62D80591701	RG ACTUATE ARM

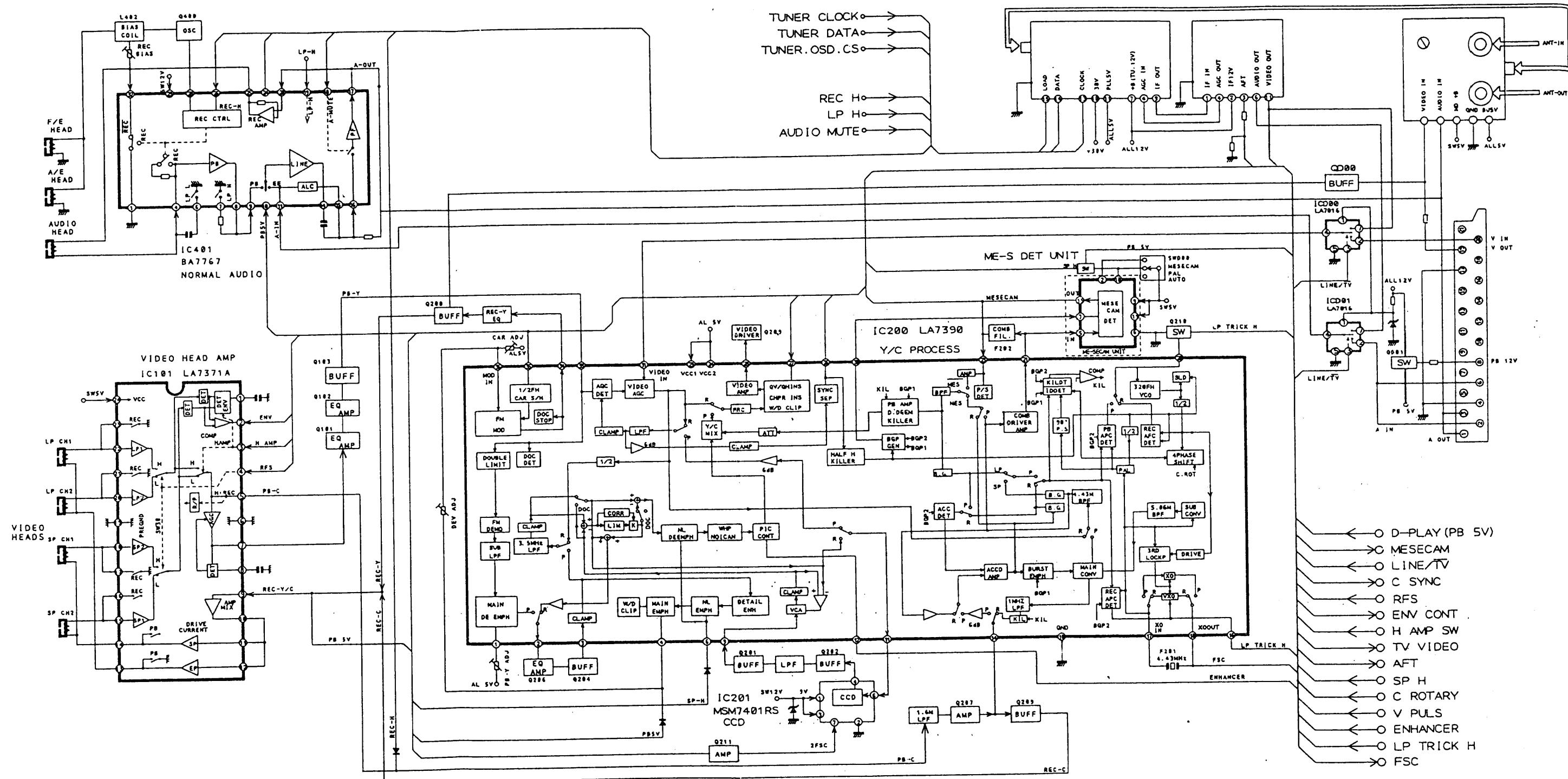
CASSETTE DECK MECHANISM 59226

Ref. No.	TN Part No.	ST Part No.	Description
539	9876-00-00	62D98760000	P WASHER CUT 2.1X5X0.5
540	8059-17-02	62D80591702	RG ACTUATOR

1. BLOCK DIAGRAM(MAIN®)



BLOCK DIAGRAM(Y/C&HEAD AMP)



2. TERMINOLOGY CHANGES

The following terms have been changed as a result of the use of a new CAD system.

Description	Parts No.	CAD Code	
◆ IC	IC101	LA3373, MT	No Connection Description (LA3373) Circuit Parts Number Head Name
◆ Transistor	Q101	2SC2785T, E,F	Rank No Connection Description (2SC2785) Circuit Parts number Head Name
◆ Diode	D101	1S2835T	No Connection Description (1S2835) Circuit Parts Number Head Name
◆ Resistor	R101	RC102F	Tolerance F: $\pm 1\%$ G: $\pm 2\%$ J: $\pm 5\%$ (No Mark) K: $\pm 10\%$ M: $\pm 20\%$ H: No Connection Resistance ($10 \times 10^2 = 1000$ ohm) Carbon Resistor 1/6W Circuit Parts Number Head Name
	R102	RA1R1	Resistance (1.1 ohm) Decimal Point Mark Chip Resistor 2125 Type 1/10W
◆ Capacitor (Chip)	C101	CA200C	Temperature Characteristic C: CH, CJ, CK U: UJ S: SL B: B D: D Capacity ($20 \times 10^6 = 20\text{pF}$) Chip Capacitor 2125 Type Circuit Parts Number Head Name
◆ Capacitor (Ceramic)	C101	SL1R5H or S or Z	No Connection Capacity (1.5pF) Decimal Point Mark Characteristic (Ceramic SL)
◆ Capacitor (Electrolytic)	C101	ES1/50H or F or Z	No Connection Voltage Proof (50V) Capacity (1 μF) Electrolytic SSM Type
◆ Hybrid IC ◆ CR Component ◆ In-Line Block ◆ Surge Absorber ◆ LED ◆ LCD ◆ FIP ◆ Pilot Lamp ◆ Neon Bulb ◆ Trimmer Cap. ◆ CFC Assy ◆ Coil ◆ Filter	IC102 CR101 IB101 D102 LD101 H101 H102 PL101 NE101 C102 C103 L101 F101	HIC..... CR..... IB..... Z..... LED..... LCD..... FIP..... PL..... NE..... CT..... CFC..... L..... F.....	Code No. (3~8 Column \rightarrow 11.....0) Code No. (3~8 Column \rightarrow 11.....0) Code No. (3~8 Column \rightarrow 11.....0) Code No. (3~8 Column \rightarrow 13.....0) Code No. (3~8 Column \rightarrow 14.....0) Code No. (5~9 Column \rightarrow 1591.....) Code No. (5~9 Column \rightarrow 1501.....) Code No. (3~8 Column \rightarrow 17.....0) Code No. (3~8 Column \rightarrow 17.....0)

Description	Type	Capacity Limit	No Marked Tolerance
Chip	CK, CJ, CH, UJ CH, UJ CH, SL SL, B D	1PF~5PF 6PF~10PF 12PF~470PF 680PF~0.022μF 0.033μF~0.1μF	C ($\pm 0.25\text{PF}$) D ($\pm 0.5\text{PF}$) J ($\pm 5\%$) K ($\pm 10\%$) M ($\pm 20\%$)
Ceramic	General B	1PF~5PF 6PF~10PF 12PF~270PF 100PF~680PF	C D J K
Semi-Conductor	SR BC	0.001μF~0.068μF 0.1μF~0.2μF	K Z (-20% ~ +80%)
Mylar (M)		0.001μF~0.1μF	J
TF		0.1μF~0.47μF	J
PS, NPS		470PF~1000PF	G ($\pm 2\%$), J
ALSICON (AS)		0.1μF~0.22μF	M
Tantalum (TA)		0.15μF~10μF	M
Electrolytic	General	0.1μF~220μF	M

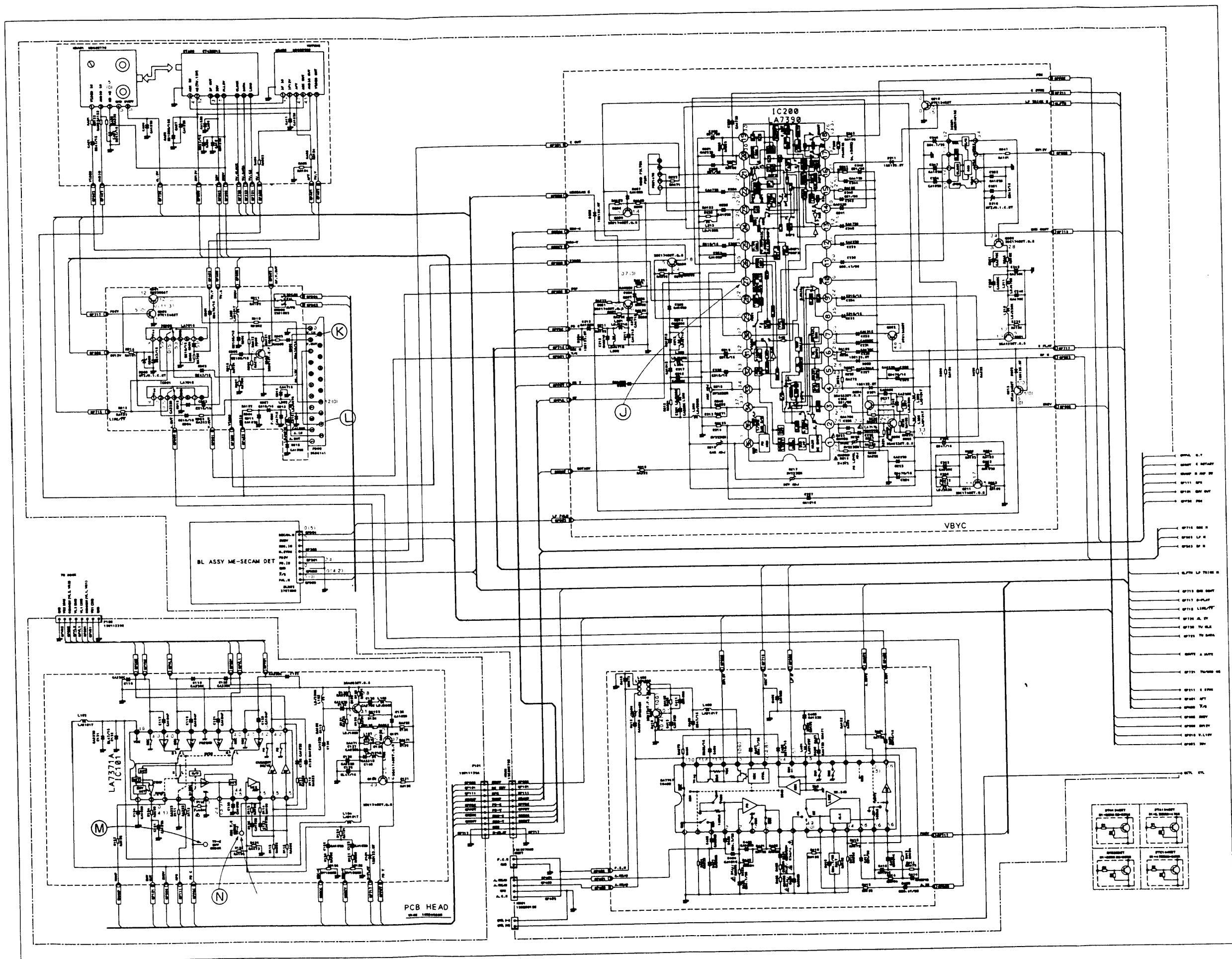
Head	Description	Head	Description
ET	Electrolytic Tuner	NE	Neon Bulb
MT	Manual Tuner	PL	Pilot Lamp
PT	Push Button Tuner	C*	Capacitor
K	Relay	R**	Resistor
MC	Microphone	L	Transformer
SP	Speaker	L	Coil, Inductor
IC	IC, Hybrid IC	F	Ceramic Filter, Crystal
IB	In-Line Block	W	Printed Circuit Board
CR	CR Component	BL	Block PC Ass'y
Q	Transistor	P	Conenctor Post
D	Diode, Surge Absorber	TP	Check Pin
LD	LED	AJ	Antenna Jack
H	LCD	SW	Switch
H	FIP	VR	Volume

CAD Code	*Capacitor
CA***	Chip Capacitor 2125 Type
CB***	Chip Capacitor 3216 Type
SL***	Ceramic Capacitor SL Type
B***	Ceramic Capacitor B Type
F***	Ceramic Capacitor F Type
CH***	Ceramic Capacitor CH Type
LH***	Ceramic Capacitor LH Type
PH***	Ceramic Capacitor PH Type
RH***	Ceramic Capacitor RH Type
SH***	Ceramic Capacitor SH Type
TH***	Ceramic Capacitor TH Type
UJ***	Ceramic Capacitor UJ Type
SR***	Semi-Conductor Cap. SR Type
BC***	Semi-Conductor Cap. BC Type
M***	Mylar Capacitor
TF***	TF Capacitor
NP***	NPS Capacitor
AS***	ALSICON Capacitor
TA***	Tantalum Capacitor
ES***	Electrolytic Cap. SSM Type
ESL***	Electrolytic Cap. SSM-L Type
ESH***	Electrolytic Cap. SSM-H Type
ESB***	Electrolytic Cap. Bi-Polar
EG***	Electrolytic Cap. GSM Type
EE***	Electrolytic Cap. SEM Type

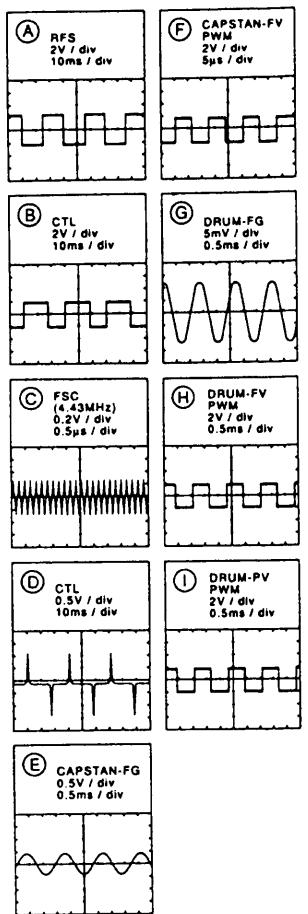
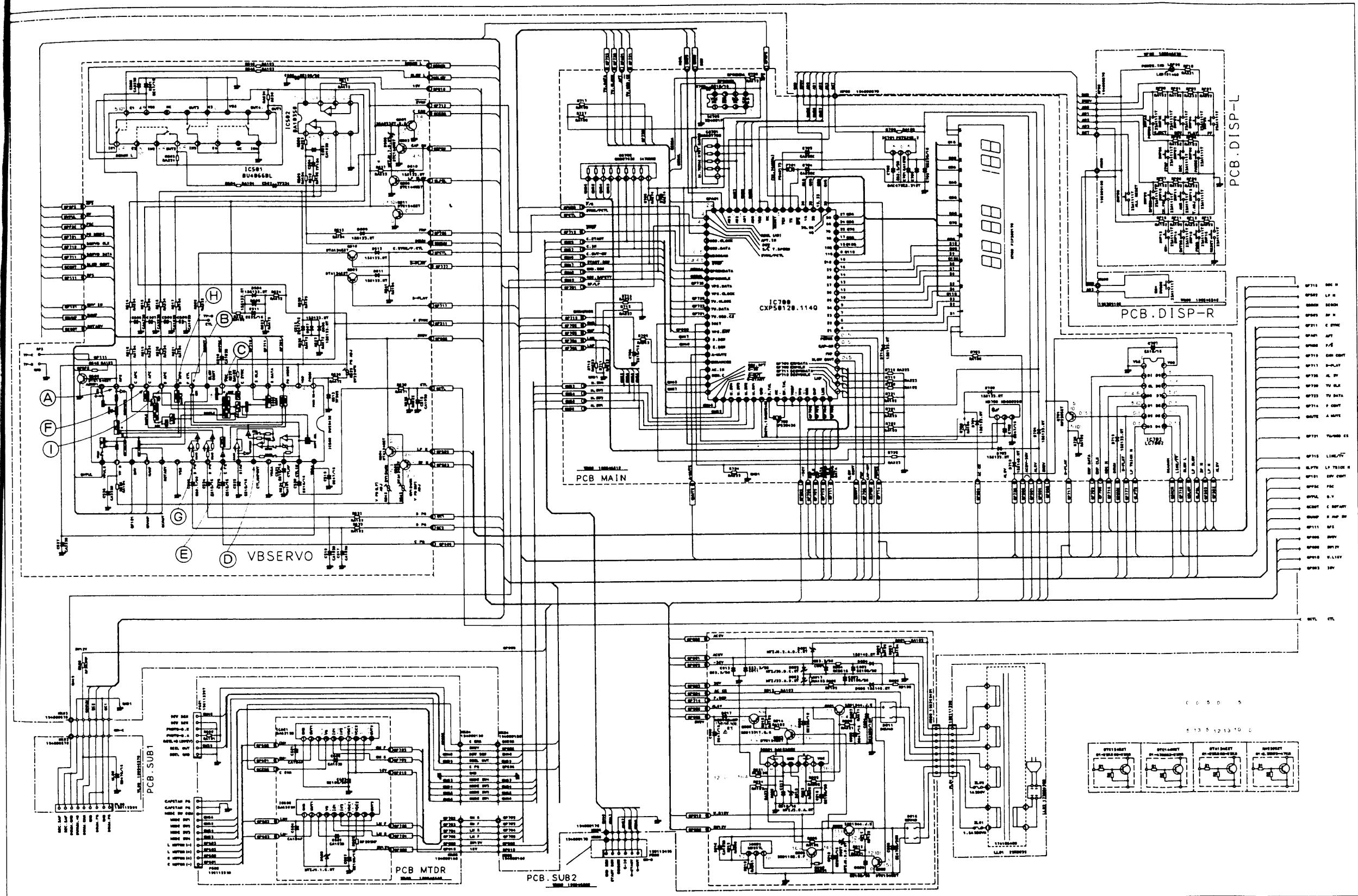
CAD Code	*Capacitor
EA**/..	Electrolytic Cap. Aibis Type
EL**/..	Electrolytic Cap. LSM Type
EH**/..	Electrolytic Cap. HPW Type
CT****	Trimmer Capacitor

CAD Code	**Resistor
RA***	Chip Resistor 2125 Type
RB***	Chip Resistor 3216 Type
RC***	Carbon Resistor 1/6W S Type
RD***	Carbon Resistor 1/4W U Type
RU***	Carbon Resistor 1/6W U Type
RF***	Carbon Resistor 1/2W S Type
RK***F	Metal Film Resistor 1/4W S $\pm 1\%$
RL***F	Metal Film Resistor 1/6W S $\pm 1\%$
RP***	Metal Oxide Resistor 1W S Type
RQ***	Metal Oxide Resistor 2W S Type
RM***	Cement Resistor 5W S Type
RV***	Variable Resistor Vertical Type 6 ϕ
RV***A	Variable Resistor Vertical Metal 6 ϕ
RV***B	Variable Resistor Down Type 6 ϕ
RV***C	Variable Resistor Vertical 6 ϕ 4 pin
PR***	Printed Resistor (on PC Board)

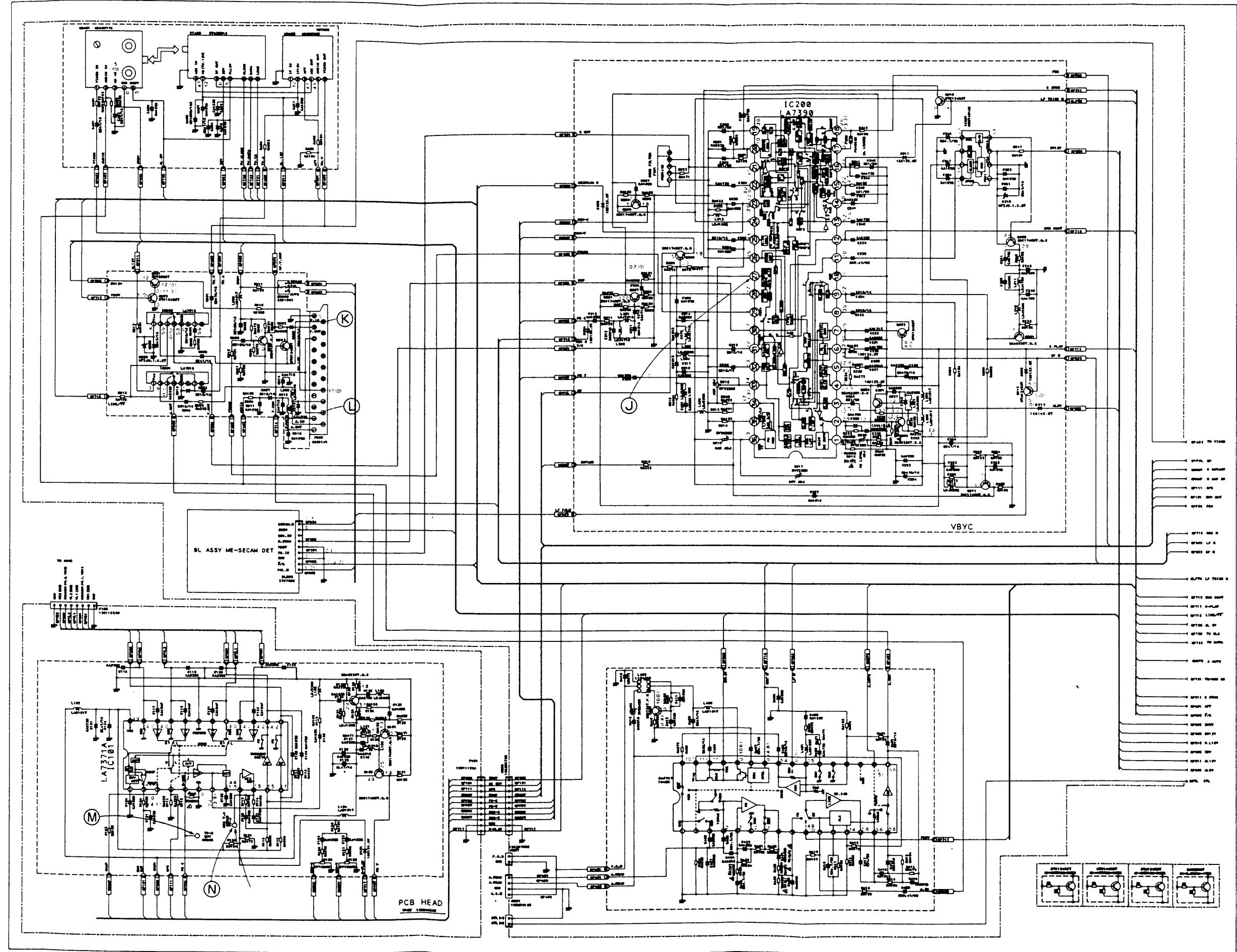
3. SCHEMATIC DIAGRAM (MAIN-1)[TVR-14BG]



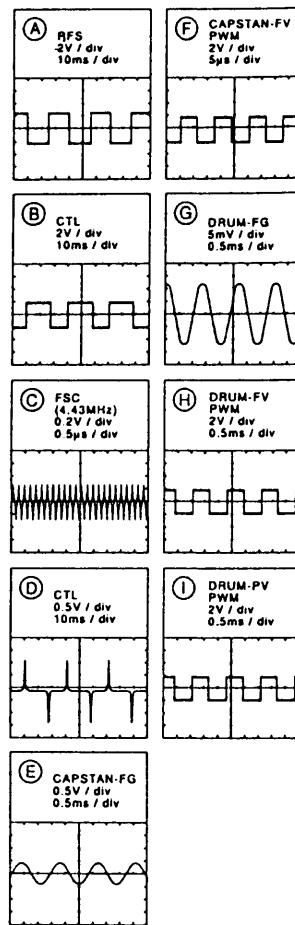
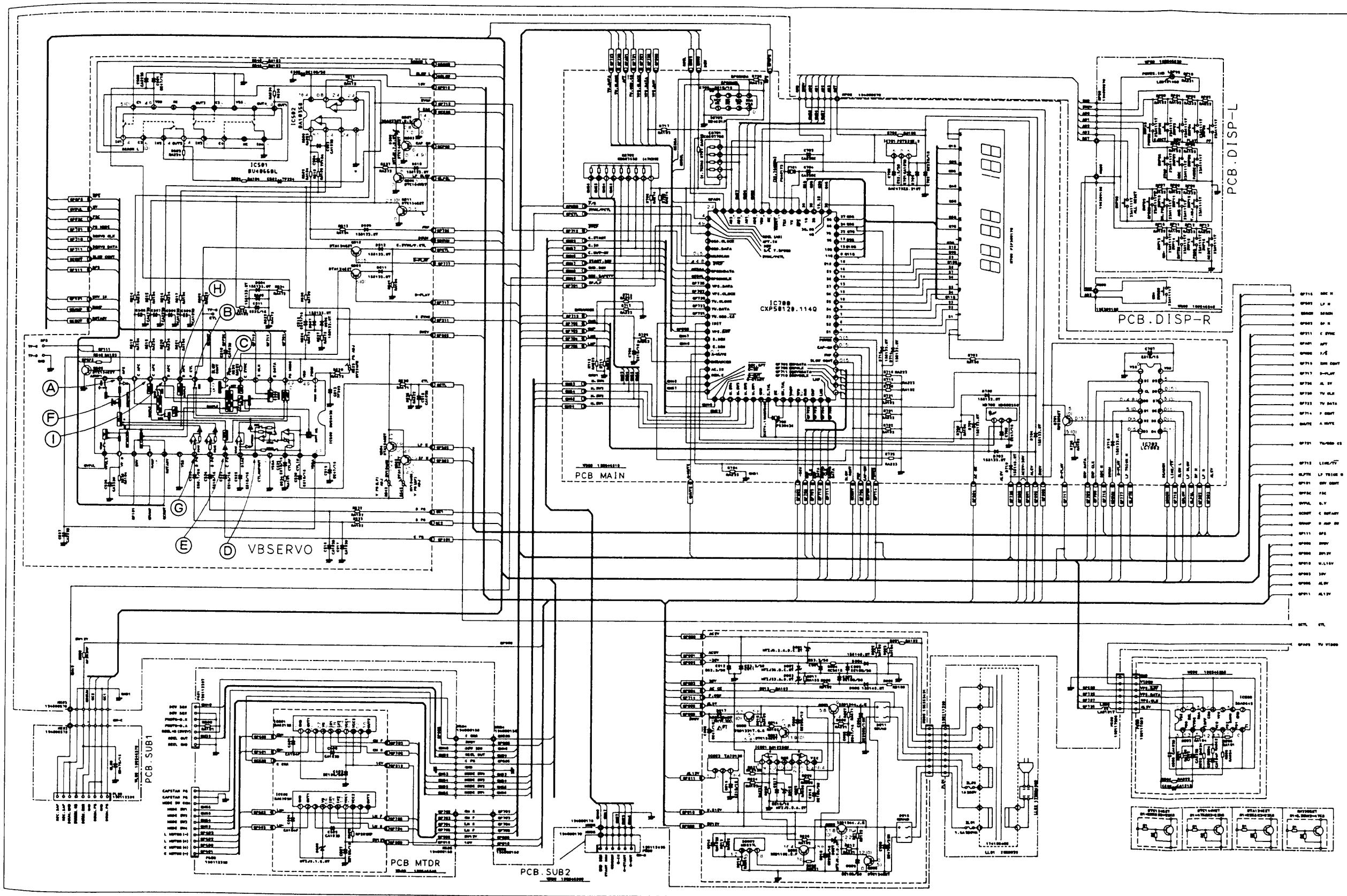
CHEMATIC DIAGRAM (MAIN-2)[TVR-14BG]



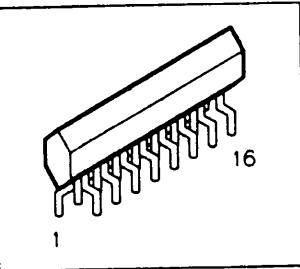
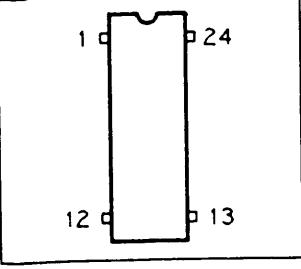
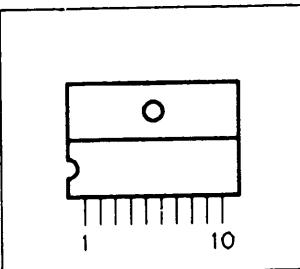
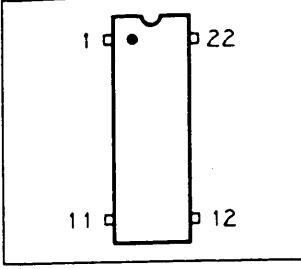
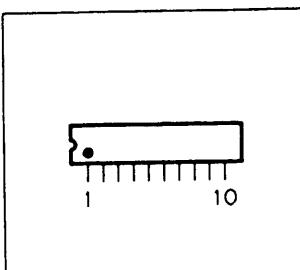
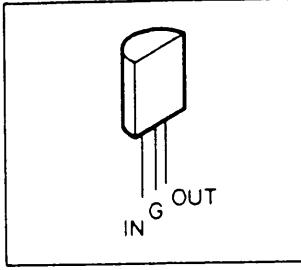
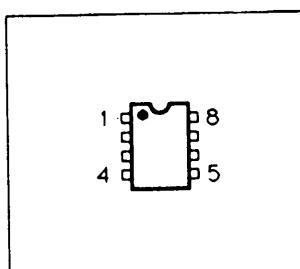
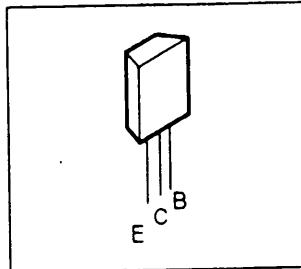
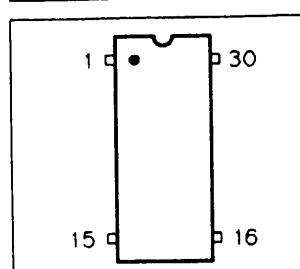
SCHEMATIC DIAGRAM (MAIN-1)[TVR-14VP]



SCHEMATIC DIAGRAM (MAIN-2)[TVR-14VP]

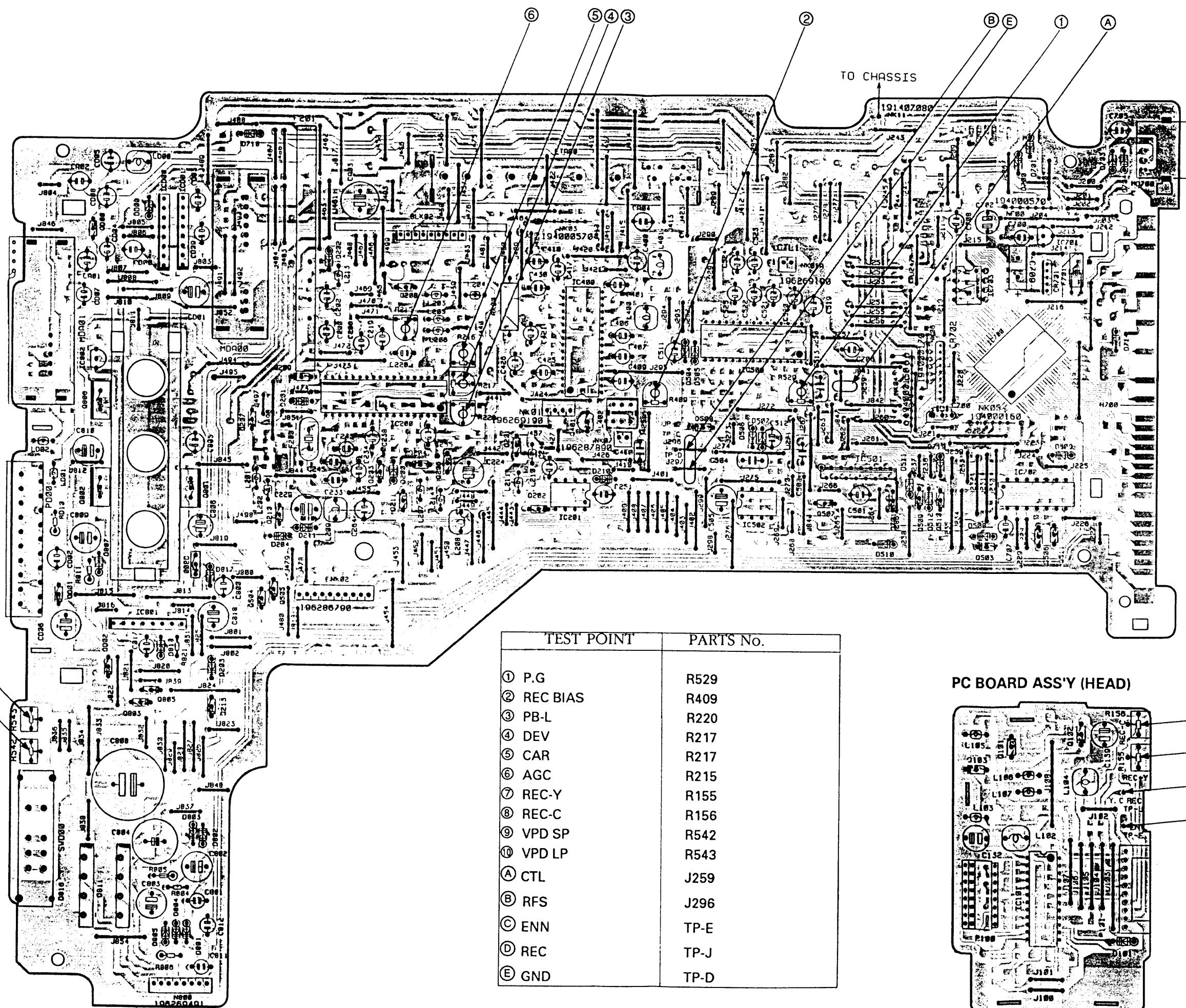


4. IC, TRANSISTOR LEAD IDENTIFICATION

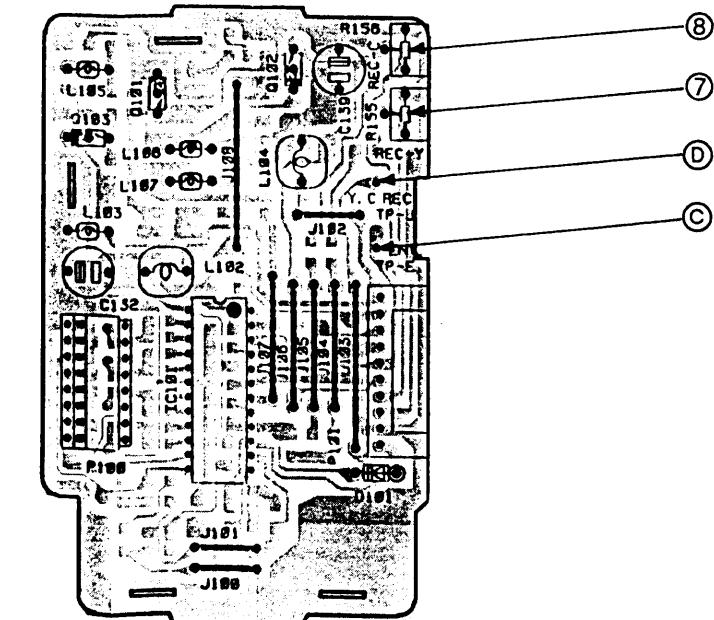
 16 1	LA7311	
 24 1 12 13	LA7116 LA7330	
 10 1	BA6222	
 22 1 11 12	LA7320	
 10 1	BA6209N	
 OUT IN G	PST 529I.2	
 8 4 5 1	MSM7401RS	
 B C E	2SA933ST.R.S 2SB891.Q.R 2SC1740ST.Q.R DTA124EST DTC124EST	
 30 1 16 15	LC7412N.8051 LA7323	

ELECTRICAL PARTS LOCATION [TVR-14BG]

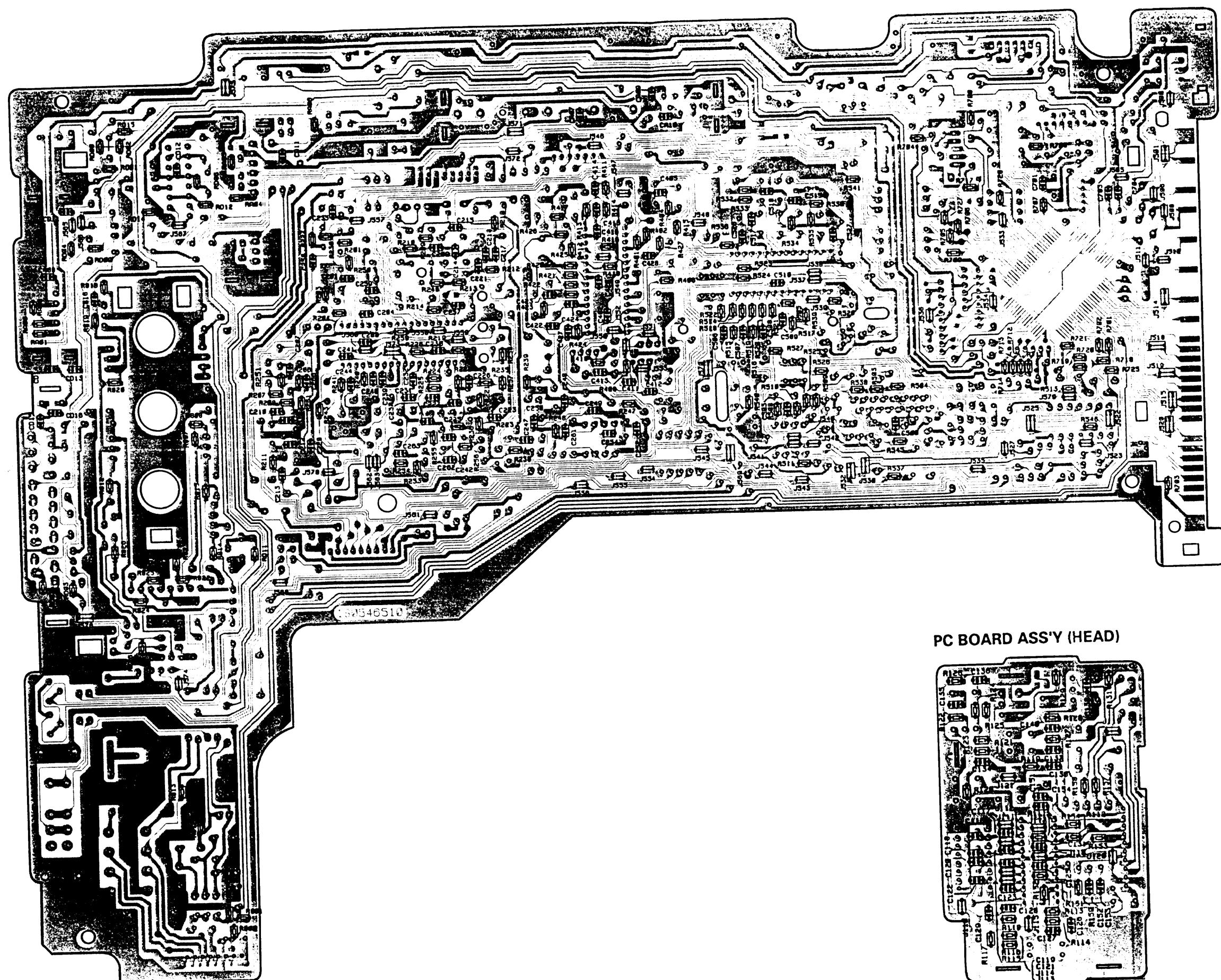
C BOARD ASS'Y (MAIN)



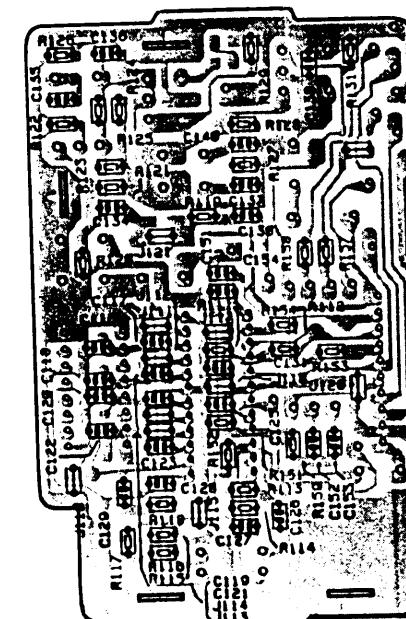
PC BOARD ASS'Y (HEAD)



PC BOARD ASS'Y (MAIN)

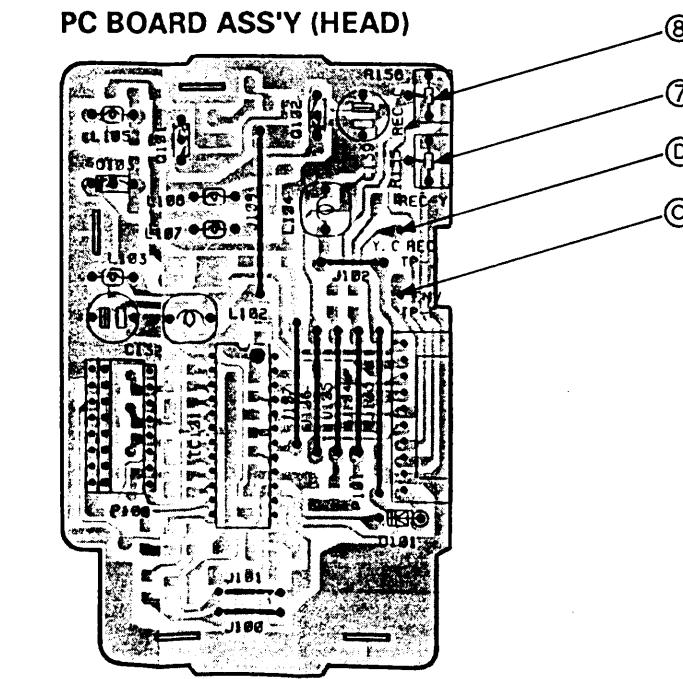
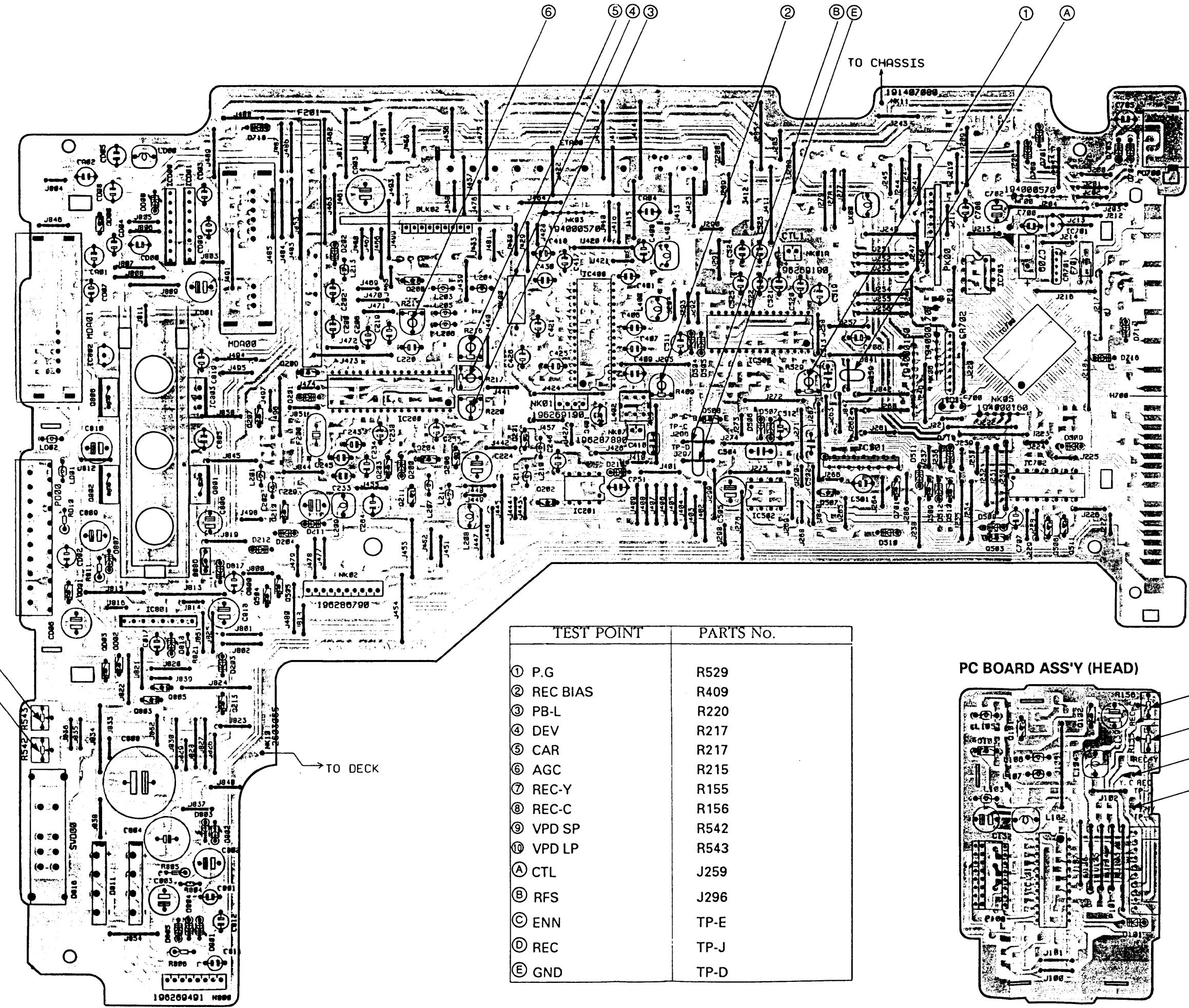


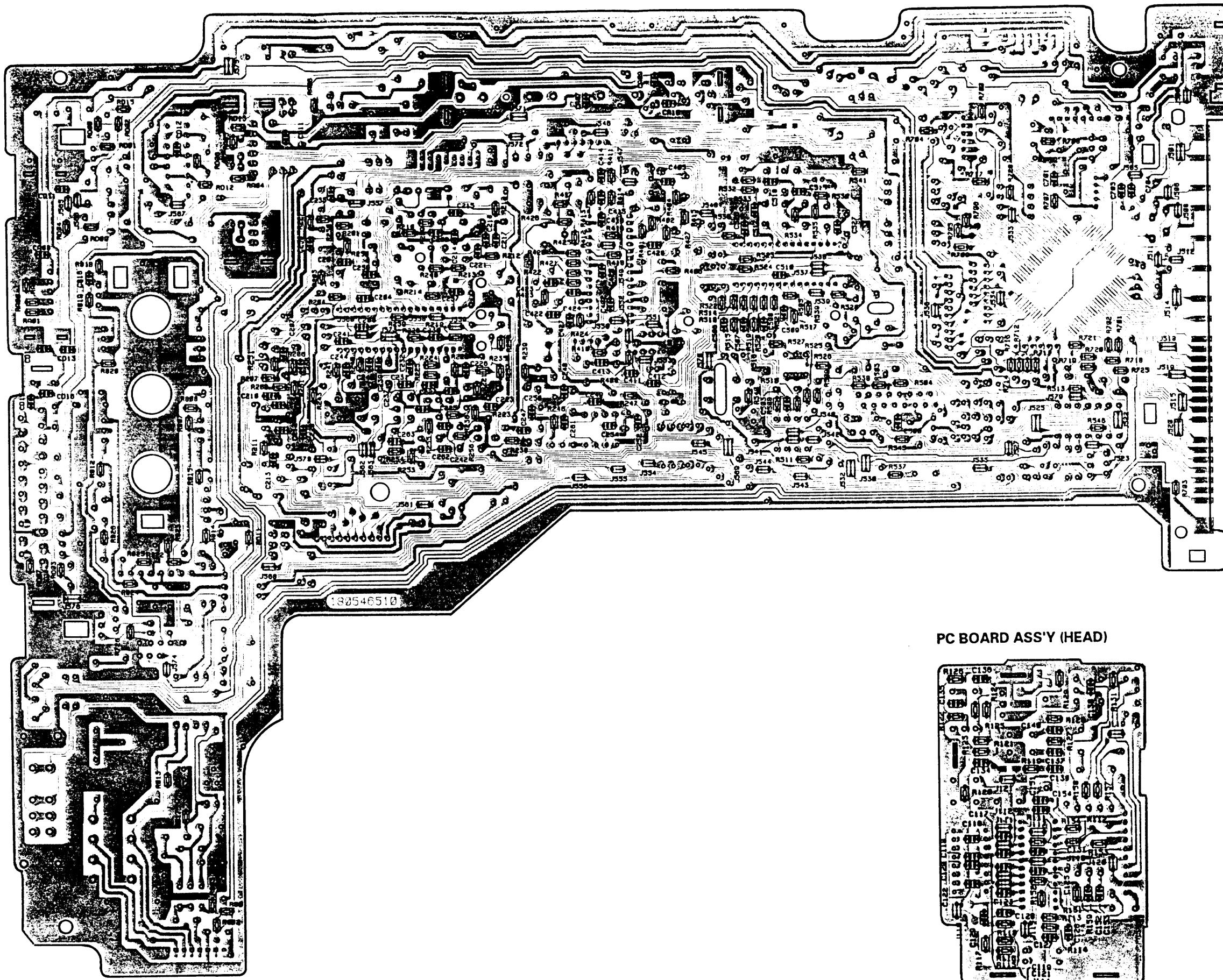
PC BOARD ASS'Y (HEAD)



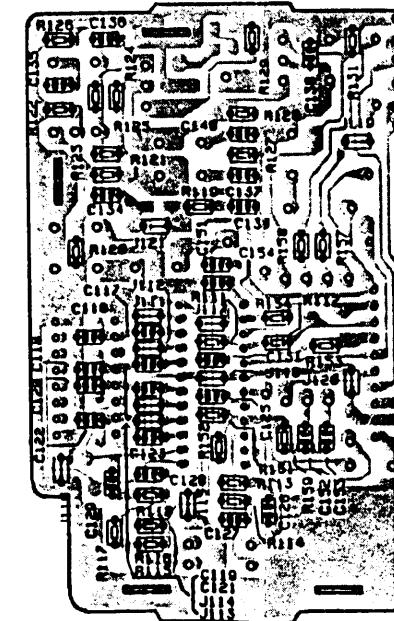
ELECTRICAL PARTS LOCATION[TVR-14VP]

BOARD ASS'Y (MAIN)

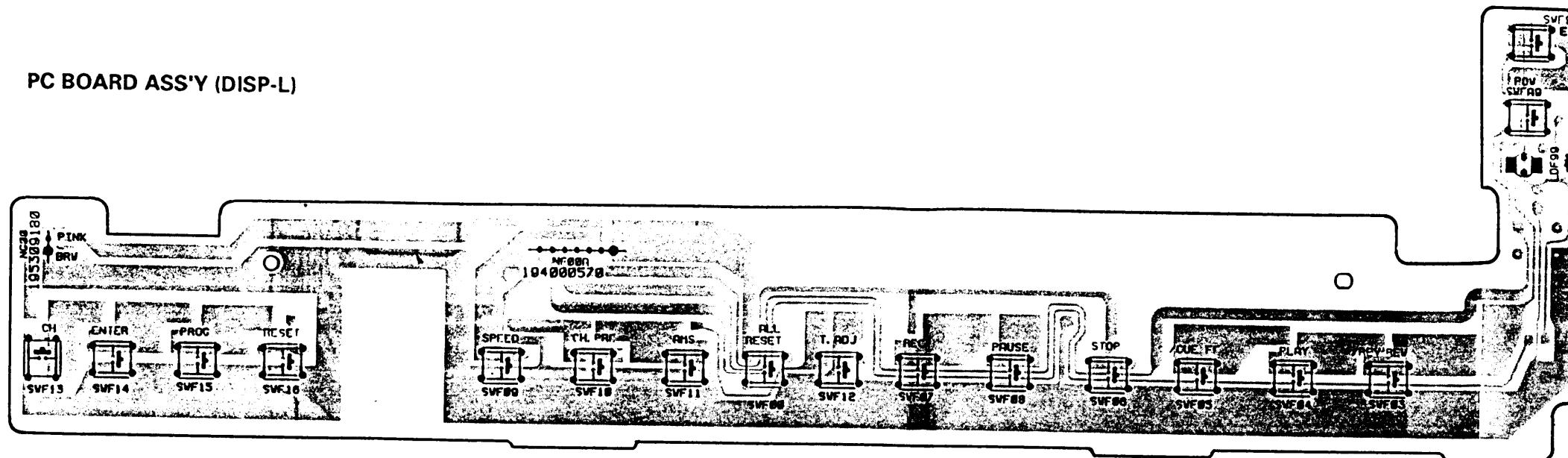




PC BOARD ASS'Y (HEAD)

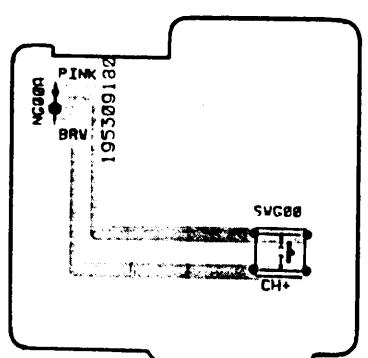


PC BOARD ASS'Y (DISP-L)

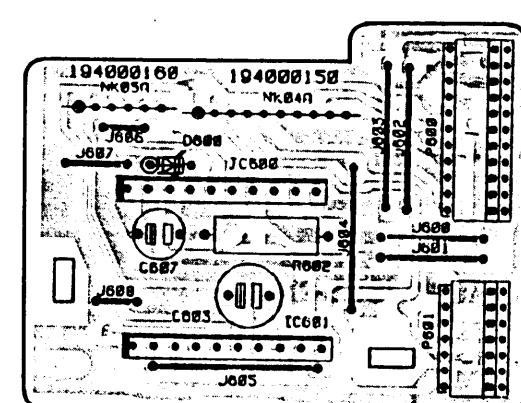


PC BOARD ASS'Y (SUB-1)

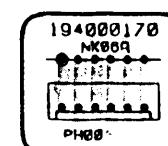
PC BOARD ASS'Y (DISP-R)



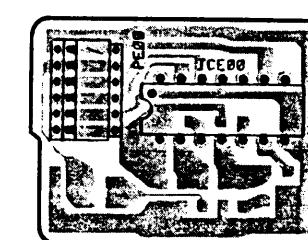
PC BOARD ASS'Y (MTDR)



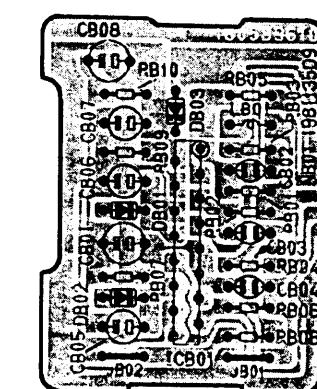
PC BOARD ASS'Y (SUB-2)



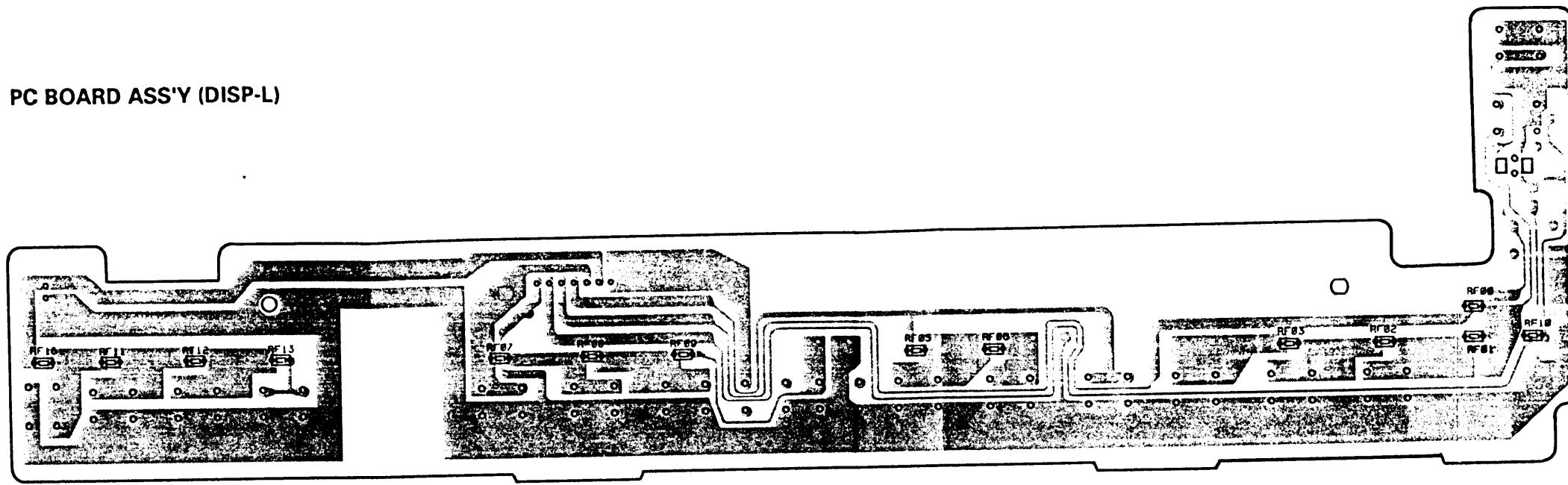
PC BOARD ASS'Y (VPS-S)
(TVR14VP only)



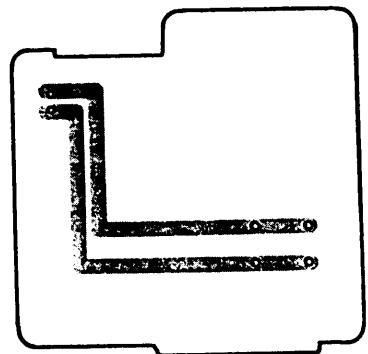
PC BOARD ASS'Y (ME-S DET)



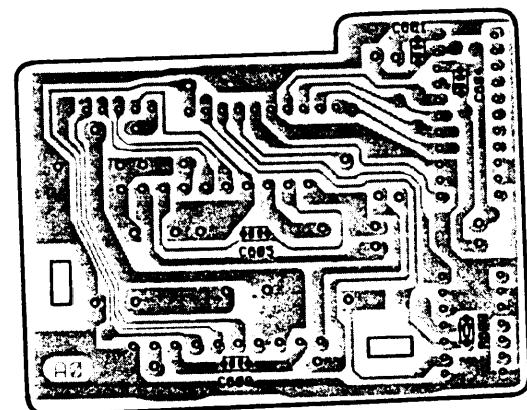
PC BOARD ASS'Y (DISP-L)



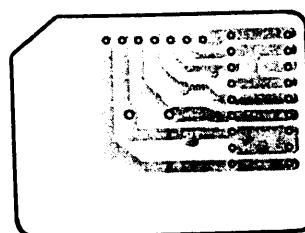
PC BOARD ASS'Y (DISP-R)



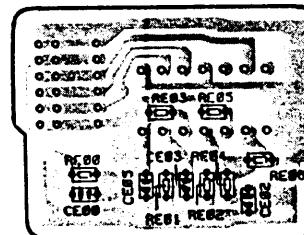
PC BOARD ASS'Y (MTDR)



PC BOARD ASS'Y (SUB-1)



**PC BOARD ASS'Y (VPS-S)
(TVR14VP only)**



PC BOARD ASS'Y (SUB-2)



WIRING DIAGRAM

