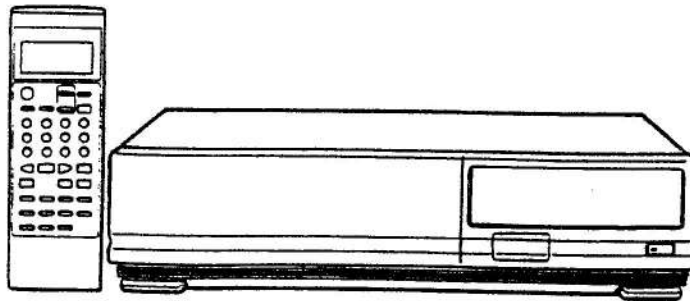


Service Manual

ORION **VHS**
PAL

Video Cassette Recorder

VH-2491HS



Bestell-Nr.:

CHASSIS CODE A

4401

SPECIFICATIONS

Power Source:	AC220V 50Hz
Power Consumption:	Approx. 34 watts
Operating Temperature:	5°C to 40°C
Television System:	CCIR: 625 lines, 50 fields PAL or SECAM/OST colour signal
Video Recording System:	2 rotary heads, helical scanning system Luminance: FM azimuth recording Colour Signal: Converted subcarrier phase shift recording
Audio Track:	1 track
Tape Format:	Tape width 12.7mm high density tape
Tape Speed:	23.39mm/s
RF Output Channel:	36 (±4)

Heads:	Video: 2 rotary heads FM Audio: 2 rotary heads Audio/Control: 1 stationary head Erase: 1 full track erase head
Input Level:	Video: VIDEO IN socket 1.0Vp-p, 75 ohm unbalanced Audio: AUDIO IN socket -8 dB, 50k ohm unbalanced
Output Level:	Video: VIDEO OUT socket 1.0Vp-p, 75 ohm unbalanced Audio: AUDIO OUT socket -6 dB, 1k ohm unbalanced
Weight:	5.9kg
Dimension:	385(W)x94(H)x358(D)mm

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HQ FEATURE

This VCR is equipped with HQ (High Quality) recording capability. A built-in detail enhancer is used to boost the recorded signal for cleaner, sharper images and maximum picture quality in playback.

VPS FUNCTION

If the VCR is turned to a TV station transmitting the VPS signal, the VCR automatically takes any delay or extension of the program into account and can record the specified program.

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage. Unless maintenance is properly carried out, the following service intervals may be quite shortened as harmful effects may be had on other parts. Also, long term storage or disuse may cause transformation and aging of rubber parts.

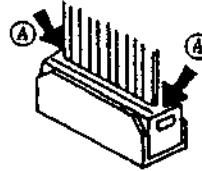
Parts Name	Time	500 hours	1,000 hours	1,500 hours	2,000 hours	3,000 hours	Notes
Full Erase Head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clean those parts in contact with the tape.
Audio Control Head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Loading Belt			<input type="checkbox"/>		○		Clean the rubber, and parts which the rubber touches.
Reel Belt			<input type="checkbox"/>		○		
Front Loading Belt			<input type="checkbox"/>		○		
Pinch Roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> ○	
Capstan DD Unit						○	Replace when rolling becomes abnormal.
Loading Motor						○	
Tension Band						○	
Capstan Shaft		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Impedance Roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Replace when rolling becomes abnormal.
Tape Running Guide Post		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cylinder Unit		<input type="checkbox"/>	<input type="checkbox"/> ○	<input type="checkbox"/>	<input type="checkbox"/> ○	<input type="checkbox"/> ○	※

○ : Replace
 : Clean

※ Clean the upper drum (especially the video heads) in the direction of drum rotation using a thick, textured cloth with a high quality methyl alcohol. Avoid wiping vertically as this may cause damage to the video heads.

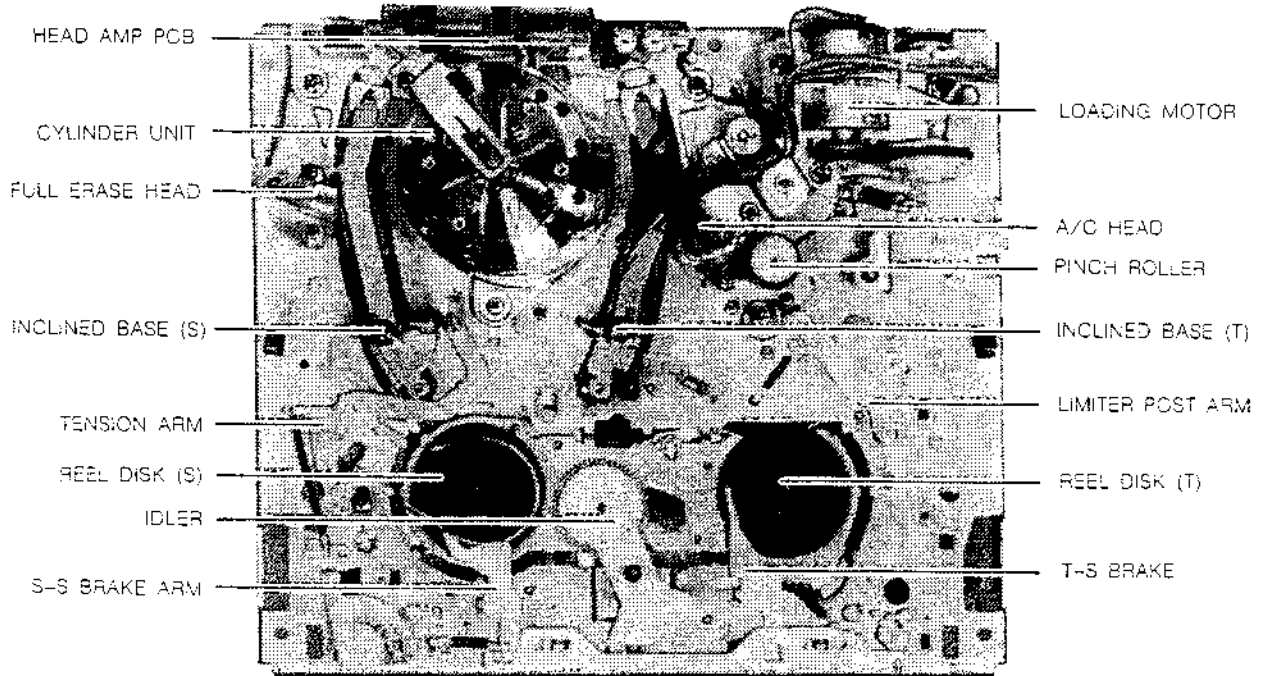
HOW TO REMOVE AND INSTALL RIBBON WIRE IN CASE OF DISCONNECTION.

1. To remove the wire, simultaneously press both parts indicated by arrow (A).
2. To install the wire, do not press the parts indicated by arrow (A), but insert the wire into the connector.

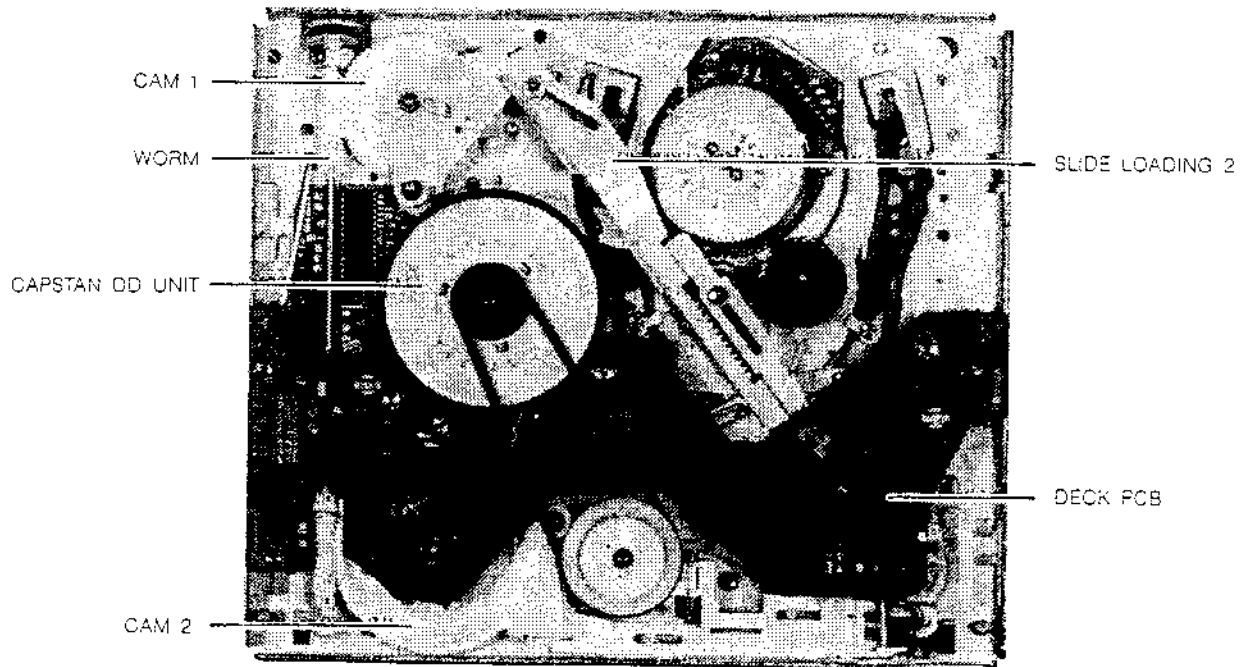


DECK PARTS LOCATION

(TOP VIEW)



(BOTTOM VIEW)



MECHANICAL ADJUSTMENTS

1. BEFORE MAKING MECHANICAL ADJUSTMENTS

CAUTION

Inferior silicon grease can damage IC's and transistors.
When replacing an IC's or transistors, use only specified silicon grease (YG6260M).
Remove all the old silicon before and apply new silicon.

PRECAUTION

Perform the following steps before making adjustments.

1. Remove 2 screws and remove the TOP CABINET.
2. Remove 3 screws and remove the FOOT.
3. Remove 5 screws and remove the BOTTOM CABINET.
4. Remove the FRONT CABINET.
5. Remove the STAGE. (Refer to Item 1-1)

Read the following NOTED items before starting work.

- * Remove the stage when replacing the deck parts.
- * Place an object which weighs between 350g and 500g on the Cassette Tape to keep it steady when you want to make the tape run without the stage. (Do not place an object which weighs over 500g.)
- * When you activate the deck without the stage, cover Q1101(BOT SENSOR) and Q1102(EOT SENSOR) with black tubes. Be sure to return the deck to its original condition after repairs are completed.

1-1: HOW TO REMOVE AND INSTALL STAGE

REMOVAL (Refer to Fig. 1)

1. Remove the pulley of loading motor box and the front loading belt hooked on the stage worm.
2. Remove the screws ① and ② in the EJECT mode.
3. Push the stage in the direction of the arrow and lift up to remove the stage.

NOTE

When you remove and install the stage, be careful not to touch the guide pin or cylinder head.

INSTALLATION

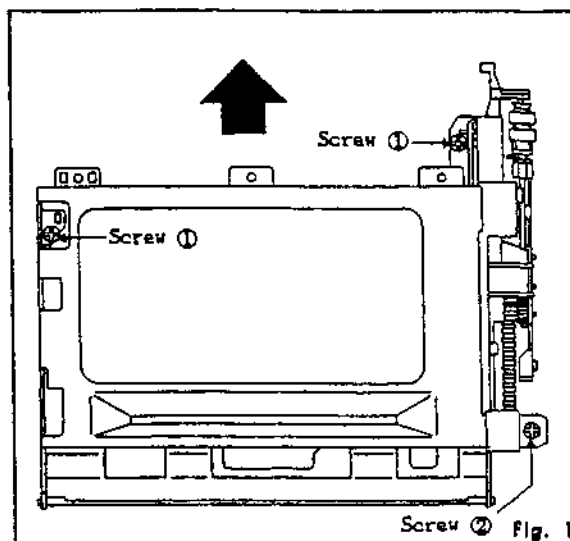
Install new stage in the reverse steps of REMOVAL.

NOTE

When you re-install the stage, it should be in the EJECT mode.

CONFIRMATION

1. The front loading operation works well when turning on the power and when inserting a cassette tape into the stage.
2. Each function works well when pressing the PLAY, EJECT and REC buttons.



2. REPLACEMENT OF MAIN PARTS

2-1: REEL DISK

REMOVAL (Refer to Fig. 2-1)

(Supply Reel Disk)

1. Remove the actuator sub brake.
2. Remove the SS brake spring, then remove the SS brake arm.
3. Remove the tension band from the main chassis.
4. Remove the polyslider washer ①.
5. Pull the supply reel disk ③ upward and replace it.

(Take-Up Reel Disk)

1. Remove the actuator sub brake.
2. Remove the TS brake spring, then remove the TS brake.
3. Remove the polyslider washer ④.
4. Pull the take-up reel disk ⑤ upward and replace it.

NOTE

The height adjustment washers ② and ⑥ are sometimes attached to the back of the reel disk.

INSTALLATION

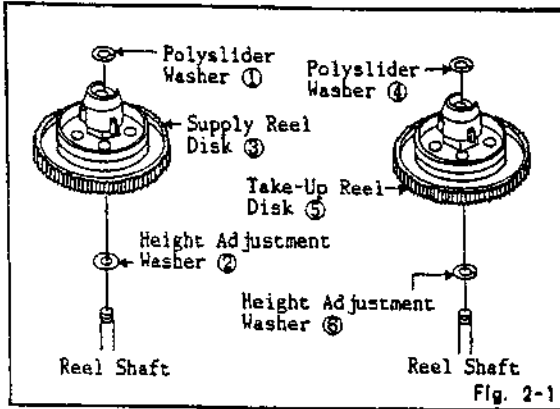
(Supply/Take-Up Reel Disk)

1. Clean the reel disk shaft and put in height adjusting washers ② and ⑥.
2. Install new reel disk.
3. Adjust the height of the reel disk. (Refer to item 3-5)
4. Pull out the new supply/take-up reel disk. After oiling (Cosmo Oil Hydro HV100) the reel disk shaft, install the new supply/take-up reel disk again.
5. Install the supply/take-up reel disk in the reverse steps of REMOVAL.

MECHANICAL ADJUSTMENTS

NOTE

1. Be careful not to damage the tension band at the time of removal and installation.
2. Be careful not to scratch the reel disk shaft with the polyslider washer or the tool at the time of removal and installation.
3. After installation, adjust and confirm the tension post position. (Refer to item 3-6)



2-2: A/C HEAD

REMOVAL (Refer to Fig. 2-2)

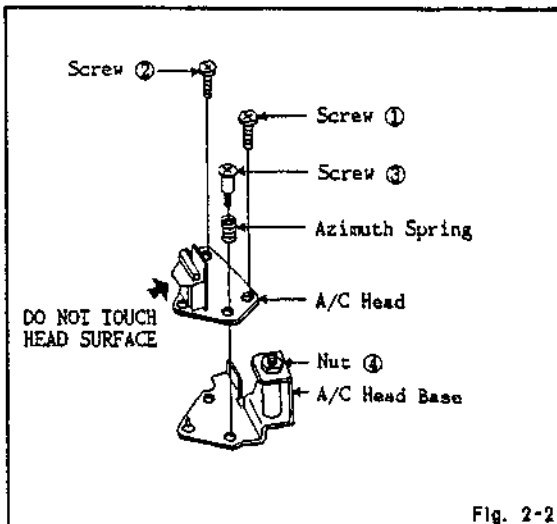
Remove the screws ①, ② and ③.

INSTALLATION

Install new A/C head in reverse steps of REMOVAL.

NOTE

Do not touch the heads by any means when replacing the A/C head.



2-3: UPPER DRUM

REMOVAL (Refer to Fig. 2-3)

1. Remove the screw ② which holds the earth brush.
2. Desolder the lead wires ① from the upper drum assembly.
3. Be sure to use gloves, avoid the surface of cylinder unit. Hold down the upper drum preventing it from turning, then remove the screws ④, and remove the upper drum with the upper drum fixing jig (JG031).

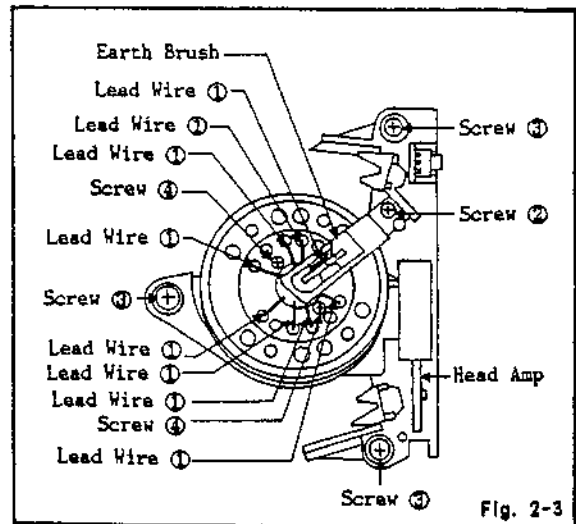
INSTALLATION

Install new upper drum in the reverse steps of REMOVAL.

NOTE

1. Do not apply excessive pressure to screwdriver.
2. Before installing, confirm that there are no scratches or dust on the disk, upper drum surface and drum head surface.
3. When setting, take care not to let any dust or dirt go into the clearance between disk and upper drum.
4. Do not touch the surface of the cylinder head.
5. Check the adjustment of tape running. (Refer to item 4-6)
6. After replacement confirm the following adjustments.

- a. ELECTRICAL ADJUSTMENTS : ITEM 2-1
- b. ELECTRICAL ADJUSTMENTS : ITEM 2-2
- c. ELECTRICAL ADJUSTMENTS : ITEM 2-3
- d. MECHANICAL ADJUSTMENTS : ITEM 4-3



MECHANICAL ADJUSTMENTS

2-4: CYLINDER UNIT

REMOVAL (Refer to Fig. 2-3)

1. Remove the transistor PCB.
(Refer to Item 2-9)
2. Disconnect the connectors (CP4102, 8 pin and CP5601, 5 pin) from the head amp PCB.
3. Remove the screws ③, then remove the cylinder unit from the main chassis.
4. Disconnect the connector of the cylinder motor.

INSTALLATION

Install new cylinder unit in reverse steps of REMOVAL.

NOTE

1. Do not touch the surface of the cylinder head.
2. After replacement confirm the following adjustments.
 - a. ELECTRICAL ADJUSTMENTS : ITEM 2-1
 - b. ELECTRICAL ADJUSTMENTS : ITEM 2-2
 - c. ELECTRICAL ADJUSTMENTS : ITEM 2-3
 - d. MECHANICAL ADJUSTMENTS : ITEM 4-3

2-5: TENSION BAND

REMOVAL (Refer to Fig. 2-4)

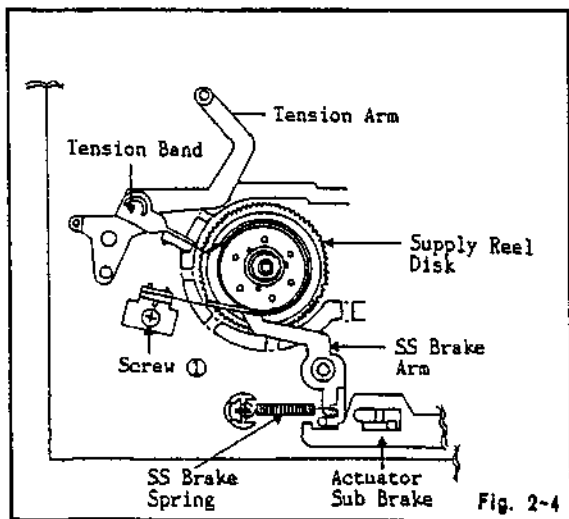
1. Remove the actuator sub braka.
2. Remove the SS brake spring, then remove the SS brake arm.
3. Remove the screw ①.
4. Remove the tension band from the tension arm.

INSTALLATION

Install new tension band in reverse steps of REMOVAL.

NOTE

1. Install the tension band without twisting it.
2. Adjust the placement of the tension post.
(Refer to Item 3-6)
3. Adjust and confirm the back tension during playback. (Refer to Item 3-7)



2-6: LOADING MOTOR / LOADING MOTOR BELT

REMOVAL (Refer to Fig. 2-5)

1. Remove the 2 wires soldered to the loading motor.
2. Remove the lead wire in the hook of the loading motor box.
3. Remove the loading motor belt ②.
4. Remove the screw ①, then remove the loading motor box.
5. Remove the front loading belt ③.
6. Remove the screw ④, then lift the loading motor upward.

INSTALLATION

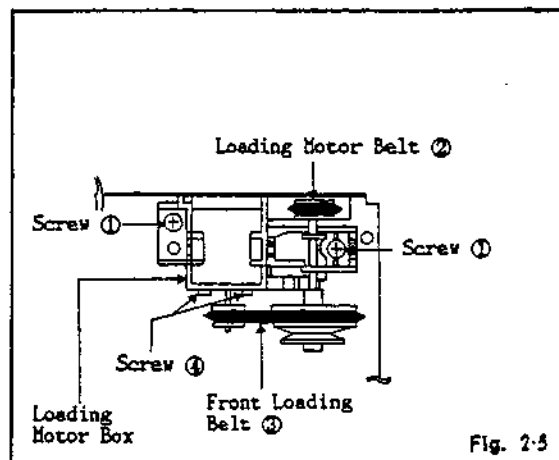
Install new loading belt in reverse steps of REMOVAL.

NOTE

1. Clean the pulley when replacing loading belt.
2. Replace it while in the EJECT mode.
3. Avoid getting grease on the loading belt.

CHECK AFTER INSTALLATION

1. Check if strange sound is heard in PLAY mode.
2. Check if P2 post and P3 post are fitted to the post stopper.
3. Check if P2 post and P3 post are completely returned in EJECT mode.



2-7: PINCH ROLLER

REMOVAL (Refer to Fig. 2-6)

1. Remove the pinch roller arm spring.
2. Remove the polyslider washer ①.
3. Remove the pinch roller.

INSTALLATION

Install new pinch roller in reverse steps of REMOVAL.

NOTE

1. Be careful not to bend the pinch roller arm in removal and installation.
2. Do not touch the pinch roller. (Use gloves.)

CHECK AFTER INSTALLATION

Check if the tape is running normally in PLAY mode.

MECHANICAL ADJUSTMENTS

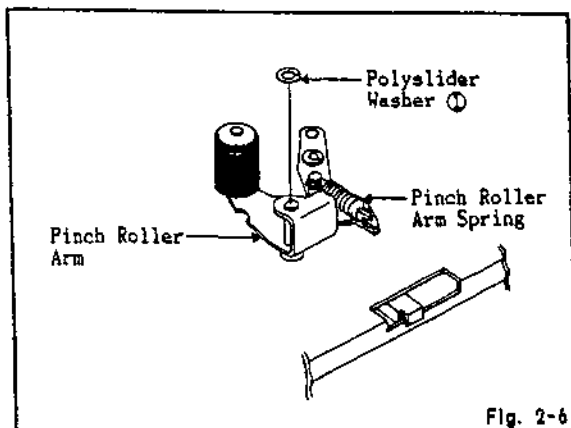


Fig. 2-6

2-8: CAPSTAN DD UNIT

REMOVAL

1. Disconnect the connector (CP2003 17 pin) from the main PCB.
2. Disconnect the connector (CP4102 8 pin) of the head amp PCB and the connector (CP5001 5 pin, CP2001 2 pin) of the main PCB.
3. Remove the screw ①, unlock the hooks (3 positions) which have been connected to the main PCB. (Refer to Fig. 2-7-A)
4. Disconnect the connector (9 pin) of the capstan DD unit.
5. Disconnect the connector (6 pin) of the cylinder unit back side.
6. Remove the reel belt.
7. Remove the solder "A" positions, remove the screws ① and then remove the deck bottom PCB.
8. Remove the loading motor belt ②.
9. Remove the screw ④, then remove the bracket worm 3.
10. Pull the hook ③ in the direction of arrow, then remove the worm. (Refer to Fig. 2-7-B)
11. Remove the screws ①, then remove the capstan DD unit. (Be sure to support with hand under the capstan DD unit.)

INSTALLATION

Install new capstan DD unit in reverse steps of REMOVAL.

NOTE

1. Do not bend the limiter post.
2. Use the specified screw held to the DD unit.
3. Avoid getting grease on the reel belt.
4. Be sure to install in the EJECT position. (Refer to Fig. 2-7-E, F)
5. Install in the position where the capstan DD unit PCB gets up to the "B" position. (Refer to Fig. 2-7-B)
6. When installing the worm, be sure to unlock the hook ③ in the direction of arrow, and the cam 1 and cam 2 must be meshed smoothly. (Refer to Fig. 2-7-B)
7. When installing the deck bottom PCB, be sure to install the rotary switch in the EJECT position. The EJECT position is the point where the "A" tooth is aligned to the "B". (Refer to Fig. 2-7-D)

CHECK AFTER INSTALLATION

1. Check if tape running is normal in PLAY mode.
2. Check if FF/REW mode works normally.

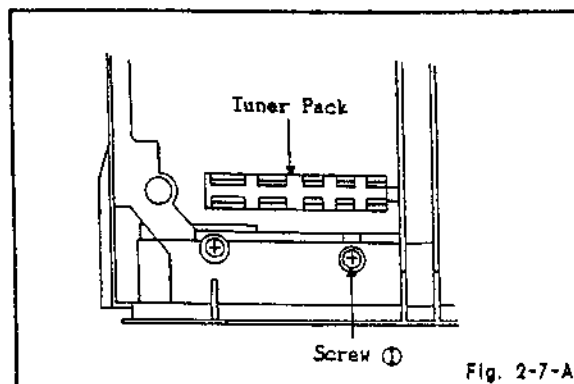


Fig. 2-7-A

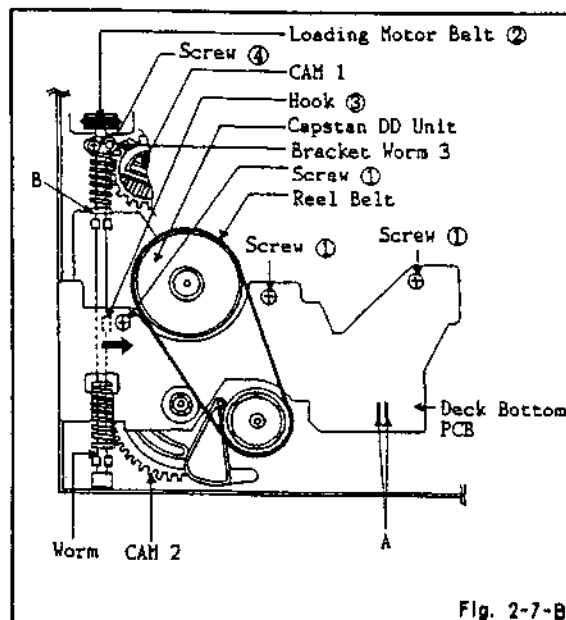


Fig. 2-7-B

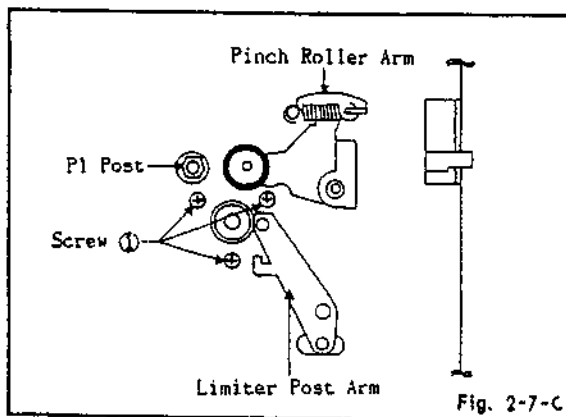


Fig. 2-7-C

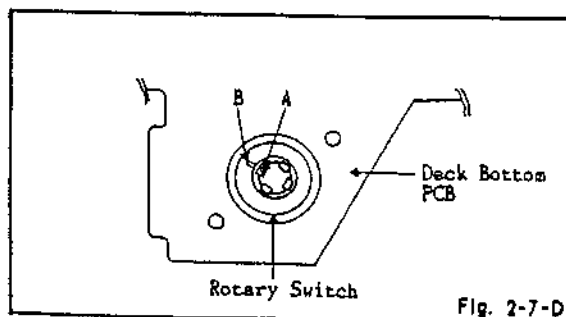
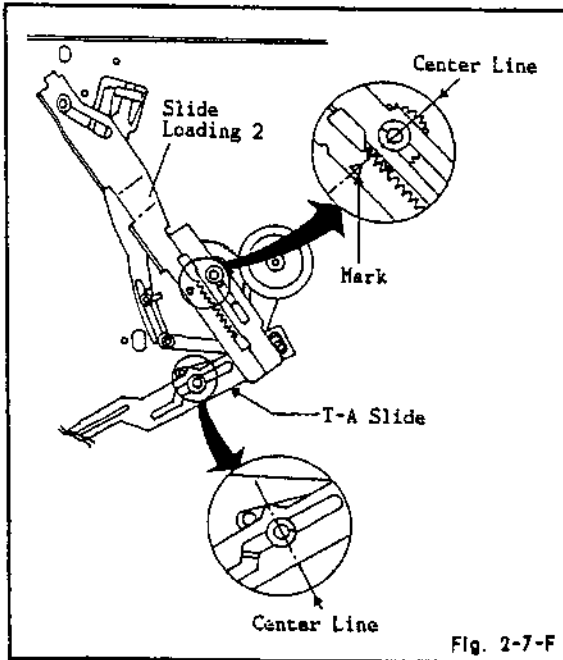
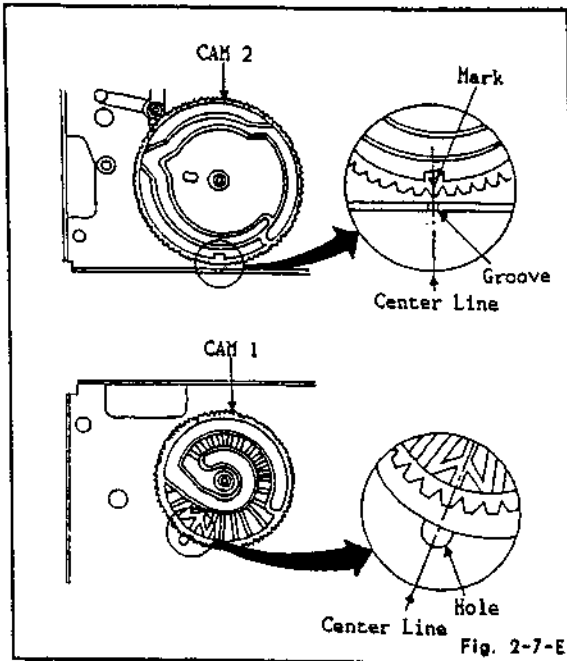


Fig. 2-7-D

MECHANICAL ADJUSTMENTS



2-9: TRANSISTOR PCB

REMOVAL

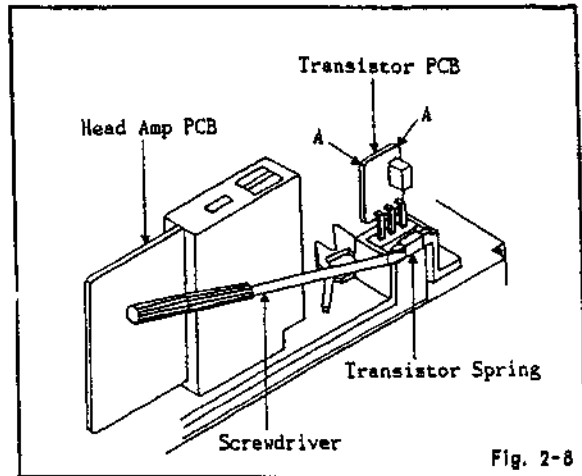
1. Insert a small flat-blade screwdriver into the transistor spring as shown in Fig. 2-8.
2. Hold both edges of the transistor PCB ("A" part) with your fingers and pull out the transistor PCB while turning the driver.

INSTALLATION

Install new transistor PCB in reverse steps of REMOVAL.

NOTE

1. The unit should be unplugged from the AC outlet.
2. Do not scratch or mar the cylinder.
3. Be careful not to split the transistor PCB.
4. If the transistor spring is broken when holding or removing the transistor PCB, replace with a new one.



3. CONFIRMATION AND ADJUSTMENT

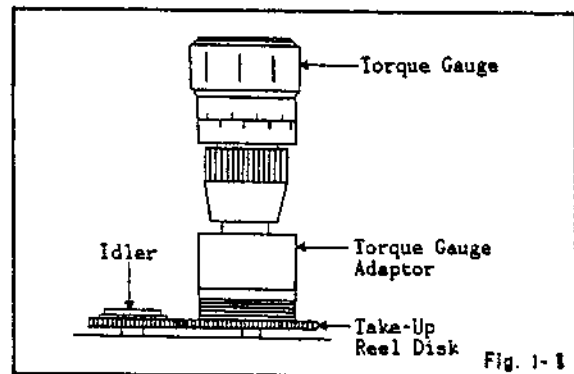
3-1: CONFIRMATION OF FAST FORWARD TORQUE

CONFIRMATION

1. Set torque gauge (J6002G) on take-up reel disk, and place unit in FAST FORWARD mode. (Refer to Fig. 3-1)
2. Confirm that torque is more than 800g/cm.

NOTE

After setting the torque gauge on the reel disk, hold the gauge in place. Push the FAST FORWARD button and the reel disk will begin to turn.



3-2: CONFIRMATION OF REWIND TORQUE

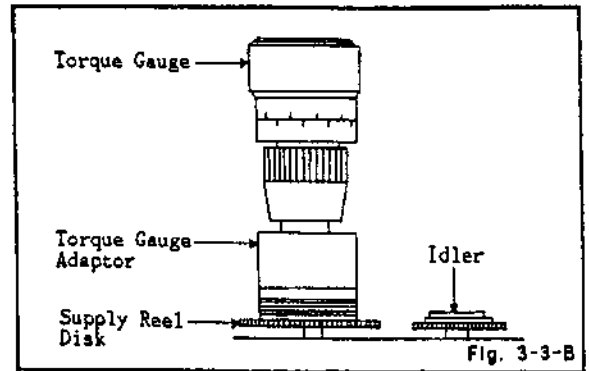
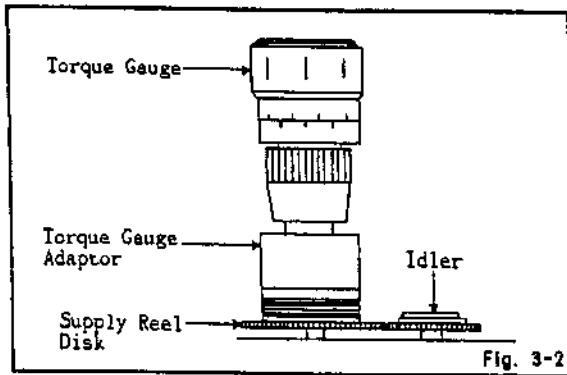
CONFIRMATION

1. Operate within 4 or 5 seconds after the reel disk begins to turn.
2. Set torque gauge (J6002G) on supply reel disk, and place the unit in REWIND mode. (Refer to Fig. 3-2)
3. Confirm that torque is more than 800g/cm.

NOTE

After setting the torque gauge on the reel disk, hold the gauge in place. Push the REWIND button and the reel disk will begin to turn.

MECHANICAL ADJUSTMENTS



3-3: CONFIRMATION OF PLAYBACK TAKE-UP TORQUE CONFIRMATION

1. Set the torque gauge (JG002F) on the rewind reel disk, then check PB mode.
2. Make sure that the torque covers the range, 60~150g/cm.

3-4: CONFIRMATION OF REEL BRAKE TORQUE

CONFIRMATION (Refer to Fig. 3-3-A)

(Take-Up Reel Brake)

1. Set to STOP mode.
2. Set the torque gauge (JG002G) to the take-up reel and turn it counter-clockwise.
3. Confirm that it is more than 200g/cm at that time.

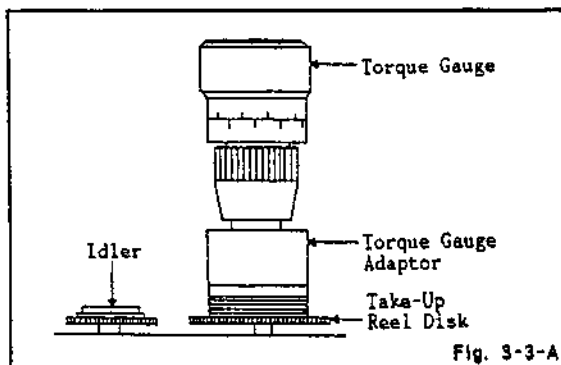
CONFIRMATION (Refer to Fig. 3-3-B)

(Supply Reel Brake)

1. Set to STOP mode.
2. Set the torque gauge (JG002G) to the supply reel and turn it clockwise.
3. Confirm that it is more than 200g/cm at that time.

NOTE

Separate the idler from the reel and confirm the brake torque.



NOTE

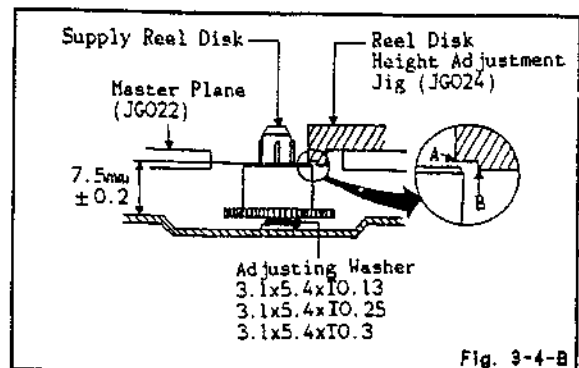
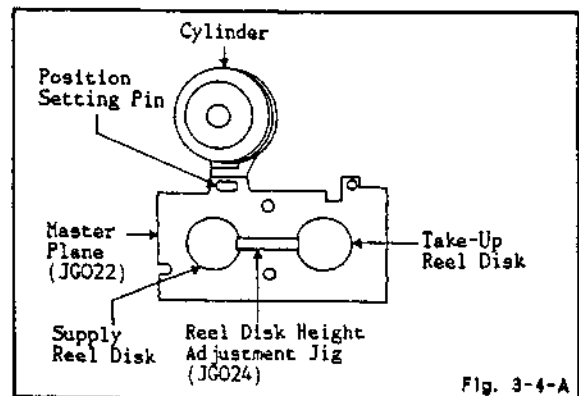
Refer to the table below for possible cause of problems when confirmation cannot be made for indicated items.

CONFIRMATION ITEM	CHECK POINT (REPLACEMENT)
3-1 3-2 3-3	Capstan belt may be stretched. Clutch may be worn out (if so, change reel disk.) Idler ass'y may be worn out.
3-4	Main brake belt may be worn out.

3-5: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

ADJUSTMENT

1. Set the master plane (JG022) at mechanism framework, taking care not to scratch the drum, as shown in Fig. 3-4-A.
2. Confirm that the reel disk is lower than "A" of the reel disk height adjustment jig, (JG024) on the master plane and higher than "B" as shown in Fig. 3-4-B.
3. When it does not satisfy above items, adjust to less than 0.1mm~0.5mm with the height adjustment washer.

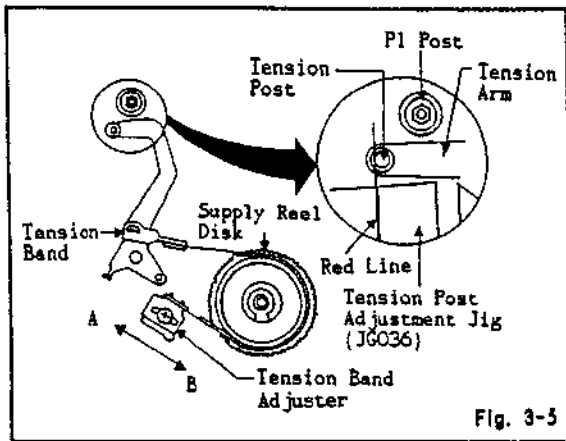


MECHANICAL ADJUSTMENTS

3-6: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

CONFIRMATION

1. Turn on the power and set to the PLAY mode by using the tension post adjustment jig (JG036).
2. As soon as the guide rollers, L, R begin to draw the tape from the cassette, the tension post shall move to the left, thus loading will start.
3. Move the tension band adjuster to the "A" or the "B" direction to set tension post adjusting jig red line to the round of the tension post. (Refer to Fig. 3-5)
4. Confirm that the video tape is not curling at the flange of P1 post or is not running on flanges.



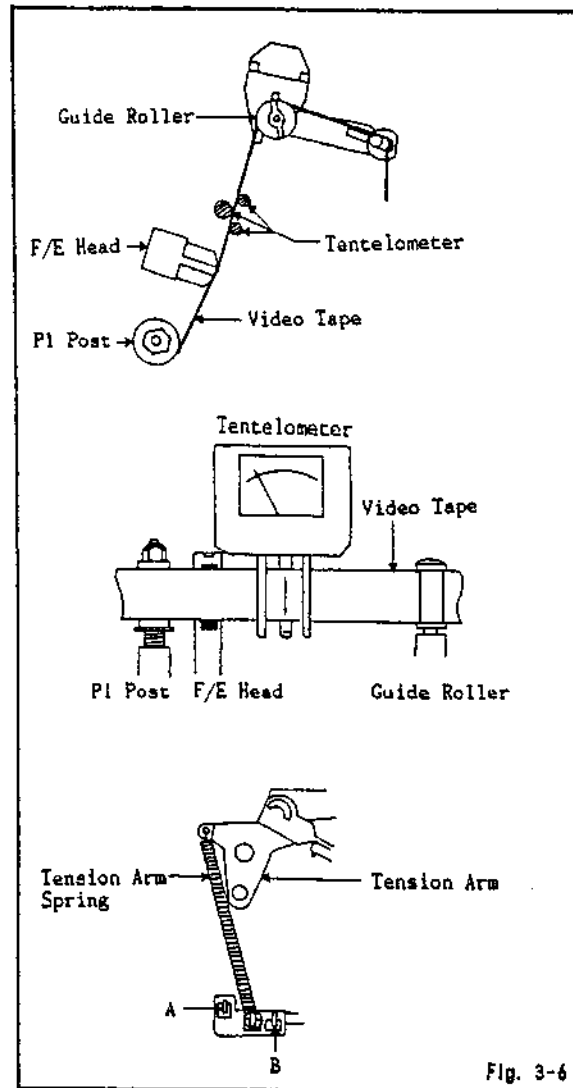
3-7: CONFIRMATION AND ADJUSTMENT OF BACK TENSION ON PLAYBACK

CONFIRMATION

1. Load the E-60 cassette tape recorded in standard speed mode.
2. Set the unit in the PLAY mode.
3. Install the tentelometer as shown in Fig. 3-6. Confirm the value is within 25~35g/cm at this time.
4. Confirm the video tape is running tight on P1 post.
5. Confirm there is no sag or damage on edges of the tape both in the beginning and ending of the video tape.
6. Adjust when it does not satisfy the above items.
7. Set the tension arm spring to "B" direction when the tentelometer indicates less than 25g/cm. (Refer to Fig. 3-6) Set the tension arm spring to "A" direction when the tentelometer indicates more than 35g/cm. (Refer to Fig. 3-6)

NOTE

The tentelometer should not touch F/E Head, cylinder or other components in the tape path.



4. TAPE RUNNING CONFIRMATION AND ADJUSTMENT

Tape running is adjusted precisely at the factory. Normally, it is not necessary to make adjustments. It is necessary to confirm and make adjustments when the parts of the tape running mechanism are replaced because of extensive usage or failure.

4-1: P1 POST

ADJUSTMENT

1. Set to the EJECT mode. Install the P1/P4 post height adjustment jig (JG035) to the main chassis.
2. Adjust the P1 post with P1/P4 post height adjustment jig "A" part. (Refer to Fig.4-1)

4-2: P4 POST

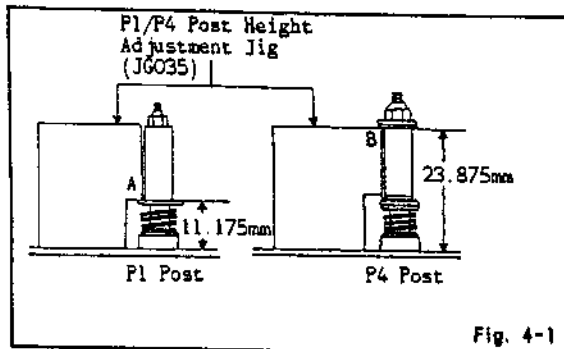
ADJUSTMENT

1. Set to the EJECT mode. Install the P1/P4 post height adjustment jig (JG035) to the main chassis.
2. Adjust the P4 post with P1/P4 post height adjustment jig "B" part. (Refer to Fig.4-1)

MECHANICAL ADJUSTMENTS

NOTE

1. Adjust the guide roller. (Refer to Item 4-3)
2. Do not move the nut.
3. Fix P4 post with screw lock.
4. Adjust the tape running. (Refer to Item 4-6)



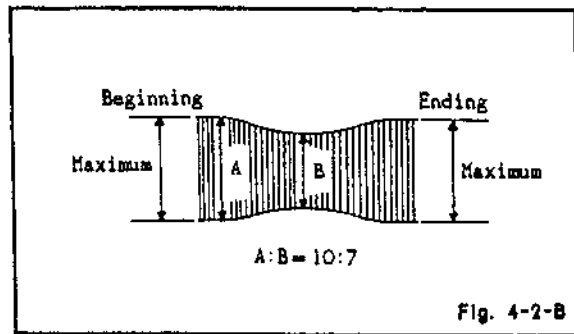
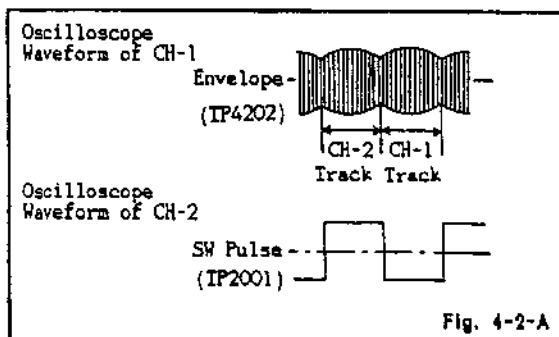
4-3: GUIDE ROLLER

ADJUSTMENT

1. Switch on main power and then connect monitor output cord and video input cord to proper positions.
2. Insert the VHS adjustment tape (JG001) into the unit.
3. Connect CH-1 and CH-2 of oscilloscope to envelope output and to the test point of switching pulse, respectively.
4. Carry out this adjustment in PLAY mode.
5. Trigger with SW pulse and observe the envelope. (Refer to Fig. 4-2-A)
6. Adjust the guide roller height while observing the envelope, and make the envelope flat. Adjust the envelope so that the flatness will not be affected even when the tracking control knob is turned. (Use the adjustment screwdriver JG005).
7. When the tracking control knob is turned (the point that the envelope waveform starts to reduce), adjust the envelope so that its A:B ratio is better than 10:7. (Refer to Fig. 4-2-B)
8. Adjust the PB switching position (ELECTRICAL ADJUSTMENTS: ITEM 2-1) in the PLAY mode.

NOTE

After adjustment, confirm and adjust A/C head tilt. (Refer to item 4-4)



4-4: CONFIRMATION AND ADJUSTMENT OF A/C HEAD TILT

ADJUSTMENT

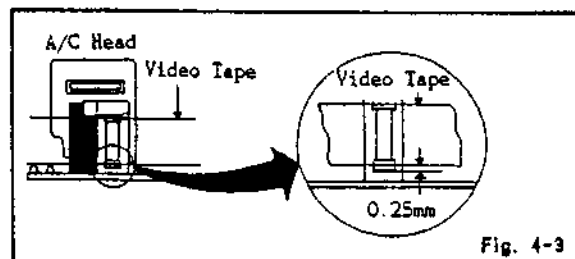
When the tape is running abnormally, perform the following adjustments.

1. Check the tape running condition with the unit in the PLAY mode using the E-60 tape.
2. Confirm that there is no crease on the tape between the guide post and guide roller (R) and the tape is running smoothly. (It is absolutely impossible to get satisfactory sound if the tape is distorted between the A/C head and guide post.)
3. If the tape still does not run smoothly, turn the screw ① and adjust the tilt of the A/C head. Do not move the guide post. (Refer to Fig. 2-2)

4-5: ADJUSTMENT OF A/C HEAD HEIGHT AND AZIMUTH

ADJUSTMENT

1. Playback a VHS adjustment tape (JG001) and observe the waveform at the audio output terminal.
2. Turn the screw ② slowly to change the height of the A/C head. Adjust the height so that the audio output becomes maximum. (Refer to Fig. 2-2)
3. Adjust the nut ③. (Refer to Fig. 2-2) until the height of the A/C head reaches the position against the tape as shown in Fig. 4-3.



4-6: TAPE RUNNING ADJUSTMENT

1. Adjust the height of reel disk. (Refer to item 3-5)
2. Adjust the P1 post, P4 post. (Refer to Item 4-1, 2)
3. Confirm and adjust tension post position. (Refer to Item 3-6)
4. Adjust the guide roller. (Refer to Item 4-3)
5. Adjust the A/C head height and azimuth. (Refer to Item 4-5)
6. Adjust the A/C head tilt. (Refer to item 4-4)
7. Set the tracking control to the center position. Turn X-nut adjustment screwdriver (JG021) until the envelope appears maximum.

ELECTRICAL ADJUSTMENTS

1. BEFORE ELECTRICAL ADJUSTMENTS

These are adjustments when you replace electric parts or PCB ass'y. When you repair the electric circuit, please read these adjustments.

1-1: Prepare the following measurement tools for the electrical adjustment.

1. Oscilloscope (2 channel type)
2. AC Voltmeter
3. Quartz Timer
4. Sweep-Marker Generator
5. AFI Adjustment Oscillator
6. VIF Unit
7. Audio Oscillator
8. Frequency Counter
9. DC Voltmeter
10. Spectrum Analyzer
11. Audio Generator
12. Separation Meter
13. Distortion Meter
14. Audio Analyzer

2. ADJUSTMENT PROCEDURE

2-1: PB. SWITCHING POSITION

CONDITIONS

MODE - PLAYBACK

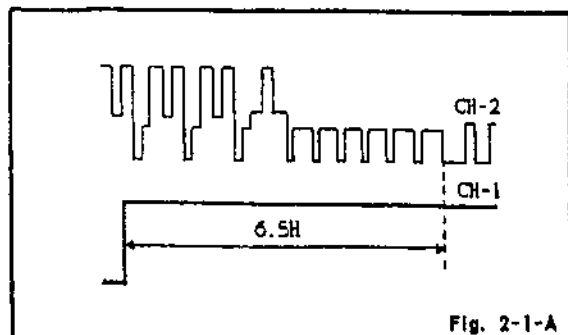
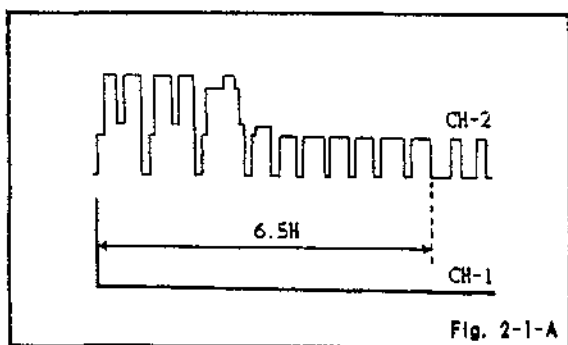
Input Signal - Standard Test Tape

NOTE

Tracking control should be set at click point.

INSTRUCTIONS

1. Connect CH-1 on the oscilloscope to TP2001 and CH-2 to TP4201.
2. Playback the tape.
3. Adjust VR2001 so that the waveform of the oscilloscope measures $6.5 \pm 0.5(H)$ at both leading and trailing edges. (Refer to Fig. 2-1-A, B)



2-2: TRACKING FIX

CONDITIONS

MODE - PLAYBACK

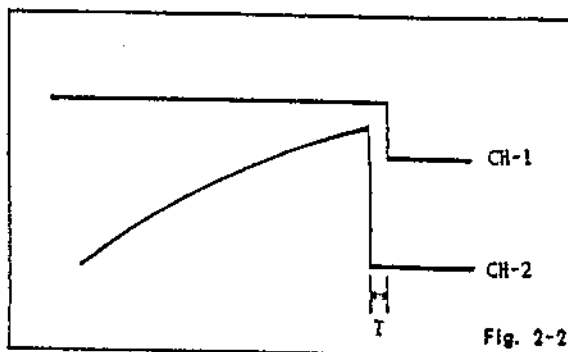
Input Signal - Standard Test Tape

NOTE

Tracking control should be set at click point.

INSTRUCTIONS

1. Connect CH-1 on the oscilloscope to TP2001 and CH-2 to TP2003.
2. Playback the tape.
3. Adjust VR2002 so that the "T" portion measures $-1.0 \pm 0.3 \text{msec.}$ (Refer to Fig. 2-2)



2-3: PLAYBACK LUMINANCE LEVEL

CONDITIONS

MODE - PLAYBACK

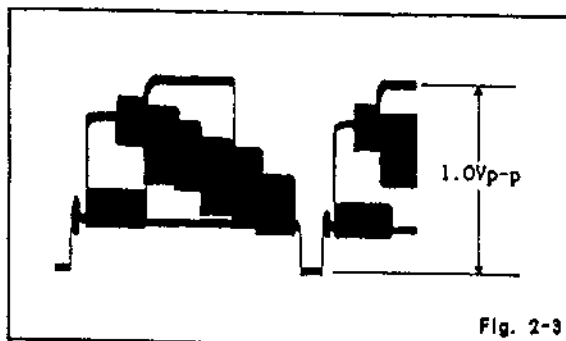
Input Signal - Color Bar Test Tape

NOTE

Video out of the unit should be terminated with 75 ohm load.

INSTRUCTIONS

1. Connect the oscilloscope to TP4201.
2. Playback the tape.
3. Adjust VR4003 so that the signal becomes $1.0 \pm 0.05 \text{Vp-p}$ as shown in Fig. 2-3.



ELECTRICAL ADJUSTMENTS

2-4: NOISE CANCEL

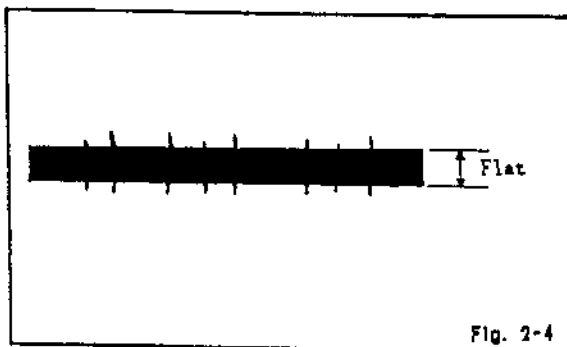
CONDITIONS

MODE - PLAYBACK

Input Signal - Color Bar Test Tape

INSTRUCTIONS

1. Connect CH-1 of the oscilloscope to TP4003 and CH-2 on the oscilloscope to TP4004.
2. Reverse the waveform for CH-2 with on inverter and put both the waveforms for CH-1 and CH-2 together by pressing the ADD SW on the oscilloscope.
3. Adjust the VR4005 so that the waveform of CH-1 is straight as shown in Fig. 2-4.



2-5: E-E LEVEL

CONDITIONS

MODE - STOP

INPUT SELECT SW - LINE POSITION

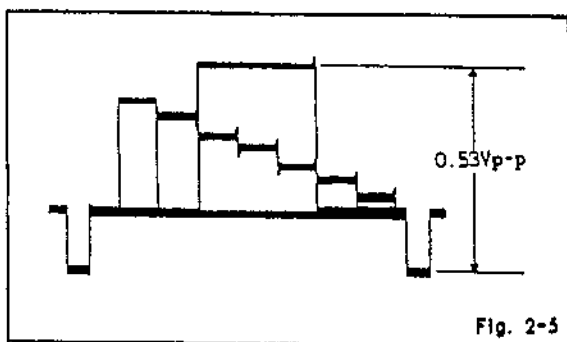
Input Signal - PAL Color Bar

NOTE

Video out of the unit should be terminated with 75 ohm load.

INSTRUCTIONS

1. Input the color bar signal to the VIDEO IN.
2. Connect the oscilloscope to TP4005.
3. Adjust VR4004 so that the waveform measures $0.53 \pm 0.01V_{p-p}$. (Refer to Fig. 2-5)



2-6: CARRIER AND DEVIATION

CONDITIONS

MODE - STOP

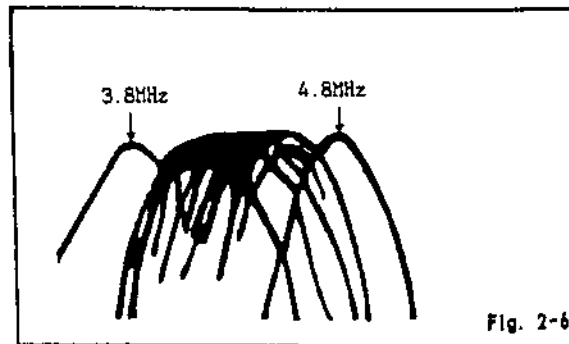
INPUT SELECT SW - LINE POSITION

Input Signal - PAL Color Bar

INSTRUCTIONS

1. Input the color bar signal to the VIDEO IN.
2. Connect TP4001 to the input terminal on the spectrum analyzer, then adjust 3.8MHz and 4.8MHz as shown in Fig. 2-6 with VR4001 and VR4002.

VR4001 (CARRIER)
VR4002 (DEVIATION)



2-7-A: SECAM IDENTIFICATION (1)

CONDITIONS

MODE - RECORD

Input signal - SECAM RF signal

INSTRUCTIONS

1. Connect CH-1 on the oscilloscope to TP4201 and CH-2 to TP3702.
2. Adjust L3702 so that peak of waveform "A" and leading edge of video signal of waveform "B" may become same as shown in Fig. 2-7.

2-7-B: SECAM IDENTIFICATION (2)

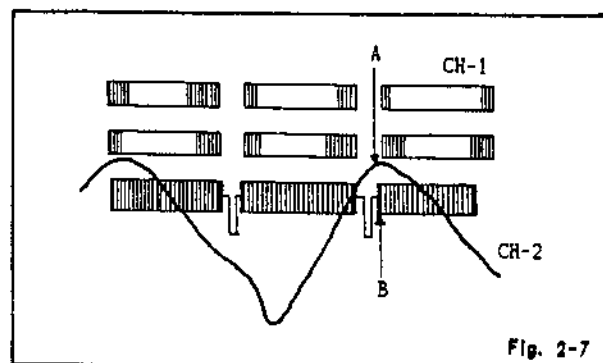
CONDITIONS

MODE - RECORD

Input signal - SECAM RF signal

INSTRUCTIONS

1. Connect the oscilloscope to TP3701.
2. Receive SECAM RF signal at 33dB.
3. At this time, adjust TP3701 to High Level with VR3701
4. Next, check that the TP3701 will indicate Low Level with adjusting the output level to 31dB.
5. Receiving the PAL signal, check that the TP3701 will indicate Low Level regardless of output strength.



ELECTRICAL ADJUSTMENTS

2-8: RECORD CURRENT

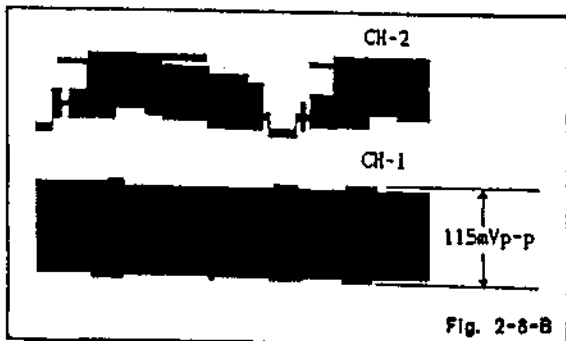
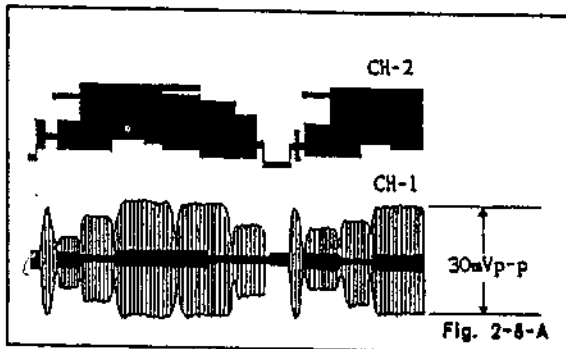
CONDITIONS

MODE - RECORD

Input Signal - PAL Color Bar

INSTRUCTIONS

1. Input the color bar signal to the VIDEO IN.
2. Connect CH-1 on the oscilloscope to TP4101 and connect the GND side to TP4102. Connect CH-2 on the oscilloscope to TP4201.
Reduce REC.-Luminance signal factors by turning VR4102 fully counter-clockwise.
3. Adjust VR4101 so that the cyan level becomes $30 \pm 2\text{mVp-p}$ as shown in Fig. 2-8-A.
4. Adjust VR4102 so that the horizontal sync level becomes $115 \pm 5\text{mVp-p}$ as shown in Fig. 2-8-B.
(REC-Y must not be less than 110mVp-p .)



2-9: CLOCK

CONDITIONS

MODE - STOP
POWER ON
CLOCK SET

INSTRUCTIONS

1. Connect the frequency counter to the "A" point.
2. Adjust TC601 so that the value of frequency counter is $1048576 \pm 1\text{Hz}$.

2-10: VCO

CONDITION

MODE - INPUT SELECT SW : TUNER POSITION

INSTRUCTIONS

1. Connect the output of the Sweep-Marker Generator to the saw filter side of C6013 ($0.01\mu\text{F}$).
2. Connect the oscilloscope to 28 pin on IC6001. (Use the detector as a prob. Refer to Fig. 2-9-A)
3. Connect the AGC volume to pin 6 on IC6001. (Refer to Fig. 2-9-B)
4. Adjust L6005 to obtain maximum amplitude of response curve at 38.9MHz. (Refer to Fig. 2-9-C)

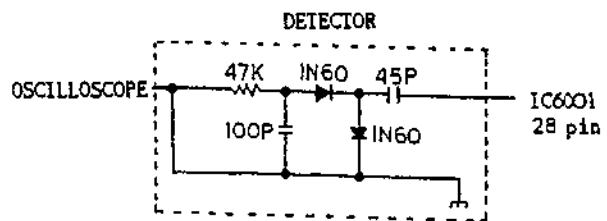


Fig. 2-9-A

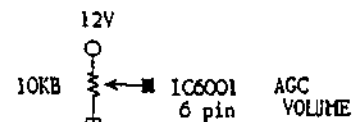


Fig. 2-9-B

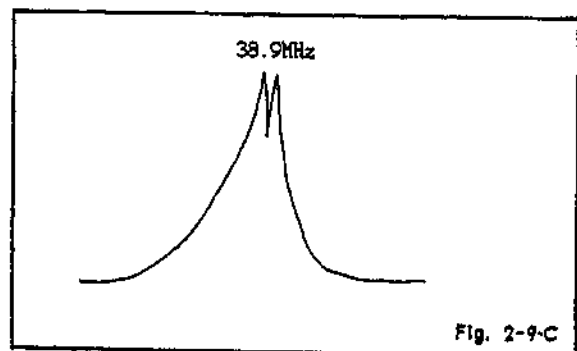


Fig. 2-9-C

2-11: TRAP

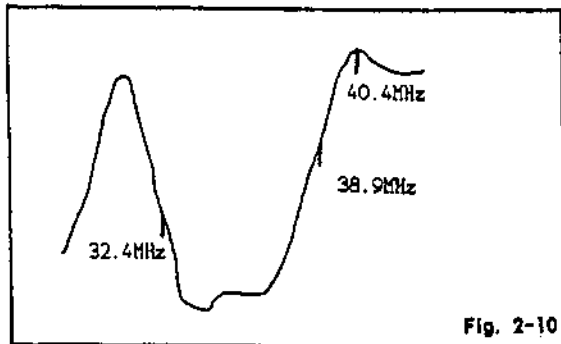
CONDITION

MODE - INPUT SELECT SW : TUNER MODE

INSTRUCTIONS

1. Connect the output of the Sweep-Marker Generator to the test point of the Tuner Pack.
2. Connect the oscilloscope to the collector of the Q6001. (Use the detector as a prob. Refer to Fig. 2-9-A)
3. Adjust L6002 to obtain maximum amplitude or response curve at 40.4MHz. (Refer to Fig. 2-10)
4. Adjust L6001 to obtain it at 32.4MHz. (Refer to Fig. 2-10)

ELECTRICAL ADJUSTMENTS



2-12: AFT

CONDITIONS

MODE - STOP
INPUT SELECT SW : TUNER MODE

INSTRUCTIONS

1. Connect the AFT adjustment oscillator (38.9MHz) to the Tuner Pack TP through 2.2K ohm and connect the DC voltmeter to TP6101.
2. Adjust L6006 so that voltage at AFT switch ON is as much as one at AFT switch OFF.

2-13: RF AGC

CONDITIONS

MODE - INPUT SELECT SW : TUNER MODE
AFT SW : ON MODE

INSTRUCTIONS

1. Receive the monochrome pattern signal. (Receive the E-11ch)
2. Connect the DC voltmeter to TP6102.
3. Set input field strength to 80dB μ .
4. Adjust VR6002 so that the voltage is equal to $4.2 \pm 0.1V$.

2-14: COLOR LEVEL

CONDITIONS

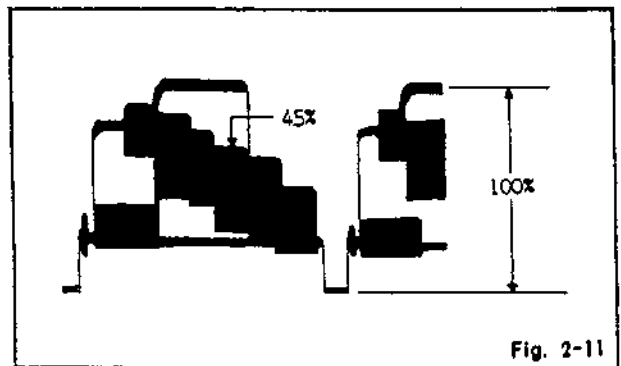
MODE - STOP
AFT SW : ON MODE

NOTE

Video out of the unit should be terminated with 75 ohm load.

INSTRUCTIONS

1. Obtain a color bar signal. (Receive the E-48ch)
2. Connect the oscilloscope to TP4201.
3. Adjust VR6003 so that the magenta level is $47 \pm 5\%$ when Y-level is 100%. (Refer to Fig. 2-11)



2-15: SIF DISTORTION

CONDITIONS

MODE - INPUT SELECT SW : TUNER MODE
AGC SW : ON POSITION
AUDIO SELECT SW : STEREO POSITION
TUNER MODE SW : AUTO POSITION
AFT SW : ON POSITION

INSTRUCTIONS

1. Receive the Bilingual pattern signal. (Receive the E-30ch)
2. Connect the distortion meter to each AUDIO OUT L-CH and R-CH of the set.
3. Adjust L6601(L-CH) and L6602(R-CH) until the distortions reach minimum.

2-16: PILOT TONE VOLUME

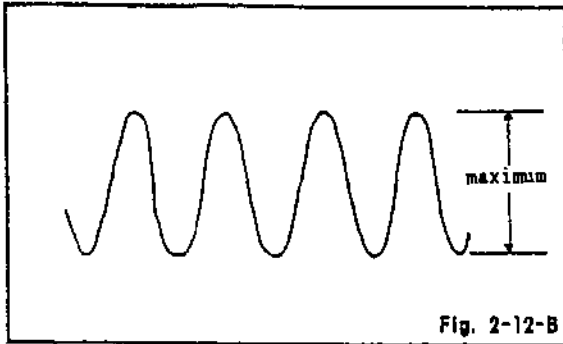
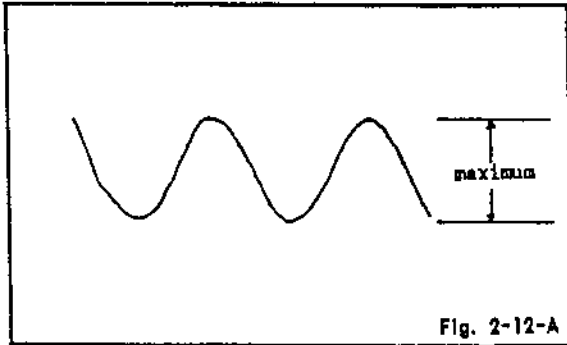
CONDITIONS

MODE - INPUT SELECT SW : TUNER MODE
AFT SW : ON POSITION
AUDIO SELECT SW : STEREO POSITION
TUNER MODE SW : AUTO POSITION

INSTRUCTIONS

1. Connect the oscilloscope to TP6602.
2. Receive the stereo pattern signal. (Receive the E-50ch)
3. Adjust VR6604 until the output waveform (117.5Hz) of TP6602 reaches maximum amplitude. (Refer to Fig. 2-12-A)
4. Turn, receive the bilingual pattern signal. (Receive the E-30ch)
5. Adjust VR6603 until the waveform(274.1Hz) of TP6602 reaches maximum amplitude. (Refer to Fig. 2-12-B)

ELECTRICAL ADJUSTMENTS



2-17: PLL CENTER FREQUENCY VOLUME

CONDITIONS

MODE - INPUT SELECT SW : TUNER MODE
AFT SW : ON POSITION

INSTRUCTIONS

1. Receive the Monochrome pattern signal.
(Receive the E-11ch)
(Sound of the tuner is MONO signal)
2. Connect the electric capacitor (1 μ F 50V) to TP6602.
Input the sine wave [196Hz (100mVp-p)] from the audio generator.
3. Connect the DC voltmeter to TP6603.
4. Adjust VR6602 until the level of the DC voltmeter reaches $6.7 \pm 0.1V$.

2-18: SEPARATION

CONDITIONS

MODE - INPUT SELECT SW : TUNER MODE
AGC SW : ON POSITION
AUDIO SELECT SW : STEREO POSITION
TUNER MODE SW : AUTO POSITION

NOTE : Adjust after approximately 20 minutes aging.

INSTRUCTIONS

1. Receive the Stereo pattern signal.
(Receive the E-50ch)
L-CH : No sound.
R-CH : Sound OK.
2. Connect the separation meter to the AUDIO OUT L-CH, R-CH of the set.
3. Adjust VR6601 until the separation of L-CH and R-CH become maximum.

2-19: CARRIER FREQUENCY

CONDITIONS

MODE - STOP
INPUT SELECT SW : LINE OR SCART POSITION
Input signal - Color bar
Audio no signal

INSTRUCTIONS

1. Connect the frequency counter to TP5504.
2. Adjust VR5504(R-CH) until the level of the frequency counter reaches $1.8MHz \pm 5KHz$.
3. Then, connect the frequency counter to TP5503.
4. Adjust VR5502(L-CH) until the level of the frequency counter reaches $1.4MHz \pm 5KHz$.

2-20: HI-FI DEVIATION

CONDITIONS

MODE - REC
AGC SW : OFF POSITION
AUDIO SELECT SW : STEREO POSITION

Input signal - Color bar
300mVrms, 400Hz sine wave
INPUT SELECT SW : LINE OR SCART POSITION

NOTE : Adjust the REC volume until the level of audio out -6dBm.

INSTRUCTIONS

1. Connect the audio analyzer to TP5601.
2. Adjust the VR5501(L-CH), VR5503(R-CH) for the audio analyzer indicates $50 \pm 5KHz$.

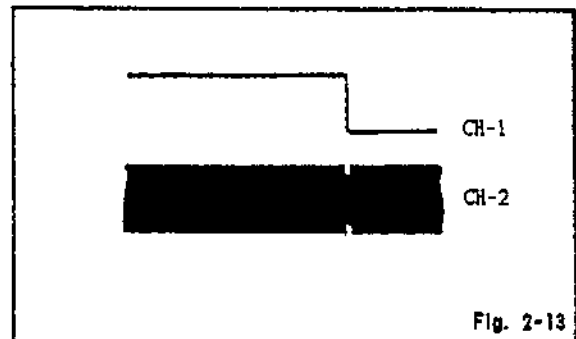
2-21: FF SWITCHING POINT

CONDITIONS

MODE - PLAY
AUDIO SELECT SW : STEREO POSITION

INSTRUCTIONS

1. Connect the CH-1 of the oscilloscope to TP5505, the CH-2 to TP5502.
2. Playback the non-overlap (HI-FI 10KHz) tape.
Adjust VR5505 until the playback envelope of CH-2 has no break possibly.
(Refer to Fig. 2-13)



ELECTRICAL ADJUSTMENTS

2-22: LEVELMETER

CONDITIONS

MODE - INPUT SELECT SW : LINE OR SCART POSITION
AGC SW : OFF POSITION
AUDIO SELECT : STEREO POSITION
Input signal - Audio input 400Hz, 300mVrms

NOTE : Adjust the REC volume until the level of audio out -6dBm.

INSTRUCTION

Adjust the VR604(L-CH), VR605(R-CH) for the indicate of levelmeter to 0 dB position (that is one red LED light).

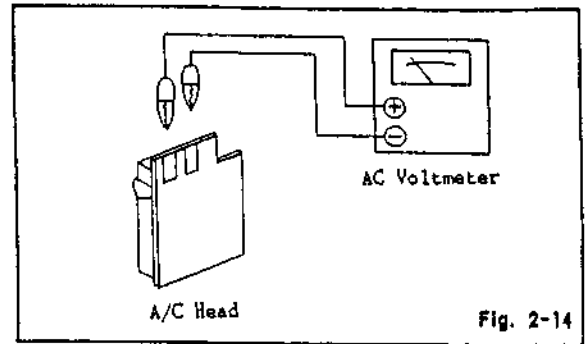
2-23: AUDIO BIAS CURRENT

CONDITIONS

MODE - RECORD
Input Signal - No Signal

INSTRUCTIONS

Connect the AC voltmeter to the arrow point, then adjust the voltage to 3.3 ± 0.1 mVrms with VR5002.(Refer to Fig. 2-14)



2-24: AUDIO PLAYBACK LEVEL

CONDITIONS

MODE - Self(RECORD and PLAYBACK)
AUDIO SELECT SW - NORMAL POSITION
INPUT SELECT SW : SCART POSITION
Input signal - 1KHz 300mVrms, Audio signal
Video signal : PAL color bar

NOTE : Audio out of the unit should be terminated with 75 ohm load.

INSTRUCTIONS

1. Input the color bar signal to the AUDIO OUT.
2. Connect the AC voltmeter to AUDIO OUT, which is terminated with 47K ohm resistor.
3. Record and then playback the audio signal as specified.
4. Adjust VR5001 so that the playback output may become 390 ± 10 mVrms.

HOW TO RESET MICROCOMPUTER

When either or both of the following conditions occur, follow the procedure below:

CONDITIONS

- * The digitron display does not light up.
- * The unit does not stop, even when the "STOP" button is pressed.

PROCEDURE

1. Open the compartment door.

The reset switch is accessed through as unmarked hole, which is pointed by arrow in the illustration.

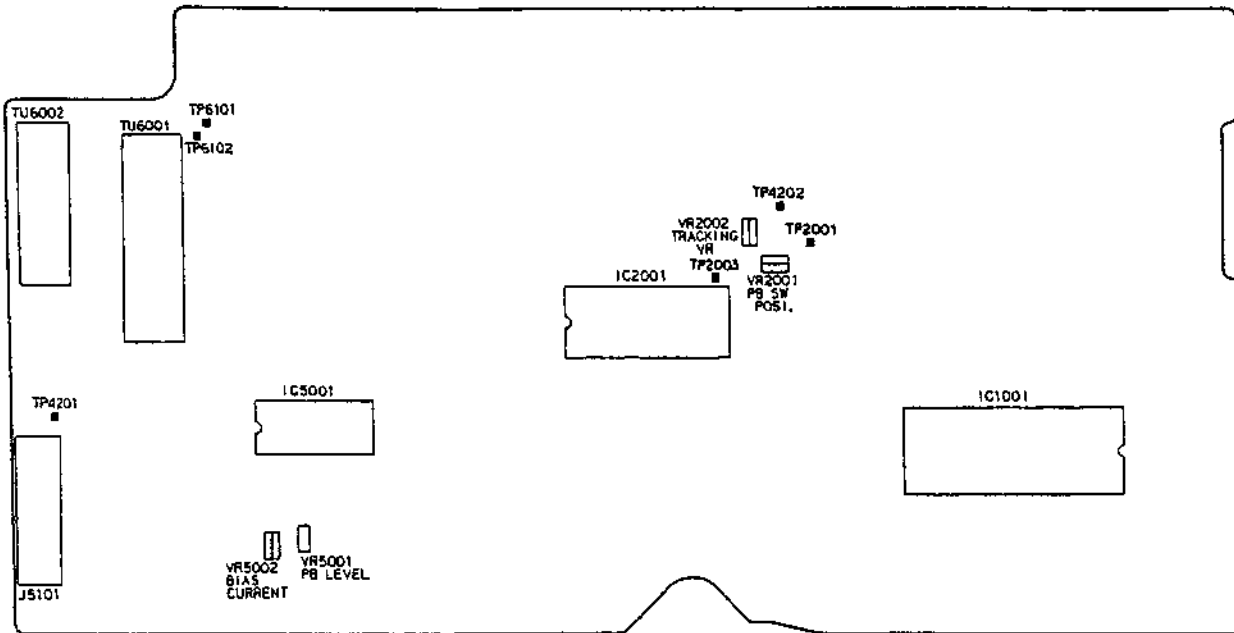
2. The unit is reset when a long, narrow probe (eg, the end of a paper clip) is inserted into the hole.

* After resetting the microcomputer, set the clock to the present time according to the owner's manual.

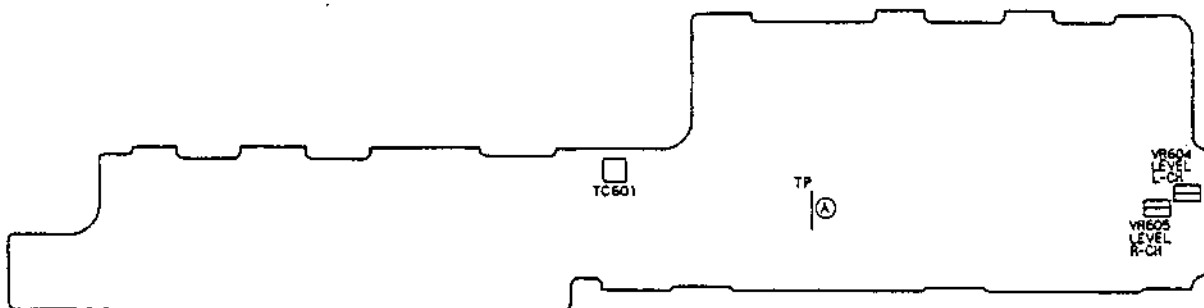
* A back-up circuit protects the unit from entering reset mode, even if the AC cord is unplugged from its AC outlet.



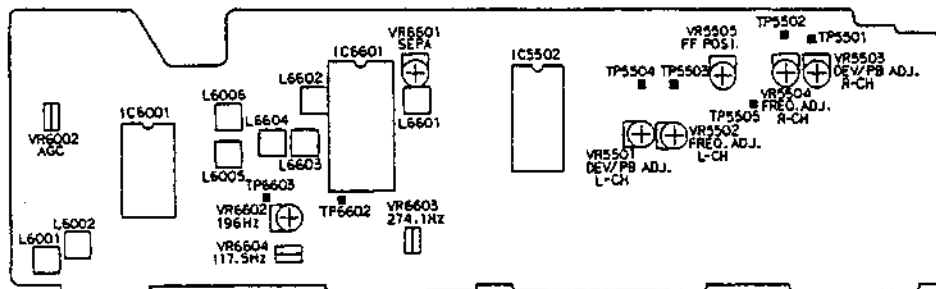
MAJOR COMPONENTS LOCATION GUIDE



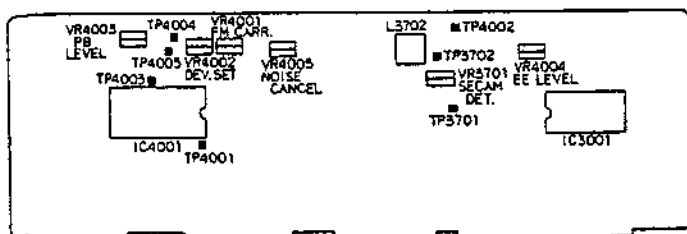
MAIN P.C. BOARD



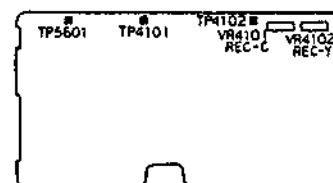
OPERATION P.C. BOARD



HI-FI P.C. BOARD

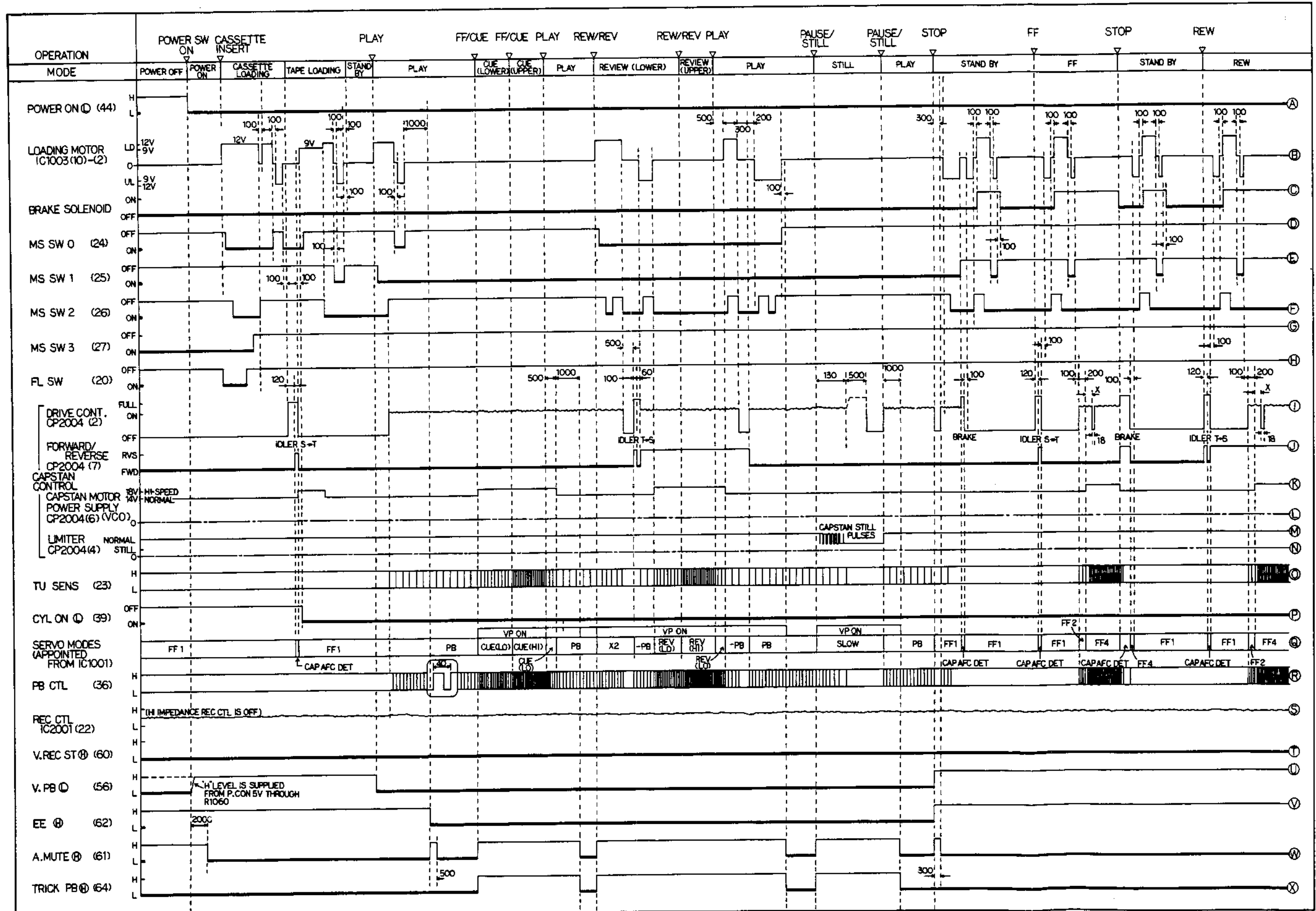


Y. C. P.C. BOARD



HEAD AMP P.C. BOARD

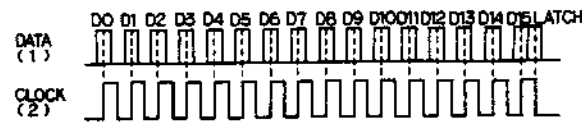
TIMING CHART



NOTE: 1. SERVO MODE SET

2. TIMING VALUES IN (ms)

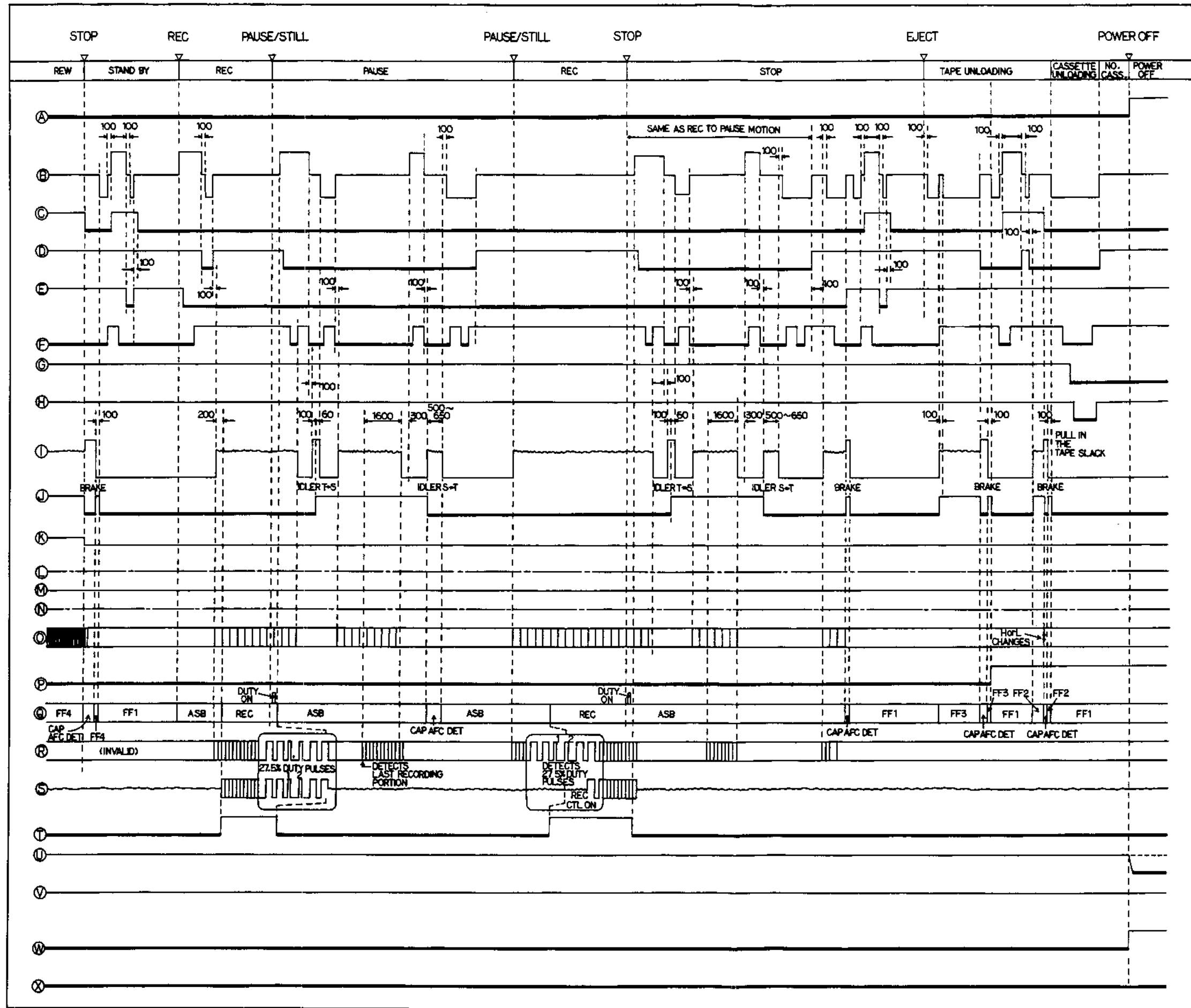
3. TIMING WAVEFORMS



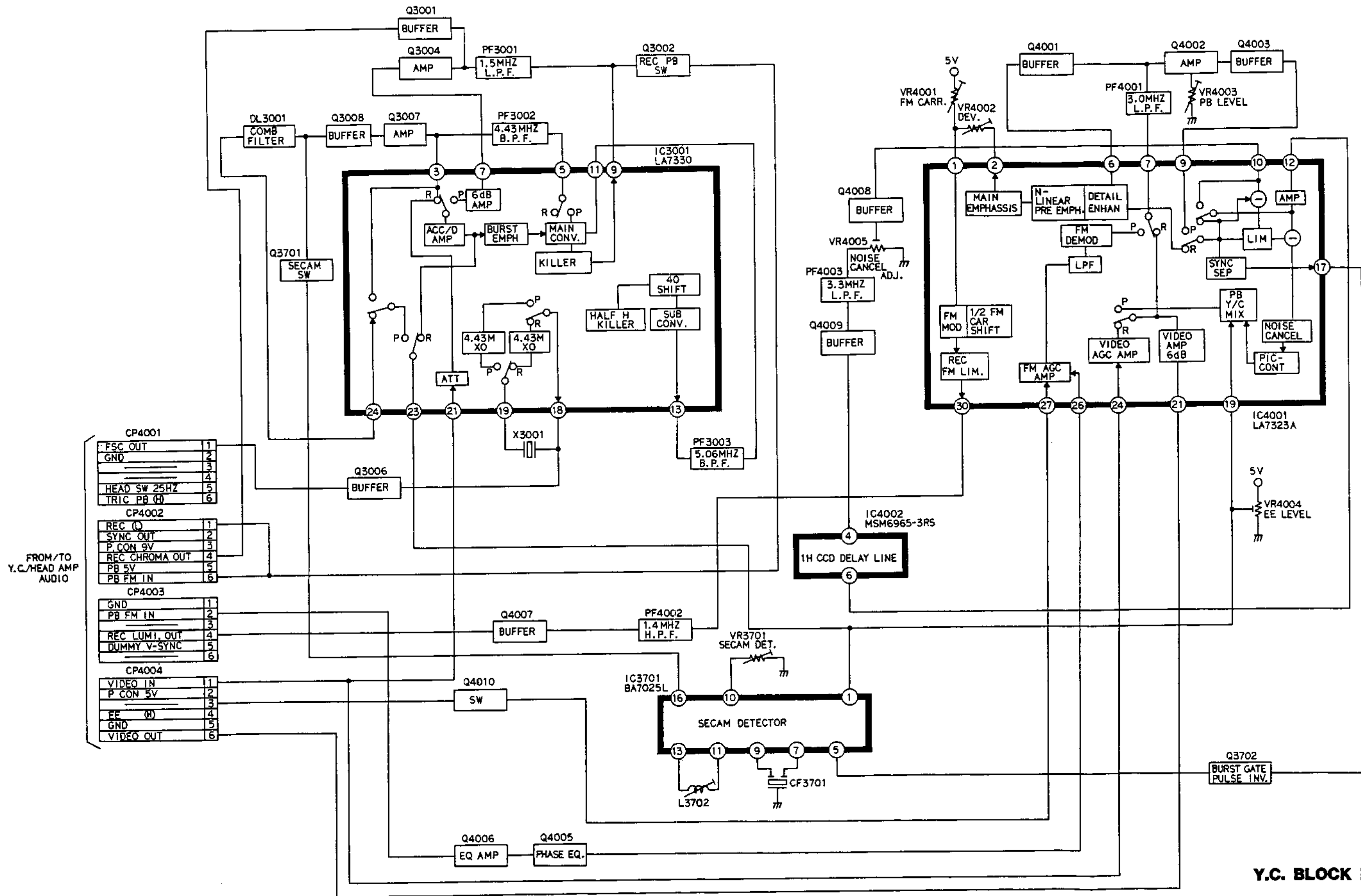
— HIGH — STAY HIGH or LOW
 — LOW — ALTERNATELY HIGH and LOW

TIMING CHART
1-8265

TIMING CHART

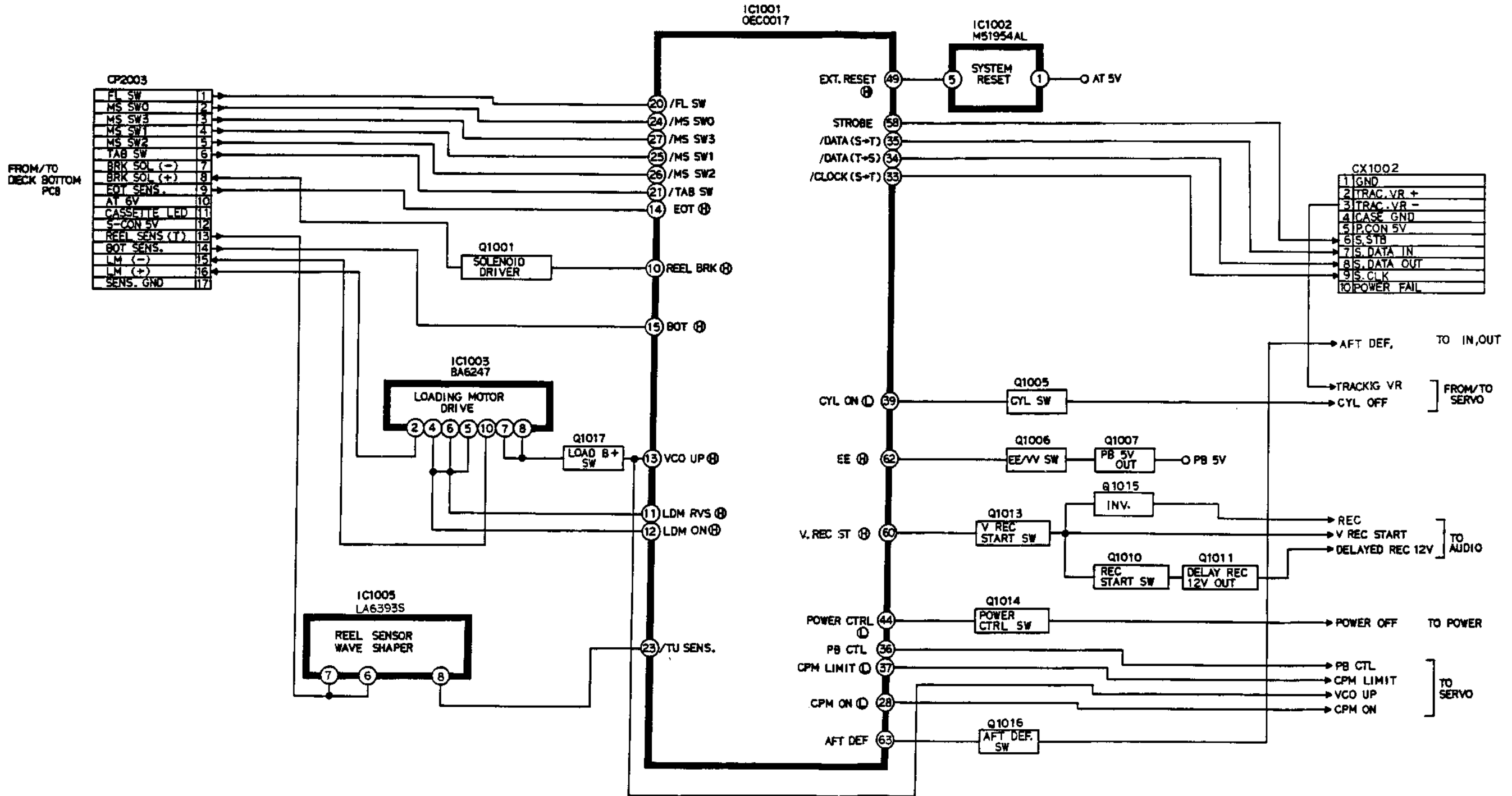


Y.C. BLOCK DIAGRAM



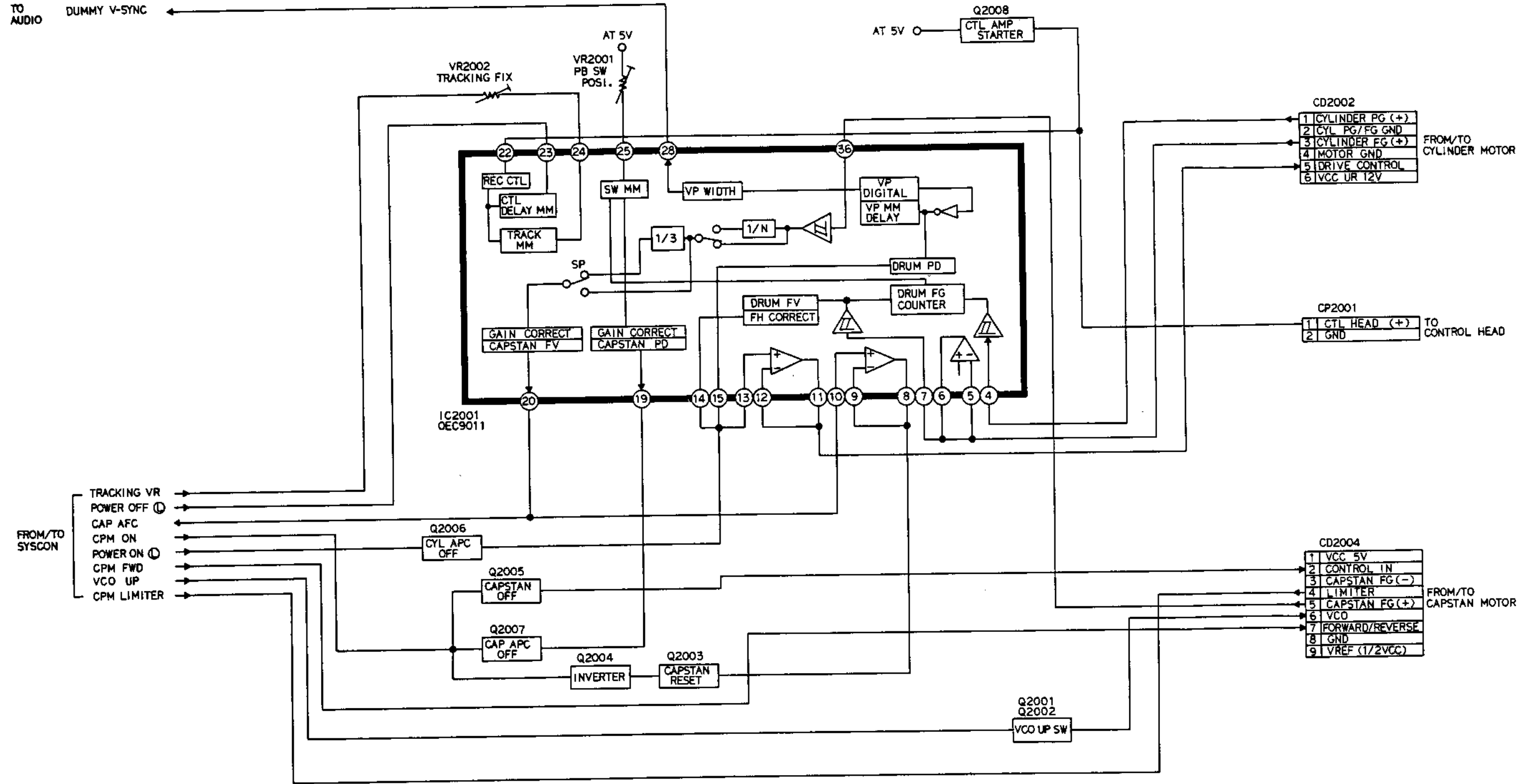
Y.C. BLOCK DIAGRAM
2-3780

SYSTEM CONTROL BLOCK DIAGRAM



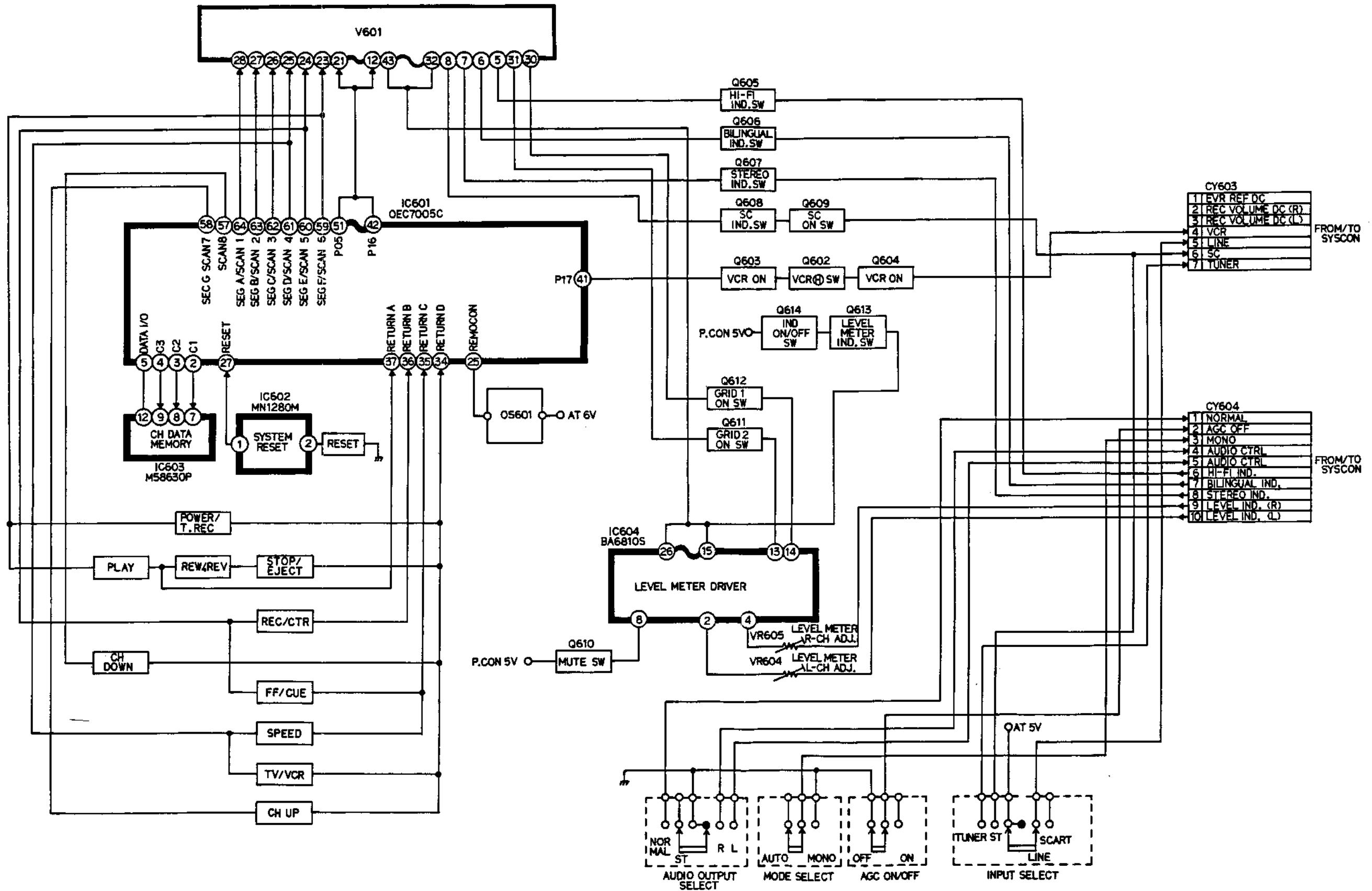
SYSTEM CONTROL BLOCK DIAGRAM

SERVO BLOCK DIAGRAM



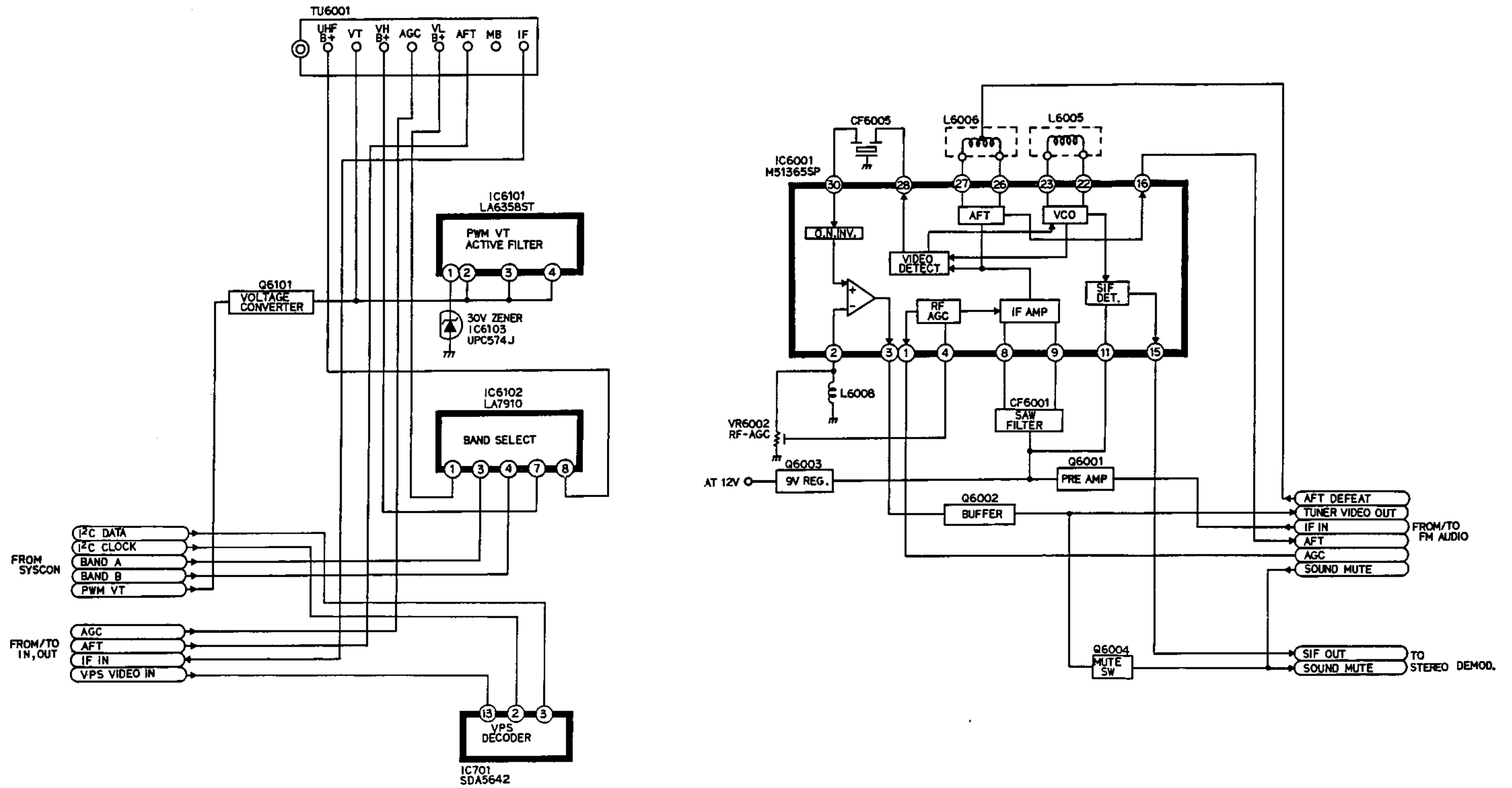
SERVO BLOCK DIAGRAM
2-3377

OPERATION 1/2 BLOCK DIAGRAM



OPERATION 1/2 BLOCK DIAGRAM

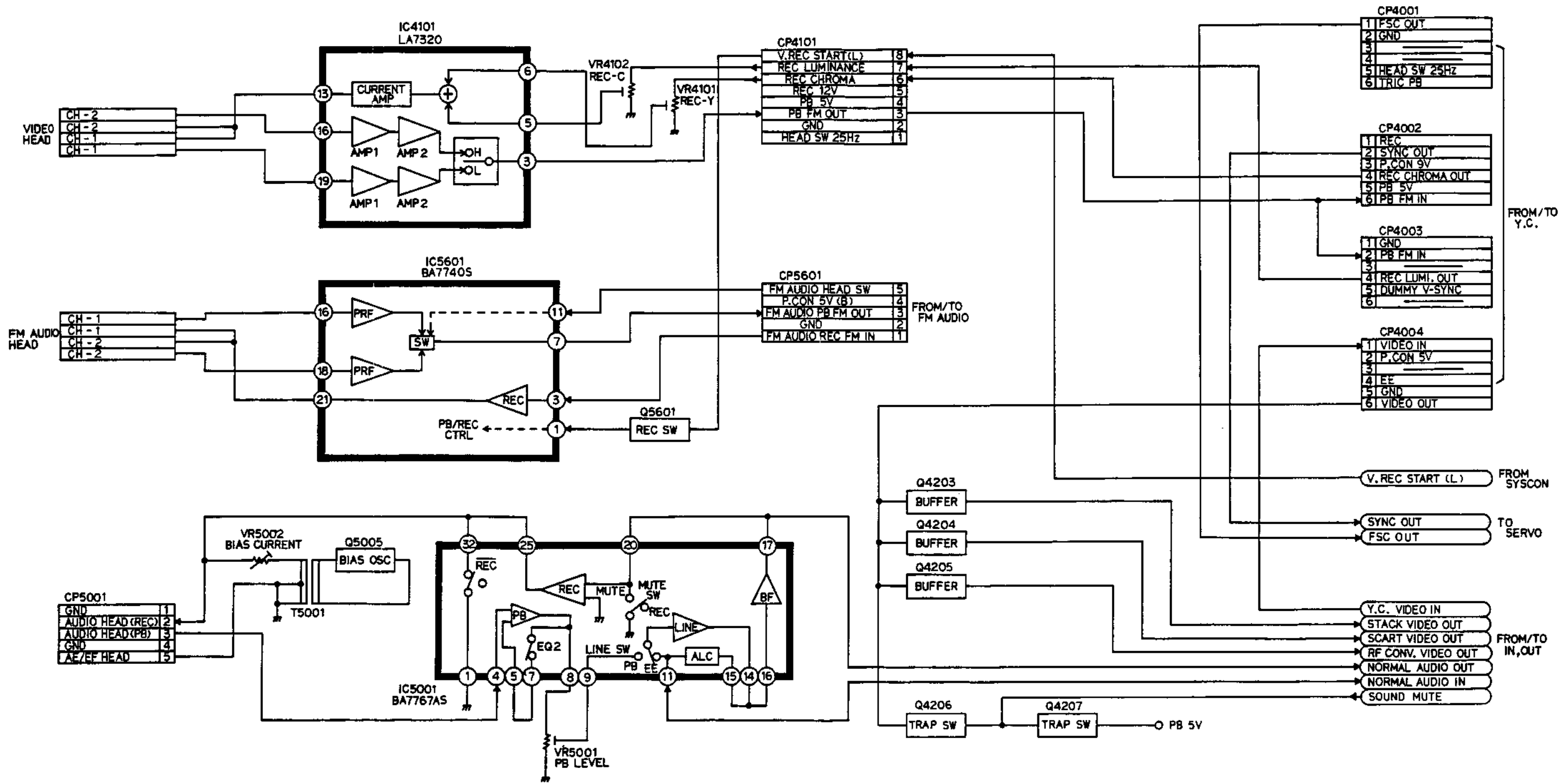
TUNER /IF BLOCK DIAGRAM



TUNER /IF BLOCK DIAGRAM

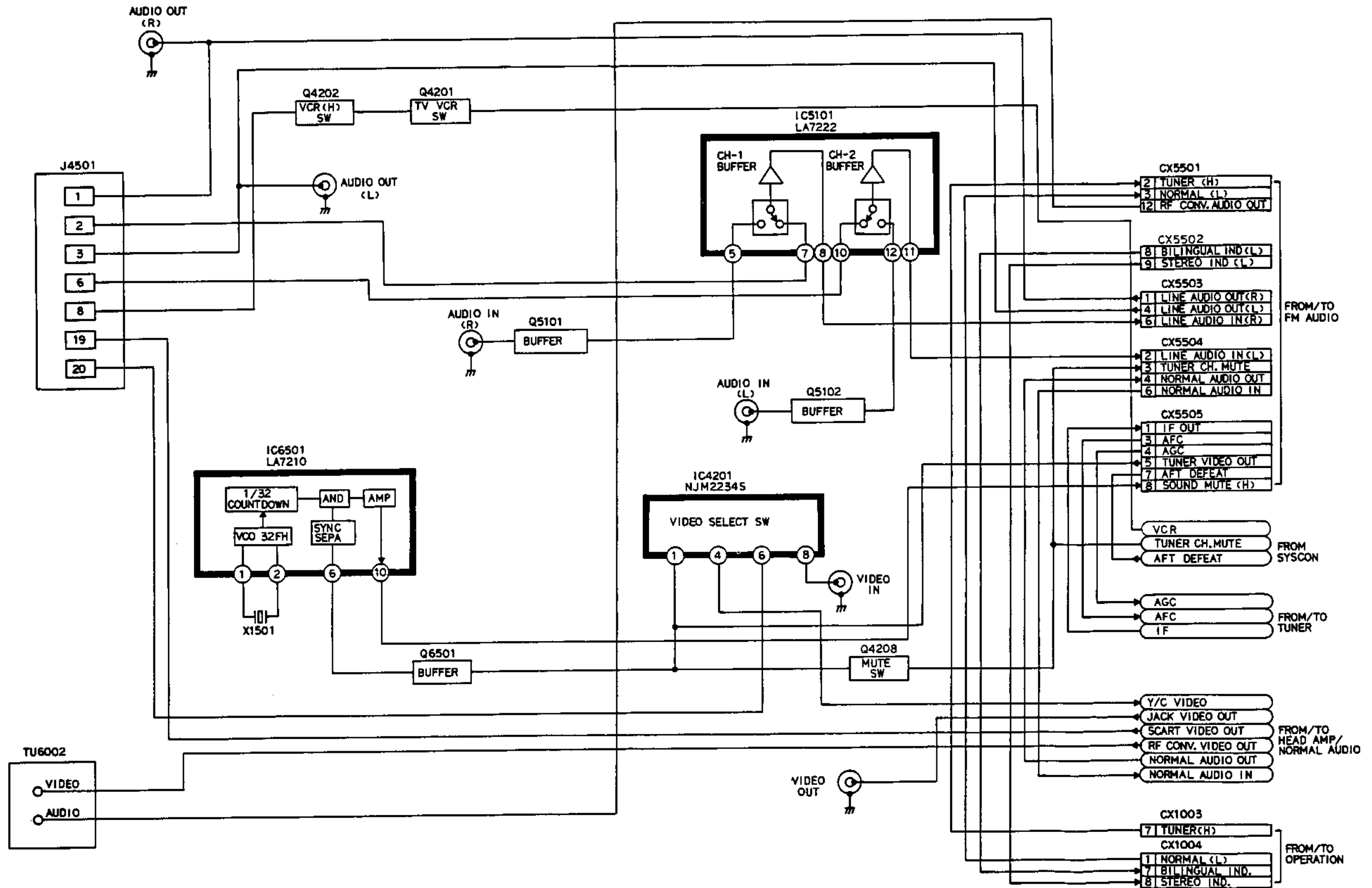
2-3781

HEAD AMP /NORMAL AUDIO BLOCK DIAGRAM



HEAD AMP /NORMAL AUDIO BLOCK DIAGRAM

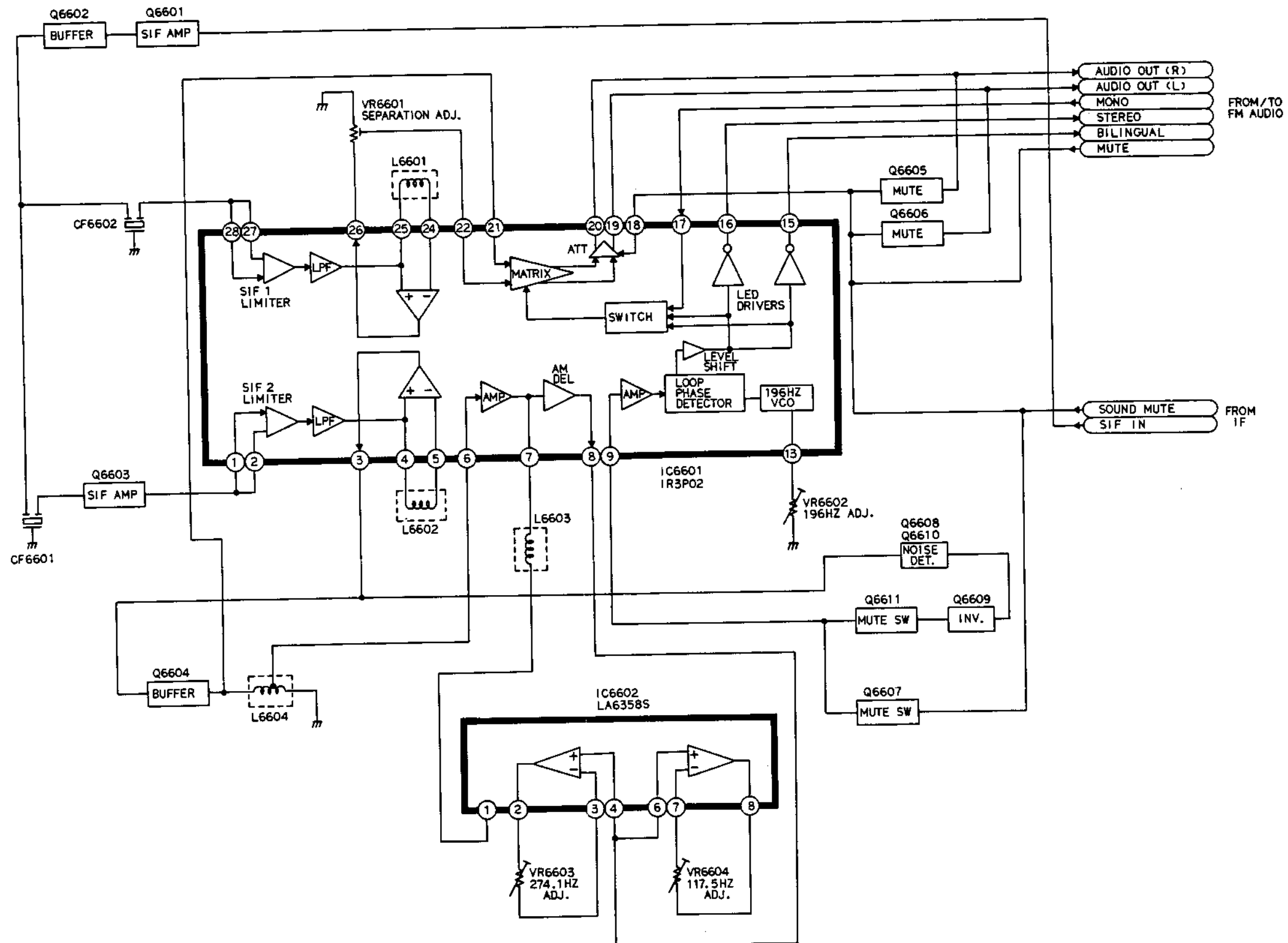
IN,OUT/ 21PIN BLOCK DIAGRAM



IN,OUT/ 21PIN BLOCK DIAGRAM

2-3804

STEREO DEMODULATOR BLOCK DIAGRAM

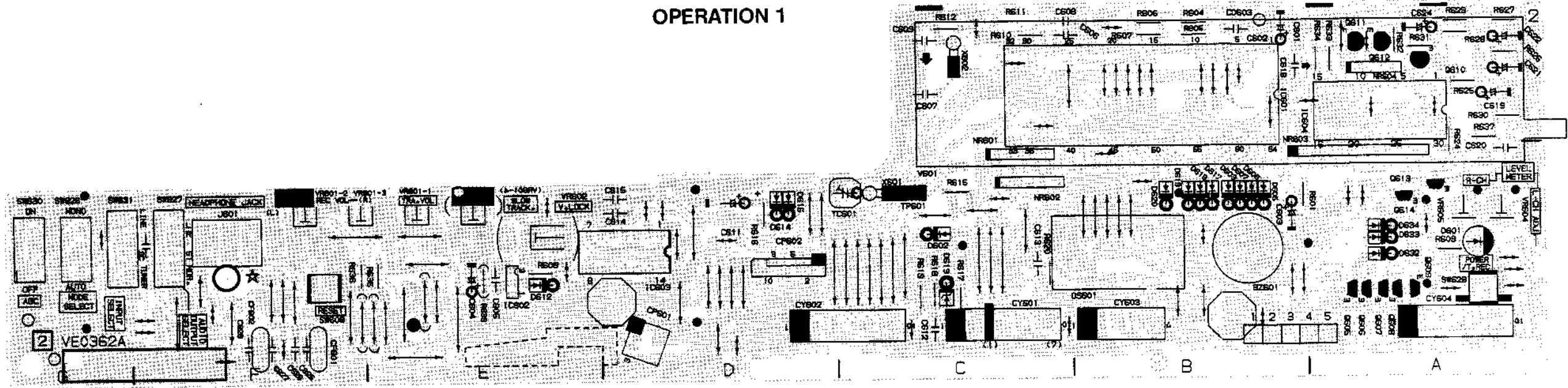


STEREO DEMODULATOR BLOCK DIAGRAM

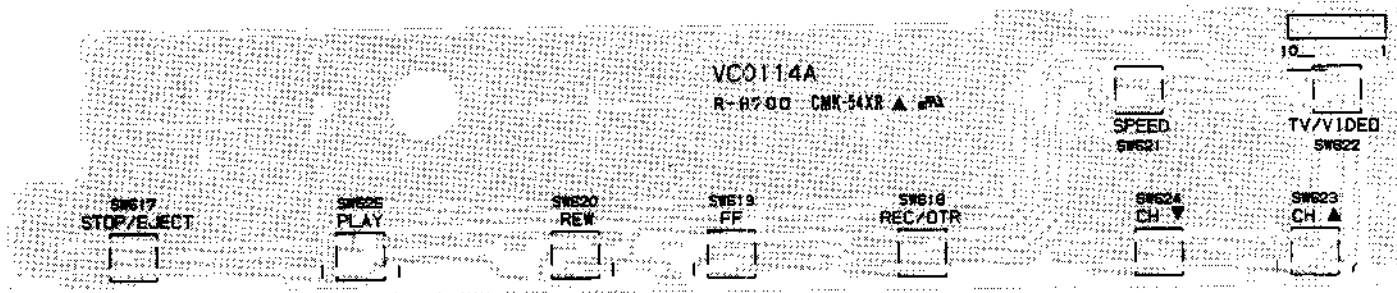
2-3325

PRINTED CIRCUIT BOARDS

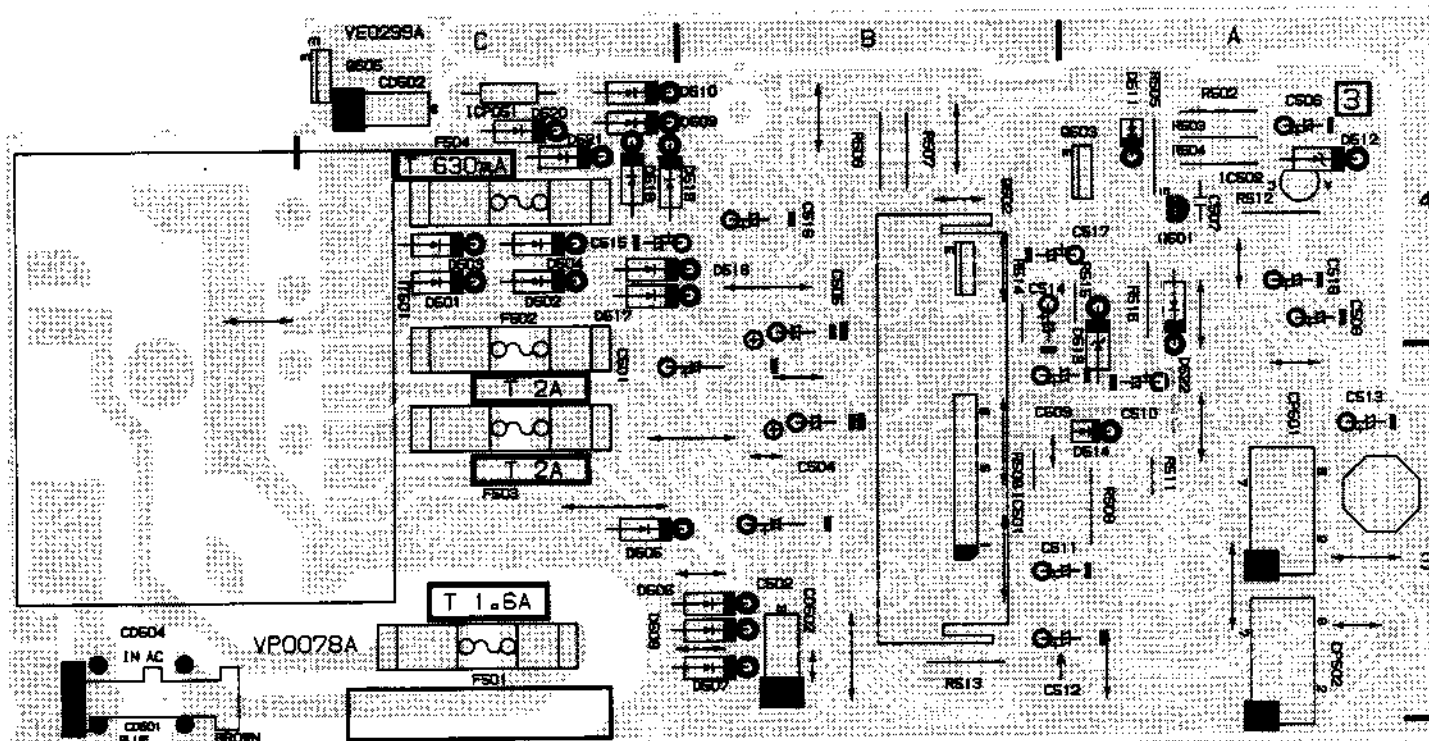
OPERATION 1



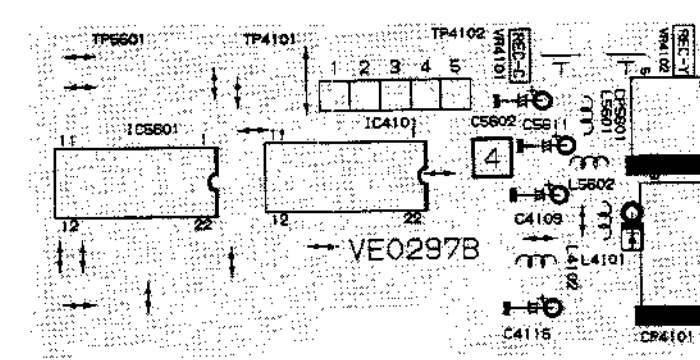
OPERATION 2



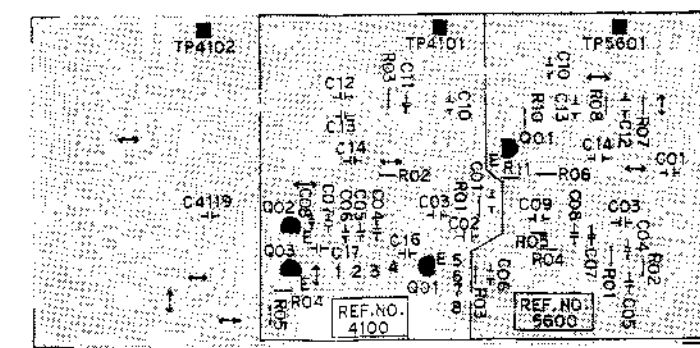
POWER SUPPLY / TRANSISTOR



HEAD AMP



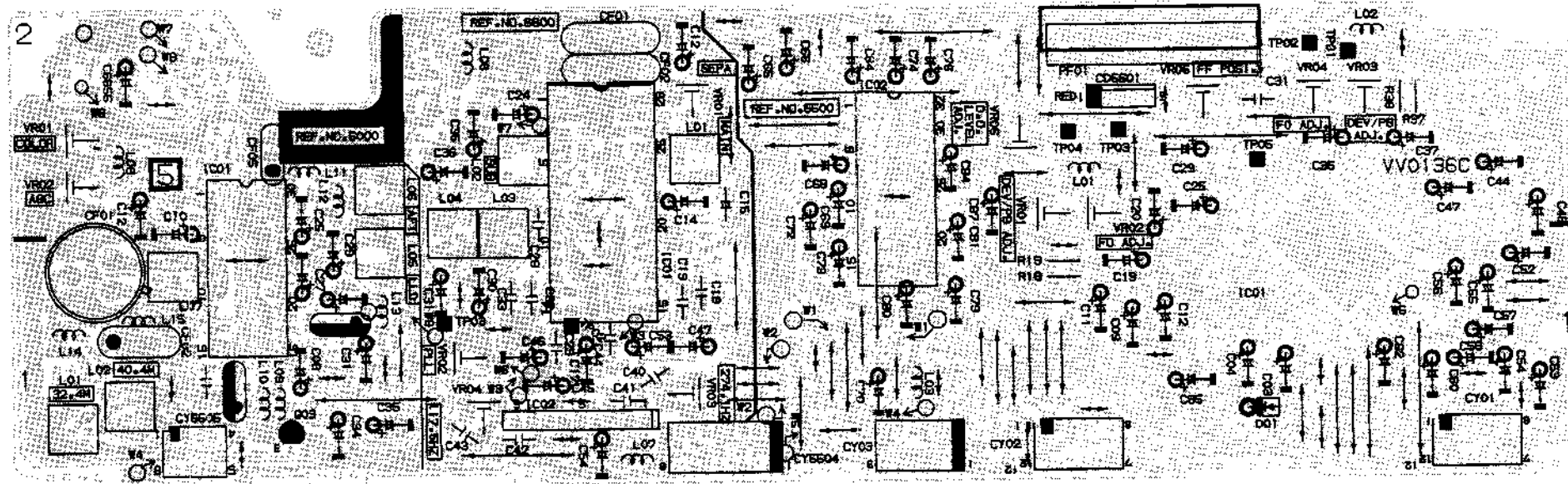
COMPONENT SIDE



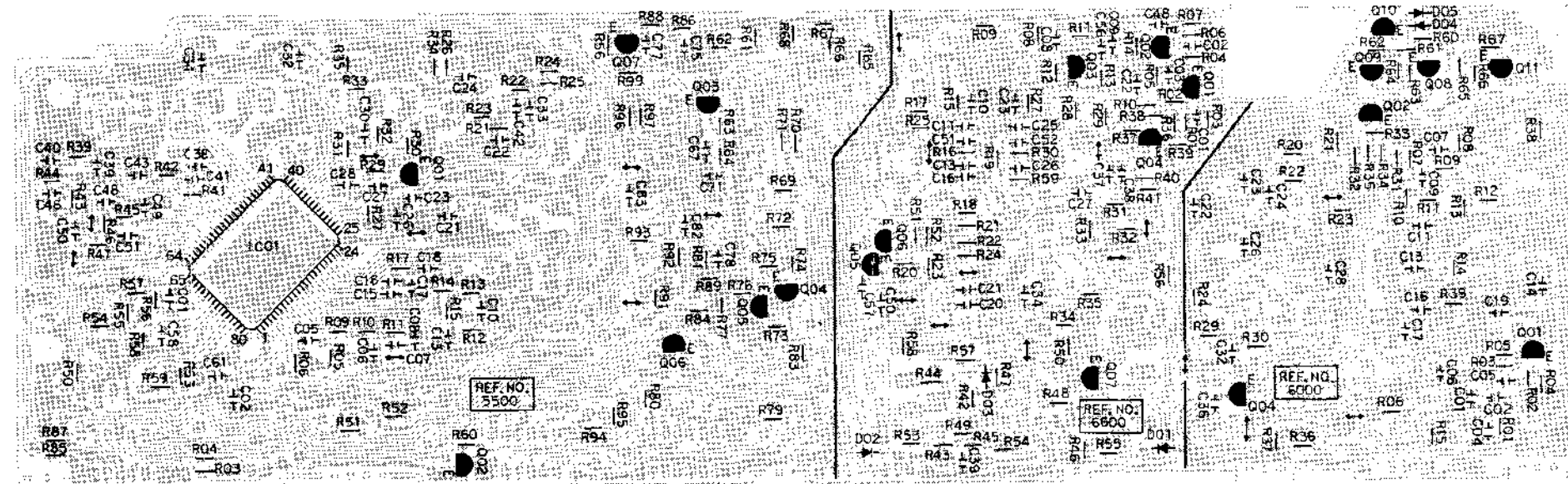
SOLDER SIDE

PRINTED CIRCUIT BOARDS

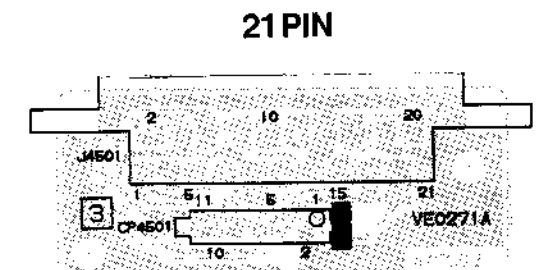
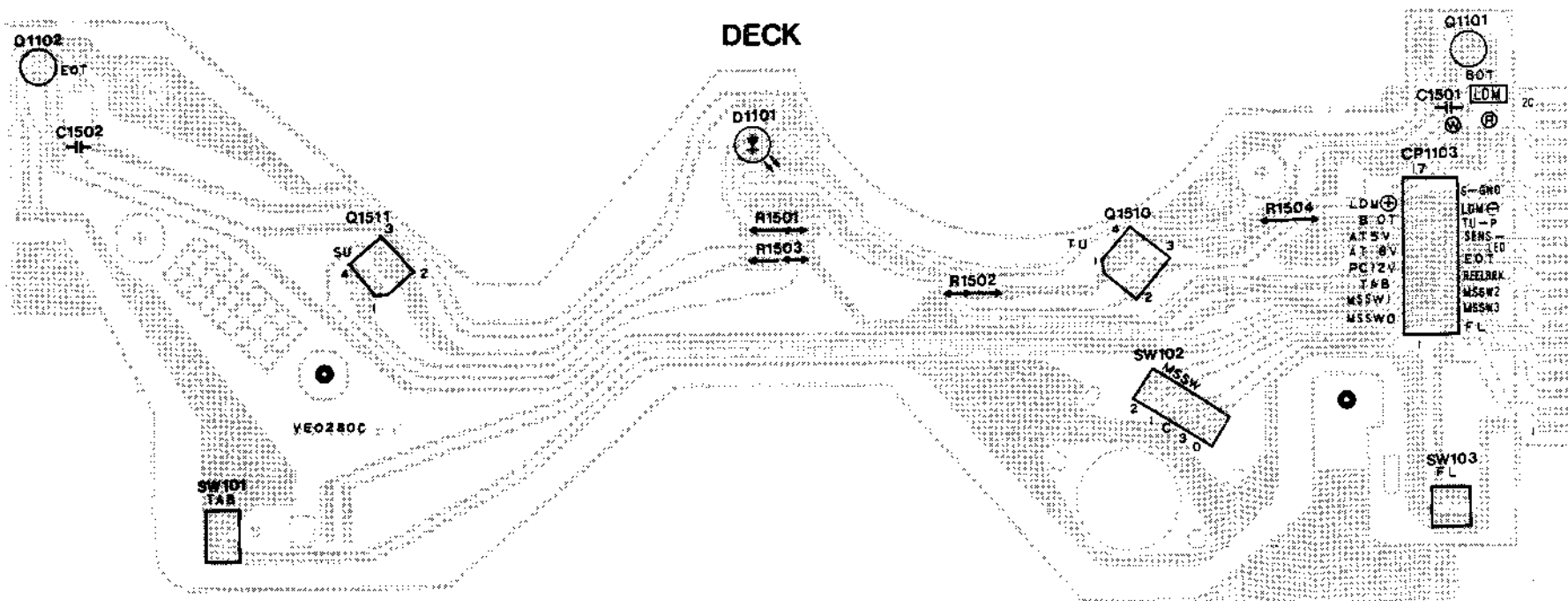
HI-FI



COMPONENT SIDE

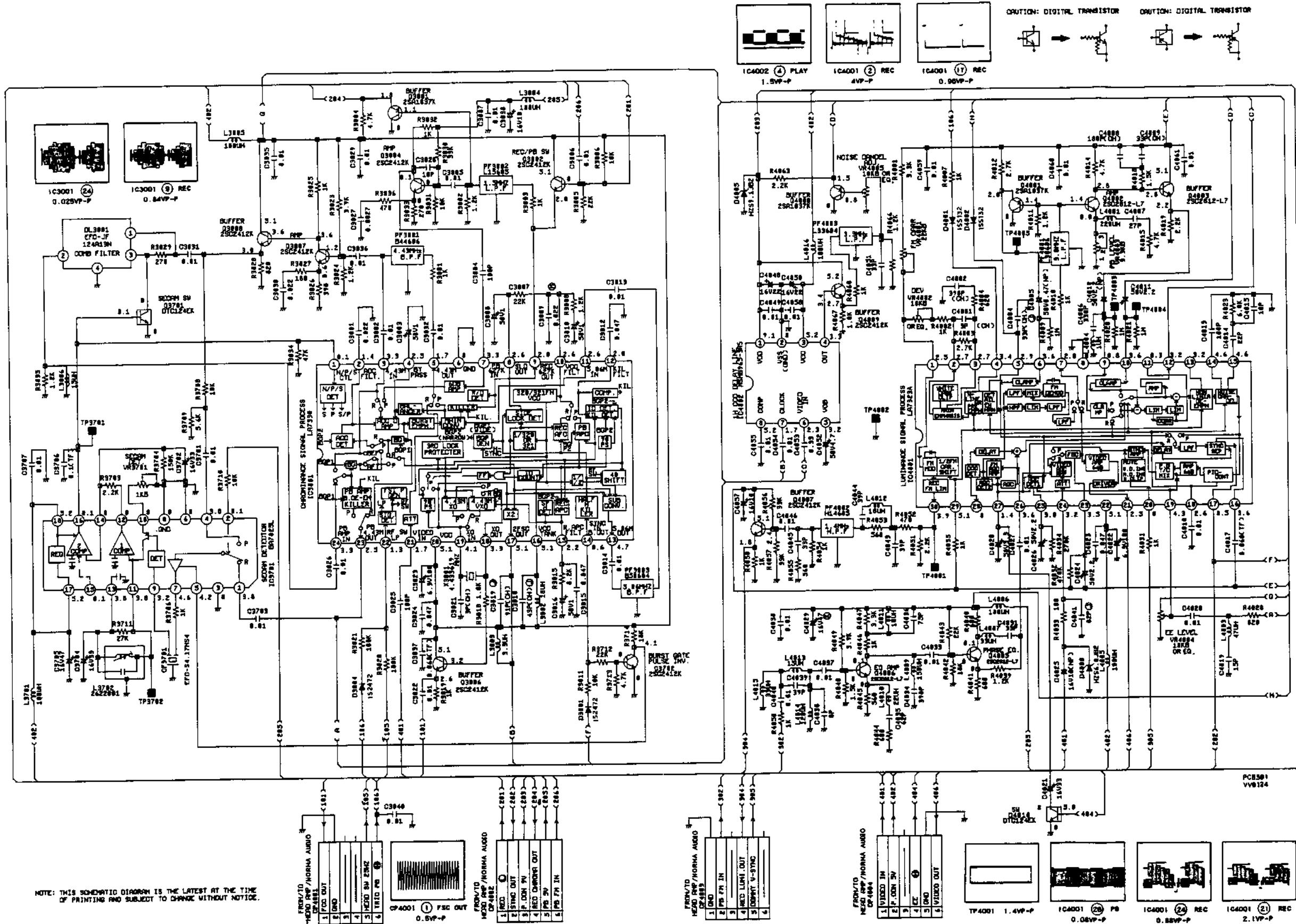


SOLDER SIDE



PRINTED CIRCUIT BOARDS

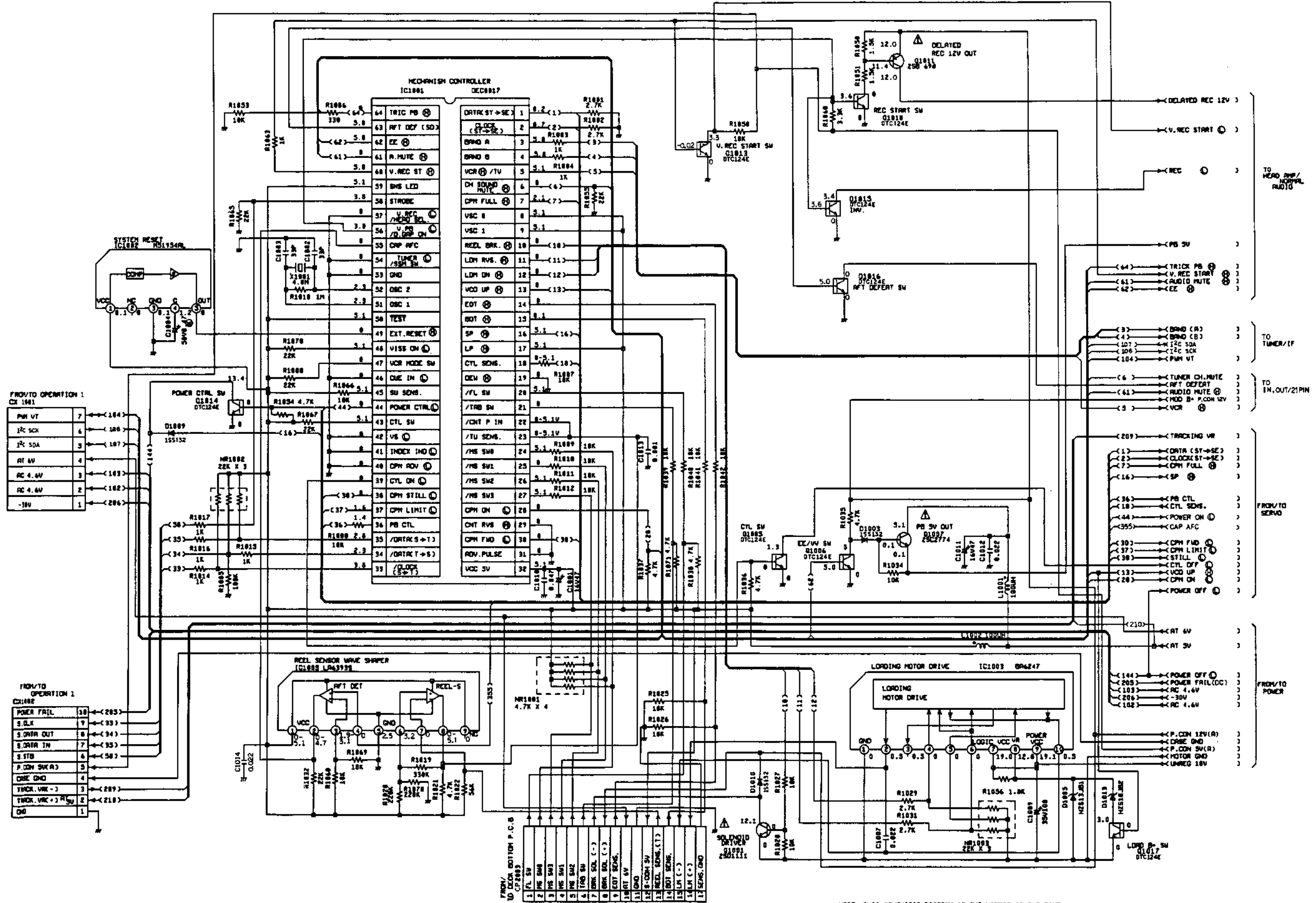
Y.C. SCHEMATIC DIAGRAM



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

Y.C. SCHEMATIC DIAGRAM

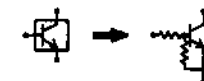
SYSTEM CONTROL SCHEMATIC DIAGRAM



CAUTION: SINCE THESE PARTS MARKED BY Δ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED ON PARTS LIST ONLY.

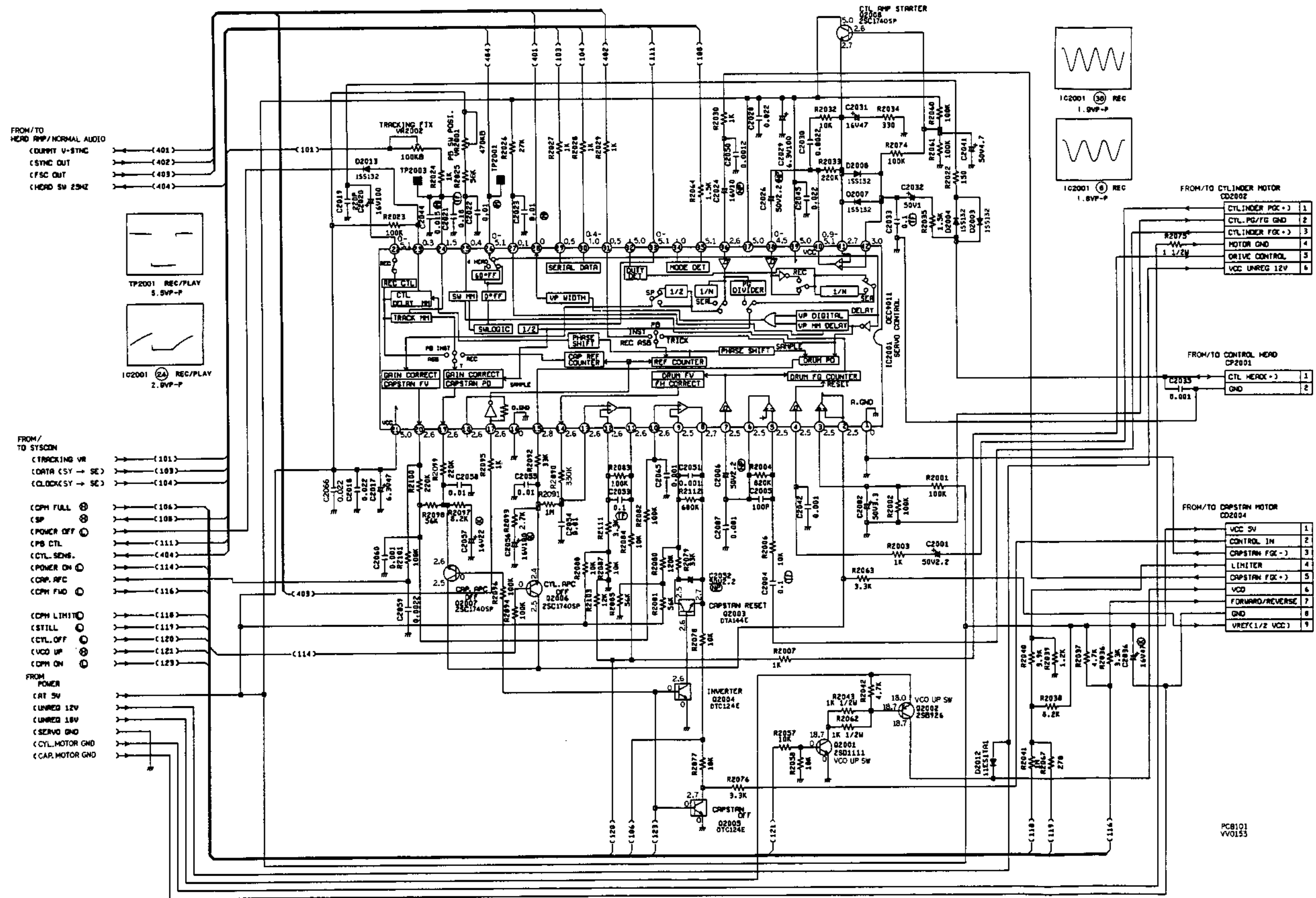
ATTENTION: LES PIÈCES MARQUÉES PAR UN Δ ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ, N'UTILISER QUE CELLES DÉCRITES DANS LA NOMÉCLATURE DES PIÈCES.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.
CAUTION: DIGITAL TRANSISTOR



SYSTEM CONTROL SCHEMATIC DIAGRAM

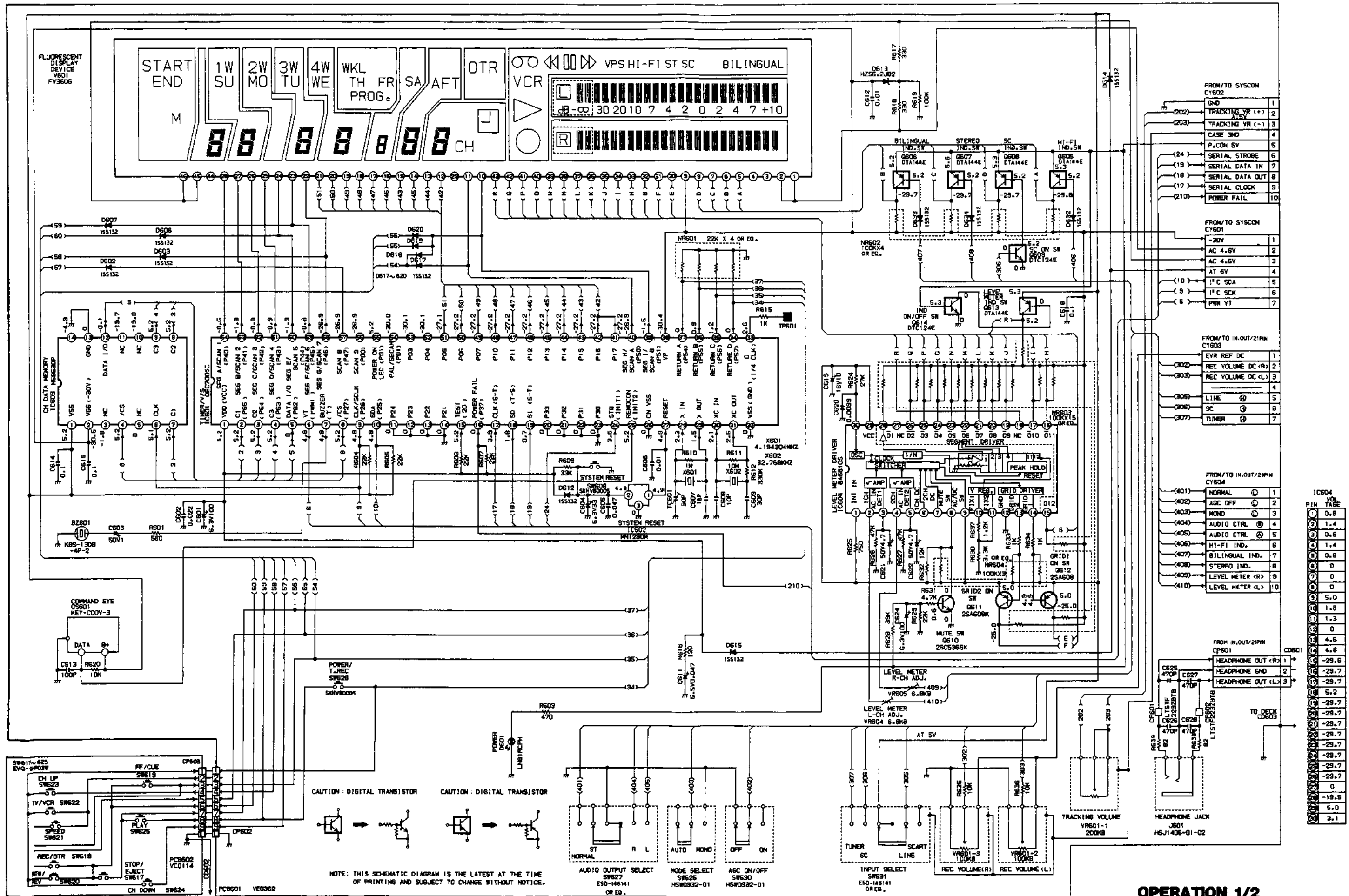
SERVO SCHEMATIC DIAGRAM



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

SERVO SCHEMATIC DIAGRAM

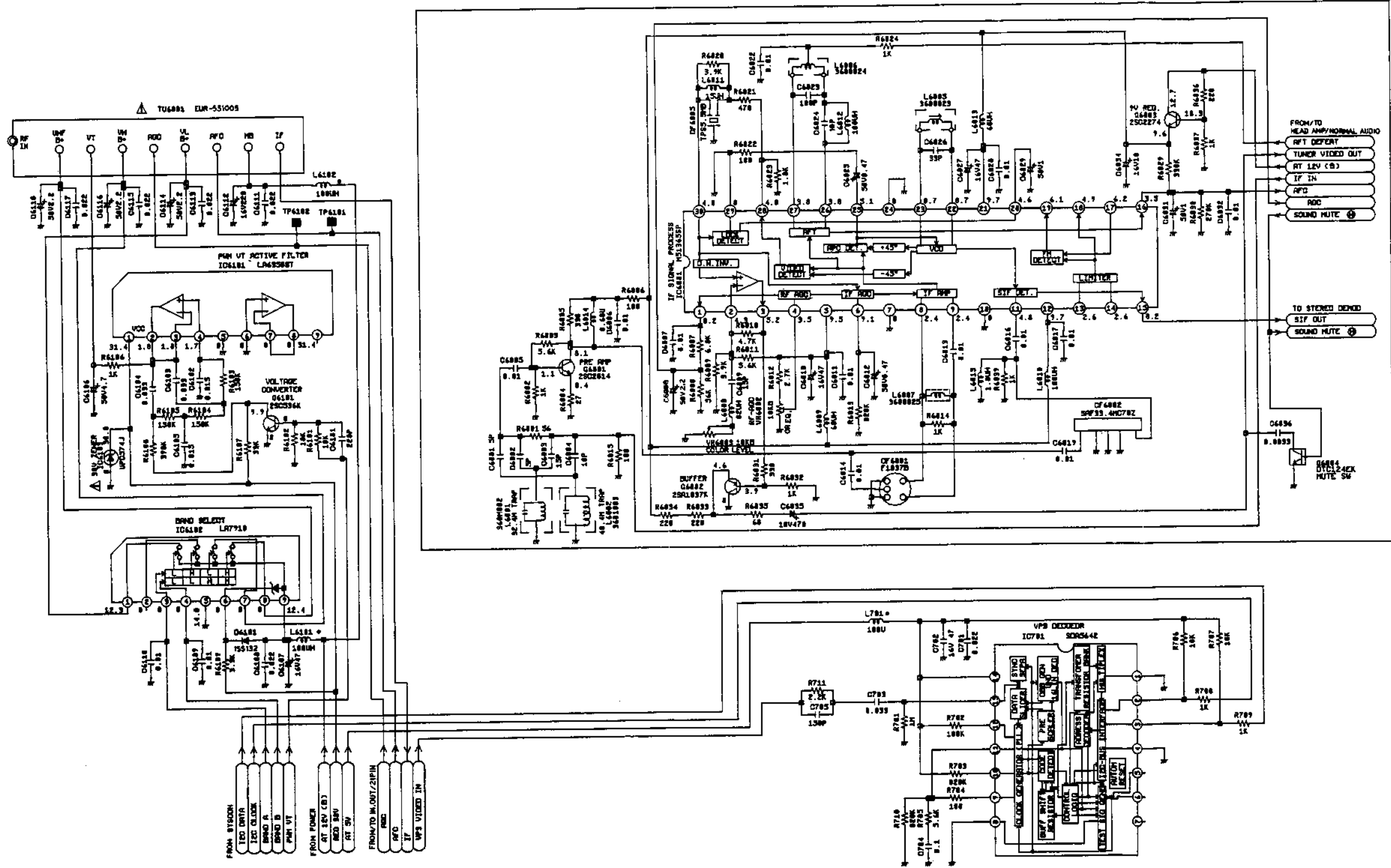
OPERATION 1/2 SCHEMATIC DIAGRAM



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

OPERATION 1/2 SCHEMATIC DIAGRAM

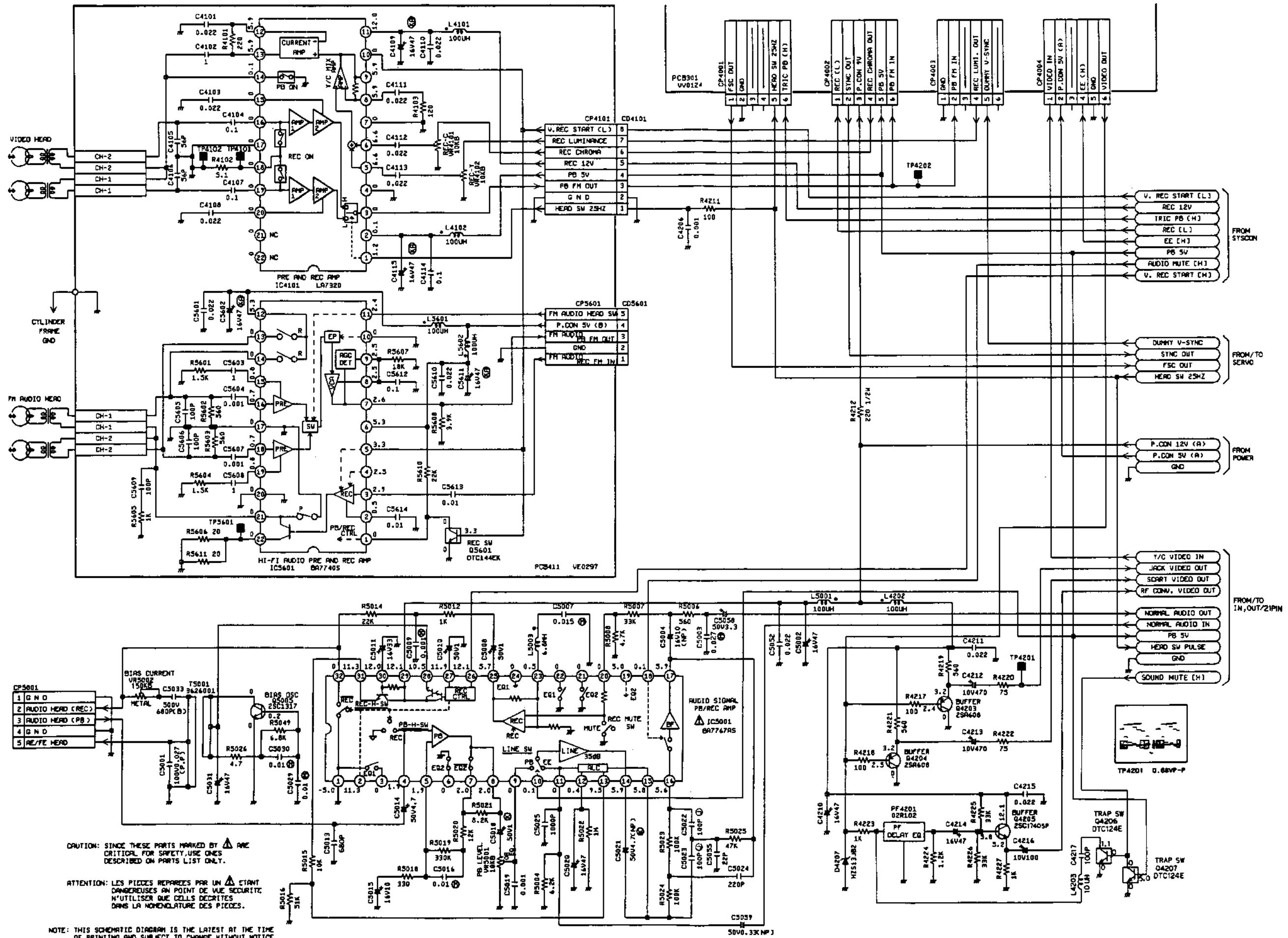
TUNER/IF/VPS SCHEMATIC DIAGRAM



TUNER/IF/VPS SCHEMATIC DIAGRAM

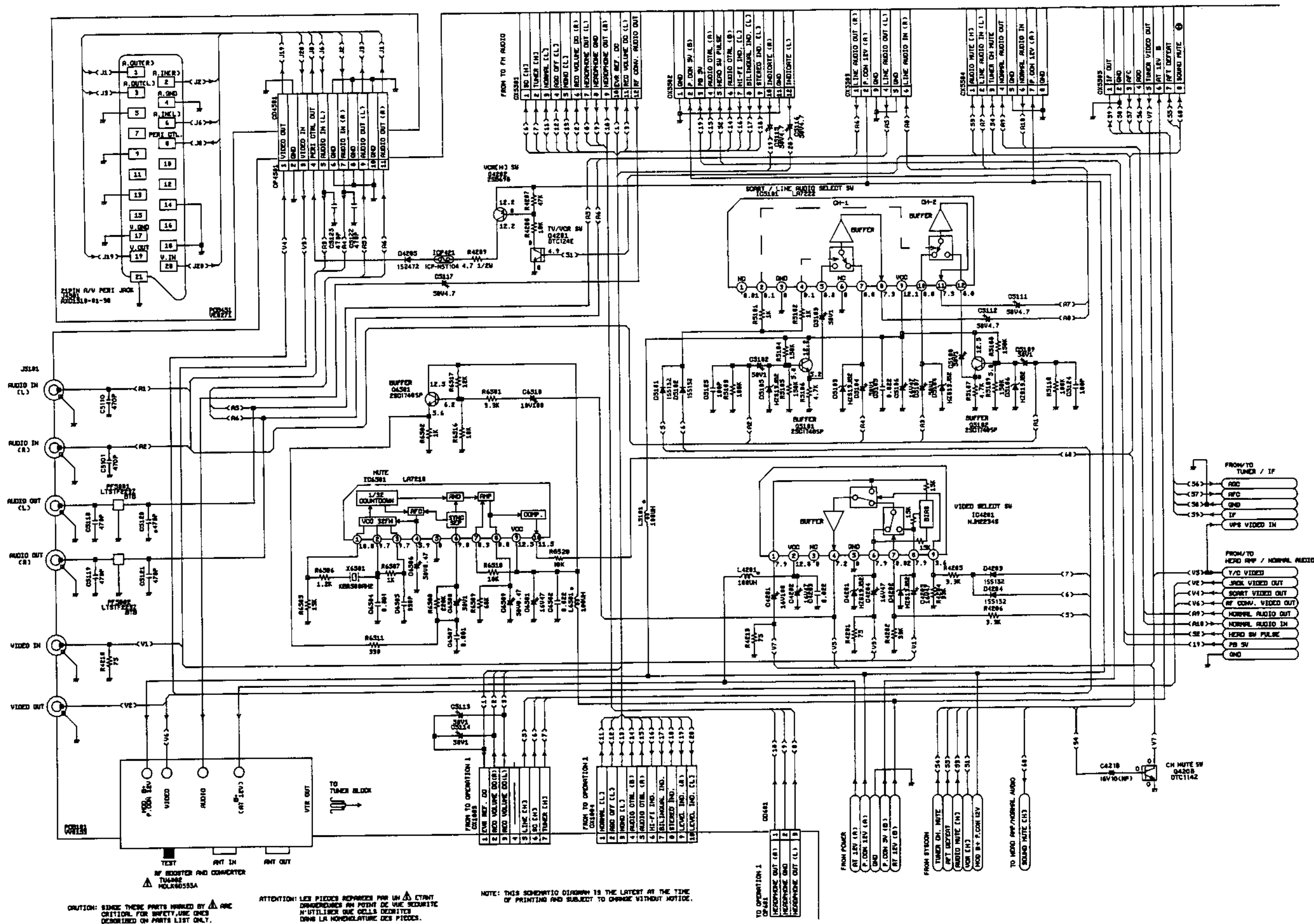
1-9987

HEAD AMP / NORMAL AUDIO SCHEMATIC DIAGRAM



HEAD AMP / NORMAL AUDIO SCHEMATIC DIAGRAM

IN, OUT/21PIN SCHEMATIC DIAGRAM



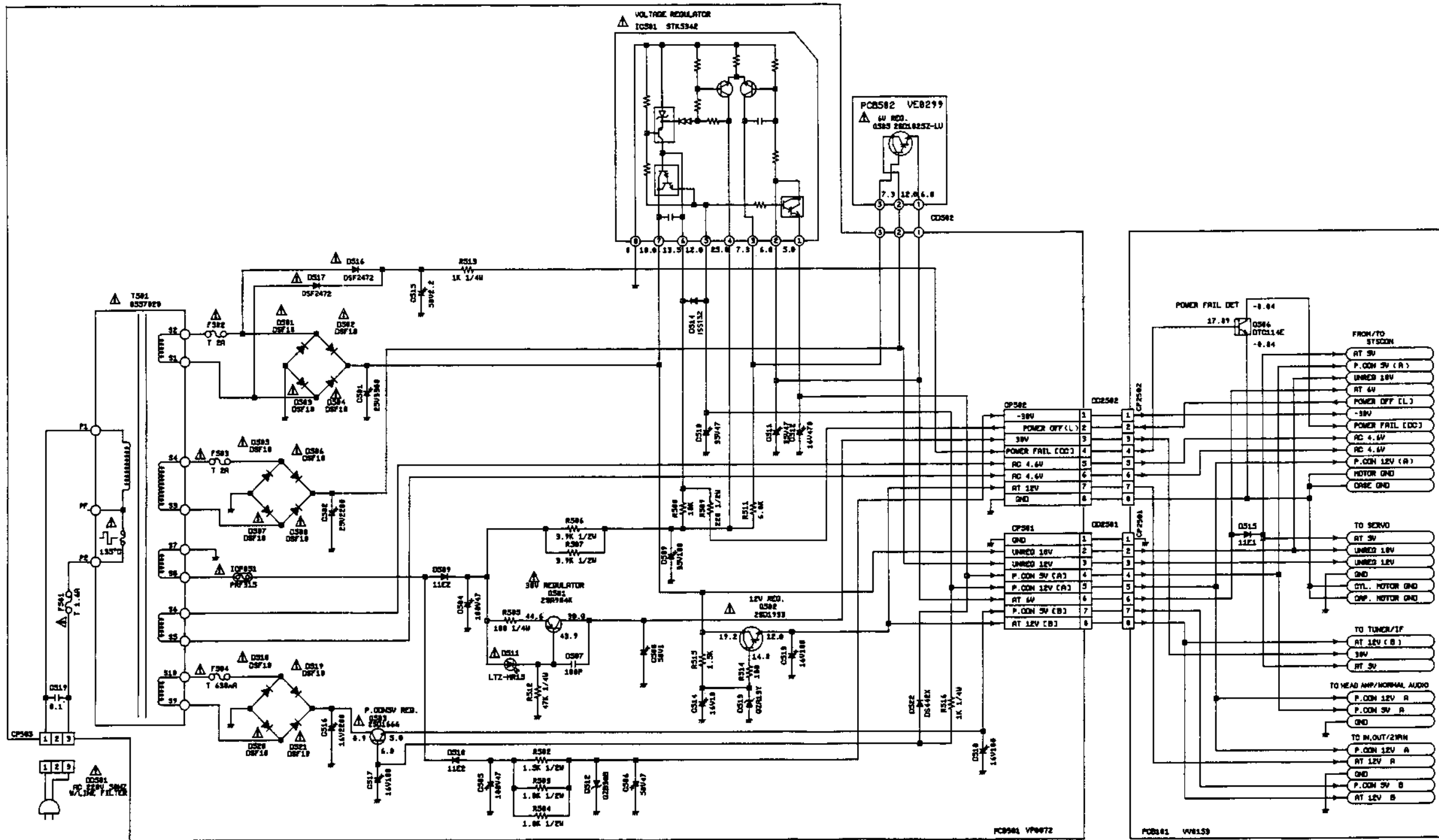
CAUTION: SINCE THESE PARTS MARKED BY Δ ARE CRITICAL FOR SAFETY, USE ONLY THOSE DESCRIBED ON PARTS LIST ONLY.

ATTENTION: LES PIÈCES MARQUÉES PAR UN Δ SONT CRUCIALES EN TERMES DE SÉCURITÉ. N'UTILISEZ QUE CELLES IDENTIFIÉES DANS LA NOMÉCLATURE DES PIÈCES.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

IN, OUT/21PIN SCHEMATIC DIAGRAM

POWER SUPPLY SCHEMATIC DIAGRAM



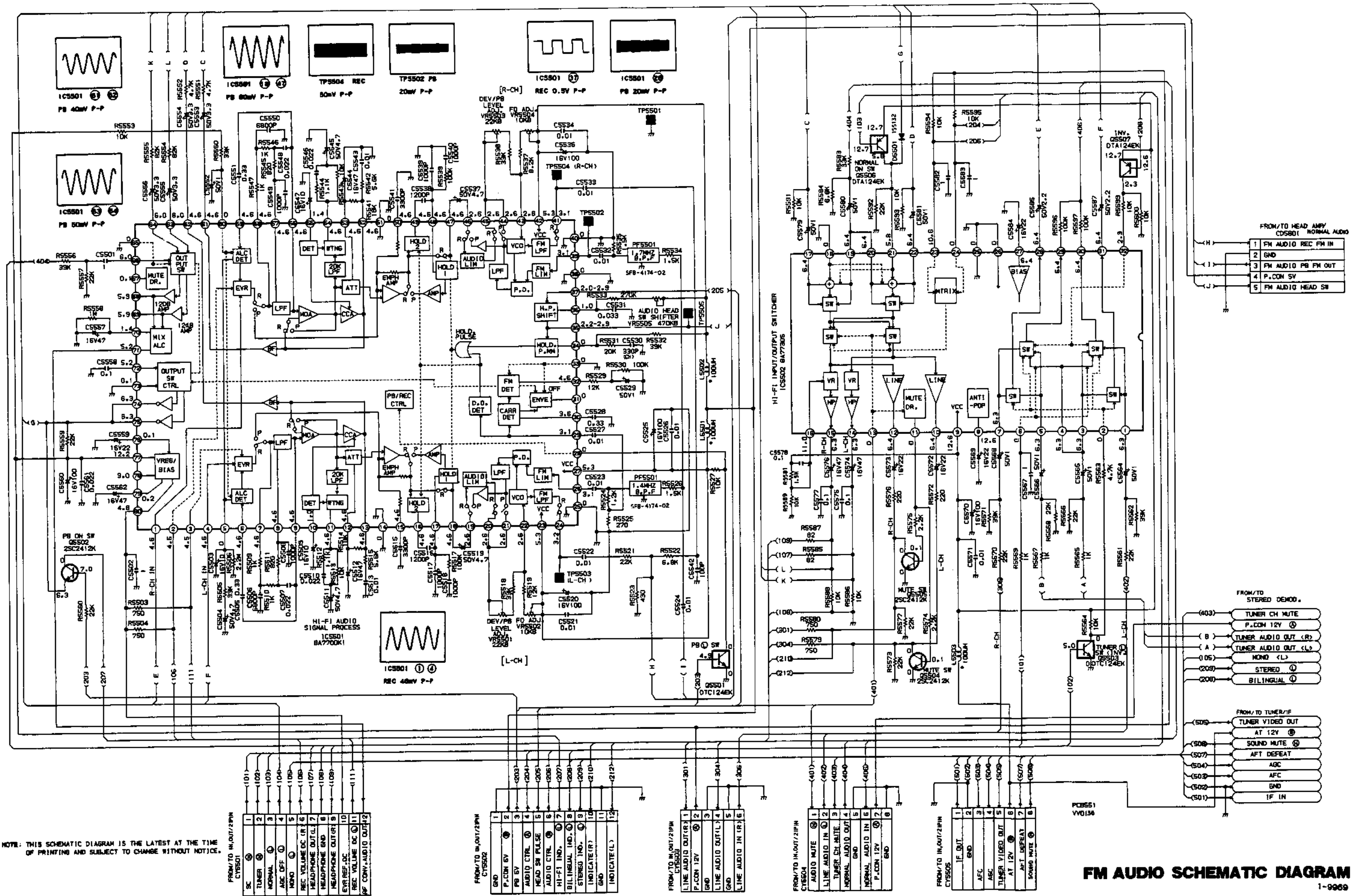
CAUTION: SINCE THESE PARTS MARKED BY Δ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED ON PARTS LIST ONLY.

ATTENTION: LES PIÈCES MARQUÉES PAR UN Δ SONT CRUCIALES EN POINT DE VUE SÉCURITÉ. N'UTILISEZ QUE CELLES DÉCRITES DANS LA NOMÉCLATURE DES PIÈCES.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

POWER SUPPLY SCHEMATIC DIAGRAM

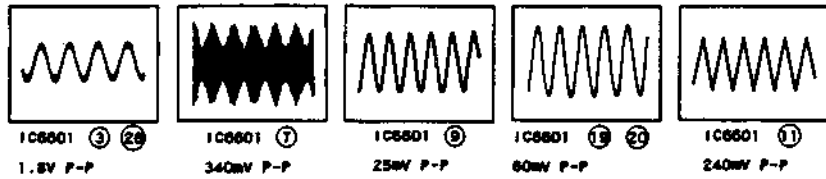
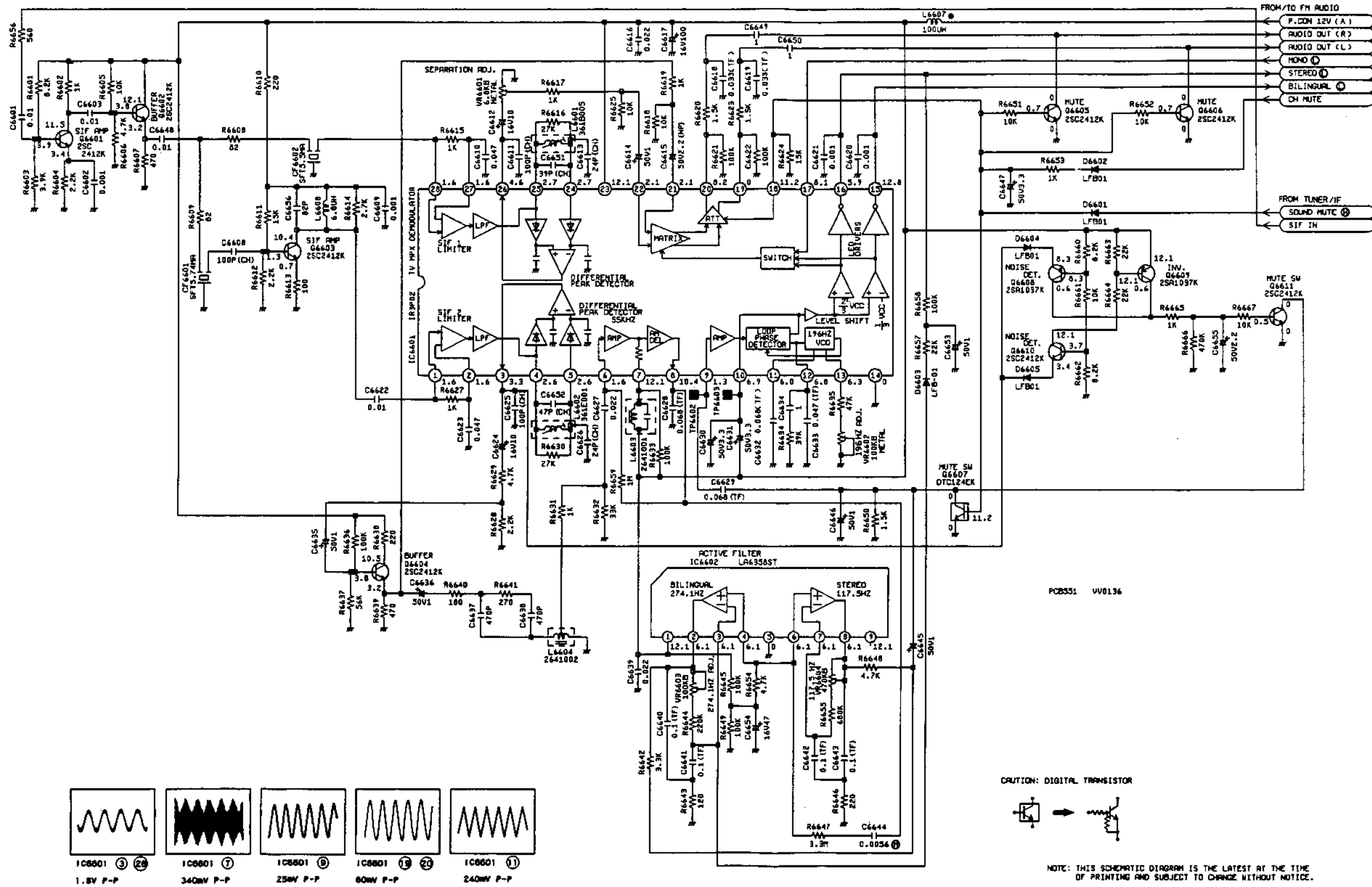
FM AUDIO SCHEMATIC DIAGRAM



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

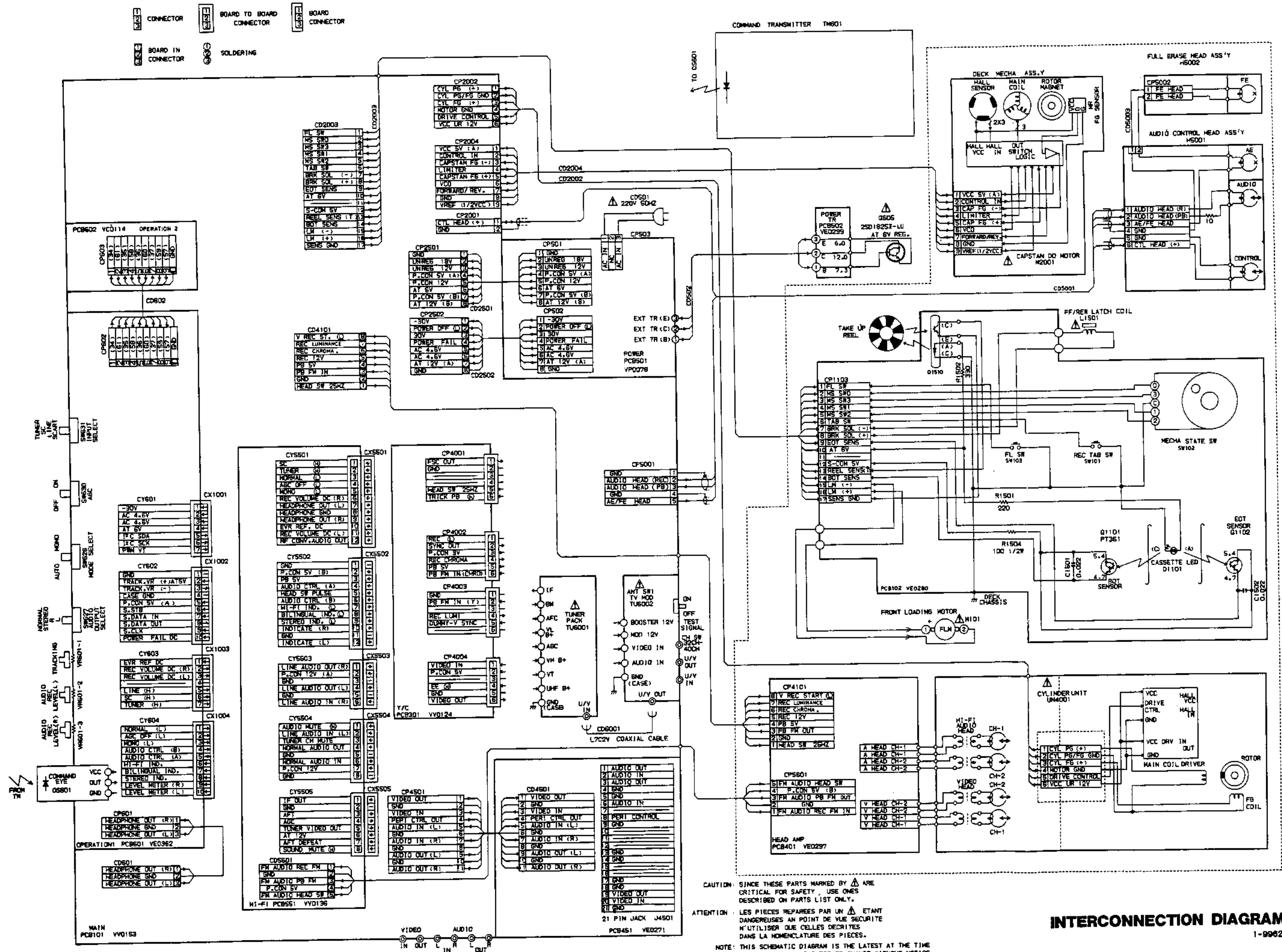
FM AUDIO SCHEMATIC DIAGRAM

STEREO DEMODULATOR SCHEMATIC DIAGRAM



STEREO DEMODULATOR SCHEMATIC DIAGRAM

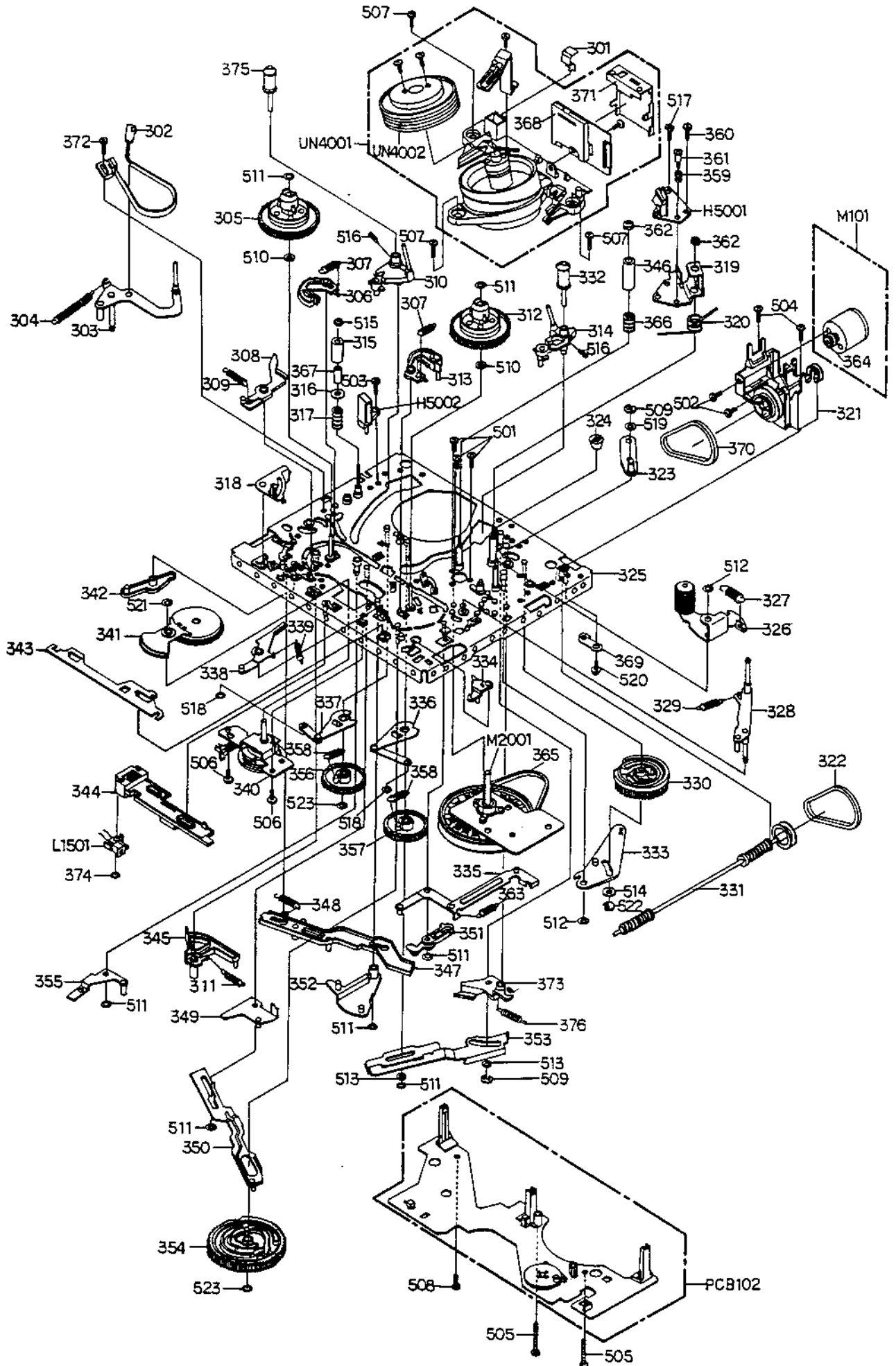
INTERCONNECTION DIAGRAM



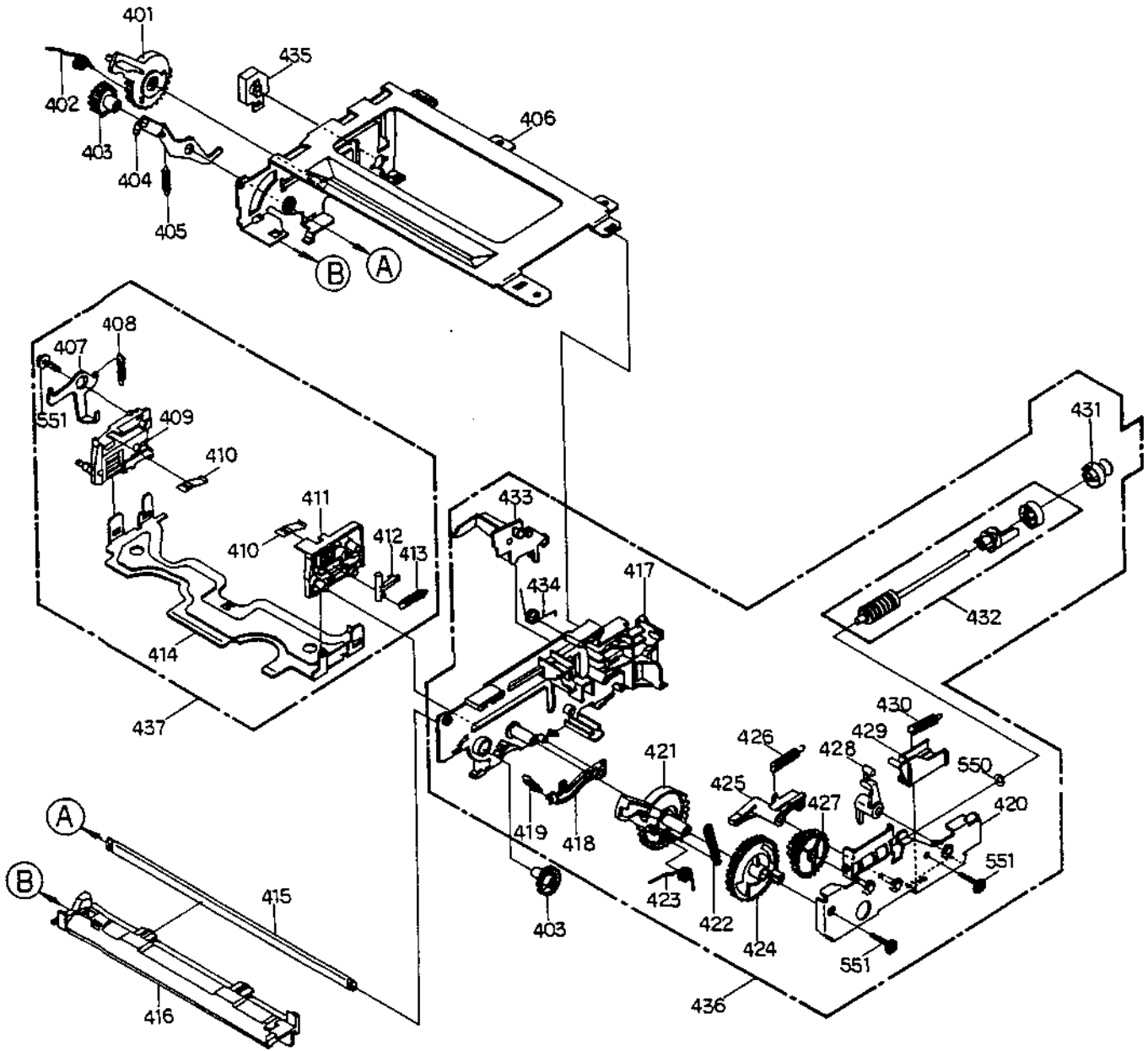
INTERCONNECTION DIAGRAM

1-9962

DECK EXPLODED VIEW



DECK EXPLODED VIEW



MECHANICAL REPLACEMENT PARTS LIST

REF. NO	PART NO	DESCRIPTION
601	702USS0014	CABINET, TOP
602	753USA0010	PLATE, DECK EARTH
603	753USA0009	PLATE, TRANS EARTH
604	702UPA0021	CABINET, INSIDE
	7222021075	SHEET, RATING
	800SFA0002	CUSHION, LEG
605	702USA0015	PLATE, BOTTOM
606	A44512A720	CABINET, FRONT ASS'Y
	701WPA0037	CABINET, FRONT
	711WPA0003	PLATE, REMOCON
	711WPA0004	PLATE, DISPLAY
	7230003729	PLATE, OPERATION
	753JSA0032	PLATE, EARTH(F)
	753JSA0034	PLATE, EARTH(W)
607	7230003731	FLAP
608	712WPA0017	DOOR
	7232020176	ORION BADGE
609	735WPA0055	BUTTON, POWER
	713WPA0015	GLASS, LED
610	788JSE0014	TAPPING(BO) TRUSS 4*12 BK
611	742JUA0039	SPRING
612	A44802A650	FRONT LOADING UNIT(FL-6)
613	850P600315	BELT, FRONT LOADING
614	787JSA0001	SHAFT, HOLDER(L)
615	787JSE0002	SHAFT, DOOR(L)
616	787JSA0002	SHAFT, HOLDER(R)
617	890Y2050F0	DAMPER Y2050-F
618	787WPA0001	GEAR
619	787JSE0003	SHAFT, DOOR(R)
620	890238Y3J0	MAGNET 238Y3J09-80
621	787JSA0003	SHAFT, PLATE
622	713WPA0003	FRAME, BUTTON
623	7230003730	PLATE, DOOR
624	759JBA0003	COVER, REMOCON
625	752TSA0062	PLATE, SHIELD SIDE
626	752TSA0061	PLATE, HEAD SHIELD
701	8102240804	BIND M4*8 CH
702	8110630A44	TAP TITE(P) BRAZIER 3*14 CH
703	8117140A24	TAPPING(BO) PAN 4*12 CH
704	8117630804	TAPPING(BO) BRAZIER 3*8 CH
705	8110630804	TAP TITE(P) BRAZIER 3*8 CH
706	8109330604	TAP TITE(B) FLAT 3*6 CH
707	8107230804	TAP TITE(S) BIND 3*8 CH
708	8107120504	TAP TITE(S) PAN 2*5 CH
709	83ETW20000	E-RING 2
710	8107630504	TAP TITE(S) BRAZIER 3*5 CH
711	8107230504	TAP TITE(S) BIND 3*5 CH
712	8117330A02	TAPPING(BO) FLAT 3*10 BK
---	J40930028	GUARANTEE CARD
---	J4244039E	VPS CAUTION SHEET
---	J4371728A	WARNING SHEET
---	J43747208	DEW CAUTION SHEET
---	J4451201A	INSTRUCTION BOOK
---	J4451207A	QUICK SET-UP SHEET
---	7230003650	VPS, CAUTION LABEL
---	791UHA0005	GIFT, SHEET
---	792UHA0027	PACKAGE
---	793UCD0306	GIFT, BOX
---	715TPA0004	HOLDER CLOCK

DECK REPLACEMENT PARTS LIST

REF. NO	PART NO	DESCRIPTION	REF. NO	PART NO	DESCRIPTION
301	850P800023	SPRING, TR.	411	850P900444	CASS. SIDE R A
302	850A600093	TENSION BAND ASS'Y	412	850P900365	REMOVING
303	850A400077	TENSION ARM ASS'Y	413	850P800156	SPRING, REMOVING
304	850P800141	SPRING, TENSION ARM	414	850P900351	CASS. HOLDER
305	850A200028	REEL DISK S ASS'Y	415	850P900267	SHAFT, SYNCHRO
306	850A600117	MAIN BRAKE S ASS'Y	416	850P900455	TAPE GUIDE PIECE VR
307	850P800168	SPRING, MAIN BRAKE	417	850P900445	BRACKET, SIDE R1A
308	850P800289	ARM, S-S BRAKE	418	850P900361	LEVER, FRONT LOADING SW.
309	850P800164	SPRING, S-S BRAKE	419	850P800156	SPRING, FRONT LOADING SW. LEVER
310	850A400087	BASE, S INCLINED ASS'Y	420	850A900098	SIDE BRACKET R2 ASSY
311	850P800171	SPRING, M-B 3	421	850P900456	LINK GEAR R
312	850A200029	REEL DISK T ASS'Y	422	850P800153	SPRING, CLUTCH GEAR
313	850A600118	MAIN BRAKE T ASS'Y	423	850P800178	SPRING, LINK GEAR R
314	850A400080	BASE, T INCLINED ASS'Y	424	850P900357	GEAR, CLUTCH
315	850P500032	ROLLER, IMPEDANCE	425	850P900362	LEVER, LOCK
316	850P600274	FLANGE, P1	426	850P800159	SPRING, LOCK LEVER
317	850P800075	SPRING, P1	427	850P900367	WHEEL
318	850P600281	LEVER, REC. SW.	428	850P900364	LEVER, CLUTCH
319	850P500042	BASE, AC HEAD 2	429	850P900363	LEVER, SLIDE
320	850P800150	SPRING, AC HEAD BASE	430	850P800160	SPRING, SLIDE LEVER
321	850A600102	LOADING MOTOR BOX ASS'Y	431	850P900366	JOINT, PULLEY
322	850P600276	BELT, LOADING MOTOR	432	850A900082	WORM ASS'Y
323	850A500008	P-R, LEVER ASS'Y	433	850P900446	OPENER A
324	850P600314	NUT, ADJUST X	434	850P800172	SPRING, OPENER A
325	850A000027	MAIN CHASSIS ASS'Y	435	850P900398	COVER, SENSOR
326	850A400073	PINCH ROLLER ARM ASS'Y	436	A44802A640	SIDE BRACKET R ASS'Y
327	850P600149	SPRING, P-R ARM	437	A44802A690	CASSETTE HOLDER ASS'Y
328	850A400078	LIMITER, POST ARM ASS'Y			
329	850P800148	SPRING, L-P ARM	501	8107126804	TAP TITE(S) PAN
330	850P600323	CAM 1	502	8102130404	PAN
331	850A600100	WORM ASS'Y	503	8107226804	TAP TITE(S) BIND
332	850A400076	G-ROLLER ASS'Y	504	8107230444	TAP TITE(S) BIND
333	850A300031	LOADING, LEVER 2 ASS'Y	505	8107230A64	TAP TITE(S) BIND
334	850P800291	LEVER, SUB BRAKE	506	8107230604	TAP TITE(S) BIND
335	850A900083	LEVER, FRONT LOADING ASS'Y	507	8107230804	TAP TITE(S) BIND
336	850A300030	LOADING, ARM T ASS'Y	508	8110230804	TAP TITE(P) BIND
337	850A300029	LOADING, ARM S ASS'Y	509	83ETW25000	E-RING
338	850A600122	T-S BRAKE 2 ASS'Y	510	82Q315483N	PW
339	850P800165	SPRING, TS BRAKE		82Q315403N	PW
340	850A200027	CLUTCH ASS'Y	511	82P255004N	PW(CUT)
341	850A200025	IDLER ASS'Y	512	82P318005N	PW(CUT)
342	850P600300	MAIN BRAKE LEVER 1	513	82A3270054	WASHER
343	850P600290	ACTUATOR, SUB BRAKE	514	82A4080054	WASHER
344	850A600113	CLUTCH ACTUATOR ASS'Y	515	8300720000	NYLON NUT
345	850P600303	LEVER TENSION	516	8150J20302	SET SCREW 6 CUP POINT
346	850P800312	POST, P4	517	8145J30501	SCREW +UPSET
347	850P600299	SLIDE, MAIN BRAKE	518	83CST35050	CS RING
348	850P800169	SPRING, M-B SLIDE	519	82A307006N	PW
349	850A600109	M-B 2 LEVER ASS'Y	520	8107330804	TAP TITE(S) FLAT
350	850A600108	T-A SLIDE ASS'Y	521	82P266005N	PW(CUT)
351	850P600301	LEVER, LIMITER POST	522	83ETW30060	E-RING
352	850P600302	LEVER, CLUTCH ACTUATOR	523	82P306005N	PW(CUT)
353	850P300112	SLIDE, LOADING 2	550	82Q315405N	PW
354	850P600324	CAM 2	551	868170GA04	TAPPING(BO) BIND WH6.5
355	850A600099	M-B 3 LEVER ASS'Y	C1501	CH4FF03H4Z	CC
356	850P300100	GEAR, LOADING S	C1502	CH4FF03H4Z	CC
357	850P300101	GEAR, LOADING T	CD5001	068126017A	CORD EIS CONNECTOR
358	850P800147	SPRING, LOADING GEAR	CD5003	068122007A	CORD EIS CONNECTOR
359	850P800167	SPRING, AZ1 MUTH	CP1103	068R7H0068	CONNECTOR PCB SIDE
360	8144J30604	CONEHEAD SCREW	D1101	0010100300	INFRARED LED
361	8146230A14	JOINT, SCREW BIND	H5001	1523D81010	HEAD AUDIO CONTROL
362	850P500010	ADJUST NUT	H5002	1543D02004	HEAD FULL ERASE
363	850P800170	SPRING, FRONT LOADING LEVER	L1501	02BL000006	ELECTRO MAGNET
364	850P600313	PULLEY, LOADING MOTOR	M101	1596858008	MOTOR, LOADING
365	850P600277	BELT, REEL	M2001	1510398011	CAPSTAN, DO UNIT
366	850P800146	SPRING, P4	PCB102	A44801A650	PCB ASS'Y
367	850P600273	SLEEVE, P1	Q1101	0000000040	PHOTO TRANSISTOR
368	850PAA0106	SHIELD CASE 4	Q1102	0000000040	PHOTO TRANSISTOR
369	850P000218	BRACKET, WORM	Q1510	0002300140	PHOTO COUPLER
370	789JRA0001	BELT, FRONT LOADING	R1501	R001T6221J	RC
371	850PAA0105	SHIELD LID 4	R1502	R001T6331J	RC
372	850P900215	BRACKET, DECK	R1504	R002T2101J	RC
373	868507H804	TAP TITE(S) PAN W6	SW101	0500211001	PUSH SWITCH
374	901B190000	EARTH LUG	SW102	0820244002	SWITCH, ROTARY
375	850P000285	CS-RING	SW103	0501211001	PUSH SWITCH
376	850A400090	G-ROLLER ASS'Y	UN4001	A44503A500	UNIT, CYLINDER
401	850P900457	LINK GEAR L	UN4002	A44501A620	UPPER DRUM ASS'Y
402	850P800175	SPRING, LINK GEAR L			
403	850P900358	GEAR, SYNCHRO			
404	850P900360	LEVER, FLAP			
405	850P800187	SPRING, FLAP			
406	850A900096	TOP BRACKET ASS'Y			
407	850P800458	LOCKER			
408	850P800154	SPRING, LOCKER			
409	850P900349	CASS. SIDE L			
410	850P900354	SPRING, PACK			

THIS ELECTRICAL PARTS LIST IS STANDARD PART LIST. BUT
 INTERCHANGEABLE PARTS MAY BE USED IN THE UNIT.
 SEE THE INTERCHANGEABLE PARTS LIST AFTER THE STANDARD PARTS LIST.

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO	PART NO	DESCRIPTION	REF. NO	PART NO	DESCRIPTION
RESISTORS			SEMICONDUCTORS (CONT)		
R611	R00104106J	RC 10M OHM 1/4W	D6603	DD3RLF801L	DIODE, SILICON LFB-01L
R638	R00104820J	RC 82 OHM 1/4W	D6604	DD3RLF801L	DIODE, SILICON LFB-01L
R639	R00104820J	RC 82 OHM 1/4W	D6605	DD3RLF801L	DIODE, SILICON LFB-01L
CAPACITORS			SEMICONDUCTORS (CONT)		
C501	E011F3332M	CE 3300 UF 25V	△ IC501	I23S953420	IC STK5342
C502	E011F3222M	CE 2200 UF 25V	IC601	I560T7005C	IC OECT005C
C516	E011F2222M	CE 2200 UF 25V	IC602	I01901280M	IC MN1280M
C519	P2150B104M	CPP 0.1 UF 18V	IC603	I560086300	IC M56630P
C611	E59A0P473Z	CE 0.1 UF 250V	IC604	I070066100	IC BA6810S
C6640	P61300104J	CMPL 0.047 UF 5.5V	IC701	I3ED656420	IC SDA5642
C6643	P61300104J	CMPL 0.1 UF 50V	IC1001	I54D50017A	IC C60017
SEMICONDUCTORS			IC1002	I06551954A	IC M51954AL
△ D501	D23TDSF10T	DIODE, RECTIFIER DSF10TB-BT-A	IC1003	I07S062470	IC BA6247
△ D502	D23TDSF10T	DIODE, RECTIFIER DSF10TB-BT-A	IC1005	I03S063930	IC LA6393S
△ D503	D23TDSF10T	DIODE, RECTIFIER DSF10TB-BT-A	IC2001	I97049011A	IC OEC9011
△ D504	D23TDSF10T	DIODE, RECTIFIER DSF10TB-BT-A	IC3001	I03D373300	IC LA7330
△ D505	D23TDSF10T	DIODE, RECTIFIER DSF10TB-BT-A	IC3701	I07TCT025L	IC BA7025L
△ D506	D23TDSF10T	DIODE, RECTIFIER DSF10TB-BT-A	IC4001	I03D37323A	IC LA7323A
△ D507	D23TDSF10T	DIODE, RECTIFIER DSF10TB-BT-A	IC4002	I08D369553	IC M5M6955-3RS
△ D508	D23TDSF10T	DIODE, RECTIFIER DSF10TB-BT-A	IC4101	I03D073200	IC LA7320
△ D509	D28T011E20	DIODE, SILICON 11E2TA1	IC4201	I0Q5022340	IC NUM2234S
△ D510	D28T011E20	DIODE, SILICON 11E2TA1	△ IC5001	I07D767A50	IC BA7767AS
△ D511	D87T2MR150	GLASS SEALED LED LTZ-MR15-T77	IC5101	I03S072220	IC LA7222
D512	D93013001B	DIODE, ZENER QZB300B	IC5501	I07F777000	IC BA7700K1
D513	D93701300Y	DIODE, ZENER QZA13Y BT	IC5502	I07D777300	IC BA7730S
D514	D1VT001320	DIODE, SILICON 1SS132T-77	IC5601	I07D777400	IC LA7740S
D515	D28T011E10	DIODE, SILICON 11E1TA1	IC6001	I06DA365SP	IC M51365SP
△ D516	D1VT024720	DIODE, SILICON 1S2472T-77	IC6101	I03S06358T	IC LA6358ST
△ D517	D1VT024720	DIODE, SILICON 1S2472T-77	△ IC6103	I03S079100	IC LA7910
△ D518	D23TDSF10T	DIODE, RECTIFIER DSF10TB-BT-A	IC6501	I03S072100	IC UPC574J-T
△ D519	D23TDSF10T	DIODE, RECTIFIER DSF10TB-BT-A	IC6601	I09DF3P020	IC LA7210
△ D520	D23TDSF10T	DIODE, RECTIFIER DSF10TB-BT-A	IC6602	I03S06358T	IC IAP302
△ D521	D23TDSF10T	DIODE, RECTIFIER DSF10TB-BT-A	△ Q501	TA3T0984K0	TRANSISTOR, SILICON 2SA984K-AA
D522	D1VT024720	DIODE, SILICON 1S2472T-77	△ Q502	TD70019330	TRANSISTOR, SILICON 2SD1933
D601	0021120050	LED LN81RCPH-(TA2)	△ Q503	TD30016660	TRANSISTOR, SILICON 2SD1666(A, S)
D602	D1VT001320	DIODE, SILICON 1SS132T-77	△ Q505	TD3H018250	TRANSISTOR, SILICON 2SD1825Z-LU
D603	D1VT001320	DIODE, SILICON 1SS132T-77	Q506	TNQT803001	COMPOUND TRANSISTOR DTC144ESTP
D606	D1VT001320	DIODE, SILICON 1SS132T-77	Q605	TPGT003001	COMPOUND TRANSISTOR DTA144ESTP
D607	D1VT001320	DIODE, SILICON 1SS132T-77	Q606	TPGT003001	COMPOUND TRANSISTOR DTA144ESTP
D612	D1VT001320	DIODE, SILICON 1SS132T-77	Q607	TPGT003001	COMPOUND TRANSISTOR DTA144ESTP
D613	D94UA6R2J2	DIODE, ZENER HZS6R2JB2-T	Q608	TPGT003001	COMPOUND TRANSISTOR DTA144ESTP
D614	D1VT001320	DIODE, SILICON 1SS132T-77	Q609	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP
D615	D1VT001320	DIODE, SILICON 1SS132T-77	Q610	TC3T0536K0	TRANSISTOR, SILICON 2SC536K-NP-AA
D617	D1VT001320	DIODE, SILICON 1SS132T-77	Q611	TA3T0608K0	TRANSISTOR, SILICON 2SA608K-NP-AA
D618	D1VT001320	DIODE, SILICON 1SS132T-77	Q612	TA3T0608K0	TRANSISTOR, SILICON 2SA608K-NP-AA
D619	D1VT001320	DIODE, SILICON 1SS132T-77	Q613	TPGT003001	COMPOUND TRANSISTOR DTA144ESTP
D620	D1VT001320	DIODE, SILICON 1SS132T-77	Q614	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP
D632	D1VT001320	DIODE, SILICON 1SS132T-77	△ Q1001	TD3T011110	TRANSISTOR, SILICON 2SD1111-AA
D633	D1VT001320	DIODE, SILICON 1SS132T-77	Q1005	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP
D634	D1VT001320	DIODE, SILICON 1SS132T-77	Q1006	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP
D1003	D1VT001320	DIODE, SILICON 1SS132T-77	△ Q1007	TC3T022740	TRANSISTOR, SILICON 2SC2274-AA
D1005	D94TA130J1	DIODE, ZENER HZS13JB1-TE	Q1010	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP
D1009	D1VT001320	DIODE, SILICON 1SS132T-77	△ Q1011	TB3T006980	TRANSISTOR, SILICON 2SB698-AA
D1010	D1VT001320	DIODE, SILICON 1SS132T-77	Q1013	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP
D1013	D94TA100J2	DIODE, ZENER HZS10JB2-TE	Q1014	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP
D2003	D1VT001320	DIODE, SILICON 1SS132T-77	Q1015	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP
D2004	D1VT001320	DIODE, SILICON 1SS132T-77	Q1016	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP
D2007	D1VT001320	DIODE, SILICON 1SS132T-77	Q1017	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP
D2008	D1VT001320	DIODE, SILICON 1SS132T-77	Q2001	TD3T011110	TRANSISTOR, SILICON 2SD1111-AA
Q2012	Q28T011ES1	DIODE, SILICON 11ES1TA1	Q2002	TB3T009260	TRANSISTOR, SILICON 2SB926-AA
Q2013	D1VT001320	DIODE, SILICON 1SS132T-77	Q2003	TPGT003001	COMPOUND TRANSISTOR DTA144ESTP
Q3001	D1VT024720	DIODE, SILICON 1S2472T-77	Q2004	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP
Q3004	D1VT024720	DIODE, SILICON 1S2472T-77	Q2005	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP
Q4001	D1VT001320	DIODE, SILICON 1SS132T-77	Q2006	TCGT1740S0	TRANSISTOR, SILICON 2SC1740SPTP
Q4002	D1VT001320	DIODE, SILICON 1SS132T-77	Q2007	TCGT1740S0	TRANSISTOR, SILICON 2SC1740SPTP
Q4005	D94TA9R1J2	DIODE, ZENER HZS9R1JB2-TE	Q2008	TCGT1740S0	TRANSISTOR, SILICON 2SC1740SPTP
Q4008	D94TA6R8J2	DIODE, ZENER HZS6R8JB2-TE	Q3001	T67A1037K0	TRANSISTOR, SILICON 2SA1037KT147
Q4201	D94TA130J2	DIODE, ZENER HZS13JB2-TE	Q3002	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147
Q4202	D94TA130J2	DIODE, ZENER HZS13JB2-TE	Q3004	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147
Q4203	D1VT001320	DIODE, SILICON 1SS132T-77	Q3006	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147
Q4204	D1VT001320	DIODE, SILICON 1SS132T-77	Q3007	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147
Q4205	D1VT024720	DIODE, SILICON 1S2472T-77	Q3008	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147
Q4207	D94TA130J2	DIODE, ZENER HZS13JB2-TE	Q3701	TNTTC05001	COMPOUND TRANSISTOR DTC124EKT147
Q5101	D1VT001320	DIODE, SILICON 1SS132T-77	Q3702	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147
Q5102	D1VT001320	DIODE, SILICON 1SS132T-77	Q4001	T67A1037K0	TRANSISTOR, SILICON 2SA1037KT147
Q5103	D94TA130J2	DIODE, ZENER HZS13JB2-TE	Q4002	T83A028127	TRANSISTOR, SILICON 2SC2812-L7-TA
Q5104	D94TA130J2	DIODE, ZENER HZS13JB2-TE	Q4003	T83A028127	TRANSISTOR, SILICON 2SC2812-L7-TA
Q5105	D94TA130J2	DIODE, ZENER HZS13JB2-TE	Q4005	T83A028127	TRANSISTOR, SILICON 2SC2812-L7-TA
Q5106	D94TA130J2	DIODE, ZENER HZS13JB2-TE	Q4006	T83A028127	TRANSISTOR, SILICON 2SC2812-L7-TA
Q5501	D1VT001320	DIODE, SILICON 1SS132T-77	Q4007	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147
D6101	D1VT001320	DIODE, SILICON 1SS132T-77	Q4008	T67A1037K0	TRANSISTOR, SILICON 2SA1037KT147
D6601	DD3RLF801L	DIODE, SILICON LFB-01L	Q4009	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147
D6602	DD3RLF801L	DIODE, SILICON LFB-01L	Q4010	TNTTC05001	COMPOUND TRANSISTOR DTC124EKT147
			Q4201	TNQT003001	COMPOUND TRANSISTOR DTC124ESTP

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO	PART NO	DESCRIPTION	REF. NO	PART NO	DESCRIPTION
SEMICONDUCTORS (CONT)			COILS & TRANSFORMERS (CONT)		
Q4202	T83T006980	TRANSISTOR, SILICON 2SB698-AA	L6014	021LA6R68M	COIL 0.68 UH
Q4203	TA3T0608K0	TRANSISTOR, SILICON 2SA608K-NP-AA	L6015	021LA61R8M	COIL 1.8 UH
Q4204	TA3T0608K0	TRANSISTOR, SILICON 2SA608K-NP-AA	L6101	021B73101K	COIL 100 UH
Q4205	TCQT174050	TRANSISTOR, SILICON 2SC1740SPTP	L6102	021B73101K	COIL 100 UH
Q4206	TNQT030001	COMPOUND TRANSISTOR DTC124ESTP	L6601	021B73101K	COIL 100 UH
Q4207	TNQT030001	COMPOUND TRANSISTOR DTC124ESTP	L6601	03361B0051	COIL, SOUND IFT 3618005
Q4208	TNQT030001	COMPOUND TRANSISTOR DTC114ESTP	L6602	03361E0011	COIL, SOUND IFT 361E001
Q5005	TC1T013170	TRANSISTOR, SILICON 2SC1317-T	L6603	0326410011	COIL, TRAP 2641001
Q5101	TCQT174050	TRANSISTOR, SILICON 2SC1740SPTP	L6604	0326410021	COIL, TRAP 2641002
Q5102	TCQT174050	TRANSISTOR, SILICON 2SC1740SPTP	L6607	021B73101K	COIL 100 UH
			L6608	021LA6R68K	COIL 6.8 UH
Q5501	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147	Δ T501	040557020C	TRANSFORMER, POWER AC 0657020
Q5502	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147	T5001	0336260010	COIL, BIAS OSC 3626001
Q5503	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147	JACKS		
Q5504	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147	J601	0502101012	JACK, RCA 3.5 HSJ1406-01-020
Q5505	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147	J4501	0632100005	SOCKET, 21 PIN HXC1510-01-300
Q5506	TP7TC05001	COMPOUND TRANSISTOR DTA124EKT147	J5101	060M111008	JACK, RCA 3.5 T5613
Q5507	TP7TC05001	COMPOUND TRANSISTOR DTA124EKT147	SWITCHES		
Q5601	TN7TC05001	COMPOUND TRANSISTOR DTC144EKT147	SW605	0504201T22	SWITCH, TACT SKHVBD005
Q6001	T83A028140	TRANSISTOR, SILICON 2SC2814-TA	SW617	0504101T27	SWITCH, TACT EVQ-QHS03W
Q6002	T67A1037K0	TRANSISTOR, SILICON 2SA1037KT147	SW618	0504101T27	SWITCH, TACT EVQ-QHS03W
			SW619	0504101T27	SWITCH, TACT EVQ-QHS03W
Q6003	TC3T022740	TRANSISTOR, SILICON 2SC2274-AA	SW620	0504101T27	SWITCH, TACT EVQ-QHS03W
Q6004	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147	SW621	0504101T27	SWITCH, TACT EVQ-QHS03W
Q6101	TC3T0536K0	TRANSISTOR, SILICON 2SC536K-NP-AA	SW622	0504101T27	SWITCH, TACT EVQ-QHS03W
Q6501	TCQT174050	TRANSISTOR, SILICON 2SC1740SPTP	SW623	0504101T27	SWITCH, TACT EVQ-QHS03W
Q6601	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147	SW624	0504101T27	SWITCH, TACT EVQ-QHS03W
Q6602	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147	SW625	0504101T27	SWITCH, TACT EVQ-QHS03W
Q6603	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147			
Q6604	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147	SW626	0510321010	SWITCH, SLIDE HSW0932-01-940
Q6605	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147	SW627	0510141006	SWITCH, SLIDE ESD-146141
Q6606	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147	SW628	0504201T22	SWITCH, TACT SKHVBD005
Q6607	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147	SW630	0510321010	SWITCH, SLIDE HSW0932-01-940
Q6608	T67A1037K0	TRANSISTOR, SILICON 2SA1037KT147	SW631	0510141006	SWITCH, SLIDE ESD-146141
Q6609	T67A1037K0	TRANSISTOR, SILICON 2SA1037KT147	COILS & TRANSFORMERS		
Q6610	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147	VARIABLE RESISTORS		
Q6611	T87A02412K	TRANSISTOR, SILICON 2SC2412KT147	VR601	V019300016	VR, ROTARY EVU-H318A0038
			VR604	V126303BT6	VR, SEMIFIXED RH0638CW3R02A
			VR605	V126303BT6	VR, SEMIFIXED RH0638CW3R02A
			VR2001	V126305BT6	VR, SEMIFIXED RH0638CS5R02A
			VR2002	V126315BT6	VR, SEMIFIXED RH0638C15R02A
			VR3701	V126313BT6	VR, SEMIFIXED RH0638C13R02A
			VR4001	V1263H48T6	VR, SEMIFIXED RH0638CJ4R02A
			VR4002	V126314BT5	VR, SEMIFIXED RH0638C14R07B
			VR4003	V1263L38T8	VR, SEMIFIXED RH0638CN3R02A
			VR4004	V126314BT5	VR, SEMIFIXED RH0638C14R07B
			VR4005	V126314BT5	VR, SEMIFIXED RH0638C14R07B
			VR4101	V126214BT1	VR, SEMIFIXED RH0632C14R01
			VR4102	V126214BT1	VR, SEMIFIXED RH0632C14R01
			VR5001	V126314BT5	VR, SEMIFIXED RH0638C14R07B
			VR5002	V1263E5B03	VR, SEMIFIXED RH0624CE5J
			VR5501	V1263H48T4	VR, SEMIFIXED RH064FCJ4R07A
			VR5502	V126314BT4	VR, SEMIFIXED RH064FC14R07A
			VR5503	V1263H48T4	VR, SEMIFIXED RH064FCJ4R07A
			VR5504	V126314BT4	VR, SEMIFIXED RH064FC14R07A
			VR5505	V126305BT4	VR, SEMIFIXED RH064FC55R07A
			VR6002	V126314BT5	VR, SEMIFIXED RH0638C14R07B
			VR6003	V126314BT5	VR, SEMIFIXED RH0638C14R07B
			VR6601	V126303BT4	VR, SEMIFIXED RH064FCW3R07A
			VR6602	V126315BT4	VR, SEMIFIXED RH064FC15R07A
			VR6603	V126315BT4	VR, SEMIFIXED RH064FC15R07A
			VR6604	V126305BT6	VR, SEMIFIXED RH0638C55R02A
			P.C. BOARDS ASS'Y		
			PCB101	A44512A01A	PCB ASS'Y VV0153
			PCB301	A44512A30A	PCB ASS'Y VV0124
			PCB411	A44503A33A	PCB ASS'Y VE0297
			PCB451	A44512A26A	PCB ASS'Y VE0271
			PCB501	A45512A02A	PCB ASS'Y VP0078
			PCB502	A44512A02A	PCB ASS'Y VE0289
			PCB551	A45512A23A	PCB ASS'Y VV0136
			PCB601	A44512A27A	PCB ASS'Y VE0362
			PCB602	A45512A28A	PCB ASS'Y VC0114
			MISCELLANEOUS		
			BT601	141T003004	BATTERY, MANGAN UM-3 1.5V
			BZ601	0717000003	BUZZER, PIEZOELECTRIC K85-13DB-4P-2
			CD501	120H450038	CORD, AC E2M 7FEET
			CD502	1227031203	CORD, JUMPER 27031203
			CD601	068123014A	CORD, EIS CONNECTOR 8123014A
			CD602	12260A0603	CORD, JUMPER 260A0603
			CD603	068101235A	CORD, EIS CONNECTOR 8101235A
L701	021B73101K	COIL 100 UH			
L1001	021B73101K	COIL 100 UH			
L1002	021LA6101K	COIL 100 UH			
L3002	021LA6180K	COIL 18 UH			
L3003	021LA63R3K	COIL 3.3 UH			
L3004	021LA6101K	COIL 100 UH			
L3005	021B73101K	COIL 100 UH			
L3006	021LA6150K	COIL 15 UH			
L3701	021B73101K	COIL 100 UH			
L3702	032622001H	COIL, TRAP 2622001			
L4001	021LA6221K	COIL 220 UH			
L4003	021LA6470K	COIL 47 UH			
L4004	021LA61R0M	COIL 1.0 UH			
L4005	021B73101K	COIL 100 UH			
L4006	021B73101K	COIL 100 UH			
L4007	021LA6330K	COIL 33 UH			
L4009	021LA6151K	COIL 150 UH			
L4010	021LA6220K	COIL 22 UH			
L4011	021LA6100K	COIL 10 UH			
L4012	021LA6180K	COIL 18 UH			
L4013	021LA6150K	COIL 15 UH			
L4014	021LA6121K	COIL 120 UH			
L4015	021LA6330K	COIL 33 UH			
L4016	021B73101K	COIL 100 UH			
L4101	021B73101K	COIL 100 UH			
L4102	021B73101K	COIL 100 UH			
L4201	021B73101K	COIL 100 UH			
L4202	021B73101K	COIL 100 UH			
L4203	021LA6100K	COIL 10 UH			
L5001	021B73101K	COIL 100 UH			
L5003	021J74682J	COIL 6.8 MH			
L5101	021B73101K	COIL 100 UH			
L5501	021B73101K	COIL 100 UH			
L5502	021B73101K	COIL 100 UH			
L5503	021B73101K	COIL 100 UH			
L5504	021B73101K	COIL 100 UH			
L5602	021B73101K	COIL 100 UH			
L6001	03360M0021	COIL, VIDEO IFT 360M002			
L6002	0336010031	COIL, VIDEO IFT 3601003			
L6005	0336000231	COIL, VIDEO IFT 3600023			
L6006	0336000241	COIL, VIDEO IFT 3600024			
L6007	0336000251	COIL, VIDEO IFT 3600025			
L6008	021LA6820K	COIL 82 UH			
L6009	021LA6680K	COIL 68 UH			
L6010	021LA6101K	COIL 100 UH			
L6011	021LA6150K	COIL 15 UH			
L6012	021LA6101K	COIL 100 UH			
L6013	021LA6680K	COIL 68 UH			

