

JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER **VHS**

HR-D337MS



SPECIFICATIONS

Format	: VHS standard	NTSC (USA)	: UHF 29 – 39 adjustable (preset 34 ch)
Recording system	: Rotary, two-head helical scan system with slant double-azimuth combination video heads	NTSC (JAPAN)	: UHF 28 – 38 adjustable (preset 33 ch)
Video signal system	: PAL and SECAM colour and CCIR monochrome signals, 625 lines	Power consumption	: 33 watts
	: NTSC colour and EIA monochrome signals, 525 lines	Power requirement	: AC110 – 240 V, 50/60 Hz
Tape width	: 12.65 mm	Video	
Maximum recording time		Input	: 0.5 to 2.0 Vp-p 75 ohms, unbalanced
(SP)	: 240 min. with E-240 video cassette (PAL/SECAM)	Output	: 1.0 Vp-p, 75 ohms, unbalanced
	: 160 min. with T-160 video cassette (NTSC)	Signal-to-noise ratio	: 43 dB (PAL/SECAM), 45 dB (NTSC), (Rohde & Schwarz noise meter) with PICTURE SHARPNESS control at centre position
(LP)	: 480 min. with E-240 video cassette (PAL/SECAM)	Horizontal resolution	
(EP)	: 480 min. with T-160 video cassette (NTSC)		: More than 240 lines (PAL/SECAM), 220 lines (NTSC) with PICTURE SHARPNESS control at centre position
Temperature		Audio	
Operating	: 5°C to 40°C	Input	: Line: -8 dBs, 50 k-ohms, unbalanced
Storage	: -20°C to 60°C	Output level	: -6 dBs, high impedance load
Aerial input (Europe ch)	: VHF ch E2 – E4 ch E5 – E12, S1' – S20	Output impedance	: Less than 1 k-ohm unbalanced
(USA ch)	: UHF ch E21 – E69	Signal-to-noise ratio	: More than 40 dB
(JAPAN ch)	: VHF ch 1 – 2, 3 – 12 UHF ch 14 – 79 CABLE ch A – I, J – W	Frequency range	: 70 Hz to 10,000 Hz
Aerial output	: VHF ch 13 – 62	Timer	: 14-day/4-programme timer
PAL	: K, I, G, M modulation	Dimensions	: 435 mm(W) x 95 mm(H) x 374 mm(D)
	: UHF 32 – 40 adjustable (preset E36 ch)	Weight	: 6.9 kg
		Provided accessories	: Aerial cable, Infrared remote control unit, "UM-4" battery x 2, Plug adapter

*Specifications shown are for SP mode unless otherwise specified.
Design and Specifications subject to change without notice.*

TABLE OF CONTENTS

Section	Title	Page	Section	Title	Page
	Important Safety Precautions				
	INSTRUCTIONS				
1. MECHANISM ADJUSTMENT					
1.1	GENERAL	1-1	3.30	SWITCH/DISPLAY SCHEMATIC DIAGRAM	3-30
1.2	MAIN ASSEMBLY REPLACEMENT	1-4	3.31	SWITCH/DISPLAY CIRCUIT BOARD	3-31
1.3	ASSEMBLY PROCEDURE OF MECHANISM	1-5	3.32	OPERATION SCHEMATIC DIAGRAM AND CIRCUIT BOARD	3-32
1.4	CONFIRMATION AND ADJUSTMENT	1-6	3.33	RF CONVERTOR AND MIX BOOSTER SCHEMATIC DIAGRAM	3-33
1.5	TAPE TRANSPORT SYSTEM CONFIRMATION AND ADJUSTMENT	1-7	3.34	REMOTE CONTROL SCHEMATIC DIAGRAM	3-34
1.6	INTERCHANGEABILITY CONFIRMATION AND ADJUSTMENT	1-8			
2. ELECTRICAL ADJUSTMENTS			4. EXPLODED VIEWS AND PARTS LIST		
2.1	PREPARATION	2-1	4.1	PACKING ASSEMBLY <M1>	4-1
2.2	TIMER CIRCUIT	2-2	4.2	CABINET ASSEMBLY <M2>	4-2
2.3	SERVO CIRCUIT	2-2	4.3	CHASSIS ASSEMBLY <M3>	4-3
2.4	VIDEO CIRCUIT	2-2	4.4	MECHANISM ASSEMBLY <M4>	4-4
2.5	AUDIO CIRCUIT	2-5			
2.6	IF CIRCUIT	2-5	5. PARTS LIST		
3. CHARTS AND DIAGRAMS				SW. REGULATOR BOARD ASSEMBLY <01>	5-1
3.1	CIRCUIT BOARD LOCATIONS	3-1		MAIN BOARD ASSEMBLY <03>	5-1
3.2	MAIN TYPES OF ACTIVE AND PACKAGE CIRCUITS	3-2		MECHACON BOARD ASSEMBLY <04>	5-8
3.3	BOARD INTERCONNECTION DIAGRAM	3-3		TERMINAL BOARD ASSEMBLY <06>	5-9
3.4	VIDEO (LUMINANCE) BLOCK DIAGRAMS	3-4		IF BOARD ASSEMBLY <07>	5-9
3.5	VIDEO (COLOR) BLOCK DIAGRAMS	3-5		TUNER CONTROL BOARD ASSEMBLY <08>	5-11
3.6	SWITCHING REGULATOR SCHEMATIC DIAGRAMS	3-6		AUDIO/CTL HEAD BOARD <12>	5-11
3.7	SWITCHING REGULATOR CIRCUIT BOARD	3-7		TIMER BOARD ASSEMBLY <20>	5-12
3.8	MECHACON SCHEMATIC DIAGRAM	3-8		OPERATION BOARD ASSEMBLY <22>	5-12
3.9	DECK TERMINAL SCHEMATIC DIAGRAMS	3-9		SWITCH/DISPLAY BOARD ASSEMBLY <28>	5-12
3.10	DECK TERMINAL CIRCUIT BOARDS	3-10		MEMORY BOARD ASSEMBLY <35>	5-13
3.11	MECHACON AND TERMINAL CIRCUIT BOARDS	3-11		UPPER DRUM BOARD <41>	5-13
3.12	SERVO SCHEMATIC DIAGRAM	3-12		PRE/REC BOARD ASSEMBLY <43>	5-13
3.13	SERVO CIRCUIT BOARD	3-13		SERVO BOARD ASSEMBLY <48>	5-14
3.14	AUDIO SCHEMATIC DIAGRAM	3-14		COLOR BOARD ASSEMBLY <45>	5-15
3.15	VIDEO --Luminance Section-- (MAIN) SCHEMATIC DIAGRAM	3-15		DECK TERMINAL BOARD ASSEMBLY <51> <53>	5-17
3.16	VIDEO --Color Section-- (MAIN) SCHEMATIC DIAGRAM (1)	3-16		RELAY BOARD ASSEMBLY <52>	5-17
3.17	VIDEO --Color Section-- (MAIN) SCHEMATIC DIAGRAM (2)	3-17		END SENSOR BOARD ASSEMBLY <54>	5-17
3.18	JUMP DET SCHEMATIC DIAGRAM	3-18		CASSETTE HOUSING BOARD <56>	5-17
3.19	COLOR SCHEMATIC DIAGRAM	3-19		JUMP DETECTOR BOARD ASSEMBLY <70>	5-18
3.20	MAIN CIRCUIT BOARD	3-20			
3.21	COLOR CIRCUIT BOARD/JUMP DET CIRCUIT BOARD	3-21			
3.22	PRE/REC SCHEMATIC DIAGRAM	3-22			
3.23	PRE/REC CIRCUIT BOARD	3-23			
3.24	TUNER CONTROL SCHEMATIC DIAGRAM	3-24			
3.25	TUNER CONTROL CIRCUIT BOARD	3-25			
3.26	IF SCHEMATIC DIAGRAM	3-26			
3.27	IF CIRCUIT BOARD	3-27			
3.28	TIMER AND MEMORY SCHEMATIC DIAGRAMS	3-28			
3.29	TIMER AND MEMORY CIRCUIT BOARDS	3-29			

Important Safety Precautions

Prior to shipment from the factory, JVC 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. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the Δ symbol and shaded (▨) parts are critical for safety.

Replace only with specified part numbers.

Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:

- 1) Wires covered with PVC tubing
- 2) Double insulated wires
- 3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:

- | | | |
|--------------------|--------------------------------------|------------|
| 1) Insulation Tape | 3) Spacers | 5) Barrier |
| 2) PVC tubing | 4) Insulation sheets for transistors | |

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

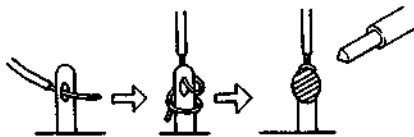


Fig. 1

7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

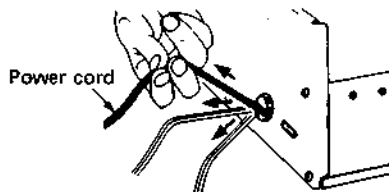


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)

In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

1) Connector part number : E03830-001

2) Required tool : Connector crimping tool of the proper type which will not damage insulated parts.

3) Replacement procedure

(1) Remove the old connector by cutting the wires at a point close to the connector.

Important : Do not reuse a connector (discard it).



Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.



Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

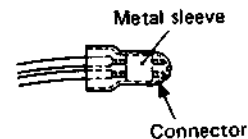


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

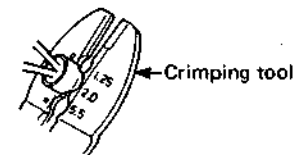


Fig. 6

(5) Check the four points noted in Fig. 7.

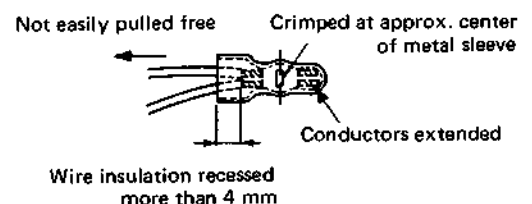


Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

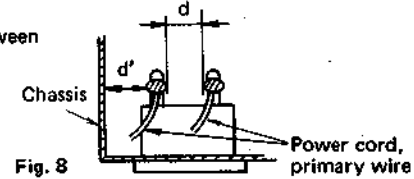
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

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 input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

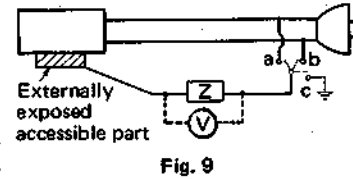


4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

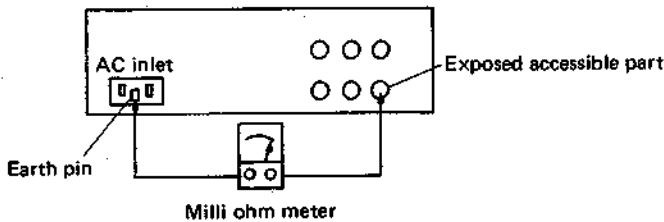


5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.



Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega / 500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	—	AC 900 V 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V 200 to 240 V	Europe & Australia	$R \geq 10 \text{ M}\Omega / 500 \text{ V DC}$	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	$d \geq 4 \text{ mm}$ $d' \geq 8 \text{ mm}$ (Power cord) $d' \geq 6 \text{ mm}$ (Primary wire)

Table 1 Specifications for each region

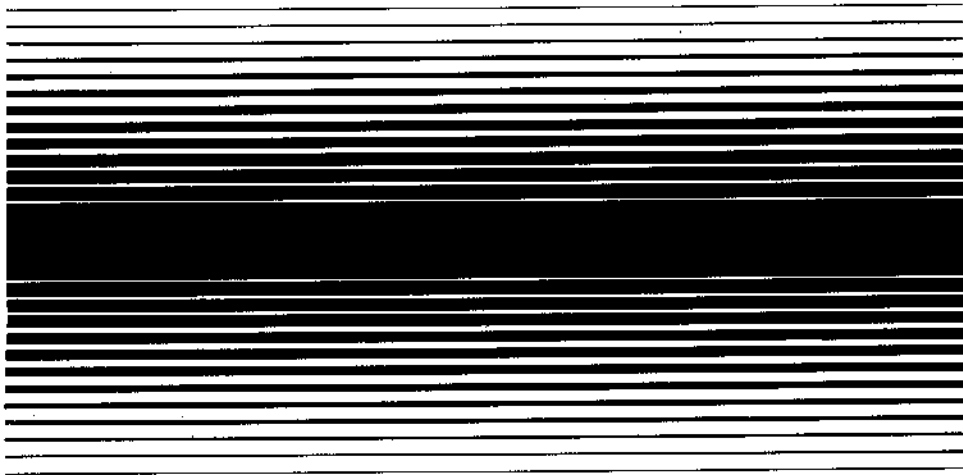
AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 k Ω	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF , 1.5 k Ω	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 k Ω	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
		50 k Ω	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

JVC | Instructions

VIDEO CASSETTE RECORDER HR-D337MS



MANUEL D'INSTRUCTIONS:
MAGNETOSCOPE A CASSETTE

BEDIENUNGSANLEITUNG:
VIDEO-KASSETTEN-REKORDER

دليل التعليمات
ممثل كاسيت الفيديو



HQ

INDEX
VHS INDEX SEARCH SYSTEM

MULTIPLE SYSTEM

VHS
PAL SECAM NTSC

PU30425-987

CONTENTS

Features	2	Recording TV programmes	14
Precautions	3	Index search and counter search	15
Controls, indicators and connectors	4	Elapsed recording time indicator	15
Connections	6	Counter Go-To function	16
Video channel setting	6	Next-function memory	16
Important information on colour system selection	7	Automatic timer recording	17
Clock setting	11	Recording from an external source	18
Loading and unloading a cassette	11	In case of difficulty	19
Operating the built-in tuner	12	Head cleaning	19
Playing back a video cassette	13	Specifications	20

SAFETY PRECAUTIONS

The rating plate and the safety caution are on the rear of the unit.

WARNING – DANGEROUS VOLTAGE INSIDE

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

IMPORTANT (In the United Kingdom)
Mains Supply (240 V~, 50 Hz only)

IMPORTANT

Do not make any connection to the Larger Terminal coded E or Green. The wires in the mains lead are coloured in accordance with following code:



If these colours do not correspond with the terminal identifications of your plug, connect as follows:
Blue wire to terminal coded N (Neutral) or coloured Black.
Brown wire to terminal coded L (Live) or coloured Red.
If in doubt – consult a competent electrician.

FOR YOUR SAFETY (in Australia)
Install any external aerial to AS 1417.1

Omkopplaren OPERATE på denna apparat är sekundärt kopplad och skiljer inte apparaten från nätet i läge OPERATE OFF.

The OPERATE button does not completely shut off mains power from the unit, but switches operating current on and off.

BEMÆRK: I stilling OFF er apparatet stadig forbundet med lysnettet. Hvis det ønskes fuldstændig afbrudt skal netledningen trækkes ud.

This unit is produced to comply with Directive 82/499/EEC, CISPR Pub. 13 and Pub. 14 and Standard IEC 65.

Video tapes recorded with this video recorder in the LP (Long Play) or EP (Extended Play) mode cannot be played back on a single-speed video recorder.

POWER SYSTEM

This set operates on any voltage between 110 and 240 V, 50/60 Hz with automatic switching.
There is no switch nor control for power line adaptation.

Use the plug adapter (provided) depending on the type of your AC wall outlet.



CAUTION

- When you are not using the HR-D337MS for a long period of time, it is recommended that you disconnect the power cord from the AC outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the AC outlet prior to connecting or disconnecting any signal lead or aerial.

VHS
PAL SECAM NTSC

HQ

- Only cassettes marked "VHS" can be used with this video cassette recorder.
- HQ VHS is compatible with existing VHS equipment.

Multi-system flexibility

- PAL/MESECAM/SECAM/NTSC3.58/NTSC4.43 five-system recording and playback circuitry incorporated to adapt to television colour systems the world over.
- Worldwide-compatible multi-system tuner (B/G, I, D/K, M) built in to directly receive off-air TV programmes in most countries. (A separate tuner will be needed in SECAM-L areas.)
- Multi-system RF converter (G, I, K, M) for UHF channels built in to provide greater compatibility with televisions.
- Multi-voltage operation with automatic switching (110 – 240 V AC)

High-quality pictures

- HQ (High Quality) System technologies with a Detail Enhancer (DE) and 20% higher White Clip Level (WCL).
- Long 8-hour recording time in the LP (Long Play) mode for PAL/SECAM/MESECAM recording or EP mode (Extended Play) mode for NTSC recording.
- Double-Azimuth 4-head (DA-4) system for quality recording and playback at both recording speeds.
- Noiseless field stills and 5-speed slow motion available with PAL/SECAM/MESECAM SP mode recordings.

Tuner and timer features

- Voltage synthesized VHF/UHF/CATV (NTSC-M) tuner with 32-channel preset capacity.
- 10-Key random-access remote channel selection and up/down scanning.
- Instant timer recording with auto shut-off.
- 14-Day/4-event programmable timer.
- Overlapped programme warning: programme numbers on the FDP blink when the preset time spans of the programmes overlap.
- Timer programme review to show the preset programme contents in the order of execution.

Tape access features

- Index Search for locating the beginning of each recording for automatic start of playback, by detecting the index code automatically marked when recording was initiated.
- Counter go-to function for direct access to any point on a tape specified by keying in a counter number with the 10 numeric keys.
- Shuttle Search with lock function: with the button locked or held depressed for instant release, offers high-speed playback at 9 times (PAL/SECAM/MESECAM) or 7 times (NTSC) normal speed in either direction.
- Counter memory for returning to a point on a tape corresponding to the counter reading of "0000".

Other value features

- Automatic functions including Auto Play and Next-Function Memory.
- Infrared remote control with 10-digit keypad for channel selection.
- On-screen record-pause mode display which signals elapsed pause time.
- Electronic tracking controls.
- Comprehensive fluorescent display.
- Tape counter switchable to elapsed recording time indicator.
- Picture sharpness control.

Handling and storage

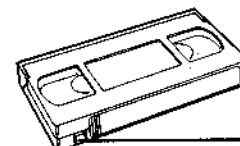
- Avoid using the recorder under the following conditions:
 - extremely hot, cold or humid places,
 - dusty places,
 - near appliances generating strong magnetic fields,
 - places subject to vibrations, and
 - poorly ventilated places.
- Be careful of moisture condensation. Avoid using the recorder immediately after moving from a cold place to a warm place. The water vapour in warm air will condense on the still-cold video head drum and tape guides and may cause damage to the tape and the recorder.
- Handle the recorder carefully.
 - Do not block the ventilation openings.
 - Do not place anything heavy on the recorder.
 - Do not place anything which might spill and cause trouble on the top cover of the recorder.
 - Use in horizontal (flat) position only.
- In case of transportation,
 - Avoid violent shocks to the recorder during packing and transportation.
 - Before packing, be sure to remove the cassette from the recorder.

Video cassettes

- This recorder employs VHS-type cassettes only.

Cassettes	Recording time	Recording system
E-240	240/480 minutes	PAL/SECAM/MESECAM
E-180	180/360 minutes	PAL/SECAM/MESECAM
E-120	120/240 minutes	PAL/SECAM/MESECAM
E-90	90/180 minutes	PAL/SECAM/MESECAM
E-30	30/60 minutes	PAL/SECAM/MESECAM
T-180	160/480 minutes	NTSC
T-120	120/360 minutes	NTSC
T-90	90/270 minutes	NTSC
T-60	60/180 minutes	NTSC
T-30	30/90 minutes	NTSC

- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be performed. If you wish to record on a cassette whose tab has already been removed, use adhesive tape to block the hole.



Safety tab

- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid extreme humidity, violent vibrations or shocks, strong magnetic fields (near a motor, transformer or magnet) and dusty places.
- Place the cassettes in cassette cases and position vertically.

Moisture condensation

- If you pour a cold liquid into a glass, water vapour in the air will condense on the surface of the glass. This is called moisture condensation.
- Moisture condensation on the head drum, one of the most crucial parts of the video recorder, will cause damage to the tape.
- Moisture condensation is apt to occur under the following conditions:
 - when the recorder is moved from a cold place to a warm place, and
 - under extremely humid conditions.
- In conditions where moisture condensation may occur, keep the power cord plugged in an AC outlet and the OPERATE switch set to ON; this would help prevent condensation from occurring. When condensation has occurred, it will not evaporate quickly once the power is switched on. Wait a few hours for the recorder to become dry.

Operation

- When a cassette is loaded, the power is switched on automatically.
- The cassette can be unloaded even when the power is off. Pressing the EJECT button turns the power on and, after ejection of the cassette, shuts it off automatically in this case.
- As long as the TIMER button is engaged with the TIMER indicator lit, the OPERATE and EJECT buttons have no effect and unloading of a cassette is not possible. If a cassette has not yet been inserted, simply insert a cassette; the power will be switched on to load the cassette properly and, after completion of automatic loading, the Timer Recording Standby mode will be engaged with power off.

Remote control unit

- Avoid violent shocks, especially take care not to drop the unit.
- Take care not to allow liquid to spill into the unit.
- Do not place heavy objects on the unit.
- Avoid leaving the unit in places subject to direct sunlight or extremely high temperatures.

IMPORTANT: It is permissible to record television programmes only in the event that third party copyrights and other rights are not violated.

CONTROLS, INDICATORS AND CONNECTORS Refer to the diagrams on the front foldout page.

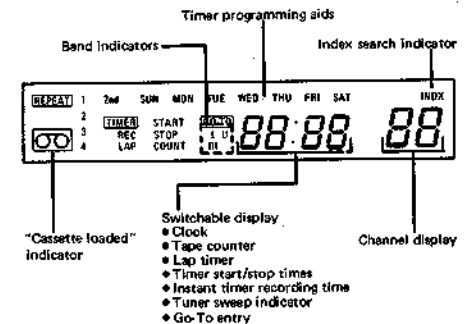
Front Panel

- ① **OPERATE button with green indicator**
Press to apply operating power to the recorder. The indicator will light. Loading a cassette also turns the power on.
- ② **Cassette EJECT button**
- ③ **PLAY button**
Press to play back the tape or cancel the Pause/Still and Search modes.
- ④ **REW and FF (SHUTTLE SEARCH) buttons**
Press while in the Stop mode to rewind or fast-forward the tape; press while in the Play mode to view the speeded-up picture for programme search. See page 13, 15 and 16.
- ⑤ **PICTURE SHARPNESS control**
Turn this knob clockwise to make the picture sharper. Turn counterclockwise to give the picture a softer tone. Effective only for playback pictures. (No effect for recording.)
- ⑥ **TAPE MEMORY switch**
COUNTER: The tape will stop automatically at the counter reading of about "0000" in the Rewind or Fast Forward mode. See page 15.
INDEX: The index code marked at the beginning of each recording will be detected in the Shuttle Search mode for automatic start of playback. See page 15.
OFF: Set to OFF if you are not going to use either of the two functions.

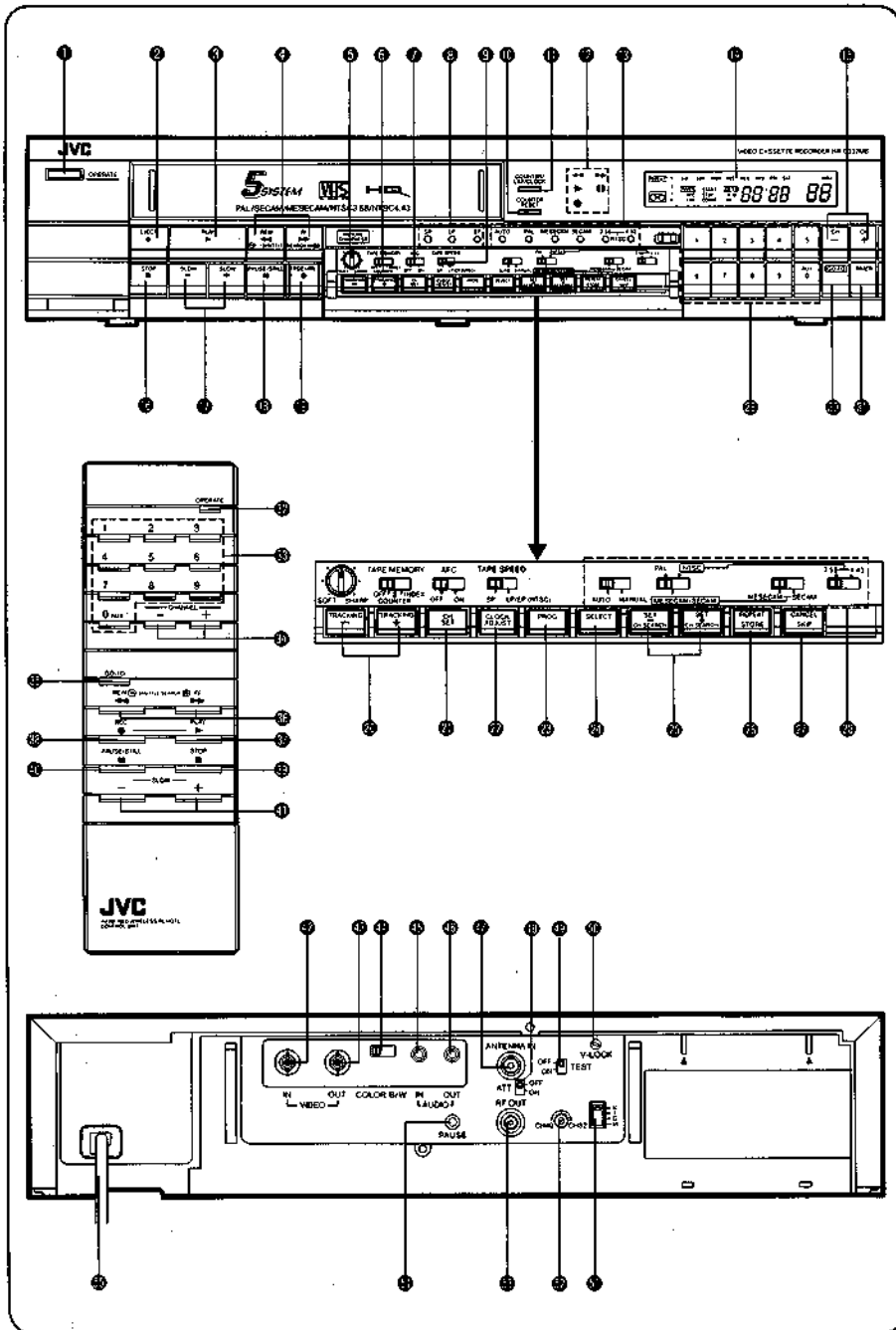
- ⑦ **AFC switch**
Normally set to ON.
- ⑧ **SP/LP/EP indicators**
The recording speed selected with the TAPE SPEED switch
 - ⑧ is indicated by one of these LED indicators.
 - SP: Lights when the SP position is selected.
 - LP: Lights when the LP/EP position is selected with the PAL/MESECAM/SECAM system working.
 - EP: Lights when the LP/EP position is selected with the NTSC system working.
 - During playback, the tape mode will automatically be detected and the corresponding LED will light.
 - NTSC LP tapes (recorded at half-speed on some other machines) can also be played back on this recorder, but the LP indicator will not function for these recordings.
- ⑨ **TAPE SPEED switch**
SP: Set to this position when you wish recordings to be made in the SP (Standard Play) mode for all systems.
LP/EP (NTSC): Set to this position when you wish to record longer TV shows or for unattended and prolonged recording of a number of TV shows with a combined time of up to 8 hours. In PAL/SECAM/MESECAM, the LP (Long Play) mode will be engaged; in NTSC, the EP (Extended Play) mode will be engaged.

- ⑩ **COUNTER RESET button**
Press to reset the counter reading or lap time to "0000" or "0:00" respectively.
- ⑪ **COUNTER/LAP/CLOCK button**
Press to switch the display among tape counter, lap time indicator and clock. Also used to change the display from the timer programming mode to the clock mode.

- ⑫ **Mode indicators**
 - ◀◀: Rewind mode
 - ▶▶: Fast Forward mode
 - ▶: Play mode
 - ⏸: Still or Slow mode
- ⑬ **Pause mode** (In the Pause mode, a white bar will also be displayed on the TV screen.)
 - ⏸: Record mode
 - ◀▶: Reverse Shuttle Search mode
 - ▶▶: Forward Shuttle Search mode
- ⑭ **Colour system indicators**
These indicators show the selected colour system according to the detected input signal or the settings of the colour system select switches ⑮. For more details refer to pages 7 through 10.
- ⑯ **Fluorescent display panel**



- ⑰ **CH +/- buttons**
Press either button to scan to a desired channel.
- ⑱ **STOP button**
Press to stop the tape.
- ⑲ **SLOW +/- buttons**
Press in the Play or Still mode to engage the Slow-motion mode. To increase the speed, press "+" button; to decrease the speed, press "-" button (see page 13).
- ⑳ **PAUSE/STILL button**
Press to stop the tape temporarily to avoid recording of unwanted material or to view a still picture. The still picture can be advanced step by step or continuously.
- ㉑ **REC/ITR button**
Press once to start recording. Pressing it again engages the Instant Timer Recording mode. See page 14.
- ㉒ **TRACKING +/- buttons**
Press either button to minimise noise bars, if observed, during playback and slow-motion.
- ㉓ **CH SET button**
Press this button to engage or disengage the tuner preset mode (see page 12).
- ㉔ **CLOCK ADJUST button**
Press to adjust the clock.
- ㉕ **PROG button**
Press to programme the timer.



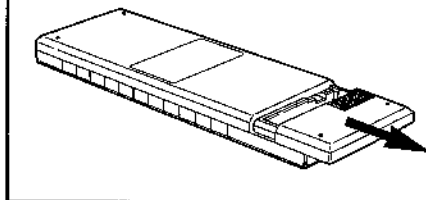
- ① **SELECT button**
Press to select the band in tuner presetting; press to select the item to be set in clock setting or timer programming.
- ② **SET/CH SEARCH -/> buttons**
Press to set to the correct data in clock setting or timer programming; press to search for broadcast programmes in tuner presetting.
- ③ **REPEAT/STORE button**
Press to enter the repeat command in timer programming; press to store the tuned-in channel in tuner presetting.
- ④ **CANCEL/SKIP button**
Press to cancel the preset programme in timer programming; press to skip unnecessary channels in tuner presetting.
- ⑤ **Colour system select switches**
 - **AUTO/MANUAL switch**
A master switch for selecting the television colour system. First set this switch to either AUTO or MANUAL depending on the required mode. When the MANUAL mode is selected, set the other system select switches manually as required. For more details refer to page 10.
 - **PAL/MESECAM/SECAM/NTSC switch**
Use this switch to manually select the appropriate system when the AUTO/MANUAL switch is set to MANUAL. For more details refer to page 10.
 - **MESECAM/SECAM switch**
Use this switch to select the appropriate system. This switch must be set correctly even in the AUTO mode. For more details refer to page 10.
 - **NTSC 3.58/4.43 switch**
Use this switch to select the appropriate system. This switch must be set correctly even in the AUTO mode. For more details refer to page 10.
- ⑥ **Numeric keys**
Use these keys for direct channel selection (see page 12) or key in the counter number in the Counter Go-To mode. The "0" key can also be used to select the external source recording mode (AUX), in which "AU" will appear in the channel display.
- ⑦ **GO-TO button**
Press to engage the Counter Go-To mode. See page 16.
- ⑧ **TIMER button**
Press to engage the Timer Recording Standby mode.

Remote Control Unit

- ① **OPERATE button**
Press to turn the recorder power on or off.
- ② **Numeric keys**
- ③ **CHANNEL -/> buttons**
Press either button to select a desired channel.
- ④ **GO-TO button**
- ⑤ **REW and FF (SHUTTLE SEARCH) buttons**
- ⑥ **PLAY button**
- ⑦ **REC button**
Press together with the PLAY button to start recording.
- ⑧ **STOP button**
- ⑨ **PAUSE/STILL button**
- ⑩ **SLOW buttons**

Operating distance for remote control unit

- The maximum operating distance is about 8 m.
- Installing the batteries**
 - Insert two "UM-4"-size batteries (provided) into the battery compartment on the rear of the remote control unit, observing correct polarity.

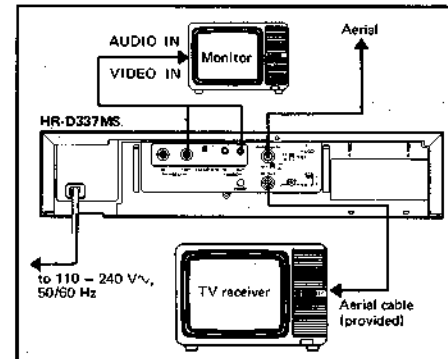


Rear Panel

- ① **VIDEO IN connector**
Connect the video output of other video equipment such as another video tape recorder for recording video signals.
- ② **VIDEO OUT connector**
Video signals being recorded or played back are available from this connector.
- ③ **Video mode select switch**
This applies to both recording and playback.
COLOR: Set to this position when the input or playback video signal is in colour.
B/W: Set to this position when the input or playback video signal is monochrome.
- ④ **AUDIO IN connector**
Connect an audio tape recorder or other audio sources for recording sound.
- ⑤ **AUDIO OUT connector**
Audio signals can be obtained from this connector.
- ⑥ **Aerial input connector (ANTENNA IN)**
Connect an aerial to this connector.
- ⑦ **Attenuator switch (ATT.)**
Set to OFF to receive broadcasts from distant stations. Set to ON to receive broadcasts of high field strength.

- ⑧ **TEST signal switch**
Set to ON when tuning your TV receiver for the VIDEO CHANNEL. A test signal in the form of two vertical white bars will be available.
- ⑨ **V-LOCK adjustment screw**
When operating in the Still mode, adjust this screw to eliminate any vertical vibration of the picture. (For any inquiry about this adjustment, contact a JVC dealer.)
- ⑩ **SYSTEM select switch**
Selects the system of the built-in RF converter. Select K, I, G or M depending on the system of your television receiver.
This switch is preset to G prior to shipment.
- ⑪ **RF converter frequency adjustment screw**
See below.
- ⑫ **RF OUT connector**
Connect to the aerial connector of a TV receiver through the aerial cable (provided).
- ⑬ **Remote PAUSE terminal**
When using a JVC video camera, connect the remote control cable of the camera adapter to this terminal for the purpose of controlling the starting and stopping of the tape with the camera's start/stop switch.
- ⑭ **Power cord**

CONNECTIONS



1. Remove the aerial cable from the TV receiver and reconnect it to the recorder's ANTENNA IN ⑥ connector. The recorder is then ready to record off-air programmes.
 2. Connect the recorder's RF OUT connector ⑫ to the TV receiver's aerial terminal using the provided aerial cable. The TV receiver is then ready to receive broadcast programmes as well as accommodate video cassette playback.
 3. When you use a video monitor for playback, connect the VIDEO OUT ② and AUDIO OUT ⑤ connectors of the recorder to the VIDEO IN and AUDIO IN connectors of the video monitor.
- Use the plug adapter (provided) depending on the type of your AC wall outlet.



VIDEO CHANNEL SETTING

- 1 Press the OPERATE button ① to turn the power on. Turn on the TV receiver.
- 2 Set the TEST switch ⑧ to ON.
- 3 Adjust your TV receiver in the vicinity of UHF channel E36 until you bring in the two white signal bars on the screen as illustrated. This is your VIDEO CHANNEL.
*UHF channel 34 in the USA, and UHF channel 33 in Japan.
- 4 Reset the TEST switch to OFF.



Notes:

- If some interference noise is seen on the screen because of broadcasts on neighbouring channels or if your preset broadcasts should be affected in picture quality, it is necessary to shift the RF converter output frequency from that of channel E36. Consult your JVC dealer for making this adjustment.
- Video channel setting is also possible using a prerecorded VHS video cassette. Play back the tape and tune the TV receiver to obtain clear pictures and sound while monitoring the playback picture on the TV screen.
- If your TV receiver is not provided with an AFC circuit, perform fine tuning of the TV receiver when you are actually viewing video cassettes.
- Set the SYSTEM select switch ⑩ to the appropriate position.

IMPORTANT INFORMATION ON COLOUR SYSTEM SELECTION

The HR-D337MS incorporates the circuitry necessary to record or play back PAL, SECAM and NTSC signals from any television broadcasting system in the world. To select the right colour system, there are four switches on the HR-D337MS: **AUTO/MANUAL switch:** A master switch to select the automatic or manual setting mode. In most cases, when this switch is set to AUTO, the appropriate system will be selected according to the input or playback signal, provided that the relevant sub switch is set correctly for MESECAM/SECAM recording or NTSC playback.

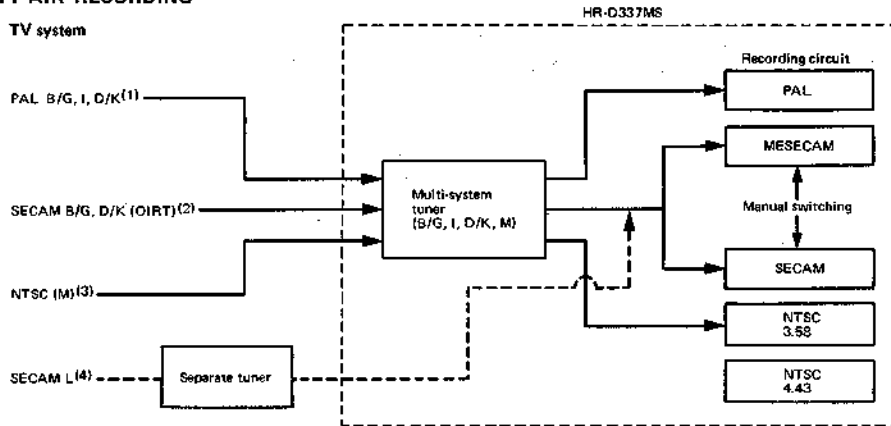
PAL/MESECAM-SECAM/NTSC switch: To select the appropriate system in the MANUAL mode.

MESECAM/SECAM switch: A sub switch to select the type of resulting recorded tape as required. When recording, this switch must be set correctly in both the AUTO and MANUAL modes.

NTSC 3.58/4.43 switch: A sub switch to select the type of monitor on which NTSC tapes are to be viewed. During playback this switch must be set correctly in both the AUTO and MANUAL modes.

OFF-AIR RECORDING

TV system



The built-in multi-system tuner is capable of receiving PAL B/G, I and D/K, SECAM B/G and D/K, and NTSC broadcasts.

1. PAL B/G, I and D/K broadcasts

PAL B/G is the colour television broadcasting system used in most Continental European countries (except France, Luxemburg and Monaco) and some countries of the Middle East, Africa and Asia. PAL I is the system used in the United Kingdom and Hong Kong, and PAL D/K, in various countries. The built-in tuner can be used to record off the air in these countries. Simply set the master switch to AUTO.

2. SECAM B/G and D/K (OIRT) broadcasts

SECAM B/G is the colour television broadcasting system employed in many countries of the Middle East and Africa, and a few Eastern European countries including East Germany, while SECAM D/K is the system used in most Eastern European countries. TV broadcasts in these countries can be recorded using the built-in tuner. If the MANUAL mode is selected with the master switch, set the system switch to MESECAM/SECAM, and, whether in AUTO or MANUAL, the MESECAM/SECAM switch to either MESECAM or SECAM depending on the type of resulting tape you want.

3. NTSC broadcasts

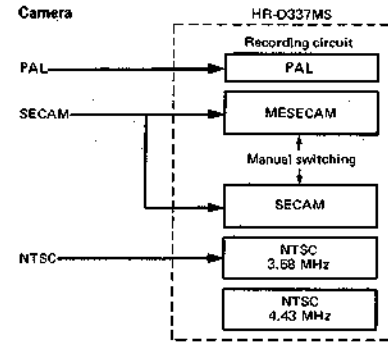
NTSC is the colour television broadcasting system used in the USA, Canada, Japan, several Latin American countries and a few Asian countries. TV broadcasts in these countries can be recorded using the built-in tuner. The broadcast NTSC signal has a colour subcarrier frequency of 3.58 MHz. Therefore, in the AUTO mode, the NTSC 3.58 circuit is automatically selected.

4. SECAM L broadcasts

SECAM L is the colour television broadcasting system usually identified as the French SECAM system and is employed in France and a few other countries. To record off the air in these countries, a tuner (or monitor-receiver) of the SECAM L system is necessary.

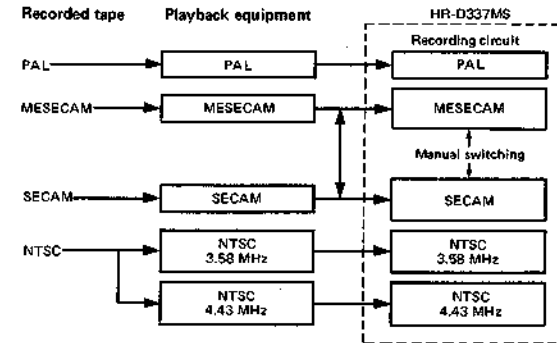
For further information, consult your nearest JVC dealer.

CAMERA RECORDING



Video cameras are built to one of the three standards: PAL, SECAM or NTSC. Any camera can be used with this recorder. The switch settings are identical to those for recording broadcasts of each system. The resulting recording corresponds to the respective system. Remember, for instance, that it is not possible to produce NTSC tapes with a PAL camera even if the NTSC system is selected manually.

TAPE-TO-TAPE TRANSFER



There are 4 different types of recorded tape, depending on the signal recorded.

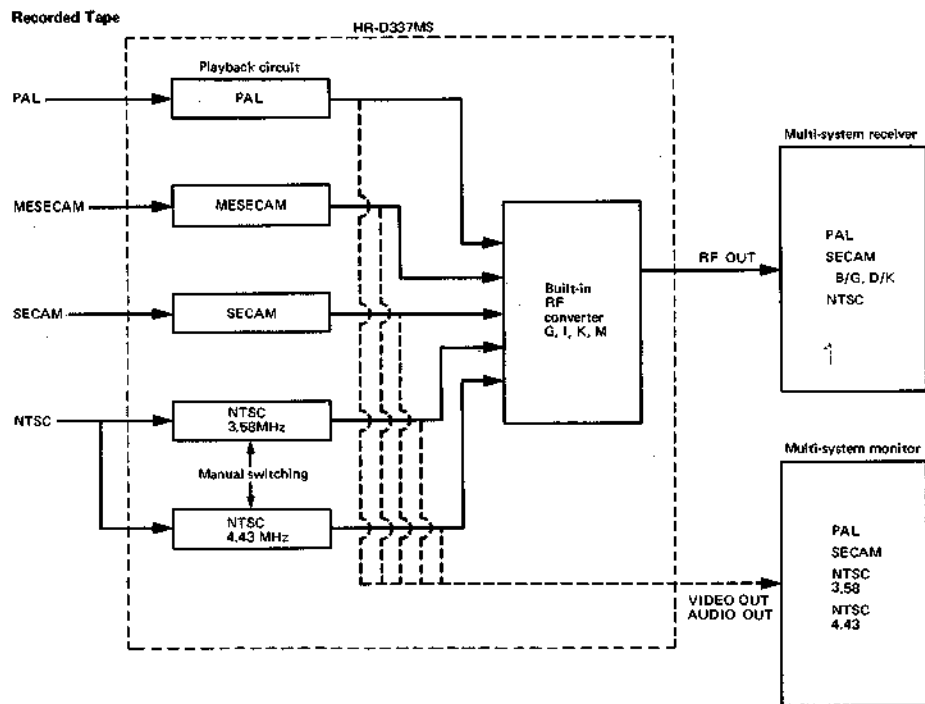
PAL tapes: Whatever broadcasts (B/G, I, D/K) the recording was made from, the resulting tape contains the same PAL signal. To transfer PAL tapes, a second recorder built to the PAL standard is required to play them back. The switch settings are identical to those for recording PAL broadcasts.

MESECAM tapes: MESECAM is a designation for tapes of SECAM broadcasts or SECAM camera signals that have been recorded with PAL/MESECAM recorders or through the MESECAM circuit of this recorder. To transfer MESECAM signals, use a second recorder which is capable of processing MESECAM signals. Depending on what type of tape is desired, either the MESECAM or SECAM circuit of this recorder can be used for recording.

SECAM tapes: Whatever broadcasts (B/G, D/K) the recording was made from, the resulting tape contains the same SECAM signal. To transfer SECAM signals, use a second recorder of the SECAM standard. Depending on what type of tape is desired, either the MESECAM or SECAM circuit of this recorder can be used for recording.

NTSC tapes: Playback equipment can be either of the NTSC 3.58 MHz or 4.43 MHz system. Depending on the played back tape signal, this recorder automatically selects the corresponding system in the AUTO mode.

PLAYBACK



The HR-D337MS can play back all 4 types of recorded tape. The built-in multi-system RF converter processes all signals for output from the RF OUT connector. Therefore, with a multi-system receiver, you can view all types of tape via RF connection. If you own a multi-system monitor, use the VIDEO OUT/AUDIO OUT connection. If your receiver or monitor is not equipped with the NTSC 3.58 MHz circuit, but only with NTSC 4.43 MHz, be sure to set the NTSC 3.58/4.43 switch to 4.43 when playing back NTSC tapes.

CAUTION
When the HR-D337MS is connected to a multi-system television set, it may happen that no colours appear on the screen if the colour system select switch of the television set is adjusted to the AUTO position. In such a case, change the setting of the colour system select switch of the television set to the position which corresponds to the setting (G, I, K or M) of the RF converter system select switch on the rear panel of the HR-D337MS.

System select switch settings & Indicators

Use	Source	System select switches						Indicators	Remarks
		AUTO mode ¹⁾			MANUAL mode				
								AUTO	
								PAL	
								MESECAM	
								SECAM	
								NTSC 3.58	
								NTSC 4.43	
Off-air recording	PAL	*	*	*	PAL	*	*	PAL	
	SECAM		MESECAM	*	MESECAM/SECAM	MESECAM	*	MESECAM	To produce MESECAM tapes.
			SECAM	*	SECAM	SECAM	*	SECAM	To produce SECAM tapes.
NTSC	*	*	*	NTSC	*	*	NTSC 3.58		
Camera recording	PAL	*	*	*	PAL	*	*	PAL	
	SECAM		MESECAM	*	MESECAM/SECAM	MESECAM	*	MESECAM	To produce MESECAM tapes.
			SECAM	*	SECAM	SECAM	*	SECAM	To produce SECAM tapes.
NTSC	*	*	*	NTSC	*	*	NTSC 3.58		
Tape-to-tape transfer	PAL	*	*	*	PAL	*	*	PAL	
	MESECAM/SECAM		MESECAM	*	MESECAM/SECAM	MESECAM	*	MESECAM	To produce MESECAM tapes.
			SECAM	*	SECAM	SECAM	*	SECAM	To produce SECAM tapes.
	NTSC (played on NTSC 3.58 MHz machine)	*	*	*	NTSC	*	*	NTSC 3.58	
NTSC (played on NTSC 4.43 MHz machine)	*	*	*	NTSC	*	*	NTSC 4.43		
Playback	PAL	*	*	*	PAL	*	*	PAL	
	MESECAM	*	*	*	MESECAM/SECAM	*	*	MESECAM	
	SECAM	*	*	*	MESECAM/SECAM	*	*	SECAM	
	NTSC (to be viewed on 3.58 MHz monitor)	*	*	NTSC 3.58	NTSC	*	NTSC 3.58	NTSC 3.58	
	NTSC (to be viewed on 4.43 MHz monitor)	*	*	NTSC 4.43	NTSC	*	NTSC 4.43	NTSC 4.43	

*The position of a switch so marked is irrelevant.

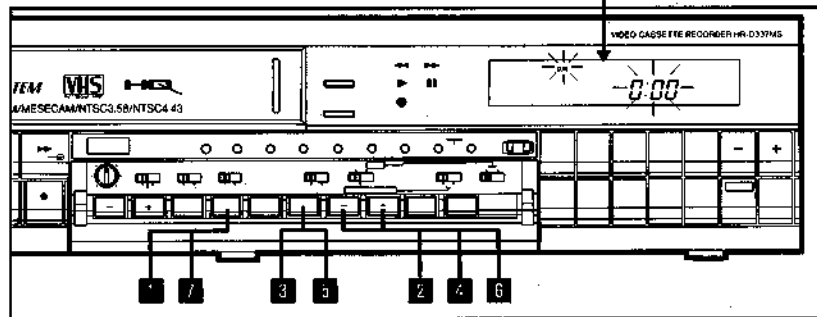
1) In the AUTO mode, the AUTO indicator remains lit as well as the one indicating the system.

Note:

- With (CCIR) B/W signal input, or when a (CCIR) B/W tape is played back in the AUTO mode, the PAL indicator will light. The NTSC 4.43 indicator will light when EIA B/W signals are being input, and either the NTSC 3.58 or 4.43 indicator will light, depending on the setting of the NTSC 3.58/4.43 switch, during playback of EIA B/W tapes.

CLOCK SETTING

Plug the recorder into an AC outlet. The display shows a blinking SUN 0:00.



- 1 Press CLOCK ADJUST \odot . The indicated day will blink.
- 2 Press SET \odot until the correct day indication appears.
- 3 Press SELECT \odot . The indicated hour digits will blink.
- 4 Press SET until the correct hour indication appears.
- 5 Press SELECT. The indicated minute digits will blink.
- 6 Press SET until the correct minute indication appears.
- 7 Press CLOCK ADJUST at the exact instant of the time signal and clock will be set accurately to the present time.

Note:

- Clock setting is not possible in the timer recording standby mode. First check to see that the TIMER indicator on the FDP is not lit.

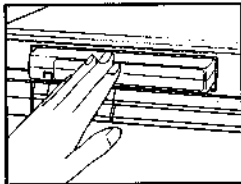
Power failure indicator

The blinking SUN 0:00 (initial condition of the display) is also a power failure indicator, showing that there has been a power failure exceeding 10 seconds. Re-adjusting the time restores the normal condition of the clock display.

LOADING AND UNLOADING A CASSETTE

Loading

Insert a cassette as illustrated. Be sure to insert it firmly into the slot; otherwise, it will be automatically ejected.



- The automatic loading mechanism will operate only when the cassette is inserted correctly.
- With a cassette inserted, the "cassette loaded" indicator will appear on the FDP.

Unloading

Press the EJECT button \odot .

CAUTION

- If unloading of the cassette is not possible, check to see whether the TIMER indicator is lit. If so, press the TIMER button so the TIMER indicator extinguishes.
- Do not attempt to pull out the cassette once automatic loading has started.
- Do not insert fingers or any foreign object beyond the door of the cassette loading slot, as this could lead to injury or damage to the mechanism. Show special caution with children.

AUTO POWER-ON AND AUTO PLAY SYSTEM

- The cassette can be loaded even when the power has not been turned on. Inserting a cassette into the loading slot turns the power on automatically.
- Inserting a cassette, with its safety tab removed, turns the recorder on and playback of the cassette begins automatically.

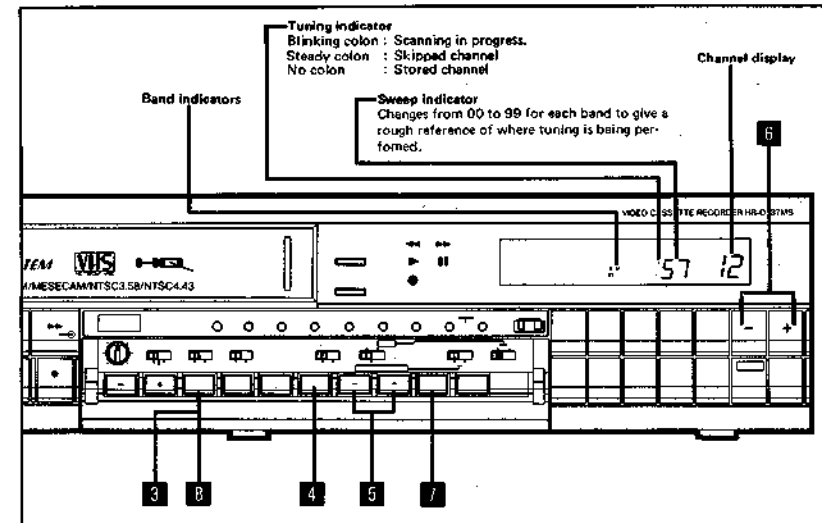
POWER-OFF EJECT SYSTEM

- The cassette can be unloaded even after the power has been turned off. Pressing the EJECT button turns the power on automatically and, after ejection of the cassette, shuts it off automatically.

OPERATING THE BUILT-IN TUNER

The HR-D337MS incorporates a voltage synthesized tuner with 32-channel preset capacity. Only channels stored can be called up with the CH buttons in modes other than Channel Set.

In the Channel Set mode, all channel numbers including skipped ones are successively displayed so that they can be stored or skipped.



Storing channels

- 1 Turn on the TV receiver and adjust it to your video channel.
- 2 Turn on the recorder.
 - If "AU" is in the channel display, press one of the numeric keys to change it to any number.
- 3 Press CH SET \odot .
- 4 Press SELECT \odot until the correct band indication appears.
- 5 Press CH SEARCH \odot until the desired broadcast signal is detected; use either the "-" or "+" button depending on the direction of search.
 - The tuning indicator "colon" will blink and the sweep indicator will count down or up.
- 6 Press CH \odot to select the channel to be stored.
- 7 Press STORE \odot . The "colon" will disappear.
 - Repeat steps 4 through 7 for all necessary channels.
- 8 Press CH SET to disengage the Channel Set mode.

Skipping channels

1. Press CH to select the channel to be skipped.
 - The band indicator and the sweep indicator corresponding to the broadcast stored in that channel will appear.
2. Press CH SET.
3. Press SKIP \odot . The steady "colon" will appear.
4. Press CH SET to disengage the Channel Set mode.

Scanning channels

Stored channels can be called up in ascending or descending order by using CH buttons \odot on the recorder or the CHANNEL buttons \odot on the remote control.

Selecting channels

By using the numeric keys \odot , \odot , direct-access channel selection is also possible.

- When using the 10 numeric keys, pay attention to the following: When 1, 2 or 3 is entered, it blinks for about

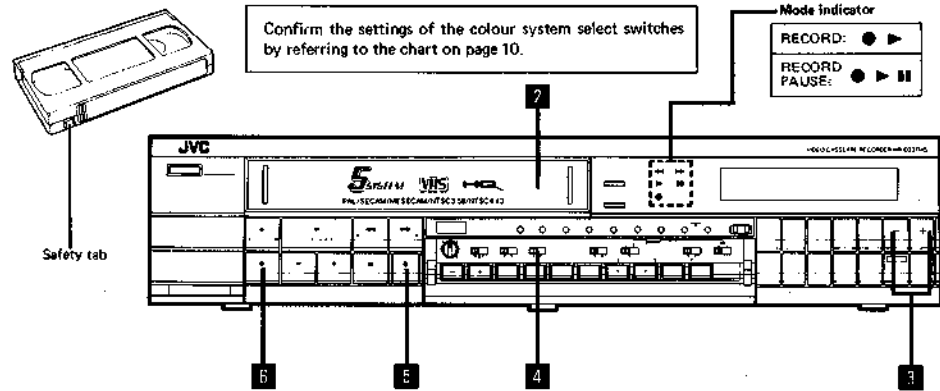
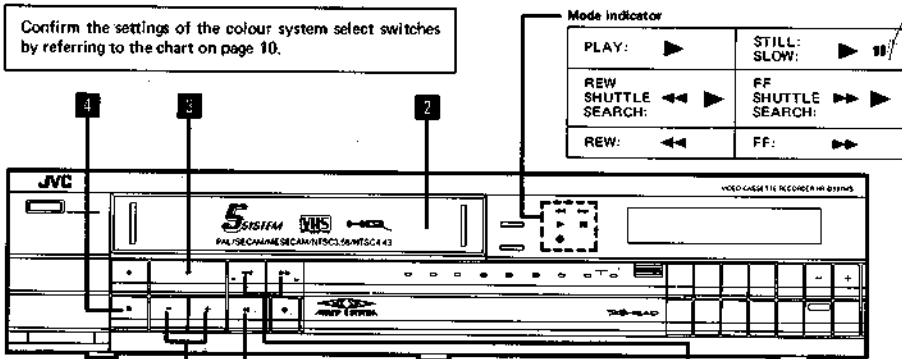
2 seconds. To set channel 1, 2 or 3, let it blink until it remains lit. To key in a two-digit number, enter the 2nd number while 1, 2 or 3 is blinking. The number entered first will be shifted to the tens place and channels 10 to 32 can be set. Invalid numbers (larger than 32) will be rejected.

Channel coverage and Available channels in each band

Band indicator	Frequency	Europe ch	USA ch	Japan ch
I	VHF band I (44 - 103 MHz)	E2 - E4 S1 - S10	2 - 6	1 - 2
III	VHF band III (102 - 300 MHz)	E5 - E12 S11 - S20	7 - 13 CABLE ch A - I J - W	3 - 12
U	UHF band (470 - 870 MHz)	E21 - E69	14 - 79	13 - 62

Note:

- It might happen for some reason in NTSC areas that channel searching does not function properly if colour system selection is in the AUTO mode. In such cases, before searching, set the AUTO/MANUAL switch to MANUAL, and the PAL/MESECAM-SECAM/NTSC switch to NTSC.



- Turn the TV receiver on and adjust it to your video channel.
- Load a pre-recorded cassette.
 - Power will be switched on automatically.
 - When the cassette loaded has no safety tab, playback will start automatically.
- Press PLAY .
 - The TAPE SPEED switch may be in either position. The SP, LP or EP mode recording is automatically detected and played back at a correct speed respectively with the corresponding indicator lit.
- Press STOP at the end of the programme.
 - The tape will be rewound automatically when its end is reached and the recorder will enter the Stop mode.

SHUTTLE SEARCH

Shuttle Search allows high-speed playback at 9 times (PAL/SECAM)/7 times (NTSC) normal speed in either direction.

- Press either REW or FF SHUTTLE SEARCH during playback.
 - No pictures in Shuttle Search of NTSC LP recordings.
 - Colours disappear in Shuttle Search of ME-SECAM LP recordings.
 - For briefer scanning, keep the SHUTTLE SEARCH button pressed for more than 2 seconds; when you release the button, the Search mode will be cancelled.
- To cancel the Search mode, press PLAY.

STILL PICTURE

- Press PAUSE/STILL during playback.
- To advance the still picture, press PAUSE/STILL a number of times.
 - Keeping this button pressed continuously advances the picture to give a slow-motion effect.
- To cancel the Still mode, press PLAY.

Notes:

- No pictures in still playback of LP/EP recordings.
- When the Still mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.
- With some televisions, the still picture may be unstable. This is not due to any defect of the unit.

Picture Sharpness Adjustment

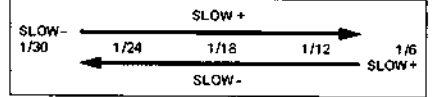
Images on the screen can be adjusted to a preferred softer or sharper definition by turning the PICTURE SHARPNESS control in the corresponding direction.

Tracking Adjustment

Noise bars may appear on the screen if you play back a tape which was recorded using another recorder. For correction, press either TRACKING control . Tracking will be reset to the preset standard each time the cassette is ejected. Use the same control for correction of the tracking in slow-motion playback.

SLOW-MOTION PLAYBACK

- Press the "-" button while in the Play or Still mode; slow-motion playback at 1/30 normal speed will start.
- Press the "+" button while in the Play or Still mode; slow-motion playback at 1/6 normal speed will start.
- Each time the "-" button is pressed, the tape speed becomes slower.
- Each time the "+" button is pressed, the tape speed becomes faster.

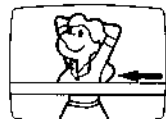


- Notes:**
- No pictures in slow-motion playback of LP/EP recordings.
 - With some video cassettes, the TV picture may distort during slow-motion playback. This is not due to any defect of the unit.

- Note:**
- Colours may slightly flicker with playback of NTSC EP recordings.

- Turn the TV receiver on and adjust it to your video channel.
- Load a cassette (with safety tab in place).
 - Power will be switched on automatically.
- Press either CH or the numeric keys to select the channel you wish to record.
- Select the recording speed (SP or LP/EP (NTSC)).
 - SP: 4 hours with an E-240 cassette (PAL/SECAM) 2 hours and 40 minutes with a T-160 cassette (NTSC)
 - LP: 8 hours with an E-240 cassette (PAL/SECAM)
 - EP: 8 hours with a T-160 cassette (NTSC)
- Press REC/ITR to start recording.
 - Be careful to press REC/ITR only once, or Instant Timer Recording will begin.
 - Press REC and PLAY simultaneously when using the remote control unit.
 - If there is part of the programme you don't want to record, press PAUSE/STILL . A white horizontal bar will appear on the screen, which reduces in size in 4 steps as time elapses. When the last quarter starts blinking and disappears, the Stop mode will be entered automatically. The pause duration is possible for about 5 minutes.

Pause mode indicator




- To continue recording from the Pause mode, press PLAY while the white bar is on-screen.
- Press STOP at the end of the programme.
 - When the end of the tape is reached during recording, the tape is automatically rewound and stops.

- Notes:**
- If you want to start recording from the Play mode, first engage the Record-Pause mode by pressing REC/ITR and PAUSE/STILL simultaneously and then press PLAY.

- When recording is restarted from the Pause mode, a few frames recorded before are erased due to overlap of the new recording. This is not due to any defect of the unit.
- The selected channel cannot be altered during recording. If you wish to change the channel, first engage the Pause mode and then select a different channel.

INSTANT TIMER RECORDING

If you wish for recording to stop automatically after a certain period of time, use this Instant Timer Recording mode.



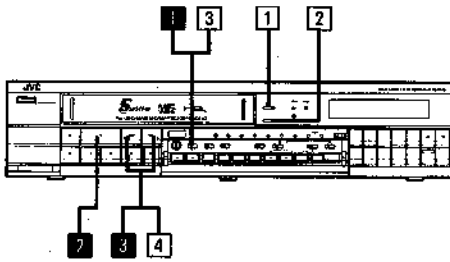
- Press REC/ITR during recording (or twice if in the Stop mode).
 - The FDP shows "REC STOP 0:30", showing that recording will automatically stop and power will switch off after 30 minutes.
- Adjust the switch-off time, if necessary.
 - Press REC/ITR to increase it in 30-minute increments (possible up to 4 hours).
 - Use SELECT and SET to set to a more precise time when required (possible up to 8 hours 59 minutes). After setting the time, press SELECT so that all digits stop blinking.

RECORDING ONE PROGRAMME WHILE WATCHING ANOTHER

A programme not being viewed can be recorded while you enjoy another programme.

- Select the channel you wish to record with the recorder's CH buttons.
- Select the channel you wish to view with the TV receiver's channel selector.

INDEX SEARCH AND COUNTER SEARCH



VHS Index Search System

When you start recording from the Stop or Timer Standby mode, an index code is marked on the tape. These index codes can be detected in the Shuttle Search mode.

- 1 Set TAPE MEMORY to INDEX.
- 2 Press PLAY to start playback.
- 3 Press REW or FF SHUTTLE SEARCH depending on the direction of search.
 - While the tape is being scanned, "INDX" will be displayed on the FDP.
- 4 When the first index code is detected, normal playback resumes automatically. To search for the next index code, press the same button once again.

Counter Search

The counter reading of "0000" can be located automatically.

- 1 Press COUNTER/LAP/CLOCK to obtain the Counter mode.
- 2 Press COUNTER RESET during playback or recording at a point which you wish to locate later.
- 3 Set TAPE MEMORY to COUNTER.

- 4 Press REW or FF when you need to return to the designated point.
 - The tape will stop automatically at about "0000".
 - When used in conjunction with the Memory Play function, this offers more convenience. See page 16.

ELAPSED RECORDING TIME INDICATOR

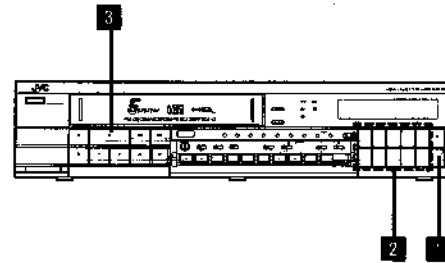
The tape counter is switchable to the elapsed recording time indicator.

1. Press COUNTER/LAP/CLOCK to obtain the Lap mode.
 - The lap time is counted up to 9 hours 59 minutes.
2. To reset the lap time to "0:00", press COUNTER RESET.

Notes:

- Unless the COUNTER RESET button is pressed in the Lap mode, the count is maintained even after the power is switched off (as long as the unit remains plugged in to an AC outlet).
- When the Lap mode is engaged during playback, counting does not take place, even though the current count is displayed.

COUNTER GO-TO FUNCTION



Counter Go-To

Specify the desired counter number, and the tape will be fast-forwarded or rewound to that point for automatic playback.

- 1 Press GO-TO in the Stop mode.
 - The counter will display the current position of the tape as calculated from the leader at the beginning of the tape.
- 2 Specify the counter number of the point you wish to locate, using the numeric keys.
- 3 Press PLAY.
 - The tape will be fast-forwarded or rewound depending on the relative position of the specified point, at which playback will start automatically.

Notes:

- If the recorder has not detected the leader tape since the tape was loaded, no number will be displayed when the GO-TO button is pressed, but after pressing the PLAY button, the tape will be rewound to the beginning (to enable counting from the leader) before fast-forwarding to the desired location.
- If the specified number exceeds the length of the tape, as calculated from the leader, the tape will fast-forward to the end, rewind to the beginning and then enter the Play mode.

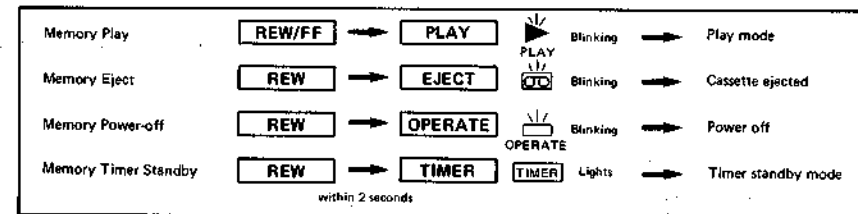
NEXT-FUNCTION MEMORY

Memory Play function

- If you want to watch the tape from its beginning after rewinding, press REW and then PLAY within 2 seconds. Playback will start automatically at the beginning of the tape. (The TAPE MEMORY switch must be in the OFF position.)
- If you want to watch the tape from the counter reading of "0000", set TAPE MEMORY to COUNTER, press REW (or FF) and then PLAY within 2 seconds.
- While the tape is being rewound, the PLAY indicator is blinking. To cancel the Memory Play mode and go to another mode, press the corresponding button (STOP, PLAY, FF, REW).

Memory Eject/Power-Off/Timer Standby

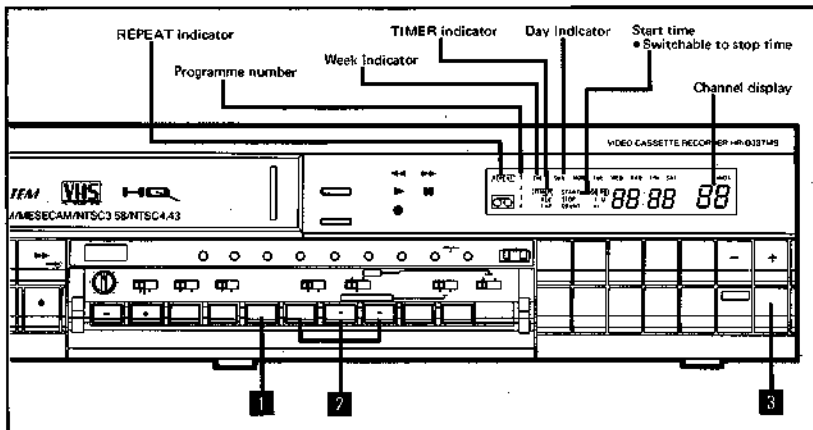
- If you are going to eject the cassette, turn the power off or engage the Timer Standby mode after rewinding the tape, you do not have to wait for completion of rewind to press the corresponding button.
- To eject the cassette after rewind, press REW and then EJECT within 2 seconds. (To cancel the Memory Eject mode, press STOP.)
 - To turn the power off after rewind, press REW and then OPERATE within 2 seconds. (To cancel the Memory Power-off mode, press OPERATE.)
 - To engage the Timer Standby mode after rewind, press REW and then TIMER within 2 seconds. (To cancel the Memory Timer Standby mode, press TIMER.)



AUTOMATIC TIMER RECORDING



First of all, load a cassette (with safety tab in place); power will be switched on automatically.

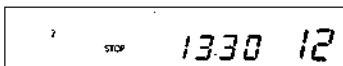


1 Press PROG

- The display will change to the Timer Set mode for programme number "1". To advance to programme number 2, 3 or 4, press PROG.

2 Set the day, start time, channel and stop time in succession by using the SELECT and SET buttons alternately.

- Select the item to be set with the SELECT button; the selected item will blink.
- Set the desired data with the SET buttons.



3 After making sure that the cassette is loaded, press TIMER

- The Timer Recording Standby mode will be engaged with the TIMER indicator and the preset programme number(s) illuminated and the power turned off.
- With no cassette loaded, the TIMER and "cassette loaded" indicators will continue blinking.
- A cassette whose safety tab has been removed will be ejected automatically.
- If a preset programme contains errors, that programme number will not be illuminated. Recheck the programmed data.

- If illuminated programme numbers are blinking, the time spans of those programmes overlap. Recheck their programmed data.

Setting the day

- With the SET "+" button, the day indication advances from "SUN" (first Sunday) to "SAT" (first Saturday), then "2nd SUN" (second Sunday) to "2nd SAT" (second Saturday) and then the all-days indication with "REPEAT" for daily serial recording.
- For weekly serial recording, press the REPEAT button any time in the Timer Set mode.
- The "REPEAT" entry can be cancelled by pressing the REPEAT button.

Setting the start and stop times

- It is not possible to set the start and stop times unless the clock has previously been set.
- Enter the data while the digits are blinking.
- The stop time can be set within 24 hours from the start time.

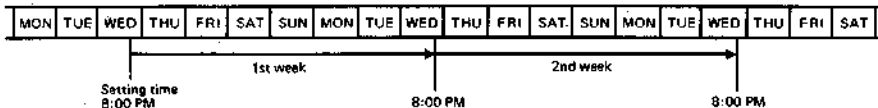
Cancelling the preset data

- The preset programmes can be cancelled. First engage the Timer Set mode for the programme number you wish to cancel and then press the CANCEL button.

Note:

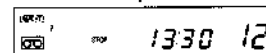
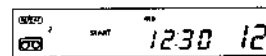
- The 1st week refers to the seven-day period from the present day and the 2nd week, to the following seven-day

period (not weeks on the calendar). These two weeks are counted from the time of setting.



Reviewing the programmed data

- Press the PROG button in the Timer Standby mode; the programmed data of the earliest-to-start programme will be shown for 6 seconds (3 seconds for START and 3 seconds for STOP) and then those of subsequent programmes, if any, in the same manner.



- If you wish to change the programmed data, engage the Timer Set mode (first press the TIMER button to disengage the Timer Standby mode and then press the PROG button) and call up the corresponding programme number for reprogramming.

Timer recording operation

- When the preset start time is reached, recording starts.
- After timer recording, the power is switched off. If the tape end is reached during timer recording, the cassette is automatically ejected and the power is switched off.
- After all preset programmes have been executed, the Timer Standby mode is cancelled.

RECORDING FROM AN EXTERNAL SOURCE

By connecting an external video source (such as a VideoMovie camera-recorder, 2nd video recorder, video camera, etc.) to the VIDEO IN, AUDIO IN connectors, recording and/or editing are possible.

- For connection of these units, an appropriate cable is necessary.
- For connection of a video camera, a camera adapter is also necessary. Connect the camera adapter's PAUSE terminal to the recorder's PAUSE connector, then you can control taping start/stop with the camera's start/stop switch. For proper connection of a camera, consult a JVC dealer.

- Turn the power on for all connected equipment.
- Adjust the TV receiver to your video channel.
- Load a cassette.
- Press either CH button or the numeric key 0/AUX to obtain "AU" in the channel display.
- Set the TAPE SPEED switch as required.
- Operate the source equipment properly.
- Press REC/ITR.
- To stop recording temporarily, press PAUSE/STILL.
- To end recording, press STOP.

Note:

- For the operation of the source equipment, refer to the instruction manual of the relevant machine.

Confirm the signal system of the camera being used and set the colour system select switches correctly to suit the camera. (See page 10.)

IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first . . .

Symptoms	Check points
No power is applied to the recorder.	<ul style="list-style-type: none"> ● Is the power cord disconnected? Connect it.
Playback picture does not appear while the tape is running.	<ul style="list-style-type: none"> ● Is the TV receiver's channel selector set to the correct video channel? Set to the RF converter channel.
Picture is normal but no sound.	<ul style="list-style-type: none"> ● Is the SYSTEM select switch set to the appropriate position?
Tape does not run in the Record mode.	<ul style="list-style-type: none"> ● Is the PAUSE/STILL button pressed? Press PLAY to release.
REC/ITR button cannot be engaged.	<ul style="list-style-type: none"> ● Is the cassette improperly loaded? Load it properly. ● Is the safety tab broken? Reseal the slot.
Tape stops in the Rewind or Fast Forward mode.	<ul style="list-style-type: none"> ● Is the TAPE MEMORY switch set to COUNTER? Set to OFF.
Tape will not rewind.	<ul style="list-style-type: none"> ● Is the tape already rewound to the end?
Noisy playback picture.	<ul style="list-style-type: none"> ● Adjust with the TRACKING controls.
Pressing PAUSE/STILL during playback brings a still picture (in a frame-by-frame manner) with noise bars.	<ul style="list-style-type: none"> ● Noise bars can be eliminated by pressing the PAUSE/STILL button a few more times.

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the power off and unplug the power cord. Then plug it in again and check the functions.

HEAD CLEANING

- Picture playback may become blurred or interrupted while the TV programme received is clear. This does not mean that the recorded programme has been erased.
- Dirt accumulated on the video heads after long periods of use causes such problems. In this case, head cleaning requiring highly technical care is necessary.

For head cleaning, consult the nearest JVC dealer.

SECTION 1 MECHANISM ADJUSTMENT

1.1 GENERAL

1.1.1 Precautions

IMPORTANT:

1. Disconnect unit from power before removing or soldering components.
2. When removing a fastener (screw, washer, etc.), be careful not to drop it into the mechanism. If a fastener should be dropped, be sure to retrieve it.
3. The tape transport mechanism has been precisely adjusted at the factory and ordinarily does not require re-adjustment.
4. When removing a part, be very careful not to damage or displace other parts. (Be especially careful with the tape guides and rotary video head drum.)
5. For service procedures that call for operation of the set when the cassette housing is separated from the main-deck, perform as below.
 - 1) Set a sheet of insulated material on the right of the chassis.
 - 2) Remove the cassette housing from the main-deck and place it on the insulated sheet, but do not disconnect the connector from the MAIN PWB.
 - 3) Insert a cassette into the cassette housing. The housing mechanism functions to retract the cassette.
 - 4) Disable the photo transistor sensor (END SENSOR) on the main-deck by applying an opaque cover.
 - 5) The desired modes can be obtained by using the operation switches.

1.1.2 Required test equipment, fixtures and tools

For proper mechanical adjustment, the following test equipment, fixtures and tools are strongly recommended. Without them, a long trial-and-error period would be necessary, resulting in possible damage. In addition, general-purpose tools are required.

1. Test equipment required:

Color television or monitor

Oscilloscope: Wide-band, dual trace, triggered, delayed sweep

Recording tape

Alignment tapes

Signal generator : PAL/SECAM/NTSC color bars, stairstep

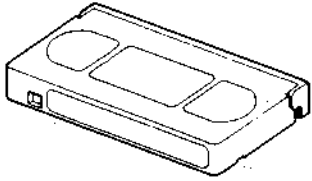
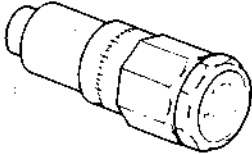
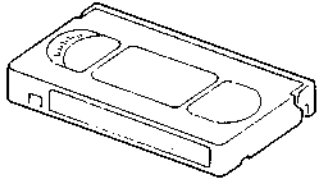
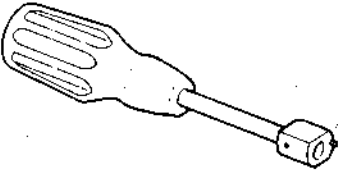
<p>JVC alignment tape MH-2/MH-2L MH-1/MH-1L/MH-4</p> 	<p>Torque gauge assembly PUJ48075-2 (Torquemeter : 600ATG Torquemeterhead : PUJ48016-2)</p> 	<p>Back tension cassette gauge PUJ48076-2</p> 
<p>A/CTL head position tool PUJ47351-2</p> 		

Table 1-1-1 Fixtures and tools

1.1.3 Disassembly (external covers)

1. Top cover
 - 1) Take out five screws from the right, left and rear sides of the set.
 - 2) Tilt up the rear end of the top cover, then remove the top cover.
2. Bottom cover
 - 1) Take out five screws from the bottom side of the set.
 - 2) Set free the bottom cover from six claws of the chassis in order to remove the bottom cover.
3. Front panel assembly
 - 1) Remove the top cover.
 - 2) Bend three upper hooks of the front panel assembly upward in order to disengage them from their chassis retainers.
 - 3) Disengage three lower hooks of the front panel assembly from their chassis retainers in order to remove the front panel assembly from the chassis.

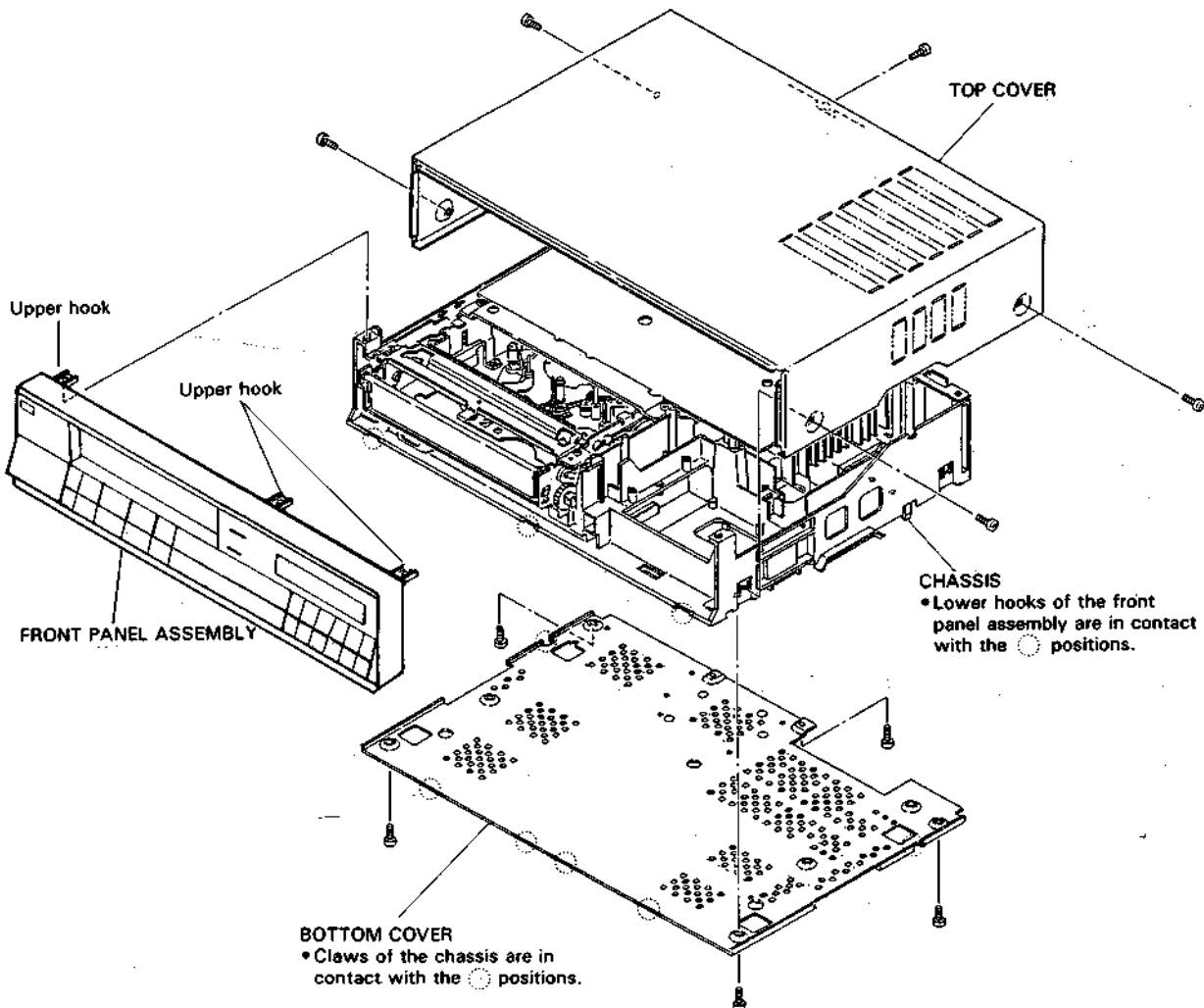


Fig. 1-1-1 Removal of external covers

1.1.4 Layout of main parts

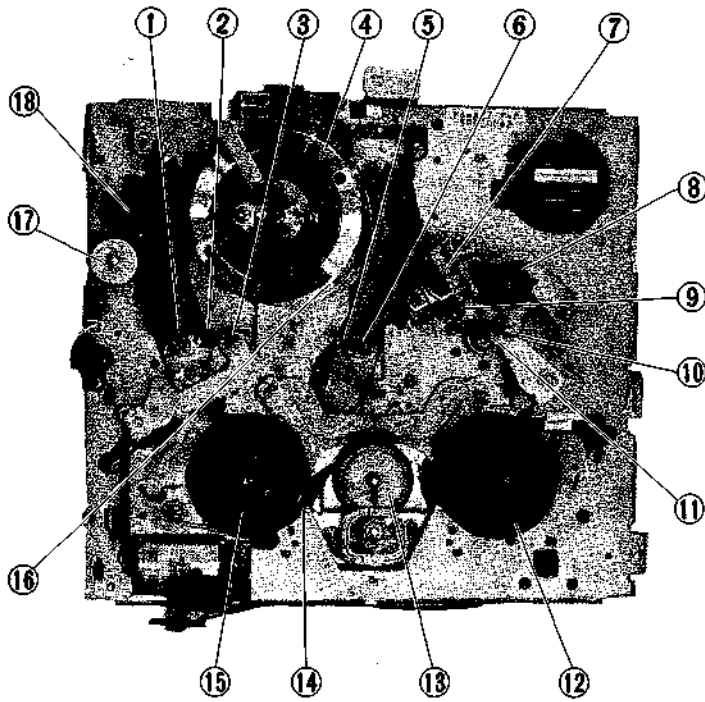


Fig. 1-1-2 Top view of main-deck

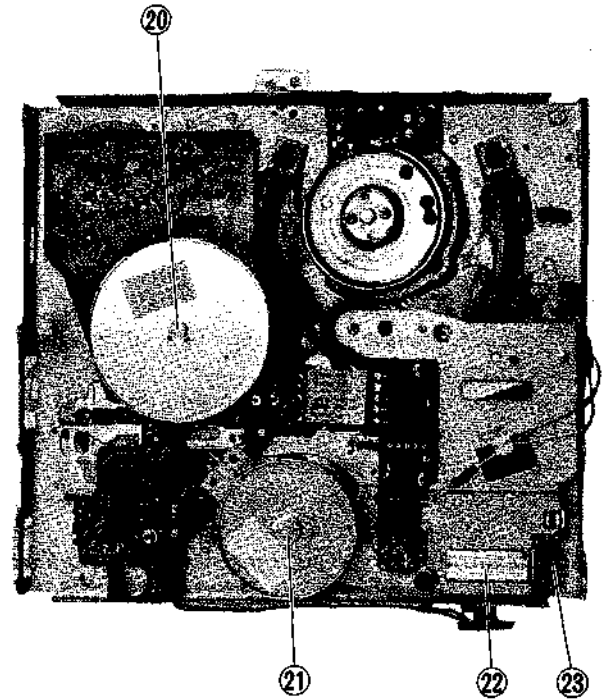


Fig. 1-1-3 Bottom view of main-deck

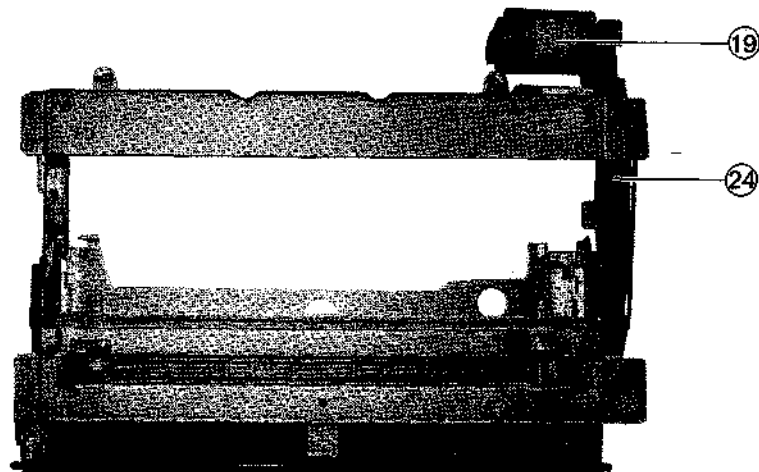


Fig. 1-1-4 Cassette housing

- | | | |
|-------------------------|-----------------------|----------------------|
| 1. Supply guide roller | 9. Take-up guide pole | 17. Impedance roller |
| 2. Supply slant pole | 10. Guide arm | 18. Full erase head |
| 3. Tension pole | 11. Capstan | 19. Cassette motor |
| 4. Upper drum | 12. Take-up reel disk | 20. Capstan motor |
| 5. Take-up slant pole | 13. Reel idler | 21. Reel motor |
| 6. Take-up guide roller | 14. Tension band | 22. Mode motor |
| 7. A/C head | 15. Supply reel disk | 23. Mode belt |
| 8. Pinch roller | 16. Lower drum | 24. Cassette belt |

1.2 MAIN ASSEMBLY REPLACEMENT

1.2.1 Upper drum assembly

Notes: When handling and installing the upper drum assembly, avoid directly touching the head tips on the upper drum assembly.

For cleaning the head tips, push and hold a lint-free cloth or chamois dampened with alcohol to the upper drum assembly by the fingers, then turn the upper drum assembly clockwise. Do not clean the upper drum assembly with a vertical stroke.

1. Removal

- 1) Take out a screw and remove the brush assembly from the drum assembly.
- 2) Unsolder all soldered portions on the DRUM PWB. Remove excess solder, then remove the DRUM PWB from the upper drum assembly.
Note: Soldered portion can be easily removed by removing solder with sucker or wick.
- 3) Take out two screws and remove the upper drum assembly upwards.

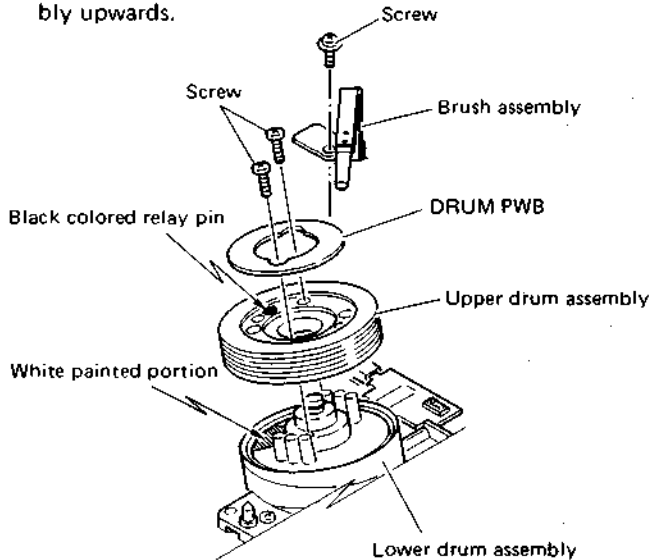


Fig. 1-2-1 Upper drum assembly

2. Installation

- 1) Install a new upper drum assembly so that the black-colored relay pin of the upper drum assembly overlies the white painted portion of the lower drum assembly, as shown in Fig. 1-2-1.
- 2) Tighten two screws in a balanced manner.
- 3) Set the DRUM PWB on the upper drum assembly, then resolder it.
- 4) Clean the drum unit (particularly clean the upper drum assembly).
- 5) Mount the brush assembly on the original position, then tighten a screw to fix the brush assembly.

3. Confirmation and adjustment

- 1) Perform the interchangeability confirmation. Refer to section 1.6.
- 2) Perform the PB switching point adjustment of the Servo (MAIN PWB) circuit. Refer to section 2.2.1.

1.2.2 A/C head (Audio/control head)

1. Removal

- 1) Disconnect connectors from the A/C HEAD PWB.
- 2) Take out two screws, then remove the A/C head and the head base together.
- 3) Unsolder and separate the A/C HEAD PWB from the A/C head.
- 4) Take out a screw and remove the shield cap from the A/C head.
- 5) Take out three screws and separate the A/C head from the head base. Use care regarding springs. Do not lose them.

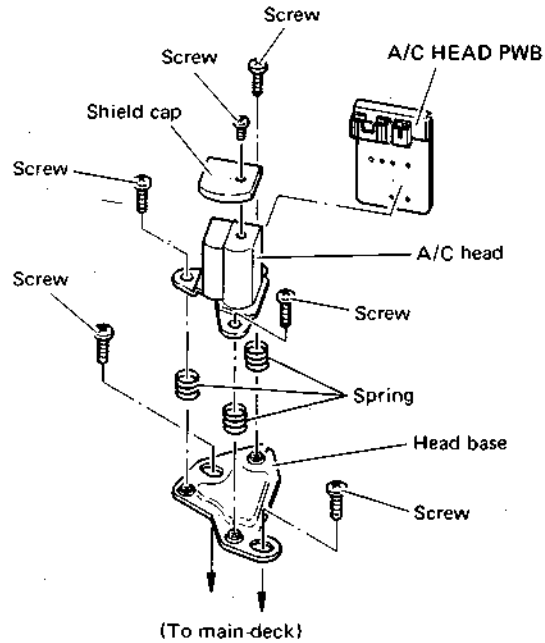


Fig. 1-2-2 A/C head

2. Installation

- 1) Mount a new A/C head and other peripheral parts on the main-deck by reversing the removal procedure.
- 2) Before installing the A/C head on the main-deck, perform rough-adjustment of A/C head height as shown in Fig. 1-2-3.

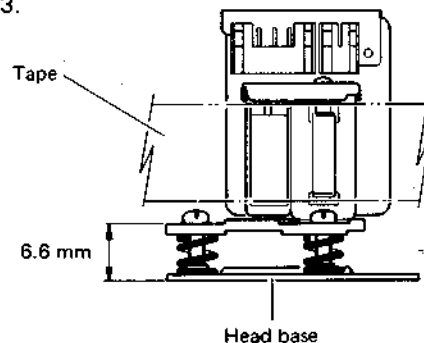


Fig. 1-2-3 A/C head height

3. Confirmation and adjustment

- 1) Use a recording tape and confirm correct tape transport operation, then perform interchangeability adjustment. Refer to sections 1.5 and 1.6.
- 2) Perform overall confirmation of the Audio circuit. Refer to section 2.4.

1.2.3 Tension band assembly

1. Removal

- 1) Take out a screw, then pry the A portion of the tension band assembly upwards to separate it from the tension arm assembly.

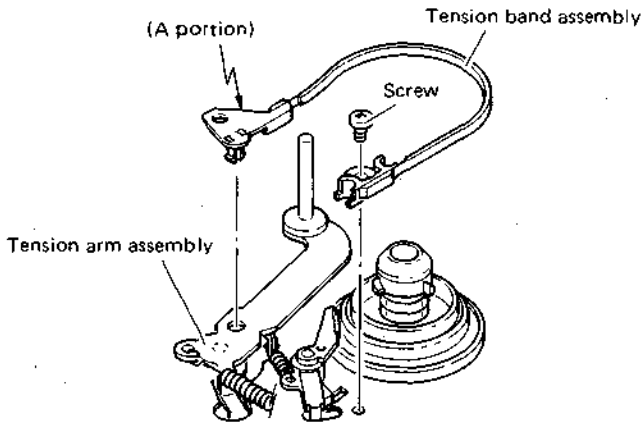


Fig. 1-2-4 Tension band assembly

2. Installation

- 1) Install a new tension band assembly by reversing the removal procedure.

3. Confirmation and adjustment

- 1) Perform tension pole position adjustment. Refer to section 1.4.1.

1.3 ASSEMBLY PROCEDURE OF MECHANISM

The mechanism of this model is mostly engaged to the mechanism control circuit, through the mode select switch. Therefore, the relation between the mode select switch and the control arm decides all mechanical movement of the mechanical parts such as levers, gears, rollers and so on. If these parts are not properly positioned, the unit will be unloaded or compulsorily stopped. This will result in damage of mechanical or electrical parts.

1.3.1 Loading arm assembly

Loading arm assembly consists of loading gear, torsion spring and loading arm.

1. Set up the loading arm assembly correctly as shown in Fig. 1-3-1.

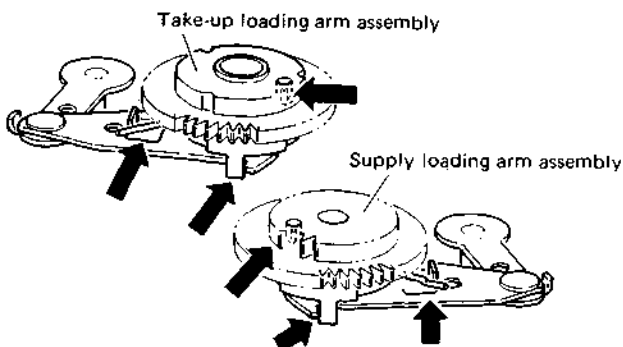


Fig. 1-3-1 Loading arm assembly (1)

2. Install the take-up loading arm assembly and the supply loading arm assembly so that the holes on the loading gears face each other, as shown in Fig. 1-3-2. Do not move the loading arm assemblies from this position for the next step.

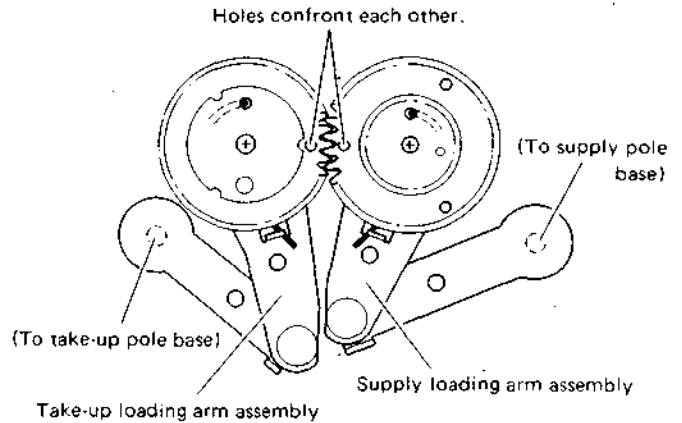


Fig. 1-3-2 Loading arm assembly (2)

1.3.2 Control cam

1. Set the arm gear assembly on the cam bracket assembly so that the hole of the arm gear assembly overlaps the hole of the cam bracket assembly.
2. Install the control cam on the cam bracket assembly so that the hole of the control cam overlaps the hole which is indicated in the step 1), as shown in Fig. 1-3-3. Do not turn the control cam from this position for the next step.

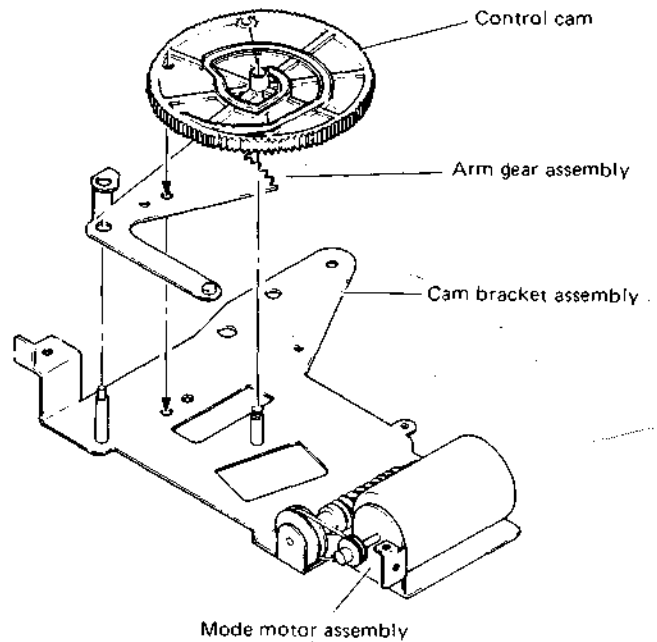


Fig. 1-3-3 Control cam

1.3.3 Cam bracket assembly

1. Push and hold the plate assembly so that the hole of the plate assembly overlaps the hole of the main-deck, as shown in Fig. 1-3-4.
2. Then mount the cam bracket assembly.

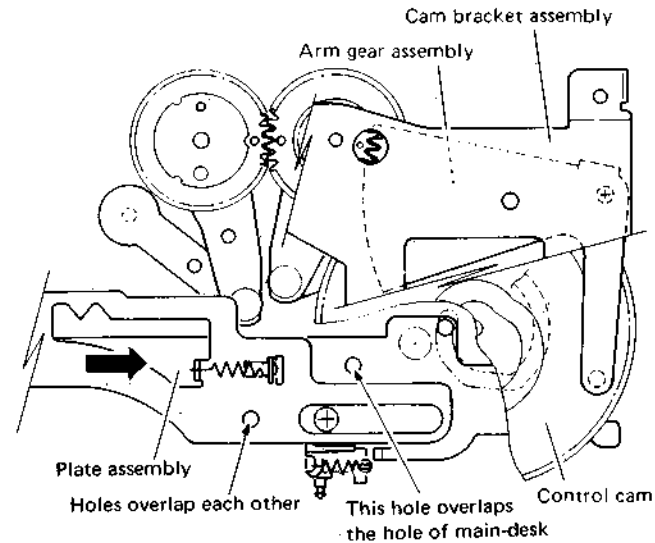


Fig. 1-3-4 Cam bracket assembly

Note: In order to overlap the holes turn the control cam fully counter clockwise by turning the mode motor with a finger.

1.3.4 Mode select switch

1. When the hole of the plate assembly overlaps the hole of main-deck, refer to Fig.1-3-4, confirm that the V-cut of the slider section just overlaps the V-cut of the outer section of the mode select switch.
2. If a difference of more than 0.5 mm is noticed, adjust the mode select switch to the correct position, after unsoldering and loosening the screw.

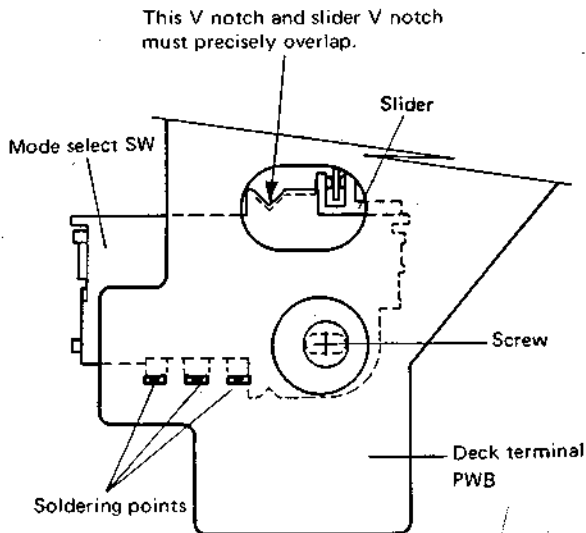


Fig. 1-3-5 Mode select switch

1.4 CONFIRMATION AND ADJUSTMENT

1.4.1 Tension pole position adjustment

1. Without loading a tape, set for the Play mode.
2. Loosen screw a little bit, then adjust the tension band holder so that the distance, shown in Fig. 1-4-1, becomes zero (0 mm).
3. Tighten screw to fix the tension band holder.

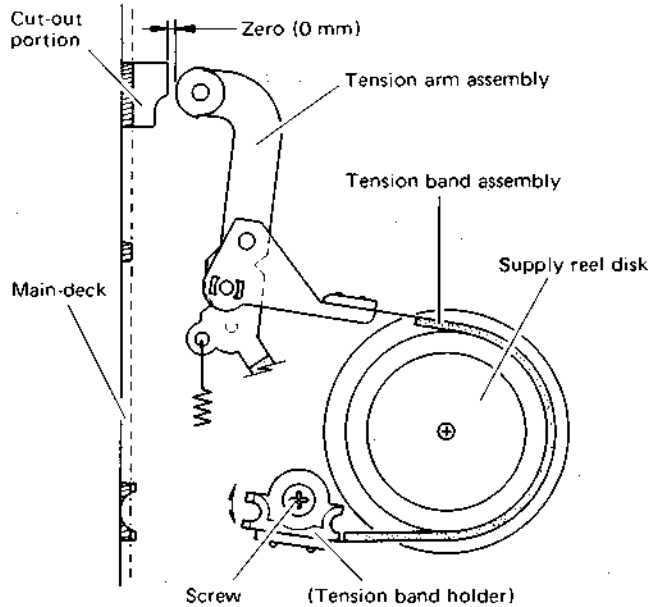


Fig. 1-4-1 Tension pole position

Note: By this adjustment, back tension is within normal specification, in spite of parts tolerances.

4. Use the back tension cassette gauge and set for the Play mode.
5. Confirm that the indication is between 25 – 75.

1.4.2 Take-up torque confirmation

1. Set the Play mode without the cassette housing assembly.
2. Set the torque gauge on the take-up reel disk.
3. The torque gauge consists of upper and lower sections connected by a spring mechanism. Relax the grip on the torque gauge so that the indicator needle and scale rotate at equal speed, then read the indication. The correct value is between 45 – 155.
4. If necessary, replace the take-up and supply clutches.

1.5 TAPE TRANSPORT SYSTEM CONFIRMATION AND ADJUSTMENT

Once adjusted to the complete condition, readjustment of the tape transport system is not necessary, except when the parts that compose the tape transport system are replaced due to troubles by long usage or unexpected accidents.

1.5.1 Tape transport system adjustment

1. Guide roller

To get the FM envelope into ideal shape for interchangeability, the height adjustment of the guide roller is needed.

Before turning the guide roller, slightly loosen the setscrew located under the guide roller. For loosening the setscrew, use the hex key (1.25 mm).

Note: Loosen the setscrew enough to allow the guide roller to be turned. If excessively loose, tape motion may turn the guide roller inadvertently.

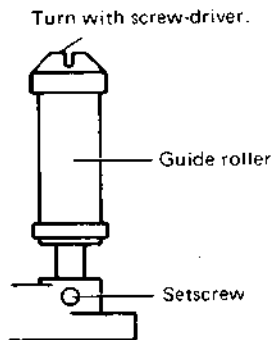


Fig. 1-5-1 Guide roller

2. Impedance roller

Normally, do not adjust the height of the impedance roller. Only when the defects of tape travel are noted at the impedance roller, after complete adjustment for interchangeability, adjust the height of impedance roller to obtain smooth tape travel. For adjustment of impedance roller height, use the nut-driver (5.5 mm).

Note: Do not lower the impedance roller excessively to avoid the defects of tape travel. Tape must be along the lower flange located under the impedance roller.

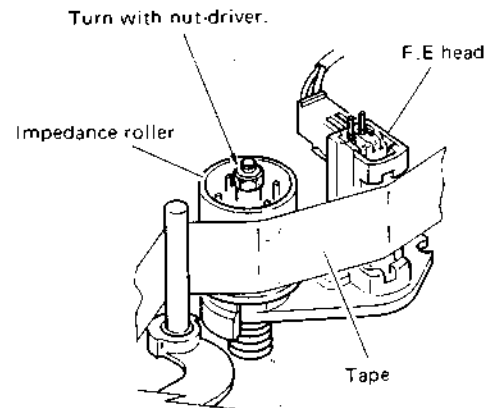


Fig. 1-5-2 Impedance roller

3. A/C head (audio/control head)

When defects of tape travel are noted at the take-up guide pole, adjust the inclination of A/C head to obtain smooth tape travel.

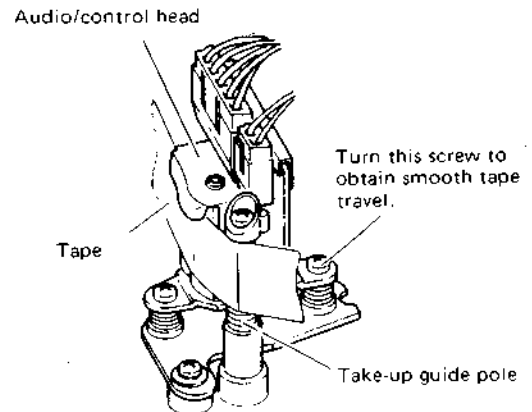


Fig. 1-5-3 A/C head

1.6 INTERCHANGEABILITY CONFIRMATION AND ADJUSTMENT

Before using an alignment tape, use a recording tape and confirm correct tape transport operation.

For the FM envelope output, connect an oscilloscope to TP6 of the PRE/REC. For audio output, connect to the AUDIO OUT terminal, and trigger the oscilloscope externally with the signal from TP11 of the SERVO PWB. Use only the stairstep segment of the alignment tape, do not use another segment for interchangeability.

1.6.1 FM envelope confirmation and adjustment

1. Push the TRACKING +/- buttons to obtain the maximum FM envelope output corresponding to (a) level in Fig. 1-6-1. Observe the FM envelope, read the maximum level (a) and the minimum levels (b), (c) and (d). Confirm that:

$$\frac{b}{a} \geq 0.7, \frac{c}{a} \geq 0.5 \text{ and } \frac{d}{a} \geq 0.5$$

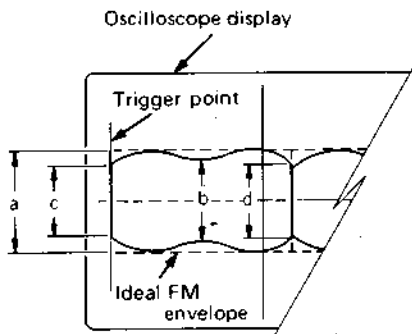


Fig. 1-6-1 FM envelope

2. If defects are noted, following adjustments are required.
 - 1) Observe the oscilloscope display and push the TRACKING +/- buttons to vary the FM output from maximum to minimum.
 - 2) If the variation is not parallel at the rising portion (drum entrance) of the FM envelope, turn the supply guide roller so that the rising portion of the envelope becomes nearly flat, as shown in Fig. 1-6-2.

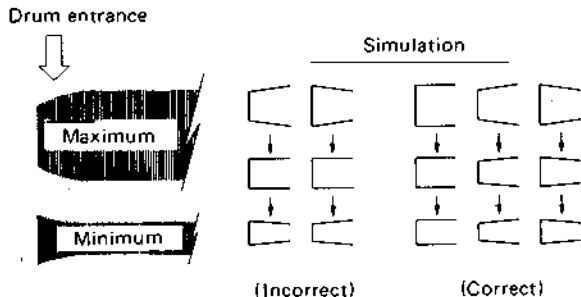


Fig. 1-6-2 Drum entrance

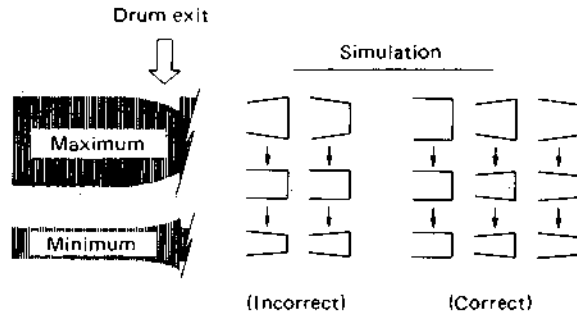


Fig. 1-6-3 Drum exit

- 3) In the same manner as for the rising portion, turn the take-up guide roller to adjust the falling portion (drum exit) of the FM envelope. See Fig. 1-6-3.
- 4) In addition to observing the envelope, confirm absence of tape curling or wrinkling at the impedance roller and take-up guide pole. If it occurs at the impedance roller, adjust the impedance roller height. If it occurs at the take-up guide pole, adjust the A/C head inclination.
- 5) Vary the FM envelope output level and perform fine adjustments of the guide rollers.

1.6.2 A/C head height and azimuth adjustments

Incorrect A/C head height can impair audio signal-to-noise ratio when playing back a pre-recorded tape.

1. For A/C head inclination, adjust screw (A) so that small tape wrinkles are not produced at the take-up guide pole. Turn screw (A) clockwise so that the tape wrinkles are apparent with the lower flange of the take-up guide pole, then turn screw (A) counter-clockwise so that the wrinkles smooth out.
2. Adjust azimuth with screw (B). Turn screw (B) to obtain maximum audio output.
3. For A/C head height, turn screws (A), (B) and (C) in succession by small and equal increments at a time and adjust for maximum audio output level.

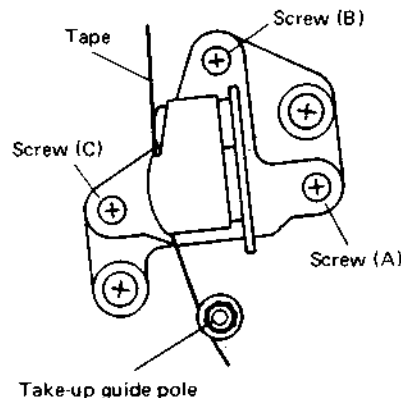


Fig. 1-6-4 A/C head

1.6.3 Control head phase adjustment

1. Set Tracking to Pre-Set Position by pushing both + button and - button at the same time.
2. Loosen screws (D) and (E) a little bit, then cover screw (D) with the A/CTL head position tool and set the pin of the tool into the hole next to screw (D).
3. Turn the tool counter-clockwise to shift the A/C head fully in the direction of the capstan, and then gradually turn the tool clockwise and observe the FM envelope output.
4. Set the A/C head at the point of the first output peak.

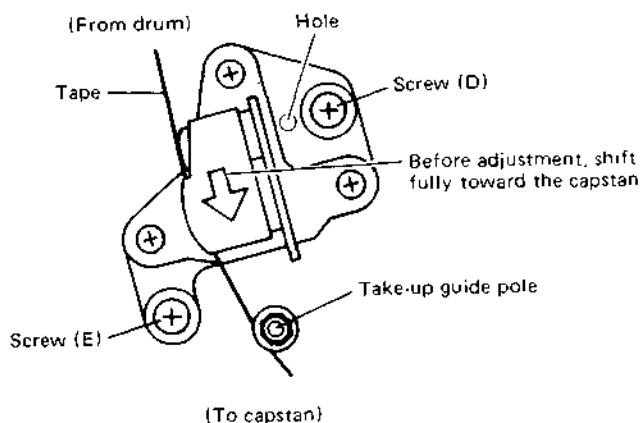


Fig. 1-6-5 Control head phase

1.6.4 Setscrew tightening

1. After confirming absence of tape wrinkling and other transport irregularities, tighten the setscrews located under the guide rollers while in the Stop mode.
Note: Since the guide rollers are easily moved, use care when tightening.
2. Again perform the FM envelope confirmation.

1.6.5 Final confirmation

1. Supply a video signal and perform recording, then play back.
Confirm that the FM envelope satisfies the specifications during playback of alignment tape MH-2.
2. Perform the PB switching point adjustment of the Servo circuit. Refer to section 2.2.1.
3. Perform the audio PB level adjustment of the Audio circuit. Refer to section 2.4.2.
4. Perform overall confirmation of the Video circuit. Refer to section 2.3.



SECTION 2 ELECTRICAL ADJUSTMENTS

2.1 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.

2.1.1 Required test equipment

1. Color television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio oscillator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: RF/IF sweep/marker
8. Signal generator: NTSC/PAL/SECAM color bar, stairstep
9. Recording tape
10. Alignment tapes: MH-1, MH-1L, MH-2, MH-2L, MH-4

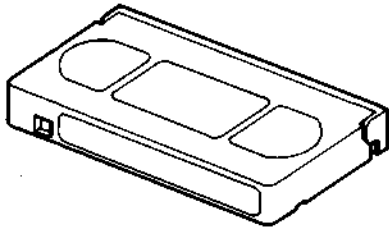


Fig. 2-1-1 Tape

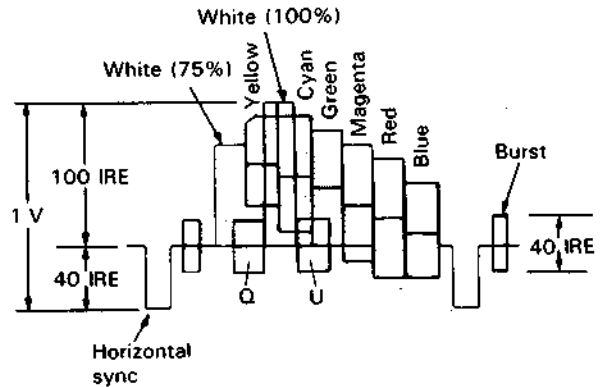


Fig. 2-1-2 Color bar signal waveform

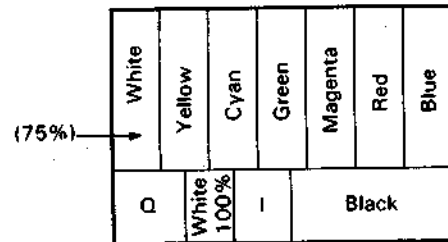
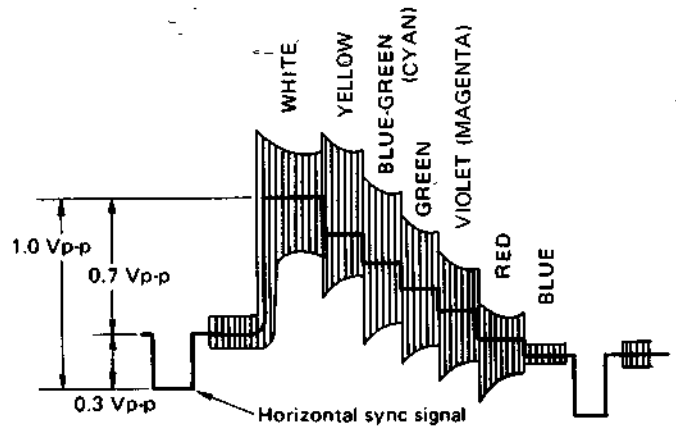
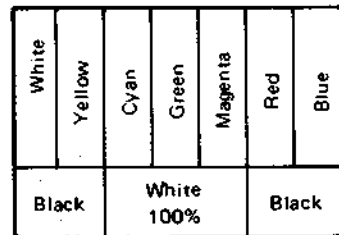


Fig. 2-1-3 PAL/NTSC color bar pattern



Color bar signal waveform



Color bar pattern

Fig. 2-1-4 SECAM color bar

2.2 TIMER CIRCUIT (2 0 TIMER Board)

Note: Unless otherwise specified, test points and variable resistors are located on the TIMER board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Timer clock	TP2	C101	E-E mode	<ol style="list-style-type: none"> 1) Connect a frequency counter to Pin 16 of IC1 and TP3 (GND). 2) Short TP1 to ground. 3) Reset the CPU by briefly shorting both leads of C10. 4) Adjust C12 for $2,048.000 \pm 0.002$ Hz. <p>Note: Adjust period T for the following value: $T = 488.2813 \pm 0.005 \mu s$</p>

2.3 SERVO CIRCUIT (4 8 SERVO Board)

Note: Unless otherwise specified, test points and variable resistors are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	PB switching point	TP11	R4 (PAL) R45 (NTSC)		<ol style="list-style-type: none"> 1) Connect an oscilloscope to VIDEO OUT. Trigger the oscilloscope externally with the signal from TP11. 2) Play color bar signal of the MH-2 alignment tape. 3) Adjust R4 for 6.5 ± 0.5 H. 4) Confirm difference within 1 H between + (plus) and - (minus) slopes. 5) In the same manner, play back MH-1 alignment tape and adjust R45 for NTSC.

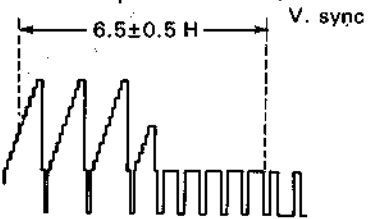


Fig. 2-3-1

2.4 VIDEO CIRCUIT (0 3 MAIN Board)

Note: Unless otherwise specified, test points and variable resistors are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Head Q	TP3, TP4, TP6 (PRE/REC)	R32, R33 (PRE/REC)	LP mode PB without tape	<ol style="list-style-type: none"> 1) Insert a cassette from which tape is absent and set for the LP Play mode. 2) Connect the oscilloscope to TP6 of the PRE/REC board. 3) Supply a sweep signal to TP3 of the PRE/REC board. 4) Adjust R32 to equalize the 1 MHz and 5 MHz levels. 5) In the same manner, apply the sweep signal to TP4 and adjust R33.
2	VXO	TP309	R328	E-E PAL mode	<ol style="list-style-type: none"> 1) Connect a frequency counter to TP309. 2) Adjust R328 for $4.433619 \text{ MHz} \pm 50 \text{ Hz}$.
3	REC FM level	TP3 (PRE/REC)	R204	LP-PAL mode	<ol style="list-style-type: none"> 1) Set for the PAL, LP mode and supply a PAL color bar signal input. 2) Connect the oscilloscope to TP3 of the PRE/REC board. 3) Record the PAL color bar. 4) Adjust the REC FM waveform for 1.3 Vp-p with R204.

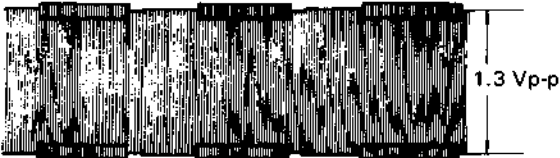

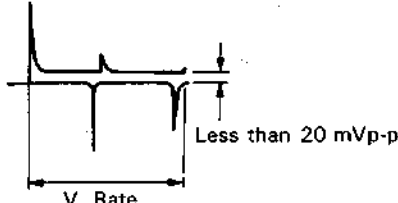
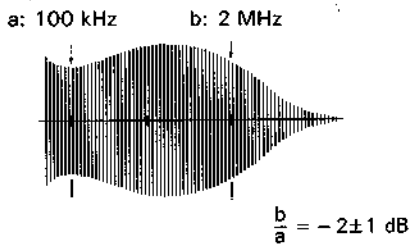


Fig. 2-4-1

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
4	SP REC color level	TP307	R639	SP-PAL mode MH-2 REC then PB	 <p>Fig. 2-4-2</p> <ol style="list-style-type: none"> 1) Play color bar signal of the MH-2 alignment tape. 2) Measure the color level at TP307. 3) Use a spare tape and record a color bar signal. Play it back and measure the color level at TP307. 4) Adjust R639 for 100%±5% color level between the alignment tape playback and the recorded signal playback. <p>Note: Confirm CH1 and CH2 level difference within 3 dB.</p>
5	LP REC color level	TP307	R640	LP PAL mode MH-2L REC then PB	<ol style="list-style-type: none"> 1) Repeat the above using the LP mode and the MH-2L alignment tape. 2) Adjust R640 for 90%±5% color level. <p>Note: Confirm CH1 and CH2 level difference within 3 dB.</p>
6	Noise cancel	TP121	R112 (PAL) R509 (NTSC)	MH-2 PB MH-1 PB	 <p>Fig. 2-4-3</p> <ol style="list-style-type: none"> 1) Play color bar signal of MH-2 alignment tape. 2) Connect the oscilloscope to TP121. 3) Adjust R112 for less than 20 mVp-p noise level. 4) In the same manner, play back NTSC color bar signal of MH-1. 5) Adjust R509 for less than 20 mVp-p.
7	Delay color level	TP416 TP408	R432	LP	<ol style="list-style-type: none"> 1) Record and playback PAL color bar signal in the LP mode. 2) Adjust R432 for equal color level at TP416 and TP408.
8	0.5 H delay video level	TP218 TP231	R223	E-E mode	<ol style="list-style-type: none"> 1) Supply a PAL color bar signal input and set for the EE mode. 2) Adjust R223 for equal Y signal level at TP218 and TP231.
9	Jump detect	TP423	R410 (Jumper detect PWB)	E-E mode	<ol style="list-style-type: none"> 1) Connect a jumper wire between TP433 and TP434. 2) Connect a frequency counter to TP432. 3) Adjust R410 for 30.0±0.2 kHz.
10	Video frequency response	VIDEO OUT	R515	SP PAL mode Video sweep	 <p>Fig. 2-4-4</p> <ol style="list-style-type: none"> 1) Record and play back the video sweep signal. 2) Adjust R515 to set the 2 MHz marker to -2±1 dB.
		VIDEO OUT	R517	LP PAL Video sweep	<ol style="list-style-type: none"> 3) Adjust R517 to set same condition as above.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
11	MESECAM DET. (1)	TP314	L351 R355	AUTO mode SECAM Color bar E-E	<ol style="list-style-type: none"> 1) Connect the oscilloscope to TP314. 2) As indicated in the figure, adjust R355 for more than 6.5 Vp-p without waveform distortion. 3) Adjust L351 for maximum waveform. <p>Note: Confirm more than 6.0 Vp-p during recording.</p>
	<p>Set this point to center position between points "A" and "B".</p>				Fig. 2-4-5
12	SECAM SP REC color level	TP207 (Color PWB)	R452 (MAIN PWB)	Color bar (SECAM) REC→PB	<ol style="list-style-type: none"> 1) Play color bar signal of MH-4 Alignment tape. 2) Connect oscilloscope to TP207 and measure the color level. 3) Record and playback color bar signal. 4) Again measure the TP207 signal. Adjust R452 to obtain $140 \pm 5\%$ of that from the Alignment tape.
	<p>SECAM signal for reference</p>				Fig. 2-4-6
13	SECAM LP REC color level	TP207 (Color PWB)	R430 (MAIN PWB)	Color bar (SECAM) REC→PB	<ol style="list-style-type: none"> 1) On the SERVO board, short TP4 and GND. 2) Play color bar signal of MH-4 Alignment tape. 3) Measure the color level at TP207. 4) Disconnect short from TP4. Record and playback color bar signal in LP mode. 5) Again measure the TP207 color level. Adjust R430 to obtain $110 \pm 5\%$ of that from the Alignment tape.
14	SECAM detector	TP214	R255 L251	Color bar (SECAM) E-E REC→PB	<ol style="list-style-type: none"> 1) In the EE mode, adjust L251 to obtain the waveform shown in the figure at TP214. 2) Record and playback color bar signal. Adjust R255 for 6.0 ± 0.5 Vp-p at TP214. <p>Confirm more than 4.0 Vp-p during recording.</p>
	<p>Set this point to center position between points "A" and "B".</p>				Fig. 2-4-7
15	NTSC SP REC color level	TP107 (Color PWB)	R655 (Color PWB)	MH-1L Color bar REC→PB	<ol style="list-style-type: none"> 1) Play color bar signal of MH-1 Alignment tape. 2) Connect oscilloscope to TP107 and measure the color level. 3) Record and playback color bar signal. Again measure the color level at TP107. 4) Adjust R655 for $95 \pm 5\%$ of the color level obtained from the Alignment tape.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
16	NTSC EP REC color level	TP107 (Color PWB)	R656 (Color PWB)	MH-1L Color bar REC→PB	1) Play color bar signal of MH-1L Alignment tape. 2) Connect oscilloscope to TP107 and measure the color level. 3) Record and playback color bar signal in EP mode. Again measure the color level at TP107. 4) Adjust R656 for $90 \pm 5\%$ of the color level obtained from the Alignment tape. Confirm channel difference within 4 dB.

2.5 AUDIO CIRCUIT (0 3 MAIN Board)

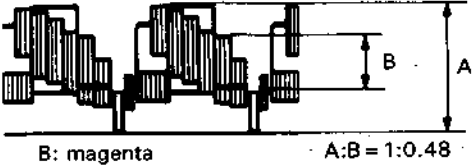
Note: Unless otherwise specified, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Bias voltage	TP31 TP32	R42	REC	1) Without connecting the input and output terminals, set the input selector switch to AUX. 2) Set for the Recording mode and use a voltmeter to measure the voltage between TP31 and TP32. 3) Adjust R42 to obtain 19 mVrms.

2.6 IF CIRCUIT (0 7 IF Board)

Note: Unless otherwise specified, all test points and adjustments are located on the IF board.

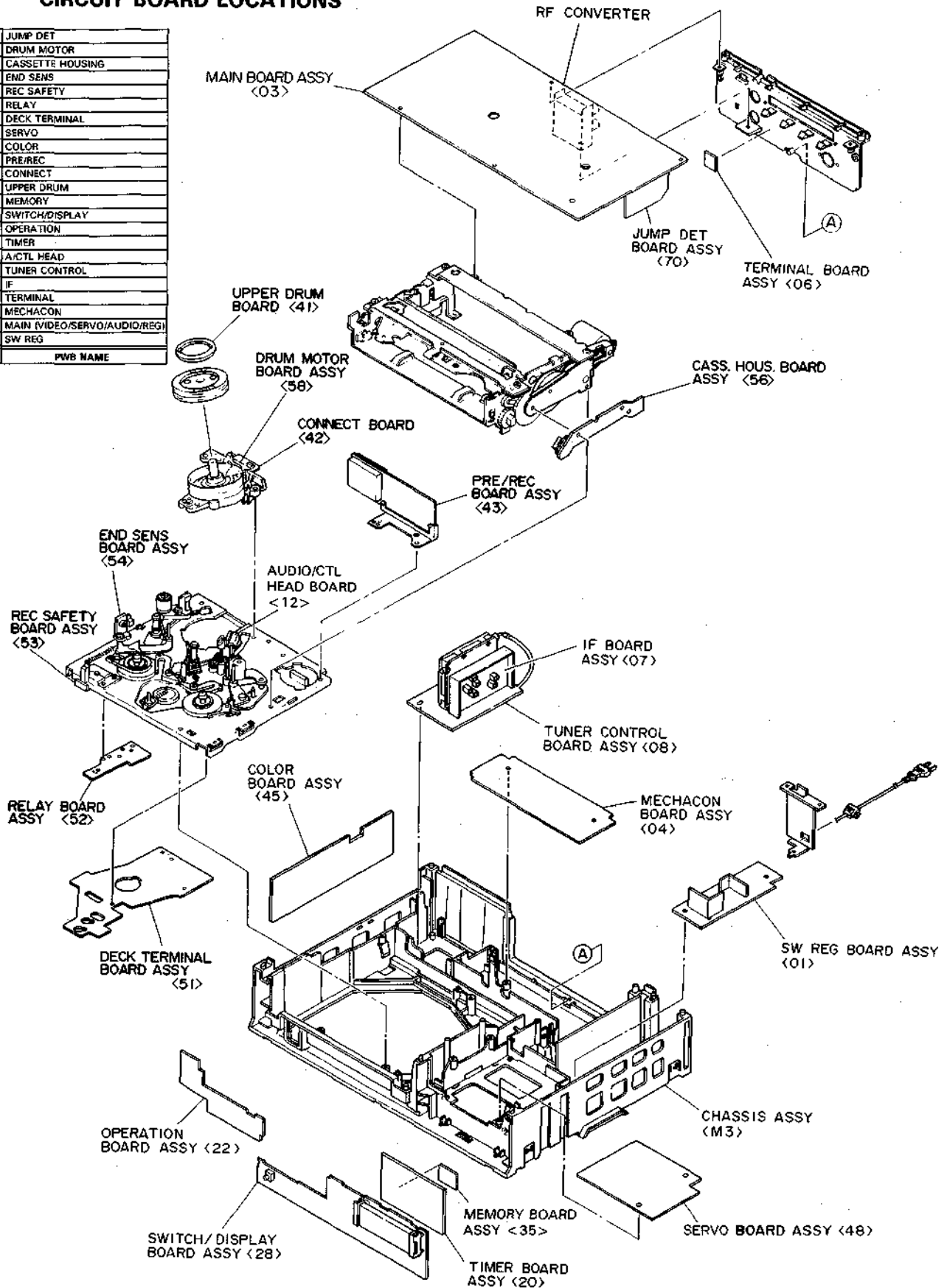
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
<p>• Equipment required</p> <ol style="list-style-type: none"> Oscilloscope IF sweep signal generator with suitable markers (PIF, SIF, etc.) DC power supplies—for power bias (12.0 V) for IF AGC bias (approx. 5 V variable) Sweeper probe (sweep signal supply cable) as shown below. 					
<p>Fig. 2-6-1 Sweep Probe</p>					
1	LLD coil	Video DET Out	T4	Sweep generator	1) Apply sweep signal to pin 5 of IC1. 2) Apply DC voltage to IC1 pin 2 so that 1 Vp-p is obtained from pin 18. 3) Adjust T4 for maximum 38.9 MHz marker.
2	AFC	Video DET Out	T3	Sweep generator	1) Apply sweep signal to pin 5 of IC1. 2) Apply DC voltage to IC1 pin 2 for maximum output from pin 13. 3) Adjust T3 to set the 38.9 MHz marker to 4.5 V.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
3	Sound trap	Base of Q1	T1	Sweep generator	<ol style="list-style-type: none"> 1) Apply sweep signal to pin 2 of JP1. 2) Apply DC 12 V to IC3 pin 13. 3) Connect the oscilloscope to the base of Q1. 4) Adjust T1 for minimum 34.4 MHz marker.
4	Color level	Video out CN1-1	R57	Signal GEN	<ol style="list-style-type: none"> 1) Receive a color bar signal. 2) As indicated in the figure, adjust R57 for 54% magenta level.
 <p>B: magenta A:B = 1:0.48</p> <p>PAL signal</p> <p>Fig. 2-6-2</p>					
5	AGC	JP1, 2 Pin	R11	Broadcast	<ol style="list-style-type: none"> 1) Turn R11 for maximum level at the front end IF terminal. 2) Then adjust R11 for 7 dB less than the maximum value.

SECTION 3 CHARTS AND DIAGRAMS

3.1 CIRCUIT BOARD LOCATIONS

70	JUMP DET
58	DRUM MOTOR
56	CASSETTE HOUSING
54	END SENS
53	REC SAFETY
52	RELAY
51	DECK TERMINAL
48	SERVO
46	COLOR
43	PRE/REC
42	CONNECT
41	UPPER DRUM
35	MEMORY
28	SWITCH/DISPLAY
22	OPERATION
20	TIMER
12	A/CTL HEAD
08	TUNER CONTROL
07	IF
06	TERMINAL
04	MECHACON
03	MAIN (VIDEO/SERVO/AUDIO/REG)
01	SW REG
NO.	PWB NAME

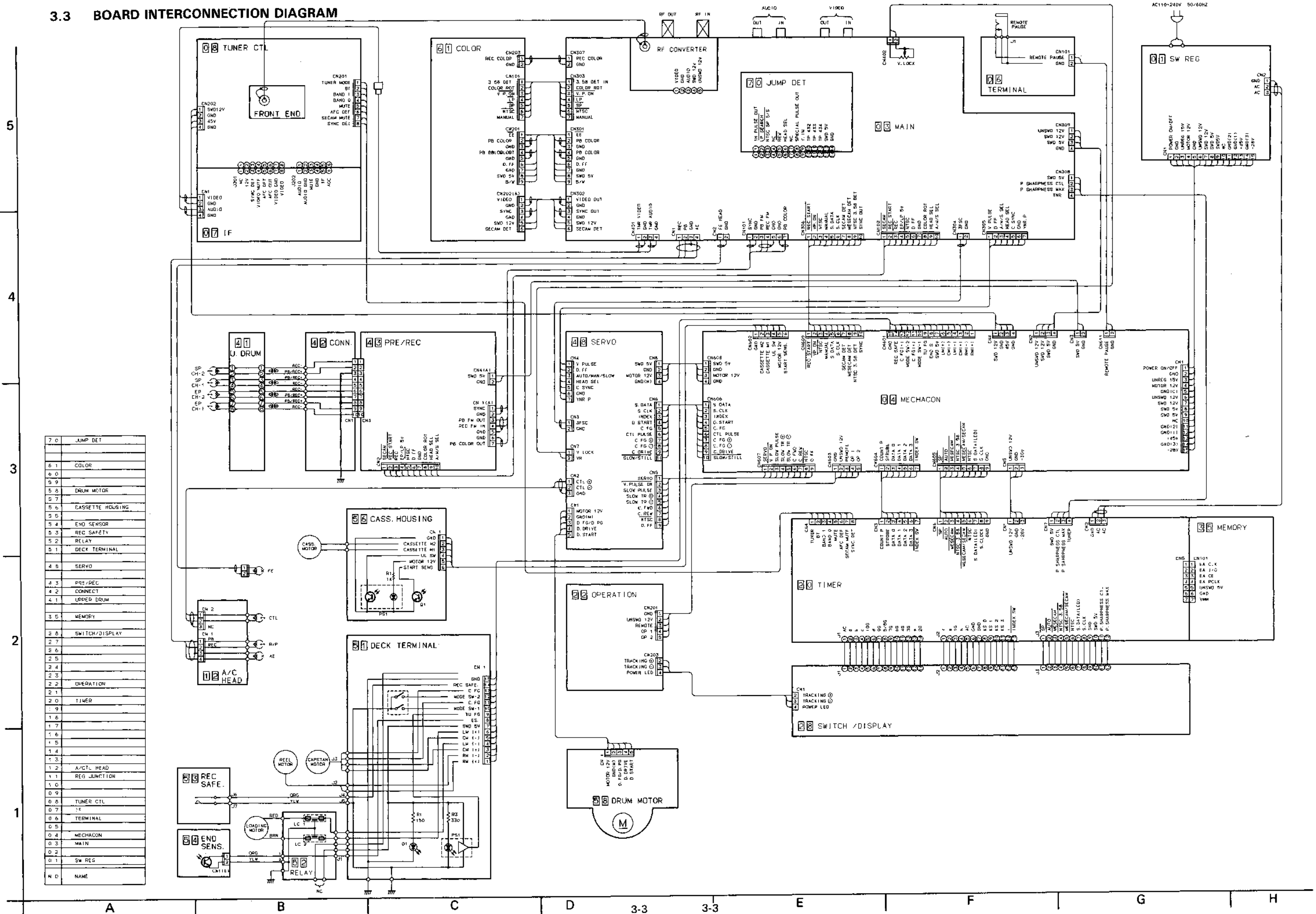


3.2 MAIN TYPES OF ACTIVE AND PACKAGE CIRCUITS

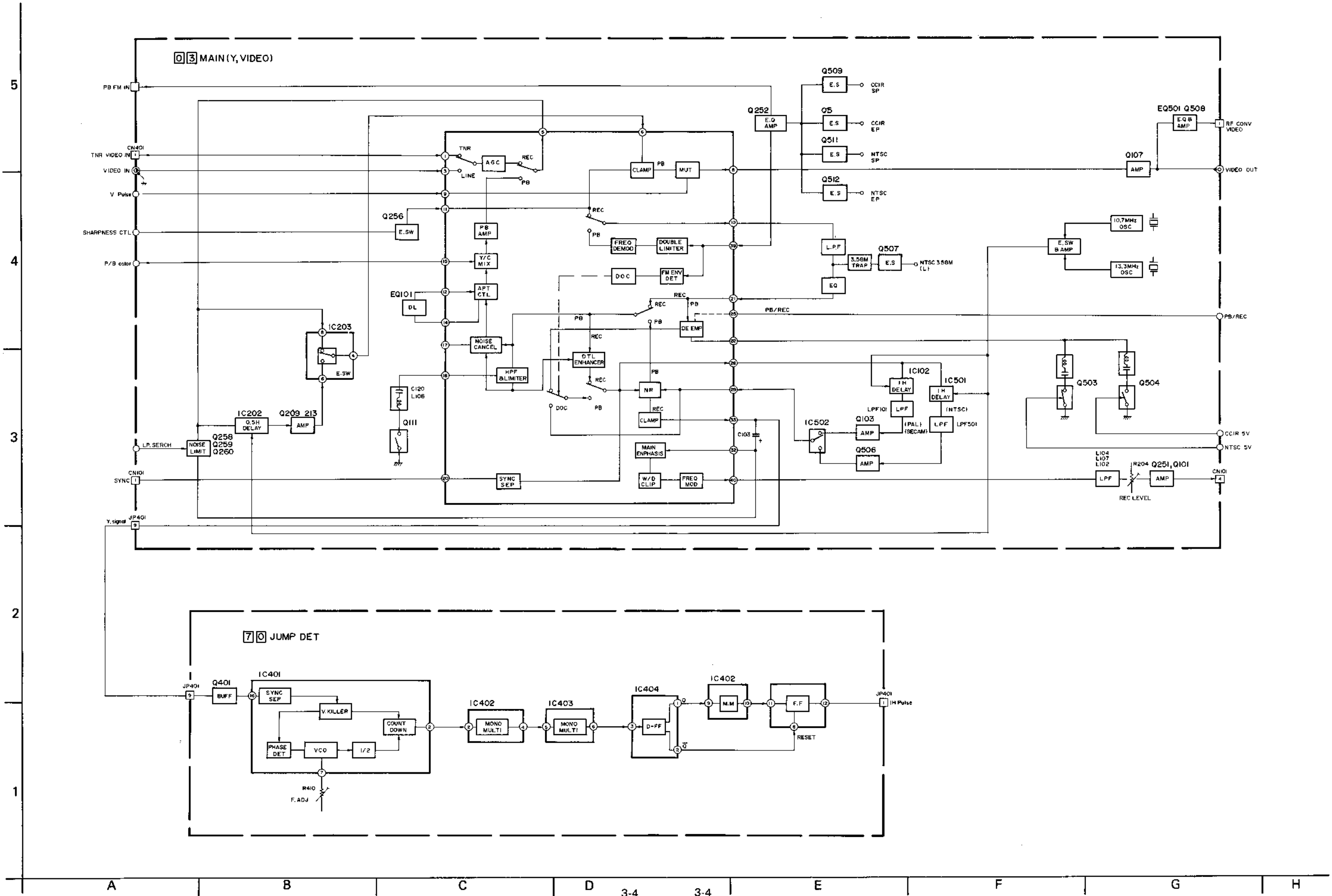
INTEGRATED CIRCUIT		TRANSISTOR		DIODE	
NAME	L	NAME	L	NAME	L
BA6222 BA6259N BU4069UB HA118019NT HD49722NT	1A 1A 2A 3A 3A	DTA114EU DTA114TS DTC144ES DTC144EU DTC144WU	3C 1D 1D 3C 3C	DAN202U HVP21-01S4A RD4.7ES-T1B3 SLH-56DC3F S1WB(A)60	2D 3D 1E 2E 3E
M50965-358SP NJM2233AS NJM2234S PB20166F STK5474	1B 2B 2B 3B 1C	DTD114ES 2SA1532(C) 2SA1576(RS) 2SC4081(RS)	1D 3C 3C 3C		
STR-D1760-F UPD75212ACW-014	2C 1B				

	A	B	C	D	E
1					
2					
3					

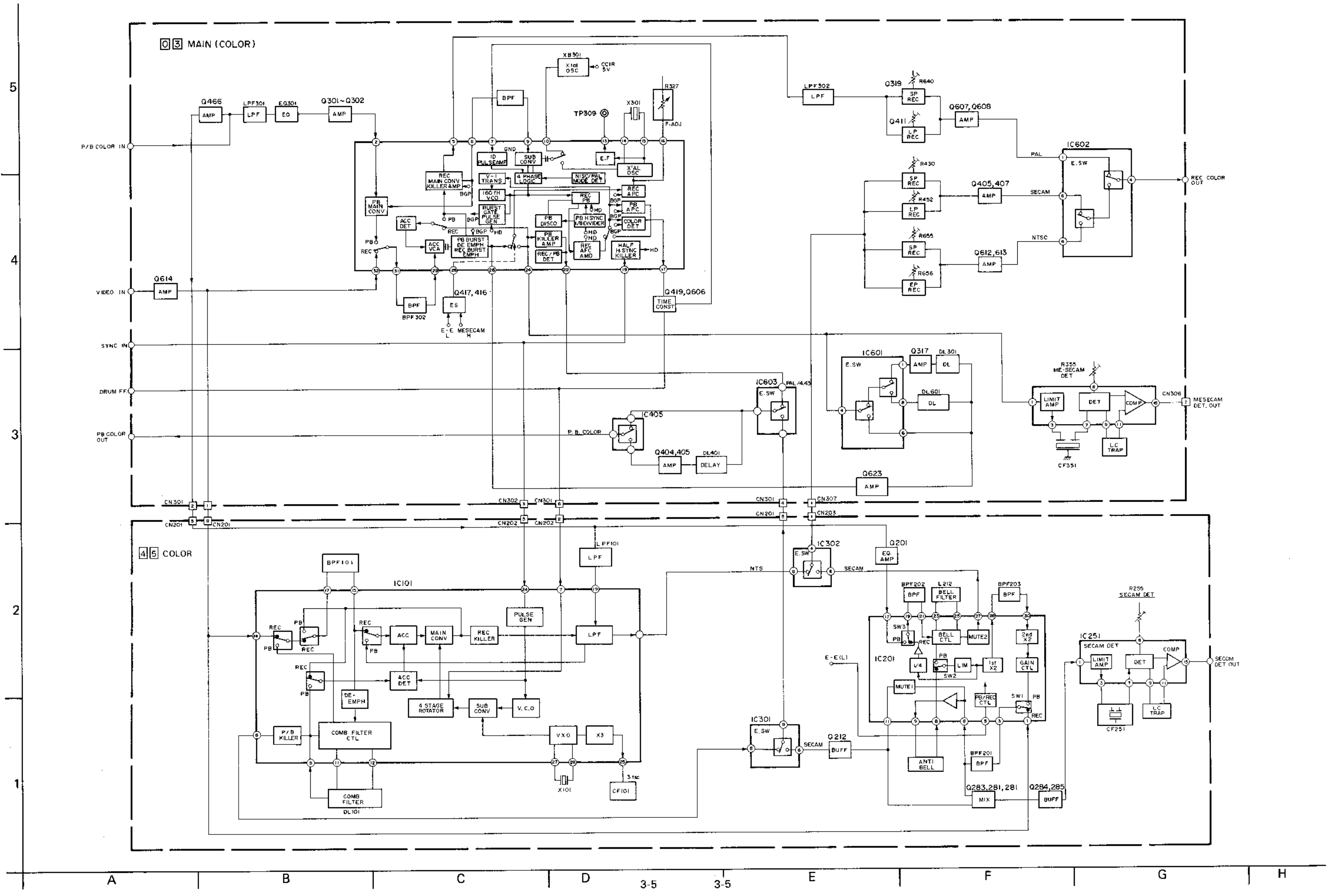
3.3 BOARD INTERCONNECTION DIAGRAM



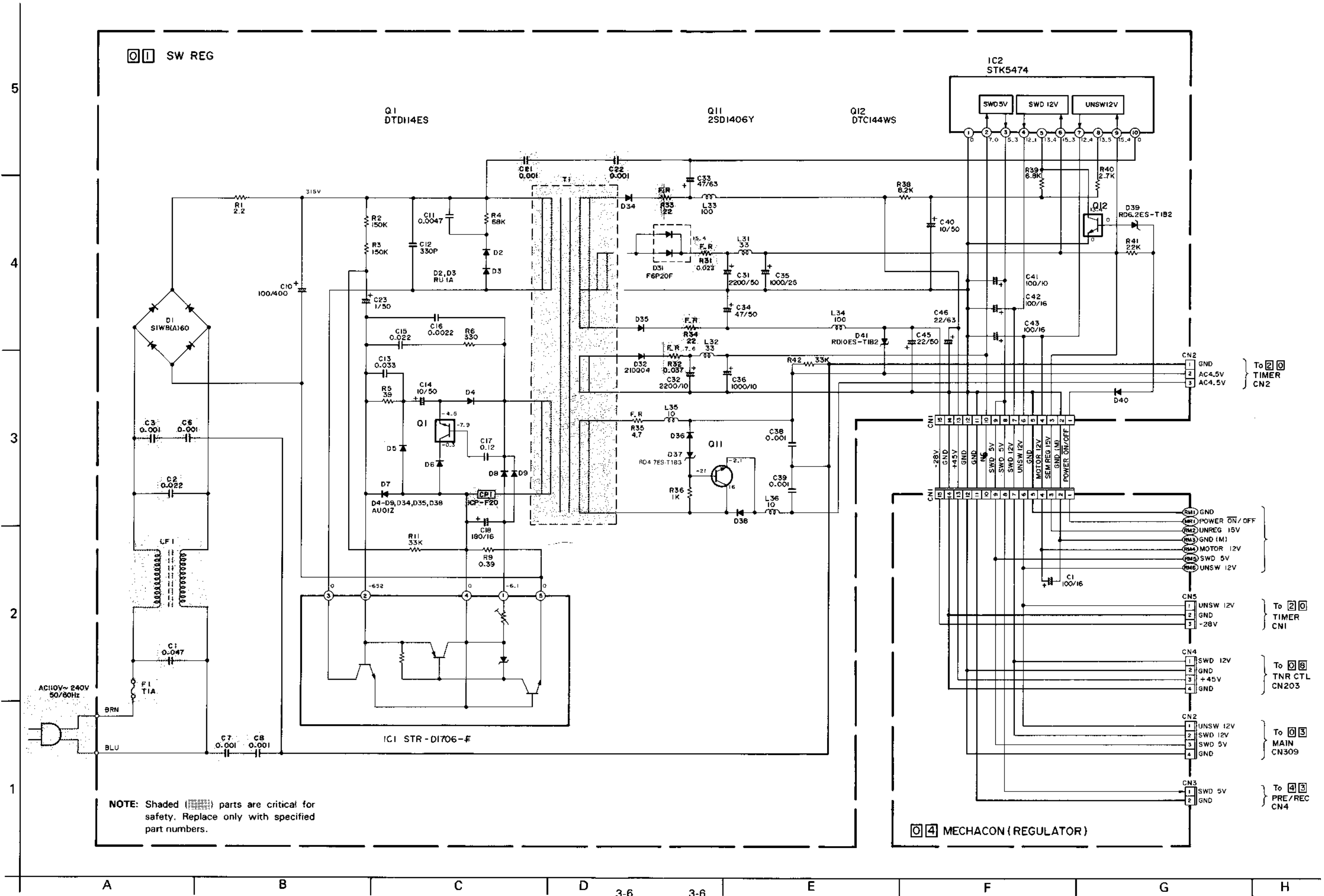
3.4 VIDEO (LUMINANCE) BLOCK DIAGRAMS



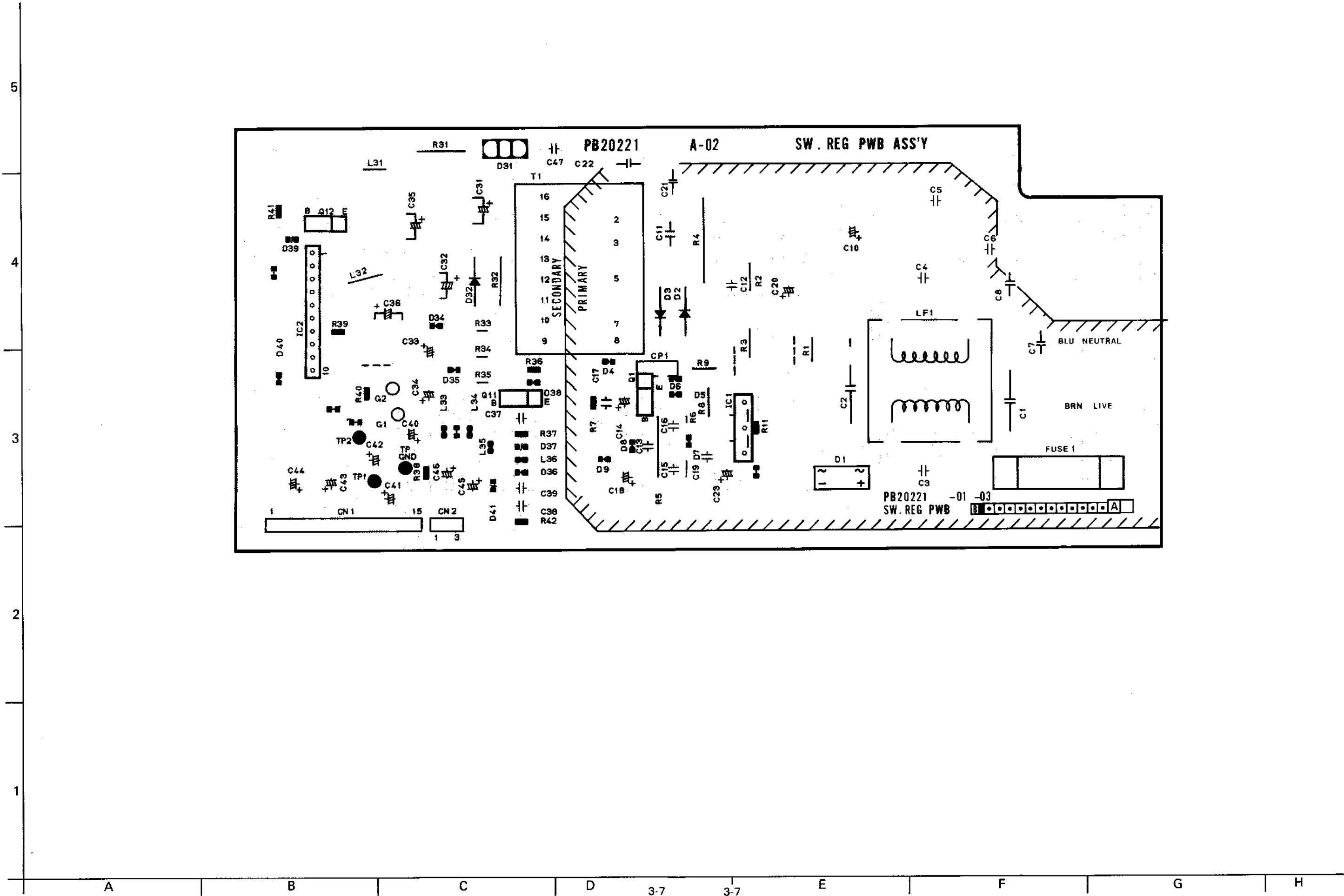
3.5 VIDEO (COLOR) BLOCK DIAGRAMS



3.6 SWITCHING REGULATOR SCHEMATIC DIAGRAMS

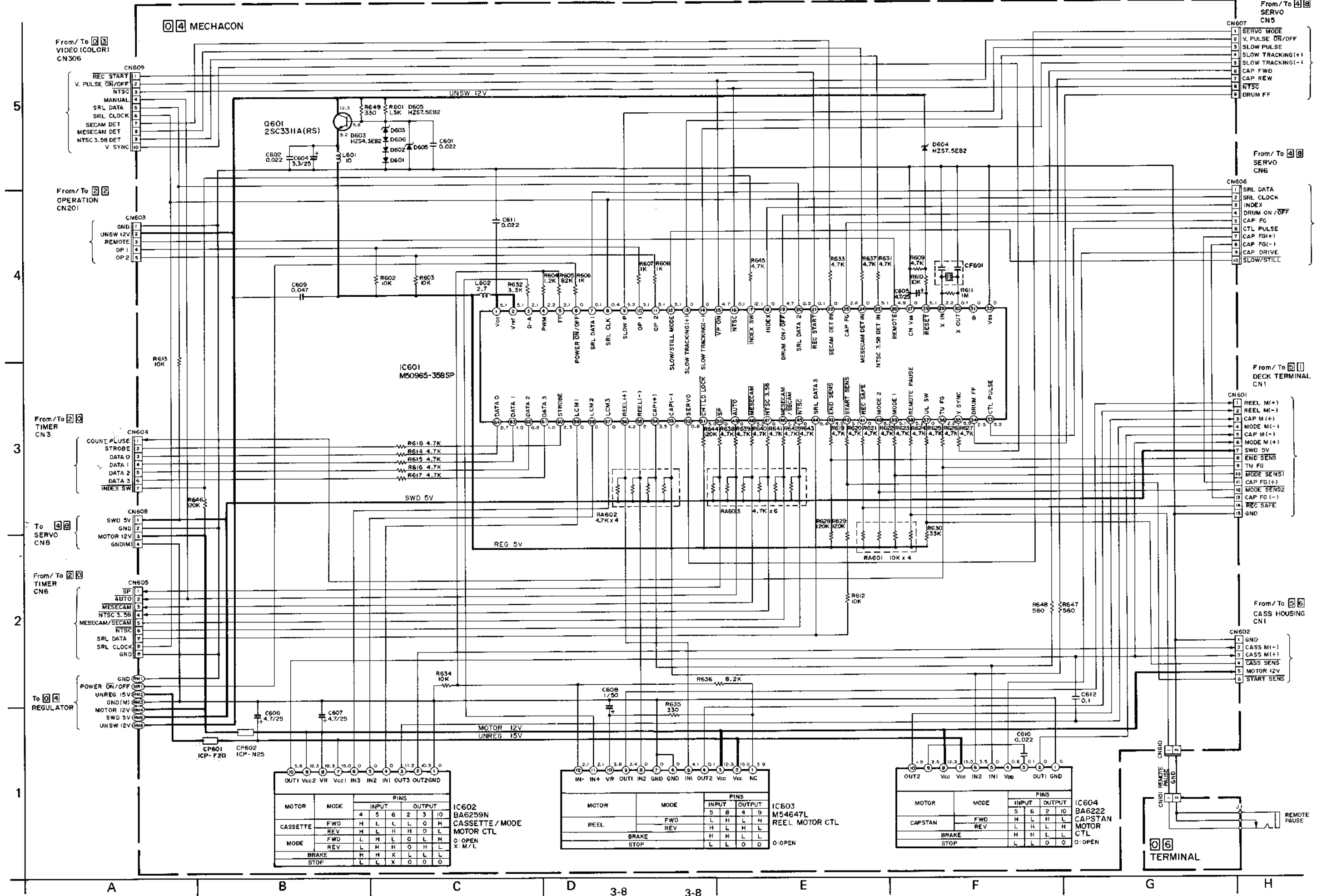


3.7 SWITCHING REGULATOR CIRCUIT BOARD



NOTE: Shaded () parts are critical for safety. Replace only with specified part numbers.

3.8 MECHACON SCHEMATIC DIAGRAM



MOTOR	MODE	PINS							
		INPUT				OUTPUT			
CASSETTE	FWD	H	L	L	L	O	H		
	REV	H	L	H	O	L	H		
MODE	FWD	L	H	L	O	L	H		
	REV	L	H	H	O	H	L		
BRAKE	STOP	H	H	X	L	L	L	L	L
	STOP	L	L	X	O	O	O	O	O

MOTOR	MODE	PINS							
		INPUT				OUTPUT			
CASSETTE	FWD	H	L	L	L	O	H		
	REV	H	L	H	O	L	H		
MODE	FWD	L	H	L	O	L	H		
	REV	L	H	H	O	H	L		
BRAKE	STOP	H	H	X	L	L	L	L	L
	STOP	L	L	X	O	O	O	O	O

MOTOR	MODE	PINS							
		INPUT				OUTPUT			
REEL	FWD	L	H	L	H	L	H		
	REV	H	L	H	L	H	L		
BRAKE	STOP	H	H	X	L	L	L	L	L
	STOP	L	L	X	O	O	O	O	O

MOTOR	MODE	PINS							
		INPUT				OUTPUT			
CAPSTAN	FWD	H	L	H	L	H	L		
	REV	L	H	L	H	L	H		
BRAKE	STOP	H	H	X	L	L	L	L	L
	STOP	L	L	X	O	O	O	O	O

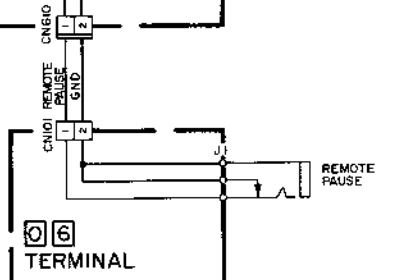
MOTOR	MODE	PINS							
		INPUT				OUTPUT			
CASSETTE	FWD	H	L	L	L	O	H		
	REV	H	L	H	O	L	H		
MODE	FWD	L	H	L	O	L	H		
	REV	L	H	H	O	H	L		
BRAKE	STOP	H	H	X	L	L	L	L	L
	STOP	L	L	X	O	O	O	O	O

A B C D 3-8 E F G H

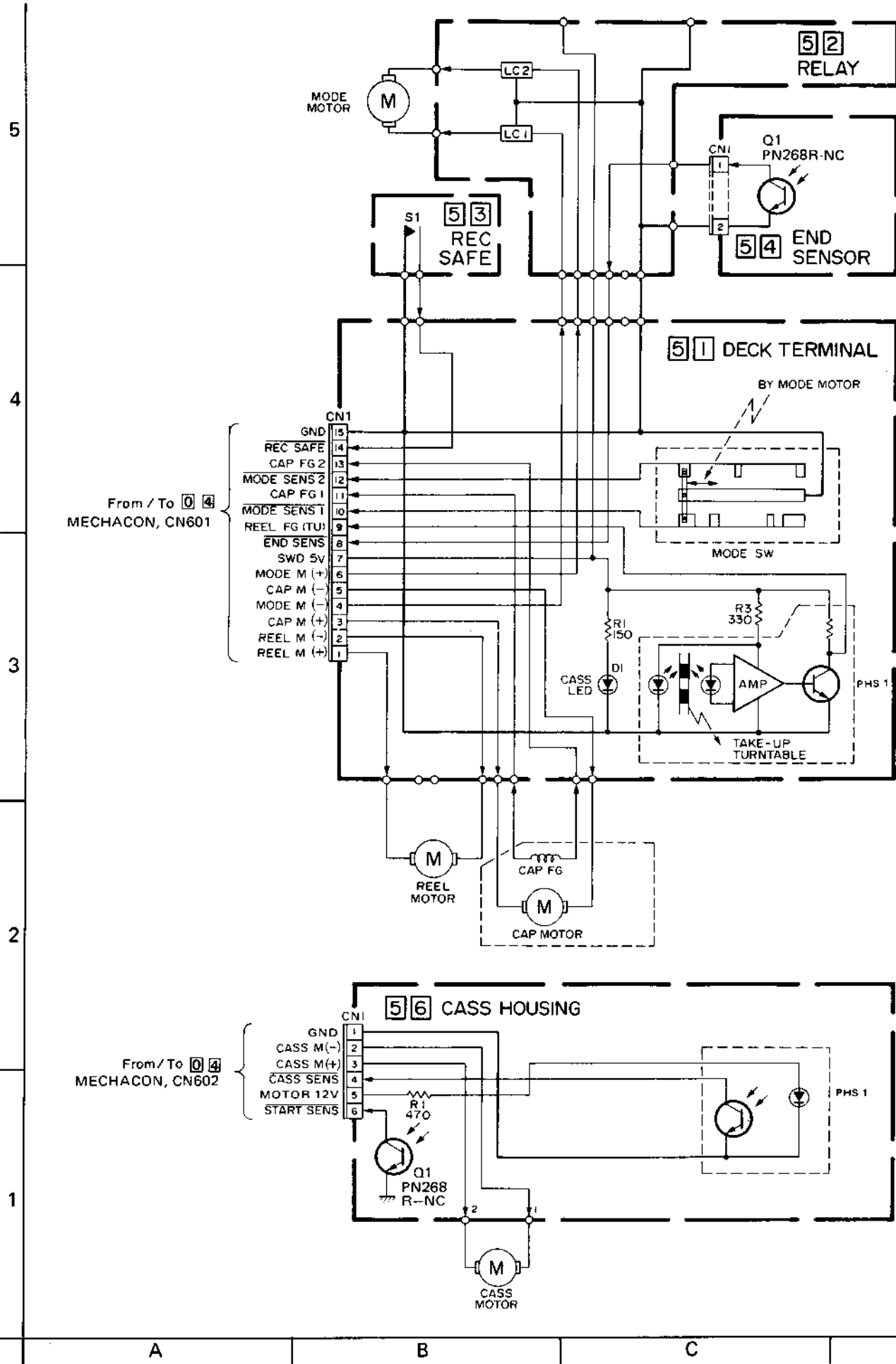
5
4
3
2
1

From/To 0 3 VIDEO (COLOR) CN306
From/To 2 2 OPERATION CN201
From/To 2 3 TIMER CN 3
To 4 3 SERVO CNB
From/To 2 0 TIMER CN6
To 0 4 REGULATOR

From/To 4 3 SERVO CN5
From/To 4 3 SERVO CN6
From/To 5 1 DECK TERMINAL CN1
From/To 5 6 CASS HOUSING CN1

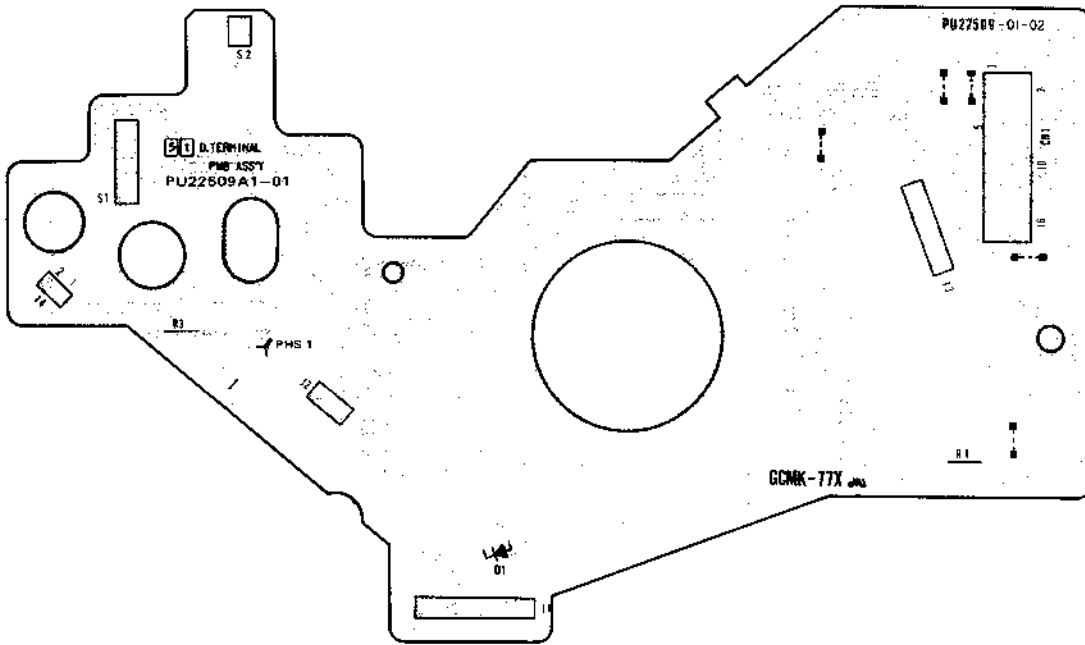


3.9 DECK TERMINAL SCHEMATIC DIAGRAMS

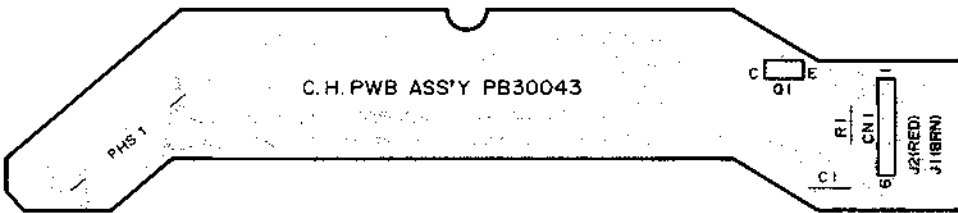


3.10 DECK TERMINAL CIRCUIT BOARDS

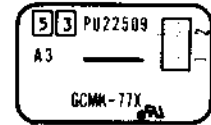
—DECK TERMINAL—



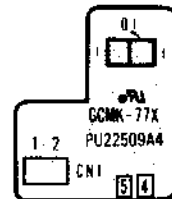
—CASSETTE HOUSING—



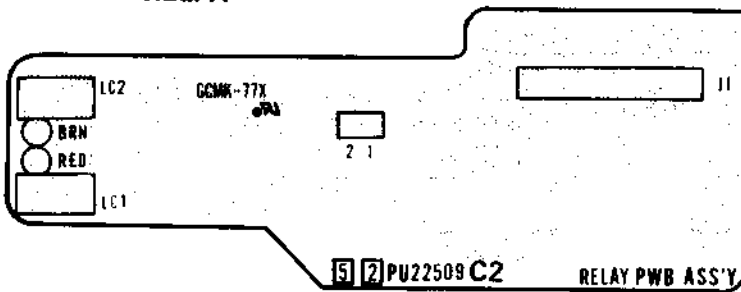
—REC SAFETY—



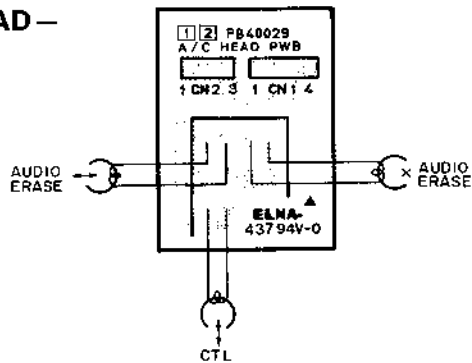
—END SENSOR—



—RELAY—

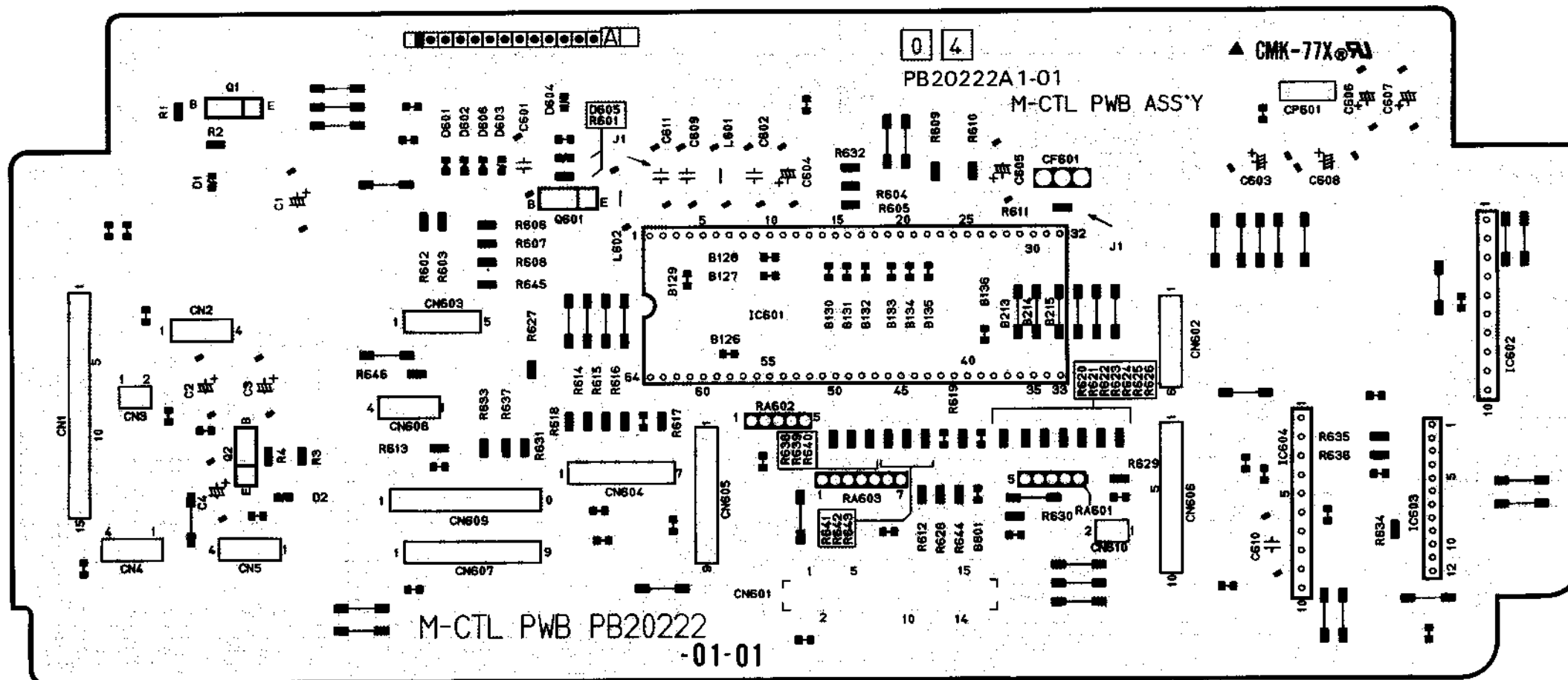


—AUDIO/CTL HEAD—

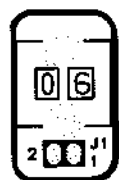


3.11 MECHACON AND TERMINAL CIRCUIT BOARDS

—MECHACON—



—TERMINAL—

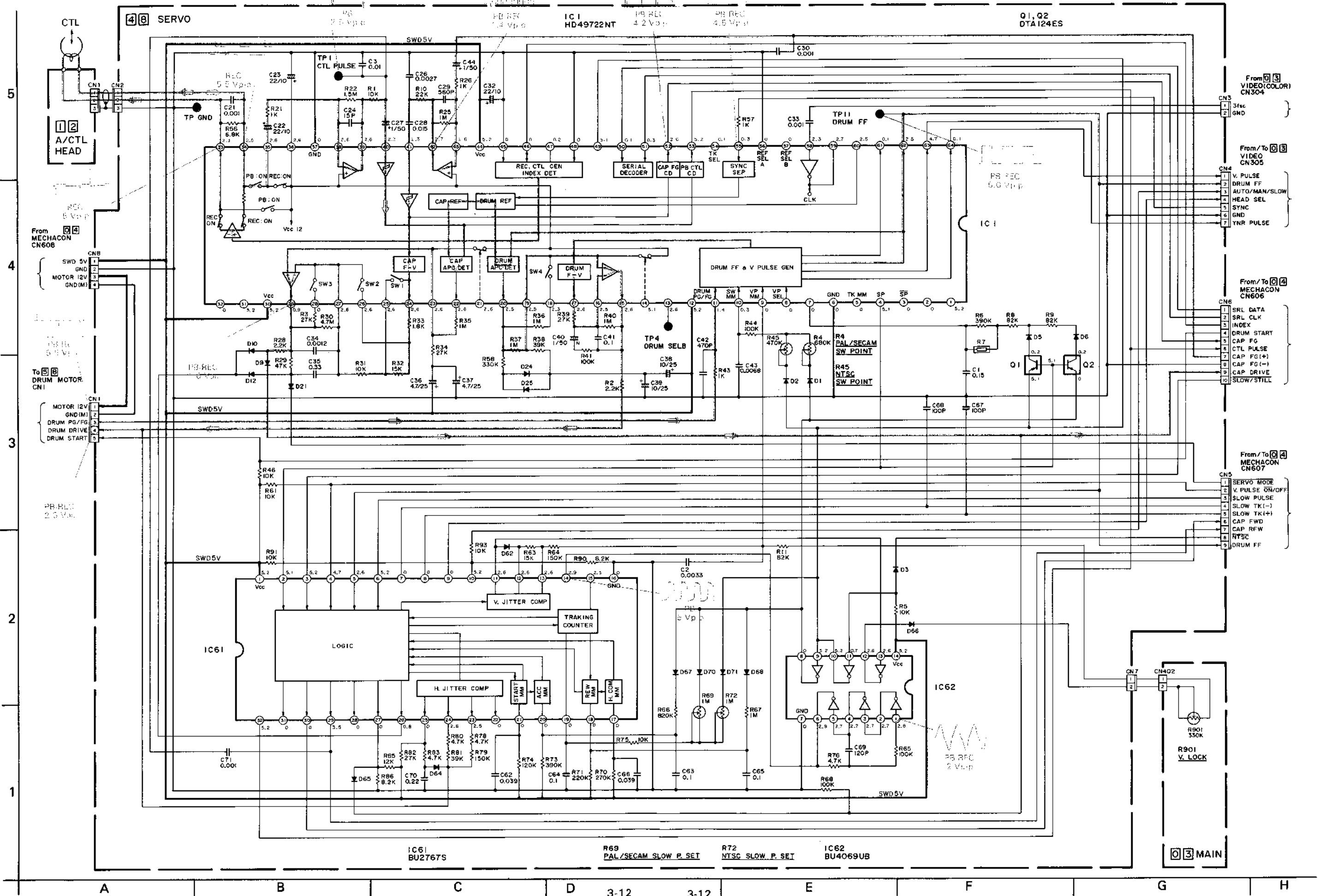


PB20222A2

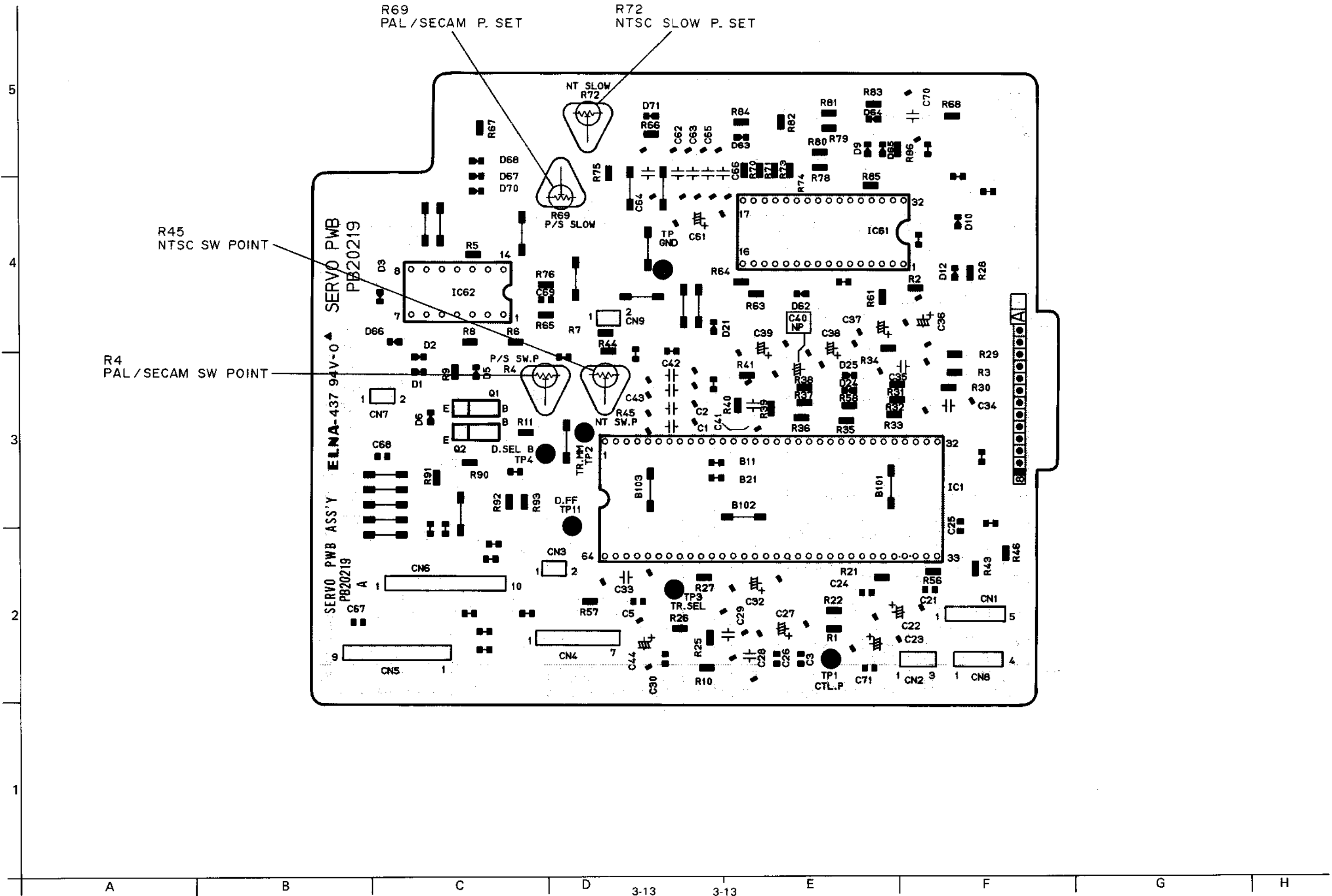
5
4
3
2
1

A B C D 3-11 3-11 E F G H

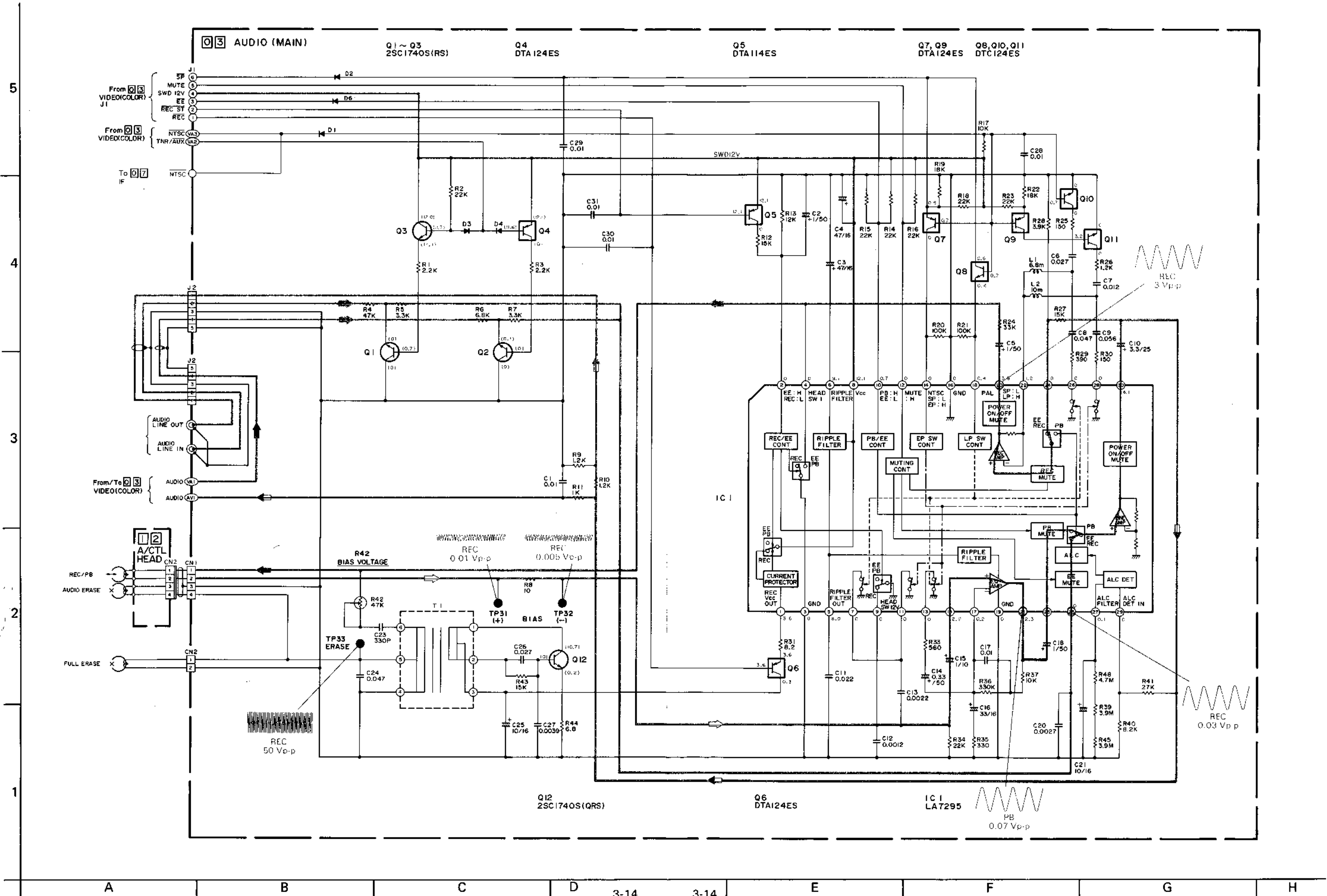
3.12 SERVO SCHEMATIC DIAGRAM



3.13 SERVO CIRCUIT BOARD

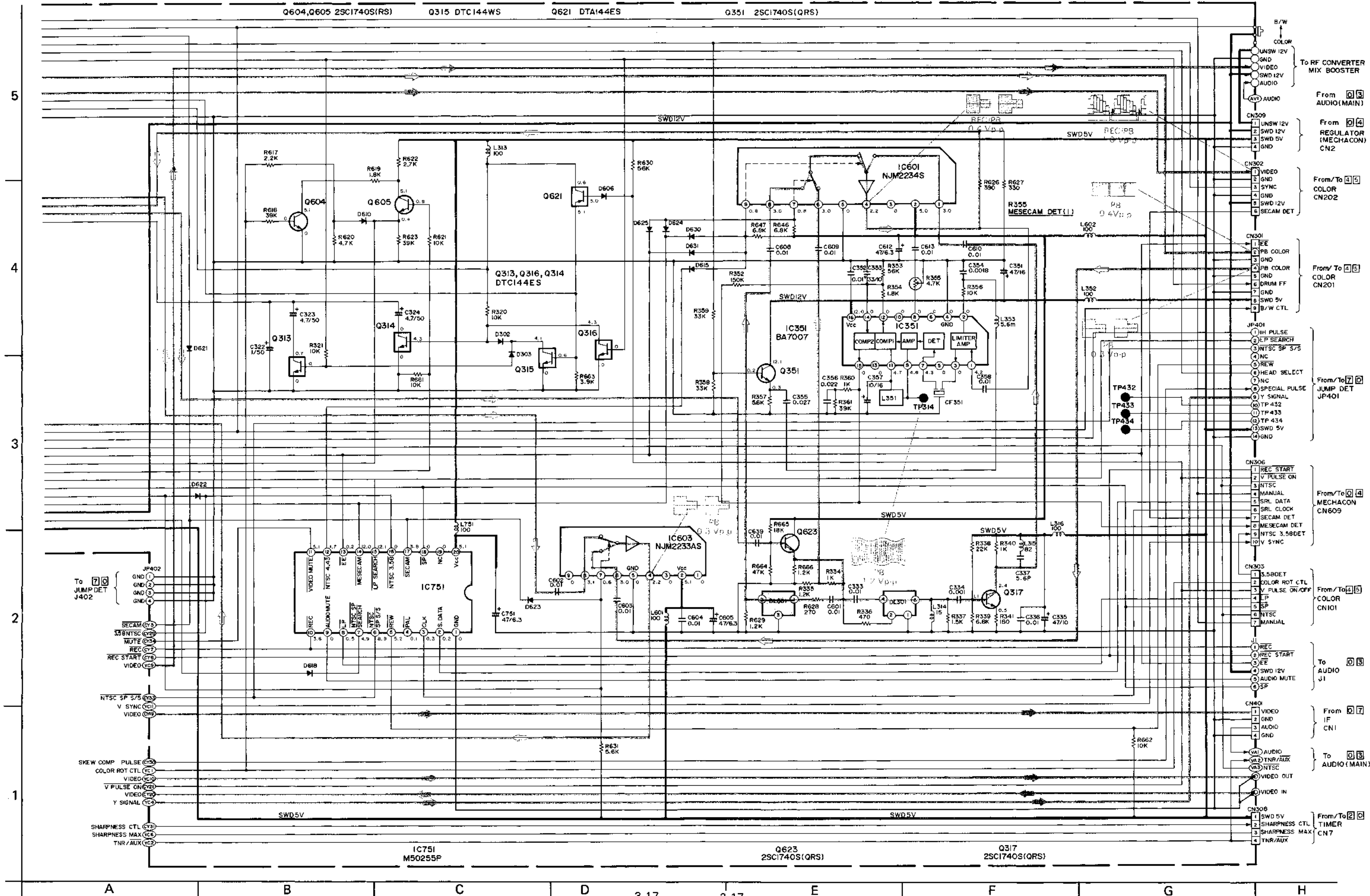


3.14 AUDIO SCHEMATIC DIAGRAM

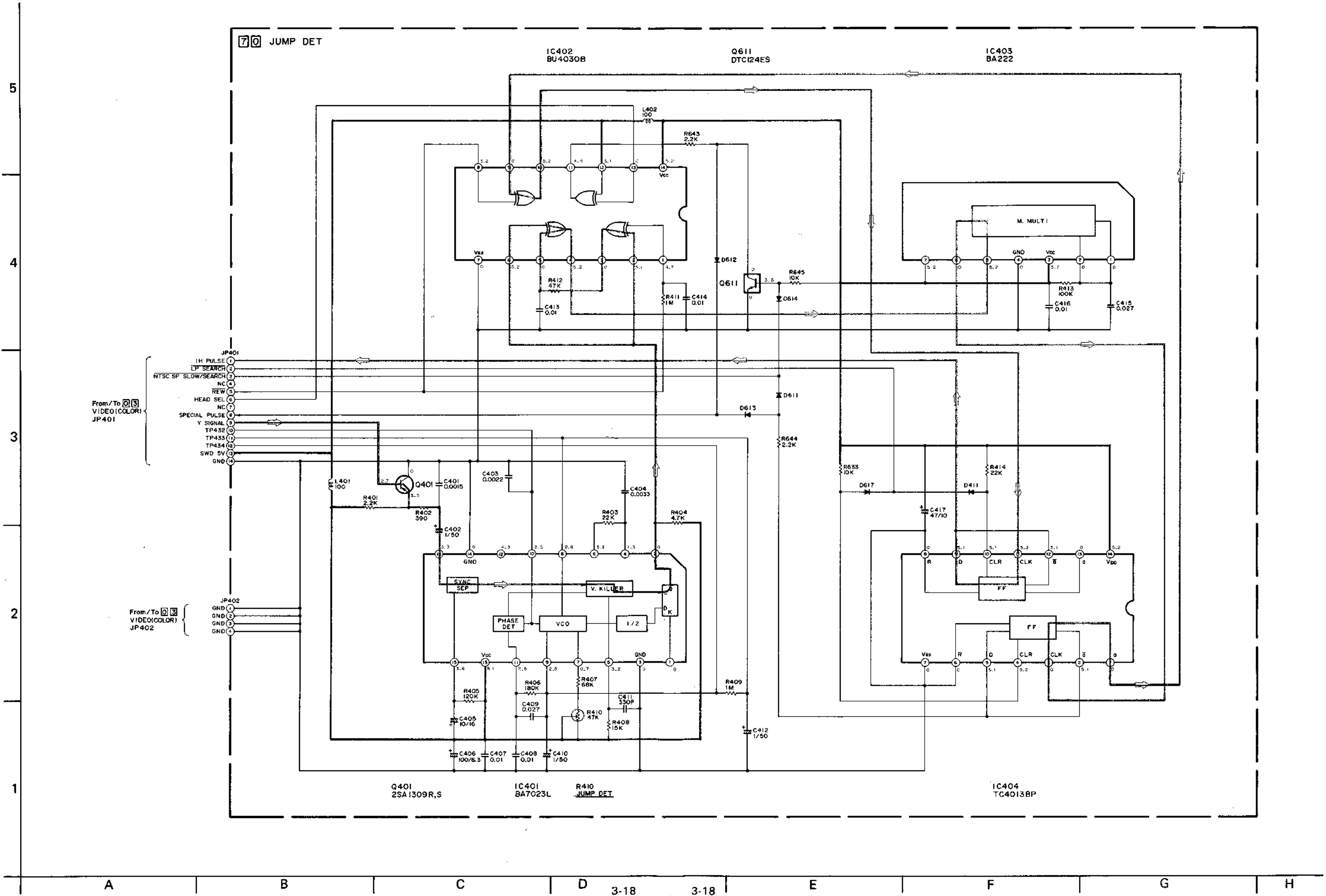


3.17 VIDEO -Color Section- (MAIN) SCHEMATIC DIAGRAM (2)

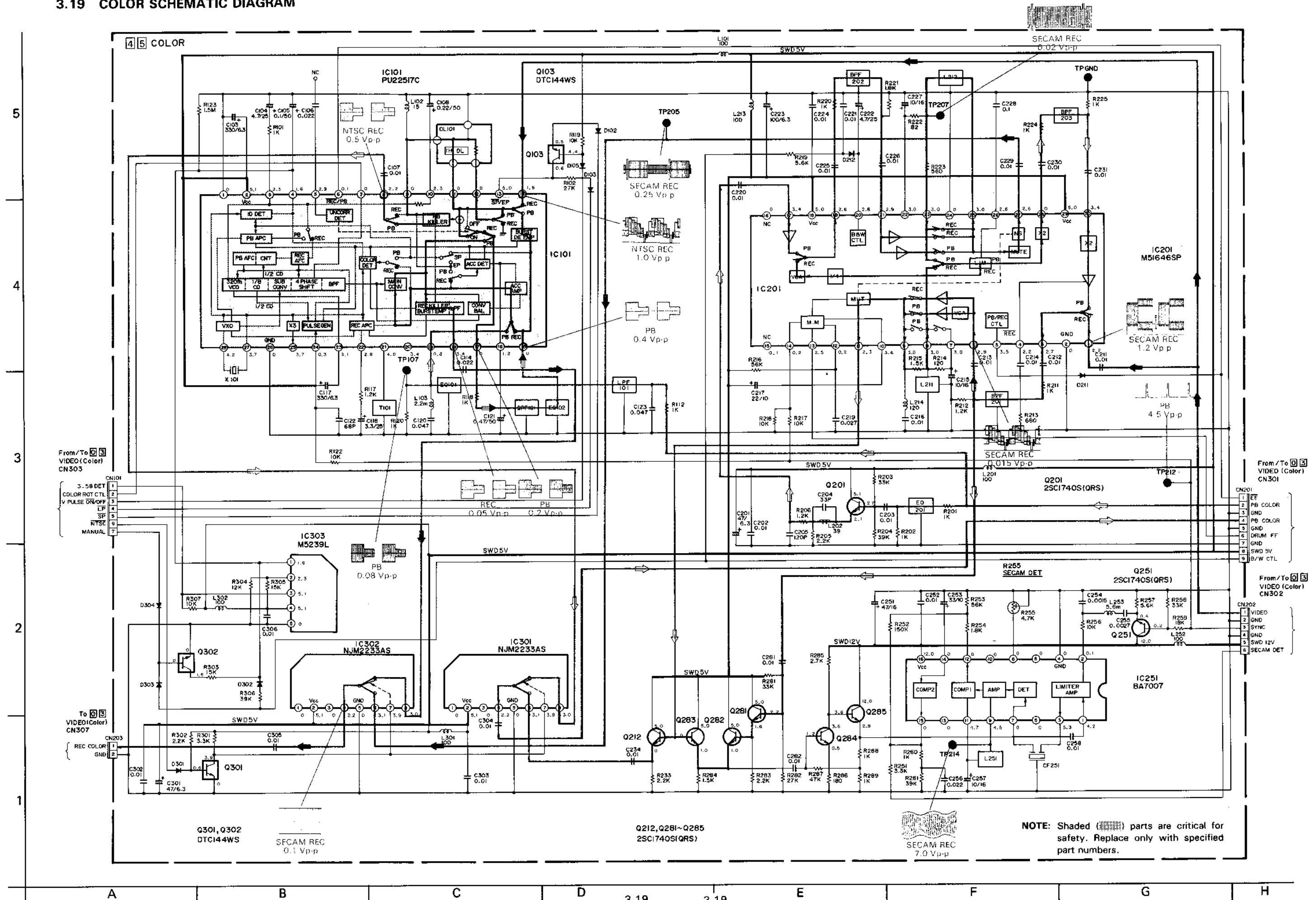
NOTE: Shaded () parts are critical for safety. Replace only with specified part numbers.



3.18 JUMP DET SCHEMATIC DIAGRAM

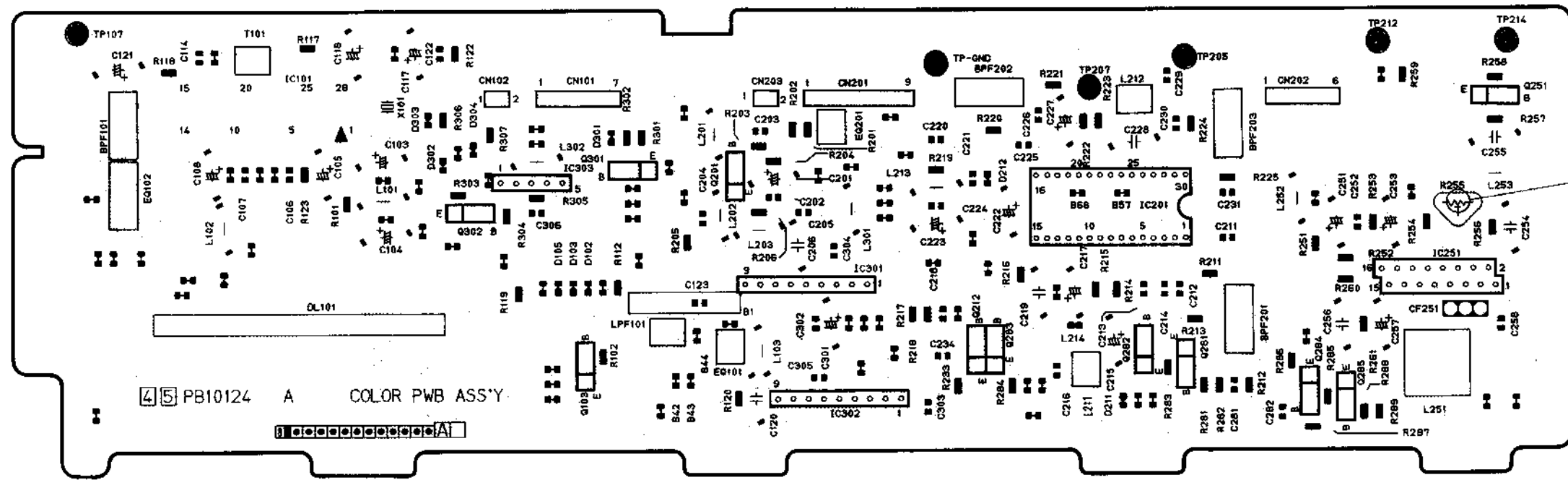


3.19 COLOR SCHEMATIC DIAGRAM

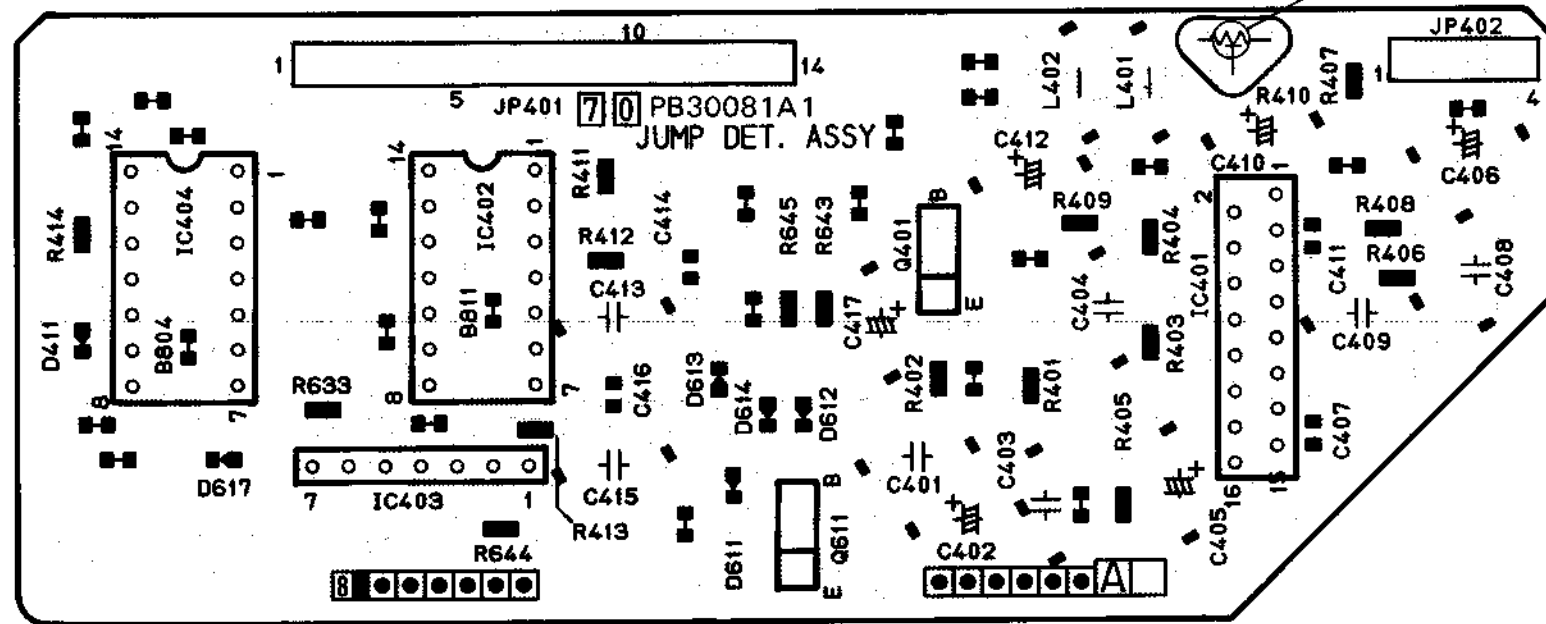


3.21 COLOR CIRCUIT BOARD/JUMP DET CIRCUIT BOARD

-COLOR-



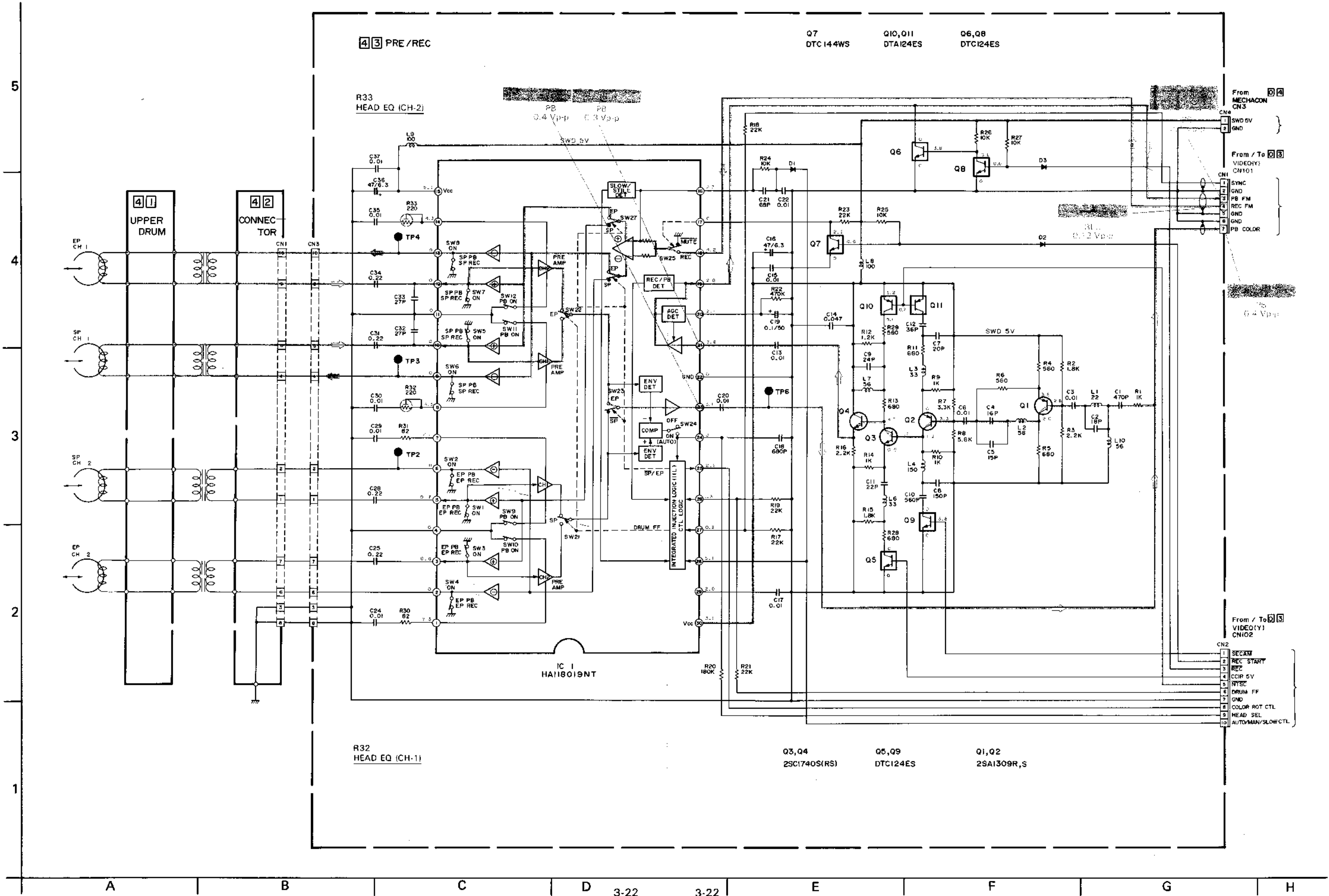
-JUMP DET-



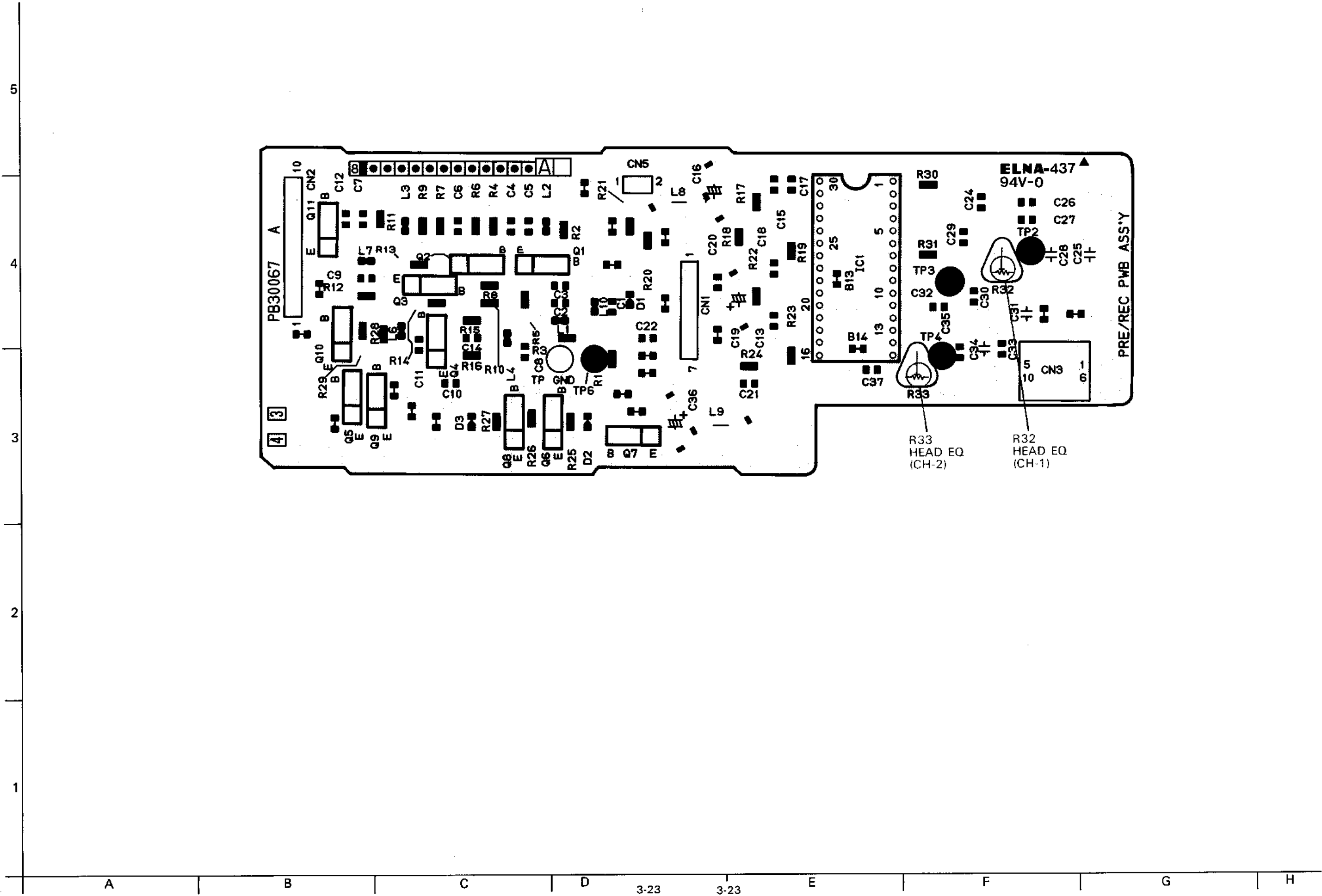
5
4
3
2
1

A B C D 3-21 3-21 E F G H

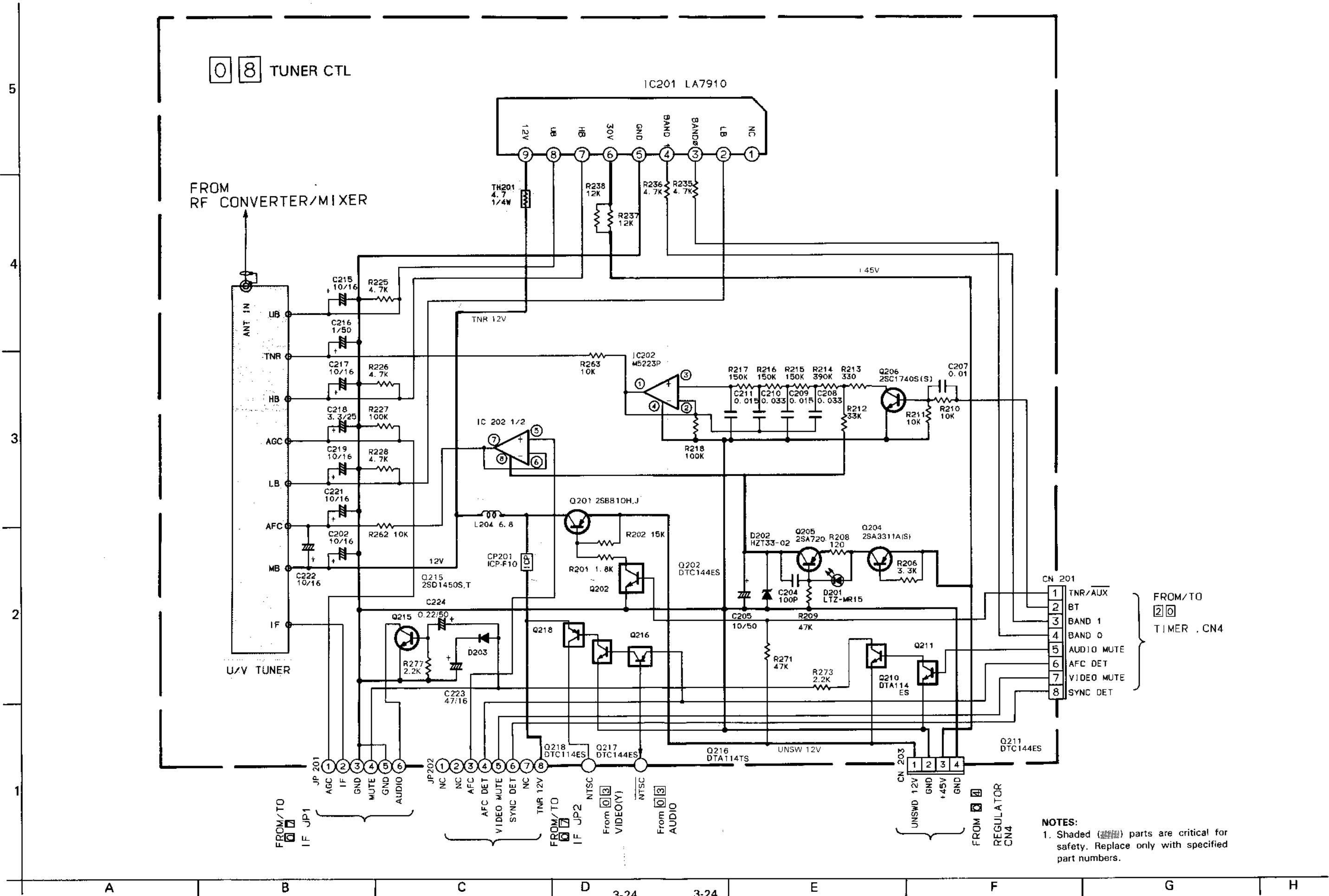
3.22 PRE/REC SCHEMATIC DIAGRAM



3.23 PRE/REC CIRCUIT BOARD

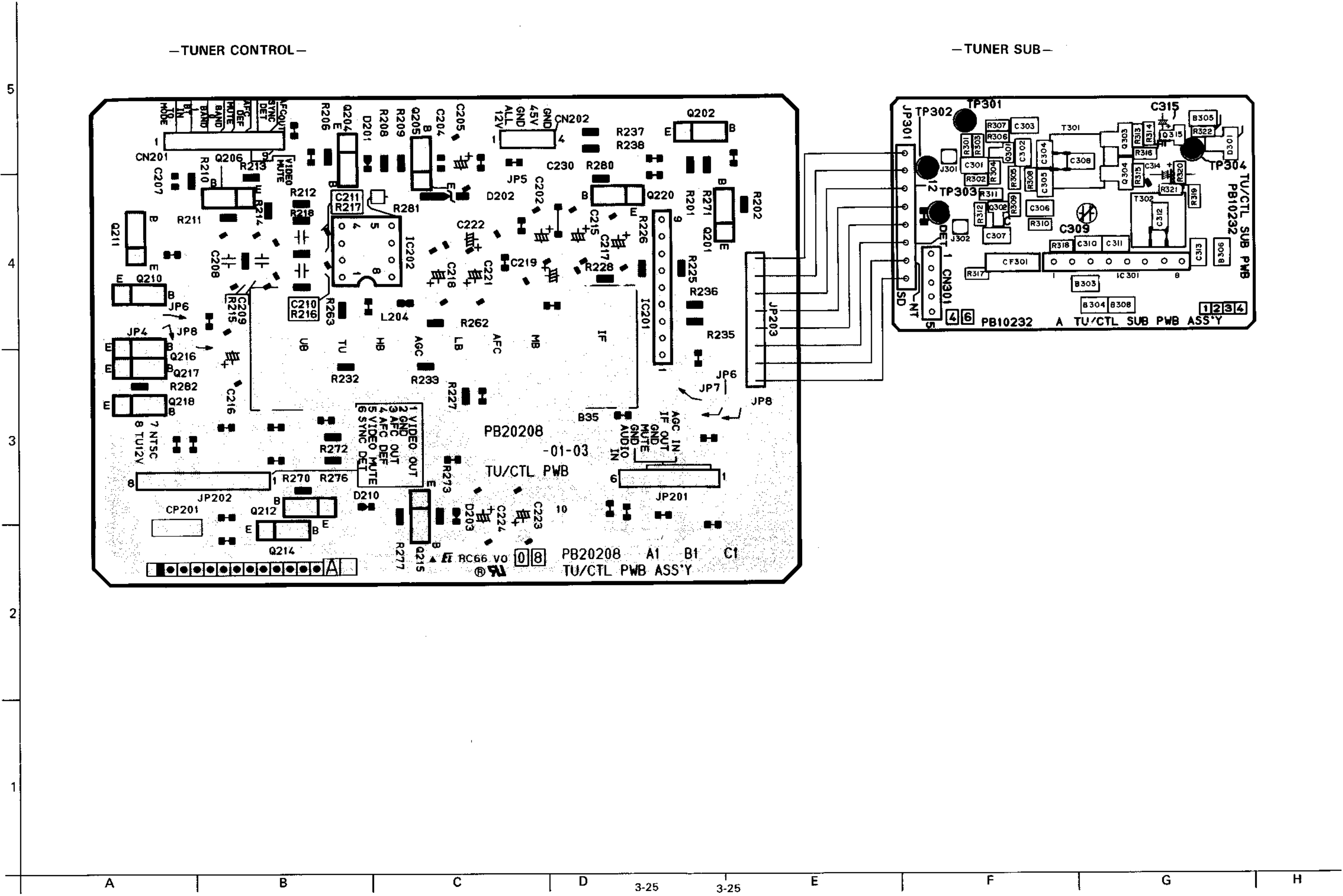


3.24 TUNER CONTROL SCHEMATIC DIAGRAM



NOTES:
 1. Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

3.25 TUNER CONTROL/TUNER SUB CIRCUIT BOARD



-TUNER CONTROL-

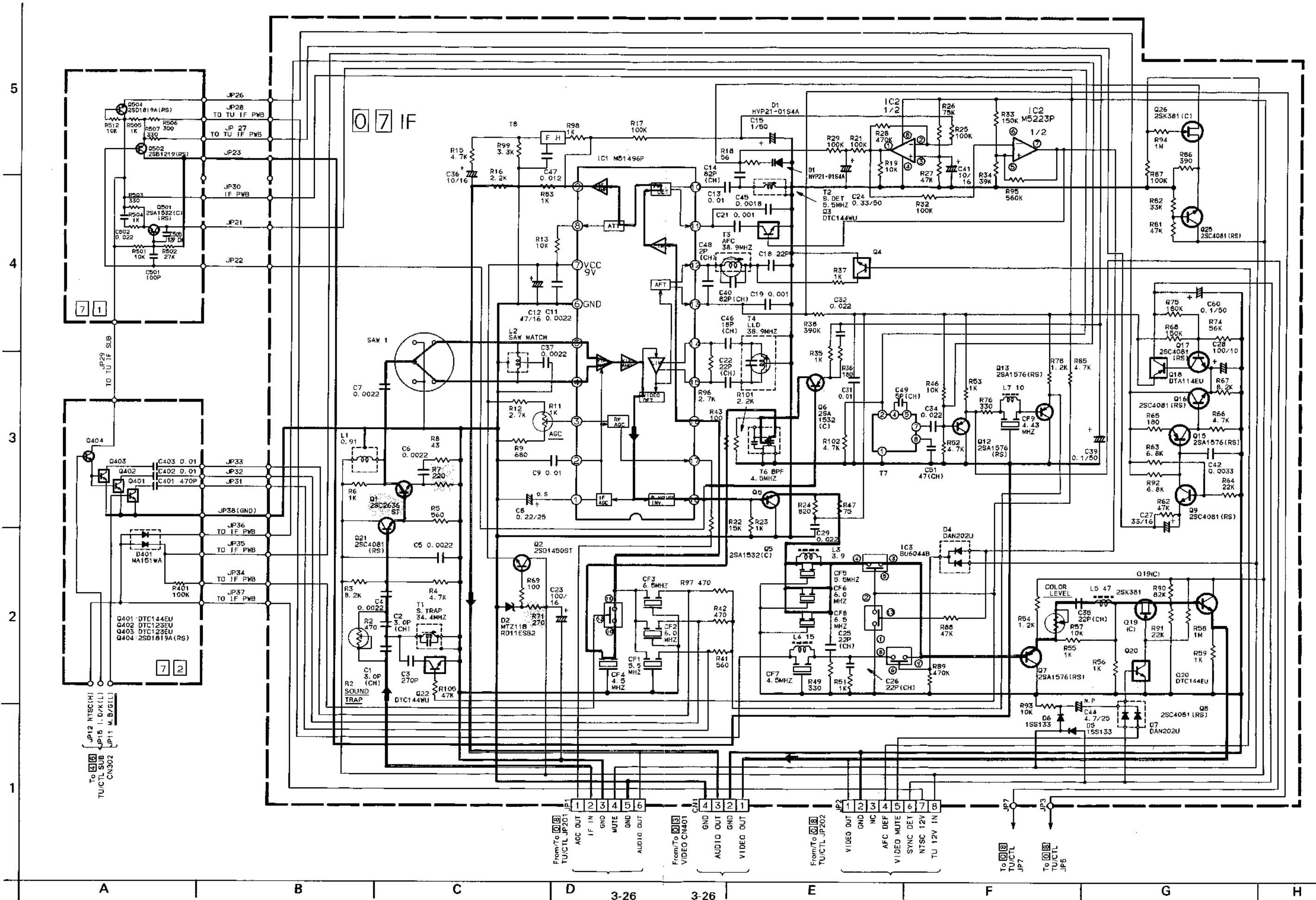
-TUNER SUB-

PB20208 A1 B1 C1
TU/CTL PWB ASS'Y

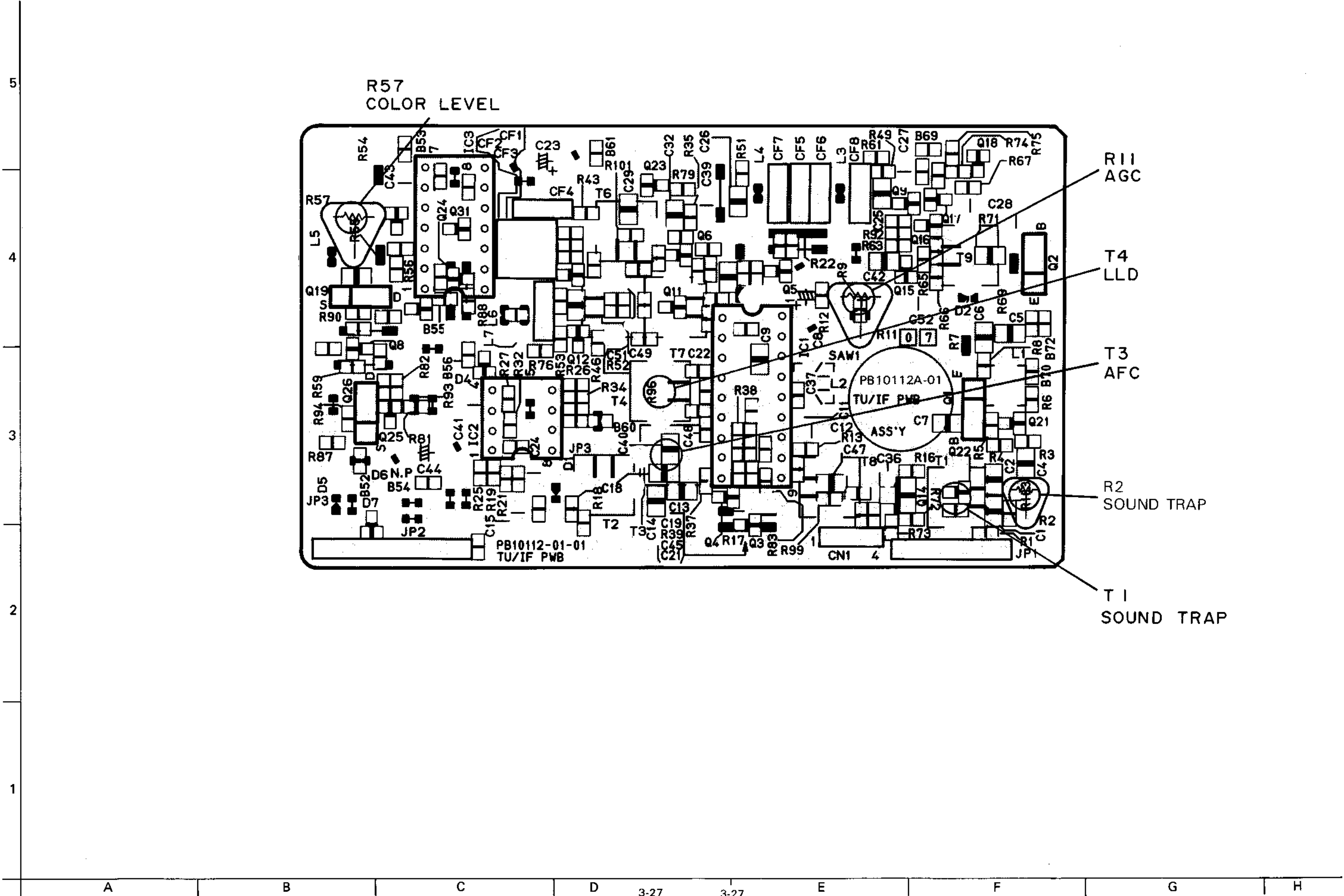
PB10232 A TU/CTL SUB PWB ASS'Y

3-25 3-25

3.26 IF SCHEMATIC DIAGRAM



3.27 IF CIRCUIT BOARD



R57
COLOR LEVEL

R11
AGC

T4
LLD

T3
AFC

R2
SOUND TRAP

T1
SOUND TRAP

5

4

3

2

1

A

B

C

D

3-27

3-27

E

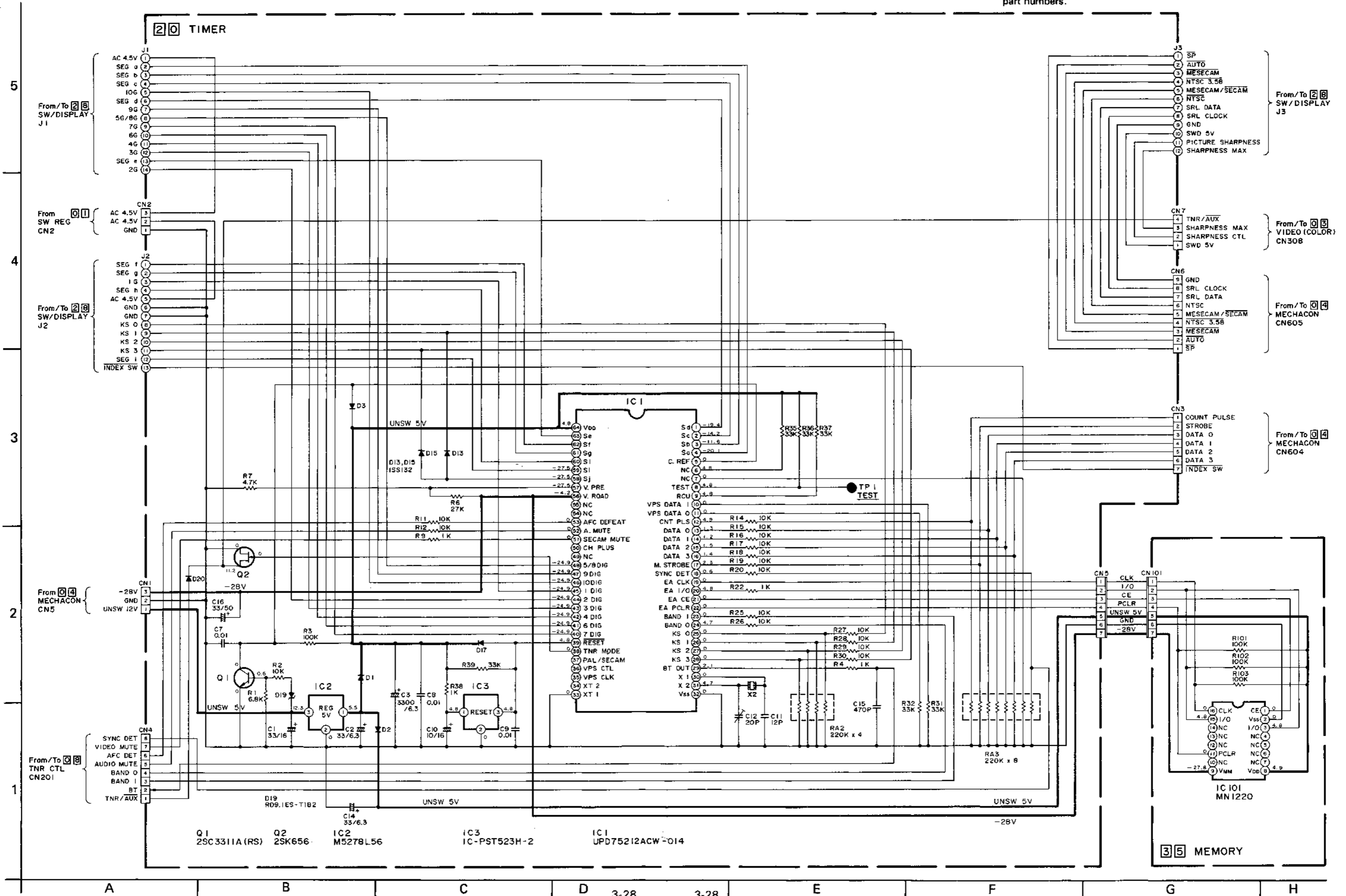
F

G

H

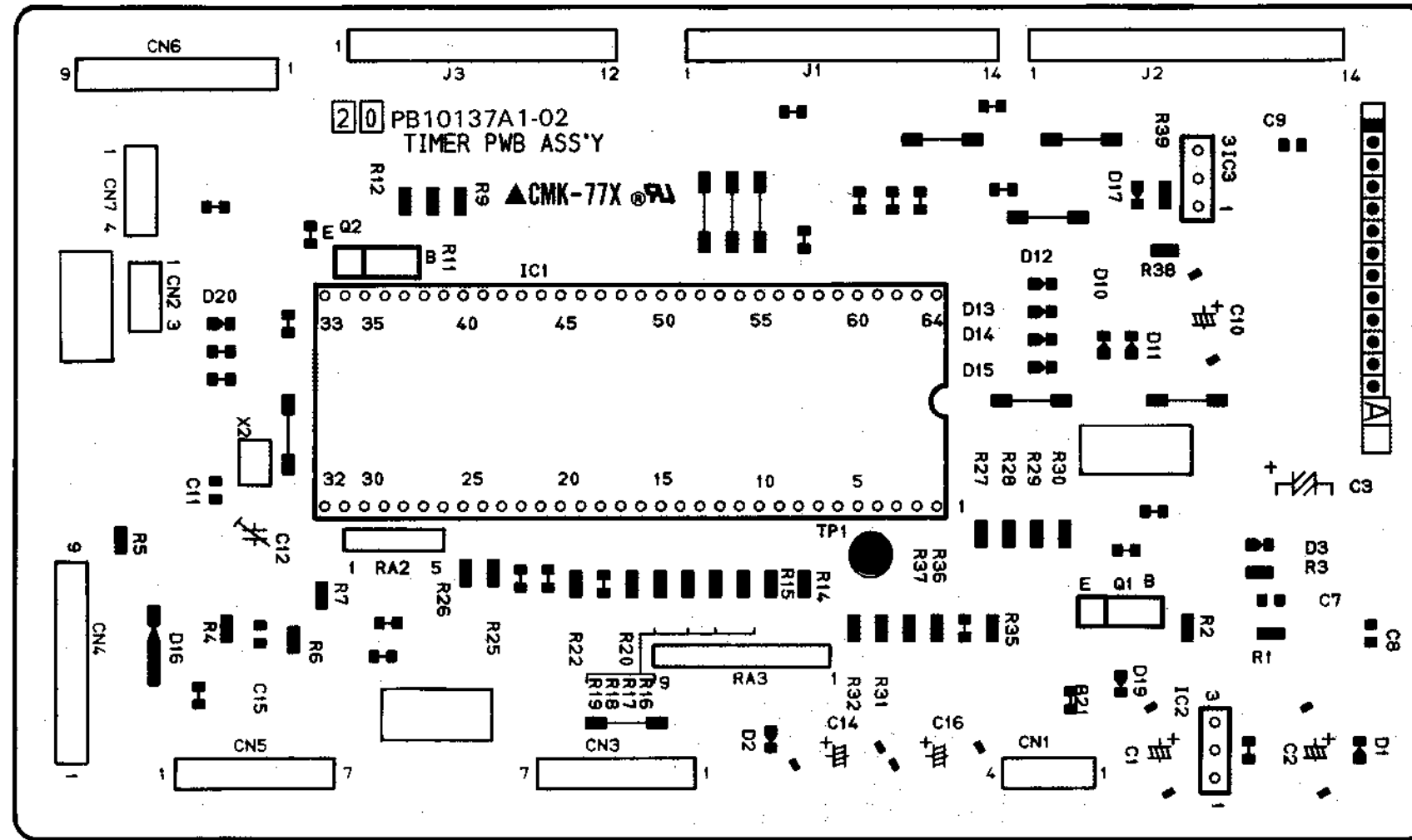
3.28 TIMER AND MEMORY SCHEMATIC DIAGRAMS

NOTE: Shaded () parts are critical for safety. Replace only with specified part numbers.

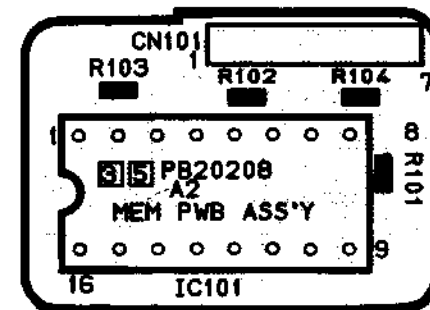


3.29 TIMER AND MEMORY CIRCUIT BOARDS

—TIMER—



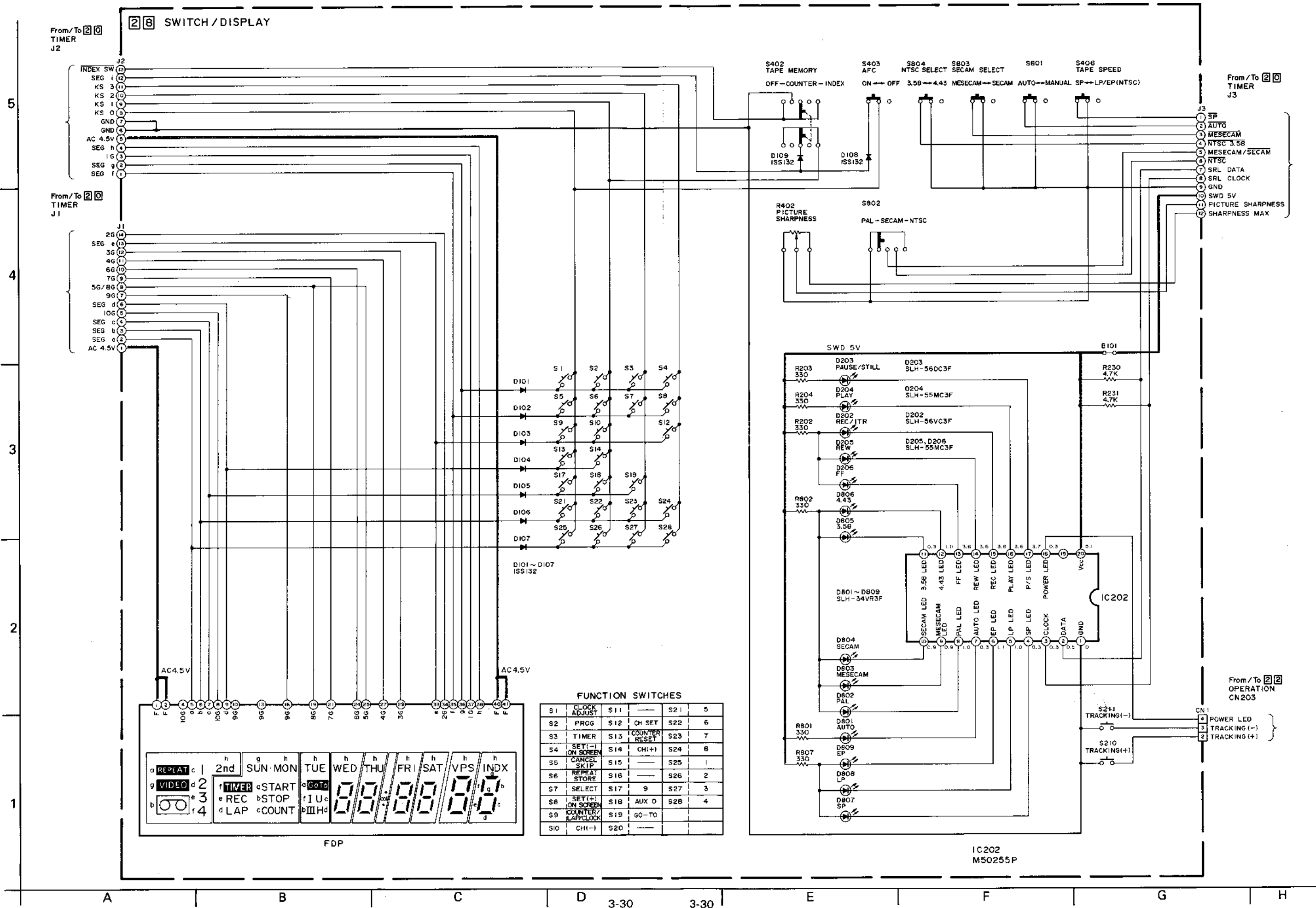
—MEMORY—



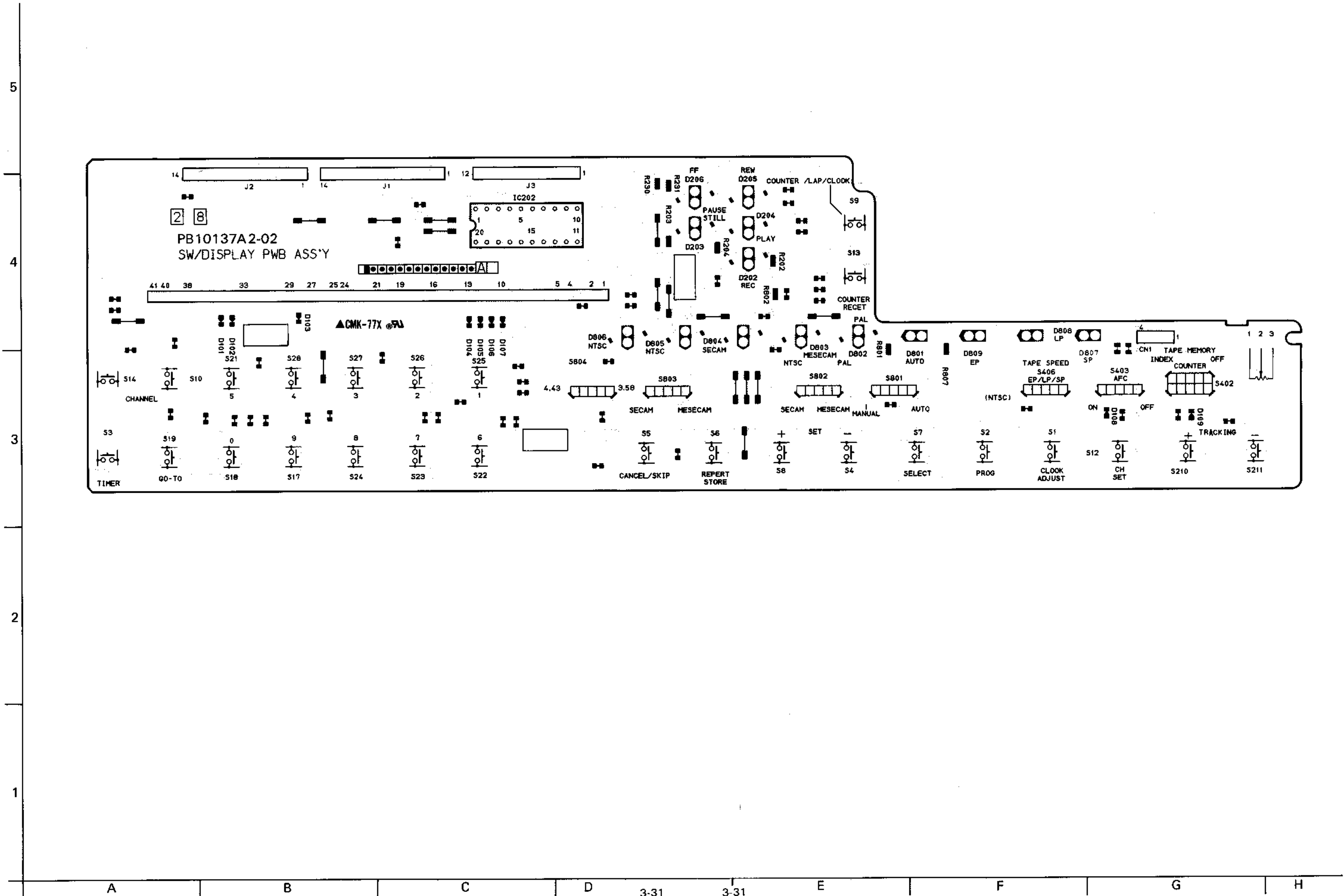
5
4
3
2
1

A B C D 3-29 3-29 E F G H

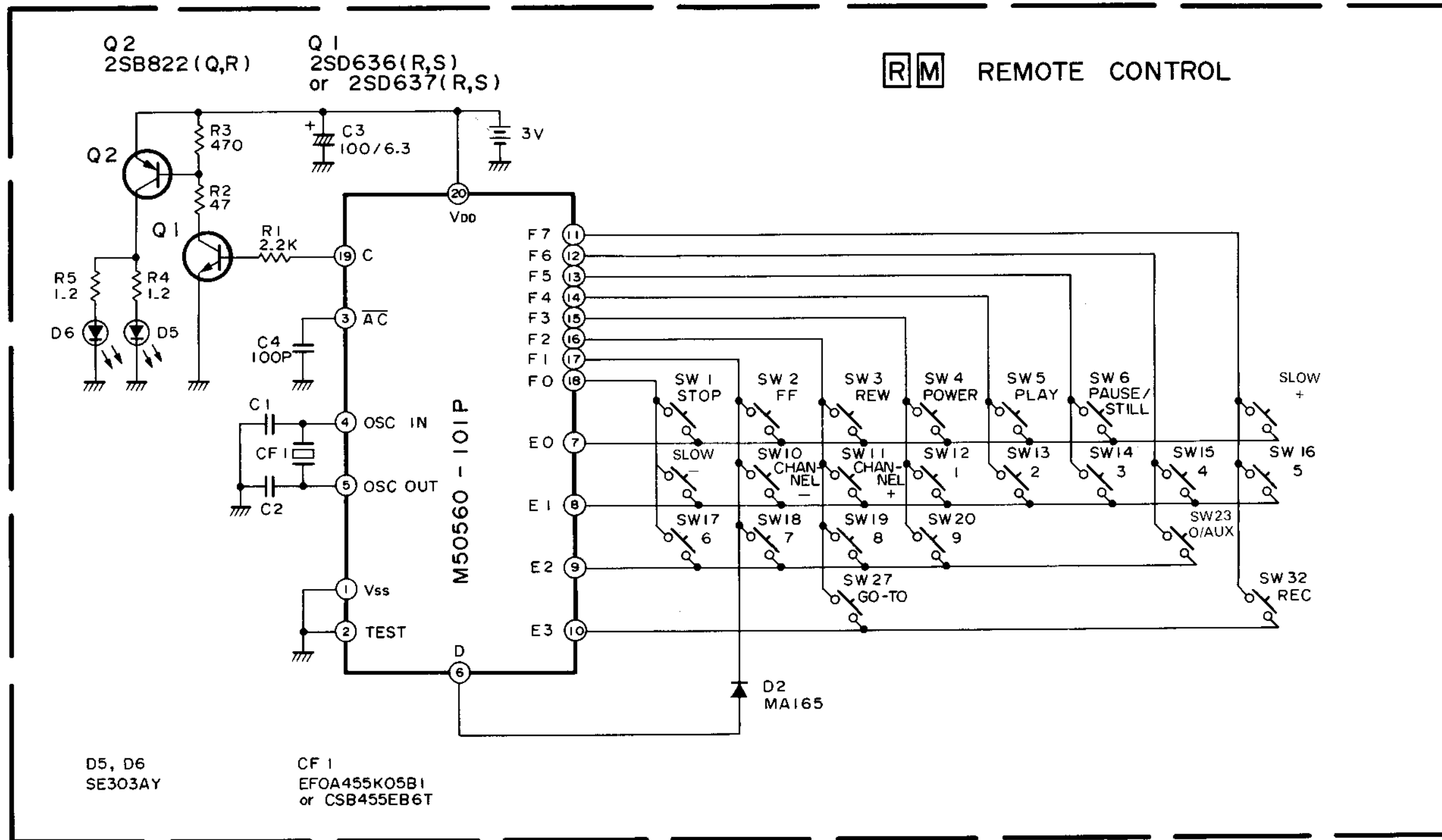
3.30 SWITCH/DISPLAY SCHEMATIC DIAGRAM



3.31 SWITCH/DISPLAY CIRCUIT BOARD



3.34 REMOTE CONTROL SCHEMATIC DIAGRAM



RM REMOTE CONTROL

D5, D6
SE303AY

CF 1
EFOA455K05B1
or CSB455EB6T

- NOTES:**
1. All parts shown in this schematic are critical for safety.
 2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

5
4
3
2
1

HR-D337MS

REVISED TUNER CONTROL AND IF

**This is an addition to the No. 82051 Service Manual for the HR-D337MS model.
Insert this to the original and use for units produced on June 1989 and later.**

3.24 TUNER CONTROL/TUNER SUB SCHEMATIC DIAGRAM

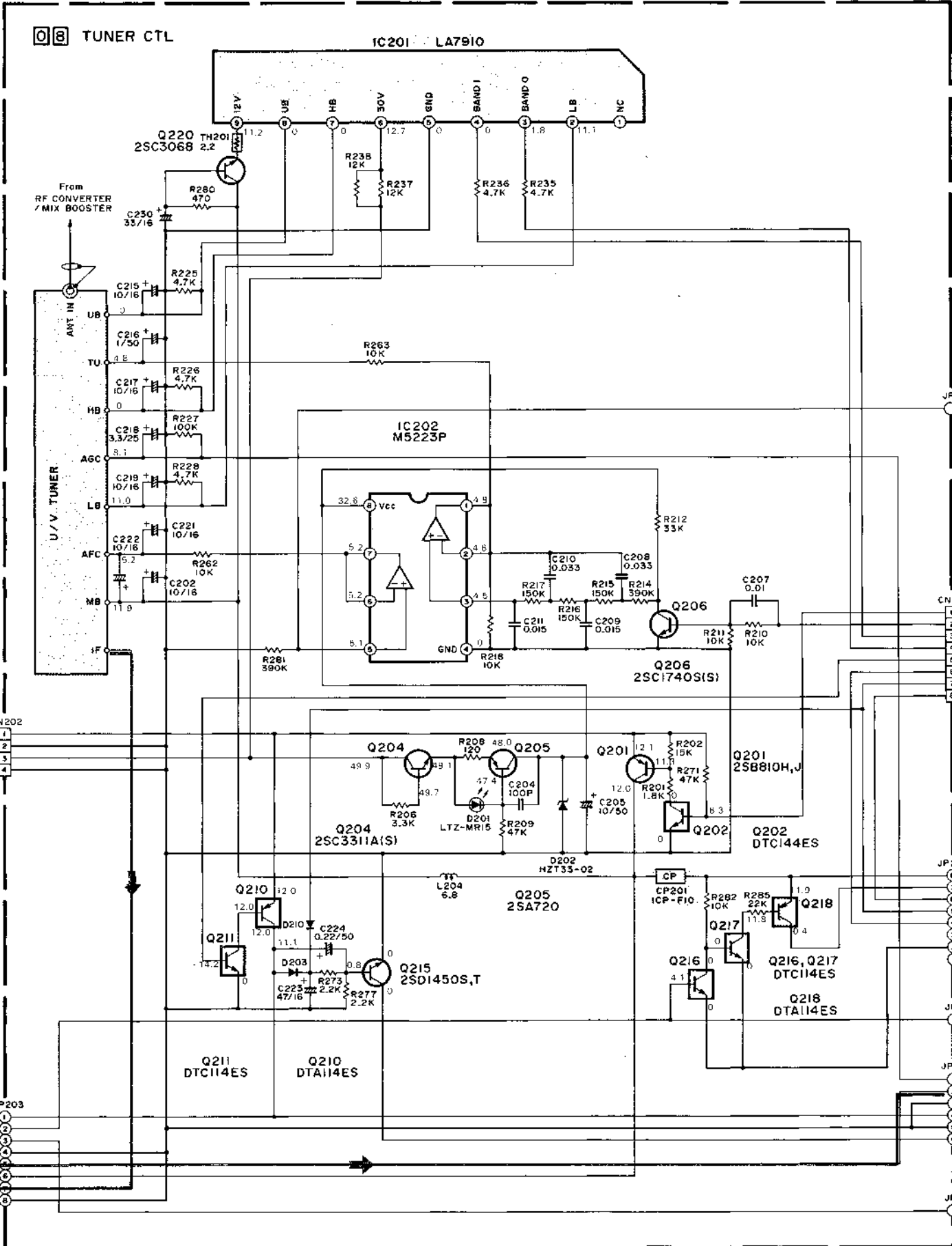
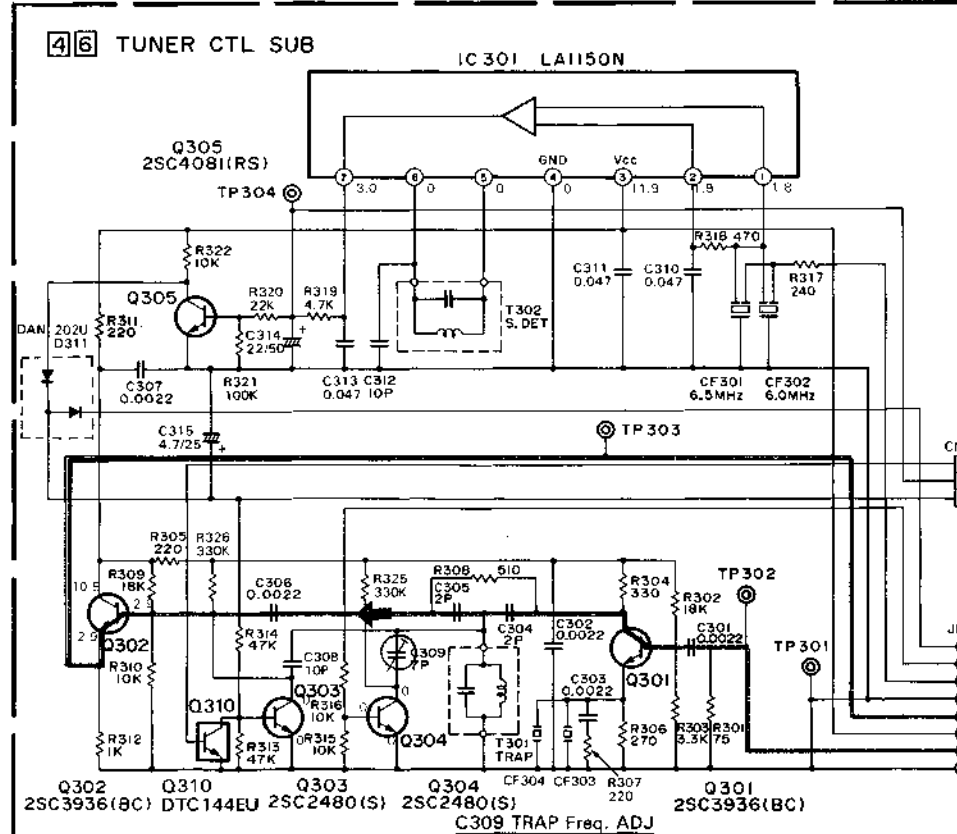
5

4

3

2

1



From 0 7 IF, JP3

From/To 0 0 TIMER, CN4

From/To 0 7 IF, JP2

From 0 5 AUDIO

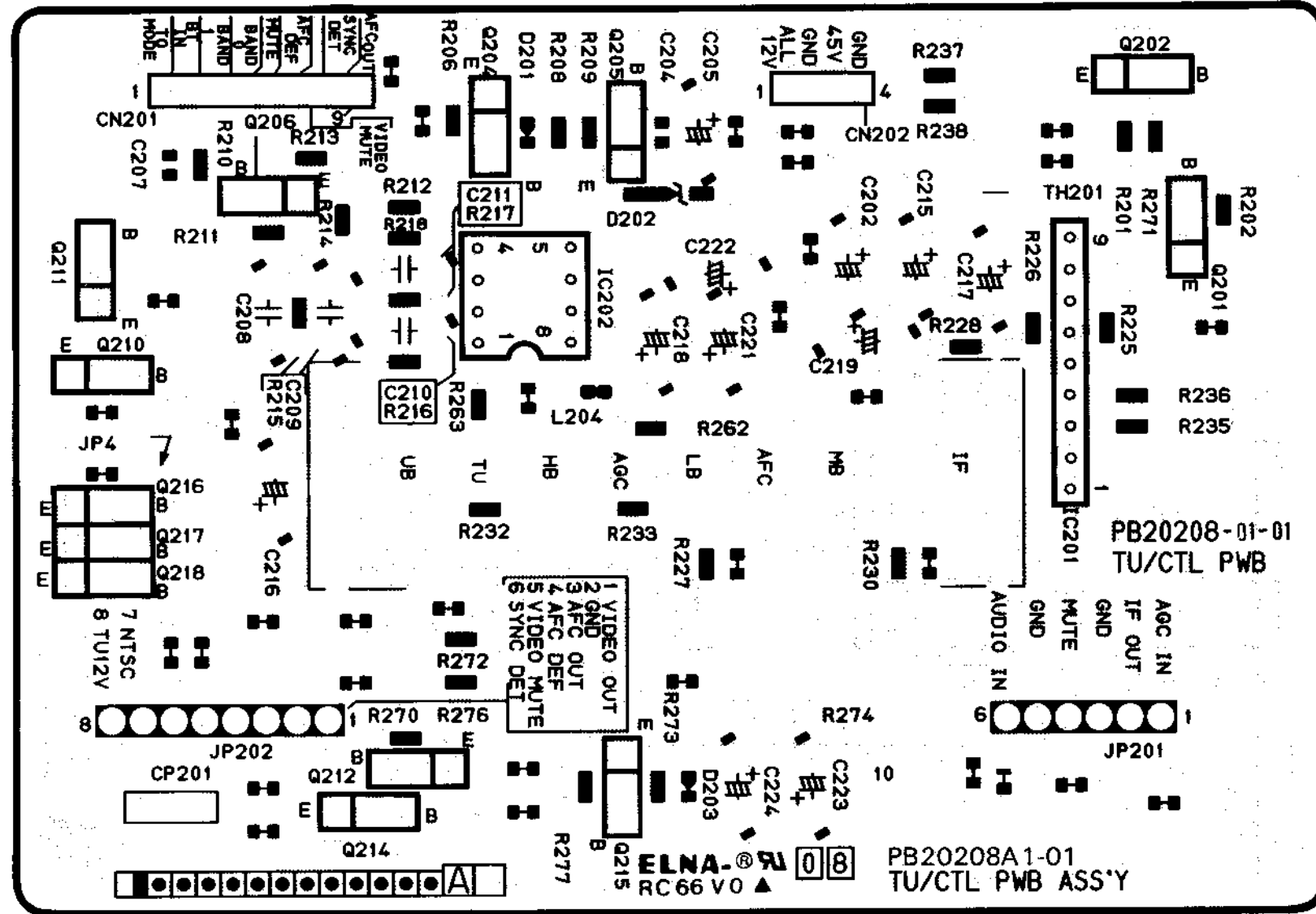
From/To 0 7 IF, JP1

From 0 7 IF, JP7

NOTE: Shaded () parts are critical for safety. Replace only with specified part numbers.

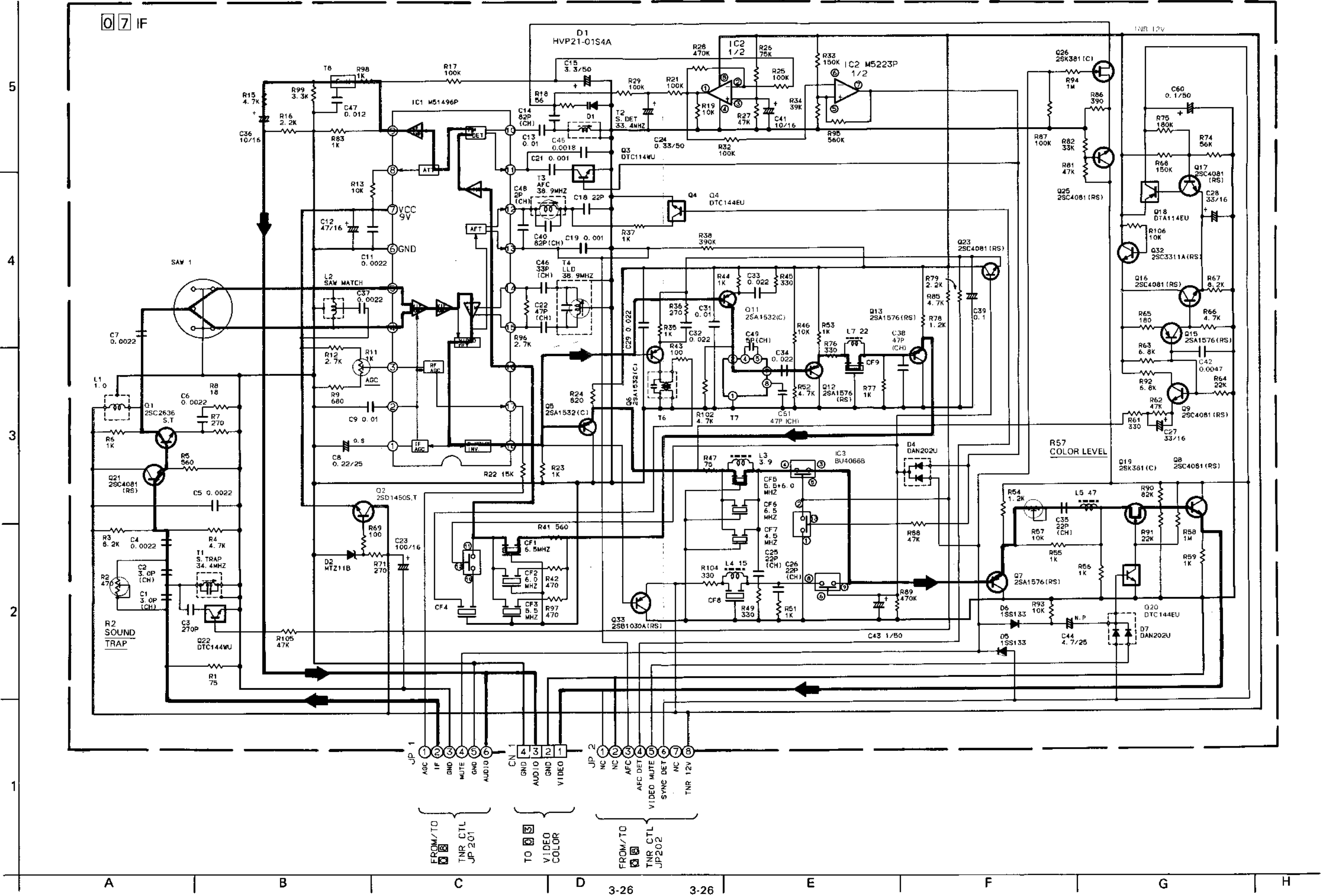
3.25 TUNER CONTROL CIRCUIT BOARD

5
4
3
2
1



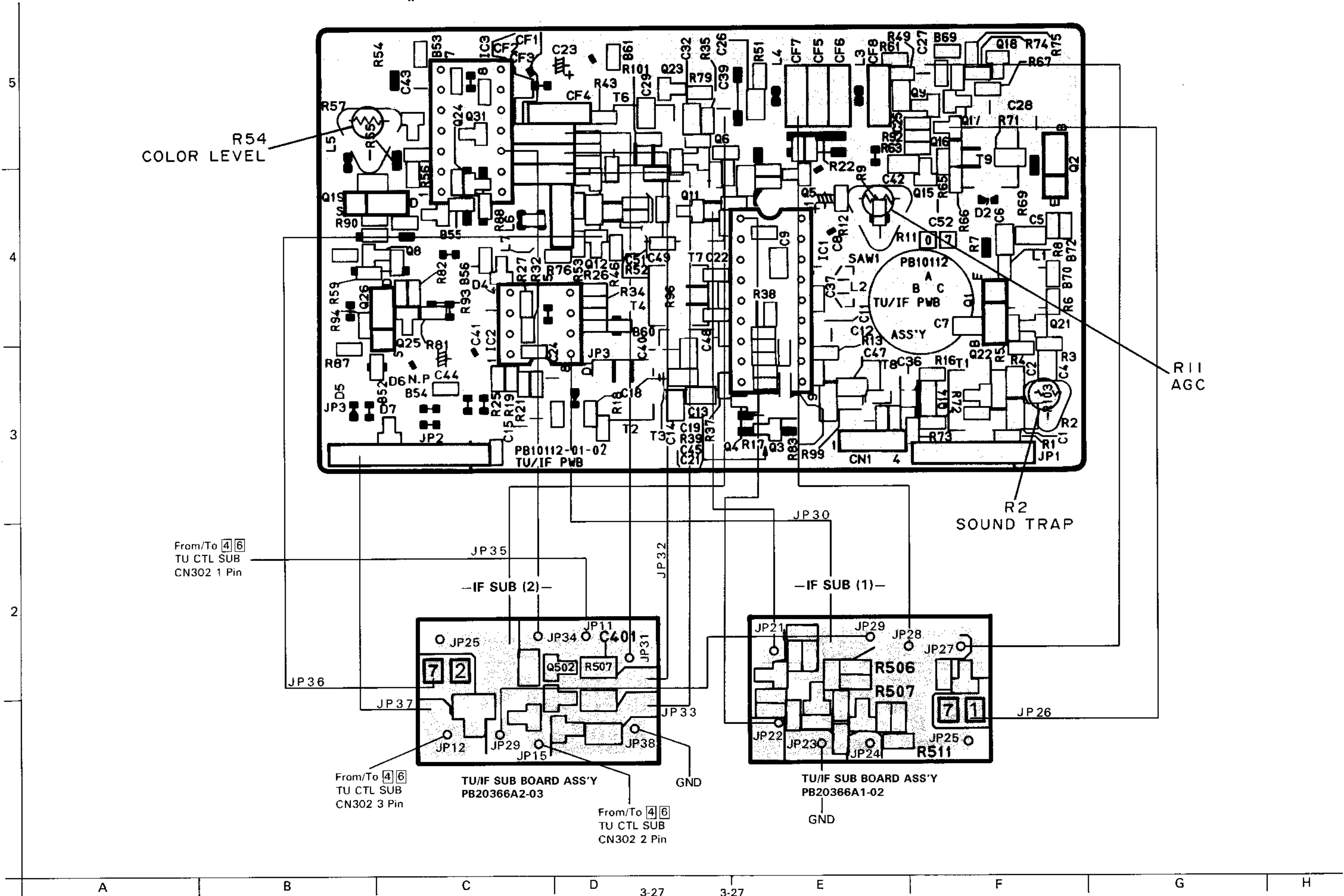
A B C D 3-25 3-25 E F G H

3.26 IF SCHEMATIC DIAGRAM



3.27 IF CIRCUIT BOARD

-IF-



R54
COLOR LEVEL

R11
AGC

R2
SOUND TRAP

From/To 4 6
TU CTL SUB
CN302 1 Pin

-IF SUB (2)-

-IF SUB (1)-

From/To 4 6
TU CTL SUB
CN302 3 Pin

TU/IF SUB BOARD ASS'Y
PB20366A2-03

From/To 4 6
TU CTL SUB
CN302 2 Pin

TU/IF SUB BOARD ASS'Y
PB20366A1-02

GND

A B C D 3-27 E F G H

SECTION 5 ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the Δ symbol are critical for safety. Replace only with specified part numbers.

Δ REF. No.	PART No.	PART NAME, DESCRIPTION
IF BOARD ASSEMBLY <07>		
PWBA	PB10112A-10	IF BOARD ASSEMBLY
IC1	M51496P	IC
IC2	M5223P	IC
IC3	BU4066B	IC
Δ Q1	2SC2636S,T	TRANSISTOR
Q2	2SD1450S,T	TRANSISTOR
Q3	DTC144WU	TRANSISTOR
Q4	DTC144EU	TRANSISTOR
Q5	2SA1532(C)	TRANSISTOR
Q6	2SA1532(C)	TRANSISTOR
Q7	2SA1576(RS)	TRANSISTOR
Q8	2SC4081(RS)	TRANSISTOR
Q9	2SC4081(RS)	TRANSISTOR
Q12	2SA1576(RS)	TRANSISTOR
Q13	2SA1576(RS)	TRANSISTOR
Q15	2SA1576(RS)	TRANSISTOR
Q16	2SC4081(RS)	TRANSISTOR
Q17	2SC4081(RS)	TRANSISTOR
Q18	DTA114EU	TRANSISTOR
Q19	2SK381(C)	FE TRANSISTOR
Q20	DTC144EU	TRANSISTOR
Q21	2SC4081(RS)	TRANSISTOR
Q22	DTC144WU	TRANSISTOR
Q25	2SC4081(RS)	TRANSISTOR
Q26	2SK381(C)	FE TRANSISTOR
D1	HVP21-01S4A	VARICAP DIODE
D2	MTZ11B	ZENER DIODE
	or RD11ES-T1B2	ZENER DIODE
D4	DAN202U	DIODE
D5	1SS133	DIODE
D6	1SS133	DIODE
D7	DAN202U	DIODE
R2	QVZ3531-471	V RESISTOR, SOUND TRAP
R3	NRSA63J-822N	RESISTOR
R4	NRSA63J-472N	RESISTOR
R5	NRSA63J-561N	RESISTOR
R6	NRSA63J-102N	RESISTOR
Δ R7	QRD161J-221	RESISTOR
R8	NRSA63J-430N	RESISTOR
R9	NRSA63J-681N	RESISTOR
R11	QVZ3518-102	V RESISTOR, RF AGC
R12	NRSA63J-272N	RESISTOR
R13	NRSA63J-103N	RESISTOR

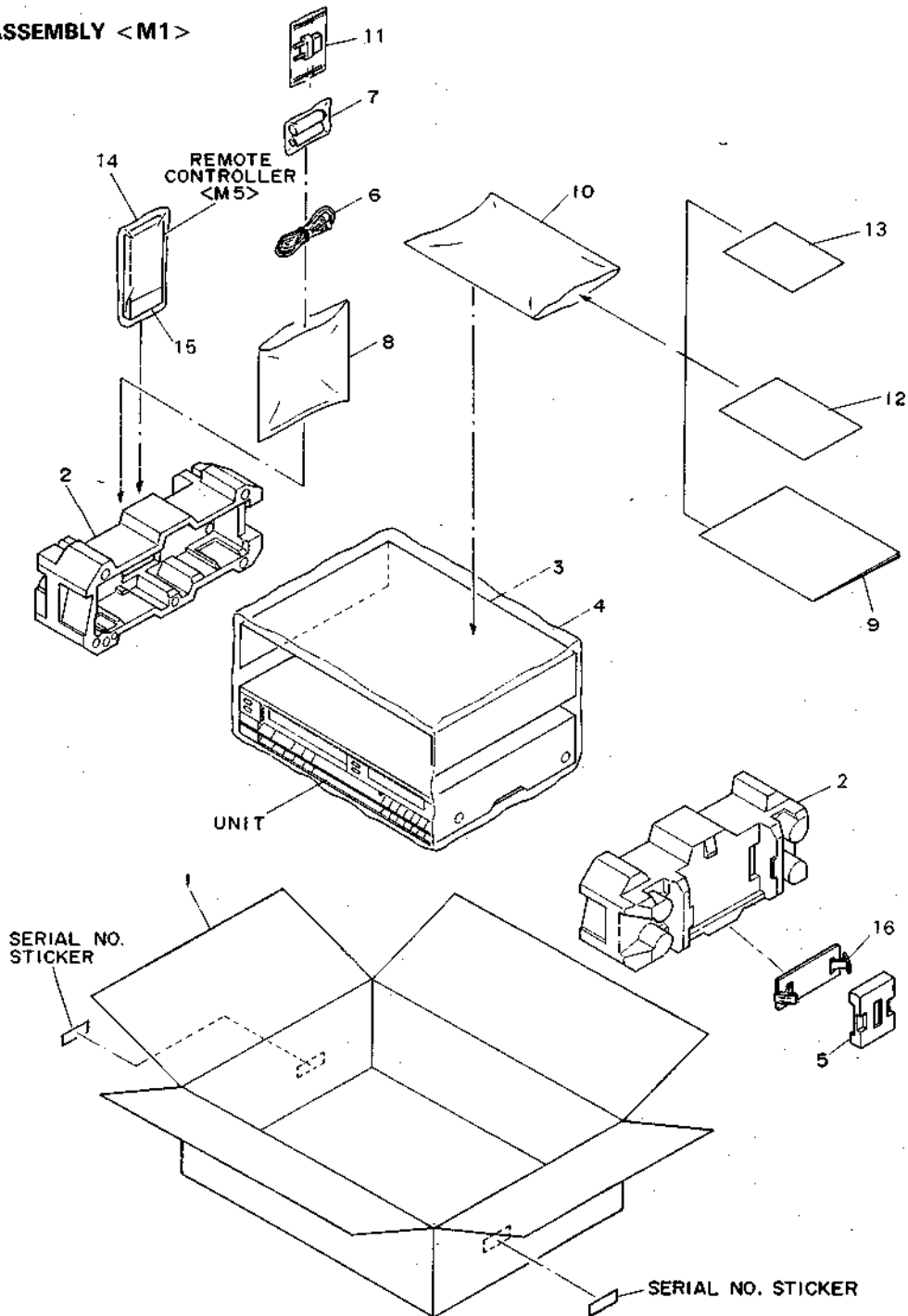
Δ REF. No.	PART No.	PART NAME, DESCRIPTION
R15	NRSA63J-472N	RESISTOR
R16	NRSA63J-222N	RESISTOR
R17	QRD181J-104	RESISTOR
R18	NRSA63J-560N	RESISTOR
R19	NRSA63J-103N	RESISTOR
R21	NRSA63J-104N	RESISTOR
R22	QRD181J-153	RESISTOR
R23	NRSA63J-102N	RESISTOR
R24	NRSA63J-821N	RESISTOR
R25	NRSA63J-104N	RESISTOR
R26	NRSA63J-753N	RESISTOR
R27	NRSA63J-473N	RESISTOR
R28	NRSA63J-474N	RESISTOR
R29	NRSA63J-104N	RESISTOR
R32	NRSA63J-104N	RESISTOR
R33	NRSA63J-154N	RESISTOR
R34	NRSA63J-393N	RESISTOR
R35	NRSA63J-102N	RESISTOR
R36	NRSA63J-181N	RESISTOR
R37	NRSA63J-102N	RESISTOR
R38	NRSA63J-394N	RESISTOR
R41	NRSA63J-561N	RESISTOR
R42	NRSA63J-471N	RESISTOR
R43	NRSA63J-101N	RESISTOR
R46	NRSA63J-103N	RESISTOR
R47	NRSA63J-750N	RESISTOR
R49	NRSA63J-331N	RESISTOR
R51	NRSA63J-102N	RESISTOR
R52	NRSA63J-472N	RESISTOR
R53	NRSA63J-102N	RESISTOR
R54	QRD161J-122	RESISTOR
R55	QRD161J-102	RESISTOR
R56	NRSA63J-102N	RESISTOR
R57	QVZ3518-103	V RESISTOR, COLOUR LEVEL
R58	NRSA63J-105N	RESISTOR
R59	NRSA63J-102N	RESISTOR
R62	NRSA63J-473N	RESISTOR
R63	NRSA63J-682N	RESISTOR
R64	NRSA63J-223N	RESISTOR
R65	NRSA63J-181N	RESISTOR
R66	NRSA63J-472N	RESISTOR
R67	NRSA63J-822N	RESISTOR
R68	NRSA63J-154N	RESISTOR
R69	QRD161J-101	RESISTOR
Δ R71	QRS08J-271YN	RESISTOR
R74	NRSA63J-563N	RESISTOR
R75	NRSA63J-184N	RESISTOR
R76	NRSA63J-331N	RESISTOR
R78	NRSA63J-122N	RESISTOR
R81	NRSA63J-473N	RESISTOR
R82	NRSA63J-333N	RESISTOR
R83	NRSA63J-102N	RESISTOR
R85	NRSA63J-472N	RESISTOR

Δ REF. No.	PART No.	PART NAME, DESCRIPTION
R86	NRSA63J-391N	RESISTOR
R87	NRSA63J-104N	RESISTOR
R88	NRSA63J-473N	RESISTOR
R89	NRSA63J-474N	RESISTOR
R90	NRSA63J-823N	RESISTOR
R91	NRSA63J-223N	RESISTOR
R92	NRSA63J-682N	RESISTOR
R93	QRD161J-103	RESISTOR
R94	NRSA63J-105N	RESISTOR
R95	NRSA63J-564N	RESISTOR
R96	NRSA63J-272N	RESISTOR
R97	NRSA63J-471N	RESISTOR
R98	NRSA63J-102N	RESISTOR
R99	NRSA63J-332N	RESISTOR
R101	NRSA63J-222N	RESISTOR
R102	NRSA63J-472N	RESISTOR
R105	QRD181J-473	RESISTOR
C1	QCTA1CH-3R0	CAPACITOR
C2	QCTA1CH-3R0	CAPACITOR
C3	NCB31HK-271A	CAPACITOR
C4	QCYA1HK-222	CAPACITOR
C5	QCYA1HK-222	CAPACITOR
C6	QCYA1HK-222	CAPACITOR
C7	QCYA1HK-222	CAPACITOR
C8	PU57601-224MEZ	E CAPACITOR
C9	QCYA1HK-103	CAPACITOR
C11	NCB31HK-222A	CAPACITOR
C12	QETG1CM-476	E CAPACITOR
C13	QCYA1HK-103	CAPACITOR
C14	QCTA1CH-820	CAPACITOR
C15	QETG1HM-105	E CAPACITOR
C18	QCTA1CH-220	CAPACITOR
C19	NCB31HK-102A	CAPACITOR
C21	NCB31HK-102A	CAPACITOR
C22	NCT06CH-220A	CAPACITOR
C23	QETC1CM-107	E CAPACITOR
C24	QEKG1HM-334	E CAPACITOR
C25	QCTA1CH-220	CAPACITOR
C26	QCTA1CH-220	CAPACITOR
C27	QETG1CM-336	E CAPACITOR
C28	QEKG1AM-107	E CAPACITOR
C29	QCYA1HK-223	CAPACITOR
C31	NCF31HZ-103A	CAPACITOR
C32	QCYA1HK-223	CAPACITOR
C34	QCYA1HK-223	CAPACITOR
C35	QCTA1CH-220	CAPACITOR
C36	QETA1CM-106	E CAPACITOR
C37	NCB31HK-222A	CAPACITOR
C39	QEK41HM-104	M CAPACITOR
C40	QCTA1CH-820	CAPACITOR
C41	QEKG1CM-106	E CAPACITOR
C42	QCYA1HK-332	CAPACITOR
C44	QEN61EM-475	NP E CAPACITOR
C45	NCB31HK-182A	CAPACITOR
C46	NCT06CH-180A	CAPACITOR

Δ REF. No.	PART No.	PART NAME, DESCRIPTION
C47	QCYA1HK-123	CAPACITOR
C48	NCT06CH-2R0A	CAPACITOR
C49	NCT06CH-5R0A	CAPACITOR
C51	NCT06CH-470A	CAPACITOR
C60	QEKG1HM-104	E CAPACITOR
L1	PU60025-R91	PEAKING COIL
L2	PU60519	IF TRANSFORMER, SAW MATCH
L3	PU59152-3R9K	PEAKING COIL
L4	PU59152-150J	PEAKING COIL
L5	PU59152-470J	PEAKING COIL
L7	PU59152-100J	PEAKING COIL
CF1	PU58558-2	CERAMIC FILTER
	or PU60774-2	CERAMIC FILTER
CF2	PU58558-3	CERAMIC FILTER
	or PU60774-3	CERAMIC FILTER
CF3	PU58558-4	CERAMIC FILTER
	or PU60774-4	CERAMIC FILTER
CF4	PU60774	CERAMIC FILTER
	or PU58558-Z	CERAMIC FILTER
	or PU58558	CERAMIC FILTER
	or PU60774-Z	CERAMIC FILTER
CF5	PU32990-2	CERAMIC FILTER
CF6	PU32990-3	CERAMIC FILTER
CF7	PU59039	CERAMIC FILTER
CF8	PU32990-4	CERAMIC FILTER
CF9	PU60680	CERAMIC FILTER, 4.43M TRAP
SAW1	PU60679	SAW FILTER
T1	PU60839	IF TRANSFORMER, S.TRAP
T2	PU60591	IF TRANSFORMER, S.DET
T3	PU60592	IF TRANSFORMER, AFC
T4	PU60593	IF TRANSFORMER, LLD
T6	PU60669-2	BAND PASS FILTER, 4.5MHZ
T7	PU60670	W-B.P.F, 5.5-6.5MHZ
T8	PU59243	FH TRAP
SLD1	PU60678	SHIELD PLATE
TML1	PU59935-6	TERMINAL
TML2	PU59935-8	TERMINAL
CN1	PU58844-4	CAP HOUSING
— IF SUB (1) <71> —		
PWBA	PB20366A1-02	TU IF SUB BOARD ASSEMBLY
Q501	2SA1532(C)	TRANSISTOR
Q502	2SB1219(RS)	TRANSISTOR
Q504	2SD1819A(RS)	TRANSISTOR
R501	NRSA63J-103N	RESISTOR
R502	NRSA63J-273N	RESISTOR
R503	NRSA63J-331N	RESISTOR
R504	NRSA63J-102N	RESISTOR
R505	NRSA63J-102N	RESISTOR
R506	NRSA63J-301N	RESISTOR
R507	NRSA63J-331N	RESISTOR

SECTION 4 EXPLODED VIEWS AND PARTS LIST

4.1 PACKING ASSEMBLY <M1>



#△ REF NO. PART NO. PART NAME, DESCRIPTION

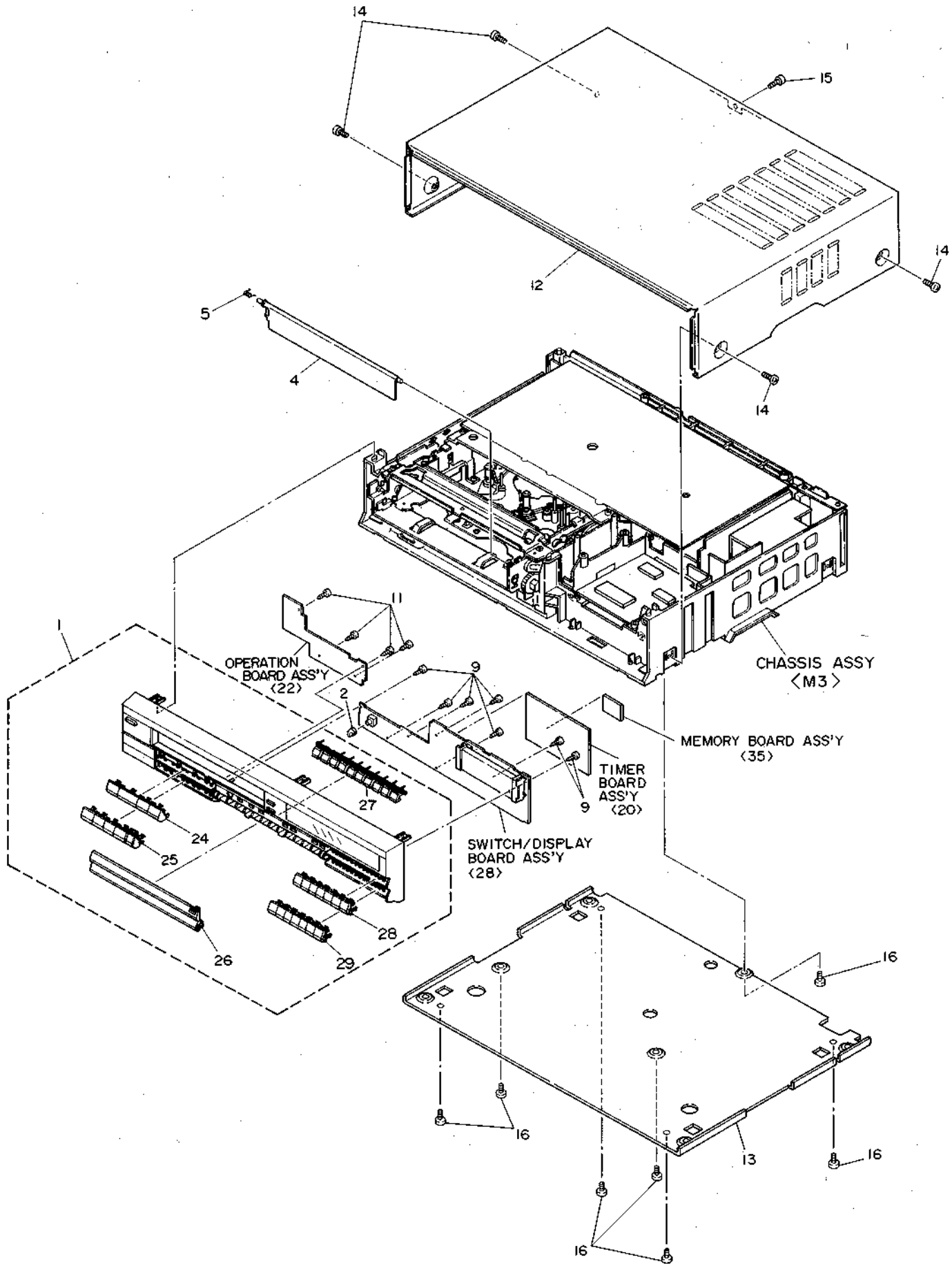
* PACKING ASSEMBLY <M1> *

1	PQ32440	PACKING CASE
2	PQ32157A-1	CUSHION ASSY
3	PQ41026-19	PROTECT SHEET
4	PQM30021-69	POLY BAG
5	PQ32196	CUSHION
△ 6	PU59168-3	RF CABLE
△ 6	OR PU59167-3	RF CABLE
7	UM-4NJ2P	BATTERY

#△ REF NO. PART NO. PART NAME, DESCRIPTION

8	QPGA020-02003	POLY BAG
△ 9	PU30425-987	INSTRUCTIONS
10	QPGA025-03505	POLY BAG
△ 11	QMC0271-001	CONVERSION PLUG
12	TCN-3318	TAPE CATALOG
13	TCN-3379	TAPE CATALOG
△ 14	PQ10474C	REMOTE CONTROLLER
15	PQ31361	BATTERY CAP
16	PQ31424A	HANDLE ASS'Y

4.2 CABINET ASSEMBLY <M2>



#3, REF NO. PART NO. PART NAME, DESCRIPTION

#4, REF NO. PART NO. PART NAME, DESCRIPTION

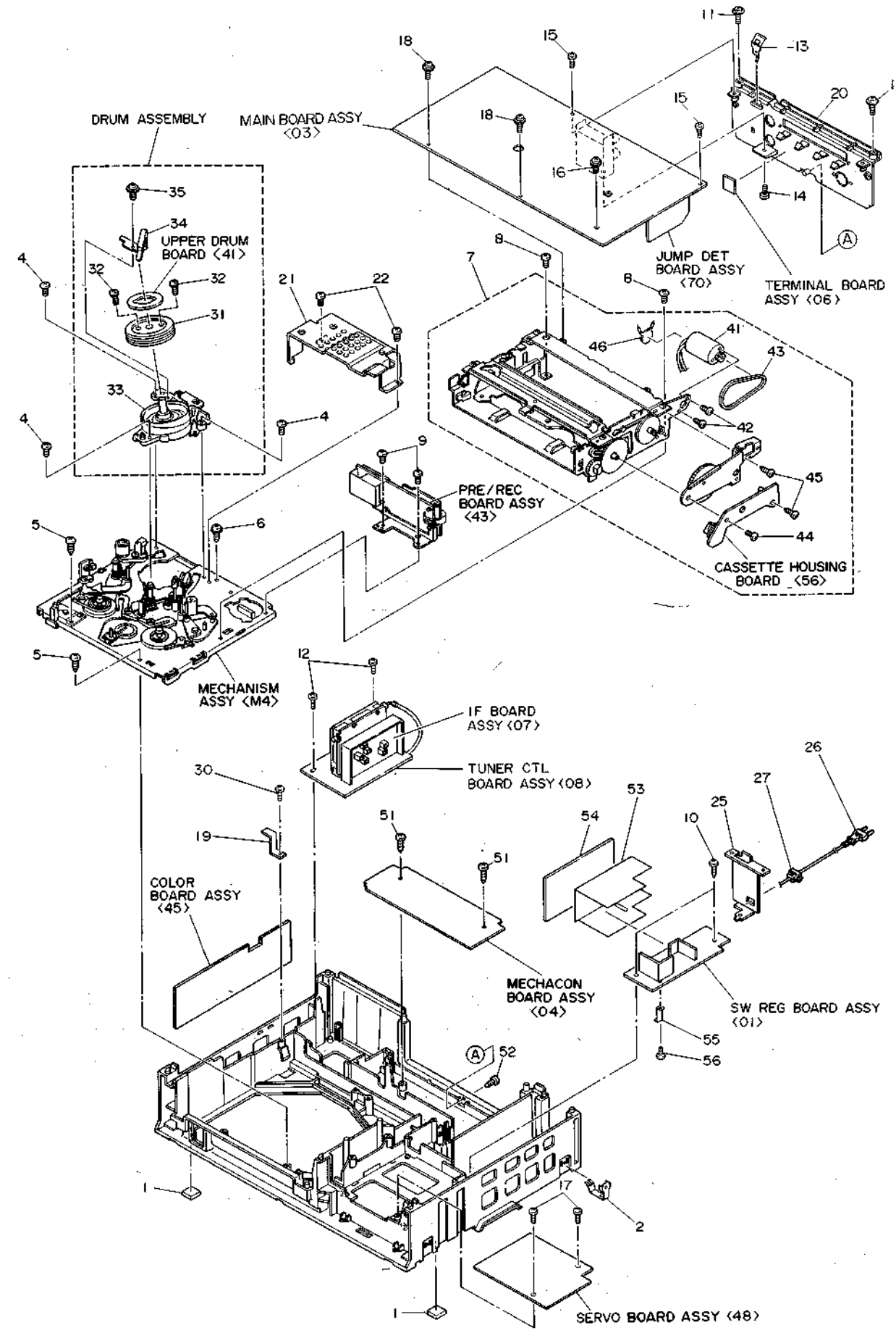
4.3 CHASSIS ASSEMBLY <M3>

* CABINET ASSEMBLY <M2> *

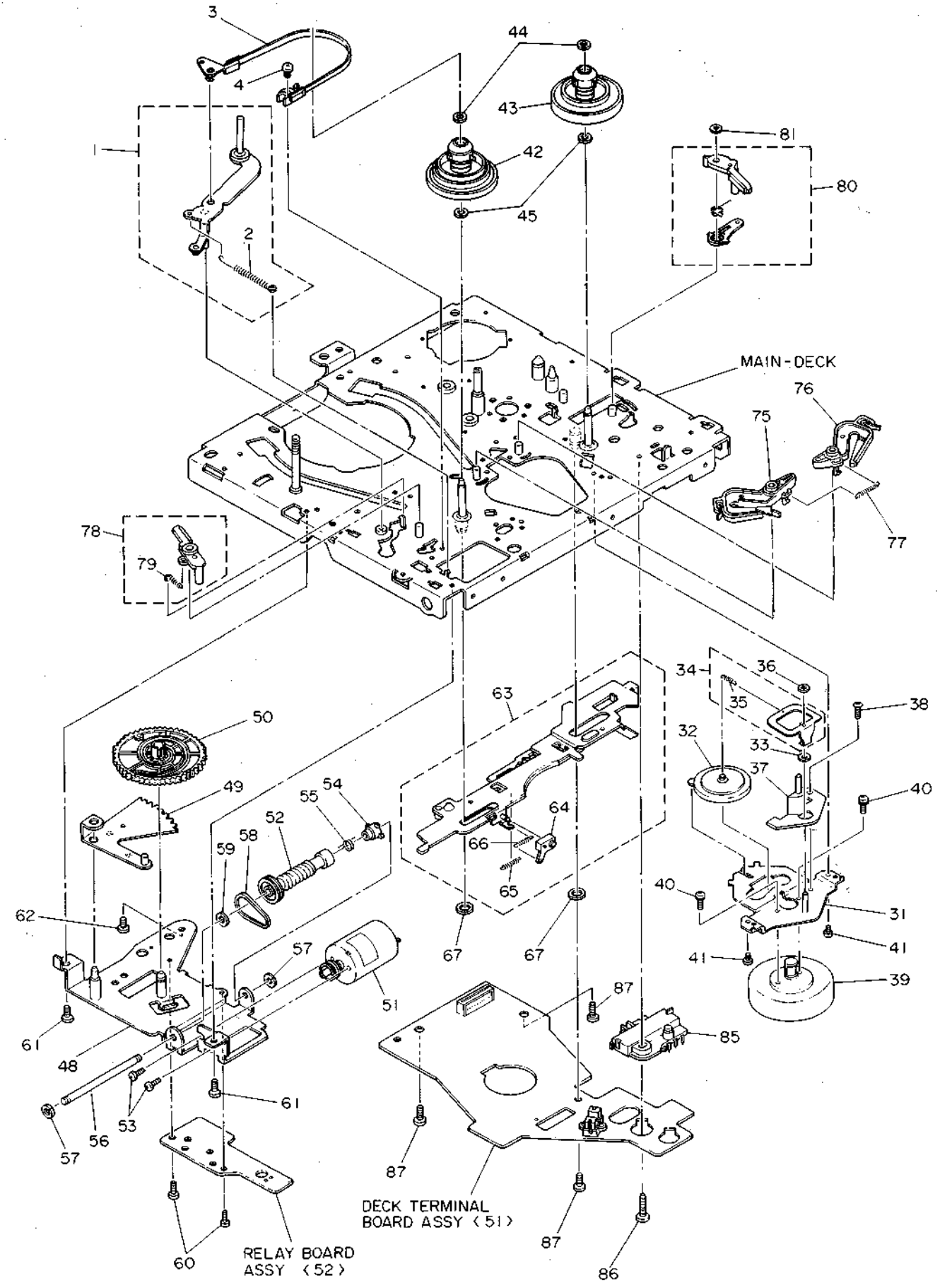
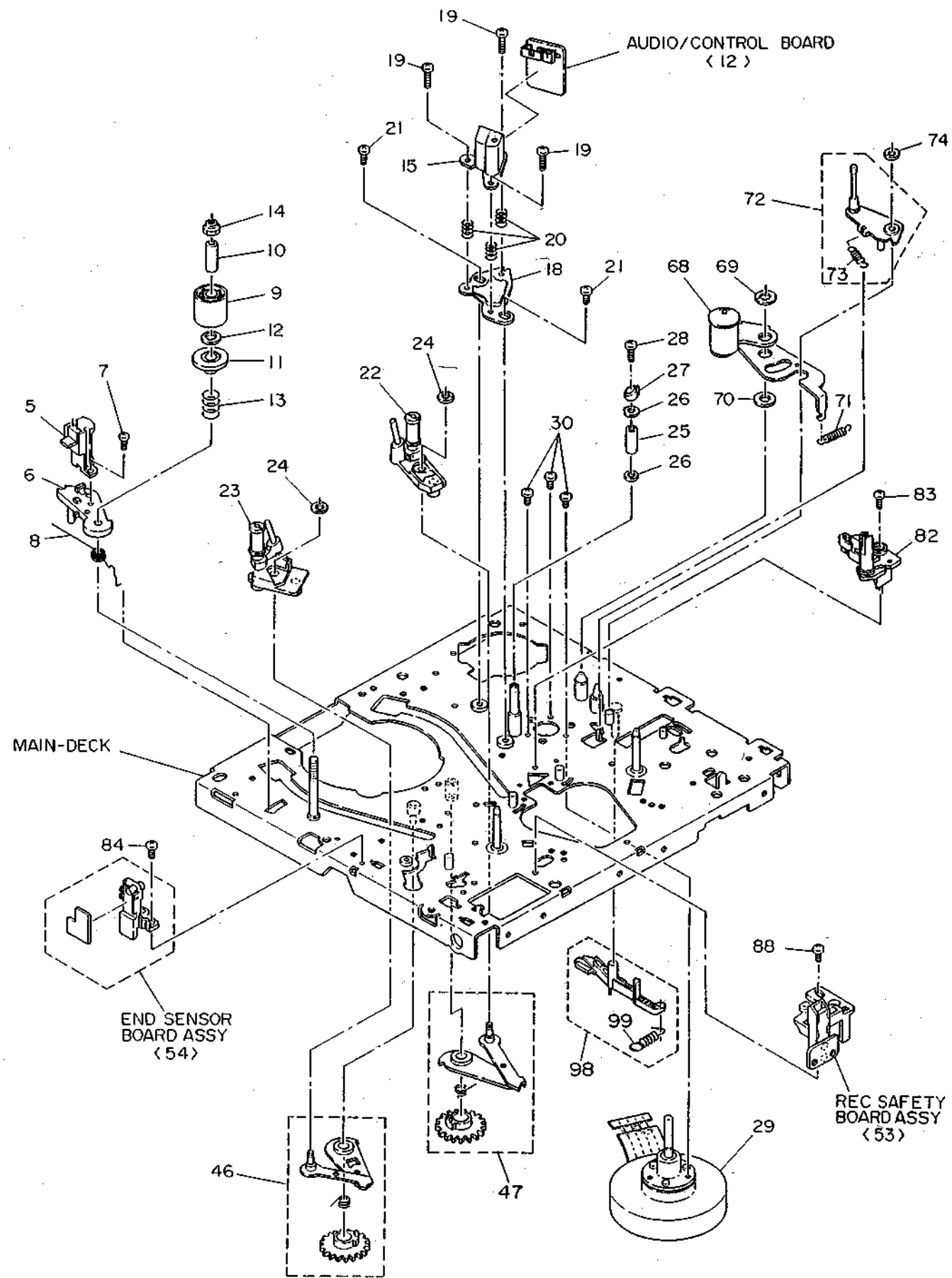
1	PQ10593C-11	FRONT PANEL ASSY
2	PQ43081	KNOB(S.VOL.)
4	PQ31267-144	C.HOUSING DOOR
5	PQ42410-1-1	TORSION SPRING
9	SDSF2608Z	TAPPING SCREW,X7
11	SDSF2608Z	TAPPING SCREW,X4
12	PQ10545	TOP COVER
13	PQ10579	BOTTOM COVER
14	SDSA4014M	TAPPING SCREW,X4
15	SDSF3010M	TAPPING SCREW,X1
16	SDSF3008Z	TAPPING SCREW,X7
24	PQ31729-5	BUTTON(OPE)
25	PQ20493	BUTTON(OPE)
26	PQ20442-9-12	DOOR
27	PQ20443-8	BUTTON(PROG.)
28	PQ31734-14	BUTTON(TEN KEY)
29	PQ31734-15	BUTTON(TEN KEY)

* CHASSIS ASSEMBLY <M3> *

1	PQ43013	FOOT,X2
2	PQ43023	EARTH PLATE
4	SDSP2608Z	SCREW,X3 FOR DRUM ASSY
5	SDSA4014Z	TAPPING SCREW,X2
6	PQ41396	SPECIAL SCREW,M-DECK
7	PUS28277H	CASS.HOUSING ASSY
8	SDST2605Z	TAPPING SCREW,X2.C HOUSING
9	SDST2605Z	TAPPING SCREW, X2
10	SDSA4012Z	TAPPING SCREW,X2
11	GPSF2610Z	TAPPING SCREW,X2
12	SDSF3008Z	TAPPING SCREW,X2
13	PQ43012	EARTH PLATE
14	SDST2605Z	TAPPING SCREW
15	SDSA2608Z	TAPPING SCREW,X2
16	GPSF2610Z	TAPPING SCREW
17	SDSF3008Z	TAPPING SCREW,X2
18	GPST2608Z	SCREW,X2
19	PQ43398	BRACKET
20	PQ20625	TERMINAL BOARD ASSY
21	PQ31171-4	DRUM SHIELD
22	SDST2605Z	TAPPING SCREW,X2 D SHIELD
25	PQ32492	TRANS BRACKET
26	QMP7340-200A	POWER CORD
27	QHS3771-108	STRAIN RELIEF
30	SDSF3008Z	TAPPING SCREW
31	PDM2008D-5	UPPER DRUM ASSY
32	PDM4165A	DRUM SCREW ASSY,X2
33	PDM2053B-15	LOWER DRUM MOTOR ASSY
34	PDM4015B	BRUSH ASSY
35	LPSP2606Z	SCREW
41	PQ42385A	CASSETTE MOTOR ASSY
42	PQ42385B	CASSETTE MOTOR ASSY
43	SPSP2603Z	SCREW,X2
44	PQM30003-19	BELT
45	SPSP2604Z	SCREW
46	SPST2605Z	TAPPING SCREW,X2
46	DV710SR223M16	VARISTOR
51	SDSF3008Z	TAPPING SCREW,X2
52	SDSF3010M	TAPPING SCREW
53	PQ32490	COVER
54	PQ32488	SHIELD PLATE
55	PQ43646	EARTH PLATE
56	SBSB3008Z	SCREW



4.4 MECHANISM ASSEMBLY <M4>



#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION

* MECHANISM ASSEMBLY <M4> *							

1		PQ41944A-7	TENSION ARM ASSY, INCL.2	51		PQ41996B	MODE MOTOR ASSY
2		PQ41952-3	SPRING	52		PQ41998A	WORM ASSY
3		PQ41948A	TENSION BAND ASSY	53		LPSP2604Z	SCREW, X2
4		SDST2606Z	TAPPING SCREW	54		PQ42001	WINDMILL
5		PU57641-2	FULL ERASE HEAD	55		PQ42002	CLUTCH SPRING
6		PQ31036	FULL ERASE HEAD BASE	56		PQ42003	WORM SHAFT
7		SPSG2606Z	TAPPING SCREW	57		PQM30017-5	SLIT WASHER, X2
8		PQ41954-1-1	TORSION SPRING	58		PQM30003-20	BELT
9		PQ41955	IMPEDANCE ROLLER	59		PQM30018-22	SPACER
10		PQ41956	COLLAR	60		SPST2606Z	TAPPING SCREW, X2
11		PQ41957	LOWER FLANGE	61		SPST2606Z	TAPPING SCREW, X2
	OR	PQ42958	LOWER FLANGE	62		SPSP2603Z	SCREW
12		PQM30018-39	SPACER	63		PQ42038D	PLATE ASSY, INCL. 64-66
	OR	PQM30018-50	SPACER	64		PQ31044-1-2	LOCK LEVER
13		PQM30002-124	COMPRESSION SPRING	65		PQM30001-191	TENSION SPRING
14		PQ40353	NYLON NUT	66		PQM30001-211	TENSION SPRING
15		PU60560	AUDIO/CONTROL HEAD	67		PQM30017-28	SLIT WASHER, X2
18		PQ42984-2	HEAD BASE	68		PQ42006B	PINCH ROLLER ARM ASSY
19		SPSP2608Z	SCREW, X3	69		PQM30017-28	SLIT WASHER
20		PU30080-49	SPRING, X3	70		Q03093-833	WASHER
21		SDSP2606Z	SCREW, X2	71		PQM30001-229	TENSION SPRING
22		PQ41963A-2	POLE BASE ASSY(TAKE-UP)	72		PQ42013B-4	GUIDE ARM ASSY, INCL. 73
	OR	PU59994	POLE BASE ASSY(TAKE-UP)	73		PQ42029	SPRING
23		PQ41969A-2	POLE BASE ASSY(SUP)	74		PQM30017-6	SLIT WASHER
	OR	PU59993	POLE BASE ASSY(SUPPLY)	75		PQ42019A-6	MAIN BRAKE ASSY(SUP)
24		PQM30017-5	SLIT WASHER, X2	76		PQ42020B	MAIN BRAKE ASSY(TU)
25		PU53629-2	TAPE GUIDE	77		PQM30001-216	TENSION SPRING
26		PQ40268-2	GUIDE FLANGE, X2	78		PQ42021A-3	SUB BRAKE ASSY(SUP), INCL. 79
27		PQ42999-2-1	GUIDE POLE CAP	79		PQ42023-1-2	TENSION SPRING
28		SDSP2006Z	SCREW	80		PQ42037A-2	SUB BRAKE ASSY(TU)
29		PU60201V	CAPSTAN MOTOR	81		PQM30017-6	SLIT WASHER
30		SPSP2605N	SCREW, X3	82		PU59925-1-1	LED HOLDER, INCL. LED
31		PQ41974A-3	REEL MOTOR BRACKET ASSY	83		SPST2606Z	TAPPING SCREW
32		PU58645-1-4	IDLER ARM	84		SPST2606Z	TAPPING SCREW
33		Q03093-834	WASHER	85		PU60444	SLIDE ENCODER
34		PQ41976A-1	SPRING ARM ASSY, INCL. 35	86		SDSP2610Z	SCREW
35		PQ42212-1-4	SPRING	87		SDSP2606Z	SCREW, X3
36		PQM30017-22	SLIT WASHER	88		SDST2606Z	TAPPING SCREW
37		PQ41978	HOLDER	98		PQ43295A-1	MOTOR BRAKE ASSY, INCL. 99
38		SPST2606Z	TAPPING SCREW	99		PQ43296	SPRING
39		PU58636W	REEL MOTOR				
	OR	PU58636M	REEL MOTOR				
40		LPSP2604Z	SCREW, X2				
41		SPST2606Z	TAPPING SCREW, X2				
42		PU59250-1-2	REEL DISK(SUP)				
43		PU58638-1-2	REEL DISK(TU)				
44		PQM30017-5	SLIT WASHER, X2				
45		Q03093-828	WASHER, X2				
46		PQ41979A-5	LOADING ARM ASSY(SUP)				
47		PQ41985B-3	LOADING ARM ASSY(TU)				
48		PQ41992A-2	CAM BRACKET SUB ASSY				
49		PQ41994A-3	ARM GEAR ASSY				
50		PQ20577-2	CONTROL CAM				



SECTION 5 PARTS LIST

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
***** ***** * SW.REGULATOR BOARD ASSEMBLY <01> * ***** *****			
	PWBA	PB20221A-02	SW.REG BOARD ASSY
	IC1	STR-D1706-F	IC
	IC2	STK5474	IC
	Q1	DTD114ES	TRANSISTOR
	Q11	2SD1406Y	TRANSISTOR
	Q12	DTC144WS	TRANSISTOR
		OR UN4212	TRANSISTOR
	D1	S1WB(A)60	DIODE
	D2	RU1A	FR DIODE
	D3	RU1A	FR DIODE
	D4	AU01Z	FR DIODE
	D5	AU01Z	FR DIODE
	D6	AU01Z	FR DIODE
	D7	AU01Z	FR DIODE
	D8	AU01Z	FR DIODE
	D9	AU01Z	FR DIODE
	D31	F6P20F	FR DIODE
		OR FML-12S	FR DIODE
	D32	21DQ04	BARRIER DIODE
		OR RK14LF-B2	BARRIER DIODE
	D34	AU01Z	FR DIODE
	D35	AU01Z	FR DIODE
	D36	MA165	DIODE
		OR 1SS133	DIODE
	D37	RD4.7ES-T1B3	ZENER DIODE
	D38	AU01Z	FR DIODE
	D39	RD6.2ES-T1B2	ZENER DIODE
	D40	MA165	DIODE
		OR 1SS133	DIODE
	D41	RD10ES-T1B2	ZENER DIODE
	R1	QRZ0078-2R2	W.W.RESISTOR
	R2	QRD121J-154S	RESISTOR
	R3	QRD121J-154S	RESISTOR
	R4	QRG029J-683	OMF RESISTOR
	R5	QRG019J-390	OMF RESISTOR
	R6	QRG019J-331	OMF RESISTOR
	R9	QRZ0078-R39	WW RESISTOR
	R11	QRD161J-333	RESISTOR
	R31	PU60466-RD23	FUSIBLE RESISTOR
	R32	PU60466-R037	FUSIBLE RESISTOR
	R33	QRZ0077-220X	FUSIBLE RESISTOR
	R34	QRZ0077-220X	FUSIBLE RESISTOR
	R35	QRZ0077-4R7X	FUSIBLE RESISTOR
	R36	QRD161J-102	RESISTOR
	R38	QRD161J-822	RESISTOR
	R39	QRD161J-682	RESISTOR
	R40	QRD161J-272	RESISTOR
	R41	QRD161J-223	RESISTOR
	R42	QRD161J-333	RESISTOR
	C1	QFZ9022-473	MM CAPACITOR
	C2	QFZ9022-223	MM CAPACITOR
	C3	QCZ9016-102K	CAPACITOR
	C6	QCZ9016-102K	CAPACITOR
	C7	QCZ9016-102K	CAPACITOR
	C8	QCZ9016-102K	CAPACITOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C10	QEZ0111-107	E CAPACITOR
	C11	QCY53AK-472	CAPACITOR
	C12	QCY43AK-331	CAPACITOR
	C13	QFV41HJ-333	M CAPACITOR
	C14	QEZ0107-106Z	E CAPACITOR
	C15	QFV41HJ-223	M CAPACITOR
	C16	QFL41HJ-222	M CAPACITOR
	C17	QFV41HJ-124	M CAPACITOR
	C18	QEZ0108-187Z	E CAPACITOR
	C21	QCZ9016-102K	CAPACITOR
	C22	QCZ9016-102K	CAPACITOR
	C23	QED61HM-105	E CAPACITOR
	C31	QEZ0125-228	E CAPACITOR
	C32	QEZ0106-228	E CAPACITOR
	C33	QEZ0104-476Z	E CAPACITOR
	C34	QEZ0107-476Z	E CAPACITOR
	C35	QETB1EM-108	E CAPACITOR
	C36	QETB1AM-108	E CAPACITOR
	C38	QFL41HJ-102	M CAPACITOR
	C39	QFL41HJ-102	M CAPACITOR
	C40	QETC1HM-106	E CAPACITOR
	C41	QETC1AM-107	E CAPACITOR
	C42	QETC1CM-107	E CAPACITOR
	C43	QETC1CM-107	E CAPACITOR
	C45	QETC1HM-226	E CAPACITOR
	C46	QETC1JM-226	E CAPACITOR
	L31	PU56183-330	CHOKO COIL
	L32	PU56183-330	CHOKO COIL
	L33	PU48530-101K	PEAKING COIL
	L34	PU48530-101K	PEAKING COIL
	L35	PU48530-100K	CHOKO COIL
	L36	PU48530-100K	CHOKO COIL
	T1	PU60667	SW.TRANS
	HD1	PU57505	FUSE CLIP
	LF1	PU60347	LINE FILTER
	CP1	ICP-F20	CIRCUIT PROTECTOR
	F1	QMF51E2-1R0	FUSE
***** ***** * MAIN BOARD ASSEMBLY <03> * ***** *****			
	PWBA	PB10123A-01	MAIN BOARD ASSY
	RF1	PU60499	RF CONV & MIXER
	R901	QVZ3521-334	V RESISTOR,V LOCK
	SLD1	PU60501	SHIELD CASE(1)
	SLD2	PU60502	SHIELD CASE(2)
	SLD3	PU60503	SHIELD CASE(3)
	TB1	PU60415A	CONNECTOR. BOARD
-AUDIO SECTION-			
	IC1	LA7295	IC
	Q1	2SC1740S(RS)	TRANSISTOR
	Q2	2SC1740S(RS)	TRANSISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
Q3		2SC1740S(RS)	TRANSISTOR
Q4		DTA124ES	TRANSISTOR
Q5		DTA114ES	TRANSISTOR
Q6		DTA124ES	TRANSISTOR
Q7		DTA124ES	TRANSISTOR
Q8		DTC124ES	TRANSISTOR
Q9		DTA124ES	TRANSISTOR
Q10		DTC124ES	TRANSISTOR
Q11		DTC124ES	TRANSISTOR
Q12		2SC1740S(QRS)	TRANSISTOR
D1		1SS133	DIODE
	OR	MA165	DIODE
D2		1SS133	DIODE
	OR	MA165	DIODE
D3		1SS133	DIODE
	OR	MA165	DIODE
D4		1SS133	DIODE
	OR	MA165	DIODE
D6		1SS133	DIODE
	OR	MA165	DIODE
R1		QRD161J-222	RESISTOR
R2		QRD161J-223	RESISTOR
R3		QRD161J-222	RESISTOR
R4		QRD161J-473	RESISTOR
R5		QRD161J-332	RESISTOR
R6		QRD161J-682	RESISTOR
R7		QRD161J-332	RESISTOR
R8		QRD161J-100	RESISTOR
R9		QRD161J-122	RESISTOR
R10		QRD161J-122	RESISTOR
R11		QRD161J-102	RESISTOR
R12		QRD161J-153	RESISTOR
R13		QRD161J-123	RESISTOR
R14		QRD161J-223	RESISTOR
R15		QRD161J-223	RESISTOR
R16		QRD161J-223	RESISTOR
R17		QRD161J-103	RESISTOR
R18		QRD161J-223	RESISTOR
R19		QRD161J-183	RESISTOR
R20		QRD161J-104	RESISTOR
R21		QRD161J-104	RESISTOR
R22		QRD161J-183	RESISTOR
R23		QRD161J-223	RESISTOR
R24		QRD161J-333	RESISTOR
R25		QRD161J-151	RESISTOR
R26		QRD161J-122	RESISTOR
R27		QRD161J-153	RESISTOR
R28		QRD161J-392	RESISTOR
R29		QRD161J-391	RESISTOR
R30		QRD161J-151	RESISTOR
R31		QRD161J-8R2	RESISTOR
R33		QRD161J-561	RESISTOR
R34		QRD161J-223	RESISTOR
R35		QRD161J-331	RESISTOR
R36		QRD161J-334	RESISTOR
R37		QRD161J-103	RESISTOR
R39		QRD161J-395	RESISTOR
R40		QRD161J-822	RESISTOR
R41		QRD161J-273	RESISTOR
R42		QVZ3523-473AZ	V RESISTOR
	OR	QVZ3518-473AZ	V RESISTOR
R43		QRD161J-153	RESISTOR
R44		QRD161J-6R8	RESISTOR
R45		QRD161J-395	RESISTOR
R48		QRD161J-475	RESISTOR
C1		QCVB1CM-103	CAPACITOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
C2		QETC1HM-105	E CAPACITOR
C3		QETC1CM-476	E CAPACITOR
C4		QETC1CM-476	E CAPACITOR
C5		QETC1HM-105	E CAPACITOR
C6		QFV71HJ-273	M CAPACITOR
C7		QFV71HJ-123	M CAPACITOR
C8		QFV71HJ-473	M CAPACITOR
C9		QFV71HJ-563	M CAPACITOR
C10		QEK61EM-335	E CAPACITOR
C11		QFV71HJ-223	M CAPACITOR
C12		QFL31HJ-122	M CAPACITOR
C13		QFL31HJ-222	M CAPACITOR
C14		QETC1HM-334	E CAPACITOR
C15		PU60550	E CAPACITOR
C16		QETB1CM-336	E CAPACITOR
C17		QFV71HJ-103	M CAPACITOR
C18		QETC1HM-105	E CAPACITOR
C20		QFL31HJ-272	M CAPACITOR
C21		QEK61CM-106	E CAPACITOR
C23		QCB1HJ-331	CAPACITOR
C24		QFV71HJ-473	M CAPACITOR
C25		QETC1CM-106	E CAPACITOR
C26		QCXB1CM-272	CAPACITOR
C27		QFL31HJ-392	M CAPACITOR
C28		QCVB1CM-103	CAPACITOR
C29		QCVB1CM-103	CAPACITOR
C30		QCVB1CM-103	CAPACITOR
C31		QCVB1CM-103	CAPACITOR
L1		PU58308-682J	PEAKING COIL
L2		PU58308-103J	PEAKING COIL
T1		PU60510-2	OSC TRANSFORMER
-LUMINANCE SECTION-			
IC101		PB20166F	Y MOD.
△ IC102		MSM6967RS	IC
△ IC202		MSM6989RS	IC
IC203		NJM2234S	IC
△ IC501		MSM6966RS	IC
IC502		BA7021	IC
IC503		NJM2233AS	IC
Q101		2SC1740S(QRS)	TRANSISTOR
Q103		2SA1309R,S	TRANSISTOR
	OR	2SA933S(RS)	TRANSISTOR
Q104		2SC1740S(QRS)	TRANSISTOR
Q107		2SA1309R,S	TRANSISTOR
	OR	2SA933S(RS)	TRANSISTOR
Q110		DTC124ES	TRANSISTOR
Q111		DTC124ES	TRANSISTOR
Q201		DTC124ES	TRANSISTOR
Q209		2SC1740S(QRS)	TRANSISTOR
Q210		2SC1740S(QRS)	TRANSISTOR
Q211		2SA1309R,S	TRANSISTOR
	OR	2SA933S(RS)	TRANSISTOR
Q212		2SC1740S(QRS)	TRANSISTOR
Q213		2SC1740S(QRS)	TRANSISTOR
Q251		2SC1740S(QRS)	TRANSISTOR
Q252		2SC1740S(QRS)	TRANSISTOR
Q253		2SA1309R,S	TRANSISTOR
	OR	2SA933S(RS)	TRANSISTOR
Q254		DTC144ES	TRANSISTOR
Q256		2SC1740S(QRS)	TRANSISTOR
Q257		DTA124ES	TRANSISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
Q258		DTC144ES	TRANSISTOR
Q259		2SC1740S(QRS)	TRANSISTOR
Q260		2SA1309R,S	TRANSISTOR
	OR	2SA933S(RS)	TRANSISTOR
Q503		DTC124ES	TRANSISTOR
Q504		DTC124ES	TRANSISTOR
Q505		2SC1740S(RS)	TRANSISTOR
Q506		2SA1309R,S	TRANSISTOR
	OR	2SA933S(RS)	TRANSISTOR
Q507		DTA124ES	TRANSISTOR
Q508		2SA1309R,S	TRANSISTOR
	OR	2SA933S(RS)	TRANSISTOR
Q509		DTC124ES	TRANSISTOR
Q510		DTC124ES	TRANSISTOR
Q511		DTC124ES	TRANSISTOR
Q512		DTC124ES	TRANSISTOR
Q513		2SA1309R,S	TRANSISTOR
	OR	2SA933S(RS)	TRANSISTOR
Q514		2SC1740S(RS)	TRANSISTOR
Q515		2SC1740S(RS)	TRANSISTOR
Q516		2SC1740S(RS)	TRANSISTOR
Q517		DTC144ES	TRANSISTOR
D101		MA165	DIODE
	OR	1SS133	DIODE
D102		MA165	DIODE
	OR	1SS133	DIODE
D103		MA165	DIODE
	OR	1SS133	DIODE
D104		RD9.1ES-T1B2	ZENER DIODE
D105		MA165	DIODE
	OR	1SS133	DIODE
D203		RD9.1ES-T1B2	ZENER DIODE
D204		MA165	DIODE
	OR	1SS133	DIODE
D206		MA165	DIODE
	OR	1SS133	DIODE
D207		MA165	DIODE
	OR	1SS133	DIODE
D251		MA165	DIODE
	OR	1SS133	DIODE
D254		MA165	DIODE
	OR	1SS133	DIODE
D255		1SS292	DIODE
D257		1SS133	DIODE
	OR	MA165	DIODE
D502		1SS133	DIODE
	OR	MA165	DIODE
D504		RD9.1ES-T1B2	ZENER DIODE
D505		1SS133	DIODE
	OR	MA165	DIODE
D506		1SS133	DIODE
	OR	MA165	DIODE
D507		1SS133	DIODE
	OR	MA165	DIODE
D508		1SS133	DIODE
	OR	MA165	DIODE
D509		1SS133	DIODE
	OR	MA165	DIODE
D512		1SS133	DIODE
	OR	MA165	DIODE
D513		1SS133	DIODE
	OR	MA165	DIODE
R101		QRD161J-103	RESISTOR
R102		QRD161J-182	RESISTOR
R103		QRD161J-333	RESISTOR
R104		QRD161J-333	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
R105		QRD161J-331	RESISTOR
R108		QRD161J-681	RESISTOR
R109		QRD161J-331	RESISTOR
R111		QRD161J-102	RESISTOR
R112		QVZ3518-222	V RESISTOR
R113		QRD161J-222	RESISTOR
R114		QRD161J-102	RESISTOR
R115		QRD161J-181	RESISTOR
R117		QRD161J-102	RESISTOR
R119		QRD122J-391	RESISTOR
R120		QRD161J-333	RESISTOR
R122		QRD161J-183	RESISTOR
R124		QRD161J-101	RESISTOR
R147		QRD161J-562	RESISTOR
R150		QRD161J-222	RESISTOR
R152		QRD161J-101	RESISTOR
R153		QRD161J-332	RESISTOR
R155		QRD161J-681	RESISTOR
R160		QRD161J-221	RESISTOR
R201		QRD161J-181	RESISTOR
R202		QRD161J-471	RESISTOR
R203		QRD161J-181	RESISTOR
R204		QVZ3518-681	V RESISTOR
R217		QRD161J-181	RESISTOR
R219		QRD161J-222	RESISTOR
R220		QRD161J-393	RESISTOR
R221		QRD161J-473	RESISTOR
R222		QRD161J-332	RESISTOR
R223		QVZ3518-682	V RESISTOR
R224		QRD161J-102	RESISTOR
R225		QRD161J-122	RESISTOR
R226		QRD161J-153	RESISTOR
R227		QRD161J-223	RESISTOR
R228		QRD161J-561	RESISTOR
R229		QRD161J-681	RESISTOR
R230		QRD161J-681	RESISTOR
R231		QRD161J-681	RESISTOR
R232		QRD161J-471	RESISTOR
R233		QRD161J-222	RESISTOR
R238		QRD161J-123	RESISTOR
R245		QRD161J-183	RESISTOR
R246		QRD161J-153	RESISTOR
R251		QRD161J-222	RESISTOR
R252		QRD161J-222	RESISTOR
R253		QRD161J-152	RESISTOR
R254		QRD161J-681	RESISTOR
R255		QRD161J-222	RESISTOR
R260		QRD161J-103	RESISTOR
R261		QRD161J-394	RESISTOR
R264		QRD161J-104	RESISTOR
R265		QRD161J-103	RESISTOR
R266		QRD161J-562	RESISTOR
R267		QRD161J-182	RESISTOR
R268		QRD161J-682	RESISTOR
R269		QRD161J-104	RESISTOR
R270		QRD161J-182	RESISTOR
R271		QRD161J-562	RESISTOR
R275		QRD161J-103	RESISTOR
R505		QRD161J-472	RESISTOR
R506		QRD161J-333	RESISTOR
R507		QRD161J-103	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
R508	QRD161J-102	RESISTOR	
R509	QVZ3518-222	V RESISTOR	
R510	QRD161J-182	RESISTOR	
R511	QRD161J-102	RESISTOR	
R512	QRD161J-392	RESISTOR	
R513	QRD161J-181	RESISTOR	
R514	QRD161J-562	RESISTOR	
R515	QVZ3518-222	V RESISTOR	
R516	QRD161J-222	RESISTOR	
R517	QVZ3518-222	V RESISTOR	
R518	QRD161J-821	RESISTOR	
R519	QRD161J-222	RESISTOR	
R520	QRD161J-750	RESISTOR	
R521	QRD161J-472	RESISTOR	
R522	QRD161J-563	RESISTOR	
R523	QRD161J-104	RESISTOR	
R524	QRD161J-272	RESISTOR	
R525	QRD161J-272	RESISTOR	
R526	QRD161J-563	RESISTOR	
R527	QRD161J-104	RESISTOR	
R528	QRD161J-472	RESISTOR	
R531	QRD161J-102	RESISTOR	
R532	QRD161J-102	RESISTOR	
R533	QRD161J-102	RESISTOR	
R534	QRD161J-103	RESISTOR	
R535	QRD161J-272	RESISTOR	
R536	QRD161J-123	RESISTOR	
R537	QRD161J-103	RESISTOR	
R538	QRD161J-103	RESISTOR	
R539	QRD161J-103	RESISTOR	
R540	QRD161J-682	RESISTOR	
R541	QRD161J-103	RESISTOR	
R542	QRD161J-750	RESISTOR	
R543	QRD161J-103	RESISTOR	
R544	QRD161J-103	RESISTOR	
B	QRD161J-0R0	RESISTOR	
C101	QCSB1HJ-220	CAPACITOR	
C102	QETC1AM-226	E CAPACITOR	
C103	QETC1EM-335	E CAPACITOR	
C104	QCVB1CN-103	CAPACITOR	
C105	QCSB1HJ-121	CAPACITOR	
C106	QCSB1HJ-121	CAPACITOR	
C107	QCSB1HJ-220	CAPACITOR	
C108	QETC1AM-226	E CAPACITOR	
C109	QETC1EM-475	E CAPACITOR	
C110	QCSB1HJ-120	CAPACITOR	
C111	QETC1HM-104	E CAPACITOR	
C112	QETC1EM-475	E CAPACITOR	
C113	QCVB1CN-103	CAPACITOR	
C114	QCVB1CN-103	CAPACITOR	
C115	QCVB1CN-103	CAPACITOR	
C116	QETC0JM-476	E CAPACITOR	
C117	QETC1AM-476	E CAPACITOR	
C118	QCVB1CN-103	CAPACITOR	
C119	QCVB1CN-103	CAPACITOR	
C120	QCVB1CN-103	CAPACITOR	
C121	QETC1CM-106	E CAPACITOR	
C122	QETC1HM-224	E CAPACITOR	
C123	QETC1EM-335	E CAPACITOR	
C124	QETC0JM-337	E CAPACITOR	
C125	QEN61EM-335	NP E CAPACITOR	
C126	QCVB1CN-103	CAPACITOR	
C127	QCVB1CN-103	CAPACITOR	
C128	QCSB1HJ-470	CAPACITOR	
C129	QETC0JM-476	E CAPACITOR	
C130	QCVB1CN-103	CAPACITOR	

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
C131	QCVB1CN-103	CAPACITOR	
C132	QETA0JM-476	E CAPACITOR	
C133	QCVB1CN-103	CAPACITOR	
C134	QETC1CM-476	E CAPACITOR	
C149	QEN41AM-226	NP E CAPACITOR	
C152	QCSB1HJ-120	CAPACITOR	
C155	QCVB1CN-103	CAPACITOR	
C201	QCSB1HJ-180	CAPACITOR	
C213	QCVB1CN-103	CAPACITOR	
C221	QETC1AM-107	E CAPACITOR	
C222	QCVB1CN-103	CAPACITOR	
C224	QETC1HM-104	E CAPACITOR	
C225	QETC1EM-475	E CAPACITOR	
C226	QCVB1CN-103	CAPACITOR	
C227	QCVB1CN-103	CAPACITOR	
C229	QETC0JM-476	E CAPACITOR	
C230	QCVB1CN-103	CAPACITOR	
C233	QEK61CM-106	E CAPACITOR	
C234	QETC1CM-476	E CAPACITOR	
C235	QCVB1CN-103	CAPACITOR	
C236	QCSB1HJ-330	CAPACITOR	
C237	QCSB1HJ-270	CAPACITOR	
C238	QETC1AM-476	E CAPACITOR	
C239	QCSB1HJ-200	CAPACITOR	
C244	QCVB1CN-103	CAPACITOR	
C245	QCVB1CN-103	CAPACITOR	
C246	QETC1CM-106	E CAPACITOR	
C247	QETC1CM-106	E CAPACITOR	
C251	QCVB1CN-103	CAPACITOR	
C252	QCVB1CN-103	CAPACITOR	
C253	QCVB1CN-103	CAPACITOR	
C255	QCVB1CN-103	CAPACITOR	
C256	QCC11EJ-104	CAPACITOR	
C257	QCVB1CN-103	CAPACITOR	
C258	QEN50JM-336	NP E CAPACITOR	
C260	QCVB1CN-103	CAPACITOR	
C261	QCVB1CN-103	CAPACITOR	
C501	QCSB1HJ-150	CAPACITOR	
C502	QCSB1HJ-151	CAPACITOR	
C503	QCSB1HJ-100	CAPACITOR	
C504	QCSB1HJ-130	CAPACITOR	
C505	QETB1EM-475	E CAPACITOR	
C506	QCSB1HJ-330	CAPACITOR	
C517	QETC1EM-475	E CAPACITOR	
C518	QETC1HM-104	E CAPACITOR	
C519	QCVB1CN-103	CAPACITOR	
C520	QCVB1CN-103	CAPACITOR	
C521	QCVB1CN-103	CAPACITOR	
C522	QETC0JM-476	E CAPACITOR	
C523	QCVB1CN-103	CAPACITOR	
C524	QETC1AM-476	E CAPACITOR	
C525	QCVB1CN-103	CAPACITOR	
C526	QCVB1CN-103	CAPACITOR	
C527	QCVB1CN-103	CAPACITOR	
C528	QETC1AM-476	E CAPACITOR	
C529	QETC1HM-225	E CAPACITOR	
C530	QETC1AM-226	E CAPACITOR	
C532	QETC0JM-477	E CAPACITOR	
C533	QFN31HJ-123	M CAPACITOR	
C534	QFN31HJ-123	M CAPACITOR	

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
C535	QETC1CM-106	E	CAPACITOR
C536	QETC0JM-476	E	CAPACITOR
C537	QCVB1CN-103		CAPACITOR
C538	QCSB1HJ-390		CAPACITOR
C539	QCBBIHJ-181		CAPACITOR
C540	QCBBIHJ-181		CAPACITOR
C541	QCBBIHJ-101		CAPACITOR
C542	QCVB1CN-103		CAPACITOR
C543	QETB0JM-476	E	CAPACITOR
C544	QCBBIHJ-101		CAPACITOR
C545	QCBBIHJ-181		CAPACITOR
C546	QCBBIHJ-181		CAPACITOR
C547	QCSB1HJ-390		CAPACITOR
C548	QCVB1CN-103		CAPACITOR
C549	QETC0JM-476	E	CAPACITOR
C550	QETB0JM-107	E	CAPACITOR
L101	PU59152-121J		PEAKING COIL
L102	PU59152-221J		PEAKING COIL
L103	PU59152-680J		PEAKING COIL
L104	PU59152-330J		PEAKING COIL
L105	PU59152-101J		PEAKING COIL
L106	PU48530-101K		PEAKING COIL
L107	PU59152-101K		PEAKING COIL
L108	PU59152-680J		PEAKING COIL
L109	PU48530-101K		PEAKING COIL
L110	PU59152-180J		PEAKING COIL
L111	PU48530-101K		PEAKING COIL
L112	PU48530-101K		PEAKING COIL
L201	PU59152-680J		PEAKING COIL
L202	PU59152-101K		PEAKING COIL
L203	PU48530-101K		PEAKING COIL
L204	PU59152-560J		PEAKING COIL
L205	PU59152-390J		PEAKING COIL
L206	PU48530-101K		PEAKING COIL
L207	PU48530-101K		PEAKING COIL
L208	PU48530-101K		PEAKING COIL
L251	PU48530-101K		PEAKING COIL
L501	PU59152-121J		PEAKING COIL
L502	PU59152-680J		PEAKING COIL
L504	PU59152-101K		PEAKING COIL
L505	PU48530-101K		PEAKING COIL
L506	PU48530-101K		PEAKING COIL
L507	PU48530-101K		PEAKING COIL
L508	PU48530-101K		PEAKING COIL
L509	PU59152-820J		PEAKING COIL
EQ101	PU60162		EQUALIZER
EQ103	PU60282-2		EQUALIZER
LPF101	PU60161		LOW PASS FILTER
LPF102	PU59855		LOW PASS FILTER
CN102	PU59555-10		CAP HOUSING
-COLOR SECTION-			
IC301	PU22046A		C.MODULE BOARD ASSY
IC351	BA7007		IC
IC405	NJM2234S		IC
IC601	NJM2234S		IC
IC602	NJM2234S		IC
IC603	NJM2233AS		IC
IC751	M50255P		IC
Q301	2SC1740S(QRS)		TRANSISTOR
Q302	2SC1740S(QRS)		TRANSISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
Q311	DTC124ES		TRANSISTOR
Q312	DTC144ES		TRANSISTOR
Q313	DTC144ES		TRANSISTOR
Q314	DTC144ES		TRANSISTOR
Q315	DTC144WS		TRANSISTOR
Q316	DTC144ES		TRANSISTOR
Q317	2SC1740S(QRS)		TRANSISTOR
Q319	2SC1740S(QRS)		TRANSISTOR
Q351	2SC1740S(QRS)		TRANSISTOR
Q402	DTA124ES		TRANSISTOR
Q403	2SC1740S(QRS)		TRANSISTOR
Q404	2SC1740S(QRS)		TRANSISTOR
Q405	2SC1740S(QRS)		TRANSISTOR
Q411	2SC1740S(QRS)		TRANSISTOR
Q415	DTC124ES		TRANSISTOR
Q416	DTC124ES		TRANSISTOR
Q417	DTC124ES		TRANSISTOR
Q418	DTC124ES		TRANSISTOR
Q419	DTC143ES		TRANSISTOR
Q456	2SA1309R,S		TRANSISTOR
OR	2SA933S(RS)		TRANSISTOR
Q457	2SC1740S(QRS)		TRANSISTOR
Q466	2SC1740S(QRS)		TRANSISTOR
Q469	DTA124ES		TRANSISTOR
Q601	2SA1309R,S		TRANSISTOR
OR	2SA933S(RS)		TRANSISTOR
Q602	DTC124ES		TRANSISTOR
Q603	2SA1309R,S		TRANSISTOR
OR	2SA933S(RS)		TRANSISTOR
Q604	2SC1740S(RS)		TRANSISTOR
Q605	2SC1740S(RS)		TRANSISTOR
Q606	DTC124ES		TRANSISTOR
Q607	2SC1740S(RS)		TRANSISTOR
Q608	2SC1740S(RS)		TRANSISTOR
Q612	2SC1740S(RS)		TRANSISTOR
Q613	2SC1740S(RS)		TRANSISTOR
Q614	2SC1740S(RS)		TRANSISTOR
Q615	2SB643R,S		TRANSISTOR
Q616	DTA144ES		TRANSISTOR
Q617	DTC144WS		TRANSISTOR
Q618	2SB643R,S		TRANSISTOR
Q619	DTC124ES		TRANSISTOR
Q620	DTA144ES		TRANSISTOR
Q621	DTA144ES		TRANSISTOR
Q622	DTC144ES		TRANSISTOR
Q623	2SC1740S(RS)		TRANSISTOR
Q624	DTA144ES		TRANSISTOR
Q625	DTC144ES		TRANSISTOR
D301	MA165		DIODE
OR	1SS133		DIODE
D302	MA165		DIODE
OR	1SS133		DIODE
D303	MA165		DIODE
OR	1SS133		DIODE
D351	MA165		DIODE
OR	1SS133		DIODE
D355	MA165		DIODE
OR	1SS133		DIODE
D356	MA165		DIODE
OR	1SS133		DIODE
D357	MA165		DIODE
OR	1SS133		DIODE
D358	MA165		DIODE

REF NO.	PART NO.	PART NAME, DESCRIPTION
	OR 1SS133	DIODE
D404	MA165	DIODE
	OR 1SS133	DIODE
D405	MA165	DIODE
	OR 1SS133	DIODE
D407	MA165	DIODE
	OR 1SS133	DIODE
D408	MA165	DIODE
	OR 1SS133	DIODE
D409	MA165	DIODE
	OR 1SS133	DIODE
D410	MA165	DIODE
	OR 1SS133	DIODE
D459	MA165	DIODE
	OR 1SS133	DIODE
D601	1SS133	DIODE
	OR MA165	DIODE
D602	1SS133	DIODE
	OR MA165	DIODE
D603	1SS133	DIODE
	OR MA165	DIODE
D604	1SS133	DIODE
	OR MA165	DIODE
D605	1SS133	DIODE
	OR MA165	DIODE
D606	1SS133	DIODE
	OR MA165	DIODE
D607	1SS133	DIODE
	OR MA165	DIODE
D608	1SS133	DIODE
	OR MA165	DIODE
D609	1SS133	DIODE
	OR MA165	DIODE
D610	1SS133	DIODE
	OR MA165	DIODE
D615	1SS133	DIODE
	OR MA165	DIODE
D618	1SS133	DIODE
	OR MA165	DIODE
D621	1SS133	DIODE
	OR MA165	DIODE
D622	1SS133	DIODE
	OR MA165	DIODE
D623	1SS133	DIODE
	OR MA165	DIODE
D624	1SS133	DIODE
	OR MA165	DIODE
D625	1SS133	DIODE
	OR MA165	DIODE
D626	1SS133	DIODE
	OR MA165	DIODE
D627	1SS133	DIODE
	OR MA165	DIODE
D628	1SS133	DIODE
	OR MA165	DIODE
D629	1SS133	DIODE
	OR MA165	DIODE
D630	1SS133	DIODE
	OR MA165	DIODE
D631	1SS133	DIODE
	OR MA165	DIODE
D632	1SS133	DIODE
	OR MA165	DIODE
D633	1SS133	DIODE
	OR MA165	DIODE
D634	1SS133	DIODE
	OR MA165	DIODE

REF NO.	PART NO.	PART NAME, DESCRIPTION
R301	QRD161J-102	RESISTOR
R302	QRD161J-102	RESISTOR
R303	QRD161J-473	RESISTOR
R304	QRD161J-182	RESISTOR
R305	QRD161J-681	RESISTOR
R306	QRD161J-102	RESISTOR
R307	QRD161J-102	RESISTOR
R312	QRD161J-391	RESISTOR
R313	QRD161J-561	RESISTOR
R314	QRD161J-563	RESISTOR
R316	QRD161J-221	RESISTOR
R317	QRD161J-391	RESISTOR
R318	QRD161J-122	RESISTOR
R319	QRD161J-393	RESISTOR
R320	QRD161J-103	RESISTOR
R321	QRD161J-103	RESISTOR
R322	QRD161J-361	RESISTOR
R325	QRD161J-102	RESISTOR
R326	QRD161J-472	RESISTOR
R327	QRD161J-274	RESISTOR
R328	QVZ3518-223	V RESISTOR
R330	QRD161J-122	RESISTOR
R331	QRD161J-222	RESISTOR
R334	QRD161J-102	RESISTOR
R335	QRD161J-122	RESISTOR
R336	QRD161J-471	RESISTOR
R337	QRD161J-152	RESISTOR
R338	QRD161J-223	RESISTOR
R339	QRD161J-682	RESISTOR
R340	QRD161J-102	RESISTOR
R341	QRD161J-181	RESISTOR
R347	QRD161J-153	RESISTOR
R348	QRD161J-103	RESISTOR
R351	QRD161J-102	RESISTOR
R352	QRD161J-154	RESISTOR
R353	QRD161J-563	RESISTOR
R354	QRD161J-182	RESISTOR
R355	QVZ3518-472	V RESISTOR
R356	QRD161J-103	RESISTOR
R357	QRD161J-562	RESISTOR
R358	QRD161J-333	RESISTOR
R359	QRD161J-333	RESISTOR
R360	QRD161J-102	RESISTOR
R361	QRD161J-393	RESISTOR
R364	QRD161J-223	RESISTOR
R365	QRD161J-333	RESISTOR
R420	QRD161J-562	RESISTOR
R421	QRD161J-103	RESISTOR
R422	QRD161J-153	RESISTOR
R423	QRD161J-103	RESISTOR
R424	QRD161J-682	RESISTOR
R425	QRD161J-472	RESISTOR
R426	QRD161J-562	RESISTOR
R428	QRD161J-473	RESISTOR
R430	QVZ3518-681	V RESISTOR
R431	QRD161J-561	RESISTOR
R432	QVZ3518-331	V RESISTOR
R433	QRD161J-221	RESISTOR
R434	QRD161J-473	RESISTOR
R435	QRD161J-223	RESISTOR
R436	QRD161J-102	RESISTOR
R437	QRD161J-102	RESISTOR
R438	QRD161J-820	RESISTOR
R439	QRD161J-222	RESISTOR
R440	QRD161J-183	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
R441	QRD161J-472	RESISTOR	
R442	QRD161J-153	RESISTOR	
R443	QRD161J-183	RESISTOR	
R444	QRD161J-333	RESISTOR	
R445	QRD161J-103	RESISTOR	
R451	QRD161J-102	RESISTOR	
R452	QVZ3518-681	V RESISTOR	
R459	QRD161J-392	RESISTOR	
R463	QRD161J-393	RESISTOR	
R477	QRD162J-153	RESISTOR	
R478	QRD161J-103	RESISTOR	
R479	QRD161J-222	RESISTOR	
R480	QRD161J-333	RESISTOR	
R481	QRD161J-333	RESISTOR	
R484	QRD161J-222	RESISTOR	
R486	QRD161J-562	RESISTOR	
R487	QRD161J-472	RESISTOR	
R601	QRD161J-393	RESISTOR	
R602	QRD161J-103	RESISTOR	
R605	QRD161J-103	RESISTOR	
R606	QRD161J-393	RESISTOR	
R607	QRD161J-103	RESISTOR	
R608	QRD161J-103	RESISTOR	
R609	QRD161J-103	RESISTOR	
R612	QRD161J-393	RESISTOR	
R613	QRD161J-682	RESISTOR	
R614	QRD161J-153	RESISTOR	
R615	QRD161J-393	RESISTOR	
R616	QRD161J-682	RESISTOR	
R617	QRD161J-222	RESISTOR	
R618	QRD161J-393	RESISTOR	
R619	QRD161J-182	RESISTOR	
R620	QRD161J-472	RESISTOR	
R621	QRD161J-103	RESISTOR	
R622	QRD161J-272	RESISTOR	
R623	QRD161J-393	RESISTOR	
R624	QRD161J-333	RESISTOR	
R626	QRD161J-391	RESISTOR	
R627	QRD161J-331	RESISTOR	
R628	QRD161J-271	RESISTOR	
R629	QRD161J-122	RESISTOR	
R630	QRD161J-562	RESISTOR	
R631	QRD161J-562	RESISTOR	
R632	QRD161J-222	RESISTOR	
R634	QRD161J-103	RESISTOR	
R635	QRD161J-153	RESISTOR	
R636	QRD161J-222	RESISTOR	
R637	QRD161J-153	RESISTOR	
R638	QRD161J-103	RESISTOR	
R639	QVZ3518-222	V RESISTOR	
R640	QVZ3518-222	V RESISTOR	
R641	QRD161J-103	RESISTOR	
R646	QRD161J-682	RESISTOR	
R647	QRD161J-682	RESISTOR	
R649	QRD161J-562	RESISTOR	
R650	QRD161J-153	RESISTOR	
R651	QRD161J-103	RESISTOR	
R652	QRD161J-222	RESISTOR	
R653	QRD161J-103	RESISTOR	
R654	QRD161J-153	RESISTOR	
R655	QVZ3518-681	V RESISTOR	
R656	QVZ3518-681	V RESISTOR	
R657	QRD161J-681	RESISTOR	
R658	QRD161J-821	RESISTOR	

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
R659	QRD161J-103	RESISTOR	
R660	QRD161J-332	RESISTOR	
R661	QRD161J-103	RESISTOR	
R662	QRD161J-103	RESISTOR	
R663	QRD161J-392	RESISTOR	
R664	QRD161J-473	RESISTOR	
R665	QRD161J-183	RESISTOR	
R666	QRD161J-122	RESISTOR	
R667	QRD161J-103	RESISTOR	
C302	QCB1HJ-820	CAPACITOR	
C303	QCB1HJ-102	CAPACITOR	
C304	QCVB1CN-103	CAPACITOR	
C305	QFN31HJ-473	M CAPACITOR	
C306	QCSB1HJ-470	CAPACITOR	
C311	QETC1CM-106	E CAPACITOR	
C312	QETB1HM-474	E CAPACITOR	
C313	QFN31HJ-563	M CAPACITOR	
C314	QETC1CM-106	E CAPACITOR	
C315	QETC1HM-225	E CAPACITOR	
C316	QETC1EM-335	E CAPACITOR	
C317	QFN31HJ-473	M CAPACITOR	
C318	QCVB1CN-103	CAPACITOR	
C319	QETC1EM-475	E CAPACITOR	
C320	QEM51AK-107	E CAPACITOR	
C321	QCVB1CN-103	CAPACITOR	
C322	QEK61HM-105	E CAPACITOR	
C323	QEK61HM-475	E CAPACITOR	
C324	QEK61HM-475	E CAPACITOR	
C326	QCVB1CN-103	CAPACITOR	
C327	QETC1HM-105	E CAPACITOR	
C328	QFN31HJ-223	M CAPACITOR	
C329	QCT25CH-220	CAPACITOR	
C330	QCVB1CN-103	CAPACITOR	
C331	QETC1CM-106	E CAPACITOR	
C332	QCB1HJ-101	CAPACITOR	
C333	QCVB1CN-103	CAPACITOR	
C334	QCB1HJ-102	CAPACITOR	
C335	QETC1AM-476	E CAPACITOR	
C336	QCVB1CN-103	CAPACITOR	
C337	QCSB1HK-5R6	CAPACITOR	
C340	QCC11EK-273	CAPACITOR	
	OR	QCC11EK-273R	CAPACITOR
C351	QETC1CM-476	E CAPACITOR	
C352	QCVB1CN-103	CAPACITOR	
C353	QETC1AM-336	E CAPACITOR	
C354	QFN31HJ-182	M CAPACITOR	
C355	QFN31HJ-272	M CAPACITOR	
C356	QFN31HJ-223	M CAPACITOR	
C357	QETC1CM-106	E CAPACITOR	
C358	QCVB1CN-103	CAPACITOR	
C422	QCVB1CN-103	CAPACITOR	
C423	QCVB1CN-103	CAPACITOR	
C424	QEK61AM-226	E CAPACITOR	
C426	QCVB1CN-103	CAPACITOR	
C431	QCVB1CN-103	CAPACITOR	
C432	QCVB1CN-103	CAPACITOR	
C433	QCVB1CN-103	CAPACITOR	
C434	QCVB1CN-103	CAPACITOR	
C435	QETC0JM-476	E CAPACITOR	
C436	QCVB1CN-103	CAPACITOR	
C439	QCVB1CN-103	CAPACITOR	
C453	QCVB1CN-103	CAPACITOR	
C454	QCVB1CN-103	CAPACITOR	
C455	QCVB1CN-103	CAPACITOR	

REF NO.	PART NO.	PART NAME, DESCRIPTION
R625	QRD161J-472	RESISTOR
R626	QRD161J-472	RESISTOR
R627	QRD161J-472	RESISTOR
R628	QRD161J-124	RESISTOR
R629	QRD161J-124	RESISTOR
R630	QRD161J-333	RESISTOR
R631	QRD161J-472	RESISTOR
R632	QRD161J-332	RESISTOR
R633	QRD161J-472	RESISTOR
R634	QRD161J-103	RESISTOR
R635	QRD161J-331	RESISTOR
R636	QRD161J-822	RESISTOR
R637	QRD161J-472	RESISTOR
R638	QRD161J-472	RESISTOR
R639	QRD161J-472	RESISTOR
R640	QRD161J-472	RESISTOR
R641	QRD161J-472	RESISTOR
R642	QRD161J-472	RESISTOR
R643	QRD161J-472	RESISTOR
R644	QRD161J-124	RESISTOR
R645	QRD161J-472	RESISTOR
R646	QRD161J-124	RESISTOR
R647	QRD161J-561	RESISTOR
R648	QRD161J-561	RESISTOR
R649	QRD161J-331	RESISTOR
RA601	QRB049J-103	RESISTOR ARRAY
OR	QRB047J-103	RESISTOR ARRAY
RA602	QRB049J-472	RESISTOR ARRAY
OR	QRB047J-472	NETWORK RESISTOR
RA603	QRB069J-472	NETWORK RESISTOR
OR	QRB067J-472	NETWORK RESISTOR
C601	QCFB1EZ-223	CAPACITOR
C602	QCFB1EZ-223	CAPACITOR
C604	QETC1EM-335	E CAPACITOR
C605	QETC1EM-475	E CAPACITOR
C606	QETC1EM-475	E CAPACITOR
C607	QETC1EM-475	E CAPACITOR
C608	QETC1HM-105	E CAPACITOR
C609	QCC11EK-473	CAPACITOR
C610	QCF31HP-223	CAPACITOR
C611	QCF31HP-223	CAPACITOR
C612	QCC11EK-104	CAPACITOR
L601	PU59152-100J	PEAKING COIL
L602	PU59152-2R7J	PEAKING COIL
CF601	PU60030	RESONATOR
OR	PU60125	RESONATOR
WR601	PW30112-GOAF6AF	PARALLEL WIRE
CN601	PU59934-15	WIRE HOLDER
CN602	PW30301-06624	DISP/SW WIRE
OR	PW30312-06624	WIRE ASSY
CN603	PU59555-5	CAP HOUSING
CN604	PU58844-7	CAP HOUSING
CN605	PU58844-9	CAP HOUSING
CN606	PU59555-10	CAP HOUSING
CN607	PU59555-9	CAP HOUSING
CN608	PU58844-4	CAP HOUSING
CN609	PU58844-10	CAP HOUSING
CN610	PU58844-2	CAP HOUSING
CP601	ICP-F20	CIRCUIT PROTECTOR
CP602	ICP-N25	CIRCUIT PROTECTOR
-MECHACON REGULATOR SECTION-		
C1	QETC1CM-107	E CAPACITOR

REF NO.	PART NO.	PART NAME, DESCRIPTION
CN1	PU58844-15	CAP HOUSING
CN2	PU58844-4Y	CAP HOUSING
CN3	PU58844-2R	CAP HOUSING
CN4	PU58844-4R	CAP HOUSING
CN5	PU58844-3	CAP HOUSING

***** * TERMINAL BOARD ASSEMBLY <06> *		

PWBA	PB20222A2	TERMINAL P ASSY
J1	PU60452	MINI JACK

***** * IF BOARD ASSEMBLY <07> *		

PWBA	PB10112A-01	IF PWB ASS'Y
IC1	M51496P	IC
IC2	M5223P	IC
IC3	BU4066B	IC
Q1	2SC2636S,T	TRANSISTOR
Q2	2SD1450S,T	TRANSISTOR
Q3	DTC144WU	TRANSISTOR
Q4	DTC144EU	TRANSISTOR
Q5	2SA1532(C)	TRANSISTOR
Q6	2SA1532(C)	TRANSISTOR
Q7	2SA1576(RS)	TRANSISTOR
Q8	2SC4081(RS)	TRANSISTOR
Q9	2SC4081(RS)	TRANSISTOR
Q11	2SA1532(C)	TRANSISTOR
Q12	2SA1576(RS)	TRANSISTOR
Q13	2SA1576(RS)	TRANSISTOR
Q15	2SA1576(RS)	TRANSISTOR
Q16	2SC4081(RS)	TRANSISTOR
Q17	2SC4081(RS)	TRANSISTOR
Q18	DTA114EU	TRANSISTOR
Q19	2SK381(C)	FE TRANSISTOR
Q20	DTC144EU	TRANSISTOR
Q21	2SC4081(RS)	TRANSISTOR
Q22	DTC144WU	TRANSISTOR
Q23	2SC4081(RS)	TRANSISTOR
Q25	2SC4081(RS)	TRANSISTOR
Q26	2SK381(C)	FE TRANSISTOR
Q32	2SC3311A(RS)	TRANSISTOR
Q33	2SB1030A(RS)	TRANSISTOR
D1	HVP21-01S4A	V. DIODE
D2	MT211B	ZENER DIODE
OR	RD11ES-T1B2	ZENER DIODE
D4	DAN202U	DIODE
D5	1SS133	DIODE
D6	1SS133	DIODE
D7	DAN202U	DIODE
R1	NRSA63J-750N	S.CHIP RESISTOR
R2	QVZ3531-471	V RESISTOR
R3	NRSA63J-822N	S.CHIP RESISTOR
R4	NRSA63J-472N	S.CHIP RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
R5		NRSA63J-561N	RESISTOR
R6		NRSA63J-102N	S.CHIP RESISTOR
R7		QRD161J-271	RESISTOR
R8		NRSA63J-180N	S.CHIP RESISTOR
R9		NRSA63J-681N	S.CHIP RESISTOR
R11		QVZ3518-102	V RESISTOR
R12		NRSA63J-272N	S.CHIP RESISTOR
R13		NRSA63J-103N	S.CHIP RESISTOR
R15		NRSA63J-472N	S.CHIP RESISTOR
R16		NRSA63J-222N	S.CHIP RESISTOR
R17		QRD181J-104	RESISTOR
R18		NRSA63J-560N	S.CHIP RESISTOR
R19		NRSA63J-103N	S.CHIP RESISTOR
R21		NRSA63J-104N	S.CHIP RESISTOR
R22		QRD181J-153	RESISTOR
R23		NRSA63J-102N	S.CHIP RESISTOR
R24		NRSA63J-821N	S.CHIP RESISTOR
R25		NRSA63J-104N	S.CHIP RESISTOR
R26		NRSA63J-753N	S.CHIP RESISTOR
R27		NRSA63J-473N	S.CHIP RESISTOR
R28		NRSA63J-474N	S.CHIP RESISTOR
R29		NRSA63J-104N	S.CHIP RESISTOR
R32		NRSA63J-104N	S.CHIP RESISTOR
R33		NRSA63J-154N	S.CHIP RESISTOR
R34		NRSA63J-393N	S.CHIP RESISTOR
R35		NRSA63J-102N	S.CHIP RESISTOR
R36		NRSA63J-271N	S.CHIP RESISTOR
R37		NRSA63J-102N	S.CHIP RESISTOR
R38		NRSA63J-394N	S.CHIP RESISTOR
R41		NRSA63J-561N	S.CHIP RESISTOR
R42		NRSA63J-471N	S.CHIP RESISTOR
R43		NRSA63J-101N	S.CHIP RESISTOR
R44		NRSA63J-102N	S.CHIP RESISTOR
R45		NRSA63J-331N	S.CHIP RESISTOR
R46		NRSA63J-103N	S.CHIP RESISTOR
R47		NRSA63J-750N	S.CHIP RESISTOR
R49		NRSA63J-331N	S.CHIP RESISTOR
R51		NRSA63J-102N	S.CHIP RESISTOR
R52		NRSA63J-472N	S.CHIP RESISTOR
R53		NRSA63J-102N	S.CHIP RESISTOR
R54		QRD161J-122	RESISTOR
R55		QRD161J-102	RESISTOR
R56		NRSA63J-102N	S.CHIP RESISTOR
R57		QVZ3518-103	V RESISTOR
R58		NRSA63J-105N	S.CHIP RESISTOR
R59		NRSA63J-102N	S.CHIP RESISTOR
R61		NRSA63J-331N	S.CHIP RESISTOR
R62		NRSA63J-473N	S.CHIP RESISTOR
R63		NRSA63J-682N	S.CHIP RESISTOR
R64		NRSA63J-223N	S.CHIP RESISTOR
R65		NRSA63J-181N	S.CHIP RESISTOR
R66		NRSA63J-472N	S.CHIP RESISTOR
R67		NRSA63J-822N	S.CHIP RESISTOR
R68		NRSA63J-154N	S.CHIP RESISTOR
R69		QRD161J-101	RESISTOR
R71		QRS08J-271YN	RESISTOR
R74		NRSA63J-563N	S.CHIP RESISTOR
R75		NRSA63J-184N	S.CHIP RESISTOR
R76		NRSA63J-331N	S.CHIP RESISTOR
R77		NRSA63J-102N	S.CHIP RESISTOR
R78		NRSA63J-122N	S.CHIP RESISTOR
R79		NRSA63J-222N	S.CHIP RESISTOR
R81		NRSA63J-473N	S.CHIP RESISTOR
R82		NRSA63J-333N	S.CHIP RESISTOR
R83		NRSA63J-102N	S.CHIP RESISTOR
R85		NRSA63J-472N	S.CHIP RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
R86		NRSA63J-391N	S.CHIP RESISTOR
R87		NRSA63J-104N	S.CHIP RESISTOR
R88		NRSA63J-473N	S.CHIP RESISTOR
R89		NRSA63J-474N	S.CHIP RESISTOR
R90		NRSA63J-823N	S.CHIP RESISTOR
R91		NRSA63J-223N	S.CHIP RESISTOR
R92		NRSA63J-682N	S.CHIP RESISTOR
R93		QRD161J-103	RESISTOR
R94		NRSA63J-105N	S.CHIP RESISTOR
R95		NRSA63J-564N	S.CHIP RESISTOR
R96		NRSA63J-272N	S.CHIP RESISTOR
R97		NRSA63J-471N	S.CHIP RESISTOR
R98		NRSA63J-102N	S.CHIP RESISTOR
R99		NRSA63J-332N	S.CHIP RESISTOR
R102		NRSA63J-472N	S.CHIP RESISTOR
R104		QRD161J-331	RESISTOR
R105		QRD181J-473	RESISTOR
C1		QCTA1CH-3R0	FC CAPACITOR
C2		QCTA1CH-3R0	FC CAPACITOR
C3		NCB31HK-271A	CAPACITOR
C4		QCYA1HK-222	CAPACITOR
C5		QCYA1HK-222	CAPACITOR
C6		QCYA1HK-222	CAPACITOR
C7		QCYA1HK-222	CAPACITOR
C8		PU57601-224MEZ	E CAPACITOR
C9		QCYA1HK-103	CAPACITOR
C11		NCB31HK-222A	S CHIP CAP
C12		QETG1CM-476	E CAPACITOR
C13		QCYA1HK-103	CAPACITOR
C14		QCTA1CH-820	CAPACITOR
C15		QETG1HM-335	E CAPACITOR
C18		QCTA1CH-220	CAPACITOR
C19		NCB31HK-102A	S CHIP CAP
C21		NCB31HK-102A	S CHIP CAP
C22		NCT06CH-470A	S.CHIP CAP
C23		QETC1CM-107	E CAPACITOR
C24		QEKG1HM-334	E CAPACITOR
C25		QCTA1CH-220	CAPACITOR
C26		QCTA1CH-220	CAPACITOR
C27		QETG1CM-336	E CAPACITOR
C28		QETG1CM-336	E CAPACITOR
C29		QCYA1HK-223	CAPACITOR
C31		NCF31HK-103A	CAPACITOR
C32		QCYA1HK-223	CAPACITOR
C33		QCYA1HK-223	CAPACITOR
C34		QCYA1HK-223	CAPACITOR
C35		QCTA1CH-220	CAPACITOR
C36		QETG1CM-106	E CAPACITOR
C37		NCB31HK-222A	S CHIP CAP
C38		NCT06CH-470A	S.CHIP CAP
C39		QEK41HM-104	M CAPACITOR
C40		QCTA1CH-820	CAPACITOR
C41		QEKG1CM-106	E CAPACITOR
C42		QCYA1HK-472	CAPACITOR
C43		QEK41HM-105	E CAPACITOR
C44		QEN61EM-475	NP E CAPACITOR
C45		NCB31HK-182A	S.CHIP CAP
C46		NCT06CH-330A	S CHIP CAP
C47		QCYA1HK-123	CAPACITOR
C48		NCT06CH-2R0A	S.CHIP CAP
C49		NCT06CH-5R0A	CAPACITOR
C51		NCT06CH-470A	S CHIP CAP

#REF NO.	PART NO.	PART NAME, DESCRIPTION
C60	QEK61HM-104	E CAPACITOR
L1	PU60025-1R0	PEAKING COIL
L2	PU60519	IF.TRANSFORMER
L3	PU59152-3R9K	PEAKING COIL
L4	PU59152-150J	PEAKING COIL
L5	PU59152-470J	PEAKING COIL
L7	PU59152-220J	PEAKING COIL
CF1	PU58558-2	CERAMIC FILTER
CF2	PU58558-3	CERAMIC FILTER
CF3	PU58558-4	CERAMIC FILTER
CF4	PU58558	CERAMIC FILTER
CF5	PU32990-2	CERAMIC FILTER
CF6	PU32990-3	CERAMIC FILTER
CF7	PU59039	CERAMIC FILTER
CF8	PU32990-4	CERAMIC FILTER
CF9	PU60680	CERAMIC FILTER
SAW1	PU60679	SAW FILTER
T1	PU60590	IF.TRANSFORMER
T2	PU60591	IF.TRANSFORMER
T3	PU60592	IF.TRANSFORMER
T4	PU60593	IF.TRANSFORMER
T6	PU60669	BAND PASS FILTER
T7	PU60670	W-B.P.F
T8	PU59243	F.HTRAP

* TUNER CONTROL BOARD ASSEMBLY <08> *		

PWBA	PB20208A1-01	TU/CTL BOARD ASSY
△ TNR	PU36421-3	U/V TUNER
IC201	LA7910	IC
IC202	M5223P	IC
Q201	2SB810H,J	TRANSISTOR
Q202	DTC144ES	TRANSISTOR
	OR 2SC3399	TRANSISTOR
	OR UN4213	TRANSISTOR
Q204	2SC3311A(S)	TRANSISTOR
Q205	2SA720	TRANSISTOR
	OR 2SB1278(QR)	TRANSISTOR
Q206	2SC1740S(S)	TRANSISTOR
	OR 2SC3311A(S)	TRANSISTOR
Q210	DTA114ES	TRANSISTOR
Q211	DTC144ES	TRANSISTOR
Q215	2SD1450S,T	TRANSISTOR
Q216	DTA114TS	TRANSISTOR
Q217	DTC144ES	TRANSISTOR
Q218	DTA114ES	TRANSISTOR
D201	LTZ-MR15	ZENER DIODE
D202	HZT33-02	ZENER DIODE
D203	1SS133	DIODE
R201	QRD161J-182	RESISTOR
R202	QRD161J-153	RESISTOR
R206	QRD161J-332	RESISTOR
R208	QRD161J-121	RESISTOR
R209	QRD161J-473	RESISTOR
R210	QRD161J-103	RESISTOR

#REF NO.	PART NO.	PART NAME, DESCRIPTION
R211	QRD161J-103	RESISTOR
R212	QRD161J-333	RESISTOR
R214	QRD161J-394	RESISTOR
R215	QRD161J-154	RESISTOR
R216	QRD161J-154	RESISTOR
R217	QRD161J-154	RESISTOR
R218	QRD161J-103	RESISTOR
R225	QRD161J-472	RESISTOR
R226	QRD161J-472	RESISTOR
R227	QRD161J-104	RESISTOR
R228	QRD161J-472	RESISTOR
R235	QRD161J-472	RESISTOR
R236	QRD161J-472	RESISTOR
R237	QRD161J-123	RESISTOR
R238	QRD161J-123	RESISTOR
R262	QRD161J-103	RESISTOR
R263	QRD161J-103	RESISTOR
R271	QRD161J-473	RESISTOR
R273	QRD161J-222	RESISTOR
R277	QRD161J-222	RESISTOR
C202	QETC1CM-106	E CAPACITOR
C204	QCBB1HJ-101	CAPACITOR
C205	QETC1HM-106	E CAPACITOR
C207	QCVB1CM-103	CAPACITOR
C208	QFV71HJ-333	M CAPACITOR
C209	QFV71HJ-153	M CAPACITOR
C210	QFV71HJ-333	M CAPACITOR
C211	QFV71HJ-153	M CAPACITOR
C215	QETC1CM-106	E CAPACITOR
C216	QETC1HM-105	E CAPACITOR
C217	QETC1CM-106	E CAPACITOR
C218	QETC1EM-335	E CAPACITOR
C219	QETC1CM-106	E CAPACITOR
C221	QETC1CM-106	E CAPACITOR
C222	QETC1CM-106	E CAPACITOR
C223	QEK61CM-476	E CAPACITOR
C224	QEK61HM-224	E CAPACITOR
L204	PU59152-6R8K	PEAKING COIL
△ TH201OR	PU52108-4R7KT	POSISTOR
△	OR PU52108-4R7T	POSISTOR
△	OR PU52108-4R7	POSISTOR
HD1	PU36378	HOLDER
CN201	PU59555-8	CAP HOUSING
CN202	PU58844-4	CAP HOUSING
△ CP201	ICP-F10	CIRCUIT PROTECTOR
JP4	QWE211-60A2A2	JUMP WIRE

* AUDIO/CTL HEAD BOARD <12> *		

PWBA	PB40029	AC HEAD BOARD
CN1	PU58844-103B	CAP HOUSING
CN2	PU58844-104	CAP HOUSING

#	REF NO.	PART NO.	PART NAME, DESCRIPTION

* TIMER BOARD ASSEMBLY <20> *			

PWBA	PB10137A1-02	T/D/S PWB ASS'Y	
IC1	UPD75212ACW-014	IC	
IC2	M5278L56	IC	
IC3	IC-PST523H-2	IC	
Q1	2SC3311A(RS)	TRANSISTOR	
Q2	2SK656	FE TRANSISTOR	
D1	1SS133	DIODE	
D2	1SS133	DIODE	
D3	1SS133	DIODE	
D13	1SS132	DIODE	
D15	1SS132	DIODE	
D17	1SS133	DIODE	
D19	RD9.1ES-T1B2	ZENER DIODE	
D20	1SS133	DIODE	
R1	QRD161J-682	RESISTOR	
R2	QRD161J-103	RESISTOR	
R3	QRD161J-104	RESISTOR	
R4	QRD161J-102	RESISTOR	
R6	QRD161J-273	RESISTOR	
R7	QRD161J-472	RESISTOR	
R9	QRD161J-102	RESISTOR	
R11	QRD161J-103	RESISTOR	
R12	QRD161J-103	RESISTOR	
R14	QRD161J-103	RESISTOR	
R15	QRD161J-103	RESISTOR	
R16	QRD161J-103	RESISTOR	
R17	QRD161J-103	RESISTOR	
R18	QRD161J-103	RESISTOR	
R19	QRD161J-103	RESISTOR	
R20	QRD161J-103	RESISTOR	
R22	QRD161J-102	RESISTOR	
R25	QRD161J-103	RESISTOR	
R26	QRD161J-103	RESISTOR	
R27	QRD161J-103	RESISTOR	
R28	QRD161J-103	RESISTOR	
R29	QRD161J-103	RESISTOR	
R30	QRD161J-103	RESISTOR	
R31	QRD161J-333	RESISTOR	
R32	QRD161J-333	RESISTOR	
R35	QRD161J-333	RESISTOR	
R36	QRD161J-333	RESISTOR	
R37	QRD161J-333	RESISTOR	
R38	QRD161J-102	RESISTOR	
R39	QRD161J-333	RESISTOR	
RA2	QRB047J-224	NETWORK RESISTOR	
OR	QRB049J-224	NETWORK RESISTOR	
RA3	QRB087J-224	NETWORK RESISTOR	
OR	QRB089J-224	NETWORK RESISTOR	
C1	QET61CM-336	E CAPACITOR	
C2	QET60JM-336	E CAPACITOR	
C3	QETA0JM-338	E CAPACITOR	
C7	QCVB1CN-103	CAPACITOR	
C8	QCVB1CN-103	CAPACITOR	
C9	QCVB1CN-103	CAPACITOR	
C10	QET61CM-106	E CAPACITOR	
C11	QCT30CH-120	CAPACITOR	

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
C12	PU57672-200	TRIMMER CAPACITOR	
C14	QET60JM-336	E CAPACITOR	
C15	QCB61HJ-471	CAPACITOR	
C16	QET61HM-336	E CAPACITOR	
X2	PU60226	CRYSTAL RESONATOR	

* OPERATION BOARD ASSEMBLY <22> *			

PWBA	PB20071G1	OPERATION BOARD ASSEMBLY	
IC201	GP1U501	INFRARED RAYS UNIT	
OR	SPS-413	INFRARED RAYS UNIT	
D200	MTZ5.1B	ZENER DIODE	
D201	SLR-55MC3F	LE DIODE	
D202	SLR-55MC3F	LE DIODE	
R200	QRD161J-821	RESISTOR	
R211	QRD161J-222	RESISTOR	
R212	QRD161J-222	RESISTOR	
R213	QRD161J-332	RESISTOR	
R214	QRD161J-472	RESISTOR	
R215	QRD161J-103	RESISTOR	
R216	QRD161J-222	RESISTOR	
R217	QRD161J-222	RESISTOR	
R221	QRD161J-471	RESISTOR	
R225	QRD161J-332	RESISTOR	
R228	QRD161J-223	RESISTOR	
R229	QRD161J-563	RESISTOR	
S201	PU57550	TACT SWITCH	
S203	PU57550	TACT SWITCH	
S204	PU57550	TACT SWITCH	
S205	PU57550	TACT SWITCH	
S206	PU57550	TACT SWITCH	
S207	PU57550	TACT SWITCH	
S208	PU57550	TACT SWITCH	
S209	PU57550	TACT SWITCH	
S213	PU57550	TACT SWITCH	
S214	PU57550	TACT SWITCH	
HD1	PQ31805-1-3	HOLDER (POWER.LED)	
CN201	PW30202-05D58	WIRE ASSY	
	PU59555-105	CAP HOUSING	
CN203	PU59513-3	CAP HOUSING	

* SWITCH /DISPLAY BOARD ASSEMBLY <28> *			

FDP	PU59951-2	FLUORESCENT DISPLAY PANEL	
PWBA	PB10137A2-02	SWITCH/DISPLAY BOARD ASSY	
IC202	M50255P	IC	
D101	1SS132	DIODE	
D102	1SS132	DIODE	

REF NO.	PART NO.	PART NAME, DESCRIPTION
D103	1SS132	DIODE
D104	1SS132	DIODE
D105	1SS132	DIODE
D106	1SS132	DIODE
D107	1SS132	DIODE
D108	1SS132	DIODE
D109	1SS132	DIODE
D202	SLH-56VC3F	LE DIODE
D203	SLH-56DC3F	LE DIODE
D204	SLR-55MC3F	LE DIODE
D205	SLR-55MC3F	LE DIODE
D206	SLR-55MC3F	LE DIODE
D801	SLH-34VR3F	LE DIODE
D802	SLH-34VR3F	LE DIODE
D803	SLH-34VR3F	LE DIODE
D804	SLH-34VR3F	LE DIODE
D805	SLH-34VR3F	LE DIODE
D806	SLH-34VR3F	LE DIODE
D807	SLH-34VR3F	LE DIODE
D808	SLH-34VR3F	LE DIODE
D809	SLH-34VR3F	LE DIODE
R202	QRD161J-331	RESISTOR
R203	QRD161J-331	RESISTOR
R204	QRD161J-331	RESISTOR
R230	QRD161J-472	RESISTOR
R231	QRD161J-472	RESISTOR
R402	PU59166	V RESISTOR
R801	QRD161J-331	RESISTOR
R802	QRD161J-331	RESISTOR
R807	QRD161J-331	RESISTOR
S1	PU53598	TACT SWITCH
S2	PU53598	TACT SWITCH
S3	PU53598	TACT SWITCH
S4	PU53598	TACT SWITCH
S5	PU53598	TACT SWITCH
S6	PU53598	TACT SWITCH
S7	PU53598	TACT SWITCH
S8	PU53598	TACT SWITCH
S9	PU53598	TACT SWITCH
S10	PU53598	TACT SWITCH
S12	PU53598	TACT SWITCH
S13	PU53598	TACT SWITCH
S14	PU53598	TACT SWITCH
S17	PU53598	TACT SWITCH
S18	PU53598	TACT SWITCH
S19	PU53598	TACT SWITCH
S21	PU53598	TACT SWITCH
S22	PU53598	TACT SWITCH
S23	PU53598	TACT SWITCH
S24	PU53598	TACT SWITCH
S25	PU53598	TACT SWITCH
S26	PU53598	TACT SWITCH
S27	PU53598	TACT SWITCH
S28	PU53598	TACT SWITCH
S210	PU53598	TACT SWITCH
S211	PU53598	TACT SWITCH
S402	PU58486-1-1	SLIDE SWITCH
S403	PU58486-1-1	SLIDE SWITCH
S406	PU58486-1-1	SLIDE SWITCH
S801	PU58486-1-1	SLIDE SWITCH
S802	PU58909	SLIDE SWITCH

REF NO.	PART NO.	PART NAME, DESCRIPTION
S803	PU58486-1-1	SLIDE SWITCH
S804	PU58486-1-1	SLIDE SWITCH
HD1	PQM30038-2-2	LED HOLDER,X14
HD2	PQ31333-1-2	D.HOLDER (L)
HD3	PQ31334-1-2	D.HOLDER (R)

* MEMORY BOARD ASSEMBLY <35> *		

PWBA	PB20208A2	MEMORY BOARD ASSY
IC101	MN1220	IC
R101	QRD161J-104	RESISTOR
R102	QRD161J-104	RESISTOR
R103	QRD161J-104	RESISTOR
CN101	PU60488-7	CAP HOUSING

* UPPER DRUM BOARD <41> *		

PWB1	PDM3017	UPPER DRUM BOARD

* PRE/REC BOARD ASSEMBLY <43> *		

PWBA	PB30067A	PRE/REC BOARD ASSY
IC1	HA118019NT	IC
Q1	2SA1309R,S	TRANSISTOR
Q2	2SA1309R,S	TRANSISTOR
Q3	2SC1740S(RS)	TRANSISTOR
Q4	2SC1740S(RS)	TRANSISTOR
Q5	DTC124ES	TRANSISTOR
Q6	DTC124ES	TRANSISTOR
Q7	DTC144WS	TRANSISTOR
Q8	DTC124ES	TRANSISTOR
Q9	DTC124ES	TRANSISTOR
Q10	DTA124ES	TRANSISTOR
Q11	DTA124ES	TRANSISTOR
D1	MA165	DIODE
OR	1SS133	DIODE
D2	MA165	DIODE
OR	1SS133	DIODE
D3	MA165	DIODE
OR	1SS133	DIODE
R1	QRD161J-102	RESISTOR
R2	QRD161J-182	RESISTOR
R3	QRD161J-222	RESISTOR
R4	QRD161J-561	RESISTOR
R5	QRD161J-681	RESISTOR
R6	QRD161J-561	RESISTOR
R7	QRD161J-332	RESISTOR

*REF NO.	PART NO.	PART NAME, DESCRIPTION
R8	QRD161J-562	RESISTOR
R9	QRD161J-102	RESISTOR
R10	QRD161J-102	RESISTOR
R11	QRD161J-681	RESISTOR
R12	QRD161J-122	RESISTOR
R13	QRD161J-681	RESISTOR
R14	QRD161J-102	RESISTOR
R15	QRD161J-182	RESISTOR
R16	QRD161J-222	RESISTOR
R17	QRD161J-223	RESISTOR
R18	QRD161J-223	RESISTOR
R19	QRD161J-223	RESISTOR
R20	QRD161J-184	RESISTOR
R21	QRD161J-223	RESISTOR
R22	QRD161J-474	RESISTOR
R23	QRD161J-223	RESISTOR
R24	QRD161J-103	RESISTOR
R25	QRD161J-103	RESISTOR
R26	QRD161J-103	RESISTOR
R27	QRD161J-103	RESISTOR
R28	QRD161J-681	RESISTOR
R29	QRD161J-561	RESISTOR
R30	QRD161J-820	RESISTOR
R31	QRD161J-820	RESISTOR
R32	PU57457-221	V RESISTOR
R33	PU57457-221	V RESISTOR
C1	QCB1HJ-471	CAPACITOR
C2	QCSB1HJ-180	CAPACITOR
C3	QCVB1CN-103	CAPACITOR
C4	QCSB1HJ-160	CAPACITOR
C5	QCSB1HJ-150	CAPACITOR
C6	QCVB1CN-103	CAPACITOR
C7	QCSB1HJ-200	CAPACITOR
C8	QCB1HJ-151	CAPACITOR
C9	QCSB1HJ-240	CAPACITOR
C10	QCB1HJ-561	CAPACITOR
C11	QCSB1HJ-220	CAPACITOR
C12	QCSB1HJ-360	CAPACITOR
C13	QCVB1CN-103	CAPACITOR
C14	QCC11EJ-473	CAPACITOR
C15	QCVB1CN-103	CAPACITOR
C16	QEK60JM-476	E CAPACITOR
C17	QCVB1CN-103	CAPACITOR
C18	QCB1HJ-681	CAPACITOR
C19	QEK61HM-104	E CAPACITOR
C20	QCVB1CN-103	CAPACITOR
C21	QCSB1HJ-680	CAPACITOR
C22	QCVB1CN-103	CAPACITOR
C24	QCVB1CN-103	CAPACITOR
C25	QFZ0096-224	MM CAPACITOR
C28	QFZ0096-224	MM CAPACITOR
C29	QCVB1CN-103	CAPACITOR
C30	QCVB1CN-103	CAPACITOR
C31	QFZ0096-224	MM CAPACITOR
C32	QCSB1HJ-270	CAPACITOR
C33	QCSB1HJ-270	CAPACITOR
C34	QFZ0096-224	MM CAPACITOR
C35	QCVB1CN-103	CAPACITOR
C36	QEK60JM-476	E CAPACITOR
C37	QCVB1CN-103	CAPACITOR
L1	PU59152-220J	PEAKING COIL
L2	PU59152-560J	PEAKING COIL
L3	PU59152-330J	PEAKING COIL
L4	PU59152-151J	PEAKING COIL
L6	PU59152-330J	PEAKING COIL
L7	PU59152-560J	PEAKING COIL

*REF NO.	PART NO.	PART NAME, DESCRIPTION
L8	PU48530-101K	PEAKING COIL
L9	PU48530-101K	PEAKING COIL
L10	PU59152-560J	PEAKING COIL
TP	PU57545	TEST PIN

* SERVO BOARD ASSEMBLY <48> *		

PWBA	PB20219A	SERVO PWB ASS'Y
IC1	HD49722NT	IC
IC61	BU2767S	IC
IC62	BU4069UB	IC
Q1	DTA124ES	TRANSISTOR
	OR UN4112	TRANSISTOR
	OR 2SA1346	TRANSISTOR
Q2	DTA124ES	TRANSISTOR
	OR 2SA1346	TRANSISTOR
	OR UN4112	TRANSISTOR
D1	1SS133	DIODE
	OR MA165	DIODE
D2	1SS133	DIODE
	OR MA165	DIODE
D3	1SS133	DIODE
	OR MA165	DIODE
D5	1SS133	DIODE
	OR MA165	DIODE
D6	1SS133	DIODE
	OR MA165	DIODE
D9	1SS133	DIODE
	OR MA165	DIODE
D10	1SS133	DIODE
	OR MA165	DIODE
D12	1SS133	DIODE
	OR MA165	DIODE
D21	1SS133	DIODE
	OR MA165	DIODE
D24	1SS133	DIODE
	OR MA165	DIODE
D25	1SS133	DIODE
	OR MA165	DIODE
D62	1SS133	DIODE
	OR MA165	DIODE
D64	1SS133	DIODE
	OR MA165	DIODE
D65	1SS133	DIODE
	OR MA165	DIODE
D66	1SS133	DIODE
	OR MA165	DIODE
D67	1SS133	DIODE
	OR MA165	DIODE
D68	1SS133	DIODE
	OR MA165	DIODE
D70	1SS133	DIODE
	OR MA165	DIODE
D71	1SS133	DIODE
	OR MA165	DIODE
R1	QRD161J-103	RESISTOR
R2	QRD161J-222	RESISTOR
R3	QRD161J-273	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R4	QVZ3518-684AZ	V RESISTOR
	OR	QVZ3518-684	V RESISTOR
	R5	QRD161J-103	RESISTOR
	R6	QRD161J-394	RESISTOR
	R7	ERT-D2FHJ503S	THERMISTOR
	R8	QRD161J-823	RESISTOR
	R9	QRD161J-823	RESISTOR
	R10	QRD161J-223	RESISTOR
	R11	QRD161J-823	RESISTOR
	R21	QRD161J-102	RESISTOR
	R22	QRD161J-155	RESISTOR
	R25	QRD161J-105	RESISTOR
	R26	QRD161J-102	RESISTOR
	R28	QRD161J-222	RESISTOR
	R29	QRD161J-473	RESISTOR
	R30	QRD161J-475	RESISTOR
	R31	QRD161J-103	RESISTOR
	R32	QRD161J-153	RESISTOR
	R33	QRD161J-182	RESISTOR
	R34	QRD161J-273	RESISTOR
	R35	QRD161J-105	RESISTOR
	R36	QRD161J-105	RESISTOR
	R37	QRD161J-105	RESISTOR
	R38	QRD161J-393	RESISTOR
	R39	QRD161J-273	RESISTOR
	R40	QRD161J-105	RESISTOR
	R41	QRD161J-104	RESISTOR
	R43	QRD161J-102	RESISTOR
	R44	QRD161J-104	RESISTOR
	R45	QVZ3518-474AZ	V RESISTOR
	OR	QVZ3523-474AZ	V RESISTOR
	R46	QRD161J-103	RESISTOR
	R56	QRD161J-682	RESISTOR
	R57	QRD161J-102	RESISTOR
	R58	QRD161J-334	RESISTOR
	R61	QRD161J-103	RESISTOR
	R63	QRD161J-153	RESISTOR
	R64	QRD161J-154	RESISTOR
	R65	QRD161J-104	RESISTOR
	R66	QRD161J-824	RESISTOR
	R67	QRD161J-105	RESISTOR
	R68	QRD161J-104	RESISTOR
	R69	QVZ3518-105AZ	V RESISTOR
	OR	QVZ3518-105	V RESISTOR
	R70	QRD161J-274	RESISTOR
	R71	QRD161J-224	RESISTOR
	R72	QVZ3518-105AZ	V RESISTOR
	OR	QVZ3518-105	V RESISTOR
	R73	QRD161J-394	RESISTOR
	R74	QRD161J-124	RESISTOR
	R75	QRD161J-103	RESISTOR
	R76	QRD161J-472	RESISTOR
	R78	QRD161J-472	RESISTOR
	R79	QRD161J-154	RESISTOR
	R80	QRD161J-472	RESISTOR
	R81	QRD161J-393	RESISTOR
	R82	QRD161J-273	RESISTOR
	R83	QRD161J-472	RESISTOR
	R85	QRD161J-123	RESISTOR
	R86	QRD161J-822	RESISTOR
	R90	QRD161J-822	RESISTOR
	R91	QRD161J-103	RESISTOR
	R93	QRD161J-103	RESISTOR
	C1	QFV71HJ-154	M CAPACITOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C2	QCC31CK-332	CAPACITOR
	C3	QCVB1CN-103	CAPACITOR
	C21	QCB1HJ-102	CAPACITOR
	C22	QEK61AM-226	E CAPACITOR
	C23	QEK61AM-226	E CAPACITOR
	C24	QCSB1HJ-150	CAPACITOR
	C26	QCXB1CN-272	CAPACITOR
	C27	QEK61HM-105	E CAPACITOR
	C28	QFV71HJ-153	M CAPACITOR
	C29	QCS31HJ-561	CAPACITOR
	C30	QCB1HJ-102	CAPACITOR
	C32	QEK61AM-226	E CAPACITOR
	C33	QCC31CK-102	CAPACITOR
	C34	QFL41HJ-122	M CAPACITOR
	C35	QFV71HJ-334	M CAPACITOR
	C36	QEK61EM-475	E CAPACITOR
	C37	QEK61EM-475	E CAPACITOR
	C38	QEK61EM-106	E CAPACITOR
	C39	QEK61EM-106	E CAPACITOR
	C40	QEN61HM-105	NP E CAPACITOR
	C41	QFV71HJ-104	M CAPACITOR
	C42	QCS31HJ-471	CAPACITOR
	C43	QFL41HJ-682	M CAPACITOR
	C44	QEK61HM-105	E CAPACITOR
	C62	QCC31CK-393	CAPACITOR
	C63	QCC31CK-104	CAPACITOR
	C64	QCC31CK-104	CAPACITOR
	C65	QCC31CK-104	CAPACITOR
	C66	QCC31CK-393	CAPACITOR
	C67	QCB1HJ-101	CAPACITOR
	C68	QCB1HJ-101	CAPACITOR
	C69	QCB1HJ-121	CAPACITOR
	C70	QFV71HJ-224	M CAPACITOR
	C71	QCB1HJ-102	CAPACITOR
	CN1	PU58844-5	CAP HOUSING
	CN2	PU58844-3	CAP HOUSING
	CN3	PU58844-2	CAP HOUSING
	CN4	PU59555-7	CAP HOUSING
	CN5	PU59555-9	CAP HOUSING
	CN6	PU59555-10	CAP HOUSING
	CN7	PU58844-2	CAP HOUSING
	CN8	PU58844-4	CAP HOUSING

* COLOR BOARD ASSEMBLY <45> *			

	PWBA	PB10124A	COLOR BOARD ASSY
	IC101	PU22517C	COLOR MODULE ASSY
	IC201	M51646SP	IC
	IC251	BA7007	IC
	IC301	NJM2233AS	IC
	IC302	NJM2233AS	IC
	IC303	M5239L	IC
	Q103	DTC144WS	TRANSISTOR
	Q201	2SC1740S(QRS)	TRANSISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
Q212		ZSC1740S(QRS)	TRANSISTOR
Q251		ZSC1740S(QRS)	TRANSISTOR
Q281		ZSC1740S(QRS)	TRANSISTOR
Q282		ZSC1740S(QRS)	TRANSISTOR
Q283		ZSC1740S(QRS)	TRANSISTOR
Q284		ZSC1740S(QRS)	TRANSISTOR
Q285		ZSC1740S(QRS)	TRANSISTOR
Q301		DTC144WS	TRANSISTOR
Q302		DTC144WS	TRANSISTOR
D102		MA165	DIODE
	OR	1SS133	DIODE
D103		MA165	DIODE
	OR	1SS133	DIODE
D105		MA165	DIODE
	OR	1SS133	DIODE
D211		MA165	DIODE
	OR	1SS133	DIODE
D212		MA165	DIODE
	OR	1SS133	DIODE
D301		MA165	DIODE
	OR	1SS133	DIODE
D302		MA165	DIODE
	OR	1SS133	DIODE
D303		MA165	DIODE
	OR	1SS133	DIODE
D304		MA165	DIODE
	OR	1SS133	DIODE
R101		QRD161J-102	RESISTOR
R102		QRD161J-273	RESISTOR
R112		QRD161J-102	RESISTOR
R117		QRD161J-222	RESISTOR
R118		QRD161J-102	RESISTOR
R119		QRD161J-103	RESISTOR
R120		QRD161J-102	RESISTOR
R122		QRD161J-103	RESISTOR
R123		QRD161J-155	RESISTOR
R201		QRD161J-102	RESISTOR
R202		QRD161J-102	RESISTOR
R203		QRD161J-333	RESISTOR
R204		QRD161J-393	RESISTOR
R205		QRD161J-222	RESISTOR
R206		QRD161J-122	RESISTOR
R211		QRD161J-102	RESISTOR
R212		QRD161J-122	RESISTOR
R213		QRD161J-681	RESISTOR
R214		QRD161J-121	RESISTOR
R215		QRD161J-152	RESISTOR
R216		QRD161J-563	RESISTOR
R217		QRD161J-103	RESISTOR
R218		QRD161J-103	RESISTOR
R219		QRD161J-562	RESISTOR
R220		QRD161J-102	RESISTOR
R221		QRD161J-182	RESISTOR
R222		QRD161J-820	RESISTOR
R223		QRD161J-561	RESISTOR
R224		QRD161J-102	RESISTOR
R225		QRD161J-102	RESISTOR
R233		QRD161J-222	RESISTOR
R251		QRD161J-332	RESISTOR
R252		QRD161J-154	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
R253		QRD161J-563	RESISTOR
R254		QRD161J-182	RESISTOR
R255		QVZ3521-472	V RESISTOR
R256		QRD161J-103	RESISTOR
R257		QRD161J-562	RESISTOR
R258		QRD161J-333	RESISTOR
R259		QRD161J-183	RESISTOR
R260		QRD161J-102	RESISTOR
R261		QRD161J-393	RESISTOR
R281		QRD161J-333	RESISTOR
R282		QRD161J-273	RESISTOR
R283		QRD161J-222	RESISTOR
R284		QRD161J-152	RESISTOR
R285		QRD161J-272	RESISTOR
R286		QRD161J-181	RESISTOR
R287		QRD161J-473	RESISTOR
R288		QRD161J-102	RESISTOR
R289		QRD161J-102	RESISTOR
R301		QRD161J-332	RESISTOR
R302		QRD161J-223	RESISTOR
R303		QRD161J-153	RESISTOR
R304		QRD161J-123	RESISTOR
R305		QRD161J-153	RESISTOR
R306		QRD161J-393	RESISTOR
R307		QRD161J-103	RESISTOR
C103		QEK60JM-337	E CAPACITOR
C104		QEK61EM-475	E CAPACITOR
C105		QEK61HM-104	E CAPACITOR
C106		QCFB1EZ-223	CAPACITOR
C107		QCVB1CN-103	CAPACITOR
C108		QEK61HM-224	E CAPACITOR
C114		QCFB1EZ-223	CAPACITOR
C117		QETCDJM-337	E CAPACITOR
C118		QETC1EM-335	E CAPACITOR
C120		QCC11EJ-473	CAPACITOR
C121		QETC1HM-474	E CAPACITOR
C122		QCSB1HJ-680	CAPACITOR
C123		QCB61HJ-820	CAPACITOR
C201		QETCOJM-476	E CAPACITOR
C202		QCVB1CN-103	CAPACITOR
C203		QCVB1CN-103	CAPACITOR
C204		QCSB1HJ-330	CAPACITOR
C205		QCB61HJ-121	CAPACITOR
C211		QCVB1CN-103	CAPACITOR
C212		QCVB1CN-103	CAPACITOR
C213		QCVB1CN-103	CAPACITOR
C214		QCVB1CN-103	CAPACITOR
C215		QEK61CM-106	E CAPACITOR
C216		QCVB1CN-103	CAPACITOR
C217		QEK61AM-226	E CAPACITOR
C219		QFN31HJ-273	M CAPACITOR
C220		QCVB1CN-103	CAPACITOR
C221		QCVB1CN-103	CAPACITOR
C222		QEK61EM-475	E CAPACITOR
C223		QEK60JM-107	E CAPACITOR
C224		QCVB1CN-103	CAPACITOR
C225		QCVB1CN-103	CAPACITOR
C226		QCVB1CN-103	CAPACITOR
C227		QEK61CM-106	E CAPACITOR
C228		QFN41HJ-104	M CAPACITOR
C229		QCVB1CN-103	CAPACITOR
C230		QCVB1CN-103	CAPACITOR
C231		QCVB1CN-103	CAPACITOR
C234		QCVB1CN-103	CAPACITOR

#A REF NO. PART NO. PART NAME, DESCRIPTION

C251	QETC1CM-476	E CAPACITOR
C252	QCVB1CN-103	CAPACITOR
C253	QETC1AM-336	E CAPACITOR
C254	QFN31HJ-152	M CAPACITOR
C255	QFN31HJ-272	M CAPACITOR
C256	QFN31HJ-223	M CAPACITOR
C257	QETC1CM-106	E CAPACITOR
C258	QCVB1CN-103	CAPACITOR
C281	QCVB1CN-103	CAPACITOR
C282	QCVB1CN-103	CAPACITOR
C301	QETC0JM-476	E CAPACITOR
C302	QCVB1CN-103	CAPACITOR
C303	QCVB1CN-103	CAPACITOR
C304	QCVB1CN-103	CAPACITOR
C305	QCVB1CN-103	CAPACITOR
C306	QCVB1CN-103	CAPACITOR
L101	PU59153-101K	INDUCTOR
L102	PU60165-1506	COIL
L103	PU48530-222J	PEAKING COIL
L201	PU48530-101K	PEAKING COIL
L202	PU59152-390J	PEAKING COIL
L211	PU60220	COIL
L212	PU60221	COIL
L213	PU48530-101K	PEAKING COIL
L214	PU59152-121J	PEAKING COIL
L251	PU49057	LC BLOCK
L252	PU48530-101K	PEAKING COIL
L253	PU47051-562	COIL
L301	PU48530-101K	PEAKING COIL
L302	PU48530-101K	PEAKING COIL
EQ101	PU53501-11	EQUALIZER
OR	PU53501-6	EQUALIZER
EQ102	PU60681	EQUALIZER
EQ201	PU53501-5	EQUALIZER
LPF101	PU58022	LOW PASS FILTER
BPF101	PU57399-3	BAND PASS FILTER
OR	PU57399-2	BAND PASS FILTER
BPF201	PU54437-2	BAND PASS FILTER
BPF202	PU54420-2	BAND PASS FILTER
BPF203	PU54421-2	BAND PASS FILTER
CF251	PU56983	CERAMIC FILTER
DL101	PU60322-2	DELAY LINE
X101	PU60059	CRYSTAL RESONATOR
T101	PU60057-3	TANK FILTER
OR	PU60057-2	TANK FILTER
CN101	PU59555-107	CAP HOUSING
CN201	PU58844-109	CAP HOUSING
CN202	PU58844-106	CAP HOUSING
CN203	PU58844-102	CAP HOUSING

#A REF NO. PART NO. PART NAME, DESCRIPTION

* DECK TERMINAL BOARD ASSEMBLY <51><53> *

PWBA PU22509C-01 DECK TERMINAL BOARD ASSY
-DECK TERMINAL BOARD SECTION <51>-

PWBA1 PU22509A1-01 DECK TERMINAL BOARD ASSY

R1 QRD181J-151 RESISTOR

R3 QRD181J-331 RESISTOR

PS1 PU60271 PHOTO INTERRUPTER

WR1 PW30110-26DD885 PARALLEL WIRE,CN1

CN1 PU59933-15 WIRE TRAP

-REC SAFETY BOARD SECTION <53>-

PWBA3 PU22509A3 REC SAFETY BOARD ASSY

SW PU58644-1-3 REC SAFETY SWITCH

* RELAY BOARD ASSEMBLY <52> *

PWBA2 PU22509C2 RELAY BOARD ASSY

LC1 PU59809-222T N FILTER

LC2 PU59809-222T N FILTER

WR2 PW30113-GOABZ62 PARALLEL WIRE

* END SENSOR BOARD ASSEMBLY <54> *

PWBA4 PU22509A4 END SENSOR BOARD ASSY

Q1 PN268R-NC PHOTO TRANSISTOR

CN1 PU59945-102 WIRE SOCKET

* CASSETTE HOUSING BOARD <56> *

PWB1 PB30043 CASSETTE HOUSING BOARD

Q1 PN268R-NC PHOTO TRANSISTOR

R1 QRD161J-471 RESISTOR

PHS1 PU58879 PHOTO INTERRUPTER

CN1 PU58844-106 CAP HOUSING

REF NO. PART NO. PART NAME, DESCRIPTION

REF NO. PART NO. PART NAME, DESCRIPTION

 * JUMP DETECTOR BOARD ASSEMBLY <70> *

PWBA PB30081A1 JUMP DET BOARD ASSY

IC401 BA7023L IC
 IC402 BU4030B IC
 IC403 BA222 IC
 IC404 TC4013BP IC

Q401 2SA1309R,S TRANSISTOR
 OR 2SA933S(RS) TRANSISTOR

Q611 DTC124ES TRANSISTOR

D411 1SS133 DIODE
 OR MA165 DIODE

D611 1SS133 DIODE
 OR MA165 DIODE

D612 1SS133 DIODE
 OR MA165 DIODE

D613 1SS133 DIODE
 OR MA165 DIODE

D614 1SS133 DIODE
 OR MA165 DIODE

D617 1SS133 DIODE
 OR MA165 DIODE

R401 QRD161J-222 RESISTOR

R402 QRD161J-391 RESISTOR

R403 QRD161J-223 RESISTOR

R404 QRD161J-472 RESISTOR

R405 QRD161J-124 RESISTOR

R406 QRD161J-184 RESISTOR

R407 QRD161J-683 RESISTOR

R408 QRD161J-153 RESISTOR

R409 QRD161J-105 RESISTOR

R410 QV23521-473 V RESISTOR

R411 QRD161J-105 RESISTOR

R412 QRD161J-473 RESISTOR

R413 QRD161J-104 RESISTOR

R414 QRD161J-223 RESISTOR

R633 QRD161J-103 RESISTOR

R643 QRD161J-222 RESISTOR

R644 QRD161J-222 RESISTOR

R645 QRD161J-103 RESISTOR

C401 QFN31HJ-152 M CAPACITOR

C402 QETC1HM-105 E CAPACITOR

C403 QFN31HJ-222 M CAPACITOR

C404 QFN31HJ-332 M CAPACITOR

C405 QETC1CM-106 E CAPACITOR

C406 QETC0JM-107 E CAPACITOR

C407 QCVB1CN-103 CAPACITOR

C408 QFN31HJ-103 M CAPACITOR

C409 QFN31HJ-273 M CAPACITOR

C410 QETC1HM-105 E CAPACITOR

C411 QCBB1HJ-331 CAPACITOR

C412 QETC1HM-105 E CAPACITOR

C413 QFN31HJ-103 M CAPACITOR

C414 QCVB1CN-103 CAPACITOR

C415 QFN31HJ-273 M CAPACITOR

C416 QCVB1CN-103 CAPACITOR

C417 QETC1AM-476 E CAPACITOR

L401 PU48530-101K PEAKING COIL

L402 PU48530-101K PEAKING COIL

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△ REF. No.	PART No.	PART NAME, DESCRIPTION
R512	NRSA63J-103N	RESISTOR
C501	NCS31HJ-101A	CAPACITOR
C502	NCB31CK-223A	CAPACITOR
C505	QCT05CH-120	C CAPACITOR
— IF SUB (2) <72> —		
PWBA	PB20366A2-03	TU IF SUB BOARD ASSEMBLY
Q401	DTC144EU	TRANSISTOR
Q402	DTC123EU	CHIP DEGI TR.
Q403	DTC123EU	CHIP DEGI TR.
Q404	2SD1819A(RS)	TRANSISTOR
D401	MA151WA	DIODE
R401	QRSA08J-104YN	RESISTOR
C401	QCSA1HJ-471	CAPACITOR
C402	QCYA1HK-103	CAPACITOR
C403	QCYA1HK-103	CAPACITOR

TUNER CONTROL BOARD ASSEMBLY <08>

PWBA	PB20208A1-03	TUNER CONTROL BOARD ASSEMBLY
△ TNR1	PU36421-3-2	UHF/VHF TUNER
△ IC201	LA7910	IC
IC202	M5223P	IC
Q201	2SB810H,J	TRANSISTOR
Q202	DTC144ES	TRANSISTOR
	or UN4213	TRANSISTOR
	or 2SC3399	TRANSISTOR
Q204	2SC3311A(S)	TRANSISTOR
Q205	2SA720	TRANSISTOR
	or 2SB1278(QR)	TRANSISTOR
Q206	2SC1740S(S)	TRANSISTOR
	or 2SC3311A(S)	TRANSISTOR
Q210	DTA114ES	TRANSISTOR
Q211	DTC144ES	TRANSISTOR
Q215	2SD1450S,T	TRANSISTOR
Q216	DTC144ES	TRANSISTOR
Q217	DTC144ES	TRANSISTOR
△ Q218	DTA144ES	TRANSISTOR
Q220	2SC3068	TRANSISTOR
D201	LTZ-MR15	ZENER DIODE
D202	HZT33-02	ZENER DIODE
D203	1SS133	DIODE
D210	1SS133	DIODE
R201	QRD161J-182	RESISTOR
R202	QRD161J-153	RESISTOR
R206	QRD161J-332	RESISTOR
R208	QRD161J-121	RESISTOR

△ REF. No.	PART No.	PART NAME, DESCRIPTION
R209	QRD161J-473	RESISTOR
R210	QRD161J-103	RESISTOR
R211	QRD161J-103	RESISTOR
R212	QRD161J-333	RESISTOR
R214	QRD161J-394	RESISTOR
R215	QRD161J-154	RESISTOR
R216	QRD161J-154	RESISTOR
R217	QRD161J-154	RESISTOR
R218	QRD161J-103	RESISTOR
R225	QRD161J-472	RESISTOR
R226	QRD161J-472	RESISTOR
R227	QRD161J-104	RESISTOR
R228	QRD161J-472	RESISTOR
R235	QRD161J-472	RESISTOR
R236	QRD161J-472	RESISTOR
R237	QRD161J-123	RESISTOR
R238	QRD161J-123	RESISTOR
R262	QRD161J-103	RESISTOR
R263	QRD161J-103	RESISTOR
R271	QRD161J-473	RESISTOR
R273	QRD161J-222	RESISTOR
R277	QRD161J-222	RESISTOR
R280	QRD161J-471	RESISTOR
R281	QRD163J-394	RESISTOR
R282	QRD161J-103	RESISTOR
R285	QRD161J-223	RESISTOR
C202	QETC1CM-106	E CAPACITOR
C204	QCBB1HJ-101	CAPACITOR
C205	QETC1HM-106	E CAPACITOR
C207	QCVB1CM-103	CAPACITOR
C208	QFV71HJ-333	TF CAPACITOR
C209	QFV71HJ-153	TF CAPACITOR
C210	QFV71HJ-333	TF CAPACITOR
C211	QFV71HJ-153	TF CAPACITOR
C215	QETC1CM-106	E CAPACITOR
C216	QETC1HM-105	E CAPACITOR
C217	QETC1CM-106	E CAPACITOR
C218	QETC1EM-335	E CAPACITOR
C219	QETC1CM-106	E CAPACITOR
C221	QETC1CM-106	E CAPACITOR
C222	QETC1CM-106	E CAPACITOR
C223	QEK61CM-476	E CAPACITOR
C224	QEK61HM-224	E CAPACITOR
C230	QEK41CM-336	E CAPACITOR
L204	PU59152-6R8K	PEAKING COIL
△ TH201	PU52108-2R2	POSITIVE THERMISTOR
HD1	PU36378	HOLDER
△ CP201	ICP-F10	CIRCUIT PROTECTOR
CN201	PU59555-8	CAP HOUSING
CN202	PU58844-4	CAP HOUSING

△ REF. No. PART No. PART NAME, DESCRIPTION

TUNER CTL SUB BOARD ASSEMBLY <46>

PWBA	PB10232A-05	TUNER CTL SUB BOARD ASSEMBLY
IC301	LA1150N	IC
Q301	2SC3936(BC)	TRANSISTOR
Q302	2SC3936(BC)	TRANSISTOR
Q303	2SC2480(S)	TRANSISTOR
Q304	2SC2480(S)	TRANSISTOR
Q305	2SC4081(RS)	TRANSISTOR
Q310	DTC144EU	TRANSISTOR
D311	DAN202U	DIODE
R301	NRSA63J-750N	RESISTOR
R302	NRSA63J-183N	RESISTOR
R303	NRSA63J-332N	RESISTOR
R304	NRSA63J-331N	RESISTOR
R305	NRSA63J-221N	RESISTOR
R306	NRSA63J-271N	RESISTOR
R307	NRSA63J-221N	RESISTOR
R308	NRSA63J-511N	RESISTOR
R309	NRSA63J-183N	RESISTOR
R310	NRSA63J-103N	RESISTOR
△ R311	NRSA63J-221N	RESISTOR
R312	NRSA63J-102N	RESISTOR
R313	NRSA63J-473N	RESISTOR
R314	NRSA63J-473N	RESISTOR
R315	NRSA63J-103N	RESISTOR
R316	NRSA63J-103N	RESISTOR
R317	NRSA63J-241N	RESISTOR
R318	NRSA63J-471N	RESISTOR
R319	NRSA63J-472N	RESISTOR
R320	NRSA63J-223N	RESISTOR
R321	NRSA63J-104N	RESISTOR
R322	NRSA63J-103N	RESISTOR
R325	NRSA63J-334N	RESISTOR
R326	NRSA63J-334N	RESISTOR
C301	QCYA1HK-222	CAPACITOR
C302	QCYA1HK-222	CAPACITOR
C303	QCYA1HK-222	CAPACITOR
C304	QCTA1CH-2R0	CAPACITOR
C305	QCTA1CH-2R0	CAPACITOR
C306	QCYA1HK-222	CAPACITOR
C307	QCYA1HK-222	CAPACITOR
C308	NCT08CH-100A	CAPACITOR
C309	QAT3120-7R0	TRIMMER CAPACITOR
C310	QCFA1HZ-473	CAPACITOR
C311	QCFA1HZ-473	CAPACITOR
C312	QCTA1CH-100	CAPACITOR
C313	QCFA1HZ-473	CAPACITOR
C314	QEK60JM-226	E CAPACITOR
C315	QEK61EM-475	E CAPACITOR

△ REF. No. PART No. PART NAME, DESCRIPTION

CF301	PU58558-4	CERAMIC FILTER
	or PU60774-4	CERAMIC FILTER
CF302	PU58558-3	CERAMIC FILTER
	or PU60774-3	CERAMIC FILTER
CF303	PU32989-3	CERAMIC FILTER
CF304	PU32989-3	CERAMIC FILTER
T301	PU60948	IF.TRANSFORMER, TRAPE
T302	PU60949	IF.TRANSFORMER, S.DET
BKT1	PU60923	BRACKET
SLD1	PU60924	SHIELD CASE
SLD2	PU60925	SHIELD PLATE
TML1	PU59935-8	TERMINAL
TP301	PU45908	TEST PIN, X4,(301-304)

TUNER UNIT ASSEMBLYPU36432G-10

PB10112A-10	IF BOARD ASSEMBLY <07>
PB20208A1-03	TUNER CTL BOARD ASSEMBLY <08>
PB10232A-05	TUNER CTL SUB BOARD ASSEMBLY <46>