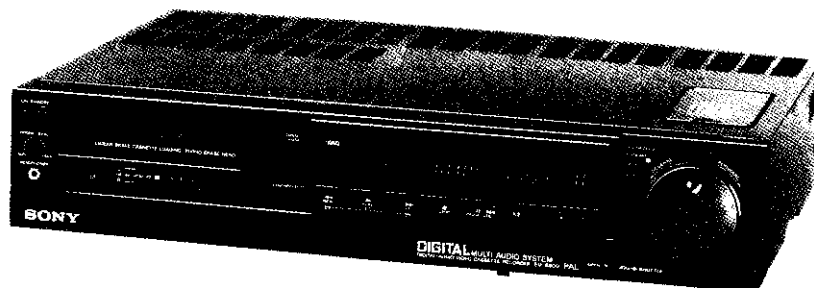


# SERVICE MANUAL

*AEP Model*  
(EV-S800)

*West Germany Model*  
(EV-S850PS)



## SPECIFICATIONS

### System

Video recording system

Rotary two-head helical scanning  
Helical scanning FM system

Audio recording system

Normal recording Standard: Rotary head FM system  
(monaural)  
PCM: PCM system (2 channels)

Digital multi audio recording

PCM system (2 channels, 6 tracks)

Colour system

EV-S800: CCIR system B,G and H,  
PAL colour  
EV-S850PS: DDR SECAM to PAL  
colour, convertible

Usable cassettes

8 mm video format cassette

Tape speed

SP: Approx. 20.051 mm/sec.  
LP: Approx. 10.058 mm/sec.

Recording or playback time

SP: 1 hr. 30 min.  
LP: 3 hr.  
(P5-90)

Fast forward time

Approx. 3 min.

### PCM, Digital multi audio system

Sampling frequency 31.25 kHz  
Audio frequency 20 Hz-15 kHz  
Dynamic range More than 90 dB  
Wow and flutter Less than 0.005 % RMS

### Tuner section

Channel coverage VHF E2-S20  
UHF E21-E69  
Programming system 30 programme-memories  
RF output signal UHF channels E30 to E39 (variable),  
75 ohms, unbalanced  
Aerial input 75-ohm, asymmetrical serial socket

—Continued on next page—

**8** STEREO VIDEO CASSETTE RECORDER  
**SONY**®



VIDEO

### Inputs and outputs

Video input	
VIDEO IN	phono jack 1 Vp-p, 75 ohms, unbalanced, sync negative
Video outputs	
EURO-AV	21-pin (pin 19) 1 Vp-p, 75 ohms, unbalanced, sync negative
VIDEO OUT	Phono jack 1 Vp-p, 75 ohms, unbalanced, sync negative
Audio inputs	
AUDIO IN	Phono jack 47 kilohms, -10 dBs (0 dBs = 0.775 V rms)
Audio outputs	
EURO-AV	21-pin (pins 1 and 3) Output impedance less than 1 kilohms -6 dBs with 10 kilohms load, unbalanced
AUDIO OUT	Phono jack Output impedance less than 1 kilohms -10 dBs with 47 kilohms load, unbalanced
CONTROL L	5-pin DIN
CONTROL S IN	Minijack
CONTROL S OUT	Minijack
Microphones inputs	Minijack -60 dBs, for low-impedance microphone
HEADPHONES jack	Stereo phone jack -20 dBs, 8 ohms

### Timer

Clock	Crystal lock
Time indication	24-hour cycle
Timer setting	Only for recording 6 events (3 weeks max. adjustable for any day or for all 7 days of the week)

### General

Power requirements	220 V AC, 50/60 Hz
Power consumption	EV-S800: 30 W EV-S850PS: 34 W
Operating temperature	5 °C to 40 °C (41 °F to 104 °F)
Storage temperature	-20 °C to +60 °C (-4 °F to +140 °F)
Dimensions	Approx. 430 × 89 × 328 mm incl. projecting parts and controls
Weight	Approx. 7.3 kg (EV-S850PS) 7.0kg (EV-S800)
Accessories supplied	75-ohm coaxial cable for TV connection (1) Connecting cord RK-74H (1) Screwdriver (1) Remote Commander RMT-425 (1) Sony battery SUM-3 (NS) (3) Feet (5)
Design and specifications	subject to change without notice.


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## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

### SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

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# SECTION 1

## GENERAL

### 1-1. PRECAUTIONS

#### On safety

- Before operating, check that the operating power voltage and frequency of the unit are identical with those of your local power supply.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the mains outlet if it is not to be used for an extended period of time. To disconnect the lead, pull it out by the plug. Never pull the lead itself.
- The unit is not disconnected from the mains (ac power source) as long as it is connected to the mains outlet, even if the unit itself has been turned off.

#### On installation

- Allow adequate air circulation to prevent internal heat build-up. Do not cover the holes on the top panel.
- Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit near heat sources such as radiators or air ducts or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- The unit is designed for operation in a horizontal position. Do not install it in an inclined position.
- Keep the unit and cassette tapes away from equipment with strong magnets, as for example a microwave oven or a large loudspeaker.
- Do not place any heavy object (over 13 kg or 28 lbs 10 oz) on the unit.  
Never place any object on the tuning compartment nor on the top of the front panel.

#### On operation

- When the unit is not in use, turn the power off to conserve energy and to extend its useful life.
- Remove and store video cassettes after recording or playback.

#### On cleaning

Clean the cabinet, panel and controls with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution.

Do not use any type of solvent, such as alcohol or benzine which might damage the finish.

#### On repacking

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

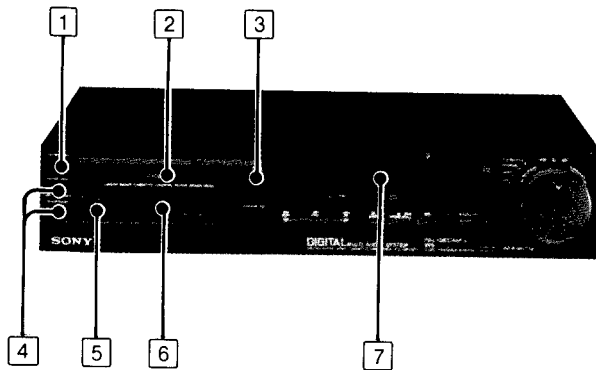
#### On cassette care

Store cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.

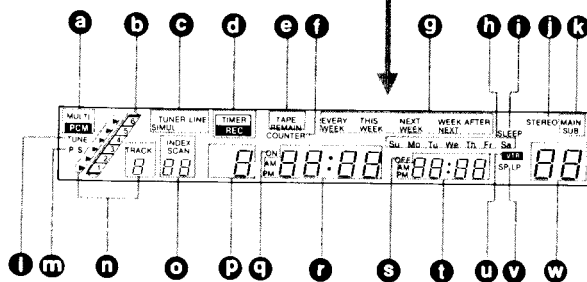
If you have any questions about this unit, contact your Sony dealer.

## 1-2. LOCATION AND FUNCTION OF CONTROLS

**A-1**



**A-2**



**A-1**

**1 ON/STANDBY switch and lamp**

**2 Cassette holder** (Page 17)

**3 OPEN/CLOSE button** (Page 17)

Press to slide out the cassette holder. Press again to slide it in.

**4 HEADPHONES jack (stereo mini type) and PHONE LEVEL control**

Connect stereo headphones (with stereo mini jack) here. Adjust the volume with the PHONE LEVEL control.

**5 REMOTE SENSOR**

**6 PEAK PROGRAM METER** (Page 26)

Shows the peak input levels of the right and left channels during recording and recorded levels during playback.

**7 Display window**

**A-2**

**a** MULTI PCM or PCM indicator

**b** Digital multi audio tracks indicator

**c** Input signal indicator

**d** TIMER REC indicator

**e** TAPE REMAIN indicator

**f** COUNTER indicator

**g** Week indicator

**h** Day of the week indicator

**i** SLEEP indicator

**j** STEREO indicator

**k** Bilingual indicator

**l** TUNE (tuning) indicator

**m** P (Parallel) or S (Series) digital multi audio timer recording indicator

**n** Digital multi audio track number and indicator

**o** INDEX indicators

**p** Timer programme position

**q** Turn-on time setting indicator

**r** Turn-on time of a timer recording/Tape counter/Tape remain indicator

**s** Turn-off time setting indicator

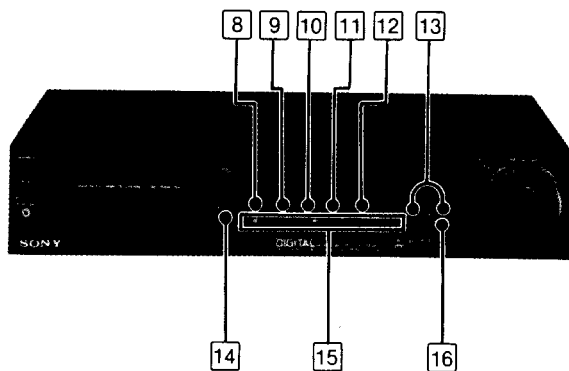
**t** Turn-off time of a timer recording/clock display

**u** VTR indicator

**v** Recording speed indicator

**w** Programme number

**A-3**

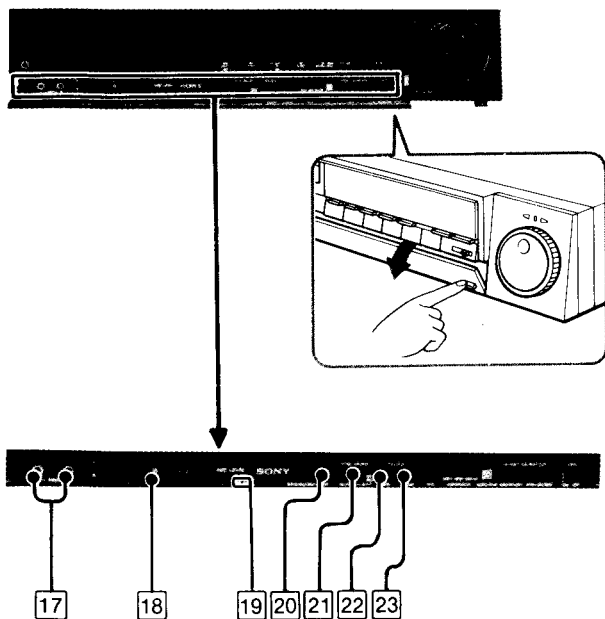


**A-3**

- 8] COUNTER/REMAIN button** (Page 24)  
Each time the button is pressed, the COUNTER and the TAPE REMAIN indicators are displayed alternately.
- 9] COUNTER RESET button** (Page 24)  
Press to reset the tape counter to "0000".
- 10] GO TO ZERO button** (Page 25)  
In stop mode, press to advance or rewind the tape approximately to the counter "0000".
- 11] INDEX button** (Page 30)  
Used for the index scan or index search operation.
- 12] ANT TV/VTR button**  
Press to view the programme selected on the recorder. The VTR indicator appears in the display window (VTR mode).  
To view a TV programme while recording another, press this button again.  
The VTR indicator disappears. (TV mode)
- 13] PROGRAM/TRACK/INDEX buttons**  
Press to: —change the programme  
—change the track for digital multi audio recording/playback  
—change the index number
- 14] SYNCHRO EDIT lamp** (Pages 40–43)  
Lights up when SYNCHRO EDIT inside the front panel is pressed.
- 15] Tape transport buttons and indicators**  
◀◀ REW (rewind)  
▶ PLAY (playback)  
▶▶ FF (fast forward)  
■ STOP (stop)  
|| PAUSE (pause)/▶◀ STILL (still)  
x2 (double speed playback)
- 16] ● REC (recording) switch**  
Slide to the right to start recording.



**A-4**



**Inside the front panel**

**A-4**

**17) MIC (microphone) jacks (L, R) (mini type)** (Page 44)

To record from these jacks, display LINE by pressing INPUT SELECT.

**Connection of the microphone and the track to be recorded**

Micro- phone jack	PCM track		Standard track
	L channel	R channel	
L	Microphone sound	Microphone sound	Microphone sound
R		Microphone sound	Microphone sound
L and R	1) Micro- phone sound of the L jack	2) Micro- phone sound of the R jack	1) and 2)

**18) REC LEVEL controls** (Page 26)

Slide to adjust the level of the PCM audio recording.

**19) SYNCHRO EDIT button** (Page 38)

Press to start the playback on this unit and the recording of the connected VTR (or vice versa; recording on this unit and playback on the other VTR). When pressed, SYNCHRO EDIT lamp lights up.

**20) EDIT button and lamp**

Normally keep the lamp off. When editing a tape onto another recorder (or vice versa), press the button so that the lamp lights up.

**21) PCM MODE selector** (Page 25)

Select the method of PCM audio recording.

Set to: **NORMAL** for normal recording on the PCM track.

**DIGITAL MULTI P** (parallel) for timer recording from the beginning of each track.

**DIGITAL MULTI S** (series) for continuous timer recording in one of six tracks.

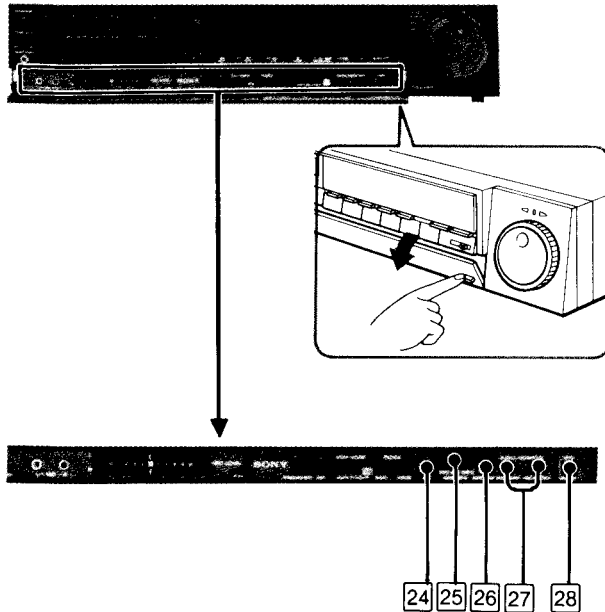
**22) INDEX MARK button** (Page 29)

Press to mark an index signal at the desired point during recording or playback.

**23) INDEX ERASE button** (Page 32)

To erase a pre-recorded index signal, locate the index signal and press this button.

A-5



A-5

**24 PFS (Picture Fine Select) button and lamp**

Normally, keep the lamp off.

If the playback picture of a tape recorded on other VTRs (which do not use the four-video heads system) is distorted or has streaks, press so that the lamp lights up.

**25 SHARPNESS control**

Use to adjust the sharpness of the picture if necessary. Normally set the control at the center detent position.

**26 AUDIO DUB button** (Page 44)

Press to start recording on the PCM track of any recorded video tape.

Set PCM MODE **21** to NORM.

**27 AUDIO MONITOR selectors** (Page 21)

During playback or recording, set to the appropriate position to monitor the desired sound.

**MAIN/SUB/M. S selector**

When monitoring bilingual programmes or playing back a bilingual tape, press to display:

**MAIN:** to listen to the main language

**SUB:** to listen to the sub language

**MAIN. SUB:** to listen to the main language from the left speaker and the sub language from the right speaker.

A stereo tape with a pilot signal (the STEREO indicator appears) is played back in the stereo mode regardless of the position of this selector.

**PCM/MIX/STD selector**

**PCM:** to play back the sound on the PCM track.

When nothing is recorded on the PCM track, the sound recorded on the standard track is played back regardless of the position of this selector.

**MIX:** to play back the sound on the PCM and standard tracks simultaneously.

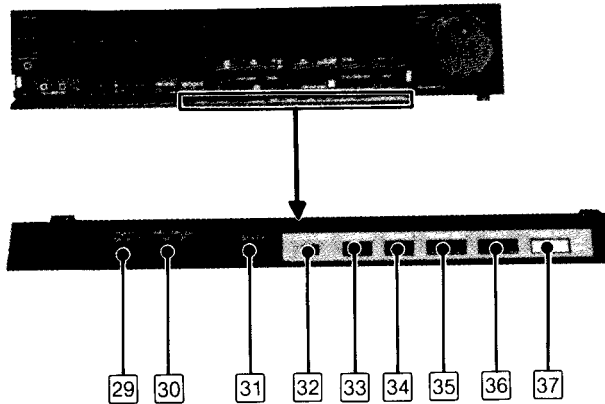
**STD:** to play back the sound on the standard track.

**28 VPS (Video Programme System) switch** (EV-S850PS only)

(Page 36)

Set to ON to activate the VPS in the timer recording.

A-6



#### On the front panel

A-6

#### 29 INPUT SELECT button

Press to display the desired input signal indication in the window.

**TUNER:** to record TV programmes

**SIMUL:** to record TV programmes and signals from the AUDIO IN jacks.

**LINE:** to record audio/video signals from the AUDIO IN/VIDEO IN jacks on the rear panel or to dub only audio signals from AUDIO IN or MIC jacks.

#### 30 REC MODE selector

This selects the recording speed, SP or LP. The recording time of any given cassette in the LP mode is 2 times that in the SP mode.

The playback speed is automatically set regardless of the setting of this selector.

#### 31 SLEEP button (Page 37)

Press to preset the turn-off time of this VTR. Playback or recording can be stopped with this timer.

#### 32 CLOCK SET button (Page 16)

Press as the first step to set the internal clock.

#### 33 CHECK button (Page 34)

Press to check the contents of the timer presettings.

#### 34 CLEAR button (Page 34)

Press to cancel a timer setting.

#### 35 TIMER SET button (Pages 33,34)

Press to start the setting or resetting of timer programmes.

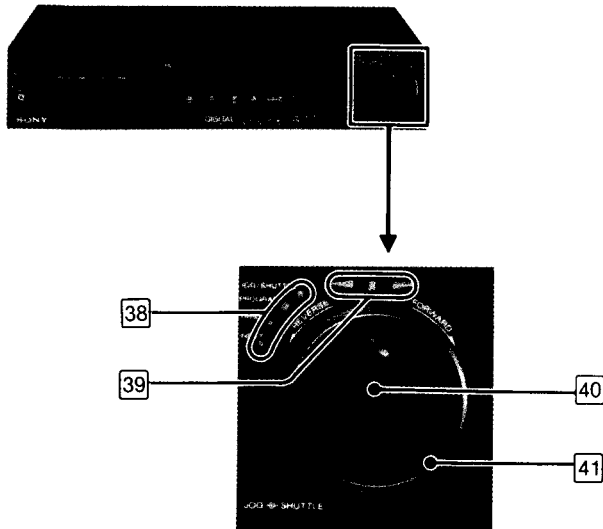
#### 36 NEXT button (Page 33)

Press to advance to the next item to be set when setting the timer or the clock.

#### 37 TIMER REC ON/OFF button (Page 33)

Press after programming VTR for timer recordings so that the timer activates. To deactivate the timer, press again.

A-7



A-7

**38 JOG dial function indicators** (Page 23)

Light up to indicate for what purpose the JOG dial is being turned.

**JOG/SHUTTLE:** when the tape is being played back at the desired speed.

**PROGRAM:** When the TV programme or digital multi audio track is being selected.

**TIMER:** When the timer or clock is being set.

**INDEX:** When the index operation is being made.

**39 Playback Indicators** (Page 23)

Indicate the forward or reverse movement or the pause mode of the tape during playback.

**40 JOG dial** (Page 23)

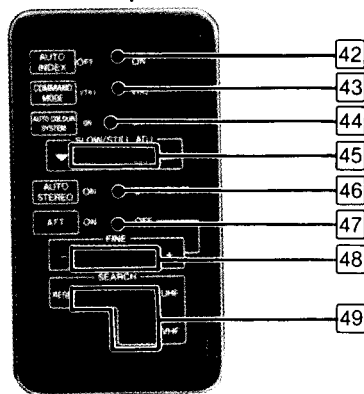
Turn to select programmes.

When this is turned during the playback pause mode, the picture will be played back at a speed according to the speed you are turning the dial. (From frame-by-frame to normal speed.) This dial is also used for setting the clock, presetting timer recordings, selecting any of the 6 digital multi audio tracks and for setting INDEX numbers.

**41 SHUTTLE ring** (Page 23)

When this ring is turned and held during the playback pause mode, you can play back the tape at various speeds: 1/5 normal speed, normal speed or double speed. The more it is turned, the faster the playback will be and when fully turned, the unit enters the "Picture search" mode in the right or in the reverse direction.

**A-8**



**A-8**

### Upper compartment

**42** **AUTO INDEX switch** (Page 29)

Normally set to OFF. To activate automatic marking of index signals during digital multi audio recording, set to ON.

**43** **COMMAND MODE selector** (Pages 39,356)

To remotely control this unit with the supplied Remote Commander, set this selector to the same position as that on the Remote Commander.

When editing tapes, switch to the appropriate position according to the connection you have made.

**44** **AUTO COLOUR SYSTEM switch** (EV-S850PS only)

Normally set to AUTO. According to the TV programme, colour system will be switched automatically to PAL or DDR SECAM.

If the signal is too weak or the picture is distorted, set the switch to PAL. DDR SECAM programmes will be displayed in black and white.

**45** **SLOW/STILL ADJ (adjust) buttons** (Page 22)

Adjust the still or slow-motion picture if necessary.

**46** **AUTO STEREO switch**

Normally set to ON. During a stereo broadcast, the mode is automatically set to stereo. If there is too much interference, set the switch to OFF in which case all the TV programmes will be received in monaural.

**47** **AFT switch**

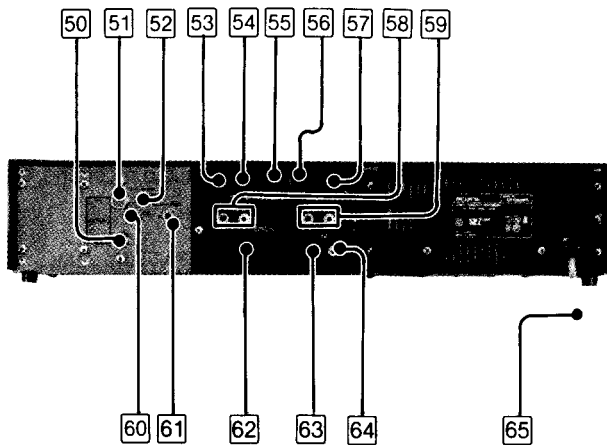
Normally set to ON. The automatic fine tuning circuit locks in and maintains a sharp picture.

**48** **FINE buttons** (Page 16)

When the AFT switch is set to OFF, press to fine tune the station.

**49** **SEARCH buttons** (Page 15)

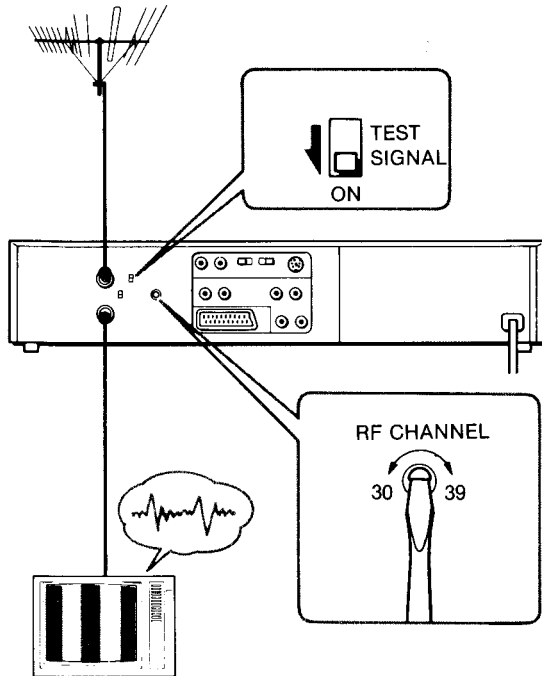
Press RESET to clear the programmed station. Press UHF or VHF to tune in a station of higher frequency.

**A-9****A-9****Rear**

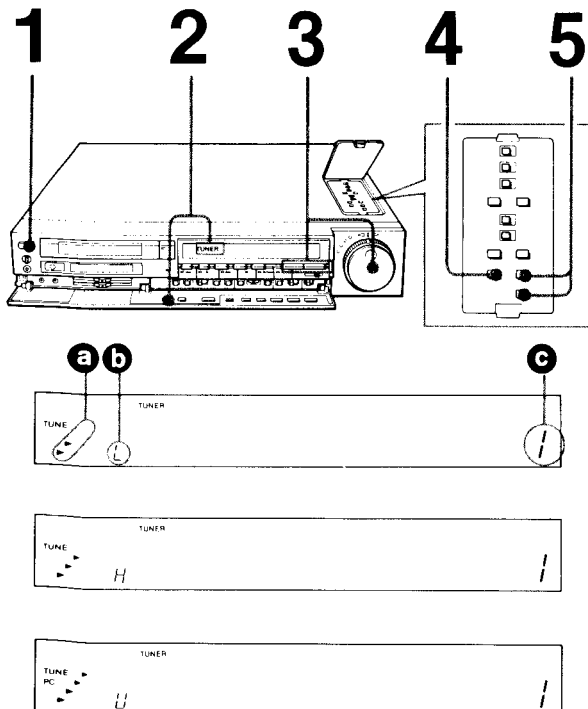
- 50 AERIAL OUT socket**  
Connect the aerial input of the TV receiver.
- 51 AERIAL IN socket**  
Connect the aerial cable.
- 52 TEST SIGNAL switch** (Page 15)  
Set to ON to obtain a test pattern.
- 53 CONTROL S IN jack (mini type)** (Page 42)  
Connect to the CONTROL S output jack of other Sony products.
- 54 CONTROL S OUT jack (mini type)**  
Connect to the CONTROL S input jack of other Sony products.
- 55 DIGITAL MULTI PLAY selector**  
Normally set to AUTO.  
The playback mode will be automatically set to the digital multi audio mode. If no sound is heard when playing back a tape recorded on another VTR, set to MULTI.
- 56 MASTER/SLAVE selector** (Page 39)  
When editing a tape using the CONTROL L connector, set to either position:  
MASTER: to control other equipment connected by the CONTROL L connector.  
SLAVE: to be controlled by other equipment (such as RM-E100V editing controller) having control L connector.
- 57 CONTROL L (5-pin) connector** (Pages 40,41)  
Connect to the CONTROL L or REMOTE connector of other Sony products.
- 58 AUDIO IN (L,R) (input) jacks (phono type)**
- 59 AUDIO OUT (L,R) (output) jacks (phono type)**
- 60 LOCAL/DX switch**  
Normally set to DX. If the TV signal is very strong, set the switch to LOCAL.
- 61 RF CHANNEL screw** (Page 15)  
If there is interference on the factory-preset channel for RF output and the output signal from this unit cannot be displayed clearly on the TV screen, adjust the screw with the supplied screwdriver.
- 62 EURO-AV connector (21-pin)**  
Connect to the 21-pin connector of a VTR or a TV/monitor, or to the audio/video input and/or output of these units with an appropriate connecting cable.
- 63 VIDEO IN (input) jack (phono type)**
- 64 VIDEO OUT (output) jack (phono type)**
- 65 AC power cord (mains lead)**  
Connect to an ac (mains) outlet.

## 1-3. ADJUSTMENTS

**B-1**



**B-2**



### ADJUSTING THE TV **B-1**

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

- 1 After making the connections, press ON/STANDBY.
- 2 Make sure that the recorder is in the stop mode and the TV is in TV mode.
- 3 Set TEST SIGNAL at the rear of the recorder to ON. The test signal is transmitted on a channel between UHF channels 30 and 39.
- 4 Turn on the TV and select a programme position which is not being used to receive a TV station. Tune the channel until you see a clear black and white pattern on the TV screen and you hear a continuous tone. This is the recorder's test signal.

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

**If the test picture is not free of disturbance,**

- 1 Reset TEST SIGNAL to OFF.
- 2 Adjust the channel of the TV to a channel between UHF channels 30 and 39 with the tuning control or the fine tuning control on the TV, so that the TV screen shows no picture and so that a steady rustling sound or no sound heard.
- 3 Set TEST SIGNAL to ON again.
- 4 Slowly turn RF CHANNEL on the rear of the recorder with the supplied screwdriver, until you see an undistorted test pattern on the TV screen.
- 5 Now the TV adjustment is complete. Reset TEST SIGNAL to OFF.

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

### PROGRAMMING TV STATIONS **B-2**

Up to 30 programmes receivable in your area can be preset on this unit.

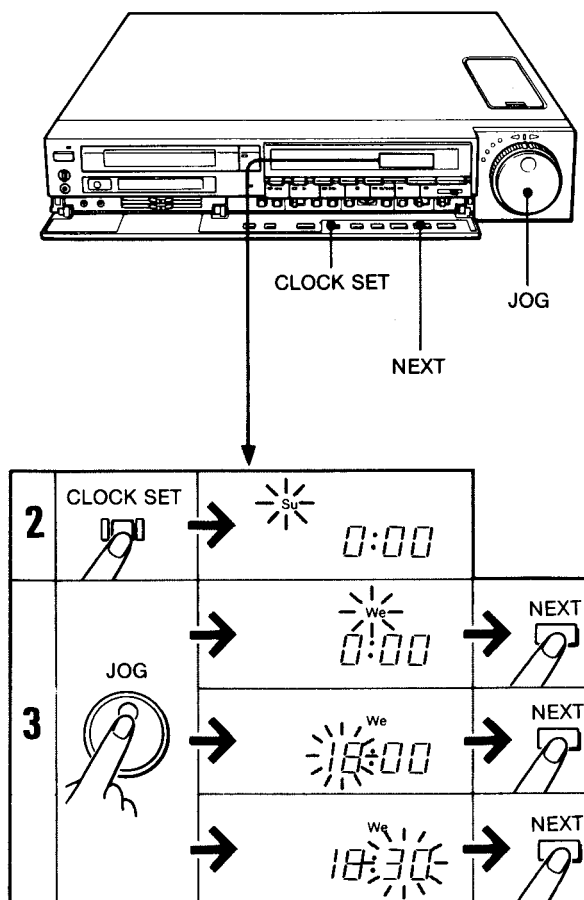
Once preset, you can select TV programmes by turning the JOG dial or pressing the +/- buttons.

- 1 Turn on the unit.
- 2 Display "TUNER" by pressing INPUT SELECT.
- 3 Turn the JOG dial or press PROGRAM/TRACK/INDEX + or - to select the programme position (0 to 30) on which the desired TV programme should be tuned in. **Ⓒ**
- 4 Press RESET in the upper compartment to clear the factory preset programmes.
- 5 Press UHF or VHF to search stations.

The tuning indicators in the window show the approximate location of the current channel. **Ⓐ** (**Ⓐ**: Band indicator)

Each time a station is received, the search stops. Press UHF or VHF again until the desired station is tuned in.

Repeat steps 3 to 5 for all the desired stations.

**B-3****To cancel an unused programme**

- 1 Select the programme to be cancelled with + or – PROGRAM/TRACK/INDEX.
- 2 Press RESET.

The cancelled programme will be skipped when + or – PROGRAM/TRACK/INDEX is pressed.

When the corresponding programme number button on the Commander is pressed, the sound of the cancelled programme will be cut out and no picture will be displayed.

**To fine tune a station**

If the picture of a particular station is not acceptable, set AFT in the upper compartment to OFF and keep + or – FINE pressed until the picture becomes clear. To view this particular station, set AFT to OFF.

**SETTING THE CLOCK** **B-3**

- 1 When you connect the unit to a mains outlet, the clock shows "Su 0:00".
- 2 Press CLOCK SET.  
This turns the unit on.
- 3 Set day, hour and minute in sequence.  
First adjust the blinking item by turning the JOG dial, and then press NEXT.  
(ex. To set for Wednesday evening at 6:30)  
For accurate setting, after adjusting the minute digit, press NEXT at the same time as an announced time signal.  
The clock will now start and the dots of the colon will alternately blink every 30 seconds.
- 4 Press ON/STANDBY to turn off the unit.

**JOG dial**

Turn clockwise to advance the digits, and anticlockwise to reverse them.

**To readjust the previously set item during clock setting**

Press CLOCK SET again for a few seconds. Press NEXT until the item to be changed blinks and reset it. Then, terminate the setting by pressing NEXT enough times until the dots of the colon blinks.

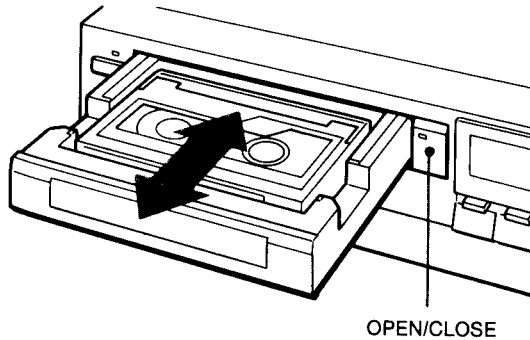
**If a power interruption occurs,**

"Su 0:00" will light up in the window.



## 1-4. ABOUT CASSETTES

C-1



### INSERTION C-1

- 1 Press OPEN/CLOSE to open the cassette holder. Power will be supplied automatically with this step.
- 2 Place the cassette with the window side up.
- 3 Press OPEN/CLOSE to close the cassette holder.

### EJECTION

- 1 Press OPEN/CLOSE.
- 2 Remove the cassette and press OPEN/CLOSE.

#### Notes

- Always insert a cassette in the correct direction.
- The lamp inside the holder blinks while the tape is being loaded. Wait until the blinking stops before proceeding.
- The cassette holder can be closed by pressing itself manually. Never press it forcibly or the cassette may be ejected.
- Once the cassette is placed, you can close the holder by pressing ►, ◀◀, ▶▶ or ● (REC).

C-2



### TO PREVENT ACCIDENTAL ERASURE C-2

When a new recording is made on a previously recorded cassette, the previous recording will be automatically erased. To protect a recording, slide the tab out to cover the opening.

When the tab is out, a recording cannot be made. To re-record on a cassette, slide the tab in.

### RECORDING TIME, PLAYBACK TIME

The LP mode is twice as long as the SP mode. For better picture and sound, recording in the SP mode is recommended.

During playback, the mode in which the tape was recorded is selected automatically.

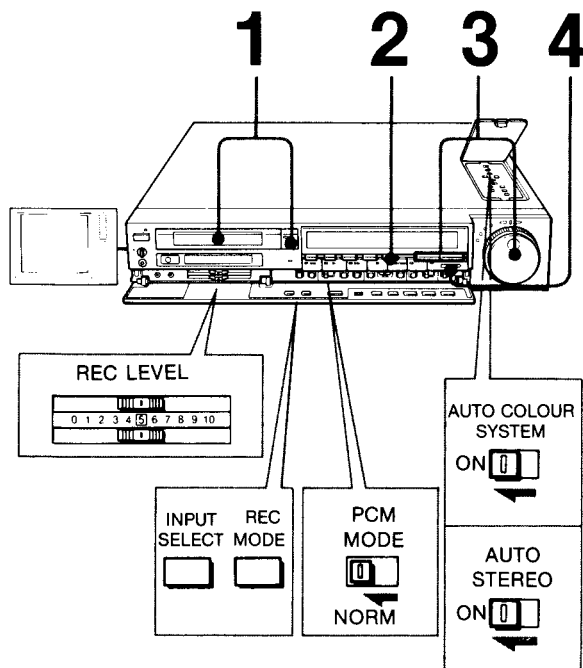
Cassette used	SP mode	LP mode
P5-30	30 min.	1 hr.
P5-60	60 min.	2 hr.
P5-90	90 min.	3 hr.

#### Note

Never insert anything in the small holes on the rear of the cassette.

## 1-5. TV PROGRAMME RECORDING

D-1



Make sure that you have finished all the connections and adjustments on pages 15 through 17.

### OPERATION D-1

#### Before recording

- Turn on the TV and select the channel for the recorder or select the input for the recorder.\*
- Check the position of the selectors:

Press	to display
INPUT SELECT	TUNER
REC MODE	SP or LP

Set	to
PCM MODE	NORM
AUTO STEREO	ON
AUTO COLOUR SYSTEM (EV-S850PS only)	ON

- Set REC LEVEL to "5".

- 1 Insert a cassette.
- 2 Press ANT TV/VTR so that the "VTR" indicator is displayed.
- 3 Select the programme to be recorded with JOG or +/- PROGRAM/TRACK/INDEX.
- 4 Slide ● REC to the right.

#### To stop recording

Press ■ STOP.

#### To stop recording for a moment

Press |||/▶ PAUSE/STILL. The TV programme can still be seen on the TV, but the picture is not recorded.

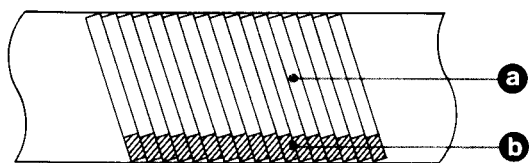
To resume recording, press |||/▶ PAUSE/STILL again. To protect the video heads and the tape, the pause mode will be automatically released after about 7 minutes and recording will stop. Smooth recordings can be made by using |||/▶ PAUSE/STILL. See page 19.

#### When the recording is made to the end of the tape,

the tape will be automatically rewound to the beginning and the unit will enter the stop mode. The power remains on.

- \* If your TV/monitor is equipped with audio/video inputs or a multiconnector, select the correct input on your TV/monitor.
- If your TV/monitor is equipped with SCART (CENELEC) or PERI-TV connector, the input signal is selected automatically when you display "VTR" with the recorder.

D-2



#### During recording...

If stereo programmes are received,  
“STEREO” indicator will be displayed in the window.

If bilingual programmes are received,  
select the sound to be monitored with AUDIO MONITOR  
MAIN/SUB/MAIN. SUB.

Recording is made as follows: D-2

**a Standard track**

Video/audio signals of the TV programme and the main sound of a bilingual programme are recorded here.

Recorded sounds are monaural.

**b PCM track**

Audio signals from the connected equipment or from TV are recorded in digital PCM sound. Sound can either be in monaural (when sounds for left and right channel are the same) or in stereo (each sound for left and right channels).

#### FOR SMOOTH RECORDING

Recording should always be started from the recording pause mode for smooth transitions between scenes. Proceed as follows if the recording was stopped or if you want to record on a pre-recorded tape from a desired point.

##### To start recording from a particular point

You can decide the starting point for recording while watching the picture.

- 1 Play back the tape and locate the point for recording while watching the picture.
- 2 Press **II/PAUSE/STILL** to stop the tape where you wish to start recording.
- 3 Slide **● REC** to the right. The recorder will enter the recording pause mode.
- 4 Press **II/PAUSE/STILL** at the desired point to release the pause mode.  
Recording starts.

#### Note

Be sure not to change the position of REC MODE (SP/LP) between different scenes. Particularly, if you change the switch from LP to SP, a short blank will be recorded.

##### Frame-by-frame recording

If **● REC** is slid to the right while the unit is in the recording pause mode, a short recording of approx. 7 seconds will be made, and then the unit enters the recording pause mode again.

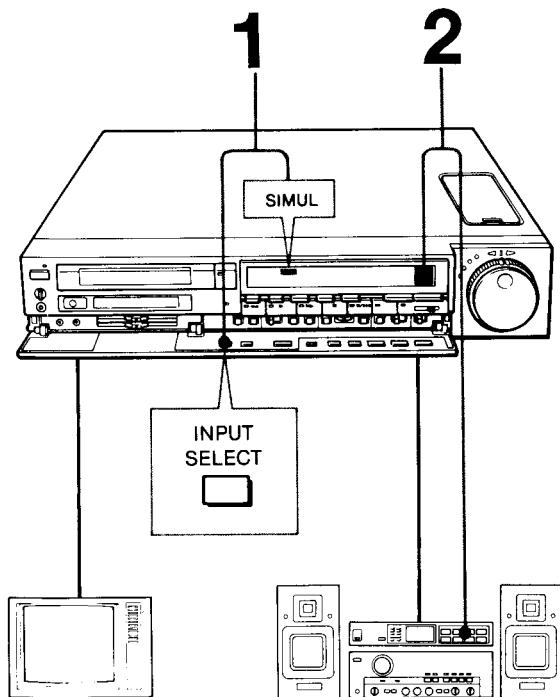
Repeat this operation as many times as you like.

### TO VIEW ONE TV PROGRAMME WHILE RECORDING ANOTHER

- 1 Press TV/VTR so that the "VTR" indicator disappears from the window.
- 2 Select the programme you want to view on the TV.

If your TV is equipped with a TV/VTR input selector, simply set the selector to "TV" and select the programme on the TV.

D-3



### TO RECORD A TV PROGRAMME WHILE RECORDING AN FM BROADCAST AT THE SAME TIME — FM simulcast recording D-3

Sometimes a TV station and an FM radio station will broadcast a programme simultaneously so that you can record a TV programme in high-fidelity stereo. The TV programme (video and monaural audio) is recorded normally on the standard track and the stereo audio portion is recorded on the PCM track from your FM tuner.

For details on connection.

#### Operation

Operate as described in "TV programme recording" on page 18 except the following points:

- 1 Press INPUT SELECT so that the "SIMUL" indication appears in the window.
- 2 Select the programme both on the VTR and the FM tuner.

Recording will be made as follows: D-4

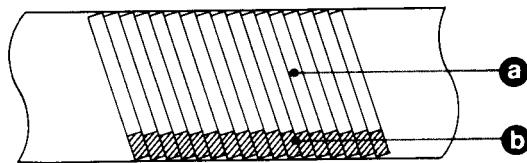
#### **a** Standard track

Video and audio signals of the TV programme will be recorded here.

#### **b** PCM track

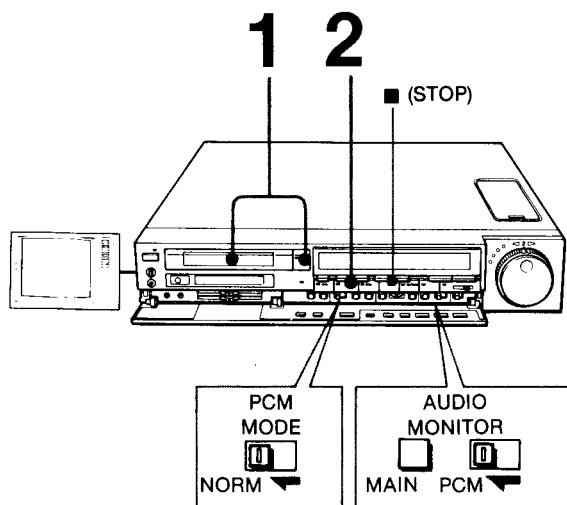
FM broadcast programme from the FM tuner will be recorded in stereo.

D-4



## 1-6. PLAYBACK

E-1



E-1

### Before playing back

- Turn on the TV and select the channel for the recorder or select the input for the recorder.\*
- Check the position of the selectors:

Set	to
PCM MODE	NORM
AUDIO MONITOR	
Press MAIN/SUB/M.S.	to display MAIN
Set PCM/MIX/STD	to PCM

- Set as above, you can listen to the MAIN language of the bilingual programme and the stereo sound recorded on the PCM track of the tape.
- When nothing is recorded on the PCM track, you will automatically hear the sound recorded on the STD track.

To monitor other kinds of sound, change these settings. See "To select the monitor sound" below.

### Note

If the picture is not displayed and/or the sound is not heard or heard only intermittently when a tape which has been recorded on a video camera recorder or a video cassette recorder without the PCM function is played back on this unit, set AUDIO MONITOR on this unit to STD. (Although AUDIO MONITOR is set to STD, the "PCM" indicator may occasionally light up.)

## OPERATION

- 1 Insert a cassette.
- 2 Press ► PLAY.

### To stop playing back

Press ■ STOP.

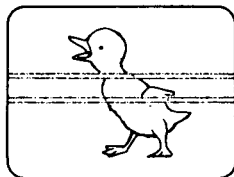
### To select the monitor sound

Kind of the tape (conditions of recorded signals)	Track to be played back	Position of the selector	
		MAIN/ SUB/M.S.	PCM/MIX/ STD
Stereo	PCM	—	PCM
FM simulcast (Page 20)	PCM	—	PCM
Bilingual	PCM	MAIN, SUB or M.S	PCM
Audio dubbed (Page 44)	PCM and STD	—	MIX

"—" means that the selector can be set to any of its position.

- \* • If your TV/monitor is equipped audio/video inputs or a multi-connector, select the correct input on your TV/monitor.
- If your TV/monitor is equipped with SCART (CENELEC) or PERI-TV connector, the input signal is selected automatically when you display "VTR" with the recorder.

E-2



**To advance or rewind the tape rapidly**

Press ►► FF or ◀◀ REW respectively in the stop mode. To stop the tape, press ■ STOP.

**Auto play — To play back a tape from the beginning of the tape after rewinding**

Press ► PLAY keeping ◀◀ REW depressed, or press AUTO PB on the Remote Commander. After the tape is completely rewound, it will automatically be played back.

**VARIOUS PLAYBACK MODES**

Use the buttons on the recorder or on the Remote Commander.

**Picture search — viewing the picture at a fast speed to find a particular scene**

Keep pressing ►► FF or ◀◀ REW during playback. When you release the button, the normal playback will be resumed.

Streaks appear and the sound is muted during “Picture search” and “Still picture”. [E-2]

**Still picture (playback pause)**

Press ■/▶◀ PAUSE/STILL during playback. The sound is muted.

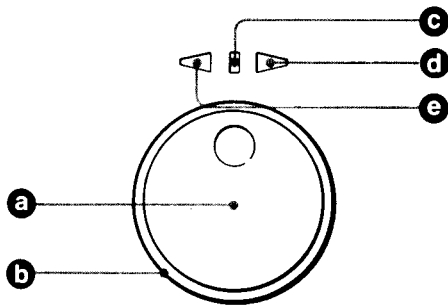
To resume normal playback, press ■/▶◀ PAUSE/STILL again or press ► PLAY.

To protect the video heads and the tape, the pause mode will be automatically released after about 7 minutes and playback will be resumed.

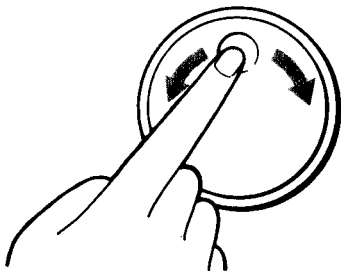
**To obtain better playback picture in variable playback modes**

- If the still picture seems to shake, press + or – SLOW/STILL ADJ in the upper compartment until the picture stabilizes.
- If streaks or noise bands appear in still, frame-by-frame, normal (x1), double (x2), 1/10 or 1/5 speed picture, set to 1/10 or 1/5 speed picture mode and press + or – SLOW/STILL ADJ.

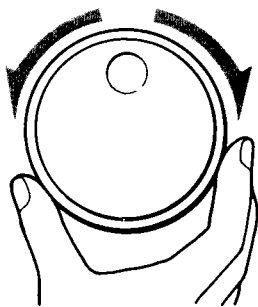
E-3



E-4



E-5



## VARIOUS SPEED PLAYBACK USING THE JOG DIAL AND SHUTTLE RING

E-3

- Ⓐ JOG dial
- Ⓑ SHUTTLE ring
- Ⓒ Lights when JOG and SHUTTLE are operable or in use.
- Ⓓ Indicates the forward playback.
- Ⓔ Indicates the reverse playback.

### Using the JOG dial E-4

- 1 Play back a tape and stop the playback by pressing **II/▶ PAUSE/STILL**.
- 2 Turn the JOG dial.  
The tape will be played back at the speed at which you are turning the dial (1/10, 1/5 or normal speed). Turn it clockwise for forward playback, or anticlockwise for reverse playback.
- 3 When you stop turning the JOG dial, the still picture will be displayed.

### Using the SHUTTLE ring E-5

- 1 Play back a tape and stop the playback by pressing **II/▶ PAUSE/STILL**.
- 2 Turn the SHUTTLE ring and hold it at the position where the desired playback speed is obtained.  
You can select 1/5, normal, double or continuous picture search speed.  
Turn it clockwise for forward playback, or anticlockwise for reverse playback.
- 3 When the SHUTTLE ring is released, the still picture will be displayed.

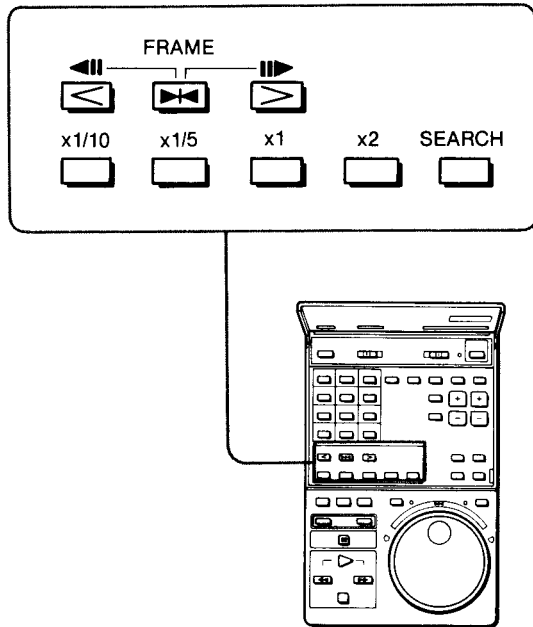
### To use the JOG dial and SHUTTLE ring on the Remote Commander

Before operating JOG or SHUTTLE, press the JOG SHUTTLE function button on the Commander so that the associated indicator lights. The VTR will enter playback pause mode.

If JOG and SHUTTLE on the Commander are not used for more than one minute, their function will be released automatically in order to prevent undue battery wear. To use JOG and SHUTTLE again, press the JOG SHUTTLE function button once more.

- JOG and SHUTTLE on the Commander will function in still picture and various speed playback modes.
- Once you have used JOG and SHUTTLE on the Commander for various speed playback, then, JOG and SHUTTLE on the unit will not function.

E-6



## VARIOUS PLAYBACK MODES USING THE REMOTE COMMANDER E-6

### Frame-by-frame picture

Press FRAME (forward) or (reverse) in still picture mode.

Press PLAY to resume normal playback.

### Variable speed playback

Press the desired speed button during playback or in still picture mode. The sound is muted (except in x1 and x2 forward picture).

: still picture

x1/10: slow motion picture at 1/10 normal speed

x1/5: slow motion picture at 1/5 normal speed

x1: normal speed picture

x2: double speed picture

SEARCH: continuous picture search

**To reverse the direction of the variable speed playback,** press . To resume forward playback, press .

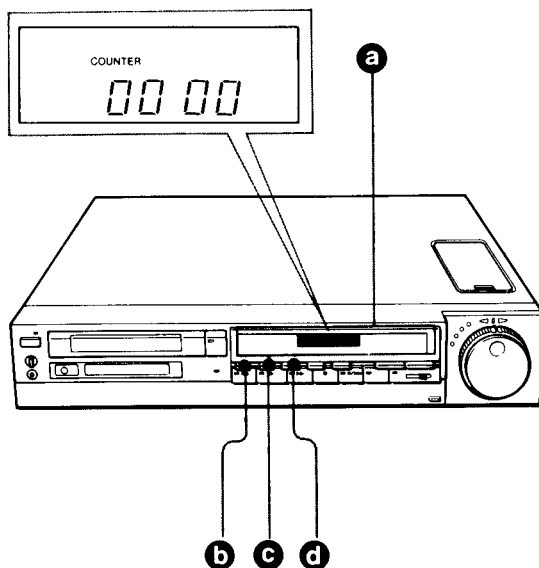
**To change the playback speed,** simply press the desired speed button.

**To resume normal playback,** press PLAY.

## USE OF THE TAPE COUNTER

The tape counter indicates the relative position of programmes on the tape.

F-1



F-1

**a** Display window

**b** COUNTER/REMAIN

**c** COUNTER RESET

**d** GO TO ZERO

### To index the tape contents

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

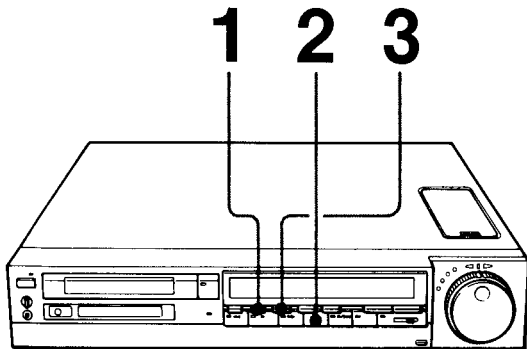
Note to list the programmes and their counter readings.

### Notes

- The counter reading is automatically reset to zero when a cassette is newly inserted.
- The counter reading will be retained in the memory even after the power is turned off, as long as the cassette is kept inserted in the cassette holder.
- The counter reading will not exactly correspond to the position of the tape after the tape has been topped or run repeatedly in fast-forward or rewind modes.



F-2



**GO TO ZERO — To stop the tape at a particular point** F-2

- 1 During recording or playback, press COUNTER RESET at the point you want to locate later.
- 2 When recording or playback is finished, stop the tape.
- 3 Press GO TO ZERO.  
The tape will be rewound or advanced close to the counter 0000 point.

**GO TO ZERO play — To start playback automatically from the counter zero point**

Press ► PLAY after pressing GO TO ZERO.  
The indicator on ► PLAY will blink.

**To check the remaining recording or playback time** F-3

During recording or playback, press COUNTER/REMAIN.

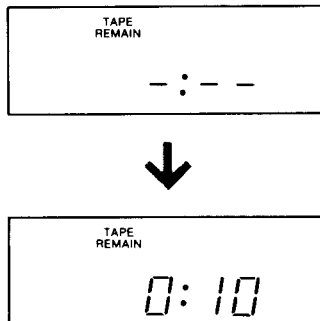
The displayed remaining time will decrease as the recording or playback goes on.

To display the tape counter, press COUNTER/REMAIN again.

**Notes**

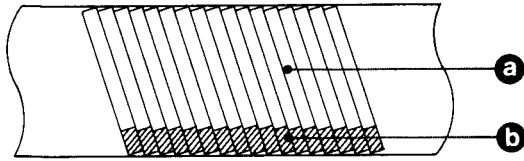
- The remaining time appears only after the “-:--” indication has been displayed for several seconds.
- If you want to display the remaining time during x2 (in the right direction) and x1, x2 (in the reverse direction), first display the remaining time in the normal playback mode. Then, set in the above speed and press COUNTER/REMAIN.
- During the frame-by-frame or the slow-speed playback, the display indicates the remaining time when the playback started.
- On the accuracy of the remaining time counter:
  - For commercially available recorded tapes, the counter will not indicate the exactly same time as the recorded time labeled on the tape.
  - For damaged tapes and nonstandard tapes, the accuracy will be degraded.
  - At the beginning of a tape, especially when the tape has just been rewound, the remaining time will be calculated greater than the actual time (by several minutes max.).

F-3



## 1-7. DIGITAL MULTI AUDIO RECORDING AND PLAYBACK

G-1



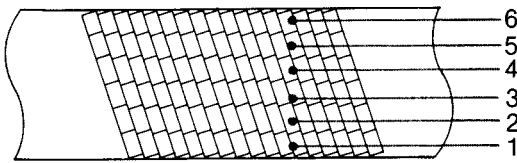
Normally, both the video and audio signals can be recorded on your video tape.

G-1

- Ⓐ Video + audio
- Ⓑ Audio

However, you can record up to 6 tracks of only the audio signals in the digital mode, using the full width of the tape. This is called digital multi audio recording, providing a high-fidelity stereo sound. G-2

G-2



To connect the VTR to your audio system.

### RECORDING G-3

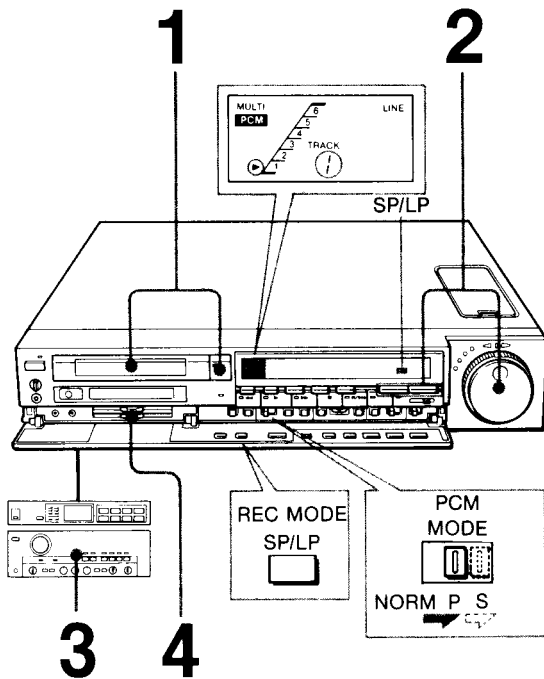
#### Before recording

Check the position of the selectors:

Set	to
REC MODE	SP or LP
PCM MODE	P or S*

\*Set to either of two positions. They activate in the same way.

G-3



#### Operation

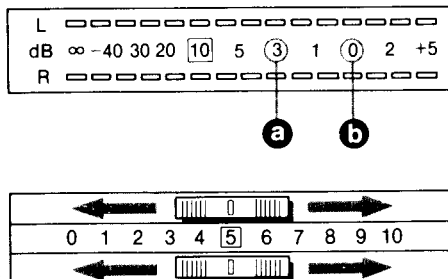
- 1 Insert a cassette.
- 2 Turn JOG or press +/- PROGRAM/TRACK/INDEX to select the digital multi audio track on which recording should be made.  
—Adjust "▶" (red indication) to the desired track.
- 3 Turn on the power on the audio equipment and set to the playback mode.
- 4 Adjust REC LEVEL.  
Verify the adjustment with the peak level meter of the recorder.

#### Recording level adjustment G-4

Referring the peak level meter, manually adjust the recording level with REC LEVEL.

Select the best recording level for each source as follows:  
**When recording sources with many high frequency signals** (ex: trumpets etc) set so that the peak programme meters deflect -3 dB. Ⓐ  
**When recording sources with midium or lower frequency signals** (ex: vocals) set so that the peak programme meters deflect 0 dB. Ⓑ

G-4



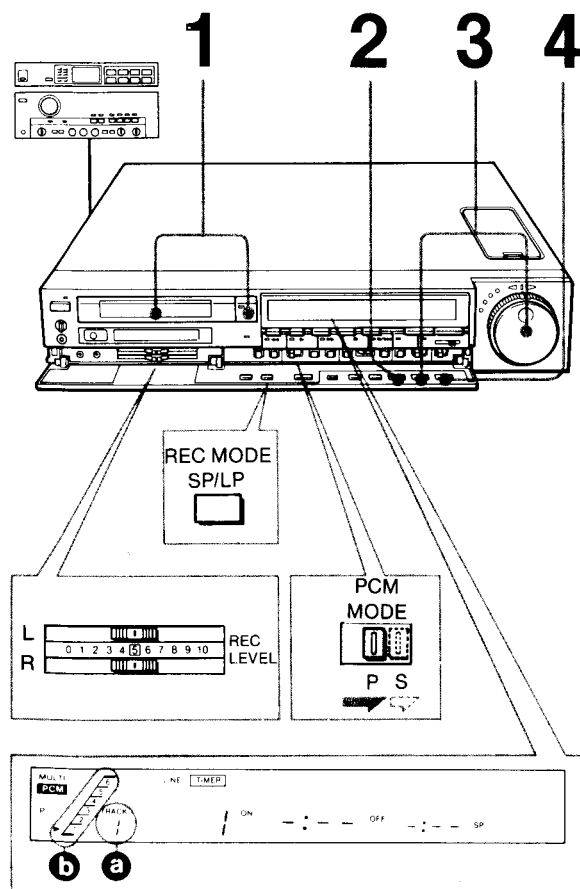
During playback, you can read the recorded level on the peak level meter.

## TIMER RECORDING

If you connect any audio tuner with timer presetting functions, you can record up to 6 radio programmes in the digital PCM sound.

6 programmes can be recorded either on 6 separate audio tracks (for parallel recording) or they can be recorded successively on one track (for series recording).

**G-5**



### Before presetting **G-5**

- Turn on the audio tuner.
- Check if the clock is set correctly. (Page 16.)
- Check the position of selectors:

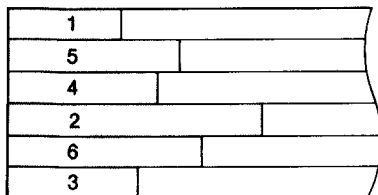
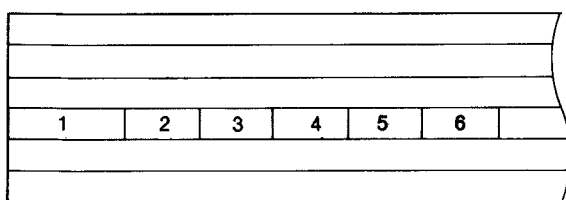
Press	to display
REC MODE	SP or LP
Set	to
PCM MODE	P (parallel) or S (series)
REC LEVEL	"5"

### Presetting

- 1 Insert a cassette.
- 2 Press TIMER SET.
- 3 Set the following items by turning JOG and pressing NEXT.
  - audio track (Set the track number displayed in numeral.) **a**
  - day of the week
  - recording starting time
  - ending time
 (Refer to "Timer-activated recording" on page 33.)
- 4 Press TIMER REC.

### Notes

- After having set the timer, do not change the position of PCM MODE because the timer recording will not be made correctly.
- Timer presettings of TV programme recordings and digital multi audio recordings can be made on one tape. However, such presettings are not recommended because you must verify the position of the PCM MODE switch before each timer recordings.
- **To preset or check the digital multi audio track while you are using this unit**
  - 1) When the unit is in digital multi audio playback/recording
    - a** The track for presetting. Set with JOG.
    - b** The track on which playback or recording is being made. Select with PROGRAM/TRACK/INDEX.
  - 2) When the unit is in normal playback/recording
    - a + b** The track for presetting. Set with JOG.

**G-6****G-7****Parallel and series recordings**

**Parallel recording** — stereo recording of one programme on each track

- After a programme is recorded on one track, then, another recording will begin on another track from the beginning of the tape.
- You can select the track in any order for any programme. **G-6**

**Series recording** — Stereo recording in series on only a single track

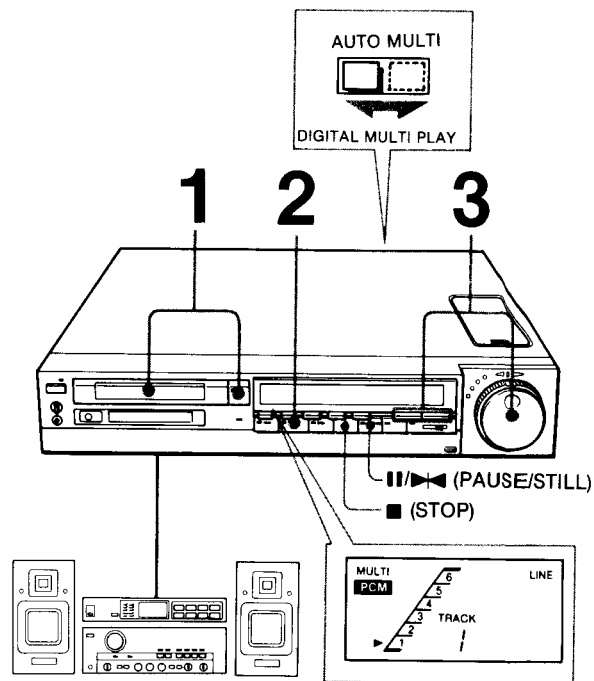
- After one programme is recorded, another one is recorded successively on the same track. **G-7**

**Notes****On parallel recording**

- If a programme is already preset on a track, you cannot preset another programme on the same track.
- For the first timer-recording programme, the tape will not be rewound automatically to the beginning. The recording will start from the current position of the tape.
- If the next programme starts before the tape has been rewound completely, the beginning of the programme will not be recorded.

**On series recording**

- The track on which timer recordings are made, is the track that is selected in the last timer programme setting.
- After all the preset programmes are preset, the tape will not be rewound to the beginning.

**PLAYBACK **G-8******G-8****Before playback**

- Turn on the audio system so that sound is heard from speakers.
- Set DIGITAL MULTI PLAY on the rear to:
  - AUTO for playing back tapes recorded by this VTR.
  - MULTI for playing back tapes recorded by other VTRs (when their sound cannot be heard with the switch set to AUTO).

**Playback**

- 1 Insert a cassette.
- 2 Press ► PLAY.
- 3 Turn JOG or press +/- PROGRAM/TRACK/INDEX to select the track to be monitored. The red ► indicates the selected track. Only the track marked with red bar on the right side has certain recorded signals. Recordings are not made on the tracks without this indication.

**To stop playing back**

Press ■ STOP.

**To stop the tape for a moment**

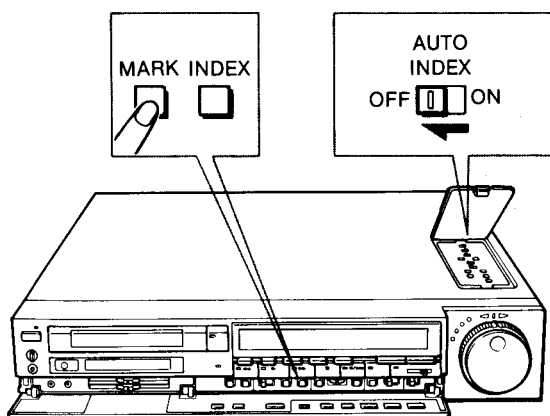
Press ||/▶ PAUSE/STILL.

**Notes**

- When DIGITAL MULTI PLAY is set to MULTI, all bars light up even if nothing has been recorded on the tracks.
- While playback, we recommend that you set REC LEVEL to the "0" position. If not noise which appears when you stop the tape, may damage the speakers.

## 1-8. INDEX FUNCTION

H-1



The desired programme can be easily located by the index signal marked on the tape. This function is effective either to normal video-audio recorded tapes and to digital multi audio recorded tapes.

### TO MARK INDEX SIGNALS

Index signals can be marked at any desired point on the tape during recording, timer recording or normal playback.

H-1

- 1 Set AUTO INDEX in the upper compartment to OFF.
- 2 Press INDEX MARK at the point where an index signal is to be marked.

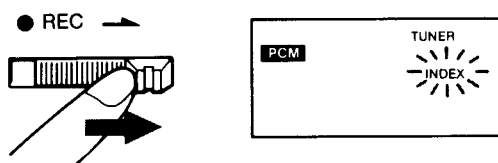
The "INDEX" indication blinks while the index signal is being marked.

An index signal is automatically marked on the tape when ● REC is slid to the right or when a timer recording starts.

H-2

The "INDEX" indication blinks in the window while the index signal is being marked.

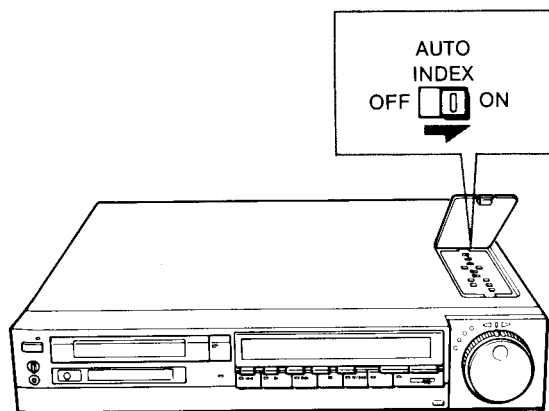
H-2



### Notes

- Index signals will not be marked on the tape when the recording is started by releasing the recording pause mode.
- The index function operates also with the index signals marked using the index function (same format) of other recorders.

H-3



### TO MARK INDEX SIGNALS AUTOMATICALLY IN DIGITAL MULTI AUDIO RECORDING H-3

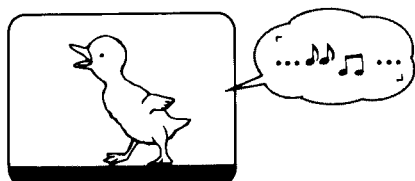
Set AUTO INDEX in the upper compartment to ON. The VTR searches for the blank spaces (of approx. 3 seconds) between programmes (musics etc.), and marks index signals.

The "INDEX" indication blinks while the index signal is being marked.

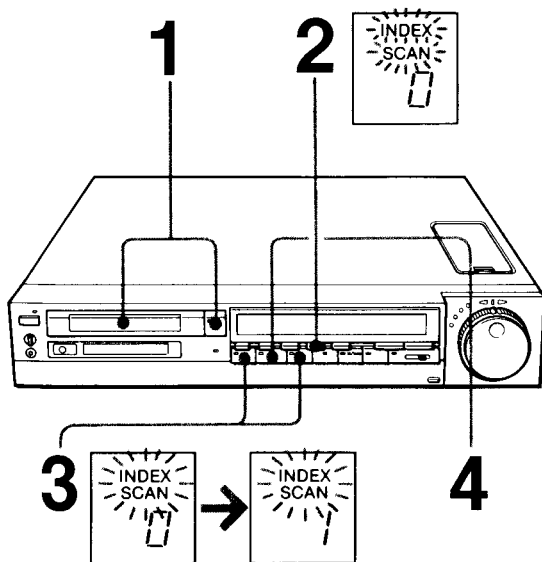
### Notes

- The sound will decrease and be kept at this volume while the index signal is being marked in the playback mode. In addition, a black bar noise will appear at the bottom of the playback picture during marking H-4. However, the recorded signals are not affected.
- During playback, index signals can be marked on cassette tapes whose safety tab is slid out (including commercially available prerecorded video tapes).
- An index signal may not be registered immediately before a point on the tape where the recording tape speed changes.
- You cannot mark nor erase index signals if no video/audio signals is recorded on the PCM track of the tape.

H-4



H-5



- Between each index signal, there must be a minimum space of 2 minutes for LP mode and 1 minute for SP mode.  
If index signals are marked at shorter intervals, index scan or search functions may not be operated correctly.
- For tapes that index signals are marked automatically, index scan or search may not be made correctly because of the quality of the audio source.  
In this case, set AUTO INDEX to OFF and mark index signals manually.
- Index marking and erasing cannot be made during tape editing. (When the EDIT lamp is lit.)

### INDEX SCAN

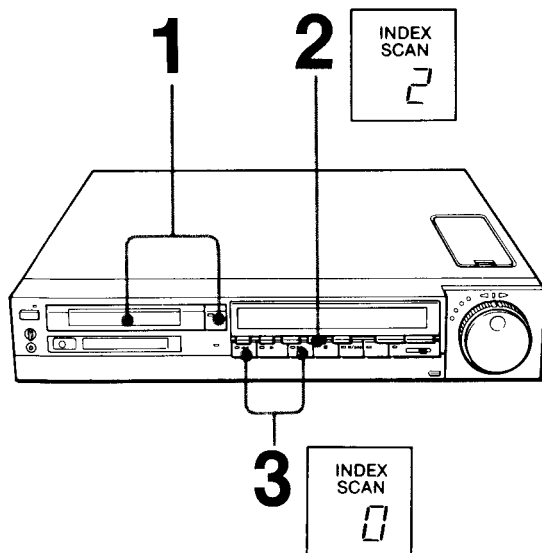
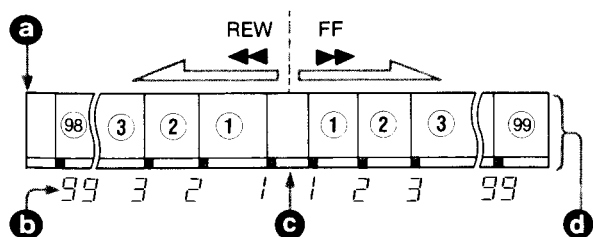
— To play back the beginning of each programme in sequence [H-5](#)

#### Before operating

Set PCM MODE to NORM, or P (or S).

If you have set to P (or S), select the digital multi audio track.

- 1 Insert a cassette that has index signals recorded.
- 2 Press INDEX once.  
The "INDEX" and "SCAN" indications blink alternately.
- 3 To scan the previous programmes, press ◀◀ REW.  
To scan the programmes ahead, press ▶▶ FF.  
The tape will be rewound or rapidly advanced to the next index signal marked.  
While scanning, the "INDEX" and "SCAN" indicators blink, simultaneously. The tape will be played back for approximately 10 seconds, and then, rewound or advanced to the next index signal.  
Everytime an index signal is detected and playback begins, the displayed index number increases.
- 4 At the desired programme, press ▶ PLAY.  
Normal playback of that programme will begin.

**H-6****H-7****INDEX SEARCH** **H-6****— To locate the desired programme**

You can locate the desired programme and play it back automatically by designating the number of its index signal. Up to 99th index signal from the present position on the tape can be located.

**Before operating**

Set PCM MODE to NORM or P (or S).

If you have set to P (or S), select the digital multi audio track.

- 1 Insert a cassette that has index signals marked.
- 2 Press INDEX several times until the index number of the desired programme is displayed.  
For instance, to locate the second programme ahead, two index signals should be detected, so press INDEX until "2" is displayed. On the other hand, to locate the second programme behind, three signals, should be detected, so press the button until "3" is displayed.

- H-7**
- Ⓐ Beginning of the programme
  - Ⓑ Index number
  - Ⓒ Present position
  - Ⓓ Video tape (or one of the 6 digital multi audio tracks)

**Notes**

- To designate higher index number, first press INDEX several times, then continue with +/- PROGRAM/TRACK/INDEX or JOG so that the desired index number display appears.
- If you enter an incorrect index number, press ■ STOP to reset the display.

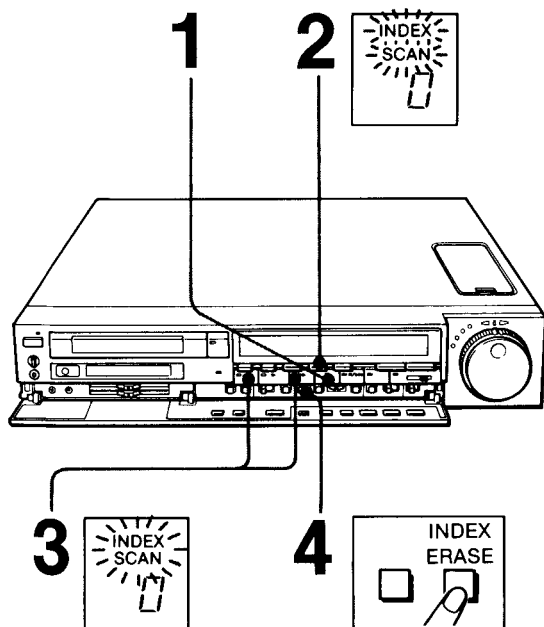
- 3 To locate a previous programme on the tape, press ◀◀ REW.  
To locate a programme ahead, press ▶▶ FF.

The tape will be rewound or rapidly advanced. Every time an index signal is detected, the displayed number will decrease. When the number reaches 0, playback of your desired programme will begin.

**Notes**

- If, on a tape, there are portions on which index signals are marked on the first PCM audio track in the digital multi audio mode, and portions on which index signals are marked in the normal mode, the index scan and search in the normal mode cannot be made correctly.
- For index scan or search in digital multi audio mode, set AUDIO MONITOR to PCM or MIX.
- Index scan and search can be activated during playback mode. (In the mode which was being selected when the playback started.)
- While the index signals are being scanned or located, nothing is displayed on the monitor and sound is cut off.
- If the tape is rewound to the beginning during index scan or index search, playback will begin automatically.
- If the tape reaches the end during index scan or index search, the tape will not be rewound automatically.

H-8



When the desired programme cannot be played back with the index function, check the following:

- The nearest index signal may not have been counted. If the point where you pressed ◀◀ REW or ▶▶ FF is fairly close within 2 minutes of the normal tape-run to the nearest index signal, that signal will not be counted.
- Is there a space of more than 2 minutes between two index signals? If there is more than one index signal marked within an interval of 2 minutes of the normal tape-run, the mechanism may not function properly.

### TO ERASE INDEX SIGNALS [H-8]

#### Before operating

Set PCM MODE to NORM or P (or S).

If you have set to P (or S), select the digital multi audio track.

#### Erasing while index scanning — To erase the index signals in sequence

- 1 Stop the tape with ■ STOP.
- 2 Press INDEX once.
- 3 Press ◀◀ REW or ▶▶ FF.  
The tape will be rewound or rapidly advanced to the next index signal and playback will begin.
- 4 Within approx. 10 seconds, while the tape is being played back, press INDEX ERASE.  
The "INDEX" indication blinks and the "SCAN" indication lights steadily while the index signal's erasure.

After the erasure, index scan will resume. At each index signal located, press INDEX ERASE.

To stop index scanning, press ■ STOP.

#### Notes

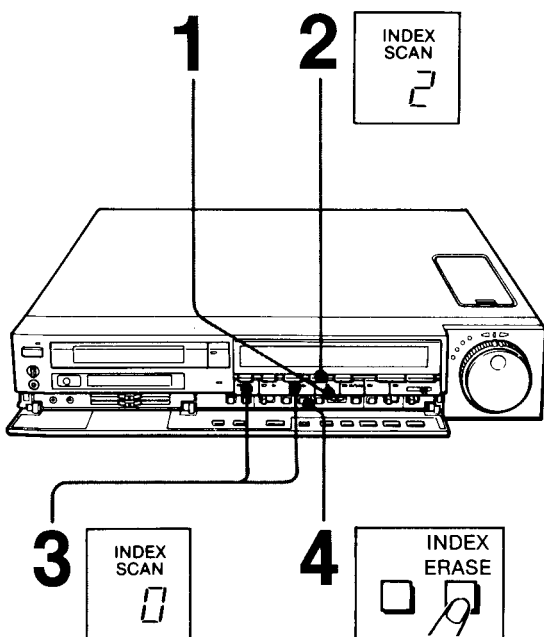
- Press INDEX ERASE more than 2 seconds after the playback starts.
- The index signals recorded immediately after an unrecorded portion on a tape, or on a portion where the recording tape speed has been changed or two recordings have been made continuously will not be erased.  
During index erasing, a black bar noise will appear at the bottom of the playback picture.

#### Erasing while index searching — To erase a particular index signal [H-9]

- 1 Stop the tape with ■ STOP.
- 2 Press INDEX button several times until the number of the index signal to be erased is displayed.
- 3 Press ◀◀ REW or ▶▶ FF.
- 4 Within approx. 10 seconds, while the tape is being played back, press INDEX ERASE.  
The "INDEX" indication blinks while the index signal is being erased.

After the erasure, the unit returns to the normal playback.

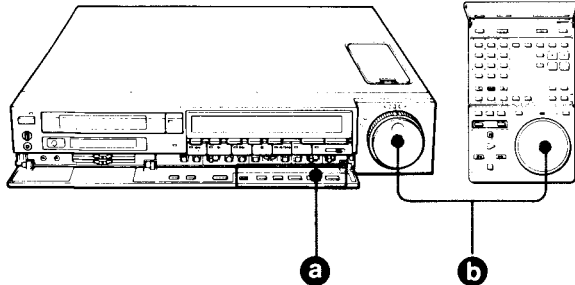
H-9



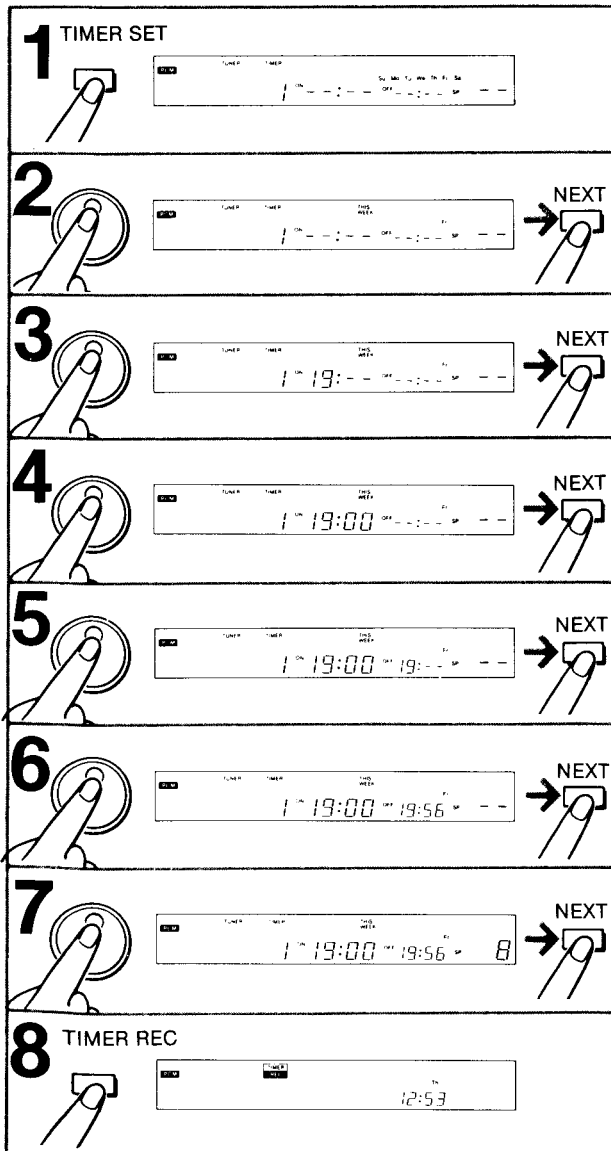


## 1-9. TIMER-ACTIVATED RECORDING

I-1



I-2



Six recordings can be preset to be made between today and Saturday of the week after next.

Su	Mo	Tu	We	Th	Fr	Sa	Today
			1	2	3	4	This week
5	6	7	8	9	10	11	Next week
12	13	14	15	16	17	18	The week after next
19	20	21	22	23	24	25	
.....							

### Before setting the timer

- The clock must be set correctly. For the setting, see page 16.
- Make sure the cassette tape is long enough to record all the programmes.
- Be sure the safety tab of the cassette has not been slid out.
- Set the selectors as in "Before recording" on page 18.

I-1

### Buttons for timer setting

You can use the buttons and JOG dial on the recorder.

#### ➊ NEXT button

Every time you press the NEXT button, the item to be set will blink.

#### ➋ JOG dial

To set the week and day, the turn-on and turn-off times and the channel, turn clockwise to advance and anticlockwise to reverse.

### Operation I-2

Suppose you want to make a recording of channel 8 from 7:00 PM to 7:56 PM Friday.

- 1 Press TIMER SET.
- 2 Set the week and day with JOG. Then, press NEXT.
- 3 Set the turn-on hour with JOG. Press NEXT.
- 4 Set the minute with JOG. Press NEXT.
- 5 Set the turn-off hour with JOG. Press NEXT.
- 6 Set the minute with JOG. Press NEXT.
- 7 Set the TV programme number to be recorded with JOG. Press NEXT.

To preset other programmes, repeat steps 1 to 7.

#### 8 Press TIMER REC.

The power will be turned off and the recorder will enter the standby mode. (The current time is displayed.)

Recording will start at the preset time and will automatically stop when the recording is completed. The memory of the timer programme will be erased if it is for only one day and the timer programme numbers will advance one by one.

**Notes**

- Once the TIMER REC indicator has been displayed, only the functions of CHECK and TIMER REC can be activated. For the usual manual operations, press TIMER REC again so that the indicator goes off, and then, turn on the power.
- Timer recordings of the signals from the AUDIO IN jacks, in the digital multi audio mode can also be made. See page 27.

**If you select an incorrect digit for the turn-on/off time setting, press CLEAR.** The programme which is currently being set will be cancelled but the other programmes previously set will remain.

**To set the week and day**

The week and day indications change in the direction of the arrow, starting from today, when you turn JOG clockwise; and in the reverse direction when you turn JOG anticlockwise.

The day(s) you want the recording(s) made	Display
At the same time every day	↳ Su Mo Tu We Th Fr Sa
Only one day	THIS WEEK We (Today) → Th → ..... → Sa NEXT WEEK ↳ Su → ..... → Sa WEEK AFTER NEXT ↳ Su → ..... → Sa
At the same time on the same day every week	EVERY WEEK ↳ Su → ..... → Fr → Sa
At the same time every day from Monday to Friday	↳ Mo Tu We Th Fr
At the same time every day from Monday to Saturday	↳ Mo Tu We Th Fr Sa

**BEFORE THE TIMER-ACTIVATED RECORDING STARTS**

**To check the timer settings**

Press CHECK.

Every time you press CHECK, each programme will be displayed in the window.

**To change the settings**

- 1 Press TIMER REC. The TIMER REC indicator goes off.
- 2 Press CHECK to select the programme to be changed.
- 3 Press TIMER SET.
- 4 Press NEXT until the item to be changed blinks.
- 5 Change the setting with JOG.
- 6 Press NEXT so that the tape counter and the current time appear in the window.
- 7 Press TIMER REC again to reactivate the timer.

**To erase the memory of a particular programme**

- 1 Press TIMER REC. The TIMER REC indicator goes off.
- 2 Press CHECK to select the programme to be erased.
- 3 Press CLEAR. The memory of the programme will be eliminated.
- 4 If other programmes have been preset for recording, press TIMER REC again to reactivate the timer.

**DURING RECORDING**

**To stop the timer recording**

Press TIMER REC. The recording will stop and the power will be turned off.

**When the tape ends during timer recording**

The tape stops but the tape will not be rewound.

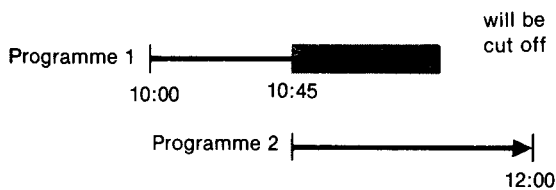
The ■ STOP and III/▶ PAUSE/STILL buttons do not function during a timer recording.

## NOTES ON TIMER-ACTIVATED RECORDINGS

### Troubles when TIMER REC is pressed

- |  |   |  |
|--|---|--|
| The cassette will be ejected automatically | → | <ul style="list-style-type: none"> <li>• The cassette inserted has the safety tab slid out.</li> <li>• No cassette is inserted.</li> <li>• The tape is at its end</li> </ul> |
| The "TIMER-REC" indicator disappears       | → |  |

**I-3**



### When the presettings of your timer-activated recordings overlap **I-3**

The recording of programme 2 will begin before the programme 1 is finished.

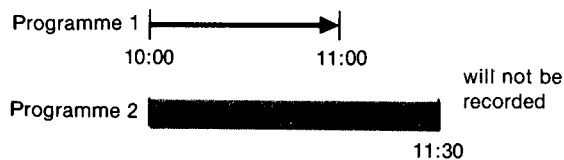
In the illust.: (The coloured portion will not be recorded.)

### If the turn-on time of two programmes are the same **I-4**

The recording of the programme having the lower programme number will be made. The memory of the programme having the higher number will be cleared.

In the illust.: (The coloured portion will not be recorded.)

**I-4**



### If the turn-on time of one programme is the same as the turn-off time of another programme

When a timer recording starts, the unit is set to recording pause mode 6 seconds before the preset turn-on time. The pause mode is released exactly at the preset turn-on time and recording starts approximately 1 second later.

Therefore, the end of the first programme will not be recorded for 6 seconds. Both recordings, however, will not be made smoothly.

### If a power interruption occurs before a timer recording

The clock will stop and "Su 0:00" will light up. This means that the memory of the timer programmes has been completely erased. Reset the clock and timer programmes.

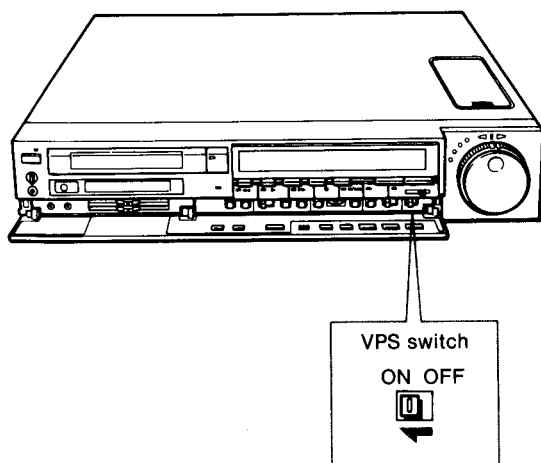
A short power interruption of less than approximately 20 seconds will not affect the memory. The clock will show the correct time and the timer programmes will be performed.

### If the power was interrupted during a timer recording

Recording will stop and the power will be turned off. If the interruption was less than approximately 20 seconds, the recording will resume.

## 1-10. ABOUT THE VPS SWITCH

1-5



— EV-S850PS only 1-5

To avoid missing a timer-activated recording because of a delay in the transmission sequence or a change in the programme schedule, the West German broadcasting stations have agreed to transmit a special code, called the VPS (Video Program System) code, together with the TV programme. The EV-S850PS is equipped with a VPS switch which allows you to preset recording times and insures that your programmes will be recorded regardless of delays.

- 1 **Set the VPS switch to ON.**  
The VPS indication appears in the display window.
- 2 **Set the timer to the time listed in the VPS programme guide which corresponds to the programme you want to record.**

The unit will be turned on 10 minutes before the preset time, but recording will start when the preset programme begins.

### Notes

- If the station you want to record fails to transmit the VPS code signal with the programme, or the VPS code cannot be detected for some reason, recording will begin at the time you preset.
- Be sure to set the timer according to the VPS programme guide, otherwise programme will not be recorded.
- Even if the preset programme does not begin, the unit will remain prepared for recording until 4:00 AM of next day. Or the unit will be prepared to record for 23 hours 50 minutes when the preset time is between 0:00 AM to 4:00 AM.
- When the unit receives a VPS programme interruption code during recording (for example, when urgent news is inserted), it will stop recording. As soon as the interrupted programme resumes, recording will continue.

### Multi-programme and multi-channel recording

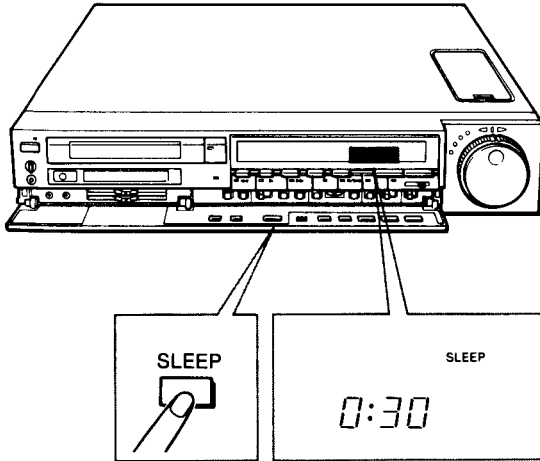
The VPS function allows you to record several successive programmes.

Occasionally, these programmes may overlap or conflict with one another. In these cases the following rules apply.

- If you are recording two successive programmes, on the same channel and the first is delayed past the starting time of the second, the first setting is cancelled and the second programme is recorded.
- If you are recording two successive programmes, each on a different channel, and the first is delayed past the starting time of the second, the first will be cancelled, and the VPS function will not be activated for the second programme and the second programme will be recorded beginning at the preset time even if the second programme is delayed.
- If the first programme is delayed so that it is not finished before the second is scheduled to begin, the unit will automatically switch to the second programme at the preset time and the second programme will be recorded.

## 1-11. USE OF THE SLEEP TIMER

I-6



— To preset the turn-off time of the unit I-6

When recording or playback is being made, preset the turn-off time of the unit.

The recording or playback duration can be set for up to 5 hours by 30 minutes.

### Press SLEEP.

Every time you press on SLEEP, the recording/playback duration indication changes as follows:

0:30 → 1:00 → 1:30 → 2:00 → ..... → 5:00 → Current time display  
30 min. One hr. One and a half hr. 2 hrs. 5 hrs. Zero hr.

The duration decreases minute by minute as the recording or playback advances. The power will be turned off automatically about 30 seconds after the duration time has elapsed.

## 1-12. TAPE EDITING

### ADVANCED EDITING

If another Sony VTR with intercomponent control terminals are used with this unit, use of the supplied Remote Commander brings you much more convenience in editing operations.

You can operate separately the two units (player and recorder) by the supplied Commander. In addition, once you have set them in tape editing standby mode, you can start and stop playback/recording simultaneously with both units simply by pressing the SYNCHRO EDIT button on the Commander. (= SYNCHRO-EDITING)

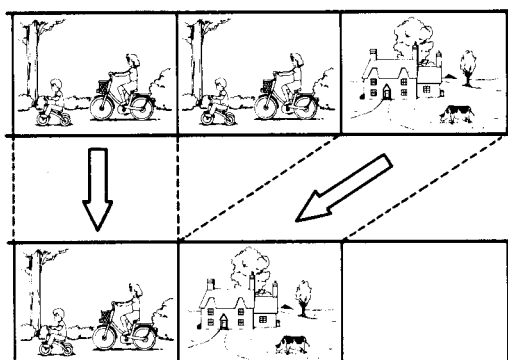
#### Synchro-editing

With this function, playback start/stop of one VTR can be activated in synchronization with recording start/stop of the other VTR.

This function is efficient, for example, when you want to reproduce only the particular portions of a tape onto another tape, or to insert the selected scenes from an original tape onto a pre-recorded tape, etc.

Two methods of synchro-editing are available:

**J-1**



**When this unit is used as a player** **J-1**

“Assemble editing” can be made.

On this unit, designate the desired scenes of the original tape.

These scenes can be “assembled” (= recorded) onto the other tape of another VTR.

**When this unit is used as a recorder** **J-2**

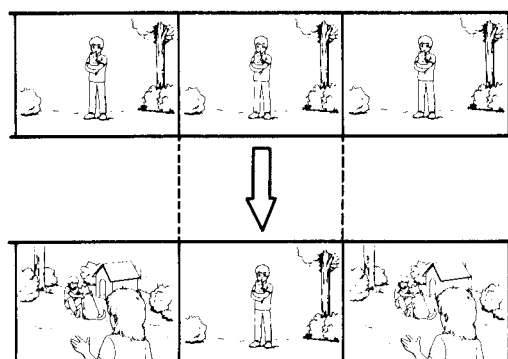
“Automatic insert editing” can be made.

On this unit, locate a portion of the tape on which any scenes from other original tape must be “inserted”.

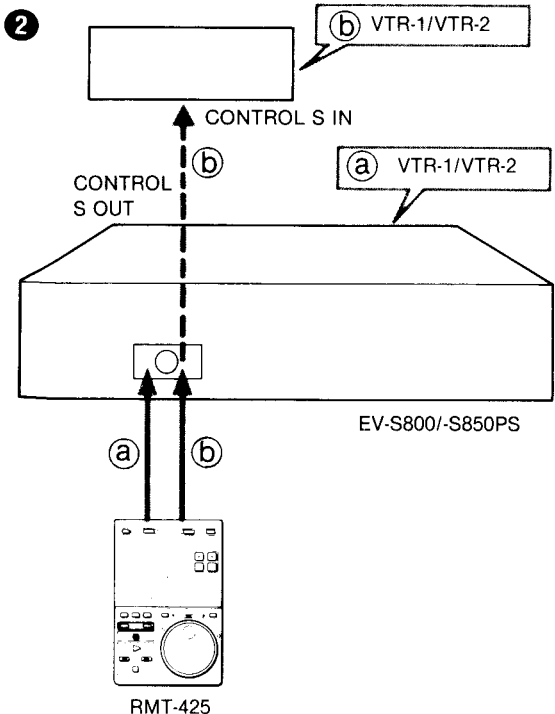
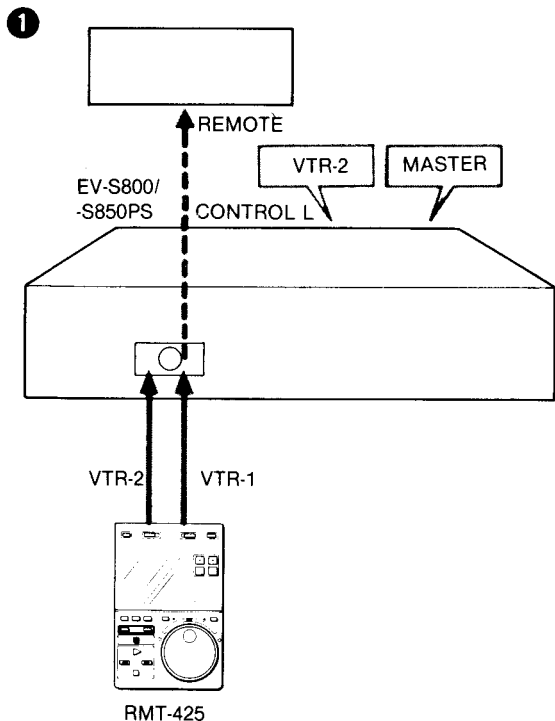
#### Notes

- Do not use simultaneously the above “synchro-editing” and the insert recording function of the VTR (ex CCD-V8 series) which is used with this unit.
- If the VTR to be used with this unit is equipped with the CONTROL L connector and the CONTROL S IN jack, make the connection to the CONTROL S IN jack. If the CONTROL L connector is used, the editing may not be made correctly.

**J-2**



**J-3**



**How are the control signals transmitted? [J-3]**

— About MASTER/SLAVE and COMMAND MODE selectors on this unit —

**① When the connection is made to the CONTROL L jack of this unit**

- **MASTER/SLAVE selector**  
Set to MASTER.

If this unit is controlled by another equipment (ex: RM-E100V), set to SLAVE.

- **COMMAND MODE selector**  
Set to VTR-2.

Set as above, commands emitted by the Remote Commander in the VTR-2 mode control only this unit and commands in the VTR-1 mode are transmitted to the other VTR through this unit.

**② When the connection is made to the CONTROL S OUT jack of this unit**

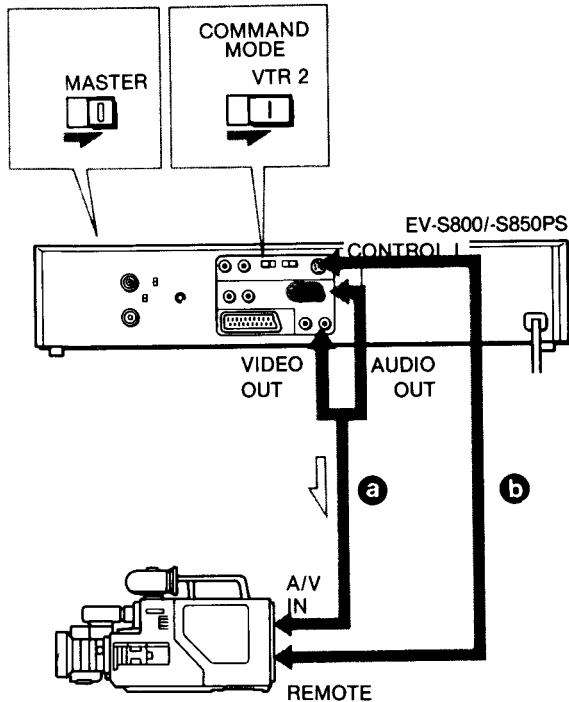
- **COMMAND MODE selector**  
Set to VTR-1 or VTR-2 so that the command mode of this unit is different than the other VTR's command mode.

- **MASTER/SLAVE selector**  
Set to either position. This selector has no effect in this connection.

Set as above, commands emitted by the Remote Commander in a command mode are effective only to one unit and commands in the other command mode control only the other unit.

In both cases (① and ②), point the Commander to the remote sensor of this unit and switch the command mode selector on the Commander to VTR 1 or VTR 2 each time you want to control the player or the recorder in editing operations.

J-4



**Editing tapes from this unit to the 8 mm video camera/  
cassette recorder having a 5-pin REMOTE connector**  
— Assemble editing —

**Connection**

J-4

Connect the CONTROL L connector of this unit to the REMOTE connector of the video camera/cassette recorder. For audio/video connection, see the illustration.

**Before operating**

**On this unit,**

set the switches as follows:

- MASTER/SLAVE on the rear panel to MASTER.
- COMMAND MODE in the upper compartment to VTR 2.
- AUDIO MONITOR in the front panel to the appropriate position. (See page 21.)

**On another VTR**

Set to the LINE IN mode.

**Operation**

Set the Commander's command mode selector to	Operation
1 VTR 1	<ol style="list-style-type: none"> <li>1 Play back the tape and decide the starting point of the recording.</li> <li>2 Set to the recording pause mode.</li> </ol>
2 VTR 2	<ol style="list-style-type: none"> <li>1 Play back the tape and decide the ending point of the recording.</li> <li>2 Press COUNTER RESET to display "0000" in the window.</li> <li>3 Rewind the tape and decide the starting point of the recording.</li> <li>4 Set to the playback pause mode.</li> <li>5 Press SYNCHRO EDIT. Playback and recording start simultaneously. When the counter reaches "0000" point, editing stops automatically and each unit enters the playback or recording pause mode. Repeat steps 1 to 5.</li> </ol>

**For accurate setting of the starting/ending point, use JOG/SHUTTLE.**

**To stop the on-going editing operation, press SYNCHRO EDIT or STOP with Commander's command mode selector set to VTR 2.**

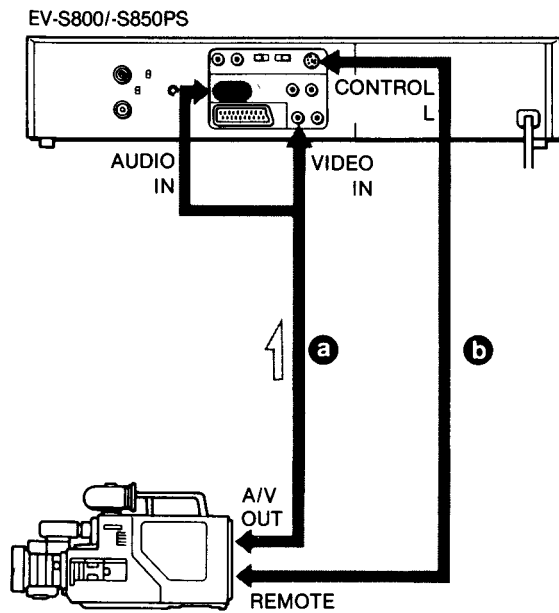
**Note**

During synchro-editing, you can set this unit to various speed playback modes. (ex: slow-motion, frame-by-frame pictures etc. can be recorded.)



J-5

**Editing tapes from the 8 mm video camera/cassette recorder having a 5-pin REMOTE connector to this unit**  
 — Automatic insert editing —



**Connection**

J-5

Connect the CONTROL L connector of this unit to the REMOTE connector of the video camera/cassette recorder. For audio/video connection, see the illustration.

**Before operating**

**On this unit**

Set the switches as follows:

- MASTER/SLAVE on the rear panel to MASTER.
  - COMMAND MODE in the upper compartment to VTR 2.
- Press INPUT SELECT to display LINE in the window.

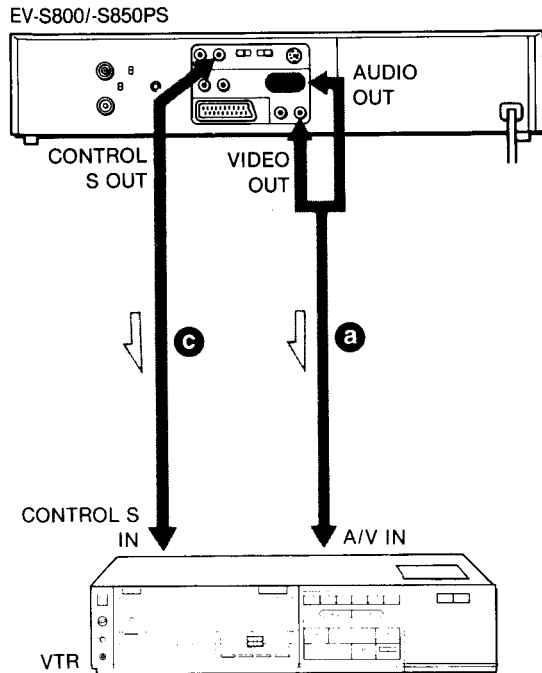
**Operation**

Set the Commander's command mode selector to	Operation
1 VTR 1	<ol style="list-style-type: none"> <li>1 Play back the tape and decide the starting point of the recording.</li> <li>2 Set in the playback pause mode.</li> </ol>
2 VTR 2	<ol style="list-style-type: none"> <li>1 Play back the tape and decide the ending point of the recording.</li> <li>2 Press COUNTER RESET to display "0000" in the window.</li> <li>3 Rewind the tape and decide the starting point of the recording.</li> <li>4 Set to the recording pause mode.</li> <li>5 Press SYNCHRO EDIT. Playback and recording start simultaneously. When the counter reaches the "0000" point, editing stops automatically and each unit enters the playback or recording pause mode.</li> </ol>

**For accurate setting of the starting/ending point, use JOG/SHUTTLE.**

**To stop the on-going editing operation, press SYNCHRO EDIT or STOP with Commander's command mode selector set to VTR 2.**

J-6



**Editing tapes from this unit to a Betamax or 8 mm VTR having a CONTROL S IN jack — Assemble editing —**

**Connection**

J-6

Connect the CONTROL S OUT jack of this unit to the CONTROL S IN jack of another VTR. For audio/video connection, see the illustration.

**Before operating**

**On this unit**

Set the switches as follows:

- COMMAND MODE in the upper compartment to VTR 1 or VTR 2 according to another VTR's type.
- AUDIO MONITOR in the front panel to the appropriate position. (See page 21 "To select the monitor sound".)

**On another VTR**

Set to the LINE IN mode.

**Operation**

Operation is similar to that is described in "Assemble editing" on page 45. However, note that Commander's command mode selector should be set to the same command mode than that of the VTR to be controlled.

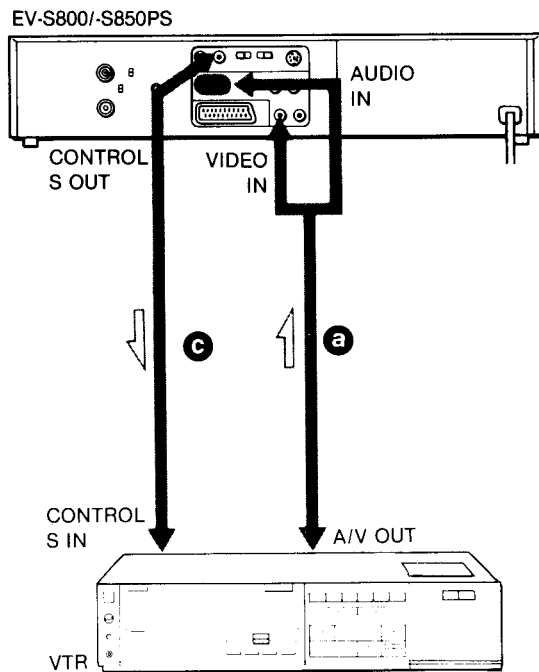
**Editing tapes from a Betamax or 8 mm VTR having a CONTROL S IN jack to this unit — Automatic insert editing —**

**Connection**

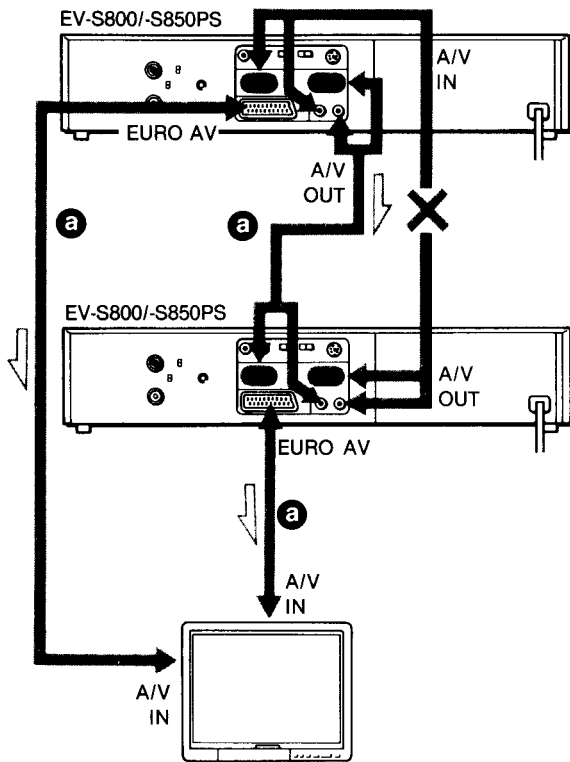
J-7

Connect the CONTROL S OUT jack of this unit to the CONTROL S IN jack of another VTR. For audio/video connection, see the illustration.

J-7



J-8



**Before operating**

- Set COMMAND MODE in the upper compartment to VTR 1 or VTR 2 according to another VTR's type. (See page 21 "To select the monitor sound".)
- Press INPUT SELECT to display LINE in the display window.

**Operation**

Operation is similar to that is described in "Automatic insert editing" on page 38. However, note that Commander's command mode selector should be set to the same command mode than that of the VTR to be controlled.

**Caution** J-8

Do not make the audio/video in and out connections simultaneously between two VTRs.

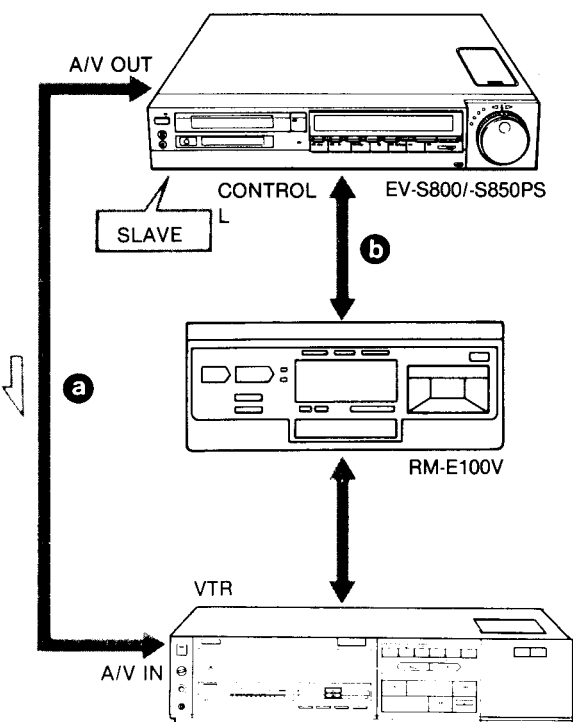
**Editing tapes from this unit to certain VTRs by using the RM-E100V editing controller** J-9

Connect the RM-E100V between the video camera recorder and this unit. With this controller, you will be able to preset the locations of the scenes you want to record (up to 8) in the controller and with a press of a button, these scenes will be recorded by this unit automatically in the order preset. For details, refer to the instruction manual of the RM-E100V.

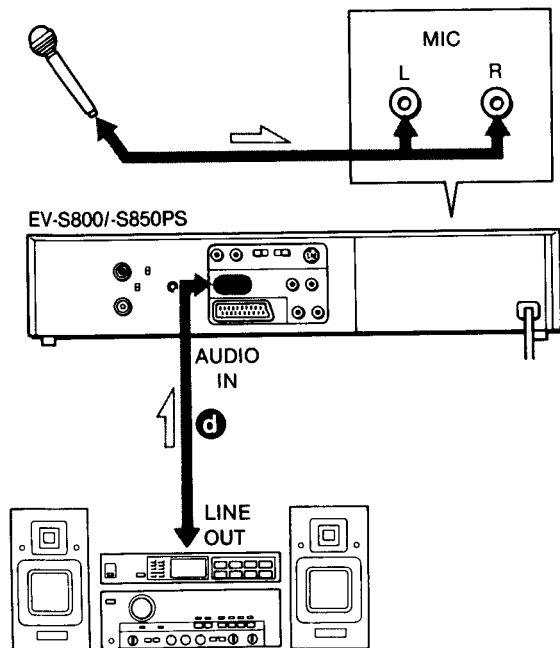
**Note**

Set MASTER/SLAVE selector of this unit to SLAVE. (COMMAND MODE selector can be set at any position.)

J-9



J-10



## AUDIO DUBBING

### Connection J-10

#### To dub signals from the audio system

Connect AUDIO IN of this unit to the REC OUT jacks of the audio system.

#### To dub signals from the microphones

Connect microphone(s) to MIC L/R.

#### To dub signals of TV programmes

You can record audio signals from the built-in tuner.

Audio signals are dubbed as follows:

Track	PCM track	
	L channel	R channel
Microphone connected to ...		
L jack	Microphone sound	Microphone sound
R jack		Microphone sound
L and R jacks	Microphone sound from the L jack	Microphone sound from the R jack

### Operation

- 1 Set PCM MODE to NORM.
- 2 Press INPUT SELECT and display:  
 LINE to dub audio signals from the audio system and/or microphone(s).  
 TUNER to dub signals of TV programmes and/or microphone(s).
- 3 Press ►.
- 4 Decide the starting point of audio dubbing, and press **||/▶◀**.
- 5 Press AUDIO DUB.
- 6 Press **||/▶◀** to release the pause mode, and at the same time start the audio source—such as talking into the microphone, playing back a tape recorder, etc.

### Notes

- When the tape which is recorded in the SP mode is used for dubbing, the black band appears in the center and lower positions of the screen.  
 When the tape which is recorded in the LP mode is used for dubbing, the black band appears in the lower position of the screen. But the recorded picture will not be affected.
- When the tape which is recorded in the different recording times is used for dubbing, noise will be heard at the point where the recording time is changed.

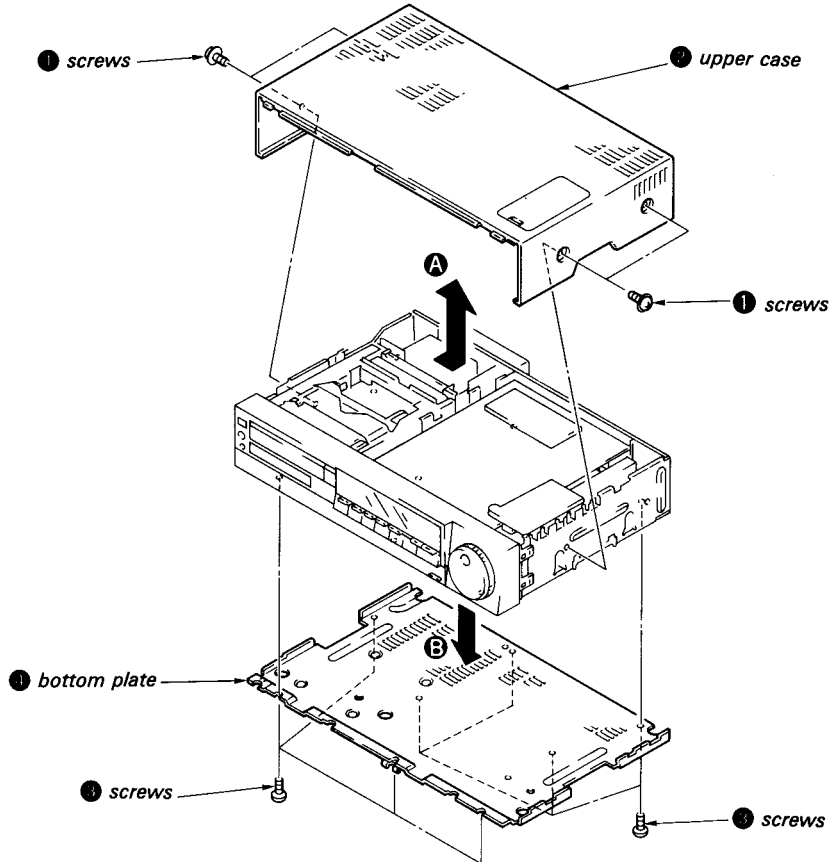
### For PCM recording using a PCM digital audio processor which is not based on the 8 mm PCM format

Set SHARPNESS to the position between the top center and SHARP, and set REC MODE to SP.

## SECTION 2 DISASSEMBLY

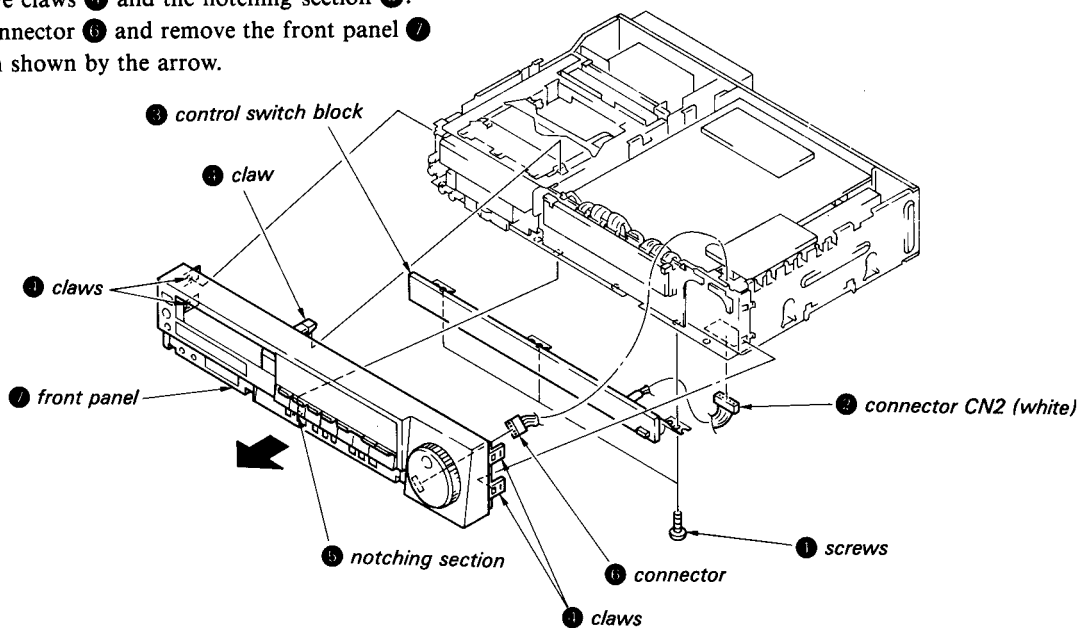
### 2-1. REMOVAL OF CABINET CASE

- 1) Remove the four screws ❶.
- 2) Remove the upper case ❷ in the direction shown by the arrow A.
- 3) Remove the eight screws ❸.
- 4) Remove the bottom plate ❹ in the direction shown by the arrow B.



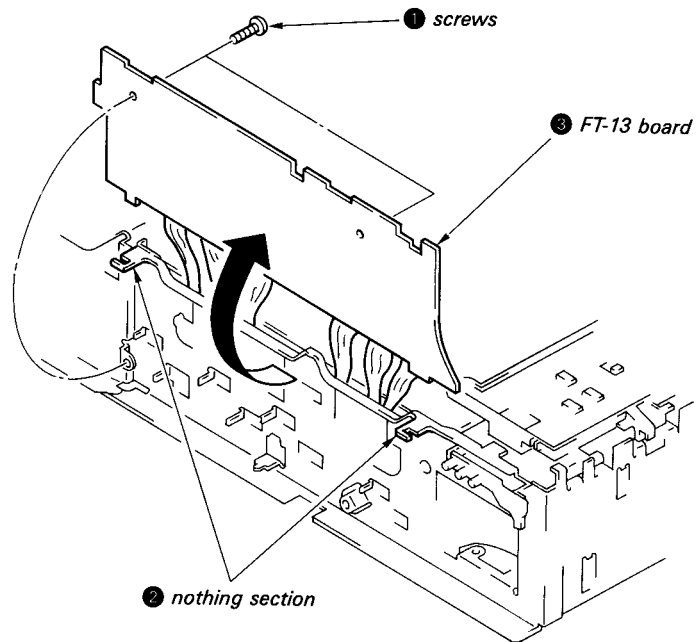
### 2-2. REMOVAL OF FRONT PANEL

- 1) Remove the three screws ❶.
- 2) Pull out the connector (CN2) ❷ and remove the control switch block ❸.
- 3) Remove the five claws ❹ and the notching section ❺.
- 4) Remove the connector ❻ and remove the front panel ❼ in the direction shown by the arrow.



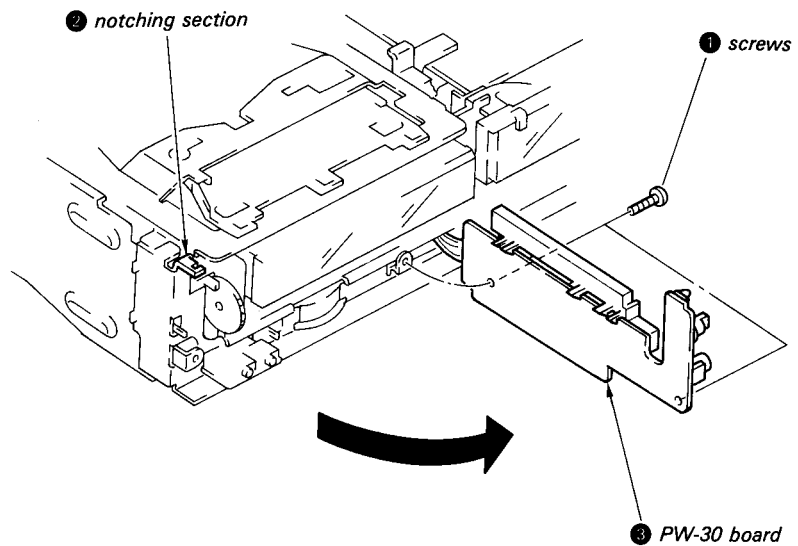
### 2-3. OPENING OF FT-13 BOARD

- 1) Remove the two screws ①.
- 2) Remove the FT-13 board ③ from the two notching section ②.
- 3) Open the FT-13 board in the direction shown by the arrow.



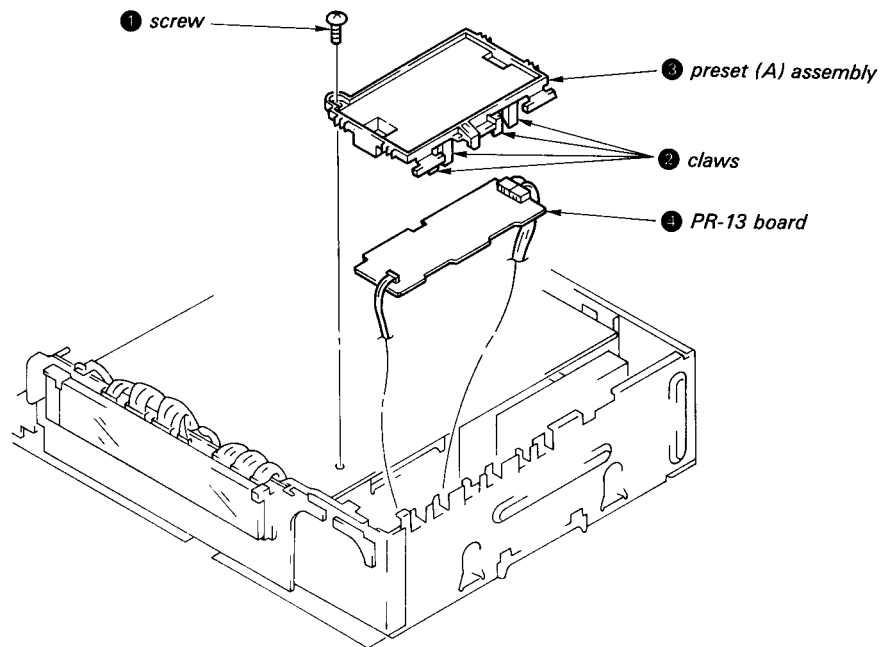
### 2-4. OPENING OF PW-30 BOARD.

- 1) Remove the two screws ①.
- 2) Remove the PW-30 board ③ from the notching section ②.
- 3) Open the PW-30 board ③ in the direction shown by the arrow.



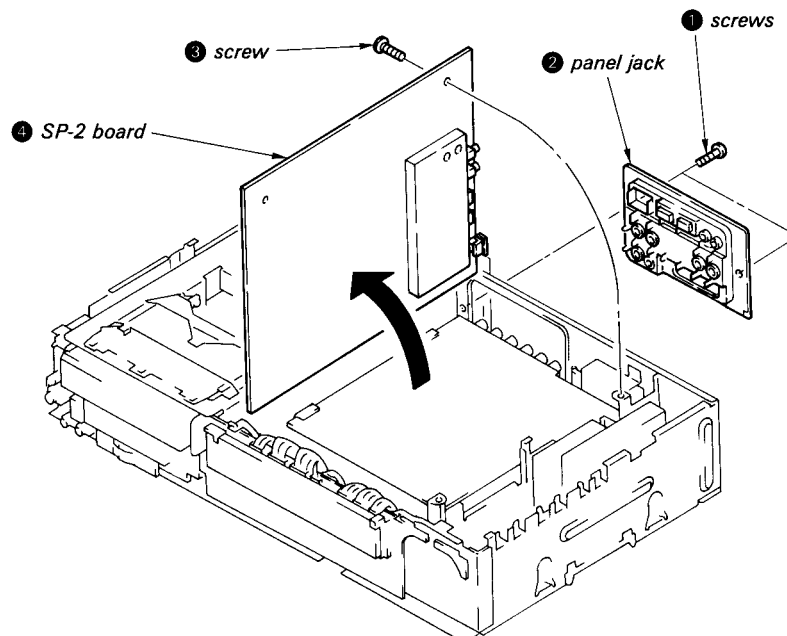
## 2-5. REMOVAL OF PR-13 BOARD

- 1) Remove the screw ①.
- 2) Take off the four claws ②.
- 3) Remove the preset (A) assembly ③.
- 4) Remove the PR-13 board ④.



## 2-6. OPENING OF SP-2 BOARD

- 1) Refer to the "REMOVAL OF PR-13 BOARD", and remove the preset (A) assembly.
- 2) Remove the two screws ①.
- 3) Remove the panel jack ②.
- 4) Remove the screw ③, and remove the SP-2 board ④ in the direction shown by the arrow.



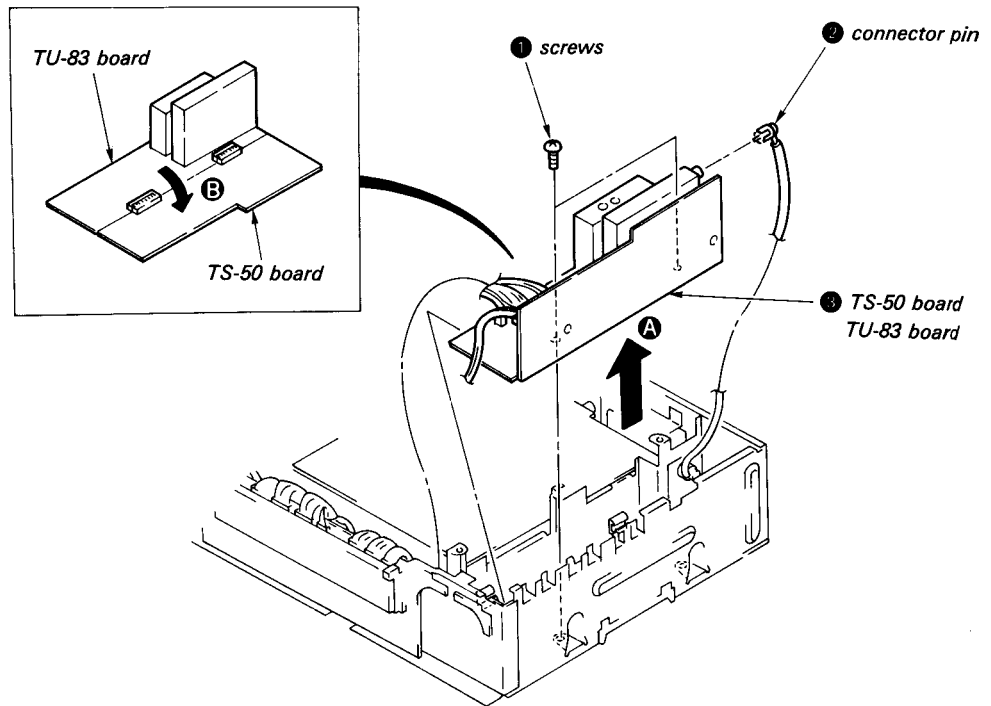
## 2-7. REMOVAL OF TS-50, TU-83 BOARD

- 1) Refer to "REMOVAL OF SP-2 BOARD", and open the SP-2 board.
- 2) Remove the two screws ❶.
- 3) Pull out the connector pin ❷.

- 4) Remove TS-50, and TU-83 board ❸ in the direction shown by the arrow A.

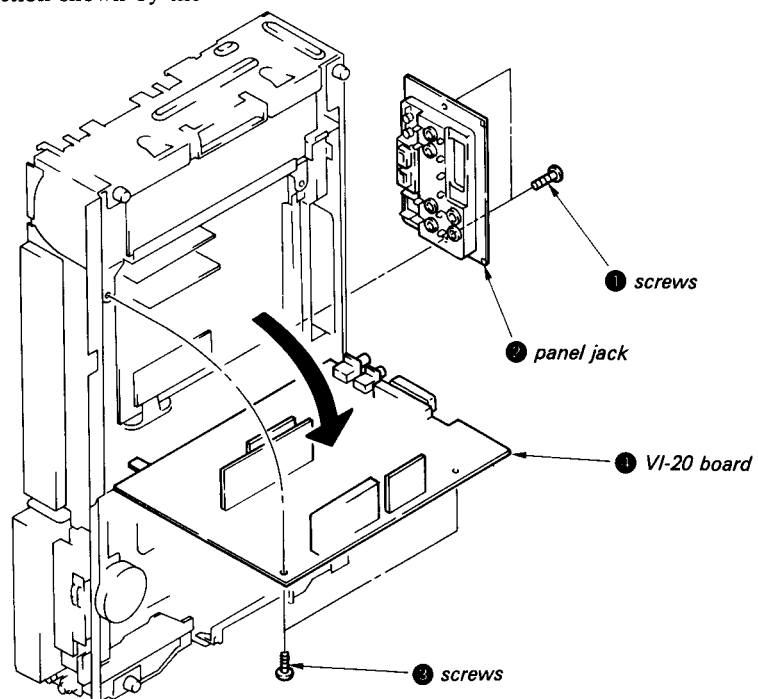
**Note:** At this time, take care not to injure the board by scratching it.

- 5) Open the TS-50 board in the direction shown by the arrow B.



## 2-8. OPENING OF VI-20 BOARD

- 1) Remove the two screws ❶.
- 2) Remove the panel jack ❷.
- 3) Remove the two screws ❸.
- 4) Open the VI-20 board ❹ in the direction shown by the arrow.

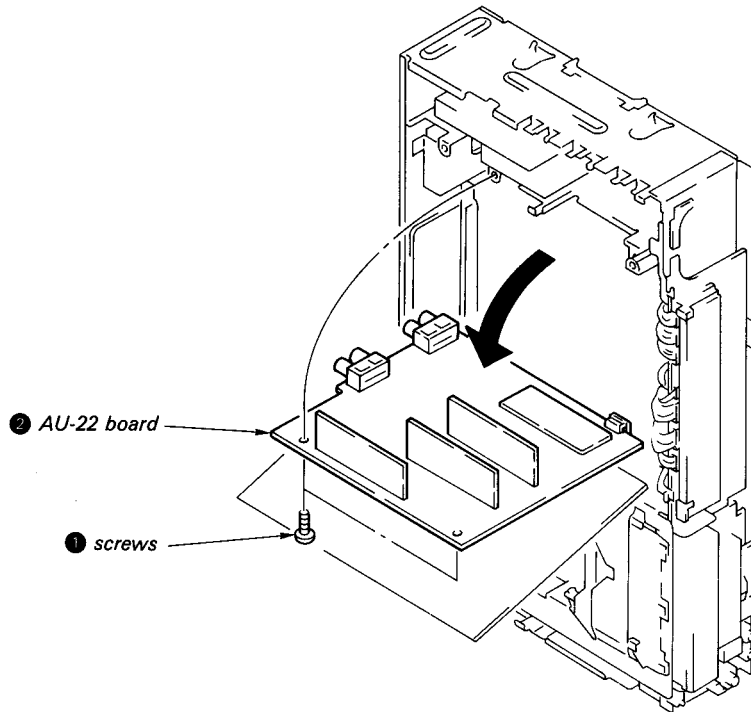




## 2-9. OPENING OF AU-22 BOARD

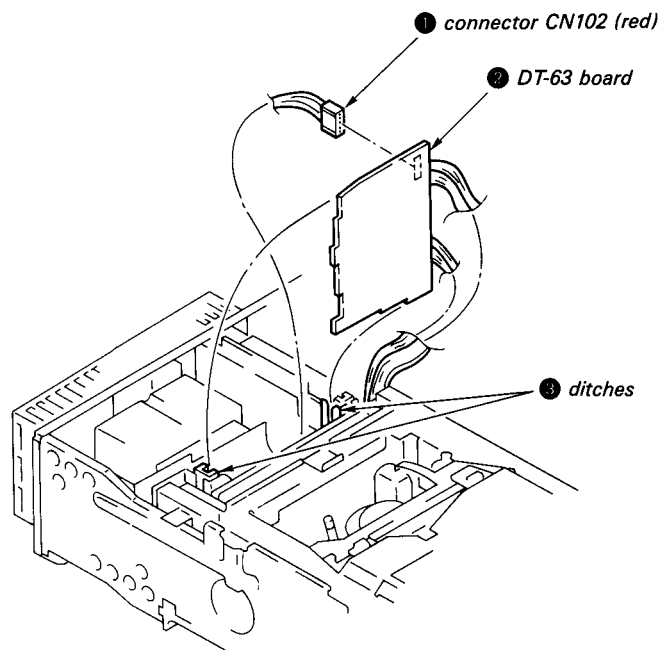
- 1) Refer to "REMOVAL OF SP-2 BOARD", and open the SP-2 board.
- 2) Remove the two screws ①.
- 3) Open the AU-22 board ② in the direction shown by the arrow.

**Note:** When opening the AU-22 board, take care not to let the AU-22 board contact with the SP-2 board.



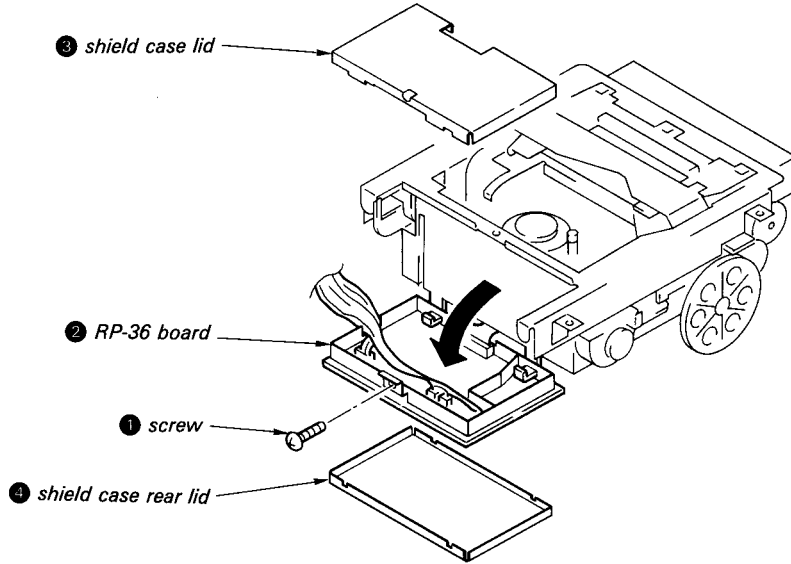
## 2-10. REMOVAL OF DT-63 BOARD

- 1) Pull out the connector (CN102) ①.
- 2) Remove the DT-63 board ② from the two ditches ③.



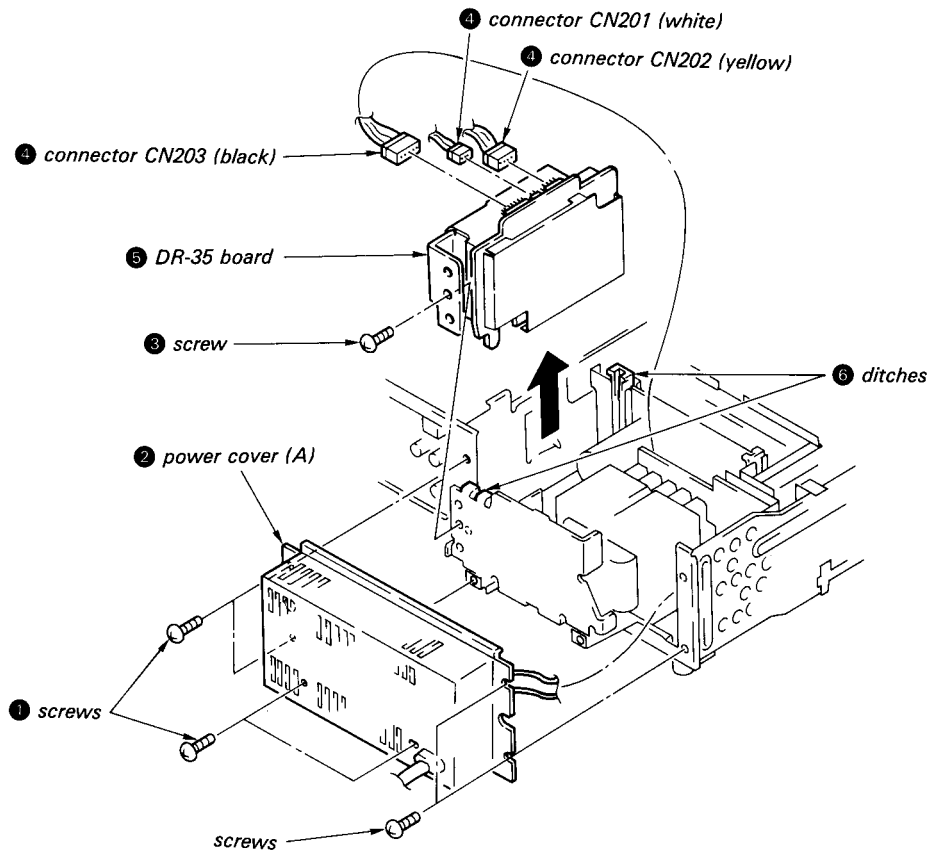
### 2-11. REMOVAL OF RP-36 BOARD

- 1) Refer to the "REMOVAL OF MECHANICAL BLOCK", and remove the mechanical block.
- 2) Remove the screw ①.
- 3) Open the RP-36 board ② in the direction shown by the arrow.
- 4) Remove the shield case lid ③ and shield case rear lid ④.



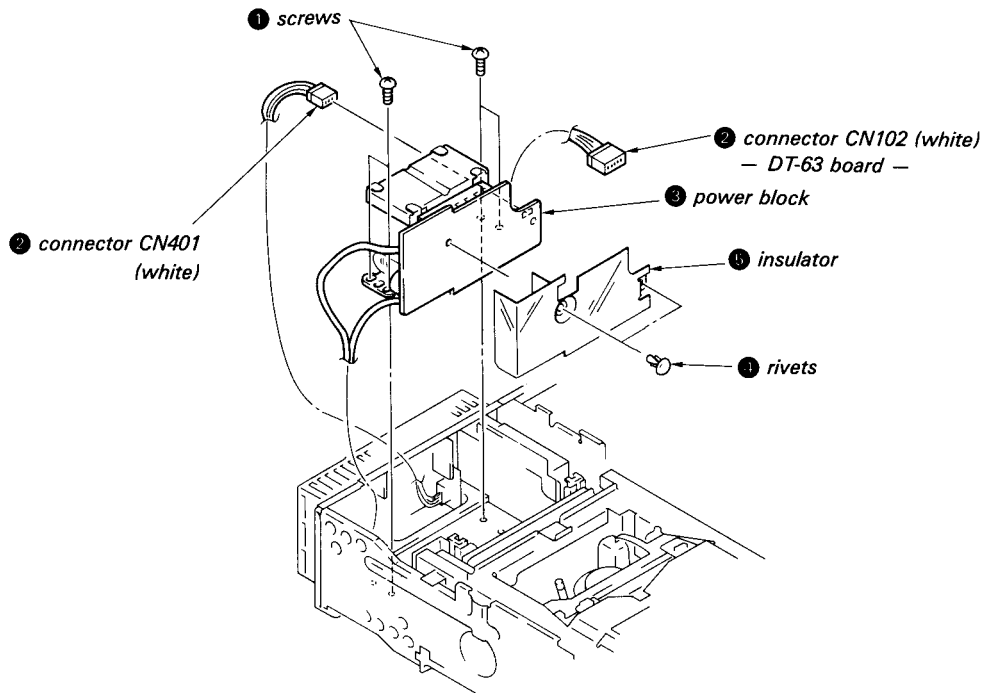
### 2-12. REMOVAL OF DR-35 BOARD

- 1) Remove the six screws ①.
- 2) Remove the power cover (A) ②.
- 3) Remove the screw ③.
- 4) Pull out the three connectors (CN201, CN202, CN203) ④.
- 5) Remove the DR-35 board ⑤ from the two ditches ⑥.



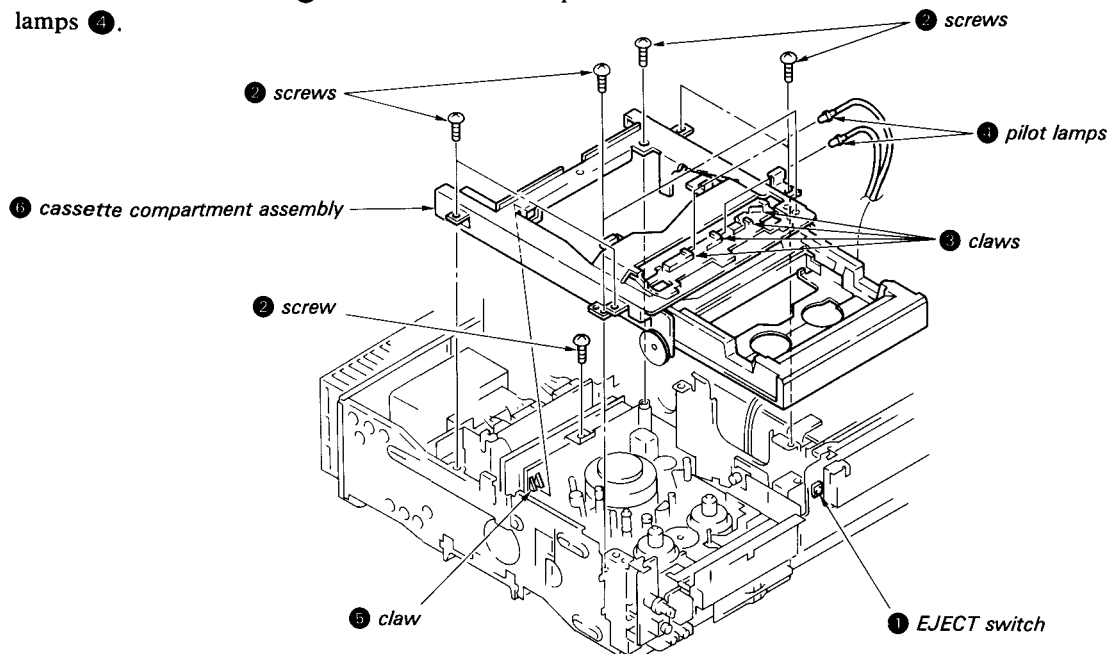
### 2-13. REMOVAL OF POWER BLOCK (DS-16 BOARD)

- 1) Refer to the "REMOVAL OF DT-63", and remove the DT-63 board.
- 2) Remove the four screws ①.
- 3) Pull out the two connectors (CN102, CN401) ②.
- 4) Remove the power block (DS-16 board) ③.
- 5) Remove the two rivets ④.
- 6) Remove the insulator ⑤.



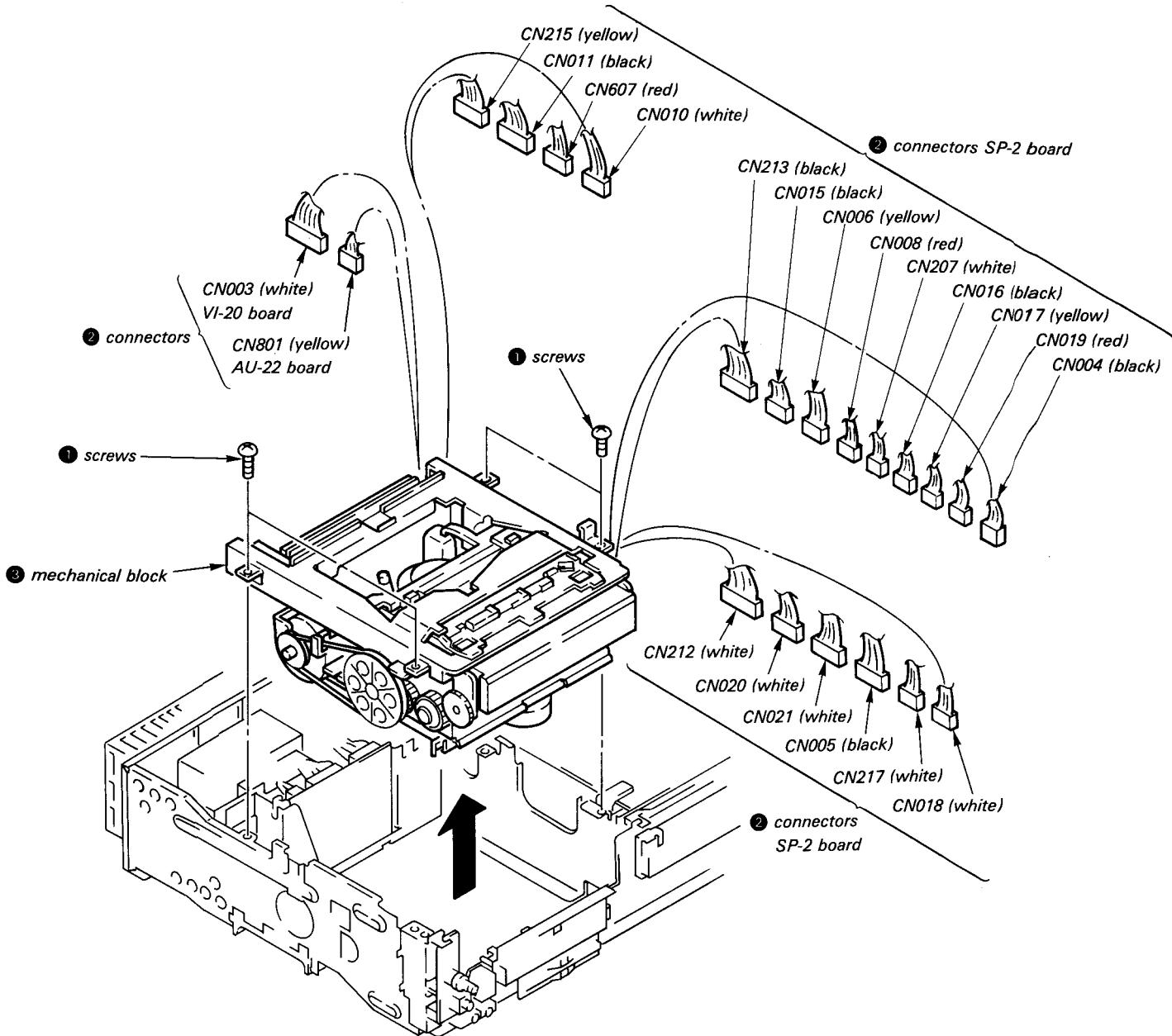
### 2-14. REMOVAL OF CASSETTE COMPARTMENT ASSEMBLY

- 1) Turn on the power and push the EJECT switch ① then put the cassette compartment assembly ⑥ in the EJECT state.
  - 2) Remove the eight screws ②.
  - 3) Take off the four claws ③ and remove the two pilot lamps ④.
  - 4) Take off the claw ⑤ and remove the cassette compartment assembly ⑥.
- Note:** After performing EJECT state, be sure to turn off the power before separating the assembly.



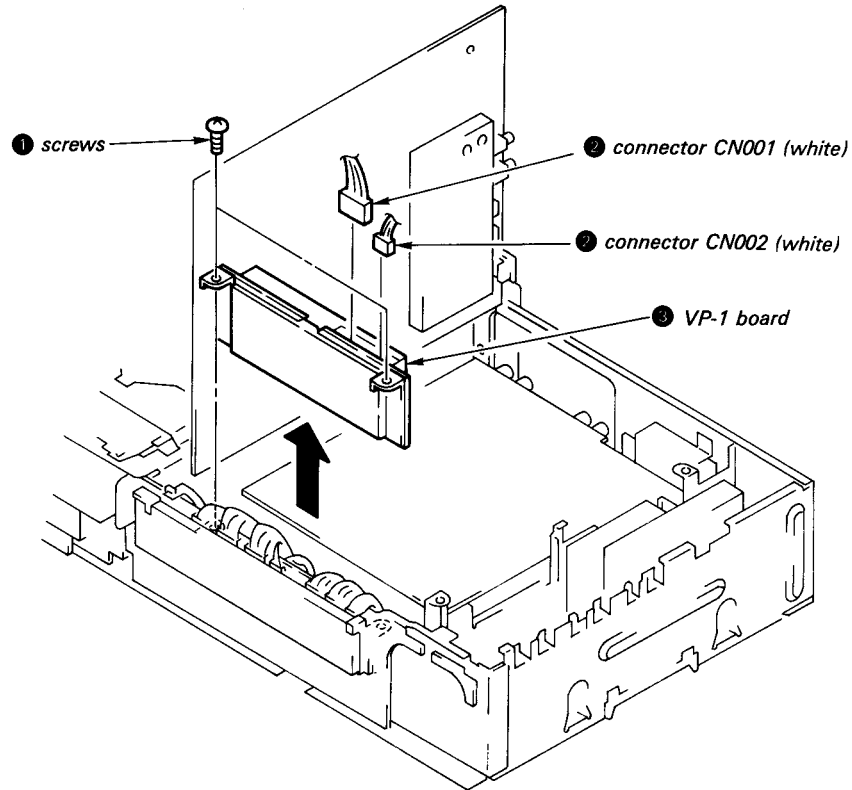
## 2-15. REMOVAL OF MECHANICAL BLOCK

- 1) Remove the four screws ❶.
- 2) Pull out the twenty one connectors (CN212, CN020, CN021, CN005, CN217, CN018, CN213, CN015, CN006, CN008, CN207, CN016, CN017, CN019, CN004, CN215, CN011, CN607, CN010, CN003, CN801) ❷.
- 3) Remove the mechanical block ❸ in the direction shown by the arrow.



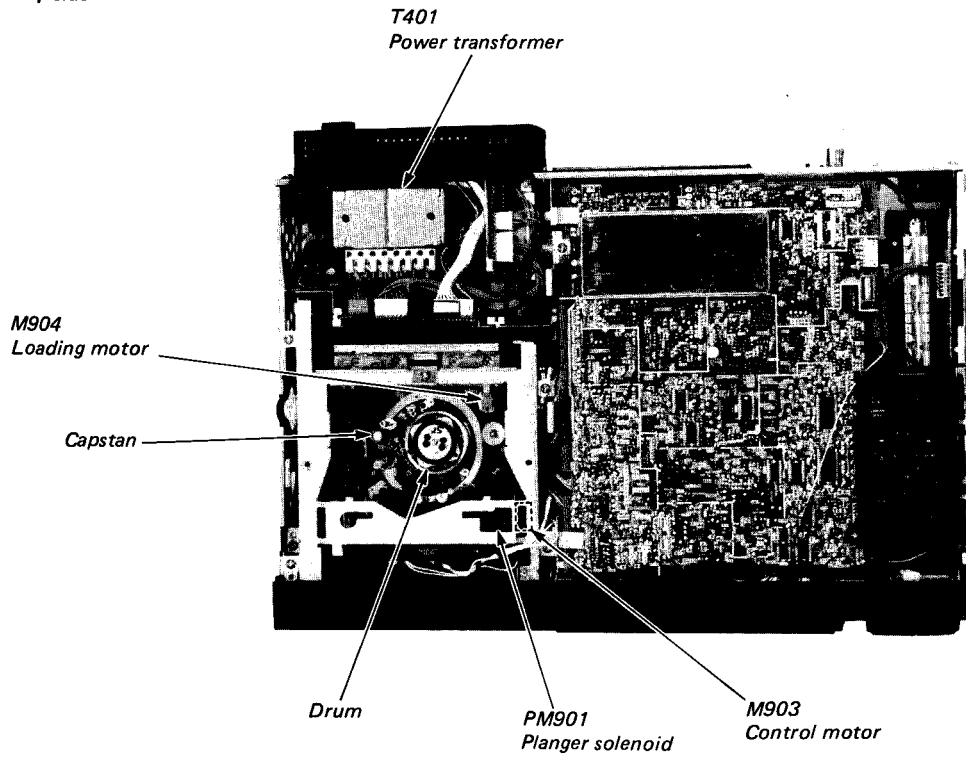
## 2-16. REMOVAL OF VP-1 BOARD

- 1) Refer to the "REMOVAL OF SP-2 BOARD", and open the SP-2 board.
- 2) Remove the two screws ①.
- 3) Pull out the two connectors (CN001, CN002) ②.
- 4) Remove the VP-1 board ③ in the direction shown by the arrow.

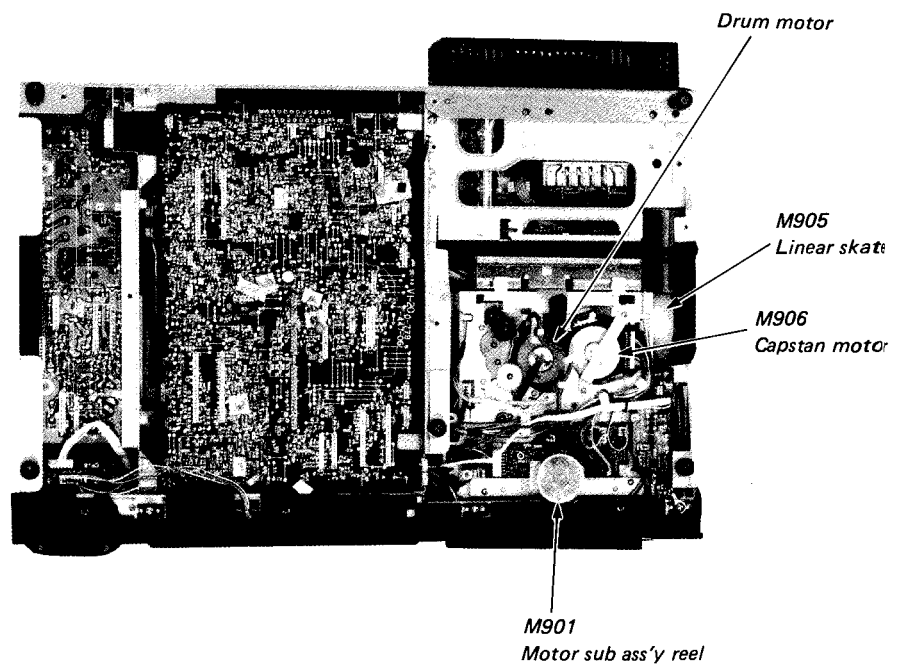


## 2-17. INTERNAL VIEWS

—Top side—

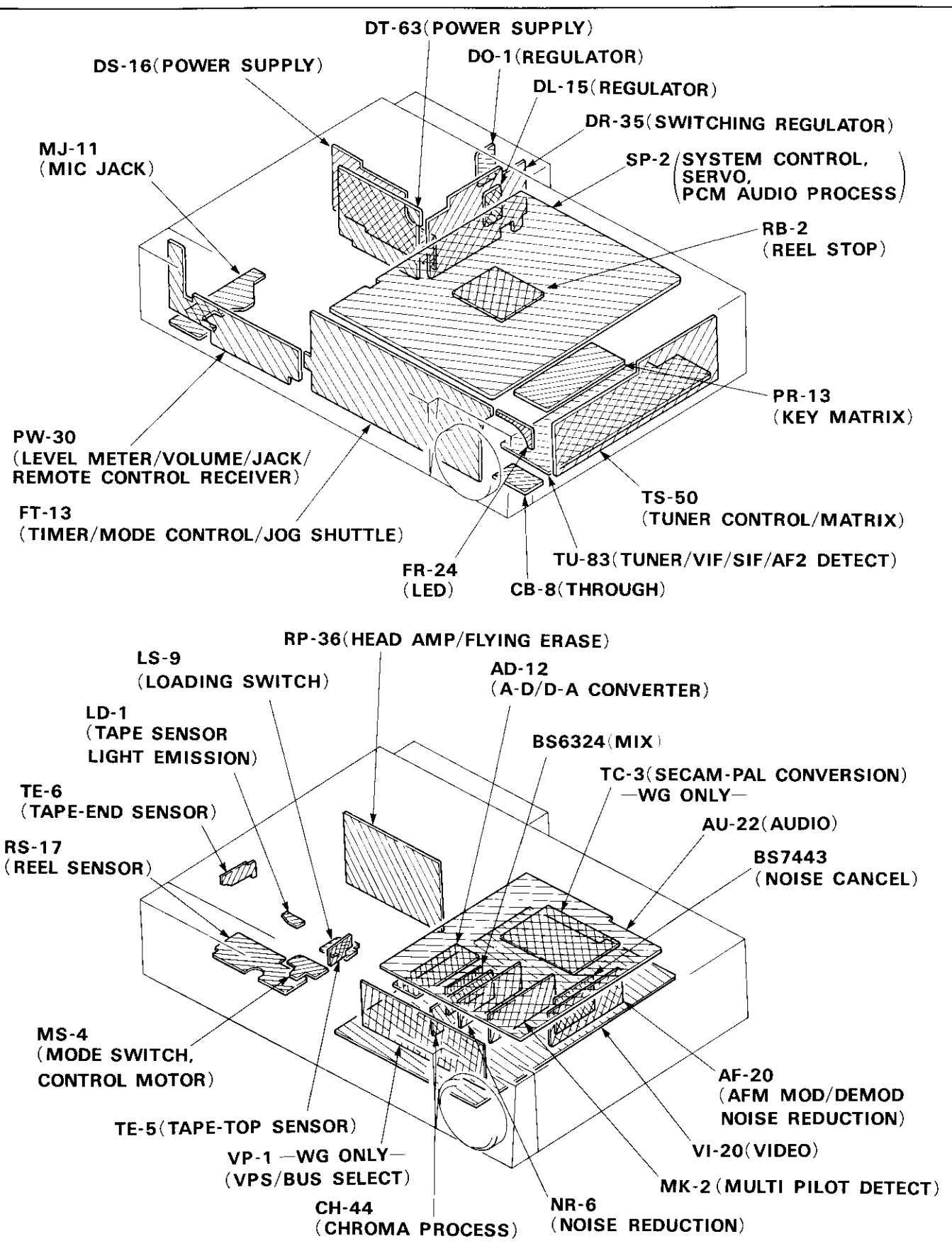


—Bottom side—

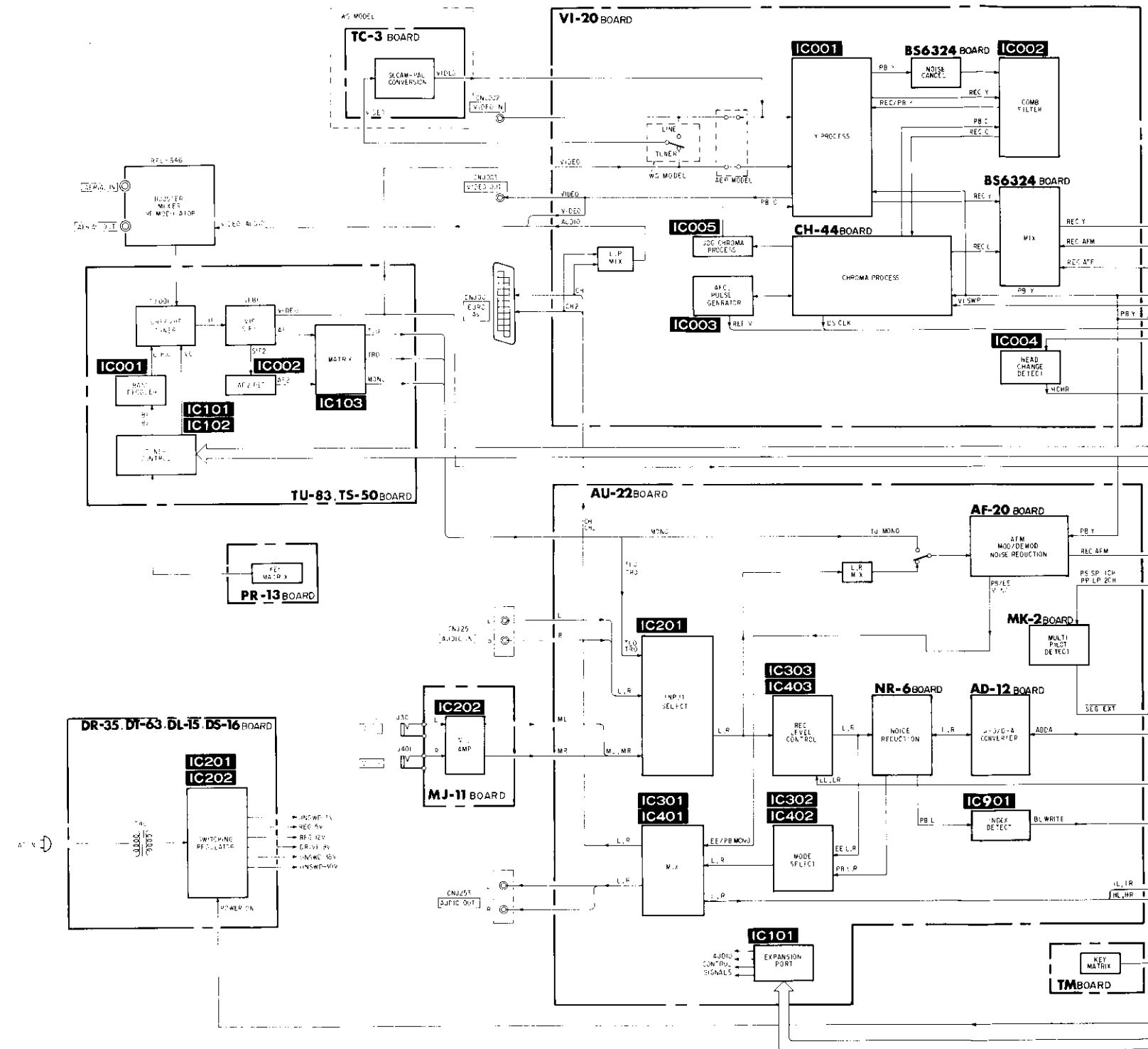


# SECTION 3 DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION



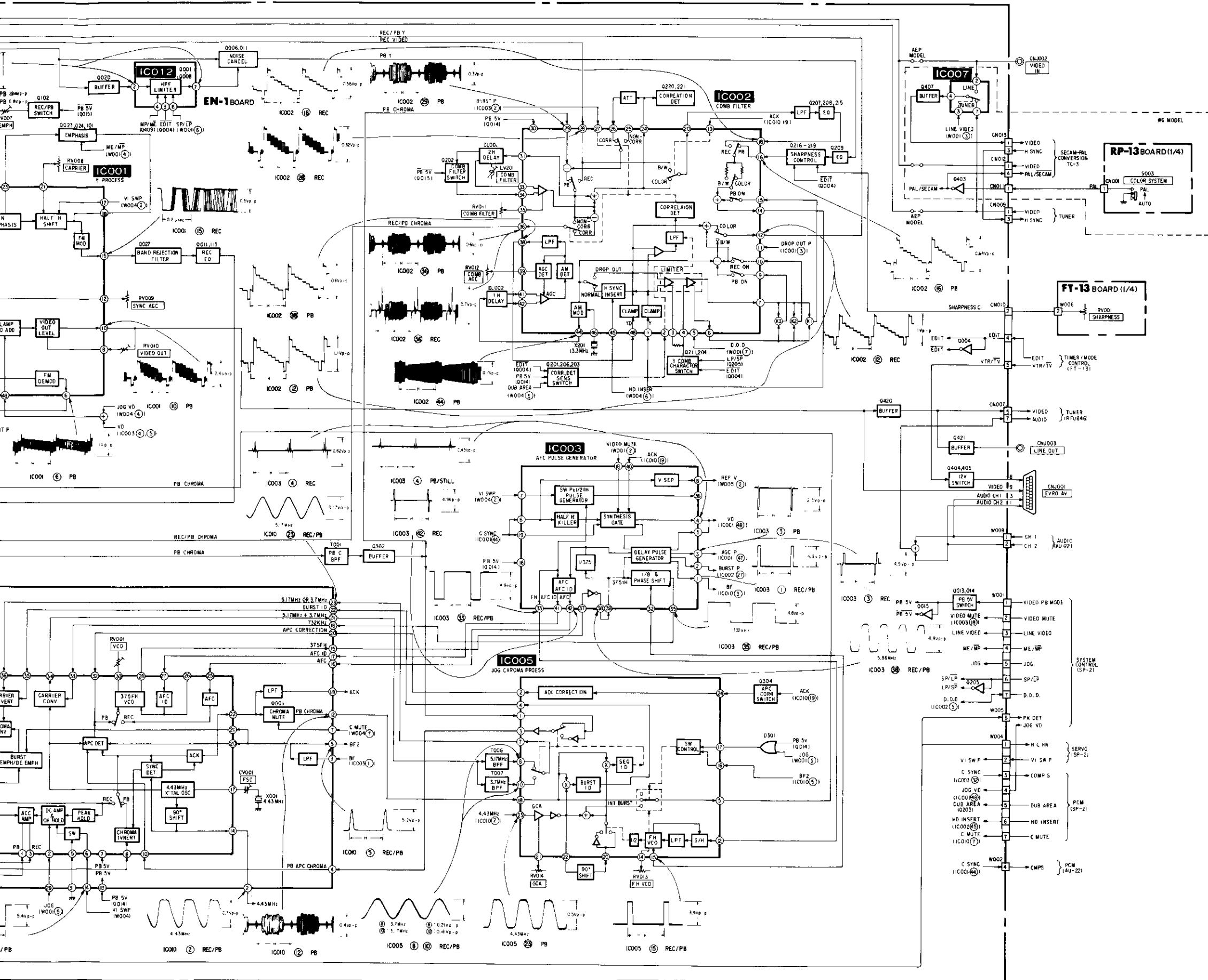
3-2. OVERALL BLOCK DIAGRAM



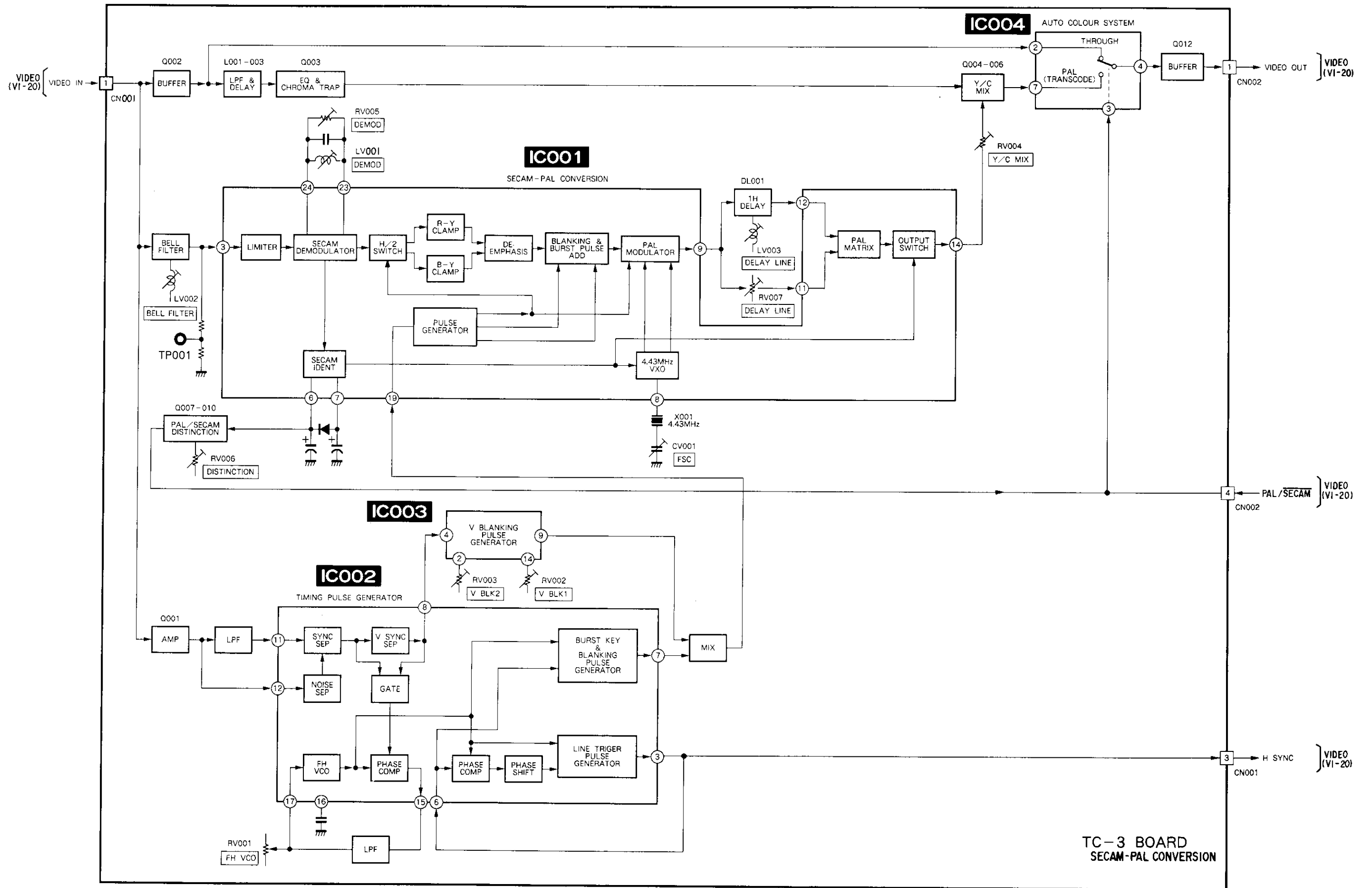


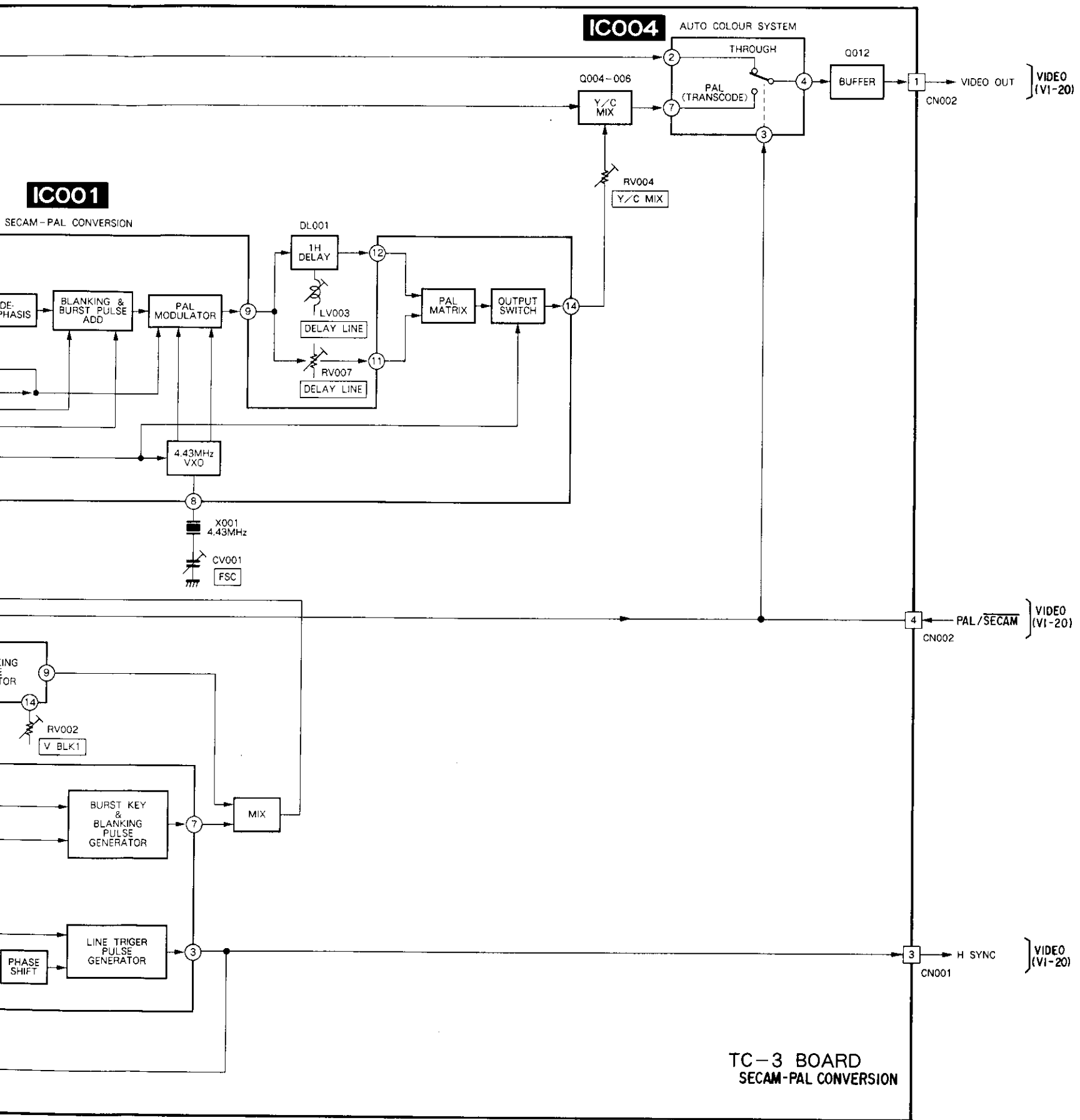




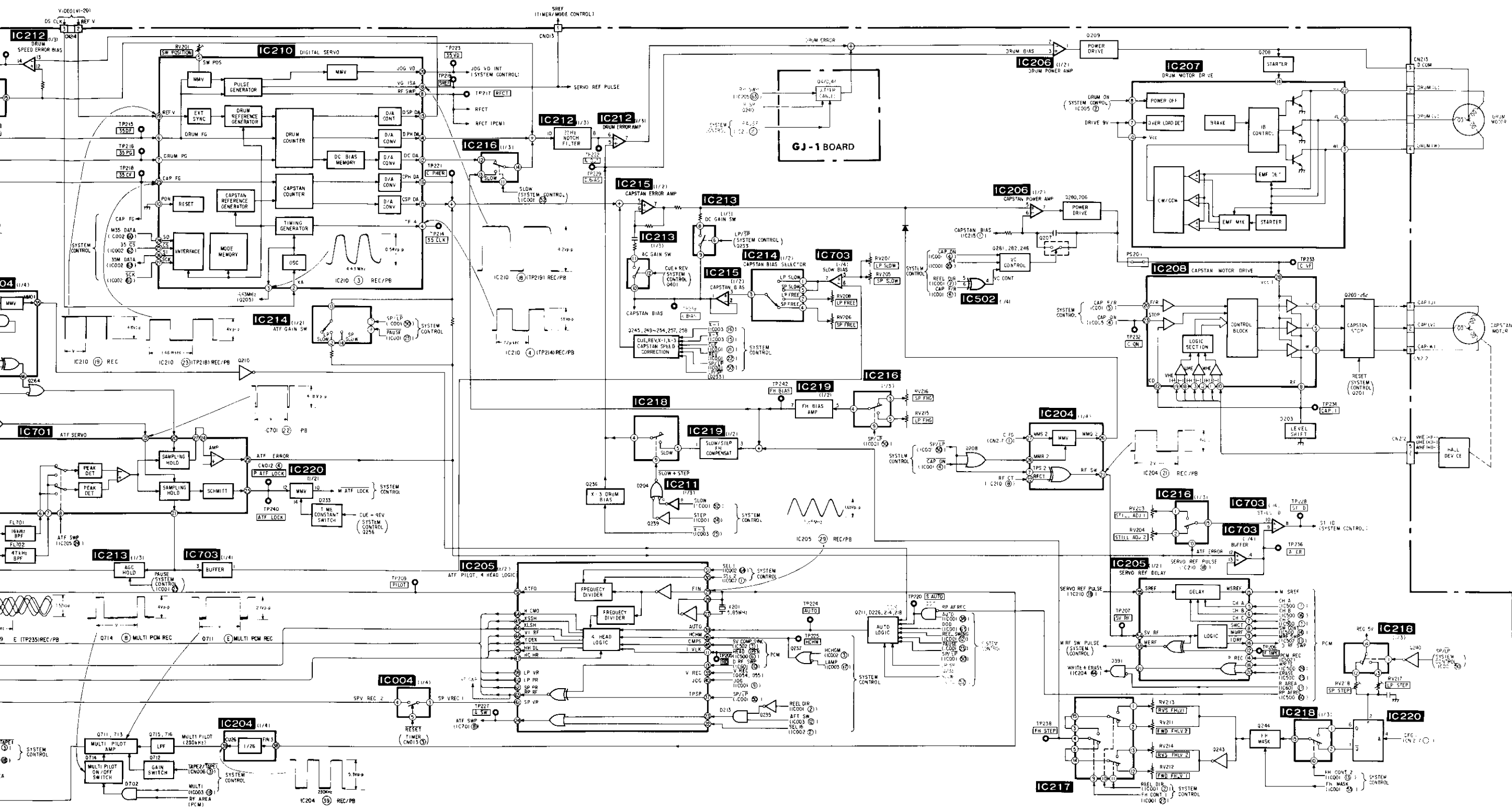


3-4. SECAM/PAL CONVERSION BLOCK DIAGRAM















### 3-7. SYSTEM CONTROL – REC PAUSE BLOCK INTERFACE

SIGNAL	MODE		STOP	FF	REW	SEARCH	-SEARCH	REC	REC PAUSE	AF REC	AF REC PAUSE	PB	PB PAUSE	×1	-×1	×2	-×2	×9	-×9	SLOW (1/5, 1/10)	SLOW (-1/5, -1/10)	CUE	REV
	I/O	Pin No.																					
RP PB MODE	O	IC001 ④ Pin	H	H	H	H	H	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H
VIDEO REC	O	Q054 collector	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
RP AF REC	O	IC500 ⑥ Pin	L	L	L	L	L	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L
H CHG	O	IC002 ③ Pin	*1	*1	*1	*1	*1	*1	*1	*1	*2	*1	*2	*1	*2	*2	*2	*2	*2	*2	*2	*2	*2
M FE ON	O	IC500 ① Pin	H	H	H	H	H	*3	H	*2	H	H	H	H	H	H	H	H	H	H	H	H	H

\*1 Be caused by Tape speed select

\*2 Output pulse

\*3 At "L" during the NORMAL or at output pulse during the MULTI

### 3-8. SYSTEM CONTROL – VIDEO BLOCK INTERFACE

SIGNAL	MODE		STOP	FF	REW	SEARCH	-SEARCH	REC	REC PAUSE	AF REC	AF REC PAUSE	PB	PB PAUSE	×1	-×1	×2	-×2	×9	-×9	SLOW (1/5, 1/10)	SLOW (-1/5, -1/10)	CUE	REV
	I/O	Pin No.																					
VIDEO PB	O	IC003 ⑲ Pin	L	L	L	L	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H
VIDEO MUTE	O	IC003 ⑳ Pin	L	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
LINE VIDEO	O	IC003 ⑱ Pin	Be caused by input select																				
JOG	O	IC001 ⑨ Pin	L	L	L	L	L	L	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H
DOD	O	IC001 ⑥ Pin	L	L	L	L	L	L	L			L											
TAPE 2/TAPE 1	O	CN009 ④ Pin	Be caused by cassette																				
SP/LP	O	IC001 ⑤ Pin	Be caused by Tape Speed Select																				
JOG VD	O	IC001 ④ Pin	NON					YES			NON		YES										

### 3-9. SYSTEM CONTROL – CAPSTAN MOTOR BLOCK INTERFACE

SIGNAL	MODE		STOP	FF	REW	SEARCH	-SEARCH	REC	REC PAUSE	AF REC	AF REC PAUSE	PB	PB PAUSE	×1	-×1	×2	-×2	×9	-×9	SLOW (1/5, 1/10)	SLOW (-1/5, -1/10)	CUE	REV
	I/O	Pin No.																					
CAP ON	O	IC001 ④ Pin	H	H	H	L	L	L	H	L	H	L	H	L	L	L	L	L	L	*1	*1	L	L
CAP ON	O	IC005 ④ Pin	L	L	L	H	H	H	L	H	L	H	L	H	H	H	H	H	H	*1	*1	H	H
CAP FWD/RVS	O	IC001 ⑤ Pin	L	L	L	L	H	L	L	L	L	L	L	L	H	L	H	L	H	*1	*1	L	H
D0-D4	O	IC001 ⑯~⑳ Pin	"1"	"1"	"1"	*2	*2	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"2"	"2"	"9"	"7"	"1"	"1"	"9"	"7"
CUE	O	IC001 ⑲ Pin	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H
REV	O	IC001 ⑳ Pin	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L
PB PAUSE	O	IC001 ⑳ Pin	H	H	H	H	H	H	H	H	L	H	L	H	H	H	H	H	H	L	L	H	H
-×1	O	IC003 ⑯ Pin	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H
-×3	O	IC003 ⑮ Pin	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H

\*1 Output pulse

\*2 PAL "18" – "17" NTSC "25" – "24"

D4 MSB  
D0 LSB  
(decimal notation)

3-10. SYSTEM CONTROL – DRUM MOTOR INTERFACE

SIGNAL	MODE		STOP	FF	REW	SEARCH	-SEARCH	REC	REC PAUSE	AF REC	AF REC PAUSE	PB	PB PAUSE	x1	-x1	x2	-x2	x9	-x9	SLOW (1/5, 1/10)	SLOW (-1/5, -1/10)	CUE	REV	
	I/O	Pin No.																						
DRUM ON	O	IC001 ⑧ Pin	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	
STEP	O	IC001 ⑭ Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	*1	*1	L	L
FH CONT1	O	IC001 ⑰ Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	*1	*1	L	L
FH CONT2	O	IC001 ⑲ Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	*1	*1	L	L
SLOW	O	IC001 ⑳ Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	L	L
FH MASK	O	IC001 ㉓ Pin	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	*1	*1	H	H

\*1 Output pulse

3-11. SYSTEM CONTROL – REEL MOTOR INTERFACE

SIGNAL	MODE		STOP	FF	REW	SEARCH	-SEARCH	REC	REC PAUSE	AF REC	AF REC PAUSE	PB	PB PAUSE	x1	-x1	x2	-x2	x9	-x9	SLOW (1/5, 1/10)	SLOW (-1/5, -1/10)	CUE	REV
	I/O	Pin No.																					
REEL FWD	O	IC001 ⑥ Pin	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	*1	*1	H	L
REEL RVS	O	IC001 ⑦ Pin	L	L	H	L	H	L	L	L	L	L	L	L	H	L	H	L	H	*1	*1	L	H
DOD	O	IC001 ⑬ Pin	H/L	L	H	L	H	L	H	H	L	L	H/L	L	H	L	H	H	H	L	H	H	H
REEL DIR	O	IC001 ② Pin	H/L	L	H	L	H	L	H	L	L	L	H/L	L	H	L	H	L	H	L	H	L	H
REEL FLYING	O	IC001 ③ Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
REEL START	O	IC001 ⑩ Pin	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
R RVS MODE	O	IC001 ⑪ Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
REEL SWG	O	IC001 ⑫ Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
REEL 0~7	O	IC003 ①-⑥, ⑧, ⑨ Pin	"70"	"96"	"96"	"A6"	"9C"	"54"	"54"	"54"	"54"	"54"	"70"	"54"	*2	"70"	*2	*3	*3	"70"	*4	*3	*3

\*1 Output pulse  
 \*2 Be caused by NTSC/PAL, REMAIN  
 \*3 Be caused by NTSC/PAL, SP/LP  
 \*4 Be caused by NTSC/PAL

REEL 7MSB  
 REEL 0LSB  
 (BCD Code)

3-12. SYSTEM CONTROL – ATF SERVO BLOCK INTERFACE

SIGNAL	MODE		STOP	FF	REW	SEARCH	-SEARCH	REC	REC PAUSE	AF REC	AF REC PAUSE	PB	PB PAUSE	x1	-x1	x2	-x2	x9	-x9	SLOW (1/5, 1/10)	SLOW (-1/5, -1/10)	CUE	REV	
	I/O	Pin No.																						
ATF SW	O	IC003 ⑫ Pin	L	L	L	L	L	L	L	L	*1	L	*1	L	L	L	L	L	L	*1	*1	L	L	
SEL16	O	IC002 ② Pin	L	L	L	L	L	*2	L	*2	L	*2	L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	
TSA	O	IC002 ④ Pin	L	L	L	H	H	L	L	*2	L	*2	L	*2	*2	*2	*2	L	L	L	L	L	L	
TSB	O	IC002 ⑤ Pin	L	L	L	L	L	L	L	*2	L	*2	L	*2	*2	*2	*2	L	L	L	L	L	L	
MULTI	O	IC003 ⑬ Pin	Be caused by NORMAL/MULTI select switch and Tape state																					
N PULSE	O	IC003 ⑬ Pin	L	L	L	L	L	L	L	L	*1	L	*1	L	L	L	L	L	L	L	*1	*1	L	L
TAPE 2/TAPE 1	O	Q227 ⑧	Be caused by CASSETTE																					
RP PB MODE	O	IC001 ④ Pin	H	H	H	H	H	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
SEL 1	O	IC002 ④ Pin	H	H	H	H	H	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	
SEL 2	O	IC002 ① Pin	H	H	H	H	H	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	
M RF SW PULSE	I	IC002 ④, ⑨ Pin	H/L	FIELD synchronized pulse																				
JOG VD INT	I	IC001, 002 ⑥ Pin	L	Input pulse																				

\*1 Output pulse  
 \*2 Be caused by ATF sequence

3-13. SYSTEM CONTROL – STILL BLOCK INTERFACE

SIGNAL	MODE		STOP	FF	REW	SEARCH	-SEARCH	REC	REC PAUSE	AF REC	AF REC PAUSE	PB	PB PAUSE	x1	-x1	x2	-x2	x9	-x9	SLOW (1/5, 1/10)	SLOW (-1/5, -1/10)	CUE	REV
	I/O	Pin No.																					
RF PK	I	IC001 ⑥ Pin	Unsettled																				
STID	I	IC001 ⑥ Pin	Unsettled																				

3-14. SYSTEM CONTROL – HEAD CHANGE BLOCK INTERFACE

SIGNAL	MODE		STOP	FF	REW	SEARCH	-SEARCH	REC	REC PAUSE	AF REC	AF REC PAUSE	PB	PB PAUSE	x1	-x1	x2	-x2	x9	-x9	SLOW (1/5, 1/10)	SLOW (-1/5, -1/10)	CUE	REV	
	I/O	Pin No.																						
AUTO	O	IC001 ⑧ Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	*1	*1	L	L
LAMP	O	IC003 ⑰ Pin	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
SP/LP	O	IC001 ⑩ Pin	Be caused by speed select																					

\*1 Be caused by SP/LP

3-15. SYSTEM CONTROL – AND OTHERS BLOCK INTERFACE

SIGNAL	MODE		STOP	FF	REW	SEARCH	-SEARCH	REC	REC PAUSE	AF REC	AF REC PAUSE	PB	PB PAUSE	x1	-x1	x2	-x2	x9	-x9	SLOW (1/5, 1/10)	SLOW (-1/5, -1/10)	CUE	REV	
	I/O	Pin No.																						
M ATF LOCK	O	IC002 ⑤ Pin	Unsettled																					
CAP FG	I	IC001 ④ Pin	Unsettled			*1	*1	*1	Unsettled	*1	Unsettled	*1	Unsettled	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
JOG	O	IC001 ⑨ Pin	L	L	L	L	L	L	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H

\*1 Input pulse

3-16. SYSTEM CONTROL – AFM AUDIO BLOCK INTERFACE

SIGNAL	MODE		STOP	FF	REW	SEARCH	-SEARCH	REC	REC PAUSE	AF REC	AF REC PAUSE	PB	PB PAUSE	x1	-x1	x2	-x2	x9	-x9	SLOW (1/5, 1/10)	SLOW (-1/5, -1/10)	CUE	REV	
	I/O	Pin No.																						
IN SEL A	O	IC101 ⑤ Pin	Be caused by input select (TUNER/LINE/SIMUL and yes or no of microphone input)																					
IN SEL B	O	IC101 ⑥ Pin																						
AF SEL	O	IC101 ⑮ Pin																						
OUT SEL A	O	IC101 ③ Pin	Be caused by output select (receive a signal or STEREO/MONO/BILINGAL of playback ID and monitor switch)																					
OUT SEL B	O	IC101 ② Pin																						
OUT SEL C	O	IC101 ① Pin																						
SP/LP	O	IC101 ⑰ Pin	Be caused by speed select																					
AUDIO MUTE	O	IC101 ④ Pin	H	H	H	L	L	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H
AF PB/REC	O	IC101 ⑮ Pin	L	L	L	H	H	L	L		L	H	H	H	H	H	H	H	H	H	H	H	H	H
REC MUTE	O	IC101 ⑮ Pin	H	H	H	H	H	L	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H
AFM MUTE 2	O	IC101 ⑮ Pin	*1	*1	*1	H	H	*1	*1	H	H	*2	H	H	H	*2	H	H	H	H	H	H	H	H
AFM MUTE 1	O	IC101 ⑮ Pin	*1	*1	*1	H	H	*1	*1	H	H	*2	H	H	H	*2	H	H	H	H	H	H	H	H
x2	O	IC101 ⑮ Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L

\*1 Be caused by on the air classify of STEREO/MONO/BILINGUAL and monitor switch

\*2 Be caused by Tape ID and monitor switch

3-17. SYSTEM CONTROL — PCM AUDIO BLOCK INTERFACE

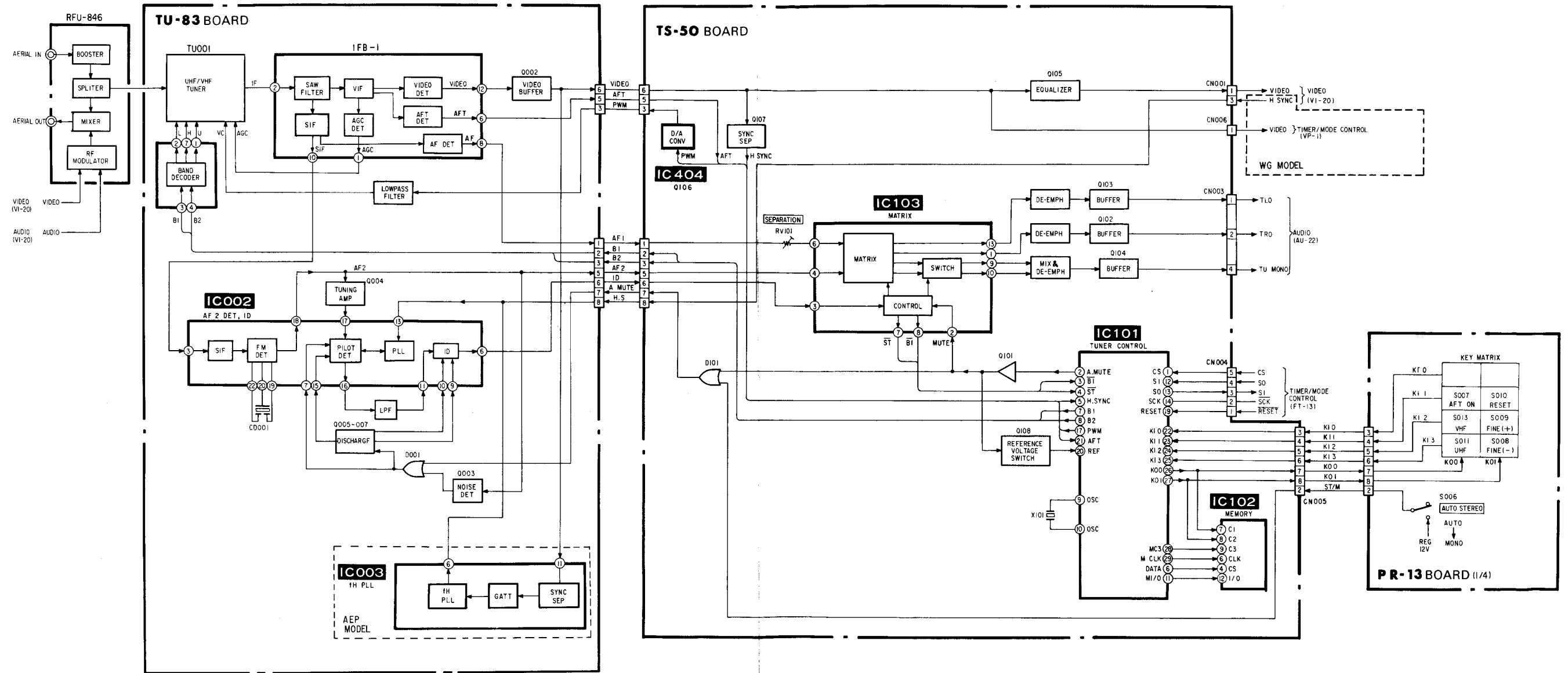
SIGNAL	MODE		STOP	FF	REW	SEARCH	-SEARCH	REC	REC PAUSE	AF REC	AF REC PAUSE	PB	PB PAUSE	×1	-×1	×2	-×2	×9	-×9	SLOW (1/5, 1/10)	SLOW (-1/5, -1/10)	CUE	REV
	I/O	Pin No.																					
PCM ACT	I	IC500 46 Pin	L	L	L	Unsettled		H	L	H	L	Unsettled											
AF REC	O	IC500 50 Pin	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L
PCM PB/REC	O	IC500 52 Pin	H	H	H	H	H	L	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H
LOCK	O	IC500 22 Pin	L	L	L	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H
FOH	O	IC500 53 Pin	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
FOL	O	IC500 54 Pin	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

3-18. SYSTEM CONTROL — MD BLOCK INTERFACE

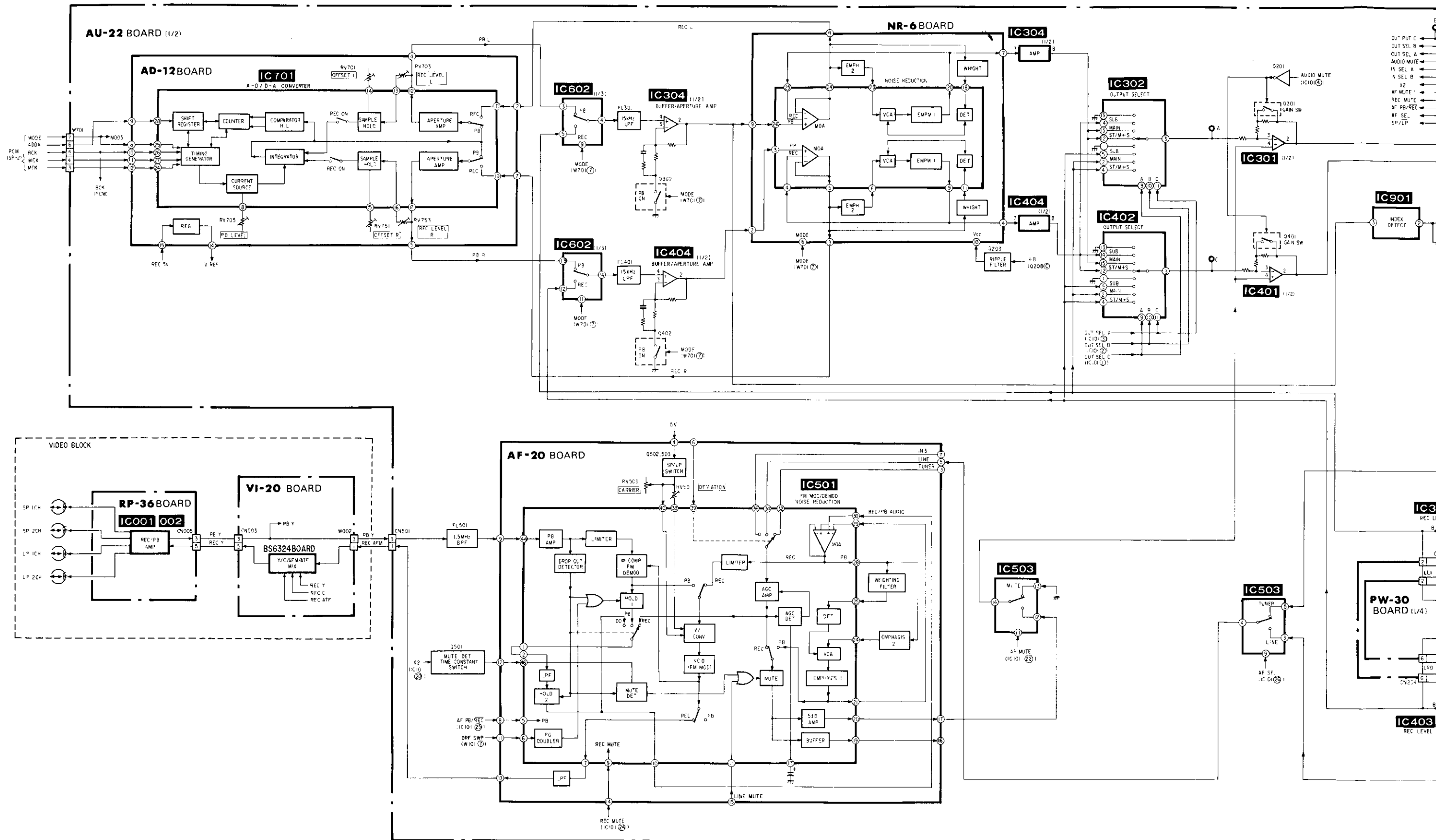
SIGNAL	MODE		STOP	FF	REW	SEARCH	-SEARCH	REC	REC PAUSE	AF REC	AF REC PAUSE	PB	PB PAUSE	×1	-×1	×2	-×2	×9	-×9	SLOW (1/5, 1/10)	SLOW (-1/5, -1/10)	CUE	REV
	I/O	Pin No.																					
LAMP	O	IC003 17 Pin	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
CDOWNL	I	IC002 47 Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
CDOWNR	I	IC002 42 Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
LSTOP	I	IC002 46 Pin	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
OPEN	O	IC003 8 Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
CLOSE	O	IC002 9 Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
LOAD	O	IC002 6 Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
UNLOAD	O	IC002 7 Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
LA ~ LC	I	IC003 16 17 18 Pin	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"	"3"
CONTL	O	IC002 20 Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
CONTR	O	IC002 21 Pin	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
MA ~ MC	I	IC002 12 13 14 Pin	"3"	"6"	"6"	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"1"	"1"
START	O	IC002 22 Pin	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
HOLD	O	IC002 22 Pin	H	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
RECPROOF	I	IC003 60 Pin	Be caused by Tape state																				
TAPE 2/TAPE 1	I	IC003 61 Pin	Be caused by Tape state																				
T10/T13	I	IC003 62 Pin	Be caused by Tape state																				
TFG1	I	IC003 30 34 Pin	Unsettled	*1	*1	*1	*1	*1	Unsettled	*1	Unsettled	*1	Unsettled	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
TFG2	I	IC003 32 Pin	Unsettled	*1	*1	*1	*1	*1	Unsettled	*1	Unsettled	*1	Unsettled	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
TOP	I	IC002 54 Pin	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
END	I	IC002 55 Pin	*2	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
SFG	I	IC003 29 33 Pin	Unsettled	*1	*1	*1	*1	*1	Unsettled	*1	Unsettled	*1	Unsettled	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1

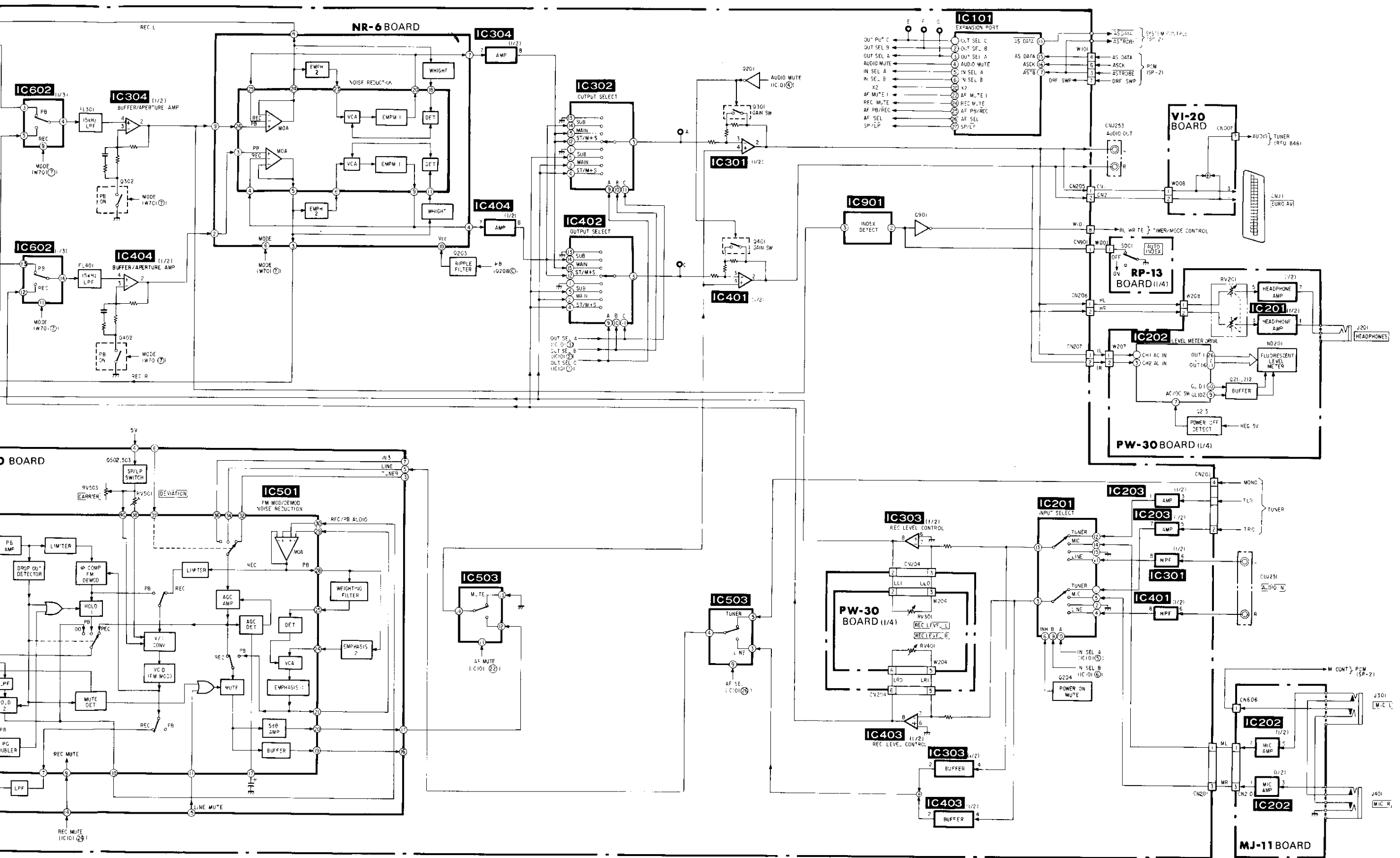
\*1 The pulse is participate of reel rotations  
 \*2 Normal...at "H", but at "L" during the Tape end

3-19. TUNER BLOCK DIAGRAM

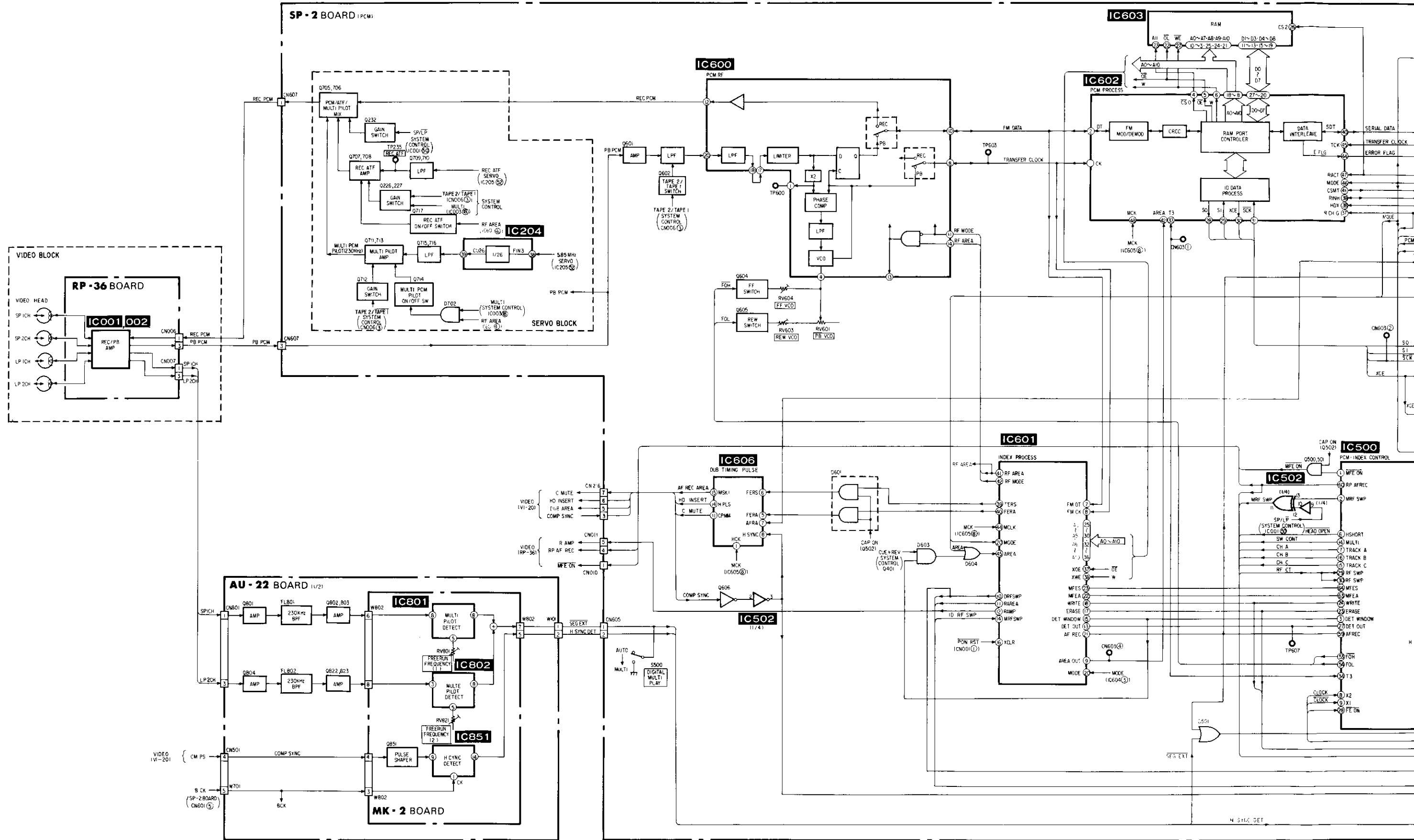


3-20. AUDIO BLOCK DIAGRAM

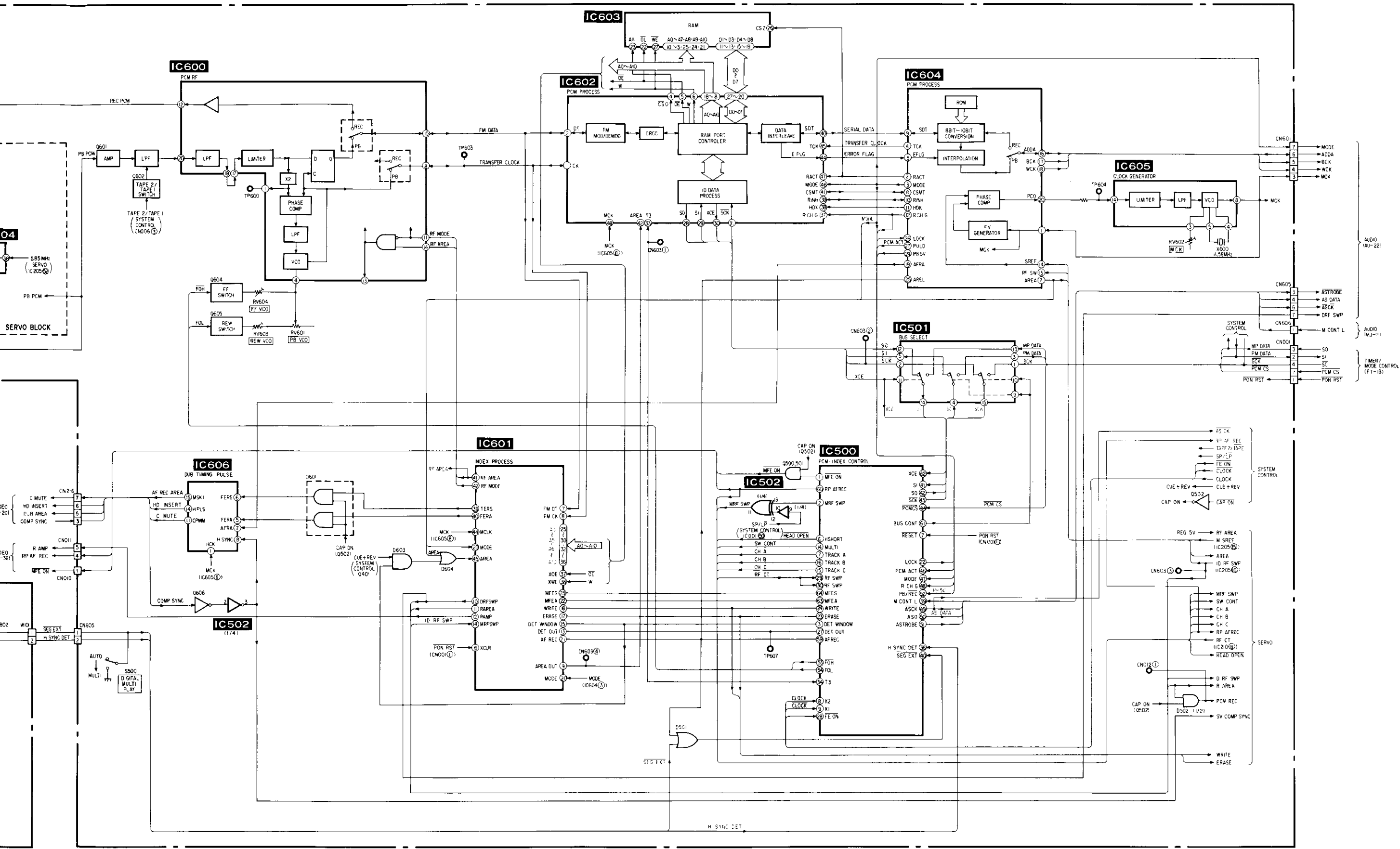




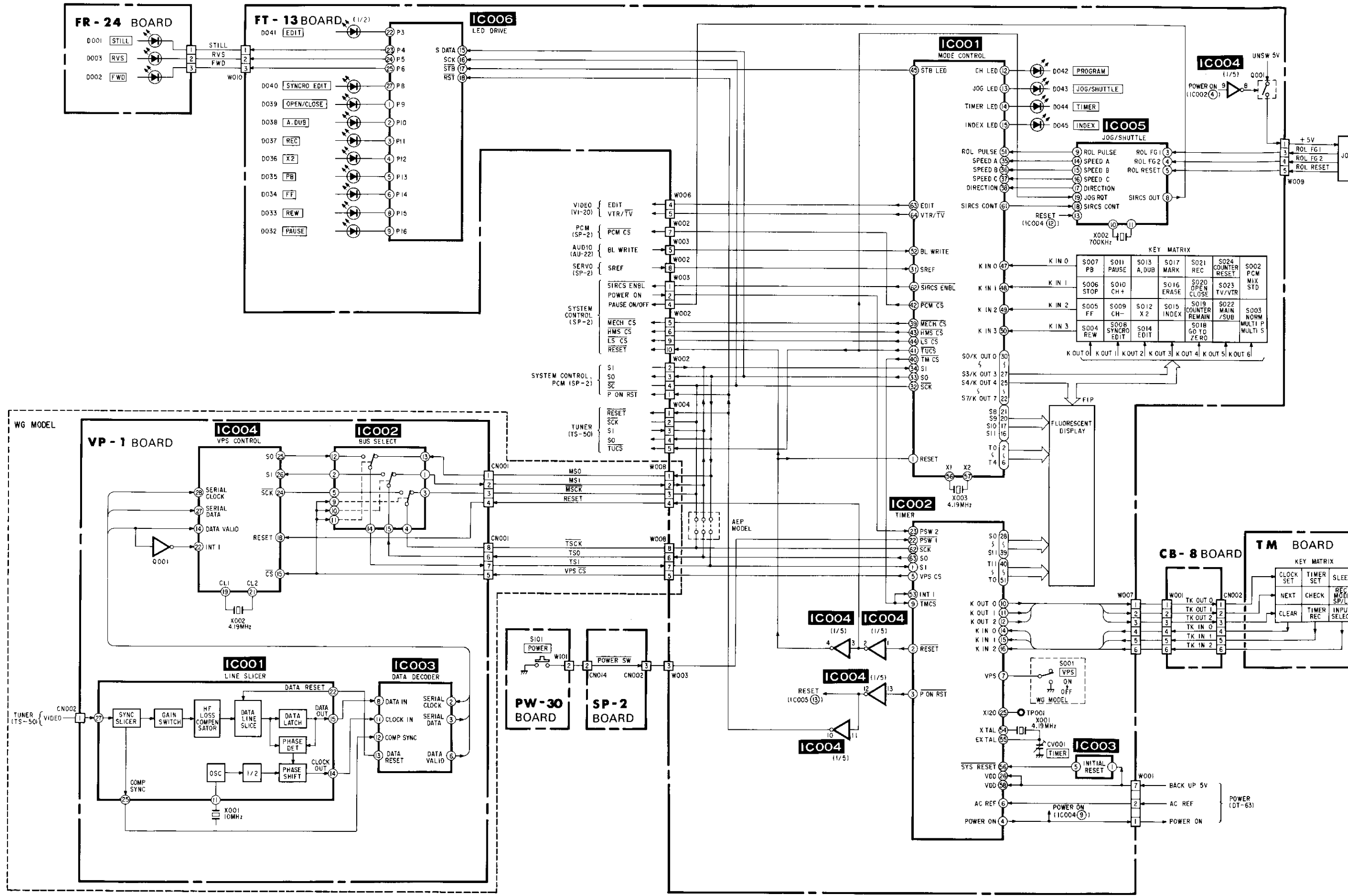
3-21. PCM AUDIO BLOCK DIAGRAM





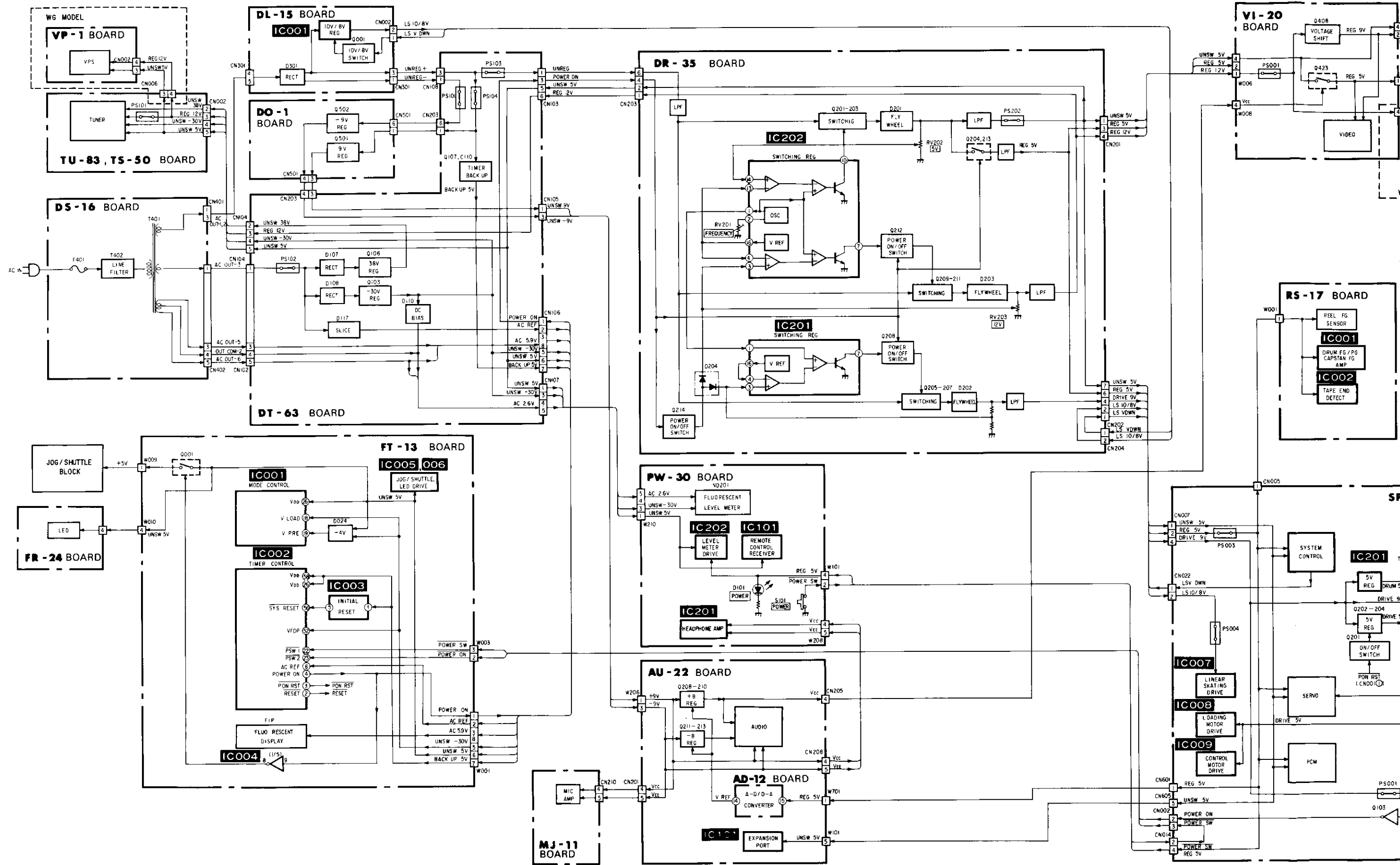


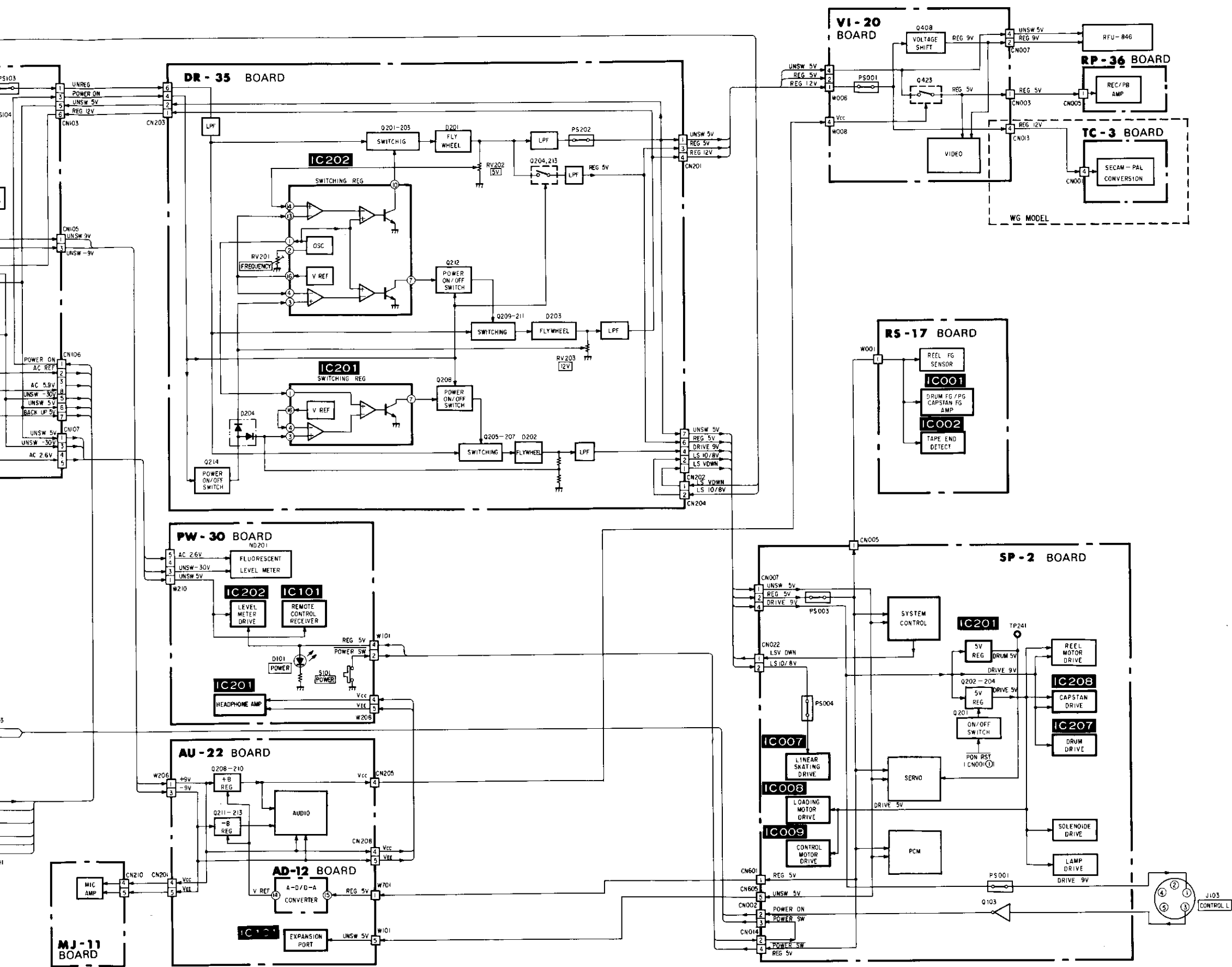
3-22. TIMER/MODE CONTROL BLOCK DIAGRAM





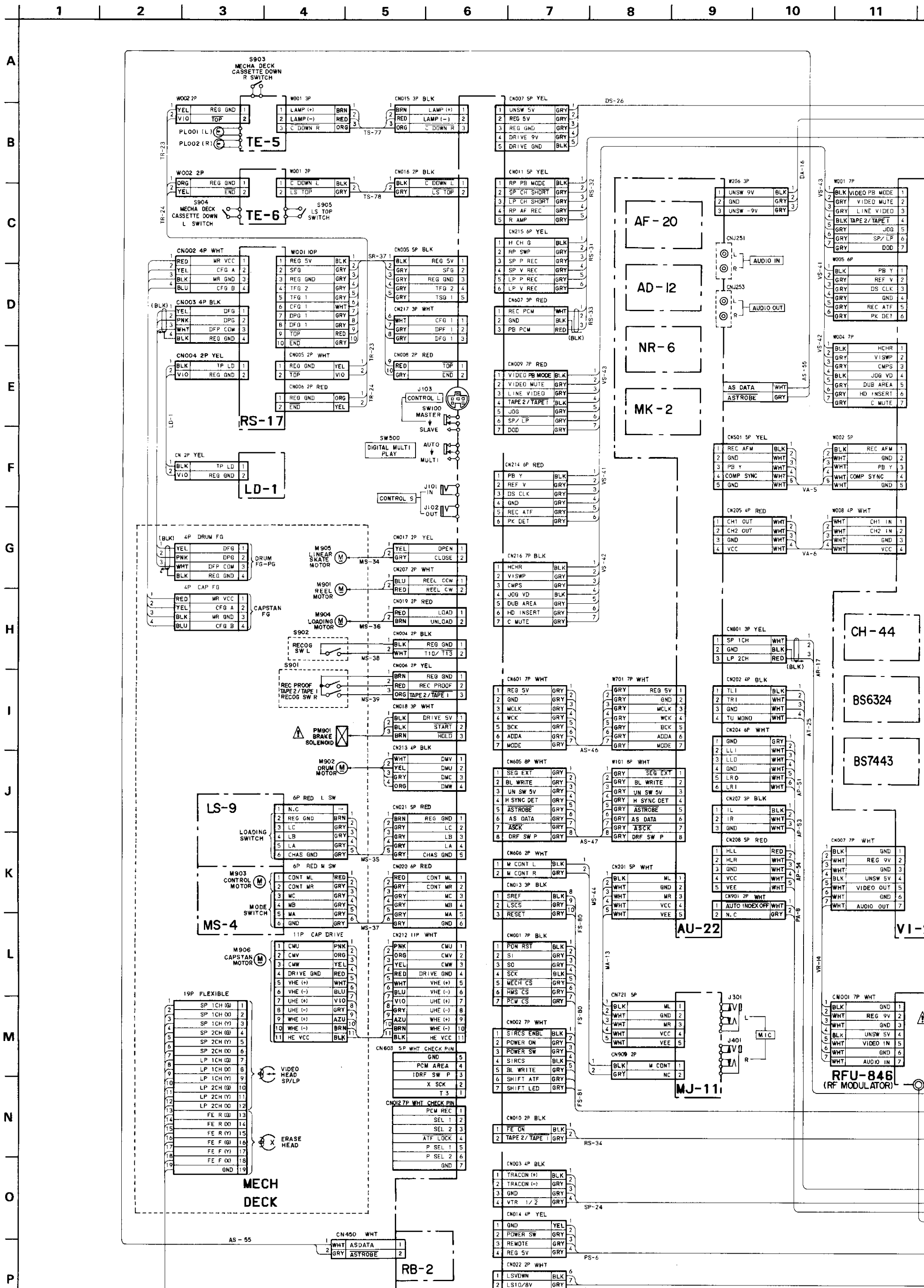
3-23. POWER BLOCK DIAGRAM





# SECTION 4 PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

## 4-1. FRAME SCHEMATIC DIAGRAM









4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

RP-36(HEAD AMP/FLYING ERASE) PRINTED WIRING BOARD  
Ref. No. RP-36 BOARD: 1,000 series

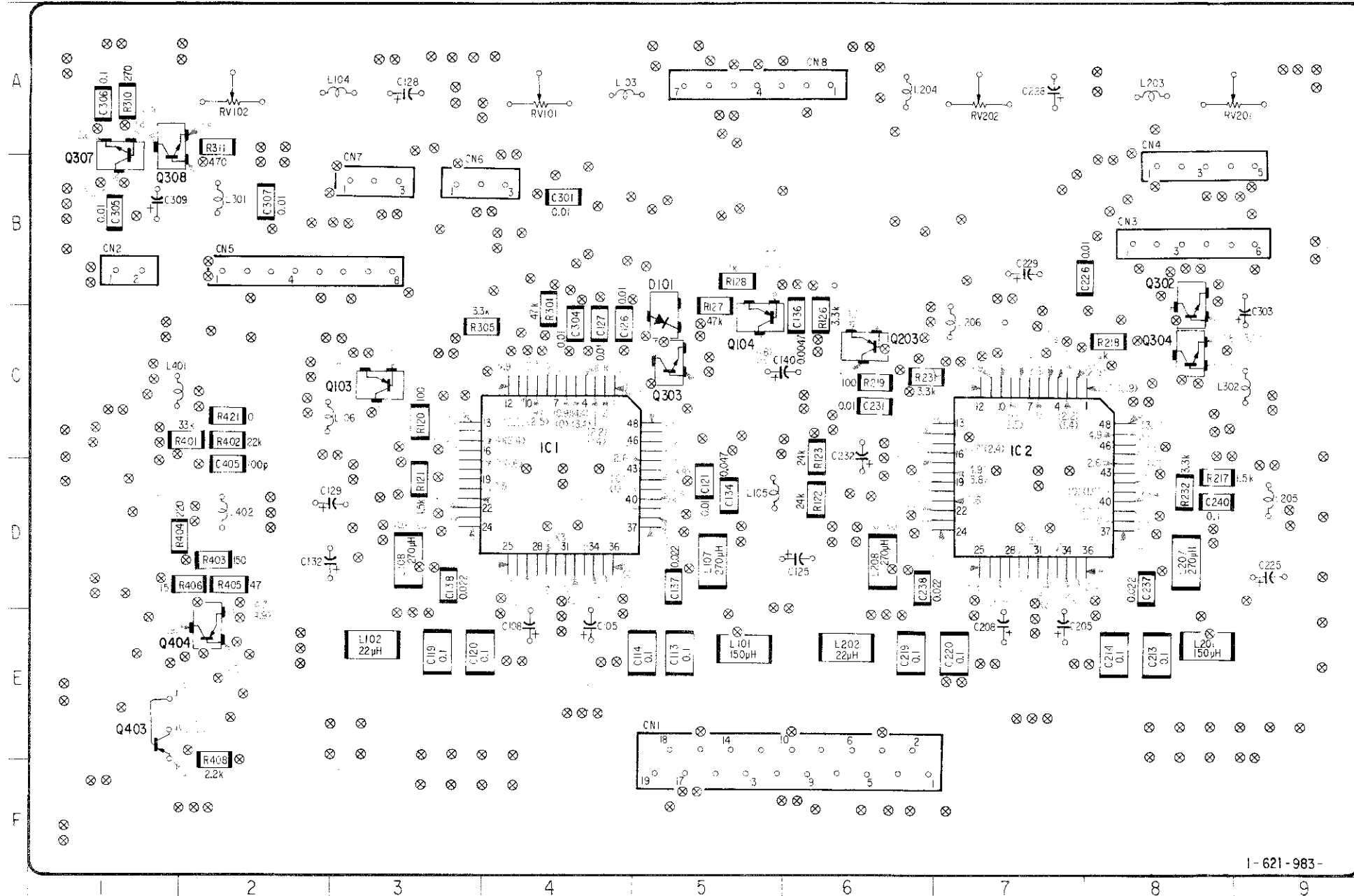
Note:

- : indicates a lead wire mounted on the component side.
- : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- : Pattern from the side which enables seeing.
- : Digital transistor (RP-36:Q103,Q105,Q203,Q302,Q303) transistor with resistors.  
Refer to the RP-36 board schematic diagram for digital transistor

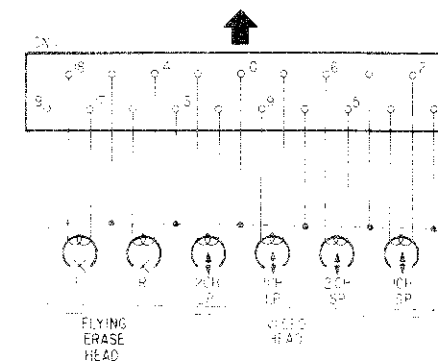
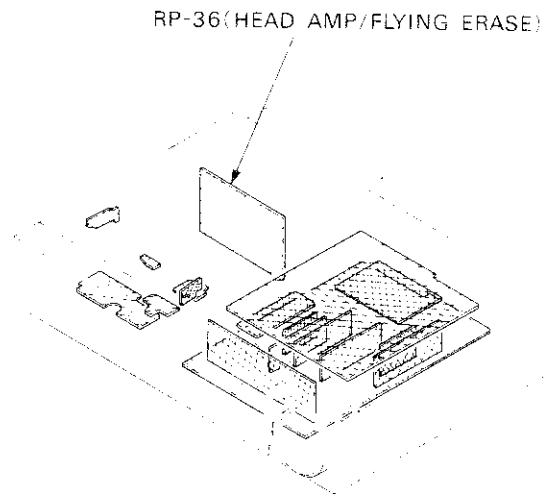
When indicating parts by reference number, please include the board name.

Q101	C-5
IC001	C-4
IC002	C-7
Q101	E-15
Q102	E-17
Q103	C-3
Q104	C-5
Q105	C-15
Q201	E-11
Q202	E-14
Q203	C-6
Q301	C-11
Q302	B-8
Q303	C-5
Q304	C-8
Q307	A-1
Q308	A-1
Q402	D-18
Q403	E-1
Q404	E-2
RV101	A-4
RV102	A-2
RV201	A-8
RV202	A-7

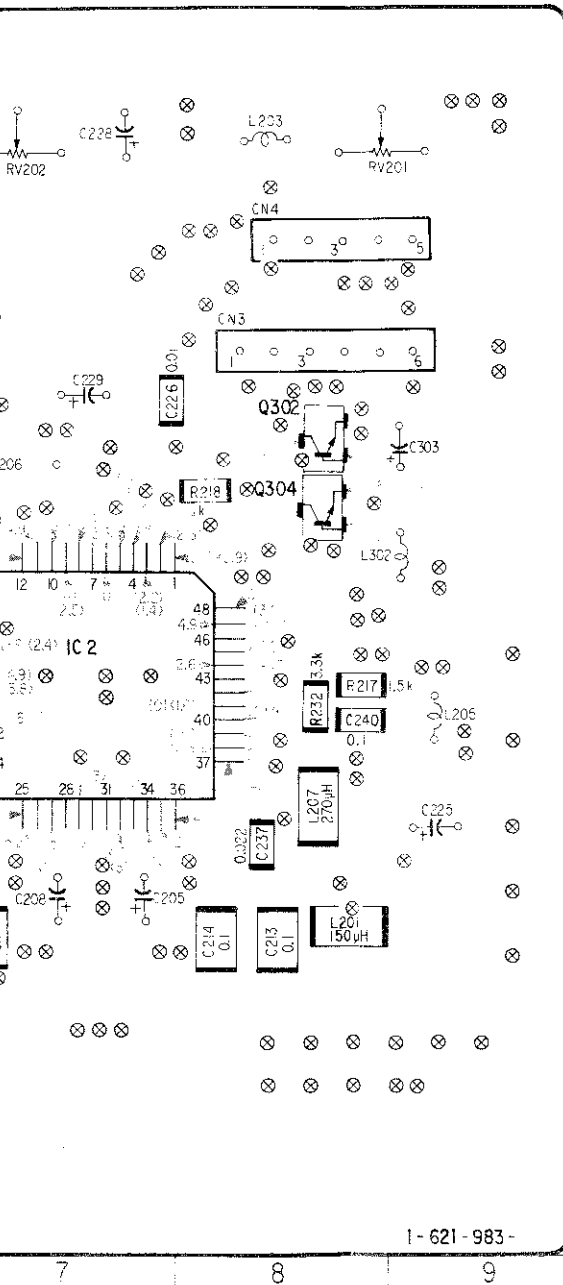
RP-36 BOARD (COMPONENT SIDE)



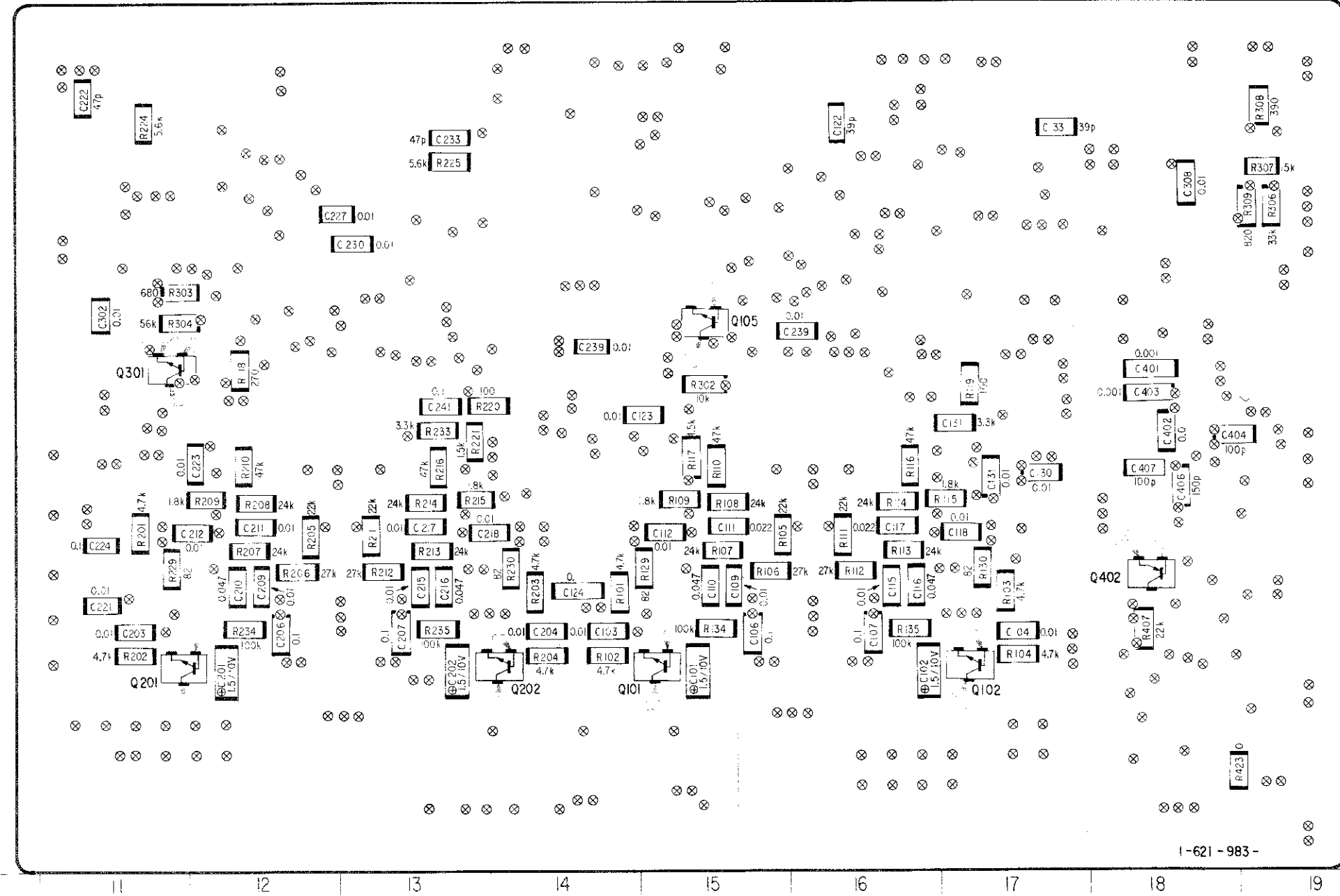
1-621-983-



RP-36 BOARD (SOLDER SIDE)



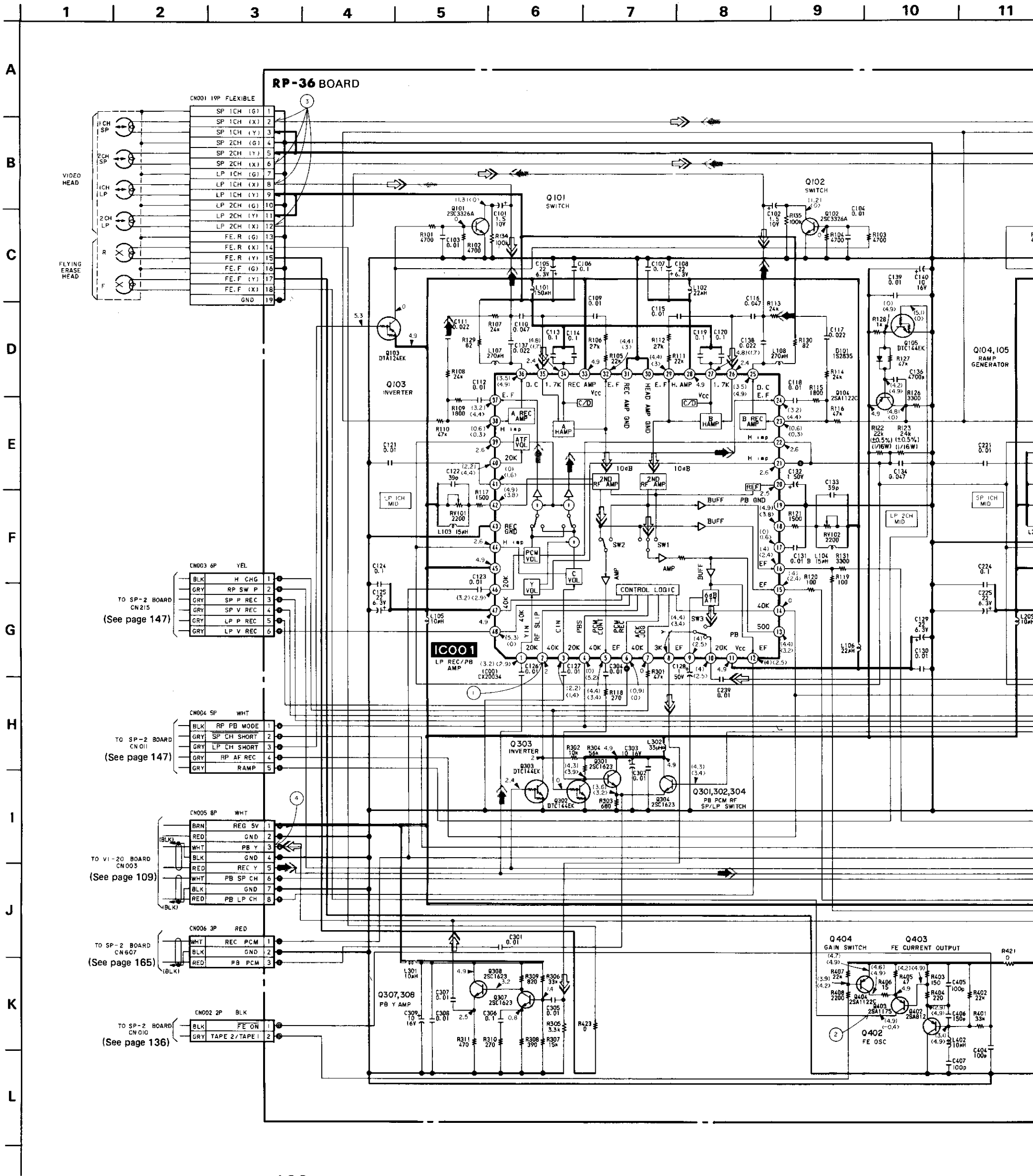
1-621-983-

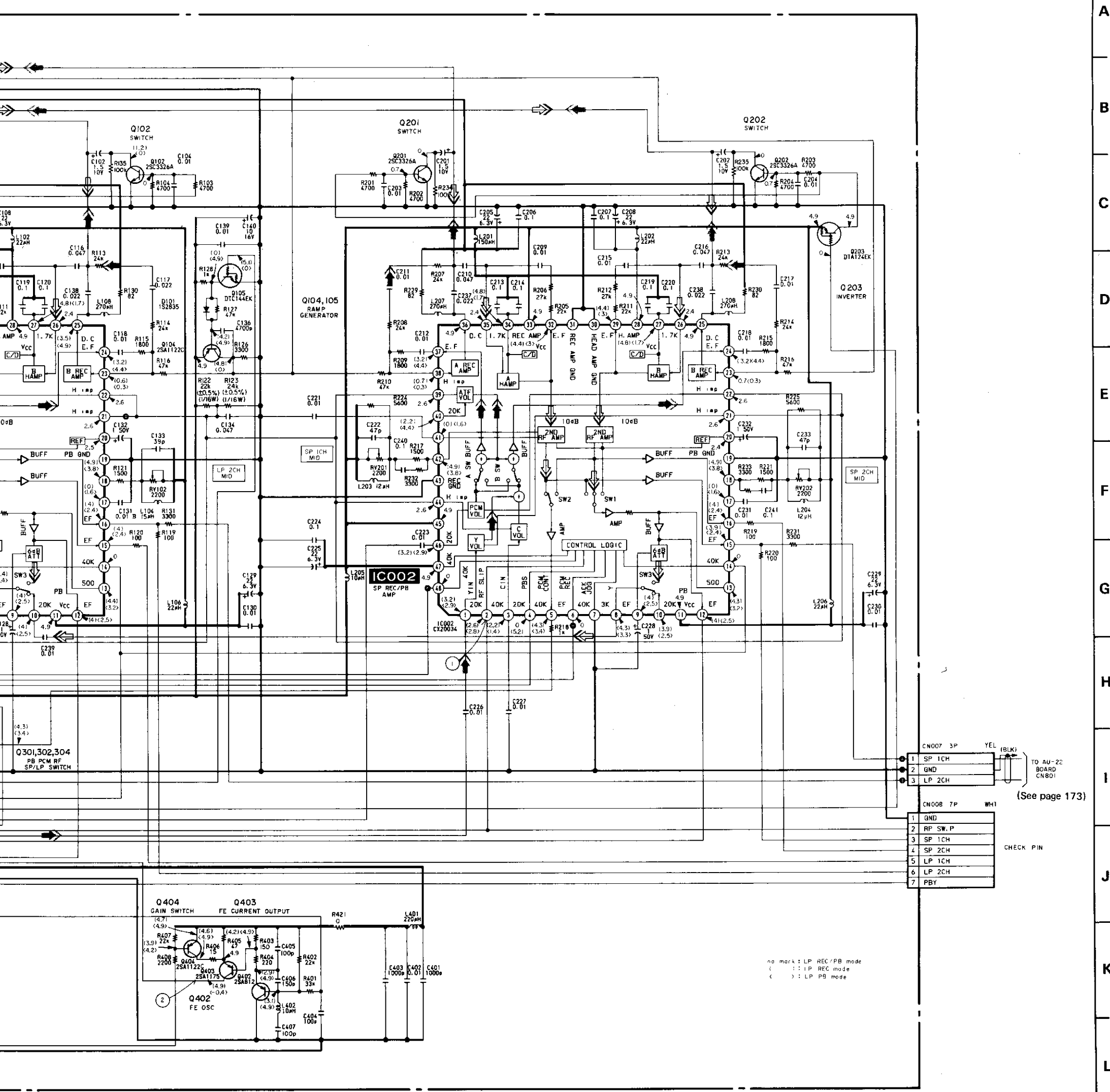


1-621-983-

**RP-36(HEAD AMP/FLYING ERASE) SCHEMATIC DIAGRAM**

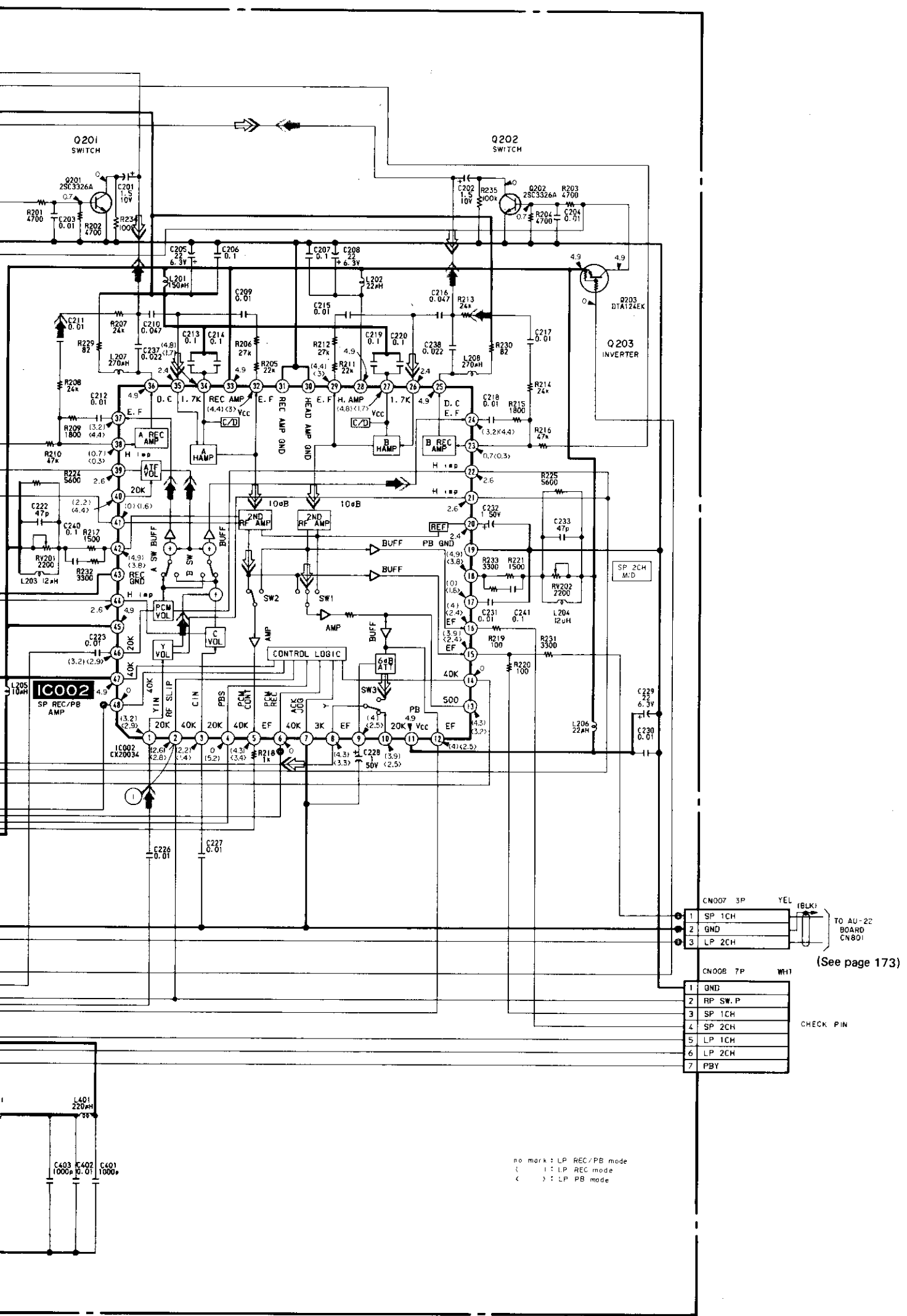
—Ref. No. RP-36 BOARD: 1,000 series—





- CN007 3P YEL (BLK)
- 1 SP 1CH
  - 2 GND
  - 3 LP 2CH
- (See page 173)
- CN008 7P WHI
- 1 GND
  - 2 RP SW.P
  - 3 SP 1CH
  - 4 SP 2CH
  - 5 LP 1CH
  - 6 LP 2CH
  - 7 PB
- CHECK PIN

no mark: LP REC/PB mode  
 ( ) : LP REC mode  
 ( ) : LP PB mode



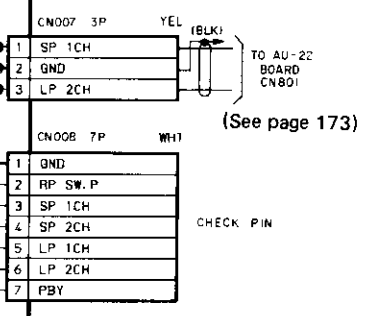
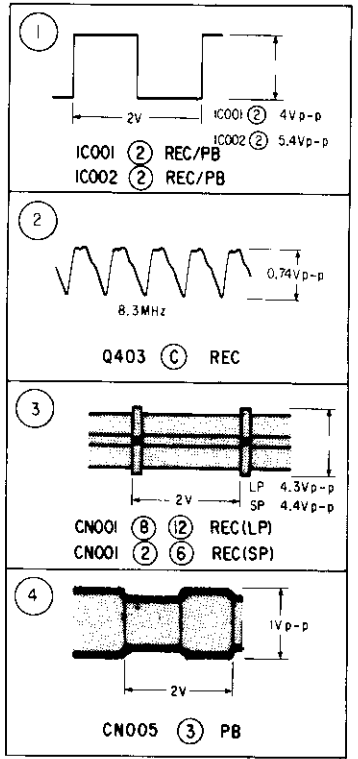
**Note:**

- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- □ : adjustment for repair.
- — : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

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

- **Signal path**
- → : REC Y/CHROMA Signal
- ⇨ : PB Y/CHROMA Signal

**RP-36 BOARD**



no mark : LP REC/PB mode  
 ( ) : LP REC mode  
 ( ) : LP PB mode

Note:

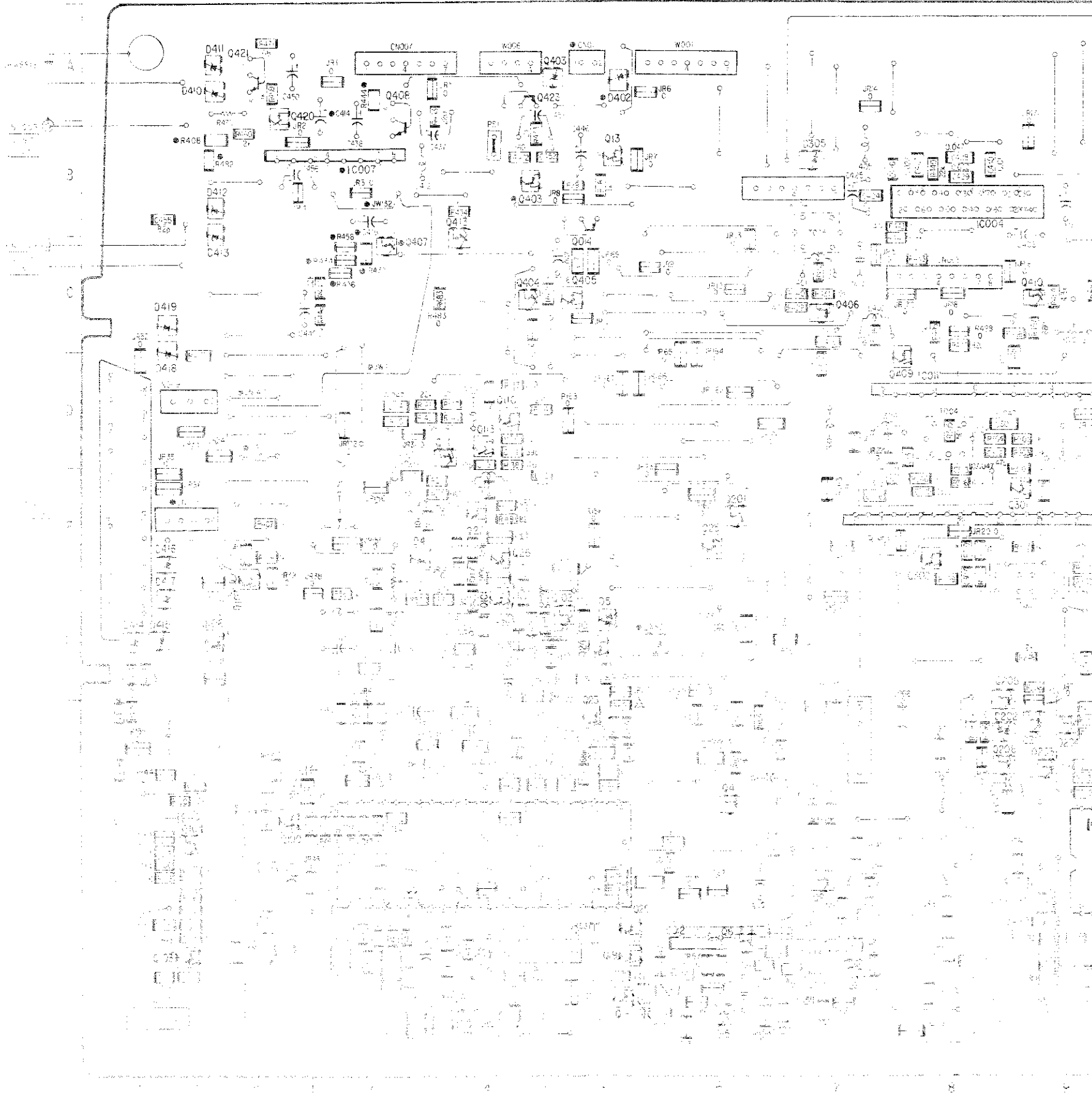
- indicates a lead wire mounted on the component side.
- indicates a lead wire mounted on the printed side.
- soldering side.

When indicating parts by note:  
 angle number, please include  
 the board name.

VI-20(VIDEO) PRINTED WIRING BOARD

Ref. No. VI-20 BOARD: 2,000 Series

VI-20BOARD



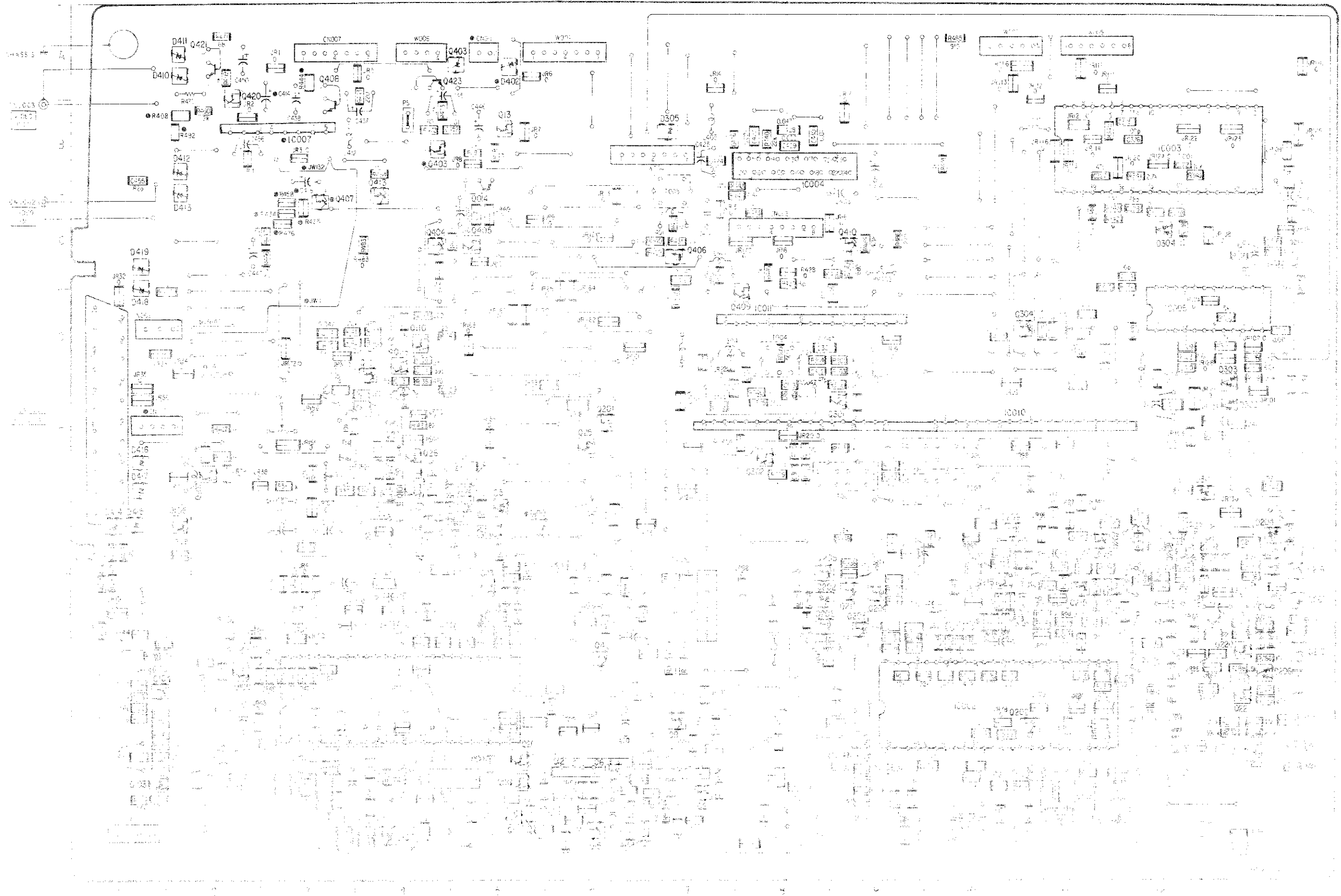
0004	2.2	Q101	1.1
0005	1.5	Q102	1.5
0101	1.0	Q103	1.1
0102	1.2	Q104	1.1
0103	1.5	Q105	1.1
0104	1.0	Q106	1.1
0105	1.5	Q107	1.1
0106	1.0	Q108	1.1
0107	1.5	Q109	1.1
0108	1.0	Q110	1.1
0109	1.5	Q111	1.1
0110	1.0	Q112	1.1
0111	1.5	Q113	1.1
0112	1.0	Q114	1.1
0113	1.5	Q115	1.1
0114	1.0	Q116	1.1
0115	1.5	Q117	1.1
0116	1.0	Q118	1.1
0117	1.5	Q119	1.1
0118	1.0	Q120	1.1
0119	1.5	Q121	1.1
0120	1.0	Q122	1.1
0121	1.5	Q123	1.1
0122	1.0	Q124	1.1
0123	1.5	Q125	1.1
0124	1.0	Q126	1.1
0125	1.5	Q127	1.1
0126	1.0	Q128	1.1
0127	1.5	Q129	1.1
0128	1.0	Q130	1.1
0129	1.5	Q131	1.1
0130	1.0	Q132	1.1
0131	1.5	Q133	1.1
0132	1.0	Q134	1.1
0133	1.5	Q135	1.1
0134	1.0	Q136	1.1
0135	1.5	Q137	1.1
0136	1.0	Q138	1.1
0137	1.5	Q139	1.1
0138	1.0	Q140	1.1
0139	1.5	Q141	1.1
0140	1.0	Q142	1.1
0141	1.5	Q143	1.1
0142	1.0	Q144	1.1
0143	1.5	Q145	1.1
0144	1.0	Q146	1.1
0145	1.5	Q147	1.1
0146	1.0	Q148	1.1
0147	1.5	Q149	1.1
0148	1.0	Q150	1.1
0149	1.5	Q151	1.1
0150	1.0	Q152	1.1
0151	1.5	Q153	1.1
0152	1.0	Q154	1.1
0153	1.5	Q155	1.1
0154	1.0	Q156	1.1
0155	1.5	Q157	1.1
0156	1.0	Q158	1.1
0157	1.5	Q159	1.1
0158	1.0	Q160	1.1
0159	1.5	Q161	1.1
0160	1.0	Q162	1.1
0161	1.5	Q163	1.1
0162	1.0	Q164	1.1
0163	1.5	Q165	1.1
0164	1.0	Q166	1.1
0165	1.5	Q167	1.1
0166	1.0	Q168	1.1
0167	1.5	Q169	1.1
0168	1.0	Q170	1.1
0169	1.5	Q171	1.1
0170	1.0	Q172	1.1
0171	1.5	Q173	1.1
0172	1.0	Q174	1.1
0173	1.5	Q175	1.1
0174	1.0	Q176	1.1
0175	1.5	Q177	1.1
0176	1.0	Q178	1.1
0177	1.5	Q179	1.1
0178	1.0	Q180	1.1
0179	1.5	Q181	1.1
0180	1.0	Q182	1.1
0181	1.5	Q183	1.1
0182	1.0	Q184	1.1
0183	1.5	Q185	1.1
0184	1.0	Q186	1.1
0185	1.5	Q187	1.1
0186	1.0	Q188	1.1
0187	1.5	Q189	1.1
0188	1.0	Q190	1.1
0189	1.5	Q191	1.1
0190	1.0	Q192	1.1
0191	1.5	Q193	1.1
0192	1.0	Q194	1.1
0193	1.5	Q195	1.1
0194	1.0	Q196	1.1
0195	1.5	Q197	1.1
0196	1.0	Q198	1.1
0197	1.5	Q199	1.1
0198	1.0	Q200	1.1
0199	1.5	Q201	1.1
0200	1.0	Q202	1.1

VI-20(VIDEO)

VI-20(VIDEO) PRINTED WIRING BOARD

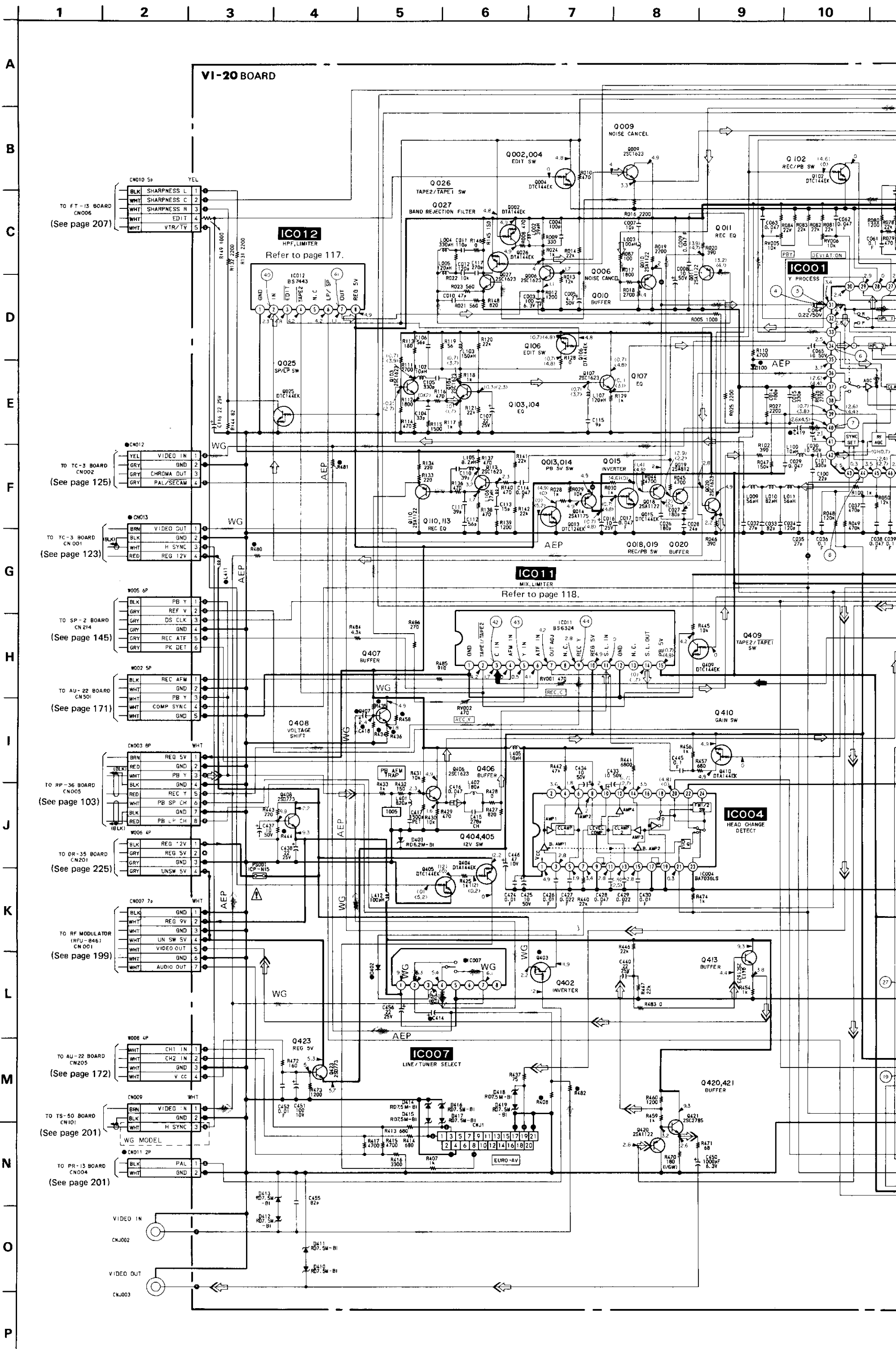
Ref. No. VI-20 BOARD 12,000 series

VI-20BOARD

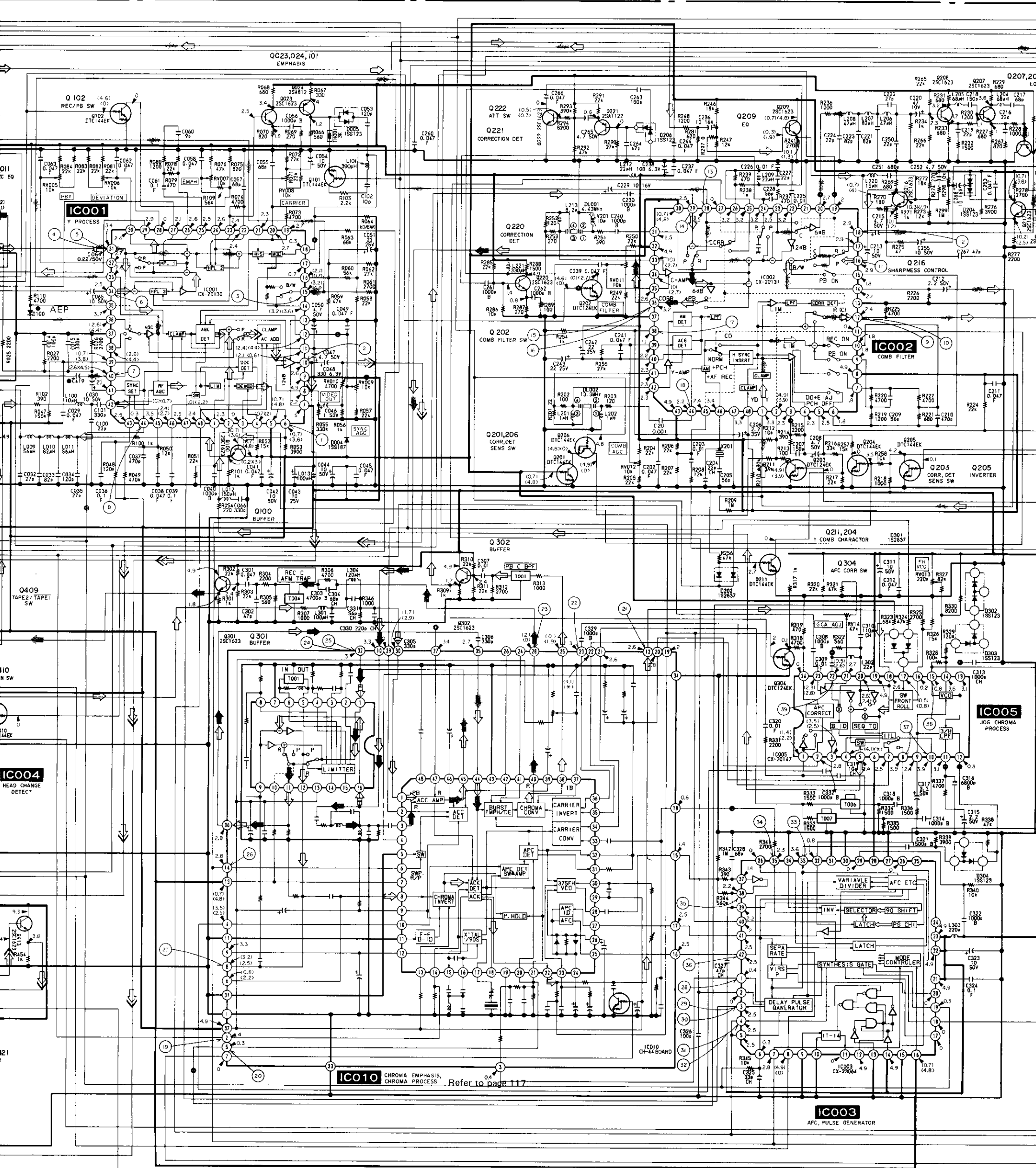


VI-20(VIDEO) SCHEMATIC DIAGRAM

—Ref. No. VI-20 BOARD: 2,000 series—



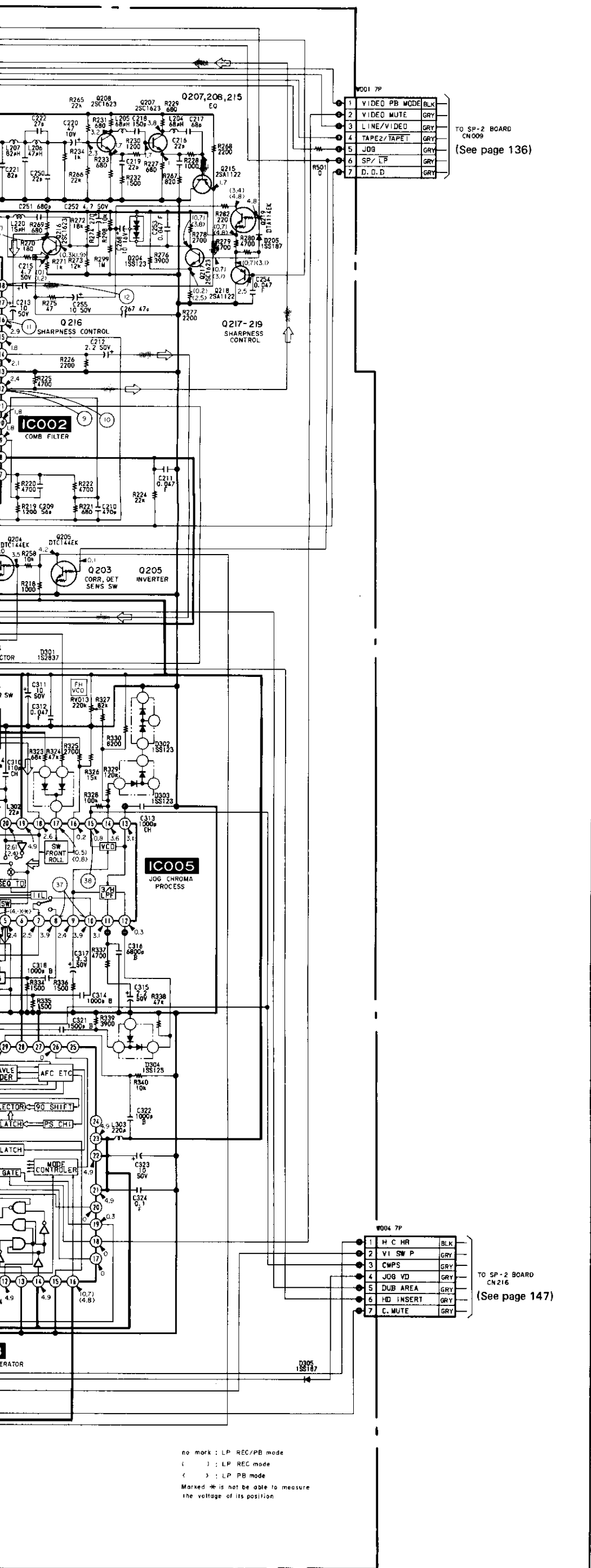




X: NO MOUNT

REF	WG MODEL	AEP MODEL	REF	WG MODEL	AEP MODEL	REF	WG MODEL	AEP MODEL
R408	75Ω	39Ω	C414	10/50	X	CNO12	4P	X
R434	22kΩ	X	C418	22/25	X	CNO13	4P	X
R435	22kΩ	X	C419	5mm JW	4.7/50V	L411	22μH	X
R436	1kΩ	X	Q403	DTA144EK	X			
R444	910Ω	820Ω	Q407	2SC1623	X			
R458	100Ω	X	O100	X	ISS187			
R480	X	0Ω	D402	1S5196	X			
R481	X	0Ω	IC007	CX-20061	X			
R482	0Ω	39Ω	CNO11	2P	X			

no mark:  
( ) :  
Marked \*  
the voltage



Note:

- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytics, and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- Marked ● parts have the difference between the WG model and the AEP model.
- : adjustment for repair.
- : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

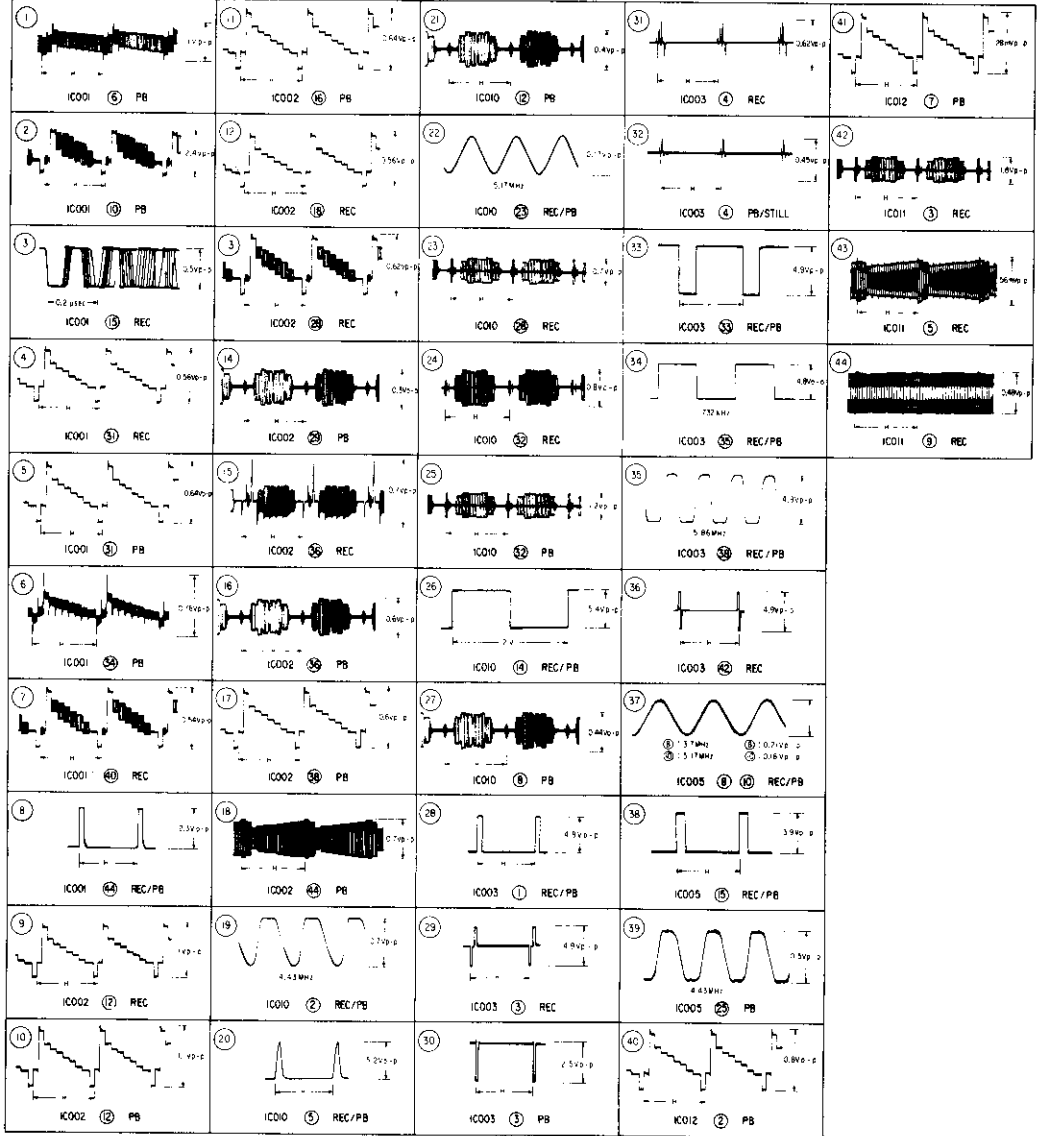
Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

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

Signal path

- : REC Y Signal
- : PB Y Signal
- : REC CHROMA Signal
- : PB CHROMA Signal
- : REC Y/CHROMA Signal
- : PB Y/CHROMA Signal

VI-20 BOARD



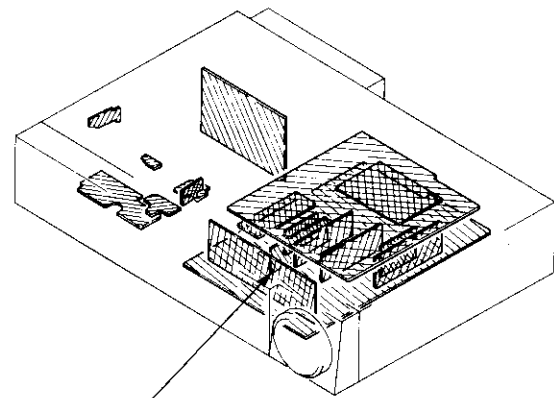
A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P

**Note:**

- — : indicates a lead wire mounted on the component side.
- — : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ☆ : Pattern from the side which enables seeing.
- : Pattern of the rear side.
- : B+ pattern from the side which enables seeing.
- Digital transistor (BS7443:DT001,DT002,DT003,DT004,DT005,DT006,BS6324:DT001) transistor with resistors.

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

**Caution:**  
 Pattern face side: Parts on the pattern face side seen from (Solder Side) the pattern face are indicated.  
 Parts face side: Parts on the parts face side seen from (Component Side) the parts face are indicated.



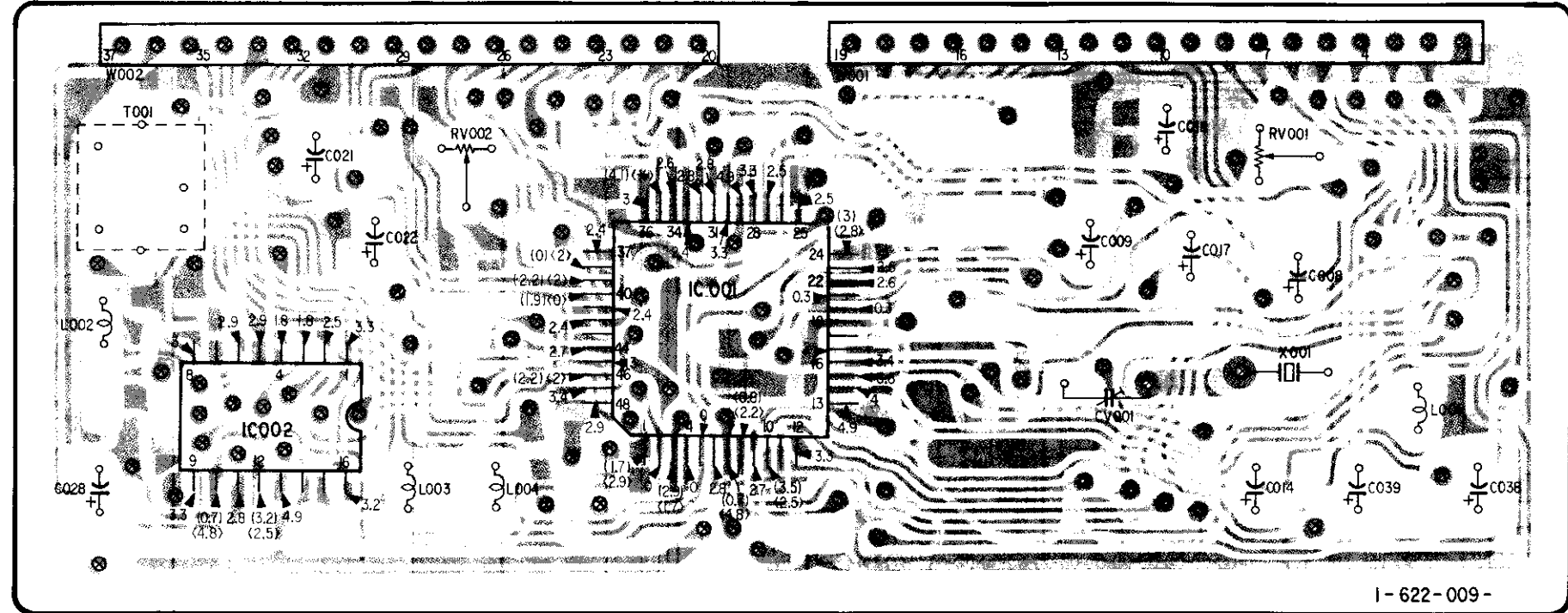
CH-44 (CHROMA PROCESS)

**CH-44(CHROMA PROCESS), BS6324(MIX), BS7443(NOISE CANCEL) PRINTED WIRING BOARDS**

-Ref. No. CH-44 BOARD : 3,000 series, BS6324 BOARD : 3,100 series, BS7443 BOARD : 3,200 series-

**IC010**

**CH-44 BOARD (COMPONENT SIDE)**



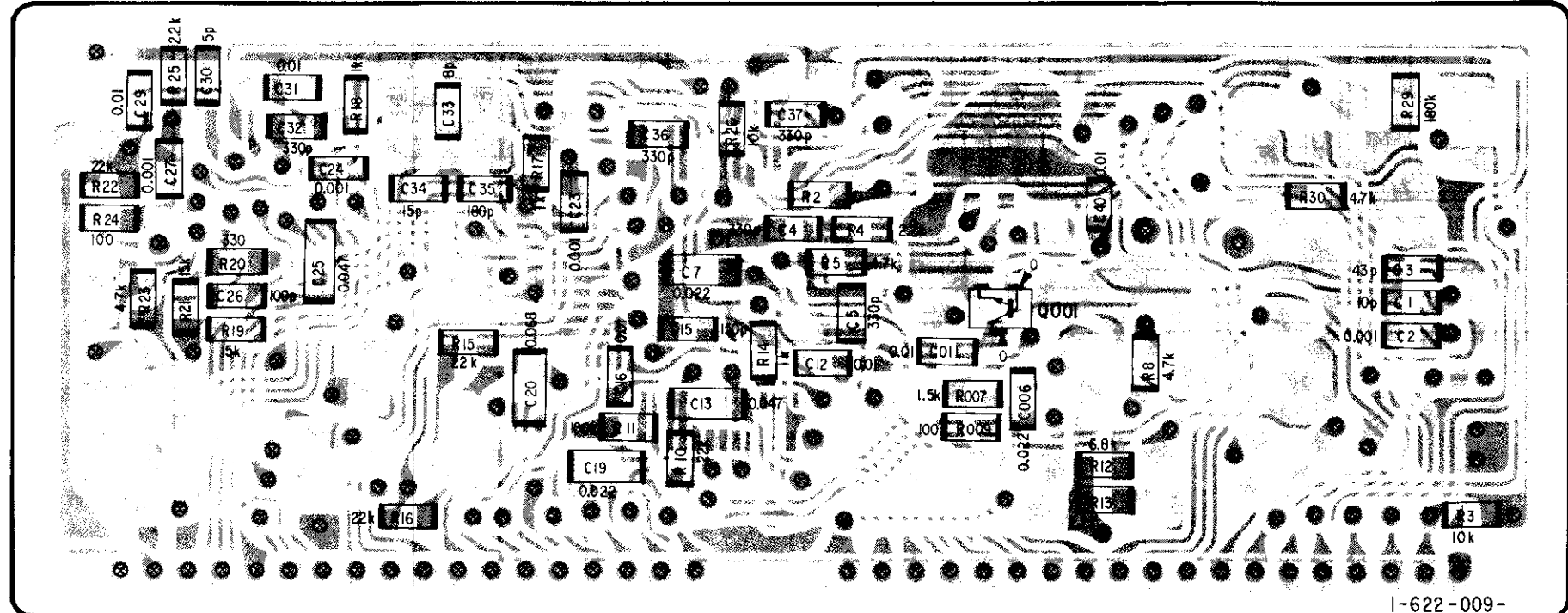
I-622-009-

II

no mark: LP REC/PB mode  
 ( ): LP REC mode  
 < > : LP PB mode  
 Markd \* is not able to measure the voltage of its position

**IC010**

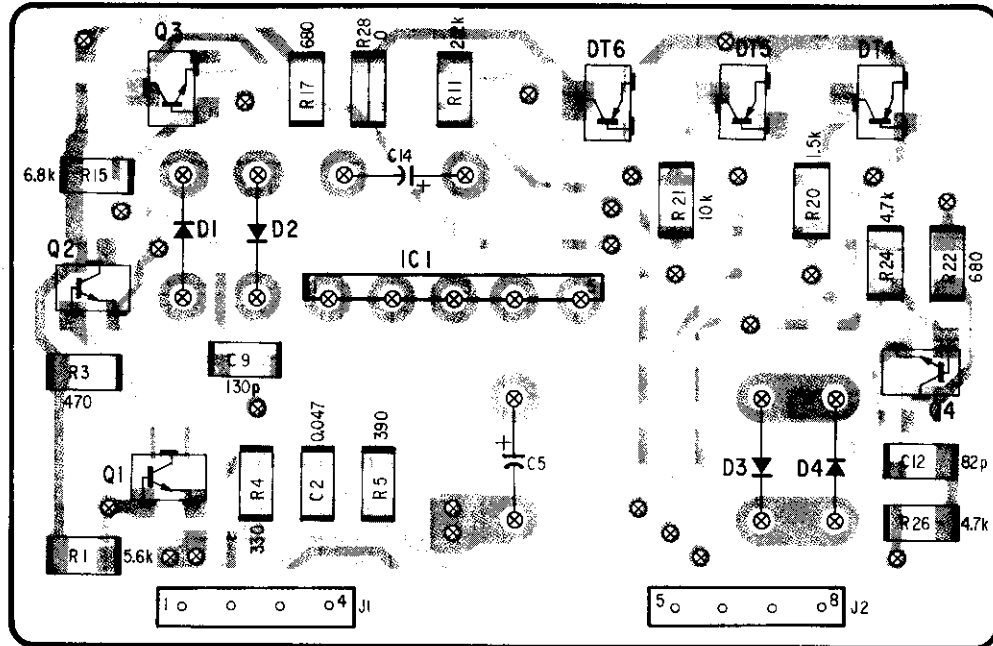
**CH-44 BOARD (SOLDER SIDE)**



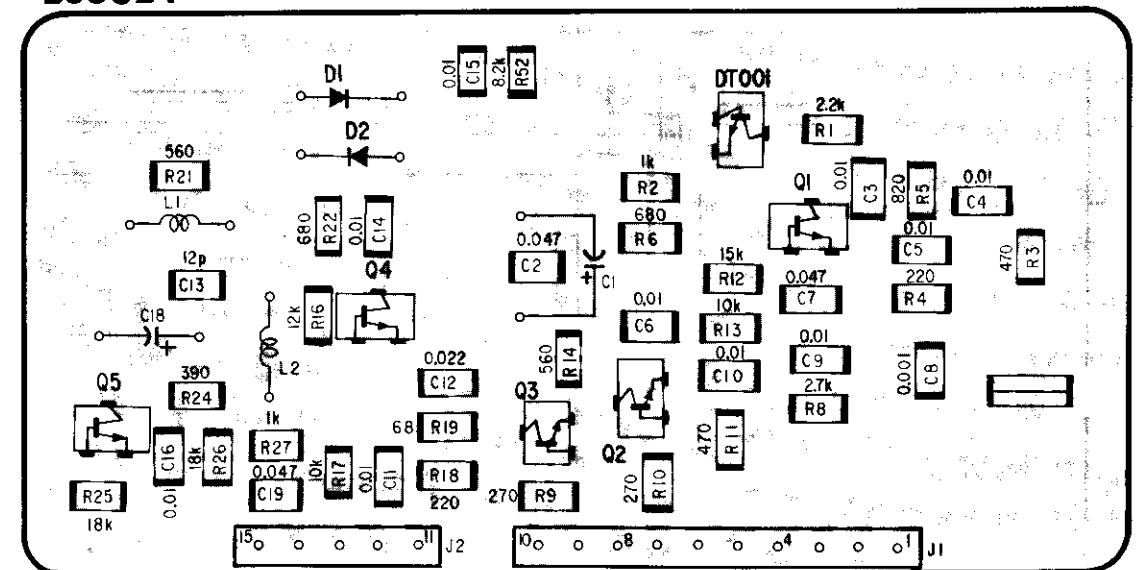
I-622-009-

II

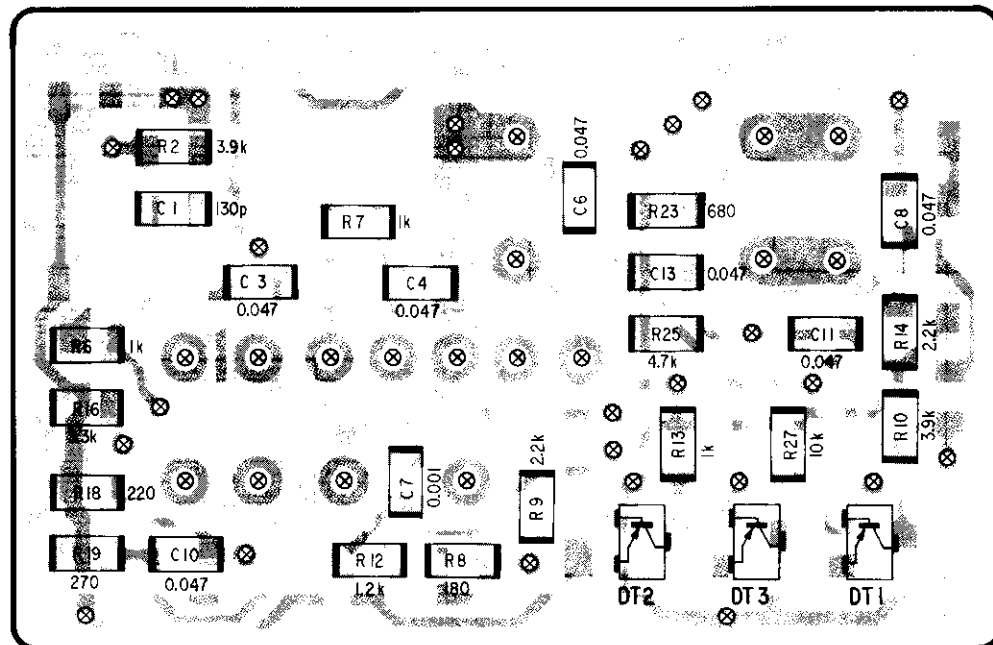
**IC012**  
**BS7443 (COMPONENT SIDE)**



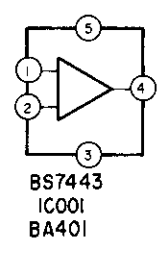
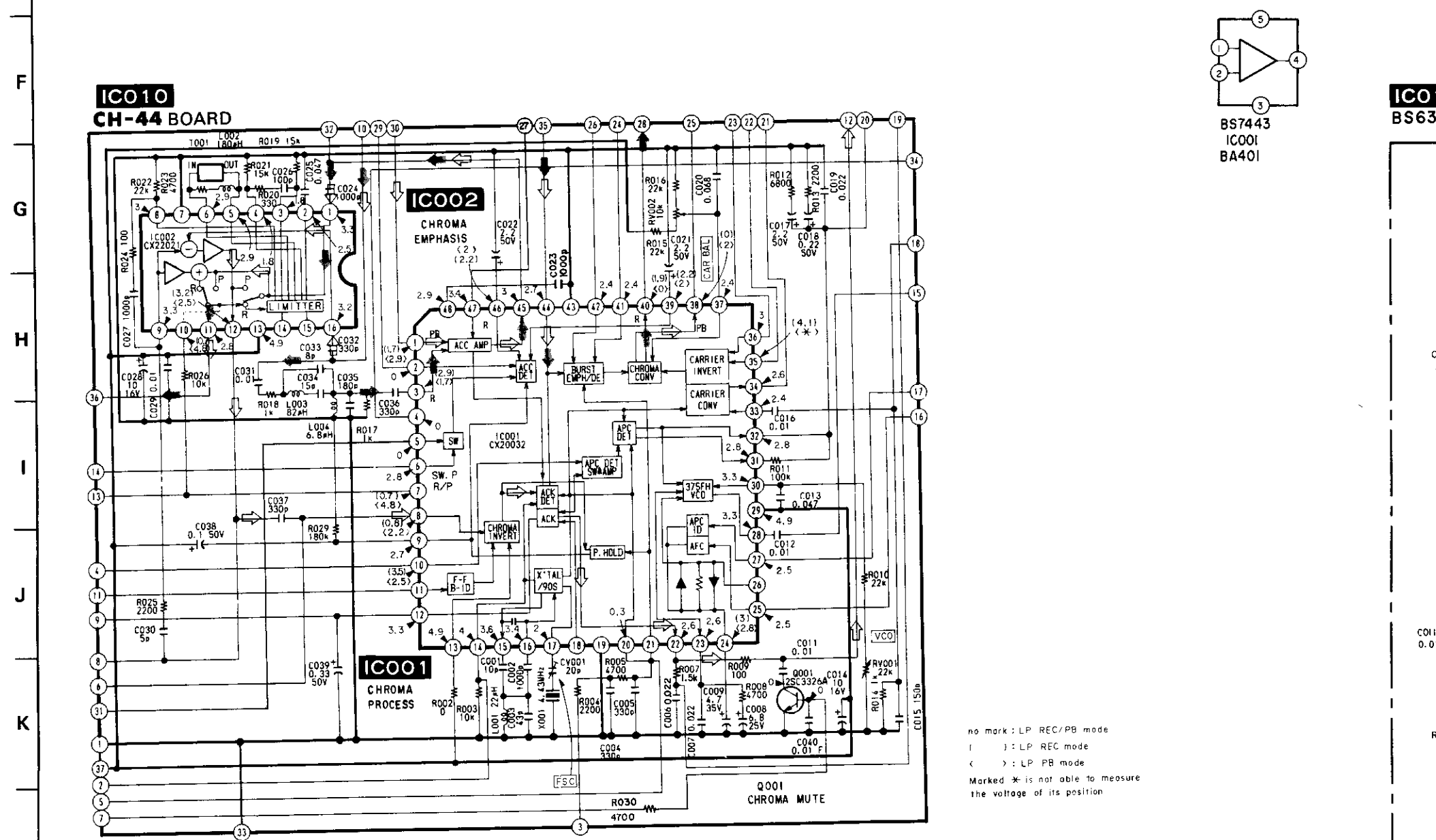
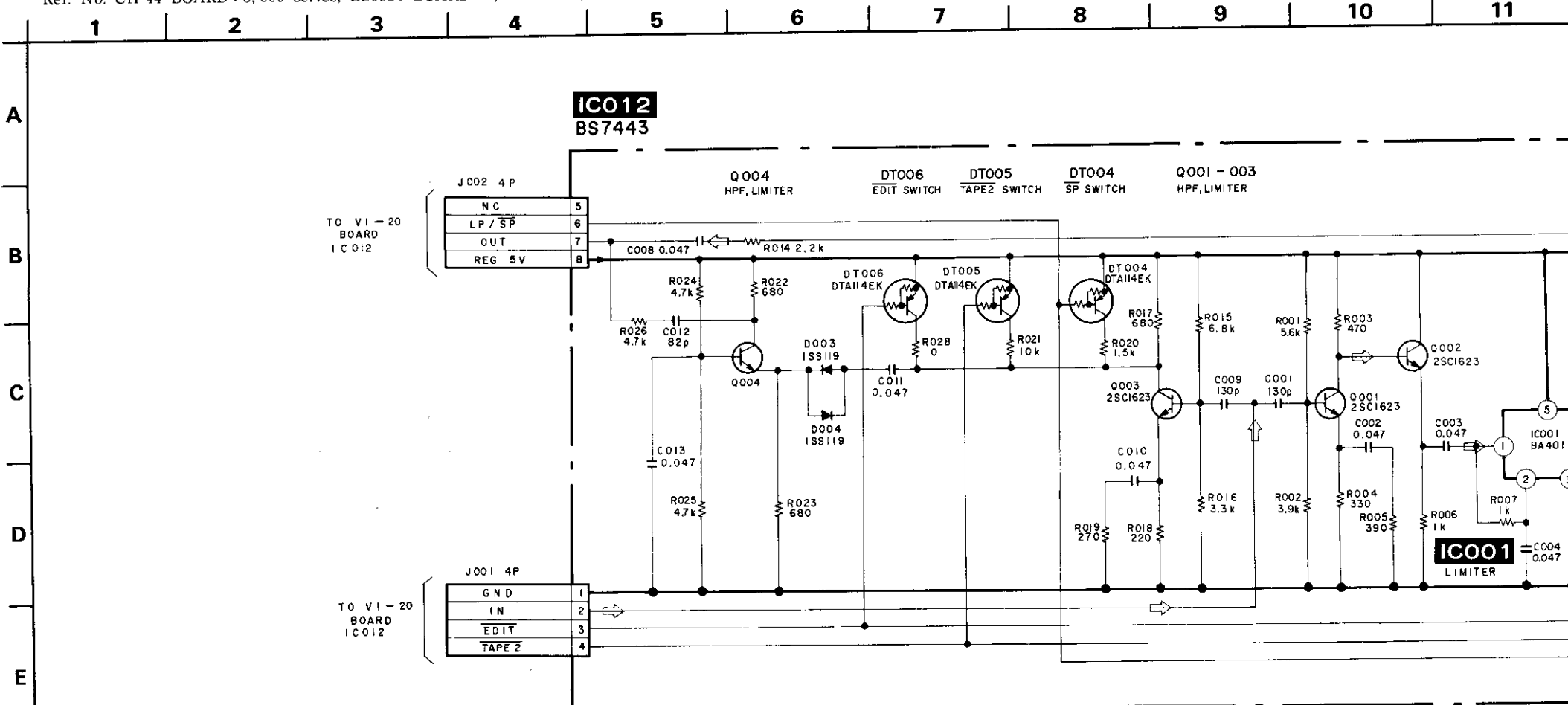
**IC011**  
**BS6324**



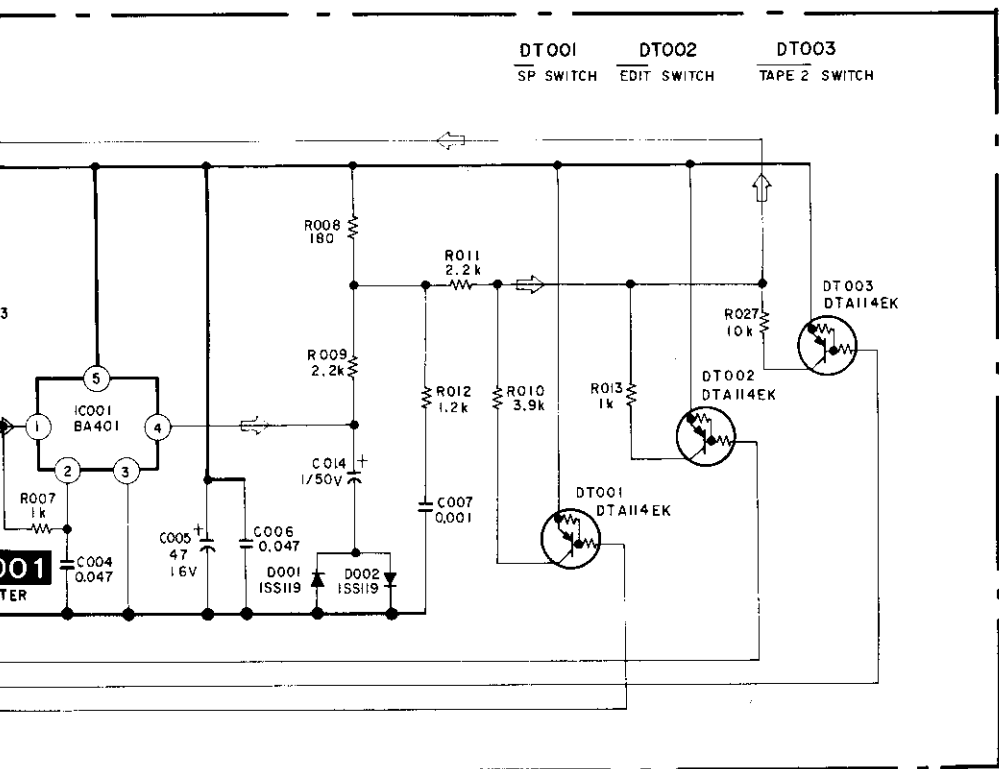
**IC012**  
**BS7443 (SOLDER SIDE)**



**CH-44(CHROMA PROCESS), BS6324(MIX), BS7443(NOISE CANCEL) SCHEMATIC DIAGRAM**  
 -Ref. No. CH-44 BOARD: 3,000 series, BS6324 BOARD: 3,100 series, BS7443 BOARD: 3,200 series-



no mark : LP REC/PB mode  
 ( ) : LP REC mode  
 < > : LP PB mode  
 Marked \* is not able to measure the voltage of its position



**Note:**

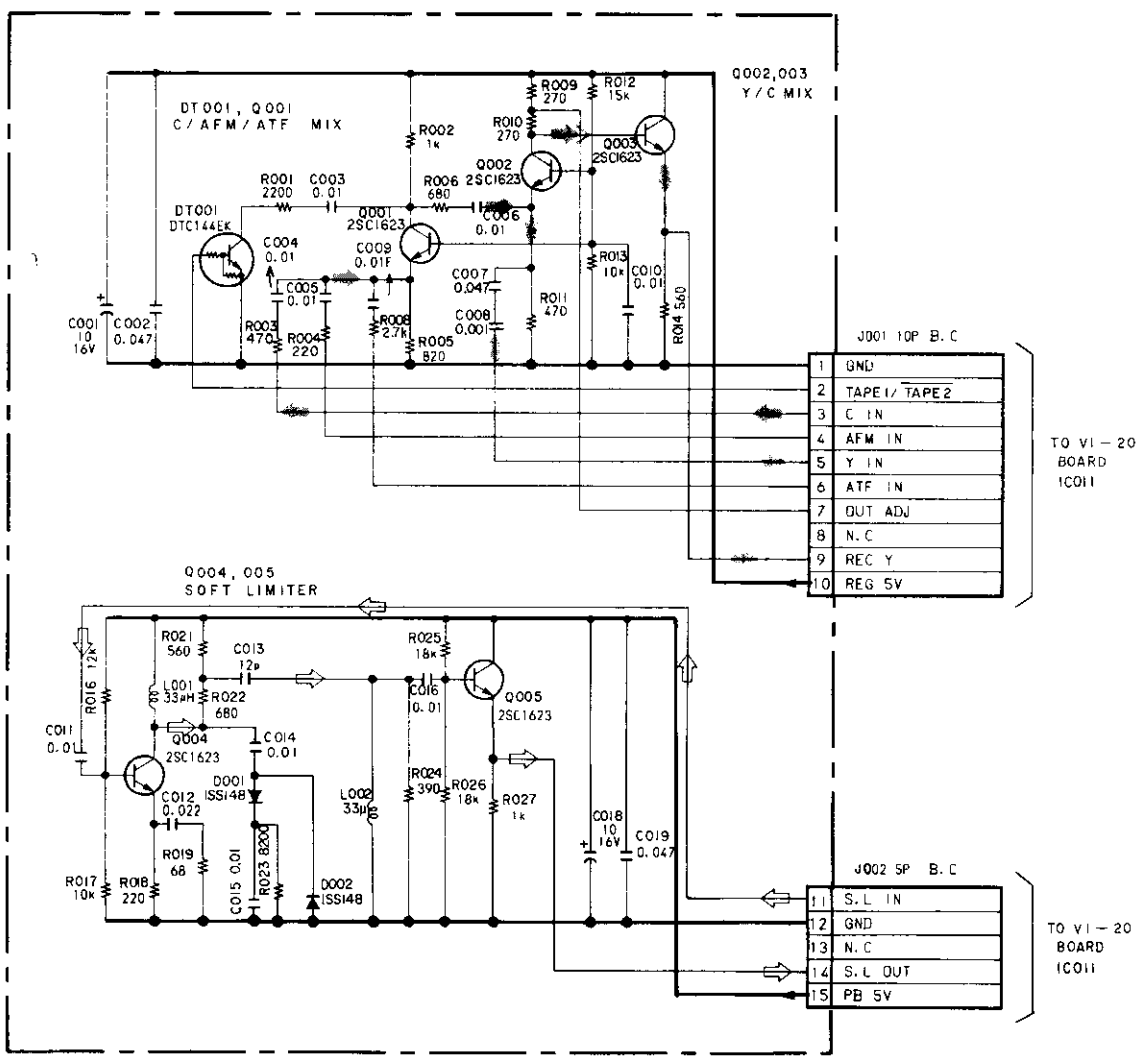
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic, and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- □ : adjustment for repair.
- — : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

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

**Signal path**

- : REC Y Signal
- ⇨ : PB Y Signal
- ⇨ : REC CHROMA Signal
- ⇨ : PB CHROMA Signal
- ⇨ : REC Y/CHROMA Signal

**IC011 BS6324**



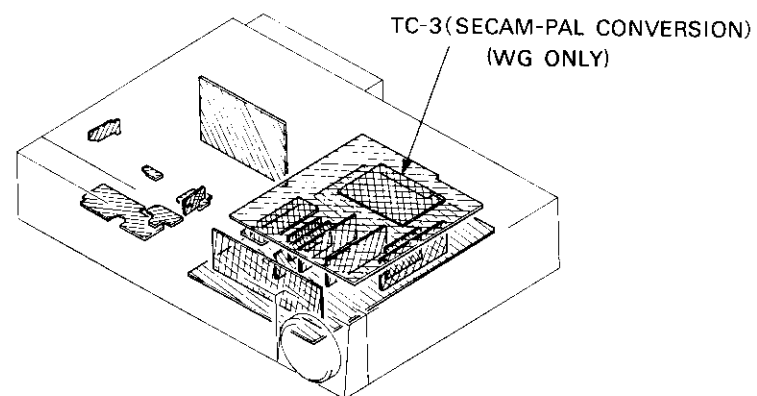
**Note:**

- : indicates a lead wire mounted on the component side.
- : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- (with dot) : Pattern from the side which enables seeing.
- (with slash) : Pattern of the rear side.
- (with cross) : B+ pattern from the side which enables seeing.
- (with cross) : Digital transistor (TC-3:Q007) transistor with resistors.  
Refer to the TC-3 board schematic diagram for digital transistor.

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

**Caution:**

Pattern face side: Parts on the pattern face side seen from (Solder Side) the pattern face are indicated.  
Parts face side: Parts on the parts face side seen from (Component Side) the parts face are indicated.

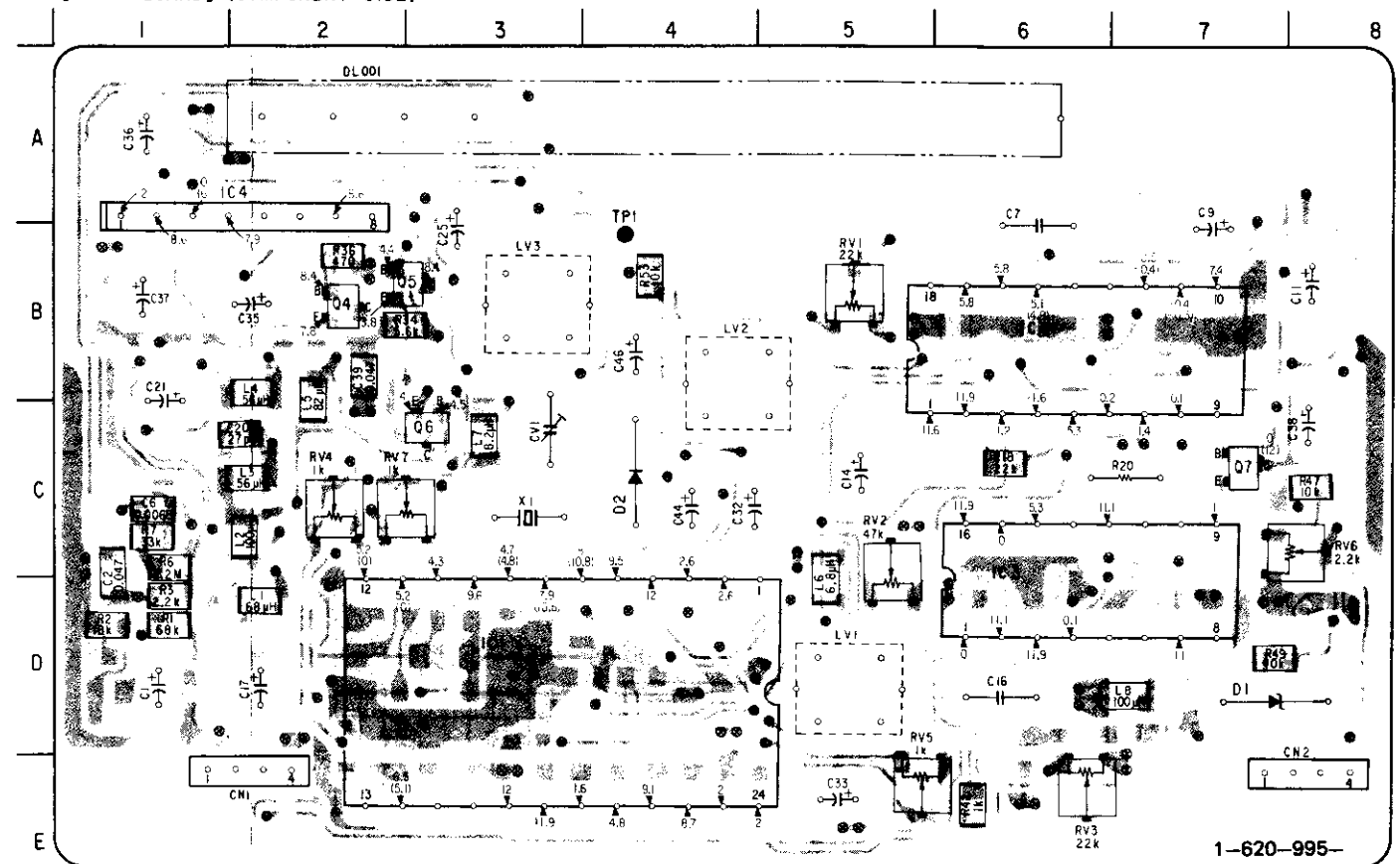


CV1	C:3
D1	D:7
D2	C:4
IC1	D:3
IC2	B:6
IC3	C:6
IC4	A:2
LV1	D:5
LV2	B:4
LV3	B:3
Q1	G:1
Q2	G:1
Q3	H:2
Q4	B:2
Q5	B:2
Q6	C:3
Q7	C:7
Q8	B:8
Q9	B:8
Q10	A:7
Q12	D:2
RV1	B:5
RV2	C:5
RV3	E:6
RV4	C:2
RV5	C:8
RV6	C:8
RV7	C:3
TP1	B:4,14

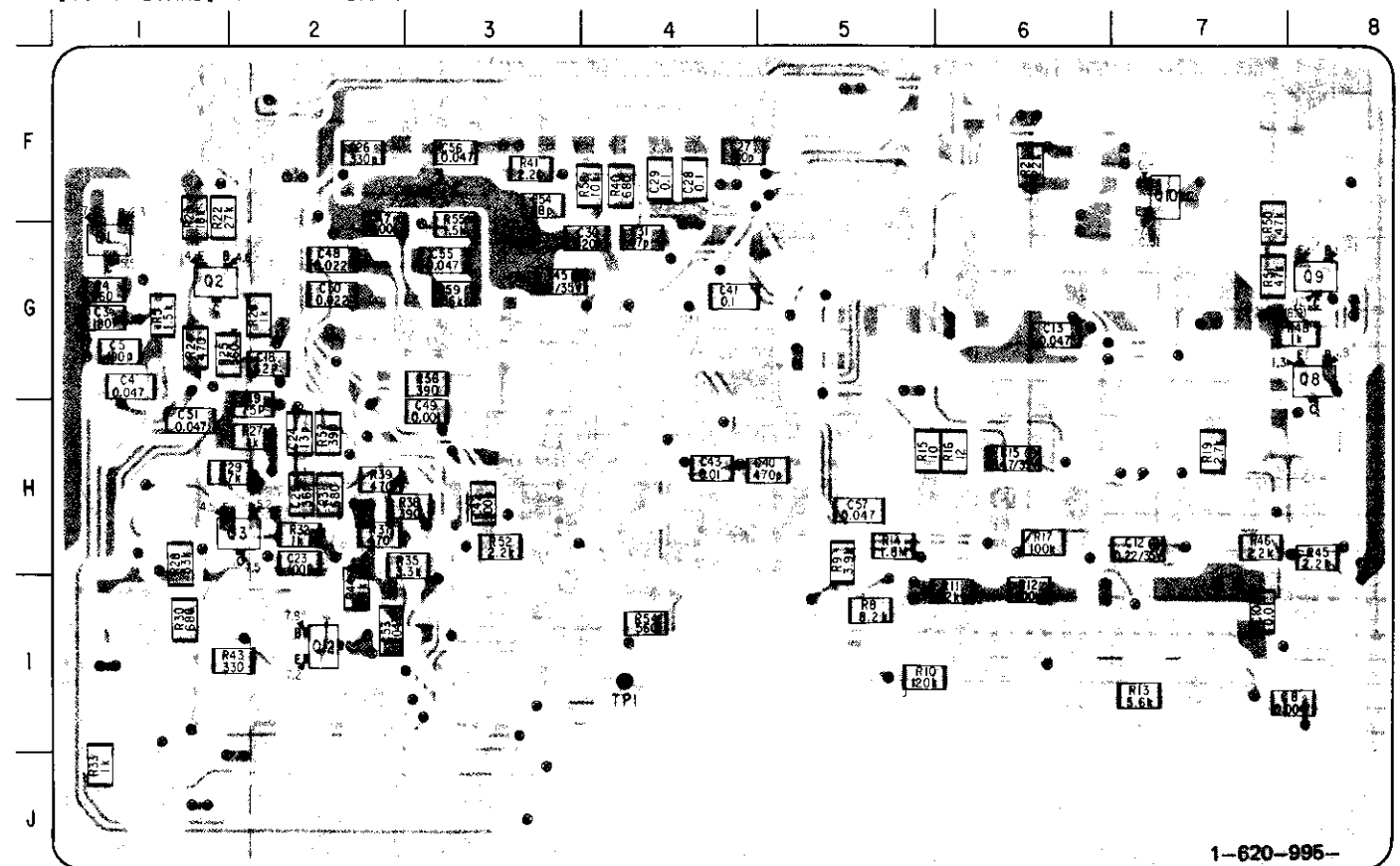
**TC-3(SECAM-PAL CONVERSION) PRINTED WIRING BOARD (WG Model)**

—Ref. No. TC-3 BOARD : 3,500 series—

[TC-3 BOARD] (COMPONENT SIDE)



[TC-3 BOARD] (SOLDER SIDE)



no mark : SECAM in  
( ) : PAL in

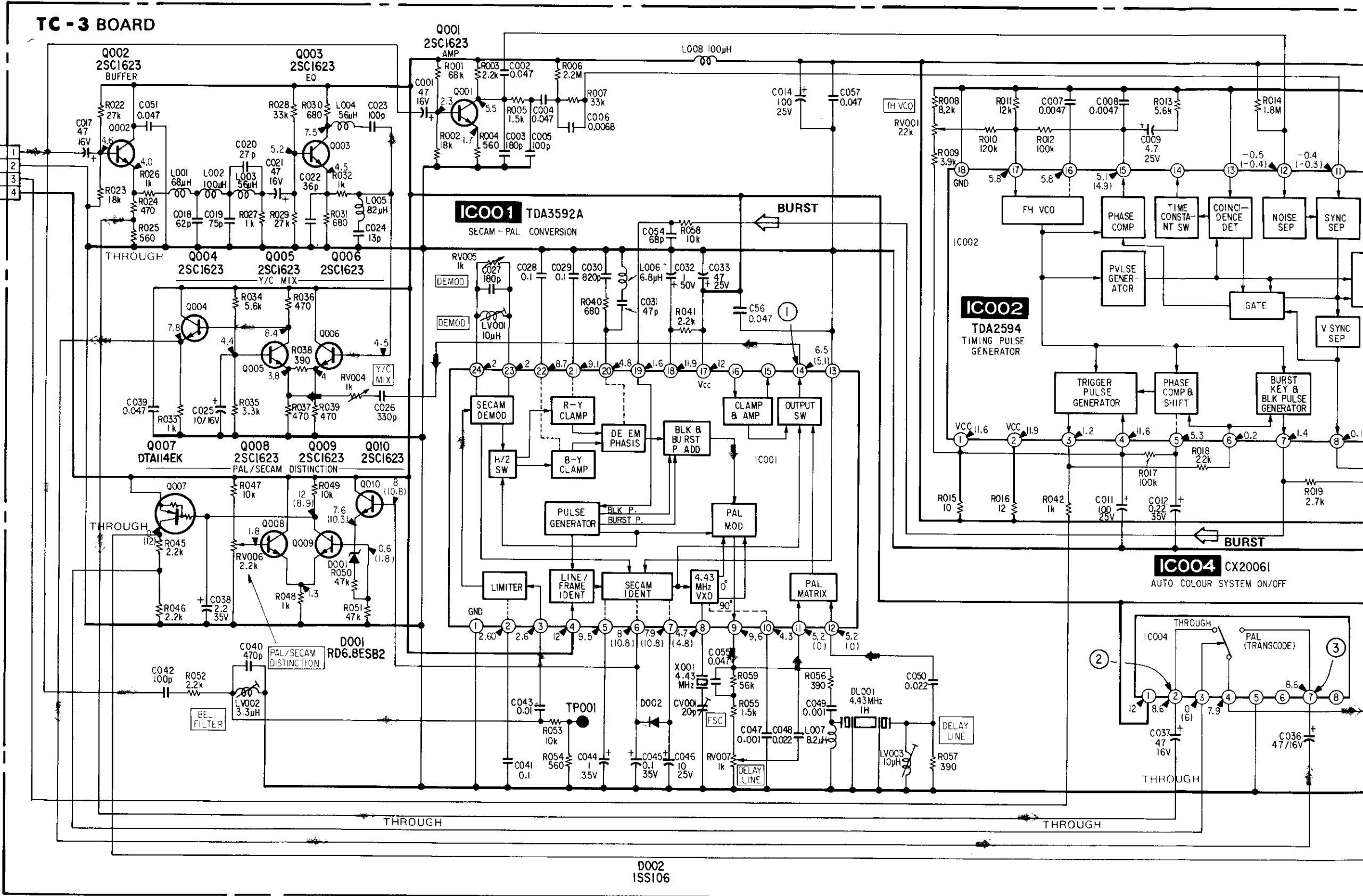
TC-3(SECAM-PAL CONVERSION) SCHEMATIC DIAGRAM (WG Model)

--Ref. No. TC-3 BOARD : 3,500 series--

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

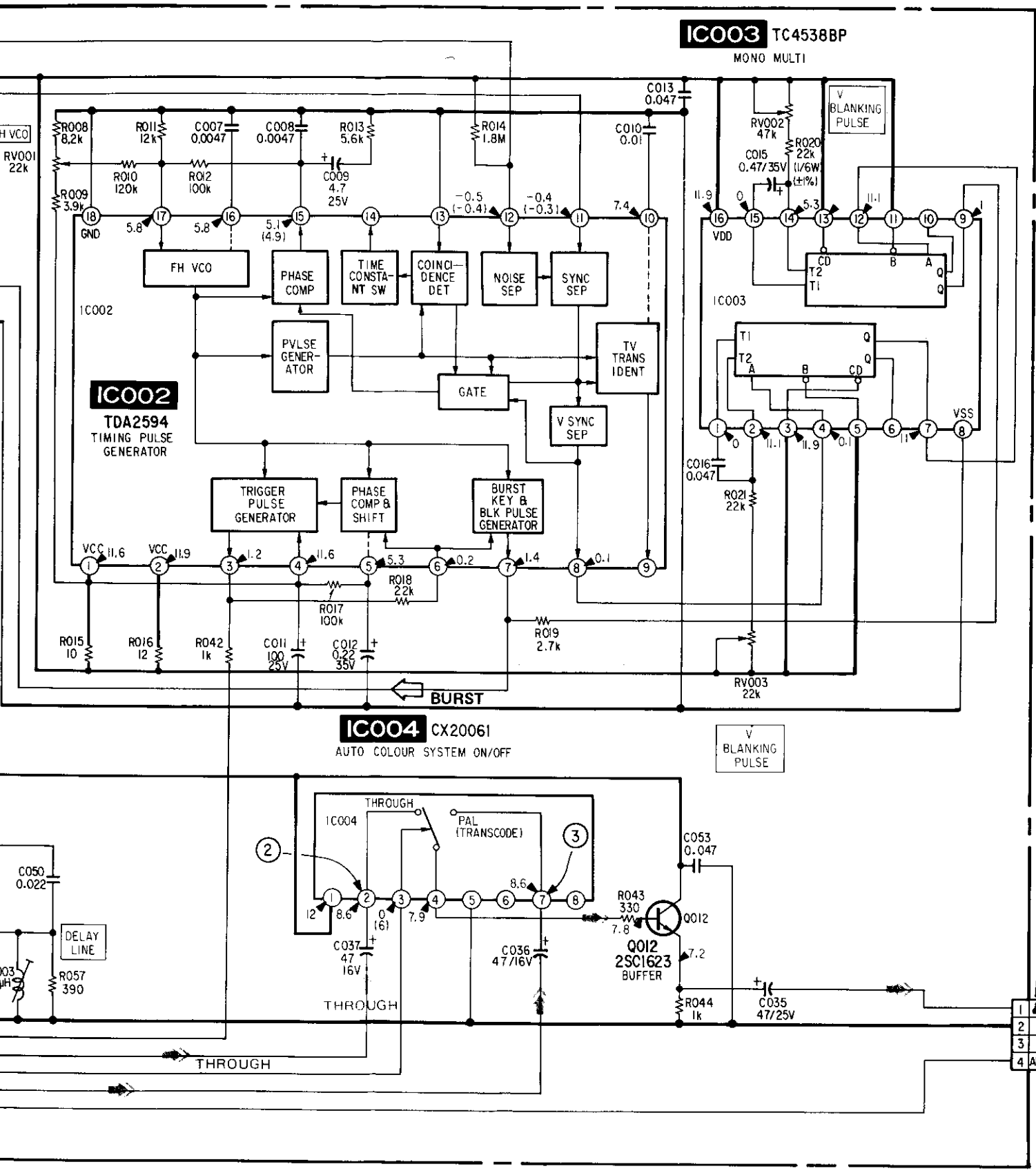
A  
B  
C  
D  
E  
F  
G  
H  
I  
J

TO VI-20 BOARD  
CN013  
(See page 109)



VIDEO(4) VIDEO(4)





**VIDEO OUT SIGNAL (AUTO COLOUR ON/OFF)**

- When ON, the signal is passing the transcoder. The PAL signal goes out unless otherwise operated wrong.
- When OFF, the signal is the THROUGH signal. Generally the PAL signal goes out, but when receiving the DDR broadcasting, the SECAM signal goes out.

1	VIDEO OUT	YEL
2	GND	GRY
3	N. C.	GRY
4	AUTO COLOUR ON/OFF	GRY

TO VI-20 BOARD  
CN012  
(See page 109)

no mark : SECAM in  
( ) : PAL in

**Note:**

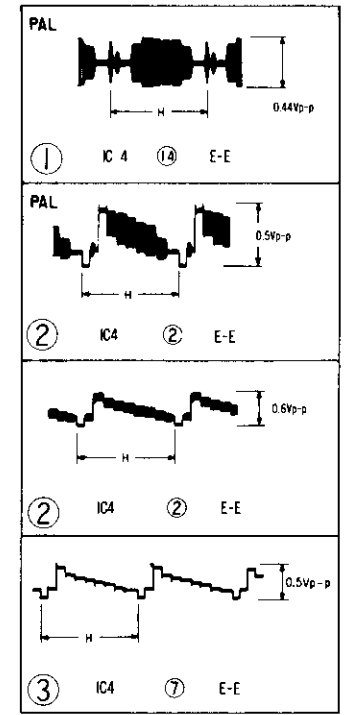
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- □ : adjustment for repair.
- — : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

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

**Signal path**

- REC Y Signal
- REC CHROMA Signal
- REC Y/CHROMA Signal

**TC - 3 BOARD**



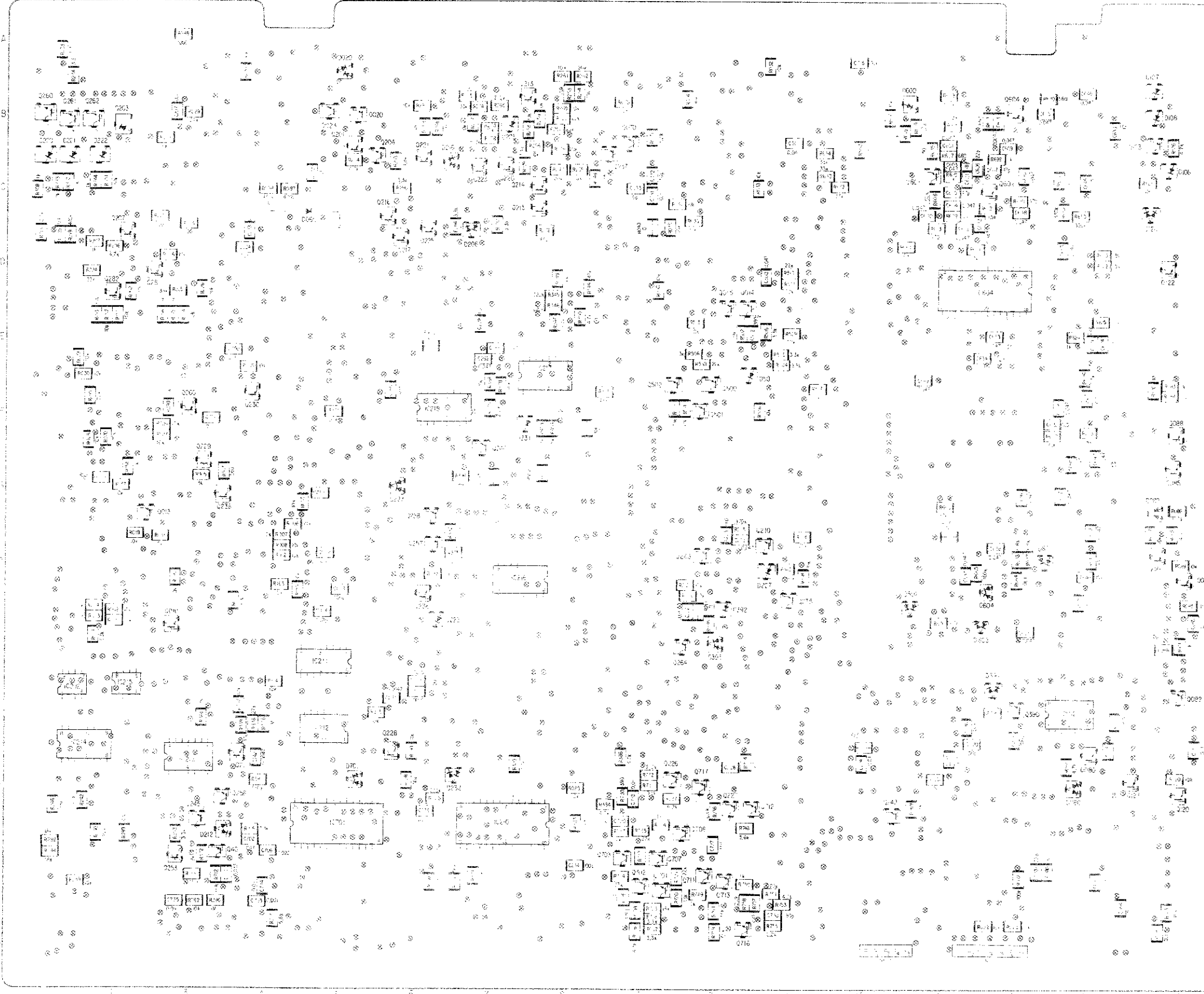


SP-2(SYSTEM CONTROL), LS-9(LOADING SWITCH), MS-4(MODE SWITCH, CONTROL MOTOR) PRINTED WIRING BOARDS

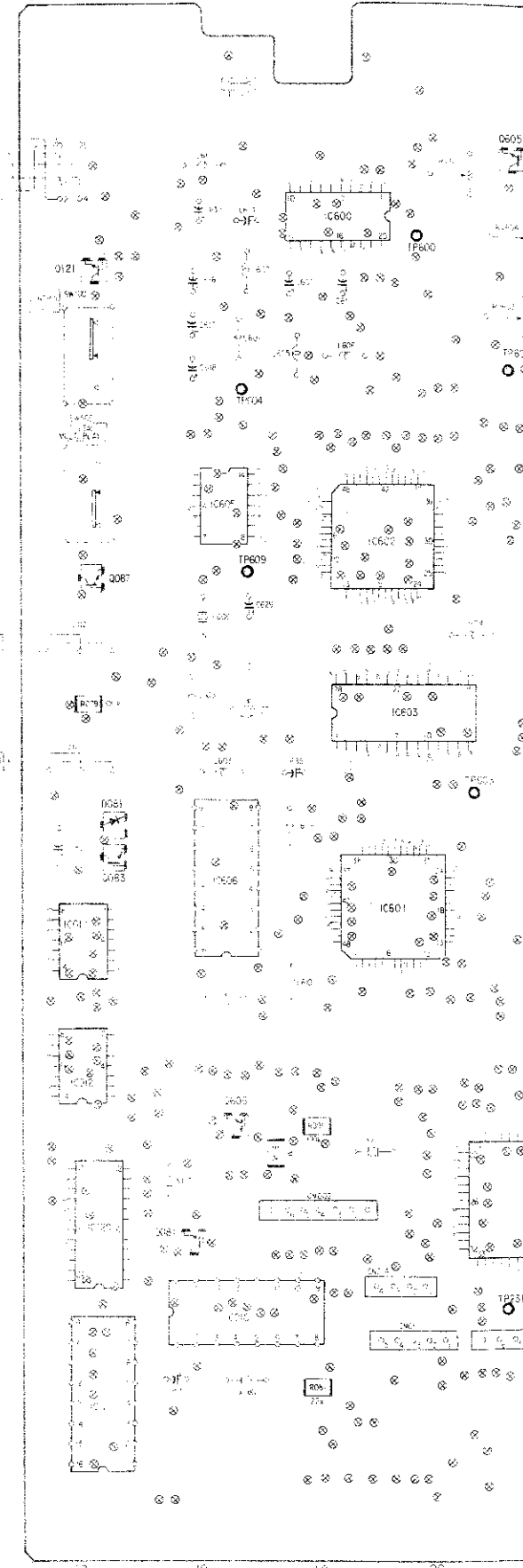
Ref. No. SP-2 BOARD 1-000-51008, LS-9 BOARD 1-000-51011, MS-4 BOARD 1-000-51012

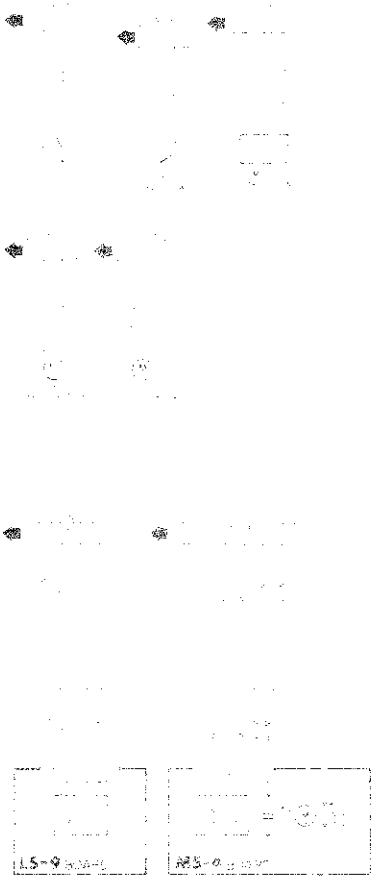
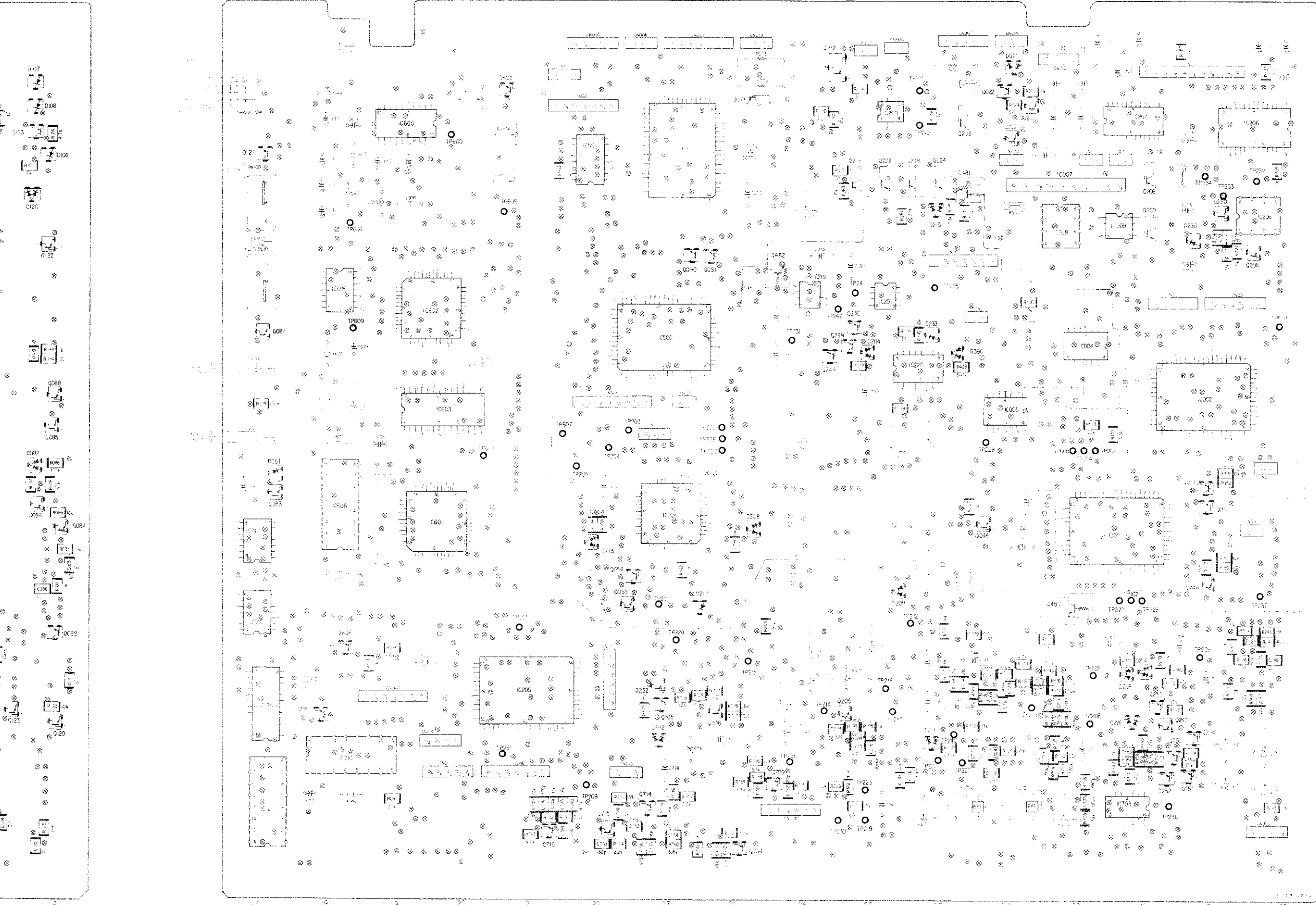
TP61 1.21  
 TP62 0.09  
 TP63 0.14  
 TP64 0.22  
 TP65 0.31  
 TP66 0.18

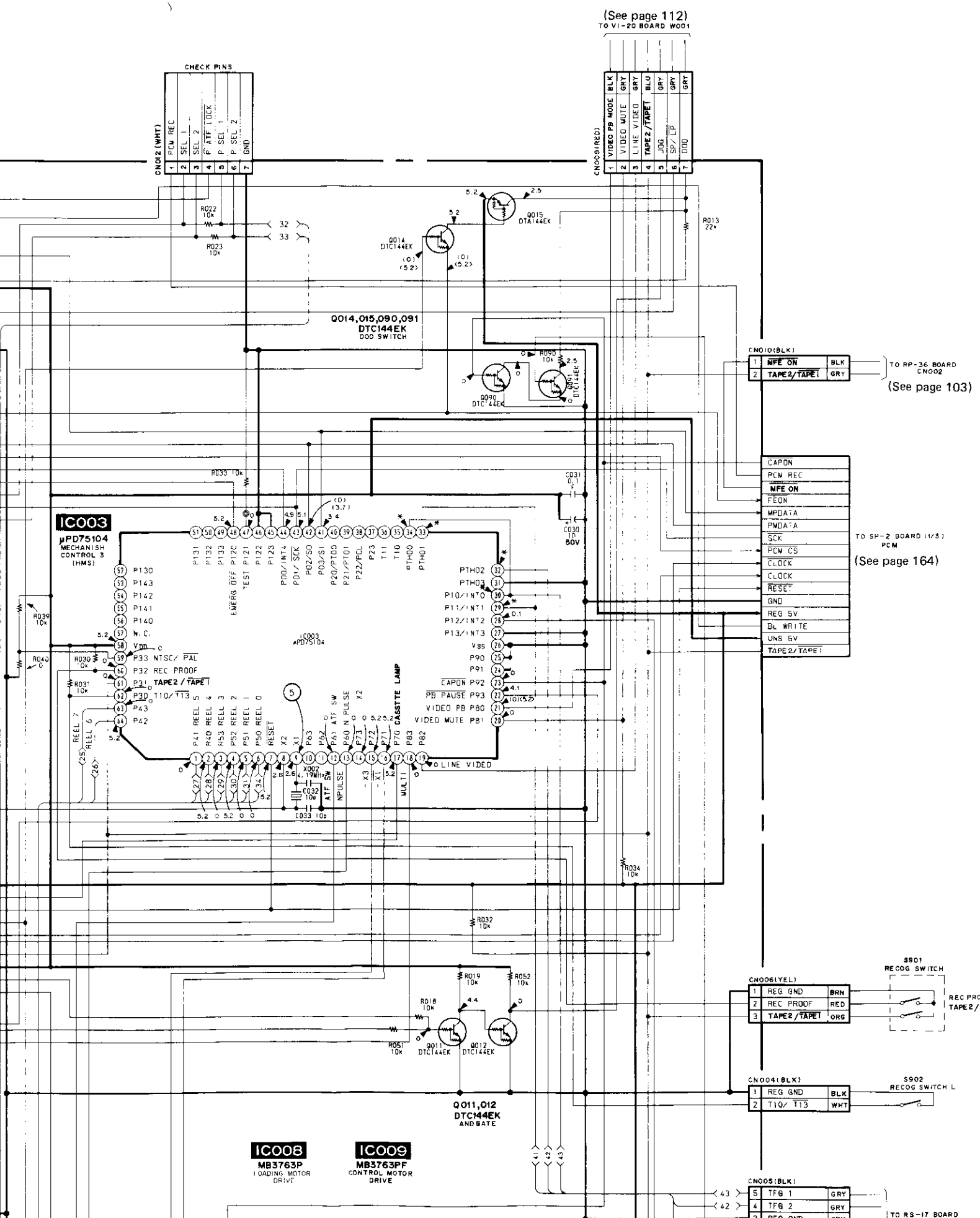
SP-2 BOARD (FOUNDER SIDE)



SP-2 BOARD (COMPONENT SIDE)



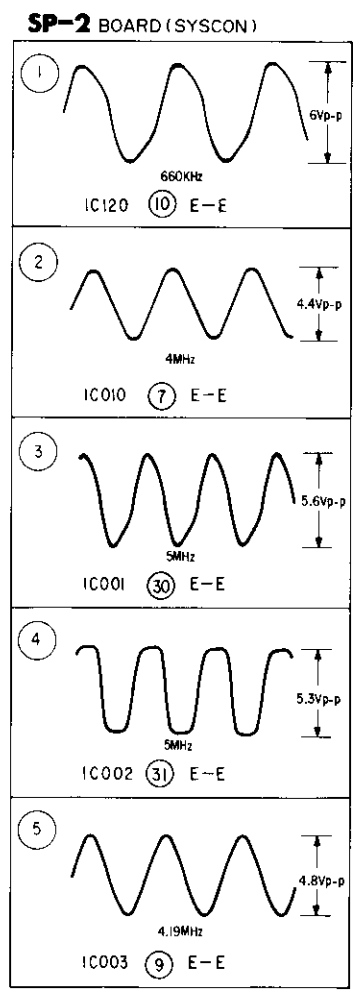




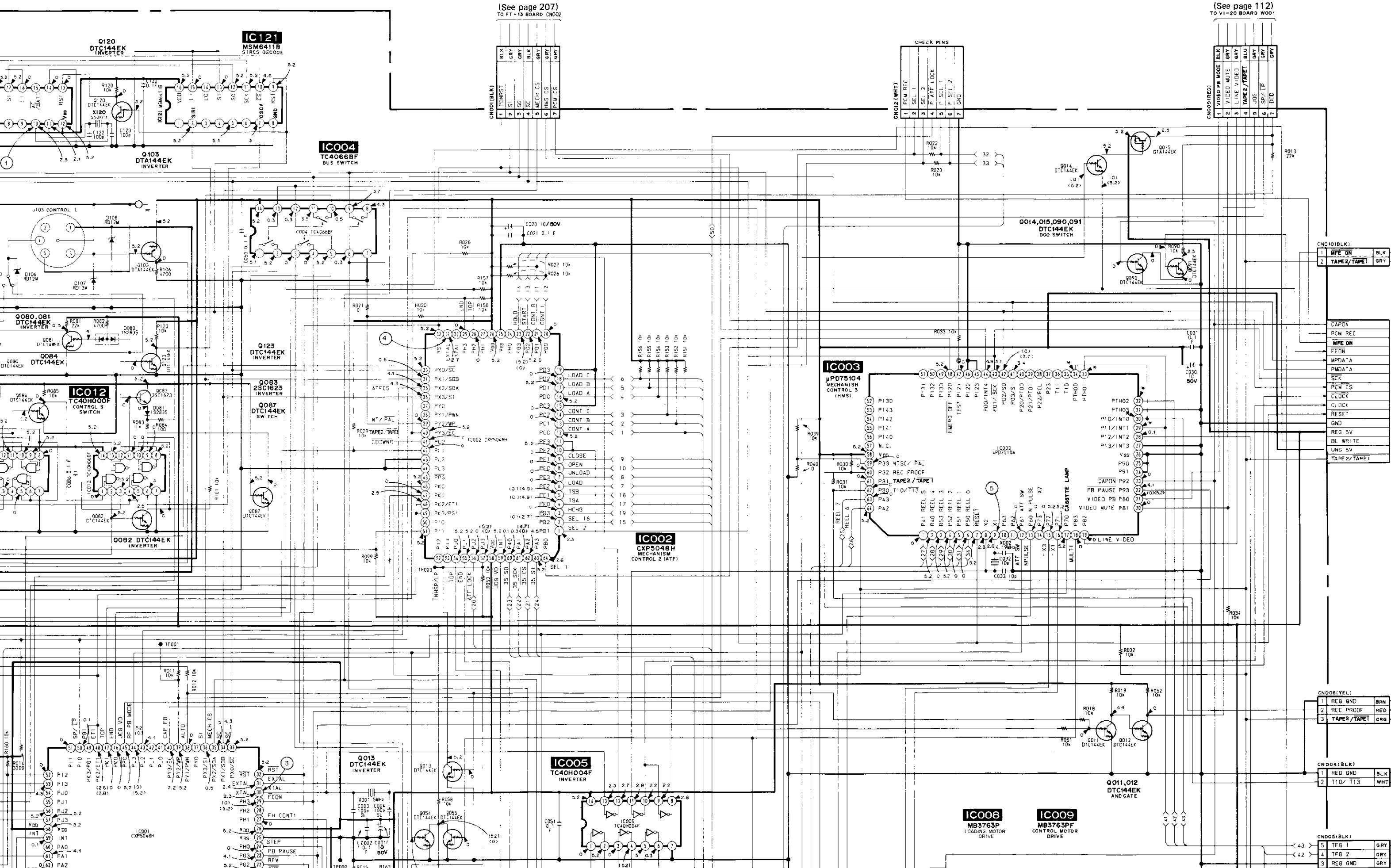
- Note:**
- Caution when replacing chip parts.  
New parts must be attached after removal of chip.  
Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
  - All resistors are in ohms, 1/10W unless otherwise noted.  
kΩ: 1000Ω, MΩ: 1000kΩ.
  - All capacitors are in µF unless otherwise noted. pF: µµF.  
50V or less are not indicated except for electrolytic and tantalums.
  - All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
  - □ : panel designation.
  - △ : internal component.
  - ◻ : adjustment for repair.
  - — : B + bus.
  - Voltages are dc with respect to ground unless otherwise noted.
  - Readings are taken with a colour-bar signal input.
  - Readings are taken with a digital multimeter (DC10MΩ).
  - Voltage variations may be noted due to normal production tolerances.

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

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



A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K



(See page 207)  
TO FT-13 BOARD CNO02

(See page 112)  
TO V1-20 BOARD W001

CNO01 (BLK)

1	PWRST	BLK
2	SI	GRY
3	SC	GRY
4	SC	BLK
5	MECH CS	GRY
6	HMS CS	GRY
7	PCM CS	GRY

CNO2 (WHT)

1	PCM REC	GRY
2	SEL 1	GRY
3	SEL 2	GRY
4	P. ATF LOCK	GRY
5	P. SEL 1	GRY
6	P. SEL 2	GRY
7	ONH	GRY

CNO03 (RED)

1	VIDEO PB MODE	BLK
2	VIDEO MUTE	GRY
3	LINE VIDEO	GRY
4	TAPE2/TAPE1	BLU
5	LOG	GRY
6	SP/LP	GRY
7	DID	GRY

CNO10 (BLK)

1	MFE ON	BLK
2	TAPE2/TAPE1	GRY

CNO10 (BLK)

1	PCM REC	BLK
2	MFE ON	BLK
3	FEDN	BLK
4	MPDATA	BLK
5	SCK	BLK
6	PCM CS	BLK
7	CLOCK	BLK
8	CLOCK	BLK
9	RESET	BLK
10	GND	BLK
11	REG 5V	BLK
12	BL WRITE	BLK
13	UNS 5V	BLK
14	TAPE2/TAPE1	BLK

CNO06 (YEL)

1	REG GND	BRN
2	REC PROOF	RED
3	TAPE2/TAPE1	ORG

CNO04 (BLK)

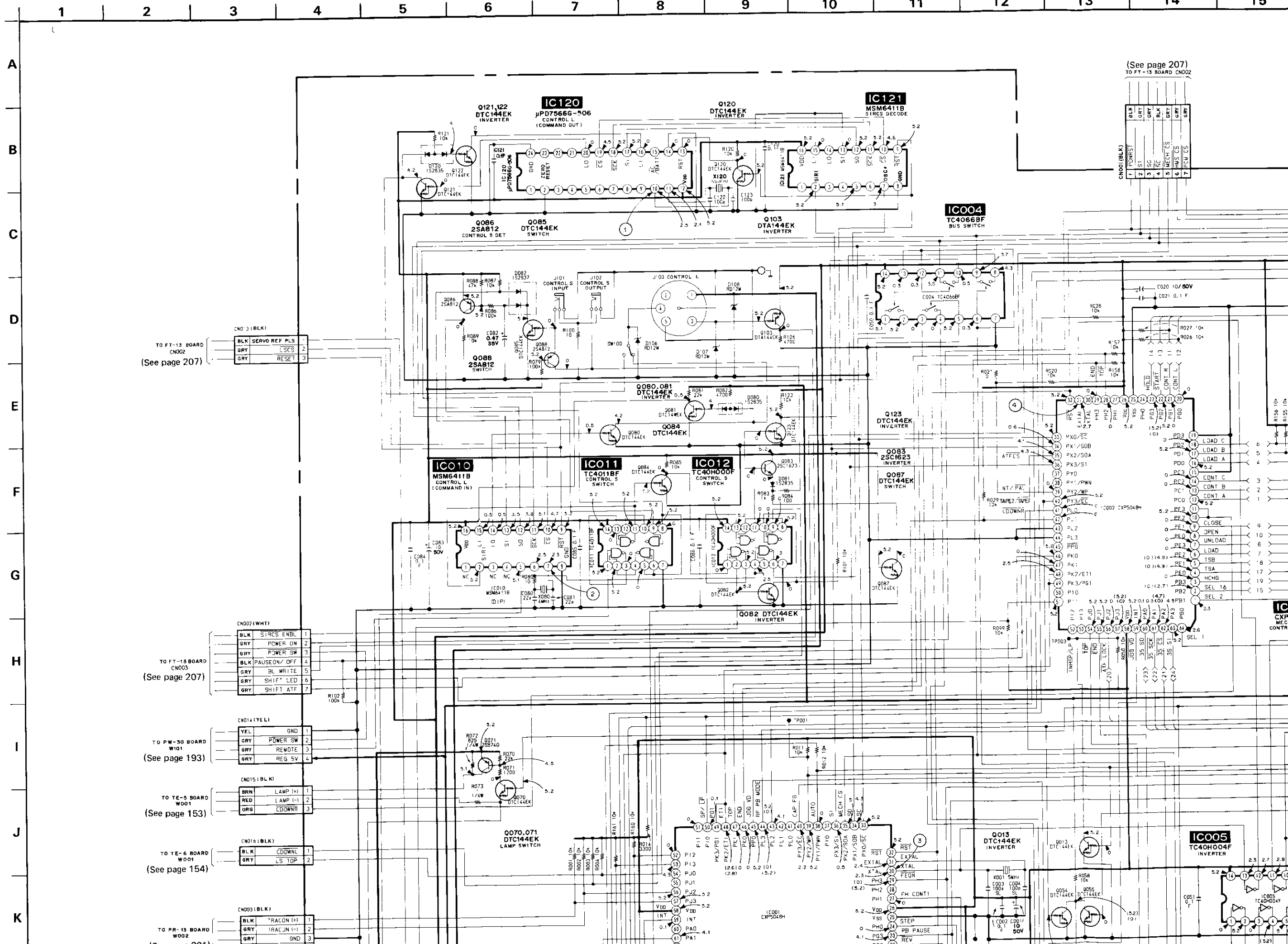
1	REG GND	BLK
2	T10/T13	WHT

CNO05 (BLK)

5	TFG 1	GRY
4	TFG 2	GRY
3	REG GND	GRY

**SP-2(SYSTEM CONTROL), LS-9(LOADING SWITCH), MS-4(MODE SWITCH, CONTROL MOTOR) SCHEMATIC DIAGRAM**

-Ref. No. SP-2 BOARD : 4,000 series, LS-9 BOARD : 5,000 series, MS-4 BOARD : 6,000 series-



(See page 207)  
TO FT-13 BOARD CN002

TO FT-13 BOARD CN002 (See page 207)

BLK	SERVO REF PLS	1
GRY	LS CS	2
GRY	RESET	3

TO FT-13 BOARD CN003 (See page 207)

BLK	SIRCS ENBL	1
GRY	POWER ON	2
GRY	POWER SW	3
BLK	PAUSEDN/ OFF	4
GRY	BL WRITE	5
GRY	SHIFT LED	6
GRY	SHIFT ATF	7

TO PW-30 BOARD W101 (See page 193)

YEL	GND	1
GRY	POWER SW	2
GRY	REMDTE	3
GRY	REG SV	4

TO TE-5 BOARD W001 (See page 153)

BRN	LAMP (+)	1
RED	LAMP (-)	2
ORG	CDDWR	3

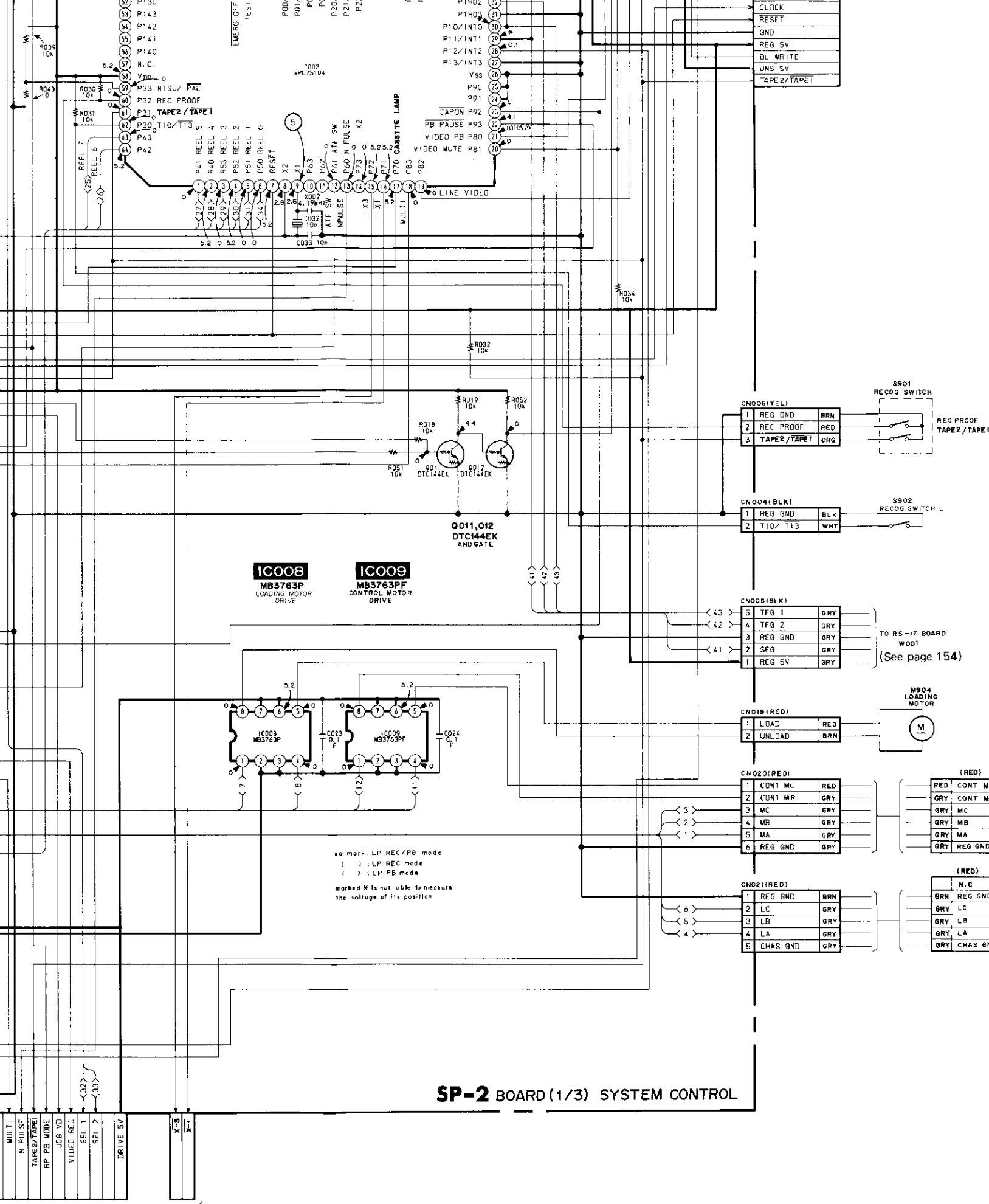
TO TE-6 BOARD W001 (See page 154)

BLK	CDDWNL	1
GRY	LS TOP	2

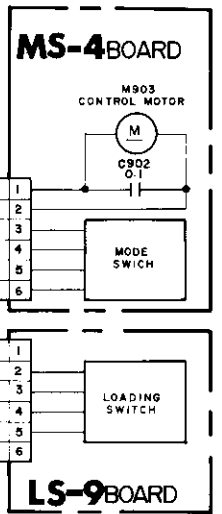
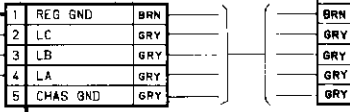
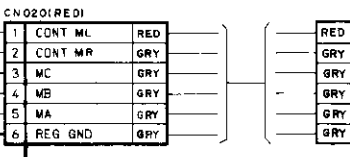
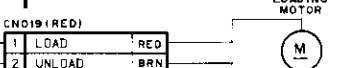
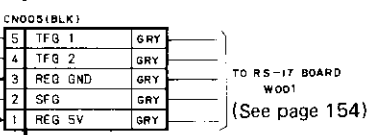
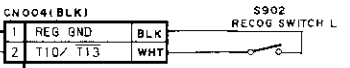
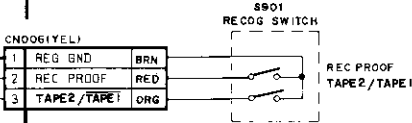
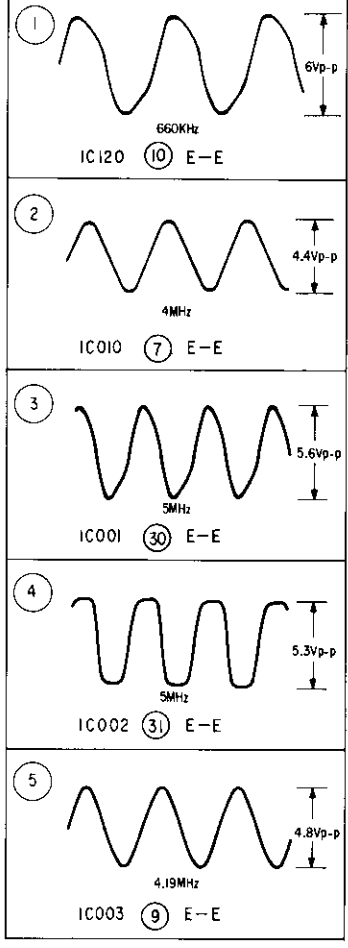
TO PR-13 BOARD W002

BLK	TRACON (+)	1
GRY	TRACON (-)	2
GRY	GND	3

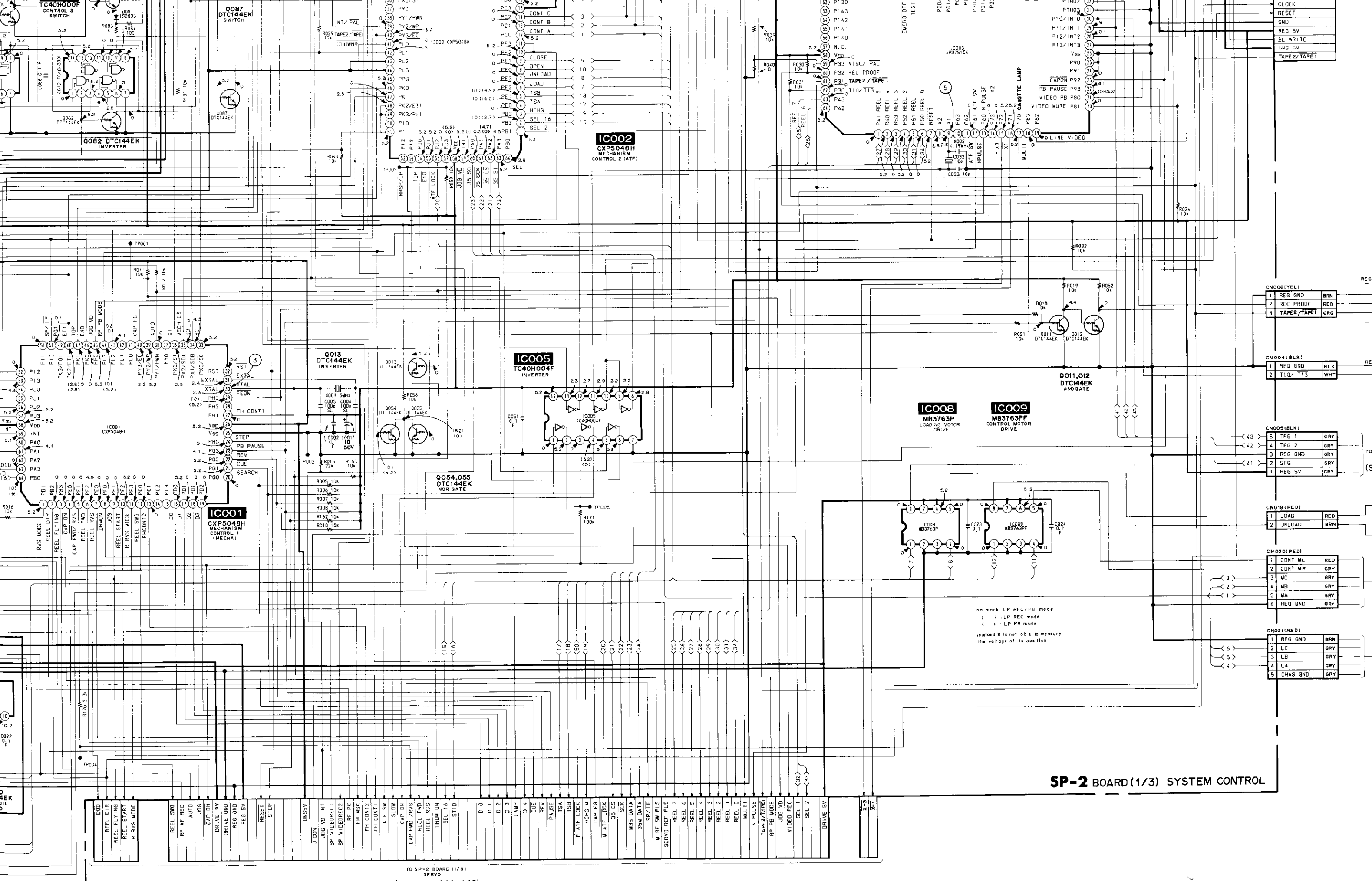
IC005  
CXP504BH  
MECHA  
CONTROL



SP-2 BOARD (1/3) SYSTEM CONTROL





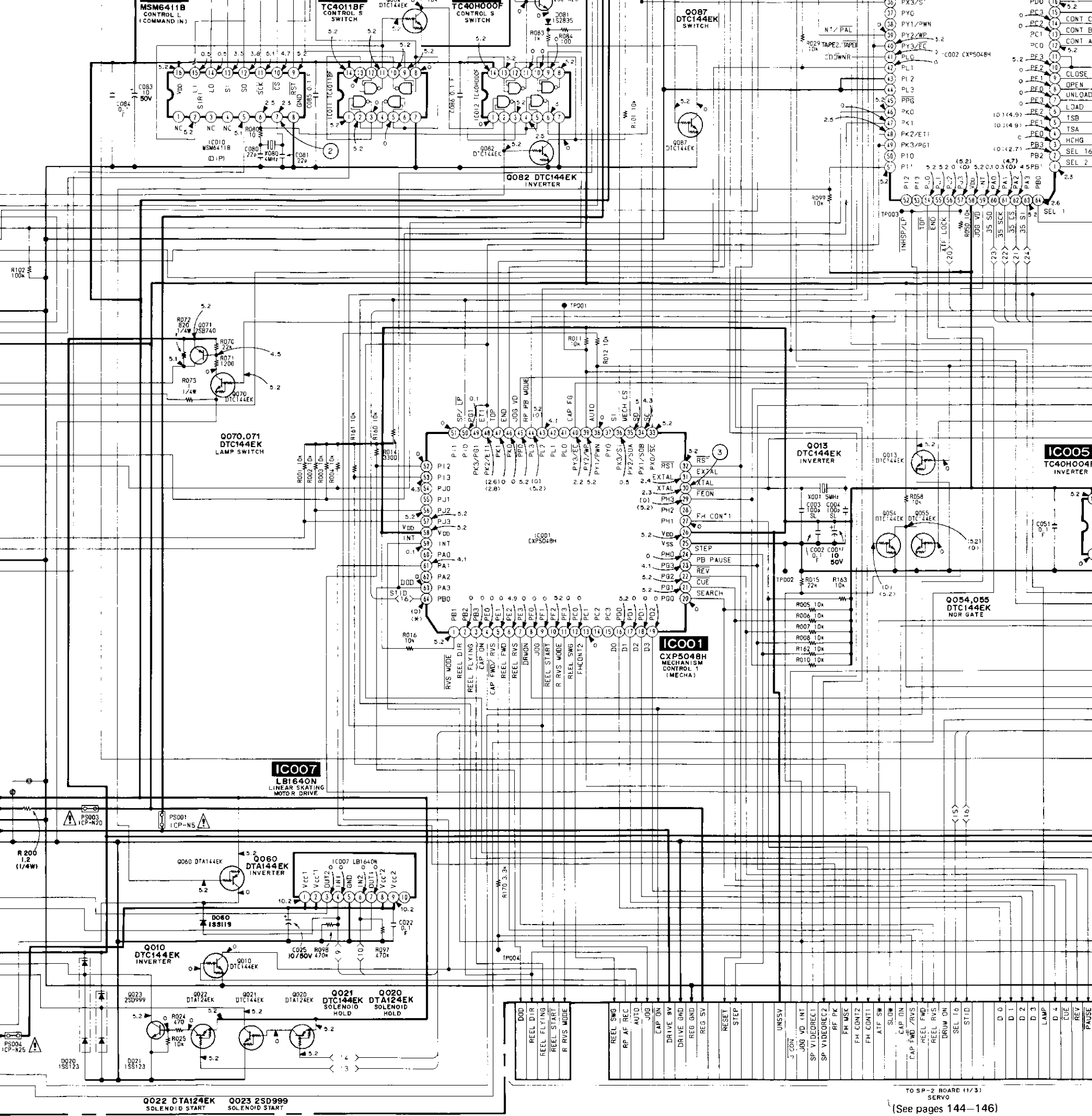
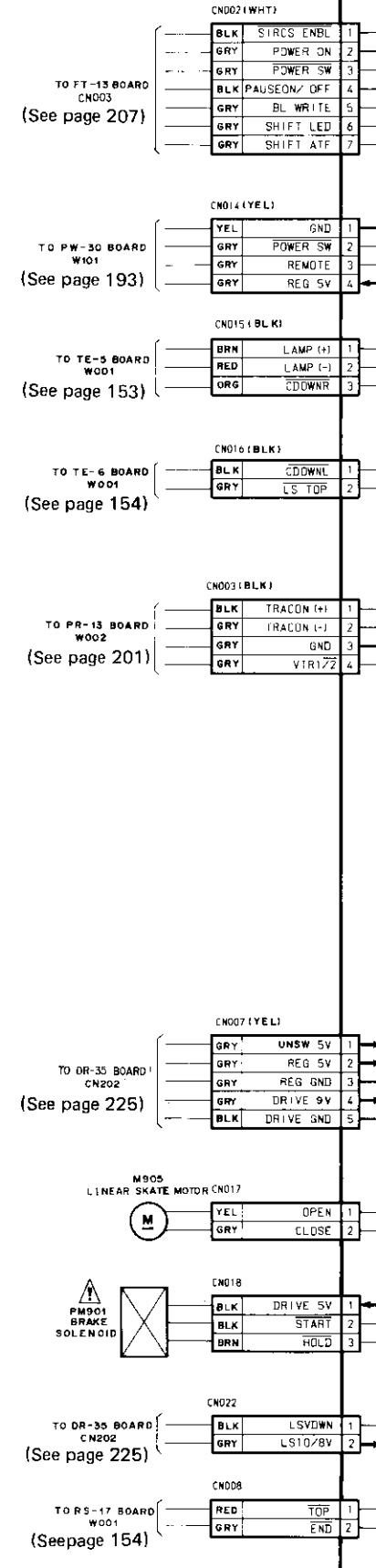


**SP-2 BOARD (1/3) SYSTEM CONTROL**

TO SP-2 BOARD (1/3)  
SERVO  
(See pages 144-146)

no mark: LP REC/PB mode  
( ) : LP REC mode  
< > : LP PB mode  
marked M is not able to measure  
the voltage of its position

F  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P



SYSTEM CONTROL SYSTEM CONTROL

Note:

- Indicates a lead wire mounted on the component side
- Indicates a lead wire mounted on the printed side
- Through hole.
- Pattern from the side which enables seeing.

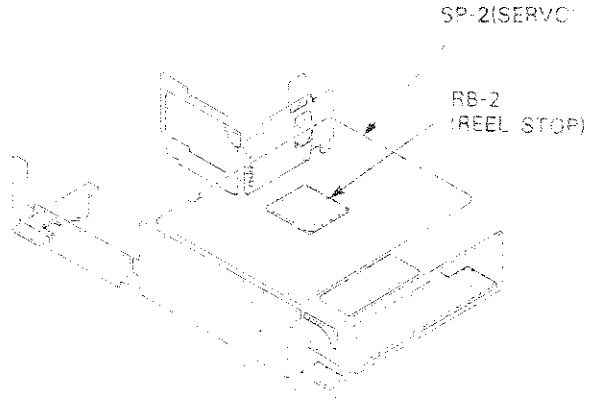
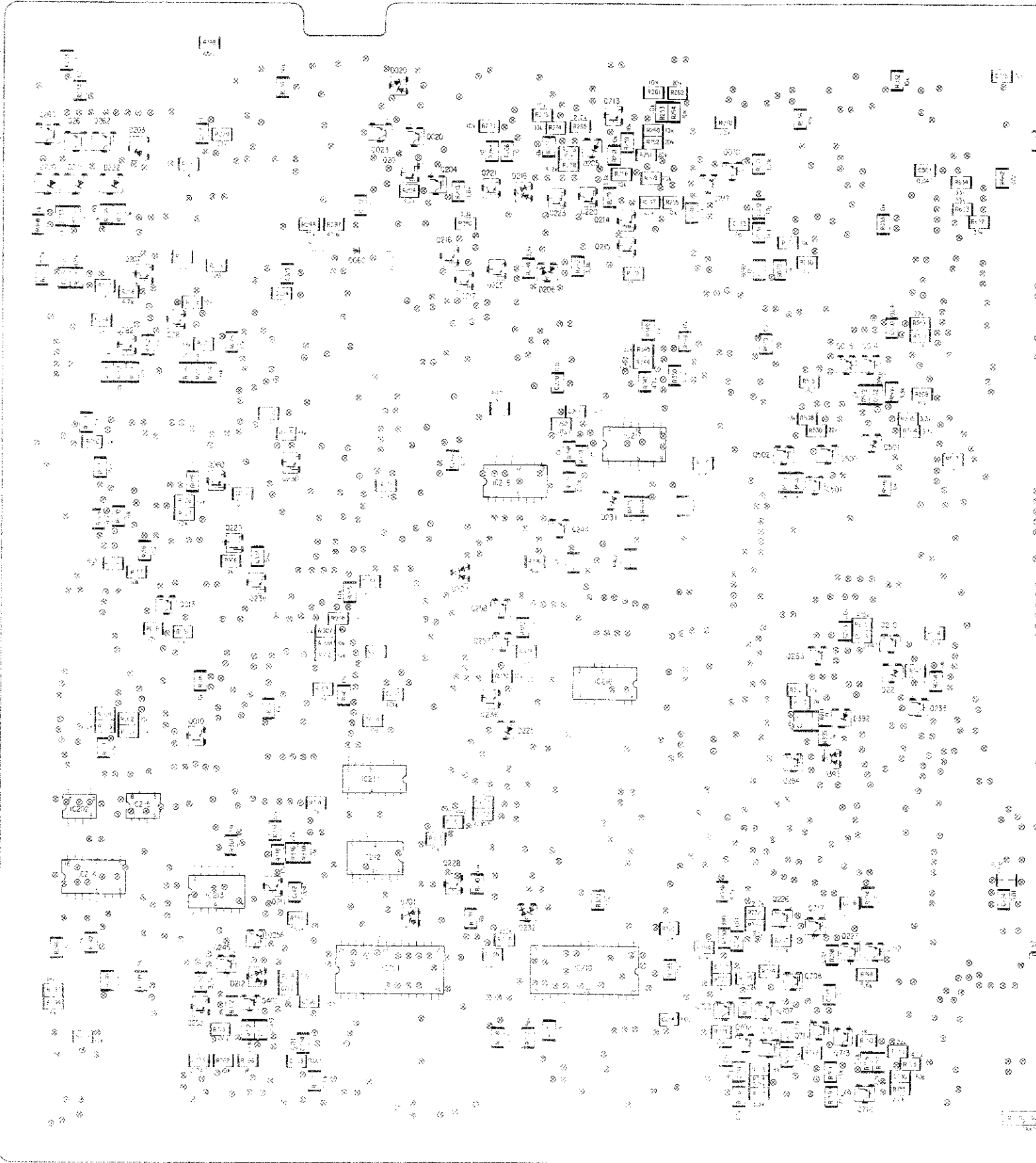
D021	A 3	C015	F 1	Q101	L 4
D021	A 2K	Q011	H 21	Q090	F 11
D060	C 4	Q012	H 21	Q011	F 10
D080	K 13	Q013	C 3	Q022	F 9
D081	G 17	Q014	D 13	Q031	C 13
D087	G 16	Q015	D 13	Q032	C 14
D100	C 16	Q027	B 8	Q034	B 14
F100	B 11	Q021	B 28	Q035	B 11
D120	C 18	Q022	B 1K	Q036	L 12
D091	B 2	Q023	B 7	Q031	L 9
D054	F 25	Q024	L 21	Q032	L 9
D085	B 7	Q025	L 22	L 23	L 4
D001	D 7	Q026	F 3	Q034	M 24
D004	H 24	Q027	B 9	Q035	K 23
D005	L 26	Q028	H 24	Q036	K 24
D011	K 27	Q029	K 15	Q037	L 5
D117	L 3	Q030	L 16	Q038	L 10
D013	L 22	Q031	H 17	Q039	L 25
D014	L 20	Q032	H 17	Q040	M 21
D119	G 27	Q033	L 17	Q041	L 21
D115	C 15	Q034	C 13	Q042	K 11
D117	L 4	Q035	L 17	Q043	L 12
D118	K 14	Q036	F 11	Q044	L 12
D116	B 1	Q037	D 21	Q045	M 10
D011	B 1	Q038	B 24	Q046	K 10
D021	B 1	Q039	B 17	Q047	K 10
D117	L 4	Q040	K 17	Q048	L 24
D021	K 32	Q041	C 17	Q049	L 24
D027	L 11	Q042	K 17	Q050	L 24
D031	C 14	Q043	B 3	Q051	L 24
D031	F 7	Q044	B 24	Q052	L 24
D031	K 7	Q045	B 21	Q053	L 24
D032	L 17	Q046	F 1	Q054	L 24
D033	F 21	Q047	K 25	Q055	L 24
D041	L 4	Q048	L 8	Q056	M 12
D041	L 4	Q049	C 7	Q057	L 24
D041	L 4	Q050	C 7	Q058	L 24
D041	L 4	Q051	C 7	Q059	L 24
D041	L 4	Q052	C 7	Q060	L 24
D041	L 4	Q053	C 7	Q061	L 24
D041	L 4	Q054	C 7	Q062	L 24
D041	L 4	Q055	C 7	Q063	L 24
D041	L 4	Q056	C 7	Q064	L 24
D041	L 4	Q057	C 7	Q065	L 24
D041	L 4	Q058	C 7	Q066	L 24
D041	L 4	Q059	C 7	Q067	L 24
D041	L 4	Q060	C 7	Q068	L 24
D041	L 4	Q061	C 7	Q069	L 24
D041	L 4	Q062	C 7	Q070	L 24
D041	L 4	Q063	C 7	Q071	L 24
D041	L 4	Q064	C 7	Q072	L 24
D041	L 4	Q065	C 7	Q073	L 24
D041	L 4	Q066	C 7	Q074	L 24
D041	L 4	Q067	C 7	Q075	L 24
D041	L 4	Q068	C 7	Q076	L 24
D041	L 4	Q069	C 7	Q077	L 24
D041	L 4	Q070	C 7	Q078	L 24
D041	L 4	Q071	C 7	Q079	L 24
D041	L 4	Q072	C 7	Q080	L 24
D041	L 4	Q073	C 7	Q081	L 24
D041	L 4	Q074	C 7	Q082	L 24
D041	L 4	Q075	C 7	Q083	L 24
D041	L 4	Q076	C 7	Q084	L 24
D041	L 4	Q077	C 7	Q085	L 24
D041	L 4	Q078	C 7	Q086	L 24
D041	L 4	Q079	C 7	Q087	L 24
D041	L 4	Q080	C 7	Q088	L 24
D041	L 4	Q081	C 7	Q089	L 24
D041	L 4	Q082	C 7	Q090	L 24
D041	L 4	Q083	C 7	Q091	L 24
D041	L 4	Q084	C 7	Q092	L 24
D041	L 4	Q085	C 7	Q093	L 24
D041	L 4	Q086	C 7	Q094	L 24
D041	L 4	Q087	C 7	Q095	L 24
D041	L 4	Q088	C 7	Q096	L 24
D041	L 4	Q089	C 7	Q097	L 24
D041	L 4	Q090	C 7	Q098	L 24
D041	L 4	Q091	C 7	Q099	L 24
D041	L 4	Q092	C 7	Q100	L 24

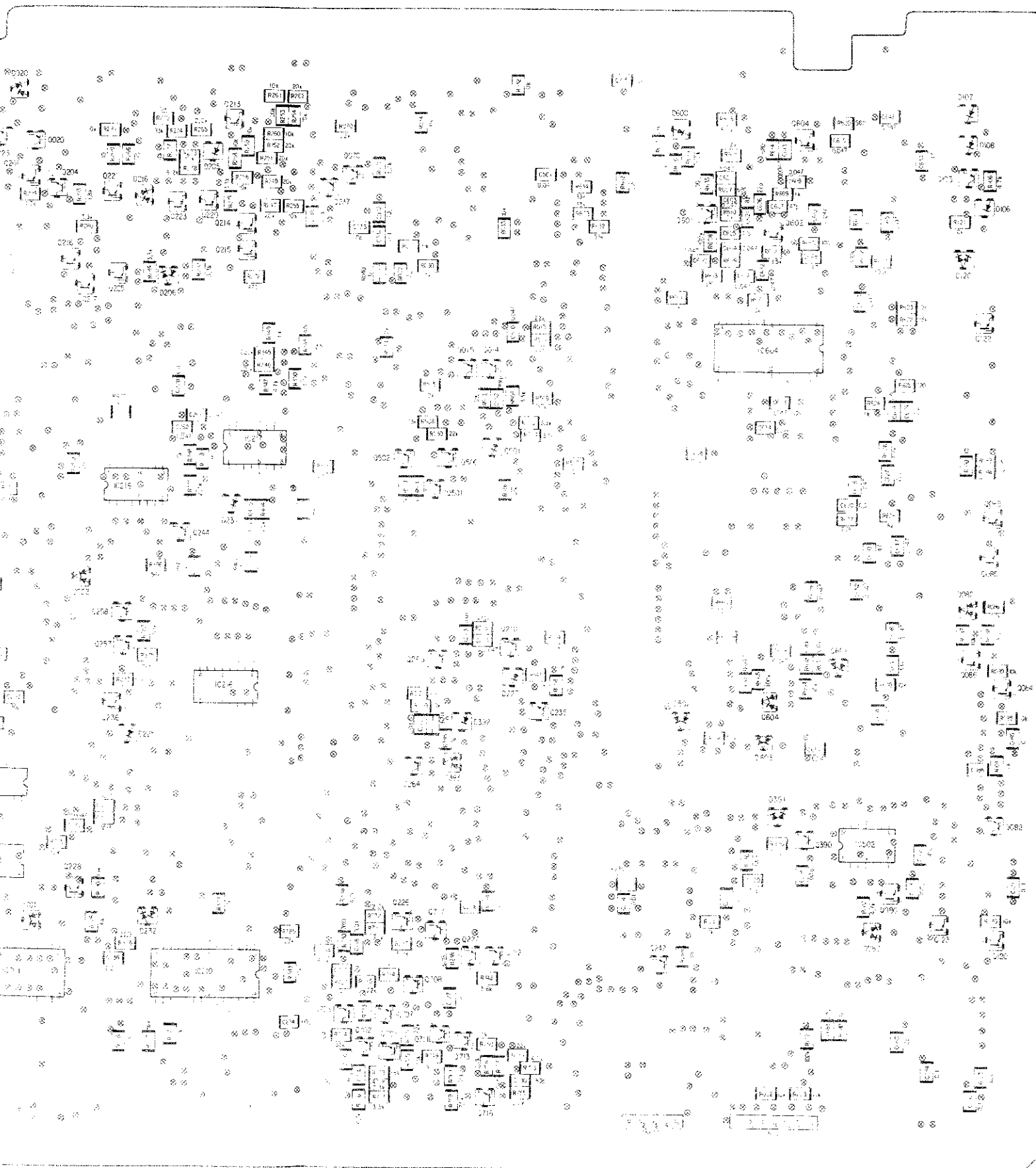
TP247	F 26
TP242	C 21
TP244	B 18
TP245	L 17
TP246	C 11
TP248	F 18

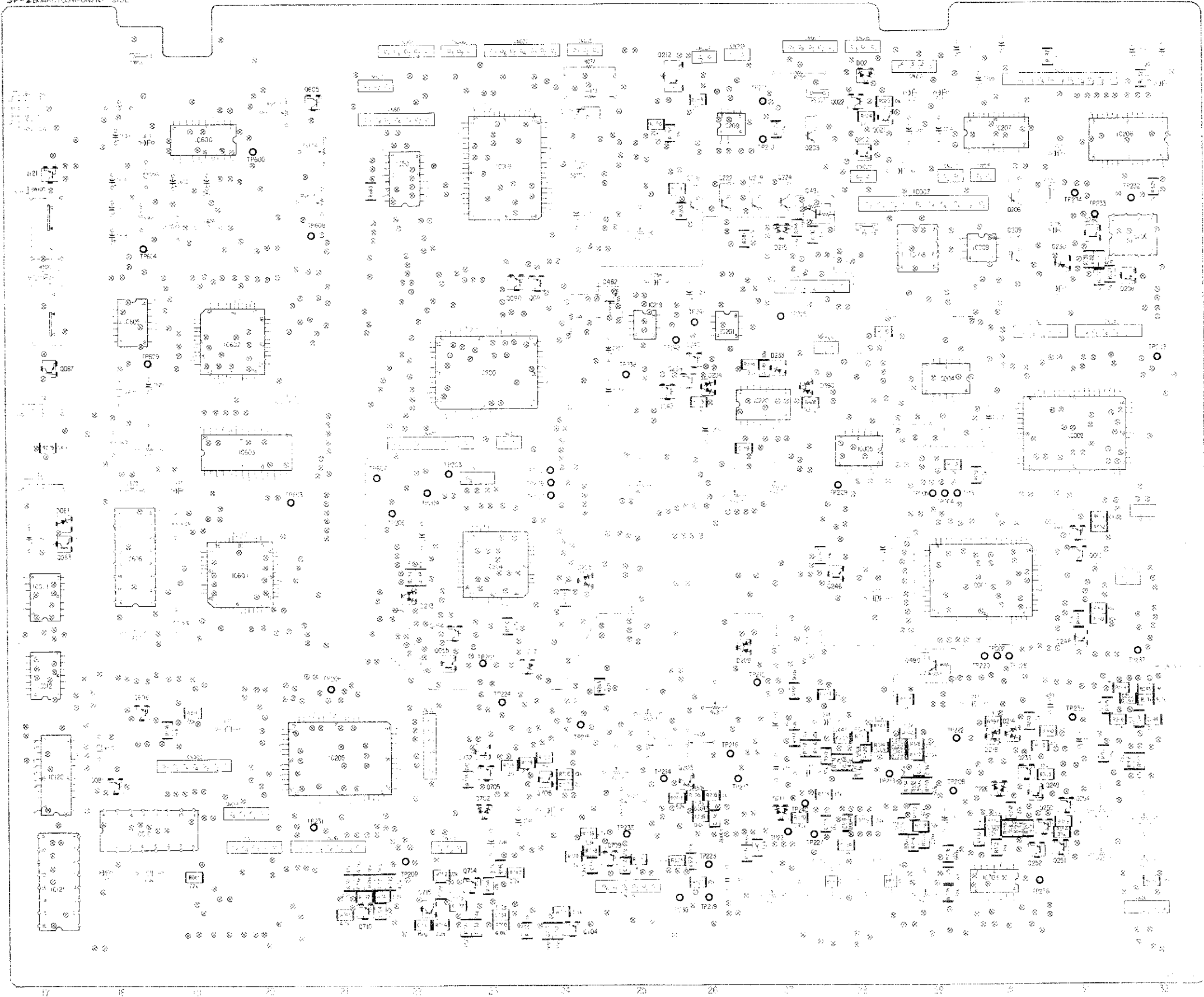
SP-2(SERVO), RB-2(REEL STOP) PRINTED WIRING BOARDS

Ref. No. SP-2 BOARD: 1100 series, RB-2 BOARD: 11000 series

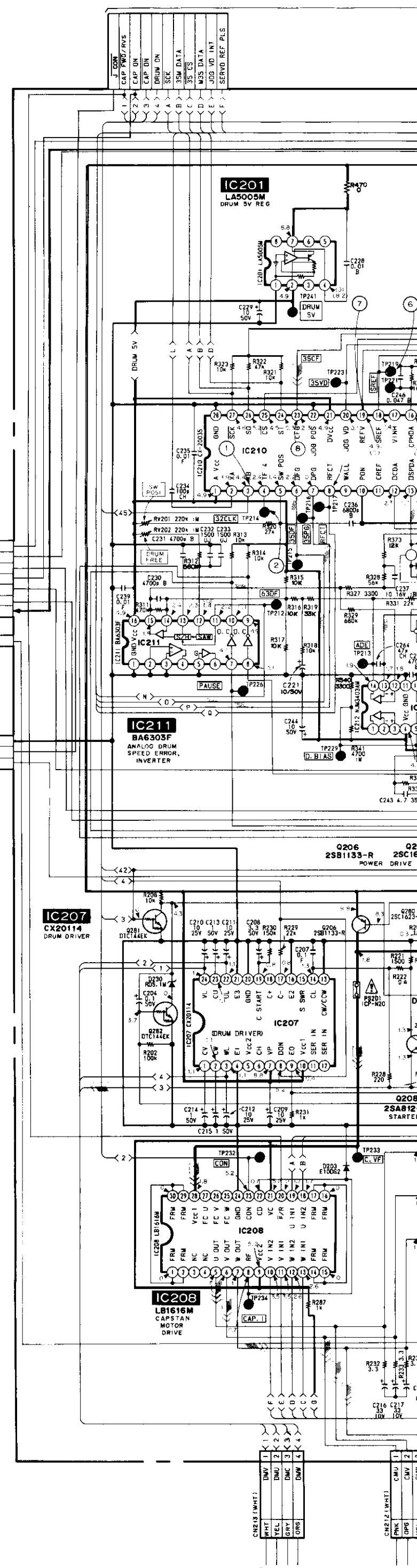
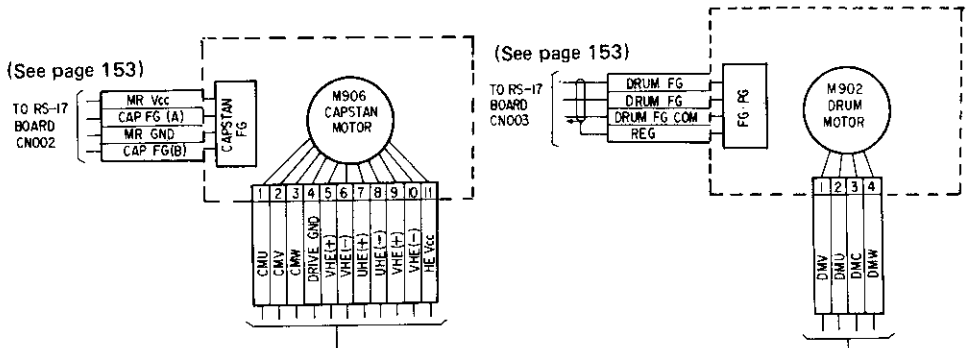
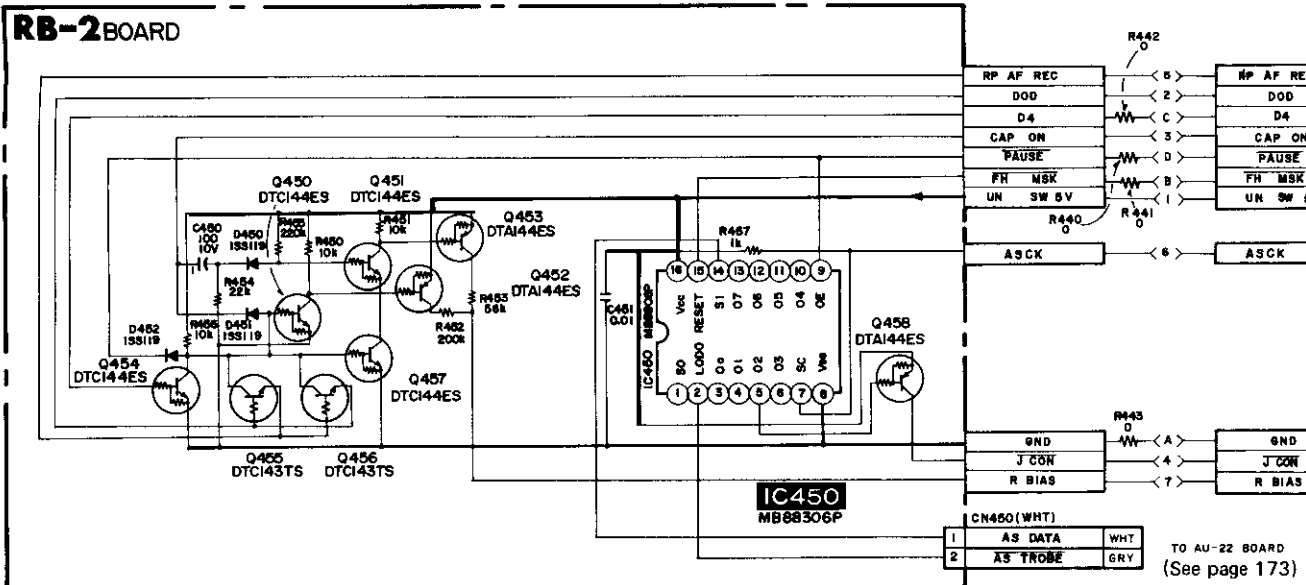
SP-2 BOARD(SOLDER SIDE)

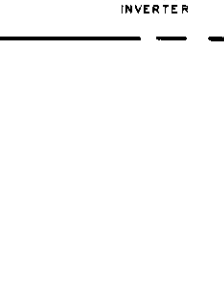
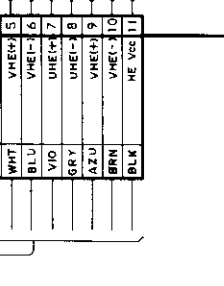
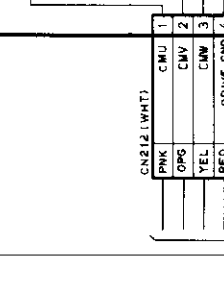
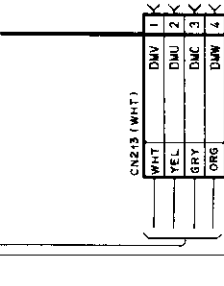
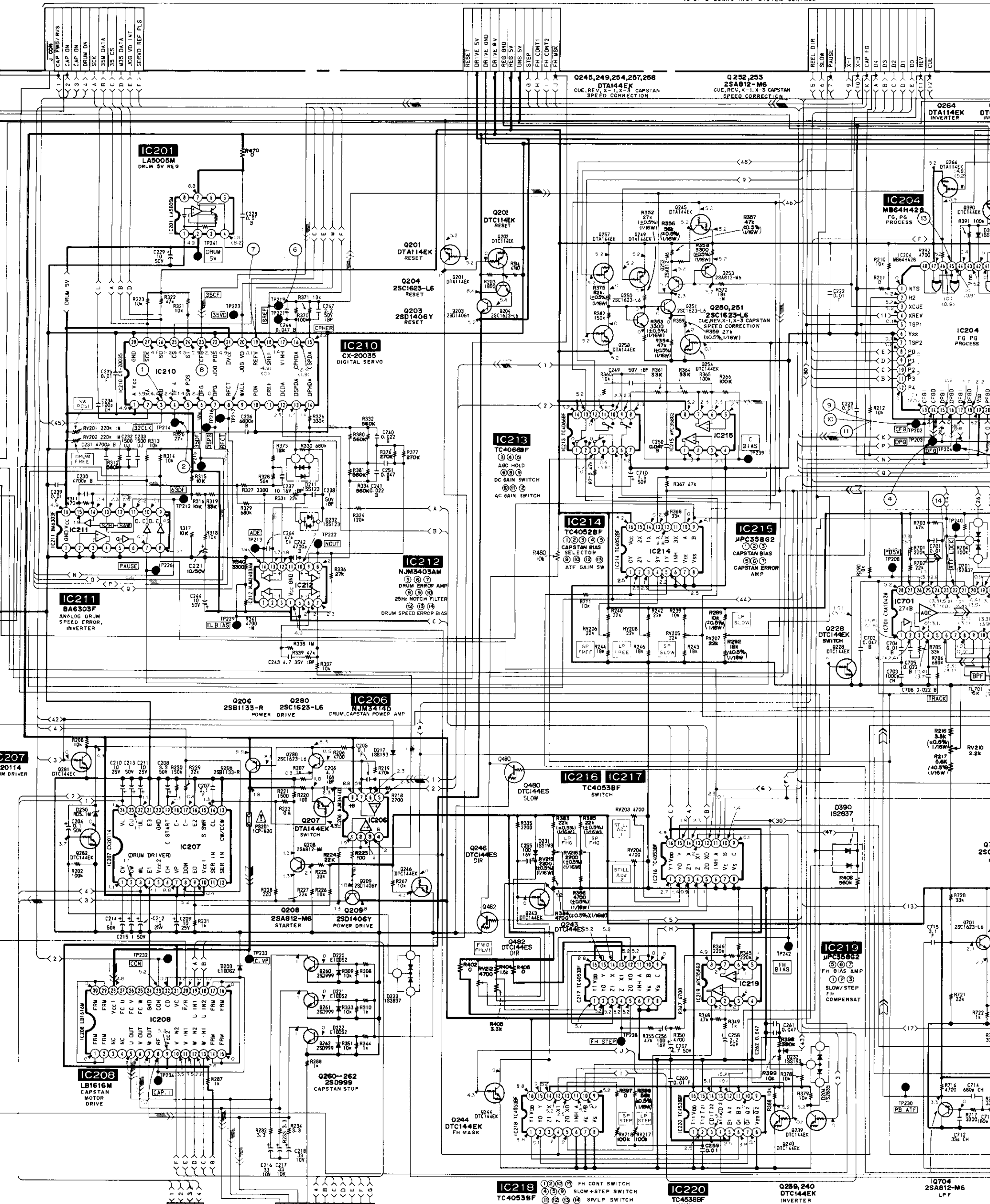


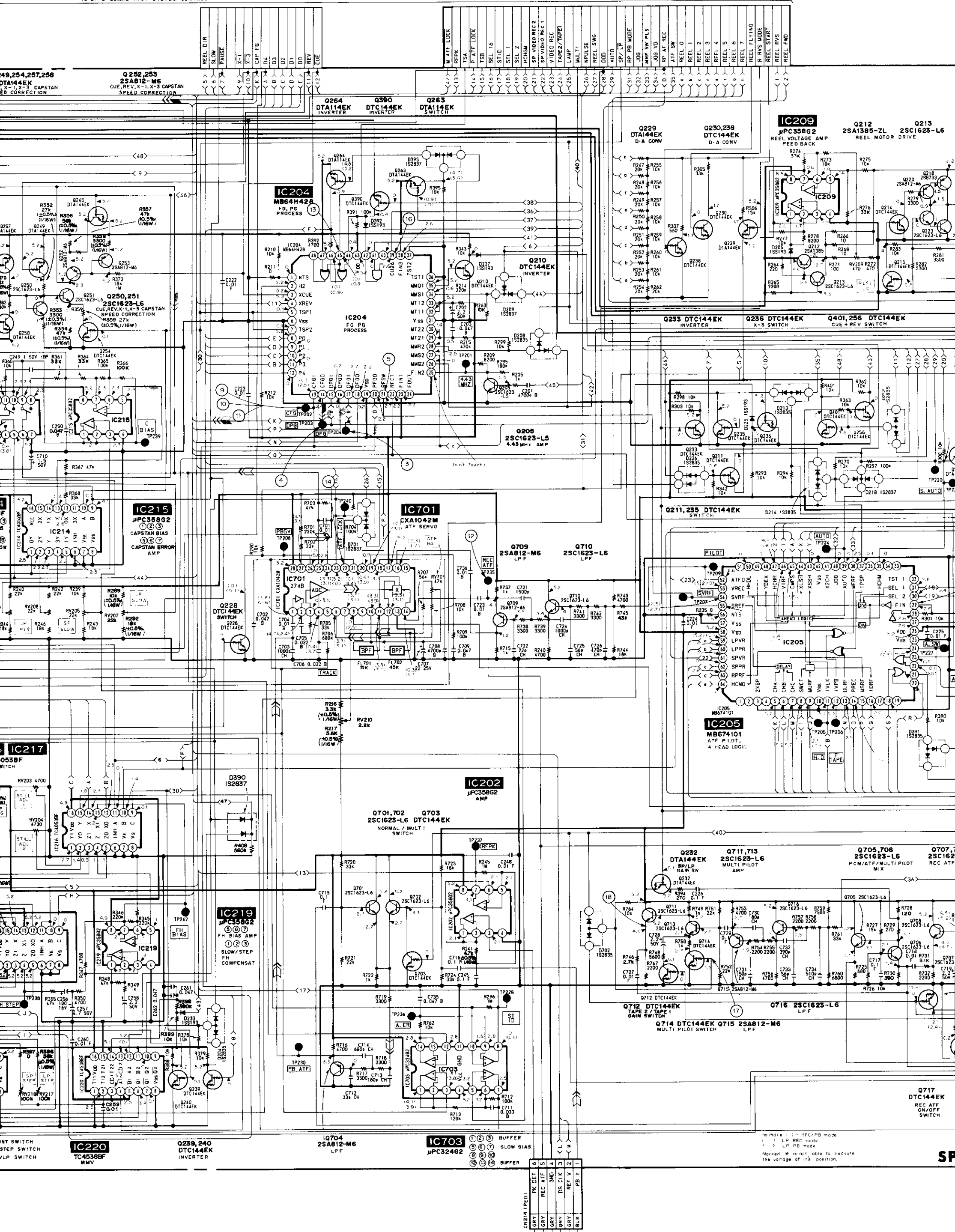




A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P

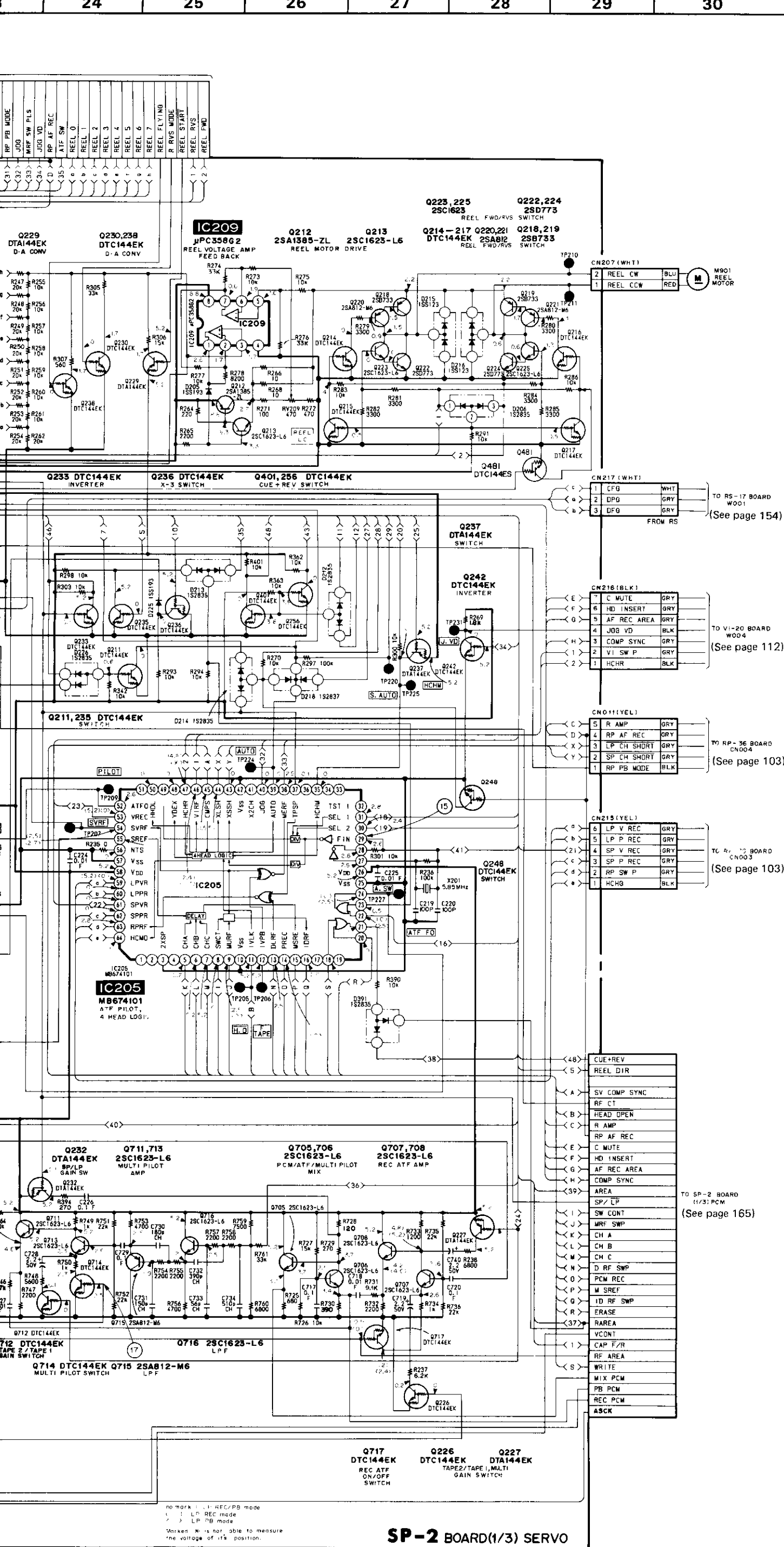






\* to mark: 1 - REC/PB mode  
 2 - LP REC mode  
 3 - LP PB mode  
 Marked \* is not able to measure the voltage of it's position.





- Note:
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
  - All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
  - All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic and tantalums.
- A
- □ : panel designation.
  - △ : internal component.
  - ◻ : adjustment for repair.
  - — : B + bus.
- B
- Voltages are dc with respect to ground unless otherwise noted.
  - Readings are taken with a colour-bar signal input.
  - Readings are taken with a digital multimeter (DC10MΩ).
  - Voltage variations may be noted due to normal production tolerances.
- C

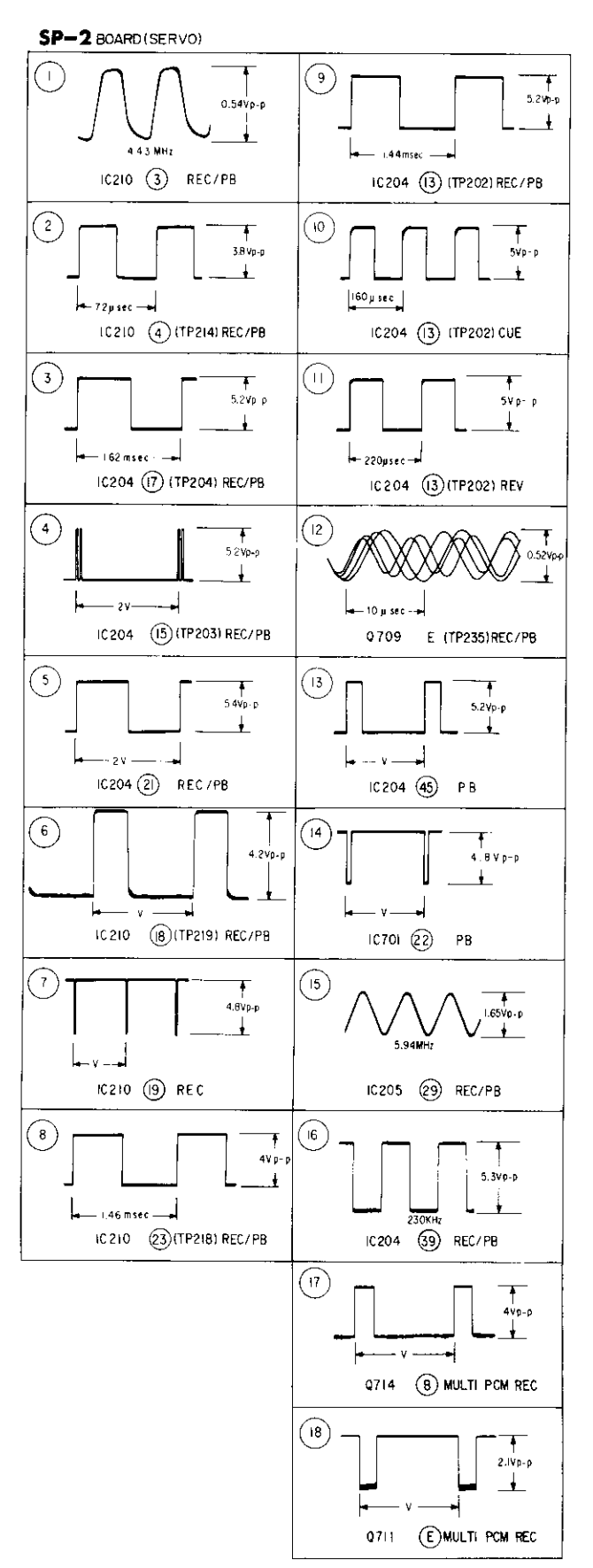
Note: The components identified by shading and mark **▲** are critical for safety. Replace only with part number specified.

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

E

Signal path

	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)			
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)			



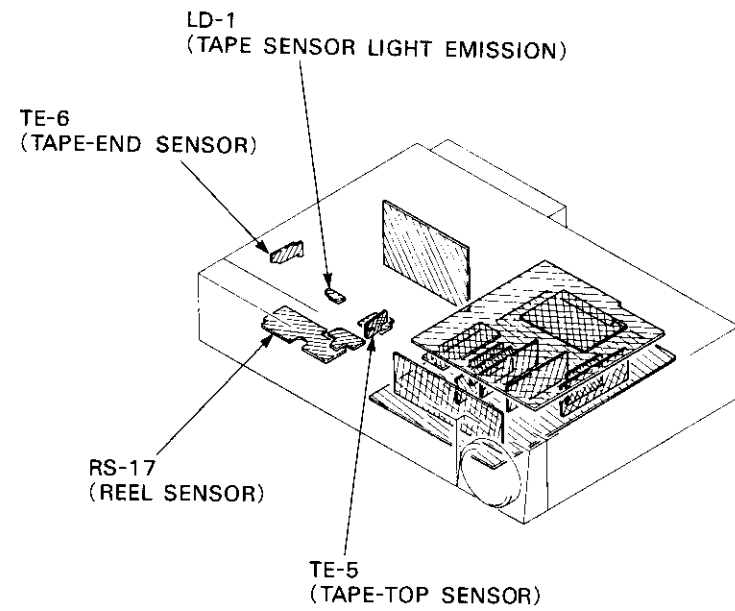
SP-2 BOARD(1/3) SERVO

**Note:**

- ○ - : Indicates a lead wire mounted on the component side.
- ● - : Indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- \* : Pattern from the side which enables seeing.
- : Pattern of the rear side.
- : B+ pattern from the side which enables seeing.
- Digital transistor (RS-17:Q001,002,003) transistor with resistors.  
Refer to the RS-17 board schematic diagram for digital transistor.

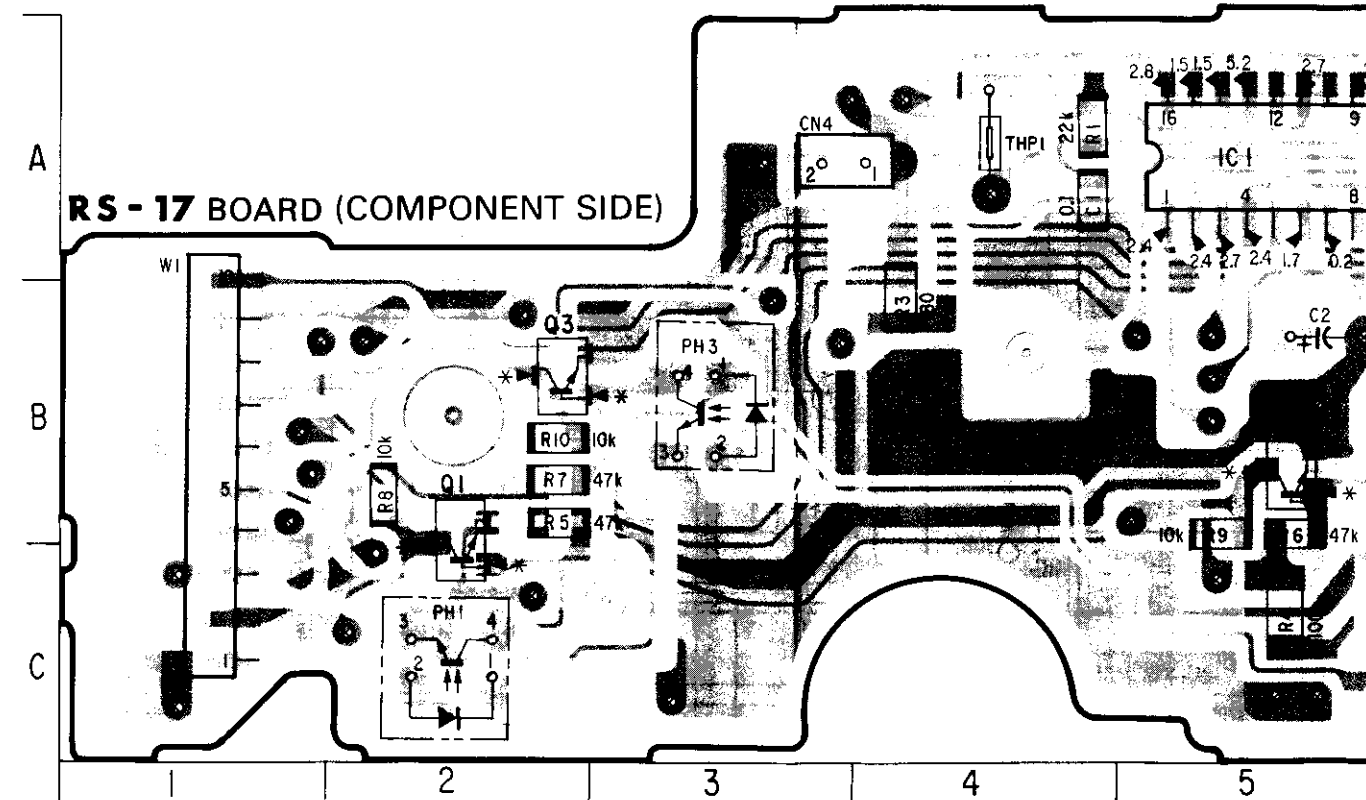
When indicating parts by reference number, please include the board name.

**Caution:**  
Parts face side: Parts on the parts face side seen from (Component Side) the parts face are indicated.

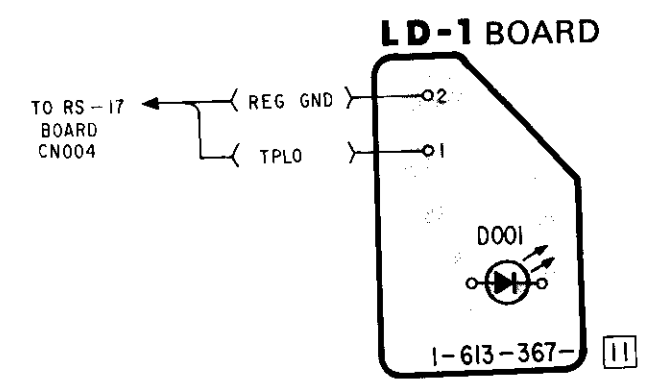
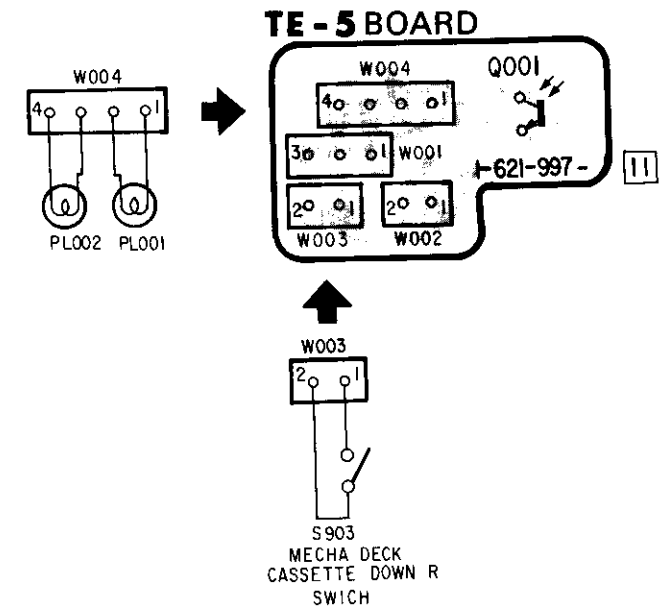
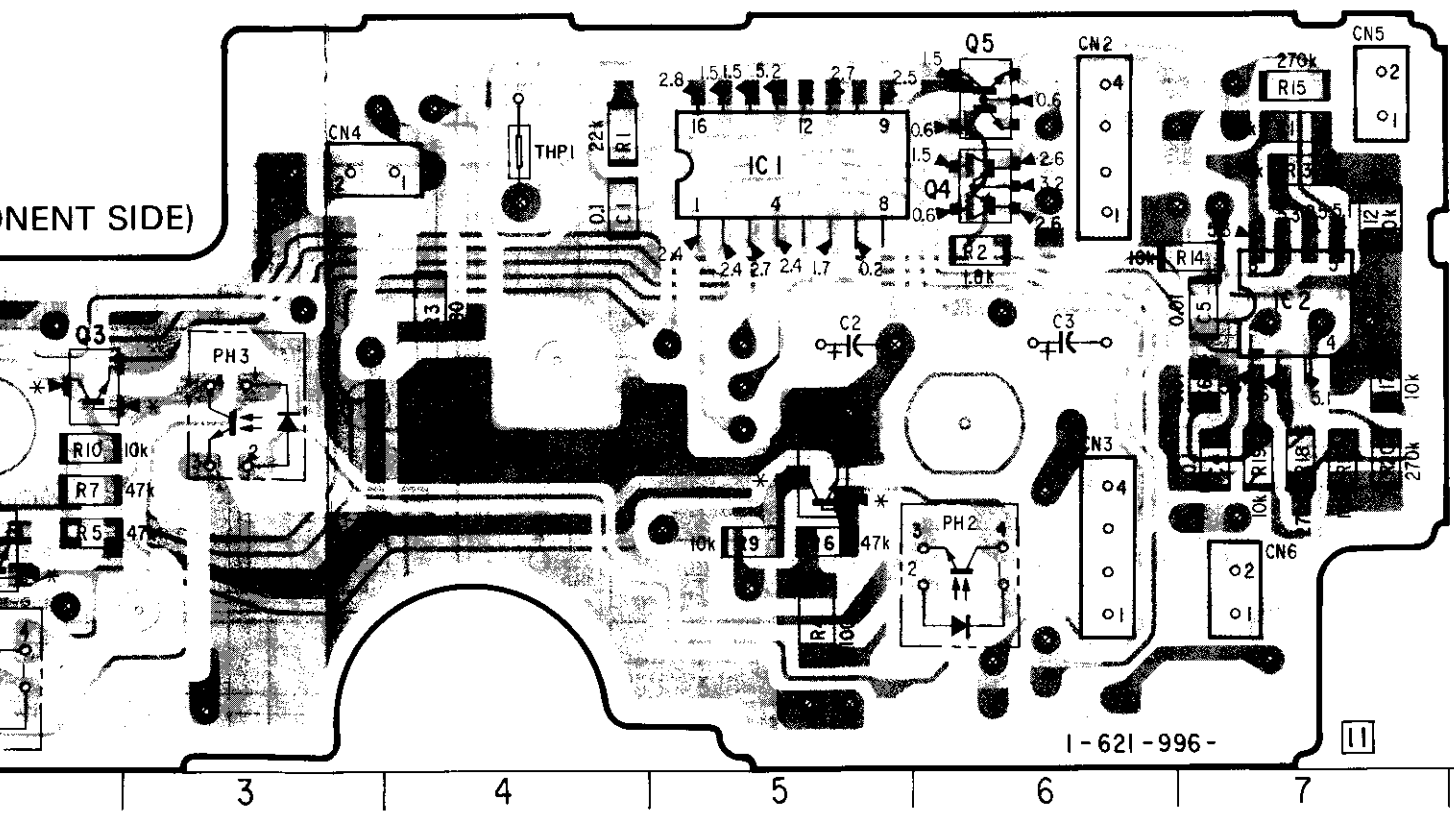


**RS-17(REEL SENSOR), TE-5(TAPE-TOP SENSOR), TE-6(TAPE-END SENSOR), LD-1(TAPE SENSOR)**  
-Ref. No. RS-17 BOARD : 5,000 series, TE-5 BOARD : 5,100 series, TE-6 : 5,200 series, LD-1 BOARD : 5,300 series-

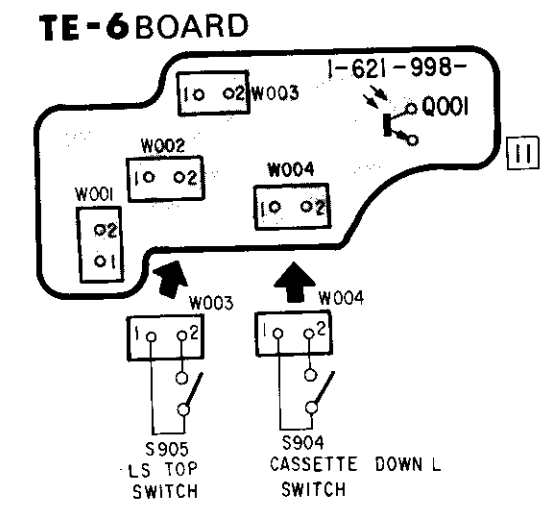
RS-17 BOARD	
IC001	A-5
IC002	B-7
PH001	C-1
PH002	C-6
PH003	B-3
Q001	B-2
Q002	B-5
Q003	B-2
Q004	A-6
Q005	A-6



TAPE-TOPE SENSOR), TE-6(TAPE-END SENSOR), LD-1(TAPE SENSOR LIGHT EMISSION) PRINTED WIRING BOARDS  
 ies, TE-5 BOARD : 5,100 series, TE-6 : 5,200 series, LD-1 BOARD : 5,300 series—

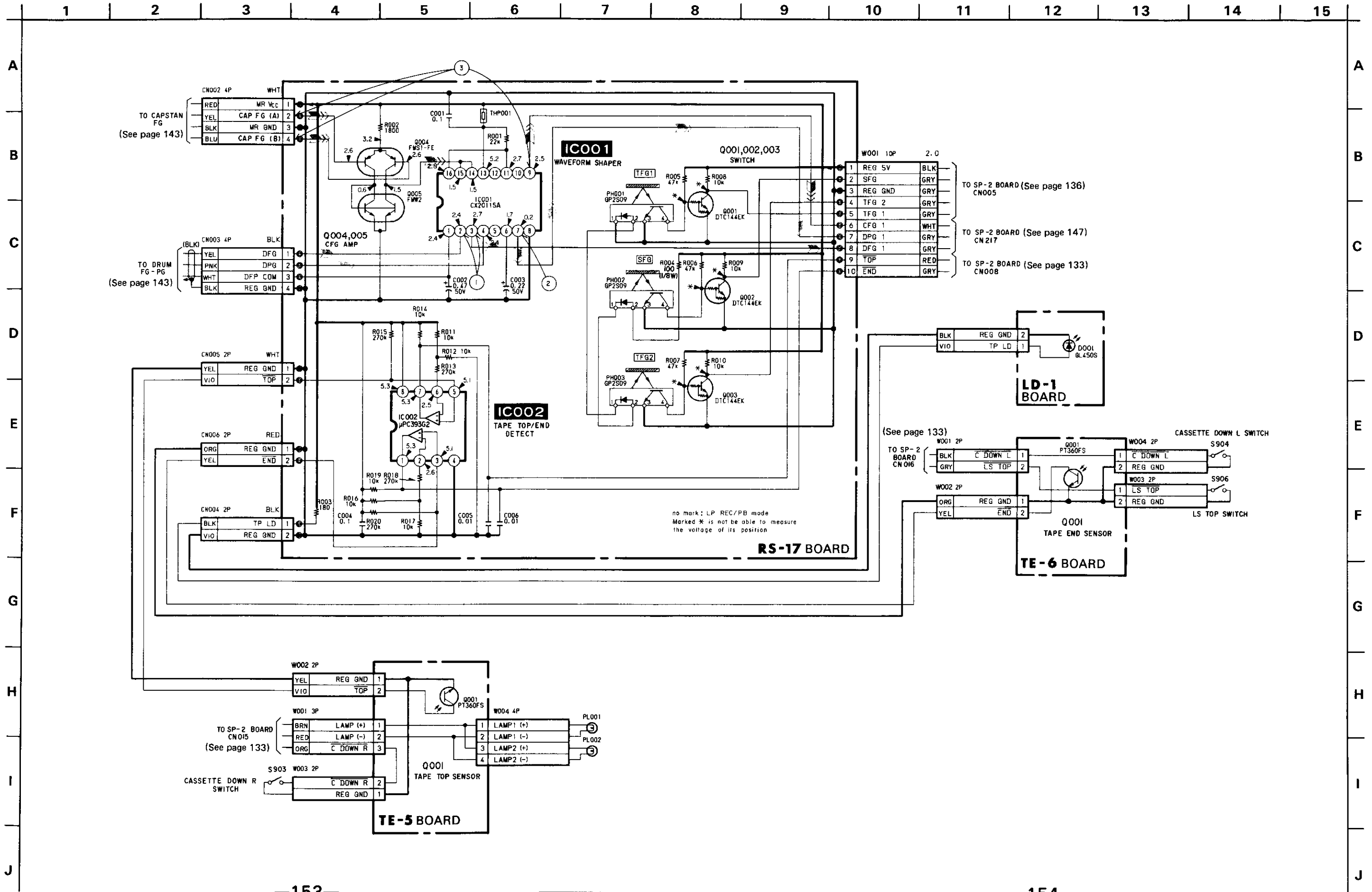


no mark: LP REC/PB mode  
 Marked \* is not be able to measure  
 the voltage of its position

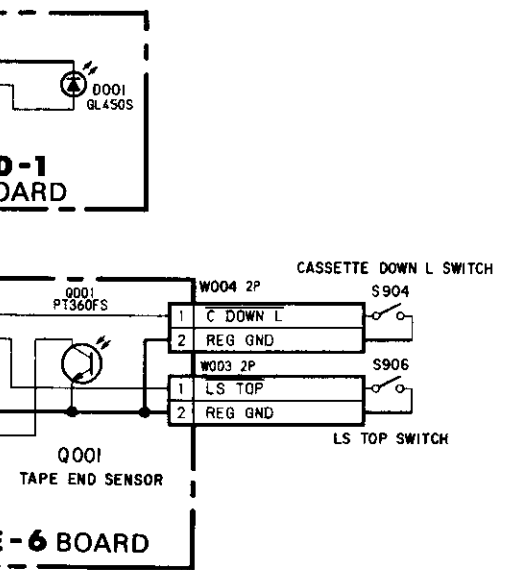


RS-17(REEL SENSOR), TE-5(TAPE-TOP SENSOR), TE-6(TAPE-END SENSOR), LD-1(TAPE SENSOR LIGHT EMISSION) SCHEMATIC DIAGRAM

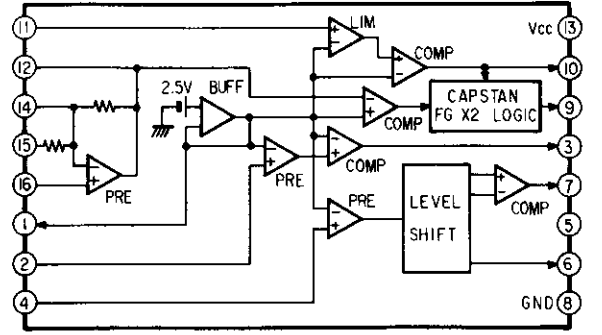
-Ref. No. RS-17 BOARD: 5,000 series, TE-5 BOARD: 5,100 series, TE-6: 5,200 series, LD-1 BOARD: 5,300 series-



see page 136)  
see page 147)  
see page 133)



IC001 CX20115A



Note:

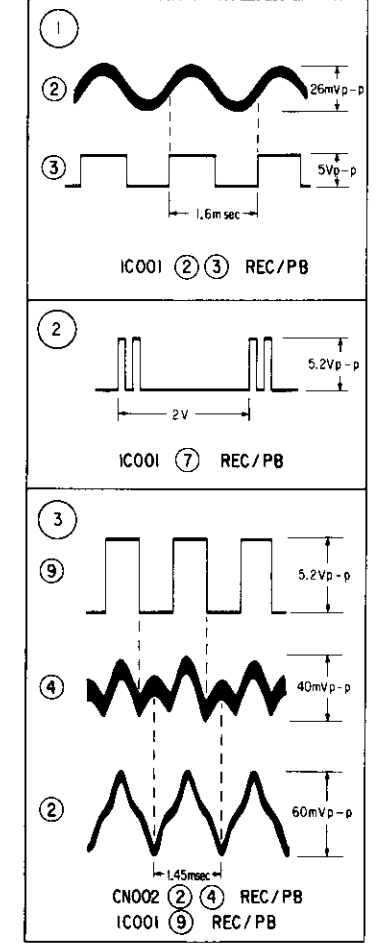
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- — : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

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

• Signal path

	REC	REC/PB	PB
Drum speed servo		⏪	
Drum phase servo		⏩	
Capstan servo (speed and phase)		⏩⏩	

RS-17 BOARD

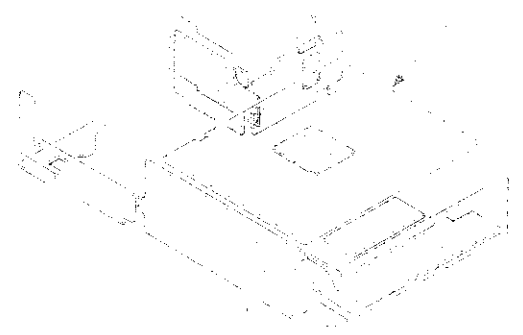


**Note:**

- - indicates a lead wire mounted on the component side
- - indicates a lead wire mounted on the printed side
- - Through hole
- - Pattern from the side which enables seeing

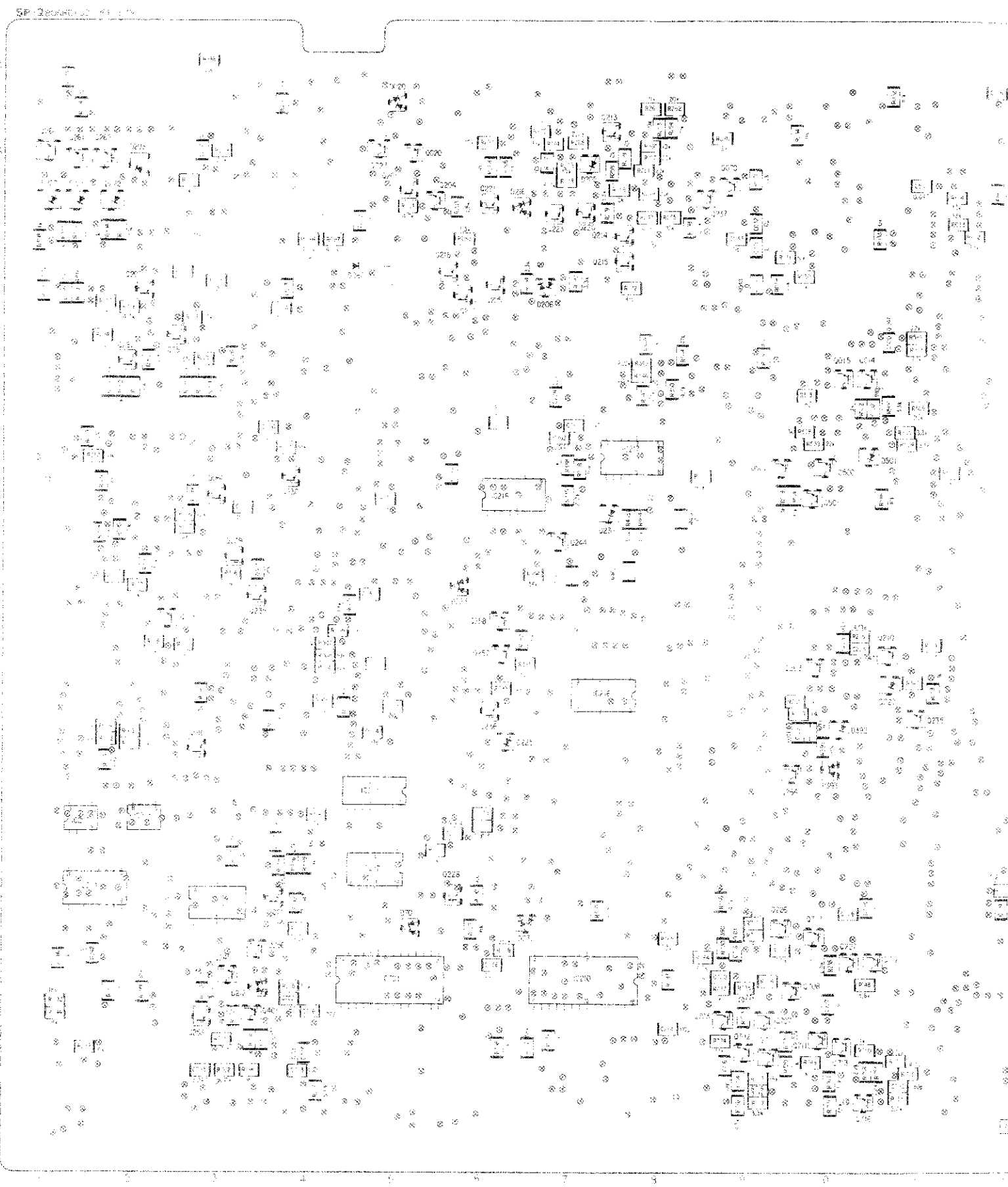
When indicating parts by reference number, please include the board name.

SP-2 (PCM AUDIO PROCESS)

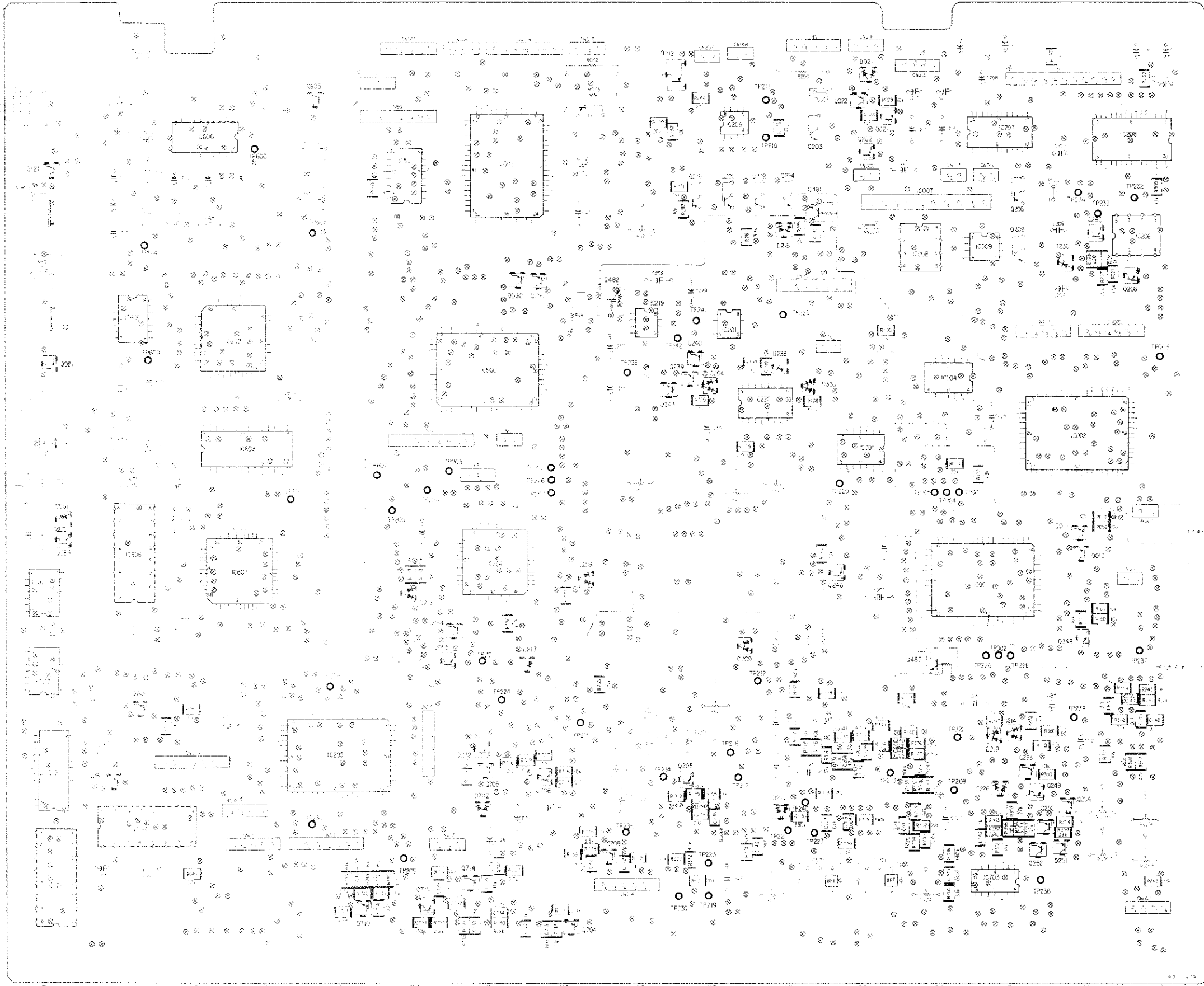


Q979	C	Q919	C	Q933	L1	TR74	T
Q980	C	Q920	C	Q934	F1	TR81	T
Q981	C	Q921	C	Q935	F1	TR82	T
Q982	C	Q922	C	Q936	C1	TR83	T
Q983	C	Q923	C	Q937	B1	TR84	T
Q984	C	Q924	C	Q938	B1	TR85	T
Q985	C	Q925	C	Q939	L1	TR86	T
Q986	C	Q926	C	Q940	L1	TR87	T
Q987	C	Q927	C	Q941	M20	TR88	T
Q988	C	Q928	C	Q942	C1	TR89	T
Q989	C	Q929	C	Q943	K1	TR90	T
Q990	C	Q930	C	Q944	K1		
Q991	C	Q931	C	Q945	L1		
Q992	C	Q932	C	Q946	L1		
Q993	C	Q933	C	Q947	L1		
Q994	C	Q934	C	Q948	M20		
Q995	C	Q935	C	Q949	L1		
Q996	C	Q936	C	Q950	L1		
Q997	C	Q937	C	Q951	L1		
Q998	C	Q938	C	Q952	L1		
Q999	C	Q939	C	Q953	L1		
		Q940	C	Q954	L1		
		Q941	C	Q955	M20		
		Q942	C	Q956	L1		
		Q943	C	Q957	L1		
		Q944	C	Q958	L1		
		Q945	C	Q959	L1		
		Q946	C	Q960	L1		
		Q947	C	Q961	L1		
		Q948	C	Q962	L1		
		Q949	C	Q963	L1		
		Q950	C	Q964	L1		
		Q951	C	Q965	L1		
		Q952	C	Q966	L1		
		Q953	C	Q967	L1		
		Q954	C	Q968	L1		
		Q955	C	Q969	L1		
		Q956	C	Q970	L1		
		Q957	C	Q971	L1		
		Q958	C	Q972	L1		
		Q959	C	Q973	L1		
		Q960	C	Q974	L1		
		Q961	C	Q975	L1		
		Q962	C	Q976	L1		
		Q963	C	Q977	L1		
		Q964	C	Q978	L1		
		Q965	C	Q979	L1		
		Q966	C	Q980	L1		
		Q967	C	Q981	L1		
		Q968	C	Q982	L1		
		Q969	C	Q983	L1		
		Q970	C	Q984	L1		
		Q971	C	Q985	L1		
		Q972	C	Q986	L1		
		Q973	C	Q987	L1		
		Q974	C	Q988	L1		
		Q975	C	Q989	L1		
		Q976	C	Q990	L1		
		Q977	C	Q991	L1		
		Q978	C	Q992	L1		
		Q979	C	Q993	L1		
		Q980	C	Q994	L1		
		Q981	C	Q995	L1		
		Q982	C	Q996	L1		
		Q983	C	Q997	L1		
		Q984	C	Q998	L1		
		Q985	C	Q999	L1		
		Q986	C	Q990	L1		

**SP-2 (PCM AUDIO PROCESS) PRINTED WIRING BOARD**  
 REF. NO. SP-2 BOARD 1 (100% SIDE)





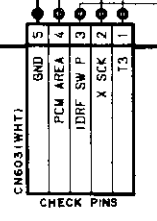
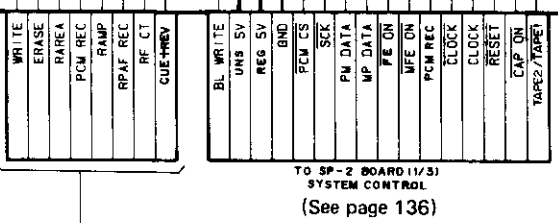
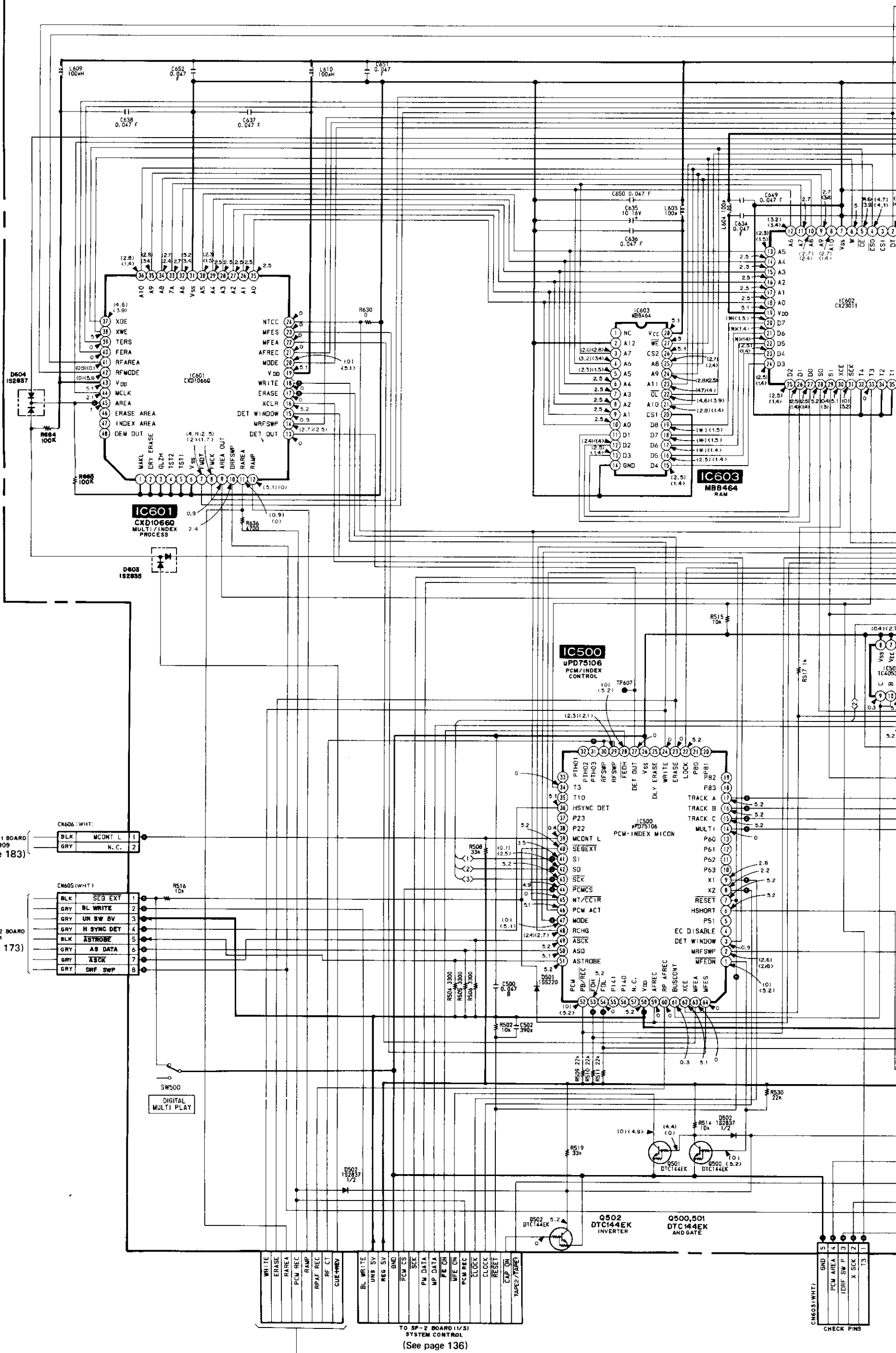




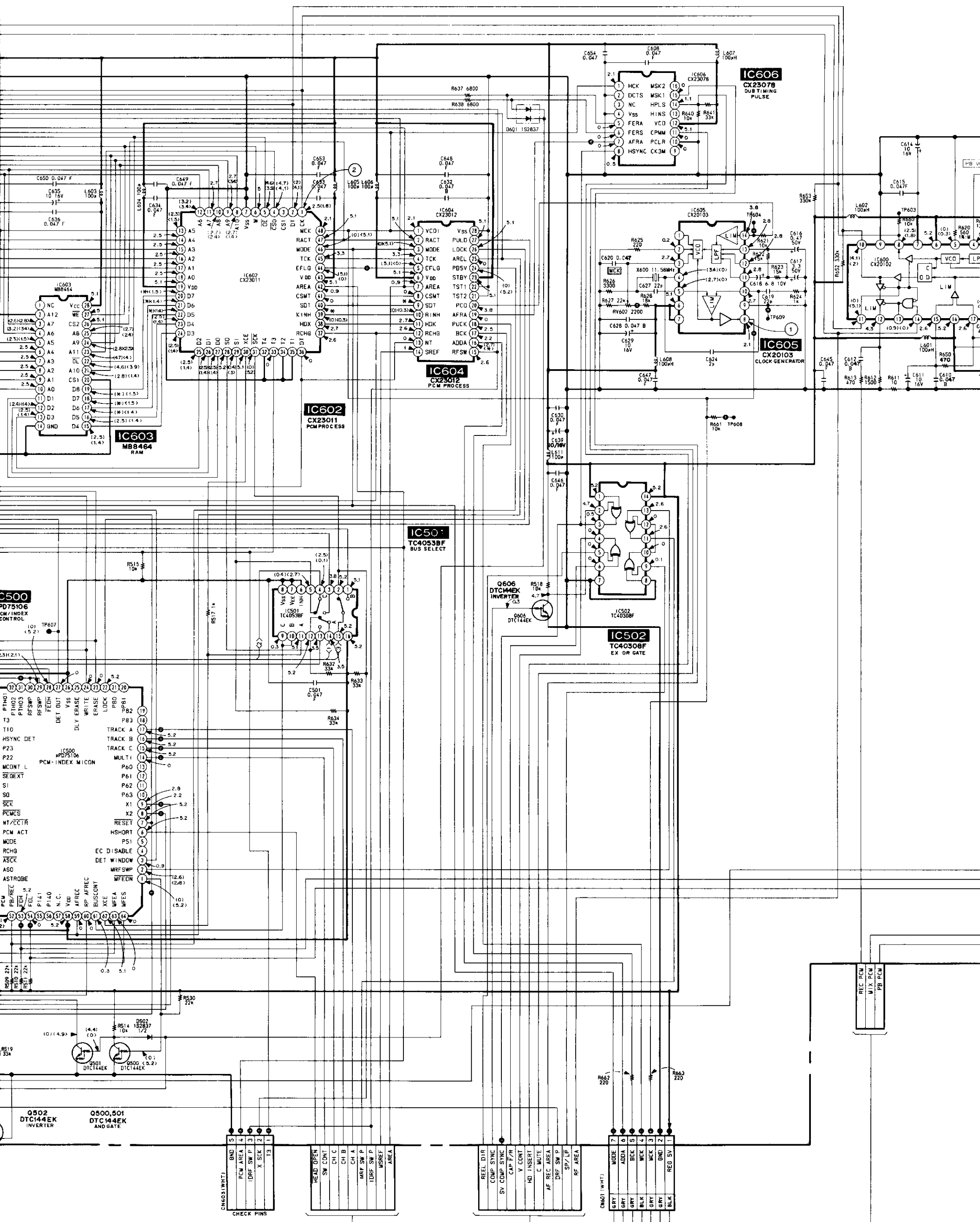
**SP-2 BOARD(1/3) PCM**

TO MJ-11 BOARD  
CN909  
(See page 183)

TO AU-22 BOARD  
W101  
(See page 173)



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



TO AU-22 BOARD W701 (See page 173)

TO SP-2 BOARD (1/3) (See page 174)

CM603 (WHT)

5	BND
4	PCM AREA
3	IDRF SW P
2	X SCK
1	T3

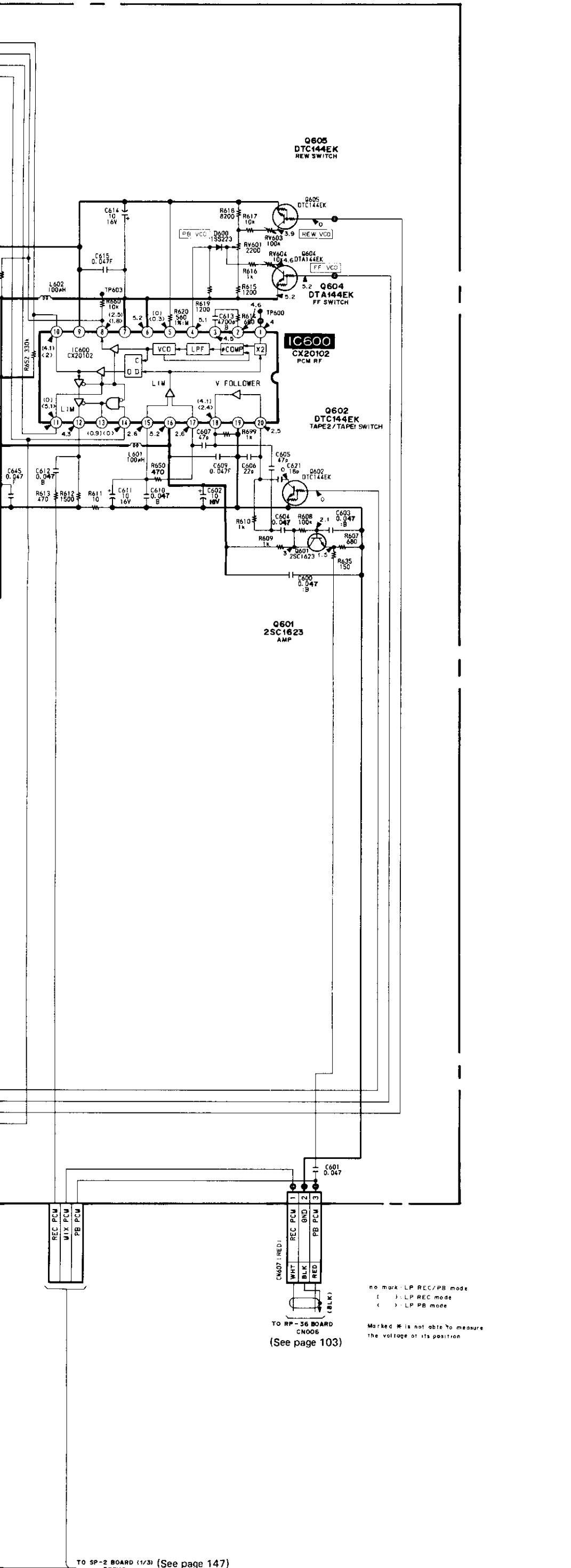
CHECK PINS

5	HEAD OPEN
4	SW CONT
3	CH C
2	CH B
1	CH A
5	MRF SW P
4	IDRF SW P
3	MSREF
2	AREA

7	REEL DIR
6	COMP SYNC
5	SV COMP SYNC
4	CAP F/R
3	V CONT
2	HD INSERT
1	C MUTE
5	AF REC AREA
4	DRF SW P
3	SP/LP
2	RF AREA

CM601 (WHT)

7	MODE
6	ADD
5	BLK
4	WCK
3	MCK
2	BND
1	REG SV

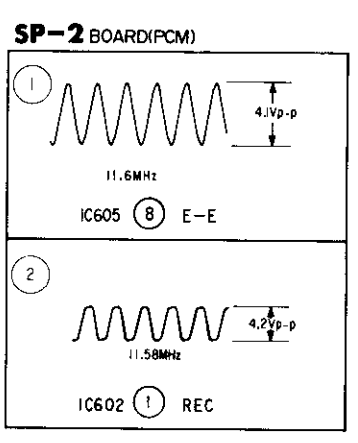


Note:

- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic and tantalums.
- □ : panel designation.
- △ : internal component.
- □ : adjustment for repair.
- — : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

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

• Signal path



no mark: LP REC/PB mode  
 ( ) : LP REC mode  
 ( ) : LP PB mode

Marked \* is not able to measure the voltage at its position

TO RP-36 BOARD (See page 103)

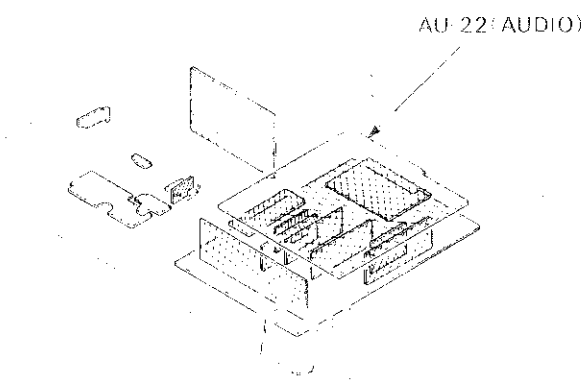
A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P

**Note:**

- - : indicates a lead wire mounted on the component side.
- • : indicates a lead wire mounted on the printed side.
- : soldering side.

- Digital transistor (AU-22:Q201,Q204,Q502) transistor with resistors.  
Refer to the AU-22 board schematic diagram for digital transistor

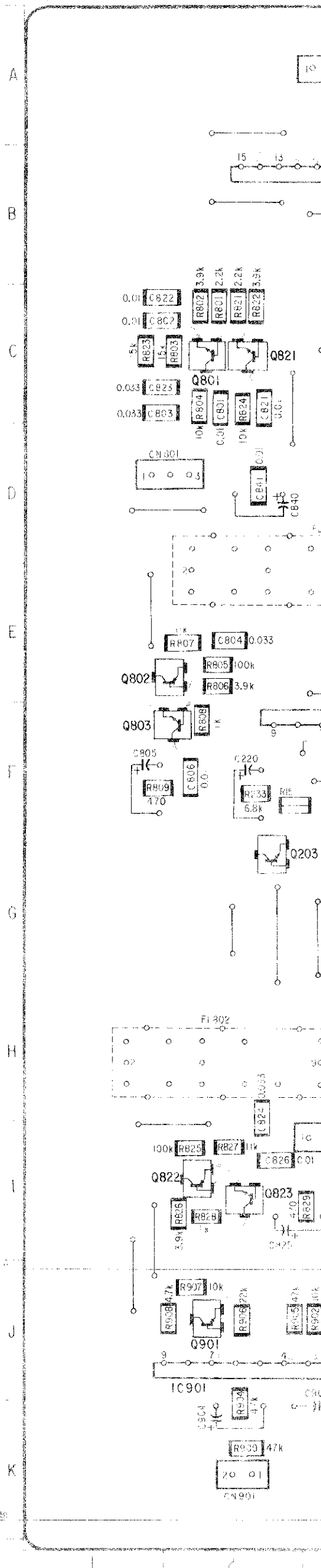
When indicating parts by reference number, please include the board name.



Q201	G 13
Q203	A 12
Q204	B 4
IC101	J 5
IC201	F 8
IC203	C 7
IC301	D 10
IC302	C 10
IC303	F 7
IC304	F 3
IC401	G 10
IC402	F 11
IC403	H 8
IC404	G 4
IC501	K 8
IC504	I 9
IC601	G 4
IC602	F 5
IC701	B 3
IC901	J 2

Q201	G 11
Q203	G 2
Q204	G 7
Q208	I 11
Q209	A 13
Q210	J 13
Q211	I 13
Q212	I 13
Q213	H 13
Q401	D 11
Q402	F 4
Q403	F 11
Q404	G 6
Q502	F 7
Q801	E 2
Q802	E 2
Q803	F 2
Q804	F 2
Q805	F 2
Q806	F 2
Q807	F 2
Q808	F 2
Q809	F 2
Q810	F 2
Q811	F 2
Q812	F 2
Q813	F 2
Q814	F 2
Q815	F 2
Q816	F 2
Q817	F 2
Q818	F 2
Q819	F 2
Q820	F 2
Q821	F 2
Q822	F 2
Q823	F 2
Q824	F 2
Q825	F 2
Q826	F 2
Q827	F 2
Q828	F 2
Q829	F 2
Q830	F 2
Q831	F 2
Q832	F 2
Q833	F 2
Q834	F 2
Q835	F 2
Q836	F 2
Q837	F 2
Q838	F 2
Q839	F 2
Q840	F 2
Q841	F 2
Q842	F 2
Q843	F 2
Q844	F 2
Q845	F 2
Q846	F 2
Q847	F 2
Q848	F 2
Q849	F 2
Q850	F 2
Q851	F 2
Q852	F 2
Q853	F 2
Q854	F 2
Q855	F 2
Q856	F 2
Q857	F 2
Q858	F 2
Q859	F 2
Q860	F 2
Q861	F 2
Q862	F 2
Q863	F 2
Q864	F 2
Q865	F 2
Q866	F 2
Q867	F 2
Q868	F 2
Q869	F 2
Q870	F 2
Q871	F 2
Q872	F 2
Q873	F 2
Q874	F 2
Q875	F 2
Q876	F 2
Q877	F 2
Q878	F 2
Q879	F 2
Q880	F 2
Q881	F 2
Q882	F 2
Q883	F 2
Q884	F 2
Q885	F 2
Q886	F 2
Q887	F 2
Q888	F 2
Q889	F 2
Q890	F 2
Q891	F 2
Q892	F 2
Q893	F 2
Q894	F 2
Q895	F 2
Q896	F 2
Q897	F 2
Q898	F 2
Q899	F 2
Q900	F 2
Q901	F 2
Q902	F 2
Q903	F 2
Q904	F 2
Q905	F 2
Q906	F 2
Q907	F 2
Q908	F 2
Q909	F 2
Q910	F 2
Q911	F 2
Q912	F 2
Q913	F 2
Q914	F 2
Q915	F 2
Q916	F 2
Q917	F 2
Q918	F 2
Q919	F 2
Q920	F 2
Q921	F 2
Q922	F 2
Q923	F 2
Q924	F 2
Q925	F 2
Q926	F 2
Q927	F 2
Q928	F 2
Q929	F 2
Q930	F 2
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Q932	F 2
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Q935	F 2
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Q937	F 2
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Q939	F 2
Q940	F 2
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Q944	F 2
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Q975	F 2
Q976	F 2
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Q980	F 2
Q981	F 2
Q982	F 2
Q983	F 2
Q984	F 2
Q985	F 2
Q986	F 2
Q987	F 2
Q988	F 2
Q989	F 2
Q990	F 2
Q991	F 2
Q992	F 2
Q993	F 2
Q994	F 2
Q995	F 2
Q996	F 2
Q997	F 2
Q998	F 2
Q999	F 2
Q1000	F 2

**AU-22 BOARD**



AU-22(AUDIO) PRINTED WIRING BOARD

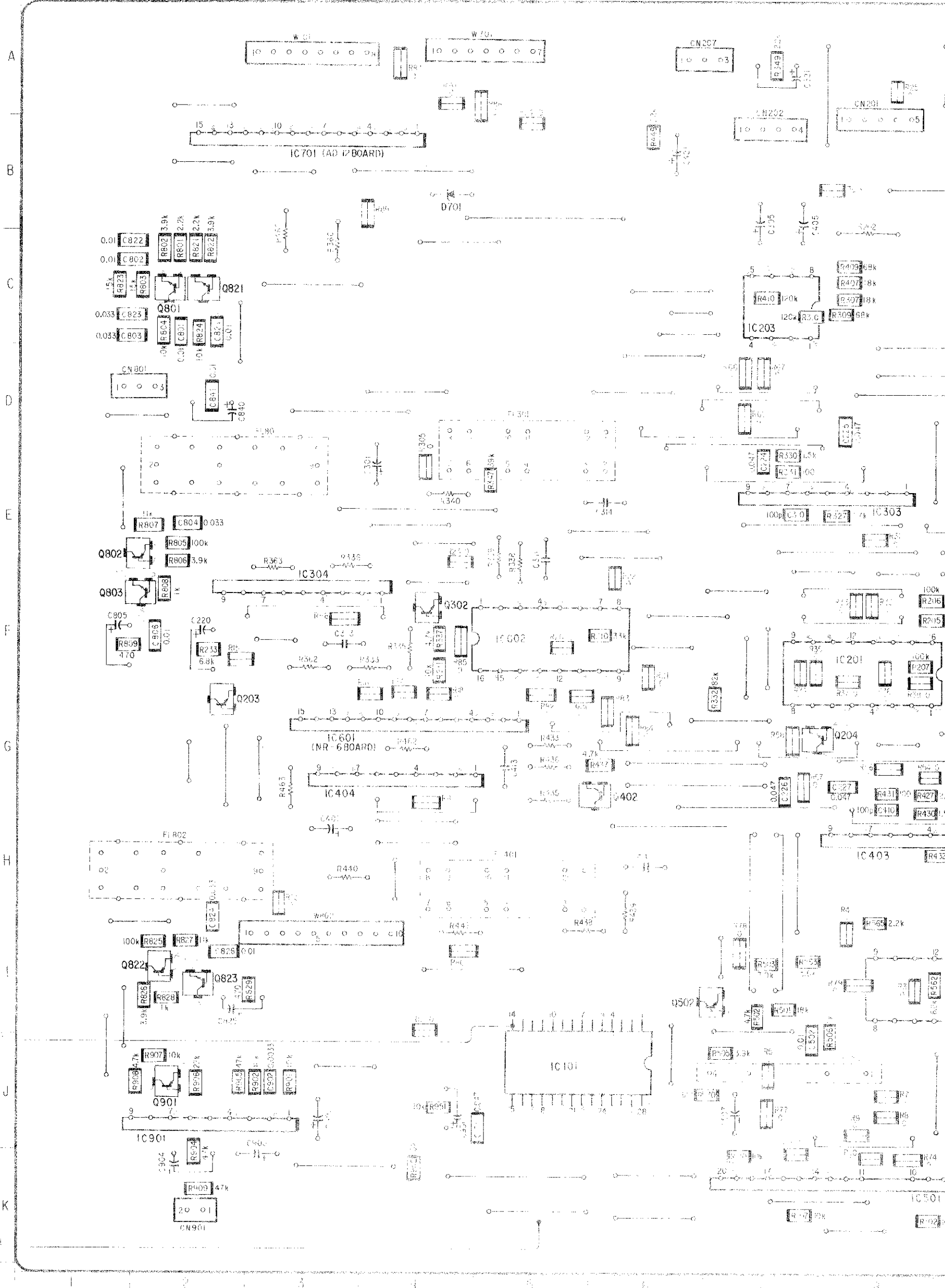
Ref. No. AU-22 BOARD 17,000 series

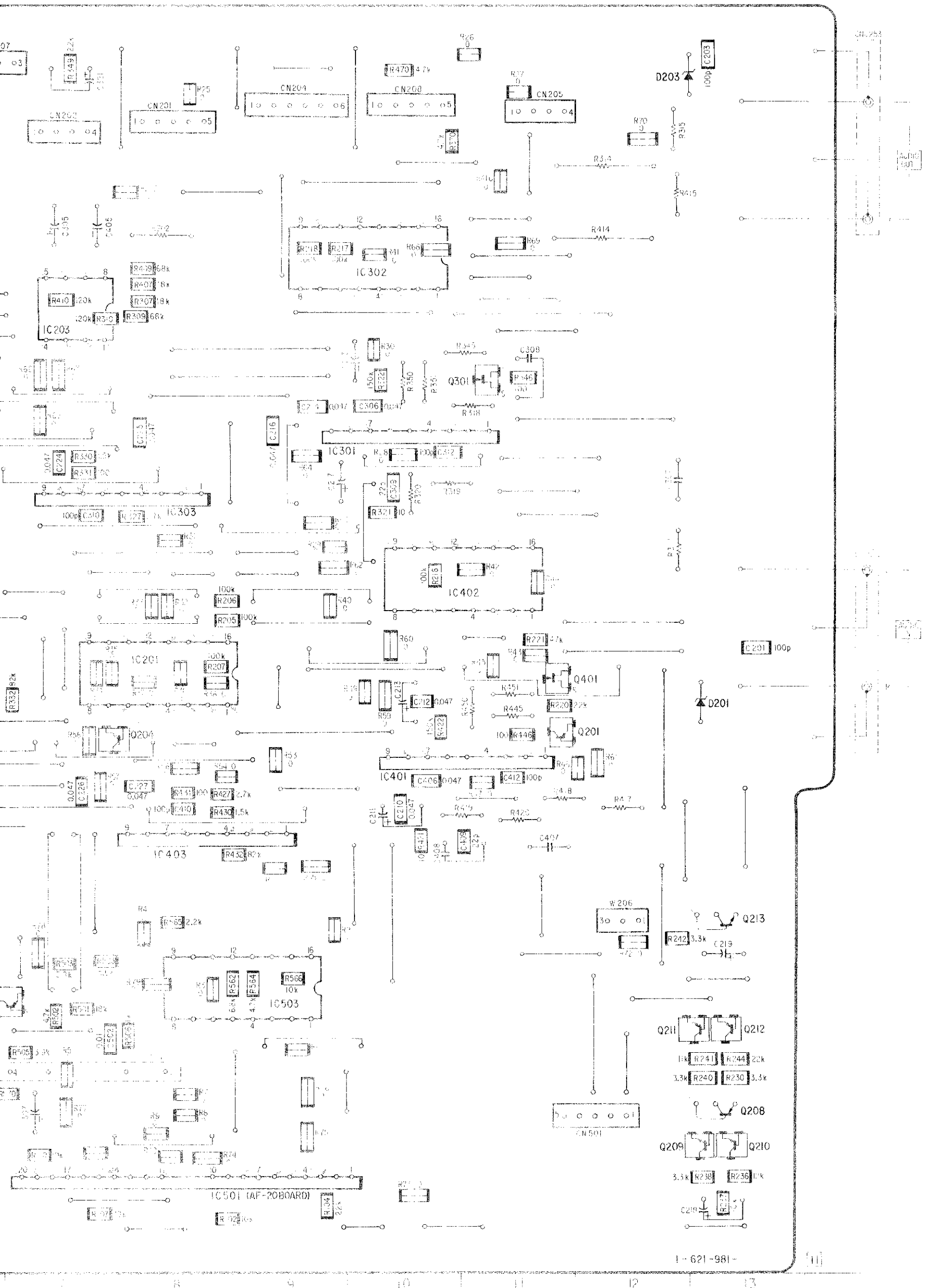
D201 G 13  
D203 A 12  
D701 B 4

IC101 J 5  
IC201 F 8  
IC203 C 7  
IC301 D 10  
IC302 C 10  
IC303 E 7  
IC304 F 3  
IC401 G 10  
IC402 F 11  
IC403 H 8  
IC404 G 4  
IC501 K 8  
IC503 I 9  
IC601 G 4  
IC602 F 5  
IC701 B 3  
IC901 I 2

Q201 G 1  
Q203 G 2  
Q204 G 1  
Q208 J 13  
Q209 J 13  
Q210 J 13  
Q211 I 3  
Q212 I 3  
Q213 H 13  
Q401 D 11  
Q402 I 4  
Q403 F 13  
Q402 G 6  
Q502 I 7  
Q801 C 2  
Q802 E 2  
Q803 F 2  
Q801 C 2  
Q802 I 2  
Q803 I 2  
Q901 I 2

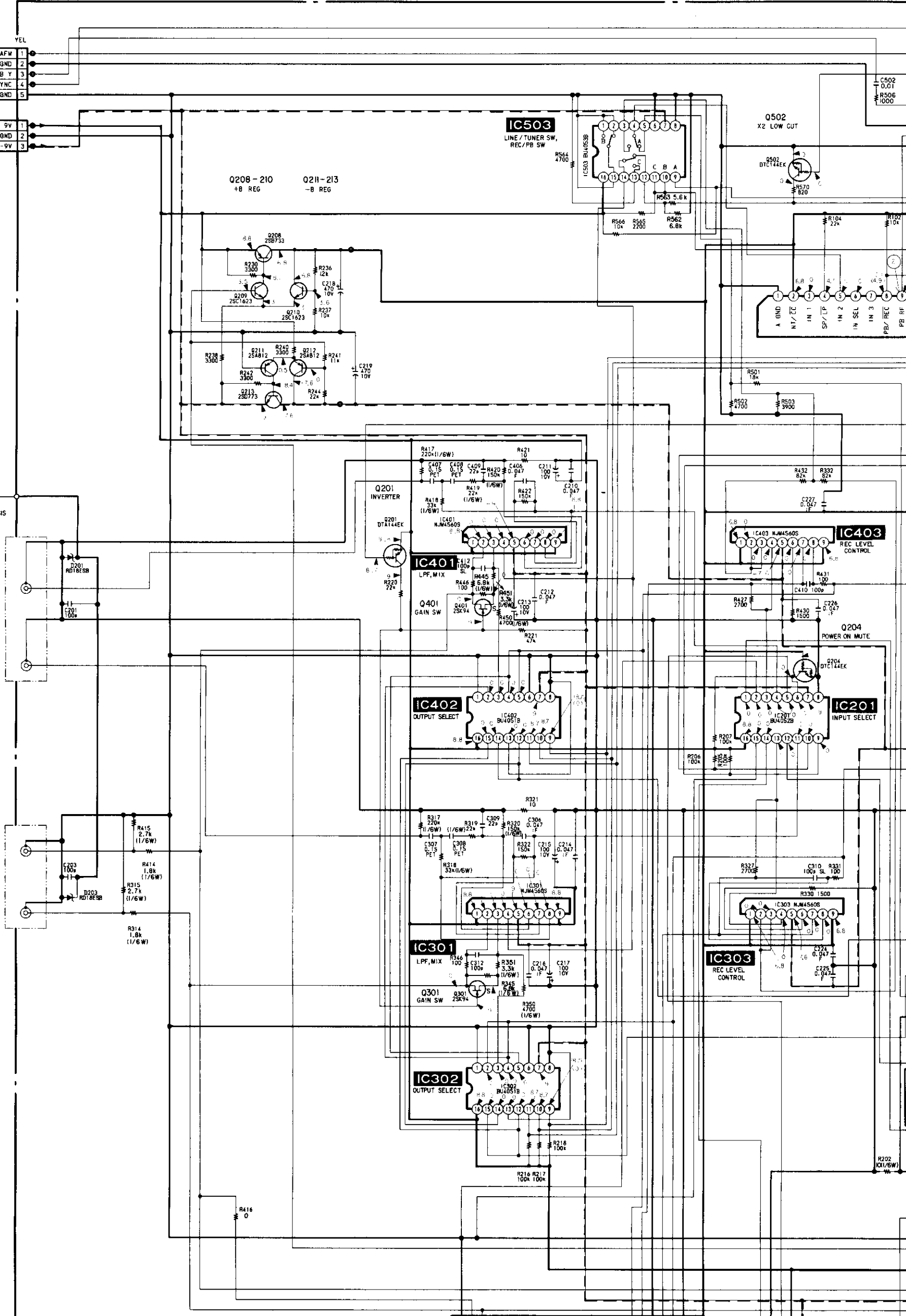
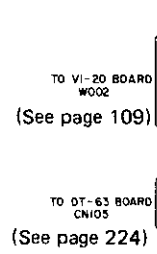
AU-22 BOARD



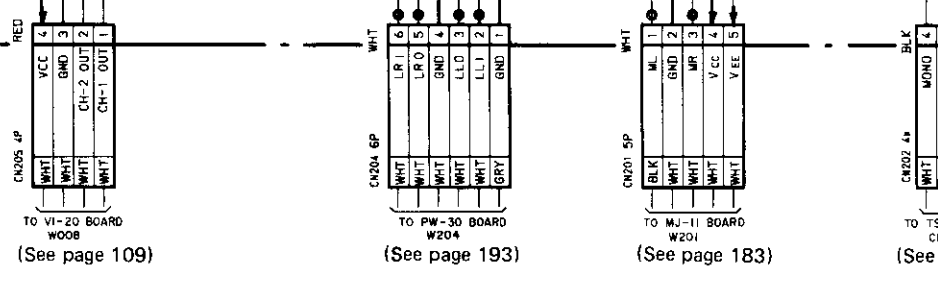


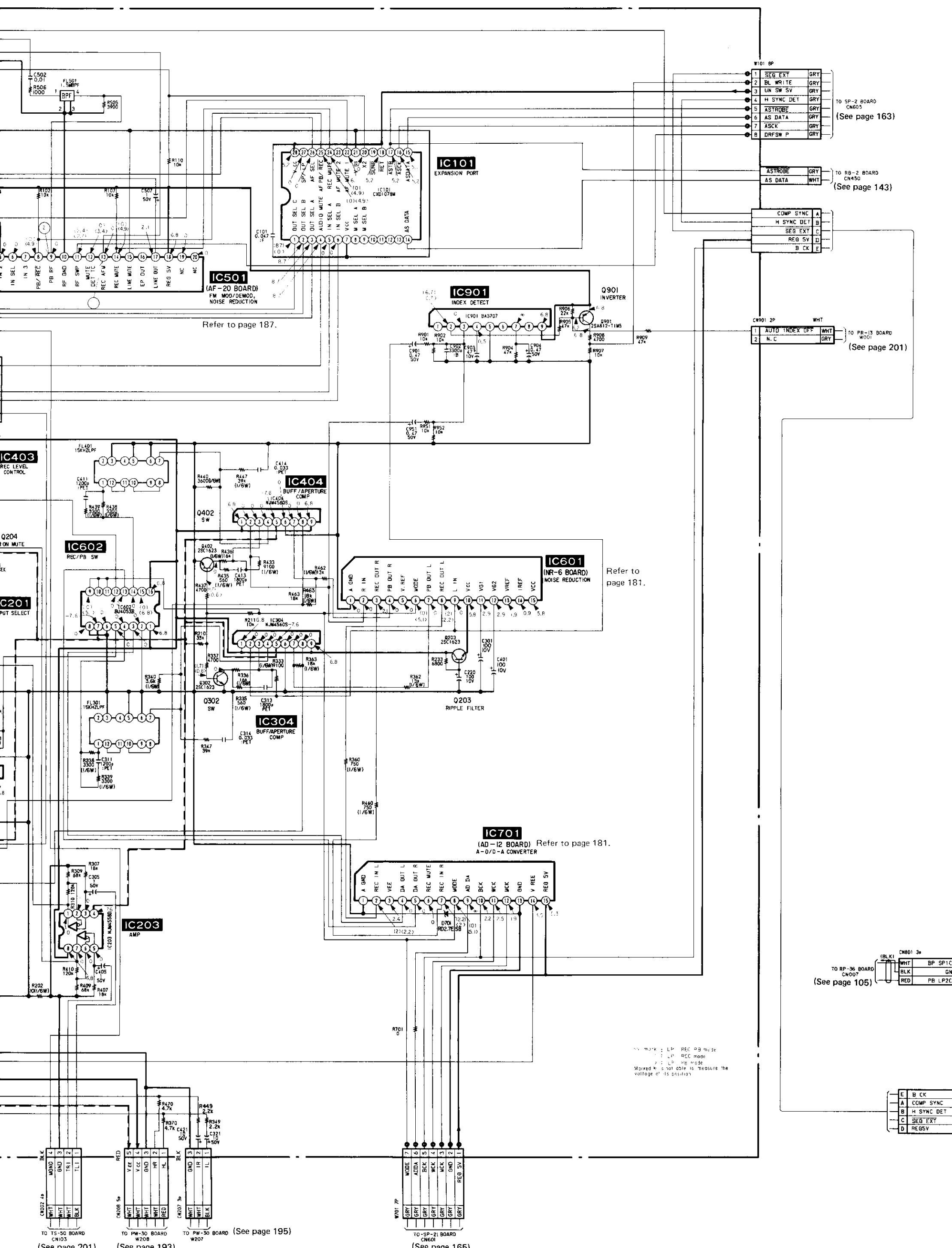
AUDIO(1) AUDIO(1)

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



AU-22 BOARD (1/2)





Refer to page 187.

Refer to page 181.

Refer to page 181.

TO SP-2 BOARD  
CN605  
(See page 163)

TO RB-2 BOARD  
CN450  
(See page 143)

TO PB-13 BOARD  
W001  
(See page 201)

TO RP-36 BOARD  
CN007  
(See page 105)

(See page 201)

(See page 193)

(See page 195)

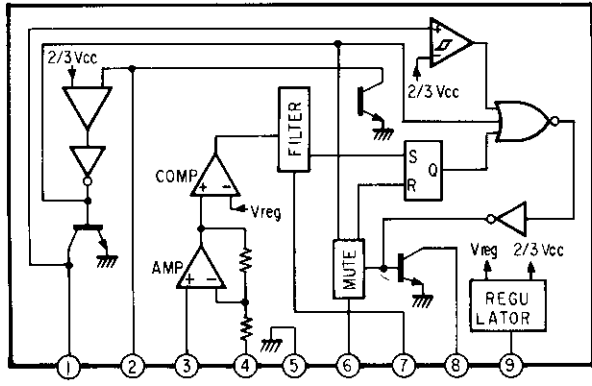
(See page 165)

\* mark : LP REC PB mode  
 : LP REC mode  
 : LP PB mode  
 Marked \* is not able to measure the voltage of its position.

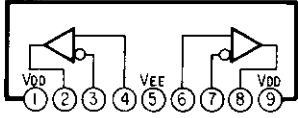
E	B CK
A	COMP SYNC
B	H SYNC DET
C	SEG EXT
D	REG SV



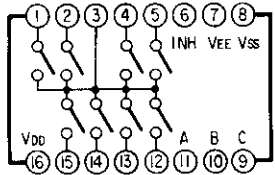
**IC901 BA3707**



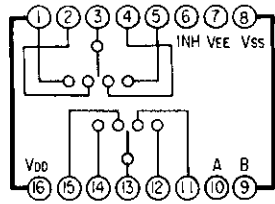
**IC301, 303, 304, 401, 403, 404 NJM4560S**



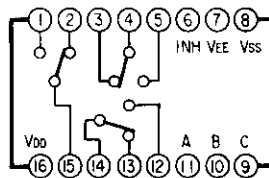
**IC302, 402 BU4051B**



**IC201 BU4052B**



**IC602 BU4053B**



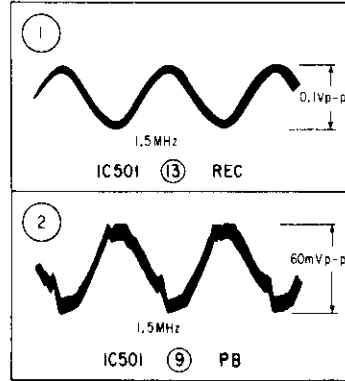
**Note:**

- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic, and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- □ : panel designation.
- △ : internal component.
- — : B + bus.
- - - - : B - bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

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

• **Signal path**

**AU-22 BOARD**

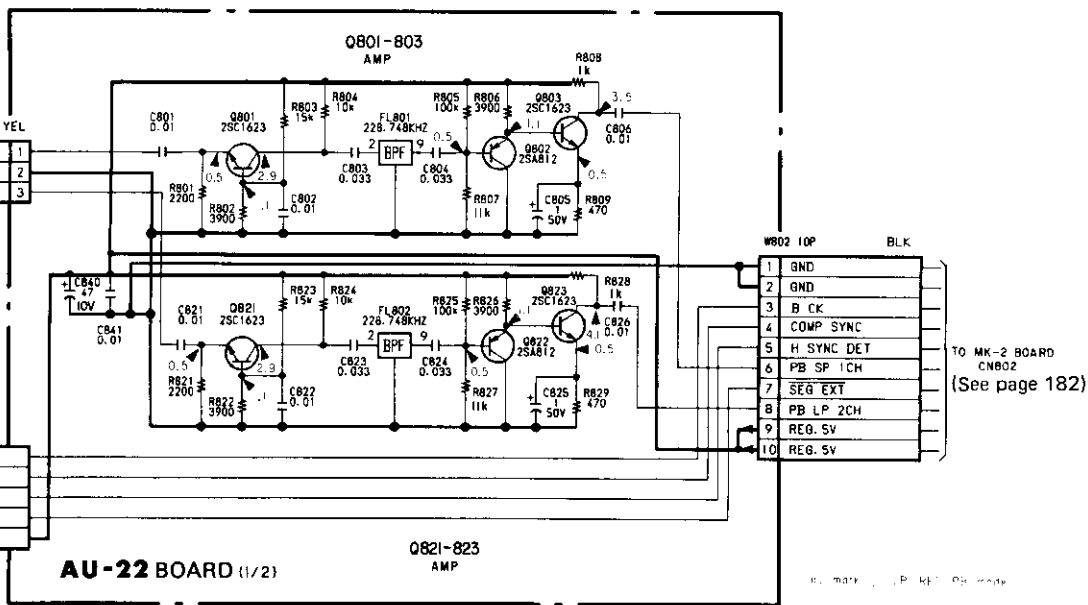


BOARD  
page 163)

BOARD  
page 143)

R-13 BOARD  
page 201)

BOARD  
page 105)



A  
B  
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G  
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TO MK-2 BOARD  
CN802  
(See page 182)

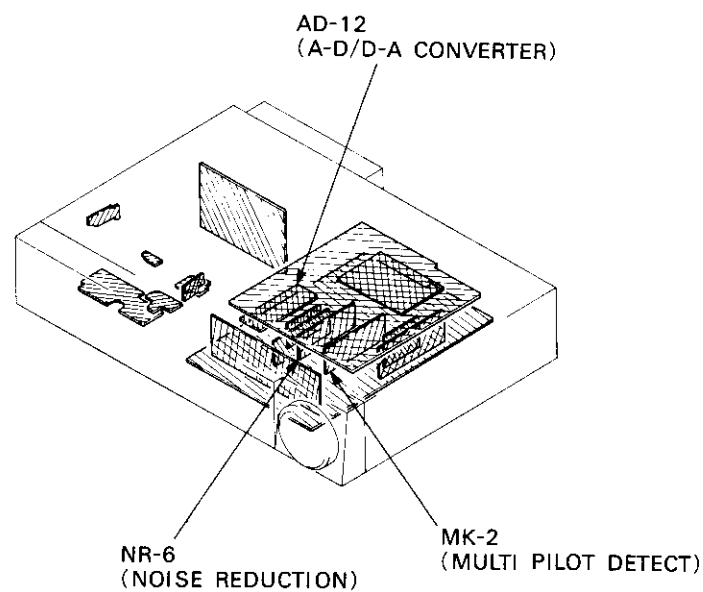
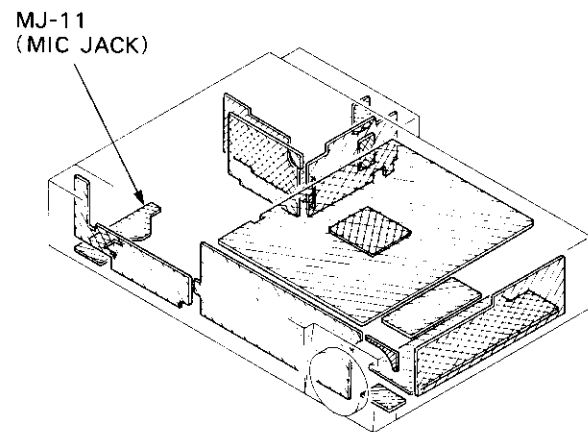
© 1984 Philips North America, Inc.

**Note:**

- : indicates a lead wire mounted on the component side.
- : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.
- : B+ pattern from the side which enables seeing.

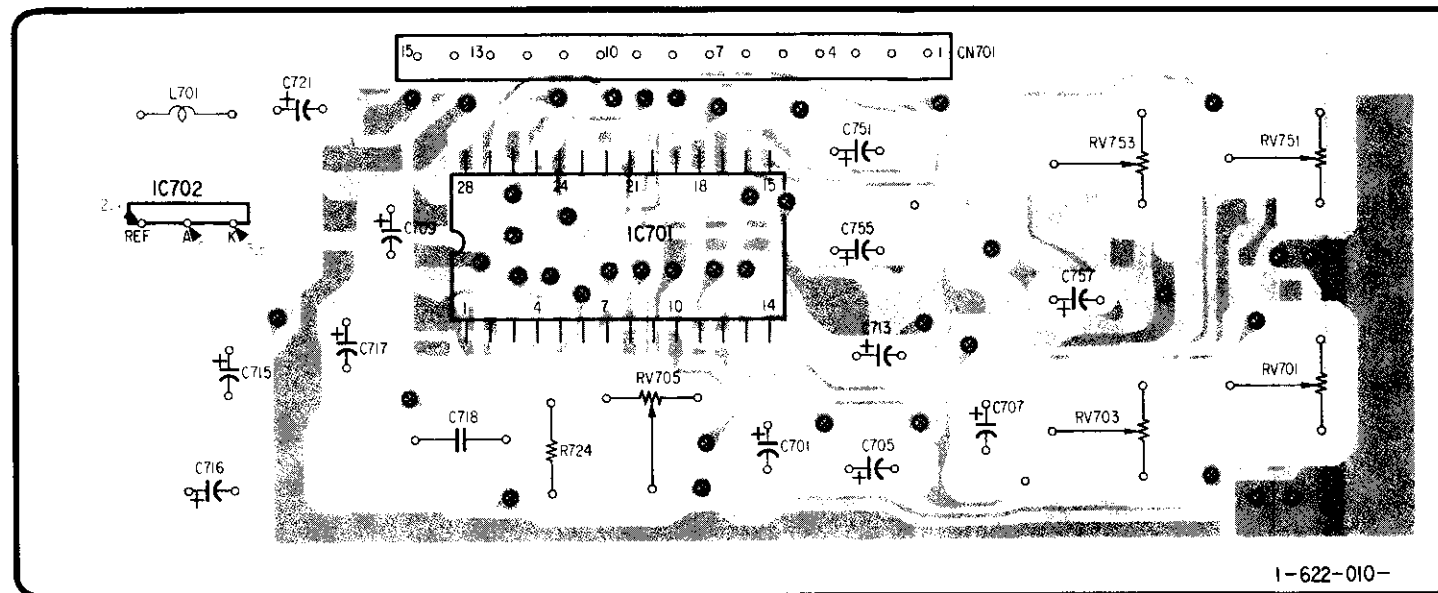
When indicating parts by reference number, please include the board name.

**Caution:**  
 Pattern face side: Parts on the pattern face side seen from (Solder Side) the pattern face are indicated.  
 Parts face side: Parts on the parts face side seen from (Component Side) the parts face are indicated.

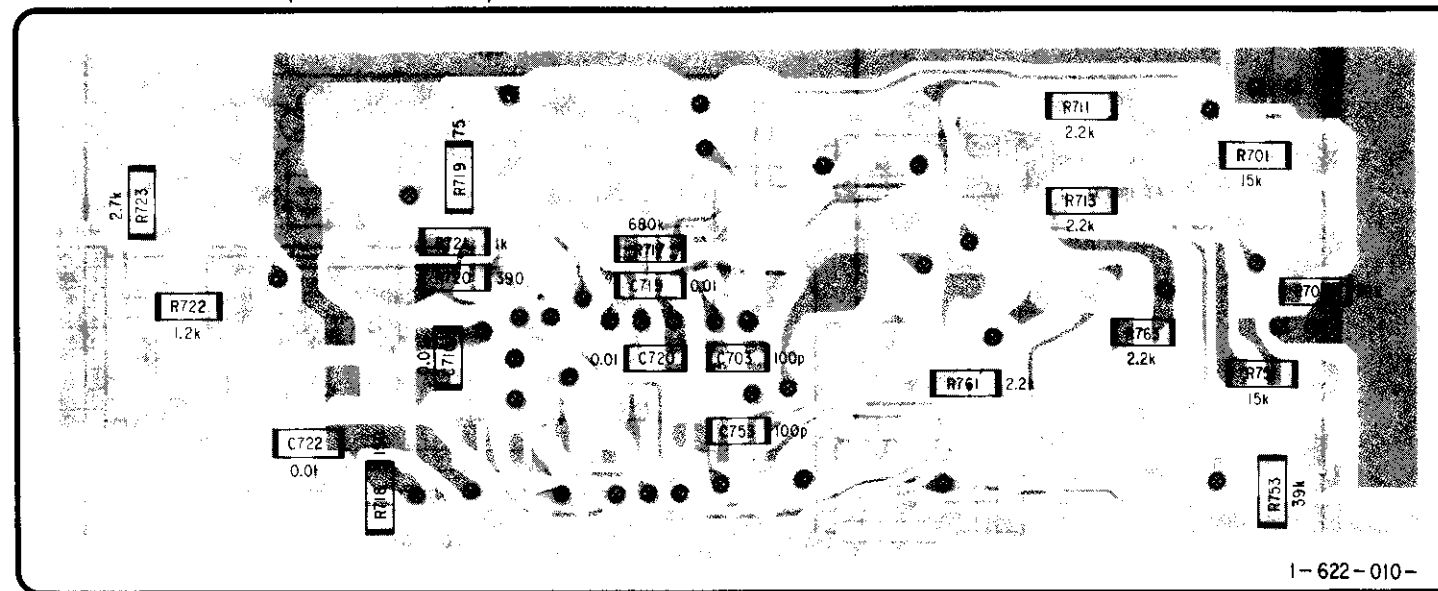


**AD-12(A-D/D-A CONVERTER), NR-6(NOISE REDUCTION), MK-2(MULTI PILOT DETECT), MJ-11(MIC JACK) PRINTED WIRING BOARDS**  
 —Ref. No. AD-12 BOARD, NR-6 BOARD, MK-2 BOARD, MJ-11 BOARD : 8,000 series—

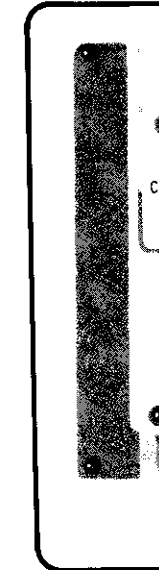
**IC701**  
**AD-12 BOARD (COMPONENT SIDE)**



**IC701**  
**AD-12 BOARD (SOLDER SIDE)**



**IC601**  
**NR-6 BOARD**

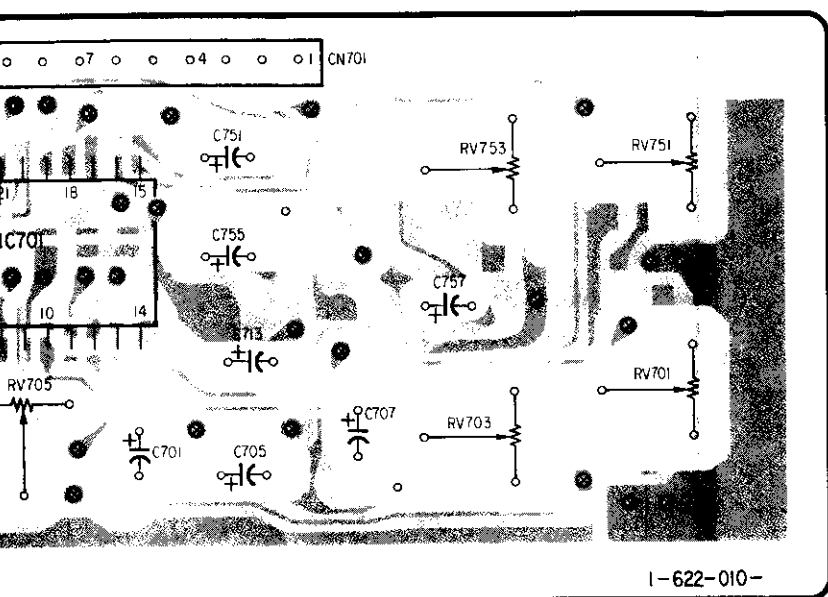


**IC601**  
**NR-6 BOARD**

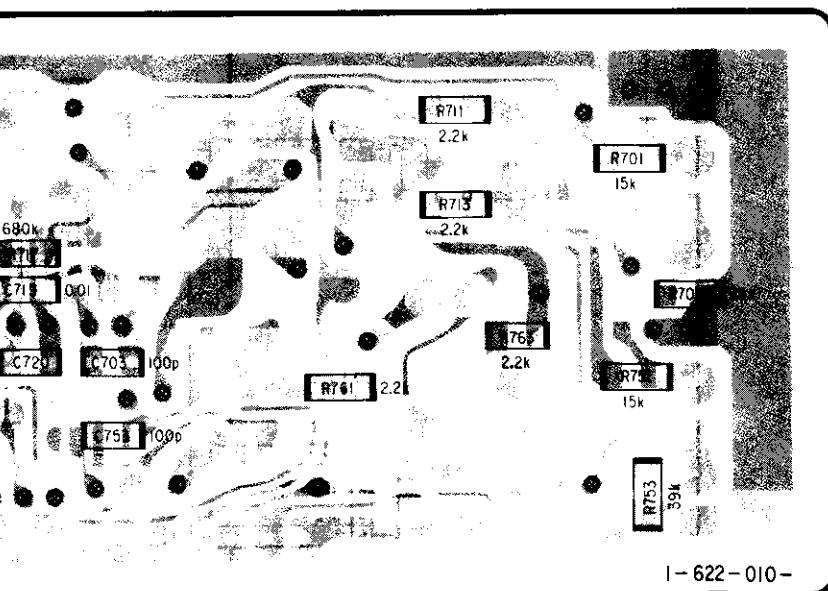


DUCTION), MK-2(MULTI PILOT DETECT), MJ-11(MIC JACK) PRINTED WIRING BOARDS

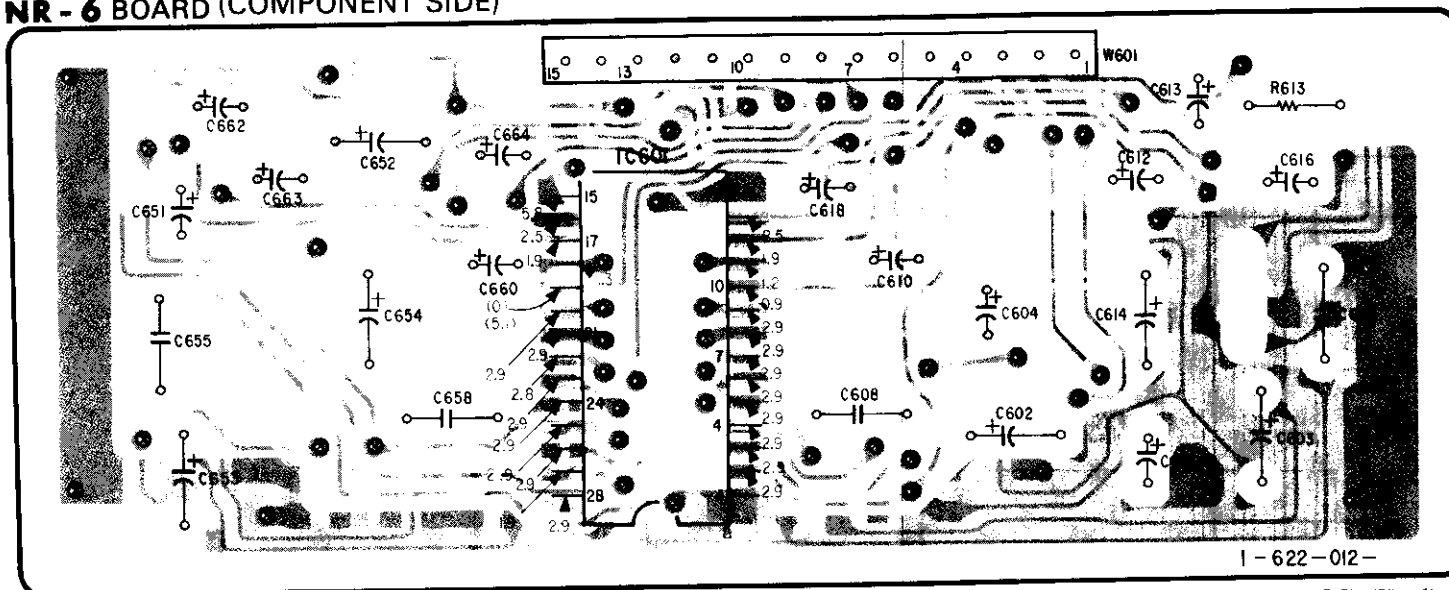
J-11 BOARD : 8,000 series-



Remarks: LP REC mode

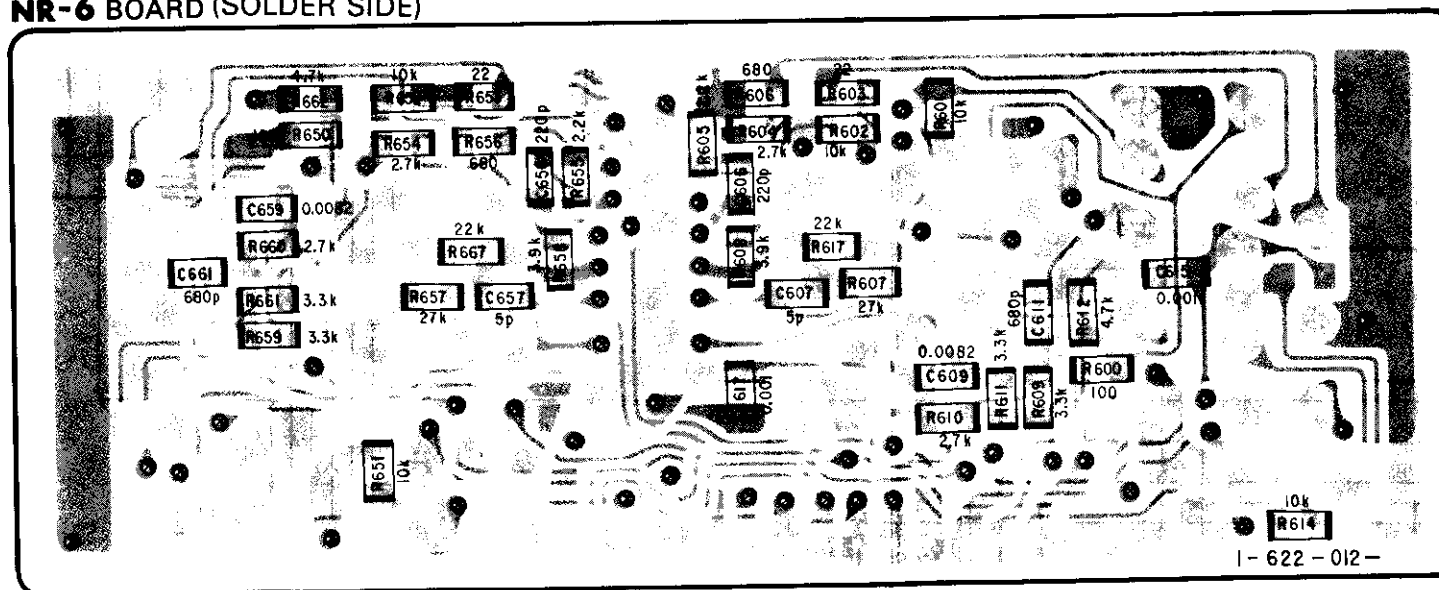


**IC601**  
NR-6 BOARD (COMPONENT SIDE)

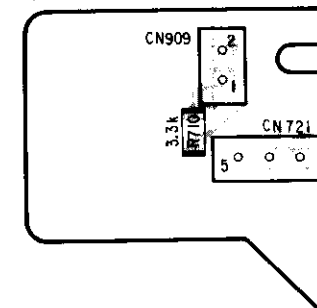


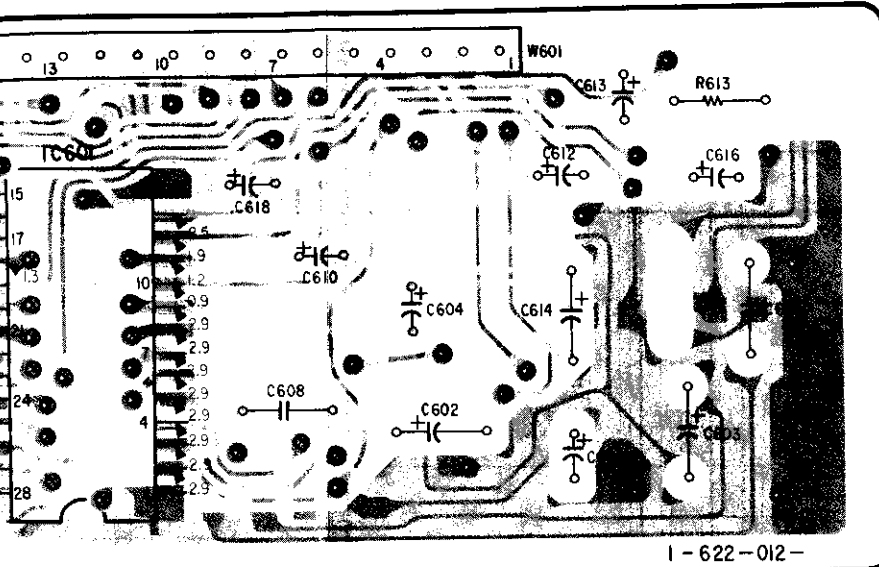
no mark : LP, RE, /PH mode  
 ( ) : LP REC mode  
 ( ) : LP PH mode

**IC601**  
NR-6 BOARD (SOLDER SIDE)



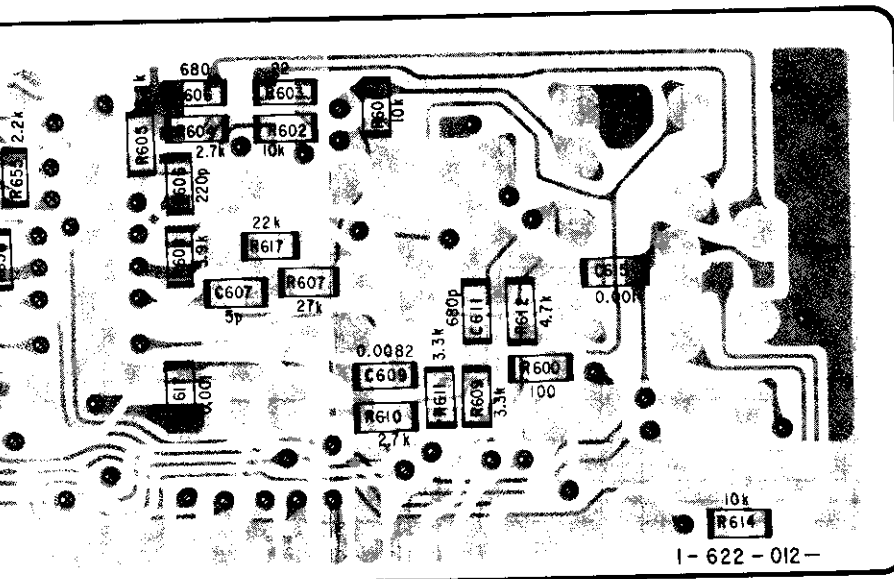
**MJ-11BOARD**





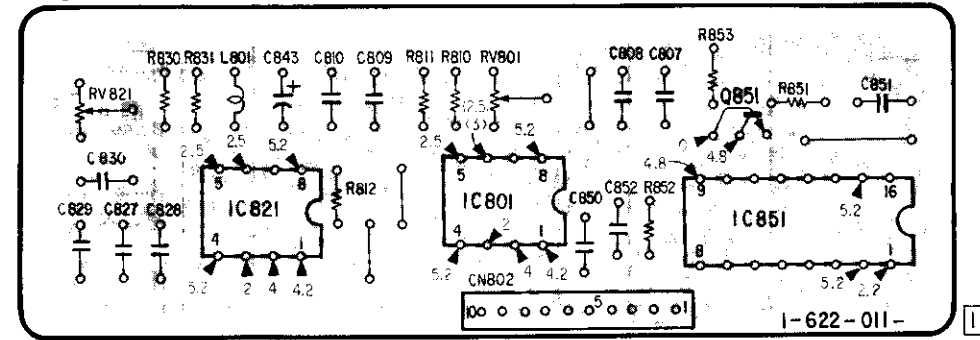
I-622-012-

no mark: LP REC/PH mode  
 ( ) : LP REC mode  
 ( ) : LP PH mode



I-622-012-

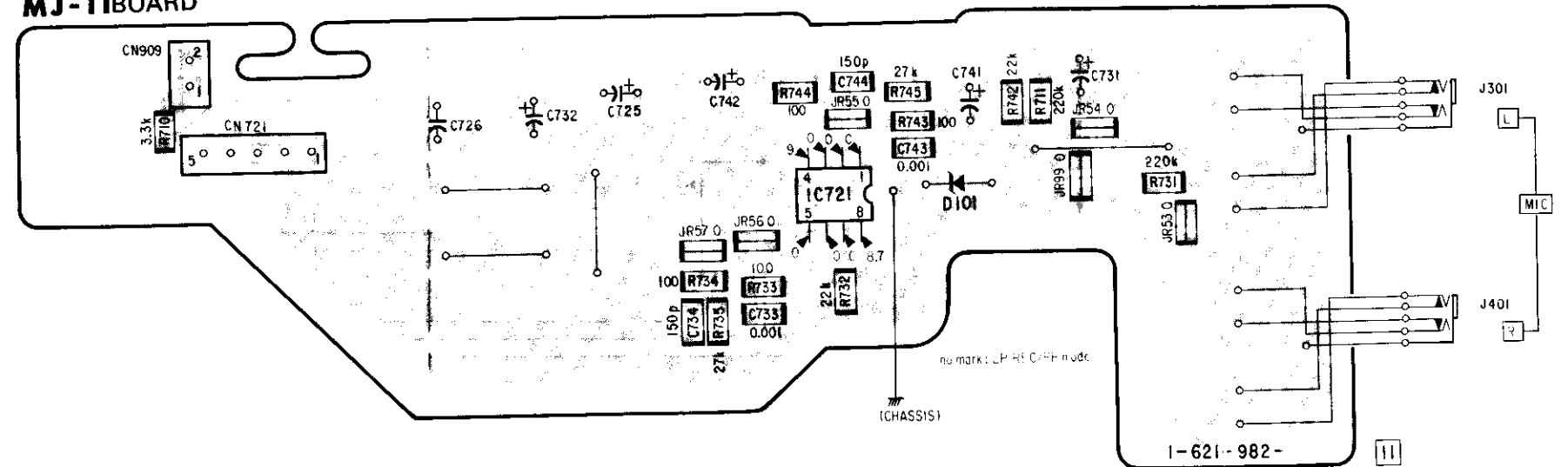
**MK-2 BOARD**



I-622-011-

no mark: LP REC mode  
 ( ) : LP REC mode  
 ( ) : LP PH mode

**MJ-11BOARD**

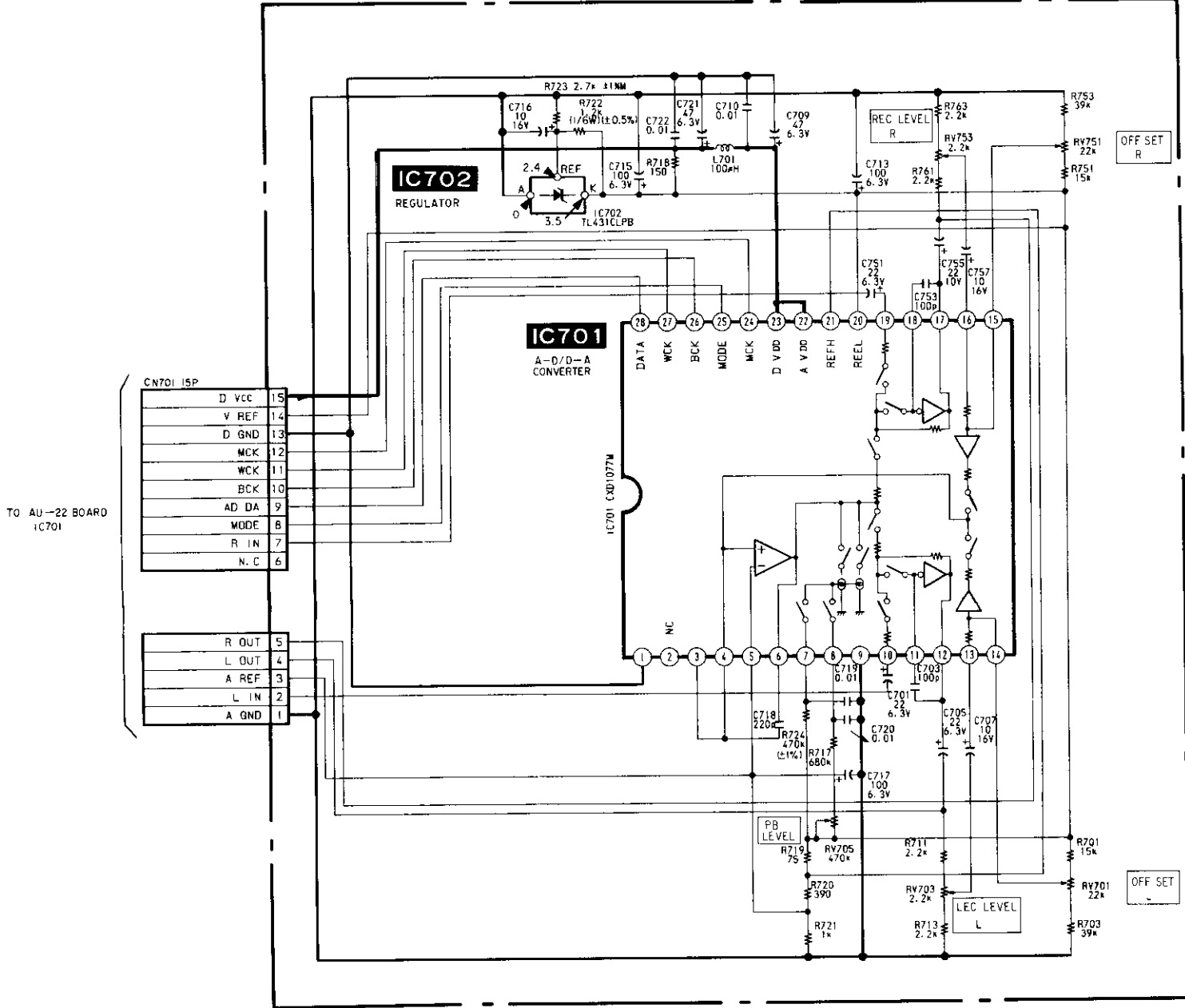


no mark: LP REC mode

I-621-982-

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

**IC701**  
**AD-12 BOARD**



TO AU-22 BOARD  
IC701

CN701 15P	D VCC	15
	V REF	14
	D GND	13
	MCK	12
	MCK	11
	BCK	10
	AD DA	9
	MODE	8
	R IN	7
	N.C	6

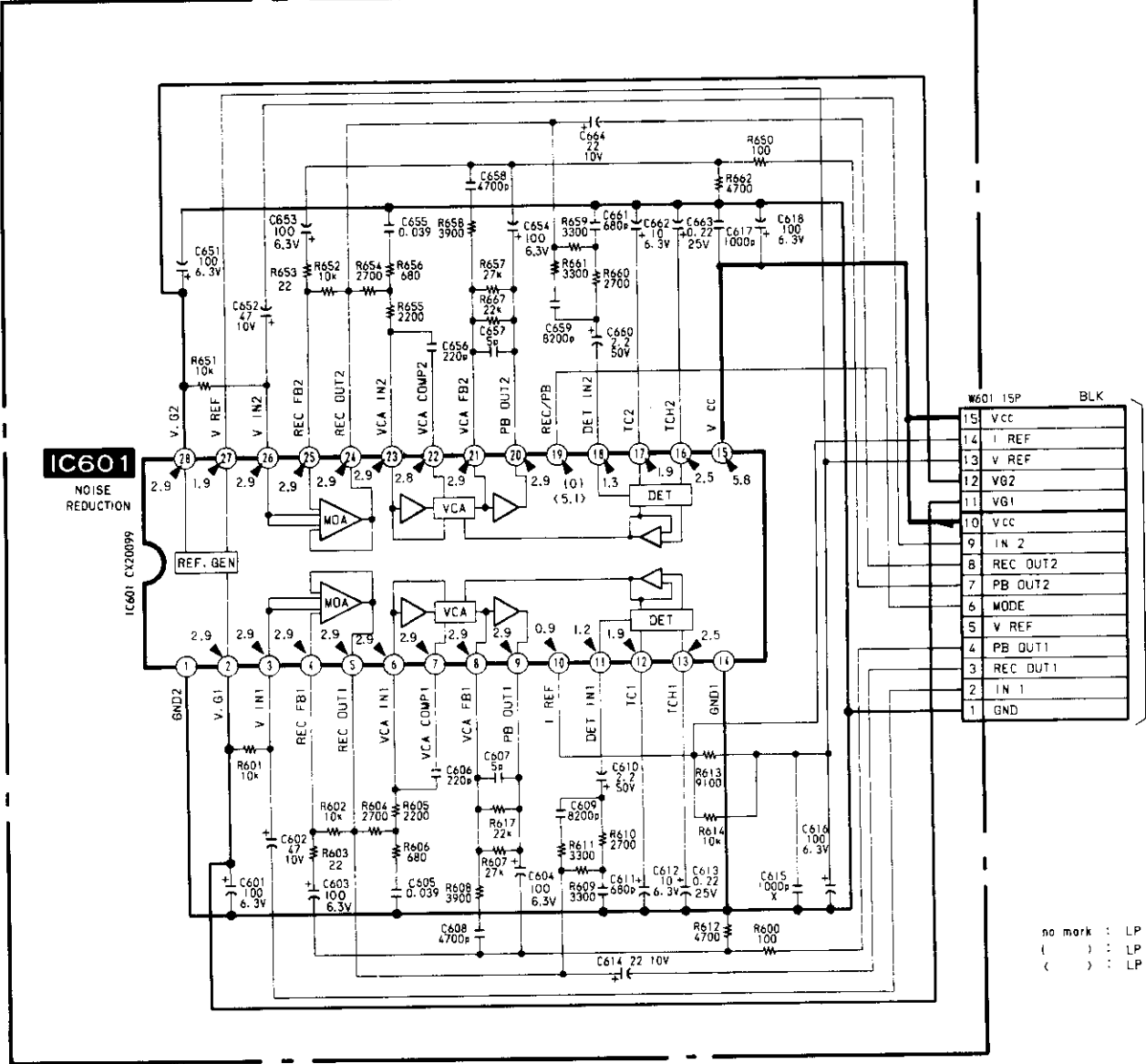
	R OUT	5
	L OUT	4
	A REF	3
	L IN	2
	A GND	1

TO AU-22 BOARD  
W802  
(See page 174)

CN802		
	CO	
	H S	
	PE	
	PB	

no mark : LP REC/PB mode

**IC601**  
**NR-6 BOARD**

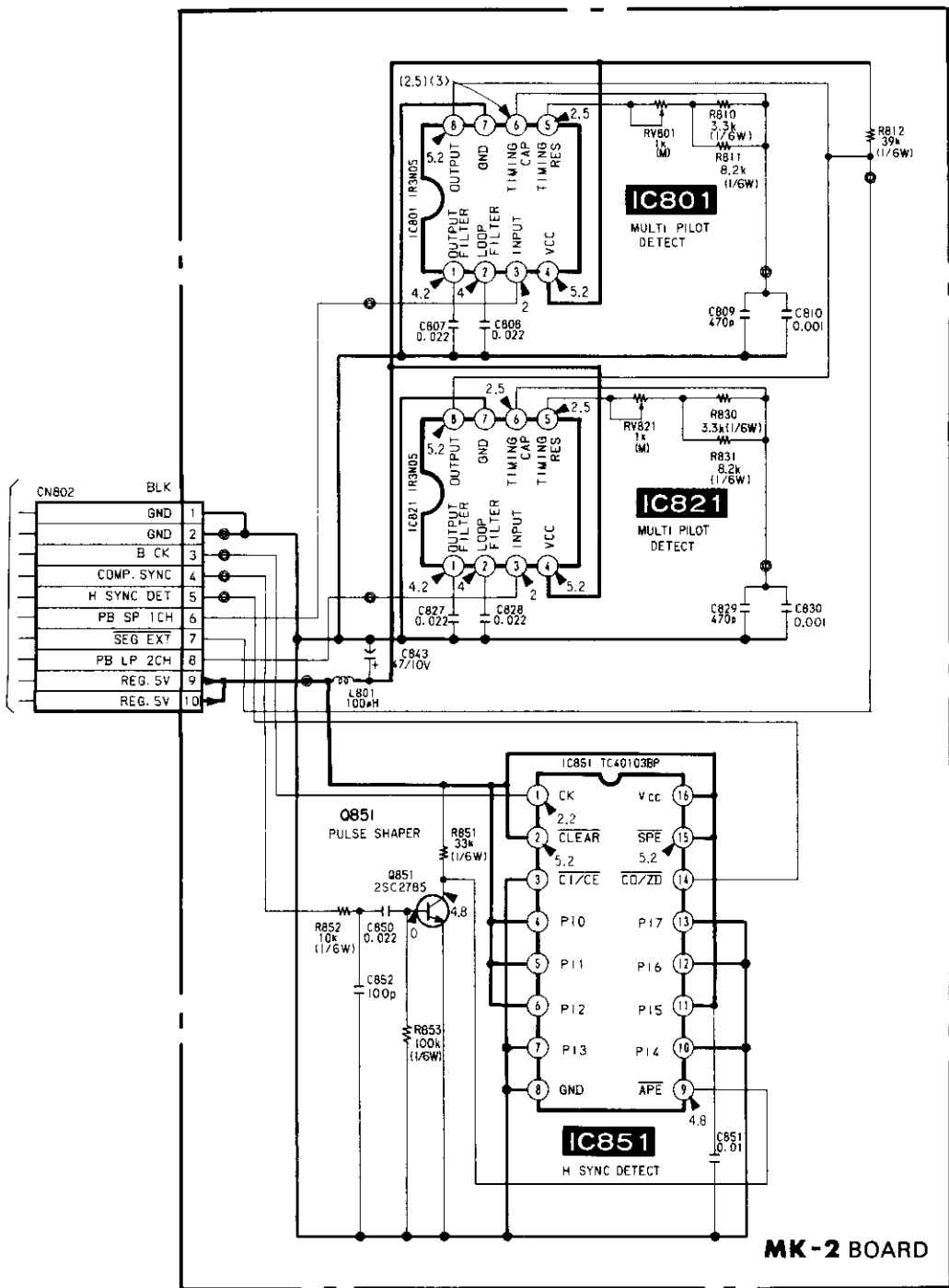


TO AU-22 BOARD  
IC601

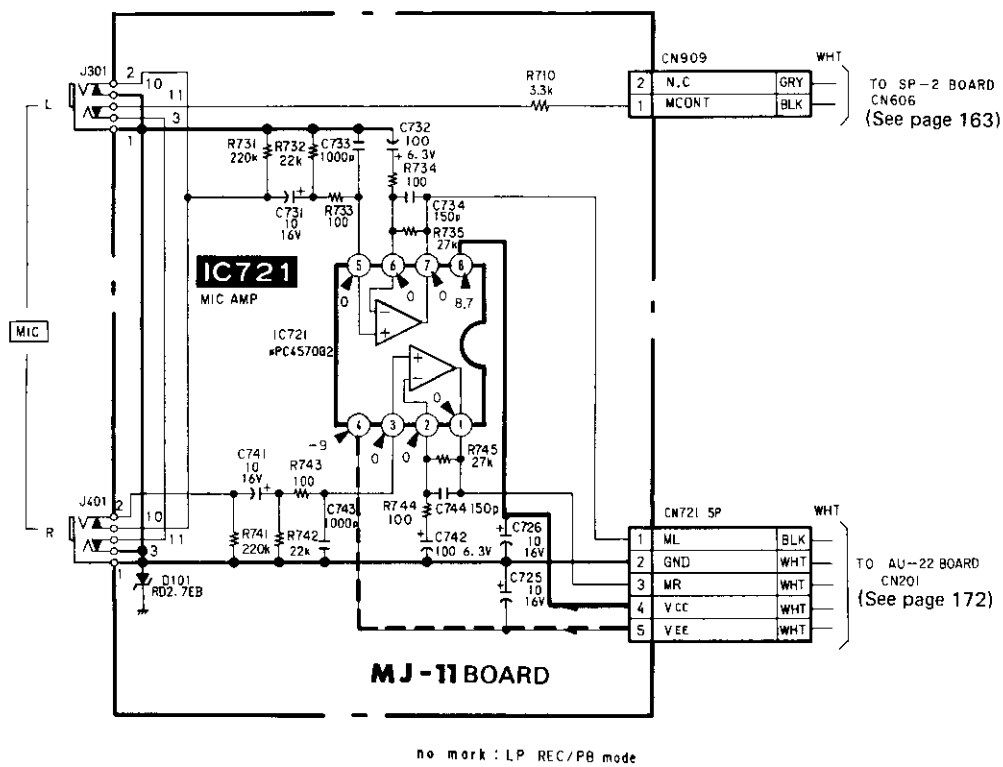
W601 15P	BLK	
	VCC	15
	I REF	14
	V REF	13
	V G2	12
	V G1	11
	VCC	10
	IN 2	9
	REC OUT2	8
	PB OUT2	7
	MODE	6
	V REF	5
	PB OUT1	4
	REC OUT1	3
	IN 1	2
	GND	1

no mark : LP REC/PB mode  
( ) : LP REC mode  
( ) : LP PB mode

AU-22 BOARD W802 (See page 174)



no mark : LP REC/PB mode  
 ( ) : LP REC mode  
 < > : LP PB mode



no mark : LP REC/PB mode

Note:

- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF. 50V or less are not indicated except for electrolytic, and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- □ : panel designation.
- ◻ : adjustment for repair.
- — : B + bus.
- - - - : B - bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

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

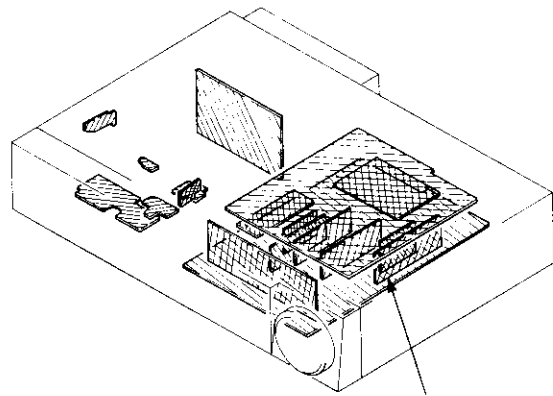
- Signal path

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

**Note:**

- : indicates a lead wire mounted on the component side.
- : indicates a lead wire mounted on the printed side.
- : soldering side.
- : Pattern of conductor and silver chloride of soldering side.
- : B+ Pattern.
- Digital transistor (AF-20:Q501, Q503) transistor with resistor refer to the AF-20 board schematic diagram for digital transistor.

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



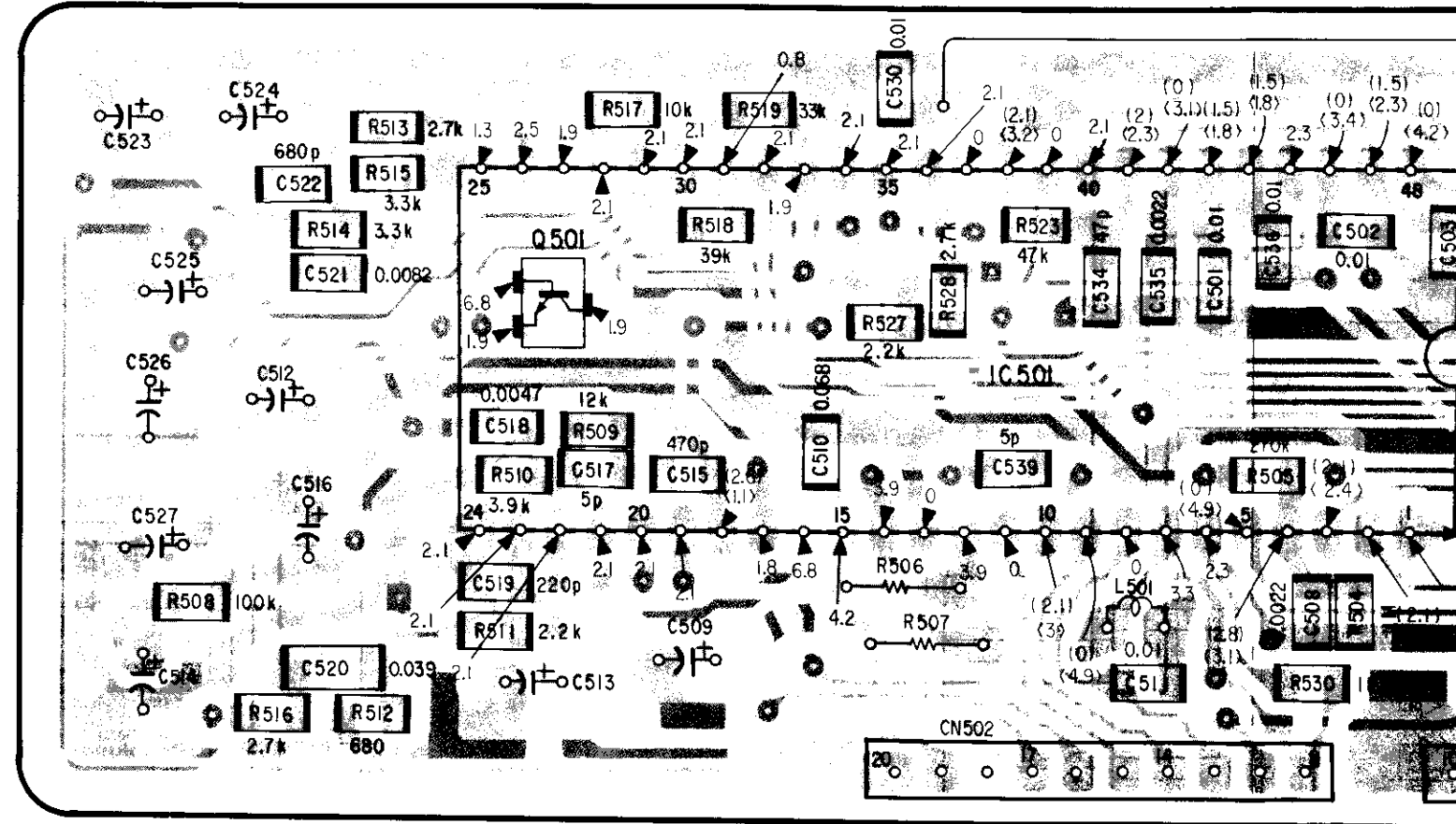
AF-20  
(AFM MOD/DEMOD  
NOISE REDUCTION)

**AF-20(AFM MOD/DEMOD NOISE REDUCTION) PRINTED WIRING BOARD**

—Ref. No. AF-20 BOARD : 8,000 series—

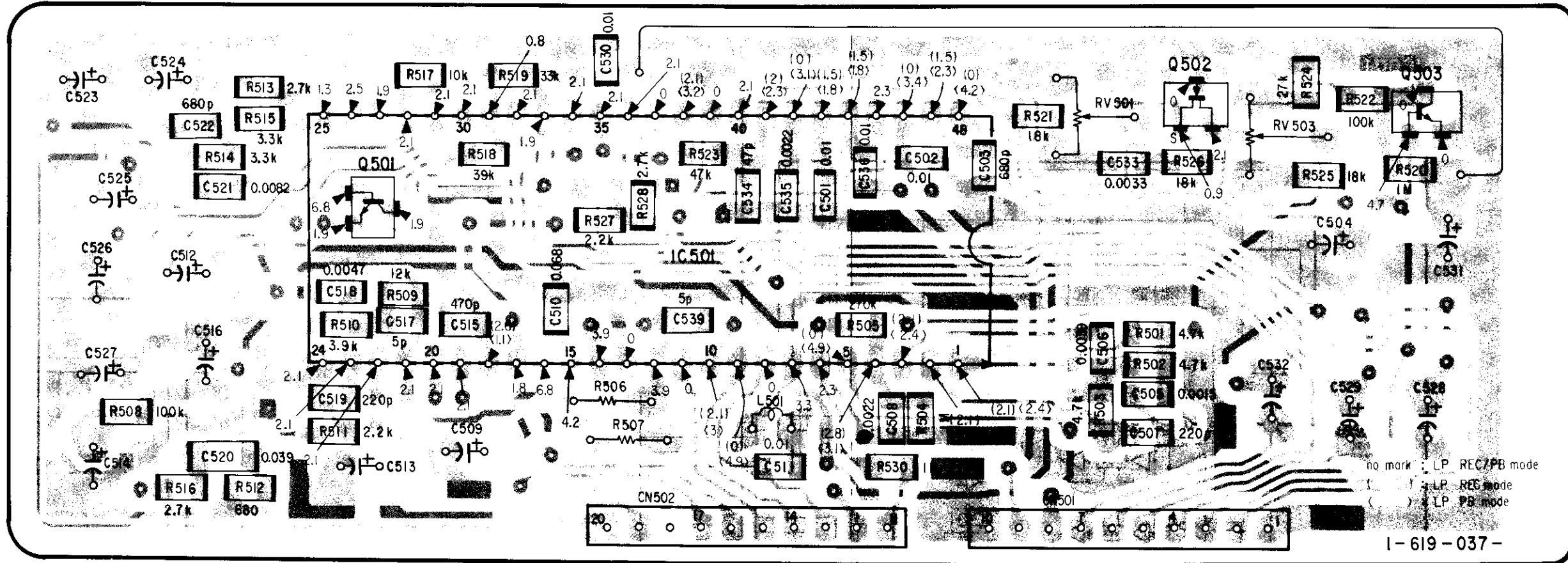
**IC501**

**AF-20 BOARD**



**AF-20(AFM MOD/DEMOD NOISE REDUCTION) PRINTED WIRING BOARD**  
 —Ref. No. AF-20 BOARD : 8,000 series—

**IC501**  
**AF-20 BOARD**



13



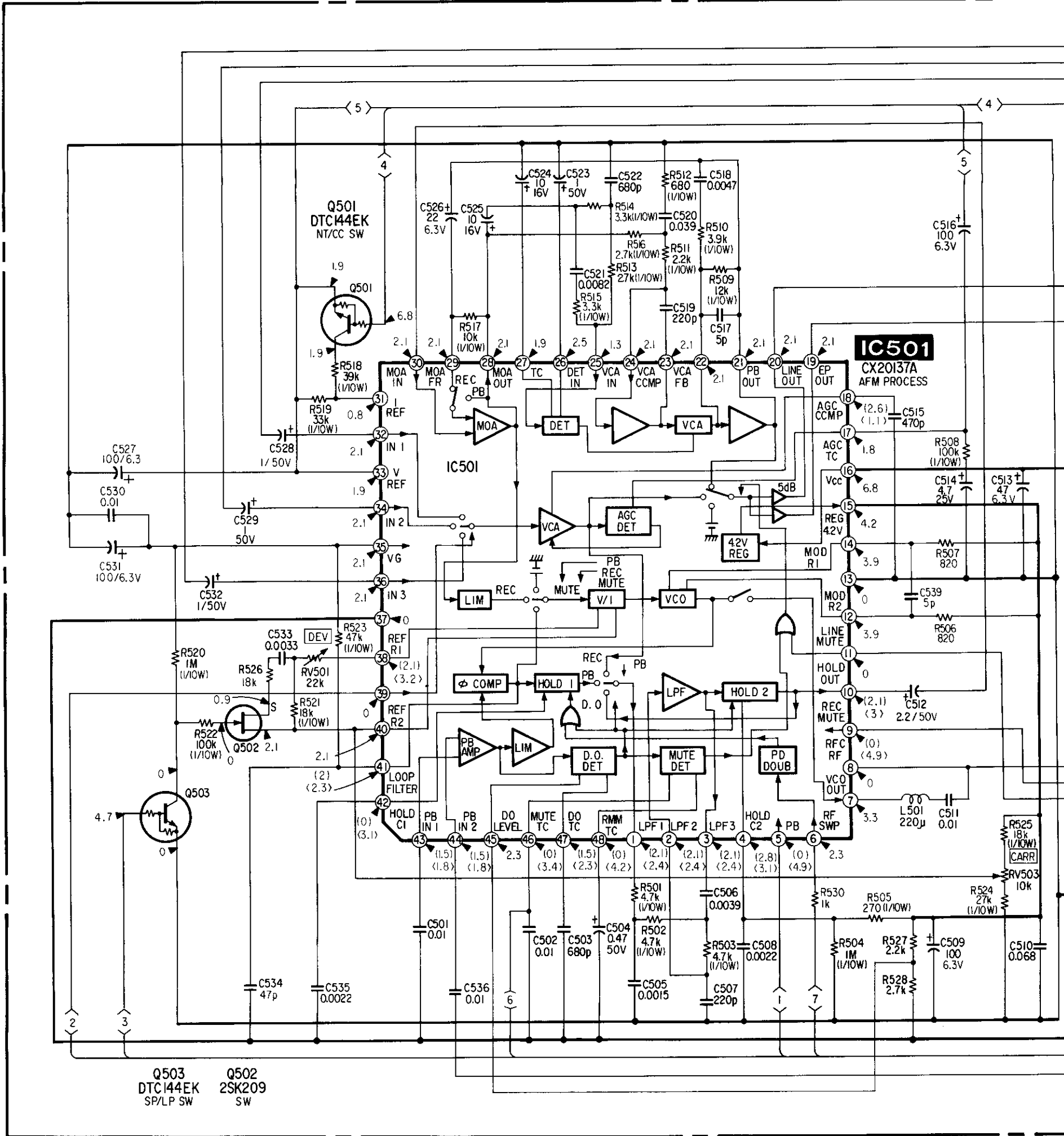
AF-20(AFM MOD/DEMOD NOISE REDUCTION) SCHEMATIC DIAGRAM

—Ref. No. AF-20 BOARD : 8,000 series—

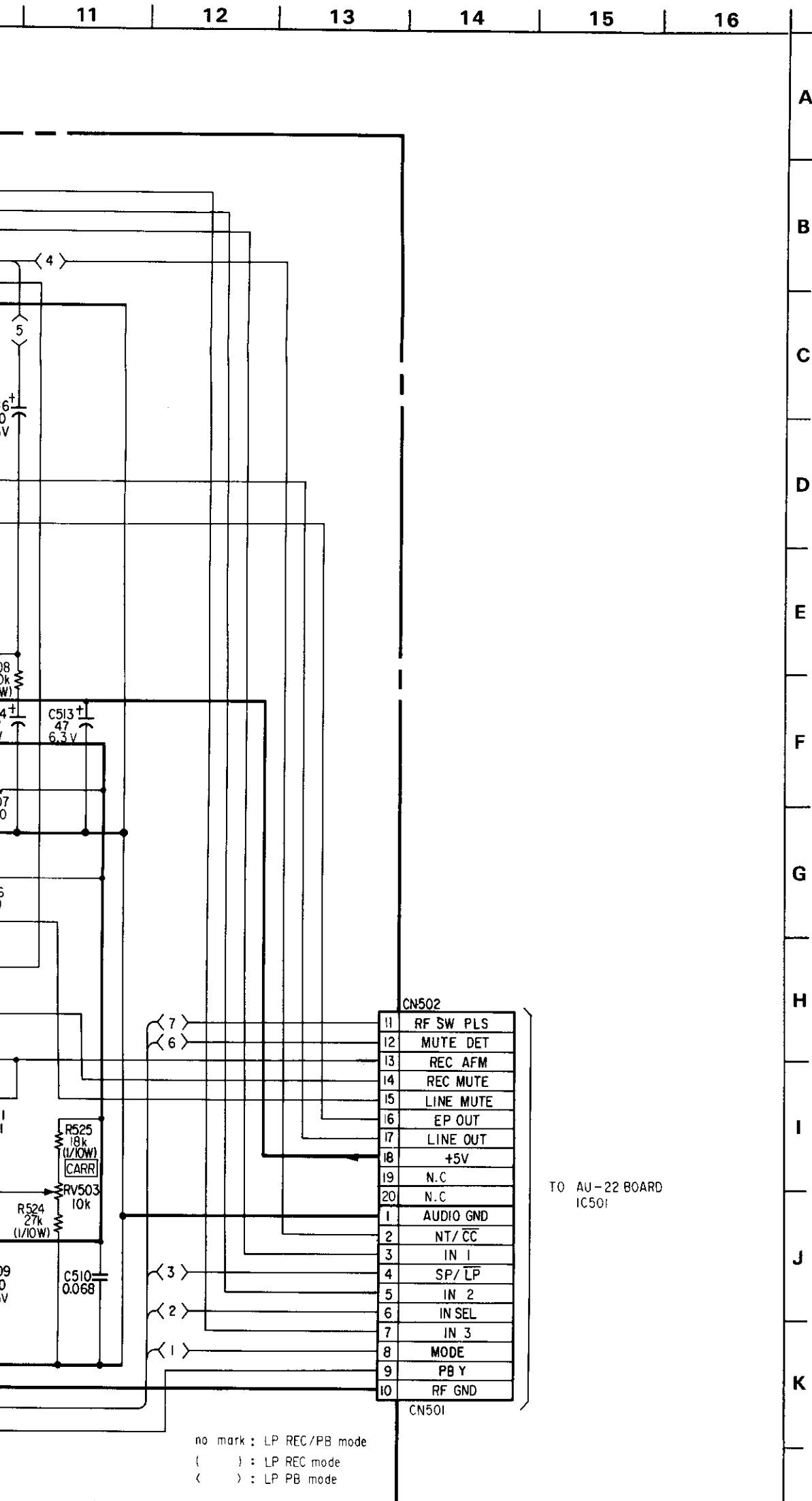
1 2 3 4 5 6 7 8 9 10 11

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

**IC501**  
**AF-20 BOARD**



Q503 DTC144EK SP/LP SW  
Q502 2SK209 SW



**Note:**

- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic, and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- □ : adjustment for repair.
- — : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

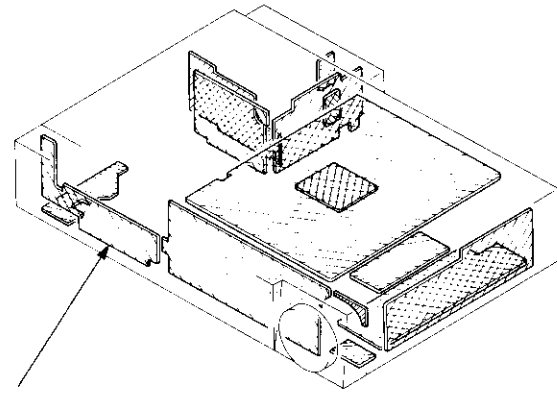
When indicating parts by reference number, please include the board name.

- Signal path

**Note:**

- ⊙ : indicates a lead wire mounted on the component side.
- ● : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ○ : soldering side.
- ⊙ : component side.
- ⊕ : B+ Pattern.

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



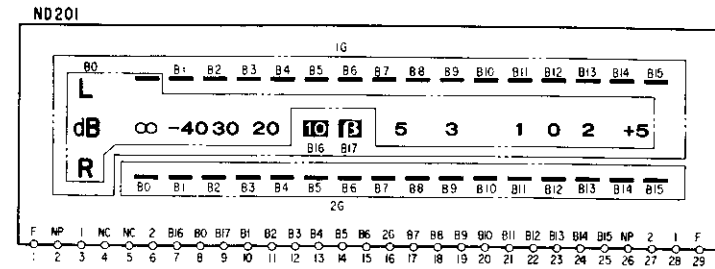
PW-30  
(LEVEL METER/VOLUME/JACK/  
REMOTE CONTROL RECEIVER)

**PW-30 (LEVEL METER/VOLUME/JACK/REMOTE CONTROL RECEIVER) PRINTED WIRING BOARD**

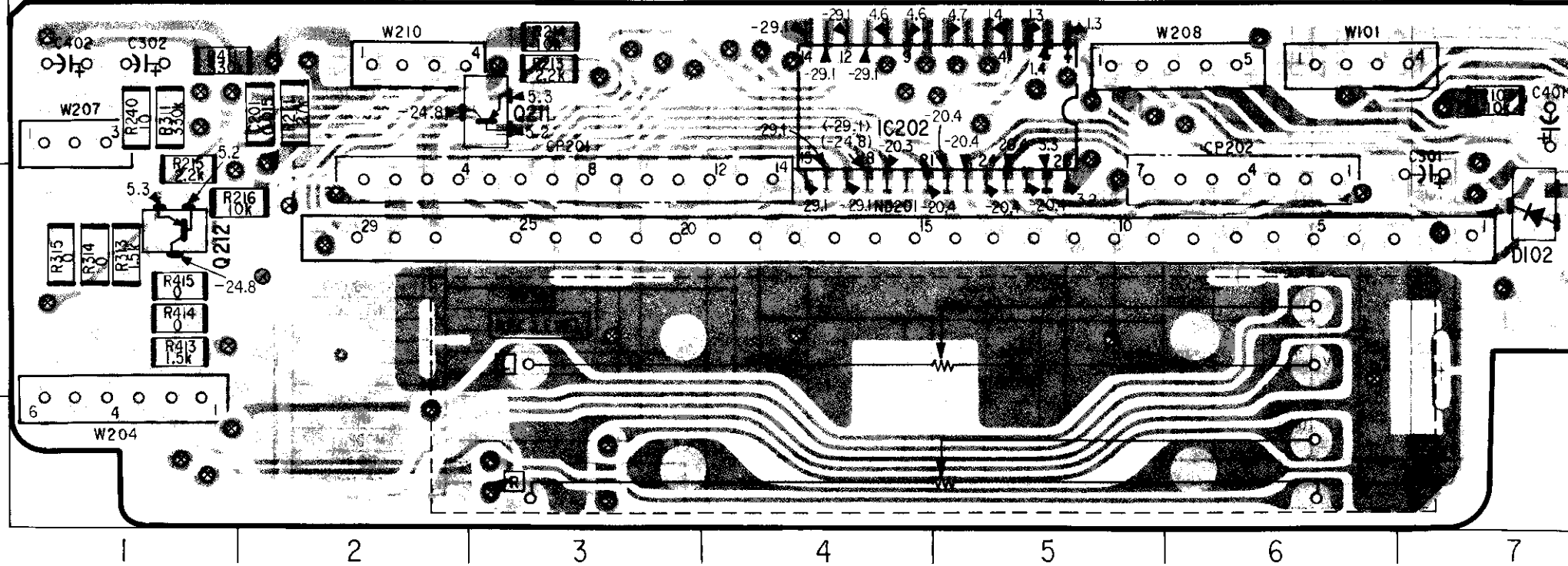
—Ref. No. PW-30 BOARD : 9,000 series—

D101	A-9
D102	D-7
D103	C-10
D104	D-9
D105	D-10
IC101	D-8
IC201	D-9
IC202	C-4
Q211	C-3
Q212	D-1
Q213	D-8
RV201	B-10
RV301	D-3

A  
B  
C  
D  
E  
1  
2  
3  
4  
5  
6  
7

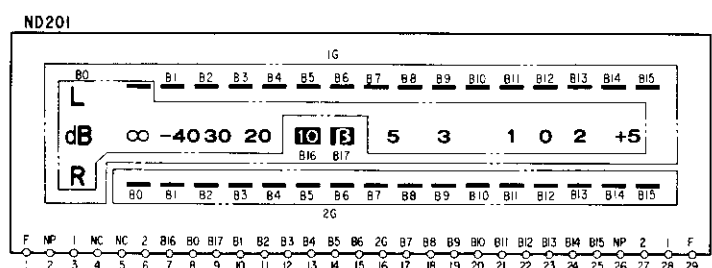


**PW-30 BOARD (SOLDER SIDE)**

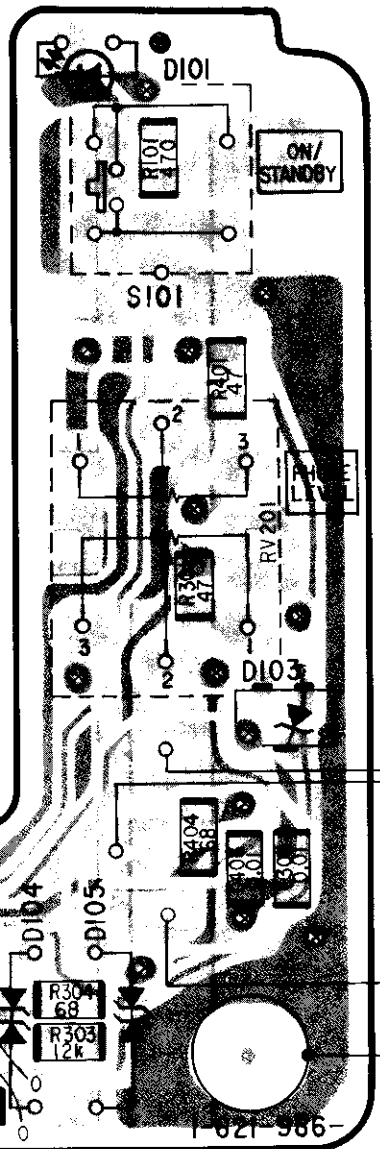
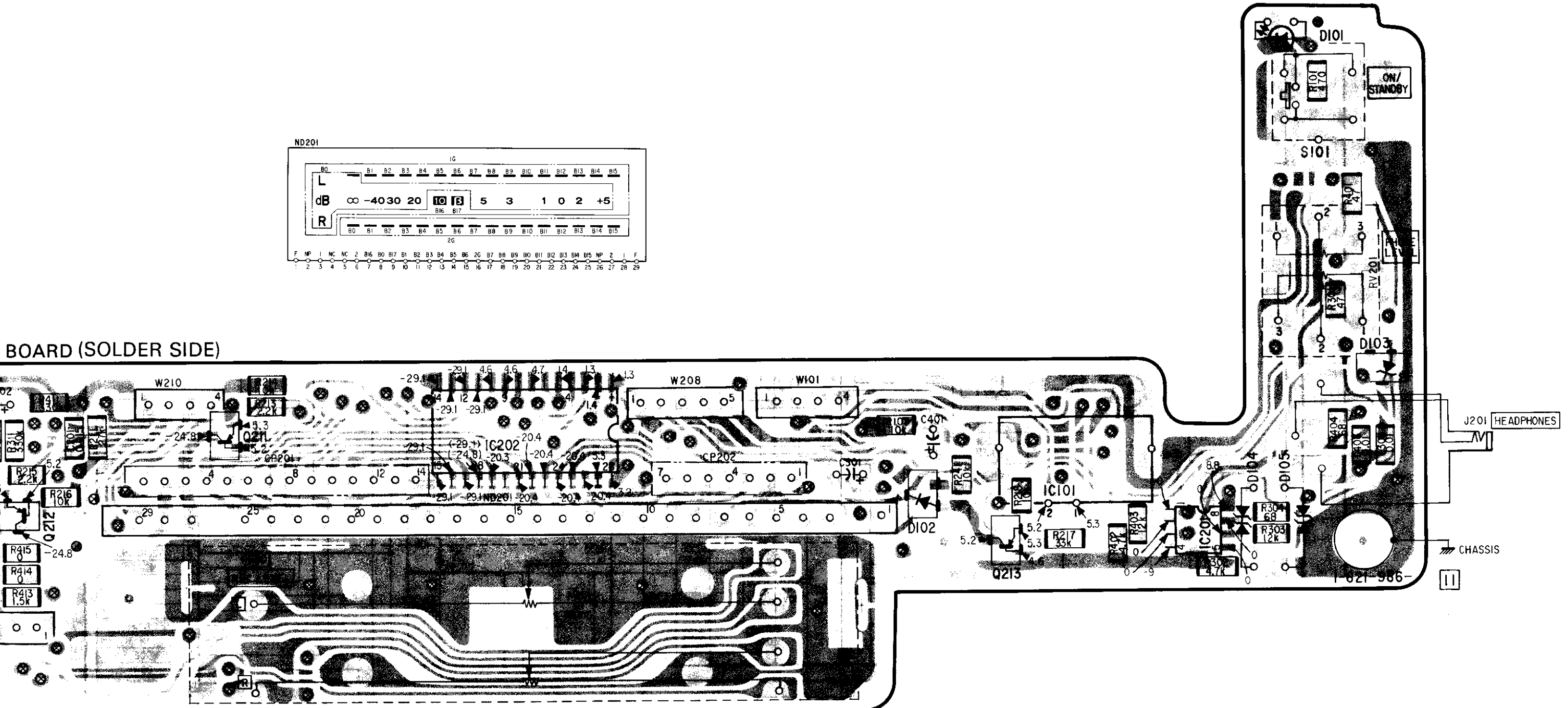


METER/VOLUME/JACK/REMOTE CONTROL RECEIVER) PRINTED WIRING BOARD

BOARD : 9,000 series--

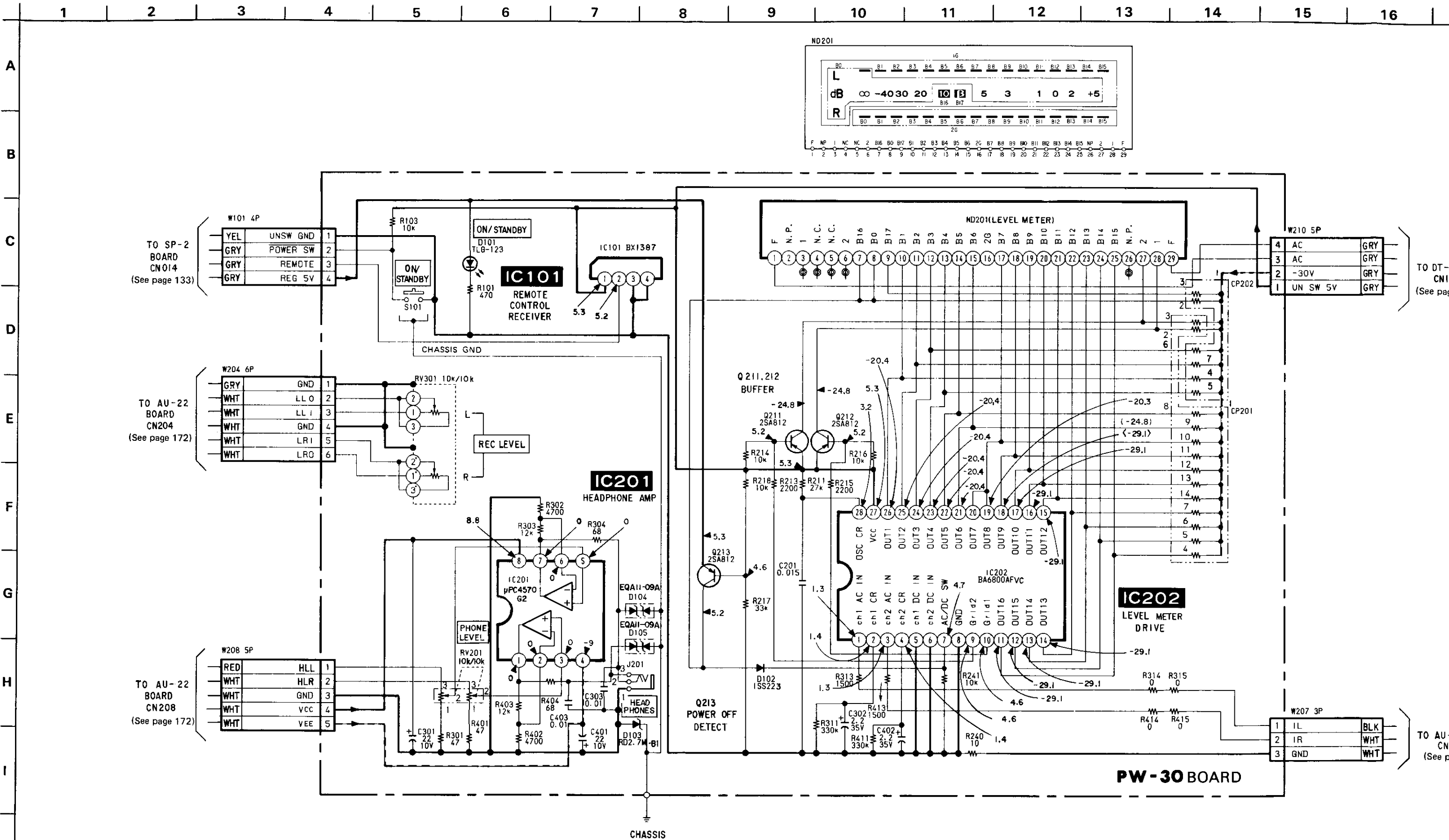


BOARD (SOLDER SIDE)



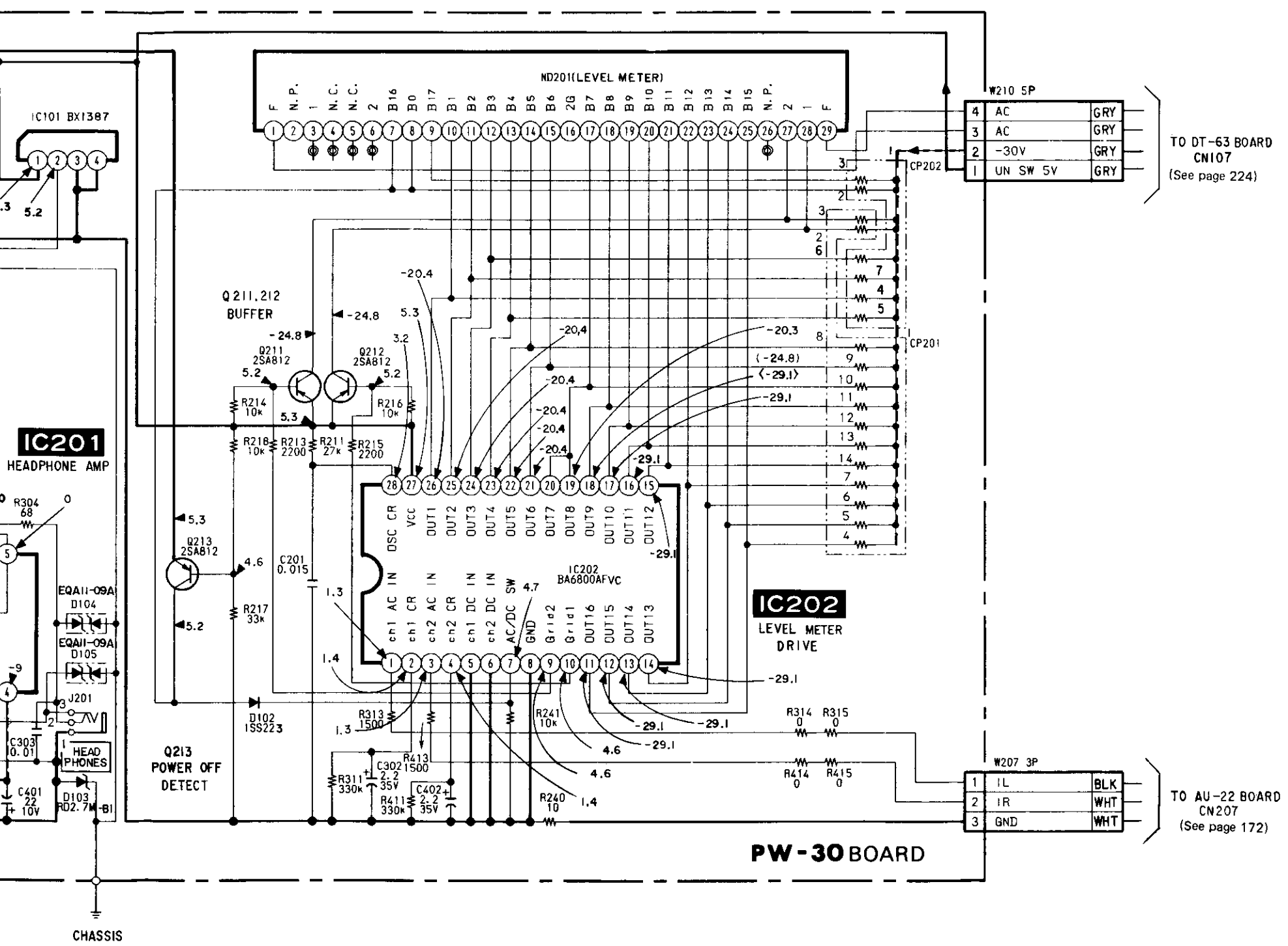
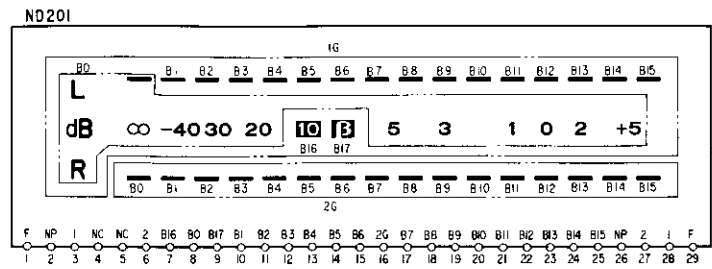
**PW-30(LEVEL METER/VOLUME/JACK/REMOTE CONTROL RECEIVER) SCHEMATIC DIAGRAM**

- Ref. No. PW-30 BOARD : 9,000 series -



**AUDIO(4) AUDIO(4)**

no mark : LP REC/PB mode  
 ( ) : LP REC mode  
 < > : LP PB mode



no mark : LP REC/PB mode  
( ) : LP REC mode  
< > : LP PB mode

Note:

- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- □ : panel designation.
- □ : adjustment for repair.
- — : B + bus.
- - - - : B - bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

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

- Signal path

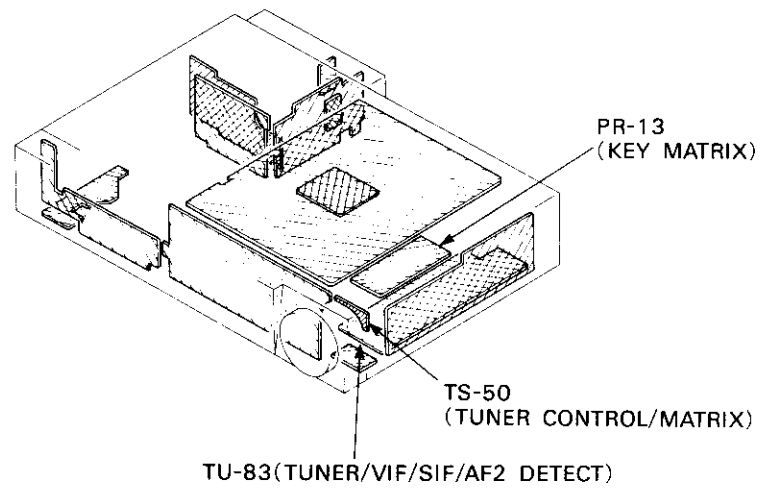
**TU-83(TUNER/VIF/SIF/AF2 DETECT), TS-50(TUNER CONTROL/MATRIX), PR-13(KEY MATRIX) PRINTED WIRING BOARDS**  
 -Ref. No. TU-83 BOARD, TS-50 BOARD : 10, 000 series, PR-13 BOARD : 10, 500 series-

**Note:**

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

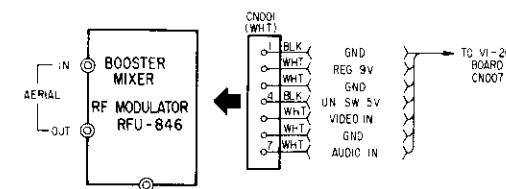
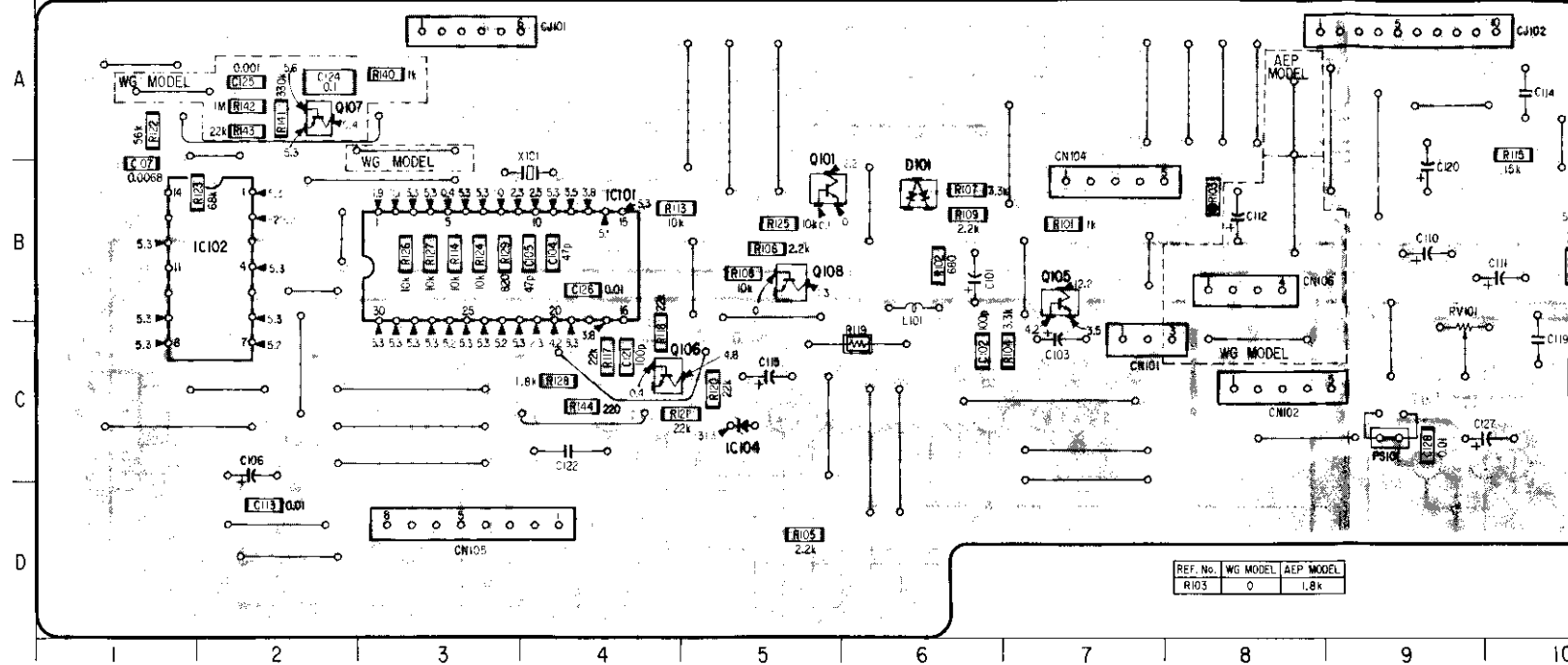
- Digital transistor (TU-83:Q005,Q006,Q007,TS-50:Q018) transistor with resistors.  
 Refer to the TU-83,TS-50 boards schematic diagram for digital transistor.

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



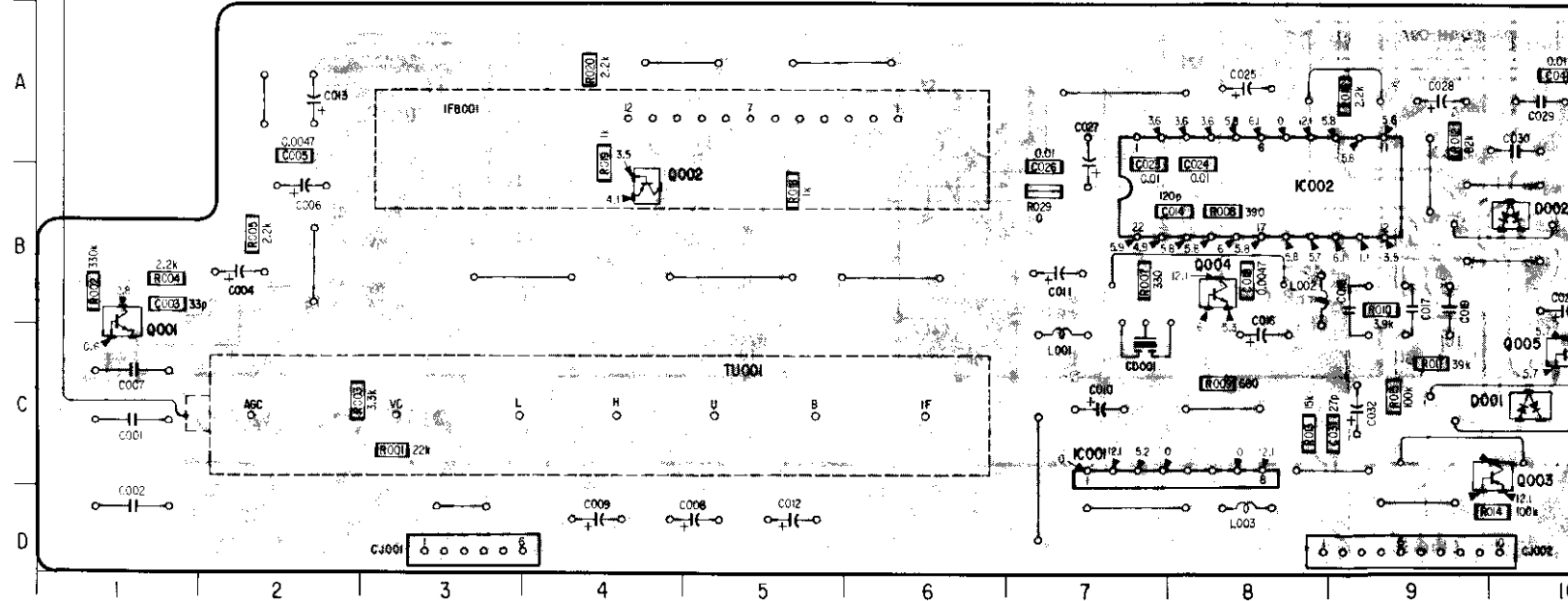
D101	B-6
IC101	B-4
IC102	B-2
IC103	A-11
IC104	C-5
Q101	B-5
Q102	B-10
Q103	B-11
Q104	B-11
Q105	B-7
Q106	C-4
Q107	A-2
Q108	B-5
RV101	C-9

**TS-50 BOARD**



D001	C-10
D002	B-10
IC001	C-7
IC002	B-8
IC003	C-11
Q001	B-1
Q002	B-4
Q003	C-10
Q004	B-8
Q005	C-10
Q006	B-10
Q007	B-10
RV001	A-11

**TU-83 BOARD**

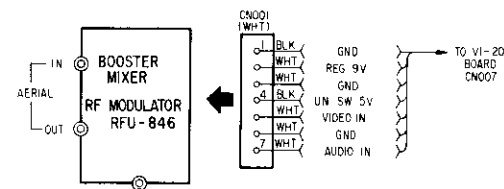
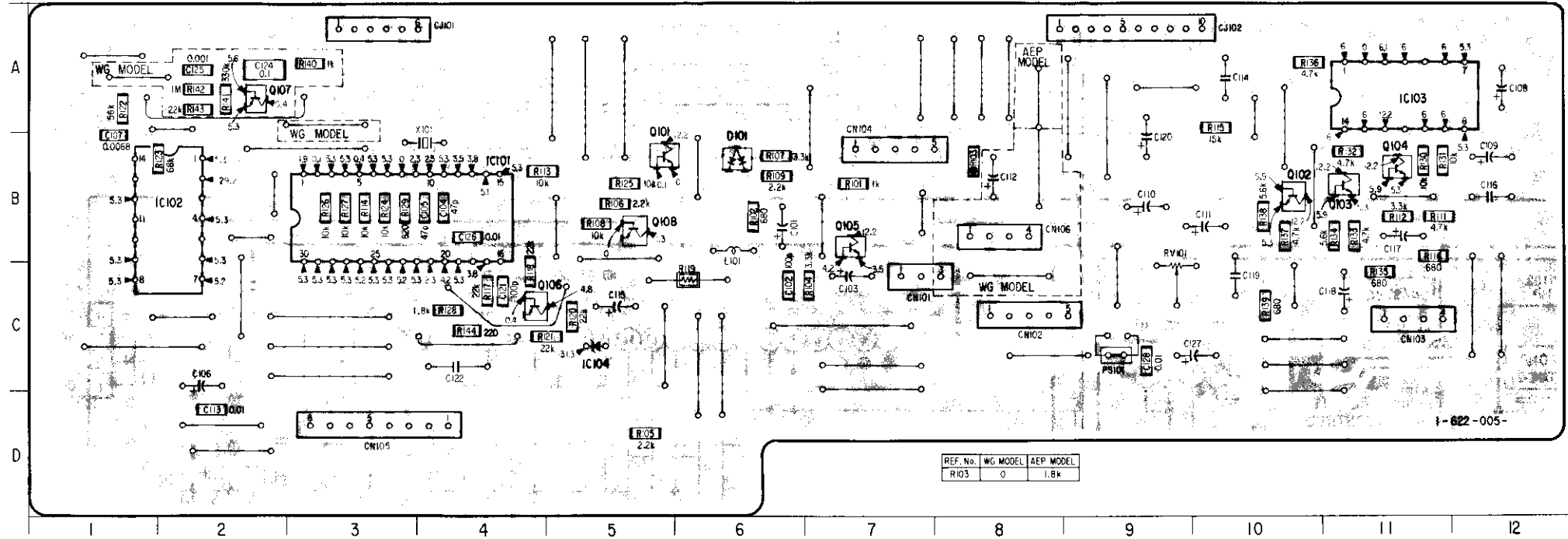


**TU-83(TUNER/VIF/SIF/AF2 DETECT), TS-50(TUNER CONTROL/MATRIX), PR-13(KEY MATRIX) PRINTED WIRING BOARDS**

—Ref. No. TU-83 BOARD, TS-50 BOARD: 10, 000 series, PR-13 BOARD: 10, 500 series—

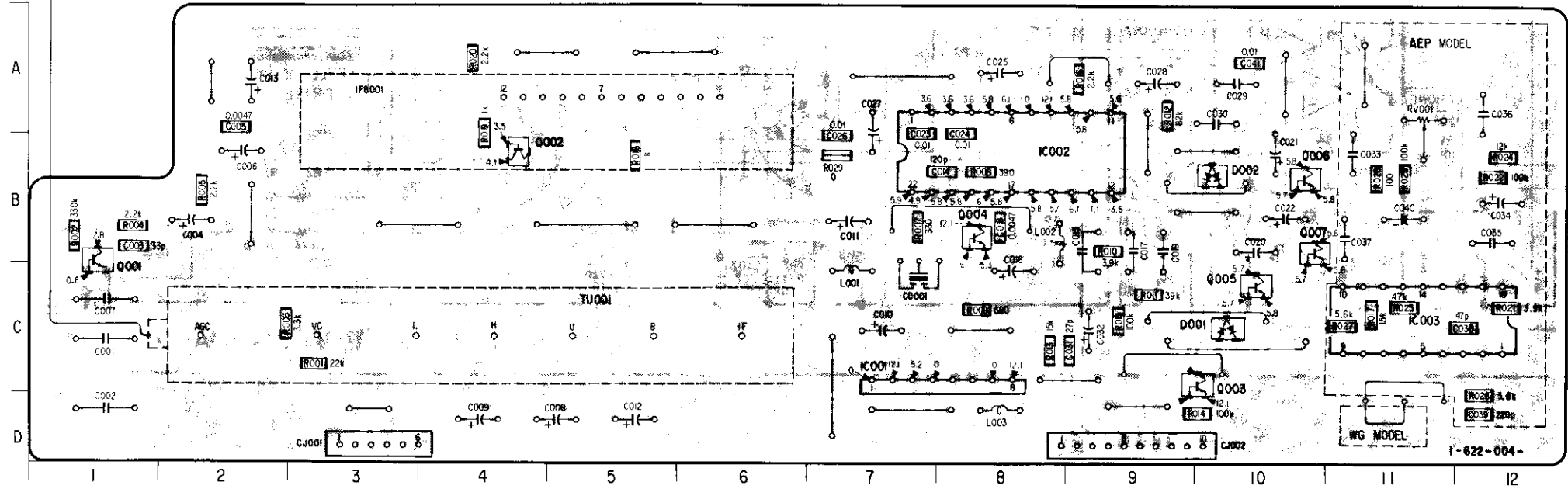
- D101 B-6
- IC101 B-4
- IC102 B-2
- IC103 A-11
- IC104 C-5
- Q101 B-5
- Q102 B-10
- Q103 B-11
- Q104 B-11
- Q105 B-7
- Q106 C-4
- Q107 A-2
- Q108 B-5
- RV101 C-9

**TS-50 BOARD**

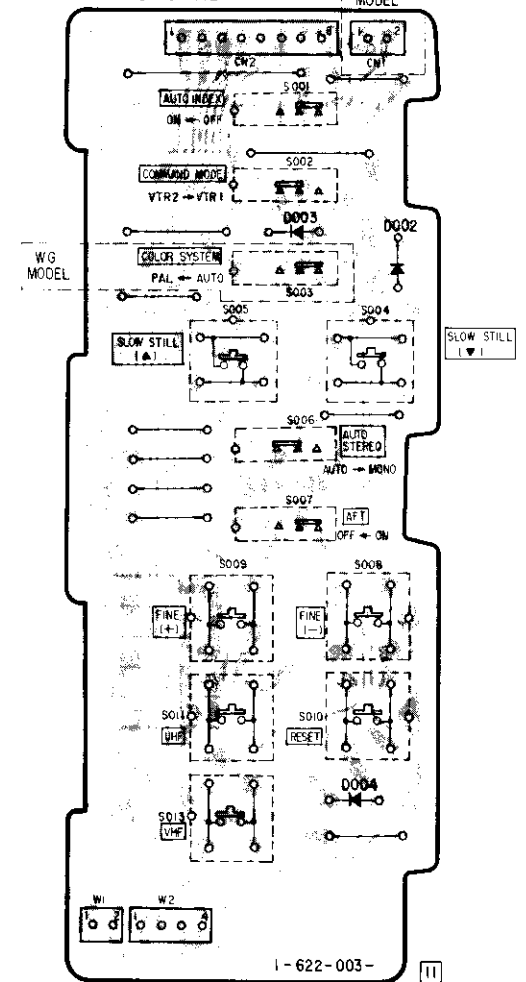


- D001 C-10
- D002 B-10
- IC001 C-7
- IC002 B-8
- IC003 C-11
- Q001 B-1
- Q002 B-4
- Q003 C-10
- Q004 B-8
- Q005 C-10
- Q006 B-10
- Q007 B-10
- RV001 A-11

**TU-83 BOARD**



**PR-13BOARD**



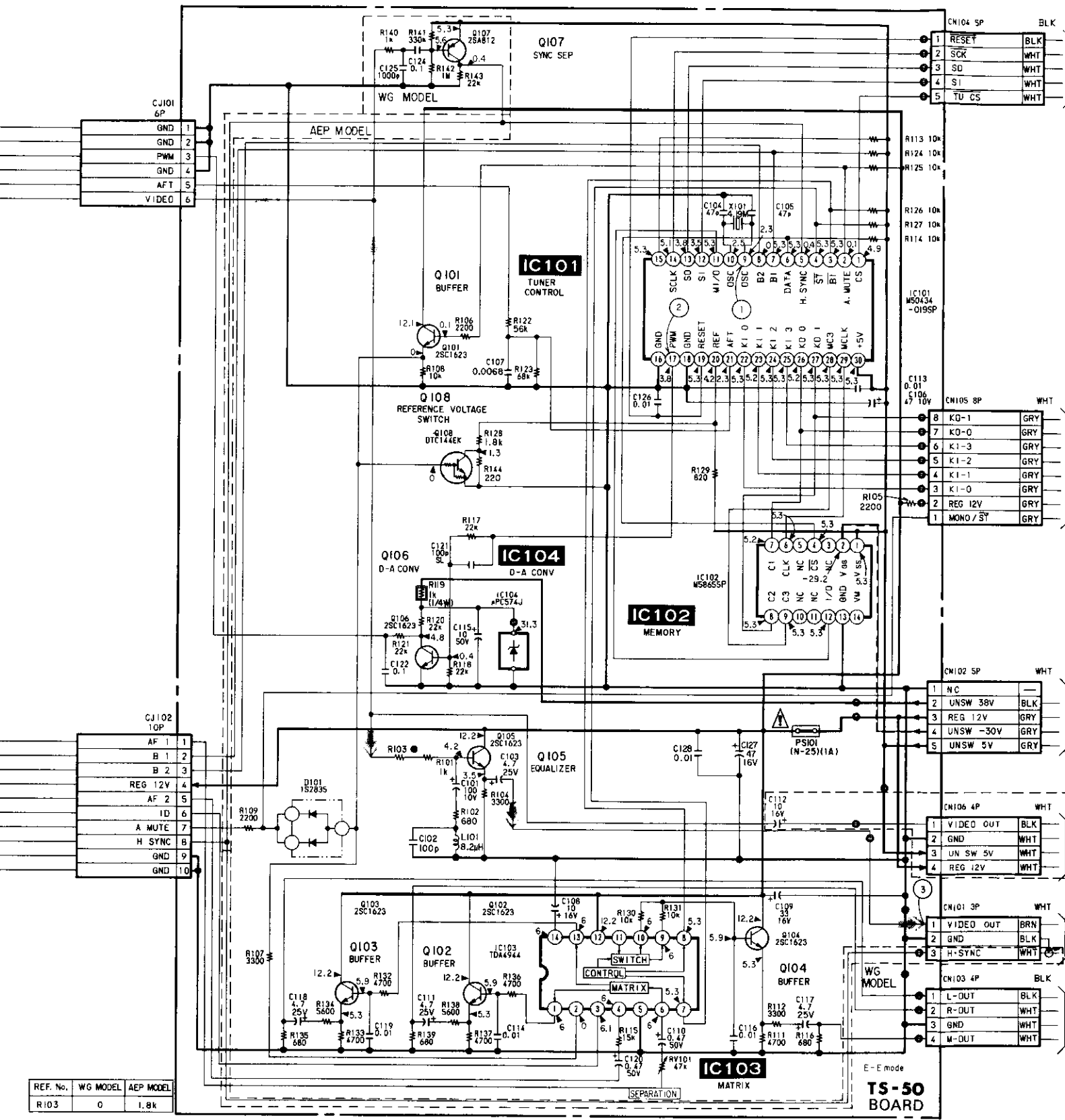
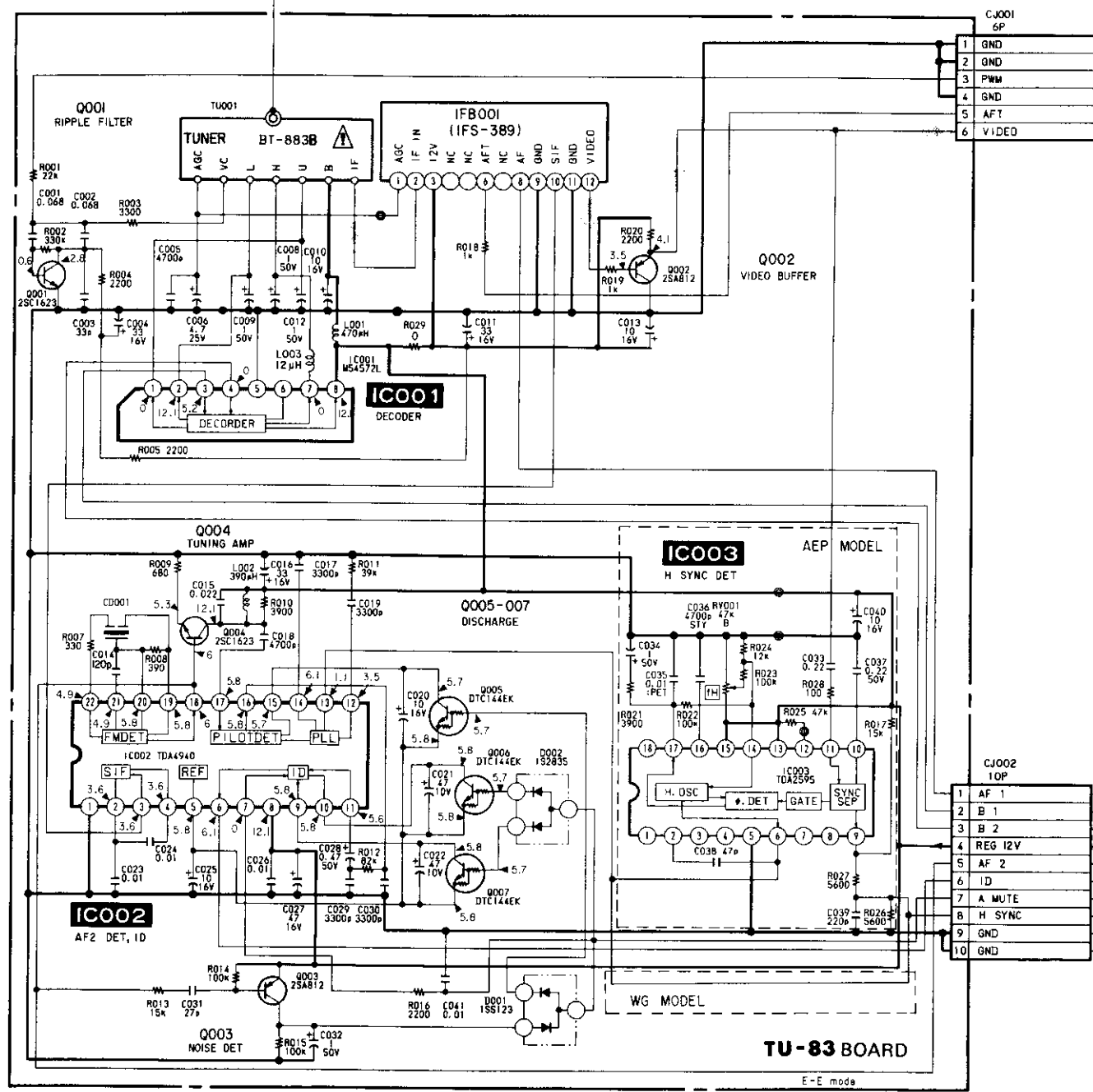
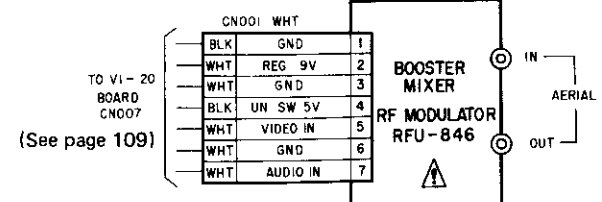


**TU-83(TUNER/VIF/SIF/AF2 DETECT), TS-50(TUNER CONTROL/MATRIX), PR-13(KEY MATRIX) SCHEMATIC DIAGRAM**

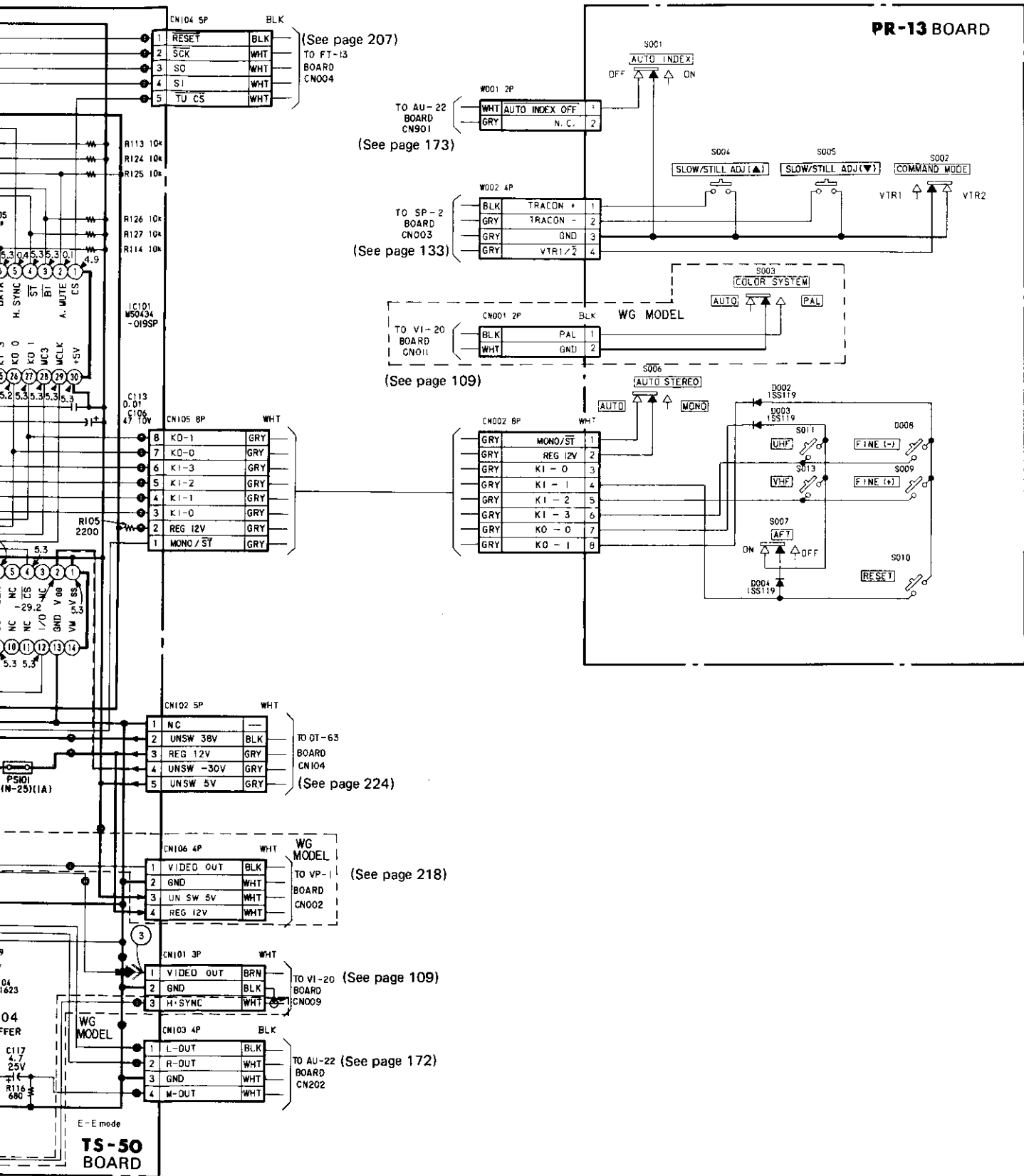
—Ref. No. TU-83 BOARD, TS-50 BOARD: 10,000 series, PR-13 BOARD: 10,500 series—

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

A  
B  
C  
D  
E  
F  
G  
H  
I  
J



REF. No.	WG MODEL	AEP MODEL
R103	0	1.8k



**Note:**

- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Marked ● parts have the difference between the WG model and the AEP model.
- □ : panel designation.
- ◻ : adjustment for repair.
- — : B + bus.
- - - - : B - bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

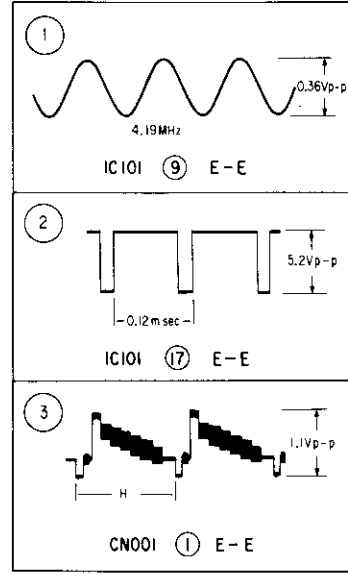
When indicating parts by reference number, please include the board name.

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

• **Signal path**

⚡ : REC Y/CHROMA Signal

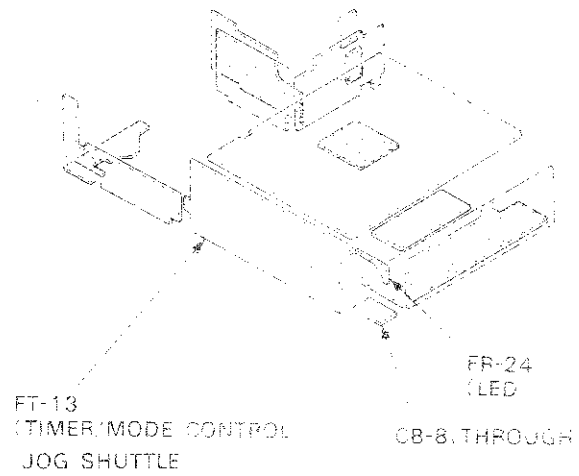
**TS-50 BOARD**



**Note:**

- indicates a lead wire mounted on the component side.
- indicates a lead wire mounted on the printed side.
- indicates a through hole.
- indicates soldering side.

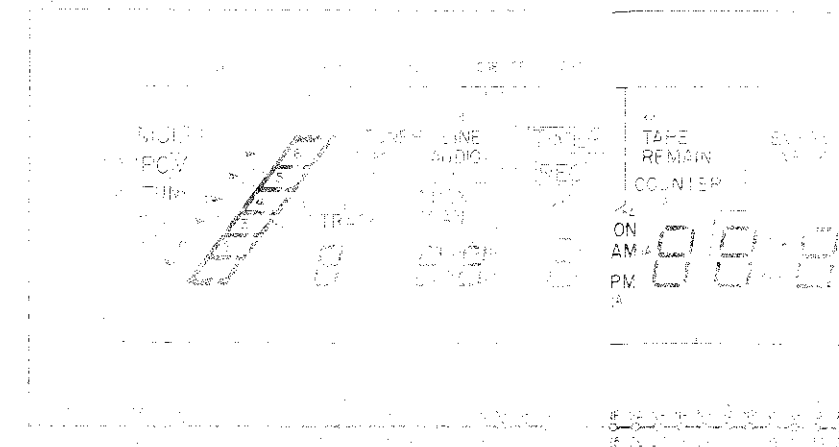
When indicating parts by reference number, please include the board name.



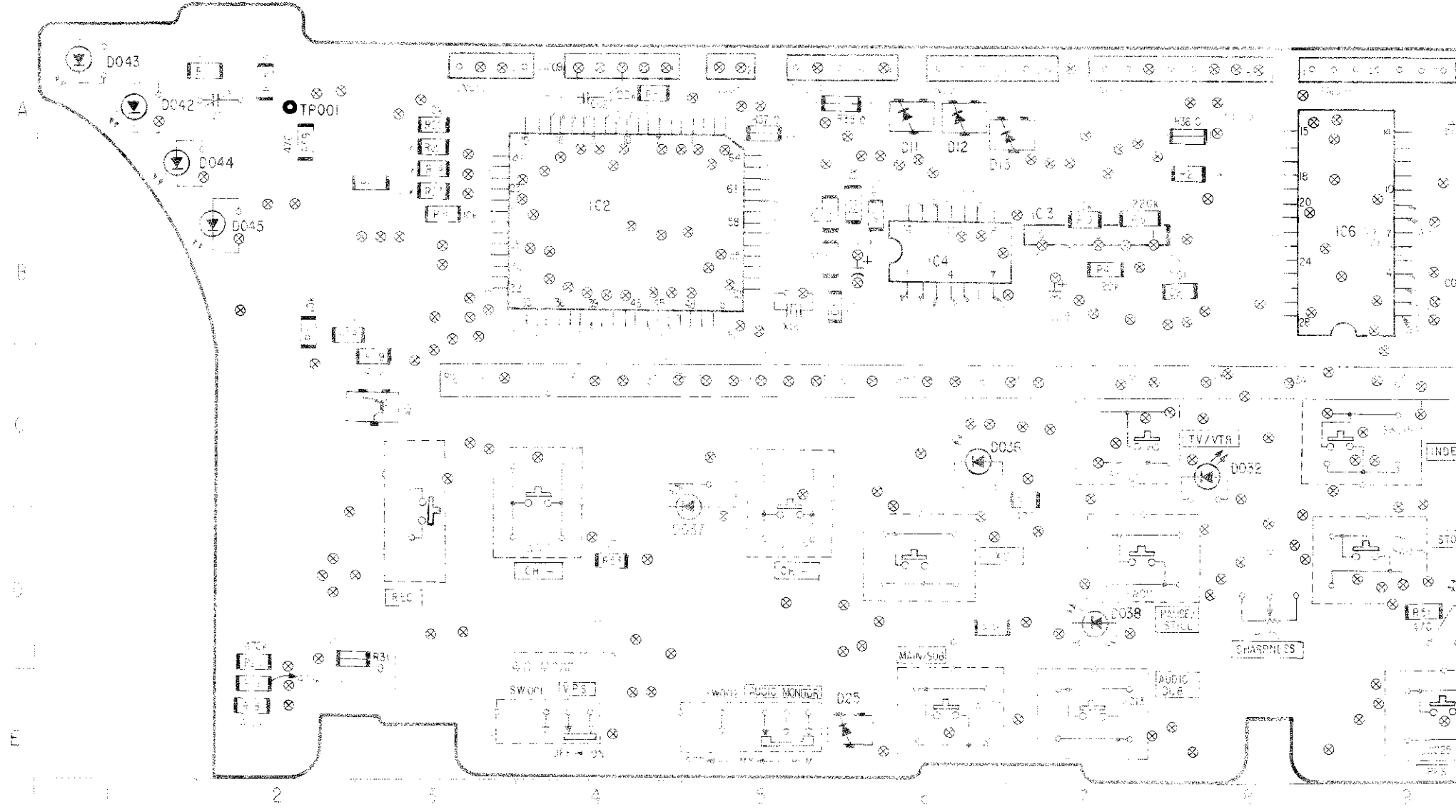
Q200	A 1
D041	D 10
D042	D 11
D043	D 12
D044	D 13
D045	D 14
U001	U 01
U002	U 02
U003	U 03
U004	U 04
U005	U 05
U006	U 06
U007	U 07
U008	U 08
U009	U 09
U010	U 10
U011	U 11
U012	U 12
U013	U 13
U014	U 14
U015	U 15
U016	U 16
U017	U 17
U018	U 18
U019	U 19
U020	U 20
U021	U 21
U022	U 22
U023	U 23
U024	U 24
U025	U 25
U026	U 26
U027	U 27
U028	U 28
U029	U 29
U030	U 30
U031	U 31
U032	U 32
U033	U 33
U034	U 34
U035	U 35
U036	U 36
U037	U 37
U038	U 38
U039	U 39
U040	U 40
U041	U 41
U042	U 42
U043	U 43
U044	U 44
U045	U 45
U046	U 46
U047	U 47
U048	U 48
U049	U 49
U050	U 50
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U052	U 52
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U062	U 62
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U067	U 67
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U080	U 80
U081	U 81
U082	U 82
U083	U 83
U084	U 84
U085	U 85
U086	U 86
U087	U 87
U088	U 88
U089	U 89
U090	U 90
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U191	U 191
U192	U 192
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U195	U 195
U196	U 196
U197	U 197
U198	U 198
U199	U 199
U200	U 200

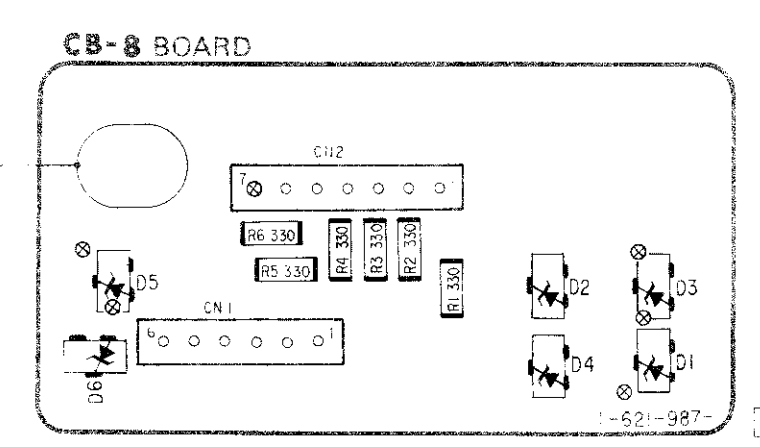
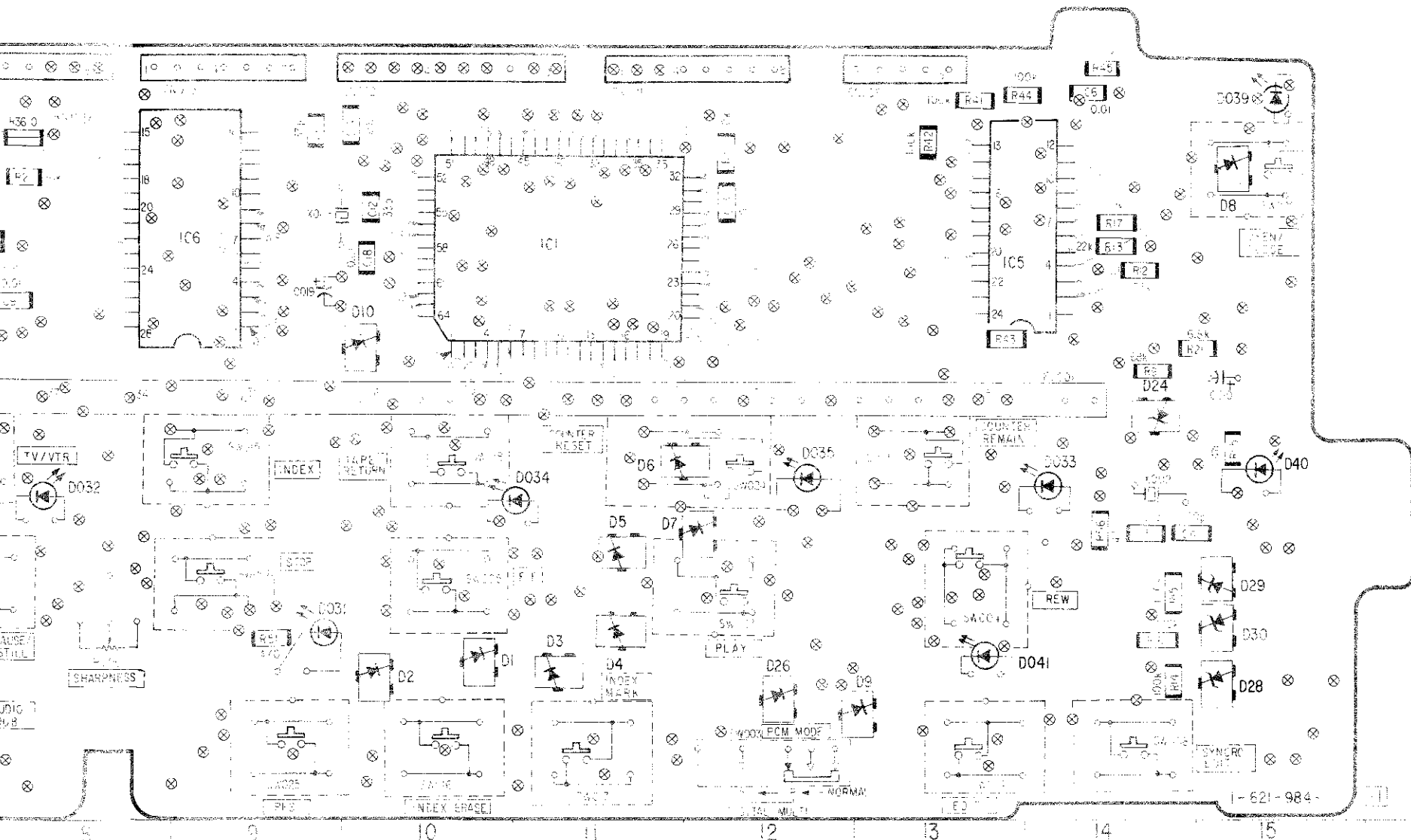
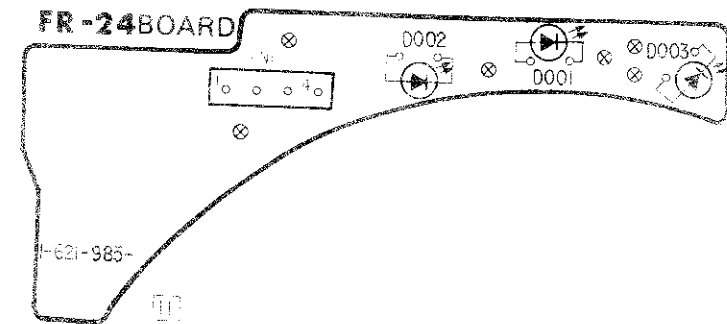
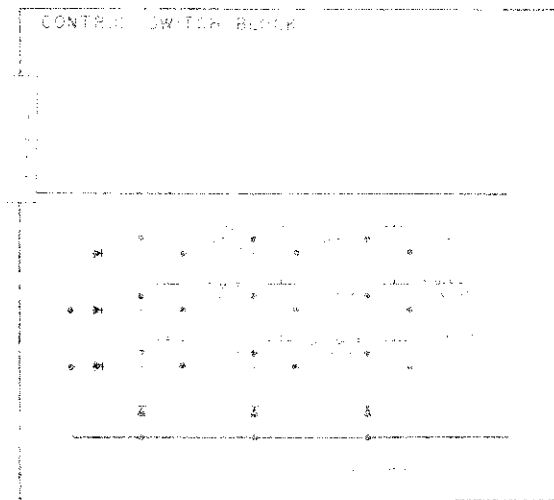
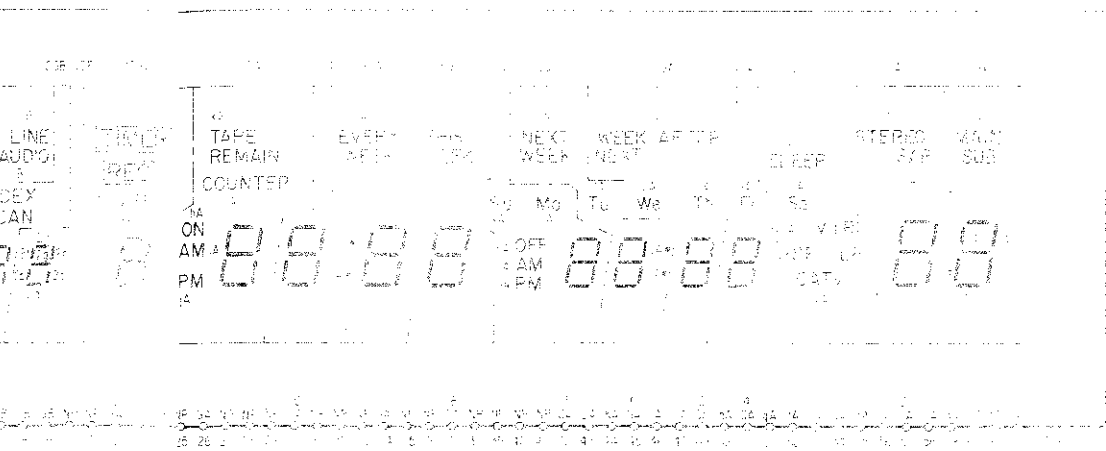
**FT-13(TIMER/MODE CONTROL/JOG SHUTTLE), FR-24(LED), CB-8(THROUGH) PRINTED WIRING BOARDS**

REF. NO. AND BOARD NO. (1) TO (5) OF 5. (2) TO (5) OF 5. (3) TO (5) OF 5. (4) TO (5) OF 5. (5) TO (5) OF 5.



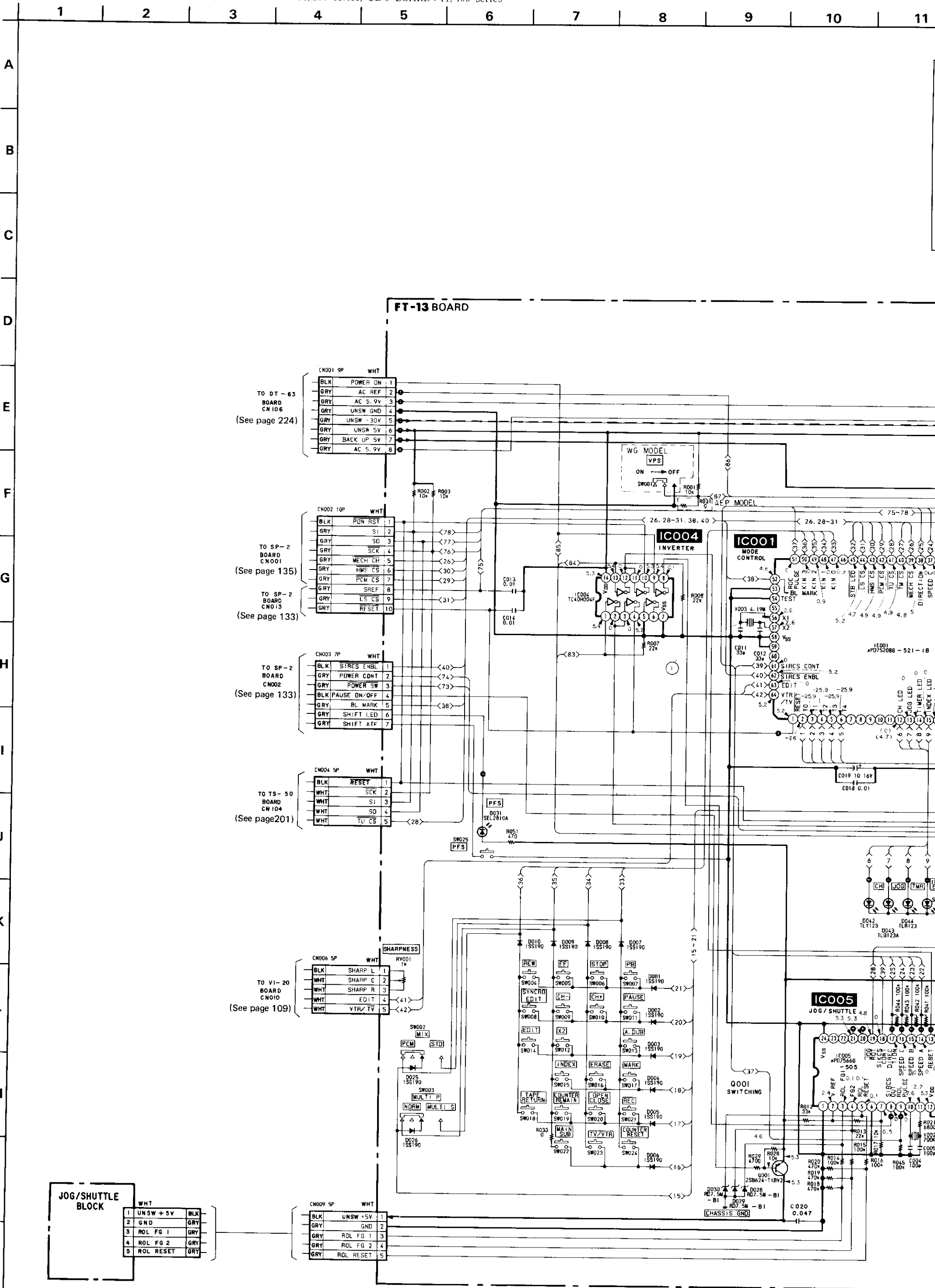
**FT-13 BOARD**

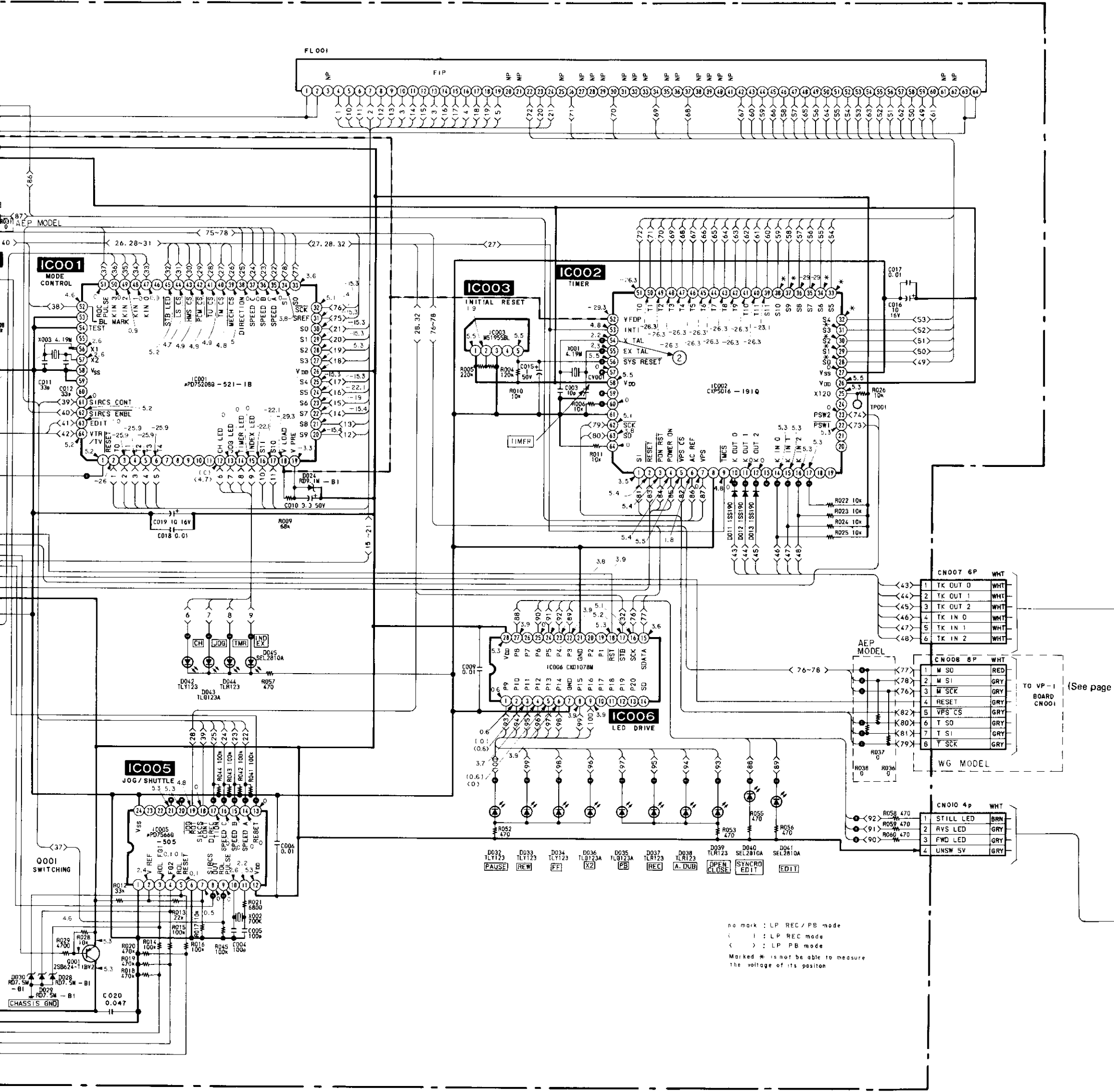
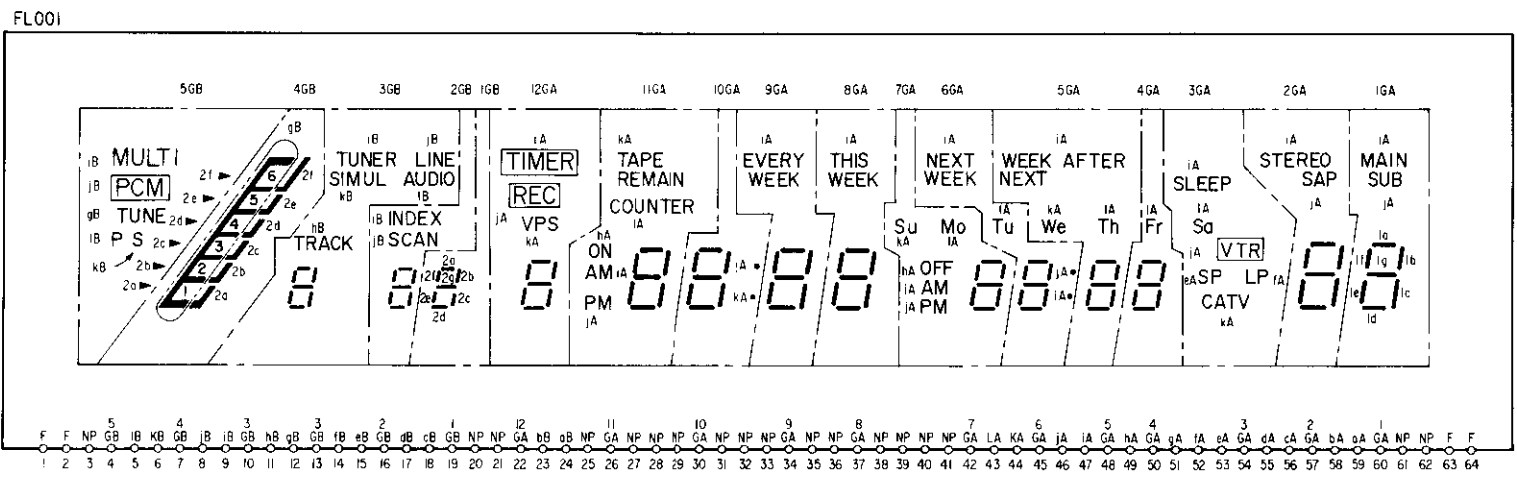




**FT-13(TIMER/MODE CONTROL/JOG SHUTTLE), FR-24(LED), CB-8(THROUGH) SCHEMATIC DIAGRAM**

-Ref. No. FT-13 BOARD: 11,000 series, FR-24 BOARD: 11,200 series, CB-8 BOARD: 11,400 series-





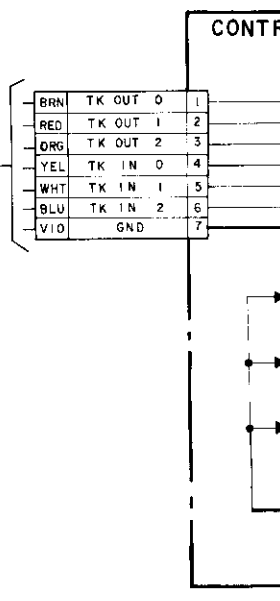
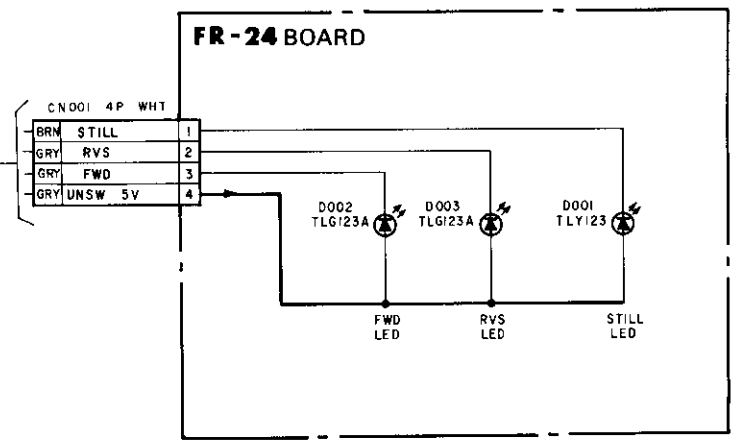
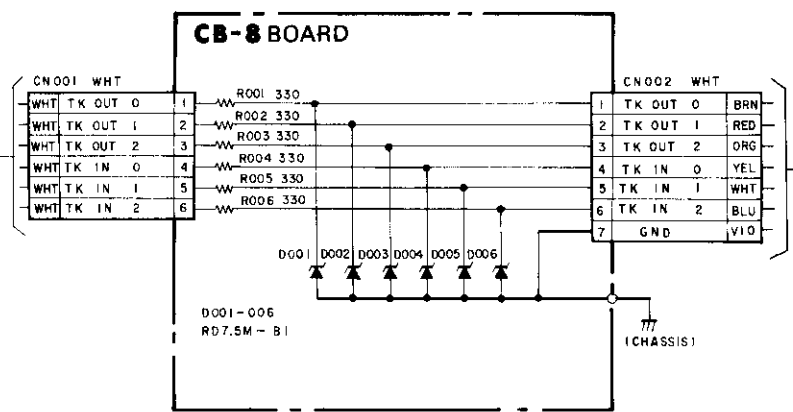
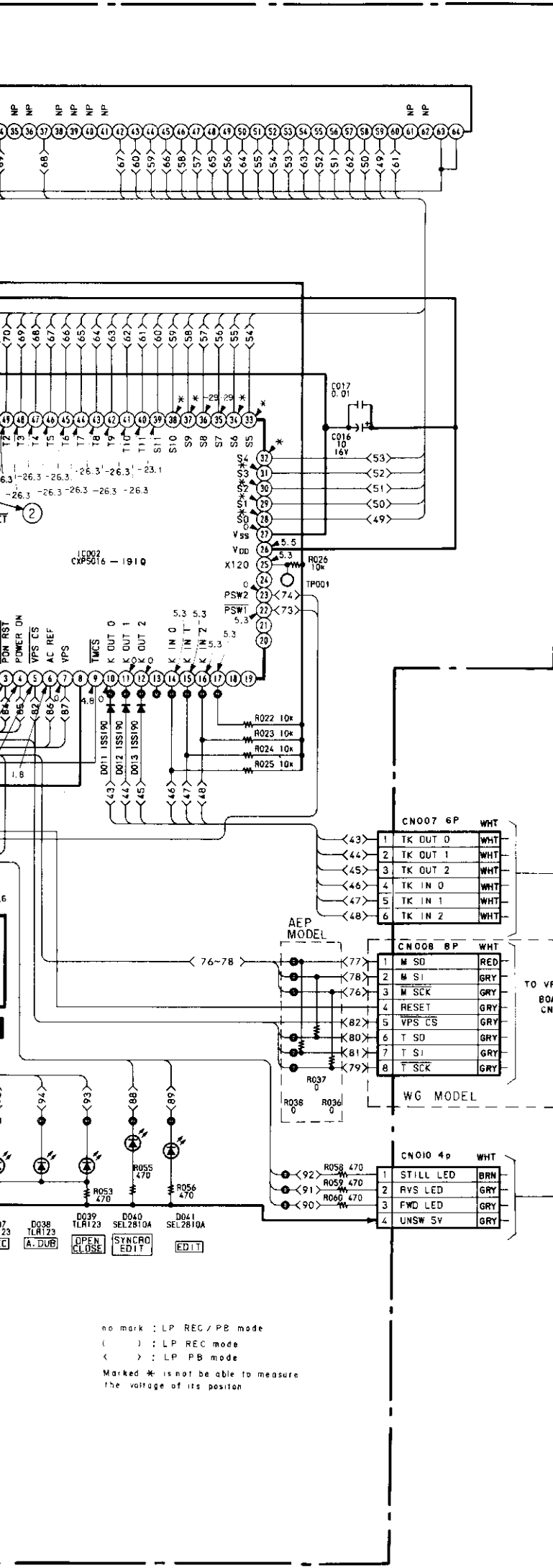
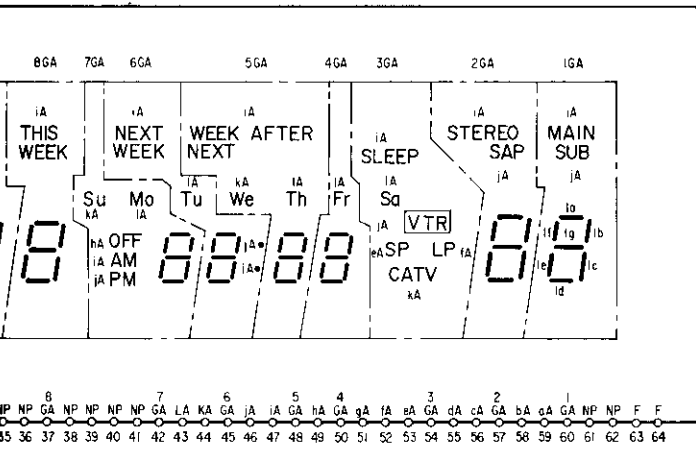
Pin	Signal	Color
1	TK OUT 0	WHT
2	TK OUT 1	WHT
3	TK OUT 2	WHT
4	TK IN 0	WHT
5	TK IN 1	WHT
6	TK IN 2	WHT

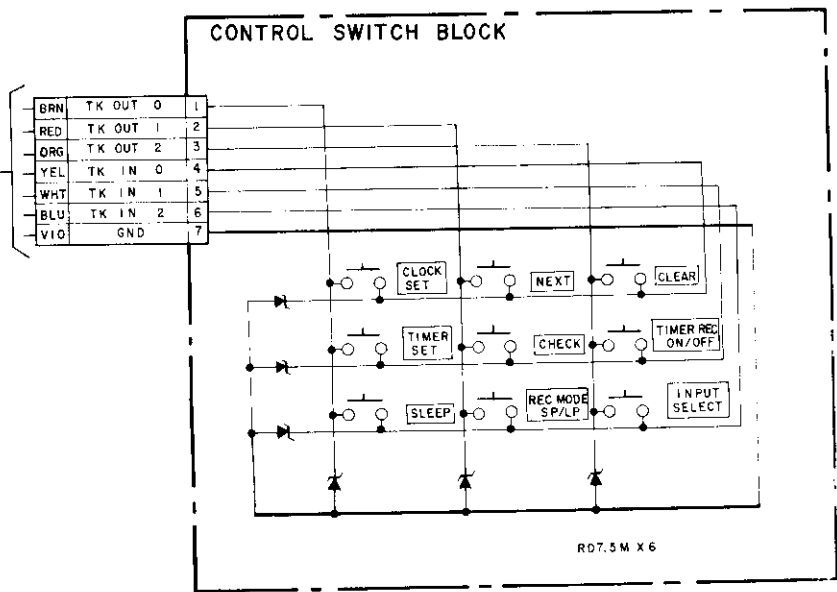
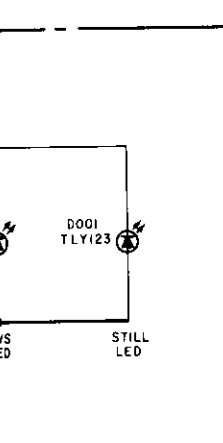
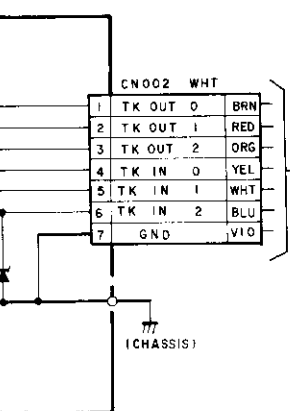
  

Pin	Signal	Color
1	M S0	RED
2	M S1	GRY
3	M SCR	GRY
4	RESET	GRY
5	VPS CS	GRY
6	T S0	GRY
7	T S1	GRY
8	T SCR	GRY

Pin	Signal	Color
1	STILL LED	BRN
2	RVS LED	GRY
3	FWD LED	GRY
4	UNSW SV	GRY

no mark : LP REC / PB mode  
 | : LP REC mode  
 < : LP PB mode  
 Marked \* is not be able to measure the voltage of its position



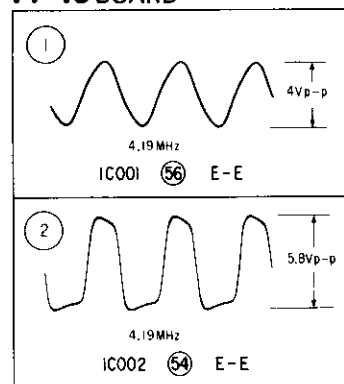


**Note:**

- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- □ : panel designation.
- □ : adjustment for repair.
- — : B + bus.
- - - - : B - bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

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

**FT-13 BOARD**

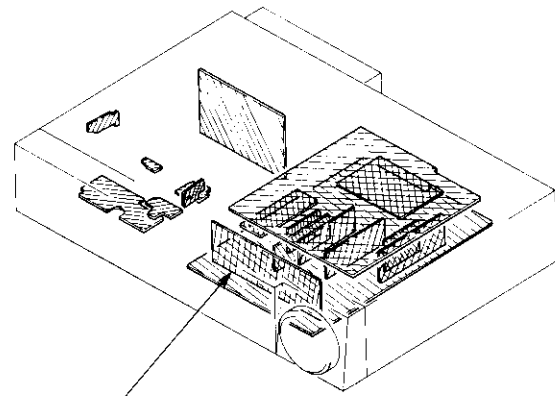




**Note:**

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

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

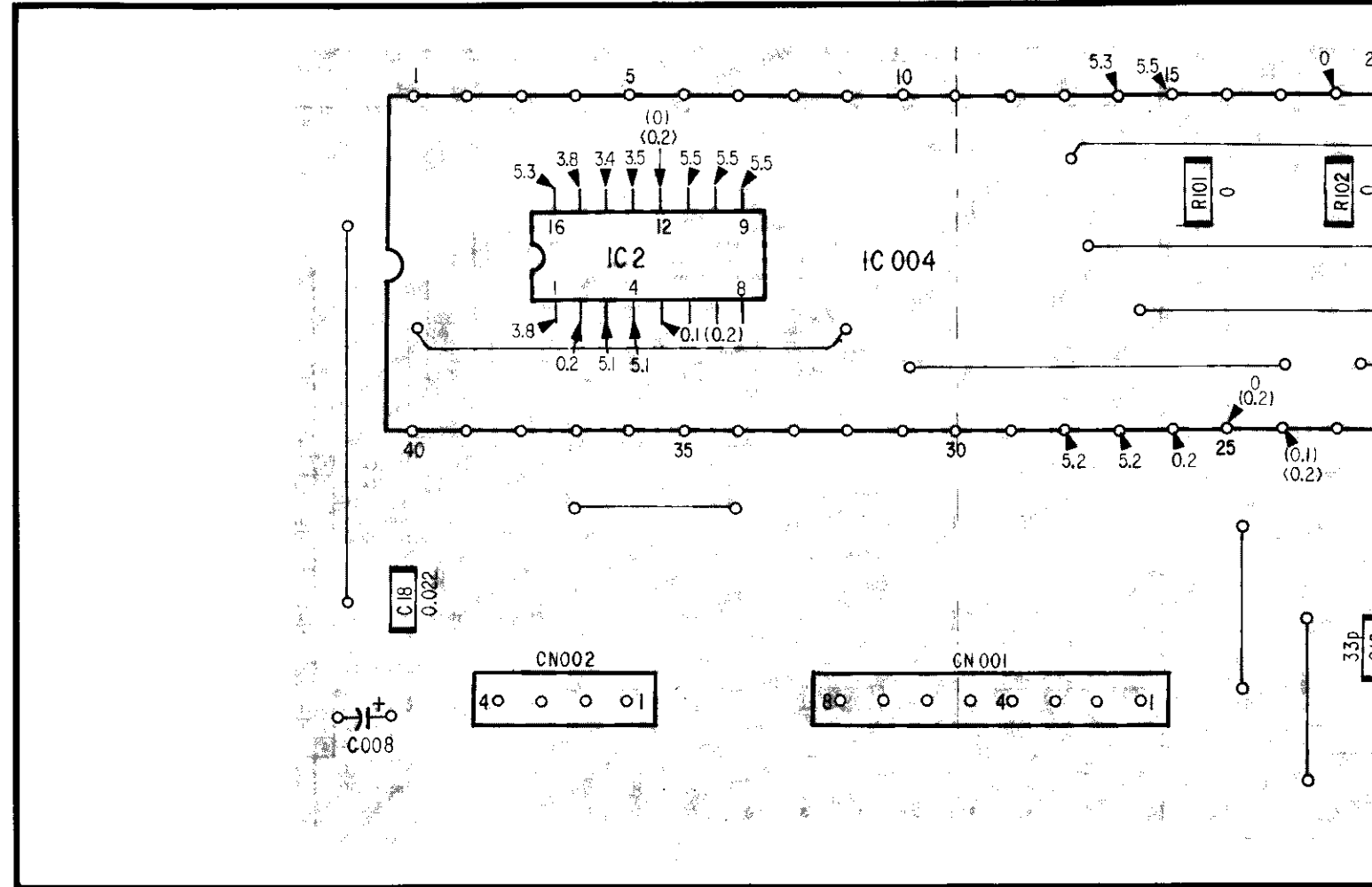


VP-1(WG ONLY)  
(VPS/BUS SELECT)

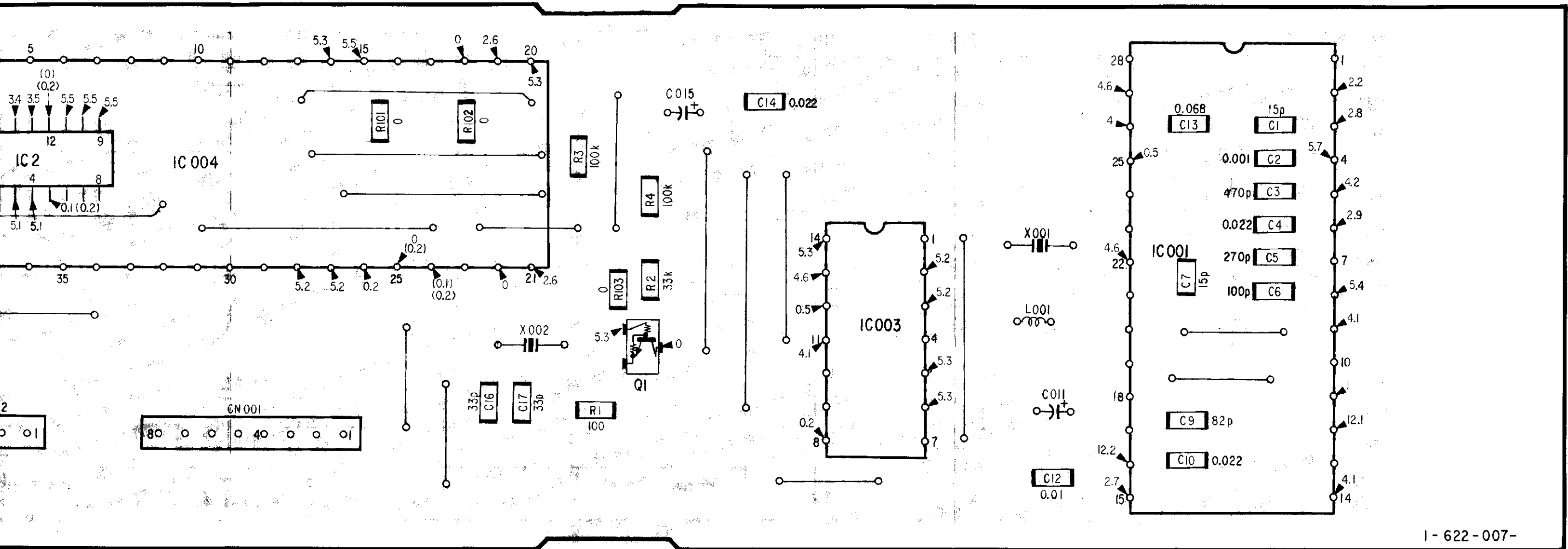
**VP-1(VPS/BUS SELECT) PRINTED WIRING BOARD (WG MODEL)**

—Ref. No. VP-1 BOARD : 12,000 series—

**VP-1 BOARD (WG MODEL)**



(WG MODEL)



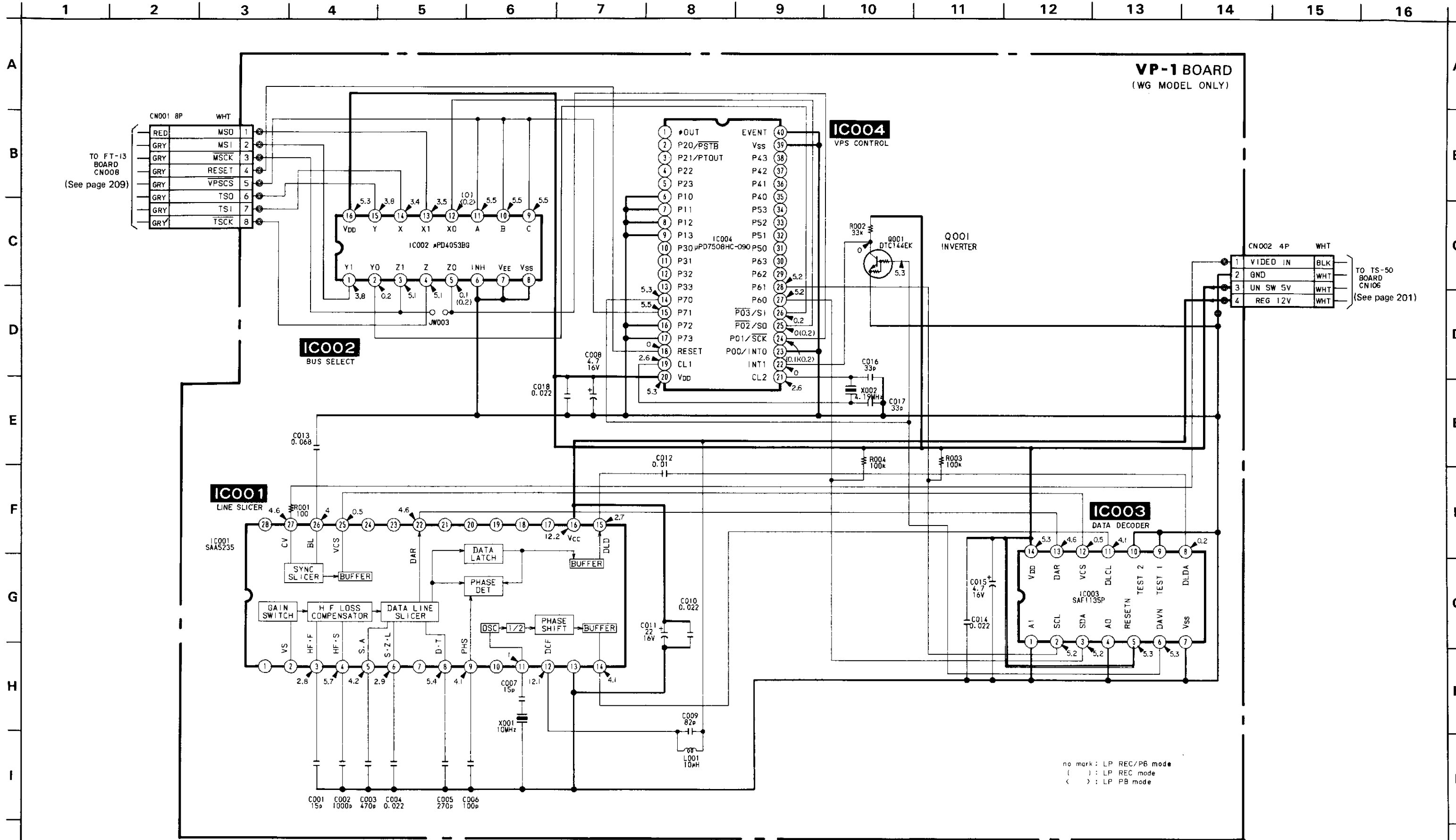
I - 622 - 007 -

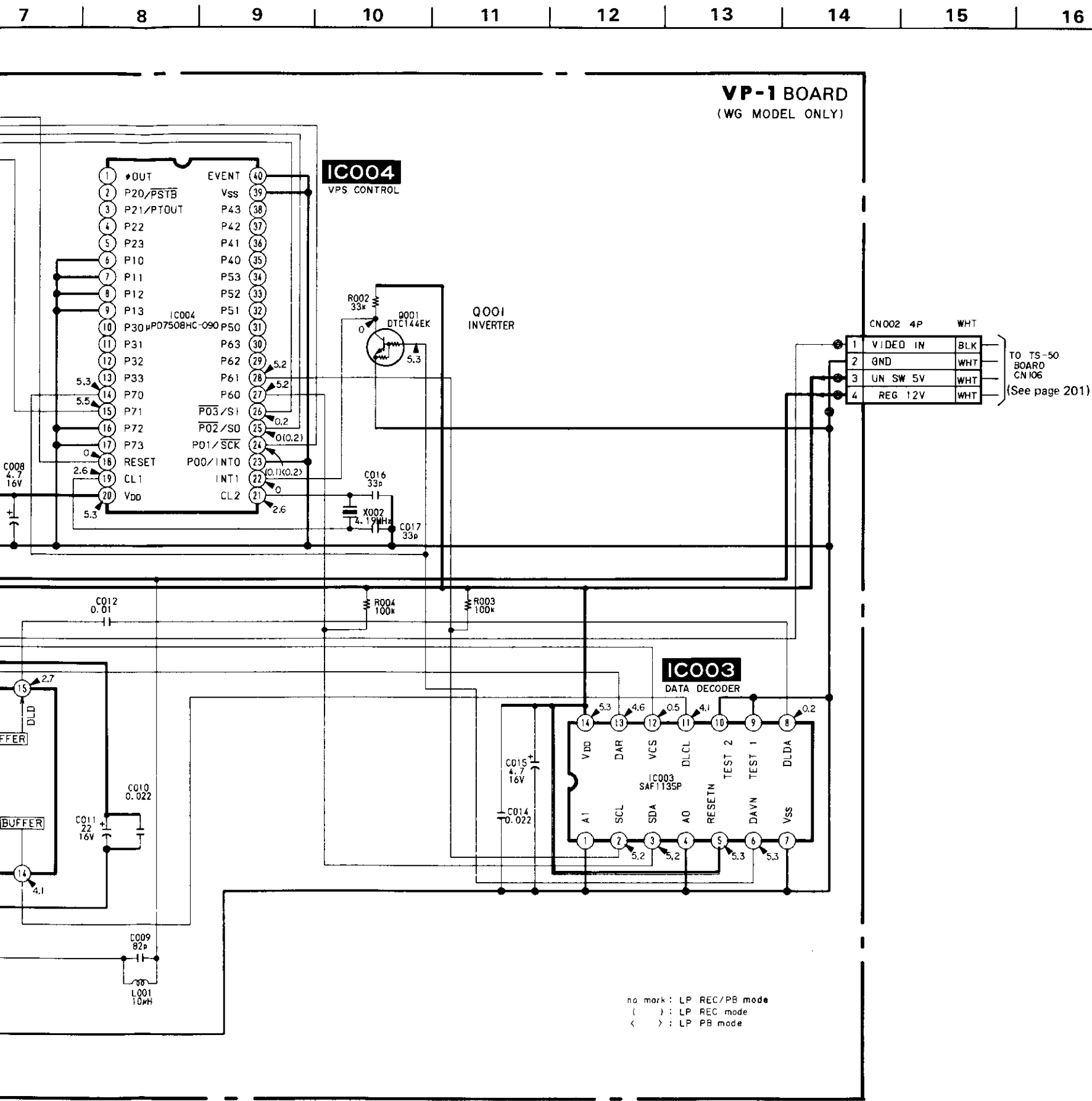
II

no mark : LP REC / PB mode  
 ( ) : LP REC mode  
 < > : LP PB mode

VP-1(VPS/BUS SELECT) SCHEMATIC DIAGRAM (WG MODEL)

-Ref. No. VP-1 BOARD: 12,000 series-





**Note:**

- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF. 50V or less are not indicated except for electrolytic and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- — : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

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

**DR-35(SWITCHING REGULATOR), DT-63(POWER SUPPLY), DL-15(REGULATOR), DO-1(REGULATOR), DS-16(POWER SUPPLY) PRINTED WIRING BOARDS**

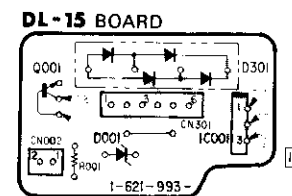
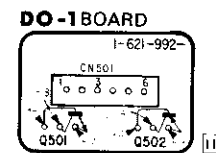
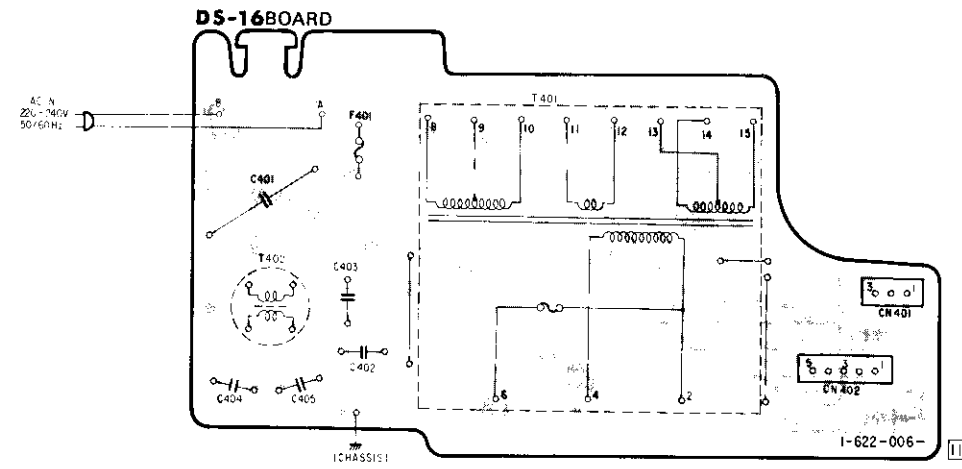
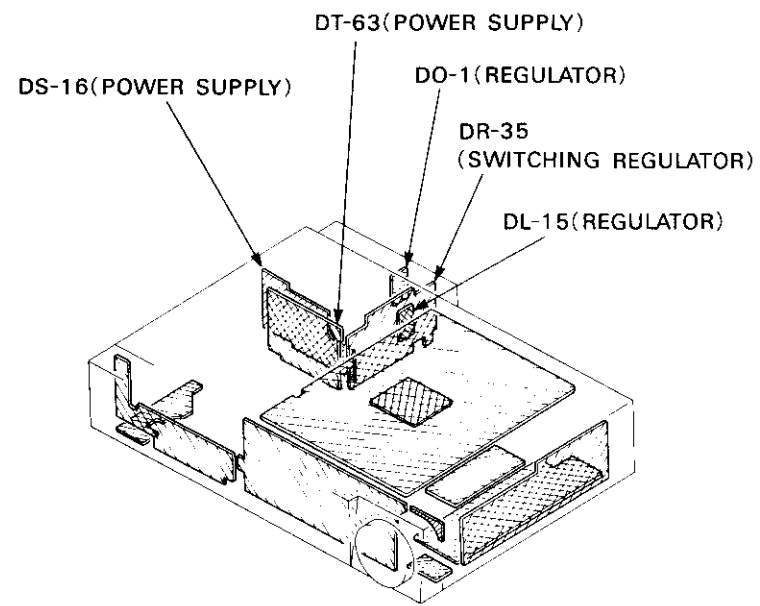
—Ref. No. DR-35 BOARD, DT-63 BOARD, DL-15 BOARD, DO-1 BOARD, DS-16 BOARD: 13,000 series—

**Note:**

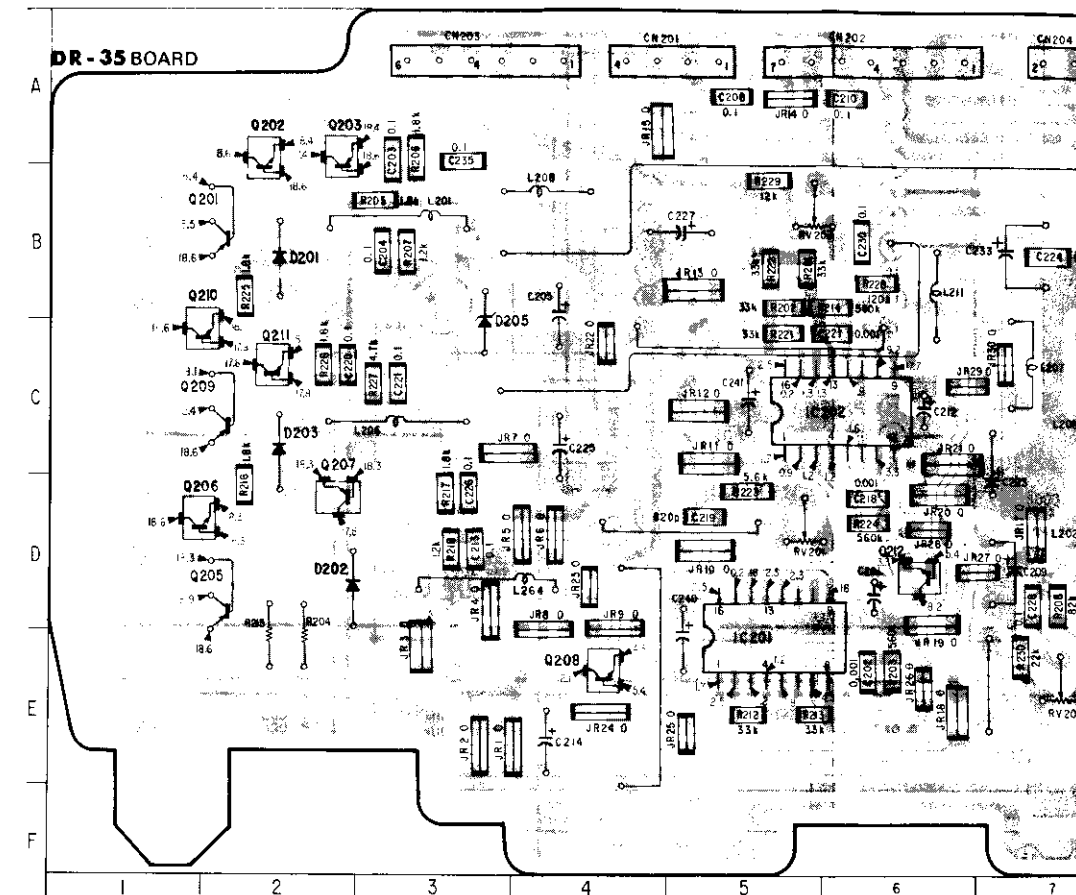
- ○ : indicates a lead wire mounted on the component side.
- ● : indicates a lead wire mounted on the printed side.
- ⊕ : soldering side.
- ⊖ : B+ Pattern.

- Digital transistor (DR-35:Q208,Q212,Q213,Q214,DL-15:Q001) transistor with resistors.
- Refer to the DR-35,DL-15 boards schematic diagram for digital transistor.

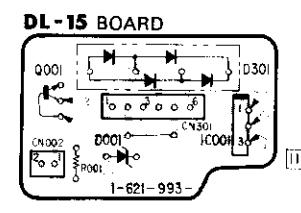
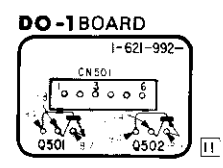
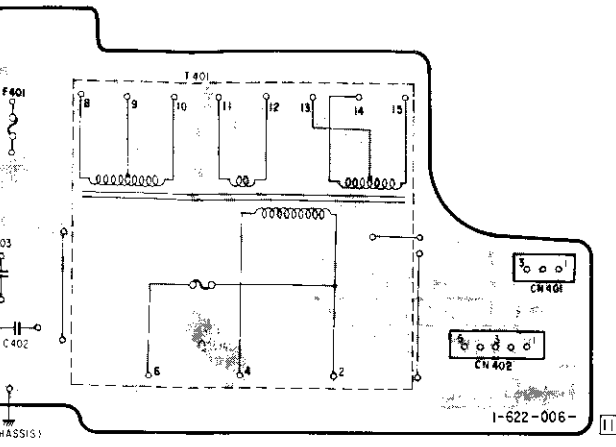
When indicating parts by reference number, please include the board name.



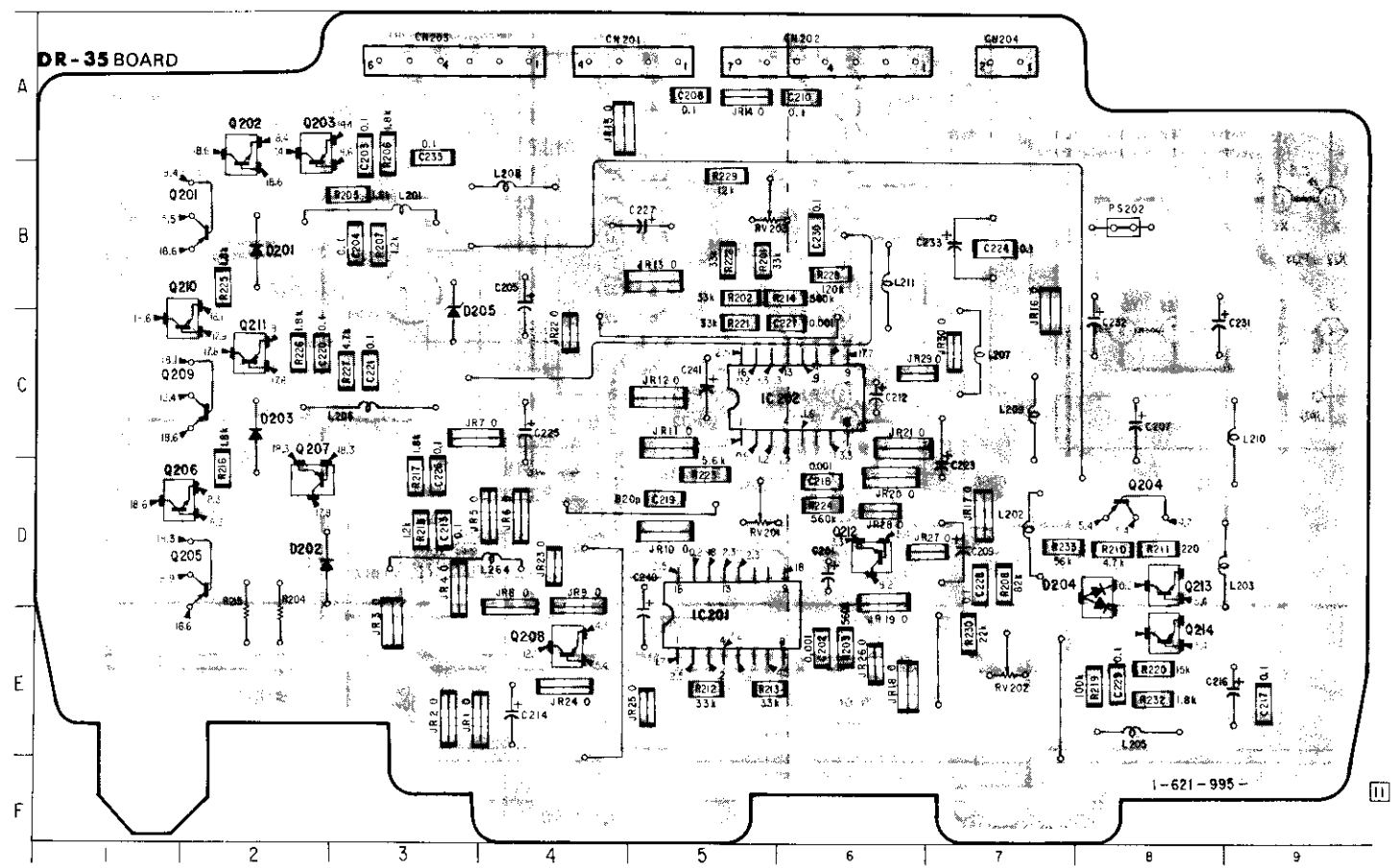
D201	B-2
D202	D-2
D203	C-2
D204	D-8
D205	B-3
IC201	E-5
IC202	C-6
Q201	B-2
Q202	A-2
Q203	A-2
Q204	D-8
Q205	D-2
Q206	D-1
Q207	D-2
Q208	E-4
Q209	C-2
Q210	C-1
Q211	C-2
Q212	D-6
Q213	D-8
Q214	E-8
RV201	D-5
RV202	E-7
RV203	B-5



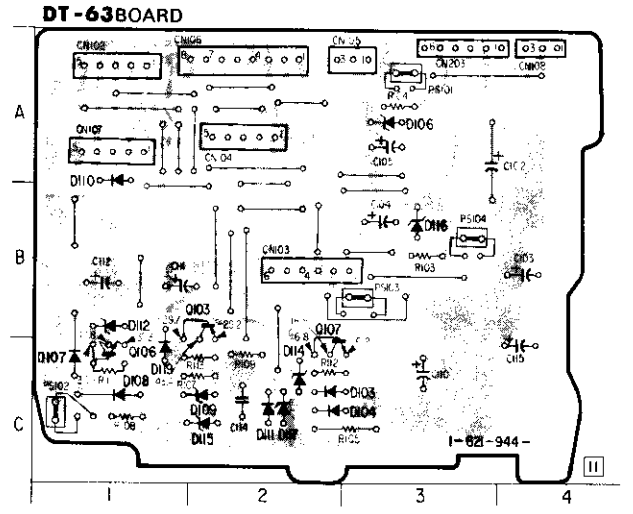
CHING REGULATOR), DT-63(POWER SUPPLY), DL-15(REGULATOR), DO-1(REGULATOR), DS-16(POWER SUPPLY) PRINTED WIRING BOARDS  
 5 BOARD, DT-63 BOARD, DL-15 BOARD, DO-1 BOARD, DS-16 BOARD : 13,000 series—



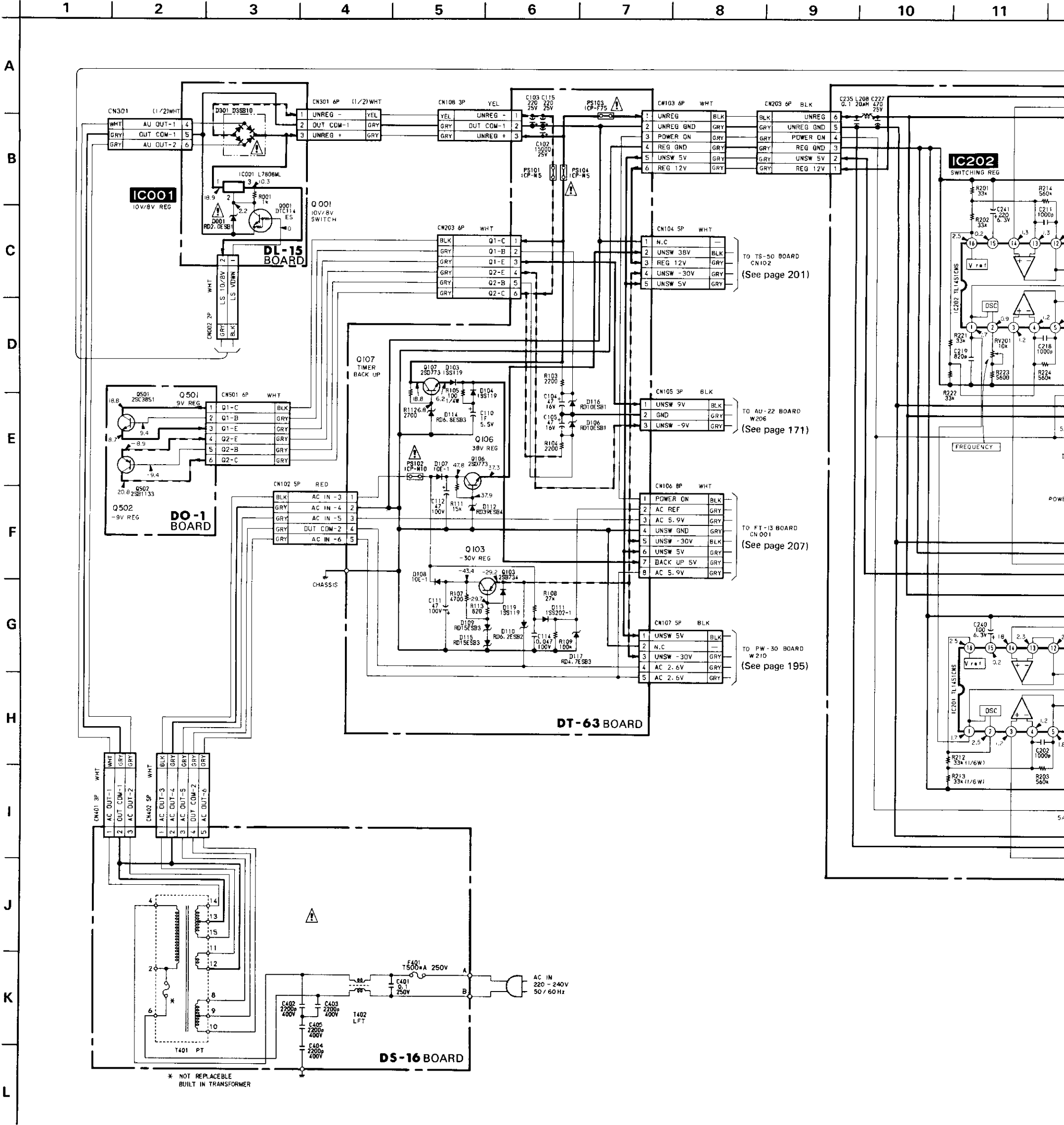
- |       |     |
|-------|-----|
| D201  | B-2 |
| D202  | D-2 |
| D203  | C-2 |
| D204  | D-8 |
| D205  | B-3 |
|       |     |
| IC201 | E-5 |
| IC202 | C-6 |
|       |     |
| Q201  | B-2 |
| Q202  | A-2 |
| Q203  | A-2 |
| Q204  | D-8 |
| Q205  | D-2 |
| Q206  | D-1 |
| Q207  | D-2 |
| Q208  | E-4 |
| Q209  | C-2 |
| Q210  | C-1 |
| Q211  | C-2 |
| Q212  | D-6 |
| Q213  | D-8 |
| Q214  | E-8 |
|       |     |
| RV201 | D-5 |
| RV202 | E-7 |
| RV203 | B-5 |



- |      |  |
|------|--|
| D103 |  |
| D104 |  |
| D106 |  |
| D107 |  |
| D108 |  |
| D109 |  |
| D110 |  |
| D111 |  |
| D112 |  |
| D114 |  |
| D115 |  |
| D116 |  |
| D117 |  |
| D119 |  |
|      |  |
| Q103 |  |
| Q106 |  |
| Q109 |  |

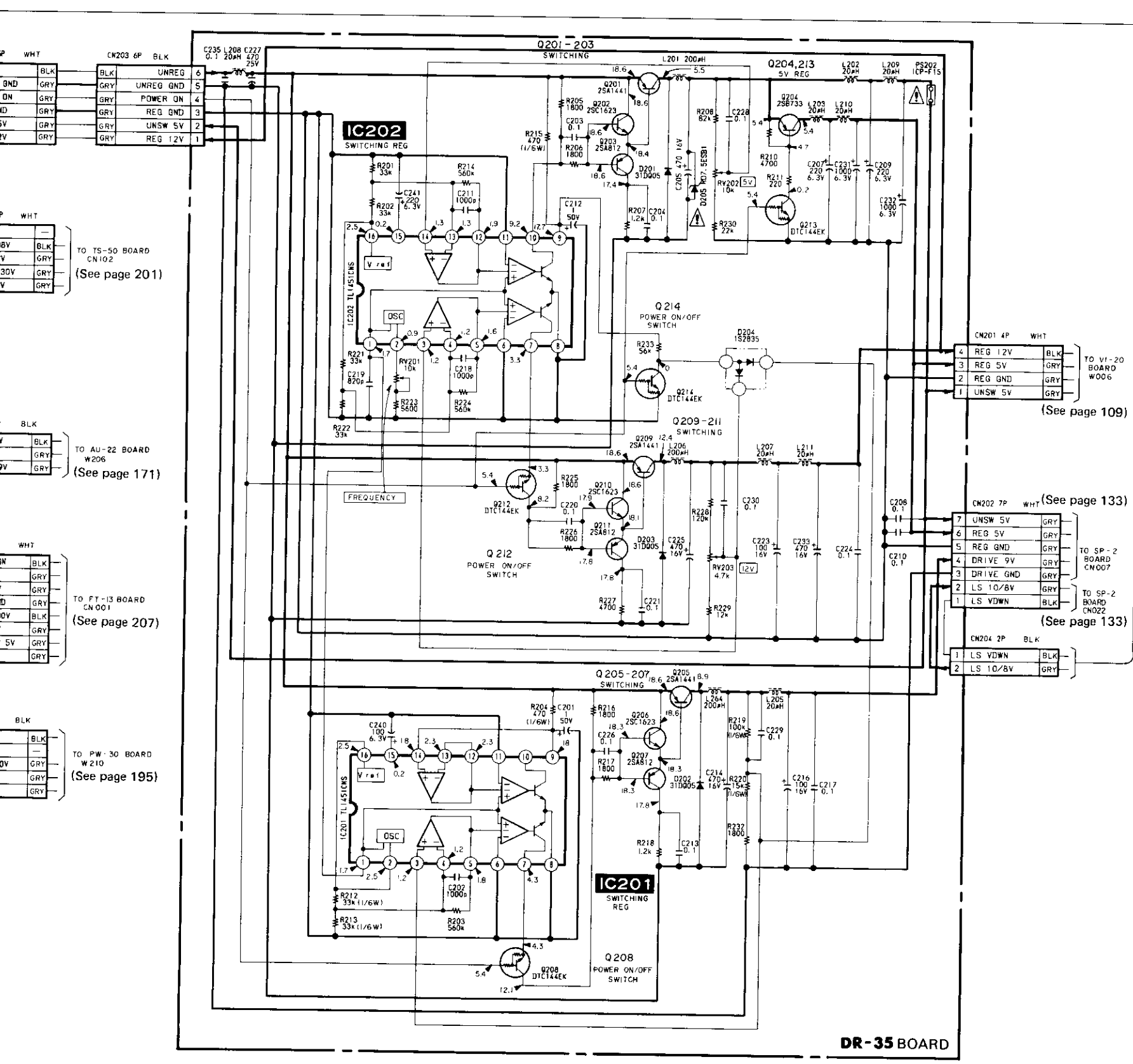


**DR-35(SWITCHING REGULATOR), DT-63(POWER SUPPLY), DL-15(REGULATOR), DO-1(REGULATOR), DS-16(POWER SUPPLY) SCHEMATIC DIAGRAM**  
 Ref. No. DR-35 BOARD, DT-63 BOARD, DL-15 BOARD, DO-1 BOARD, DS-16 BOARD : 13,000 series



PS-16(POWER SUPPLY) SCHEMATIC DIAGRAM

8 9 10 11 12 13 14 15 16 17



A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L

Note:

- Caution when... New parts must... Be careful not... because it is...
- Resistors on... otherwise noted... kΩ: 1000Ω, MΩ: 1000000Ω
- All capacitors... 50V or less... tantalums.
- All variable... unless otherwise noted.
- [Symbol] : adjustable
- [Symbol] : B + bus
- [Symbol] : B - bus
- Voltages are... Readings are... Voltage variations are within tolerances.

When indicating... reference number, the board name.

Note: The components are... part numbers.

WHT	BLK
UNREG	UNREG GND
POWER ON	POWER ON
REG GND	REG GND
UNSW 5V	UNSW 5V
REG 12V	REG 12V

WHT	BLK
REG 12V	REG 12V
REG 5V	REG 5V
REG GND	REG GND
UNSW 5V	UNSW 5V

BLK	BLK
TO AU-22 BOARD	W206
WHT	WHT
TO FT-13 BOARD	CN001

WHT	BLK
UNSW 5V	UNSW 5V
REG 5V	REG 5V
REG GND	REG GND
DRIVE 9V	DRIVE 9V
DRIVE GND	DRIVE GND
LS 10/BV	LS 10/BV
LS VDOWN	LS VDOWN

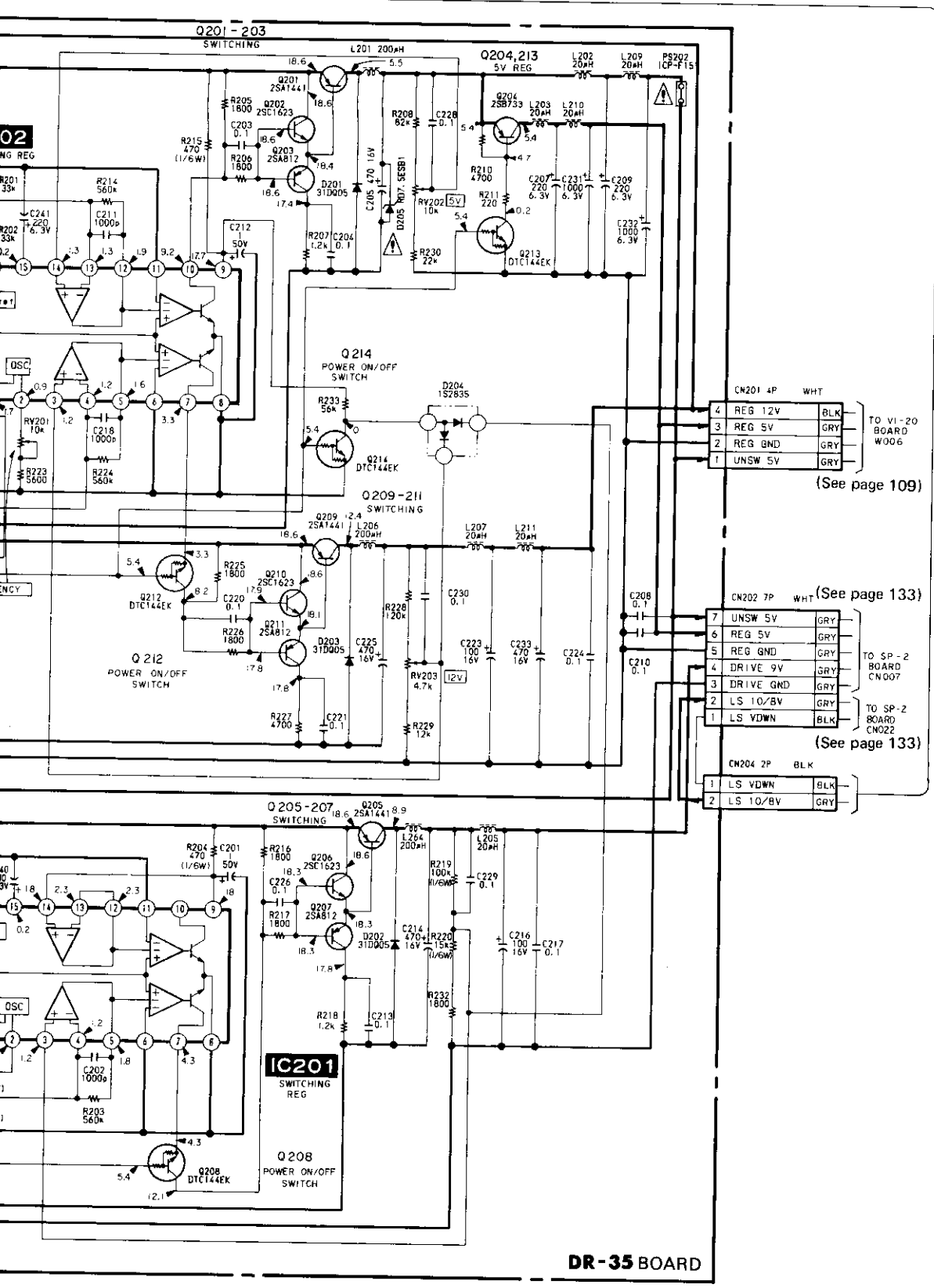
BLK	BLK
TO PW-30 BOARD	W210
WHT	WHT
TO SP-2 BOARD	CN007
WHT	WHT
TO SP-2 BOARD	CN022

DR-35 BOARD

no mark: E-E mode



11 12 13 14 15 16 17



DR-35 BOARD

no mark: E-E mode

**Note:**

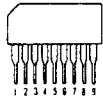
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- Resistors on the DR-35 board are in ohms 1/10W unless otherwise noted. Resistors on the DT-63 and DL-15 boards are in ohms 1/6W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic, and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- □ : adjustment for repair.
- — : B + bus.
- - - - : B - bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a colour-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

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

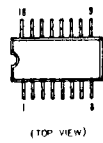
**Note:** The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

4-3. SEMICONDUCTORS

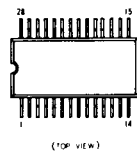
BA3707  
NJM4560S



BA6303F  
BU4053BF  
CX20115A  
CX22021  
HD14052BFP  
LA5005M  
MB84053BPF  
TC4052BF  
TC4053BF  
TC4538BF  
TL1451CNS  
 $\mu$ PD4052BG  
 $\mu$ PD4053BG



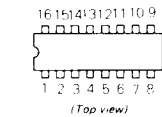
BA6800AF  
CXD1077M  
CXD1078M  
CX20035  
CX20099  
CX23012  
MB8464-12LPF  
MB8464-15LPF  
M51955BL



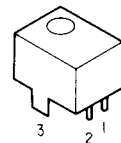
BA7036LS



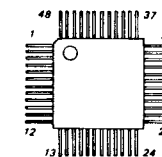
BU4051B  
BU4052B  
BU4053B  
CXA1042M  
CX23078  
HD14051BP  
HD14052BP  
HD14053BFP  
HD14053BP  
HD14538BP  
MB84051B  
MB84052B  
MB84053B  
MB88306P  
MC14538BCP  
MSM6411B-19RS  
TC40103BP  
TC4051BP  
TC4051BP-HB  
TC4052BP  
TC4052BP-HP  
TC4053BP  
TC4053BP-HP  
TC4538BP  
 $\mu$ PD4051BC  
 $\mu$ PD4052BC  
 $\mu$ PD4053BC



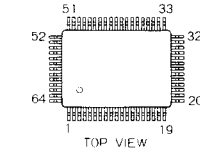
BX1387



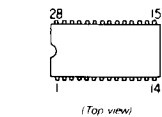
CXD1066Q  
CX20034  
CX23011  
MB64H428PF



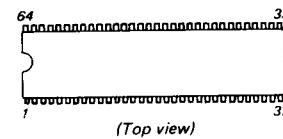
CXP5016-191Q  
CXP5048H-069Q  
CXP5048H-070Q  
MB674101PF  
 $\mu$ PD75104G-519-B1  
 $\mu$ PD75106G-518-1B  
 $\mu$ PD75208G-521-1B



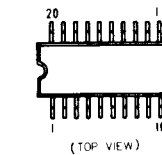
CX20032  
SAA5235  
 $\mu$ PD4364G-15L



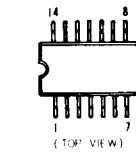
CX20061



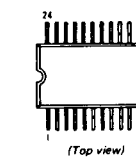
CX20102



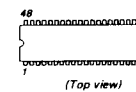
CX20103  
HD14066BFP  
HD14070BFP  
NJM3403AM  
TC40H000F  
TC40H004F  
TC4011BF  
TC4030BF  
TC4030BF-HB  
TC4066BF  
 $\mu$ PC324G2  
 $\mu$ PD4066BG



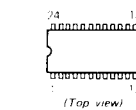
CX20114  
 $\mu$ PD7566G-505



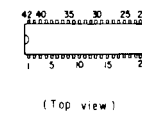
CX20130  
CX20131  
CX20137



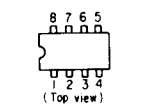
CX20147  
TDA3592A  
 $\mu$ PD7566G-506



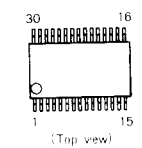
CX23064



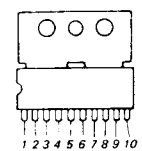
IR3N05  
MB3763P  
NJM3414D  
NJM4558D  
 $\mu$ PC4558C



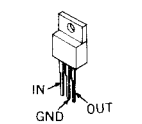
LB1616M



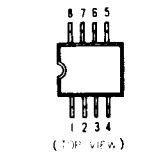
LB1640N



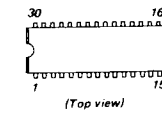
L7808ML



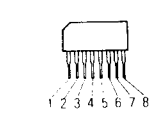
MB3763PF  
NJM4560M  
 $\mu$ PC358G2  
 $\mu$ PC393G2  
 $\mu$ PC4570G2



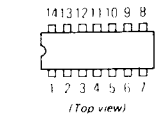
M50434-019SP



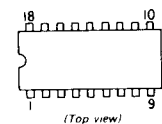
M54572L



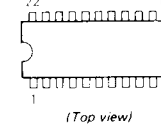
M58655P  
SAF1135P  
TDA4944



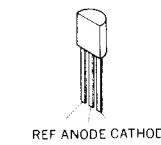
TDA2594  
TDA2595



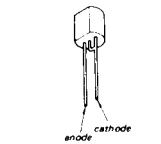
TDA4940



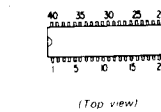
TL431CLP  
TL431CLPB



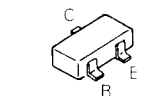
$\mu$ PC574J



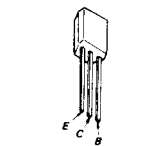
$\mu$ PD7508HC-090



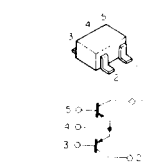
DTA114EK  
DTA124EK  
DTA144EK  
DTC144EK  
2SA1037K  
2SA1122C  
2SA1162  
2SA1179  
2SA812  
2SB624  
2SC1623  
2SC2412K  
2SC2712  
2SC2812L5  
2SC2812L6  
2SC2812L7  
2SC3052  
2SC3326N



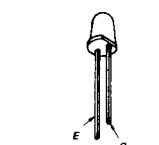
DTC114ES  
DTC143TS



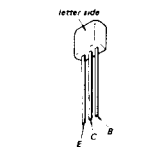
FMS1FE  
FMW2



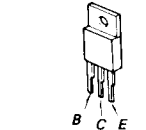
PT360FS



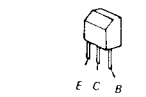
2SA1175  
2SC2785



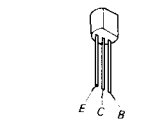
2SA1441  
2SB1133-R  
2SC3851  
2SD1266-Q  
2SD1406  
2SD1585  
2SD1666



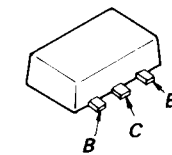
2SB733  
2SB734  
2SD773



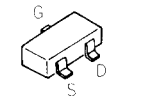
2SB739  
2SB740  
2SD788



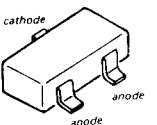
2SD1366A  
2SD1664-Q  
2SD999



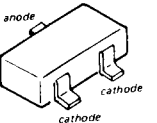
2SK209-0  
2SK209-Y  
2SK433  
2SK94-X2



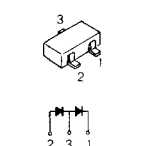
DAN202K  
1S2835



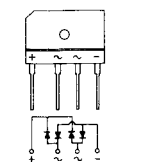
DAP202K  
1S2837  
MA152WK  
MA157



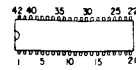
DA204K  
1S123  
MA151WK



D3SB10

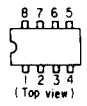


CX23064



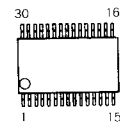
(Top view)

IR3N05  
MB3763P  
NJM3414D  
NJM4558D  
μPC4558C



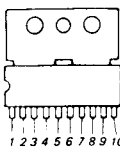
(Top view)

LB1616M

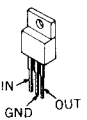


(Top view)

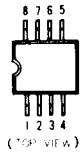
LB1640N



L7808ML

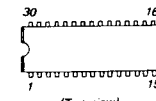


MB3763PF  
NJM4560M  
μPC358G2  
μPC393G2  
μPC4570G2



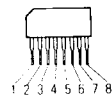
(TOP VIEW)

M50434-019SP

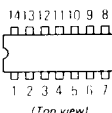


(Top view)

M54572L

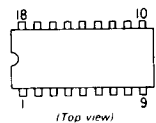


M58655P  
SAF1135P  
TDA4944



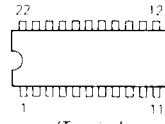
(Top view)

TDA2594  
TDA2595



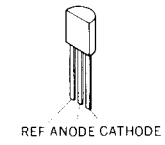
(Top view)

TDA4940



(Top view)

TL431 CLP  
TL431 CLPB



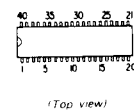
REF ANODE CATHODE

μPC574J



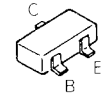
anode cathode

μPD7508HC-090



(Top view)

DTA114EK  
DTA124EK  
DTA144EK  
DTC144EK  
2SA1037K  
2SA1122C  
2SA1162  
2SA1179  
2SA812  
2SB624  
2SC1623  
2SC2412K  
2SC2712  
2SC2812L5  
2SC2812L6  
2SC2812L7  
2SC3052  
2SC3326N



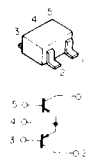
C B E

DTC114ES  
DTC143TS



E C B

FMS1FE  
FMW2

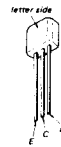


PT360FS



B C E

2SA1175  
2SC2785



letter side C B E

2SA1441  
2SB1133-R  
2SC3851  
2SD1266-Q  
2SD1406  
2SD1585  
2SD1666



B C E

2SB733  
2SB734  
2SD773



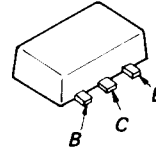
E C B

2SB739  
2SB740  
2SD788



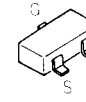
E C B

2SD1366A  
2SD1664-Q  
2SD999

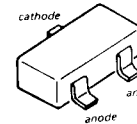


B C E

2SK209-0  
2SK209-Y  
2SK433  
2SK94-X2

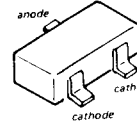


DAN202K  
1S2835



cathode anode

DAP202K  
1S2837  
MA152WK  
MA157



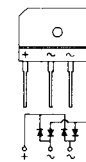
anode cathode

DA204K  
1SS123  
MA151WK



3 2 1

D3SB10

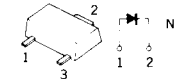


4 3 2 1

EQA11-09A



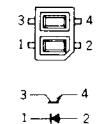
E10DS2



GL-450S

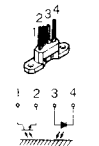


GP-2S09



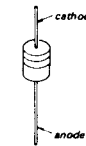
3 4 1 2

MA153



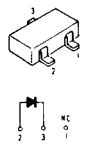
1 2 3 4

RD10ES-B1  
RD15ES-B3  
RD18ES-B1  
RD2.0ES-B1  
RD39JS-B  
RD4.7ES-B3  
RD6.2ES-B1  
RD6.2ES-B2  
RD6.2ES-B3  
RD6.8ES-B2  
RD6.8ES-B3  
RD7.5ES-B1  
1SS119  
1SS133  
1SS148  
1SS202-1



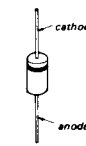
cathode anode

RD12M-B1  
RD12M-B2  
RD12M-B3  
RD5.1M-B2  
RD7.5M-B1  
RD9.1M-B1  
1SS193  
1SS220



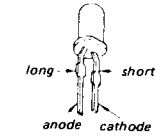
3 1 2

RD2.7ES-B1  
RD2.7ES-B2  
RD39ES-B4  
1SS106  
10E1  
10E2



cathode anode

SEL2810A-C  
TLG123A  
TLR123  
TLY123



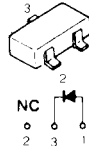
long short anode cathode

1SS187  
1SS190  
1SS223



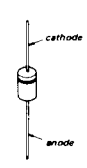
1 2 3

1SS196



3 1 2 NC

31DQ05



cathode anode

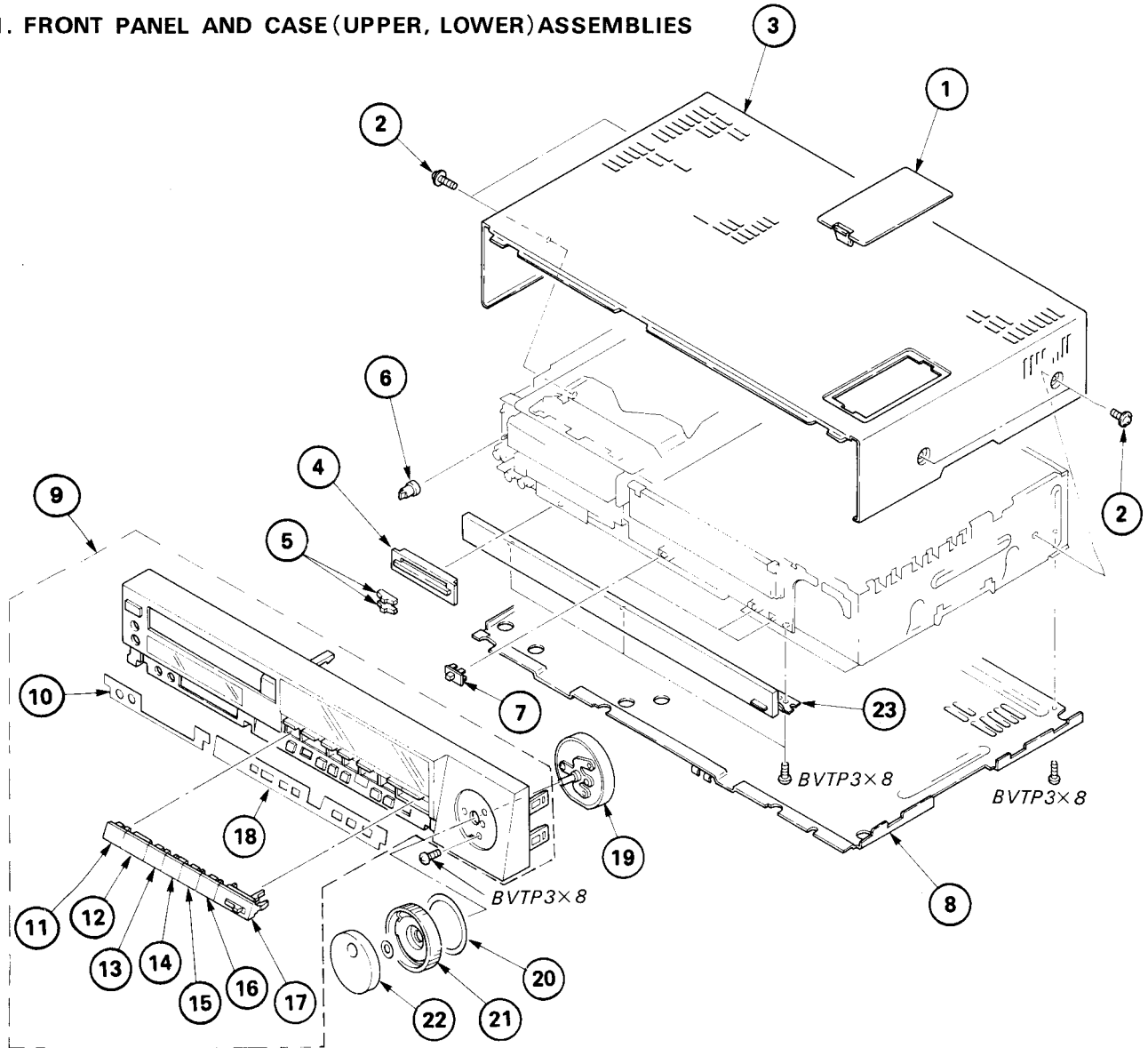
## SECTION 5 EXPLODED VIEWS

**NOTE:**

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

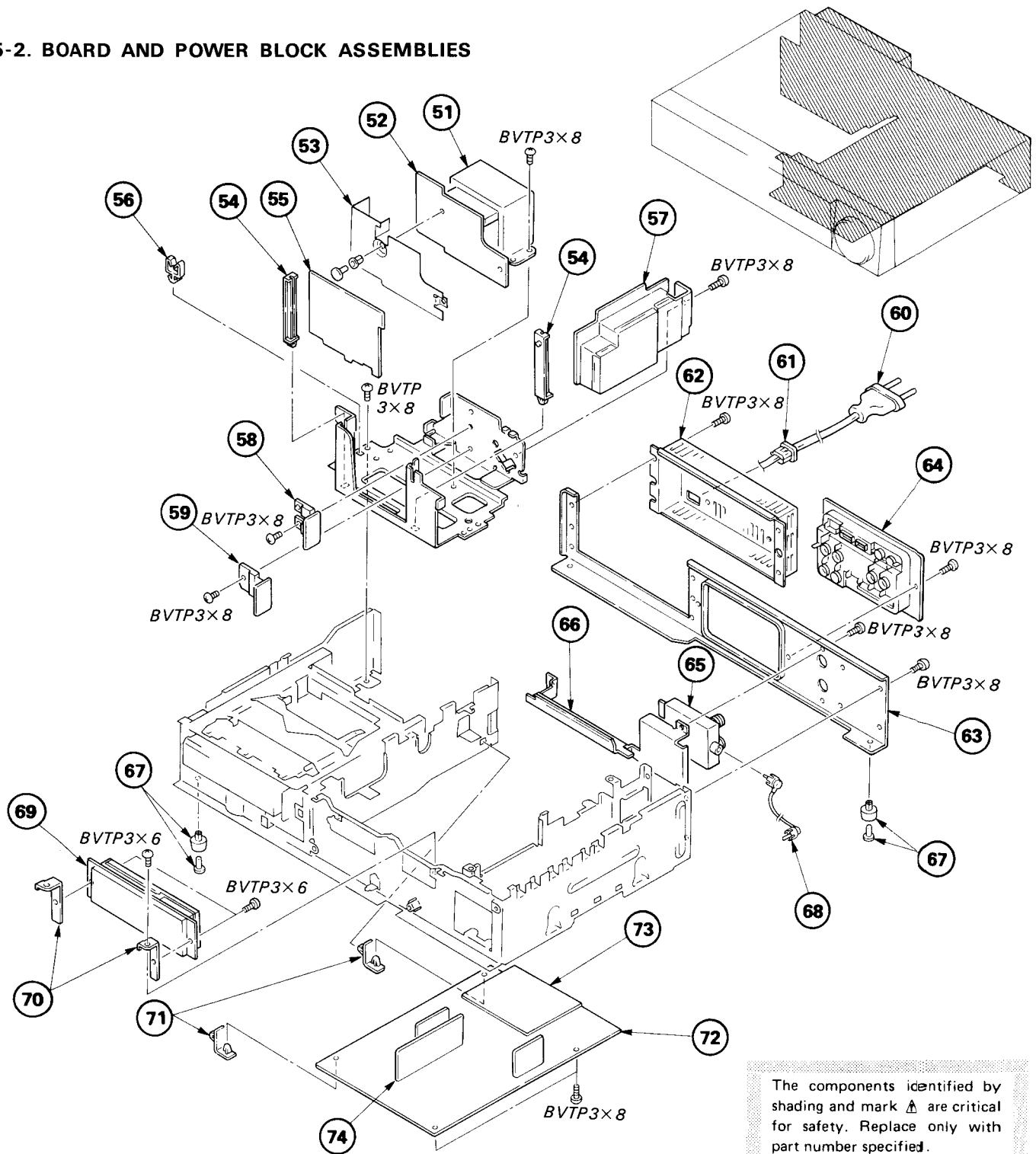
The components identified by shading and mark are critical for safety. Replace only with part number specified.

### 5-1. FRONT PANEL AND CASE (UPPER, LOWER) ASSEMBLIES



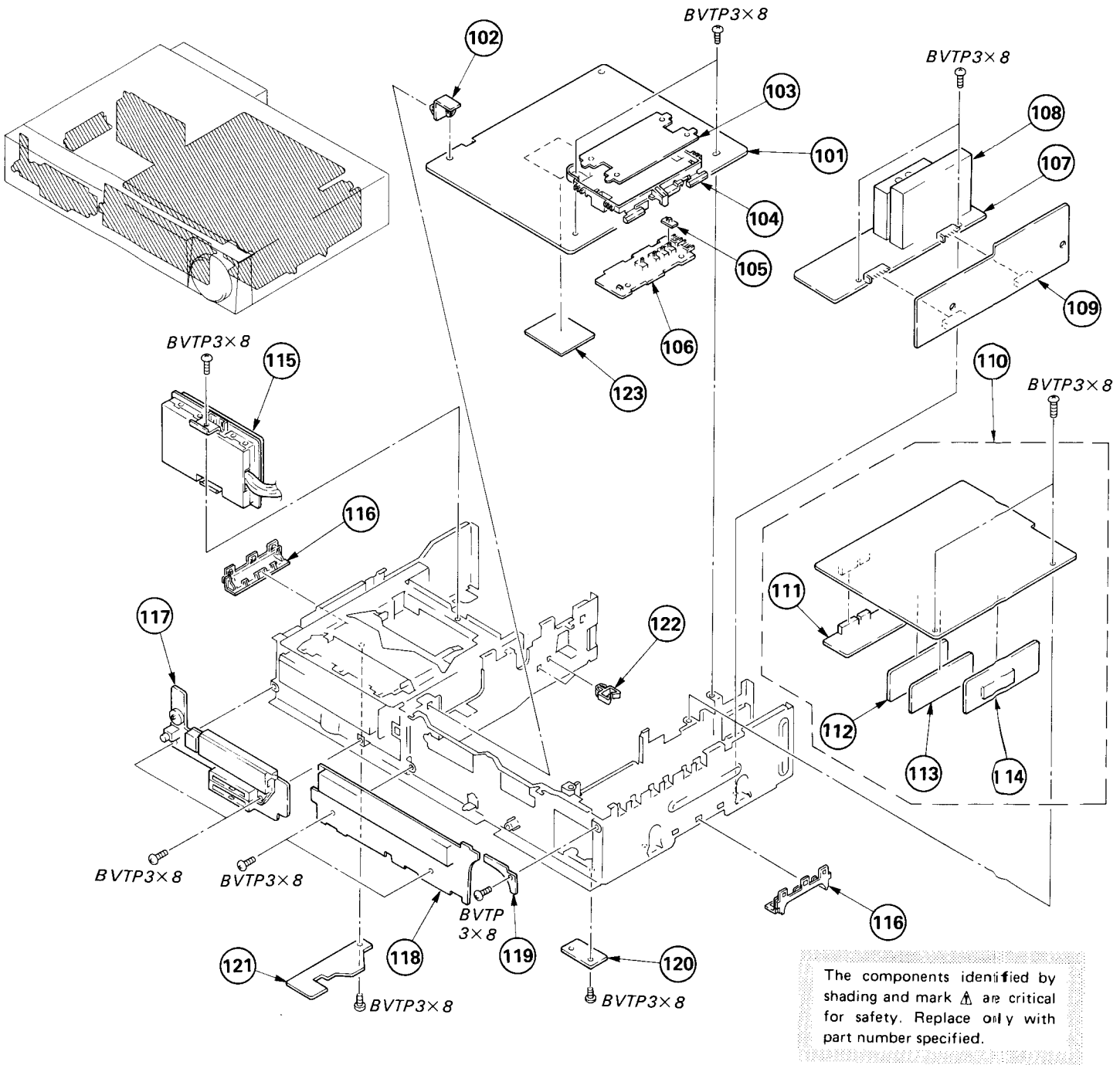
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
1	X-3711-957-1	LID ASSY, PRESET		13	X-3711-952-1	KEY ASSY, FF	
2	4-886-821-01	SCREW, M3 CASE		14	3-716-856-01	KEY, STOP	
3	X-3711-979-1	CASE ASSY, UPPER		15	X-3711-954-1	KEY ASSY, PAUSE	
4	X-3711-980-1	COVER ASSY, SLIDE		16	X-3711-955-1	KEY ASSY, X2	
5	3-716-868-01	KEY, SLIDE		17	X-3711-981-1	KEY ASSY, REC	
6	3-716-867-01	KNOB, HP		18	*3-716-865-21	PLATE (A), INDICATION, POCKET (WG MODEL)	
7	3-716-882-01	KNOB, SLIDE			*3-716-865-31	PLATE (A), INDICATION, POCKET (AE P MODEL)	
8	*3-716-913-01	PLATE, BOTTOM		19	1-464-784-11	ENCODER, ROTARY	
9	X-3711-983-1	PANEL (A) ASSY, FRONT (WG MODEL)	10-18	20	3-716-831-01	SPACER	
	X-3711-984-1	PANEL (UK) ASSY, FRONT (AEP MODEL)	10-18	21	3-711-962-01	DIAL, SHUTTLE	
10	*3-716-866-11	PLATE (B), INDICATION, POCKET		22	X-3711-914-1	DIAL ASSY, JOG	
11	X-3711-953-1	KEY ASSY, REW		23	1-464-785-31	SWITCH BLOCK, CONTROL (WG MODEL)	
12	X-3711-951-1	KEY ASSY, FWD			1-464-785-41	SWICH BLOCK, CONTROL (AEP MODEL)	

## 5-2. BOARD AND POWER BLOCK ASSEMBLIES



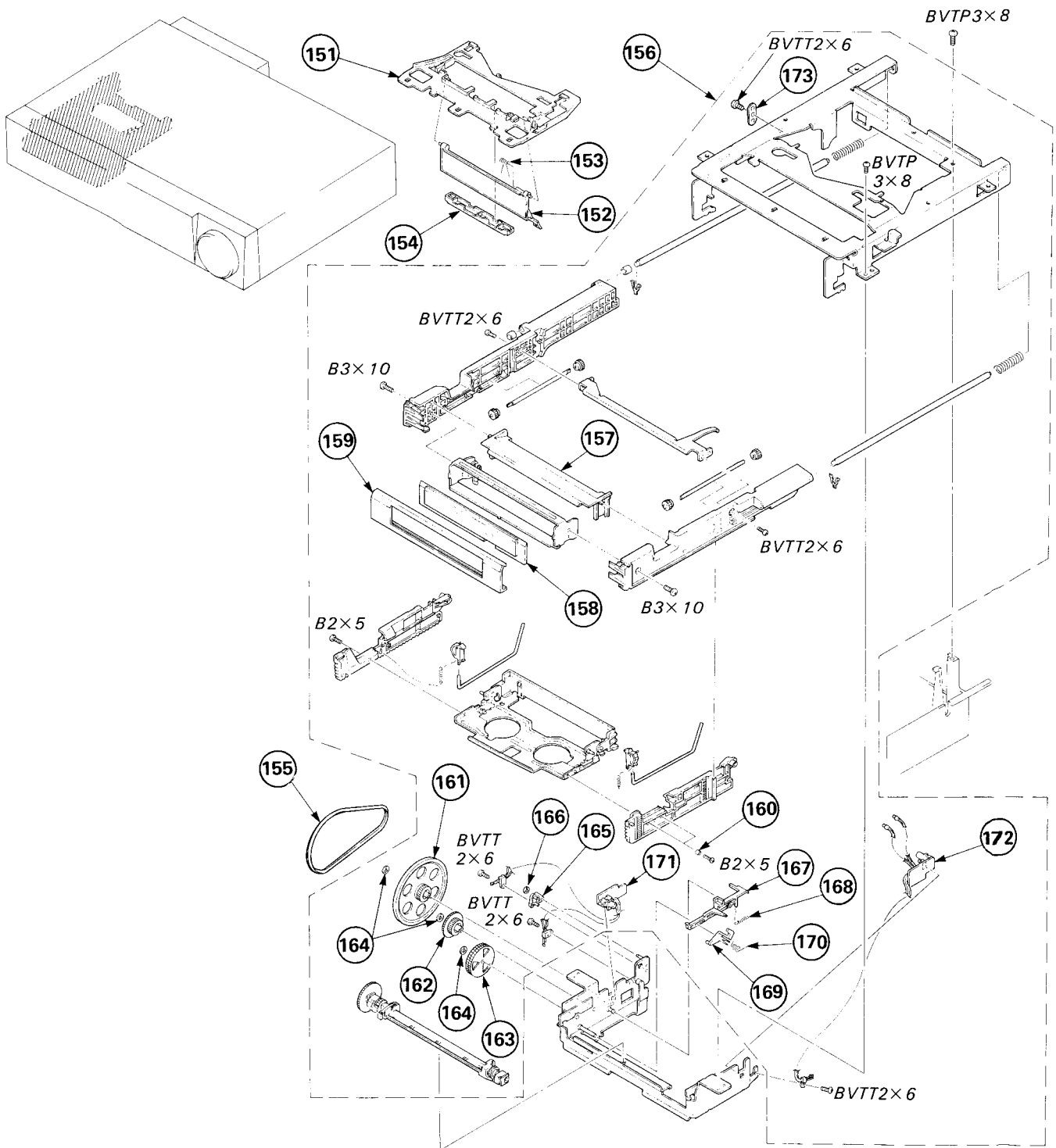
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
51	Δ.1-448-836-11	TRANSFORMER, POWER		63	3-713-669-01	FRAME (A), REAR	
52	*1-622-006-11	DS-16 (C) BOARD		64	3-713-668-01	PLATE (A), ORNAMENTAL, JACK	
53	3-716-892-11	SHEET (LARGE), INSULATING		65	Δ.1-464-690-11	MODULATOR, RF (RFU-857)	
54	3-680-719-11	GUIDE, CHASSIS		66	*3-713-665-01	BAND (A), RF MODULATOR	
55	*A-7070-325-A	DT-63 (C) BOARD, COMPLETE		67	3-697-937-01	LEG	
56	*4-309-753-00	HOLDER, WIRE		68	*1-555-110-00	CABLE, PIN	
57	*A-7060-585-A	DR-35 (B) BOARD, COMPLETE		69	*A-7060-475-A	VP-1 (A) BOARD, COMPLETE (WG MODEL)	
58	*1-621-992-11	DO-1 BOARD		70	*3-713-660-01	HOLDER, VPS (WG MODEL)	
59	*1-621-993-11	DL-15 BOARD		71	*3-701-832-00	HINGE, CIRCUIT BOARD	
60	Δ.1-534-817-XX	CORD, POWER		72	*A-7060-469-A	VI-20 (A) BOARD, COMPLETE (WG MODEL) 74	
61	Δ.3-703-244-00	BUSHING (2104), CORD			*A-7060-792-A	VI-20 (B) BOARD, COMPLETE (AEP MODEL) 74	
62	3-713-667-01	COVER (A), POWER (WG MODEL)		73	*A-7068-031-A	TC-3 BOARD, COMPLETE (WG MODEL)	
	3-713-667-21	COVER (A), POWER (AEP MODEL)		74	*A-7068-030-A	CH-44 (B) BOARD, COMPLETE	

### 5-3. BOARD ASSEMBLY



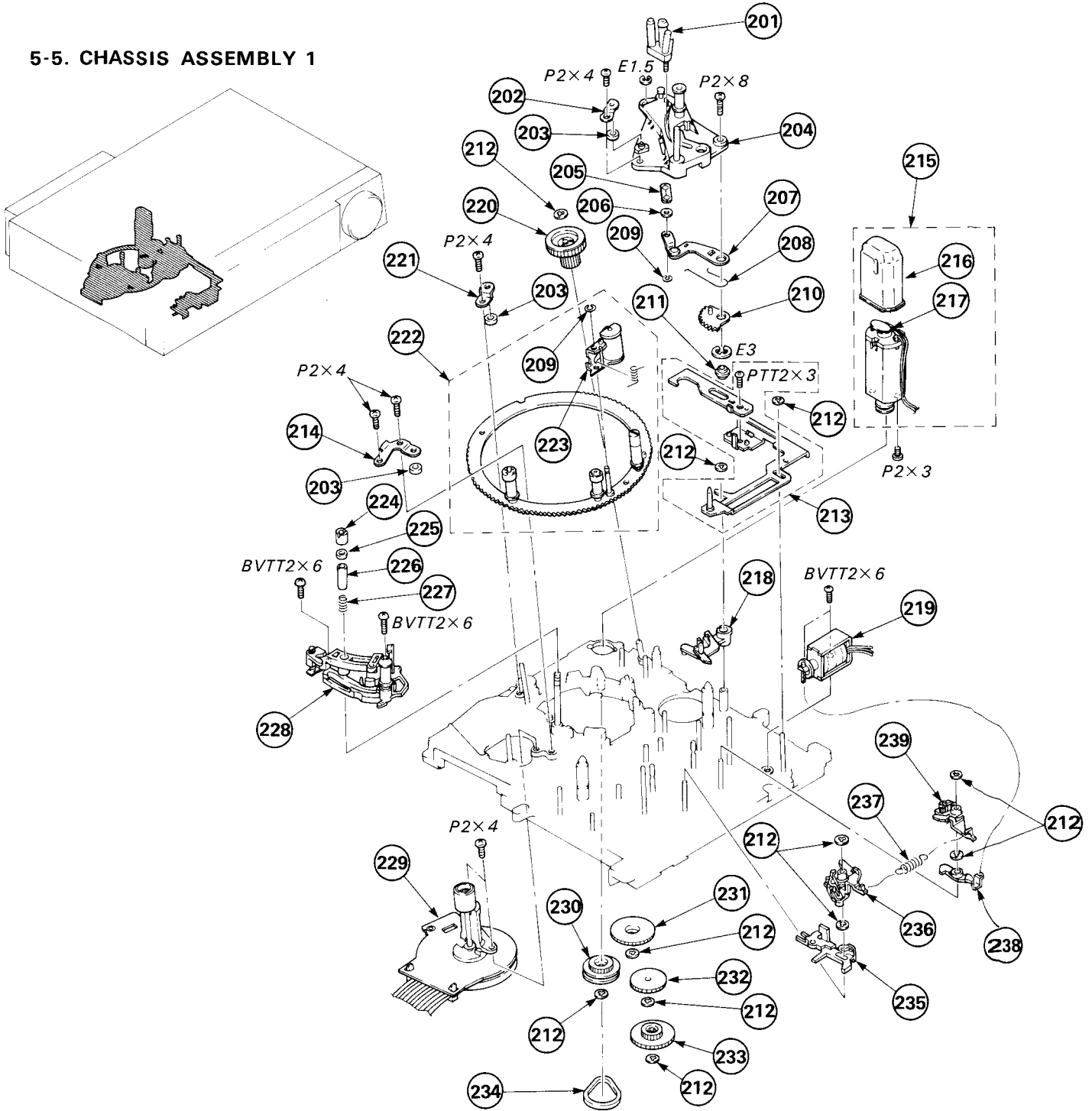
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
101	*A-7060-467-A	SP-2 (B) BOARD, COMPLETE		111	*A-7068-022-A	AD-12 (A) BOARD, COMPLETE	
102	*3-701-832-00	HINGE, CIRCUIT BOARD	123	112	*A-7068-025-A	NR-6 (A) BOARD, COMPLETE	
103	3-716-841-21	SHEET, PRESET (WG MODEL)		113	*A-7068-032-A	MK-2 (B) BOARD, COMPLETE	
	3-716-841-41	SHEET, PRESET (AEP MODEL)		114	*A-7068-021-A	AF-20 (A) BOARD, COMPLETE	
104	3-716-896-01	PRESET (MAIN) (WG MODEL)		115	*A-7060-466-A	RP-36 (B) BOARD, COMPLETE	
	3-716-896-31	PRESET (MAIN) (AEP MODEL)		116	3-716-907-01	PROTECTOR, FRAME	
105	3-713-694-01	KNOB (P), SLID		117	*A-7060-407-A	PW-30 (A) BOARD, COMPLETE	
106	*A-7060-474-A	PR-13 (A) BOARD, COMPLETE (WG MODEL)		118	*A-7060-470-A	FT-13 (C) BOARD, COMPLETE (WG MODEL)	
	*A-7060-609-A	PR-13 (B) BOARD, COMPLETE (AEP MODEL)			*A-7060-793-A	FT-13 (D) BOARD, COMPLETE (AEP MODEL)	
107	*A-7060-471-A	TU-83 (A) BOARD, COMPLETE (WG MODEL)		119	*1-621-985-11	FR-24 (A) BOARD	
	*A-7060-607-A	TU-83 (B) BOARD, COMPLETE (AEP MODEL)		120	*1-621-987-11	CB-8 (A) BOARD	
108	1-463-761-11	TUNER, ET (DT-883B)		121	*1-621-982-11	MJ-11 (A) BOARD	
109	$\Delta$ *A-7060-482-A	TS-50 (A) BOARD, COMPLETE (WG MODEL)		122	*4-309-753-00	HOLDER, WIRE	
	$\Delta$ *A-7060-608-A	TS-50 (B) BOARD, COMPLETE (AEP MODEL)		123	*1-622-469-11	RB-2B BOARD	
110	*A-7060-468-A	AU-22 (B) BOARD, COMPLETE	111-114				

### 5-4. CASSETTE COMPARTMENT ASSEMBLY



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
151	3-716-908-01	CLAMP, LAMP		163	X-3711-968-1	GEAR ASSY, LIMITER	
152	X-3711-965-1	MIRROR ASSY		164	3-669-596-00	WASHER (2.3), STOPPER	
153	3-713-686-01	SPRING		165	3-716-821-01	ARM, SW	
154	3-716-884-01	HOLDER, LAMP		166	3-669-465-00	WASHER (1.5), STOPPER	
155	3-713-670-01	BELT, LS		167	3-716-937-01	SLIDER, LOCK	
156	*A-7090-443-A	COMPARTMENT ASSY, CASSETTE, LS	157-173	168	3-716-825-01	SPRING, TENSION	
157	3-716-885-01	PLATE, SLOPE		169	3-716-850-01	HOLDER, LOCK	
158	3-713-684-01	GLASS, WINDOW		170	3-713-687-01	SPRING	
159	3-713-682-01	HEAD, FRONT		171	*1-621-998-11	TE-6 BOARD	
160	*3-657-841-01	SPACER (2X2)		172	*1-621-997-11	TE-5 BOARD	
161	3-716-849-01	PULLEY, MIDWAY		173	*3-716-944-01	STOPPER PLATE, SHAFT	
162	3-716-819-01	GEAR, DECELERATION					

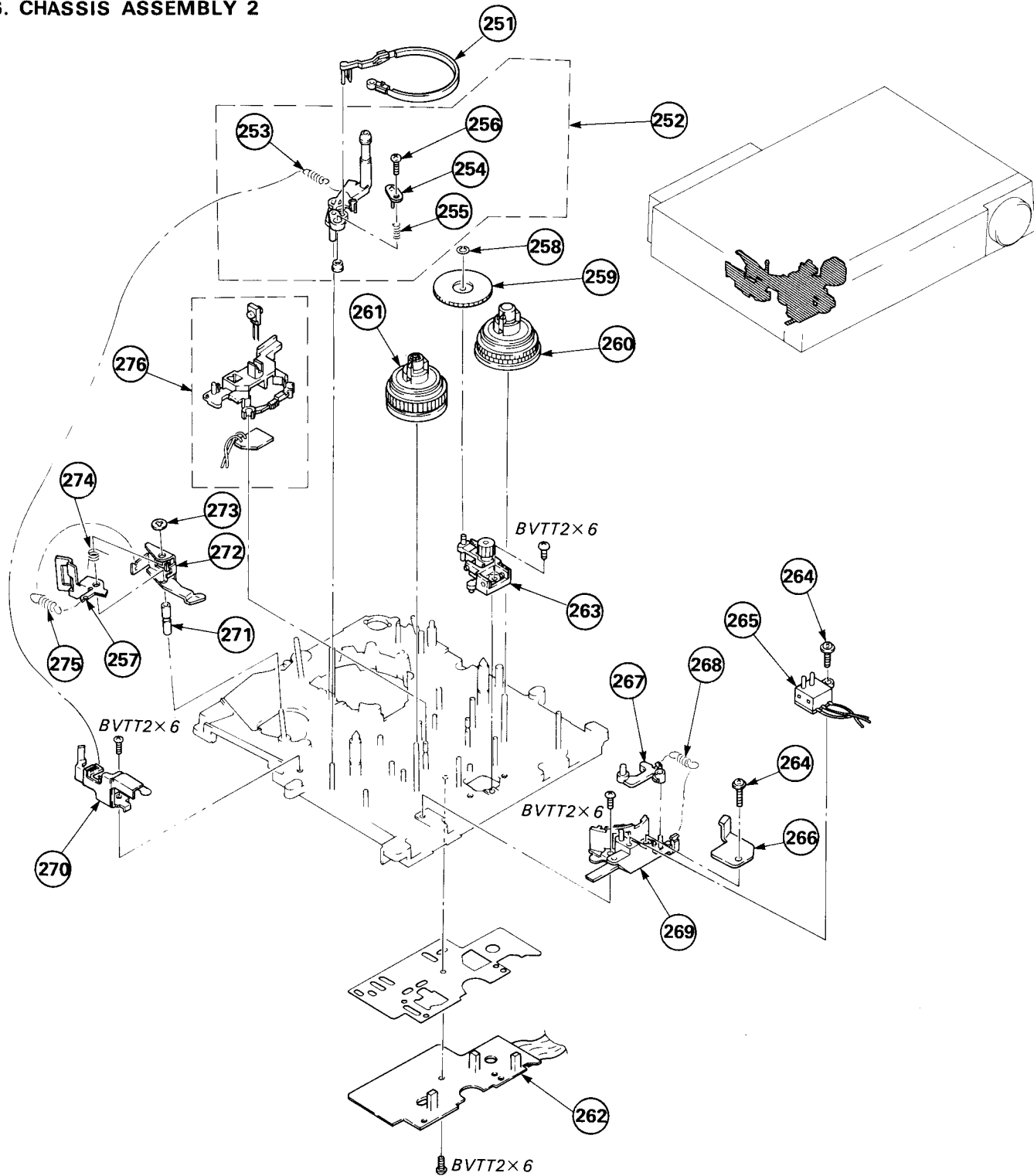
### 5-5. CHASSIS ASSEMBLY 1



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
201	X-3686-502-1	BASE ASSY, GUIDE		221	*3-686-911-01	PLATE, TOP, ROLLER	
202	*3-686-503-01	RETAINER, ROLLER		222	A-7040-123-A	RING ASSY, LOADING	209, 223
203	3-697-538-01	ROLLER, RING		223	X-3686-648-2	ARM ASSY, PINCH ROLLER	
204	X-3686-577-1	CHASSIS ASSY, GUIDE, SLANT		224	3-686-724-01	NUT, GUIDE	
205	3-686-663-01	WASHER, STOPPER, 2 GANG		225	*3-686-894-01	FLANGE, #3 #4 GUIDE	
206	3-701-436-21	WASHER, POLYETHYLENE		226	3-686-912-01	GUIDE, #3 #4	
207	X-3686-537-1	ARM ASSY		227	3-699-609-01	SPRING, COMPRESSION	
208	3-686-701-01	SPRING		228	A-7040-054-A	GUIDE (P) ASSY, ENTRANCE	
209	3-315-384-31	WASHER, STOPPER		229	8-835-247-01	MOTOR, DC BHF-2804D (CAPSTAN) M906	
210	3-699-509-01	GEAR, SECTOR		230	X-3686-514-1	GEAR ASSY, NO.1	
211	3-686-537-01	RETAINER, LOCK SLIDER		231	3-686-508-01	GEAR, NO.2	
212	3-669-465-00	WASHER (1.5), STOPPER		232	3-686-545-01	GEAR, NO.3	
213	A-7040-103-A	SLIDER ASSY, LOCK		233	3-686-544-01	GEAR, NO.4	
214	*3-686-675-01	STOPPER, RING		234	3-686-546-01	BELT, L- MOTOR	
215	A-7040-065-A	MOTOR ASSY, L (LOADING) M904	216, 217	235	*3-686-629-01	SLIDER, SELECTION, UPPER & LOER	
216	*3-686-757-01	CAP, SHIELD, L MOTOR		236	X-3686-895-1	BRAKE ASSY, S MAIN	
217	1-161-057-00	CAP, CERAMIC 0.033MF X C901		237	3-713-560-01	SPRING, TENSION	
218	*3-686-636-04	ARM, T.S RELEASE		238	*3-686-635-01	ARM, P	
219	1-454-377-31	SOLENOID, PLUNGER (BRAKE) PM901		239	X-3686-574-1	BRAKE ASSY, MAIN, TAKE-UP	
220	3-697-518-01	GEAR, NO.10					

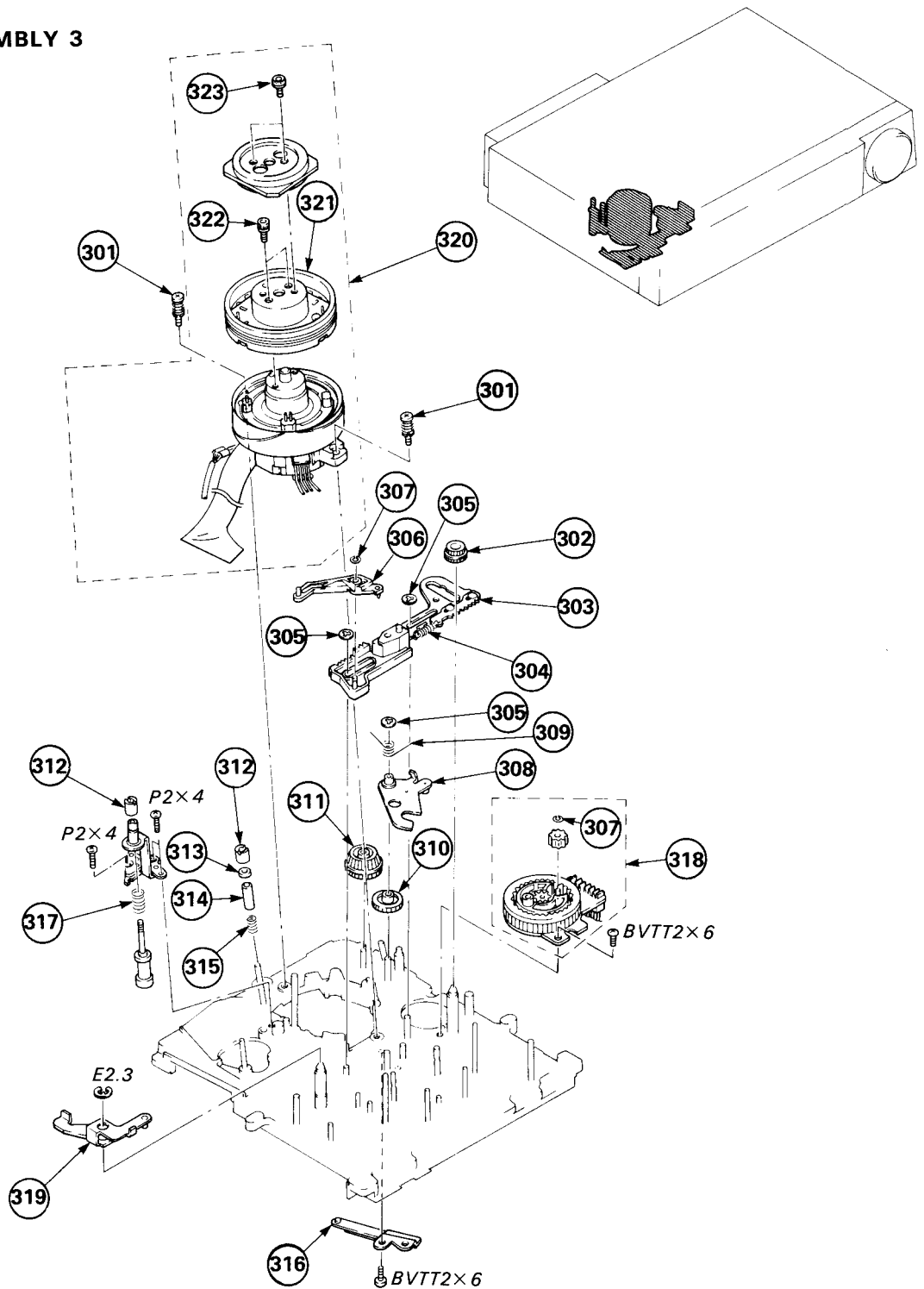


### 5-6. CHASSIS ASSEMBLY 2



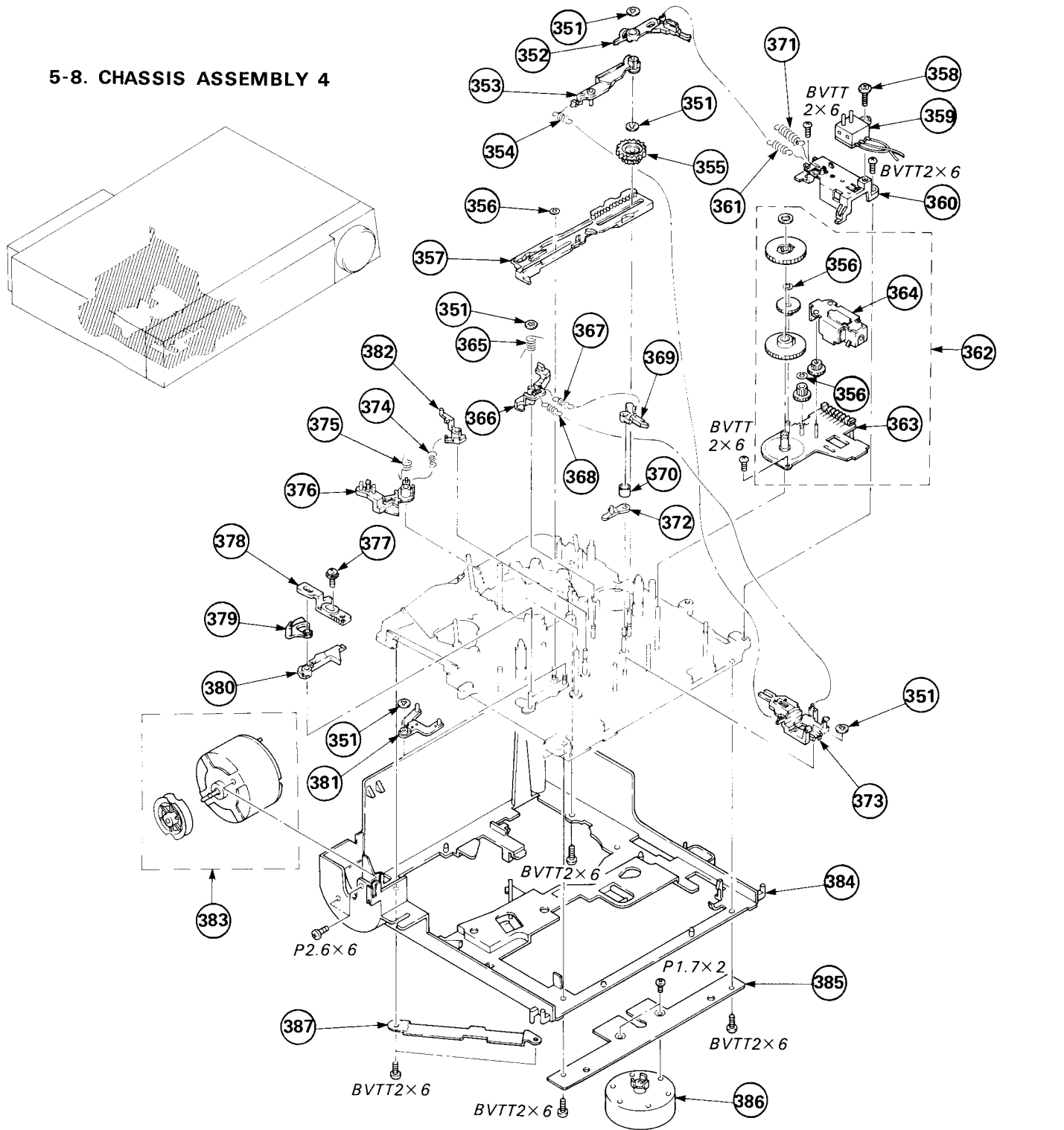
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
251	X-3686-531-1	BAND ASSY, TENSION REGULATOR		264	3-669-480-11	+ PTPWH 2	
252	A-7040-071-A	ARM ASSY, TENSION REGULATOR	253-256	265	1-554-942-11	SWITCH, PUSH (RECOG R) S901	
253	3-699-519-01	SPRING, TENSION		266	*3-686-991-01	STOPPER, REEL TABLE	
254	*X-3686-523-1	PLATE ASSY, TENSION REGULATOR		267	*3-686-637-01	BRAKE (S), SOFT	
255	3-669-666-00	SPRING, COMPRESSION		268	3-696-082-01	SPRING, TENSION	
256	3-697-546-01	SCREW (+-M2X6), SPECIAL		269	*3-686-760-01	GUIDE, BAND	
257	*3-686-641-01	ARM, PINCH PRESS		270	*X-3686-525-1	HOOK ASSY, SPRING	
258	3-315-384-31	WASHER, STOPPER		271	*3-686-567-01	SLEEVE, PINCH PRESS	
259	X-3686-763-1	GEAR (B) ASSY, DRIVING		272	*3-686-660-01	ARM, PINCH LIMITER	
260	X-3686-572-2	TABLE ASSY, REEL, TAKE-UP		273	3-669-465-00	WASHER (1.5), STOPPER	
261	X-3711-962-1	TABEL ASSY, SUPPLY REEL		274	3-686-568-01	SPRING, TORSION	
262	*A-7060-411-A	RS-17 BOARD, COMPLETE		275	3-686-885-01	SPRING, TENSION	
263	X-3711-963-1	DRIVING COMPLETE ASSY		276	*A-7070-024-A	LD-1 BOARD, COMPLETE	

5-7. CHASSIS ASSEMBLY 3



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
301	X-3686-569-1	SCREW ASSY, FITTING		313	*3-686-894-01	FLANGE, #3 #4 GUIDE	
302	3-686-702-01	GEAR, DRIVING, GUIDE. SLANT		314	3-686-912-01	GUIDE, #3 #4	
303	*X-3686-548-2	SLIDER SUB ASSY, L		315	3-699-609-01	SPRING, COMPRESSION	
304	3-686-886-01	SPRING, TENSION		316	1-535-535-11	TERMINAL, SHAFT GROUND	
305	3-669-465-00	WASHER (1.5), STOPPER		317	3-699-514-01	SPRING, COMPRESSION	
306	*X-3686-518-3	ARM ASSY		318	X-3712-403-1	L-SW ASSY	307
307	3-701-437-11	WASHER		319	*X-3686-509-1	LEVER ASSY, PINCH PRESS	
308	X-3686-579-1	CHANGE ASSY, DRIVE		320	A-7048-102-A	DRUM ASSY (DGH-12D-R)	321-323
309	3-686-540-01	SPRING, TORSION		321	A-7049-121-A	DRUM ASSY, UPPER, ROTARY (DGR-12-R)	
310	3-686-535-01	GEAR, NO.8		322	3-686-403-01	SCREW (2X5), BOLT WASHER	
311	3-686-539-01	GEAR, NO.9		323	3-686-422-01	WASHER (2X2.7), BOLT, HOLE	
312	3-686-724-01	NUT, GUIDE					

5-8. CHASSIS ASSEMBLY 4



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
351	3-669-465-00	WASHER (1.5), STOPPER		370	3-716-933-01	SPACER, REW BRAKE	
352	X-3686-777-1	BRAKE ASSY, T.S		371	3-699-650-01	SPRING, TENSION	
353	*X-3686-528-4	ARM ASSY, B RELEASE		372	*3-686-580-01	ARM, SET UP	
354	3-686-903-01	SPRING, TENSION		373	*3-686-656-01	SLIDER, B RELEASE	
355	3-686-909-01	GEAR, MODE OUTPUT		374	3-686-905-02	SPRING, TENSION	
356	3-315-384-31	WASHER, STOPPER		375	3-686-603-04	SPRING	
357	3-716-935-01	SLIDER, M		376	*3-686-644-01	ARM, BAND	
358	3-669-480-11	+ PTPWH 2		377	3-686-528-01	SCREW (2X6), +	
359	1-554-942-11	SWITCH, PUSH (REC OG L) S902		378	*3-686-642-01	PLATE, ADJUSTMENT, BAND	
360	*3-699-556-01	COVER, CONTROL MOTOR		379	*3-716-934-01	DISK, EJECT	
361	3-714-035-00	SPRING, TENSION		380	*3-686-643-01	ARM, MODE	
362	A-7090-029-A	M-SW ASSY	356, 363, 364	381	*X-3686-530-1	ARM (A) ASSY, SELECTION	
363	*A-7070-025-A	MS-4 BOARD, COMPLETE		382	3-686-996-01	BRAKE (S), HARD	
364	8-835-138-01	MOTOR, DC (DNR-5301B) (CONTROL) M903		383	A-7090-661-A	MOTOR BLOCK ASSY, LS (LINEAR SKATE) M905	
365	3-686-579-01	SPRING		384	*3-716-915-01	FRAME, MD	
366	*3-686-634-01	ARM, RL		385	*3-716-922-01	BRACKET, REEL MOTOR	
367	3-686-906-01	SPRING, TENSION		386	X-3711-961-1	MOTOR SUB ASSY, REEL	
368	3-686-904-01	SPRING, TENSION		387	*3-716-894-01	RETAINER, ROTOR	
369	X-3686-510-1	BRAKE ASSY, REW					

## 5-9. HARDWARE LIST

### SCREW

7-621-255-20 SCREW +P 2X4  
7-621-255-50 SCREW +P 2X8  
7-621-772-20 SCREW +B 2X5  
7-627-552-28 SCREW, PRECISION +P 1.7X2  
7-627-553-48 SCREW, PRECISION +P 2X4  
  
7-628-254-00 SCREW +PS 2.6X5  
7-682-549-09 SCREW +B 3X10  
7-685-133-19 SCREW +P 2.6X6 TYPE1  
7-685-233-19 SCREW +KTP 2.6X6 TYPE2NON-SLIT  
7-685-645-79 SCREW +BVTP 3X6 TYPE2 IT-3  
  
7-685-645-79 SCREW +BVTP 3X6 TYPE2  
7-685-646-79 SCREW +BVTP 3X8 TYPE2 IT-3  
7-685-646-79 SCREW +BVTP 3X8 TYPE2  
7-685-780-04 SCREW +PTT 2X3 (S)  
7-685-853-01 SCREW +BVTT 2X6 (S)

### STOP RING

7-624-101-01 STOP RING 1.2 (E TYPE)  
7-624-102-04 STOP RING 1.5, TYPE -E  
7-624-105-04 STOP RING 2.3, TYPE -E  
7-624-106-04 STOP RING 3.0, TYPE -E  
7-624-190-71 STOP RING 5, TYPE-CS

### DRUM\*\*\*\*

### SCREW

7-621-255-15 SCREW +P 2X3  
7-621-255-25 SCREW +P 2X4  
7-621-734-09 SET-SCT, HEX, 2.6X3

### WASHER

7-623-420-07 LW 2, TYPE B



Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
PH002	8-719-939-11	GP2S09-B		C114	1-163-818-00	CERAMIC CHIP 0.1MF	10% 50V
PH003	8-719-939-11	GP2S09-B		C115	1-163-021-00	CERAMIC CHIP 0.01MF	50V
<u>TRANSISTOR</u>				C116	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V
Q001	8-729-901-01	TRANSISTOR DTC144EK		C117	1-163-033-00	CERAMIC CHIP 0.022MF	50V
Q002	8-729-901-01	TRANSISTOR DTC144EK		C118	1-163-021-00	CERAMIC CHIP 0.01MF	50V
Q003	8-729-901-01	TRANSISTOR DTC144EK		C119	1-163-818-00	CERAMIC CHIP 0.1MF	10% 50V
Q004	8-729-903-97	TRANSISTOR FMS1FE		C120	1-163-818-00	CERAMIC CHIP 0.1MF	10% 50V
Q005	8-729-903-82	TRANSISTOR FMW2		C121	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
<u>RESISTOR</u>				C122	1-163-107-00	CERAMIC CHIP 39PF	5% 50V
R001	1-216-081-00	METAL CHIP 22K 5%	1/10W	C123	1-163-021-00	CERAMIC CHIP 0.01MF	50V
R002	1-216-055-00	METAL CHIP 1.8K 5%	1/10W	C124	1-163-038-00	CERAMIC CHIP 0.1MF	25V
R003	1-216-031-00	METAL CHIP 180 5%	1/10W	C125	1-124-638-11	ELECT 22MF	20% 6.3V
R004	1-216-174-00	METAL CHIP 100 5%	1/8W	C126	1-163-021-00	CERAMIC CHIP 0.01MF	50V
R005	1-216-089-00	METAL CHIP 47K 5%	1/10W	C127	1-163-021-00	CERAMIC CHIP 0.01MF	50V
R006	1-216-089-00	METAL CHIP 47K 5%	1/10W	C128	1-123-611-00	ELECT 1MF	20% 50V
R007	1-216-089-00	METAL CHIP 47K 5%	1/10W	C129	1-124-638-11	ELECT 22MF	20% 6.3V
R008	1-216-073-00	METAL CHIP 10K 5%	1/10W	C130	1-163-021-00	CERAMIC CHIP 0.01MF	50V
R009	1-216-073-00	METAL CHIP 10K 5%	1/10W	C131	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
R010	1-216-073-00	METAL CHIP 10K 5%	1/10W	C132	1-123-611-00	ELECT 1MF	20% 50V
R011	1-216-073-00	METAL CHIP 10K 5%	1/10W	C133	1-163-107-00	CERAMIC CHIP 39PF	5% 50V
R012	1-216-073-00	METAL CHIP 10K 5%	1/10W	C134	1-163-035-00	CERAMIC CHIP 0.047MF	50V
R013	1-216-107-00	METAL CHIP 270K 5%	1/10W	C136	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V
R014	1-216-073-00	METAL CHIP 10K 5%	1/10W	C137	1-163-033-00	CERAMIC CHIP 0.022MF	10% 25V
R015	1-216-107-00	METAL CHIP 270K 5%	1/10W	C138	1-163-033-00	CERAMIC CHIP 0.022MF	10% 25V
R016	1-216-073-00	METAL CHIP 10K 5%	1/10W	C139	1-163-021-00	CERAMIC CHIP 0.01MF	50V
R017	1-216-073-00	METAL CHIP 10K 5%	1/10W	C140	1-123-617-00	ELECT 10MF	20% 16V
R018	1-216-107-00	METAL CHIP 270K 5%	1/10W	C201	1-135-095-00	TANTAL. CHIP 1.5MF	20% 10V
R019	1-216-073-00	METAL CHIP 10K 5%	1/10W	C202	1-135-095-00	TANTAL. CHIP 1.5MF	20% 10V
R020	1-216-107-00	METAL CHIP 270K 5%	1/10W	C203	1-163-021-00	CERAMIC CHIP 0.01MF	50V
<u>THERMISTOR</u>				C204	1-163-021-00	CERAMIC CHIP 0.01MF	50V
THP001	1-806-886-11	THERMISTOR (POSITIVE)		C205	1-124-638-11	ELECT 22MF	20% 6.3V
*****				C206	1-163-038-00	CERAMIC CHIP 0.1MF	25V
*A-7060-466-A RP-36 BOARD, COMPLETE				C207	1-163-038-00	CERAMIC CHIP 0.1MF	25V
*****				C208	1-124-638-11	ELECT 22MF	20% 6.3V
<u>CAPACITOR</u>				C209	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C101	1-135-095-00	TANTAL. CHIP 1.5MF	20% 10V	C210	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V
C102	1-135-095-00	TANTAL. CHIP 1.5MF	20% 10V	C211	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C103	1-163-021-00	CERAMIC CHIP 0.01MF	50V	C212	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C104	1-163-021-00	CERAMIC CHIP 0.01MF	50V	C213	1-163-818-00	CERAMIC CHIP 0.1MF	10% 50V
C105	1-124-638-11	ELECT 22MF	20% 6.3V	C214	1-163-818-00	CERAMIC CHIP 0.1MF	10% 50V
C106	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C215	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C107	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C216	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V
C108	1-124-638-11	ELECT 22MF	20% 6.3V	C217	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C109	1-163-021-00	CERAMIC CHIP 0.01MF	50V	C218	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C110	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V	C219	1-163-818-00	CERAMIC CHIP 0.1MF	10% 50V
C111	1-163-033-00	CERAMIC CHIP 0.022MF	50V	C220	1-163-818-00	CERAMIC CHIP 0.1MF	10% 50V
C112	1-163-021-00	CERAMIC CHIP 0.01MF	50V	C221	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
C113	1-163-818-00	CERAMIC CHIP 0.1MF	10% 50V	C222	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
				C223	1-163-021-00	CERAMIC CHIP 0.01MF	50V
				C224	1-163-038-00	CERAMIC CHIP 0.1MF	25V
				C225	1-124-638-11	ELECT 22MF	20% 6.3V
				C226	1-163-021-00	CERAMIC CHIP 0.01MF	50V
				C227	1-163-021-00	CERAMIC CHIP 0.01MF	50V

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







# SP-2

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C205	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C262	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V
C206	1-124-283-00	ELECT 4.7MF	20% 16V	C264	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C207	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C490	1-101-006-00	CERAMIC CHIP 0.047MF	50V
C208	1-123-613-00	ELECT 3.3MF	20% 50V	C491	1-101-006-00	CERAMIC CHIP 0.047MF	50V
C209	1-124-240-00	ELECT 10MF	20% 25V	C492	1-163-059-00	CERAMIC CHIP 0.01	10% 50V
C210	1-124-240-00	ELECT 10MF	20% 25V	C500	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C211	1-124-240-00	ELECT 10MF	20% 25V	C501	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C212	1-124-240-00	ELECT 10MF	20% 25V	C502	1-163-131-00	CERAMIC CHIP 390PF	10% 50V
C213	1-124-255-00	ELECT 1MF	20% 50V	C600	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C214	1-124-903-00	ELECT 1MF	20% 50V	C601	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V
C215	1-124-903-00	ELECT 1MF	20% 50V	C602	1-123-617-00	ELECT 10MF	20% 16V
C216	1-124-229-00	ELECT 33MF	20% 10V	C603	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C217	1-124-229-00	ELECT 33MF	20% 10V	C604	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C218	1-124-229-00	ELECT 33MF	20% 10V	C605	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C219	1-163-117-00	CERAMIC CHIP 100PF	5% 50V	C606	1-163-101-00	CERAMIC CHIP 22PF	5% 50V
C220	1-163-117-00	CERAMIC CHIP 100PF	5% 50V	C607	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C221	1-124-907-00	ELECT 10MF	20% 50V	C608	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C222	1-163-021-00	CERAMIC CHIP 0.01MF	50V	C609	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C223	1-163-021-00	CERAMIC CHIP 0.01MF	50V	C610	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C224	1-163-021-00	CERAMIC CHIP 0.01MF	50V	C611	1-123-617-00	ELECT 10MF	20% 16V
C225	1-163-021-00	CERAMIC CHIP 0.01MF	50V	C612	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C226	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C613	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V
C228	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C614	1-123-617-00	ELECT 10MF	20% 16V
C229	1-124-907-00	ELECT 10MF	20% 50V	C615	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C230	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V	C616	1-123-610-00	ELECT 0.47MF	20% 50V
C231	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V	C617	1-124-258-00	ELECT 3.3MF	20% 50V
C232	1-163-692-11	CERAMIC CHIP 0.0015MF	5% 50V	C618	1-124-239-00	ELECT 6.8MF	20% 10V
C233	1-163-692-11	CERAMIC CHIP 0.0015MF	5% 50V	C619	1-163-101-00	CERAMIC CHIP 22PF	5% 50V
C234	1-163-117-00	CERAMIC CHIP 100PF	5% 50V	C620	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C235	1-163-021-00	CERAMIC CHIP 0.01MF	50V	C621	1-163-099-00	CERAMIC CHIP 18PF	5% 50V
C236	1-163-019-00	CERAMIC CHIP 0.0068MF	10% 50V	C624	1-163-085-00	CERAMIC CHIP 2PF	0.25PF 50V
C237	1-124-645-11	ELECT 10MF	20% 16V	C627	1-163-101-00	CERAMIC CHIP 22PF	5% 50V
C238	1-124-002-11	ELECT 1MF	20% 50V	C628	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C239	1-163-021-00	CERAMIC CHIP 0.01MF	50V	C629	1-123-617-00	ELECT 10MF	20% 16V
C240	1-163-033-00	CERAMIC CHIP 0.022MF	10% 25V	C630	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C241	1-163-033-00	CERAMIC CHIP 0.022MF	10% 25V	C632	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C242	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V	C633	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C243	1-124-648-00	ELECT 4.7MF	20% 35V	C634	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C244	1-124-907-00	ELECT 10MF	20% 50V	C635	1-123-617-00	ELECT 10MF	20% 16V
C245	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C636	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C246	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V	C637	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C247	1-124-656-00	ELECT 2.2MF	20% 50V	C638	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C248	1-163-021-00	CERAMIC CHIP 0.01MF	50V	C639	1-123-617-00	ELECT 10MF	20% 16V
C249	1-124-499-11	ELECT 1MF	20% 50V	C645	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C250	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V	C646	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C251	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V	C647	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C255	1-124-445-00	ELECT 100MF	20% 16V	C648	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C256	1-124-445-00	ELECT 100MF	20% 16V	C649	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C257	1-124-927-11	ELECT 4.7MF	20% 50V	C650	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C258	1-124-904-00	ELECT 2.2MF	20% 50V	C651	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C259	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C652	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C260	1-163-021-00	CERAMIC CHIP 0.01MF	50V	C653	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C261	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V	C654	1-163-035-00	CERAMIC CHIP 0.047MF	50V
				C701	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
				C702	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V
				C703	1-163-141-00	CERAMIC CHIP 0.001MF	5% 50V

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

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C704	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	CN018	*1-564-002-00	PIN, CONNECTOR 3P	
C705	1-163-033-00	CERAMIC CHIP 0.022MF	10% 25V	CN019	*1-564-001-11	PIN, CONNECTOR 2P	
C706	1-163-033-00	CERAMIC CHIP 0.022MF	10% 25V	CN020	*1-564-005-00	PIN, CONNECTOR 6P	
C707	1-124-908-11	ELECT 22MF	20% 25V	CN021	*1-564-004-00	PIN, CONNECTOR 5P	
C708	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V	CN022	*1-564-001-11	PIN, CONNECTOR 2P	
C709	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V	CN207	*1-564-001-11	PIN, CONNECTOR 2P	
C710	1-124-256-00	ELECT 1.5MF	20% 50V	CN212	*1-564-010-11	PIN, CONNECTOR 11P	
C711	1-163-034-00	CERAMIC CHIP 0.033MF	10% 25V	CN213	*1-564-014-00	PIN, CONNECTOR 4P	
C712	1-163-105-00	CERAMIC CHIP 33PF	5% 50V	CN214	*1-564-005-00	PIN, CONNECTOR 6P	
C713	1-163-123-00	CERAMIC CHIP 180PF	5% 50V	CN215	*1-564-005-00	PIN, CONNECTOR 6P	
C714	1-163-271-00	CERAMIC CHIP 680PF	5% 50V	CN216	*1-564-006-11	PIN, CONNECTOR 7P	
C715	1-163-038-00	CERAMIC CHIP 0.1MF	25V	CN217	*1-564-002-00	PIN, CONNECTOR 3P	
C716	1-163-038-00	CERAMIC CHIP 0.1MF	25V	CN601	*1-564-006-11	PIN, CONNECTOR 7P	
C717	1-163-038-00	CERAMIC CHIP 0.1MF	25V	CN603	*1-564-015-00	PIN, CONNECTOR 5P	
C718	1-163-021-00	CERAMIC CHIP 0.01MF	50V	CN605	*1-564-007-00	PIN, CONNECTOR 8P	
C719	1-124-904-00	ELECT 2.2MF	20% 50V	CN606	*1-564-001-11	PIN, CONNECTOR 2P	
C720	1-163-038-00	CERAMIC CHIP 0.1MF	25V	CN607	*1-564-002-00	PIN, CONNECTOR 3P	
C721	1-163-145-00	CERAMIC CHIP 0.0015MF	5% 50V				
C722	1-163-101-00	CERAMIC CHIP 22PF	5% 50V				
C723	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V				
C724	1-163-141-00	CERAMIC CHIP 0.001MF	5% 50V				
C725	1-163-111-00	CERAMIC CHIP 56PF	5% 50V				
C726	1-163-133-00	CERAMIC CHIP 470PF	5% 50V				
C727	1-163-021-00	CERAMIC CHIP 0.01MF	50V				
C728	1-124-904-00	ELECT 2.2MF	20% 50V				
C729	1-163-038-00	CERAMIC CHIP 0.1MF	25V				
C730	1-163-123-00	CERAMIC CHIP 180PF	5% 50V				
C731	1-163-121-00	CERAMIC CHIP 150PF	5% 50V				
C732	1-163-265-91	CERAMIC CHIP 390PF	5% 50V				
C733	1-163-111-00	CERAMIC CHIP 56PF	5% 50V				
C734	1-163-268-00	CERAMIC CHIP 510PF	5% 50V				
C735	1-163-035-00	CERAMIC CHIP 0.047MF	10% 25V				
C736	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V				
C740	1-124-904-00	ELECT 2.2MF	20% 50V				
<u>CONNECTOR</u>							
CN001	*1-564-006-11	PIN, CONNECTOR 7P		D020	8-719-101-23	DIODE 1SS123	
CN002	*1-564-006-11	PIN, CONNECTOR 7P		D021	8-719-101-23	DIODE 1SS123	
CN003	*1-564-003-00	PIN, CONNECTOR 4P		D060	8-719-911-19	DIODE 1SS119	
CN004	*1-564-001-11	PIN, CONNECTOR 2P		D080	8-719-100-03	DIODE 1S2835	
CN005	*1-564-004-00	PIN, CONNECTOR 5P		D081	8-719-100-03	DIODE 1S2835	
CN006	*1-564-002-00	PIN, CONNECTOR 3P		D082	8-719-100-05	DIODE 1S2837	
CN007	*1-564-004-00	PIN, CONNECTOR 5P		D106	8-719-106-71	DIODE RD12M-B2	
CN008	*1-564-001-11	PIN, CONNECTOR 2P		D107	8-719-106-71	DIODE RD12M-B2	
CN009	*1-564-006-11	PIN, CONNECTOR 7P		D108	8-719-106-71	DIODE RD12M-B2	
CN010	*1-564-001-11	PIN, CONNECTOR 2P		D120	8-719-100-03	DIODE 1S2835	
CN011	*1-564-004-00	PIN, CONNECTOR 5P		D203	8-719-200-27	DIODE E10DS2	
CN012	*1-564-006-11	PIN, CONNECTOR 7P		D204	8-719-100-03	DIODE 1S2835	
CN013	*1-564-002-00	PIN, CONNECTOR 3P		D205	8-719-801-48	DIODE 1SS193	
CN014	*1-564-003-00	PIN, CONNECTOR 4P		D206	8-719-100-03	DIODE 1S2835	
CN015	*1-564-002-00	PIN, CONNECTOR 3P		D208	8-719-100-03	DIODE 1S2835	
CN016	*1-564-001-11	PIN, CONNECTOR 2P		D209	8-719-100-05	DIODE 1S2837	
CN017	*1-564-001-11	PIN, CONNECTOR 2P		D211	8-719-101-23	DIODE 1SS123	
				D212	8-719-100-03	DIODE 1S2835	
				D213	8-719-100-03	DIODE 1S2835	
				D214	8-719-100-03	DIODE 1S2835	
				D215	8-719-101-23	DIODE 1SS123	
				D216	8-719-101-23	DIODE 1SS123	
				D217	8-719-801-48	DIODE 1SS193	
				D218	8-719-100-05	DIODE 1S2837	
				D220	8-719-200-27	DIODE E10DS2	
				D221	8-719-200-27	DIODE E10DS2	
				D222	8-719-200-27	DIODE E10DS2	
				D223	8-719-100-05	DIODE 1S2837	
				D225	8-719-801-48	DIODE 1SS193	
				D226	8-719-100-03	DIODE 1S2835	
				D227	8-719-801-48	DIODE 1SS193	
				D230	8-719-105-82	DIODE RD5.1M	
				D231	8-719-801-48	DIODE 1SS193	
				D232	8-719-101-23	DIODE 1SS123	

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

Ref.No	Part No.	Description
D233	8-719-801-48	DIODE 1SS193
D390	8-719-100-05	DIODE 1S2837
D391	8-719-100-03	DIODE 1S2835
D392	8-719-801-48	DIODE 1SS193
D393	8-719-100-05	DIODE 1S2837
D501	8-719-118-29	DIODE 1SS220
D502	8-719-100-05	DIODE 1S2837
D600	8-719-108-24	DIODE 1SS223
D601	8-719-100-05	DIODE 1S2837
D603	8-719-100-03	DIODE 1S2835
D604	8-719-100-05	DIODE 1S2837
D701	8-719-100-05	DIODE 1S2837
D702	8-719-100-03	DIODE 1S2835
<u>FILTER</u>		
FL701	1-235-829-11	BPF (15KHz)
FL702	1-235-830-11	BPF (45KHz)
<u>IC</u>		
IC001	8-752-800-76	IC CXP5048H-069Q
IC002	8-752-800-91	IC CXP5048H-070Q
IC003	8-759-112-01	IC UPD75104G-519-1B
IC004	8-759-201-01	IC TC4066BF
IC005	8-759-201-61	IC TC40H004F
IC007	8-759-801-60	IC LB1640N
IC008	8-759-913-67	IC MB3763P
IC009	8-759-908-81	IC MB3763PF
IC010	8-759-920-94	IC MSM6411B-19RS
IC011	8-759-200-68	IC TC4011BF
IC012	8-759-201-53	IC TC40H000F
IC120	8-759-111-62	IC UPD7566G-506
IC121	8-759-920-94	IC MSM6411B-19RS
IC201	8-759-803-47	IC LA5005M
IC202	8-759-100-94	IC UPC358G2
IC204	8-759-929-55	IC MB64H428PF
IC205	8-759-932-07	IC MB674101PF
IC206	8-759-701-43	IC NJM3414D
IC207	8-759-202-45	IC CX20114
IC208	8-759-802-79	IC LB1616M
IC209	8-759-100-94	IC UPC358G2
IC210	8-752-003-50	IC CX20035
IC211	8-759-925-66	IC BA6303F
IC212	8-759-701-39	IC NJM3403AM
IC213	8-759-201-01	IC TC4066BF
IC214	8-759-201-00	IC TC4052BF
IC215	8-759-100-94	IC UPC358G2
IC216	8-759-200-81	IC TC4053BF
IC217	8-759-200-81	IC TC4053BF
IC218	8-759-200-81	IC TC4053BF
IC219	8-759-100-94	IC UPC358G2
IC220	8-759-200-90	IC TC4538BF
IC500	8-759-111-96	IC UPD75106G-518-1B
IC501	8-759-200-81	IC TC4053BF

Remark	Ref.No	Part No.	Description	Remark
	IC502	8-759-200-78	IC TC4030BF	
	IC600	8-752-010-20	IC CX20102	
	IC601	8-752-321-97	IC CXD1066Q	
	IC602	8-759-911-18	IC CX23011	
	IC603	8-759-927-98	IC MB8464-15LPF	
	IC604	8-759-911-19	IC CX23012	
	IC605	8-752-010-30	IC CX20103	
	IC606	8-759-915-30	IC CX23078	
	IC701	8-759-928-56	IC CXA1042M	
	IC703	8-759-193-24	IC UPC324G2	
	<u>JACK</u>			
	J101	1-507-678-21	JACK	
	J102	1-507-678-21	JACK	
	J103	1-562-732-11	SOCKET 5P	
	<u>COIL</u>			
	L601	1-408-421-00	MICRO INDUCTOR 100UH	
	L602	1-408-421-00	MICRO INDUCTOR 100UH	
	L603	1-408-421-00	MICRO INDUCTOR 100UH	
	L604	1-408-421-00	MICRO INDUCTOR 100UH	
	L605	1-408-421-00	MICRO INDUCTOR 100UH	
	L606	1-408-421-00	MICRO INDUCTOR 100UH	
	L607	1-408-421-00	MICRO INDUCTOR 100UH	
	L608	1-408-421-00	MICRO INDUCTOR 100UH	
	L609	1-408-421-00	MICRO INDUCTOR 100UH	
	L610	1-408-421-00	MICRO INDUCTOR 100UH	
	L611	1-408-421-00	MICRO INDUCTOR 100UH	
	<u>IC LINK</u>			
	PS001A	1-532-727-11	LINK, IC (ICP-N5)	
	PS003A	1-532-685-00	LINK, IC (ICP-N20)	
	PS004A	1-532-637-00	LINK, IC (ICP-N25)	
	PS201A	1-532-685-00	LINK, IC (ICP-N20)	
	<u>TRANSISTOR</u>			
	Q010	8-729-901-01	TRANSISTOR DTC144EK	
	Q011	8-729-901-01	TRANSISTOR DTC144EK	
	Q012	8-729-901-01	TRANSISTOR DTC144EK	
	Q013	8-729-901-01	TRANSISTOR DTC144EK	
	Q014	8-729-901-01	TRANSISTOR DTC144EK	
	Q015	8-729-901-06	TRANSISTOR DTA144EK	
	Q020	8-729-901-05	TRANSISTOR DTA124EK	
	Q021	8-729-901-01	TRANSISTOR DTC144EK	
	Q022	8-729-901-05	TRANSISTOR DTA124EK	
	Q023	8-729-199-92	TRANSISTOR 2SD999	
	Q054	8-729-901-01	TRANSISTOR DTC144EK	
	Q055	8-729-901-01	TRANSISTOR DTC144EK	
	Q060	8-729-901-06	TRANSISTOR DTA144EK	
	Q070	8-729-901-01	TRANSISTOR DTC144EK	
	Q071	8-729-374-02	TRANSISTOR 2SB740	
	Q080	8-729-901-01	TRANSISTOR DTC144EK	
	Q081	8-729-901-01	TRANSISTOR DTC144EK	

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

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



# SP-2

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R003	1-216-073-00	METAL CHIP	10K 5% 1/10W	R098	1-216-113-00	METAL CHIP	470K 5% 1/10W
R004	1-216-073-00	METAL CHIP	10K 5% 1/10W	R099	1-216-073-00	METAL CHIP	10K 5% 1/10W
R005	1-216-073-00	METAL CHIP	10K 5% 1/10W	R100	1-216-025-00	METAL CHIP	100 5% 1/10W
R006	1-216-073-00	METAL CHIP	10K 5% 1/10W	R101	1-216-073-00	METAL CHIP	10K 5% 1/10W
R007	1-216-073-00	METAL CHIP	10K 5% 1/10W	R102	1-216-097-00	METAL CHIP	100K 5% 1/10W
R008	1-216-073-00	METAL CHIP	10K 5% 1/10W	R106	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R010	1-216-073-00	METAL CHIP	10K 5% 1/10W	R120	1-216-073-00	METAL CHIP	10K 5% 1/10W
R011	1-216-073-00	METAL CHIP	10K 5% 1/10W	R121	1-216-073-00	METAL CHIP	10K 5% 1/10W
R012	1-216-073-00	METAL CHIP	10K 5% 1/10W	R123	1-216-073-00	METAL CHIP	10K 5% 1/10W
R013	1-216-081-00	METAL CHIP	22K 5% 1/10W	R151	1-216-073-00	METAL CHIP	10K 5% 1/10W
R014	1-216-061-00	METAL CHIP	3.3K 5% 1/10W	R152	1-216-073-00	METAL CHIP	10K 5% 1/10W
R015	1-216-081-00	METAL CHIP	22K 5% 1/10W	R153	1-216-073-00	METAL CHIP	10K 5% 1/10W
R016	1-216-073-00	METAL CHIP	10K 5% 1/10W	R154	1-216-073-00	METAL CHIP	10K 5% 1/10W
R018	1-216-073-00	METAL CHIP	10K 5% 1/10W	R155	1-216-073-00	METAL CHIP	10K 5% 1/10W
R019	1-216-073-00	METAL CHIP	10K 5% 1/10W	R156	1-216-073-00	METAL CHIP	10K 5% 1/10W
R020	1-216-073-00	METAL CHIP	10K 5% 1/10W	R157	1-216-073-00	METAL CHIP	10K 5% 1/10W
R021	1-216-295-00	METAL CHIP	0 5% 1/10W	R158	1-216-073-00	METAL CHIP	10K 5% 1/10W
R022	1-216-073-00	METAL CHIP	10K 5% 1/10W	R160	1-216-073-00	METAL CHIP	10K 5% 1/10W
R023	1-216-073-00	METAL CHIP	10K 5% 1/10W	R161	1-216-073-00	METAL CHIP	10K 5% 1/10W
R024	1-216-041-00	METAL CHIP	470 5% 1/10W	R162	1-216-073-00	METAL CHIP	10K 5% 1/10W
R025	1-216-073-00	METAL CHIP	10K 5% 1/10W	R163	1-216-073-00	METAL CHIP	10K 5% 1/10W
R026	1-216-073-00	METAL CHIP	10K 5% 1/10W	R170	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R027	1-216-073-00	METAL CHIP	10K 5% 1/10W	R171	1-216-097-00	METAL CHIP	100K 5% 1/10W
R028	1-216-073-00	METAL CHIP	10K 5% 1/10W	R200	1-246-403-00	CARBON	1.2 5% 1/4W
R029	1-216-073-00	METAL CHIP	10K 5% 1/10W	R202	1-216-097-00	METAL CHIP	100K 5% 1/10W
R030	1-216-073-00	METAL CHIP	10K 5% 1/10W	R203	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R031	1-216-073-00	METAL CHIP	10K 5% 1/10W	R204	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R032	1-216-073-00	METAL CHIP	10K 5% 1/10W	R205	1-216-049-00	METAL CHIP	1K 5% 1/10W
R033	1-216-073-00	METAL CHIP	10K 5% 1/10W	R206	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R034	1-216-073-00	METAL CHIP	10K 5% 1/10W	R207	1-216-049-00	METAL CHIP	1K 5% 1/10W
R039	1-216-073-00	METAL CHIP	10K 5% 1/10W	R208	1-216-073-00	METAL CHIP	10K 5% 1/10W
R040	1-216-295-00	METAL CHIP	0 5% 1/10W	R209	1-216-071-00	METAL CHIP	8.2K 5% 1/10W
R050	1-216-073-00	METAL CHIP	10K 5% 1/10W	R210	1-216-073-00	METAL CHIP	10K 5% 1/10W
R051	1-216-073-00	METAL CHIP	10K 5% 1/10W	R211	1-216-295-00	METAL CHIP	0 5% 1/10W
R052	1-216-073-00	METAL CHIP	10K 5% 1/10W	R212	1-216-073-00	METAL CHIP	10K 5% 1/10W
R058	1-216-073-00	METAL CHIP	10K 5% 1/10W	R214	1-216-105-00	METAL CHIP	220K 5% 1/10W
R070	1-216-081-00	METAL CHIP	22K 5% 1/10W	R215	1-216-113-00	METAL CHIP	470K 5% 1/10W
R071	1-216-051-00	METAL CHIP	1.2K 5% 1/10W	R216	1-216-663-11	METAL CHIP	3.3K 0.50% 1/16W
R072	1-247-712-11	CARBON	820 5% 1/4W	R217	1-216-669-11	METAL CHIP	5.6K 0.50% 1/16W
R073	1-249-447-11	CARBON	1 5% 1/4W	R218	1-216-059-00	METAL CHIP	2.7K 5% 1/10W
R079	1-216-097-00	METAL CHIP	100K 5% 1/10W	R219	1-216-113-00	METAL CHIP	470K 5% 1/10W
R080	1-216-001-00	METAL CHIP	10 5% 1/10W	R220	1-216-025-00	METAL CHIP	100 5% 1/10W
R081	1-216-081-00	METAL CHIP	22K 5% 1/10W	R221	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R082	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R222	1-216-295-00	METAL CHIP	0 5% 1/10W
R083	1-216-049-00	METAL CHIP	1K 5% 1/10W	R223	1-216-025-00	METAL CHIP	100 5% 1/10W
R084	1-216-025-00	METAL CHIP	100 5% 1/10W	R224	1-216-081-00	METAL CHIP	22K 5% 1/10W
R085	1-216-073-00	METAL CHIP	10K 5% 1/10W	R225	1-216-085-00	METAL CHIP	33K 5% 1/10W
R086	1-216-097-00	METAL CHIP	100K 5% 1/10W	R226	1-216-073-00	METAL CHIP	10K 5% 1/10W
R087	1-216-073-00	METAL CHIP	10K 5% 1/10W	R227	1-216-081-00	METAL CHIP	22K 5% 1/10W
R088	1-216-089-00	METAL CHIP	47K 5% 1/10W	R228	1-216-033-00	METAL CHIP	220 5% 1/10W
R089	1-216-073-00	METAL CHIP	10K 5% 1/10W	R229	1-216-081-00	METAL CHIP	22K 5% 1/10W
R090	1-216-073-00	METAL CHIP	10K 5% 1/10W	R230	1-216-101-00	METAL CHIP	150K 5% 1/10W
R097	1-216-113-00	METAL CHIP	470K 5% 1/10W	R231	1-216-049-00	METAL CHIP	1K 5% 1/10W

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

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R232	1-216-304-11	METAL CHIP	3.3 5% 1/10W	R285	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R233	1-216-304-11	METAL CHIP	3.3 5% 1/10W	R286	1-216-073-00	METAL CHIP	10K 5% 1/10W
R234	1-216-304-11	METAL CHIP	3.3 5% 1/10W	R287	1-216-049-00	METAL CHIP	1K 5% 1/10W
R235	1-216-295-00	METAL CHIP	0 5% 1/10W	R288	1-216-049-00	METAL CHIP	1K 5% 1/10W
R236	1-216-097-00	METAL CHIP	100K 5% 1/10W	R289	1-216-295-00	METAL CHIP	0 5% 1/10W
R237	1-216-068-00	METAL CHIP	6.2K 5% 1/10W	R290	1-216-073-00	METAL CHIP	10K 5% 1/10W
R238	1-216-069-00	METAL CHIP	6.8K 5% 1/10W	R291	1-216-073-00	METAL CHIP	10K 5% 1/10W
R239	1-216-675-11	METAL CHIP	10K 0.50% 1/16W	R292	1-216-295-00	METAL CHIP	0 5% 1/10W
R240	1-216-683-11	METAL CHIP	22K 0.50% 1/16W	R293	1-216-073-00	METAL CHIP	10K 5% 1/10W
R241	1-216-667-11	METAL CHIP	4.7K 0.50% 1/16W	R294	1-216-073-00	METAL CHIP	10K 5% 1/10W
R242	1-216-683-11	METAL CHIP	22K 0.50% 1/16W	R295	1-216-103-00	METAL CHIP	180K 5% 1/10W
R243	1-216-681-11	METAL CHIP	18K 0.50% 1/16W	R296	1-216-121-00	METAL CHIP	1M 5% 1/10W
R244	1-216-681-11	METAL CHIP	18K 0.50% 1/16W	R297	1-216-097-00	METAL CHIP	100K 5% 1/10W
R245	1-216-121-00	METAL CHIP	1M 5% 1/10W	R298	1-216-073-00	METAL CHIP	10K 5% 1/10W
R246	1-216-681-11	METAL CHIP	18K 0.50% 1/16W	R299	1-216-073-00	METAL CHIP	10K 5% 1/10W
R247	1-216-080-00	METAL CHIP	20K 5% 1/10W	R300	1-216-073-00	METAL CHIP	10K 5% 1/10W
R248	1-216-080-00	METAL CHIP	20K 5% 1/10W	R301	1-216-073-00	METAL CHIP	10K 5% 1/10W
R249	1-216-080-00	METAL CHIP	20K 5% 1/10W	R303	1-216-073-00	METAL CHIP	10K 5% 1/10W
R250	1-216-080-00	METAL CHIP	20K 5% 1/10W	R305	1-216-085-00	METAL CHIP	33K 5% 1/10W
R251	1-216-080-00	METAL CHIP	20K 5% 1/10W	R306	1-216-077-00	METAL CHIP	15K 5% 1/10W
R252	1-216-080-00	METAL CHIP	20K 5% 1/10W	R307	1-216-043-00	METAL CHIP	560 5% 1/10W
R253	1-216-080-00	METAL CHIP	20K 5% 1/10W	R308	1-216-049-00	METAL CHIP	1K 5% 1/10W
R254	1-216-080-00	METAL CHIP	20K 5% 1/10W	R309	1-216-073-00	METAL CHIP	10K 5% 1/10W
R255	1-216-073-00	METAL CHIP	10K 5% 1/10W	R310	1-216-049-00	METAL CHIP	1K 5% 1/10W
R256	1-216-073-00	METAL CHIP	10K 5% 1/10W	R311	1-216-113-00	METAL CHIP	470K 5% 1/10W
R257	1-216-073-00	METAL CHIP	10K 5% 1/10W	R312	1-216-115-00	METAL CHIP	560K 5% 1/10W
R258	1-216-073-00	METAL CHIP	10K 5% 1/10W	R313	1-216-073-00	METAL CHIP	10K 5% 1/10W
R259	1-216-073-00	METAL CHIP	10K 5% 1/10W	R314	1-216-073-00	METAL CHIP	10K 5% 1/10W
R260	1-216-073-00	METAL CHIP	10K 5% 1/10W	R315	1-216-073-00	METAL CHIP	10K 5% 1/10W
R261	1-216-073-00	METAL CHIP	10K 5% 1/10W	R316	1-216-073-00	METAL CHIP	10K 5% 1/10W
R262	1-216-080-00	METAL CHIP	20K 5% 1/10W	R317	1-216-073-00	METAL CHIP	10K 5% 1/10W
R263	1-216-073-00	METAL CHIP	10K 5% 1/10W	R318	1-216-073-00	METAL CHIP	10K 5% 1/10W
R264	1-216-033-00	METAL CHIP	220 5% 1/10W	R319	1-216-085-00	METAL CHIP	33K 5% 1/10W
R265	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R320	1-216-685-11	METAL CHIP	27K 0.50% 1/16W
R266	1-216-150-00	METAL CHIP	10 5% 1/8W	R321	1-216-073-00	METAL CHIP	10K 5% 1/10W
R267	1-216-073-00	METAL CHIP	10K 5% 1/10W	R322	1-216-089-00	METAL CHIP	47K 5% 1/10W
R268	1-216-150-00	METAL CHIP	10 5% 1/8W	R323	1-216-073-00	METAL CHIP	10K 5% 1/10W
R269	1-216-055-00	METAL CHIP	1.8K 5% 1/10W	R324	1-216-099-00	METAL CHIP	120K 5% 1/10W
R270	1-216-073-00	METAL CHIP	10K 5% 1/10W	R326	1-216-109-00	METAL CHIP	330K 5% 1/10W
R271	1-216-025-00	METAL CHIP	100 5% 1/10W	R327	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R272	1-216-041-00	METAL CHIP	470 5% 1/10W	R328	1-216-091-00	METAL CHIP	56K 5% 1/10W
R273	1-216-073-00	METAL CHIP	10K 5% 1/10W	R329	1-216-117-00	METAL CHIP	680K 5% 1/10W
R274	1-216-085-00	METAL CHIP	33K 5% 1/10W	R330	1-216-117-00	METAL CHIP	680K 5% 1/10W
R275	1-216-073-00	METAL CHIP	10K 5% 1/10W	R331	1-216-081-00	METAL CHIP	22K 5% 1/10W
R276	1-216-085-00	METAL CHIP	33K 5% 1/10W	R332	1-216-115-00	METAL CHIP	560K 5% 1/10W
R277	1-216-073-00	METAL CHIP	10K 5% 1/10W	R333	1-216-073-00	METAL CHIP	10K 5% 1/10W
R278	1-216-071-00	METAL CHIP	8.2K 5% 1/10W	R334	1-216-115-00	METAL CHIP	560K 5% 1/10W
R279	1-216-061-00	METAL CHIP	3.3K 5% 1/10W	R335	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R280	1-216-061-00	METAL CHIP	3.3K 5% 1/10W	R336	1-216-083-11	METAL CHIP	27K 5% 1/10W
R281	1-216-061-00	METAL CHIP	3.3K 5% 1/10W	R337	1-216-073-00	METAL CHIP	10K 5% 1/10W
R282	1-216-061-00	METAL CHIP	3.3K 5% 1/10W	R338	1-216-121-00	METAL CHIP	1M 5% 1/10W
R283	1-216-073-00	METAL CHIP	10K 5% 1/10W	R339	1-216-089-00	METAL CHIP	47K 5% 1/10W
R284	1-216-061-00	METAL CHIP	3.3K 5% 1/10W	R340	1-216-663-11	METAL CHIP	3.3K 0.50% 1/16W
				R341	1-216-667-11	METAL CHIP	4.7K 0.50% 1/16W

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

# SP-2

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R342	1-216-073-00	METAL CHIP	10K 5% 1/10W	R401	1-216-073-00	METAL CHIP	10K 5% 1/10W
R343	1-216-073-00	METAL CHIP	10K 5% 1/10W	R402	1-216-295-00	METAL CHIP	0 5% 1/10W
R344	1-216-049-00	METAL CHIP	1K 5% 1/10W	R404	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R345	1-216-105-00	METAL CHIP	220K 5% 1/10W	R405	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R346	1-216-105-00	METAL CHIP	220K 5% 1/10W	R406	1-216-295-00	METAL CHIP	0 5% 1/10W
R347	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R408	1-216-115-00	METAL CHIP	560K 5% 1/10W
R348	1-216-089-00	METAL CHIP	47K 5% 1/10W	R470	1-216-295-00	METAL CHIP	0 5% 1/10W
R349	1-216-049-00	METAL CHIP	1K 5% 1/10W	R476	1-217-587-11	CARBON	0 1/4W
R350	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R477	1-217-587-11	CARBON	0 1/4W
R351	1-216-073-00	METAL CHIP	10K 5% 1/10W	R478	1-217-587-11	CARBON	0 1/4W
R352	1-216-685-11	METAL CHIP	27K 0.50% 1/16W	R502	1-216-073-00	METAL CHIP	10K 5% 1/10W
R353	1-216-663-11	METAL CHIP	3.3K 0.50% 1/16W	R504	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R354	1-216-689-11	METAL CHIP	39K 0.50% 1/16W	R505	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R355	1-216-089-00	METAL CHIP	47K 5% 1/10W	R506	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R356	1-216-693-11	METAL CHIP	56K 0.50% 1/16W	R508	1-216-085-00	METAL CHIP	33K 5% 1/10W
R357	1-216-691-11	METAL CHIP	47K 0.50% 1/16W	R509	1-216-081-00	METAL CHIP	22K 5% 1/10W
R358	1-216-663-11	METAL CHIP	3.3K 0.50% 1/16W	R510	1-216-081-00	METAL CHIP	22K 5% 1/10W
R359	1-216-685-11	METAL CHIP	27K 0.50% 1/16W	R511	1-216-081-00	METAL CHIP	22K 5% 1/10W
R360	1-216-073-00	METAL CHIP	10K 5% 1/10W	R514	1-216-073-00	METAL CHIP	10K 5% 1/10W
R361	1-216-085-00	METAL CHIP	33K 5% 1/10W	R515	1-216-073-00	METAL CHIP	10K 5% 1/10W
R362	1-216-073-00	METAL CHIP	10K 5% 1/10W	R516	1-216-073-00	METAL CHIP	10K 5% 1/10W
R363	1-216-073-00	METAL CHIP	10K 5% 1/10W	R517	1-216-049-00	METAL CHIP	1K 5% 1/10W
R364	1-216-085-00	METAL CHIP	33K 5% 1/10W	R518	1-216-073-00	METAL CHIP	10K 5% 1/10W
R365	1-216-097-00	METAL CHIP	100K 5% 1/10W	R519	1-216-085-00	METAL CHIP	33K 5% 1/10W
R366	1-216-097-00	METAL CHIP	100K 5% 1/10W	R530	1-216-081-00	METAL CHIP	22K 5% 1/10W
R367	1-216-089-00	METAL CHIP	47K 5% 1/10W	R607	1-216-045-00	METAL CHIP	680 5% 1/10W
R368	1-216-085-00	METAL CHIP	33K 5% 1/10W	R608	1-216-097-00	METAL CHIP	100K 5% 1/10W
R370	1-216-097-00	METAL CHIP	100K 5% 1/10W	R609	1-216-049-00	METAL CHIP	1K 5% 1/10W
R371	1-216-073-00	METAL CHIP	10K 5% 1/10W	R610	1-216-049-00	METAL CHIP	1K 5% 1/10W
R372	1-216-681-11	METAL CHIP	18K 0.50% 1/16W	R611	1-216-001-00	METAL CHIP	10 5% 1/10W
R373	1-216-075-00	METAL CHIP	12K 5% 1/10W	R612	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R375	1-216-697-11	METAL CHIP	82K 0.50% 1/16W	R613	1-216-041-00	METAL CHIP	470 5% 1/10W
R376	1-216-107-00	METAL CHIP	270K 5% 1/10W	R614	1-216-045-00	METAL CHIP	680 5% 1/10W
R377	1-216-107-00	METAL CHIP	270K 5% 1/10W	R615	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
R378	1-216-073-00	METAL CHIP	10K 5% 1/10W	R616	1-216-049-00	METAL CHIP	1K 5% 1/10W
R379	1-216-073-00	METAL CHIP	10K 5% 1/10W	R617	1-216-073-00	METAL CHIP	10K 5% 1/10W
R380	1-216-115-00	METAL CHIP	560K 5% 1/10W	R618	1-216-071-00	METAL CHIP	8.2K 5% 1/10W
R381	1-216-115-00	METAL CHIP	560K 5% 1/10W	R619	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
R382	1-216-101-00	METAL CHIP	150K 5% 1/10W	R620	1-216-645-11	METAL CHIP	560 0.50% 1/16W
R383	1-216-683-11	METAL CHIP	22K 0.50% 1/16W	R621	1-216-073-00	METAL CHIP	10K 5% 1/10W
R384	1-216-667-11	METAL CHIP	4.7K 0.50% 1/16W	R622	1-216-077-00	METAL CHIP	15K 5% 1/10W
R385	1-216-683-11	METAL CHIP	22K 0.50% 1/16W	R623	1-216-077-00	METAL CHIP	15K 5% 1/10W
R386	1-216-667-11	METAL CHIP	4.7K 0.50% 1/16W	R624	1-216-049-00	METAL CHIP	1K 5% 1/10W
R388	1-216-073-00	METAL CHIP	10K 5% 1/10W	R625	1-216-033-00	METAL CHIP	220 5% 1/10W
R390	1-216-073-00	METAL CHIP	10K 5% 1/10W	R626	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R391	1-216-097-00	METAL CHIP	100K 5% 1/10W	R627	1-216-081-00	METAL CHIP	22K 5% 1/10W
R392	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R628	1-216-079-00	METAL CHIP	18K 5% 1/10W
R394	1-216-035-00	METAL CHIP	270 5% 1/10W	R630	1-216-295-00	METAL CHIP	0 5% 1/10W
R395	1-216-073-00	METAL CHIP	10K 5% 1/10W	R632	1-216-085-00	METAL CHIP	33K 5% 1/10W
R396	1-216-693-11	METAL CHIP	56K 0.50% 1/16W	R633	1-216-085-00	METAL CHIP	33K 5% 1/10W
R397	1-216-295-00	METAL CHIP	0 5% 1/10W	R634	1-216-085-00	METAL CHIP	33K 5% 1/10W
R398	1-216-111-00	METAL CHIP	390K 5% 1/10W	R635	1-216-029-00	METAL CHIP	150 5% 1/10W
R399	1-216-073-00	METAL CHIP	10K 5% 1/10W	R636	1-216-065-00	METAL CHIP	4.7K 5% 1/10W

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





**SP-2****RB-2****AU-22**

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
X120	1-527-841-11	OSCILLATOR, CERAMIC (660KHz)		C201	1-163-181-00	CERAMIC CHIP 100PF	5% 50V
X201	1-567-345-11	VIBRATOR, CRYSTAL (5.94MHz)		C203	1-163-181-00	CERAMIC CHIP 100PF	5% 50V
X600	1-567-419-11	VIBRATOR, LITHIUM TANTALATE (11.58MHz)		C210	1-163-075-00	CERAMIC CHIP 0.047MF	50V
*****				C211	1-124-443-00	ELECT 100MF	20% 10V
*****				C212	1-163-075-00	CERAMIC CHIP 0.047MF	50V
*****				C213	1-124-443-00	ELECT 100MF	20% 10V
*****				C214	1-163-075-00	CERAMIC CHIP 0.047MF	50V
*****				C215	1-124-443-00	ELECT 100MF	20% 10V
*****				C216	1-163-075-00	CERAMIC CHIP 0.047MF	50V
*****				C217	1-124-443-00	ELECT 100MF	20% 10V
*****				C218	1-124-472-11	ELECT 470MF	20% 10V
*****				C219	1-124-472-11	ELECT 470MF	20% 10V
*****				C220	1-124-443-00	ELECT 100MF	20% 10V
*****				C224	1-163-075-00	CERAMIC CHIP 0.047MF	50V
*****				C225	1-163-075-00	CERAMIC CHIP 0.047MF	50V
*****				C226	1-163-075-00	CERAMIC CHIP 0.047MF	50V
*****				C227	1-163-075-00	CERAMIC CHIP 0.047MF	50V
*****				C301	1-124-443-00	ELECT 100MF	20% 10V
*****				C305	1-124-903-00	ELECT 1MF	20% 50V
*****				C306	1-163-075-00	CERAMIC CHIP 0.047MF	50V
*****				C307	1-130-497-00	MYLAR 0.15MF	5% 50V
*****				C308	1-130-497-00	MYLAR 0.15MF	5% 50V
*****				C309	1-163-101-00	CERAMIC CHIP 22PF	5% 50V
*****				C310	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
*****				C311	1-130-472-00	MYLAR 0.0012MF	5% 50V
*****				C312	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
*****				C313	1-130-474-00	MYLAR 0.0018MF	5% 50V
*****				C314	1-130-489-00	MYLAR 0.033MF	5% 50V
*****				C321	1-124-610-00	ELECT 10MF	20% 50V
*****				C401	1-124-443-00	ELECT 100MF	20% 10V
*****				C405	1-124-903-00	ELECT 1MF	20% 50V
*****				C406	1-163-075-00	CERAMIC CHIP 0.047MF	50V
*****				C407	1-130-497-00	MYLAR 0.15MF	5% 50V
*****				C408	1-130-497-00	MYLAR 0.15MF	5% 50V
*****				C409	1-163-101-00	CERAMIC CHIP 22PF	5% 50V
*****				C410	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
*****				C411	1-130-472-00	MYLAR 0.0012MF	5% 50V
*****				C412	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
*****				C413	1-130-474-00	MYLAR 0.0018MF	5% 50V
*****				C414	1-130-489-00	MYLAR 0.033MF	5% 50V
*****				C421	1-124-610-00	ELECT 10MF	20% 50V
*****				C502	1-163-059-00	CERAMIC CHIP 0.01MF	10% 50V
*****				C507	1-124-903-00	ELECT 1MF	20% 50V
*****				C801	1-163-059-00	CERAMIC CHIP 0.01MF	10% 50V
*****				C802	1-163-059-00	CERAMIC CHIP 0.01MF	10% 50V
*****				C803	1-163-074-00	CERAMIC CHIP 0.033MF	10% 25V
*****				C804	1-163-074-00	CERAMIC CHIP 0.033MF	10% 25V
*****				C805	1-124-903-00	ELECT 1MF	20% 50V
*****				C806	1-163-059-00	CERAMIC CHIP 0.01MF	10% 50V
*****				C821	1-163-059-00	CERAMIC CHIP 0.01MF	10% 50V
*****				C822	1-163-059-00	CERAMIC CHIP 0.01MF	10% 50V
*****				C823	1-163-074-00	CERAMIC CHIP 0.033MF	10% 25V
*****				C824	1-163-074-00	CERAMIC CHIP 0.033MF	10% 25V
*****							
*1-622-469-11	RB-2 BOARD *****						
<u>CAPASITOR</u>							
C450	1-124-584-00	ELECT	100MF	20%	10V		
C451	1-101-004-00	CERAMIC	0.01MF		50V		
<u>CONNECTOR</u>							
CN450	*1-564-012-00	PIN, CONNECTOR 2P					
<u>DIODE</u>							
D450	8-719-911-19	DIODE 1SS119					
D451	8-719-911-19	DIODE 1SS119					
D452	8-719-911-19	DIODE 1SS119					
<u>IC</u>							
IC450	8-759-932-04	IC MB88306P					
<u>TRANSISTOR</u>							
Q450	8-729-900-89	TRANSISTOR DTC144ES					
Q451	8-729-900-89	TRANSISTOR DTC144ES					
Q452	8-729-900-65	TRANSISTOR DTA144ES					
Q453	8-729-900-65	TRANSISTOR DTA144ES					
Q454	8-729-900-89	TRANSISTOR DTC144ES					
Q455	8-729-900-74	TRANSISTOR DTC143TS					
Q456	8-729-900-74	TRANSISTOR DTC143TS					
Q457	8-729-900-89	TRANSISTOR DTC144ES					
Q458	8-729-900-65	TRANSISTOR DTA144ES					
<u>RESISTOR</u>							
R450	1-247-429-00	CARBON	10K	5%	1/6W		
R451	1-247-429-00	CARBON	10K	5%	1/6W		
R452	1-247-886-00	CARBON	200K	5%	1/6W		
R453	1-249-438-11	CARBON	56K	5%	1/6W		
R454	1-249-433-11	CARBON	22K	5%	1/6W		
R455	1-215-477-00	CARBON	220K	5%	1/6W		
R456	1-247-429-00	CARBON	10K	5%	1/6W		
R457	1-249-417-11	CARBON	1K	5%	1/6W		
*****							
*A-7060-468-A	AU-22 BOARD, COMPLETE ***** (Including the MK-2, AF-20(IC501), NR-6(IC601) and AD-12(IC701) board)						
<u>CAPACITOR</u>							
C101	1-163-075-00	CERAMIC CHIP	0.047MF		50V		

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

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C825	1-124-255-91	ELECT 1MF	50V	IC701	*A-7068-025-A	NR-6 BOARD, COMPLETE	
C826	1-163-059-00	CERAMIC CHIP 0.01MF	10% 50V	IC901	8-759-933-22	IC BA3707	
C840	1-124-892-11	ELECT 47MF	20% 10V			<u>TRANSISTOR</u>	
C841	1-163-059-00	CERAMIC CHIP 0.01MF	10% 50V	Q201	8-729-901-06	TRANSISTOR DTA144EK	
C901	1-124-902-00	ELECT 0.47MF	20% 50V	Q203	8-729-100-67	TRANSISTOR 2SC1623-L7	
C902	1-163-015-00	CERAMIC CHIP 0.0033MF	10% 50V	Q204	8-729-901-01	TRANSISTOR DTC144EK	
C903	1-124-230-91	ELECT 47MF	10V	Q208	8-729-113-32	TRANSISTOR 2SB733	
C904	1-124-610-91	ELECT 0.47MF	50V	Q209	8-729-100-67	TRANSISTOR 2SC1623-L7	
C951	1-124-902-00	ELECT 0.47MF	20% 50V	Q210	8-729-100-67	TRANSISTOR 2SC1623-L7	
		<u>CONNECTOR</u>		Q211	8-729-100-76	TRANSISTOR 2SA812	
CN201	*1-564-004-00	PIN, CONNECTOR 5P		Q212	8-729-100-76	TRANSISTOR 2SA812	
CN202	*1-564-003-00	PIN, CONNECTOR 4P		Q213	8-729-177-32	TRANSISTOR 2SD773	
CN204	*1-564-005-00	PIN, CONNECTOR 6P		Q301	8-729-109-42	TRANSISTOR 2SK94-X2	
CN205	*1-564-003-00	PIN, CONNECTOR 4P		Q302	8-729-100-67	TRANSISTOR 2SC1623-L7	
CN207	*1-564-002-00	PIN, CONNECTOR 3P		Q401	8-729-109-42	TRANSISTOR 2SK94-X2	
CN208	*1-564-004-00	PIN, CONNECTOR 5P		Q402	8-729-100-67	TRANSISTOR 2SC1623-L7	
CN501	*1-564-004-00	PIN, CONNECTOR 5P		Q502	8-729-901-01	TRANSISTOR DTC144EK	
CN801	*1-564-002-00	PIN, CONNECTOR 3P		Q801	8-729-100-67	TRANSISTOR 2SC1623-L7	
CN901	*1-564-001-11	PIN, CONNECTOR 2P		Q802	8-729-100-76	TRANSISTOR 2SA812	
		<u>JACK</u>		Q803	8-729-100-67	TRANSISTOR 2SC1623-L7	
CNJ251	1-507-500-61	JACK, PIN 2P		Q821	8-729-100-67	TRANSISTOR 2SC1623-L7	
CNJ253	1-507-500-61	JACK, PIN 2P		Q822	8-729-100-76	TRANSISTOR 2SA812	
		<u>DIODE</u>		Q823	8-729-100-67	TRANSISTOR 2SC1623-L7	
D201	8-719-110-47	DIODE RD18ESB		Q901	8-729-100-76	TRANSISTOR 2SA812	
D203	8-719-110-47	DIODE RD18ESB				<u>RESISTOR</u>	
D701	8-719-109-58	DIODE RD2.7ES-B		R001	1-216-295-00	METAL CHIP 0 5% 1/10W	
		<u>FILTER</u>		R002	1-216-295-00	METAL CHIP 0 5% 1/10W	
FL301	1-235-565-21	FILTER, LOW PASS (15KHz)		R003	1-216-295-00	METAL CHIP 0 5% 1/10W	
FL401	1-235-565-21	FILTER, LOW PASS (15KHz)		R004	1-216-295-00	METAL CHIP 0 5% 1/10W	
FL501	1-235-484-11	FILTER, BAND PASS (1.5MHZ)		R005	1-216-295-00	METAL CHIP 0 5% 1/10W	
FL801	1-235-517-21	FILTER, BAND PASS (228.748KHz)		R006	1-216-295-00	METAL CHIP 0 5% 1/10W	
FL802	1-235-517-21	FILTER, BAND PASS (228.748KHz)		R007	1-216-295-00	METAL CHIP 0 5% 1/10W	
		<u>IC</u>		R008	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC101	8-759-937-21	IC CXD1078M		R009	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC201	8-759-240-52	IC TC4052BP		R010	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC203	8-759-145-58	IC UPC4558C		R011	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC301	8-759-700-40	IC NJM4560S		R012	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC302	8-759-240-51	IC TC4051BP		R013	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC303	8-759-700-40	IC NJM4560S		R015	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC304	8-759-700-40	IC NJM4560S		R016	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC401	8-759-700-40	IC NJM4560S		R017	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC402	8-759-240-51	IC TC4051BP		R018	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC403	8-759-700-40	IC NJM4560S		R019	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC404	8-759-700-40	IC NJM4560S		R020	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC501	A-7068-021-A	AF-20 BOARD, COMPLETE		R021	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC503	8-759-240-53	IC TC4053BP		R022	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC601	*A-7068-022-A	AD-12 BOARD, COMPLETE		R023	1-216-295-00	METAL CHIP 0 5% 1/10W	
IC602	8-729-240-53	IC TC4053BP		R024	1-216-965-00	METAL CHIP 0 5% 1/10W	
				R025	1-216-965-00	METAL CHIP 0 5% 1/10W	
				R026	1-216-295-00	METAL CHIP 0 5% 1/10W	

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

# AU-22

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R027	1-216-295-00	METAL CHIP	0 5% 1/10W	R086	1-216-296-00	METAL CHIP	0 5% 1/8W
R028	1-216-295-00	METAL CHIP	0 5% 1/10W	R087	1-216-296-00	METAL CHIP	0 5% 1/8W
R029	1-216-295-00	METAL CHIP	0 5% 1/10W	R088	1-216-296-00	METAL CHIP	0 5% 1/8W
R030	1-216-295-00	METAL CHIP	0 5% 1/10W	R089	1-216-296-00	METAL CHIP	0 5% 1/8W
R031	1-216-295-00	METAL CHIP	0 5% 1/10W	R102	1-216-073-00	METAL CHIP	10K 5% 1/10W
R032	1-216-295-00	METAL CHIP	0 5% 1/10W	R104	1-216-081-00	METAL CHIP	22K 5% 1/10W
R033	1-216-295-00	METAL CHIP	0 5% 1/10W	R107	1-216-073-00	METAL CHIP	10K 5% 1/10W
R034	1-216-295-00	METAL CHIP	0 5% 1/10W	R110	1-216-073-00	METAL CHIP	10K 5% 1/10W
R035	1-216-295-00	METAL CHIP	0 5% 1/10W	R202	1-249-393-11	CARBON	10 5% 1/6W
R036	1-216-295-00	METAL CHIP	0 5% 1/10W	R203	1-216-295-00	METAL CHIP	0 5% 1/10W
R037	1-216-295-00	METAL CHIP	0 5% 1/10W	R205	1-216-097-00	METAL CHIP	100K 5% 1/10W
R038	1-216-295-00	METAL CHIP	0 5% 1/10W	R206	1-216-097-00	METAL CHIP	100K 5% 1/10W
R039	1-216-295-00	METAL CHIP	0 5% 1/10W	R207	1-216-097-00	METAL CHIP	100K 5% 1/10W
R040	1-216-295-00	METAL CHIP	0 5% 1/10W	R210	1-216-085-00	METAL CHIP	33K 5% 1/10W
R041	1-216-295-00	METAL CHIP	0 5% 1/10W	R211	1-216-073-00	METAL CHIP	10K 5% 1/10W
R042	1-216-295-00	METAL CHIP	0 5% 1/10W	R216	1-216-097-00	METAL CHIP	100K 5% 1/10W
R043	1-216-295-00	METAL CHIP	0 5% 1/10W	R217	1-216-097-00	METAL CHIP	100K 5% 1/10W
R044	1-216-295-00	METAL CHIP	0 5% 1/10W	R218	1-216-097-00	METAL CHIP	100K 5% 1/10W
R045	1-216-295-00	METAL CHIP	0 5% 1/10W	R220	1-216-081-00	METAL CHIP	22K 5% 1/10W
R046	1-216-295-00	METAL CHIP	0 5% 1/10W	R221	1-216-089-00	METAL CHIP	47K 5% 1/10W
R047	1-216-295-00	METAL CHIP	0 5% 1/10W	R230	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R053	1-216-295-00	METAL CHIP	0 5% 1/10W	R233	1-216-069-00	METAL CHIP	6.8K 5% 1/10W
R054	1-216-295-00	METAL CHIP	0 5% 1/10W	R236	1-216-071-00	METAL CHIP	8.2K 5% 1/10W
R055	1-216-296-00	METAL CHIP	0 5% 1/8W	R237	1-216-073-00	METAL CHIP	10K 5% 1/10W
R056	1-216-296-00	METAL CHIP	0 5% 1/8W	R238	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R057	1-216-296-00	METAL CHIP	0 5% 1/8W	R240	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R058	1-216-296-00	METAL CHIP	0 5% 1/8W	R241	1-216-074-00	METAL CHIP	11K 5% 1/10W
R059	1-216-296-00	METAL CHIP	0 5% 1/8W	R242	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R060	1-216-296-00	METAL CHIP	0 5% 1/8W	R244	1-216-081-00	METAL CHIP	22K 5% 1/10W
R061	1-216-296-00	METAL CHIP	0 5% 1/8W	R305	1-216-295-00	METAL CHIP	0 5% 1/10W
R062	1-216-296-00	METAL CHIP	0 5% 1/8W	R307	1-216-079-00	METAL CHIP	18K 5% 1/10W
R063	1-216-296-00	METAL CHIP	0 5% 1/8W	R309	1-216-093-00	METAL CHIP	68K 5% 1/10W
R064	1-216-296-00	METAL CHIP	0 5% 1/8W	R310	1-216-099-00	METAL CHIP	120K 5% 1/10W
R065	1-216-296-00	METAL CHIP	0 5% 1/8W	R314	1-247-837-00	CARBON	1.8K 5% 1/6W
R066	1-216-296-00	METAL CHIP	0 5% 1/8W	R315	1-247-841-00	CARBON	2.7K 5% 1/6W
R067	1-216-296-00	METAL CHIP	0 5% 1/8W	R317	1-215-477-00	CARBON	220K 5% 1/6W
R068	1-216-296-00	METAL CHIP	0 5% 1/8W	R318	1-249-435-11	CARBON	33K 5% 1/6W
R069	1-216-296-00	METAL CHIP	0 5% 1/8W	R319	1-249-433-11	CARBON	22K 5% 1/6W
R070	1-216-296-00	METAL CHIP	0 5% 1/8W	R320	1-215-473-00	CARBON	150K 5% 1/6W
R072	1-216-296-00	METAL CHIP	0 5% 1/8W	R321	1-216-001-00	METAL CHIP	10 5% 1/10W
R073	1-216-296-00	METAL CHIP	0 5% 1/8W	R322	1-216-101-00	METAL CHIP	150K 5% 1/10W
R074	1-216-296-00	METAL CHIP	0 5% 1/8W	R327	1-216-059-00	METAL CHIP	2.7K 5% 1/10W
R075	1-216-296-00	METAL CHIP	0 5% 1/8W	R330	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R076	1-216-296-00	METAL CHIP	0 5% 1/8W	R331	1-216-025-00	METAL CHIP	100 5% 1/10W
R077	1-216-296-00	METAL CHIP	0 5% 1/8W	R332	1-216-095-00	METAL CHIP	82K 5% 1/10W
R078	1-216-296-00	METAL CHIP	0 5% 1/8W	R333	1-247-854-00	CARBON	9.1K 5% 1/6W
R079	1-216-296-00	METAL CHIP	0 5% 1/8W	R335	1-249-414-11	CARBON	560 5% 1/6W
R080	1-216-296-00	METAL CHIP	0 5% 1/8W	R336	1-247-860-00	CARBON	16K 5% 1/6W
R081	1-216-296-00	METAL CHIP	0 5% 1/8W	R337	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R082	1-216-296-00	METAL CHIP	0 5% 1/8W	R338	1-249-423-11	CARBON	3.3K 5% 1/6W
R083	1-216-296-00	METAL CHIP	0 5% 1/8W	R339	1-249-423-11	CARBON	3.3K 5% 1/6W
R084	1-216-296-00	METAL CHIP	0 5% 1/8W	R340	1-247-844-00	CARBON	3.6K 5% 1/6W
R085	1-216-296-00	METAL CHIP	0 5% 1/8W	R345	1-249-427-11	CARBON	6.8K 5% 1/6W

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

Ref.No	Part No.	Description	Remark
R346	1-216-025-00	METAL CHIP	100 5% 1/10W
R347	1-216-087-00	METAL CHIP	39K 5% 1/10W
R349	1-216-059-00	METAL CHIP	2.7K 5% 1/10W
R350	1-249-425-11	CARBON	4.7K 5% 1/6W
R351	1-249-423-11	CARBON	3.3K 5% 1/6W
R360	1-215-418-00	CARBON	750 5% 1/6W
R362	1-247-858-00	CARBON	13K 5% 1/6W
R363	1-247-861-00	CARBON	18K 5% 1/6W
R370	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R407	1-216-079-00	METAL CHIP	18K 5% 1/10W
R409	1-216-093-00	METAL CHIP	68K 5% 1/10W
R410	1-216-099-00	METAL CHIP	120K 5% 1/10W
R414	1-247-837-00	CARBON	1.8K 5% 1/6W
R415	1-247-841-00	CARBON	2.7K 5% 1/6W
R416	1-216-295-00	METAL CHIP	0 5% 1/10W
R417	1-215-477-00	CARBON	220K 5% 1/6W
R418	1-249-435-11	CARBON	33K 5% 1/6W
R419	1-249-433-11	CARBON	22K 5% 1/6W
R420	1-215-473-00	CARBON	150K 5% 1/6W
R421	1-216-001-00	METAL CHIP	10 5% 1/10W
R422	1-216-101-00	METAL CHIP	150K 5% 1/10W
R427	1-216-059-00	METAL CHIP	2.7K 5% 1/10W
R430	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R431	1-216-025-00	METAL CHIP	100 5% 1/10W
R432	1-216-095-00	METAL CHIP	82K 5% 1/10W
R433	1-247-854-00	CARBON	9.1K 5% 1/6W
R435	1-249-414-11	CARBON	560 5% 1/6W
R436	1-247-860-00	CARBON	16K 5% 1/6W
R437	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R438	1-249-423-11	CARBON	3.3K 5% 1/6W
R439	1-249-423-11	CARBON	3.3K 5% 1/6W
R440	1-247-844-00	CARBON	3.6K 5% 1/6W
R445	1-249-427-11	CARBON	6.8K 5% 1/6W
R446	1-216-025-00	METAL CHIP	100 5% 1/10W
R447	1-247-869-00	CARBON	39K 5% 1/6W
R449	1-216-059-00	METAL CHIP	2.7K 5% 1/10W
R450	1-249-425-11	CARBON	4.7K 5% 1/6W
R451	1-249-423-11	CARBON	3.3K 5% 1/6W
R460	1-215-418-00	CARBON	750 5% 1/6W
R462	1-247-858-00	CARBON	13K 5% 1/6W
R463	1-247-861-00	CARBON	18K 5% 1/6W
R470	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R501	1-216-079-00	METAL CHIP	18K 5% 1/10W
R502	1-216-067-00	METAL CHIP	5.6K 5% 1/10W
R503	1-216-063-00	METAL CHIP	3.9K 5% 1/10W
R505	1-216-063-00	METAL CHIP	3.9K 5% 1/10W
R506	1-216-049-00	METAL CHIP	1K 5% 1/10W
R562	1-216-069-00	METAL CHIP	6.8K 5% 1/10W
R563	1-216-067-00	METAL CHIP	5.6K 5% 1/10W
R564	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R565	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R566	1-216-073-00	METAL CHIP	10K 5% 1/10W
R570	1-216-047-00	METAL CHIP	820 5% 1/10W

Ref.No	Part No.	Description	Remark
R701	1-216-295-00	METAL CHIP	0 5% 1/10W
R801	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R802	1-216-063-00	METAL CHIP	3.9K 5% 1/10W
R803	1-216-077-00	METAL CHIP	15K 5% 1/10W
R804	1-216-073-00	METAL CHIP	10K 5% 1/10W
R805	1-216-097-00	METAL CHIP	100K 5% 1/10W
R806	1-216-063-00	METAL CHIP	3.9K 5% 1/10W
R807	1-216-074-00	METAL CHIP	11K 5% 1/10W
R808	1-216-049-00	METAL CHIP	1K 5% 1/10W
R809	1-216-041-00	METAL CHIP	470 5% 1/10W
R821	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R822	1-216-063-00	METAL CHIP	3.9K 5% 1/10W
R823	1-216-077-00	METAL CHIP	15K 5% 1/10W
R824	1-216-073-00	METAL CHIP	10K 5% 1/10W
R825	1-216-097-00	METAL CHIP	100K 5% 1/10W
R826	1-216-063-00	METAL CHIP	3.9K 5% 1/10W
R827	1-216-074-00	METAL CHIP	11K 5% 1/10W
R828	1-216-049-00	METAL CHIP	1K 5% 1/10W
R829	1-216-041-00	METAL CHIP	470 5% 1/10W
R901	1-216-073-00	METAL CHIP	10K 5% 1/10W
R902	1-216-073-00	METAL CHIP	10K 5% 1/10W
R904	1-216-089-00	METAL CHIP	47K 5% 1/10W
R905	1-216-089-00	METAL CHIP	47K 5% 1/10W
R906	1-216-081-00	METAL CHIP	22K 5% 1/10W
R907	1-216-073-00	METAL CHIP	10K 5% 1/10W
R908	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R909	1-216-089-00	METAL CHIP	47K 5% 1/10W
R951	1-216-073-00	METAL CHIP	10K 5% 1/10W
R952	1-216-073-00	METAL CHIP	10K 5% 1/10W

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\*A-7068-021-A AF-20 BOARD, COMPLETE (IC501)  
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CAPACITOR

C501	1-163-021-00	CERAMIC CHIP	0.01MF	50V
C502	1-163-021-00	CERAMIC CHIP	0.01MF	50V
C503	1-163-137-00	CERAMIC CHIP	680PF	10% 50V
C504	1-124-465-00	ELECT	0.47MF	20% 50V
C505	1-163-145-00	CERAMIC CHIP	0.0015MF	10% 50V
C506	1-163-016-00	CERAMIC CHIP	0.0039MF	10% 50V
C507	1-163-125-00	CERAMIC CHIP	220PF	5% 50V
C508	1-163-013-00	CERAMIC CHIP	0.0022MF	10% 50V
C509	1-124-123-00	ELECT	100MF	20% 6.3V
C510	1-163-036-00	CERAMIC CHIP	0.068MF	50V
C511	1-163-021-00	CERAMIC CHIP	0.01MF	50V
C512	1-123-612-00	ELECT	2.2MF	20% 50V
C513	1-123-306-00	ELECT	47MF	20% 6.3V
C514	1-123-369-00	ELECT	4.7MF	20% 25V
C515	1-163-133-00	CERAMIC CHIP	470PF	5% 50V
C516	1-123-661-00	ELECT	100MF	20% 6.3V
C517	1-163-088-00	CERAMIC CHIP	5PF	0.25HF 50V
C518	1-163-017-00	CERAMIC CHIP	0.0047MF	10% 50V

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

Ref.No	Part No.	Description	Remark
C519	1-163-125-00	CERAMIC CHIP 220PF	5%
C520	1-163-079-00	CERAMIC CHIP 0.039MF	10%
C521	1-163-020-00	CERAMIC CHIP 0.0082MF	10%
C522	1-163-137-00	CERAMIC CHIP 680PF	10%
C523	1-124-255-00	ELECT 1MF	20%
C524	1-124-462-00	ELECT 10MF	20%
C525	1-123-617-00	ELECT 10MF	20%
C526	1-124-638-11	ELECT 22MF	20%
C527	1-123-661-00	ELECT 100MF	20%
C528	1-123-611-00	ELECT 1MF	20%
C529	1-123-380-00	ELECT 1MF	20%
C530	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C531	1-123-661-00	ELECT 100MF	20%
C532	1-123-380-00	ELECT 1MF	20%
C533	1-163-015-00	CERAMIC CHIP 0.0033MF	10%
C534	1-163-109-00	CERAMIC CHIP 47PF	5%
C535	1-163-013-00	CERAMIC CHIP 0.0022MF	10%
C536	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C539	1-163-088-00	CERAMIC CHIP 5PF	0.25PF 50V
<u>CONNECTOR</u>			
CN501	*1-564-318-00	PIN, BOARD TO BOARD 10P	
CN502	*1-564-318-00	PIN, BOARD TO BOARD 10P	
<u>IC</u>			
IC501	8-752-013-71	IC CX20137A	
<u>COIL</u>			
L501	1-408-948-00	MICRO INDUCTOR 220UH	
<u>TRANSISTOR</u>			
Q501	8-729-901-01	TRANSISTOR DTC144EK	
Q502	8-729-109-42	TRANSISTOR 2SK94-X2	
Q503	8-729-901-00	TRANSISTOR DTC124EK	
<u>RESISTOR</u>			
R501	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R502	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R503	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R504	1-216-121-00	METAL CHIP 1M 5%	1/10W
R505	1-216-107-00	METAL CHIP 270K 5%	1/10W
R506	1-249-416-11	CARBON 820 5%	1/6W
R507	1-249-416-11	CARBON 820 5%	1/6W
R508	1-216-097-00	METAL CHIP 100K 5%	1/10W
R509	1-216-075-00	METAL CHIP 12K 5%	1/10W
R510	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
R511	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R512	1-216-045-00	METAL CHIP 680 5%	1/10W
R513	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
R514	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R515	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R516	1-216-059-00	METAL CHIP 2.7K 5%	1/10W

Ref.No	Part No.	Description	Remark
R517	1-216-073-00	METAL CHIP 10K 5%	1/10W
R518	1-216-087-00	METAL CHIP 39K 5%	1/10W
R519	1-216-085-00	METAL CHIP 33K 5%	1/10W
R520	1-216-121-00	METAL CHIP 1M 5%	1/10W
R521	1-216-079-00	METAL CHIP 18K 5%	1/10W
R522	1-216-097-00	METAL CHIP 100K 5%	1/10W
R523	1-216-089-00	METAL CHIP 47K 5%	1/10W
R524	1-216-083-00	METAL CHIP 27K 5%	1/10W
R525	1-216-079-00	METAL CHIP 18K 5%	1/10W
R526	1-216-079-00	METAL CHIP 18K 5%	1/10W
R527	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R528	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
R530	1-216-049-00	METAL CHIP 1K 5%	1/10W
<u>VARIABLE RESISTOR</u>			
RV501	1-228-995-00	RES, ADJ, CARBON 22K	
RV503	1-228-994-00	RES, ADJ, CARBON 10K	
*****			
*A-7068-022-A AD-12 BOARD, COMPLETE (IC701) *****			
<u>CAPASITOR</u>			
C701	1-123-618-00	ELECT 22MF	20% 6.3V
C703	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
C705	1-123-618-00	ELECT 22MF	20% 6.3V
C707	1-123-617-00	ELECT 10MF	20% 16V
C709	1-124-224-00	ELECT 47MF	20% 6.3V
C710	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C713	1-123-661-00	ELECT 100MF	20% 6.3V
C715	1-123-661-00	ELECT 100MF	20% 6.3V
C716	1-123-617-00	ELECT 10MF	20% 16V
C717	1-123-661-00	ELECT 100MF	20% 6.3V
C718	1-102-978-00	CERAMIC 220PF	5% 50V
C719	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C720	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C721	1-124-224-00	ELECT 47MF	20% 6.3V
C722	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C751	1-123-618-00	ELECT 22MF	20% 6.3V
C753	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
C755	1-123-618-00	ELECT 22MF	20% 6.3V
C757	1-123-617-00	ELECT 10MF	20% 16V
<u>CONNECTOR</u>			
CN701	1-566-139-11	CONNECTOR, BOARD TO BOARD 15P	
<u>IC</u>			
IC701	8-752-322-57	IC CXD1077M	
IC702	8-759-914-44	IC TL431CLPB	
<u>COIL</u>			
L701	1-408-421-00	MICRO INDUCTOR 100UH	

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

Ref.No	Part No.	Description	Remark
<u>RESISTOR</u>			
R701	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R703	1-216-087-00	METAL CHIP 39K 5% 1/10W	
R711	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R713	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R717	1-216-117-00	METAL CHIP 680K 5% 1/10W	
R718	1-216-029-00	METAL CHIP 150 5% 1/10W	
R719	1-216-022-00	METAL CHIP 75 5% 1/10W	
R720	1-216-039-00	METAL CHIP 390 5% 1/10W	
R721	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R722	1-216-653-11	METAL CHIP 1.2K 0.50% 1/16W	
R723	1-216-661-11	METAL CHIP 2.7K 0.50% 1/16W	
R724	1-215-485-00	METAL 470K 1% 1/6W	
R751	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R753	1-216-087-00	METAL CHIP 39K 5% 1/10W	
R761	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R763	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
<u>VARIABLE RESISTOR</u>			
RV701	1-228-995-00	RES, ADJ, CARBON 22K	
RV703	1-228-991-00	RES, ADJ, CARBON 2.2K	
RV705	1-228-999-00	RES, ADJ, CARBON 470K	
RV751	1-228-995-00	RES, ADJ, CARBON 22K	
RV753	1-228-991-00	RES, ADJ, CARBON 2.2K	
*****			
*A-7068-025-A NR-6 BAORD, COMPLETE (IC601)			
*****			
<u>CAPACITOR</u>			
C601	1-123-661-00	ELECT 100MF 20% 6.3V	
C602	1-123-306-00	ELECT 47MF 20% 10V	
C603	1-123-661-00	ELECT 100MF 20% 6.3V	
C604	1-123-661-00	ELECT 100MF 20% 6.3V	
C605	1-130-490-11	MYLAR 0.039MF 5% 50V	
C606	1-163-125-00	CERAMIC CHIP 220PF 10% 50V	
C607	1-163-088-00	CERAMIC CHIP 5PF 0.25PF 50V	
C608	1-130-479-00	MYLAR 0.0047MF 5% 50V	
C609	1-163-020-00	CERAMIC CHIP 0.0082MF 10% 50V	
C610	1-123-612-00	ELECT 2.2MF 20% 50V	
C611	1-163-137-00	CERAMIC CHIP 680PF 10% 50V	
C612	1-127-482-11	ELECT(SOLID) 10MF 20% 6.3V	
C613	1-127-502-00	ELECT(SOLID) 0.22MF 20% 25V	
C614	1-123-330-00	ELECT 22MF 20% 10V	
C615	1-163-141-00	CERAMIC CHIP 0.001MF 10% 50V	
C616	1-123-661-00	ELECT 100MF 20% 6.3V	
C617	1-163-141-00	CERAMIC CHIP 0.001MF 10% 50V	
C618	1-123-661-00	ELECT 100MF 20% 6.3V	
C651	1-123-661-00	ELECT 100MF 20% 6.3V	
C652	1-123-306-00	ELECT 47MF 20% 10V	
C653	1-123-661-00	ELECT 100MF 20% 6.3V	
C654	1-123-661-00	ELECT 100MF 20% 6.3V	

Ref.No	Part No.	Description	Remark
C655	1-130-490-11	MYLAR 0.039MF 5% 50V	
C656	1-163-125-00	CERAMIC CHIP 220PF 10% 50V	
C657	1-163-088-00	CERAMIC CHIP 5PF 0.25PF 50V	
C658	1-130-479-00	MYLAR 0.0047MF 5% 50V	
C659	1-163-020-00	CERAMIC CHIP 0.0082MF 10% 50V	
C660	1-123-612-00	ELECT 2.2MF 20% 50V	
C661	1-163-137-00	CERAMIC CHIP 680PF 10% 50V	
C662	1-127-482-11	ELECT(SOLID) 10MF 20% 6.3V	
C663	1-127-502-00	ELECT(SOLID) 0.22MF 20% 25V	
C664	1-123-330-00	ELECT 22MF 20% 10V	
<u>IC</u>			
IC601	8-752-009-90	IC CX20099	
<u>RESISTOR</u>			
R600	1-216-025-00	METAL CHIP 100 5% 1/10W	
R601	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R602	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R603	1-216-009-00	METAL CHIP 22 5% 1/10W	
R604	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R605	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R606	1-216-045-00	METAL CHIP 680 5% 1/10W	
R607	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R608	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R609	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R610	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R611	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R612	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R613	1-216-072-00	METAL CHIP 9.1K 5% 1/10W	
R614	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R617	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R650	1-216-025-00	METAL CHIP 100 5% 1/10W	
R651	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R652	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R653	1-216-009-00	METAL CHIP 22 5% 1/10W	
R654	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R655	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R656	1-216-045-00	METAL CHIP 680 5% 1/10W	
R657	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R658	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R659	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R660	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R661	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R662	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R667	1-216-081-00	METAL CHIP 22K 5% 1/10W	
<u>PIN BOARD</u>			
W601	*1-566-099-11	PIN, BOARD TO BOARD 15P	
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When indicating parts by reference number, please include the board name.

**MK-2****VI-20**

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
	*A-7068-032-A	MK-2 BOARD, COMPLETE *****			*3-703-353-07	SUPPORT, PC BOARD	
		<u>CAPACITOR</u>				<u>CAPACITOR</u>	
C807	1-130-487-00	MYLAR 0.022MF	5% 50V	C003	1-124-468-11	ELECT 100MF	20% 6.3V
C808	1-130-487-00	MYLAR 0.022MF	5% 50V	C004	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
C809	1-130-467-00	MYLAR 470PF	5% 50V	C005	1-123-619-00	ELECT 4.7MF	20% 50V
C810	1-130-471-00	FILM 0.001MF	5% 50V	C007	1-163-093-00	CERAMIC CHIP 10PF	5% 50V
C827	1-130-487-00	MYLAR 0.022MF	5% 50V	C008	1-124-907-00	ELECT 10MF	20% 50V
C828	1-130-487-00	MYLAR 0.022MF	5% 50V	C009	1-163-075-00	CERAMIC CHIP 0.047MF	50V
C829	1-130-467-00	MYLAR 470PF	5% 50V	C010	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C830	1-130-471-00	FILM 0.001MF	5% 50V	C011	1-163-118-00	CERAMIC CHIP 110PF	5% 50V
C843	1-124-892-11	ELECT 47MF	20% 10V	C012	1-163-119-00	CERAMIC CHIP 120PF	5% 50V
C850	1-101-005-00	CERAMIC 0.022MF	50V	C014	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
C852	1-102-973-00	CERAMIC 100PF	5% 50V	C015	1-163-129-00	CERAMIC CHIP 330PF	5% 50V
		<u>CONNECTOR</u>		C016	1-124-247-00	ELECT 10MF	20% 25V
CN802	*1-564-318-00	PIN, BOARD TO BOARD 10P		C017	1-163-075-00	CERAMIC CHIP 0.047MF	50V
		<u>IC</u>		C026	1-163-123-00	CERAMIC CHIP 180PF	5% 50V
IC801	8-759-913-62	IC IR3N05		C027	1-163-123-00	CERAMIC CHIP 180PF	5% 50V
IC821	8-759-913-62	IC IR3N05		C028	1-163-102-00	CERAMIC CHIP 24PF	5% 50V
IC851	8-759-206-68	IC TC40103BP		C029	1-163-075-00	CERAMIC CHIP 0.047MF	50V
		<u>COIL</u>		C030	1-124-907-00	ELECT 10MF	20% 50V
L801	1-408-421-00	MICRO INDUCTOR 100UH		C032	1-163-103-00	CERAMIC CHIP 27PF	5% 50V
		<u>TRANSISTOR</u>		C033	1-163-115-00	CERAMIC CHIP 82PF	5% 50V
Q851	8-729-178-54	TRANSISTOR 2SC2785		C034	1-163-119-00	CERAMIC CHIP 120PF	5% 50V
		<u>RESISTOR</u>		C035	1-163-103-00	CERAMIC CHIP 27PF	5% 50V
R810	1-249-423-11	CARBON 3.3K 5%	1/6W	C036	1-163-077-00	CERAMIC CHIP 0.1MF	50V
R811	1-249-428-11	CARBON 8.2K 5%	1/6W	C037	1-163-133-00	CERAMIC CHIP 470PF	5% 50V
R812	1-249-436-11	CARBON 39K 5%	1/6W	C038	1-163-075-00	CERAMIC CHIP 0.047MF	50V
R830	1-249-423-11	CARBON 3.3K 5%	1/6W	C039	1-163-077-00	CERAMIC CHIP 0.1MF	50V
R831	1-249-428-11	CARBON 8.2K 5%	1/6W	C040	1-163-141-00	CERAMIC CHIP 0.001MF	10% 50V
R851	1-249-435-11	CARBON 33K 5%	1/6W	C041	1-163-075-00	CERAMIC CHIP 0.047MF	50V
R852	1-249-435-11	CARBON 33K 5%	1/6W	C042	1-124-907-00	ELECT 10MF	20% 50V
R853	1-249-441-11	CARBON 100K 5%	1/6W	C043	1-124-247-00	ELECT 10MF	20% 25V
		<u>VARIABLE RESISTOR</u>		C044	1-124-907-00	ELECT 10MF	20% 50V
RV801	1-228-990-00	RES, ADJ, METAL GLAZE 1K		C045	1-163-075-00	CERAMIC CHIP 0.047MF	50V
RV821	1-228-990-00	RES, ADJ, METAL GLAZE 1K		C046	1-124-903-00	ELECT 1MF	20% 50V
		*****		C047	1-124-927-11	ELECT 4.7MF	20% 50V
	*A-7060-469-A	VI-20 BOARD, COMPLETE (WG MODEL) *****		C048	1-124-442-00	ELECT 330MF	20% 6.3V
	*A-7060-792-A	VI-20 BOARD, COMPLETE (AEP MODEL) ***** (Including the CH-44 board(IC010), BS6324(IC011) and BS7443(IC012))		C049	1-163-075-00	CERAMIC CHIP 0.047MF	50V
				C050	1-124-927-11	ELECT 4.7MF	20% 50V
				C051	1-124-908-11	ELECT 22MF	20% 25V
				C053	1-163-119-00	CERAMIC CHIP 120PF	5% 50V
				C054	1-124-907-00	ELECT 10MF	20% 50V
				C055	1-163-113-00	CERAMIC CHIP 68PF	5% 50V
				C056	1-163-141-00	CERAMIC CHIP 0.001MF	10% 50V
				C057	1-163-113-00	CERAMIC CHIP 68PF	5% 50V
				C058	1-163-075-00	CERAMIC CHIP 0.047MF	50V
				C060	1-163-092-00	CERAMIC CHIP 9PF	0.25PF 50V
				C061	1-163-077-00	CERAMIC CHIP 0.1MF	50V
				C062	1-163-075-00	CERAMIC CHIP 0.047MF	50V
				C063	1-163-075-00	CERAMIC CHIP 0.047MF	50V
				C064	1-124-464-11	ELECT 0.22MF	20% 50V
				C065	1-124-907-00	ELECT 10MF	20% 50V

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

Ref.No	Part No.	Description		Remark	Ref.No	Part No.	Description		Remark
C066	1-163-129-00	CERAMIC CHIP 330PF	5%	50V	C244	1-163-075-00	CERAMIC CHIP 0.047MF		50V
C100	1-163-101-00	CERAMIC CHIP 22PF	5%	50V	C250	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C101	1-163-129-00	CERAMIC CHIP 330PF	5%	50V	C251	1-163-137-00	CERAMIC CHIP 680PF	5%	50V
C102	1-163-093-00	CERAMIC CHIP 10PF	5%	50V	C252	1-124-927-11	ELECT 4.7MF	20%	50V
C104	1-163-105-00	CERAMIC CHIP 33PF	5%	50V	C253	1-163-075-00	CERAMIC CHIP 0.047MF		50V
C105	1-163-129-00	CERAMIC CHIP 330PF	5%	50V	C254	1-163-075-00	CERAMIC CHIP 0.047MF		50V
C106	1-163-111-00	CERAMIC CHIP 56PF	5%	50V	C255	1-124-907-00	ELECT 10MF	20%	50V
C107	1-124-908-11	ELECT 22MF	20%	25V	C260	1-163-075-00	CERAMIC CHIP 0.047MF		50V
C110	1-163-107-00	CERAMIC CHIP 39PF	5%	50V	C261	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C111	1-163-107-00	CERAMIC CHIP 39PF	5%	50V	C262	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C112	1-163-111-00	CERAMIC CHIP 56PF	5%	50V	C263	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C113	1-163-097-00	CERAMIC CHIP 15PF	5%	50V	C264	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C114	1-163-075-00	CERAMIC CHIP 0.047MF		50V	C265	1-124-927-11	ELECT 4.7MF	20%	50V
C115	1-163-092-00	CERAMIC CHIP 9PF		0.25PF 50V	C266	1-163-075-00	CERAMIC CHIP 0.047MF		50V
C116	1-124-908-11	ELECT 22MF	20%	25V	C267	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C117	1-163-127-00	CERAMIC CHIP 270PF	5%	50V	C268	1-124-462-00	ELECT 10MF	20%	16V
C201	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V	C301	1-163-075-00	CERAMIC CHIP 0.047MF		50V
C202	1-163-075-00	CERAMIC CHIP 0.047MF		50V	C302	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C203	1-163-021-00	CERAMIC CHIP 0.01MF		50V	C303	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C204	1-163-101-00	CERAMIC CHIP 22PF	5%	50V	C304	1-163-113-00	CERAMIC CHIP 68PF	5%	50V
C205	1-163-111-00	CERAMIC CHIP 56PF	5%	50V	C305	1-163-129-00	CERAMIC CHIP 330PF	5%	50V
C206	1-124-257-00	ELECT 2.2MF	20%	35V	C306	1-163-129-00	CERAMIC CHIP 330PF	5%	50V
C207	1-163-121-00	CERAMIC CHIP 150PF	5%	50V	C307	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C208	1-123-619-00	ELECT 4.7MF	20%	50V	C308	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C209	1-163-111-00	CERAMIC CHIP 56PF	5%	50V	C309	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C210	1-163-133-00	CERAMIC CHIP 470PF	5%	50V	C310	1-163-118-00	CERAMIC CHIP 110PF	5%	50V
C211	1-163-075-00	CERAMIC CHIP 0.047MF		50V	C311	1-124-907-00	ELECT 10MF	20%	50V
C212	1-124-904-00	ELECT 2.2MF	20%	50V	C312	1-163-075-00	CERAMIC CHIP 0.047MF		50V
C213	1-124-907-00	ELECT 10MF	20%	50V	C313	1-163-141-00	CERAMIC CHIP 0.001MF	5%	50V
C215	1-124-927-11	ELECT 4.7MF	20%	50V	C314	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C216	1-163-101-00	CERAMIC CHIP 22PF	5%	50V	C315	1-124-904-00	ELECT 2.2MF	20%	50V
C217	1-163-113-00	CERAMIC CHIP 68PF	5%	50V	C316	1-163-019-00	CERAMIC CHIP 0.0068MF	10%	50V
C218	1-163-121-00	CERAMIC CHIP 150PF	5%	50V	C317	1-124-905-11	ELECT 3.3MF	20%	50V
C219	1-163-101-00	CERAMIC CHIP 22PF	5%	50V	C318	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C220	1-124-892-11	ELECT 47MF	20%	10V	C319	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C221	1-163-115-00	CERAMIC CHIP 82PF	5%	50V	C320	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C222	1-163-103-00	CERAMIC CHIP 27PF	5%	50V	C321	1-163-145-00	CERAMIC CHIP 0.0015MF	10%	50V
C223	1-163-115-00	CERAMIC CHIP 82PF	5%	50V	C322	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C224	1-163-101-00	CERAMIC CHIP 22PF	5%	50V	C323	1-124-907-00	ELECT 10MF	20%	50V
C225	1-163-021-00	CERAMIC CHIP 0.01MF		50V	C324	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C226	1-163-021-00	CERAMIC CHIP 0.01MF		50V	C325	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C227	1-163-101-00	CERAMIC CHIP 22PF	5%	50V	C326	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C228	1-163-111-00	CERAMIC CHIP 56PF	5%	50V	C327	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C229	1-124-462-00	ELECT 10MF	20%	16V	C328	1-163-113-00	CERAMIC CHIP 68PF	5%	50V
C230	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V	C329	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C236	1-124-462-00	ELECT 10MF	20%	16V	C330	1-163-125-00	CERAMIC CHIP 220PF	5%	50V
C237	1-163-075-00	CERAMIC CHIP 0.047MF		50V	C331	1-163-111-00	CERAMIC CHIP 56PF	5%	50V
C238	1-124-468-11	ELECT 100MF	20%	6.3V	C332	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C239	1-163-075-00	CERAMIC CHIP 0.047MF		50V	C414	1-124-907-00	ELECT 10MF 20%		50V (WG MODEL)
C240	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V	C415	1-163-127-00	CERAMIC CHIP 270PF	5%	50V
C241	1-163-075-00	CERAMIC CHIP 0.047MF		50V	C417	1-130-473-00	MYLAR 0.0015MF	5%	50V
C242	1-124-908-11	ELECT 22MF	20%	25V	C418	1-124-908-11	ELECT 22MF 20%		25V (WG MODEL)
C243	1-124-908-11	ELECT 22MF	20%	25V	C419	1-124-927-11	ELECT 4.7MF 20%		50V (AEP MODEL)

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



Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C424	1-163-021-00	CERAMIC CHIP 0.01MF	50V	D413	8-719-106-22	DIODE RD7.5M-B1	
C425	1-124-907-00	ELECT 10MF	20% 50V	D414	8-719-106-22	DIODE RD7.5M-B1	
C426	1-163-021-00	CERAMIC CHIP 0.01MF	50V	D415	8-719-106-22	DIODE RD7.5M-B1	
C427	1-163-063-00	CERAMIC CHIP 0.022MF	50V	D416	8-719-106-22	DIODE RD7.5M-B1	
C428	1-163-075-00	CERAMIC CHIP 0.047MF	50V	D417	8-719-106-22	DIODE RD7.5M-B1	
C429	1-163-063-00	CERAMIC CHIP 0.022MF	50V	D418	8-719-106-22	DIODE RD7.5M-B1	
C430	1-163-021-00	CERAMIC CHIP 0.01MF	50V	D419	8-719-106-22	DIODE RD7.5M-B1	
C433	1-124-907-00	ELECT 10MF	20% 50V	<u>DELAY LINE</u>			
C434	1-124-907-00	ELECT 10MF	20% 50V	DL001	1-415-282-00	DELAY LINE	
C437	1-124-907-00	ELECT 10MF	20% 50V	DL002	1-415-386-21	DELAY LINE, 1H (13.3MHZ)	
C438	1-124-908-11	ELECT 22MF	20% 25V	<u>IC</u>			
C440	1-124-908-11	ELECT 22MF	20% 25V	IC001	8-752-013-00	IC CX20130	
C445	1-163-077-00	CERAMIC CHIP 0.1MF	50V	IC002	8-752-013-10	IC CX20131	
C446	1-124-892-11	ELECT 47MF	20% 10V	IC003	8-759-913-64	IC CX23064	
C450	1-124-471-00	ELECT 1000MF	20% 6.3V	IC004	8-759-927-52	IC BA7036LS	
C451	1-124-443-00	ELECT 100MF	20% 10V	IC005	8-759-202-68	IC CX20147	
C452	1-163-021-00	CERAMIC CHIP 0.01MF	50V	IC007	8-752-006-10	IC CX20061 (WG MODEL)	
C455	1-163-115-00	CERAMIC CHIP 82PF	5% 50V	IC010	*A-7068-030-A	CH-44 BOARD, COMPLETE	
C456	1-124-908-11	ELECT 22MF	20% 25V	IC011	1-807-844-11	IC BS6324	
<u>CONNECTOR</u>				IC012	1-807-846-11	IC BS7443	
CN003	*1-564-007-00	PIN, CONNECTOR 8P		<u>JUMPER RESISTOR</u>			
CN007	*1-564-006-11	PIN, CONNECTOR 7P		JR001	1-216-295-00	METAL CHIP 0 5% 1/10W	
CN009	*1-564-027-00	PIN, CONNECTOR 2P (AEP MODEL)		JR002	1-216-295-00	METAL CHIP 0 5% 1/10W	
CN009	*1-564-028-00	PIN, CONNECTOR 3P (WG MODEL)		JR003	1-216-295-00	METAL CHIP 0 5% 1/10W	
CN010	*1-560-893-00	PIN, CONNECTOR 5P		JR004	1-216-295-00	METAL CHIP 0 5% 1/10W	
CN011	*1-564-001-11	PIN, CONNECTOR 2P (WG MODEL)		JR005	1-216-295-00	METAL CHIP 0 5% 1/10W	
CN012	*1-564-003-00	PIN, CONNECTOR 4P (WG MODEL)		JR006	1-216-295-00	METAL CHIP 0 5% 1/10W	
CN013	*1-564-014-00	PIN, CONNECTOR 4P (WG MODEL)		JR007	1-216-295-00	METAL CHIP 0 5% 1/10W	
<u>JACK</u>				JR008	1-216-295-00	METAL CHIP 0 5% 1/10W	
CNJ001	1-561-534-82	SOCKET 21P		JR009	1-216-295-00	METAL CHIP 0 5% 1/10W	
CNJ002	1-507-945-21	JACK, PIN 1P		JR010	1-216-295-00	METAL CHIP 0 5% 1/10W	
CNJ003	1-507-945-21	JACK, PIN 1P		JR011	1-216-295-00	METAL CHIP 0 5% 1/10W	
<u>DIODE</u>				JR012	1-216-295-00	METAL CHIP 0 5% 1/10W	
D004	8-719-100-03	DIODE 1S2835		JR013	1-216-295-00	METAL CHIP 0 5% 1/10W	
D005	8-719-101-23	DIODE 1SS123-T1		JR014	1-216-295-00	METAL CHIP 0 5% 1/10W	
D100	8-719-100-03	DIODE 1S2835 (AEP MODEL)		JR015	1-216-295-00	METAL CHIP 0 5% 1/10W	
D202	8-719-100-05	DIODE 1S2837-T1		JR016	1-216-295-00	METAL CHIP 0 5% 1/10W	
D204	8-719-101-23	DIODE 1SS123		JR018	1-216-295-00	METAL CHIP 0 5% 1/10W	
D205	8-719-100-03	DIODE 1S2835		JR019	1-216-295-00	METAL CHIP 0 5% 1/10W	
D206	8-719-101-23	DIODE 1SS123		JR020	1-216-295-00	METAL CHIP 0 5% 1/10W	
D301	8-719-100-05	DIODE 1S2837		JR021	1-216-295-00	METAL CHIP 0 5% 1/10W	
D302	8-719-101-23	DIODE 1SS123		JR022	1-216-295-00	METAL CHIP 0 5% 1/10W	
D303	8-719-101-23	DIODE 1SS123		JR023	1-216-295-00	METAL CHIP 0 5% 1/10W	
D304	8-719-101-23	DIODE 1SS123		JR024	1-216-295-00	METAL CHIP 0 5% 1/10W	
D305	8-719-100-03	DIODE 1S2835		JR025	1-216-295-00	METAL CHIP 0 5% 1/10W	
D402	8-719-100-05	DIODE 1S2837 (WG MODEL)		JR026	1-216-295-00	METAL CHIP 0 5% 1/10W	
D403	8-719-106-08	DIODE RD6.2M-B2		JR027	1-216-295-00	METAL CHIP 0 5% 1/10W	
D410	8-719-106-22	DIODE RD7.5M-B1		JR028	1-216-295-00	METAL CHIP 0 5% 1/10W	
D411	8-719-106-22	DIODE RD7.5M-B1		JR029	1-216-295-00	METAL CHIP 0 5% 1/10W	
D412	8-719-106-22	DIODE RD7.5M-B1		JR030	1-216-295-00	METAL CHIP 0 5% 1/10W	

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



# VI-20

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
JR137	1-216-296-00	METAL CHIP	0 5% 1/8W	L106	1-408-414-00	MICRO INDUCTOR 27UH	
JR138	1-216-296-00	METAL CHIP	0 5% 1/8W	L107	1-408-422-00	MICRO INDUCTOR 120UH	
JR139	1-216-296-00	METAL CHIP	0 5% 1/8W	L201	1-408-397-00	MICRO INDUCTOR 1UH	
JR140	1-216-296-00	METAL CHIP	0 5% 1/8W	L202	1-408-397-00	MICRO INDUCTOR 1UH	
JR141	1-216-296-00	METAL CHIP	0 5% 1/8W	L204	1-408-419-00	MICRO INDUCTOR 68UH	
JR142	1-216-296-00	METAL CHIP	0 5% 1/8W	L205	1-408-419-00	MICRO INDUCTOR 68UH	
JR143	1-216-296-00	METAL CHIP	0 5% 1/8W	L206	1-408-417-00	MICRO INDUCTOR 47UH	
JR144	1-216-296-00	METAL CHIP	0 5% 1/8W	L207	1-408-420-00	MICRO INDUCTOR 82UH	
JR145	1-216-296-00	METAL CHIP	0 5% 1/8W	L208	1-408-417-00	MICRO INDUCTOR 47UH	
JR146	1-216-296-00	METAL CHIP	0 5% 1/8W	L209	1-408-413-00	MICRO INDUCTOR 22UH	
JR147	1-216-296-00	METAL CHIP	0 5% 1/8W	L212	1-408-413-00	MICRO INDUCTOR 22UH	
JR148	1-216-296-00	METAL CHIP	0 5% 1/8W	L213	1-408-408-00	MICRO INDUCTOR 8.2UH	
JR149	1-216-296-00	METAL CHIP	0 5% 1/8W	L220	1-408-411-00	MICRO INDUCTOR 15UH	
JR150	1-216-296-00	METAL CHIP	0 5% 1/8W	L221	1-408-427-00	MICRO INDUCTOR 330UH	
JR151	1-216-296-00	METAL CHIP	0 5% 1/8W	L301	1-408-421-00	MICRO INDUCTOR 100UH	
JR152	1-216-296-00	METAL CHIP	0 5% 1/8W	L302	1-408-413-00	MICRO INDUCTOR 22UH	
JR153	1-216-296-00	METAL CHIP	0 5% 1/8W	L303	1-408-425-00	MICRO INDUCTOR 220UH	
JR154	1-216-296-00	METAL CHIP	0 5% 1/8W	L304	1-408-422-00	MICRO INDUCTOR 120UH	
JR155	1-216-296-00	METAL CHIP	0 5% 1/8W	L401	1-410-118-11	MICRO INDUCTOR 0.82MMH	
JR156	1-216-296-00	METAL CHIP	0 5% 1/8W	L402	1-408-424-00	MICRO INDUCTOR 180UH	
JR157	1-216-296-00	METAL CHIP	0 5% 1/8W	L405	1-408-409-00	MICRO INDUCTOR 10UH	
JR158	1-216-296-00	METAL CHIP	0 5% 1/8W	L411	1-408-413-00	MICRO INDUCTOR 22UH (WG MODEL)	
JR159	1-216-296-00	METAL CHIP	0 5% 1/8W	L412	1-408-421-00	MICRO INDUCTOR 100UH	
JR160	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR161	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR162	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR163	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR164	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR165	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR166	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR167	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR168	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR169	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR170	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR171	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR172	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR173	1-216-296-00	METAL CHIP	0 5% 1/8W				
JR174	1-216-296-00	METAL CHIP	0 5% 1/8W				
		<u>COIL</u>					
L002	1-408-416-00	MICRO INDUCTOR 39UH					
L003	1-408-421-00	MICRO INDUCTOR 100UH					
L004	1-408-427-00	MICRO INDUCTOR 330UH					
L005	1-408-422-00	MICRO INDUCTOR 120UH					
L009	1-408-418-00	MICRO INDUCTOR 56UH					
L010	1-408-420-00	MICRO INDUCTOR 82UH					
L011	1-408-418-00	MICRO INDUCTOR 56UH					
L012	1-408-423-00	MICRO INDUCTOR 150UH					
L013	1-408-421-00	MICRO INDUCTOR 100UH					
L100	1-408-409-00	MICRO INDUCTOR 10UH					
L101	1-408-428-00	MICRO INDUCTOR 390UH					
L102	1-408-409-00	MICRO INDUCTOR 10UH					
L103	1-408-423-00	MICRO INDUCTOR 150UH					
L105	1-408-408-00	MICRO INDUCTOR 8.2UH					
						<u>VARIABLE COIL</u>	
				LV201	1-408-512-00	COIL (VARIABLE) 10UH	
						<u>IC LINK</u>	
				PS001A	1-532-679-00	LINK, IC (ICP-N15)	
						<u>TRANSISTOR</u>	
				Q002	8-729-901-06	TRANSISTOR DTA144EK	
				Q004	8-729-901-06	TRANSISTOR DTC144EK	
				Q006	8-729-100-67	TRANSISTOR 2SC1623-L7	
				Q009	8-729-100-67	TRANSISTOR 2SC1623-L7	
				Q010	8-729-312-22	TRANSISTOR 2SA1122	
				Q011	8-729-312-22	TRANSISTOR 2SA1122	
				Q013	8-729-901-00	TRANSISTOR DTC124EK	
				Q014	8-729-117-54	TRANSISTOR 2SA1175	
				Q015	8-729-901-06	TRANSISTOR DTC144EK	
				Q018	8-729-312-22	TRANSISTOR 2SA1122	
				Q019	8-729-100-76	TRANSISTOR 2SA812	
				Q020	8-729-100-67	TRANSISTOR 2SC1623-L7	
				Q023	8-729-100-67	TRANSISTOR 2SC1623-L7	
				Q024	8-729-100-76	TRANSISTOR 2SA812	
				Q025	8-729-901-06	TRANSISTOR DTC144EK	
				Q026	8-729-901-06	TRANSISTOR DTA144EK	
				Q027	8-729-100-67	TRANSISTOR 2SC1623-L7	
				Q100	8-729-100-67	TRANSISTOR 2SC1623-L7	
				Q101	8-729-901-06	TRANSISTOR DTC144EK	
				Q102	8-729-901-06	TRANSISTOR DTC144EK	
				Q103	8-729-100-67	TRANSISTOR 2SC1623-L7	

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

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

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
Q104	8-729-100-67	TRANSISTOR 2SC1623-L7		R023	1-216-043-00	METAL CHIP 560 5%	1/10W
Q106	8-729-901-06	TRANSISTOR DTA144EK		R024	1-216-049-00	METAL CHIP 1K 5%	1/10W
Q107	8-729-100-67	TRANSISTOR 2SC1623-L7		R025	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
Q110	8-729-312-22	TRANSISTOR 2SA1122C		R026	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
Q113	8-729-100-67	TRANSISTOR 2SC1623-L7		R027	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
Q201	8-729-901-06	TRANSISTOR DTC144EK		R028	1-216-049-00	METAL CHIP 1K 5%	1/10W
Q202	8-729-901-00	TRANSISTOR DTC124EK		R029	1-216-073-00	METAL CHIP 10K 5%	1/10W
Q203	8-729-901-00	TRANSISTOR DTC124EK		R030	1-216-049-00	METAL CHIP 1K 5%	1/10W
Q204	8-729-901-06	TRANSISTOR DTC144EK		R044	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
Q205	8-729-901-06	TRANSISTOR DTC144EK		R045	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
Q206	8-729-901-06	TRANSISTOR DTC144EK		R046	1-216-039-00	METAL CHIP 390 5%	1/10W
Q207	8-729-100-67	TRANSISTOR 2SC1623-L7		R047	1-216-101-00	METAL CHIP 150K 5%	1/10W
Q208	8-729-100-67	TRANSISTOR 2SC1623-L7		R048	1-216-099-00	METAL CHIP 120K 5%	1/10W
Q209	8-729-100-67	TRANSISTOR 2SC1623-L7		R049	1-216-113-00	METAL CHIP 470K 5%	1/10W
Q211	8-729-901-06	TRANSISTOR DTC144EK		R050	1-216-075-00	METAL CHIP 12K 5%	1/10W
Q215	8-729-312-22	TRANSISTOR 2SA1122		R051	1-216-081-00	METAL CHIP 22K 5%	1/10W
Q216	8-729-100-67	TRANSISTOR 2SC1623-L7		R052	1-216-077-00	METAL CHIP 15K 5%	1/10W
Q217	8-729-100-67	TRANSISTOR 2SC1623-L7		R053	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
Q218	8-729-312-22	TRANSISTOR 2SA1122		R054	1-216-033-00	METAL CHIP 220 5%	1/10W
Q219	8-729-901-04	TRANSISTOR DTA114EK		R055	1-216-109-00	METAL CHIP 330K 5%	1/10W
Q220	8-729-100-67	TRANSISTOR 2SC1623-L7		R056	1-216-049-00	METAL CHIP 1K 5%	1/10W
Q221	8-729-312-22	TRANSISTOR 2SA1122		R057	1-216-081-00	METAL CHIP 22K 5%	1/10W
Q222	8-729-100-67	TRANSISTOR 2SC1623-L7		R058	1-216-081-00	METAL CHIP 22K 5%	1/10W
Q301	8-729-100-67	TRANSISTOR 2SC1623-L7		R059	1-216-089-00	METAL CHIP 47K 5%	1/10W
Q302	8-729-100-67	TRANSISTOR 2SC1623-L7		R060	1-216-091-00	METAL CHIP 56K 5%	1/10W
Q304	8-729-901-00	TRANSISTOR DTC124EK		R061	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
Q403	8-729-901-06	TRANSISTOR DTA144EK (WG MODEL)		R062	1-216-083-00	METAL CHIP 27K 5%	1/10W
Q404	8-729-901-06	TRANSISTOR DTA144EK		R063	1-216-093-00	METAL CHIP 68K 5%	1/10W
Q405	8-729-901-06	TRANSISTOR DTC144EK		R064	1-249-417-11	CARBON 1K 5%	1/6W
Q406	8-729-100-67	TRANSISTOR 2SC1623-L7		R066	1-216-043-00	METAL CHIP 560 5%	1/10W
Q407	8-729-100-67	TRANSISTOR 2SC1623-L7 (WG MODEL)		R067	1-216-037-00	METAL CHIP 330 5%	1/10W
Q408	8-729-177-33	TRANSISTOR 2SD773-4		R068	1-216-045-00	METAL CHIP 680 5%	1/10W
Q409	8-729-901-06	TRANSISTOR DTC144EK		R069	1-216-035-00	METAL CHIP 270 5%	1/10W
Q410	8-729-901-06	TRANSISTOR DTA144EK		R070	1-216-047-00	METAL CHIP 820 5%	1/10W
Q413	8-729-100-67	TRANSISTOR 2SC1623-L7		R071	1-216-081-00	METAL CHIP 22K 5%	1/10W
Q420	8-729-312-22	TRANSISTOR 2SA1122		R072	1-216-081-00	METAL CHIP 22K 5%	1/10W
Q421	8-729-178-54	TRANSISTOR 2SC2785		R073	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
Q423	8-729-177-33	TRANSISTOR 2SD773-4		R074	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
<u>RESISTOR</u>				R075	1-216-047-00	METAL CHIP 820 5%	1/10W
R008	1-216-041-00	METAL CHIP 470 5%	1/10W	R076	1-216-089-00	METAL CHIP 47K 5%	1/10W
R009	1-216-037-00	METAL CHIP 330 5%	1/10W	R078	1-216-081-00	METAL CHIP 22K 5%	1/10W
R010	1-216-041-00	METAL CHIP 470 5%	1/10W	R079	1-216-041-00	METAL CHIP 470 5%	1/10W
R012	1-216-051-00	METAL CHIP 1.2K 5%	1/10W	R080	1-216-051-00	METAL CHIP 1.2K 5%	1/10W
R013	1-216-075-00	METAL CHIP 12K 5%	1/10W	R081	1-216-081-00	METAL CHIP 22K 5%	1/10W
R014	1-216-081-00	METAL CHIP 22K 5%	1/10W	R082	1-216-081-00	METAL CHIP 22K 5%	1/10W
R016	1-216-057-00	METAL CHIP 2.2K 5%	1/10W	R083	1-216-081-00	METAL CHIP 22K 5%	1/10W
R017	1-216-055-00	METAL CHIP 1.8K 5%	1/10W	R084	1-216-081-00	METAL CHIP 22K 5%	1/10W
R018	1-216-059-00	METAL CHIP 2.7K 5%	1/10W	R087	1-216-025-00	METAL CHIP 100 5%	1/10W
R019	1-216-057-00	METAL CHIP 2.2K 5%	1/10W	R100	1-216-049-00	METAL CHIP 1K 5%	1/10W
R020	1-216-039-00	METAL CHIP 390 5%	1/10W	R101	1-216-049-00	METAL CHIP 1K 5%	1/10W
R021	1-216-043-00	METAL CHIP 560 5%	1/10W	R102	1-216-039-00	METAL CHIP 390 5%	1/10W
R022	1-216-073-00	METAL CHIP 10K 5%	1/10W	R103	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
				R109	1-216-091-00	METAL CHIP 56K 5%	1/10W

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

Ref.No	Part No.	Description				Remark	Ref.No	Part No.	Description				Remark
R110	1-216-065-00	METAL CHIP	4.7K	5%	1/10W		R224	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R111	1-216-059-00	METAL CHIP	2.7K	5%	1/10W		R225	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R112	1-216-055-00	METAL CHIP	1.8K	5%	1/10W		R226	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R113	1-216-031-00	METAL CHIP	180	5%	1/10W		R227	1-216-045-00	METAL CHIP	680	5%	1/10W	
R114	1-216-041-00	METAL CHIP	470	5%	1/10W		R228	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R115	1-216-053-00	METAL CHIP	1.5K	5%	1/10W		R229	1-216-045-00	METAL CHIP	680	5%	1/10W	
R116	1-216-041-00	METAL CHIP	470	5%	1/10W		R230	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R117	1-216-049-00	METAL CHIP	1K	5%	1/10W		R231	1-216-045-00	METAL CHIP	680	5%	1/10W	
R118	1-216-049-00	METAL CHIP	1K	5%	1/10W		R232	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R119	1-216-019-00	METAL CHIP	56	5%	1/10W		R233	1-216-045-00	METAL CHIP	680	5%	1/10W	
R120	1-216-081-00	METAL CHIP	22K	5%	1/10W		R234	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R121	1-216-081-00	METAL CHIP	22K	5%	1/10W		R236	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R128	1-216-295-00	METAL CHIP	0	5%	1/10W		R237	1-216-041-00	METAL CHIP	470	5%	1/10W	
R129	1-216-049-00	METAL CHIP	1K	5%	1/10W		R238	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R131	1-216-057-00	METAL CHIP	2.2K	5%	1/10W		R239	1-216-041-00	METAL CHIP	470	5%	1/10W	
R132	1-216-057-00	METAL CHIP	2.2K	5%	1/10W		R241	1-216-035-00	METAL CHIP	270	5%	1/10W	
R133	1-216-033-00	METAL CHIP	220	5%	1/10W		R246	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R134	1-216-033-00	METAL CHIP	220	5%	1/10W		R247	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R136	1-216-041-00	METAL CHIP	470	5%	1/10W		R248	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R137	1-216-041-00	METAL CHIP	470	5%	1/10W		R249	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R138	1-216-041-00	METAL CHIP	470	5%	1/10W		R250	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R139	1-216-051-00	METAL CHIP	1.2K	5%	1/10W		R251	1-216-039-00	METAL CHIP	390	5%	1/10W	
R140	1-216-041-00	METAL CHIP	470	5%	1/10W		R252	1-216-027-00	METAL CHIP	120	5%	1/10W	
R141	1-216-081-00	METAL CHIP	22K	5%	1/10W		R253	1-216-035-00	METAL CHIP	270	5%	1/10W	
R142	1-216-081-00	METAL CHIP	22K	5%	1/10W		R254	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R144	1-216-023-00	METAL CHIP	82	5%	1/10W		R255	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R145	1-216-029-00	METAL CHIP	150	5%	1/10W		R256	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R146	1-216-296-00	METAL CHIP	0	5%	1/8W		R257	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R148	1-216-047-00	METAL CHIP	820	5%	1/10W		R258	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R149	1-216-049-00	METAL CHIP	1K	5%	1/10W		R265	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R175	1-216-295-00	METAL CHIP	0	5%	1/10W		R266	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R201	1-216-009-00	METAL CHIP	22	5%	1/10W		R267	1-216-047-00	METAL CHIP	820	5%	1/10W	
R202	1-216-025-00	METAL CHIP	100	5%	1/10W		R268	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R203	1-216-027-00	METAL CHIP	120	5%	1/10W		R269	1-216-045-00	METAL CHIP	680	5%	1/10W	
R204	1-216-081-00	METAL CHIP	22K	5%	1/10W		R270	1-216-031-00	METAL CHIP	180	5%	1/10W	
R205	1-216-081-00	METAL CHIP	22K	5%	1/10W		R271	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R206	1-216-081-00	METAL CHIP	22K	5%	1/10W		R272	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R207	1-216-081-00	METAL CHIP	22K	5%	1/10W		R273	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R208	1-216-075-00	METAL CHIP	12K	5%	1/10W		R274	1-216-035-00	METAL CHIP	270	5%	1/10W	
R209	1-216-121-00	METAL CHIP	1M	5%	1/10W		R275	1-216-017-00	METAL CHIP	47	5%	1/10W	
R210	1-216-117-00	METAL CHIP	680K	5%	1/10W		R276	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R211	1-216-087-00	METAL CHIP	39K	5%	1/10W		R277	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R212	1-216-073-00	METAL CHIP	10K	5%	1/10W		R278	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R213	1-216-025-00	METAL CHIP	100	5%	1/10W		R279	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R214	1-216-039-00	METAL CHIP	390	5%	1/10W		R280	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R215	1-216-057-00	METAL CHIP	2.2K	5%	1/10W		R281	1-216-044-00	METAL CHIP	620	5%	1/10W	
R216	1-216-085-00	METAL CHIP	33K	5%	1/10W		R282	1-216-033-00	METAL CHIP	220	5%	1/10W	
R217	1-216-081-00	METAL CHIP	22K	5%	1/10W		R285	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R218	1-216-049-00	METAL CHIP	1K	5%	1/10W		R286	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R219	1-216-051-00	METAL CHIP	1.2K	5%	1/10W		R287	1-216-035-00	METAL CHIP	270	5%	1/10W	
R220	1-216-065-00	METAL CHIP	4.7K	5%	1/10W		R288	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R221	1-216-045-00	METAL CHIP	680	5%	1/10W		R289	1-216-025-00	METAL CHIP	100	5%	1/10W	
R222	1-216-065-00	METAL CHIP	4.7K	5%	1/10W		R290	1-216-083-00	METAL CHIP	27K	5%	1/10W	

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



Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
RVO08	1-228-994-00	RES, ADJ, CARBON 10K		C028	1-124-462-00	ELECT 10MF	20% 16V
RVO09	1-228-994-00	RES, ADJ, CARBON 10K		C029	1-163-021-00	CERAMIC CHIP 0.01MF	50V
RVO10	1-228-993-00	RES, ADJ, CARBON 4.7K		C030	1-163-088-00	CERAMIC CHIP 5PF	0.25PF 50V
RVO11	1-228-994-00	RES, ADJ, CARBON 10K		C031	1-163-021-00	CERAMIC CHIP 0.01MF	50V
RVO12	1-228-994-00	RES, ADJ, CARBON 10K		C032	1-163-129-00	CERAMIC CHIP 330PF	5% 50V
RVO13	1-228-998-00	RES, ADJ, CARBON 220K		C033	1-163-091-00	CERAMIC CHIP 8PF	0.25PF 50V
RVO14	1-228-996-00	RES, ADJ, CARBON 47K		C034	1-163-097-00	CERAMIC CHIP 15PF	5% 50V
<u>TRANSFORMER</u>				C035	1-163-123-00	CERAMIC CHIP 180PF	5% 50V
T001	1-235-437-11	BPF, PB C		C036	1-163-129-00	CERAMIC CHIP 330PF	5% 50V
T004	1-409-396-11	REC C TRAP		C037	1-163-129-00	CERAMIC CHIP 330PF	5% 50V
T005	1-409-397-11	TRAP		C038	1-124-249-00	ELECT 0.1MF	20% 50V
T006	1-235-632-11	BPF		C039	1-124-252-00	ELECT 0.33MF	20% 50V
T007	1-235-633-11	BPF		C040	1-163-021-00	CERAMIC CHIP 0.01MF	50V
<u>THERMISTOR</u>				<u>TRIMMER</u>			
TH001	1-800-200-00	THERMISTOR S-3K		CV001	1-141-227-00	CAP, CERAMIC TRIMMER	
<u>CRYSTAL</u>				<u>IC</u>			
X201	1-567-442-11	VIBRATOR, CRYSTAL		IC001	8-752-003-20	IC CX20032	
*****				IC002	8-752-202-10	IC CX22021	
*****				<u>COIL</u>			
*A-7068-030-A CH-44 BOARD, COMPLETE				L001	1-408-607-00	MICRO INDUCTOR 22UH	
*****				L002	1-407-172-XX	MICRO INDUCTOR 180UH	
<u>CAPASITOR</u>				L003	1-407-168-XX	MICRO INDUCTOR 82UH	
C001	1-163-093-00	CERAMIC CHIP 10PF	5% 50V	L004	1-407-188-XX	MICRO INDUCTOR 6.8UH	
C002	1-163-141-00	CERAMIC CHIP 0.001MF	10% 50V	<u>TRANSISTOR</u>			
C003	1-163-108-00	CERAMIC CHIP 43PF	5% 50V	Q001	8-729-202-38	TRANSISTOR 2SC3326N	
C004	1-163-129-00	CERAMIC CHIP 330PF	5% 50V	<u>RESISTOR</u>			
C005	1-163-129-00	CERAMIC CHIP 330PF	5% 50V	R002	1-216-295-00	METAL CHIP 0 5% 1/10W	
C006	1-163-033-00	CERAMIC CHIP 0.022MF	50V	R003	1-216-073-00	METAL CHIP 10K 5% 1/10W	
C007	1-163-063-00	CERAMIC CHIP 0.022MF	10% 50V	R004	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
C008	1-131-358-41	TANTALUM 6.8MF	10% 25V	R005	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
C009	1-124-245-00	ELECT 4.7MF	20% 35V	R007	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
C011	1-163-021-00	CERAMIC CHIP 0.01MF	50V	R008	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
C012	1-163-021-00	CERAMIC CHIP 0.01MF	50V	R009	1-216-025-00	METAL CHIP 100 5% 1/10W	
C013	1-163-075-00	CERAMIC CHIP 0.047MF	50V	R010	1-216-081-00	METAL CHIP 22K 5% 1/10W	
C014	1-124-462-00	ELECT 10MF	20% 16V	R011	1-216-097-00	METAL CHIP 100K 5% 1/10W	
C015	1-163-121-00	CERAMIC CHIP 150PF	5% 50V	R012	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
C016	1-163-021-00	CERAMIC CHIP 0.01MF	50V	R013	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
C017	1-124-257-00	ELECT 2.2MF	20% 50V	R014	1-216-049-00	METAL CHIP 1K 5% 1/10W	
C018	1-124-251-00	ELECT 0.22MF	20% 50V	R015	1-216-081-00	METAL CHIP 22K 5% 1/10W	
C019	1-163-063-00	CERAMIC CHIP 0.022MF	50V	R016	1-216-081-00	METAL CHIP 22K 5% 1/10W	
C020	1-163-076-00	CERAMIC CHIP 0.068MF	50V	R017	1-216-049-00	METAL CHIP 1K 5% 1/10W	
C021	1-124-257-00	ELECT 2.2MF	20% 50V	R018	1-216-049-00	METAL CHIP 1K 5% 1/10W	
C022	1-124-257-00	ELECT 2.2MF	20% 50V	R019	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C023	1-163-141-00	CERAMIC CHIP 0.001MF	10% 50V	R020	1-216-037-00	METAL CHIP 330 5% 1/10W	
C024	1-163-141-00	CERAMIC CHIP 0.001MF	5% 50V	R021	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C025	1-163-075-00	CERAMIC CHIP 0.047MF	50V	R022	1-216-081-00	METAL CHIP 22K 5% 1/10W	
C026	1-163-117-00	CERAMIC CHIP 100PF	5% 50V	R023	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
C027	1-163-141-00	CERAMIC CHIP 0.001MF	10% 50V				

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

# CH-44

# IC BS6324

# IC BS7443

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R024	1-216-025-00	METAL CHIP 100 5%	1/10W				
R025	1-216-057-00	METAL CHIP 2.2K 5%	1/10W				
R026	1-216-073-00	METAL CHIP 10K 5%	1/10W				
R029	1-216-103-00	METAL CHIP 180K 5%	1/10W				
R030	1-216-065-00	METAL CHIP 4.7K 5%	1/10W				
<u>VARIABLE RESISTOR</u>							
RV001	1-230-524-11	RES, ADJ, SOLID 22K					
RV002	1-230-523-11	RES, ADJ, SOLID 10K					
<u>TRANSFORMER</u>							
T001	1-409-394-11	TRAP, CHROMA EMPHASIS					
<u>JACK</u>							
W001	*1-566-103-11	PIN, BOARD TO BOARD, 19P					
W002	*1-566-102-11	PIN, BOARD TO BOARD, 18P					
<u>CRYSTAL</u>							
X001	1-527-345-00	CRYSTAL, OSC (4.43MHz)					
*****							
IC011	1-807-844-11	IC BS6324 *****					
<u>CAPACITOR</u>							
C001	1-124-462-00	ELECT 10MF	20% 16V				
C002	1-163-035-00	CERAMIC CHIP 0.047MF	50V				
C003	1-163-021-00	CERAMIC CHIP 0.01MF	50V				
C004	1-163-021-00	CERAMIC CHIP 0.01MF	50V				
C005	1-163-021-00	CERAMIC CHIP 0.01MF	50V				
C006	1-163-021-00	CERAMIC CHIP 0.01MF	50V				
C007	1-163-035-00	CERAMIC CHIP 0.047MF	50V				
C008	1-163-141-00	CERAMIC CHIP 1000PF	5% 50V				
C009	1-163-021-00	CERAMIC CHIP 0.01MF	50V				
C010	1-163-021-00	CERAMIC CHIP 0.01MF	50V				
C011	1-163-021-00	CERAMIC CHIP 0.01MF	50V				
C012	1-163-033-00	CERAMIC CHIP 0.022MF	50V				
C013	1-163-095-00	CERAMIC CHIP 12PF	5% 50V				
C014	1-163-021-00	CERAMIC CHIP 0.01MF	50V				
C015	1-163-021-00	CERAMIC CHIP 0.01MF	50V				
C016	1-163-021-00	CERAMIC CHIP 0.01MF	50V				
C018	1-124-462-00	ELECT 10MF	20% 16V				
C019	1-163-035-00	CERAMIC CHIP 0.047MF	50V				
<u>DIODE</u>							
D001	8-719-911-19	DIODE 1SS119					
D002	8-719-911-19	DIODE 1SS119					
<u>TRANSISTOR</u>							
DT001	8-729-901-01	TRANSISTOR DTC144EK					
		<u>CONNECTOR</u>					
J001	1-564-549-11	PIN, BOARD TO BOARD 10P					
J002	1-564-548-11	PIN, BOARD TO BOARD 5P					
		<u>COIL</u>					
L001	1-408-415-00	MICRO INDUCTOR 33UH					
L002	1-408-415-00	MICRO INDUCTOR 33UH					
		<u>TRANSISTOR</u>					
Q001	8-729-100-66	TRANSISTOR 2SC1623					
Q002	8-729-100-66	TRANSISTOR 2SC1623					
Q003	8-729-100-66	TRANSISTOR 2SC1623					
Q004	8-729-100-66	TRANSISTOR 2SC1623					
Q005	8-729-100-66	TRANSISTOR 2SC1623					
		<u>RESISTOR</u>					
R001	1-216-057-00	METAL CHIP 2.2K 5%	1/10W				
R002	1-216-049-00	METAL CHIP 1K 5%	1/10W				
R003	1-216-041-00	METAL CHIP 470 5%	1/10W				
R004	1-216-033-00	METAL CHIP 220 5%	1/10W				
R005	1-216-047-00	METAL CHIP 820 5%	1/10W				
R006	1-216-045-00	METAL CHIP 680 5%	1/10W				
R008	1-216-059-00	METAL CHIP 2.7K 5%	1/10W				
R009	1-216-035-00	METAL CHIP 270 5%	1/10W				
R010	1-216-035-00	METAL CHIP 270 5%	1/10W				
R011	1-216-041-00	METAL CHIP 470 5%	1/10W				
R012	1-216-077-00	METAL CHIP 15K 5%	1/10W				
R013	1-216-073-00	METAL CHIP 10K 5%	1/10W				
R014	1-216-043-00	METAL CHIP 560 5%	1/10W				
R016	1-216-075-00	METAL CHIP 12K 5%	1/10W				
R017	1-216-073-00	METAL CHIP 10K 5%	1/10W				
R018	1-216-033-00	METAL CHIP 220 5%	1/10W				
R019	1-216-021-00	METAL CHIP 68 5%	1/10W				
R021	1-216-043-00	METAL CHIP 560 5%	1/10W				
R022	1-216-045-00	METAL CHIP 680 5%	1/10W				
R023	1-216-071-00	METAL CHIP 8.2K 5%	1/10W				
R024	1-216-039-00	METAL CHIP 390 5%	1/10W				
R025	1-216-079-00	METAL CHIP 18K 5%	1/10W				
R026	1-216-079-00	METAL CHIP 18K 5%	1/10W				
R027	1-216-049-00	METAL CHIP 1K 5%	1/10W				
*****							
IC012	1-807-846-11	IC BS7443 *****					
<u>CAPACITOR</u>							
C001	1-163-120-00	CERAMIC CHIP 130PF	5% 50V				
C002	1-163-035-00	CERAMIC CHIP 0.047MF	50V				
C003	1-163-035-00	CERAMIC CHIP 0.047MF	50V				
C004	1-163-035-00	CERAMIC CHIP 0.047MF	50V				
C005	1-124-236-00	CERAMIC CHIP 47MF	20% 16V				
C006	1-163-035-00	CERAMIC CHIP 0.047MF	50V				

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



Ref.No	Part No.	Description	Remark
C007	1-163-141-00	CERAMIC CHIP 1000PF	5% 50V
C008	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C009	1-163-120-00	CERAMIC CHIP 130PF	5% 50V
C010	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C011	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C012	1-163-115-00	CERAMIC CHIP 82PF	5% 50V
C013	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C014	1-124-255-00	CERAMIC CHIP 1.0MF	20% 50V
<u>DIODE</u>			
D001	8-719-911-19	DIODE 1SS119	
D002	8-719-911-19	DIODE 1SS119	
D003	8-719-911-19	DIODE 1SS119	
D004	8-719-911-19	DIODE 1SS119	
<u>TRANSISTOR</u>			
DT001	8-729-901-04	TRANSISTOR DTA114EK	
DT002	8-729-901-04	TRANSISTOR DTA114EK	
DT003	8-729-901-04	TRANSISTOR DTA114EK	
DT004	8-729-901-04	TRANSISTOR DTA114EK	
DT005	8-729-901-04	TRANSISTOR DTA114EK	
DT006	8-729-901-04	TRANSISTOR DTA114EK	
<u>IC</u>			
IC001	8-759-925-60	IC BA401	
<u>CONNECTOR</u>			
J001	1-506-592-11	PIN, BOARD TO BOARD 4P	
J002	1-506-592-11	PIN, BOARD TO BOARD 4P	
<u>TRANSISTOR</u>			
Q001	8-729-100-66	TRANSISTOR 2SC1623	
Q002	8-729-100-66	TRANSISTOR 2SC1623	
Q003	8-729-100-66	TRANSISTOR 2SC1623	
Q004	8-729-100-66	TRANSISTOR 2SC1623	
<u>RESISTOR</u>			
RO01	1-216-067-00	METAL CHIP 5.6K 5%	1/10W
RO02	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
RO03	1-216-041-00	METAL CHIP 470 5%	1/10W
RO04	1-216-037-00	METAL CHIP 330 5%	1/10W
RO05	1-216-039-00	METAL CHIP 390 5%	1/10W
RO06	1-216-049-00	METAL CHIP 1K 5%	1/10W
RO07	1-216-049-00	METAL CHIP 1K 5%	1/10W
RO08	1-216-031-00	METAL CHIP 180 5%	1/10W
RO09	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
RO10	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
RO11	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
RO12	1-216-051-00	METAL CHIP 1.2K 5%	1/10W
RO13	1-216-049-00	METAL CHIP 1K 5%	1/10W
RO14	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
RO15	1-216-069-00	METAL CHIP 6.8K 5%	1/10W

Ref.No	Part No.	Description	Remark
RO16	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
RO17	1-216-045-00	METAL CHIP 680 5%	1/10W
RO18	1-216-033-00	METAL CHIP 220 5%	1/10W
RO19	1-216-035-00	METAL CHIP 270 5%	1/10W
RO20	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
RO21	1-216-073-00	METAL CHIP 10K 5%	1/10W
RO22	1-216-045-00	METAL CHIP 680 5%	1/10W
RO23	1-216-045-00	METAL CHIP 680 5%	1/10W
RO24	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
RO25	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
RO26	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
RO27	1-216-073-00	METAL CHIP 10K 5%	1/10W
RO28	1-216-295-00	METAL CHIP 0 5%	1/10W

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\*A-7060-470-A FT-13 BOARD, COMPLETE (WG MODEL)  
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\*A-7060-477-A FT-13 BOARD, COMPLETE (AEP MODEL)  
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\*3-689-521-01 HOLDER, LED, ROUND  
\*3-691-611-11 KNOB (S), CONTROL  
\*3-697-607-11 HOLDER (SU), LED  
\*3-716-870-01 HOLDER (LEFT), INDICATION TUBE  
\*3-716-871-01 HOLDER (RIGHT), INDICATION TUBE

CAPACITOR

C003	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C004	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C005	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C006	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C009	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C010	1-124-258-00	ELECT 3.3MF	20%	50V
C011	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C012	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C013	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C014	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C015	1-124-255-00	ELECT 1MF	20%	50V
C016	1-124-462-00	ELECT 10MF	20%	16V
C017	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C018	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C019	1-124-462-00	ELECT 10MF	20%	16V
C020	1-163-035-00	CERAMIC CHIP 0.047MF	10%	25V

TRIMMER

CV001 1-141-294-11 CAP, TRIMMER

DIODE

D001	8-719-801-52	DIODE 1SS190	
D002	8-719-801-52	DIODE 1SS190	
D003	8-719-801-52	DIODE 1SS190	
D004	8-719-801-52	DIODE 1SS190	
D005	8-719-801-52	DIODE 1SS190	

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

<u>Ref.No</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>	<u>Ref.No</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
D006	8-719-801-52	DIODE 1SS190		R008	1-216-081-00	METAL CHIP 22K 5%	1/10W
D007	8-719-801-52	DIODE 1SS190		R009	1-216-093-00	METAL CHIP 68K 5%	1/10W
D008	8-719-801-52	DIODE 1SS190		R010	1-216-073-00	METAL CHIP 10K 5%	1/10W
D009	8-719-801-52	DIODE 1SS190		R011	1-216-073-00	METAL CHIP 10K 5%	1/10W
D010	8-719-801-52	DIODE 1SS190		R012	1-216-085-00	METAL CHIP 33K 5%	1/10W
D011	8-719-801-52	DIODE 1SS190		R013	1-216-081-00	METAL CHIP 22K 5%	1/10W
D012	8-719-801-52	DIODE 1SS190		R014	1-216-097-00	METAL CHIP 100K 5%	1/10W
D013	8-719-801-52	DIODE 1SS190		R015	1-216-097-00	METAL CHIP 100K 5%	1/10W
D024	8-719-106-43	DIODE RD9.1M		R016	1-216-097-00	METAL CHIP 100K 5%	1/10W
D025	8-719-801-52	DIODE 1SS190		R017	1-216-073-00	METAL CHIP 10K 5%	1/10W
D026	8-719-801-52	DIODE 1SS190		R018	1-216-113-00	METAL CHIP 470K 5%	1/10W
D028	8-719-106-22	DIODE RD7.5M		R019	1-216-113-00	METAL CHIP 470K 5%	1/10W
D029	8-719-106-22	DIODE RD7.5M		R020	1-216-113-00	METAL CHIP 470K 5%	1/10W
D030	8-719-106-22	DIODE RD7.5M		R021	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
D031	8-719-301-49	DIODE SEL2810A		R022	1-216-073-00	METAL CHIP 10K 5%	1/10W
D032	8-719-812-32	DIODE TLY123		R023	1-216-073-00	METAL CHIP 10K 5%	1/10W
D033	8-719-812-32	DIODE TLY123		R024	1-216-073-00	METAL CHIP 10K 5%	1/10W
D034	8-719-812-32	DIODE TLY123		R025	1-216-073-00	METAL CHIP 10K 5%	1/10W
D035	8-719-812-33	DIODE TLG123A		R026	1-216-073-00	METAL CHIP 10K 5%	1/10W
D036	8-719-812-33	DIODE TLG123A		R028	1-216-073-00	METAL CHIP 10K 5%	1/10W
D037	8-719-812-31	DIODE TLR123		R029	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
D038	8-719-812-31	DIODE TLR123		R031	1-216-295-00	METAL CHIP 0 5%	1/10W (AEP MODEL)
D039	8-719-812-31	DIODE TLR123		R033	1-216-295-00	METAL CHIP 0 5%	1/10W
D040	8-719-301-49	DIODE SEL2810A		R036	1-216-295-00	METAL CHIP 0 5%	1/10W (AEP MODEL)
D041	8-719-301-49	DIODE SEL2810A		R037	1-216-295-00	METAL CHIP 0 5%	1/10W (AEP MODEL)
D042	8-719-812-32	DIODE TLY123		R038	1-216-295-00	METAL CHIP 0 5%	1/10W (AEP MODEL)
D043	8-719-812-33	DIODE TLG123A		R041	1-216-097-00	METAL CHIP 100K 5%	1/10W
D044	8-719-812-31	DIODE TLR123		R042	1-216-097-00	METAL CHIP 100K 5%	1/10W
D045	8-719-301-49	DIODE SEL2810A		R043	1-216-097-00	METAL CHIP 100K 5%	1/10W
<u>INDICATOR TUBE</u>				R044	1-216-097-00	METAL CHIP 100K 5%	1/10W
FLO01	1-519-410-11	INDICATOR TUBE, FLUORESCENT		R045	1-216-097-00	METAL CHIP 100K 5%	1/10W
<u>IC</u>				R051	1-216-041-00	METAL CHIP 470 5%	1/10W
IC001	8-759-111-98	IC UPD75208G-521-1B		R052	1-216-041-00	METAL CHIP 470 5%	1/10W
IC002	8-752-800-70	IC CXP5016-191Q		R053	1-216-041-00	METAL CHIP 470 5%	1/10W
IC003	8-759-604-09	IC M51955BL		R055	1-216-041-00	METAL CHIP 470 5%	1/10W
IC004	8-759-201-61	IC TC40H004F		R056	1-216-041-00	METAL CHIP 470 5%	1/10W
IC005	8-759-111-66	IC UPD7566G-505		R057	1-216-041-00	METAL CHIP 470 5%	1/10W
IC006	8-759-937-21	IC CXD1078M		R058	1-216-041-00	METAL CHIP 470 5%	1/10W
<u>TRANSISTOR</u>				R059	1-216-041-00	METAL CHIP 470 5%	1/10W
Q001	8-729-162-44	TRANSISTOR 2SB624-BV4		R060	1-216-041-00	METAL CHIP 470 5%	1/10W
<u>RESISTOR</u>				<u>VARIABLE RESISTOR</u>			
R001	1-216-073-00	METAL CHIP 10K 5%	1/10W	RV001	1-237-219-11	RES, VAR, CARBON 1K	
R002	1-216-073-00	METAL CHIP 10K 5%	1/10W	<u>SWITCH</u>			
R003	1-216-073-00	METAL CHIP 10K 5%	1/10W	SW001	1-570-865-11	SWITCH, SLIDE (WG MODEL)	
R004	1-216-099-00	METAL CHIP 120K 5%	1/10W	SW002	1-570-854-11	SWITCH, SLIDE	
R005	1-216-105-00	METAL CHIP 220K 5%	1/10W	SW003	1-570-854-11	SWITCH, SLIDE	
R006	1-216-073-00	METAL CHIP 10K 5%	1/10W	SW004	1-554-174-42	SWITCH, KEY BOARD	
R007	1-216-081-00	METAL CHIP 22K 5%	1/10W	SW005	1-554-174-42	SWITCH, KEY BOARD	
				SW006	1-554-174-42	SWITCH, KEY BOARD	
				SW007	1-554-174-42	SWITCH, KEY BOARD	
				SW008	1-554-174-42	SWITCH, KEY BOARD	

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

Ref.No	Part No.	Description	Remark
SW009	1-554-174-42	SWITCH, KEY BOARD	
SW010	1-554-174-42	SWITCH, KEY BOARD	
SW011	1-554-174-42	SWITCH, KEY BOARD	
SW012	1-554-174-42	SWITCH, KEY BOARD	
SW013	1-554-174-42	SWITCH, KEY BOARD	
SW014	1-554-174-42	SWITCH, KEY BOARD	
SW015	1-554-174-42	SWITCH, KEY BOARD	
SW016	1-554-174-42	SWITCH, KEY BOARD	
SW017	1-554-174-42	SWITCH, KEY BOARD	
SW018	1-554-174-42	SWITCH, KEY BOARD	
SW019	1-554-174-42	SWITCH, KEY BOARD	
SW020	1-554-174-42	SWITCH, KEY BOARD	
SW021	1-554-088-00	SWITCH, KEY BOARD	
SW022	1-554-174-42	SWITCH, KEY BOARD	
SW023	1-554-174-42	SWITCH, KEY BOARD	
SW024	1-554-174-42	SWITCH, KEY BOARD	
SW025	1-554-174-42	SWITCH, KEY BOARD	
<u>CRYSTAL</u>			
X001	1-567-519-11	VIBRATOR, CRYSTAL (4.19MHz)	
X002	1-567-714-11	OSCILLATOR, CERAMIC (700KHz)	
X003	1-567-160-21	OSCILLATOR, CERAMIC (4.19MHz)	
*****			
*A-7060-471-A	TU-83	BOARD, COMPLETE (WG MODEL)	*****
*A-7060-607-A	TU-83	BOARD, COMPLETE (AEP MODEL)	*****
<u>CAPACITOR</u>			
C001	1-130-493-00	MYLAR 0.068MF	5% 50V
C002	1-130-493-00	MYLAR 0.068MF	5% 50V
C003	1-163-105-00	CERAMIC CHIP 33PF	5% 50V
C004	1-123-318-00	ELECT 33MF	20% 16V
C005	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V
C006	1-123-369-00	ELECT 4.7MF	20% 25V
C008	1-123-380-00	ELECT 1MF	20% 50V
C009	1-123-380-00	ELECT 1MF	20% 50V
C010	1-123-356-00	ELECT 10MF	20% 16V
C011	1-123-318-00	ELECT 33MF	20% 16V
C012	1-123-380-00	ELECT 1MF	20% 50V
C013	1-123-356-00	ELECT 10MF	20% 16V
C014	1-163-119-00	CERAMIC CHIP 120PF	5% 50V
C015	1-130-072-00	FILM 0.022MF	2% 100V
C016	1-123-318-00	ELECT 33MF	20% 16V
C017	1-106-184-00	MYLAR 0.0033MF	5% 50V
C018	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V
C019	1-106-184-00	MYLAR 0.0033MF	5% 50V
C020	1-123-356-00	ELECT 10MF	20% 16V
C021	1-123-306-00	ELECT 47MF	20% 10V
C022	1-123-306-00	ELECT 47MF	20% 10V
C023	1-163-021-00	CERAMIC CHIP 0.01MF	50V

Ref.No	Part No.	Description	Remark
C024	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C025	1-123-356-00	ELECT 10MF	20% 16V
C026	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C027	1-123-332-00	ELECT 47MF	20% 16V
C028	1-123-379-00	ELECT 0.47MF	20% 50V
C029	1-106-184-00	MYLAR 0.0033MF	5% 50V
C030	1-106-184-00	MYLAR 0.0033MF	5% 50V
C031	1-163-103-00	CERAMIC CHIP 27PF	5% 50V
C032	1-123-380-00	ELECT 1MF	20% 50V
C033	1-136-169-00	FILM 0.22MF	5% 50V (AEP MODEL)
C034	1-123-380-00	ELECT 1MF	20% 50V (AEP MODEL)
C035	1-106-367-00	MYLAR 0.01MF	10% 100V (AEP MODEL)
C036	1-103-741-00	POLYSTYRENE 0.0047MF	5% 50V (AEP MODEL)
C037	1-136-169-00	FILM 0.22MF	5% 50V (AEP MODEL)
C038	1-163-109-00	CERAMIC CHIP 47PF	5% 50V (AEP MODEL)
C039	1-163-125-00	CERAMIC CHIP 220PF	5% 50V (AEP MODEL)
C040	1-123-356-00	ELECT 10MF	20% 16V (AEP MODEL)
C041	1-163-021-00	CERAMIC CHIP 0.01MF	50V
<u>CONNECTOR</u>			
CJ001	1-566-285-11	CONNECTOR, BOARD TO BOARD 6P	
CJ002	1-566-287-11	CONNECTOR, BOARD TO BOARD 10P	
<u>DIODE</u>			
D001	8-719-101-23	DIODE 1SS123	
D002	8-719-100-03	DIODE 1S2835	
<u>IC</u>			
IC001	8-759-602-16	IC M54572L	
IC002	8-759-007-54	IC TDA4940	
IC003	8-759-907-45	IC TDA2595 (AEP MODEL)	
<u>IF</u>			
IFB001	1-464-697-11	IF BLOCK (IFS-389)	
CD1	1-404-501-00	DISCRIMINATOR, CERAMIC	
<u>COIL</u>			
L001	1-408-429-00	MICRO INDUCTOR 470UH	
L002	1-408-428-00	MICRO INDUCTOR 390UH	
L003	1-408-422-00	MICRO INDUCTOR 120UH	
<u>TRANSISTOR</u>			
Q001	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q002	8-729-100-76	TRANSISTOR 2SA812	
Q003	8-729-100-76	TRANSISTOR 2SA812	
Q004	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q005	8-729-901-01	TRANSISTOR DTC144EK	
Q006	8-729-901-01	TRANSISTOR DTC144EK	
Q007	8-729-901-01	TRANSISTOR DTC144EK	
<u>RESISTOR</u>			
R001	1-216-081-00	METAL CHIP 22K 5% 1/10W	

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

Ref.No	Part No.	Description	Remark
R002	1-216-109-00	METAL CHIP 330K 5% 1/10W	
R003	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R004	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R005	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R007	1-216-037-00	METAL CHIP 330 5% 1/10W	
R008	1-216-039-00	METAL CHIP 390 5% 1/10W	
R009	1-216-045-00	METAL CHIP 680 5% 1/10W	
R010	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R011	1-216-087-00	METAL CHIP 39K 5% 1/10W	
R012	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R013	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R014	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R015	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R016	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R017	1-216-077-00	METAL CHIP 15K 5% 1/10W (AEP MODEL)	
R018	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R019	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R020	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R021	1-216-063-00	METAL CHIP 3.9K 5% 1/10W (AEP MODEL)	
R022	1-216-097-00	METAL CHIP 100K 5% 1/10W (AEP MODEL)	
R023	1-216-097-00	METAL CHIP 100K 5% 1/10W (AEP MODEL)	
R024	1-216-075-00	METAL CHIP 12K 5% 1/10W (AEP MODEL)	
R025	1-216-089-00	METAL CHIP 47K 5% 1/10W (AEP MODEL)	
R026	1-216-067-00	METAL CHIP 5.6K 5% 1/10W (AEP MODEL)	
R027	1-216-067-00	METAL CHIP 5.6K 5% 1/10W (AEP MODEL)	
R028	1-216-025-00	METAL CHIP 100K 5% 1/10W (AEP MODEL)	
R029	1-216-295-00	METAL CHIP 0 5% 1/10W	
<u>VARIABLE RESISTOR</u>			
RV001	1-228-996-00	RES, ADJ, CARBON 47K (AEP MODEL)	
<u>TUNER</u>			
TU001	1-463-761-11	TUNER, ET (BT-883B)	
*****			
*A-7060-474-A	PR-13 BOARD, COMPLETE (WG MODEL)	*****	
*A-7060-609-A	PR-13 BOARD, COMPLETE (AEP MODEL)	*****	
<u>CONNECTOR</u>			
CN001	*1-564-012-00	PIN, CONNECTOR 2P (WG MODEL)	
CN002	*1-564-018-11	PIN, CONNECTOR 8P	
<u>DIODE</u>			
D002	8-719-911-19	DIODE 1SS119	
D003	8-719-911-19	DIODE 1SS119	
D004	8-719-911-19	DIODE 1SS119	
<u>SWITCH</u>			
S001	1-553-716-00	SWITCH, SLIDE	

Ref.No	Part No.	Description	Remark
S002	1-553-716-00	SWITCH, SLIDE	
S003	1-553-716-00	SWITCH, SLIDE (WG MODEL)	
S004	1-554-174-00	SWITCH, KEY BOARD	
S005	1-554-174-00	SWITCH, KEY BOARD	
S006	1-553-716-00	SWITCH, SLIDE	
S007	1-553-716-00	SWITCH, SLIDE	
S008	1-554-174-00	SWITCH, KEY BOARD	
S009	1-554-174-00	SWITCH, KEY BOARD	
S010	1-554-174-00	SWITCH, KEY BOARD	
S011	1-554-174-00	SWITCH, KEY BOARD	
S013	1-554-174-00	SWITCH, KEY BOARD	
*****			
*A-7060-475-A	VP-1 BOARD, COMPLETE (WG MODEL)	*****	
<u>CAPACITOR</u>			
C001	1-163-097-00	CERAMIC CHIP 15PF 5% 50V	
C002	1-163-141-00	CERAMIC CHIP 0.001MF 5% 50V	
C003	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C004	1-163-033-00	CERAMIC CHIP 0.022MF 10% 25V	
C005	1-163-127-00	CERAMIC CHIP 270PF 5% 50V	
C006	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C007	1-163-097-00	CERAMIC CHIP 15PF 5% 50V	
C008	1-124-245-00	ELECT 4.7MF 20% 16V	
C009	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C010	1-163-033-00	CERAMIC CHIP 0.022MF 10% 25V	
C011	1-124-234-00	ELECT 22MF 20% 16V	
C012	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C013	1-163-833-00	CERAMIC CHIP 0.068MF 25V	
C014	1-163-033-00	CERAMIC CHIP 0.022MF 10% 25V	
C015	1-124-245-00	ELECT 4.7MF 20% 16V	
C016	1-163-105-00	CERAMIC CHIP 33PF 5% 50V	
C017	1-163-105-00	CERAMIC CHIP 33PF 5% 50V	
C018	1-163-033-00	CERAMIC CHIP 0.022MF 10% 25V	
<u>CONNECTOR</u>			
CN001	*1-564-018-11	PIN, CONNECTOR 8P	
CN002	*1-564-014-00	PIN, CONNECTOR 4P	
<u>IC</u>			
IC001	8-759-929-51	IC SAA5235	
IC002	8-759-103-25	IC UPD4053BG	
IC003	8-759-929-52	IC SAF1135P	
IC004	8-759-111-94	IC UPD7508HC-090	
<u>COIL</u>			
L001	1-408-970-21	MICRO INDUCTOR 10UH	
<u>TRANSISTOR</u>			
Q001	8-729-901-01	TRANSISTOR DTC144EK	

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

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

**VP-1****TS-50**

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
<u>RESISTOR</u>				<u>CONNECTOR</u>			
R001	1-216-025-00	METAL CHIP	100 5% 1/10W	CN101	*1-560-891-00	PIN, CONNECTOR 3P	
R002	1-216-085-00	METAL CHIP	33K 5% 1/10W	CN102	*1-560-893-00	PIN, CONNECTOR 5P	
R003	1-216-097-00	METAL CHIP	100K 5% 1/10W	CN103	*1-560-892-00	PIN, CONNECTOR 4P	
R004	1-216-097-00	METAL CHIP	100K 5% 1/10W	CN104	*1-560-893-00	PIN, CONNECTOR 5P	
R101	1-216-295-00	METAL CHIP	0 5% 1/10W	CN105	*1-564-033-00	PIN, CONNECTOR 8P	
R102	1-216-295-00	METAL CHIP	0 5% 1/10W	CN106	*1-560-892-00	PIN, CONNECTOR 4P (WG MODEL)	
R103	1-216-295-00	METAL CHIP	0 5% 1/10W	<u>DIODE</u>			
<u>CRYSTAL</u>				<u>IC</u>			
X001	1-527-317-00	OSCILLATOR, CRYSTAL (10MHz)		D101	8-719-100-03	DIODE 1S2835	
X002	1-567-160-21	OSCILLATOR, CERAMIC (4.19MHz)		<u>IC</u>			
*****				IC101	8-759-604-20	IC M50434-019SP	
*A-7060-482-A	TS-50 BOARD, COMPLETE (WG MODEL)	*****		IC102	8-759-603-41	IC M58655P	
*A-7060-608-A	TS-50 BOARD, COMPLETE (AEP MODEL)	*****		IC103	8-759-007-55	IC TDA4944	
<u>CAPACITOR</u>				IC104	8-759-157-40	IC UPC574J	
C101	1-123-307-00	ELECT	100MF 20% 10V	<u>COIL</u>			
C102	1-163-117-00	CERAMIC CHIP	100PF 5% 50V	L101	1-408-408-00	MICRO INDUCTOR 8.2UH	
C103	1-123-369-00	ELECT	4.7MF 20% 25V	<u>IC LINK</u>			
C104	1-163-109-00	CERAMIC CHIP	47PF 5% 50V	PS101A	1-532-637-00	LINK, IC (ICP-N25)	
C105	1-163-109-00	CERAMIC CHIP	47PF 5% 50V	<u>TRANSISTOR</u>			
C106	1-123-822-00	ELECT	47MF 20% 10V	Q101	8-729-100-67	TRANSISTOR 2SC1623-L7	
C107	1-163-019-00	CERAMIC CHIP	0.0068MF 10% 50V	Q102	8-729-100-67	TRANSISTOR 2SC1623-L7	
C108	1-123-356-00	ELECT	10MF 20% 16V	Q103	8-729-100-67	TRANSISTOR 2SC1623-L7	
C109	1-123-318-00	ELECT	33MF 20% 16V	Q104	8-729-100-67	TRANSISTOR 2SC1623-L7	
C110	1-123-379-00	ELECT	0.47MF 20% 50V	Q105	8-729-100-67	TRANSISTOR 2SC1623-L7	
C111	1-123-369-00	ELECT	4.7MF 20% 25V	Q106	8-729-100-67	TRANSISTOR 2SC1623-L7	
C112	1-123-356-00	ELECT	10MF 20% 16V (WG MODEL)	Q107	8-729-100-76	TRANSISTOR 2SA812 (WG MODEL)	
C113	1-163-021-00	CERAMIC CHIP	0.01MF 50V	Q108	8-729-901-01	TRANSISTOR DTC144EK	
C114	1-130-483-00	MYLAR	0.01MF 5% 50V	<u>RESISTOR</u>			
C115	1-123-816-00	ELECT	10MF 20% 50V	R101	1-216-049-00	METAL CHIP	1K 5% 1/10W
C116	1-130-483-00	MYLAR	0.01MF 5% 50V	R102	1-216-045-00	METAL CHIP	680 5% 1/10W
C117	1-123-369-00	ELECT	4.7MF 20% 25V	R103	1-216-055-00	METAL CHIP	1.8K 5% 1/10W (AEP MODEL)
C118	1-123-369-00	ELECT	4.7MF 20% 25V	R103	1-216-295-00	METAL CHIP	0 5% 1/10W (WG MODEL)
C119	1-130-483-00	MYLAR	0.01MF 5% 50V	R104	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
C120	1-123-379-00	ELECT	0.47MF 20% 50V	R105	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
C121	1-163-117-00	CERAMIC CHIP	100PF 5% 50V	R106	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
C122	1-130-495-00	MYLAR	0.1MF 5% 50V	R107	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
C124	1-163-818-00	CERAMIC CHIP	0.1MF 10% 50V (WG MODEL)	R108	1-216-073-00	METAL CHIP	10K 5% 1/10W
C125	1-163-141-00	CERAMIC CHIP	0.001MF 10% 50V (WG MODEL)	R109	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
C126	1-163-021-00	CERAMIC CHIP	0.01MF 50V	R111	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
C127	1-123-332-00	ELECT	47MF 20% 16V	R112	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
C128	1-163-021-00	CERAMIC CHIP	0.01MF 50V	R113	1-216-073-00	METAL CHIP	10K 5% 1/10W
<u>CONNECTOR</u>				R114	1-216-073-00	METAL CHIP	10K 5% 1/10W
CJ101	1-563-717-11	CONNECTOR, BOARD TO BOARD 6P		R115	1-216-077-00	METAL CHIP	15K 5% 1/10W
CJ102	1-563-719-11	CONNECTOR, BOARD TO BOARD 10P		R116	1-216-045-00	METAL CHIP	680 5% 1/10W
				R117	1-216-081-00	METAL CHIP	22K 5% 1/10W

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**TS-50****CB-8****FR-24****DS-16****DR-35**

Ref.No	Part No.	Description	Remark
R118	1-216-081-00	METAL CHIP 22K 5%	1/10W
R119	1-247-713-11	CARBON 1K 5%	1/4W F
R120	1-216-081-00	METAL CHIP 22K 5%	1/10W
R121	1-216-081-00	METAL CHIP 22K 5%	1/10W
R122	1-216-091-00	METAL CHIP 56K 5%	1/10W
R123	1-216-093-00	METAL CHIP 68K 5%	1/10W
R124	1-216-073-00	METAL CHIP 10K 5%	1/10W
R125	1-216-073-00	METAL CHIP 10K 5%	1/10W
R126	1-216-073-00	METAL CHIP 10K 5%	1/10W
R127	1-216-073-00	METAL CHIP 10K 5%	1/10W
R128	1-216-055-00	METAL CHIP 1.8K 5%	1/10W
R129	1-216-047-00	METAL CHIP 820 5%	1/10W
R130	1-216-073-00	METAL CHIP 10K 5%	1/10W
R131	1-216-073-00	METAL CHIP 10K 5%	1/10W
R132	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R133	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R134	1-216-067-00	METAL CHIP 5.6K 5%	1/10W
R135	1-216-045-00	METAL CHIP 680 5%	1/10W
R136	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R137	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R138	1-216-067-00	METAL CHIP 5.6K 5%	1/10W
R139	1-216-045-00	METAL CHIP 680 5%	1/10W
R140	1-216-049-00	METAL CHIP 1K 5%	1/10W (WG MODEL)
R141	1-216-109-00	METAL CHIP 330K 5%	1/10W (WG MODEL)
R142	1-216-121-00	METAL CHIP 1M 5%	1/10W (WG MODEL)
R143	1-216-081-00	METAL CHIP 22K 5%	1/10W (WG MODEL)
R144	1-216-033-00	METAL CHIP 220 5%	1/10W
<u>VARIABLE RESISTOR</u>			
RV101	1-228-996-00	RES, ADJ, CARBON 47K	
<u>CRYSTAL</u>			
X101	1-567-121-00	VIBRATOR, CRYSTAL (4.19MHz)	
*****			
*1-621-987-11	CB-8 BOARD	*****	
<u>CONNECTOR</u>			
CN001	*1-564-005-00	PIN, CONNECTOR 6P	
CN002	*1-564-006-11	PIN, CONNECTOR 7P	
<u>DIODE</u>			
D001	8-719-106-22	DIODE RD7.5M-B1	
D002	8-719-106-22	DIODE RD7.5M-B1	
D003	8-719-106-22	DIODE RD7.5M-B1	
D004	8-719-106-22	DIODE RD7.5M-B1	
D005	8-719-106-22	DIODE RD7.5M-B1	
D006	8-719-106-22	DIODE RD7.5M-B1	
<u>RESISTOR</u>			
R001	1-216-037-00	METAL CHIP 330 5%	1/10W

Ref.No	Part No.	Description	Remark
R002	1-216-037-00	METAL CHIP 330 5%	1/10W
R003	1-216-037-00	METAL CHIP 330 5%	1/10W
R004	1-216-037-00	METAL CHIP 330 5%	1/10W
R005	1-216-037-00	METAL CHIP 330 5%	1/10W
R006	1-216-037-00	METAL CHIP 330 5%	1/10W
*****			
*1-621-985-11	FR-24 BOARD	*****	
*3-689-521-01	HOLDER, LED, ROUND		
<u>DIODE</u>			
D001	8-719-812-32	DIODE TLY123	
D002	8-719-812-33	DIODE TLG123A	
D003	8-719-812-33	DIODE TLG123A	
*****			
*1-622-006-11	DS-16 BOARD	*****	
▲*1-533-189-11	HOLDER, FUSE		
▲.2-430-344-01	COVER (CC-1017), INSULATING		
<u>CAPACITOR</u>			
C401	▲.1-136-472-13	FILM 0.1MF	20% 250V
C402	▲.1-161-742-00	CERAMIC 0.0022MF	20% 400V
C403	▲.1-161-742-00	CERAMIC 0.0022MF	20% 400V
C404	▲.1-161-742-00	CERAMIC 0.0022MF	20% 400V
C405	▲.1-161-742-00	CERAMIC 0.0022MF	20% 400V
<u>CONNECTOR</u>			
CN401	*1-560-891-00	PIN, CONNECTOR 3P	
<u>FUSE</u>			
F401	▲.1-532-279-00	FUSE, TIME-LAG (T500mA 250V)	
<u>TRANSFORMER</u>			
T402	▲.1-421-357-31	TRANSFORMER, LINE FILTER	
*****			
*A-7060-585-A	DR-35 BOARD, COMPLETE	*****	
7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3		
<u>CAPACITOR</u>			
C201	1-124-255-00	ELECT 1MF	20% 50V
C202	1-163-141-00	CERAMIC CHIP 0.001MF	5% 50V
C203	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C204	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C205	1-123-874-00	ELECT 470MF	20% 16V
C207	1-124-124-00	ELECT 220MF	20% 6.3V

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Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C208	1-163-038-00	CERAMIC CHIP 0.1MF	25V	JR008	1-216-296-00	METAL CHIP 0 5%	1/8W
C209	1-124-124-00	ELECT 220MF	20% 6.3V	JR009	1-216-296-00	METAL CHIP 0 5%	1/8W
C210	1-163-038-00	CERAMIC CHIP 0.1MF	25V	JR010	1-216-296-00	METAL CHIP 0 5%	1/8W
C211	1-163-141-00	CERAMIC CHIP 0.001MF	5% 50V	JR011	1-216-296-00	METAL CHIP 0 5%	1/8W
C212	1-124-255-00	ELECT 1MF	20% 50V	JR012	1-216-296-00	METAL CHIP 0 5%	1/8W
C213	1-163-038-00	CERAMIC CHIP 0.1MF	25V	JR013	1-216-296-00	METAL CHIP 0 5%	1/8W
C214	1-123-874-00	ELECT 470MF	20% 16V	JR014	1-216-296-00	METAL CHIP 0 5%	1/8W
C216	1-123-333-00	ELECT 100MF	20% 16V	JR015	1-216-296-00	METAL CHIP 0 5%	1/8W
C217	1-163-038-00	CERAMIC CHIP 0.1MF	25V	JR016	1-216-296-00	METAL CHIP 0 5%	1/8W
C218	1-163-141-00	CERAMIC CHIP 0.001MF	5% 50V	JR017	1-216-296-00	METAL CHIP 0 5%	1/8W
C219	1-163-139-00	CERAMIC CHIP 820PF	5% 50V	JR018	1-216-296-00	METAL CHIP 0 5%	1/8W
C220	1-163-038-00	CERAMIC CHIP 0.1MF	25V	JR019	1-216-296-00	METAL CHIP 0 5%	1/8W
C221	1-163-038-00	CERAMIC CHIP 0.1MF	25V	JR020	1-216-296-00	METAL CHIP 0 5%	1/8W
C223	1-123-333-00	ELECT 100MF	20% 16V	JR021	1-216-296-00	METAL CHIP 0 5%	1/8W
C224	1-163-038-00	CERAMIC CHIP 0.1MF	25V	JR022	1-216-295-00	METAL CHIP 0 5%	1/10W
C225	1-123-874-00	ELECT 470MF	20% 16V	JR023	1-216-295-00	METAL CHIP 0 5%	1/10W
C226	1-163-038-00	CERAMIC CHIP 0.1MF	25V	JR024	1-216-295-00	METAL CHIP 0 5%	1/10W
C227	1-123-336-00	ELECT 470MF	20% 25V	JR025	1-216-295-00	METAL CHIP 0 5%	1/10W
C228	1-163-038-00	CERAMIC CHIP 0.1MF	25V	JR026	1-216-295-00	METAL CHIP 0 5%	1/10W
C229	1-163-038-00	CERAMIC CHIP 0.1MF	25V	JR027	1-216-295-00	METAL CHIP 0 5%	1/10W
C230	1-163-038-00	CERAMIC CHIP 0.1MF	25V	JR028	1-216-295-00	METAL CHIP 0 5%	1/10W
C231	1-123-299-00	ELECT 1000MF	20% 6.3V	JR029	1-216-295-00	METAL CHIP 0 5%	1/10W
C232	1-123-299-00	ELECT 1000MF	20% 6.3V	JR030	1-216-295-00	METAL CHIP 0 5%	1/10W
C233	1-123-323-00	ELECT 470MF	20% 16V	<u>COIL</u>			
C235	1-163-038-00	CERAMIC CHIP 0.1MF	25V	L201	1-408-945-00	COIL, CHOKE 200UH	
C240	1-124-123-00	ELECT 100MF	20% 6.3V	L202	1-408-944-00	COIL, CHOKE 20UH	
C241	1-123-296-00	ELECT 220MF	20% 6.3V	L203	1-408-944-00	COIL, CHOKE 20UH	
<u>CONNECTOR</u>				L205	1-408-944-00	COIL, CHOKE 20UH	
CN201	*1-560-892-00	PIN, CONNECTOR 4P		L206	1-408-945-00	COIL, CHOKE 200UH	
CN202	*1-560-895-00	PIN, CONNECTOR 7P		L207	1-408-944-00	COIL, CHOKE 20UH	
CN203	*1-560-894-00	PIN, CONNECTOR 6P		L208	1-408-944-00	COIL, CHOKE 20UH	
CN204	*1-560-890-00	PIN, CONNECTOR 2P		L209	1-408-944-00	COIL, CHOKE 20UH	
<u>DIODE</u>				L210	1-408-944-00	COIL, CHOKE 20UH	
D201	8-719-200-00	DIODE 31DQ05		L211	1-408-944-00	COIL, CHOKE 20UH	
D202	8-719-200-00	DIODE 31DQ05		L264	1-408-945-00	COIL, CHOKE 200UH	
D203	8-719-200-00	DIODE 31DQ05		<u>IC LINK</u>			
D204	8-719-100-03	DIODE 1S2835		PS202A	1-532-679-21	LINK, IC (ICP-F15)	
D205	△.8-719-110-02	DIODE RD7.5ESB1		<u>TRANSISTOR</u>			
<u>IC</u>				Q201	8-729-112-61	TRANSISTOR 2SA1441-L	
IC201	8-759-908-95	IC TL1451CNS		Q202	8-729-100-66	TRANSISTOR 2SC1623	
IC202	8-759-908-95	IC TL1451CNS		Q203	8-729-100-76	TRANSISTOR 2SA812	
<u>JUMPER RESISTOR</u>				Q204	8-729-113-33	TRANSISTOR 2SB733-4	
JR001	1-216-296-00	METAL CHIP 0 5%	1/8W	Q205	8-729-112-61	TRANSISTOR 2SA1441-L	
JR002	1-216-296-00	METAL CHIP 0 5%	1/8W	Q206	8-729-100-66	TRANSISTOR 2SC1623	
JR003	1-216-296-00	METAL CHIP 0 5%	1/8W	Q207	8-729-100-76	TRANSISTOR 2SA812	
JR004	1-216-296-00	METAL CHIP 0 5%	1/8W	Q208	8-729-901-01	TRANSISTOR DTC144EK	
JR005	1-216-296-00	METAL CHIP 0 5%	1/8W	Q209	8-729-112-61	TRANSISTOR 2SA1441-L	
JR006	1-216-296-00	METAL CHIP 0 5%	1/8W	Q210	8-729-100-66	TRANSISTOR 2SC1623	
JR007	1-216-296-00	METAL CHIP 0 5%	1/8W	Q211	8-729-100-76	TRANSISTOR 2SA812	

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

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

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
Q212	8-729-901-01	TRANSISTOR DTC144EK		C006	1-163-019-00	CERAMIC CHIP 0.0068MF	10% 50V
Q213	8-729-901-01	TRANSISTOR DTC144EK		C007	1-130-026-00	FILM 0.0047MF	5% 50V
Q214	8-729-901-01	TRANSISTOR DTC144EK		C008	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V
<u>RESISTOR</u>				C009	1-124-245-00	ELECT 4.7MF	20% 25V
R201	1-216-085-00	METAL CHIP 33K 5% 1/10W		C010	1-163-021-00	CERAMIC CHIP 0.01MF	50V
R202	1-216-085-00	METAL CHIP 33K 5% 1/10W		C011	1-123-333-00	ELECT 100MF	20% 25V
R203	1-216-115-00	METAL CHIP 560K 5% 1/10W		C012	1-135-072-21	TANTAL. CHIP 0.22MF	20% 35V
R204	1-249-413-11	CARBON 470 5% 1/6W		C013	1-163-075-00	CERAMIC CHIP 0.047MF	50V
R205	1-216-055-00	METAL CHIP 1.8K 5% 1/10W		C014	1-123-333-00	ELECT 100MF	20% 25V
R206	1-216-055-00	METAL CHIP 1.8K 5% 1/10W		C015	1-135-074-21	TANTAL. CHIP 0.47MF	20% 35V
R207	1-216-051-00	METAL CHIP 1.2K 5% 1/10W		C016	1-130-491-00	MYLAR 0.047MF	5% 50V
R208	1-216-095-00	METAL CHIP 82K 5% 1/10W		C017	1-124-236-00	ELECT 47MF	20% 16V
R210	1-216-065-00	METAL CHIP 4.7K 5% 1/10W		C018	1-163-112-00	CERAMIC CHIP 62PF	5% 50V
R211	1-216-033-00	METAL CHIP 220 5% 1/10W		C019	1-163-114-00	CERAMIC CHIP 75PF	5% 50V
R212	1-216-687-11	METAL CHIP 33K 0.50% 1/16W		C020	1-163-103-00	CERAMIC CHIP 27PF	5% 50V
R213	1-216-687-11	METAL CHIP 33K 0.50% 1/16W		C021	1-124-236-00	ELECT 47MF	20% 16V
R214	1-216-115-00	METAL CHIP 560K 5% 1/10W		C022	1-163-106-00	CERAMIC CHIP 36PF	5% 50V
R215	1-249-413-11	CARBON 470 5% 1/6W		C023	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
R216	1-216-055-00	METAL CHIP 1.8K 5% 1/10W		C024	1-163-096-00	CERAMIC CHIP 13PF	5% 50V
R217	1-216-055-00	METAL CHIP 1.8K 5% 1/10W		C025	1-124-462-00	ELECT 10MF	20% 16V
R218	1-216-051-00	METAL CHIP 1.2K 5% 1/10W		C026	1-163-129-00	CERAMIC CHIP 330PF	5% 50V
R219	1-216-699-11	METAL CHIP 100K 0.50% 1/16W		C027	1-162-816-11	CERAMIC CHIP 180PF	5% 50V
R220	1-216-679-11	METAL CHIP 15K 0.50% 1/16W		C028	1-163-077-00	CERAMIC CHIP 0.1MF	50V
R221	1-216-085-00	METAL CHIP 33K 5% 1/10W		C029	1-163-077-00	CERAMIC CHIP 0.1MF	50V
R222	1-216-085-00	METAL CHIP 33K 5% 1/10W		C030	1-163-139-00	CERAMIC CHIP 820PF	5% 50V
R223	1-216-067-00	METAL CHIP 5.6K 5% 1/10W		C031	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
R224	1-216-115-00	METAL CHIP 560K 5% 1/10W		C032	1-124-255-00	ELECT 1MF	20% 50V
R225	1-216-055-00	METAL CHIP 1.8K 5% 1/10W		C033	1-123-332-00	ELECT 47MF	20% 25V
R226	1-216-055-00	METAL CHIP 1.8K 5% 1/10W		C035	1-124-245-00	ELECT 4.7MF	20% 25V
R227	1-216-065-00	METAL CHIP 4.7K 5% 1/10W		C036	1-124-236-00	ELECT 47MF	20% 16V
R228	1-216-099-00	METAL CHIP 120K 5% 1/10W		C037	1-124-236-00	ELECT 47MF	20% 16V
R229	1-216-075-00	METAL CHIP 12K 5% 1/10W		C038	1-124-257-00	ELECT 2.2MF	20% 35V
R230	1-216-081-00	METAL CHIP 22K 5% 1/10W		C039	1-163-075-00	CERAMIC CHIP 0.047MF	50V
R232	1-216-055-00	METAL CHIP 1.8K 5% 1/10W		C040	1-163-133-00	CERAMIC CHIP 470PF	5% 50V
R233	1-216-091-00	METAL CHIP 56K 5% 1/10W		C041	1-163-077-00	CERAMIC CHIP 0.1MF	50V
<u>VARIABLE RESISTOR</u>				C042	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
RV201	1-230-523-11	RES, ADJ, METAL GLAZE 10K		C043	1-163-021-00	CERAMIC CHIP 0.01MF	50V
RV202	1-230-523-11	RES, ADJ, METAL GLAZE 10K		C044	1-124-255-00	ELECT 1MF	20% 50V
RV203	1-230-522-11	RES, ADJ, METAL GLAZE 4.7K		C045	1-135-070-00	TANTAL. CHIP 0.1MF	20% 35V
*****				C046	1-124-240-00	ELECT 10MF	20% 25V
*A-7068-031-A TC-3 BOARD, COMPLETE (WG MODEL)				C047	1-163-141-00	CERAMIC CHIP 0.001MF	5% 50V
*****				C048	1-163-063-00	CERAMIC CHIP 0.022MF	50V
<u>CAPACITOR</u>				C049	1-163-141-00	CERAMIC CHIP 0.001MF	5% 50V
C001	1-124-236-00	ELECT 47MF 20% 16V		C050	1-163-063-00	CERAMIC CHIP 0.022MF	50V
C002	1-163-075-00	CERAMIC CHIP 0.047MF 50V		C051	1-163-075-00	CERAMIC CHIP 0.047MF	50V
C003	1-163-123-00	CERAMIC CHIP 180PF 5% 50V		C053	1-163-075-00	CERAMIC CHIP 0.047MF	50V
C004	1-163-075-00	CERAMIC CHIP 0.047MF 50V		C054	1-163-113-00	CERAMIC CHIP 68PF 5% 50V	
C005	1-163-117-00	CERAMIC CHIP 100PF 5% 50V		C055	1-163-075-00	CERAMIC CHIP 0.047MF	50V
				C056	1-163-075-00	CERAMIC CHIP 0.047MF	50V
				C057	1-163-075-00	CERAMIC CHIP 0.047MF	50V
				<u>CONNECTOR</u>			
				CN001	*1-564-014-00	PIN, CONNECTOR 4P	

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# TC-3

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
CN002	*1-564-014-00	PIN, CONNECTOR 4P		R006	1-216-129-00	METAL CHIP 2.2M 5%	1/10W
		<u>TRIMMER</u>		R007	1-216-085-00	METAL CHIP 33K 5%	1/10W
CV001	1-141-227-00	CAP, CERAMIC TRIMMER 20PF		R008	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
		<u>DIODE</u>		R009	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
D001	8-719-109-97	DIODE RD6.8ESB2		R010	1-216-099-00	METAL CHIP 120K 5%	1/10W
D002	8-719-911-06	DIODE 1SS106		R011	1-216-075-00	METAL CHIP 12K 5%	1/10W
		<u>DELAY LINE</u>		R012	1-216-097-00	METAL CHIP 100K 5%	1/10W
DL001	1-415-313-00	DELAY LINE (1H)		R013	1-216-067-00	METAL CHIP 5.6K 5%	1/10W
		<u>IC</u>		R014	1-216-127-11	METAL CHIP 1.8M 5%	1/10W
IC001	8-759-933-40	IC HD14538BP		R015	1-216-001-00	METAL CHIP 10 5%	1/10W
IC002	8-759-933-74	IC TDA2594		R016	1-216-003-11	METAL CHIP 12 5%	1/10W
IC003	8-759-345-38	IC TC4538BP		R017	1-216-097-00	METAL CHIP 100K 5%	1/10W
IC004	8-752-006-10	IC CX20061		R018	1-216-081-00	METAL CHIP 22K 5%	1/10W
		<u>COIL</u>		R019	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
L001	1-408-787-00	INDUCTOR CHIP 68UH		R020	1-215-453-00	METAL 22K 1%	1/6W
L002	1-408-789-21	INDUCTOR CHIP 100UH		R021	1-216-081-00	METAL CHIP 22K 5%	1/10W
L003	1-408-786-21	INDUCTOR CHIP 56UH		R022	1-216-083-00	METAL CHIP 27K 5%	1/10W
L004	1-408-786-21	INDUCTOR CHIP 56UH		R023	1-216-079-00	METAL CHIP 18K 5%	1/10W
L005	1-408-788-21	INDUCTOR CHIP 82UH		R024	1-216-041-00	METAL CHIP 470 5%	1/10W
L006	1-408-775-41	INDUCTOR CHIP 6.8UH		R025	1-216-043-00	METAL CHIP 560 5%	1/10W
L007	1-408-776-00	INDUCTOR CHIP 8.2UH		R026	1-216-049-00	METAL CHIP 1K 5%	1/10W
L008	1-408-789-21	INDUCTOR CHIP 100UH		R027	1-216-049-00	METAL CHIP 1K 5%	1/10W
		<u>VARIABLE COIL</u>		R028	1-216-085-00	METAL CHIP 33K 5%	1/10W
LV001	1-408-512-00	COIL (VARIABLE) 10UH		R029	1-216-083-00	METAL CHIP 27K 5%	1/10W
LV002	1-408-530-00	COIL (VARIABLE) 3.3UH		R030	1-216-045-00	METAL CHIP 680 5%	1/10W
LV003	1-408-512-00	COIL (VARIABLE) 10UH		R031	1-216-045-00	METAL CHIP 680 5%	1/10W
		<u>TRANSISTOR</u>		R032	1-216-049-00	METAL CHIP 1K 5%	1/10W
Q001	8-729-100-67	TRANSISTOR 2SC1623-L7		R033	1-216-049-00	METAL CHIP 1K 5%	1/10W
Q002	8-729-100-67	TRANSISTOR 2SC1623-L7		R034	1-216-067-00	METAL CHIP 5.6K 5%	1/10W
Q003	8-729-100-67	TRANSISTOR 2SC1623-L7		R035	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
Q004	8-729-100-67	TRANSISTOR 2SC1623-L7		R036	1-216-041-00	METAL CHIP 470 5%	1/10W
Q005	8-729-100-67	TRANSISTOR 2SC1623-L7		R037	1-216-041-00	METAL CHIP 470 5%	1/10W
Q006	8-729-100-67	TRANSISTOR 2SC1623-L7		R038	1-216-039-00	METAL CHIP 390 5%	1/10W
Q007	8-729-901-04	TRANSISTOR DTA114EK		R039	1-216-041-00	METAL CHIP 470 5%	1/10W
Q008	8-729-100-67	TRANSISTOR 2SC1623		R040	1-216-045-00	METAL CHIP 680 5%	1/10W
Q009	8-729-100-67	TRANSISTOR 2SC1623		R041	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
Q010	8-729-100-67	TRANSISTOR 2SC1623		R042	1-216-049-00	METAL CHIP 1K 5%	1/10W
Q012	8-729-100-67	TRANSISTOR 2SC1623		R043	1-216-037-00	METAL CHIP 330 5%	1/10W
		<u>RESISTOR</u>		R044	1-216-049-00	METAL CHIP 1K 5%	1/10W
R001	1-216-093-00	METAL CHIP 68K 5%	1/10W	R045	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R002	1-216-079-00	METAL CHIP 18K 5%	1/10W	R046	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R003	1-216-057-00	METAL CHIP 2.2K 5%	1/10W	R047	1-216-073-00	METAL CHIP 10K 5%	1/10W
R004	1-216-043-00	METAL CHIP 560 5%	1/10W	R048	1-216-049-00	METAL CHIP 1K 5%	1/10W
R005	1-216-053-00	METAL CHIP 1.5K 5%	1/10W	R049	1-216-073-00	METAL CHIP 10K 5%	1/10W
				R050	1-216-089-00	METAL CHIP 47K 5%	1/10W
				R051	1-216-089-00	METAL CHIP 47K 5%	1/10W
				R052	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
				R053	1-216-073-00	METAL CHIP 10K 5%	1/10W
				R054	1-216-043-00	METAL CHIP 560 5%	1/10W
				R055	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
				R056	1-216-039-00	METAL CHIP 390 5%	1/10W
				R057	1-216-039-00	METAL CHIP 390 5%	1/10W
				R058	1-216-073-00	METAL CHIP 10K 5%	1/10W

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Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R059	1-216-091-00	METAL CHIP 56K 5% 1/10W				<u>IC</u>	
		<u>VARIABLE RESISTOR</u>		IC721	8-759-106-02	IC UPC4570G2	
RV001	1-230-871-11	RES, ADJ, METAL GLAZE 22K				<u>JACK</u>	
RV002	1-230-873-11	RES, ADJ, METAL GLAZE 47K		J301	1-507-899-21	JACK (SMALL TYPE)	
RV003	1-230-871-11	RES, ADJ, METAL GLAZE 22K		J401	1-507-899-00	JACK (SMALL TYPE)	
RV004	1-230-867-11	RES, ADJ, METAL GLAZE 1K				<u>JUMPER RESISTOR</u>	
RV005	1-230-867-11	RES, ADJ, METAL GLAZE 1K		JR053	1-216-295-00	METAL CHIP 0 5% 1/10W	
RV006	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K		JR054	1-216-295-00	METAL CHIP 0 5% 1/10W	
RV007	1-230-867-11	RES, ADJ, METAL GLAZE 1K		JR055	1-216-295-00	METAL CHIP 0 5% 1/10W	
		<u>CRYSTAL</u>		JR056	1-216-295-00	METAL CHIP 0 5% 1/10W	
X001	1-527-345-00	CRYSTAL, OSC (4.43MHz)		JR057	1-216-295-00	METAL CHIP 0 5% 1/10W	
*****				JR099	1-216-296-00	METAL CHIP 0 5% 1/8W	
	*A-7070-024-A	LD-1 BOARD, COMPLETE				<u>RESISTOR</u>	
		*****		R710	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
		<u>DIODE</u>		R731	1-216-105-00	METAL CHIP 220K 5% 1/10W	
D001	8-719-928-54	DIODE GL-450S		R732	1-216-081-00	METAL CHIP 22K 5% 1/10W	
*****				R733	1-216-025-00	METAL CHIP 100 5% 1/10W	
	A-7070-025-A	MS-4 BOARD, COMPLETE		R734	1-216-025-00	METAL CHIP 100 5% 1/10W	
		*****		R735	1-216-083-00	METAL CHIP 27K 5% 1/10W	
C902	1-163-038-00	CERAMIC CHIP 0.1MF	25V	R741	1-216-105-00	METAL CHIP 220K 5% 1/10W	
	*1-564-671-31	PIN, CONNECTOR (HOOK TYPE)		R742	1-216-081-00	METAL CHIP 22K 5% 1/10W	
*****				R743	1-216-025-00	METAL CHIP 100 5% 1/10W	
		<u>LS-9 BOARD</u>		R744	1-216-025-00	METAL CHIP 100 5% 1/10W	
		*****		R745	1-216-083-00	METAL CHIP 27K 5% 1/10W	
	*1-564-671-11	PIN, CONNECTOR (HOOK TYPE)		*****			
*****					*1-621-998-11	TE-6 BOARD	
		<u>MJ-11 BOARD</u>				*****	
		*****			*3-716-845-01	HOLDER (LEFT), SENSOR	
		<u>CAPACITOR</u>				<u>TRANSISTOR</u>	
C725	1-124-462-00	ELECT 10MF 20% 16V		Q001	8-729-904-10	PT360FS	
C726	1-124-462-00	ELECT 10MF 20% 16V				<u>SWITCH</u>	
C731	1-124-462-00	ELECT 10MF 20% 16V		S904	1-570-112-11	SWITCH, LEAF	
C732	1-124-225-00	ELECT 100MF 20% 6.3V		S905	1-570-112-11	SWITCH, LEAF	
C733	1-163-141-00	CERAMIC CHIP 0.001MF 10% 50V		*****			
C734	1-163-121-00	CERAMIC CHIP 150PF 5% 50V			*1-621-997-11	TE-5 BOARD	
C741	1-124-462-00	ELECT 10MF 20% 16V				*****	
C742	1-124-225-00	ELECT 100MF 20% 6.3V			*3-716-844-01	HOLDER (RIGHT), SENSOR	
C743	1-163-141-00	CERAMIC CHIP 0.001MF 10% 50V				<u>PILOT LAMP</u>	
C744	1-163-121-00	CERAMIC CHIP 150PF 5% 50V		PLO01	1-518-621-11	LAMP, PILOT	
		<u>DIODE</u>		PLO02	1-518-621-21	LAMP, PILOT	
D101	8-719-109-60	DIODE RD2.7ESB2					

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**TE-5**

**DL-15**

**DO-1**

**DT-63**

Ref.No	Part No.	Description	Remark
<u>TRANSISTOR</u>			
Q001	8-729-904-10	PT360FS	
<u>SWITCH</u>			
S001	1-570-112-11	SWITCH, LEAF	
*****			
	*1-621-993-11	DL-15 BOARD *****	
<u>DIODE</u>			
D001	△.8-719-109-50	DIODE RD2.OESB1	
D301	△.8-719-500 32	DIODE D3SB10	
<u>IC</u>			
IC001	8-759-803-56	IC L7808ML	
<u>TRANSISTOR</u>			
Q001	8-729-900-80	TRANSISTOR DTC114ES	
<u>RESISTOR</u>			
R001	1-249-417-11	CARBON 1K 5% 1/6W	
*****			
	*1-621-992-11	DO-1 BOARD *****	
<u>TRANSISTOR</u>			
Q501	8-729-303-58	TRANSISTOR 2SC3851-0	
Q502	8-729-804-67	TRANSISTOR 2SB1133-R	
*****			
	*1-621-994-11	DT-63 BOARD *****	
	1-938-846-11	HARNES (DD-12)	
<u>CAPACITOR</u>			
C102	1-126-175-11	ELECT 15000MF 20% 25V	
C103	1-123-334-00	ELECT 220MF 20% 25V	
C104	1-123-332-00	ELECT 47MF 20% 16V	
C105	1-123-332-00	ELECT 47MF 20% 16V	
C110	1-125-447-11	DOUBLE LAYERS 1F 5.5V	
C111	1-123-387-00	ELECT 47MF 20% 100V	
C112	1-123-387-00	ELECT 47MF 20% 100V	
C114	1-106-212-00	MYLAR 0.047MF 10% 100V	
C115	1-123-334-00	ELECT 220MF 20% 25V	
<u>CONNECTOR</u>			
CN102	*1-560-893-00	PIN, CONNECTOR 5P	

Ref.No	Part No.	Description	Remark
CN104	*1-560-893-00	PIN, CONNECTOR 5P	
CN105	*1-560-891-00	PIN, CONNECTOR 3P	
CN106	*1-560-896-00	PIN, CONNECTOR 8P	
CN107	*1-560-893-00	PIN, CONNECTOR 5P	
CN108	*1-560-891-00	PIN, CONNECTOR 3P	
CN203	*1-560-894-00	PIN, CONNECTOR 6P	
<u>DIODE</u>			
D103	8-719-911-19	DIODE 1SS119	
D104	8-719-911-19	DIODE 1SS119	
D106	8-719-110-16	DIODE RD10ES-B1	
D107	8-719-200-02	DIODE 10E2	
D108	8-719-200-02	DIODE 10E2	
D109	8-719-110-42	DIODE RD15ES-B3	
D110	8-719-109-93	DIODE RD6.2ES-B2	
D111	8-719-107-94	DIODE 1SS202	
D112	8-719-115-21	DIODE RD39JSB	
D114	8-719-109-98	DIODE RD6.8ES-B3	
D115	8-719-110-42	DIODE RD15ESB3	
D116	8-719-110-16	DIODE RD10ES-B1	
D117	8-719-109-82	DIODE RD4.7ES-B3	
D119	8-719-911-19	DIODE 1SS119	
<u>IC LINK</u>			
PS101	△.1-532-727-11	LINK, IC (ICP-N5)	
PS102	△.1-532-605-00	LINK, IC (ICP-N10)	
PS103	△.1-532-686-00	LINK, IC (ICP-F75)	
PS104	△.1-532-727-11	LINK, IC (ICP-N5)	
<u>TRANSISTOR</u>			
Q103	8-729-103-43	TRANSISTOR 2SB734	
Q106	8-729-177-32	TRANSISTOR 2SD773	
Q107	8-729-177-32	TRANSISTOR 2SD773	
<u>RESISTOR</u>			
R103	1-249-421-11	CARBON 2.2K 5% 1/6W	
R104	1-249-421-11	CARBON 2.2K 5% 1/6W	
R105	1-246-449-25	CARBON 100 5% 1/4W	
R107	1-249-425-11	CARBON 4.7K 5% 1/6W	
R108	1-249-434-11	CARBON 27K 5% 1/6W	
R109	1-249-441-11	CARBON 100K 5% 1/6W	
R111	1-249-431-11	CARBON 15K 5% 1/6W	
R112	1-249-422-11	CARBON 2.7K 5% 1/6W	
R113	1-249-416-11	CARBON 820 5% 1/6W	
*****			

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

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

<u>Ref.No</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
MISCELLANEOUS *****			
	△.1-464-690-11	MODULATOR, RF (RFU-857)	
	1-464-784-11	ENCODER, ROTARY	
	1-464-785-11	SWICH BLOCK, CONTROL	
	△.1-534-817-XX	CORD, POWER	
	1-535-535-11	TERMINAL, SHAFT GROUND	
	*1-555-110-00	CABLE, PIN	
C901	1-161-057-00	CAP, CERAMIC 0.033MF X C901	
M901	X-3711-961-1	MOTOR SUB ASSY, REEL	
M903	8-835-138-01	MOTOR, DC (DNR-5301B) (CONTROL)	
M904	A-7040-065-A	MOTOR ASSY, L (LOADING)	
M905	A-7090-661-A	MOTOR BLOCK ASSY, LS (LINEAR SKATE)	
M906	8-835-247-01	MOTOR, DC BHF-2804D (CAPSTAN)	
PM901	△.1-454-377-31	SOLENOID, PLUNGER (BRAKE)	
S901	1-554-942-11	SWITCH, PUSH (RECOG R)	
S902	1-554-942-11	SWITCH, PUSH (RECOG L)	
T401	△.1-448-836-11	TRANSFORMER, POWER	

\*\*\*\*\*

ACCESSORIES AND PACKING MATERIALS  
\*\*\*\*\*

<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
A-6767-420-A	COMMANDER ASSY	
1-534-049-31	CORD, CONNECTION (RK-74H)	
1-551-513-00	CORD ASSY, COAXIAL	
1-551-734-11	CORD, CONNECTION	
*3-677-503-00	SHEET, PROTECTION	
3-694-484-01	DRIVER, VOLUME	
*3-713-408-01	CASE, ACCESSORY	
*3-713-409-01	CUSHION (UPPER)	
*3-713-410-01	CUSHION (LOWER)	
*3-713-465-01	LID, ACCESSORY CASE	
*3-713-487-01	INDIVIDUAL CARTON (WG MODEL)	
*3-713-605-01	INDIVIDUAL CARTON (AEP MODEL)	
3-765-626-11	MANUAL, INSTRUCTION (ENGLISH)	
3-765-626-41	MANUAL, INSTRUCTION (FRENCH, GERMANS, DUTCH)	
3-765-626-51	MANUAL, INSTRUCTION (SPANISH, SWEDISH, ITALIAN)	
X-3711-986-1	INSULATOR ASSY	

\*\*\*\*\*

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

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

## SECTION 7 MECHANISM ADJUSTMENT

### 7-1. MECHANICAL CHECK, ADJUSTMENT AND PREPARATIONS FOR REPLACEMENT

Note: Regarding the removal procedures of the cabinet and board, see Section 2.

#### 7-1-1. Cassette Compartment Assembly And Operation Without Tape Inserted

Note: The set will not operate if there is a strong light source near it.

##### 1. Method to loading (See Fig. 7-1)

- 1) Remove the front panel and covers (upper, lower) according to item Section 2, 2-1 and 2-2.
- 2) Connect a power supply and press the power button to turn on.
- 3) Press the EJECT button.
- 4) Disconnect power supply.
- 5) According to item Section 2, 2-14, remove the cassette compartment assembly.
- 6) Place tape over the pin coming out of the push switch ①.
- 7) Place a cap ② over the LED assembly.
- 8) Press the lock holder ③ in the direction of arrow A.
- 9) Short-circuit the leaf switch ④ by clip ⑤, etc.
- 10) Connect power supply and press the power button to turn on.

##### 2. Putting into Playback State (See Fig. 7-1)

- 1) Perform the loading procedure in 1.
- 2) Place the rubber band ⑥ as shown between S reel and T reel sides.
- 3) Press the playback button, and when the T reel side starts to rotate, press the tension regulator arm assembly ⑦ in the direction of arrow B. (At this time, the tension regulator band is released and the S reel side rotates.)
- 4) Press the stop button to stop.

##### 3. Putting into Recording State (See Fig. 7-1)

- 1) Perform the loading procedure in 1.
- 2) Place a rubber band ⑥ as shown between the S reel and T reels.
- 3) Press the recording button, and when the T reel side starts to rotate, push the tension regulator arm assembly ⑦ in the direction of arrow B. (At this time, the tension regulator band is released and the S reel side rotates.)
- 4) Press the stop button to stop.

##### 4. Eject

- 1) Press the EJECT button.

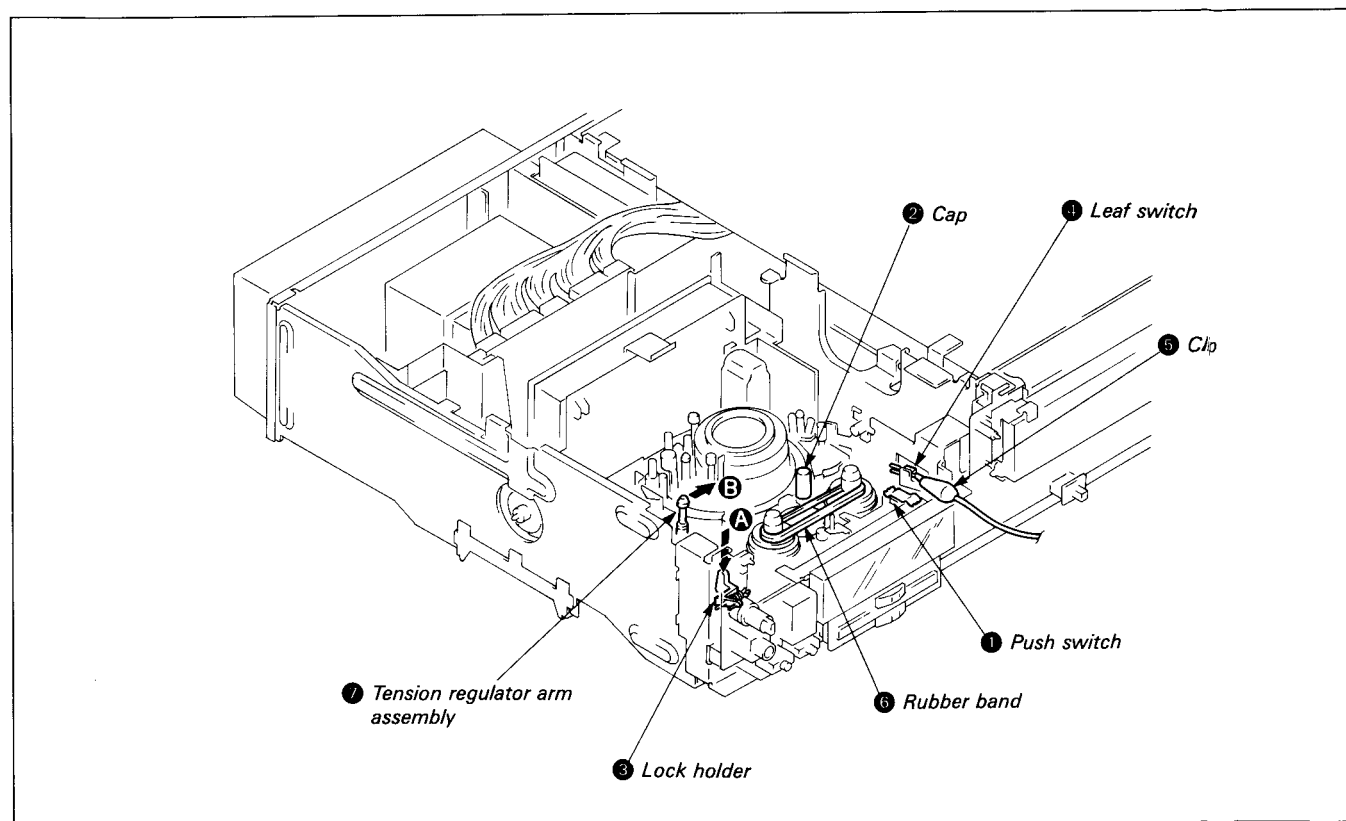


Fig. 7-1.

## 7-1-2. Handling of Mode Selector

### 1. Location of parts (External view)

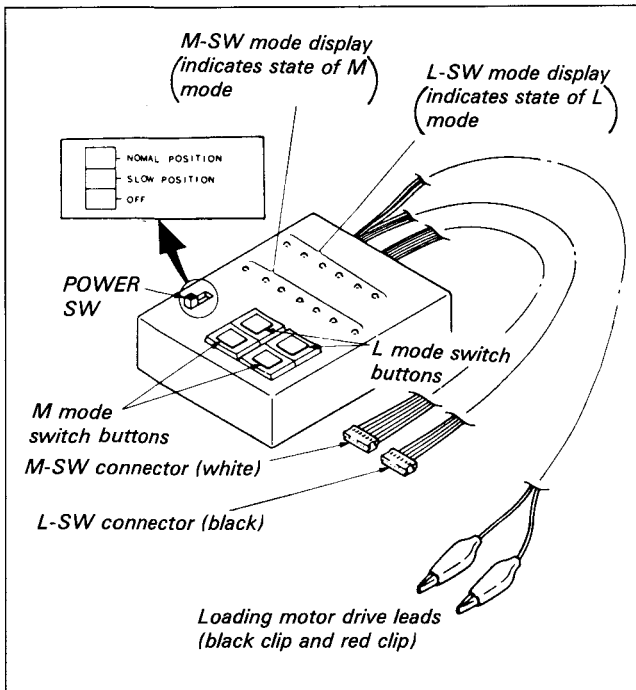


Fig. 7-2.

### 2. Connection (See Fig. 7-3.)

- 1) Remove the front panel and covers (upper, lower) according to item Section 2, 2-1 and 2-2.
- 2) According to item Section 2, 2-14, remove the cassette compartment assembly.
- 3) Remove the MS-4 board and LS-9 board connectors.
- 4) Insert the M-SW connector (6P connector, 6 harness, white) ① into the set MS-4 board.
- 5) Insert the L-SW connector (6P connector, 4 harness, black) ② into the set LS-9 board.
- 6) Connect the loading motor drive lead ③ red lead side to the loading motor red clip and the brown lead to the black clip.

### 3. Caution

- 1) When operating L-SW, be sure to set the M-SW mode to LOADING/UNLOADING.
- 2) When operating M-SW, be sure to set the L-SW mode to TOP or END.

## 4. Handling

BLANK lights up regardless of L MODE or M MODE when it is in neither mode during select.

### 1) L MODE

- When the L mode switch button right side is pressed continuously, the display lights up from LOADING TOP ⇒ LOADING END, in order from left to right.
- To go from LOADING END ⇒ LOADING TOP, press the left button continuously until the desired MODE is reached.
- In slow position, the L mode operates more slowly than for normal position.

### 2) M MODE

- Set L-SW to LOADING TOP before performing EJECT.
- Set L-SW to LOADING END to perform FF/REW ⇒ RVS or RVS ⇒ FF/REW.
- When the right M MODE switch button is pressed continuously, the display lights up from EJECT ⇒ RVS in order from left to right.
- To go from RVS ⇒ EJECT, press the left side switch button continuously until the desired MODE is reached.

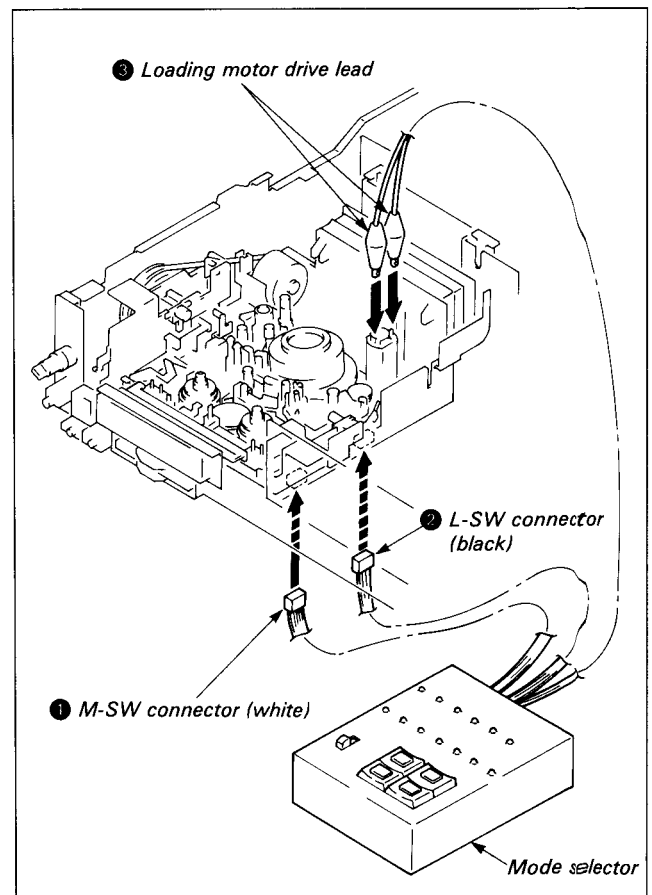
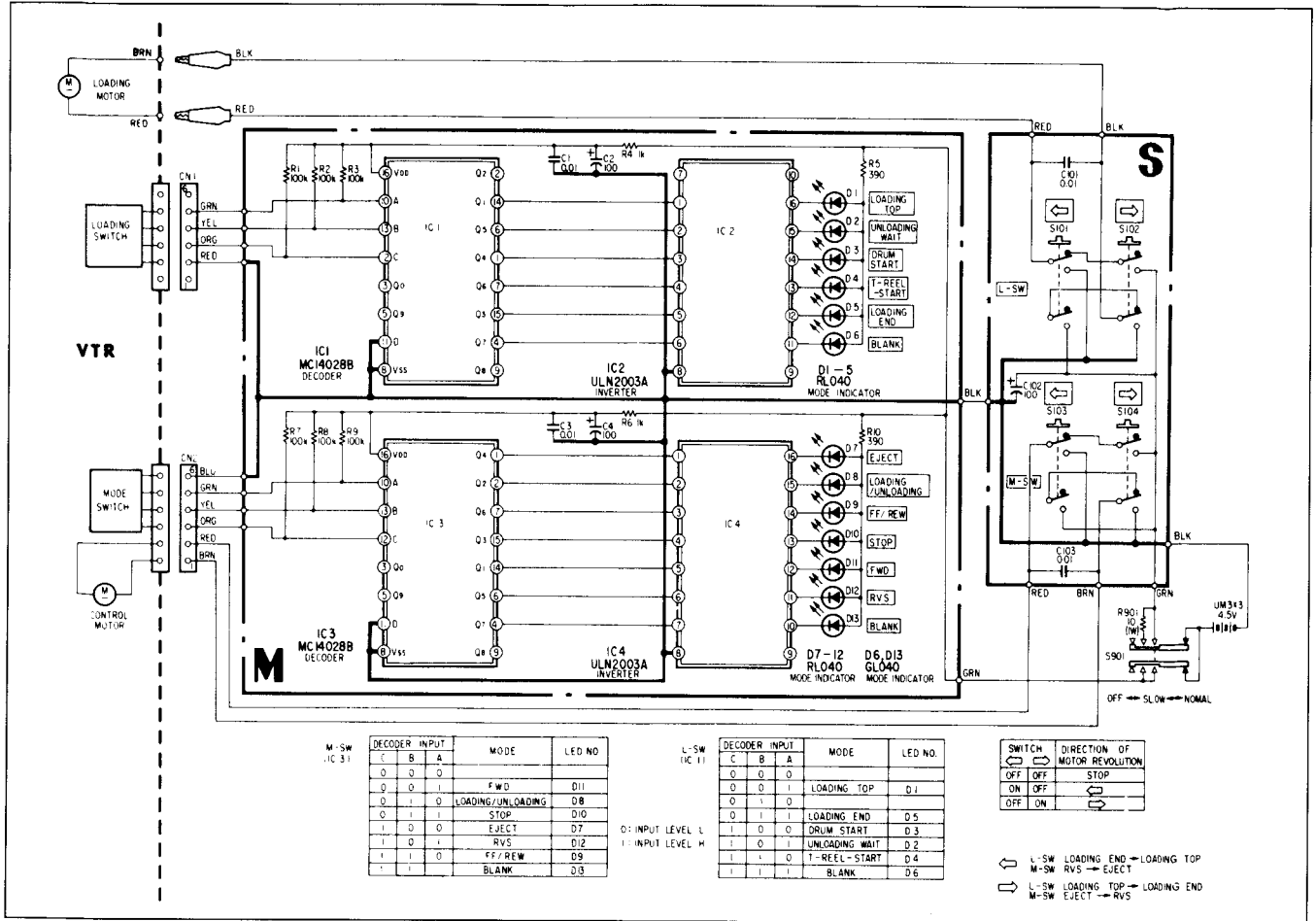


Fig. 7-3.

## 5. Mode Selector Schematic



## 6. Mode Selector Parts List

Symbol	Part No.	Part Name
<u>capacitors</u>		
C1	1-108-579-00	mylar 0.01 $\mu$ F 50V
C2	1-123-333-00	electrolytic 100 $\mu$ F 24V
C3	1-108-579-00	mylar 0.01 $\mu$ F 50V
C4	1-123-333-00	electrolytic 100 $\mu$ F 24V
C101	1-108-579-00	mylar 0.01 $\mu$ F 50V
C102	1-123-333-00	electrolytic 100 $\mu$ F 24V
C103	1-108-579-00	mylar 0.01 $\mu$ F 50V
<u>Diodes</u>		
D1	8-179-812-31	diode RL040
D2	8-179-812-31	diode RL040
D3	8-179-812-31	diode RL040
D4	8-179-812-31	diode RL040
D5	8-179-812-31	diode RL040
D6	8-719-812-33	diode GL040
D7	8-179-812-31	diode RL040
D8	8-179-812-31	diode RL040
D9	8-179-812-31	diode RL040
D10	8-179-812-31	diode RL040
D11	8-179-812-31	diode RL040
D12	8-179-812-31	diode RL040
D13	8-719-812-33	diode GL040
<u>resistor</u>		
R1	1-247-179-00	carbon 100K 1/4W
R2	1-247-179-00	carbon 100K 1/4W
R3	1-247-179-00	carbon 100K 1/4W
R4	1-247-131-00	carbon 1K 1/4W
R5	1-247-121-00	carbon 390 1/4W
R6	1-247-131-00	carbon 1K 1/4W
R7	1-247-179-00	carbon 100K 1/4W
R8	1-247-179-00	carbon 100K 1/4W
R9	1-247-179-00	carbon 100K 1/4W
R10	1-247-121-00	carbon 390 1/4W
R901	1-214-594-00	metal film 10 1W
<u>IC</u>		
IC1	8-759-240-28 IC	TC4028BP
IC2	8-759-120-03 IC	$\mu$ PA2003A
IC3	8-759-240-28 IC	TC4028BP
IC4	8-759-120-03 IC	$\mu$ PA2003A

## 7-2. PERIODIC CHECK AND MAINTENANCE

Please perform the following periodic checks and maintenance in order to obtain optimum set function and performance, and to keep the mechanism and tape in good condition. Also, perform the maintenance below after repair, regardless of the length of time the set has been used by the user.

### 7-2-1. Cleaning of Rotary Drum Assembly

- 1) Press a chamois cloth (Ref. No. J-2) soaked in cleaning fluid (Ref. No. J-1) lightly against the rotary drum assembly, and slowly rotate the rotary upper drum assembly counterclockwise by finger to clean.

**Note:** Do not use the power supply to rotate the motor, and do not rotate the drum clockwise by finger.

Also, there is a danger of damaging the head tip if the chamois cloth is moved vertically relative to the head tip, so please follow the instruction above for cleaning.

### 7-2-2. Cleaning of Tape Path (See Fig. 7-4)

- 1) Place the cassette compartment assembly in EJECT state, and clean the tape path (No. 1 ~ No. 11 guides, capstan shaft, pinch roller) with a chamois cloth soaked in cleaning fluid.

### 7-2-3. Cleaning of Drive System

- 1) Clean the drive system (timing belt, surface of reel tables) with a chamois cloth soaked in cleaning fluid.

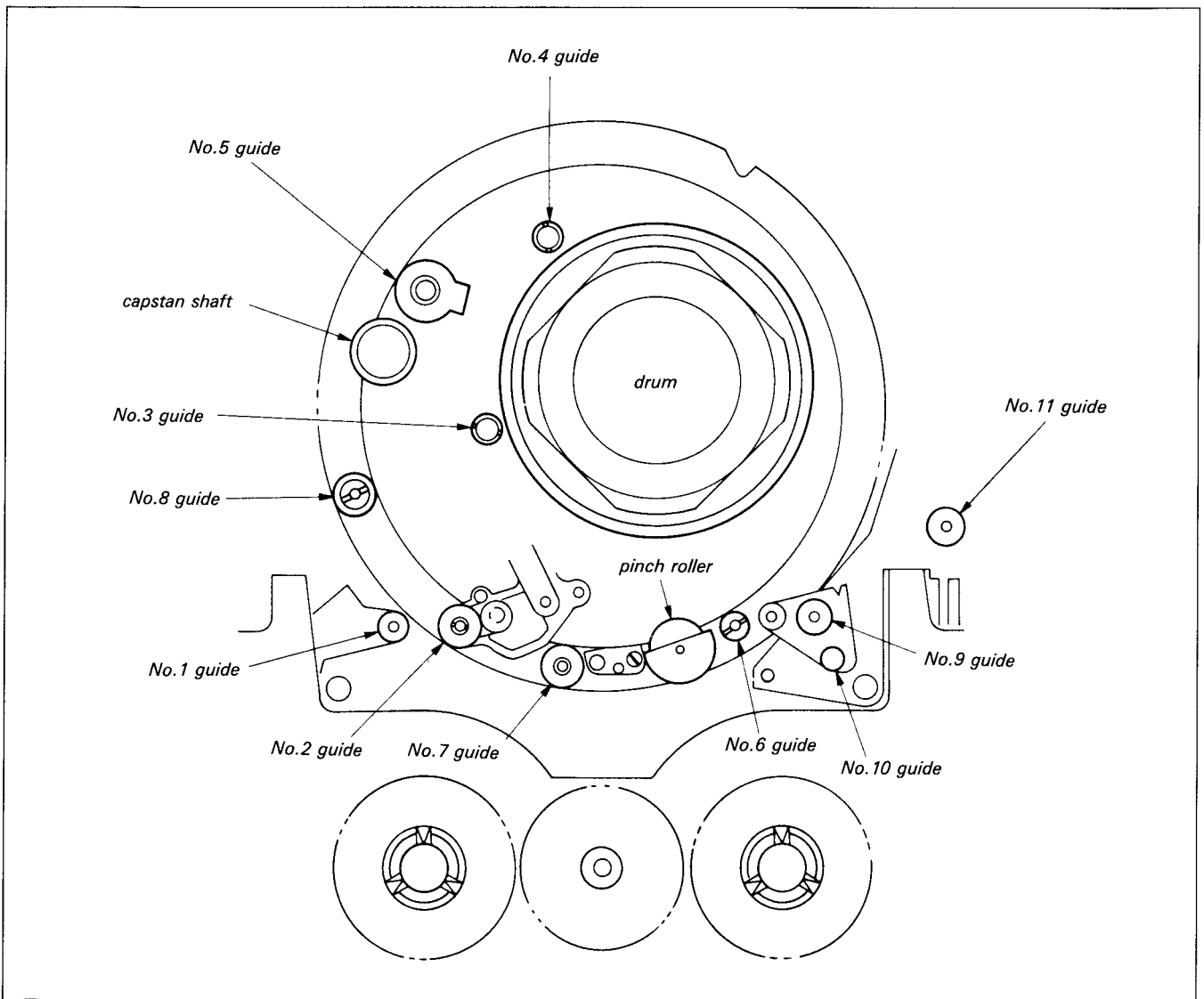


Fig. 7-4.



### 7-2-4. Periodic Check

Perform following according to number of hours of use.

○Cleaning    ◎Oiling    ★ Replacement    ☆ Checking

Location		Hours of Use (H)									Notes	
		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500		5,000
Tape Path	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary drum assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Drive System	L motor belt	○	○	○	○	○	○	○	★	○	○	3-686-546-01 Replace here, or every two years.
	Plunger solenoid	—	—	—	○	—	—	—	○	—	—	1-454-377-31
	Capstan shaft bearing	—	◎	—	◎	—	◎	—	◎	—	◎	Be careful not to get oil on the tape path surface.
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	A-7040-065-A
	Control motor	—	☆	—	☆	—	☆	—	☆	—	☆	8-835-110-01
	LS motor belt	○	○	○	○	○	○	○	★	○	○	3-713-670-01
	LS motor	—	☆	—	☆	—	☆	—	☆	—	☆	A-7090-661-A
	Reel motor	—	☆	—	☆	—	☆	—	☆	—	☆	A-7040-066-A
Performance Check	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD, RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

**Note:** When performing an overhaul, refer to the items above when replacing parts.

**Note:** Sony Oil

- Be sure to use Sony Oil. (There is a danger of trouble occurring if a different viscosity is used.)  
Sony Oil: Parts No. 7-661-018-01 (Mitsubishi Diamond oil Hydrofluid EP56)
- Be sure to use clean oil when lubricating the shaft bearing, because there is a danger of wear and burning if dirty oil is used.
- One drop of oil means the amount which sticks to a 2mm diameter rod, as shown in Fig. 7-5.

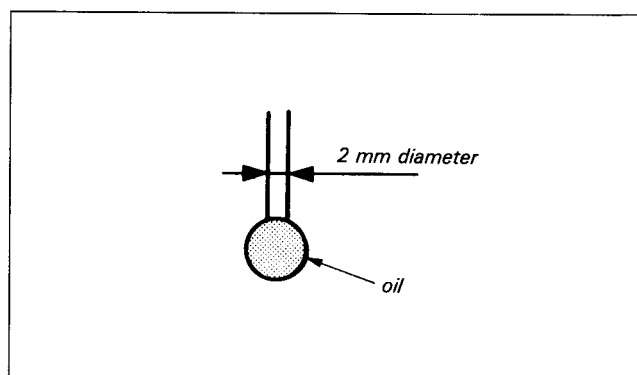

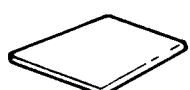
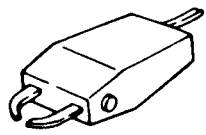
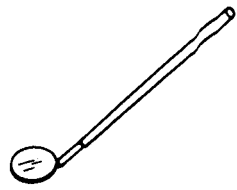
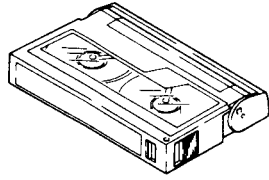
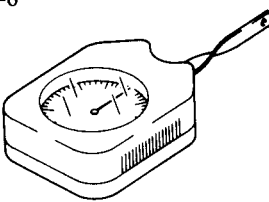
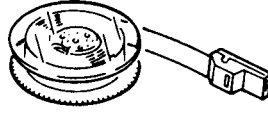
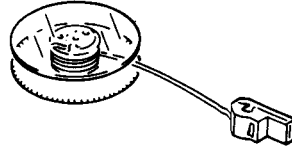
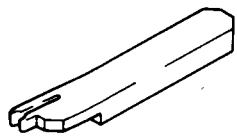


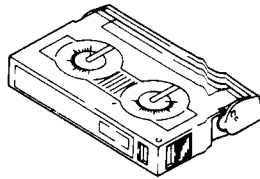
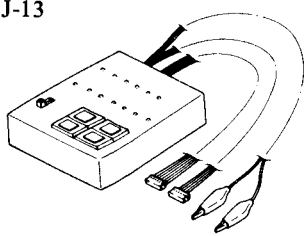
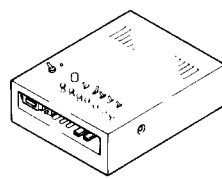
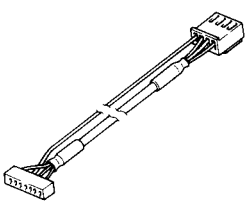
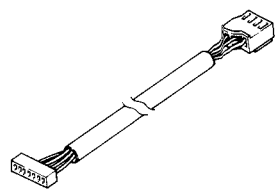


Fig. 7-5.

### 7-2-5. Service Jig Table

Ref. No.	Name	Part No.	Jig	Use, Notes
J-1	Cleaning fluid	Y-2031-001-1	_____	
J-2	Chamois cloth	2-034-697-00	_____	
J-3	Head degausser	Commercially sold	_____	
J-4	Small adjustment mirror, spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-5	Alignment tape (WR5-1C)	8-967-995-06		Tape path
J-6	Dial tension gauge	J-6080-827-A		torque measurement
J-7	Tension measurement reel	J-6080-831-A		with $\phi 30$ tape
J-8	Tension measurement reel	J-6080-832-A		with $\phi 16$ string
J-9	No. 10 gear phase jig	J-6080-823-A	GD-2047	
J-10	Rotary drum jig	(packed with the repair rotary upper drum)		
J-11	No. 6 guide lock jig	J-6080-826-A		
J-12	FWD, RVS take-up torque cassette	J-6080-824-A	GD-2089	
J-13	Mode selector	J-6080-825-A		for all models
J-14	TRACK SHIFT & MONITOR JIG	J-6080-851-A		Tape path
J-15	RF/SWP connector	J-6080-883-A		Tape path
J-16	CTL connector	J-6080-884-A		Tape path

Other equipment: Oscilloscope  
Analog tester (20k $\Omega$ )

J-1 	J-2 	J-3 	J-4 
J-5 	J-6 	J-7 	J-8 
J-9 	J-10 (Packed with repair use rotary upper drum) 	J-11 	J-12 
J-13 	J-14 	J-15 	J-16 

### 7-3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

**Note:** Use the mode selector (Ref. No. J-13) for this mechanical check, adjustment and replacement.

The mode inside the  is the mode set by pressing the mode selector button.

#### 7-3-1. S Reel Table Assembly (See Fig. 7-6.)

##### 1. Removal

- 1) Remove the cassette compartment assembly according to item Section 2, 2-14.
- 2) Set to **FF/REW** mode.
- 3) Remove screw ① and reel table stopper ②.
- 4) Remove the S reel table assembly ③.

**Note:** Be sure to hold the upper reel hook when removing.

##### 2. Mounting

- 1) Place a half drop of oil on the spindle ④ upper surface.
- 2) Move the S main brake assembly, ⑤ in the direction of arrow.
- 3) Mount the S reel table assembly ③, being careful not to hit the tension regulator band assembly ⑥.
- 4) Mount the reel table stopper ② and tighten with screw ①.
- 5) Set to **LOADING/UNLOADING** mode.
- 6) Mount the cassette compartment assembly by following the procedure in item Section 2, 2-14. in reverse.

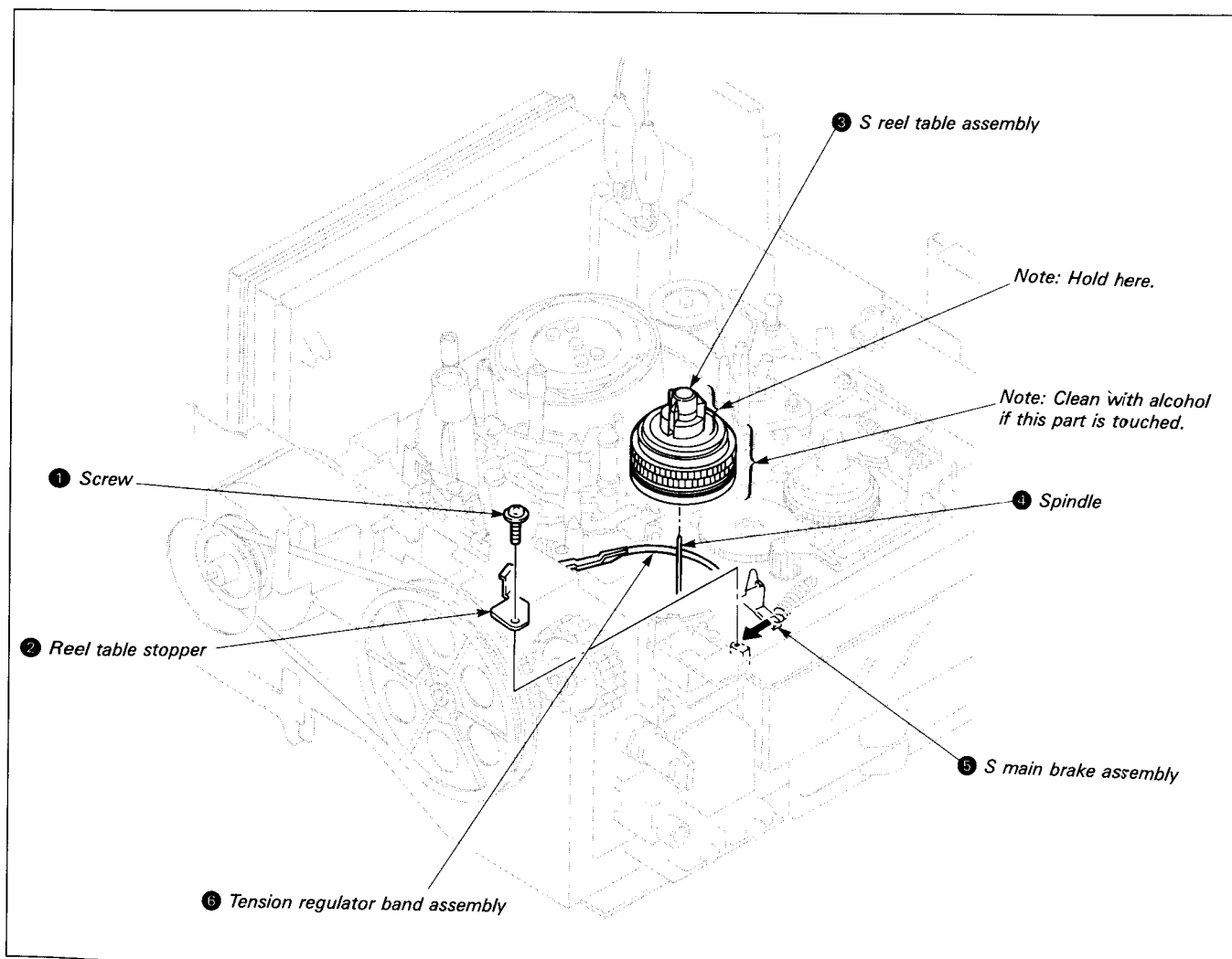


Fig. 7-6.

### 7-3-2. T Reel Table Assembly (See Fig. 7-7.)

#### 1. Removal

- 1) Remove the cassette compartment assembly according to item Section 2, 2-14.
- 2) Set to **UNLOADING WAIT** mode.
- 3) Place the spring ② on the T.S brake assembly ① on the hook on the lock slider assembly.
- 4) Remove the stopper washer ③ and the T soft brake assembly ①.
- 5) Set to **EJECT** mode.
- 6) Move drive gear (B) assembly ④ in the direction of arrow.
- 7) Remove T reel table assembly ⑤.

**Note:** Be sure to hold the upper reel hook when removing.

#### 2. Mounting

- 1) Place a half drop of oil on the spindle ⑥ upper surface.
- 2) Move the drive gear (B) assembly ④ in the direction of arrow. (Check **EJECT** mode.)
- 3) Mount the T reel table assembly ⑤.
- 4) Mount the T soft brake assembly ① and the stopper washer ③.
- 5) Place the spring ② on the T.S brake assembly ① hook.
- 6) Set to **LOADING TOP**, **LOADING/UNLOADING** mode.
- 7) Mount the cassette compartment assembly by following the procedure in item Section 2, 2-14. in reverse.

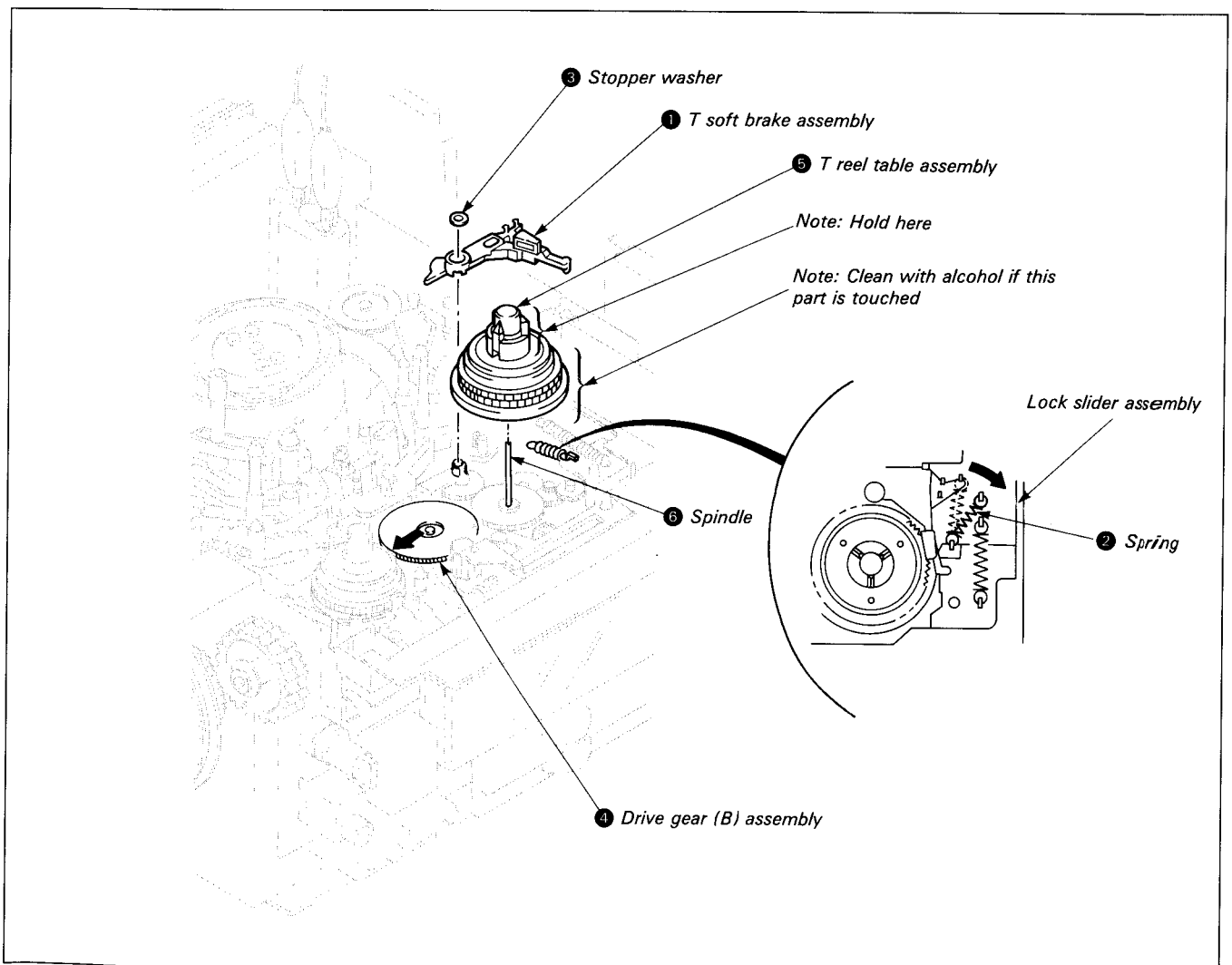


Fig. 7-7.

### 7-3-3. Pinch Press Arm Assembly (See Fig. 7-8)

#### 1. Removal

- 1) Remove the cassette compartment assembly according to item Section 2, 2-14.
- 2) Place the spring ① on the pinch press arm assembly ②.
- 3) Remove the stopper washer ③ and the pinch press arm assembly ②.

#### 2. Mounting

- 1) Place a half drop of oil on shaft ④.
- 2) Mount the pinch press arm assembly ② and the stopper washer ③.
- 3) Place the spring ① on the tension regulator spring hook assembly ⑤.
- 4) Mount the cassette compartment assembly by following the procedure in item Section 2, 2-14. in reverse.

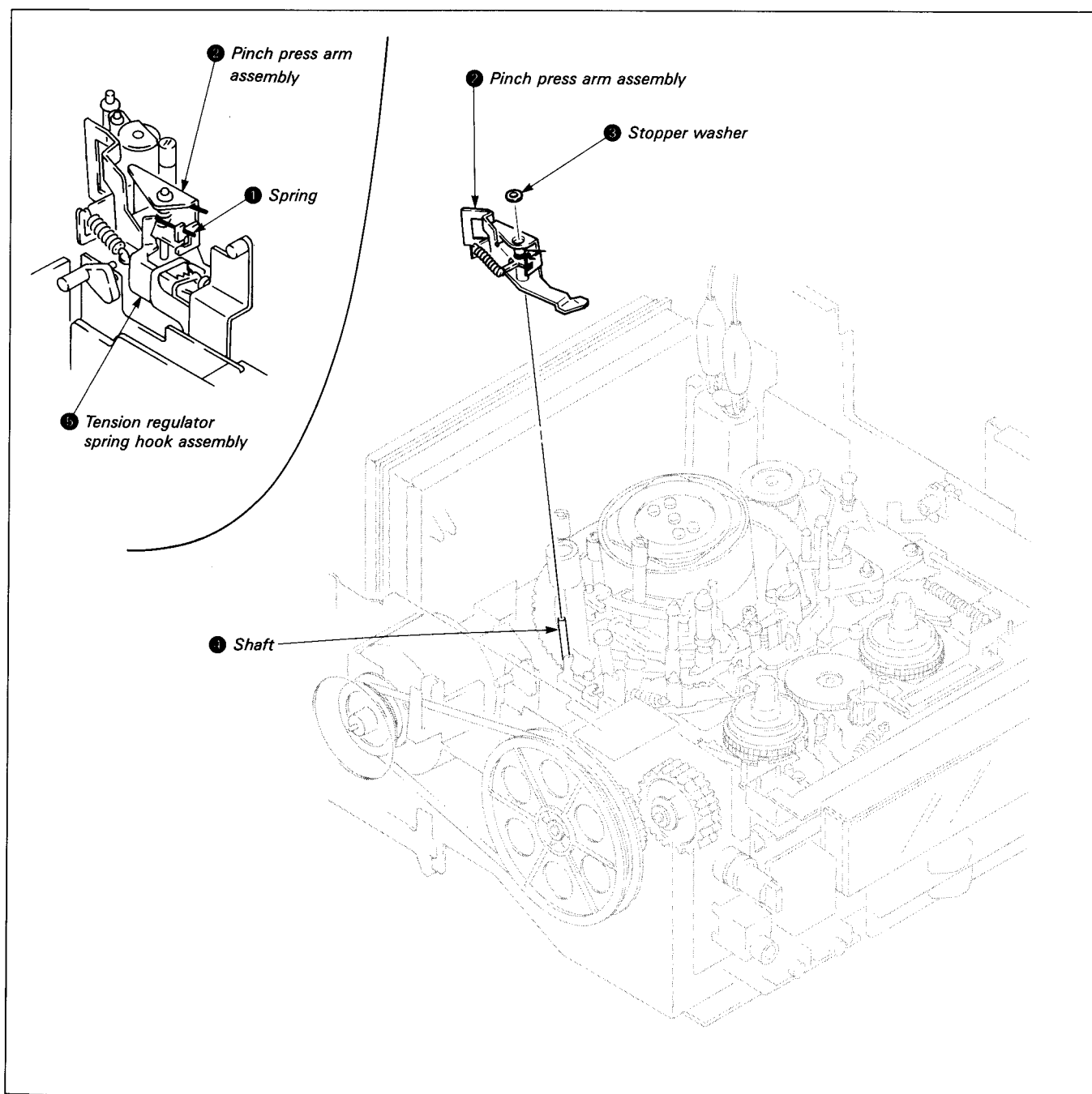


Fig. 7-8.

### 7-3-4. Tension Regulator Arm Assembly (See Fig. 7-9.)

#### 1. Removal

- 1) Remove the cassette compartment assembly according to item Section 2, 2-14.
- 2) Remove the mechanism as described in item Section 2, 2-15.
- 3) Remove the LS motor belt ①.
- 4) Remove the Four screws ②, and then move the Front base ③ in the direction of arrow.
- 5) Change the spring position as described in 7-3-3. 1. Removal, 2). (See Fig. 7-8.)
- 6) Remove tension spring ④. (Note its position.)
- 7) Remove screw ⑤ and the tension regulator spring hook assembly ⑥.
- 8) Set to **FF/REW** mode.
- 9) Remove the tension regulator band assembly hook ⑦.
- 10) Remove the tension regulator arm assembly ⑧.

#### 2. Mounting

- 1) Place a half drop of oil on the spindle ⑨.
- 2) Mount the tension regulator arm assembly ⑧, placing the tension regulator load arm assembly pin ⑩ in the tension regulator arm assembly ⑧ cam groove (on the back).
- 3) Mount the tension regulator band assembly hook ⑦. (Do not touch the band or change its shape.)
- 4) Set to **LOADING/UNLOADING** mode.
- 5) Mount the tension regulator spring hook assembly ⑥ and tighten with screw ⑤.
- 6) Replace tension spring ④ in its original position and lock the screws.
- 7) Position the spring according to item 7-3-3, 2. Mounting, 3). (See Fig. 7-8.)
- 8) Mount the Front base ③, and then tighten with four screws ②.
- 9) Mount the LS motor belt ①.
- 10) Mount the mechanism by following the procedure in Section 2, 2-15. in reverse.
- 11) Mount the cassette compartment assembly by following the procedure in item Section 2, 2-14. in reverse.

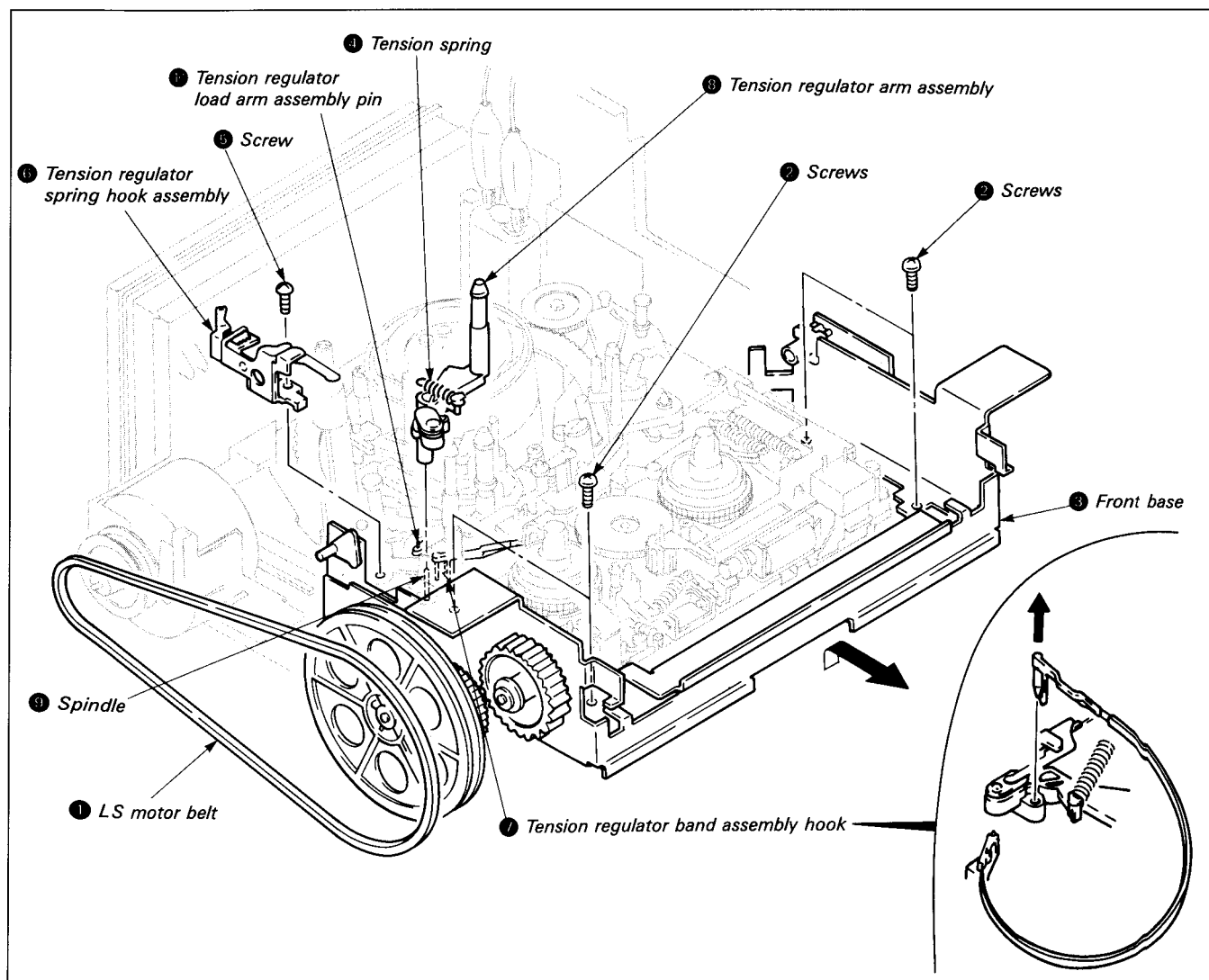


Fig. 7-9.

### 7-3-5. Tension Regulator Band Assembly (See Fig. 7-10.)

#### 1. Removal

- 1) Remove the S reel table assembly according to item 7-3-1, 1. Removal. (See Fig. 7-6.)
- 2) Remove the band arm hook ①.
- 3) Remove hook ② and the tension regulator band assembly ③.

#### 2. Mounting

- 1) Mount the tension regulator band assembly ③. (Do not touch the band or change its shape.)
- 2) Fit on the band arm hook ①.
- 3) Mount the S reel table assembly according to 7-3-1, 2. Mounting. (See Fig. 7-6.)
- 4) Perform 7-3-21. FWD Back Tension Adjustment.

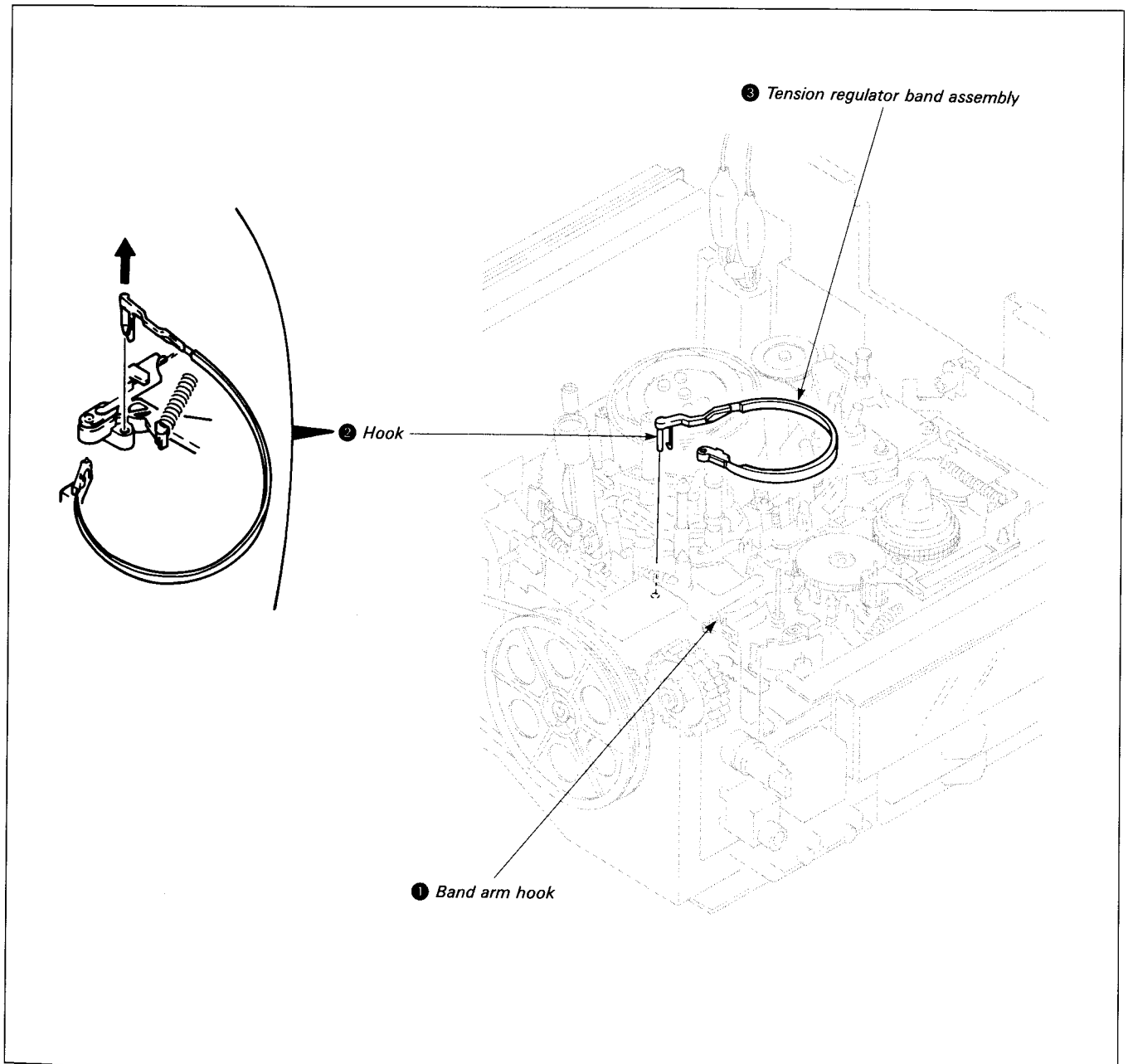


Fig. 7-10.

### 7-3-6. Loading Motor Assembly (See Fig. 7-11.)

#### 1. Removal

- 1) Connect a power supply and press the push button to turn on.
- 2) Press the EJECT button.

**Note:** Disconnect the power supply after being set to EJECT state.

- 3) Open the SP-2 board ① according to item Section 2, 2-6.
- 4) Remove connector ② from SP-2 board ①.
- 5) Remove L motor belt ③.
- 6) Remove the two screws ④.
- 7) Remove the claw ⑤ and the loading motor assembly ⑥.

#### 2. Mounting

- 1) Mount the loading motor assembly ⑥ and tighten the two screws ④.
- 2) Mount L motor belt ③.
- 3) Connect connector ② to SP-2 board ①. (See Fig. 3-6)
- 4) Mount SP-2 board ① by following the procedure in item Section 2, 2-6. in reverse.

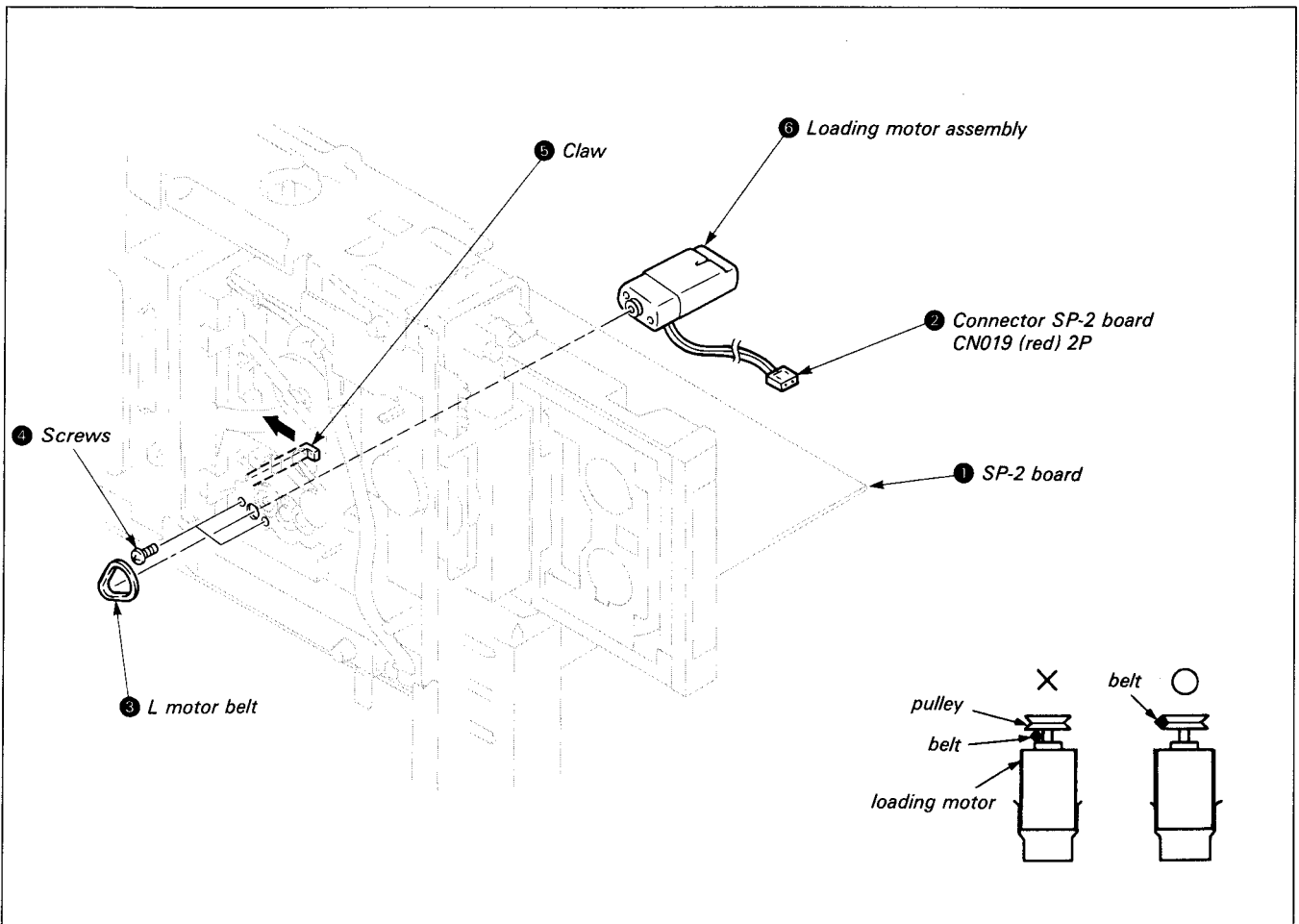


Fig. 7-11.



### 7-3-7. Loading Ring Assembly (See Fig. 7-12, 13.)

#### 1. Removal

- 1) Remove the mechanism as described in item Section 2, 2-15.
- 2) Remove the cassette compartment assembly according to item Section 2, 2-14.
- 3) Operate the mode selector, and move the guide base assembly ① until just before lock, and the entrance guide assembly ② until just before lock where the ring stopper ③ screw is visible. (Do not move loading ring assembly ⑪.)

- 4) Remove the stopper washer ④ and remove No. 10 gear assembly ⑤.
- 5) Remove screw ⑥ and the roller retainer ⑦ and ring roller ⑧.
- 6) Remove the two screws ⑨ and the ring stopper ③ and ring roller ⑩.
- 7) Remove the loading ring assembly ⑪ as shown by arrow. (See Fig. 7-12.)

**Note:** Be careful that the loading ring assembly ⑪ does not touch the drum when it is removed.

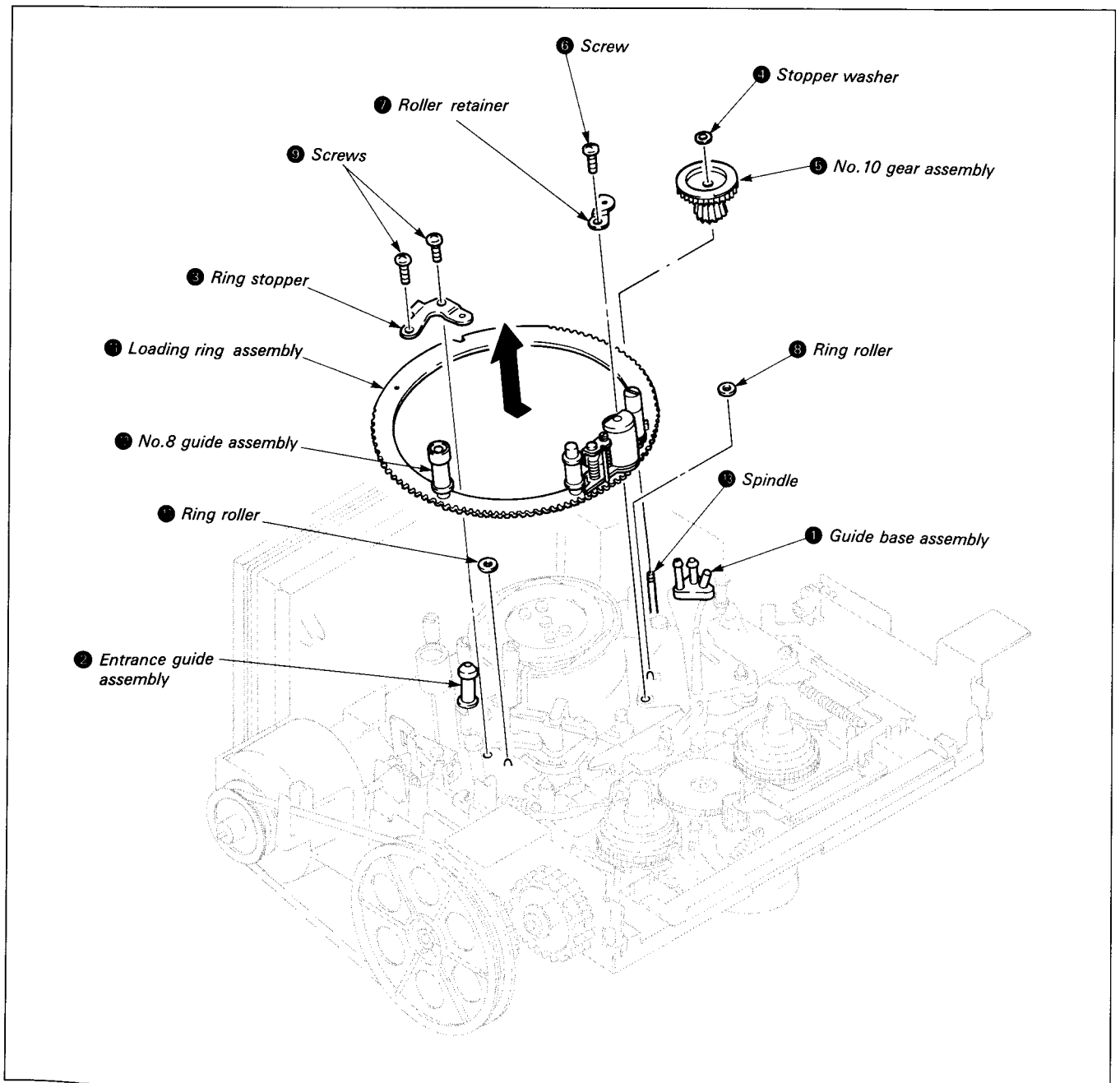


Fig. 7-12.

## 2. Mounting

- 1) Mount the loading ring assembly ① so that it is in unthreaded state (pinch roller arm assembly is on the front panel side). (Check that it is in the state in step 3) under Removal.)
- 2) Mount the ring roller ② and ring stopper ③ and tighten with the two screws ④. (No. 8 guide assembly ⑫ should be closer to the front panel than the ring stopper ③.)
- 3) Mount the ring roller ⑧ and roller retainer ⑦ and tighten with screw ⑥. (Check that the loading ring assembly matches the three ring spacers.)
- 4) Place a half drop of oil on the spindle ⑬. (See Fig. 7-12.)
- 5) Check that the protrusions on the drive changer assembly are in the indentations of the L-SW assembly and insert the No. 10 gear phase jig (Ref. No. J-9). (See Fig. 7-13.)
- 6) Mount No. 10 gear assembly ⑤ and stopper washer ④ while pushing the No. 8 guide assembly ⑫ against the ring stopper ③.
- 7) Pull out the No. 10 gear phase jig.
- 8) Set to **LOADING TOP** mode. (See Fig. 7-12.)
- 9) Mount the mechanism by following the procedure in Section 2, 2-15. in reverse.
- 10) Mount the cassette compartment assembly by following the procedure in item Section 2, 2-14. in reverse.

**Note:** Be sure to perform 7-4. Tape Path Adjustment after mounting.

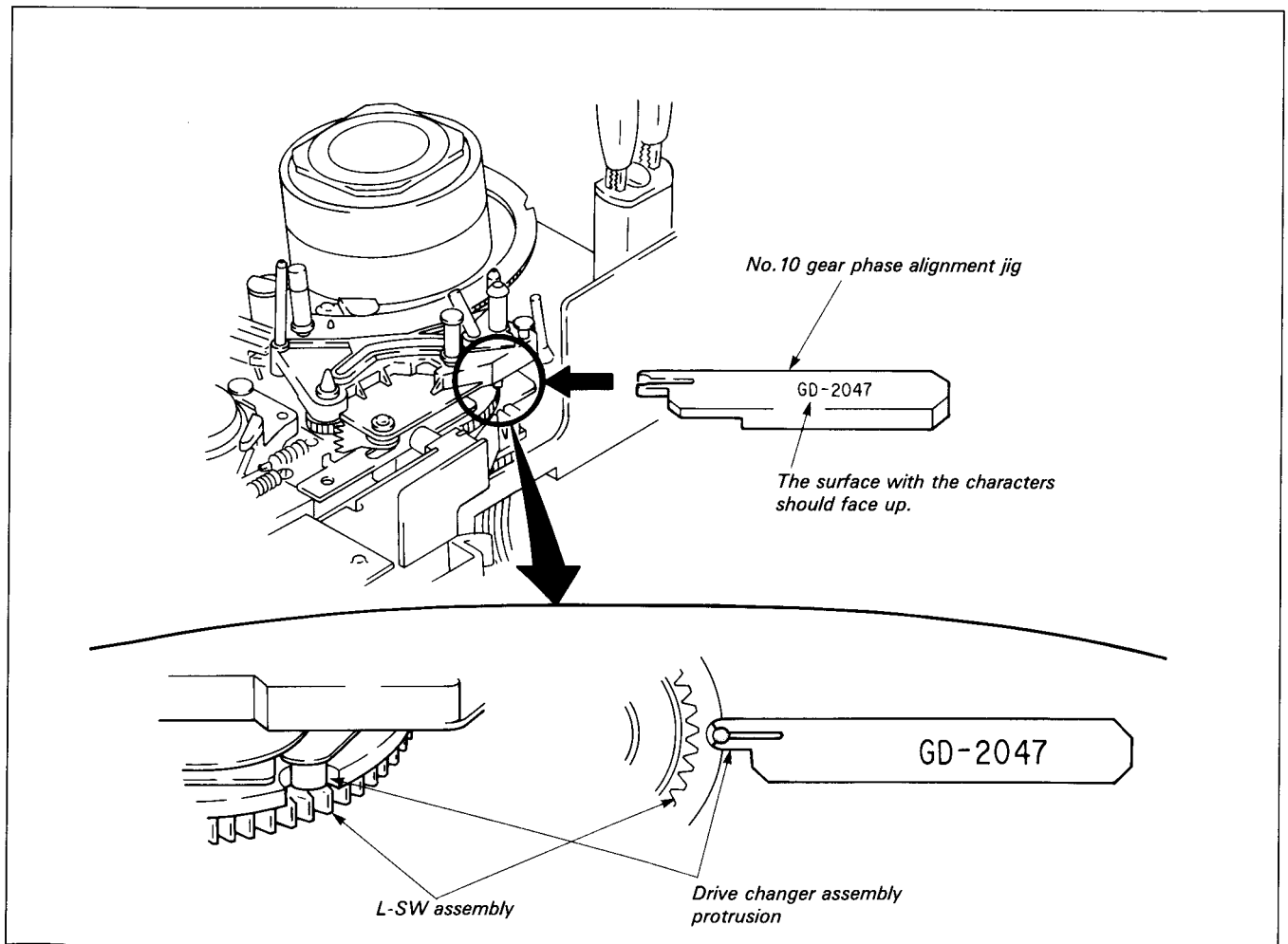


Fig. 7-13.

### 7-3-8. Pinch Roller Assembly (See Fig. 7-14. ~ 25.)

#### 1. Removal

- 1) Remove the loading ring assembly as described in 7-3-7., 1. Removal. (See Fig. 7-12.)
- 2) Remove stopper washer ①. (See Fig. 7-14.)
- 3) Change the position of the torsion spring ③ on No. 7 guide assembly ②. (See Fig. 7-15.)
- 4) Rotate pinch roller arm assembly ④ in the direction of arrow. (See Fig. 7-16.)
- 5) Remove pinch roller arm assembly ④ in the direction of arrow. (See Fig. 7-17.)
- 6) Remove torsion spring ③. (See Fig. 7-18.)

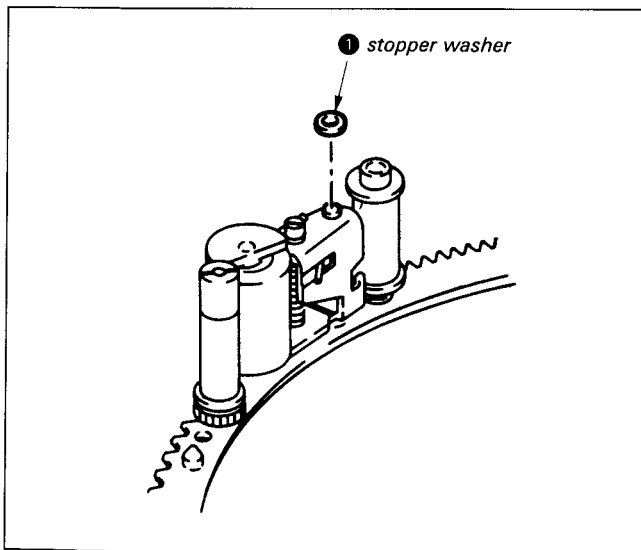


Fig. 7-14.

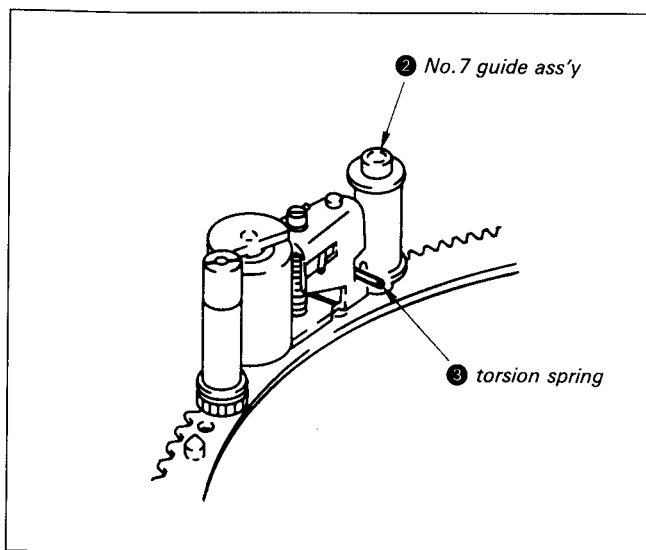


Fig. 7-15

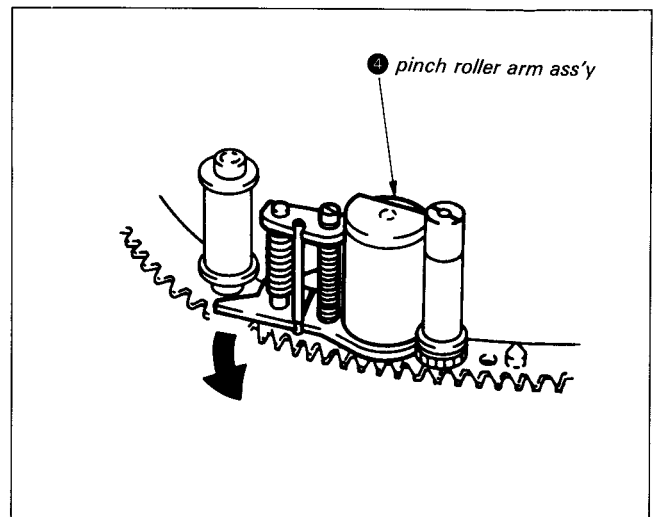


Fig. 7-16.

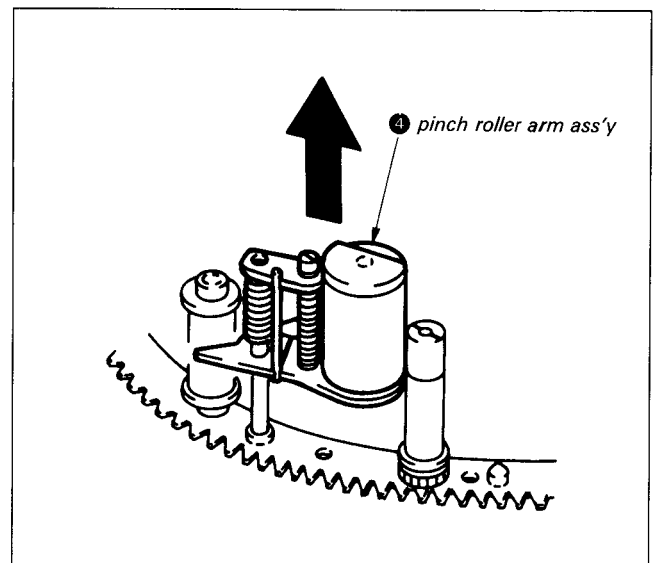


Fig. 7-17.

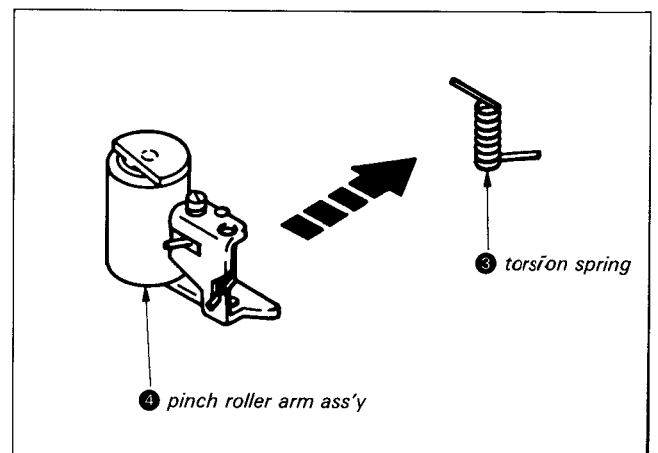


Fig. 7-18.

## 2. Mounting

- 1) Position torsion spring ③. (See Fig. 7-19.)
- 2) Insert the end of a paper clip ⑤ or other thin rod inside the pinch roller arm assembly hole ⑥. (See Fig. 7-20, 7-21.)
- 3) Push the end of the clip ⑤ through to contact the loading ring assembly shaft ⑦ and mount the pinch roller arm assembly ④. (See Fig. 7-22, 7-23.)
- 4) Place the spring on No. 7 guide assembly ②. At this time, check that the spring is hooked on section A. (See Fig. 7-24.)
- 5) Mount the stopper washer ①. (See Fig. 7-25.)
- 6) Mount the loading ring assembly according to 7-3-7., 2. Mounting. (See Fig. 7-12, 7-13)

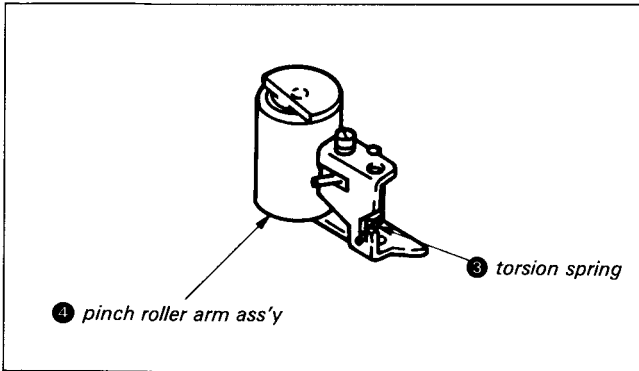


Fig. 7-19.

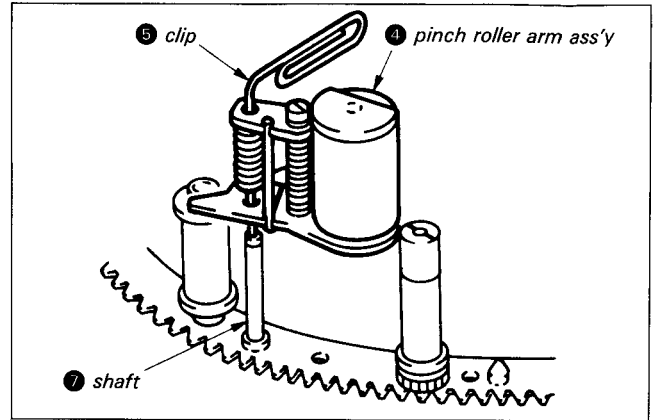


Fig. 7-22.

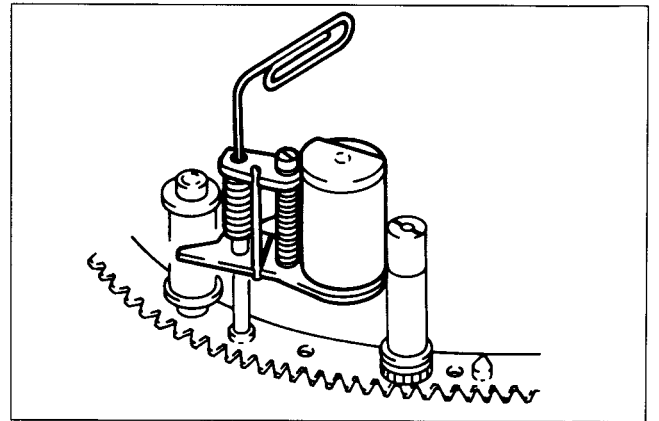


Fig. 7-23.

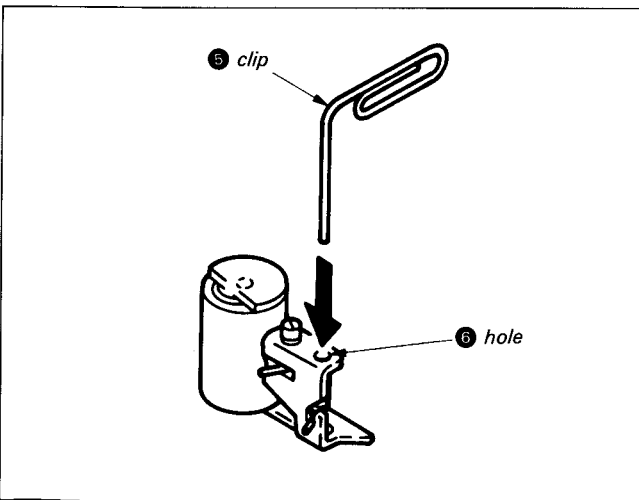


Fig. 7-20.

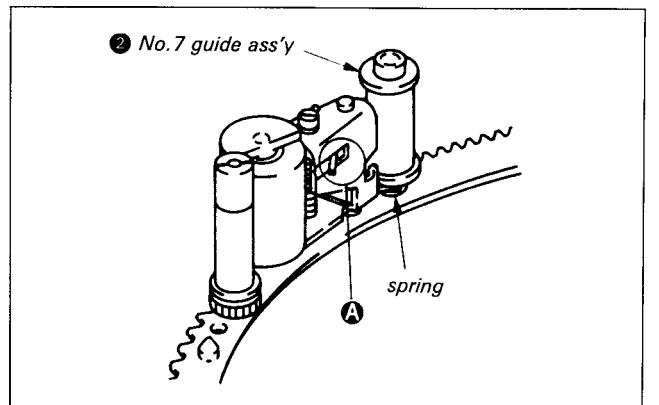


Fig. 7-24.

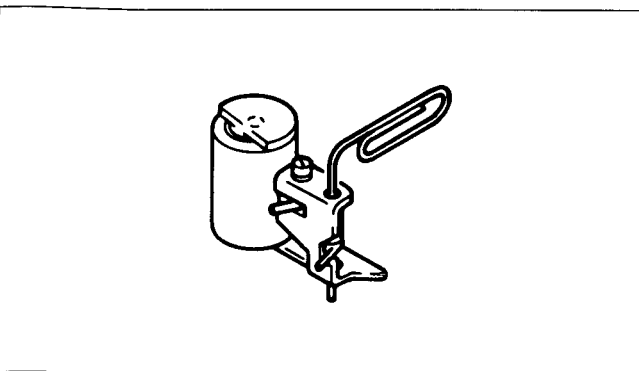


Fig. 7-21.

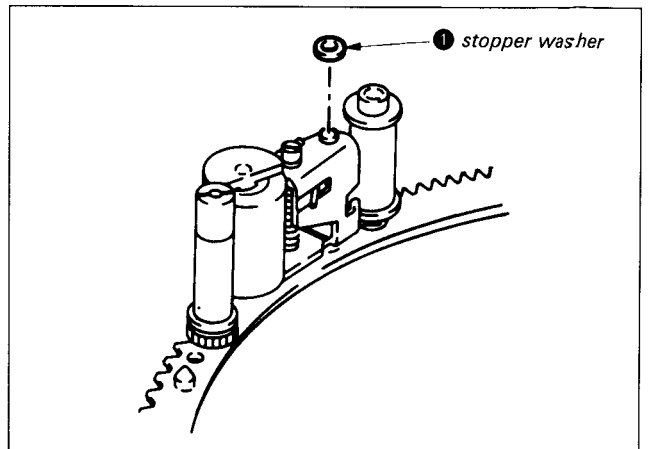


Fig. 7-25.

**7-3-9. Slant Guide Assembly (See Fig. 7-26 ~ 28.)**

**1. Removal**

- 1) Remove the loading ring assembly according to 7-3-7., 1. Removal. (See Fig. 7-12.)
- 2) Remove screw ① and E ring ②.
- 3) Remove the slant guide assembly ③. (See Fig. 7-26.)

**2. Mounting**

- 1) Operate the mode selector, and line up the right edge of the L slider assembly and the right edge of the lock slider assembly. (See Fig. 7-27.)

- 2) Set the slant guide assembly guide base assembly in unthreaded state (guide base assembly is on front panel side) and mount. (See Fig. 7-28.)

**Note:** At this time, confirm the engagement position of the slant guide drive gear and L slider assembly gear. (See Fig. 7-32.)

- 3) Mount the E ring ② and tighten screw ①. (See Fig. 7-26.)
- 4) Put in the state in 7-3-7., 1. Removal, 3).
- 5) Mount the loading ring assembly according to 7-3-7., 2. Mounting (See Fig. 7-12, 7-13.)

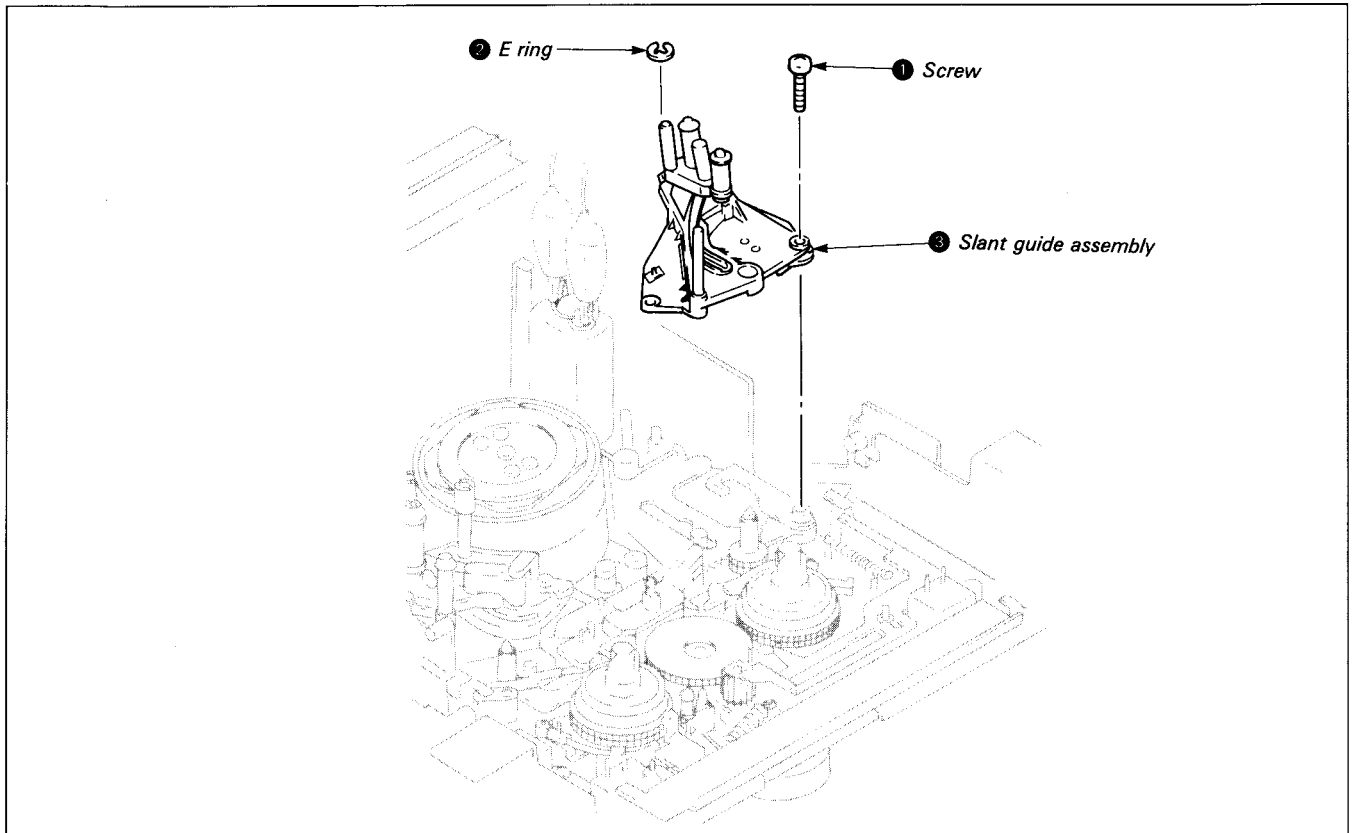


Fig. 7-26.

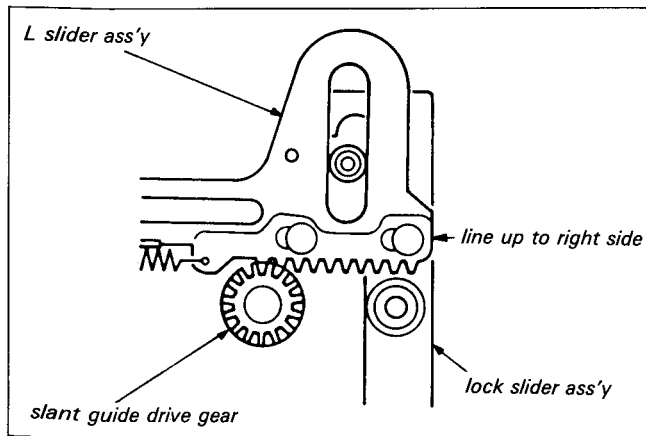


Fig. 7-27.

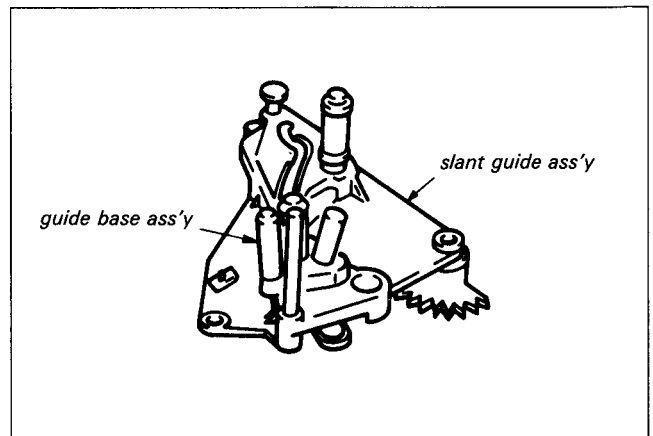


Fig. 7-28.

**7-3-10. Entrance Guide (P) Assembly  
(No. 2 Guide Assembly) (See Fig. 7-29.)**

**1. Removal**

- 1) Remove the cassette compartment assembly according to item Section 2, 2-14.
- 2) Turn the rotary upper drum counterclockwise and separate the head portion from the entrance guide (P) assembly ①.
- 3) Remove the two screws ②.
- 4) Remove No. 3 guide nut ③, and remove guide flange ④, guide ⑤ and compression spring ⑥.
- 5) Remove the entrance guide assembly ①.

**2. Mounting**

- 1) Engage the entrance guide (P) assembly and L slider assembly so that the part without teeth **A** on the bottom of the entrance guide (P) assembly and the part without teeth **B** on the L slider assembly match.
- 2) Mount the compression spring ⑥, guide ⑤ and guide flange ④ in that order, then temporarily tighten the guide nut ③.
- 3) Tighten the two screws ②.
- 4) Mount the cassette compartment assembly by following the procedure in item Section 2, 2-14. in reverse.

**Note:** Be sure to perform 7-4. Tape Path Adjustment after mounting.

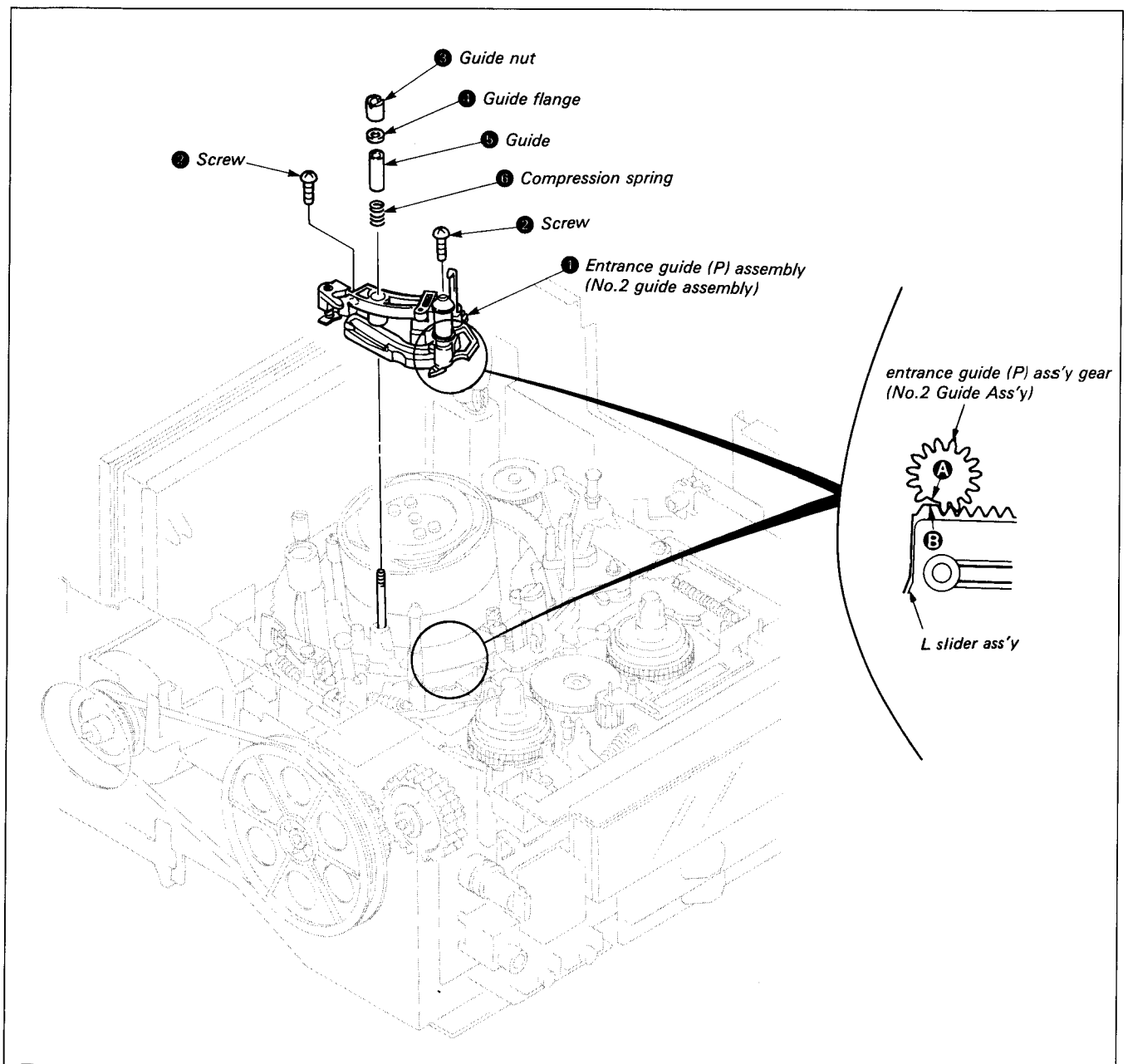


Fig. 7-29.

### 7-3-11. L Slider Assembly (See Fig. 7-30. ~ 32.)

#### 1. Removal

- 1) Remove the slant guide assembly according to 7-3-9., 1. Removal.
- 2) Remove the entrance guide (P) assembly according to 7-3-10., 1. Removal.
- 3) Set to **DRUM START** mode.
- 4) Remove slant guide drive gear ①.
- 5) Remove the tension regulator load arm assembly ② pin from the cam groove of the tension regulator arm assembly. (Refer to 7-3-4. Tention Regulator Arm Assembly.)
- 6) Remove the two stopper washers ③.
- 7) Remove the L slider assembly ⑤ while pushing the RL arm assembly protrusion ④ in the direction of arrow.
- 8) Remove the stopper washer ⑥ and the tension regulator load arm assembly ②.

#### 2. Mounting

- 1) Lubricate the portions indicated in Fig. 7-31.
- 2) Mount the tension regulator load arm assembly ② and the stopper washer ⑥.
- 3) Mount the L slider assembly ⑤ while pushing the RL arm assembly protrusion ④ in the direction of arrow.
- 4) Put the tension regulator load arm assembly ② pin into the M slider groove. (Refer to 7-3-15. M slider)
- 5) Mount the two stopper washers ③.
- 6) Refer to 3-4, 2. Mounting, 2), and place the tension regulator load arm assembly ② pin in the tension regulator arm assembly cam groove.
- 7) Operate the mode selector, and match up the right edge of the L slider assembly and the right edge of the lock slider assembly. (Refer to 7-3-9, 2. Mounting, 1)
- 8) Engage the slant guide drive gear so that the notch is 1 tooth away from the L slider assembly left side tooth. (See Fig. 7-32.)
- 9) Mount the entrance guide (P) assembly according to 7-3-10., 2. Mounting.
- 10) Mount the slant guide assembly according to 7-3-9., 2. Mounting.

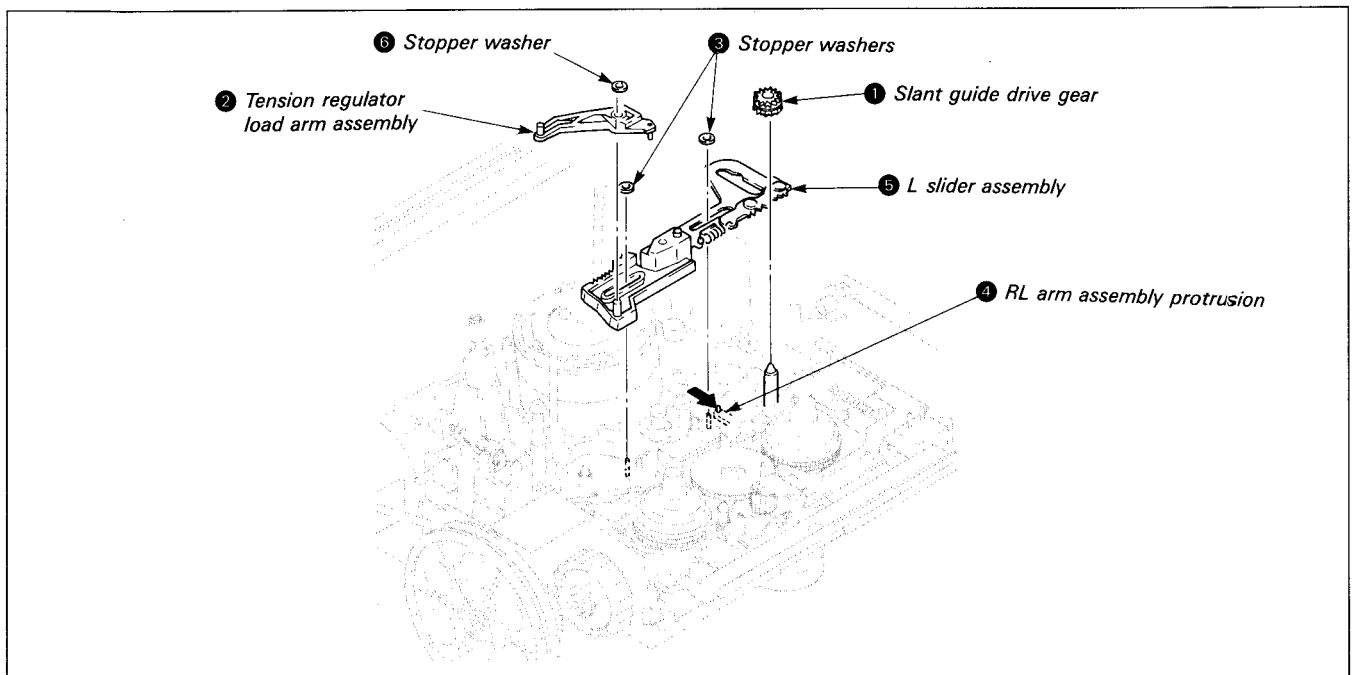


Fig. 7-30.

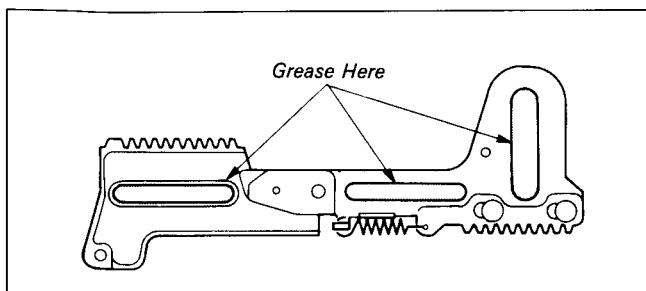


Fig. 7-31.

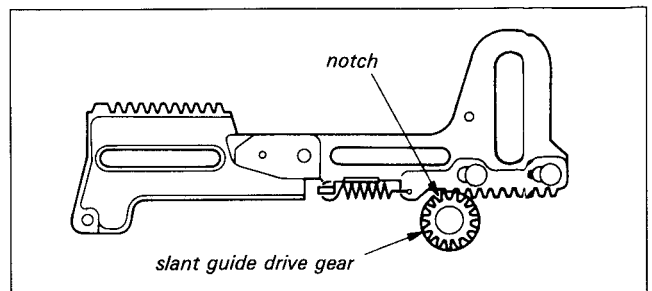


Fig. 7-32.

### 7-3-12. L-SW Assembly (See Fig. 7-33 ~ 35.)

#### 1. Removal

- 1) Remove the L slider assembly according to 7-3-11., 1. Removal.
- 2) Remove lock slider retainer ①.
- 3) Remove screw ② and lock slider A ③.
- 4) Remove stopper washer ④ and torsion spring ⑤.
- 5) Remove drive changer assembly ⑥.
- 6) Remove connector ⑦.
- 7) Remove the two screws ⑧ and the L-SW assembly ⑨.

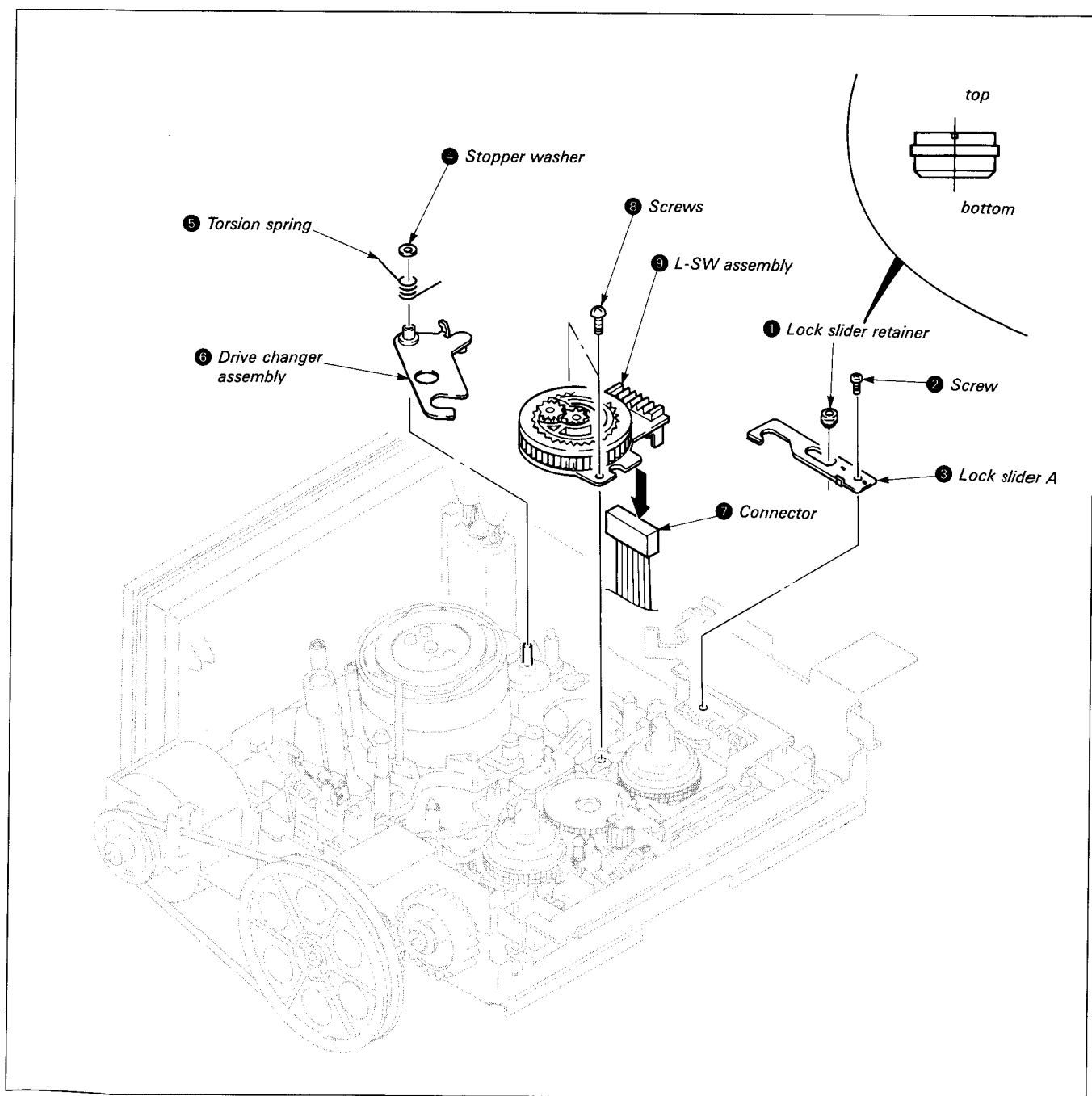


Fig. 7-33.



## 2. Mounting

- 1) Place a half drop of oil on the L-SW assembly ⑨ spindle (planetary gear).
- 2) Mount L-SW assembly ⑨ and tighten with the two screws ⑧.
- 3) Connect connector ⑦.
- 4) Operate the mode selector and check that the L-SW assembly ⑨ rotates.
- 5) Place a half drop of oil on spindle ⑩.
- 6) Grease the drive change assembly ⑥ as shown in Fig. 7-34.
- 7) Mount the drive changer assembly ⑥.
- 8) Mount the torsion spring ⑤ and the stopper washer ④.
- 9) Operate the mode selector and check that the L-SW assembly ⑨ rotates.
- 10) Mount lock slider A ③ and tighten screw ②.
- 11) Mount lock slider retainer ①.
- 12) Operate the mode selector and set to the position in Fig. 7-35.
- 13) Mount the L slider assembly according to 7-3-11., 2, Mounting.

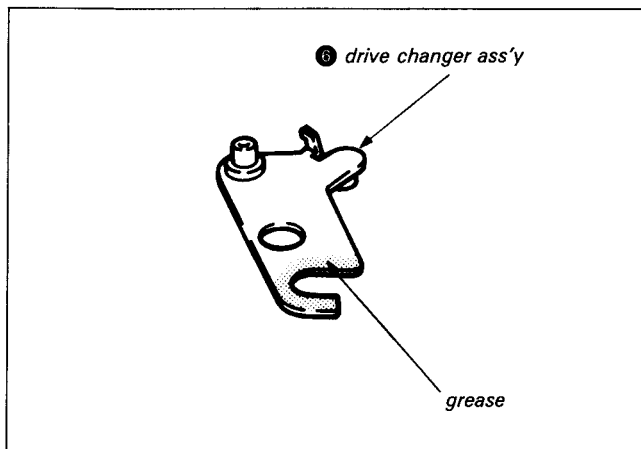


Fig. 7-34.

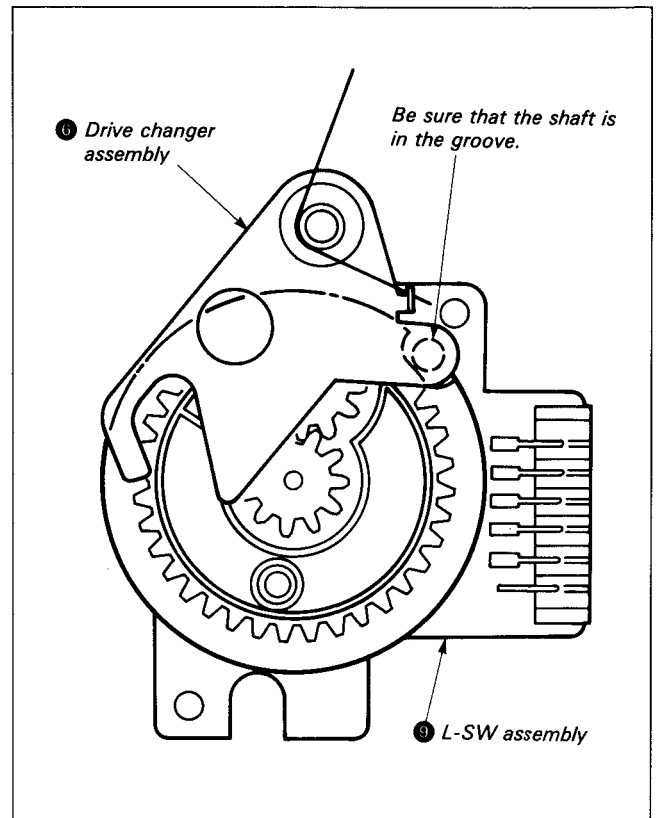


Fig. 7-35.

### 7-3-13. Plunger Solenoid (See Fig. 7-36.)

#### 1. Removal

- 1) Open the SP-2 board according to Section 2, 2-6. and remove connector CN018 (white) 3P.
- 2) Remove the cassette compartment assembly according to Section 2, 2-14.
- 3) Remove tension spring ①.
- 4) Remove the two stopper washers ②.
- 5) Remove screw ③ and the lock slider B assembly ④.
- 6) Remove the two screws ⑤ and the plunger solenoid ⑥.  
(At this time, be careful not to scratch the T reel assembly with the screwdriver, and do not touch it.)

#### 2. Mounting

- 1) Insert the plunger solenoid pin ⑦ into the P arm hole ⑧ and mount with the two screws ⑤. (Again, be careful not to scratch or touch the T reel assembly.)
- 2) Mount lock slider B assembly ④ and tighten screw ③.
- 3) Mount the two stopper washers ②.
- 4) Hook on the tension spring ①.
- 5) Mount the cassette compartment assembly by following the procedure in item Section 2, 2-14. in reverse.
- 6) Connect the CN018 connector (white) to the SP-2 board.
- 7) Mount the SP-2 board by following the procedure in Section 2, 2-6. in reverse.

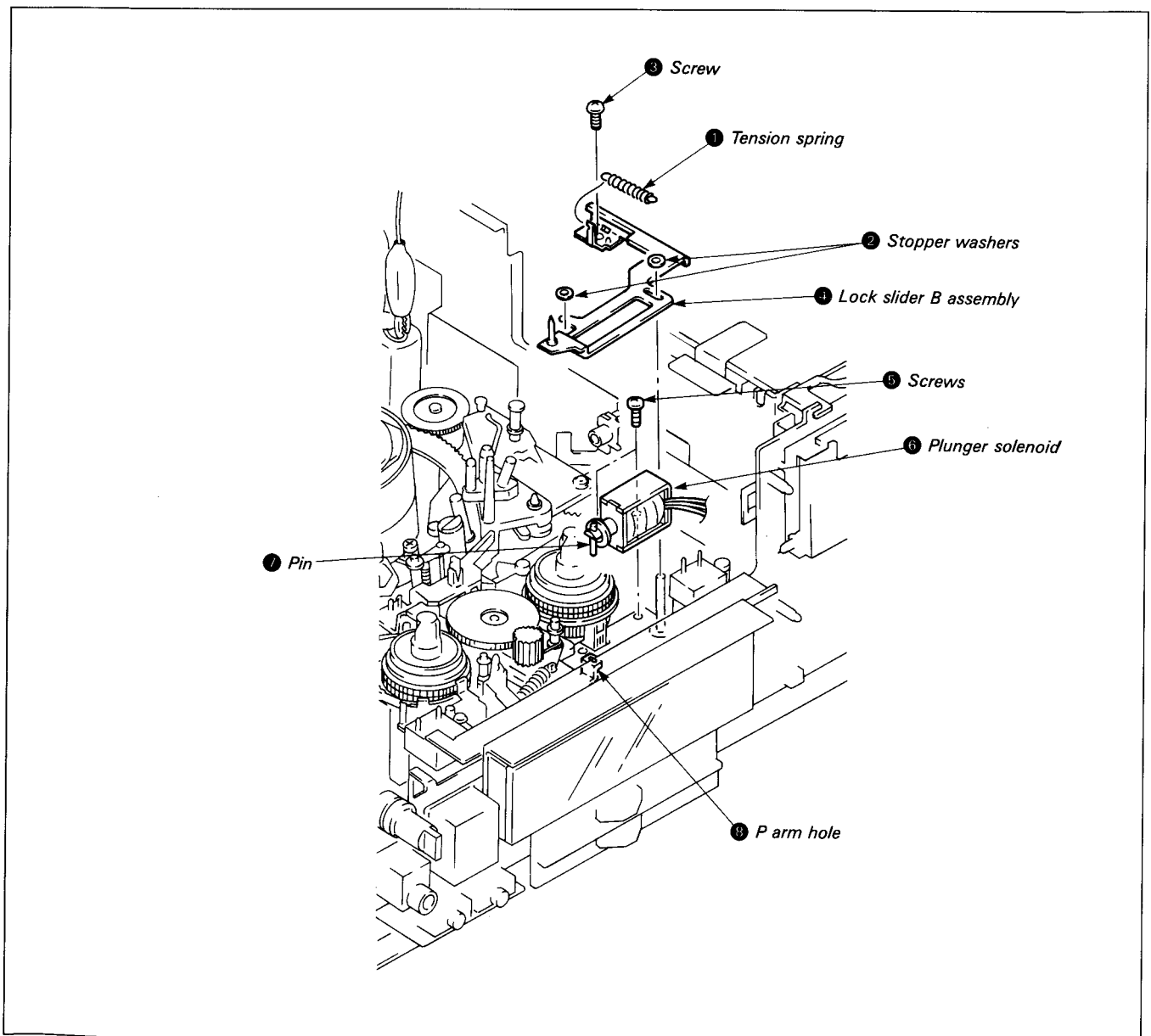


Fig. 7-36.

### 7-3-14. M-SW Assembly (See Fig. 7-37 ~ 39)

#### 1. Removal

- 1) Remove the T reel assembly according to 7-3-2. (See Fig. 7-7.)
- 2) Remove stopper washer ① and the drive gear (B) assembly ②.
- 3) Remove the LD-1 board ③. (See Fig. 7-37.)
- 4) Remove lock slider B assembly according to 7-3-13., 1. Removal, 3), 4) and 5).
- 5) Remove tension spring ④ and B release arm ⑤.
- 6) Check **EJECT** mode.
- 7) Remove stopper washer ⑥ and the mode output gear ⑦.
- 8) Remove screw ⑧ and the push switch ⑨.
- 9) Remove connector ⑩.
- 10) Remove the three screws ⑪, the control motor cover ⑫ and the M-SW assembly ⑬.
- 11) Remove solder ⑭ and remove the DC motor ⑮.

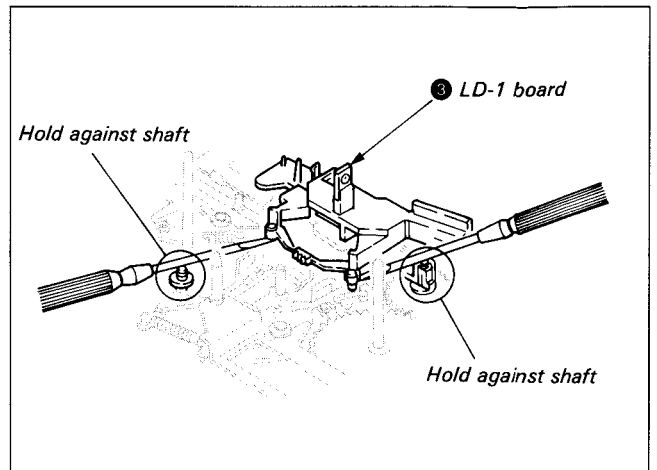


Fig. 7-37.

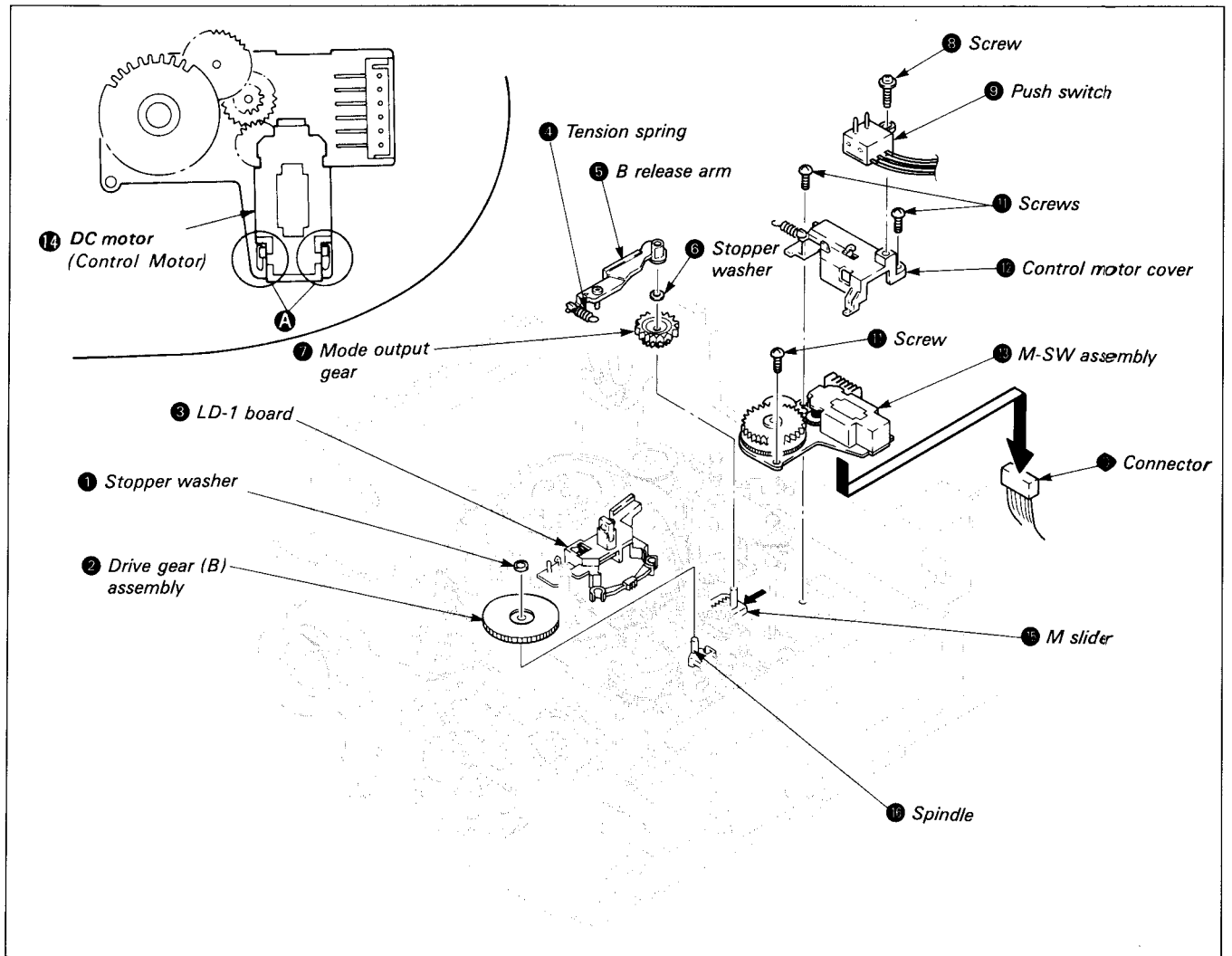


Fig. 7-38.

## 2. Mounting

- 1) Solder the DC motor (Control Motor) ⑩.
- 2) Mount the M-SW assembly ⑬ and the control motor cover ⑫, and tighten the three screws ⑪.
- 3) Connect connector ⑬.
- 4) Mount push switch ⑨ and tighten screw ⑧.
- 5) Check **EJECT** mode.
- 6) Check that M slider ⑮ is moved fully in the direction of arrow **B**.
- 7) Place a half drop of oil on spindle ⑯. (See Fig. 7-38.)
- 8) Mount the mode output gear ⑦ so that the positioning holes are lined up. (See Fig. 7-39.)
- 9) Mount stopper washer ⑥.
- 10) Set to **LOADING/UNLOADING** mode.
- 11) Mount B release arm ⑤ and tension spring ④.
- 12) Mount the lock slider B assembly according to 7-3-13., 2. Mounting, 2), 3) and 4).
- 13) Mount the LD-1 board ③.
- 14) Mount drive gear B assembly ② and stopper washer ①.
- 15) Mount the T reel assembly according to 7-3-2., Mounting.

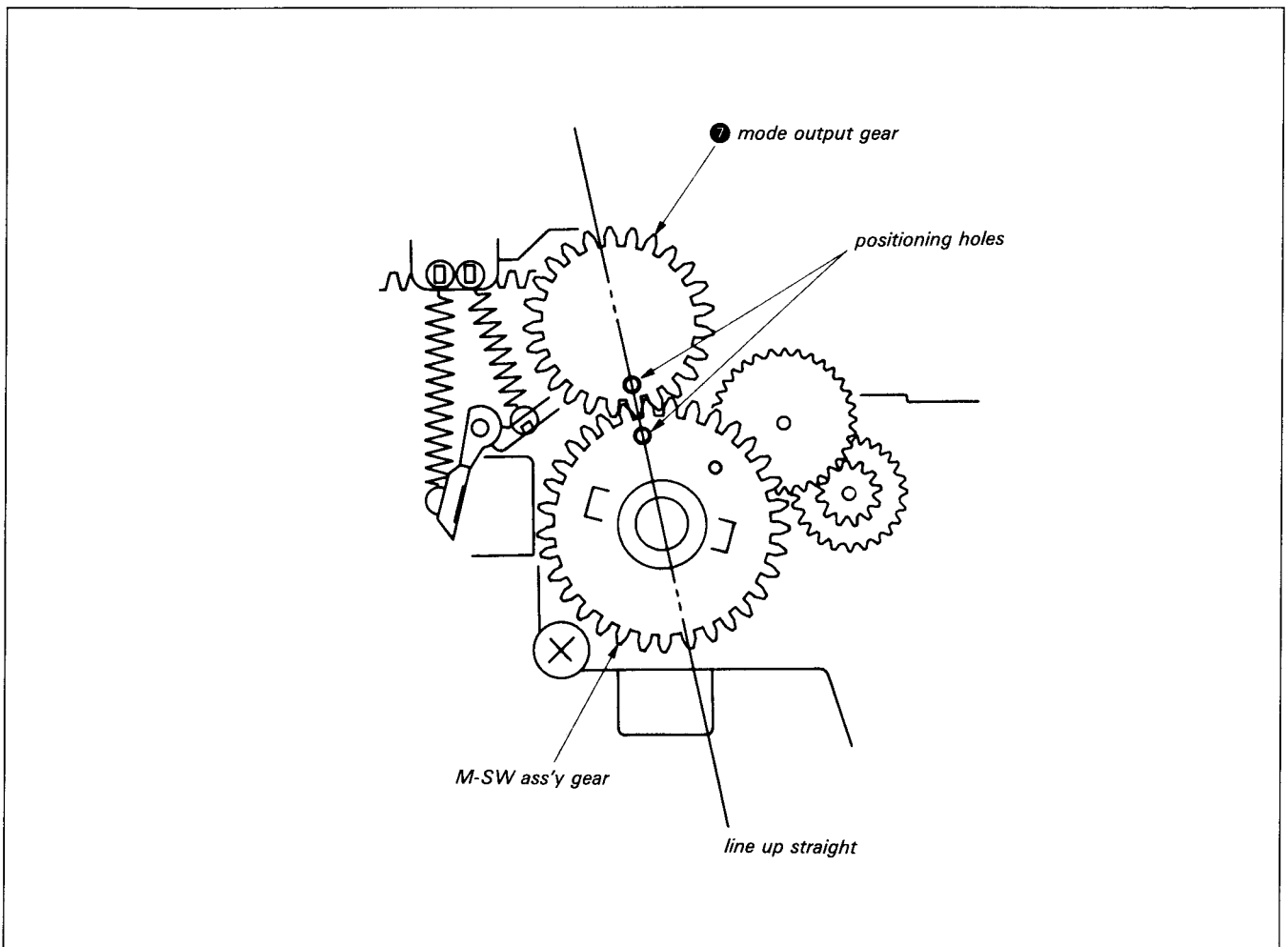


Fig. 7-39.

### 7-3-15. M Slider (See Fig. 7-40 ~ 43.)

#### 1. Removal

- 1) Remove the pinch press arm assembly according to 7-3-3., 1. Removal. (See Fig. 7-8.)
- 2) Remove the tension regulator arm assembly according to 7-3-4., 1. Removal. (See Fig. 7-9.)
- 3) Remove the tension regulator band assembly according to 7-3-5., 1. Removal. (See Fig. 7-10.)
- 4) Remove the loading ring assembly according to 7-3-7., 1. Removal. (See Fig. 7-12.)
- 5) Perform 7-3-14., 1. Removal, Steps 1)~5). (See Fig. 7-37, 7-38.)
- 6) Remove the tension regulator load arm assembly according to 7-3-11., 1. Removal, 8). (See Fig. 7-30.)
- 7) Remove tension spring ①.
- 8) Remove the two stopper washers ② and remove the S main brake assembly ③ and T main brake assembly ④.
- 9) Set to **LOADING TOP** , **LOADING/UNLOADING** mode.

- 10) Remove the screw ⑤ and the drive assembly ⑥.
- 11) Perform 7-3-14., 1. Removal, steps 6) and 7).
- 12) Remove the two tension springs ⑦.
- 13) Remove REW brake assembly ⑧.
- 14) Remove stopper washer ⑨ and B release slider ⑩.
- 15) Remove stopper washer ⑪ and ring lock spring ⑫ and RL arm ⑬.
- 16) Move the M slider ⑭ to the right (leave about 5 mm at the left.)
- 17) Remove the E ring ⑮ and the pinch press lever assembly ⑯.
- 18) Remove spring ⑰ and the hard brake (S) ⑱.
- 19) Remove stopper washer ⑲, push the mode arm ⑳ in the direction of arrow, and lift up the left side of the M slider ㉑ to remove.

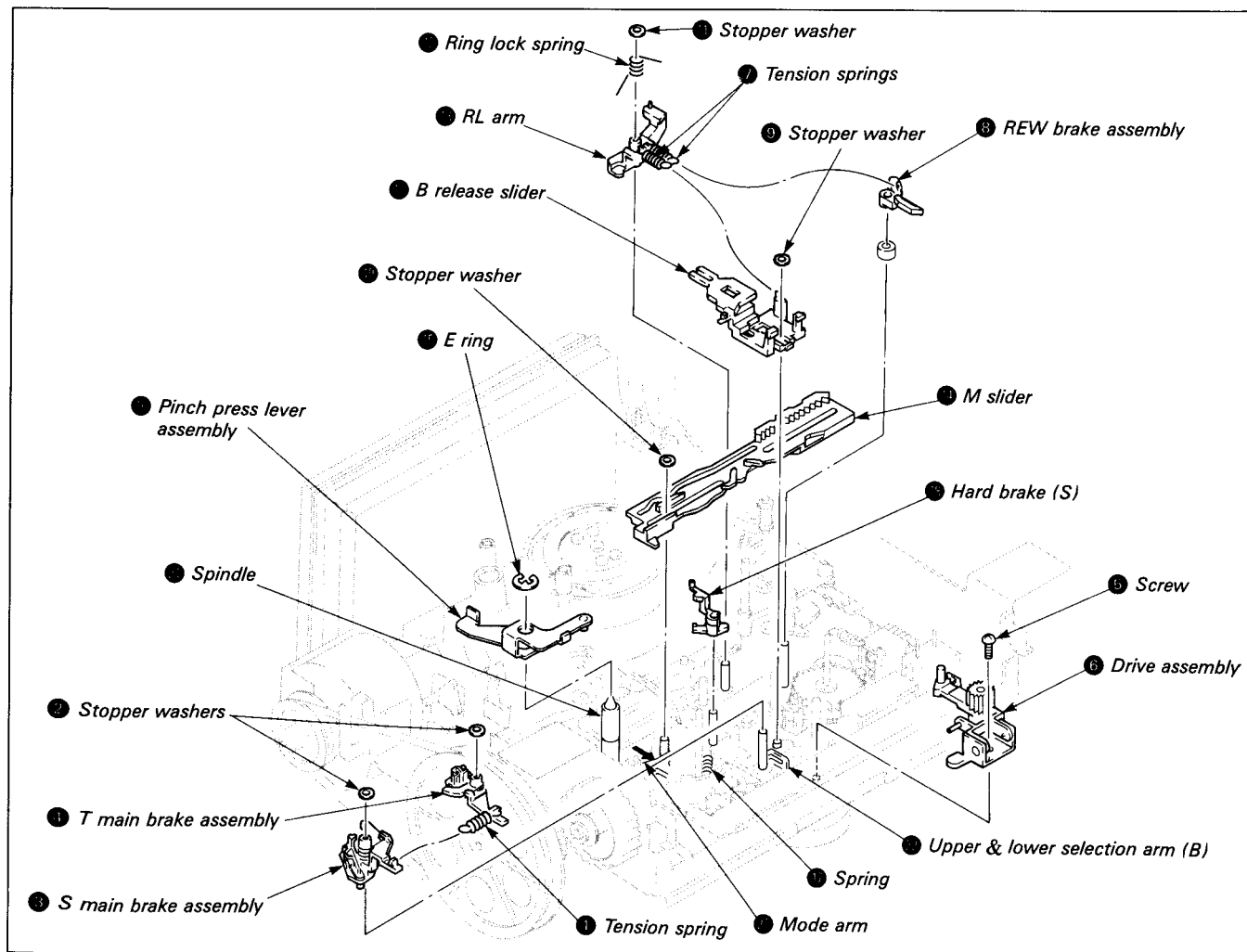


Fig. 7-40.

## 2. Mounting

- 1) Apply grease. (See Fig. 7-41.)
- 2) Push mode arm ① in the direction of arrow, and mount the M slider ②, noticing the positioning of the other parts in Fig. 7-42. and mount the stopper washer ③.
- 3) Mount hard brake (S) ④ and spring ⑤.
- 4) Apply grease. (See Fig. 7-43.)
- 5) Apply a half drop of oil from the spindle ⑥ groove to the bottom, mount the pinch press lever assembly ⑦ and the E ring ⑧.
- 6) Mount RL arm ⑨, mount the ring lock spring ⑩ and the stopper washer ⑪.
- 7) Mount B release slider ⑫ and stopper washer ⑬.
- 8) Mount REW brake assembly ⑭.
- 9) Mount the two tension springs ⑮.

**Note:** Mount the springs as follows, being careful not to mix them up.

- B release slider spring: total diameter 2 mm, wire diameter 0.18 mm
- REW brake assembly spring: total diameter 1.6 mm, wire diameter 0.12 mm

- 10) Push the M slider ② all the way to the left.
- 11) Perform 7-3-14., 2. Mounting, steps 7), 8) and 9).
- 12) Set to **LOADING/UNLOADING** mode.
- 13) Insert the drive assembly ⑥ horizontal shaft into the upper & lower selection arm (B) ③ groove, and mount with the screw ⑤.
- 14) Mount T main brake assembly ④ and S main brake assembly ⑤. Mount the two stopper washers ② and the tension spring ①.
- 15) Mount the tension regulator load arm assembly according to 7-3-11., 2. Mounting, step 2).
- 16) Perform 7-3-14., 2. Mounting, steps 11)~15).
- 17) Mount the loading ring assembly according to 7-3-7., 2. Mounting.
- 18) Mount the tension regulator band assembly according to 7-3-5., 2. Mounting.
- 19) Mount the tension regulator arm assembly according to 7-3-4., 2. Mounting.
- 20) Mount the pinch press arm assembly according to 7-3-3., 2. Mounting.

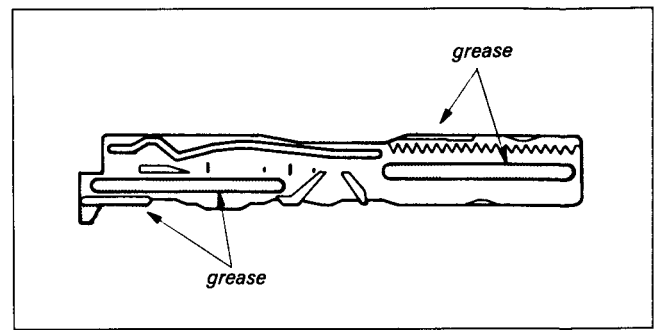


Fig. 7-41.

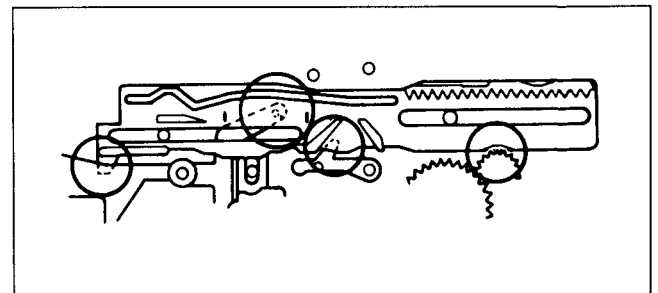


Fig. 7-42.

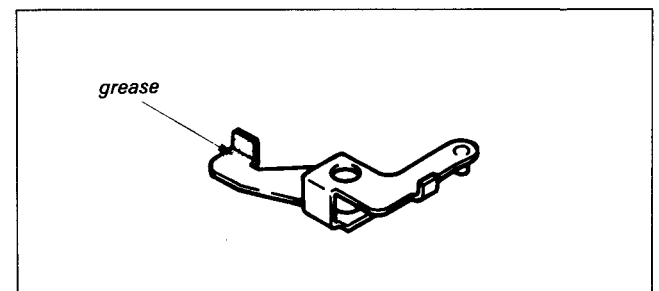


Fig. 7-43.

### 7-3-16. Capstan Motor (See Fig. 7-44.)

#### 1. Removal

- 1) Remove the loading ring assembly according to 7-3-7., 1. Removal. (See Fig. 7-12.)
- 2) Open the SP-2 board according to Section 2, 2-6.
- 3) Remove the connector ① (CN212, white, 11P) from SP-2 board.
- 4) Remove the connector ② (CN005, white, 4P) from RS-17 board.
- 5) Remove the two screws ③ and rotor retainer ④.
- 6) Remove the two screws ⑤ and remove the capstan motor ⑥ in the direction of arrow.

#### 2. Mounting

- 1) Mount capstan motor ⑥ and tighten the two screws ⑤.
- 2) Mount the rotor retainer ④ and tighten the two screws ③.
- 3) Connect connectors ① and ②.
- 4) Mount the loading ring assembly according to 7-3-7., 2. Mounting. (See Fig. 7-12, 7-13.)
- 5) Mount the SP-2 board by performing the procedure in Section 2, 2-6. in reverse.

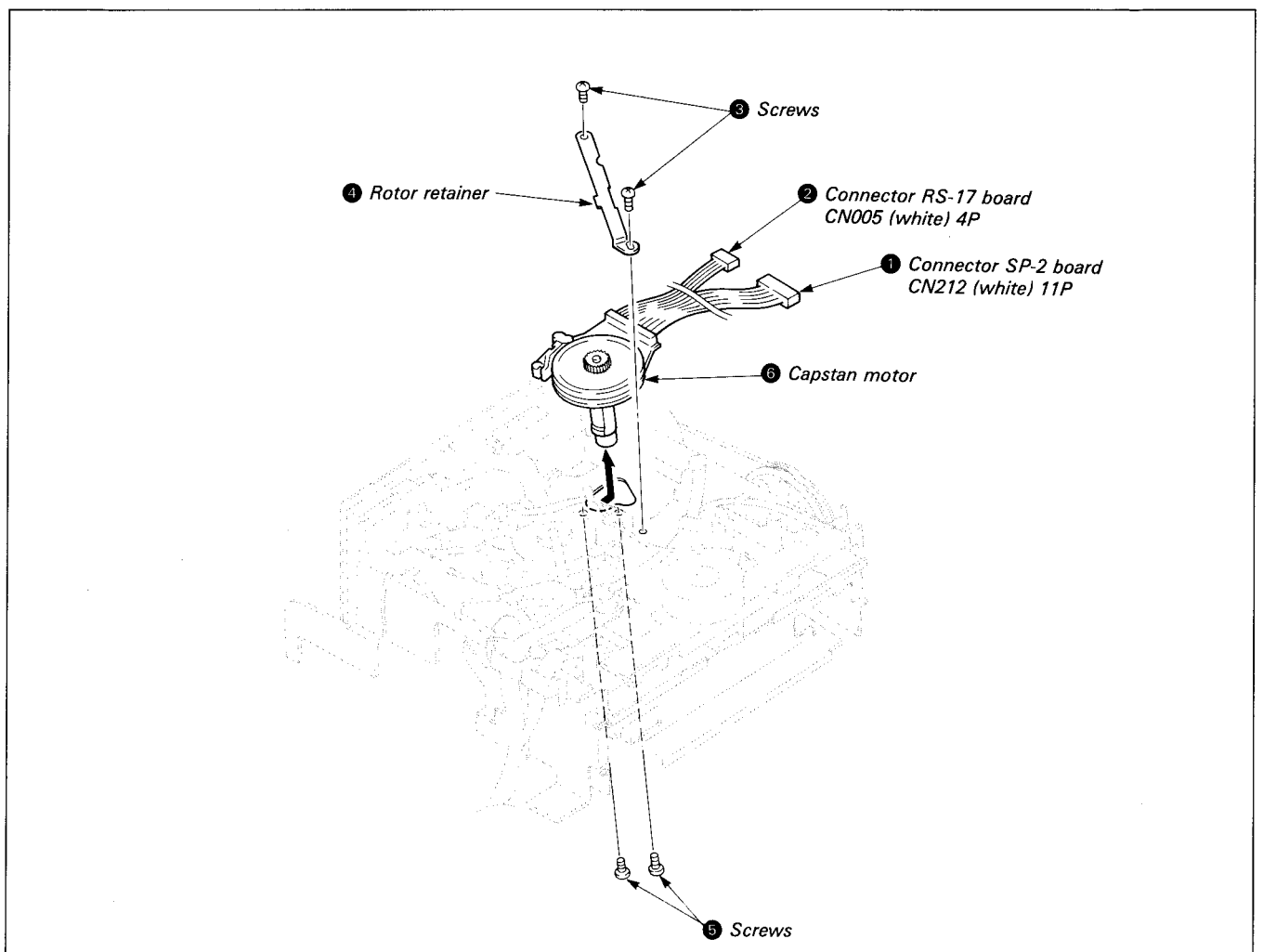


Fig. 7-44.

## 7-3-17. Rotary Upper Drum Replacement

### 1. Removal

- 1) Remove two hexagon socket screws (2 × 2.7) ① and dismount the dynamic damper ②. (See Fig. 7-45.)
- 2) Suction solder at all of the soldered eight positions A. Check that the printed wiring board and pins jutting out from below freely move using tweezers, or other tool. (See Fig. 7-45.)
- 3) Remove the two hexagon socket screws (2 × 5) ③. (See Fig. 7-45.)
- 4) Mount the dismantling Jig B with the accessory screws ④ utilizing the screw holes in which the dynamic damper was mounted. Drive the hexagon socket screw ⑤ into the jig B and remove the rotary upper drum ⑥. (See Fig. 7-46.)

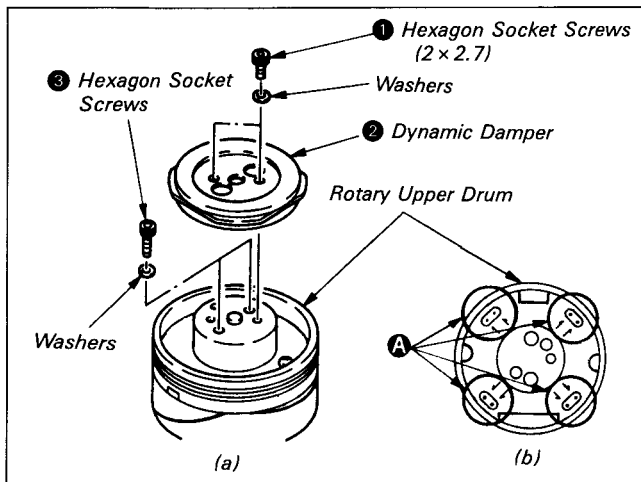


Fig. 7-45.

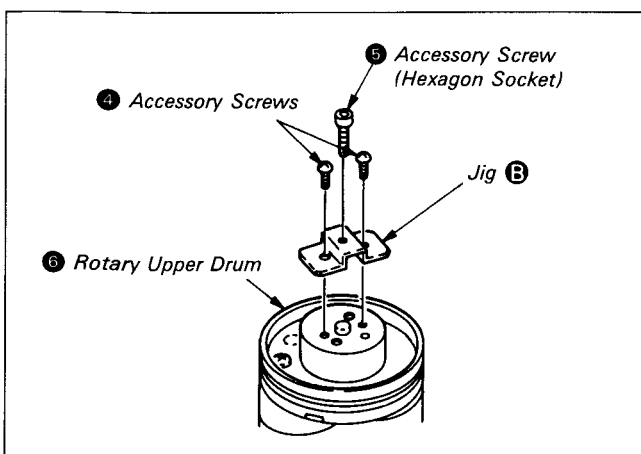


Fig. 7-46.

### 2. Mounting

Rotary Upper Drum

DGR-12-R

Part No.

A-7049-120-A

- 1) Carefully clean the flange surfaces and planes of the rotary upper drum and visually check that no blemishes or flaws are left.
- 2) Insert Jig C in the positioning hole D so that the holes of the rotary upper drum ⑥ and flange coincide. Lightly insert the rotary upper drum in the drum shaft while aligning their positions. (See Fig. 7-47.) (Check that pins are projecting above the holes on the printed circuit board of the rotary upper drum. When the pins are caught, correct using tweezers, etc.)
- 3) Remove Jig C, lightly push the rotary upper drum by hands. If the rotary upper drum does not go in to the bottom, alternately tighten the two hexagon socket screws (2 × 5) ③ by hand and fix them temporarily. (See Fig. 7-45, 7-48.)
- 4) Reinsert the Jig C in the positioning hole D and check that the jig can be inserted smoothly. (When the jig cannot be inserted, loosen the two hexagon socket screws (2 × 5) ③ and slide it inserting a clock screw-driver in the hole.)
- 5) Tighten the two hexagon socket screws (2 × 5) ③.
- 6) Solder the eight positions A. (See Fig. 7-45.)
- 7) Tighten the two hexagon socket screws (2 × 2.7) ① reversing the screw removal procedure and remount the dynamic damper ②. (See Fig. 7-45.)

**Note:** Do not tighten too strongly.

**Note:** Be careful not to flow solder below the printed wiring board.

**Note:** Be careful not to tighten too strongly.

When mounting, be careful not to mix the hexagon socket screws (2 × 2.7) ① and hexagon socket screws (2 × 5) ③.

**Note:** After mounting, be sure to perform 7-4. Tape Path Adjustment.

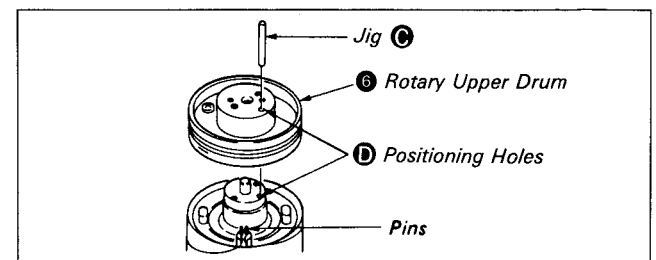


Fig. 7-47.

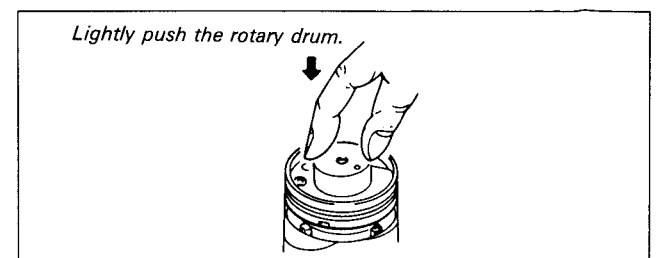


Fig. 7-48.



### Notes on Drum Assembly and Rotary Upper Drum Mounting

1. When mounting the drum assembly with a magnetized screwdriver, mount with the head tip in the position shown below to prevent it from being affected by the screwdriver.
2. Be sure to perform tape path adjustment after mounting.

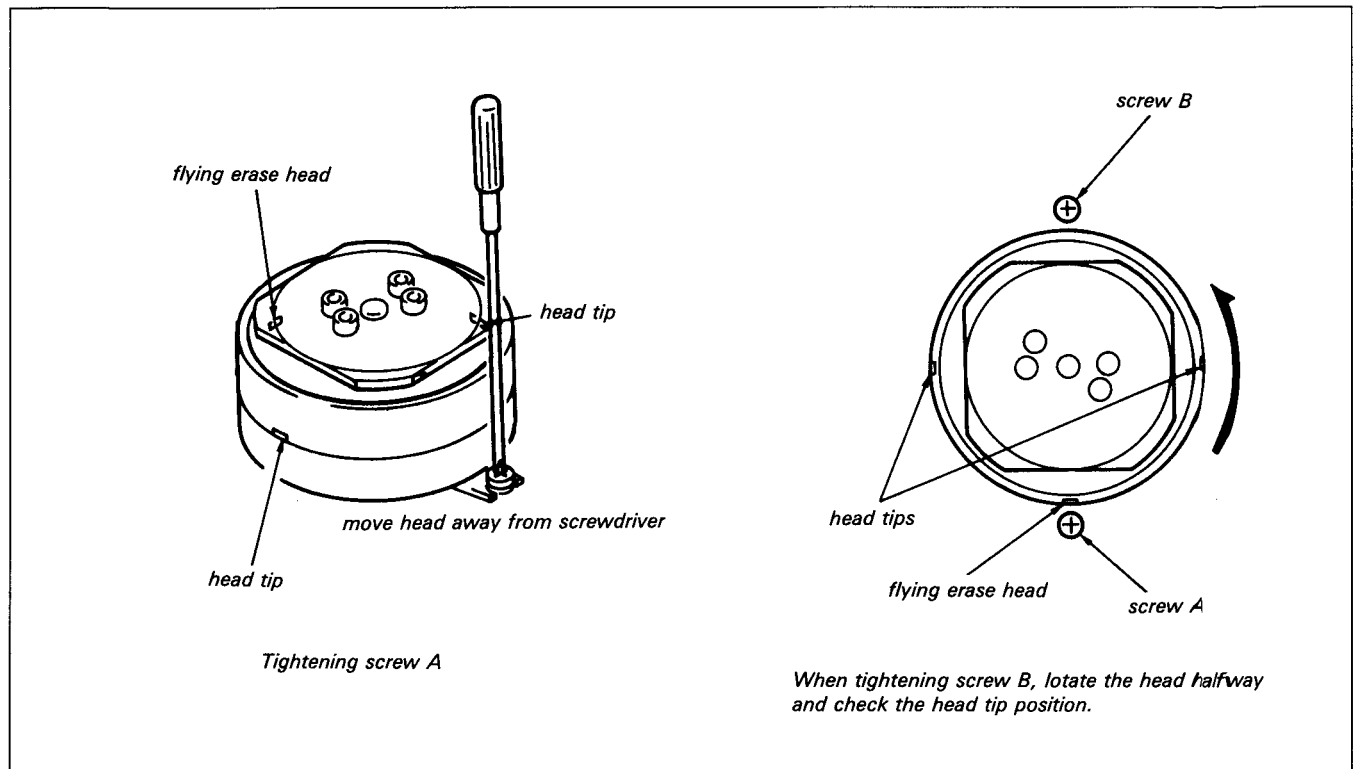


Fig. 7-49.

### 7-3-18. Replacement of Drum Assembly

(See Fig. 7-50, 51)

#### 1. Removal

- 1) Remove the cassette compartment assembly according to item Section 2, 2-14.
- 2) Open the SP-2 board according to Section 2, 2-6.
- 3) Remove screw ① and the shaft ground terminal ②. (See Fig. 7-50.)
- 4) Remove the three connectors ③.
- 5) Remove the two screws ④.
- 6) Remove the drum assembly ⑤. (See Fig. 7-51.)

**Note:** At this time, be careful that the drum assembly does not hit No. 3 guide, etc.

#### 2. Mounting

- 1) Mount drum assembly ⑤ and tighten the two screws ④.
- 2) Connect the three connectors ③.
- 3) Mount shaft ground terminal ② and tighten screw ①.
- 4) Mount the SP-2 board by following the procedure in Section 2, 2-6. in reverse.
- 5) Mount the cassette compartment assembly by following the procedure in item Section 2, 2-14. in reverse.

**Note:** Be sure to perform 4. Tape Path Adjustment after mounting.

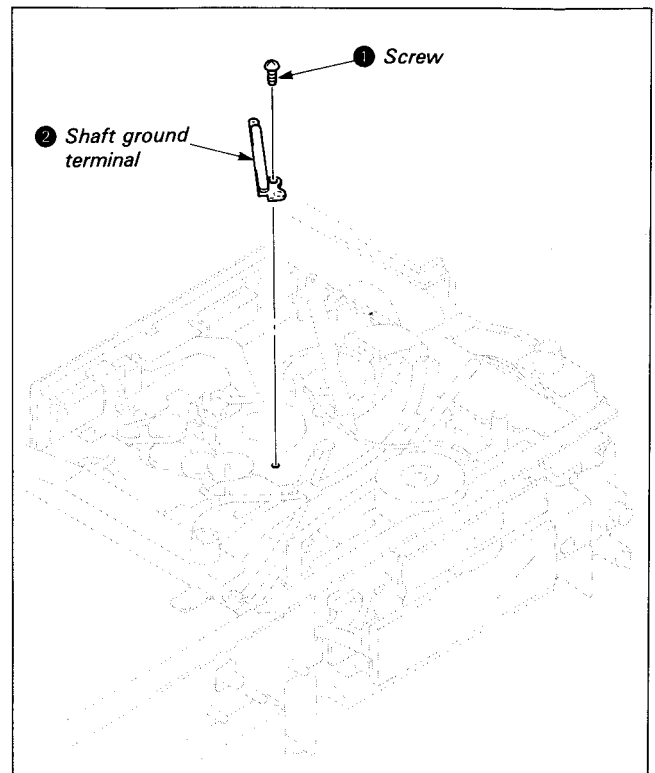


Fig. 7-50.

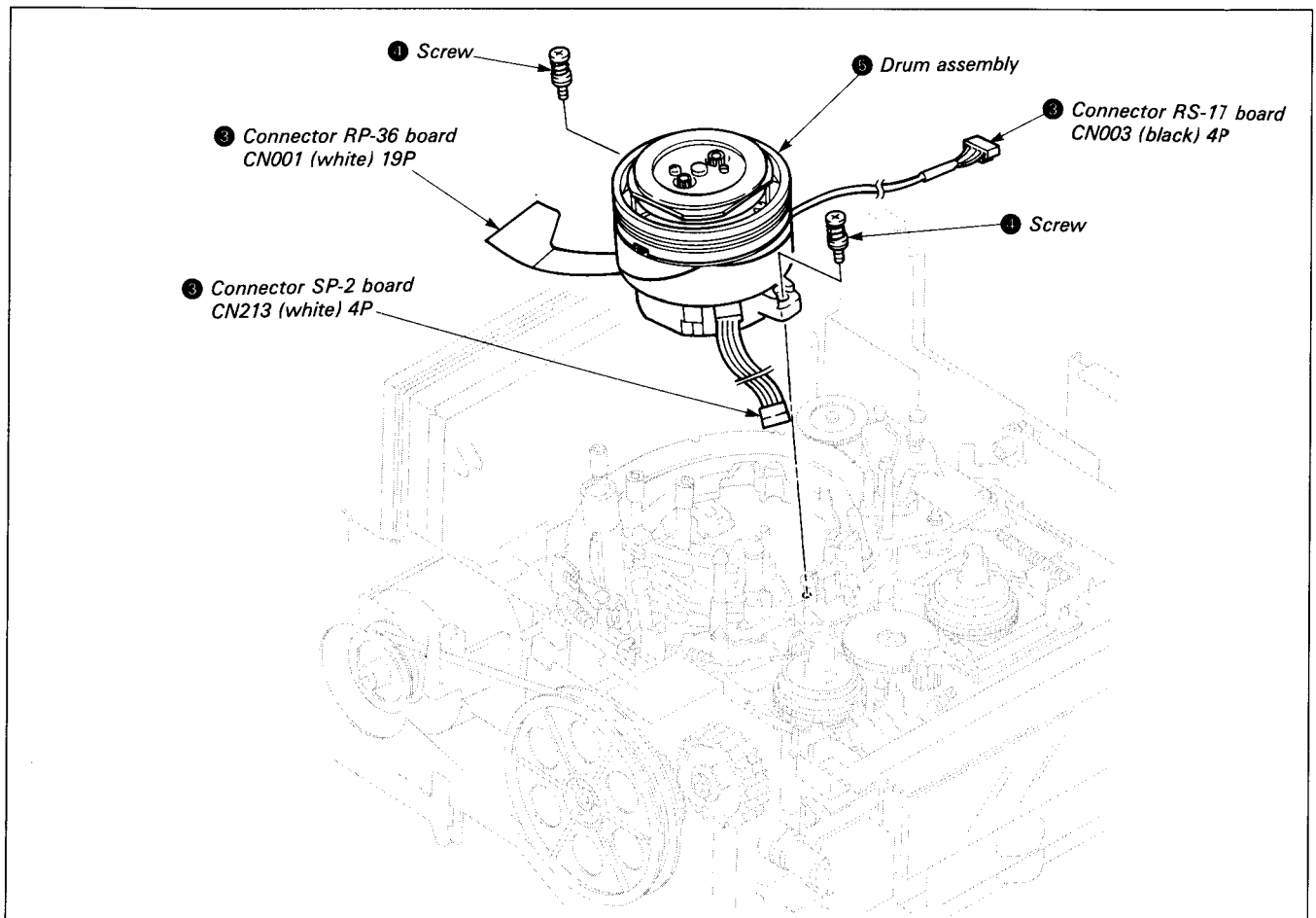


Fig. 7-51.

### 7-3-19. Adjustment After Replacement of No.3 Guide and No.4 Guide

For replacement of both No.3 and No.4 guides, line up the tape along the upper flange after replacing. (See Fig. 7-66.)

### 7-3-20. No.5 Guide Assembly (See Fig. 7-52.)

#### 1. Removal

- 1) Remove the cassette compartment assembly according to item Section 2, 2-14.
- 2) Remove the three screws ① and No.5 guide assembly.
- 3) Remove guide nut ②, compression spring ③ and No.5 guide roller assembly ④.

#### 2. Mounting

- 1) Insert compression spring ③ into No.5 guide roller assembly ④, engage the bottom section and tighten guide nut ②.
- 2) Mount No.5 guide assembly and tighten the three screws ①.
- 3) Mount the cassette compartment assembly by following the procedure in item Section 2, 2-14. in reverse.

**Note:** Be sure to perform 4. Tape Path Adjustment after mounting.

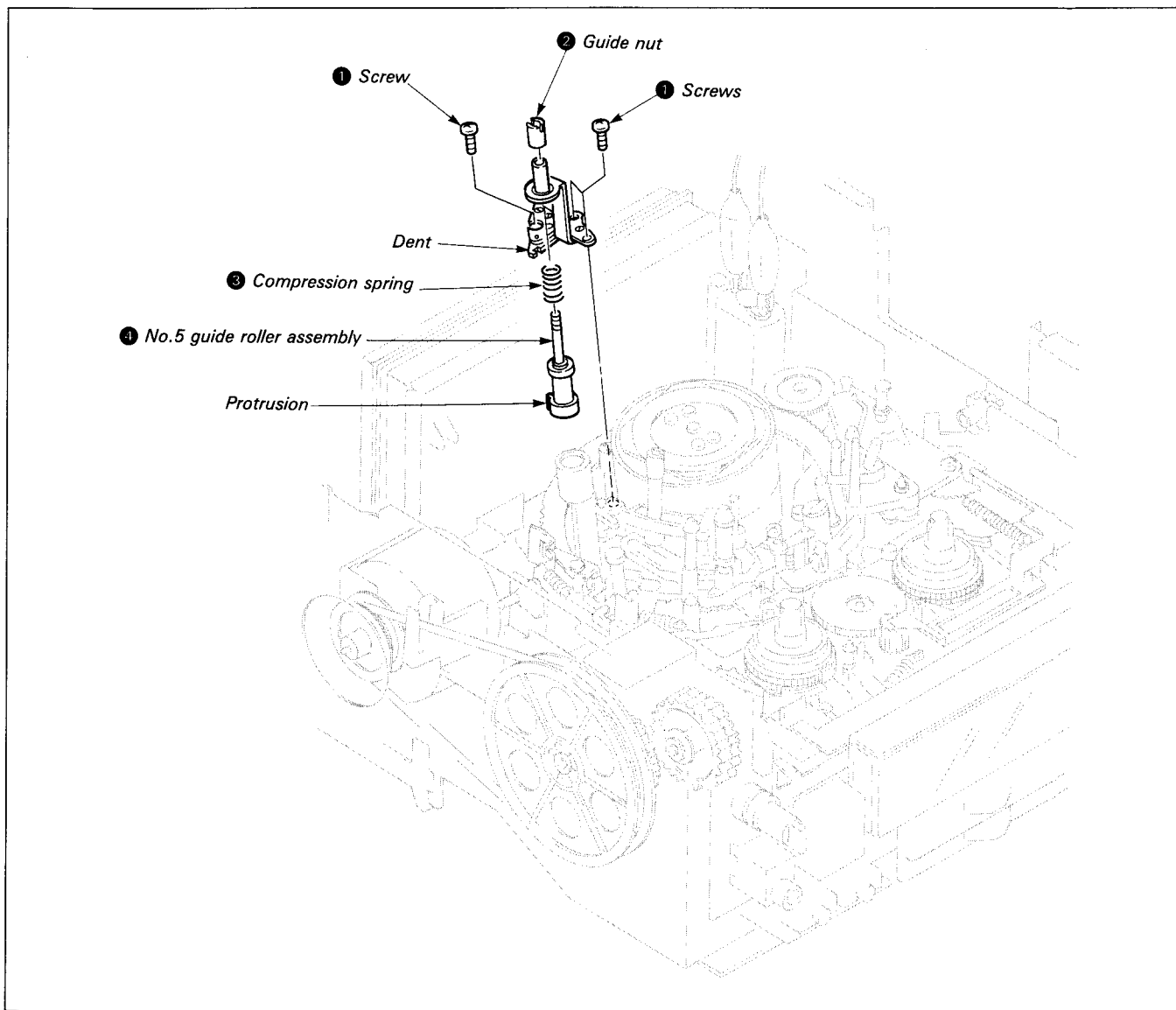


Fig. 7-52.

**7-3-21. FWD Back Tension Adjustment**  
(See Fig. 7-53.)

- 1) Remove the cassette compartment assembly according to Section 2, 2-14.
- 2) Remove the mechanism according to Section 2, 2-15.
- 3) Set to **LOADING END FWD** mode.
- 4) Loosen band adjustment plate ① screw ② and adjust as shown by arrow **A** so that the tension regulator arm assembly slit ③ and tension regulator arm assembly pin ④ are positioned as shown, and tighten screw ②.
- 5) Place tension measurement reel (Ref. No. J-7) ⑥ on the S reel table assembly ⑤ and line up with No.1 guide, No.2, No.3 guide and the drum.
- 6) Pull dial tension gauge (Ref. No. J-6) ⑦ in the direction of arrow **B** and hook tension spring ⑨ onto the tension regulator spring hook assembly ⑧ so that the value is  $13.0 \pm 1g$ , as shown.  
Value too large: arrow **C** direction  
Value too small: arrow **D** direction

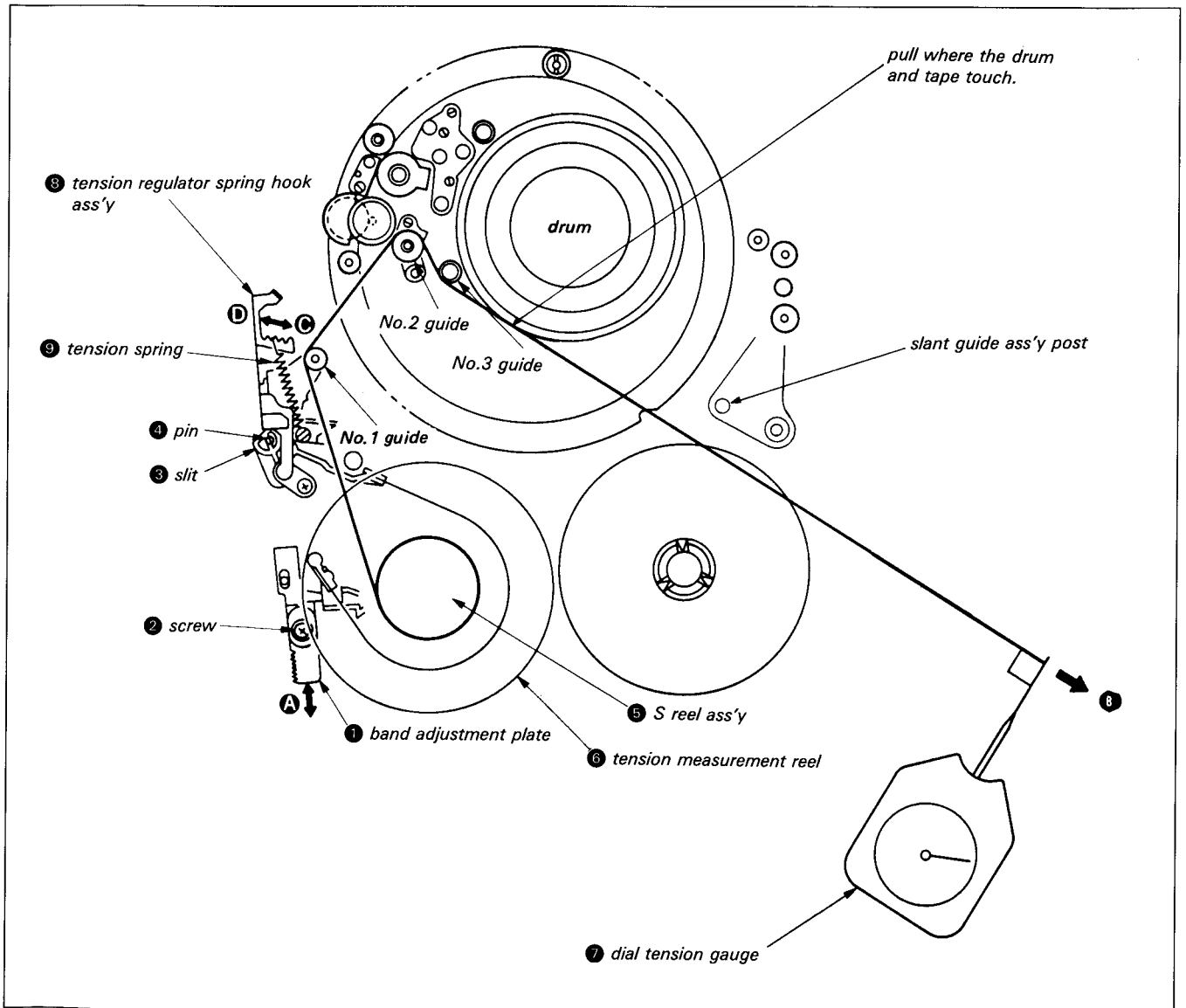


Fig. 7-53.

### 7-3-22. Replacement of Reel Motor (See Fig. 7-54.)

#### 1. Removal

- 1) Open the SP-2 board according to item Section 2, 2-6.
- 2) Remove connector ① from SP-2 board.
- 3) Remove the two screws ② and reel motor bracket ③.
- 4) Remove the two screws ④ and reel motor ⑤ in the direction of arrow.

#### 2. Mounting

- 1) Mount the reel motor ⑤ to reel motor bracket ③ with two screws ④.
- 2) Mount the reel motor assembly and tighten with two screws ②.
- 3) Connect the connector ① to SP-2 board.
- 4) Mount the SP-2 board by following the procedure in Section 2, 2-6. in reverse.

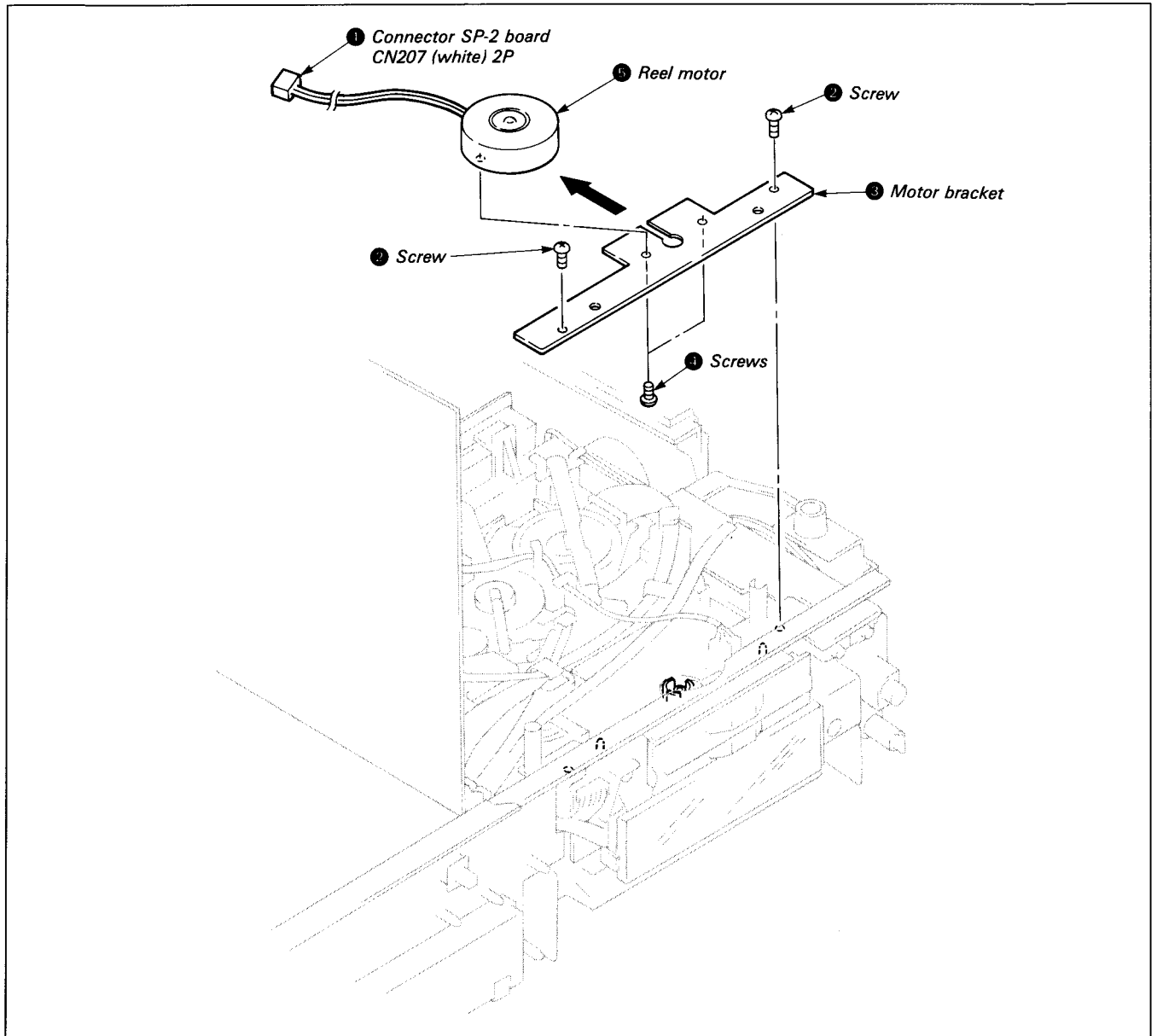


Fig. 7-54.

### 7-3-23. Check of S and T Main Brake Torque

- 1) Remove the front panel according to Section 2, 2-2.
- 2) Remove the cassette compartment assembly according to Section 2, 2-14.

#### 1. S Main Brake Torque (See Fig. 7-55, 7-56)

- 1) Set to **FF/REW** mode.
- 2) Place the tension measurement reel (Ref. No. J-8) on the S reel table.
- 3) Pull the dial tension gauge (Ref. No. J-6) in the direction of the arrow and confirm that the value are satisfied.

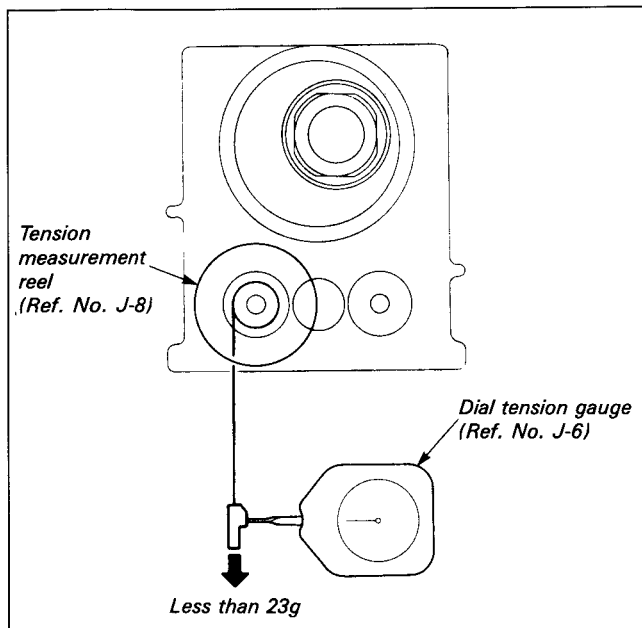


Fig. 7-55.

#### 2. T Main Brake Torque (See Fig. 7-57, 7-58.)

- 1) Set to **FF/REW** mode.
- 2) Place the tension measurement reel (Ref. No. J-8) on the T reel table.
- 3) Pull the dial tension gauge (Ref. No. J-6) in the direction of the arrow and confirm that the value are satisfied.

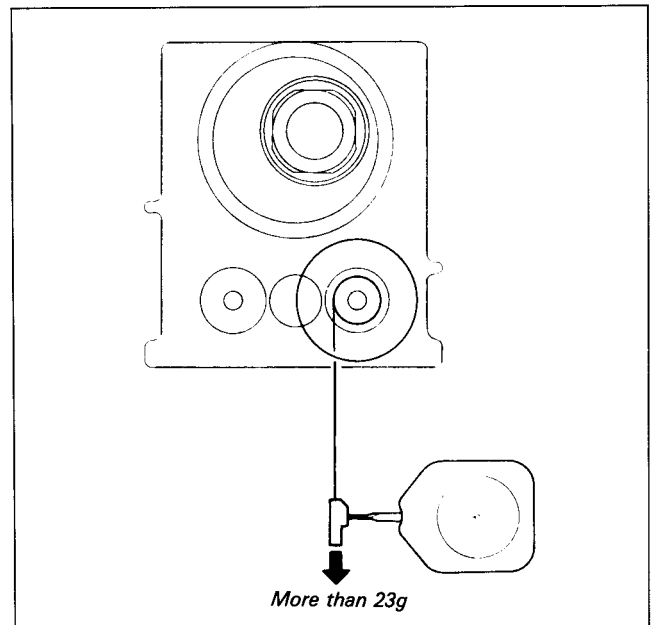


Fig. 7-57.

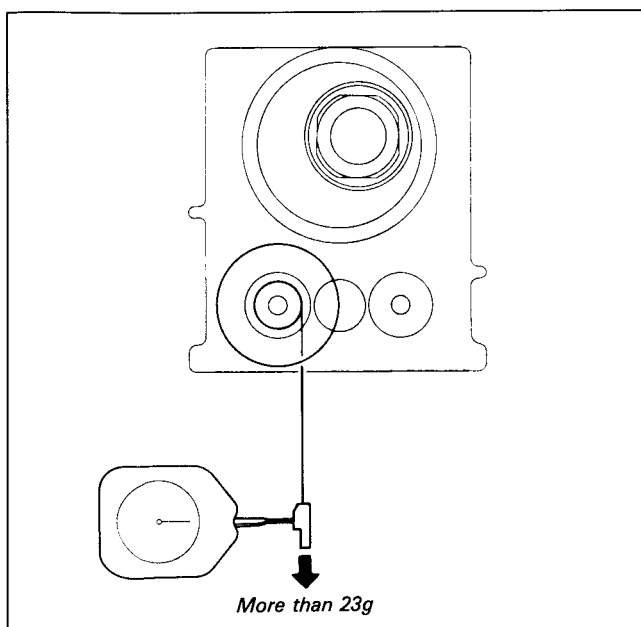


Fig. 7-56.

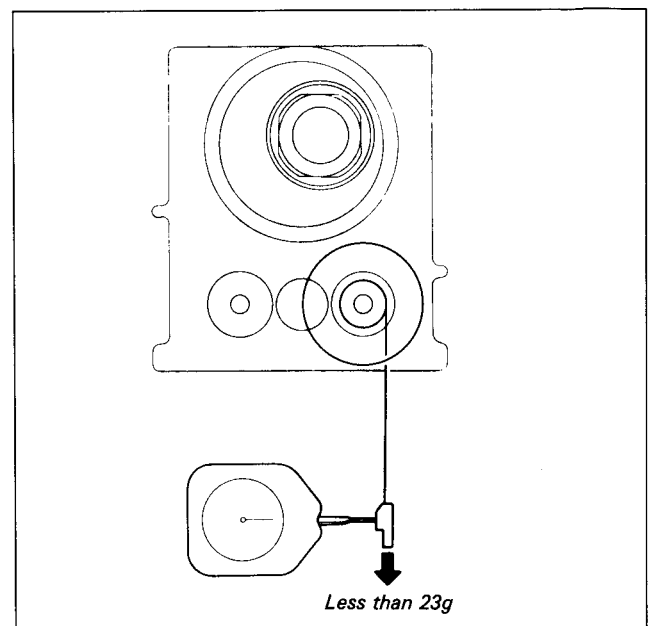


Fig. 7-58.

### 7-3-24. Check of S and T Soft Brake Torque

- 1) Remove the front panel according to Section 2, 2-2.
- 2) Remove the cassette compartment assembly according to Section 2, 2-14.

#### 1 S Soft Brake Torque (See Fig. 7-59.)

- 1) Set to **FF/REW** mode.
- 2) Place the tension measurement reel (Ref. No. J-8) on the S reel table.
- 3) Release the S main brake with a finger.
- 4) Pull the dial tension gauge (Ref. No. J-6) in the direction of the arrow and confirm that the value are satisfied.

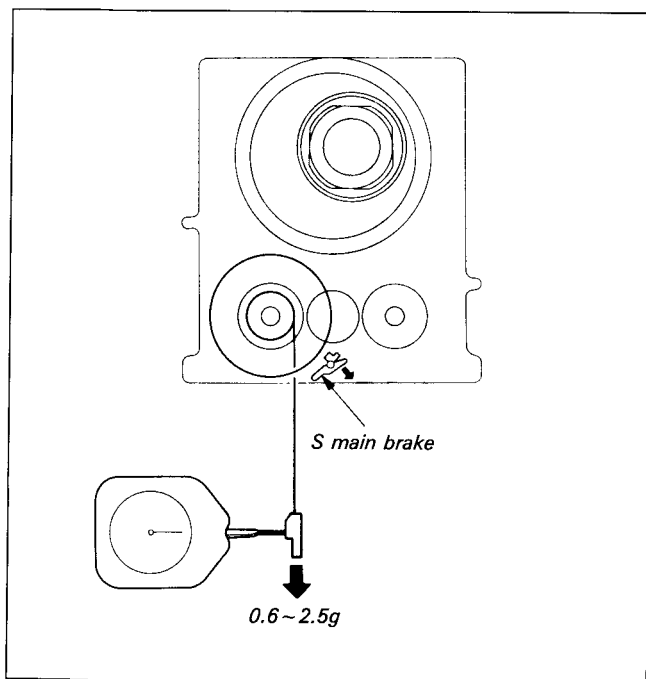


Fig. 7-59.

#### 2. T Soft Brake Torque (See Fig. 7-60.)

- 1) Set to **REV** mode.
- 2) Place the tension measurement reel (Ref. No. J-8) on the T reel table.
- 3) Release the T main brake with a finger.
- 4) Pull the dial tension gauge (Ref. No. J-6) in the direction of the arrow and confirm that the value are satisfied.

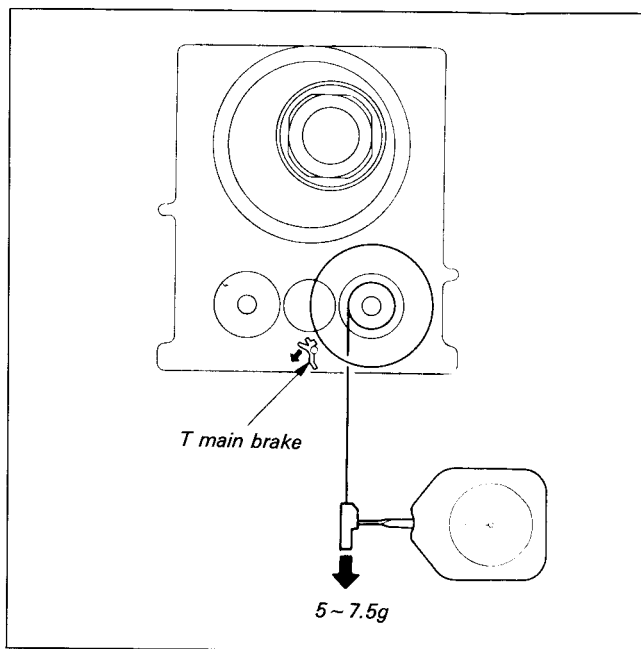


Fig. 7-60.

### 7-3-25. Check of REV and REW Brake Torque

- 1) Remove the front panel according to Section 2, 2-2.
- 2) Remove the cassette compartment assembly according to Section 2, 2-14.

#### 1. REV Brake Torque (See Fig. 7-61.)

- 1) Set to **REV** mode.
- 2) Place the tension measurement reel (Ref. No. J-8) on the S reel table.
- 3) Release the S main brake with a finger.
- 4) Pull the dial tension gauge (Ref. No. J-6) in the direction of the arrow and confirm that the value are satisfied.

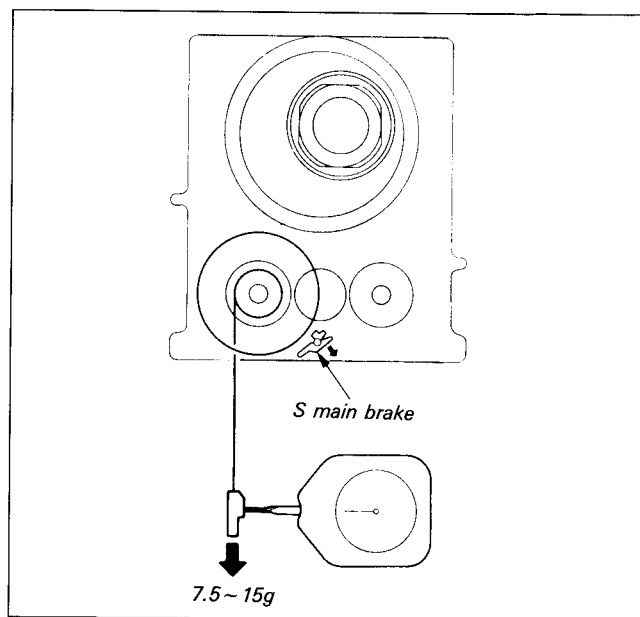


Fig. 7-61.

**2. REW Brake Torque (See Fig. 7-62.)**

- 1) Set to **FF/REW** mode.
- 2) Place the tension measurement reel (Ref. No. J-8) on the T reel table.
- 3) Release the T main brake with a finger.
- 4) Pull the dial tension gauge (Ref. No. J-6) in the direction of the arrow and confirm that the value are met.

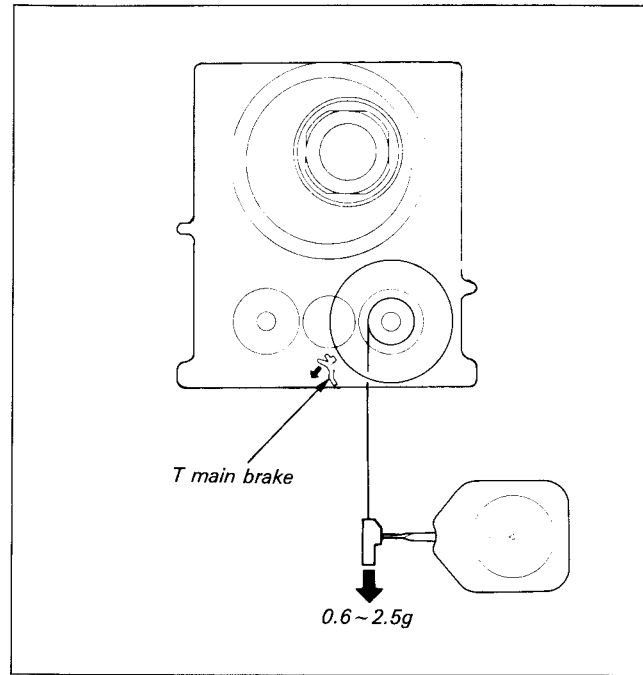
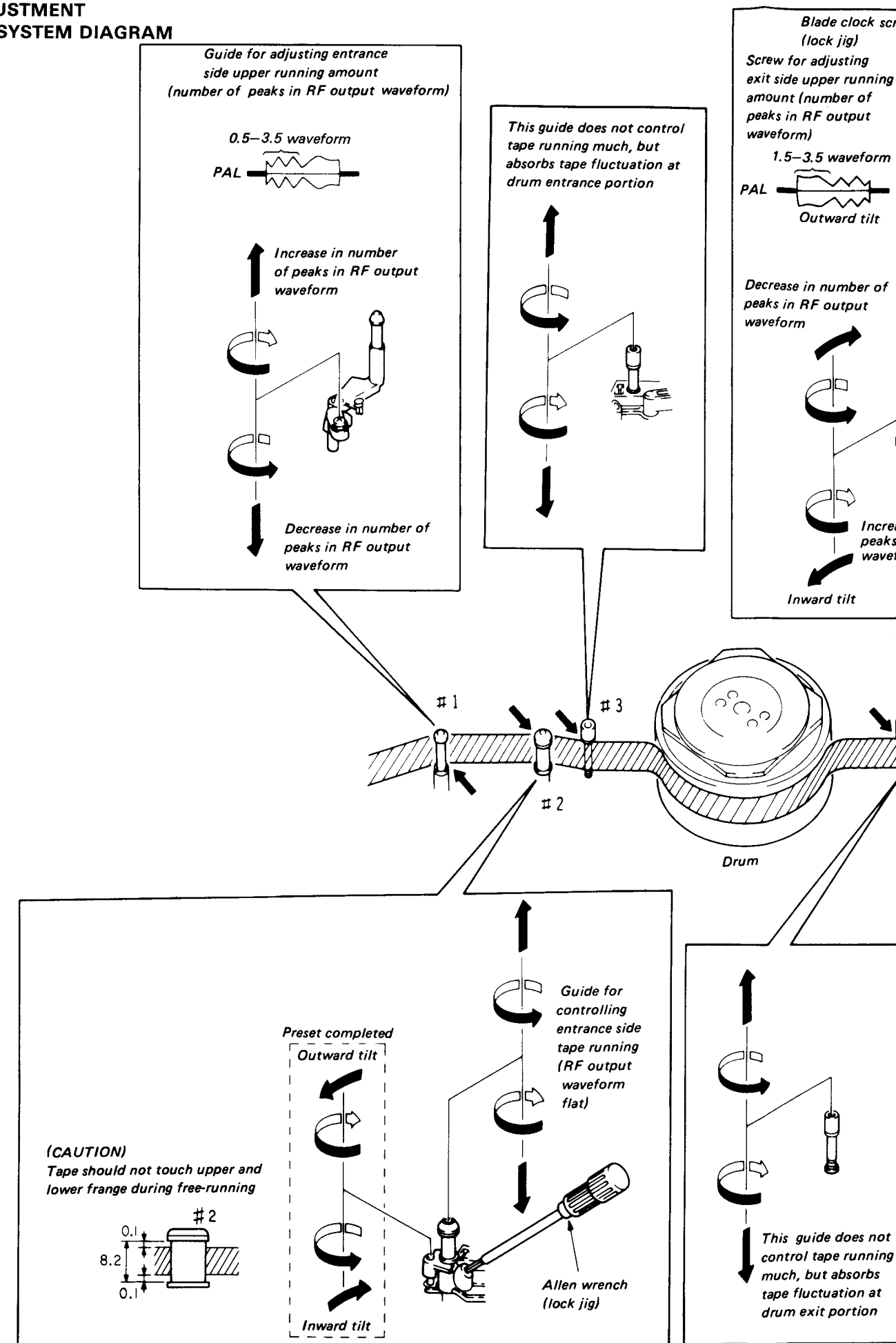


Fig. 7-62.

**7-3-26. Check by FWD, RVS Take-up Torque Cassette**

- 1) Insert the FWD, RVS take-up torque cassette (Ref. No. J-12).
- 2) Set for playback mode and confirm that T reel table torque is 9.5 ~ 15.5 g · cm.
- 3) Set for playback mode, and check that the S reel torque immediately after the REW button is pressed is 17-23 g · cm.
- 4) Replace the appropriate reel table if the above value are not satisfied.

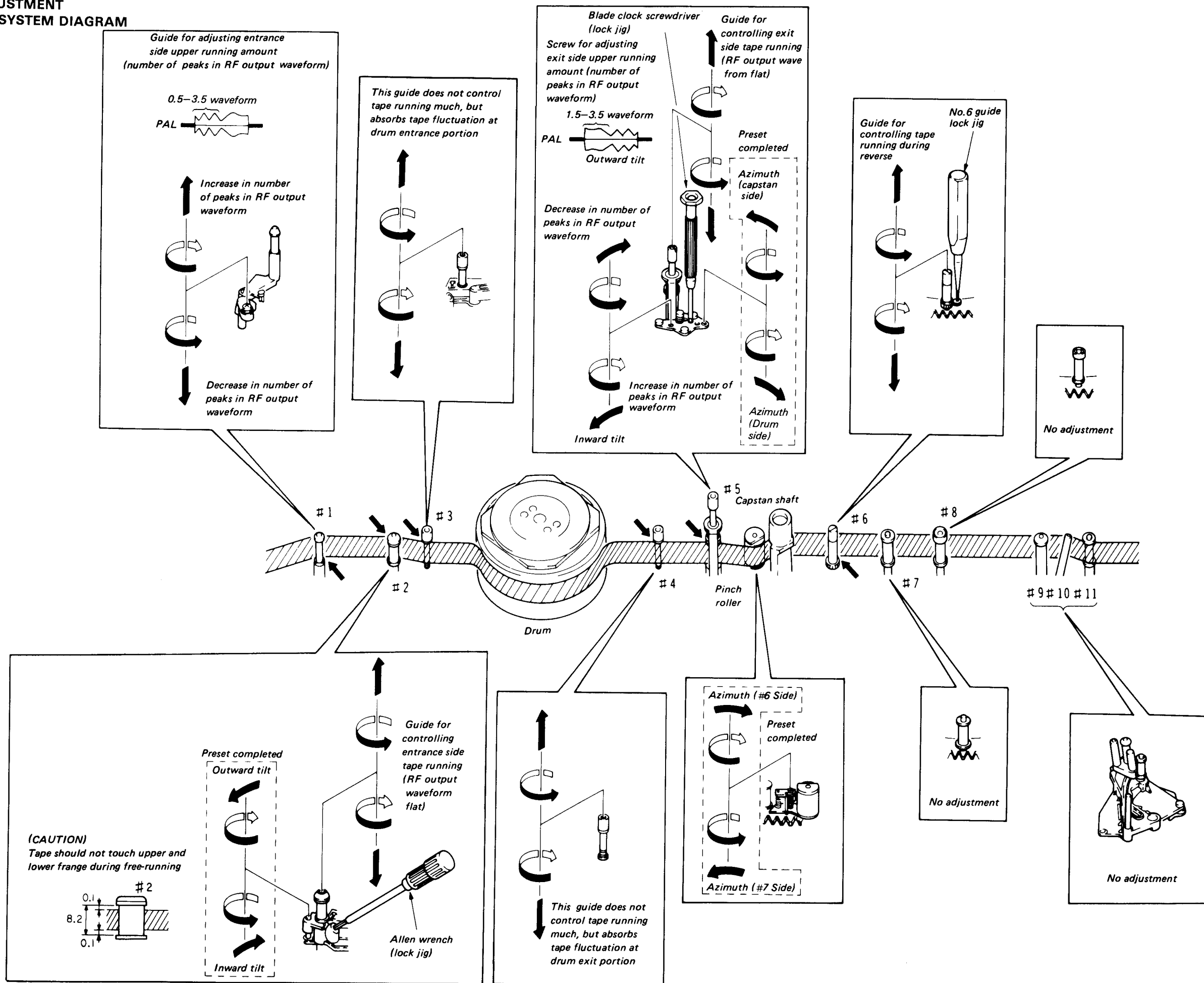
**7-4. TAPE PATH ADJUSTMENT  
TAPE RUNNING SYSTEM DIAGRAM**





7-4. TAPE PATH ADJUSTMENT  
TAPE RUNNING SYSTEM DIAGRAM

ue  
(Ref. No.  
reel table  
eel torque  
7-23 g·cm.  
value are



## [REGARDING TRACK SHIFT AND MONITOR JIG]

The video 8 system employs a high precision tracking ATF (auto track finding) and instantaneously controls the tape running speed with the 4 kinds pilot signals. In this way, the tracking adjustment knob becomes unnecessary, and accurate tracking has become possible.

However, on the other hand, there has been difficulty in adjusting the tape path system with the ATF method. It was due to the fact that complete adjustment had been impossible to be performed because even when the tracing of the head had been a slightly off course, the ATF would perform correction automatically.

Because of this, adjustment is carried out to the tape path system by using the track shift & monitor jig (Ref. No. J-6080-851-A). As the track shift and monitor jig forcibly releases the ATF and sets the tracking amount (track shift) manually, the adjustment of the tape path system can easily be carried out.

**Perform this adjustment after the electrical adjustment of Section 8 has been completed.**

### 7-4-1. Connection with Track Shift and Monitor Jig

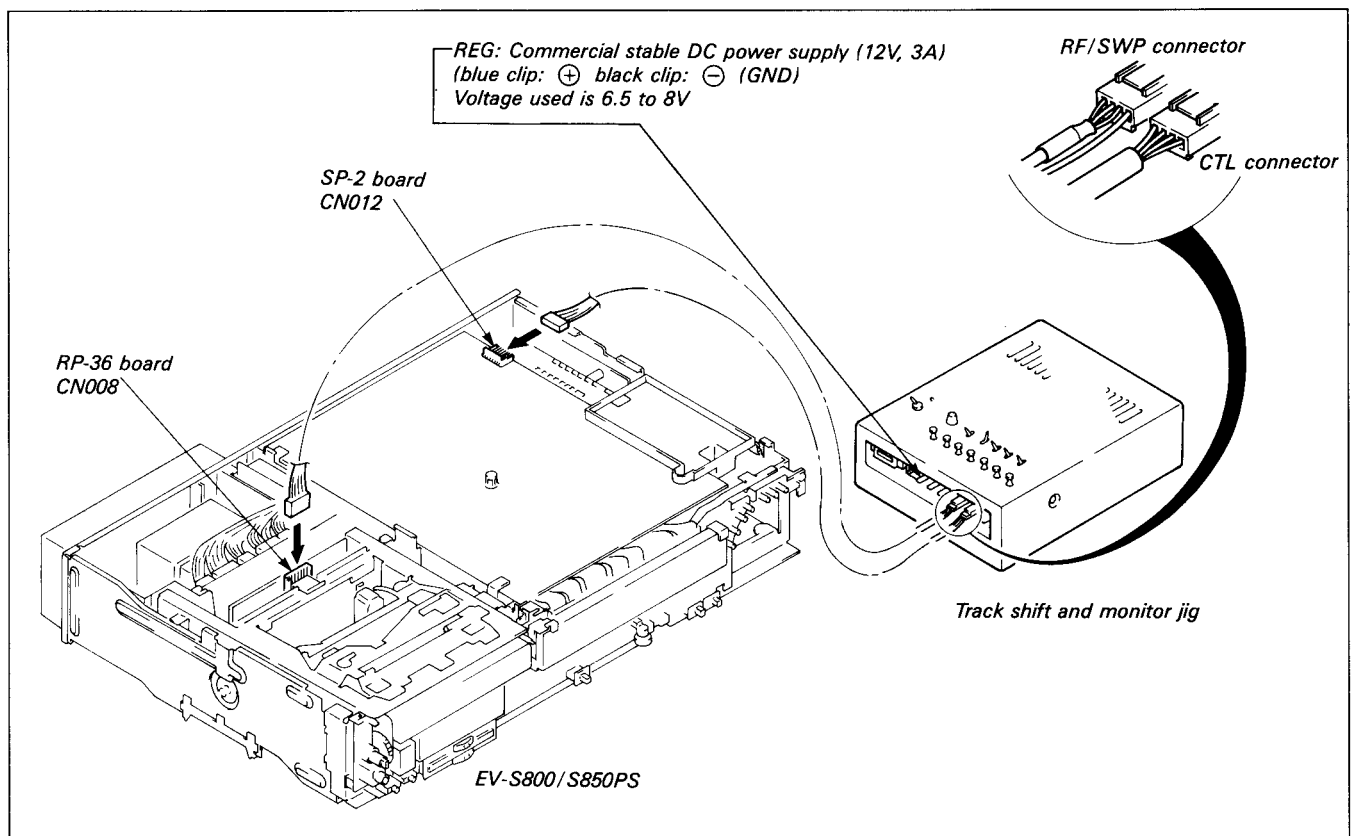


Fig. 7-63.

### [Track Shift and Monitor Jig Power Supply]

The track shift & monitor jig has three types of connectors for external power supply, and the following three types of power supply can be used.

Connector Name	Power Supply
SYSTEM CONN	Connect modified CCD-V8E/UB AC adapter AC-V8 E/UB. (Refer to the track shift and monitor jig instruction manual for the modification procedure.)
AC ADP	Betamovie AC adapter AC-M100E/UB is connected.
REG	Connect commercially sold DC stable power supply of more than 12V3A and use at 6.5~8V. Be sure to make correct ⊕ and ⊖ connections.

- Two or more types of power supply can not be used at the same time.
- Use the connector supplied with the track shift & monitor jig when connecting.
- Power supplies or voltages other than those given above should not be used.
- When using the modified AC-V8E/UB, the circuit power supply is cut off about 10 seconds after the AC-V8E/UB power switch is turned off.
- Power is not supplied to itself, so be sure to supply AC power to it at the same time.

#### [Connector Connection]

Connect the track shift & monitor jig as shown in Fig. 7-63. Connect RF/SWP connector to RP-36 board CN008, and the CTL conector to SP-2 board CN012.

#### [Switch Settings]

- SEL switch: Set to ON when doing track shift. When OFF, control is from side.
- PATTERN switch: Set to EV side.
- ATF LOCK: Set to OFF.
- Other switches are not used during adjustment.

### 7-4-2. Preparation for Adjustment

- 1) Perform cleaning of the tape running surface (the individual tape guides, drum, capstan shaft and pinch roller).
- 2) Connection of oscilloscope  
1ch: CH2 pin (RF signal)  
2ch: RF SWP pin (RF SWP signal)  
(Fig. 4-1)
- 3) Set the SEL switch of the track shift & monitor jig to OFF, then playback the alignment tape (WR5-1C) for tracking, and confirm that the RF waveform of both the entrance and exit sides become flat (Fig. (a) in 7-64.). If the RF waveform of both sides is not flat, the adjustment should be carried out in accordance with the following.
  - \* In case the RF waveform on the entrance side is not flat (Fig. (b) in 7-64.) . . . Perform the adjustment in Item 7-4-3. Entrance side adjustment.
  - \* In case RF waveform on the exit side is not flat (Fig. (c) in 7-64.) . . . Perform the adjustment in Item 7-4-4, Exit Side Adjustment.

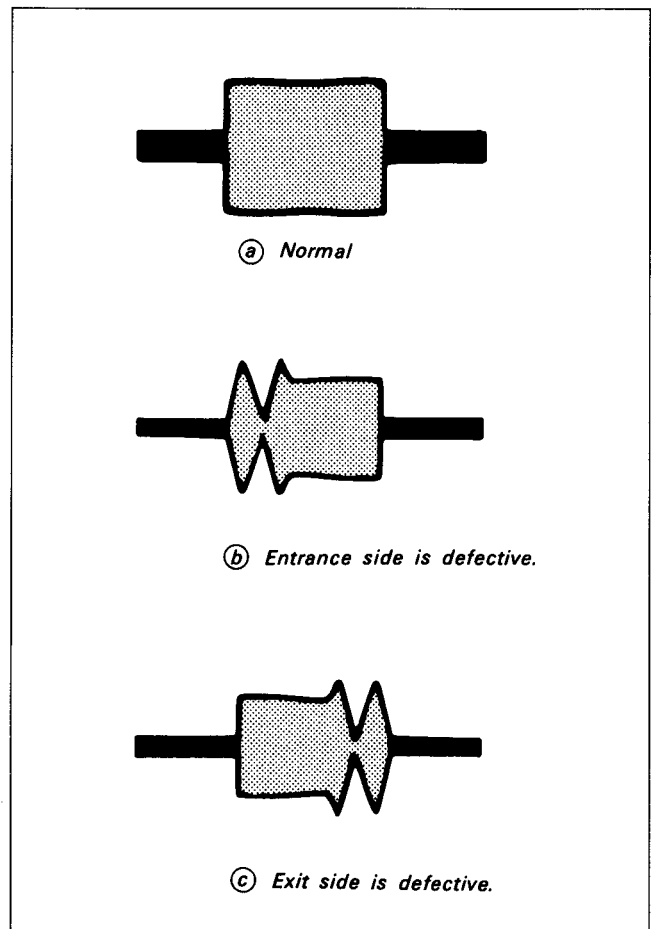


Fig. 7-64.

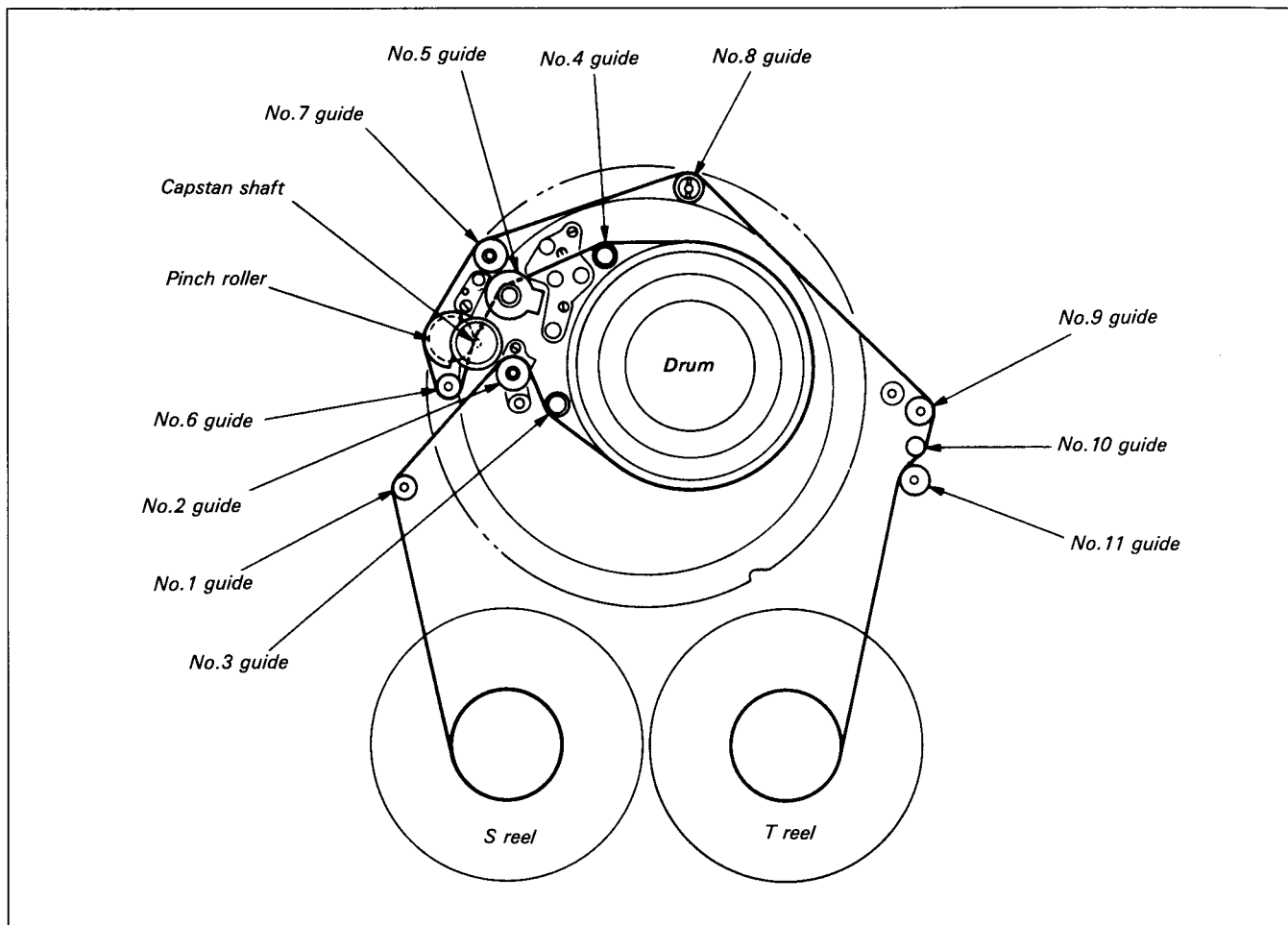


Fig. 7-65. Tape guide arrangement diagram

### 7-4-3. Entrance Side Adjustment

- 1) Playback the tracking alignment tape (WR5-1C) and loosen No.2 guide lock screw ❶, and rotate No.2 and No.3 guides counterclockwise to free tape running on the entrance side. (See Fig. 7-66.)

**Note:** Since the space between the top and bottom flanges of No.2 guide is narrow, confirm that the tape is contacting neither top nor bottom flanges at this point. If No.2 guide is loosened excessively, the tape contacts the bottom flange and the RF waveform on the entrance side ceases to be the original free waveform.

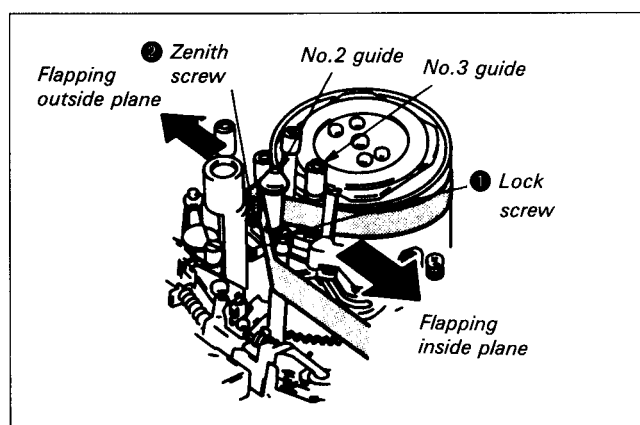


Fig. 7-66.

- 2) Confirm that RF waveform on the entrance side has 0.5 to 3.5 peaks in this condition. If not, adjust as follows. (See Fig. 7-67.)

**[less the 0.5 peak]**

Adjust the No.2 guide zenith screw ② by turning it counterclockwise 90° at a time. (See Fig. 7-66.)

**[more than 3.5 peaks]**

Adjust the height adjustment screw of No.1 guide (tension regulator assembly) by turning it counterclockwise 90° at a time. (See Fig. 7-68.)

- 3) Slowly rotate the No.2 guide clockwise to make the entrance side waveform approximately flat. (See Fig. 7-69)

**Note: Do not rotate No.2 guide excessively.**

- 4) Set the SEL switch of the track shift & monitor jig to ON, then turn the track shift knob until the RF waveform amplitude is 2/3. (See Fig. 7-70.)
- 5) Turn No.2 guide so that the entrance side waveform flattens slightly. (See Fig. 7-71.)
- 6) Flatten the waveform with No.3 guide. (See Fig. 7-72.)
- 7) Tighten No.2 lock screw ①. (See Fig. 7-66.)

**Note: Be sure to perform checking in accordance with 7-4-5. after making the adjustment.**

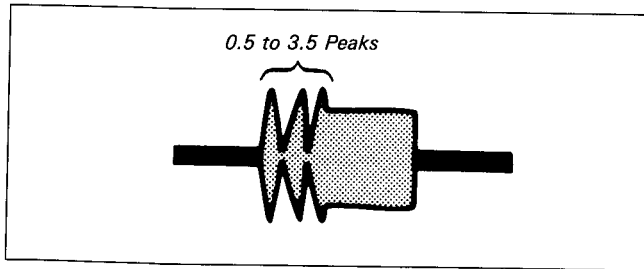


Fig. 7-67.

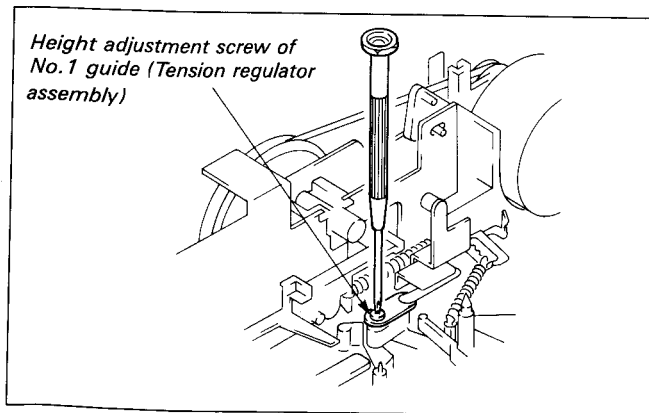


Fig. 7-68.

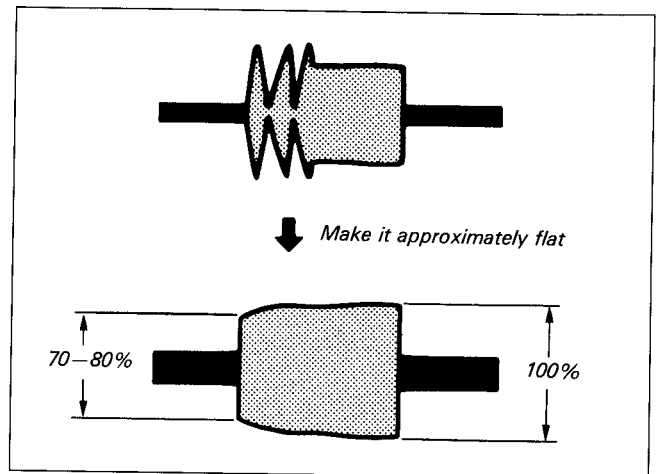


Fig. 7-69.

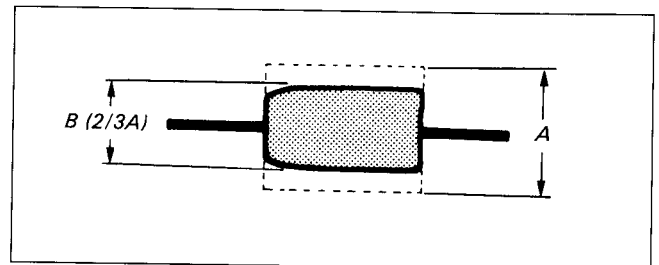


Fig. 7-70.

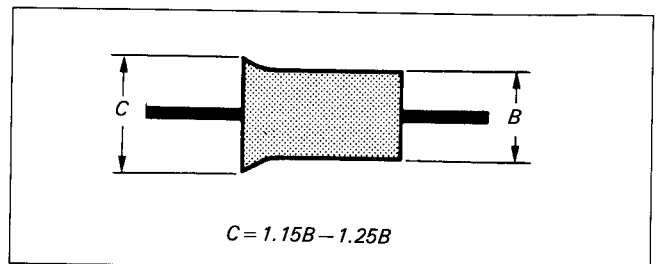


Fig. 7-71.

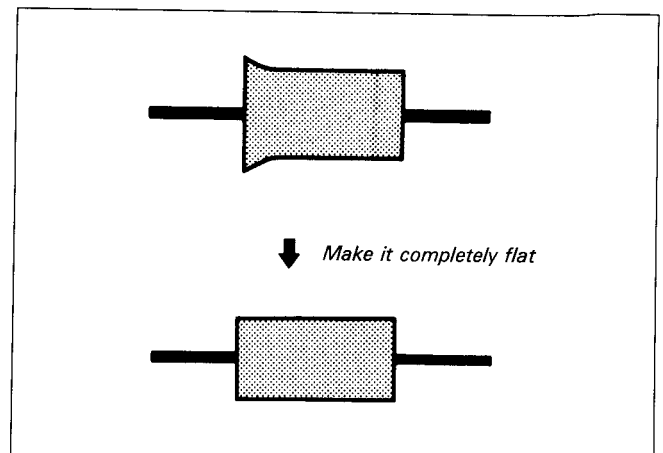


Fig. 7-72.

#### 7-4-4. Exit Side Adjustment

- 1) Playback the alignment tape (WR5-1C) for tracking. Rotate No.4 guide counterclockwise and No.5 guide clockwise in order to make the tape running on the exit side free. (See Fig. 7-73.)

**Note:** • If screw lock is stuck to the No.5 guide nut, it may prevent the nut from rotating. Rotate the guide after immersing the nut thread into alcohol and to dissolve the screw lock agent.

- Check that the tape is not contacting the top and bottom of flanges of No.5 guide during free tape running.

- 2) Check that the RF waveform on the exit side has 1.5 to 3.5 peaks. If not, readjust as follows: (See Fig. 7-74.)

**If off standard**

- i) Rotate the lock screw ① counterclockwise to loosen.
- ii) Slowly rotate the zenith screw ② 45° at a time and wait until the RF waveform varies.
- iii) Rotate the lock screw ① clockwise to tighten. (See Fig. 7-73.)

**Note:** • The waveform varies if the lock screw is tightened too strongly. Tighten moderately.

- Never rotate the azimuth screw of No.5 guide.

- 3) Rotate No.5 guide counterclockwise to make the RF waveform on the exit side approximately flat. (See Fig. 7-75.)

**Note:** The waveform reaction is slow against nut rotation. Rotate the nut after the waveform variations are stabilized.

- 4) Set the SEL switch of the track shift & monitor jig to ON, then turn the track shift knob until the RF waveform amplitude is 2/3 (See Fig. 7-76.)

- 5) Turn No.5 guide so that the exit side waveform flats slightly. (See Fig. 7-77.)

- 6) Turn No.4 guide so that waveform flat. (See Fig. 7-78.)

**Note:** Be sure to perform checking in accordance with 7-4-5. after making the adjustment.

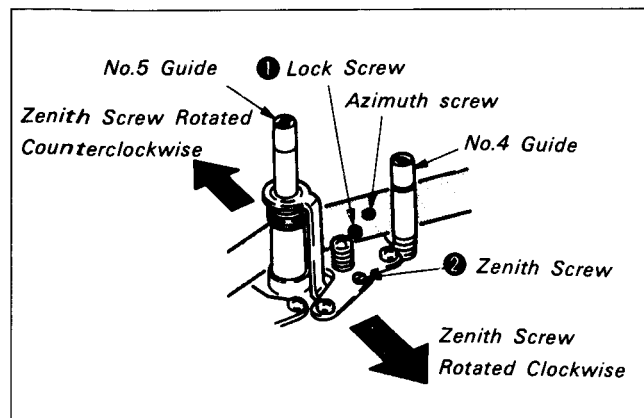


Fig. 7-73.

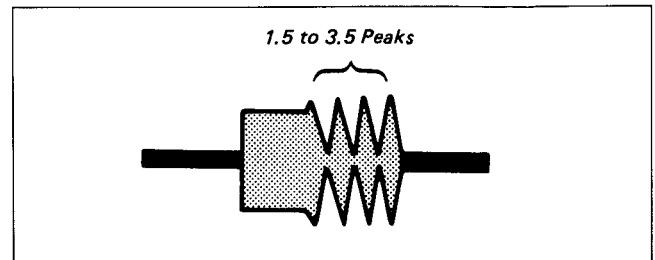


Fig. 7-74.

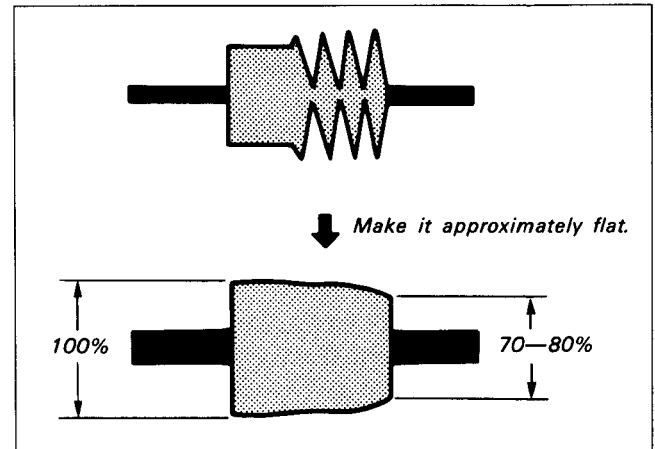


Fig. 7-75.

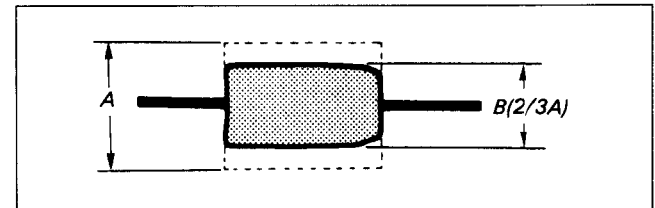


Fig. 7-76.

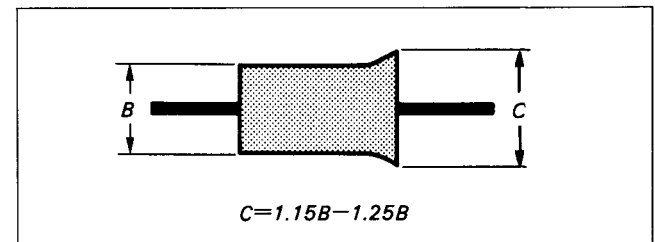


Fig. 7-77.

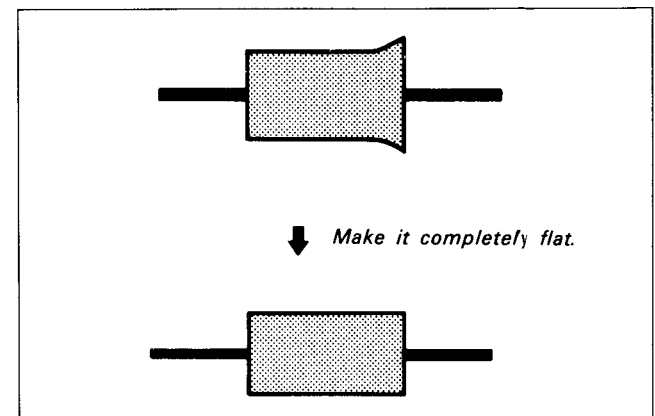


Fig. 7-78.

### 7-4-5. Checking After Adjustment

#### 1. Tracking check

- 1) Playback the alignment tape (WR5-1C) for tracking.
- 2) Set the SEL switch of the track shift & monitor jig to ON, and turn track shift knob until the RF waveform amplitude is 2/3. (See Fig. 7-79.)

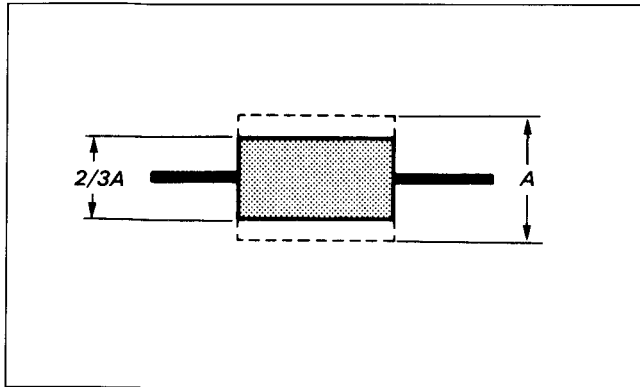


Fig. 7-79.

- 3) Confirm that the RF waveform amplitude minimum value (E min) at this time is more than 80% of maximum value (E max.). (See Fig. 7-80.)

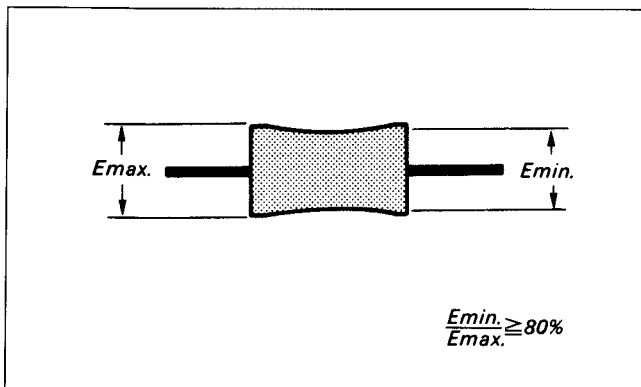


Fig. 7-80.

- 4) Check that the fluctuation amount of RF waveform entrance and exit sides both is as shown in Fig. 7-81.

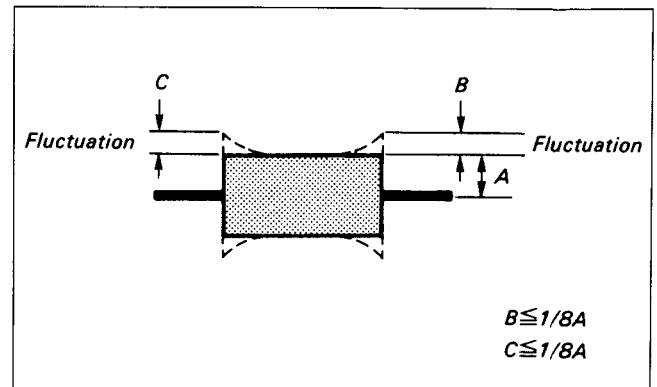


Fig. 7-81.

- 5) Set the SEL switch of the track shift & monitor jig to OFF.
- 6) Set up the REV mode and confirm that the waveform noise pitches are uniform. If not adjust as follows. (See Fig. 7-82.)

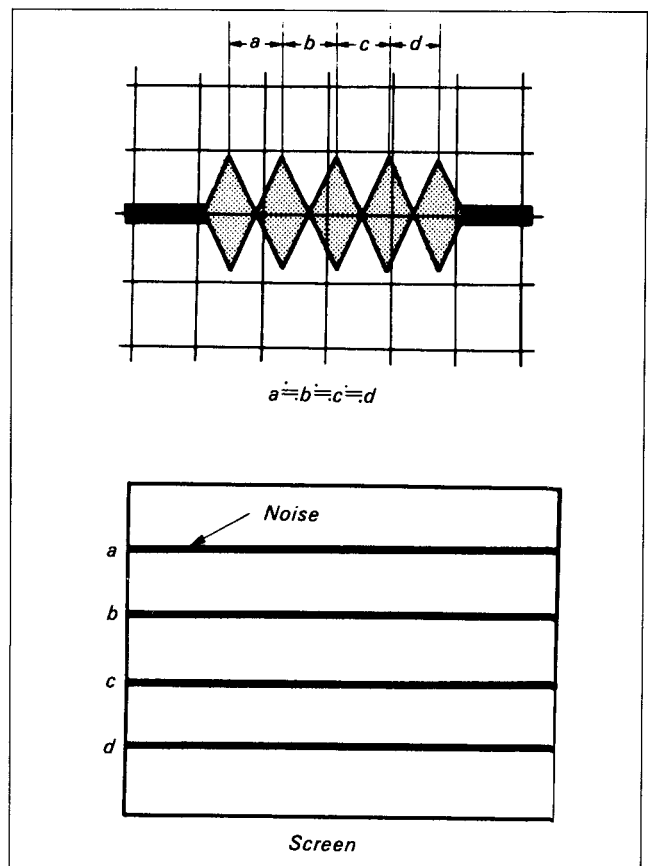


Fig. 7-82.

[Narrow noise pitch on entrance side (upper screen)]  
 (See Fig. 7-83.)

Confirm that the RF waveforms are flat in the PLAYBACK mode.

**Waveform is not flat:**

Adjust the heights of No.2 and 3 guides as in 7-4-3. Entrance Side Adjustment.

**Waveform is flat:**

Check again by performing No.1 guide height and No.2 guide zenith adjustment according to 7-4-3. Entrance Side Adjustment.

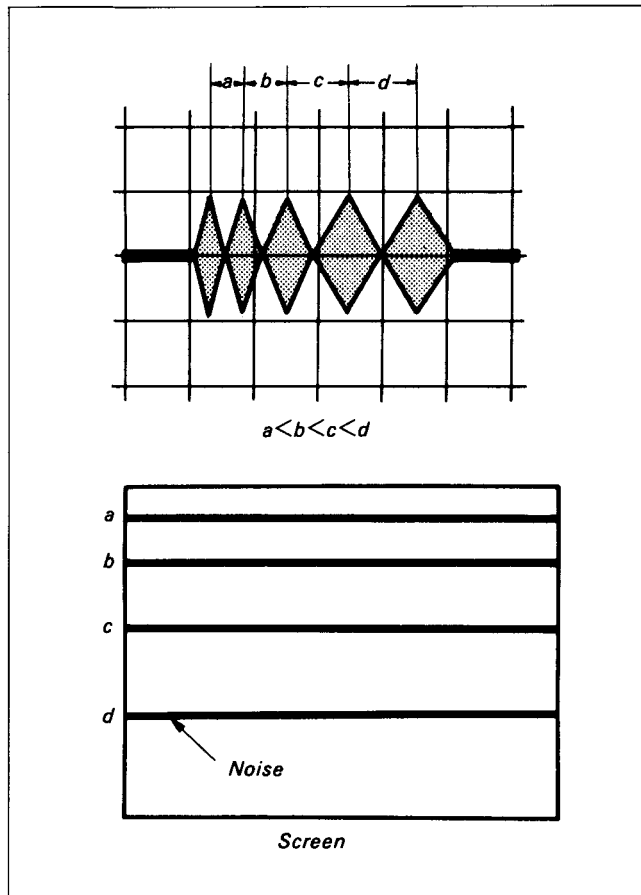


Fig. 7-83.

[Narrow noise pitch on exit side (lower screen)]  
 (See Fig. 7-84.)

Set up the PLAYBACK mode and adjust No.4 and 5 guide heights in accordance with 7-4-4. Exit Side Adjustment.

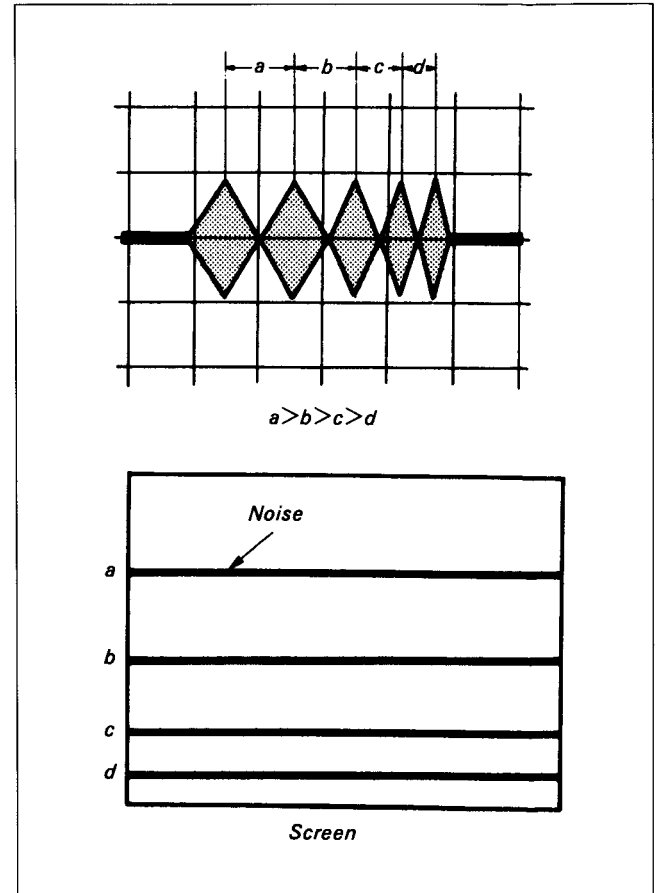


Fig. 7-84



[Wide noise pitch on exit side (lower screen)]  
 (See Fig. 7-85.)

Set up the PLAYBACK mode and confirm that the RF waveform is flat.

**Waveform is not flat:**

Adjust height of No.4 and 5 guides in accordance with 7-4-4. Exit Side Adjustment.

**Waveform is flat:**

Rotate the guide lower toothed wheel counterclockwise with No.6 guide lock jig (Ref. No. J-11) to loosen the toothed wheel. Rotate No.6 guide counterclockwise 45° to tighten the lower toothed wheel. Confirm the RF waveform of the REV mode again. (See Fig. 7-86.)

**Note:** Wrinkles may be caused in Part A between the capstan spindle and No.5 guide, if No.6 guide is raised excessively. Confirm that no wrinkles have been caused. (See Fig. 7-87.)

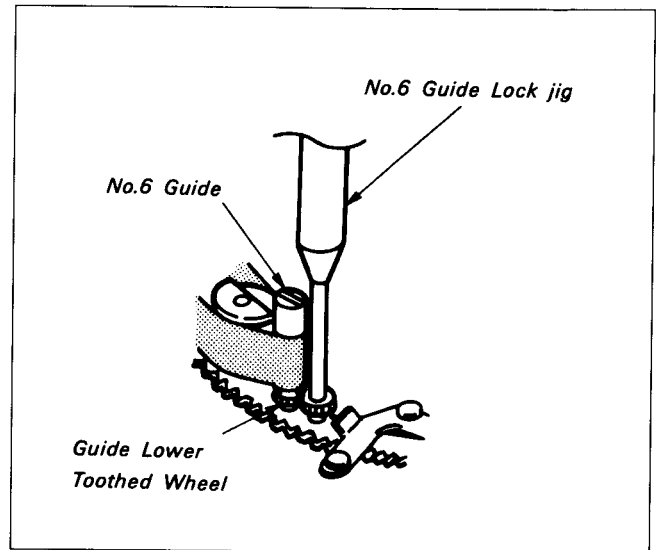


Fig. 7-86.

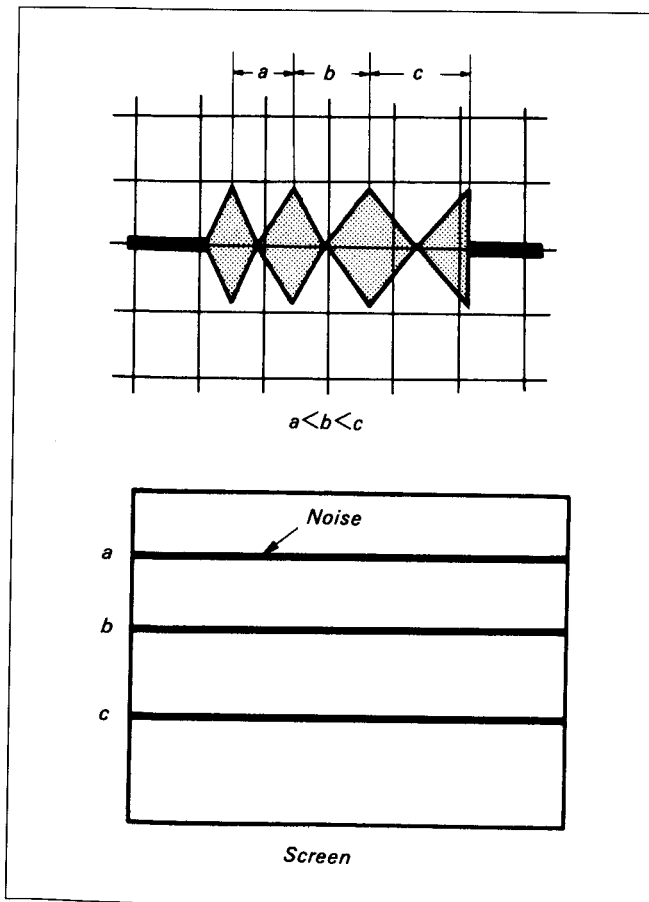


Fig. 7-85.

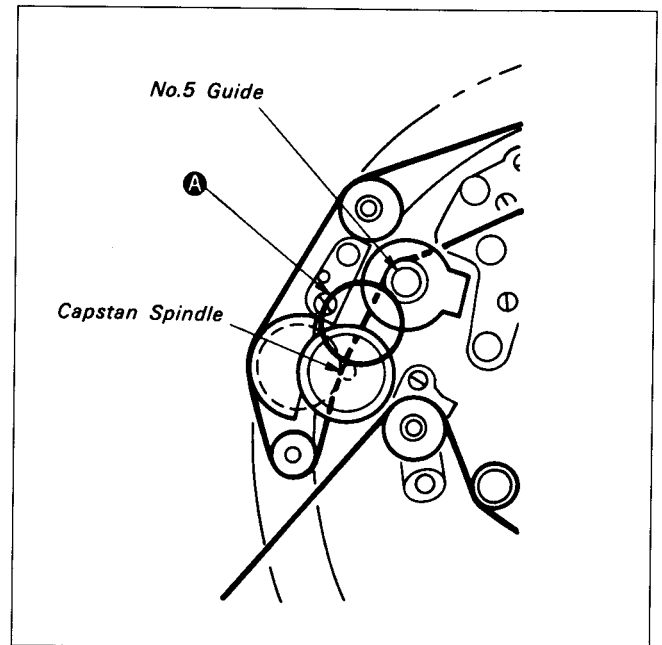


Fig. 7-87.

## 2. Checking rising edge

- 1) Check that the RF waveform rises horizontally during playback after finishing loading, after CUE/REV, and during playing back after FF. If not, adjust as follows.

[Noise emits from the exit side (lower screen) with rising during playback after finishing loading]  
(See Fig. 7-88.)

Check that the FWD back tension is not too low.

**If too low:**

Readjust as instructed in 7-3-21. FWD Back Tension Adjustment.

**If normal:**

Rotate the azimuth screw of the pinch roller clockwise  $5^\circ$  at a time and adjust after rechecking the rising edge. (See Fig. 7-89.)

[Noise emits from the exit side (lower screen) with rising during playback after REV]  
(See Fig. 7-88.)

Loosen the guide lower toothed wheel of No.6 guide using No.6 guide lock jig, rotate No.6 guide  $90^\circ$  counterclockwise to tighten the toothed wheel, then recheck the rising edge.

**Note:** Wrinkles may be caused in Part A of Fig. 7-87, if No.6 guide is raised excessively at this time, between the capstan spindle and No.5 guide, so check that no wrinkles are caused.

[Noise emits from the exit side (lower screen) with rising during playing back after FF]  
(See Fig. 7-88.)

Confirm that the FWD back tension is not too low.

**If too low:**

Readjust as required in 7-3-21. FWD Back Tension Adjustment.

**If normal:**

Remote the azimuth screw of the pinch roller clockwise by  $5^\circ$  at a time and adjust after checking the rising edge. (See Fig. 7-89.)

**Note:** Be sure to check play rising after finishing loading in case an adjustment is made.

## 3. Tape running check

In PLAYBACK and REV modes, there should be no spaces and curl should be within 0.3 mm for No.1, 2 and 5 guides at No.1 — No.6 guide flanges (Fig. 7-90.). Check also that there is no space or curl at No.3, 4 and 6 guides.

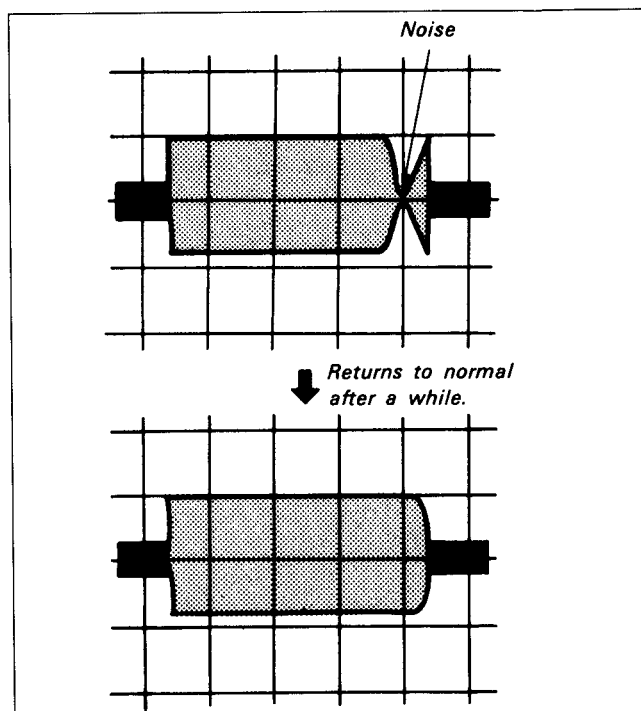


Fig. 7-88.

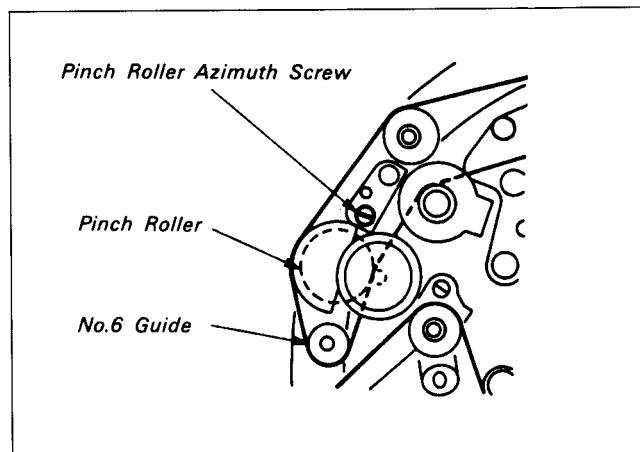


Fig. 7-89.

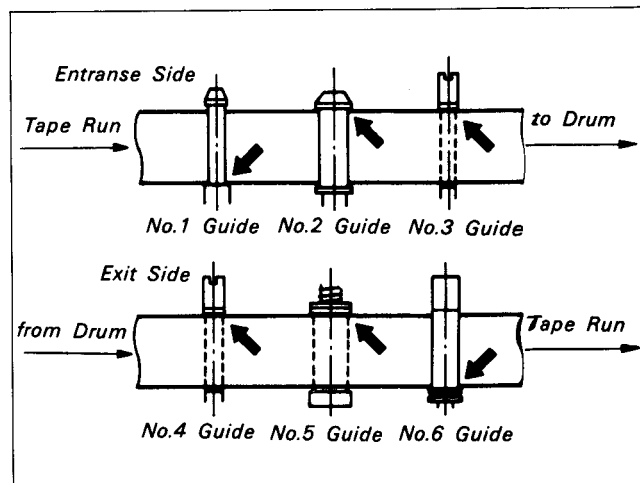


Fig. 7-90.

## SECTION 8 ELECTRICAL ADJUSTMENT

**During the adjustment, see the parts arrangement diagram relevant to the adjustment on page 348.**

The following measuring instruments are needed for electrical adjustment.

**[Equipment]**

- 1) Monitor TV
- 2) Oscilloscope, dual trace, band 10 MHz or wider, with delay mode (Use a 10:1 probe unless otherwise specified)
- 3) Frequency counter
- 4) PAL pattern generator
- 5) Digital voltmeter
- 6) Audio generator
- 7) Audio level meter
- 8) Audio distortion meter
- 9) Audio attenuator
- 10) Alignment tapes
  - Tracking adjustment (WR5-1C) Parts code: 8-967-995-06
  - Video frequency response adjustment (WR5-2C) Parts code: 8-967-995-16
  - Operation check (WR5-3CL) Parts code: 8-967-995-36
  - Operation check (WR5-3CSP) Parts code: 8-967-995-27

**[Equipment Connection]**

Unless otherwise specified, adjustment is made by connecting the measuring instruments as shown below.

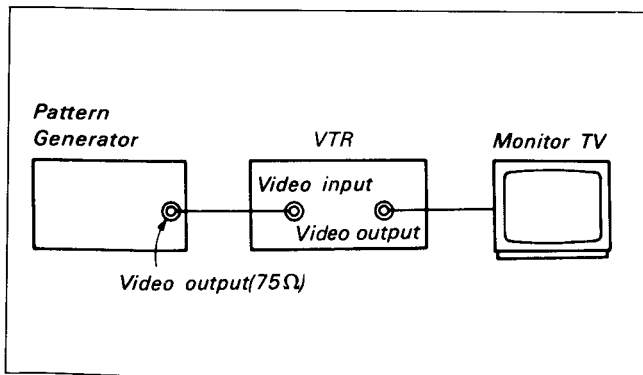


Fig. 8-1.

**Setting up during adjustment**

Video signals output by a pattern generator are used as adjustment signals when making the electrical adjustments, and these video output signals should be within the required standard. Connect an oscilloscope CNJ002 (VIDEO IN) on the VI-20 Board. Check that the amplitudes of video signal SYNC signals, picture portions, and burst signals are flat at approximately 0.3, 0.7, and 0.3V, respectively, and that the level ratio of the burst signal and "red" signal is 0.30:0.66. Fig. 8-2. shows video signals (colour bars) used in making the electrical adjustment.

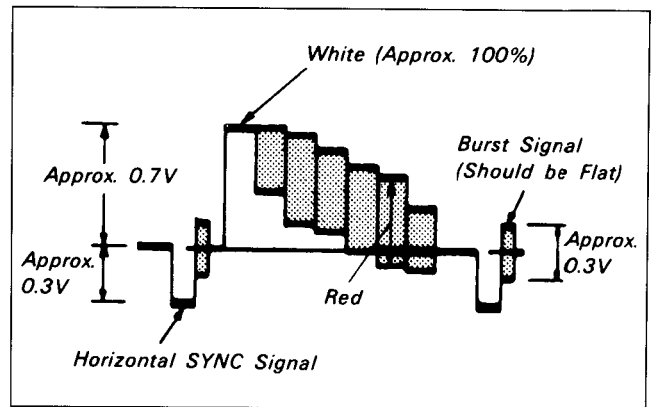


Fig. 8-2.

[Alignment tape]

Tape	Content	Use																		
Tracking (WR5-1C)	1. Recording area: PCM — video 2. Recording content: CH2: 1 MHz linearity adjustment signal (CH1: 9 MHz)	Drum linearity adjustment																		
Video Frequency Response (WR5-2C)	1. Recording area: Video 2. Recording content: RF sweep 0 to 10 MHz 3. Marker: 1, 3.58, 5.5 and 7 MHz	Frequency response adjustment																		
Operation Check SP mode WR5-3CSP LP mode (WR5-3CL)	1. Recording area: Video, PCM 2. Recording content: <ul style="list-style-type: none"> <li>■ Video area</li> <li>● Video signals                             <table style="display: inline-table; vertical-align: middle;"> <tr> <td>Colour bars</td> <td>10 sec</td> <td rowspan="2">} Iterative</td> </tr> <tr> <td>Monoscope</td> <td>8 sec</td> </tr> </table> </li> </ul> (Colour bars) <div style="text-align: center; margin: 10px 0;"> </div> <ul style="list-style-type: none"> <li>● Audio signals (AFM)                             <ul style="list-style-type: none"> <li>400 Hz 60% modulation</li> </ul> </li> <li>■ PCM area (WR5-3CSP only)</li> <li>● Audio signals (PCM)                             <table style="display: inline-table; vertical-align: middle;"> <tr> <td>1kHz</td> <td>0dBs</td> <td>10sec</td> <td rowspan="4">} Iterative</td> </tr> <tr> <td>20Hz</td> <td>-6dBs</td> <td>2sec</td> </tr> <tr> <td>400Hz</td> <td>-6dBs</td> <td>4sec</td> </tr> <tr> <td>14kHz</td> <td>-0.7dBs</td> <td>2sec</td> </tr> </table> </li> </ul>	Colour bars	10 sec	} Iterative	Monoscope	8 sec	1kHz	0dBs	10sec	} Iterative	20Hz	-6dBs	2sec	400Hz	-6dBs	4sec	14kHz	-0.7dBs	2sec	Operation check
Colour bars	10 sec	} Iterative																		
Monoscope	8 sec																			
1kHz	0dBs	10sec	} Iterative																	
20Hz	-6dBs	2sec																		
400Hz	-6dBs	4sec																		
14kHz	-0.7dBs	2sec																		

**Input/output level and impedance**

Video input Phono jack

Input signals: 1 Vp-p, 75Ω unbalanced, sync negative

Video output Phono jack

Output signals: 1 Vp-p, 75Ω unbalanced, sync negative

Audio input Phono jack

Input level: -10dBs (0dBs=0.775 Vrms)

Input impedance: 47kΩ or higher

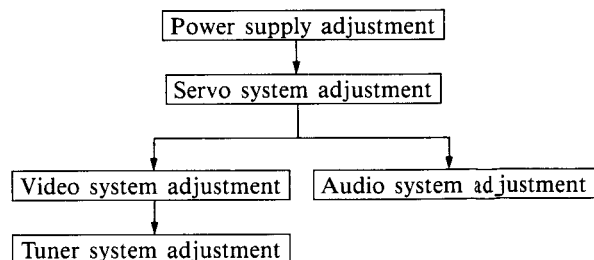
Audio output Phono jack

Regulated output: -10dBs (at load impedance 47kΩ)

Load impedance: More than 10kΩ

**Adjustment Procedure**

Adjust in the following sequence:



## 8-1. Power Supply Adjustment

### 8-1-1. Oscillation frequency adjustment (DR-35 board)

Mode	E-E
Measurement point	Q201 collector
Measurement equipment	Frequency counter
Adjustment element	RV201
Specified value	$91 \pm 2\text{kHz}$

#### [Adjustment method]

- 1) Adjust with RV201 so that it becomes  $91 \pm 2\text{kHz}$ .

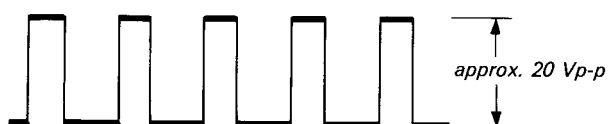


Fig. 8-3.

### 8-1-2. REG 5V adjustment (DR-35 board)

Mode	E-E
Measurement point	Pin ③ of CN201
Measurement equipment	Digital voltmeter
Adjustment element	RV202
Specified value	$5.3 \pm 0.1\text{Vdc}$

#### [Adjustment method]

- 1) Adjust with RV202 so that it becomes  $5.3 - 0.1\text{Vdc}$ .

### 8-1-3. REG 12V adjustment (DR-35 board)

Mode	E-E
Measurement point	Pin ① of CN203
Measurement equipment	Digital voltmeter
Adjustment element	RV203
Specified value	$12.3 \pm 0.3\text{Vdc}$

#### [Adjustment method]

- 1) Adjust with RV203 so that it becomes  $12.3 \pm 0.3\text{Vdc}$ .

### 8-1-4. Voltages Check (DR-35, DT-63 Boards)

Mode	E-E
Measurement equipment	Digital voltmeter
UNSW 5V Check	
Measurement point	Pin ② of CN203 on DR-35 board
Specified value	$5.4 \pm 0.2\text{Vdc}$
DRIVE 9V Check	
Measurement point	Pin ④ of CN202 on DR-35 board
Specified value	$9.1 \pm 0.2\text{Vdc}$
UNSW 38V Check	
Measurement point	Pin ② of CN104 on DT-63 board
Specified value	$36.5 \pm 0.8\text{Vdc}$
UNSW -30V Check	
Measurement point	Pin ④ of CN104 on DT-63 board
Specified value	$-29 \pm 0.8\text{Vdc}$
UNSW 9V Check	
Measurement point	Pin ① of CN105 on DT-63 board
Specified value	$8.8 \pm 0.2\text{Vdc}$
UNSW -9V Check	
Measurement point	Pin ③ of CN105 on DT-63 board
Specified value	$-8.8 \pm 0.2\text{Vdc}$
BACK UP 5V Check	
Measurement point	Pin ⑦ of CN106 on DT-63 board
Specified value	$5.7 \pm 0.8\text{Vdc}$

#### [Confirmation method]

Check that each voltage satisfies the specified value.

## 8-2. SERVO SYSTEM ADJUSTMENT

### 8-2-1. Reel Bias Adjustment (SP-2 board)

Mode	REC (SP)
Signal	Arbitrary
Measurement point	+ : TP210 (Pin ② of CN207) - : TP211 (Pin ① of CN207)
Measurement equipment	Digital voltmeter
Adjustment element	RV209
Specified value	1.00 - 0.05Vdc

#### [Adjustment method]

- 1) Set up the REC mode and wait for 5 seconds.
- 2) Adjust with RV209 so that the DC-voltage is  $1.00 \pm 0.05\text{Vdc}$ .
- 3) Set up the FF mode.
- 4) Check that the DC-voltage is  $2.25 \pm 0.1\text{Vdc}$ .

### 8-2-2. REC ATF Level Check (SP-2 board)

Mode	E-E
Signal	Arbitrary
Measurement point	TP235 (CN214 ⑤) PIN: REC ATF)
Measurement equipment	Oscilloscope
Specified value	$500 \pm 50\text{mVp-p}$

#### [Confirmation method]

- 1) Check that the REC ATF level is  $500 \pm 50\text{mVp-p}$ .

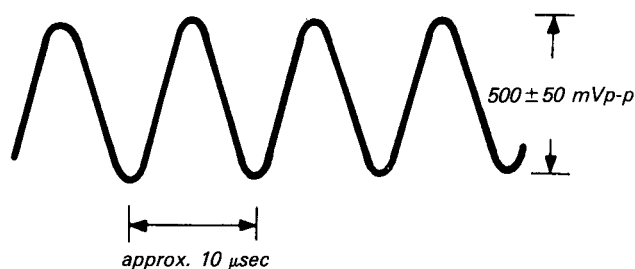


Fig. 8-4.

### 8-2-3. Drum Free Speed Adjustment (SP-2 Board)

Mode	REC
Signal	Arbitrary
Measurement point	TP213 (IC212 ⑭) PIN: ADE)
Measurement equipment	Digital voltmeter
Adjustment element	RV202
Specified value	$1.9 \pm 0.1\text{Vdc}$

#### [Adjustment method]

- 1) Adjust with RV202 so that it becomes  $1.9 \pm 0.1\text{Vdc}$ .

### 8-2-4. Capstan Free Speed Adjustment (SP-2 Boards)

Mode	Playback
Signal	Arbitrary tape
Measurement point	TP202 (IC204 ⑬) PIN: CFG)
Measurement equipment	Frequency counter
Adjustment element	SP mode: RV206 LP mode: RV208
Specified value	SP mode: $1341 \pm 1\text{Hz}$ LP mode: $670 \pm 1\text{Hz}$

#### [Connection]

- 1) Connect TP230 (Q704 emitter: PB ATF) and TP002 (GND) with a jumper wire.

#### [Adjustment method]

The adjustment element of LP mode is shown in parentheses [ ].

- 1) Set up the SP [LP] mode by the SP/LP button.
- 2) Set up the playback mode.
- 3) Adjust with RV206 [RV208] so that it becomes  $1341 \pm 1\text{Hz}$  [ $670 \pm 1\text{Hz}$ ].



$1341 \pm 1\text{Hz}$  (SP mode)  
 $670 \pm 1\text{Hz}$  (LP mode)

Fig. 8-5.

### 8-2-5. Switching Position Adjustment (SP-2 Board)

Mode	Playback
Signal	Alignment tape: For operation confirmation (WR5-3CSP)
Measurement point	CH1: VIDEO OUT terminal CH2: TP207 (IC204 ②) PIN: SV RF)
Measurement equipment	Oscilloscope
Adjustment element	RV201
Specified value	$6.5 \pm 0.3H$ ( $416 \pm 20 \mu\text{sec}$ )

#### [Adjustment method]

- 1) Adjust with RV201 so that it becomes  $6.5 \pm 0.3H$  ( $416 \pm 20 \mu\text{sec}$ ).

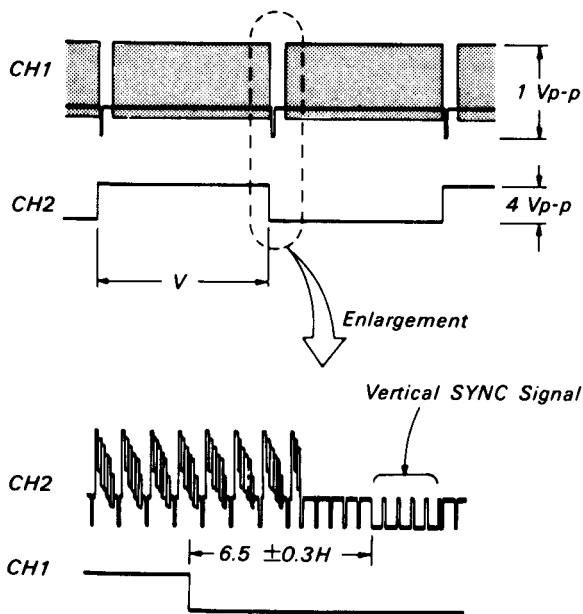


Fig. 8-6.

### 8-2-6. ATF BPF Balance Adjustment (SP-2 Board)

Mode	Playback
Signal	See Fig. 8-7
Measurement point	TP236 (IC703 ⑨) PIN: ATF ER)
Measuring equipment	Oscilloscope.
Adjustment element	RV701
Specified value	Minimum level difference of the ATF ERROR signal.

#### [Connection 1]

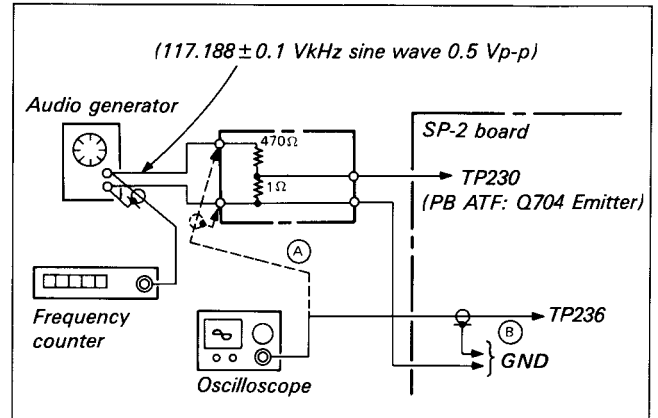


Fig. 8-7.

#### [Connection 2]

Connect Pin ⑤ of CN012 (P SEL 1) to Pin ① of CN005 (REG 5V) with a jumper wire.

#### [Adjustment method]

- 1) Check the output level of the audio generator with an oscilloscope and adjust so that the sine wave output level becomes  $0.5 \text{ Vp-p}$ . (Fig. 8-7 (A))
- 2) Adjust the oscillation frequency of the audio generator so that reading of the frequency counter becomes  $117.188 \pm 0.1\text{kHz}$ .
- 3) Playback an arbitrary tape.
- 4) Connect an oscilloscope to TP236.
- 5) Adjust with RV701 to eliminate level difference of the ATF ERROR signal.

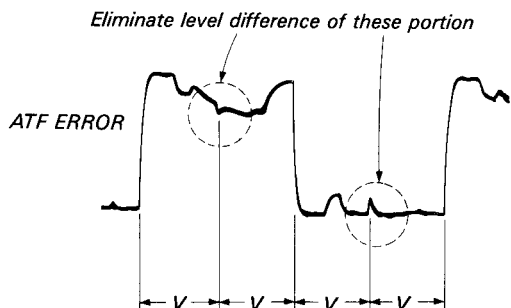


Fig. 8-8.

### 8-2-7. SLOW Tracking Adjustment (SP-2 Board)

The adjustment element of LP mode is shown in parenthesis [ ].

Mode	SLOW
Signal	SP [LP] mode recorded tape
Measurement point	TP232 (IC208 (23) PIN: C. ON)
Measurement equipment	Oscilloscope •Trigger mode: NORMAL •Trigger slope: +
Adjustment element	SLOW/STILL ADJ buttons in the tuner preset compartment (S004, S005 on PR-13 board)
Specified value	$38.5 \pm 0.5$ msec

#### [Connection]

Connect TP001 (IC001 (39) PIN: EMERG OFF) and TP002 (GND) with a jumper wire to set up the TEST mode.

#### [Adjustment method]

- 1) Playback the SP [LP] recorded tape.
- 2) Adjust to  $38.5 \pm 0.5$  msec with the SLOW/STILL ADJ buttons.

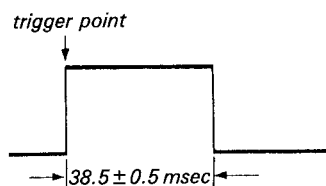


Fig. 8-9.

### 8-2-8. TRACKING Adjustment (SP-2 Board)

Mode	Playback
Signal	SP mode Self-recorded tape
Measurement point	CH1: Pin (3) of CN008 on RP-36 board (SP 1 CH) CH2: TP207 (Pin (21) of IC204: SV RF)
Measurement equipment	Oscilloscope
Adjustment element	RV210
Specified value	Maximum SP 1 channel RF level

#### [Adjustment method]

- 1) Maximize the SP 1 channel RF level by turning RV210 slowly.

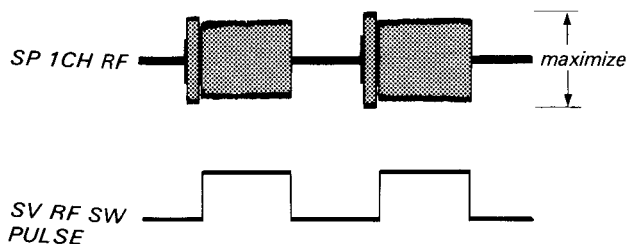


Fig. 8-10.

### 8-2-9. STILL Adjustment (SP-2 Board)

Mode	STILL
Signal	SP mode self-recorded tape
Measurement point	CH1: TP207 (Pin (21) of IC204: SV RF) CH2: TP228 (Pin (8) of IC703: ST ID)
Measurement equipment	Oscilloscope.
Adjustment element	RV203, RV204
Specified value	1. $4.8 \pm 0.6$ msec (RV203) 2. $13.8 \pm 0.6$ msec (RV204)

#### [Adjustment method]

- 1) Rotate the rotor of the capstan motor by your hand and stop it at the position that noise on the monitor screen is hidden into its upper or lower section.
- 2) Adjust to  $4.8 \pm 0.6$  msec with RV203. (See Fig. 8-11.)
- 3) Adjust to  $13.8 \pm 0.6$  msec with RV204. (See Fig. 8-11.)

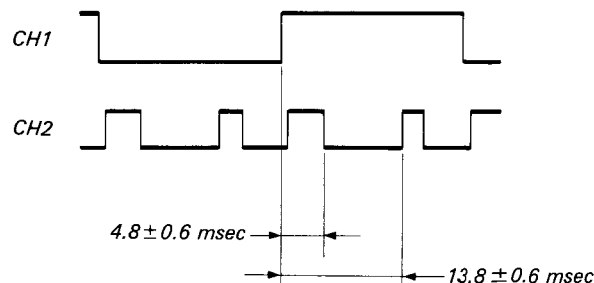


Fig. 8-11.

### 8-2-10. FORWARD SLOW Adjustment (SP-2 Board)

The adjustment element of LP mode is shown in parentheses [ ].

Mode	FORWARD SLOW
Signal	SP [LP] mode self-recorded tape
Measurement point	Confirm with monitor TV screen picture
Measurement equipment	
Adjustment element	RV205 [RV207]
Specified value	Be sure that there is no noise and no skew on the monitor TV screen.

#### [Adjustment method]

- 1) Adjust with RV205 [RV207] so that noise on the monitor screen is hidden into its upper or lower section.



### 8-2-11. SLOW fH Adjustment (SP-2 Board)

#### 1. fH Bias Adjustment

The adjustment element of LP mode is shown in parentheses [ ].

Mode	E-E
Signal	None
Measurement point	TP242 (Pin ⑦ of IC219: FH BIAS)
Measurement equipment	Digital voltmeter
Adjustment element	RV216 [RV215]
Specified value	$2.0 \pm 0.1\text{Vdc}$

#### [Adjustment method]

- 1) Set up the SP [LP] mode by the SP/LP button.
- 2) Adjust with RV216 [RV215] to  $2.0 \pm 0.1\text{Vdc}$ .

### 8-2-12. SLOW fH Adjustment

The adjustment element of LP mode is shown in parentheses [ ].

Mode	FORWARD SLOW
Signal	SP [LP] mode self-recorded tape
Measurement point	Pin ③ of CN216 (COMP SYNC)
Measurement equipment	Oscilloscope
Adjustment element	RV218, RV212 [RV217]
Specified value	Minimum shaking width of fH pulse

#### [Connection]

Connect TP001 (EMERG OFF) and TP002 (GND) with a jumper wire to set up the TEST mode.

#### [Adjustment method]

- 1) Adjust with RV218 and RV212 Alternately to minimize the shaking of the fH pulse.  
[Adjust with RV217 to minimize the shaking width of fH pulse.]

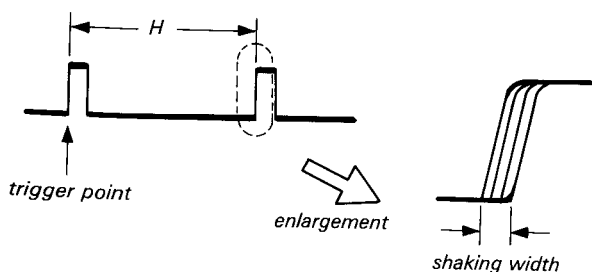


Fig. 8-12.

### 8-3. VIDEO SYSTEM ADJUSTMENT

The adjustment of the video system should in principle be followed the undermentioned adjustment procedure.

The colour video signal supplied from the pattern generator is utilized as the video input signal of the video system adjustment in recording mode. Make sure to check that the SYNC signal and colour burst signal are matched with those in the set-up of during the adjustment of as shown in Fig. 8-2.

#### [Adjustment procedure]

- 1) Playback frequency characteristics adjustment
- 2) Flying erase check
- 3) Crystal oscillator  $f_0$  adjustment
- 4) Y/C separation adjustment
- 5) Y comb type filter adjustment
- 6) SYNC AGC adjustment
- 7) VIDEO OUT level adjustment
- 8) PB Y level adjustment
- 9) Y FM carrier frequency adjustment
- 10) Y FM deviation adjustment
- 11) AC clipping adjustment
- 12) 375fH VCO adjustment
- 13) Chroma emphasis  $f_0$  adjustment
- 14) Carrier balance adjustment
- 15) GCA adjustment
- 16) fH VCO adjustment
- 17) REC Y level adjustment
- 18) REC C level adjustment
- 19) REC AFM level check
- 20) REC ATF level check

### 8-3-1. Playback Frequency Characteristic Adjustment (RP-36 Board)

#### (1) LP playback frequency characteristic adjustment

The adjustment elements of CH2 are shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment (WR5-2C)
Measurement point	Pin ⑤ [Pin ⑥] of CN008 •External trigger: Pin ② of CN008 •Trigger slope: + [-]
Measurement equipment	Oscilloscope
Adjustment element	RV101 [RV102]
Specified value	3.58MHz level: 5.5MHz level = 10:7

#### [Adjustment method]

- 1) Adjust with RV101 [RV102] so that the level difference ratio between 3.58 MHz and 5.5 MHz becomes 10:7.

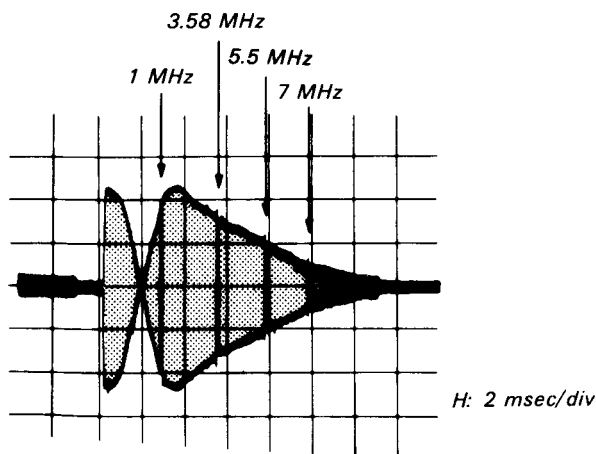


Fig. 8-13.

#### (2) SP playback frequency characteristic adjustment

The adjustment elements of CH2 are shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment use (WR5-2C)
Measurement point	Pin ③ [Pin ④] of CN008 •External trigger: Pin ② of CN008 •Trigger slope: - [+]
Measurement equipment	Oscilloscope.
Adjustment element	RV201 [RV202]
Specified value	3.58MHz level: 5.5MHz level = 10:7

#### [Connection]

Connect TP206 (F TAPE) on the SP-2 board and GND with a jumper wire.

#### [Adjustment method]

- 1) Adjust with RV201 [RV202] so that the level difference ratio between 3.58 MHz and 5.5 MHz becomes 10:7.

### 8-3-2. Flying Erase Check (RP-36 Board)

Mode	REC
Signal	Arbitrary
Measurement point	Pin ⑱ of CN001 (FE(X))
Measurement equipment	Oscilloscope and frequency counter
Specified value	Frequency: Over 7 MHz Voltage: Over 8 Vp-p

**Note:** Be sure to use MP type tape (Pin ② of CN002 should be "L").

#### [Confirmation method]

- 1) Make sure that the oscillation frequency is over 7 MHz and the oscillation voltage is over 8 Vp-p.

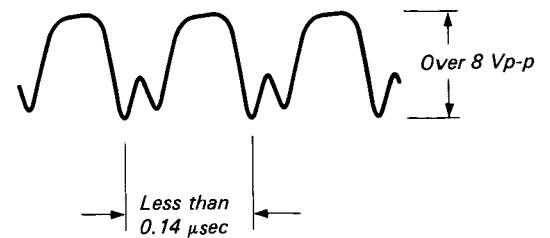


Fig. 8-14.

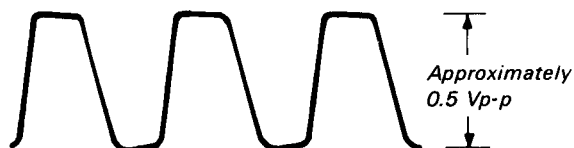
### 8-3-3. Crystal Oscillator fo Adjustment (CH-44/VI-20 Board)

Mode	Playback
Signal	Alignment tape: For operation confirmation (WR5-3CSP)
Measurement point	Pin ② of CH-44 board
Measurement equipment	Frequency counter
Adjustment element	CV001 on CH-44 board
Specified value	4433619 ± 50Hz

**Note:** Connect the frequency counter through a buffer of high impedance (approximately 10 MΩ) and low capacitance (less than 10pF)

#### [Adjustment method]

- 1) Adjust with CV001 on the CH-44 board so that it becomes 4433619 ± 50Hz.



(4433619 ± 50 Hz)

Fig. 8-15.

### 8-3-4. Chrome Comb Filter Adjustment (VI-20 Board)

Mode	E-E
Signal	Colour bar
Measurement point	Pin ② of IC002
Measuring equipment	Oscilloscope.
Adjustment element	RV011, LV201
Specified value	Minimum residual chroma component

#### [Connection]

Connect Q202 base to GND with a jumper wire.

#### [Adjustment method]

- 1) Adjust with RV011 and LV201 alternately so that the residual chroma component becomes minimum.

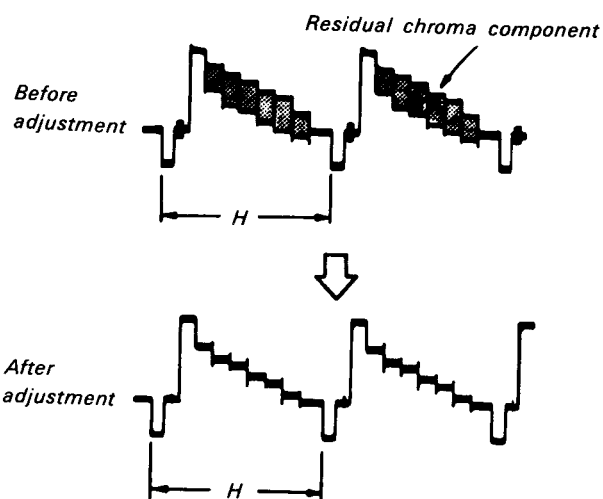


Fig. 8-16.

### 8-3-5. Y Comb Type Filter Adjustment (VI-20 Board)

Mode	E-E
Signal	Colour bar
Measurement point	Pin ③ of IC002
Measurement equipment	Oscilloscope
Adjustment element	RV012
Specified value	Minimum Y-Y <sub>D</sub> signal level

**Note:** Be sure to connect a 22kΩ of resistor in series between Pin ③ of IC002 and 10:1 probe.

#### [Adjustment method]

- 1) Adjust with RV012 so that the Y-Y<sub>D</sub> signal level at the sync portion is minimum.
- 2) While playing back a tape in which dropouts are recorded, be sure to confirm that these dropouts are not discernible. In the event the dropouts become discernible, adjust with RV012 so that they become undiscernible.

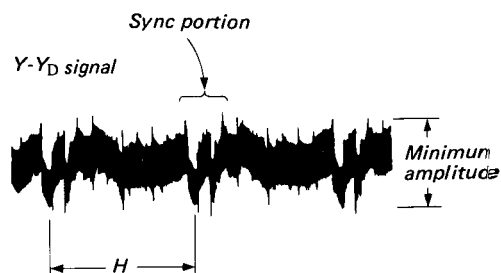


Fig. 8-17.

### 8-3-6. SYNC AGC Adjustment (VI-20 Board)

Mode	E-E
Signal	Colour bar
Measurement point	Pin ③① of IC001
Measurement equipment	Oscilloscope
Adjustment element	RV009
Specified value	$0.50 \pm 0.02 V_{p-p}$

#### [Adjustment method]

- 1) Adjust with RV009 so that it becomes  $0.50 \pm 0.02 V_{p-p}$ .

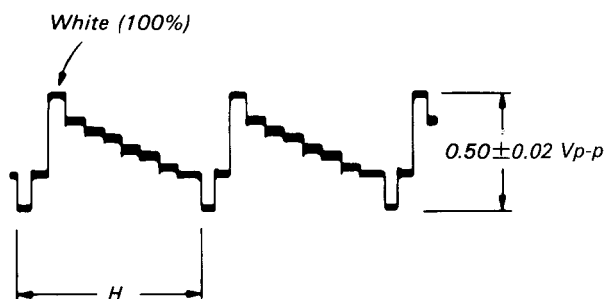


Fig. 8-18.

### 8-3-7. VIDEO OUT Level Adjustment (VI-20 Board)

Mode	E-E
Signal	Colour bar
Measurement point	Pin ⑤ of CN007
Measurement equipment	Oscilloscope.
Adjustment element	RV010
Specified value	$1.00 \pm 0.05 V_{p-p}$

#### [Adjustment method]

- 1) Adjust with RV010 so that it becomes  $1.00 \pm 0.05 V_{p-p}$ .

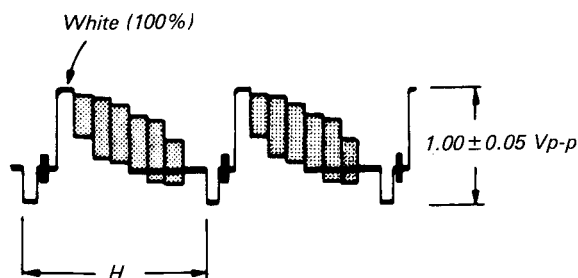


Fig. 8-19.

### 8-3-8. PB Y Level Adjustment (VI-20 Board)

Mode	Playback
Signal	Alignment tape: For operation confirmation (WR5-3 CSP) Colour bar section
Measurement point	Pin ⑤ of CN007
Measurement equipment	Oscilloscope
Adjustment element	RV005
Specified value	$1.00 \pm 0.05 V_{p-p}$

- Note:**
1. Set the SHARPNESS control (FT-13 board RV001) to the center click position.
  2. Be sure that the EDIT switch (S014 on FT-13 board) is turned OFF. (Confirm that the EDIT lamp is not lit.)

#### [Adjustment method]

- 1) Adjust with RV005 so that it becomes  $1.00 \pm 0.05 V_{p-p}$ .

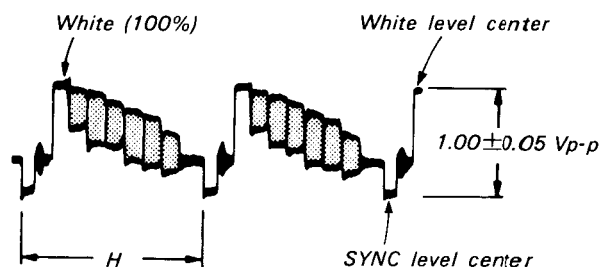


Fig. 8-20.

### 8-3-9. Y FM Carrier Frequency Adjustment (VI-20 Board)

Mode	E-E
Signal	Non-signal
Measurement point	Pin ⑤ of CN003 (REC Y)
Measurement equipment	Frequency counter
Adjustment element	RV008
Specified value	$4.20 \pm 0.05 \text{ MHz}$

**Note:** Set up the SP mode.

#### [Adjustment method]

- 1) Set RV007 (EMPH) to the mechanical center. (The slide pin of RV007 is approximately 2.7Vdc.)
- 2) Adjust with RV008 so that it becomes  $4.20 \pm 0.05 \text{ MHz}$ .
- 3) Be sure to perform the "Deviation adjustment" and "AC CLIP adjustment".

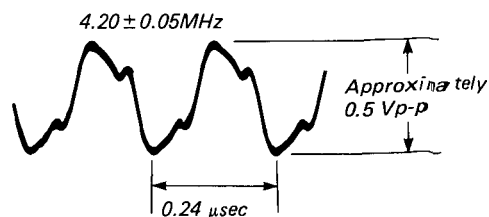


Fig. 8-21.

### 8-3-10. Y FM Deviation Adjustment (VI-20 Board)

Mode	Recording and playback
Signal	Colour bar
Measurement point	Pin ⑤ of CN007
Measurement equipment	Oscilloscope
Adjustment element	RV006
Specified value	Playback level: $1.00 \pm 0.05 V_{p-p}$

- Note:** 1. Be sure that the "VIDEO OUT level adjustment", "PB Y level adjustment" and "Y FM carrier frequency adjustment" have been completed.  
 2. Set the SHARPNESS Control (FT-13 board RV001) to the center click position.  
 3. Be sure the EDIT switch (S014 on the FT-13 board) is turned OFF. (Confirm that the EDIT lamp is not lit.)

**[Adjustment method]**

- 1) Record the colour bar signal.
- 2) Playback the recorded section.
- 3) Be sure to check the playback output level.  
Specified value:  $1.00 \pm 0.05 V_{p-p}$
- 4) When the specified value is not satisfied, repeat 1) to 3) after turning RV006 in the following manner.

	Turning direction of RV006 Seen from component side
When larger than the specified value	Clockwise (↻)
When smaller than the specified value	Counterclockwise (↺)

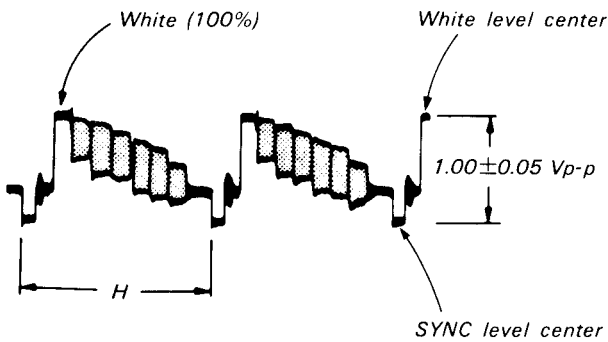


Fig. 8-22.

### 8-3-11. Emphasis Adjustment (VI-20 Board)

Mode	E-E
Signal	Colour bar
Measurement point	Pin ⑱ of IC001
Measurement equipment	Oscilloscope
Adjustment element	RV007
Specified value	$230 \pm 10\%$

**[Adjustment method]**

- 1) Adjust with RV007 so that the peak of the white 100% becomes  $230 \pm 10\%$ .

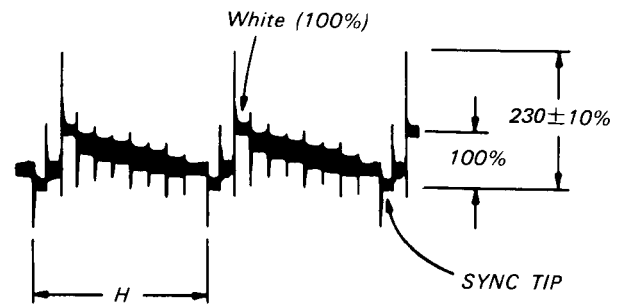


Fig. 8-23.

### 8-3-12. 375fH VCO Adjustment (CH-44/VI-20 Board)

Mode	Recording
Signal	Colour bar
Measurement point	Pin ⑳ of IC001 on CH-44 board
Measurement equipment	Digital voltmeter
Adjustment element	RV001 on CH-44 board
Specified value	$3.00 \pm 0.05 V_{dc}$

**[Adjustment method]**

- 1) Adjust with RV001 on the CH-44 board so that it becomes  $3.0 \pm 0.05 V_{dc}$ .

### 8-3-13. Chroma Emphasis fo Adjustment (CH-44/VI-20 Boards)

Mode	E-E
Signal	Colour bar
Measurement point	Pin ③⑥ of CH-44 board
Measurement equipment	Oscilloscope
Adjustment element	T001 on CH-44 board
Specified value	Be sure to confirm that the fo component is minimum and zero cross appears between green and magenta.

#### [Connection]

Connect the following two locations of CH-44 board using 4.7kΩ resistors.

- Pin ②⑦ (ACC) — Pin ③③ (GND)
- Pin ②⑦ (ACC) — Pin ③⑦ (5V)

#### [Adjustment method]

- 1) Adjust with T001 on the CH-44 board so that the amplitude of the flat cyan section of the chroma signal becomes minimum.  
At this point, be sure to confirm that the zero cross appears between the green and magenta.

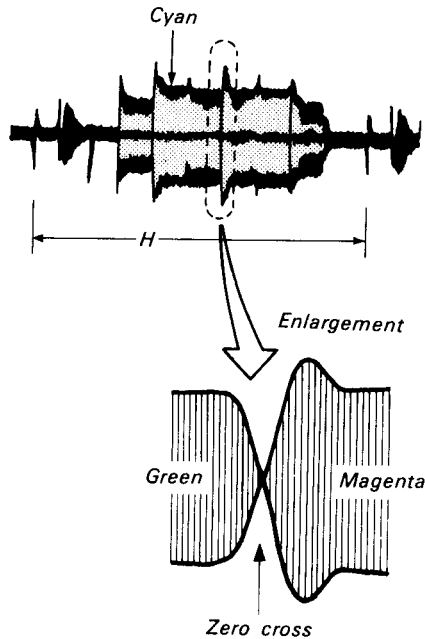


Fig. 8-24.

### 8-3-14. Carrier Balance Adjustment (CH-44/VI-20 Board)

Mode	E-E
Signal	Colour bar
Measurement point	Pin ②⑧ of CH-44 board
Measurement equipment	Oscilloscope
Adjustment element	RV002 on CH-44 board
Specified value	Minimize 5.17 MHz signal component

#### [Adjustment method]

- 1) Adjust with RV002 on the CH-44 board so that the 5.17 MHz signal component becomes minimum.

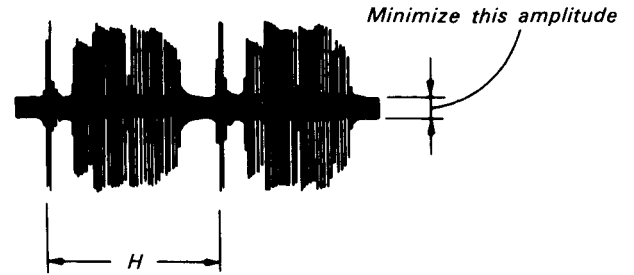


Fig. 8-25.

### 8-3-15. GCA Adjustment (VI-20 Board)

Mode	Playback
Signal	Arbitrary tape
Measurement point	Pin ②② of IC005
Measurement equipment	Oscilloscope
Adjustment element	RV014
Specified value	500 ± 25 mVp-p

#### [Adjustment method]

- 1) Adjust with RV014 so that it becomes 500 ± 25 mVp-p.
- 2) Set to either the STILL, CUE or REVIEW mode, and be sure to confirm that the thickness of the colour does not differ from that of the playback mode. If necessary, adjust with RV014. (Be sure to play back a tape of LP mode.)



Fig. 8-26.

### 8-3-16. fh VCO Adjustment (VI-20 Boards)

Mode	E-E
Signal	Colour bar
Measurement point	CH1: Pin ⑬ of IC005 CH2: Pin ⑤ of CN007
Measurement equipment	Oscilloscope
Adjustment element	RV013
Specified value	$14.5 \pm 0.2 \mu\text{sec}$

#### [Adjustment method]

- 1) Adjust RV013 so that the  $T_R$  of CH1 is  $14.5 \pm 0.2 \mu\text{sec}$ .
- 2) Confirm that the H (time) of CH1 and CH2 is stable.

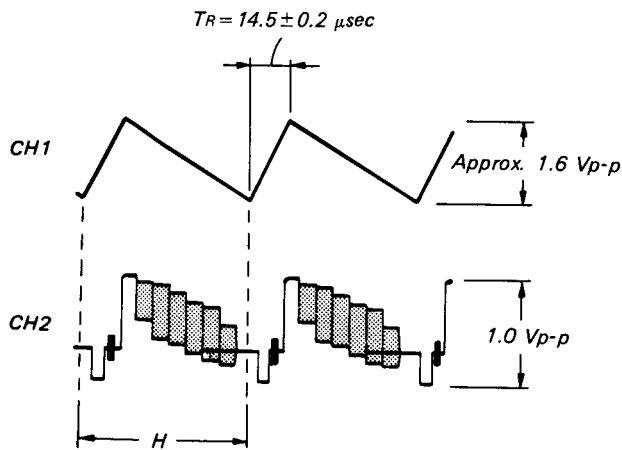


Fig. 8-27.

### 8-3-17. REC Y Level Adjustment (VI-20 Boards)

Mode	REC (SP mode)
Signal	Non-signal
Measurement point	Pin ⑤ of CN003 (Note 2.)
Measurement equipment	Oscilloscope
Adjustment element	RV005
Specified value	$0.46 \pm 0.02 \text{ Vp-p}$

**Note 1:** Be sure to always perform the adjustment of the REC C level after the REC Y level adjustment has been completed.

**Note 2:** Use the low-pass filter shown in Fig. 8-28.

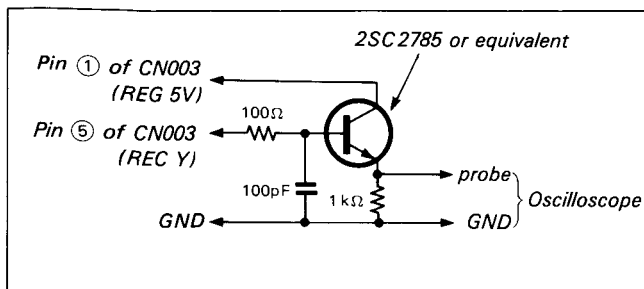


Fig. 8-28.

#### [Adjustment method]

- 1) Adjust with RV005 so that it becomes  $0.46 \pm 0.02 \text{ Vp-p}$ .

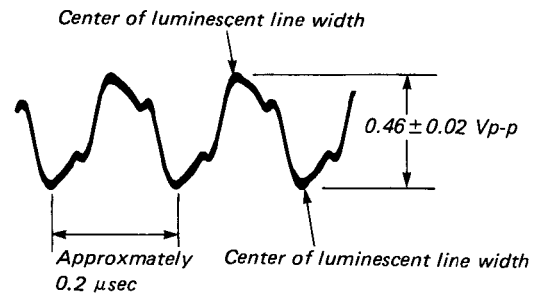


Fig. 8-29.

### 8-3-18. REC C Level Adjustment (VI-20 Board)

Mode	REC
Signal	Colour bar
Measurement point	Pin ⑤ of CN003 (Note 1.)
Measurement equipment	Oscilloscope
Adjustment element	RV001
Specified value	$58 \pm 3 \text{ mVp-p}$

**Note 1:** Use the low-pass filter shown in Fig. 8-28.

**Note 2:** Be sure to use the MP type tape. (Be sure Pin ④ of W001 TAPE 2/TAPE 1 is at "L".)

#### [Connection]

Connect the following three points on VI-20 board with jumper wires.

- 1) L106 (Q113 base: REC Y) and GND.
- 2) W002 ① PIN (REC AFM) and GND.
- 3) W005 ⑤ PIN (REC ATF) and GND.

#### [Adjustment method]

- 1) Adjust with RV001 so that it becomes  $60 \text{ mVp-p}$ .

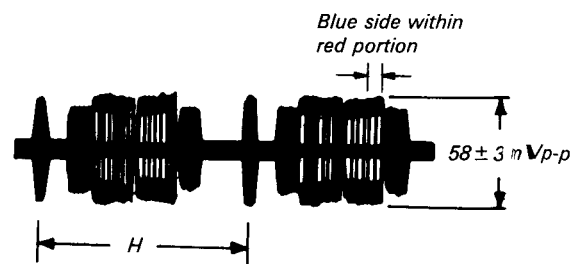


Fig. 8-30.

### 8-3-19. REC AFM Level Check (VI-20 Boards)

Mode	REC (SP mode)
Signal	Non-signal
Measurement point	Pin ⑤ of CN003 (Note 1.)
Measurement equipment	Oscilloscope
Specified value	$20.5 \pm 4.0$ mVp-p

- Note:** 1. Use the low-pass filter shown in Fig. 8-28.  
 2. Be sure to use the MP type tape.  
 (Be sure Pin ④ of W001 TAPE 2/TAPE 1 is at "L".)  
 3. When the signal level is too small to read, use a 1:1 probe.

#### [Connection]

Connect the following three points on the VI-20 board with jumper wires.

- 1) L106 (Q113 base: REC Y) and GND.
- 2) W005 ⑤ PIN (REC ATF) and GND.

#### [Confirmation method]

- 1) Check that the REC AFM level is  $20.5 \pm 4.0$  mVp-p.

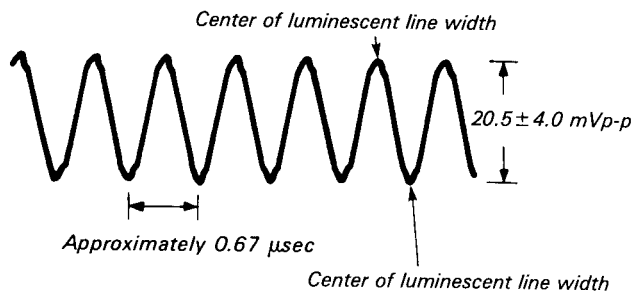


Fig. 8-31.

### 8-3-20. REC ATF Level Check (VI-20 Board)

Mode	REC (SP mode)
Signal	Non-signal
Measurement point	Pin ⑤ of CN003 (Note 1.)
Measurement equipment	Oscilloscope
Specified value	$13.5 \pm 3.0$ mVp-p

- Note:** 1. Use the low-pass filter shown in Fig. 8-28.  
 2. Be sure to use the MP type tape.  
 (Be sure Pin ④ of W001 TAPE 2/TAPE 1 is at "L".)  
 3. When the signal level is too small too read, use a 1:1 probe.

#### [Connection]

Connect the following two points on the VI-20 board with jumper wires.

- 1) L106 (Q113 base: REC Y) and GND.
- 2) W002 ① PIN (REC AFM) and GND.

#### [Confirmation method]

- 1) Check that the REC ATF level is  $13.5 \pm 3.0$  mVp-p.

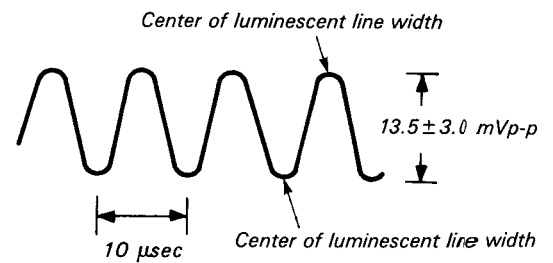


Fig. 8-32.



### 8-4. AUDIO SYSTEM ADJUSTMENT

Use a colour bar signal as video signal input when performing adjustment.

Connection of Audio Adjustment Measuring Instruments  
Connect the following audio measuring equipment in addition to the video measuring instruments.

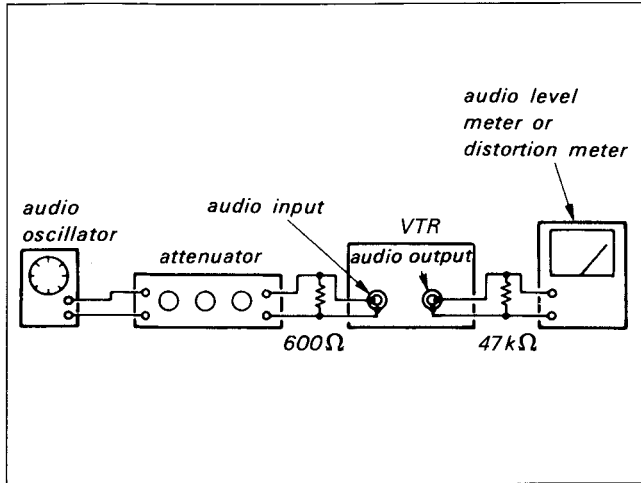


Fig. 8-33.

#### 8-4-1. PCM Audio System Adjustment

Unless otherwise specified, set the VTR switches and controls as shown below when making the adjustment.

INPUT SELECT switch .....LINE  
 AUDIO MONITOR (PCM/MIX/STD)  
 switch .....PCM  
 REC LEVEL controls .....5  
 PCM MODE switch .....NORMAL

**Note:** The adjustment element of R ch is shown in parentheses [ ].

#### [Adjustment Order]

- 1) PCM Master Clock Oscillation Frequency Adjustment
- 2) REC PCM Level Check
- 3) MULTI PILOT Frequency Check
- 4) PCM Playback VCO Free Oscillation Frequency Adjustment
- 5) MULTI PILOT Detector Adjustment
- 6) PCM Playback Level Adjustment
- 7) E-E Output Level Check
- 8) PCM Offset Adjustment
- 9) PCM Recording Level Adjustment
- 10) Overall Frequency Characteristics
- 11) Overall Distortion Ratio Check
- 12) Overall S/N Check

### 1. PCM Master Clock Adjustment (SP-2 Board)

Mode	Record
Signal	None
Measurement point	Pin ③ of CN601
Measurement equipment	Frequency counter
Adjustment element	RV602
Specified value	11.45 ± 0.01 MHz

#### [Adjustment method]

- 1) Connect TP604 (IC605 ⑭ PIN) to Pin ① (REG 5V) of CN601 with a jumper wire.
- 2) Adjust to 11.45 ± 0.01 MHz with RV602.
- 3) Remove the jumper wire.
- 4) Connect TP604 to GND with a jumper wire.
- 5) Check that the frequency is more than 11.63MHz.



Fig. 8-34.

### 2. REC PCM Level Check (SP-2 board)

Mode	Record
Signal	None
Measurement point	Pin ① of CN607
Measurement equipment	Oscilloscope
Specified value	approx. 0.5 Vp-p

#### [Confirmation method]

- 1) Check that the REC PCM level is approximately 0.5 Vp-p.



Fig. 8-35.

### 3. MULTI PILOT Frequency Check (SP-2 board)

Mode	E-E
Signal	Arbitrary
Measurement point	Pin ③⑨ of IC204
Measurement equipment	Frequency counter
Specified value	225.360 ± 0.200 kHz

#### [Confirmation method]

- 1) Check that the frequency is 225.360 ± 0.200 kHz.

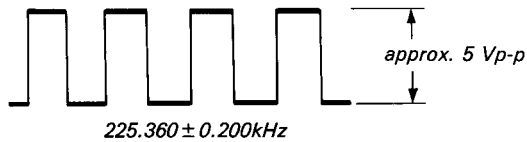


Fig. 8-36.

### 4. PCM Playback VCO Free Oscillation Frequency Adjustment (SP-2 Board)

Mode	PLAYBACK, FF INDEX SEARCH and REW INDEX SEARCH
Signal	Arbitrary tape
Measurement point	TP603
Measurement equipment	Frequency counter
Adjustment element	RV601 (PLAYBACK) RV604 (FF INDEX SEARCH) RV603 (REW INDEX SEARCH)
Specified value	11.50 ± 0.05 MHz (PLAYBACK) 10.29 ± 0.05 MHz (FF INDEX SEARCH) 12.71 ± 0.05 MHz (REW INDEX SEARCH)

#### [Connection]

- 1) Connect TP600 (IC600 ① PIN) to Pin ① (REG 5V) of CN005 with a jumper wire.
- 2) Disconnect the CN607 from the SP-2 board.

#### [Adjustment method]

- 1) Set up the PLAYBACK mode.
- 2) Adjust to 11.50 ± 0.05 MHz with RV601.
- 3) Set up the FF INDEX SEARCH mode.
- 4) Adjust to 10.29 ± 0.05 MHz with RV604.
- 5) Set up the REW INDEX SEARCH mode.
- 6) Adjust to 12.71 ± 0.05 MHz with RV603.



Fig. 8-37.

### 5. MULTI PILOT Detector Adjustment (MK-2/AU-22 board)

Mode	E-E
Signal	None
Measurement point	1. Pin ⑤ of IC801 on MK-2 board 2. Pin ⑤ of IC821 on MK-2 board
Measurement equipment	Frequency counter
Adjustment element	1. RV801 (SP 1 CH) on MK-2 board 2. RV821 (LP 2 CH) on MK-2 board
Specified value	225.361 ± 1 kHz

**Note:** Connect the frequency counter through a buffer of high impedance (approximately 10MΩ) and low capacitance (less than 10pF)

The adjustment element of LP 2 CH is shown in parentheses [ ].

#### [Adjustment method]

- 1) Connect the frequency counter to Pin ⑤ of IC801 [IC851].
- 2) Adjust to 225.361 ± 1kHz with RV801 [RV821].

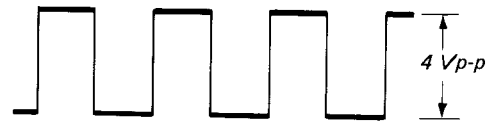


Fig. 8-38.

### 6. PCM Playback Level Adjustment (AD-12/AU-22 Board)

Mode	Playback
Signal	Alignment tape: For Operation confirmation (WR5-3CSP) 400Hz section
Measurement point	AUDIO OUT L [R]
Measurement equipment	Audio level meter
Adjustment element	RV705 on AD-12 board
Specified value	-10.0 ± 0.1dBs

#### [Adjustment method]

- 1) Adjust to -10.0 ± 0.1dBs with RV705.

**Note:** If there is a level difference between Lch and Rch, adjust to the center level.

## 7. E-E Output Level Check

Mode	E-E
Signal	400Hz, -10dBs: AUDIO IN L [R]
Measurement point	AUDIO OUT L [R]
Measurement equipment	Audio level meter
Specified value	-10 ± 2dBs

### [Confirmation method]

- 1) Set the REC LEVEL control to **5** position.
- 2) Check that the REC LEVEL meter indicate -10dB.
- 3) Check that the AUDIO OUT L [R] level is -10 ± 2dBs.

## 8. PCM Offset Adjustment (AD-12/AU-22 Board)

Mode	REC
Signal	None
Measurement point	CH1: Pin ⑨ (ADDA) of AD-12 board CH2: Pin ⑩ (WCK) of AD-12 board
Measurement equipment	Oscilloscope
Adjustment element	RV701 [RV751] on AD-12 board
Specified value	Equal brightness of the upper luminescent line and the lower

**Note:** Be sure to perform the adjustment alternately, since Lch and Rch affect each others.

### [Adjustment method]

- 1) Set the REC LEVEL controls to the minimum position.
- 2) Adjust with RV701 [RV705] so that the brightness of the upper luminescent line is equal to that of the lower luminescent line.

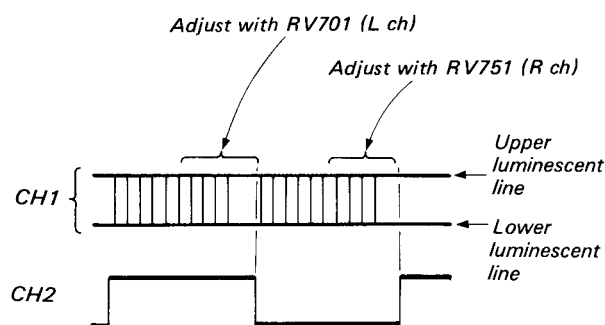


Fig. 8-39.

## 9. PCM Recording Level Adjustment (AD-12/AU-22 board)

Mode	Self-recording and playback
Signal	400Hz, -10dBs: AUDIO IN (Both L and R)
Measurement point	AUDIO OUT L [R]
Measurement equipment	Audio level meter
Adjustment element	RV703 [RV753] on AD-12 board
Specified value	-10 ± 0.5dBs

**Note:** Be sure that the "PCM playback level adjustment" have been completed.

### [Adjustment method]

- 1) Set up E-E mode.
- 2) Adjust with the REC LEVEL control so that the AUDIO OUT level is -10dBs. (Both L CH and R CH).
- 3) Record the signal.
- 4) Playback the recorded portion.
- 5) Check that the AUDIO OUT L [R] level is -10 ± 0.5dBs.
- 6) If the specified value is not satisfied, repeat 1 to 5 after turning RV703 [RV753] on AD-12 board.

## 10. Overall Frequency Characteristic Check

Mode	Self-recording and playback
Signal	Ⓐ 400Hz, -10dBs Ⓑ 20Hz, -10dBs Ⓒ 14kHz, -10dBs AUDIO IN L [R]
Measurement point	AUDIO OUT L [R]
Measurement equipment	Audio level meter
Specified value	When the playback output level of 400Hz is specified as 0dB, that of 20Hz should be 0 ± 2dB, and that of 14kHz should be 0 ± 3dB.

### [Confirmation method]

- 1) Adjust the AUDIO OUT L [R] level to -10dBs with REC LEVEL control.
- 2) Record the signals Ⓐ to Ⓒ in sequence.
- 3) Playback the recorded section.
- 4) When the playback output level of 400Hz is specified as 0dB, that of 20Hz should be 0 ± 2dB, that of 14kHz should be 0 ± 3dB.

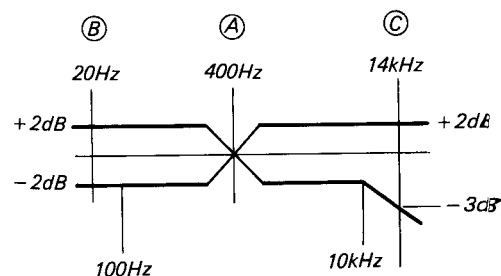


Fig. 8-40.

### 11. Overall Distortion Ratio Check

Mode	Self-recording and playback
Signal	400Hz, -10dBs: AUDIO IN L [R]
Measurement point	LINE OUT L [R]
Measurement equipment	Distortion meter
Specified value	Less than 0.35%

**[Confirmation method]**

- 1) Adjust the AUDIO OUT L [R] level to -10dBs with REC LEVEL control.
- 2) Record the signal.
- 3) Playback the recorded section.
- 4) The distortion ratio should be less than 0.35%.

### 12. Overall Noise Level Check

Mode	Self-recording and playback
Signal	Non-signal (Install shorting plugs to AUDIO IN both of L and R.)
Measurement point	AUDIO OUT L [R]
Measurement equipment	Audio level meter
Specified value	Less than -89dBs* <sup>1</sup>

**[Confirmation method]**

- 1) Record the signal.
- 2) Playback the recorded section.
- 3) The noise level should be less than -89dBs\*<sup>1</sup>

\*<sup>1</sup> :The measured value when using IHF-A hearing sensitivity compensation filter.

### 8-4-2. AFM Audio System Adjustment

Unless otherwise specified, set the VTR switches and controls as shown below when making the adjustment.

INPUT SELECT switch .....LINE  
AUDIO MONITOR (PCM/MIX/STD) switch .....STD

**[Adjustment Order]**

- 1) AFM carrier frequency adjustment.
- 2) AFM deviation adjustment.
- 3) E-E output level check
- 4) Overall level characteristics check
- 5) Overall frequency characteristics check
- 6) Overall distortion check
- 7) Overall noise level check

### 1. AFM Carrier Frequency Adjustment (AF-20/AU-22 Board)

Mode	REC (SP mode)
Signal	Non-signal
Measurement point	Pin ⑬ (REC AFM) of AF-20 board
Measurement equipment	Frequency counter and oscilloscope
Adjustment element	RV503 on AF-20 board
Specified value	1.500 ± 0.003MHz

**[Adjustment method]**

- 1) Adjust with RV503 so that it becomes 1.500 ± 0.003MHz.
- 2) Check that the REC AFM level is approx. 90 mVp-p.

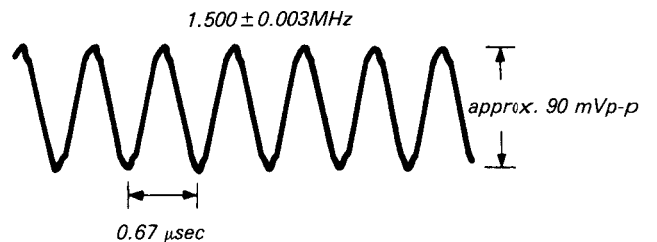


Fig. 8-41.

## 2. AFM Deviation Adjustment (AF-20/AU-22 Board)

Mode	Playback
Signal	Alignment tape: For operation confirmation (WR5-3CSP)
Measurement point	AUDIO OUT L or R
Measurement equipment	Audio level meter
Adjustment element	RV501 on AF-20 board
Specified value	$-10 \pm 0.2\text{dBs}$

### [Adjustment method]

- 1) Adjust with RV501 so that the AUDIO OUT level becomes  $-10 \pm 0.2\text{dBs}$ .

## 3. E-E Output Level Check

The Checking element of Rch is shown in parentheses [ ].

Mode	E-E
Signal	400Hz, $-10\text{dBs}$ : AUDIO IN (Both of L and R)
Measurement point	AUDIO OUT L [R]
Measurement equipment	Audio level meter
Specified value	$-10 \pm 2\text{dBs}$

### [Confirmation method]

- 1) Be sure the AUDIO OUT L [R] level is  $-10 \pm 2\text{dBs}$ .

## 4. Overall Level Characteristics Check

Mode	Self-recording and playback (SP)
Signal	400Hz, $-10\text{dBs}$ : AUDIO IN (Both of L and R)
Measurement point	AUDIO OUT L or R
Measurement equipment	Audio level meter
Specified value	$-10 \pm 3\text{dBs}$ .

### [Confirmation method]

- 1) Record the signal.
- 2) Playback the recorded section.
- 3) Be sure the AUDIO OUT level is  $-10 \pm 3\text{dBs}$ .

## 5. Overall Frequency Characteristics Check

Mode	Self-recording and playback (SP)
Signal	Ⓐ 400Hz, $-20\text{dBs}$ Ⓑ 30Hz, $-20\text{dBs}$ Ⓒ 14kHz, $-20\text{dBs}$ : AUDIO IN (Both of L and R)
Measurement point	AUDIO OUT L or R
Measurement equipment	Audio level meter
Specified value	When the 400Hz playback output level is specified as 0dB, the playback output levels of 30Hz and 14kHz become both $0 \pm 3\text{dB}$ .

### [Confirmation method]

- 1) Record the signals of Ⓐ to Ⓒ in sequence.
- 2) Playback the recorded section.
- 3) Be sure that when the 400Hz playback output level is specified as 0dB, the playback output levels of 30Hz and 14kHz become both  $0 \pm 3\text{dB}$ .

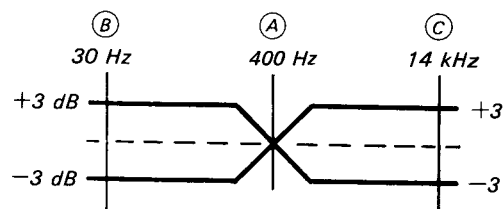


Fig. 8-42.

## 6. Overall Distortion Check

Mode	Self-recording and playback
Signal	400Hz, $-10\text{dBs}$ : AUDIO IN (Both of L and R)
Measurement point	AUDIO OUT L or R
Measurement equipment	Distortion meter
Specified value	Less than $0.5\%$ *1

### [Confirmation method]

- 1) Record the signal
- 2) Playback the recorded section.
- 3) Be sure the distortion is less than  $0.5\%$ \*1.

\*1: The value when a distortion measuring filter (Fig. 8-43.) is used and that when the filter is not used is less than  $1.0\%$ .

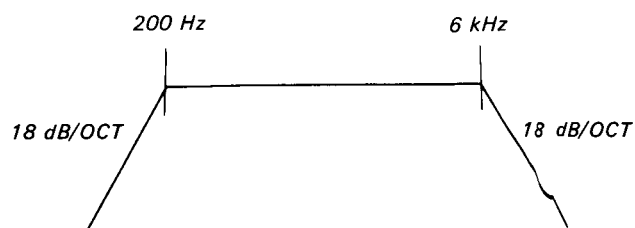


Fig. 8-43

## 7. Overall Noise Level Check

Mode	Self-recording and playback (SP)
Signal	Non-signal (Install shorting plugs to AUDIO IN both of L and R.)
Measurement point	AUDIO OUT L or R
Measurement equipment	Audio level meter
Specified value	Less than $-62\text{dBs}^{*2}$

### [Confirmation method]

- 1) Record the signal.
- 2) Playback the recorded section.
- 3) Be sure the noise level is less than  $-62\text{dBs}^{*2}$ .

\*2: The value when an IHF-A listening sensitivity correction filter is used.

## 8-5. TUNER SYSTEM ADJUSTMENT

### 8-5-1. f<sub>H</sub> Adjustment (TU-83 board) (AEP model only)

Mode	E-E
Signal	None
Measurement point	Pin ⑥ of IC003
Measurement equipment	Frequency counter
Adjustment element	RV001
Specified value	$15.625 \pm 0.01\text{kHz}$

### [Connection]

Connect Pin ⑫ of IC003 to GND with a jumper wire.

### [Adjustment method]

Adjust to  $15.625 \pm 0.01\text{kHz}$  with RV001.

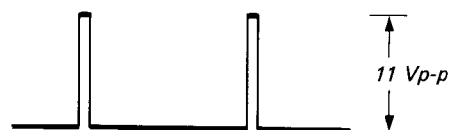


Fig. 8-44

### 8-5-2. Stereo Separation Adjustment (TS-50 Board)

Mode	E-E
Signal	Stereo broadcasting signal by a RF signal generator L CH...None R CH...400Hz 30% MOD •INPUT...AERIAL IN
Measurement point	AUDIO OUT (L) terminal
Measurement equipment	Audio level meter
Adjustment element	RV101
Specified value	Minimum output level

### [Adjustment method]

Minimize the 400Hz output level with RV101.

## 8-6. TIMER SYSTEM ADJUSTMENT (FT-13 Board)

Measurement point	Pin ⑥ of IC002
Measurement equipment	Frequency counter
Adjustment element	CV001
Specified value	$1048.58 \pm 0.01\text{kHz}$

### [Connection]

- 1) Connect Pin ⑥ of IC002 and GND with a jumper wire.
- 2) Connect Pin ⑨ of IC002 and GND with a jumper wire.

### [Adjustment method]

Adjust to  $1048.58 \pm 0.01\text{kHz}$  with CV001.

## 8-7. SECAM-PAL CONVERSION SYSTEM ADJUSTMENT (West Germany model only)

- Make this adjustment aligning the PAL video system.
- For this adjustment, use the equipment listed below.

### [Equipment Required]

- (1) PAL Colour Monitor TV
- (2) Oscilloscope, Dual-trace, Bandwidth...more than 10MHz with delay mode
- (3) SECAM colour-bar generator
- (4) PAL vector scope
- (5) Frequency counter
- (6) Digital voltmeter

### Setting up during adjustment

Video signals output by a pattern generator are used as adjustment signals when making the electrical adjustments, and these video output signals should be within the required standard. Connect an oscilloscope to CNJ002 (VIDEO IN) on the VI-20 Board. Check that the amplitudes of video signal SYNC signals, picture portions, and line ID signals are flat at approximately 0.3, 0.7, and 0.3V, respectively. Fig. 8-45. shows video signals (colour bars) used in making the electrical adjustment.

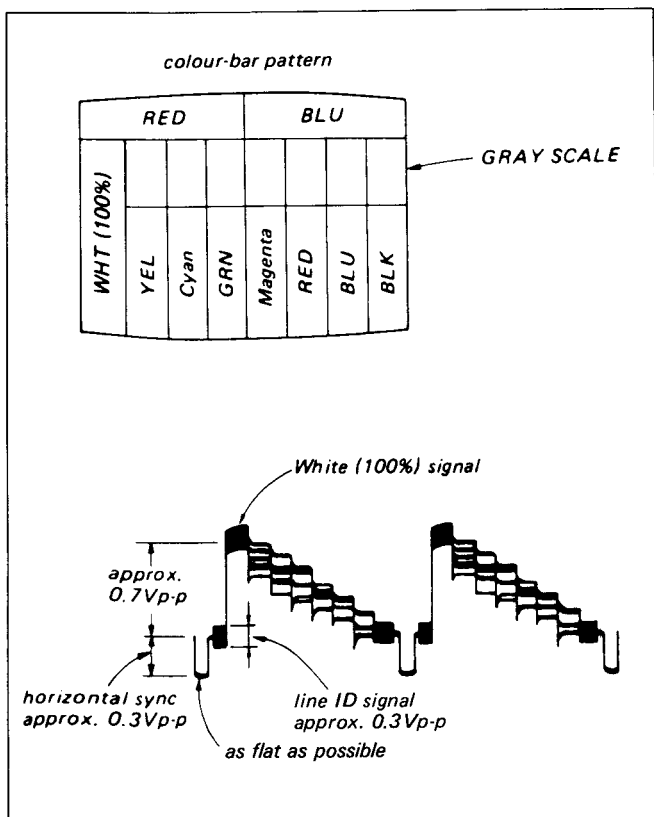


Fig. 8-45

### 8-7-1. fH VCO ADJUSTMENT (TC-3 Board)

Mode	E-E
Signal	Non-signal
Measurement point	Pin ③ of IC002
Measurement equipment	Frequency counter
Adjustment element	RV001
Specified value	$15.630 \pm 0.01\text{kHz}$

#### [Connection]

Connect between pin ⑩ of IC002 and GND with a capacitor of 0.1  $\mu\text{F}$ .

#### [Adjustment method]

- 1) Adjust with RV001 so that it becomes  $15.630 \pm 0.01\text{kHz}$ .

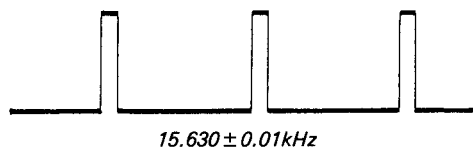


Fig. 8-46.

### 8-7-2. V Blanking Pulse Adjustment (TC-3 Board)

Mode	E-E
Signal	SECAM colour-bar
Measurement point	CH1: Pin ① of CN002 CH2: Pin ⑨ of IC003
Measurement equipment	Oscilloscope
Adjustment element	RV002, RV003
Specified value	Leading edge adjustment (RV002) ... $-6 \pm 1\text{H}$ Trailing edge adjustment (RV003) ... $+23 \pm 0.5\text{H}$

#### [Adjustment method]

- 1) Adjust with RV003 so that the trailing edge of the V blanking pulse comes to the position of  $+23 \pm 0.5\text{H}$  ( $+1472 \pm 32\mu\text{sec}$ ) from the front edge of the vertical SYNC signal.
- 2) Adjust with RV002 so that the leading edge of the V blanking pulse comes to the position of  $-6 \pm 1\text{H}$  ( $-384 \pm 64\mu\text{sec}$ ) from the front edge of the vertical SYNC signal.

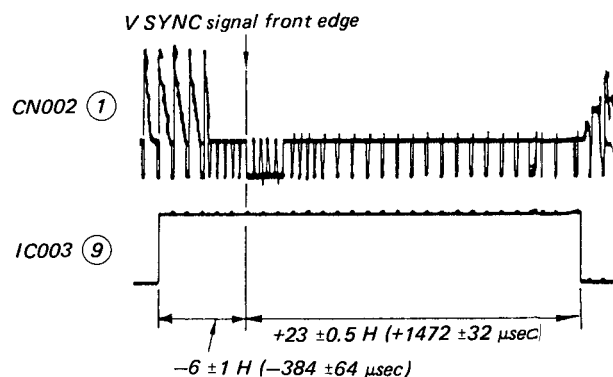


Fig. 8-47

### 8-7-3. Bell Filter Adjustment (TC-3 Board)

Mode	E-E
Signal	SECAM colour-bar
Measurement point	TP001 (Connecting point of R053 and R054)
Measurement equipment	Oscilloscope
Adjustment element	LV002
Specified value	The level variation of the chroma signal amplitude is $0 \pm 10\%$ .

**Note:** When performing (Adjustment method 1), be sure to use 1:1 probe as the signal level of TP001 is extremely small. In addition, when the adjustment is impossible because of the signal level is too small to read, perform (Adjustment method 2).

#### [Adjustment method 1]

- 1) Adjust LV002 until the waveform is flat.

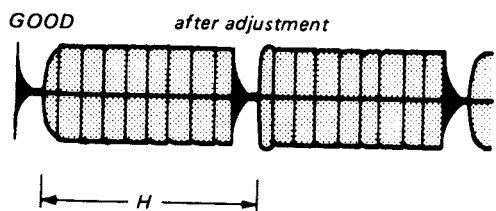
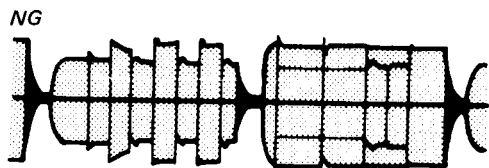


Fig. 8-48.

#### [Adjustment method 2]

- 1) Set the picture level of the monitor TV to maximum.
- 2) Adjust by turning LV002 so that the borders of the respective colour-bars (especially red and blue) become vivid and stop LV002 at the position where the beat (red and magenta sections) becomes small.

### 8-7-4. FSC Adjustment (TC-3/VI-20 Board)

Mode	E-E
Signal	SECAM colour-bar
Measurement point	Pin ③ W005 on VI-20 board
Measurement equipment	Frequency counter
Adjustment element	CV001 on TC-3 board
Specified value	$4433618.75 \pm 10\text{Hz}$

**Note:** Connect the frequency counter through a buffer with high impedance (approx.  $10\text{M}\Omega$ ) and low capacity (less than  $10\text{ pF}$ .)

#### [Adjustment method]

- 1) Adjust to  $4433618.75 \pm 10\text{Hz}$  with CV001 on TC-3 board.

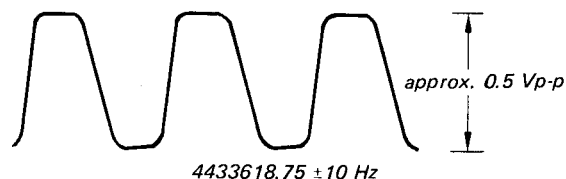


Fig. 8-49.

### 8-7-5. Demodulator Adjustment (TC-3 Board)

Mode	E-E
Signal	SECAM colour-bar
Measurement point	Pin ① of CN002
Measurement equipment	Oscilloscope
Adjustment element	LV001, RV005
Specified value	Minimum carrier leak (less than $20\text{ mVp-p}$ )

#### [Adjustment method]

- 1) Adjust LV001 and RV005 alternately to minimize carrier leak.

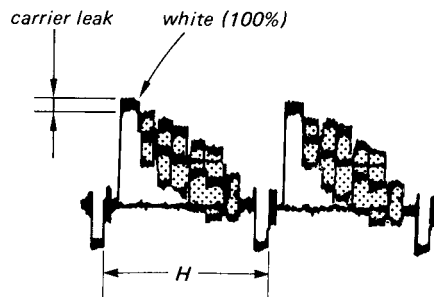


Fig. 8-50.



### 8-7-6. Delay Line Adjustment (TC-3, Board)

Mode	E-E
Signal	SECAM colour-bar
Measurement point	VIDEO OUT terminal
Measurement equipment	PAL vector scope (75Ω terminated)
Adjustment element	LV003, RV007
Specified value	1. Be sure that RED and CYAN are within the (田). 2. Be sure that other colours than the above are within (□).

#### [Adjustment method]

- 1) Adjust with LV003 and RV007 alternately so that the colour luminescent spots come into the specified frame.

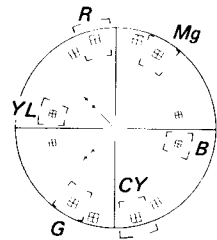


Fig. 8-51

### 8-7-7. Y/C Mix Adjustment (TC-3 Board)

Mode	E-E
Signal	SECAM colour-bar
Measurement point	Pin ① of CN002
Measurement equipment	Oscilloscope
Adjustment element	RV004
Specified value	When the SYNC level is specified as 100%, the burst level becomes $100 \pm 5\%$ .

#### [Adjustment method]

- 1) Adjust with RV004 so that burst level becomes equivalent to the SYNC level.



Fig. 8-52

### 8-7-8. PAL/SECAM Distinction Adjustment (TC-3 Board)

Mode	E-E
Signal	SECAM colour-bar
Measurement point	1. Pin ⑭ of IC001 2. Pin ④ of CN002
Measurement equipment	Digital voltmeter
Adjustment element	RV006
Specified value	$12.0 \pm 0.5$ V dc

#### [Connection]

Connect an adjustable resistor of 2.2 kΩ in parallel with LV002.

#### [Adjustment method]

- 1) Set the adjustable resistor of 2.2 kΩ to its maximum resistance value.
- 2) Confirm the DC voltage of pin ⑭ of IC001 is approx. 6.5 Vdc.
- 3) Make the resistance value of the adjustable resistor of 2.2 kΩ gradually small and stop it at the position when the DC voltage of pin ⑭ of IC001 becomes approx. 5 V dc after suddenly dropped.
- 4) Set RV006 to the position that it is turned fully to counterclockwise (↺).

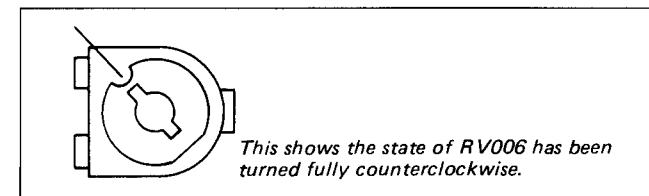
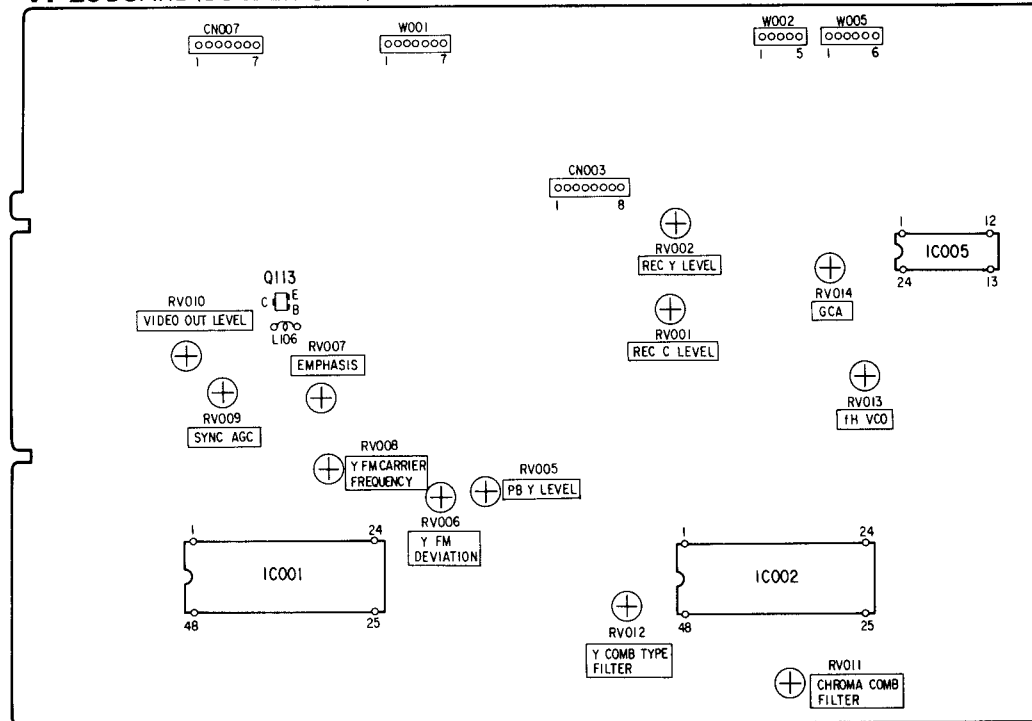


Fig. 8-53

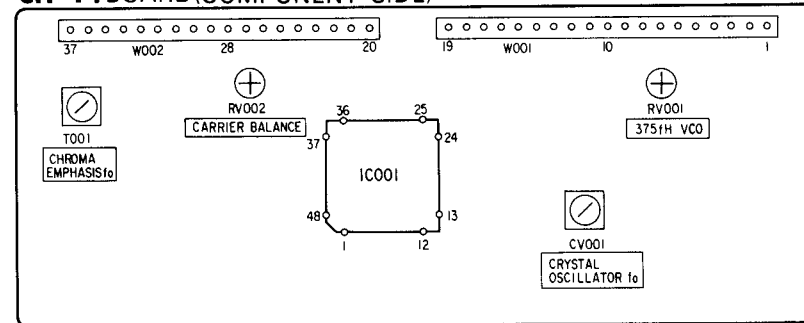
- 5) Connect a digital voltmeter to pin ④ of CN002 and confirm that the DC voltage is 0 Vdc.
- 6) Turn RV006 gradually clockwise (↻) and stop it at the position when the DC voltage at pin ④ of CN002 becomes  $12 \pm 0.5$  Vdc after suddenly increased.

### 8-8. ADJUSTMENT ELEMENT LOCATION

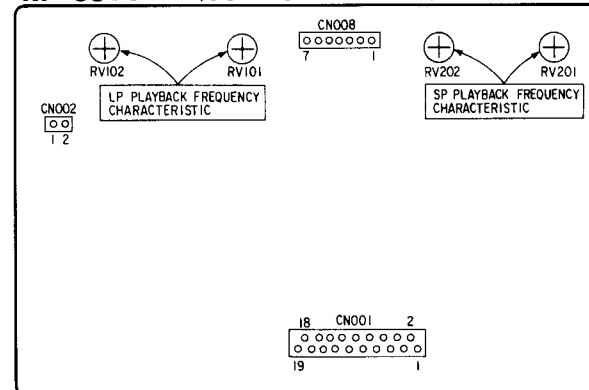
#### VI-20 BOARD (SOLDER SIDE)



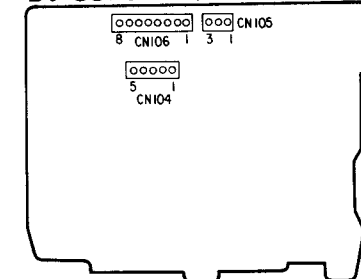
#### CH-44 BOARD (COMPONENT SIDE)



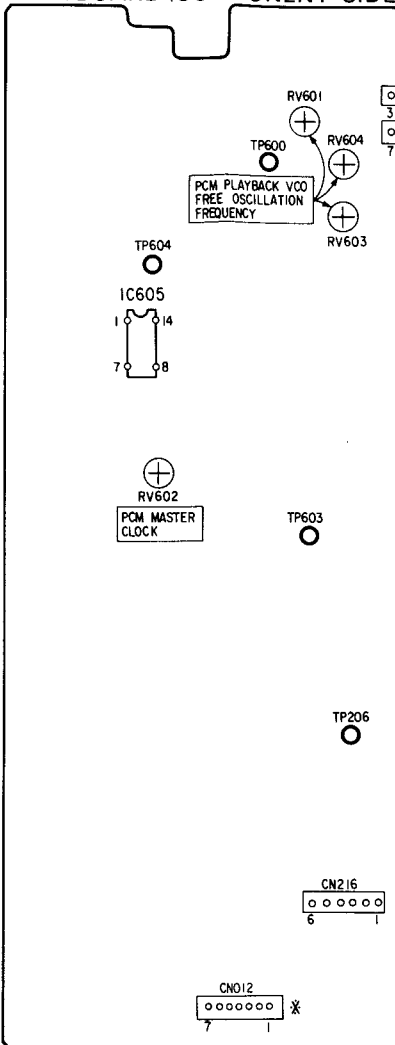
#### RP-36 BOARD (COMPONENT SIDE)



#### DT-63 BOARD (SOLDER SIDE)

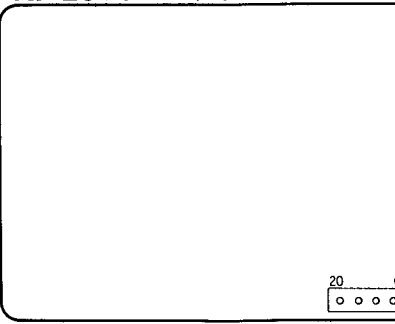


#### SP-2 BOARD (COMPONENT SIDE)

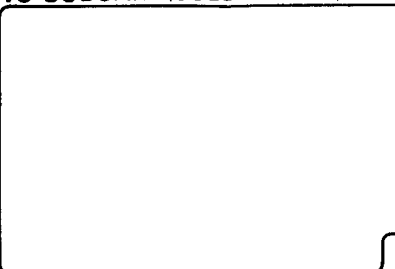


\* mark is soldering side.

#### AF-20 BOARD (SOLDER SIDE)

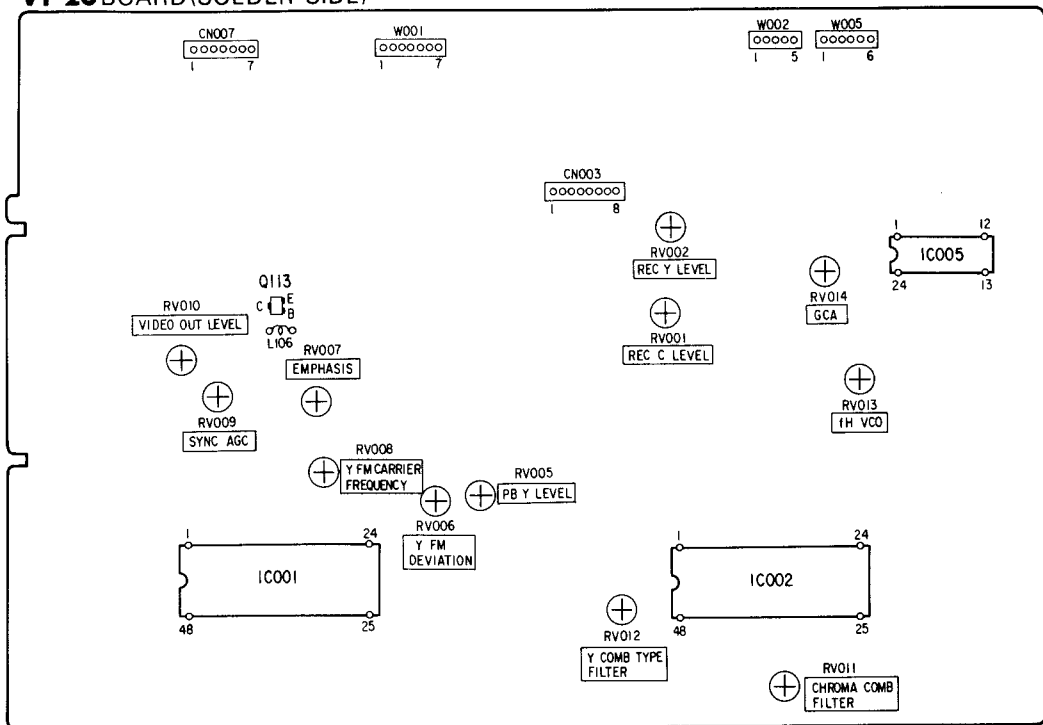


#### TS-50 BOARD (SOLDER SIDE)

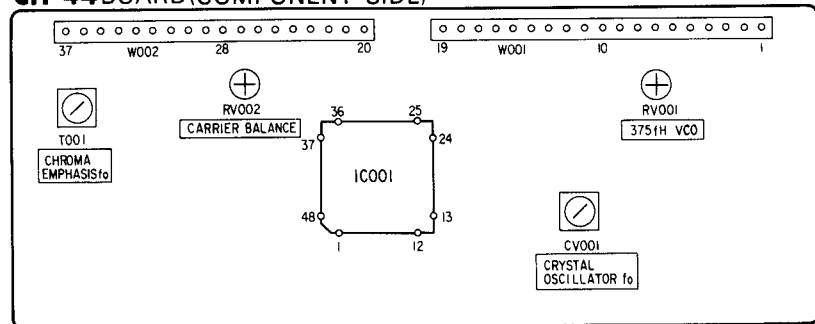


8-8. ADJUSTMENT ELEMENT LOCATION

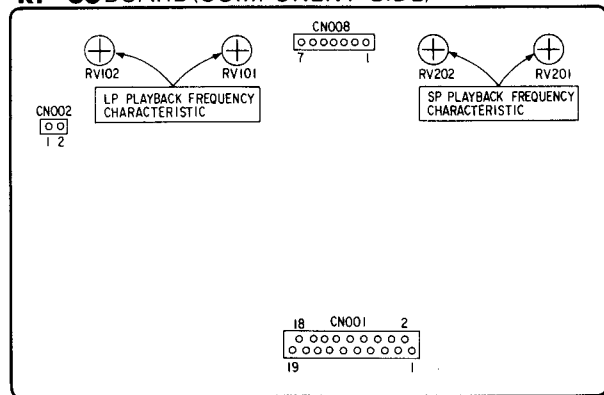
VI-20 BOARD (SOLDER SIDE)



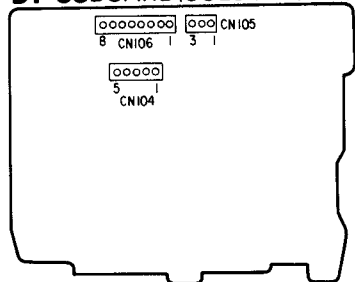
CH-44 BOARD (COMPONENT SIDE)



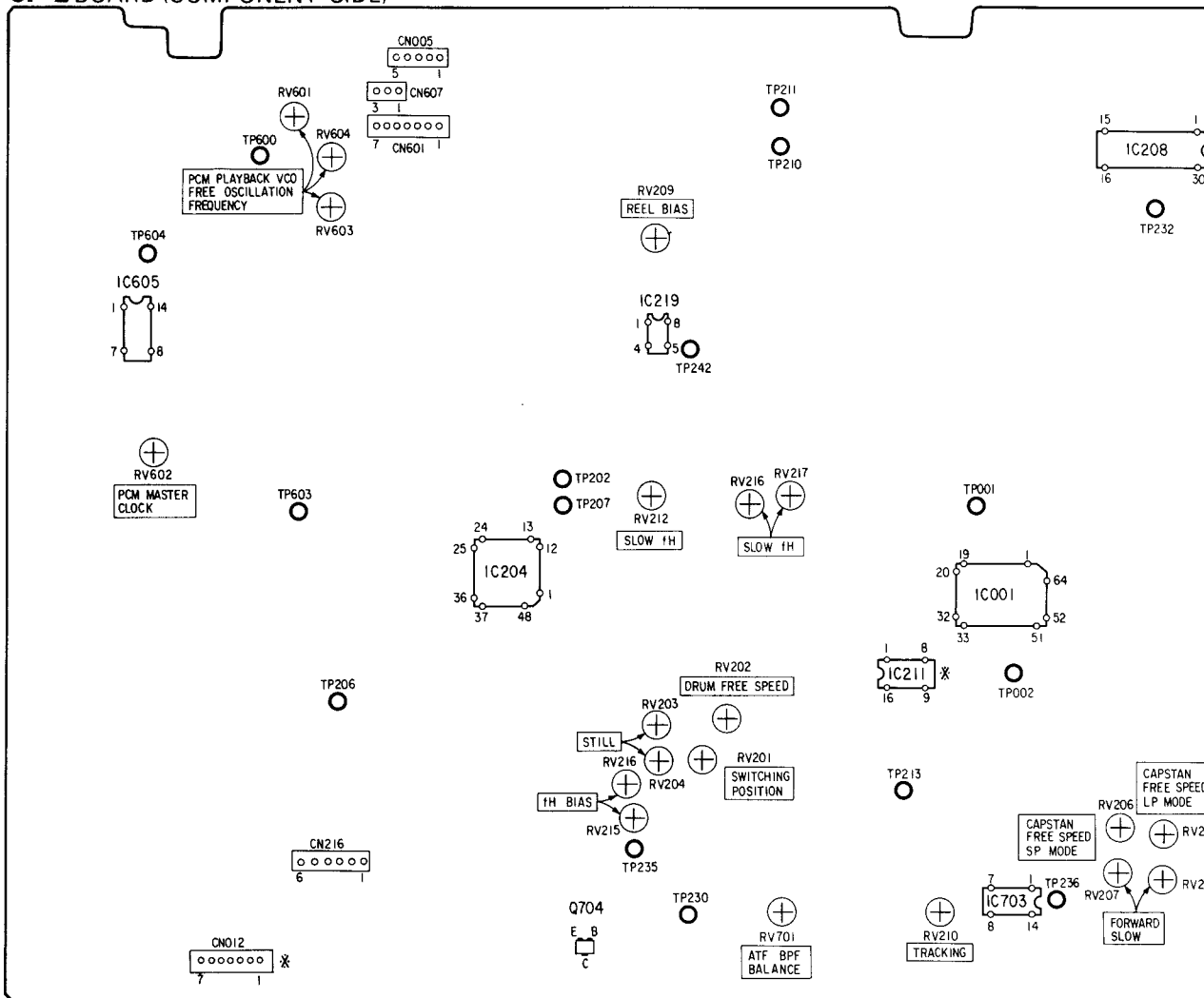
RP-36 BOARD (COMPONENT SIDE)



DT-63 BOARD (SOLDER SIDE)

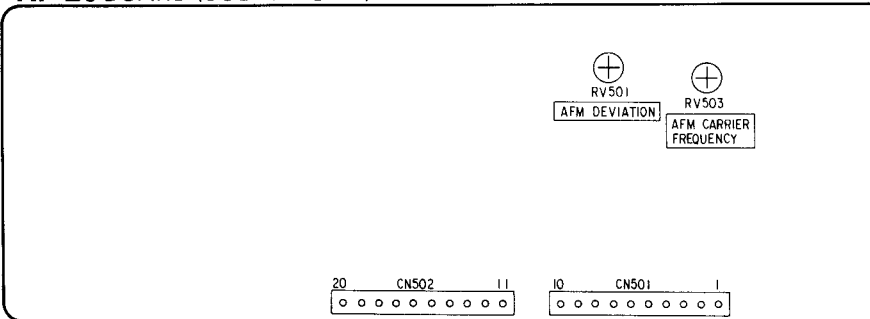


SP-2 BOARD (COMPONENT SIDE)

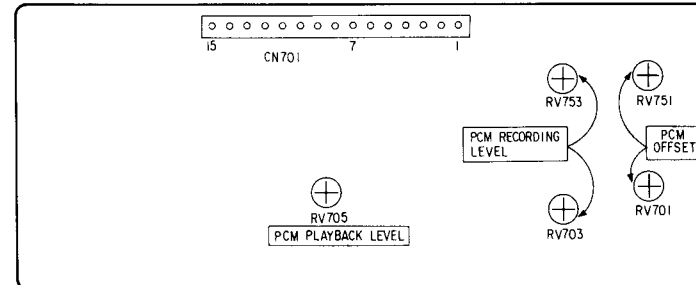


\* mark is soldering side.

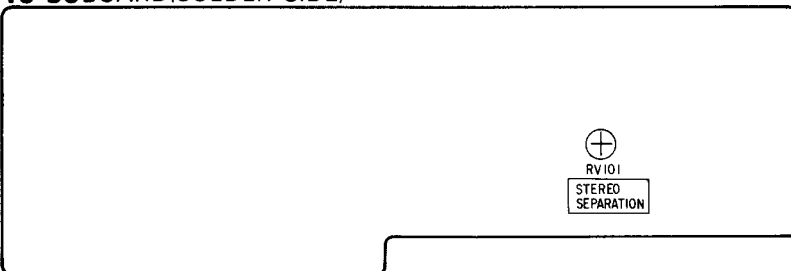
AF-20 BOARD (SOLDER SIDE)



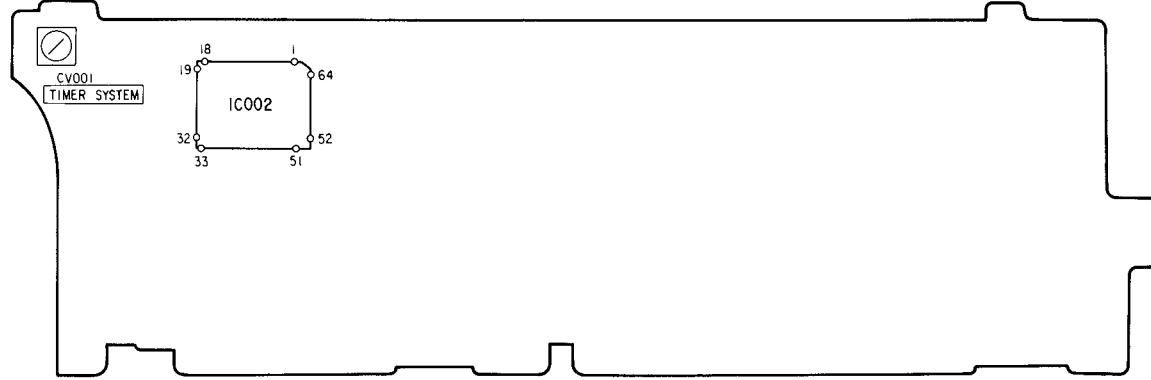
AD-12 BOARD (COMPONENT SIDE)



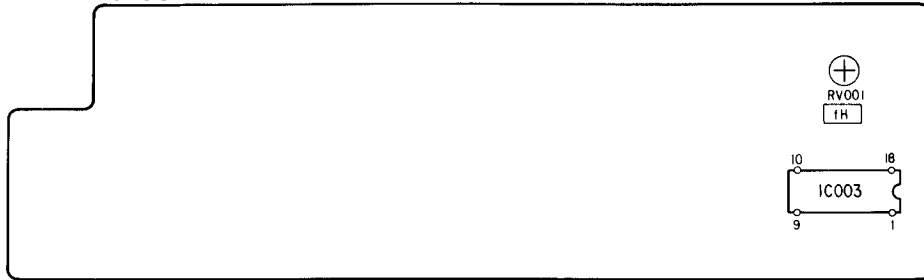
TS-50 BOARD (SOLDER SIDE)



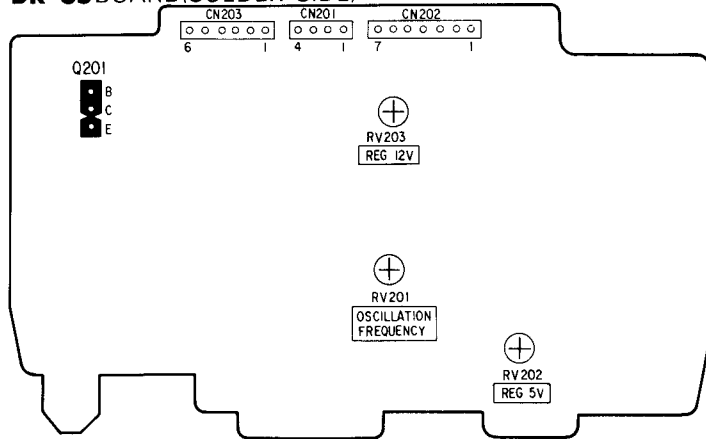
**FT-13 BOARD(SOLDER SIDE)**



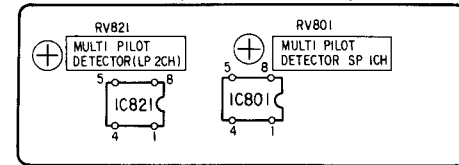
**TU-83 BOARD(SOLDER SIDE)**



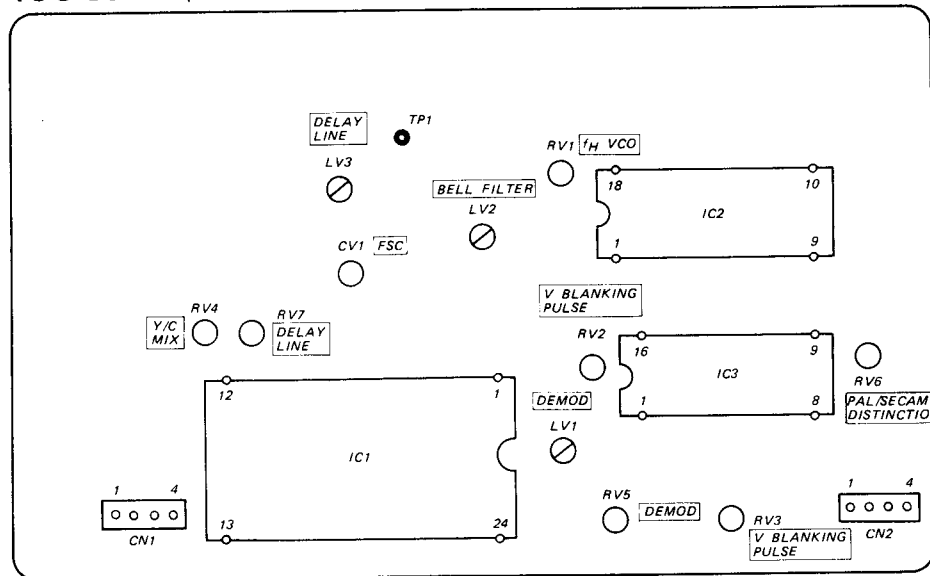
**DR-35 BOARD(SOLDER SIDE)**



**MK-2 BOARD(SOLDER SIDE)**



**TC-3 BOARD (COMPONENT SIDE)**





# RMT-425

## SERVICE MANUAL



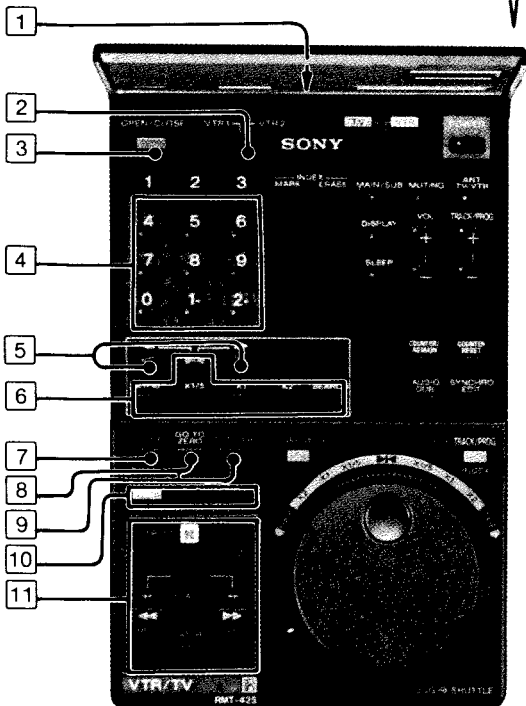
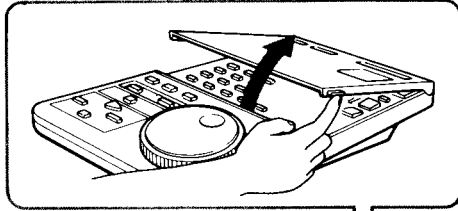
### SPECIFICATIONS

Remote control system	Infrared control
Power requirements	4.5 V dc, 3 R6 (size AA) batteries
Dimensions	Approx. 105 × 40 × 160 mm (w/h/d) (4 1/10 × 1 1/2 × 6 1/4 in.)
Weight	incl. projecting parts and controls Approx. 220 g (8oz) without batteries

REMOTE COMMANDER  
**SONY**®

## 1. LOCATION AND FUNCTION OF CONTROLS

B-1



B-1

### FUNCTION OF CONTROLS

**1 Transmitter**

**2 Command mode selector** (Page 356)

Select the command mode of the equipment you want to operate with the Commander.  
To operate this VTR, set to the same position as that of the COMMAND MODE selector inside the upper compartment of the VTR.

**3 OPEN/CLOSE button**

**4 Number buttons**

Use for selecting programmes.

For 0 through 9, press corresponding single-digit numerals.

For 10 through 19, press "1—" for tens-digit and then ones-digit.

For 20 through 29, press "2—" and then ones-digit.

**5 ◀◀ and ▶▶ FRAME buttons** (Page 24)

In the still picture mode, press ◀◀ to reverse the picture by one frame, and ▶▶ to advance the picture by one frame (frame-by-frame picture).

If the button is kept depressed, the picture moves continuously.

These buttons are also used to select the direction of playback.

Press ◀◀ to reverse picture, and ▶▶ for forward picture.

**6 Variable speed playback buttons** (Page 24)

During playback, press one of these buttons to select the desired playback speed.

◀◀ (still picture), x1/10, x1/5, x1, x2, SEARCH (for picture search)

**7 INDEX button**

**8 GO TO ZERO button**

**9 AUTO PB (playback) button**

Press to play back a tape automatically from the beginning of the tape after rewinding.

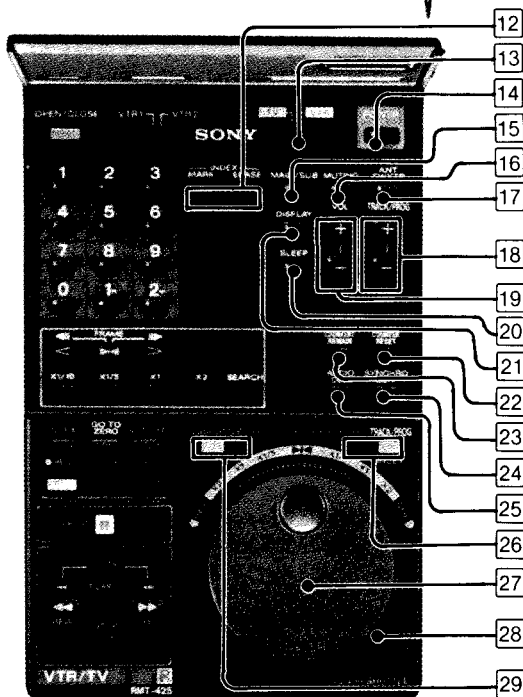
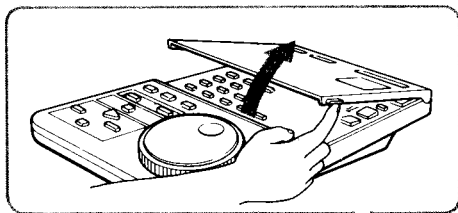
**10 ● REC (record) buttons**

To start recording, press these buttons simultaneously.

**11 Tape transport buttons**

- ⏸ PAUSE
- ▶ PLAY
- ◀◀ REW
- ▶▶ FF
- STOP


**B-2**



**B-2**

**12 INDEX MARK and ERASE buttons**

**13 Remote control TV/VTR selector** (Page 356)

Normally set to VTR for operating the recorder. To operate certain Sony TVs (having a  mark), set to TV.

**14 ON switch**

**15 MAIN/SUB button**

Each pressing selects the MAIN, SUB or MAIN/SUB language of the bilingual programme or the played back bilingual tape.

**16 MUTING button**


**17 ANT TV/VTR button**

**18 TRACK/PROG (programme) buttons**

**19 VOL (volume) buttons**

**20 SLEEP button**

**21 DISPLAY button**

Press to retain or extinguish the on-screen display of certain Sony TVs (having a  mark).

**22 COUNTER RESET button**

**23 COUNTER/REMAIN button**

**24 SYNCHRO EDIT button**

**25 AUDIO DUB (dubbing) button**

**26 TRACK/PROG/INDEX function button and lamp**

Press when using the JOG dial for digital multi audio track selection, programme and index number selection.

**27 JOG dial**

**28 SHUTTLE ring**

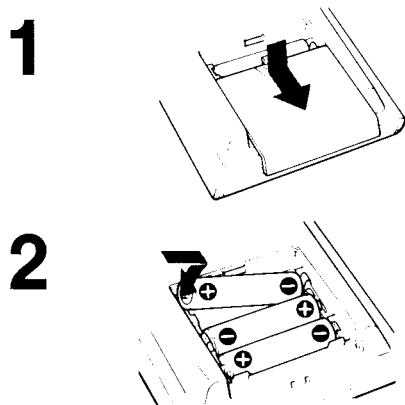
**29 JOG SHUTTLE function button and lamp** (Page 23)

Press this button when using the JOG dial and SHUTTLE ring for various speed playback.

- The buttons with the similar name or mark as the buttons on the VTR have the same function as those of the VTR.
- The buttons marked with an orange dot can be used to operate certain Sony remote control TVs.

## 2. REMOTE COMMANDER SET-UP

**B-3**



**B-3**

### Battery insertion

- 1 Open the lid.
- 2 Insert three R6(AA) batteries with correct polarity.
- 3 Slide and close the lid.

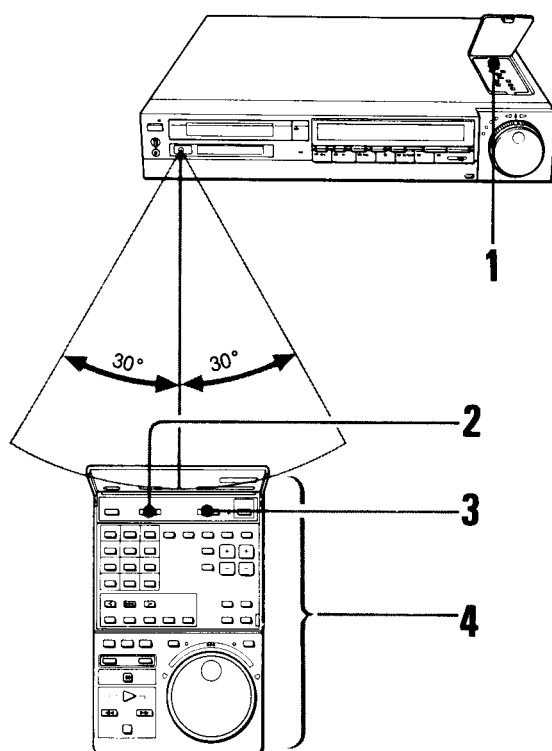
### Battery life

In normal operation, batteries will last for about three months.

When the batteries are exhausted, the JOG dial and SHUTTLE ring on the Commander will not function, and then the indicator will not light when the buttons on the Commander are pressed.

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

**B-4**



**B-4**

### TO CONTROL THIS VTR

- 1 Set the COMMAND MODE selector in the upper compartment to VTR 1 or VTR 2.
- 2 Set the command mode selector on the Commander to the same position as that on the VTR.\*
- 3 Set TV/VTR to VTR.
- 4 Press the required buttons.

\* Command mode should be selected correctly according to which equipment you use with this VTR simultaneously.

### Notes on remote control operation

- There should be no obstacles between the Commander and the remote sensor.
- Operable range is limited.  
Distance: Approx. 7 meters from the remote sensor.  
Angle: Approx.  $\pm 30$  degrees from the centre.  
The shorter the distance between the Commander and the equipment, the wider the angle within which the equipment can be controlled.



### 3. PRINTED WIRING BOARDS

**Note:**

- : indicates a lead wire mounted on the component side.
- : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.
- (with diagonal lines) : B+ pattern from the side which enables seeing.
- (with horizontal lines) : Carbon pattern.

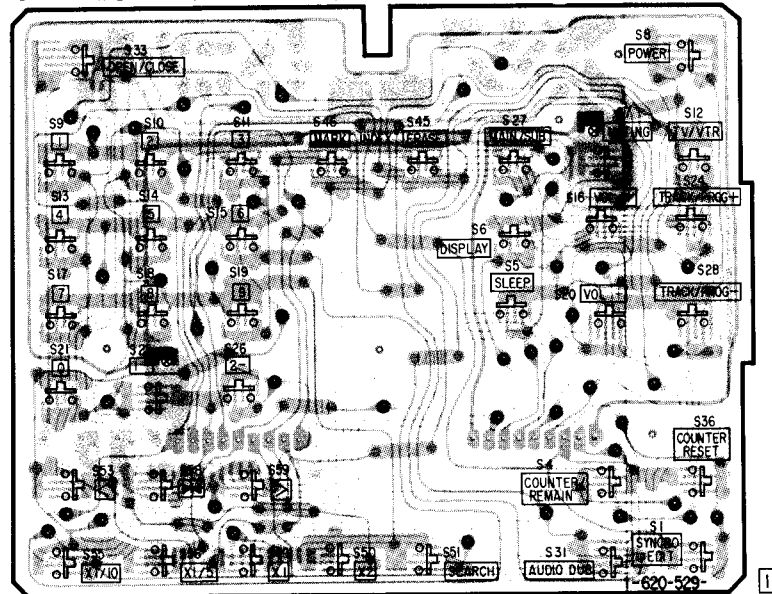
When indicating parts by reference number, please include the board name.

**Caution:**  
 Pattern face side: Parts on the pattern face side seen from (Solder Side) the pattern face are indicated.  
 Parts face side: Parts on the parts face side seen from (Component Side) the parts face are indicated.

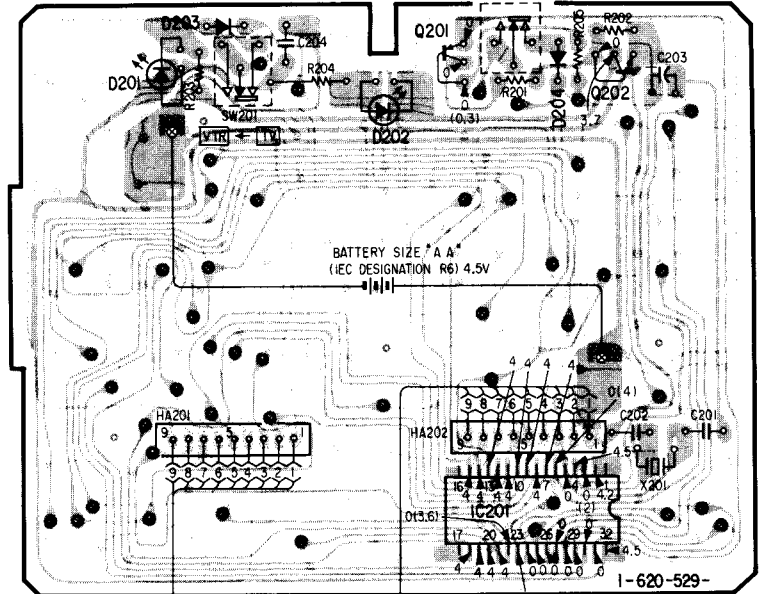
**JA-2**

**JB-7**

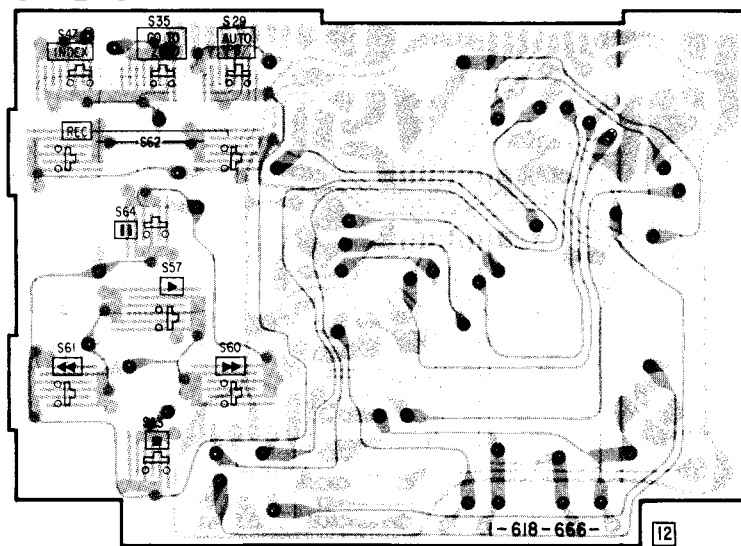
**JB-7 BOARD (COMPONENT SIDE)**



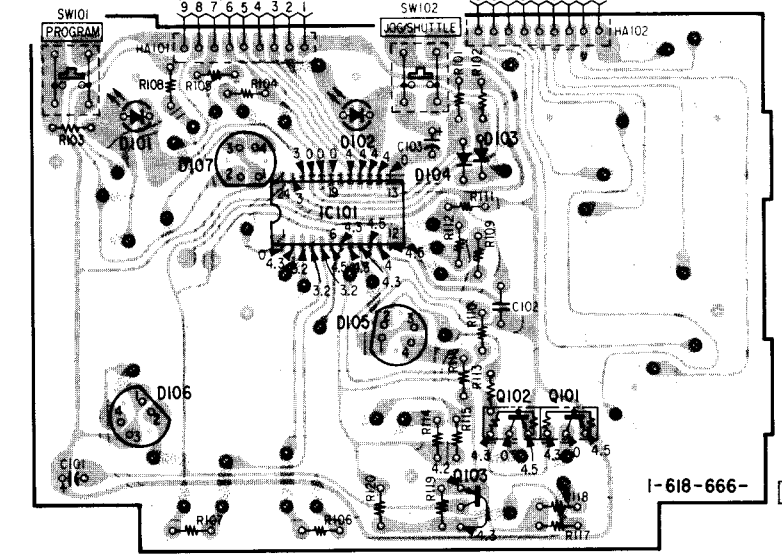
**JB-7 BOARD (SOLDER SIDE)**



**JA-2 BOARD (COMPONENT SIDE)**

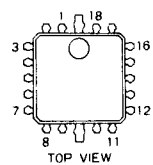


**JA-2 BOARD (SOLDER SIDE)**

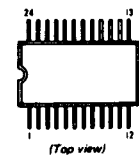


**SEMICONDUCTORS**

M50461-039FP



μ PD7556G-506



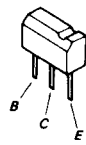
2SA1048-GR  
2SA1115  
DTA144ES



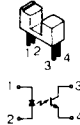
2SA1175



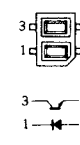
2SC2673



1SS119  
1SS133  
1SS148



GP2509



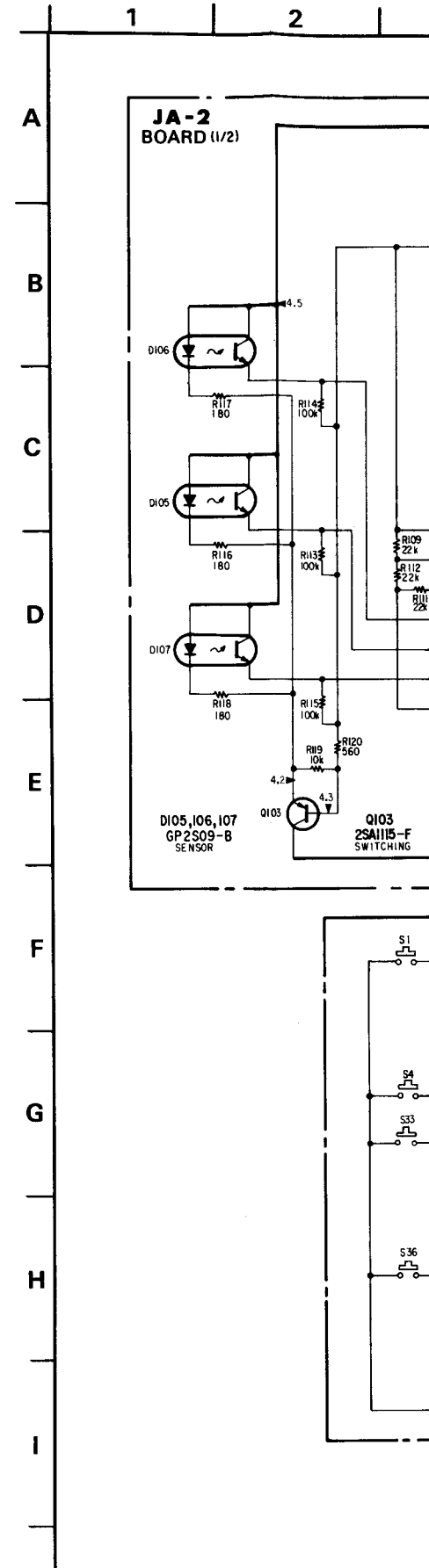
SLP144B



SLR932A



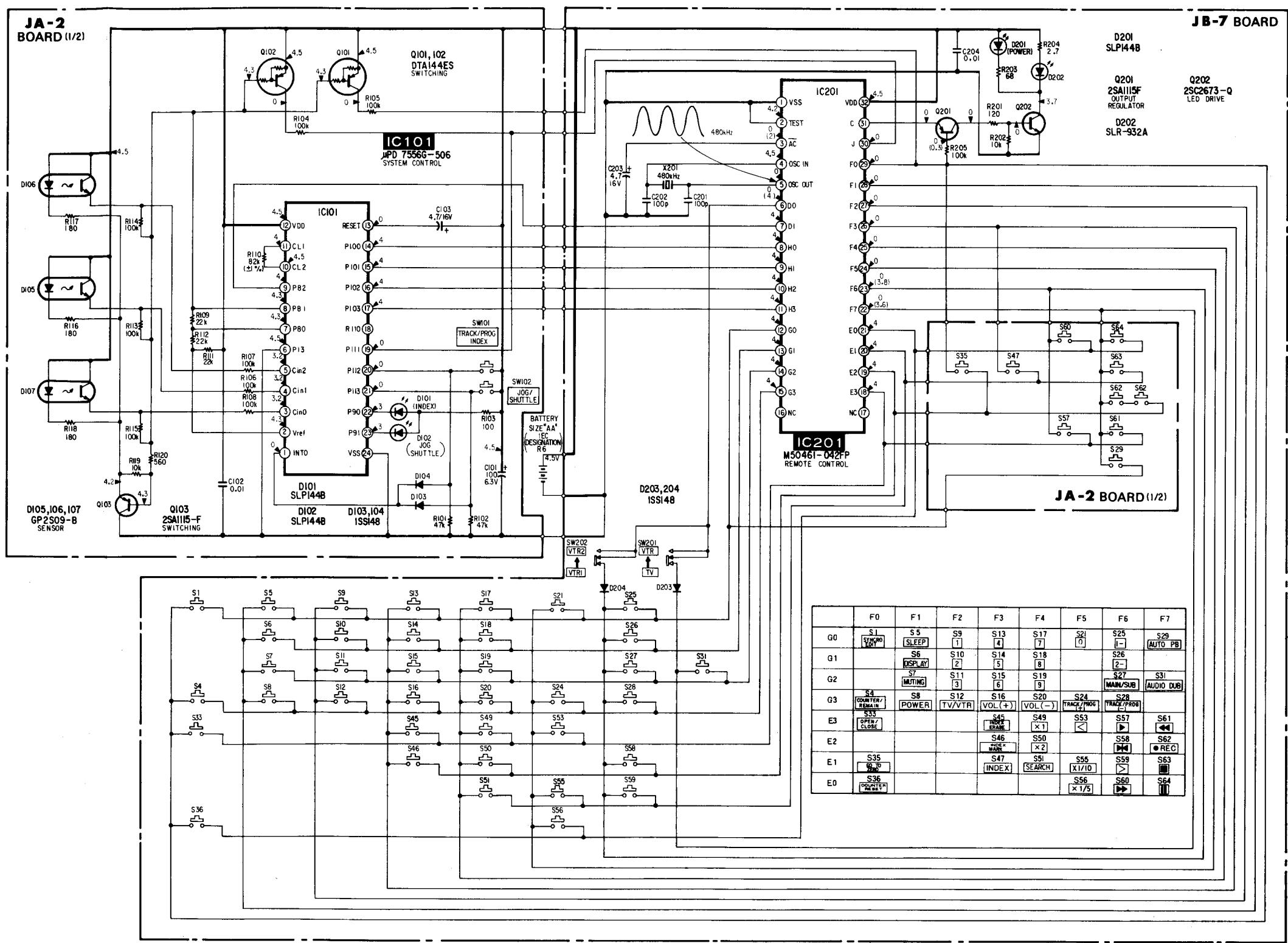
### 4. SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM

JA-2 JB-7

1 2 3 4 5 6 7 8 9 10 11 12



Note:

- All resistors are in ohms, 1/6W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytic and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- : internal component.
- : adjustment for repair.
- : B + bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

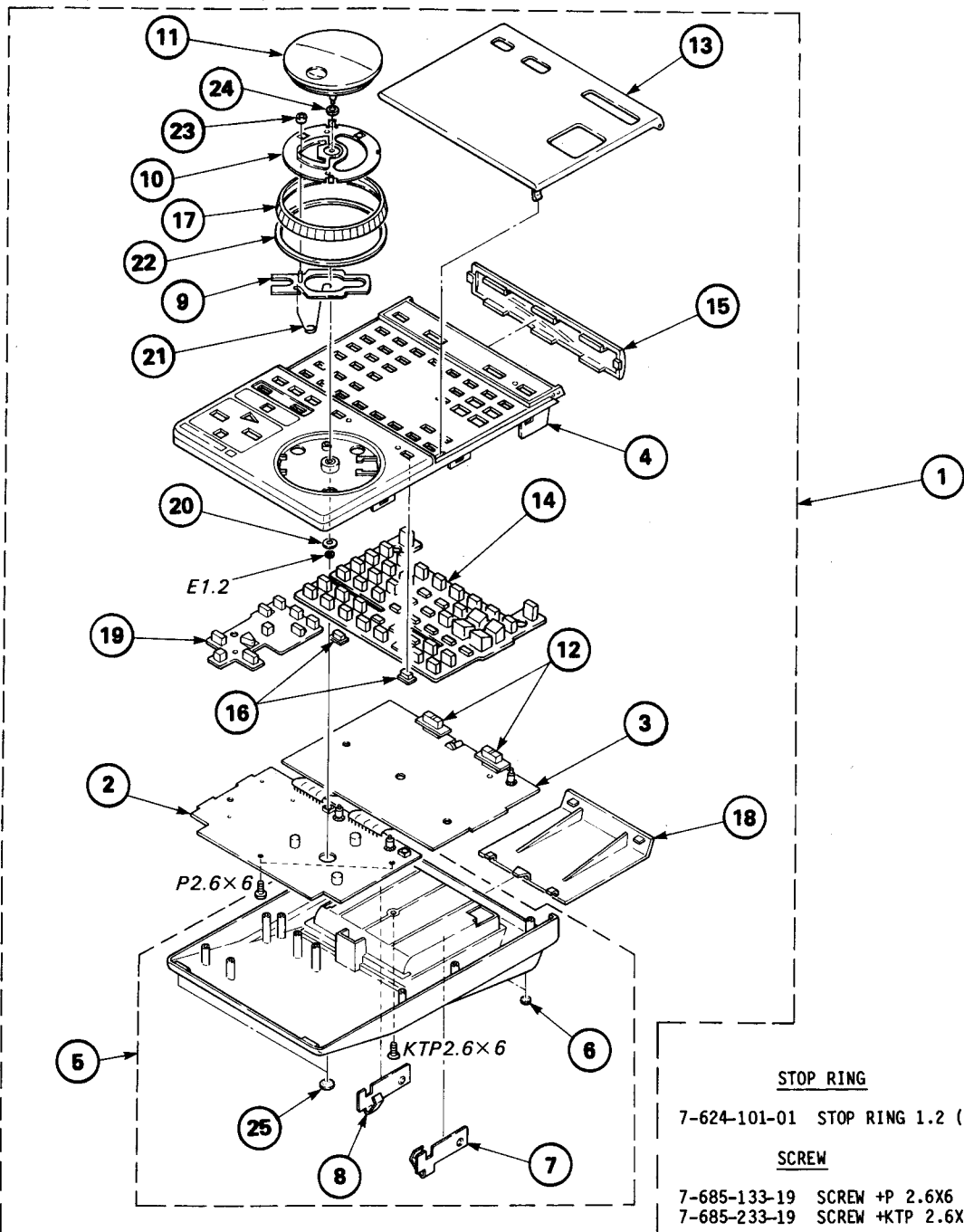
A  
B  
C  
D  
E  
F  
G  
H  
I

5. EXPLODED VIEW

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

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



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
1	A-6767-420-A	COMMANDER ASSYKNOB	2-25	14	2-357-222-11	RUBBER (B), CONTACT	
2	*1-618-666-12	JA-2 BOARD		15	2-357-223-01	PANEL, FRONT	
3	*1-620-529-11	JB-7 BOARD		16	2-357-224-01	BUTTON	
4	X-2357-252-1	CASE ASSY, UPPER		17	2-357-225-01	DIAL, SHUTTLE	
5	X-2357-215-1	CASE ASSY, LOWER	6-8, 25	18	2-357-227-01	COVER, BATTERY	
6	4-374-469-01	FOOT, RUBBER		19	2-357-292-01	RUBBER, CONTACT	
7	2-383-106-00	TERMINAL (D), BATTERY		20	3-320-412-01	WASHER (1.4), SPECIAL	
8	4-350-925-00	TERMINAL (C), BATTERY		21	3-691-634-01	SPRING, TORSION	
9	X-3691-605-1	PLATE ASSY, SLIDE		22	3-691-635-01	SPACER, SHUTTLE	
10	X-3691-615-1	PLATE ASSY, DIAL, SHUTTLE		23	3-691-648-01	ROLLER	
11	X-3691-672-1	DIAL (R) (N) ASSY, JOG		24	3-701-439-21	WASHER	
12	2-357-217-01	KNOB, SLIDE		25	2-270-305-00	FOOT, RUBBER	
13	2-357-221-61	LID, UPPER					

JA-2 JB-7

6. ELECTRICAL PARTS LIST

NOTE:

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

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

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- All resistors are in ohms
- F : nonflammable
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS

- MF :  $\mu$ F, PF :  $\mu$  $\mu$ F

COILS

- MMH : mH, UH :  $\mu$ H

RESISTORS

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
	*1-618-666-12	JA-2 BOARD			*1-620-529-11	JB-7 BOARD	
		*****				*****	
		CAPACITOR				2-357-218-01	TERMINAL (A), BATTERY
						2-357-219-01	TERMINAL (B), BATTERY
						CAPACITOR	
C101	1-124-225-00	ELECT	100MF 20% 6.3V	C201	1-102-973-00	CERAMIC	100PF 10% 50V
C102	1-101-004-00	CERAMIC	0.01MF 50V	C202	1-102-973-00	CERAMIC	100PF 10% 50V
C103	1-124-245-00	ELECT	4.7MF 20% 16V	C203	1-124-245-00	ELECT	4.7MF 20% 16V
				C204	1-101-004-00	CERAMIC	0.01MF 50V
		DIODE				DIODE	
D101	8-719-901-44	DIODE SLP144B		D201	8-719-901-44	DIODE SLP144B	
D102	8-719-901-44	DIODE SLP144B		D202	8-719-912-39	DIODE SLR-932A	
D103	8-719-911-19	DIODE 1SS119		D203	8-719-911-19	DIODE 1SS119	
D104	8-719-911-19	DIODE 1SS119		D204	8-719-911-19	DIODE 1SS119	
D105	8-719-939-11	GP2S09-B				IC	
D106	8-719-939-11	GP2S09-B		IC201	8-759-603-88	IC M50461-042FP	
D107	8-719-939-11	GP2S09-B				TRANSISTOR	
		IC				Q201	8-729-204-83 TRANSISTOR 2SA1048-GR
IC101	8-759-111-60	IC UPD7556G-506		Q202	8-729-967-32	TRANSISTOR 2SC2673	
		TRANSISTOR				RESISTOR	
Q101	8-729-900-65	TRANSISTOR DTA144ES		R201	1-249-406-11	CARBON	120 5% 1/6W
Q102	8-729-900-65	TRANSISTOR DTA144ES		R202	1-249-429-11	CARBON	10K 5% 1/6W
Q103	8-729-611-53	TRANSISTOR 2SA1115-F		R203	1-249-403-11	CARBON	68 5% 1/6W
		RESISTOR		R204	1-249-452-11	CARBON	2.7 5% 1/4W
R101	1-249-437-11	CARBON	47K 5% 1/6W	R205	1-249-441-11	CARBON	100K 5% 1/6W
R102	1-249-437-11	CARBON	47K 5% 1/6W			SWITCH	
R103	1-249-405-11	CARBON	100 5% 1/6W	SW201	1-553-977-00	SWITCH, SLIDE	
R104	1-249-441-11	CARBON	100K 5% 1/6W	SW202	1-553-977-00	SWITCH, SLIDE	
R105	1-249-441-11	CARBON	100K 5% 1/6W			CRYSTAL	
R106	1-249-441-11	CARBON	100K 5% 1/6W	X201	1-527-476-00	OSCILLATOR, CERAMIC (480KHz)	
R107	1-249-441-11	CARBON	100K 5% 1/6W			*****	
R108	1-249-441-11	CARBON	100K 5% 1/6W				
R109	1-249-433-11	CARBON	22K 5% 1/6W				
R110	1-215-467-00	METAL	82K 1% 1/6W				
R111	1-249-433-11	CARBON	22K 5% 1/6W				
R112	1-249-433-11	CARBON	22K 5% 1/6W				
R113	1-249-441-11	CARBON	100K 5% 1/6W				
R114	1-249-441-11	CARBON	100K 5% 1/6W				
R115	1-249-441-11	CARBON	100K 5% 1/6W				
R116	1-247-813-00	CARBON	180 5% 1/6W				
R117	1-247-813-00	CARBON	180 5% 1/6W				
R118	1-247-813-00	CARBON	180 5% 1/6W				
R119	1-249-429-11	CARBON	10K 5% 1/6W				
R120	1-249-414-11	CARBON	560 5% 1/6W				
		SWITCH					
SW101	1-553-856-00	SWITCH, KEY BOARD					
SW102	1-553-856-00	SWITCH, KEY BOARD					