3-MOTOR 3-HEAD TAPE DECK

RT-701

SERVICE MANUAL

PIONEER

MODEL RT-701 COMES IN TWO VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KC	120V	Canada model
KU	120V	U.S.A. model

CONTENTS

1. SPECIFICATIONS

Type	4-track, 2-channel stereo tape deck
Operation system	Solenoid drive, Pushbutton direct change system, Timer can be set for recording and playback.
Heads	Recording Head ; 1 Erase Heads ; 1 Playback Head ; 1
Motors	Capstan drive motor ; 1 (FG-system, AC servo, direct drive) Reel base drive motors ; 2 (6-pole inner rotor induction type)
Acceptable Reel Size	7in (17cm)
Tape Speed	19cm/s (7-1/2ips), 9.5cm/s (3-3/4ips) ±0.5%
Fast Forward/Rewind Times	Less than 100 sec. with 7-inch reel and 370m tape
Wow and Flutter	Less than 0.05% WRMS (19cm/s) Less than 0.08% WRMS (9.5cm/s)
Signal-to-Noise Ratio	More than 58dB
Total Harmonic Distortion	Less than 1% (19cm/s)
Frequency Response	
19cm/s	20Hz to 28,000Hz (30Hz to 24,000Hz ±3dB)
9.5cm/s	20Hz to 20,000Hz (30Hz to 16,000Hz ±3dB)
Crosstalk	More than 50dB
Channel Separation	More than 50dB
Erasing coefficient	More than 70dB
Recording bias Frequency	125kHz
Equalization	NAB standards
Inputs (Sensitivity/Maximum allowable level/Input impedance)	
MIC	0.25mV/100mV/27kΩ, 6mm diam. jacks (suitable microphone, 250Ω to 30kΩ)
LINE	50mV/25V/100kΩ
Outputs (Reference level/Maximum level/Load impedance)	
LINE	450mV/50kΩ
HEADPHONES	70mV/8Ω, 6mm diam. jack
Semiconductors	55 transistors (2 FET's), 3 IC's, 35 diodes (1 thyristor, 4 Zener diodes, 1 varistor, 2 LED's)
Accessory Functions	
• Pitch control (more than ±6% of rated tape speed)	
• Tape selectors: BIAS (STD/LH); EQ (STD/LH)	
• MIC/LINE mixing	
• Pause indicator lamp	
Power Requirements	AC 120V 60Hz
Power Consumption	115 watts, Max.
Dimensions	480(W) x 230(H) x 356(D)mm 18-29/32 x 9-1/16 x 14-3/14 in
Weight	Without package; 19.5kg 43 lb With package; 23 kg 50 lb 7 oz
Accessories	• 7in metal reel (Pioneer PR-85) x 1 • Connecting cord with pin plugs x 2 • Head cleaning kit x 1 • Sensing tape x 1 • Splicing tape x 1 • Operating instructions x 1

NOTE:
Specifications and the design subject to possible modification without notice due to improvements.

Test Conditions:

1. Reference tape: Scotch #206
2. Reference recording level: meter 0dB level (NAB standard reference level)
3. Reference signal: 1,000Hz
4. Wow & Flutter: at 3,000Hz weighted RMS
5. Frequency response: measured at −20dB level (19cm/s)
6. Signal-to-Noise ratio: measured at +6dB level (reference recording level)
7. Total Harmonic Distortion: measured at reference recording level
8. Channel separation: measured at reference recording level
9. Channel crosstalk: measured at 0dB level (reference recording level)
10. Sensitivity: Input level (mV) for reference recording measured with input (recording) level control set at maximum position.
11. Maximum allowable input level: measured at the point where the output signal wave is clipped while gradually turning the input control.
12. Reference output level: meter 0dB level.

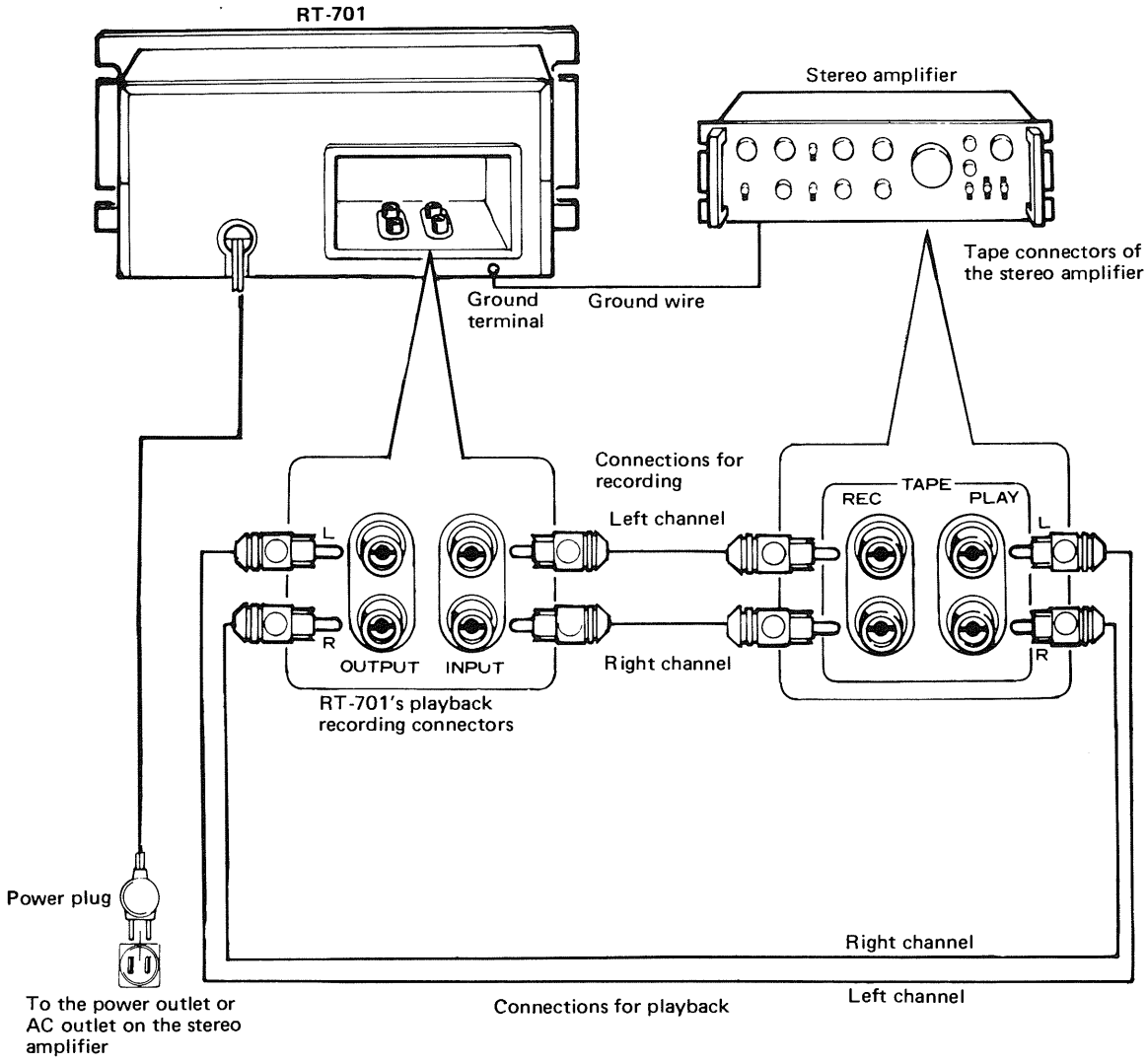
2. CONNECTION DIAGRAM

Use the accessory connecting cords to connect the RT-701's LINE terminals with the tape terminals on the stereo amplifier or receiver. The terminals in front are for the right channel and those behind are for the left channel.

If you do not connect the tape deck with the other audio equipment properly, you will hear a monotonous single-pitched hum and this will impair your recording. Take care, therefore, to connect properly.

Connections for playback: Connect the TAPE PLAY input terminals on the stereo amplifier with the LINE OUTPUT terminals on the RT-701.

Connections for recording: Connect the TAPE REC output terminals on the stereo amplifier with the LINE INPUT terminals on the RT-701.



3. FRONT PANEL FACILITIES

POWER SWITCH

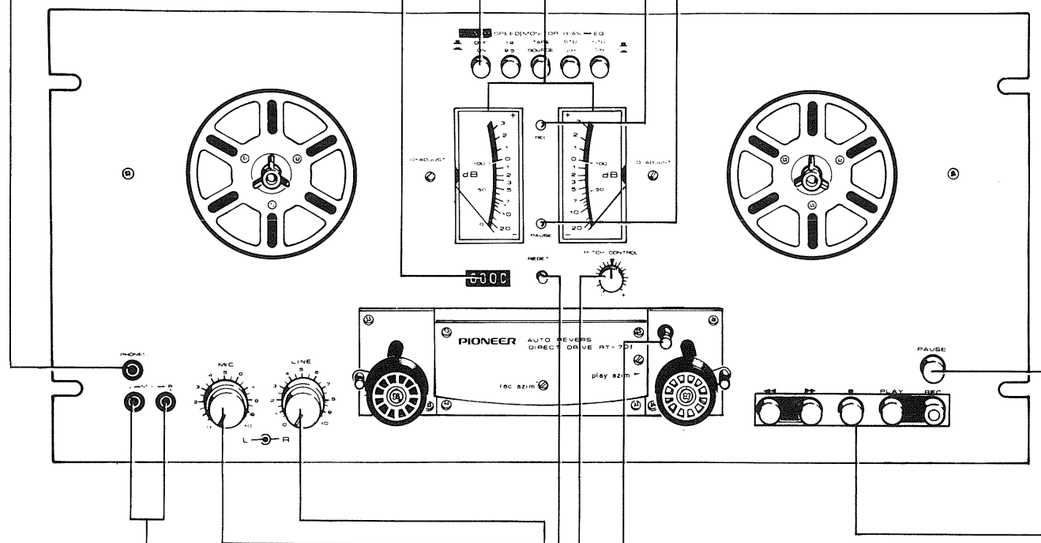
TAPE COUNTER
This indicates how much tape has been recorded or played back and how much there is left over.

PHONES JACK
This is the output jack for stereo headphones. Signals selected by the MONITOR switch are available here. Use it when you want to monitor the recording or listen to a performance directly taped from the RT-701. The output level is not variable.

LEVEL METERS
These allow you to read out the levels during recording and playback. When the MONITOR switch is set to SOURCE, they indicate the input signal level, and when set to TAPE, they indicate the playback output level.

RECORDING LAMP (REC)
This red lamp lights up during recording. Check that it has lit up before recording.

PAUSE LAMP
This green lamp lights up when the PAUSE button is pressed to indicate the tape has stopped temporarily.



MIC JACKS
Input jack for microphone recording. L (left) and R (right) channels can be used independently. As long as the microphone has a standard 6mm diameter plug, you can use either a low impedance (600-ohms) or high impedance (10 – 50-kohms) type.

MIC RECORDING LEVEL CONTROLS
Use these controls to adjust the recording level when you are recording with a microphone. Turn them clockwise to increase the level. Use the outer control for the right and the inner control for the left channel.

LINE RECORDING LEVEL CONTROLS
Adjust the recording input level from the LINE INPUT terminals on the rear panel. The level increases as the controls are turned to the right. The outer control is for the right channel and the inner, for the left.

CAPSTAN
This rotates when the power is switched on. Together with the pinch roller, it keeps the tape at its rated speed.

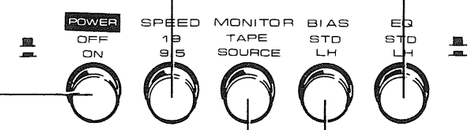
PITCH CONTROL KNOB
You can use this to make the tape travel 6% faster or slower than the normal tape speed during playback. When set to the central position, the tape speed is 19cm/s or 9.5cm/s (standard values). Turn the control to the left and the speed drops and the musical steps are lowered; conversely, turn it to the right, and the speed rises and the musical steps are raised. This control cannot be used during recording.

COUNTER RESET BUTTON
Push this button to reset the tape counter to "0000"

POWER SWITCH
Push this switch and power is supplied to the tape deck. Push for a second time to turn the power off.

SPEED SWITCH
This switch selects the tape speed. Push for a 9.5cm/s speed; push again for a 19cm/s speed (released position).
19cm/s: Used for recording music programs, etc.
9.5cm/s: Used for recording lengthy conversations, etc.

EQ SWITCH
This selects the recording equalization characteristics according to the type of tape used. Select same position for playback as for recording according to the characteristics of the recording tape. Push for LH; push again for STD (released).
STD: For standard tapes.
LH: For low noise and high output tapes.



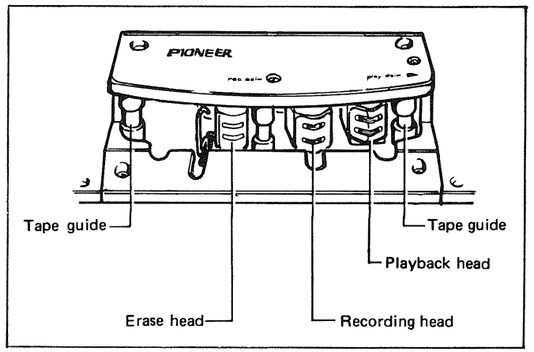
MONITOR SWITCH
Use this switch to monitor your recording.
TAPE: Allows you to listen to the recorded signals.
SOURCE: You can listen to the signals before recording if this position is selected (press switch once).
If this switch is switched alternately to SOURCE and TAPE during recording, you can compare the sound signals before and after recording.

BIAS SWITCH
This selects the recording bias current according to the type of tape used for recording. Push for LH tapes; push again for STD tapes (released position).
STD: For standard tapes.
LH: For low noise and high output tapes.

PAUSE BUTTON
This temporarily stops the tape during tape play. When pressed during recording or playback, the tape merely stops. When pressed again, the tape starts to run. This button does not work during fast forward or rewind.

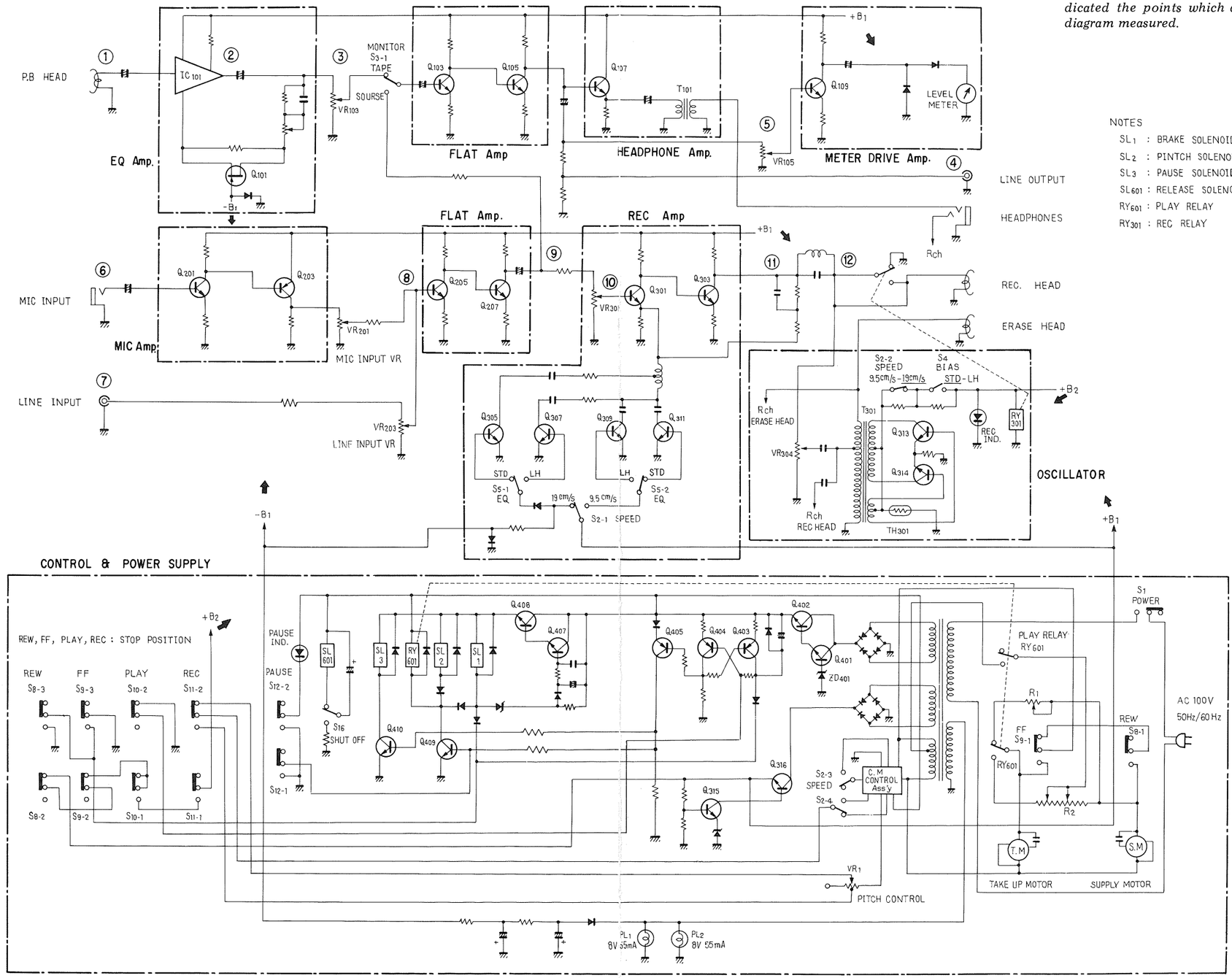
FUNCTION BUTTONS
◀◀ REWIND: This causes the tape to be wound at a high speed from the right to the left reel.
▶▶ FAST FORWARD: This causes the tape to be wound at a high speed from the left to the right reel.
PLAY: For tape playback, or recording, push this button.
REC: To record, press this button together with the PLAY button.
■ STOP: This stops the tape and releases the other function buttons.

NOTE:
- *The function buttons will not return to their preset positions if the power is turned off.*
- *There is no need to press the (■) stop button if you want to change over from one function to another.*



4. BLOCK DIAGRAM

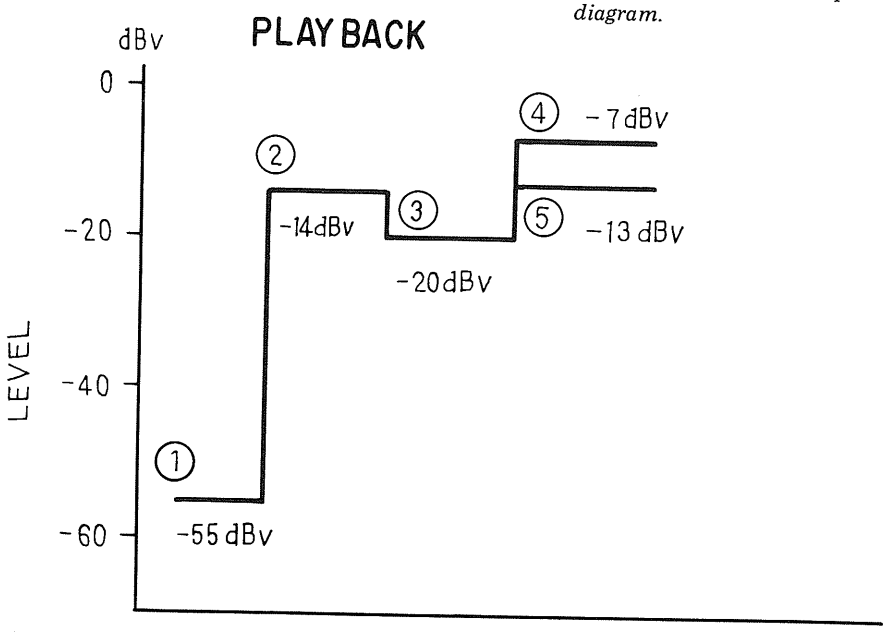
NOTE:
The number which are circled in the block diagram indicated the points which are to be measured in the level diagram measured.

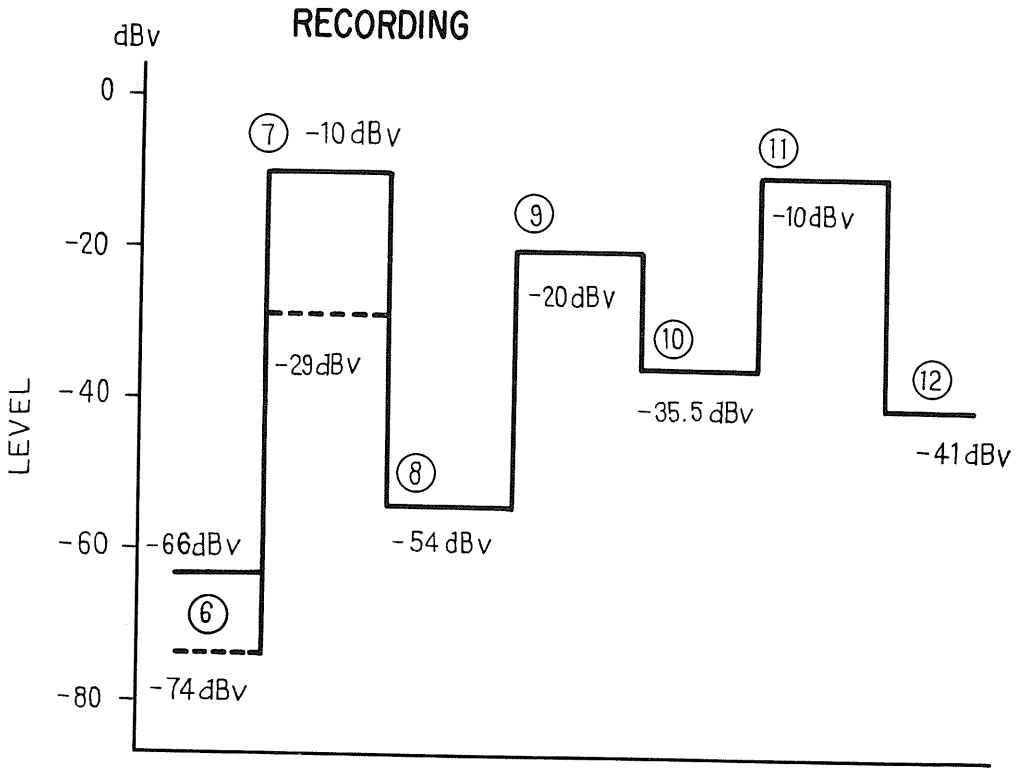


NOTES
- SL_1 : BRAKE SOLENOID
- SL_2 : PINTCH SOLENOID
- SL_3 : PAUSE SOLENOID
- SL_{601} : RELEASE SOLENOID
- RY_{601} : PLAY RELAY
- RY_{301} : REC RELAY

5. LEVEL DIAGRAM

NOTES:
0dBv = 1V
Frequency: 1kHz
The level measurement points are indicated on the block diagram.





6. CIRCUIT DESCRIPTIONS

The block diagram is shown on page 7.
Model RT-701 is an open reel tape deck characterized by direct drive 4-track 2-channel configuration, 3 motors, 3heads feature.
The sensor touch pushbuttons used in most 3-motor tape decks necessitate a relatively large number of relays in the transport control electronics; the RT-701, however, uses locking type pushbuttons which permit simplified circuit construction and also facilitate automatic unattended recording in conjunction with a timer.

6.1 POWER SUPPLY

When the power switch S_1 is switched on, AC 100V is supplied to the capstan motor from the secondary side of the power transformer, and the motor begins to rotate. A DC voltage rectified in D_{401} D_{402}, stabilized in the stabilizer formed by Q_{401}, Q_{402} and ZD_{401}, is supplied to the control circuit (Fig. 1).

6.2 CONTROL CIRCUIT

The control circuit is shown in Fig. 2. Table 1 indicates the transistor states for the different transport modes.

• Play Function (Fig. 2)

1. When the play button $S_{10\text{-}2}$ is pushed, ground connection of R_{407} is interrupted and the base circuit of Q_{404} is opened. No current can flow through Q_{404}, and it enters OFF state.
2. +B voltage causes current to flow along the route $D_{405} \rightarrow Q_{405} \rightarrow R_{411} \rightarrow R_{410}$, whereby Q_{405} is turned ON.
3. As R_{419} is connected between base and emitter of Q_{409}, this transistor is turned ON. The collector current of Q_{409} activates brake solenoid SL_1, pinch solenoid SL_2 and play relay RY_{601}.
4. As R_{419} is connected between base and emitter of Q_{410}, base current can flow and the transistor becomes ON. Q_{410} collector current activates PAUSE solenoid SL_3.

Operation of brake solenoid SL_1 releases the brakes of the supply motor (SM) and take-up motor (TM). Operation of the pinch solenoid SL_2 causes the pinch roller to be pressed against the capstan. Operation of the play relay RY_{601} enables AC 70V from the secondary side of the power transformer (see Fig. 1) to be applied to the supply and take-up motors through slide resistors R_2.

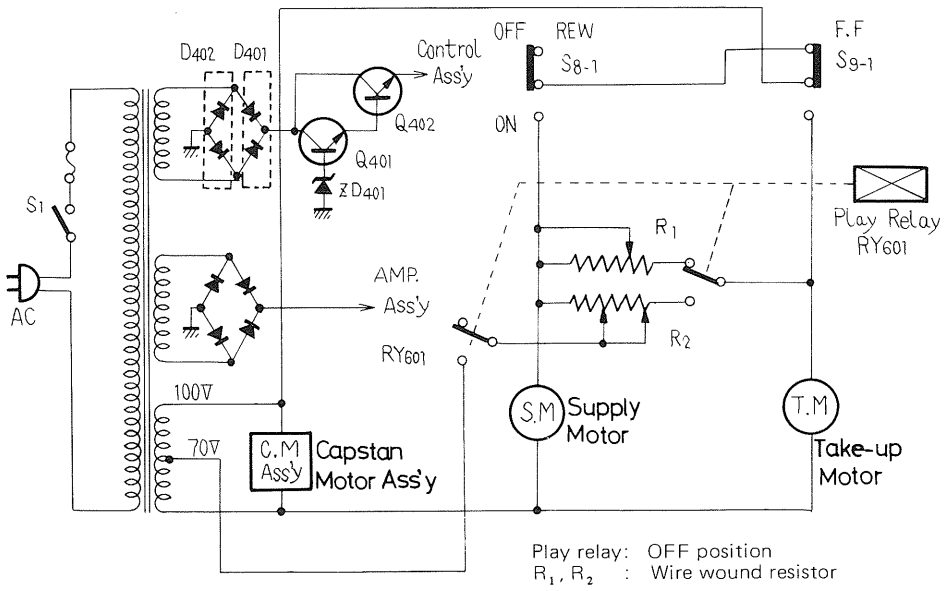


Fig. 1

• Rewind (& Fast Forward) Function (Fig. 2)

1. When the rewind button S_{8-3} is pushed, +B current flows along the path brake solenoid $SL_1 \rightarrow D_{407} \rightarrow S_{8-3}$, and SL_1 operates, releasing the supply and take-up reel brakes.
2. As shown in Fig. 1, AC 100V is applied to the supply motor via F.F. button S_{9-1} and rewind button S_{8-1}, and tape rewind begins.
3. AC100V also flows to the take-up motor via F.F. button $S_{9-1} \rightarrow$ rewind button $S_{8-1} \rightarrow$ slide resistor $R_1 \rightarrow$ play relay RY_{601}. The slide resistor serves to apply the proper amount of back tension to the take-up motor in rewind mode.
4. In F.F. mode, on the other hand, AC 100V from the secondary side of the power transformer is applied to the take-up motor through F.F. button S_{9-1}.
5. AC 100V also flows to the supply motor via the route formed by $S_{9-1} \rightarrow$ play relay $RY_{601} \rightarrow$ slide resistor R_1. The slide resistor serves to apply the proper amount of back tension to the supply motor in fast forward mode.

• Solenoid Voltage Control Circuit (Fig. 2)

When transport functions are switched, operating current of the solenoids must be temporarily increased to effect the switching action, but current must be reduced again immediately to avoid overheating of the solenoids.

1. When, for example, the play button is pushed, a surge of charge current (base current from Q_{407}) flows to C_{408}, and Q_{407} is turned ON.
2. Brake solenoid SL_1, pinch solenoid SL_2, play relay RY_{601} and pause solenoid SL_3 are connected as loads to Q_{408}. As explained under PLAY FUNCTION, above, these solenoids operate in play mode, whereby the Q_{407} emitter current becomes the Q_{408} base current, turning Q_{408} ON.
3. As soon as C_{408} has been charged, bias of Q_{407} returns to the normal operating value determined by stabilization in R_{415}, ZD_{402}.

Table 1

Transport Mode	Transistors in ON state	Transistors in OFF state
STOP	Q_{404}	Q_{403} . Q_{405} , Q_{409} , Q_{410}
PLAY	Q_{403}, Q_{405}, Q_{409}, Q_{410}	Q_{404}
FF/REW	Q_{404}	Q_{403} , Q_{405} , Q_{409} , Q_{410}
PAUSE	Q_{403}, Q_{405}, Q_{410}	Q_{404} , Q_{409}

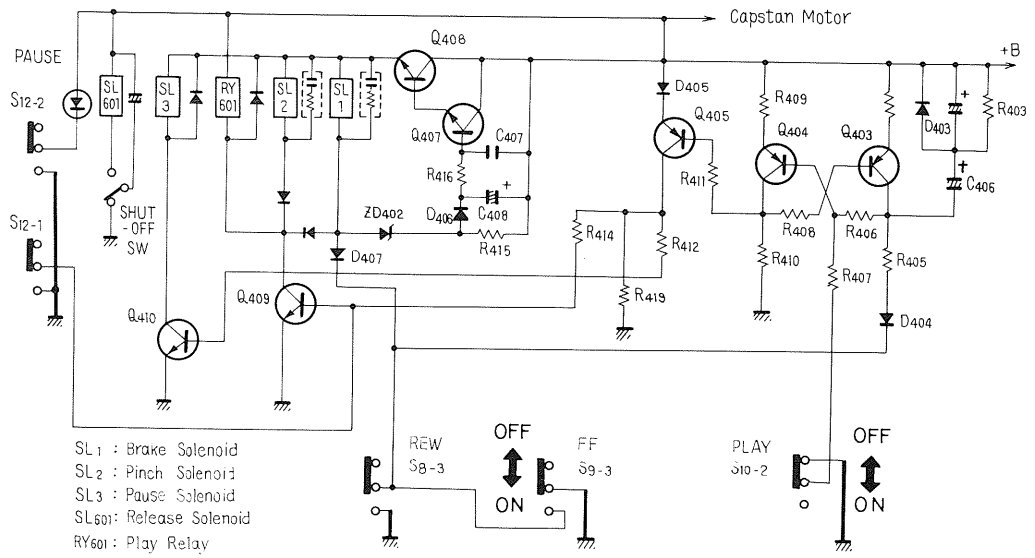


Fig. 2

• Time Lag In Switching Functions (Fig. 2)

When the transport is switched from rewind (or fast forward) directly to play mode, it is necessary in the interest of tape protection to bring the tape to a standstill for a certain length of time.

Switchover from fast forward or rewind to play

1. In F.F. (or REW) mode, Q_{404} base current flows via the route formed by $R_{409} \rightarrow Q_{404} \rightarrow R_{407} \rightarrow$ play button S_{10-2}, and Q_{404} is in ON state.
2. Therefore (and because the Q_{403} base is connected to the Q_{404} collector via R_{408}), reverse bias is applied and Q_{403} is OFF.
3. +B voltage causes a current flow through $R_{403} \rightarrow C_{406} \rightarrow R_{405} \rightarrow D_{404}$, whereby C_{406} (timing capacitor) is charged.
4. When the Play button is pushed, the F.F. switch S_{9-3} is turned off, and C_{406} begins to discharge via $D_{403} \rightarrow R_{409} \rightarrow Q_{404} \rightarrow R_{406}$. As Q_{404} base current gradually decreases, its internal resistance goes up and Q_{404} attains OFF state.
5. When Q_{404} becomes OFF, Q_{405}, Q_{409} and Q_{410} become ON (as explained under PLAY FUNCTION, above).
6. Therefore, the brake solenoid SL_1, pinch solenoid SL_2, play relay RY_{601} and Q_{410}, operate and the unit enters play mode.
7. The required stop time between pushing of the play button and start of play is determined by the discharge time of C_{406}; it is approximately 2 seconds.

• Pause Function (Fig. 2)

1. When the pause button S_{12} is pushed while the transport is in play or rec mode, potential at the base of Q_{409} becomes 0V, meaning that Q_{409} becomes OFF.
2. Thereby the loads on Q_{409}, i.e. brake solenoid SL_1 and pinch solenoid SL_2 are released; supply and take-up motor brakes are applied and the pinch roller retracted from the capstan.
3. Play relay RY_{601} also opens, and AC 70V current flow to the take-up and supply motors is interrupted. The motors stop, the transport is new in pause mode.
4. The pause indicator LED also lights.
5. When pause switch S_{12} is released, current again flows through the base of Q_{409}, the transistor becomes ON, brake solenoid SL_1, pinch solenoid SL_2, play relay RY_{601} and pause solenoid SL_3 operate, and play or rec mode is resumed. Refer to PLAY FUNCTION, below.

NOTE:
With the pause switch S_{12} on, Q_{410} remains on, and +B voltage is still applied to pause solenoid SL_3. The pinch roller is therefore retracted only about 2mm from the capstan.

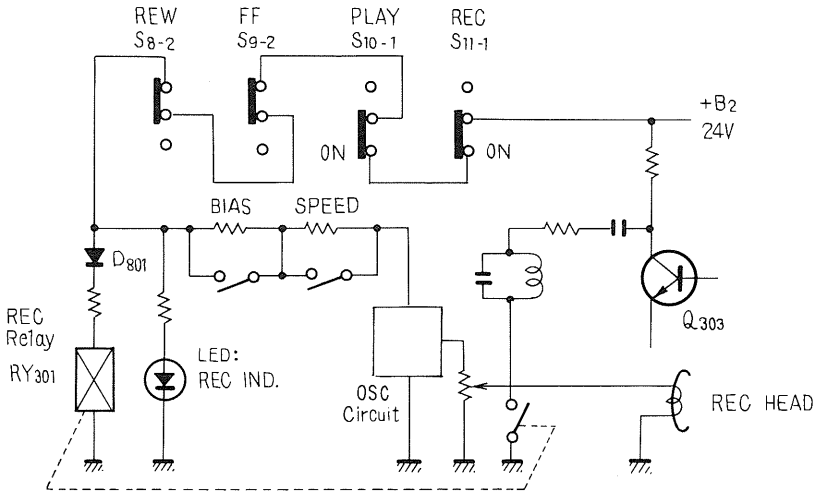


Fig. 3

• Record Function (Fig. 3)

1. The unit is put into recording mode when the play (S_{10-1}) and rec (S_{11-1}) buttons are operated at the same time.
2. +B current flow is as follows: rec button S_{11-1} → play button S_{10-1} → F.F. button S_{9-2} → rewind button S_{8-2} → speed switch → bias oscillator switch → OSC circuit. Current is also supplied to the rec relay RY_{301} and the rec indicator LED.
3. Output from the bias oscillator is supplied to the recording and erase heads.
4. At the same time, recording signal current (which is grounded through rec relay RY_{301} in other modes) is supplied to the recording head to be recorded on tape.

NOTE:
Functions of the control circuit in rec mode are the same as in play mode.

6.3 RECORDING AMPLIFIER (Fig. 4)

1. Input from the microphone jacks passes through C_{201} and is amplified in the 2-stage direct coupled amplifier formed by Q_{201}, Q_{203}.
2. Output from this mic head amp, after level adjustment by VR_{201}, enters Q_{205}.
   Line input is level adjusted in VR_{203} and then enters Q_{205}. Mic and line inputs can thus be mixed, with independent level adjustments for each.
3. The signal, amplified in Q_{205}, Q_{207} passes through VR_{102} and enters the base of Q_{301}.
4. Q_{301} and Q_{303} serve to obtain the current required for driving the recording head.
   A feedback loop (Q_{303} collector → R_{313}, C_{307} → R_{315} → Q_{301} emitter)has been provided to obtain +4dB at 20Hz of bass equalization.
5. To achieve the different amounts of treble equalization required for the two tape speeds, a transistorized switching circuit has been included.
   Assuming, for instance, that low noise high output tape is being used at 19cm/s: a positive voltage is applied to the base of Q_{307}, its internal impedance drops, and the series resonant circuit constituted by L_{301}, C_{313}, functions.
6. From Q_{303}, the signal enters the recording head via L_{303}, C_{325}. L_{303} & C_{325} are tuned to the recording bias frequency, preventing reverse bias flow in the circuit.

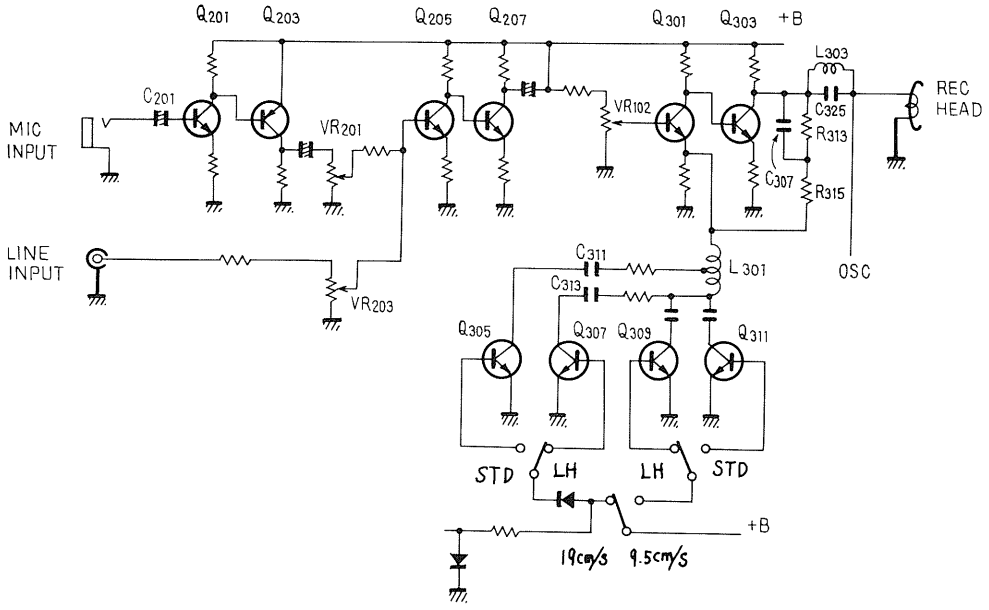


Fig. 4

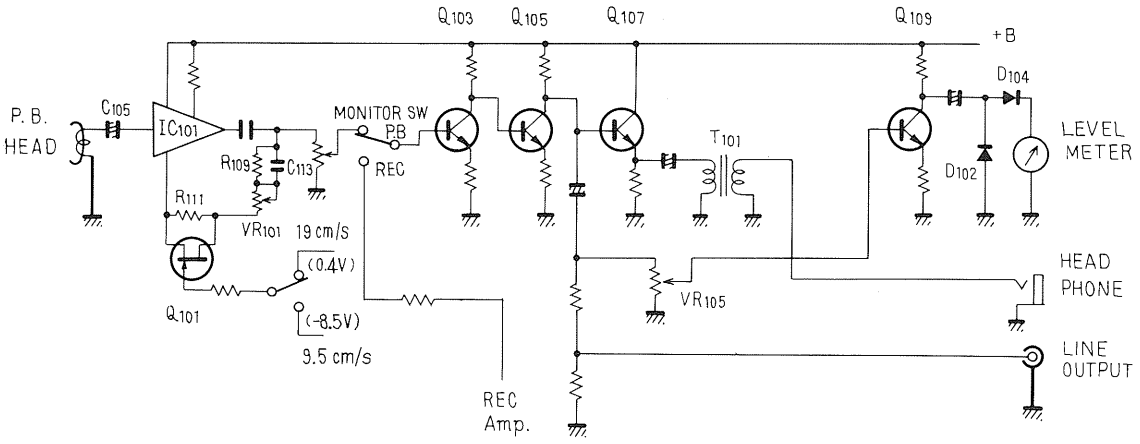


Fig. 5

6.4 PLAYBACK AMPLIFIER (Fig. 5)

1. The playback signal from the playback head enters IC_{101} through C_{105}.
2. The amplified output from IC_{101} undergoes playback equalization in the equalizer formed by VR_{101}, R_{109}, C_{113}, R_{111}.
3. The difference in equalization between 19cm and 9.5cm/s tape speeds is obtained by varying the voltage applied to the gate of FET Q_{101} (0.4V for 19cm/s, −8.5V for 9.5cm/s) and utilizing the resultant change in the FET's internal impedance.
4. The signal from IC_{101} is then amplified in the direct coupled NPN amplifier (Q_{103}, Q_{105}) and becomes available at the line output terminals.
5. A portion of the output signal undergoes impedance conversion in Q_{107} and matching transformer T_{101} and becomes available at the phones output jack.
6. For driving the level meters, output from Q_{105} is amplified in Q_{109} and rectified in D_{102}, D_{104}.

6.5 BIAS OSCILLATOR

1. When +B (approx. 30V) is applied to Q_{313}, Q_{314}, a positive feedback loop is established through the oscillator transformer T_{301}, and oscillation begins.
2. From the secondary side of T_{301}, the oscillation signal is supplied to the erase and recording heads.
3. The oscillation frequency is stabilized against temperature fluctuations by means of thermistor TH_{301} which regulates the base current of Q_{313}, Q_{314}.

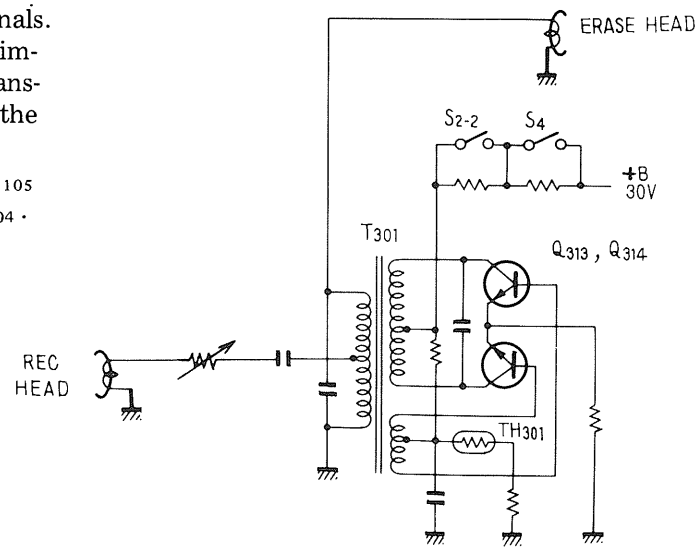


Fig. 6

6.6 FREQUENCY GENERATOR

The frequency servo generator block diagram is given in Fig. 7. For the circuit schematic, please refer to page 89.

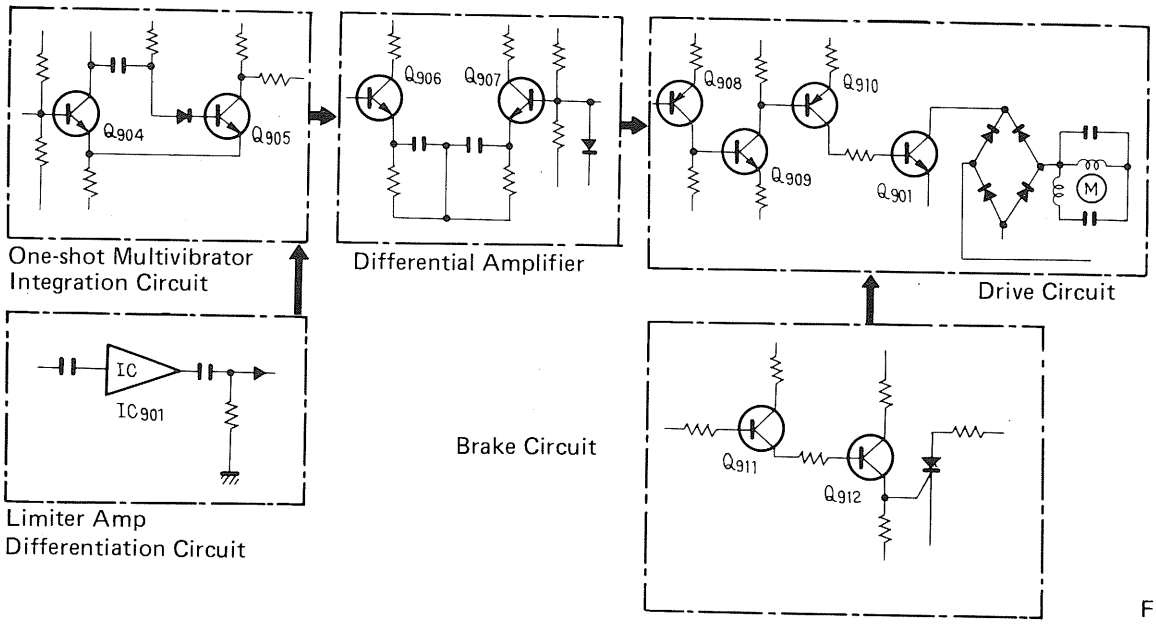


Fig. 7

The construction of the frequency generator (abbreviated F G) is shown in Fig. 9. The rotor is mounted to the flywheel and the stator, magnet and generation coil are installed to the motor bracket.

The magnetic flux from the magnet flows through the loop stator teeth ~ rotor teeth ~ magnet. When the motor rotates 1 revolution, the rotor and stator teeth alignment changes as illustrated by a and b of Fig. 8. Therefore, the amount of magnetic flux (magnetic flux density) flowing through the loop changes. An AC voltage of a frequency proportional to the number of times the magnetic flux density changes is generated in the generation coil. The output signal of this F G is approximately 1360Hz, 150mV at a tape speed of 19cm/s.

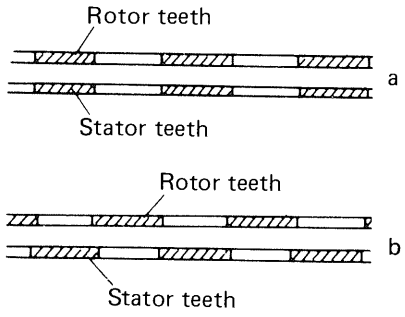


Fig. 8

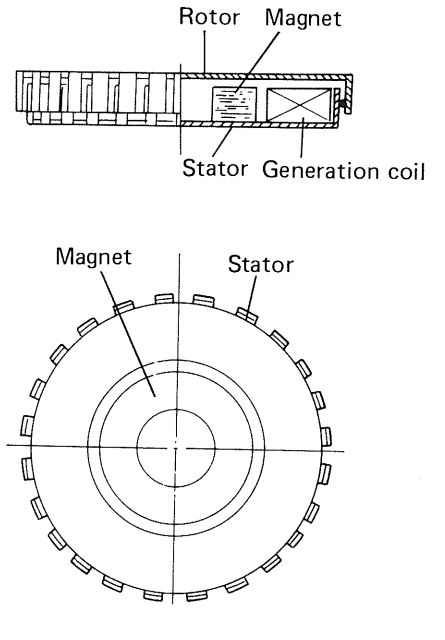


Fig. 9

● Limiter Amplifier and Differentiator Circuit

The limiter amp and differentiator circuit are shown in Fig. 10. The AC signal generated by the FG circuit is shaped to the square wave shown in Fig. 15-2 (Fig. 10-a) by an IC limiter amp.
The output of this amp is shaped into a pulse by a CR differentiator circuit and the positive pulse of Fig. 15-4 (Fig. 10-b) is extracted by means of a diode D.

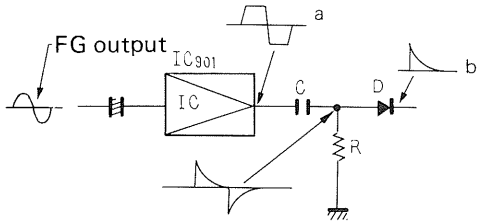


Fig. 10

● One-shot Multivibrator Circuit and Integrating Circuit (Fig. 11)

The positive pulse obtained above is used to trigger a one-shot multivibrator. When there is no input signal, Q_{904} is OFF and Q_{905} is ON and point Ⓐ becomes nearly stable due to the voltage drop across R_L. However, when a positive pulse is applied to the input of the multivibrator, Q_{904} is turned ON, Q_{905} is turned OFF (Q_2 collector current doesn't flow) and the voltage of point Ⓐ rises to near the power supply voltage. The multivibrator remains in this state during time T_2 determined by the time constant of C and R and then returns to its original stable state.
In short, positive square waves equal to the number of input trigger pulses are produced. When the frequency of the signal generated by the FG circuit changes (motor speed changes), the spacing T_3 of the trigger pulses also changes. Looking at this at point Ⓐ, the output is different for the time interval of T_2, output 0V as shown in Fig. 15-5.
If the output of a one-shot multivibrator is passed through an integrating circuit consisting of Rx and Cx, when the closing time of T_2 is long as illustrated in Fig. 15-6, the output of point B at which the DC has changed can be made low and the change of T_2 (change in speed) can be extracted as a DC voltage change. Moreover, the speed (tape speed) may also be changed even when T_1 is changed in a like manner. In this machine, the tape speed is adjusted by changing R.

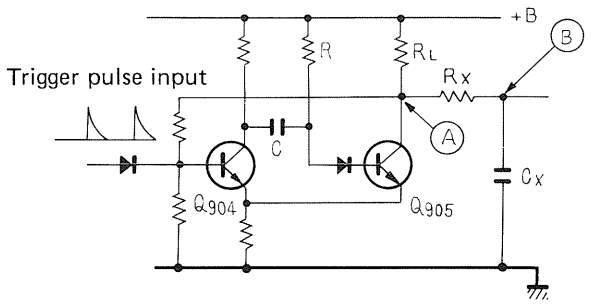


Fig. 11

● Differential Amplifier

The DC voltage ΔDC obtained at the low-pass filter circuit is applied to the differential amplifier of Fig. 12 and compared with the reference voltage. The difference between this voltage and the DC voltage obtained at the correct speed, that is, the voltage component produced by the speed error, is operated differentially.
For instance, when the motor speed is too fast, since ΔDC increases, I_{C2} increases, the voltage of point Ⓐ rises, I_{C1} decreases, and ΔEo also decreases. This ΔEo is sent to the drive circuit.

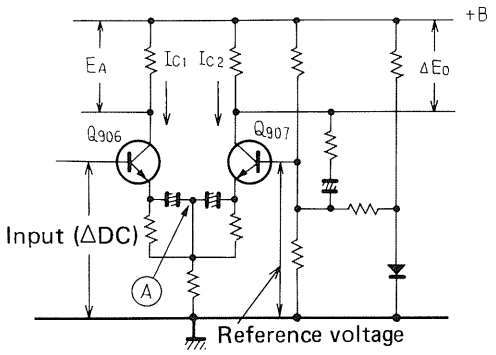


Fig. 12

● Drive Circuit

The drive circuit is shown in Fig. 13.
ΔEo of the differential amplifier is the input of Q_{908}. When ΔEo is reduced (that is, when the speed of the motor is fast), the collector current of Q_{908}, Q_{909} and Q_{910} is reduced until, finally, the internal resistance of Q_{901} increases.
When point Ⓐ has become positive, the current path from the AC input is through the route Ⓐ → motor winding → $D_{901\text{-}2}$ → Q_{901} → $D_{901\text{-}3}$ → Ⓑ and when point Ⓑ has become positive it is through the route Ⓑ → $D_{901\text{-}1}$ → Q_{901} → $D_{901\text{-}4}$ → motor winding → Ⓐ. The increase in the internal resistance of Q_{901} causes the motor current winding current to decrease and the motor speed decreases and is returned to an accurate speed.

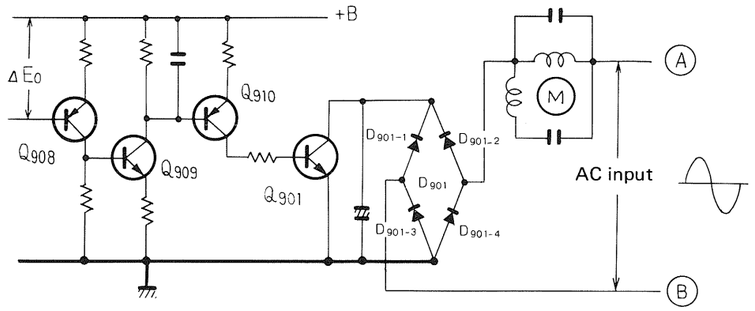


Fig. 13

• Brake Circuit

The brake circuit is shown in Fig. 14. Input E_A of Q_{911} is the collector output of the differential amplifier Q_{907} (Fig. 12). Voltage E_B of point a is set by R_A, R_B so that it is higher than E_A at the rated speed. Consequently, Q_{911}, Q_{912} and the SCR are turned OFF and the brake is not operated.

If it is assumed that the tape speed has been switched from 19cm/s to 9.5cm/s, for example, the servo circuit detects the change in speed. The internal resistance of Q_{901} of Fig. 13 increases, the motor winding current decreases and the motor speed decreases. Since the motor is unloaded if the function switch on the tape deck is set to a position other than PLAY (REC) at this time, it is rotated by the inertial energy of the flywheel and the rated speed is not reached immediately (this machine requires about 10 seconds to reach the rated speed). The increase of E_A when the speed

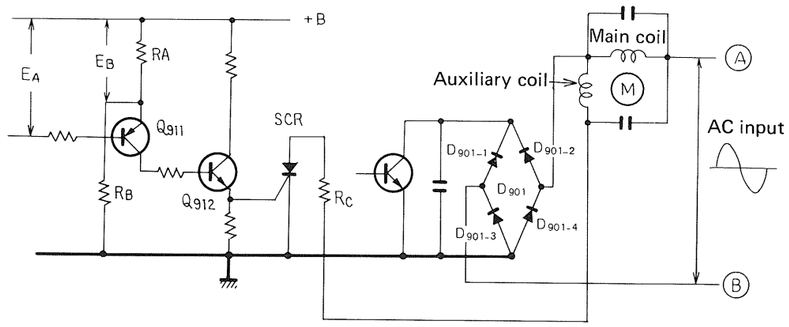


Fig. 14

Frequency too low (Rotation too slow)

Frequency too high (Rotation too fast)

Fig. 15-1 F.G. Output

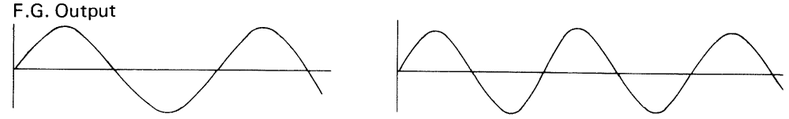


Fig. 15-2 Limiter Output

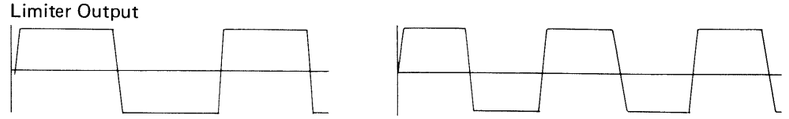


Fig. 15-3 Differentiator Output

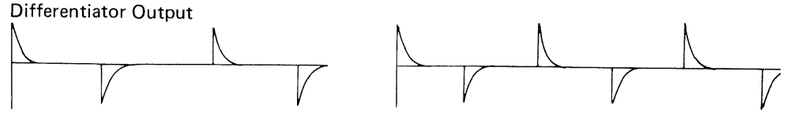


Fig. 15-4 Trigger Input

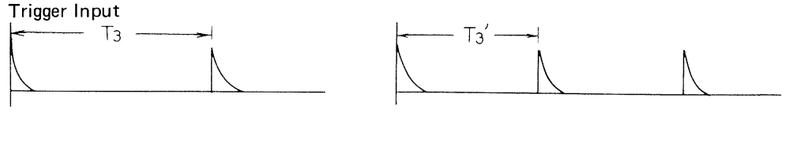


Fig. 15-5 One-shot Multivibrator Output

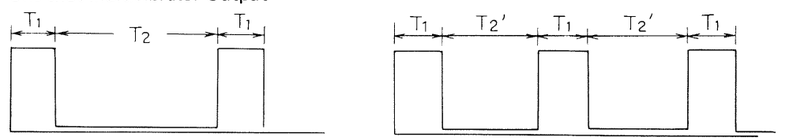


Fig. 15-6 Integrator Output

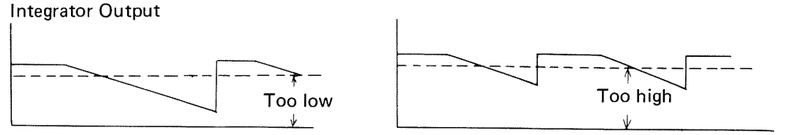


Fig. 15

7. DISASSEMBLY

Bonnet

Remove the screws ①~⑧ on the each side of the bonnet, then remove the screws ⑨~ ⑩ as shown in Fig. 16.

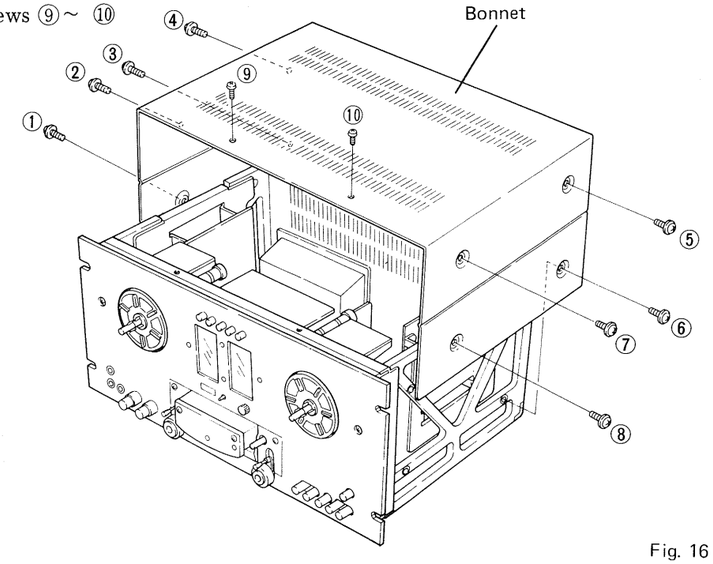


Fig. 16

Rear Panel

Remove the screws ①~⑨ to detach the rear panel, then remove the screw ⑩ for ground as shown in Fig. 17.

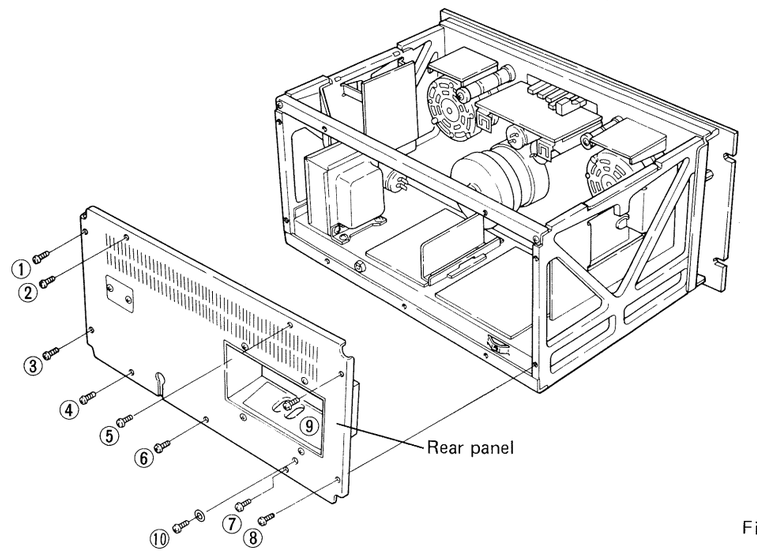


Fig. 17

Bottom Panel

Remove the screws ①~⑥ to detach the bottom panel as shown in Fig. 18.

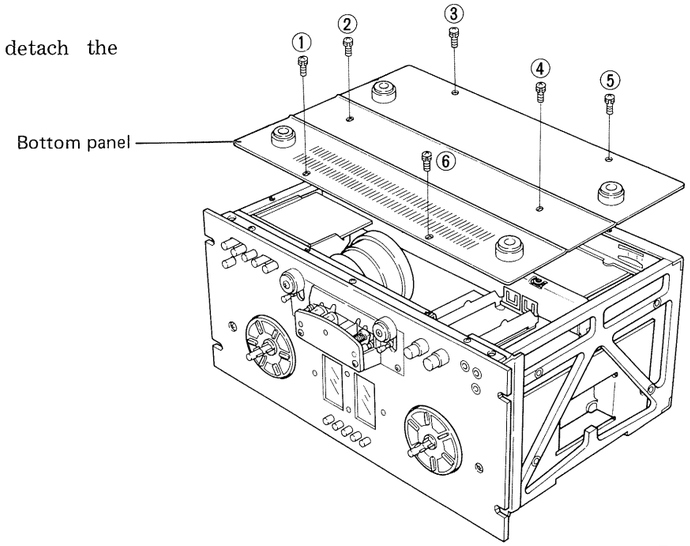


Fig. 18

Front Panel

1. Pull off the knobs (MIC, LINE, and PITCH CONTROL).
2. Remove the screws ①~⑤ to detach the front panel.

NOTES:

- *Hook a rubber band as illustrated in Fig. 19 and remove the front panel without remove the tension roller and pinch roller.*
- *After removing the front panel, misalignment and scratching of the meter can be prevented by hooking a rubber band to the level meter as illustrated in the figure (at reel base height adjustment, brake adjustment, etc.).*

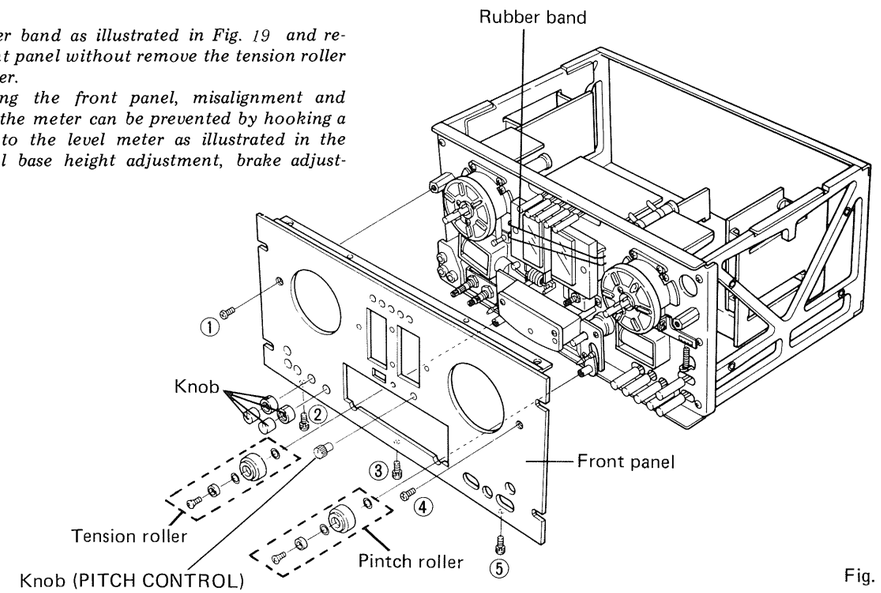
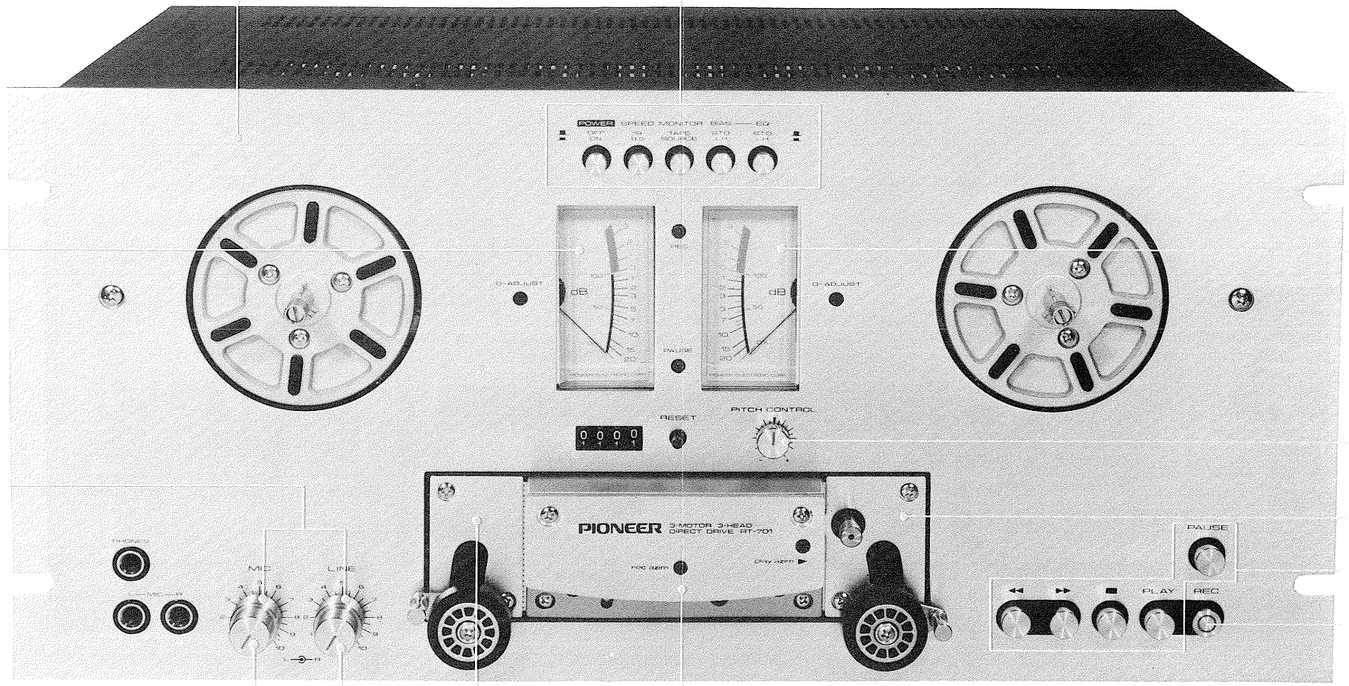


Fig. 19

8. PARTS LOCATION

8.1 FRONT PANEL VIEW



Front panel assembly
RXX-199

Level meter L
RAW-056

Knob B
RAA-165

Knob A
RAA-164

Base cover L
RAH-171

Knob (SWITCH) assembly
RAA-169

Level meter R
RAW-055

Knob (PITCH CONTROL)
RAA-166

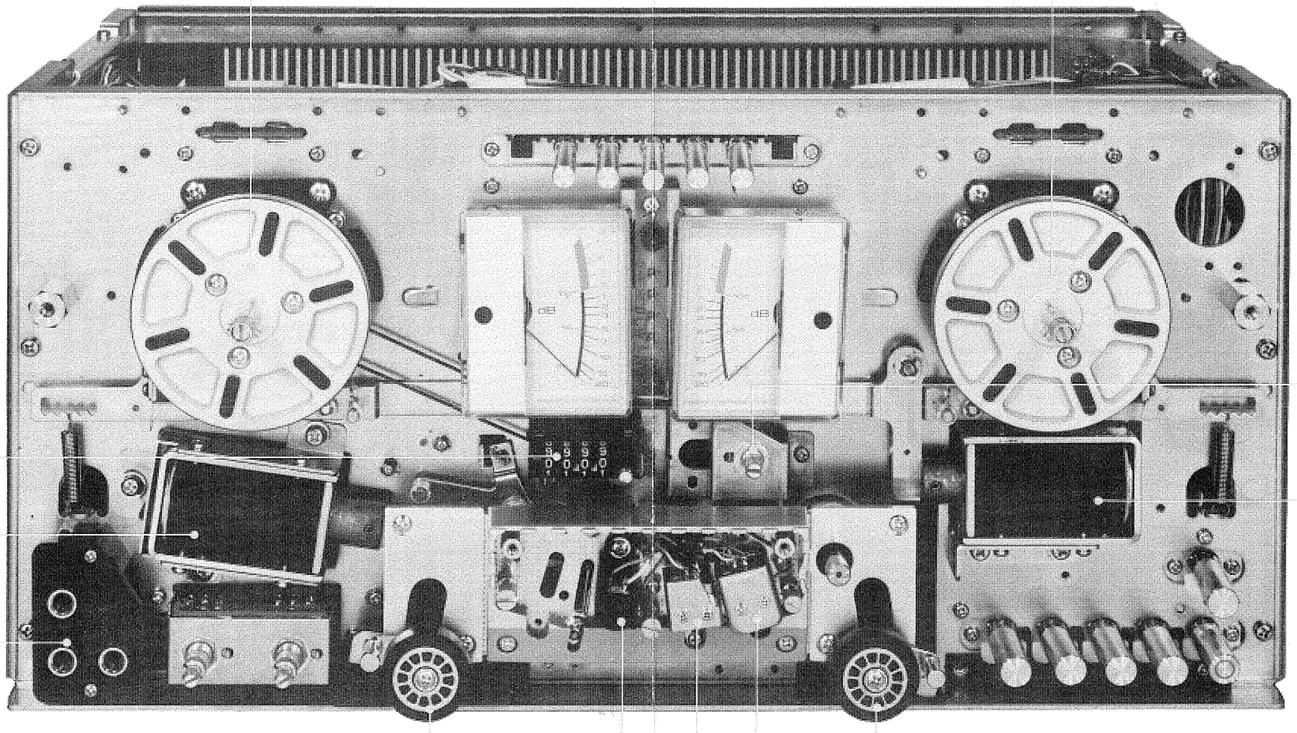
Base cover R
RAH-170

Knob (FUNCTION SWITCH) assembly
RAA-167

REC bottom assembly
RAA-173

Head panel A
RAH-169

8.2 FRONT VIEW WITH FRONT PANEL REMOVED



Reel base
RNG-112
or RNG-123

Tape counter
RAW-054

Solenoid (PINCH)
RXP-038

Jack assembly
RXA-758

Shifter roller assembly
RXA-760

E.R. Head
RPB-039

Reel base
RNG-112
or RNG-123

Variable resistor (PITCH CONTROL)
RCS-011

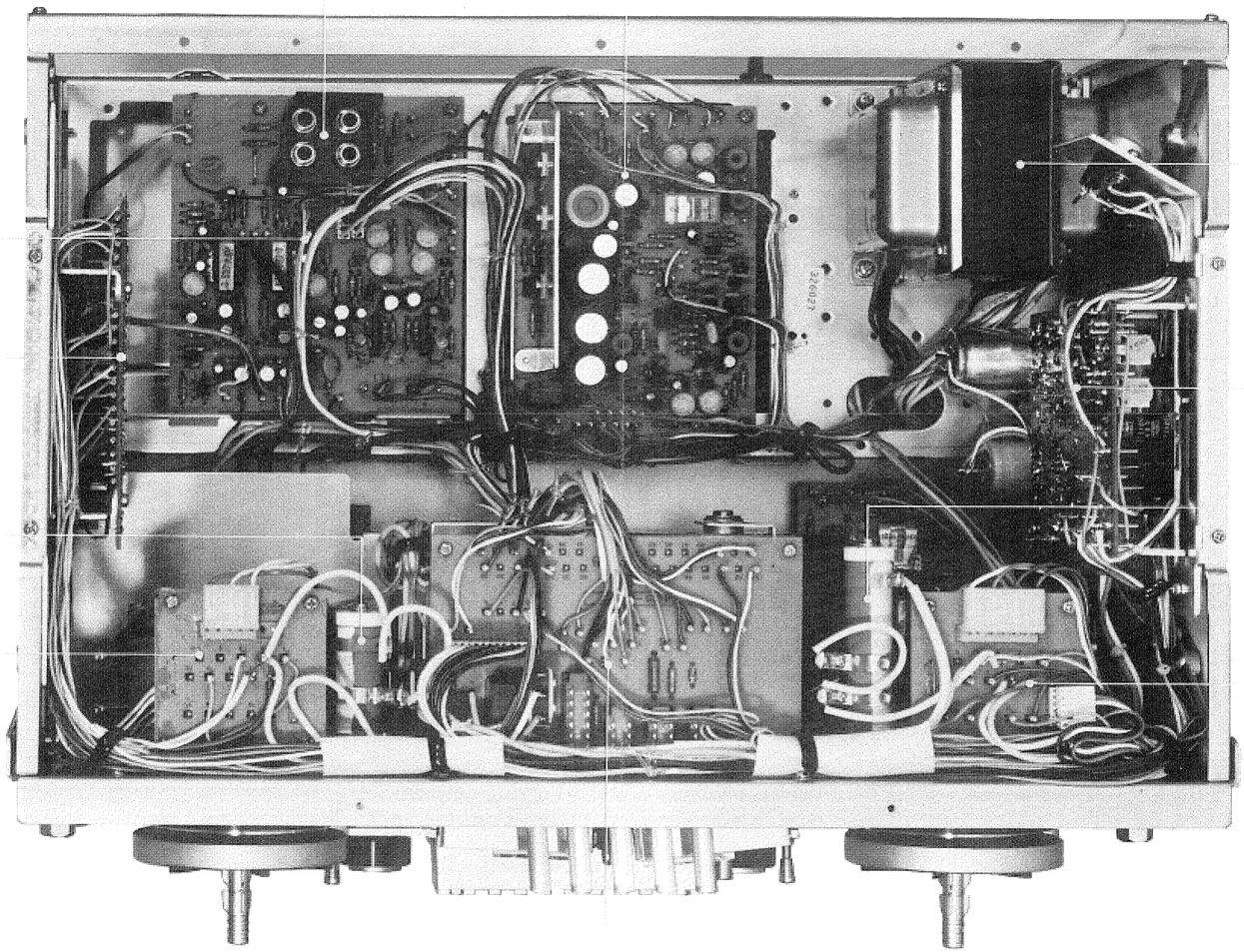
Solenoid (BRAKE)
RXP-040

Pinch roller assembly
RXA-759

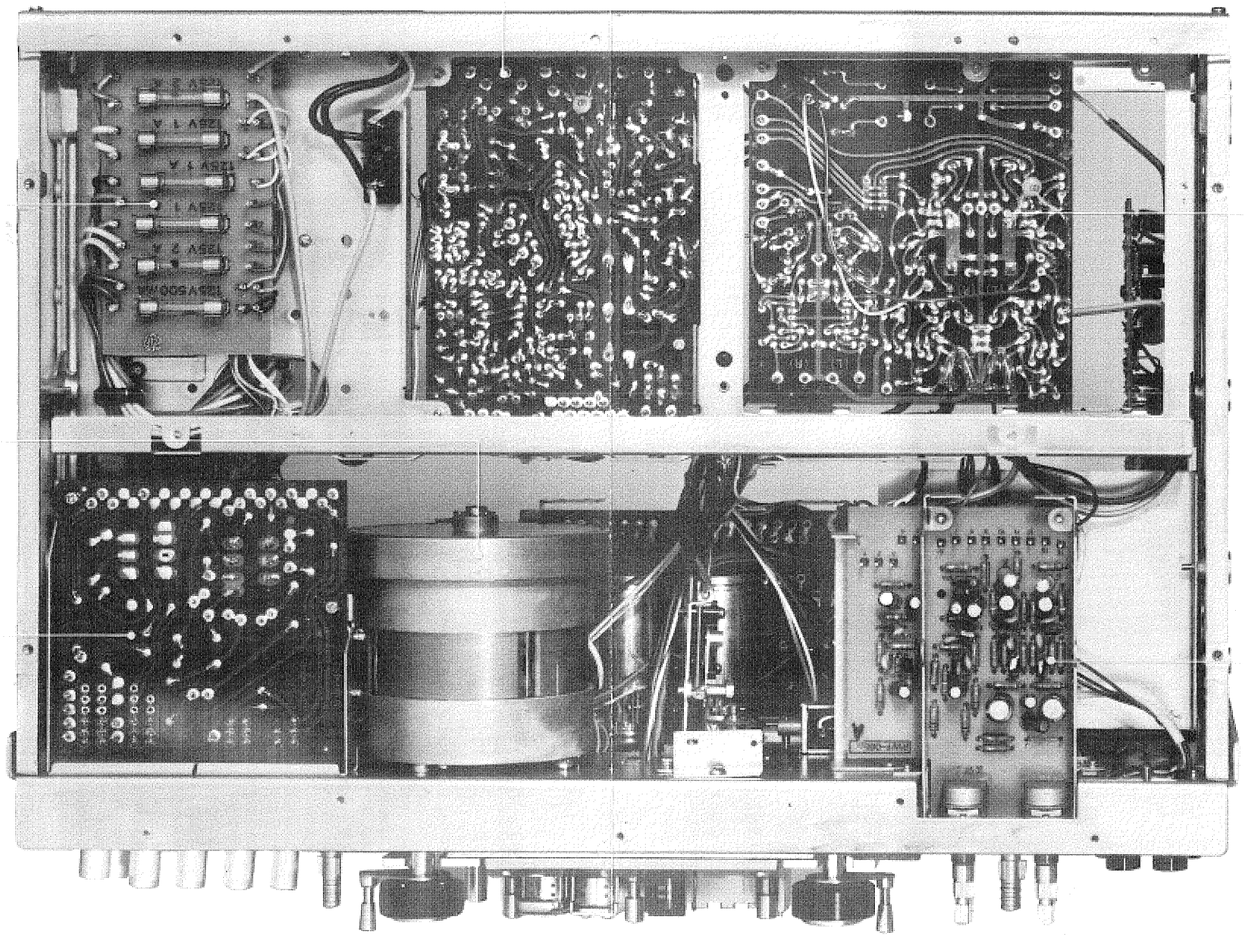
P.B. Head
RPB-041

REC Head
RPB-040

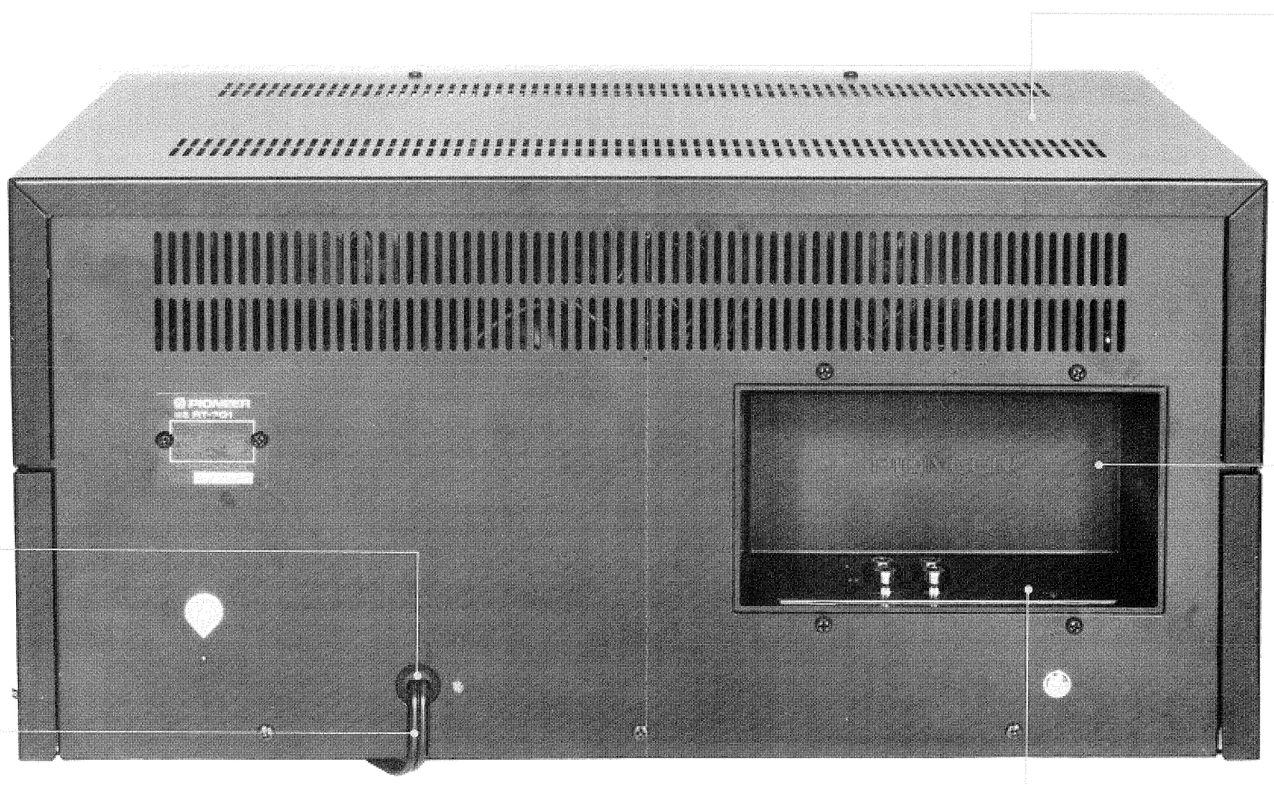
8.3 TOP VIEW WITH BONNET REMOVED



8.4 BOTTOM VIEW WITH BOTTOM PANEL REMOVED



8.5 REAR PANEL VIEW



9. MECHANICAL ADJUSTMENTS

● Perform adjustments in the vertical position unless otherwise specified.

9.1 REEL BASE HEIGHT ADJUSTMENT

This adjustment is necessary when the height of the reel base is unsuitable and when the supply motor or takeup motor has been replaced.

1. Remove the bonnet (see page 19) and place the tape deck in the horizontal position.
2. Loosen and adjust the set screw with an allen wrench as illustrated in Fig. 20 so that the clearance between the mechanism chassis and brake drum becomes 25.4mm ±0.15mm.
3. This adjustment is performed in the same manner at both the supply reel base and takeup reel base. After adjustment, retighten the set screw.

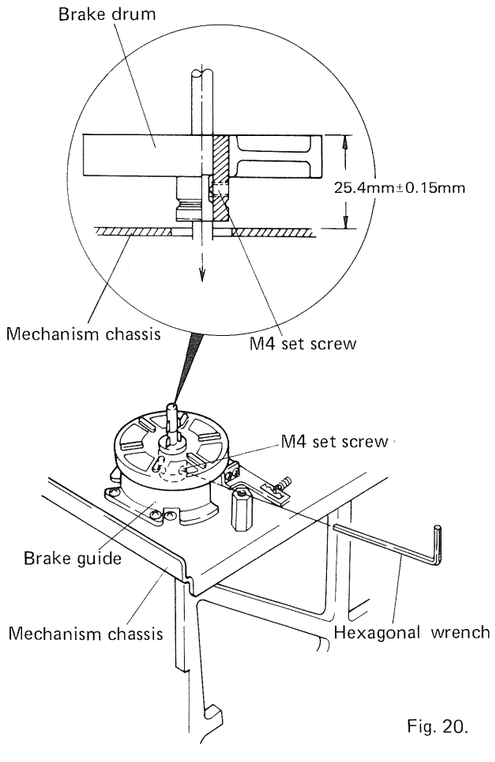


Fig. 20.

9.2 BRAKE ADJUSTMENT

This adjustment must be performed when the brake solenoid or motor has been replaced or when the tape is abnormally tight or loose when the tape has been stopped.

Check the following items before beginning adjustment:

1. Are dimensions Ⓑ and Ⓒ shown in Fig. 23 as specified when the brake is applied (solenoid attracted)? When outside the specified dimensions, loosen and readjust the M2.6 screw.
2. Is the brake guide mounted so that the brake drum and brake felt are uniformly separated when the brake is released (when the shaft of the solenoid is pushed by hand) after the check of item 1 above?
   If the motor does not rotate smoothly when turned by hand, loosen the screw mounting the brake guide and adjust the guide mounting position.

● **Adjustment Procedure**

1. Set the tape deck to the STOP state.
   Fasten a piece of string to a 7-inch reel (hub diameter 60mm) and place the reel onto the reel base (Fig. 21).
2. Hook a tension gauge to the end of the string and pull in direction B (C) and read the value indicated at the tension gauge when the reel base begins to turn.
3. Adjust the hooking position of the brake spring shown in Fig. 23 so that this value becomes 300 ~ 400g (torque = 900g.cm ~ 1200g.cm).
4. If the specified value cannot be obtained by changing the hooking position of the brake spring, check for the following:
   a) Brake drum dirty
   b) Brake felt dirty
   c) Brake guide mispositioned
   d) Brake arm operation not smooth
5. Confirm that the following relation is established between the above measured value and the value measured when the tension gauge is pulled in direction D (A).

$$\text{Brake ratio} = \frac{\text{Direction B (C) measured value}}{\text{Direction D (A) measured value}} = 1.7 \sim 2.3$$

9.3 TAKEUP TORQUE, BACK TENSION ADJUSTMENT

● **Back Tension Torque Adjustment at PLAY**

1. Playback at a set tape speed of 19cm/s and measure the back tension of the supply side reel base. (Pull the gauge in direction B of Fig. 21.)
2. Adjust the slider ($R_{2\text{-}1}$) of sliding resistor R_2 shown in Fig. 22 so that the measured value becomes 80 ~ 90g (torque = 240g.cm ~ 270g.cm).
3. After adjustment, securely retighten the slider screw.

● **Takeup Torque Adjustment at PLAY**

1. Playback at a set tape speed of 19cm/s and measure the takeup tension of the takeup side reel base. (Send the tension gauge in the E direction of Fig. 21).
2. Adjust the slider ($R_{2\text{-}2}$) of sliding resistor R_2 shown in Fig. 22 so that the measured value becomes 125 ~ 135g (torque = 375g.cm ~ 405g.cm).
3. After adjustment, securely retighten the slider screw.

● **Fast Forward (FF) Back Tension Torque Adjustment**

1. Operate the set at fast forward and measure the back tension of the supply side reel base. (Pull the tension gauge in the B direction of Fig. 21.)
2. Adjust the slider of sliding resistor R_1 shown in Fig. 22 so that the measured value becomes 35 ~ 40g (torque = 105g.cm ~ 120g.cm).
3. After adjustment, securely retighten the slider screw.

● Since sliding resistor R_1 is also used in rewind adjustment, the rewind back tension is automatically determined when the fast forward back tension has been adjusted.

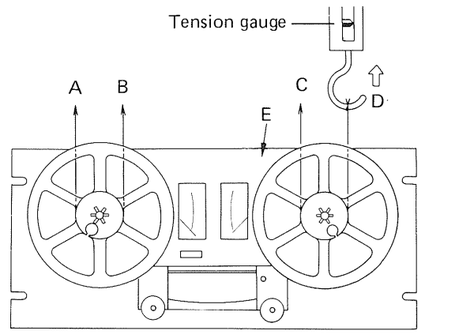


Fig. 21

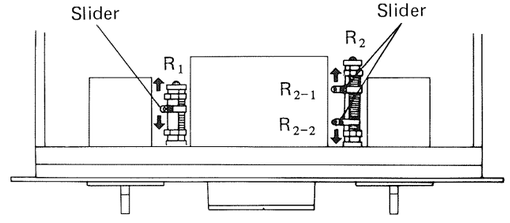


Fig. 22

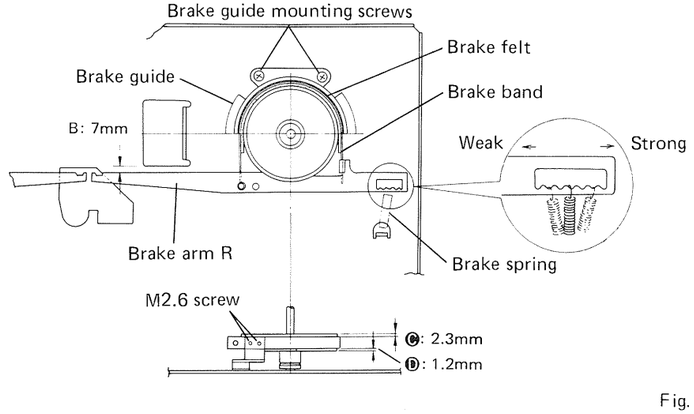


Fig. 23

9.4 PINCH ROLLER PRESSURE ADJUSTMENT

When the pinch solenoid or pinch roller has been replaced, adjust the pinch pressure as follows:

1. Playback at a set tape speed of 19cm/s and confirm that Ⓐ of the pinch pressure spring shown in Fig. 25 is within 0.7mm.
2. If outside this value, loosen the 3 screws fastening the solenoid bracket and adjust the position of the bracket.
3. Load a tape, and run it at fast forward until the same amount of tape is wound on both the supply reel and takeup reel.
4. Hook a tension gauge to the pinch roller and confirm that the tape is stopped within a range of 1.1 ~ 1.4kg (Fig. 24).
5. If the tape isn't stopped within the 1.1 ~ 1.4kg range, check for the following:
   a) Pinch pressure spring tightening faulty
   b) Pinch pressure spring faulty
   c) Pinch roller dirty
   d) Capstan dirty

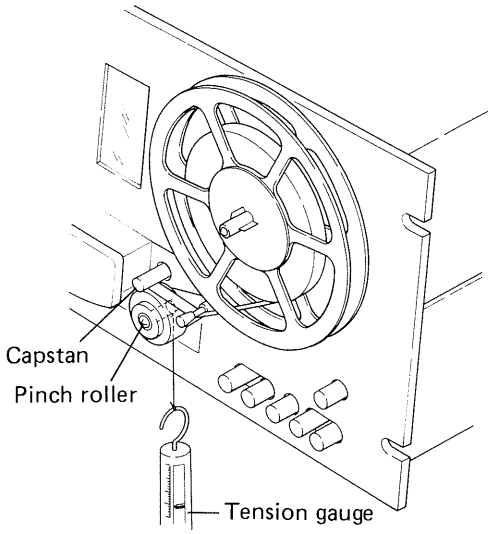


Fig. 24

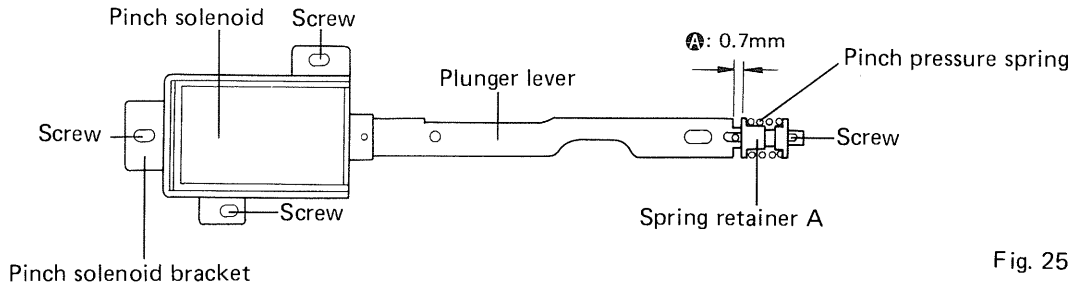


Fig. 25

9.5 PAUSE ADJUSTMENT

- Perform PAUSE adjustment after pinch pressure adjustment is complete.

1. Operate the set at playback and loosen the PAUSE solenoid set screw and adjust the solenoid position so that the clearance Ⓐ between the PAUSE adjuster and PAUSE arm ass'y in Fig. 26 becomes 0.1 ~ 0.3mm.
2. Next, set the PAUSE switch to the ON position.
   Loosen the PAUSE adjuster set screw and adjust the position of the adjuster so that the clearance Ⓑ between the capstan shaft and pinch roller becomes 1.5 ~ 2.0mm at this time.

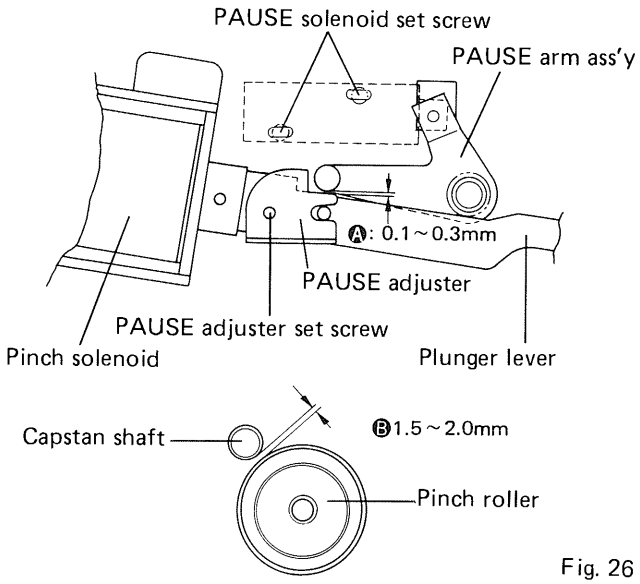


Fig. 26

9.6 TAPE SPEED ADJUSTMENT

Perform the following before beginning adjustment:

1. Set the pitch control to the center click position.
2. Wipe the capstan shaft and pinch roller off with absolute alcohol.
3. Mount the same size reel at the supply side and takeup side.
4. Check the takeup torque, back tension torque and pinch pressure.

● Adjustment

19cm/s tape speed

1. Playback the wow and tape speed measurement standard tape STD-101 until the same amount of tape is wound on the supply reel and takeup reel and measure the frequency with a frequency counter.
2. Adjust VR_2 (2kΩ) of the servo amp.ass'y of Fig. 27 so that this value becomes 3000Hz/s.

9.5cm/s tape speed

1. Playback the wow and tape speed measurement standard tape STD-101 until about the same amount of tape is wound on the supply reel and takeup reel and measure the frequency with a frequency counter, the same as at 19cm/s.
2. Adjust VR_3(2kΩ) in the servo amp ass'y of Fig. 27 so that this frequency becomes 1500Hz/s.

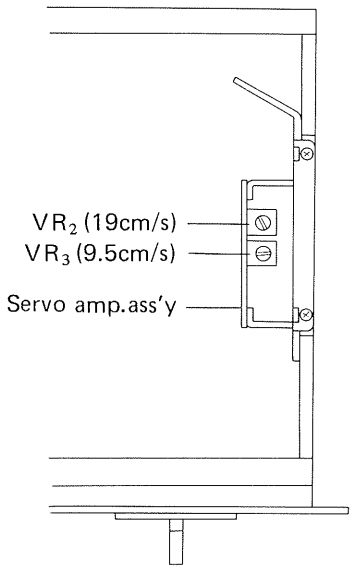


Fig. 27

10. HEAD ADJUSTMENTS

Before beginning head adjustment:
- Clean the head and degauss the head with a head eraser.
- The following test equipment are necessary in head adjustment and electrical circuit adjustment.

1. AC voltmeter (millivoltmeter) x 2
2. Oscilloscope
3. Audio frequency generator
4. Frequency counter

- Use all the specified measurement tapes.
  STD-154 (play system adjustment tape)
  STD-502 (record/play general adjustment tape)
- Position the switches as follows unless otherwise specified:
  Tape speed 19cm/s
  BIAS switch ..... STD
  EQ switch ..... STD
  MONITOR switch ..... TAPE
  Playback control ..... Center click
- Make the level at measurement 0dBv=1V and connect a 50kΩ (47~51kΩ) dummy resistor to the LINE OUTPUT terminals.

10.1 HEAD ROUGH ADJUSTMENT

• HEIGHT Adjustment

Adjust the screws of Fig. 29 so that the heads and tape become the dimensions shown in Fig. 28 when the tape has been run.
Playback head ..... ❶, ❷, ❸
Record head ..... ❻, ❼, ❽
Erase head ..... * ⓫ , * ⓬
*When the height of the erase head is not the dimension given in Fig. 28, loosen screws ⓫ , ⓬ and adjust the height by inserting an adjustment spacer under the head.
Spacer A (0.1t) RNF-077
Spacer B (0.2t) RNF-078

• AZIMUTH Adjustment

Adjust the screws of Fig. 29 so that the head gaps are at right angles to the tape.
Playback head ..... ❷
Record head ..... ❼

• TILT Adjustment

Adjust the screws of Fig. 29 so that the top and bottom of the front of the head contact the tape uniformly when the tape is running.
Playback head ..... ❶, ❸
Record head ..... ❻, ❽

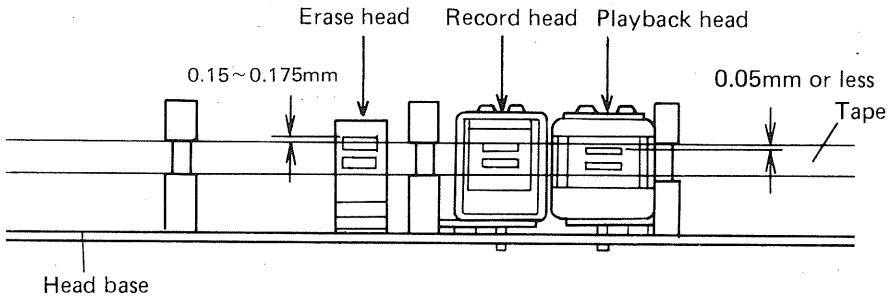


Fig. 28

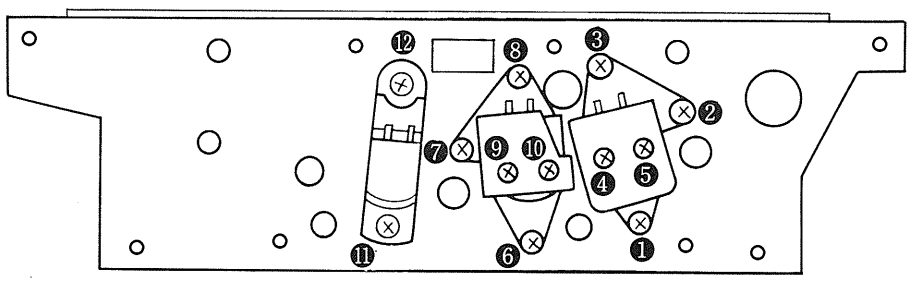


Fig. 29

10.2 PLAYBACK HEAD ADJUSTMENT

- Connect a voltmeter (millivoltmeter) to the LINE OUTPUT terminals (Fig. 30).
- Run the test tape STD-154 at 19cm/s and playback the standard signal 15kHz.

1. Adjust screw ❷ of Fig. 29 for maximum output level at both the L and R channels. The difference in the L and R channels output does not require attention unless it is too large.
2. When the output difference is excessive, loosen screws ❹, ❺ and determine the optimum position while turning the head within the horizontal plane (left, right).

10.3 RECORD HEAD ADJUSTMENT

- After the playback head has been adjusted, apply a 1kHz signal to the LINE INPUT terminals and simultaneous record/play on test tape STD-152.

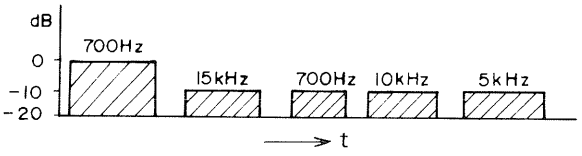
1. Adjust screws ❻, ❼, and ❽ of Fig. 29 for maximum R channel output level at the voltmeter (millivoltmeter) connected to the LINE OUTPUT terminals.
2. Next, apply a 15kHz signal, set to the simultaneous record/play mode and fine adjust screw ❼ of Fig. 29 for maximum L and Rchannel output.
3. Confirm that the output does not change even when the front of the head is pushed lightly with your finger while the tape is running.
4. When there is a difference in the L and R channel output, loosen screws ❾, ❿ of Fig. 29 and determine the optimum position while turning the head in the horizontal plane (left, right).

11. ELECTRICAL ADJUSTMENTS

- Confirm that head adjustments and mechanism adjustments have been performed correctly before attempting to adjust the electrical circuit.
- Always perform adjustment is the below order. The rated values will not be satisfied if any adjustment items are skipped.

1. Head adjustment (page 35)
2. Playback level
3. Playback EQ adjustment
4. Level meter 0 VU adjustment
5. Bias trap adjustment
6. Recording bias adjustment
7. Record/playback frequency adjustment
8. Recording level adjustment

- Adjustment points are shown in page 39.
- Recorded contents of tape STD-154
- Adjustment points are shown in page 39 (PHOTO 1).
- Recorded contents of test tape STD-154 is shown below.



11.1 PLAYBACK LEVEL ADJUSTMENT

- Connect a voltmeter (millivoltmeter) to the LINE OUTPUT terminals (Fig. 30).
- Playback the reference level setting signal 700Hz 0dB zone of test tape STD-154.

1. Adjust semifixed resistors VR_{103} (L ch), VR_{104} (R ch) for a voltmeter reading of −7dBv (450mV).

11.2 PLAYBACK EQUALIZER ADJUSTMENT

- Connect a voltmeter (millivoltmeter) to the LINE OUTPUT terminals (Fig. 30).
- Playback the reference level signal 700Hz −10dB and 10kHz −10dB of test tape STD-154.

1. Adjust semifixed resistors VR_{101} (L ch), VR_{102} (R ch) for a voltmeter (millivoltmeter) reading deviation of $0\ ^{+0.5}_{-0}$dB.

NOTE:
Since VR_{101} and VR_{103}, and VR_{102} and VR_{104} effect each other, repeat adjustment several times.

11.3 LEVEL METER 0 VU ADJUSTMENT

- Connect a voltmeter (millivoltmeter) to the LINE OUTPUT terminals (Fig. 30).
- Apply a 1kHz signal to the LINE INPUT terminals and set the MONITOR switch to the SOURCE position.

1. Adjust the LINE input control so that the voltmeter (millivoltmeter) reads −7dBv (450mV).
2. At this time, adjust VR_{105} (L ch), VR_{106} (R ch) so that the level meter indicates "0".

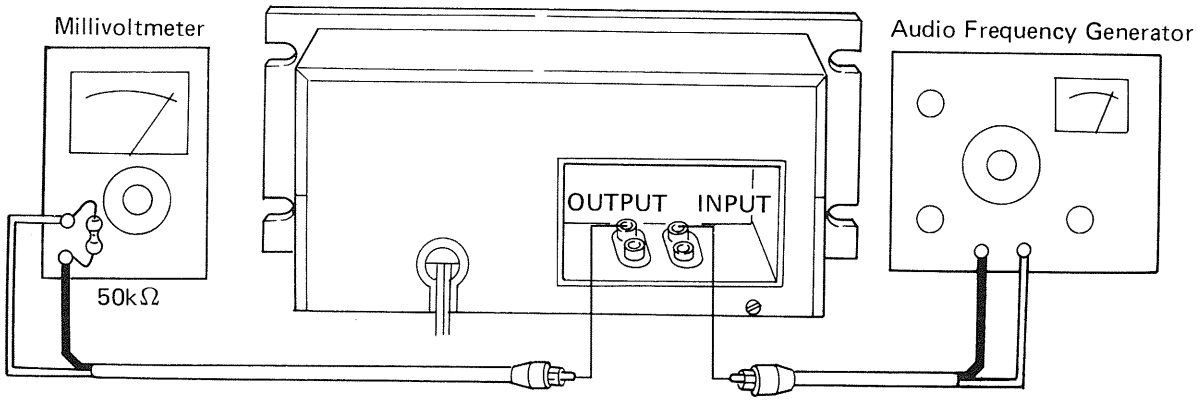


Fig. 30

11.4 BIAS TRAP ADJUSTMENT

1. Connect an oscilloscope to test points TP_{301} (L ch), TP_{302} (R ch) of the power and oscillation ass'y RWR-054 (Fig. 31).
2. Set the BIAS switch to the LH position and place the set into the record state.
3. Adjust L_{303} (L ch) and L_{304} (R ch) for minimum bias leakage waveform (1Vp-p or less) at the oscilloscope.

11.5 RECORDING BIAS ADJUSTMENT

- Connect a voltmeter (millivoltmeter) to the LINE OUTPUT terminals and apply a 1kHz, −10dBv (316mV) signal to the LINE INPUT terminals (Fig. 30).
- Set the MONITOR switch to the SOURCE position.

1. Adjust the LINE input control so that the voltmeter (millivoltmeter) reads −7dBv (450mV).
2. Set the BIAS switch and EQ switch to LH and the MONITOR switch to TAPE.
3. While simultaneously recording and playing back with test tape STD-502, turn the bias adjustment semifixed resistors VR_{303} (L ch), VR_{304} (R ch) clockwise from minimum value to maximum value and adjust to the point at which the playback level drops 0.2dB past the maximum value. (Fig. 32).
4. Since the adjustments of item 3 effect each other, repeat adjustment several times.

11.6 RECORD/PLAY FREQUENCY RESPONSE ADJUSTMENT

- Perform this adjustment after "Recording bias adjustment" is complete.
- Connect a voltmeter (millivoltmeter) to the LINE OUTPUT terminals and apply a 1kHz signal to the LINE INPUT terminals.
- Set the BIAS switch and EQ switch to LH and the MONITOR switch to SOURCE.

1. Adjust the LINE input control for a reading of −7dBv (450mV) at the voltmeter (millivoltmeter).
2. Reduce the input level 20dB more without moving the LINE input control and record/playback a 1kHz and 15kHz signal at test tape STD-502.
3. Confirm that the 15kHz level deviation for 1kHz is −3dB $^{+1.5}_{-1.0}$. When this deviation is −4dB or greater, adjust to −3dB with the bias adjustment semifixed resistors VR_{303} (L ch), VR_{304} (R ch).
   Furthermore, perform this adjustment within the range at which the bias does not become an underbias lower than the maximum sensitivity bias value.

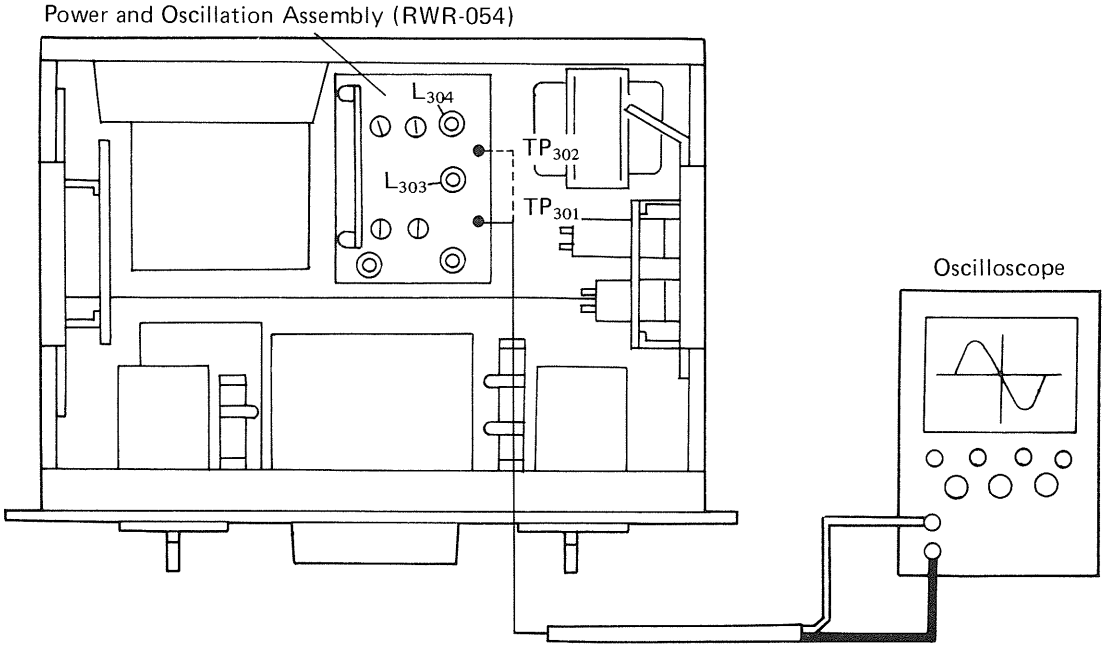


Fig. 31

11.7 RECORDING LEVEL ADJUSTMENT

- Connect a voltmeter (millivoltmeter) to the LINE OUTPUT terminals.
- Apply a 1kHz −10dBv (316mV) signal to the LINE INPUT terminal.
- Set the BIAS switch to LH and the EQ switch to LH.

1. Adjust the LINE input control for a reading of −7dBv (450mV) at the voltmeter (millivoltmeter).
2. Adjust semifixed resistor VR_{301} (L ch) and VR_{302} (R ch) so that the voltmeter (millivoltmeter) reads −7dBv (450mV) when the MONITOR switch has been set to TAPE while recording.

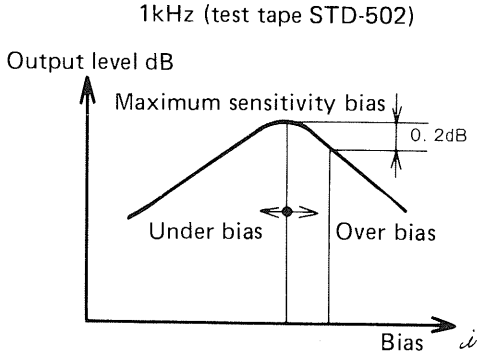


Fig. 32

Playback amplifier assembly (RWF-064)

Power and oscillation assembly (RWR-054)

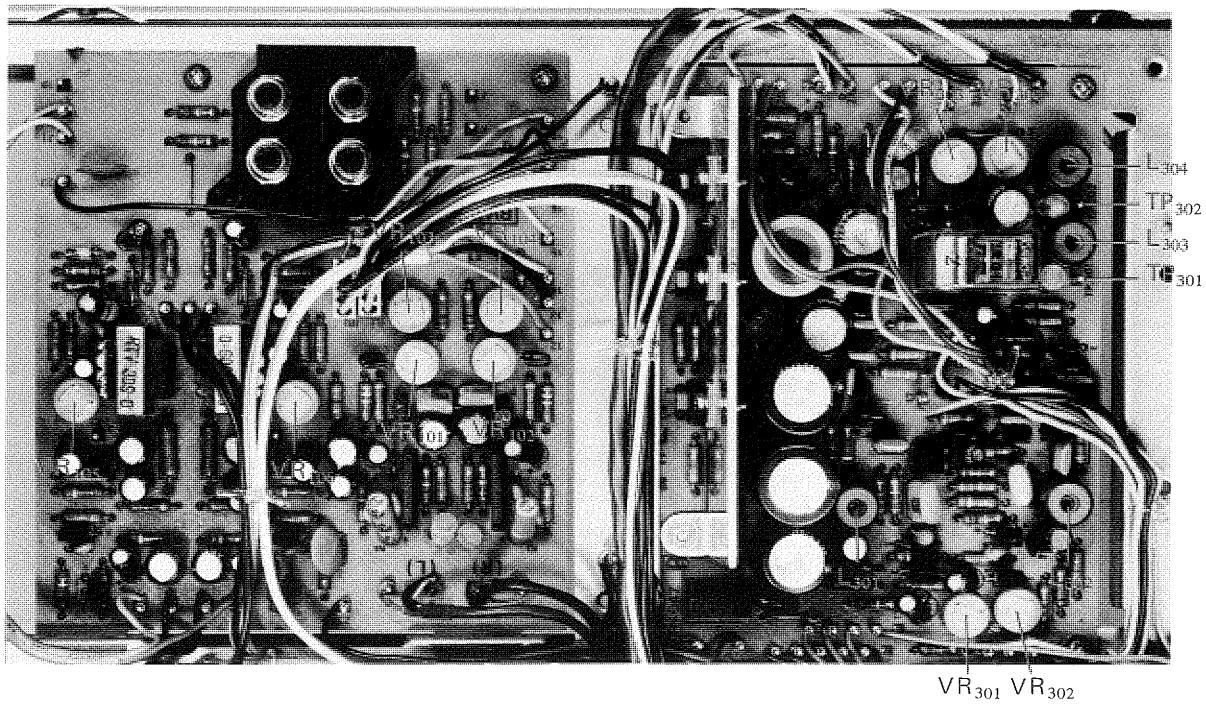


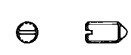
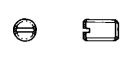
PHOTO 1

12. EXPLODED VIEWS

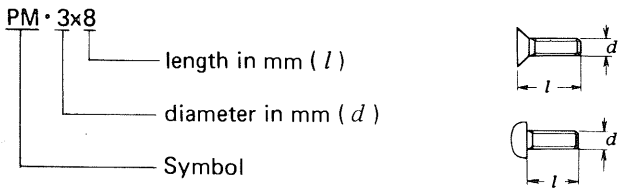
Nomenclature of Screws, Washers and Nuts.

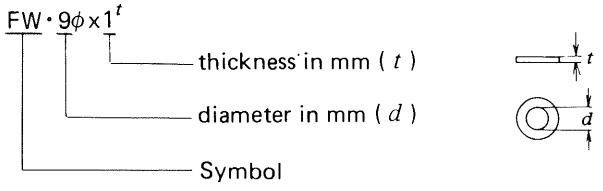
The following symbols stand for screws, washers and nuts as shown in exploded view.

Symbol	Description	Shape
RT	Brazier head tapping screw	
PT	Pan head tapping screw	
BT	Binding head tapping screw	
CT	Countersunk head tapping screw	
TT	Truss head tapping screw	
OCT	Oval countersunk head tapping screw	
PM	Pan head machine screw	
CM	Countersunk head machine screw	
OCM	Oval countersunk head machine screw	
TM	Truss head machine screw	
BM	Binding head machine screw	
PSA	Pan head screw with spring lock washer	
PSB	Pan head screw with spring lock washer and flat washer	
PSF	Pan head screw with flat washer	

Symbol	Description	Shape
EW	E type washer	
FW	Flat washer	
SW	Spring lock washer	
N	Nut	
WN	Washer faced nut	
ITW	Internal toothed lock washer	
OTW	Outernal toothed lock washer	
SC	Slotted set screw (Cone point)	
SF	Slotted set screw (Flat point)	
HS	Hexagon socket headless set screw	
OCW	Oval countersunk head wood screw	
CW	Countersunk head wood screw	
RW	Round head wood screw	

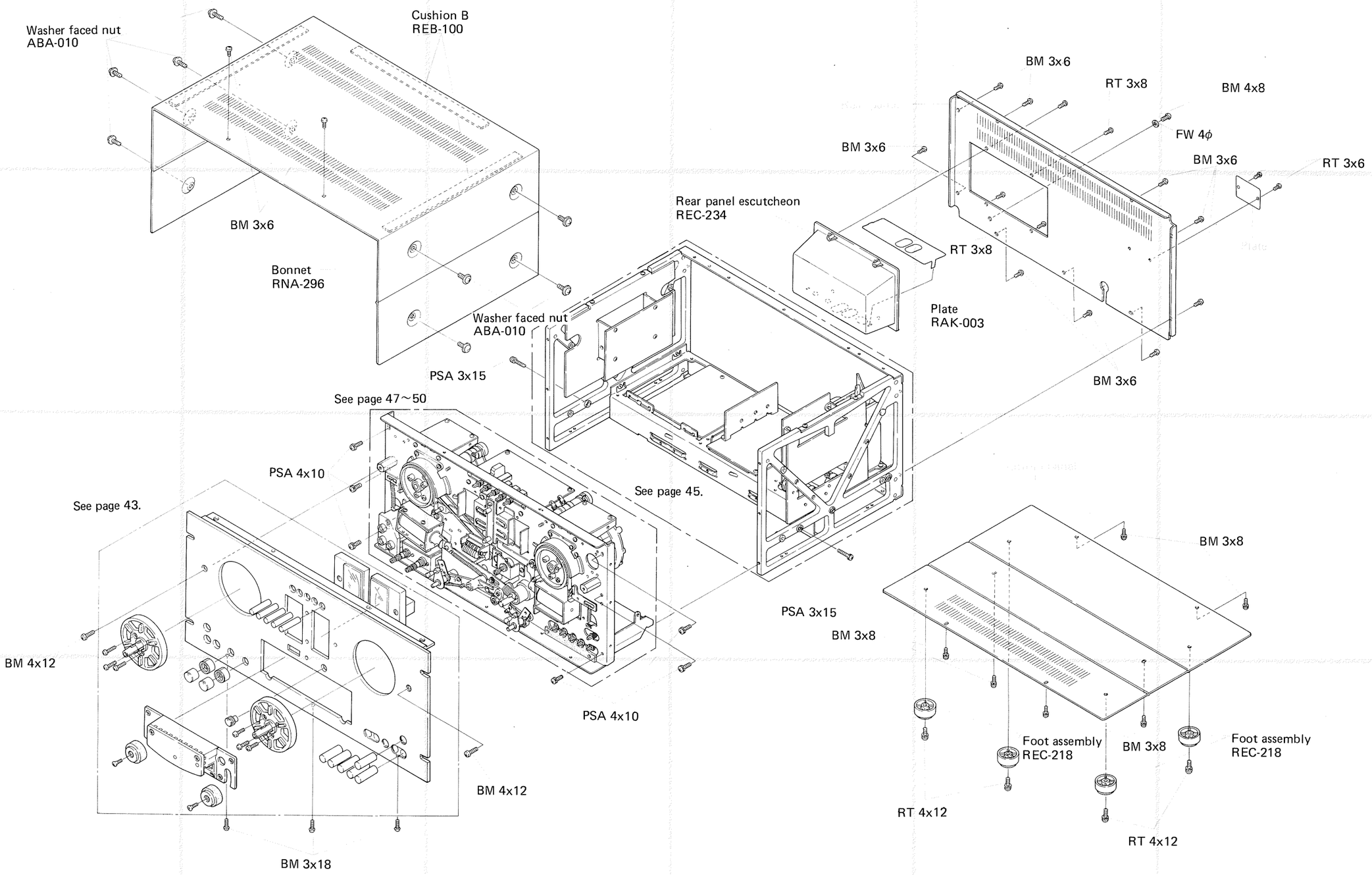
EXAMPLE





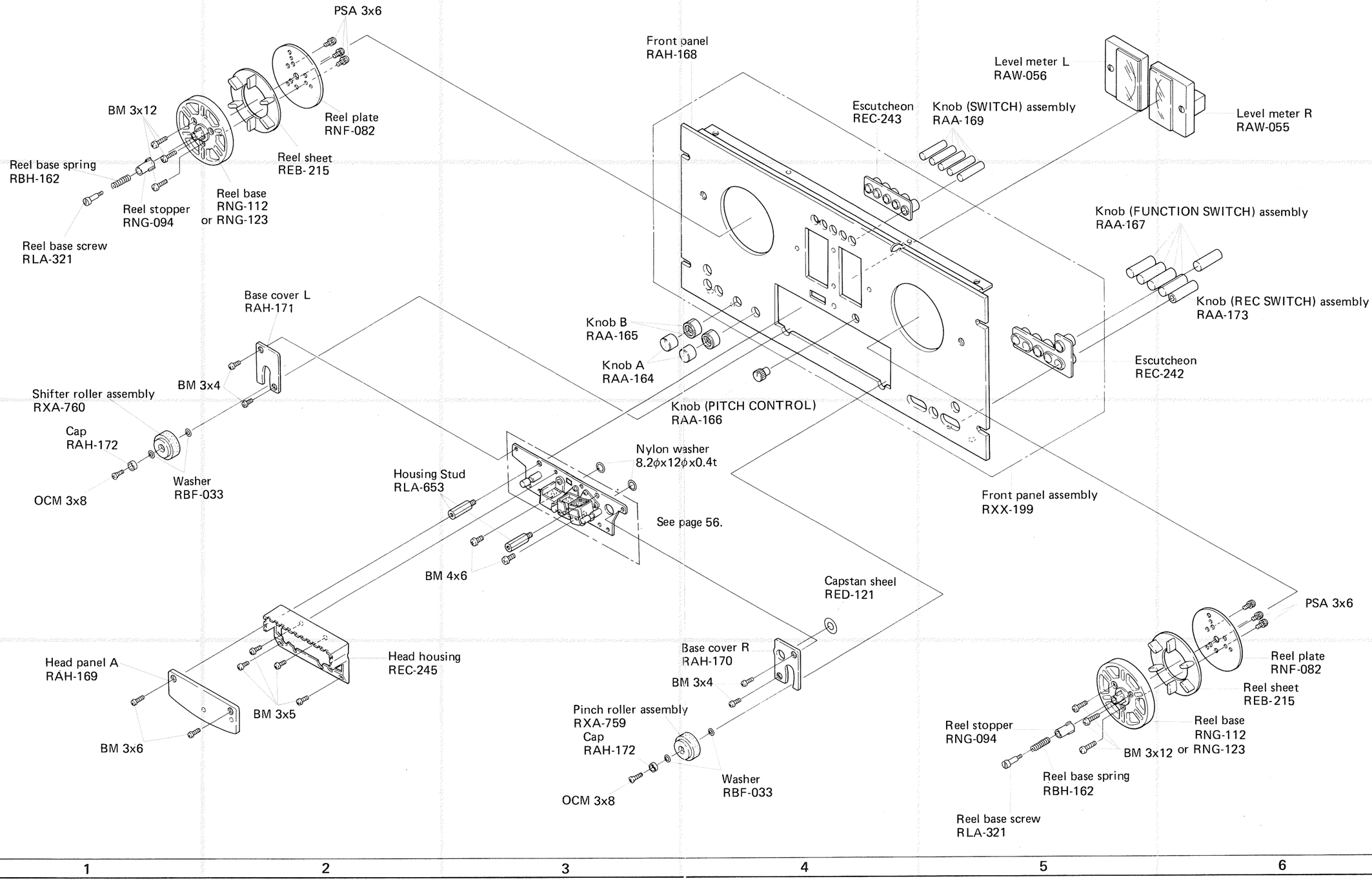
External view

NOTE:
Parts indicated in green type cannot be supplied.



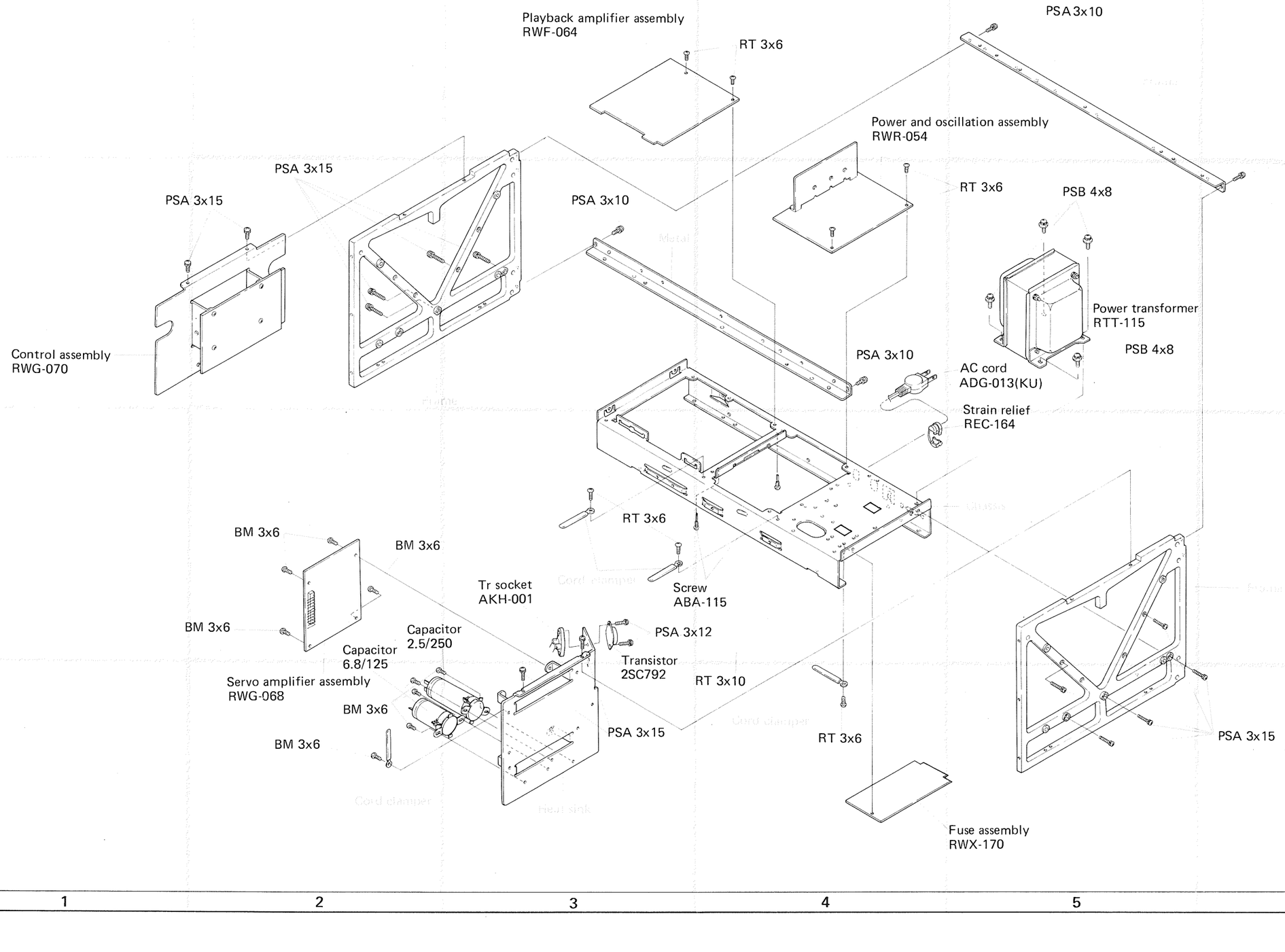
Front panel view

NOTE:
Parts indicated in green type cannot be supplied.



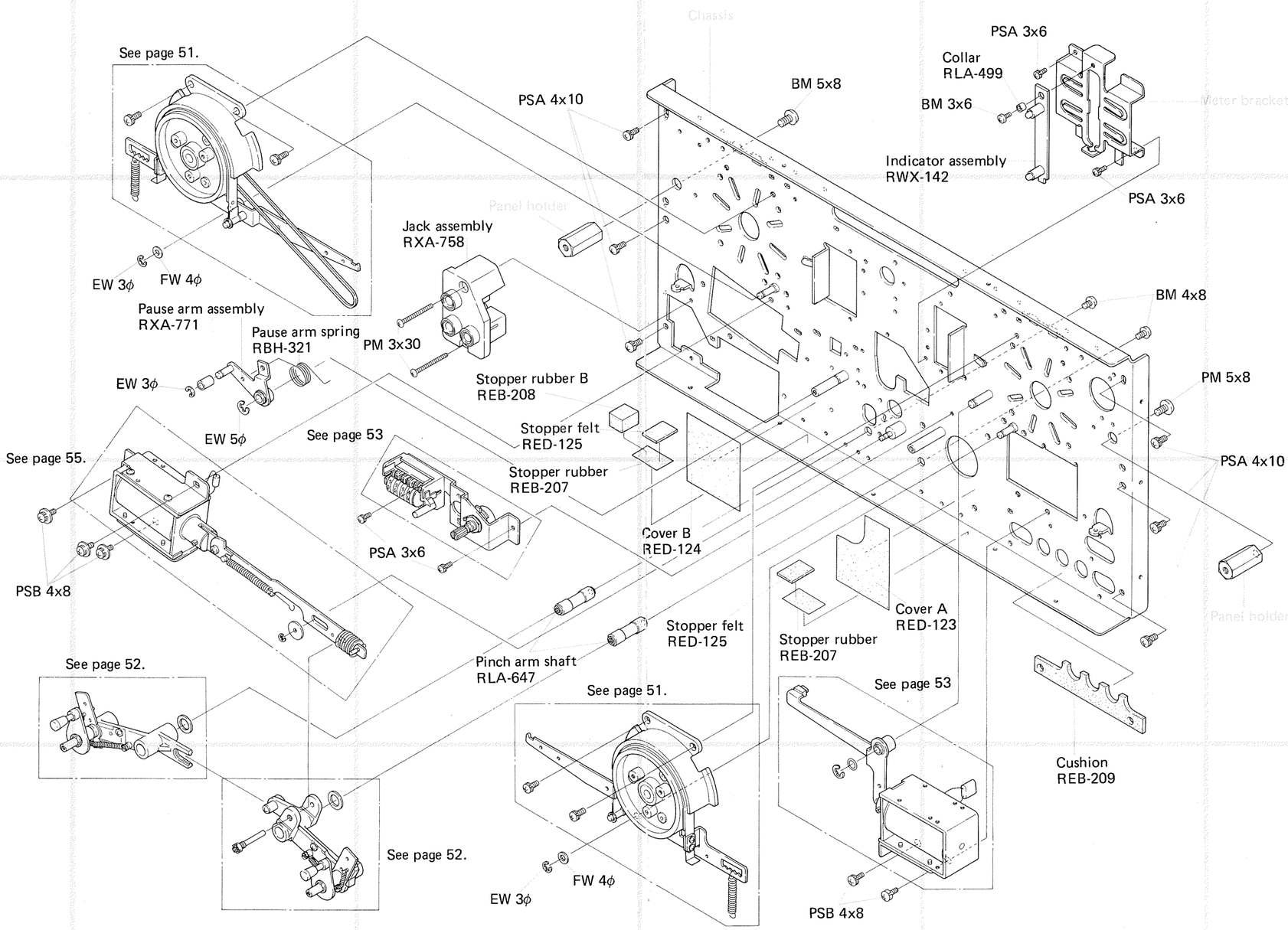
Structure view

NOTE:
Parts indicated in green type cannot be supplied.



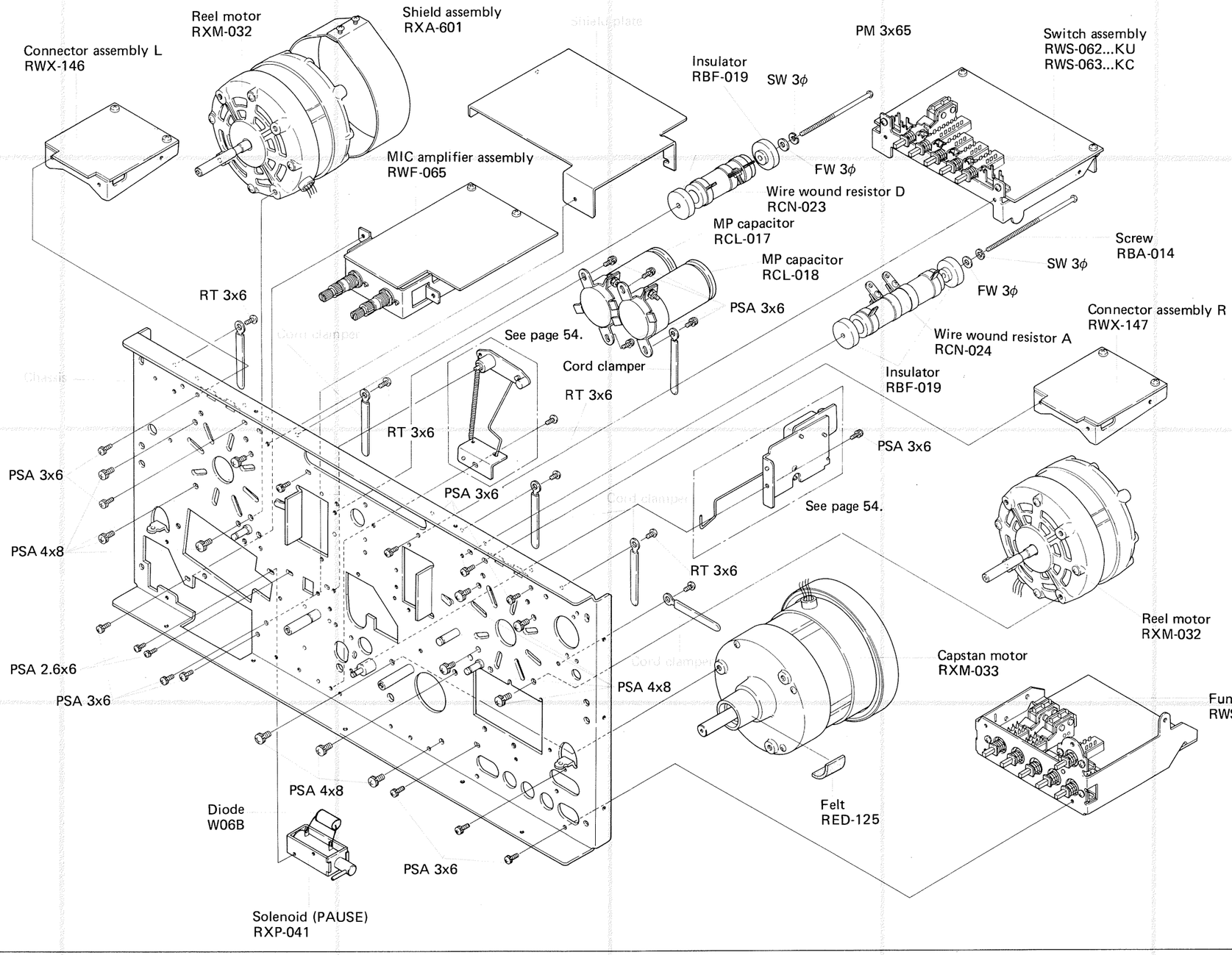
Front side view of mechanism chassis

NOTE:
Parts indicated in green type cannot be supplied.



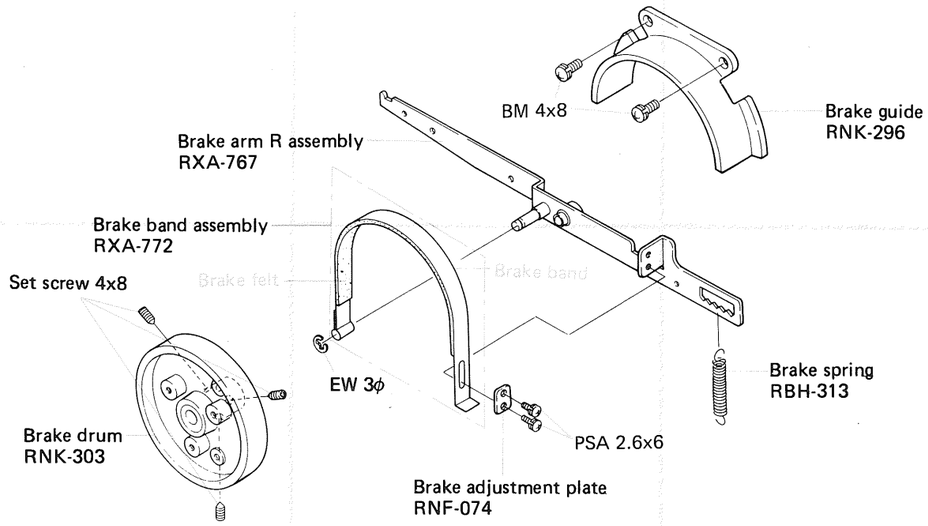
Rear side view of mechanism chassis

NOTE:
Parts indicated in green type cannot be supplied.

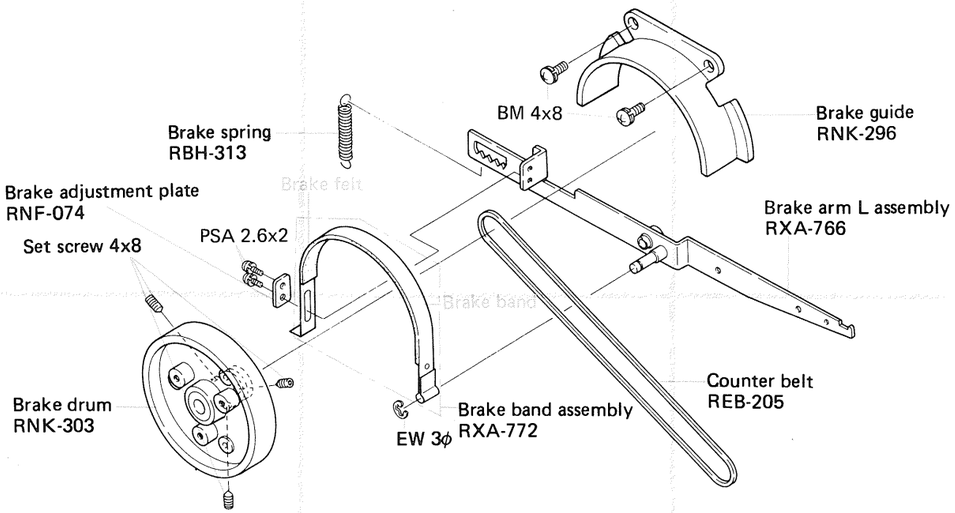


Brake assembly R

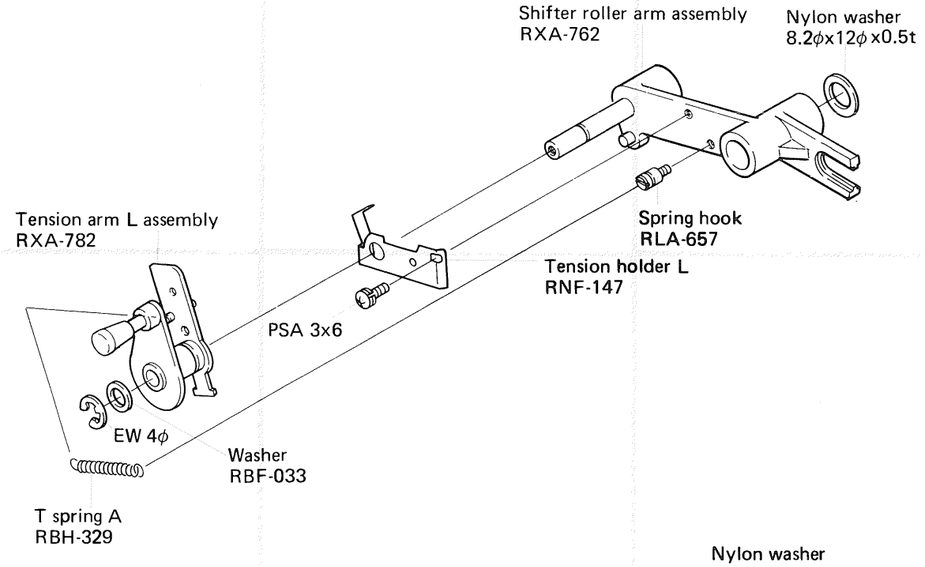
NOTE:
Parts indicated in green type cannot be supplied.



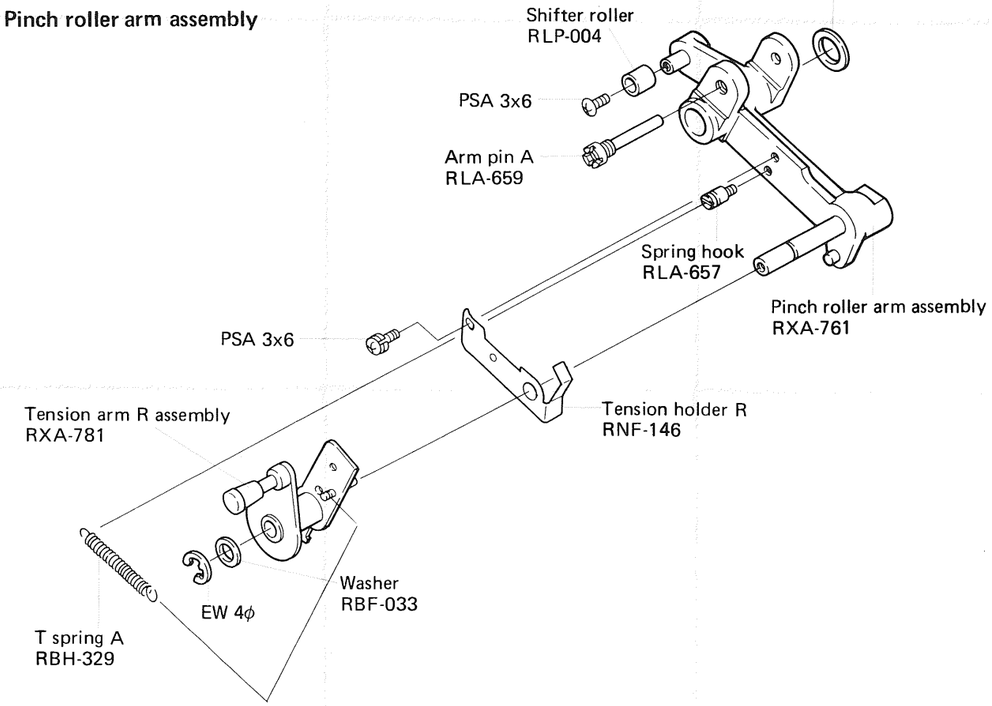
Brake assembly L



Shifter roller arm assembly

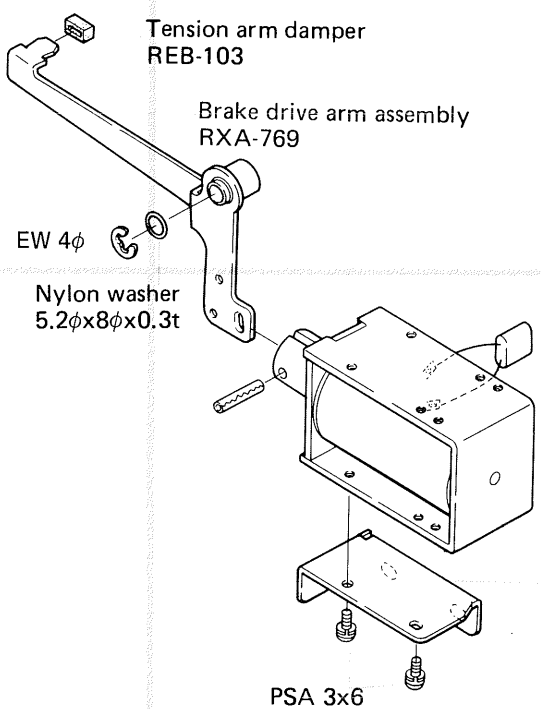


Pinch roller arm assembly

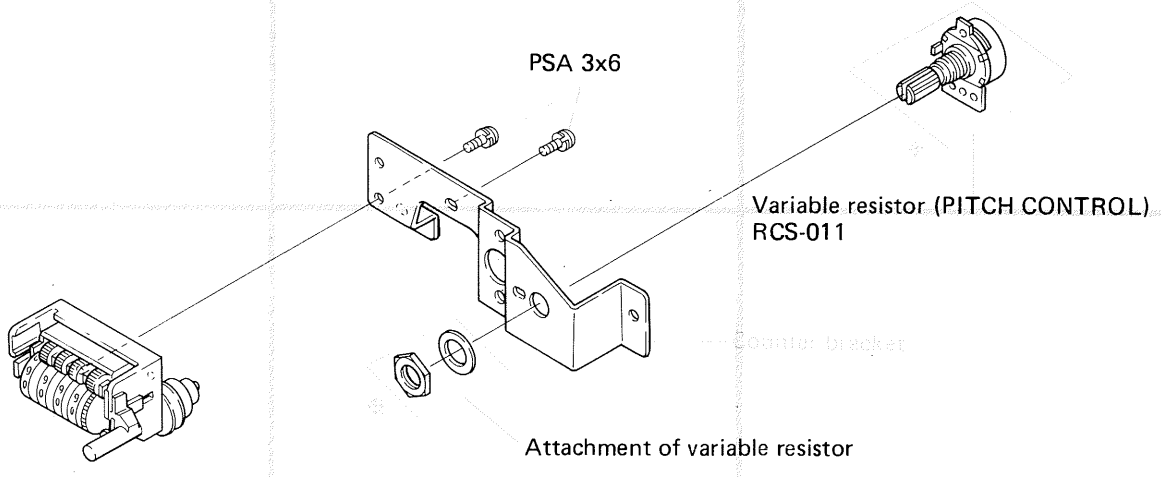


Solenoid (BRAKE) assembly

NOTE:
Parts indicated in green type cannot be supplied.



Tape counter assembly



Shut off assembly

NOTE:
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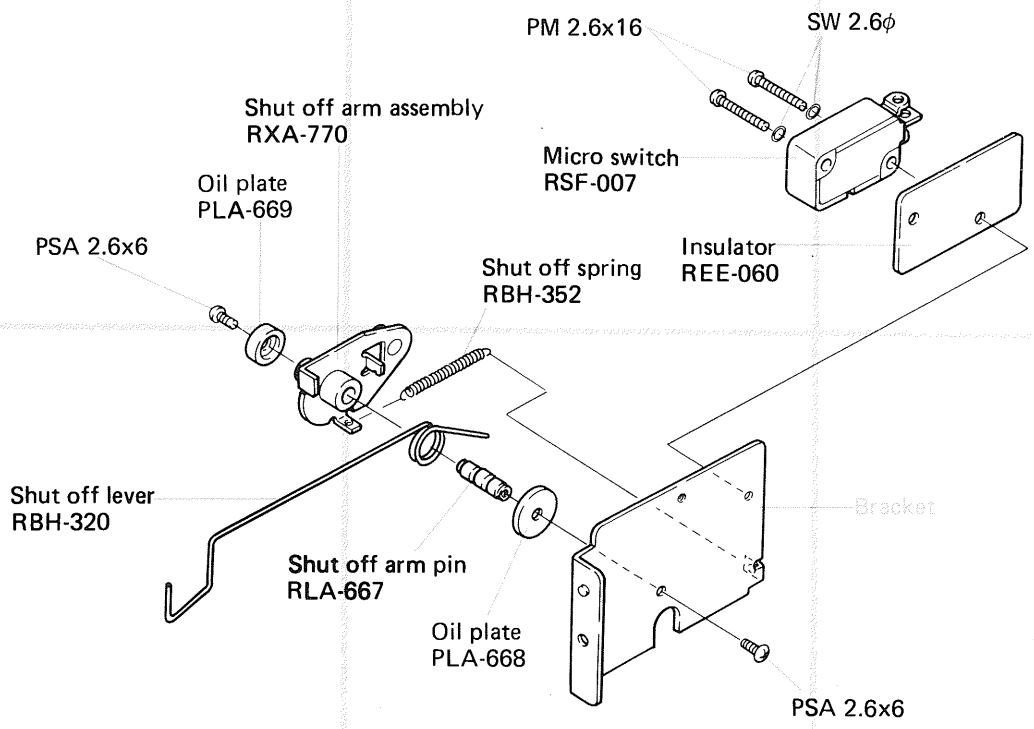
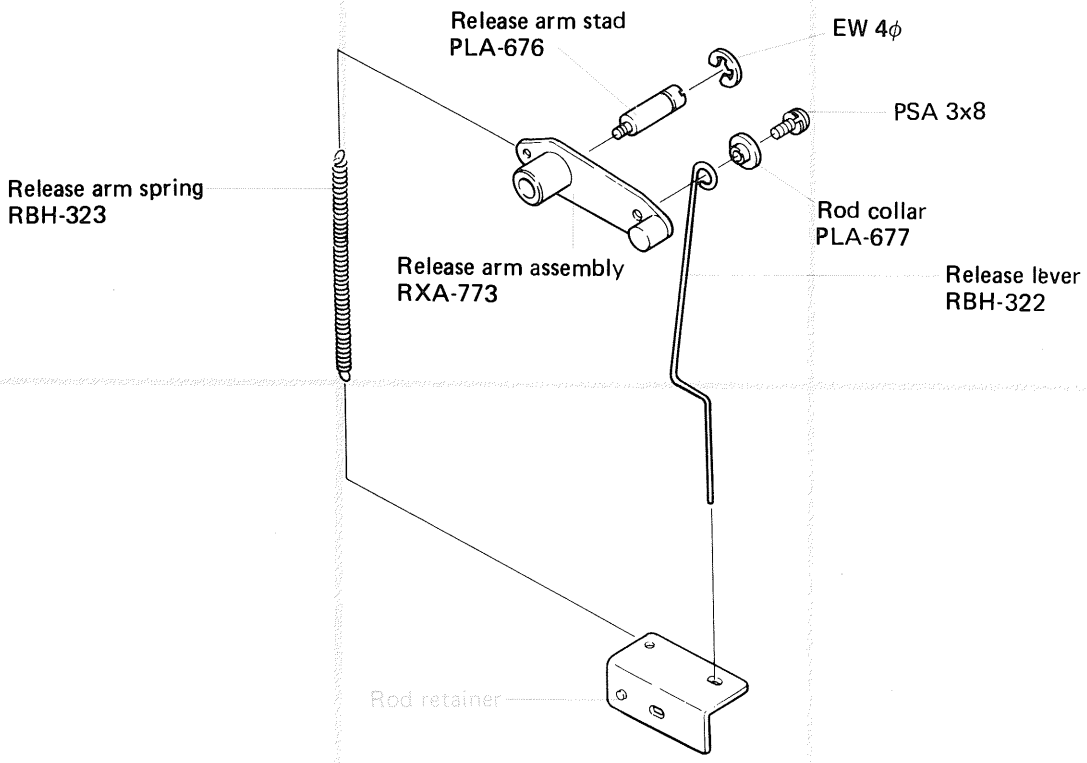
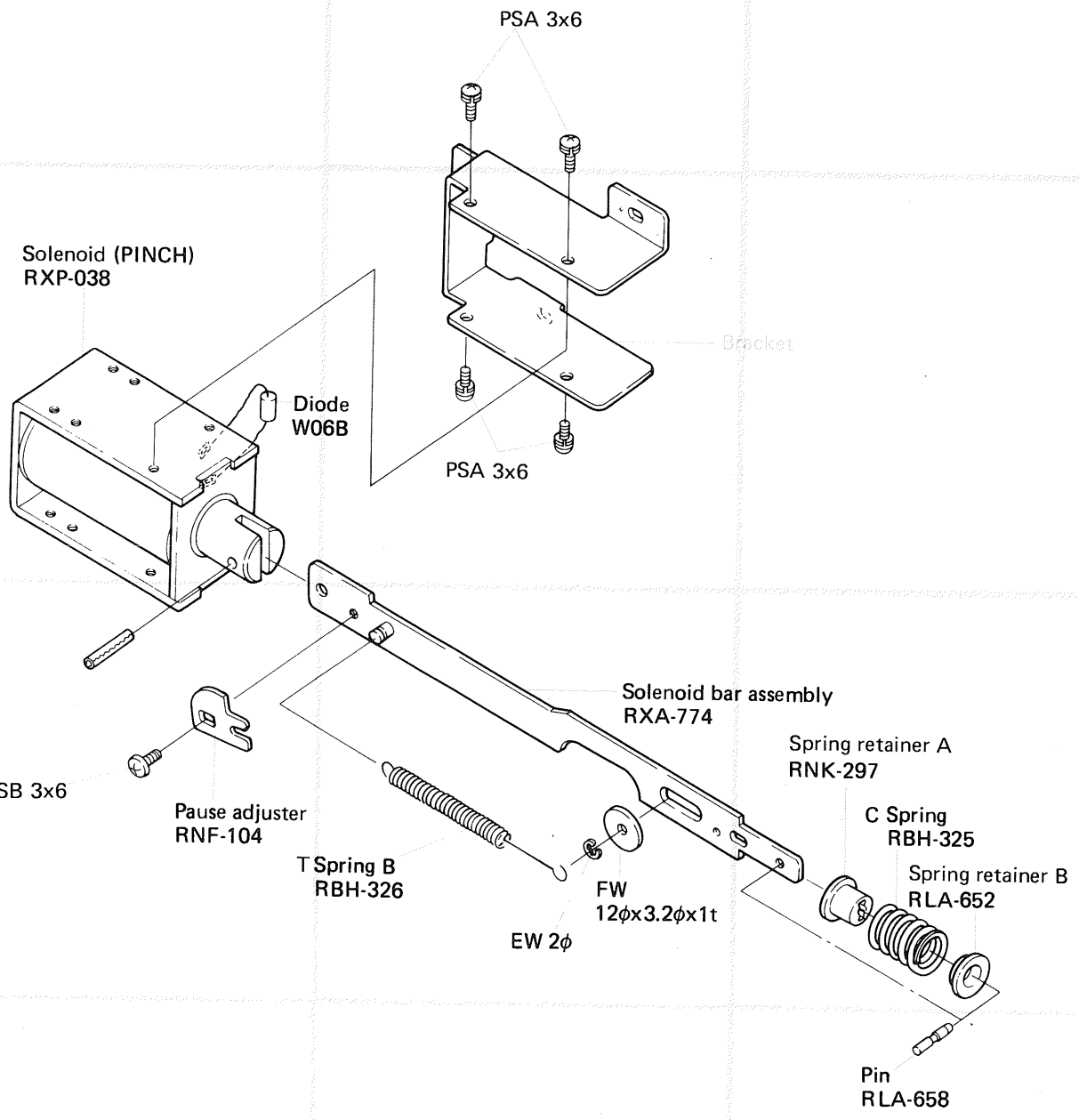


Release assembly



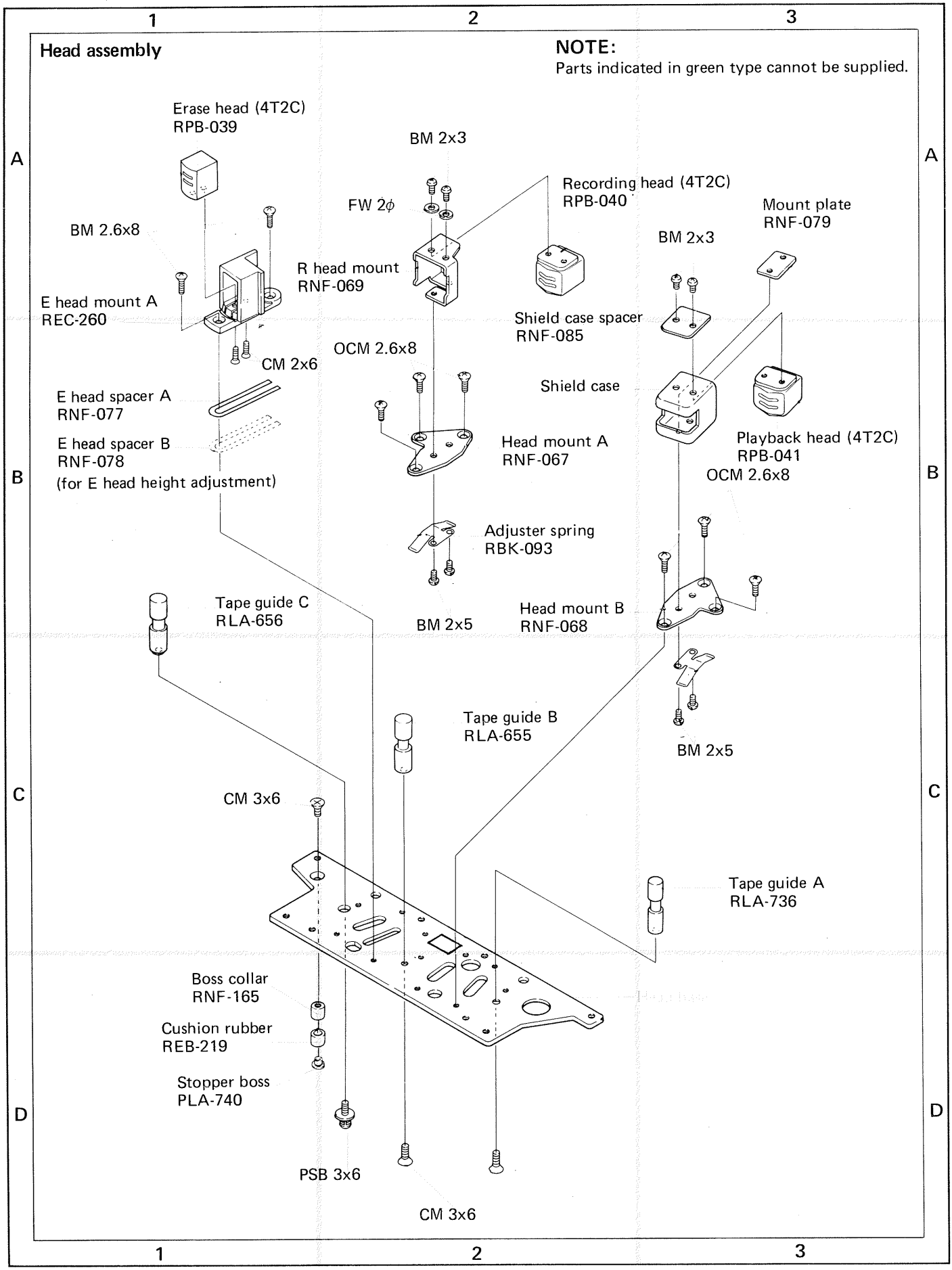
Solenoid (PINCH) assembly

NOTE:
Parts indicated in green type cannot be supplied.



Head assembly

NOTE:
Parts indicated in green type cannot be supplied.



13. SCHEMATIC DIAGRAMS, P.C. BOARD PATTERNS AND PARTS LIST

13.1 MISCELLANEOUS PARTS LIST

NOTE:
- *Capacitors: in μF unless otherwise noted p:pF*
- *Resistors: in Ω, ¼W unless otherwise noted k:kΩ, M:MΩ*

CAPACITORS

Symbol	Description	Part No.
C1	MP capacitor	RCL-017
C2	MP capacitor	RCL-018

RESISTORS

Symbol	Description	Part No.
R1	Wire wound resistor D 2k 20W	RCN-023
R2	Wire wound resistor A 350 25W	RCN-024
VR1	Variable resistor (PITCH CONTROL)	RCS-011

SEMICONDUCTORS

Symbol	Description	Part No.
D1	Diode	W06B
D2	Diode	W06B

TRANSFORMER

Symbol	Description	Part No.
T1	Power transformer	RTT-115

OTHERS

Symbol	Description	Part No.
VU1	Level meter L	RAW-056
VU2	Level meter R	RAW-055
S16	Micro switch	RSF-007
CR1	Spark killer	RWX-030
CR2	Spark killer	RWX-030
	Solenoid (PINCH)	RXP-038
	Solenoid (PAUSE)	RXP-041
	Solenoid (BRAKE)	RXP-040
	Erase head	RPB-040
	Playback head	RPB-041
	Power and oscillation assembly	RWR-054
	Playback amplifier assembly	RWF-064
	Fuse assembly	RWX-170
	Mic amplifier assembly	RWF-065
	Switch assembly (KU)	RWS-062
	Switch assembly (KC)	RWS-063
	Function switch assembly	RWS-051
	Jack assembly	RXA-758
	Connector socket assembly L	RXP-028
	Connector socket assembly R	RXP-029
	Connector socket assembly A	RKP-021
	Connector socket assembly B	RKP-023
	Connector socket assembly C	RKP-025
	Capstan motor	RXM-033
	Reel motor	RXM-032

NOTE:

List of changed parts information will be furnished whenever necessary and you are requested to amend parts number in this parts list.

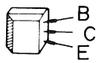
List of Changed Parts for Factory Modification

Symbol	Description	Part No.

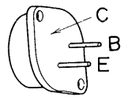
13.2 EXTERNAL APPEARANCE OF TRANSISTORS AND ICS

2SC1344
2SA672

2SC1213

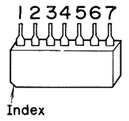


2SC792

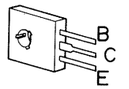


2SC945
2SA564A
2SC828
2SA564
2SC1959

TA7061AP

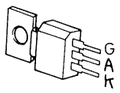


2SC496

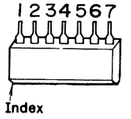


2SK30A

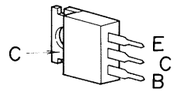
SF1R3G41



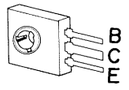
TA7129P



2SD525
2SD526



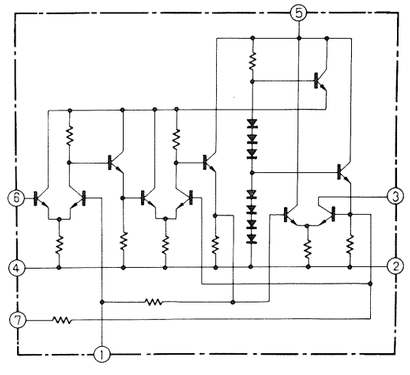
2SC1567



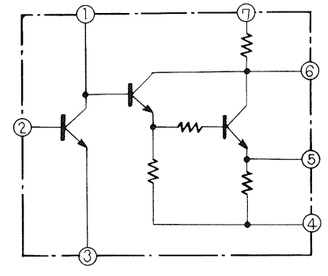
2SC1166

Circuit Diagram of ICs

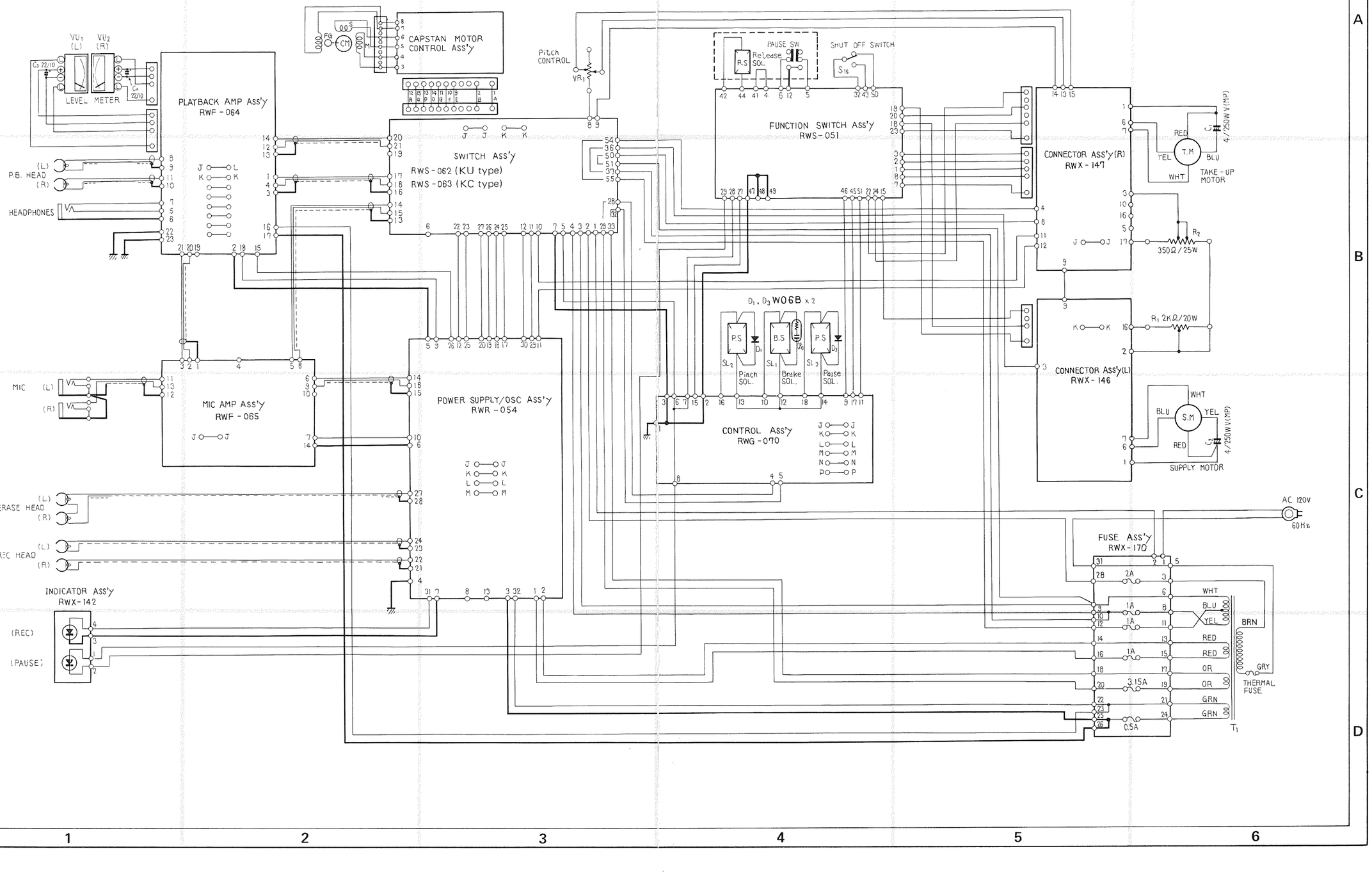
TA7061AP



TA7129P



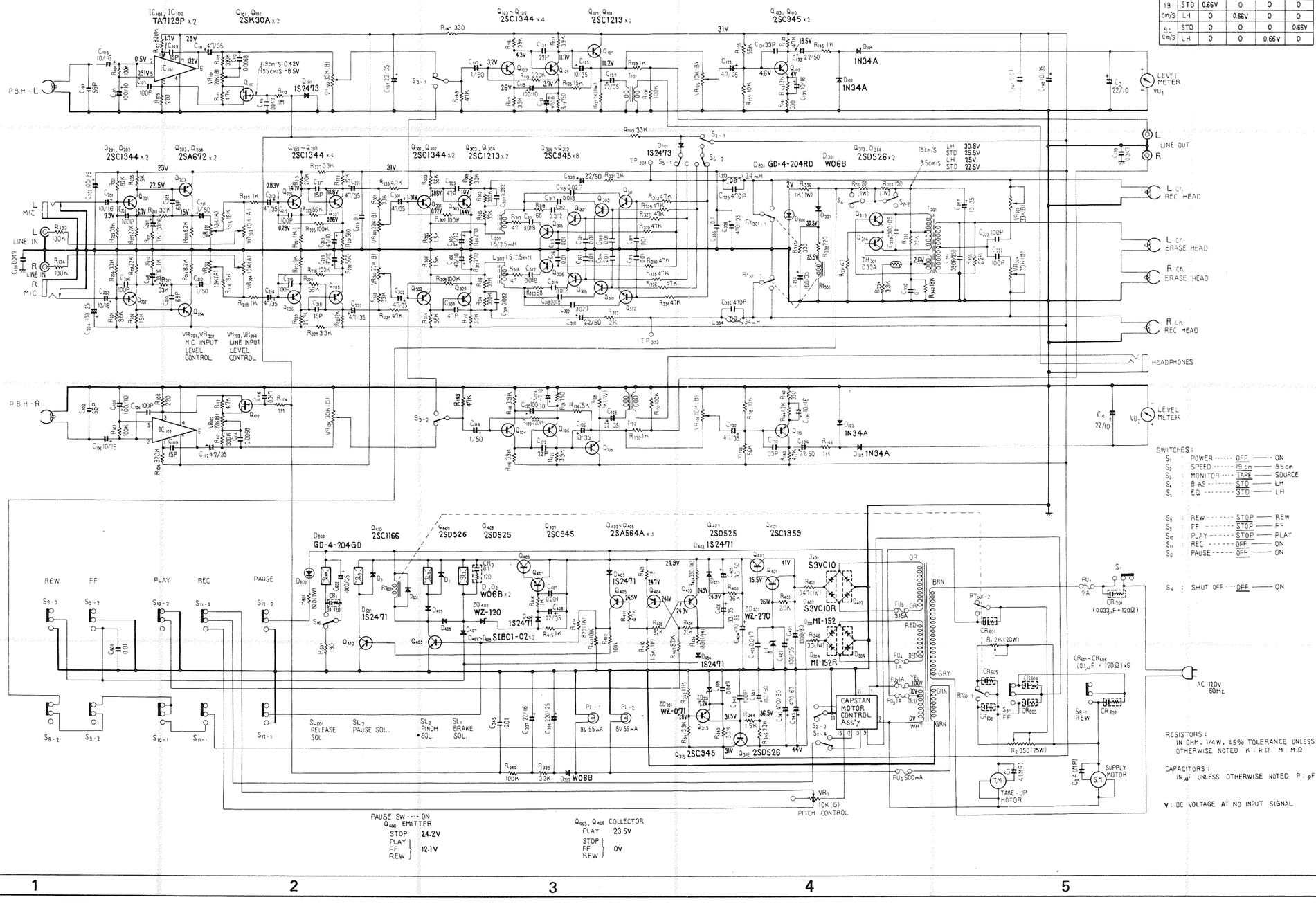
13.3 CONNECTION DIAGRAM



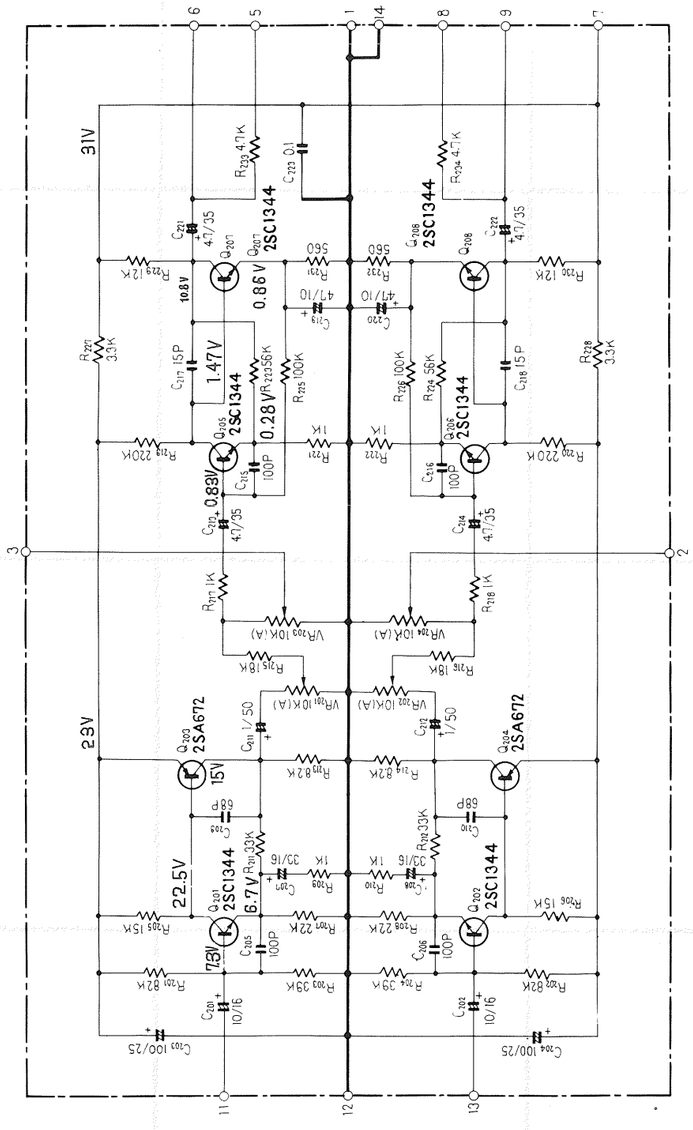
13.4 SCHEMATIC DIAGRAM

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts lists.

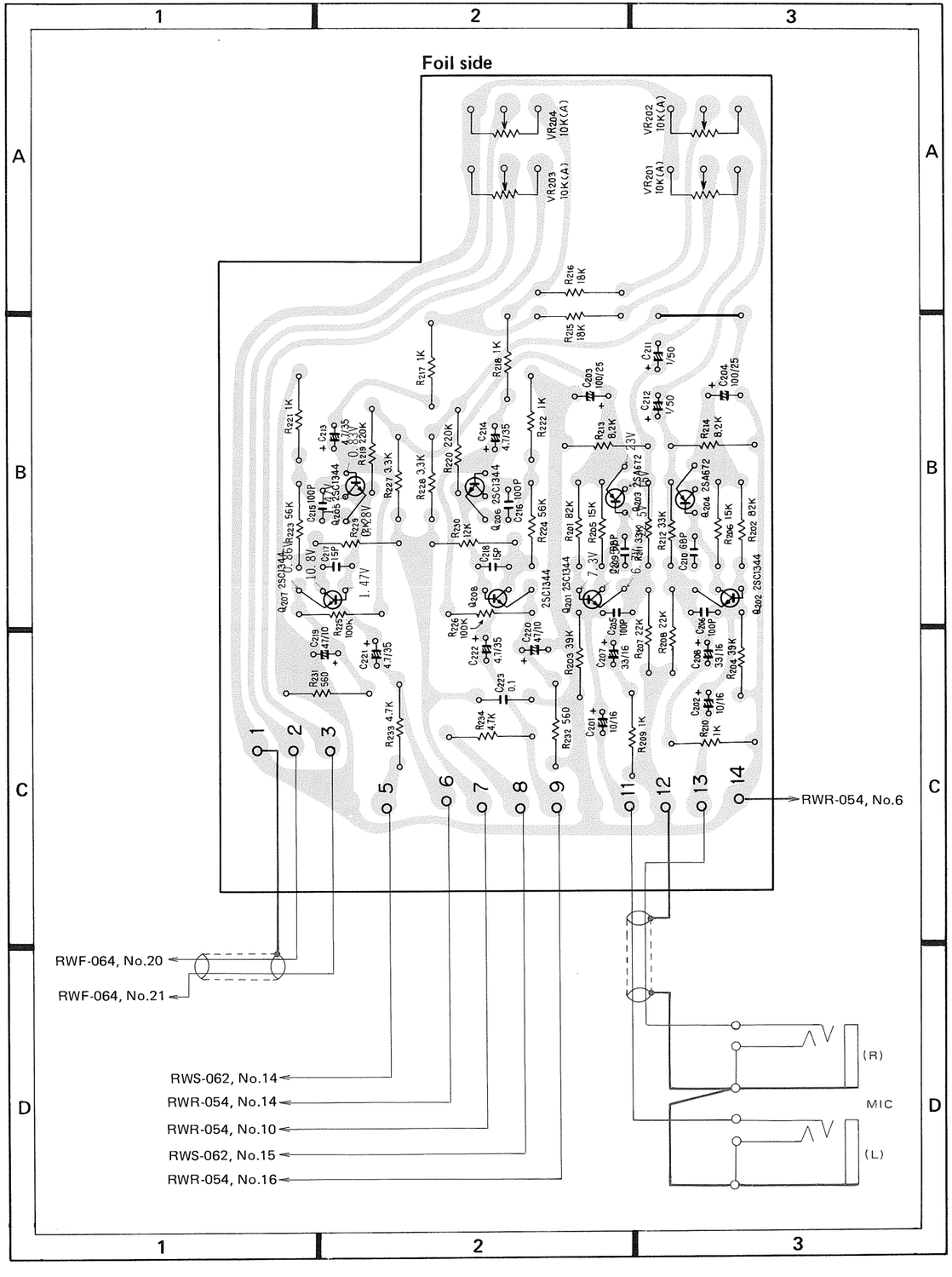
		Q_{305} BASE	Q_{307} BASE	Q_{309} BASE	Q_{311} BASE
19 cm/S	STD	0.66V	0	0	0
	LH	0	0.66V	0	0
9.5 cm/S	STD	0	0	0	0.66V
	LH	0	0	0.66V	0



13.5 MIC AMPLIFIER ASSEMBLY (RWF-065)



Foil side



Parts List

CAPACITORS

Symbol	Description			Part No.
C201	Electrolytic	10	16V	RCH-018
C202	Electrolytic	10	16V	RCH-018
C203	Electrolytic	100	25V	CEA 101P 25
C204	Electrolytic	100	25V	CEA 101P 25
C205	Ceramic	100p	50V	CCDSL 101K 50
C206	Ceramic	100p	50V	CCDSL 101K 50
C207	Electrolytic	33	16V	CEA 330P 16
C208	Electrolytic	33	16V	CEA 330P 16
C209	Ceramic	68p	50V	CCASL 680K 50
C210	Ceramic	68p	50V	CCDSL 680K 50
C211	Electrolytic	1	50v	CEA 010P 50
C212	Electrolytic	1	50V	CEA 010P 50
C213	Electrolytic	4.7	35V	CEA 4R7P 35
C214	Electrolytic	4.7	35V	CEA 4R7P 35
C215	Ceramic	100p	50V	CCDSL 101K 50
C216	Ceramic	100p	50V	CCDSL 101K 50
C217	Ceramic	15p	50V	CCDSL 150K 50
C218	Ceramic	15p	50V	CCDSL 150K 50
C219	Electrolytic	47	10V	CEA 470P 10
C220	Electrolytic	47	10V	CEA 470P 10
C221	Electrolytic	4.7	35V	CEA 4R7P 35
C222	Electrolytic	4.7	35V	CEA 4R7P 35
C223	Mylar	0.1	50V	CQMA 104K 50

RESISTORS

Symbol	Description		Part No.
VR201	Variable resistor	10k-A	RCV-033
VR202	Variable resistor	10k-A	RCV-033
VR203	Variable resistor	10k-A	RCV-033
VR204	Variable resistor	10k-A	RCV-033
R201	Carbon film	82k	RD¼PS 823J
R202	Carbon film	82k	RD¼PS 823J
R203	Carbon film	39k	RD¼PS 393J
R204	Carbon film	39k	RD¼PS 393J
R205	Carbon film	15k	RD¼PS 153J
R206	Carbon film	15k	RD¼PS 153J
R207	Carbon film	22k	RD¼PS 223J
R208	Carbon film	22k	RD¼PS 223J
R209	Carbon film	1k	RD¼PS 102J
R210	Carbon film	1k	RD¼PS 102J
R211	Carbon film	33k	RD¼PS 333J
R212	Carbon film	33k	RD¼PS 333J
R213	Carbon film	8.2k	RD¼PS 822J
R214	Carbon film	8.2k	RD¼PS 822J
R215	Carbon film	18k	RD¼PS 183J
R216	Carbon film	18k	RD¼PS 183J
R217	Carbon film	1k	RD¼PS 102J
R218	Carbon film	1k	RD¼PS 102J
R219	Carbon film	220k	RD¼PS 224J
R220	Carbon film	220k	RD¼PS 224J
R221	Carbon film	1k	RD¼PS 102J
R222	Carbon film	1k	RD¼PS 102J
R223	Carbon film	56k	RD¼PS 563J
R224	Carbon film	56k	RD¼PS 563J
R225	Carbon film	100k	RD¼PS 104J
R226	Carbon film	100k	RD¼PS 104J
R227	Carbon film	3.2k	RD¼PS 332J
R228	Carbon film	3.2k	RD¼PS 332J
R229	Carbon film	12k	RD¼PS 123J
R230	Carbon film	12k	RD¼PS 123J
R231	Carbon film	560	RD¼PS 561J
R232	Carbon film	560	RD¼PS 561J
R233	Carbon film	4.7k	RD¼PS 472J
R234	Carbon film	4.7k	RD¼PS 472J

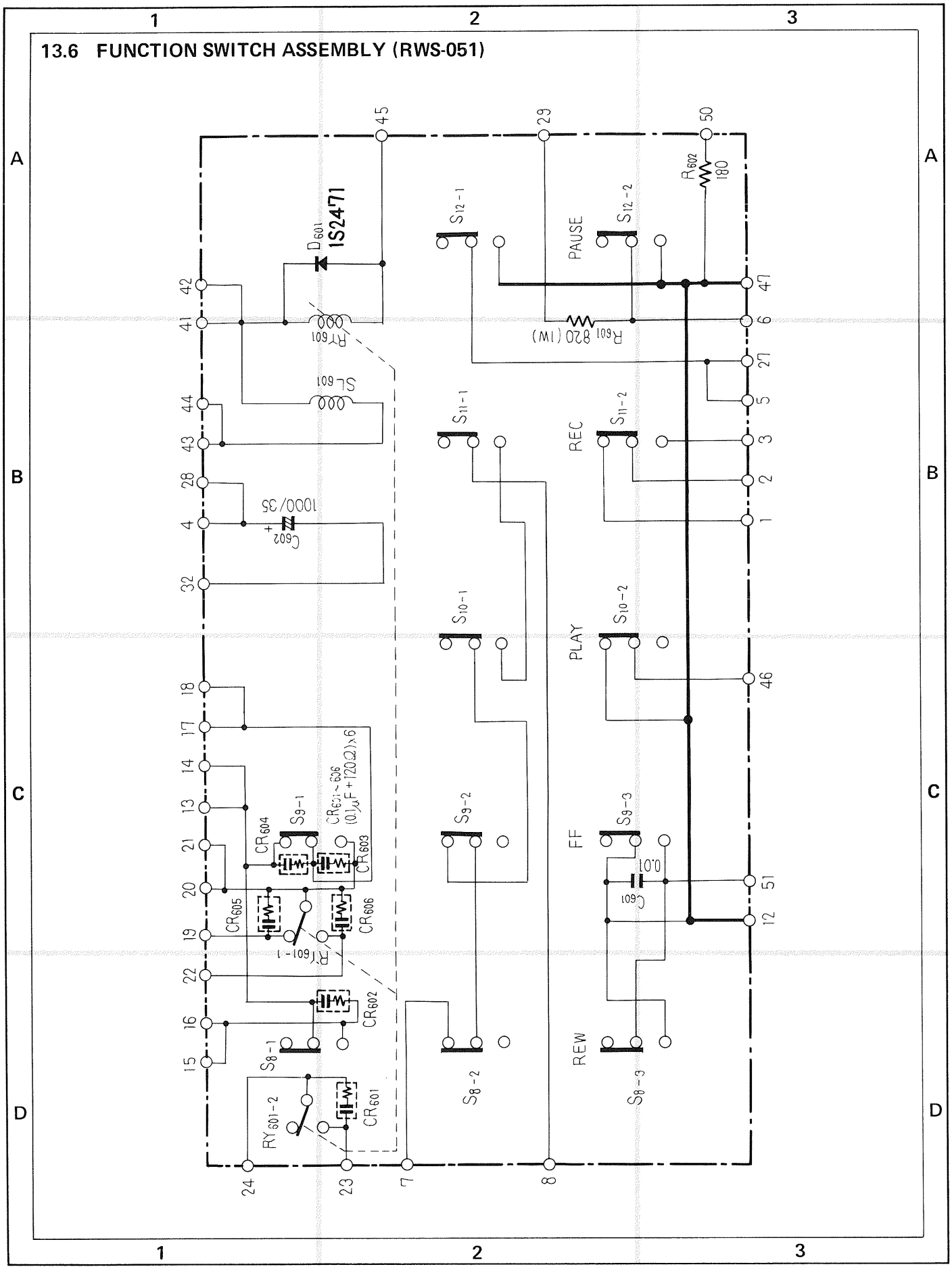
SEMICONDUCTORS

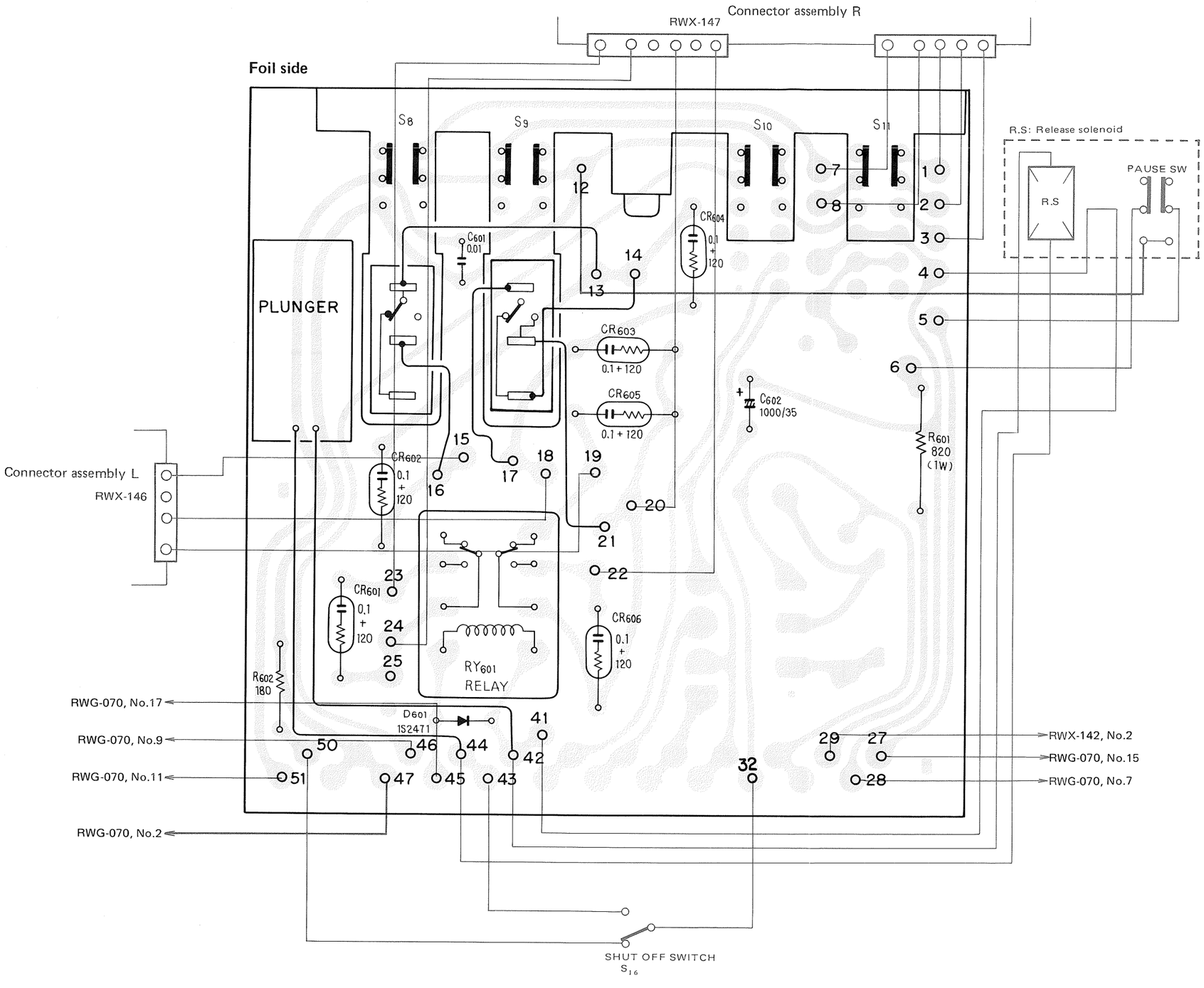
Symbol	Description	Part No.
Q201	Transistor	2SC1344 D or E
Q202	Transistor	2SC1344 D or E
Q203	Transistor	2SA672 B or C
Q204	Transistor	2SA672 B or C
Q205	Transistor	2SC1344 D or E
Q206	Transistor	2SC1344 D or E
Q207	Transistor	2SC1344 D or E
Q208	Transistor	2SC1344 D or E

List of Changed Parts for Factory Modification

Symbol	Description	Part No.

13.6 FUNCTION SWITCH ASSEMBLY (RWS-051)





Parts List

CAPACITORS

Symbol	Description			Part No.
C601	Ceramic	0.01	50V	CKDYF 103Z 50
C602	Electrolytic	1000	35V	CEA 102P 35

RESISTORS

Symbol	Description			Part No.
R601	Metal oxide	820	1W	RS1P 821J
R602	Carbon film	180		RD¼PS 181J

SEMICONDUCTOR

Symbol	Description	Part No.
D601	Diode	1S2471

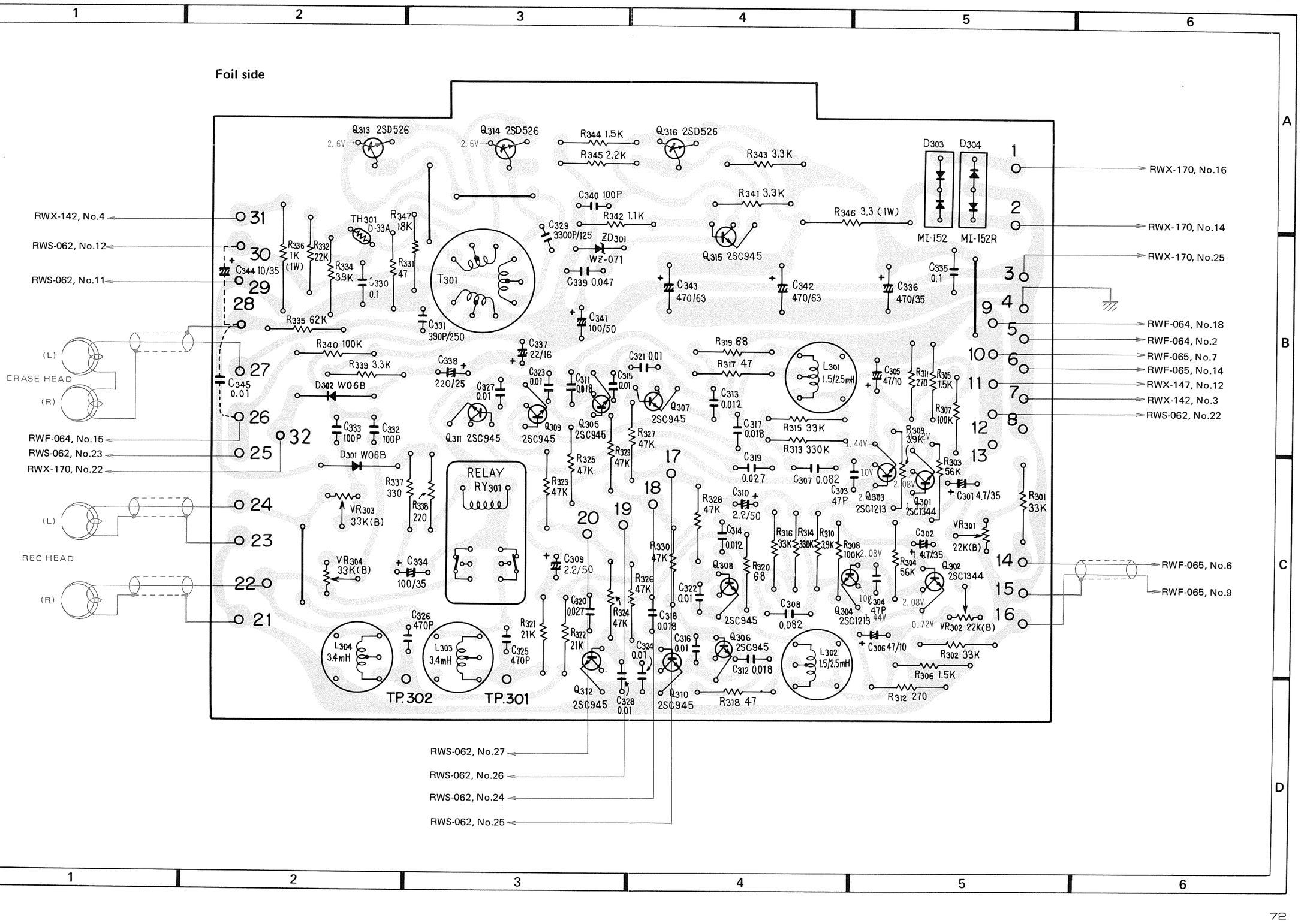
OTHERS

Symbol	Description	Part No.
RY601	Relay	RSR-016
CR601	Spark killer	RWX-030
CR602	Spark killer	RWX-030
CR603	Spark killer	RWX-030
CR604	Spark killer	RWX-030
CR605	Spark killer	RWX-030
CR606	Spark killer	RWX-030
S8	Function switch	RSG-047
S12	Pause switch	RSG-048
	Release plate	RNF-084
	Release spring	RBH-152
	Connector socket assembly A	RKP-021
	Connector socket assembly B	RKP-023
	Connector socket assembly C	RKP-025

List of Changed Parts for Factory Modification

Symbol	Description	Part No.

Foil side


Q313 2SD526
2.6V
Q314 2SD526
2.6V
Q316 2SD526
R344 1.5K
R345 2.2K
R343 3.3K
D303
D304
MI-152
MI-152R
RWX-170, No.16
RWX-170, No.14
RWX-170, No.25
RWX-142, No.4
RWS-062, No.12
RWS-062, No.11
C340 100P
R342 1.1K
R341 3.3K
R346 3.3 (1W)
Q315 2SC945
C329 3300P/125
ZD301
WZ-071
C339 0.047
TH301 D-33A
R347 18K
R336 1K (1W)
R332 22K
R334 3.9K
C330 0.1
R331 47
C344 10/35
R335 62K
T301
C331 390P/250
C341 100/50
C343 470/63
C342 470/63
C336 470/35
C335 0.1
R340 100K
R339 3.3K
D302 W06B
C345 0.01
C338 220/25
C337 22/16
C323 0.01
C327 0.01
Q311 2SC945
Q309 2SC945
C311 0.018
C315 0.01
Q305 2SC945
C321 0.01
Q307 2SC945
R319 68
R317 47
L301 1.5/2.5mH
C305 47/10
R311 270
R305 1.5K
R307 100K
C313 0.012
C317 0.018
R315 33K
R313 330K
C319 0.027
C307 0.082
C303 47P
Q303 2SC1213
R309 3.9K
Q301 2SC1344
R303 56K
C301 4.7/35
R301 33K
RWF-064, No.18
RWF-064, No.2
RWF-065, No.7
RWF-065, No.14
RWX-147, No.12
RWX-142, No.3
RWS-062, No.22
RWF-064, No.15
RWS-062, No.23
RWX-170, No.22
C333 100P
C332 100P
D301 W06B
R337 330
R338 220
VR303 33K(B)
RELAY RY301
R325 47K
R323 47K
R329 47K
R327 47K
R328 47K
C310 2.2/50
C314 0.012
R316 33K
R314 330K
R310 39K
R308 100K
C302 4.7/35
VR301 22K(B)
Q308 2SC945
R320 68
Q304 2SC1213
Q302 2SC1344
C304 47P
VR304 33K(B)
C334 100/35
C309 2.2/50
C322 0.01
C308 0.082
VR302 22K(B)
RWF-065, No.6
RWF-065, No.9
C326 470P
R321 21K
C320 0.027
R322 21K
R324 47K
R326 47K
C318 0.018
C324 0.01
C316 0.01
Q306 2SC945
C312 0.018
C306 47/10
R302 33K
R306 1.5K
R312 270
L304 3.4mH
L303 3.4mH
C325 470P
Q312 2SC945
C328 0.01
Q310 2SC945
R318 47
L302 1.5/2.5mH
TP.302
TP.301
ERASE HEAD
REC HEAD
(L)
(R)
RWS-062, No.27
RWS-062, No.26
RWS-062, No.24
RWS-062, No.25

Parts List of Power and Oscillation Assembly (RWR-054)

TRANSFORMER AND COILS

Symbol	Description	Part No.
T301	Oscillator transformer	RTD-013
L301	Peaking coil	RTF-014
L302	Peaking coil	RTF-014
L303	Trap coil	RTF-013
L304	Trap coil	RTF-013

CAPACITORS

Symbol	Description			Part No.
C301	Electrolytic	4.7	35V	CEA 4R7P 35
C302	Electrolytic	4.7	35V	CEA 4R7P 35
C303	Ceramic	47p	50V	CCDSL 470K 50
C304	Ceramic	47p	50V	CCDSL 470K 50
C305	Electrolytic	47	10V	CEA 470P 10
C306	Electrolytic	47	10V	CEA 470P 10
C307	Mylar	0.1	50V	CQMA 104K 50
C308	Mylar	0.1	50V	CQMA 104K 50
C309	Electrolytic	4.7	35V	CEA 4R7P 35
C310	Electrolytic	4.7	35V	CEA 4R7P 35
C311	Mylar	0.018	50V	CQMA 183K 50
C312	Mylar	0.018	50V	CQMA 183K 50
C313	Mylar	0.012	50V	CQMA 123K 50
C314	Mylar	0.012	50V	CQMA 123K 50
C315	Mylar	0.01	50V	CQMA 103K 50
C316	Mylar	0.01	50V	CQMA 103K 50
C317	Mylar	0.018	50V	CQMA 183K 50
C318	Mylar	0.018	50V	CQMA 183K 50
C319	Mylar	0.027	50V	CQMA 273K 50
C320	Mylar	0.027	50V	CQMA 273K 50
C321	Mylar	0.01	50V	CQMA 103K 50
C322	Mylar	0.01	50V	CQMA 103K 50
C323	Mylar	0.01	50V	CQMA 103K 50
C324	Mylar	0.01	50V	CQMA 103K 50
C325	Styrol	470p	50V	CQSA 471K 50
C326	Styrol	470p	50V	CQSA 471K 50
C327	Mylar	0.01	50V	CQMA 103K 50
C328	Mylar	0.01	50V	CQMA 103K 50
C329	Styrol	3300p	125V	CQSA 332J 125
C330	Mylar	0.1	50V	CQMA 104K 50
C331	Styrol	390p	250V	CQSA 391J 250
C332	Styrol	100p	50V	CQSA 101K 50
C333	Styrol	100p	50V	CQSA 101K 50
C334	Electrolytic	100	35V	CEA 101P 35
C335	Mylar	0.1	50V	CQMA 104K 50
C336	Electrolytic	470	35V	CEA 471P 35
C337	Electrolytic	22	16V	CEA 220P 16
C338	Electrolytic	220	25V	CEA 221P 25
C339	Mylar	0.047	50V	CQMA 473K 50
C340	Ceramic	100p	50V	CCDSL 101K 50
C341	Electrolytic	100	50V	CEA 101P 50
C342	Electrolytic	470	50V	CEA 471P 50
C343	Electrolytic	470	50V	CEA 471P 50
C344	Electrolytic	10	35V	CEA 100P 35
C345	Ceramic	0.01	50V	CKDYF 103Z 50

RESISTORS

Symbol	Description			Part No.
VR301	Semi-fixed	22k-B		C92-857
VR302	Semi-fixed	22k-B		C92-857
VR303	Semi-fixed	33k-B		C81-426
VR304	Semi-fixed	33k-B		C81-426
R301	Carbon film	33k		RD¼PS 333J
R302	Carbon film	33k		RD¼PS 333J
R303	Carbon film	56k		RD¼PS 563J
R304	Carbon film	56k		RD¼PS 563J
R305	Carbon film	1.5k		RD¼PS 152J
R306	Carbon film	1.5k		RD¼PS 152J
R307	Carbon film	100k		RD¼PS 104J
R308	Carbon film	100k		RD¼PS 104J
R309	Carbon film	3.9k		RD¼PS 392J
R310	Carbon film	3.9k		RD¼PS 392J
R311	Carbon film	270		RD¼PS 271J
R312	Carbon film	270		RD¼PS 271J
R313	Carbon film	330k		RD¼PS 334J
R314	Carbon film	330k		RD¼PS 334J
R315	Carbon film	33k		RD¼PS 333J
R316	Carbon film	33k		RD¼PS 333J
R317	Carbon film	47		RD¼PS 470J
R318	Carbon film	47		RD¼PS 470J
R319	Carbon film	68		RD¼PS 680J
R320	Carbon film	68		RD¼PS 680J
R321	Carbon film	2k		RD¼PS 202J
R322	Carbon film	2k		RD¼PS 202J
R323	Carbon film	47k		RD¼PS 473J
R324	Carbon film	47k		RD¼PS 473J
R325	Carbon film	47k		RD¼PS 473J
R326	Carbon film	47k		RD¼PS 473J
R327	Carbon film	47k		RD¼PS 473J
R328	Carbon film	47k		RD¼PS 473J
R329	Carbon film	47k		RD¼PS 473J
R330	Carbon film	47k		RD¼PS 473J
R331	Carbon film	47		RD¼PS 470J
R332	Carbon film	22k		RD¼PS 223J
R334	Carbon film	3.9k		RD¼PS 392J
R335	Carbon film	62k		RD¼PS 623J
R336	Carbon film	1k	1W	RS1P 102J
R337	Metal oxide	330		RD¼PS 331J
R338	Carbon film	220		RD¼PS 221J
R339	Carbon film	3.3k		RD¼PS 332J
R340	Carbon film	100k		RD¼PS 104J
R341	Carbon film	3.3k		RD¼PS 332J
R342	Carbon film	1.1k		RD¼PS 112J
R343	Carbon film	3.3k		RD¼PS 332J
R344	Carbon film	1.5k		RD¼PS 152J
R345	Carbon film	2.2k		RD¼PS 222J
R346	Metal oxide	3.3	1W	RN1PSF 3R3J

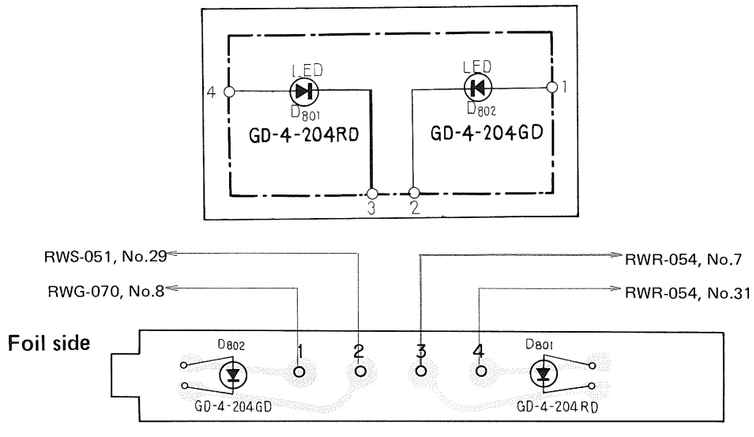
SEMICONDUCTORS

Symbol	Description	Part No.
Q301	Transistor	2SC1344 D or E
Q302	Transistor	2SC1344 D or E
Q303	Transistor	2SC1213 B or C
Q304	Transistor	2SC1213 B or C
Q305	Transistor	2SC945 P or Q
Q306	Transistor	2SC945 P or Q
Q307	Transistor	2SC945 P or Q
Q308	Transistor	2SC945 P or Q
Q309	Transistor	2SC945 P or Q
Q310	Transistor	2SC945 P or Q
Q311	Transistor	2SC945 P or Q
Q312	Transistor	2SC945 P or Q
Q313	Transistor	2SD526 D
Q314	Transistor	2SD526 D
Q315	Transistor	2SC945 P or Q
Q316	Transistor	2SD526 O or Y
D301	Diode	W06B
D302	Diode	W06B
D303	Diode	MI-152
D304	Diode	MI-152R
ZD301	Zener diode	WZ-071
TH301	Thermister	D33A

OTHERS

Symbol	Description	Part No.
RY301	Relay (24V)	RSR-019
	Tr socket	AKH-002
	Insulator spacer	REE-051

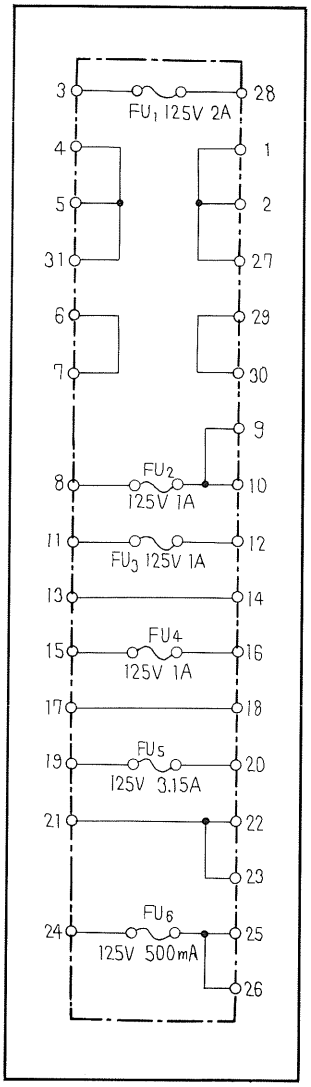
13.8 INDICATOR ASSEMBLY (RWX-142)

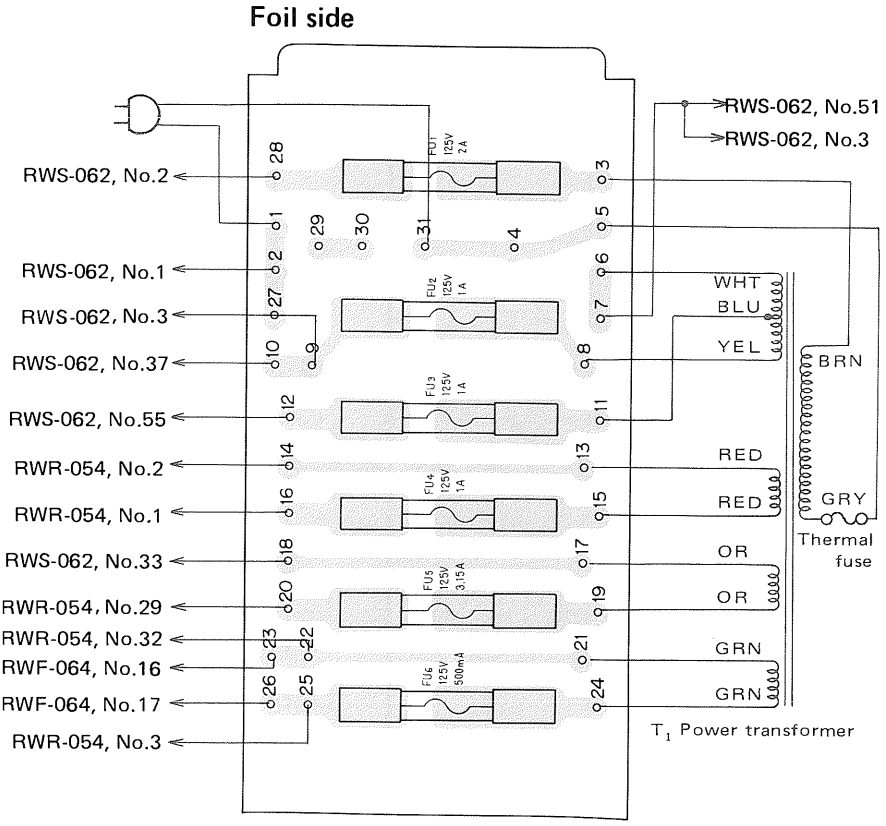


Parts List

Symbol	Description	Part No.
D801	Light emitting diode	GD-4-204RD
D802	Light emitting diode	GD-4-204GD
	Diode holder	REB-204

13.9 FUSE ASSEMBLY (RWX-170)

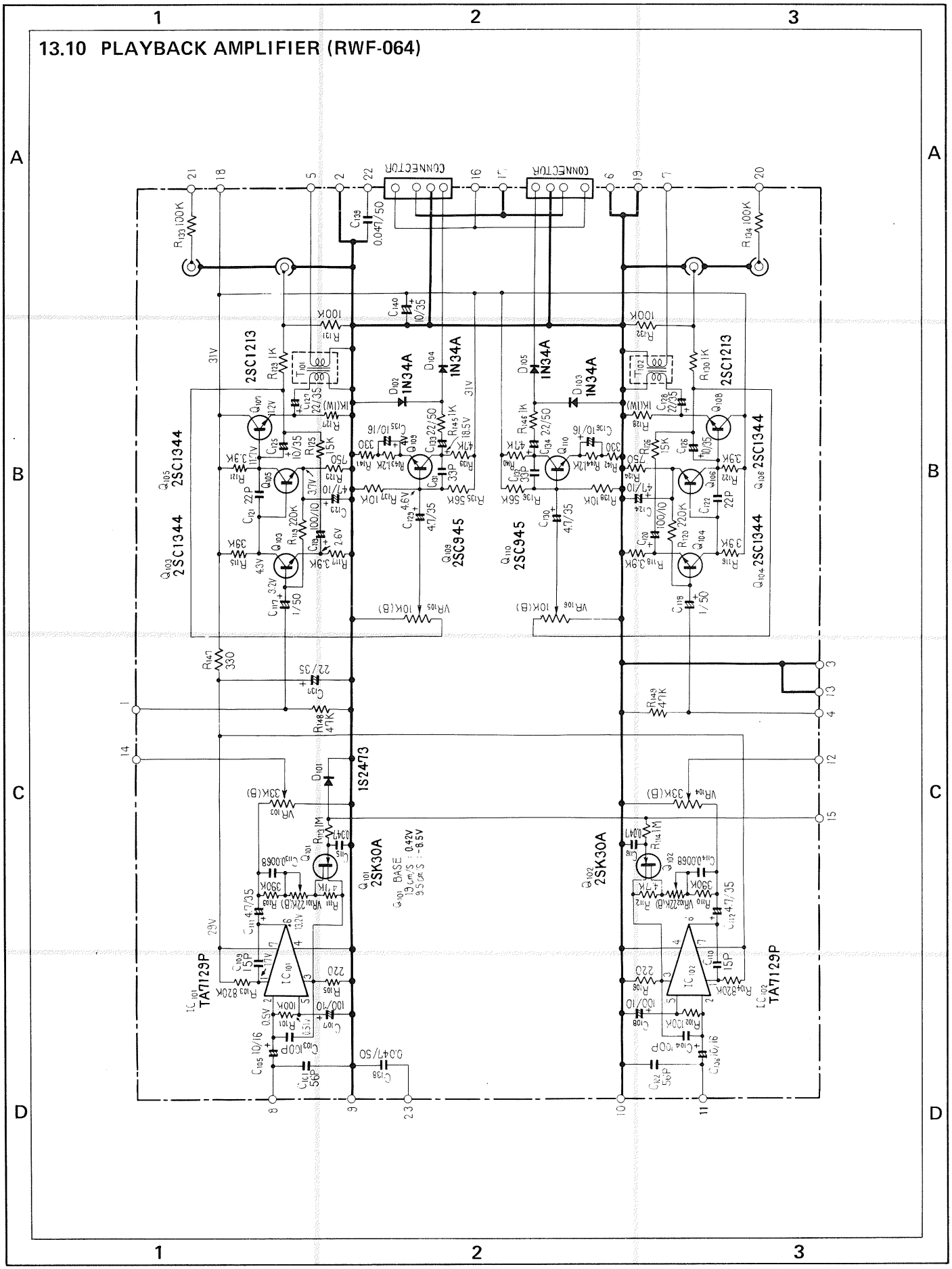


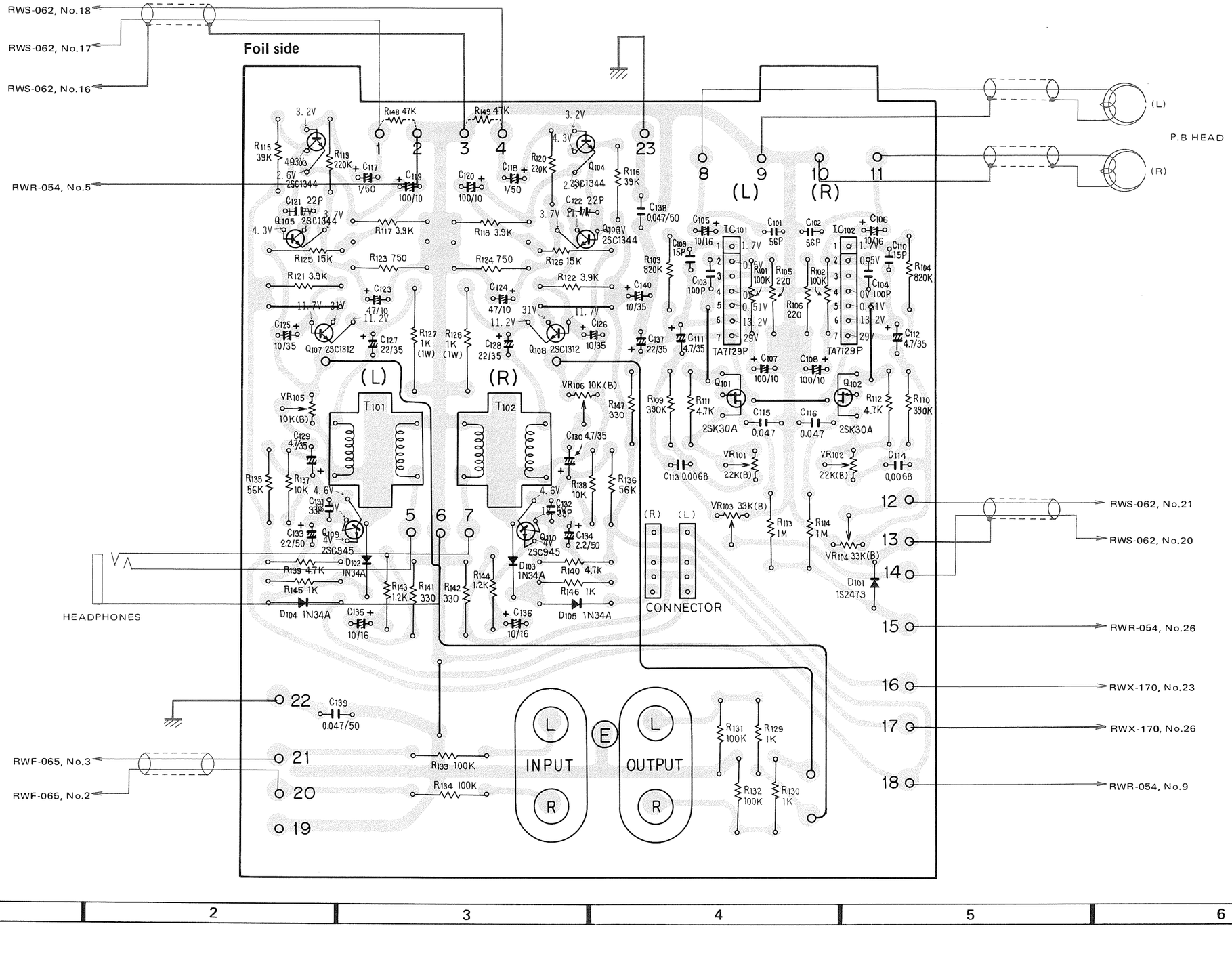


Parts List

Symbol	Description		Part No.
FU1	Fuse	2A	REK-055
FU2	Fuse	1A	REK-051
FU3	Fuse	1A	REK-051
FU4	Fuse	1A	REK-051
FU5	Fuse	3.15A	REK-044
FU6	Fuse	0.5A	REK-048
	Fuse clip		RKR-017

13.10 PLAYBACK AMPLIFIER (RWF-064)




Foil side
RWS-062, No.18
RWS-062, No.17
RWS-062, No.16
RWR-054, No.5
(L)
(R)
P.B HEAD
HEADPHONES
CONNECTOR
INPUT
OUTPUT
RWF-065, No.3
RWF-065, No.2
RWS-062, No.21
RWS-062, No.20
RWR-054, No.26
RWX-170, No.23
RWX-170, No.26
RWR-054, No.9
TA7129P
2SK30A
2SC1344
2SC1312
2SC945
1N34A
1S2473

Parts List of Playback Amplifier Assembly (RWF-064)

TRANSFORMERS

Symbol	Description	Part No.
T101	Matching transformer	RTV-009
T102	Matching transformer	RTV-009

CAPACITORS

Symbol	Description			Part No.
C101	Styrol	56p	50V	RCE-004
C102	Styrol	56p	50V	RCE-004
C103	Ceramic	100p	50V	CCDSL 101K 50
C104	Ceramic	100p	50V	CCDSL 101K 50
C105	Electrolytic	10	16V	CEANL 100P 16
C106	Electrolytic	10	16V	CEANL 100P 16
C107	Electrolytic	100	10V	CEA 101P 10
C108	Electrolytic	100	10V	CEA 101P 10
C109	Ceramic	15p	50V	CCDSL 150K 50
C110	Ceramic	15p	50V	CCDSL 150K 50
C111	Electrolytic	4.7	35V	CEA 4R7P 35
C112	Electrolytic	4.7	35V	CEA 4R7P 35
C113	Mylar	0.0068	50V	CQMA 682K 50
C114	Mylar	0.0068	50V	CQMA 682K 50
C115	Mylar	0.047	50V	CQMA 473K 50
C116	Mylar	0.047	50V	CQMA 473K 50
C117	Electrolytic	1	50V	CEA 010P 50
C118	Electrolytic	1	50V	CEA 010P 50
C119	Electrolytic	100	10V	CEA 101P 10
C120	Electrolytic	100	10V	CEA 101P 10
C121	Ceramic	22p	50V	CCDSL 220K 50
C122	Ceramic	22p	50V	CCDSL 220K 50
C123	Electrolytic	47	10V	CEA 470P 10
C124	Electrolytic	47	10V	CEA 470P 10
C125	Electrolytic	10	35V	CEA 100P 35
C126	Electrolytic	10	35V	CEA 100P 35
C127	Electrolytic	22	35V	CEA 220P 35
C128	Electrolytic	22	35V	CEA 220P 35
C129	Electrolytic	4.7	35V	CEA 4R7P 35
C130	Electrolytic	4.7	35V	CEA 4R7P 35
C131	Ceramic	33p	50V	CCDSL 330K 50
C132	Ceramic	33p	50V	CCDSL 330K 50
C133	Electrolytic	2.2	50V	CEA 2R2P 50
C134	Electrolytic	2.2	50V	CEA 2R2P 50
C135	Electrolytic	10	16V	CEA 100P 16
C136	Electrolytic	10	16V	CEA 100P 16
C137	Electrolytic	22	35V	CEA 220P 35
C138	Ceramic	0.047	50V	CKDYF 473Z 50
C139	Ceramic	0.047	50V	CKDYF 473Z 50
C140	Electrolytic	10	35V	CEA 100P 35
C141	Ceramic	0.01	50V	CKDYF 103Z 50

RESISTORS

Symbol	Description			Part No.
VR101	Semi-fixed	22k-B		C92-857
VR102	Semi-fixed	22k-B		C92-857
VR103	Semi-fixed	33k-B		C81-426
VR104	Semi-fixed	33k-B		C81-426
VR105	Semi-fixed	10k-B		C92-048
VR106	Semi-fixed	10k-B		C92-048
R101	Carbon film	100k		RD¼PS 104J
R102	Carbon film	100k		RD¼PS 104J
R103	Carbon film	820k		RD¼PS 824J
R104	Carbon film	820k		RD¼PS 824J
R105	Carbon film	220		RD¼PS 221J
R106	Carbon film	220		RD¼PS 221J
R109	Carbon film	390k		RD¼PS 394J
R110	Carbon film	390k		RD¼PS 394J
R111	Carbon film	4.7k		RD¼PS 472J
R112	Carbon film	4.7k		RD¼PS 472J
R113	Carbon film	1M		RD¼PS 105J
R114	Carbon film	1M		RD¼PS 105J
R115	Carbon film	39k		RD¼PS 393J
R116	Carbon film	39k		RD¼PS 393J
R117	Carbon film	3.9k		RD¼PS 392J
R118	Carbon film	3.9k		RD¼PS 392J
R119	Carbon film	220k		RD¼PS 224J
R120	Carbon film	220k		RD¼PS 224J
R121	Carbon film	3.9k		RD¼PS 392J
R122	Carbon film	3.9k		RD¼PS 392J
R123	Carbon film	750		RD¼PS 751J
R124	Carbon film	750		RD¼PS 751J
R125	Carbon film	15k		RD¼PS 153J
R126	Carbon film	15k		RD¼PS 153J
R127	Metal oxide	1k	1W	RS1P 102J
R128	Metal oxide	1k	1W	RS1P 102J
R129	Carbon film	1k		RD¼PS 102J
R130	Carbon film	1k		RD¼PS 102J
R131	Carbon film	100k		RD¼PS 104J
R132	Carbon film	100k		RD¼PS 104J
R133	Carbon film	100k		RD¼PS 104J
R134	Carbon film	100k		RD¼PS 104J
R135	Carbon film	56k		RD¼PS 563J
R136	Carbon film	56k		RD¼PS 563J
R137	Carbon film	10k		RD¼PS 103J
R138	Carbon film	10k		RD¼PS 103J
R139	Carbon film	4.7k		RD¼PS 472J
R140	Carbon film	4.7k		RD¼PS 472J
R141	Carbon film	330		RD¼PS 331J
R142	Carbon film	330		RD¼PS 331J
R143	Carbon film	1.2k		RD¼PS 122J
R144	Carbon film	1.2k		RD¼PS 122J
R145	Carbon film	1k		RD¼PS 102J
R146	Carbon film	1k		RD¼PS 102J
R147	Carbon film	330		RD¼PS 331J
R148	Carbon film	47k		RD¼PS 473J
R149	Carbon film	47k		RD¼PS 473J

SEMICONDUCTORS

Symbol	Description	Part No.
IC101	IC	TA7129P
IC102	IC	TA7129P
Q101	Transistor	2SK30A-Y or O
Q102	Transistor	2SK30A-Y or O
Q103	Transistor	2SC1344 D or E
Q104	Transistor	2SC1344 D or E
Q105	Transistor	2SC1344 D or E
Q106	Transistor	2SC1344 D or E
Q107	Transistor	2SC1213 B or C
Q108	Transistor	2SC1213 B or C
Q109	Transistor	2SC945 P or Q
Q110	Transistor	2SC945 P or Q
D101	Diode	1S2473
D102	Diode	1N34A
D103	Diode	1N34A
D104	Diode	1N34A
D105	Diode	1N34A

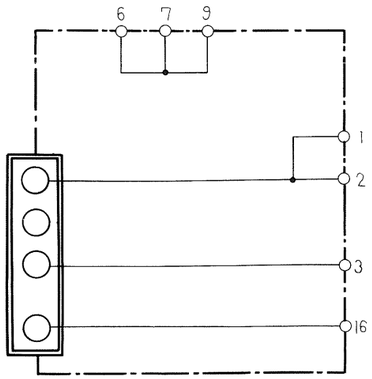
OTHERS

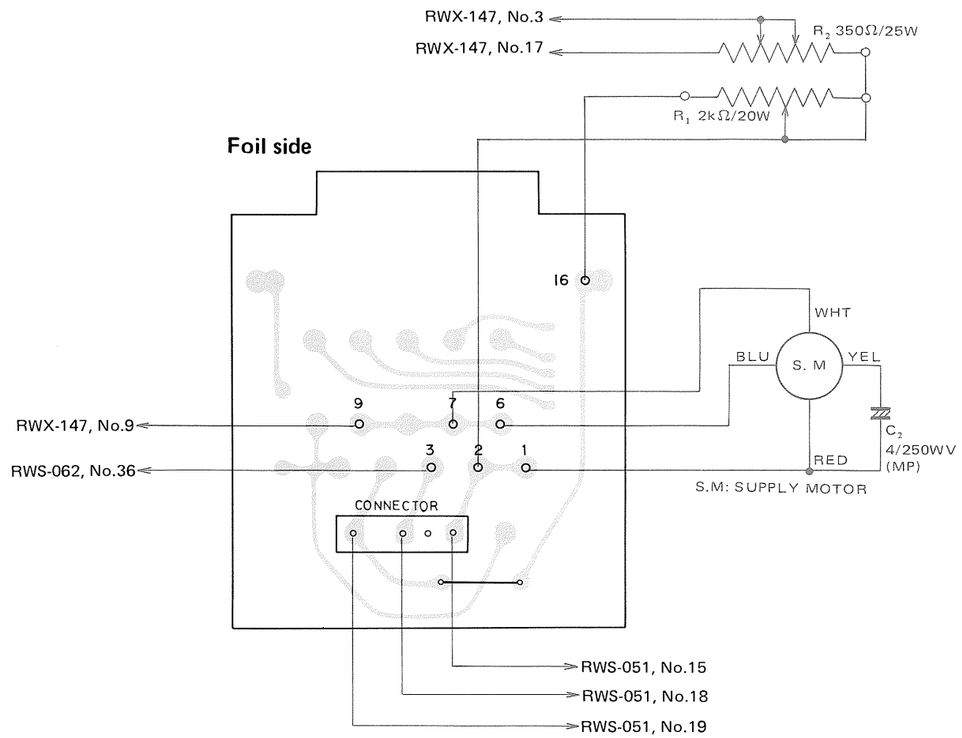
Symbol	Description	Part No.
	Terminal (INPUT, OUTPUT)	RKB-011
	Connector	RKP-027

List of Changed Parts for Factory Modification

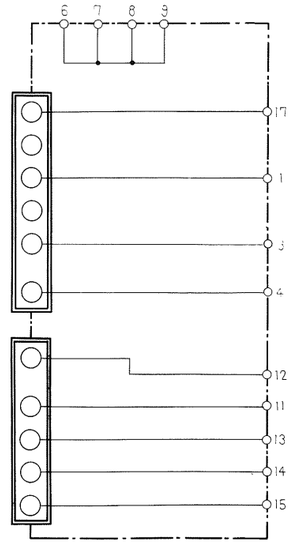
Symbol	Description	Part No.

13.11 CONNECTOR ASSEMBLY L (RWX-146)

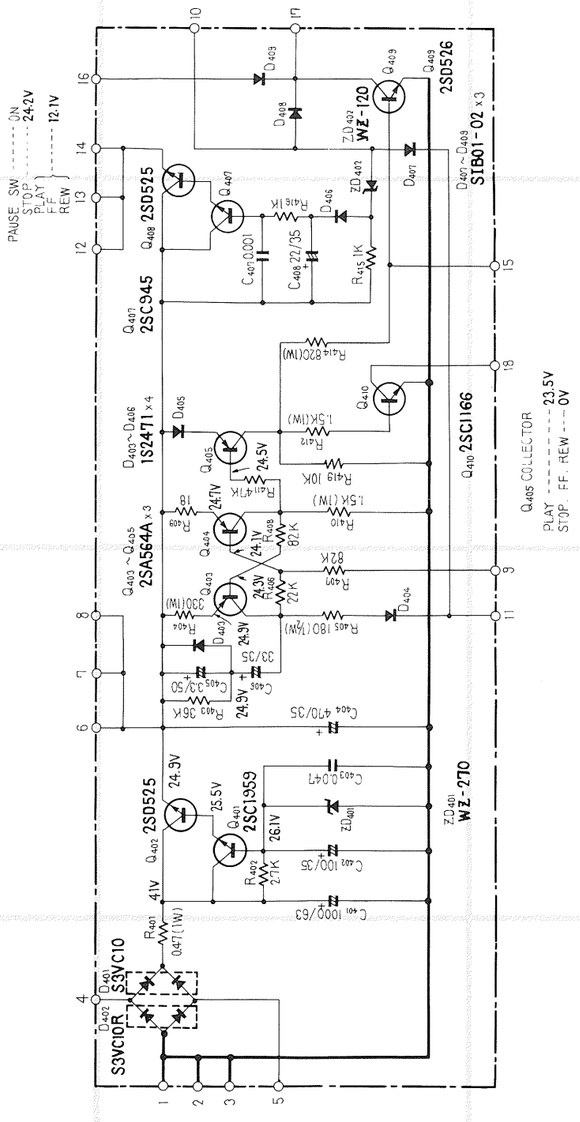


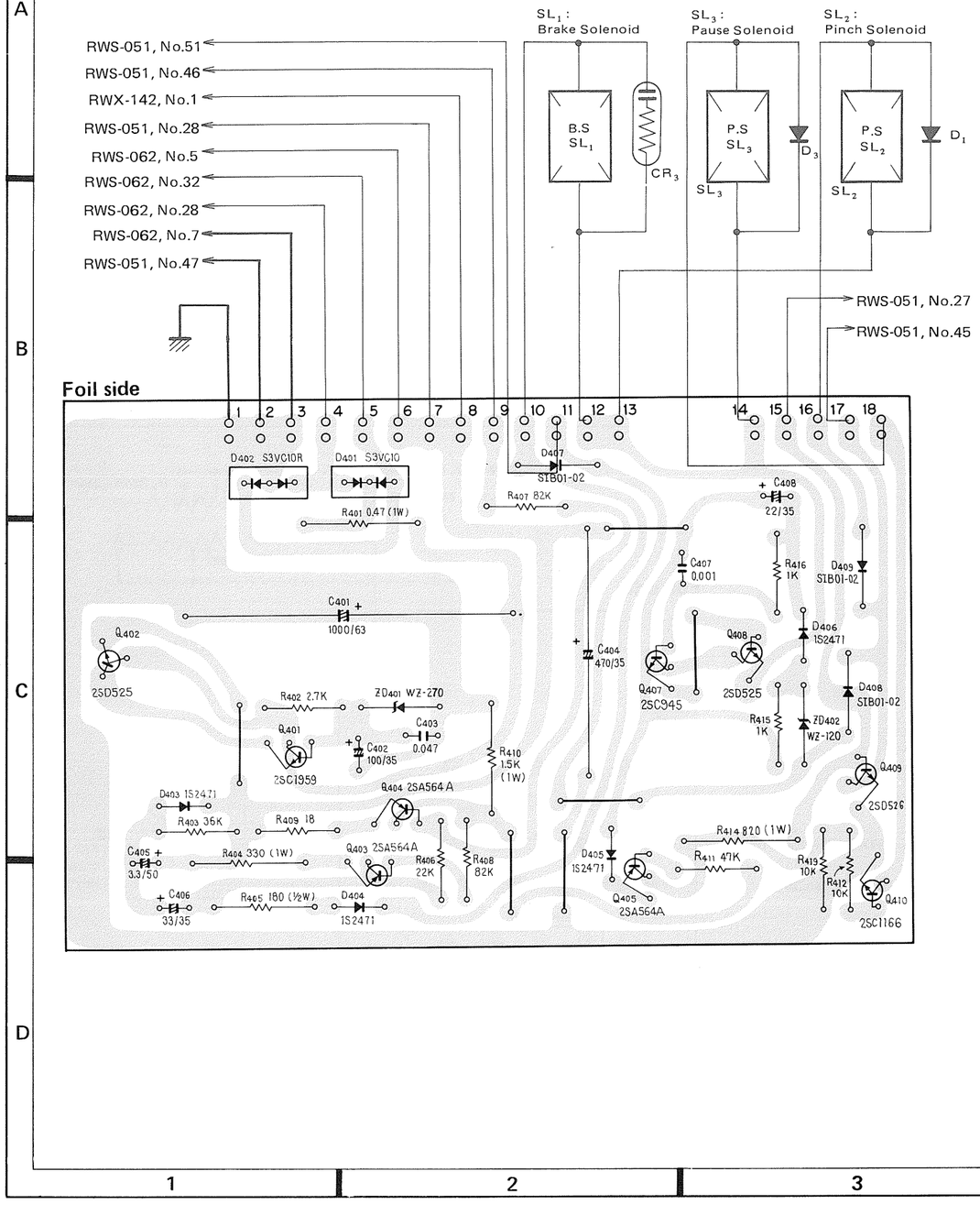


13.12 CONNECTOR ASSEMBLY R (RWX-147)



13.13 CONTROL ASSEMBLY (RWG-070)





Parts List

CAPACITORS

Symbol	Description			Part No.
C401	Electrolytic	1 000	63V	CEB 102P 63
C402	Electrolytic	100	35V	CEA 101P 35
C403	Mylar	0.047	50V	CQMA 473K 50
C404	Electrolytic	470	35V	CEB 471P 35
C405	Electrolytic	3.3	50V	CEA 3R3P 50
C406	Electrolytic	33	35V	CEA 330P 35
C407	Mylar	0.001	50V	CQMA 102K 50
C408	Electrolytic	22	35V	CEA 220P 35

RESISTORS

Symbol	Description			Part No.
R401	Metal oxide	0.47	1W	RN1PSF R47J
R402	Carbon film	2.7k		RD¼PS 272J
R403	Carbon film	36k		RD¼PS 363J
R404	Metal oxide	330	1W	RD1PSF 331J
R405	Carbon film	180	½W	RD½PSF 181J
R406	Carbon film	20k		RD¼PS 223J
R407	Carbon film	82k		RD¼PS 823J
R408	Carbon film	82k		RD¼PS 823J
R409	Carbon film	18		RD¼PS 180J
R410	Metal oxide	1.5k	1W	RS1P 152J
R411	Carbon film	47k		RD¼PS 473J
R412	Carbon film	10k		RD¼PS 103J
R414	Metal oxide	820	1W	RS1P 821J
R415	Carbon film	1k		RD¼PS 102J
R416	Carbon film	1k		RD¼PS 102J
R419	Carbon film	10k		RD¼PS 103J

SEMICONDUCTORS

Symbol	Description	Part No.
Q401	Transistor	2SC1959 Y
Q402	Transistor	2SD525 O or Y
Q403	Transistor	2SA564A-R or S
Q404	Transistor	2SA564A-R or S
Q405	Transistor	2SA564A-R or S
Q407	Transistor	2SC945 P or Q
Q408	Transistor	2SD525 O or Y
Q409	Transistor	2SD526 O or Y
Q410	Transistor	2SC1166 O or Y
D401	Diode	S3VC10
D402	Diode	S3VC10R
D403	Diode	1S2471
D404	Diode	1S2471
D405	Diode	1S2471
D406	Diode	1S2471
D407	Diode	SIB01-02
D408	Diode	SIB01-02
D409	Diode	SIB01-02
ZD401	Zener Diode	WZ-270
ZD402	Zener Diode	WZ-120

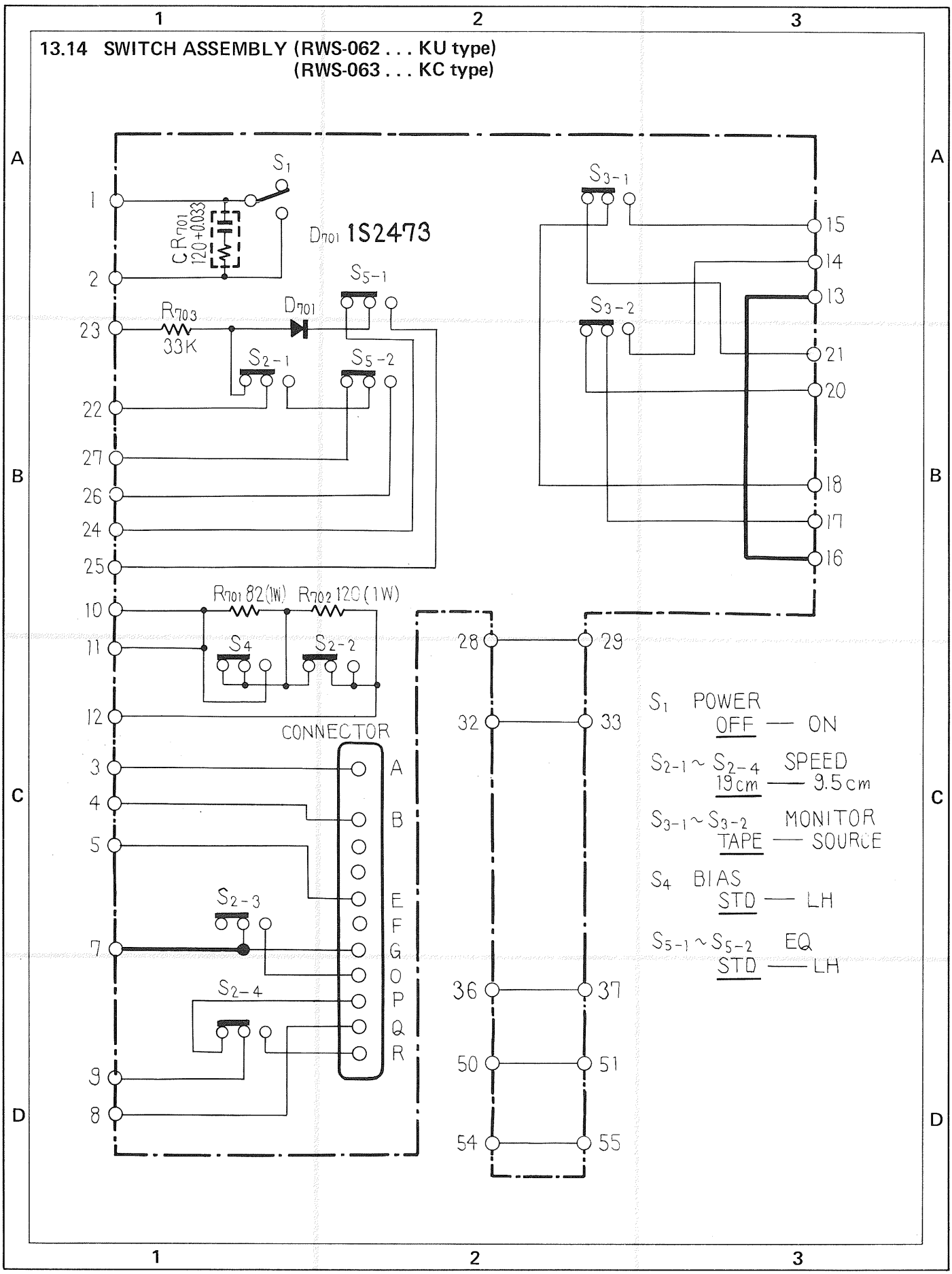
OTHERS

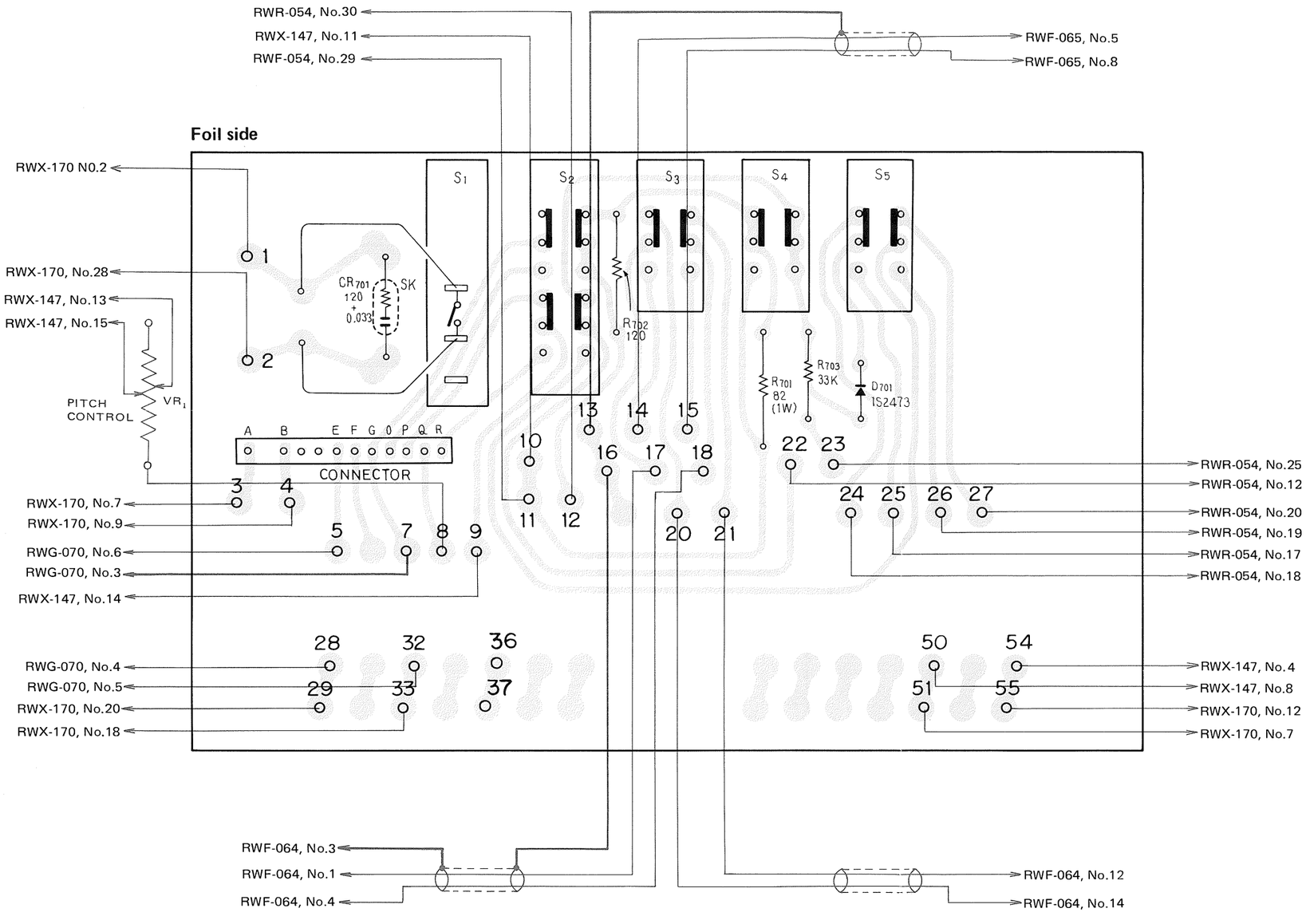
Symbol	Description	Part No.
	Heat sink	RNF-083
	Insulator spacer	REE-051
	Tr socket	AKH-002

List of Changed Parts for Factory Modification

Symbol	Description	Part No.

13.14 SWITCH ASSEMBLY (RWS-062 . . . KU type)
(RWS-063 . . . KC type)





Parts List

RESISTORS

Symbol	Description			Part No.
R701	Metal oxide	82	1W	RS1P 820K
R702	Metal oxide	120	1W	RS1P 121J
R703	Carbon film	33k		RD¼PS 333J

SEMICONDUCTOR

Symbol	Description	Part No.
D701	Diode	1S2473

SWITCHES

Symbol	Description	Part No.
S1	Push switch (POWER)	RSG-049
S2	Push switch (SPEED)	RSG-049
S3	Push switch (MONITOR)	RSG-049
S4	Push switch (BIAS)	RSG-049
S5	Push switch (EQ)	RSG-049

OTHERS

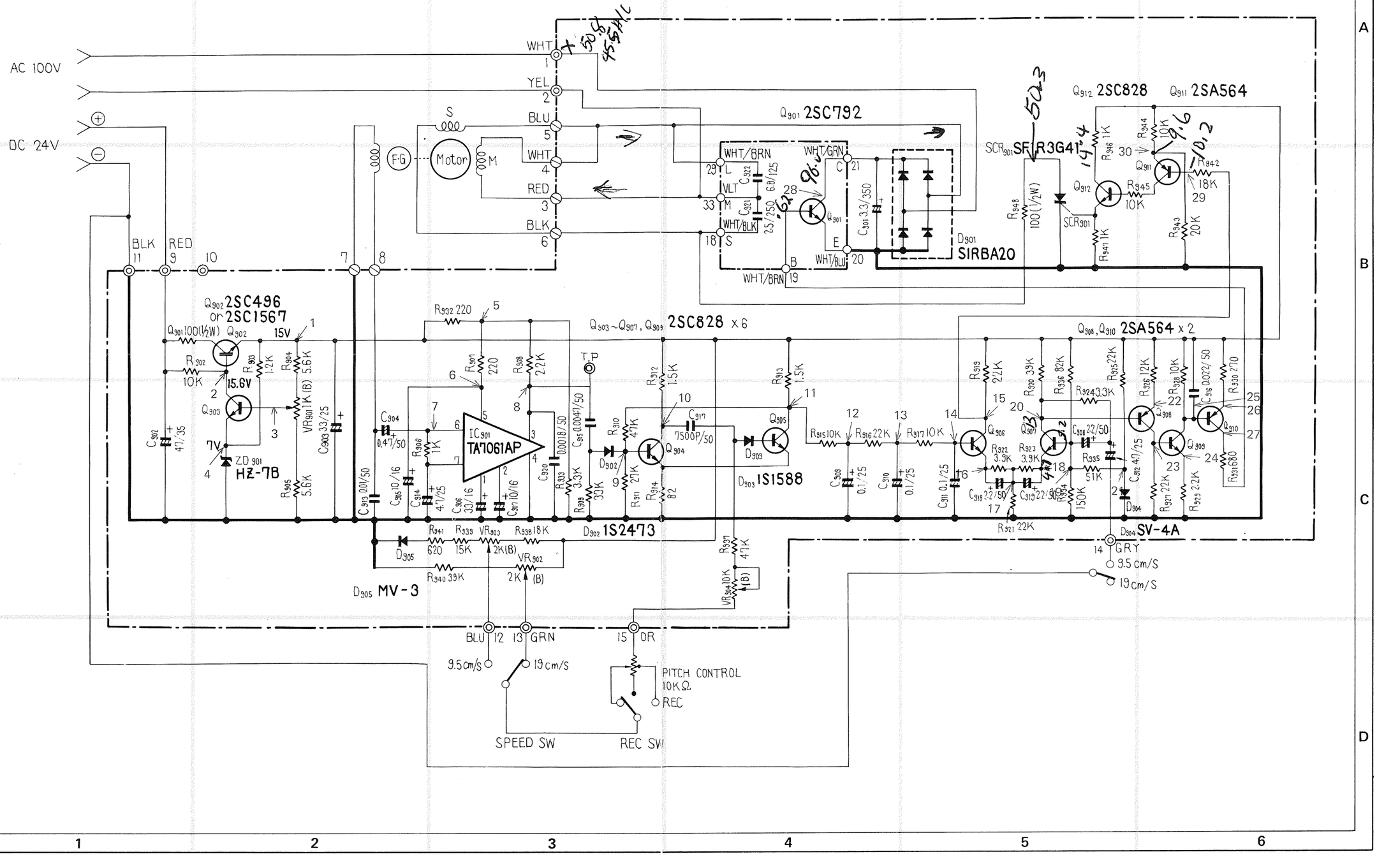
Symbol	Description	Part No.
CR701	Spark killer (KC)	RWX-148
CR701	Spark killer (KU)	RWX-150
	Connector	RKP-018

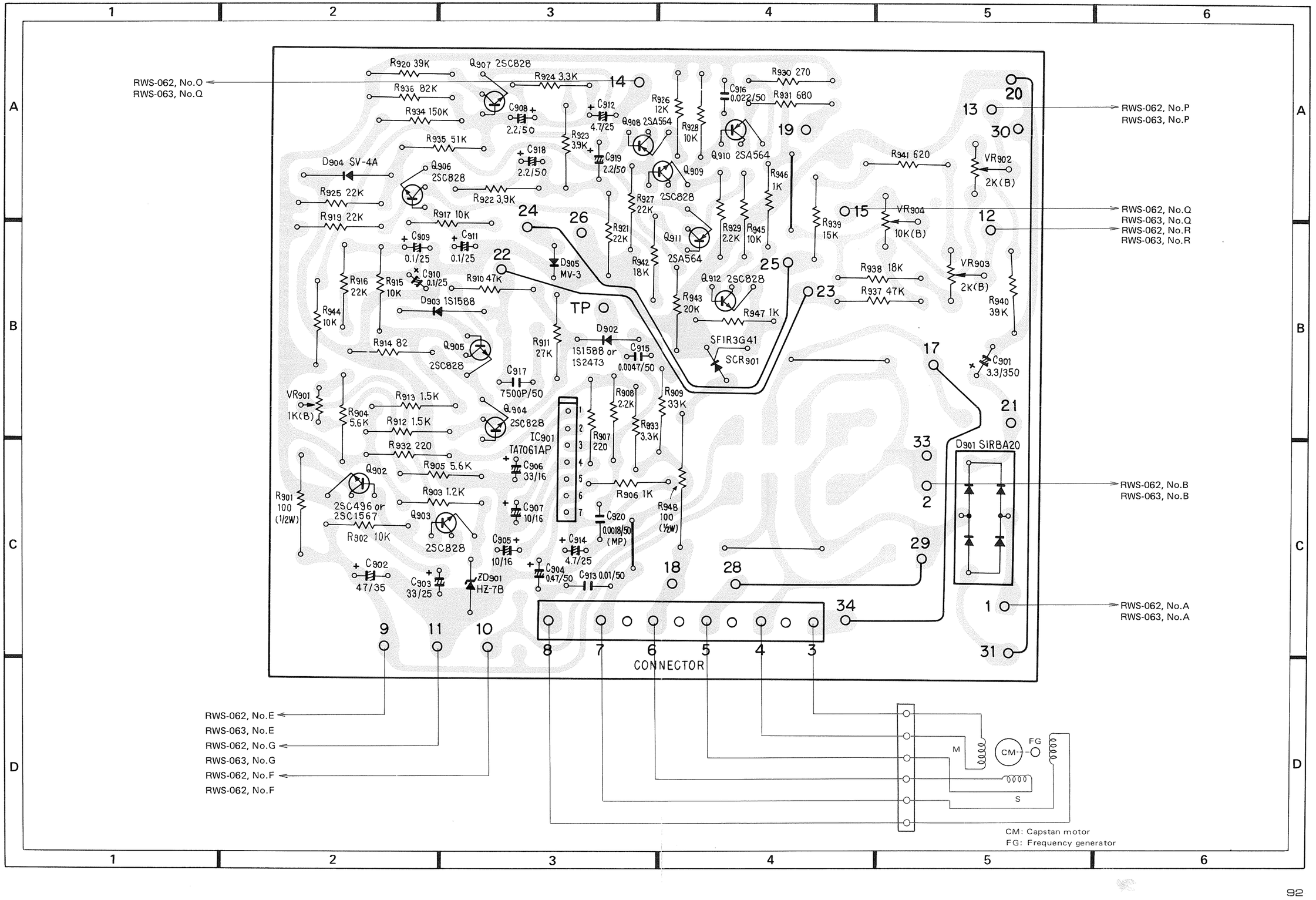
List of Changed Parts for Factory Modification

Symbol	Description	Part No.

13.15 SERVO AMPLIFIER ASSEMBLY (RWG-068)

NOTE:
The voltage at each measure points are indicated in page 93.




RWS-062, No.O
RWS-063, No.Q
R920 39K
Q907 2SC828
R924 3.3K
14
R936 82K
R934 150K
R935 51K
C908 2.2/50
C912 4.7/25
R923 3.9K
C919 2.2/50
C918 2.2/50
R926 12K
Q908 2SA564
R928 10K
C916 0.022/50
R930 270
R931 680
Q910 2SA564
19
20
13
RWS-062, No.P
RWS-063, No.P
30
D904 SV-4A
Q906 2SC828
R925 22K
R922 3.9K
R919 22K
R917 10K
Q909
R927 22K
2SA564
R946 1K
R941 620
VR902 2K(B)
24
26
C909 0.1/25
C911 0.1/25
R921 22K
Q911
R929 2.2K
R945 10K
R939 15K
15
VR904 10K(B)
12
RWS-062, No.Q
RWS-063, No.Q
RWS-062, No.R
RWS-063, No.R
22
D905 MV-3
R942 18K
25
R938 18K
VR903 2K(B)
C910 0.1/25
R916 22K
R915 10K
R910 47K
Q912 2SC828
23
R937 47K
R940 39K
R944 10K
D903 1S1588
TP
R943 20K
R947 1K
D902 1S1588 or 1S2473
C915 0.0047/50
SF1R3G41 SCR901
17
C901 3.3/350
R914 82
Q905 2SC828
R911 27K
C917 7500P/50
VR901 1K(B)
R913 1.5K
Q904 2SC828
R904 5.6K
R912 1.5K
IC901 TA7061AP
R907 220
R908 2.2K
R909 33K
21
R932 220
R905 5.6K
C906 33/16
R933 3.3K
33
D901 SIRBA20
Q902 2SC496 or 2SC1567
R903 1.2K
C907 10/16
R906 1K
R948 100 (1/2W)
C920 0.0018/50 (MP)
R901 100 (1/2W)
R902 10K
Q903 2SC828
2
RWS-062, No.B
RWS-063, No.B
C905 10/16
C914 4.7/25
29
C902 47/35
C903 33/25
ZD901 HZ-7B
C904 0.47/50
C913 0.01/50
18
28
34
1
RWS-062, No.A
RWS-063, No.A
31
9
11
10
8
7
6
5
4
3
CONNECTOR
RWS-062, No.E
RWS-063, No.E
RWS-062, No.G
RWS-063, No.G
RWS-062, No.F
RWS-062, No.F
M
CM
FG
S
CM: Capstan motor
FG: Frequency generator

The Measurement Voltage of Servo Amplifier (RWG-068)

- The number of measurement points are indicated on page 89.
- The motor is non load situation.
- Prepare the high input impedance meter for measure the points 13 ~ 22.

Measurement point	Measurement Voltage (V)
1	15.0
2	15.6
3	7.7
4	7.0
5	10.8
6	7.6
7	2.0 (DC ingredient)
8	Fig. 33
9	Fig. 34
10	Fig. 35
11	Fig. 36
12	Fig. 37
13	6.1 (DC ingredient)
14	6.1 (DC ingredient)
15	10.8
16	5.6
17	4.8
18	4.9
19	5.5
20	14.1
21	1.42
22	14.8
23	0.7 (0.66)
24	0.14 (0.11)
25	14.6 (14.7)
26	0.71 (0.56)
27	15
28	Fig. 38
29	10.8
30	10.1
31	15.0

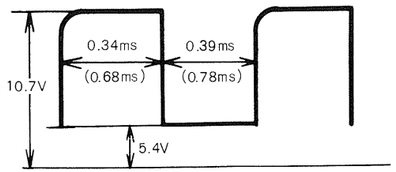


Fig. 33

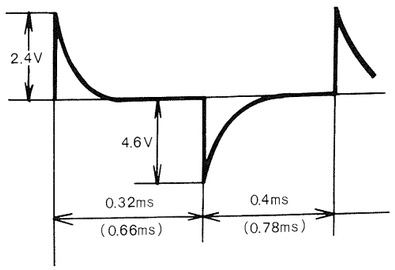


Fig. 34

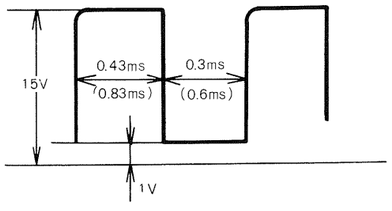


Fig. 35

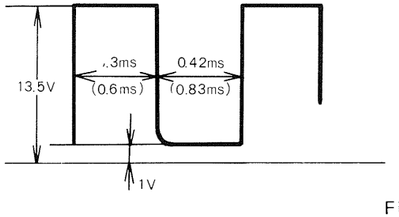


Fig. 36

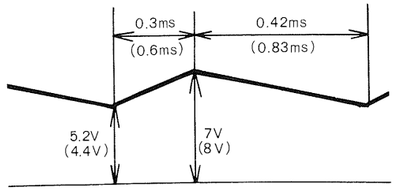


Fig. 37

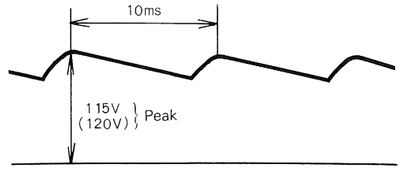


Fig. 38

Parts List of Servo Amplifier Assembly (RWG-068)

CAPACITORS

Symbol	Description			Part No.
C901	Electrolytic	3.3	350V	RCH-029
C902	Electrolytic	47	35V	CEA 470P 35
C903	Electrolytic	33	25V	CEA 330P 25
C904	Electrolytic	0.47	50V	CEA 0R47P 50
C905	Electrolytic	10	16V	CEA 100P 16
C906	Electrolytic	33	16V	CEA 330P 16
C907	Electrolytic	10	16V	CEA 100P 16
C908	Electrolytic	2.2	25V	RCH-032
C909	Electrolytic	0.1	25V	CSSA 0R1M 25
C910	Electrolytic	0.1	25V	CSSA 0R1M 25
C911	Electrolytic	0.1	25V	CSSA 0R1M 25
C912	Electrolytic	4.7	25V	RCH-031
C913	Mylar	0.01	50V	CQMA 103K 50
C914	Electrolytic	4.7	25V	CEA 4R7P 25
C915	Mylar	0.0047	50V	CQMA 472K 50
C916	Mylar	0.022	50V	CQMA 223K 50
C917	Styrol	0.0075	50V	RCE-027
C918	Electrolytic	2.2	25V	RCH-032
C919	Electrolytic	2.2	25V	RCH-032
C920	Mylar	0.0018	50V	CQMA 182K 50
C921	Metallized paper	2.5	250V	
C922	Electrolytic	6.8	125V	

RESISTORS

Symbol	Description			Part No.
VR901	Semi-fixed	1k-B		RCP-036
VR902	Semi-fixed	2k-B		RCP-034
VR903	Semi-fixed	2k-B		RCP-034
VR904	Semi-fixed	10k-B		RCP-035
R901	Carbon film	100	½W	RD½PSF 101K
R902	Carbon film	10k		RD¼PSF 103K
R903	Carbon film	1.2k		RD¼PS 122J
R904	Carbon film	5.6k		RD¼PS 562J
R905	Carbon film	5.6k		RD¼PS 562J
R906	Carbon film	1k		RD¼PS 102J
R907	Carbon film	220		RD¼PS 221J
R908	Carbon film	2.2k		RD¼PS 222J
R909	Carbon film	33k		RD¼PS 333J
R910	Carbon film	47k		RD¼PS 473J
R911	Carbon film	27k		RD¼PS 273J
R912	Carbon film	1.5k		RD¼PS 152J
R913	Carbon film	1.5k		RD¼PS 152J
R914	Carbon film	82		RD¼PS 820J
R915	Carbon film	10k		RD¼PS 103J
R916	Carbon film	22k		RD¼PS 223J
R917	Carbon film	10k		RD¼PS 103J
R918	.....			.....

Symbol	Description			Part No.
R919	Carbon film	22k		RD¼PS 223J
R920	Carbon film	39k		RD¼PS 393J
R921	Carbon film	22k		RD¼PS 223J
R922	Carbon film	3.9k		RD¼PS 392J
R923	Carbon film	3.9k		RD¼PS 392J
R924	Carbon film	3.3k		RD¼PS 332J
R925	Carbon film	22k		RD¼PS 223J
R926	Carbon film	12k		RD¼PS 123J
R927	Carbon film	22k		RD¼PS 223J
R928	Carbon film	10k		RD¼PS 103J
R929	Carbon film	2.2k		RD¼PS 222J
R930	Carbon film	270		RD¼PS 271J
R931	Carbon film	680		RD¼PS 681J
R932	Carbon film	220		RD¼PS 221J
R933	Carbon film	3.3k		RD¼PS 332J
R934	Carbon film	150k		RD¼PS 154J
R935	Metal oxide	51k		RN¼PS 513G
R936	Metal oxide	82k		RN¼PS 823G
R937	Metal oxide	47k		RN¼PS 473G
R938	Metal oxide	18k		RN¼PS 183G
R939	Metal oxide	15k		RN¼PS 153G
R940	Metal oxide	39k		RN¼PS 393G
R941	Carbon film	620		RD¼PS 621J
R942	Carbon film	18k		RD¼PS 183J
R943	Carbon film	20k		RD¼PS 203J
R944	Carbon film	10k		RD¼PS 103J
R945	Carbon film	10k		RD¼PS 103J
R946	Carbon film	1k		RD¼PS 102J
R947	Carbon film	1k		RD¼PS 102J
R948	Carbon film	100	½W	RD½PSF 101K

SEMICONDUCTORS

Symbol	Description	Part No.
IC901	IC	TA7061 AP
Q901	Transistor	2SC792
Q902	Transistor	2SC496 Y or O
Q903	Transistor	2SC828 R
Q904	Transistor	2SC828 R
Q905	Transistor	2SC828 R
Q906	Transistor	2SC828 R
Q907	Transistor	2SC828 R
Q908	Transistor	2SA564 Q
Q909	Transistor	2SC828 R
Q910	Transistor	2SA564 Q
Q911	Transistor	2SA564 Q
Q912	Transistor	2SC828 R

Symbol	Description	Part No.
D901	Diode	SIRBA 20
D902	Diode	1S1588 or 1S2473
D903	Diode	1S1588
D904	Diode	SV-4A
D905	Diode	MV-3
ZD901	Zener diode	HZ-7B
SCR901	Thyristor	SFIR3G41

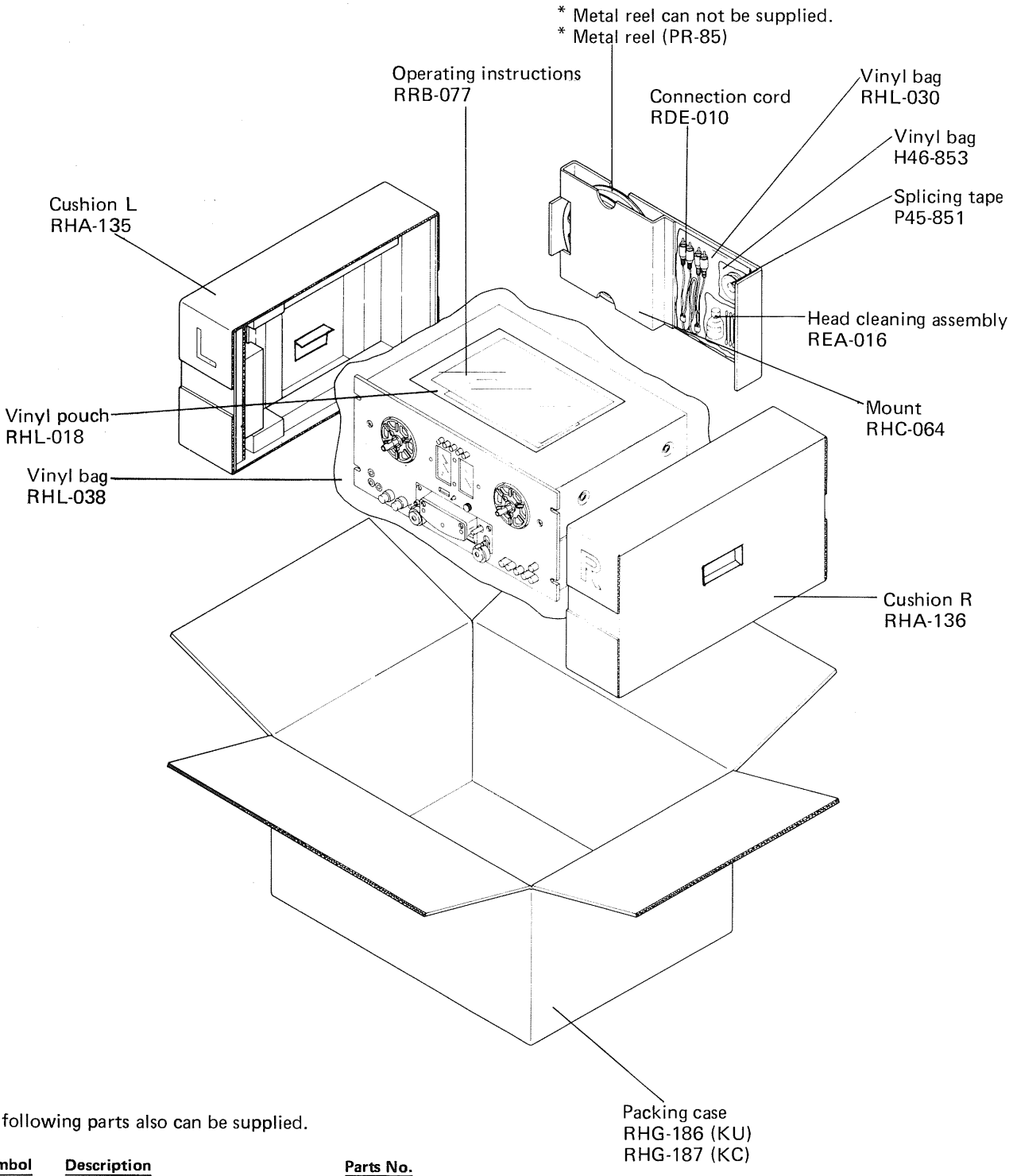
OTHERS

Symbol	Description	Part No.
	Tr socket	AKH-001
	Connector socket assembly	RKP-019
	Connector	RKP-020
	Insulator sheet	REC-247

List of Changed Parts for Factory Modification

Symbol	Description	Part No.

14. PACKING



The following parts also can be supplied.

Symbol	Description	Parts No.
	Reel pad	REB-210
	Reel pad instructions	RRF-040

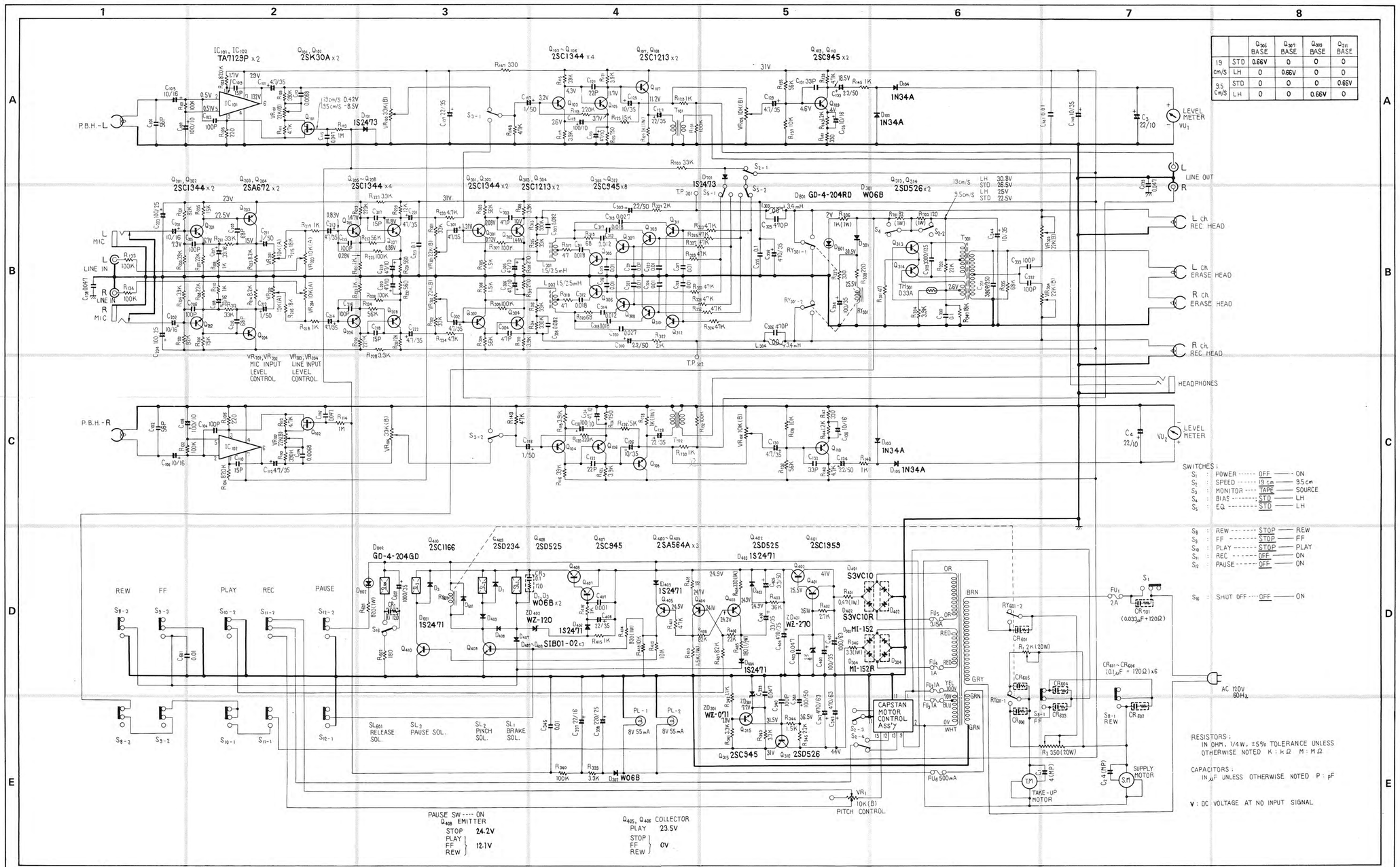
3-MOTOR 3-HEAD
TAPE DECK

RT-701

KCU

PIONEER

		Q_{305} BASE	Q_{307} BASE	Q_{309} BASE	Q_{311} BASE
19 cm/s	STD	0.66V	0	0	0
	LH	0	0.66V	0	0
9.5 cm/s	STD	0	0	0	0.66V
	LH	0	0	0.66V	0



SWITCHES :

S_1	:	POWER ----	OFF	ON
S_2	:	SPEED ----	19 cm	9.5 cm
S_3	:	MONITOR ----	TAPE	SOURCE
S_4	:	BIAS ----	STD	LH
S_5	:	EQ ----	STD	LH
S_6	:	REW ----	STOP	REW
S_7	:	FF ----	STOP	FF
S_8	:	PLAY ----	STOP	PLAY
S_9	:	REC ----	OFF	ON
S_{10}	:	PAUSE ----	OFF	ON
S_{16}	:	SHUT OFF ----	OFF	ON