



Shown in this Photo is Model CT-F605.

Service Manual

CASSETTE TAPE DECK

CT-F600
CT-F605

 **PIONEER®**

MODEL CT-F600 COMES IN SIX VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KC	AC 120V only	Canada model
HE	AC 220V and 240V (Switchable)	Europe model
HB	AC 220V and 240V (Switchable)	United kingdom model
HP	AC 220V and 240V (Switchable)	Oceania model
D	AC 120V, 220V and 240V (Switchable)	General export model
D/G	AC 120V, 220V and 240V (Switchable)	U.S. military model

MODEL CT-F605/KU

Type	Voltage	Remarks
KU	AC 120V only	U.S.A. model

- This service manual is applicable to the CT-F600/KC, CT-F605/KU. For servicing of the other types, please refer to the additional service manuals.

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1. SPECIFICATIONS

Systems	Compact cassette, 2-channel stereo
Motor	Electronically-controlled DC motor x 1
Heads	"Hard Permalloy" recording/playback head x 1 Ferrite erasing head x 1
Fast Winding Time	Approximately 90 seconds (C-60 tape)
Wow and Flutter	No more than 0.05% (WRMS)
Frequency Response	Standard, LH tapes; 20 to 15,000Hz (40 to 13,000Hz ± 3 dB), Ferrichrome tape: 20 to 16,000Hz (40 to 15,000Hz ± 3 dB) Chromium dioxide tape: 20 to 16,000Hz (40 to 15,000Hz ± 3 dB)
Signal-to-Noise Ratio	Dolby NR OFF: More than 58dB Dolby NR ON: More than 68dB (over 5kHz, standard, LH tapes)
Harmonic Distortion	No more than 1.2% (0dB)
Inputs (Sensitivity/Maximum allowable input/Impedance)	
	MIC (L, R); 0.3mV/100mV/10kilo ohms, 6mm diam. jacks (Reference MIC impedance; 250 ohms to 10kiloohms)
	LINE (2-channel stereo); 55mV/25V/75 kilohms, pin jacks
	REC/PLAY x 1; Input & Output, 15mV/5V/9.1 kilohms
Outputs (Reference level/Load impedance)	
	LINE (2-channel stereo); 450mV/50 kilohms, pin jacks
	REC/PLAY x 1; 450mV/50 kilohms
	Headphones x 1; 70mV/8 ohms, 6mm diam. jack
Semiconductors	
Amplifier Section	Transistors x 30, Diodes x 15, ICs x 4
Motor control section ...	IC x 1, Diode x 1
Subfunctions	
	• Dolby NR system (ON-OFF) with LED indicator lamp
	• Tape Selector (STD/FeCr/CrO ₂)
	• Standby mechanism with unattended recording
	• Full automatic stop mechanism
	• Fluorescence tube level meter (-20 to +8dB)
Power Requirements	AC 120V, 50/60Hz
Power Consumption	14 watts
Dimensions	420(W) x 143(H) x 290(D) mm Max. 16-9/16 x 5-5/8 x 11-7/16 in
Weight	5.5 kg (12 lb)
Furnished parts	Stereo connecting cord with pin plugs x 2 Head cleaning swabs x 3

NOTES:

1. Reference Recording Level: Meter 0dB indicating level (160 nwb/m magnetic level = Philips cassette reference level)
2. Reference Signal: 333Hz
3. Wow & Flutter: • JIS [3kHz, with acoustic compensation (weighted), rms value] DIN [3,150Hz, with acoustic compensation (weighted) PEAK value]: DIN 45507
4. Frequency Response: • Measured at the third harmonic distortion 3% level, weighted
5. Signal-to-Noise Ratio: • Measured at +4dB level [250nwb/m magnetic level = DIN 45513 specified reference level]. DIN is DIN 45500 (weighted)
6. Sensitivity: Input level (mV) required for reference recording level with input (REC) controls set to maximum.
7. Maximum Allowable Input: While decreasing settings of input (REC) level controls and increasing level at input jacks, this is the maximum input level (mV) at the point where recording amplifier output waveform becomes clipped.
8. Reference Output Level: Playback output level when meter indicates 0dB.
9. This model doesn't employ with a recording/playback connector (DIN-type).

NOTE:

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

2. FRONT PANEL FACILITIES

POWER SWITCH

Power is supplied to the deck which this switch is set to ON, and the level meter lights up.

CASSETTE HOLDER

The cassette tape is loaded into this holder. When the STOP/EJECT (■) lever is depressed, the holder will jump forward. To close it, push the top part of the holder back into position until it is locked.

RECORD INDICATOR

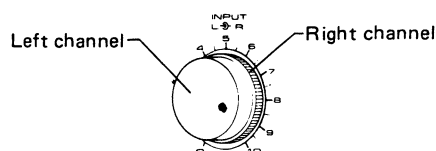
This light comes on when the play (▶) and REC levers are depressed together to indicate that the cassette deck is now set to the recording mode.

TIMER START SWITCH

Set this switch to ON when you are making use of the unattended recording or wake-up playback function together with the timer.

INPUT LEVEL CONTROLS

Use these controls to adjust the input signal from the MIC jacks and the rear panel INPUT jacks. Turning them to the right increases the signal level. They are coupled to the left and right channels when rotated, but you can also use them to adjust the right channel and left channel independently by rotating the appropriate control and holding the other in position.

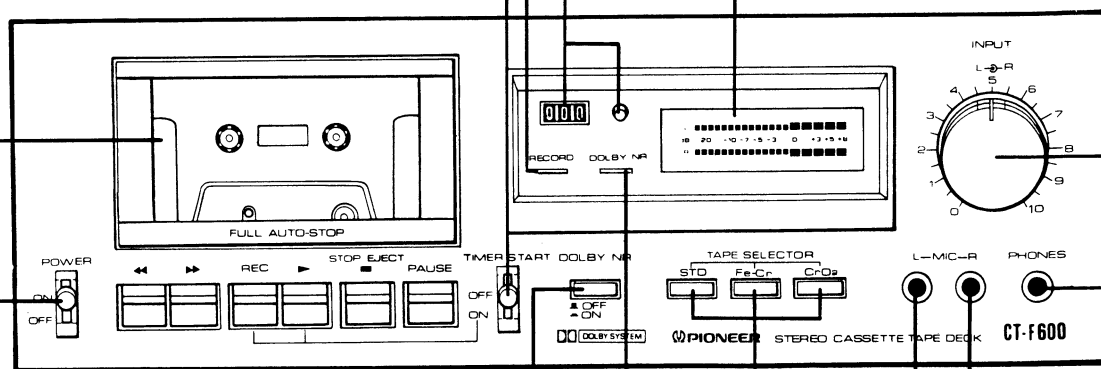


COUNTER RESET BUTTON/TAPE COUNTER

Depress this button to reset the tape counter display to "000." Tape counter indicates the position of the tape run.

LEVEL METERS

These indicate the input level during recording and the output level during playback.



DOLBY NR SWITCH

Push this button to ON for recording with the built-in Dolby noise reduction system and for the playback of tapes which have been recorded using the Dolby NR system.

DOLBY NR INDICATOR

This light comes on when the DOLBY NR switch is set to ON to indicate that the cassette deck is now set up for recording using the Dolby NR system or playback using the Dolby NR system.

TAPE SELECTOR SWITCHES

Depress the switch which corresponds to the type of tape you are using.

- STD: For ordinary tapes, and LH tapes.
- Fe-Cr: For ferrichrome tapes
- CrO₂: For chrome tapes

MIC JACKS

These are the input jacks for microphone recording. Plug the left channel microphone into L and the right channel microphone into R.

NOTE:

Disconnect your microphones from the MIC jacks when you are not using them, otherwise you will not be able to record to LINE and DIN input terminals.

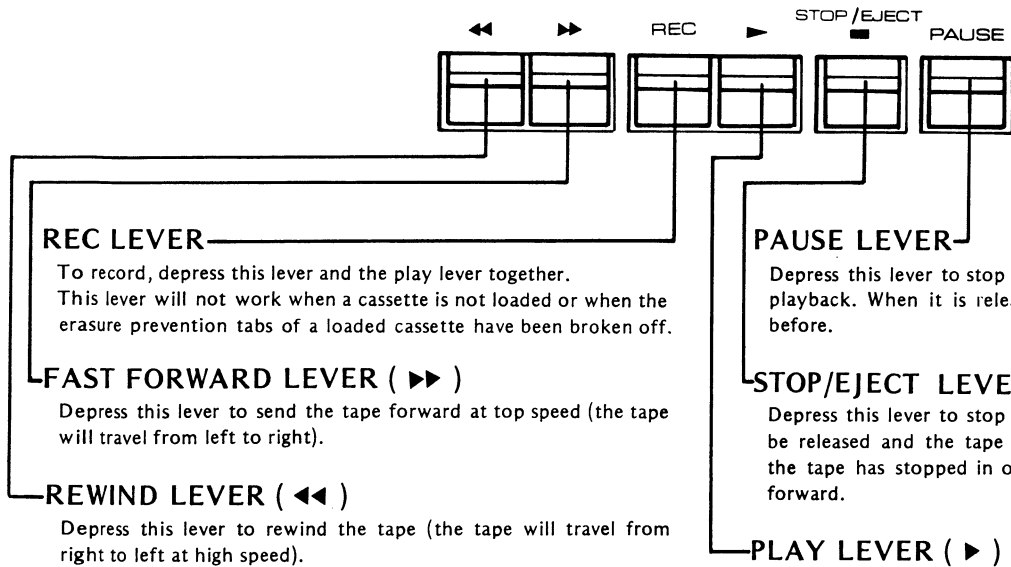
HEADPHONE JACK

This is the output jack for stereo headphones. Plug your headphones into this jack when you want to monitor the quality of a recording or when you want to listen to a tape privately.

NOTE:

Do not connect a microphone to this Jack as the microphone may be damaged.

OPERATING LEVERS



NOTES:

1. Apart from the play and REC levers, do not depress any of the levers simultaneously.
2. The operating levers will not return to their original positions even when the power is switched OFF.

3. DISASSEMBLY

External Covers

1. Remove the bonnet by undoing screws (1).
2. Remove the front panel by undoing screws (2).
3. Remove the panel stay by undoing screws (3).
4. Remove the transport mechanism by undoing screws (4).
5. Remove the INPUT VOLUME control by undoing screw (5).

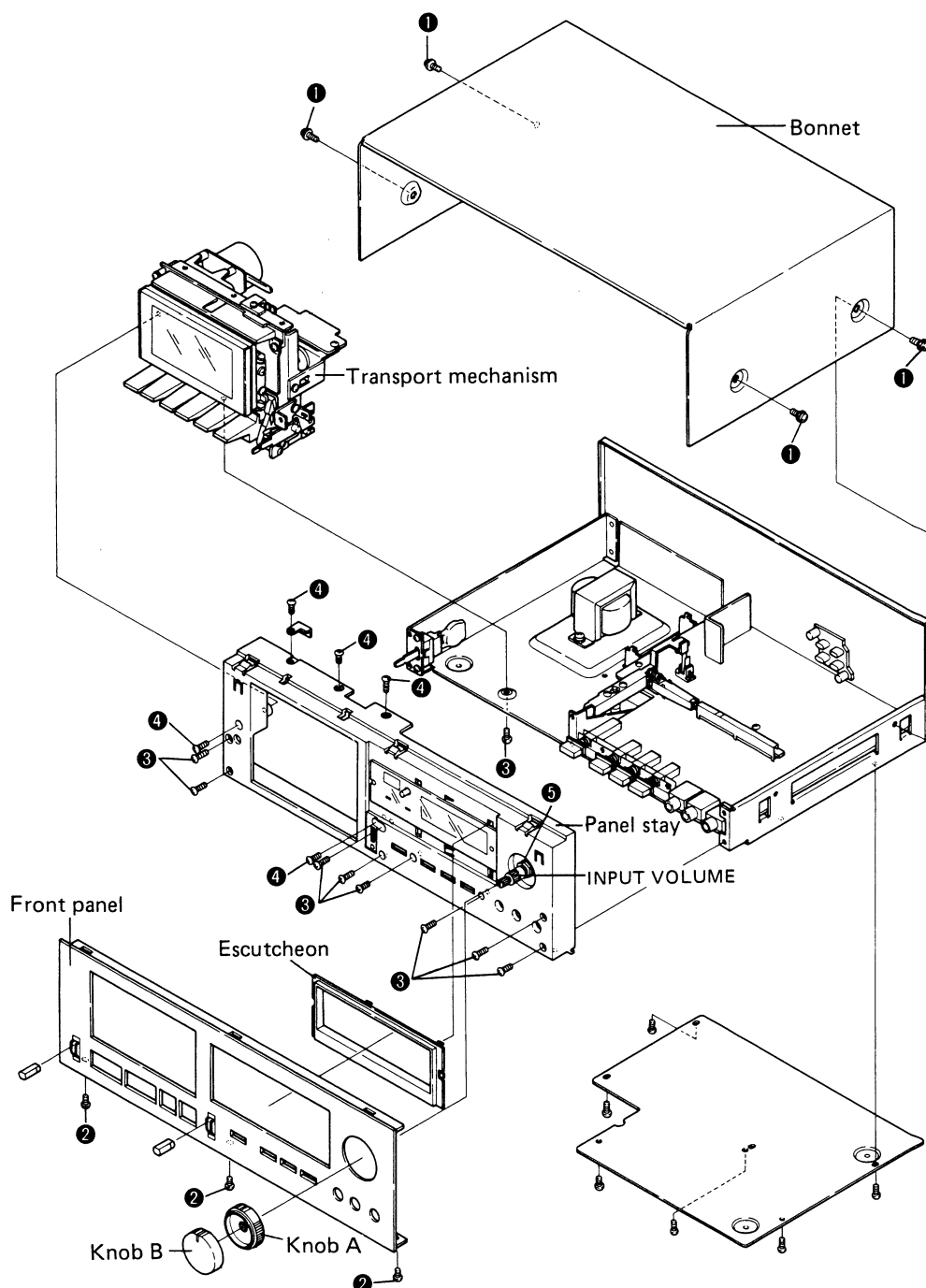


Fig. 3-1 Removal of Panel Stay and Transport Mechanism

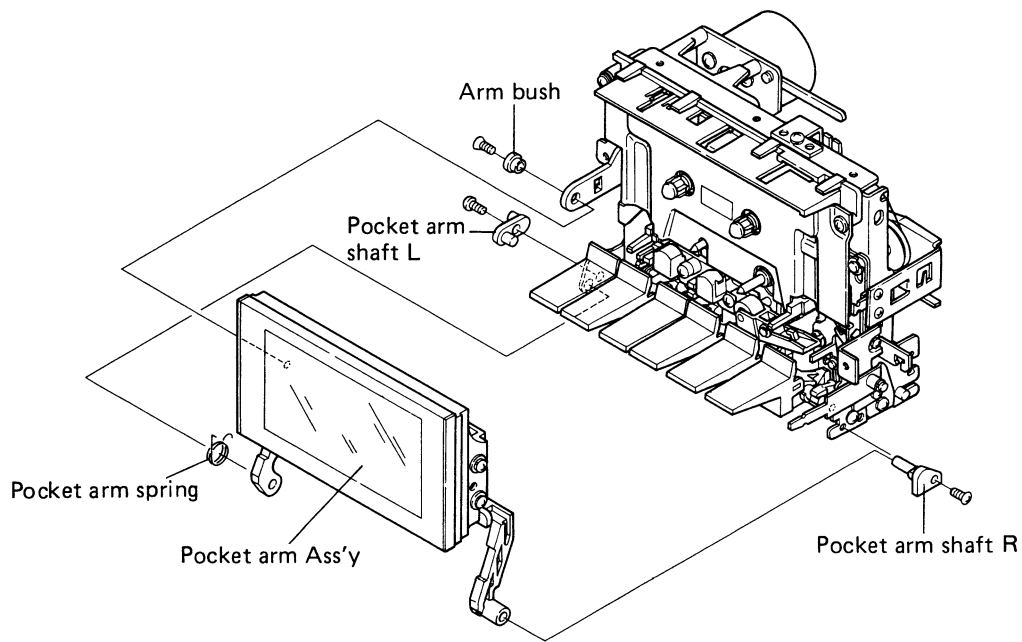


Fig. 3-2 Removal of Pocket Arm Ass'y

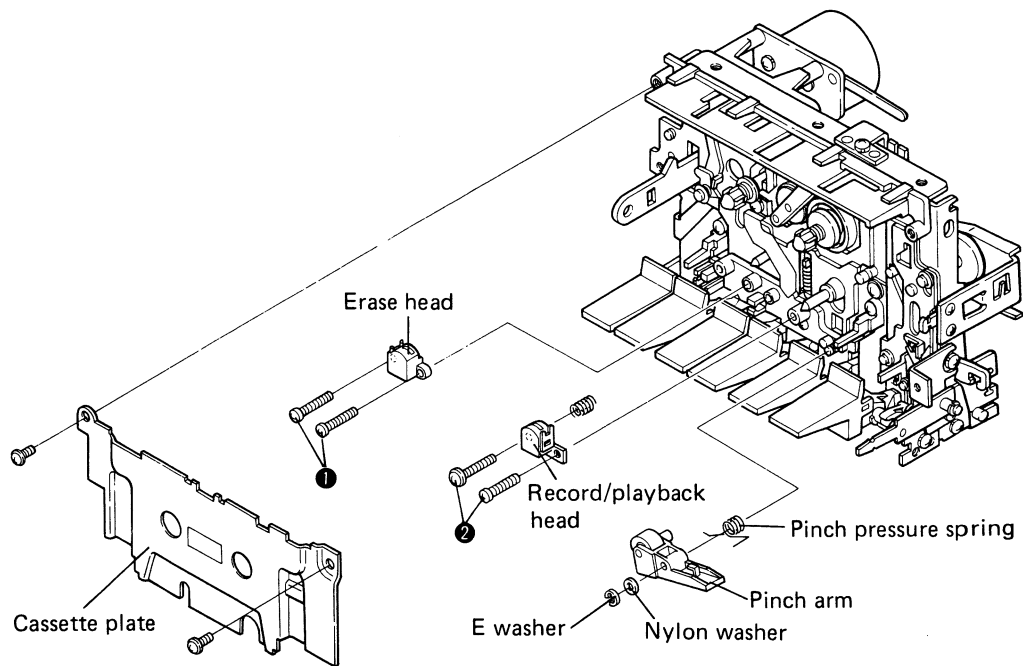


Fig. 3-3 Removal of Pinch Roller, Erase Head and Record/Playback Head

Erase Head and Record/Playback Head

1. Undo screws (1) and disconnect the wiring to replace the erase head.
2. Undo screws (2) and disconnect the relevant wiring to replace the record/playback head. After mounting the new head, adjust all electrical systems as described.

Pinch Roller

1. Undo the screws to remove the cassette plate.
2. Remove the E washer and nylon washer, and then the pinch pressure spring by pushing downwards.

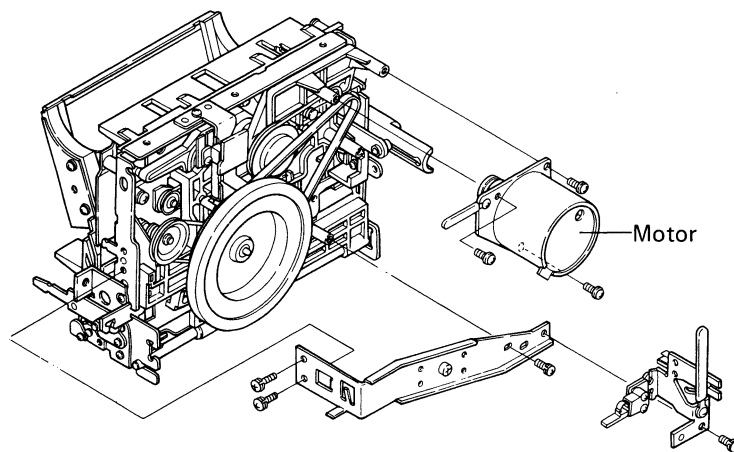


Fig. 3-4 Disassembly of Transport Mechanism 1

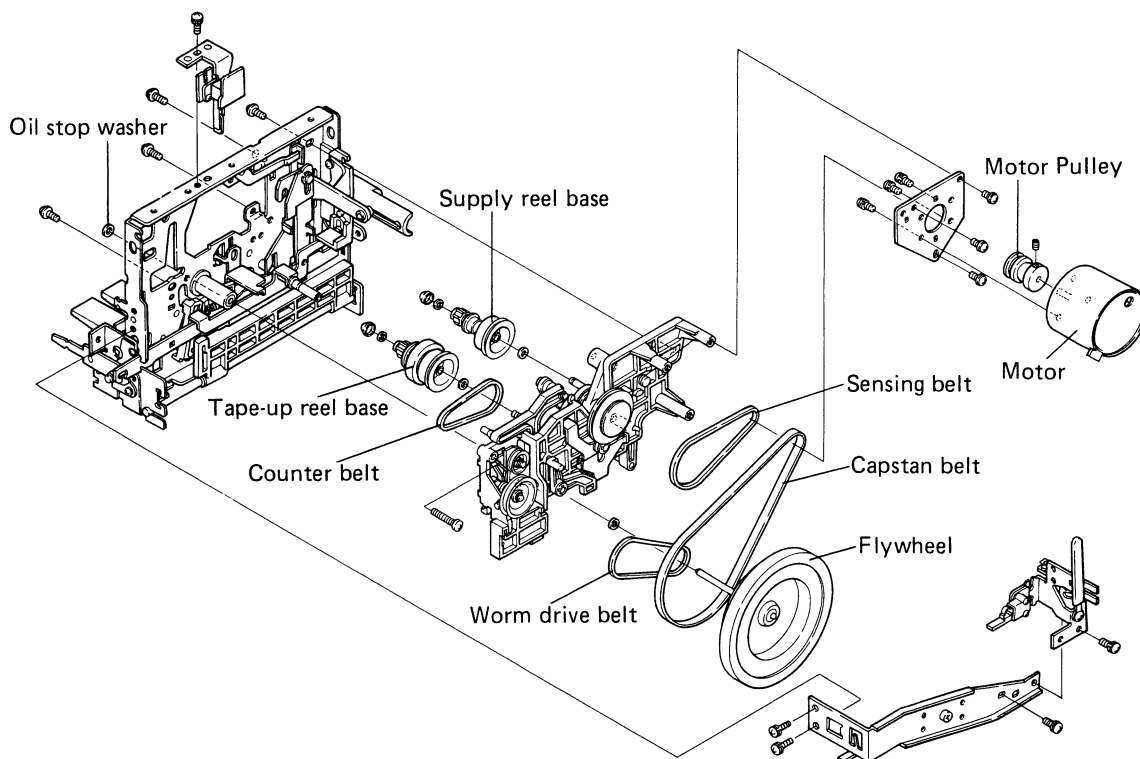


Fig. 3-5 Disassembly of Transport Mechanism 2

Flywheel and Capstan Belt

1. When the flywheel ass'y is removed, the oil stop washer in the front of the transport mechanism is also released. Be particularly careful not to misplace this small but important component part.
2. When removing the capstan belt, protect the belt from all forms of oil smears and spillages (the use of work gloves is recommended).
3. The flywheel ass'y should be carefully removed after first removing the capstan belt and accompanying screws.

4. Since both sides of the capstan belt have been polished, either side may be used when putting the assembly back together again.

Reel Base Ass'y

1. To remove the cassette door and plate ass'y plus the take-up reel base, first remove the counter belt. To remove the supply reel base, first remove the sensing belt.
2. The reel bases may be removed after removing the corresponding cap and washer for each reel base.

Motor

1. The motor is removed by simply undoing the relevant screws.
2. When attaching the motor pulley to the motor shaft, ensure that there is a gap of about 0.3 to 0.5mm between motor and pulley (use spacers if necessary). Tighten the hexagonal setscrew securely, and apply screw-lock (see Fig. 3-6).
3. When mounting the motor, do not apply any undue pressure to the motor shaft. Furthermore, secure the lock screws with "Screw-Tight Green" No. 300.

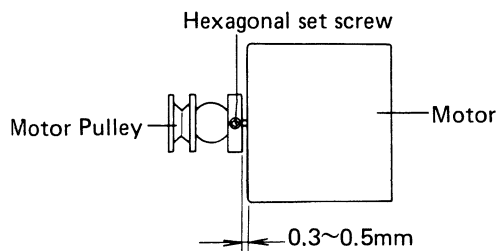


Fig. 3-6 Motor Pulley Attachment

Lubrication of Capstan Shaft

1. Carefully remove the flywheel and lay it down with capstan shaft pointing upwards. Apply a small amount of lubrication oil in the designation position (see Fig. 3-7).
2. Be particularly careful not to spill oil on any other parts during this operation. The recommended oil type is General Turbinol No. 30.
3. After lubrication, replace the bearing washer back over the capstan shaft, and carefully return the shaft to the shaft bearing. Clean the protruding portion of shaft with "Daiflon", and finally replace the oil stop washer.

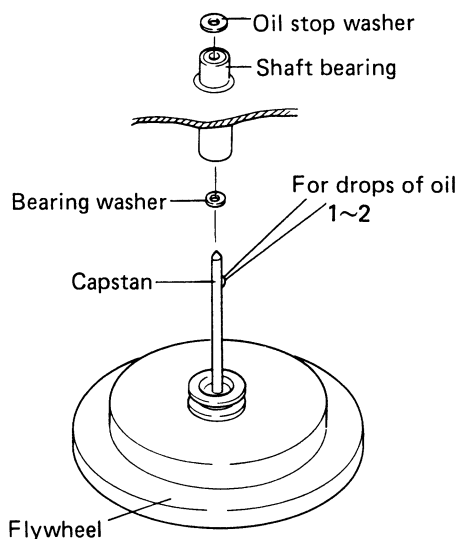


Fig. 3-7 Lubrication of Capstan Shaft

Transport Mode Keys

1. Individual transport mode keys are removed by carefully forcing the rear catch portions sideways with a screwdriver, and pulling the key forwards (as shown in Fig. 3-8). Do not apply too much force since the catch portions may possibly crack.
2. To replace the keys, simply reverse the operation.

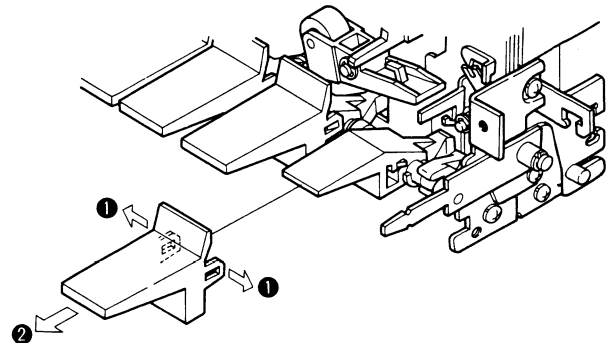
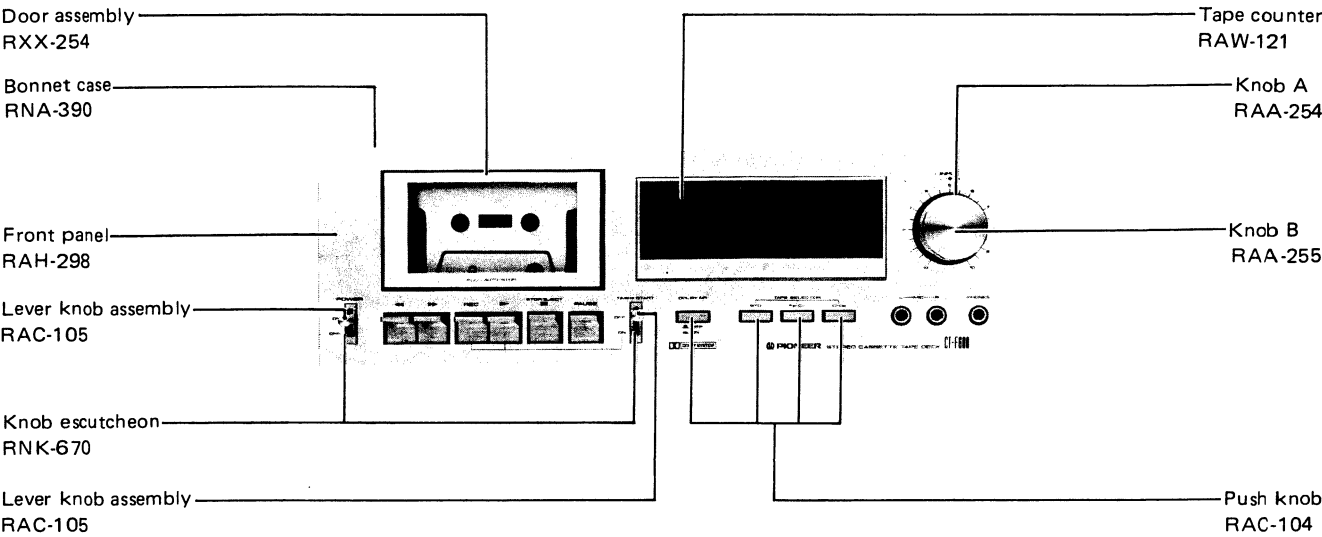


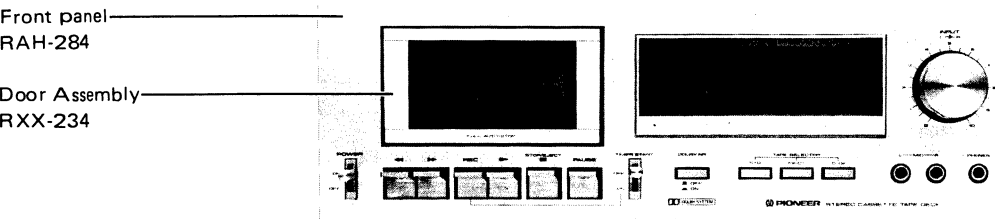
Fig. 3-8 Replacement of Transport Mode Keys

4. PARTS LOCATION

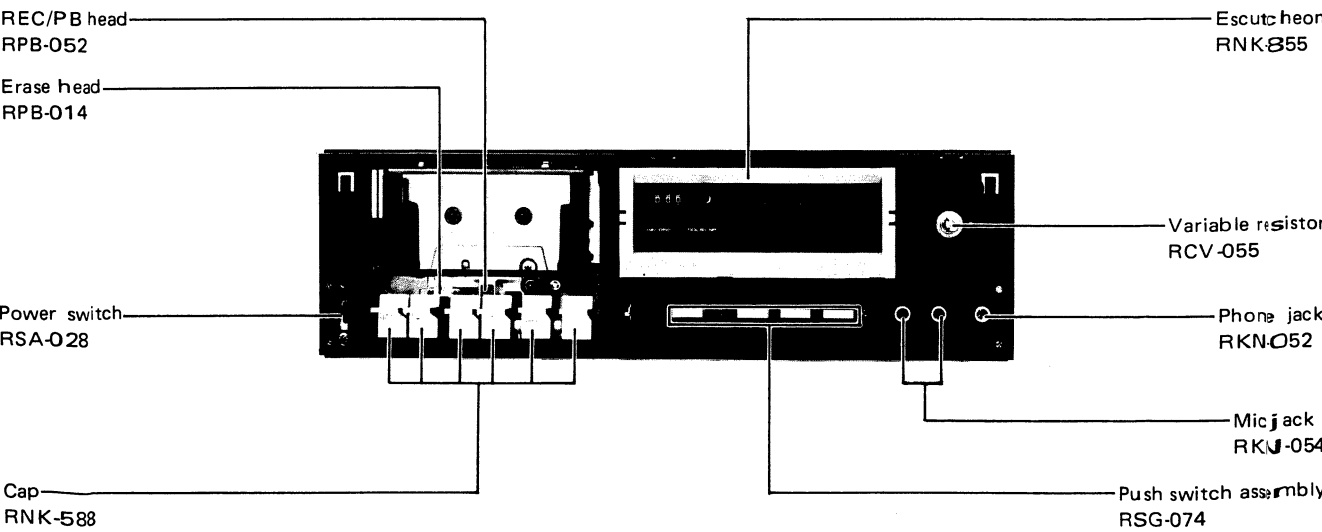
■ FRONT PANEL VIEW CT-F600/KC



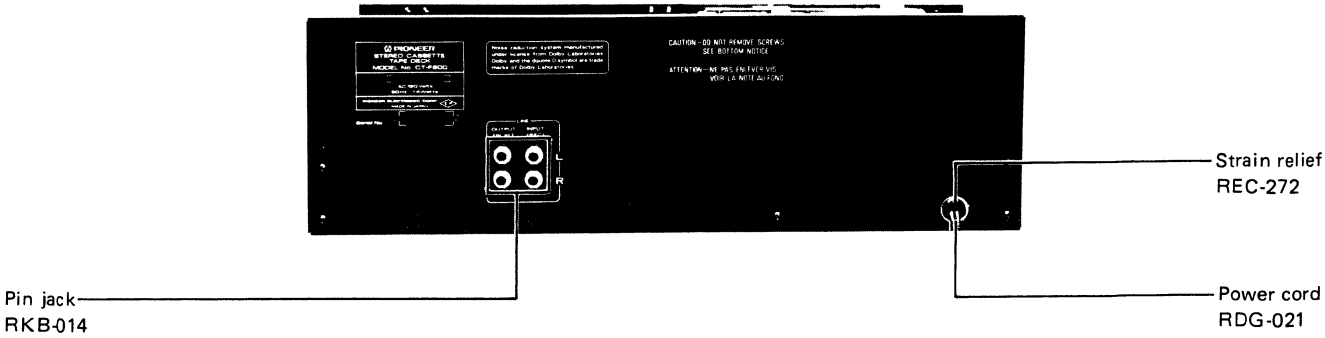
■ FRONT PANEL VIEW CT-F605/KU



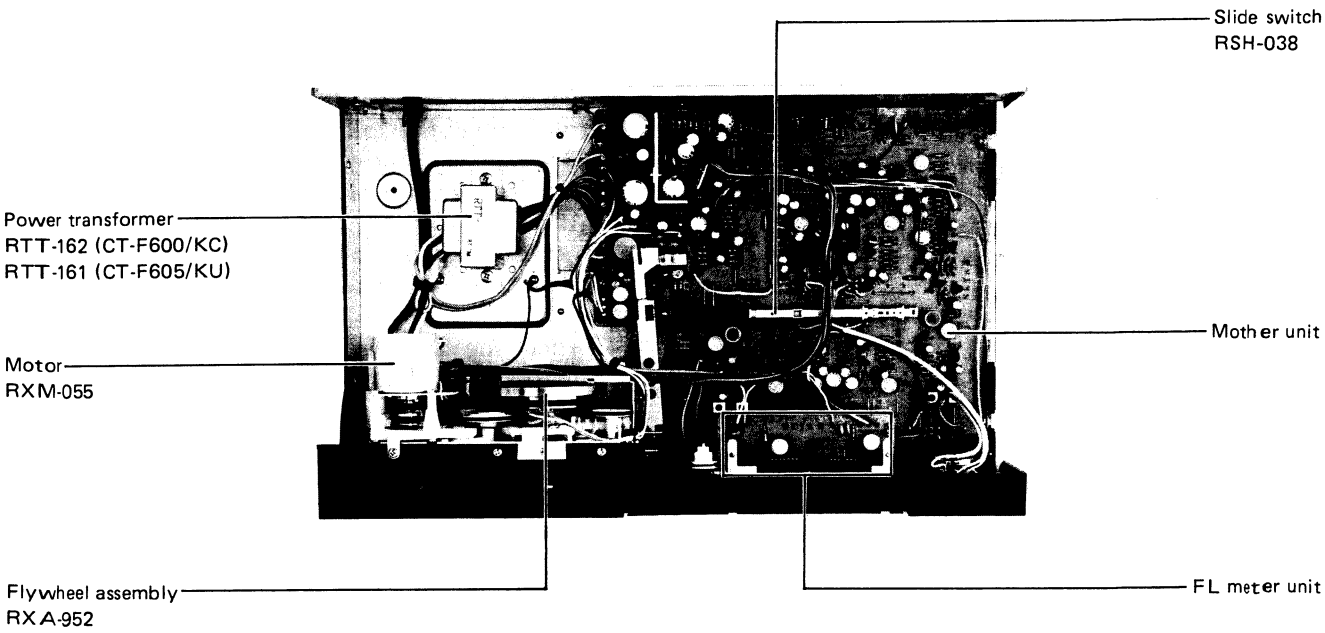
■ FRONT VIEW WITH FRONT PANEL REMOVED



■ REAR PANEL VIEW



■ TOP VIEW WITH BONNET REMOVED



5. MECHANICAL DESCRIPTIONS

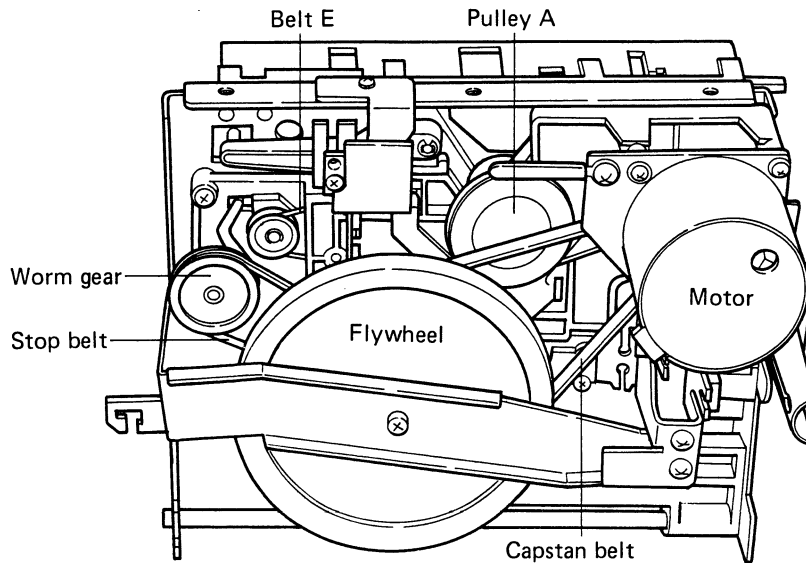


Fig. 5-1 Mechanical Parts Name

5.1 PLAY OPERATION

1. When the PLAY key is pushed, the motor switch is turned on by movement of the head base, and the motor rotates.
2. The rotation of the motor is transmitted to the flywheel by capstan belt. At the end of the flywheel shaft is the capstan. When the pinch roller is pushed against this capstan, the tape is driven at a constant speed.
3. The rotation of the motor is transmitted to pulley A (idler A) by belt B and to the take-up reel base thru idler B; the tape is then wound. Belt C connects the take-up reel base and the tape counter.

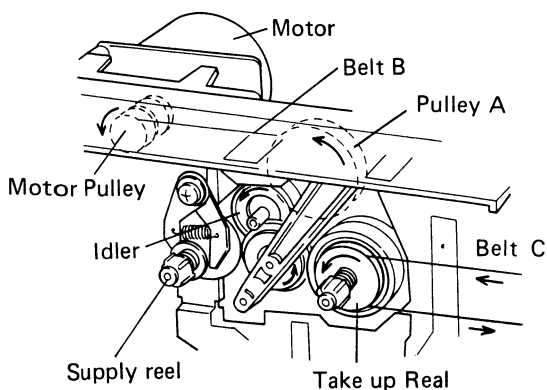


Fig. 5-2 Play Operation

5.2 AUTO-STOP OPERATION

1. The rotation of the flywheel is transmitted to a worm gear thru belt D. The worm gear rotates shaft A.

2. There are two cams on shaft A, with a projection for auto-stop between them.
3. While the tape is running, belt E transmits the rotation of the take-up reel base to plate A. There is also a projection for auto-stop on plate A, the same as on shaft A.
4. At PLAY and FF, the projection on plate A moves along the outside cam, and at REW, the projection on plate A moves along the inside cam.
5. When the tape is stopped, the projection on plate A is brought to the center by the depression in the cam. (see Fig. 5-4).
6. The projection on shaft A engages the projection on plate A, and plate A is pushed down. (see Fig. 5-5).
7. When plate A is pushed down, plate C is moved thru plate B, and the operation keys are unlocked (see Fig. 5-6).

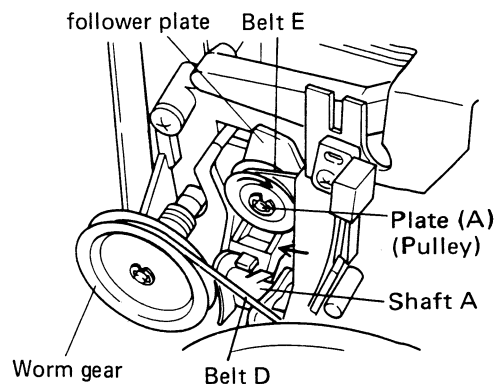


Fig. 5-3 Tape Running

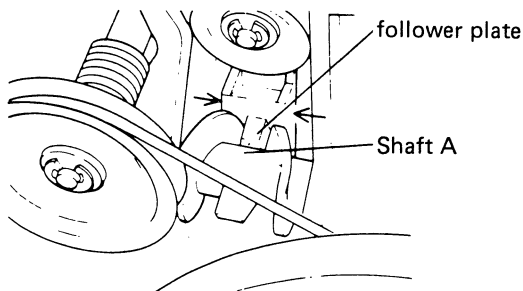


Fig. 5-4 Auto-stop Operation 1

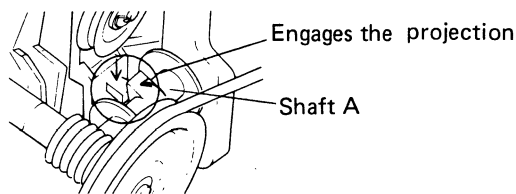


Fig. 5-5 Auto-stop Operation 2

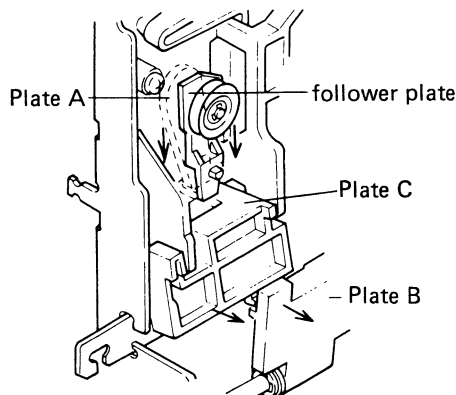


Fig. 5-6 Auto-stop Operation 3

5.3 FF. REW

1. When the FF key is pushed, the rotation of idler A (pulley A) is transmitted to the take-up reel base thru idler C.
2. Since the pinch roller is separated from the capstan at FF operation, the tape is wound at high speed (see Fig. 5-7).
3. When the REW key is pushed, rotation of idler A is transmitted directly to the supply reel base, and the tape is wound at high speed (see Fig. 5-8).

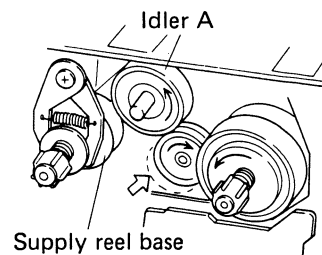


Fig. 5-7 FF Operation

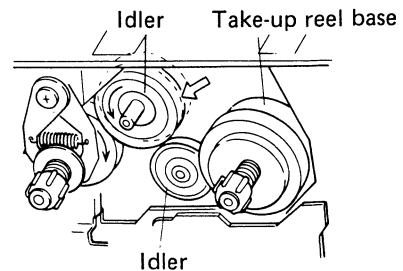


Fig. 5-8 REW Operation

5.4 Auto-Start Operation

Timer recording is possible by pressing the PLAY and REC keys, and setting the TIMER START key in the ON position.

When the CT-F600 power supply is turned on by means of an audio timer, the tape deck motor will be switched on. But since the TIMER START key is on, and the TU idler still disengaged, the take-up reel will not commence to rotate. Consequently, the projecting part of the follower plate will be in towards the center (as during auto-stop mode) engaged with the projection on the cam-type worm wheel. The plate A which moves together with the follower plate drops down in a diagonal direction to release the lock arm, thereby releasing the standby plate (see Fig. 5-9). The pinch roller then engages the capstan, and the TU idler engages the fast idler and take-up reel to commence tape transport at a constant speed.

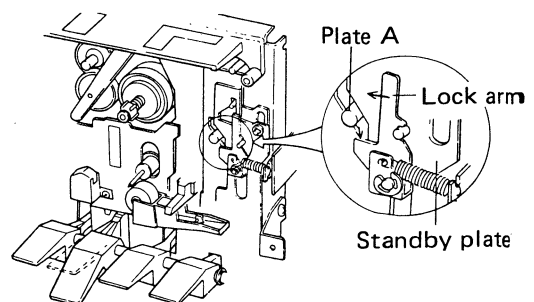


Fig. 5-9 Auto-start Operation

6. CIRCUIT DESCRIPTION

6.1 RECORDING/PLAYBACK CIRCUIT

Signal Path during Recording Mode

The input signal from MIC is amplified to a constant level by the mic amplifier (Q_{101} and Q_{102}), and then passed via the input level control, flat amplifier (Q_{103} and Q_{104}) and MPX filter to be applied to the Dolby NR IC (PA4005).

The input signal from LINE IN is passed directly to the input level control, and on to the flat amplifier, MPX filter, and Dolby NR IC.

The frequency response of the Dolby NR IC output is then adjusted by the recording ampli-

fier (Q_{106}) equalizer circuit according to the type of tape being employed, the signal subsequently being applied to the recording head.

Signal Path during Playback Mode

The signal from the PB HEAD is applied to the playback equalizer (Q_{101} and Q_{102}) where the frequency response is adjusted according to the type of tape. The output signal is then passed via the flat amplifier where it is amplified to a constant level before being applied to the Dolby NR circuit, and then to the LINE OUT terminals.

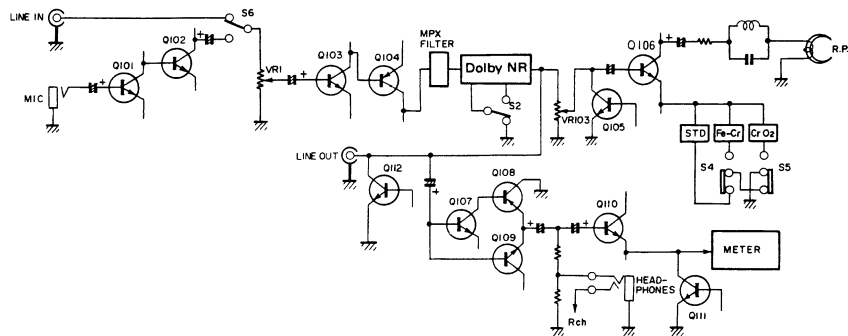


Fig. 6-1 Block Diagram of Recording Circuit

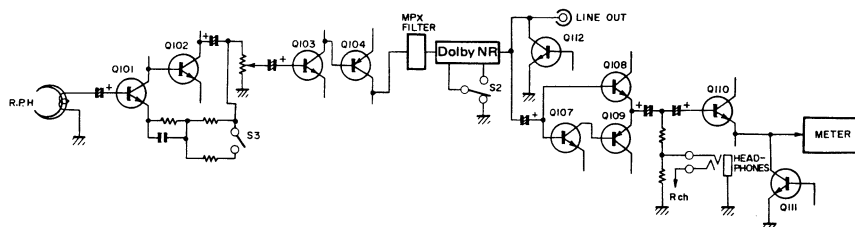


Fig. 6-2 Block Diagram of Playback Circuit

■ MIC and Playback Equalizer Amplifier (Q_{101} & Q_{102})

This 2-stage direct-coupled amplifier stage consists of 2 NPN transistors. During recording mode, the MIC input signal is amplified to a constant level with flat frequency response. During playback mode, this amplifier stage is used as the playback equalizer amplifier for adjustment of the frequency response when using CrO_2 or Fe-Cr tapes.

■ Flat Amplifier (Q_{103} & Q_{104})

A 2-stage direct-coupled amplifier is consisting of NPN and PNP transistors. Recording and playback input signals are amplified to a constant level while maintaining a flat frequency response, the output being applied to the Dolby NR circuit.

■ Recording Amplifier (Q_{106})

This single-stage NPN transistor amplifier employs a low frequency compensatory circuit in the input stage and a reverse flow trap in the output stage to block reverse flow of recording bias current.

The Q_{106} emitter is also connected to a recording equalizer circuit where the frequency response is switched according to the type of tape being employed.

■ Headphone Amplifier (Q_{107} , Q_{108} , Q_{109})

This SEPP circuit contains 1 PNP and 2 NPN transistors. The output is divided by resistors, and applied to the HEADPHONES terminals and level meters.

Dolby NR Processor

The Dolby circuit employed in this tape deck is the type B noise reduction system where the noise reduction effect is applied only in the mid to high frequency regions, achieving an improvement in playback S/N ratio of up to 10dB.

This circuit also features a Dolby NR processor IC (PA4005) developed by Pioneer. Unlike conventional Dolby NR ICs employing variable resistance elements, the PA4005 uses a voltage controlled variable gain circuit (VCA). The block diagram for this processor circuit is outlined in Fig. 6-3. The same circuitry is employed during both recording and playback modes after appropriate switching.

Operation during Recording Mode

1. The input signal is first passed through an MPX filter and buffer amplifier stage. Besides eliminating the FM broadcasting pilot signal, the MPX filter also serves as a bias trap to block the 85kHz bias signal, thereby preventing any possible misoperation of the system.
2. The buffer amplifier output is divided into 2 portions:— the main signal is applied directly to the adding amplifier, while the sub signal is applied to the side-chain amplifier and clipper before being applied to the adding amplifier where it is recombined with the main signal.
3. Besides being applied to the clipper, the side-chain amplifier output is also fed back to the input via the voltage controlled variable gain circuit and integrating circuit, thereby constituting a variable filter circuit.
4. The side-chain amplifier output is also applied to a high-pass filter whose output is rectified into a DC signal used to control the voltage controlled variable gain circuit.
5. When the level of the signal passed through the high-pass filter is low, the rectifier DC output voltage will be almost 0, and the variable filter turnover frequency will be at a minimum value. Under these conditions, the adding amplifier output level will be increased by 10dB (above 5kHz) above the main signal input level, and the dynamic range will be compressed.
6. The clipper produces a time delay in the signal applied to the voltage controlled variable gain circuit in respect to the main signal, and because it is incapable of responding to very sudden changes in level, it effectively prevents non-controlled signals from being applied to the adding amplifier.
7. When the level of the high-pass filter signal is high, the rectifier DC output voltage will also be high, thereby shifting the variable filter turnover frequency to a higher value. The level of the sub signal will be reduced to almost zero, and there will be no compression of the dynamic range.

Operation during Playback Mode

Although the operation of each stage is the same as during recording mode, the sub signal is separated after the adding amplifier output. Since this amplifier is an inversion amplifier (input and output of opposite phase) the sub signal will be of opposite phase to the main signal, and will thus form an NFB loop. The adding amplifier will thus be involved in subtraction operations.

In type B Dolby NR systems where the level is compressed and expanded within a frequency range determined by the variable filter, it is necessary to set an operational reference level in order to ensure that compression and expansion are performed with complete symmetry. This is the Dolby NR level below which there is no compression or expansion.

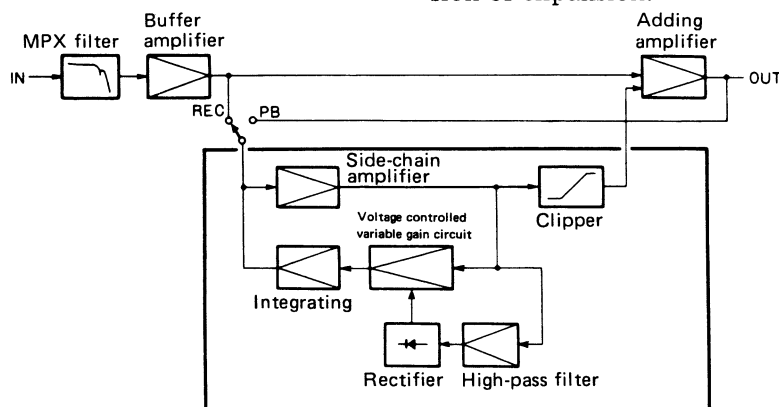


Fig. 6-3 Dolby NR Processor Circuit

6.2 MUTING CIRCUIT

See Fig. 6-4 for an outline of the muting circuit.

When Power Switch Turned ON

When the power switch is first turned on, +B is applied to R306, C310, and R307, with Q303 remaining on until C310 is charged up. And as long as Q303 is on, Q304 will also be on.

And as long as the Q304 transistor is on, +B will be applied to D302, Q304, R313, and Q112, thereby turning this latter transistor on. The LINE OUT terminals will thus be connected to ground, thereby preventing any output signal, or noise, from appearing at the LINE OUT terminals when the power switch is turned on.

During FF, REW, and STOP Modes

Whenever the FF, REW, or STOP is pressed, +B is applied to S10 (S8), R313, and Q112, thereby turning this transistor on to connect the LINE OUT terminals to ground. This again will prevent any output signal or noise from appearing at the output terminals.

During PLAY Mode

The +B applied to Q112 will be cut by S8 once the PLAY is pressed. As a result, -B will be applied to Q112 via R316, thereby turning this transistor off.

In addition, +B will be applied to Q105 via S1 and R153 to mute the REC amplifier.

During Recording Mode

The Q112 transistor is turned off in the same way as during play mode.

When S1 is turned off, the +B applied to Q105 is cut, and -B will be applied instead via R152, thereby resulting in Q105 being turned off to release the REC amplifier from muting status.

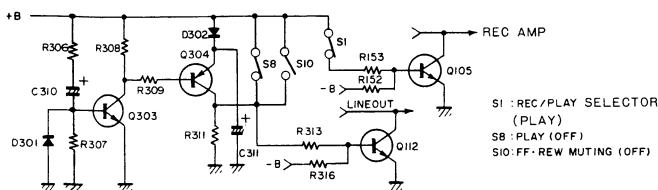


Fig. 6-4 Muting Circuit

6.3 Oscillator

This push-pull type oscillator circuit (see Fig. 6-5) supplies the recording bias current for the record head, and the erase current for the erase head. The oscillator frequency has been set to about 85kHz, a frequency which will not interfere with audio signals or AM and FM broadcasts.

If the front panel REC key is pressed without pressing the PLAY key, the REC switch S9 will be

turned on, but the PLAY switch S8 will remain in the STOP position, thereby preventing any current being passed through the oscillator circuit. (In this case, only the amplifier stage will be in "recording mode").

When the PLAY and REC keys are both pressed, the PLAY switch S8 will be switched to the PLAY position, and a current will flow through the oscillator circuit.

The switching of the recording bias for CrO2 and STD (Fe-Cr) tape changes the supply voltage applied to the oscillator circuit.

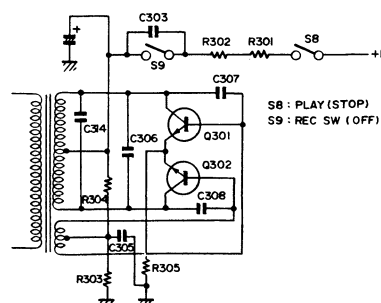


Fig. 6-5 Oscillator Circuit

6.4 Level Meters

The headphone amplifier output is amplified by the Q110 transistor, rectified by D101, and then applied to the meter drive IC (IC401). (See Fig. 6-6).

This driver IC is equipped with 12 level display comparators (note 1) used to drive the level display segments via corresponding resistors. The +B applied to one side of the comparators serves as the reference voltage for each comparator.

The reference voltage applied to each comparator is set at different values, increasing stepwise from the position of low level display to high level display. The DC component rectified by D101 is compared with each reference voltage level, resulting in corresponding segments being lit up if the DC component is higher than the reference voltage.

NOTE 1:

Level display segments for levels up to 0dB are combined in segment pairs.

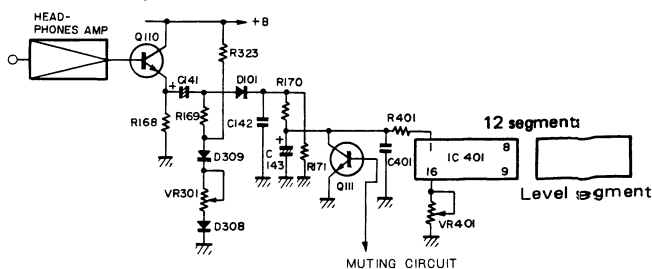
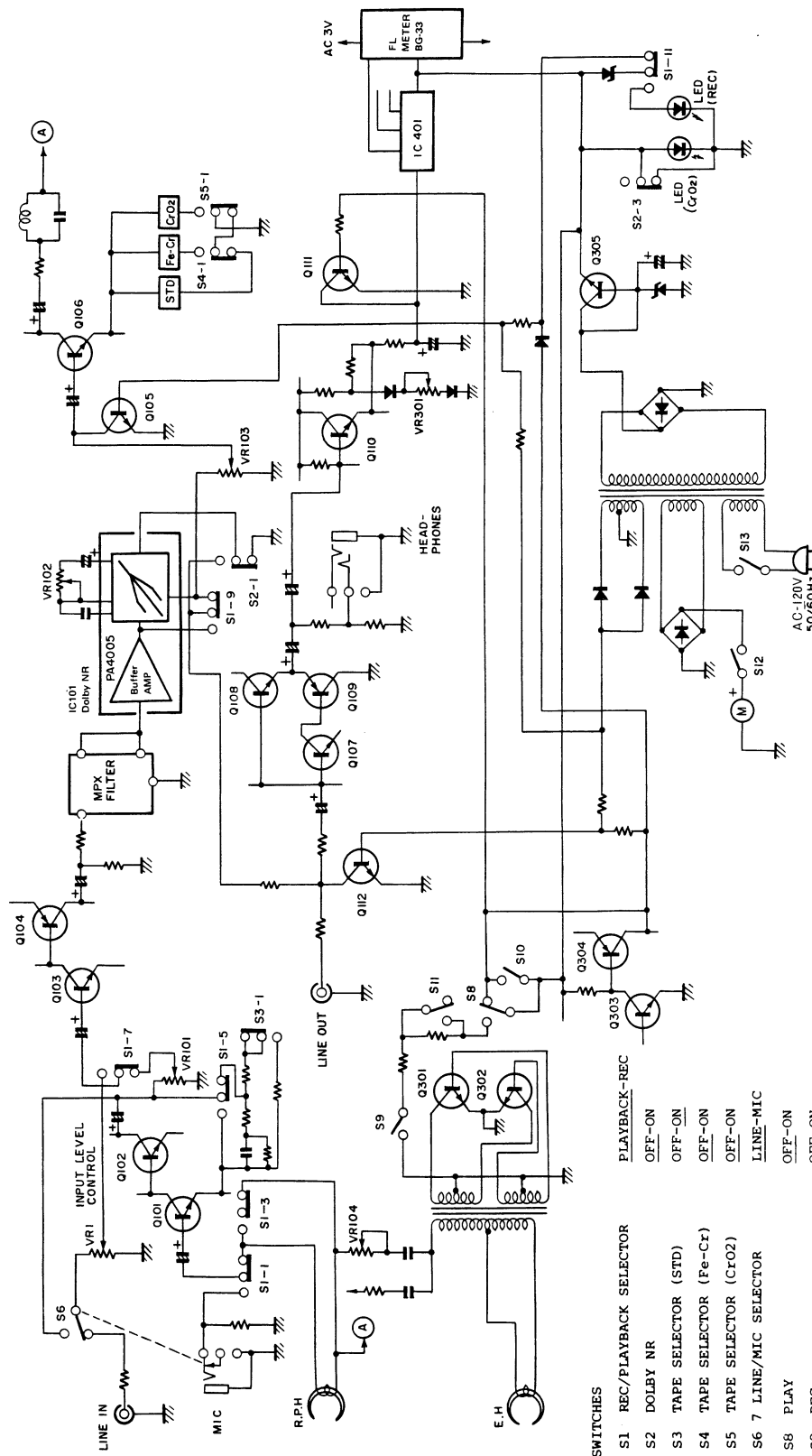


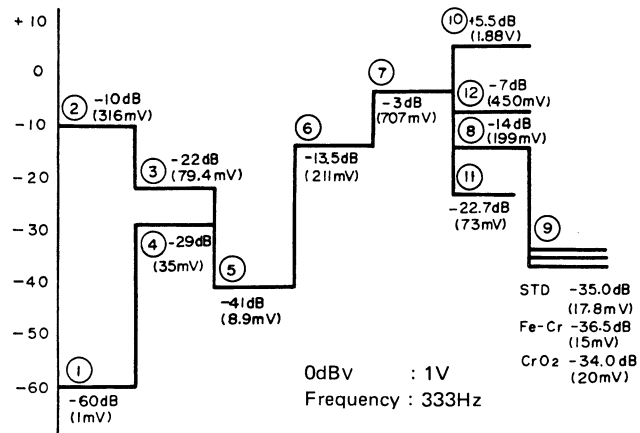
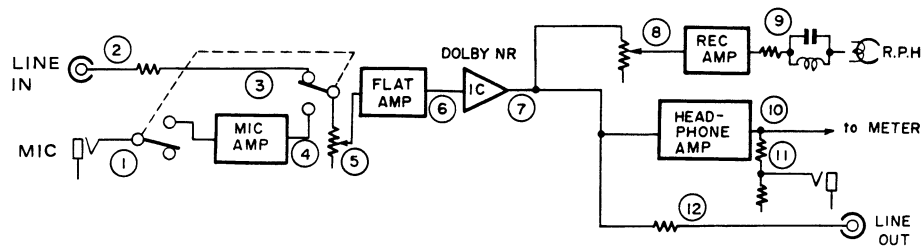
Fig. 6-6 Level Meters Circuit

7. BLOCK DIAGRM

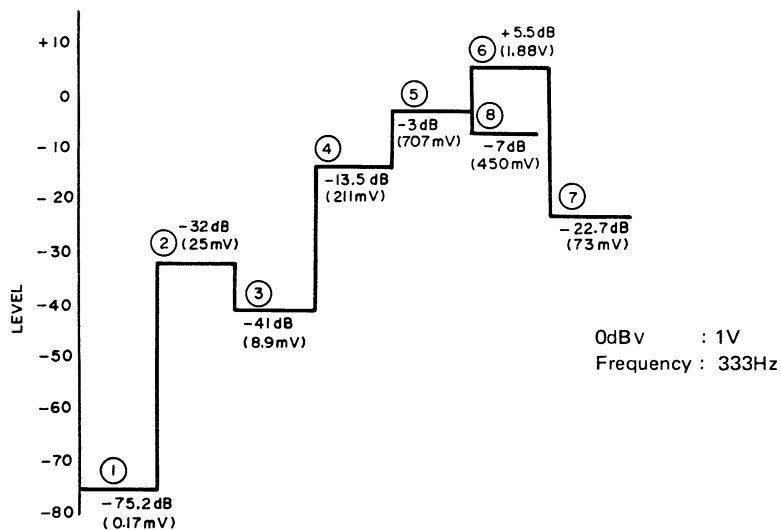
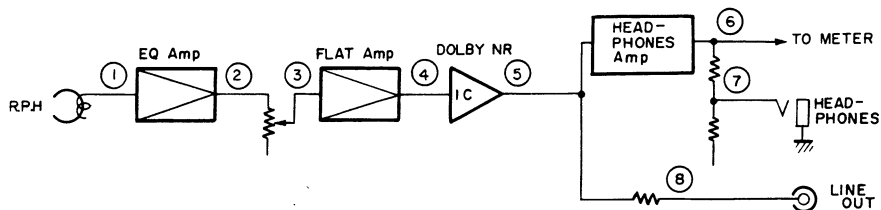


8. LEVEL DIAGRM

RECORDING



PLAYBACK



9.7 PLAY TIMING ADJUSTMENT

Press the PLAY key down slowly, and adjust the switch bracket so that the PLAY key locks at the same time that the PLAY switch is turned on.

Then connect a millivoltmeter to the LINE outputs, and confirm the absence of switching noise while switching back and forth between PLAY and STOP. (Fig. 9-8).

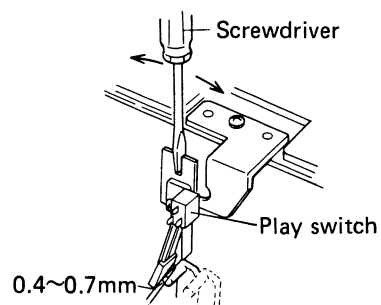


Fig. 9-8 Play Timing Adjustment

9.8 LEAF SWITCH TIMING ADJUSTMENT

1. Slowly press down on the REC lever so as to cause the REC/P.B switch to operate, and then adjust the tip of Fig. 9-9 using a screwdriver until the leaf switch operates.

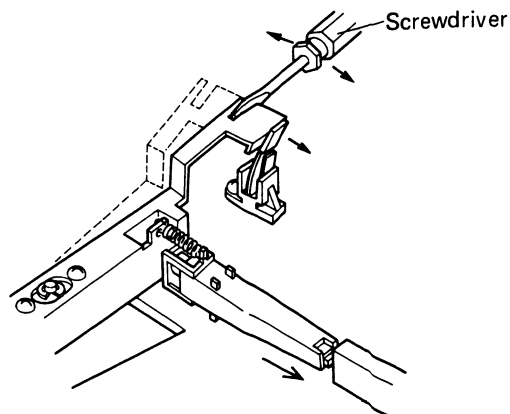


Fig. 9-9 Leaf Switch Timing Adjustment

10. ELECTRICAL ADJUSTMENTS

Prior to commencing electrical adjustments, first check the following:—

1. All mechanical adjustments should be completed.
2. The heads should be cleaned, and properly demagnetized.
3. Set the measuring level to 0dB 1V by connecting a 50k Ω (47 — 52k Ω) dummy load to the LINE output terminals.
4. Employ the following test tapes.
STD-331A... For general playback purposes.
STD-341A... For playback adjustments.
STD-601 STD blank tape.
STD-603 ... CrO₂ blank tape.

Note:

Although both sides of test tapes are available, always use side A.

5. Prepare the following measuring equipment: two millivoltmeters, low frequency oscillator, oscilloscope, attenuator.
6. Unless otherwise designated, "recording mode" in the following paragraphs to normal recording mode with PLAY and REC keys depressed, and using a cassette half not equipped with chrome detector holes.

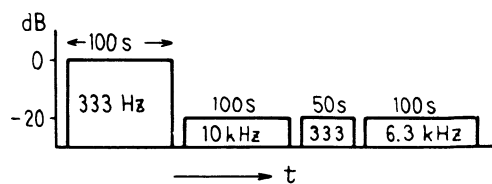
7. The adjustments must be performed in the order shown in the Adjustment Procedure. If the order is changed, proper adjustments will not be possible, and the tape deck will fail to operate with optimum performance.

Playback

1. Head azimuth adjustment
2. Playback equalizer check
3. Playback level adjustment

Recording

4. REC switch operation timing check
5. Meter adjustments
6. Approximate adjustment of recording current
7. Approximate adjustment of recording bias
8. Recording and playback frequency response adjustments
9. Recording level adjustment



Test Tape STD-341A

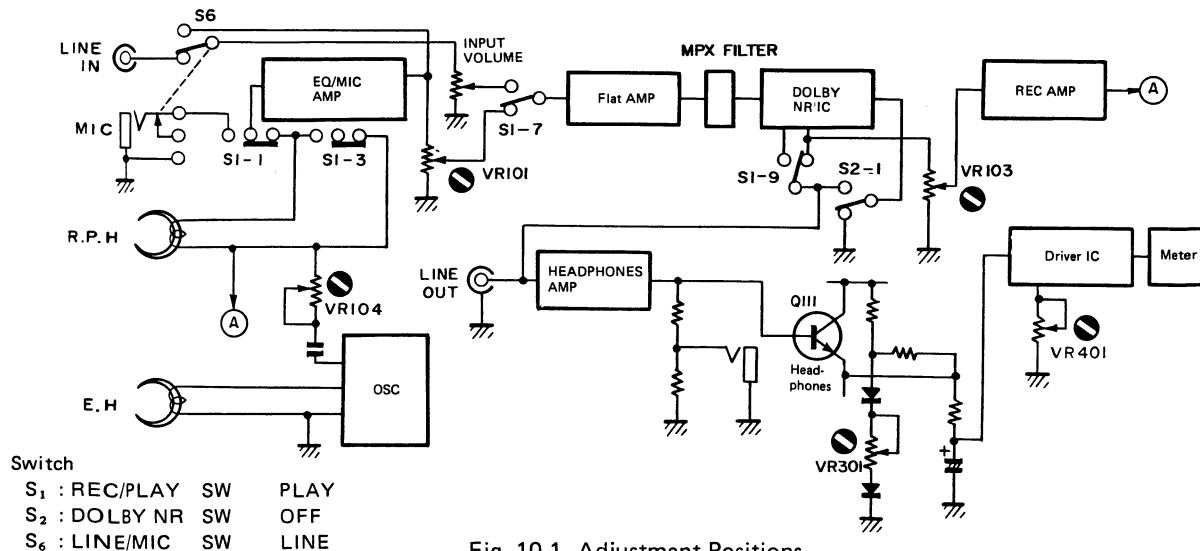


Fig. 10-1 Adjustment Positions

10.1 HEAD AZIMUTH ADJUSTMENT

1. Connect millivoltmeters to the OUTPUT terminals.
2. Turn VR₁₀₁ (L ch) and VR₂₀₁ (R ch) up to maximum levels (full around, counterclockwise direction).
3. Set the TAPE selector to the STD position.

4. Play the 10kHz section of the STD-341A test tape, and adjust the head azimuth adjustment screw (see Fig. 10-2) to obtain maximum output levels (millivoltmeter readings) in both left and right channels.
5. Complete the adjustment by locking the screw, using screw tight green No. 300.

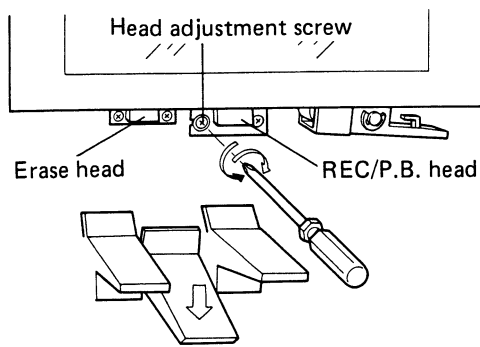


Fig. 10-2 Head Azimuth Adjustment

10.2 PLAYBACK EQUALIZER CHECK

1. Again connect millivoltmeters to the output terminals.
2. Also set the TAPE selector to the STD position.
3. Play the 333Hz, -20dB section of the STD-341A test tape, and read the values shown in the millivoltmeters.
4. Then play the 6.3kHz section of the same test tape, and confirm that the millivoltmeters read 0.5dB \pm 1dB higher than the readings given in step 3 above.
5. Without making any other changes, set the TAPE selector to the Fe-Cr position, and confirm that the frequency response at 6.3kHz is -3.5dB \pm 1.0dB, below the reference level at 333Hz.

10.3 PLAYBACK LEVEL ADJUSTMENT

This adjustment must be performed accurately since it determines the Dolby NR level.

1. Connect the millivoltmeters to the TP terminals of the mother assembly.
2. Turn the DOLBY NR switch OFF, and set the TAPE selector to the STD position.
3. Play the 333Hz, 0dB section of the STD-341A test tape, and adjust VR₁₀₁ (L ch) and VR₂₀₁ (R ch) to obtain millivoltmeter readings of 1dBv (1.12V).

10.4 REC SWITCH OPERATION TIMING CHECK

1. Prior to commencing any adjustment of the recording system, first turn the power supply off. Depress the REC key and confirm that the REC switch (S₉) turns on after the record and playback slide switch (S₁) has been fully moved across to the REC position.
2. Then also confirm that the record and playback slide switch (S₁) returns to the PLAY position after the REC switch (S₉) has been turned off.
3. If the above operations fail to proceed as prescribed, readjust according to section 9.8, "Leaf Switch Adjustment".

NOTE:

If these switching operations fail to proceed as prescribed, the head may become magnetized during recording and playback modes.

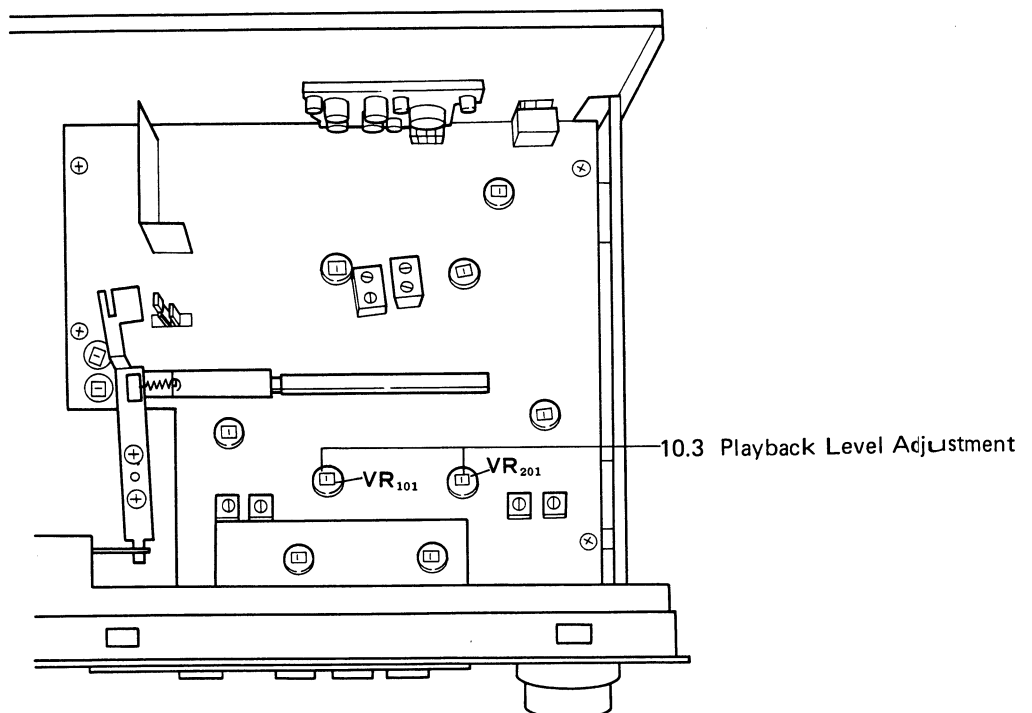


Fig. 10-3 Adjustment Positions

10.5 METER ADJUSTMENTS

1. Turn the DOLBY NR switch off, and apply a 333Hz, -10dBv (316mV) signal to the INPUT terminals.
2. Connect millivoltmeters to the TP₁ (L) and TP₂ (R) terminals in the mother unit, and adjust the INPUT level control to obtain an output level of -23dBv (71mV).
3. Turn VR₃₀₁ located in the mother unit counter-clockwise, and stop it immediately at the point where the -20dB readings shown in the meters for both channels disappear.
4. Next readjust the INPUT level control to obtain output level readings at TP₁ and TP₂ of -3dBv (710mV).
5. Then adjust VR₄₀₁ (L) and VR₄₀₂ (R) in the meter unit to obtain level meter readings of 0dB.
6. Return the INPUT level control to the "0" position, and increase the input level gradually. When the level meters read -20dB, check that the TP₁ (L) and TP₂ (R) output lie in the -23(+4 ~ -2)dBv range (44.7mV ~ 89.1mV). Then when the level meters read +5dB, the TP₁ and TP₂ outputs should lie within the +2dBv \pm 2dB range (2.51V ~ 1.26V).

10.6 APPROXIMATE ADJUSTMENT OF RECORDING CURRENT

Because of the very low levels involved, be particularly careful to eliminate external induction noise during this adjustment.

1. Apply a 333Hz, -10dBv (316mV) signal to the INPUT terminals.
2. Connect millivoltmeters to the TP₁ (L) and TP₂ (R) terminals in the mother unit, and adjust the INPUT level control to obtain an output level of -3dBv (710mV).
3. Also connect millivoltmeters across terminals No. 35 and No. 32 (L) and No. 37 and No. 40 (R) in the mother unit.
4. Switch the tape selector to the STD position, and adjust VR₁₀₃ (L) VR₂₀₃ (R) in the mother unit until the millivoltmeters read 0.42mV (42 μ A).

NOTE:

During this adjustment, insert a piece of insulation paper between the contacts of the REC switch (S₉) in order to maintain the bias oscillator switched off.

10.7 APPROXIMATE ADJUSTMENT OF RECORDING BIAS

1. Connect millivoltmeters across terminals No. 35 and No. 32 (L) and No. 37 and No. 40 (R) in the mother unit.
2. Switch the tape selector to the STD position, and load a standard cassette tape.
3. Put the deck into recording mode, and turn the INPUT level control down to minimum.
4. Adjust VR₁₀₄ (L) and VR₂₀₄ (R) in the mother unit to obtain a 4mV (400 μ A) reading in the millivoltmeters.

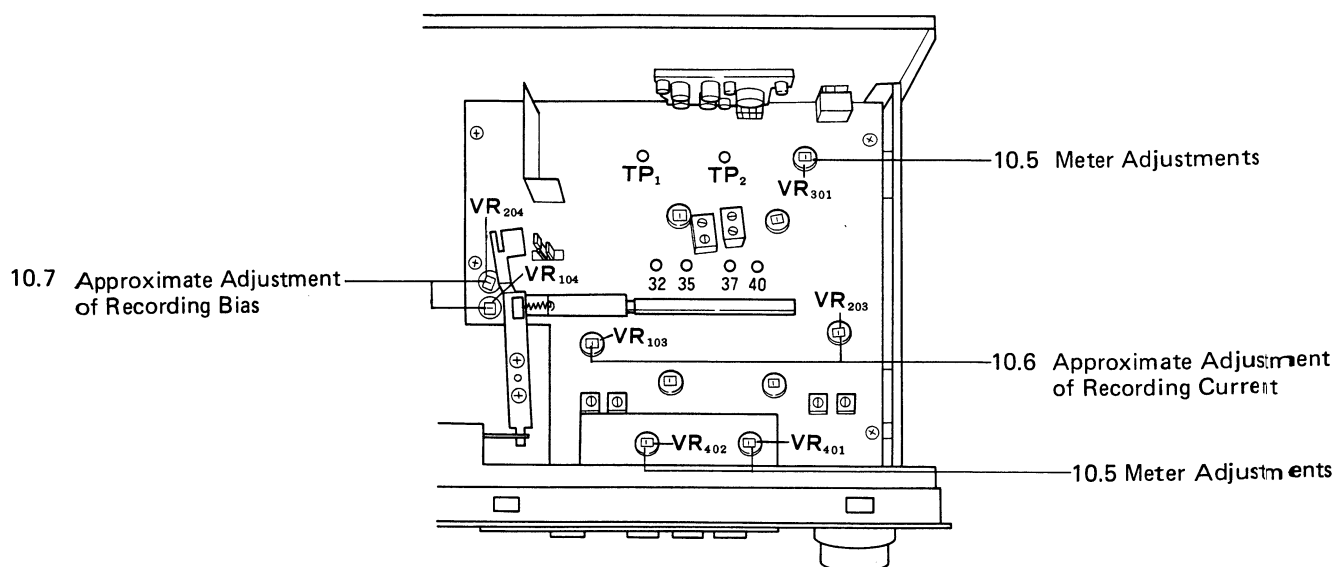


Fig. 10-4 Adjustment Positions

10.8 RECORDING AND PLAYBACK FREQUENCY RESPONSE ADJUST- MENTS

1. Switch the tape selector to the STD position, and turn the DOLBY NR switch off.
2. Connect millivoltmeters to the OUTPUT terminals, put the deck into recording mode, and apply a 333Hz, -30dBv (31.6mV) signal to the INPUT terminals.
3. Adjust the INPUT level control to obtain millivoltmeter readings of -27dBv (44.6mV).
4. Record the above input signal onto the STD-601 standard tape.
5. Then record the 6.3kHz signal onto the same standard tape, and adjust VR₁₀₄ (L) and VR₂₀₄ (R) in the mother unit to eliminate any difference in playback output level between the 333Hz and 6.3kHz signals recorded on the tape.

NOTE:

Changes in frequency response due to VR₁₀₄ and VR₂₀₄ adjustments will not become apparent until recording and playback are repeated several times. Continue to repeat these operations until the playback output level difference is reduced to zero.

6. Record and play back signals from 63Hz to 12kHz, and confirm that the record and playback frequency response satisfies the standard curve shown on page 26.
7. Switch the tape selector to the CrO₂ position, and record the 333Hz and 6.3kHz signals onto the STD-603 standard tape. Again adjust as described above so as to reduce the playback output level difference between the 333Hz and 6.3kHz to 0dB \pm 1dB.

8. Recording and play back signals up to 12kHz, and again check that the results satisfy the standard record and playback frequency response for CrO₂ as shown on page 26.
9. Also repeat the above procedures with the DOLBY NR switch on.

10.9 RECORDING LEVEL ADJUSTMENT

1. Switch the tape selector to the STD position, and turn the DOLBY NR switch off.
2. Connect millivoltmeters to the TP₁ (L) and TP₂ (R) terminals in the mother unit.
3. Apply the 333Hz, -10dBv (316mV) signal to the INPUT terminals, and put the deck into recording mode.
4. Adjust the INPUT level control to obtain millivoltmeter readings of -3dBv (710mV).
5. Turn the DOLBY NR switch on, and record the 333Hz signal onto the STD-601 test tape. Then during playback of this signal, adjust VR₁₀₃ and VR₂₀₃ (in mother unit) to obtain millivoltmeter readings of -3dBv (710mV).

NOTE:

Changes in playback output level due to VR₁₀₃ (L) and VR₂₀₃ (R) adjustments will not become apparent until recording and playback are repeated several times. Continue to repeat the adjustment until an output of -3dBv (710mV) is obtained during playback.

6. Record the 333Hz, -10dBv (316mV) signal onto the STD-603 test tape, and check that a playback output level of -3dBv (710mV) is obtained.

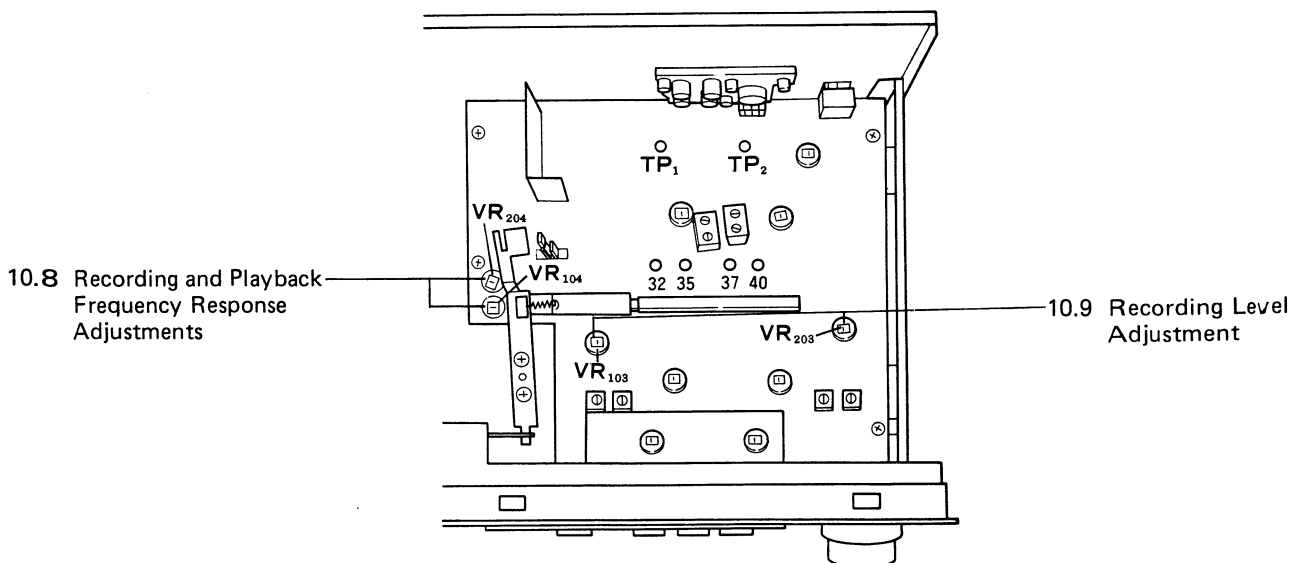
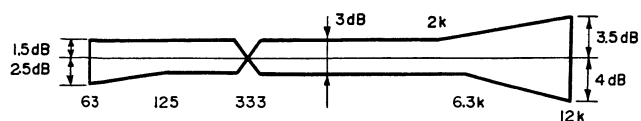
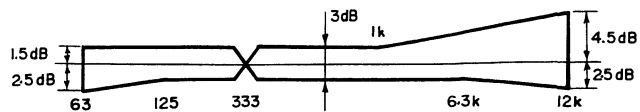


Fig. 10-5 Adjustment Positions

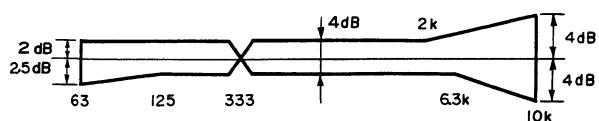
FREQUENCY RESPONSE



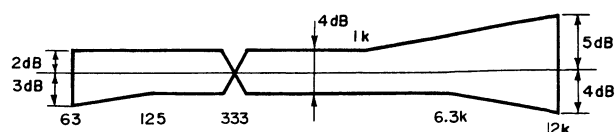
Using STD-601 and TAPE switch STD position, with DOLBY NR OFF.



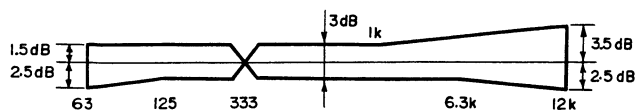
Using DUAD C60 and TAPE switch Fe-Cr position with DOLBY NR OFF.



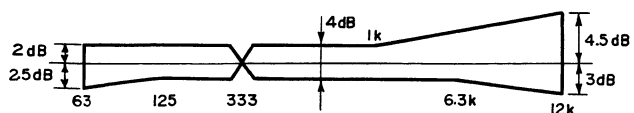
Using STD-601 and TAPE switch STD position, with DOLBY NR ON.



Using DUAD C60 and TAPE switch Fe-Cr position with DOLBY NR ON.

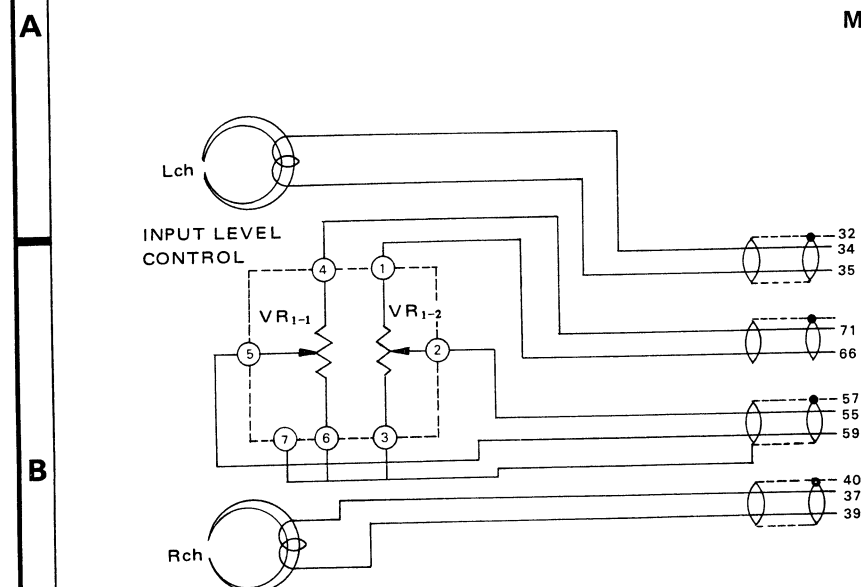


Using STD-603 and TAPE switch CrO₂ position, with DOLBY NR OFF.

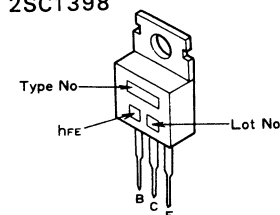
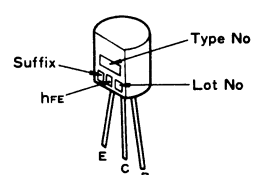
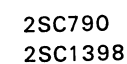
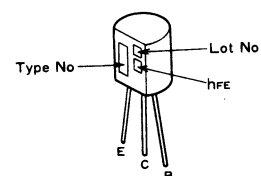
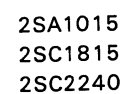
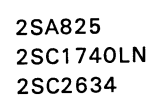


Using STD-603 and TAPE switch CrO₂ position, with DOLBY NR ON.

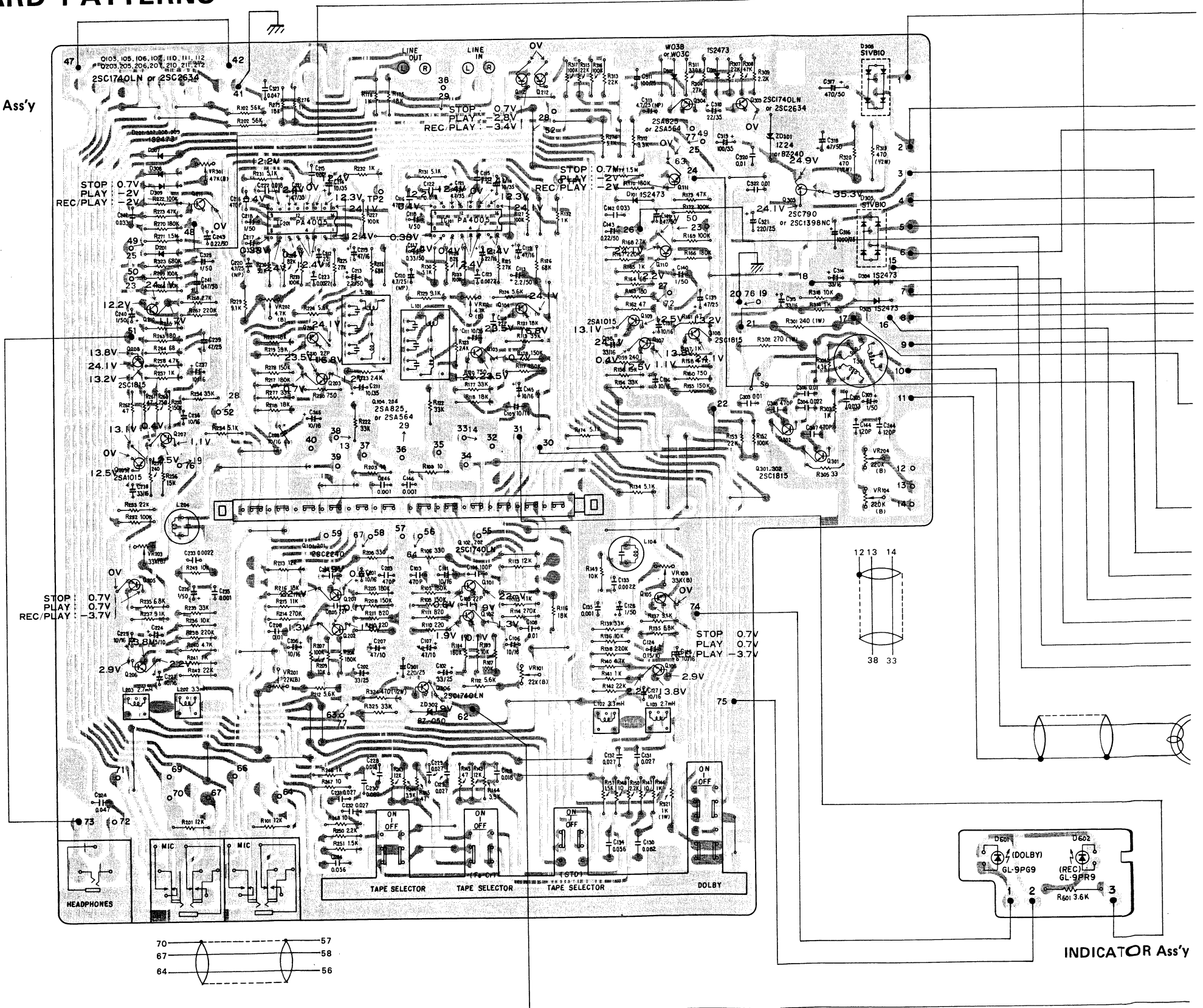
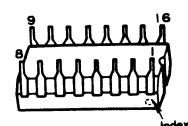
11.1 P.C. BOARDS CONNECTION DIAGRAM

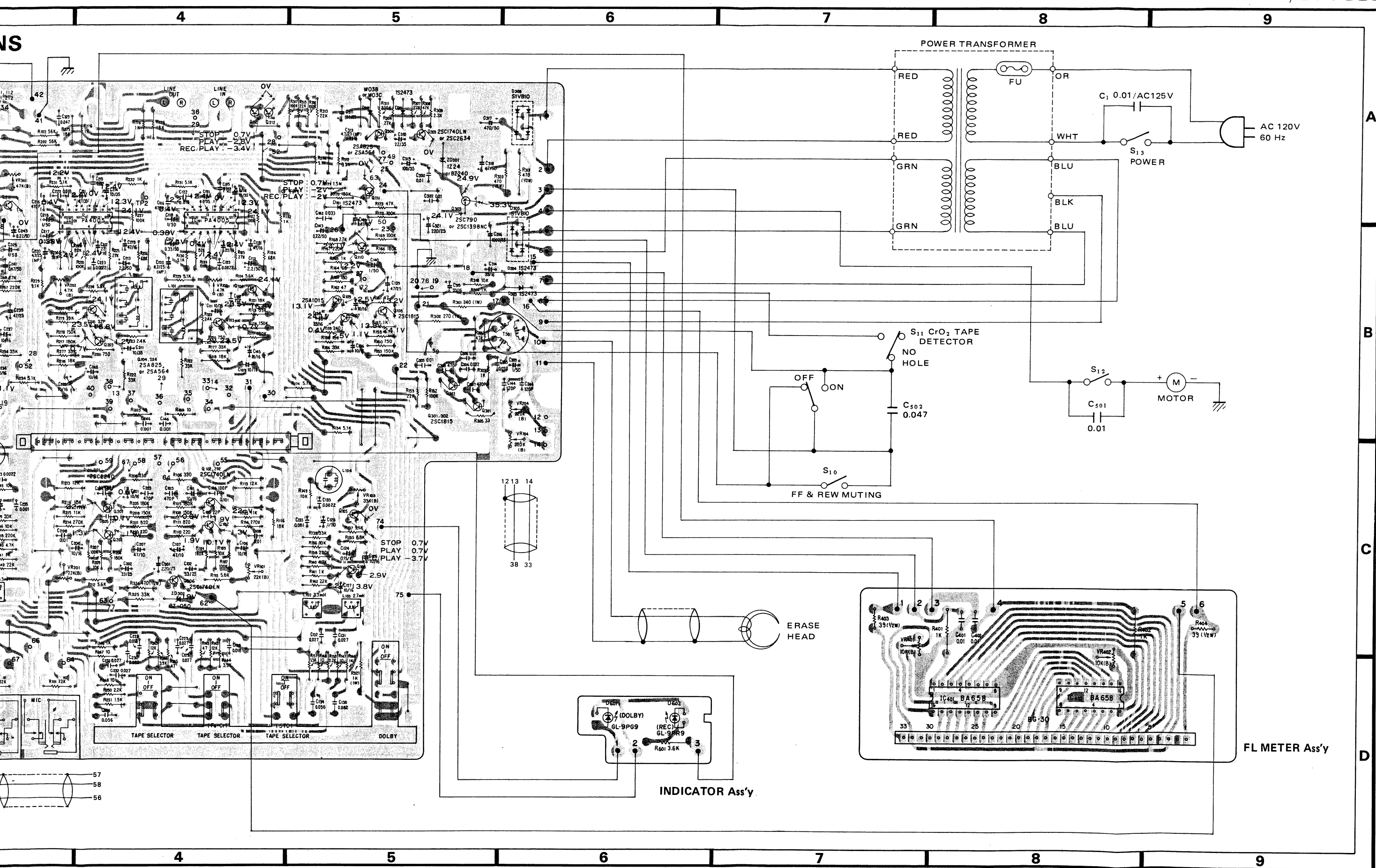


External Appearance of Transistors and ICs



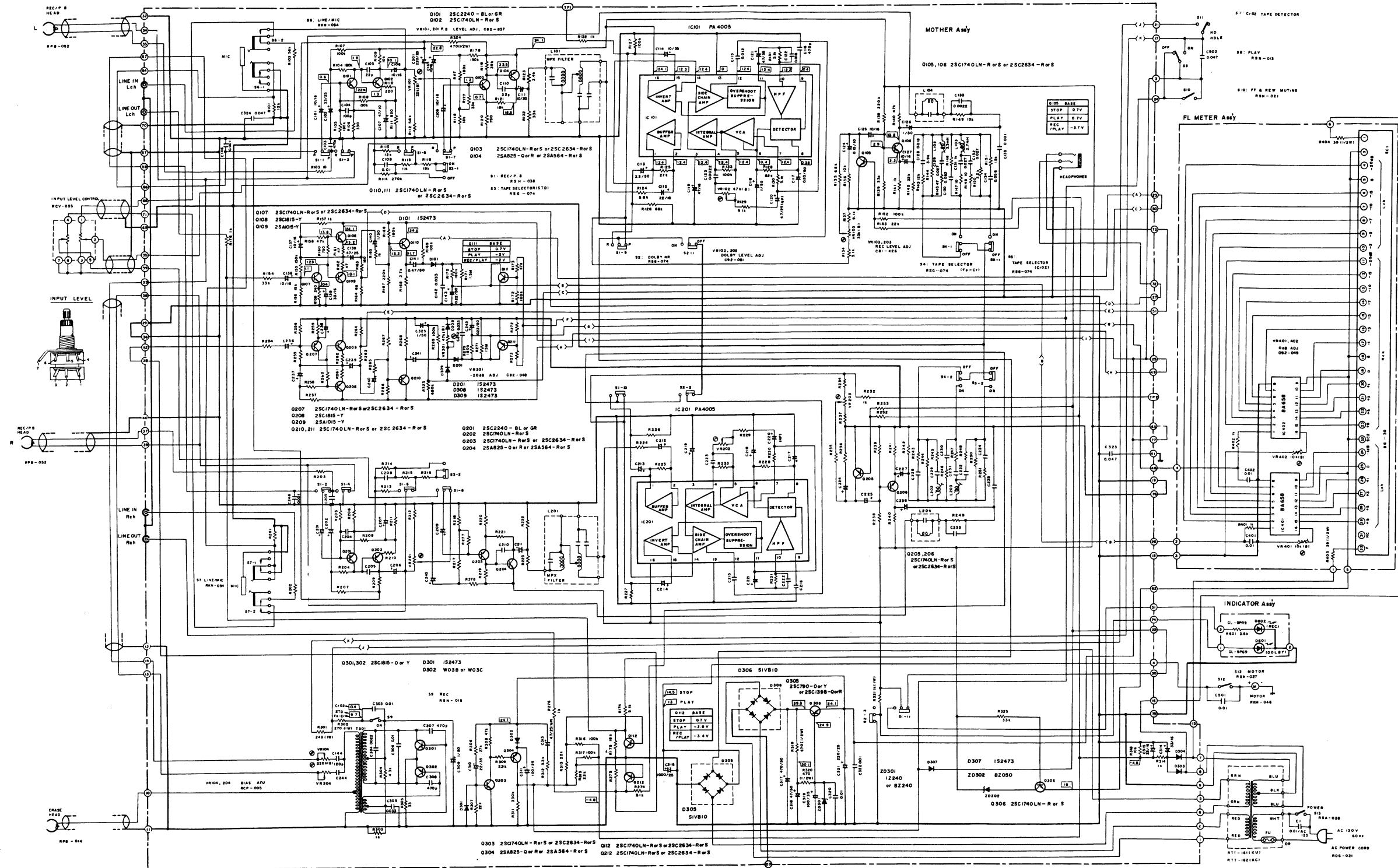
PA4005
BA658





CT-F600/CT-F605

11.2 SCHEMATIC DIAGRAM



1. RESISTORS:
Indicated in Ω , $1/k\Omega$, $\pm 5\%$ tolerance unless otherwise noted
k: 10^3 , M: 10^6 , (F): 10^{-15} , (G): 10^{-9} , (K): 10^3 tolerance
2. CAPACITORS:
Indicated in capacity (uF) or voltage (V) unless otherwise noted pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE:
□: DC voltage (V) at no input signal
4. OTHERS:
⊗: Adjusting point
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

- SWITCHES
- | | |
|--------------------------|--------------|
| S1 REC/PLAYBACK SELECTOR | PLAYBACK-REC |
| S2 DOLBY NR | OFF-ON |
| S3 TAPE SELECTOR (STD) | OFF-ON |
| S4 TAPE SELECTOR (Fe-Cr) | OFF-ON |
| S5 TAPE SELECTOR (CrO2) | OFF-ON |
| S6 7 LINE/MIC SELECTOR | LINE-MIC |

- | | |
|------------------------|--------------|
| S8 PLAY | OFF-ON |
| S9 REC | OFF-ON |
| S10 FF & TAPE DETECTOR | NO HOLE-HOLE |
| S12 MOTOR | OFF-ON |
| S13 POWER | OFF-ON |
- The underlined indicates the switch position.

12. F

NOTE:

- When the foil is used, the following parts are required: 56, 47, 0.1, 10.

- Ex. 2 W re. 5.

Miscellar

Part No.

- RPB-05:
RPB-01:
RCV-05
RTT-16
RTT-16

RCG-00
RSA-02
RXM-01
RSN-02
(RSN-0

- RSN-0C
RSN-02
RSN-02

Mother SWITCH

Part No.

- RSH-0
RSG-0
RKN-C
RSN-0

COILS

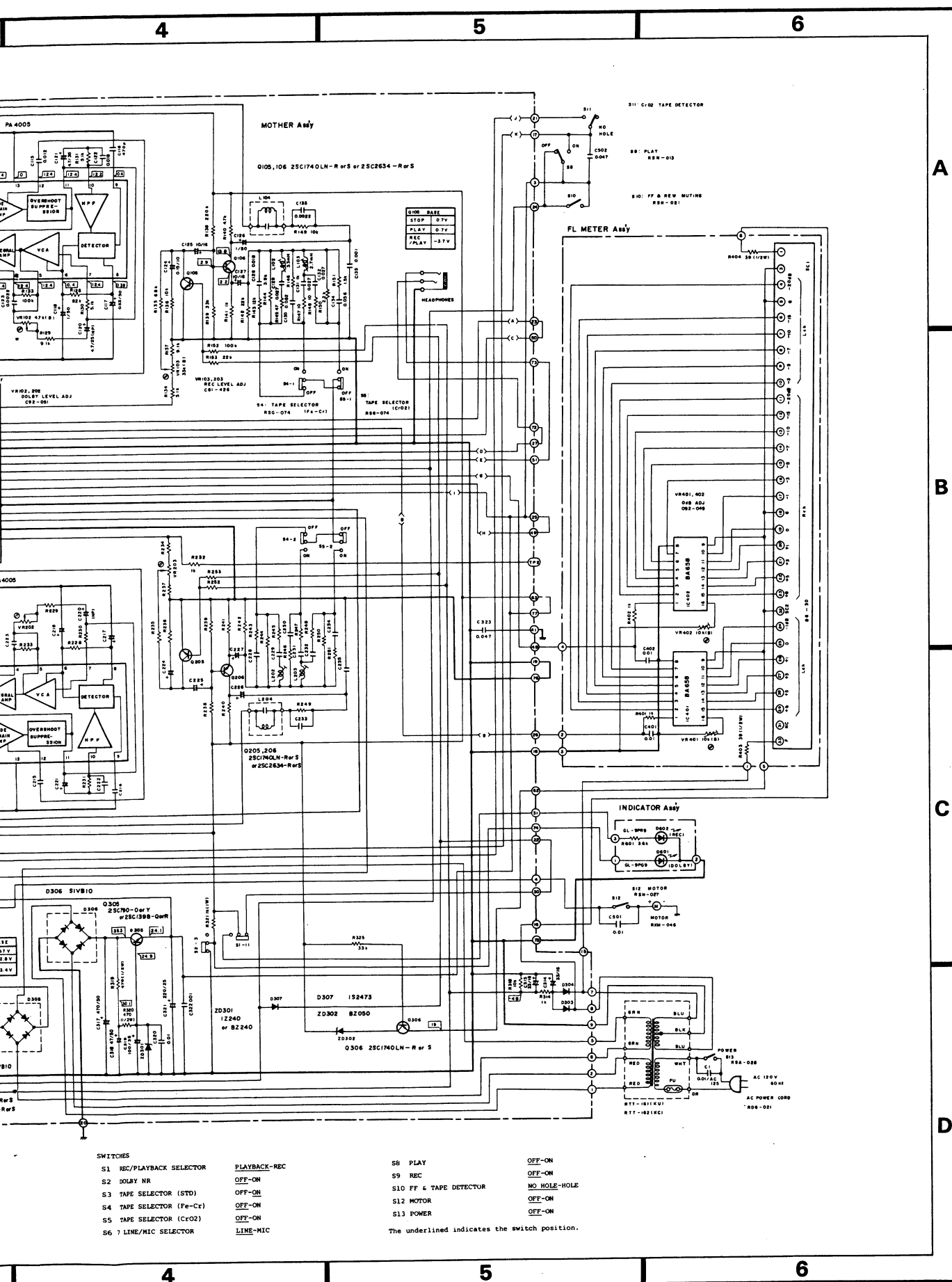
Part No.

- T64-01
RTF-0
RTF-0
RTF-0
RTF-0

OTHER

Part No.

- RKN-1
RKB-1
(RKB-1
RBF-0



12. PARTS LIST

NOTE:

- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	— 56 × 10 ¹ —	561	.....	RD½PS	561J
47kΩ	— 47 × 10 ³ —	473	.....	RD½PS	473J
0.5Ω	— 0R5		.....	RN2H	055K
1Ω	— 010		.....	RS1P	010K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

Miscellaneous Parts List

<u>Part No.</u>	<u>Symbol & Description</u>
RPB-052	REC/PB head
RPB-014	Erase head
RCV-055	Variable resistor
RTT-162	Power transformer CT-F600/KC
RTT-161	Power transformer CT-F605/KU
RCG-006	Capacitor
RSA-028	Power switch
RXM-055	Motor
RSN-027	S11 Lever switch
(RSN-010)	
RSN-006	S8 Switch
RSN-024	S7 Switch
RSN-025	S9 Switch

CAPACITORS

Part No.	Symbol & Description
CEANL 100P 16	C101, C201
CEA 471P 50	C317
CEA 470P 50	C318
CEA 010P 50	C126, C140, C226, C240, C325, C309
CEA 0R47P 50	C141, C241
CEA 101P 35	C319
CEA 4R7P 35	C121, C221
CEA 102P 25	C316
CEA 221P 25	C301, C321
CEA 101P 25	C311
CEA 470P 25	C139, C239
CEA 330P 25	C102, C202
CEA 220P 35	C310
CEA 100P 35	C111, C114, C211, C214
CEA 470P 16	C119, C219
CEA 330P 16	C138, C238, C314, C315
CEA 220P 16	C112, C212
CEA 100P 16	C106, C109, C125, C127, C136, C137, C145, C206, C209, C225, C227, C236, C237, C245
CEA 470P 10	C107, C207
CEA 4R7M 25NP	C120, C220, C313
CEA 010M 50	C118, C218
CEA R33M 50	C117, C217
CEA R22M 50	C143, C243
CEA 2R2P 50	C113, C213
CSSA 0R15M 10	C124, C224

Mother Unit

SWITCHES

Part No.	Symbol & Description	
RSH-038	S1	Slide switch
RSG-074	S2–S5	Push switch ass’y
RKN-054	S6, S7	Mic jack
RSN-018	S9	Switch

COILS

Part No.	Symbol & Description	
T64-001	T301	OSC coil
RTF-040	L101, L201	MPX filter block
RTF-045	L102, L202	Peaking coil
RTF-047	L103, L203	Peaking coil
RTF-046	L104, L204	Trap coil

OTHERS

Part No.	Symbol & Description
RKN-052	Phone jack
RKB-014	Pin jack (4P)
(RKB-016)	
RBF-041	Ceramic tube

Part No.	Symbol & Description
CQMA 333K 50	C142, C242, C305
CQMA 273K 50	C129, C131 C132, C229, C231, C232
CQMA 183K 50	C122, C128, C222, C228
CQMA 123K 50	C115, C215
CQMA 103K 50	C108, C208, C306
CQMA 222K 50	C123, C133, C223, C233
CQMA 102K 50	C135, C146, C235, C246

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Part No.	Symbol & Description
C92-857	VR101, VR201 Semi-fixed 22K(B)
C92-051	VR102, VR202 Semi-fixed 4R7K(B)
C81-426	VR103, VR203 Semi-fixed 33K(B)
RCP-005	VR104, VR204 Semi-fixed 220K(B)
C92-048	VR301 Semi-fixed 47K(B)
RD¼PM □□□J	R101—R178, R201—R278, R303—R309, R311—R318, R323, R325
RS1PF □□□J	R301, R302, R321
RD½PSF □□□J	R319, R320, R324

SEMICONDUCTORS

Part No.	Symbol & Description
2SC2240	Q101, Q201
2SC1740LN	Q102, Q202, Q306
2SC1740LN (2SC2634)	Q103, Q105—Q107, Q110—Q112, Q203, Q205—Q207, Q210—Q212, Q303
2SA825 (2SA564)	Q104, Q204, Q304
2SC1815-Y	Q108, Q208
2SA1015-Y	Q109, Q209
2SC1815	Q301, Q302
2SC790 (2SC1398NC)	Q305
PA4005	IC101, IC201
1S2473-T	D101, D201, D301, D303, D304, D307—D309
W03B (W03C)	D302
S1VB10	D305, D306
1Z24 (BZ-240)	ZD301
BZ-050	ZD302

Indicator Unit

Parts List

Part No.	Symbol & Description
RD¼PS 362J	R601
GL-9PG9	D601
GL-9PR9	D602
REB-326	LED holder

FL Meter Unit

CAPACITORS

Part No.	Symbol & Description
CKDYF 103Z 50	C401, C402

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

RESISTORS

Part No.	Symbol & Description
C92-049	VR401, VR402 Semi-fixed 10K(B)
RD¼PS □□□J	R401, R402
RD½PSF □□□J	R403, R404

SEMICONDUCTORS

Part No.	Symbol & Description
BA658	IC401, IC402

OTHERS

Part No.	Symbol & Description
RNF-499	Meter holder
REB-223	Cover cushion

13. EXPLODED VIEWS

11.1 EXTERIOR

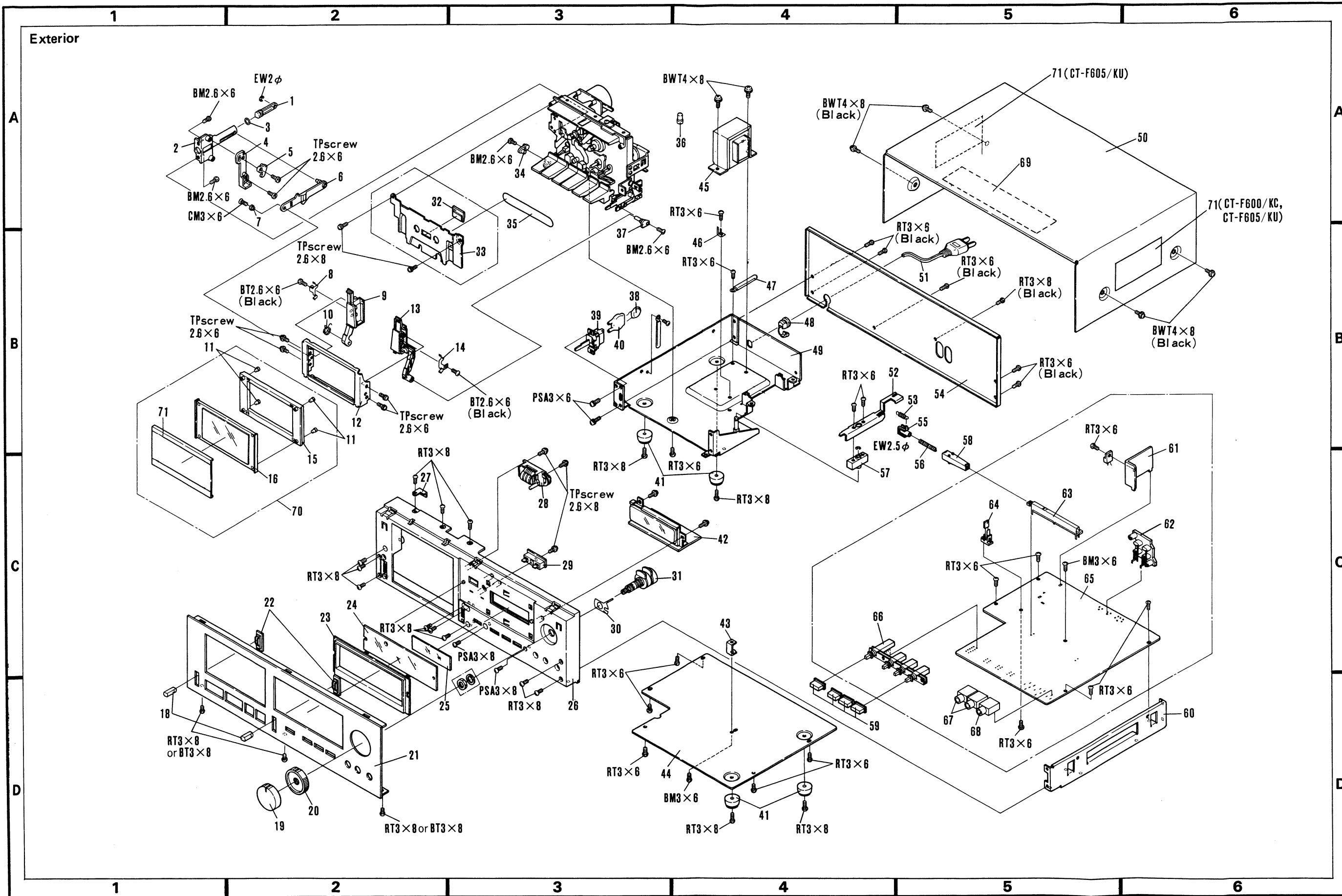
Parts List

Key No.	Part No.	Description
1.	RNK-485	Shaft
2.	RXA-949	Air dump assembly
3.	REB-275	"O" type ring
4.	RNK-484	Lever
5.	RNK-483	Lever
6.	RXA-950	Arm assembly
7.	RLA-915	Arm bush
8.	RBK-128	Spring L
9.	RNK-486	Arm L
10.	RBH-537	Spring
11.		Nylon rivet
12.		Pocket frame
13.	RNK-487	Arm R
14.	RBK-129	Spring R
15.		Frame cover
16.		Door
17.	.....
18.	RAC-105	Lever knob assembly
19.	RAA-255	Knob B
20.	RAA-254	Knob A
21.	RAH-298	Front panel
22.	RNK-670	Knob escutcheon
23.	RNK-855	Escutcheon
24.	RNK-666	Front cover
25.	RNK-746	Meter lens
26.		Panel stay
27.		Angle
28.	RAW-121	Tape counter
29.		Indicator unit
30.		Grand plate
31.	RCV-055	Variable resistor
32.	RNK-856	Lens
33.	RAH-259	Dress plate
34.	RNK-489	Shaft L
35.	REB-310	Counter belt
36.	RBM-004	Wire nut
37.	RNK-495	Shaft R
38.	RCG-006	Capacitor
39.	RSA-028	Power switch
40.	REC-297	Capacitor cover
41.	RXA-703	Foot assembly
42.		FL meter unit
43.		PC board holder
44.		Bottom plate
45.	RTT-162	Power transformer
46.		Terminal (GND)
47.		Cord clamber B
48.	REC-272	Strain relief
49.		Chassis assembly
50.	RNA-390	Bonnet case

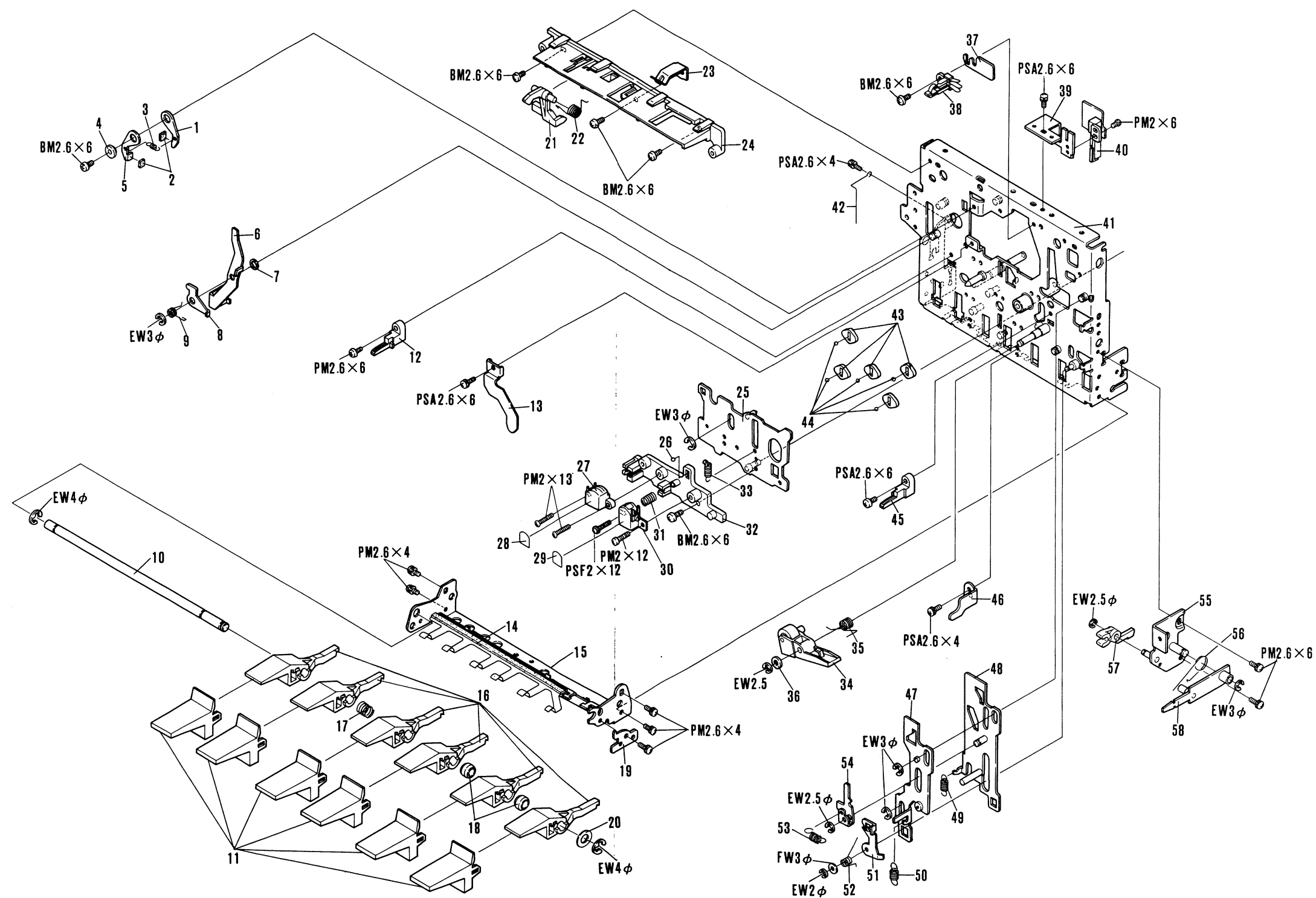
Key No.	Part No.	Description
51.	RDG-021	Power cord
52.		Switch arm
53.	RBH-556	T Spring
54.		Rear panel
55.	RNK-558	REC joint
56.	RBH-553	C spring
57.	RNK-559	REC pivot
58.	RNK-665	REC hook
59.	RAC-104	Push knob
60.		Side frame
61.		Heat sink
62.	RKB-014	Pin jack
63.	RSH-038	Slide switch
64.	RSN-018	Switch
65.		Mother unit
66.	RSG-074	Push switch assembly
67.	RKN-054	Mic jack
68.	RKN-052	Phone jack
69.	REB-223	Cushion
70.	RXX-254	Door assembly
71.	RRW-112	UL Label (A)

CT-F605/KU Model

Key No.	Part No.	Description
21.	RAH-284	Front panel
45.	RTT-161	Power transformer
70.	RXX-234	Door assembly
71.	RRW-112	UL Label (A)



13.2 MECHANISM-1



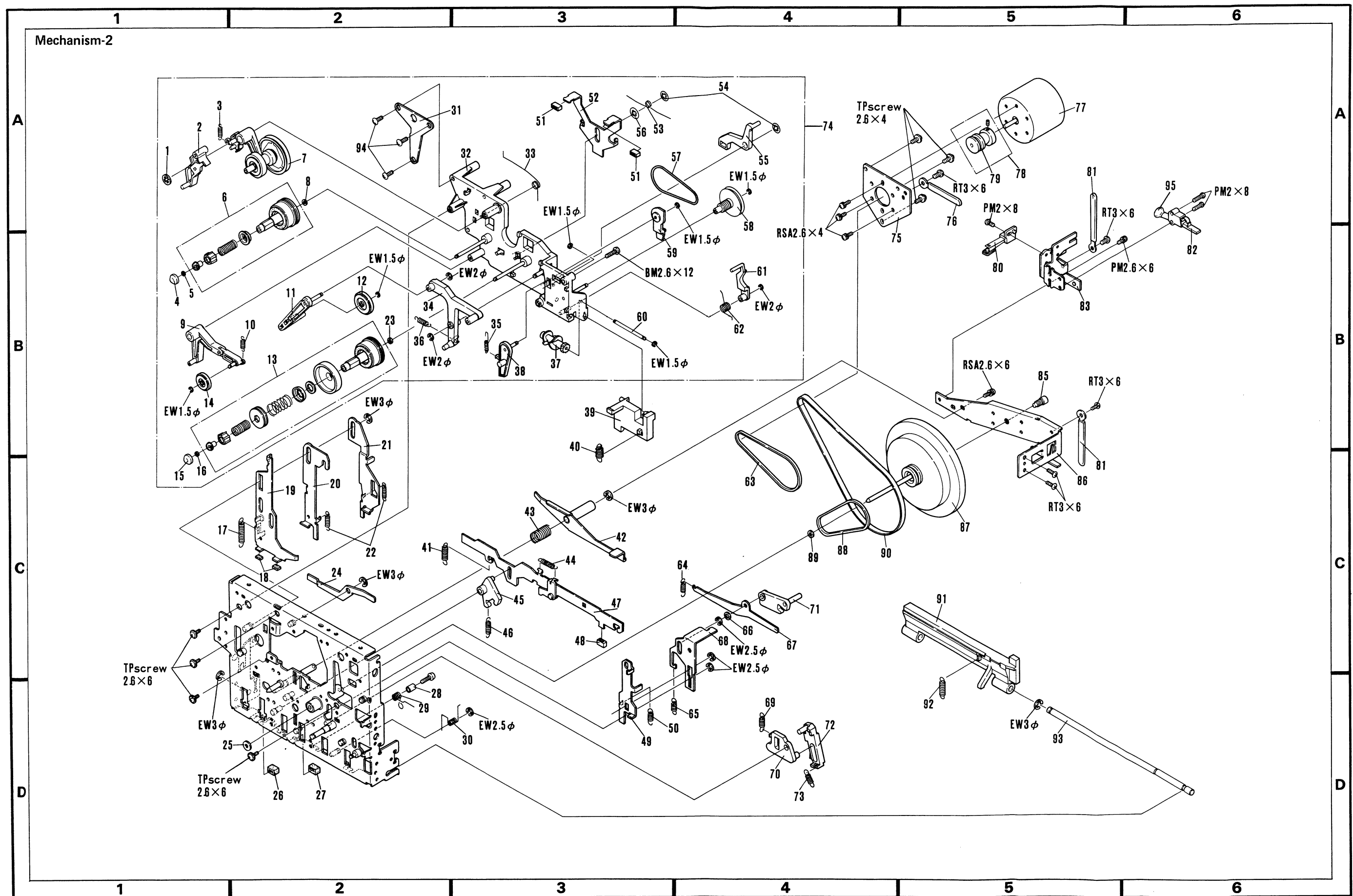
Parts List of Mechanism-1

Key No.	Part No.	Description
1.		Back tension arm A
2.	RED-136	Felt
3.	RBH-547	Spring
4.	RLA-989	Collar
5.		Back tension arm B
6.		REC prevention plate
7.		Nylon washer 4.2φ x 8φ x 0.2
8.		Plate
9.	RBH-530	Spring
10.		Shaft
11.	RNK-588	Cap
12.	RNK-472	Cassette guide L
13.		Spring
14.	RED-147	Button stopper
15.	RXA-976	Button frame assembly
16.	RNK-493	Operation button
17.	RBH-433	Spring
18.	RLP-019	Collar
19.		Plate
20.		Nylon washer 5.2φ x 8φ x 0.3
21.	RNK-477	Erase preventing lever
22.	RBH-477	Spring
23.		Spring
24.		Holder
25.		Head base assembly
26.	REF-013	Steel ball
27.	RPB-014	Erase head
28.	RRW-081	Erase label
29.	RRW-082	REC/PB label
30.	RPB-052	REC/PB head
31.	RBH-306	Head adjusting spring
32.		Sub head base
33.	RBH-444	Spring
34.	RXB-105	Pinch arm (B) assembly
35.	RBH-548	Spring
36.		Nylon washer 3.2φ x 6φ x 0.2
37.	REE-062	Insulator (CKDYF473Z 50)
38.	RSN-024	Chrome switch S7
39.		MU-SW bracket
40.	RSN-006	Switch
41.		Mechanism chassis assembly
42.	RBH-471	Spring
43.	RNK-290	Guide
44.	REF-013	Steel ball
45.	RNK-473	Cassette guide R
46.		Plate
47.		Pause plate assembly
48.		Plate assembly
49.	RBH-442	Spring
50.	RBH-470	Spring

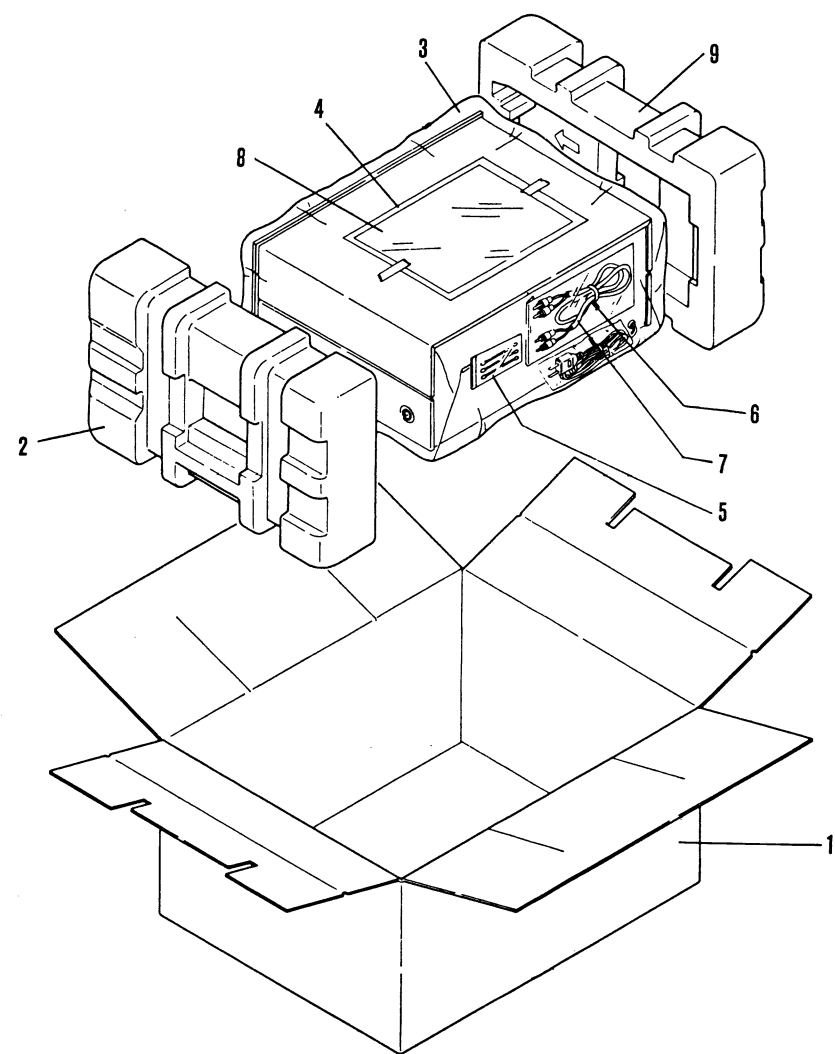
Key No.	Part No.	Description
51.		Latchet plate
52.	RBH-443	Spring
53.	RBH-473	Spring
54.		Angle
55.		Frame assembly
56.	RBH-434	Spring
57.	RNK-478	Lever
58.		Lever assembly

12.3 MECHANISM-2

Key No.	Part No.	Description	Key No.	Part No.	Description
1.		CT-TW3	51.	REB-187	Brake shoe
2.	RNK-451	Drive Arm (B)	52.		Brake plate
3.	RBH-436	Spring	53.	RBH-439	Spring
4.	RNK-447	Cap	54.		CS-TW3
5.		Nylon washer 1.7 ϕ x 3.2 ϕ x 0.25	55.		Switch arm (B)
6.	RXA-955	Supply reel assembly	56.		CS-TW4
7.	RXA-956	Drive pulley assembly	57.	REB-292	Sensing belt
8.		Nylon washer 2.1 ϕ x 4 ϕ x 0.25	58.	RXA-962	Pulley assembly
9.	RXA-960	FF idler arm full assembly	59.	RXA-963	Plate assembly
10.	RBH-438	Spring	60.		Shaft
11.	RXA-959	TU idler arm assembly	61.	RNK-461	Arm
12.	RNK-454	TU idler	62.	RBH-441	Spring
13.	RXA-954	Take-up reel assembly	63.	REB-212	Worm drive belt
14.	RNK-457	FF idler	64.	RBH-451	Spring
15.	RNK-447	Cap	65.	RBH-450	Spring
16.		Nylon washer 1.7 ϕ x 3.2 ϕ x 0.25	66.		Nylon washer 3 ϕ x 0.25
17.	RBH-451	Spring	67.		Return arm
18.	RED-136	BT felt	68.		Brake operation plate
19.		Fast operation plate (B)	69.	RBH-452	Spring
20.		REW operation plate	70.	RNK-480	Return lever
21.		FF operation plate	71.	RNK-464	Switch arm (A)
22.	RBH-531	Spring	72.	RNK-466	Lever
23.		Nylon washer 2.1 ϕ x 4 ϕ x 0.25	73.	RBH-542	Spring
24.		TU return lever	74.	RXB-089	Reel base assembly
25.	RBH-030	Washer	75.		Plate (motor mount)
26.	REB-260	Cushion	76.		Cord clamper (B)
27.	REB-187	Brake shoe	77.	RXM-055	Motor
28.	RLB-001	Collar	78.	RXX-230	Motor pulley assembly
29.	RBH-554	Spring	79.		Motor pulley
30.	RBH-545	Spring	80.	RSN-025	Switch S9
31.		Plate	81.		Cord clamper
32.		Reel base assembly	82.	RSN-027 (RSN-010)	Lever switch S11
33.	RBH-541	Spring	83.		Switch bracket A
34.	RNK-455	TU arm	84.		
35.	RBH-440	Spring	85.	RNK-319	Screw
36.	RBH-437	Spring	86.		Flywheel bearing
37.	RXA-965	Gear assembly	87.	RXA-952	Flywheel assembly
38.	RXA-964	Plate assembly	88.	REB-283	Stop belt
39.	RNK-463	Pinch return lever	89.		Nylon washer 2.6 ϕ x 4.7 ϕ x 0.25
40.	RBH-431	Spring	90.	REB-330	Capstan belt
41.	RBH-447	Spring	91.	RNK-616	Lock plate
42.		Latchet arm assembly	92.	RBH-432	Spring
43.	RBH-538	Spring	93.		Lock plate shaft
44.	RBH-446	Spring	94.	RBA-036	Screw
45.	RNK-613	REC lever	95.	CKDYF 103Z 50	Capacitor C501
46.	RBH-442	Spring			
47.	RXB-056	REC arm assembly			
48.	REB-187	Brake shoe			
49.		Head base			
50.	RBH-470	Spring			



14. PACKING



Parts List

Key No.	Part No.	Description
1.	RHG-267	Packing case (CT-F600/KC)
	RHG-266	Packing case (CT-F605/KU)
2.	RHA-176	Side protector (L)
3.	RHL-050	Vinyl bag
4.	RHL-018	Vinyl bag
5.	REA-021	Head cleaning kit
6.	RDE-027	Cord assembly
	(RDE-028)	
	(RDE-031)	
7.	RDE-010	Cord
	(RDE-024)	
	(RDE-025)	
8.	RBS-110	Operating instruction (CT-F600/KC)
	RRB-103	Operating instruction (CT-F605/KU)
9.	RHA-177	Side protector (R)