

DENON

Hi-Fi Component

SERVICE MANUAL STEREO CASSETTE TAPE DECK MODEL DRM-700A

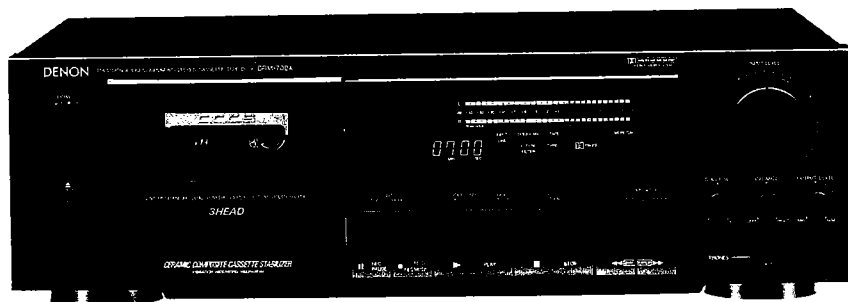
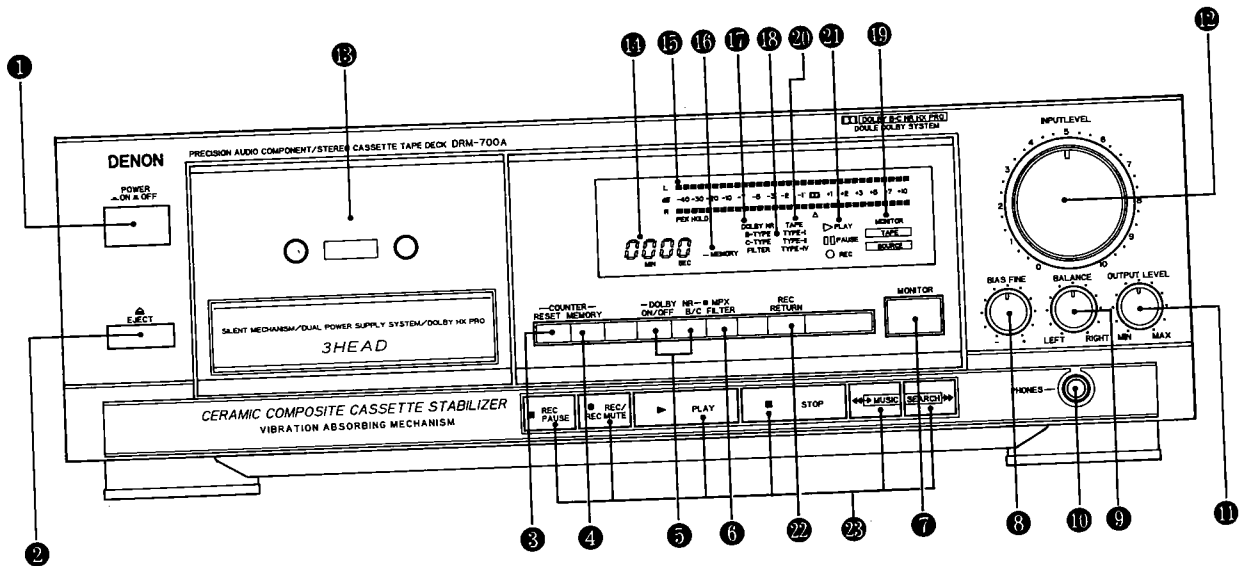


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NAMES AND FONCTIONS OF PARTS



- 1 POWER switch**
Controls the supply of AC power to the deck. One push turns the deck on, a second push turns it off. The deck remains in a stand-by (non-operative) mode for approximately 2 seconds after it is switched on.
- 2 EJECT button**
Press this button to eject the cassette. When the deck is operating (tape is running), press the stop (■) button first to stop the tape transport; then press the EJECT button.
- 3 COUNTER RESET button**
Operation of the button resets the counter to all zero.
- 4 MEMORY STOP button**
During rewinding operations, the tape will stop at the "0000" counter point automatically when this button is pressed in.
- 5 DOLBY NR button**
When the left-side DOLBY NR button is pressed once with DOLBY NR being at the "ON" state. DOLBY NR B-TYPE is preferred and turned on. Every time when the right-side B/C button is pressed, B-TYPE and C-TYPE are selected alternately.
- 6 MPX FILTER button**
The MPX FILTER button should be used to prevent interference with the Dolby NR circuit when making Dolby NR encoded recordings of FM stereo programs. When making Dolby NR encoded recordings from any program source other than FM stereo, leave this button in the "OFF" position.
- 7 MONITOR button**
The SOURCE position of this button allows you to monitor the source program before it is recorded. The TAPE position of this button is used for tape playback monitoring or simultaneous monitoring during recording.
- 8 BIAS control**
(for NORMAL CrO₂ and METAL tape)
Adjust the bias according to the tape characteristics. Standard biasing is obtained at the center click-stop position.
- 9 BALANCE control**
This is the knob to adjust the recording level balance between the left and right channels. Turn it counter-clockwise to reduce the right channel's level and clockwise to reduce the left channel's. Usually, put the knob at the center click position.
- 10 PHONES jack**
For private music enjoyment without disturbing others, or for monitoring a recording, a set of headphones may be plugged in. Impedance should be from 8 to 1200 ohms.
- 11 OUTPUT LEVEL control**
This control adjusts playback, recording monitor, and headphones output levels for the both channels simultaneously.
- 12 INPUT LEVEL control**
The recording input level is adjusted by this knob. The levels in the left and right channels can be changed simultaneously.
- 13 Cassette compartment cover**
If this compartment cover is not closed completely, the deck's transport controls will remain inoperative.
- 14 LINEAR TAPE COUNTER**
Tape-passage is indicated digitally in minutes and seconds.
- 15 FLUORESCENT PEAK METERS**
These meters indicate recording or playback peak levels for each channel. For peak levels exceeding -7dB, the Auto Peak Hold Feature holds the peak level reading for approximately 1 seconds.
- 16 MEMORY indicator**
This indicator light is interlocked with the memory stop button. (MEMORY)
- 17 NR SYSTEM indicator**
This indicator light is interlocked with the DOLBY NR button and informs the user that DOLBY NR is in use as well as which B-TYPE or C-TYPE.
- 18 FILTER indicator**
This indicator light is interlocked with the MPX FILTER button. (FILTER)
- 19 MONITOR indicator**
This indicator light is interlocked with the MONITOR button to inform the use of the selected monitoring source— TAPE or SOURCE .
- 20 TAPE SELECT indicator**
This indicator light is interlocked with the Auto Tape Select feature which automatically adjusts the deck to the type of tape in use. (TYPE I TYPE II or TYPE IV).
- 21 PLAY, PAUSE and REC indicator**
When the PLAY, REC PAUSE and REC buttons are pressed, this indicator will light.
- 22 REC RETURN Button**
When this button is pressed at the recording state, the tape is rewound to the starting point. When the starting point is automatically reached, the record standby mode (rec pause state) comes.

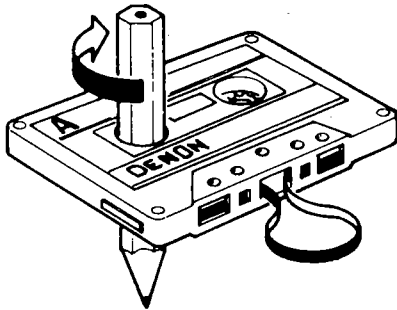
23 Tape transport controls

| | | | |
|----|--------------|--------------------|---|
| ▶ | PLAY | PLAY button | Press to playback tape. |
| ■ | STOP | STOP button | Press to stop tape in any mode. |
| ◀◀ | | REW button | Press for fast rewind. |
| ▶▶ | | FF button | Press for fast forward tape winding. |
| ● | REC/REC MUTE | RECORD/MUTE button | To begin recording, press the RECORD and PLAY buttons simultaneously. If only the RECORD button is pressed, the deck is placed in the REC PAUSE (record standby) mode. When this button is pressed under the REC PAUSE state, the mode shifts to the Auto Rec Mute. When this button is pressed for making a non-recorded part between two melodies, about 5 sec of non-recorded part can automatically be created. |
| | REC PAUSE | REC PAUSE button | Press this button if you want to change from the rec mute or recording state into the rec pause state. "REC PAUSE" is effective during "RECORDING" only. |

CASSÉTE TAPE

■ Handling Precautions

- C120 cassettes
C120 cassettes are not recommended as they use a very thin tape base which may become tangled around the capstan or pinchroller.
- Tape slack
This cassette deck incorporates an automatic tape slackness preventive mechanism, but it can not prevent such a slackness as shown below. Remove it with a pencil or the like prior to use.

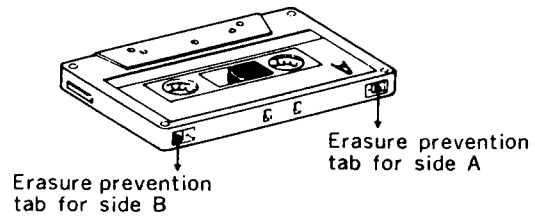


■ Storage Precautions

- Do not store cassette tapes in a place where they will be subject to:
 - Extremely high temperature or excessive moisture
 - Excessive dust
 - Direct sunlight
 - Magnetic fields (near TV set or speakers)
- To eliminate tape slack, store your cassettes in cassette cases with hub stops.

■ Accidental Erasure Prevention

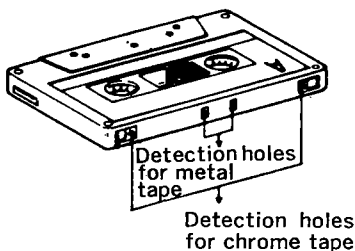
- Every cassette has erasure prevention tabs for each side. To protect your valuable recorded tapes from accidental or inadvertent erasure, remove the tab for the appropriate side with a screwdriver or other tools.
- To record on a tape with the erasure prevention tabs removed, cover the tab holes with plastic tape.



AUTO TAPE SELECT FEATURE

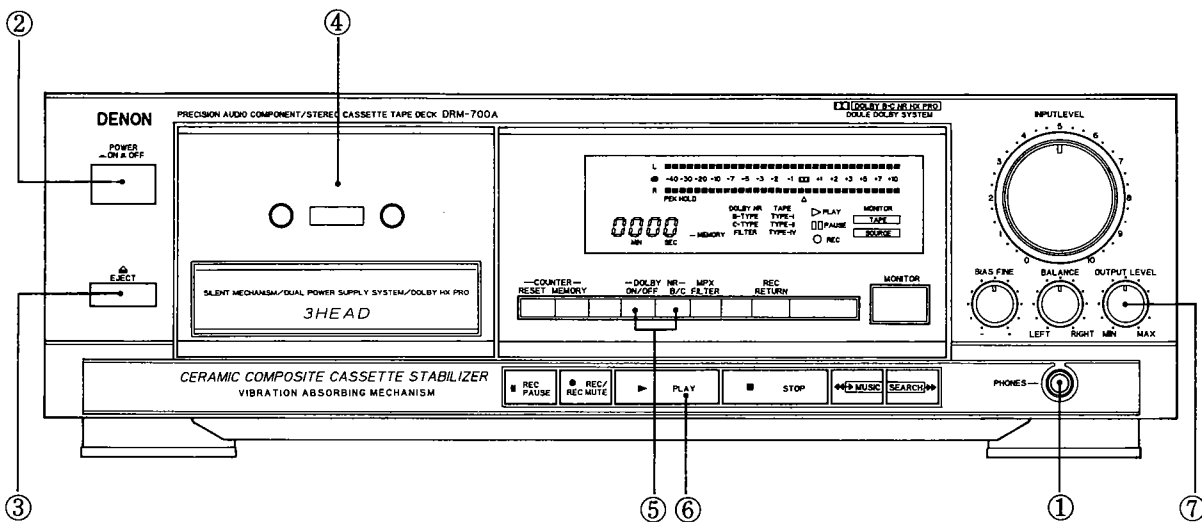
This Stereo Cassette Deck contains an Auto Tape Select feature which automatically selects the optimum bias and equalization for the tape in use. This is accomplished by detection of tape type detection holes in the cassette housing.

- If a tape without tape type detection holes is used, the deck will automatically adjust itself for normal tapes.



PLAYBACK

- Switch on your amplifier or receiver.
- Set the TAPE MONITOR switch on your amplifier or receiver to the TAPE position
- Operate the deck in numerical order as illustrated below:



① PHONES

Playback sound is fed into the headphones set.

② POWER

Push the switch to turn "ON" (▲) the power.

③ EJECT

Press the EJECT button to open the cassette compartment.

④ Cassette Compartment Cover

Load the cassette tape

⑤ DOLBY NR

For recordings made without Dolby NR, set to "OFF".
 For recordings made with Dolby B NR, set to "B".
 (The B-TYPE indicator will light up.)
 For recordings made with Dolby C NR, set to "C".
 (The C-TYPE indicator will light up.)

⑥ ►PLAY

Push the PLAY KEY (The ►PLAY indicator will light up).

- When playback is finished, press the stop (■STOP) button.
- To restart the tape, press the PLAY (►PLAY) button.
- If different types of Dolby Noise Reduction are used for record and playback, playback response will be adversely effected.

⑦ OUTPUT

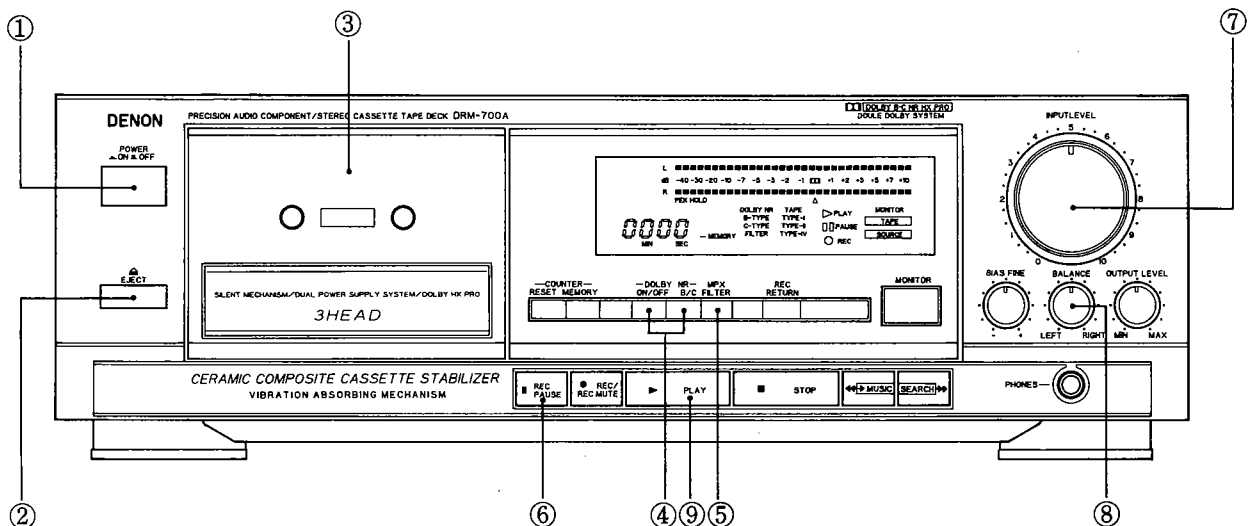
Check to make sure the OUTPUT LEVEL.

Note :

If the power switch is turned OFF in either the recording or playback mode, the cassette cannot be removed, even if the EJECT button is pressed. Please turn the power switch ON again, and then in stop mode, press the EJECT button to remove the cassette tape.

RECORDING

- Switch on the source component (tuner, amplifier, etc.).
- Set the TAPE MONITOR switch on your amplifier or receiver to the SOURCE position.



① **POWER**

Push the switch to turn "ON" (⬅) the power.

② **EJECT**

Press the EJECT button to open the cassette compartment.

③ **Cassette Compartment Cover**

(Make sure the erasure prevention tab has not been removed from the cassette shell half.)

④ **DOLBY NR**

Set, in accordance with the recording to be made. For recordings without Dolby NR, set to "OFF". For recordings with Dolby B NR, set to "B" (The B-TYPE indicator will light up). For recordings with Dolby C NR, set to "C" (The C-TYPE indicator will light up). Future mistakes during playback can be avoided if the cassette is so marked for Dolby NR encoded recordings.

⑤ **MPX FILTER**

Button it "ON" for the DOLBY NR recording of FM broadcasts (The FILTER indicator will light up).

⑥ **● REC/REC MUTE**

When pressed, the deck goes into the record standby mode. The ○REC and □ PAUSE indicators will light. Initial setting of recording levels should be made in the record standby mode.

⑦ **INPUT LEVEL**

Used to set the recording level.

⑧ **BALANCE**

Adjust the recording level balance between the left and right channels.

⑨ **▶ PLAY**

When pressed, the recording will start. (The ▶PLAY and ○REC indicators will light up).

• When recording is finished, press the STOP (■STOP) button.

Caution :

Be careful not to erase important recordings by mistake. Mis-erasing can be avoided by following the two steps below :

1. If the PLAY (▶PLAY) button is pressed while the ○REC indicator is on, the tape will be recorded.
2. If the PLAY (▶PLAY) and RECORD (●REC) button are pressed at the same time, the tape will be recorded.

PROPER RECORDING LEVEL

A too high recording level can saturate the tape and cause distortion. On the other hand, if recording levels are set too low, soft passages will be marked by residual noise. Proper recording level is the single most important factor for making well balanced recordings.

Guideline for maximum recording level

| | |
|---------------------------------|-----------------------|
| Normal tape (TYPE I) | +1 dB levels on peaks |
| CrO ₂ tape (TYPE II) | +3 dB levels on peaks |
| Metal tape (TYPE IV) | +5 dB levels on peaks |

Note : Optimum recording levels can differ depending on program sources or the type of tape used. Make trial recordings using the simultaneous monitoring. Refer to the description under "MONITOR" BUTTON.

■ **Meter reading difference between L and R channels**

The left and right channels readings of the PEAK METER can differ due to variations in input signal levels. In such cases, adjust the individual channels of the BALANCE control until identical meter readings are obtained for both channels.

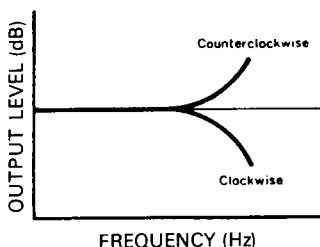
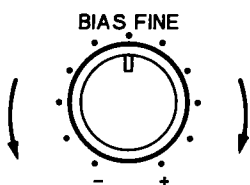
RECORDING BIAS ADJUSTMENT

For best recording results, monitoring during the recording process and comparing various recordings using your own judgement are essential.

The DRM-700A is equipped with a bias adjustment control to assist you in setting the proper bias for different types and brands of recording tape. At the center-stop position, the deck is set for a reference bias level for NORMAL, CrO₂ and METAL tapes. If the resulting recording in this position has too much or too little high frequency

content, varying the bias adjustment control can be useful to achieve better results.

If the high frequencies (treble sounds) are to be boosted, turn the bias control counterclockwise to decrease bias current. If distortion is of more concern than high frequency response, turn the control clockwise to increase bias current. By the use of this control, you can record tapes with response that matches your personal listening tastes.



REC/REC MUTE BUTTON

REC/REC MUTE is the DENON's unique and convenient function. By using this button, it is easily possible to insert a suitable space (the non-recorded part) between two melodies.

1. When you want to make about 5 sec of non-recorded part after the recording state:
Press the REC/REC MUTE button. The recorder will automatically create about 5 sec of non-recorded part and will stay in the recording standby state.
2. To create about 5 sec of non-recorded part after the standby state:

Press the REC/REC MUTE button, and the recorder will enter the non-recording state, automatically create about 5 sec of non-recorded part and stay in the standby state.

3. To cancel the non-recording state (the REC MUTE state):
Press the REC PAUSE button, and the recorder will cancel the non-recording state and will stay in the standby state.
4. To extend the non-recording state (the REC MUTE state) for further 5 sec or more:
Press the REC/REC MUTE button, and the non-recorded part will automatically be extended for another 5 sec.

MUSIC SEARCH SYSTEM

This device is a convenient system which detects the non-recorded part of more than 4 seconds between melodies, cues the next melody while the present melody is being reproduced or automatically detects the beginning of the melody now being reproduced and makes it into the reproducible state.

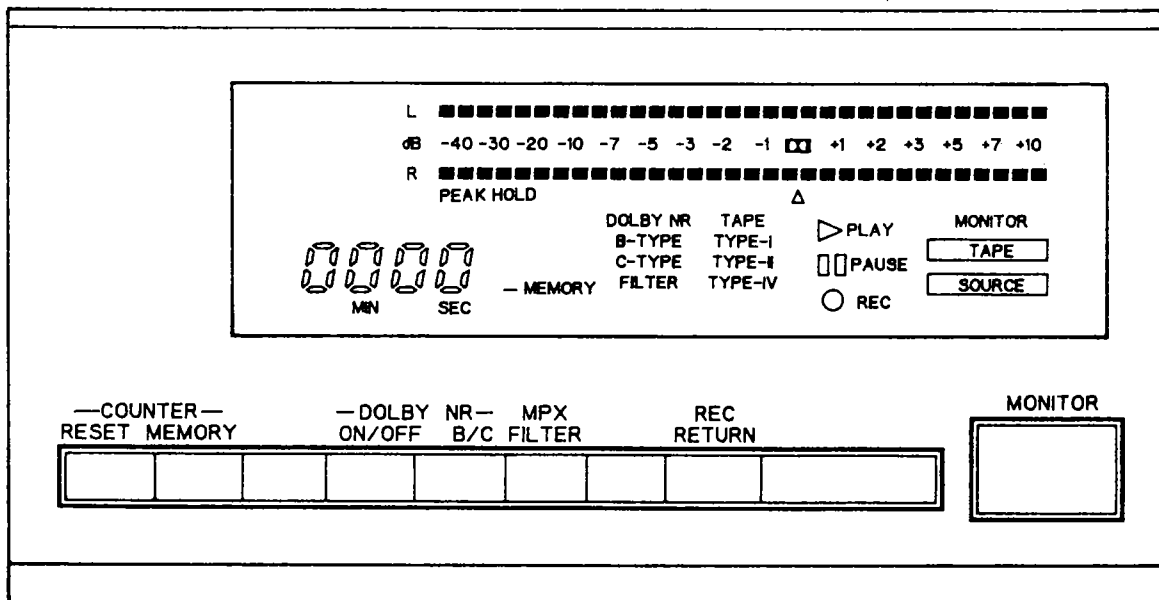
1. For cueing the next melody while the present melody is being reproduced:
At PLAY mode, depress the PLAY button and the FF button simultaneously. This device will detect the interval between melodies with the CUE state on, automatically become the PLAY mode and begin performing the next melody.
2. For hearing again the melody being reproduced:
At PLAY mode, depress the PLAY button and the REW button simultaneously. This device will detect the interval between melodies with the REVIEW state on, automatically become the PLAY mode, detect the beginning of the melody now being performed and play it from the first again.

Note: Note about MUSIC SEARCH action:

MUSIC SEARCH is a function which operates by detecting a comparatively long non-recorded part on the tape. Therefore, MUSIC SEARCH may not operate normally in the following cases.

- Sound on the tape is interrupted by speech or conversation.
- Long periods of pianissimo (softly played music) or non-recorded intervals occur on the tape.
- The tape has picked up noise in a non-recorded interval.
- Non-recorded intervals on the tape are less than 4 seconds in length.
- Noise-emitting electrical appliances are in operation nearby. i.e.; Electric razors, drills, refrigerators, etc.

TAPE COUNTER AND MEMORY STOP



1) Operation of the Linear Tape Counter

- (1) Press the RESET button to reset the counter to "0000".
- (2) By using the PLAY, FF, or REW function, the reading of the counter indicate in minutes and seconds. This linear counter is set by the basis of C-90 type.

Note

- There may be errors between the counter indication and the real recording time. This is inevitable to some extent due to the fact the counter indicates time during FF and REW as those during recording and playback.
The time of the error itself is different among tapes used.
- During recording and playback operations, the counter is useful for noting the location of existing programs or positions where recording is to be started.

2) Operation of MEMORY STOP

- (1) During recording or playback operations, MEMORY STOP can be used to locate a particular point on the tape. At the desired point, reset the counter to "0000". With the MEMORY STOP button in the "ON" position, the deck will stop at the "0000" point (actually "5955" and "0000") during REWIND operations.
- (2) The MEMORY indication will light when this function is activated.
- (3) Notes:
 - When the power is turned "OFF", this function is automatically deactivated.
 - The MEMORY STOP is accurate to ± 5 on the counter, and will stop between "5955" and "0000".
 - The MEMORY STOP is released by pressing the EJECT button.
 - The MEMORY STOP does not operate during the REC RETURN.

3) Display Back-up

- (1) The functions DOLBY NR, MPX FILTER, MONITOR and the counter content are protected by 24-hour memory back-up. After 24 hours, DOLBY NR and MPX FILTER are set to "OFF", MONITOR is reset to "TAPE" and the counter content is reset to "0000".

MONITOR BUTTON

This Stereo cassette deck uses a three-head system which permits simultaneous "off-the-tape monitoring" during recording. Incidentally, as this Stereo Cassette Deck adopts an automonitor system, [TAPE] or [SOURCE] can automatically be activated according to the operation conditions. These modes can also be activated manually.

| | | |
|------------------|--|---|
| Recording | | The signal recorded on the tape is monitored simultaneously "off-the-tape". This monitoring mode enables you easy check for optimum recording levels. In the [TAPE] mode, the FL PEAK METER indicates the signal levels played back off-the-tape. |
| | | The SOURCE position enables you to monitor the input source signal before it is recorded on the tape. Using the FL PEAK METER, this mode is convenient for setting recording levels or input level monitoring during recording. |
| Playback | | During playback, the MONITOR button must be placed in the [TAPE] position. If it is set in the [SOURCE] position, the signal from the tape won't be heard. |

DOLBY C NOISE REDUCTION SYSTEM

- The Dolby noise reduction system substantially reduces the tape background noise (hiss) inherent in the cassette medium. Dolby B NR is most widely in use. However, Dolby C NR is a much more recent development and represents a significantly improvements over Dolby B NR.
- Tape background noise consists primarily of high frequency information which is particularly annoying during soft passages. The Dolby NR system increase the level of low volume mid and high frequency signal during recording and reduces the level of these signals by an identical amount during playback. As a result, the playback signal is identical to the original source signal, but the level of background noise generated by the tape is greatly reduced.
- The operating principle of Dolby C NR is similar to that of B except for the encoding/decoding response curves. The noise reduction effect obtained by Dolby C NR is up to 20dB, compared to 10dB with Dolby B NR. In addition, Dolby C NR uses an antisaturation network and spectral skewing circuitry, and significantly improves the dynamic range in the mid to high frequencies.

DOLBY HX-PRO HEADROOM EXTENSION SYSTEM

This deck is equipped with the DOLBY HX-PRO headroom extension system. Since the system functions automatically during recording, no switching operation or adjustment is required. The system is effective with any type of Normal, CrO₂ or Metal tapes.

The Dolby HX-PRO headroom extension system functions during recording to lift up the saturation level in the treble range. Therefore, most of the treble range components distorted or lost during recording on conventional cassette decks are more faithfully recorded on the new DRM-700A cassette deck.

Features of the DOLBY HX-PRO headroom extension system

- (1) Performance of Normal and CrO₂ tapes can be upgraded closer to that of Metal tapes.
- (2) The dynamic range in the treble is improved significantly.
- (3) Since no decoding in playback is necessary, the improvement can be obviously heard on any hi-fi playback system including portable components and car systems.
- (4) The system functions whether the Dolby B/C NR is engaged or not.

MAINTENANCE

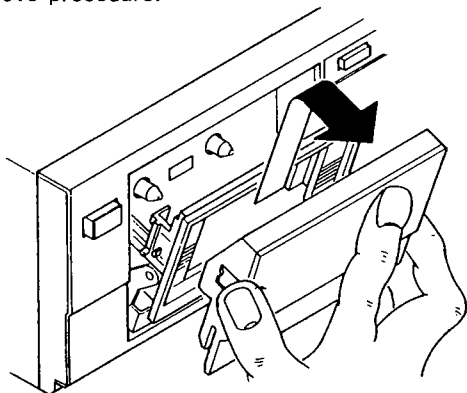
■ Removing the cassette compartment cover

It will be more convenient if the cassette compartment cover is removed during the cleaning of the pinchroller and heads, or during demagnetizing of heads.

Follow these procedures:

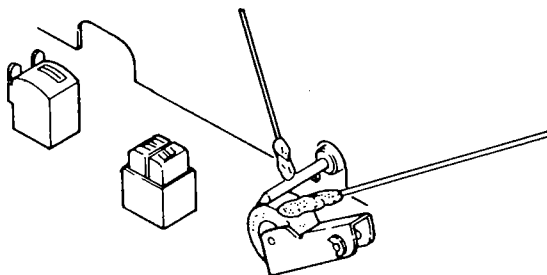
1. Press the EJECT button to open the cassette compartment.
2. Hold only the cover of the cassette compartment and pull it up. The compartment cover is removed from the front.

When attaching the cassette compartment cover, reverse the above procedure.



■ Cleaning the pinchroller and the capstan

If the pinchroller or the capstan accumulate dust, tape transport may become unstable resulting from slippage during recording or playback. The tape can also be damaged by being rolled up around the capstan. Clean them with a cotton swab or a soft cloth moistened with cleaning solution (such as alcohol).

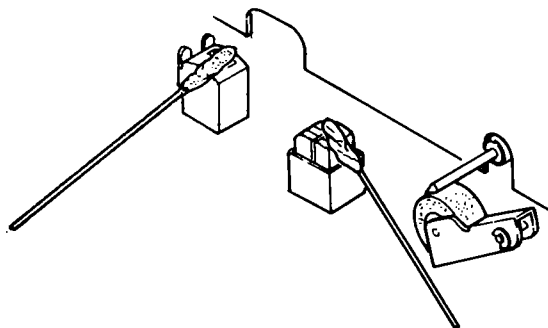


■ Head Cleaning

After long usage, tape coating or dust may adhere to the heads causing deterioration of sound. Clean them regularly. Use a cotton swab moistened with cleaning solution (such as alcohol).

Note:

1. Some cleaning cassettes on the market have a strong abrasive effect and scratch the heads. Use cotton swabs instead of cleaning cassettes.
2. Since the use of metal tapes is apt to collect more dust on the heads, clean the heads more often to enjoy optimum sound.



■ Demagnetizing the heads

The heads may become magnetized after long usage or by having a strongly magnetized object brought near them. The result is a generation of noise, loss of the high frequency range, or erasing the treble components of pre-recorded tapes and adding noise. Demagnetize the heads on a regular basis.

■ Procedure

1. Be sure to turn "off" the power supply.
2. Turn the demagnetizer "on" while it is more than 30cm away from the heads. Bring the demagnetizer near the heads and slowly move it in a small circle four or five times.
3. Slowly move the demagnetizer away from the heads and turn "off" the power of the demagnetizer when it is about 30cm away from the heads.

SYMPTOMS OFTEN MISTAKEN AS BREAKDOWNS


Make sure of the followings before you consider as any malfunctions:

1. Are all the connections correct?
2. Is the set being operated correctly in accordance with the operating instructions?
3. Are the speakers and amplifiers functioning correctly?

If the tape deck still does not function properly, check it again, using the check list below. If the symptom does not correspond to the check list, please contact your DENON dealer.

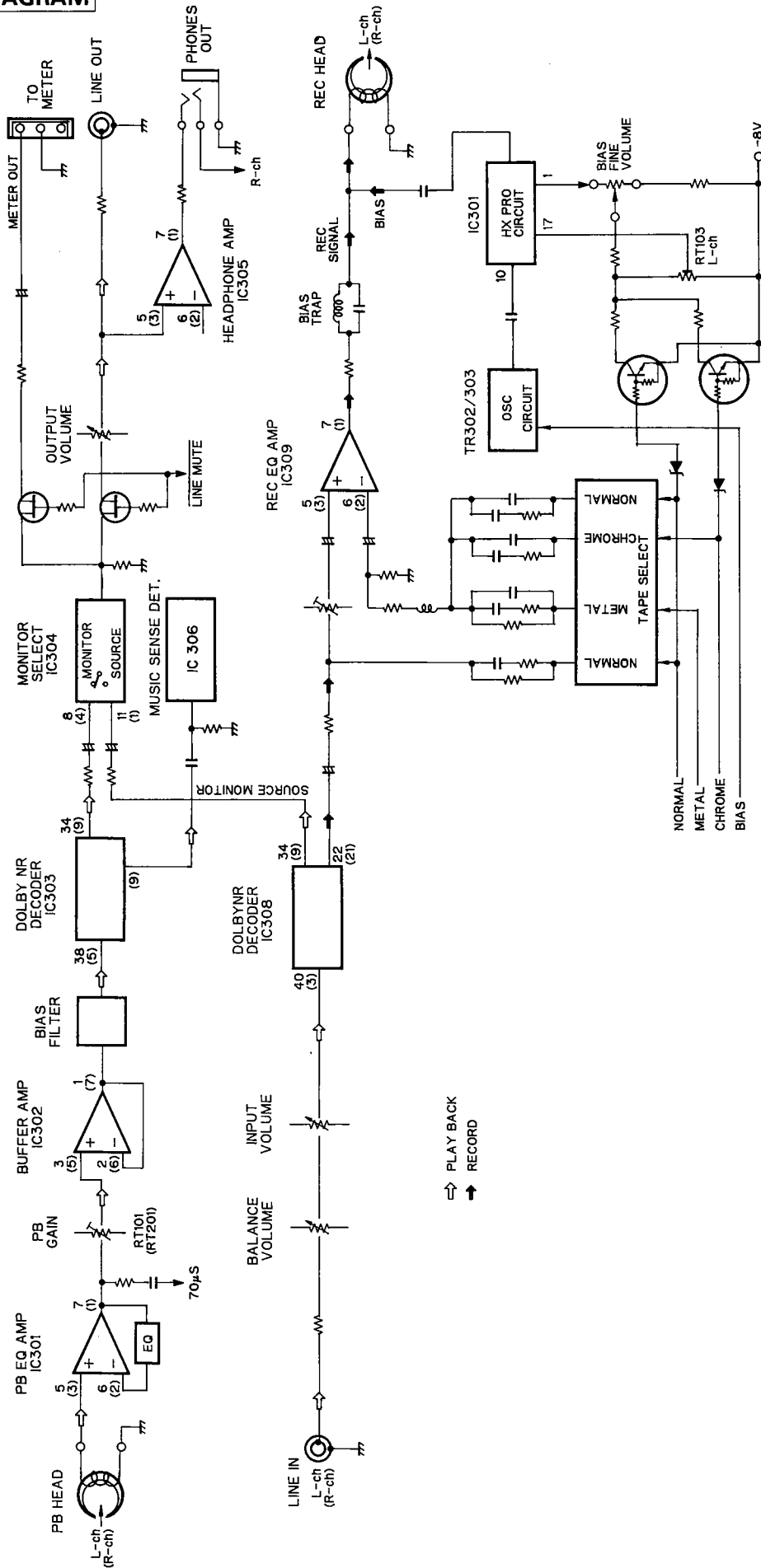
| Symptom | Cause | Remedy |
|---|--|--|
| Tape does not run. | Power cord is off. Tape is completely wound up. Tape is loose. Cassette is not loaded properly. Defective cassette. | Check power cord. Rewind tape. Tighten tape with pencil, etc. Load cassette properly. Replace cassette. |
| Tape is not recorded when recording button is pressed. | No cassette is loaded. Erase prevention tab is broken off. | Load cassette. Cover hole with plastic tape. |
| Sound is warbled or distorted. | Heads, capstan or pinchroller are contaminated. Tape is wound too tight. Recording input level is too high. Tape is worn out and has "drop-outs". | Clean them. Fast forward or rewind to loosen tape winding. Adjust recording input level. Replace tape. |
| Excessive noise. | Tape is worn. Heads, capstan or pinchroller are contaminated. Heads are magnetized. Recording input level is too low. | Replace tape. Clean them. Demagnetize heads. Adjust recording input level. |
| High frequency (treble) is emphasized. | Dolby NR button is set improperly. | Set Dolby NR button properly. |
| High frequency (treble) is lost. | Heads are contaminated. Tape is worn. | Clean them. Replace tape. |
| When a CrO ₂ or metal tape is placed in the deck, a different tape indicator comes on. | The cassette housing is of an older design without tape type detection holes. | Use the latest cassette with tape type detection holes. |
| The cassette tape cannot be removed. | If the power switch is turned off in either the recording or playback mode, and the unit is stopped, there may be case when the cassette cannot be removed, even if the EJECT button is pressed. | Turn the power switch ON again, and then press the stop (■) button. Then, in the stop mode, press the EJECT button to remove the cassette tape. |

SPECIFICATIONS

- Type Vertical tape loading 4-track 2-channel stereo cassette deck
 - Heads Record & Playback (combination head) × 1
Erase (Double gap ferrite head) × 1
 - Motors Capstan (DC servo motor) × 1
Reel (DC motor) × 1
Actuator (DC motor) × 1
 - Tape Speed 4.8 cm/sec.
 - Fast forward, rewind time Approx. 100 sec. with a C-60 cassette
 - Recording bias Approx. 105 kHz
 - Overall S/N ratio (at 3% THD level) .. Dolby C NR on ... more than 74 dB (CCIR/ARM)
 - Overall frequency response 20~20,000 Hz ±3 dB (at -20 dB METAL tape)
 - Channel separation .. more than 40 dB (at 1 kHz)
 - Crosstalk more than 65 dB (at 1 kHz)
 - Wow & flutter 0.045% wrms, ±0.1% w. peak
 - Inputs
line 80 mV (-20 dBm) input level at maximum
Input impedance : 50 kohm unbalanced
 - Outputs
line 620 mV (0 dB) output level at maximum (with 47 kohm load, recorded level of 200 pwb/mm)
headphone 1.2 mW output level at maximum (optimum load impedance 8 ohm~1.2 kohm)
 - Accessories Parallel pin cord × 2
Mini-plug cable × 1
 - Power supply 50 Hz/60 Hz compatible, voltage is shown on rating label
 - Power consumption .. 19 W
 - Dimensions 434 (W) × 135 (H) × 303 (D) mm
 - Weight 5 kg
- Above specifications and design styling are subject to change for improvement.
- Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.
"DOLBY", the double-D symbol  and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

Best results will be obtained with use of DENON DX and HD Series cassette tapes.

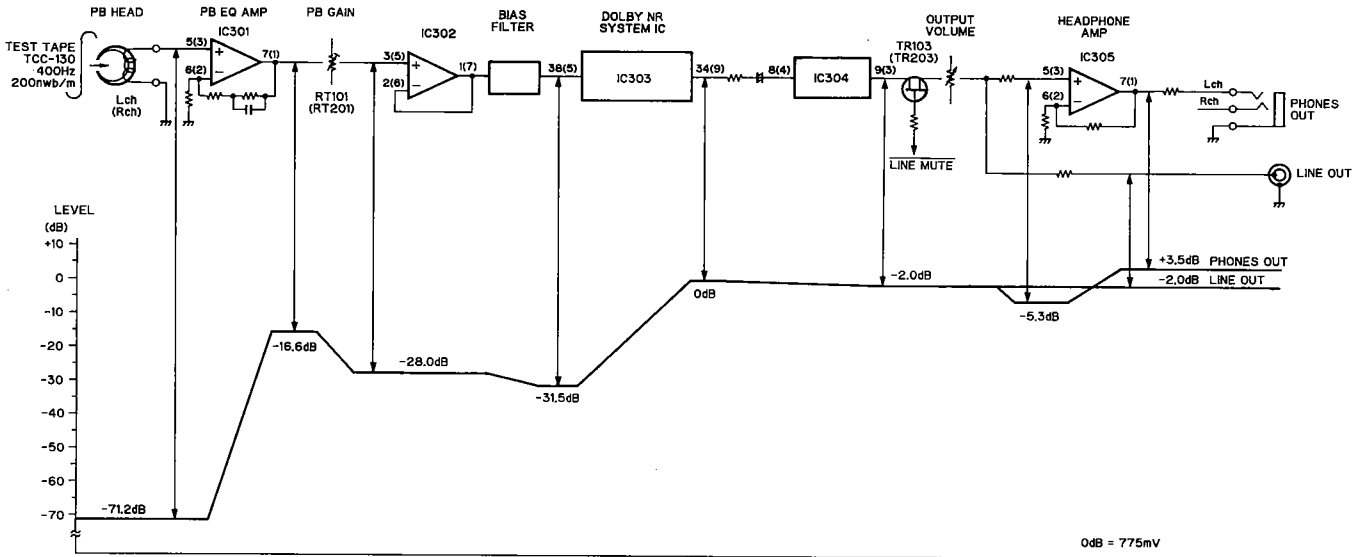
BLOCK DIAGRAM



LEVEL DIAGRAM

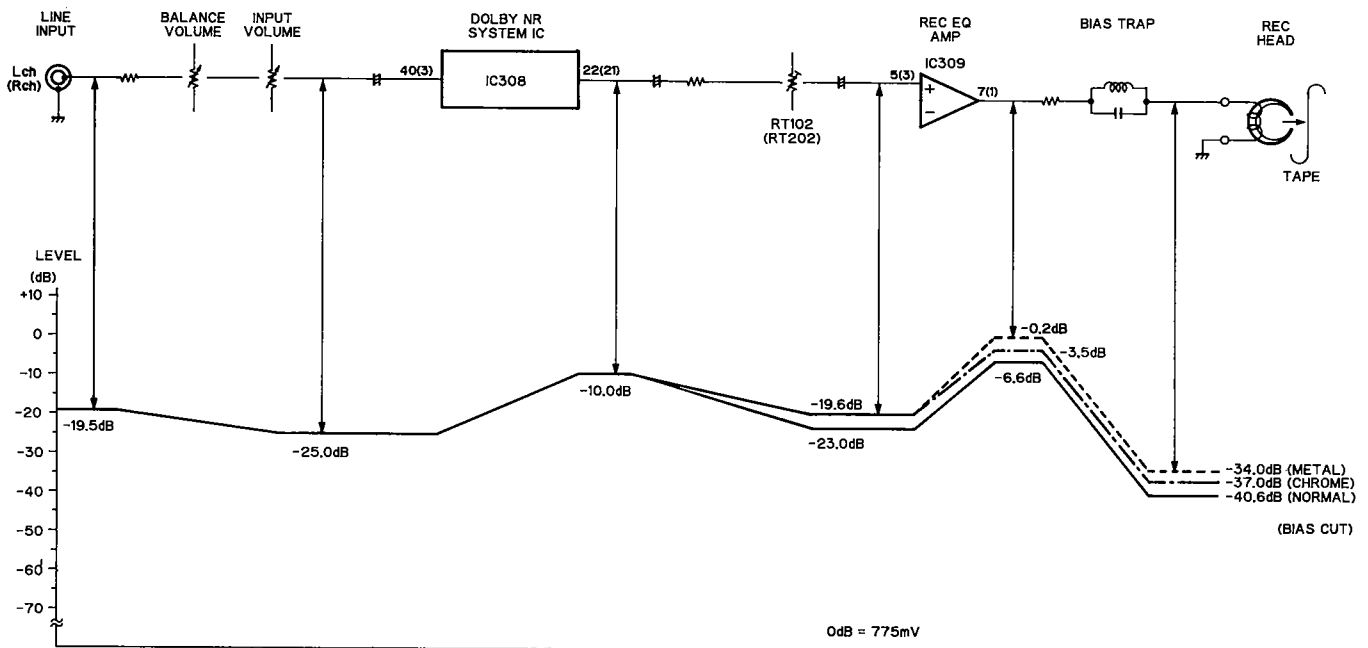
PLAYBACK SYSTEM

TCC-130 DOLBY B-TYPE
400 Hz 200 nwb/m



RECORDING SYSTEM

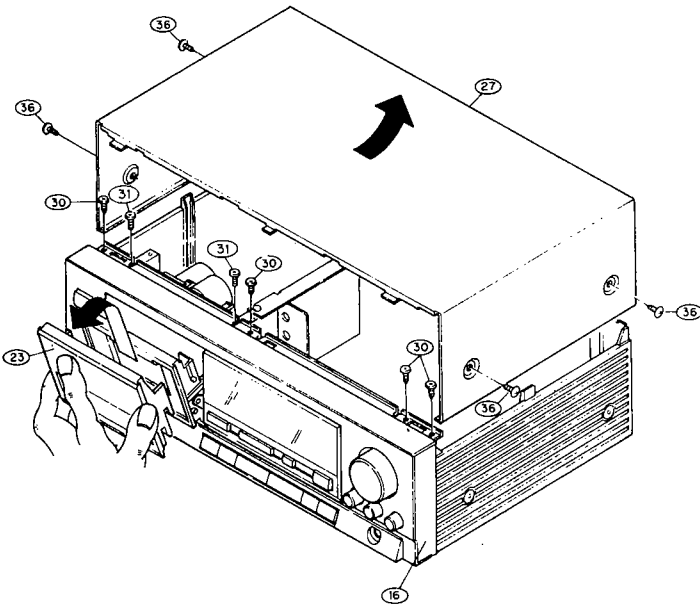
INPUT FREQUENCY
400 Hz



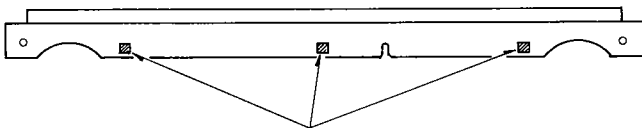
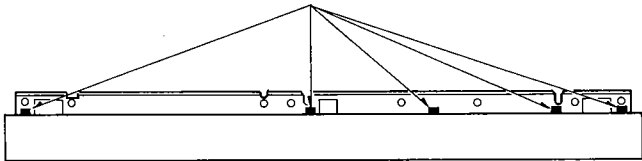
DISASSEMBLY INSTRUCTIONS

1. How to Remove the Front Panel

- (1) Remove the four screws 4 × 10 CTTS(P) BK (36) at the side of the top cover (27). Move the top cover to the rear and rise it to remove it.
- (2) Press the eject knob (14), open the cassette window (23) and remove the mechanism as shown in the figure.
Note: Handle the cassette window with care because it can be scratched easily.
- (3) Remove the four screws (3 × 10 CBTS-P) (30) on top of the front panel (16), the five hooks on the top, the three hooks on the bottom and pull the unit forward to detach it.



5 hooks on the top of the front panel



3 hooks on the bottom of the front panel

2. How to Remove the Mechanism

- (1) Remove the top cover (27) and front panel (16). (Refer to Step 1.)
- (2) Remove the three securing screws on the shield bracket (18) and the screws (3 × 6 CBTS-P) (31) and detach the shield bracket. (Refer to the disassembly figure.)
- (3) Remove the two securing screws (3 × 10 CBTS-P) (30) for the mechanism.

- (4) Remove the connectors attached to the leads from the mechanism that are attached to the audio board and the power supply board. Remove the style pins that secure the wires.

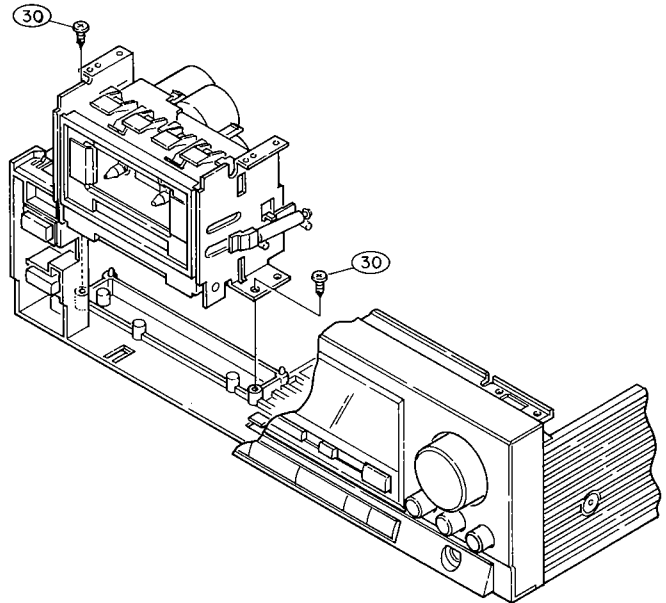
Mechanism

| | |
|-----------------------------|------------------------------|
| W891 → (8P) → CN891 (WHITE) | } Power supply circuit board |
| W892 → (8P) → CN892 (RED) | |
| W171 → (6P) → CN171 | } Audio circuit board |
| W172 → (4P) → CN172 | |

Note: Be sure to check that the connectors are reconnected correctly when the unit is reassembled.

- (5) Lift the unit up to remove it.

Note: When the reassembly is performed make sure that the stays at the bottom of the unit enter the slots in the chassis and that no wires are pinched between the unit and the chassis.



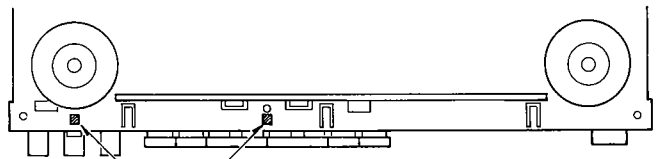
3. How to Remove the Front Escape Assembly

- (1) Remove the top cover (27) and the front panel (16). (Refer to Step 1.)
- (2) Remove the wires from the front escape assembly (9) that are connected to the audio board and power supply board.

Front Escape Assembly

| | |
|-----------------------------|------------------------------|
| W141 → (13P) → CN141 | } Audio circuit board |
| W151 → (3P) → CN151 | |
| W121 → (3P) → CN121 (Blue) | } Power supply circuit board |
| W291 → (25P) → CN291 | |

- (3) Remove the two front escape screws from the bottom of the chassis and the front escape assembly can be removed towards the front.



Front escape screws (2)

4. How to Remove the Meter Circuit Board

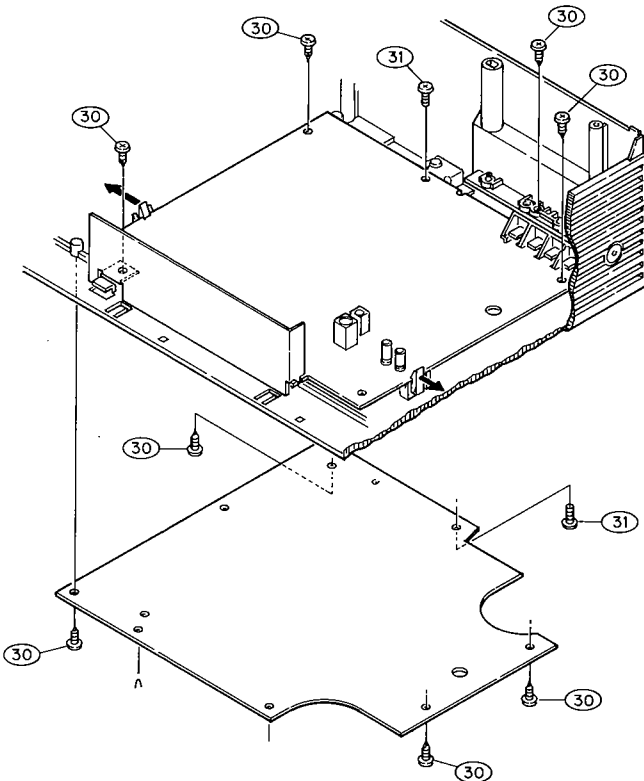
- (1) Remove the top cover (27) and front panel (16). (Refer to Step 1.)
- (2) Remove the front escape assembly (9). (Refer to Step 3.)
- (3) Remove the three screws (3 × 10 CBTS-P) (30) that secure the unit board, the seven screws and remove the meter board.

Note: When replacing the (tactile-takuto) switch (X) insert it so it is not raised after assembly.



5. How to Remove the Audio Circuit Board

- (1) Remove the top cover (27) and the front panel. (Refer to Step 1.)
- (2) Remove the two cushions (26) attached to the chassis and the shield bracket (18).
- (3) Remove the front escape assembly. (Refer to Step 3.)
- (4) Remove the shield bracket (18).
- (5) Remove the wires from the power supply board that are connected to the unit.
- (6) Remove the screws (3 × 10 CBTS-P) that press the 4-pin jack, the three screws (3 × 10 CBTS-P) that secure the circuit board and the two screws that secure the board to the chassis and the board can be pulled out of the assembly.

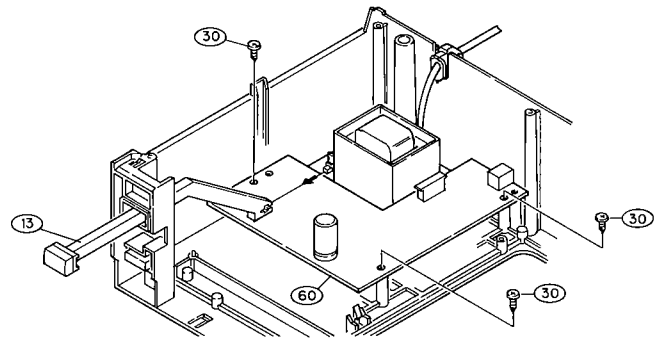


Note: Most service operations for the audio board can be performed by removing the bottom plate from the rear of the chassis. Refer to the previously described disassembly procedures if it is necessary to remove the entire unit.

Assembly is the reverse of disassembly. Each part must be mounted in the correct position or the unit may not be able to be installed. Make sure that each part is mounted correctly during assembly.

6. How to Remove the Power Supply Board

- (1) Remove the top cover and front panel. (Refer to Step 1.)
- (2) Pull out the power switch lever (13) from the power switch.
- (3) Remove the wires from the unit that are attached to the audio board or power supply board.
- (4) Remove the three screws (3 × 10 CBTS-P) (30) that secure the power supply circuit board and raise the board to remove it.



ADJUSTING AND CHECKING THE MECHANISM SECTION

1. Replacing the Pinch Roller Arm Ass'y 9

Before replacing the pinch roller, clean the tape contact surface of the pinch roller and the capstan shaft.

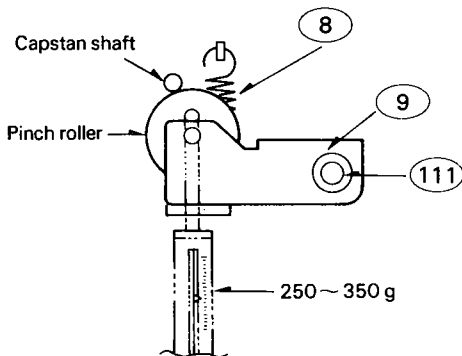
Most causes of poor tape transport can be traced to dirty pinch roller and capstan shaft.

The pinch roller arm ass'y 9 can be removed by removing the spring 8 and the slit washer 111.

After replacing, run a padless C-90 tape to check for tape curls at the tape guide section of the head.

2. Checking the Pressure Force of the Pinch Roller

In the playback mode, hook a spring weight onto the bracket at the center of the pinch roller. After separating the pinch roller from the capstan shaft, allow the pinch roller to contact the capstan shaft again. Check to make sure the spring weight reads between 250 ~ 350 g when the pinch roller starts to rotate. If it is not within the normal range, replace the spring 8.



3. Exchanging recording/playback head (23)

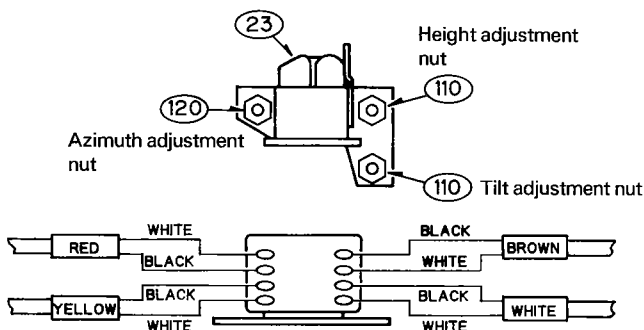
Detach the front panel first.

3-1 Dismounting recording/playback head

- (1) Detach the recording/playback head locking screw (110) and the azimuth adjusting nut (120).
- (2) Remove soldering on the head wire and separate the mechanical unit to dismount the recording/playback head.

3-2 Recording/playback head installation

Assembly is the reverse of the installation procedure described in section 3-1. The soldering for the head wire is performed as shown in Figure 3-1.



4. Recording/playback head Adjustment

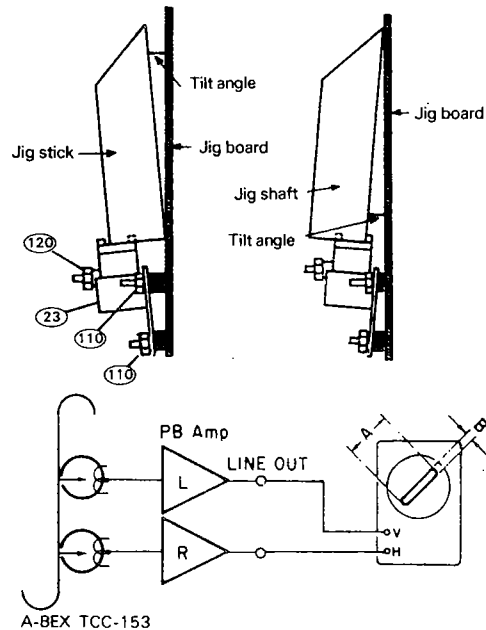
4-1 Height adjustment (adjust with head adjustment jig THG-801)

- (1) Set THG-801 (jig board) on the mechanical unit and perform the adjustment by turning the special height adjustment nut (110) so the 3.8 mm part on THG-801 (jig shaft) can move without touching the tape guide on the recording/playback head (23).
- (2) Turn the azimuth adjusting nut (120) so that the recording/playback head does not tilt while adjusting the height, and make a rough visual adjustment.

4-2 Adjustment of tilt angle

- (1) Set THG-801 (jig board) in the mechanical unit and place THG-801 (jig shaft) on the recording head to inspect the gap between the jig board. If the jig shaft is tilted forward, the tilt screw (110) is too tight. Loosen it slightly and adjust the tilt screw (110) until the jig stick is parallel to the jig board and the gap is completely eliminated.
- (2) Readjusting the tilt may cause the height adjustment to slip. After adjusting the tilt, be sure to verify the height. If the height is misaligned, turn the special height adjustment nut (110) and the tilt screw (110) to the same angle to shift the recording/playback head so it is parallel to the jig board for height readjustment. After the adjustment is completed, tighten the lock nuts.

Figure 4-2.1 Forward tilt case Figure 4-2.2 Backward tilt case



Note: Be sure to mount the head adjust spacer.

5. Replacing the ERASE HEAD 24

- (1) Unscrew the erase head holding screws 104, 105.
- (2) By unsoldering the HEAD WIRES 72 can be taken off the mechanism unit.

4-3 Azimuth Adjustment

Playback test tape A-BEX TCC-153 and perform the adjustment by turning the azimuth adjustment nut (120) until A and B in the Lissajous wave figure are at the maximum and the minimum positions respectively. After azimuth adjustment is completed, check again to make sure there is no dislocation on the head height with the readjusting jig THG-801. After the adjustment is completed, secure the lock nuts on the adjusted parts.

6. Checking for Axis Direction Movements of the Capstan Shaft

Hold the capstan shaft from the front of the mechanism and move it in the axis direction; check to make sure some movement exists.

7. Checking the Take-up Torque

Load the cassette type torque meter (SONY TW2111). Check to make sure that the torque meter average reading is within 30~80 g-cm during playback. If it is not within this range, check the voltage (2.5~3 V) of the reel motor. If the voltage is low, the torque will be weak; if it is high, the torque will be strong.

8. Checking the FF and REW Torques

Load the cassette type torque meter (SONY TW2231). Check to make sure the torque meter indicates within 60~130 g-cm at the end of FF and REW.

9. Checking the Back Tension Torque During Record/Playback

Load the cassette type torque meter (SONY TW2111); check to make sure the torque meter reads between 1.5~7 g-cm during playback and that there is no unevenness.

If it is not within this range, check the section on adjusting the reel thrust movement; or else replace the spring 10.

10. Checking the FF and REW Times

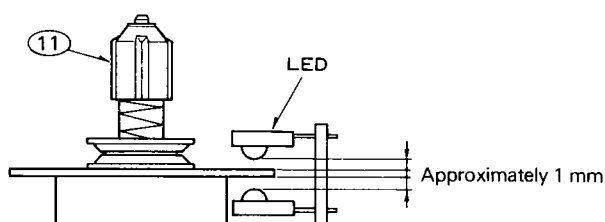
Load a C-60 cassette tape (DENON HD7E/60); check to make sure the tape is fast forwarded or rewound within 110 seconds. If it is not within this range, check section 9.

11. Checking the Operation of the Erase Prevention, Metal and Chrome Switch

Confirm that the leaf switch properly detecting the tape type detection holes on the cassette housing.

12. Checking the Gap Between the Pulse Detection LED and the Reel Ass'y

Check to make sure the gap between the surface of the shutter section of the reel ass'y and the LEDs is approximately 1 mm.



ADJUSTING THE ELECTRICAL SECTIONS

• Measuring instruments necessary for adjustments

- (1) Audio signal generator
- (2) Variable resistance attenuator
- (3) Electronic voltmeter
- (4) Oscilloscope
- (5) Frequency counter
- (6) Adjustment screwdriver
- (7) Trap coil adjustment square stick
- (8) Test tapes (SONY TY-224)
(A-BEX TCC-130, TCC-153, TCC-262B/162B)
(DENON HD7E/60)
- (9) Transport Check cassette tape (A-BEX TCC-902)

• Caution on adjusting

- (1) Before adjusting, clean the head surface, capstan and the pinch roller with a gauze or a cotton swab moistened with alcohol.
- (2) Demagnetize the R/P HEAD and the E. HEAD with a head eraser.
- (3) Completely demagnetize the adjustment screwdriver.
- (4) Unless instructed otherwise, set the various controls as follows:
 - INPUT volume maximum
 - OUTPUT LEVEL volume maximum
 - DOLBY NR switch OFF
 - BIAS volume Center click position
 - BALANCE volume Center click position

1. Tape Transport Check

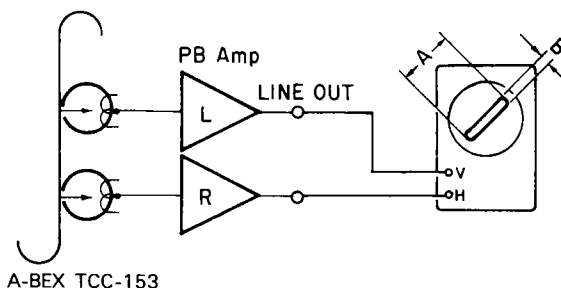
Load the transport check cassette. In the operational mode, illuminate the fixing guides of the R/P HEAD with a lamp and check to make sure the tape edge does not come in contact with the tape guide section.

The tape transport is the most important element in determining the performance of a cassette deck.

Avoid moving the various adjustment screws, nuts, etc., as much as possible. Refer to the pages on "Adjusting and Checking the Mechanism Section" when replacing or adjusting the R/P HEAD.

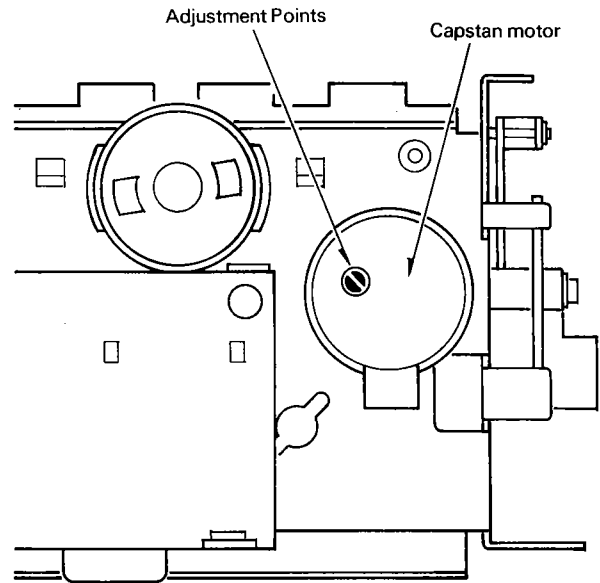
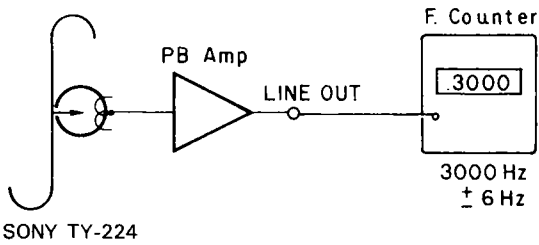
2. Adjusting the Azimuth

- (1) After completing the tape transport check, load the test tape (A-BEX TCC-153).
- (2) Playback the test tape; adjust the azimuth screw so that section A of the resurge wave form is maximum and section B is minimum.



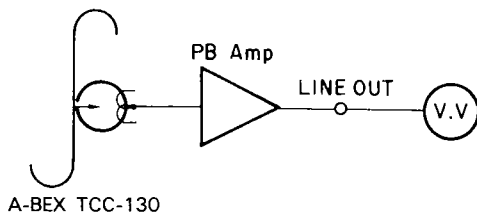
3. Checking and Adjusting the Tape Speed

- (1) Connect the frequency counter to the LINE OUT terminal and load test tape (SONY TY-224).
- (2) Playback a test tape. At about halfway through the tape, where the tape transport is stable, adjust the adjustment points on the back of the capstan motor so that the frequency counter will have a reading within the range of 3,000 Hz ± 6 Hz.



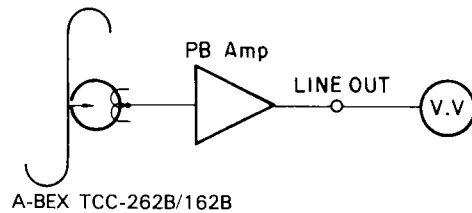
4. Adjusting the Playback Section

- (1) Adjusting the playback level
Playback the Dolby standard level test tape (A-BEX TCC-130) and adjust RT-101 (L ch), RT-201 (R ch) so that the LINE OUT voltage becomes -2 dB (0.620 V).

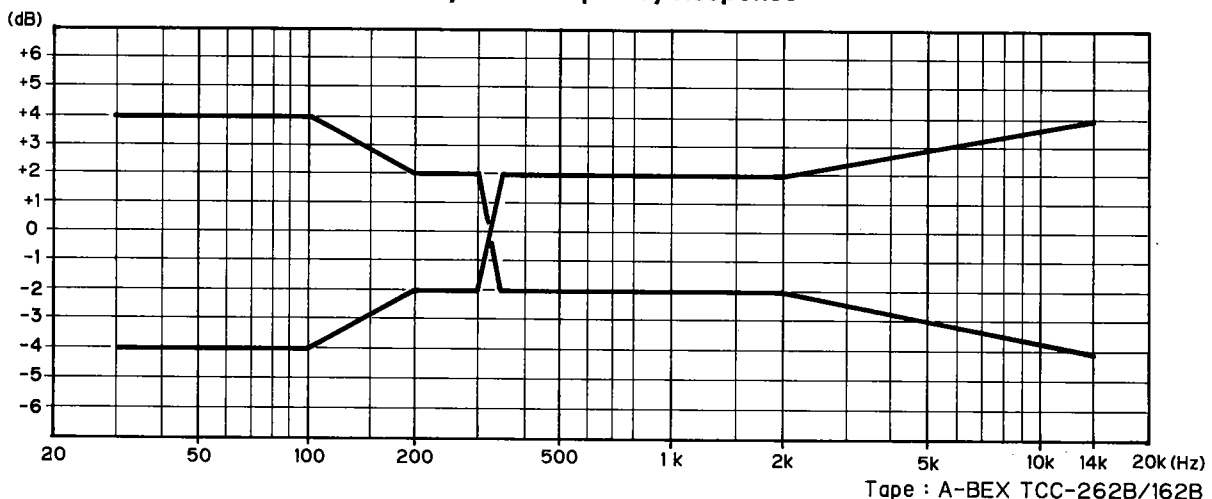


- (2) Adjusting the playback frequency response
Playback the test tape (A-BEX TCC-262B/162B) and check to make sure that the frequency response meets the specifications in the diagram.

Note: Before adjusting the playback frequency response, first adjust the azimuth using the 8 kHz signal at the beginning of the test tape (A-BEX TCC-262B). Also, after adjusting the playback frequency, make sure to readjust the azimuth with the test tape (A-BEX TCC-153) and then lock the adjustment screw.



Playback Frequency Response

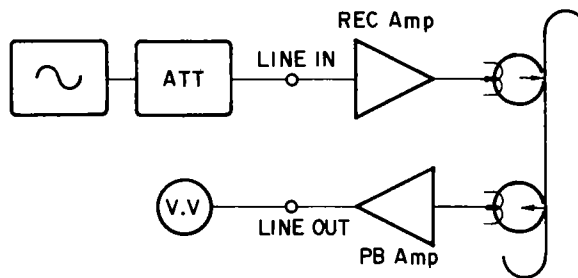


5. Adjusting the Recording Section

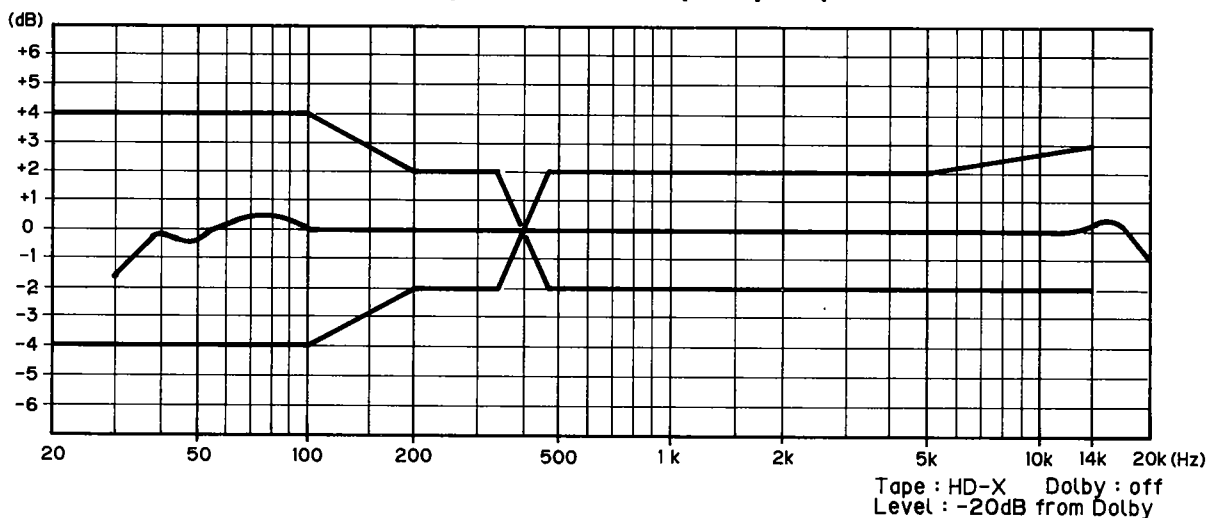
(1) Adjusting the record/playback overall frequency response. (CrO₂)

- 1) Load the test tape HD7E/60, record a signal with an input level of -20 dB, 1 kHz at the LINE IN terminal; playback this recording.
- 2) Change the frequency of the input signal to 10 kHz, record and playback; adjust RT-103 (L ch), RT-203 (R ch) so that the characteristic standards meet the following diagram when compared to the 1 kHz signal output level.

(The other TAPE POSITIONS will automatically be adjusted by finishing of the foregoing adjustments.)



Record/Playback Overall Frequency Response



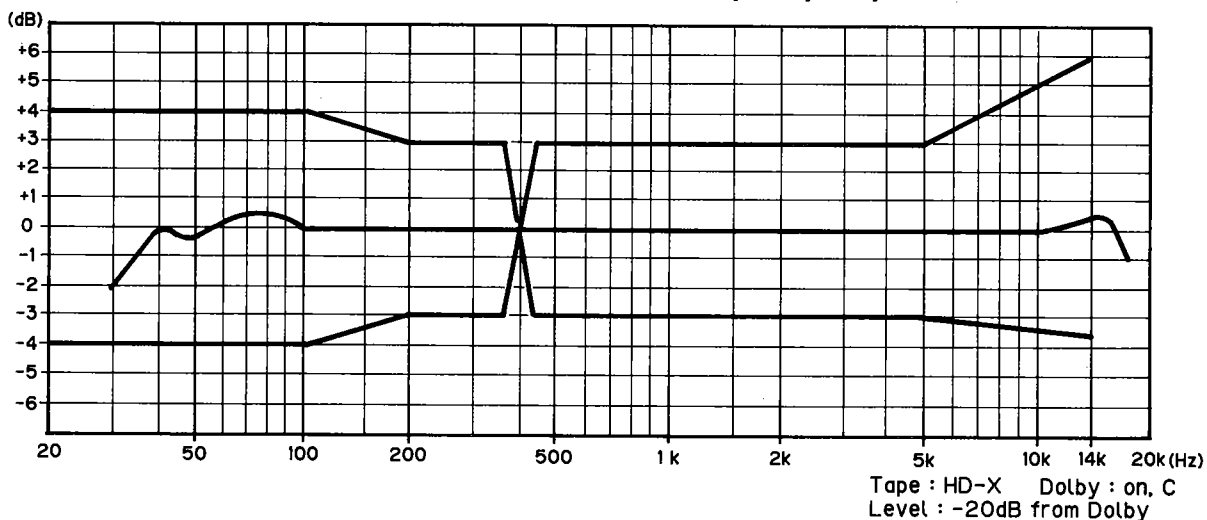
(2) Adjusting the record/playback levels (CrO₂)

- 1) Load a HD7E/60 tape and after having recorded a signal of 1 kHz (-20 dB), play it back.
- 2) Adjust RT-102 (L ch) and RT-202 (R ch) so that the output from the line out terminal has the same value as the output when monitoring the recording.

(3) Checking the Dolby C record/playback overall frequency response

- 1) Set the DOLBY NR switch to the "C" position.
- 2) Using the test tapes HD7E/60, perform record/playback in the same manner as 5-(1).
- 3) Check to make sure that the record/playback overall frequency response meets the specifications in the diagram.

Dolby C Record/Playback Overall Frequency Response

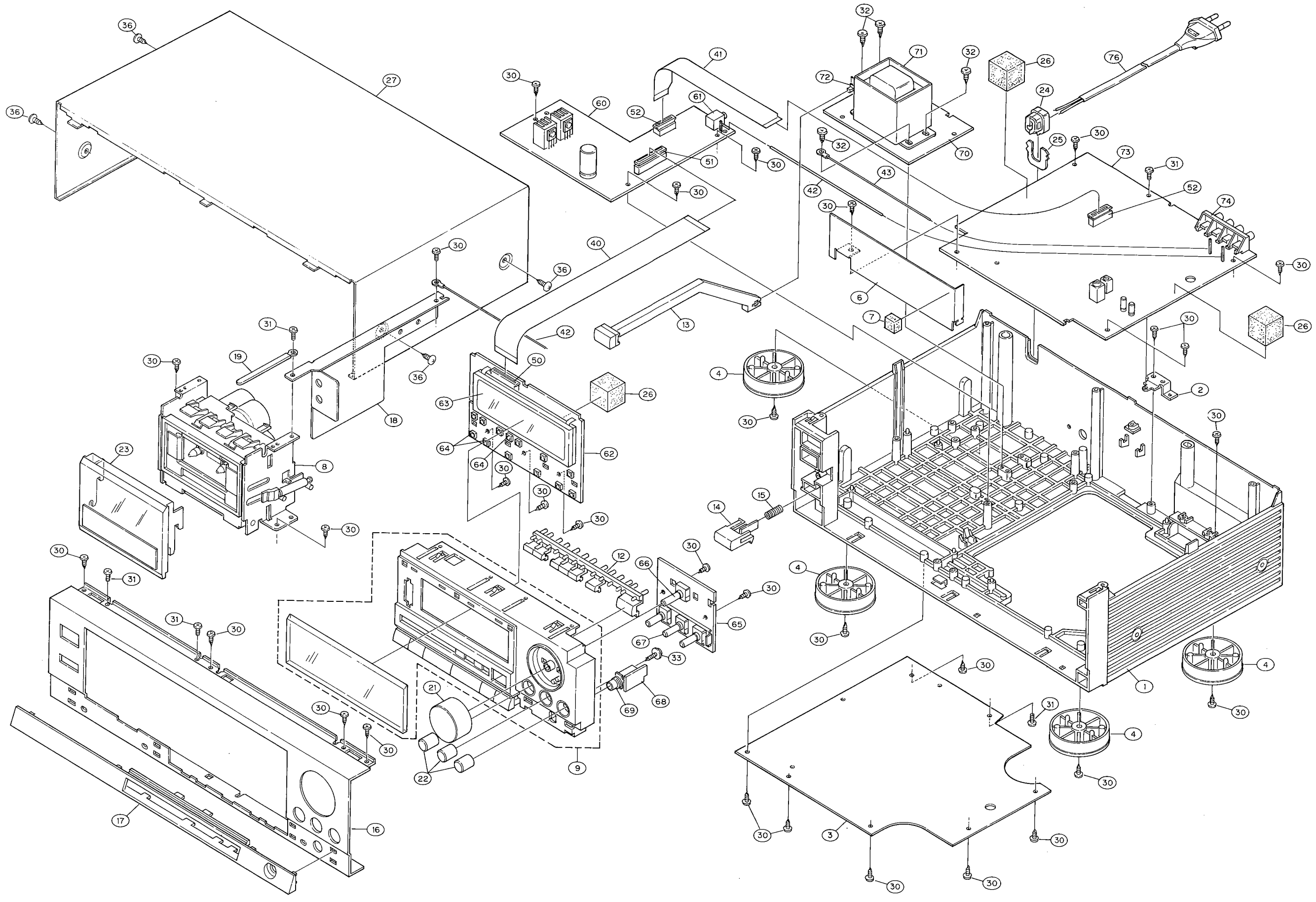


PARTS LIST OF EXPLODED VIEW

| Ref. No. | Part No. | Part Name | Remarks |
|----------|--------------|------------------|------------------------|
| 1 | 411 0857 301 | CHASSIS | Europe, U.K. |
| | | | Australia (Black) |
| | 411 0857 330 | CHASSIS | U.S.A., Canada (Black) |
| | 411 0857 314 | CHASSIS | Asia (Black) |
| | 411 0857 327 | CHASSIS | Europe (Gold) |
| ⊙ 2 | 414 0525 001 | EARTH BRACKET | |
| ⊙ 3 | 105 0828 105 | BOTTOM COVER | |
| 4 | 104 0183 119 | FOOT ASS'Y | |
| | 104 0183 122 | FOOT ASS'Y | U.S.A. only |
| 6 | 412 2782 008 | SHIELD PLATE | |
| 7 | 461 0178 001 | RUBBER SHEET | |
| 8 | VM154 | CASSETTE MECHA | |
| 9 | 103 1389 003 | FRONT ESC ASS'Y | (Black) |
| | 103 1389 029 | FRONT ESC ASS'Y | U.S.A., Canada (Black) |
| | 103 1389 016 | FRONT ESC ASS'Y | Europe (Gold) |
| 12 | 113 1190 105 | PUSH KNOB (A) | (Black) |
| | 113 1190 121 | PUSH KNOB (A) | U.S.A. only (Black) |
| | 113 1190 118 | PUSH KNOB (A) | Europe (Gold) |
| 13 | 113 1188 104 | P.S. LEVER ASS'Y | (Black) |
| | 113 1188 120 | P.S. LEVER ASS'Y | U.S.A. only (Black) |
| | 113 1188 117 | P.S. LEVER ASS'Y | Europe (Gold) |
| 14 | 113 1187 202 | EJECT KNOB | (Black) |
| | 113 1187 228 | EJECT KNOB | U.S.A. only (Black) |
| | 113 1187 215 | EJECT KNOB | Europe (Gold) |
| 15 | 463 0617 005 | SPRING | |
| 16 | 144 1844 277 | FRONT PANEL | (Black) |
| | 144 1844 280 | FRONT PANEL | Europe (Gold) |
| 17 | 103 1223 240 | ESC BAR | (Black) |
| | 103 1223 266 | ESC BAR | U.S.A., Canada (Black) |
| | 103 1223 253 | ESC BAR | Europe (Gold) |
| 18 | 414 0527 106 | SHIELD BRACKET | |
| 19 | 445 0048 003 | CORD HOLDER | |
| 21 | 112 0515 131 | VOL KNOB | (Black) |
| | 112 0515 128 | VOL KNOB | U.S.A. only (Black) |
| | 112 0515 144 | VOL KNOB | Europe (Gold) |
| 22 | 112 0555 007 | VOL KNOB (B) | (Black) |
| | 112 0555 010 | VOL KNOB (B) | Europe (Gold) |
| 23 | 103 1401 004 | C. WINDOW | (Black) |
| | 103 1401 020 | C. WINDOW | U.S.A. only (Black) |
| | 103 1401 017 | C. WINDOW | Europe (Gold) |
| 24 | 445 0056 008 | CORD BUSH | |
| 25 | 412 2008 012 | BUSHING PLATE | |
| 26 | 461 0502 004 | CUSHION | |
| | 461 0502 017 | CUSHION | U.S.A. only |
| 27 | 102 0386 004 | TOP COVER | (Black) |
| | 102 0386 020 | TOP COVER | Europe (Gold) |

| Ref. No. | Part No. | Part Name | Remarks |
|----------|--------------|-----------------------|-------------------------|
| 30 | 473 7508 017 | 3 × 10 CBTS(P)-B | |
| 31 | 473 7002 018 | 3 × 8 CBTS(S)-Z | |
| 32 | 473 7502 013 | 4 × 10 CBTS(P)-Z | |
| 33 | 477 0262 006 | SPECIAL SCREW | |
| 36 | 473 7503 038 | 4 × 10 CTTS(P)-BK | |
| 40 | 009 0027 006 | 25P FFC CABLE | |
| 41 | 009 0028 005 | 17P FFC CABLE | |
| 42 | 001 0038 075 | VINYL WIRE | |
| 50 | 205 0499 025 | 25P FFC CON. BASE(S) | CN291 |
| 51 | 205 0491 036 | 25P FFC CON. BASE(S) | CN291 |
| 52 | 205 0491 023 | 17P FFC CON. BASE(S) | CN191 |
| ⊙ 60 | 4U- 1817 Z71 | PWR LOGIC PWB ASS'Y | |
| 61 | 204 8260 004 | MINI JACK | JK002 |
| ⊙ 62 | 4U- 1817 Z72 | MTR CONTROL PWB ASS'Y | |
| 63 | 393 4075 001 | FIP9BEM8 | FL901 |
| 64 | 212 4388 907 | TACT SWITCH | |
| ⊙ 65 | 4U- 1817 Z74 | VOLUME PWB ASS'Y | |
| 66 | 211 0597 003 | V1620P30FA104 | VR302 |
| 67 | 211 0595 005 | V1103P25C | VR301 |
| ⊙ 68 | 4U- 1817 Z75 | H. PHONE PWB ASS'Y | |
| 69 | 204 8264 026 | H/P JACK | J001 |
| ⊙ 70 | 4U- 1823 Z | P. SUPPLY UNIT | Europe |
| | 4U- 1823 U | P. SUPPLY UNIT | U.S.A., Canada |
| | 4U- 1823 K | P. SUPPLY UNIT | U.K., Australia |
| | 4U- 1823 M | P. SUPPLY UNIT | Asia |
| △ 71 | 233 5736 005 | POWER TRANS. | Australia, Europe, U.K. |
| | 233 5737 004 | POWER TRANS. | U.S.A. |
| | 233 5739 002 | POWER TRANS. | Canada |
| | 233 5738 003 | POWER TRANS. | Asia |
| △ 72 | 212 0286 003 | POWER SWITCH | SW901 |
| ⊙ 73 | 4U- 1816 Z7 | AUDIO PWB DIAGRAM | |
| 74 | 204 8310 006 | 4P PIN JACK | JK301 |
| △ 76 | 206 2063 009 | AC CORD | Europe |
| | 206 2067 001 | AC CORD | U.S.A., Canada |
| | 206 2024 006 | AC CORD | U.K. |
| | 206 2025 005 | AC CORD | Australia |
| | 200 6031 026 | AC CORD | Asia |
| ★ | 513 8294 000 | VDE LABEL | Europe only |
| ★ | 515 8253 025 | APPROVAL MARK | Europe only |
| ★ | 513 8266 009 | DANGEROUS MARK | U.S.A. only |
| ★ | 513 1222 008 | DATE LABEL | Canada only |
| ★ | 513 8244 005 | UL LABEL WITH DATE | U.S.A. only |
| ★ | 515 0418 301 | DAI WARRANTY HOME | U.S.A. only |
| ★ | 515 0388 208 | DCI WARRANTY | Canada only |
| ★ | 212 4698 008 | VOLTAGE SELECTOR | Asia only |
| ★ | 515 8030 008 | PRESET LABEL | Asia only |

1 2 3 4 5 6 7 8
EXPLODED VIEW OF CABINET AND CHASSIS GROUP



**PARTS LIST OF 4U-1817, 4U-1823
(POWER/LOGIC SELECTION)**

| Ref. No. | Part No. | Part Name | Remarks |
|--|--------------|--------------------------|---------------------------|
| SEMICONDUCTOR GROUP | | | |
| IC801 | 263 0618 006 | BA6800A | |
| IC901 | 262 1404 009 | μ PD75206CW | |
| IC902, 903 | 262 0447 009 | BA6109U1 | |
| TR601, 602 | 269 0022 904 | DTA143ES (4.7K-4.7K)T | |
| TR800 | 269 0040 902 | DTC144ES (47K-47K)T | |
| TR901 | 279 0021 009 | 2SD985 (L) | |
| TR902 | 279 0020 000 | 2SB794 (L) | |
| TR903, 905 | 273 0178 925 | 2SC1740 (R/S) T-70 | |
| TR904 | 272 0025 907 | 2SB562(C)T.F | |
| TR908, 909 907 | 269 0015 908 | DTC124XS (22K-47K)T | |
| TR916 | 269 0062 906 | DTC124ES | |
| TR910 | 269 0019 904 | DTA143XS (4.7K-10K)T | |
| TR911, 912 | 269 0090 907 | DTC143XS-T | |
| TR913 | 271 0183 901 | 2SA933 (Q/R/S) T-93 | |
| D801 ~ 811 813, 814 820 ~ 824 921, 924 925, 928 929 | 276 0432 903 | 1SS270A TE | |
| D901 ~ 908 922, 927 | 276 0519 907 | 1SR35-200AT82 | |
| D911, 912 | 276 0469 918 | HZS9C-2TD | |
| D913 | 276 0483 910 | HZS30-2TD | |
| D914 | 276 0466 911 | HZS7C-2TD | |
| D915, 918 | 276 0463 927 | HZS6C-3TD | |
| D917 | 276 0455 906 | HZS4A-1TD | |
| D919 | 276 0469 905 | HZS9C-1TD | |
| D930 | 276 0519 004 | 1SR35-200A | |
| D920 | 276 0462 928 | HZS6B-3 | |
| RESISTOR GROUP | | | |
| R931 | 244 0079 026 | RS14B3D270JNBF | 27 Ω 2 W |
| VR301 | 211 0595 005 | V1103P25C | |
| VR302 | 211 0597 003 | V1620P30FA104 | |
| CAPACITOR GROUP | | | |
| Ceramic | | | |
| Δ C001 | 253 8010 007 | CK45=2GAC103P | 0.01 μ F/ 400 V AC |
| C801 | 253 9030 947 | CK45=1E472KT | 0.0047 μ F/ 25 V |
| C915, 916 917, 918 | 253 1180 921 | CK45B1H102KT (DD-3) | 0.001 μ F/50 V |
| C919 | 253 9031 917 | CK45=1E683KT | 0.068 μ F/25 V |
| C923, 924 926, 927 | 253 9030 963 | CK45=1E103KT | 0.01 μ F/25 V |
| C933 | 253 9030 044 | CK45=1E472K | 0.0047 μ F/ 25 V |

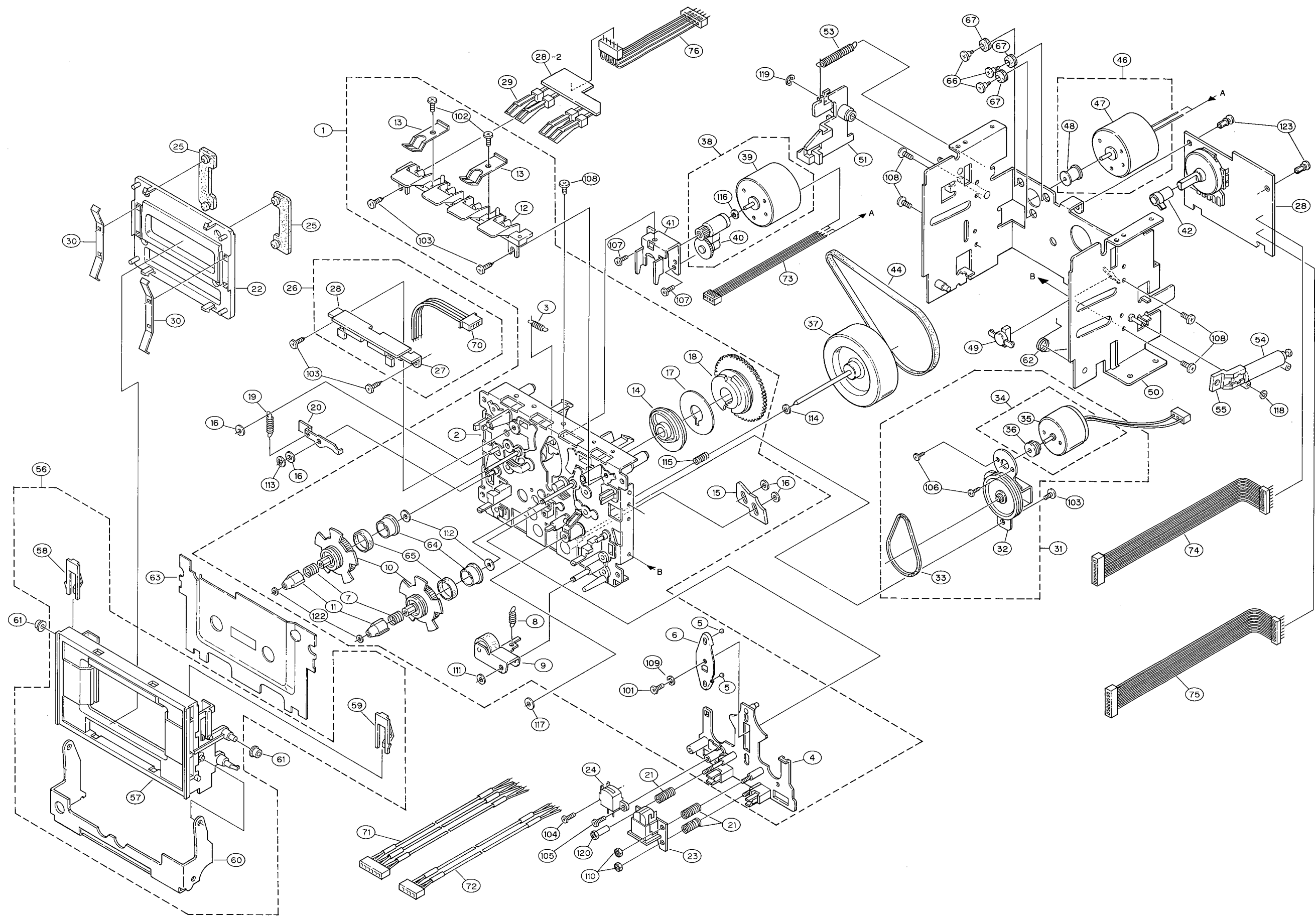
| Ref. No. | Part No. | Part Name | Remarks |
|---------------------------|--------------|--------------------------|--------------------|
| Electrolytic | | | |
| C602, 702 | 254 4252 901 | CE04W1A220MT | 22 μ F/10 V |
| C901, 904 | 254 4256 790 | CE04W1E222MC | 2200 μ F/25 V |
| C902, 905 908 | 254 4252 927 | CE04W1A470MT | 47 μ F/10 V |
| C903, 906 | 254 4252 930 | CE04W1A101MT | 100 μ F/10 V |
| C909 | 254 4256 952 | CE04W1E221MT | 220 μ F/25 V |
| C910 | 254 4261 730 | CE04W1H221MC | 220 μ F/50 V |
| C911, 912 | 254 4258 947 | CE04W1V470MT | 47 μ F/35 V |
| C913 | 254 4256 907 | CE04W1E100MT | 10 μ F/25 V |
| C914, 929 | 254 4260 951 | CE04W1H2R2MT | 2.2 μ F 50 V |
| C921 | 259 0007 702 | SBCAP==822=C | 8200 μ F/6.3 V |
| C925 | 254 4255 717 | CE04W1C472MC | 4700 μ F/16 V |
| C931 | 254 4254 954 | CE04W1E100MT | 10 μ F/25 V |
| C932 | 254 4260 948 | CE04W1H010MT | 1 μ F/50 V |
| OTHER PARTS GROUP | | | |
| XT901 | 399 0079 009 | CST4, 19MG | |
| SW801 ~811 813, 814 | 212 4388 907 | TACT SWITCH (IM) | |
| SW901 | 212 0286 003 | POWER SWITCH | |
| CN891 | 205 0343 087 | 8P CONN. BASE (KR-PH) | |
| CN892 | 205 0321 083 | 8P CONN. BASE (RED) | |
| CN901 | 205 0343 074 | 7P CONN. BASE (KR-PH) | |
| * | 415 0299 000 | CONDENSER COVER | |
| * | 202 0022 008 | FUSE HOLDER | Asia only |
| * | 206 1031 045 | FUSE (0.25) A | Asia only |

PARTS LIST OF MECHANISM

| Ref. No. | Part No. | Part Name | Remarks |
|----------|--------------|----------------------------|---------|
| 1 | 411 1011 308 | MECHA BASE (G) ASS'Y | |
| 2 | 411 0469 809 | MECHA BASE ASS'Y | |
| 3 | 463 0420 001 | SPRING | |
| 4 | 431 0297 305 | HEAD PLATE ASS'Y | |
| 5 | 425 0177 006 | STEEL BALL D3.5 | |
| 6 | 463 0418 301 | HEAD PLATE SPRING | |
| 7 | 463 0522 103 | SPRING | |
| 8 | 463 0456 004 | SPRING | |
| 9 | 433 0451 008 | P. ROLLER ARM ASS'Y | |
| 10 | 424 0085 108 | REEL DRIVE WHEEL | |
| 11 | 421 0446 104 | REEL DRIVER | |
| 12 | 411 0471 509 | SWITCH HOLDER | |
| 13 | 463 0422 407 | CASSETTE SPRING | |
| 14 | 424 0080 103 | CAM (2) | |
| 15 | 431 0180 409 | PINCH LEVER | |
| 16 | 443 0426 001 | SPEED NUT | |
| 17 | 412 1853 006 | SEPARATOR | |
| 18 | 424 0079 101 | CAM (1) | |
| 19 | 463 0453 104 | RETURN SPRING | |
| 20 | 433 0425 102 | STOPPER | |
| 21 | 463 0607 002 | ADJUST SPRING | |
| 22 | 103 1221 514 | STABILIZER | |
| 23 | 391 0283 008 | R/P HEAD | |
| 24 | 391 0265 000 | E HEAD | |
| 25 | 461 0491 209 | STABILIZER PAD (A) | |
| 26 | DSO 4A0 1 | SENER HOLDER SUB ASS'Y | |
| 27 | 441 0546 309 | SENER HOLDER | |
| 28 | 2U- 143 8-32 | MECHA P.W.B UNIT | |
| 29 | 212 4649 002 | LEAF SWITCH | |
| 30 | 463 0609 107 | STABILIZER SPRING | |
| 31 | DCO 6A0 1 | CAM MOTOR (G) SUB ASS'Y | |
| 32 | 441 0580 103 | PULLEY GEAR ASS'Y | |
| 33 | 423 0037 001 | BELT | |
| 34 | DCO 6A0 2 | CAM MOTOR SUB ASS'Y | |
| 35 | 217 0133 012 | CAM MOTOR | |
| 36 | 421 0420 007 | PULLEY (1) | |
| 37 | 421 0418 006 | FLY WHEEL ASS'Y | |
| 38 | DRO 4A0 2 | REEL MOTOR SUB ASS'Y | |
| 39 | 217 0161 000 | REEL MOTOR | |
| 40 | 424 0113 504 | DIRECTION GEAR ASS'Y | |
| 41 | 441 0874 301 | REEL MOTOR PLATE | |
| 42 | 435 0106 100 | CONNECTING PIECE | |
| 44 | 423 0038 204 | BELT | |
| 46 | DCO 7A0 2 | CAPSTAN MOTOR SUB ASS'Y | |
| 47 | 217 0162 009 | CAPSTAN MOTOR | |
| 48 | 421 8383 007 | MOTOR PULLEY | |
| 49 | 461 0473 201 | THRUST STOPPER | |

| Ref. No. | Part No. | Part Name | Remarks |
|----------|--------------|---------------------------|--------------|
| 50 | 441 1052 504 | MECHA STAY ASS'Y | |
| 51 | 433 8269 700 | HOOK | |
| 52 | | | |
| 53 | 463 0457 003 | SPRING | |
| 54 | 469 8013 133 | AIR DUMPER | |
| 55 | 433 8271 400 | DAMPER GUIDE | |
| 56 | DCO 5A0 1 | CASSETTE BOX SUB ASS'Y | |
| 57 | 103 1209 400 | CASSETTE BOX | |
| 58 | 103 8243 401 | CASSETTE SUPPORT (L) | |
| 59 | 103 8243 414 | CASSETTE SUPPORT (R) | |
| 60 | 433 0535 005 | CASSETTE BOX HOLDER | |
| 61 | 431 8097 002 | COLLAR | |
| 62 | 463 0636 002 | BOX SPRING | |
| 63 | 144 1351 320 | ESC PLATE | |
| 64 | 421 0374 001 | BUSH | |
| 65 | 423 0042 009 | BRAKE RING | |
| 66 | 477 0294 003 | SPECIAL SCREW | |
| 67 | 462 0086 015 | MOTOR CUSHION | |
| 70 | 203 6268 005 | 4P EH CONN. CORD | W-504 |
| 71 | 204 0164 001 | 6P EH CONN. CORD | FOR P/B HEAD |
| 72 | 203 6168 008 | 4P EH CONN. CORD | FOR E. HEAD |
| 73 | 203 6192 016 | 4P PH CONN. CORD | W-505 |
| 74 | 204 2349 015 | 8P KR-DS CONN. CORD | W-501 |
| 75 | 204 2348 029 | 8P KR-DS CONN. CORD | W-503 |
| 76 | 203 8180 000 | 5P DA-DA CONN. CORD | W-502 |
| 101 | 471 3204 018 | 2.6 \times 8 CBS-Z | |
| 102 | 473 7500 057 | 3 \times 5 CBTS(P)-Z | |
| 103 | 473 7500 015 | 3 \times 8 CBTS(P)-Z | |
| 104 | 471 3812 002 | 2 \times 8 CBS-B | |
| 105 | 473 7507 005 | 2 \times 8 CBTS(P)-B | |
| 106 | 471 9004 005 | M1.7 \times 2 #0 | |
| 107 | 471 3802 012 | 2.6 \times 3 CBS-Z | |
| 108 | 471 3202 010 | 2.6 \times 5 CBS | |
| 109 | 475 2002 006 | 2.6 SW | |
| 110 | 475 6020 000 | 2N | |
| 111 | 475 1121 108 | SLIT WASHER | |
| 112 | 477 0265 058 | WASHER | |
| 113 | 477 0266 002 | CS WASHER | |
| 114 | 477 0090 087 | WASHER | |
| 115 | 463 0618 004 | FLY WHEEL SPRING | |
| 116 | 477 0265 032 | WASHER | |
| 117 | 477 0090 074 | WASHER | |
| 118 | 475 1120 109 | SLIT WASHER | |
| 119 | 476 1003 009 | 3E RING | |
| 120 | 443 8671 104 | SPECIAL NUT | |
| 122 | 475 1119 110 | SLIT WASHER | |
| 123 | 477 0096 007 | PUSH RIVET | |

EXPLODED VIEW OF MECHANISM



PARTS LIST OF 4U-1816 (AUDIO SECTION)

| Ref. No. | Part No. | Part Name | Remarks |
|--|--------------|------------------------------|-------------------------------------|
| SEMICONDUCTOR GROUP | | | |
| IC301 | 263 0317 006 | M-5220P | |
| IC302, 305 309 | 263 0257 001 | M-5218P | |
| IC312 | 263 0515 007 | BA15218 | |
| IC303, 308 | 263 0455 007 | CX20187 | |
| IC304 | 262 0276 005 | HD14066BP | |
| IC310 | 263 0354 001 | μPC1297CA | |
| TR102, 105 107, 202 205, 207 302, 303 | 273 0245 900 | 2SC2603E/FT | |
| TR103, 106 203, 206 | 275 0048 909 | 2SK381 (D)/(E)-T | |
| TR104, 108 ~ 111 204, 208 ~ 211 310, 311 314, 316 | 269 0015 908 | DTC124XS (22K-47K)T | |
| TR304, 305 | 269 0014 909 | DTA124XS (22K-47K)T | |
| TR313 | 272 0025 907 | 2SB562 (C)TF | |
| TR319 | 269 0093 904 | DTA144ES (47K-47K)T | |
| TR320, 321 | 269 0019 904 | DTA143XS (4.7K-10K)T | |
| TR322 | 269 0062 906 | DTC124ES (22K-22K)T | |
| D310 | 276 0459 915 | HZS5B-2TD | |
| D312 | 276 0432 903 | ISS270ATE | |
| D532, 311 | 276 0468 919 | HZS9B-2 | |
| RESISTOR GROUP | | | |
| R304 | 244 2036 012 | RD14B2H3R9JFRF | 3.9 Ω 1/2 W |
| RT102, 103 202, 203 | 211 6077 954 | V06PB223 (IM) | REC. CAL |
| RT101, 201 | 211 6077 938 | V06PB104 (IM) | PB, GAIN |
| CAPACITOR GROUP | | | |
| Ceramic | | | |
| C101, 201 | 253 1179 945 | CK45B1H221KT (DD-3) | 220 PF/50 V |
| C154, 254 C111, 138 211, 238 | 253 1179 923 | CK45B1H151KT | 150PF/50 V |
| C134, 234 306 | 253 9031 962 | CK45=1E683KT | 0.068 μF/25 V |
| C143, 243 150, 250 | 253 9030 963 | CK45=1E272KT | 0.0027 μF/ 25 V |
| C149, 249 | 253 9031 975 | CK45=1E103KT | 0.01 μF/25 V |
| C146, 246 | 253 9030 989 | CK45=1E392KT | 0.0039 μF/ 25 V |
| C151, 251 315 | 253 9030 934 | CK45=1E223KT CK45=1E332KT | 0.022 μF/25 V 0.0033 μF/ 25 V |

| Ref. No. | Part No. | Part Name | Remarks |
|-----------------------|--------------|------------------------|---------------------|
| C160, 260 | 253 1180 918 | CK45B1H821KT (DD-3) | 820 PF/50 V |
| C152, 252 | 253 1179 987 | CK45B1H471KT (DD-3) | 470 PF/50 V |
| C153, 253 | 253 9030 918 | CK45=1E152KT | 0.0015 μF/ 25 V |
| C319 | 253 9030 921 | CK45=1E222KT | 0.0022 μF/ 25 V |
| C156, 256 | 253 1180 947 | CK45B1H152KT (DD-3) | 0.0015 μF/50 V |
| C161, 261 305 | 253 9030 989 | CK45=1E223KT | 0.022 μF/25 V |
| C162, 262 | 253 9030 992 | CK45=1E333KT | 0.033 μF/25 V |
| C163, 263 | 253 1179 903 | CK45B1H101KT | 100 PF/50 V |
| C164, 264 | 253 1131 909 | CK45B2H391KT | 390 PF/500 V |
| C165, 265 | 253 9030 963 | CK45=1E103KT | 0.01 μF/25 V |
| C170, 270 | 253 1179 945 | CK45B1H221KT (DD-3) | 220 PF/50 V |
| C307 | 253 4470 900 | CC45SL2H100DT | 10 PF/500 V |
| C311 | 253 9031 904 | CK45=1E473KT | 0.047 μF/25 V |
| C360 | 253 9036 909 | CK45=1E104ZT | 0.1 μF/25 V |
| Electrolytic | | | |
| C103, 115 203, 215 | 254 4254 909 | CE04W1C100MT | 10 μF/16 V |
| C105, 205 | 254 3056 920 | CE04D1H2R2MBPT | 2.2 μF/50 V |
| C107, 133 207, 233 | 254 4260 935 | CE04W1HR47MT | 0.47 μF/50 V |
| C108, 135 208, 235 | 254 4228 919 | CE04W1HR15MT (LL) | 0.15 μF/50 V |
| C110, 137 210, 237 | 254 4260 919 | CE04W1HR22MT | 0.22 μF/50 V |
| C316 | 254 4252 901 | CE04W1A220MT | 22 μF/16 V |
| C116, 216 | 254 4260 948 | CE04W1H010MT | 1 μF/50 V |
| C130, 230 | 254 3056 917 | CE04D1H010MBPT | 1 μF/50 V |
| C131, 231 | 254 3055 905 | CE04D1V4R7MBPT | 4.7 μF/35 V |
| C142, 242 317, 318 | 254 4254 909 | CE04W1C100MT | 10 μF/16 V |
| C144, 244 | 254 4258 905 | CE04W1V4R7MT | 4.7 μF/35 V |
| C145, 245 312, 313 | 254 4252 927 | CE04W1A470MT | 47 μF/10 V |
| C321 | 254 4256 910 | CE04W1E220MT | 22 μF/25 V |
| C325, 326 | 254 4252 930 | CE04W1A101MT | 100 μF/10 V |
| C601, 701 | 254 4260 951 | CE04W1H2R2MT | 2.2 μF/50 V |
| Film | | | |
| C102, 202 | 255 1209 905 | CQ93M1H562JT | 0.0056 μF/50 V |
| C104, 204 | 255 1213 904 | CQ93M1H123JT | μF/50 V |
| C106, 132 206, 232 | 255 1208 906 | CQ93M1H472JT | 0.0047 μF/50 V |
| C109, 136 209, 236 | 255 1214 903 | CQ93M1H153JT | 0.015 μF/50 V |
| C112, 139 212, 239 | 255 1220 900 | CQ93M1H473JT | 0.047 μF/50 V |
| C113, 140 213, 240 | 255 1210 907 | CQ93M1H682JT | 0.0068 μF/50 V |
| C147, 247 | 255 1209 905 | CQ93M1H562JT | 0.0056 μF/50 V |
| C114, 141 214, 241 | 255 1212 905 | CQ93M1H103JT | 0.01 μF/50 V |
| C308 | 255 4079 925 | CQ93P2A822JT | 0.0083 μF/ 100 V |

PARTS LIST OF PACKING & ACCESSORIES

| Ref. No. | Part No. | Part Name | Remarks |
|----------|--------------|--------------------------------|----------------|
| ★ | 505 0038 030 | POLY COVER | |
| ★ | 203 2223 002 | 2P PIN CORD | |
| ★ | 203 2227 008 | 2P MINI PLUG CORD | |
| ★ | 511 1796 004 | INST MANUAL | |
| ★ | 511 1800 000 | INST MANUAL | U.S.A. |
| ★ | 511 1797 003 | SPANISH INST MANUAL | Europe |
| ★ | 515 0455 005 | TAPE CATALOG (E ₂) | |
| ★ | 515 0443 004 | TAPE CATALOG | Canada, U.S.A. |
| ★ | 505 0131 050 | CABINET COVER | |
| ★ | 504 0012 060 | STYLEN PAPER | |
| ★ | 503 0778 006 | PACKING | |
| ★ | 501 1338 009 | CARTON CASE | |
| ★ | 513 1389 006 | CONTROL CARD BASE | |
| ★ | 513 1349 004 | THERMAL CARBON FILM | |
| ★ | 203 3667 007 | PLUG ADAPTER | Asia only |

| Ref. No. | Part No. | Part Name | Remarks |
|--------------------------|--------------|---------------------------|---------|
| OTHER PARTS GROUP | | | |
| L101, 201 | 231 0825 009 | BIAS FILTER | |
| L102, 104 202, 204 | 232 9007 009 | SKEWING COIL | |
| L103, 203 | 232 0109 003 | MPX FILTER | |
| L105, 205 | 235 0020 916 | INDUCTOR 822JT | |
| L106, 206 | 235 0020 945 | INDUCTOR 153JT | |
| L107, 207 | 239 0010 009 | HX STEP UP COIL | |
| L303 | 232 0135 006 | OSC COIL | |
| CN121 | 205 0406 034 | 3P CONN. BASE (KR-PH) | |
| CN141 | 205 0375 039 | 13P CONN. BASE (KR-PH) | |
| CN151 | 205 0343 032 | 3P CONN. BASE (KR-PH) | |
| CN171 | 205 0233 061 | 6P EH CONN. BASE | |
| CN172 | 205 0233 045 | 4P EH CONN. BASE | |
| CN191 | 205 0514 010 | 17P FFC CONN. BASE(S) | |
| JK301 | 204 8310 006 | 4P PIN JACK | |

NOTE FOR PARTS LIST

- Part indicated with the mark "⊙" are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicated "1" and "I" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film ±5%, 1/6 W, 1/4 W Type in the P. W. Board parts list.
- Parts marked with this symbol have critical characteristics. Use ONLY replacement parts recommended by the manufacturer.

● Refer to the following table for the codes of the resistors and capacitors appearing on the parts list.

Resistors

Ex.: RN 14K 2E 182 G FR
 Type Shape and performance Power Resistance Allowable error Others

| | | | |
|--------------------|-----------|----------|--------------------------|
| RD : Carbon | 2B : 1/8W | F : ±1% | P : Pulse-resistant type |
| RC : Fixed | 2E : 1/4W | G : ±2% | NL : Low noise type |
| RS : Metallic film | 2H : 1/2W | J : ±5% | NB : Non-burning type |
| RW : Winding | 3A : 1W | K : ±10% | FR : Fuse resistor |
| RN : Metal film | 3D : 2W | M : ±20% | F : Lead wire forming |
| RK : Metal mixture | 3F : 3W | | |
| | 3H : 5W | | |

★ Resistance

1 8 2 ⇨ 1800Ω = 1.8kΩ
 Indicates number of zeros after effective number
 2-digit effective number, decimal point indicated by R.
 • Units: Ω

Capacitors

Ex.: CE 04W 1H 2R2 M BP
 Type Shape and performance Dielectric strength Capacity Allowable error Others

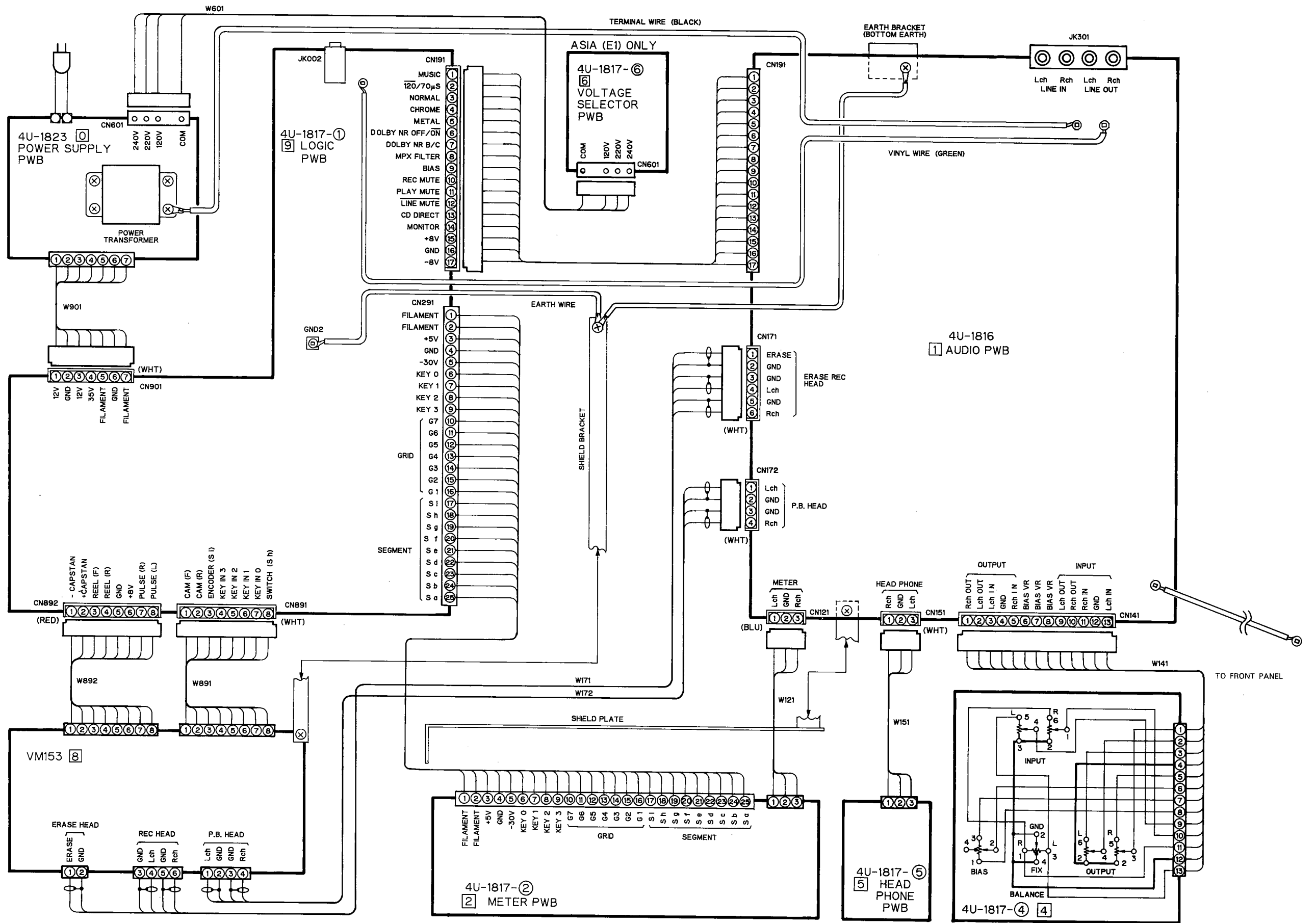
| | | | |
|---------------------------------|-----------|-------------|----------------------------------|
| CE : Aluminum foil electrolyte | 0J : 6.3V | F : ±1% | HS : High stability type |
| CA : Aluminum solid electrolyte | 1A : 10V | G : ±2% | BP : Non-polar type |
| CS : Tantalum electrolyte | 1C : 16V | J : ±5% | HR : Ripple-resistant type |
| CQ : Film | 1E : 25V | K : ±10% | DL : For charge and discharge |
| CK : Ceramic | 1Y : 35V | M : ±20% | HF : For assuring high frequency |
| CC : Ceramic | 1H : 50V | Z : +80% | U : UL part |
| CP : Oil | 2A : 100V | -20% | C : CSA part |
| CM : Mica | 2B : 125V | P : +100% | W : UL-CSA type |
| CF : Metallized | 2C : 160V | -0% | F : Lead wire forming |
| CH : Metallized | 2D : 200V | C : ±0.25pF | |
| | 2E : 250V | D : ±0.5pF | |
| | 2H : 500V | = : Others | |
| | 2J : 630V | | |

★ Capacity

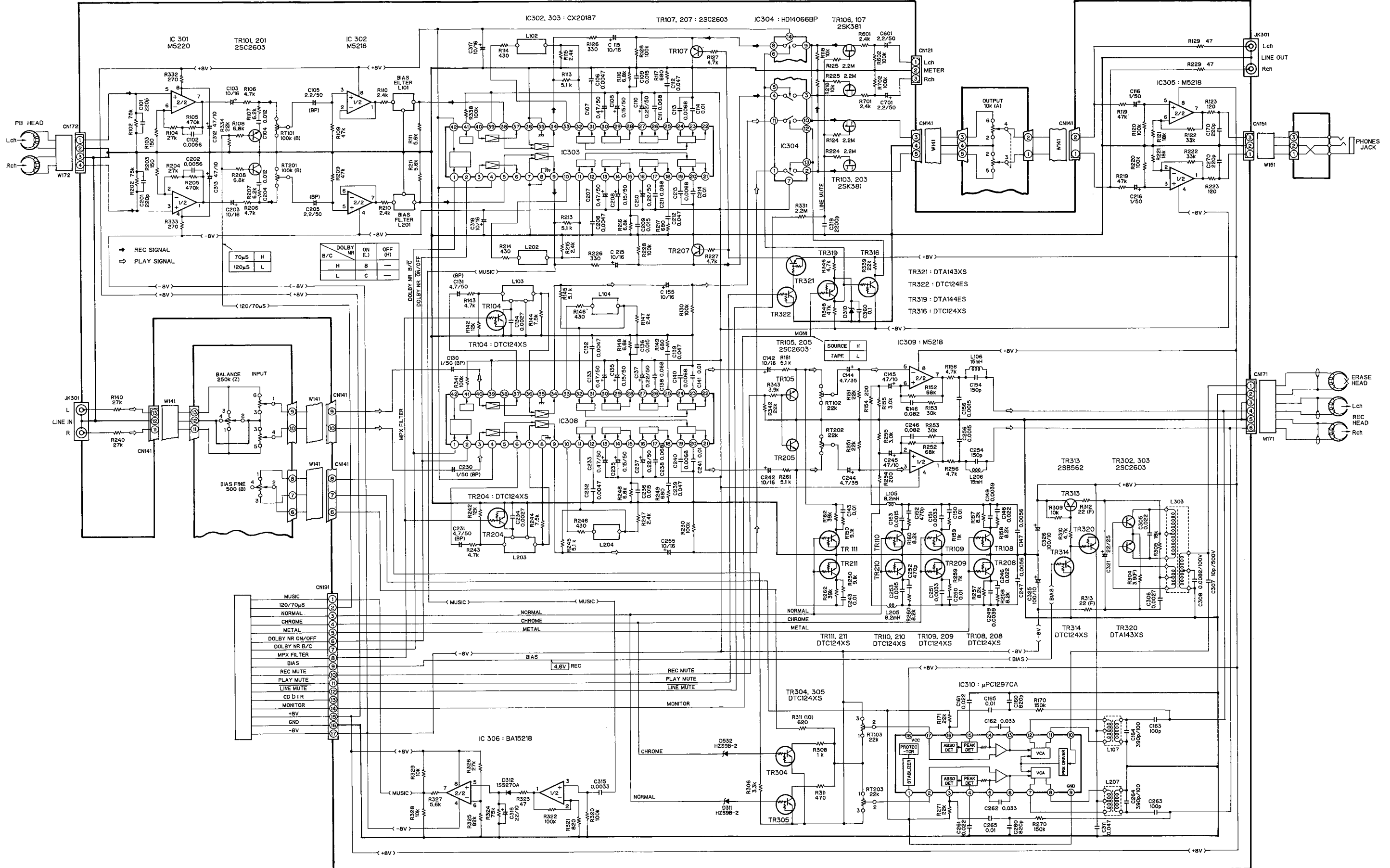
2 R 2 ⇨ 2.2μF
 1-digit effective number, decimal point indicated by R.
 2-digit effective number, decimal point indicated by R.

- Units: μF, (for P, pF (μμF))
- When the dielectric strength is indicated in AC, "AC" is included after the dielectric strength value.

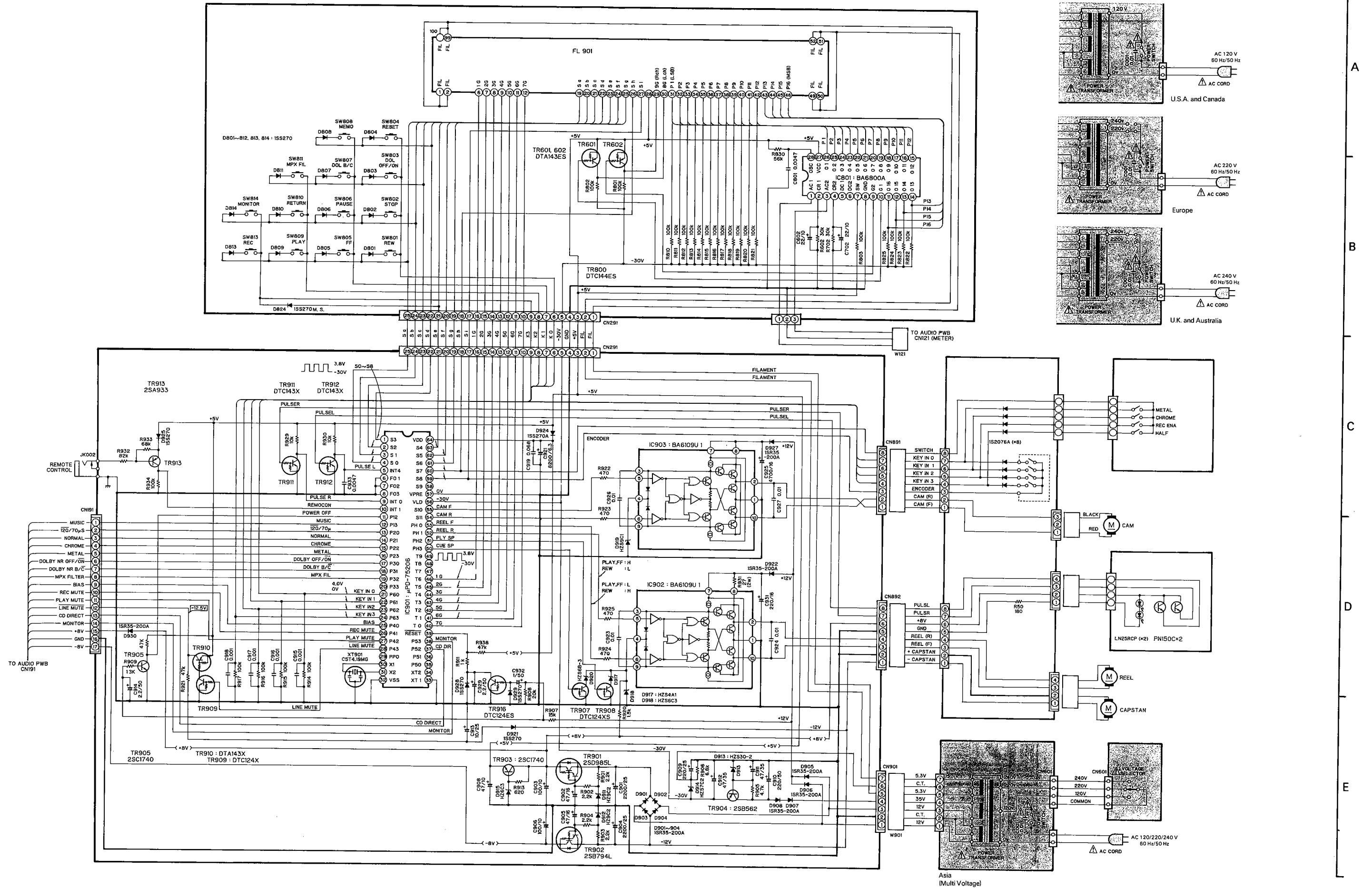
WIRING DIAGRAM



SCHEMATIC DIAGRAM OF AUDIO SECTION

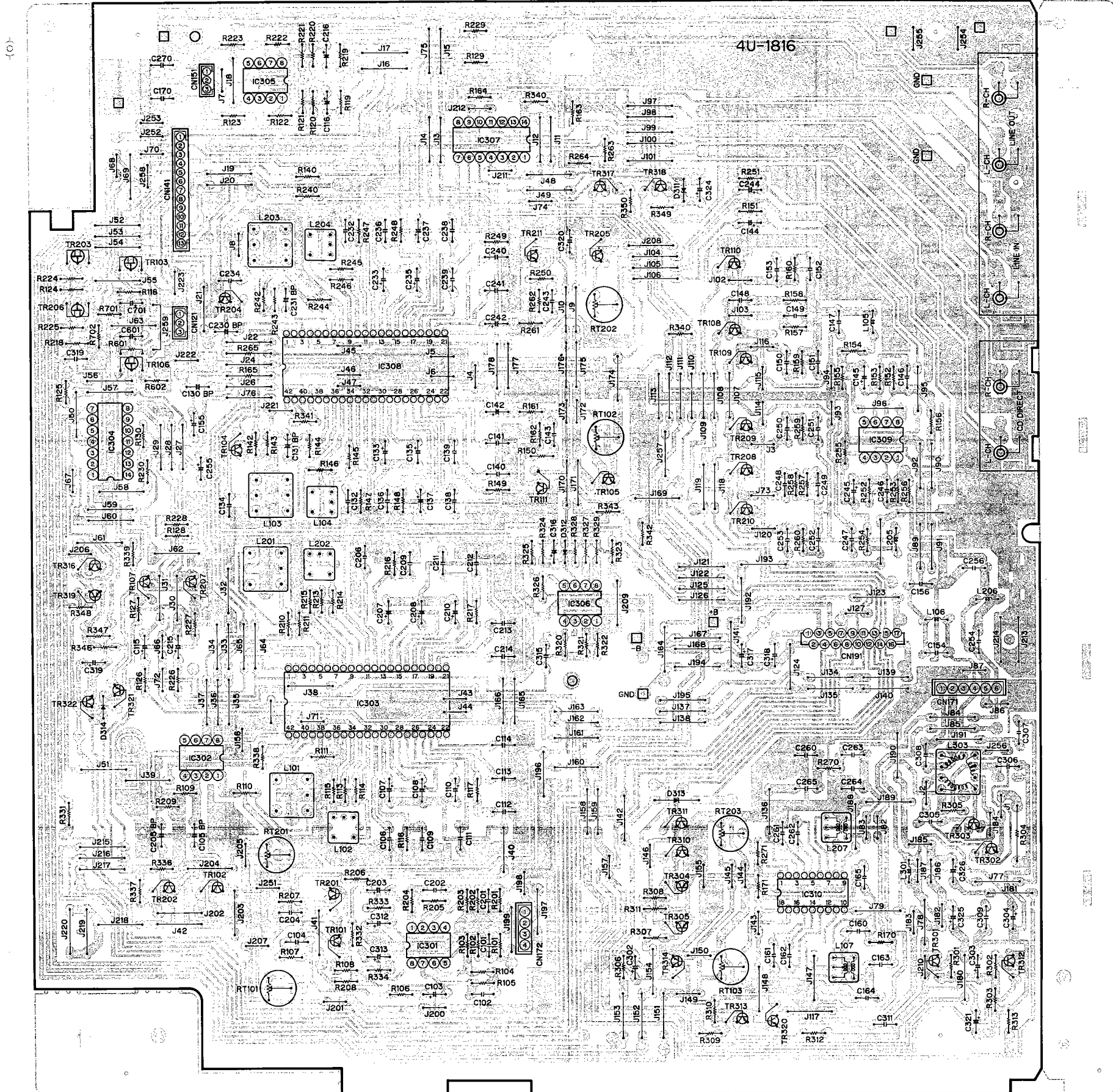


SCHMATIC DIAGRAM OF POWER & LOGIC SECTION



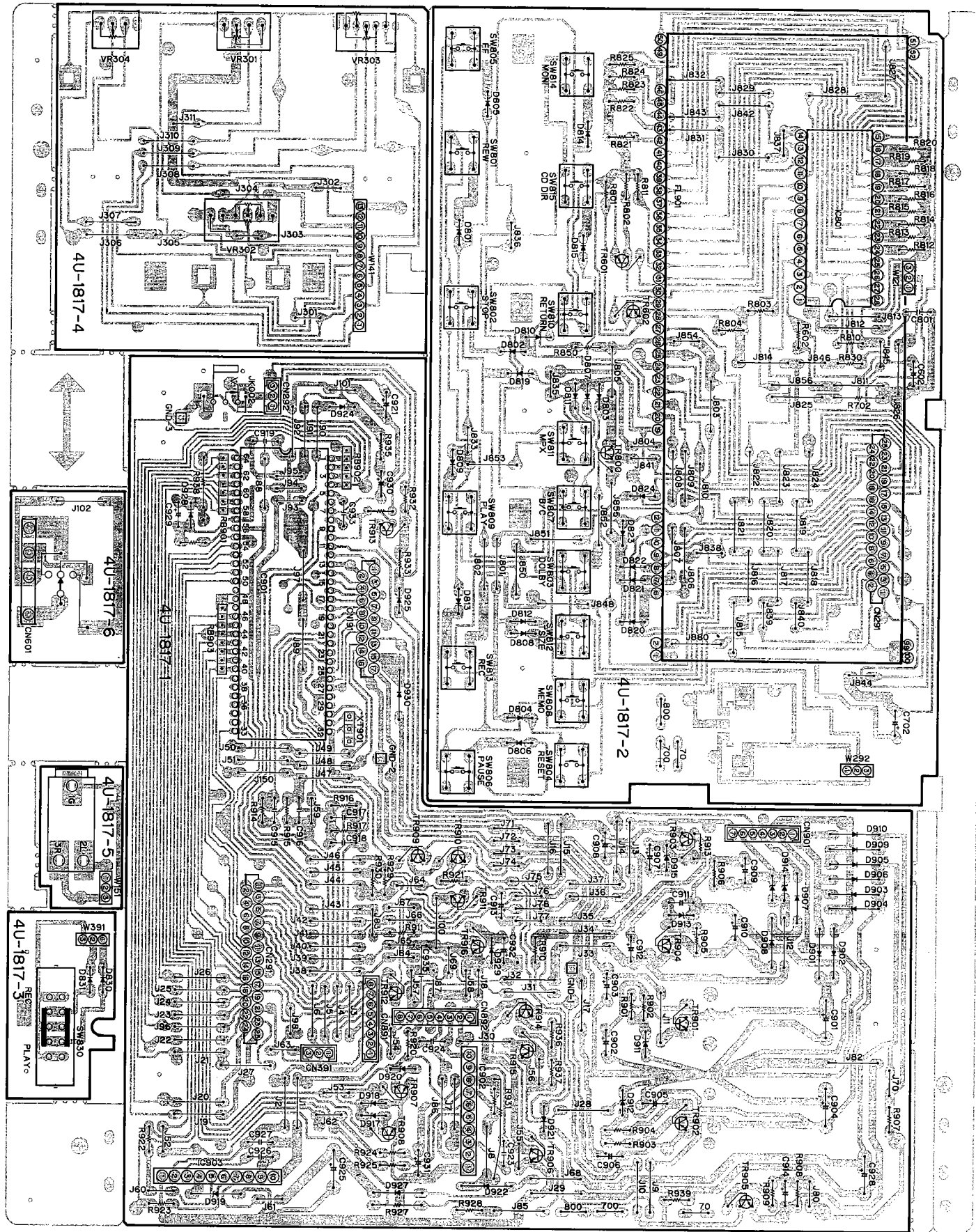
P.W. BOARD OF 4U-1816

A
B
C
D
E

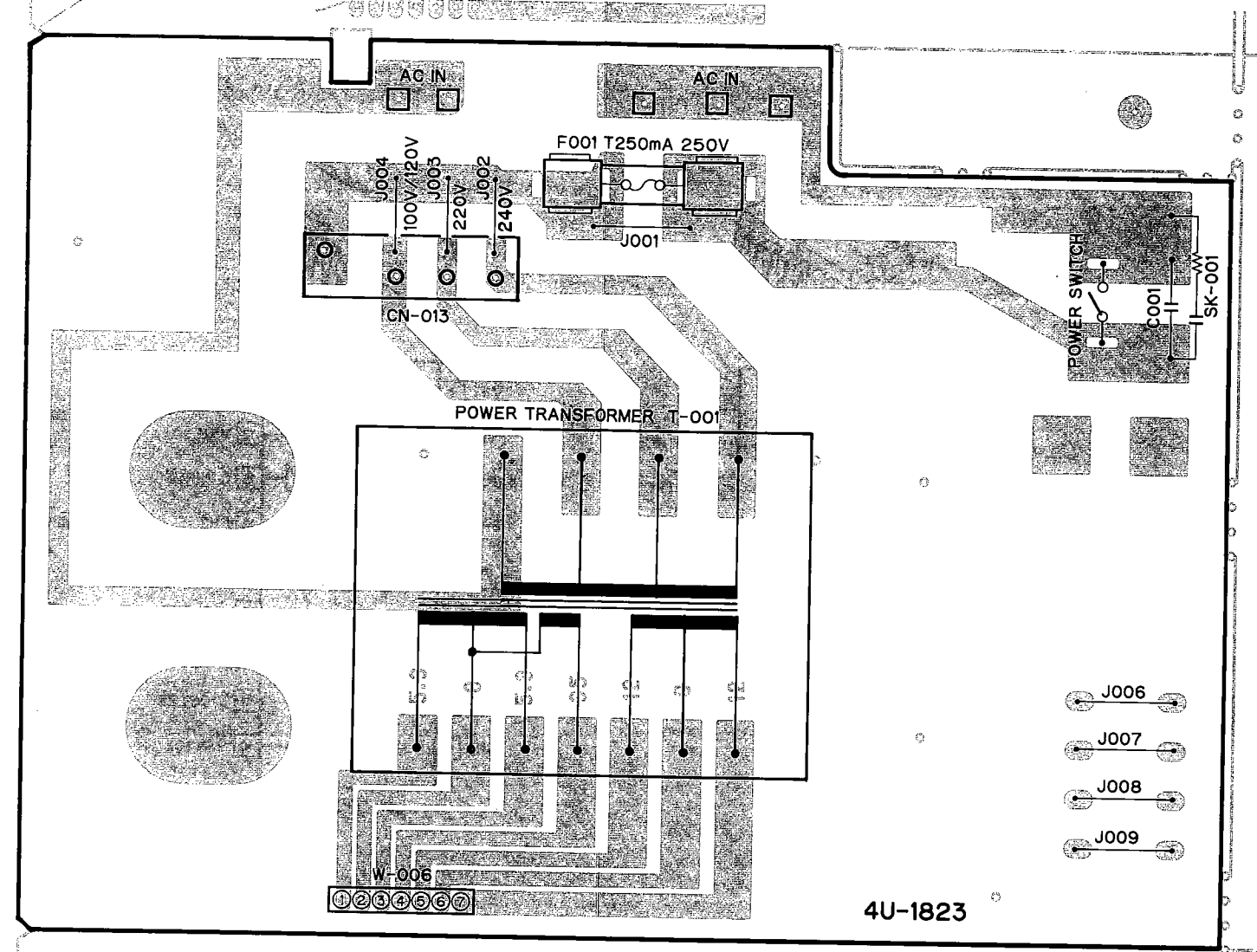


P.W. BOARD

4U-1817

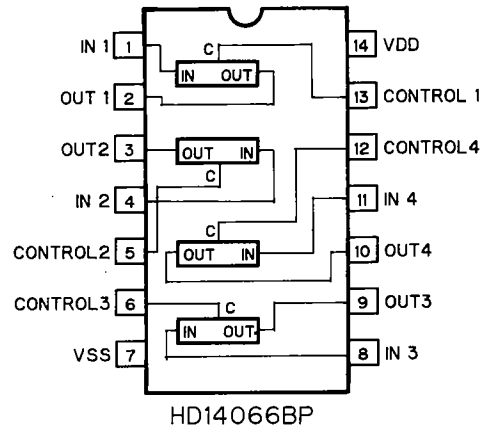
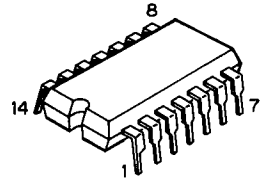


4U-1823

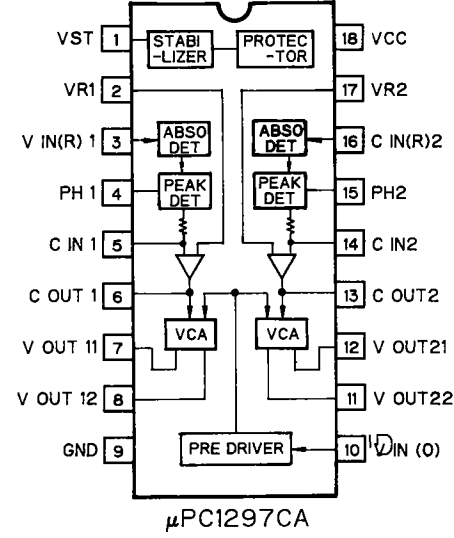
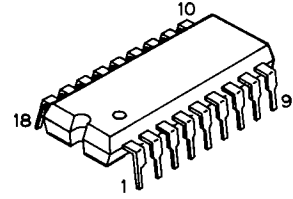


SEMICONDUCTORS

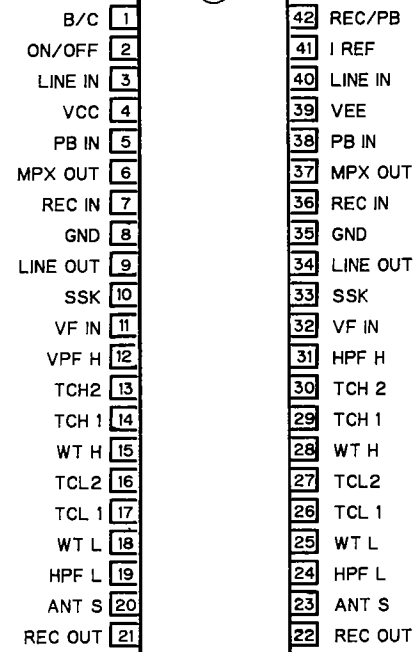
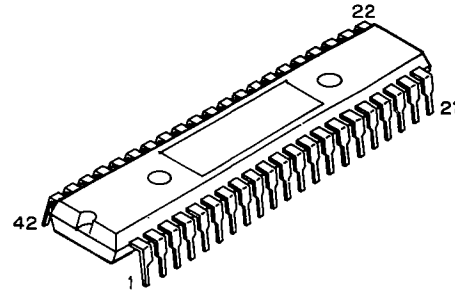
⊙ IC



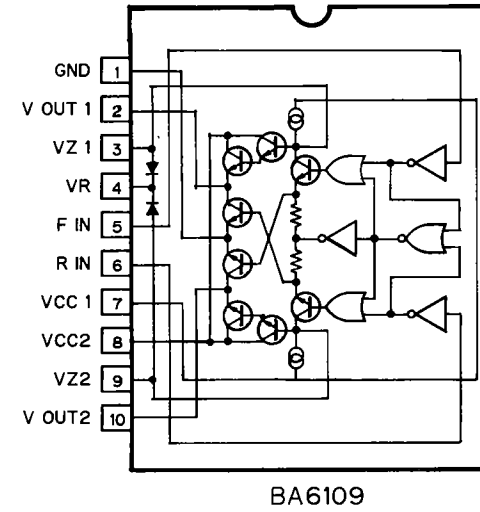
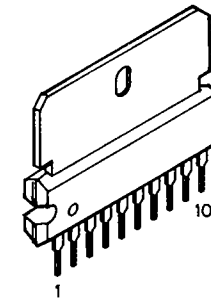
HD14066BP



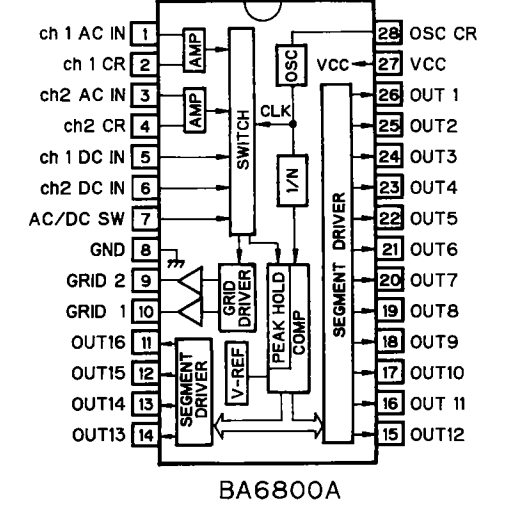
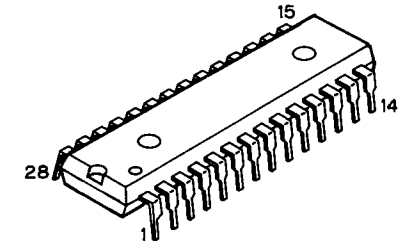
μPC1297CA



CX20187

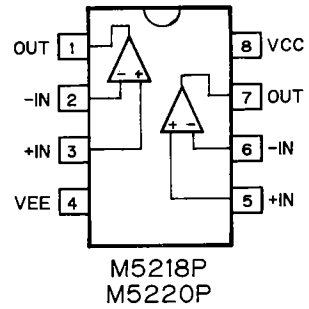
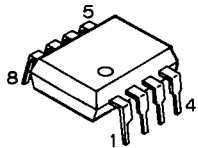


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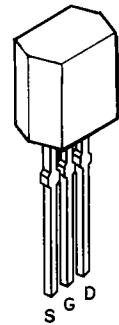
BA6800A

⊙ IC

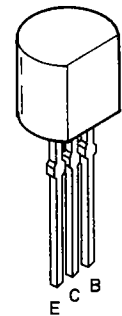


M5218P
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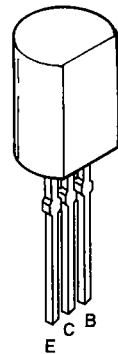
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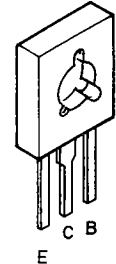
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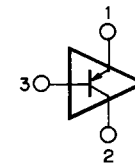
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2SC2603



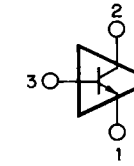
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2SB794
2SD985

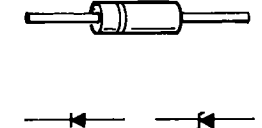


DTA124XS
DTA143ES
DTA143XS
DTA144ES



DTC124ES
DTC124XS
DTC143XS
DTC144ES

⊙ Diodes



1SR35
ISS270A

HZ4A-1
HZ6C-3
HZ7C-2
HZ9C-1
HZ9C-2
HZ30-2



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