PIONEER

Service Manual

Original

CIRCUIT DESCRIPTIONS

The photo shows the model KEX-900/EW.

ORDER NO.
CRT 1076

CENTRATE COMPONENT CAR STEREO
EQUALIZER DECK

KEX-900 ES, EW
KEX-900SDK WG

- For the repair & adjustments, please refer to the KEX-900 service manual (CRT1074).

CENTRATE COMPONENT CAR STEREO
CASSETTE DECK

KEX-500 EW
KEX-500SDK WG

- For the repair & adjustments, please refer to the KEX-500 service manual (CRT1075).

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PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A. TEL: (213) 420-5700
PIONEER ELECTRONIC (EUROPE) N.V. Keetberglaan 1, 2740 Beveren, Belgium TEL: 03/775·28·08
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia
TEL: (03) 580-9911

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1. SECRET CODE

This unit is equipped with a secret code function. The secret code (4-digit) electronically locks the unit to reduce the danger of theft.
The code is preset to 0 0 0 0 at the time of purchase, and the unit can be used normally without altering the code as preset. It is recommended, however, that the user change the code to another value to take full advantage of the anti-theft properties of this system.
Once a code is set, the unit will operate normally without input of the secret code, even if the ignition of the vehicle is switched OFF and then ON again. Should power to the unit be interrupted due to a battery change, repairs, or theft, however, the unit will fail to operate when power is restored unless the preset secret code is first entered. Three consecutive wrong inputs of the code will cause the unit to lock electronically to accept no input of code for three hours. Once operation is restored, three more wrong code inputs result in another three hours of electronic lock up. This feature helps to prevent breaking of the secret code through sequential or random input.
These features mean that once the power supplied to the unit is completely cut, further operation is impossible except for those who know the secret code. This makes the unit unuseable if stolen, thus reducing the danger of theft.

- When taking the unit to a service station for repair, be sure to either tell the service personnel the registered code or return the value to 0 0 0 0.
- Should you forget your registered secret number, consult your local service station taking along a such proof of purchase and ownership as the original receipt, etc.

Secret Code Registration

The secret code should be registered after all connection and installation procedures are complete. Perform the procedures outlined in "Registering the secret code" within one minute after switching the ignition key of the vehicle to ON or ACC.
The internal microprocessor will judge that a secret code has not been set if registration is not begun within one minute, if the mode switch is pressed during the one-minute period, or if an attempt is made to load a cassette. At this time, switch the ignition key OFF and then disconnect the unit's orange lead from the vehicle's battery. Then reconnect the lead and attempt secret code registration again.

Accessory Sticker and Card

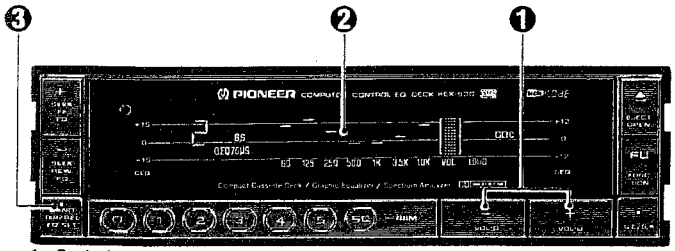
- Affix the sticker on a window of the vehicle in which the unit is installed to inform potential thieves of the anti-theft function of the unit.
- Write the secret code, unit model number, and unit serial number on the card and store it in a safe place outside of the vehicle itself. The serial number of this device is located on the bottom of the unit. This information can then be made available to the police and your PIONEER service station should your unit be stolen.

Dealer Installation

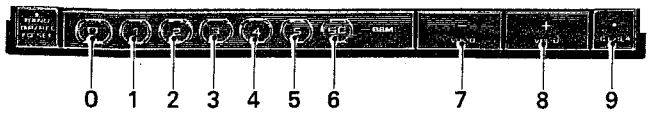
When this unit is installed by the dealer, either inform the dealer of the desired secret code for presetting or be present during the installation procedures to set the secret code yourself.

Registering the Secret Code

KEX-900



1. Switch the ignition key of the vehicle to ON or ACC.
2. Simultaneoulsy press the volume control buttons ❶ (+) and (−) within one minute after performing step 1.
3. The message C O d E will flash on the display ❷ to indicate that secret code registration is now possible. During this period, the buttons illustrated below become numeric input buttons (0—9) for the purpose of secret code registration.

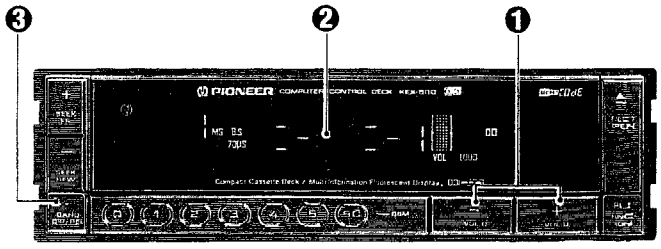


4. Use the numeric input buttons to register the 4-digit secret number of your choice.

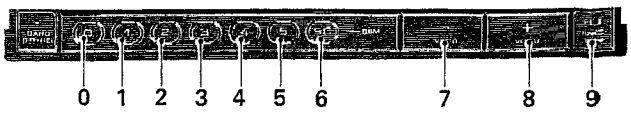
Ex. Registration of "8642"
Press:

1. Volume control button (+)	8
2. Music Scan button	8 6
3. Command button 4	8 6 4
4. Command button 2	8 6 4 2

KEX-500



1. Switch the ignition key of the vehicle to ON or ACC.
2. Simultaneoulsy press the volume control buttons ❶ (+) and (−) within one minute after performing step 1.
3. The message C O d E will flash on the display ❷ to indicate that secret code registration is now possible. During this period, the buttons illustrated below become numeric input buttons (0—9) for the purpose of secret code registration.

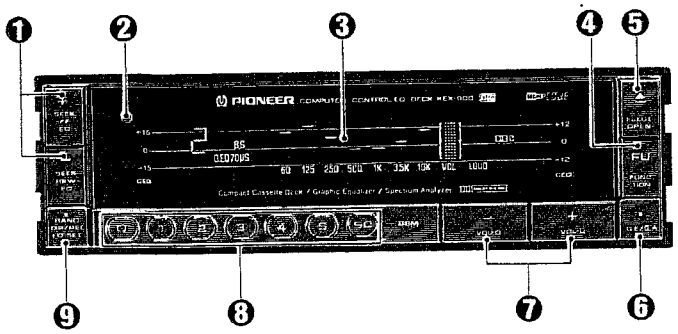


4. Use the numeric input buttons to register the 4-digit secret number of your choice.

Ex. Registration of "8642"
Press:

1. Volume control button (+)	8
2. Music Scan button	8 6
3. Command button 4	8 6 4
4. Command button 2	8 6 4 2

2. NOMENCLATURE AND USE (KEX-900)



❶ Fast Forward (+), Rewind (−)/Level Up (+), Down (−) Button

Fast Forward (+), Rewind (−) Button

Control fast forward/rewind only when the display is indicating tape transport or when the spectrum analyzer is shown. The (+) button is used for fast forward, while the (−) button is used for rewind. Pressing either of these buttons twice in succession activates the music search function, and pressing a third time returns to normal playback.

Level Up (+), Down (−) Button

Pressing the equalizer set button while the graphic equalizer display is shown changes the function of these buttons to level up/down buttons.

❷ Clear Button

Not used for normal operation, this button is pressed using a thin, pointed object to reset the unit when such symptoms as power supply failure, operation button failure, and abnormal display indicate misoperation of the unit's built-in microcomputer caused by noise. Pressing this button causes the message C O d E to appear on the display. Input the previously registered secret code at this time.

❸ Display

❹ Mode Button

Switches the power of the cassette deck ON and OFF.

- When a CD player and hide-away tuner are included in the system, each press of this button switches from cassette deck to CD player to tuner.

❺ Open/Eject Button

Opens the flip down control panel. Press again to eject the cassette tape from the deck.

❻ Display Select Button

Switches the contents of the display from tape transport, to spectrum analyzer, to graphic equalizer.

❼ Volume/Attenuator Button

Pressing (+) increases volume while (−) decreases volume. Simultaneously pressing (+) and (−) immediately cuts the volume to 1/10 of its current setting. The volume display flashes at this time to indicate that the volume is attenuated. Simultaneously pressing the two buttons again returns the volume to its original level .

❽ Command (0−5)/Music Scan (SC)/Equalizer Preset, Frequency Select Button

Command Buttons (0−5)

Sets the number of selections to be skipped in the skip search function when pressed while the tape transport display or spectrum analyzer display is shown.

Music Scan Button (SC)

Plays back 10 seconds of each successive selection when pressed while the tape transport display or spectrum analyzer display is shown. Pressing the release button cancels this function and resumes normal playback when the desired selection is located.

Equalizer Preset, Frequency Select Button

Presetting up to three equalizer curves (user preset curves) to buttons 0 through 2 allows instant recall when one of the buttons is pressed while the equalizer display is shown. Pressing button 3 through 5 selects one of three factory preset curves, and pressing the flat curve button (SC) recalls an uncompensated flat curve.

After the equalizer set button is pressed, these buttons function to select the desired frequency on the equalizer curve.

❾ Program Select/Release/Equalizer Set Button

Program Select Button

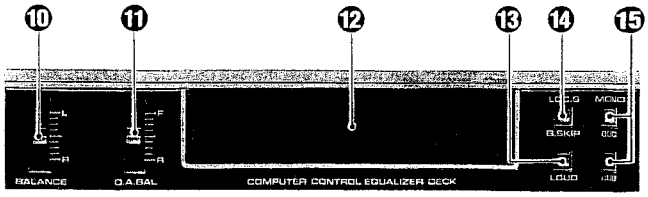
Switches the playback of the cassette tape between SIDE A and SIDE B when the tape transport display or spectrum analyzer display is shown.

Release Button

Cancels music scan, music search, skip search, and fast forward/rewind when pressed while the tape transport display or spectrum analyzer display is shown.

Equalizer Set Button

Allows creation of an equalizer curve using the frequency select button and level up/down buttons when pressed while the equalizer display is shown. This button is pressed once again to exit the equalizer set mode after the curve is set to the desired configuration.



(Flip-Down Control Panel Section)

❿ Balance Control

⓫ Dual-amp Balance Control

Adjusts the balance between the front and rear speakers for a 2-amp/4-speaker system. Sliding towards F cuts the volume of the rear speakers, while sliding towards R cuts the volume of the front speakers.

⓬ Cassette Insertion Slot

⓭ Loudness Button

Compensates the low and high ranges when pressed to improve output at low volume.

⓮ Blank Skip Button

Sets the unit to automatically skip past long unrecorded portions (longer than 10 seconds) between selections or at the end of the tape. The B.S indicator is shown on the display while this function is activated.

⓯ Dolby NR Button

Activates the Dolby NR system to improve the signal-to-noise ratio and cut tape hiss. DD is shown on the display when Dolby B Type NR is selected, while DD C indicates Dolby C Type NR.

- If an input error is made, simply reinput the correct secret code from the beginning. The last four values input are registered as the secret code.

5. The entered value is registered as the secret code by pressing the program switching button ❸ after input is complete. The display ❷ will be cleared once this is done and normal operation of the unit will be possible. Be sure to attempt operation only after thoroughly reading the owner's manual.

Interruption of Power Supply

Interruption the power supplied to the unit caused by battery replacement, reparis or theft of the unit causes the message CODE to flash on the display once power supply is resumed and the ignition key of the vehicle is switched to ON or ACC. At this time the previously registered secret code should be entered using the following procedures:

1. Use the numeric input buttons (see "Registering the secret code") to enter the previously registered 4-digit secret code.
2. Press the program switching ❸ button. The message PASS will appear on the display, an audible beep will sound, and normal operation will resume if the number entered matches the secret code registered before the power to the unit was interrupted. If the two numbers do not match, CODE will flash on the display again and the unit will await input of the correct value:

Anti-theft Function

These consecutive inputs of values which do not match the previously registered secret code activates and error timer causing the message Err to appear on the display. Once this occurs, all operation of the unit, including code input, will be impossible for three hours. The message CODE will return after three hours have passed. The anti-theft function will operate for all subsequent input until the correct value is entered.

CAUTION

Read the following in combination with the corresponding sections in the Owner's Manual.

Registering the Secret Code

Set the ignition of the vehicle to ON or ACC, and then **be sure to register the secret code within one minute after pressing the clear button.**

- Subsequent procedures should be performed as outlined in the Owner's Manual.

Anti-theft Function

The message Err appears on the display when wrong secret codes are entered three times in succession. The following procedure can be used to enter the correct secret code when the Err message is shown on the display.

1. **Press the clear button** and switch the ignition of the vehicle **OFF.**
2. Leave the ignition of the vehicle OFF **for three hours.**
3. Switch the ignition **ON within one hour** from the point in time that the three hour period is completed (i.e. if the clear button is pressed at 1:00, the ignition should be switched on sometime between 4:00 and 5:00).
4. Enter the correct secret code once the message CODE begins to flash on the display. The message PASS appears when the secret code is entered correctly.

- Note that leaving the ignition OFF for more than four hours in step 2 will cause the Err message to remain on the display when ignition is finally switched ON. In such a case, steps 1 through 4 must be repeated to enter the correct secret code.

Changing the Secret Code

1. Switch the ignition key of the vehicle OFF. Disconnect the unit's orange connecting cord from the battery of the vehicle and then reconnect it.
2. Switch the ignition key of the vehicle to ON or ACC and the message CODE will flash on the display indicating that the unit is waiting for input of a secret code.
3. Use the numeric input buttons (see "Registering the secret code") to enter the previously registered 4-digit secret code.
4. Press the program switching button ❸. The message PASS will appear on the display, an audible beep will sound, and normal operation will resume if the number entered matches the secret code registered before the power to the unit was interrupted. If the two numbers do not match, CODE will flash on the display again and the unit will await input of the correct value.
5. Simultaneously press the volume control buttons ❶ (+) and (−) within one minute after performing step 4.
6. The message CODE will flash on the display ❷ to indicate is now possible to change the registered secret code.
7. Use the numeric input buttons to register the 4-digit secret number of your choice.
8. The entered value is registered as the new secret code by pressing the program switching button ❸ after input is complete. The display will be cleared once this is done.

❸ Blank Skip Display
Lights when the blank skip button is pressed.

❹ Music Scan Display
Lights when the music scan button is pressed. The music scan function is in operation while this indicator is lit.

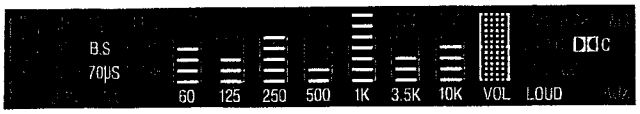
❺ Tape Transport/Spectrum Analyzer/Graphic Equalizer
Each press of the display select button causes the display to change as shown in A, B, and C below.

A: Tape Transport Display

▬—moving from the left to the right of the display indicates normal tape transport. When tape transport is reversed, —▬ moves from right to left. The respective indicators increase in speed fro such functions as fast forward, rewind, and music search.

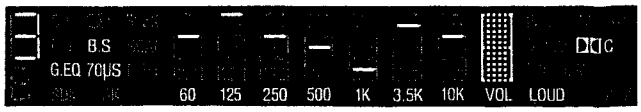
B: Spectrum Analyzer Display

Frequency power levels are shown divided among seven frequencies.



C: Graphic Equalizer Display

Levels are shown divided among seven frequencies. The levels indicated by the red lines on the display are the uncompensated levels. The area above the red lines is the high level, while that below the red lines is the low level.



❻ Volume Level/Attenuator Display
Displays the volume level. The indicator at the bottom of the display is always lit, even when volume is at its minimum setting. Simultaneously pressing both volume buttons cuts the volume to 1/10 of its current setting (attenuator function) and causes the volume display to flash.

❼ Dolby NR Display
DOLBY lights while the Dolby B NR button is pressed, while DOLBY C lights while the Dolby C NR is pressed.

❽ External Input Display
Lights when a unit (CD player) connected through the external input connector is in operation while the cassette deck is OFF.

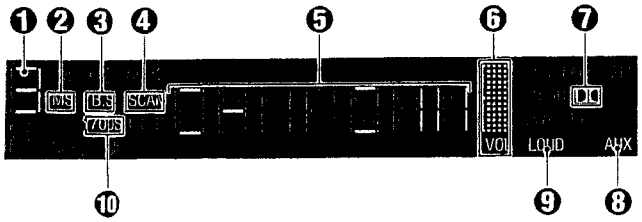
❾ Loudness Indicator
Appears when the loudness button is pressed to indicate that the loudness function is activated.

❿ Frequency Display
Lights while the graphic equalizer display or spectrum analyzer display is shown.

⓫ 70 μs Tape Display
An automatic tape selector will switch the equalization (70 μs/120 μs) when a cassette tape is loaded into the unit. A 70 μs tape will cause 70 μs to be displayed, while a 120 μs tape will result in no display at all.

⓬ Graphic Equalizer Display
Lights along with the preset number when an equalizer preset button is pressed while the graphic equalizer display is shown.

5. READING THE DISPLAYS (KEX-500)



❶ Skip Number Display
Displays the number of selections (set using the command buttons) to be skipped by the skip search function.

❷ Music Search/Skip Search Display
MS appears on the display during music search and skip search operations.

• The display changes as shown during music search:

Ex. Locating the beginning of the current selection.

• The display changes as shown during skip search:

Ex. Locating the beginning of the second selection before the current one.

❸ Blank Skip Display
Lights when the blank skip button is pressed.

❹ Music Scan Display
Lights when the music scan button is pressed. The music scan function is in operation while this indicator is lit.

❺ Tape Transport Display
▬—moving from the left to the right of the display indicates normal tape transport. When tape transport is reversed, —▬ moves from right to left. The respective indicators increase in speed for such functions as fast forward, rewind, and music search.

❻ Volume Level/Attenuator Display
Displays the volume level. The indicator at the bottom of the display is always lit, even when volume is at its minimum setting. Simultaneously pressing both volume buttons cuts the volume to 1/10 of its current setting (attenuator function) and causes the volume display to flash.

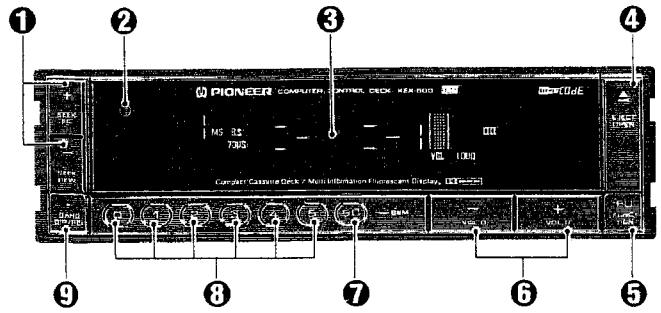
❼ Dolby NR Display
DOLBY will light when the Dolby NR button is pressed.

❽ External Input Display
Lights when a unit (CD player) connected through the external input connector is in operation while the cassette deck is OFF.

❾ Loudness Indicator
Appears when the loudness button is pressed to indicate that the loudness function is activated.

❿ 70 μs Tape Display
An automatic tape selector will switch the equalization (70 μs/120 μs) when a cassette tape is loaded into the unit. A 70 μs tape will cause 70 μs to be displayed, while a 120 μs tape will result in no display at all.

3. NOMENCLATURE AND USE (KEX-500)



❶ Fast Forward (+)/Rewind (−) Button

The (+) button is used for fast forward, while the (−) button is used for rewind. Pressing either of these buttons twice in succession activates the music search function, and pressing a third time returns to normal playback.

❷ Clear Button

Not used for normal operation, this button is pressed using a thin, pointed object to reset the unit when such symptoms as power supply failure, operation button failure, and abnormal display indicate misoperation of the unit's built-in microcomputer caused by noise. Pressing this button causes the message C O d E to appear on the display. Input the previously registered secret code at this time.

❸ Display

❹ Open/Eject Button

Opens the flip down control panel. Press again to eject the cassette tape from the deck.

❺ Mode Button

Switches the power of the cassette deck ON and OFF.

- When a CD player and hide-away tuner are included in the system, each press of this button switches from cassette deck to CD player to tuner.

❻ Volume/Attenuator Button

Pressing (+) increases volume while (−) decreases volume. Simultaneously pressing (+) and (−) immediately cuts the volume to 1/10 of its current setting. The volume display flashes at this time to indicate that the volume is attenuated. Simultaneously pressing the two buttons again returns the volume to its original level .

❼ Music Scan Button

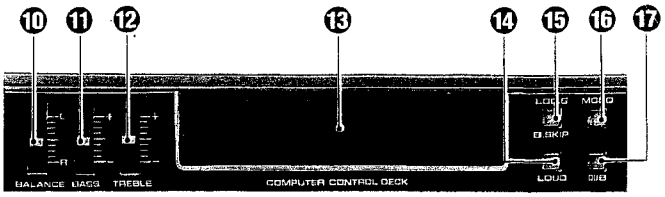
Plays back 10 seconds of each successive selection when pressed. Pressing the release button cancels this function and resumes normal playback when the desired selection is located.

❽ Command Buttons

Sets the number of selections to be skipped by the skip search function.

❾ Program Switching/Release Button

Press this button to switch from side A to side B and vice versa. Also, you can press this button to cancel music scan, search, skip search, and fast forward or rewind.



(Flip-Down Control Panel Section)

❿ Balance Control

⓫ Bass Control

⓬ Treble Control

⓭ Cassette Insertion Slot

⓮ Loudness Button

Compensates the low and high ranges when pressed to improve output at low volume.

⓯ Blank Skip Button

Sets the unit to automatically skip past long unrecorded portions (longer than 10 seconds) between selections or at the end of the tape. The B.S indicator is shown on the display while this function is activated.

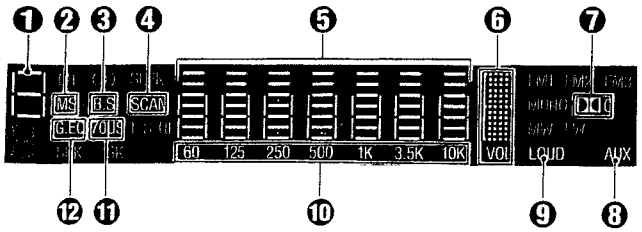
⓰ FM Stereo/Monaural Button

Used when a hide-away tuner is included in the system.

⓱ Dolby NR Button

Press when playing a tape recorded with a Dolby NR. (DD appears on the display).

4. READING THE DISPLAYS (KEX-900)



❶ Skip/Equalizer Preset Number

Shows the number of selections skipped by the skip search function. Also shows the preset number (0—5, F) when the equalizer preset button is pressed.

❷ Music Search/Skip Search Display

MS appears on the display during music search and skip search operations.

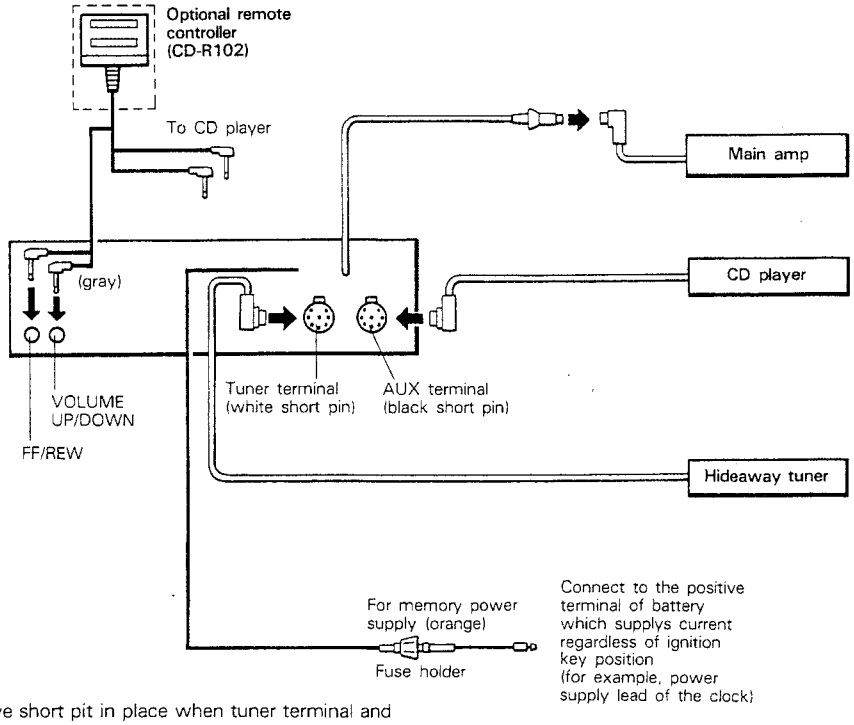
- The display changes as shown during music search:

Ex. Locating the beginning of the current selection.

- The display changes as shown during skip search:

Ex. Locating the beginning of the second selection before the current one.

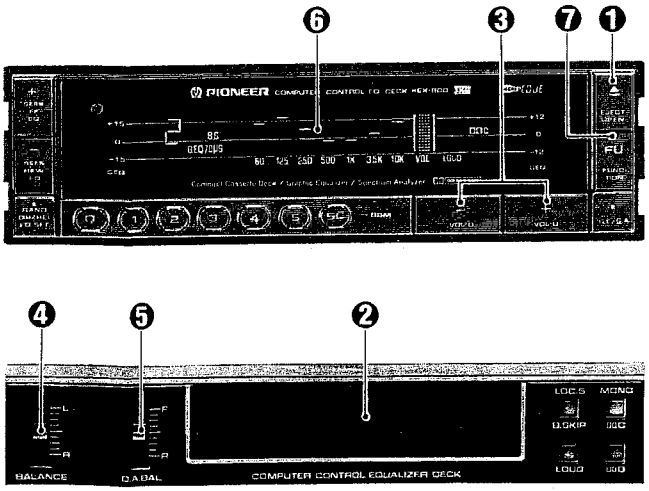
• KEX-500



- Always leave short pit in place when tuner terminal and AUX terminal are not used.

7. PLAYBACK

• KEX-900



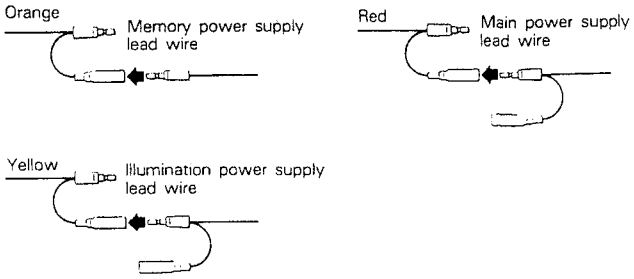
(Flip-Down Control Panel Section)

1. With the ignition switch in the ON or ACC position, press the open button ❶ and the flip-down control panel will open.
2. Insert a cassette tape into the tape slot ❷. The deck will automatically set the tape and begin playback.
3. Adjust the volume ❸, balance ❹, and dual amp balancer ❺ (for 4-speaker systems) to the desired levels.
4. Close the flip-down control panel ❻.
5. Press the mode button ❼ to stop tape transport. Press again to resume tape transport.
6. To remove a tape, press the open/eject button ❶ and the flip-down control panel will open. Press the button once more and the cassette will eject.

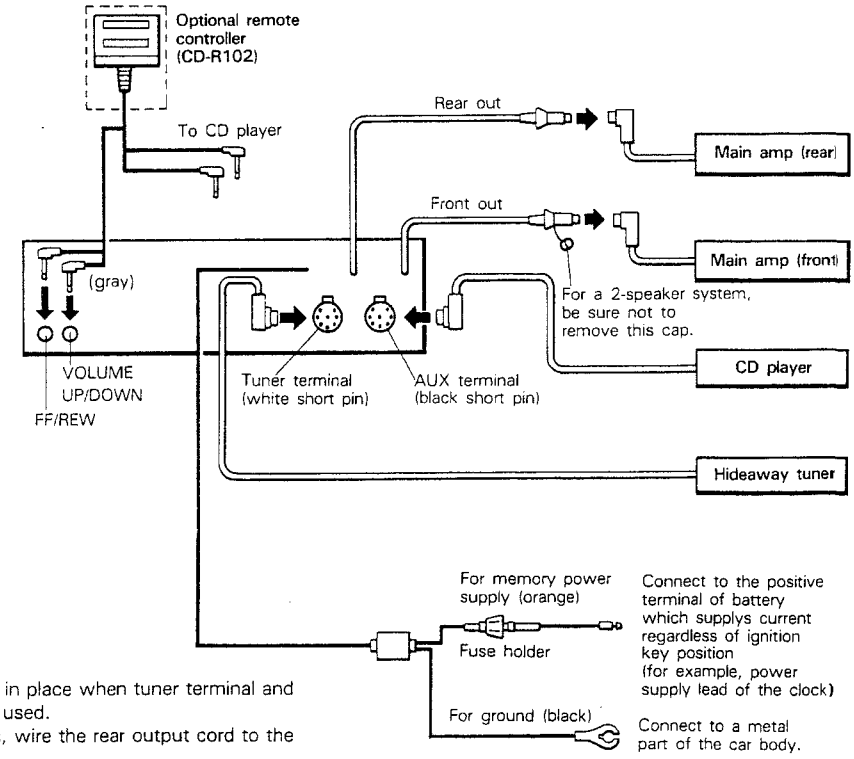
- The cassette tape will automatically be ejected after a few seconds if it fails to be set. Reinsert the tape and try to set it again.
- A loose or warped label on a cassette tape may interfere with the eject mechanism of the unit or cause the cassette to become jammed in the unit. Avoid using such tapes or remove such labels from the cassette before attempting use.

6. CONNECTING THE UNITS

- Before making final connections, make temporary connections then operate the unit to check for any connecting cord problems.
- Refer to the owner's manual for details on connecting the various cords of the main amp and other units then make connections correctly.
- Be sure to correctly connect the memory power supply lead (orange) as specified. If the connection is made incorrectly or forgotten, this unit will not work at all.
- Don't pass the memory power supply lead (orange) through a hole into the engine compartment to connect to the battery. This will damage the lead insulation and cause a very dangerous short.
- If you should encounter more than two lead wires of the same color, when wiring connections, it will be convenient to wire them together, as shown in the following diagram.



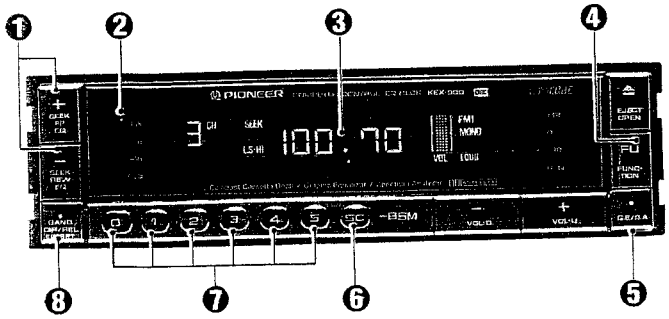
● KEX-900



- Always leave short pit in place when tuner terminal and AUX terminal are not used.
- For 2-speaker systems, wire the rear output cord to the main amp.

9. NOMENCLATURE AND USE (TUNER SECTION)

• KEX-900



❶ Seek/Manual Tuning Button

Simultaneously pressing these two buttons switches between manual and seek tuning.

Seek Tuning (SEEK appears on display)
Automatically tunes in the nearest receivable frequency. Pressing (+) tunes in the nearest higher receivable frequency, while pressing (−) tunes in the nearest lower receivable frequency.

Manual Tuning
Each press of (+) increases FM frequencies in 50 kHz steps, MW frequencies in 9 kHz steps, and LW frequencies in 1 kHz steps. Each press of (−) decreases frequencies in the same steps. Pressing and holding down either button causes high speed changes in the frequency according to the respective steps.

❷ Clear Button

Not used for normal operation, this button is pressed using a thin, pointed object to reset the unit when such symptoms as power supply failure, operation button failure, and abnormal display indicate misoperation of the unit's built-in microcomputer caused by noise. Pressing this button causes the message CODE to appear on the display. Input the previously registered secret code at this time.

❸ Display

❹ Mode Button

Switches from cassette deck to power OFF to tuner.

- When the AUX terminal is used, this button switches from cassette deck, to AUX (CD player, etc.), to tuner.
- This button may not function properly when the unit is first installed, and it may be impossible to switch to the tuner mode. In this case, pressing the clear button should allow normal operation.

❺ Display Select Button

Switches the display contents from reception frequency, to spectrum analyzer, to graphic equalizer.

❻ Preset Scan Tuning/Best Station Memory Button

Preset Scan Tuning Button
Sequentially recalls frequencies assigned to the preset buttons for play of approximately eight seconds each.
Pressing the release button cancels this function when a desired function is located.

Best Station Memory Button
Automatically tunes strong frequencies and assigns them to preset buttons 0 through 5 for one-touch automatic tuning. The best station memory function is activated by pressing and holding down this button until a beep is heard (approximately two seconds). The best station memory function is indicated by -------- flashing on the display, and this function can be canceled by pressing the release button.

- The frequencies previously assigned to the preset buttons are retained when six strong frequencies cannot be located.
- The best station memory function does not operate during preset scan tuning. To use the best station memory function, first use the release button to cancel preset scan tuning.
- The best station memory is operational while -------- is flashing on the display.

❼ Frequency Preset/Memory Buttons

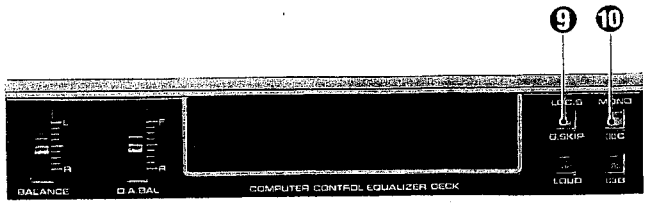
Frequency Preset
Assignment of FM/MW/LW frequencies to these buttons allows one-touch tuning. 18 frequencies (6 for FM1, 6 for FM2, 6 for FM3) and 6 MW/LW frequencies can be assigned for a total of 24 different frequencies.

Memory
Frequencies tuned using seek or manual tuning can be assigned to memory by pressing and holding down the desired button until a beep is heard (approximately two seconds).

❽ Band Select/Release Button

Switches bands in the following sequence:
FM1 → FM2 → FM3 → MW/LW
Also cancels seek tuning, preset scan tuning, and the best station memory function.

- Switching between FM and MW/LW is performed using the band select button. Switching between LW and MW is accomplished using the tuning button. The MW band is from 531 kHz to 1,602 kHz, and the LW band is from 153 kHz to 281 kHz.



• (Flip-Down Control Panel Section)

❾ Local Station Button

Switches the seek level sensitivity of the seek tuning function among three levels in the following sequence:
OFF → L.S → L.S-HI
The OFF level has the greatest sensitivity, while the L.S-HI setting will tune in only the strongest broadcasts.

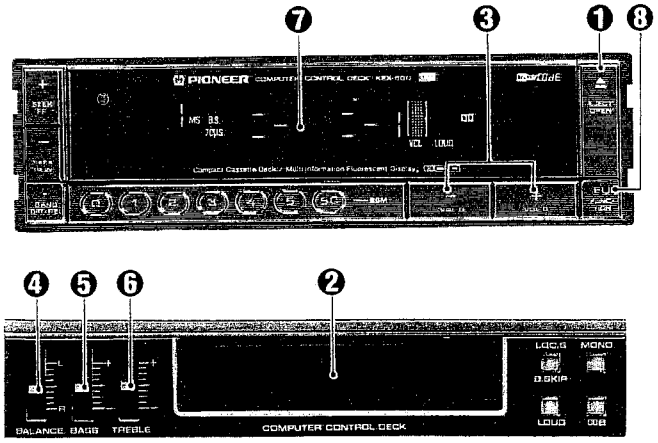
❿ FM Stereo/Monaural Button

Switches between stereo and monaural for FM broadcasts. This button is usually left in the stereo setting for enjoyment of stereo broadcasts signaled by the stereo indicator appearing on the display. This setting also allows clear sound quality when the ARC (automatic reception control) circuit is activated. This button should only be used in the manual setting when the FM broadcast is being interfered with by excessive noise.

System Remote Control Unit CD-R102 (Option)
Connection of the optional CD-R102 allows remote control of seek and manual tuning within easy reach.

- All the press type control buttons have an electronic sound (beep) and display for dual confirmation of operation.

• KEX-500

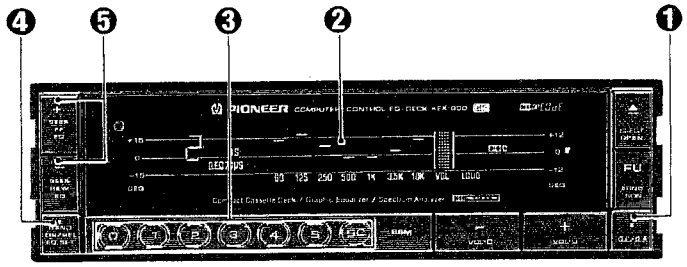


(Flip-Down Control Panel Section)

1. With the ignition switch in the ON or ACC position, press the open button ❶ and the flip-down control panel will open.
2. Insert a cassette tape into the tape slot ❷. The deck will automatically set the tape and begin playback.
3. Adjust volume ❸, balance ❹, bass ❺, and treble ❻ controls as you like.
4. Close the flip-down control panel ❼.
5. Press the mode button ❽ to stop tape transport. Press again to resume tape transport.
6. To remove a tape, press the open/eject button ❶ and the flip-down control panel will open. Press the button once more and the cassette will eject.

- The cassette tape will automatically be ejected after a few seconds if it fails to be set. Reinsert the tape and try to set it again.
- A loose or warped label on a cassette tape may interfere with the eject mechanism of the unit or cause the cassette to become jammed in the unit. Avoid using such tapes or remove such labels from the cassette before attempting use.

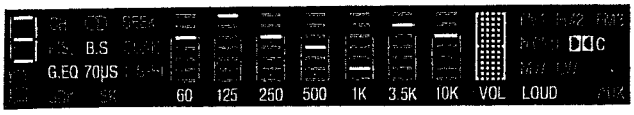
8. USING THE GRAPHIC EQUALIZER (KEX-900)



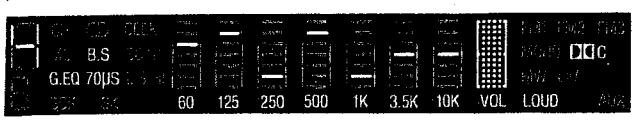
Factory Preset Curves

1. Press the display select button ❶ to switch the display ❷ to the graphic equalizer curve.
2. Pressing equalizer preset button 3, 4, 5 or SC ❸ will cause one of the following equalizer curves to appear on the display.

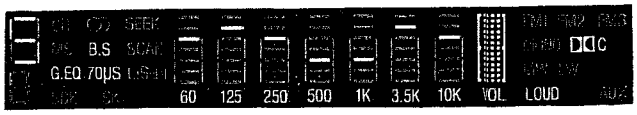
③ : **Equalizer Powerful Curve**
Compensates for the frequency characteristics inside of the vehicle while enhancing the low and high ranges to produce a powerful sound.



④ : **Rear Speaker Equalizer Curve**
Compensates for the frequency characteristics inside of the vehicle to produce the equivalent of a flat curve (in most vehicles).



⑤ : **Powerful Curve**
Enhances the low and high ranges to produces a powerful curve.



SC : **Flat Curve**
An uncompensated flat curve that can be used as a reference to determine the effects of the other curves.

Forming Equalizer Curves

1. Pressing the equalizer set button ❹ causes the equalizer preset buttons ❸ (0—5, SC) to function as frequency select buttons.
2. Select the frequency to be adjusted using the frequency select buttons (the display of the selected frequency will flash).
3. Use the level up (+)/down (−) buttons ❺ to set the frequency to the desired level.

- Repeat steps 2 and 3 to adjust the other frequences.

4. Press the equalizer set button once again when settings are complete.

- User preset curves based on a factory preset curve by first calling the desired factory preset curve.

Recording to Memory .

Once an equalizer curve is created, the following operation is used to assign the curve to preset buttons 0 through 2.

5. Press and hold down one of the equalizer curve preset buttons (0—2) until a beep is heard (approximately 2 seconds). This signals that the curve has been stored in memory under the preset button pressed.

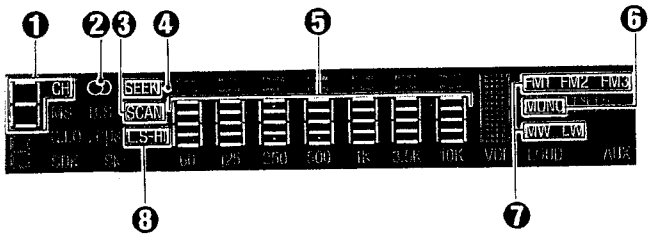
- The procedure outlined above can be used to create and store up to three equalizer curves.
- The level can be adjusted within ±15 dB in the low range (60 Hz, 125 Hz).

Note:

- If the program source does not include components in the vicinity of 60 Hz, or if small diameter speakers are used, little change will be noticeable even if the 60 Hz frequency level is adjusted.

10. READING THE DISPLAY (TUNER SECTION)

• KEX-900



❶ Preset Number Display
Indicates the number of the preset button pressed to tune in the current frequency.

❷ FM Stereo Indicator
Indicates reception of a strong FM stereo broadcast.

❸ Preset Scan Tuning Display
Indicates operation of the preset scan tuning function.

❹ Seek Tuning Indicator
Indicates operation of the seek tuning function.

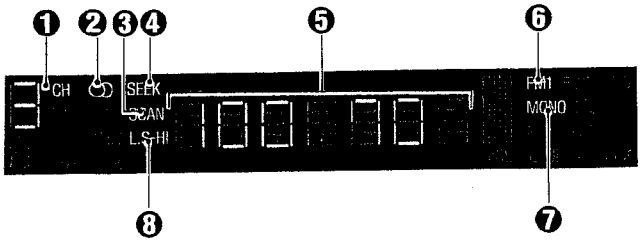
❺ Frequency Indicator
Shows -------- while the best station memory function is in operation.

❻ FM Monaural Indicator
Indicates reception of an FM broadcast while the stereo/monaural button is in the monaural position.

❼ Band Indicator
Indicates the band, switching in the sequences FM1 → FM2 → FM3 → MW/LW → FM1... with each press of the band select button.

❽ Local Station Indicator
Indicates the seek level during operation of the seek tuning function.
L.S-HI: Low sensitivity
L.S: Medium sensitivity
OFF (no display): High sensitivity

• KEX-500



❶ Preset Number Display
Indicates the number of the preset button pressed to tune in the current frequency.

❷ FM Stereo Indicator
Indicates reception of a strong FM stereo broadcast.

❸ Preset Scan Tuning Display
Indicates operation of the preset scan tuning function.

❹ Seek Tuning Indicator
Indicates operation of the seek tuning function.

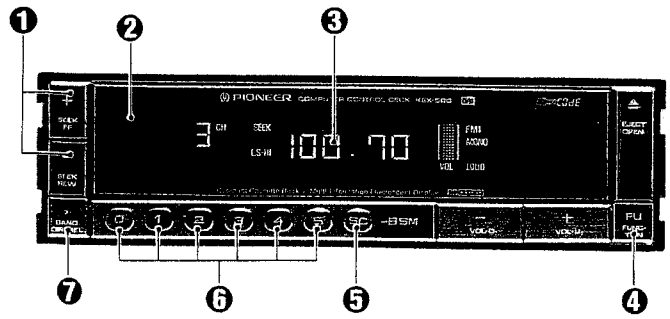
❺ Frequency Indicator
Shows -------- while the best station memory function is in operation.

❻ Band Indicator
Indicates the band, switching in the sequences FM1 → FM2 → FM3 → MW/LW → FM1... with each press of the band select button.

❼ FM Monaural Indicator
Indicates reception of an FM broadcast while the stereo/monaural button is in the monaural position.

❽ Local Station Indicator
Indicates the seek level during operation of the seek tuning function.
L.S-HI: Low sensitivity
L.S: Medium sensitivity
OFF (no display): High sensitivity

• KEX-500



❶ Seek/Manual Tuning Button

Simultaneously pressing these two buttons switches between manual and seek tuning.

Seek Tuning (SEEK appears on display)
Automatically tunes in the nearest receivable frequency. Pressing (+) tunes in the nearest higher receivable frequency, while pressing (−) tunes in the nearest lower receivable frequency.

Manual Tuning
Each press of (+) increases FM frequencies in 50 kHz steps, MW frequencies in 9 kHz steps, and LW frequencies in 1 kHz steps. Each press of (−) decreases frequencies in the same steps. Pressing and holding down either button causes high speed changes in the frequency according to the respective steps.

❷ Clear Button

Not used for normal operation, this button is pressed using a thin, pointed object to reset the unit when such symptoms as power supply failure, operation button failure, and abnormal display indicate misoperation of the unit's built-in microcomputer caused by noise. Pressing this button causes the message C O d E to appear on the display. Input the previously registered secret code at this time.

❸ Display

❹ Mode Button

Switches from cassette deck to power OFF to tuner.

- When the AUX terminal is used, this button switches from cassette deck, to AUX (CD player, etc.), to tuner.
- This button may not function properly when the unit is first installed, and it may be impossible to switch to the tuner mode. In this case, pressing the clear button should allow normal operation.

❺ Preset Scan Tuning/Best Station Memory Button

Preset Scan Tuning Button
Sequentially recalls frequencies assigned to the preset buttons for play of approximately eight seconds each.
Pressing the release button cancels this function when a desired function is located.

Best Station Memory Button
Automatically tunes strong frequencies and assigns them to preset buttons 0 through 5 for one-touch automatic tuning. The best station memory function is activated by pressing and holding down this button until a beep is heard (approximately two seconds). The best station memory function is indicated by -------- flashing on the display, and this function can be canceled by pressing the release button.

- The frequencies previously assigned to the preset buttons are retained when six strong frequencies cannot be located.
- The best station memory function does not operate during preset scan tuning. To use the best station memory function, first use the release button to cancel preset scan tuning.
- The best station memory is operational while -------- is flashing on the display.

❻ Frequency Preset/Memory Buttons

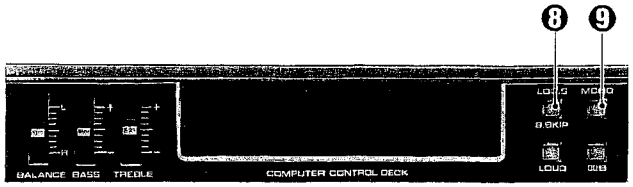
Frequency Preset
Assignment of FM/MW/LW frequencies to these buttons allows one-touch tuning. 18 frequencies (6 for FM1, 6 for FM2, 6 for FM3) and 6 MW/LW frequencies can be assigned for a total of 24 different frequencies.

Memory
Frequencies tuned using seek or manual tuning can be assigned to memory by pressing and holding down the desired button until a beep is heard (approximately two seconds).

❼ Band Select/Release Button

Switches bands in the following sequence:
FM1 → FM2 → FM3 → MW/LW
Also cancels seek tuning, preset scan tuning, and the best station memory function.

- Switching between FM and MW/LW is performed using the band select button. Switching between LW and MW is accomplished using the tuning button. The MW band is from 531 kHz to 1,602 kHz, and the LW band is from 153 kHz to 281 kHz.



(Flip-Down Control Panel Section)

❽ Local Station Button

Switches the seek level sensitivity of the seek tuning function among three levels in the following sequence:
OFF → L.S → L.S-HI
The OFF level has the greatest sensitivity, while the L.S-HI setting will tune in only the strongest broadcasts.

❾ FM Stereo/Monaural Button

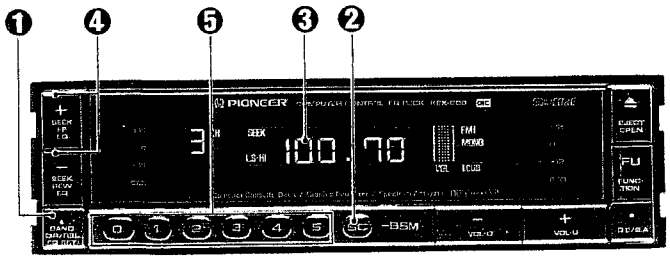
Switches between stereo and monaural for FM broadcasts. This button is usually left in the stereo setting for enjoyment of stereo broadcasts signaled by the stereo indicator appearing on the display. This setting also allows clear sound quality when the ARC (automatic reception control) circuit is activated. This button should only be used in the manual setting when the FM broadcast is being interfered with by excessive noise.

System Remote Control Unit CD-R102 (Option)
Connection of the optional CD-R102 allows remote control of seek and manual tuning within easy reach.

- All the press type control buttons have an electronic sound (beep) and display for dual confirmation of operation.

12. ASSIGNING FREQUENCIES TO MEMORY

• KEX-900

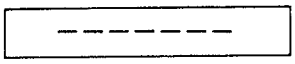


Frequently listened to frequencies can be assigned to preset buttons for later one-touch tuning. Frequencies can be assigned using either the best station memory function or seek/manual tuning.

Best Station Memory

The single touch of a button causes automatic tuning of strong broadcasts for assignment to preset buttons 0 through 5.

1. Press the band select button ❶ to select the desired band.
2. Press and hold down the best station memory button ❷ (for approximately two seconds) until the display ❸ appears as illustrated below. The display flashes as illustrated to indicate that the memory function is being performed.



3. The frequency display returns once the best station memory function is complete. The frequency displayed at this time is the one assigned to preset button ⓪ by the best station memory function.

Seek/Manual Tuning

1. Press the band select button ❶ to select FM1, FM2, FM3 or MW/LW.
2. Press the (+) or (−) tuning button ❹ to tune in the desired frequency.
3. Press and hold down (for approximately two seconds) one of the preset buttons ❺ until a beep sound is heard to indicate that assignment is complete. At this time the display ❸ should show the number that corresponds to the preset button pressed.
4. Frequencies can be assigned to the remaining preset buttons by repeating steps 2 and 3.

• 18 FM frequencies (6 for FM1, 6 for FM2, 6 for FM3) and 6 MW/LW frequencies can be assigned for a total of 24 different frequencies.

Note on LW Band Seek Tuning

The following shows changes in LW BAND broadcast frequency steps enacted by WARC/1979. The underlined italic figures indicate changes.

A. Up to January 1986
155-164-173-182-191-200-209-218-227-236-245-254-263-272-281

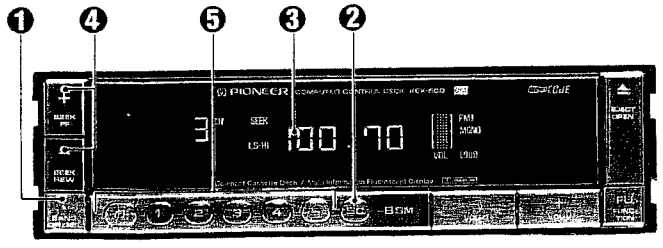
B. From February 1986
153-162-171-180-189-200-209-218-227-236-245-254-263-272-281

C. From February 1988
153-162-171-180-189-*198-207-216-225-234*-245-254-263-272-281

D. From February 1990
153-162-171-180-189-198-207-216-225-234-*243-252-261-270-279.*

The LW BAND SEEK operations of this unit are performed in 9 kHz steps starting from 155 kHz. In the case of B, the change results in the first five frequencies being shifted (2 kHz each) from A, while the remaining ten are identical to those of A. Consequently, manual tuning (in 1 kHz steps) and seek tuning should be used together to tune in the desired LW broadcast. It is also suggested that your favorite LW stations will be memorized for instant recall.

• KEX-500

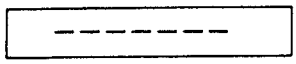


Frequently listened to frequencies can be assigned to preset buttons for later one-touch tuning. Frequencies can be assigned using either the best station memory function or seek/manual tuning.

Best Station Memory

The single touch of a button causes automatic tuning of strong broadcasts for assignment to preset buttons 0 through 5.

1. Press the band select button ❶ to select the desired band.
2. Press and hold down the best station memory button ❷ (for approximately two seconds) until the display ❸ appears as illustrated below. The display flashes as illustrated to indicate that the memory function is being performed.



3. The frequency display returns once the best station memory function is complete. The frequency displayed at this time is the one assigned to preset button ⓪ by the best station memory function.

Seek/Manual Tuning

1. Press the band select button ❶ to select FM1, FM2, FM3 or MW/LW.
2. Press the (+) or (−) tuning button ❹ to tune in the desired frequency.
3. Press and hold down (for approximately two seconds) one of the preset buttons ❺ until a beep sound is heard to indicate that assignment is complete. At this time the display ❸ should show the number that corresponds to the preset button pressed.
4. Frequencies can be assigned to the remaining preset buttons by repeating steps 2 and 3.

• 18 FM frequencies (6 for FM1, 6 for FM2, 6 for FM3) and 6 MW/LW frequencies can be assigned for a total of 24 different frequencies.

Note on LW Band Seek Tuning

The following shows changes in LW BAND broadcast frequency steps enacted by WARC/1979. The underlined italic figures indicate changes.

A. Up to January 1986
155-164-173-182-191-200-209-218-227-236-245-254-263-272-281

B. From February 1986
153-162-171-180-189-200-209-218-227-236-245-254-263-272-281

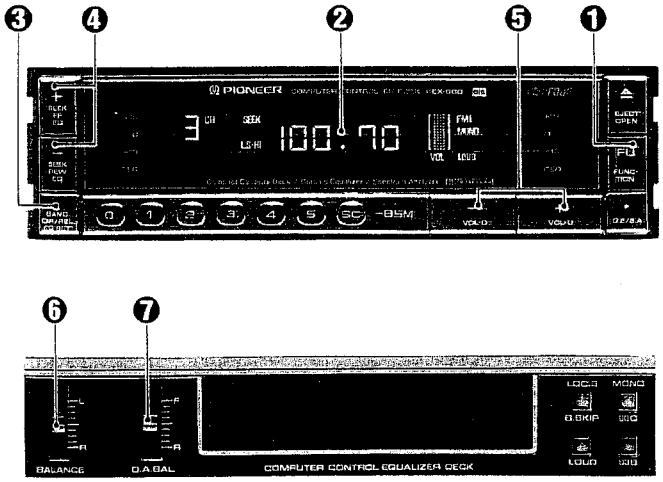
C. From February 1988
153-162-171-180-189-*198-207-216-225-234*-245-254-263-272-281

D. From February 1990
153-162-171-180-189-198-207-216-225-234-*243-252-261-270-279.*

The LW BAND SEEK operations of this unit are performed in 9 kHz steps starting from 155 kHz. In the case of B, the change results in the first five frequencies being shifted (2 kHz each) from A, while the remaining ten are identical to those of A. Consequently, manual tuning (in 1 kHz steps) and seek tuning should be used together to tune in the desired LW broadcast. It is also suggested that your favorite LW stations will be memorized for instant recall.

11. TUNING AN FM/MW/LW SECTION

• KEX-900



(Flip-Down Control Panel Section)

1. Press the mode button ❶ until the tuner indicator is shown on the display ❷.
2. Press the band select button ❸ to select the desired band.
3. Press the (+) or (−) tuning button ❹. Pressing (+) tunes in the nearest higher receivable frequency, while pressing (−) tunes in the nearest lower receivable frequency (seek tuning).
4. Adjust the volume ❺, balance ❻, and dual amp balancer ❼ (for 4-speaker systems) to the desired levels.

- The unit is set for manual tuning when the seek indicator is not shown on the display ❷. Simultaneously pressing the (+) and (−) tuning buttons ❹ activates seek tuning (SEEK indicator appears on the display).

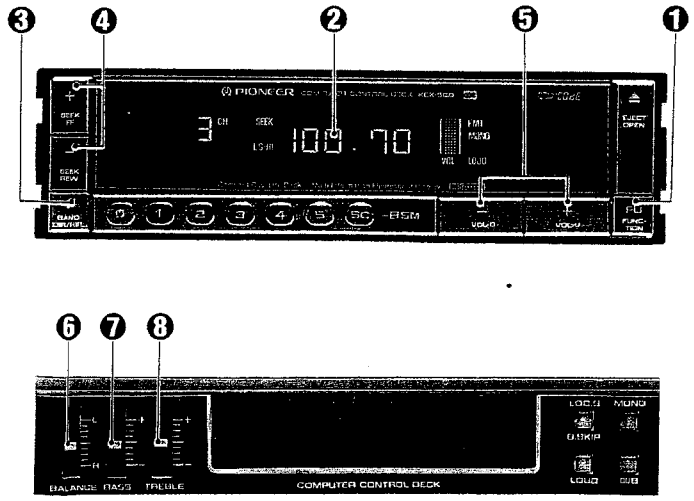
Manual Tuning

When manual tuning is selected, tuning can be performed in 50 kHz steps for FM, 9 kHz steps for MW, and 1 kHz steps for LW. Manual tuning is useful when tuning in frequencies unobtainable with seek tuning.

1. Simultaneously press the (+) and (−) tuning buttons ❹ until the seek indicator disappears from the display ❷.
2. Now pressing the (+) button increases the frequency, while pressing the (−) button decreases the frequency. Pressing and holding down either button causes high speed change of the frequency in the respective direction.

- Simultaneously press the (+) and (−) tuning buttons ❹ until the seek indicator appears on the display to return to seek tuning.

• KEX-500



(Flip-Down Control Panel Section)

1. Press the mode button ❶ until the tuner indicator is shown on the display ❷.
2. Press the band select button ❸ to select the desired band.
3. Press the (+) or (−) tuning button ❹. Pressing (+) tunes in the nearest higher receivable frequency, while pressing (−) tunes in the nearest lower receivable frequency (seek tuning).
4. Adjust volume ❺, balance ❻, bass ❼, and treble ❽ controls as you like.

- The unit is set for manual tuning when the seek indicator is not shown on the display ❷. Simultaneously pressing the (+) and (−) tuning buttons ❹ activates seek tuning (SEEK indicator appears on the display).

Manual Tuning

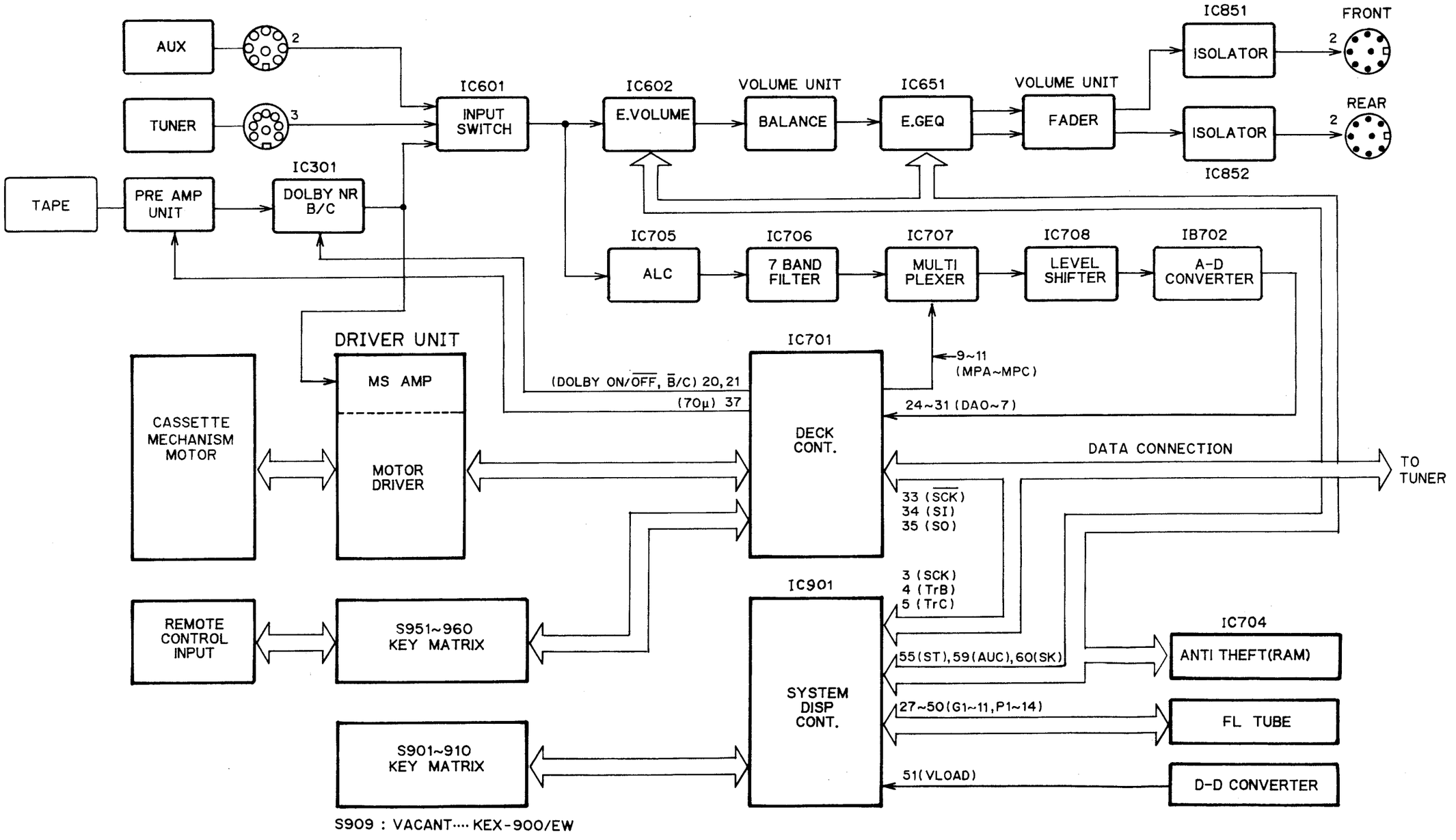
When manual tuning is selected, tuning can be performed in 50 kHz steps for FM, 9 kHz steps for MW, and 1 kHz steps for LW. Manual tuning is useful when tuning in frequencies unobtainable with seek tuning.

1. Simultaneously press the (+) and (−) tuning buttons ❹ until the seek indicator disappears from the display ❷.
2. Now pressing the (+) button increases the frequency, while pressing the (−) button decreases the frequency. Pressing and holding down either button causes high speed change of the frequency in the respective direction.

- Simultaneously press the (+) and (−) tuning buttons ❹ until the seek indicator appears on the display to return to seek tuning.

13. CIRCUIT DESCRIPTION

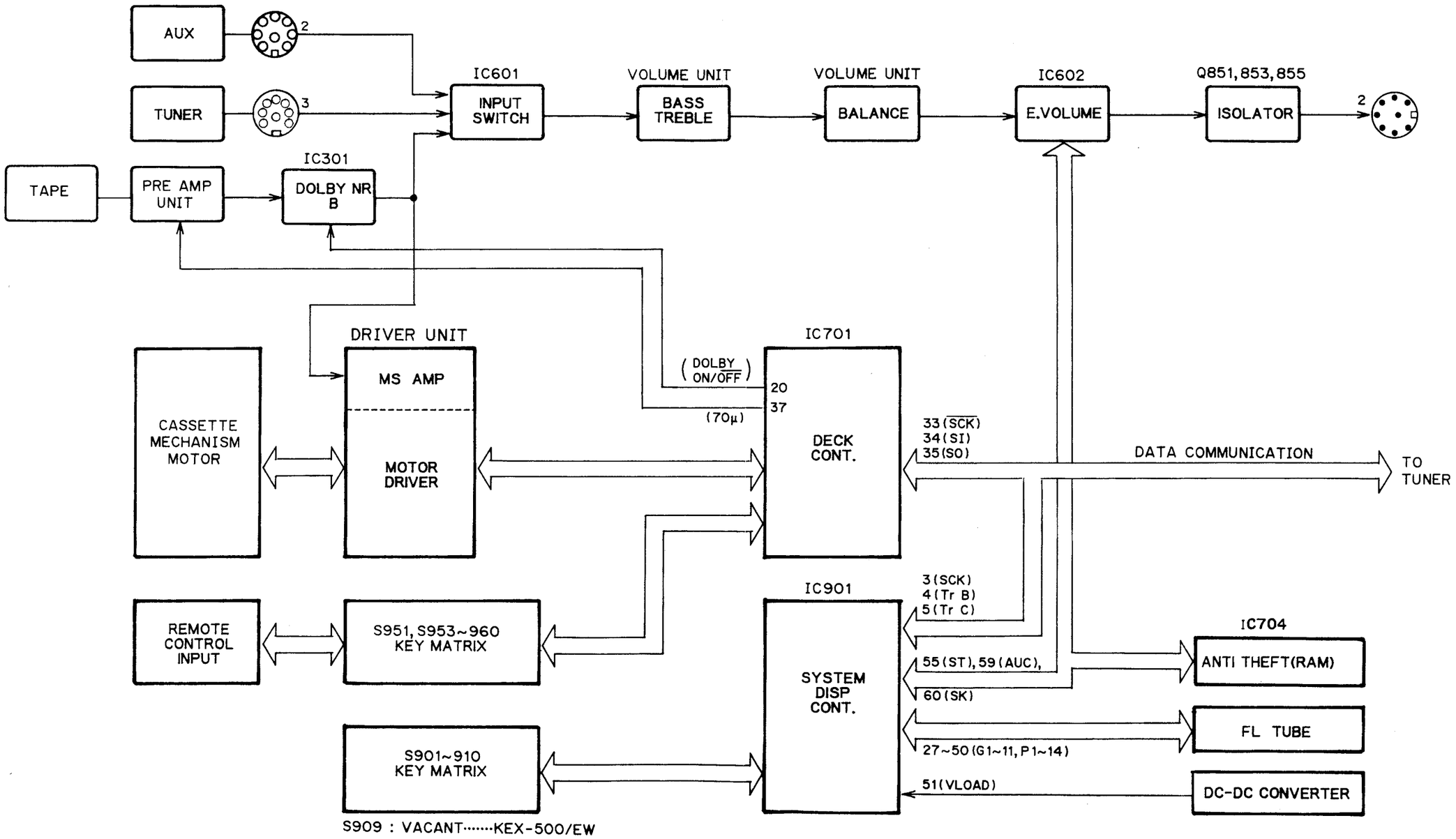
- **Block Diagram (KEX-900)**



S909 : VACANT···· KEX-900/EW

Fig. 1

- **Block Diagram (KEX-500)**



S909 : VACANT·····KEX-500/EW

Fig. 1

● +B Blcok Diagram (KEX-900)

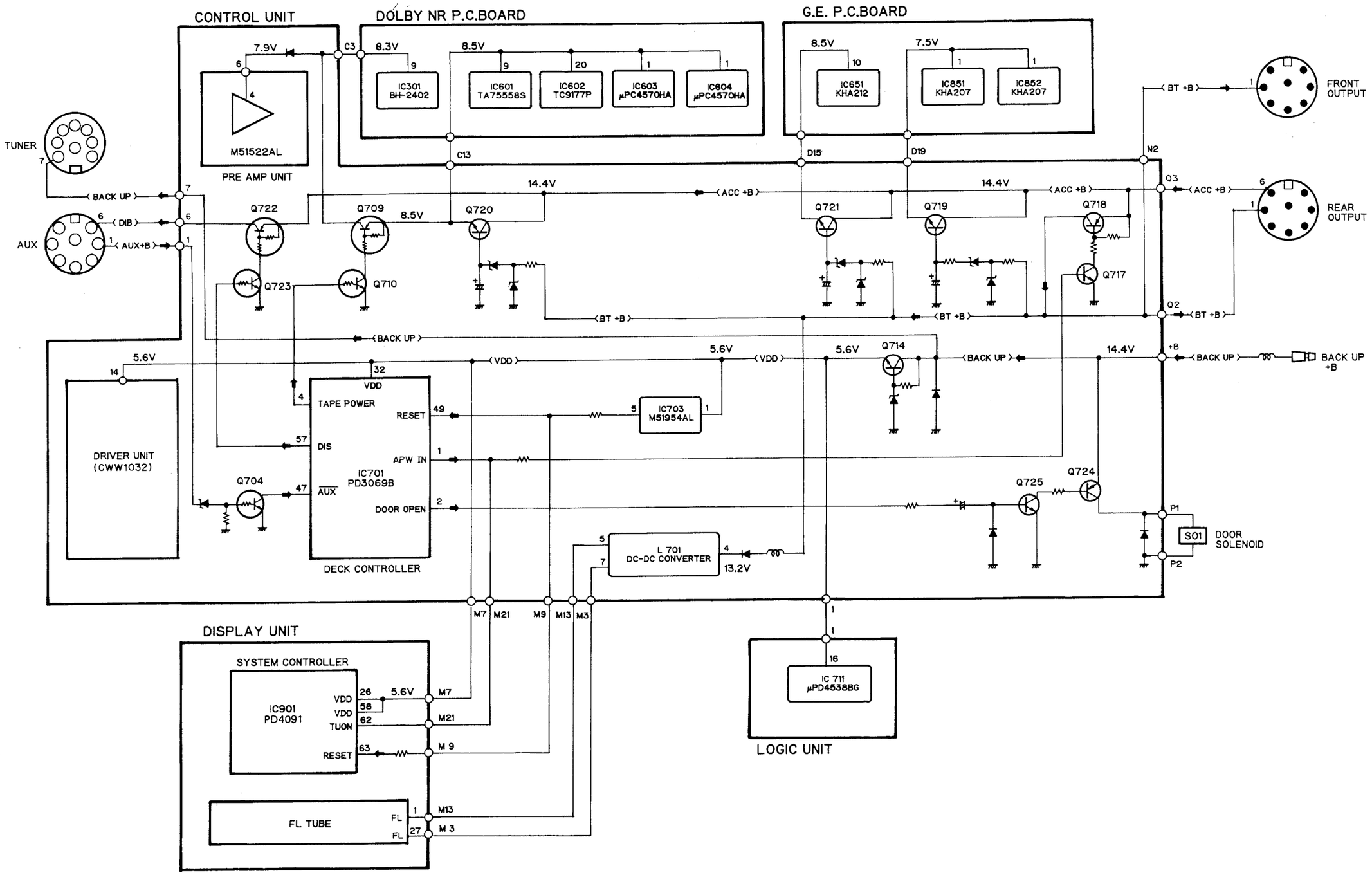


Fig. 3

● +B Block Diagram (KEX-500)

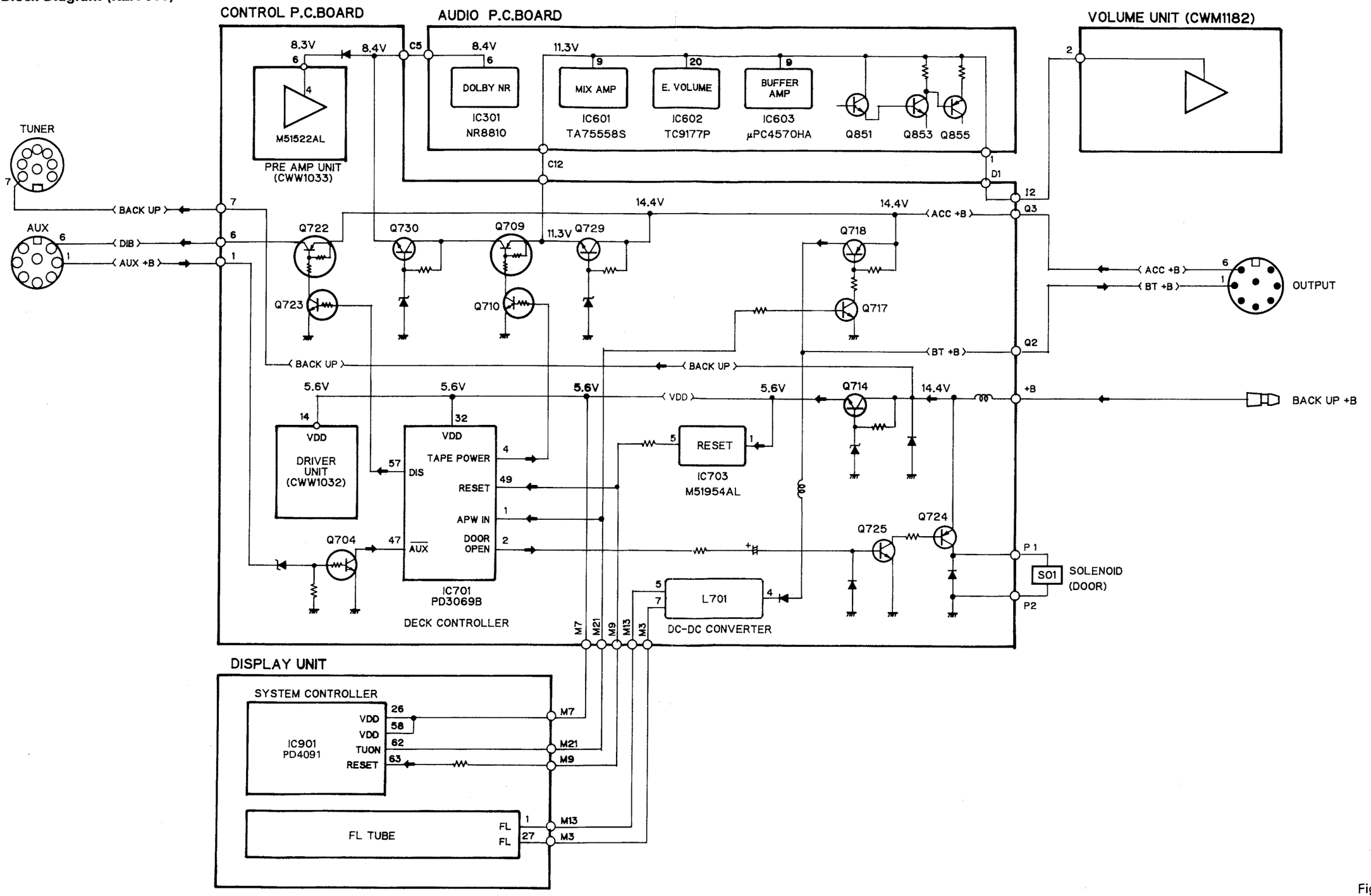


Fig. ↓

● Level Diagram (KEX-900)

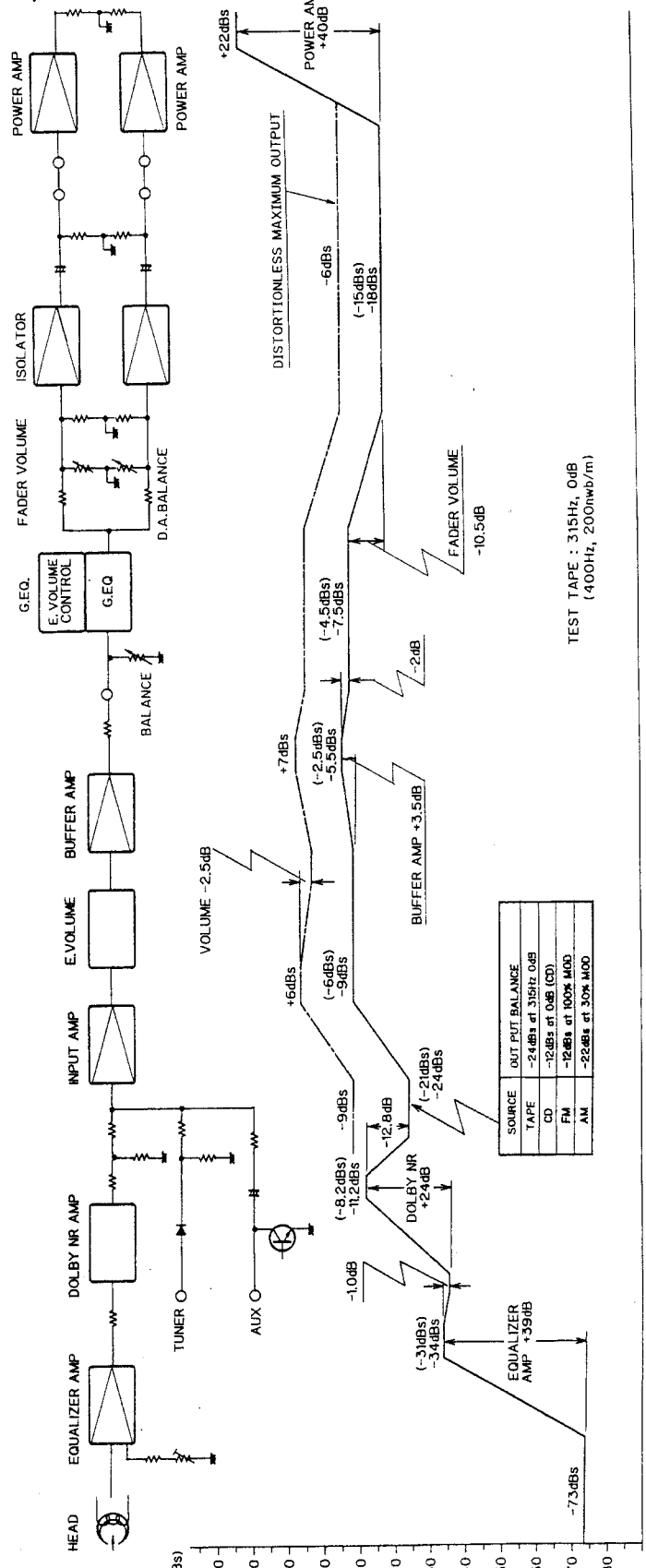


Fig. 5

• Level Diagram (KEX-500)

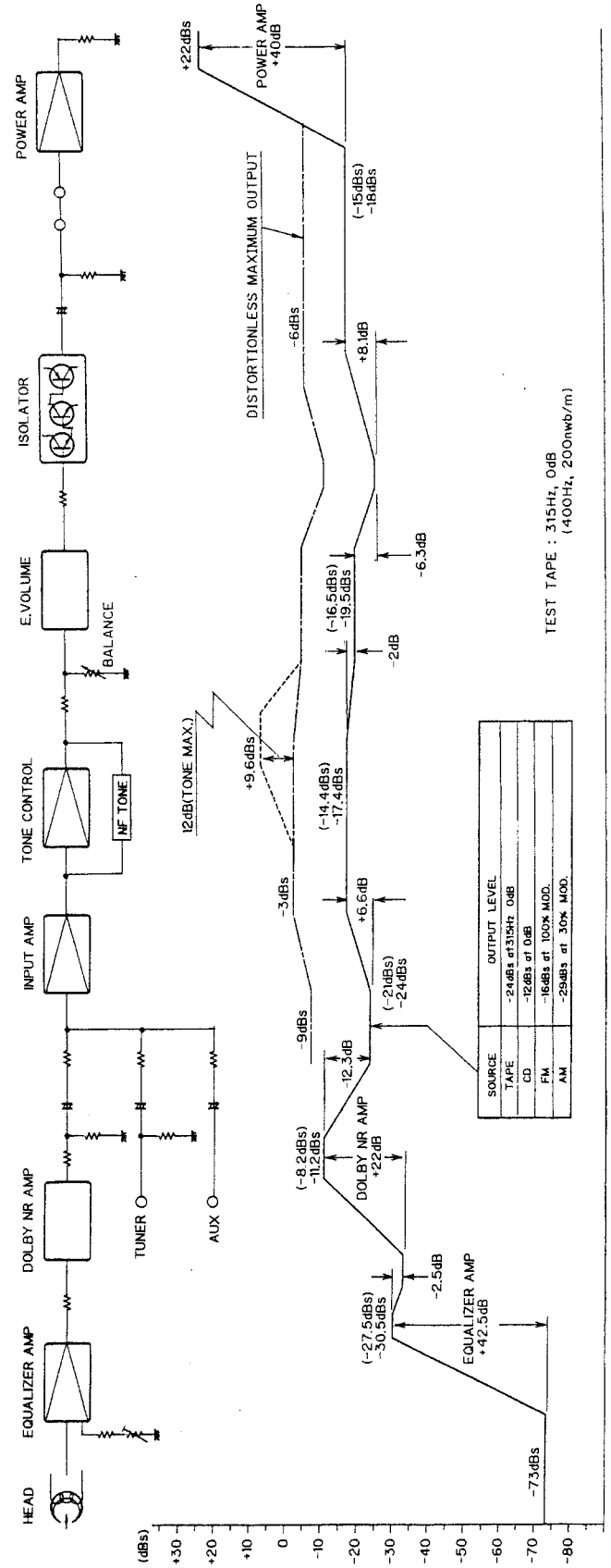


Fig. 6

● Electronic Volume (KEX-900)

○ Function of terminals (TC9177P)

In the unit's circuitry, input and output of Lch and Rch are used in reverse.

Terminal	Name	I/O	Function and operation
2, 3 19, 18	L-Loudness 1, 2 R-Loudness 1, 2	Output	Loudness terminal When loudness data is input, this terminal will be −20 dB tap terminal. Loudness is controlled by the high-low boost circuit connected to this terminal.
4 17	L-OUT1 R-OUT1	Output	10dB step attenuator output Signal with IN is attenuated from 0 to 70 dB in 8 steps at the 10 dB step.
5 16	L-IN1 R-IN1	Input	10 dB attenuator input
6, 15	A-GND		AC ground terminal
7 14	L-IN2 R-IN2	Input	2 dB attenuator input
8 13	L-OUT2 R-OUT2	Output	2 dB attenuator output Signal with IN is attenuated from 0 to 8 dB in 5 steps at the 2 dB step.
11	DATA	Input	Data input of attenuation amount and chnnel selection Consisting of 20 bits, it is input by the CK signal.
10	CK	Input	Clock input Clock input to fetch data of the DATA terminal.
12	ST	Input	Strobe input Attenuation amount and channel selection data fetched from the DATA and CK terminal can be latched by having this terminal set to "H" level. If "H" level is not applied to this terminal, the previous data will be in effect.
20	VDD		(+) power applied terminal
9	GND		Ground terminal
1	VSS		(−) power applied terminal

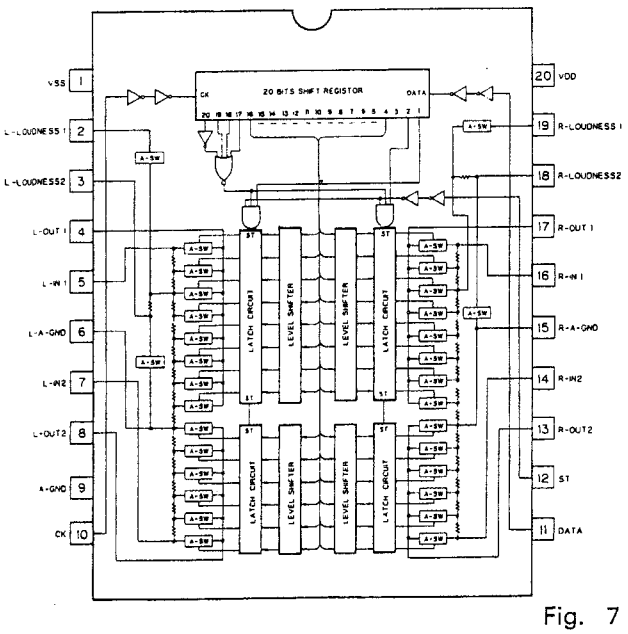
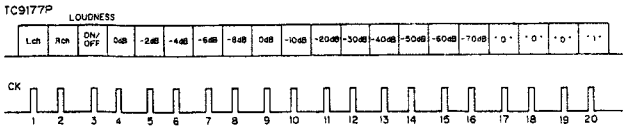


Fig. 7

The TC9177P is a built-in electronic volume IC for loudness ON/OFF. The attenuation volume data output by the system controller (IC3), is input to the DATA, CK, and ST terminals. The data consists of 20 bits. It consists of the following.

Bit	Description
1, 2	Selection of L channel, R channel
3	Bit for loudness ON/OFF. "1" is ON, and "0" is OFF.
4 – 8	Setting of 2 dB step attenuator
9 – 16	Setting of 10 dB step attenuator
17 – 20	Chip select bit "0001" is select mode, for values other than this, there is no operation.

There will be infinite attenuation volume for −78 dB data. Therefore, step up from infinity to 1 will be −76 dB. Changes of the fetched data will all be synchronized with ST signal transition.



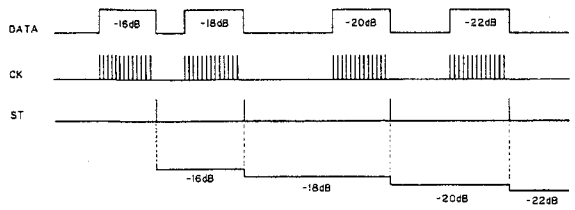


Fig. 8

The attenuator section consists of a diffused resistor array and an analog switch. Attenuator 1 can attenuate 0 to 70 dB at 10 dB step, and attenuator 2 can attenuate 0 to 8 dB at 2 dB step, for a total attenuation of 0 to 76 dB at 2 dB step.

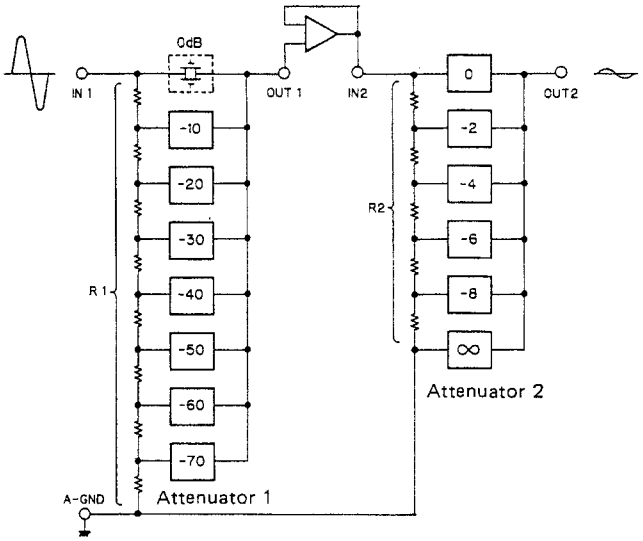


Fig. 9

○ **Loudness function**

The TC9177P has tap for loudness. When bit 3 of the data is made to "1, " loudness switch LS1 will turn ON, LS2 will turn OFF, and the –20 dB tap is output to loudness-1 and loudness-2 terminals.

With the loudness-1 and loudness-2 terminals having a high-low band boost circuit, loudness can be controlled below –20 dB.

When bit 3 of the data is made to "0, " loudness switch LS1 will go OFF, and LS2 will go ON. Loudness will go OFF without high-low band boost circuit operation.

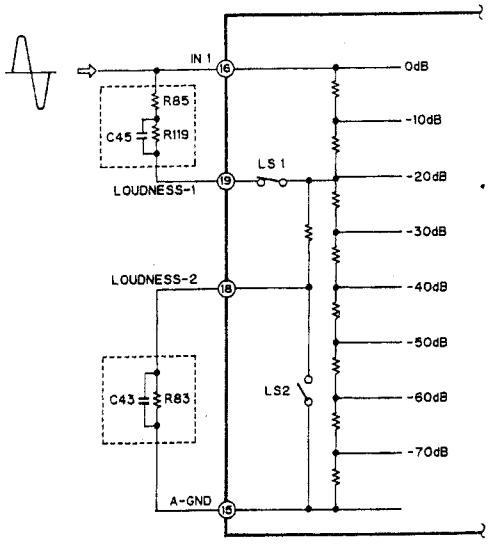
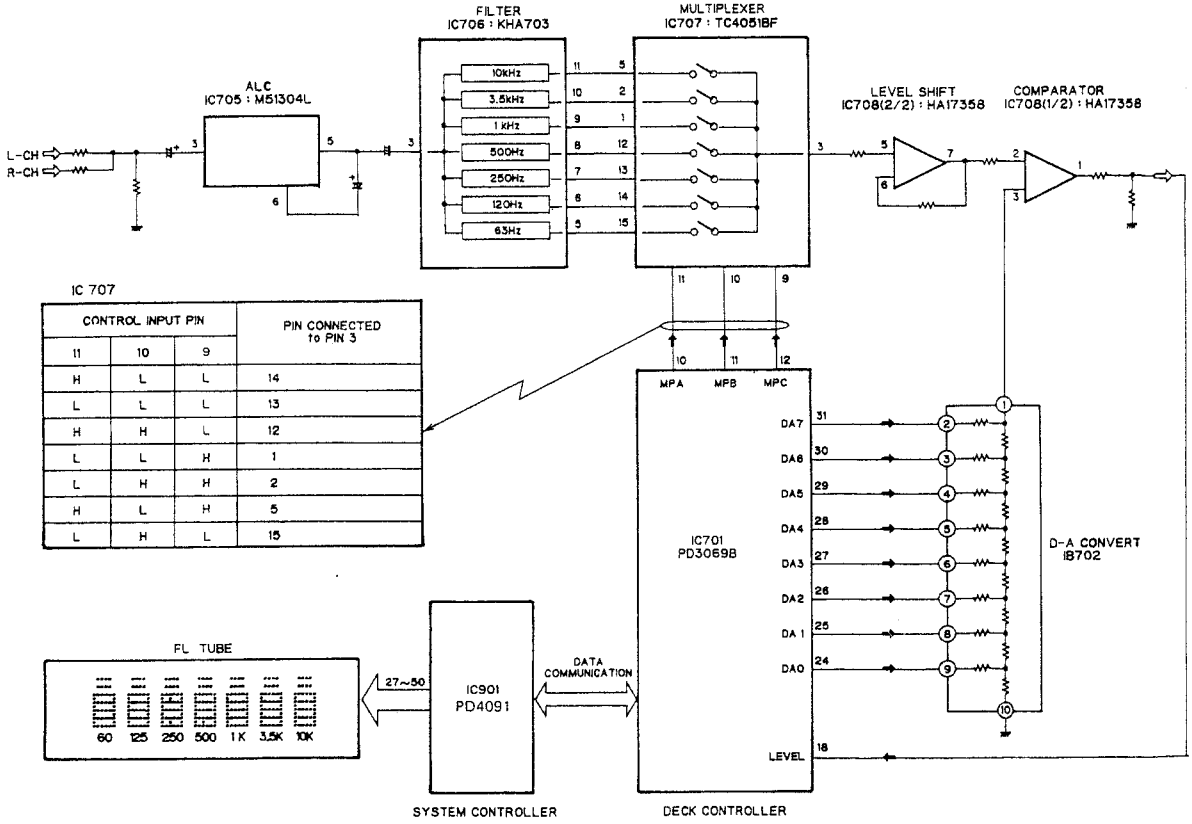


Fig. 10

• Spectrum Analyzer Circuit (KEX-900)



CONTROL INPUT PIN			PIN CONNECTED to PIN 3
11	10	9	
H	L	L	14
L	L	L	13
H	H	L	12
L	L	H	1
L	H	H	2
H	L	H	5
L	H	L	15

Fig. 11

Audio signals are divided into seven frequencies, and their power level is displayed sequentially.
The L and R output signals of the mixing amplifier (IC601) are combined and input to the ALC circuit (IC705). The audio signals, whose levels are adjusted by IC705, are separated into the following 7 frequencies via the IC706 band pass filter: 63 Hz, 120 Hz, 250 Hz, 500 Hz, 1 kHz, 3.5 kHz, and 10 kHz. It is further rectified into DC voltage by the IC's internal rectifier. Each signal is selected by the multiplexer (IC707) which is controlled by the deck controller (IC701). The signals will become 0 V to 4 V through the level shift circuit (IC708 2/2). These signals are input to pin 2 of the comparator circuit (IC708 1/2). Pin 3 is of standard voltage. The digital signals of pins 24 to 31 of the deck controller (IC701) add the voltage converted by IB702's D-A convertor circuit. The A-D converted signals converted by IC708 1/2 are input to the deck controller's pin 18. The power level of each frequency is then displayed on the FL tube.
The relation between the standard voltage of IC708's pin 3 and IC701's pins 24 to 31 is shown in Table 1.

IC701								IC708
24 DA0	25 DA1	26 DA2	27 DA3	28 DA4	29 DA5	30 DA6	31 DA7	3
0	0	0	0	0	0	0	0	0.0 (V)
0	1	0	0	1	0	0	0	0.38
0	0	1	1	1	0	0	0	0.60
1	0	1	1	0	1	0	0	0.96
0	1	1	0	0	0	1	0	1.50
1	1	1	1	0	1	1	0	2.38
1	0	0	0	1	1	0	1	3.78

(V_{DD} = 5.5V)

Table 1

• Graphic Equalizer Circuit (KEX-900)

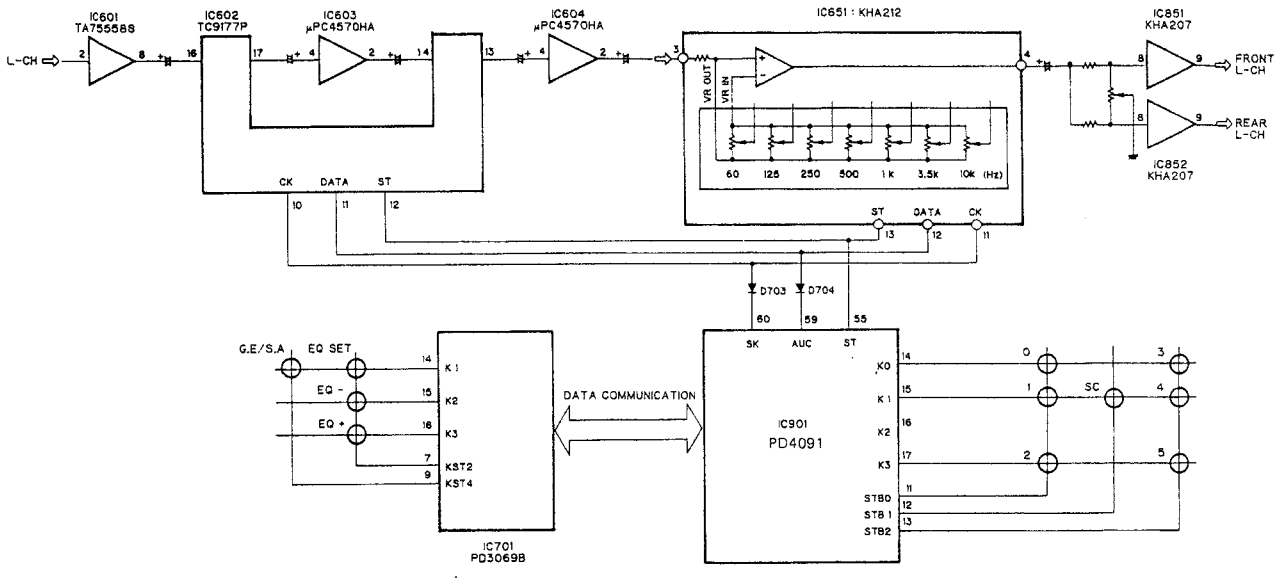


Fig. 12

The signals that have passed through electronic volume (IC602) passes through IC604 and are input to IC651's pin 3. As for IC651, the input signals are divided into separate frequencies, and each level is set by the electronic volume. The control of each level of the graphic equalizer is done by the data sent via serial transmission from the system controller (IC901).
The control signals output from IC901's pin 59 (AUC), pin 60 (SK), and pin 55 (ST) are input to IC651's pin 12 (DATA), pin 11 (CK), and pin 13 (ST).

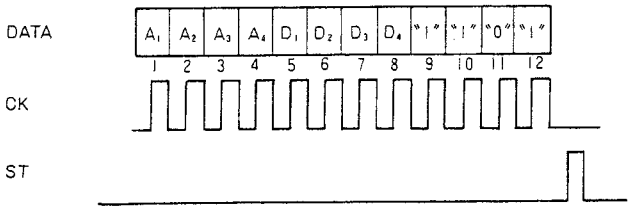


Fig. 13

1. The DATA line transmits the decreased amount composed of 12 bits and the volume select data.

- **A1 to A4 (1 to 4 bits)**
  This bit selects one of the seven volume circuits, VR1 to VR7.

A1	A2	A3	A4	
H	L	L	H	VR1(60Hz)
L	H	L	H	VR2(125Hz)
H	H	L	H	VR3(250Hz)
L	L	H	H	VR4(500Hz)
H	L	H	H	VR5(1kHz)
L	H	H	H	VR6(3.5kHz)
H	H	H	H	VR7(10kHz)

- **D1 to D4 (5 to 8 bits)**
  This data changes the volume selected by A1 to A4 in 13 steps.

D1	D2	D3	D4	Step
L	H	H	L	+ 6 (+12dB)
H	L	H	L	+ 5 (+10dB)
L	L	H	L	+ 4 (+ 8 dB)
H	H	L	L	+ 3 (+ 6 dB)
L	H	L	L	+ 2 (+ 4 dB)
H	L	L	L	+ 1 (+ 2 dB)
L	L	L	L	0 (0 dB)
H	H	H	H	− 1 (− 2 dB)
L	H	H	H	− 2 (− 4 dB)
H	L	H	H	− 3 (− 6 dB)
L	L	H	H	− 4 (− 8 dB)
H	H	L	H	− 5 (−10dB)
L	H	L	H	− 6 (−12dB)

- **Code bit (9 to 12 bits)**
  Data cannot be received by codes other than IC651's code bit.

9	10	11	12
H	H	L	H

2. The CK line is the clock signal.
3. When the ST line becomes "H" by the strobe signal, it latches the volume data.

The signals set up for each level of IC651 are input to IC851.

● Location of Major Parts

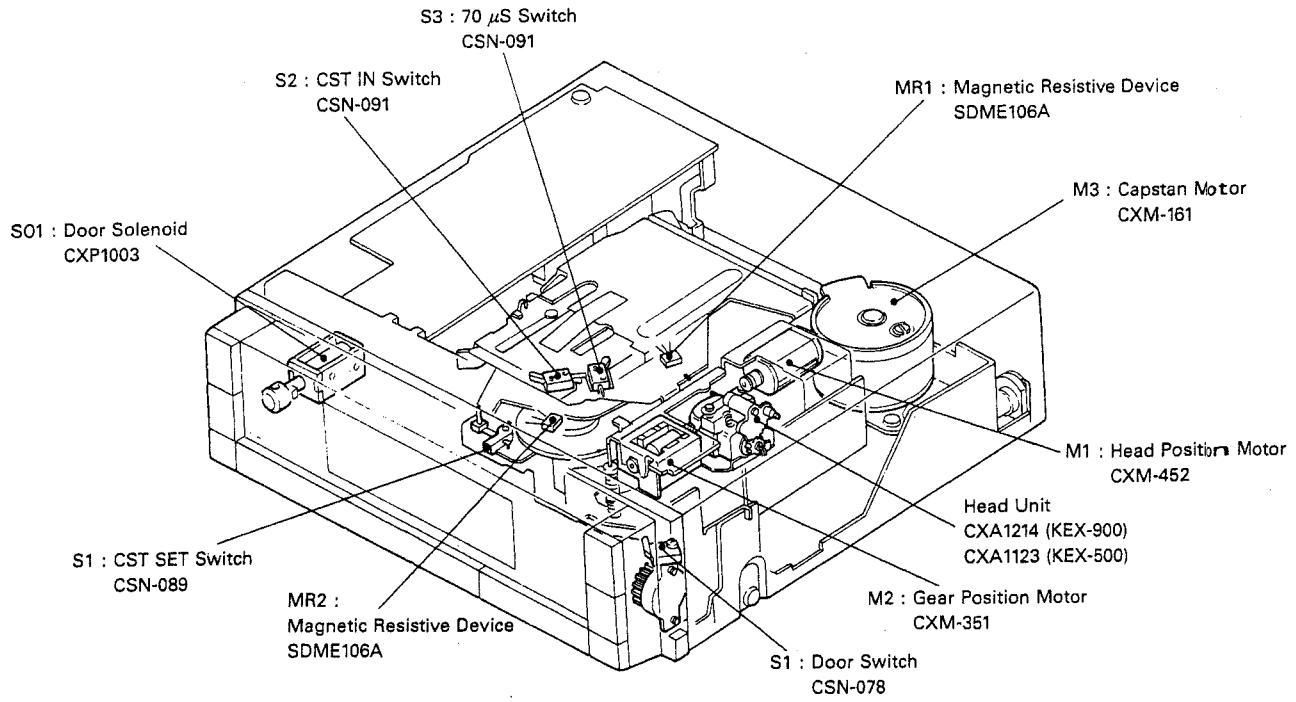


Fig. 14

○ **Sensing switches**

Cassette Position

Switch	Function
CST IN switch	Turned OFF when a cassette tape is inserted.
CST SET switch	Turned ON when the cassette tape is set in position.
70μs switch	Turned OFF when a 70μs cassette tape is inserted.

Head Position (Switch Position) . . . . . Sense P.C. Board (A)

Position	Mechanism operation
FP	FWD PLAY
MS	MS
EJ	Eject
RP	REV PLAY

FF/REW Gear Position (Switch Position) . . . . . Sense P.C. Board (B)

Position	Mechanism operation
L	FF in FWD (normal) and REW in REV
C	Eject or play
R	REW in FWD (normal) and FF in REV

● Control Mode and Operation of Mechanism

Control mode		Control code IC701 (PD3069B) I0 (44)	I1 (43)	I2 (42)	Mechanism operation	Output terminal voltage Driver Unit (PA3019) CMH (19)	CMR (20)	CMG (21)	M 1 (15)	MC (16)	M 2 (17)
Output OFF		0	0	0	Release	Z	Z	Z	Z	Z	Z
M 3 (CM)	Normal	1	0	0	Loading	HC	L	↑	↑	↑	↑
	Reverse	0	1	0	Eject	L	HC	↑	↑	↑	↑
	Constant speed	1	1	0	PLAY, FF, REW or MS	HO	Z	L	↑	↑	↑
M1	Normal	0	0	1	Head EJ → FP	↑	↑	↑	HC	L	↑
	Reverse	1	0	1	Head EJ → RP	↑	↑	↑	L	HC	↑
M2	Normal	0	1	1	Gear direction: R → L	↑	↑	↑	Z	L	HC
	Reverse	1	1	1	Gear direction: L → R	↑	↑	↑	↑	HC	L

Notes: 1) Numbers in parentheses indicate pin numbers of each IC.
2) Output terminal voltage
Z: High impedance
HC: Approximately 7V
HO: Vcc – 1.7V
L: 0V

● **KEX-900**

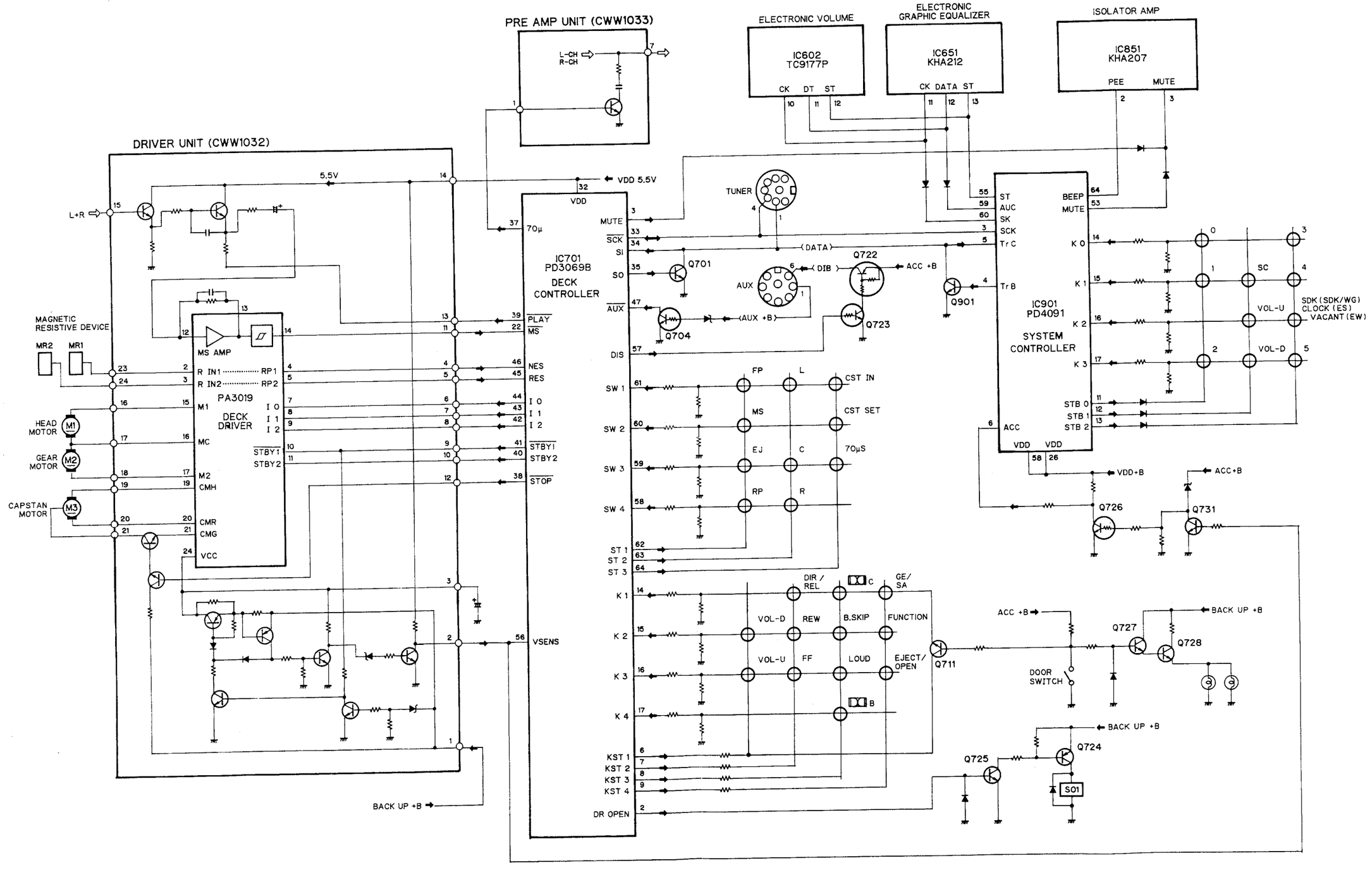


Fig. 15

● **KEX-500**

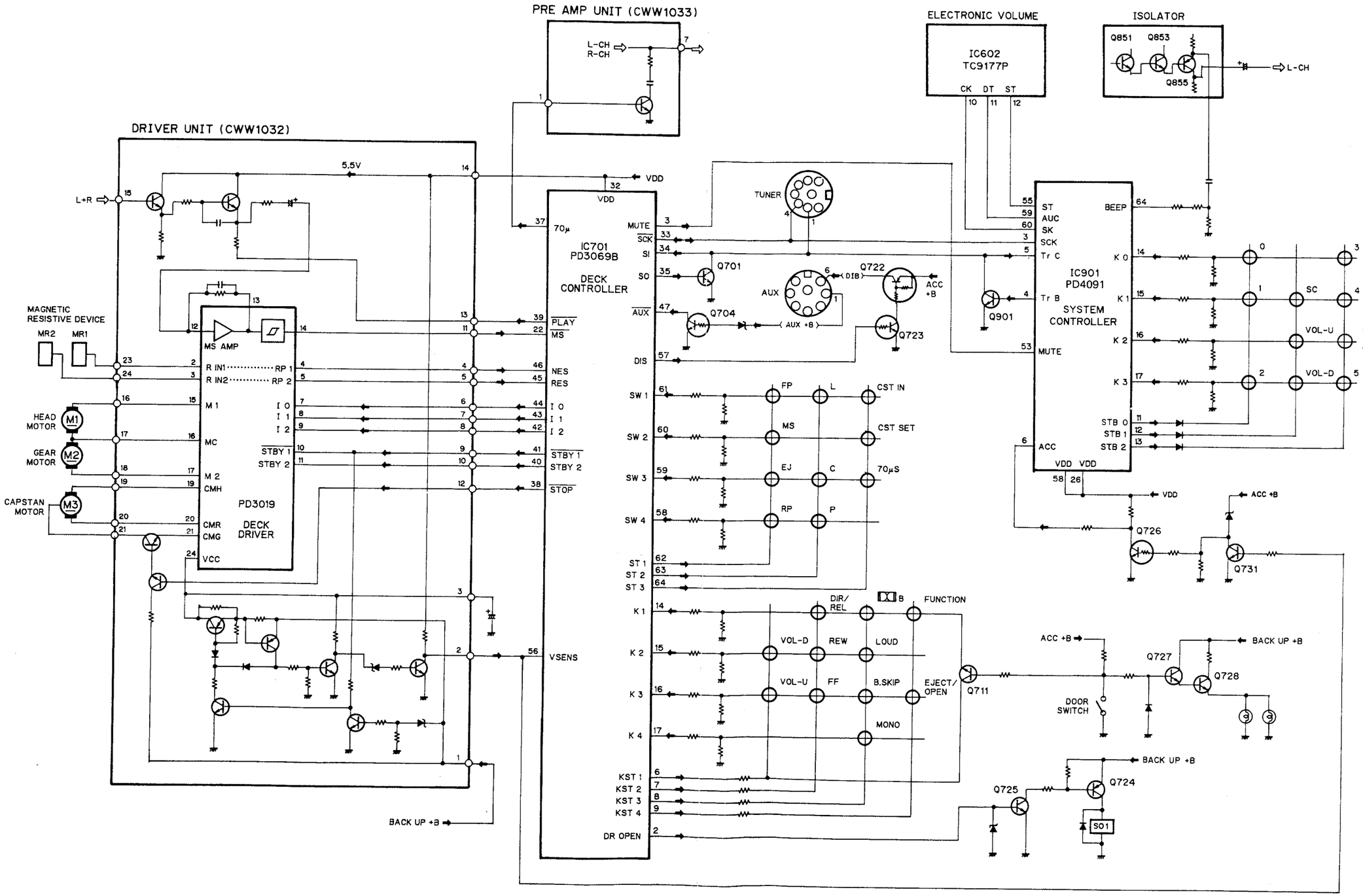

PRE AMP UNIT (CWW1033)
L-CH
R-CH
DRIVER UNIT (CWW1032)
5.5V
L+R
MAGNETIC RESISTIVE DEVICE
MR2
MR1
MS AMP
R IN1
R IN2
RP 1
RP 2
HEAD MOTOR
GEAR MOTOR
CAPSTAN MOTOR
M1
M2
M3
M 1
MC
M 2
CMH
CMR
CMG
VCC
I 0
I 1
I 2
STBY 1
STBY 2
PD3019
DECK DRIVER
VDD
70µ
IC701
PD3069B
DECK CONTROLLER
MUTE
SCK
SI
SO
AUX
DIS
PLAY
MS
NES
RES
STOP
VSENS
BACK UP +B
TUNER
Q701
Q704
Q722
Q723
AUX
DIB
AUX +B
ACC +B
SW 1
SW 2
SW 3
SW 4
FP
L
CST IN
MS
CST SET
EJ
C
70µS
RP
P
ST 1
ST 2
ST 3
K 1
K 2
K 3
K 4
DIR/ REL
B
FUNCTION
VOL-D
REW
LOUD
VOL-U
FF
B.SKIP
EJECT/ OPEN
MONO
KST 1
KST 2
KST 3
KST 4
DR OPEN
Q711
ELECTRONIC VOLUME
IC602
TC9177P
CK DT ST
ISOLATOR
Q851
Q853
Q855
L-CH
IC901
PD4091
SYSTEM CONTROLLER
ST
AUC
SK
SCK
Tr C
Tr B
MUTE
Q901
BEEP
K 0
K 1
K 2
K 3
SC
VOL-U
VOL-D
SDK (SDK/WG)
VACANT (EW)
STB 0
STB 1
STB 2
ACC
VDD VDD
Q726
Q731
ACC +B
DOOR SWITCH
Q727
Q728
BACK UP +B
Q725
Q724
SO1

Fig. 5

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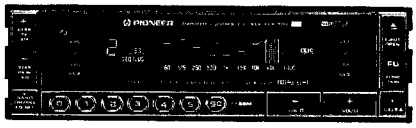
PIONEER®

Service Manual

REPAIR & ADJUSTMENTS



The photo shows the model KEX-900/EW.

ORDER NO.
CRT 1074

CENTRATE COMPONENT CAR STEREO
EQUALIZER DECK

KEX-900 ES, EW
KEX-900SDK WG

- **For the circuit descriptions, please refer to the KEX-900 service manual (CRT1076).**

Note:

- **See the separate manual CRT-467 for the cassette mechanism description.**

SPECIFICATIONS

General/Equalizer

Power source	14.4 V DC (10.8 – 15.6 V allowable)
Grounding system	Negative type
Dimensions	180 (W) × 50 (H) × 163 (D) mm
Weight	1.5 kg
Equalization frequency	10 kHz, 3.5 kHz, 1 kHz, 500 Hz 250 Hz, 125 Hz, 60 Hz
Equalization range	±15 dB (125 Hz, 60 Hz) ±12 dB (10 kHz, 3.5 kHz, 1 kHz, 500 Hz, 250 Hz)
Loudness contour	+10 dB (100 Hz), +7dB (10kHz) (volume: –30 dB)
Maximum output level	200 mV
Output impedance	1 kΩ

Tape player

Tape	Compact cassette tape (C-30 – C-90)
Tape speed	4.76 cm/sec. (+0.14 cm/sec., –0.05 cm/sec.)
Fast forward/rewind time	Approx. 100 sec. for C-60
Wow & flutter	0.09 % (WRMS)
Frequency response	Metal: 30 – 20,000 Hz (±3 dB) Normal: 30 – 17,000 Hz (±3 dB)
Stereo separation	45 dB
Signal-to-noise ratio	Dolby C-type NR IN: 70 dB (IEC-A network) Dolby B-type NR IN: 63 dB (IEC-A network) Dolby NR OUT: 55 dB (IEC-A network)

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

- **Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.**
- **Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.**

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A. TEL: (213) 420-5700
PIONEER ELECTRONIC (EUROPE) N.V. Keetberglaan 1, 2740 Beveren, Belgium TEL: 03/775·28·08
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia
TEL: (03) 580-9911

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CONTENTS

1. PARTS LOCATION

NOTE:

- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

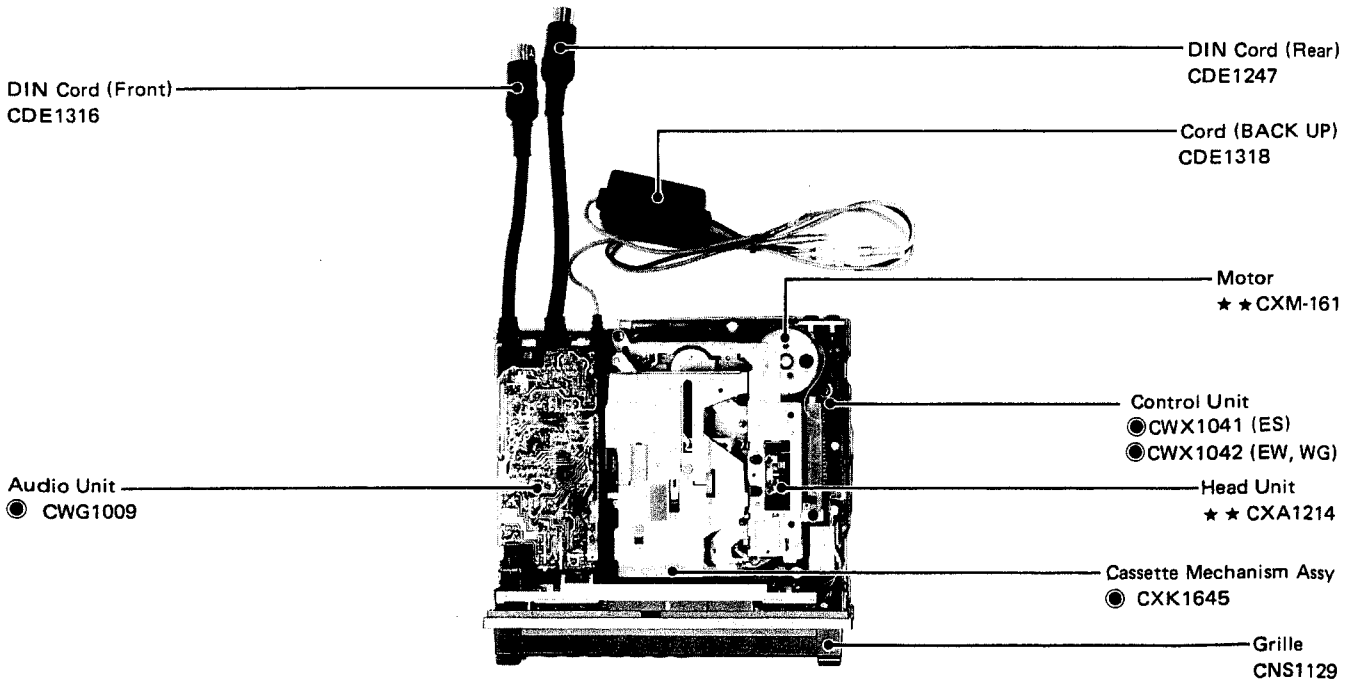


Fig. 1

2. DISASSEMBLY

● Case Removal (Fig. 2)

1. Remove 4 screws, then remove the case unit.

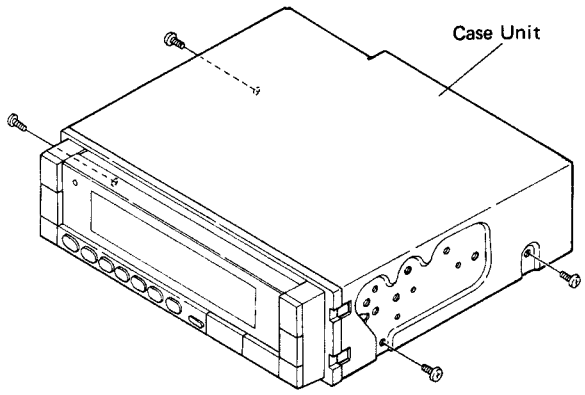


Fig. 2

● Removal of Cassette Mechanism Assy (Fig. 3)

1. Remove 4 screws, disconnect the connector, then remove the cassette mechanism assy.

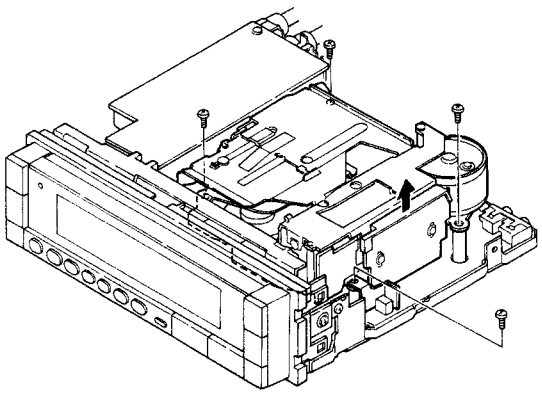


Fig. 3

● Removal of Dolby NR P. C. Board (Fig. 4)

1. Remove 1 "B" screw.
2. The Dolby NR p. c. board is connected to the control unit by the connector indicated by the arrow, so remove the board by lifting if upward.

● Chassis Removal (Fig. 4)

1. Remove 3 "A" screws, then remove the chassis unit.

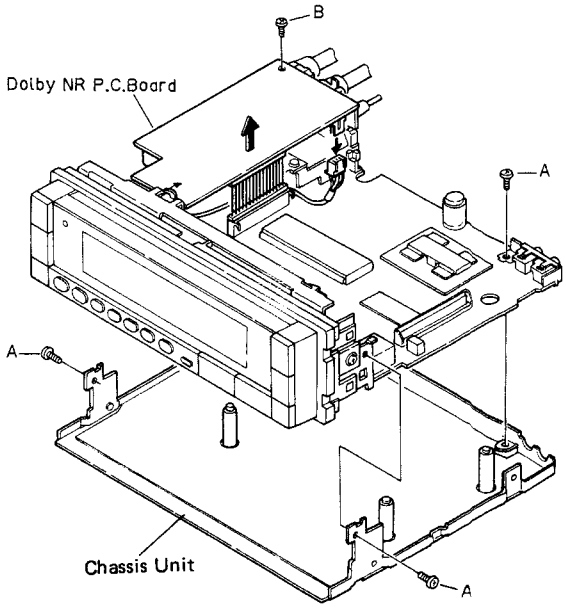


Fig. 4

● Grille Assy Removal (Fig. 5)

1. Remve 2 screws and the soldering indicated by the arrow.
2. Remove the connector indicated by the arrow, then remove the grille assy.

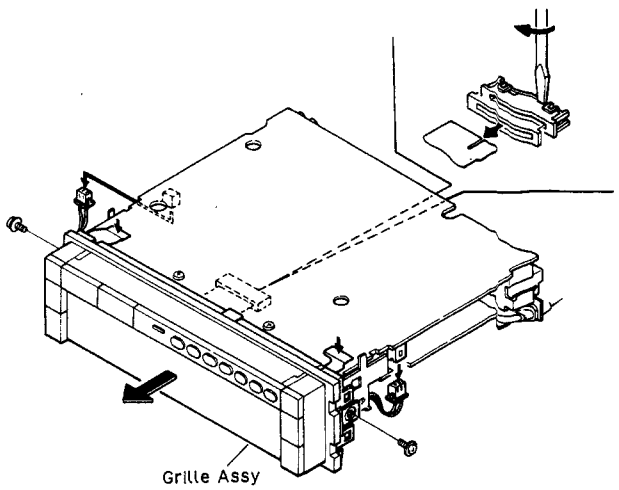


Fig. 5

- **Removal of Right Switch (R. SW) Unit (Fig. 6)**

1. Remove 2 screws, then remove the damper unit.
2. Remove 2 screws, then remove the right switch unit.

- **Removal of Left Switch (L. SW) Unit (Fig. 6)**

1. Remove 2 screws, then remove the solenoid unit.
2. Remove 2 screws, then remove the left switch unit.

- **Removal of Display Unit**

1. Remove 1 screw, then remove the holder.
2. Remove the display unit.

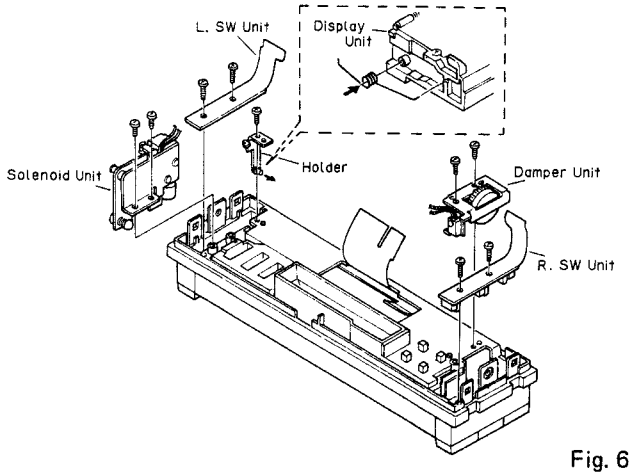


Fig. 6

- **Removal of Display P.C. Board (Fig. 7)**

1. Remove 2 "C.. screws, then remove the plate unit.
2. Remove 1 "D" screw and 3 "E" screws, then remove the display p.c. board.

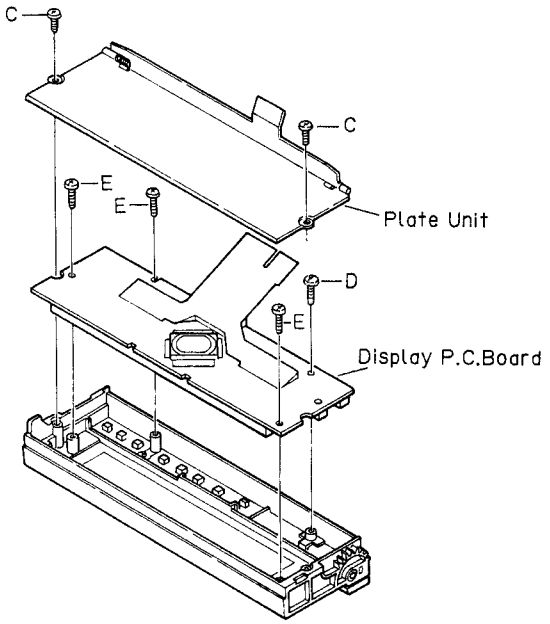


Fig. 7

3. ADJUSTMENT

3.1 AZIMUTH ADJUSTMENT

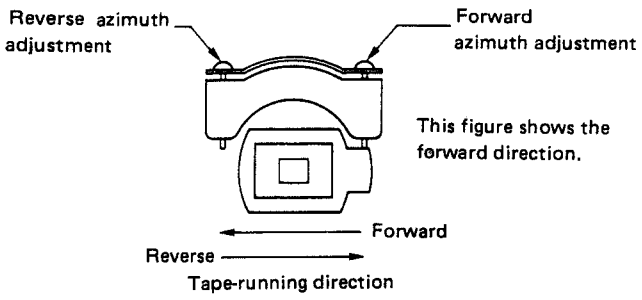


Fig. 8

- **Adjustment Procedure**

1. Play back Side A of STD-341A (10dHz, −20dB), and adjust the respective adjusting screws for maximum output in the forward and reverse directions.
2. Play back Side B in the forward and reverse directions, then confirm the respective output.

3.2 TAPE SPEED ADJUSTMENT

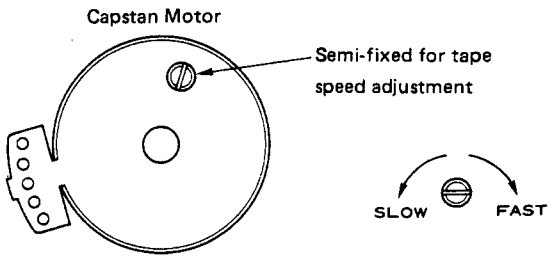
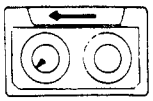
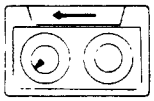
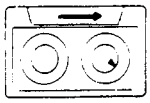
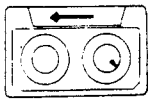


Fig. 9

- **Adjustment Procedure**

1. Play back STD-301 (3kHz, −10dB), then adjust the semifixed resistor so that the value of the frequency counter display is whthin 3,010Hz ±30Hz.

3.3 CHECK POINTS OF CASSETTE MECHANISM

Confirm the following items when replacing parts of the cassette mechanism.	■ Tape speed deviation: 3,000 $^{+90}_{-30}$ Hz (4.76 cm/s $\pm^{3}_{1}$%) Using an STD-301, measure the speed at the start and end of winding and see that a deviation remains within the limits each time. If values indicated by the pointer vary considerably, adjust to 70% of the minimum and maximum values. Measuring time shall be 5∼6 seconds.	■ Wow and flutter: Less than 0.15% (WRMS) Using an STD-301, measure the wow and flutter at the start and end of winding and take the maximum value. If values indicated by the pointer vary considerably, adjust to 70% of the minimum and maximum values. Measuring time shall be 5 ∼ 6 seconds.
■ Fast forward and rewinding time: 95 ∼ 115 seconds Using a C-60, set to fast forward and rewind, and measure the time with a stop watch.	■ Winding torque: 37 ∼ 63g•cm  Using a cassette type torque meter (100 g·cm), measure the minimum value while in the play mode. Measuring time shall be 5 ∼ 6 seconds.	■ F.F. torque: 67 ∼ 130g•cm  Using a cassette type torque meter (120 g·cm), measure the value when the tape stops in the F.F. mode.
■ REW torque: 67 ∼ 130g•cm  Using a cassette type torque meter (120 g·cm), measure the value when the tape stops in the REW mode.	■ Back tension torque: 1.8∼4.2g • cm  After setting in the REW mode without loading a cassette tape for 5 minutes, measure the back tension torque in the play mode, using a cassette type torque meter.	■ Cassette loading force: 450 ∼ 550 g Push the center of the cassette and measure the force with a tension meter (1 kg).

3.4 CLOCK FREQUENCY ADJUSTMENT (ES)

- **Connection Diagram**

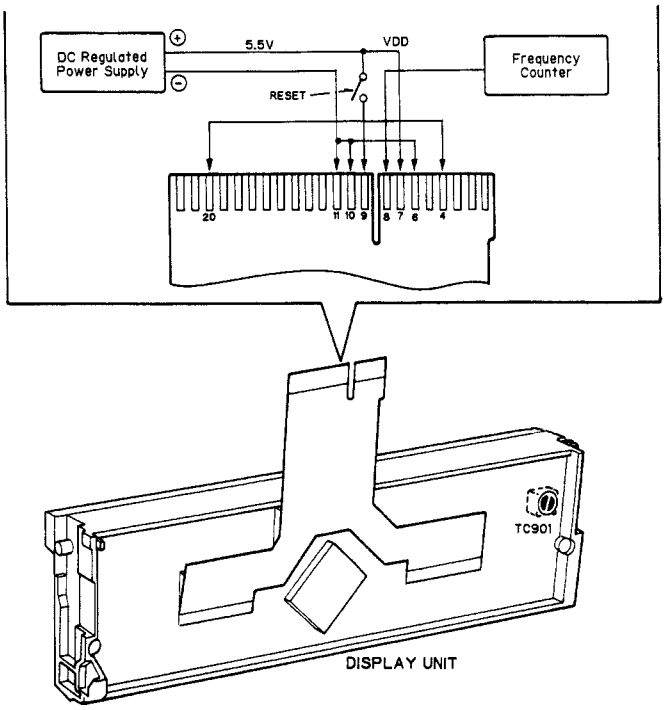


Fig. 10

- **To Adjust**

1. Remve the display unit. Because the display unit is connected as shwon in the Fig. 10, set the RESET switch to ON to reset the display unit.
2. Adjust TC901 so that the value of the frequency counter display is within 131.072kHz ±1Hz.

3.5 DOLBY NR LEVEL ADJUSTMENT

- **Connection Diagram**

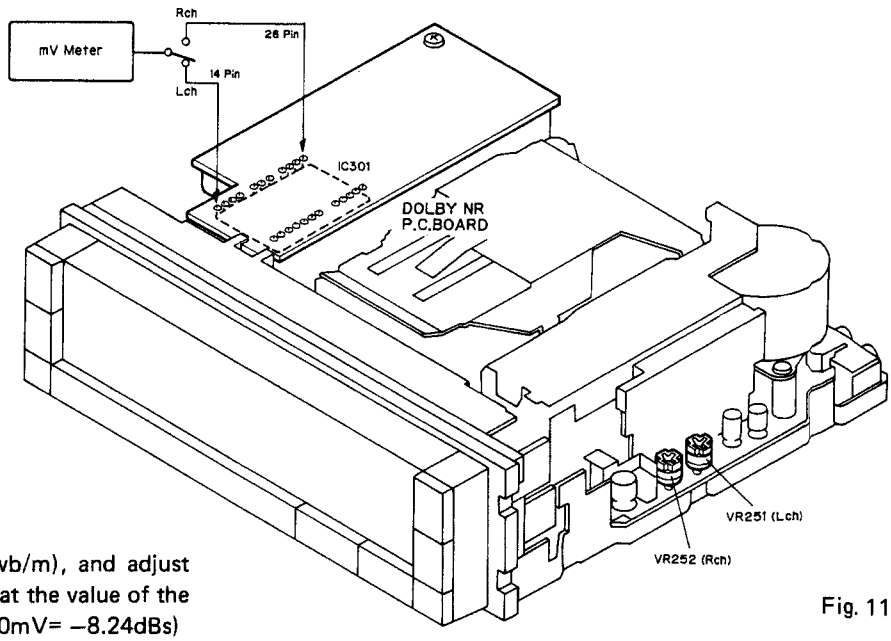


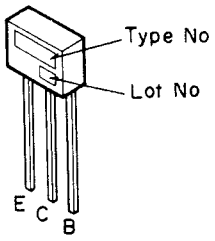
Fig. 11

- **To Adjust**

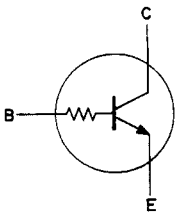
1. Set the DOLBY NR switch to OFF.
2. Play back NCT-150 (400 Hz, 200 nwb/m), and adjust VR251 (L ch) and VR252 (R ch) so that the value of the mV meter is within 300mV ± 1dB. (300mV= −8.24dBs)

● ICs and Transistors

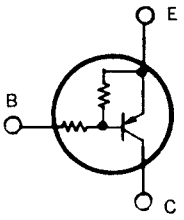
UN4122
UN4215
UN4212



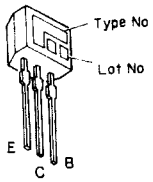
UN4215
DTC114TC



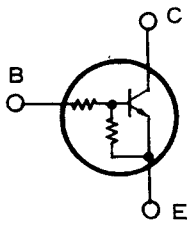
UN4122
DTA143ES



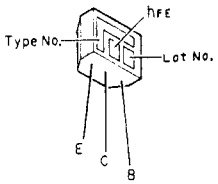
DTA143ES
DTC114TS
DTC124ES



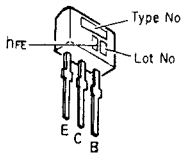
UN4212
DTC124ES



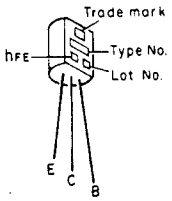
2SA933S
2SC2872S



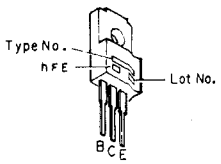
2SD1227M



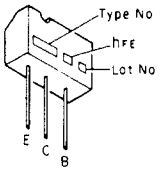
2SC2634NC



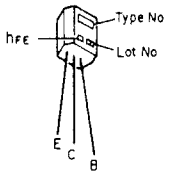
2SB945



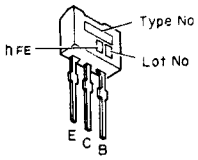
2SD1055F



2SA1048
2SC1740S
2SC2458
2SC2458L
2SC3113

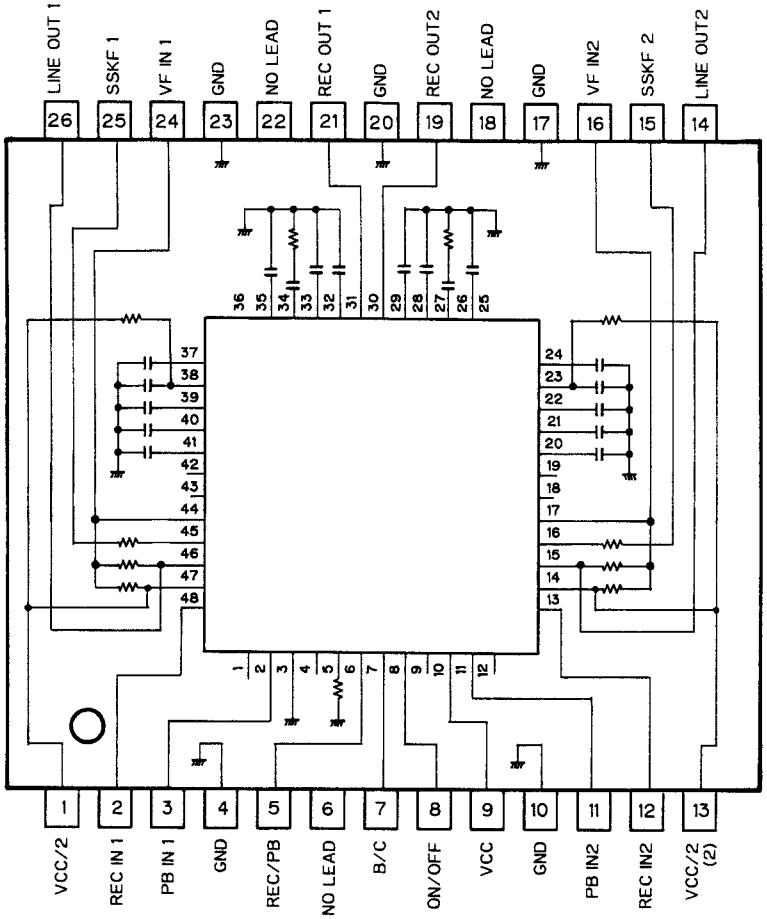


2SB1066M

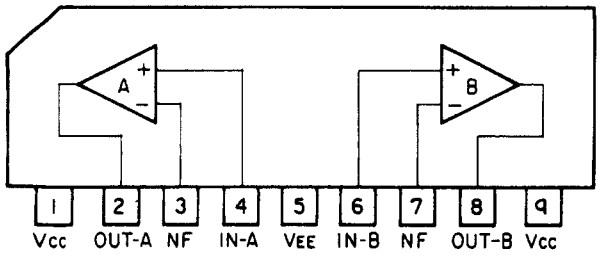


• Dolby NR P.C. Board

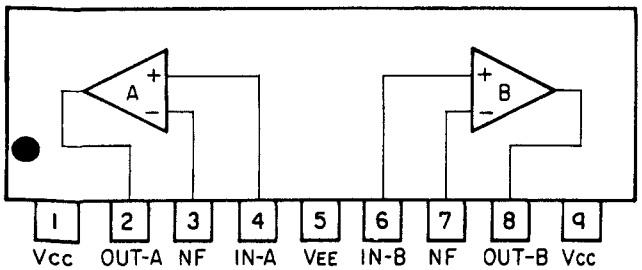
IC301: BH-2402



IC601: TA75558S

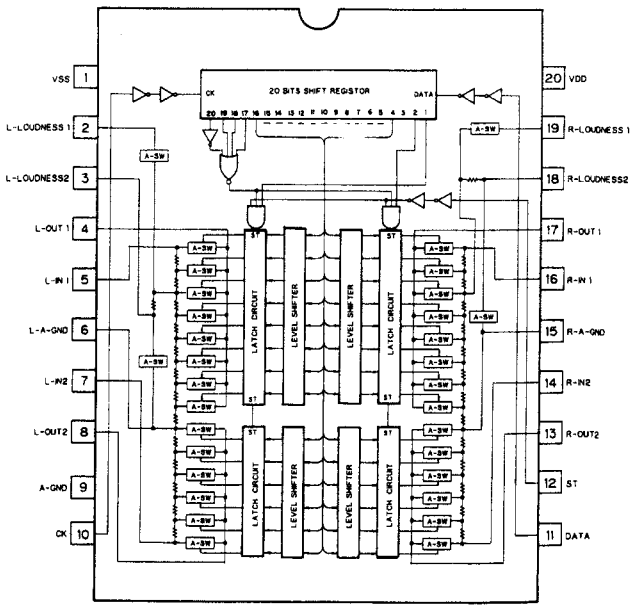


IC603, 604: μPC4570HA



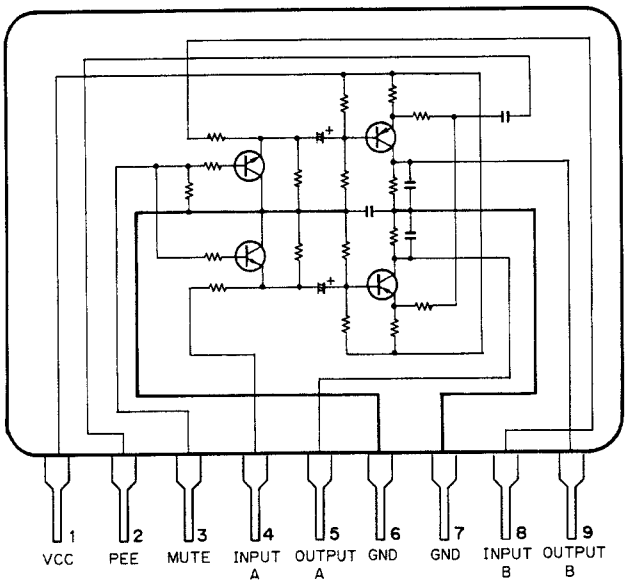
IC602: TC9177P

Due to the circuit configuration of KEX-900, Lch and Rch of input and output are used in reverse position.

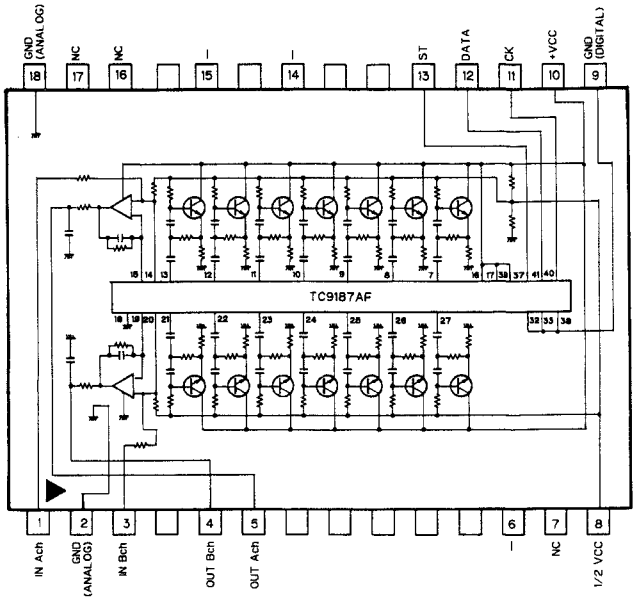


• G.E. P.C. Board

IC851, 852: KHA207

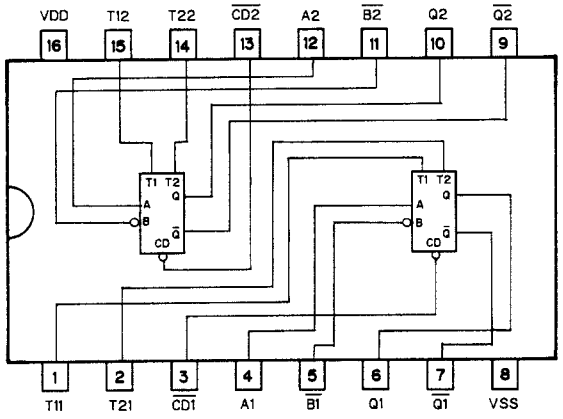


IC651: KHA212



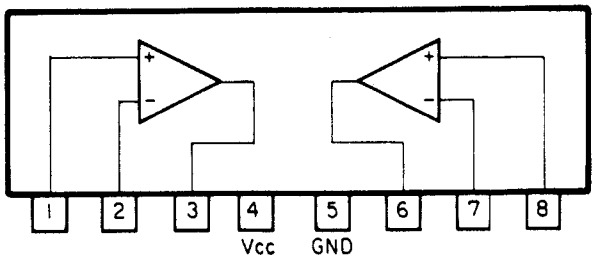
• Logic Unit

IC711 : μPD4538BG

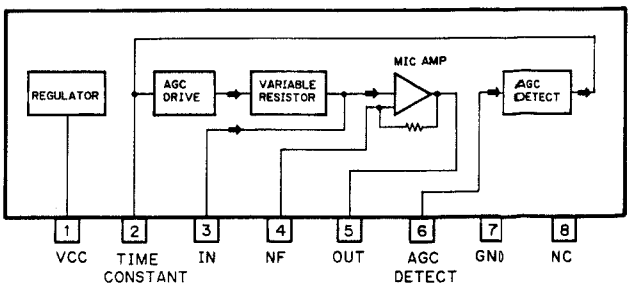


• Control Unit

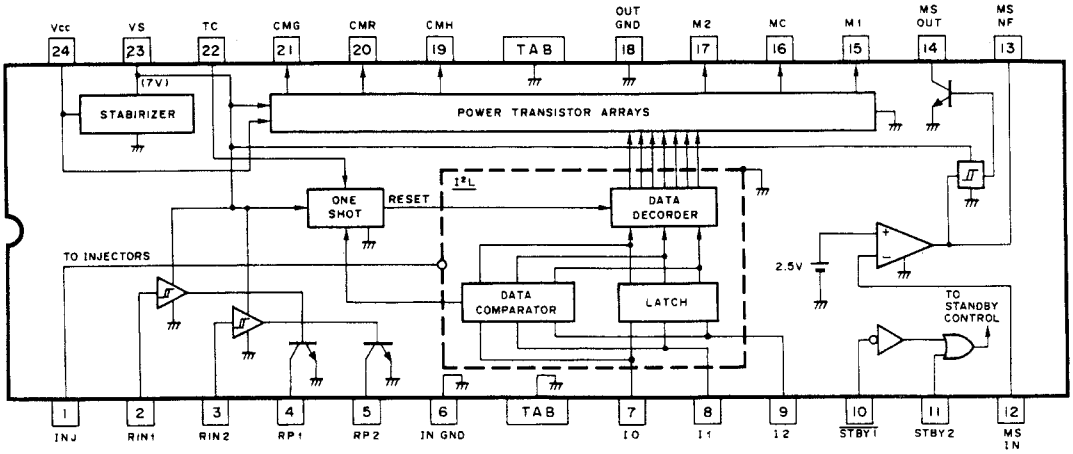
M51522L (Pre Amp Unit)



IC705 : M51304L

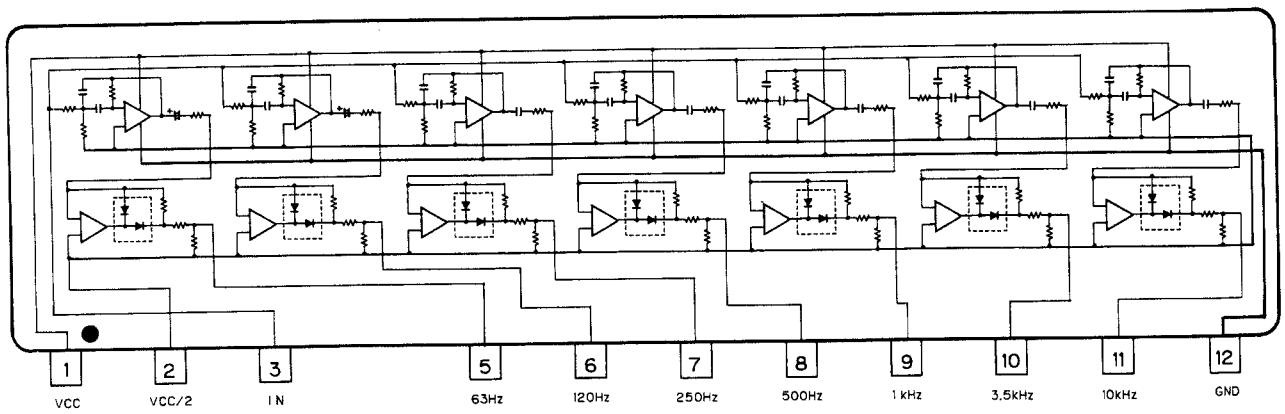


PA3019 (Driver Unit)

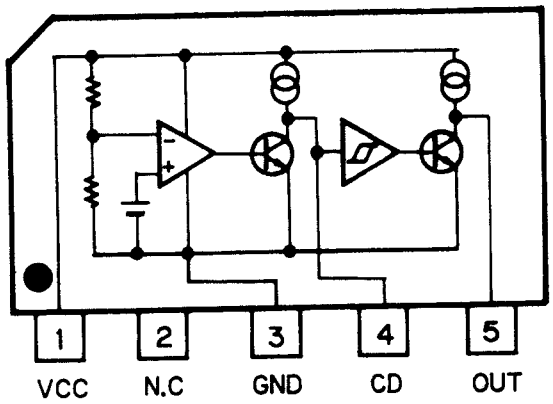


Pin No.	Pin Name	I/O	Function and Operation
1	INJ	Input	Power supply for internal logic (I^2L).
2	R IN 1	Input	Input terminal for Relay Table Rotation Sensor (MR1) signal.
3	R IN 2	Input	Input terminal for Relay Table Rotation Sensor (MR2) signal.
4	RP 1	Output	Waveform output of Relay Sensor Input 1 (2 Pin) signal.
5	RP 2	Output	Waveform output of Relay Sensor Input 2 (3 Pin) signal.
6	IN GND	—	GND terminal of small-signal series.
7	I 0	Input	Logic input terminal for motor control
8	I 1	Input	
9	I 2	Input	
10	$\overline{\text{STBY 1}}$	Input	Standby control. At active "L" (0.7V or less), the IC current is switched OFF.
11	STBY 2	Input	Standby control. At active "H" (3.5V or more), the IC current is switched OFF.
12	MS IN	Input	Amplifier input (inverted input) terminal for Music Sensing (MS).
13	MS NF	I/O	Output of the MS amplifier and input of the MS Schmitt circuit.
14	MS OUT	Output	Output of Schmitt circuit for MS. MS OUT outputs a pulse when the signal level of the MSNF terminal exceeds 0dBm or enters OPEN staturs when it is 0 dBm or less.
15	M1	Output	+ terminal drive output of motor M1 for the head table drive.
16	MC	Output	Drive output of the common terminal of motors M1 and M2.
17	M2	Output	+ terminal drice output of drive motor M2 of the FF/REW selecting gear.
18	OUT GND	—	GND terminal of the motor drive circuit.
19	CMH	Output	H (+) terminal drive output of capstan motor M3. Output voltage: During speed control = approx. Vcc-1.7V During LOAD or EJECT = 6.9V
20	CMR	Output	R terminal drive output of capstan motor M3. (1) During speed control: OPEN (2) During LOAD: approx. 0V (3) During EJECT: approx. 7V
21	CMG	Output	GND (−) terminal drive output of capstan motor M3. (1) During speed control: approx. 0V (2) During LOAD/EJECT: OPEN
22	TC	Output	Connecting terminal of capacitor for setting the timer that switches OFF the power transistor for constant motor drive at a change in logic input I0, I1. I2.
23	VS	Output	Power supply for relay table rotation sensor. Approx. 7V.
24	Vcc	Input	Power supply terminal for IC.

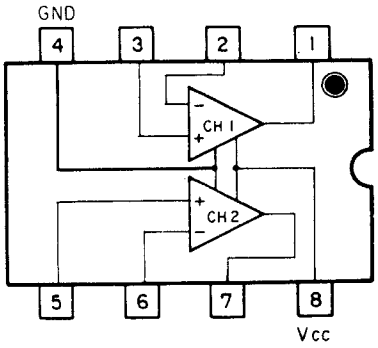
IC706 : KHA703



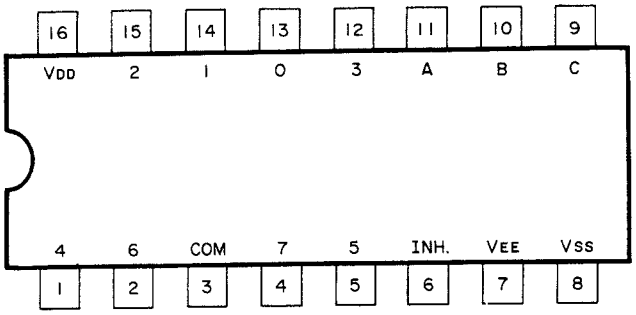
IC703 : M51954AL

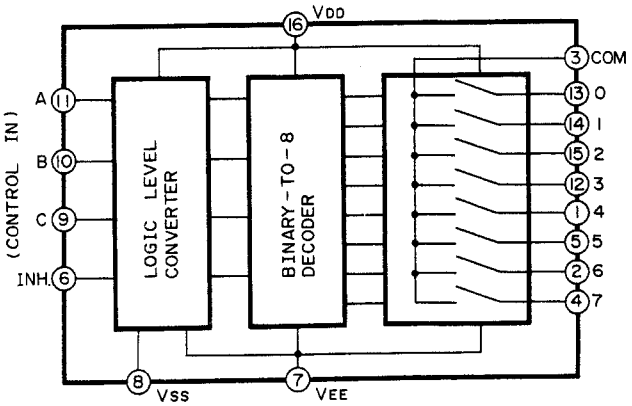


IC708 : HA17358



IC707 : TC4051BF





TC4051BF is an eight-channel multiplexer that enables the selection and mixing of analogue and digital signals.

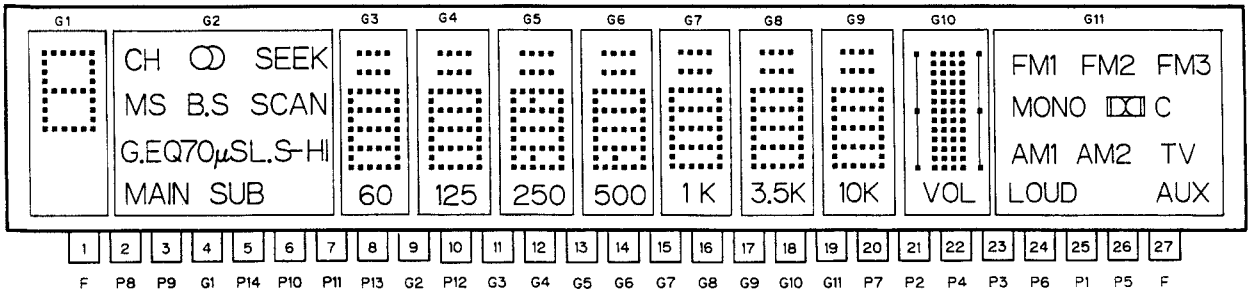
The switch corresponding to each channel is switched ON by the digital signal of the control terminal.

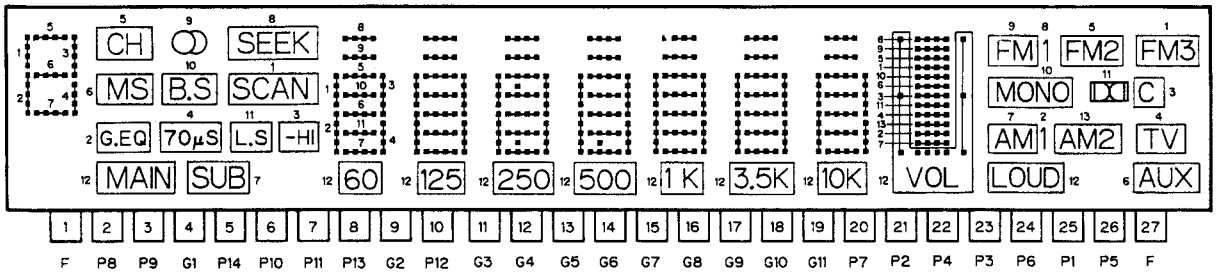
TC4051BF Table of Logic Values

Control Input				"ON" Channel
INH.	C	B	A	
L	L	L	L	0
L	L	L	H	1
L	L	H	L	2
L	L	H	H	3
L	H	L	L	4
L	H	L	H	5
L	H	H	L	6
L	H	H	H	7

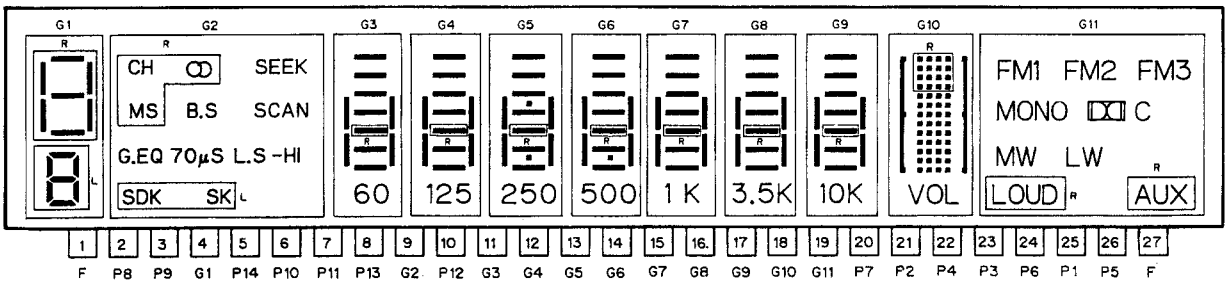
When "H" is input to INH., no channels will enter ON status regardless of any other input.

FL Tube : CAW1004 (KEX-900/ES)



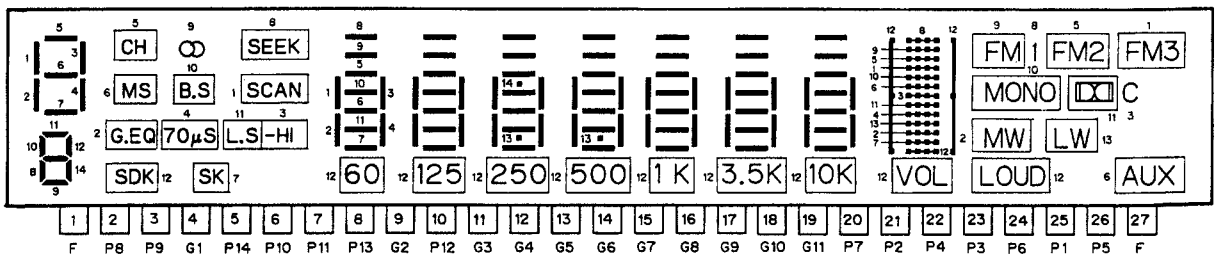


FL Tube: CAW1011 (KEX-900/EW, KEX-900SDK/WG)

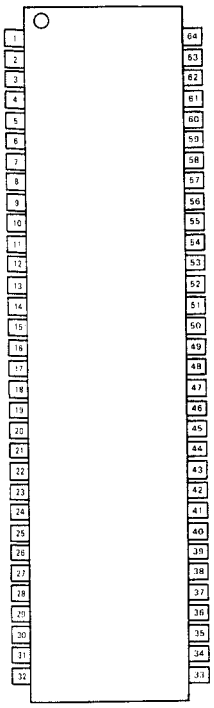


COLOR OF ILLUMINATION

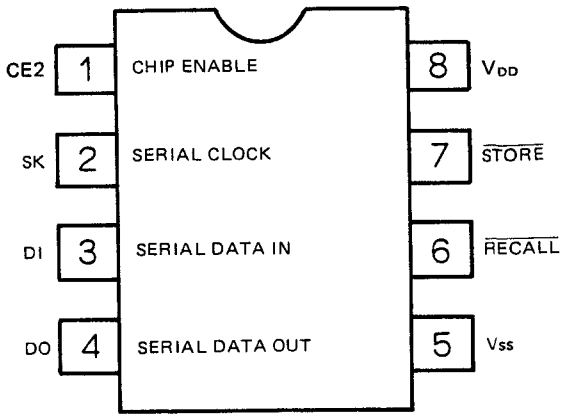
G : BLUE-GREEN (OTHERWISE SPECIFIED SEGMENTS.)
L : LEMON
R : RED



IC701: *PD3069B



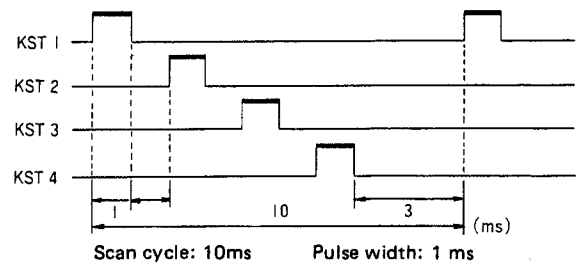
IC704 : PDH001 (EW, WG)



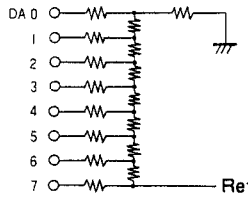
*IC's marked by * are MOS type.*
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

• Terminal Functions of PD3069B

Pin No.	Pin name	I/O	I/O Format	Logic	Function and Operation	At RESET
1	APWIN	Input	Gate	H	• Audio power supply ON/OFF input terminal. • When "⌐" input, performs output of 200-ms standby data to the mechanical driver and inhibits VSENSE output. * At Audio Power ON, APWIN prevents mulfunction of mechanical driver PA3019 by dropping the power voltage at Power Amp ON and also prevents error in judging the VSENSE status.	Z
2	DROPEN	Output	P	H	• Door open solenoid control terminal. • At Acc ON in the DOOR CLOSE (DOOR SW: Make) status, EROPCN performs 100-ms pulse output when the DOOR OPEN key is switched ON. • While remaining in DOOR CLOSE status, only one DOOR OPEN key data is received per second. • MUTE output terminal.	Z
3	MUTE	Output	P	H	• In Acc OFF status, MUTE performs "L" output. In Acc ON status, "L" is output only in TAPE OFF or TAPE PLAY status. TAPE OFF staus: During system ALL OFF, TUNER AUX, DK interrupt.	Z
4	TAPW	Output	P	H	• TAPE AUDIO (pre-amp, Dolby) power supply control terminal. • Performs constant "H" output during tape operation.	Z
5	N.C					
6	KST 1	Output	P	H	• Strobe output for key scanning.	Z
7	KST 2	Output	P	H		Z
8	KST 3	Output	P	H		Z
9	KST 4	Output	P	H		Z



Scan cycle: 10ms Pulse width: 1 ms

<table>
<tr><th>Pin No.</th><th>Pin Name</th><th>I/O</th><th>I/O Format</th><th>Logic</th><th>Function and Operation</th><th>At RESET</th></tr>
<tr><td>10</td><td>MPA</td><td>Output</td><td>P</td><td>H</td><td rowspan="3">• Multiplexer control output. • At Acc ON, constant output is performed.
<table><tr><th></th><th>MPC</th><th>MPB</th><th>MPA</th><th>4051 Selecting Pin</th></tr><tr><td>63Hz</td><td>0</td><td>1</td><td>0</td><td>15</td></tr><tr><td>125Hz</td><td>0</td><td>0</td><td>1</td><td>14</td></tr><tr><td>250Hz</td><td>0</td><td>0</td><td>0</td><td>13</td></tr><tr><td>500Hz</td><td>0</td><td>1</td><td>1</td><td>12</td></tr><tr><td>1kHz</td><td>1</td><td>0</td><td>0</td><td>1</td></tr><tr><td>3kHz</td><td>1</td><td>1</td><td>0</td><td>2</td></tr><tr><td>10kHz</td><td>1</td><td>0</td><td>1</td><td>5</td></tr><tr><td>OFF</td><td>1</td><td>1</td><td>1</td><td>4</td></tr></table></td><td>Z</td></tr>
<tr><td>11</td><td>MPB</td><td>Output</td><td>P</td><td>H</td><td>Z</td></tr>
<tr><td>12</td><td>MPC</td><td>Output</td><td>P</td><td>H</td><td>Z</td></tr>
<tr><td>13</td><td>ALIVE</td><td>Output</td><td>P</td><td>H</td><td>• Runaway detection output terminal for IC. • At Acc ON, ALIVE changes from "H" to "L" at each 8-bit clock input.
• In normal Acc ON status, ALIVE repeats H/L output.</td><td>Z</td></tr>
<tr><td>14</td><td>K1</td><td>Input</td><td>Gate</td><td>H</td><td rowspan="4">• Key input terminal. • Matrix configuration.
<table><tr><th></th><th>KST 1</th><th>KST 2</th><th>KST 3</th><th>KST 4</th></tr><tr><td>K1</td><td>DOOR SW</td><td>DR BAND</td><td>C AUTO</td><td>SP/GEQ</td></tr><tr><td>K2</td><td>VOL DWN</td><td>REW DWN</td><td>BS LOC</td><td>FUN</td></tr><tr><td>K3</td><td>VOL UP</td><td>FF UP</td><td>LOUD</td><td>OP/EJ</td></tr><tr><td>K4</td><td>–</td><td>(SCAN)</td><td>B</td><td>(DK)</td></tr></table>Signals with parentheses are valid only in TEST mode.</td><td>Z</td></tr>
<tr><td>15</td><td>K2</td><td>Input</td><td>Gate</td><td>H</td><td>Z</td></tr>
<tr><td>16</td><td>K3</td><td>Input</td><td>Gate</td><td>H</td><td>Z</td></tr>
<tr><td>17</td><td>K4</td><td>Input</td><td>Gate</td><td>H</td><td>Z</td></tr>
<tr><td>18</td><td>LEVEL</td><td>Input</td><td>Gate</td><td></td><td>• Spare analogue level input terminal. • Connects comparator output A/D conversion.</td><td>Z</td></tr>
<tr><td>19</td><td>VDISP</td><td></td><td></td><td></td><td>• Connected to GND.</td><td></td></tr>
<tr><td>20</td><td>Dolby ON/$\overline{\text{OFF}}$</td><td>Output</td><td>CMOS</td><td>H</td><td>• Dolby ON/OFF control output terminal. • Outputs the "Dolby ON/OFF memory" contents during TAPE operation. • Performs "H" output by Dolby B or C.</td><td>H</td></tr>
<tr><td>21</td><td>Dolby $\overline{\text{B}}$/C</td><td>Output</td><td>CMOS</td><td>H</td><td>• Dolby B/C selection output terminal. * Outputs the "Dolby B/C momory" contents during TAPE operation.
Dolby B or Dolby B and C common OFF →"L"
Dolby C →"H"</td><td>H</td></tr>
<tr><td>22</td><td>MS</td><td>Input</td><td>Gate</td><td>L</td><td>• Music signal input terminal. • Uses an internal timer to judge the presence/absence of a Song signal based on the "H"/"L" change in the terminal. • Input provided with trailing latch.</td><td></td></tr>
<tr><td>23</td><td>N.C</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>24</td><td>DA 0</td><td>Output</td><td>CMOS</td><td></td><td rowspan="8">• Reference voltage data output terminal for spare analogue A/D conversion. • With an externally installed ladder resistor, DA0-DA7 outputs the reference voltage below:
 

<table><tr><th>DA7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th><th>Refernce voltage</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0.0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0.38</td></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0.60</td></tr><tr><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td><td>0.96</td></tr><tr><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1.50</td></tr><tr><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>2.38</td></tr><tr><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>3.78</td></tr></table>(V_{DD}=5.5V)</td><td>H</td></tr>
<tr><td>25</td><td>DA 1</td><td>Output</td><td>CMOS</td><td></td><td>H</td></tr>
<tr><td>26</td><td>DA 2</td><td>Output</td><td>CMOS</td><td></td><td>H</td></tr>
<tr><td>27</td><td>DA 3</td><td>Output</td><td>CMOS</td><td></td><td>H</td></tr>
<tr><td>28</td><td>DA 4</td><td>Output</td><td>CMOS</td><td></td><td>H</td></tr>
<tr><td>29</td><td>DA 5</td><td>Output</td><td>CMOS</td><td></td><td>H</td></tr>
<tr><td>30</td><td>DA 7</td><td>Output</td><td>CMOS</td><td></td><td>H</td></tr>
<tr><td>31</td><td>DA 7</td><td>Output</td><td>CMOS</td><td></td><td>H</td></tr>
</table>

Pin No.	Pin Name	I/O	I/O Format	Logic	Function and Operation	At RESET
32	VDD		—	—	• Connected to +5V power supply.	
33	$\overline{SCK}$	I/O	Gate input CMOS Output		• 8-bit serial data communication clock I/O terminal. • SCK is in high-impedance in INPUT mode, and performs CMOS output in mode.	Z
34	SI	Input	Gate input		• 8-bit serial data input terminal.	Z
35	SO	Output	CMOS		• 8-bit serial data output terminal	H
36	900/$\overline{500}$	Input	RUP		• KEX-900/KEX-500 model-selection input terminal. • KEX-900 = "H": KEX-500 = "L". • Built-in pull-up resistor.	Z
37	70μ	Output	CMOS	H	• Output terminal for the 70 ON/OFF memory contents during deck operation. • 70μ = mechanical auto sensing.	H
38	$\overline{STOP}$	Output	CMOS	L	• Main motor ON/OFF control terminal. • Outputs "L" during Deck OFF status or Power Loading. • "L" is output during the mechanical transition of the deck operating state from mechanical Fast-Forward (Rewind) to PLAY, RLS or EJECT. In other states, "H" is output.	H
39	$\overline{PLAY}$	Output	CMOS	L	• Filter-switching output terminal of MS in PLAY/FF modes. • "L" is output during deck operating state of PLAY; "H" is output in other states. * "L" is output during Deck OFF status and during Power Loading.	H
40	STBY2	Output	CMOS	H	• Connects and controls STBY2 of mechanical motor driver PA3019. • "H" is output only during hard reset of IC; "L" is output in all other cases.	H
41	$\overline{STBY1}$	Output	CMOS	L	• Connects and controls STBY1 of mechanical motor driver PA3019. • "H" is output only during hard reset of IC; "L" is output in all other cases.	H
42	I 2	Output	CMOS		• Control data output terminal with respect to mechanical motor driver PA3019. 6 The output pattern is as below:	H
43	I 1	Output	CMOS			H
44	I 0	output	CMOS			H
45	RES	Input	RUP	L	• Reel table rotation pulse input terminal. • Detects rotation according to "H"/"L" change. • A continuous "H" status for 1.2 s is regarded as the TAPE END status.	H
46	NES	Input	RUP	L		
47	$\overline{AUX}$	Input	RUP	L	• AUX mode input terminal. • Detects AUX+B and performs input. • Transmits data by data communication to the system controller.	H
48	$\overline{DIM}$	Input	RUP	L	• Dimmer input terminal. * Detects and inputs the illumination line. • Transmits data by data communication to the system controller. (The system controller lowers the luminance of the FL display.)	H
49	RESET	Input	Gate input	H	• Initialize/Reset input terminal of ICs.	Z
50	$\overline{TEST}$	Input	Gate input	L	• Test input terminal for IC mechanisms.	Z
51	OSC 1	Input			• Terminal for generating the ICclock.	
52	OSC 2	Output			• Employs a 4-MHz ceramic oscillator element.	
53	VSS				• Power supply terminal. • Connected to GND.	
54	CHECK 0	Input	RUP	L	• Setting of CHECK0, CHECK1 selects the CHECK mode.	H
55	CHECK 1	Input	RUP	L	1 Unit Check mode 2 Communication OFF mode When RESET is initiated in the above modes, the respective mode is entered. 1 is used with the unit checker (control checker). (Not used in actual servicing) 2 is mode enabling independent mechanical operation of the control p. c. board and can be controlled by usual key input.	H

12	11	10	CM Control mode	M1 · M2 Control mode
0	0	0	OFF	OFF
0	0	1	Power LOAD forward rotation	↑
0	1	0	Power LOAD forward ratation	↑
0	1	1	SPEED CONT	↑
1	0	0	↑	M1 Positive rotation
1	0	1	↑	M1 Reverse rotation
1	1	0	↑	M2 Positive rotation
1	1	1	↑	M2 Reverse rotation

Pin No.	Pin Name	I/O	I/O Format	Logic	Function and Operation	At RESET
56	VSENSE	Input	Gate	H	• PA3019 supply voltage sensor input terminal. • At "H" input, the mechanism is stopped and the system controller is informed by data communication of the Emergency status. • ON chatter (_∫‾) 20 ms • OFF chatter (‾∫_) 1s • "H" is output in the cases below: (1) By loss of power at PA3019 (2) By excess voltage at PA3019 (3) By excess current at PA3019	Z
57	DIS	Output	CMOS	H	• Control output terminal of Disable B line. • Constant "H" output during TAPE or TUNER. • "H" is output for about 1 s at Acc ON/OFF. • ON/OFF switching is done by a command from the system controller.	
58	SW 4	Input	Gate		• Mechanical switch matrix input terminal. • Detects the status of the head position, gear position, etc. by a matrix with Strobe signals ST1-ST3.	Z
59	SW 3	Input	Gate			Z
60	SW 2	Input	Gate			Z
61	SW 1	Input	Gate			Z
62	ST 1	Output	P	H	• Strobe signal output terminals for the mechanical switch matrix. • ST1: head position sensing strobe; ST2: FF/RES gear position sensing strobe; ST3: $\overline{LOAD}$, SET, 70μ switch sensing strobe.	Z
63	ST 2	Output	P	H		Z
64	ST 3	Output	P	H		Z

	SW 1	SW 2	SW 3	SW 4
ST 1	Np	MSp	EJp	Rp
ST 2	L	—	C	R
ST 3	$\overline{LOAD}$	SET	$\overline{70\mu}$	—

I/O Format

P: P-ch OPEN drain output

RUP: Input with built-in Pull-up resistor

At RESET

Z: High-impedance state

• Communication OFF Mode

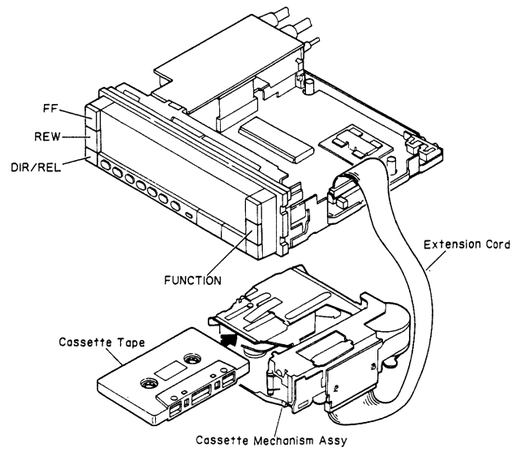
The deck controller (IC701: PD3069B) and system controller (IC901: PD4092A) usually conduct data communication. In this mode, however, the cassette mechanism can be operated by only the deck controller despite the ceasing of communication. (IC901: PD4091 ..... EW, WG)

• How to Enter the Communication OFF Mode:

1. Perform grounding of 55 Pin of IC701.
2. Switch ON the back-up power supply and ACC power supply.
3. Disconnect Pin 55 of IC701 from ground.
4. Insert a cassette tape.
5. When the cassette tape is loading, the cassette mechanism stops once. It recommences operation by pressing a Function key and enters PLAY mode.
6. Operation can be confirmed by usual key input.

• Cancellation of the Communication OFF Mode

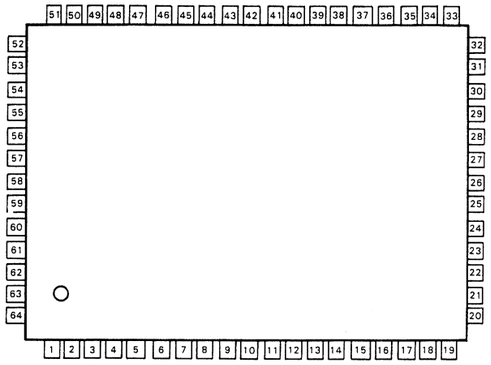
This mode can be cancelled by switching OFF the back-up power supply and ACC power supply, and ACC power supply, then switching them ON again.



	At RESET
ut, the data	Z
mand	
tus of signals	Z
	Z
	Z
	Z
matrix.	Z
ition	Z
	Z

• Display Unit

IC901 : *PD4091 (EW, WG)
*PD4092A (ES)



*IC's marked by * are MOS type.*
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

• Terminal Functions of PD4091, PD4092A

Pin No.	Pin Name	I/O	Function and Operation
1	N. C	–	Not used.
2	MRQ	Input	MUTE request input terminal. At "H" input, the amount of electronic volume attenuation is maximized and Isolate Mute is concurrently output from the MUTE terminal (53 Pin).
3	SCK	I/O	Shift clock input/output terminal for the serial interface. Frequency during clock output: 65.5kHz.
4	Tr B	Output	Data output terminal for the serial interface.
5	Tr C	Input	Data input terminal for the serial interface.
6	$\overline{ACC}$	Input	Acc sensing input terminal. Active low.
7	MOD 0	Input	Input terminal for selecting the application destination.
8	MOD 1		

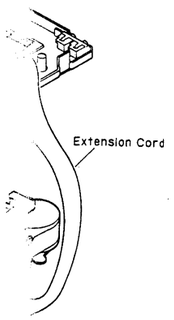
MOD 0	MOD 1	Destination
L	L	Commercial model
L	H	ES
H	L	EW
H	H	WG

EW and WG use the dedicated microcomputer PD4091 and are thus not used with PD4092A.

9	SEC	Input	Not used. (Data input terminal for anti-theft use)
10	NC	Output	Set to OPEN.
11	STB 0	Output	Key matrix input terminals. Active high.
12	STB 1		
13	STB 2		
14	K0	Input	Key matrix input terminals. Active high.
15	K 1		
16	K 2		
17	K 3		

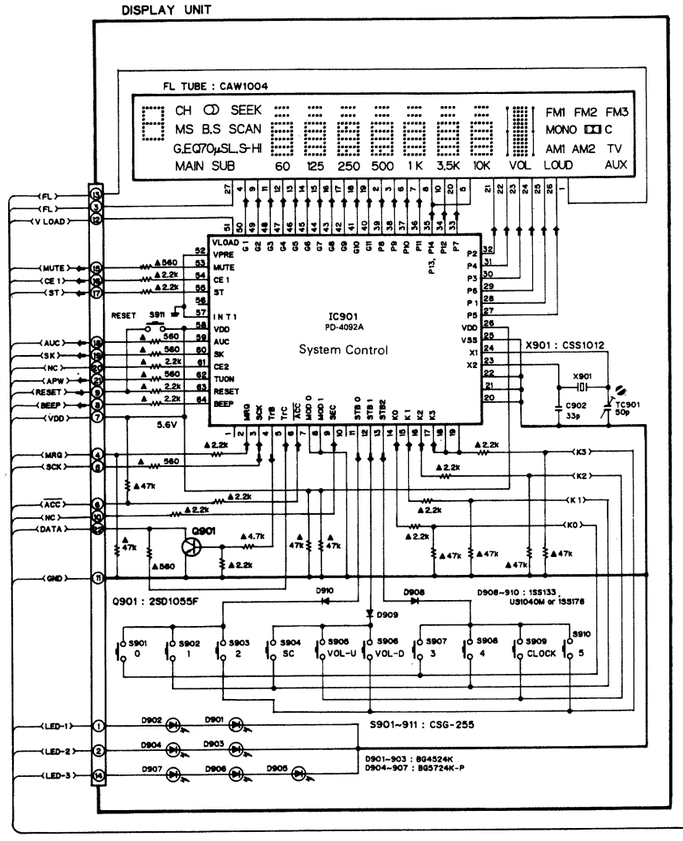
	K 0	K 1	K 2	K 3
STB 0	0	1	–	2
STB 1	–	AS	VOL +	VOL –
STB 2	3	4	CLOCK	5

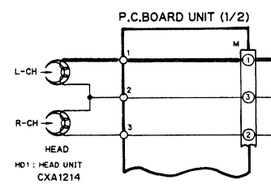
18 – 21	NC	Input	Not used. Set to V or Vss level.
22	EVENT	Input	Not used. Connected to GND.
23	X 2	Output	Crystal oscillating element connection terminal.
24	X 1	Input	Oscillating frequency: 4.19MHz.

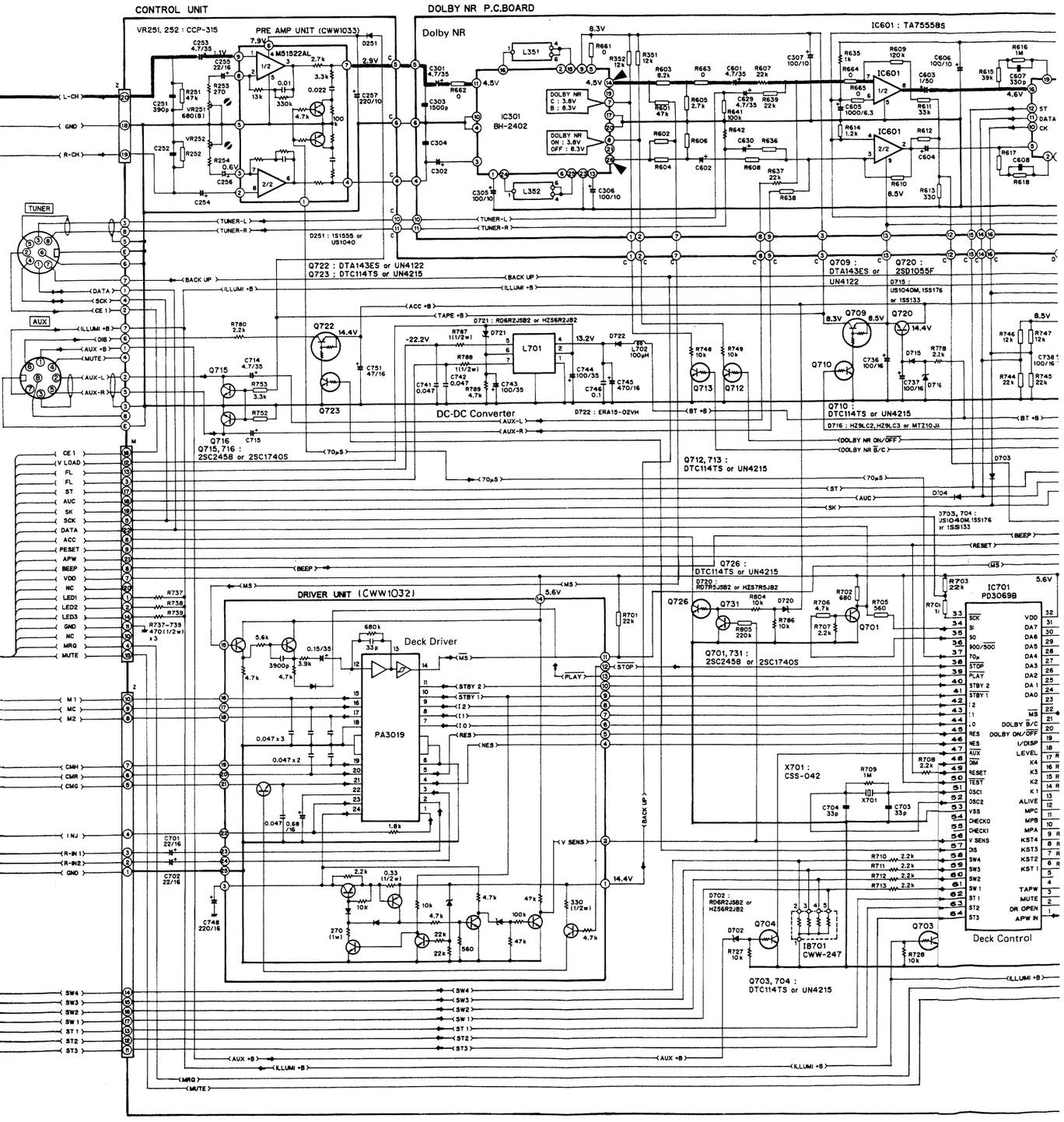


Pin No.	Pin Name	I/O	Function and Operation
25	Vss	–	Power supply terminal. Connected to GND.
26	VDD	–	Power supply terminal. +5V input.
27	P5	Output	Display segment drive output. Active high. P-ch OPEN drain output. Internally pulled-down by VLOAD (–28V).
28	P1		
29	P6		
30	P3		
31	P4		
32	P2		
33	P7		
34	P12		
35	P13, 14		
36	P11		
37	P10		
38	P9		
39	P8		
40 – 50	G11 – G1	Output	Display timing driving output. Active high. P-ch OPEN drain output. Internally pulled-down by VLOAD (–28V).  The parentheses indicate the value in DIMMER mode.
51	VLOAD	Input	Display driver power supply input terminal. Connected to D/D converter DC output (–28V)
52	VPRE	Input	Display pre-driver power supply terminal. Connected to GND.
53	MUTE	Output	Isolator MUTE output teminal. Active high. Output when the source is switched. Pre-muting: approx. 50ms Post-muting: approx. 1.5s Output when MRQ is input. Output at VR MIN status.
54	CE 1	Output	Hideaway tuner control output. Active high. Output when the tuner is connected.
55	ST	Output	Control data latch output for electronic volume ad electronic GEQ. Active high. Output when electronic volume and electronic GEQ are set.
56	N. C	Output	Not used. Set to OPEN.
57	INT 1	Input	Not used. Connected to GND.
58	VDD	–	Power supply terminal. +5V.
59	AUC	Output	Control data output terminal for electronic volume and electronic GEQ. Active high. AUC also functions as the data shift clock output terminal for anti- theft use. (PD4091)
60	SK	Output	Control data shift clock output for electronic volume and elecrronic GEQ. Active high. Output when electronic volume and electronic GEQ are set. SK also functions as the data shift clock output terminal for anti-theft use. (PD4091)
61	CE 2	Output	Not used. Non-voltatile RAM PDH001 chip for anti-theft use. Enable output terminal. Active high.
62	TUON	Output	BT+B control terminal. Active high. "H" output when the source is ON.
63	RESET	Input	Reset signal input terminal. Active high. During Reset status, all input/output terminals are in high-impedance state.
64	BEEP	Output	BEEP waveform output terminal. Frequency: approx. 4kHz. Output time: approx. 40ms.

4. SCHEMATIC CIRCUIT DIAGRAM (KEX-900/ES)



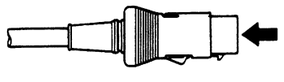




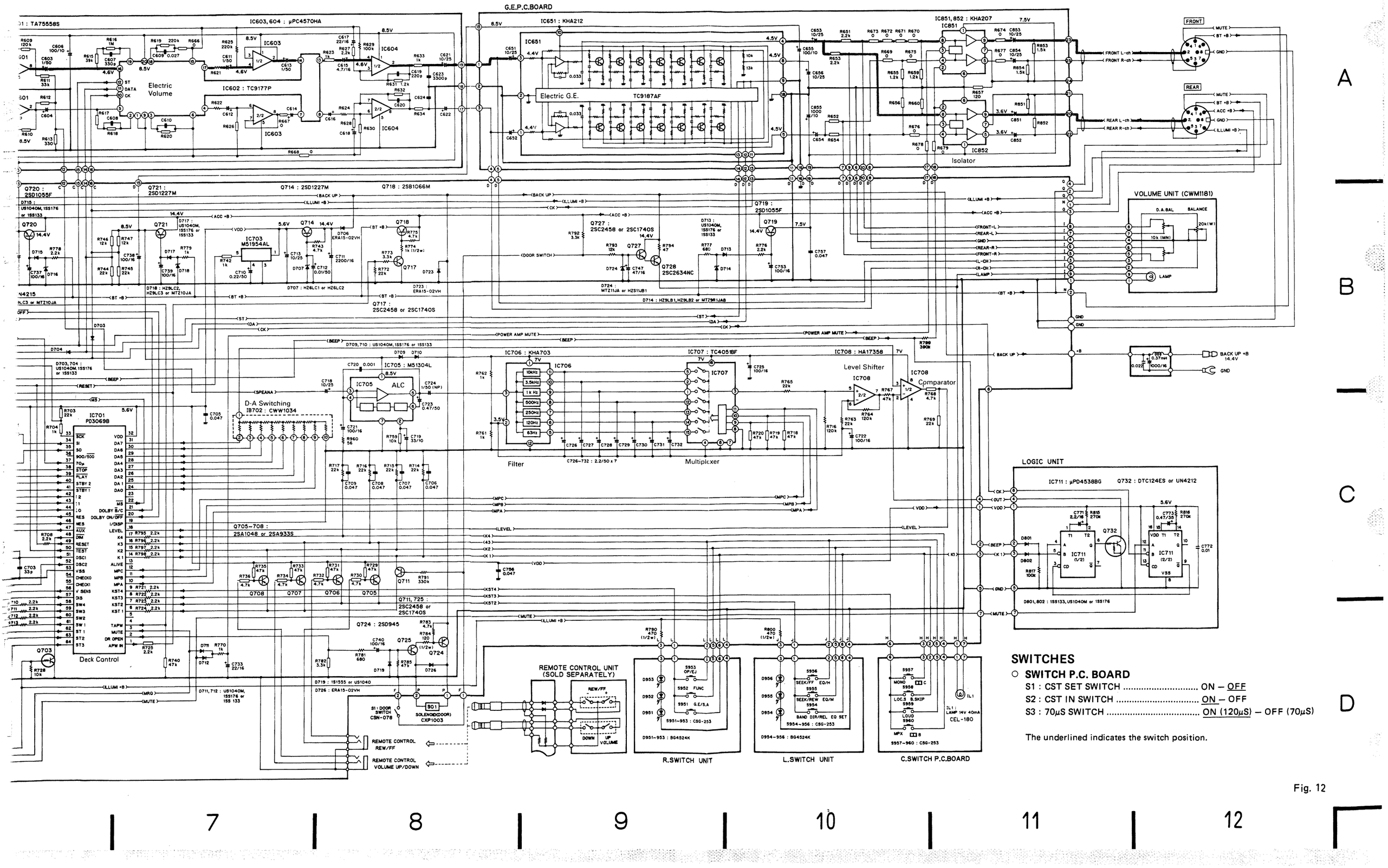
NOTE :

- Indicates a chip resistor.
- Indicates a chip capacitor.
- Indicates a printed resistor.

Audio Unit
Consists of
Dolby NR. P.C. Board
G.E. P.C. Board
C. Switch P.C. Board



Connection is viewed from the direction of the arrow.



SWITCHES

○ **SWITCH P.C. BOARD**

S1 : CST SET SWITCH ..... ON – OFF

S2 : CST IN SWITCH ..... ON – OFF

S3 : 70μS SWITCH ..... ON (120μS) – OFF (70μS)

The underlined indicates the switch position.

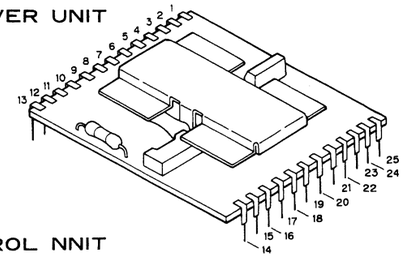
Fig. 12

5. CONNECTION DIAGRAM (KEX-900/ES)

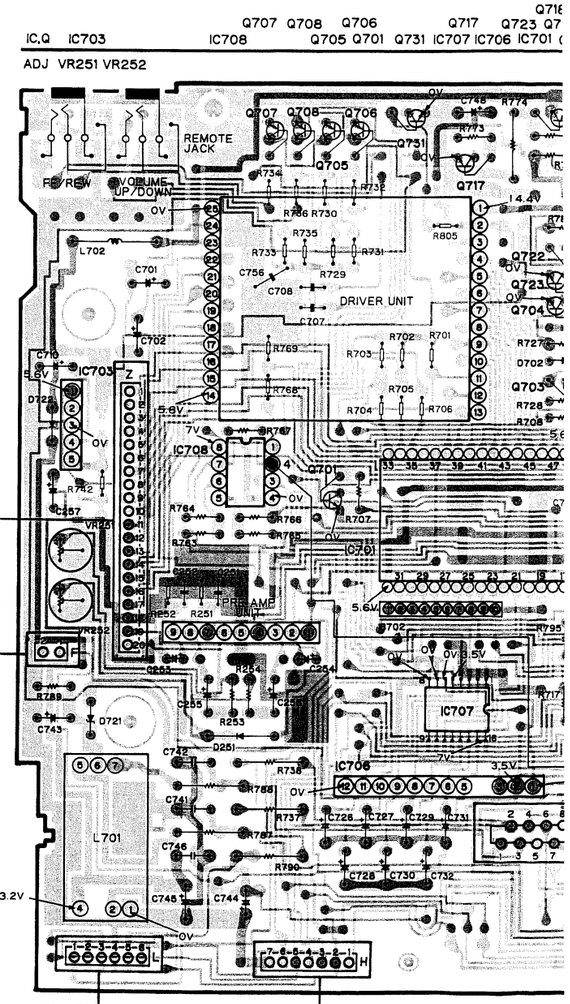
PRE AMP UNIT

1	2	3	4	5	6	7	8	9
	1.1V	0.6V	2.9V	0V	7.9V	2.9V	0.6V	1.1V

DRIVER UNIT

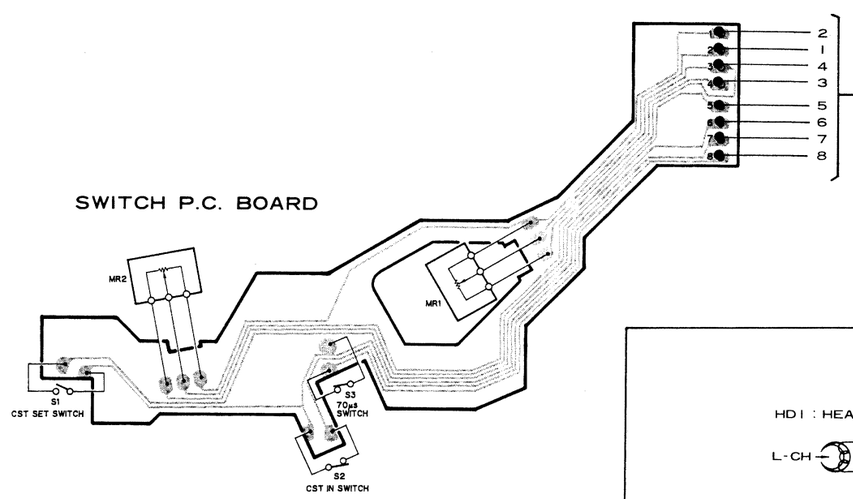


CONTROL NNIT



IC701 : PD3069B IC703 : M51954AL IC705 : M51304L IC706 : KHA703 IC707 : T
Q701, 711, 715~717, 725, 727, 731 : 2SC2458 or 2SC1740S Q703, 704, 710, 712, 713, 7
Q714, 721 : 2SD1227M Q718 : 2SB1066M Q719, 720 : 2SD1055F Q724 : 2SD945
D251, 719 : 1S1555 or US1040 D702, 721 : RD6R2JSB2 or HZS6R2JB2 D703, 704, 70
D707 : HZ6LC1 or HZ6LC2 D714 : HZ9LB1, HZ9LB2 or MTZ9R1JAB D716, 718 : HZ9LC

SWITCH P.C. BOARD

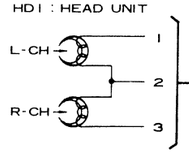


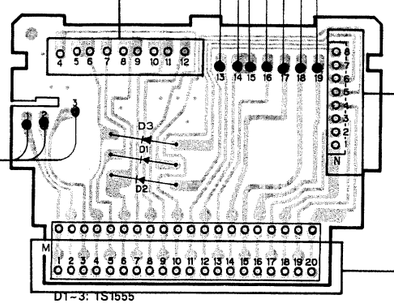
MOTOR (HEAD) M1

MOTOR (FF/REW) M2

MOTOR (CAPSTAN) M3

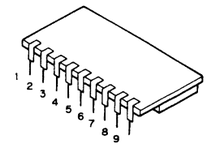
HD1 : HEAD UNIT



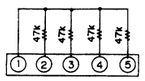


D1~3: 1S1555

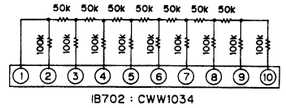
P.C. BOARD UNIT



PRE AMP UNIT

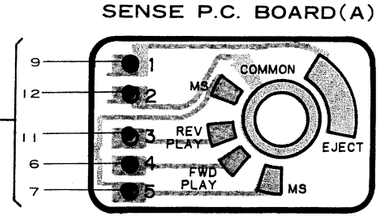


IB701 : CWW-247

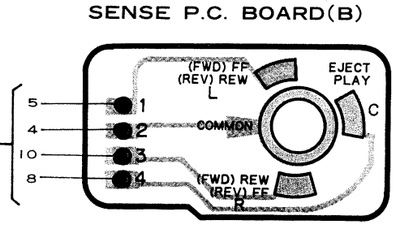


IB702 : CWW1034

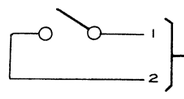
SENSE P.C. BOARD(A)



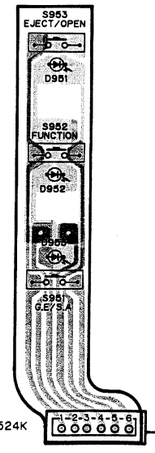
SENSE P.C. BOARD(B)



S1 : DOOR SWITCH

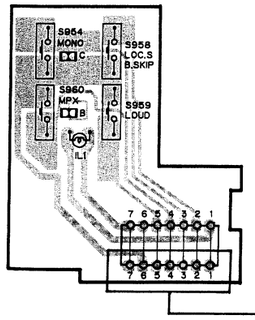


R.SWITCH UNIT

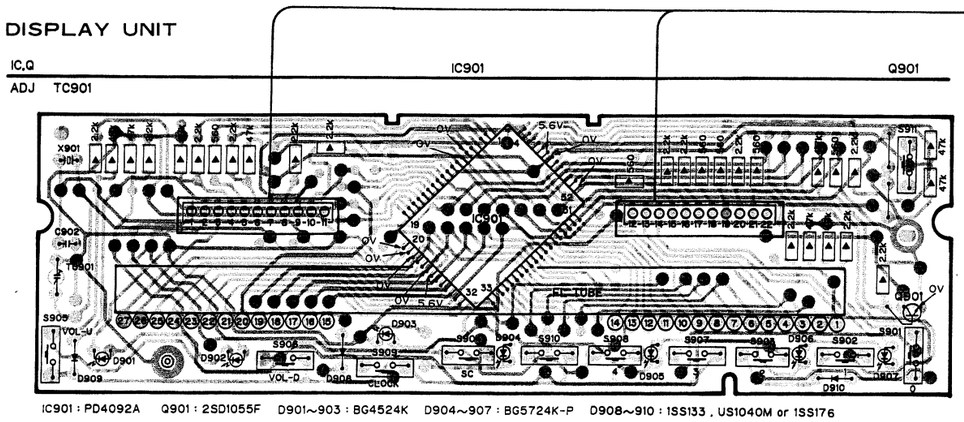


D951~953 : BG4524K

C.SWITCH P.C. BOARD



DISPLAY UNIT



IC901 : PD4092A Q901 : 2SD1055F D901~903 : BG4524K D904~907 : BG5724K-P D908~910 : 1SS133 , US1040M or 1SS176

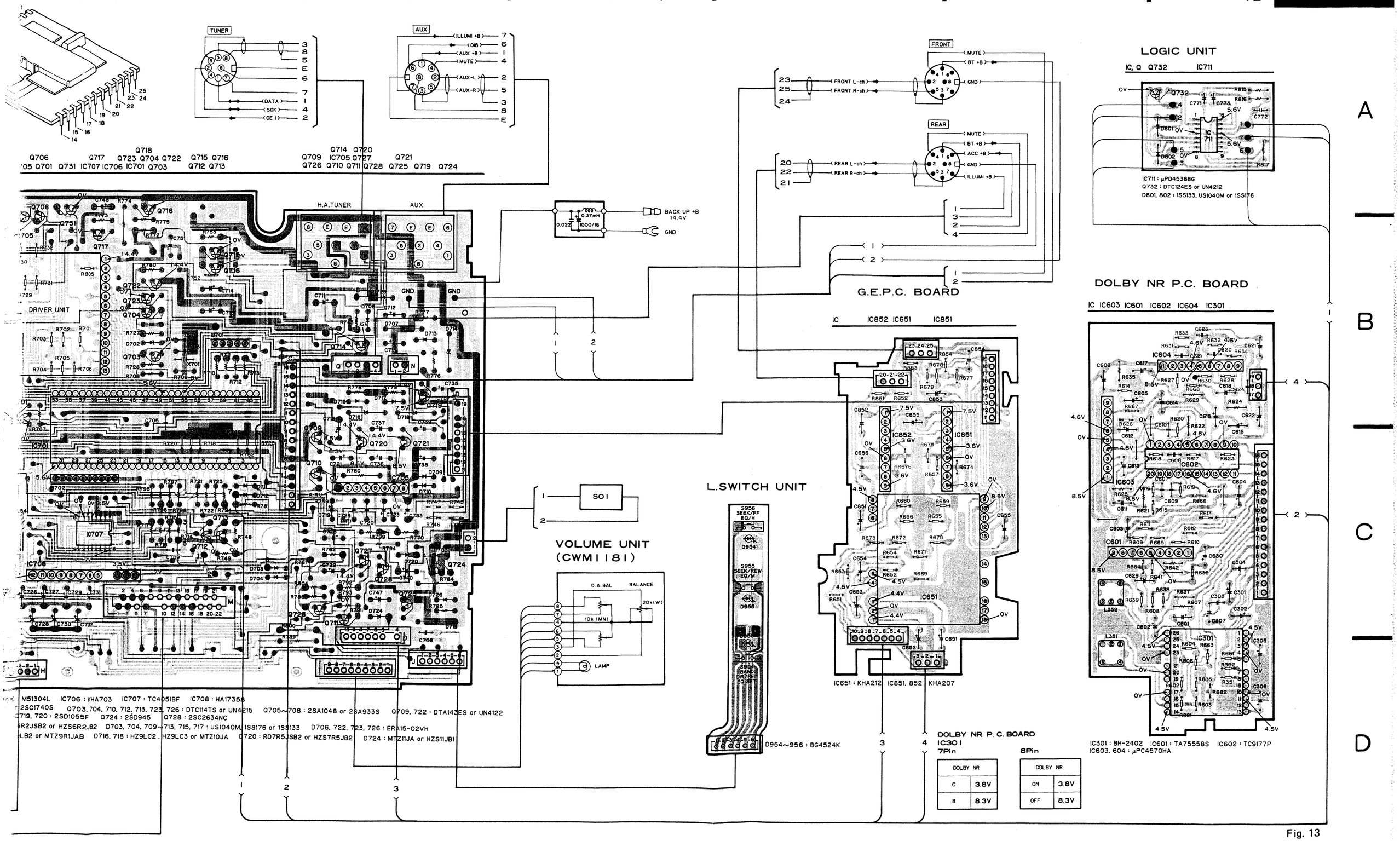
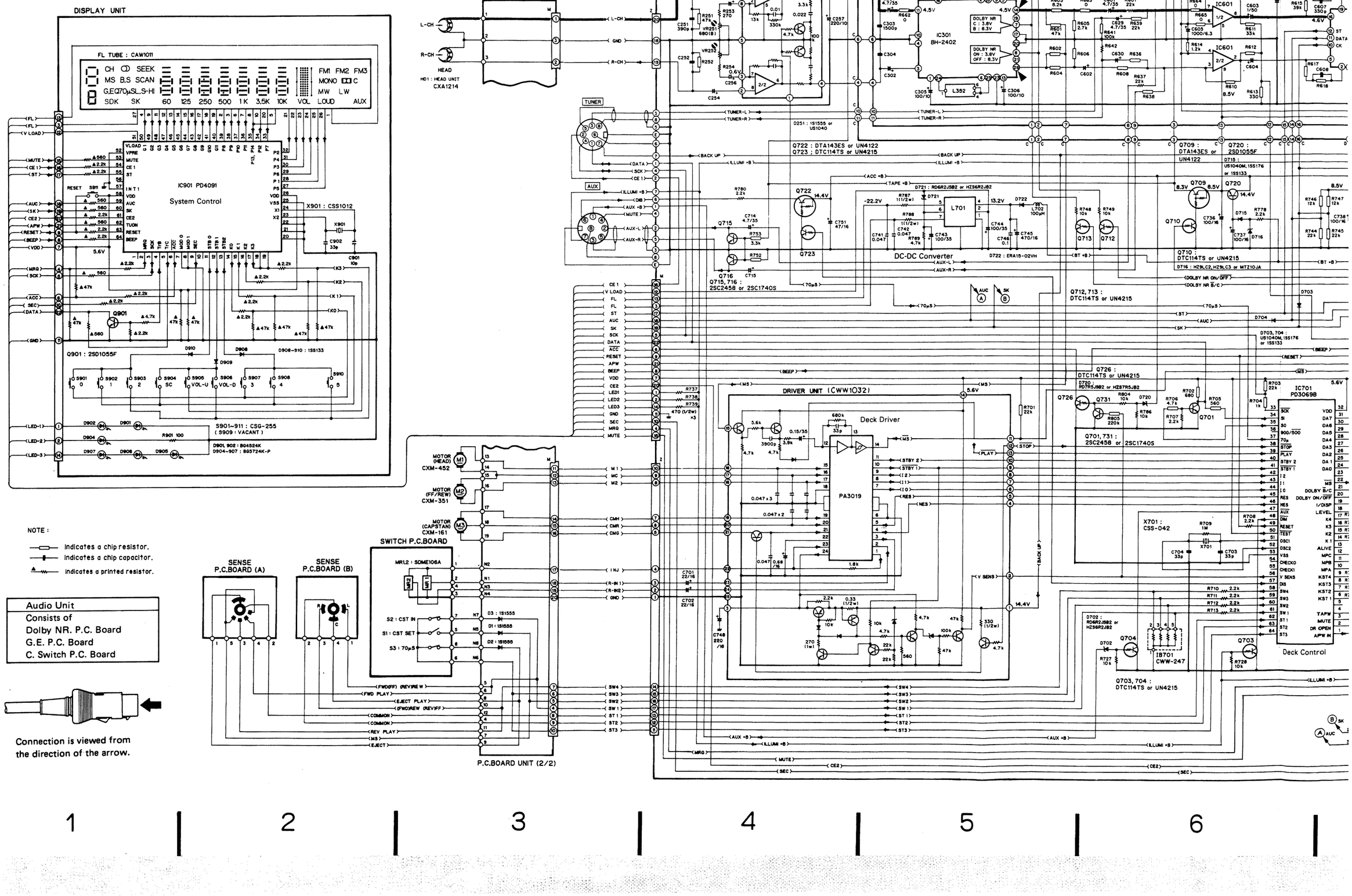

TUNER
AUX
(ILLUMI +B)
(DIM)
(AUX +B)
(MUTE)
(AUX-L)
(AUX-R)
(DATA)
(SCK)
(CE1)
Q706 Q718 Q717 Q723 Q704 Q722 Q715 Q716
Q705 Q701 Q731 IC707 IC706 IC701 Q703 Q712 Q713
Q714 Q720
Q709 IC705 Q727 Q721
Q726 Q710 Q711 Q728 Q725 Q719 Q724
DRIVER UNIT
H.A.TUNER
AUX
GND
BACK UP +B 14.4V
0.37mH
0.022
1000/16
SO1
VOLUME UNIT (CWM1181)
D.A.BAL
BALANCE
10k (MN)
20k(W)
LAMP
L.SWITCH UNIT
S956 SEEK/FF EQ/H
S955 SEEK/REV EQ/M
S954 BAND DX/REL EQ/OFF
D954
D955
FRONT
REAR
(MUTE)
(BT +B)
(ACC +B)
(GND)
(ILLUMI +B)
FRONT L-ch
FRONT R-ch
REAR L-ch
REAR R-ch
G.E.P.C. BOARD
IC IC852 IC651 IC851
IC852 3.6V
IC851 3.6V
IC651 4.4V
LOGIC UNIT
IC, Q Q732 IC711
IC711 : μPD4538BG
Q732 : DTC124ES or UN4212
D801, 802 : 1SS133, US1040M or 1SS176
DOLBY NR P.C. BOARD
IC IC603 IC601 IC602 IC604 IC301
IC604
IC603
IC602
IC601
IC301
IC301 : BH-2402 IC601 : TA75558S IC602 : TC9177P
IC603, 604 : μPC4570HA
DOLBY NR P. C. BOARD
IC301
7Pin
DOLBY NR
C 3.8V
B 8.3V
8Pin
DOLBY NR
ON 3.8V
OFF 8.3V
M51304L IC706 : KHA703 IC707 : TC4051BF IC708 : HA17358
2SC1740S Q703, 704, 710, 712, 713, 723, 726 : DTC114TS or UN4215 Q705~708 : 2SA1048 or 2SA933S Q709, 722 : DTA143ES or UN4122
719, 720 : 2SD1055F Q724 : 2SD945 Q728 : 2SC2634NC
6R2JSB2 or HZS6R2JB2 D703, 704, 709~713, 715, 717 : US1040M, 1SS176 or 1SS133 D706, 722, 723, 726 : ERA15-02VH
LB2 or MTZ9R1JAB D716, 718 : HZ9LC2, HZ9LC3 or MTZ10JA D720 : RD7R5JSB2 or HZS7R5JB2 D724 : MTZ11JA or HZS11JB1
D954~956 : BG4524K
IC651 : KHA212 IC851, 852 : KHA207

Fig. 13

6. SCHEMATIC CIRCUIT DIAGRAM (KEX-900/EW)

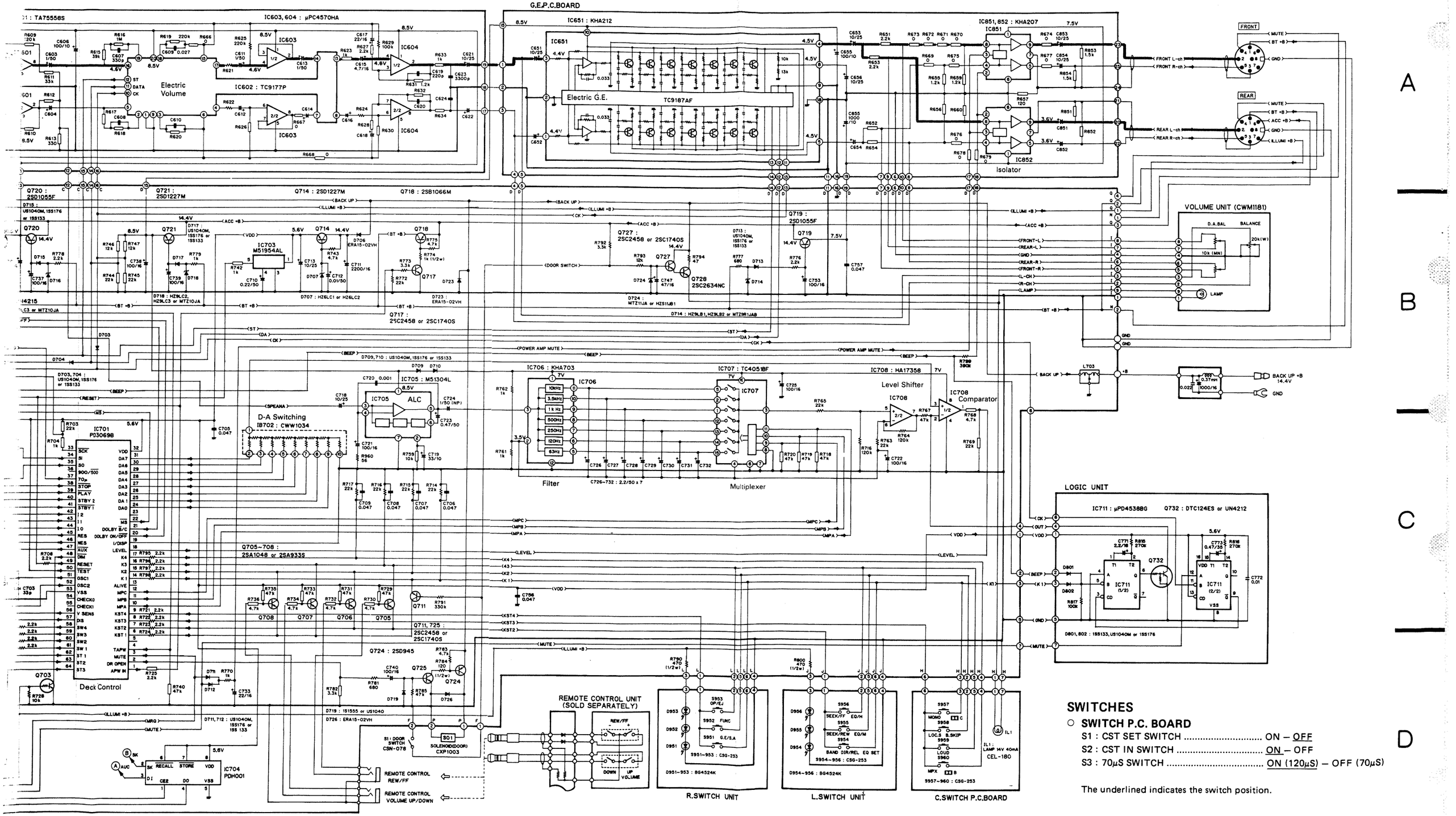


NOTE :

- indicates a chip resistor.
- indicates a chip capacitor.
- indicates a printed resistor.

Audio Unit
Consists of
Dolby NR. P.C. Board
G.E. P.C. Board
C. Switch P.C. Board

Connection is viewed from the direction of the arrow.



SWITCHES

○ **SWITCH P.C. BOARD**

S1 : CST SET SWITCH ..... ON – OFF

S2 : CST IN SWITCH ..... ON – OFF

S3 : 70μS SWITCH ..... ON (120μS) – OFF (70μS)

The underlined indicates the switch position.

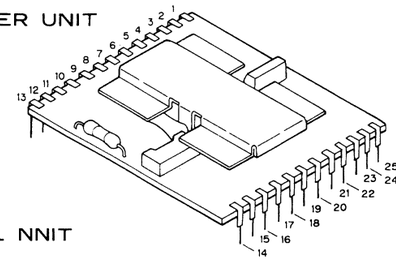
Fig. 14

7. CONNECTION DIAGRAM (KEX-900/EW)

PRE AMP UNIT

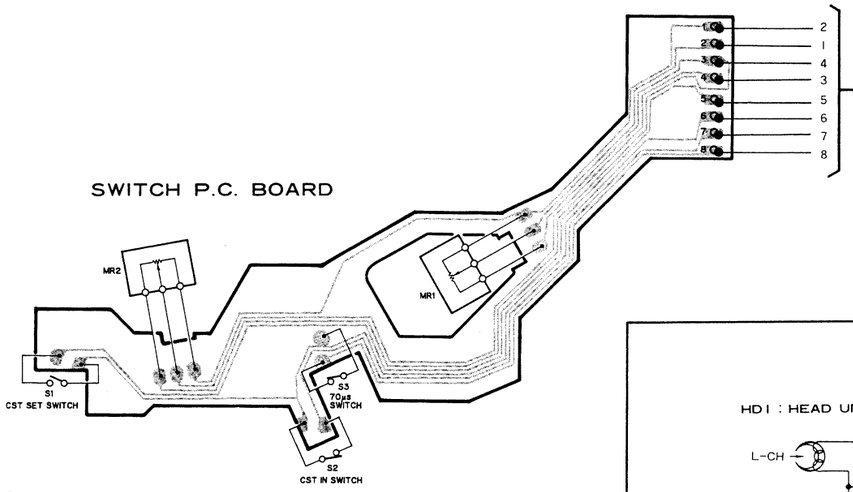
1	2	3	4	5	6	7	8	9
	1.1V	0.6V	2.9V	0V	7.9V	2.9V	0.6V	1.1V

DRIVER UNIT



CONTROL NNIT

SWITCH P.C. BOARD

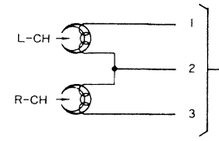


MOTOR (HEAD) M1

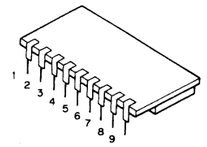
MOTOR (FF/REW) M2

MOTOR (CAPSTAN) M3

HD1 : HEAD UNIT

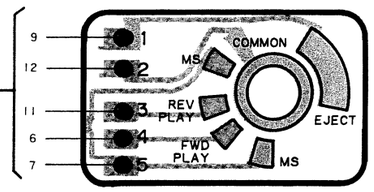


PRE AMP UNIT

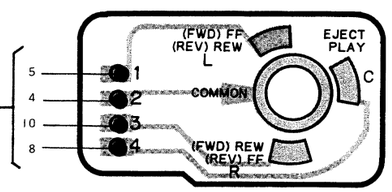


IB701 : CWW-247

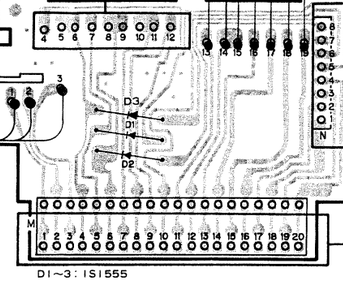
SENSE P.C. BOARD(A)



SENSE P.C. BOARD(B)



P.C. BOARD UNIT

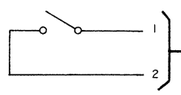


D1~3 : 1S1555

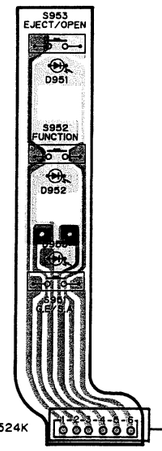
50k 50k 50k 50k 50k 50k 50k

IB702 : CWW1034

S1 : DOOR SWITCH

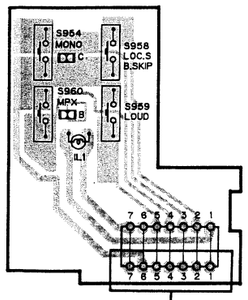


R.SWITCH UNIT

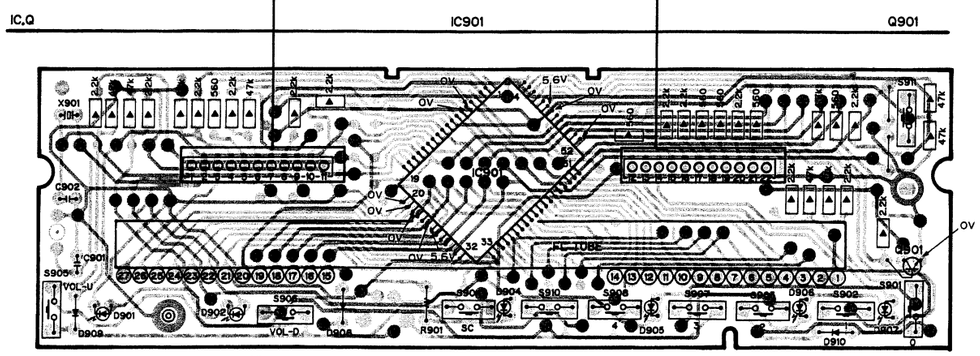


D951~953 : BG4524K

C.SWITCH P.C. BOARD

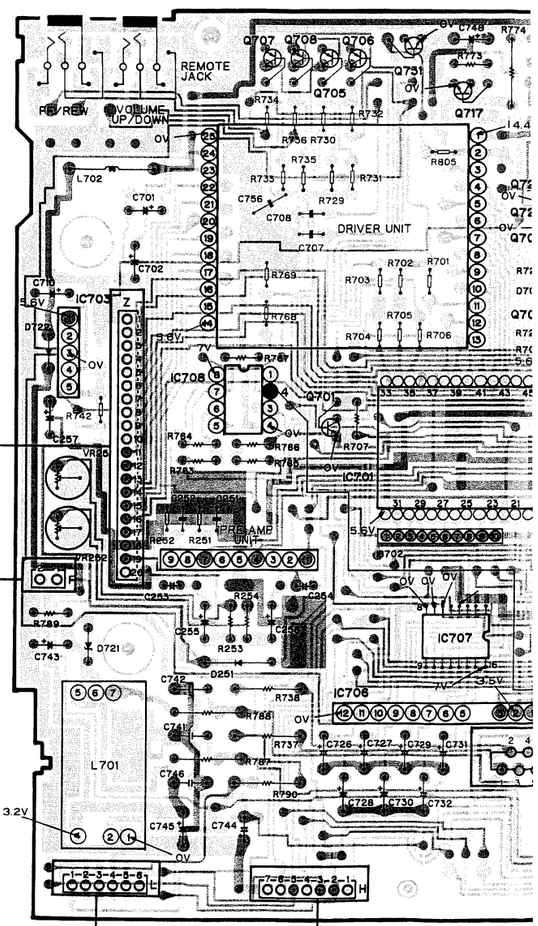


DISPLAY UNIT



IC901 : PD4091 Q901 : 2SD1055F D904~907 : BG5724K-P D908~910 : 1SS133

D901, 902 : BG4524K



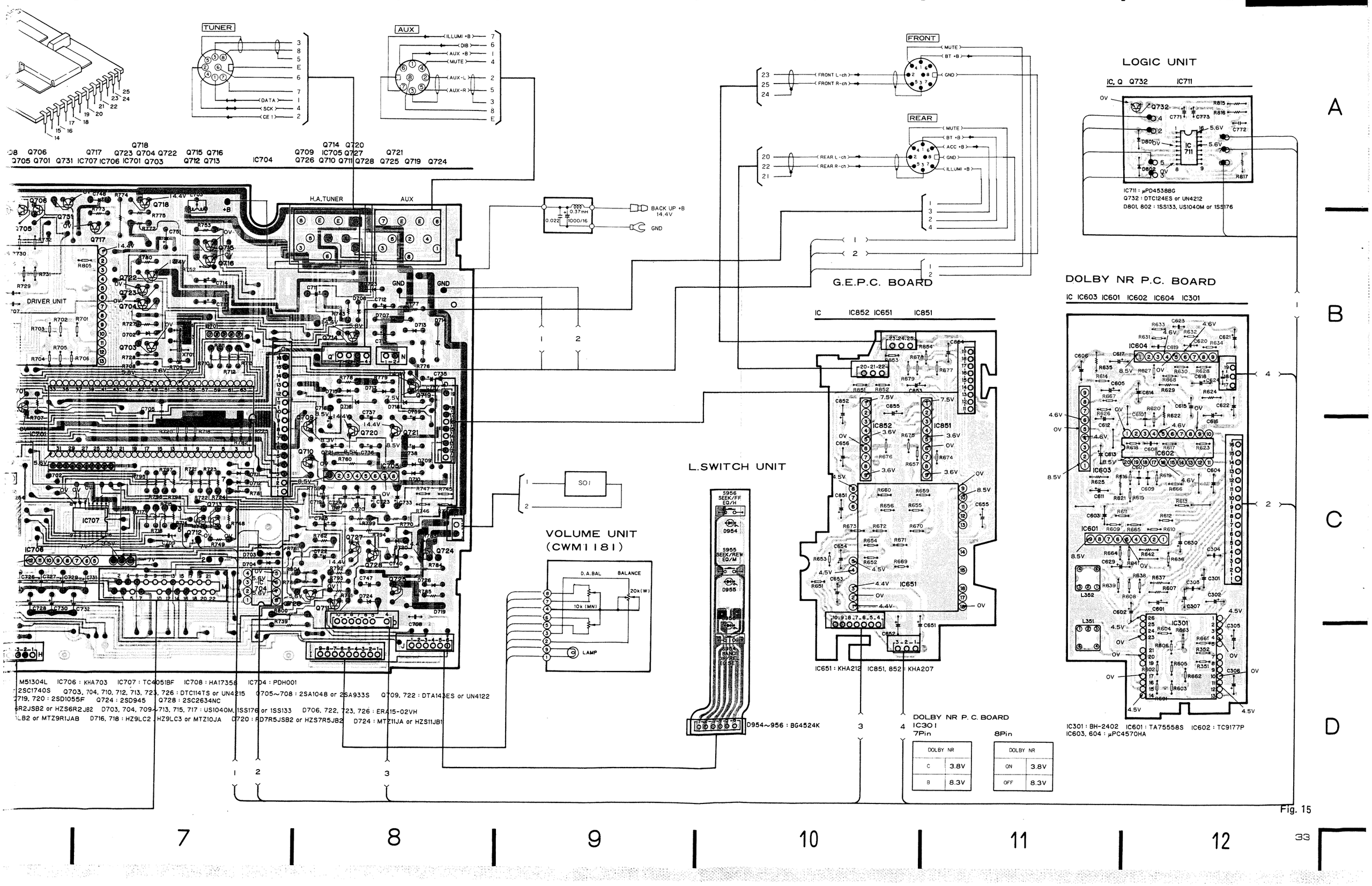
IC701 : PD3069B IC703 : M51954AL IC705 : M51304L IC706 : KHA703 IC7C

Q701, 711, 715~717, 725, 727, 731 : 2SC2458 or 2SC1740S Q703, 704, 710, 712,

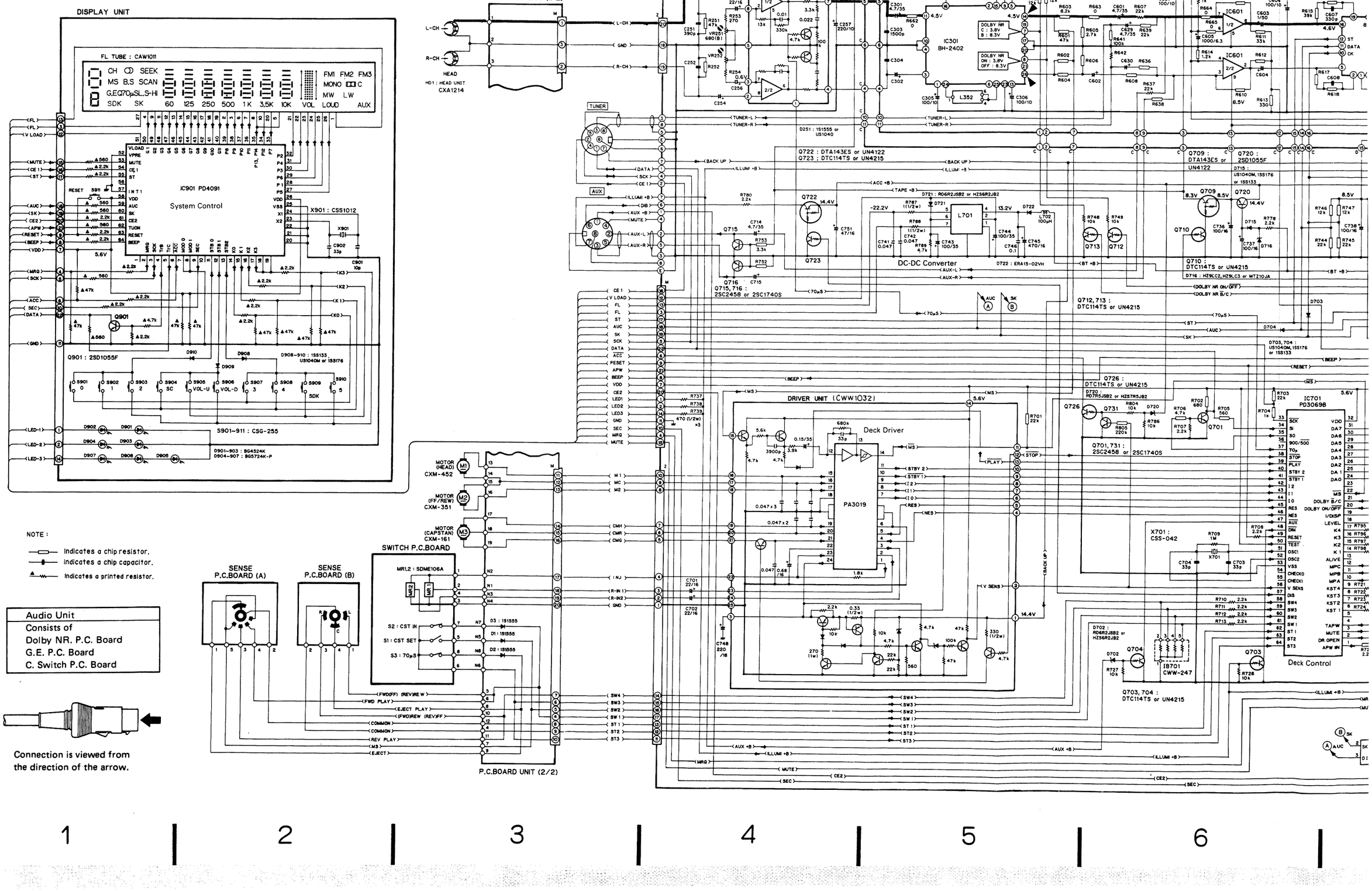
Q714, 721 : 2SD1227M Q718 : 2SB1066M Q719, 720 : 2SD1055F Q724 : 2SI

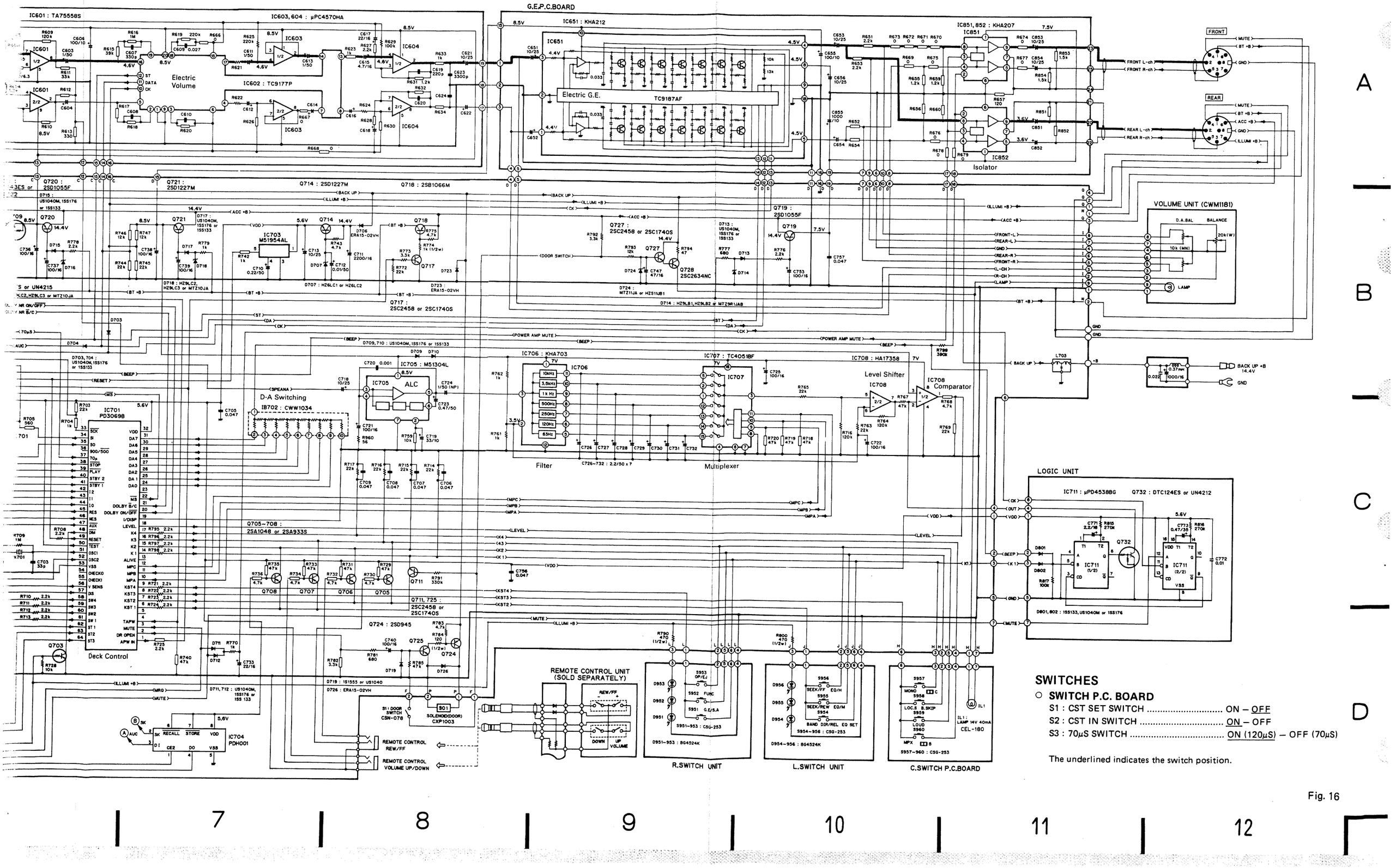
D251, 719 : 1S1555 or US1040 D702, 721 : RD6R2JSB2 or HZS6R2JB2 D703, 70

D707 : HZ6LC1 or HZ6LC2 D714 : HZ9LB1, HZ9LB2 or MTZ9R1JAB D716, 718 : H


TUNER
AUX
FRONT
REAR
G.E.P.C. BOARD
LOGIC UNIT
IC, Q Q732 IC711
IC711 : μPD4538BG
Q732 : DTC124ES or UN4212
D801, 802 : 1SS133, US1040M or 1SS176
DOLBY NR P.C. BOARD
IC IC603 IC601 IC602 IC604 IC301
IC301 : BH-2402 IC601 : TA75558S IC602 : TC9177P
IC603, 604 : μPC4570HA
DOLBY NR P. C. BOARD
IC301
7Pin
8Pin
DOLBY NR
C 3.8V
B 8.3V
ON 3.8V
OFF 8.3V
IC IC852 IC651 IC851
IC651 : KHA212 IC851, 852 : KHA207
L.SWITCH UNIT
D954~956 : BG4524K
VOLUME UNIT
(CWM1181)
D.A.BAL
BALANCE
10k (MN)
20k(W)
LAMP
DRIVER UNIT
IC707
IC706
IC704
H.A.TUNER
AUX
BACK UP +B
14.4V
GND
SOI
M51304L IC706 : KHA703 IC707 : TC4051BF IC708 : HA17358 IC704 : PDH001
2SC1740S Q703, 704, 710, 712, 713, 723, 726 : DTC114TS or UN4215 Q705~708 : 2SA1048 or 2SA933S Q709, 722 : DTA143ES or UN4122
719, 720 : 2SD1055F Q724 : 2SD945 Q728 : 2SC2634NC
R2JSB2 or HZS6R2JB2 D703, 704, 709~713, 715, 717 : US1040M, 1SS176 or 1SS133 D706, 722, 723, 726 : ERA15-02VH
LB2 or MTZ9R1JAB D716, 718 : HZ9LC2 HZ9LC3 or MTZ10JA D720 : RD7R5JSB2 or HZS7R5JB2 D724 : MTZ11JA or HZS11JB1
Fig. 15

8. SCHEMATIC CIRCUIT DIAGRAM (KEX-900SDK/WG)





SWITCHES

○ **SWITCH P.C. BOARD**

S1 : CST SET SWITCH ..... ON – OFF

S2 : CST IN SWITCH ..... ON – OFF

S3 : 70μS SWITCH ..... ON (120μS) – OFF (70μS)

The underlined indicates the switch position.

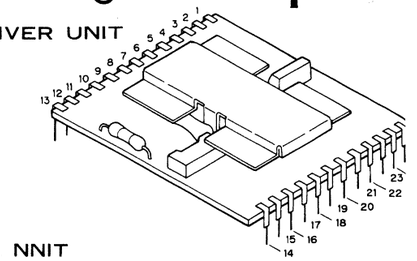
Fig. 16

9. CONNECTION DIAGRAM (KEX-900SDK/WG)

PRE AMP UNIT

1	2	3	4	5	6	7	8	9
	1.1V	0.6V	2.9V	0V	7.9V	2.9V	0.6V	1.1V

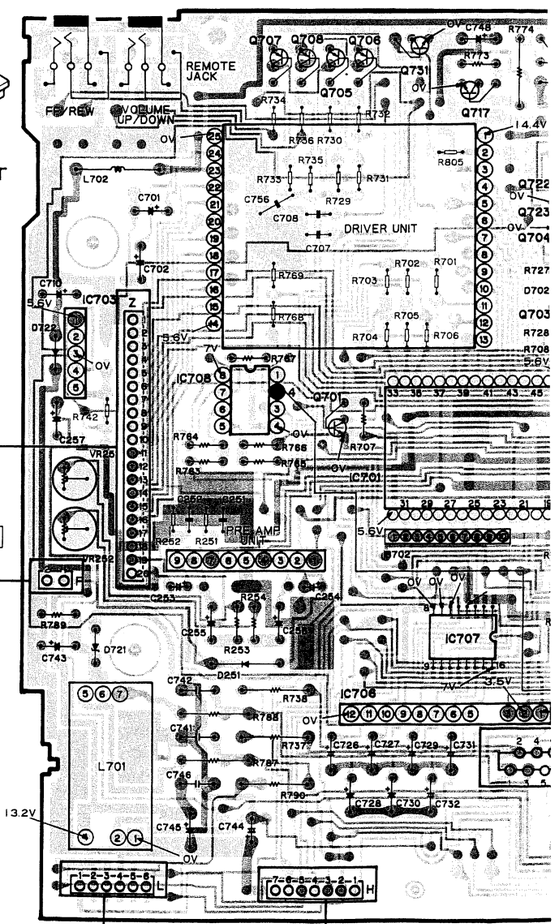
DRIVER UNIT



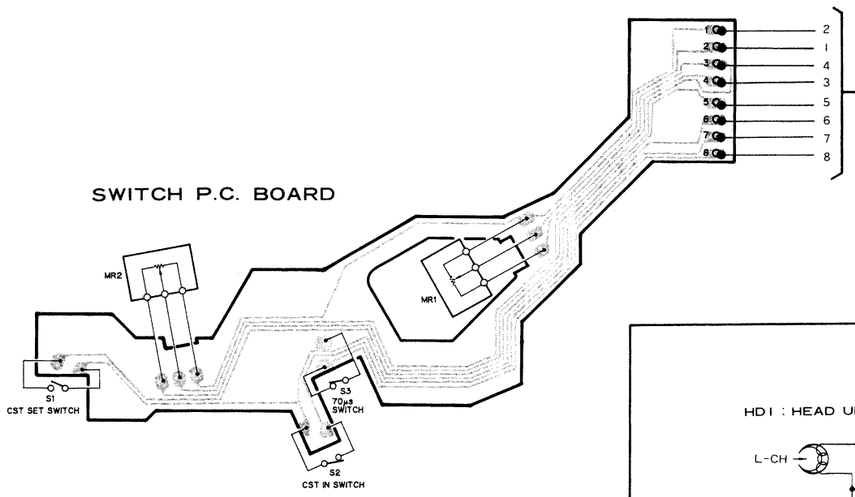
CONTROL NNIT

IC,Q IC703 IC708 Q707 Q708 Q706 Q705 Q701 Q731 Q717 IC707 IC706 Q723 IC7C

ADJ VR251 VR252



SWITCH P.C. BOARD



MOTOR (FF/REW) M2

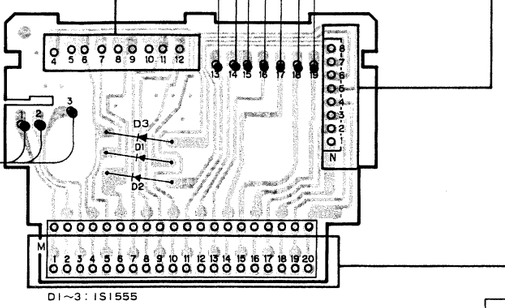
MOTOR (HEAD) M1

MOTOR (CAPSTAN) M3

HD1 : HEAD UNIT

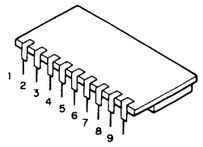
L-CH

R-CH



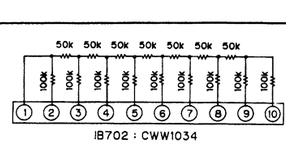
P.C. BOARD UNIT

PRE AMP UNIT



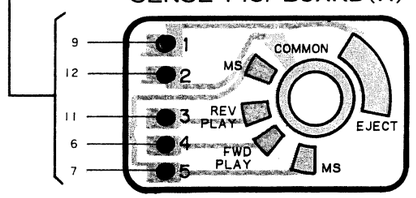
IB701 : CWW-247

50k 50k 50k 50k 50k 50k 50k 50k

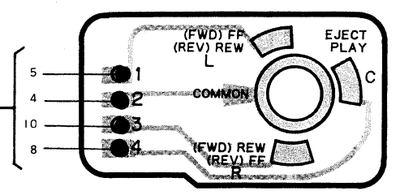


IB702 : CWW1034

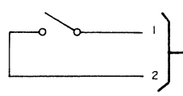
SENSE P.C. BOARD(A)



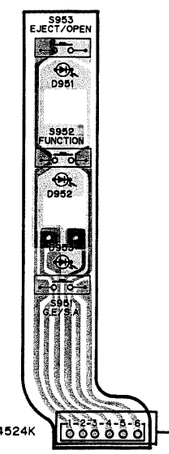
SENSE P.C. BOARD(B)



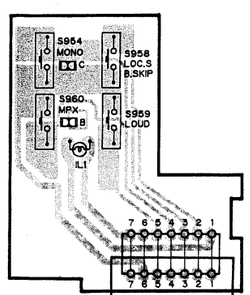
S1 : DOOR SWITCH



R.SWITCH UNIT

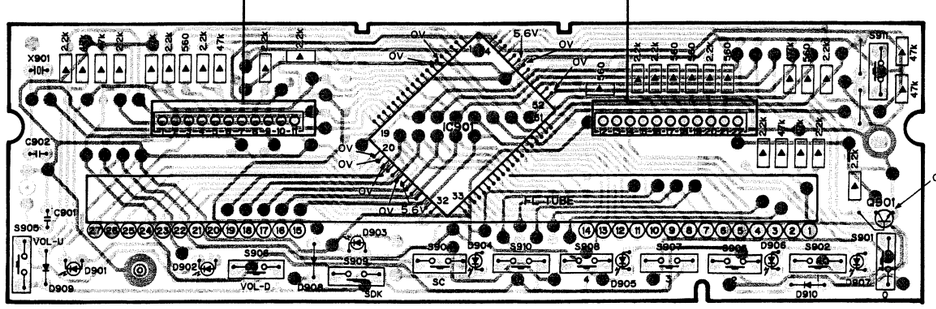


C.SWITCH P.C. BOARD



DISPLAY UNIT

IC,Q IC901 Q901



IC901 : PD4091 Q901 : 2SD1055F D901~903 : BG4524K D904~907 : BG5724K-P D908~910 : 1SS133 , US1040M or 1SS176

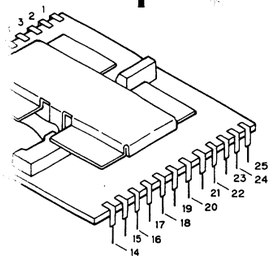
IC701 : PD3069B IC703 : M51954AL IC705 M51304L IC706 : KHA703 IC707

Q701, 711, 715~717, 725, 727, 731 : 2SC2458 or 2SC1740S Q703, 704, 710, 712, 71

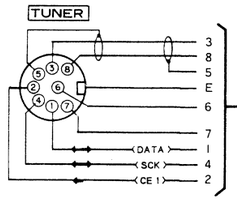
Q714, 721 : 2SD1227M Q718 : 2SB1066M Q719, 720 : 2SD1055F Q724 : 2SD9

D251, 719 : 1S1555 or US1040 D702, 721 : RD6R2JSB2 or HZS6R2JB2 D703, 704

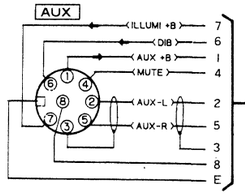
D707 : HZ6LC1 or HZ6LC2 D714 : HZ9LB1, HZ9LB2 or MTZ9R1JAB D716, 718 : HZ9



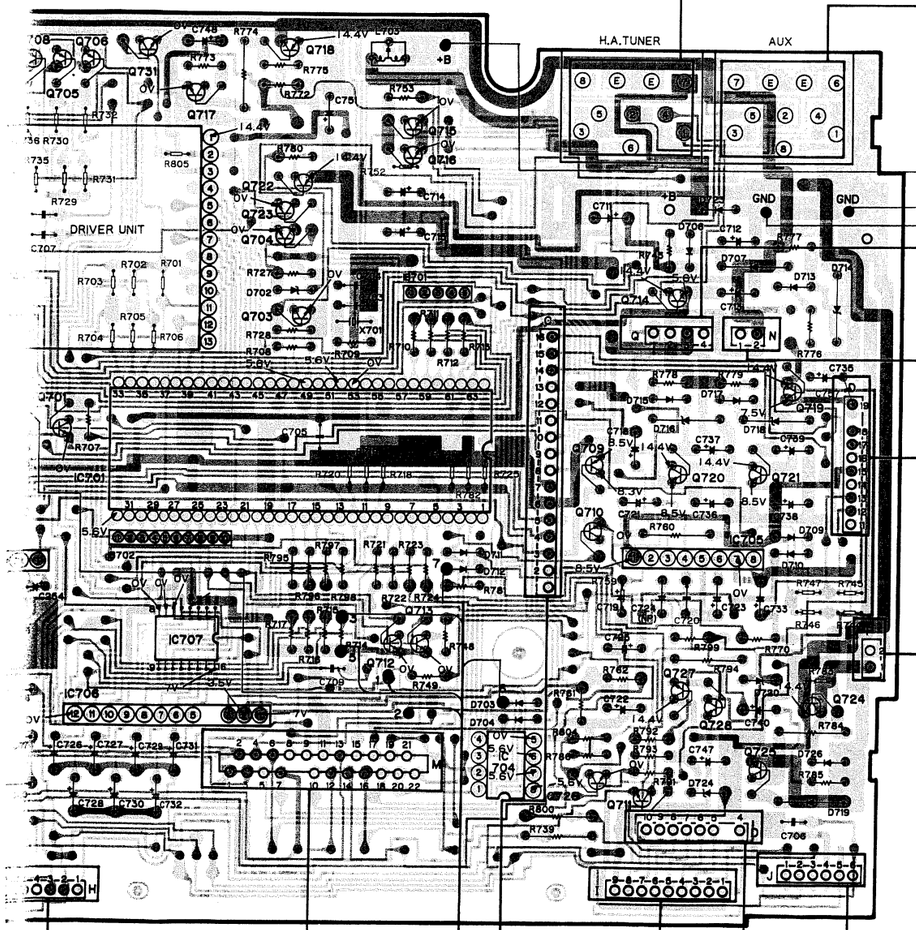
TUNER

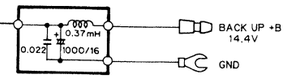


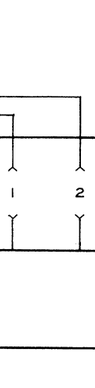
AUX

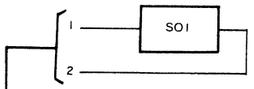


Q718
Q706 Q717 Q723 Q704 Q722 Q715 Q716 Q714 Q720
Q705 Q701 Q731 IC707 IC706 IC701 Q703 Q712 Q713 IC704 Q709 IC705 Q727 Q721
Q726 Q710 Q711 Q728 Q725 Q719 Q724

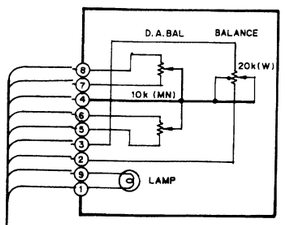




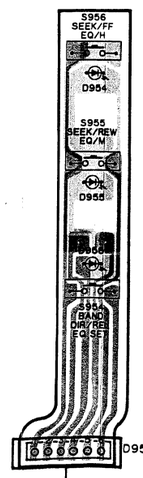




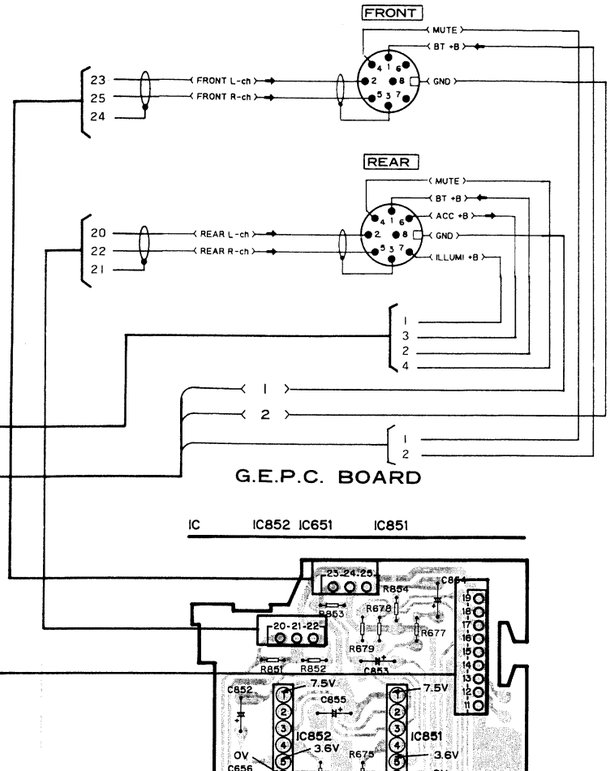
VOLUME UNIT
(CWM1181)



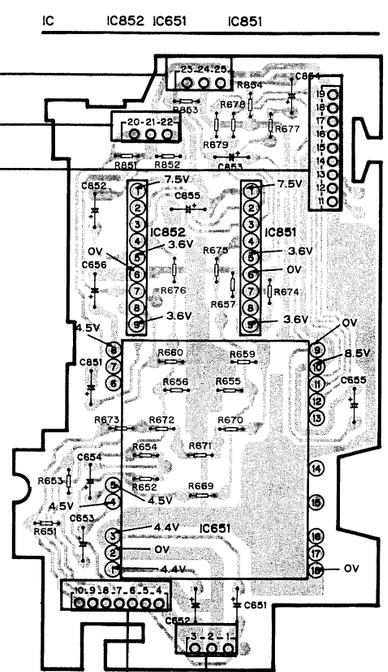
L.SWITCH UNIT



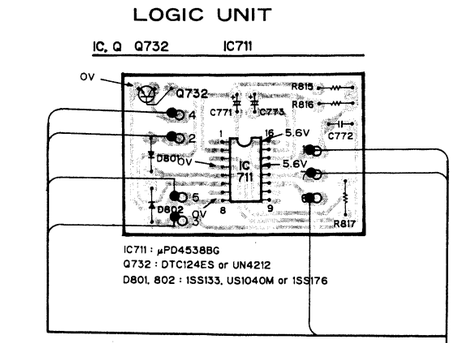
D954~956 : BG4524K

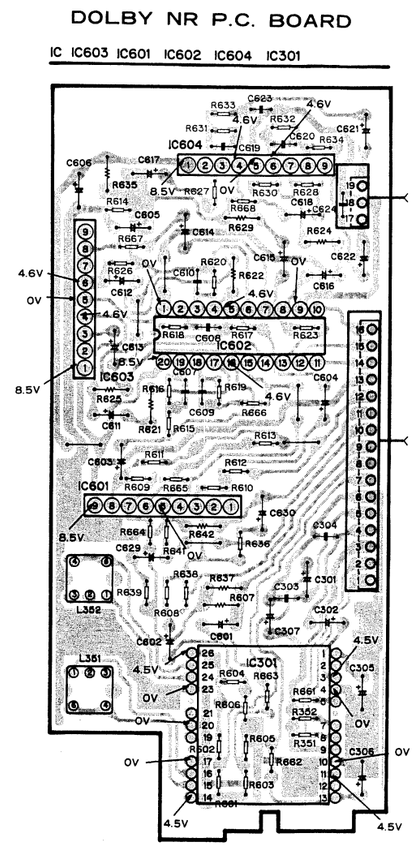


G.E.P.C. BOARD



IC651 : KHA212 IC851, 852 : KHA207





IC301 : BH-2402 IC601 : TA75558S IC602 : TC9177P
IC603, 604 : μPC4570HA

DOLBY NR P. C. BOARD
IC301

7Pin

DOLBY NR	
C	3.8V
B	8.3V

8Pin

DOLBY NR	
ON	3.8V
OFF	8.3V

IC : M51304L IC706 : KHA703 IC707 : TC4051BF IC708 : HA17358 IC704 : PDH001
Q705~708 : 2SA1048 or 2SA933S Q709, 722 : DTA143ES or UN4122
Q703, 704, 710, 712, 713, 723, 726 : DTC114TS or UN4215
Q719, 720 : 2SD1055F Q724 : 2SD945 Q728 : 2SC2634NC
D703, 704, 709~713, 715, 717 : US1040M, 1SS176 or 1SS133 D706, 722, 723, 726 : ERA15-02VH
D716, 718 : HZ9LC2, HZ9LC3 or MTZ10JA D720 : RD7R5JSB2 or HZS7R5JB2 D724 : MTZ11JA or HZS11JB1

Fig. 17

10. CABINET EXPLODED VIEW

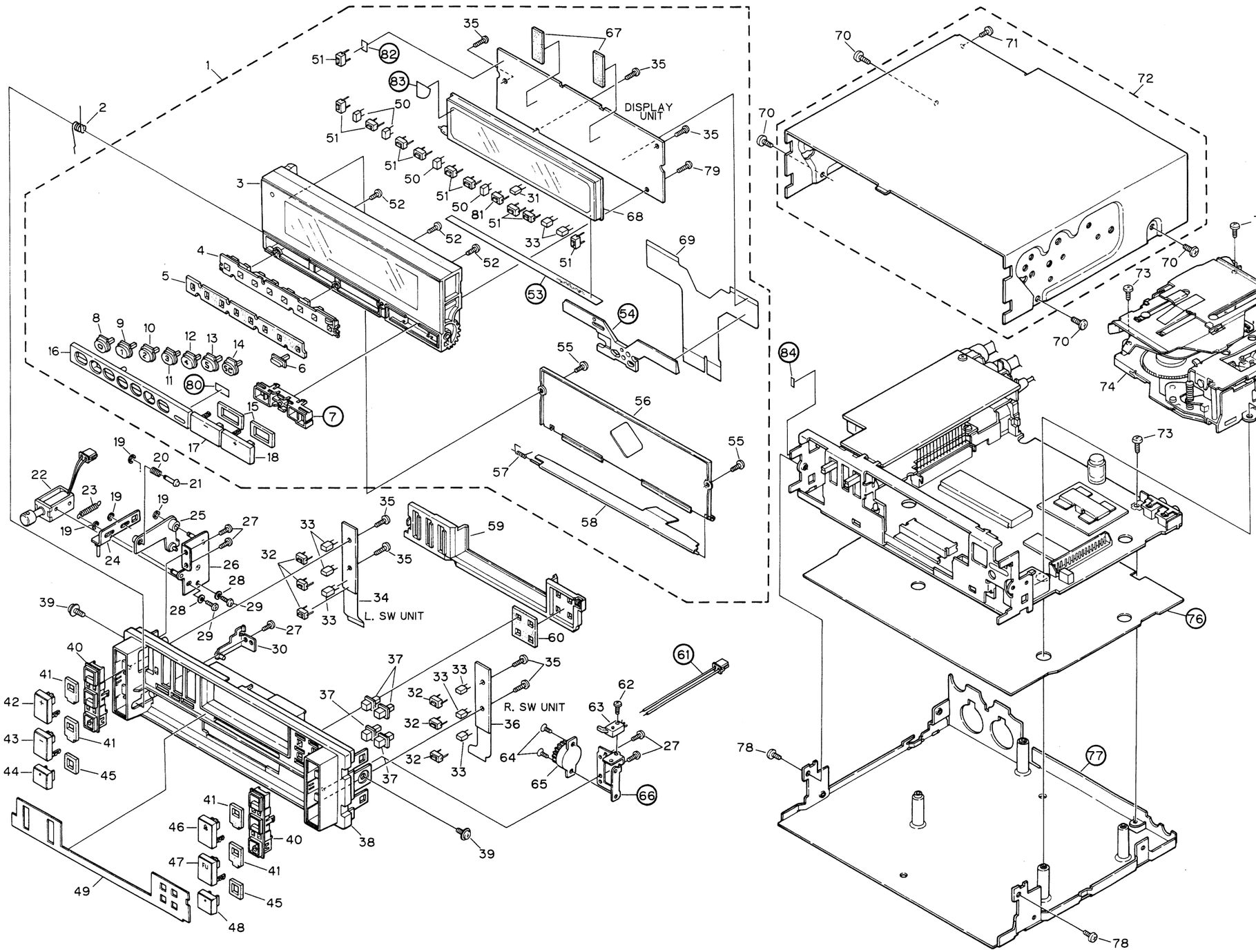


Fig. 18

- Parts

NOTE:
- *For yo*
  marks
  ★★: G
  This c
  model
- *Parts v*
- *Parts r*
  longer

Mark

• Parts List

NOTE:

- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Mark	No.	Part No.	Description
◉	1.	CWS1042	Display Unit (ES)
◉		CWS1041	Display Unit (EW)
◉		CWS1040	Display Unit (WG)
	2.	CBH1037	Spring
	3.	CXA1257	Grille Unit (ES)
		CXA1462	Grille Unit (EW)
		CXA1542	Grille Unit (WG)
	4.	CNV1169	Holder
	5.	CNM1193	Cushion
★	6.	CAC1229	Button (ES)
		VACANT	(EW)
★		CAC1233	Button (WG)
	7.		Holder
★	8.	CAC1153	Button (0)
★	9.	CAC1154	Button (1)
★	10.	CAC1155	Button (2)
★	11.	CAC1156	Button (3)
★	12.	CAC1157	Button (4)
★	13.	CAC1158	Button (5)
★	14.	CAC1177	Button (SC)
	15.	CNM1266	Cushion
	16.	CWS1042	Escutchion (ES)
		CWS1041	Escutchion (EW)
		CWS1040	Escutchion (WG)
★	17.	CAC1174	Button
★	18.	CAC1175	Button
	19.	YE15FUC	Washer
	20.	CBH1088	Spring
	21.	CLA1111	Shaft
★	22.	CXP1003	Solenoid
	23.	CBH-909	Spring
	24.	CXA1153	Lever Unit
	25.	CXA1558	Arm Unit
	26.	CXD-868	Bracket Unit
	27.	BPZ20P050FMC	Screw
	28.	WB20FMC	Washer
	29.	BMZ20P025FMC	Screw
	30.	CNC1199	Holder
★	31.	BG4524K	LED (ES, WG)
★★	32.	CSG-253	Switch
★	33.	BG4524K	LED
	34.	CNP1211	P.C. Board
	35.	PPZ20P080FMC	Screw
	36.	CNP1210	P.C. Board
★	37.	CAE-121	Button
	38.	CNS1129	Grille
	39.	PMS30P040FMC	Screw
	40.	CNV1202	Holder
	41.	CNM1249	Cushion
★	42.	CAC1168	Button (ES)
★		CAC1283	Button (EW, WG)
★	43.	CAC1170	Button (ES)
★		CAC1284	Button (EW, WG)
★	44.	CAC1171	Button
	45.	CNM1250	Cushion
★	46.	CAC1169	Button
★	47.	CAC1152	Button
★	48.	CAC1172	Button
	49.	CNM1352	Cover (ES)
		CNM1185	Cover (EW, WG)
★	50.	BG5724K-P	LED
★★	51.	CSG-255	Switch
	52.	PPZ20P050FMC	Screw
	53.		Cover
	54.		Spacer
	55.	BTZ20P060FZK	Screw
	56.	CXA1456	Plate Unit
	57.	CBH1001	Spring
	58.	CAT1029	Door
	59.	CNV1167	Lens
	60.	CNM1186	Cushion
	61.		Connector
	62.	CBA-172	Screw
★★	63.	CSN-078	Switch
	64.	CMZ20P040FMC	Screw
	65.	CXD-766	Damper Unit
	66.		Holder
	67.	CNM1189	Cushion
	68.	CAW1004	FL Tube (ES)
		CAW1011	FL Tube (EW, WG)
	69.	CNP1212	P.C. Board
	70.	CBA-178	Screw
	71.	BMZ26P040FZK	Screw
	72.	CXA1260	Case Unit
	73.	BMZ26P050FMC	Screw
◉	74.	CXK1645	Cassette Mechanism Assy
	75.		Shield Plate Assy
	76.		Insulator
	77.		Chassis Unit
	78.	BMZ26P040FMC	Screw
	79.	BPZ20P100FMC	Screw
	80.		Filter
★★	81.	CSG-255	Switch (ES, WG)
	82.		Spacer
	83.		Cover
	84.		Spacer

Fig. 18

11. CHASSIS EXPLODED VIEW

• Parts List

Mark	No.	Part No.	Description
	1.	CWM1181	Volume Unit (Complex Unit)
	2.	CNV1288	Cover
	3.		Frame
★	4.	CAC1228	Knob
★★	5.	CSG-253	Switch
★★	6.	CEL-180	Lamp, 14V40mA
	7.		Connector
	8.		Connector
	9.	BMZ26P050FMC	Screw
◉	10.	CWG1009	Audio Unit
	11.		Plug
	12.		Plug
	13.		Plug
	14.		Plug
	15.		Plug
	16.		Insulator
	17.		Connector
	18.		Connector
	19.		Plug
	20.		Plug
	21.		Connector
	22.		Plug
	23.	CKS1127	Connector
	24.		Spacer
	25.		Plug
	26.		Bracket
	27.	CWW1032	Driver Unit
	28.		Spacer
	29.	CDE1316	DIN Cord
	30.	CDE1247	DIN Cord
	31.	CDE1318	Cord
	32.	CNV1308	Cap
	33.	CNV1309	Cap
	34.	CKS-549	Socket
	35.	CKS-550	Socket
◉	36.	CWX1050	Logic Unit
	37.		Bracket
	38.	HKN-151	Jack
	39.		Plug
	40.	CWW1033	Pre Amp Unit
◉	41.	CWX1041	Control Unit (ES)
		CWX1042	Control Unit (EW, WG)
	42.	CNW-770	Cap

• Chassis

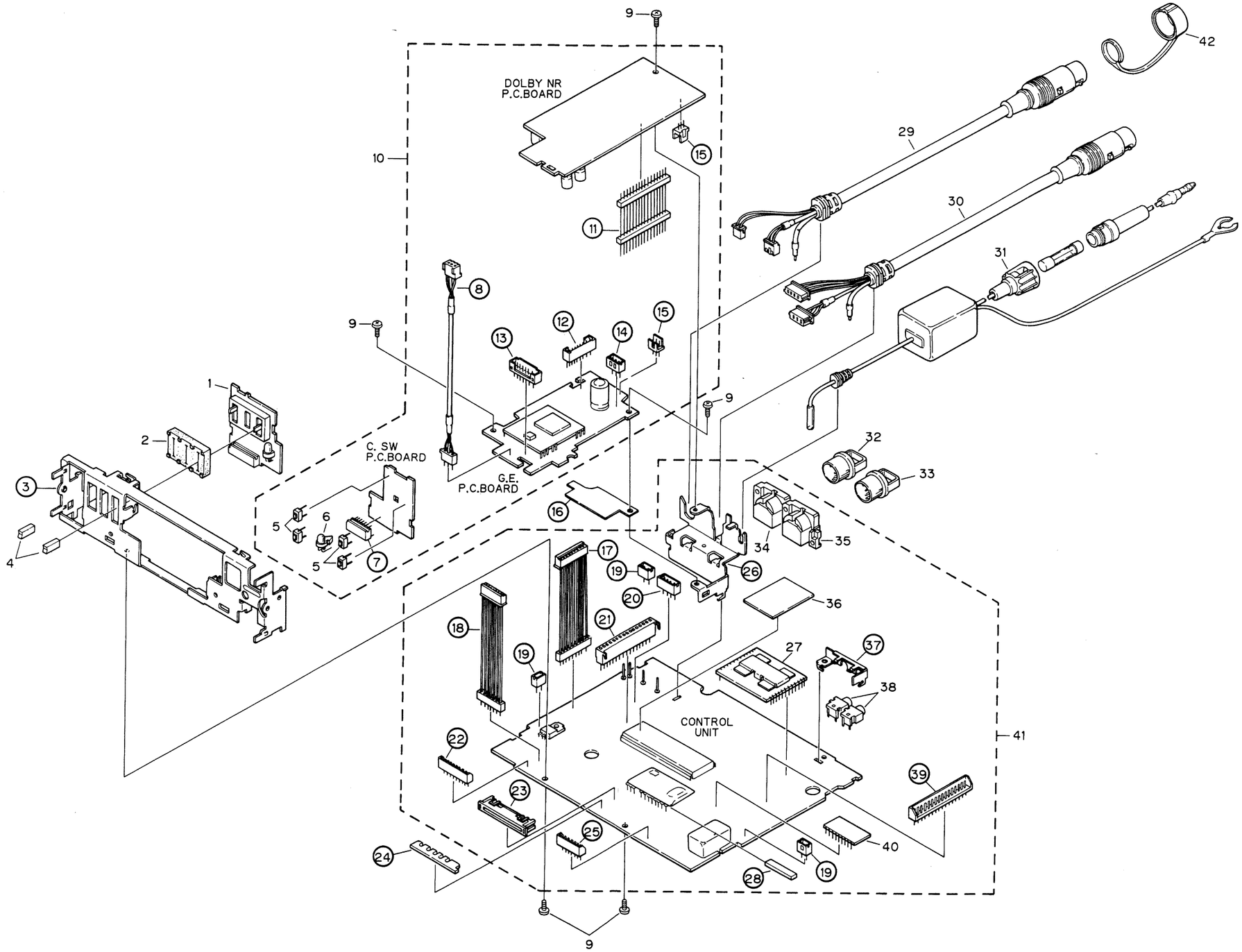


Fig. 19

12. CASSETTE MECHANISM ASSEMBLY EXPLODED VIEW

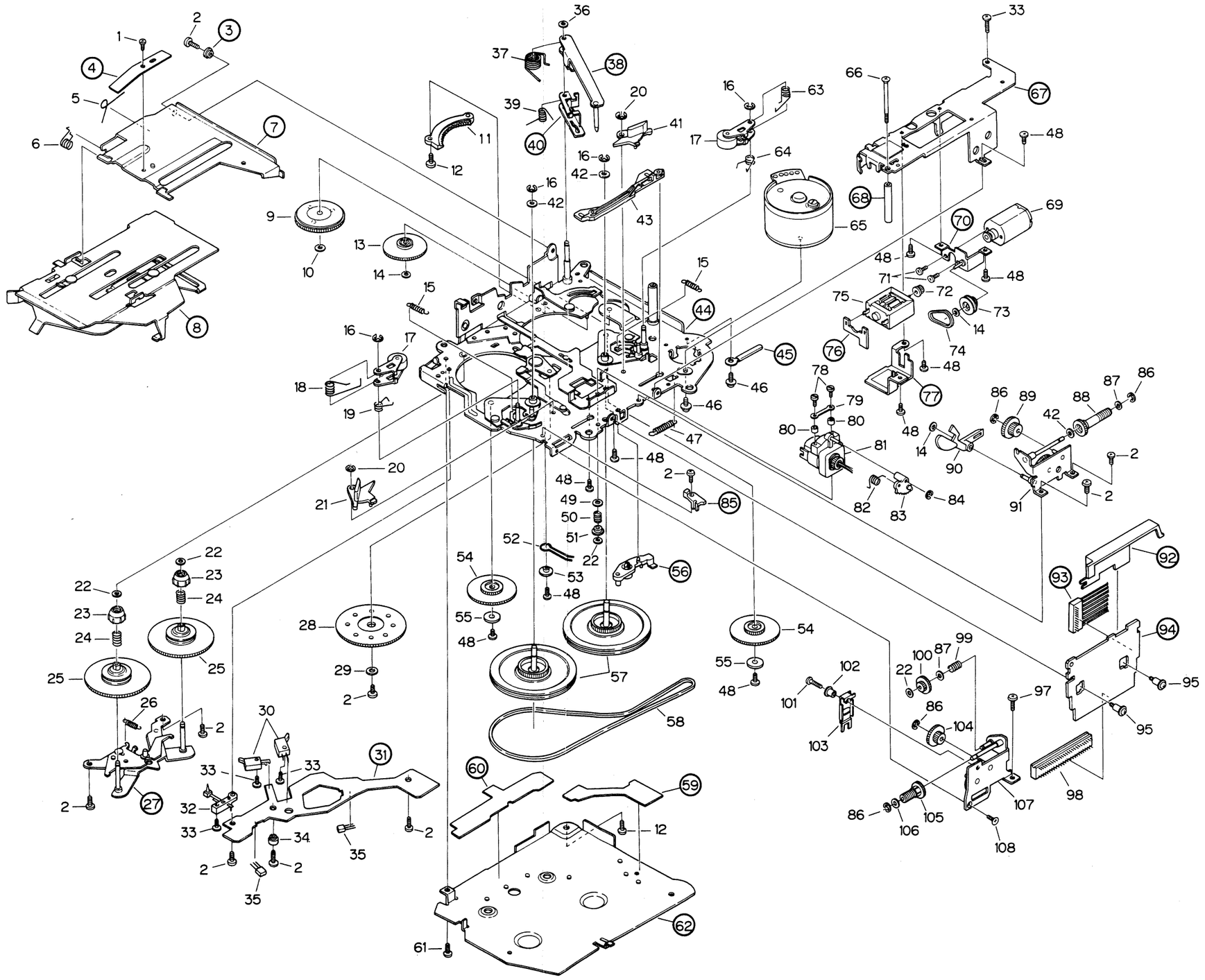


Fig. 20

● Parts List

Mark	No.	Part No.	Description
	1.	HBA-147	Screw, M1.4 x 1.4
	2.	BMZ20P040FMC	Screw
	3.		Bush
	4.		Spring
	5.	CBH-867	Spring
	6.	CBH-837	Spring
	7.		Arm
	8.		Holder Unit
	9.	CXD-900	Gear Unit
	10.	HBF-119	Washer
	11.	CNV1075	Gear
	12.	CBA1004	Screw, M2 x 6
	13.	CNY-271	Gear
	14.	CBF-126	Washer
	15.	CBH-835	Spring
	16.	CBG1001	E type Washer
★★	17.	CXA1445	Pinch Roller Unit
	18.	CBH-832	Spring
	19.	CBH-834	Spring
	20.	YE25FUC	Washer
	21.	CNW-930	Arm
	22.	CBF-135	Washer
	23.	CNW-932	Collar
	24.	CBH-827	Spring
★★	25.	CXD-877	Reel Unit
	26.	CBH-868	Spring
	27.		Bracket Unit
	28.	CNW-944	Gear
	29.	CLA1109	Collar
★★	30.	CSN-091	Switch (70μS, CST IN)
	31.		P.C. Board
★★	32.	CSN-089	Switch (CST SET)
	33.	CBA-172	Screw, M1.7 x 5.5
	34.	CLA1087	Collar
	35.	SDME106A	Magnetic Resistive Device
	36.	CBF-046	Washer
	37.	CBH-887	Spring
	38.		Arm Unit
	39.	CBH-886	Spring
	40.		Arm
	41.	CNW-931	Arm
	42.	HBF-179	Washer
	43.	CNY-263	Lever
	44.		Chassis Unit
	45.		Clamper
	46.	PMS26P030FMC	Screw
	47.	CBH-830	Spring
	48.	HBA-175	Screw, M2 x 2.5
	49.	CBE-123	Washer
	50.	CBH-902	Spring
	51.	HNC-953	Holder
	52.	CBH-893	Spring
	53.	CLA1110	Collar
	54.	CNV1178	Gear
	55.	CLA1108	Collar
	56.		Clamper
	57.	CNV1333	Flywheel
★★	58.	CNT-111	Belt
	59.		Insulator
	60.		Insulator
	61.	BMZ20P030FMC	Screw
	62.		Cover
	63.	CBH-831	Spring
	64.	CBH-833	Spring
★★	65.	CXM-161	Motor (Capstan)
	66.	CBA-165	Screw, M2 x 25
	67.		Guide
	68.		Spacer
★★	69.	CXM-452	Motor (Head Position)
	70.		Bracket Unit
	71.	HBA-244	Screw, M1.4 x 1.6
	72.	CNW-941	Gear
	73.	CNY-075	Pulley
★★	74.	CNT-114	Belt
	75.	CXM-351	Motor (Gear Position)
	76.		P.C. Board
	77.		Bracket
	78.	CBA-173	Screw, M1.4 x 8
	79.	CBE-114	Spring
	80.	CNY-134	Azimuth Rubber
★★	81.	CXA1214	Head Unit
	82.	CBH-829	Spring
	83.	CNW-939	Gear
	84.	YE15FUC	E type Washer
	85.		Spacer
	86.	YE12FUC	E type Washer
	87.	HBF-116	Washer
	88.	CNW-956	Gear
	89.	CNW-955	Gear
	90.	CNV1260	Arm
	91.	CXA1432	Holder Assy
	92.		Holder
	93.		Connector (8P)
	94.		P.C. Board
	95.	CBA1022	Screw, M2 x 2 x 3
	96.	VACANT	
	97.	BMZ20P060FMC	Screw
	98.	CKS-678	Connector (40P)
	99.	CBH-866	Spring
	100.	CNW-954	Gear
	101.	HBA-158	Screw, M1.4 x 5
	102.	CLB-750	Collar
	103.	CNH-004	Arm
	104.	CNY-077	Gear
	105.	CNY-148	Gear
	106.	CBF-088	Washer
	107.	CXA1433	Holder Assy
	108.	HBA-209	Screw, M2 x 2

13. ELECTRICAL 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 × 10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

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

5.62kΩ	*562 × 10¹*	*RN1/4SR 5 6 2 1 F*

- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*
  Chip Resistor
  RS1/8S □□□J, RS1/10S □□□J
  Chip Capacitor (except for CQS.....)
  CKS....., CCS....., CSZS.....

Audio Unit
Consists of
Dolby NR. P.C. Board
G.E. P.C. Board
C. Switch P.C. Baord

Audio Unit

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC301	BH-2402
★★	IC601	TA75558S
★★	IC602	TC9177P
★★	IC603, 604	μPC4570HA
★★	IC651	KHA212
★★	IC851, 852	KHA207
	L351, 352 Coil	CTF1019
★★	IL1 Lamp, 14V40mA	CEL-180
★★	S957 – 960 Switch	CSG-253

RESISTORS

Mark	Symbol & Description	Part No.
	R607, 621, 622, 624, 625, 629, 635, 637, 642	RD1/4PS□□□JL
	Other Resistors	RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C301, 302, 601, 602, 615, 616	CEA4R7M35LS
	C303, 304	CKSYB152K50
	C305 – 307, 606, 655	CEA101M10LL
	C603, 604, 611 – 614	CEA010M50LS2
	C605	CEA102M6R3L2
	C607, 608	CKSYB331K50
	C609, 610	CKSYB273K25
	C617, 618	CEA220M16LS
	C619, 620	CKSYB221K50
	C621, 622, 651 – 654, 656	CEA100M25LS
	C623, 624	CKSYB332K50
	C629, 630	CEA4R7M35LS
	C851 – 854	CEA100M25LS
	C855	CEA102M10L2

Control Unit

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC701	PD3069B
★★	IC703	M51954AL
★★	IC704 (EW, WG)	PDH001
★★	IC705	M51304L
★★	IC706	KHA703
★★	IC707	TC4051BF
★★	IC708	HA17358
★★	Q701, 711, 715 – 717, 725, 727, 731	2SC2458 or 2SC1740S
★★	Q703, 704, 710, 712, 713, 723, 726	DTC114TS or UN4215
★★	Q705 – 708	2SA1048 or 2SA933S
★★	Q709, 722	DTA143ES or UN4122
★★	Q714, 721	2SD1227M
★★	Q718	2SB1066M
★★	Q719, 720	2SD1055F
★★	Q724	2SD945
★★	Q728	2SC2634NC
★	D251, 719	1S1555 or US1040
★	D702, 721	RD6R2JSB2 or HZS6R2JB2
★	D703, 704, 709 – 713, 715, 717	US1040M or 1SS176 or 1SS133
★	D706, 722, 723, 726	ERA15-02VH
★	D707	HZ6LC1 or HZ6LC2
★	D714	HZ9LB1 or HZ9LB2 or MTZ9R1JAB
★	D716, 718	HZ9LC2 or HZ9LC3 or MTZ10JA
★	D720	RD7R5JSB2 or HZS7R5JB2
★	D724	MTZ11JA or HZS11JB1
	L701 DC-DC Converter	CTX1007
	L702 Coil	CTF-113
	L703 (EW, WG)	CCG-081
	IB701	CWW-247
	IB702	CWW1034
	X701 Ceramic Oscillator	CSS-042
★★	VR251, 252 Semi-fixed, 680Ω (B)	CCP-315
	Pre Amp Unit	CWW1033
	Driver Unit	CWW1032

RESISTORS

Mark	Symbol & Description	Part No.
	R253, 254, 707 – 717, 721 – 724, 727, 728, 743, 748, 749, 753, 761 – 767, 770, 772, 773, 775 – 781, 785, 786, 789, 791 – 793, 795 – 799, 804	RD1/4PS□□□JL
	R737 – 739, 774, 784, 787 – 790, 800	RD1/2PS□□□JL
	R760, 794	RD1/4PM□□□J
	Other Resistors	RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C251, 252	CKSYB391K50
	C253, 254	CEANL4R7M35LL
	C255, 256, 701, 702, 733	CEA220M16LS
	C257	CEA221M10L2
	C703, 704	CCSCH330J50
	C705 – 709	CKSYB473K25
	C710	CEAR22M50L2
	C711 2200μF/16V	CCH1001
	C712	CEA0R1M50LS2
	C713, 718	CEA100M25LS
	C714, 715	CEA4R7M35LS
	C719	CEA330M10LS
	C720	CKSYB102K50
	C721, 722, 725, 735 – 740	CEA101M16LL
	C723	CEAR47M50LS2
	C724	CEA010M50NPLL
	C726 – 732	CEA2R2M50LS2
	C741, 742	CQEA473J50
	C743, 744	CEA101M35L2
	C745 470μF/16V	CCH-114
	C746	CQEA104J50
	C747, 751	CEA470M16LS
	C748	CEA221M16L2
	C756, 757	CKSYB473K25

Logic Unit

Mark	Symbol & Description	Part No.
★	IC711	μPD45388G
★★	Q732	DTC124ES or UN4212
★	D801, 802	1SS133 or US1040M or 1SS176
	R815 – 817	RD1/4PS□□□JL
	C771	CSZA2R2K16L
	C772	CQMA103J50LL
	C773	CSZAR47M35L

R. Switch Unit

Mark	Symbol & Description	Part No.
★	D951 – 953 LED	BG4524K
★★	S951 – 953 Switch	CSG-253

L. Switch Unit

Mark	Symbol & Description	Part No.
★	D954 – 956 LED	BG4524K
★★	S954 – 956 Switch	CSG-253

Display Unit

Mark	Symbol & Description	Part No.
★★	IC901 (ES)	PD4092A
★★	IC901 (EW, WG)	PD4091
★★	Q901	2SD1055F
★	D901, 902 LED	BG4524K
★	D903 (ES, WG) LED	BG4524K
★	D904 – 907 LED	BG5724K-P
★	D908 – 910 (ES, WG)	1SS133 or US1040M or 1SS176
★	D908 – 910 (EW)	1SS133
	TC901 (ES) Trimmer	CCL1006
	X901 Crystal	CSS1012
★★	S901 – 908, 910, 911 Switch	CSG-255
★★	S909 (ES, WG) Switch	CSG-255
	FL Tube (ES)	CAW1004
	FL Tube (EW, WG)	CAW1011
	R901 (EW)	RD1/4PS□□□JL
	C901 (EW, WG)	CCDCH100D50L
	C902	CCDCH100D50L

Switch P.C. Board

Mark	Symbol & Description		Part No.
★★	S1	Switch (CST SET)	CSN-089
★★	S2, 3	Switch (CST IN, 70μs)	CSN-091
	MR1, 2	Magnetic Resistive Device	SDME106A

P.C. Board Unit

Mark	Symbol & Description	Part No.
★	D1 – 3	1S1555

Miscellaneous Part List

Mark	Symbol & Description		Part No.
★★	HD1	Head Unit	CXA1214
★★	M1	Motor (Head)	CXM-452
★★	M2	Motor (Gear)	CXM-351
★★	M3	Motor (Capstan)	CXM-161
★★	S1	Switch (Door)	CSN-078
★	SO1	Solenoid (Door)	CXP1003
	Volume Unit (Complex Unit)		CWM1181

14. PACKING METHOD

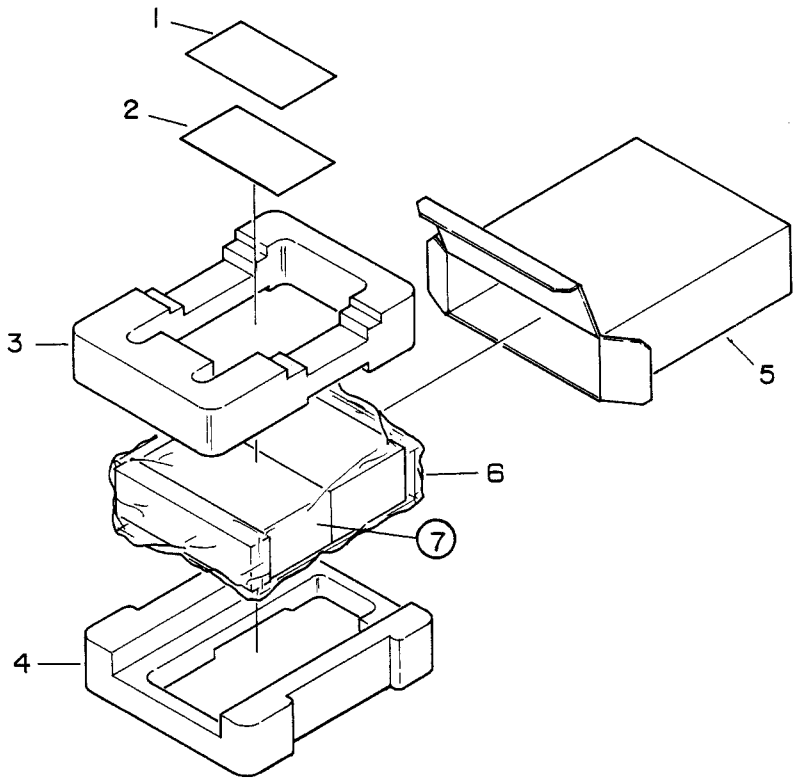


Fig. 21

● Parts List

Mark	No.	Part No.	Description
	1.	CRD1082	Owner's Manual (ES) (English, French, Spanish, Arabic)
		CRD1070	Owner's Manual (EW) (English, French, German, Spanish)
		CRD1071	Owner's Manual (EW) (Swedish, Norwegian, Dutch, Italian)
		CRD1072	Owner's Manual (WG) (French, German)
			Card (EW, WG)
			Card (EW, WG)
			Caution Card (WG)
		CNW-757	Holder
		CNB1044	Panel
			Double-sided Seal
	2.	CEA1106	Accessory Assy
	2-1.		Screw Assy
	2-1-1.	CBA-102	Screw
	2-1-2.	CBA1002	Screw
	2-1-3.	NF50FMC	Nut
	2-2.	CNF-111	Strap
	2-3.	CNF-382	Lever
	2-4.	CNV1009	Bush
	3.	CHP1042	Styrofoam
	4.	CHP1041	Styrofoam
	5.	CHG1238	Carton (ES)
		CHG1236	Carton (EW)
		CHG1237	Carton (WG)
	6.	CEG-114	Cover
	7.		Holder