

 PIONEER®

Service Manual



The photo shows the model FX-K5/EW

ORDER NO.
CRT-469-0

CENTRATE COMPONENT CAR STEREO CASSETTE DECK

FX-K5SDK

WG

FX-K5B

EW

FX-K5

EW

• Cassette Mechanism Assembly

See the Service Manual CX-156/A (CRT-468) when servicing the cassette mechanism assembly.

SPECIFICATION

General

Power source DC 14.4V (10.8 ~ 15.6V allowable)
Grounding system Negative type
Dimensions 180(W)×50(H)×168(D) mm
(chassis) 178(W)×50(H)×175(D) mm (FX-K5B)
(front face) 188(W)×58(H)×25(D) mm (FX-K5B)
Weight 1.4kg
Tone controls (bass) ±10dB (100Hz)
(treble) ±10dB (10kHz)
Maximum output level 200mV
Output impedance 2kΩ

Tape Player

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

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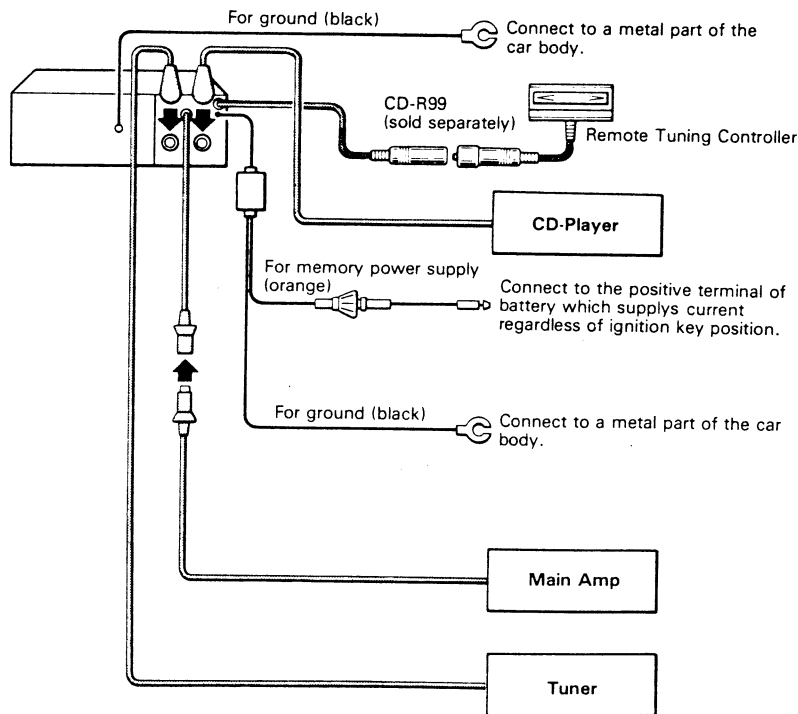
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1. CONNECTION



QUESTIONNAIRE

MODEL _____

One Model per questionnaire

Dear Servicer,

Thank you for your cooperation in the post-sale service of Pioneer products.

This questionnaire is used as a tool to improve the serviceability of our products and service manuals. Please evaluate this model and service manual by answering the following questions. Your ideas may be realized in our future products. Your answers will be appreciated. Thank you.

PIONEER ELECTRONIC CORP.

T. Nakagawa, Manager, Service Section, International Division

| 1. SERVICING EVALUATION | Circle applicable number: | Good | Fair | Poor | | |
|-----------------------------|---------------------------|------|------|------|----|----|
| a. Disassembly/Re-assembly: | | 1 | 2 | 3 | *4 | *5 |
| b. Circuit Checks: | | 1 | 2 | 3 | *4 | *5 |
| c. Replacement of Parts: | | 1 | 2 | 3 | *4 | *5 |
| d. Adjustment (s): | | 1 | 2 | 3 | *4 | *5 |

* If (4) or (5) was circled, please be specific. _____

e. Your advice, opinion or ideas related to servicing this product.

2. SERVICE MANUAL EVALUATION

a. Circuit & Mechanism Description

b. Circuit Diagram

3. OTHER

Please describe other areas of servicing which you may find difficult.

Completed by :

Date :

Company Name :

Address :

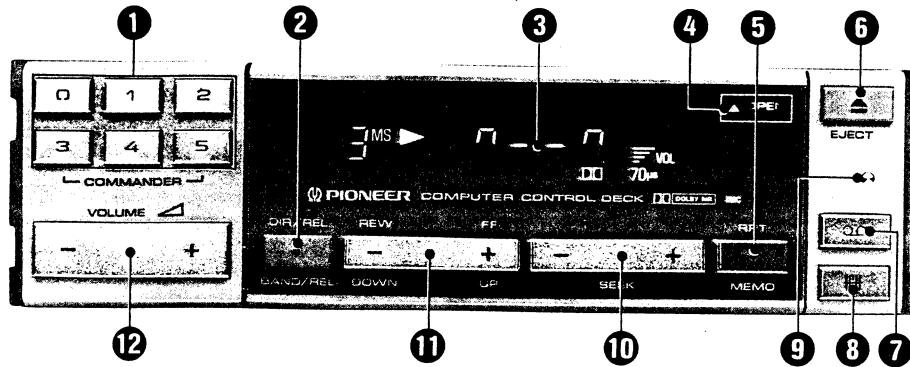
City/State/Zip :

Please send this form filled to the distributor in your country.

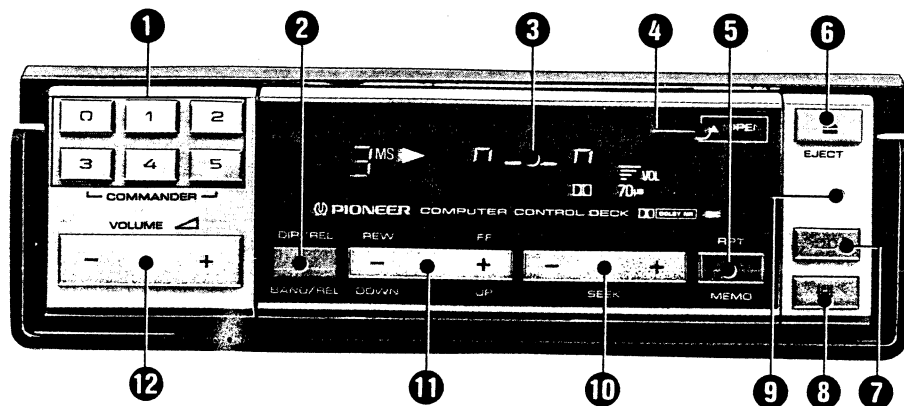
2. OPERATION

(Front section)

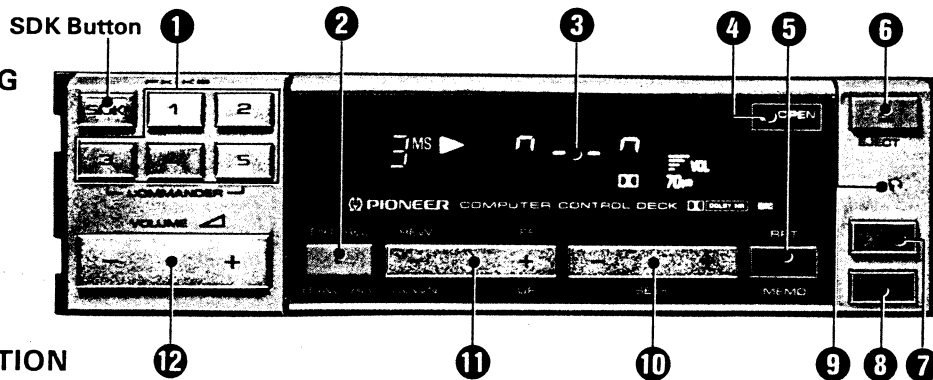
FX-K5/EW



FX-K5B/EW



FX-K5 SDK/WG



2.1 TAPE SECTION

① Command Button

Press the command button to set the number of recorded selections to be skipped or to set the number of times a piece is to be repeated.

② 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 search, repeat, skip search, and fast forward or rewind.

③ Display

④ Open Indicator

Flip-down control panel opens when pressed.

⑤ Music Repeat Button

Press this button to hear the piece you are listening to as many times as you wish. Also, with the repeat command set, the piece will play as many times as the number you have set. To cancel music repeat, press the release button or music repeat button one time.

⑥ Eject Button

Use this button to eject the cassette from the unit.

⑦ Tape Power Switch

Press to stop the play of a selection. Pressing again will supply power and cause the tape to continue from the position at which it stopped.

When switching to the tuner (sold separately), pressing the tuner power switch without turning the deck off will switch from the deck to the tuner.

⑧ Tuner Power Switch

⑨ Clear Button

Press this button with a pointed rod if the tape running should by chance malfunction (incorrect display, etc.). After several seconds, tape running will return to normal.

⑩ Seek Button

⑪ Fast Forward Button (+) / Rewind Button (-)

Press the (+) side for fast forward or the (-) side for rewind. For music search, press this button twice.

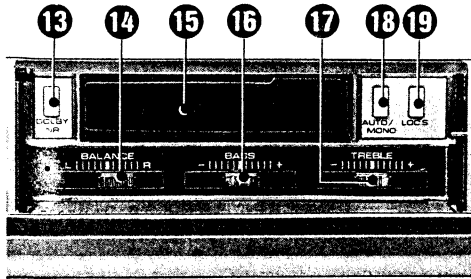
⑫ Volume Increase Button (+) Volume Decrease Button (-)

Press the (+) side to increase volume (soft → loud) or the (-) side to decrease volume (loud → soft). The button has 34 levels of adjustment. Each time you press the button, the volume level increases or decreases accordingly. Hold the button and the volume will increase or decrease continuously.

FX-K5SDK/FX-K5B/FX-K5

- Nomenclature and Use
- Nomenclature and Use

(Flip-Down Control Panel Section)



13 Dolby NR Button

Press this button to play a tape recorded on a Dolby NR system. (□□ will light up on the display.)

14 Balance Control

15 Cassette Insert Slot

Insert the cassette into the loading slot with the playing edge (the edge where the tape is exposed) to the right, and the deck will set the cassette automatically.

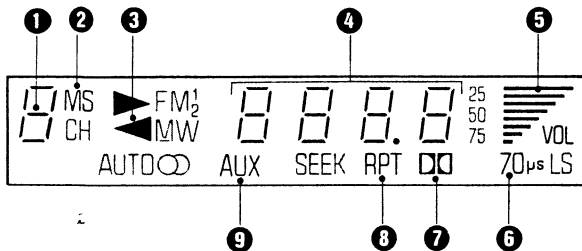
16 Bass Control

17 Treble Control

18 Auto/Mono Switching Button

19 Local Station Button

• Reading the Display



1 : Number of Times to Skip or Repeat

The number corresponding to the commander button pressed to set the number of recorded sections to skip in skip search or the number of times to replay in music repeat is displayed.

- For music repeat, the number of repeats is set and the display changes as shown in the following figure.

Example: Set repeat for 2 times



2 : Skip Search/Music Search Display

MS display lights when skip search or music search is operating.

- For skip search, the display changes as shown in the following figure.

Example: To find the beginning of the second selection before the one being played.

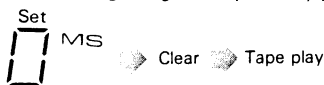


Example: To find the beginning of the second selection following the one being played.



- For music search, the display changes as shown in the following figure.

Find the beginning of the presently playing piece.



Find the beginning of the next piece following the presently playing piece.



3 : Tape Play Indication

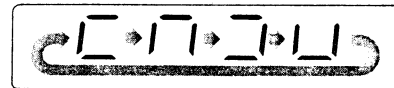
When playing back upper tracks mark appears and when lower tracks are played back, mark appears.

4 - 1 : Tape Play, Fast Forward/Rewind Indication

When the mark appears, tape travel is in the normal direction and the mark rolls in the direction shown in the following figure: (counterclockwise)



When the mark appears, tape travel is in the reverse direction and the mark rolls in the direction shown in the following figure: (clockwise)



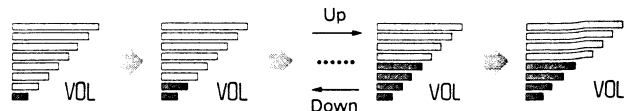
During fast forward and rewind, speed of rotation of the mark is faster. During fast forward, the mark rolls in the normal direction. During rewind, the mark rolls in the reverse direction.

4 - 2 : ATSC (Automatic Tape Slack Canceled) Display

When a cassette is set in the deck, the tape slack is taken up automatically. At this time _ _ display flashes.

5 : Volume Level

Press the volume button and the volume level is indicated in yellow steps from 1 to 19 and red steps from 20 to 34. Volume level change is indicated as shown in the following figure. The symbol is always lit.



6 : 70µs Tape Display

Insert a cassette tape and the auto tape selector will automatically switch the equalizer (70µs/120µs). If it is a 70µs tape, the display will illuminate. If it is a 120µs tape, there is no display.

7 : Dolby NR Display

Press Dolby NR button to listen to a tape recorded on Dolby N R. display will illuminate.

8 : Music Repeat Display

Press music repeat button and RPT display will illuminate to indicate the function.

9 : External Input Display

With this set OFF and another unit connected by external input jack (Compact Disc Player, etc.), operating, AUX display will illuminate.

• **Playing**

1. Press the **▲ OPEN** ④ indicator and the flip-down control panel will open.
2. Insert a cassette tape into the slot ⑮ and the deck will load the cassette automatically to play the tape.
3. Press Dolby NR button ⑯ to listen to your tapes recorded on Dolby NR system.
4. Adjust volume ⑫, balance ⑭, bass ⑰ and treble ⑱ controls as you like.
5. Close the flip-down control panel.
6. To stop a tape, press the tape power switch ⑦. Press the switch again, and play will begin at the place where it was stopped.
7. To eject the cassette from the unit, first press the **▲ OPEN** ④ indicator to open the flip-down control panel. Next press the eject button ⑥ to eject the cassette.

Note:

- When the flip-down control panel is open, do not use excessive force to the panel so as not to damage it.
- 4 seconds after a cassette is set, the cassette ejects automatically because the set condition is not correct. In this case, check for tape damage.
- 4 seconds after pressing the eject button, the cassette does not eject but starts to play again. If the cassette still does not eject after three attempts, stop all equipment. If the condition should occur again, contact the dealer where you bought the deck or your nearest Pioneer Service Station for repairs.

2.2 TUNER SECTION

① **Station Preset Button**

A total of 12 FM stations (6 under FM1 and 6 under FM2), 6 MW stations and 6 LW stations can be preprogrammed into memory using this button. Once in memory, these 24 frequencies are available for tuning at the touch of a button.

② **Band Switching/Release Button**

Pressing this button will switch to the next band in the following order: FM1 → FM2 → MW → LW → FM1. This button also works to cancel a seek tune frequency.

③ **Display**

⑤ **Memory Button**

⑥ **Tuner Power Switch**

Press this button to turn on power to the tuner control section. Press the button again to turn power off.

Also, when you want to listen to a tape, press the tape power switch directly and tape play will be selected instead of the tuner.

⑧ **Clear Button**

If something goes wrong (display is incorrect, etc.) while you are listening, press this button with a pointed rod. After several seconds, operation will return to normal. Remember that when you press this button, all preset frequencies entered into memory are erased and programmed function settings are cleared so you should make settings again as desired.

⑩ **Seek Button**

Pressing the (+) side of this button automatically advances the tuning to the next higher frequency, while pressing the (-) side tunes to the next lower frequency.

⑪ **Tuning Button**

Press the (+) side (low → high) or the (-) side (high → low) to adjust the station frequency setting.

⑬ **Auto/Mono Switching Button**

This button functions during FM broadcasts. Generally this button is pressed and left in the AUTO setting. (Note: The word AUTO is illuminated on the display in this setting.) In this position the unit will automatically switch to high quality stereo when a strong signal is

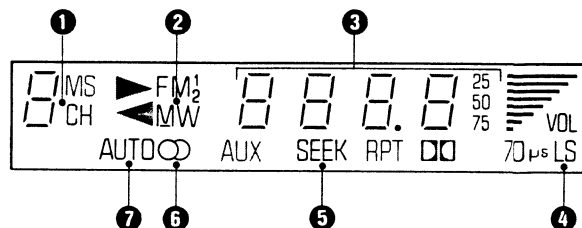
present, and to the optimal reception condition should the signal weaken or to monaural when a very weak signal is present. Pressing the button once more (Note: the illuminated AUTO will disappear from the display) will allow reception of frequencies regardless of their strength, in monaural.

⑭ **Local Station Button**

Use this button to change the seek threshold level of the seek function. Normally, this button is kept in the OFF position. At night, when radio signal conditions are favorable, very weak signals are often detected and sought out by the seek function. Pressing this button (Note: LS will illuminate on the display) will raise the seek threshold level to eliminate this problem.

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

• **Reading the Display (FX-K5, FX-K5B)**



① **CH : Channel Number Display**

Press the station preset button and the number of preset channel is displayed.

② **FM₁/MW : Band Display**

Pressing the band switching button will let you select and display the band you desire (FM1 → FM2 → MW → LW → FM1). Select FM1 or FM2 to listen to an FM broadcast, MW to listen to an MW broadcast and LW for LW broadcasts.

③ **Frequency Display**

When the tuner is turned on, each band can be displayed over the following frequency ranges: FM = 87.5~108MHz, MW = 531~1,602kHz, LW = 153~281kHz.

④ **LS : Local Station Display**

Press local station button and LS display will illuminate to indicate the function.

⑤ **SEEK : Seek Display**

Press seek button and SEEK display will illuminate to indicate the function.

⑥ **FM Stereo Reception Display**

When FM stereo is being received, is illuminated.

⑦ **AUTO : Auto Display**

Pressing the auto/mono switching button illuminates AUTO on the display. When pressed one more, it will go out.

• **Reading the Display (FX-K5SDK)**



⑧ **SDK : SDK Display**

⑨ **SK : SK Display**

• **Tuning an FM/MW/LW station**

1. Press tuner power switch ④ to turn power on. Band and frequency will illuminate on the display ③.
2. Press band selection button ② to set the band you wish to listen to.
3. Select the station you want to listen to by using either manual or seek tuning. Press preset button ① to place in memory the frequency of a station you often listen to.
4. Set volume ⑫, balance ⑬, bass ⑩ and treble ⑰ controls to the position you like best.
5. Press tuner power switch ④ to turn the power off.

Manual Tuning

To manually tune a station, press the tuning button ① on the (+) side (low to high frequency) or (-) side (high to low frequency). Press the button once and the frequency will change 25kHz under FM, 9kHz under MW, and 1kHz under LW. Holding the button down longer than 0.5 seconds enables high speed frequency change.

Note:

Frequencies in the range of 281~153kHz can be tuned in the downward direction in the LW band, but in the upward direction the range becomes 155~281kHz.

Seek Tuning

To use seek tuning to find the next higher broadcast frequency from the present frequency, press the (+) side of the seek button ⑩. To find the next lower frequency, press the (-) side. (Note: SEEK will illuminate on the display when this function is in operation.)

Note:

Seek tuning changes frequencies in the FM band in 50kHz steps, and those in the LW band in 9kHz steps.

Example: Seek tuning upwards from 158 kHz

158 kHz → 167 kHz → 176 kHz... 266 kHz → 275 kHz

Example: Seek tuning upwards from 266 kHz

266 kHz → 275 kHz → 155 kHz → 164 kHz... 281 kHz

• **Station Tuning Memory**

Press the preset button to place a frequency in memory. This is convenient for finding a station you listen to often. Afterwards, the station can be recalled with a simple one-touch operation by pressing the preset button. Follow the steps below to use the preset station memory.

1. Press band selection button ② to set the band of FM1, FM2, MW or LW.
2. Receive the station that you wish to memorize using either manual or seek tuning.
3. Press memory button ⑤ and CH will flash on the display ③ for 5 seconds. During this time, press the preset button ① once. (for example, press button 2 and \square_{CH} will illuminate on the display.)
4. Now one button and one station frequency are in memory. Follow steps (2) and (3) for the other 5 buttons.

Note:

Both FM1 and FM2 cover the frequency band for 87.5 to 108MHz. One preset button sets FM broadcast for two stations in memory, so a total of 12 stations can be set.

3. PARTS LOCATION (FX-K5/EW, FX-K5SDK/WG)

- 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.
- The photo shows the model FX-K5/EW.

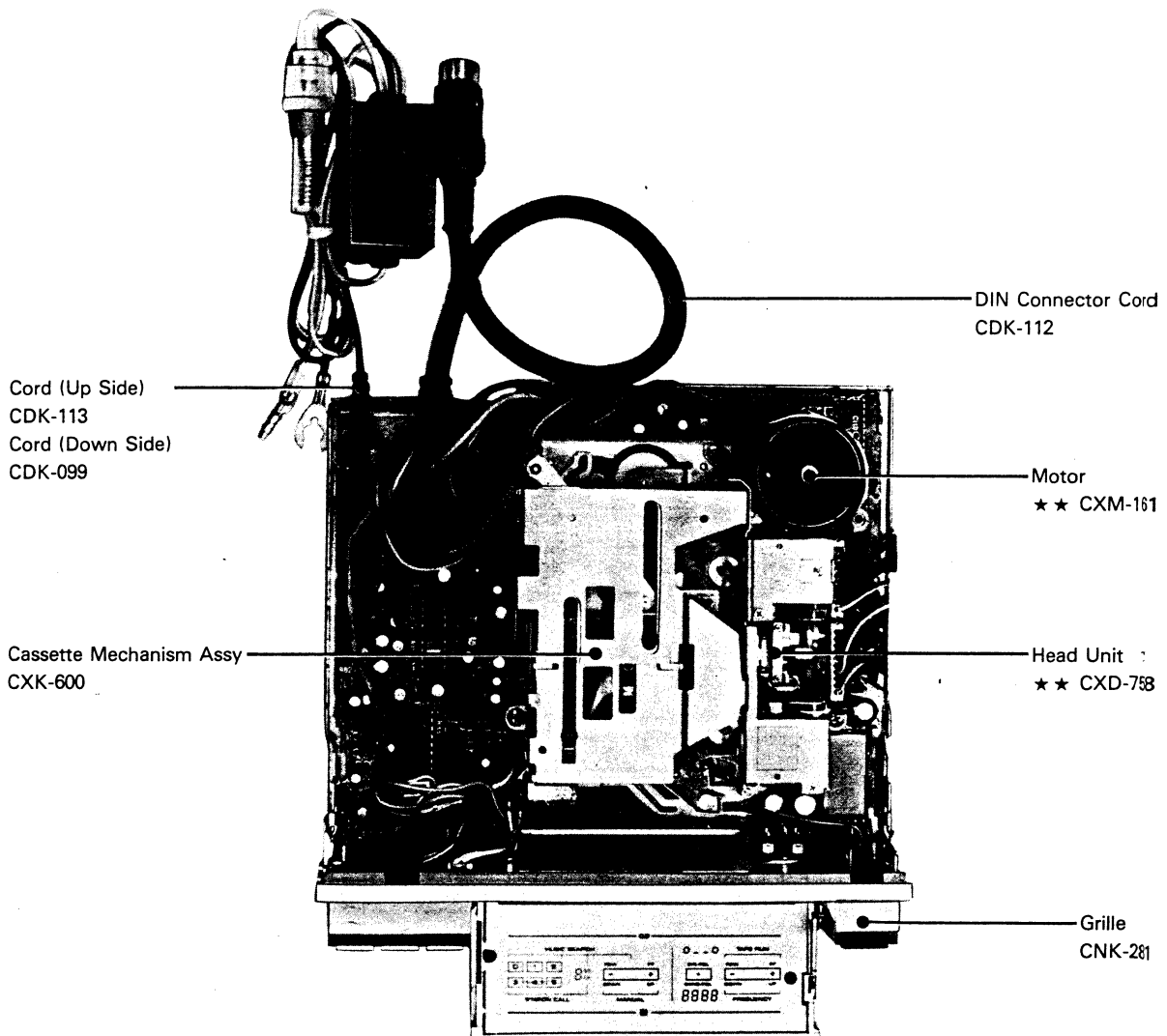


Fig. 1

4. PARTS LOCATION (FX-K5B/EW)

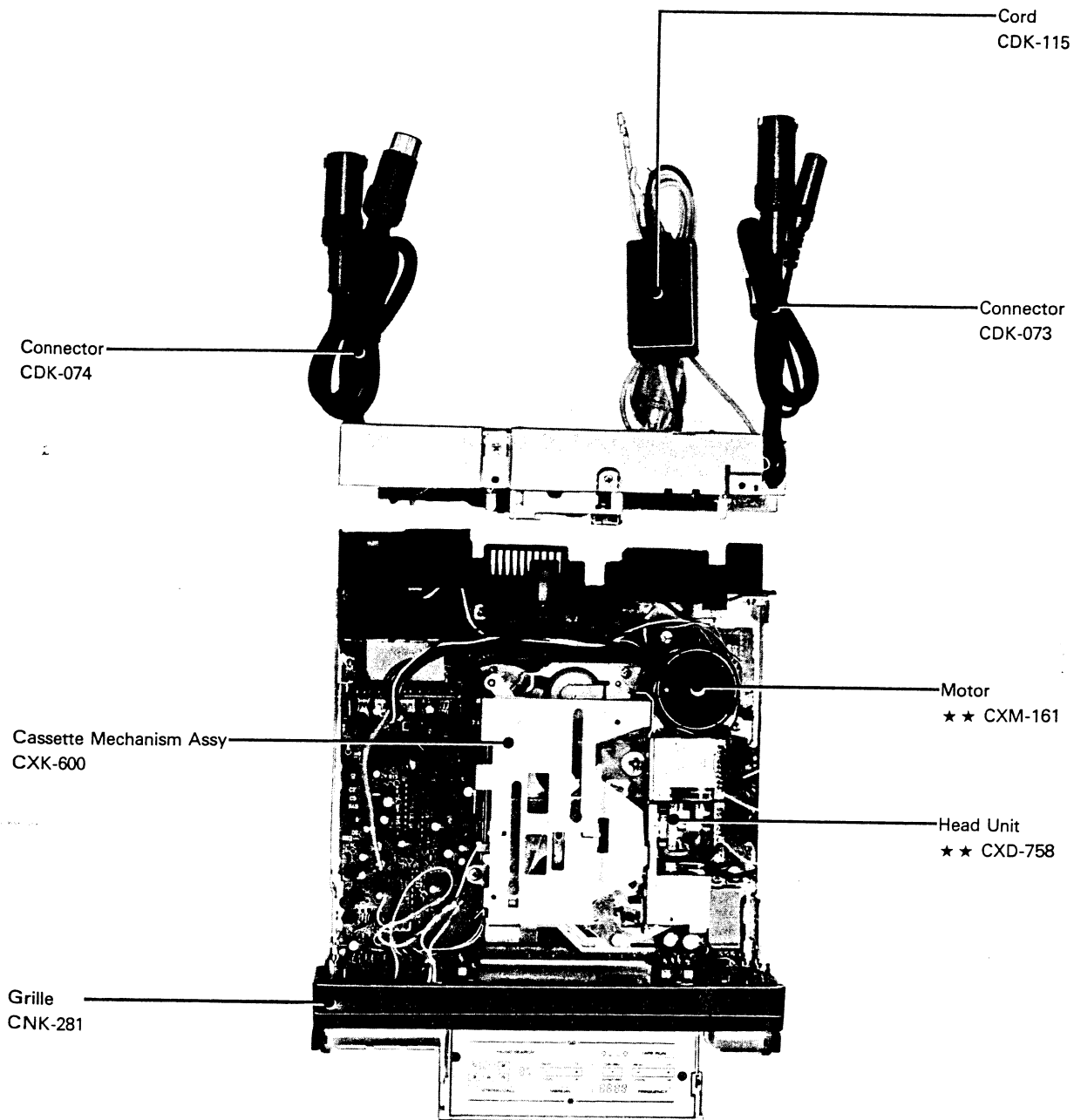


Fig. 2

5. DISASSEMBLY

• Case removal (FX-K5/EW, FX-K5SDK/WG)

1. The case can be removed by removing the four screws labeled "A".

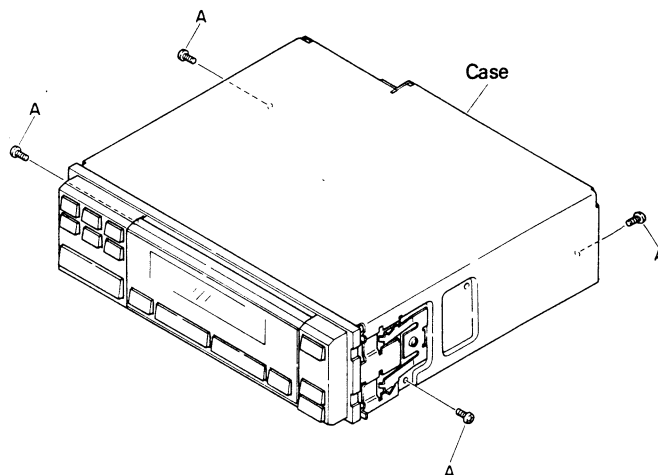


Fig. 3

• Case removal (FX-K5B/EW)

1. The case can be removed by first removing the battery cover and then the six screws.

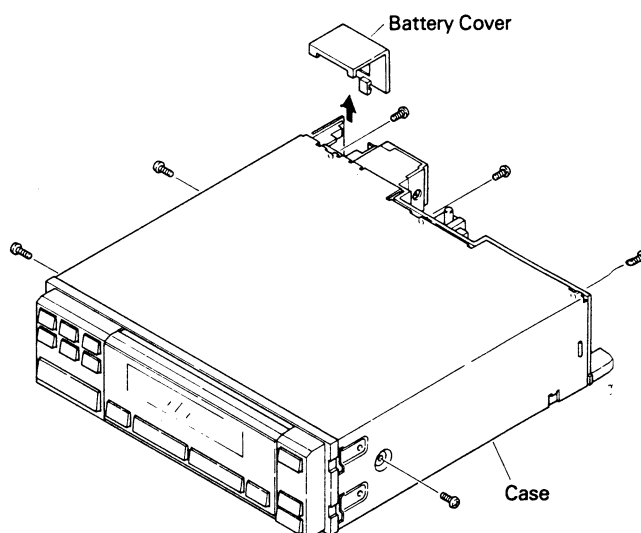


Fig. 4

• Cassette mechanism assembly removal

1. This assembly can be removed by removing the four screws labeled "B" and the connector.

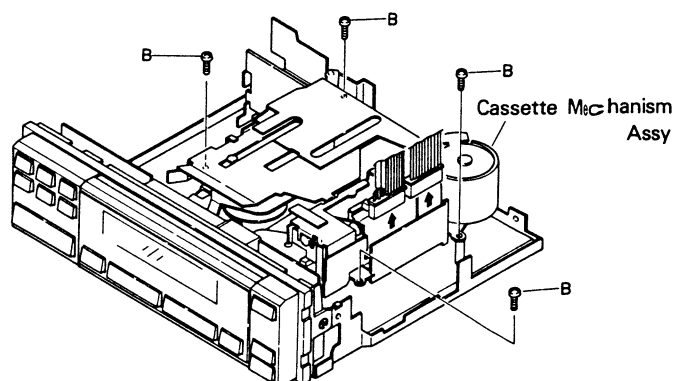


Fig. 5

• Chassis unit removal (FX-K5/EW, FX-K5SDK/WG)

1. This unit can be removed by removing the four screws labeled "C".

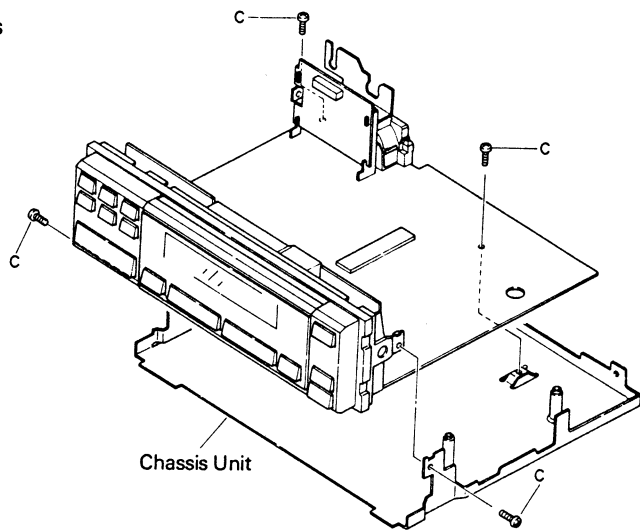


Fig. 6

• Chassis unit removal (FX-K5B/EW)

1. Remove the three screws labeled "H" and remove the rear panel assembly.
2. The chassis unit can then be removed by removing the four screws labeled "J".

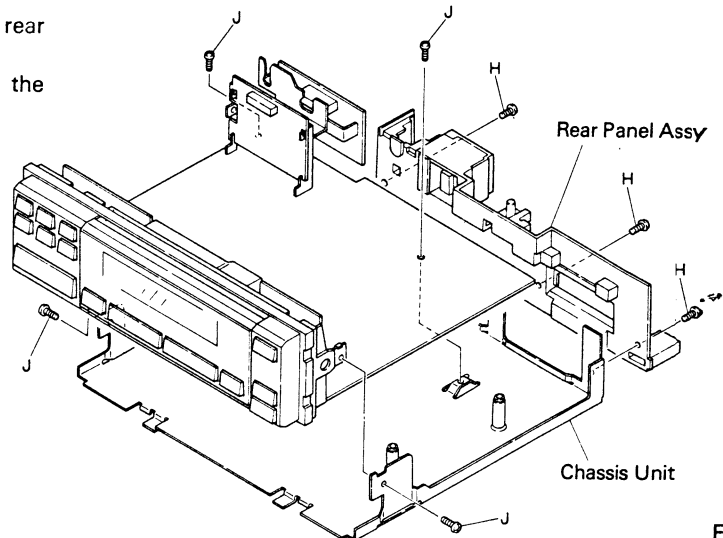


Fig. 7

• Grille assembly removal

1. This assembly can be removed by unsoldering points "A", "B", and "C" and then removing the two screws labeled "D".

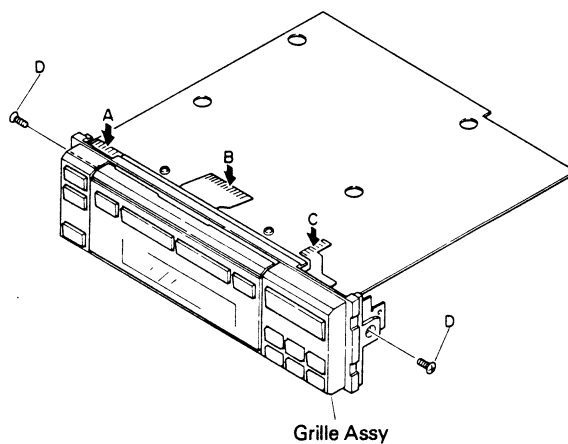


Fig. 8

• Switch unit (B) removal

1. This unit can be removed by removing the screw labeled "F".

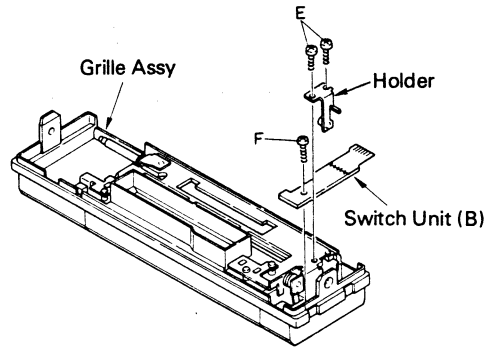


Fig. 9

• Display unit removal

1. Remove the two screws labeled "E" and take off the holder. The holder supports the display unit and allows it to turn, so it should be slid to the side and removed. (Fig. 9)
2. The display unit can be removed as shown in Fig. 10.

In the assembly process, put the grille unit so that this part of the grille assy fits in the hole in the grille unit.

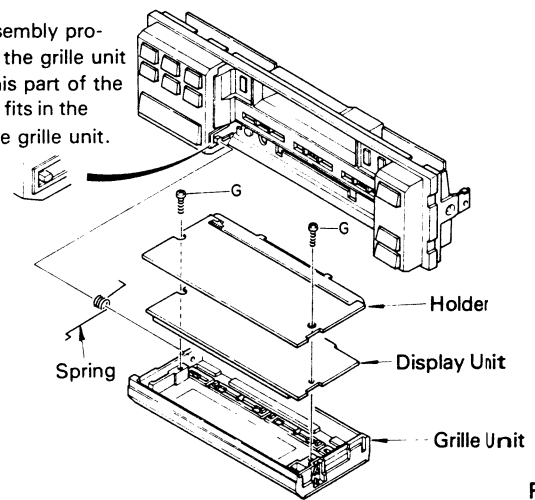


Fig. 10

6. CIRCUIT DESCRIPTION

• Level Diagram

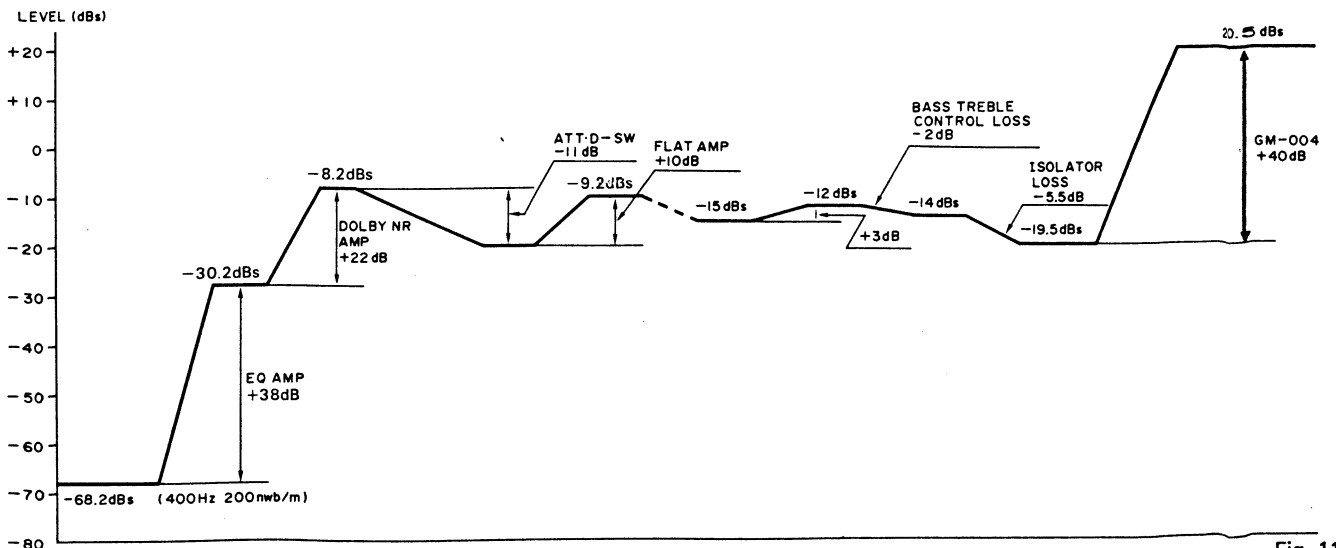
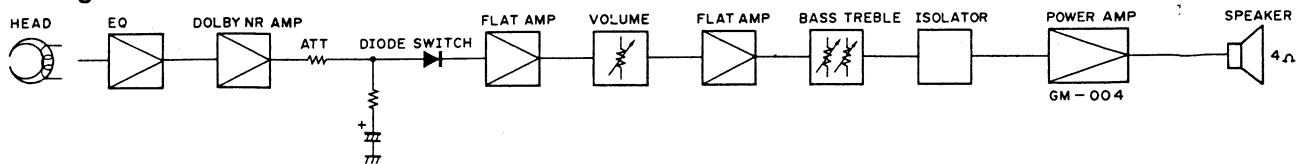


Fig. 11

• + B Diagram (FX-K5B/EW)

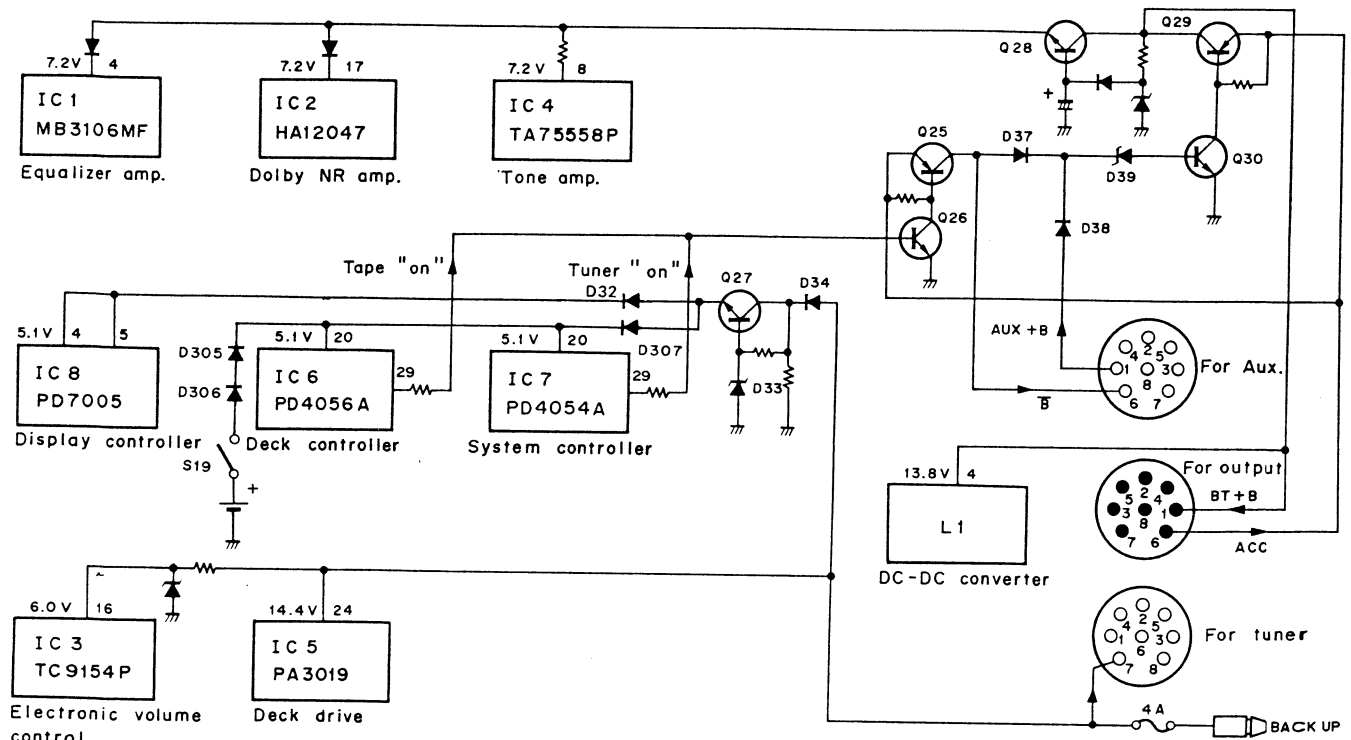


Fig. 12-1

• + B Diagram (FX-K5/EW, FX-K5SDK/WG)

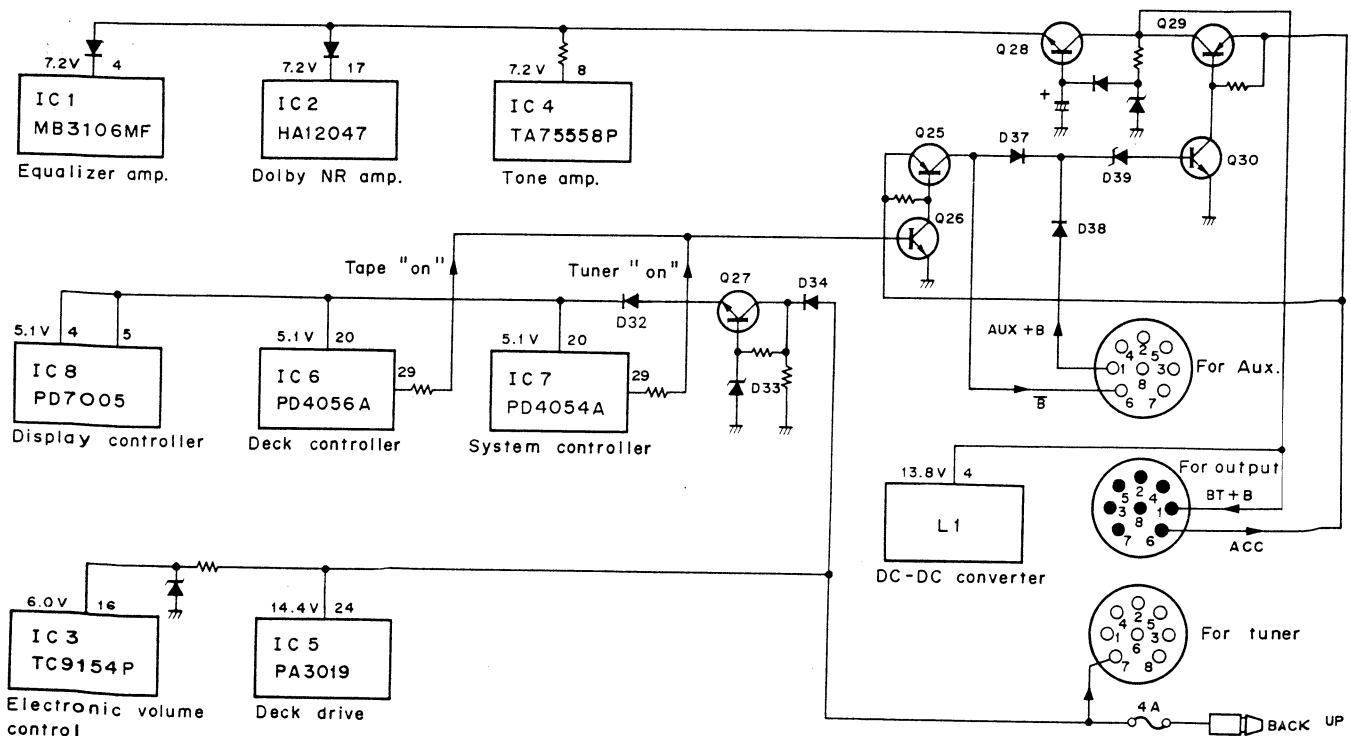


Fig. 12-2

• Block Diagram

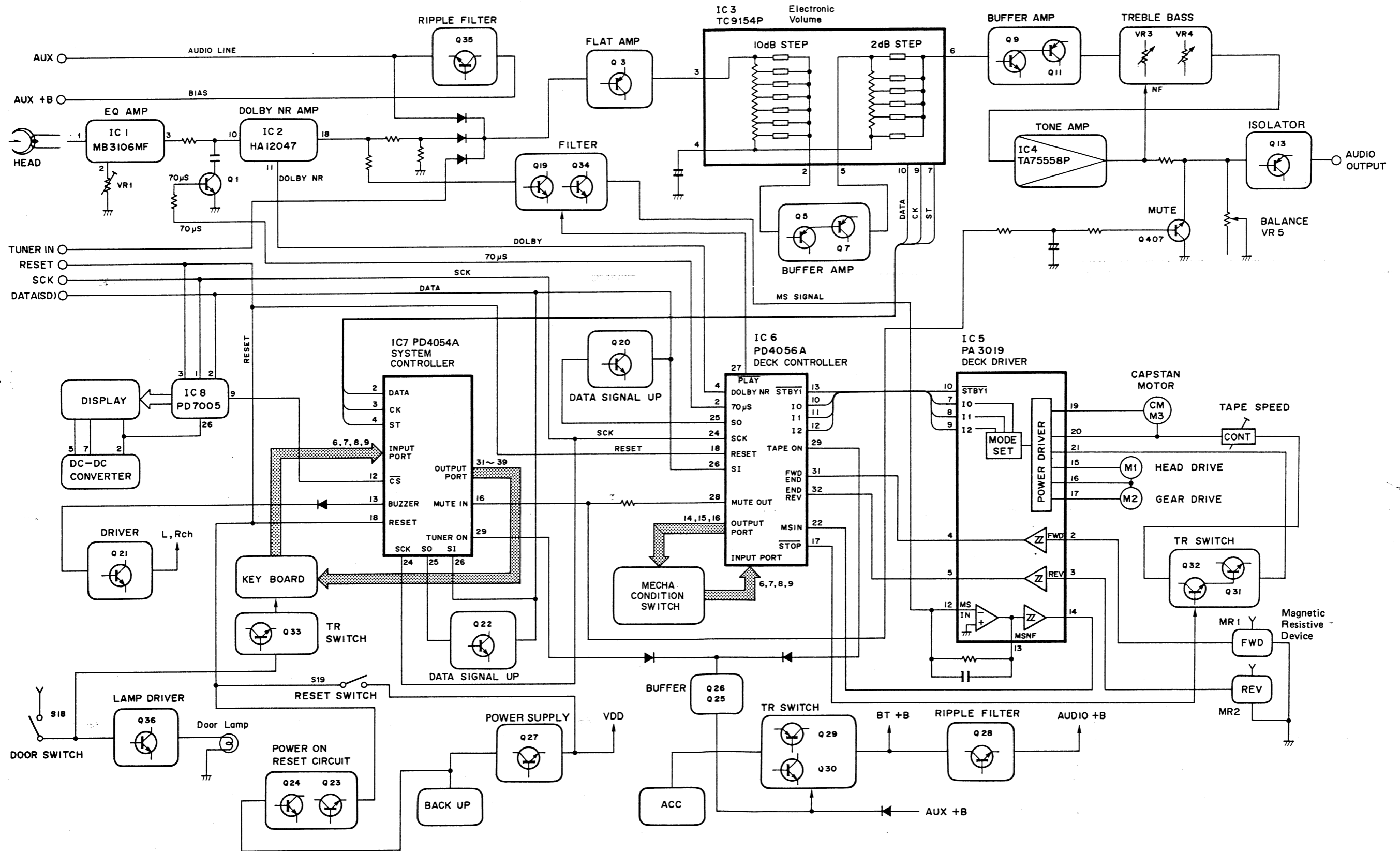


Fig. 13

• System Outline

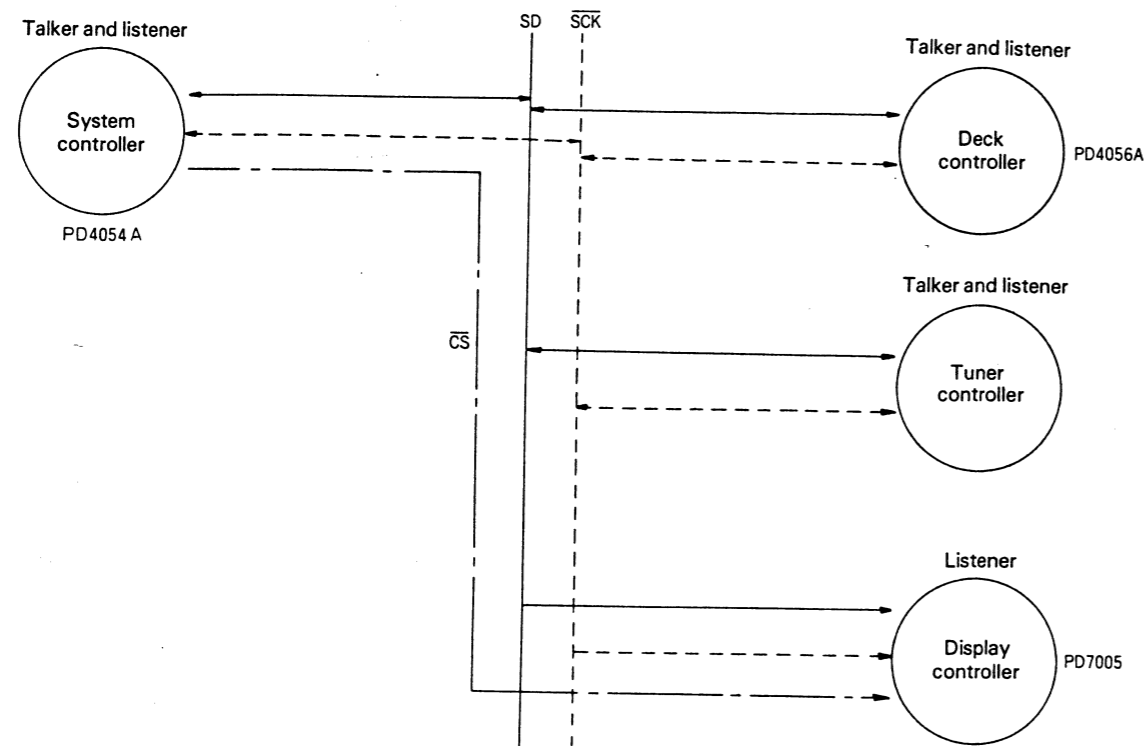


Fig. 14

In this unit, a system controller (PD 4054A), a deck controller (PD 4056A), and a tuner controller are linked via eight bit serial data transmission. There are three signal lines. These are: a data line (SD), a serial clock line (SCK), and a CS line between the system controller and the display controller. The system, deck, and tuner controllers switch automatically between talker and listener in the sequence shown in Figure 15. The display controller is "listener only", and obtains 80 bits of serial data from the CS signal from the system controller.

Data is transmitted among the controllers by switching between talker and listener in the order shown in Figure 15 (system to deck to tuner to system). If two seconds pass after the command controller transmits a command, without a command being transmitted by either the deck or tuner controller, the system controller will transmit a "reset" command, followed by a "standby" command. The tuner and deck will then be switched "off."

When the deck and tuner controllers receive the "reset" command from the system controllers, they will enter the "listener" regardless of the above timing. They will receive the "standby" command from the system controller in this state.

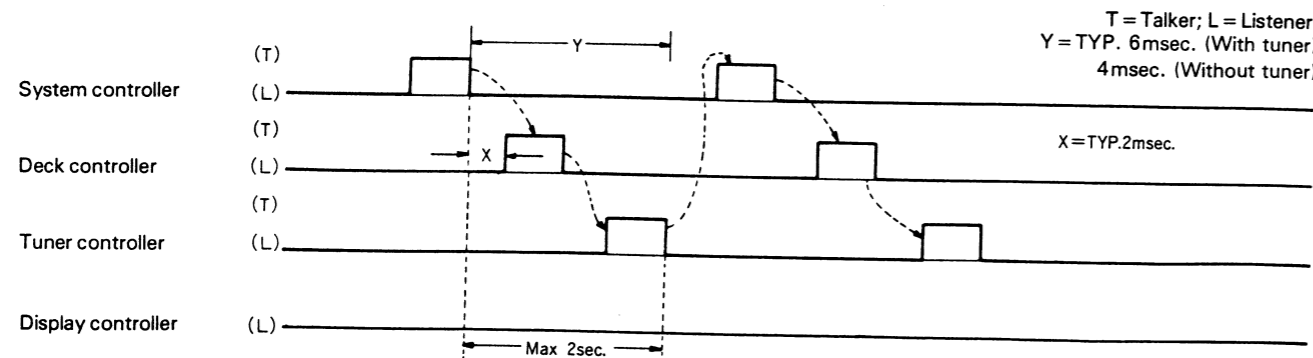


Fig. 15 Sequence of Switching between Talker and listener

When the tuner is not linked directly with the system, the system controller switches to "talker" after receiving data from the deck controller.

Display data may be transmitted from the system controller to the display controller independently. In such case, the system controller first transmits a display command in the "talker" mode. It then transmits a CS signal and 80 bits of display data to the display controller. The deck controller does not enter the "talker" mode immediately after receiving the display command. It enters the "talker" mode after 80 bits of display data have been transmitted. The tuner controller then enters the "command receipt from deck controller" mode.

When either the deck or tuner controller causes a change in the display, the controller causing the change transmits a command in the "talker" mode. It then transmits 80 bits of display data. The other controller, which is in the "listening" mode, ignores this transmission. The system controller inputs this transmission of display data. It then adds volume data, etc., as necessary, and switching temporarily to "talker", outputs 80 bits of display data to the display controller.

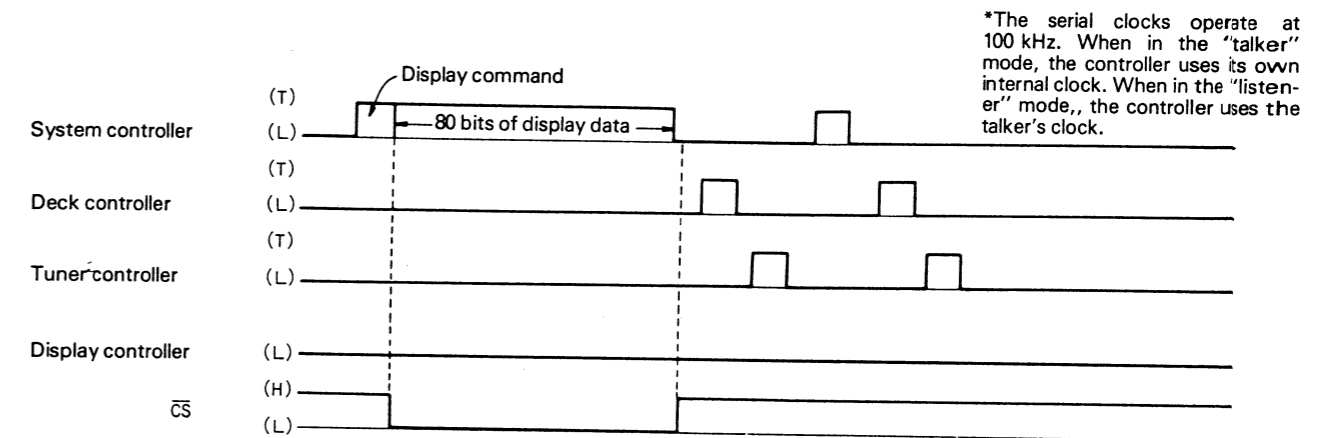


Fig. 16 Sequence of Transmission of Display Data by System Controller

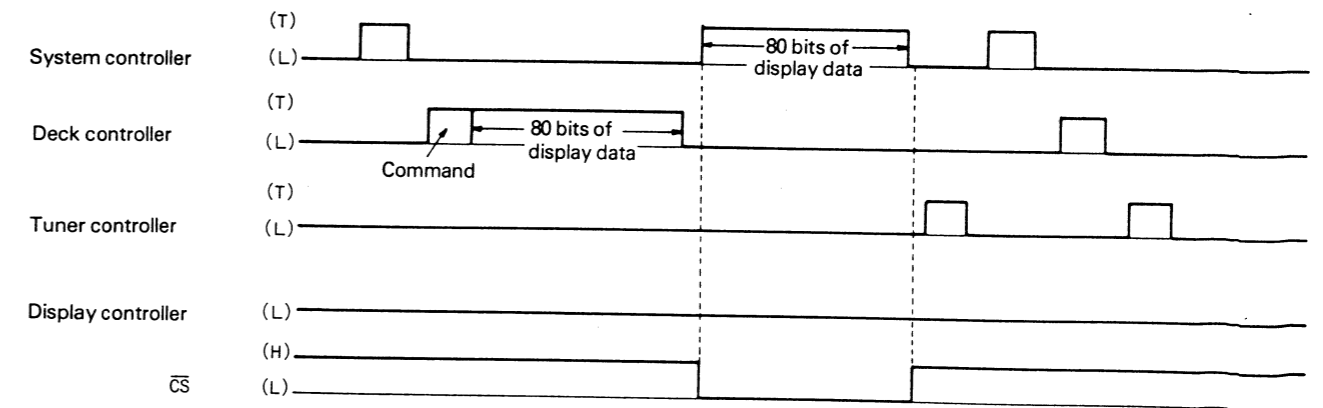


Fig. 17 Sequence of Transmission of Display Data from Deck Controller

• Standby Function

The system controller checks the position of the automobile Acc switch at least once every 6 microseconds (pin 50). If the system controller detects that the Acc switch is in the "off" position, it sends a display command after it switches to the "talker" mode. It then transmits an 80-bit "all 0" display data to the display controller, thus turning off the display. When it next switches to the "talker" mode, it transmits a "standby" command to the deck and tuner controllers, switching the deck and tuner off.

When in the "standby" (Acc off) mode, the deck and tuner controllers' CPUs are shut down, but data in RAM is preserved. The system controller, however, continues to check the position of the Acc switch and to run the clock.

If the system controller detects the Acc switch to be in the "on" position for two seconds, it transmits a display command to the serial interface and transmits the display data which was stored before the Acc switch was moved to the "off" position. This data releases the deck and tuner controllers from the standby mode. If the unit was in the "deck" mode or "tuner" mode prior to the Acc switch having been moved to the "off" position, the unit is now returned to that mode.

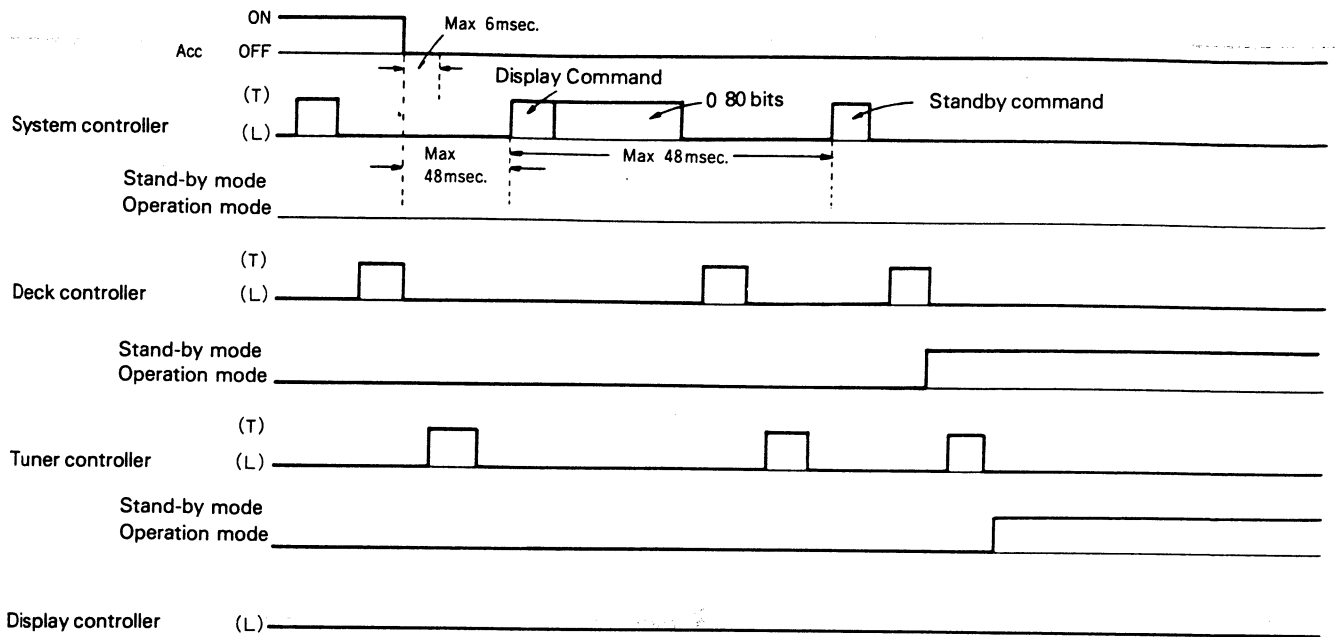


Fig. 18 Standby Mode Sequence

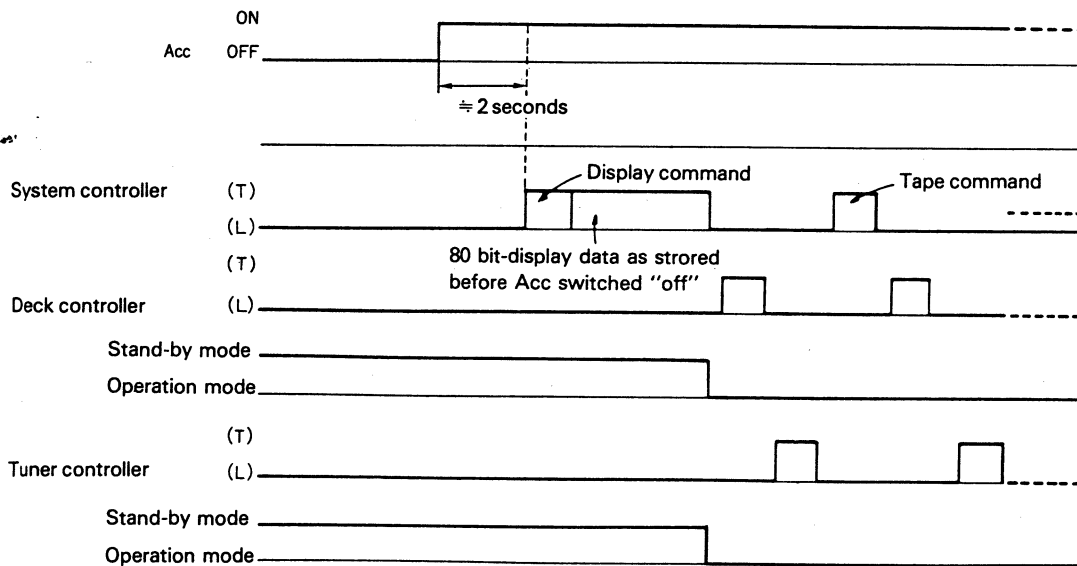


Fig. 19 Standby Release Sequence (When Unit Was in "Deck" Mode before Acc Switched "Off")

• Switching Between Tape and Tuner

1. Tape to Tuner (Figure 20)

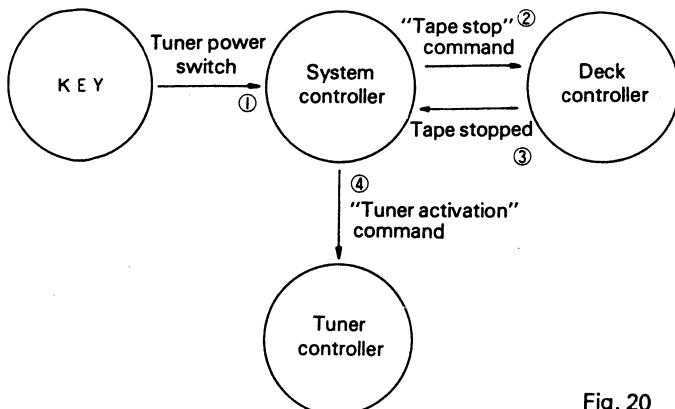


Fig. 20

If the "tuner power" switch is pressed while a tape is running, the system controller will send a "tape stop" command to the deck controller. When the system controller receives the "tape stopped" message from the deck controller, it will send a "tuner activation" command to the tuner controller, and the unit switches from the "tape" mode to the "tuner" mode.

2. Tuner to Tape

a. Tape Power Switch Pressed

If the "tape power" switch is pressed while the tuner is operating, the system controller will send a "stop tuner" to the tuner controller. When the system controller receives the "tuner stopped" signal from the tuner controller, it will send a "tape activation" command to the deck controller, and the unit switches from the "tuner" mode to the "tape" mode.

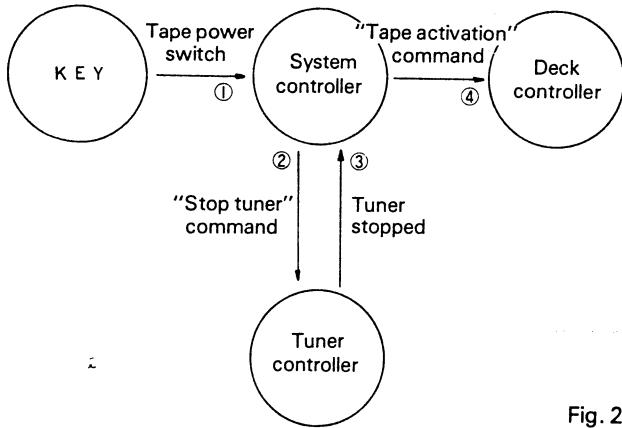


Fig. 21

b. Cassette Inserted

If a cassette is loaded while the tuner is operating, the deck controller will send a "tape activation" request message to the system controller. When the system controller receives this message, it will send a "stop tuner" command to the tuner controller. When the system controller receives the "tuner stopped" signal from the tuner controller, it will send a "tape activation" command to the deck controller. In this way, the unit automatically switches from the "tuner" mode to the "tape" mode when a cassette is loaded.

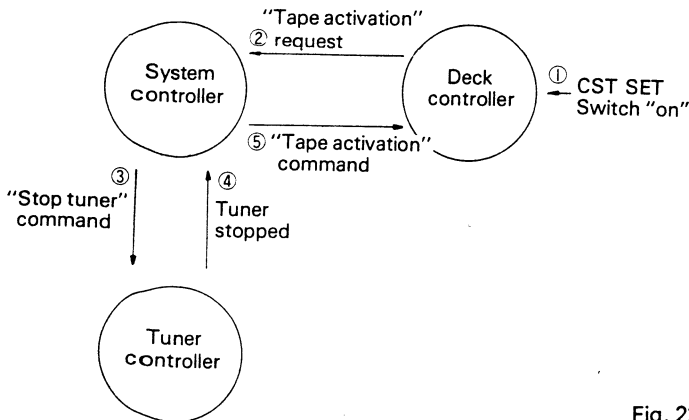


Fig. 22

• Drive system outline

The deck in this unit uses a motor drive, rather than the traditional solenoid. The drive system is composed of three motors: one providing power for the running and loading modes; one to drive the head base; and one to drive the "FF/REW" switching gear. Position sensing switches are arranged to correspond to each of the positions of the head base (FWD PLAY, REV PLAY, FF/REW & EJECT, and MS (music search)). Sensing switches are also arranged to correspond to each of the positions of the "FF/REW" switching gear (L (left), R (right), and CENTER)). Finally, two sensing switches are arranged to correspond to the LOADING and EJECT positions. Each of these positions is controlled by the "deck controller" (IC 6). Multipolar magnets are attached to each of the two reel spindles, and magnetic resistive device (MR 1, MR 2) are positioned to receive signals from these magnets indicating rotation.

The "deck driver" (IC 5) receives motor control signals from the deck controller and sends signals to drive each of the motors. The rotation of the reel unit is converted into an electrical signal, which is then "wave-form shaped" and converted into pulses and fed to the deck controller. When a music signal above a certain level is received from the audio section, a signal is sent to the deck controller in the form of a pulse (MS (music search)). In response to input from the keyboard or the tape insertion sensing switch, the deck controller sends a control signal for the appropriate motor to the deck driver. When a signal is received from a sensing switch that the deck has been set in a particular mode, a motor control signal is sent to the deck driver to turn the motor off. A reel pulse signal is used to detect the end of a tape, and to compensate reel unit over-run while in the MS mode.

• Electronic Volume Control

Electronic volume control (IC 3) is carried out by serial transmission of data from the system controller (IC 7), allowing volume to be adjusted in 2 dB increments. The control signals from IC 7 pin 2 (DATA), pin 3 (CK) and pin 4 (ST) are as follows:

1. The data line transmits data concerning degree of damping and channel selection. This data is made up of 18 bits. (Fig. 23)
2. The CK line is for the clock signal.
3. A strobe signal latches volume data by causing the ST Line to go "H."

| | | | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|---|----|----|----|----|----|-----|-----|-----|-----|-----|
| 0 | -10 | -20 | -30 | -40 | -50 | -60 | 0 | -2 | -4 | -6 | -8 | | Lch | Rch | "0" | "0" | "0" |
| | dB | dB | dB | dB | dB | dB | | dB | dB | dB | dB | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

Fig. 23

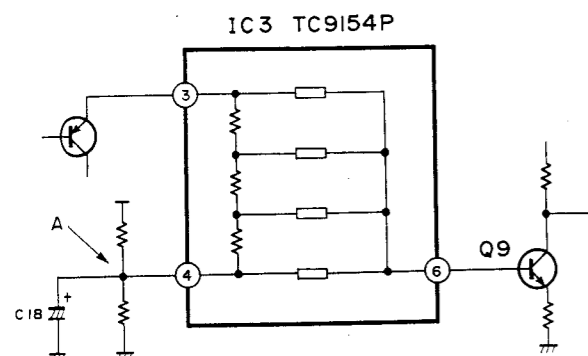
• Electronic Muting

The mute function electronically reduces volume. Consequently, in the MS mode, the audio signal does not go further than the volume control.

The mute circuit (Q407, Q408) in the stage part of the treble and bass circuits serves to prevent noise from developing between the latter part of the electronic volume and the bass and treble circuits.

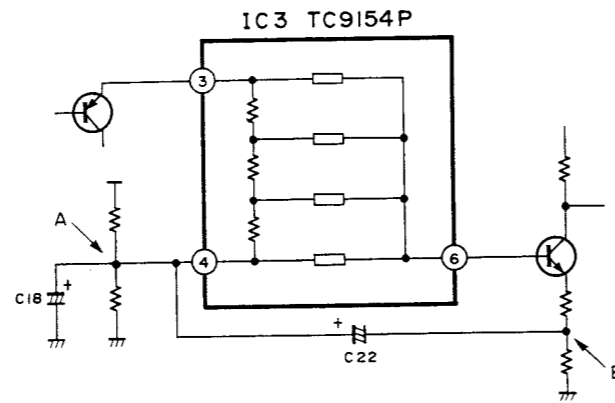
• Electronic Volume Buffer Amplifier

The buffer amplifiers (Q9, Q10) which are connected to the end of the electronic volume control (pin 6, pin 11) increase the degree of muting by changing from the general circuit shown in Figure 24 to the circuit shown in Figure 25.



If the impedance of C18 is not reduced sufficiently, a signal will leak through even with volume reduced.

Fig. 24



The a.c. potential at points A and B is equalized by C22, thus increasing the degree of muting.

Fig. 25

• Reel Unit Rotation Pulse Detection Circuit

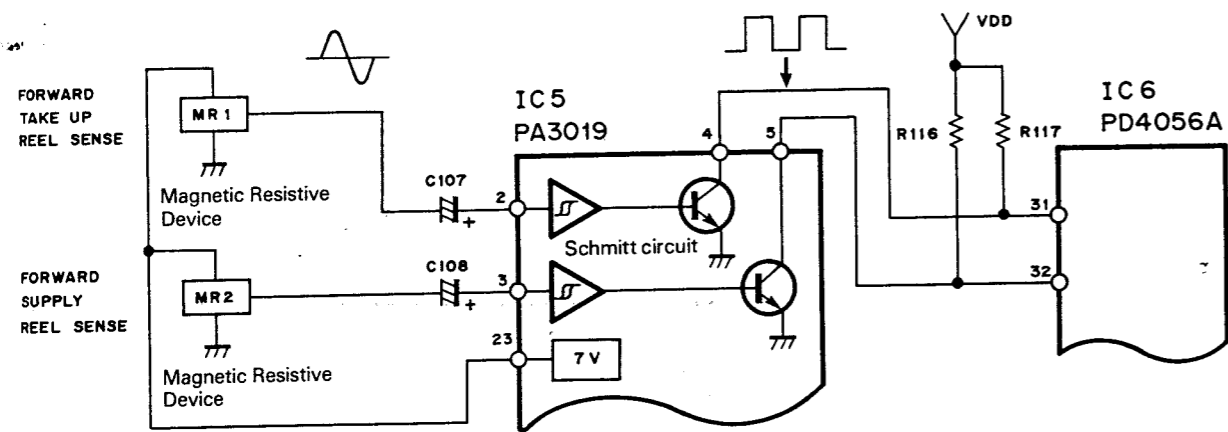


Fig. 26

- A continuous-wave is transmitted by the magnetic resistive device (MR 1, MR 2) as the reel unit rotates. This signal is formed into a wave pattern in the Schmitt circuit within IC 5, and a square wave is output from pins 4 and 5 (IC 5) in synchronization with the rotation of the reel unit. When rotation stops, potential is fixed at 0 or 5 volts.
- 1. **Tape end detector:** When in the forward play mode, the forward take-up reel is monitored. When in the reverse play mode, the forward supply reel (reverse take-up reel) is monitored. When the reel stops, "direction change" occurs.
- 2. **ATSC:** While rewinding, when rotation of the reel unit on the side from which the tape is being supplied (the take-up side when in the forward play mode) is detected (8 pulses within 560 ms), the deck switches to the play mode.

- 3. **Reel motor racing detector:** As in the case of tape end detection, the take-up reel unit is monitored (forward take-up reel unit when in forward play, reverse take-up reel unit when in reverse play). When the number of revolutions per unit of time exceeds the determined level, the motor is stopped.
- 4. **MS overrun compensator:** When a blank spot on the tape is detected when RMS (rewind music search) is engaged, a stop message is sent to the mechanism, but overrun occurs due to inertia in the cassette and in the reel unit. The length of this overrun (number of revolutions) is monitored, and after switching to the play mode, volume is muted until that length of tape is played. When FMS (fast forward music search) is engaged, the start of the next piece is detected. The deck then switches automatically to RMS, and the actions described above take place.

• MS Circuit

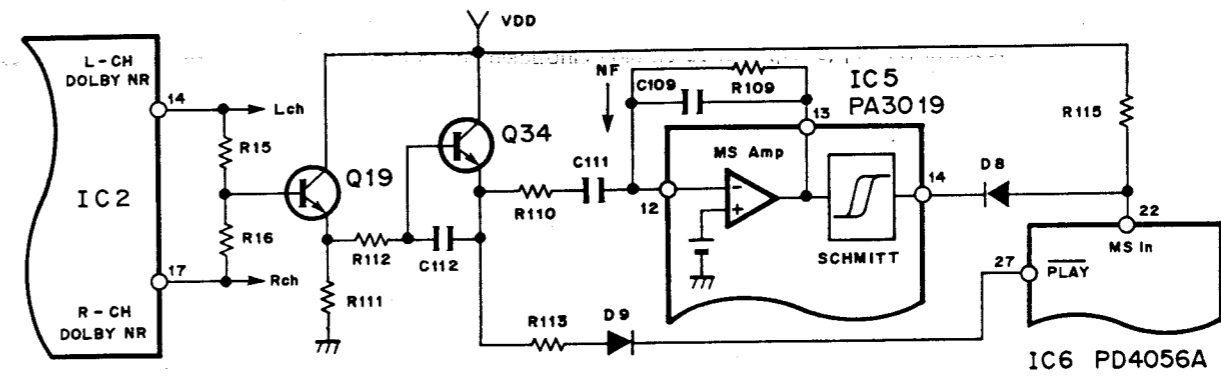


Fig. 27

The MS circuit detects blank spots on the tape. It consists of a filter, a differential MS amplifier (inside IC 5), and a Schmitt comparator (inside IC 5). The non-inverted input pin on the MS amplifier is fixed at a standard voltage inside the IC, and the inverted input pin is connected with the outside. The left and right output signals from the Dolby NR circuit are combined and transmitted to pin 12 of IC 5 after passing through the filter circuit. Pulses are generated at the output pin of the Schmitt comparator when recorded music exceeds a minimum amplitude. Music selection is then carried out by IC 6, which senses these pulses. The filter circuit switches between frequency response and gain when changing from the "Play" music selection mode to the "high speed" music selection mode.

- 1. **"Play" Music Selection (Equivalent circuit diagram 28):** IC 6 pin 27 goes "Low", and Q34 and D9 go to the "on" position. Since Q34 is acting as an emitter follower at this time, its output impedance is sufficiently low compared with R110. The gain from either the left channel or the right channel to IC 5 pin 13 is approximately 45 dB. The low range cut off frequency is approximately 300 Hz and the high range cut off frequency is approximately 7 kHz.

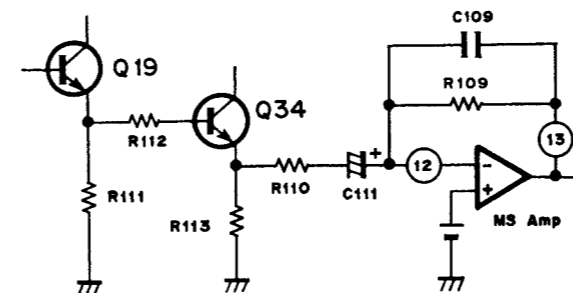


Fig. 28 Equivalent Circuit During "Play" Music Selection (Music Repeat, etc.)

- 2. **"FF" "REW" Music Selection (Equivalent circuit diagram 29):** IC 6 pin 27 goes "high", and Q34 and D9 go to "off." At this time, the gain is approximately 37 dB, the low range cut off frequency is approximately 4 kHz and the high range cut off frequency is approximately 7 kHz.

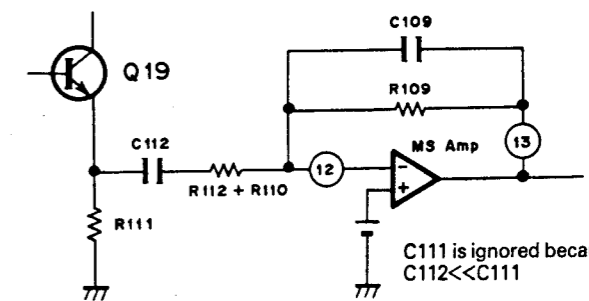


Fig. 29 Equivalent Circuit During the MS Mode

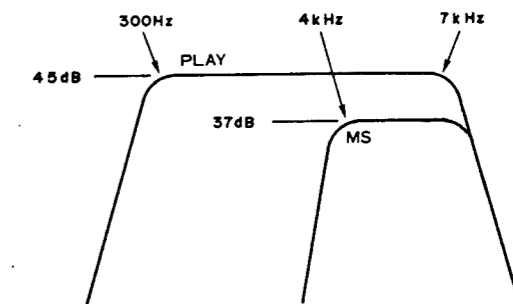


Fig. 30 Filter Characteristics

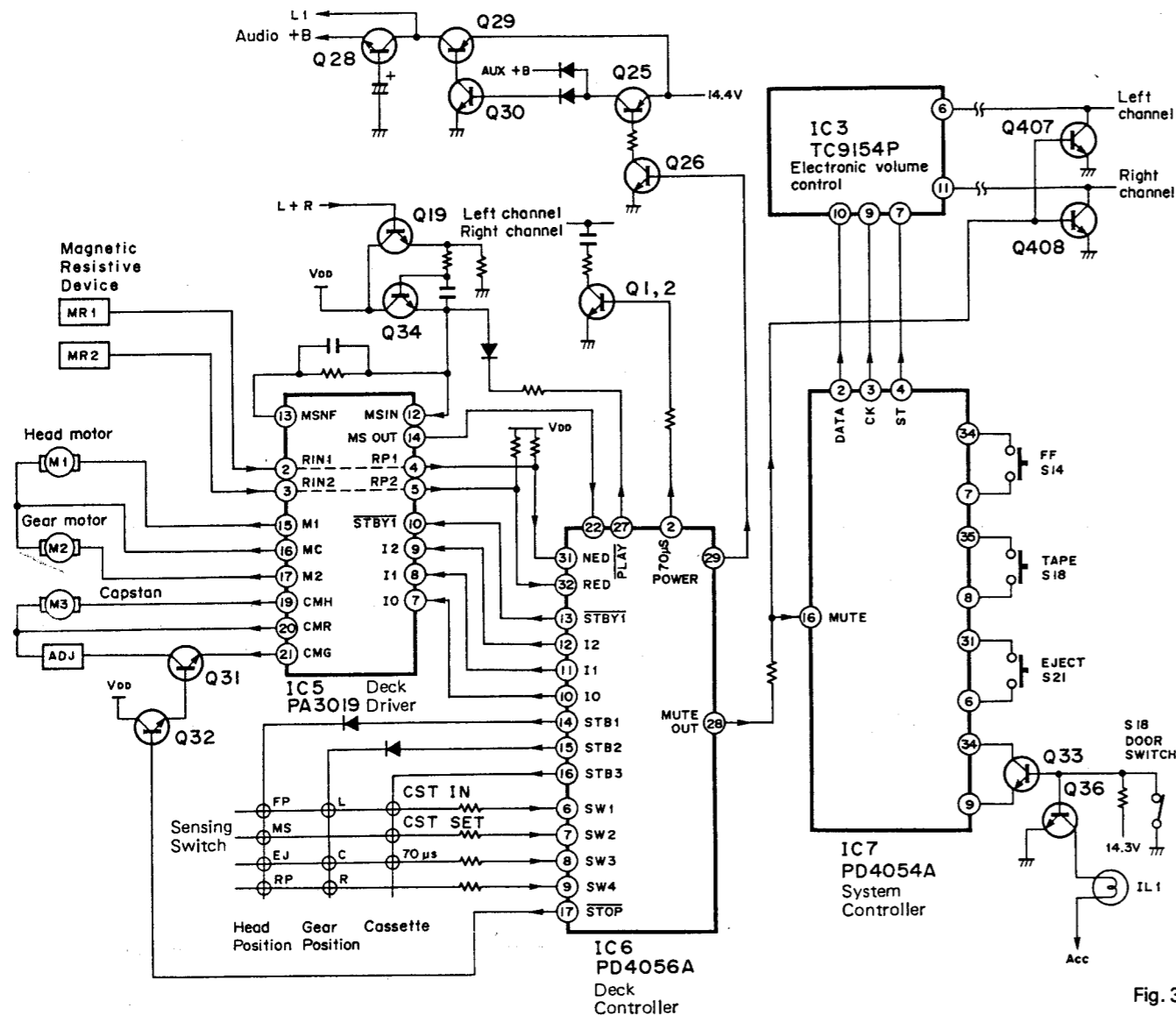


Fig. 31

• Protection Circuits

Protection circuits operate in the following manner if one of the six problems described occurs:

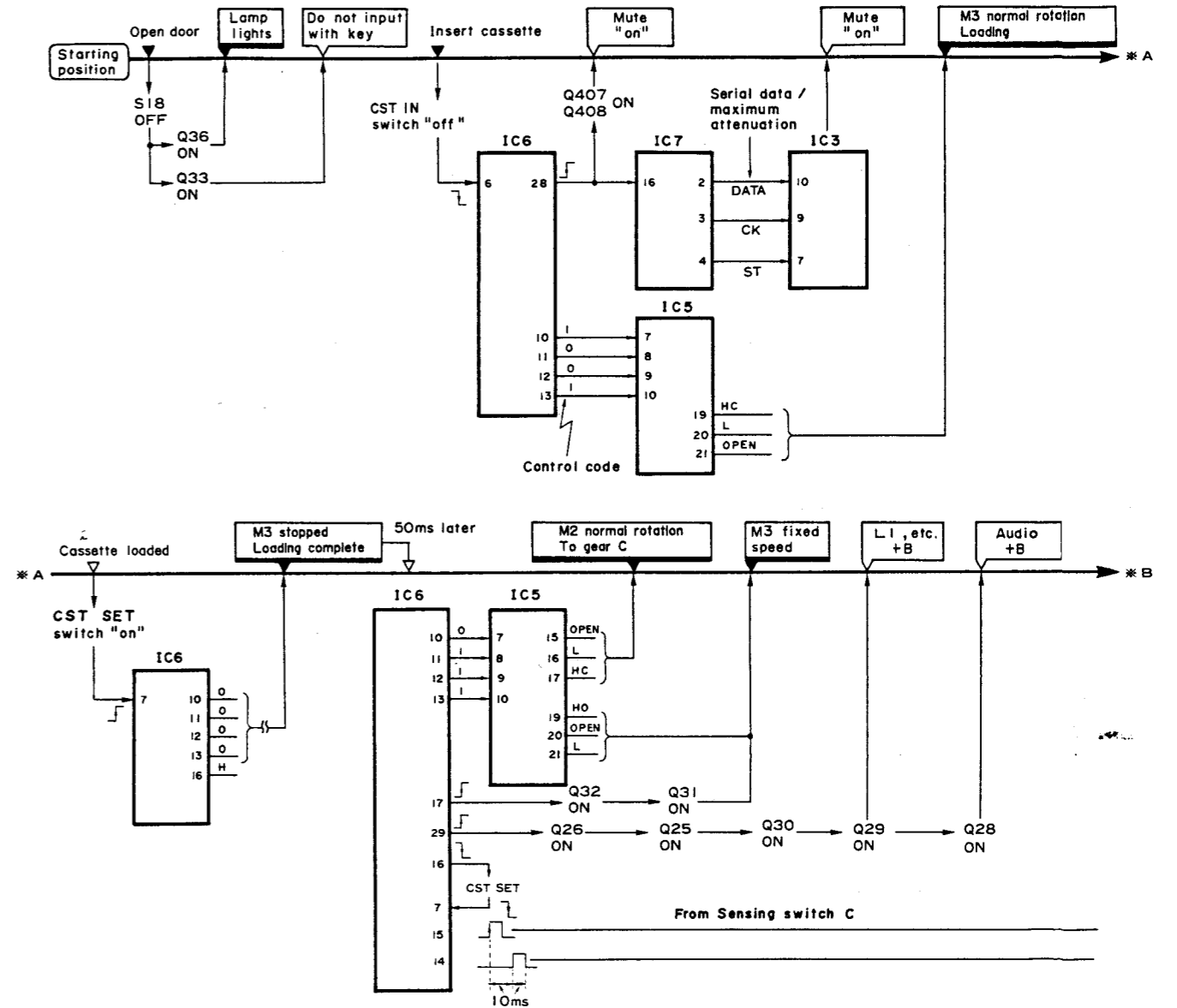
1. If the tape should break while in the play mode, tape action will be released when the reel unit racing is detected.
2. If ATSC operation should continue for 10 seconds without stopping, it will be discontinued and the tape stopped. Normal action will resume if the tape is then ejected and a new tape inserted.
3. If a tape end is detected three times in 16 seconds, the deck will be stopped in order to protect the mechanism. If the "TAPE" button is then pressed, action will resume.
4. Detection of error in data communication. This unit operates by continually transmitting data between four ICs (integrated circuits). If something should cause noise to develop in the communication lines, causing an error in the data being transmitted, the deck and tuner will be shut down for two seconds, then returned to the state that they were in before the error developed.

Note, however, that if the deck or tuner were in the "scan", "frequency up", "frequency down", or "music search" mode immediately prior to the error in data transmission, it will not be returned to that mode. Rather, the deck will enter the "play" mode and the tuner will be tuned to the last station being played.

5. If, for some reason, either loading or unloading should take longer than five seconds, the deck will switch to the opposite mode (loading in the case of unloading, and unloading in the case of loading). If the cassette should somehow become stuck, and the deck switches between loading and unloading three times with neither ejection nor loading taking place, the deck will shut down.
6. If, while the mechanism is operating, the head and gear motors do not go to their prescribed positions in two seconds, they will be released.

• Explanation of operation (Refer to Fig. 31)

1. Cassette insertion → forward play (deck was last run in forward direction; or, after resetting)



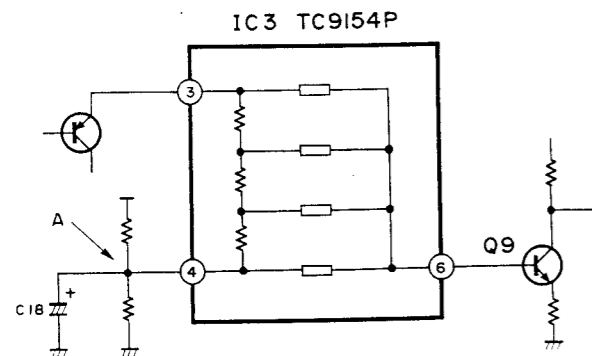
• Control code

| Control mode | IC6 PD4056A | | | | Mechanism action | IC5 PA3019 | | | | | |
|--------------|-------------|----|----|----|------------------|--------------------------------|------|------|------|------|------|
| | 10 | 11 | 12 | 13 | | 19 | 20 | 21 | 15 | 16 | 17 |
| Output "off" | 0 | 0 | 0 | 0 | Release | open | open | open | open | open | open |
| M3 | Normal | 1 | 0 | 0 | 1 | Loading | HC | L | ↑ | ↑ | ↑ |
| | Reverse | 0 | 1 | 0 | 1 | Eject | L | HC | ↑ | ↑ | ↑ |
| | Fixed speed | 1 | 1 | 0 | 1 | Normal operation | HO | open | L | ↑ | ↑ |
| M1 | Normal | 0 | 0 | 1 | 1 | Head in forward play direction | ↑ | ↑ | ↑ | HC | L |
| | Reverse | 1 | 0 | 1 | 1 | Head in reverse play direction | ↑ | ↑ | ↑ | L | HC |
| M2 | Normal | 0 | 1 | 1 | 1 | Gear in left "L" direction | ↑ | ↑ | ↑ | Open | L |
| | Reverse | 1 | 1 | 1 | 1 | Gear in right "R" direction | ↑ | ↑ | ↑ | ↑ | HC |

HC.....app. 7V HO.....Vcc-1.7V Open.....high impedance L.....0V

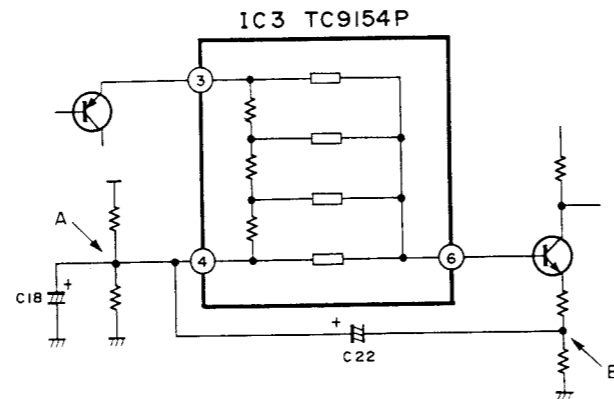
• Electronic Volume Buffer Amplifier

The buffer amplifiers (Q9, Q10) which are connected to the end of the electronic volume control (pin 6, pin 11) increase the degree of muting by changing from the general circuit shown in Figure 24 to the circuit shown in Figure 25.



If the impedance of C18 is not reduced sufficiently, a signal will leak through even with volume reduced.

Fig. 24



The a.c. potential at points A and B is equalized by C22, thus increasing the degree of muting.

Fig. 25

• Reel Unit Rotation Pulse Detection Circuit

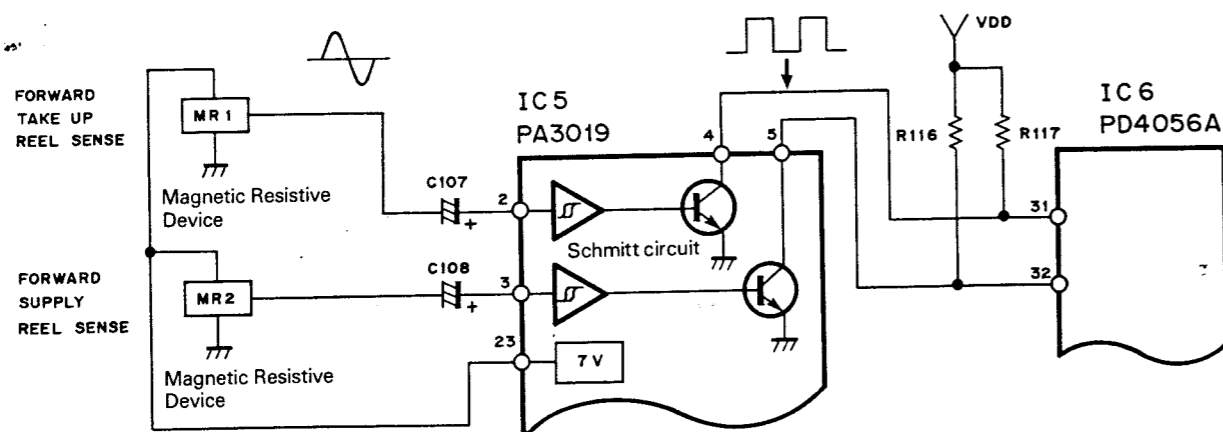


Fig. 26

• A continuous-wave is transmitted by the magnetic resistive device (MR 1, MR 2) as the reel unit rotates. This signal is formed into a wave pattern in the Schmitt circuit within IC 5, and a square wave is output from pins 4 and 5 (IC 5) in synchronization with the rotation of the reel unit. When rotation stops, potential is fixed at 0 or 5 volts.

1. **Tape end detector:** When in the forward play mode, the forward take-up reel is monitored. When in the reverse play mode, the forward supply reel (reverse take-up reel) is monitored. When the reel stops, "direction change" occurs.

2. **ATSC:** While rewinding, when rotation of the reel unit on the side from which the tape is being supplied (the take-up side when in the forward play mode) is detected (8 pulses within 560 ms), the deck switches to the play mode.

3. **Reel motor racing detector:** As in the case of tape end detection, the take-up reel unit is monitored (forward take-up reel unit when in forward play, reverse take-up reel unit when in reverse play). When the number of revolutions per unit of time exceeds the determined level, the motor is stopped.

4. **MS overrun compensator:** When a blank spot on the tape is detected when RMS (rewind music search) is engaged, a stop message is sent to the mechanism, but overrun occurs due to inertia in the cassette and in the reel unit. The length of this overrun (number of revolutions) is monitored, and after switching to the play mode, volume is muted until that length of tape is played. When FMS (fast forward music search) is engaged, the start of the next piece is detected. The deck then switches automatically to RMS, and the actions described above take place.

• MS Circuit

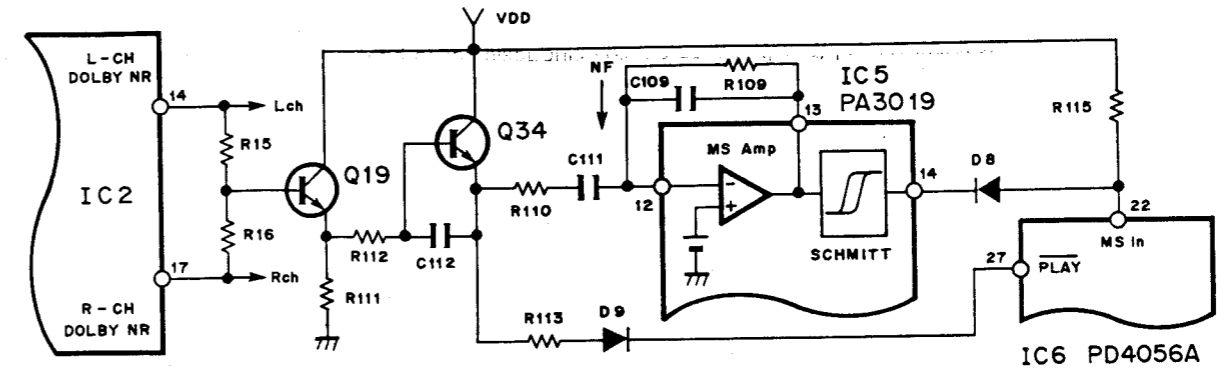


Fig. 27

The MS circuit detects blank spots on the tape. It consists of a filter, a differential MS amplifier (inside IC 5), and a Schmitt comparator (inside IC 5). The non-inverted input pin on the MS amplifier is fixed at a standard voltage inside the IC, and the inverted input pin is connected with the outside. The left and right output signals from the Dolby NR circuit are combined and transmitted to pin 12 of IC 5 after passing through the filter circuit. Pulses are generated at the output pin of the Schmitt comparator when recorded music exceeds a minimum amplitude. Music selection is then carried out by IC 6, which senses these pulses. The filter circuit switches between frequency response and gain when changing from the "Play" music selection mode to the "high speed" music selection mode.

1. **"Play" Music Selection (Equivalent circuit diagram 28):** IC 6 pin 27 goes "Low", and Q34 and D9 go to the "on" position. Since Q34 is acting as an emitter follower at this time, its output impedance is sufficiently low compared with R110. The gain from either the left channel or the right channel to IC 5 pin 13 is approximately 45 dB. The low range cut off frequency is approximately 300 Hz and the high range cut off frequency is approximately 7 kHz.

2. **"FF" "REW" Music Selection (Equivalent circuit diagram 29):** IC 6 pin 27 goes "high", and Q34 and D9 go to "off." At this time, the gain is approximately 37 dB, the low range cut off frequency is approximately 4 kHz and the high range cut off is approximately 7 kHz.

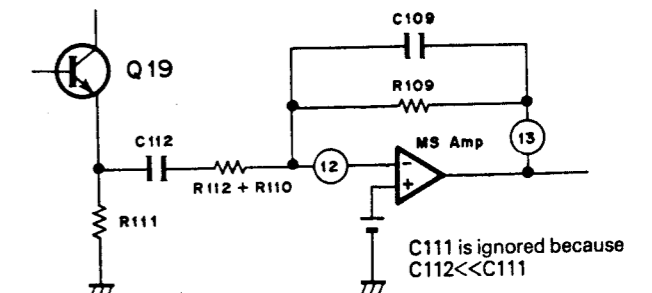


Fig. 29 Equivalent Circuit During the MS Mode

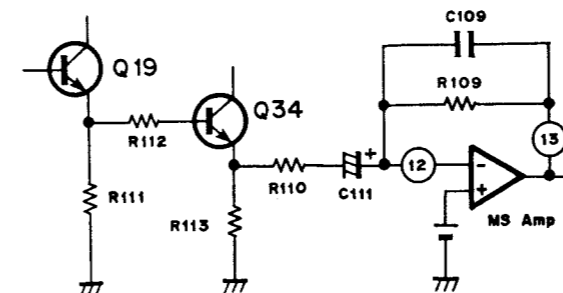


Fig. 28 Equivalent Circuit During "Play" Music Selection (Music Repeat, etc.)

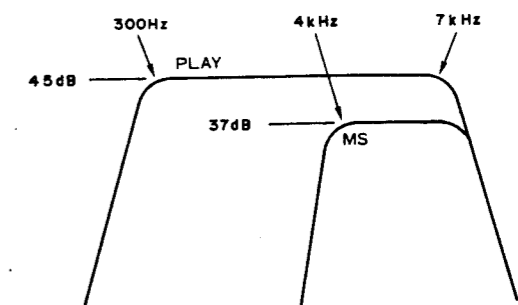


Fig. 30 Filter Characteristics

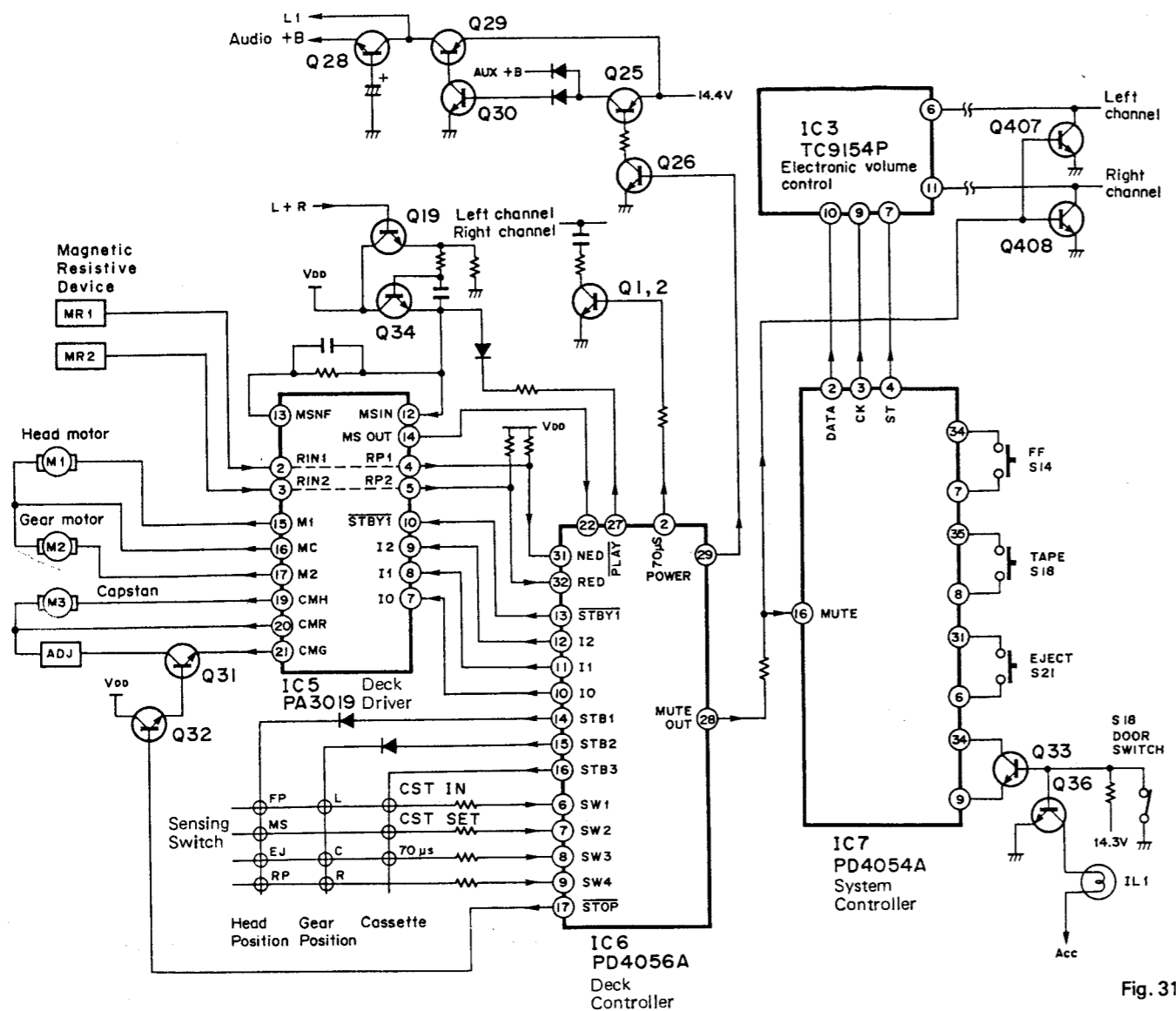


Fig. 31

• Protection Circuits

Protection circuits operate in the following manner if one of the six problems described occurs:

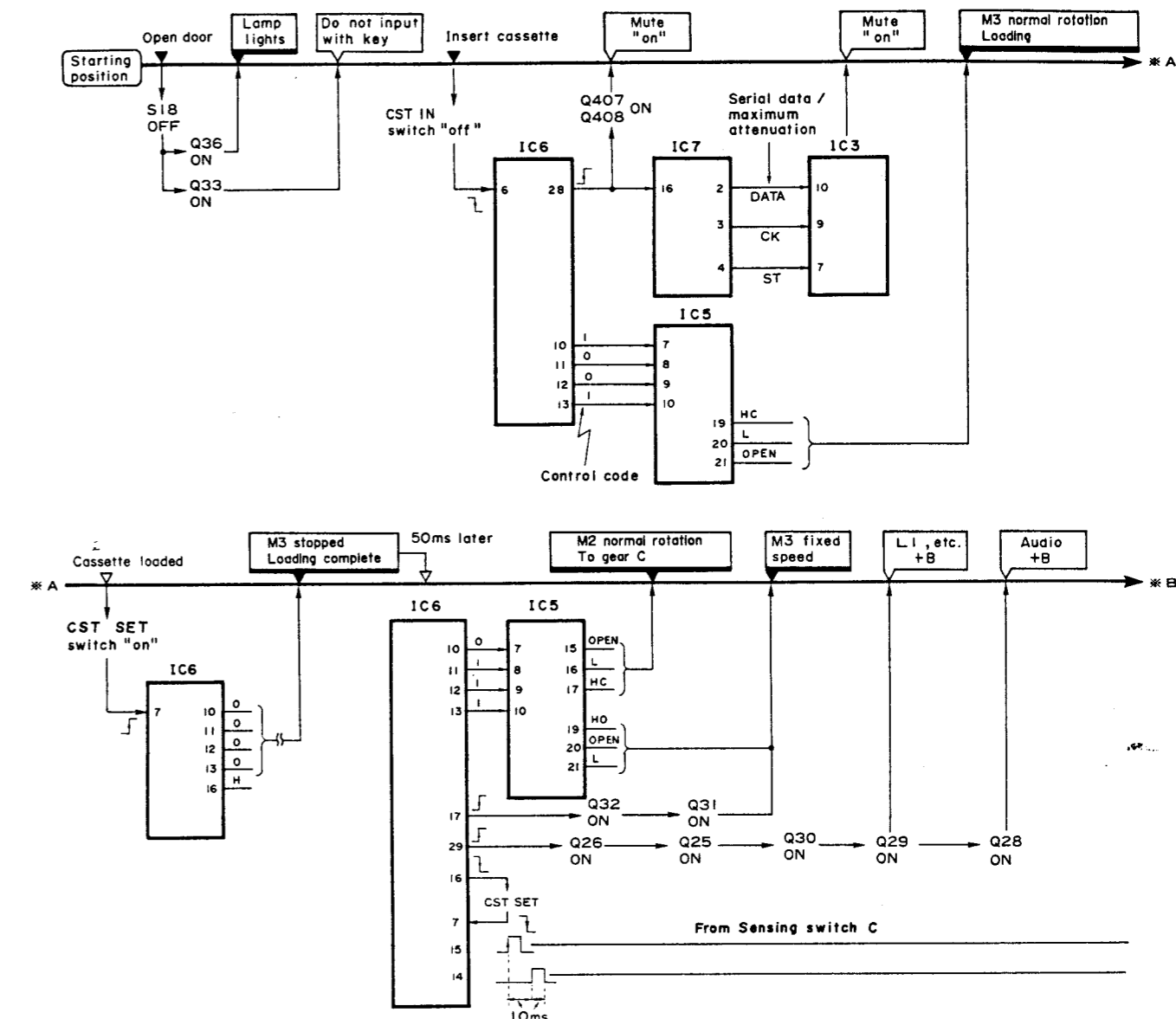
1. If the tape should break while in the play mode, tape action will be released when the reel unit racing is detected.
2. If ATSC operation should continue for 10 seconds without stopping, it will be discontinued and the tape stopped. Normal action will resume if the tape is then ejected and a new tape inserted.
3. If a tape end is detected three times in 16 seconds, the deck will be stopped in order to protect the mechanism. If the "TAPE" button is then pressed, action will resume.
4. Detection of error in data communication. This unit operates by continually transmitting data between four ICs (integrated circuits). If something should cause noise to develop in the communication lines, causing an error in the data being transmitted, the deck and tuner will be shut down for two seconds, then returned to the state that they were in before the error developed.

Note, however, that if the deck or tuner were in the "scan", "frequency up", "frequency down", or "music search" mode immediately prior to the error in data transmission, it will not be returned to that mode. Rather, the deck will enter the "play" mode and the tuner will be tuned to the last station being played.

5. If, for some reason, either loading or unloading should take longer than five seconds, the deck will switch to the opposite mode (loading in the case of unloading, and unloading in the case of loading). If the cassette should somehow become stuck, and the deck switches between loading and unloading three times with neither ejection nor loading taking place, the deck will shut down.
6. If, while the mechanism is operating, the head and gear motors do not go to their prescribed positions in two seconds, they will be released.

• Explanation of operation (Refer to Fig. 31)

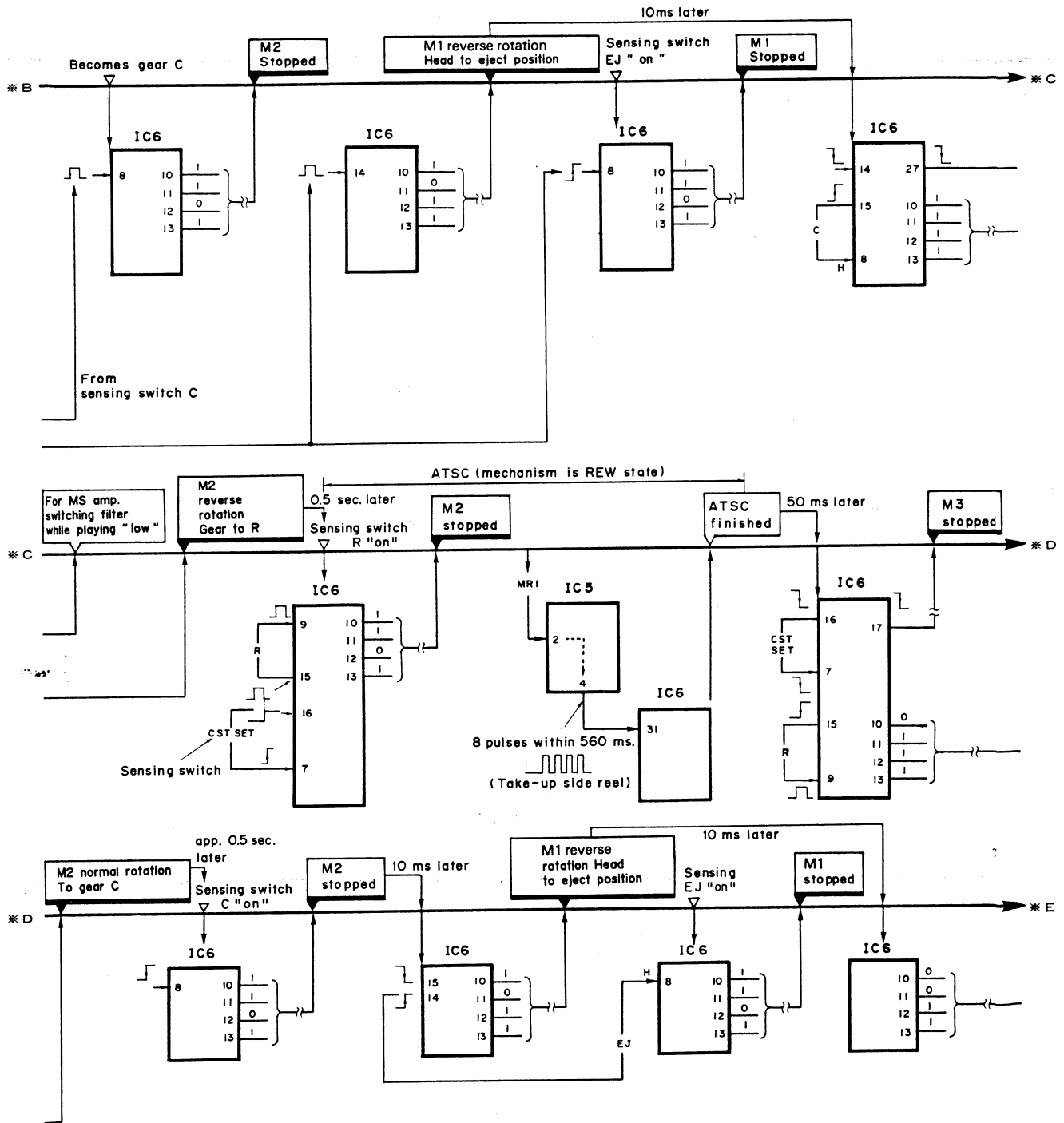
1. Cassette insertion → forward play (deck was last run in forward direction; or, after resetting)



• Control code

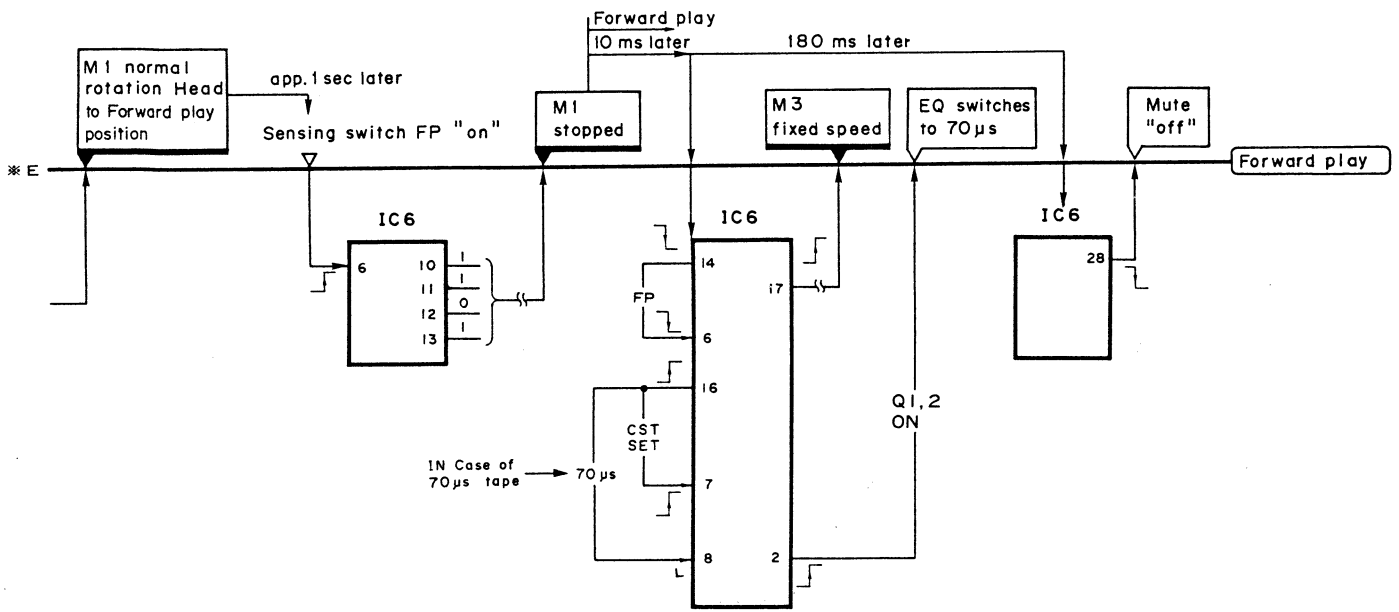
| Control mode | Control code | | | | Mechanism action | Output pin voltage | | | | | |
|--------------|--------------|----|----|----|------------------|--------------------------------|------|------|------|------|------|
| | 10 | 11 | 12 | 13 | | 19 | 20 | 21 | 15 | 16 | 17 |
| Output "off" | 0 | 0 | 0 | 0 | Release | open | open | open | open | open | open |
| M3 | Normal | 1 | 0 | 0 | 1 | Loading | HC | L | ↑ | ↑ | ↑ |
| | Reverse | 0 | 1 | 0 | 1 | Eject | L | HC | ↑ | ↑ | ↑ |
| | Fixed speed | 1 | 1 | 0 | 1 | Normal operation | HO | open | L | ↑ | ↑ |
| M1 | Normal | 0 | 0 | 1 | 1 | Head in forward play direction | ↑ | ↑ | ↑ | HC | L |
| | Reverse | 1 | 0 | 1 | 1 | Head in reverse play direction | ↑ | ↑ | ↑ | L | HC |
| M2 | Normal | 0 | 1 | 1 | 1 | Gear in left "L" direction | ↑ | ↑ | ↑ | Open | L |
| | Reverse | 1 | 1 | 1 | 1 | Gear in right "R" direction | ↑ | ↑ | ↑ | ↑ | HC |

HC.....app. 7V HO.....Vcc - 1.7V Open.....high impedance L.....0V

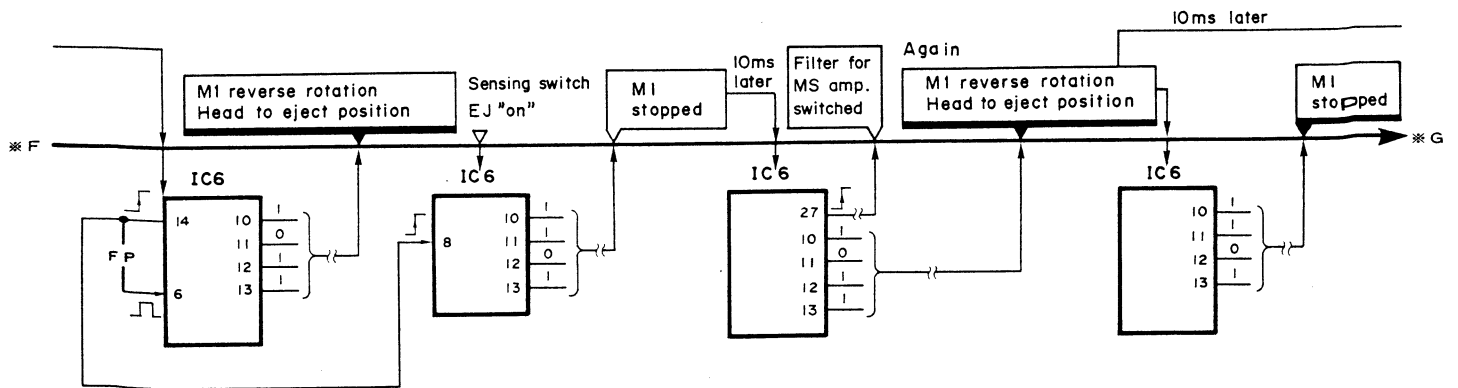
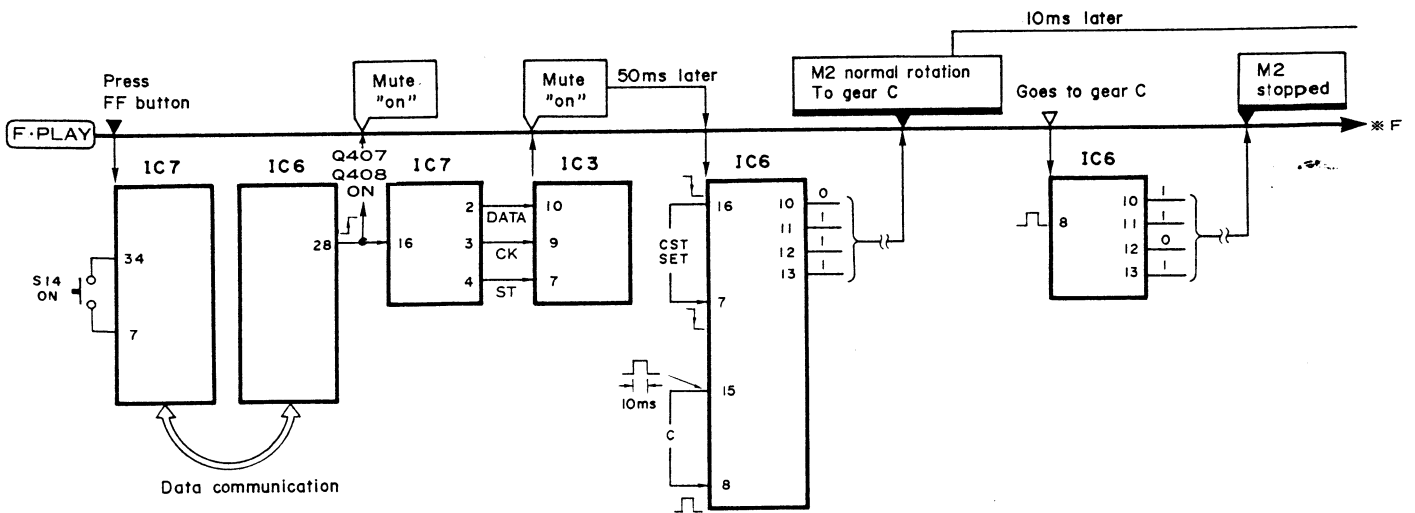


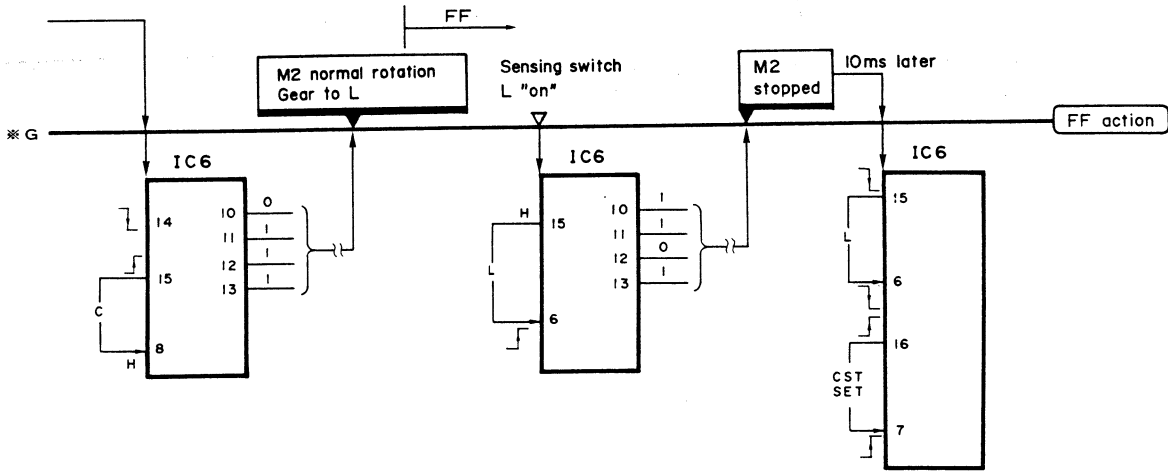
• Sensing switch

| | Switch name | Description | | Switch name | Description |
|----------------------|-------------|---------------------------------------|---------------|-------------|--------------|
| Cassette state | CST IN | Turns "off" when cassette is inserted | Head position | FP | Forward play |
| | CST SET | Turns "on" when cassette is loaded | | MS | MS |
| | 70 μs | "off" for 70 μs tape | | EJ | Eject |
| FF/REW gear position | L | FF when forward direction | | RP | Reverse play |
| | C | Eject or play | | | |
| | R | REW when forward direction | | | |

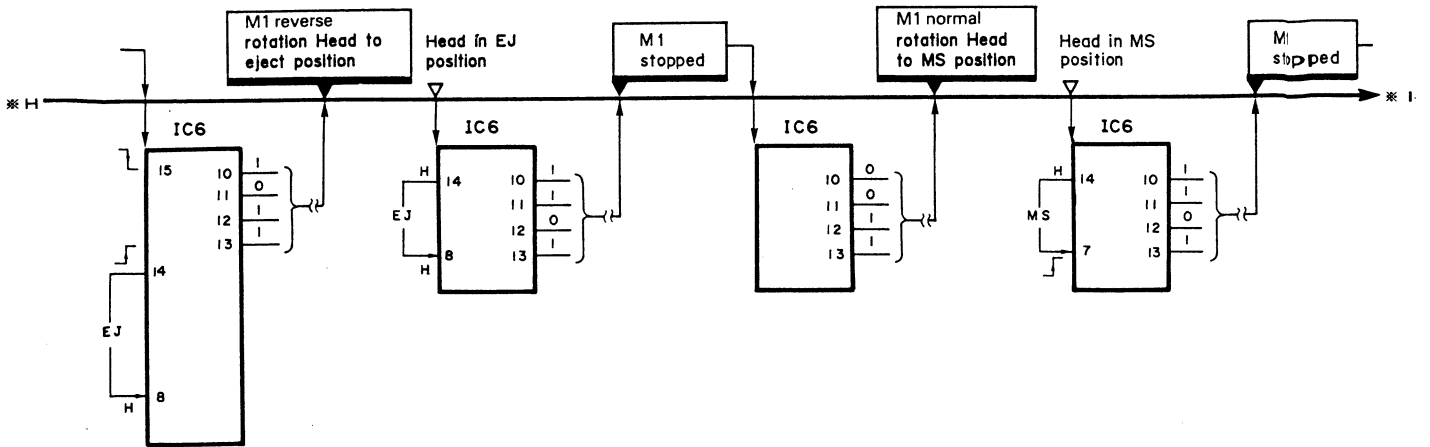
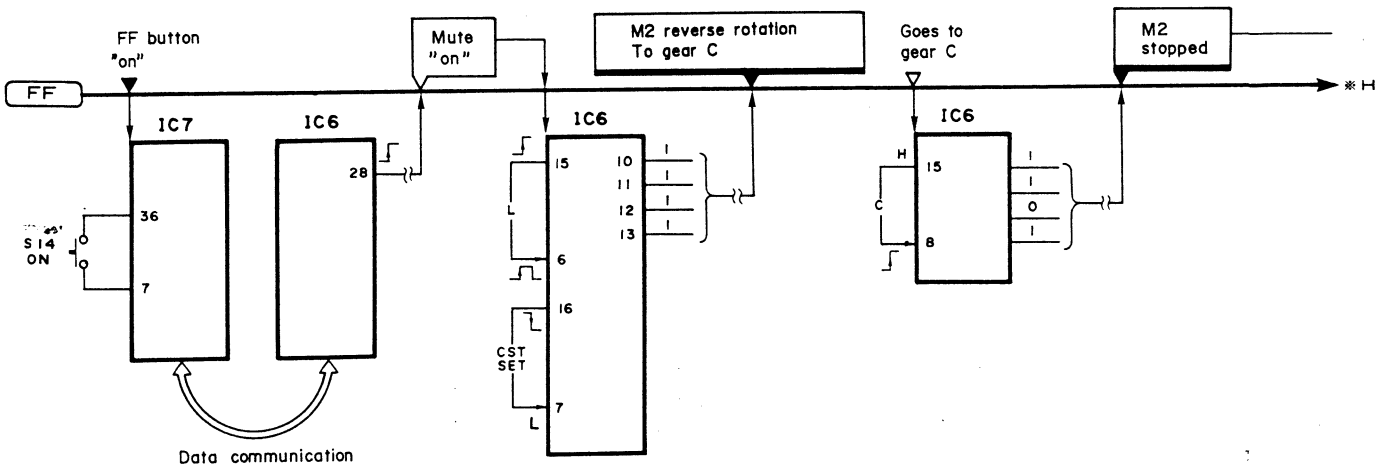


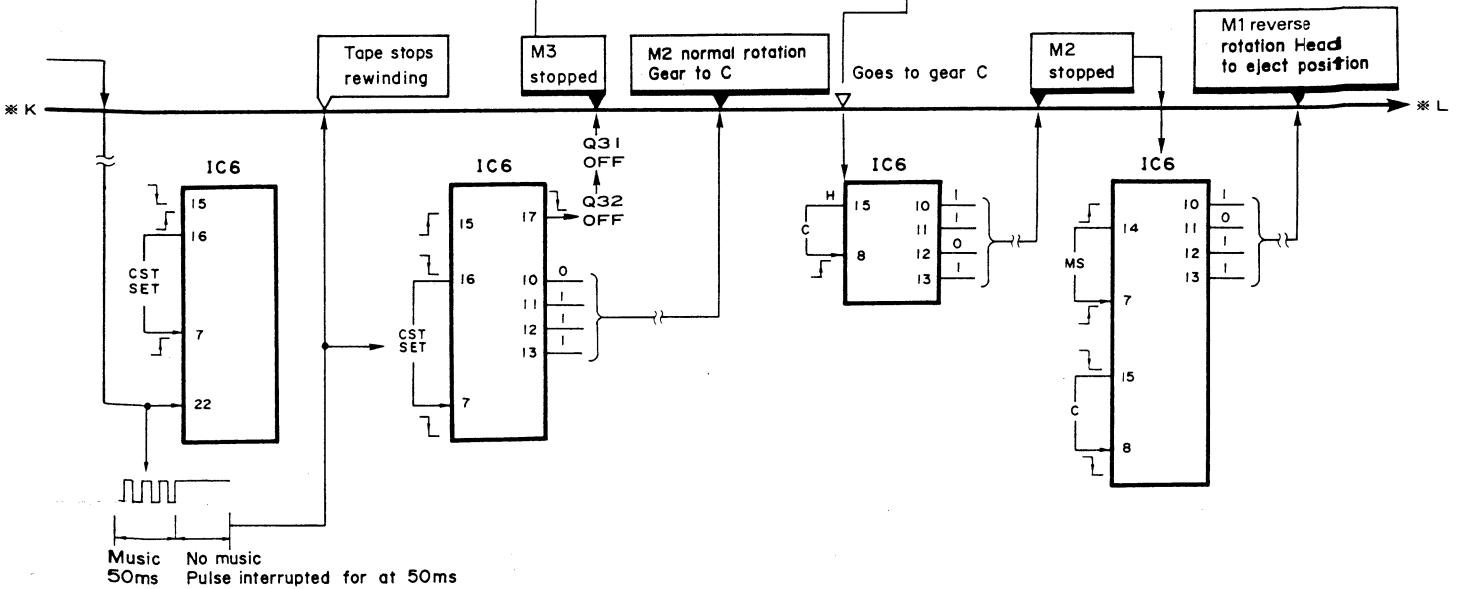
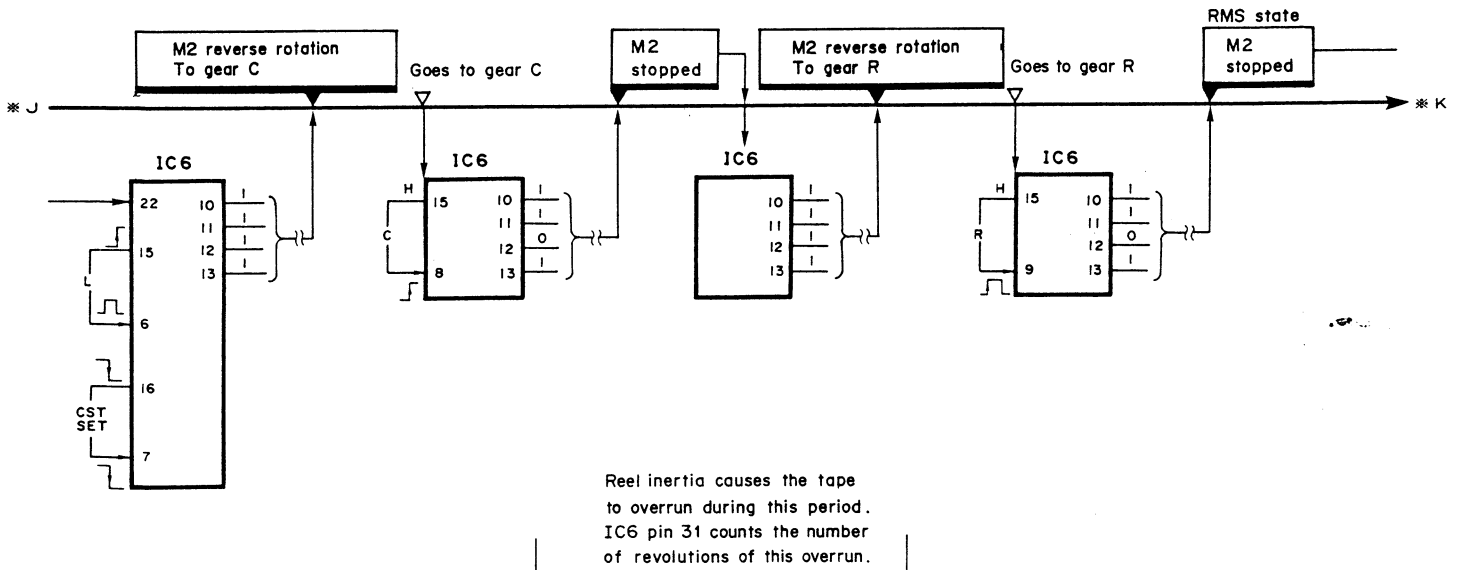
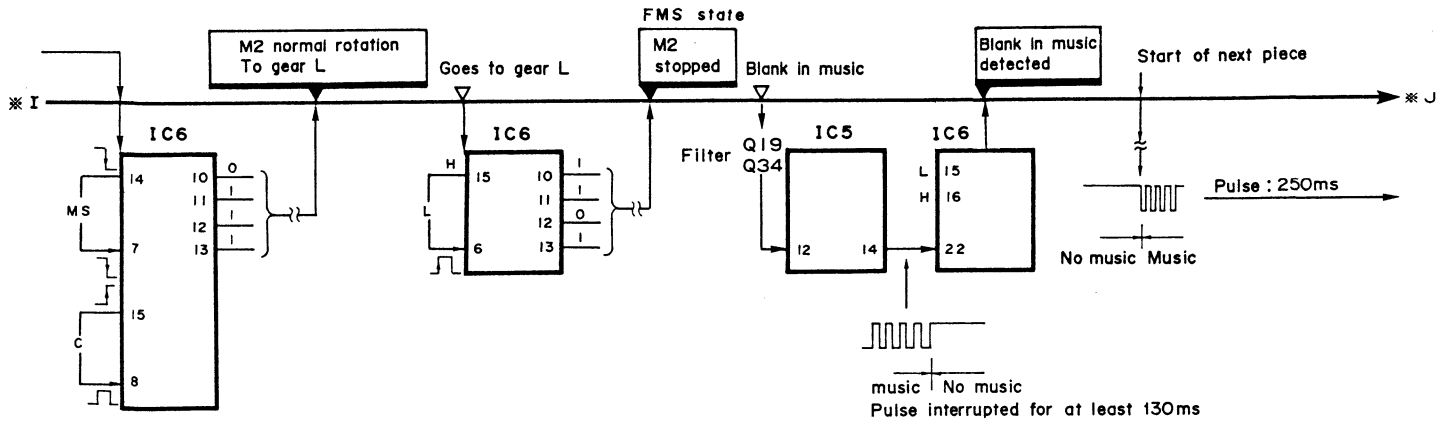
2. F-PLAY → FF

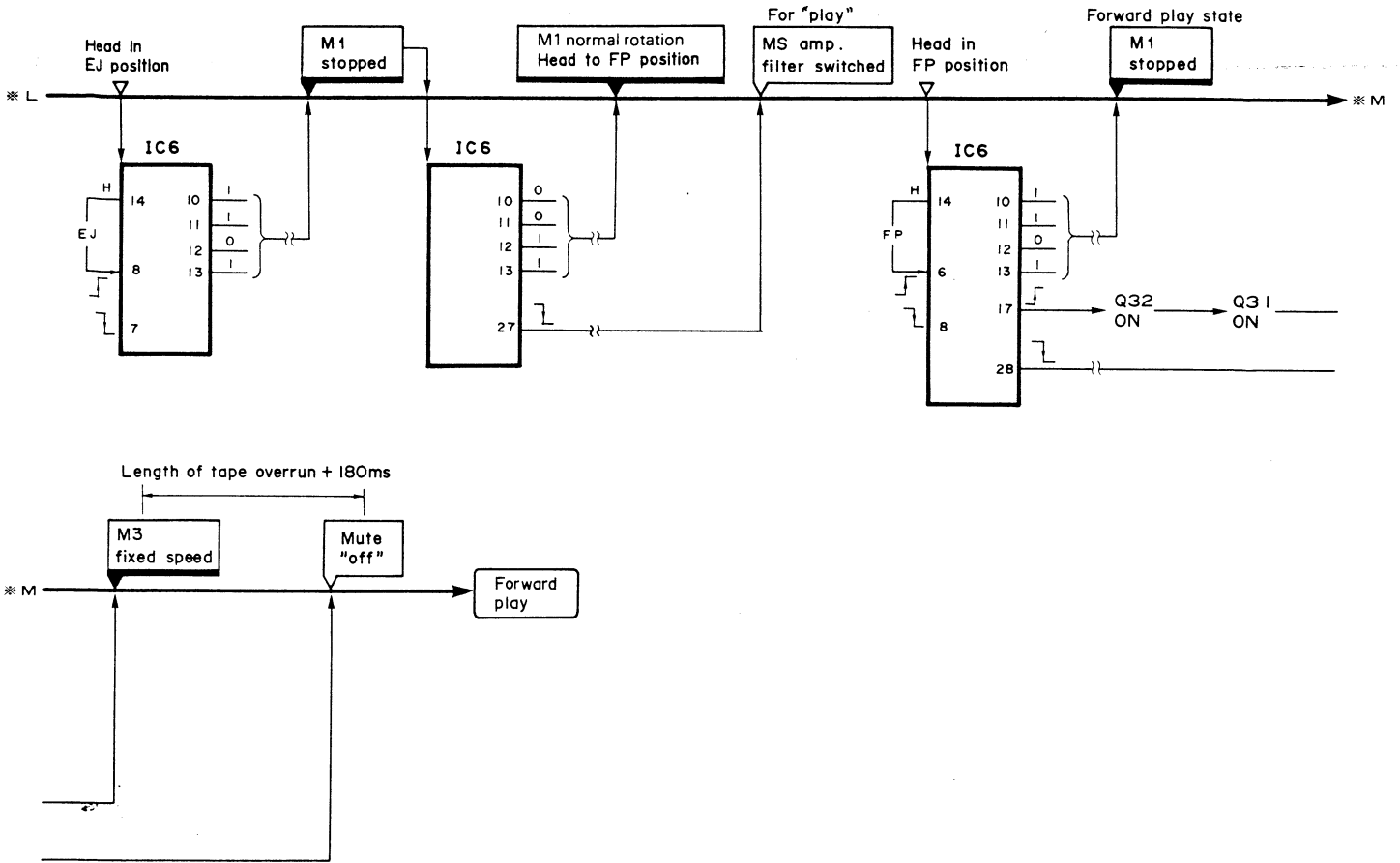




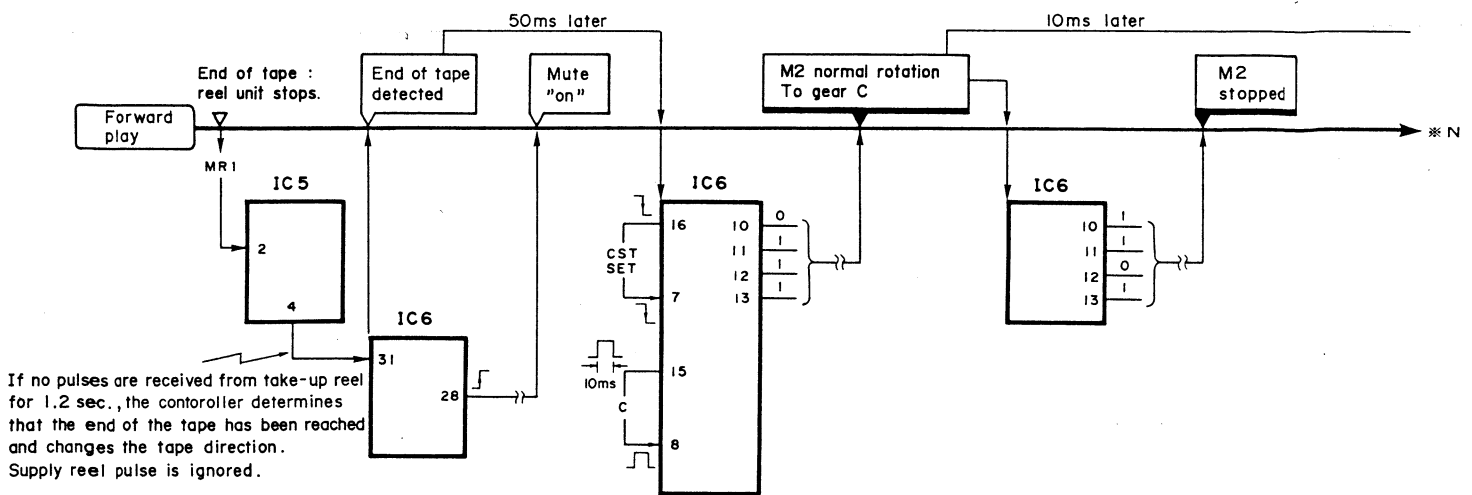
3. FF → F-MS

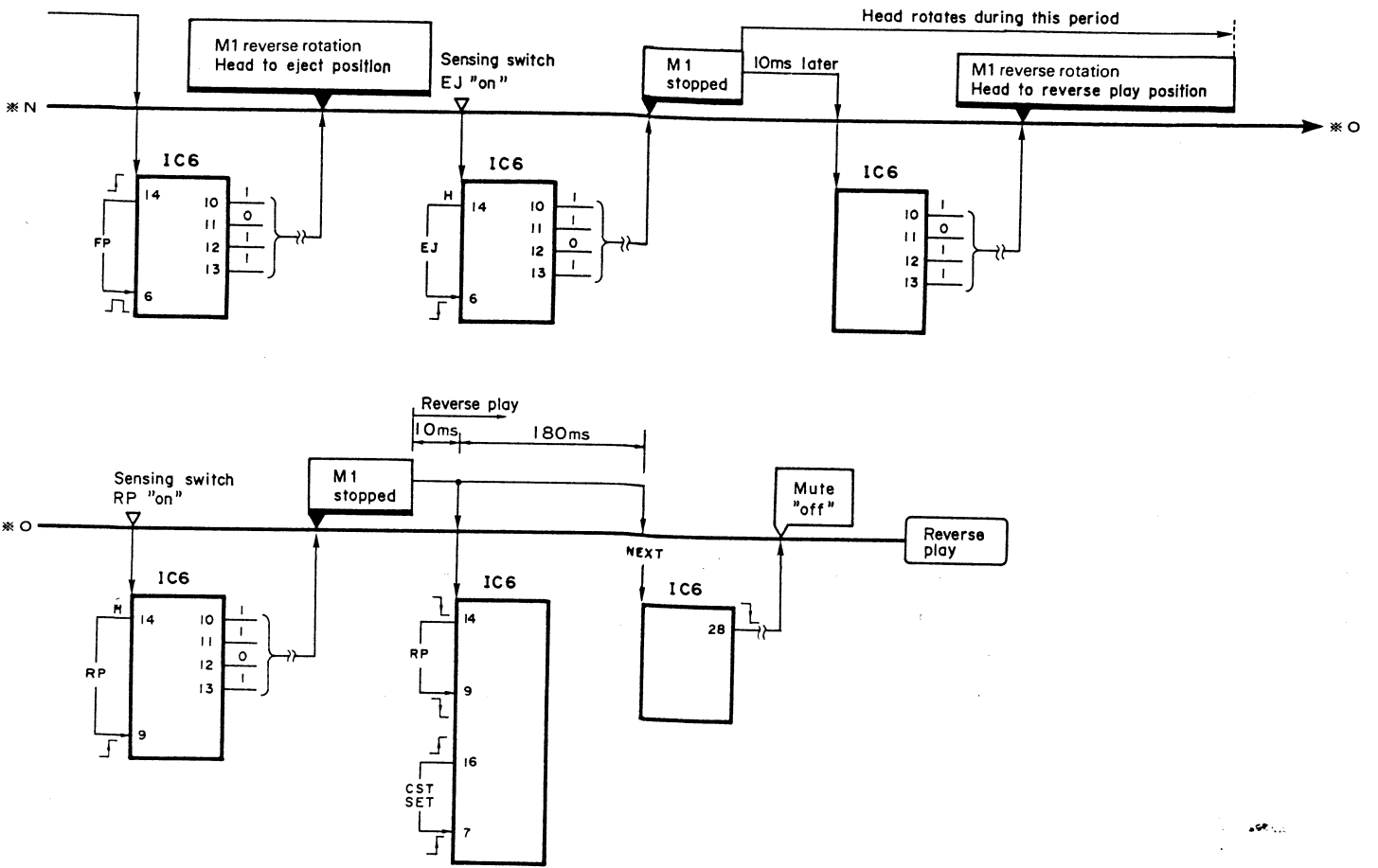




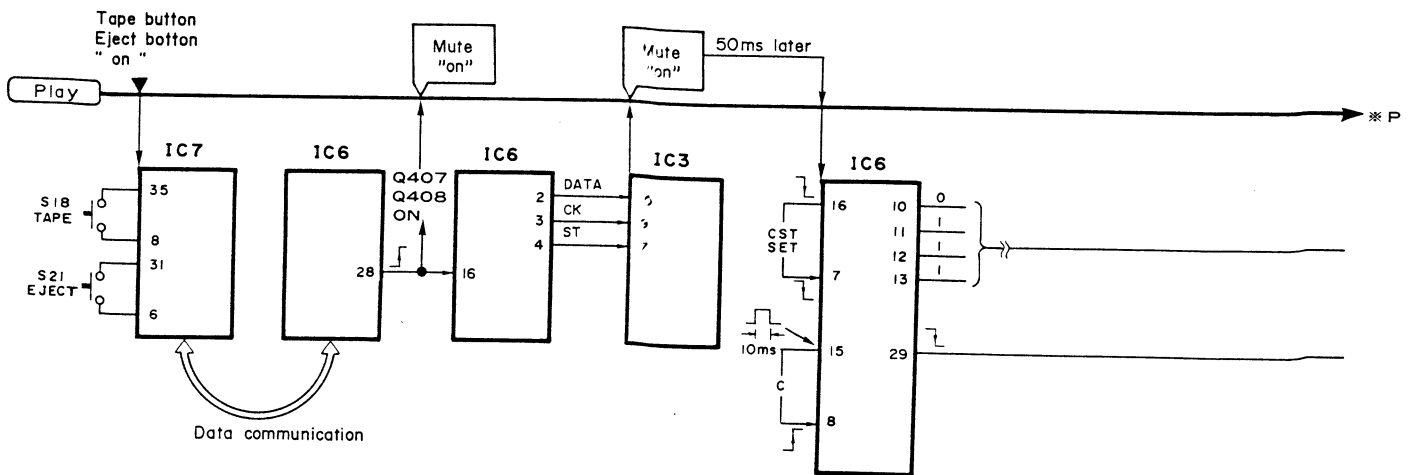


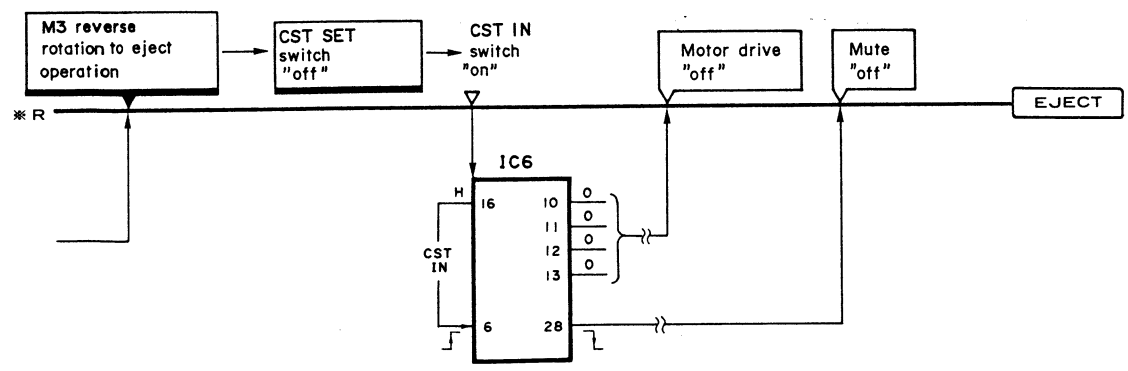
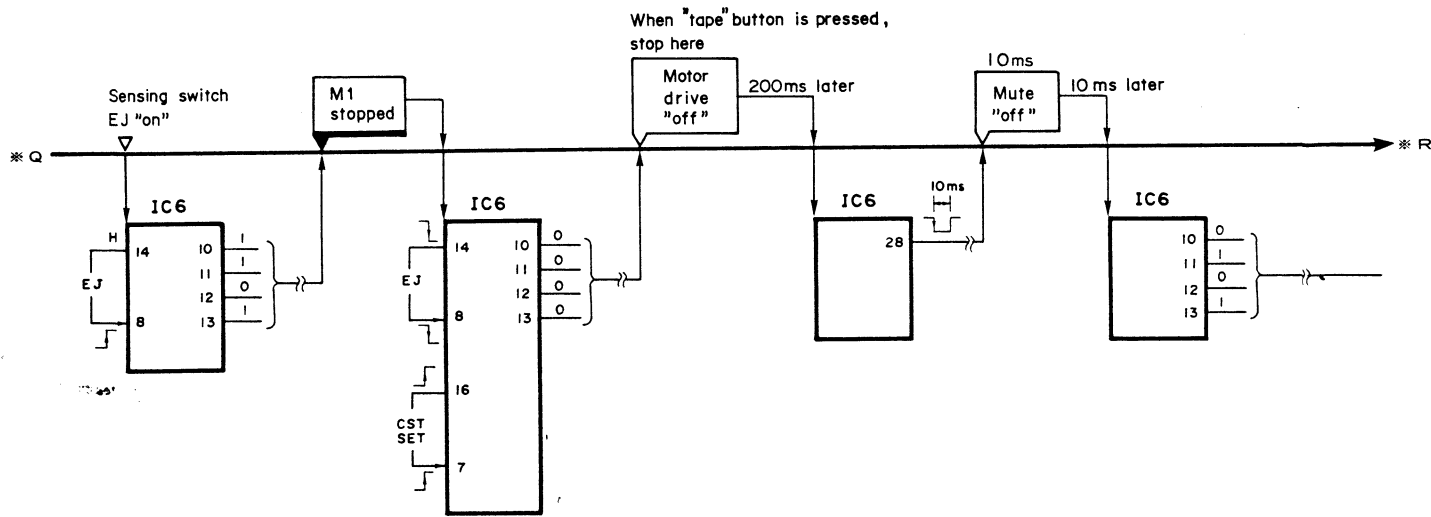
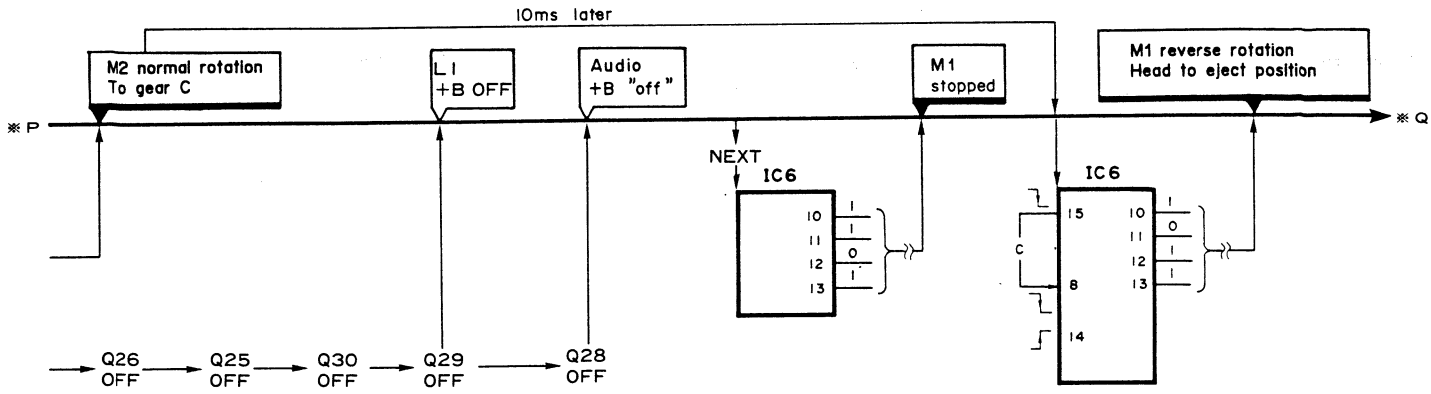
4. Forward Play → Reverse Play





5. Play → Eject





7. ADJUSTMENT

7.1 DOLBY NR LEVEL ADJUSTMENT

• Connection Diagram

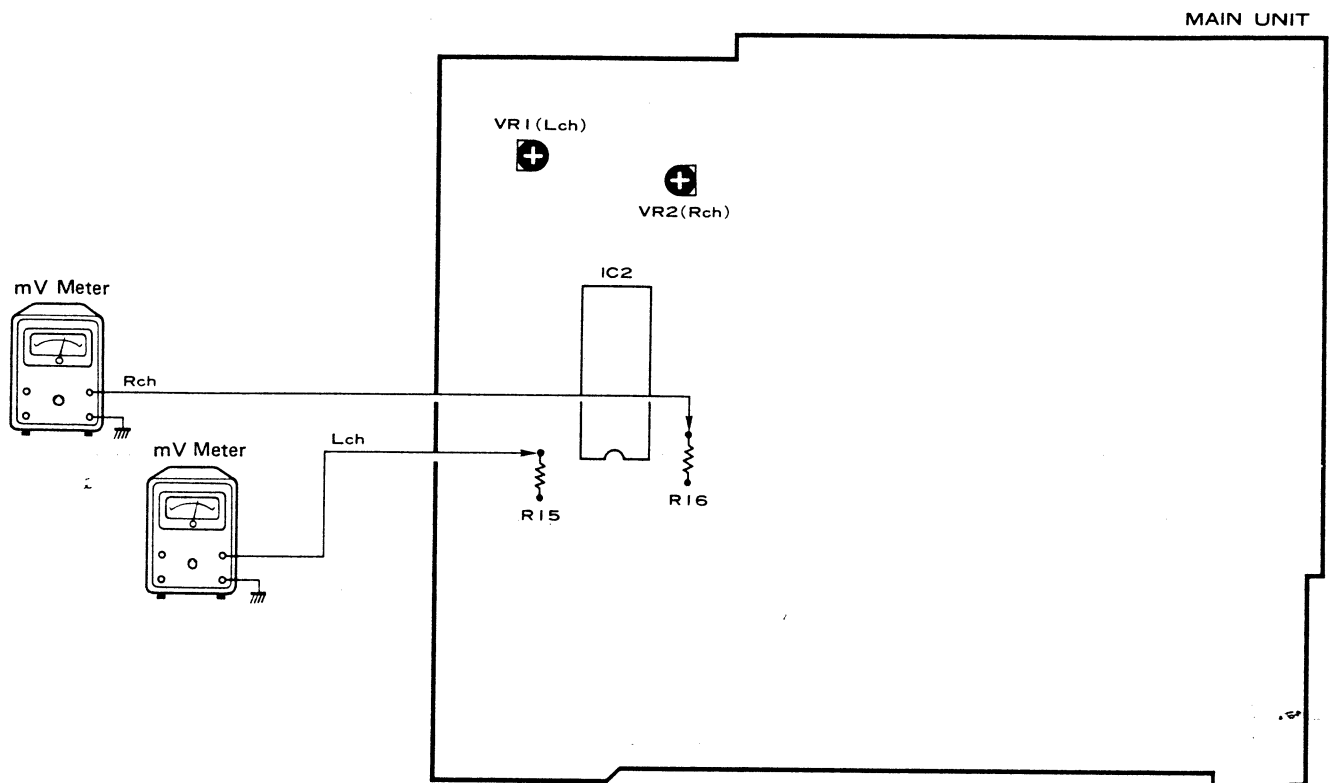


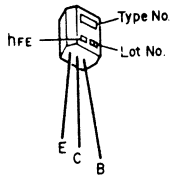
Fig. 32

• To Adjust

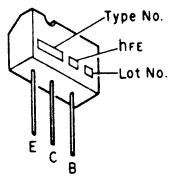
1. Set Dolby NR switch in "off" position.
2. Reproduce CT-150 (400 Hz, 200 nwb/m). Adjust VR 1 (left channel) and VR 2 (right channel) so that the mV meters show 300 mV. Adjustment accuracy should be ± 1 dB.

• ICs and Transistors

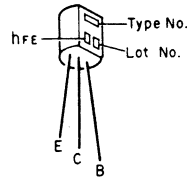
2SA933S
2SC1740S
2SC2458
2SC3113



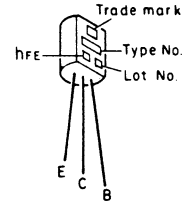
2SD1055F



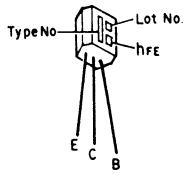
2SA934
2SC2060



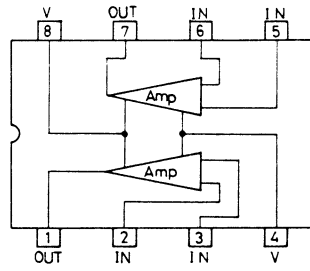
2SA838



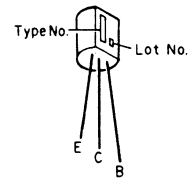
2SA608SP



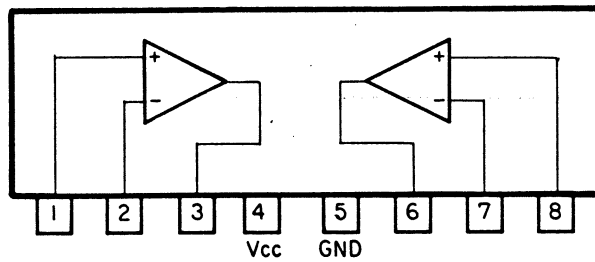
TA75558P



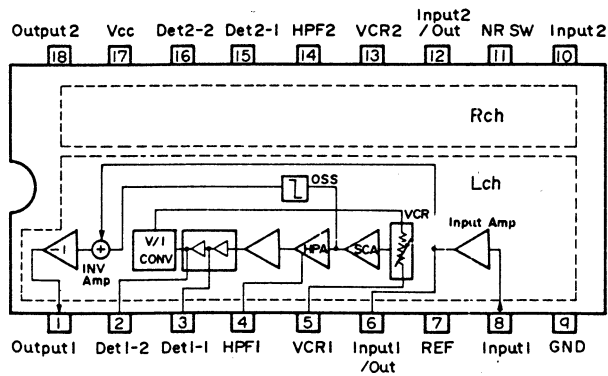
2SA1005



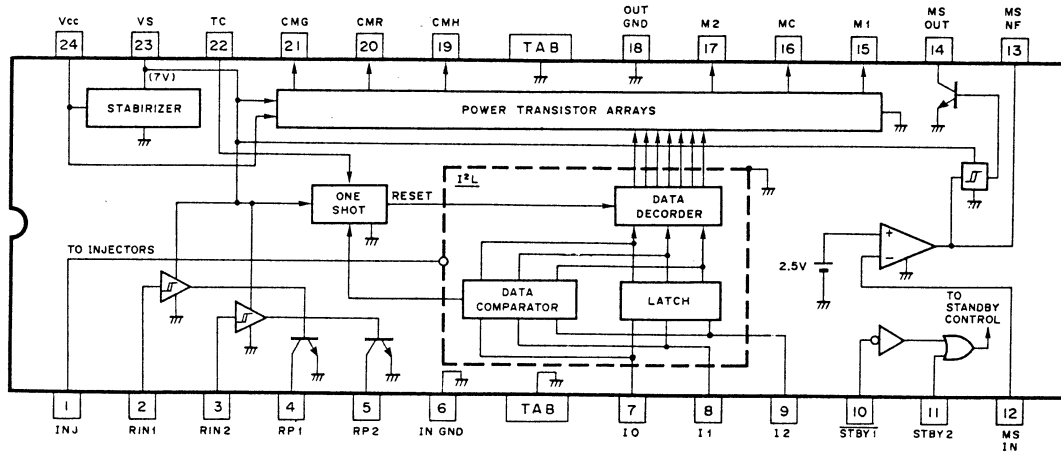
MB3106M



HA12047



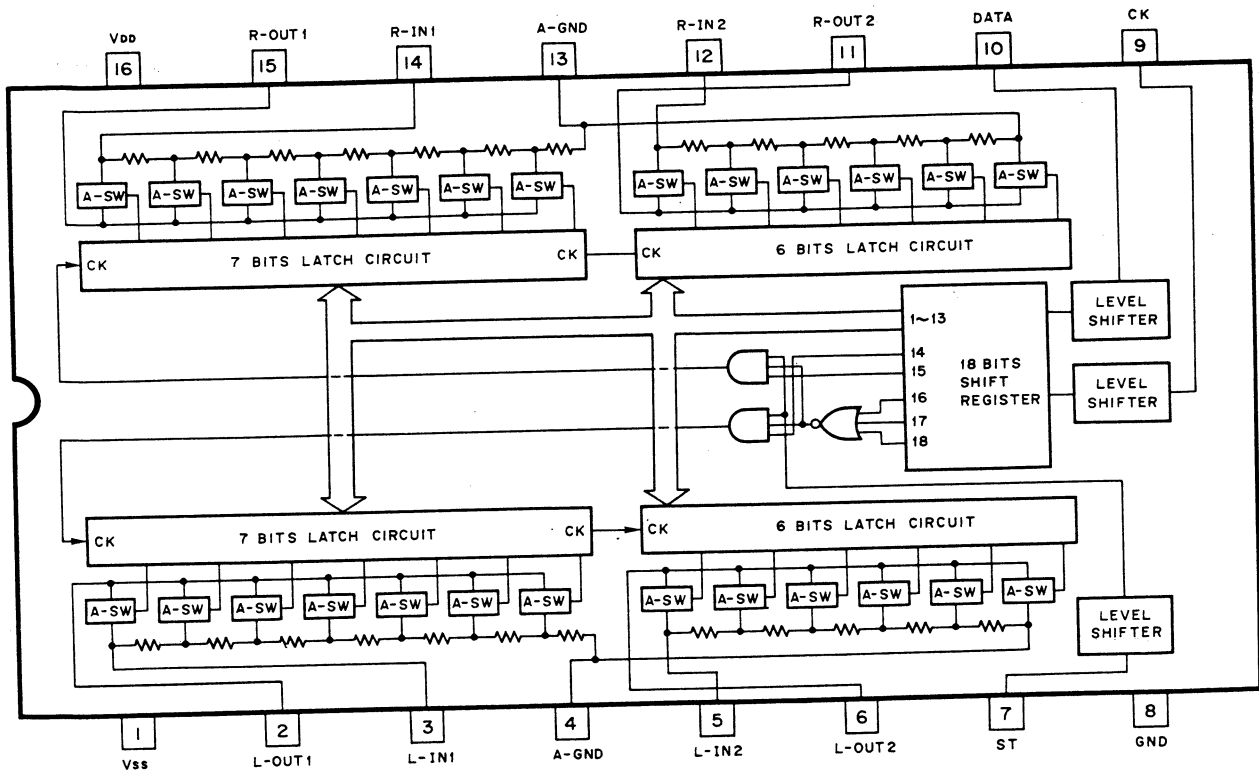
PA 3019



• Pin Function (PA 3019)

| Pin No. | Pin Name | I/O | Function and Operation |
|---------|----------|------------------|--|
| 1 | INJ | Input | "Internal logic" (I ² L) power source |
| 2 | RIN1 | Input | Input pin for reel unit rotation sensor (MR 1) |
| 3 | RIN2 | Input | Input pin for reel unit rotation sensor (MR 2) |
| 4 | RP1 | Output | Output for wave form signal from reel sensor input 1 (pin 2) |
| 5 | RP2 | Output | Output for wave form signal from reel sensor input 2 (pin 3) |
| 6 | IN GND | — | Low signal system ground pin |
| 7 | I0 | Input | Motor control logic input pin |
| 8 | I1 | Input | |
| 9 | I2 | Input | |
| 10 | STBY1 | Input | Standby control — switches IC power circuit off at active low (0.7V or less). |
| 11 | STBY2 | Input | Standby control — switches IC power circuit off at active high (3.5V or more). |
| 12 | MSIN | Input | Input (inverted) pin for MS amp. |
| 13 | MSNF | Output/ Input | MS amp. output and MS Schmitt circuit input |
| 14 | MSOUT | Output | MS Schmitt circuit output — when signal level at MSNF pin exceeds 0 dBm, pulse is outputted open when below 0 dBm |
| 15 | M1 | Output | Drive output "+" pin for head drive motor M1 |
| 16 | MC | Output | Drive output common pin for motors M1 and M2 |
| 17 | M2 | Output | Drive output "+" pin for drive motor M2 ("FF/REW" switching gear) |
| 18 | OUT GND | — | Motor drive circuit ground pin |
| 19 | CMH | Output | Drive output H (+) pin for capstan motor M3 output voltage: During speed control: app. Vcc-1.7V During loading and eject: 6.9V |
| 20 | CMR | Output | Drive output R pin for capstan motor M3 During speed control: open During loading: app. 0V During eject: app. 7V |
| 21 | CMG | Output | Drive output GND (-) pin for capstan motor M3 During speed control: app. 0V During loading and eject: open |
| 22 | TC | Output | Pin for capacitor for setting timer to switch power transistor off in a set time when logic inputs I0, I1, I2 change. |
| 23 | VS | Output | Power source for reel rotation sensor — app. 7V |
| 24 | Vcc | Input | IC power supply pin |

TC9154P

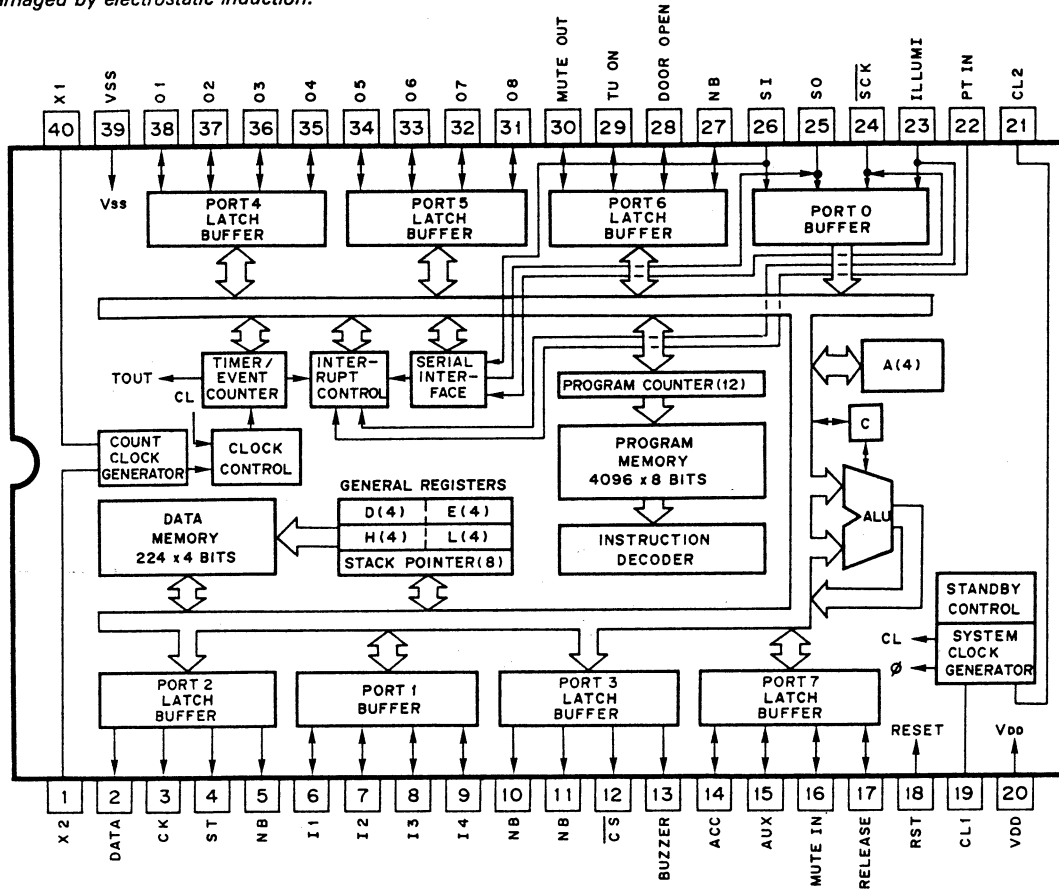


• Pin Function (TC9154P)

| Pin No. | Pin Name | I/O | Function and Operation |
|---------|----------|--------|---|
| 1 | Vss | — | (-) power source pin |
| 2 | L-OUT1 | Output | 10 dB step attenuation output |
| 15 | R-OUT1 | Output | Signal received at IN, reduced from 0 dB to -60 dB in 7 steps of 10 dB |
| 3 | L-IN1 | Input | 10 dB step attenuation input |
| 14 | R-IN1 | Input | |
| 4 | A-GND | — | AC ground |
| 13 | A-GND | — | |
| 5 | L-IN2 | Input | 2 dB step attenuation input |
| 12 | R-IN2 | Input | |
| 6 | L-OUT2 | Output | 2 dB step attenuation output |
| 11 | R-OUT2 | Output | Signal received at IN, reduced from 0 dB to -8 dB in 5 steps of 2 dB |
| 7 | ST | Input | Strobe input pin — attenuation & channel selection signals received from the DATA and CK terminals are latched by going "H" level at this pin — if "H" level not reached at this pin, prior data is used. |
| 8 | GND | — | |
| 9 | CK | Input | Input pin for clock used when receiving data from the DATA pin |
| 10 | DATA | Input | Attenuation and channel selection data input pin — inputted as 18 bit CK signal. |
| 16 | VDD | — | (+) power source pin |

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

*PD 4054A



• Pin Function (PD4054A)

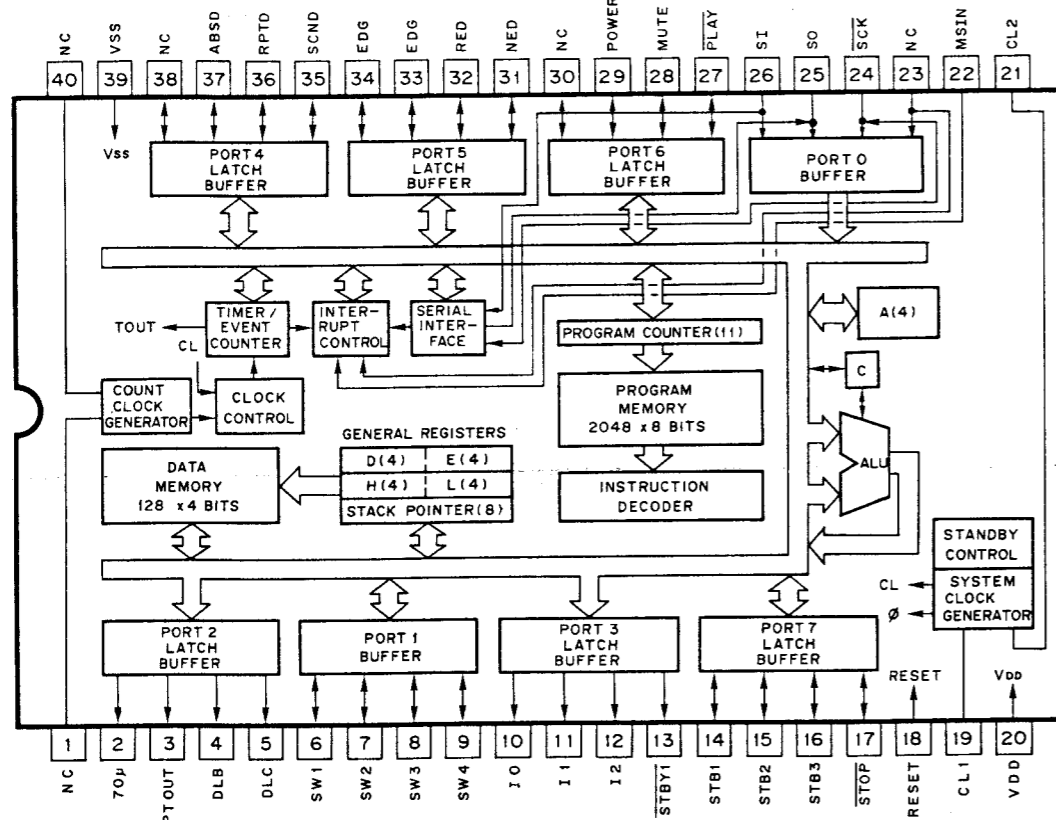
| Pin No. | Pin Name | I/O | Function and Operation |
|---------|----------|--------|--|
| 1 | X2 | Output | Pin for counter clock oscillator crystal |
| 2 | DATA | Output | Pin for driving electronic volume control IC and TC 9154P when transmitting serially |
| 3 | CK | Output | |
| 4 | ST | Output | |
| 5 | NB | Output | |
| 6-9 | I1-I4 | Input | Keyboard switch matrix input |
| 10, 11 | NB | Output | Open |
| 12 | CS | Output | Activates display controller IC |
| 13 | BUZZER | Output | Outputs 3.8 kHz when control buttons are switched on or off, etc. |
| 14 | ACC | Input | Connects to automobile Acc. power source—"H" at app. 5V or more. |
| 15 | AUX | Input | "H" when device connected to AUX pin is "on" |
| 16 | MUTE IN | Input | When "H", attenuation of serial transmission of electronic volume is maximized. |
| 17 | RELEASE | Input | When "H", release command is sent to deck controller—FX-K5 is GND |
| 18 | RST | Input | Reset to start when back up power source is "on" or reset button pushed |
| 19 | CL1 | Input | Pin for system clock oscillator crystal—external clock input |
| 20 | VDD | — | Power source pin |
| 21 | CL2 | Output | Pins for the capacitor and resistor for the system clock oscillator. |
| 22 | PT IN | Input | Input pin for deck controller pulse (100 Hz, DUTY 50% output) |
| 23 | ILLUMI | Input | Connected to "small-lamp-linked" power source |

| Pin No. | Pin Name | I/O | Function and Operation |
|---------|-----------|--------------|--|
| 24 | SCK | Input/Output | Pin for synchronized clock for serial transmission among the deck, tuner and display controllers |
| 25 | SO | Output | Data output pin for serial transmission among the deck, tuner and display controllers |
| 26 | SI | Input | Data input pin for serial transmission between the deck and tuner controllers |
| 27 | NB | Output | Alarm output (FX-K5SDK/WG only) |
| 28 | DOOR OPEN | Output | Not used at present |
| 29 | TU ON | Output | "H" when tuner is "on" |
| 30 | MUTE OUT | Output | Not used at present |
| 31-38 | O1-O8 | Output | Keyboard switch matrix output |
| 39 | Vss | - | Power source GND |
| 40 | X1 | Input | Pin for counter clock oscillator crystal - external clock input |

• Pin Function (PD4056A)

| Pin No. | Pin Name | I/O | Function and Operation |
|---------|-----------|--------------|--|
| 1 | NC | Output | Open |
| 2 | 70 μs | Output | Pin for switching the 70 μs equalizer. Active "H." |
| 3 | PT OUT | Output | 100 Hz Duty 50% pulse output pin. This signal is output during reset operation and while Acc is not off. |
| 4 | DLB | Output | Dolby B switching output pin. Dolby B at "H" level. |
| 5 | DLC | Output | Not used at present. |
| 6-9 | SW1-SW4 | Input | Mechanism control switch matrix input pin |
| 10-12 | I0-I2 | Output | Motor drive IC (PA3019) control signal output pin |
| 13 | STBY1 | Output | • I0, 11, 12: control code output • STBY1: PA3019 output "off." Active "L." |
| 14-16 | STB1-STB3 | Output | Mechanism control switch matrix strobe output pin. Active "H" STB1: head position sensor STB2: FF/REW gear position sensor STB3: Loading and 70 μs sensor |
| 17 | STOP | Output | Pin for stopping capstan motor. Is "L" when entering the "play" or "release" mode from FF/REW. Active "L." |
| 18 | RESET | Input | Reset input pin - active "H." |
| 19 | CL1 | Input | Pin for system clock oscillator circuit. Used to connect a capacitor and a resistor. |
| 20 | VDD | - | Power source pin |
| 21 | CL2 | Output | Pin for system clock oscillator circuit. Used to connect a capacitor and a resistor. |
| 22 | MS IN | Input | Music detection signal input pin for MS: No music - "L" level input; Music - pulse input. |
| 23 | NC | - | Fixed at GND level |
| 24 | SCK | Input/Output | Input/output pin for shift clock For serial interface |
| 25 | SO | Output | Serial interface data output pin |
| 26 | SI | Input | Serial interface data input pin |
| 27 | PLAY | Output | MS amp. filter switching output pin. "L" level when in "play." |
| 28 | MUTE | Output | Mute signal output pin. Active "H." |
| 29 | POWER | Output | Output pin for power source control. "H" level when deck is "on." |
| 30 | NC | - | Fixed at GND level |
| 31 | NED | Input | Forward side reel rotation pulse input pin. Monitors tape end. |
| 32 | RED | Input | Reverse side reel rotation pulse input pin. Monitors tape end. |
| 33, 34 | EDG | Input | Fixed at GND level |
| 35 | SCND | Input | Mode set input pin |
| 36 | RPTD | Input | • SCND: SCAN function cancelled at "H" level. |
| 37 | ABSD | Input | • RPTD: repeat function cancelled at "H" level. |
| 38 | NC | Input | • ABSD: ABS function at "H" level. • NC: fixed at level VDD. |
| 39 | Vss | - | |
| 40 | NC | - | Fixed at GND level |

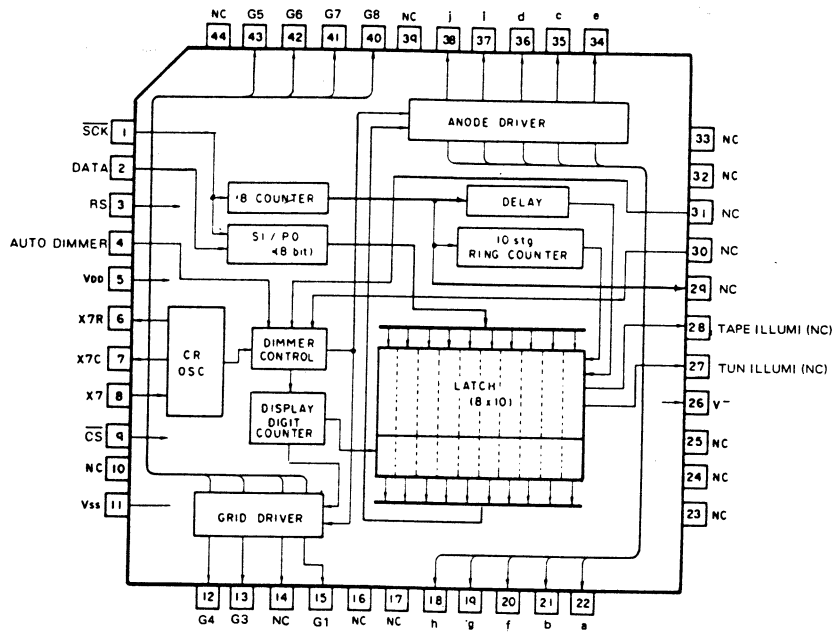
*PD 4056A



Pin Function

| Pin No. | Pin Name |
|---------|---------------|
| 1 | SCK |
| 2 | DATA |
| 3 | RS |
| 4 | AUTO |
| 5 | VDD |
| 6-8 | |
| 9 | CS |
| 10 | NC |
| 11 | Vss |
| 12-15 | G4-C |
| 16, 17 | NC |
| 18-22 | h, g, f, e, d |
| 23-25 | NC |
| 26 | V- |
| 27 | TUN |
| 28 | TAPE |
| 29-31 | NC |
| 32, 33 | NC |
| 34-36 | e, c, b |
| 37, 38 | i, j |
| 39 | NC |
| 40-43 | G8-C |
| 44 | NC |

*PD 7005

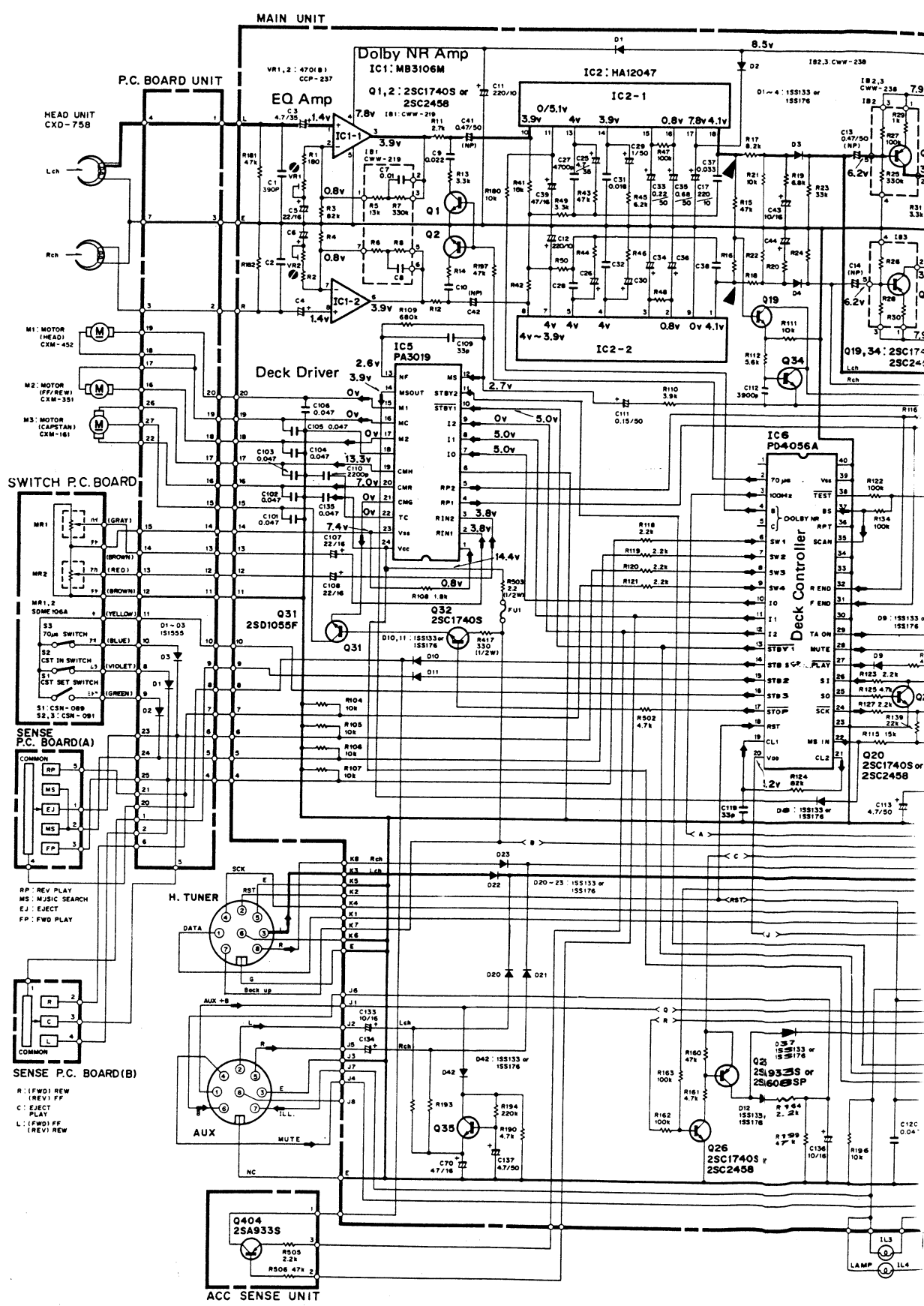


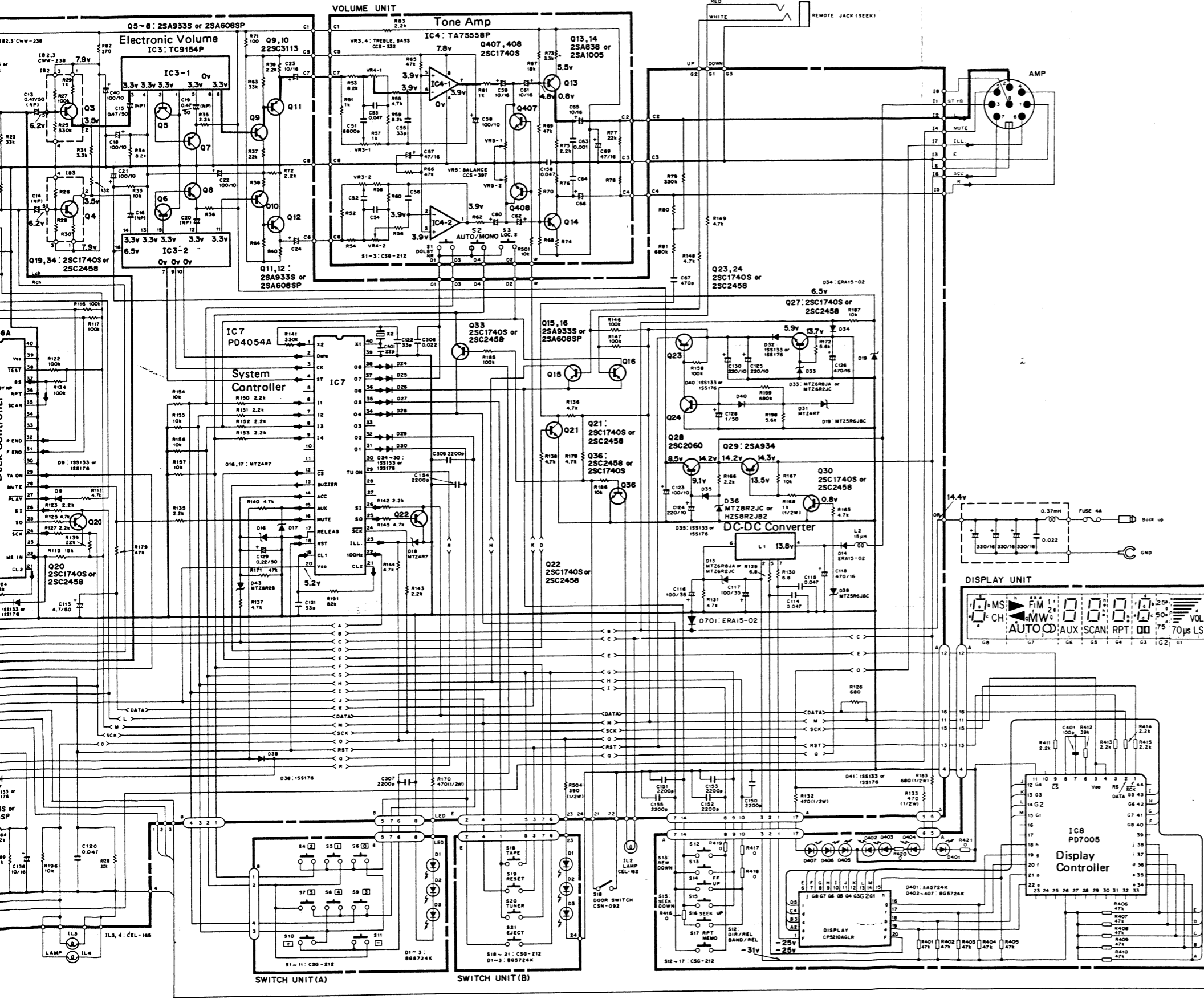
Pin Functions (PD7005)

| Pin No. | Pin Name | I/O | Function and Operation |
|---------|---------------|--------|--|
| 1 | SCK | Input | Serial interface system clock input pin. Active "L". |
| 2 | DATA | Input | Data input pin |
| 3 | RS | | Reset pin |
| 4 | AUTO DIMMER | | Not used |
| 5 | VDD | | Power supply pin. 5V ± 0.3V |
| 6 ~ 8 | | | For oscillator circuit |
| 9 | CS | Input | Chip selector signal input pin. Active "L". |
| 10 | NC | | |
| 11 | VSS | | GND |
| 12~15 | G4~G1 | Output | FL grid outputs |
| 16, 17 | NC | | |
| 18~22 | h, g, f, b, a | Output | FL anode outputs |
| 23~25 | NC | | |
| 26 | V- | Output | Grid output. Negative voltage Output pin for pull-down resistor. |
| 27 | TUN ILLUMI. | Output | TUN illuminator ON output pin ("H" level). Not used |
| 28 | TAPE ILLUMI. | Output | TAPE illuminator ON output pin ("H" level). Not used |
| 29~31 | NC | | Not used |
| 32, 33 | NC | | |
| 34~36 | e, c, d | Output | FL anode outputs |
| 37, 38 | i, j | Output | |
| 39 | NC | | |
| 40~43 | G8~G5 | Output | FL grid outputs |
| 44 | NC | | |

8. SCHEMATIC CIRCUIT DIAGRAM (FX-K5/EW)

A
B
C
D





AUDIO CONTROL UNIT(CWX-574)
 CONSISTS OF
 • MAIN UNIT
 • VOLUME UNIT
 • ACC SENSE UNIT

- SWITCHES:**
 © SWITCH P.C. BOARD
 S1: CST SET SWITCH ON - OFF
 S2: CST IN SWITCH ON - OFF
 S3: 70µs SWITCH ON(120µs) - OFF(70µs)
 © MISCELLANEOUS
 S18: DOOR SWITCH ON(CLOSE) - OFF(OPEN)

THE UNDERLINED INDICATED THE SWITCH POSITION.

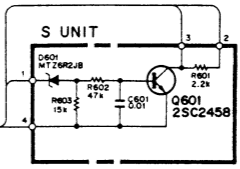
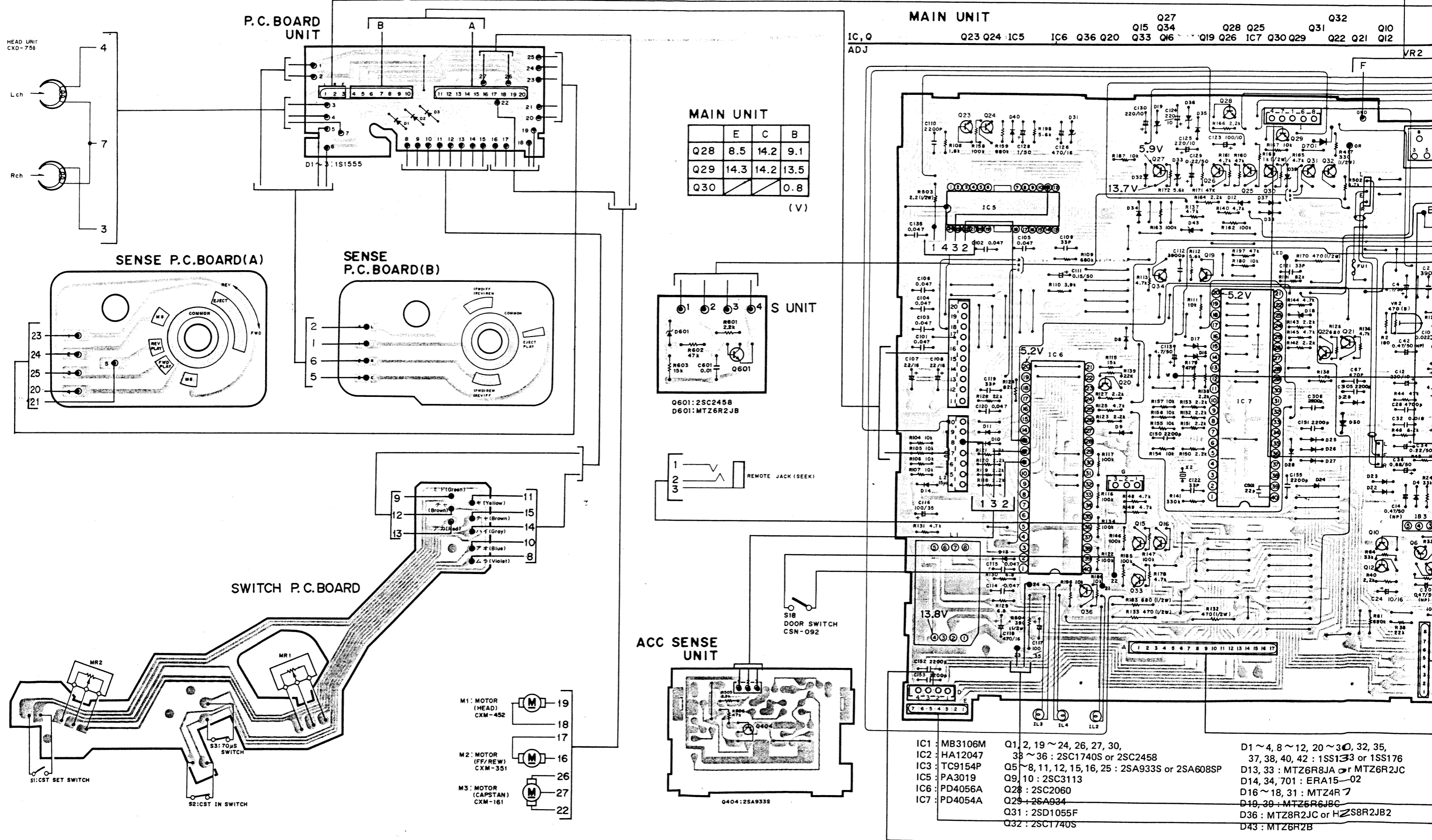


Fig. 33

9. CONNECTION DIAGRAM (FX-K5/EW)



A

B

C

D

1

2

3

4

5

6

1

2

3

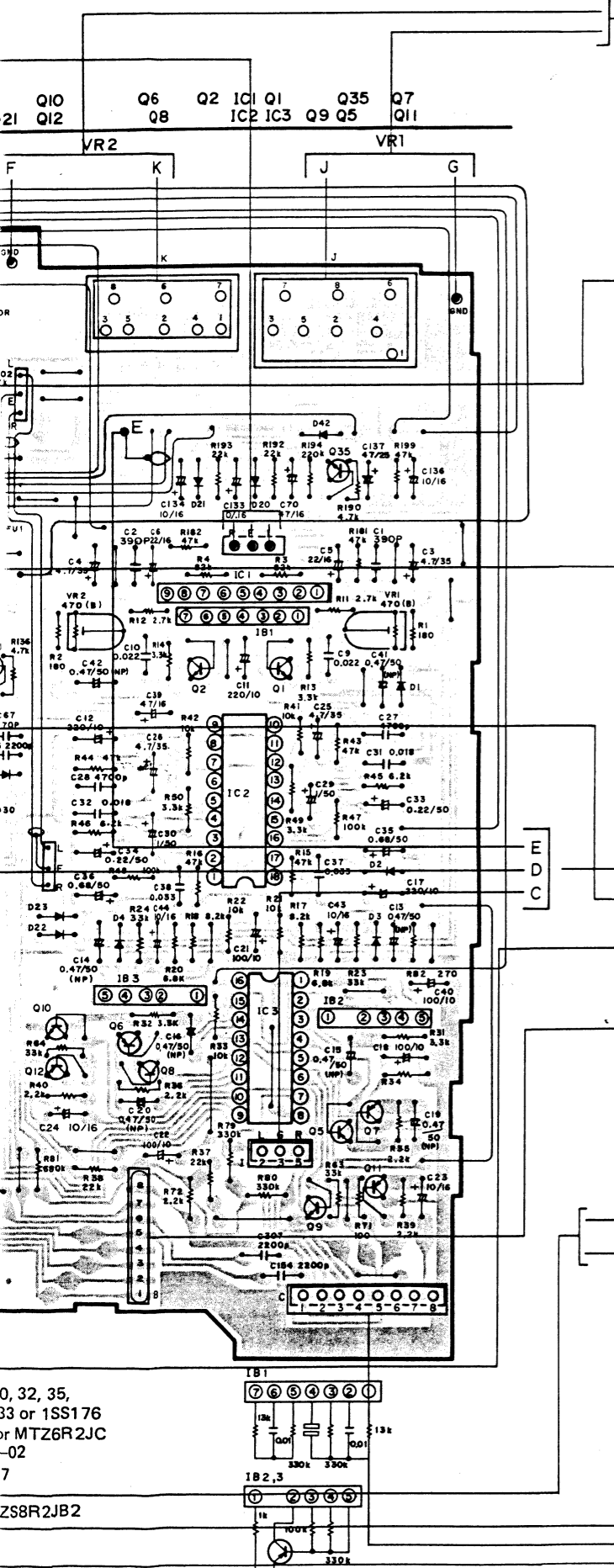
4

5

6

7

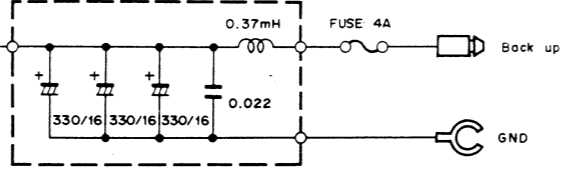
7 | 8 | 9 | 10 | 11



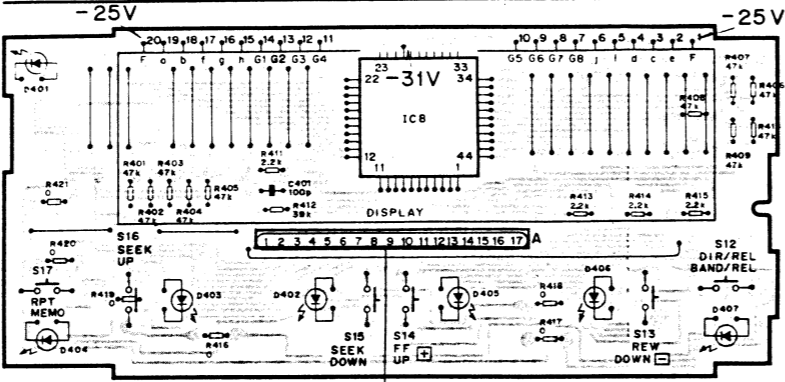
MAIN UNIT

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|------|-----|----|----|-----|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| IC 1 | 1.4 | 0.8 | 3.9 | 7.8 | 0 | 3.9 | 0.8 | 1.4 | | | | | | | | | | | | | | | | | |
| IC 2 | 4.1 | 0.8 | | 4.0 | 4.0 | | 4.0 | 3.9 | 0 | 3.9 | 5.1 | | 4.0 | 3.9 | | 0.8 | 7.8 | 4.1 | | | | | | | |
| IC 3 | 0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 0 | 0 | 0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 6.5 | | | | | | | | | |
| IC 5 | 0.8 | 3.8 | 3.8 | | | | 0 | 5.0 | 5.0 | 0 | 5.0 | | 2.7 | 2.6 | 3.9 | 0 | 0 | 0 | 0 | 13.3 | 7.0 | 0 | 0 | 7.4 | 14.4 |

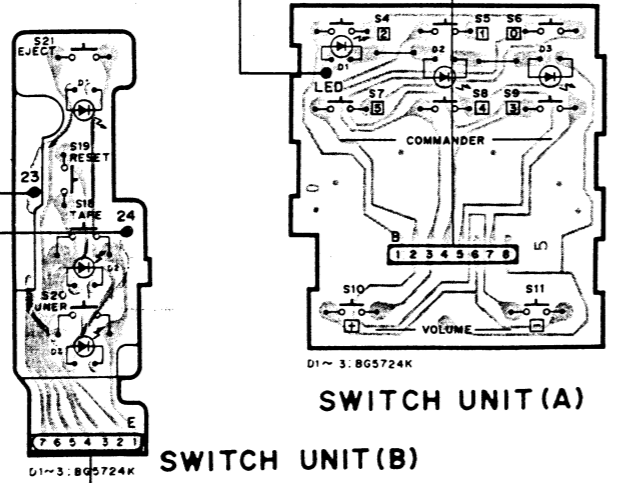
(V)



DISPLAY UNIT

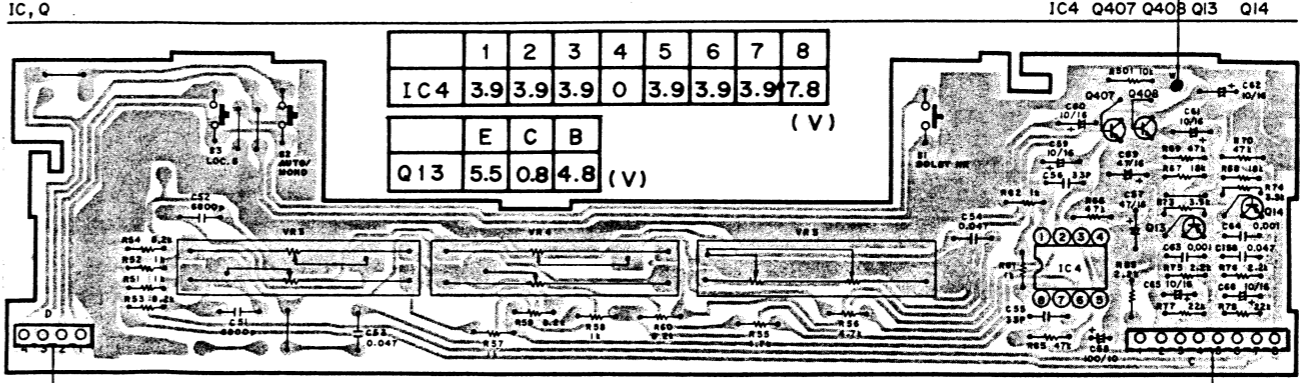


IC8: PD7005
IC9: AA5724K
D402~407: 8G5724K



D1~3: 8G5724K

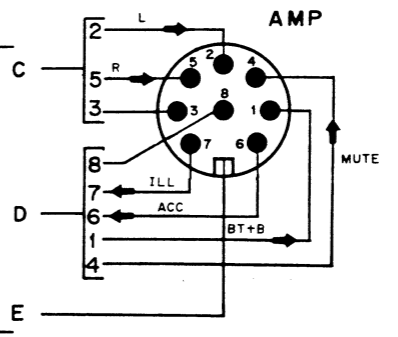
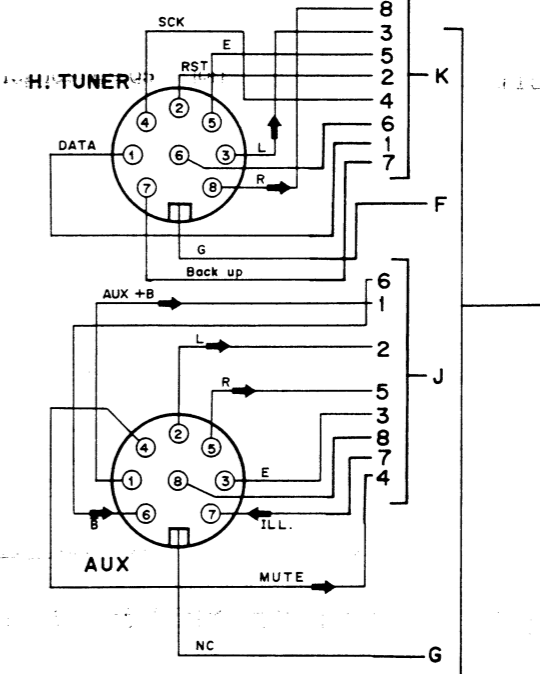
VOLUME UNIT



IC4: A7558P
Q13, 14: 2SA1005
Q407, 408: 2SC1740S

| | | | | | | | | |
|------|-----|-----|-----|---|-----|-----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| IC 4 | 3.9 | 3.9 | 3.9 | 0 | 3.9 | 3.9 | 3.9 | 7.8 |
| E | | | | | | | | |
| C | | | | | | | | |
| B | | | | | | | | |
| Q 13 | 5.5 | 0.8 | 4.8 | | | | | |

(V)



A

B

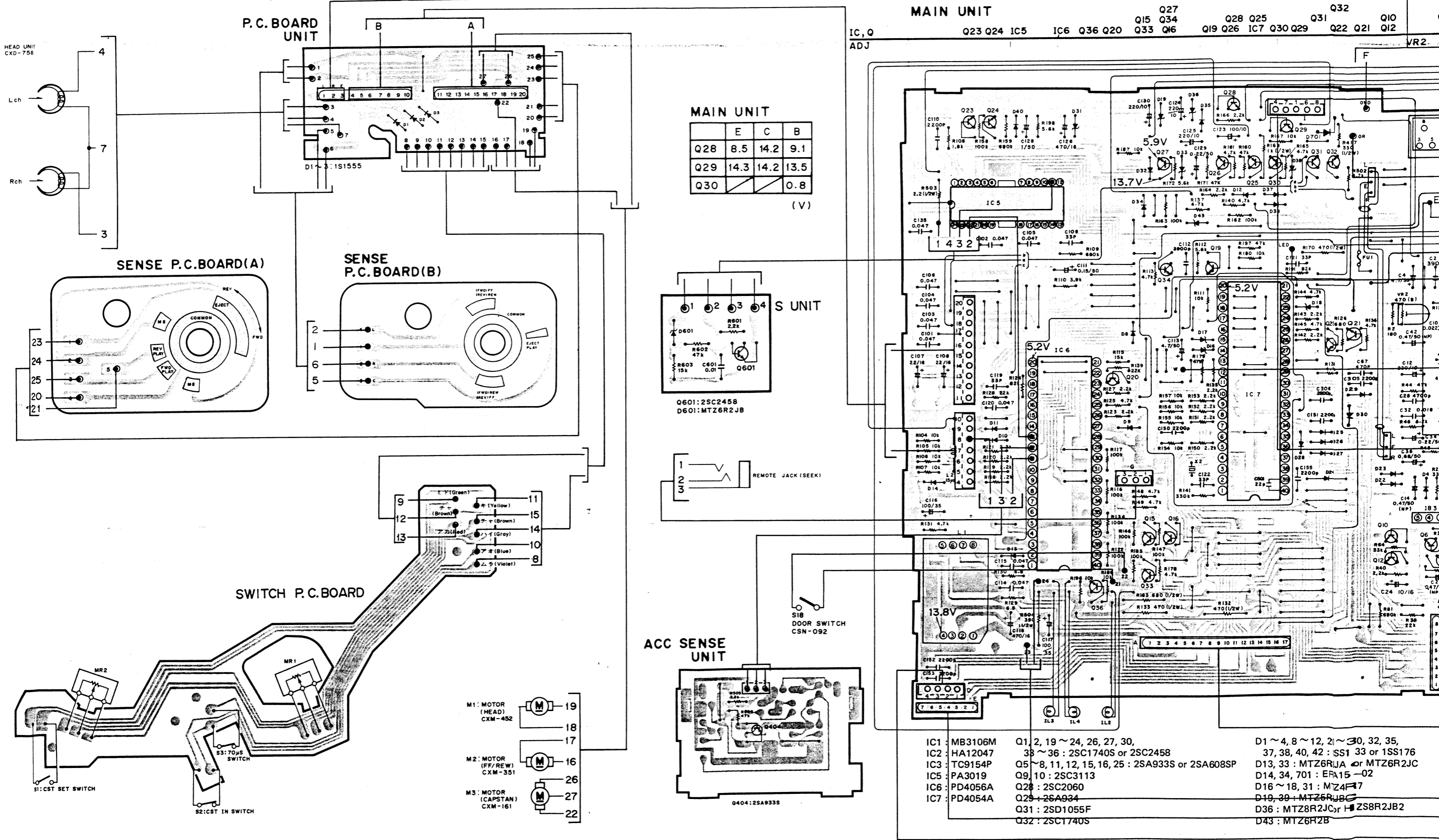
C

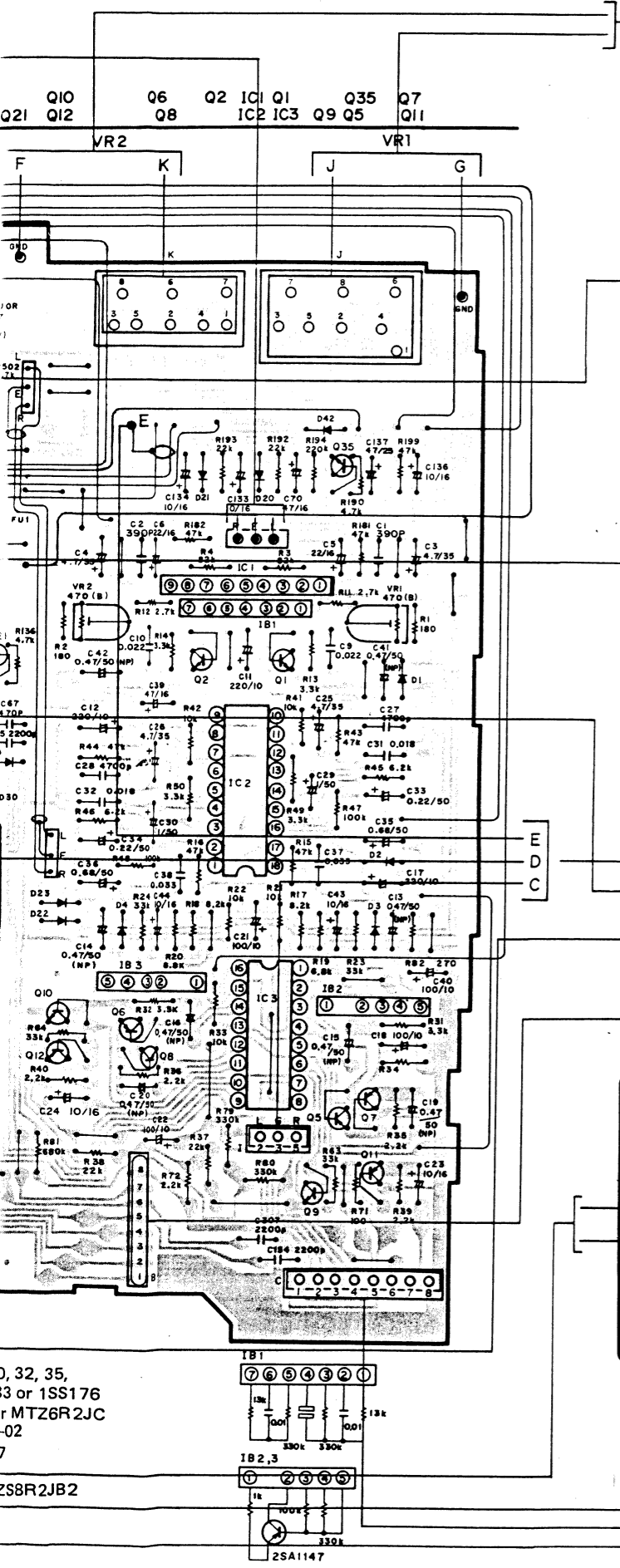
D

Fig. 34

7 | 8 | 9 | 10 | 11 | 12

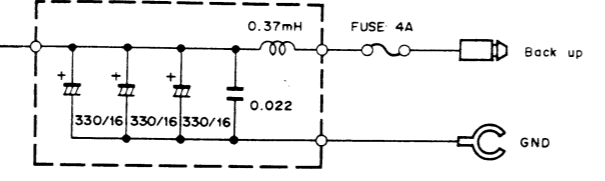
9. CONNECTION DIAGRAM (FX-K5/EW)



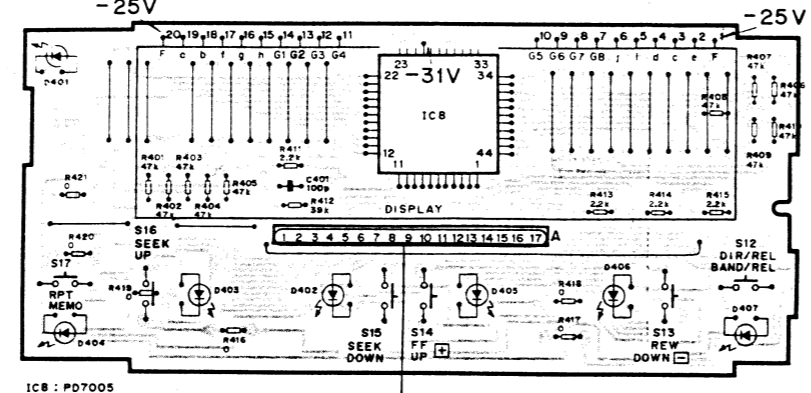


MAIN UNIT

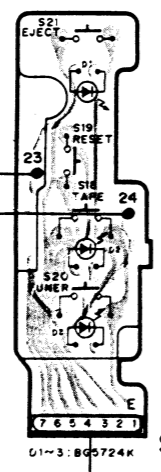
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|------|-----|-----|-----|-----|-----|-----|-----|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|------|-----|----|----|-----|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| IC 1 | 1.4 | 0.8 | 3.9 | 7.8 | 0 | 3.9 | 0.8 | 1.4 | | | | | | | | | | | | | | | | | |
| IC 2 | 4.1 | 0.8 | | 4.0 | 4.0 | | 4.0 | 3.9 | 0 | 3.9 | 0 | | 4.0 | 3.9 | | 0.8 | 7.8 | 4.1 | | | | | | | |
| IC 3 | 0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 0 | 0 | 0 | 0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 6.5 | | | | | | | | | |
| IC 5 | 0.8 | 3.8 | 3.8 | | | 0 | 5.0 | 5.0 | 0 | 5.0 | | | 2.7 | 2.6 | 3.9 | 0 | 0 | 0 | 0 | 13.3 | 7.0 | 0 | 0 | 7.4 | 14.4 |



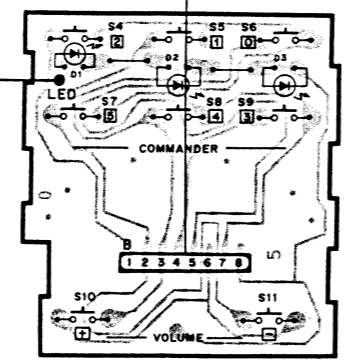
DISPLAY UNIT



IC8: PD7005
D401: AA5724K D402~407: BG5724K

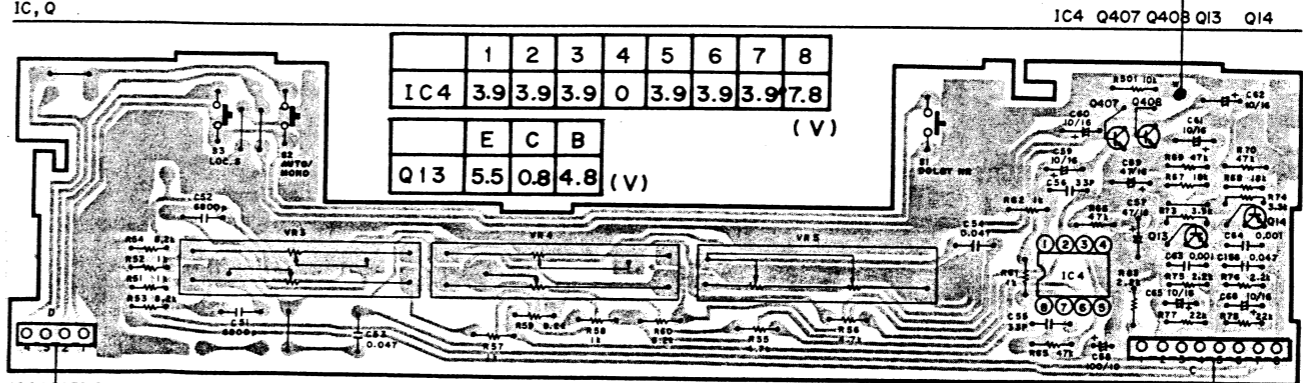


SWITCH UNIT (B)

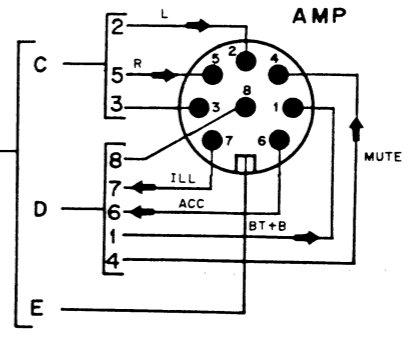
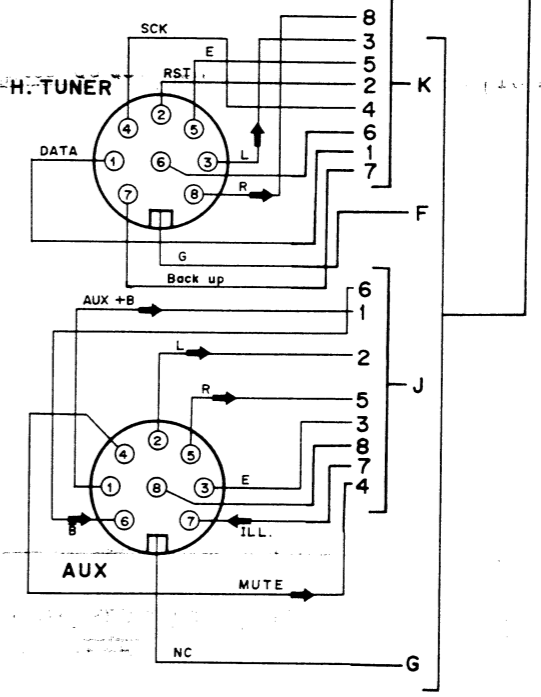


SWITCH UNIT (A)

VOLUME UNIT



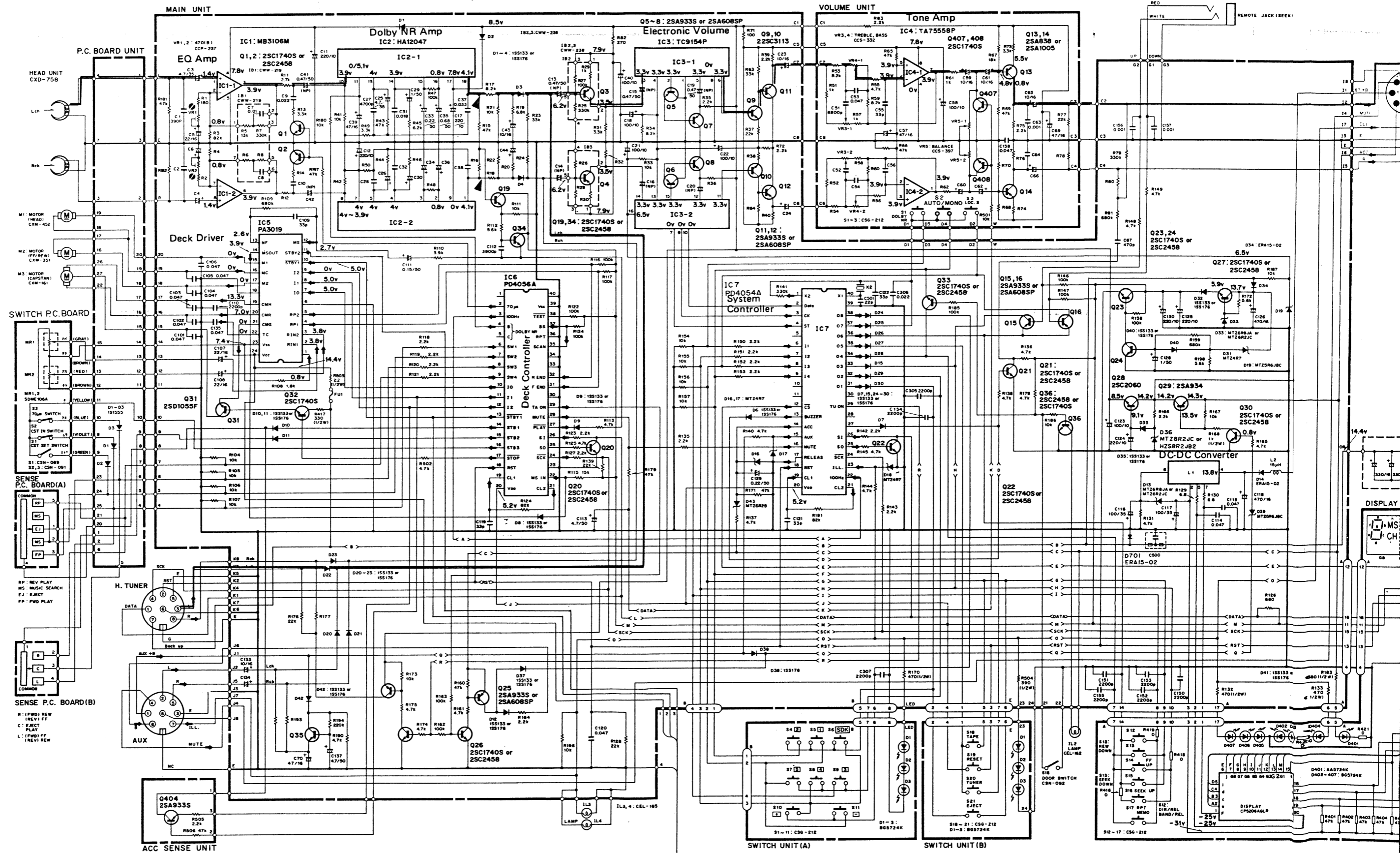
IC4: A7558P
Q13, 14: 2SA83B or 2SA1005
Q407, 408: 2SC1740S



A
B
C

Fig. 34

11. SCHEMATIC CIRCUIT DIAGRAM (FX-K5SDK/WG)

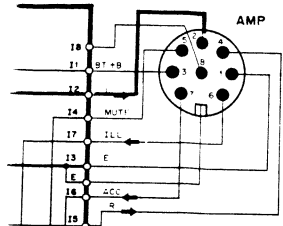


A

B

C

D



AUDIO CONTROL UNIT(CWX-575)

CONSISTS OF

- MAIN UNIT
- VOLUME UNIT
- ACC SENSE UNIT

- SWITCHES:**
- ◎ SWITCH P.C. BOARD
 - S1: CST SET SWITCH ···· ON - OFF
 - S2: CST IN SWITCH ···· ON - OFF
 - S3: 70µs SWITCH ······ ON(120µs) - OFF(70µs)
 - ◎ MISCELLANEOUS
 - S18: DOOR SWITCH ······ ON(CLOSE) - OFF(OPEN)

THE UNDERLINED INDICATED THE SWITCH POSITION.

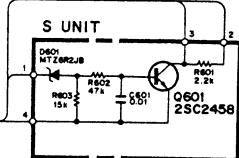
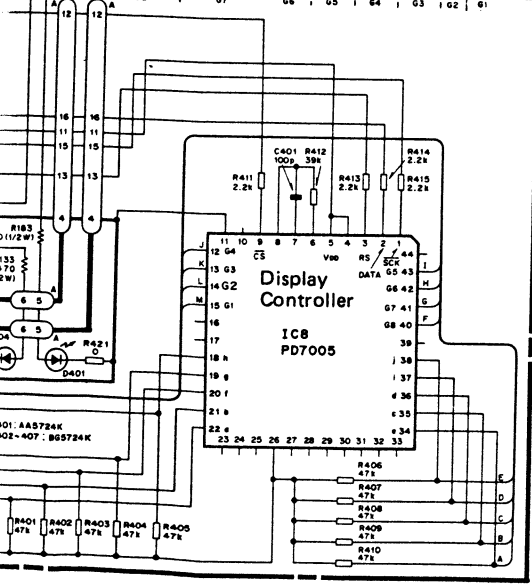
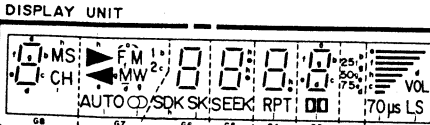
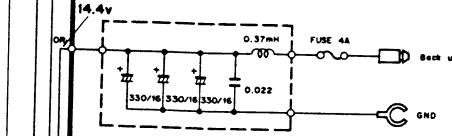


Fig. 36

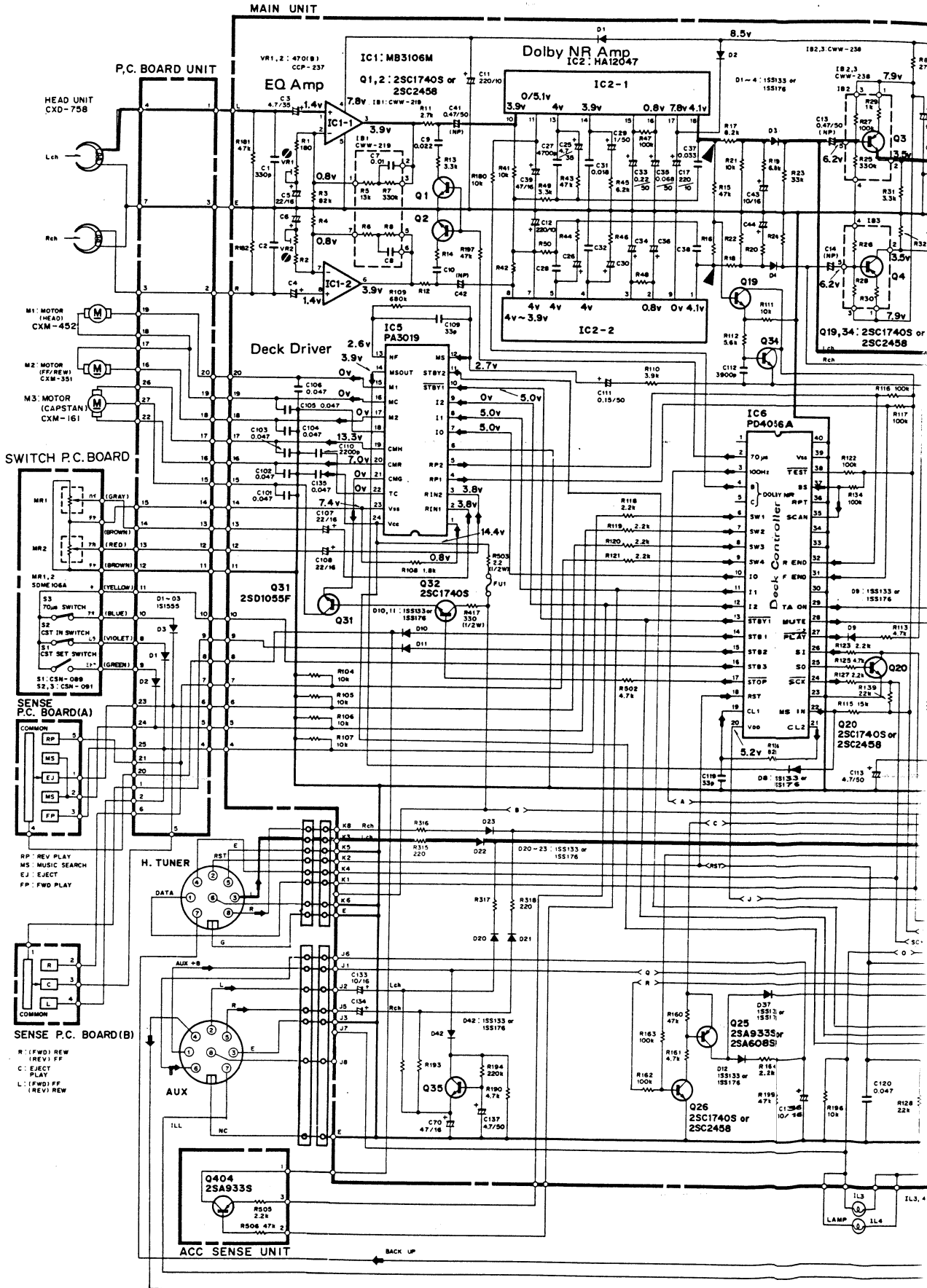
12. SCHEMATIC CIRCUIT DIAGRAM (FX-K5B/EW)

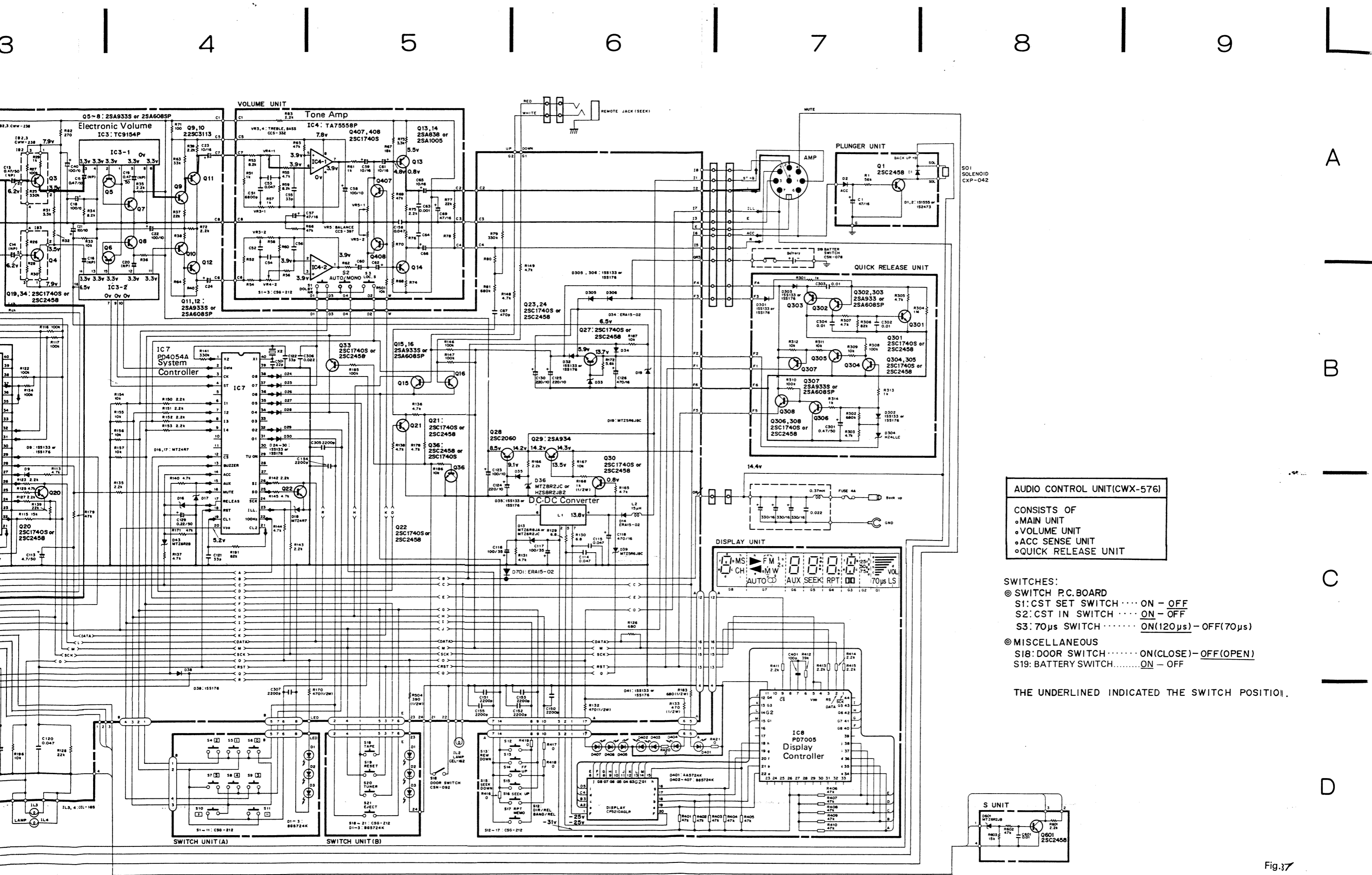
A

B

C

D





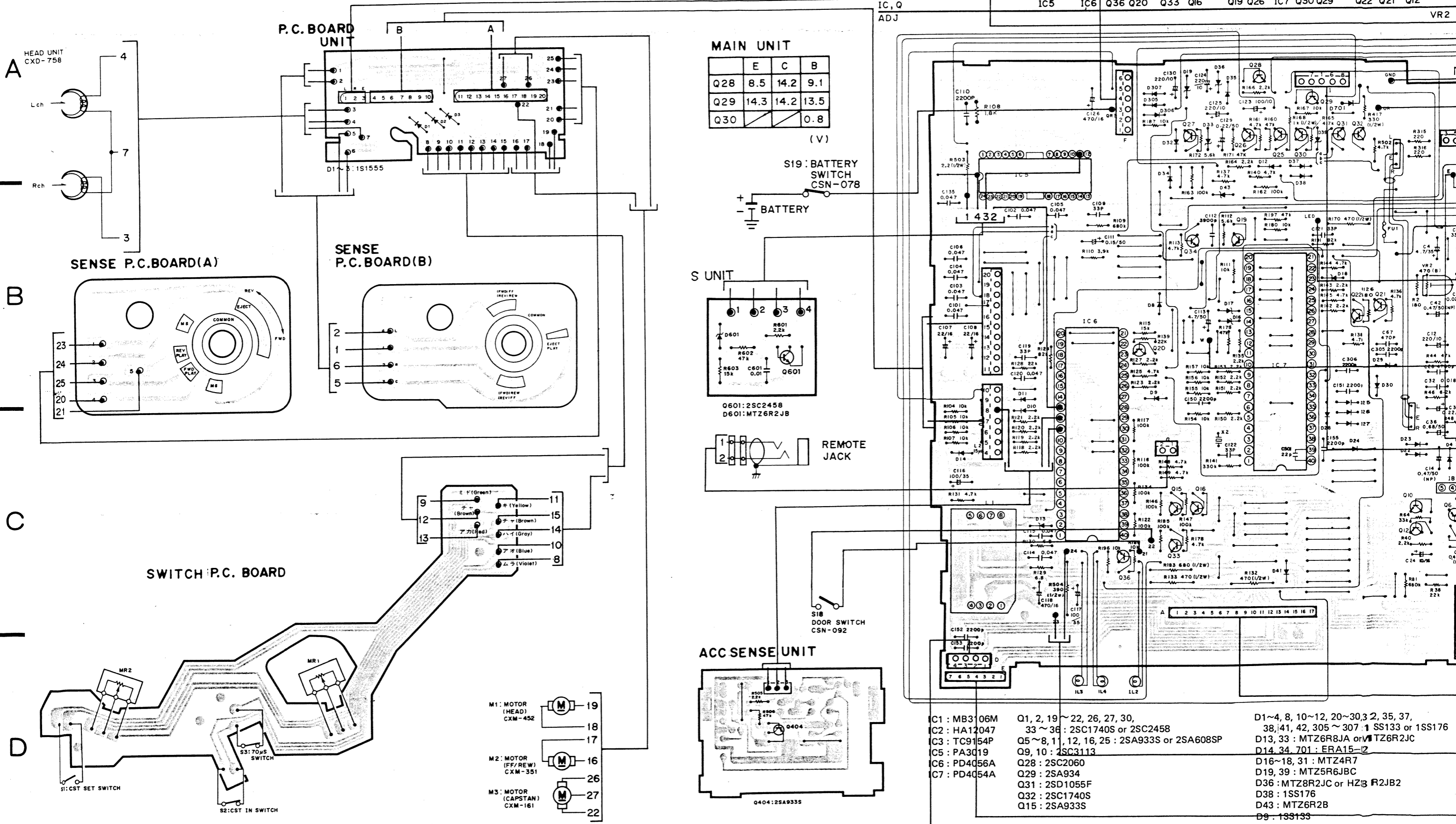
AUDIO CONTROL UNIT(CWX-576)
 CONSISTS OF
 • MAIN UNIT
 • VOLUME UNIT
 • ACC SENSE UNIT
 • QUICK RELEASE UNIT

- SWITCHES:
 ⊙ SWITCH P.C. BOARD
 S1: CST SET SWITCH ON - OFF
 S2: CST IN SWITCH ON - OFF
 S3: 70μs SWITCH ON(120μs) - OFF(70μs)
 ⊙ MISCELLANEOUS
 S18: DOOR SWITCH ON(CLOSE) - OFF(OPEN)
 S19: BATTERY SWITCH ON - OFF

THE UNDERLINED INDICATED THE SWITCH POSITION.

Fig.37

13. CONNECTION DIAGRAM (FX-K5B/EW)



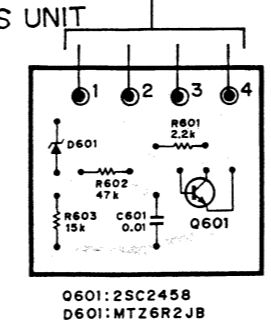
MAIN UNIT

| | E | C | B |
|-----|------|------|------|
| Q28 | 8.5 | 14.2 | 9.1 |
| Q29 | 14.3 | 14.2 | 13.5 |
| Q30 | | | 0.8 |

(V)

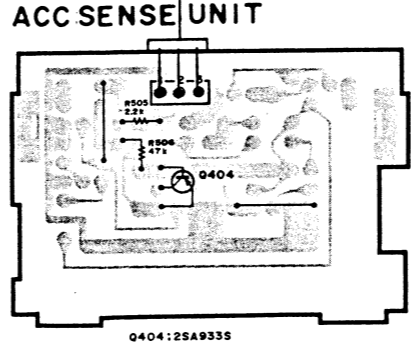
S19: BATTERY SWITCH CSN-078

BATTERY



REMOTE JACK

S18 DOOR SWITCH CSN-092



- C1: MB3106M
- C2: HA12047
- C3: TC9154P
- C5: PA3019
- C6: PD4056A
- C7: PD4054A
- Q1, 2, 19~22, 26, 27, 30, 33~36: 2SC1740S or 2SC2458
- Q5~8, 11, 12, 16, 25: 2SA933S or 2SA608SP
- Q9, 10: 2SC3113
- Q28: 2SC2060
- Q29: 2SA934
- Q31: 2SD1055F
- Q32: 2SC1740S
- Q15: 2SA933S
- D1~4, 8, 10~12, 20~30, 32, 35, 37, 38, 41, 42, 305~307: 1SS133 or 1SS176
- D13, 33: MTZ6R8JA or MTZ6R2JC
- D14, 34, 701: ERA15-2
- D16~18, 31: MTZ4R7
- D19, 39: MTZ5R6JBC
- D36: MTZ8R2JC or HZ3 R2JB2
- D38: 1SS176
- D43: MTZ6R2B
- D9: 1SS133

- M1: MOTOR (HEAD) CXM-452
- M2: MOTOR (FF/REW) CXM-351
- M3: MOTOR (CAPSTAN) CXM-161

7 | 8 | 9 | 10 | 11

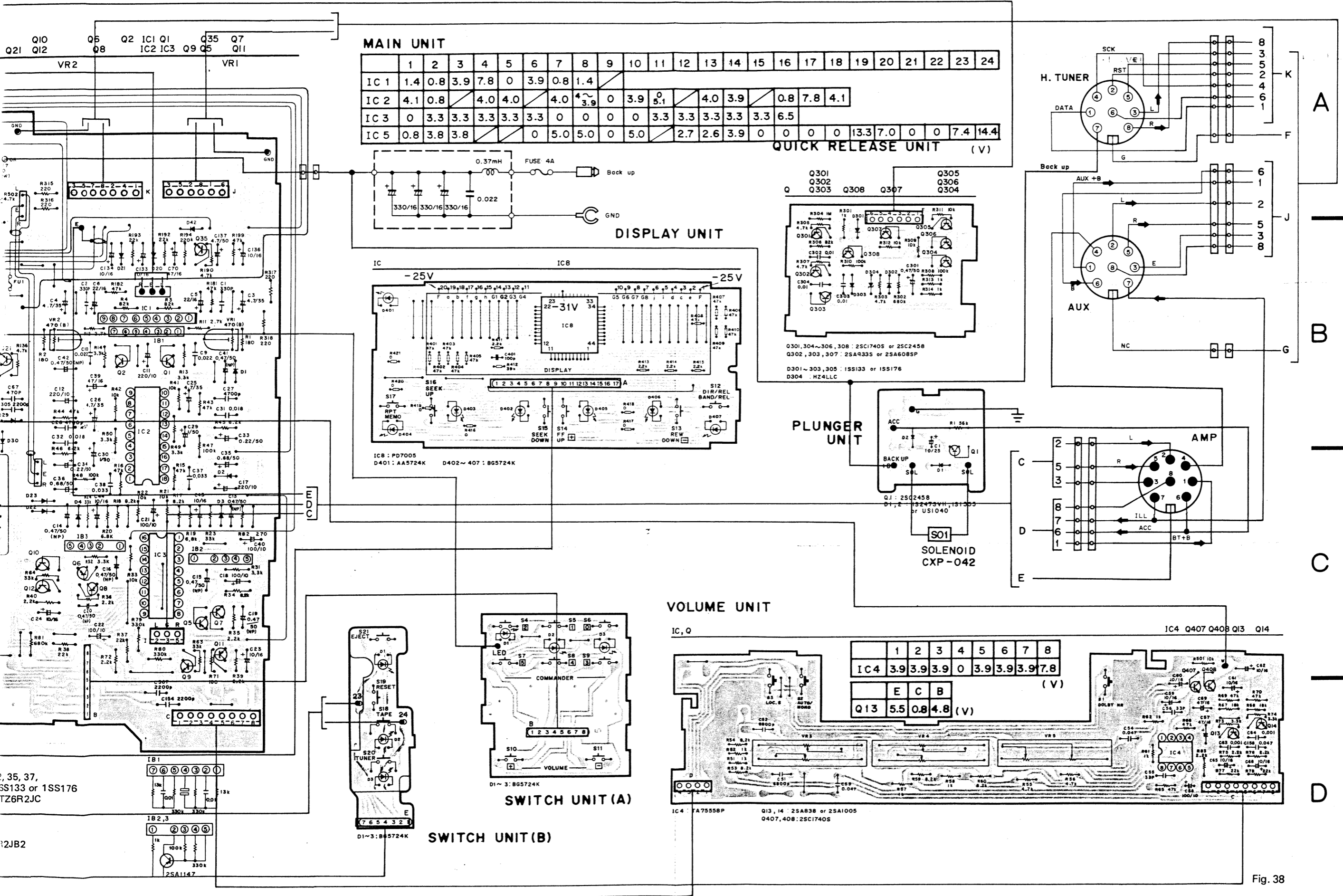


Fig. 38

7 | 8 | 9 | 10 | 11 | 12 | 57

14.CHASSIS (1) EXPLODED VIEW (FX-K5/EW, FX-K5 SDK/WG)

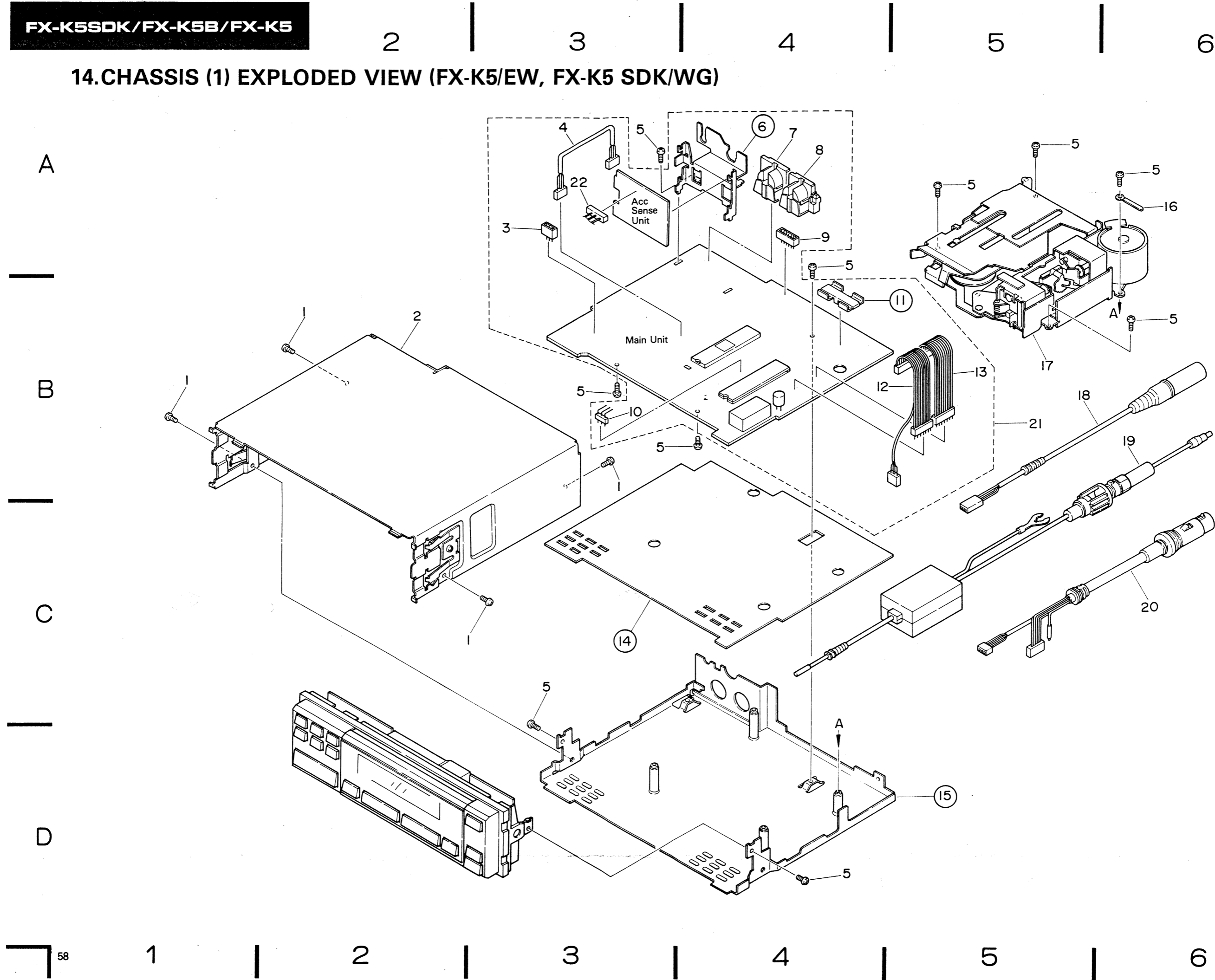


Fig. 39

• Chassis (1) (FX-K5/EW, FX-K5 SDK/WG)

• 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.

| Mark | No. | Part No. | Description |
|------|-----|---------------|-----------------------------------|
| | 1. | CBA-121 | Screw |
| | 2. | CXD-637 | Case Unit |
| | 3. | CKS-567 | Plug |
| | 4. | CDF-657 | Connector |
| | 5. | BMZ 26P050FMC | Screw |
| | 6. | | Holder |
| | 7. | CKS-549 | Connector |
| | 8. | CKS-550 | Connector |
| | 9. | CKS-569 | Plug |
| | 10. | CKS-207 | Plug |
| | 11. | | Heat Sink |
| | 12. | CDF-994 | Connector |
| | 13. | CDF-995 | Connector |
| | 14. | | Insulator |
| | 15. | | Chassis Unit |
| | 16. | CEF-007 | Clamper |
| | 17. | CXK-600 | Cassette Mechanism Assy |
| | 18. | CDK-113 | Cord |
| | 19. | CDK-099 | Cord |
| | 20. | CDK-112 | DIN Connector Cord |
| | 21. | CWX-574 | Audio Control Unit (1/2) (/EW) |
| | | CWX-575 | Audio Control Unit (1/2) (SDK/WG) |
| | 22. | CDK-274 | Connector |

15. CHASSIS (2) EXPLODED VIEW (FX-K5/EW, FX-K5 SDK/WG)

• Parts List

| Mark | No. | Part No. | Description | Mark | No. | Part No. | Description |
|------|-----|--------------|----------------------------|------|-----|--------------|-----------------------------------|
| | 1. | CBH-792 | Spring | | 38. | CNW-824 | Lens |
| | 2. | CMZ30P050FMC | Screw | | 39. | BPZ20P040FMC | Screw |
| | 3. | CNW-978 | Plate | | 40. | | Holder |
| | 4. | CNW-976 | Plate | | 41. | YE30FUC | Washer |
| | 5. | BMZ26P040FMC | Screw | | 42. | CBH-793 | Spring |
| | 6. | CWS-220 | Display Unit (/EW) | | 43. | | Lever |
| | | CWS-221 | Display Unit (SDK/WG) | | 44. | | Holder |
| | 7. | CNN-369 | Film | | 45. | CXD-519 | Bearing Unit |
| ★ | 8. | CAC-826 | Button (DIR, BAND/REL) | | 46. | CNL-921 | P.C. Board |
| | 9. | CNN-289 | Spacer | | 47. | BPZ20P080FMC | Screw |
| | 10. | CNN-170 | Cushion | | 48. | CNY-142 | Spacer |
| ★ | 11. | CAC-825 | Button | ★ | 49. | CAC-577 | Button (EJECT) |
| ★ | 12. | CAC-827 | Button (RPT, MEMO) | ★ | 50. | CAC-609 | Button (Tape) |
| | 13. | CXD-538 | Grille Unit | ★ | 51. | CAC-615 | Button (Clear) |
| | 14. | CNK-281 | Grille | ★ | 52. | CAC-608 | Button (Tuner) |
| | 15. | CNW-979 | Plate | | 53. | CNN-169 | Cushion |
| | 16. | CP5210AGLR | FL Tube (/EW) | | 54. | CXD-435 | Grille Assy (/EW) |
| | | CP5206AGLR | FL Tube (SDK/WG) | | | CXD-436 | Grille Assy (SDK/WG) |
| | 17. | CNN-341 | Cushion | | 55. | PTZ20P080FNI | Screw |
| | 18. | CBA-172 | Screw | | 56. | CNW-818 | Holder (/EW) |
| ★ ★ | 19. | CSN-092 | Switch (Door) | | | CNY-022 | Holder (SDK/WG) |
| | 20. | BPZ20P040FMC | Screw | | 57. | CAT-220 | Door |
| | 21. | | Holder | | 58. | CBH-888 | Spring |
| | 22. | CNN-171 | Cushion | | 59. | | P.C. Board |
| ★ | 23. | CAC-829 | Button (DOLBY NR) | | 60. | CNL-819 | P.C. Board |
| | 24. | CNN-290 | Cushion | ★ ★ | 61. | CEL-165 | Lamp |
| ★ | 25. | CAC-829 | Button (AUTO/MONO, LOC. S) | | 62. | HBF-120 | Washer |
| ★ | 26. | BG5724K | LED | | 63. | BMZ20P030FBK | Screw |
| ★ ★ | 27. | CSG-212 | Switch | ★ | 64. | CAC-970 | Knob |
| ★ | 28. | AA5724K | LED | | 65. | CWX-574 | Audio Control Unit (2/1) (/EW) |
| | 29. | CNL-622 | P.C. Board | | | CWX-575 | Audio Control Unit (2/1) (SDK/WG) |
| | 30. | CAC-772 | Button (0) (/EW) | | 66. | CKS-212 | Plug |
| | | CAC-798 | Button (SDK) (SDK/WG) | ★ ★ | 67. | CEL-162 | Lamp |
| ★ | 31. | CAC-775 | Button (3) | ★ ★ | 68. | CSG-212 | Switch |
| ★ | 32. | CAC-776 | Button (4) | ★ ★ | 69. | CCS-397 | Volume (BALANCE) |
| ★ | 33. | CAC-773 | Button (1) | | 70. | CCS-332 | Volume (BASS, TREBLE) |
| ★ | 34. | CAC-774 | Button (2) | | 71. | CKS-208 | Plug |
| ★ | 35. | CAC-777 | Button (5) | | 72. | | Frame |
| ★ | 36. | CAC-824 | Button (VOLUME) | | 73. | CNM-930 | Cover |
| | 37. | CNN-168 | Cushion | | | | |

• Chassis (2) (FX-K5/EW, FX-K5 SDK/WG)

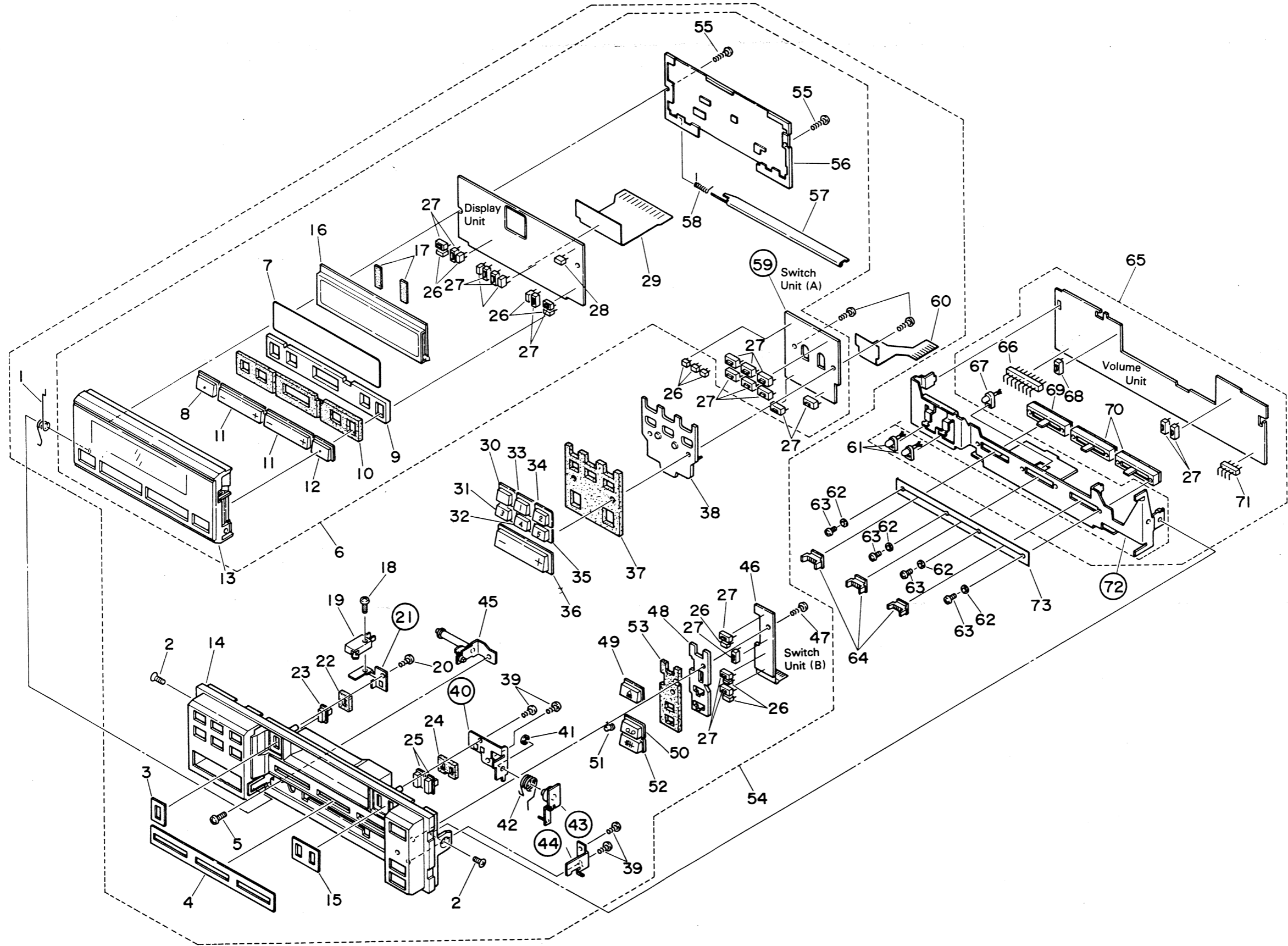


Fig. 40

16.CHASSIS (1) EXPLODED VIEW (FX-K5B/EW)

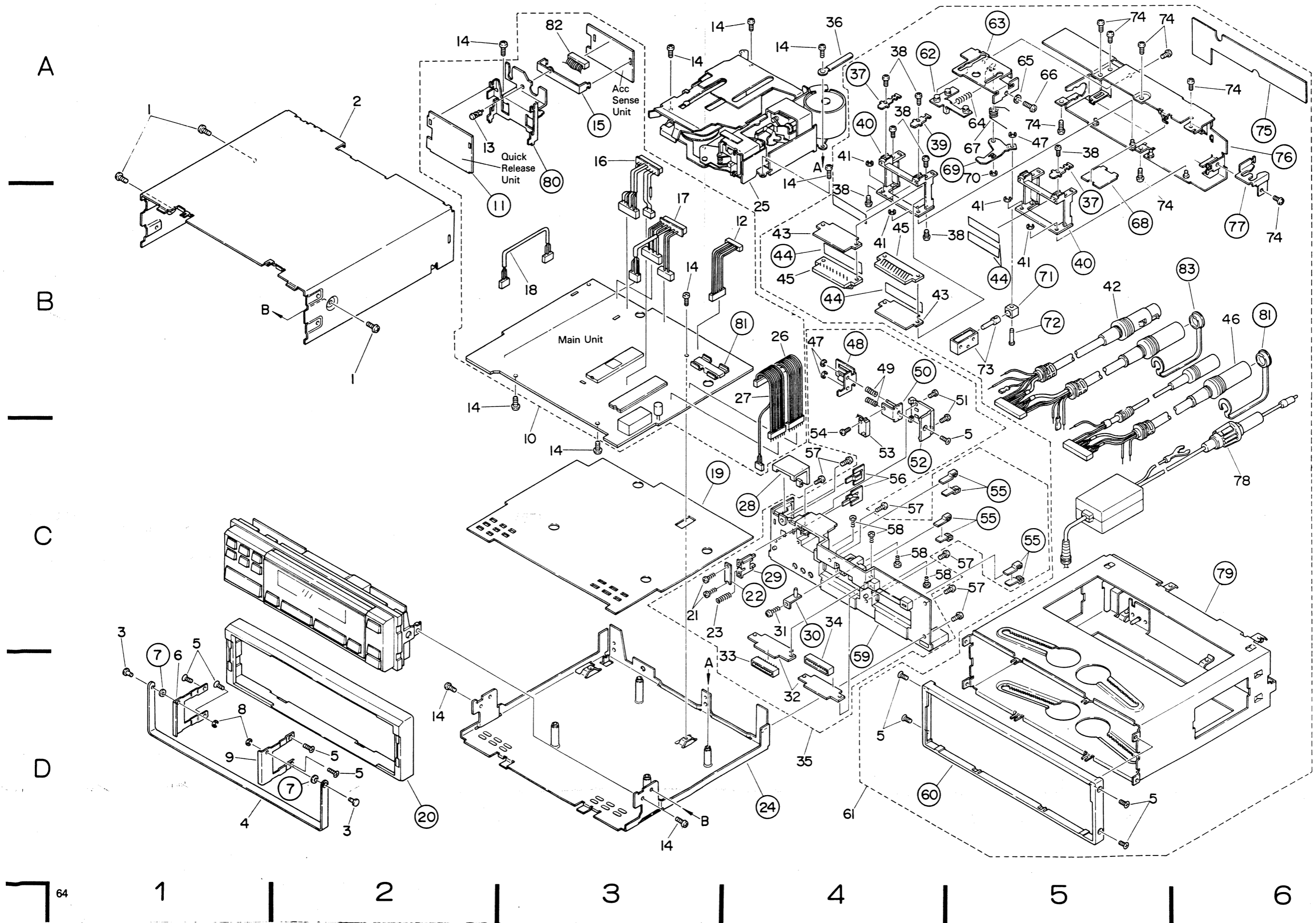


Fig.41

• Chassis (1) (FX-K5B/EW)

• Parts List

| Mark | No. | Part No. | Description | Mark | No. | Part No. | Description |
|------|-----|--------------|--------------------------|------|-----|--------------|--------------------|
| | 1. | BMZ30P050FNZ | Screw | | 41. | YE25FUC | Washer |
| | 2. | CNB - 864 | Case | | 42. | CDK - 074 | Connector |
| | 3. | CLB - 553 | Pin | | 43. | CNL - 530 | P.C. Board |
| | 4. | CNG - 471 | Handle | | 44. | | Cover |
| | 5. | CMZ26P040FZK | Screw | | 45. | CKS - 528 | Connector |
| | 6. | CNG - 472 | Holder | | 46. | CDK - 073 | Connector |
| | 7. | | Spring | | 47. | YE15FUC | Washer |
| | 8. | YE20FUC | Washer | | 48. | | Slide Plate |
| | 9. | CNG - 476 | Holder | | 49. | CBH - 781 | Spring |
| | 10. | CWX - 576 | Audio Control Unit (1/2) | | 50. | | Holder |
| | 11. | | Quick Release Unit | | 51. | HBA - 355 | Screw |
| | 12. | CDK - 028 | Connector | | 52. | | Cover |
| | 13. | CBM - 023 | Rivet | ★ ★ | 53. | CSN - 078 | Switch |
| | 14. | BMZ26P050FMC | Screw | | 54. | HBA - 171 | Screw |
| | 15. | | Holder | | 55. | | Terminal |
| | 16. | CDK - 298 | Connector | | 56. | CKF - 072 | Terminal |
| | 17. | CDK - 075 | Connector | | 57. | BMZ30P050FZK | Screw |
| | 18. | CDF - 657 | Connector | | 58. | BTZ20P060FZK | Screw |
| | 19. | | Insulator | | 59. | | Holder |
| | 20. | | Spacer | | 60. | | Panel |
| | 21. | HBA - 355 | Screw | | 61. | CXD - 520 | Quick Release Assy |
| | 22. | | Holder | | 62. | | Slide Plate |
| | 23. | CBH - 782 | Spring | | 63. | | Frame |
| | 24. | | Chassis Unit | | 64. | CBH - 789 | Spring |
| | 25. | CXK - 600 | Cassette Mechanism Assy | | 65. | WB20FZN | Washer |
| | 26. | CDF - 995 | Connector | | 66. | BMZ20P025FMC | Screw |
| | 27. | CDF - 994 | Connector | | 67. | CBH - 783 | Spring |
| | 28. | | Cover | | 68. | | Plunger Unit |
| | 29. | | Stopper | | 69. | | Lever |
| | 30. | | Stopper | | 70. | YE30FUC | Washer |
| | 31. | BTZ26P060FMC | Screw | | 71. | | Holder |
| | 32. | CNL - 529 | P.C. Board | | 72. | | Shaft |
| | 33. | CKS - 476 | Plug | ★ | 73. | CXP - 042 | Solenoid |
| | 34. | CKS - 547 | Plug (Red) | | 74. | BMZ26P030FMC | Screw |
| | 35. | CXD - 521 | Rear Panel Assy | | 75. | | Cover |
| | 36. | CEF - 007 | Clamper | | 76. | | Cover |
| | 37. | | Terminal | | 77. | | Holder |
| | 38. | BTZ20P060FMC | Screw | | 78. | CDK - 115 | Cord |
| | 39. | | Terminal | | 79. | | Box |
| | 40. | | Holder | | 80. | | Holder |
| | | | | | 81. | | Cap |
| | | | | | 82. | CDK - 274 | Connector |
| | | | | | 83. | | Cap |

17.CHASSIS (2) EXPLODED VIEW (FX-K5B/EW)

• Parts List

| Mark | No. | Part No. | Description | Mark | No. | Part No. | Description |
|------|-----|--------------|----------------------------|------|-----|--------------|--------------------------|
| | 1. | CBH-792 | Spring | | 41. | YE30FUC | Washer |
| | 2. | CMZ30P050FMC | Screw | | 42. | CBH-793 | Spring |
| | 3. | CNW-978 | Plate | | 43. | | Lever |
| | 4. | CNW-976 | Plate | | 44. | | Holder |
| | 5. | BMZ26P040FMC | Screw | | 45. | CXD-519 | Bearing Unit |
| | 6. | CWS-220 | Display Unit | | 46. | CNL-921 | P.C. Board |
| | 7. | CNN-369 | Film | | 47. | BPZ20P080FMC | Screw |
| ★ | 8. | CAC-826 | Button (DIR, BAND/REL) | ★ | 48. | CNY-142 | Spacer |
| | 9. | CNN-289 | Spacer | ★ | 49. | CAC-577 | Button (EJECT) |
| | 10. | CNN-170 | Cushion | ★ | 50. | CAC-609 | Button (Tape) |
| ★ | 11. | CAC-825 | Button | ★ | 51. | CAC-615 | Button (Clear) |
| ★ ★ | 12. | CAC-827 | Button (RPT, MEMO) | ★ | 52. | CAC-608 | Button (Tuner) |
| | 13. | CXD-538 | Grille Unit | | 53. | CNN-169 | Cushion |
| | 14. | CNK-281 | Grille | | 54. | CXD-435 | Grille Assy |
| | 15. | CNW-979 | Plate | | 55. | PTZ20P080FNI | Screw |
| | 16. | CP5210AGLR | FL Tube | | 56. | CNW-818 | Holder |
| | 17. | CNN-341 | Cushion | | 57. | CAT-220 | Door |
| | 18. | CBA-172 | Screw | | 58. | CBH-888 | Spring |
| ★ ★ | 19. | CSN-092 | Switch (Door) | | 59. | | P.C.Board |
| | 20. | BPZ20P040FMC | Screw | | 60. | CNL-819 | P.C. Board |
| | 21. | | Holder | ★ ★ | 61. | CEL-165 | Lamp |
| | 22. | CNN-171 | Cushion | | 62. | HBF-120 | Washer |
| ★ | 23. | CAC-829 | Button (DOLBY NR) | | 63. | BMZ20P030FBK | Screw |
| | 24. | CNN-290 | Cushion | ★ | 64. | CAC-970 | Knob |
| ★ | 25. | CAC-829 | Button (AUTO/MONO, LOC. S) | | 65. | CWX-576 | Audio Control Unit (2/2) |
| ★ | 26. | BG5724K | LED | | 66. | CKS-212 | Plug |
| ★ ★ | 27. | CSG-212 | Switch | ★ ★ | 67. | CEL-162 | Lamp |
| ★ | 28. | AA5724K | LED | ★ ★ | 68. | CSG-212 | Switch |
| | 29. | CNL-622 | P.C. Board | ★ ★ | 69. | CCS-397 | Volume (BALANCE) |
| ★ | 30. | CAC-772 | Button (0) | ★ ★ | 70. | CCS-332 | Volume (BASS, TREBLE) |
| ★ | 31. | CAC-775 | Button (3) | | 71. | CKS-208 | Plug |
| ★ | 32. | CAC-776 | Button (4) | | 72. | | Frame |
| ★ | 33. | CAC-773 | Button (1) | | 73. | CNM-930 | Cover |
| ★ | 34. | CAC-774 | Button (2) | | | | |
| ★ | 35. | CAC-777 | Button (5) | | | | |
| ★ | 36. | CAC-824 | Button (VOLUME) | | | | |
| | 37. | CNN-168 | Cushion | | | | |
| | 38. | CNW-824 | Lens | | | | |
| | 39. | BPZ20P040FMC | Screw | | | | |
| | 40. | | Holder | | | | |

• Chassis (2) (FX-K5B/EW)

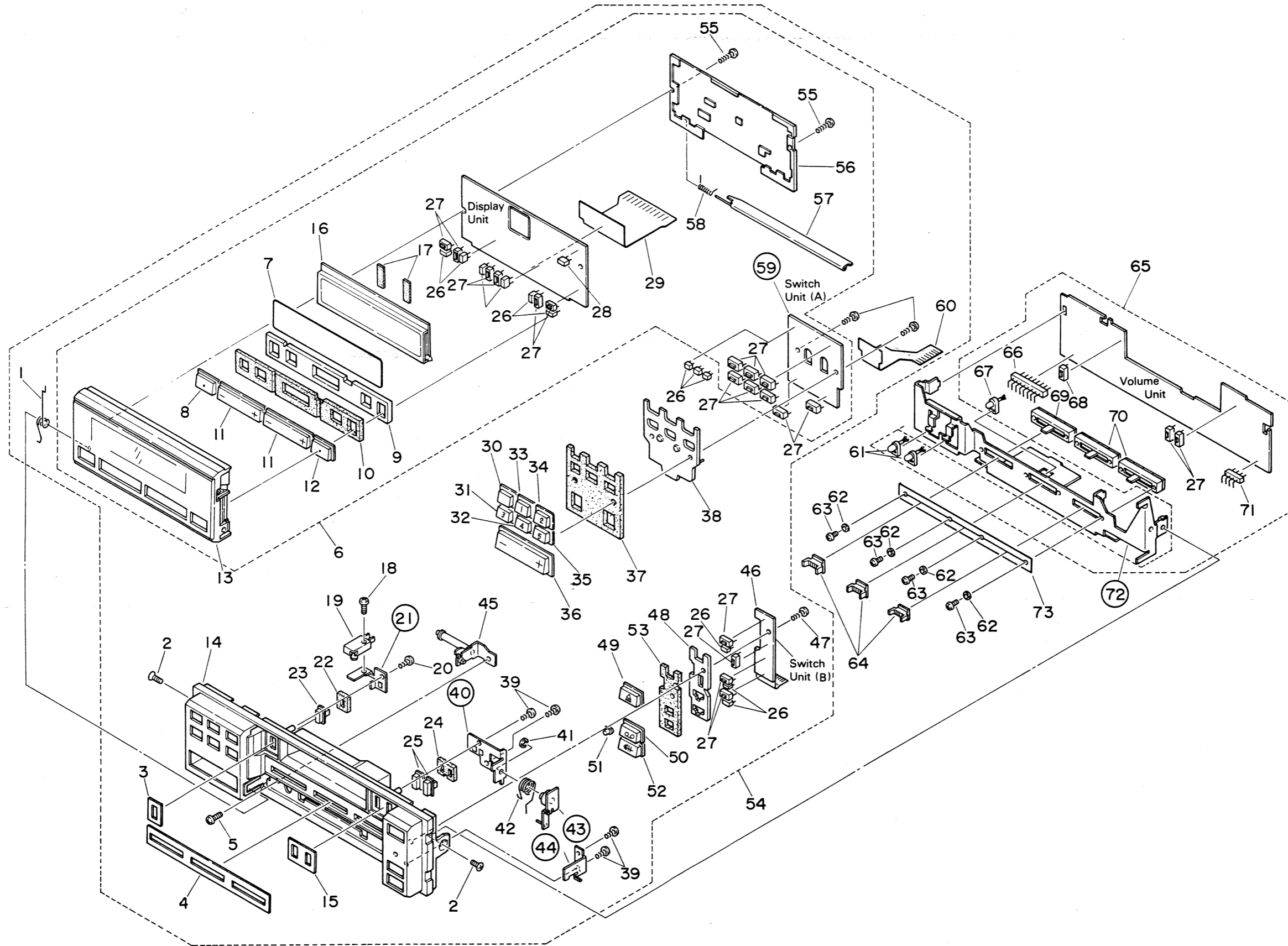


Fig. 42

18. 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.

FX-K5/EW

| Audio Control Unit (CWX-574) | |
|------------------------------|--|
| Consists of | |
| • Main Unit | |
| • Volume Unit | |
| • Acc Sense Unit | |

Audio Control Unit (CWX-574)

MISCELLANEOUS

| Mark | Symbol & Description | Part No. |
|------|--|-----------------------|
| ★★ | IC1 | MB3106M |
| ★★ | IC2 | HA12047 |
| ★★ | IC3 | TC9154P |
| ★★ | IC4 | TA75558P |
| ★★ | IC5 | PA3019 |
| ★★ | IC6 | PD4056A |
| ★★ | IC7 | PD4054A |
| ★★ | Q1, Q2, Q19 - Q24, Q26, Q27, Q30, Q33 - Q36 | 2SC1740S or 2SC2458 |
| ★★ | Q5 - Q8, Q11, Q12, Q15, Q16, Q25, Q404 | 2SA933S or 2SA608SP |
| ★★ | Q9, Q10 | 2SC3113 |
| ★★ | Q13, Q14 | 2SA838 or 2SA1005 |
| ★★ | Q28 | 2SC2060 |
| ★★ | Q29 | 2SA934 |
| ★★ | Q31 | 2SD1055F |
| ★ | Q32, Q407, Q408 | 2SC1740S |
| ★ | D1 - D4, D8 - D12, D20 - D30, D32, D35, D37, D38, D40, D42 | 1SS133 or 1SS176 |
| ★ | D9 | 1SS133 |
| ★ | D13, D33 | MTZ6R8JA or MTZ6R2JC |
| ★ | D14, D34 | ERA15-02 |
| ★ | D16 - D18, D31 | MTZ4R7 |
| ★ | D19, D39 | MTZ5R6JBC |
| ★ | D36 | MTZ8R2JC or HZS8R2JB2 |
| ★ | D43 | MTZ6R2B |

| Mark | Symbol & Description | Part No. |
|------|------------------------------|----------|
| | L1 Transformer | CTX-073 |
| | L2 Ferri Inductor | CTF-156 |
| | IB1 | CWW-219 |
| | IB2, IB3 | CWW-238 |
| ★★ | S1 - S3 Switch | CSG-212 |
| ★★ | VR1, VR2 Semi-fixed, 470Ω(B) | CCP-237 |
| ★★ | VR3, VR4 Volume, 25 kΩ(B) | CCS-332 |
| ★★ | VR5 Volume, 10 kΩ(AB) | CCS-397 |
| ★★ | X2 Crystal | CSS-029 |
| ★★ | IL2 Lamp | CEL-162 |
| ★★ | IL3, IL4 Lamp | CEL-165 |
| ★★ | FU1 Fuse | CEK-058 |

RESISTORS

| Mark | Symbol & Description | Part No. |
|------|--|--------------|
| | R132, R133, R168, R170, R183, R503, R504 | RD1/2PS□□□JL |
| | R417 | RD1/2PS□□□J |
| | Other Resistors | RD1/4PS□□□JL |

CAPACITORS

| Mark | Symbol & Description | Part No. |
|------|--------------------------------|---------------|
| | C1, C2 | CKPYB391K50L |
| | C3, C4, C25, C26 | CEANL4R7M35LL |
| | C5, C6, C107, C108 | CEA220M16L2 |
| | C9, C10 | CQMA223J50L |
| | C11, C12, C17, C124, C125 | CEA221M10L2 |
| | C13 - C16, C19, C20, C41, C42 | CEAR47M50NPLL |
| | C18, C21, C22, C40, C123 | CEA101M10L2 |
| | C23, C24, C43, C44, C133, C134 | CEA100M16L2 |
| | C27, C28 | CQMA472J50L |
| | C29, C30, C128 | CEA010M50L2 |
| | C31, C32 | CQMA183J50L |
| | C33, C34 | CEAR22M50L2 |
| | C35, C36 | CEAR68M50LL |
| | C37, C38 | CQMA333J50L |
| | C39, C70 | CEA470M16L2 |
| | C51, C52 | CKPYX682M16L |
| | C53, C54, C101 - C106 | CQMA473J50L |
| | C55, C56, C109 | CCPSL330J50L |
| | C57, C69 | CEA470M16LS |
| | C58 | CEA101M10LL |
| | C59 - C62, C65, C66 | CEA100M25LS |
| | C63, C64 | CKPYB102K50L |
| | C67 | CKPYB471K50L |
| | C110, C150 - C155, C305 - C307 | CKPYX222M16L |
| | C111 | CEAR15M50LS2 |
| | C112 | CQMA392J50LL |
| | C113 | CEA4R7M35LS |
| | C114, C115, C120, C158 | CQEA473J50 |
| | C116, C117 | CEA101M35L2 |
| | C118, C126 470μF/16V | CCH-114 |
| | C119, C121, C122 | CCDCH330J50L |
| | C129 | CEAR22M50LS |
| | C135 | CQMA473J50L |
| | C136 | CEA100M16L2 |
| | C137 | CEA4R7M25L2 |
| | C501 | CCDCH220J50 |

FX-K5B/EW

| Audio Control Unit (CWX-576) | |
|------------------------------|--|
| Consists of | |
| • Main Unit | |
| • Volume Unit | |
| • Quick Release Unit | |
| • Acc Sense Unit | |

Audio Control Unit (CWX-576)

MISCELLANEOUS

| Mark | Symbol & Description | Part No. |
|------|---|-----------------------|
| ★★ | IC1 | MB3106M |
| ★★ | IC2 | HA12047 |
| ★★ | IC3 | TC9154P |
| ★★ | IC4 | TA75558P |
| ★★ | IC5 | PA3019 |
| ★★ | IC6 | PD4056A |
| ★★ | IC7 | PD4054A |
| ★★ | Q1, Q2, Q19 - Q22, Q26, Q27, Q30, Q33 - Q36, Q301, Q304 - Q306, Q308 | 2SC1740S or 2SC2458 |
| ★★ | Q5 - Q8, Q11, Q12, Q16, Q25, Q302, Q303, Q307, Q404 | 2SA933S or 2SA608SP |
| ★★ | Q9, Q10 | 2SC3113 |
| ★★ | Q13, Q14 | 2SA838 or 2SA1005 |
| ★★ | Q15 | 2SA933S |
| ★★ | Q28 | 2SC2060 |
| ★★ | Q29 | 2SA934 |
| ★★ | Q31 | 2SD1055F |
| ★★ | Q32, Q407, Q408 | 2SC1740S |
| ★ | D1 - D4, D8, D10 - D12, D20 - D30, D32, D35, D37, D38, D41, D42, D301 - D303, D305 - D307 | 1SS133 or 1SS176 |
| ★ | D9 | 1SS133 |
| ★ | D13, D33 | MTZ6R8JA or MTZ6R2JC |
| ★ | D14, D34 | ERA15-02 |
| ★ | D16 - D18, D31 | MTZ4R7 |
| ★ | D19, D39 | MTZ5R6JBC |
| ★ | D36 | MTZ8R2JC or HZS8R2JB2 |
| ★ | D43 | MTZ6R2B |
| ★ | D304 | HZ4LLC |
| | L1 Transformer | CTX-073 |
| | L2 Ferri-Inductor | CTF-156 |
| | IB1 | CWW-219 |
| | IB2, IB3 | CWW-238 |
| ★★ | S1 - S3 Switch | CSG-212 |
| ★★ | VR1, VR2 Semi-fixed, 470Ω(B) | CCP-237 |
| ★★ | VR3, VR4 Volume, 25 kΩ(B) | CCS-332 |
| ★★ | VR5 Volume, 10 kΩ(AB) | CCS-397 |
| ★★ | X2 Crystal | CSS-029 |
| ★★ | IL2 Lamp | CEL-162 |
| ★★ | IL3, IL4 Lamp | CEL-165 |
| ★★ | FU1 Fuse | CEK-058 |

RESISTORS

| Mark | Symbol & Description | Part No. |
|------|--|--------------|
| | R132, R133, R168, R170, R183, R503, R504 | RD1/2PS□□□JL |
| | R417 | RD1/2PS□□□J |
| | Other Resistors | RD1/4PS□□□JL |

CAPACITORS

| Mark | Symbol & Description | Part No. |
|------|--------------------------------|---------------|
| | C1, C2 | CKPYB391K50L |
| | C3, C4, C25, C26 | CEANL4R7M35LL |
| | C5, C6, C107, C108 | CEA220M16L2 |
| | C9, C10 | CQMA223J50L |
| | C11, C12, C17, C124, C125 | CEA221M10L2 |
| | C13 — C16, C19, C20, C41, C42 | CEAR47M50NPLL |
| | C18, C21, C22, C40, C123 | CEA101M10L2 |
| | C23, C24, C43, C44, C133, C134 | CEA100M16L2 |
| | C27, C28 | CQMA472J50L |
| | C29, C30, C128 | CEA010M50L2 |
| | C31, C32 | CQMA183J50L |
| | C33, C34 | CEAR22M50L2 |
| | C35, C36 | CEAR68M50LL |
| | C37, C38 | CQMA333J50L |
| | C39, C70 | CEA470M16L2 |
| | C51, C52 | CKPYX682M16L |
| | C53, C54, C101 — C106 | CQMA473J50L |
| | C55, C56, C109 | CCPSL330J50L |
| | C57, C69 | CEA470M16LS |
| | C58 | CEA101M10LL |
| | C59 — C62, C65, C66 | CEA100M25LS |
| | C63, C64 | CKPYB102K50L |
| | C67 | CKPYB471K50L |
| | C110, C150 — C155, C305 — C307 | CKPYX222M16L |
| | C111 | CEAR15M50LS2 |
| | C112 | CQMA392J50LL |
| | C113 | CEA4R7M35LS |
| | C114, C115, C120, C158 | CQEA473J50 |
| | C116, C117 | CEA101M35L2 |
| | C118, C126 470 μF/16V | CCH-114 |
| | C119, C121, C122 | CCDCH330J50L |
| | C129 | CEAR22M50LS |
| | C135 | CQMA473J50L |
| | C137 | CEA4R7M25L2 |
| | C156, C157 | CKPYB102K50L |
| | C500 | CCG-081 |
| | C501 | CCDCH220J50 |

S Unit

| Mark | Symbol & Description | Part No. |
|------|----------------------|--------------|
| ★★ | Q601 | 2SC2458 |
| ★ | D601 | MTZ6R2JB |
| ★ | R601 — R603 | RD1/4PS□□□JL |
| ★ | C601 | CQMA103J50L |

Switch Unit (A)

| Mark | Symbol & Description | Part No. |
|------|----------------------|----------|
| ★ | D1 — D3 LED | BG5724K |
| ★★ | S4 — S11 Switch | CSG-212 |

Switch Unit (B)

| Mark | Symbol & Description | Part No. |
|------|----------------------|----------|
| ★★ | S18 — S21 Switch | CSG-212 |
| ★ | D1 — D3 LED | BG5724K |

Display Unit

| Mark | Symbol & Description | Part No. |
|------|---|-------------|
| ★★ | IC8 | PD7005 |
| ★ | D401 LED | AA5724K |
| ★ | D402 — D407 LED | BG5724K |
| ★★ | S12 — S17 Switch | CSG-212 |
| ★ | FL Tube (FX-K5/EW, FX-K5B/EW) | CP5210AGLR |
| ★ | FL Tube (FX-K5SDK/WG) | CP5206AGLR |
| | R401 — R421 Chip Resistor (FX-K5/EW, FX-K5B/EW) | RS1/8S□□□J |
| | R401 — R416, Chip Resistor | RS1/8S□□□J |
| | R418 — R421 (FX-K5SDK/WG) | |
| | C401 Chip Capacitor | CCSCH101J50 |

Plunger Unit (FX-K5B/EW)

| Mark | Symbol & Description | Part No. |
|------|----------------------|------------------|
| ★★ | Q1 | 2SC2458 |
| ★ | D1, D2 | 1S2473 or 1S1555 |
| | R1 | RD1/6PS563J |
| | C1 | CEA470M16LS |

Switch P.C. Board

| Mark | Symbol & Description | Part No. |
|------|------------------------------------|----------|
| ★★ | S1 Switch (CST SET) | CSN-089 |
| ★★ | S2, S3 Switch (CST IN, 70 μs) | CSN-091 |
| ★ | MR1, MR2 Magnetic Resistive device | SDME106A |

P.C. Board Unit

| Mark | Symbol & Description | Part No. |
|------|----------------------|----------|
| ★ | D1 — D3 | 1S1555 |

Miscellaneous Parts List

| Mark | Symbol & Description | Part No. |
|------|----------------------|----------|
| ★★ | Head Unit | CXD-758 |
| ★★ | S18 Switch (Door) | CSN-092 |
| ★★ | M1 Motor (Head) | CXM-452 |
| ★★ | M2 Motor (Gear) | CXM-351 |
| ★★ | M3 Motor (Capstan) | CXM-161 |

RESISTORS

| Mark | Symbol & Description | Part No. |
|------|--|--------------|
| | R132, R133, R168, R170, R183, R503, R504 | RD1/2PS□□□JL |
| | R417 | RD1/2PS□□□J |
| | Other Resistors | RD1/4PS□□□JL |

CAPACITORS

| Mark | Symbol & Description | Part No. |
|------|-------------------------------------|---------------|
| | C1, C2 | CKPYB331K50L |
| | C3, C4, C25, C26 | CEANL4R7M35LL |
| | C5, C6, C107, C108 | CEA220M16L2 |
| | C9, C10 | CQMA223J50L |
| | C11, C12, C17, C124, C125 | CEA221M10L2 |
| | C13 – C16, C19, C20, C41, C42, C301 | CEAR47M50NPLL |
| | C18, C21, C22, C40, C123 | CEA101M10L2 |
| | C23, C24, C43, C44, C133, C134 | CEA100M16L2 |
| | C27, C28 | CQMA472J50L |
| | C29, C30 | CEA010M50L2 |
| | C31, C32 | CQMA183J50L |
| | C33, C34 | CEAR22M50L2 |
| | C35, C36 | CEAR68M50LL |
| | C37, C38 | CQMA333J50L |
| | C39, C70 | CEA470M16L2 |
| | C51, C52 | CKPYX682M16L |
| | C53, C54, C101 – C106 | CQMA473J50L |
| | C55, C56, C109 | CCPSL330J50L |
| | C57, C69 | CEA470M16LS |
| | C58 | CEA101M10LL |
| | C59 – C62, C65, C66 | CEA100M25LS |
| | C63, C64 | CKPYB102K50L |
| | C67 | CKPYB471K50L |
| | C110, C150 – C155, C305 – C307 | CKPYX222M16L |
| | C111 | CEAR15M50LS2 |
| | C112 | CQMA392J50LL |
| | C113 | CEA4R7M35LS |
| | C114, C115, C120, C158 | CQEA473J50 |
| | C116, C117 | CEA101M35L2 |
| | C118, C126 470 μF/16V | CCH-114 |
| | C119, C121, C122 | CCDCH330J50L |
| | C129 | CEAR22M50LS |
| | C135 | CQMA473J50L |
| | C136 | CEA100M16L2 |
| | C137 | CEA4R7M25L2 |
| | C302 – C304 | CKPYY103M16L |
| | C501 | CCDCH220J50 |

FX-K5SDK/WG

| Audio Control Unit (CWX-575) |
|------------------------------|
| Consists of |
| • Main Unit |
| • Volume Unit |
| • Acc Sense Unit |

Audio Control Unit (CWX-575)

MISCELLANEOUS

| Mark | Symbol & Description | Part No. |
|------|---|-----------------------|
| ★ ★ | IC1 | MB3106M |
| ★ ★ | IC2 | HA12047 |
| ★ ★ | IC3 | TC9154P |
| ★ ★ | IC4 | TA75558P |
| ★ ★ | IC5 | PA3019 |
| ★ ★ | IC6 | PD4056A |
| ★ ★ | IC7 | PD4054A |
| ★ ★ | Q1, Q2, Q18 – Q24, Q26, Q27, Q30, Q32 – Q36, Q407, Q408 | 2SC1740S or 2SC2458 |
| ★ ★ | Q5 – Q8, Q11, Q12, Q15 – Q17, Q25, Q404 | 2SA933S or 2SA608SP |
| ★ ★ | Q9, Q10 | 2SC3113 |
| ★ ★ | Q13, Q14 | 2SA838 or 2SA1005 |
| ★ ★ | Q28 | 2SC2060 |
| ★ ★ | Q29 | 2SA934 |
| ★ ★ | Q31 | 2SD1055F |
| ★ | D1 – D4, D6 – D12, D15, D20 – D30, D32, D35, D37, D38, D40, D42 | 1SS133 or 1SS176 |
| ★ | D13, D33 | MTZ6R8JA or MTZ6R2JC |
| ★ | D14, D34 | ERA15-02 |
| ★ | D16 – D18, D31 | MTZ4R7 |
| ★ | D19, D39 | MTZ5R6JBC |
| ★ | D36 | MTZ8R2JC or HZS8R2JB2 |
| ★ | D43 | MTZ6R2B |
| | L1 Transformer | CTX-073 |
| | L2 Ferri-Inductor | CTF-156 |
| | IB1 | CWW-219 |
| | IB2, IB3 | CWW-238 |
| ★ ★ | S1 – S3 Switch | CSG-212 |
| ★ ★ | VR1, VR2 Semi-fixed, 470Ω(B) | CCP-237 |
| ★ ★ | VR3, VR4 Volume, 25 kΩ(B) | CCS-332 |
| ★ ★ | VR5 Volume, 10 kΩ(AB) | CCS-397 |
| ★ ★ | X2 Crystal | CSS-029 |
| ★ ★ | IL2 Lamp | CEL-162 |
| ★ ★ | IL3, IL4 Lamp | CEL-165 |
| ★ ★ | FU1 Fuse | CEK-058 |

19. PACKING METHOD (FX-K5/EW, FX-K5SDK/WG)

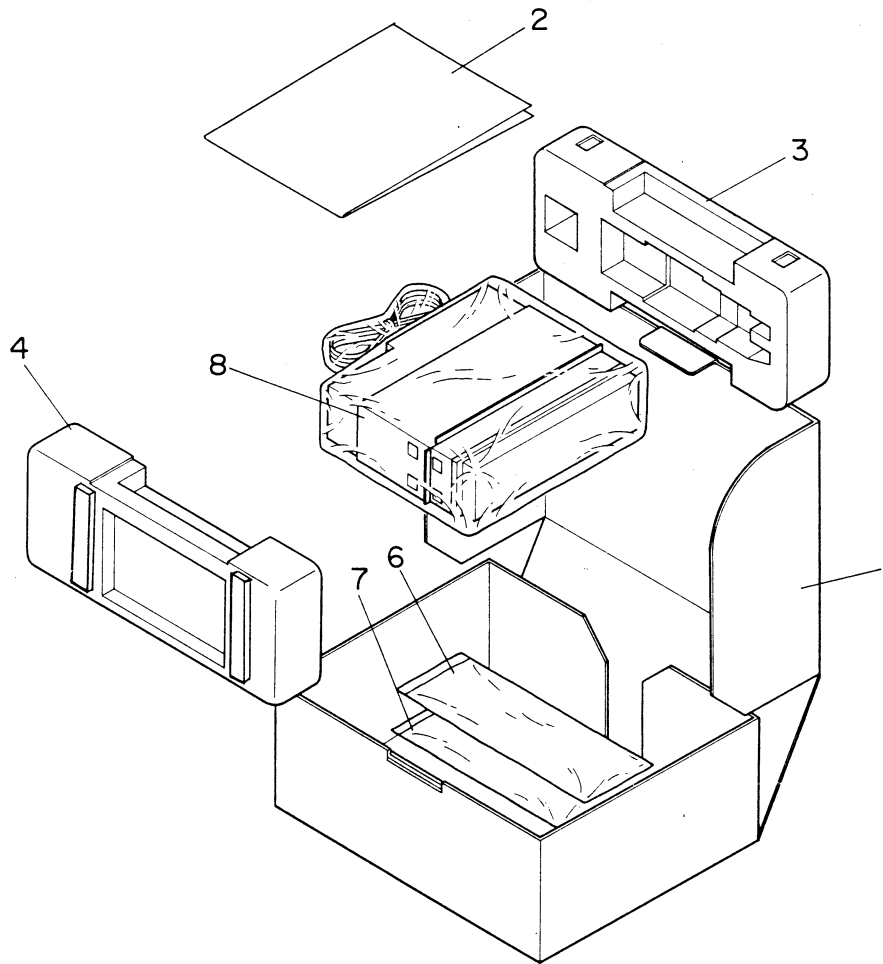


Fig. 43

• **Parts List**

| Mark | No. | Part No. | Description | Mark | No. | Part No. | Description |
|------|------|----------|--------------------------------------|------|--------|--------------|-----------------|
| | 1. | CHF-181 | Carton (EW) | | 6-3. | CNF-382 | Lever |
| | | CHF-183 | Carton (SDK/WG) | | 6-4. | CNW-642 | Holder |
| | 2. | CRD-530 | Owner's Manual (EW) | | 6-5. | | Screw Assy |
| | | | (English, French, German, Spanish) | | 6-5-1. | CBA-028 | Screw for Strap |
| | | CRD-531 | Owner's Manual (EW) | | 6-5-2. | NF40FMC | Nut |
| | | | (Swedish, Norwegian, Dutch, Italian) | | 6-5-3. | NF50FMC | Nut |
| | | CRD-532 | Owner's Manual (SDK/WG) | | 6-5-4. | PMB50Y160FMC | Screw |
| | | | (German, French) | | 6-5-5. | WS40FMC | Washer |
| | | | Card | | 7. | CNW-757 | Holder |
| | | | | | | CNB-793 | Panel |
| | 3. | CHF-153 | Styrofoam | | 8. | CNG-223 | Holder |
| | 4. | CHF-154 | Styrofoam | | | | |
| | 5. | VACANT | | | | | |
| | 6. | CEA-885 | Accessory Kit | | | | |
| | 6-1. | CDE-437 | Cord | | | | |
| | 6-2. | CNF-111 | Strap | | | | |

20. PACKING METHOD (FX-K5B/EW)

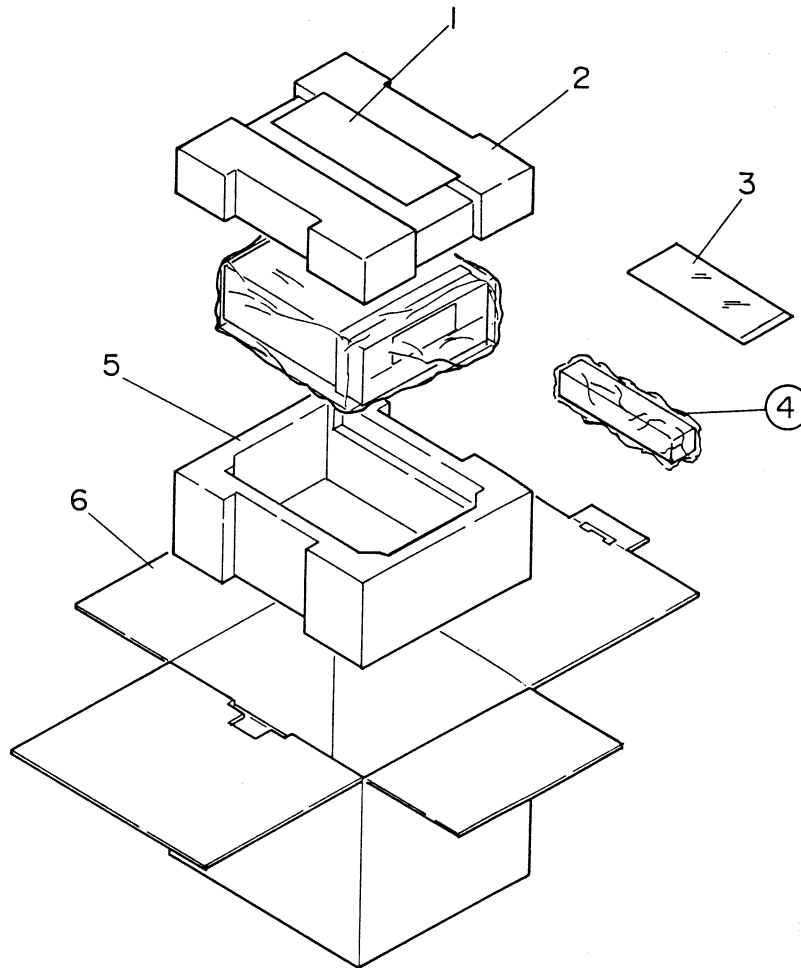


Fig. 44

• Parts List

| Mark | No. | Part No. | Description | Mark | No. | Part No. | Description |
|------|--------|----------|--|------|--------|----------|-------------|
| | 1. | CRD-533 | Owner's Manual (English, French, Italian, Spanish) Card | | 3-4-2. | CBA-102 | Screw |
| | 2. | CHD-573 | Styrofoam | | 3-4-3. | NF40FMC | Nut |
| | 3. | CEA-986 | Accessory Kit | | 3-4-4. | NF50FMC | Nut |
| | 3-1. | CDE-437 | Cord | | 3-4-5. | WS40FMC | Washer |
| | 3-2. | CNF-111 | Strap | | 4. | | Cover |
| | 3-3. | CEA-892 | Gear Assy | | 5. | CHD-572 | Styrofoam |
| | 3-4. | | Screw Assy | | 6. | CHD-948 | Carton |
| | 3-4-1. | CBA-028 | Screw for Strap | | | | |