STEREO GRAPHIC EQUALIZER

GE-810

SERVICE MANUAL

KENWOOD

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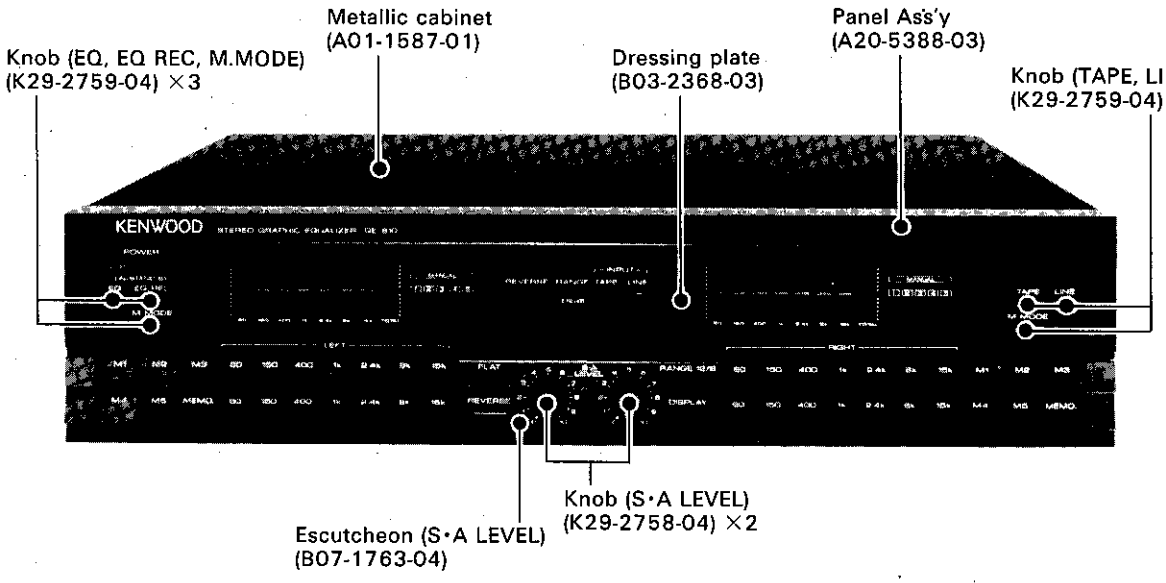

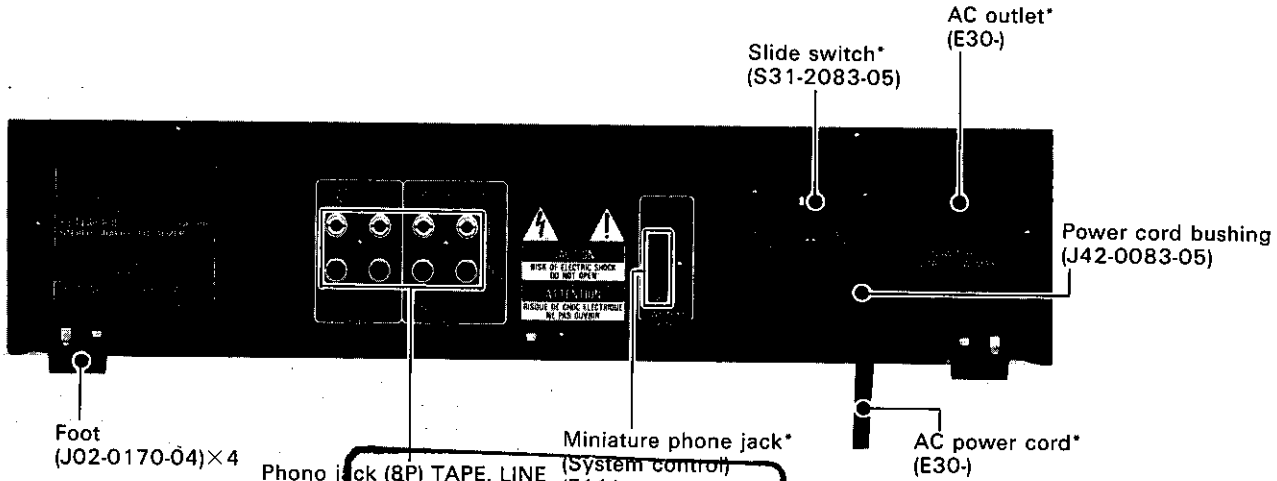

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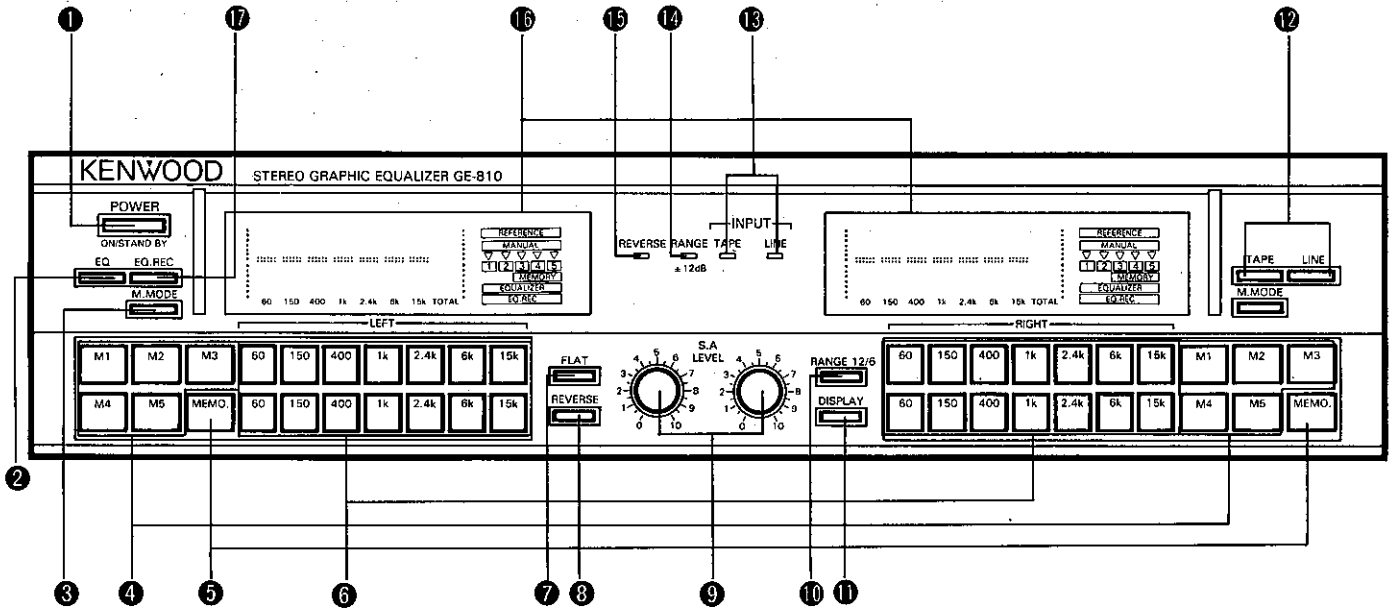
* Refer to parts list on page 38.

CONTENTS

CONTROLS AND INDICATORS



❶ POWER switch

Press to turn the power ON. Press it again to set the unit to STANDBY mode.

* In STANDBY mode, all functions, except for the memory backup function, are turned OFF.

❷ EQ switch

Press to apply the sound equalizer effect.

❸ M.MODE select switch (L/R)

This switch is used to select the memory mode between MANUAL memory mode and fixed memory mode (REFERENCE).

❹ M1 to M5 keys (L/R)

Press one of the M1 to M5 keys to memorize the response pattern.

❺ MEMORY keys (L/R)

Press this key when memorizing the response pattern set by the equalizer level controls.

❻ Equalizer level controls (LEFT/RIGHT)

Each time any of the upper keys is pressed, the equalizer level is raised by one step to boost the response. Each time any of the lower keys is pressed, to attenuate the response, the equalizer level is lowered by one step. When a key is kept pressed for more than 1/2 second, the equalizer level is changed up or down at high seed.

❼ FLAT switch

Press to set all the equalizer levels to flat.

❽ REVERSE switch

When this switch is pressed, the response which is boosted or attenuated by the equalizer level controls is reversed.

❾ S.A (Spectrum Analyzer) LEVEL controls (L/R)

These control knobs are used to control the display level of the spectrum analyzer. Turn clockwise to increase the display level and turn counterclockwise to decrease it.

⑩ RANGE select switch

Press this switch to select the maximum variable range of the equalizer level controls, between ±12 dB and ±6 dB.

±12 dB: Set to this position when a wide compensation range is required, to equalize the listening room or speakers, etc.

±6 dB: Set to this position when a narrow compensation range is required, to equalize the frequency response of a tape deck or high frequency compensation of a cartridge, etc.

⑪ DISPLAY switch

When this switch is pressed in the spectrum analyzer mode, the display changes to graphic equalizer mode. When the switch is pressed again, the display returns to the spectrum analyzer mode.

⑫ Input select switches

Select the input signal to which the equalizing effect is applied.

TAPE switch:

Press this switch when equalizing the sound from equipment connected to the TAPE INPUT jacks of this unit.

LINE switch:

Press this switch when equalizing the sound from equipment connected to the LINE INPUT jacks of this unit.

⑬ Input indicators

TAPE indicator:

Lights when the TAPE switch is pressed.

LINE indicator:

Lights when the LINE switch is pressed.

⑭ RANGE indicator

Lights when the RANGE switch is pressed to set to ±12 dB.

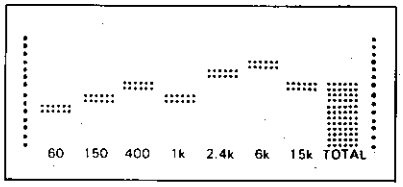
⑮ REVERSE indicator

Lights when the REVERSE indicator switch is pressed.

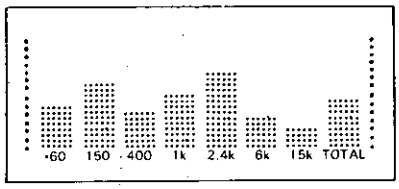
⑯ Display section

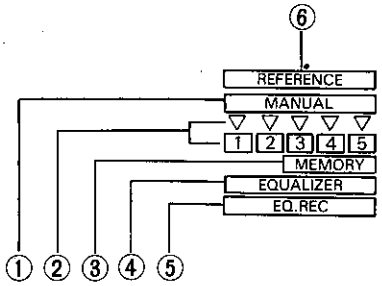
Graphic equalizer display

By display is changed each time the DISPLAY switch is pressed.



Spectrum analyzer display





① MANUAL indicator

Lights when the M.MODE select switch is set to manual mode.

② M1 to M5 indicators

When one of the M1 to M5 keys is pressed, the "▼" indicator lights above the corresponding number.

③ MEMORY indicator

Lights for about 5 seconds when the MEMORY key is pressed.

④ EQUALIZER indicator

Lights when the EQ switch is pressed.

⑤ EQ.REC indicator

Lights when the EQ.REC switch is pressed.

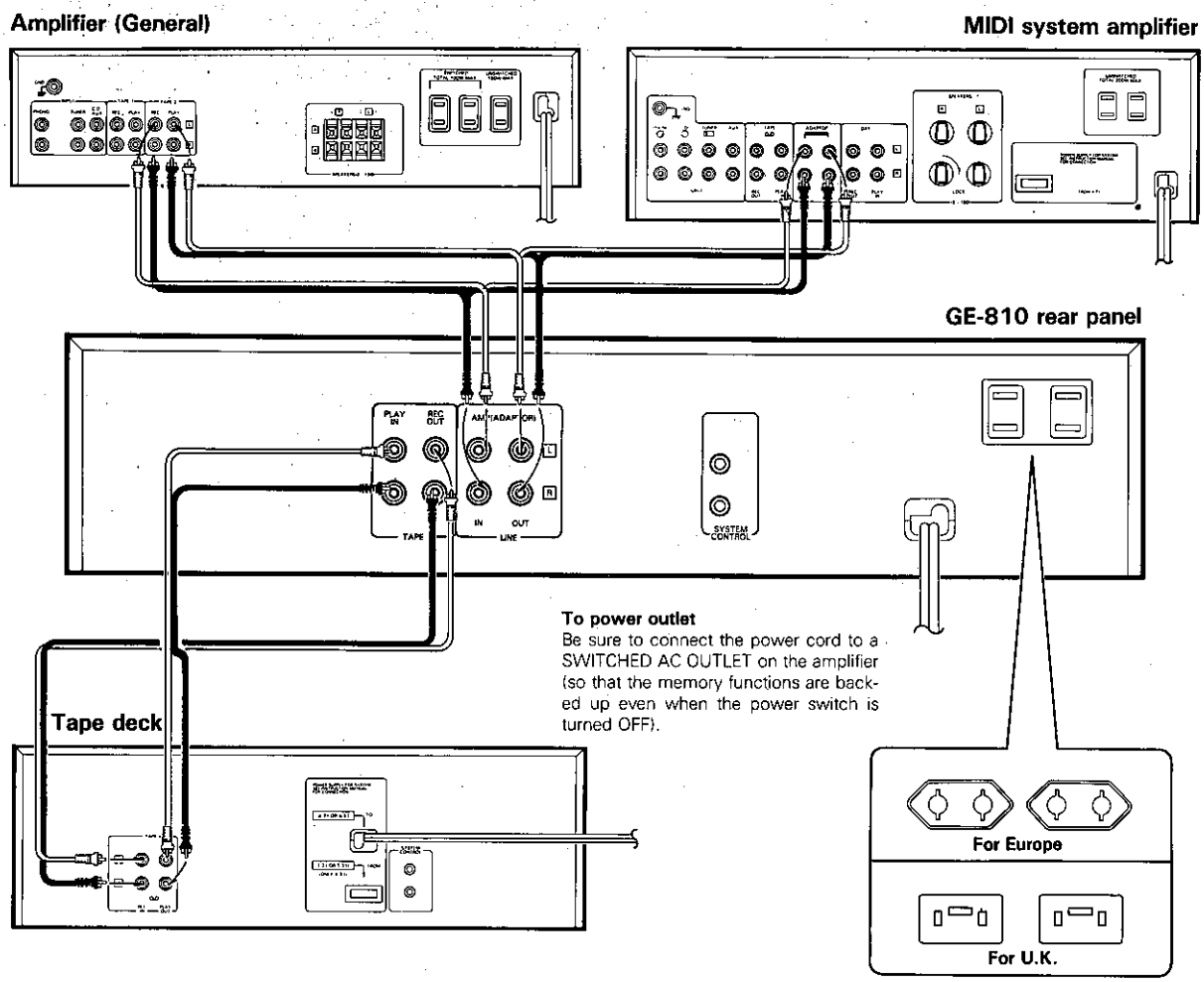
⑥ REFERENCE indicator

Lights when the M.MODE select switch is pressed, to set to fixed preset memory mode.

⑰ EQ.REC switch

Press this switch when recording the equalized sound onto the tape with the cassette deck.

System connections



Connections

Connecting to TAPE jacks of the amplifier

To use the tape jacks, connect between the line input jacks (LINE IN) of the graphic equalizer and the tape record jacks (TAPE REC OUT) of your amplifier. Connect between the line output jacks (LINE OUT) of the graphic equalizer and the tape playback jacks (TAPE PLAY IN) of your amplifier with RCA pin-plug cords. Take care not to mistake the left L and right R channels.

Connecting to MIDI system amplifier

Connect the LINE IN jacks of this unit to the ADAPTOR OUT jacks of the amplifier and connect the LINE OUT jacks to the ADAPTOR IN jacks with RCA pin-plug cords. Take are not to mistake the left [L] and right [R] channels.

Tape decks

Connect between the tape record jacks (TAPE REC OUT) of the graphic equalizer and the record input jacks (REC IN) of your tape deck. And connect between the tape play back jack (TAPE PLAY IN) of the graphic equalizer and the play back output jacks (PLAY OUT) of your tape deck with RCA pin-plug cords. Take care not to mistake the left [L] and right [R] channels.

AC outlet (UNSWITCHED) (Except for some areas)

This outlet provides power when the unit is plugged into an active AC wall outlet, regardless of the setting of the POWER switch. Its total maximum capacity is 200 watts.

Precautions

1. Before connecting or disconnecting any cord, be sure to turn off the power switches of the unit and pre-main amplifier.
2. Each audio cord must be connected securely to the corresponding terminals ([L] to [L] and [R] to [R]).
3. Do not bind the input/output cords with the power cord and speaker cord. Do not extend the input/output cords unnecessarily to avoid the possibility of noise or deterioration of tone qualitiy.

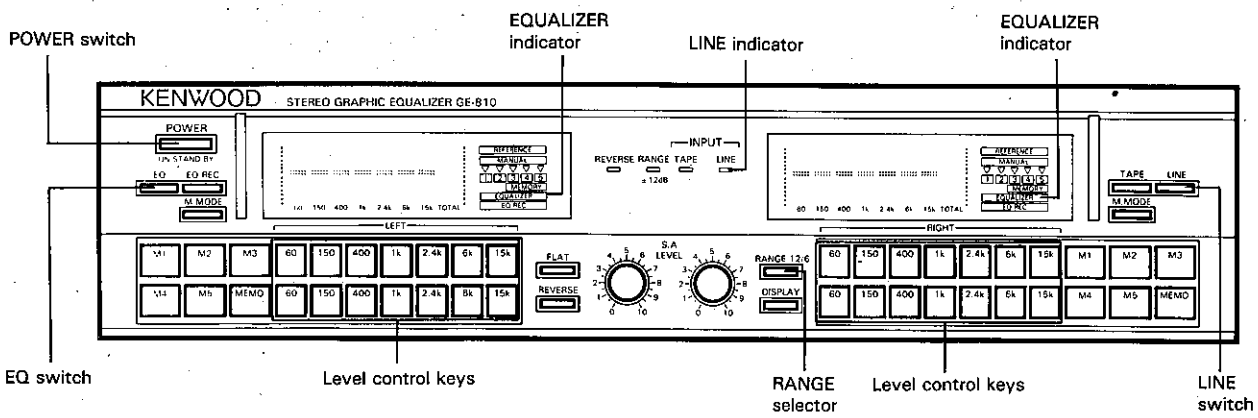
SYSTEM CONTROL jacks

These jacks are used for synchro recording. Using the synchro cords with miniplugs, connect these jacks to the SYSTEM CONTROL jacks of the amplifier and cassette deck.

Operating instructions

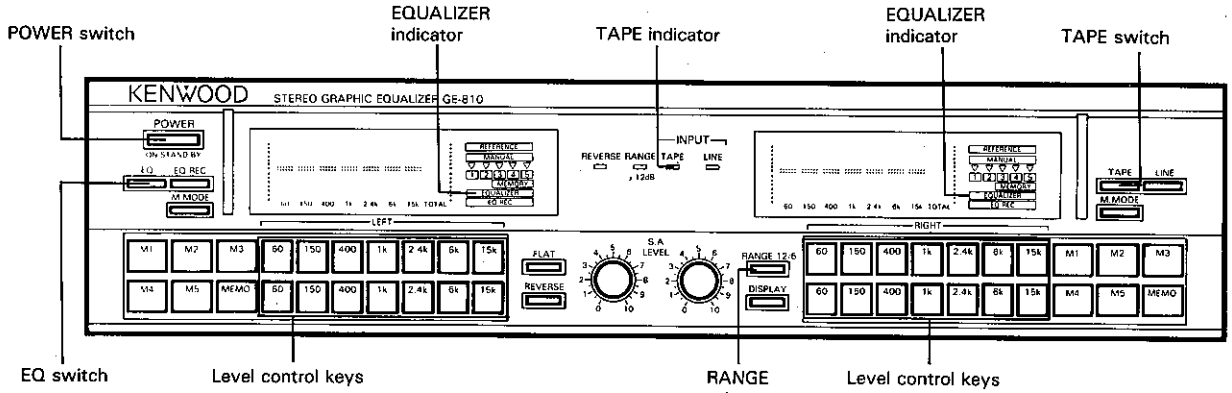
■ To listen to the amplifier's program source after equalization

1. Set the POWER switch to ON.
2. Press the input selector LINE switch to on. The LINE input indicator will light.
3. Set the EQ switch to on. The equalizer indicator (EQUALIZER) will light.
4. Play the program source connected to the amplifier.
5. Use the equalizer range selector (RANGE) to select the appropriate maximum equalization range.
6. Adjust the level controls (Right/Left channel) to compensate the sound quality.
7. The equalized sound can be checked by the EQ switch to on or off.



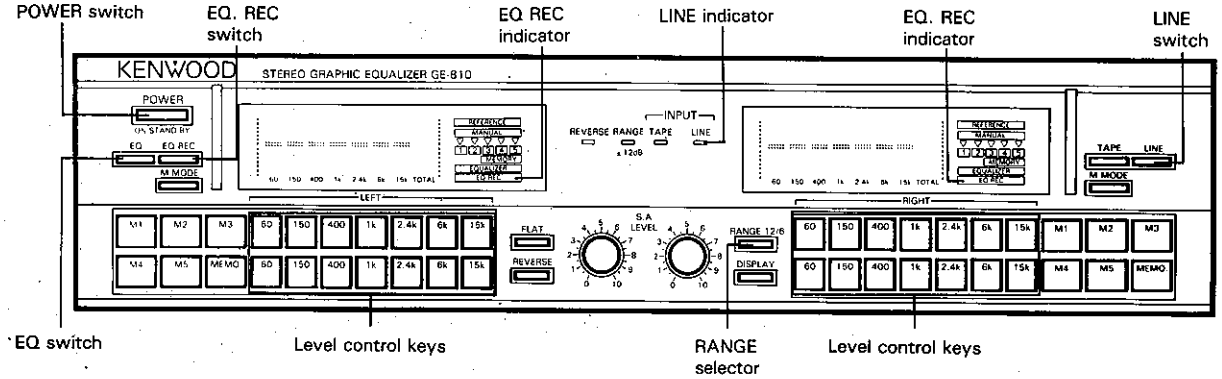
■ To listen to tape playback after equalization

1. Set the POWER switch to ON.
2. Press the input selector TAPE switch to on. The TAPE input indicator will light.
3. Set the EQ switch to on. The equalizer indicator (EQUALIZER) will light.
4. Set the tape deck to the playback mode.
5. Use the equalizer range selector (RANGE) to select the appropriate maximum equalization range.
6. Adjust the level controls (Right/Left channel) to compensate the sound quality.
7. The equalized sound can be checked by the EQ switch to on or off.



■ To record amplifier's program source after equalization

1. Set the POWER switch to ON.
2. Press the input selector LINE switch to on. The LINE input indicator will light.
3. Set the EQ. REC switch to on. The equalizer recording effect indicator (EQ. REC) will light.
4. Play the program source connected to the amplifier.
5. Use the equalizer rang selector (RANGE) to select the appropriate maximum equalization range.
6. Adjust the level controls (Right/Left channel) to compensate the sound quality.
   The equalized sound can be checked by the EQ switch to on or off.
7. Set the tape deck to the rec pause mode and adjust the recording level.
8. Set the tape deck to the recording mode. Equalized sound can be recorded.



Memory function

The GE-810 has two types of preset memories; MANUAL preset memories, in which writing or recalling is possible, and fixed (REFERENCE) preset memories, which can be recalled only.

■ Fixed Memory Presets (REFERENCE)

In the GE-810, five types of factory-preset fixed memories are incorporated, and each of the 5 patterns can be recalled for the right and left channels respectively.

1. Press the DISPLAY switch to set the display to graphic equalizer mode.
2. Press the M.MODE switch to set to fixed preset memory mode. At this time, the MANUAL indicator goes off and the REFERENCE indicator lights in the display.
3. When the spectrum analyzer is displayed, press the M.MODE switch. The display shows graphic equalizer mode for about 5 seconds. During this time, press one of the M1 to M5 keys to recall a fixed preset pattern, as desired.
4. When one of the M1 to M5 keys is pressed, the "▼" indicator lights above the selected number ([1] to [5]), and the corresponding preset memory is recalled.

The fixed memories are preset according to the music genre to be listened to, or to the listening room, as follows:

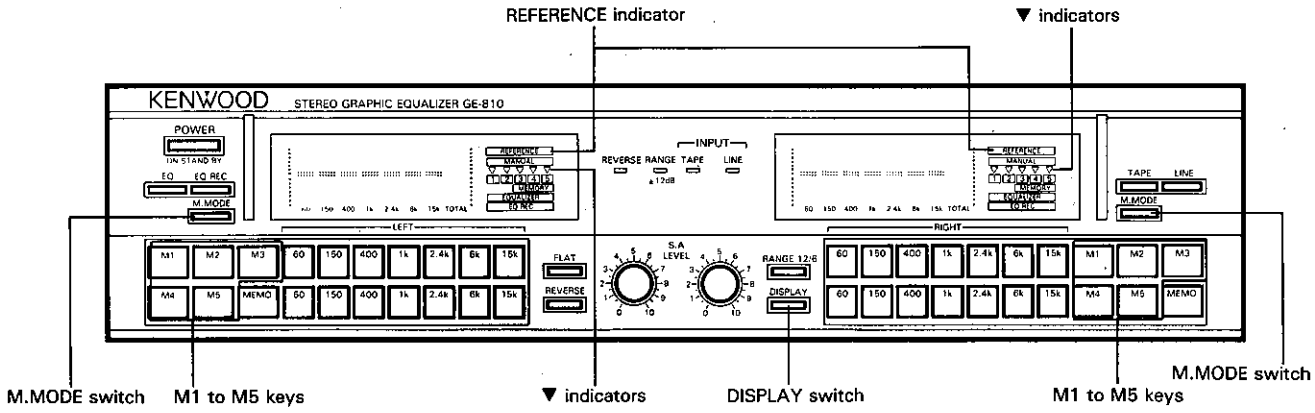
M1: For rock or fusion music, etc.
Used when more powerful and dynamic sound is required.

M2: For jazz music in the 50's style, etc.
Used when an old-fashioned style is required.

M3: For vocal music, etc.
Used when listening to vocal music of various types. The human voice comes forward and the vocal sound can be fully enjoyed.

M4: For soft and smooth sound
Used when listening to music for an extended period of time, or in the night. A harshless mellow sound will be obtained.

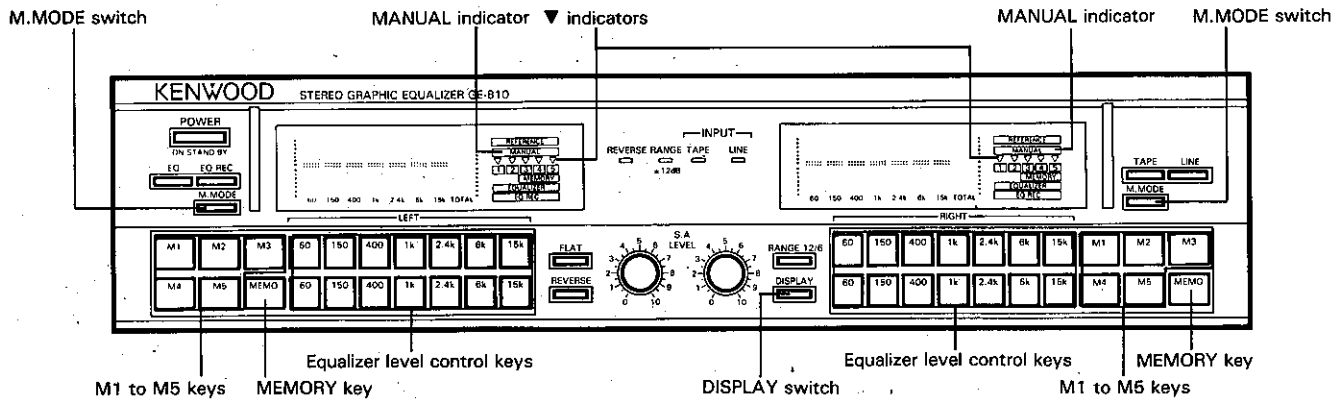
M5: For sharp and crisp sound
Used when listening to music in detail. The sound edge and details will be clearly perceived.



■ How to Store the Manual Memory Presets (MANUAL)

Up to five response curve patterns which are set as desired, can be stored in memory for both the right and left channels independently, to be recalled at any time.

1. Press the DISPLAY switch to set the display to graphic equalizer mode.
2. Press the M.MODE switch to activate manual memory mode. At this time, the MANUAL indicator lights.
3. Adjust the response curve with the equalizer level controls as desired.
4. When the MEMORY switch is pressed, the MEMORY indicator lights in the display.
5. Within 5 seconds after the MEMORY switch is pressed, press one of the M1 to M5 keys. The "▼" indicator lights above the selected number ([1] to [5]), and the response curve is stored in memory.
6. To recall the desired response curve, first press the M.MODE switch to set to manual mode. At this time, the MANUAL indicator lights in the display.
7. When one of the M1 to M5 keys is pressed, the corresponding memory stored by that key will be recalled.



Display modes

■ In Spectrum Analyzer Display Mode

Press the DISPLAY switch to set the display to spectrum analyzer mode.
In this mode, the frequency levels of the signal output from the output jacks, from the program source selected by the input select switch, are displayed.
Turn the S.A LEVEL controls to adjust the display level for the left channel and the right channel independently, so that the spectrum analyzer display can be read easily.

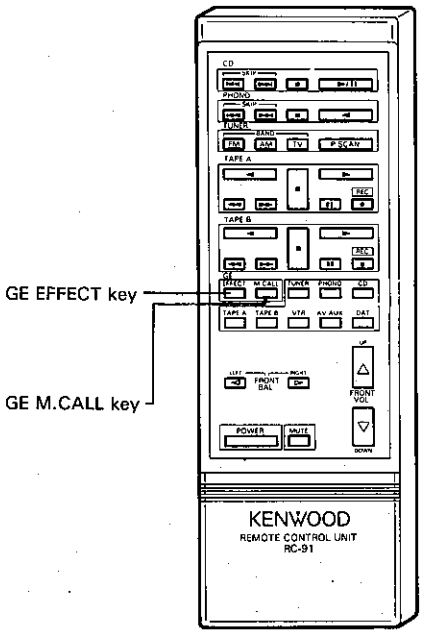
■ In Graphic Equalizer Display Mode

Press the DISPLAY switch to set the display to graphic equalizer mode.
The graphic equalizer display can be recalled for about 5 seconds, even when the spectrum analyzer is displayed, in the following cases:

1. When the POWER switch is turned ON.
2. When the equalizer level control key is pressed.
3. When the MEMORY switch is pressed.
4. When the M.MODE switch is pressed.
5. When one of the M1 to M5 keys is pressed.
6. When the FLAT switch is pressed.
7. When the REVERSE switch is pressed.

When used with a MIDI system

To connect the GE-810 to a KENWOOD M-91/M-71 MIDI system, refer to "Connections" in the manual that comes with the MIDI system.

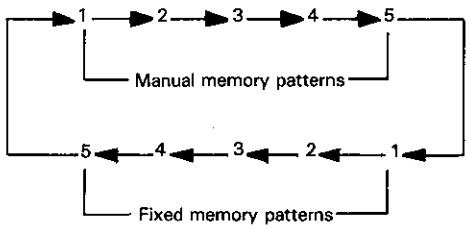


■ Operations with the remote control unit supplied with the MIDI system

Using the remote control unit provided with the MIDI system, the following operations can be controlled from a distance.

1. GE M.CALL key

The desired graphic equalizer memory can be recalled. (However, in this case, memory patterns cannot be separately recalled for the left and right channels.)
Each time the key is pressed, the memory patterns will be recalled in the following order:



2. GE EFFECT key

The graphic equalizer effect can be set ON and OFF with the remote control unit.

Note:

If the KENWOOD MIDI system is connected and the CCRS (Computer-controlled CD Recording System) function is used, the EQUALIZER or EQ.REC switch on the Graphic Equalizer will automatically be set to OFF. In this case, the equalized sound cannot be recorded onto the tape.

DISASSEMBLY FOR REPAIR

1. Remove the case by removing screws fixing it; two screws from the left side, two from the right side, and two from the rear side.

2. Remove three screws (❶) fixing the front panel.

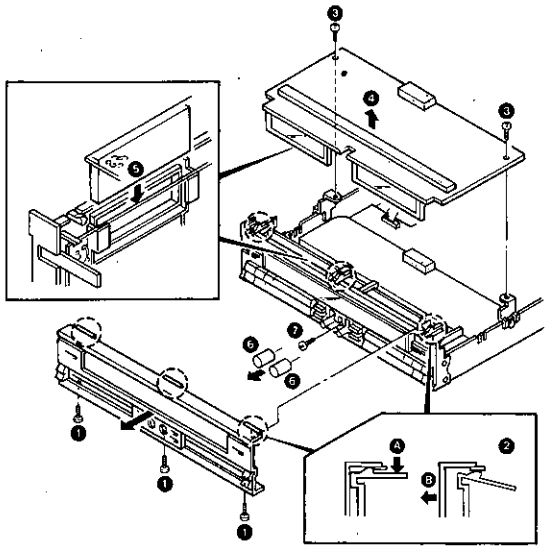
3. Disengage three lugs on the upper edge of the front panel, and remove the front panel in the direction of the arrow (❷).

4. Remove two screws (❸) fixing the PC board (X13-A/2) on which fluorescent (FL) tubes are mounted, and remove the PC board in the direction of the arrow (❹).

   Note: When mounting the PC board later, take care that the FL tubes come in the correct position referring to the positions of the sub-panel lugs (❺).

5. Remove two SA level control knobs (❻) in the direction of the arrow.

6. Remove the fixing screw (❼) from the sub-panel side.



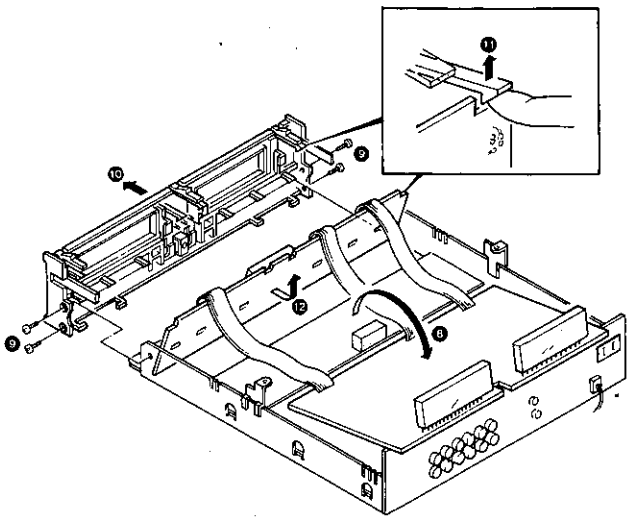
7. Tilt the FL board (X13-A/2) in the direction of the arrow (❽).

8. Remove screws (❾) fixing the sub-panel; two screws from the left side and two from the right side.

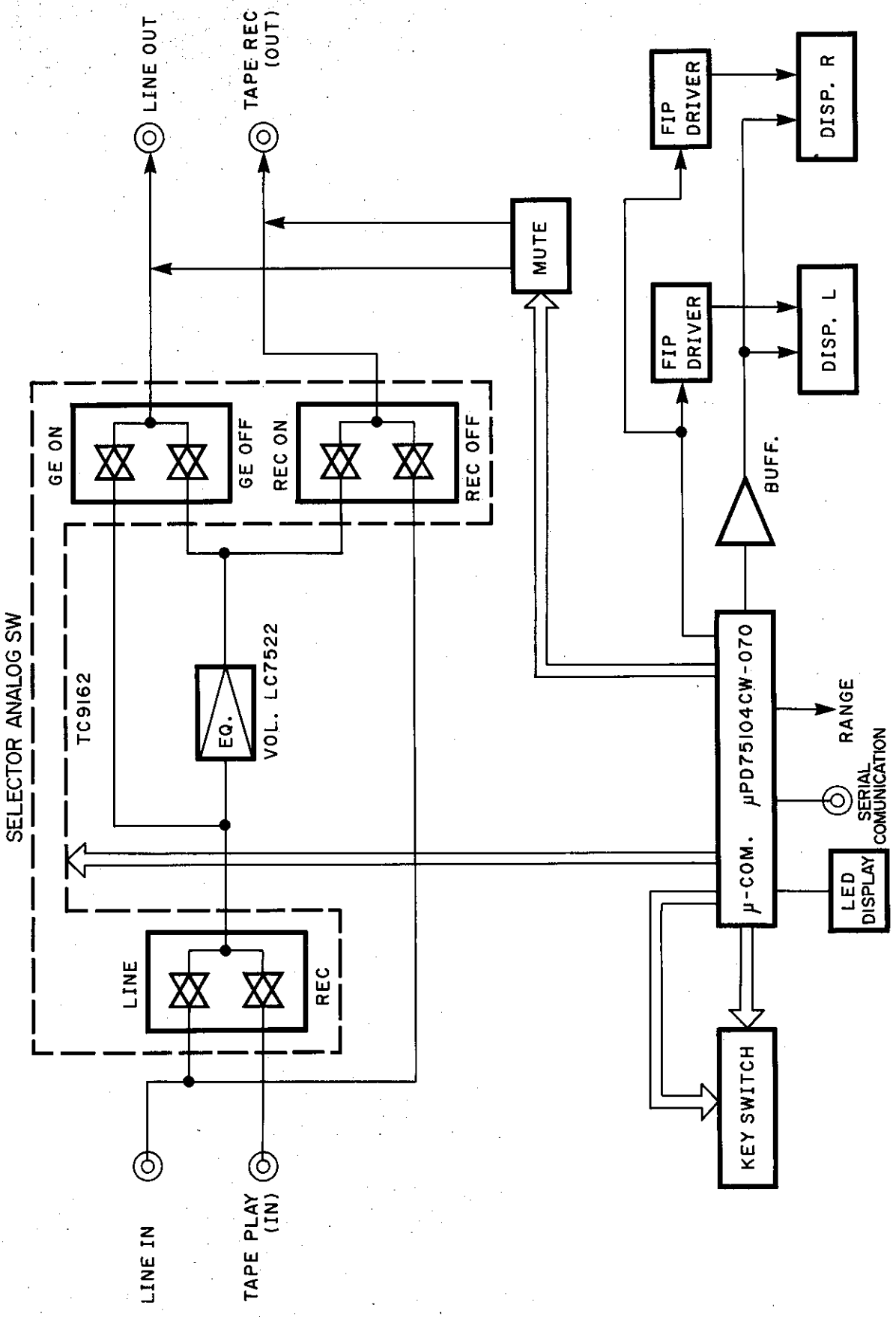
9. Move the sub-panel slightly forward (❿).

10. Disengage ten sub-panel lugs (⓫) retaining the SW board (X13-B/2).

11. Remove the SW board (X13-B/2) in the direction of the arrow (⓬).



BLOCK DIAGRAM



CIRCUIT DESCRIPTION

Functions of components
Control Unit (X11-2430-01)

Components	Use/Function	Operation/Condition/Interchangeability
IC1	Selector	
IC3	Buffer	For spectrum analyzer
IC4	Constant-voltage supply (+5.6 V)	
IC6	Filament ON/OFF	
IC7, 8	Buffer	For graphic equalizer
IC9 ,10	Range switching	
IC11, 14	Graphic equalizer	
IC12, 15	Electronic volume control	
Q1~4, 7, 9	Signal-circuitry muting	
Q10, 11, 23, 24	Display-circuitry muting	
Q12, 13	Constant-voltage supply (+14 V)	
Q14,15	Constant-voltage supply (-14 V)	
Q16	Stop circuit	
Q17	Reset circuit	
Q18~21	Range switching	
Q22, 25, 26	Filament ON/OFF	

Switch Unit (X13-5710-01)

Components	Use/Function	Operation/Condition/Interchangeability
IC1	Microprocessor	
IC2, 3	FIP driver	5 V single power supply
IC4	Buffer	For spectrum analyzer
IC5~8	Band-pass filter	+5 V and -14 V power supplies. 60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.4 kHz, 6 kHz, 15 kHz
IC9	Constant-voltage supply (+5 V)	
Q1~6, 11~16	FIP current amp	NPN, with built-in 10-kΩ base resistance
Q7, 8, 17, 18	FIP current amp	PNP, with built-in 10-kΩ base resistance and 10-kΩ base-emitter resistance

Microprocessor Operation Specification (outline of functions)

1. Graphic equalizer functions

Control of spectrum analyzer or graphic equalizer equipped with two independent systems of 7-band 13-step (±12dB or ±6dB) graphic equalizers.

1) UP/DOWN key control for each band
2) EQ preset/recall control (A total of 20 presets: 5 User's and 5 Maker's for each of A and B systems)
3) User memory write function (5 x 2 User memory)
4) EQ ON/DEFEAT switching (independently for A and B)
5) EQ REC switching (independently for A and B)
6) Spectrum analyzer/equalizer display switching
7) 12dB/6dB range switching
8) REVERSE key function
9) FLAT key function

2. Remote control function (valid with systematized components)

1) EQ effect ON/OFF switching
2) EQ presets recall control
3) CCRS synchro operations
4) LINE/TAPE switching interlocked with amplifier's SOURCE switching **(GE-810 only)**

CIRCUIT DESCRIPTION

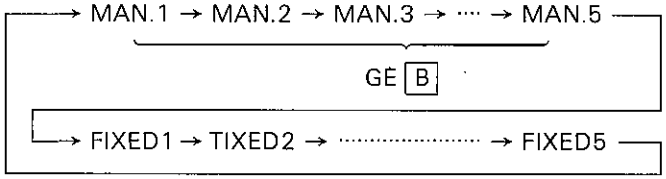
Symbols	Fuctions
POWER (Not remote controllable)	Power ON/OFF key. Each press alternates the power between ON and OFF (standby). The power is OFF when the power cord is plugged in an outlet. The initial conditions when the power is switched ON are as follows. • GE (Graphic Equalizer) selectors (A, B): OFF **[GE-910]** • LINE, EQ DEFEAT, EQ REC OFF **[GE-810]** • MANUAL MEMORY, no GE memory recall, GE flat, SA (Spectrum Analyzer) display 12 dB, REVERSE OFF While all keys are accepted when power is ON, only the POWER key is accepted when power is OFF. When power is OFF, the input terminals (LINE, REC A or REC B) of the **GE-910** are looped through, while the input of the **GE-810** is fixed to LINE and looped through. The last statuses of the GE mode characteristics and modes (display, memory, 12/6dB, REVERSE ON/OFF, etc.) set after turning power ON are held as long as they are backed up. Note 1) The power cord of this unit shall be plugged into a switched outlet of the pre-main integrated amplifier or preamplifier. As the EQ display appears for 5 seconds after the power is switched ON, set to SA if SA mode is required. Note 2) If the microprocessor seems to malfunction, clear the memory and reset the microprocessor by plugging in the power cord while depressing the [MEMORY] and [M.MODE] keys of B(R).
EQ UP/DOWN x 7 x 2 (Not remote controllable)	Graphic equalizer boost/cut amount setting keys. Two variation modes are available for each band, ±12dB in 13 steps with 2dB/step, or ±6dB in 13 steps with 1dB/step. (for 12/6dB switching refer to the description of "12/6dB RANGE"). Each press of the EQ UP or DOWN key varies the setting one step up or down, and continuous UP or DOWN variation at 120ms/step when the key has been held depressed for more than 0.5second. When one of these keys is pressed in the SA display mode, it is switched to GE display mode, which shows the graphic equalizer up/down operations. The GE display continues for 5seconds after the key is pressed, and returns to the SA display mode again. With the EQ UP/DOWN keys, several keys can be pressed and simultaneous operations occur in this case. When this key is pressed after recalling a Fixed memory, the Fixed memory display is switched to the MANUAL MEMORY display.
MEMORY	This key is used to store the current GE setup in the GE memory. When this key is pressed, the [MEMORY] indicator lights, preset 1 to 5 indicator "▽" and [REFERENCE] indicator go off, and the [MANUAL] indicator lights. This is the GE memory enabled mode which lasts for approx. 5seconds. Pressing one of keys 1 to 5 stores the current GE setup in the memory specified, or the mode is canceled if none of keys 1 to 5 is pressed in 5seconds. The MEMORY key is valid even during SA display, which plays the role of the present GE display when the MEMORY key is pressed.
MEMO•MODE	This key is used to classify each GE memory (1 to 5) as a writable user memory (MANUAL MEMORY) or non-writable memory (FIXED MEMORY). When this key is pressed in the MANUAL MEMORY mode, the graphic equalizer is set to the last status of the FIXED MEMORY mode. Inversely, when this key is pressed in the FIXED MEMORY mode, it is set to the last status of the MANUAL MEMORY mode. As this is the same operation as when storing the GE memory, pressing the MEMO-MODE switch in the middle of SA display switched the display to the GE display for 5 seconds.

CIRCUIT DESCRIPTION

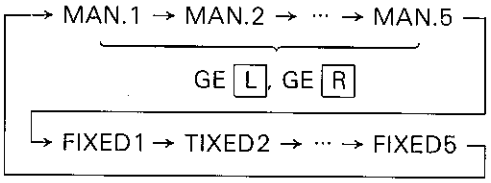
<table>
<tr><th>Symbols</th><th>Fuctions</th></tr>
<tr><td>1, 2, 3, 4, 5</td><td>These keys correspond either to one of the writable GE memories (5 x 2) or to one of the recall-only GE memories (5 x 2), and used for writing or recalling them.
• To write the current GE status in a GE memory, press the [MEMORY] key of GE A (L) or GE B (R) and, within 5seconds (while the [MEMORY] indicator is lit), press one of keys 1 to 5.
• To recall a GE status from the user memory, set the MEMO-MODE of the required group of memory to [MANUAL], and press one of keys 1 to 5.
• To recall a GE status from the fixed memory, set the MEMO-MODE of the required group of memory to [REFERENCE], and press one of keys 1 to 5.
In any of the above cases, if the normal display mode is the SA mode, the GE display appears for approx. 5seconds and returns to the SA display.

The fixed memory contents are set as follows.
(for digits in the table, refer to the diagram on the left.)
<table><tr><th>Frequency / Fixed memory</th><th>f1</th><th>f2</th><th>f3</th><th>f4</th><th>f5</th><th>f6</th><th>f7</th></tr><tr><td>1</td><td>B</td><td>8</td><td>7</td><td>7</td><td>7</td><td>9</td><td>A</td></tr><tr><td>2</td><td>2</td><td>5</td><td>9</td><td>B</td><td>9</td><td>6</td><td>3</td></tr><tr><td>3</td><td>7</td><td>7</td><td>9</td><td>A</td><td>9</td><td>7</td><td>7</td></tr><tr><td>4</td><td>A</td><td>9</td><td>8</td><td>8</td><td>8</td><td>8</td><td>7</td></tr><tr><td>5</td><td>7</td><td>8</td><td>8</td><td>8</td><td>9</td><td>9</td><td>A</td></tr></table>
+ 12dB E D C B A 9
0dB 8
7 6 5 4 3
− 12dB 2</td></tr>
<tr><td>GE SELECT A (LINE/REC A/OFF) [GE-910 only]</td><td>OFF : Press when not using GE [A].
LINE : Press to listen to the sound compensated by GE [A].
When LINE is pressed, the [EQUALIZER] indicator of GE [A] lights.
REC A : Press to record the sound compensated by GE [A] onto deck connected to REC A terminal.
When REC A is pressed, the [EQ REC] indicator of GE [A] lights.</td></tr>
<tr><td>GE SELECT B (LINE/REC B/OFF) [GE-910 only]</td><td>OFF : Press when not using GE [B].
LINE : Press to listen to the sound compensated by GE [B].
When LINE is pressed, the [EQUALIZER] indicator of GE [B] lights.
REC B : Press to record the sound compensated by GE [B] onto deck connected to REC B terminals.
When REC B is pressed, the [EQ REC] indicator of GE [B] lights.</td></tr>
<tr><td>INPUT SELECTOR (LINE/TAPE) [GE-810 only]</td><td>LINE : Press to listen to the LINE input sound.
TAPE : Press to listen to the input from the deck connected to the TAPE MONITOR terminals.</td></tr>
<tr><td>EQ ON/OFF [GE-910 only]</td><td>This key selects whether the GE effect is applied to the signal selected with the INPUT SELECTOR switch or not.</td></tr>
</table>

CIRCUIT DESCRIPTION

Symbols	Fuctions
EQ REC **[GE-810 only]**	GE recording ON./OFF key. This key is not valid while the INPUT SELECTOR is set to TAPE.
DISPLAY	SA (spectrum analyzer)/GE (graphic equalizer) display select key. Pressing the key switches the SA display to GE display and vice versa. Even when the SA display mode is selected with the DISPLAY key, pressing any of the EQ UP/DOWN, FLAT, REVERSE, MEMO-MODE, MEMORY, 12/6 RANGE and GE memory 1 to 5 keys displays the GE display for approx. 5seconds; the display is switched to the SA mode again after this period.
REVERSE	This key alternates the GE pattern between + and – (reverse). The LED lights in the Reverse mode, and goes off in the normal mode. The REVERSE LED also goes off when the UP/DOWN or FLAT key is pressed or GE memory is recalled (i.e. when the current GE curve changes).
FLAT	This key puts the GE level to flat. (Similarly to when the UP/DOWN key is pressed, the MANUAL mode is activated and the REVERSE LED goes OFF.)
12/6 RANGE	This key switches the maximum variation range of equalizer to ±12dB or ±6dB. When the range is ±12dB, the ±12dB LED lights to indicate it.
GE (Remote control only) **[GE-910 only]**	GE memory recall key on the remote control unit. When this key is pressed with no GE memory displayed, MAN.1 of GE [B] will be recalled. When a GE memory has already been displayed, pressing this key changes the displayed memory as follows.  Each press of the key changes the display as shown above. Note that MANUAL MEMORY of GE [A] cannot be recalled from the remote control unit. For the operation specification of he **GE-810**, read description in **"GE-810 operation"**.
EQ ON/OFF (Remote control only)	This key switches the graphic equalizer effect between ON and DEFEAT. **[With GE-910]** • With GE [B] selector at OFF: Pressing the EQ ON/OFF key switches GE B to LINE, and each subsequent press alternates the GE B mode between LINE B and OFF. • With GE [B] selector at LINE: Each press of the EQ ON/OFF key alternates the GE B mode between OFF and LINE B. • With GE [B] selector at REC B: Pressing the EQ ON/OFF key does not cause any change. **[With GE-810]** When the EQ ON/OFF key is pressed, the INPUT SELECTOR position (LINE/TAPE) is not affected but only the GE effect is switched between ON and DEFEAT. This key is valid even when EQ REC is ON.

CIRCUIT DESCRIPTION

Symbols	Fuctions
CCRS synchro operation (valid with systematized components)	When EQ REC is ON at the start of the CCRS operation, EQ REC is turned OFF and switched to NORMAL REC mode. **[With GE-910]** • When the "computer CD REC standby code" is received, both GE [A] and GE [B] are switched OFF. **[With GE-810]** • When the "computer CD REC standby code" is received, the INPT SELECTOR is switched to LINE, and EQ and EQ REC are switched OFF.
[Operation of GE-810]	The **GE-810** allows to set the L and R graphic equalizers perfectly independently. Therefore, the following keys function independently for the L and R channels. • EQ UP/DOWN • GE memory is recalled. • MEMORY • MEMO-MODE • SA.LEVEL However, when the GE memory is recalled from the remote control, the following operations occur simultaneously for the L and R channels. ① When the same GE memory has been recalled for L and R: The operations are similar to the **GE-910** as shown below.  ② When no GE memory has been recalled for L nor R: MAN.1 of GE [L] and GE [R] are recalled. ③ When GE memory has been recalled only for either L or R: The next memory No. to the memory having been recalled for L or R will be recalled for L and R simultaneously. The subsequent operations are the same as ①. ④ When different GE memory Nos. have been recalled for L and R: Both L and R are switched for the next GE memory No. to the GE memory having been recalled for L. The subsequent operations are the same as ①. ex.) ① L : MAN.3 → MAN.4 →..... R : MAN.3 → MAN.4 →..... ② L : * → MAN.1 → MAN.2 →..... R : * → MAN.1 → MAN.2 →..... ③ L : * → FIXED5 → MAN.1 →..... R : FIXED4 → FIXED5 → MAN.1 →..... ④ L : FIXED1 → FIXED2 → FIXED3 →..... R : MAN.3 → FIXED2 → FIXED3 →.....

CIRCUIT DESCRIPTION

Initial switch switching method

The microprocessor operation can be switched by the following switch ports to HIGH or LOW. To switch the microprocessor operating condition, unplug the power cord, set the required ports from HIGH to LOW or vice versa, and plug the power cord again. If HIGH and LOW are switched with the power cord plugged in, the microprocessor condition will not be switched until the power cord is unplugged then plugged in.

Initial switches
- PTH01 PPHOLD
  - H ..... With peak hold
  - L ..... No peak hold
- PTH02 P5343
  - H GE-810
  - L GE-910
- PTH03 PTEST
  - H ..... Normal mode
  - L (two TEST pins short-circuited) ..... Test mode

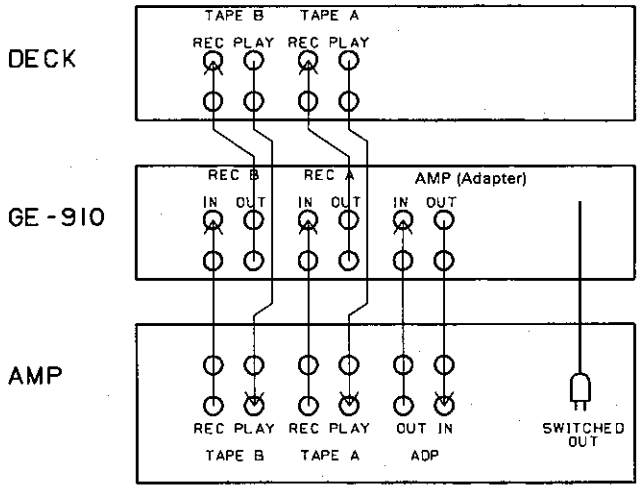
Test mode

When the PTEST (PTH03 terminal is switched for the test mode following "Initial switching method", the microprocessor mode is switched from the normal mode to test mode, in which the following operation is different.

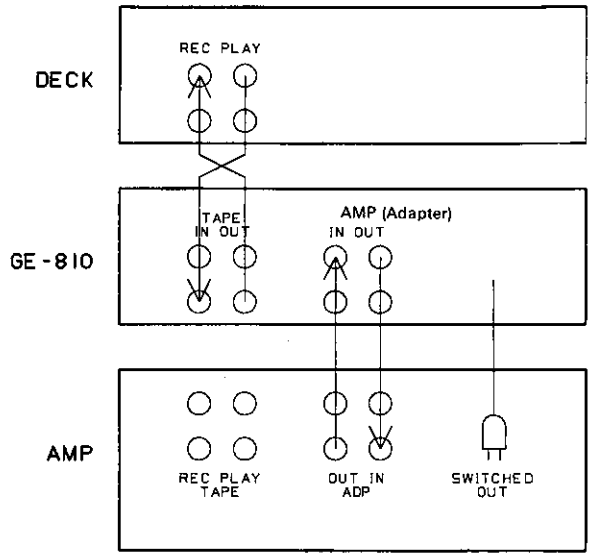
- Just one press of the GE UP/DOWN key varies the GE boost/cut amount from flat (0dB) to MAX (+12dB) or MIN (−12 dB). Intermediate values other than MAX and MIN cannot be set.

To return to the normal mode, set the test pin OPEN (PTEST to HIGH), then unplug and plug in the power cord.

GE-910 connection method (seen from rear)



GE-810 connection method (seen from rear)



* The deck terminals on the AMP shall be left OPEN.

CIRCUIT DESCRIPTION

GE-910: Relationship Between EQ A/B Input Positions and Outputs

In the table shown on the right, the vertical column consists of EQ A input positions, and horizontal row consists of EQ B input positions.
The table shows the relation between the signals at the output terminals and the combinations of EQ A and EQ B input positions.

Note) When IDRS is not activated, A = LINE OUT and B = LINE OUT. Therefore, if LINE B (LINE A) is activated during recording REC A (or REC B), double equalizations are applied and the tone being recorded will be different.
When IDRS is applied, A = LINE OUT and B = LINE OUT, and the double equalization will not occur.

EQ A \ EQ B	OFF	LINE	REC B
OFF	LINE OUT = L REC A OUT = A REC B OUT = B	LINE OUT = L + EQB REC A OUT = A REC B OUT = B	LINE OUT = L REC A OUT = A REC B OUT = B + EQB
LINE	LINE OUT = L + EQA REC A OUT = A REC B OUT = B		LINE OUT = L + EQA REC A OUT = A REC B OUT = B + EQB
REC A	LINE OUT = L REC A OUT = A + EQA REC B OUT = B	LINE OUT = L + EQB REC A OUT = A + EQA REC B OUT = B	LINE OUT = L REC A OUT = A + EQA REC B OUT = B + EQB

Abbreviations in the table are as follows.
L: LINE IN
A: REC A IN
B: REC B IN
LINE OUT = L*EQA : LINE IN O→ [EQA] →O LINE OUT

GE-910: Relationship Between EQ A/B Input Positions and Display

In the table shown on the right, the vertical column consists of EQ A input positions, and horizontal row consists of EQ B input positions.
The table shows the relation between the display contents and the combinations of EQ A and EQ B input positions.

Abbreviations in the table are as follows
SA.A : Display on GE A side
SA.B : Display on GE B side
L : LINE IN
A : REC A IN
B : REC B IN

EQ A \ EQ B	OFF	LINE	REC B
OFF	SA.A=L SA.B=L	SA.A=L SA.B=L+EQB	SA.A=L SA.B=B+EQB
LINE	SA.A=L+EQA SA.B=L		SA.A=L+EQA SA.B=L+EQB
REC A	SA.A=A+EQA SA.B=B	SA.A=A+EQA SA.B=L+EQB	SA.A=A+EQA SA.B=B+EQB

GE-810: Relationship Between INPUT SELECTOR/EQ Positions and Outputs

In the table shown on the right, the vertical columns consist of GE INPUT SELECTOR and EQ positions, and horizontal row consists of EQ REC positions.
The table shows the relation between the signals at the output terminals and the combinations of INPUT SELECTOR positions, EQ input positions and EQ REC positions.

Abbreviations in the table are as follows.
L : LINE IN
T : TAPE IN

		EQ.REC OFF	EQ.REC ON
LINE	EQ OFF	LINE OUT = L REC OUT = L	LINE OUT = L REC OUT = L+EQ
	EQ ON	LINE OUT = L+EQ REC OUT = L	LINE OUT = L+EQ REC OUT = L+EQ
TAPE	EQ OFF	LINE OUT = T REC OUT = L	
	EQ ON	LINE OUT = T+EQ REC OUT = L	

GE-810: Relationship Between INPUT SELECTOR/EQ Positions and Display

In the table shown on the right, the vertical columns consists of GE INPUT SELECTOR positions and EQ positions, and horizontal row consists of EQ REC positions.
The table shows the relation between the display contents and the combinations of INPUT SELECTOR positions, EQ positions and EQ REC positions.

Abbreviation in the tables are as follows.
SA. (L): L CH display
SA. (R): R CH display
L. (L): LINE IN (L CH)
L. (R): LINE IN (R CH)
T. (L): TAPE IN (L CH)
T. (R): TAPE IN (R CH)

		EQ.REC OFF	EQ.REC ON
LINE	EQ OFF	SA.(L)=L,(L) SA.(R)=L,(R)	SA.(L)=L,(L) SA.(R)=L,(R)
	EQ ON	SA.(L)=L+EQ. (L) SA.(R)=L+EQ. (R)	SA.(L)=L+EQ. (L) SA.(R)=L+EQ. (R)
TAPE	EQ OFF	SA.(L)=T,(L) SA.(R)=T,(R)	
	EQ ON	SA.(L)=T+EQ. (L) SA.(R)=T+EQ. (R)	

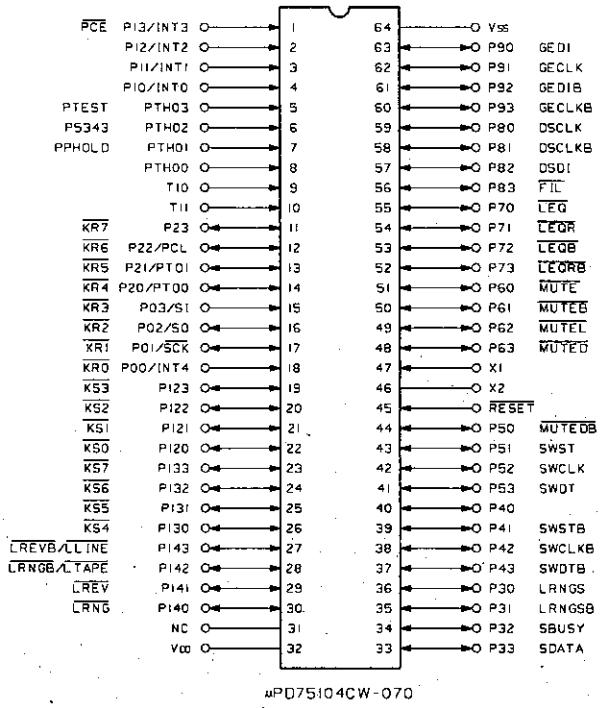
CIRCUIT DESCRIPTION

Note 1) It is recommended to plug the power cord of the **GE-910/GE-810** into the Switched Outlet of an amplifier.
If the unit should be connected to an ordinary power outlet, the sound may sometimes be heard even after the power cord is unplugged. However, do not use the unit under such condition.

Note 2) During the use of the **GE-910** with IDRS OFF (i.e. if recording onto a tape deck is started after selecting a source with the amplifier's input selector), when the GE effect is turned ON for REC A (REC B) then for LINE B (LINE A), double equalization effects will be applied to the GE's REC A IN and REC B IN terminals, causing a change in the sound being recorded.
With IDRS ON (i.e. if the amplifier's input selector is switched after starting recording), recording signal is applied directly to the GE's REC IN terminals, so turning the GE line ON does not cause any change in the sound being recorded.
Therefore, when it is required to record a source (e.g. CD) at the same time listening to it through speakers by applying a different equalizing effect, first select the source (CD) with the amplifier's input selector, start recording it with the deck, then select another source (TUNER, etc.) with the amplifier's input selector, and select the previous source (CD) again. Now, the equalization applied to the speaker sound is different from that applied to the recorded sound.

2. Microprocessor Terminal Description

GE-910/GE-810 Microprocessor Terminal Diagram



μPD75104CW-070

Note 3) During the use of the **GE-810**, the basic connection is as mentioned above. However, with this system, starting the deck playback switches the graphic equalizer's INPUT SELECTOR automatically to TAPE.
Therefore, if another deck B is connected to the amplifier's TAPE terminals, switching the amplifier's input selector to TAPE after having started deck B playback does not produce any sound, because the graphic equalizer's INPUT SELECTOR has been switched to TAPE automatically.
To listen to deck B sound, first start deck B playback, switch the amplifier's input selector to TAPE, and also switch the graphic equalizer's INPUT SELECTOR to LINE.

Note 4) When CCRS is activated, both EQ A and EQ B of the graphic equalizer are switched automatically to OFF.

CIRCUIT DESCRIPTION

GE-910/GE-810 Microprocessor Terminal Description

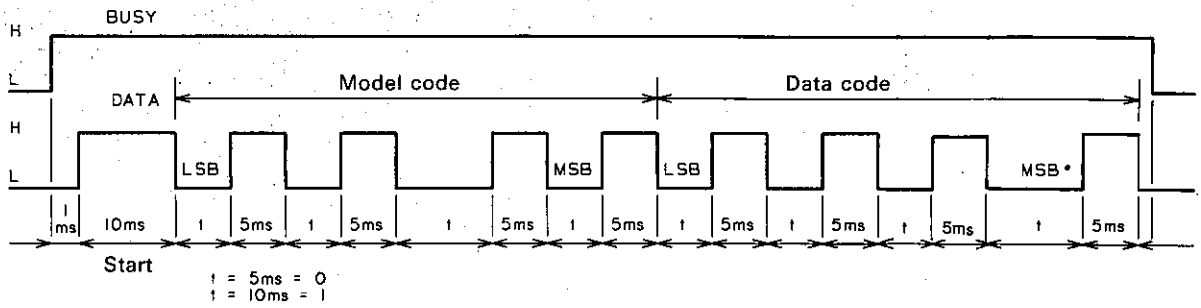
Pin No.	Pin name		I/O	Logic	Name	Function Discription
18	PO	0/INT4	I	L	$\overline{KRO}$	key return (input)
17		1/$\overline{SCK}$	I	L	$\overline{KRI}$	Key return (input).
16		2/SO	I	L	$\overline{KR2}$	key return (input)
15		3/SI	I	L	$\overline{KR3}$	key return (input)
4	PI	0/INT0	I	–	–	Not used.
3		1/INT1	I	–	–	Not used.
2		2/INT2	I	–	–	Not used.
1		3/INT3	I	L	$\overline{PCE}$	Power failure signal detection input. H: Active L: Stop
14	P2	0/PTO0	I	L	$\overline{KR4}$	key return (input)
13		1/PTO1	I	L	$\overline{KR5}$	Key return (input).
12		2/PCL	I	L	$\overline{KR6}$	key return (input)
11		3	I	L	$\overline{KR7}$	key return (input)
8	PTHO	0	I	–	–	Not used.
7		1	I	H	PPHOLD	(Initial switch) H: With peak hold L: Without peak hold
6		2	I	H	P5343	(Initial switch) H: GE-810 L: GE-910
5		3	I	H	PTEST	(Initial switch) H: Normal mode L: Test mode
9	T1	0	I	–	–	Not used
10		1	I	–	–	Not used
36	P3	0	O	L	$\overline{LRNGS}$	A 12/6 dB switching (for signal). H: 6dB L: 12dB
35		1	O	L	$\overline{LRNGB}$	B 12/6 dB switching (for signal). H: 6dB L: 12dB
34		2	I	H	SBUSY	Busy signal for serial communication
33		3	I	H	SDATA	Data signal for serial communication
40	P4	0	O	–		Not used
39		1	O	H	SWSTB	Selector IC B control signal (Store signal)
38		2	O	H	SWCLKB	Selector IC B control signal (Clock signal)
37		3	O	H	SWDTB	Selector IC B control signal (Data signal)
44	P5	0	O	L	$\overline{MUTEDB}$	DISP B muting signal ("L" for muting)
43		1	O	H	SWST	Selector IC A control signal (Store signal)
42		2	O	H	SWCLK	Selector IC A control signal (Clock signal)
41		3	O	H	$\overline{SWDT}$	Selector IC A control signal (Data signal)
51	P6	0	O	L	$\overline{MUTE}$	REC A OUT muting signal ("L" for muting)
50		1	O	L	$\overline{MUTEB}$	REC B OUT muting signal ("L" for muting)
49		2	O	L	$\overline{MUTEL}$	LINE OUT muting signal ("L" for muting)
48		3	O	L	$\overline{MUTED}$	DISP A muting signal ("L" for muting)

CIRCUIT DESCRIPTION

Pin No.	Pin name		I/O	Logic	Name	Function Discription
55	P7	0	O	L	$\overline{\text{LEQ}}$	Direct segment signal for FL tube (A [EQUALIZER])
54		1	O	L	$\overline{\text{LEQR}}$	Direct segment signal for FL tube (A [EQ.REC])
53		2	O	L	$\overline{\text{LEQB}}$	Direct segment signal for FL tube (B [EQUALIZER])
52		3	O	L	$\overline{\text{LEQRB}}$	Direct segment signal for FL tube (B [EQ.REC])
59	P8	0	O	H	DSCLK	LC7565 control signal (A Clock signal)
58		1	O	H	DSCLKB	LC7565 control signal (B Clock signal)
57		2	O	H	DSDI	LC7565 control signal (A/B Data signal)
56		3	O	L	$\overline{\text{FIL}}$	FL filament ON/OFF. H: LF tube ON L: FL tube OFF
63	P9	0	O	H	GEDI	LC7522 control signal (A Data signal)
62		1	O	H	GECLK	LC7522 control signal (A Clock signal)
61		2	O	H	GEDIB	LC7522 control signal (B Data signal)
60		3	O	H	GECLKB	LC7522 control signal (B Clock signal)
22	P12	0	O	L	$\overline{\text{KSO}}$	Key Scanning (output) (with built-in pull-up resistor and mask option)
21		1	O	L	$\overline{\text{KSI}}$	
20		2	O	L	$\overline{\text{KS2}}$	
19		3	O	L	$\overline{\text{KS3}}$	
26	P13	0	O	L	$\overline{\text{KS4}}$	Key Scanning (output) (with built-in pull-up resistor and mask option)
25		1	O	L	$\overline{\text{KS5}}$	
24		2	O	L	$\overline{\text{KS6}}$	
23		3	O	L	$\overline{\text{KS7}}$	
30	P14	0	O	L	$\overline{\text{LRNG}}$	LED output H....LED OFF L....LED ON: A12/6db RANGE (H ..... 6db, L ..... 12db)
29		1	O	L	$\overline{\text{LREV}}$	A REVERSE
28		2	O	L	$\overline{\text{LRNGB}}$/ $\overline{\text{LTAPE}}$	GE-910:B 12/6db RANGE/GE-810 "TAPE" LED
27		3	O	L	$\overline{\text{LREVB}}$/ $\overline{\text{LLINE}}$	GE-910:B REVERSE/GE-810 "LINE" LED

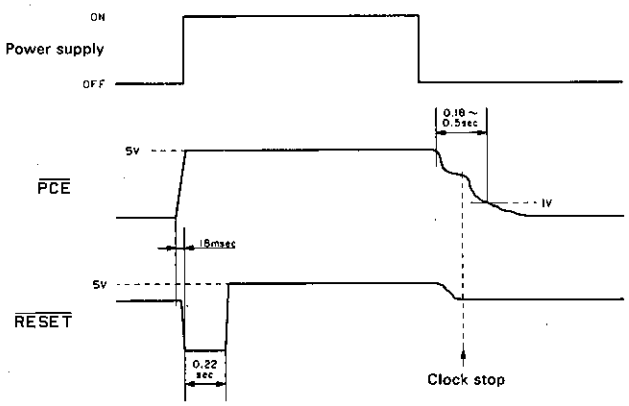
CIRCUIT DESCRIPTION

3. Serial Data Communication



The serial data communication uses the BUSY/DATA 2-wire bi directional bus format as shown in the diagram above. Each word consists of 8 bits, with the first 4 bits defining the transmitter model code (in above example, 4 = CD player) and the subsequent 4 bits defining the data code (in above example, 8 = PLAY). (48 H)

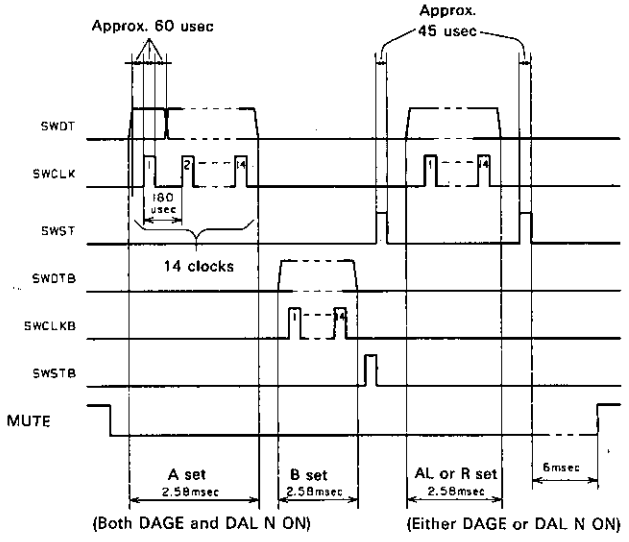
The first 10ms "H" of DATA indicates the status of serial data. The duration of "L" period determines each data, which is "0" with 5ms duration and "1" with 10ms. The 5ms "H" periods indicate the separation between data. BUSY rises at the same time or before the starts of DATA, and falls at the same time or after the stop of DATA. BUSY is provided to prevent collision of DATA outputs from different units, and serial data can be output only while BUSY = "L". If BUSY = "H", data is output only after it has become "L".



GE-910/GE-810 Power Failure (PCE) Reset Signal Timing Chart

① With "A set", "B set" and "A L or R set", a set is not output if there is no corresponding change in the selector contents. The "A L or R set" is always output when A is set. **(With GE-910)**

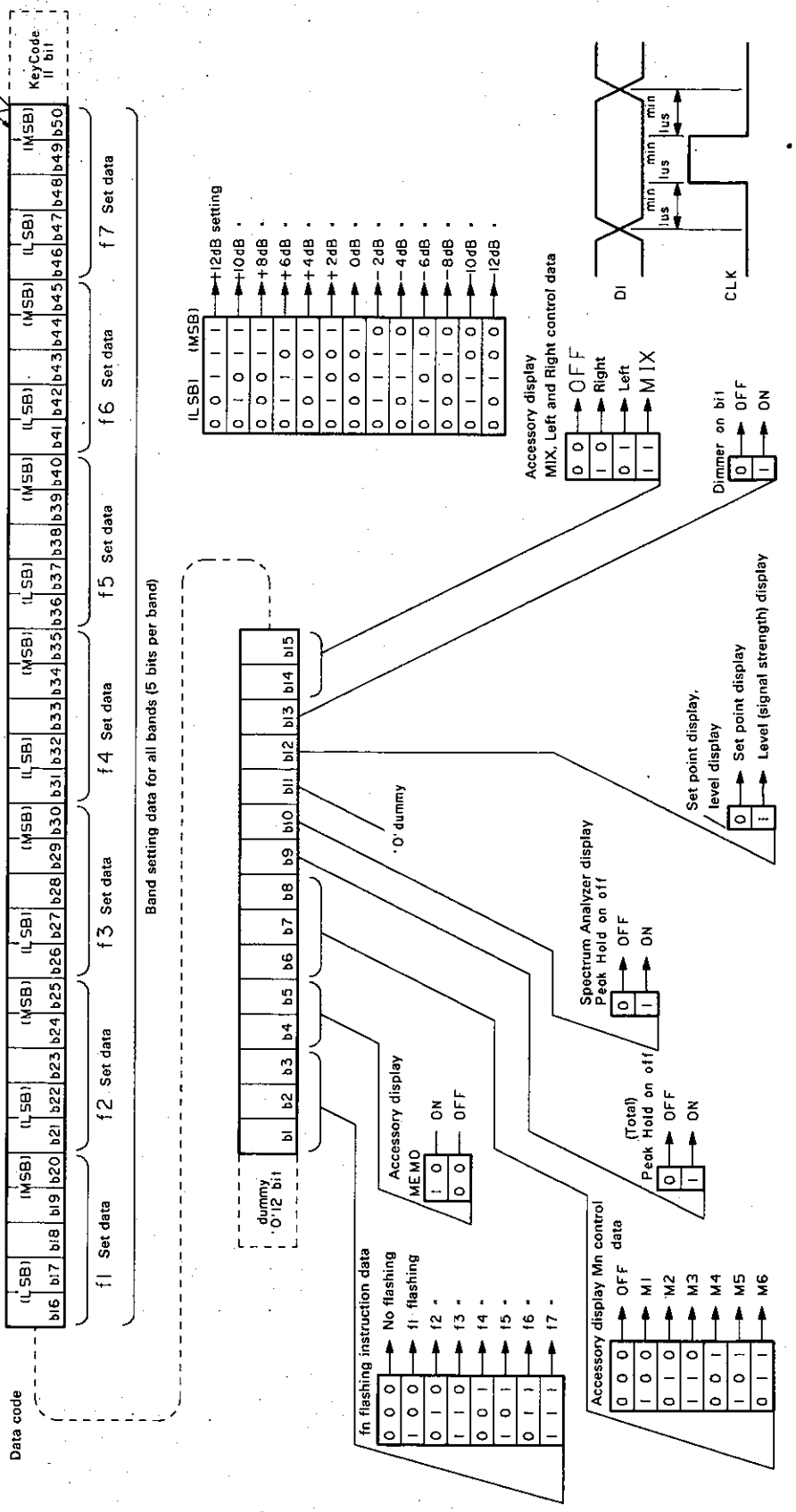
② With the **GE-810**, only the "A set" is output while the "B set" and "A L or R set" are not output.



TC9162 (Selector IC) Control Signal Timing Chart

CIRCUIT DESCRIPTION

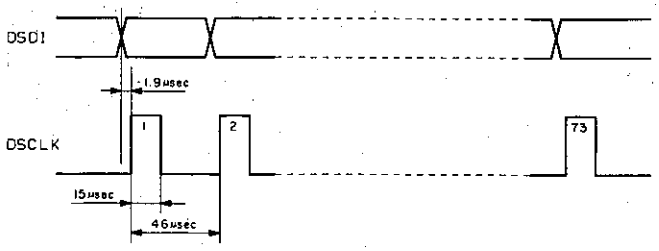
● **Data codes (LC7565)**



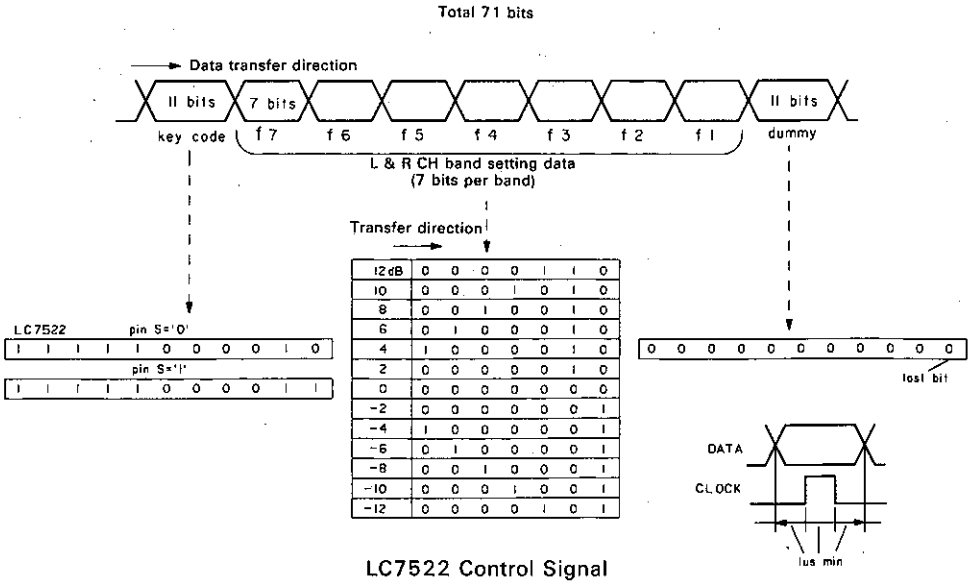
LC7565 Control Signal

CIRCUIT DESCRIPTION

● Timing chart (LC7565)



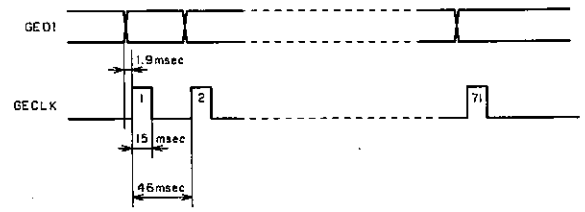
● Data code (LC7522)



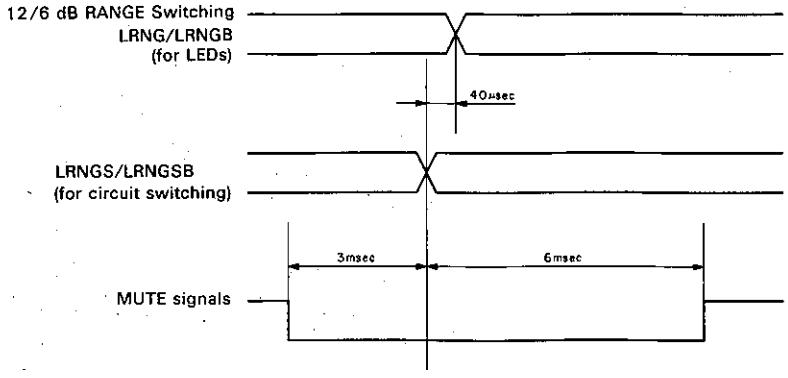
12dB	0	0	0	0	1	1	0
10	0	0	0	1	0	1	0
8	0	0	1	0	0	1	0
6	0	1	0	0	0	1	0
4	1	0	0	0	0	1	0
2	0	0	0	0	0	1	0
0	0	0	0	0	0	0	0
-2	0	0	0	0	0	0	1
-4	1	0	0	0	0	0	1
-6	0	1	0	0	0	0	1
-8	0	0	1	0	0	0	1
-10	0	0	0	1	0	0	1
-12	0	0	0	0	1	0	1

LC7522 Control Signal

● Timing chart (LC7522)



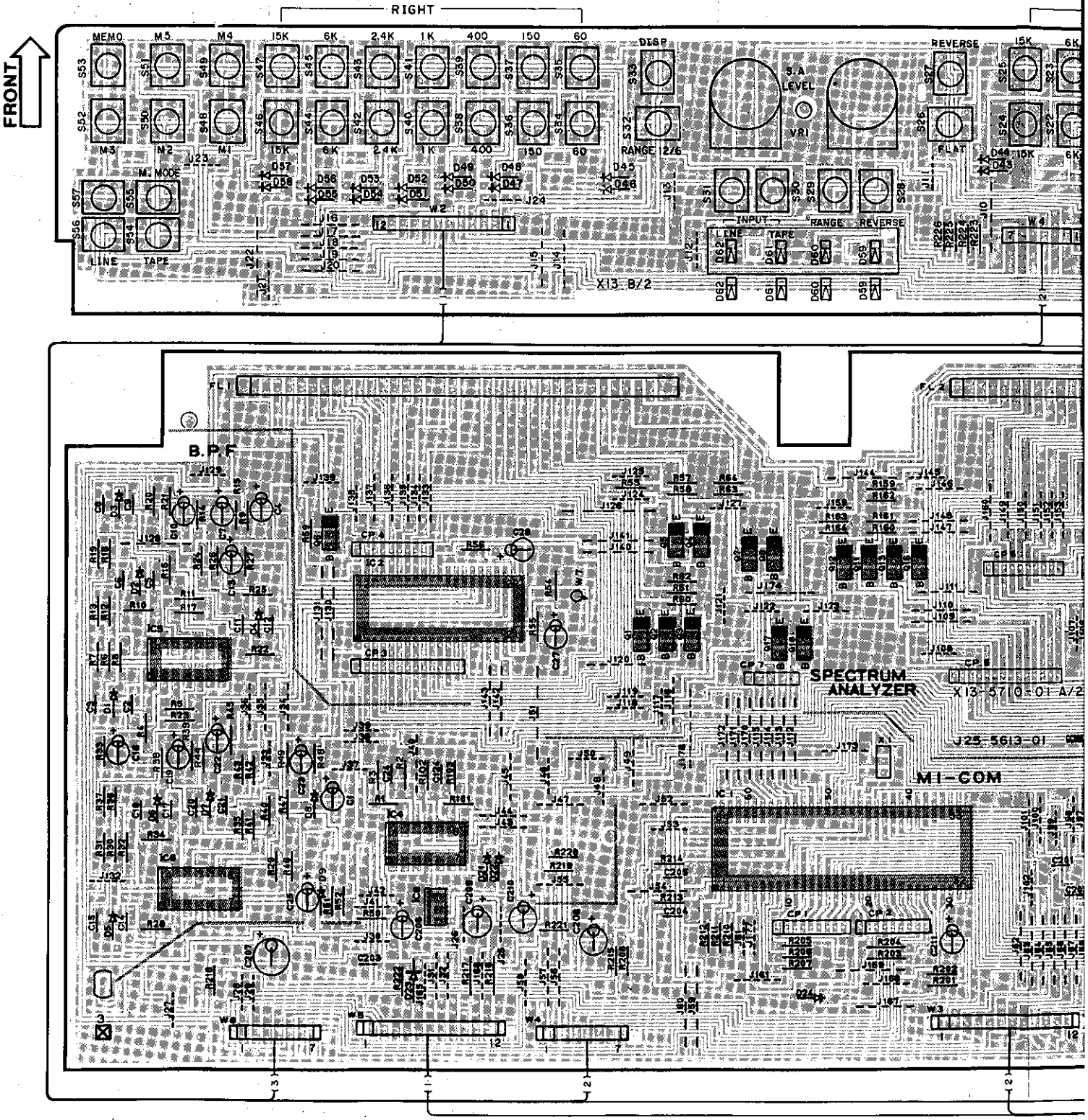
● 12/6dB RANGE switching

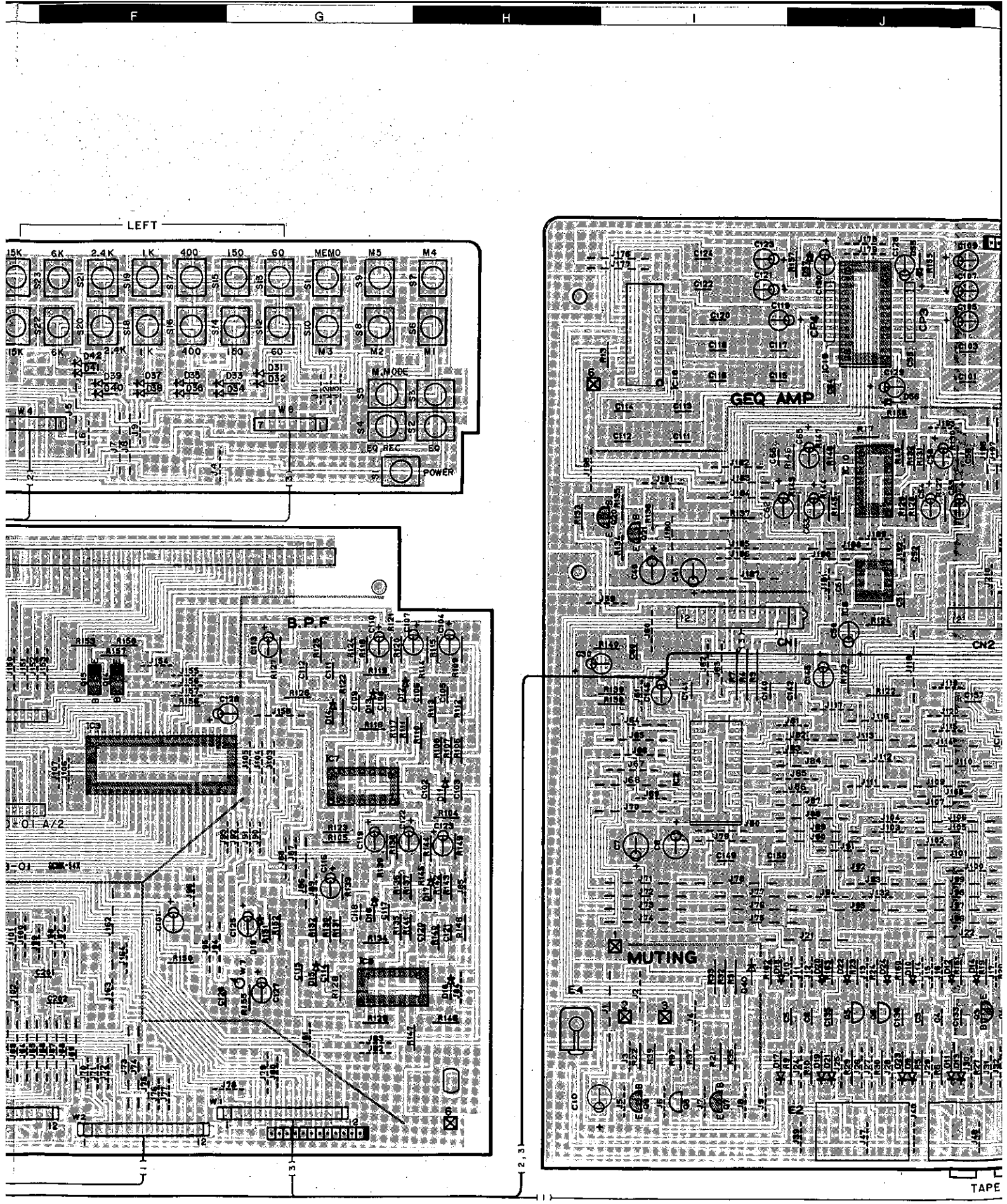


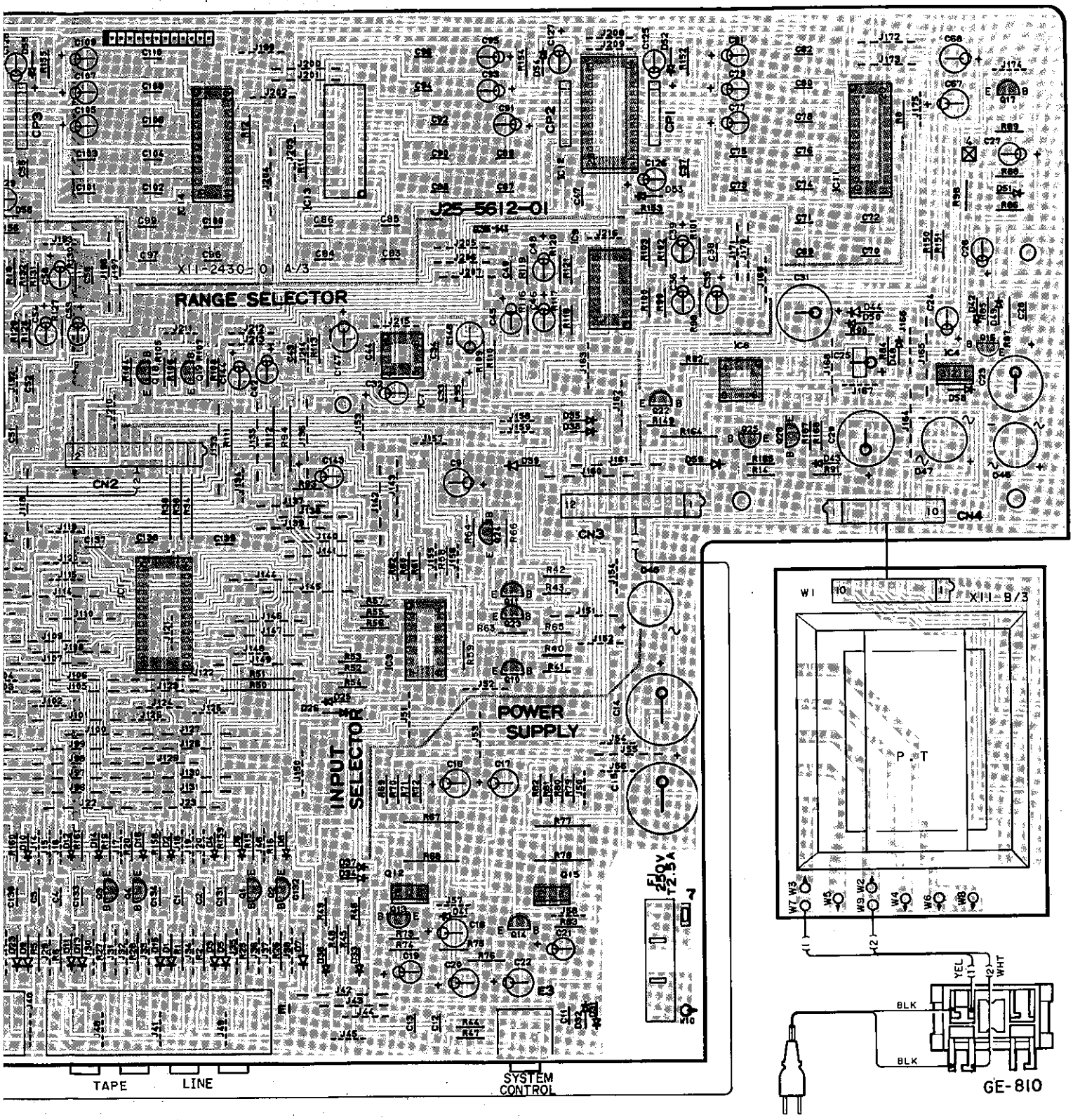
① When the POWER key is pressed, LRNG/LRNGB is turned HIGH to turn the LED OFF. However, LRNGS/LRNGSB is not switched at this time (because both EQ A and EQ B are looped through when Power is OFF).

PC BOARD

COMPONENT SIDE VIEW



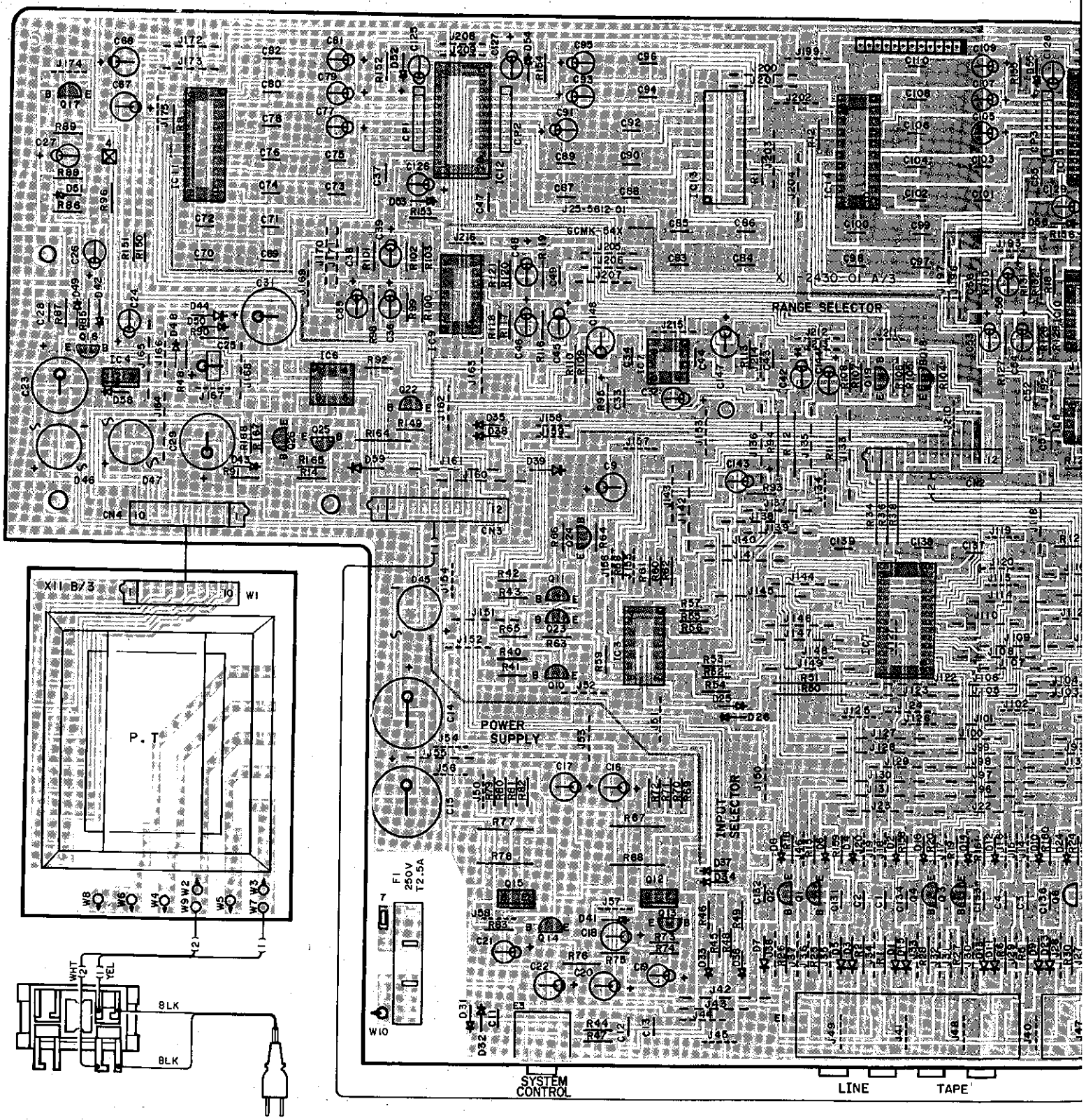

F
G
H
I
J
LEFT
15K
6K
2.4K
1K
400
150
60
MEMO
M5
M4
M3
M2
M1
M.MODE
EQ REC
EQ
POWER
B.P.F
GEQ AMP
MUTING
CN1
CN2
TAPE

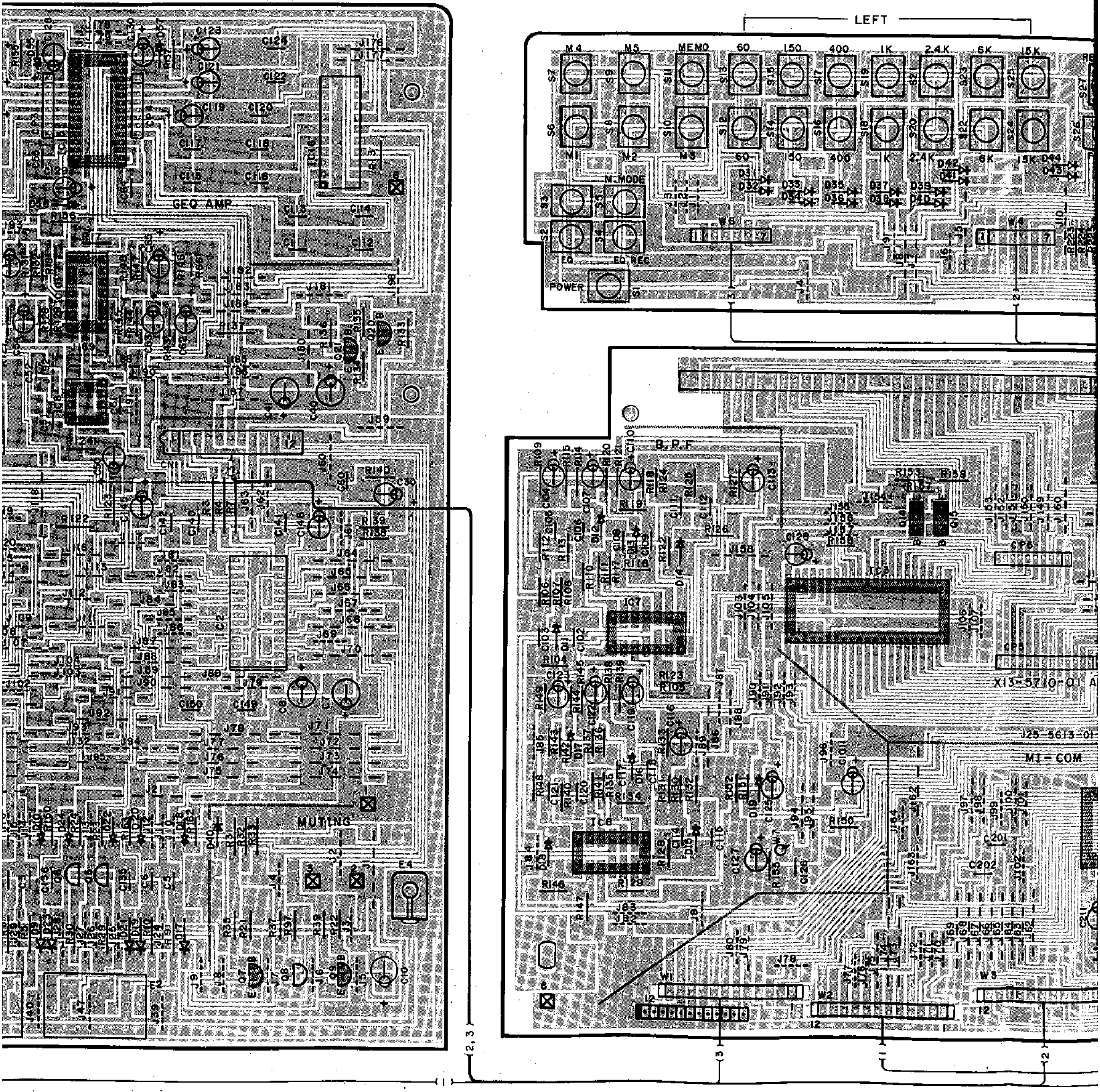


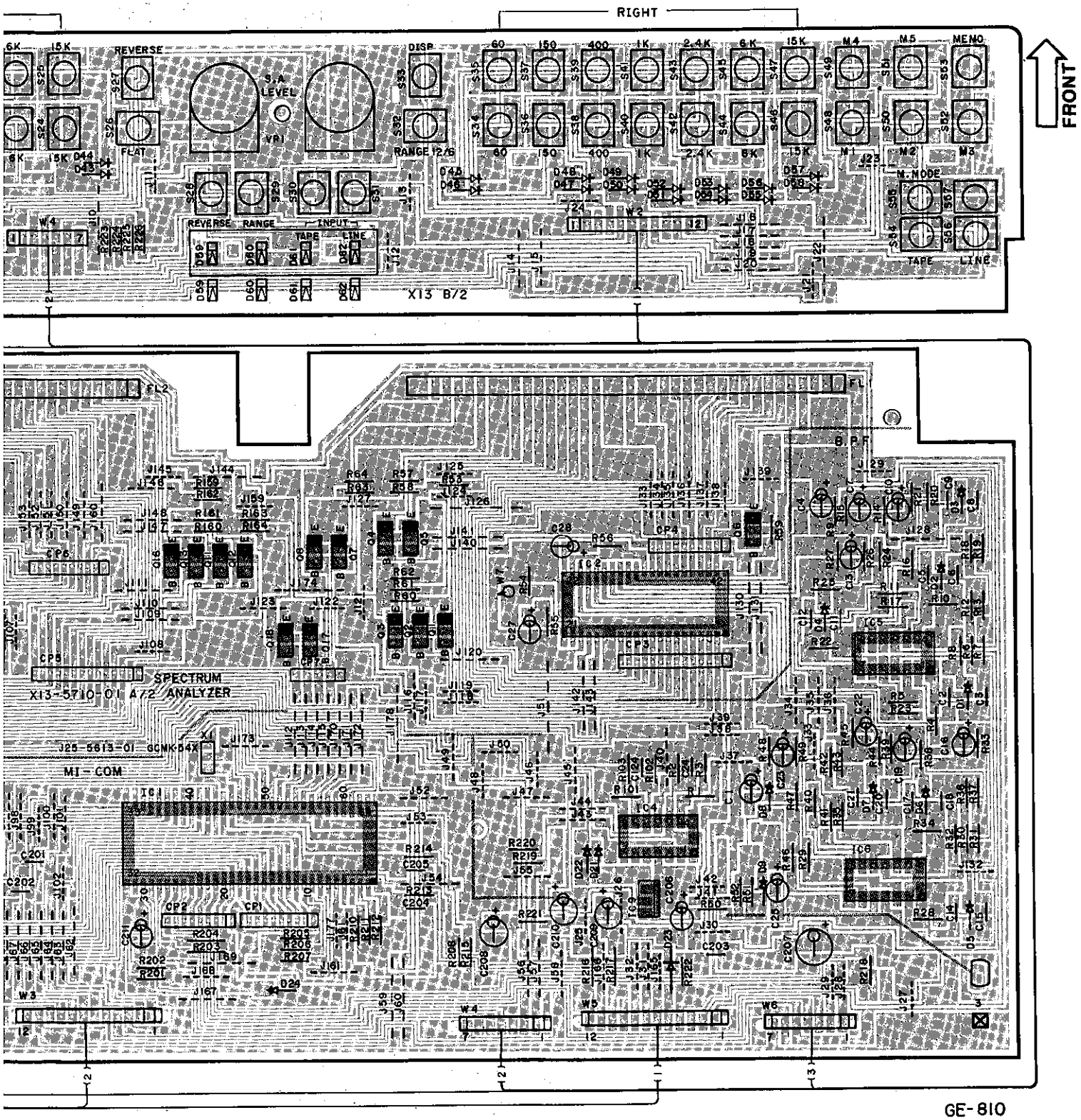
Refer to the schematic diagram for the values of resistors and capacitors.

PC BOARD

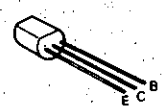
FOIL SIDE VIEW



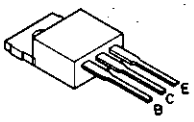

GEQ AMP
MUTING
LEFT
M4
M5
MEMO
60
150
400
1K
2.4K
6K
15K
M1
M2
M3
M.MODE
EQ
EQ REC
POWER
B.P.F
X13-5710-01
J25-5613-01
MI-COM



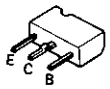
Refer to the schematic diagram for the values of resistors and capacitors.



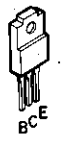
2SA1286
2SA733(A)
2SA999
2SC2320
2SC2878
2SC945(A)



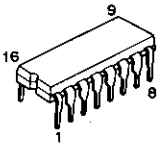
2SD1266



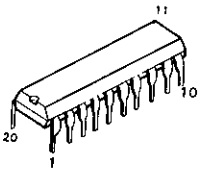
DTA114TFF
DTC114EFF



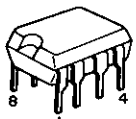
2SB941



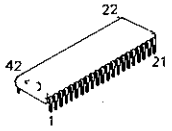
UPC4574C



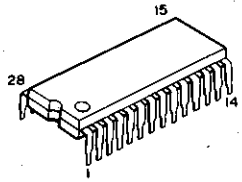
M5229P



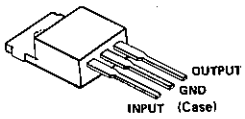
UPC4570C



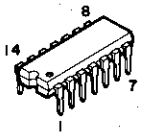
LC7565



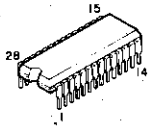
LC7522



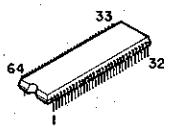
AN7805F



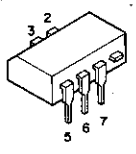
LC4966



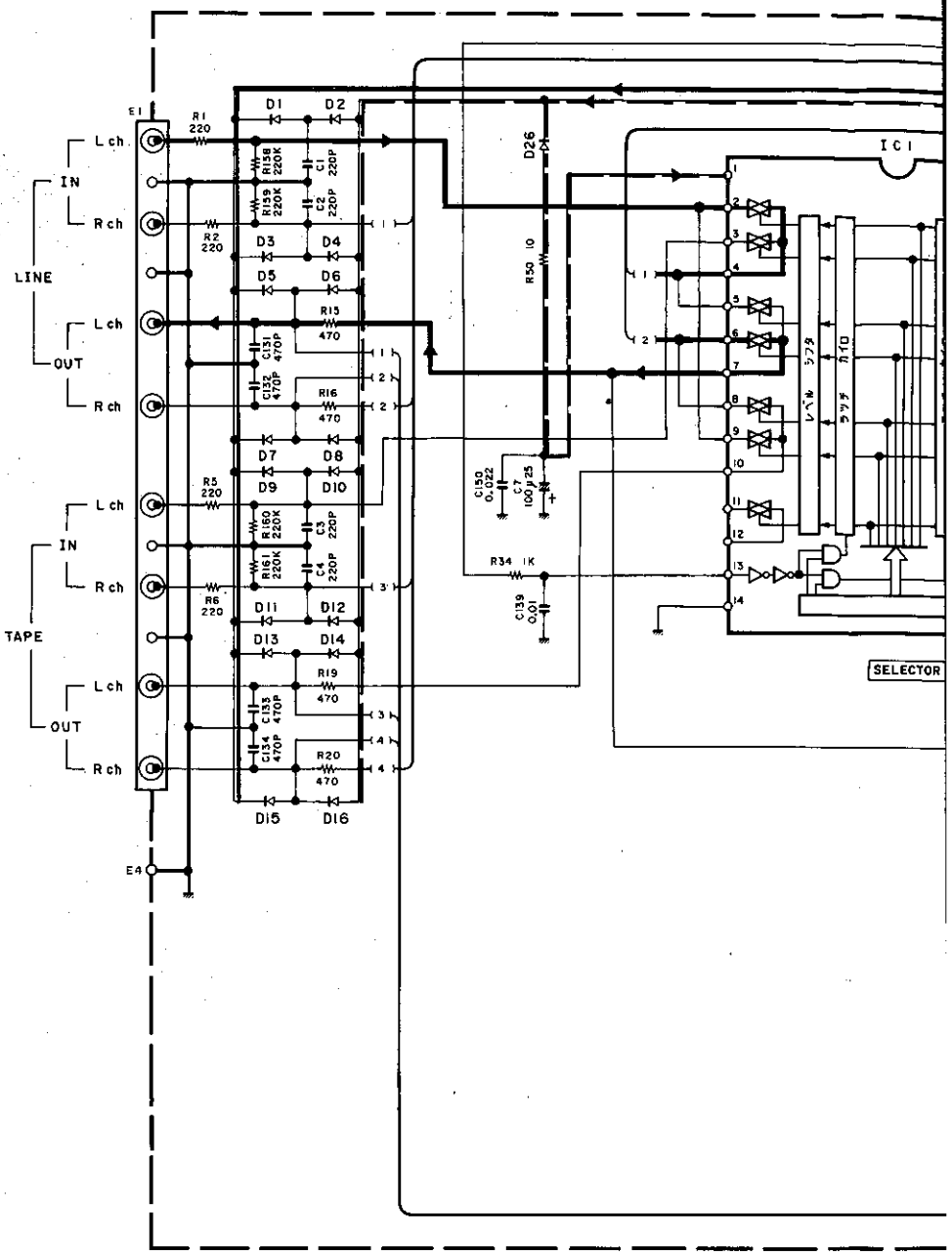
TC9162N



UPD75104CW-070

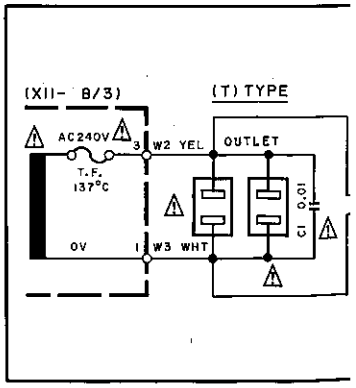


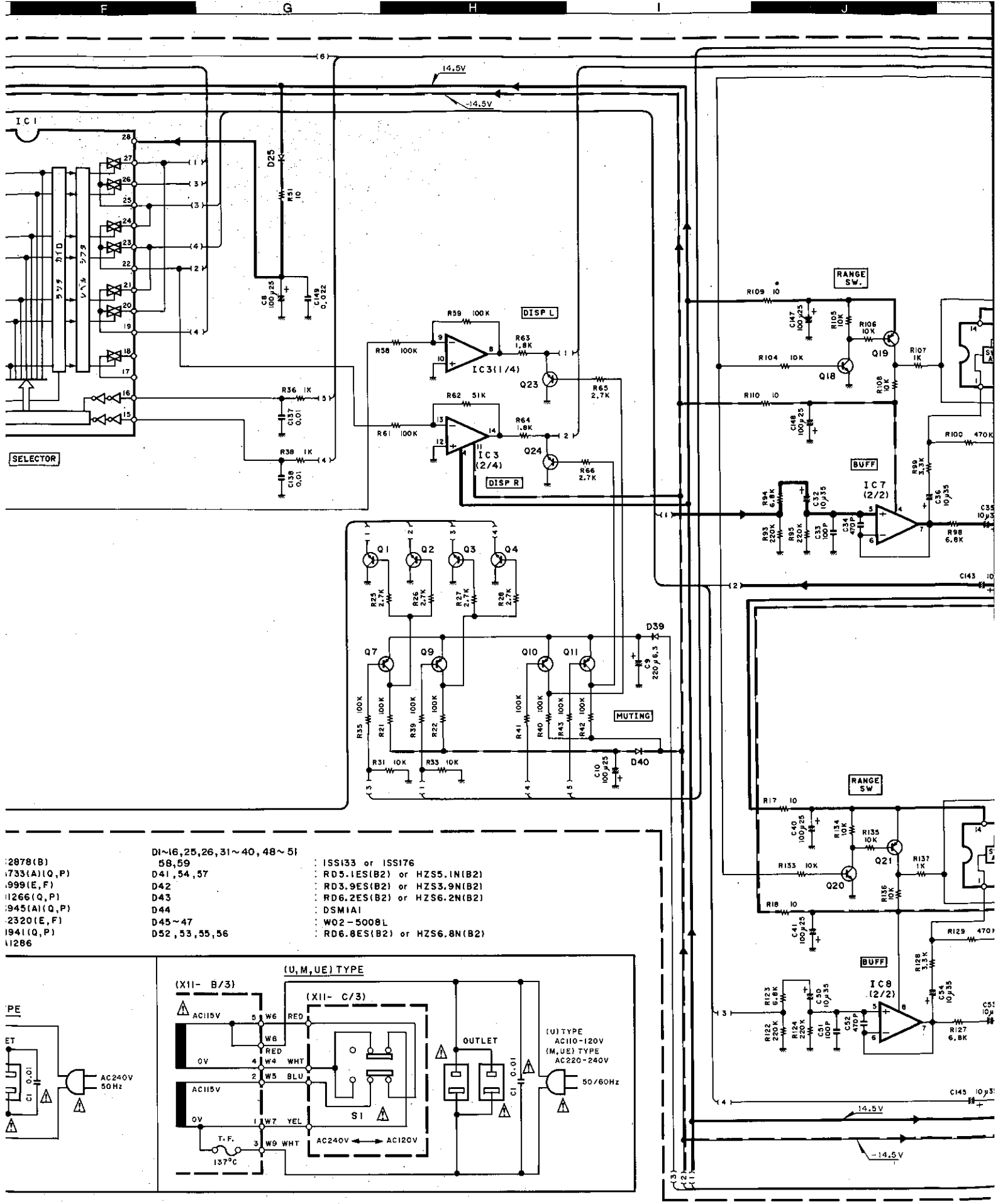
TLP3501



(X11-243X-XX)(A/3)

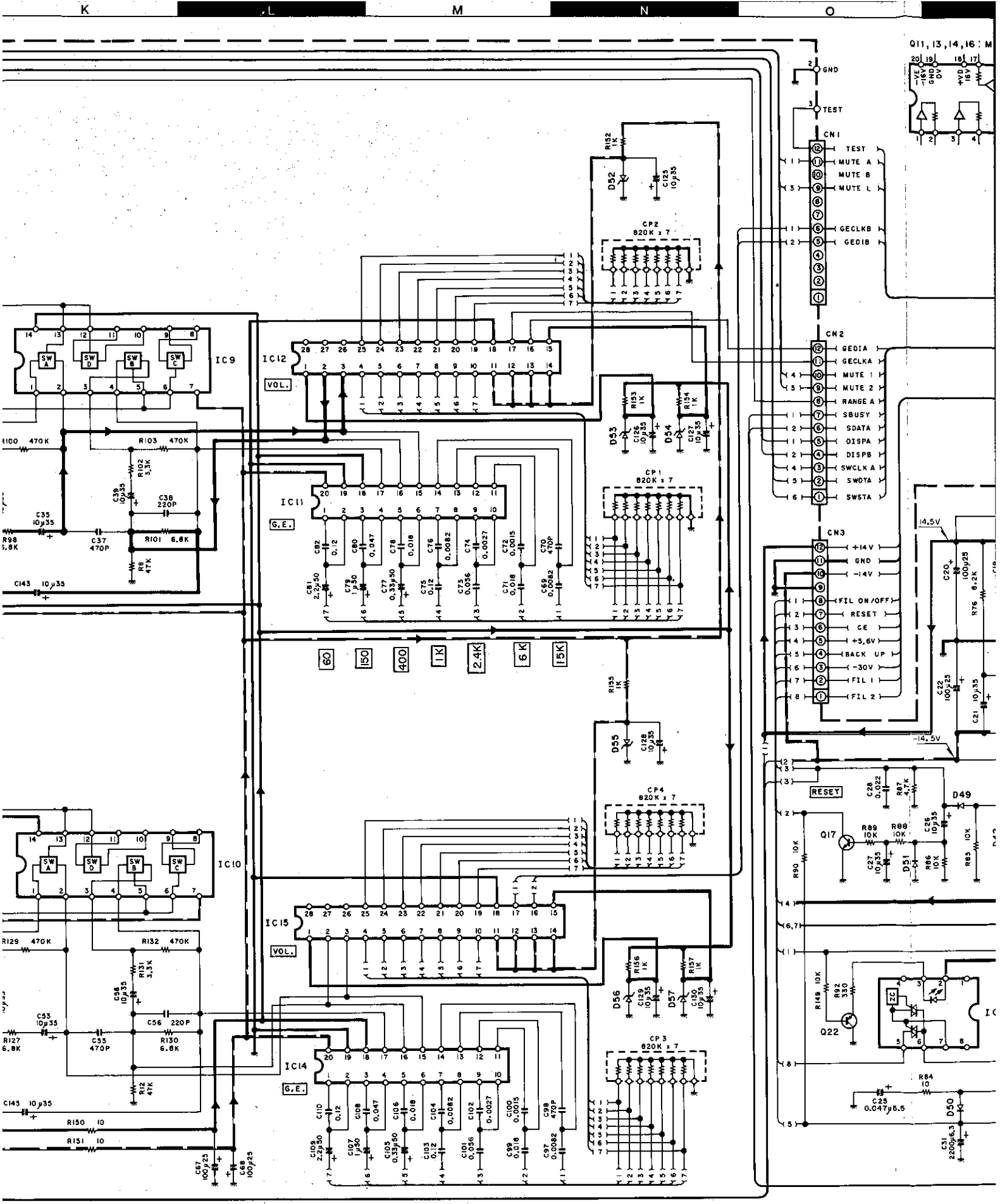
IC1	: TC9162N	Q1~4,23,24	: 2SC2878(B)
IC3	: μPC4574C	Q7,9~11,14,19,21,22,25	: 2SA733(A)(Q,
IC4	: AN7805F		or 2SA999(E,F)
IC6	: TLP3501	Q12	: 2SD1266(Q,P)
IC7,8	: μPC4570C	Q13,17,18,20,26	: 2SC945(A)(Q,
IC9,10	: LC4966		or 2SC2320(E,F)
IC11,14	: M5229P	Q15	: 2SB941(Q,P)
IC12,15	: LC7522	Q16	: 2SA1286





2878(B)	D1~16,25,26,31~40,48~51	
733(A)(Q,P)	58,59	: ISS133 or ISS176
999(E,F)	D41,54,57	: RD5.1ES(B2) or HZS5.1N(B2)
1266(Q,P)	D42	: RD3.9ES(B2) or HZS3.9N(B2)
945(A)(Q,P)	D43	: RD6.2ES(B2) or HZS6.2N(B2)
2320(E,F)	D44	: DSM1A1
941(Q,P)	D45~47	: W02-5008L
1266	D52,53,55,56	: RD6.8ES(B2) or HZS6.8N(B2)

CAUTION: For continued safety, replace sa
nents only with manufacture's recommended
list). ⚠ Indicates safety critical components.
of electric shock, leakage-current or resista
shall be carried out (exposed parts are accept
the supply circuit) before the appliance
customer.



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mended parts (refer to parts
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DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variatons between individual instruments or/and units.

Les tensions c.c. doivent êntre mesurées avec un
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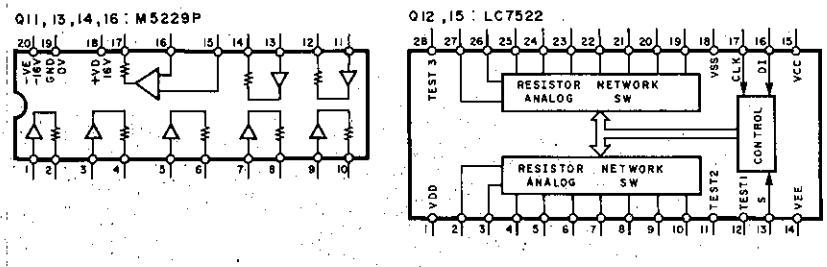
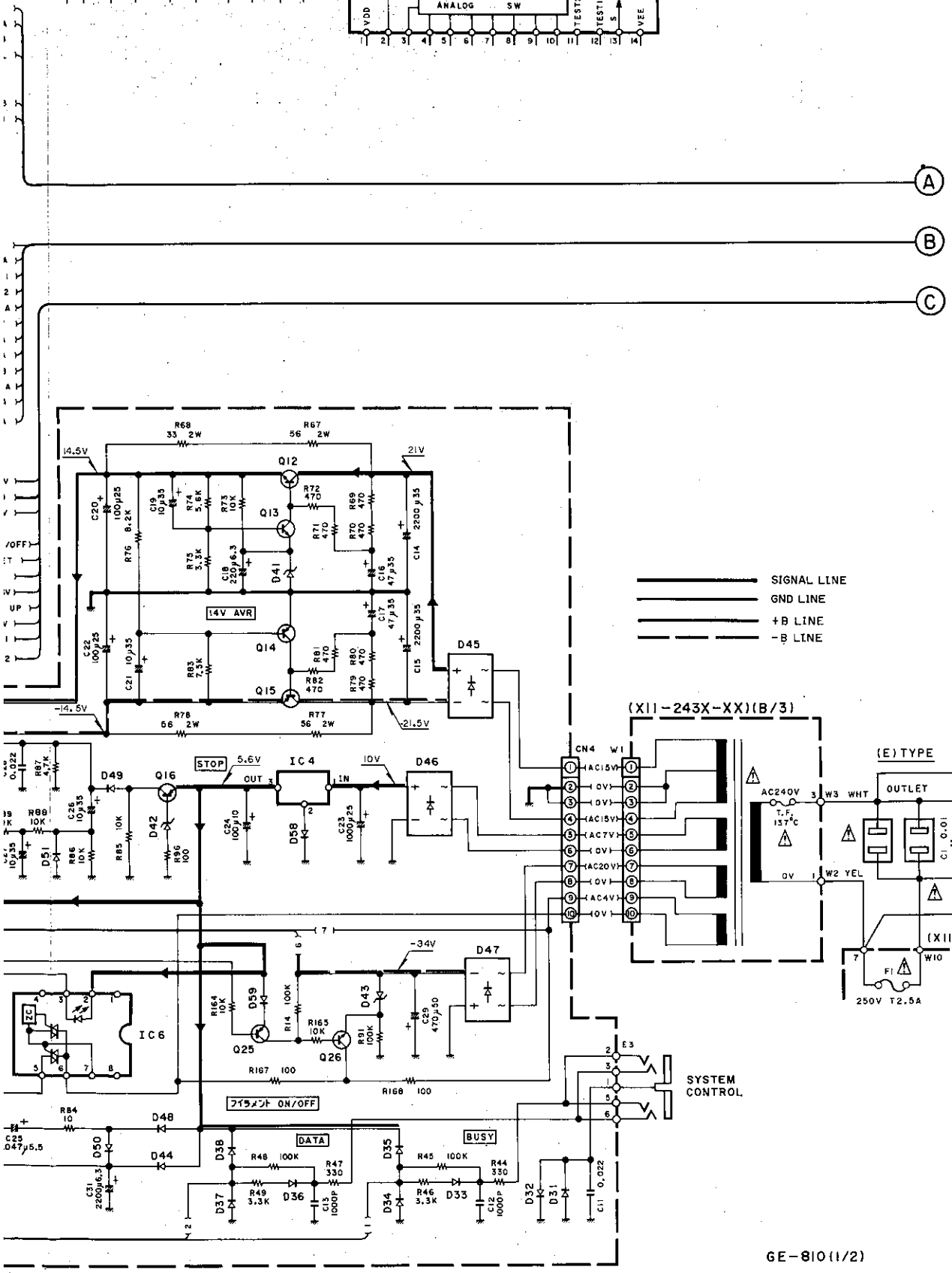
peuvent différer légèrement du fait des variatio
hérentes aux appareils et aux instruments de m
individuels.





GE-810(1/2)

tre mesurées avec un volt-
s signal d'entrée. Les valeurs
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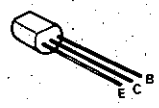
ıux instruments de mesure

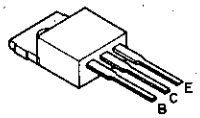
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschienden zwischen einzelnen Instrumentenoder Geräten u. U.geringfügig.

GE-810
KENWOOD

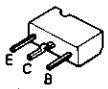
(X13-5710-01) (B/2)



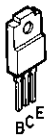
2SA1286
2SA733(A)
2SA999
2SC2320
2SC2878
2SC945(A)



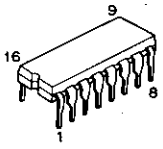
2SD1266



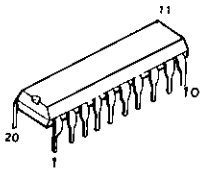
DTA114TFF
DTC114EFF



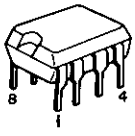
2SB941



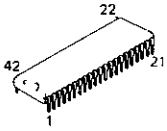
UPC4574C



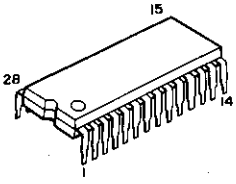
M5229P



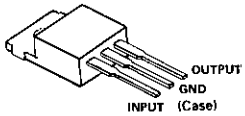
UPC4570C



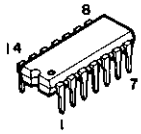
LC7565



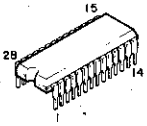
LC7522



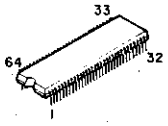
AN7805F



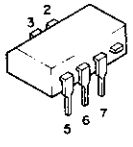
LC4966



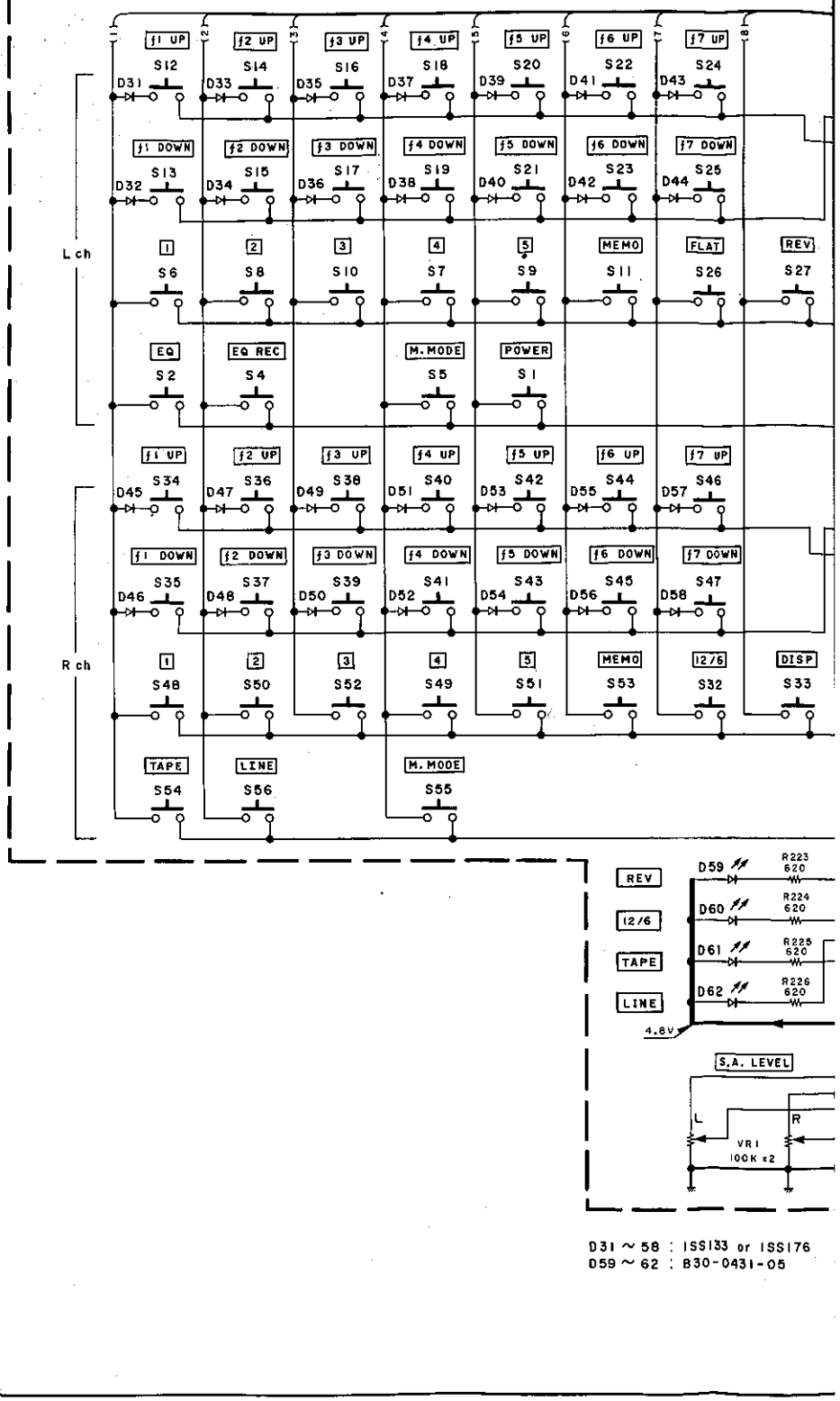
TC9162N



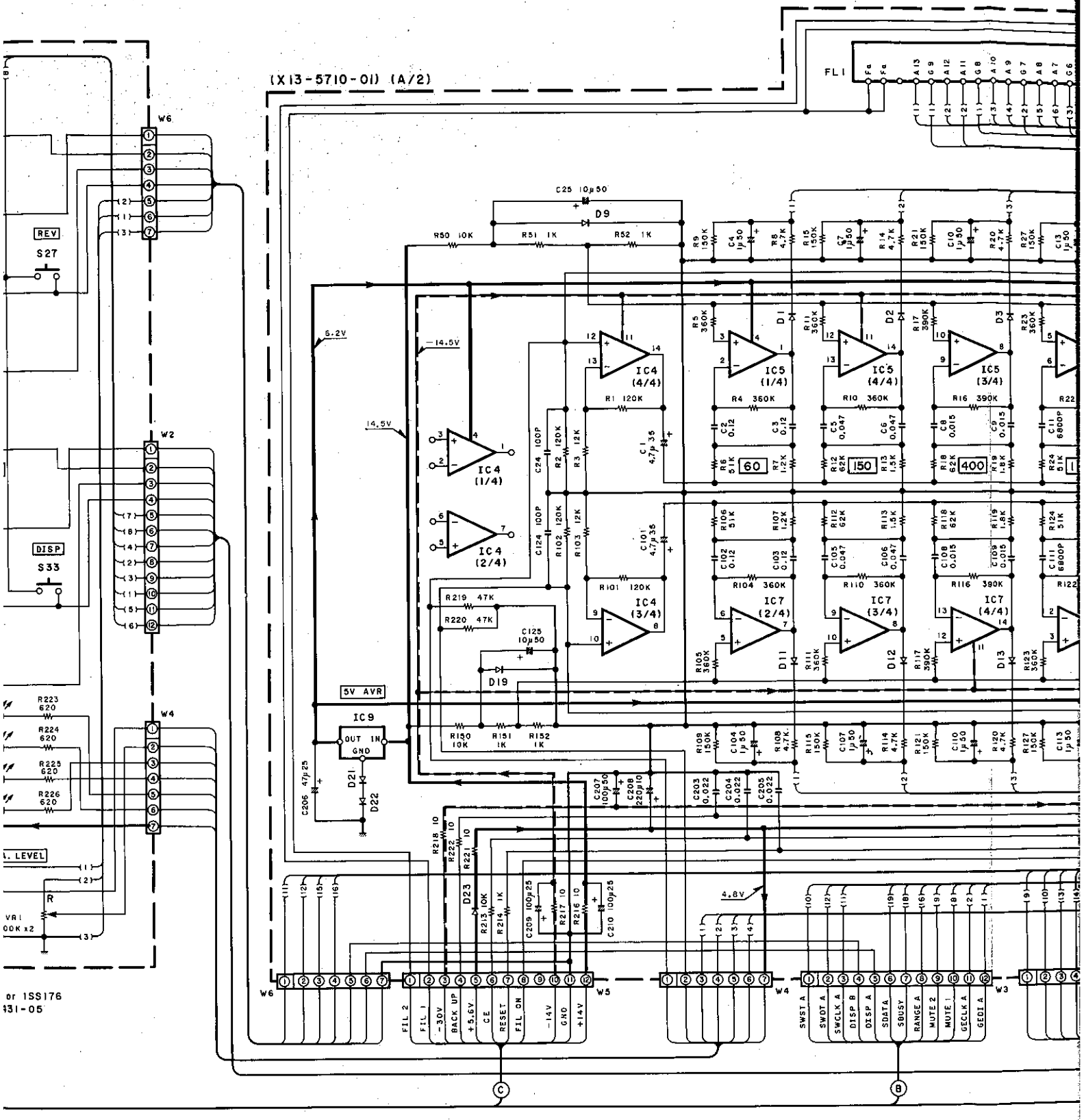
UPD75104CW-070



TLP3501



D31 ~ 58 : 1SS133 or 1SS176
D59 ~ 62 : B30-0431-05



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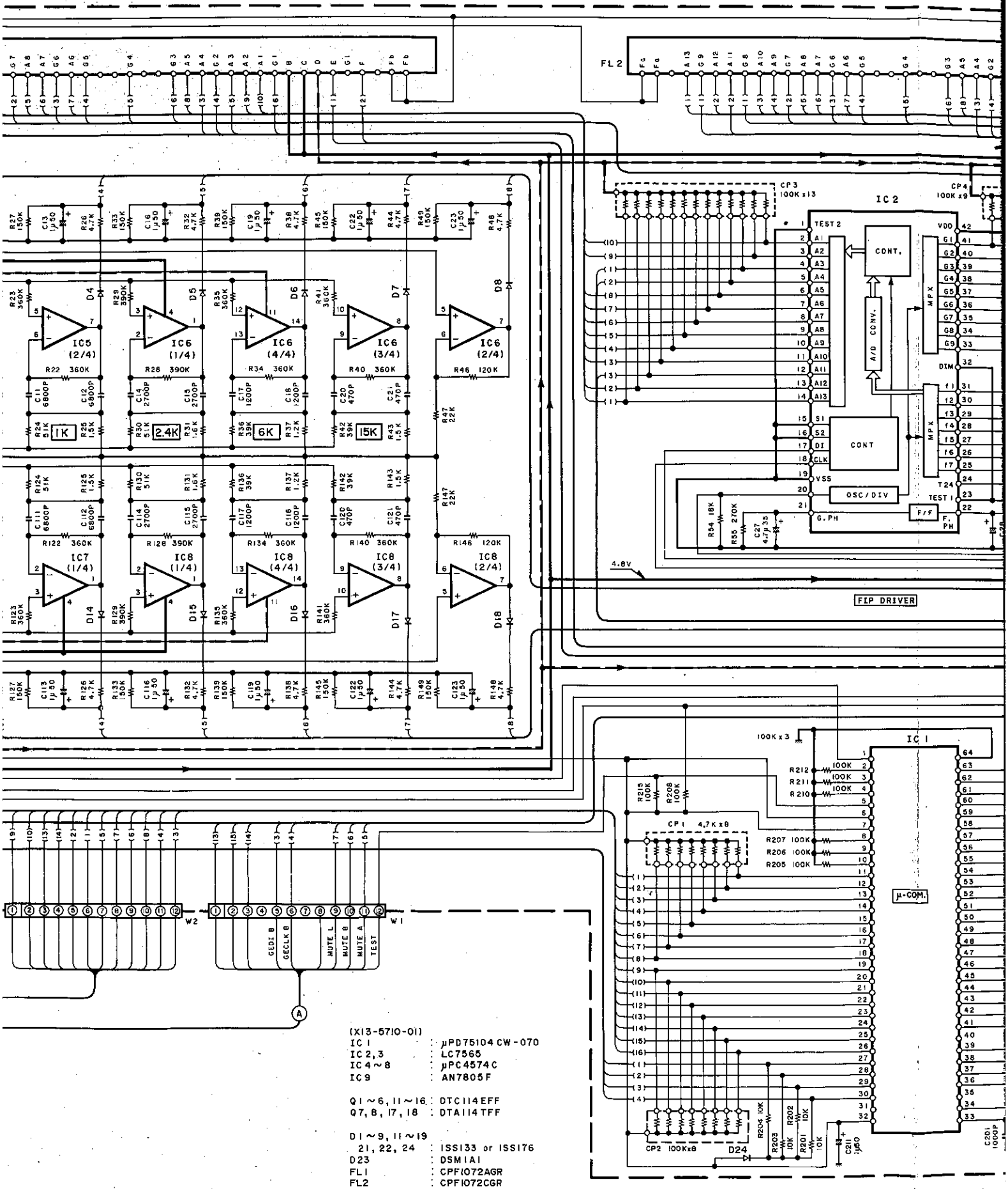
DC voltages are as voltmeter with no s due to variatons be units.

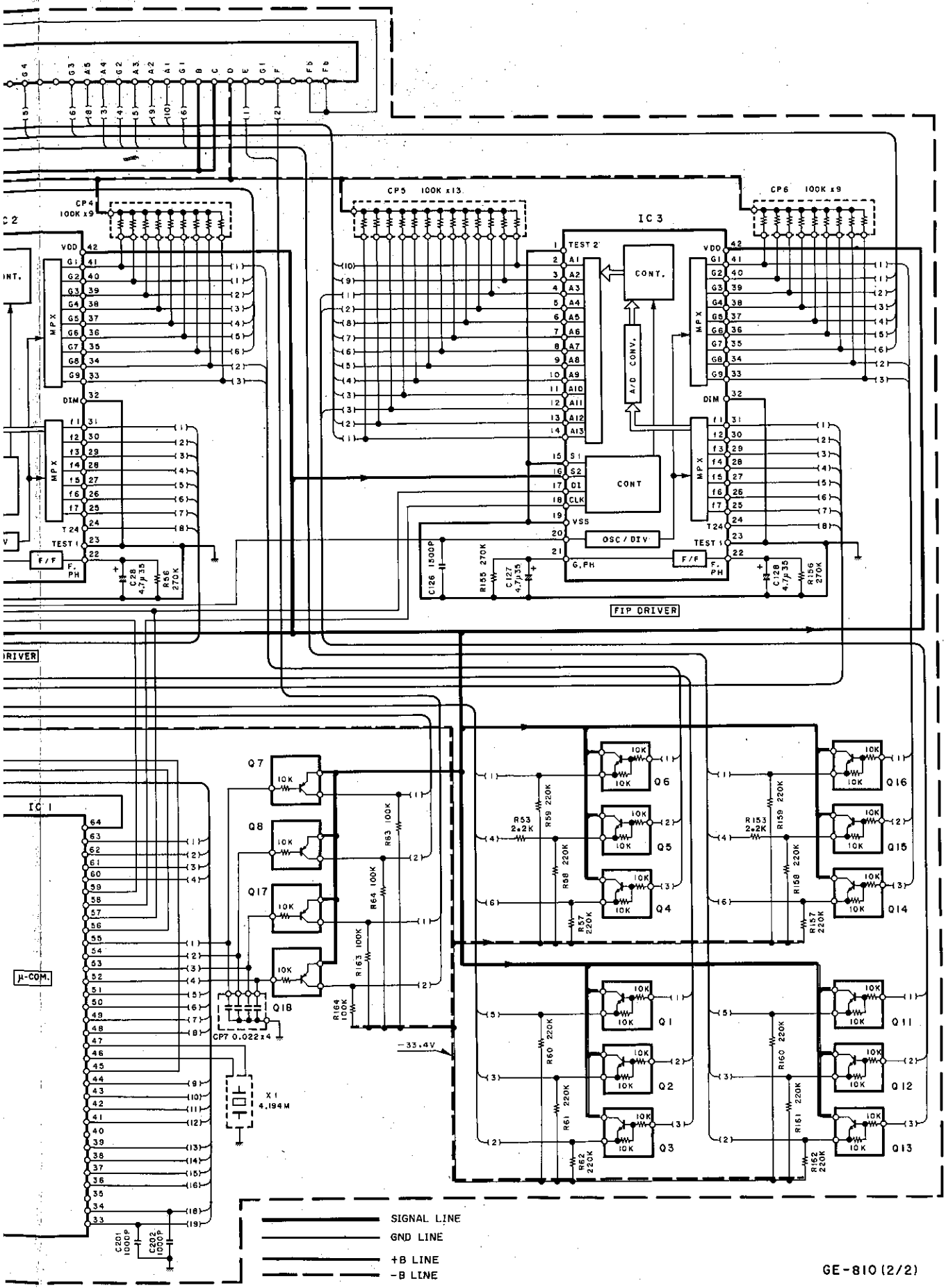


(X13-5710-01)

IC 1	: μPD75104 CW-070
IC 2,3	: LC7565
IC 4 ~ 8	: μPC4574C
IC 9	: AN7805F
Q 1 ~ 6, 11 ~ 16	: DTC114EFF
Q 7, 8, 17, 18	: DTA114TFF
D 1 ~ 9, 11 ~ 19, 21, 22, 24	: ISS133 or ISS176
D 23	: DSM1A1
FL 1	: CPF1072AGR
FL 2	: CPF1072CGR

ges are as measured with a high impedance with no signal input. Values may vary slightly riatons between individual instruments. or/and

Les tensions c.c. doivent être mesurées mètre à haute impédance sans signal d'entré peuvent différer légèrement du fait des hérentes aux appareils et aux instrument individuels.



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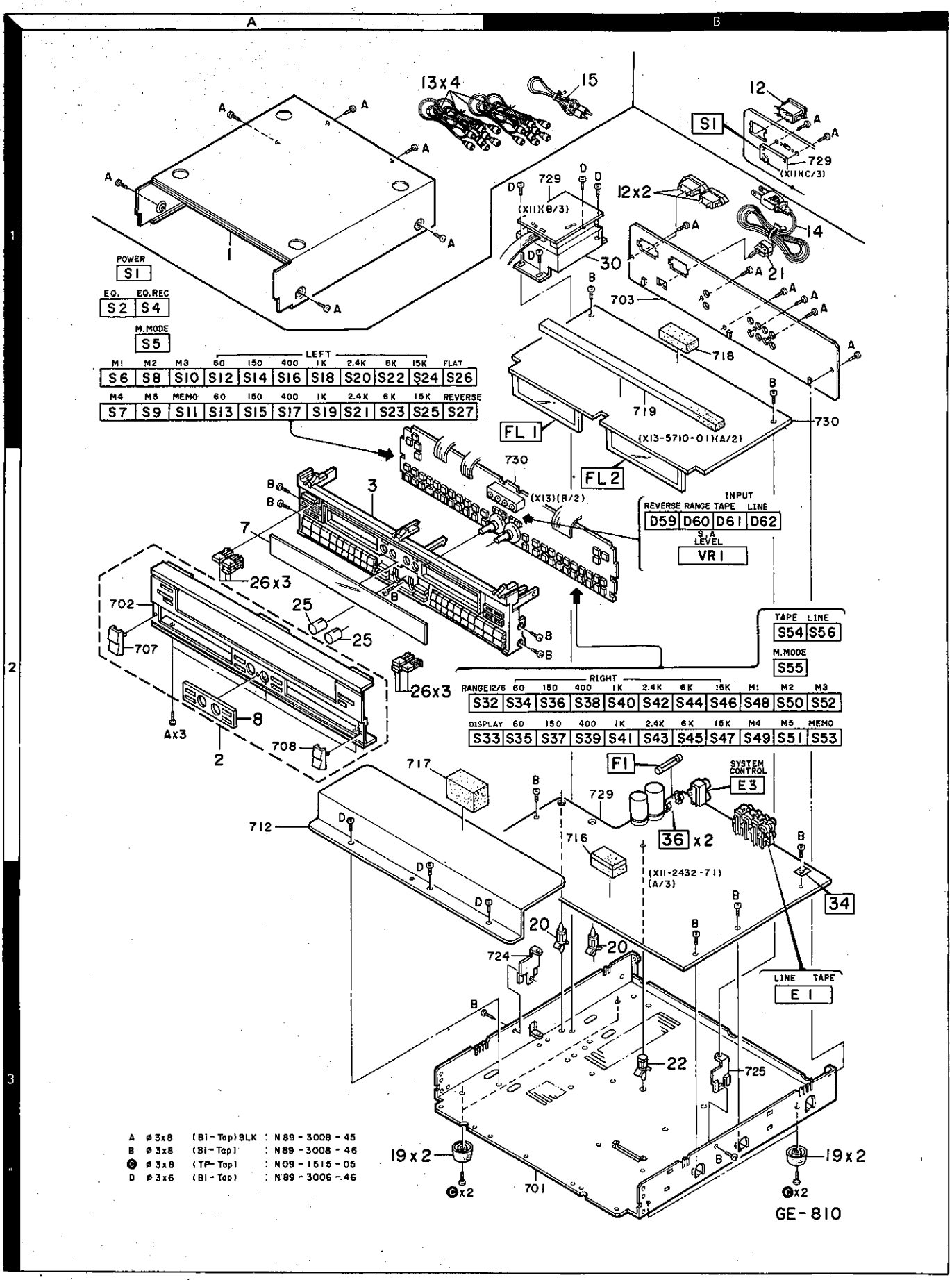
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschienden zwischen einzelnen Instrumentenoder Geräten u. U.geringfügig.

GE-810 (2/2)

GE-810

KENWOOD

EXPLODED VIEW



Parts with the exploded numbers larger than 700 are not supplied.

PARTS LIST

* New Parts
Parts without Parts No. are not supplied.
Les articles non mentionnes dans le Parts No. ne sont pas fournis.
Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
			GE-810			
1	1A	*	A01-1587-01	METALLIC CABINET		
2	2A	*	A20-5388-03	PANEL ASSY		
3	2A	*	A22-0923-02	SUB PANEL ASSY		
7	2A	*	B03-2368-03	DRESSING PLATE		
8	2A	*	B07-1763-04	ESCUTCHEON (S.A LEVEL)		
-			B46-0094-03	WARRANTY CARD	UUE	
-			B46-0095-03	WARRANTY CARD	UUE	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0143-03	WARRANTY CARD	T	
-		*	B50-8507-00	INSTRUCTION MANUAL(ENGLISH)		
-		*	B50-8508-00	INSTRUCTION MANUAL(FRENCH)	ME	
-		*	B50-8509-00	INSTRUCTION MANUAL(SPANISH)	M	
-		*	B50-8510-00	INSTRUCTION MANUAL(G,D,I)	E	
-			B58-0223-04	CAUTION CARD (PRE-SET 120V)	U	
-			B58-0513-04	CAUTION CARD (PRESET220-240)	UE	
-			B58-0803-03	CAUTION CARD	E	
-			B59-0092-00	SERVICE DIRECTORY	UUE	
C1			C91-0023-05	CERAMIC 0.01UF AC250V	UMUE	
C1			C91-0647-05	CERAMIC 0.01UF P	TE	
12	1B		E03-0055-05	AC OUTLET	E	
12	1B		E03-0072-05	AC OUTLET	UMUE	
12	1B		E03-0085-05	AC OUTLET	T	
13	1A		E30-0615-05	AUDIO CORD		
14	1B		E30-0459-05	AC POWER CORD	E	
14	1B		E30-0812-05	AC POWER CORD	UMUE	
14	1B		E30-1416-05	AC POWER CORD	T	
15	1B		E30-1392-05	CORD WITH PLUG		
-		*	H01-7657-04	ITEM CARTON CASE		
-		*	H10-3479-02	POLYSTYRENE FOAMED FIXTURE		
-			H25-0223-04	PROTECTION BAG (750X350X0.03)		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)		
19	3A,3B		J02-0170-04	FOOT		
20	3B		J19-0514-05	UNIT HOLDER		
21	1B		J42-0083-05	POWER CORD BUSHING		
22	3B		J19-2598-05	HOLDER		
-			J61-0307-05	WIRE BAND	UMUE	
25	2A	*	K29-2758-04	KNOB (S.A LEVEL)		
26	2A	*	K29-2759-04	KNOB (BUTTON) REC,LINE,M.MODE		
30	1B	*	L01-4692-05	POWER TRANSFORMER	T	
30	1B	*	L01-4695-05	POWER TRANSFORMER	UMUE	
30	1B	*	L01-4697-05	POWER TRANSFORMER	E	
C	3A,3B		N09-1515-05	TAPPING SCREW (Ø3X8) FOOT		
			CONTROL UNIT (X11-243X-XX; 0-82: U, M, UE, 0-52: T, 2-71: E)			
C1 -4			CC45FSL1H221J	CERAMIC 220PF J		
C7 ,8			CE04KW1E101M	ELECTRO 100UF 25WV		
C9			CE04KW0J221M	ELECTRO 220UF 6.3WV		
C10			CE04KW1E101M	ELECTRO 100UF 25WV		
C11			CK45FF1H223Z	CERAMIC 0.022UF Z		
C12 ,13			CK45FB1H102K	CERAMIC 1000PF K		
C14 ,15			CE04KW1V222M	ELECTRO 2200UF 35WV		

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C16 ,17			CE04KW1V470M	ELECTRO	47UF	35WV		
C18			CE04KW0J221M	ELECTRO	220UF	6.3WV		
C19			CE04KW1V100M	ELECTRO	10UF	35WV	•	
C20			CE04KW1E101M	ELECTRO	100UF	25WV		
C21			CE04KW1V100M	ELECTRO	10UF	35WV		
C22			CE04KW1E101M	ELECTRO	100UF	25WV		
C23			CE04KW1E102M	ELECTRO	1000UF	25WV		
C24			CE04KW1A101M	ELECTRO	100UF	10WV		
C25			C91-0928-05	BACKUP C	0.047UF	5.5WV		
C26 ,27			CE04KW1V100M	ELECTRO	10UF	35WV		
C28			CK45FF1H223Z	CERAMIC	0.022UF	Z		
C29			CE04KW1H471M	ELECTRO	470UF	50WV		
C31			CE04KW0J222M	ELECTRO	2200UF	6.3WV		
C32			CE04KW1V100M	ELECTRO	10UF	35WV		
C33			CC45FSL1H101J	CERAMIC	100PF	J		
C34			CK45FB1H471K	CERAMIC	470PF	K		
C35 ,36			CE04KW1V100M	ELECTRO	10UF	35WV		
C37			CK45FB1H471K	CERAMIC	470PF	K		
C38			CC45FSL1H221J	CERAMIC	220PF	J		
C39			CE04KW1V100M	ELECTRO	10UF	35WV		
C40 ,41			CE04KW1E101M	ELECTRO	100UF	25WV		
C50			CE04KW1V100M	ELECTRO	10UF	35WV		
C51			CC45FSL1H101J	CERAMIC	100PF	J		
C52			CK45FB1H471K	CERAMIC	470PF	K		
C53 ,54			CE04KW1V100M	ELECTRO	10UF	35WV		
C55			CK45FB1H471K	CERAMIC	470PF	K		
C56			CC45FSL1H221J	CERAMIC	220PF	J		
C58			CE04KW1V100M	ELECTRO	10UF	35WV		
C67 ,68			CE04KW1E101M	ELECTRO	100UF	25WV		
C69			CF92FV1H822J	MF	8200PF	J		
C70			CK45FB1H471K	CERAMIC	470PF	K		
C71			CF92FV1H183J	MF	0.018UF	J		
C72			CF92FV1H152J	MF	1500PF	J		
C73			CF92FV1H563J	MF	0.056UF	J		
C74			CF92FV1H272J	MF	2700PF	J		
C75			CF92FV1H124J	MF	0.12UF	J		
C76			CF92FV1H822J	MF	8200PF	J		
C77			CE04KW1HR33M	ELECTRO	0.33UF	50WV		
C78			CF92FV1H183J	MF	0.018UF	J		
C79			CE04KW1H010M	ELECTRO	1.0UF	50WV		
C80			CF92FV1H473J	MF	0.047UF	J		
C81			CE04KW1H2R2M	ELECTRO	2.2UF	50WV		
C82			CF92FV1H124J	MF	0.12UF	J		
C97			CF92FV1H822J	MF	8200PF	J		
C98			CK45FB1H471K	CERAMIC	470PF	K		
C99			CF92FV1H183J	MF	0.018UF	J		
C100			CF92FV1H152J	MF	1500PF	J		
C101			CF92FV1H563J	MF	0.056UF	J		
C102			CF92FV1H272J	MF	2700PF	J		
C103			CF92FV1H124J	MF	0.12UF	J		
C104			CF92FV1H822J	MF	8200PF	J		
C105			CE04KW1HR33M	ELECTRO	0.33UF	50WV		
C106			CF92FV1H183J	MF	0.018UF	J		
C107			CE04KW1H010M	ELECTRO	1.0UF	50WV		
C108			CF92FV1H473J	MF	0.047UF	J		

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C109			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C110			CF92FV1H124J	MF 0.12UF J		
C125-130			CE04KW1V100M	ELECTRO 10UF 35WV		
C131-134			CK45FB1H471K	CERAMIC 470PF K		
C137-139			CK45FF1H103Z	CERAMIC 0.010UF Z		
C143			CE04KW1V100M	ELECTRO 10UF 35WV		
C145			CE04KW1V100M	ELECTRO 10UF 35WV		
C147,148			CE04KW1E101M	ELECTRO 100UF 25WV		
C149,150			CK45FF1H223Z	CERAMIC 0.022UF Z		
34	3B		E23-0149-05	TERMINAL		
E1	3B		E13-0820-05	PHONO JACK (LINE,TAPE)		
E3	2B		E11-0165-05	MINIATURE PHONE JACK(SYS CONT)	UMUE	
E3	2B		E11-0168-05	MINIATURE PHONE JACK(SYS CONT)	TE	
F1	2B		F05-2525-05	FUSE (SEMKO) (250V T2.5A)	E	
36	2B		J13-0054-05	FUSE CLIP	E	
CP1 -4		*	R90-0491-05	MULTI-COMP 83KX7 J 1/6W		
R67			RS14KB3D560J	FL-PROOF RS 56 J 2W		
R68			RS14KB3D330J	FL-PROOF RS 33 J 2W		
R77 ,78			RS14KB3D560J	FL-PROOF RS 56 J 2W		
S1	1B		S31-2083-05	SLIDE SWITCH (POWER TYPE)	UMUE	
D1 -16			1SS133	DIODE		
D1 -16			1SS176	DIODE		
D25 ,26			1SS133	DIODE		
D25 ,26			1SS176	DIODE		
D31 -40			1SS133	DIODE		
D31 -40			1SS176	DIODE		
D41			HZS5.1N(B2)	ZENER DIODE		
D41			RD5.1ES(B2)	ZENER DIODE		
D42		*	HZS3.9N(B2)	ZENER DIODE		
D42		*	RD3.9ES(B2)	ZENER DIODE		
D43			HZS6.2N(B2)	ZENER DIODE		
D43			RD6.2ES(B2)	ZENER DIODE		
D44			DSM1A1	DIODE		
D45 -47			W02-5008L	DIODE		
D48 -51			1SS133	DIODE		
D48 -51			1SS176	DIODE		
D52 ,53			HZS6.8N(B2)	ZENER DIODE		
D52 ,53			RD6.8ES(B2)	ZENER DIODE		
D54			HZS5.1N(B2)	ZENER DIODE		
D54			RD5.1ES(B2)	ZENER DIODE		
D55 ,56			HZS6.8N(B2)	ZENER DIODE		
D55 ,56			RD6.8ES(B2)	ZENER DIODE		
D57			HZS5.1N(B2)	ZENER DIODE		
D57			RD5.1ES(B2)	ZENER DIODE		
D58 ,59			1SS133	DIODE		
D58 ,59			1SS176	DIODE		
IC1			TC9162N	IC(ANALOG SWITCH ARRAY)		
IC3			UPC4574C	IC(OP AMP X4)		
IC4			AN7805F	IC(VOLTAGE REGULATOR/ +15V)		
IC6		*	TLP3501	IC(PHOTO TRIAC +LED)		
IC7 ,8			UPC4570C	IC(OP AMP X2)		
IC9 ,10			LC4966	IC(CMOS LOGIC BILATERAL SW)		

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IC11			M5229P	IC(7CH GRAPHIC EQUALIZER)		
IC12			LC7522	IC(7CH GRAPHIC EQUALIZER)		
IC14			M5229P	IC(7CH GRAPHIC EQUALIZER)	•	
IC15			LC7522	IC(7CH GRAPHIC EQUALIZER)		
Q1 -4			2SC2878(B)	TRANSISTOR		
Q7			2SA733(A)(Q,P)	TRANSISTOR		
Q7			2SA999(E,F)	TRANSISTOR		
Q9 -11			2SA733(A)(Q,P)	TRANSISTOR		
Q9 -11			2SA999(E,F)	TRANSISTOR		
Q12			2SD1266(Q,P)	TRANSISTOR		
Q13			2SC2320(E,F)	TRANSISTOR		
Q13			2SC945(A)(Q,P)	TRANSISTOR		
Q14			2SA733(A)(Q,P)	TRANSISTOR		
Q14			2SA999(E,F)	TRANSISTOR		
Q15			2SB941(Q,P)	TRANSISTOR		
Q16			2SA1286	TRANSISTOR		
Q17 ,18			2SC2320(E,F)	TRANSISTOR		
Q17 ,18			2SC945(A)(Q,P)	TRANSISTOR		
Q19			2SA733(A)(Q,P)	TRANSISTOR		
Q19			2SA999(E,F)	TRANSISTOR		
Q20			2SC2320(E,F)	TRANSISTOR		
Q20			2SC945(A)(Q,P)	TRANSISTOR		
Q21 ,22			2SA733(A)(Q,P)	TRANSISTOR		
Q21 ,22			2SA999(E,F)	TRANSISTOR		
Q23 ,24			2SC2878(B)	TRANSISTOR		
Q25			2SA733(A)(Q,P)	TRANSISTOR		
Q25			2SA999(E,F)	TRANSISTOR		
Q26			2SC2320(E,F)	TRANSISTOR		
Q26			2SC945(A)(Q,P)	TRANSISTOR		
SWITCH UNIT (X13-5710-01)						
D59 -62	2B		B30-0431-05	LED(LN21CPH)RVS,RANGE,INPUT		
C1			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C2 ,3			CF92FV1H124J	MF 0.12UF J		
C4			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C5 ,6			CF92FV1H473J	MF 0.047UF J		
C7			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C8 ,9			CF92FV1H153J	MF 0.015UF J		
C10			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C11 ,12			CF92FV1H682J	MF 6800PF J		
C13			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C14 ,15			CF92FV1H272J	MF 2700PF J		
C16			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C17 ,18			CF92FV1H122J	MF 1200PF J		
C19			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C20 ,21			CK45FB1H471K	CERAMIC 470PF K		
C22 ,23			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C24			CC45FSL1H101J	CERAMIC 100PF J		
C25			CE04KW1H100M	ELECTRO 10UF 50WV		
C27 ,28			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C101			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C102,103			CF92FV1H124J	MF 0.12UF J		
C104			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C105,106			CF92FV1H473J	MF 0.047UF J		
C107			CE04KW1H010M	ELECTRO 1.0UF 50WV		

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C108,109			CF92FV1H153J	MF 0.015UF J		
C110			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C111,112			CF92FV1H682J	MF 6800PF J		
C113			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C114,115			CF92FV1H272J	MF 2700PF J		
C116			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C117,118			CF92FV1H122J	MF 1200PF J		
C119			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C120,121			CK45FB1H471K	CERAMIC 470PF K		
C122,123			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C124			CC45FSL1H101J	CERAMIC 100PF J		
C125			CE04KW1H100M	ELECTRO 10UF 50WV		
C126			CF92FV1H152J	MF 1500PF J		
C127,128			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C201,202			CK45FB1H102K	CERAMIC 1000PF K		
C203-205			CK45FF1H223Z	CERAMIC 0.022UF Z		
C206			CE04KW1E470M	ELECTRO 47UF 25WV		
C207			CE04KW1H101M	ELECTRO 100UF 50WV		
C208			CE04KW1A221M	ELECTRO 220UF 10WV		
C209,210			CE04KW1E101M	ELECTRO 100UF 25WV		
C211			CE04KW1H010M	ELECTRO 1.0UF 50WV		
W1 -3			J19-2721-05	HOLDER		
W5			J19-2721-05	HOLDER		
X1			L78-0209-05	RESONATOR (4.194MHZ)		
CP1			R90-0488-05	MULTI-COMP 4.7K J 1/6W		
CP2		*	R90-0492-05	MULTI-COMP 100KX8 J 1/6W		
CP3			R90-0483-05	MULTI-COMP 100KX13 J 1/6W		
CP4		*	R90-0493-05	MULTI-COMP 100KX9 J 1/6W		
CP5			R90-0483-05	MULTI-COMP 100KX13 J 1/6W		
CP6		*	R90-0493-05	MULTI-COMP 100KX9 J 1/6W		
CP7		*	R90-0497-05	COMPO-ELE 0.022UF X4		
VR1	2B	*	R29-5013-05	POTENTIOMETER(100KX2)S.A LEVEL		
S1 ,2	1A		S40-1064-05	PUSH SWITCH (POWER,EQ LINE)		
S4 -27	1A		S40-1064-05	PUSH SWITCH (EQ.LEFT)		
S32 -56	2B		S40-1064-05	PUSH SWITCH (EQ.RIGHT)		
D1 -9			1SS133	DIODE		
D1 -9			1SS176	DIODE		
D11 -19			1SS133	DIODE		
D11 -19			1SS176	DIODE		
D21 ,22			1SS133	DIODE		
D21 ,22			1SS176	DIODE		
D23			DSM1A1	DIODE		
D24			1SS133	DIODE		
D24			1SS176	DIODE		
D31 -58			1SS133	DIODE		
D31 -58			1SS176	DIODE		
FL1	1B	*	CPF1072AGR	FLUORESCENT INDICATOR TUBE(L)		
FL2	2B	*	CPF1072CGR	FLUORESCENT INDICATOR TUBE(R)		
IC1		*	UPD75104CW-070	IC(MICROPROCESSOR)		
IC2 ,3			LC7565	IC(GRAPHIC EQ FL DISPLAY DR)		
IC4 -8			UPC4574C	IC(OP AMP X4)		
IC9			AN7805F	IC(VOLTAGE REGULATOR/ +15V)		

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Q1 -6			DTC114EFF	DIGITAL TRANSISTOR		
Q7 ,8			DTA114TFF	DIGITAL TRANSISTOR		
Q11 -16			DTC114EFF	DIGITAL TRANSISTOR		
Q17 ,18			DTA114TFF	DIGITAL TRANSISTOR		

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GE-810

SPECIFICATIONS

Equalizer characteristic	
Variable range	±12 dB/±6 dB (L & R independently adjustable)
Center frequencies	60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.4 kHz, 6 kHz, 15 kHz
Frequency response	10 Hz-100 kHz, +1 dB, −3 dB
Total harmonic distortion	Less than 0.006% (1 kHz, all controls flat, output 1 V)
Gain	0±1 dB
Maximum output voltage	3.7 V (1 kHz, THD 0.03%)
S/N ratio	100 dB (IHF-A network, 1 V)
Input impedance	47 k ohms
Output impedance	1.8 k ohms
Power consumption	15 W
Dimensions	W 340 mm (13-3/8″) H 84 mm (3-5/16″) D 351 mm (13-13/16″)
Weight (Net)	3.8 kg (8.4 lb)

Note:

We follow a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Note

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on the Europe (E) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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