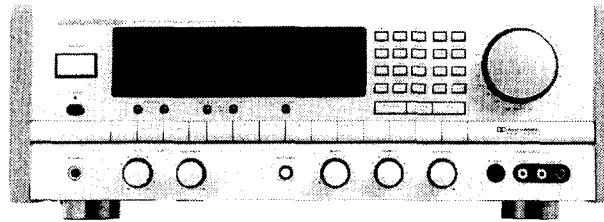


# Service Manual

SR-92U/K

Audio/Video surround stereo receiver



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# marantz®

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## model SR-92

# 1. TECHNICAL SPECIFICATIONS

## FM Tuner Section

Frequency Range	87.5 – 108.0 MHz
Usable Sensitivity	IHF 1.3 $\mu$ V/13.5 dBf
Signal to Noise Ratio	Mono/Stereo 76/68 dB
Distortion	Mono/Stereo 0.2/0.5%
Stereo Separation	1 kHz 40 dB
A.C.S. (Wide/Narrow)	$\pm$ 400 kHz 60/70 dB
Image Rejection	98 MHz 50 dB
Tuner Output Level	1 kHz, $\pm$ 75 kHz Dev 940 mV

## AM Tuner Section

Frequency Range	520 – 1710 kHz
Usable Sensitivity	Dummy/Loop 15/500 $\mu$ V
Signal to Noise Ratio	50 dB
Distortion	1 kHz, 30% Mod. 0.5%
Selectivity	$\pm$ 20 kHz 70 dB

## Audio Section

Rated Power	
Front	20 Hz – 20 kHz 8 ohms 100W/Ch (only 2ch driven)
(Main in) Center	40 Hz – 20 kHz 8 ohms 70W
(Main in) Surround	40 Hz – 20 kHz 8 ohms 30W/Ch
THD Front	20 Hz – 20 kHz 8 ohms 0.09%
Input Sensitivity/Impedance	
Phono	3.5 mV/47 kohms
Linear	220 mV/40 kohms
Front Main in	1.5V/20 kohms
Center Main in	1.5V/20 kohms
Surround Main in	1.0V/20 kohms
Phono Overload (1 kHz, 1% THD)	
Phono	120 mV
Signal to Noise Ratio (IHFA)	
Phono	75 dB
Linear	82 dB

## Video Section

Input/Output Level/Impedance	1.0 Vp-p/75 ohms
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## Others

Power Supply	AC 120V 60 Hz
Power Consumption	640W

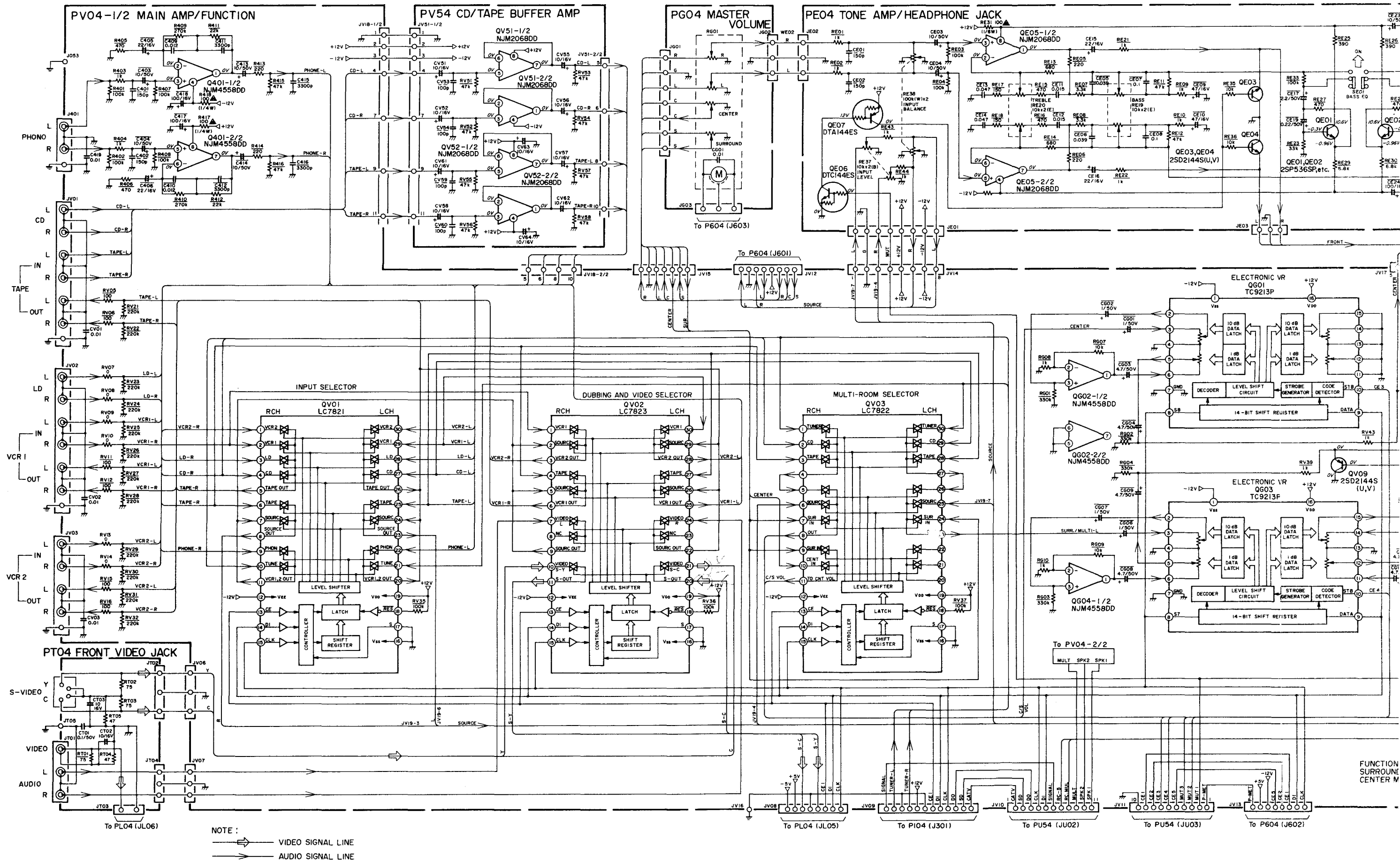
## Dimensions

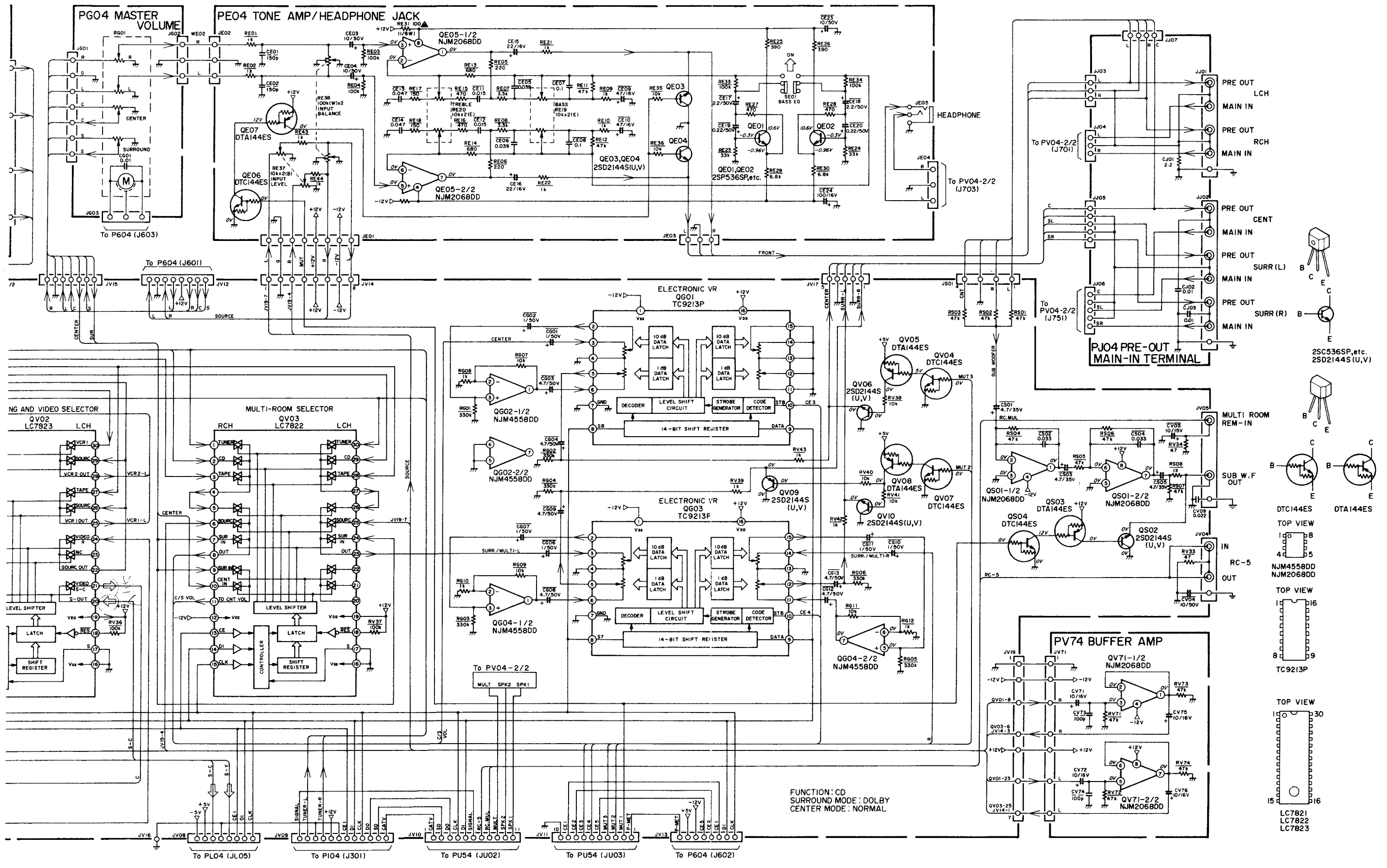
Width	17-7/8 inches (454 mm)
Height	5-3/4 inches (146 mm)
Depth	15 inches (380 mm)
Weight	34.1 lbs (15.5 kg)

Specifications subject to change without prior notice.

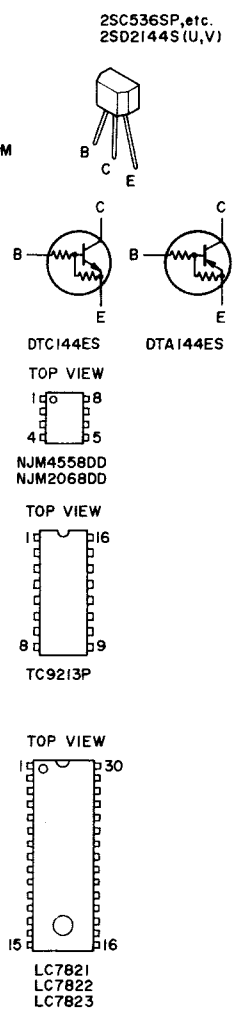


3. SCHEMATIC DIAGRAM AND PARTS LOCATION (Pattern side)





FUNCTION: CD  
 SURROUND MODE: DOLBY  
 CENTER MODE: NORMAL

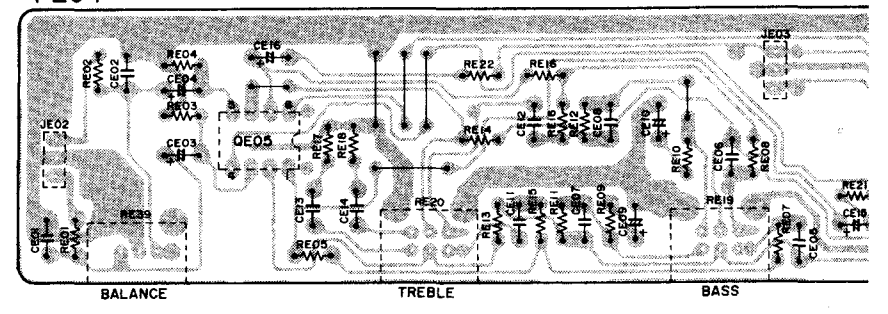
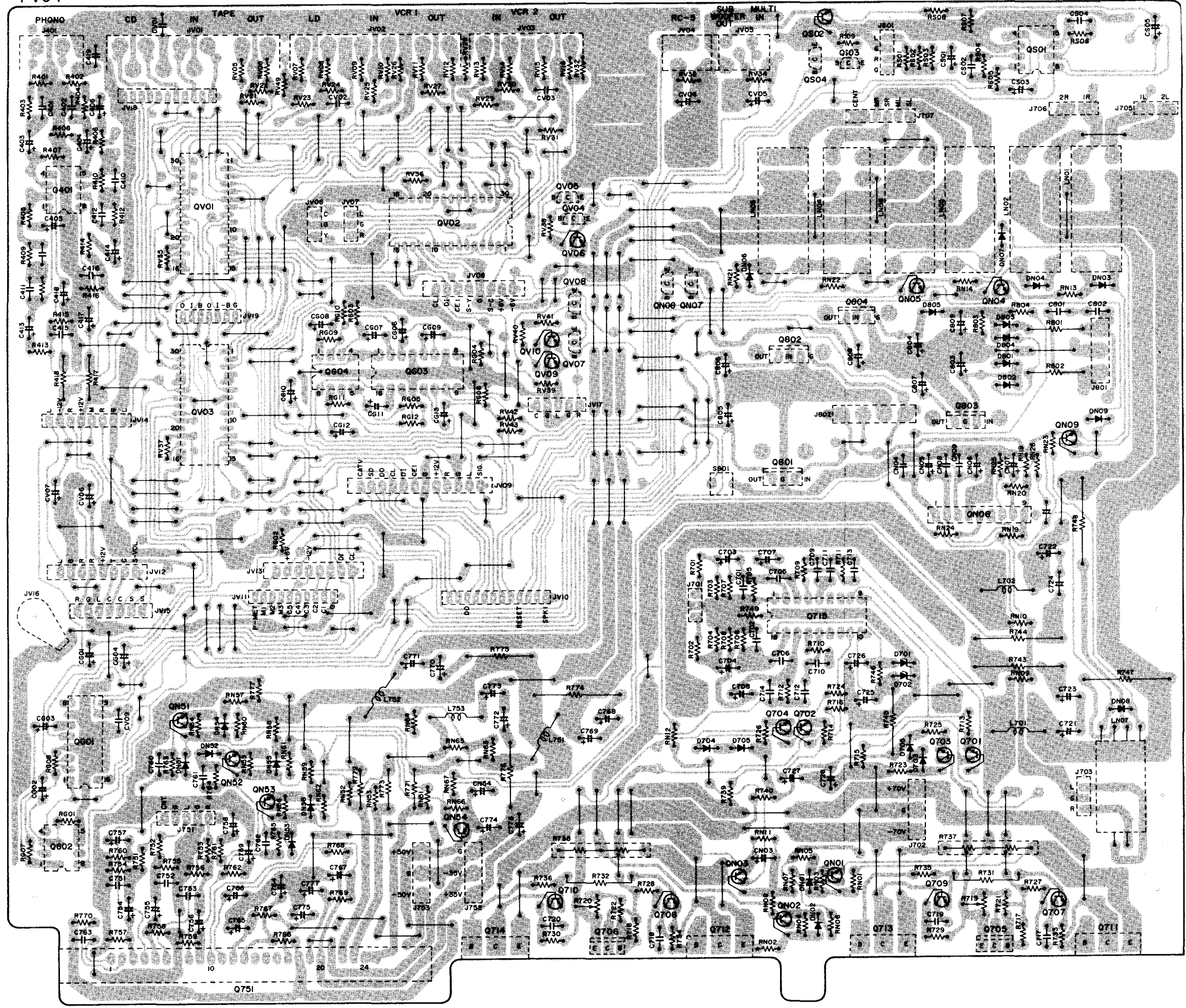




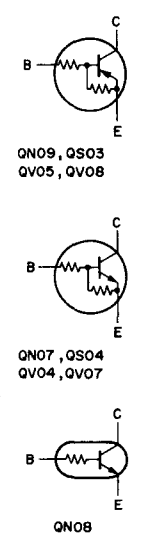
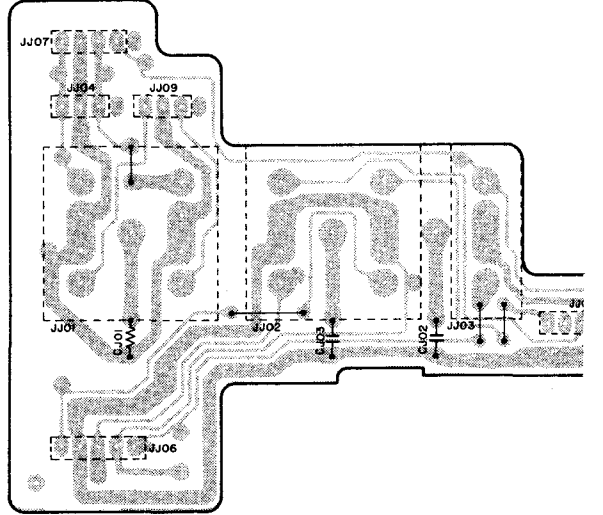
Q401 QV01 QV03 Q604 Q603 QV02 QV04~QV10 QN08 QN07 Q801 Q802 Q502 1S04 Q804 QN05 Q803 QN06 QN04 Q501 QN09 Q602 Q601 QN51~QN53 Q751 QN: Q714 Q710 Q706 Q708 Q712 QN03 Q704 Q702 QN02 Q715 QN01 Q713 Q709 Q703 Q701 Q705 Q707 Q711

PE04 QE05

PV04



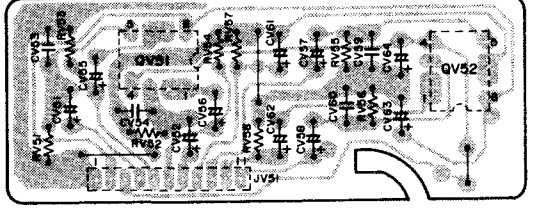
PJ04



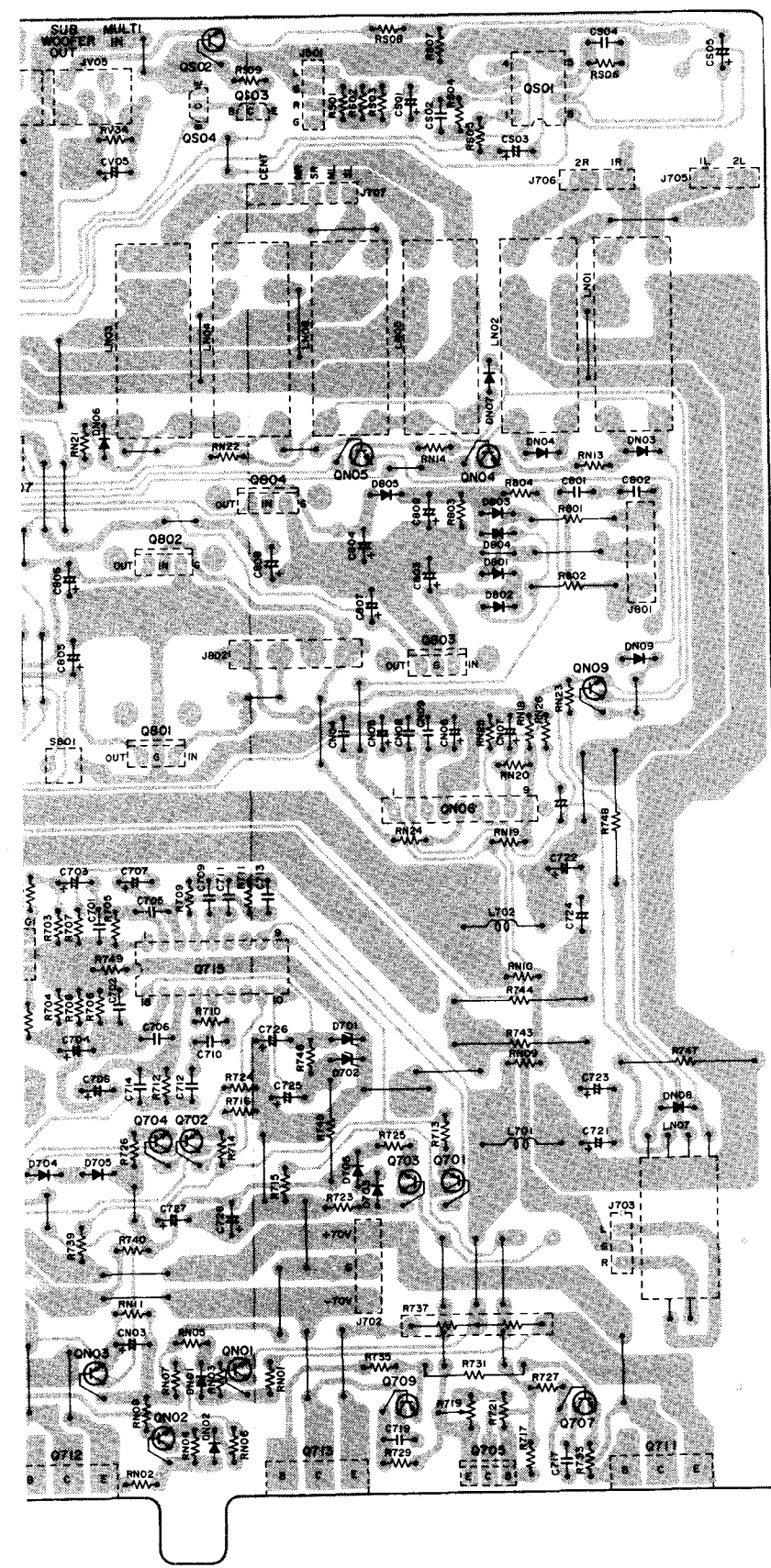
QV51

QV52

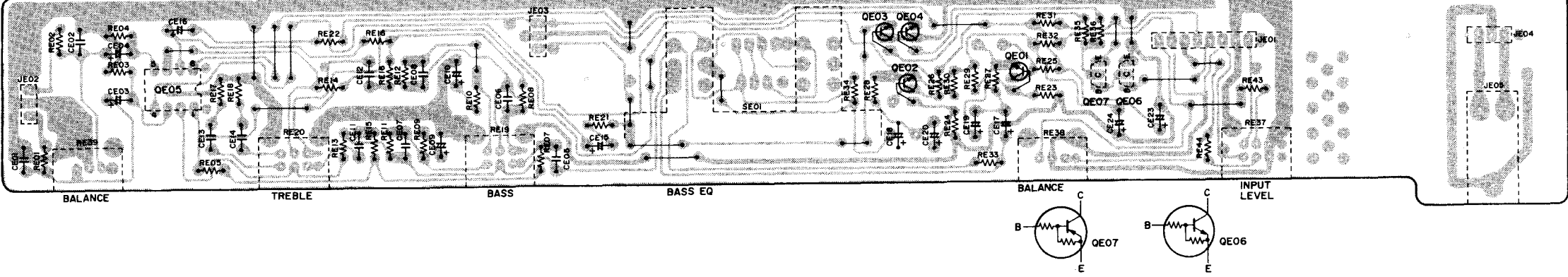
PV54



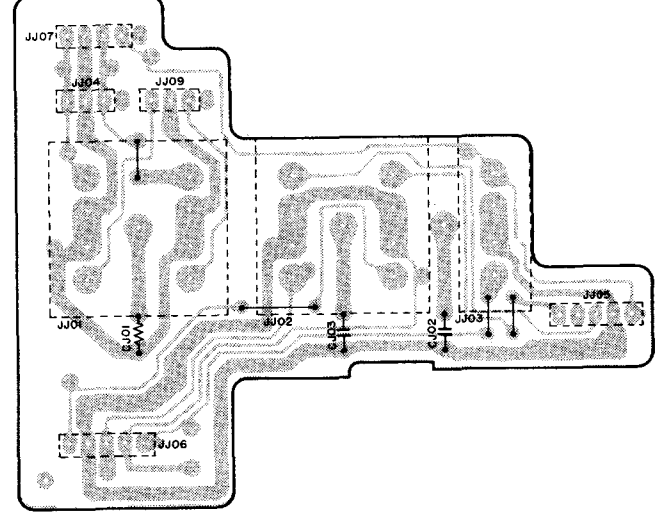
17 Q801 Q802 Q803 Q804 Q805 Q806 Q807 Q808 Q809 Q810 Q811 Q812 Q813 Q814 Q815 Q816 Q817 Q818 Q819 Q820 Q821 Q822 Q823 Q824 Q825 Q826 Q827 Q828 Q829 Q830 Q831 Q832 Q833 Q834 Q835 Q836 Q837 Q838 Q839 Q840 Q841 Q842 Q843 Q844 Q845 Q846 Q847 Q848 Q849 Q850 Q851 Q852 Q853 Q854 Q855 Q856 Q857 Q858 Q859 Q860 Q861 Q862 Q863 Q864 Q865 Q866 Q867 Q868 Q869 Q870 Q871 Q872 Q873 Q874 Q875 Q876 Q877 Q878 Q879 Q880 Q881 Q882 Q883 Q884 Q885 Q886 Q887 Q888 Q889 Q890 Q891 Q892 Q893 Q894 Q895 Q896 Q897 Q898 Q899 Q900 Q901 Q902 Q903 Q904 Q905 Q906 Q907 Q908 Q909 Q910 Q911 Q912 Q913 Q914 Q915 Q916 Q917 Q918 Q919 Q920 Q921 Q922 Q923 Q924 Q925 Q926 Q927 Q928 Q929 Q930 Q931 Q932 Q933 Q934 Q935 Q936 Q937 Q938 Q939 Q940 Q941 Q942 Q943 Q944 Q945 Q946 Q947 Q948 Q949 Q950 Q951 Q952 Q953 Q954 Q955 Q956 Q957 Q958 Q959 Q960 Q961 Q962 Q963 Q964 Q965 Q966 Q967 Q968 Q969 Q970 Q971 Q972 Q973 Q974 Q975 Q976 Q977 Q978 Q979 Q980 Q981 Q982 Q983 Q984 Q985 Q986 Q987 Q988 Q989 Q990 Q991 Q992 Q993 Q994 Q995 Q996 Q997 Q998 Q999 Q1000



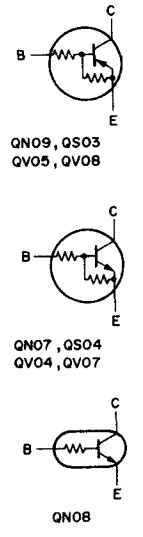
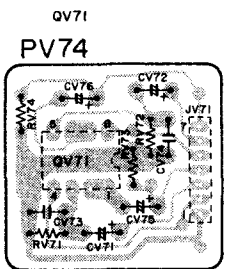
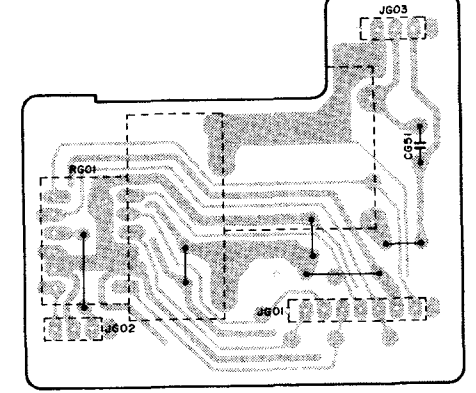
PE04



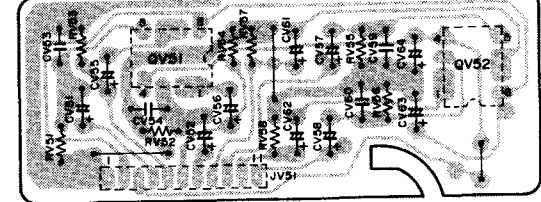
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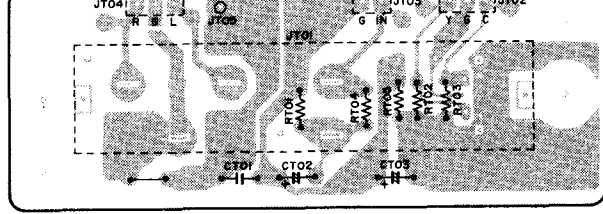
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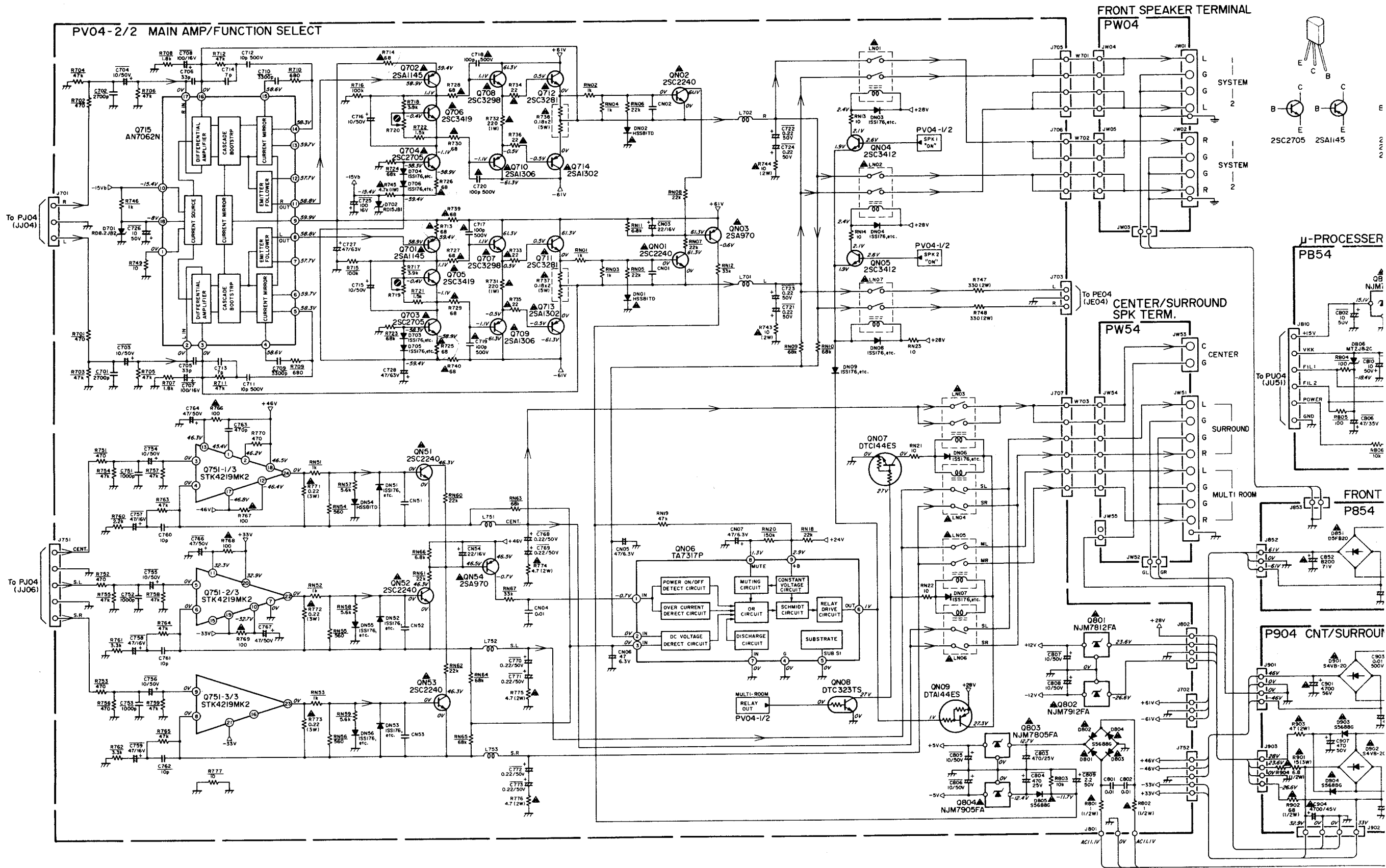
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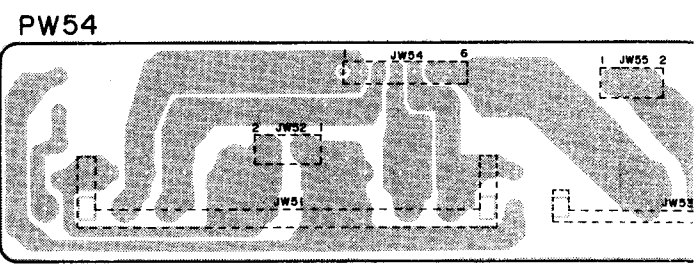
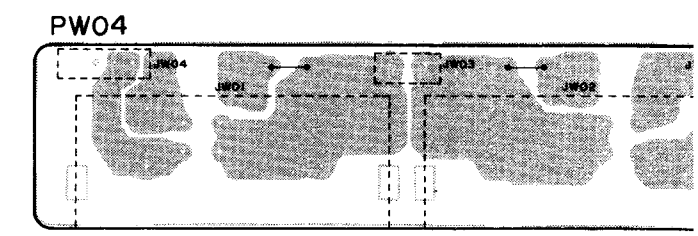
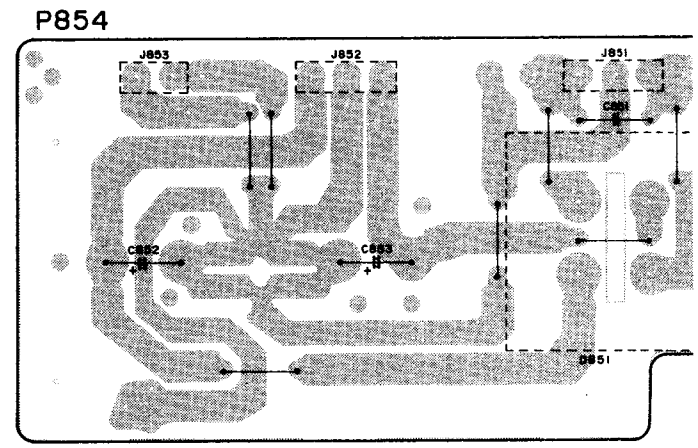
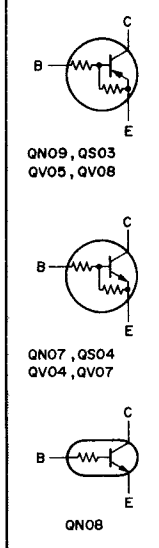
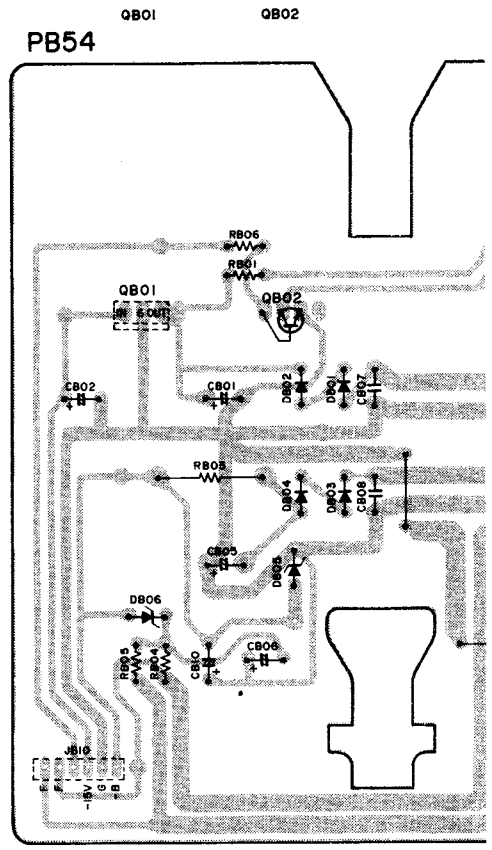
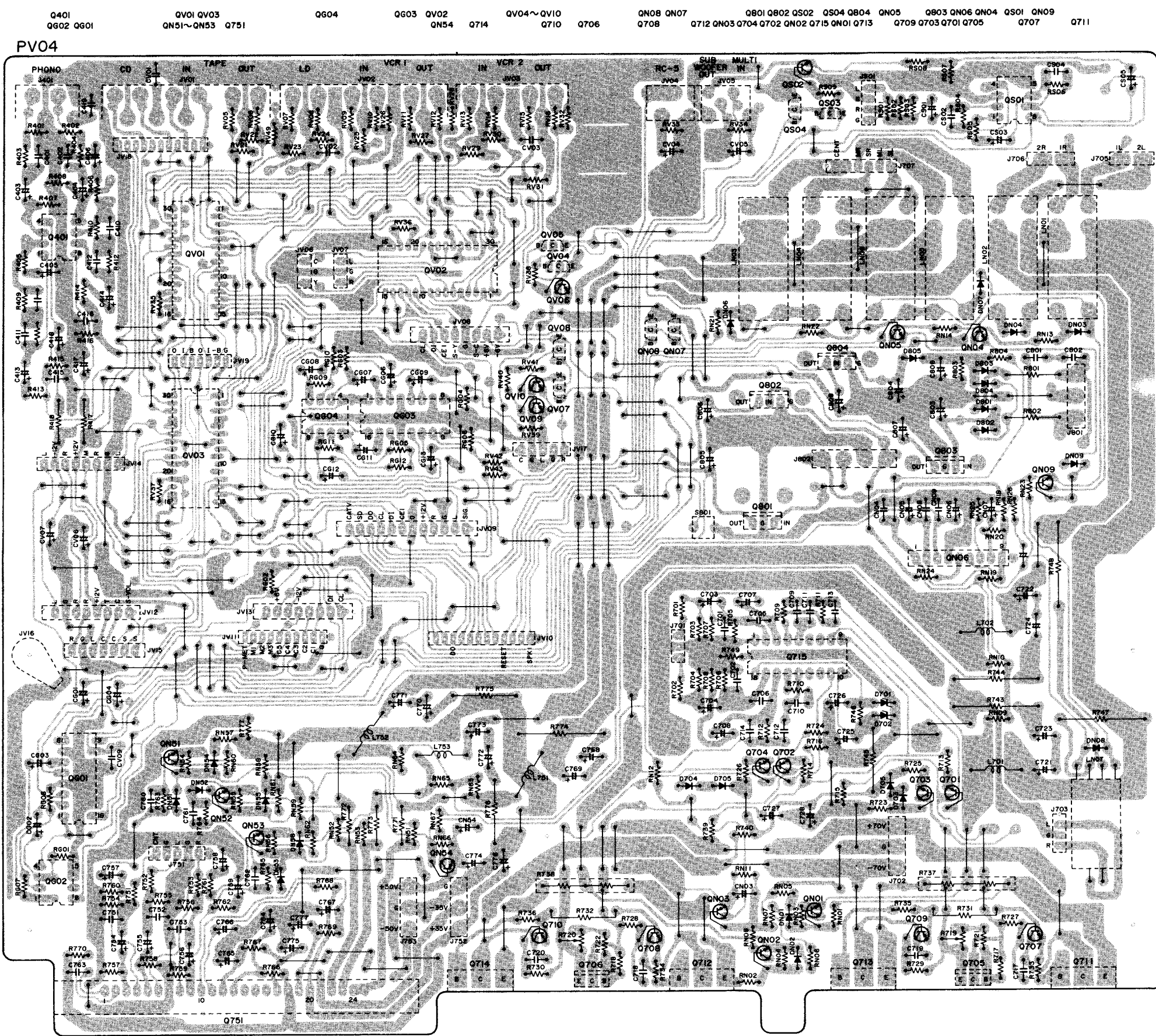






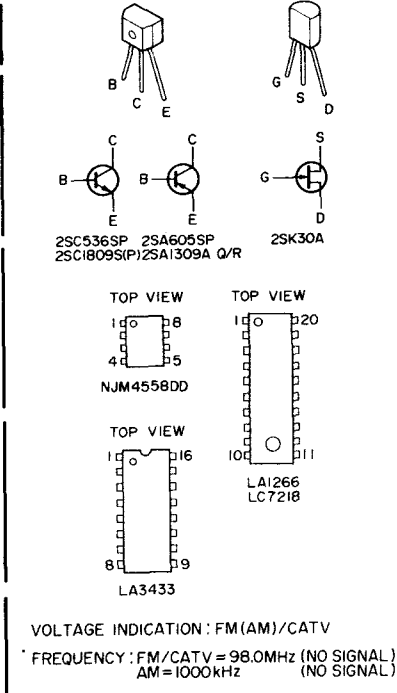
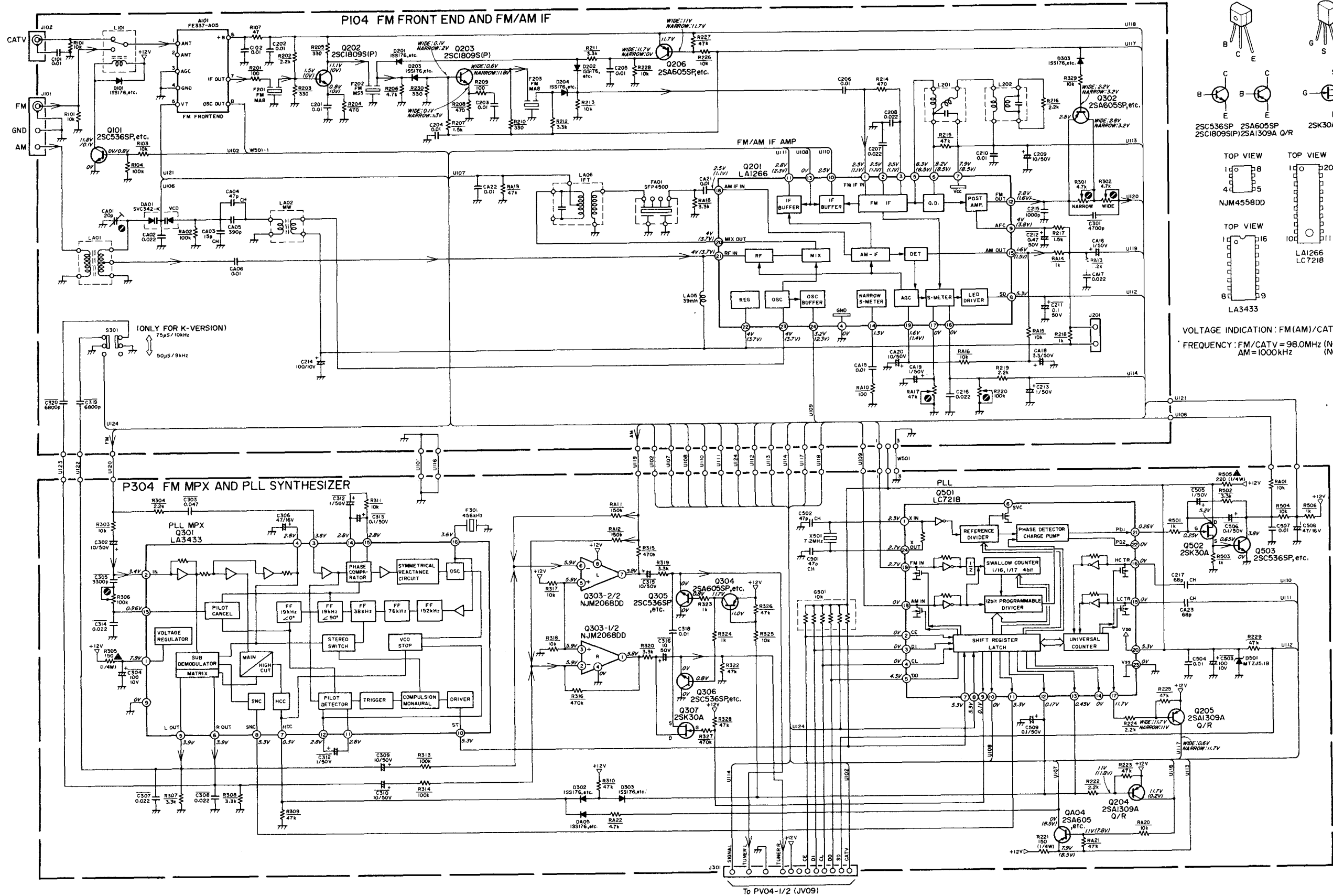




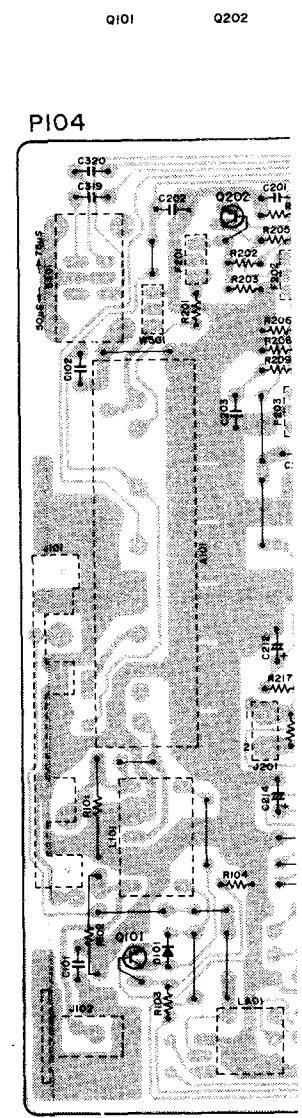






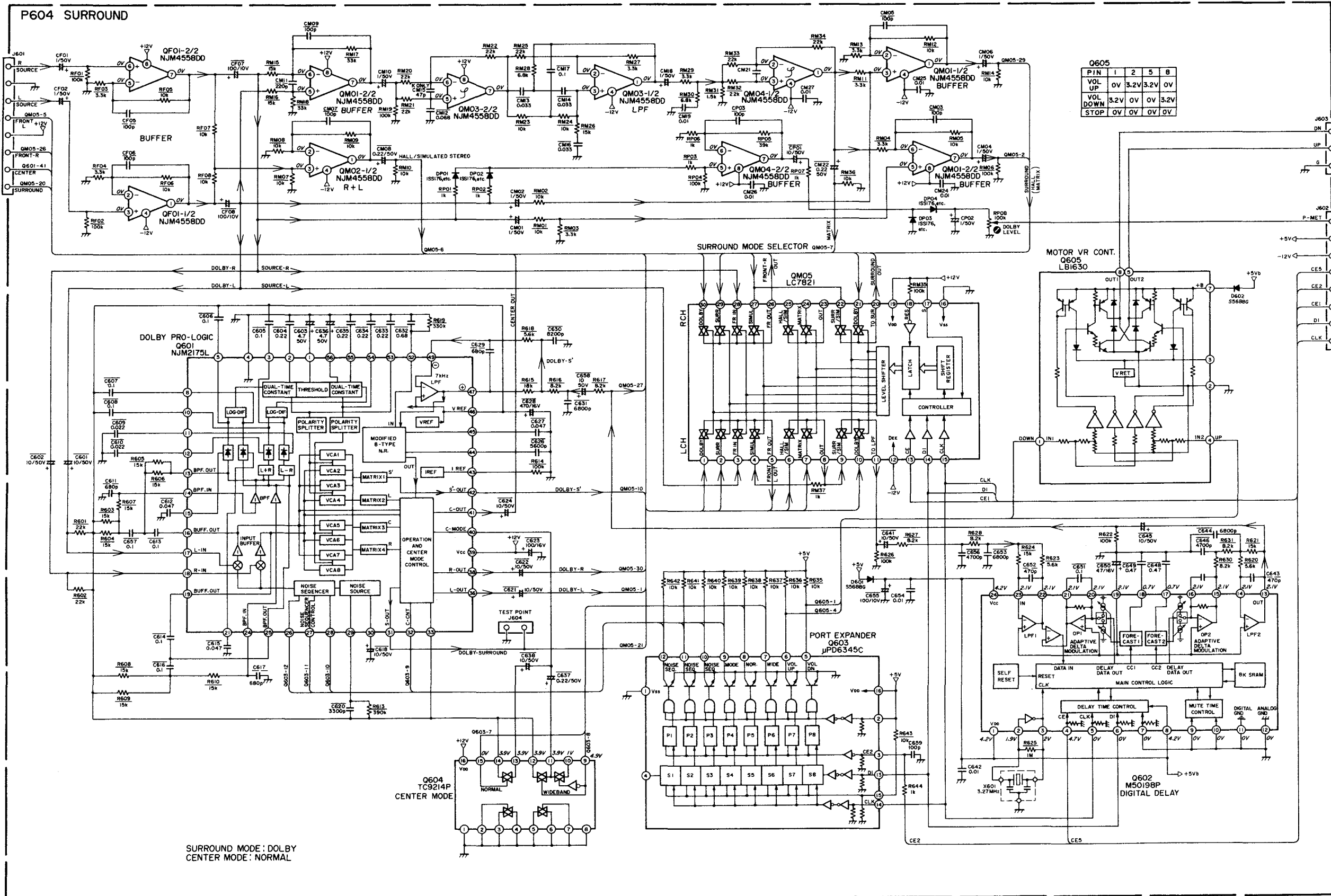


VOLTAGE INDICATION: FM(AM)/CATV  
 FREQUENCY: FM/CATV = 98.0MHz (NO SIGNAL)  
 AM = 1000kHz (NO SIGNAL)









SURROUND MODE: DOLBY  
 CENTER MODE: NORMAL

PIN	1	2	5	8
VOL UP	0V	3.2V	3.2V	0V
VOL DOWN	3.2V	0V	0V	3.2V
STOP	0V	0V	0V	0V

- TOP VIEW  
1 8  
4 5  
LB1630  
NJM4558DD
- TOP VIEW  
1 16  
8 9  
TC9214P
- TOP VIEW  
1 16  
8 9  
µPD6345C
- TOP VIEW  
1 24  
12 13  
M50198P
- TOP VIEW  
1 30  
15 16  
LC7821
- TOP VIEW  
1 56  
28 29  
NJM2175L

QF01 QM01~QM03

QM05

QM04

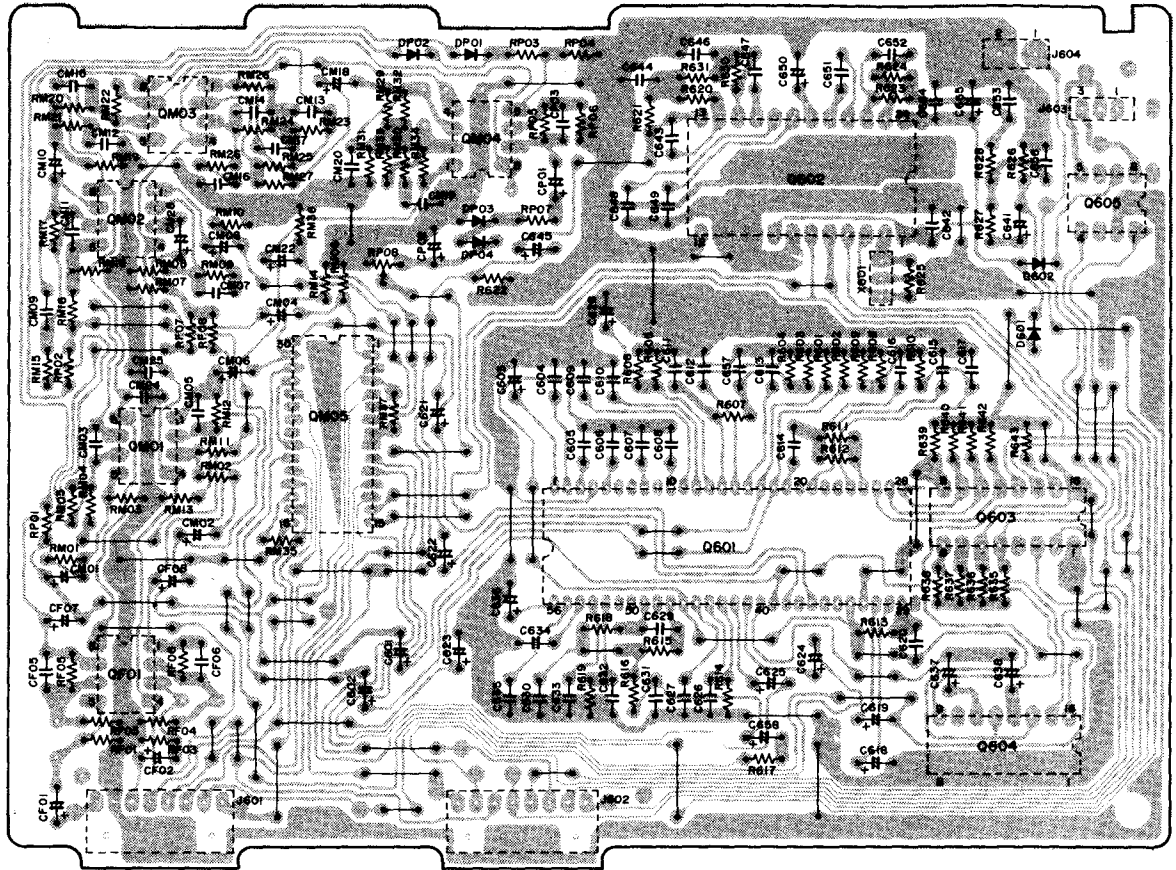
Q601

Q602

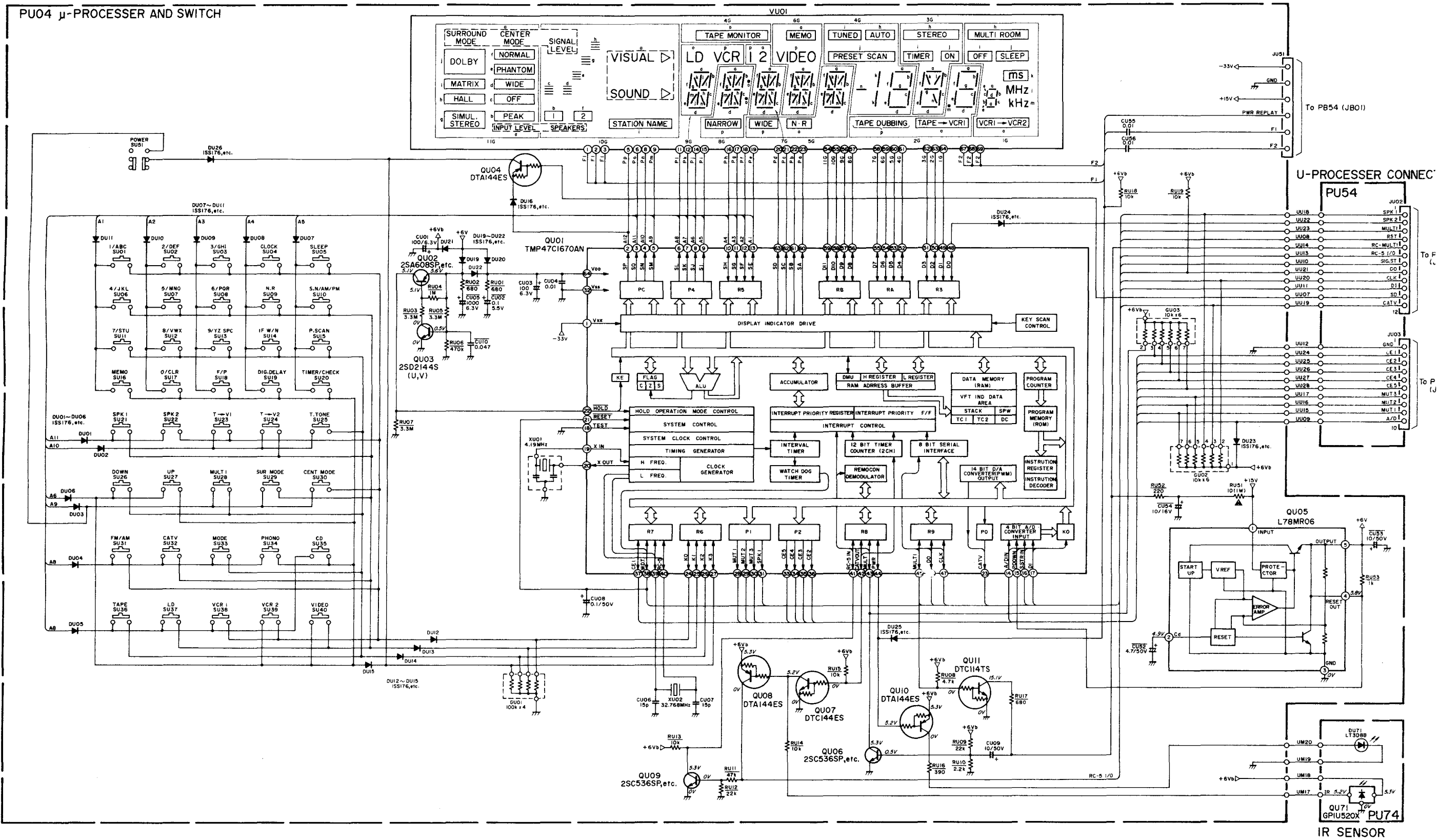
Q603 Q604

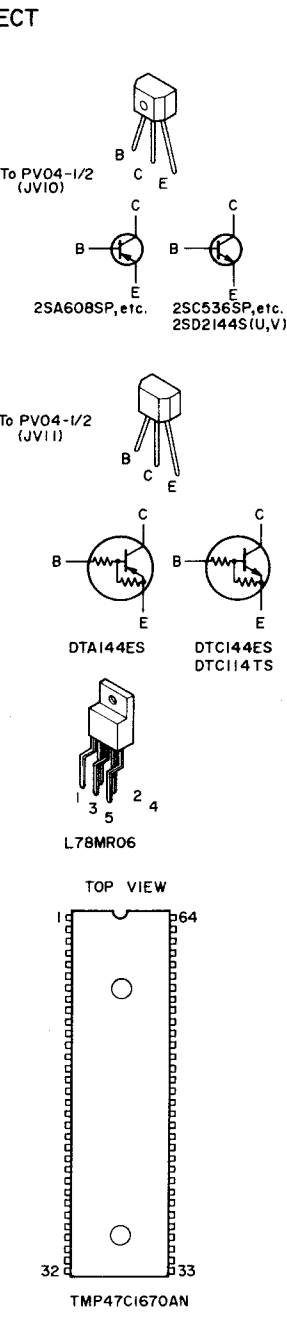
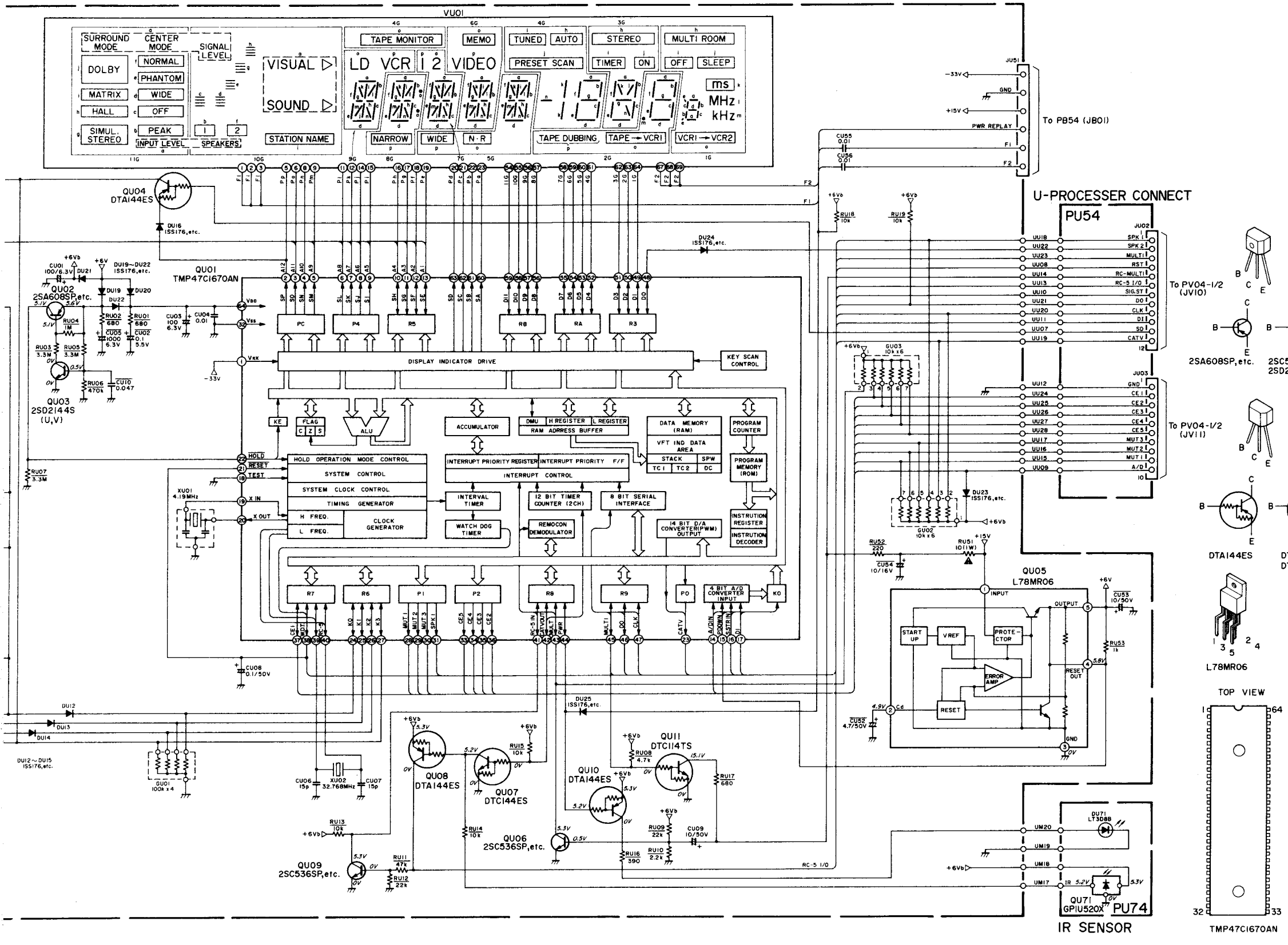
Q605

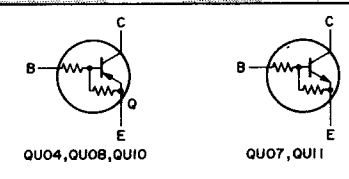
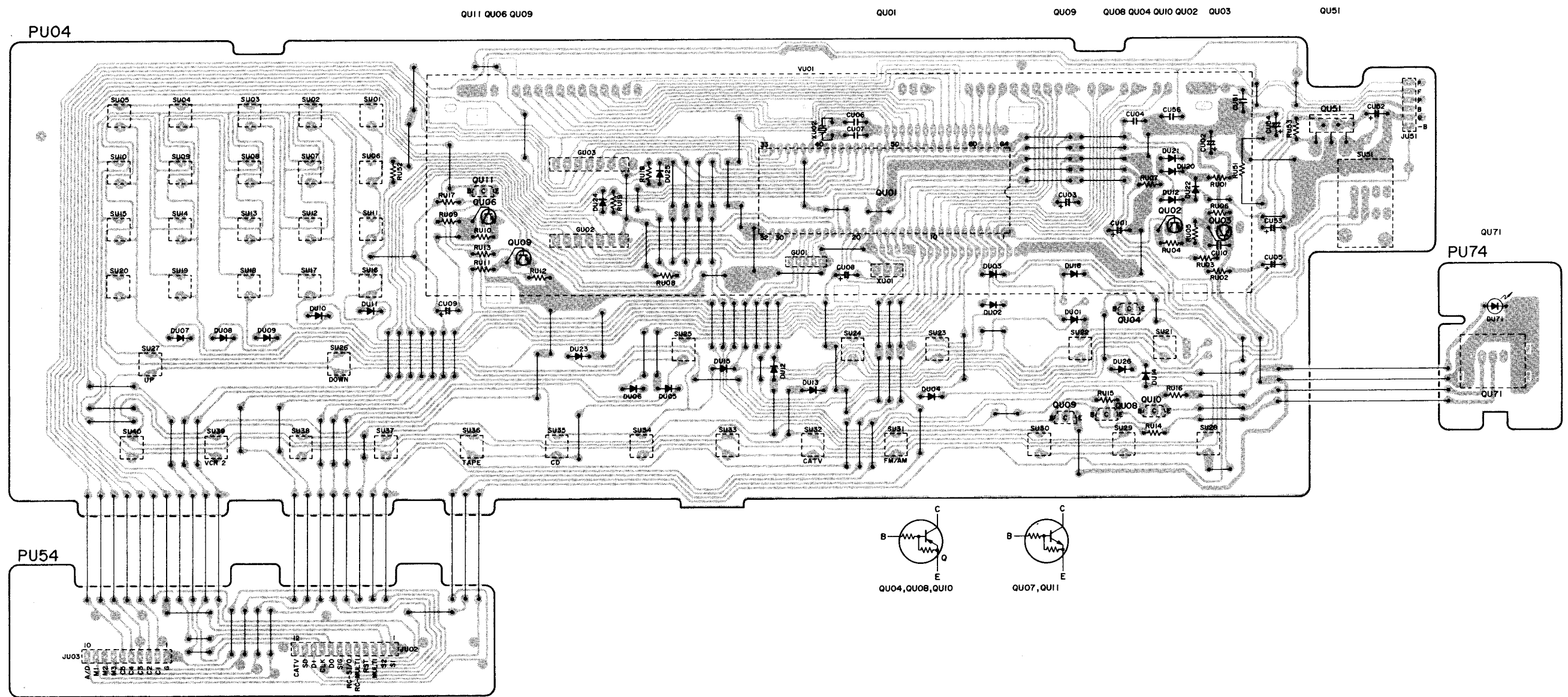
P604



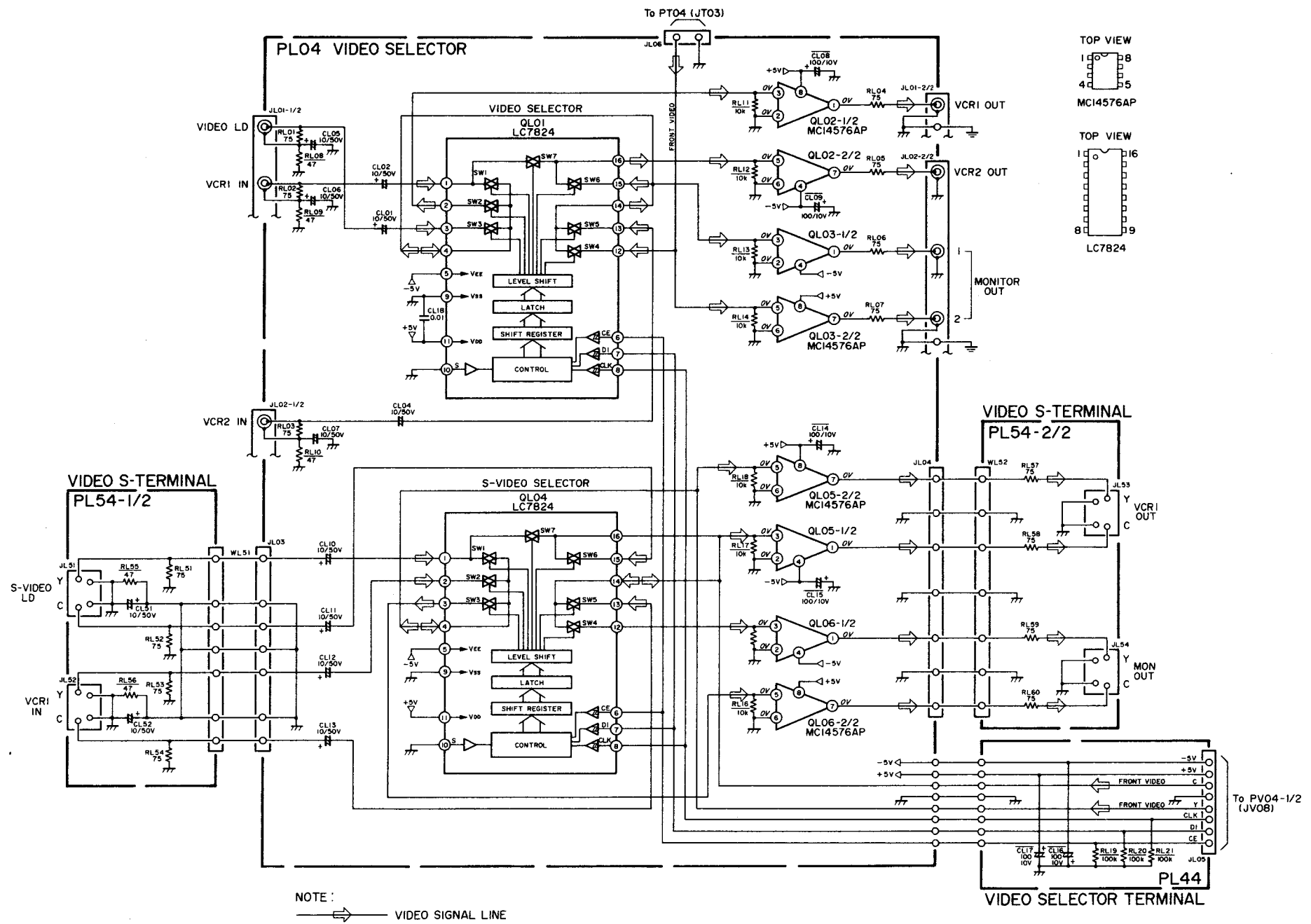
PU04 μ-PROCESSOR AND SWITCH





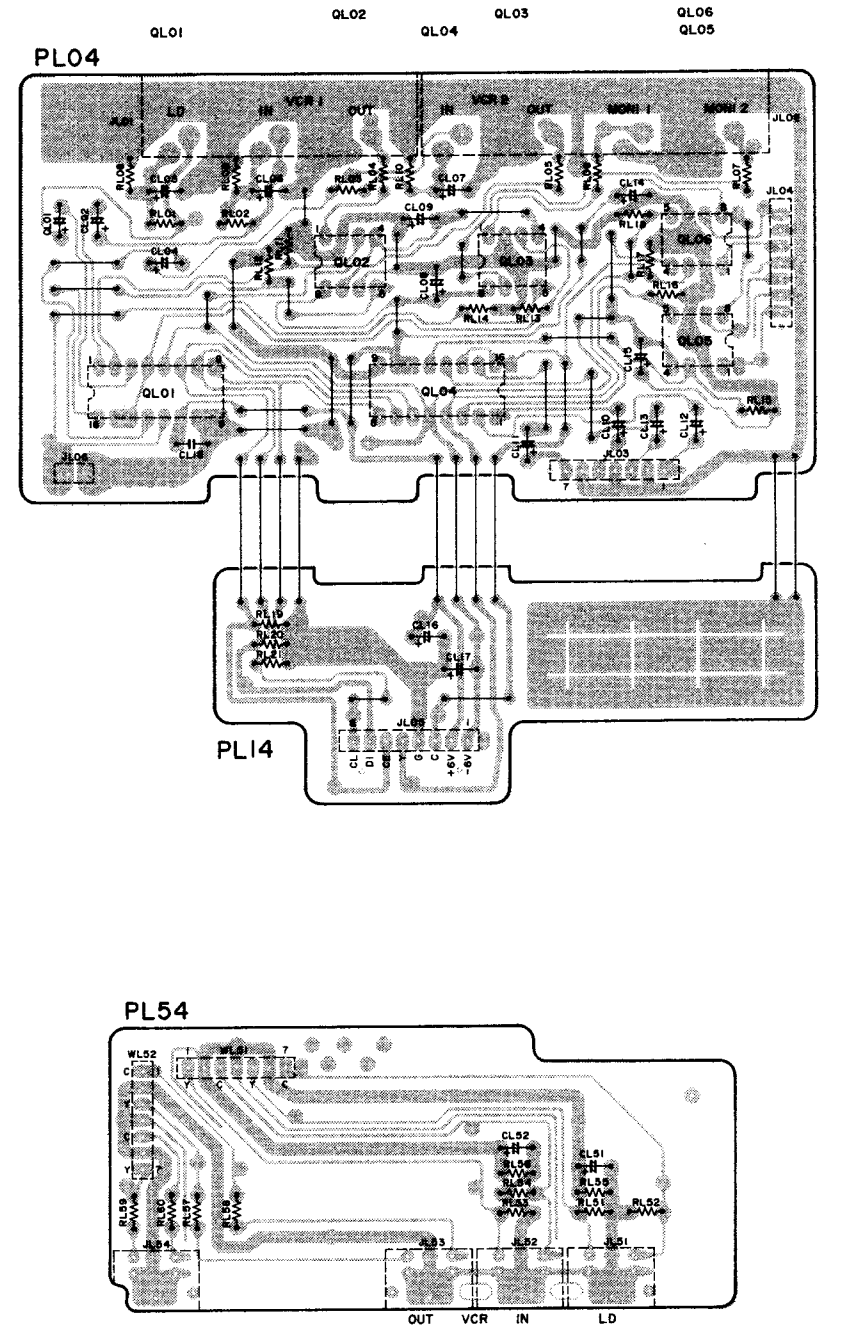




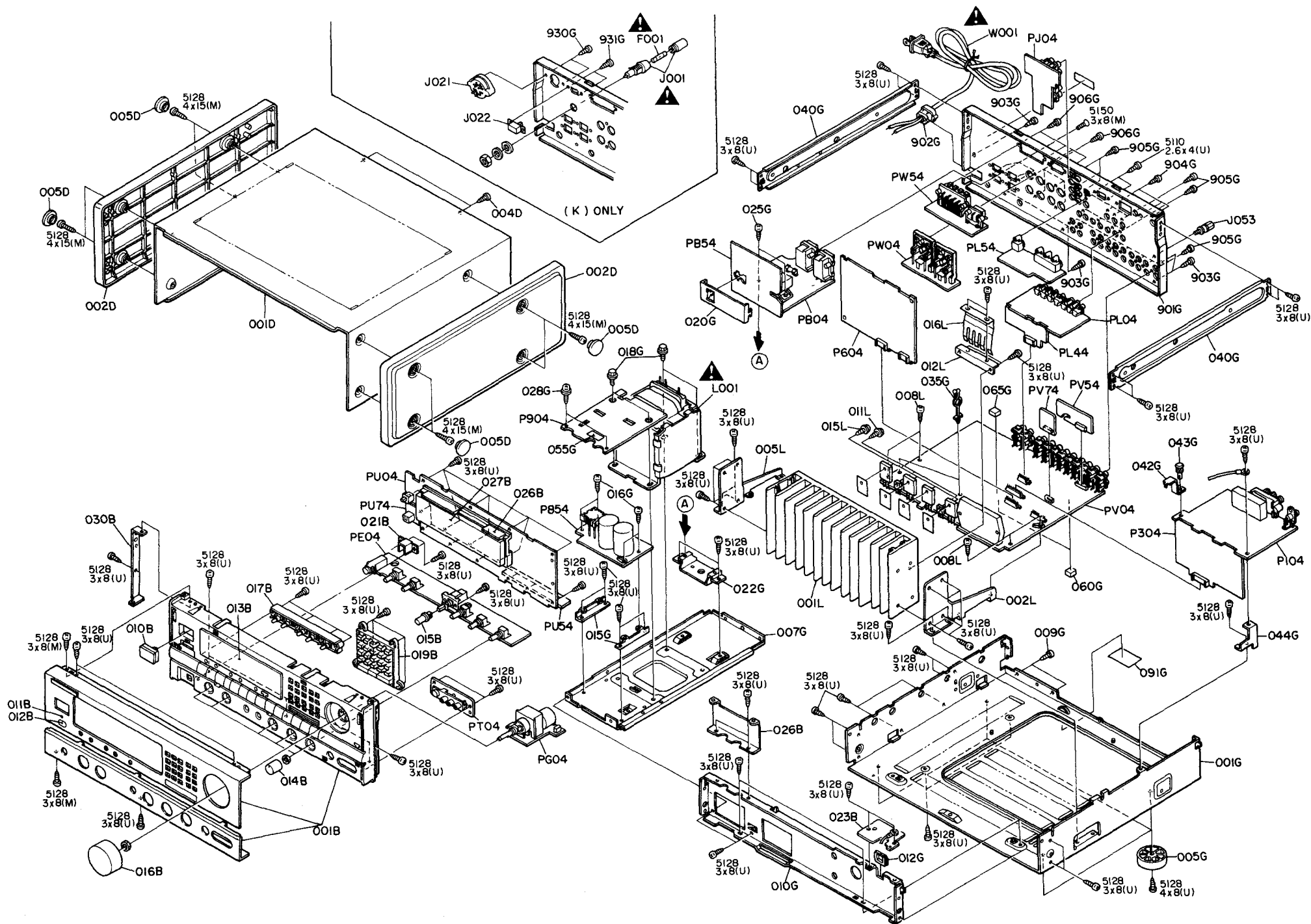


TOP VIEW  
 1 8  
 4 5  
 MCI4576AP

TOP VIEW  
 1 16  
 8 19  
 LC7824



#### 4. EXPLODED VIEW AND PARTS LIST



REF. DESIG.	PART NO.	DESCRIPTOIN
001B	129J105520	CHASSIS, FRONT AL PANEL ASSY
010B	415T270120	BUTTON, POWER
011B	391H355010	LENS, LED
012B	431T355010	LENS, IR
013B	129J158010	WINDOW
014B	025J154090	KNOB, ROTARY
015B	117J270030	BUTTON, PUSH AL
016B	063J154090	KNOB, VOLUME
017B	129J270030	BUTTON, SPK/TAPE/TEST TONE
019B	129J270020	BUTTON, 10KEY
021B	129J104050	RETAINER, HEAD PHONE BRACKET
026B	017J271030	HOLDER, FL
027B	056J122020	STICKER, ADHESIVE
001D	017J257020	LID, TOP COVER GOLD
002D	129J249010	SIDE PANEL, MOLD GOLD
005D	198K067110	CAP, SIDE CAP GOLD
005G	176H057540	LEG, GOLD AL CAP
012G	129J005010	CLAMPER, WIRE
018G	52040408A0	H.HEAD BOLT, TRANSF. + TABLE
035G	086J005030	CLAMPER, MAIN PCB
043G	2276005050	CLAMPER, TUNER SURR. PCB
902G	450H259010	BUSHING
011L	51260315M0	B.T.SCREW (W/W), PCT TR
015L	51260320U0	B.T.SCREW (W/W), POWER TR
016L	129J116010	LEAF SPRING, POWER PACK
001T	129J851250	USER MANUAL, SR-92
▲ F001	FS10315850	FUSE, 250V T3.15A [ K ]
▲ J001	YJ08000290	JACK, FUSE HOLDER [ K ]
J021	BY05080070	VOLT.SELECT., 110-240V 4 VOLTAGE [ K ]
J022	SS02021290	SLIDE SWITCH, VOLT.SEL. 115/230V [ K ]
▲ L001	TS19634020	POWER TRANSF., 110-240V 4VOLT [ K ]
▲ L001	TS19634010	POWER TRANSF., 120V/60Hz [ U ]
▲ W001	YC01800330	A.C.POWER CORD, SPT-2UL [ U ]
▲ W001	YC01900080	A.C.POWER CORD [ K ]
Z001	ZA02000070	EXT. ANTENNA, FM
Z002	YP90000310	PLUG, ANT ADAPTOR
Z003	LA00055010	ANT COIL, LA-700HB LOOP
Z004	ZK129J0010	UNIT K, REMOTE CONTROL UNIT
Z005	FS10630850	FUSE, 250V T6.3A FOR 110/120V [ K ]
▲ Z006	YJ04001240	JACK, AC ADAPTOR FOR EUROPE [ K ]

**NOTE ON SAFETY:**  
**Symbol ▲** Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ▲. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

## 5. TEST EQUIPMENT REQUIRED FOR SERVICING

This table lists the test equipment required for servicing.

Item	Use
Distortion Analyzer	Distortion measurements
Audio Oscillator	Sinewave and squarewave signal source
ACVTVM	Voltage measurements (AC)
Oscilloscope	Waveform analysis and trouble shooting and ASO aignment
Circuit Tester	Trouble shooting
DCVTVM	Voltage measurements (DC)
AC Wattmeter	Monitors primary power to amplifier
Line Voltmeter	Monitors potential of primary power to amplifier
Variable Autotransformer	Adjust level of primery power to amplifier
Shorting Plug	Shorts amplifier input to eliminate noise pickup

## 6. IDLING CURRENT ADJUSTMENT

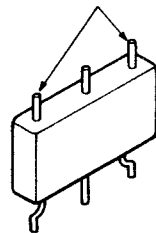
- Before switching the power ON, set the Master Volume control to the minimum position and the Balance and Tone controls to the center positions. Then, rotate the semi-fixed resistors R721 (L CH) and R722 (R CH) on the PC board PV04 fully clockwise.
- Connect a digital voltmeter, set for the DC voltage input to the pertinent test points (the marked ones of R737-R738) on the PC board PV04. (Positive: Left side, Negative: Right side)
- After the completion of the above setup. Switch the power ON and adjust the semi-fixed resistors R721 (L CH) and R722 (R CH) on the PC board PV04 according to the reading of the digital voltmeter. The setting values are 6 ~ 7.6 mV (16.7 ~ 20 mA) of the both channels.

Please refer to the table below.

Power ON

20 sec later	2 mV
1 min later	4 mV
More than 5 min	6 ~ 7.6 mV

Measurement point



R737/R738

## 7. SERVICE PROGRAM

### 1. T.R POINT ME (tracking point memory) mode.

From power OFF (stand-by mode), when the POWER switch is pressed ON while pressing the MEMO key, the T.R POINT ME mode is called.

Frequencies to be memorized are as follows.

	P1	P2	P3	P4	P5	P6	P7	P8
FM	90.0 MHz	98.0 MHz	106.0 MHz	87.5 MHz				
AM					600 kHz	1000 kHz	1400 kHz	520 kHz

	P9	P10	P11	P12-P30
FM				
AM	520 kHz	520 kHz	520 kHz	520 kHz

— The T.R POINT ME mode can be canceled by setting the POWER switch to OFF.

### 2. FL segment check mode.

From power OFF (stand-by mode), when the POWER switch is pressed ON while pressing the UP and MEMO keys simultaneously, the FL segment check mode is called.

— When the test mode is entered, microprocessor's MUTE OUT becomes "HIGH" to apply muting to the unit itself. No change occurs in any setting.

— All segments are alight for 5 seconds.

— The segment check mode can be canceled by setting the POWER switch to OFF.

## 8. TUNER ALIGNMENT PROCEDURES

- When you adjust a set, use a signal generator with a counter with which you can correctly read frequencies, or connect a counter to a signal generator with a counter terminal for both AM and FM.
- As a rule, use a band-pass filter (B.P.F 200-15 kHz) designated by IHF in adjustment and measurement of FM. Be sure to use a filter especially in adjustment of STEREO DISTORTION and SEPARATION. (Attenuation at 19 kHz is to be 30 dB at least.)
- The controller (QU01) used in this set has a function to preset and memorize the frequencies of guard and tracking point to be used in adjustment and measurement.

Caution:  
Alignment of FM needs to set the IF BAND SWITCH to "WIDE" position if any other instruction does not require.

- Set to T.R point ME mode of the service program, after that, needs POWER OFF and POWER ON again. (P1) to (P7) in the Digital Readout Frequency Setting column shows preset numbers for the above mode. Before alignment, connect a dummy resistor of 47 kohms to the tape out terminal.

### 4. FM Alignment Procedures

(Function switch at "FM" position and MODE switch at "MONAURAL" position)

#### • FM RF Alignment

IF BAND switch at "WIDE" position

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator to FM antenna terminal. Adjust the RF signal output so that slight noise occurs at the upper and lower sides of the output waveform.	98.0 MHz	AC VTVM to L- or R-channel output (TAPE OUT)	98.0 MHz (P2)	Front end IFT for maximum output and minimum distortion.
2	FM signal generator 500 $\mu$ V output to FM antenna terminal (75-ohm).	98.0 MHz	"0" center meter or DC current meter (100 $\mu$ A range) to J201 or R218	98.0 MHz (P2)	L201 core so that the meter points to its center or reads "0".
3			Distortion meter to L- or R-channel output (TAPE OUT)		L202 core fore minimum distortion.
4	Repeat steps 2 and 3 until distortion is minimized.				

#### • FM IF Alignment

(Function switch at "FM" position and MODE switch at "AUTO STEREO" position)

IF BAND switch at "WIDE" position

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 500 $\mu$ V output modulated by MPX signal generator to FM antenna terminal (75-ohm).	Stereo L-channel (1,000 Hz)	VTVM to L-channel output (TAPE OUT L channel)	98.0 MHz (P2)	Front end IFT for minimum distortion.
2	Modulation level: IHF 67.5 kHz +9% pilot dev.	Stereo R-channel (1,000 Hz)	VTVM to R-channel output (TAPE OUT R channel)		

● **Muting Level Alignment**

(Function switch at "FM" position and MODE switch at "AUTO STEREO" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 6.3 $\mu$ V output to FM antenna terminal (75-ohm)	98.0 MHz		98.0 MHz (P2)	R220 to a point at which shows "tuned."

● **Multiplex Alignment**

(Function switch at "FM" position and MODE switch at "AUTO STEREO" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 500 $\mu$ V output modulated by MPX signal generator to FM antenna terminal (75-ohm) Modulation level: 1HF 67.5 kHz +9% pilot dev.	Stereo L-channel (1,000 Hz)	VTVM to R-channel output (TAPE OUT R channel)	98.0 MHz (P2)	IF BAND WIDE R301/ NARROW R302 so that channel separation is identical between both channels. (At this time, needs adjust the NARROW at first next adjust the wide.)
2		Stereo R-channel (1,000 Hz)	VTVM to L-channel output (TAPE OUT L channel)		
3	Repeat steps 1 and 2.				

**5. AM Alignment Procedures**

(Function switch at "AM" position)

● **AM IF Alignment**

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	Sweep generator to AM antenna terminal	450 kHz	AC VTVM to L- or R-channel output (TAPE OUT)	—	LA06 maximum and symmetrical waveform.

● **AM RF Alignment**

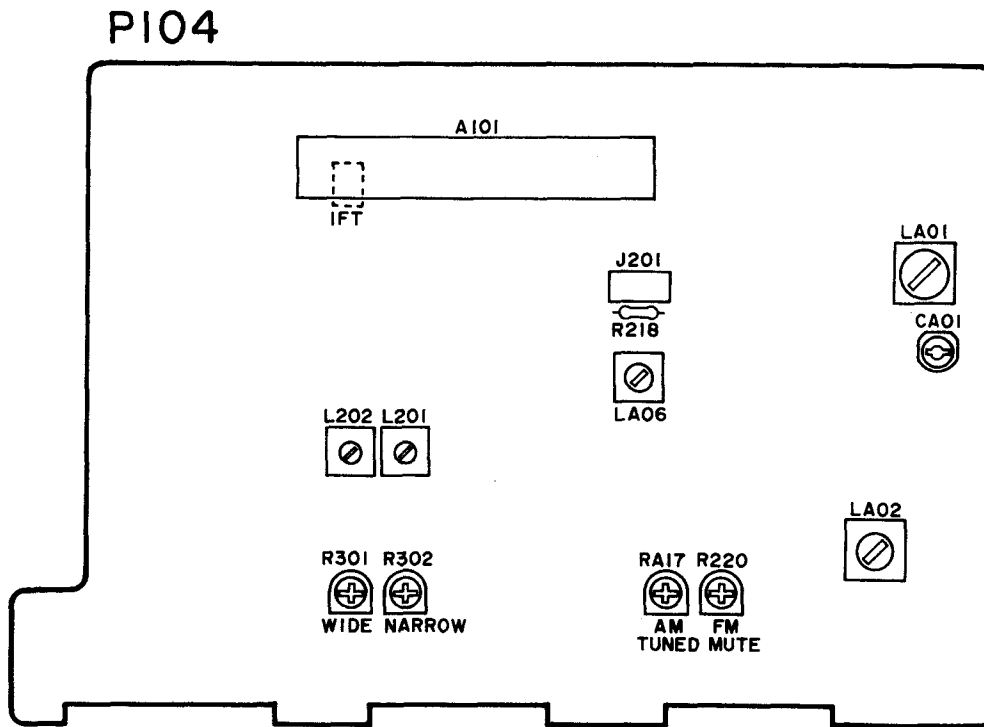
Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	AM signal generator to AM loop antenna in a test loop	600 kHz	VTVM to L- or R-channel output (TAPE OUT)	600 kHz (P5)	LA01 for maximum output.
2		1,400 kHz		1,400 kHz (P7)	CA01 for maximum output.
3	Repeat steps 1 and 2 until sensitivity is maximized.				

● **AM Auto Stop Alignment**

(Function switch at "AM" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	RF generator to AM loop antenna in a test loop (500 $\mu$ V/m)	1,000 kHz	—	1,000 kHz (P6)	RA17 so that shows "TUNED" on the display tube lights.

## 9. ALIGNMENT AND TEST POINT



## 10. CIRCUIT DESCRIPTION

### 1. Input Selector, Multi Room Selector and Dubbing Selector

- **Input selector**  
The function of this circuit is to select between the components connected to the rear panel. The circuit uses an LC7821 IC (QV01), which is serially controlled by the microprocessor (QU01).
- **Multi room selector**  
This circuit functions as a switch to select which input is heard in the "multi room" when the unit is in multi room mode. The circuit uses an LC7822 IC (QV03), which is serially controlled by the microprocessor. The multi room selector can select between CD/TAPE and the preset channel of the tuner, and it can also select the source selected by the input selector.
- **Dubbing selector**  
This circuit has two independent functions for copying from TAPE to VCR1 or from VCR1 to VCR2 using an LC7823 IC (C102). These functions are serially controlled by the microprocessor. The same IC also functions to switch the front video input.
- **Buffer amplifiers**  
Buffer amplifiers (QV01, QV02) are located between the input side of the CD and TAPE and the output side of the input selector in order to prevent switching noise caused by mutual switching between the multi room selector and input selector.

### 2. Surround Block

- The surround block consists of a buffer amplifier, phase shifter, peak indicator amplifier, Dolby Pro Logic decoder and its controller, and digital delay and surround mode switches.
- **Buffer amplifier**  
The stereo signal is first input into this buffer amplifier (QF01), which provides a 12 dB gain at all frequencies. After passing through the amplifier, the signal is distributed to the various blocks.
- **Phase shifter and adder**  
Here the phase of the signal from low range to high range frequencies is shifted. First, the L/R signals are input to the QM02-2 and the L-R (phase difference component) signal is extracted. This L-R signal passes through the phase shifter (QM03, QM04-1) and then enters the matrix circuit (QM01). Here the L-R signal is applied in reverse phase to the L signal and in same phase to the R signal. These signals then become the front L and R signals for the MATRIX and HALL surround modes. The adder (QM02-1) produces an L+R signal which is used as the surround signal in the HALL surround mode and as the L channel signal in SIMULATED STEREO mode.
- **Peak indicator amplifier**  
The L/R signals from the buffer amplifier (QE01) are half-wave rectified by diodes DP01 and DP02 and then added. The half-wave rectified signal is amplified by 32 dB by an op amp (QM04-2). The amplified signal is rectified again by a diode and capacitor to become a DC voltage (approx. 4.5V) which is input to pin 14 of the microprocessor (QU01) to light the peak indicator.



● **Dolby Pro Logic decoder**

This circuit uses a Pro Logic decoder to decode a Dolby-encoded signal into four signals for the front left, front right, center and surround channels. The IC used is an NJM2175L (Q601). This circuit operates together with center mode control.

This IC has 2-channel and 3-channel modes in addition to the Dolby Pro Logic 4-channel mode, but in this unit the IC is used for 4-channel operation only. (See the Q601 Function Table.) Also, the center mode is controlled by the  $\mu$ PD6345C (Q603) and TC9214P (Q604).

The signal output from the buffer amplifier (QF01) is input to the L and R input pins of the Dolby Pro Logic decoder (Q601, pins 17 and 18). The front L and R channel signals decoded here are then output from pins 36 and 38 of Q601 and input to the surround mode selector (QM05). These signals are then output as the front L and R channel signals whenever the unit is set to Dolby surround mode. In the same way, the center signal is output from pin 41 of Q601 and input to the master volume (RG01).

The surround signal is output from pin 42 of Q601, input to the surround mode selector (QM05), and then sent to the digital delay circuit (Q602). After the signal is applied with a delay in this circuit, it is returned to the Q601 and input to the Dolby B decoder circuit. The signal is then output from pin 31 of Q601 as the final surround signal. After that, the signal passes through QM05 and enters the master volume (RG01).

There are four center modes—NORMAL, PHANTOM, WIDE and OFF. Control of these modes is carried out by the TC9214P (Q604), which is in turn controlled by the port expander  $\mu$ PD6345C (Q603). The center mode control signal from the microprocessor is input as serial data from pins 36, 46 and 47 of QU01 to pins 3, 13 and 14 of Q603 to set each of Q603's ports to H or L. The control pins of the analog switch (Q604) connected to these ports turn the internal switches ON/OFF to control the Q601's center mode. (See the Q601 Function Table.) When the center mode is set to NORMAL, the center channel signal's low-frequency component is output to the front L and R channels. In PHANTOM mode, since no center speaker is used, the entire center channel signal is distributed to the front L and R channels. When set to OFF—the mode where no center channel is output—the center channel signal is used when adjusting the balance. The Q603, in addition to controlling the center mode, also carries out control of the Q601 noise sequencer and the motor used for the master volume control. The noise sequencer functions to generate the signal used to adjust the balance of each channel in Dolby Pro Logic mode. When the TEST TONE switch is pressed ON, the noise sequencer outputs pink noise to each channel in sequence at 1.5-second intervals in the order: L → CENTER → R → SURROUND → L. (See the Q601 Function Table.)

NJM2175L (Q601) Function Table

NOISE SEQUENCER				OPERATION MODE		
PIN NAME PIN No.	NOISE-CNT-E PIN 26	NOISE-CNT-A PIN 27	NOISE-CNT-B PIN 28	PIN NAME PIN No.	MODE-CNT PIN 33	Note
SIGNAL SELECT	H	X	X	2CH (Lt, Rt, S')	L	S' = Lt-Rt or NOISE
NOISE L	L	L	L	3CH (L, C, R, S')	High Z	S' = Lt-Rt or NOISE
NOISE C	L	L	H	4CH (L, C, R, S', S)	H	
NOISE R	L	H	L	CENTER MODE		
NOISE S	L	H	H	PIN NAME PIN No.	CENTER-CNT PIN 32	CENTER-MODE PIN 40
				CENTER OFF	L	X
				NORMAL	H	0.22 $\mu$ F
				PHANTOM	H	OPEN
				WIDEBAND	H	10 $\mu$ F

● **Digital delay**

This circuit uses the M50198 (Q602) to add a time delay to the surround channel signal when a surround mode is selected, and is controlled by the microprocessor.

10 kHz active filters (L.P.F.) are placed on both the input side and output side of the delay circuit. Each filter has a gain of 0 dB. The delay times used for the various modes are as follows:

DOLBY: 15 ~ 30 ms, MATRIX/HALL/SIMULATED:  
5 ~ 40 ms

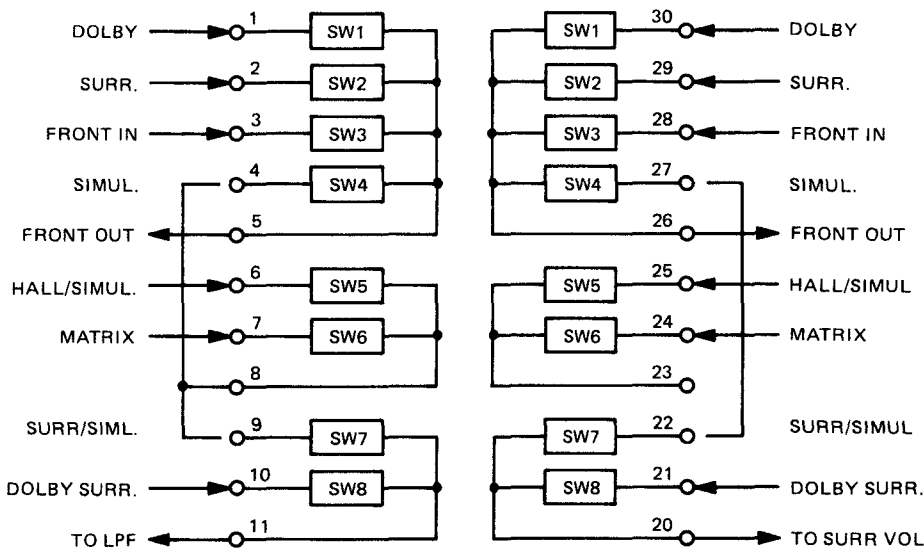
Initial delay settings are as follows:

DOLBY/MATRIX/HALL: 20 ms, SIMULATED:  
10 ms

● Surround mode selector

The LC7821 (QM05) is used for the surround mode selector, which switches the surround modes in the following sequence:

OFF → DOLBY → MATRIX → HALL → SIMULATED



LC7821 (QM05) Function Table

SURROUND SELECTOR	SWITCH No.							
	1	2	3	4	5	6	7	8
OFF	0	0	1	0	X	X	X	X
DOLBY	1	0	0	0	0	0	0	1
MATRIX	0	1	0	0	0	1	1	0
HALL	0	1	0	0	1	0	1	0
SIMULATED STEREO	0	0	0	1	1	0	1	0

0 = SWITCH OFF  
 1 = SWITCH ON  
 X = DON'T CARE

3. Master Volume

- The master volume (RG01) is a motor-driven quadruple potentiometer for controlling the volume of the front left, front right, center and surround channels. Control of the motor is carried out by the LB1630 (Q605). Q605 is a motor drive IC with pins 1 and 4 used for input and pins 5 and 8 used for output.

LB1630 (Q605) Function Table

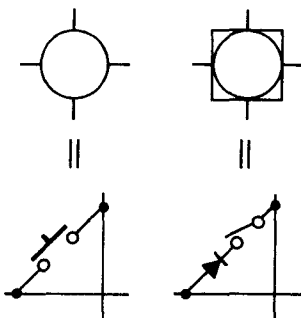
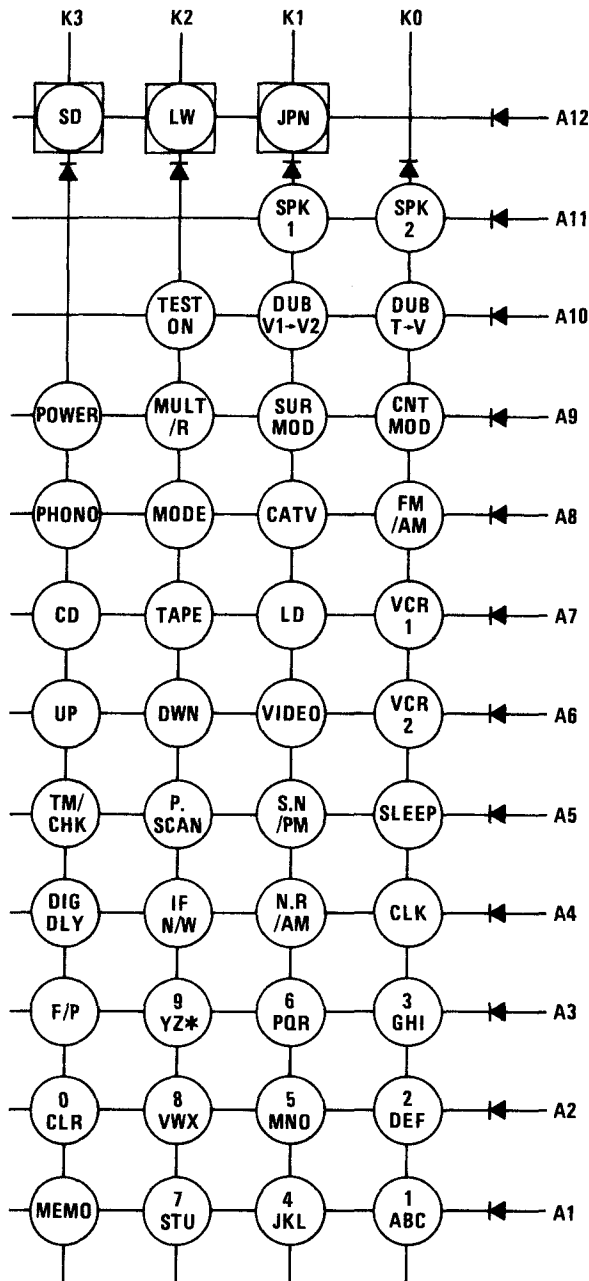
Volume	Input		Output	
	1	4	5	8
UP	L	H	H	L
DOWN	H	L	L	H
STOP	L	L	L	L

Q605 is controlled by the  $\mu$ PD6345C (Q603). Q603 is controlled by serial data from the microprocessor.

4. Center/Surround Volume


- Electronic potentiometers (TC9213P) are used for the center channel volume (QG01) and surround channel volume (QG03). One potentiometer consists of an element for varying the volume in 10 dB steps and an element for varying the volume in 1 dB steps. Buffer amplifiers (QG02 or QG04, NJM4558DD) are located between the elements.  
 In multi room mode, QG01 functions as the surround channel volume and QG03 functions as the multi room volume.


## Key Matrix



## Description of Keys


### 1. Diode Switches (for initial settings)


 : Used to switch the tuner frequency band. When pressed ON, the AM band unconditionally becomes MW and LW. The FL display shows MW and LW.


 : Used to switch the tuner frequency band. When pressed ON, the band is unconditionally switched to the Japan version.




Resetting the initial settings: Initial settings are recalled when HOLD goes from LO to HI while the POWER key is held pressed.


### 2. Momentary Switches and Lock Switches (switches are momentary unless indicated otherwise)


 : This key turns ON when an SD signal is input in TUNER mode. When turned ON, the stipulated operation is carried out. (Lock switch)


 : Used to set the unit to clock mode. When this key is pressed, the FL display switches to the clock display and stays in clock mode until the current general operation is completed.


 : Used to set the unit to timer mode and to check the program contents after the timer is set. If this key is pressed after a timer program has been set, the program contents are shown on the FL display in the specified sequence. If no timer program is set, the unit enters timer mode allowing the user to select the timer program or to set the timer to execute or standby mode.

 ~  : Used for entering numbers and alphabetic characters when recalling preset stations and entering station names. A space can be inserted by entering the \*symbol with the  key. Although these keys are normally used as numeric keys, when the S.N/PM (Station Name/PM) key is pressed to set the unit to station name preset mode, they are used for entering alphabetic characters. One press enters the first alphabetic from the left (e.g., "A" when the ABC key is pressed), and subsequent pressing allows the user to select one of the key's four characters in sequence (e.g., A → B → C → 1 → A).

 : Used for entering "0" and also as a CLEAR key in various modes.

 : This is the sleep timer mode key, used for operations such as turning the sleep timer mode ON/OFF.

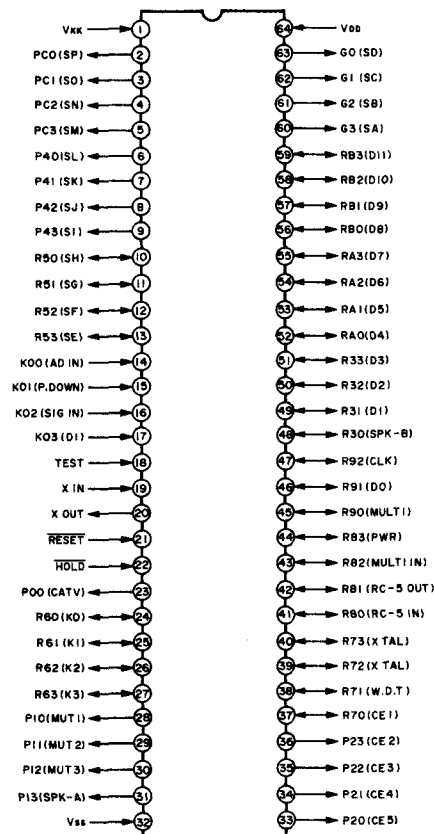
 : Used as a noise reduction switch and for entering AM/PM in clock mode and timer mode. The setting of the N.R switch is included in data sent to the PLL. When used as an N.R switch, noise reduction is alternately switched ON and OFF.

 : Used to switch the IF band between NARROW and WIDE. This switch normally functions only in FM mode, but can also function in AM mode depending on the initial settings. It is included in PLL port data.

- DIG DLY** : This is the digital delay control key. When pressed, the current delay time is displayed for five seconds, during which time the delay time can be changed using the UP or DOWN key.
- P SCAN** : Used for automatically scanning the tuner's preset channels. When this key is pressed, the FL display's "PRESET SCAN" segments blink and preset scanning can be started by pressing the UP or DOWN key.
- MEMO** : Used to enter a memory mode such as preset memory, timer set or station name preset mode, or to complete the memory operation.
- POWER** : Turns the power ON/OFF. This is a non-lock switch which turns the power ON and OFF alternately. When turned OFF, all output ports except for specified ports become LO level, but specified input ports and the remote control input port remain accessible.
- F/P** : This is the Frequency/Preset key used for switching the FL display mode between the frequency display and preset display. The initial setting is the frequency display mode. The frequency and preset display modes are switched in cyclic sequence. The UP/DOWN keys and other keys function differently depending on the display mode.
- CNT MOD** : Used for selecting the mode of the center channel used in surround mode. Operation of this key is coupled with the surround mode key and is valid only in Dolby mode.
- SUR MOD** : This key selects the surround mode and is accessible at all times.
- MULT /R** : Used for setting the unit to multi room mode. In multi room mode, certain restrictions apply to the surround modes. Also, the volume control for the center and surround channels is switched for use as the multi room volume control.
- S.N /PM** : Used to set the station name preset mode and for entering the PM indicator in clock mode. Operation as the station name key is valid only in tuner mode.
- SPK 1**, **SPK 2** : Used for selecting the speaker system. These keys are initially set to OFF (port is LO) and switch ON/OFF in cyclic sequence. The corresponding output ports switch ON/OFF. Current settings are stored by the last memory function.
- TEST ON** : The signal used for adjusting the Dolby surround level is turned ON/OFF by this key. The initial setting is OFF. When switched ON, the unit unconditionally enters Dolby surround mode and the surround mode selector is set.
- DUB VI-V2**, **DUB T-V** : These are dubbing switch keys which control the input selector data.
- PHONO**, **VCR 1**, **VCR 2**, **CD**, **LD**, **TAPE**, **VIDEO** : These are input selector keys. Each key outputs the corresponding serial data.
- MODE** : Switches the FM mode between stereo and monaural. When the AM/STEREO initial setting is set, this switch can also be used to switch the AM mode between stereo and monaural. Switching is carried out by serial data sent to the PLL. In either case, the initial mode is stereo. Switch operation is cyclic. In stereo mode, "AUTO" lights in the FL display.
- CATV** : Controls the CATV dedicated port in the FM band. When CATV is selected, the CATV port goes HI. The FL display normally shows "CATV" in this case. If JPN is set, however, the FL display shows "ANT B".
- FM /AM** : Used to switch the tuner frequency band. The initial setting is FM. Switch operation is cyclic. When two bands are set the FL display is "FM/AM", and when LW is added the display is "FM.MW/LW". The band is switched in the sequence: FM → MW → LW → FM.
- UP**, **DWN** : Used for increasing/decreasing the tuner frequency or preset channel number. UP adds and DOWN subtracts. Operation differs depending on the mode set by the F/P key. In frequency mode, the keys increase/decrease the frequency, and in preset mode, the keys increase/decrease the preset channel number. In station name preset mode, the keys function as cursor keys for selecting the character input position.

\* Except for special cases (service mode), when several keys are pressed the last-pressed key has priority.

# 11. MICROPROCESSOR DATA



Pin Nbr.	Pin Name	I/O	Active	Function	Pin Nbr.	Pin Name	I/O	Active	Function
1	VKK	-	-	-35V (FL Display Drive)	33	P20 (CE5)	O	H	Digital Delay Control
2	PC0 (SP)	O	H	FL P-segment/Key Switch (A12)	34	P21 (CE4)	O	H	Surround/Multi Room Volume Chip Enable
3	PC1 (SO)	O	H	FL O-segment/Key Switch (A11)	35	P22 (CE3)	O	H	Center/Surround Volume Chip Enable
4	PC2 (SN)	O	H	FL N-segment/Key Switch (A10)	36	P23 (CE2)	O	H	Port Expander Chip Enable
5	PC3 (SM)	O	H	FL M-segment/Key Switch (A9)	37	R70 (CE1)	O	H	Analog Switch/PLL Chip Enable
6	P40 (SL)	O	H	FL L-segment/Key Switch (A8)	38	R71 (W.D.T)	O	L	Watch-Dog Timer
7	P41 (SK)	O	H	FL K-segment/Key Switch (A7)	39	R72 (XTAL)	I	-	Slow Mode Clock (32.768 kHz)
8	P42 (SJ)	O	H	FL J-segment/Key Switch (A6)	40	R73 (XTAL)	O	-	
9	P43 (SI)	O	H	FL I-segment/Key Switch (A5)	41	R80 (RC-5 IN)	I	L	Remote Control (RC-5) Input
10	R50 (SH)	O	H	FL H-segment/Key Switch (A4)	42	R81 (RC-5 OUT)	O	H	Remote Control (RC-5) Output
11	R51 (SG)	O	H	FL G-segment/Key Switch (A3)	43	R82 (MULTI IN)	I	L	Remote Control (Multi Room) Input
12	R52 (SF)	O	H	FL F-segment/Key Switch (A2)	44	R83 (PWR)	O	H	Power Relay Drive
13	R53 (SE)	O	H	FL E-segment/Key Switch (A1)	45	R90 (MULTI)	O	H	Multi Room Mode
14	K00 (AD IN)	I	-	Analog Input	46	R91 (DO)	O	H	Serial Data
15	K01 (P. DOWN)	I	L	Power On/Off (Off = L)	47	R92 (CLK)	O	H	Serial Clock
16	K02 (SIG. IN)	I	-	Signal Strength Indicator	48	R30 (SPK-B)	O	H	Speaker-B Relay
17	K03 (DI)	I	H	Serial Data Input	49	R31 (D1)	O	H	FL Display D1 Digit
18	TEST	-	-	Not Used	50	R32 (D2)	O	H	FL Display D2 Digit
19	X IN	I	-	Clock (4.19 MHz)	51	R33 (D3)	O	H	FL Display D3 Digit
20	X OUT	O	-		52	RA0 (D4)	O	H	FL Display D4 Digit
21	RESET	I	L	Reset and Watch-Dog Timer	53	RA1 (D5)	O	H	FL Display D5 Digit
22	HOLD	I	L	Hold Mode	54	RA2 (D6)	O	H	FL Display D6 Digit
23	P00 (CATV)	O	H	Relay Trigger Output for CATV	55	RA3 (D7)	O	H	FL Display D7 Digit
24	R60 (K0)	I	H	Key Switch	56	R80 (D8)	O	H	FL Display D8 Digit
25	R61 (K1)	I	H		57	RB1 (D9)	O	H	FL Display D9 Digit
26	R62 (K2)	I	H		58	RB2 (D10)	O	H	FL Display D10 Digit
27	R63 (K3)	I	H		59	RB3 (D11)	O	H	FL Display D11 Digit
28	P10 (MUT1)	O	H	Front Muting	60	G3 (SA)	O	H	FL Display A-segment
29	P11 (MUT2)	O	H	Center/Surround Muting	61	G2 (SB)	O	H	FL Display B-segment
30	P12 (MUT3)	O	H	Surround Muting	62	G1 (SC)	O	H	FL Display C-segment
31	P13 (SPK-A)	O	H	Speaker-A Relay	63	G0 (SD)	O	H	FL Display D-segment
32	VSS	-	-	GND	64	VDD	-	-	+5.5V





REF. DESIG.	PART NO.	DESCRIPTOIN
<b>PE04-RESISTORS</b>		
RE19	RM01030820	10k $\Omega$ VARIABLE E BASS
RE20	RM01030820	10k $\Omega$ VARIABLE E TREBLE
RE31	GG05101160	100 $\Omega$ $\pm$ 5% 1/6W
RE32	GG05101160	100 $\Omega$ $\pm$ 5% 1/6W
RE37	RM01030720	10k $\Omega$ x 2 VARIABLE B
RE38	RK01040600	100k $\Omega$ VARIABLE W
RE39	RK01040600	100k $\Omega$ VARIABLE W
<b>PE04-SEMICONDUCTORS</b>		
QE01	HT30001000	TRANSISTOR 2SC536SP, etc.
QE02	HT30001000	TRANSISTOR 2SC536SP, etc.
QE03	HT421442A0	TRANSISTOR 2SD2144S (U,V)
QE04	HT421442A0	TRANSISTOR 2SD2144S (U,V)
QE05	HC10053090	IC NJM-2068-DD
QE06	BA20012210	TRANSISTOR, DIGITAL DTC144ES
QE07	BA10010210	TRANSISTOR, DIGITAL DTA144ES
<b>PE04-MISCELLANEOUS</b>		
JE05	YJ01003410	H.P.JACK,
SE01	SP02012020	PUSH SWITCH, BASS EQ
<b>PG04-MASTER VOLUME CIRCUIT BOARD</b>		
<b>PG04-CAPACITORS</b>		
CG51	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
<b>PG04-RESISTORS</b>		
RG01	RY01040190	100k $\Omega$ x 4, VARIABLE B
<b>PJ04-PRE-OUT, MAIN-IN TERMINAL CIRCUIT BOARD</b>		
<b>PJ04-CAPACITORS</b>		
CJ01	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
CJ02	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
CJ03	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
<b>PJ04-MISCELLANEOUS</b>		
JJ01	YT02040990	TERMINAL, 4P RCA
JJ02	YT02040990	TERMINAL, 4P RCA
JJ03	YT02020520	TERMINAL, 2P RCA
JJ08	YQ01000080	SHORT PLUG

REF. DESIG.	PART NO.	DESCRIPTOIN
<b>PL04-VIDEO SELECTOR CIRCUIT BOARD</b>		
<b>PL04-CAPACITORS</b>		
CL01	EJ10601610	ELECT 10 $\mu$ F 16V
CL02	EJ10601610	ELECT 10 $\mu$ F 16V
CL04	EJ10601610	ELECT 10 $\mu$ F 16V
}		
CL07		
CL10	EJ10601610	ELECT 10 $\mu$ F 16V
}		
CL13		
CL18	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
<b>PL04-RESISTORS</b>		
RL01	GD05750160	75 $\Omega$ $\pm$ 5% 1/6W
}		
RL07		
<b>PL04-SEMICONDUCTORS</b>		
QL01	HC10275030	IC LC7824
QL02	HC10046170	IC MC14576AP
QL03	HC10046170	IC MC14576AP
QL04	HC10275030	IC LC7824
QL05	HC10046170	IC MC14576AP
QL06	HC10046170	IC MC14576AP
<b>PL04-MISCELLANEOUS</b>		
JL01	YT02030060	TERMINAL, 3P RCA PINJACK
JL02	YT02040710	TERMINAL, RCA PIN JACK
<b>PL54-VIDEO S-TERMINAL CIRCUIT BOARD</b>		
<b>PL54-CAPACITORS</b>		
CL51	EJ10601610	ELECT 10 $\mu$ F 16V
CL52	EJ10601610	ELECT 10 $\mu$ F 16V
<b>PL54-RESISTORS</b>		
RL51	GD05750160	75 $\Omega$ $\pm$ 5% 1/6W
}		
RL54	GD05750160	75 $\Omega$ $\pm$ 5% 1/6W
RL57		
}		
RL60		
<b>PL54-MISCELLANEOUS</b>		
JL51	YJ11000370	JACK, S-VIDEO
}		
JL54		
<b>PT04-FRONT VIDEO JACK CIRCUIT BOARD</b>		
<b>PT04-CAPACITORS</b>		
CT01	DA17223110	CERAMIC 0.022 $\mu$ F $\pm$ 20% 25V
CT02	EG10601650	ELECT 10 $\mu$ F 16V
CT03	EG10601650	ELECT 10 $\mu$ F 16V

REF. DESIG.	PART NO.	DESCRIPTOIN
CT04	DA17223110	CERAMIC 0.022 $\mu$ F $\pm$ 20% 25V
		<b>PT04-RESISTORS</b>
RT02	GD05750160	75 $\Omega$ $\pm$ 5% 1/6W
RT03	GD05750160	75 $\Omega$ $\pm$ 5% 1/6W
RT04	GD05750160	75 $\Omega$ $\pm$ 5% 1/6W
		<b>PT04-MISCELLANEOUS</b>
JT01	BY04040020	TERMINAL, RCA PIN JACK x 3
		<b>PU04-<math>\mu</math>-PROCESSOR &amp; SWITCH CIRCUIT BOARD</b>
		<b>PU04-CAPACITORS</b>
CU01	EJ10700610	ELECT 100 $\mu$ F 6.3V
CU02	EX10400530	ELECT 0.1F 5.5V
CU03	EJ10700610	ELECT 100 $\mu$ F 6.3V
CU04	DA17103110	CERAMIC 0.01 $\mu$ F $\pm$ 20% 16V
CU06	DD15150300	CERAMIC 15pF $\pm$ 5% 50V BLK
CU07	DD15150300	CERAMIC 15pF $\pm$ 5% 50V BLK
CU08	EJ10405010	ELECT 0.1 $\mu$ F 50V
CU09	EJ10601610	ELECT 10 $\mu$ F 16V
CU55	DA17103110	CERAMIC 0.01 $\mu$ F $\pm$ 20% 16V
CU56	DA17103110	CERAMIC 0.01 $\mu$ F $\pm$ 20% 16V
		<b>PU04-RESISTORS</b>
GU01	BW05104080	RESISTOR COMPO. 100k $\Omega$ x 4
GU02	BW05103230	RESISTOR COMPO. 10k $\Omega$ x 6
GU03	BW05103230	RESISTOR COMPO. 10k $\Omega$ x 6
RU03	GD05335160	3.3M $\Omega$ $\pm$ 5% 1/6W
RU05	GD05335160	3.3M $\Omega$ $\pm$ 5% 1/6W
RU07	GD05335160	3.3M $\Omega$ $\pm$ 5% 1/6W
RU51	GA05100010	10 $\Omega$ $\pm$ 5% 1W
		<b>PU04-SEMICONDUCTORS</b>
DU01 } DU16 DU19 } DU26	HD20002000	DIODE 1SS176, MA165, 1SS254
	HD20002000	DIODE 1SS176, MA165, 1SS254
DU51	HD31501000	ZENER DIODE 15V RD15JB3, etc.
QU01	HU10049050	MICROPROCESSOR TMP47C1670AN
QU02	HT10001000	TRANSISTOR 2SA608SP, etc.
QU03	HT421442A0	TRANSISTOR 2SD2144S(U, V)
QU04	BA10010210	TRANSISTOR, DIGITAL DTA144ES
QU06	HT30001000	TRANSISTOR 2SC536SP, etc.
QU07	BA20012210	TRANSISTOR, DIGITAL DTC144ES
QU08	BA10010210	TRANSISTOR, DIGITAL DTA144ES
QU09	HT30001000	TRANSISTOR 2SC536SP, etc.
QU10	BA10010210	TRANSISTOR, DIGITAL DTA144ES
QU11	BA20017210	TRANSISTOR, DIGITAL DTC114TS
▲QU51	HC10263030	IC L78MR06

REF. DESIG.	PART NO.	DESCRIPTOIN
		<b>PU04-MISCELLANEOUS</b>
SU01	SP01011280	PUSH SWITCH, 1/ABC
SU02	SP01011280	PUSH SWITCH, 2/DEF
SU03	SP01011280	PUSH SWITCH, 3/GHI
SU04	SP01011280	PUSH SWITCH, CLOCK
SU05	SP01011280	PUSH SWITCH, SLEEP
SU06	SP01011280	PUSH SWITCH, 4/JKL
SU07	SP01011280	PUSH SWITCH, 5/MNO
SU08	SP01011280	PUSH SWITCH, 6/PQR
SU09	SP01011280	PUSH SWITCH, N.R/AM
SU10	SP01011280	PUSH SWITCH, S.N/PM
SU11	SP01011280	PUSH SWITCH, 7/STU
SU12	SP01011280	PUSH SWITCH, 8/VWX
SU13	SP01011280	PUSH SWITCH, 9/YZ
SU14	SP01011280	PUSH SWITCH, IF W/N
SU15	SP01011280	PUSH SWITCH, P.SCAN
SU16	SP01011280	PUSH SWITCH, MEMO
SU17	SP01011280	PUSH SWITCH, 0/CLR
SU18	SP01011280	PUSH SWITCH, F/P
SU19	SP01011280	PUSH SWITCH, DIG.DELAY
SU20	SP01011280	PUSH SWITCH, TIMER/CHECK
SU21	SP01011280	PUSH SWITCH, SPK1
SU22	SP01011280	PUSH SWITCH, SPK2
SU23	SP01011280	PUSH SWITCH, T-V1
SU24	SP01011280	PUSH SWITCH, V1-V2
SU25	SP01011280	PUSH SWITCH, T.TONE
SU26	SP01011280	PUSH SWITCH, DOWN
SU27	SP01011280	PUSH SWITCH, UP
SU28	SP01011280	PUSH SWITCH, MULTI
SU29	SP01011280	PUSH SWITCH, SUR MODE
SU30	SP01011280	PUSH SWITCH, CENT MODE
SU31	SP01011280	PUSH SWITCH, FM/AM
SU32	SP01011280	PUSH SWITCH, CATV
SU33	SP01011280	PUSH SWITCH, MODE
SU34	SP01011280	PUSH SWITCH, PHONO
SU35	SP01011280	PUSH SWITCH, CD
SU36	SP01011280	PUSH SWITCH, TAPE
SU37	SP01011280	PUSH SWITCH, LD
SU38	SP01011280	PUSH SWITCH, VCR1
SU39	SP01011280	PUSH SWITCH, VCR2
SU40	SP01011280	PUSH SWITCH, VIDEO
SU51	SP02012040	PUSH SWITCH
VU01	HQ31102060	DISPLAY UNIT, FIP13BM10
XU01	FQ04194020	SERAMIC VIB., EFO-GC4194T3 4.19MHz
XU02	XO001001T2	CRYSTAL, DT-38 32.768kHz
		<b>PU74-IR SENSOR CIRCUIT BOARD</b>
		<b>PU74-SEMICONDUCTORS</b>
DU71	HI10062320	L.E.D.LT3D8B RED
		<b>PU74-MISCELLANEOUS</b>
QU71	HW10012320	PHOTO UNIT, GPIU520X 36.0kHz

REF. DESIG.	PART NO.	DESCRIPTOIN
<b>PV04-MAIN AMP/FUNCTION SELECT CIRCUIT BOARD</b>		
<b>PV04-CAPACITORS</b>		
CN04	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
CN08	DA17103110	CERAMIC 0.01 $\mu$ F $\pm$ 20% 16V
CN09	DA17103110	CERAMIC 0.01 $\mu$ F $\pm$ 20% 16V
CV01	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
CV02	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
CV03	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
C403	EJ10601610	ELECT 10 $\mu$ F 16V
C404	EJ10601610	ELECT 10 $\mu$ F 16V
C419	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
C705	DD15330300	CERAMIC 33pF $\pm$ 5% 50V BLK
C706	DD15330300	CERAMIC 33pF $\pm$ 5% 50V BLK
C711	DD11100560	CERAMIC 10pF $\pm$ 1% SL 500V
C712	DD11100560	CERAMIC 10pF $\pm$ 1% SL 500V
C713	DD11070300	CERAMIC 7pF $\pm$ 1% CH 50V BLK
C714	DD11070300	CERAMIC 7pF $\pm$ 1% CH 50V BLK
C717		
}	DD15101560	CERAMIC 100pF $\pm$ 5% SL 500V
C720		
C727	EA10610010	ELECT 10 $\mu$ F 100V
C728	EA10610010	ELECT 10 $\mu$ F 100V
C760	DD11100300	CERAMIC 10pF $\pm$ 1% CH 50V BLK
C761	DD11100300	CERAMIC 10pF $\pm$ 1% CH 50V BLK
C762	DD11100300	CERAMIC 10pF $\pm$ 1% CH 50V BLK
C764	EA10610010	ELECT 10 $\mu$ F 100V
C765	EA10610010	ELECT 10 $\mu$ F 100V
C774		
}	EA10606310	ELECT 10 $\mu$ F 63V
C777		
C801	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
C802	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
<b>PV04-RESISTORS</b>		
RN13	GG05100160	10 $\Omega$ $\pm$ 5% 1/6W
RN14	GG05100160	10 $\Omega$ $\pm$ 5% 1/6W
RN21	GG05100160	10 $\Omega$ $\pm$ 5% 1/6W
RN22	GG05100160	10 $\Omega$ $\pm$ 5% 1/6W
RN23	GG05100160	10 $\Omega$ $\pm$ 5% 1/6W
RV49	GG05101140	100 $\Omega$ $\pm$ 5% 1/4W
R417	GG05101140	100 $\Omega$ $\pm$ 5% 1/4W
R418	GG05101140	100 $\Omega$ $\pm$ 5% 1/4W
R713	GG05680160	68 $\Omega$ $\pm$ 5% 1/6W
R714	GG05680160	68 $\Omega$ $\pm$ 5% 1/6W
R719	RA01020780	1k $\Omega$ TRIMMING
R720	RA01020780	1k $\Omega$ TRIMMING
R725		
}	GG05680160	68 $\Omega$ $\pm$ 5% 1/6W
R730		
R731	GA05221010	220 $\Omega$ $\pm$ 5% 1W
R732	GA05221010	220 $\Omega$ $\pm$ 5% 1W
R733		
}	GG05220160	22 $\Omega$ $\pm$ 5% 1/6W
R736		

REF. DESIG.	PART NO.	DESCRIPTOIN
▲R737	BZ10182020	0.18 $\Omega$ K 5W x 2, RESISTOR COMP
▲R738	BZ10182020	0.18 $\Omega$ K 5W x 2, RESISTOR COMP
R739	GG05680160	68 $\Omega$ $\pm$ 5% 1/6W
R740	GG05680160	68 $\Omega$ $\pm$ 5% 1/6W
R743	GA05100020	10 $\Omega$ $\pm$ 5% 2W
R744	GA05100020	10 $\Omega$ $\pm$ 5% 2W
R745	GA05472010	4.7k $\Omega$ $\pm$ 5% 1W
R747	GA05331020	330 $\Omega$ $\pm$ 5% 2W
R748	GA05331020	330 $\Omega$ $\pm$ 5% 2W
R766		
}	GG05470160	47 $\Omega$ $\pm$ 5% 1/6W
R769		
▲R770	NF02471140	470 $\Omega$ $\pm$ 2% 1/4W, FUSIBLE
▲R771	GO10222030	0.22 $\Omega$ $\pm$ 5% 3W
▲R772	GO10222030	0.22 $\Omega$ $\pm$ 5% 3W
▲R773	GO10222030	0.22 $\Omega$ $\pm$ 5% 3W
R774	GA05047020	4.7 $\Omega$ $\pm$ 5% 2W
R775	GA05047010	4.7 $\Omega$ $\pm$ 5% 1W
R776	GA05047010	4.7 $\Omega$ $\pm$ 5% 1W
▲R801	NH05010120	1 $\Omega$ $\pm$ 5% 1/2W, FUSIBLE
▲R802	NH05010120	1 $\Omega$ $\pm$ 5% 1/2W, FUSIBLE
<b>PV04-SEMICONDUCTORS</b>		
DN01	HD20027010	DIODE HSS81TD
DN02	HD20027010	DIODE HSS81TD
DN03		
}	HD20002000	DIODE 1SS176, MA165, 1SS254
DN09		
DN51	HD20002000	DIODE 1SS176, MA165, 1SS254
DN52	HD20002000	DIODE 1SS176, MA165, 1SS254
DN53	HD20002000	DIODE 1SS176, MA165, 1SS254
DN54	HD20027010	DIODE HSS81TD
DN55	HD20002000	DIODE 1SS176, MA165, 1SS254
DN56	HD20002000	DIODE 1SS176, MA165, 1SS254
D701	HD30821000	ZENER DIODE 8.2V RD8.2JB2, etc.
D702	HD31501000	ZENER DIODE 15V RD15JB3, etc.
D703		
}	HD20002000	DIODE 1SS176, MA165, 1SS254
D706		
D801		
}	HD20029050	DIODE S5688G
D805		
QG01	HC10304050	IC TC9213P
QG02	HC10008090	IC NJM4558D-D
QG03	HC10304050	IC TC9213P
QG04	HC10008090	IC NJM4558D-D
▲QN01	HT322402A0	TRANSISTOR 2SC2240 (GR, BL)
▲QN02	HT322402A0	TRANSISTOR 2SC2240 (GR, BL)
▲QN03	HT109702A0	TRANSISTOR 2SA970 (GR, BL)
QN04	HT333122A0	TRANSISTOR 2SC3312 (R, S)
QN05	HT333122A0	TRANSISTOR 2SC3312 (R, S)
▲QN06	HC10042050	IC TA7317P
QN07	BA20012210	TRANSISTOR, DIGITAL DTC144ES
QN08	BA20028210	TRANSISTOR, DIGITAL DTC323TS
▲QN09	BA10010210	TRANSISTOR, DIGITAL DTA144ES
QN51	HT322402A0	TRANSISTOR 2SC2240 (GR, BL)
QN52	HT322402A0	TRANSISTOR 2SC2240 (GR, BL)
QN53	HT322402A0	TRANSISTOR 2SC2240 (GR, BL)
QN54	HT109702A0	TRANSISTOR 2SA970 (GR, BL)

REF. DESIG.	PART NO.	DESCRIPTOIN
QS01	HC10008090	IC NJM4558D-D
QS02	HT421442A0	TRANSISTOR 2SD2144S(U, V)
QS03	BA10010210	TRANSISTOR, DIGITAL DTA144ES
QS04	BA20012210	TRANSISTOR, DIGITAL DTC144ES
QV01	HC10228030	IC LC7821
QV02	HC10247030	IC LC7823
QV03	HC10241030	IC LC7822
QV04	BA20012210	TRANSISTOR, DIGITAL DTC144ES
QV05	BA10010210	TRANSISTOR, DIGITAL DTA144ES
QV06	HT421442A0	TRANSISTOR 2SD2144S (U, V)
QV07	BA20012210	TRANSISTOR, DIGITAL DTC144ES
QV08	BA10010210	TRANSISTOR, DIGITAL DTA144ES
QV09	HT421442A0	TRANSISTOR 2SD2144S (U, V)
QV10	HT421442A0	TRANSISTOR 2SD2144S (U, V)
Q401	HC10008090	IC NJM4558D-D
▲ Q701	HT111452A0	TRANSISTOR 2SA1145 (O, Y)
▲ Q702	HT111452A0	TRANSISTOR 2SA1145 (O, Y)
▲ Q703	HT327052A0	TRANSISTOR 2SC2705 (O, Y)
▲ Q704	HT327052A0	TRANSISTOR 2SC2705 (O, Y)
▲ Q705	HT334191Y0	TRANSISTOR 2SC3419
▲ Q706	HT334191Y0	TRANSISTOR 2SC3419
Q707	HT332982D0	TRANSISTOR 2SC3298 (O, Y)
Q708	HT332982D0	TRANSISTOR 2SC3298 (O, Y)
Q709	HT113062D0	TRANSISTOR 2SA1306 (O, Y)
Q710	HT113062D0	TRANSISTOR 2SA1306 (O, Y)
Q711	HT332812A0	TRANSISTOR 2SC3281 (R, O)
Q712	HT332812A0	TRANSISTOR 2SC3281 (R, O)
Q713	HT113022A0	TRANSISTOR 2SA1302 (R, O)
Q714	HT113022A0	TRANSISTOR 2SA1302 (R, O)
▲ Q715	HC10066020	IC AN7062N
▲ Q751	HC10276030	IC STK4219MK2
▲ Q801	HC38912090	IC NJM7812FA
▲ Q802	HC39912090	IC NJM7912FA
▲ Q803	HC38905090	IC NJM7805FA
▲ Q804	HC39905090	IC NJM7905FA
<b>PV04-MISCELLANEOUS</b>		
JV01	YT02060360	TERMINAL, 6P RCA JACK
JV02	YT02060360	TERMINAL, 6P RCA JACK
JV03	YT02040860	TERMINAL, 4P RCA JACK
JV04	YT02020550	TERMINAL, 2P RCA JACK
JV05	YT02021020	TERMINAL, 2P RCA JACK
J401	YT02020990	TERMINAL, 2P RCA JACK
L701	ML08010030	AIR COIL
L702	ML08010030	AIR COIL
L751	ML08010030	AIR COIL
L752	ML08010030	AIR COIL
L753	ML08010030	AIR COIL
LN01	LY20240310	RELAY, VB24MBU
LN06		
LN07	LY20240240	RELAY, (24V)
S801	SP01011280	PUSH SWITCH, SYSTEM RESET

REF. DESIG.	PART NO.	DESCRIPTOIN
<b>PV54-CD/TAPE BUFFER AMP CIRCUIT BOARD</b>		
<b>PV54-CAPACITORS</b>		
CV51	EJ10601610	ELECT 10 $\mu$ F 16V
CV52	EJ10601610	ELECT 10 $\mu$ F 16V
CV55	EJ10601610	ELECT 10 $\mu$ F 16V
}		
CV58		
CV61	EJ10601610	ELECT 10 $\mu$ F 16V
}		
CV64		
CV71	EJ10601610	ELECT 10 $\mu$ F 16V
CV72	EJ10601610	ELECT 10 $\mu$ F 16V
CV75	EJ10601610	ELECT 10 $\mu$ F 16V
CV76	EJ10601610	ELECT 10 $\mu$ F 16V
<b>PV54-SEMICONDUCTORS</b>		
QV51	HC10053090	IC NJM2068DD
QV52	HC10053090	IC NJM2068DD
QV71	HC10053090	IC NJM2068DD
<b>PW04-FRONT SPEAKER TERMINALCIRCUIT BOARD</b>		
<b>PW04-MISCELLANEOUS</b>		
JW01	YT01040480	TERMINAL, SPK
JW02	YT01040470	TERMINAL, SPK
<b>PW54-CENTER/SURROUND SPK TERM. CIRCUIT BOARD</b>		
<b>PW54-MISCELLANEOUS</b>		
JW51	YT03080050	TERMINAL, 8P SPK
JW53	YT03020150	TERMINAL, 2P SPK
<b>P104-FM FRONT END &amp; FM/AM IFCIRCUIT BOARD</b>		
<b>P104-CAPACITORS</b>		
CA01	CT12000200	TRIMMING 20pF VCT51E
CA02	DK18223310	CERAMIC 0.022 $\mu$ F +80% -20% 50V
CA03	DD15150300	CERAMIC 15pF $\pm$ 5% 50V BLK
CA04	DD15470300	CERAMIC 47pF $\pm$ 5% 50V BLK
CA05	DF55391090	CERAMIC 390pF $\pm$ 5% 50V
CA06	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
CA15	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
CA17	DK18223310	CERAMIC 0.022 $\mu$ F +80% -20% 50V
CA20	EJ10601610	ELECT 10 $\mu$ F 16V
CA21	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
CA22	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
CA25	DK18473310	CERAMIC 0.047 $\mu$ F +80% -20% 50V
C101	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
C102	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V

REF. DESIG.	PART NO.	DESCRIPTOIN
C201 }	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
C206		
C207	DK18223310	CERAMIC 0.022 $\mu$ F +80% -20% 50V
C208	DK18223310	CERAMIC 0.022 $\mu$ F +80% -20% 50V
C209	EJ10601610	ELECT 10 $\mu$ F 16V
C210	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
C216	DK18223310	CERAMIC 0.022 $\mu$ F +80% -20% 50V
<b>P104-RESISTORS</b>		
RA17	RA04730780	470k $\Omega$ TRIMMING
R101	GG05103120	10k $\Omega$ $\pm$ 5% 1/2W
R102	GG05103120	10k $\Omega$ $\pm$ 5% 1/2W
R220	RA01040780	100k $\Omega$ TRIMMING
R221	GG05151140	150 $\Omega$ $\pm$ 5% 1/4W
R301	RA04720780	4.7k $\Omega$ TRIMMING
R302	RA04720780	4.7k $\Omega$ TRIMMING
<b>P104-SEMICONDUCTORS</b>		
DA01	HD40009030	VARICAP, SVC342-K
D101	HD20002000	DIODE 1SS176, MA165, 1SS254
D201		
}	HD20002000	DIODE 1SS176, MA165, 1SS254
D204		
D301	HD20002000	DIODE 1SS176, MA165, 1SS254
Q101	HT30001000	TRANSISTOR 2SC536SP, etc.
Q201	HC10222030	IC LA1266
Q202	HT318091P0	TRANSISTOR 2SC1809S(P)
Q203	HT318091P0	TRANSISTOR 2SC1809S(P)
Q206	HT10001000	TRANSISTOR 2SA608SP, etc.
Q302	HT10001000	TRANSISTOR 2SA608SP, etc.
Q304	HT10001000	TRANSISTOR 2SA608SP, etc.
Q305	HT30001000	TRANSISTOR 2SC536SP, etc.
Q306	HT30001000	TRANSISTOR 2SC536SP, etc.
Q307	HF200300B0	F.E.T.2SK30A Y
<b>P104-MISCELLANEOUS</b>		
A101	AV01202220	V.H.F.TUNER, FM FRONT END
FA01	FF10045360	CERAMIC FILTER SFF450D
F201	FF11070610	CERAMIC FILTER SFF10.7MA8-A
F202	FF11070620	CERAMIC FILTER SFE10.7MS3-A
F203	FF11070620	CERAMIC FILTER SFE10.7MS3-A
J101	YT01030100	TERMINAL, FM/AM ANT
J102	YT01010180	TERMINAL, F CONNECTOR
LA01	LA10295170	ANT COIL, MW 280 $\mu$ H
LA02	LO10013400	OSC COIL, MW
LA05	LC23960710	CHOKE COIL, TL-8 393J
LA06	LI70033510	I.F.T., AM IFT K7-H5,
L101	LY10120230	RELAY, UM1-12W-K
L201	LI70379040	I.F.T., FM DET COIL
L202	LI70379050	I.F.T., FM DET COIL FOR
S301	SS02020940	SLIDE SWITCH, SCAN STEP [ K ]

REF. DESIG.	PART NO.	DESCRIPTOIN
<b>P304-FM MPX &amp; PLL SYNTHESIZER CIRCUIT BOARD</b>		
<b>P304-CAPACITORS</b>		
CA23	DD15680300	CERAMIC 68pF $\pm$ 5% 50V BLK
CA24	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
C217	DD15680300	CERAMIC 68pF $\pm$ 5% 50V BLK
C302	EJ10601610	ELECT 10 $\mu$ F 16V
C306	EJ47601010	ELECT 47 $\mu$ F 10V
C317	EJ10601610	ELECT 10 $\mu$ F 16V
C501	DD15470300	CERAMIC 47pF $\pm$ 5% 50V BLK
C502	DD15470300	CERAMIC 47pF $\pm$ 5% 50V BLK
C504	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
C507	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
C508	EJ47601010	ELECT 47 $\mu$ F 10V
<b>P304-RESISTORS</b>		
R305	GG05151140	150 $\Omega$ $\pm$ 5% 1/4W
R306	RA01040760	100k $\Omega$ TRIMMING
R505	GG05221140	220 $\Omega$ $\pm$ 5% 1/4W
G501	BW05103090	RESISTOR COMPO. NETWORK RN5E x 6
<b>P304-SEMICONDUCTORS</b>		
DA05	HD20002000	DIODE 1SS176, MA165, 1SS254
D302	HD20002000	DIODE 1SS176, MA165, 1SS254
D303	HD20002000	DIODE 1SS176, MA165, 1SS254
D501	HD30511000	ZENER DIODE 5.1V RD5.1JB2, etc.
QA04	HT10001000	TRANSISTOR 2SA608SP, etc.
Q204	HT113092C0	TRANSISTOR 2SA1309A(Q, R)
Q205	HT113092C0	TRANSISTOR 2SA1309A(Q, R)
Q301	HC10278030	IC LA3433
Q303	HC10053090	IC NJM-2068-DD
Q501	HC10221030	IC LC7218
Q502	HF200300B0	F.E.T.2SK30A Y
Q503	HT30001000	TRANSISTOR 2SC536SP, etc.
<b>P304-MISCELLANEOUS</b>		
X301	FQ04563010	CERAMIC VIB. CSB456F11
X501	JX07001260	CRYSTAL, AD0618CTB 7.2MHz
<b>P604-SURROUND CIRCUIT BOARD</b>		
<b>P604-CAPACITORS</b>		
CF01	EJ10505010	ELECT 1 $\mu$ F 50V
CF02	EJ10505010	ELECT 1 $\mu$ F 50V
CM01	EJ10505010	ELECT 1 $\mu$ F 50V
CM02	EJ10505010	ELECT 1 $\mu$ F 50V
CM04	EJ10505010	ELECT 1 $\mu$ F 50V
CM06	EJ10505010	ELECT 1 $\mu$ F 50V
CM10	EJ10505010	ELECT 1 $\mu$ F 50V
CM15	DD15470300	CERAMIC 47pF $\pm$ 5% 50V BLK
CM18	EJ10505010	ELECT 1 $\mu$ F 50V
CM24	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V



REF. DESIG.	PART NO.	DESCRIPTOIN
CM25	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
CM28	EJ10505010	ELECT 1 $\mu$ F 50V
CP02	EJ10505010	ELECT 1 $\mu$ F 50V
C642	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
C654	DK18103310	CERAMIC 0.01 $\mu$ F +80% -20% 50V
<b>P604-RESISTORS</b>		
RP08	RA01040760	100k $\Omega$ TRIMMING
<b>P604-SEMICONDUCTORS</b>		
DP01 }	HD20002000	DIODE 1SS176, MA165, 1SS254
DP04		
D601	HD20029050	DIODE S5688G
D602	HD20029050	DIODE S5688G
QF01	HC10008090	IC NJM4558D-D BUFFER AMP.
QM01 }	HC100080900	IC NJM4558D-D
QM04		
QM05	HC10228030	IC LC7821 SURROUND SELECTOR
Q601	HC10101090	IC NJM2175L DOLBY PRO-LOGIC
Q602	HC10137200	IC M50198P DIGITAL DELAY
Q603	HC10228060	IC $\mu$ PD6345C
Q604	HC10209050	IC TC9214P
Q605	HC10235030	IC LB1630
<b>P604-MISCELLANEOUS</b>		
X601	FQ03274010	CERAMIC VIB. EFO-GC3274A4 3.27MHz
<b>P854-FRONT AMP POWER SUPPLY CIRCUIT BOARD</b>		
<b>P854-CAPACITORS</b>		
C851	DK18103560	CERAMIC 0.01 $\mu$ F +80% -20% 500V
C852	EB82807120	ELECT 8200 $\mu$ F 71V
C853	EB82807120	ELECT 8200 $\mu$ F 71V
<b>P854-SEMICONDUCTORS</b>		
D851	HE20012290	DIODE D5FB20 200V 5A
<b>P904-CNT/SURR.POWER SUPP CIRCUIT BOARD</b>		
<b>P904-CAPACITORS</b>		
C901	EB47805620	ELECT 4700 $\mu$ F 56V
C902	EB47805620	ELECT 4700 $\mu$ F 56V
C903	DK18103560	CERAMIC 0.01 $\mu$ F +80% -20% 500V
C906	DK18103560	CERAMIC 0.01 $\mu$ F +80% -20% 500V

REF. DESIG.	PART NO.	DESCRIPTOIN
<b>P904-RESISTORS</b>		
▲ R901	GA05150030	15 $\Omega$ $\pm$ 5% 3W
▲ R902	NH05680120	68 $\Omega$ $\pm$ 5% 1/2W FUSIBLE
▲ R903	GA05470020	47 $\Omega$ $\pm$ 5% 2W
▲ R904	NH05068120	6.8 $\Omega$ $\pm$ 5% 1/2W FUSIBLE
<b>P904-SEMICONDUCTORS</b>		
▲ D901	HE20015290	DIODE S4VB-20
▲ D902	HE20015290	DIODE S4VB-20
▲ D903	HD20029050	DIODE S5688G
▲ D904	HD20029050	DIODE S5688G
<b>P904-MISCELLANEOUS</b>		
F903	FS10630300	FUSE 6.3A 125V UL
F904	FS10630300	FUSE 6.3A 125V UL

**NOTE ON SAFETY:**

Symbol ▲ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ▲. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

# Model SR-92 Multi Voltage Version

Use this unit referring to the supplied Operating Manual.

The only differences between the unit and the description in the Operating Manual are that the unit's rear panel is equipped with a VOLTAGE SELECTOR, AM SCAN STEP switch, FM DE-EMPHASIS switch and fuse holder. The other components are the same as those in the Operating Manual.

The unit has a 4-position voltage selector (110/120/220/240V).

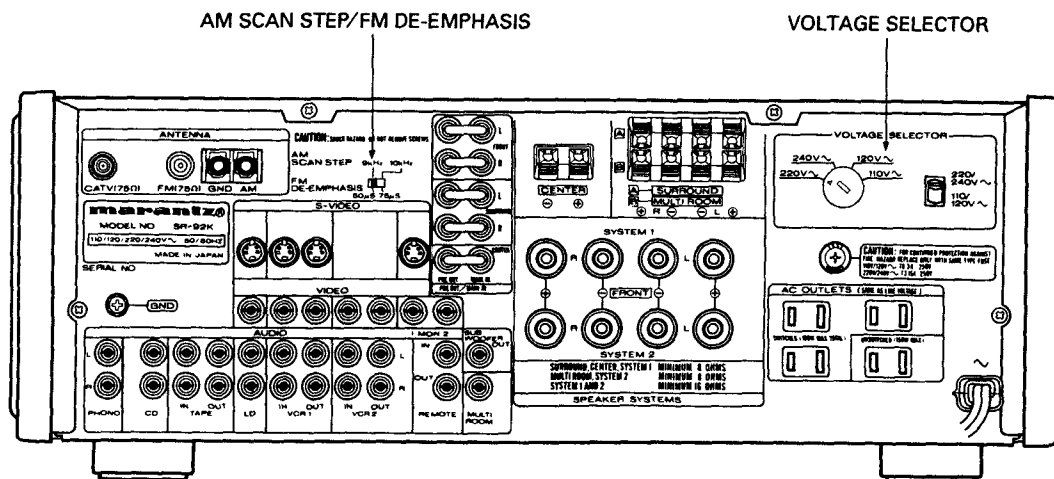
Check your local voltage before use and set the voltage selector to the appropriate position.

The initial setting of the voltage selector at the factory is 220V.

When using 110/120V power, replace the fuse in the rear panel with the supplied T6.3A fuse.

## Note:

There are two voltage selectors. If it is necessary to switch the voltage setting, be sure to set both voltage selectors to the same voltage. Changing only one of the voltage selectors without changing the other will damage the circuitry inside the unit and may cause a fire.



For use in North and South America:

Set the AM SCAN STEP and FM DE-EMPHASIS switches as indicated below.

AM SCAN STEP: 10 kHz

FM DE-EMPHASIS: 75  $\mu$ S

Note: The switches are set to 9 kHz and 50  $\mu$ S at the factory.