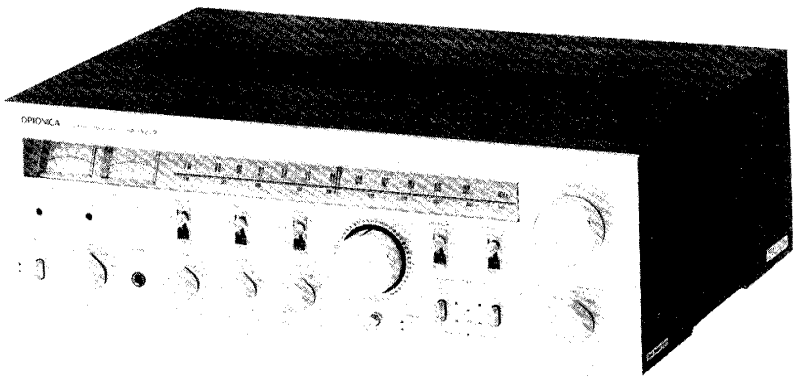
OPTONICA SERVICE MANUAL

SA-5206
SA-5202



FM/AM,
FM STEREO RECEIVER

MODEL
SA-5202
(Silver Panel)
SA-5206
(Black Panel)

(PHOTO : SA-5202)

SIMULATED WALNUT GRAINED VINYL ON WOOD PRODUCT MATERIAL

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SHARP ELECTRONICS CORPORATION

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SPECIFICATIONS

• GENERAL DESCRIPTION

Power source:	120 V, 50/60 Hz
Circuit	
Tuner:	Superheterodyne system, AM /FM 2-band tuner, with P.L.L. stereo demodulation circuit, FM muting circuit, air check calibration circuit
Main (Power) amplifier:	Differential amplifier, semi-complimentary system, OCL (Output Capacitor-Less)
Tone amplifier:	"NF" type tone control circuit
Equalizer:	Dual power supply IC amplifier circuit
Semiconductors:	1-FET 8-IC (Integrated circuit) 12-Transistor 18-Diode (2-Zener diodes) 2-LED
Dimensions:	Width: 490 mm (19-9/32") Height: 163 mm (6-13/32") Depth: 382 mm (15-1/32")
Weight:	12.5 kg (27.5 lbs)

• MAIN (POWER) AMPLIFIER

Continuous power Output:	45 watts per channel, minimum RMS, at 8 ohms, from 20 Hz to 20 kHz, with no more than 0.04% total harmonic distortion
Total harmonic distortion:	0.03% at 30 W (Aux. in)
Intermodulation distortion:	0.04% at 45 W (Aux. in)
Damping factor:	46 (at 1 kHz 8 ohms)
Hum and noise level:	
Residual;	1 mV
Maximum volume;	Aux.: 1 mV Phono: 10 mV Tape: 1 mV
Signal to noise ratio (IHF, closed circuit "A" network):	Aux.: 96 dB Phono: 73 dB Tape: 96 dB

• PRE-AMPLIFIER

Input Sensitivity and Input Impedance:	
Phono;	2.5 mV/47K ohms
Aux.;	150 mV/47K ohms
Tape play back 1 and 2;	150 mV/47K ohms
Phono overload:	160 mV (RMS. 1 kHz 0.04% THD.)
RIAA curve deviation: (30 ~ 20 kHz)	± 0.5 dB
Frequency response:	10Hz ~ 55 kHz ± 1.5 dB (Aux., Tape play back)
Tone control:	
Bass; ± 10 dB at 100 Hz	
Treble; ± 10 dB at 10 kHz	
Low cut filter:	30 Hz (–12 dB/oct)
High cut filter:	7 kHz (–6 dB/oct)

• FM SECTION

Tuning range:	87.6 ~ 108 MHz
Intermediate frequency:	10.7 MHz.
Sensitivity (IHF):	10.8 dBf 1.9μV
Total harmonic distortion:	
Mono;	0.2%
Stereo;	0.4%
Image rejection ratio:	50 dB
IF rejection ratio:	80 dB
AM suppression ratio:	50 dB
Selectivity:	60 dB
Stereo separation:	45 dB (1 kHz)

• AM SECTION

Tuning range:	520 ~ 1620 kHz
Intermediate frequency:	455 kHz
Quieting sensitivity:	300μV/m
Image rejection ratio:	46 dB (1400 kHz)
IF rejection ratio:	30 dB (600 kHz)
Total harmonic distortion:	0.8%

Specifications are subject to change without prior notice.

Prior to removing the chassis, be sure to draw the power supply plug from a wall outlet. Then, proceed with the removal work in the following order after disconnecting all of the connection cords at the rear of the set.

1) To remove the cabinet:
Remove 4 screws ① retaining the cabinet (2 screws each for the right and left sides), then the cabinet can be detached.

2) To remove the bottom plate:
Turn over the set and remove 10 screws ② retaining the bottom plate, then the bottom plate can be detached.

3) To remove the front panel:
(1) Pull out the knobs ③ (12 knobs).
(2) Remove the nuts ④ retaining the speaker selector switch shaft and function selector switch shaft.
(3) Finally remove 2 screws ⑤ retaining the front panel, then the front panel can be detached.

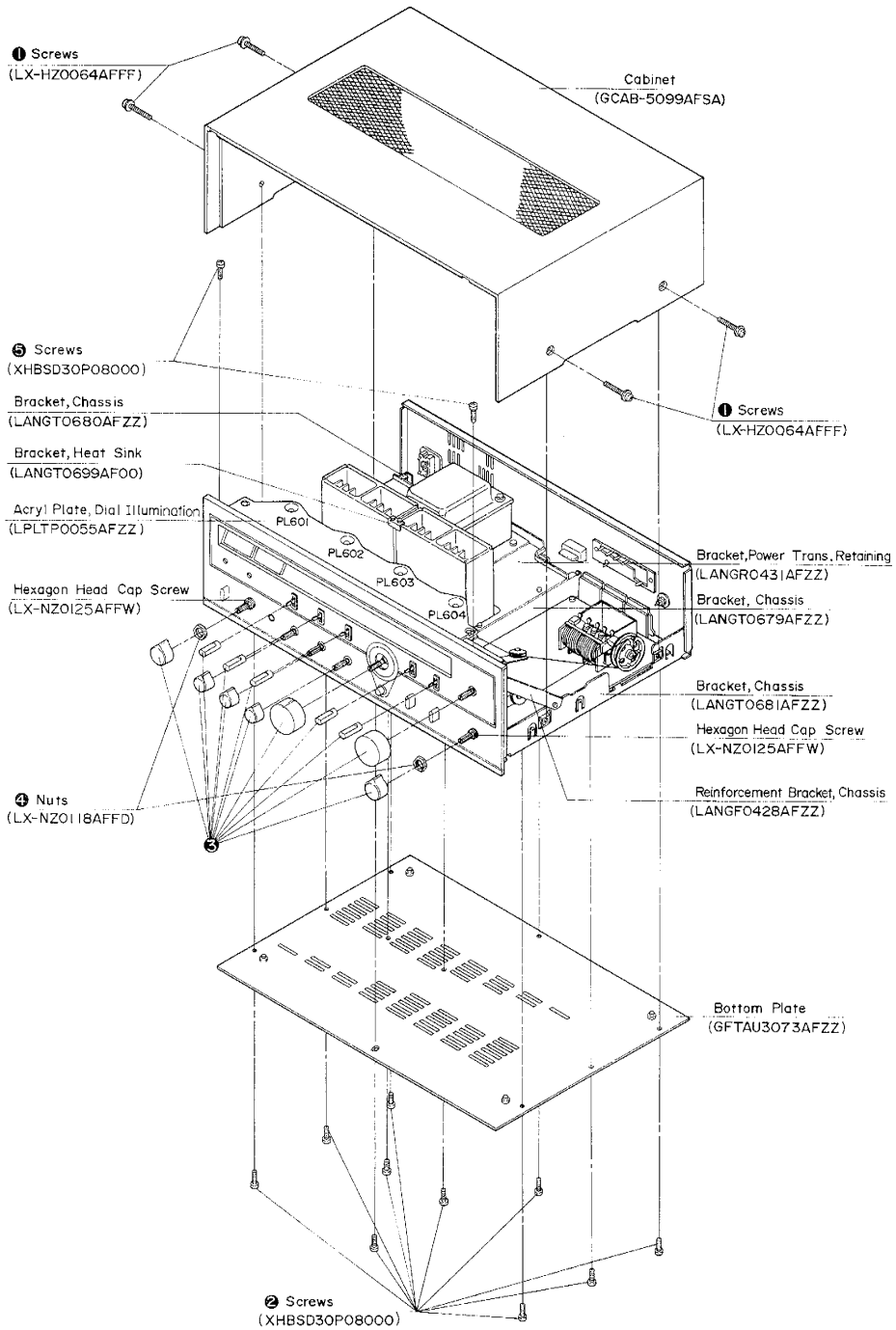


Figure 1 DISASSEMBLY

DIAL CORD STRINGING

1) Setting of the dial cord:

(1) Turn the drum fully counterclockwise (at the highest frequency position).

(2) Put a hook of the spring on the central hole of the drum.

(3) Then proceed with stringing in the numerical order from ① to ⑧ . At this work, while holding a hand at the position ⑥ to temporarily fix a dial string, wind the string on the drum by 1-½ turns at the position ⑦ (which is an extention of the string wound at the position ⑥) and bring it through the position ⑧ . Then release a hand from the position ⑥ and thus the stringing is completed.

2) Setting of the pointer:

(1) Turn the tuning shaft fully counterclockwise (at the lowest frequency position).

(2) Align the pointer to the extreme left (zero point) of the dial scale plate. (See Fig. 2–1.)

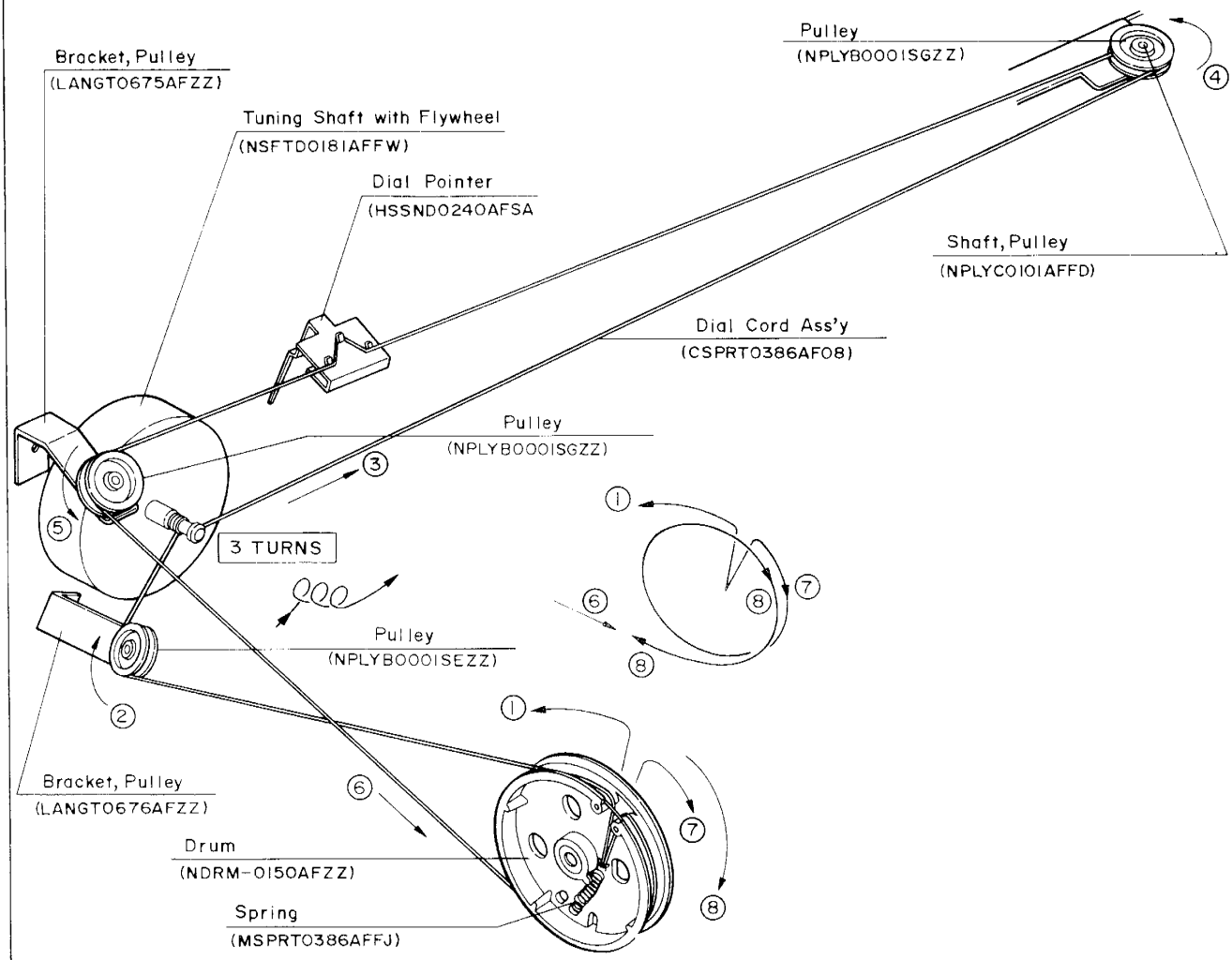
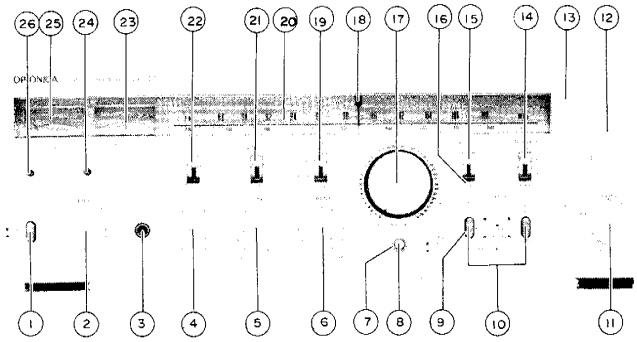


Figure 2–1

Figure 2 DIAL CORD STRINGING

FRONT PARTS LAYOUT

(PHOTO : SA-5202)

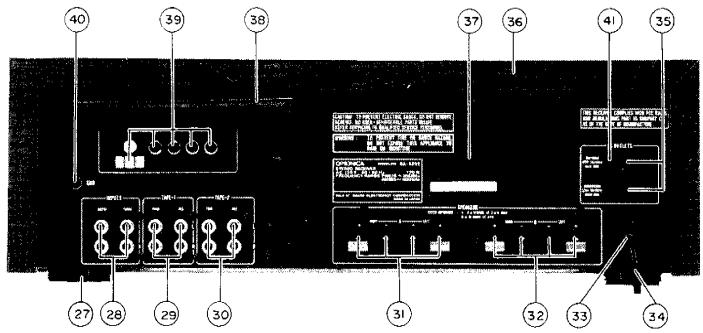


① Power Switch Knob
(SA-5202 JKNBP0078AFSA, SA-5206 JKNBP0078AFSB)
② Speakers Selector Knob
(SA-5202 JKNBN0330AFSA, SA-5206 JKNBN0318AFSB)
③ Headphones Jack (QJAKJ0057AFZZ)
④ Bass Control Knob
(SA-5202 JKNBN0338AFSA, SA-5206 JKNBN0367AFSA)
⑤ Treble Control Knob
(SA-5202 JKNBN0338AFSA, SA-5206 JKNBN0367AFSA)
⑥ Balance Control Knob
(SA-5202 JKNBN0338AFSA, SA-5206 JKNBN0367AFSA)
⑦ Spacer, Loudness Switch
(SA-5202 PSPAS0008SGSA, SA-5206 PSPAS0008SGSB)
⑧ Loudness Switch Knob
(SA-5202 JKNBM0136AFSE, SA-5206 JKNBM0136AFSD)
⑨ Spacer, Push Switch (PSPAS0066AF00)
⑩ Tape Monitor and Tape Dubbing Switch Knobs
(SA-5202 JKNBP0078AFSA, SA-5206 JKNBP0078AFSB)
⑪ Function Selector Knob
(SA-5202 JKNBN0330AFSA, SA-5206 JKNBN0318AFSB)
⑫ Tuning Control Knob
(SA-5202 JKNBN0317AFSA, SA-5206 JKNBN0317AFSB)
⑬ Front Panel
(SA-5202 HPNLC3372AFSA, SA-5206 HPNLC3373AFSA)
⑭ FM Muting Switch Knob
(SA-5202 JKNBP0070AFSA, SA-5206 JKNBP0070AFSB)
⑮ Air Check Calibrator Switch Knob
(SA-5202 JKNBP0070AFSA, SA-5206 JKNBP0070AFSB)
⑯ Guide, Lever Switch
(SA-5202 GCOVA1076AFSC, SA-5206 GCOVA1076AFSB)
⑰ Volume Control Knob
(SA-5202 JKNBN0316AFSA, SA-5206 JKNBN0316AFSB)
⑱ Dial Pointer (HSSND0240AFSA)
⑲ Mode Selector Knob
(SA-5202 JKNBP0070AFSA, SA-5206 JKNBP0070AFSB)
⑳ Dial Scale (HDALM0189AFSA)
㉑ High Cut Filter Switch Knob
(SA-5202 JKNBP0070AFSA, SA-5206 JKNBP0070AFSB)
㉒ Low Cut Filter Switch Knob
(SA-5202 JKNBP0070AFSA, SA-5206 JKNBP0070AFSB)
㉓ FM Tuning (center) Meter (RMTRL0134AFSA)
㉔ FM Stereo Indicator, Red, LED (VHPGL-52AR/1F)
㉕ Signal (strength) Meter (RMTRL0142AFSA)
㉖ Power Indicator, Green, LED (VHPGL-5PG5/1F)

Figure 3 FRONT PARTS LAYOUT

REAR PARTS LAYOUT

(PHOTO : SA-5202)



㉗ Leg (GLEGP0002SG00)
㉘ Inputs (AUX Ⓟ and PHONO) Socket (QSOCZ2472AFZZ)
㉙ Tape-1 (PB Ⓟ and REC) Socket (QSOCJ2264AFZZ)
㉚ Tape-2 (PB Ⓟ and REC) Socket (QSOCJ2264AFZZ)
㉛ Speakers Terminals-A (QTANZ0454AFZZ)
㉜ Speakers Terminals-B (QTANZ0454AFZZ)
㉝ Bushing, AC Cord (LBSHC0007AFZZ)
㉞ AC Cord with Plug (QACCU0052AFZZ)
㉟ AC Outlets Socket (QSOCA0402SGZZ)
㊱ Cabinet (GCAB-5099AFSA)
㊲ Rear Panel
(SA-5202 LANGQ0656AFSA, SA-5206 LANGQ0659AFSA)
㊳ Built-In AM Bar Antenna (RCILA0429AFZZ)
㊴ Antenna Terminals (QTANN0453AFZZ)
㊵ Ground Terminal (QTANN0150AFZZ)
㊶ Screw, AC Outlets Socket (LX-BZ0220AFFF)

Figure 4 REAR PARTS LAYOUT

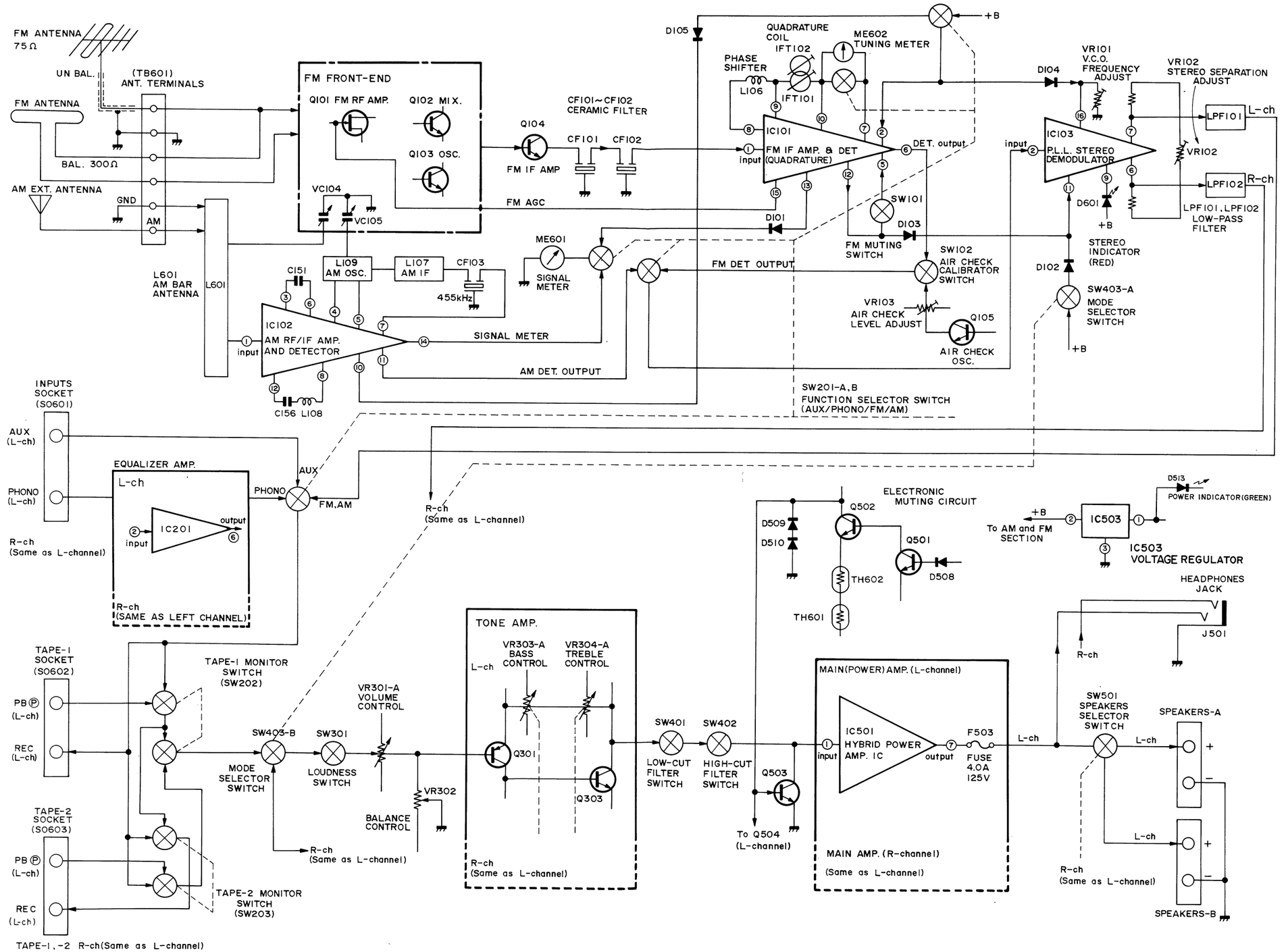


Figure 5 BLOCK DIAGRAM

FM RF SECTION

FM antenna input circuit has two input terminals (75ohms and 300ohms). The 75ohms input terminal is used when FM antenna is connected to the unit by using a coaxial cable. The 300 ohms input terminal is used when FM antenna is connected to the unit by using a balanced feeder. Figure 6 shows FM Front-End circuit. The front-end section consists of 1 FET and 2 transistors. Transistor Q101 is FET (Field Effect Transistor) and its function is nearly the same as of vacuum tube. Due to the adoption of FET, crossmodulation characteristic and spurious characteristic are remarkably improved compared with conventional transistor type.

It is so devised that AGC voltage is applied to the gate of FET Q101 of FM Front-End circuit.....this results in that when input signal to FM antenna is strong, amplification degree of FET Q101 is lowered so as to stabilize FM reception. The voltage applied to the gate of FET Q101 is at the level of about 4.3V when the antenna is receiving no input signal. The voltage is decreased as the input signal to the antenna is increased and it becomes at the level of about less than 1V when the input signal to the antenna is of 100 dB.

Therefore, the amplification degree of FET Q101 is attenuated by more than about 30 dB.

FET Q101 is FM high frequency amplifier. Transistor Q102 works as frequency mixer, in which high frequency signal coming from the FET Q101 and local oscillation frequency coming from the transistor Q103 are mixed to produce 10.7 MHz IF signal which will enter IF tuning transformer T101. The transistor Q103 is for the local oscillation and it applies oscillation voltage to the base of transistor Q102 via capacitor C112 (1.5pF).

Therefore, coil L101 is for antenna tuning, coil L102 is for FM RF amplification and tuning and coil L104 is for local oscillation.

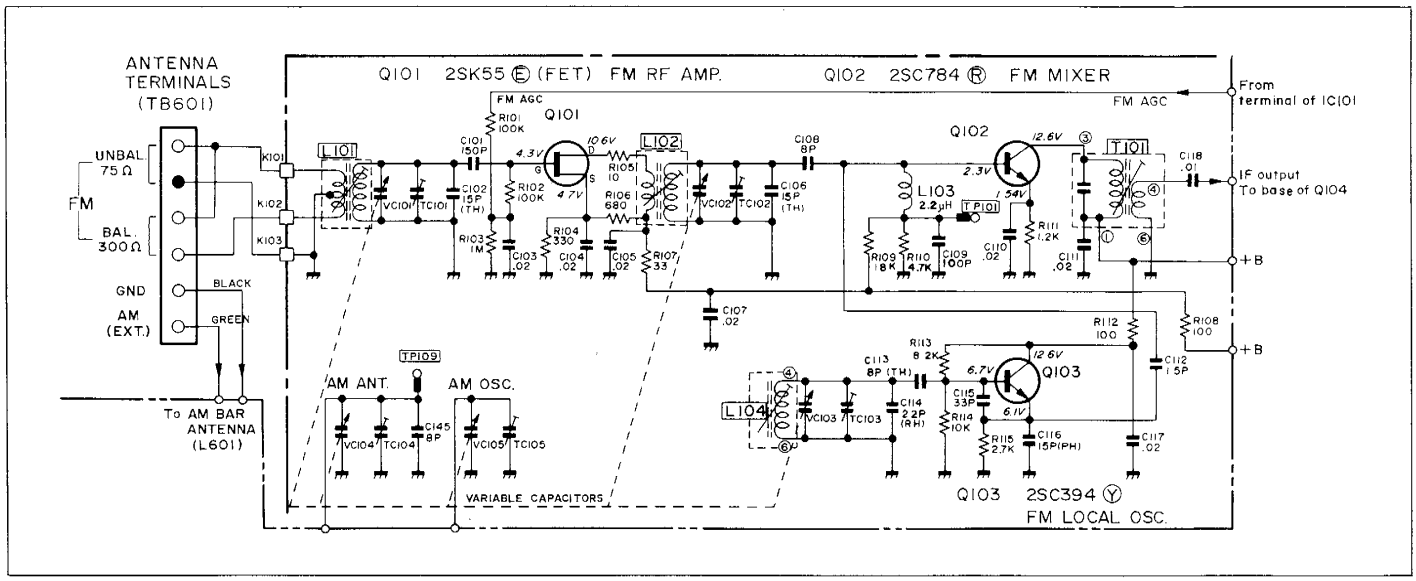


Figure 6 FM FRONT-END CIRCUIT

FM AGC

FM AGC voltage is developed at terminal (15) of IC101, and is applied to the gate of FET Q101 through resistors R102 and R101.

The AGC voltage is developed in IC101 as delayed AGC voltage, and the AGC starts to operate when antenna input reaches approx. 60 dB and thus a voltage at terminal (15) of IC101 starts to drop.

FM IF SECTION

FM IF section consists of 1 IC (integrated circuit), 1 transistor and 2 ceramic filters. Transistor Q104 is FM IF amplification transistor, which is to amplify IF signal which has been converted into 10.7 MHz signal at FM front end section. This 10.7 MHz IF signal is given a higher selectivity since it runs through the concentrated selective elements, that is, ceramic filters CF101 and CF102. These filters function to amplify IF (intermediate frequency) signals giving no distortion and to assure a necessary selectivity. The IF signal is further supplied to the terminal (1) of IC101, in which the gain of this signal is increased by about 66 dB by the three-stage differential amplifier thus being subjected to an appropriate limiter function.

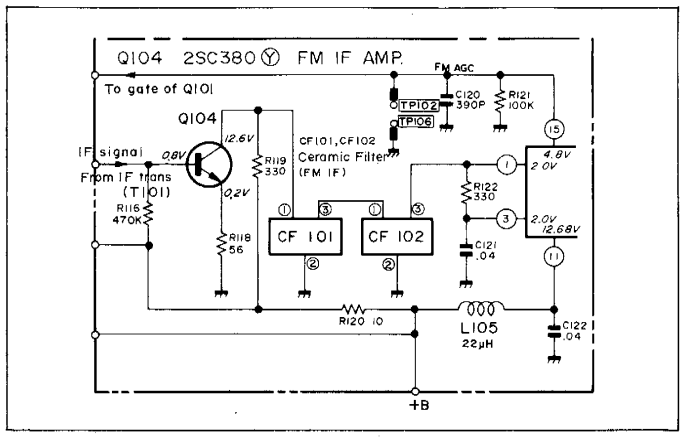


Figure 7 FM IF CIRCUIT

FM Detector Circuit

This unit employs 'Quadrature Detector' based on newly developed IC (Integrated Circuit), which is substituted for ratio detector and Foster-Seeley s detector that have been so far used. The basic structure of quadrature detector circuit is as shown in Figure 8.

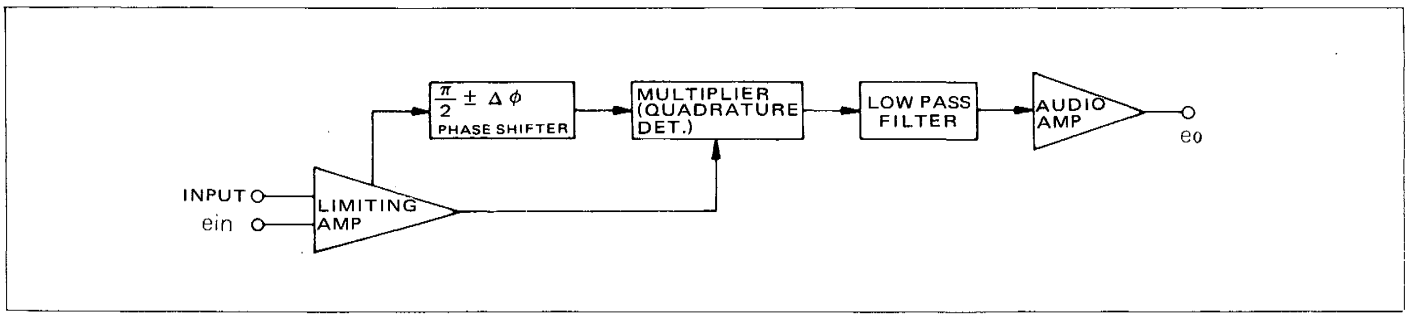


Figure 8 BASIC STRUCTURE OF QUADRATURE DETECTOR CIRCUIT

With this detection system, the multiplier (quadrature detector) circuit receives two types of input signals, one is the signal which has been amplified by the limiting amplifier and another which has passed through the phase shift circuit (about $\pi/2$). Thus, the quadrature detector circuit produces demodulation signal.

The term 'quadrature' is resulted from that the phase difference between these two signal is $\pi/2$. The multiplier consists of doubly balance circuit as shown in the following circuit drawing. Phase characteristic of the phase shift circuit is as shown in Figure 10.

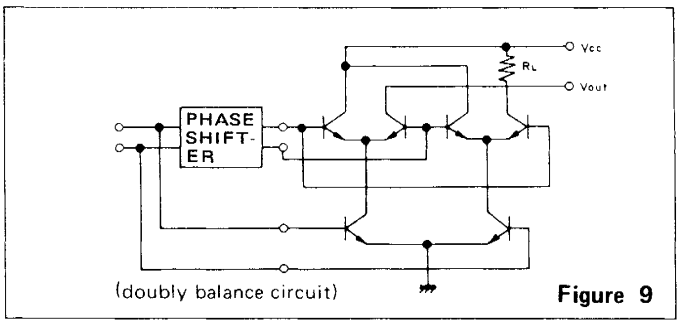
This circuit is featured by:

(1) Good linearity and low distortion.
(2) Operates on small signal and less higher harmonics.
(3) Wide-band detection of as much as 1.2MHz.

Therefore, this circuit assures low distortion even with the overmodulation of more than 100% thereby reproducing high quality sound.

Actually saying, the detecting circuit SA-5202 and SA-5206 uses L106 as phase-shift coil. IFT101 and IFT102 are 10.7 MHz tuning quadrature coil.

Detection output appears at the terminal (6) of IC101 and it is supplied to the terminal (2) of P.L.L. multiplex integrated circuit IC103.



(doubly balance circuit) **Figure 9**

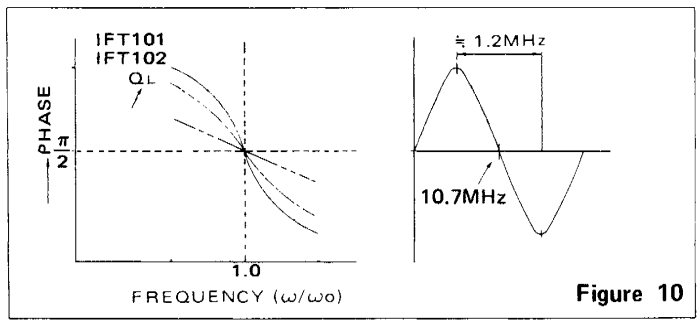


Figure 10

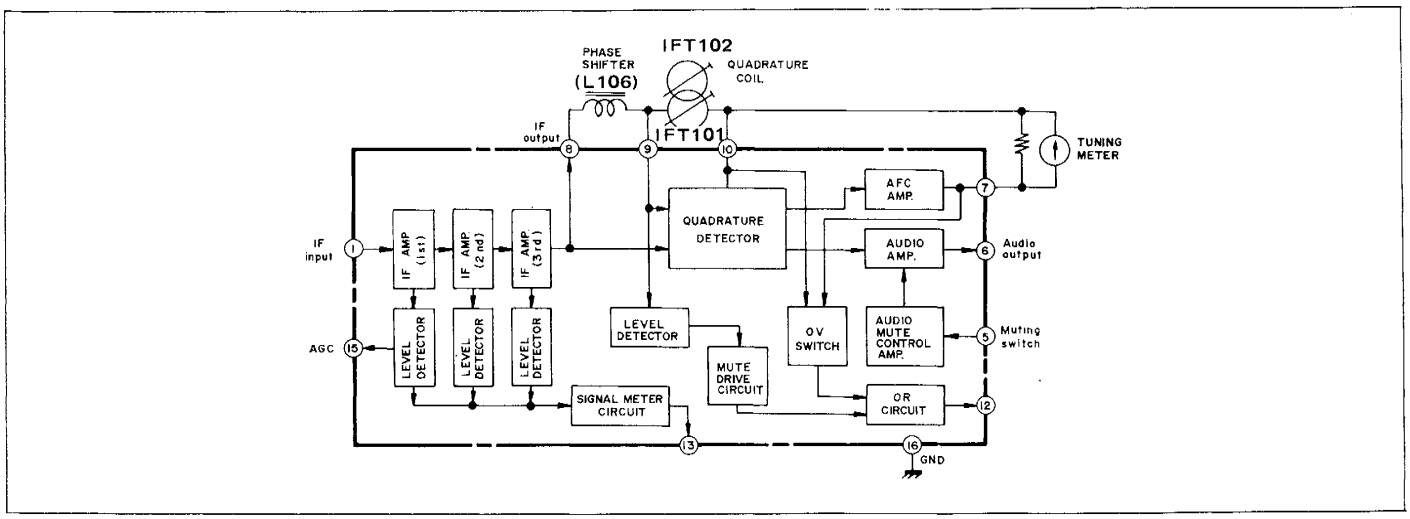


Figure 11 BLOCK DIAGRAM OF IC101

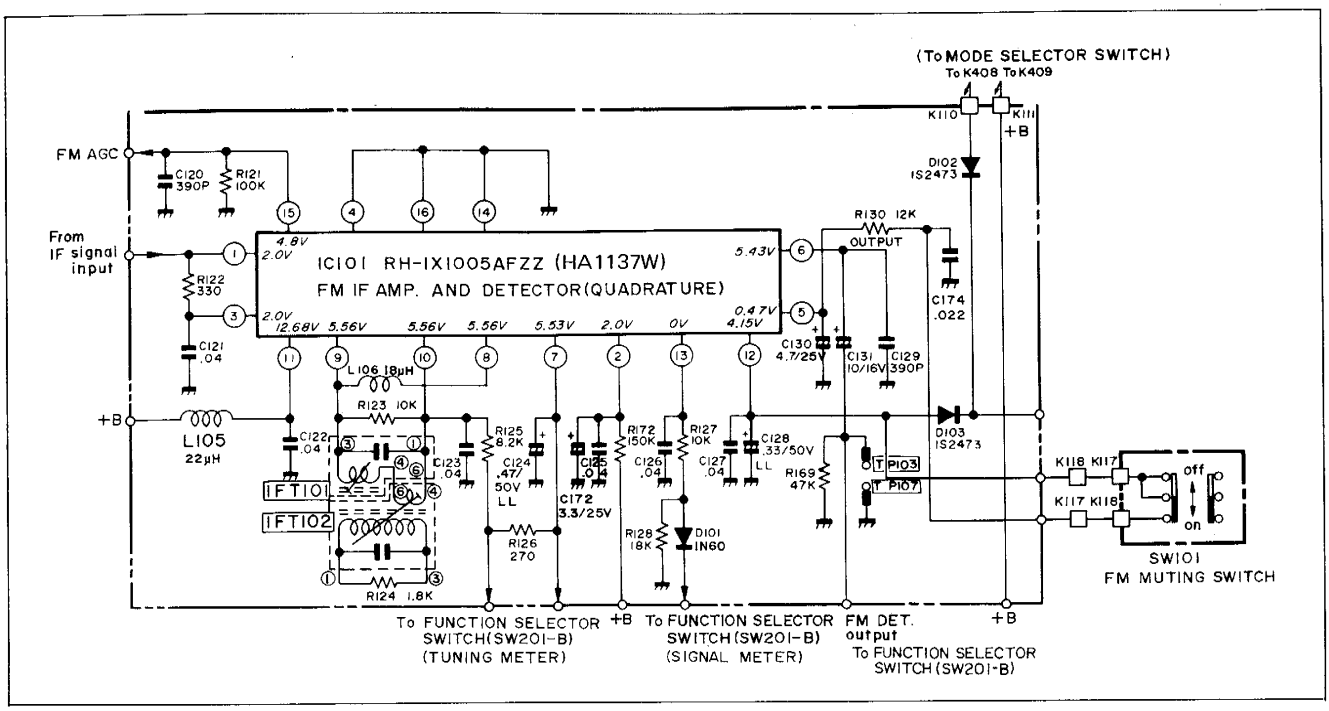


Figure 12 FM DETECTOR (QUADRATURE) CIRCUIT AND FM MUTING CIRCUIT

FM MUTING CIRCUIT

In these sets SA-5202 and SA-5206, IC101 incorporates a muting circuit and this circuit is so designed that if FM input signal caught by the antenna becomes about 10dB when the muting switch (SW101) has been set "on" position, the muting effect is released and thus the signal can appear at the output without undergoing muting. The muting release signal first develops at the terminal (12) of IC101, then to be applied through the muting switch (SW101) to the terminal (5) of IC101, so that the muting effect is able to become nil.
Figure 13 shows the output voltage of the terminal (12) of IC101. This signal (to release the muting) is then supplied to the terminal (11) of P.L.L. stereo multiplex demodulator integrated circuit IC103 to make stereo signal be forced to monaural signal.

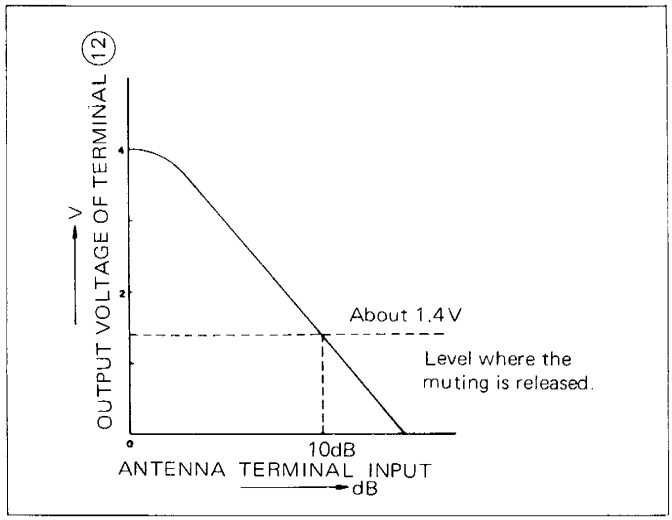


Figure 13

LOW-PASS FILTER

LPF101 and LPF102 are low-pass filters to remove carrier signals (19 kHz and 38 kHz) leaking from the stereo multiplex IC103. The characteristic is as shown in the Figure 14.

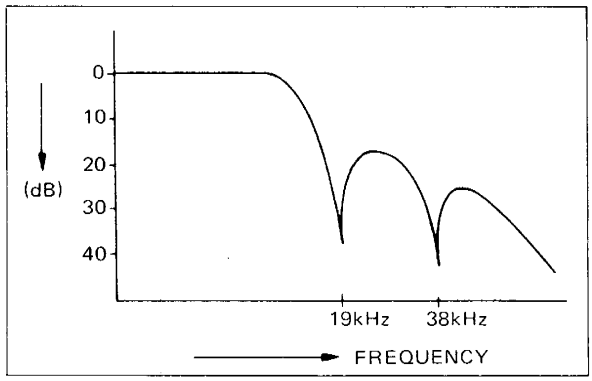


Figure 14

FM STEREO DEMODULATOR SECTION

1) Features of P.L.L. stereo demodulator circuit

This set incorporates a stereo demodulator circuit that comprises IC's with the P.L.L. (Phase Locked Loop) system applied. The P.L.L. stereo demodulator circuit is provided with such characteristics as mentioned below.

In order to demodulate stereo composite signals, it is necessary to take a 19kHz pilot signal out of the stereo composite signals and to make it a 38kHz signal.

Most of the conventional methods to obtain such a 38kHz signal are frequency doubling ones which utilize a nonlinearity of the elements. Compared with the conventional type, the recently developed IC-ed demodulator provides more sufficient separation effects. However, since it also requires 2 or 3 coils like the conventional one, if even one of them is dislocated from the initially adjusted point due to a secular change the separation effects will be deteriorated. Moreover there is such a contradiction that the more the efficiencies of the coils are increased enough to withstand the outer pulse signals like automobil ignition noises, the more the coils suffer secular changes.

To eliminate such disadvantages as above, P.L.L. system is employed in the method to make a 38kHz signal using a 19kHz pilot signal.

The P.L.L. system stereo demodulator gives such three merits as:

(1) Since the phases of a pilot signal and a 38kHz signal are automatically made the same with each other, the deterioration of separation effect is strongly minimized.

(2) Since only one of variable resistor, being newly employed, plays the role of 2 to 3 pieces of conventional coils, troubles of the parts due to secular changes are decreased. In addition, even if this variable resistor is slightly dislocated, the separation effect will never be deteriorated because of the merit as mentioned in 1 by which the automatic phase adjustment is assured.

(3) Compared with the conventional one, the P.L.L. system demodulator shows a more noise withstanding characteristic since it has such performances as the selection of frequencies and the continuity of oscillation frequencies (short-time memory); thus assuring a stable stereo demodulation.

2) FM stereo demodulator circuit

IC103 is an integrated circuit for P.L.L. stereo demodulation and its block diagram is as shown in Figure 15.

V.C.O. free-running frequency is to be adjusted to 76kHz by adjusting semi-fixed resistor VR101 (10K ohm). TP104 is the test point for frequency observation. (See the paragraph 'Adjustment' described later.)

During AM reception, +B voltage is supplied to the terminal (16) of IC103 through diode D104 and resistor R135 so that oscillation frequency of V.C.O. will be stopped.

Semi-fixed resistor VR102 (200K ohms) aim at the adjustment of stereo separation and with this resistor it is possible to minimize crosstalk to the opposite channel. +B voltage is supplied to the terminal (11) of IC103 to force stereo signals to become monaural ones.

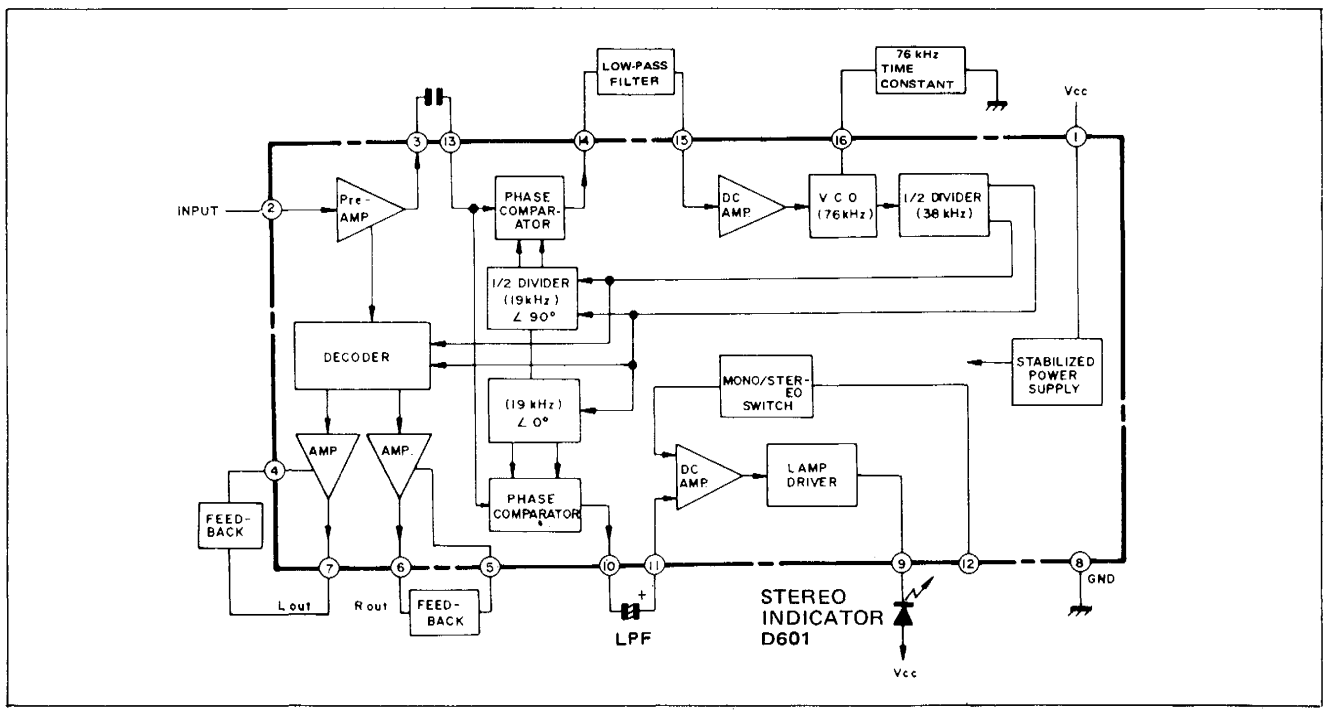


Figure 15 BLOCK DIAGRAM OF IC102

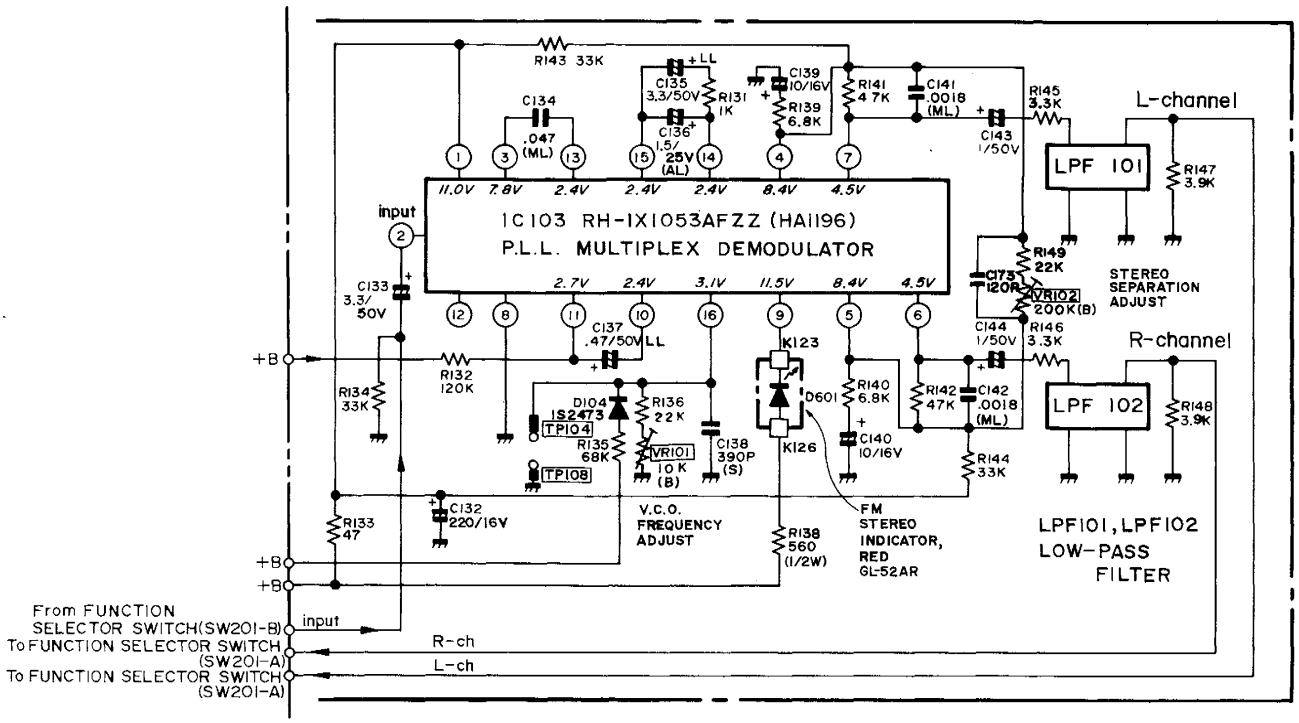


Figure 16 FM STEREO DEMODULATOR CIRCUIT

AIR CHECK CALIBRATION CIRCUIT

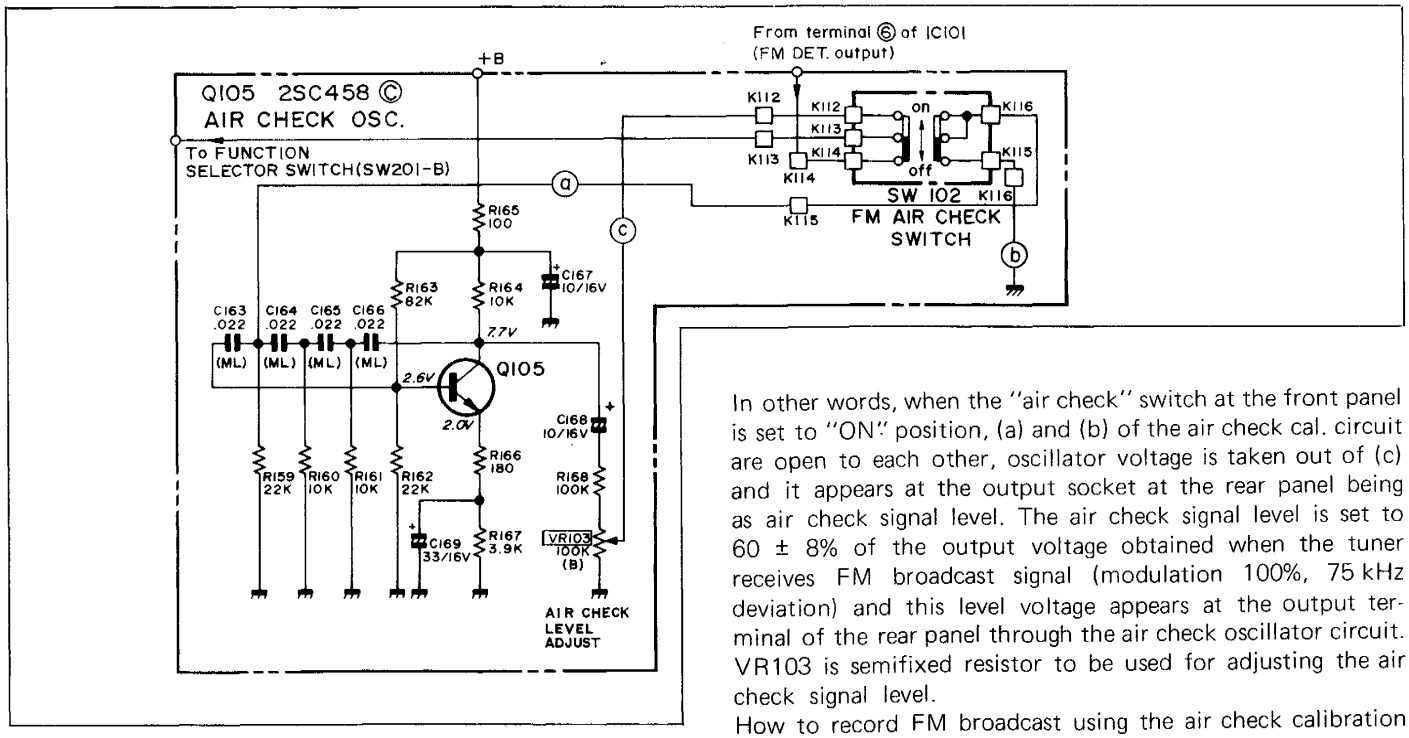


Figure 17 AIR CHECK CAL. CIRCUIT

This circuit is to make appropriate the recording level in advance when recording FM broadcast into the tape recorder. The circuit shown in Figure 17 hereof is CR type oscillator circuit to be used for the air check calibration (about 400 Hz).

In other words, when the "air check" switch at the front panel is set to "ON" position, (a) and (b) of the air check cal. circuit are open to each other, oscillator voltage is taken out of (c) and it appears at the output socket at the rear panel being as air check signal level. The air check signal level is set to 60 ± 8% of the output voltage obtained when the tuner receives FM broadcast signal (modulation 100%, 75 kHz deviation) and this level voltage appears at the output terminal of the rear panel through the air check oscillator circuit. VR103 is semifixed resistor to be used for adjusting the air check signal level.

How to record FM broadcast using the air check calibration system is described below.

Set the "air check" switch to "ON" position, put the tape recorder in record mode, apply air check signal to the tape recorder and adjust the record level so that the record level meter of tape recorder indicates "0VU". After that, set the air check switch to "OFF" position and proceed with recording FM broadcast.

NOTE:
In the case of AM reception, in other words, when the function selector switch is kept to the position AM, air check level signal does not appear at the output terminal located at the rear of the set since the air check calibrator is not functioning at the time.

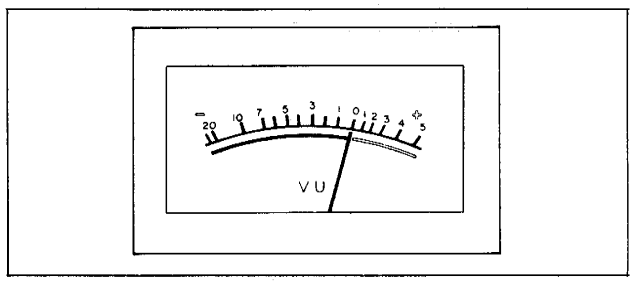


Figure 18 "0VU"

AM SECTION

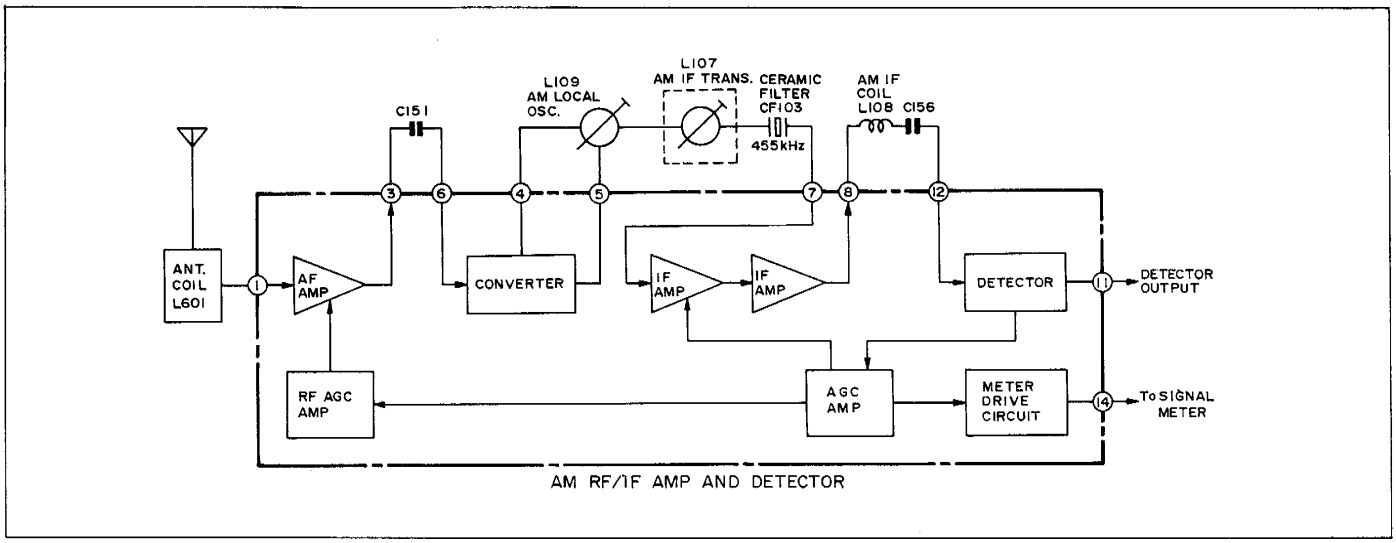


Figure 19 BLOCK DIAGRAM OF IC102

Figure 19 is a block diagram of IC102. The coil L601 is AM ferrite bar antenna and it serves as antenna tuning circuit. Being received by the coil L601, AM broadcast signal is applied to the terminal (1) of the integrated circuit IC102 to be amplified by RF amplifier and then be supplied to the converter via the capacitor C151. L109 is an oscillation coil for AM local oscillation circuit. AM broadcast signal is thus converted to 455kHz IF signal by the converter to be applied to the ceramic filter (CF103) which works as intermediate frequency selection element via the transformer L107 and the signal will further be amplified by 1st and 2nd IF amplifiers to be applied to the coil L108 and capacitor C156. Then the signal is finally detected by the detector circuit and it will be output at the terminal (11).
This IC102 also includes signal meter drive circuit which enables easier tuning and the output at the terminal (14) is connected to the signal meter (ME601).

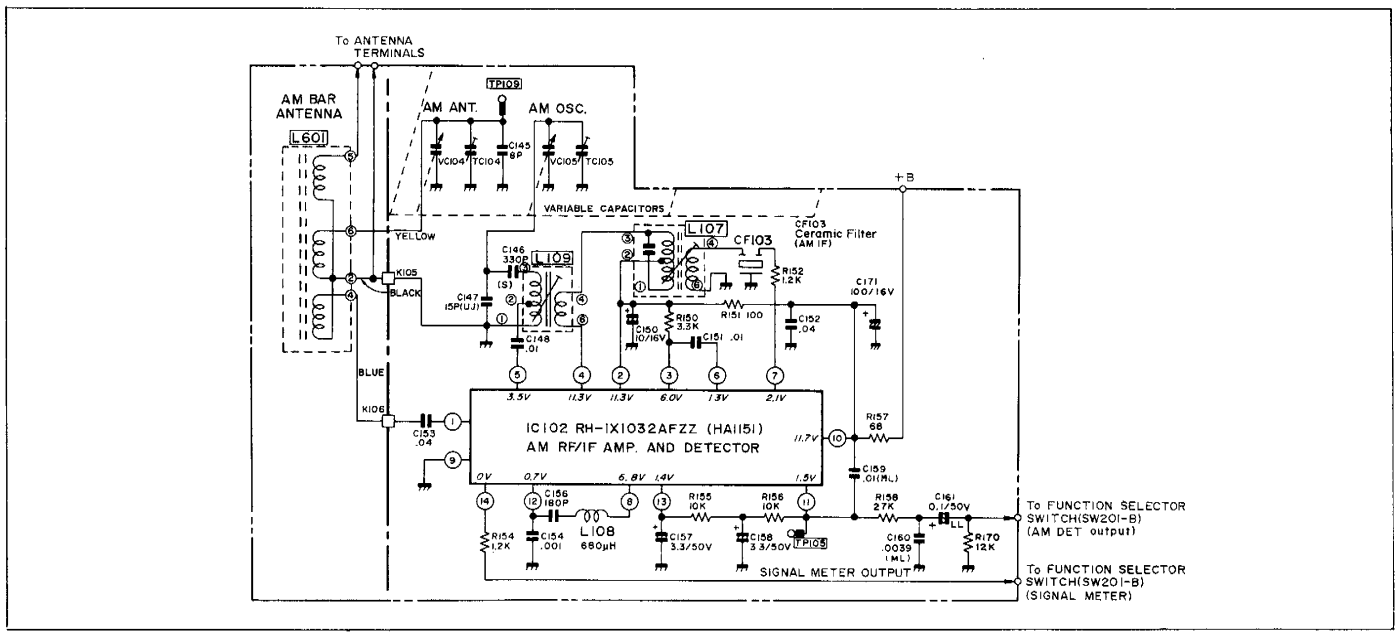


Figure 20 AM CIRCUIT

TONE AMPLIFIER CIRCUIT

The tone amplifier is an N.F. type direct coupled amplifier consisting of Q301 and Q303. Q301 at the first stage is a PNP type low noise transistor to assure satisfactory S/N ratio. The power supply is of 2-power (positive and negative) system, in which the voltage at the input and output terminals is designated to be 0V. The coupling capacitor used for input and output signals is of the low leak type which enables reduction of residual noises. The variable resistor aimed to control bass and treble is able to control the resistance in particular when the set is kept in "mechanical center" condition so that beat characteristic at the tone flat mode can be minimized.

Input signal which has been applied to the base of Q301 (Q302) is taken out of the load resistor R319 (R320) at the collector of Q301 (Q302). The signal enters the base of Q303 (Q304), and amplified by Q303 (Q304) comes out of the collector.

The negative feedback circuit consists of parts of tone circuit. Tone control of low or high frequency band is made by varying NF amount by the variable resistor (VR303-A, B, VR304-A, B).

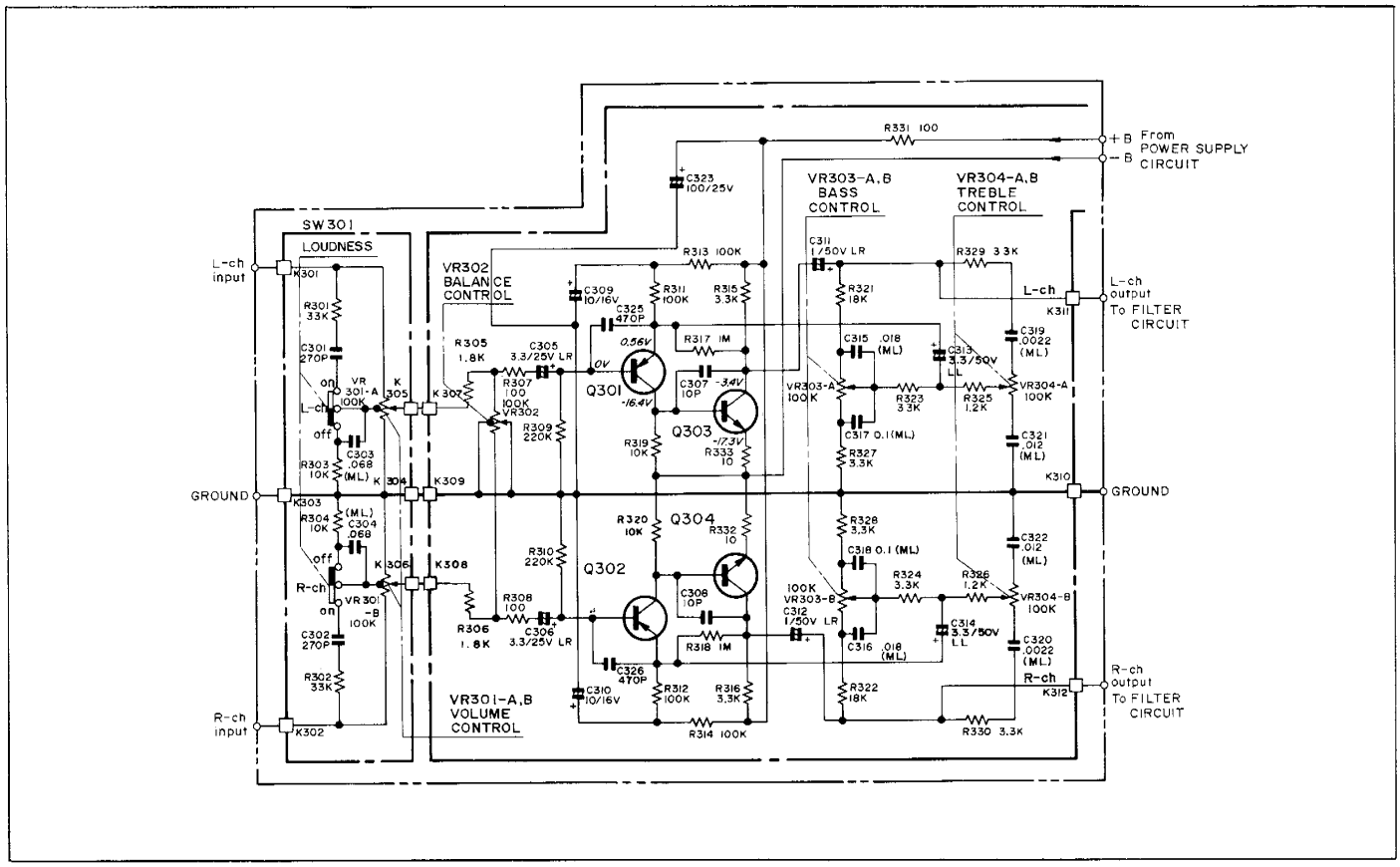


Figure 21 TONE AMP. CIRCUIT

EQUALIZER AMPLIFIER CIRCUIT

The equalizer circuit is an integrated circuit of differential 1-stage and directly-coupled 3-stage, which assures both higher gain and lower distortion factor.

The power supply is of 2-power (positive and negative) system, in which the voltage at the input and output terminals is designated to be 0V. The coupling capacitor used for input and output signals is of the low leak type which enables reduction of residual noises.

Signal coming from the terminal PHONO is applied, via the resistor R201 and capacitor C201, to the terminal ② of the integrated circuit IC201 to be amplified. The signal thus amplified comes out of the terminal ⑥ of IC201 and it will be applied, via the capacitor C215 and resistor R217, to the function selector switch (SW201-A). By the way, a part of such output signal is applied to the terminal ③ of IC201 through the NF circuit used for increase of "RIAA" characteristic.

Composed of resistors R211 and R235 and capacitors C211 and C213 which are precision parts having too small error. NF element aiming at "RIAA" characteristic is able to restrict "RIAA" deviation to ± 1.5 dB.

Resistor R215 is respectively to prevent capacitor C215 from discharging and to eliminate noise generation caused at the time of selecting the switches.

Capacitors C207 and C209 are for the purpose to prevent interference noises due to SW broadcasts, etc.

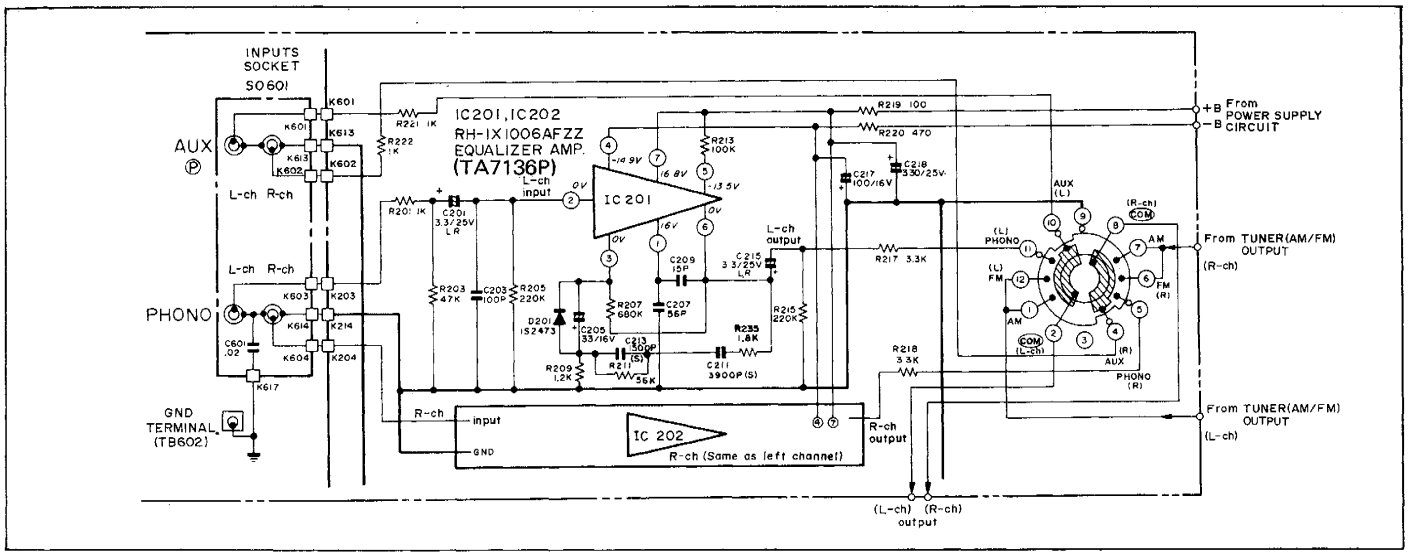


Figure 22 EQUALIZER (PHONO) CIRCUIT

MAIN (POWER) AMPLIFIER SECTION

The main amplifier consists of all-stage direct-coupled semi-complementary output capacitorless circuit.
This main amplifier is designed to operate on the 2-power (positive and negative) supply system and so the speaker terminal output voltage becomes earth potential (0V) in terms of DC component. Therefore, with this amplifier it is not necessary to use a coupling capacitor for cutting off DC component although it has so far been required when the speaker is connected to the amplifier. Besides, it enables the amplification in a wider range from lower frequency to higher frequency. This is an origin of the term OCL (Output Capacitor-Less).

FEATURE OF SEMI-COMPLEMENTARY OCL CIRCUIT

Since this circuit is not using output capacitor, the frequency characteristic is kept uniform even at very low frequency band and the output impedance is low in any of frequency bands resulting in that the value of damping factor is made larger so that the braking efficiency of speaker is increased. With this circuit, since a 100 percent NF is assured when the frequency of signal is zero and the value of NF is determined at only one place when the frequency of signal is at low band, the function of circuit is stabilized.

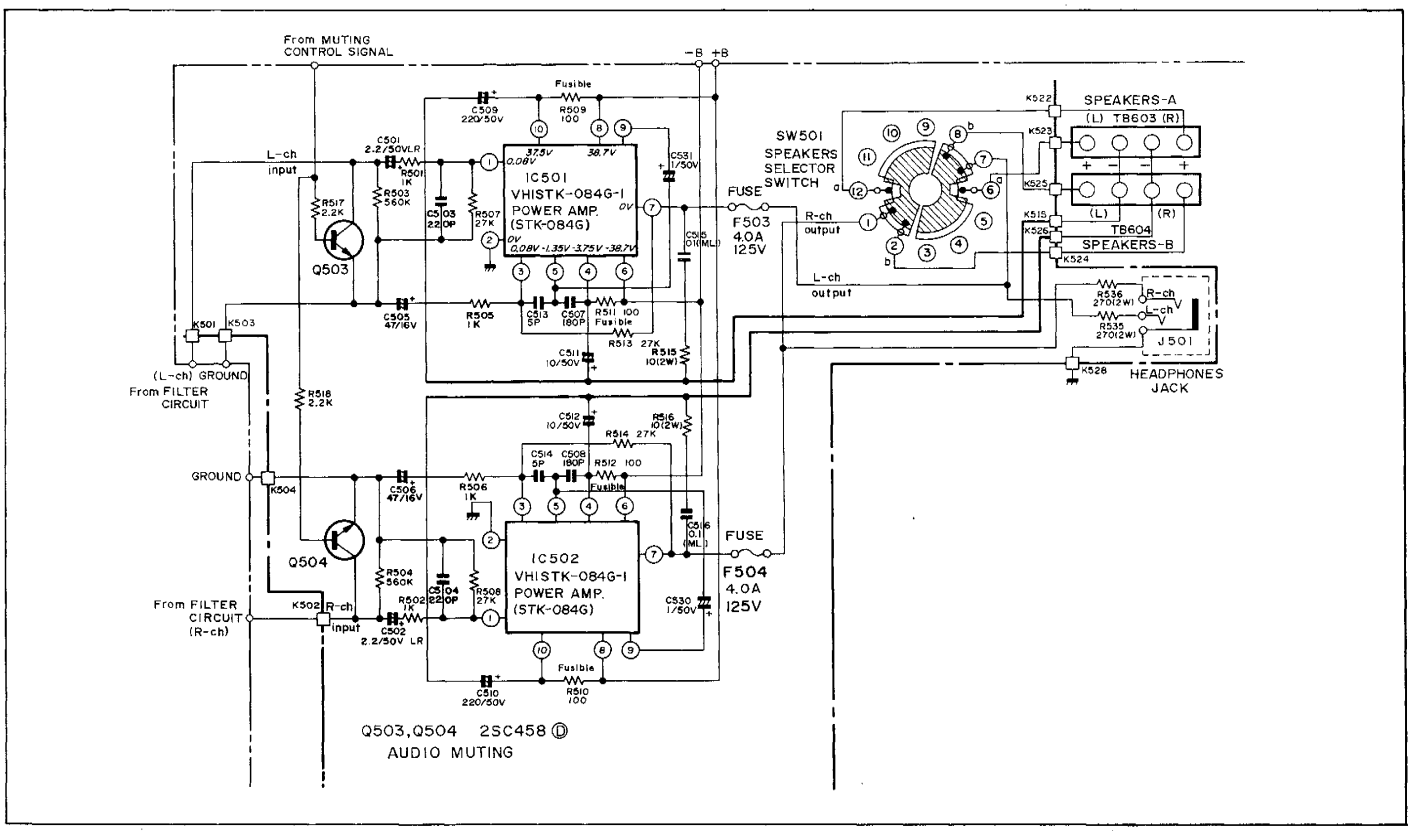


Figure 23 MAIN (POWER) AMPLIFIER CIRCUIT

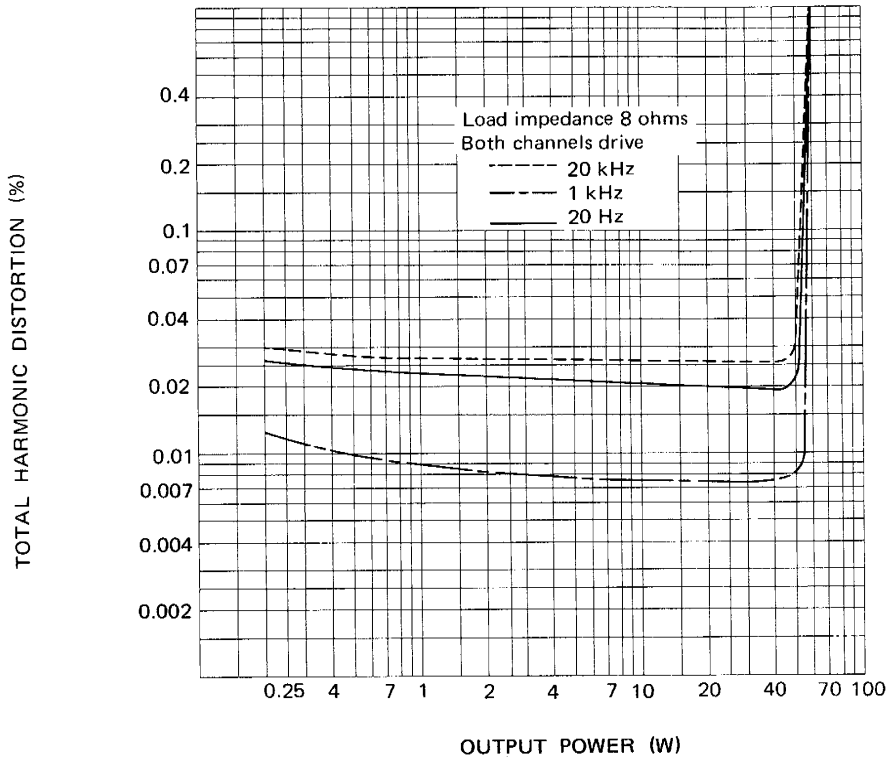


Figure 24 OUTPUT POWER VS TOTAL HARMONIC DISTORTION

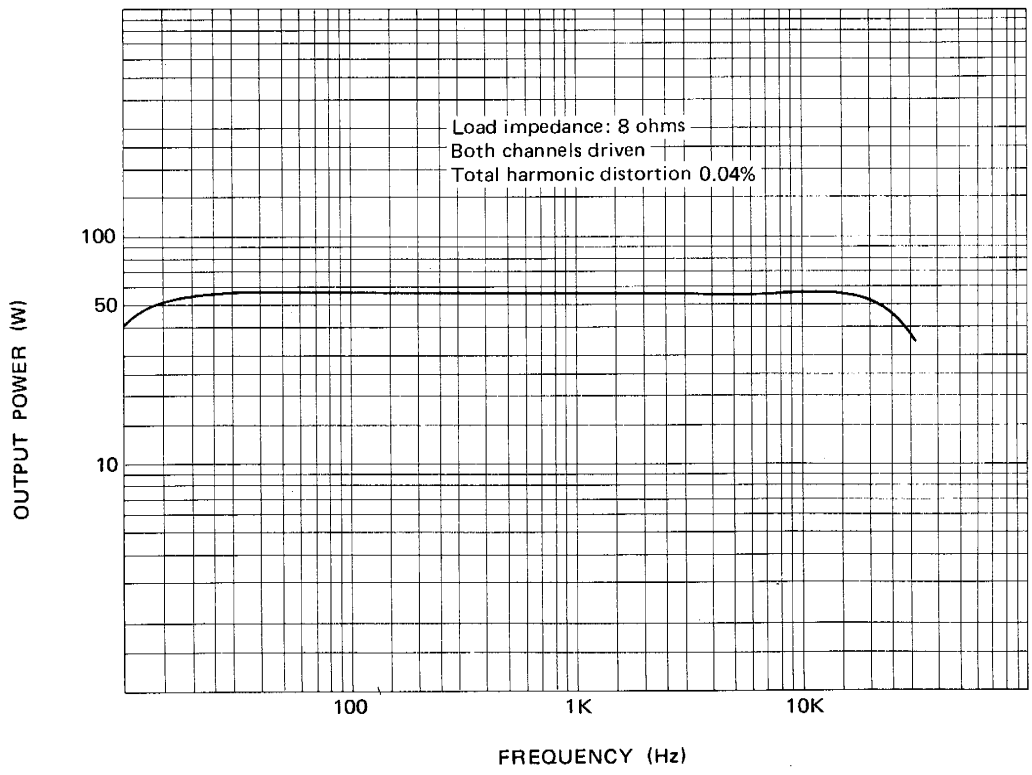


Figure 25 POWER BANDWIDTH CHARACTERISTIC

ELECTRONIC MUTING CIRCUIT

The electronic muting circuit is composed of transistors Q501 to Q504, diodes D507 to D510 and other resistors and capacitors and it works to prevent an occurrence of noises when the power switch SW601 is turned on or off, and to eliminate an abnormal thermal increase of the heat sink.

- **When the power switch is turned "ON"**

The electronic muting circuit works as follows;
A current runs in the bases of Q503 and Q504 through R531 and thus inputs to the main amplifier are shorted so that the signals of the tone amplifier won't enter the main amplifier. At the same time, a current also runs in R528 and C528 and so the base potential of Q502 increases until the Q502 is eventually turned on, so that a collector current will be produced. As a result, a voltage drop of R531 becomes drastic so that there will be no current caused at the bases of Q503 and Q504. Thus it is allowed for the main amplifier to receive signals.

- **When the power switch is turned "OFF"**

The electronic muting circuit works as follows;
The negative potential which has been charged in C527 becomes zeronized instantly and so the emitter potential of Q502 is increased to turn off the Q502. As a result, a current runs in the bases of Q503 and Q504 so that these transistors are turned on; this results in that no signal will enter the main amplifier.
Q501 is to discharge the C528 which has been once charged up when the power switch was turned off.

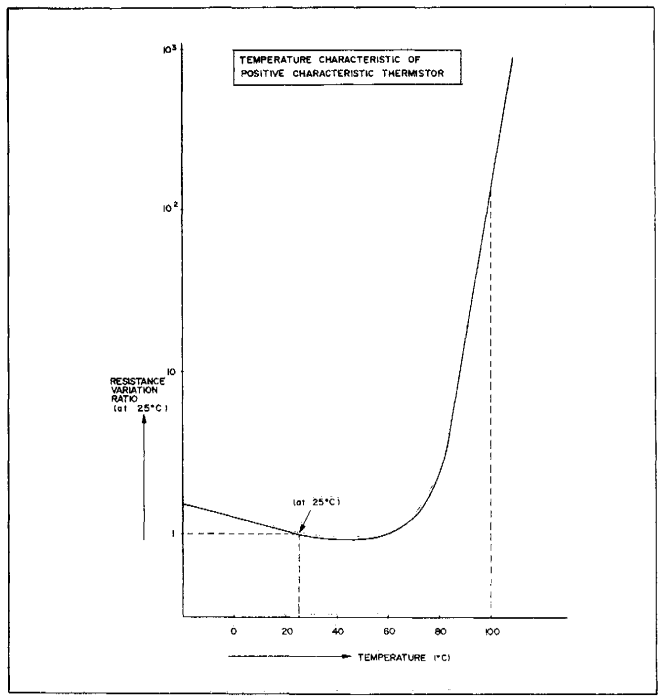


Figure 26

- **When temperature of the heat sink abnormally increases**

The electronic muting circuit works as follows;
If the heat sink of IC501 and IC502 are over-heated, the resistance of TH601 and TH602 are suddenly increased. As a result, the current of Q502 is reduced while its collector potential is increased so that the transistors Q503 and Q504 are turned on; this results in that no signals will enter the main amplifier so that an abnormal thermal increase of the heat sink can be eliminated.

POWER SUPPLY CIRCUIT

Power supply to the main (power) amplifier section is depended upon the 2-power supply system. With this 2-power supply system, AC voltage coming from the power transformer T601 is subjected to rectification by the bridge full-wave rectifier circuit consisting of diodes D501, D502, D503 and D504 and then be smoothed by the low impedance capacitor C521 and C522 to become DC voltage to finally be supplied to the main amplifier circuit section. The DC voltage thus smoothed is further applied to the ripple filter circuit to become stabilized so that it will be supplied to the tone circuit and equalizer circuit. Capacitors C517 and C518 are for the purpose to eliminate switching noises due to diodes D501 to D504 and further to remove noises coming from the power supply primary side. Power supply voltage to the tuner circuit is depended upon the fact that: AC voltage coming from the power transformer is rectified by the half-wave rectifier circuit with diode D511 to become DC voltage and it is further smoothed by the capacitor C529. Besides, to the tuner circuit (FM circuit section and AM circuit section) the supply voltage (DC) is regulated through the integrated circuit (IC503). These regulator circuits all function to effectively suppress fluctuations of the power supply voltage.

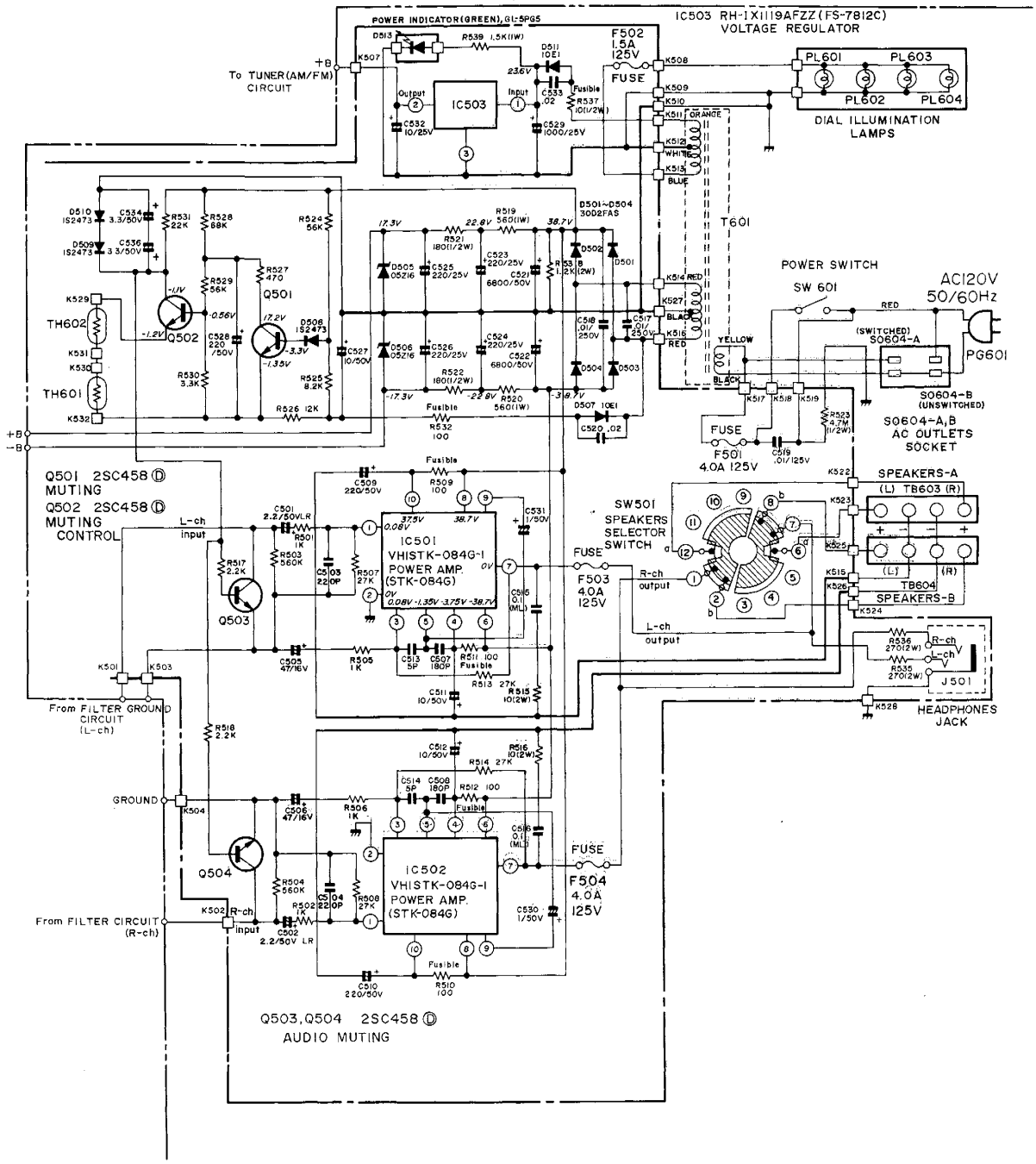


Figure 27 ELECTRONIC MUTING CIRCUIT AND POWER SUPPLY CIRCUIT

ALIGNMENT INSTRUCTIONS

Alignment is an exacting procedure and should be undertaken only when necessary. If alignment of AM and FM is required, either section may be done first. The FM stereo section, however, should be done only if the FM monaural section is properly adjusted.

REQUIRED EQUIPMENT

1. Signal generator with a frequency range of 450kHz to 1,650kHz; AM
2. Signal generator with a frequency range of 86.1MHz to 109.2MHz; FM
3. Vacuum tube voltmeter (AC-VTVM)
4. Sweep signal generator with a sweep range of at least 500kHz and center frequency of 10.7MHz with at least a 10.7MHz marker may be used. (For FM)
5. Sweep signal generator with a sweep range of at least 50kHz and center frequency of 455kHz with at least a 455kHz marker may be used. (For AM)
6. Oscilloscope with a wide range amplifier of approximately 100kHz.
7. Test loops, a coil of any size wire, one turn or more; AM
8. Vacuum tube voltmeter (DC-VTVM)
9. FM stereo signal generator.
10. Audio signal generator with a frequency range of 20Hz to 100kHz.
11. Frequency counter with a frequency range of approximately 100kHz.

Notes:

Allow the set at least five minutes to warm up before attempting alignment. During alignment keep the signal generator output at the lowest level that will maintain a usable output from the set.

For the adjustment of stereo separation, the FM stereo generator output is usually 1,000μV. Incorrect grounding to the metal chassis may pick up an unwanted 10.7MHz signal from the final IF stage, which will cause a regenerative sweep response on the sweep curve and result in misalignment.

Therefore always connect a ground to point.

Ground connection of signal generator:	Chassis ground
Generator modulation (AM):	30%, 400Hz
Generator modulation (FM):	75kHz, 1,000Hz
Generator modulation (FM stereo):	Ch. L. or Ch. R. 67.5kHz, 1,000Hz Mod.

AM IF ALIGNMENT

PROCEDURE NUMBER	SWEEP GENERATOR		DIAL POINTER SETTING	SELECTOR SETTING	SCOPE CONNECTION	ADJUSTMENT	REMARKS
	CONNECTION	FREQUENCY					
1	Connect AM sweep generator to the test point TP109 (VC104) and variable capacitor case (ground). Keep the input be closed as much as possible.	455 kHz (Central frequency of ceramic filter)	High end of Dial	Function selector switch (AM)	Oscilloscope is connected between TP105 and K105 (ground)	L107	Maximum response at 455 kHz Repeat 2 or 3 times

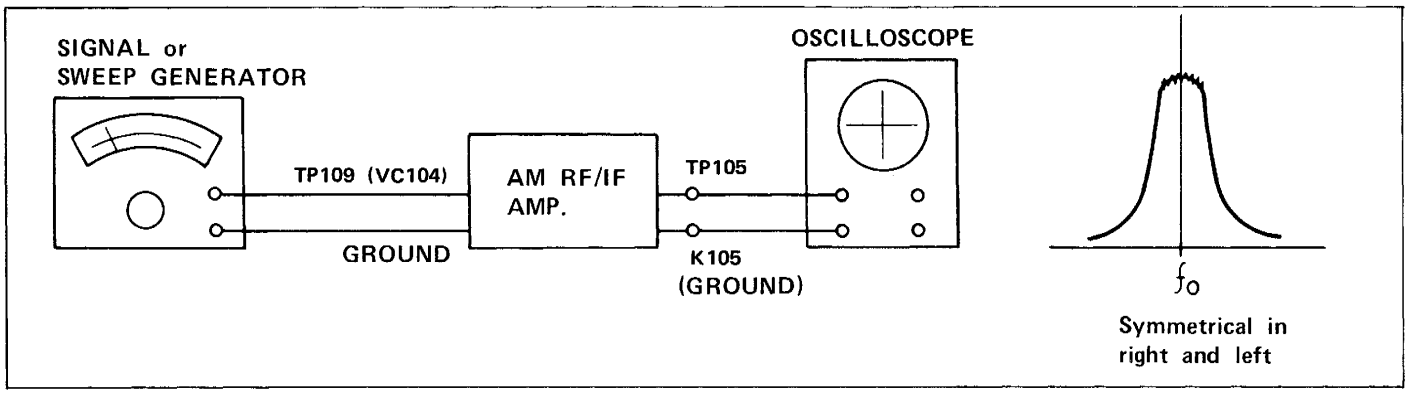


Figure 28 AM IF ALIGNMENT EQUIPMENT CONNECTIONS

AM RF ALIGNMENT

PROCE-DURE NUMBER	TEST STAGE	SIGNAL GENERATOR		DIAL POINTER SETTING	SELECTOR SETTING	SCOPE CONNECTION	ADJUSTMENT	REMARKS
		CONNECTION	FREQUENCY					
1	Band Coverage	Connect AM signal generator to the loop antenna and place this assembly at near the bar antenna coil (L601) (Keep the input be closed as much as possible).	515 kHz Modulated	Low end of Dial	Function selector switch (AM)	Oscilloscope is connected between TP105 and K105 (ground)	Oscillator Coil L109.	Adjust for maximum output
2		Same as above	1650 kHz Modulated	High end of Dial	Same as above	Same as above	Oscillator Trimmer TC105.	Same as above. Repeat steps 1 and 2, 2 or 3 times.
3	Tracking	Same as above	1400 kHz Modulated	Tuning in 1400 kHz	Same as above	Same as step 1	Antenna Trimmer TC104	Same as step 1
4		Same as above	600 kHz Modulated	Tuning in 600 kHz	Same as above	Same as step 1	Antenna Coil L601	Same as above. Repeat steps 3 and 4, 2 or 3 times.

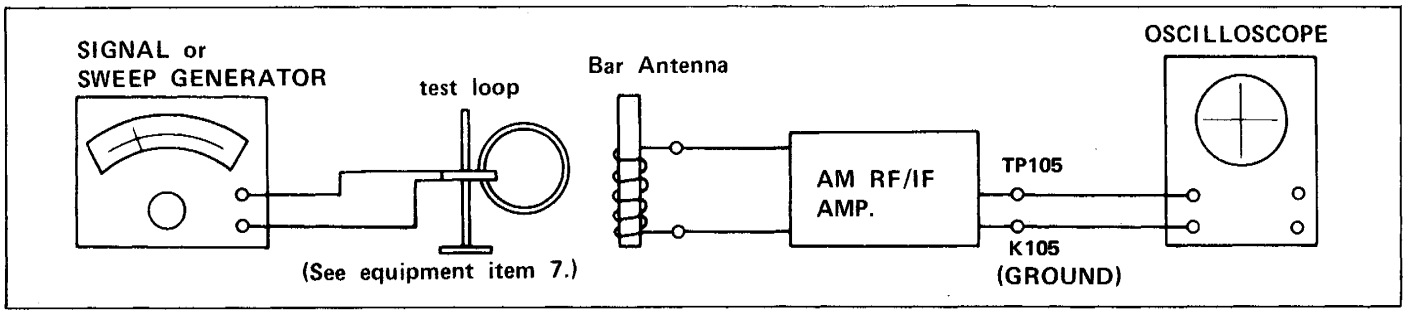


Figure 29 AM RF ALIGNMENT EQUIPMENT CONNECTIONS

FM ALIGNMENT

Set the FM Muting switch (SW101) at "OFF" position and MODE switch (SW403-A, B) at "mono" position.

PROCEDURE NUMBER	TEST STAGE	SIGNAL GENERATOR		DIAL POINTER SETTING	SELECTOR SETTING	METER CONNECTION	ADJUSTMENT	REMARKS
		CONNECTION	FREQUENCY					
1	IF (Note 1)	Connect FM sweep generator, through 6PF capacitor, to the test point TP101. Connect the ground to the shield plate.	Central frequency of ceramic filter (as small as possible)	High end of Dial	Function selector switch (FM)	Connect an oscilloscope to the test points TP102 and TP106 (ground)	T101	Rotate the core of T101 to adjust so that the waveform becomes symmetrical in right and left and attains the maximum in height and width
2	Detector	Connect FM sweep generator, through 6PF capacitor, to the test point TP101. Connect the ground to the shield plate.	Same as above	Same as above	Function selector switch (FM)	Connect an oscilloscope to the test points TP103 and TP107 (ground)	IFT101, IFT102	Rotate the core to adjust so that the waveform (Fig. 32) becomes symmetrical in the upper and lower with the best linearity.
3	Repeat the steps 1 and 2 until no further improvement can be made.							
4	Band Coverage	Connect FM signal generator to the FM antenna terminals. (Keep the input be closed as much as possible)	87.0 MHz (Modulated) as small as possible	Low end of Dial	Function selector switch (FM)	Connect VTVM to the test points TP103 and TP107 (ground)	Oscillator Coil L104	Adjust for maximum output
5		Same as above	109 MHz (Modulated) as small as possible	High end of Dial	Same as step 4	Same as above	Oscillator Trimmer TC103.	Same as above
6	Tracking	Same as above	90 MHz (Modulated) as small as possible	Tuning in 90 MHz	Same as step 4	Same as step 4	Antenna Coil L101 and RF Coil L102.	Same as step 4
7		Same as above	106 MHz (Modulated) as small as possible	Tuning in 106 MHz	Same as step 4	Same as step 4	Antenna Trimmer TC101 and RF Trimmer TC102.	Same as above
8	Repeat the steps 4 to 7 until no further improvement can be made.							

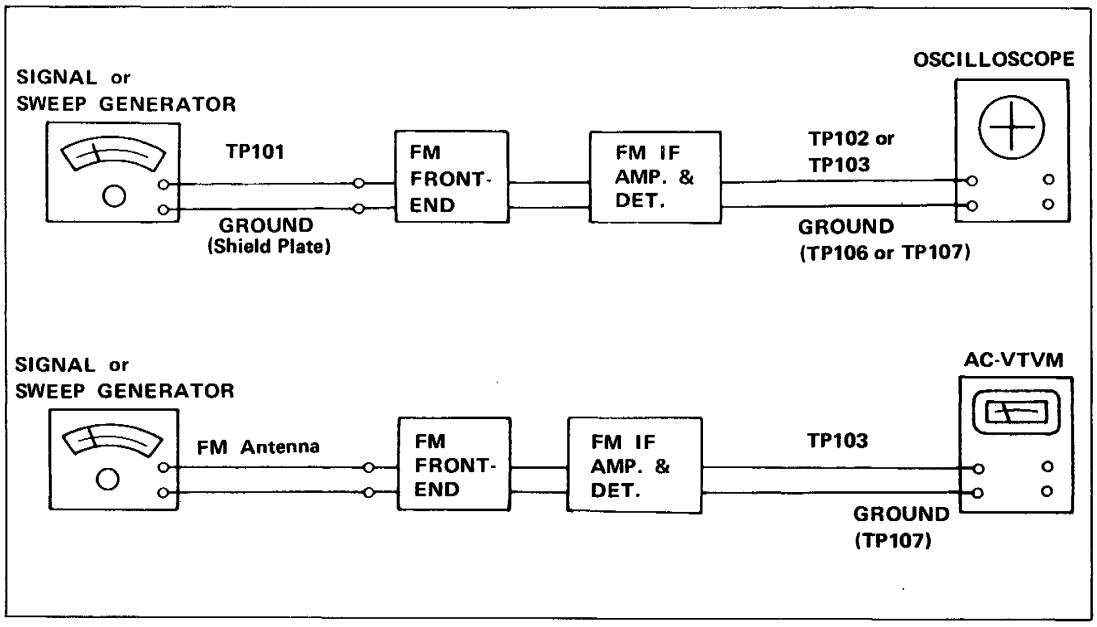


Figure 30 FM ALIGNMENT EQUIPMENT CONNECTIONS

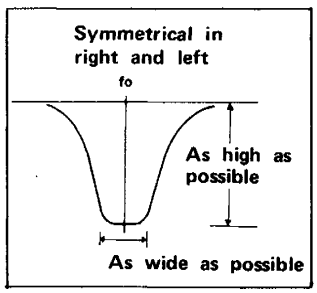


Figure 31 "IF" CURVE

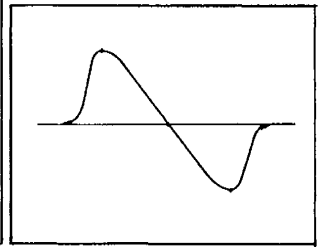


Figure 32 "S" CURVE

Note 1

The ceramic filter used for this set is available in 5 types and each of them is given a color indication to differentiate the central frequency from that of the others, as described below. In the actual use, be sure to make 2 ceramic filters of the same type (the same color) as a pair to put them in the set. When other ceramic filters than that given red color indication (with the central frequency of 10.7MHz) are used, note that with such filters the marker (10.7MHz) of FM sweep generator will be deviated; therefore be sure to cut off the marker at the time of the adjustment.

Central frequency (fo)	D	Black	10.64MHz ± 0.03MHz
	B	Blue	10.67MHz ± 0.03MHz
	A	Red	10.70MHz ± 0.03MHz
	C	Orange	10.73MHz ± 0.03MHz
	E	White	10.76MHz ± 0.03MHz

(2 ceramic filters to be used in a set as a pair should be of the same type (the same color).)

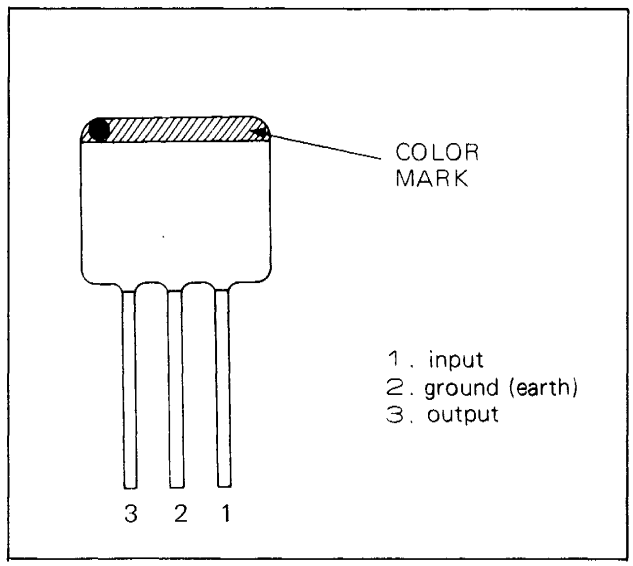


Figure 33

FM TUNING METER ADJUSTMENT AND DISTORTION FACTOR ADJUSTMENT

1) Set the frequency of FM signal generator to 98 MHz (75 kHz deviation, 1000 Hz), fully close the output and connect such signal to the FM antenna terminal of the set through a dummy resistor of 300 ohms.
2) Connect a dummy resistor of 8 ohms to the speaker terminal of the set.
3) Set the switches and controls of the set to the respective positions shown below and turn on the power switch. [Low cut filter—off, High cut filter—off, Bass, Treble and Balance controls—center (zero), Mode—mono, Loudness—off, Volume control—min., Tape-1 and-2— source, Function selector—FM, FM muting—off, air check—off]
4) Keeping the output of FM signal generator be fully closed (that is, with no signal given), rotate the core of IFT101 to have the pointer of the tuning meter indicate the center (around "98 MHz" position).
5) Adjust the output of FM signal generator to 60 dB, make the set be tuned to this signal so that the tuning meter indicates its center and under the condition, adjust the core of IFT102 so that the distortion will be minimized.
6) Fully close the output of FM signal generator and make sure the pointer of the tuning meter is at the center.
7) Repeat the steps 1) to 6) until the best point will be found.

ADJUSTMENT OF AIR CHECK CAL.

Produce 98 MHz, 60 dB FM mono signal (modulation 100%, 400 Hz) by a signal generator to apply it to the antenna of the unit and read the output voltage.
Next, set AIR CHECK switch to "ON" position, then the output voltage will vary. Adjust semi-fixed resistor VR103 so that the output voltage with AIR CHECK switch set to "ON" becomes about 60% (–4.4 dB), of that with AIR CHECK switch kept at "OFF".

FM STEREO V.C.O. AND SEPARATION ADJUSTMENT

1) Connect FM signal generator, through a dummy resistor of 300 ohms, to the FM antenna terminal of the set.
2) As to setting of the switches and controls, take the same procedures as in the step 3 "FM TUNING METER ADJUSTMENT AND DISTORTION FACTOR ADJUSTMENT".
3) Set the frequency of FM signal generator to 98 MHz (75 kHz deviation, 1000 Hz) and the output to 60 dB (mono signal), place the mode switch of the set to the position "stereo" and let the set be exactly tuned to such signal. (FM muting switch is kept to the position "muting off".)
4) Connect VTVM, through a 3.3 Meg. ohm resistor, to the test point TP104 and a frequency counter to the output terminal of VTVM.
   Make the test points TP103 and TP107 (ground) of the set be connected (shorted). Rotate the semi-fixed resistor VR101 to adjust so that the frequency counter will read 76.00 kHz ± 200 Hz. (After the adjustment; reset the connection between the test points TP103 and TP107).
5) Connect FM stereo modulator to FM signal generator. At the time, the following should be set: modulation frequency; 1 kHz (L + R; 33.75 kHz, L − R; 33.75 kHz, pilot (19 kHz); 7.5 kHz deviation).
6) Set the frequency of FM signal generator to 98 MHz and its output to 60 dB, tune the set in such signal so that the tuning meter will indicate the position "center". Set the modulator so as to cause modulation only in L-channel and consider the output of L-channel as 0 dB. Connect VTVM to the output terminal (R-channel side only) of the set and adjust semi-fixed resistor VR102 so that the separation becomes maximum (the output leaking to the opposite channel is minimized.)
   Take the above procedures also for checking the separation of R-channel, then, adjust so that the separations of both channels will be equal to each other.

[If without the frequency counter, proceed with the alignment as follows. While receiving a FM stereo signal, turn the VR101 until the P.L.L. will be locked (when it is locked, the stereo indicator will be lit). Then, reversely turn the VR101 halfway and fix it.]

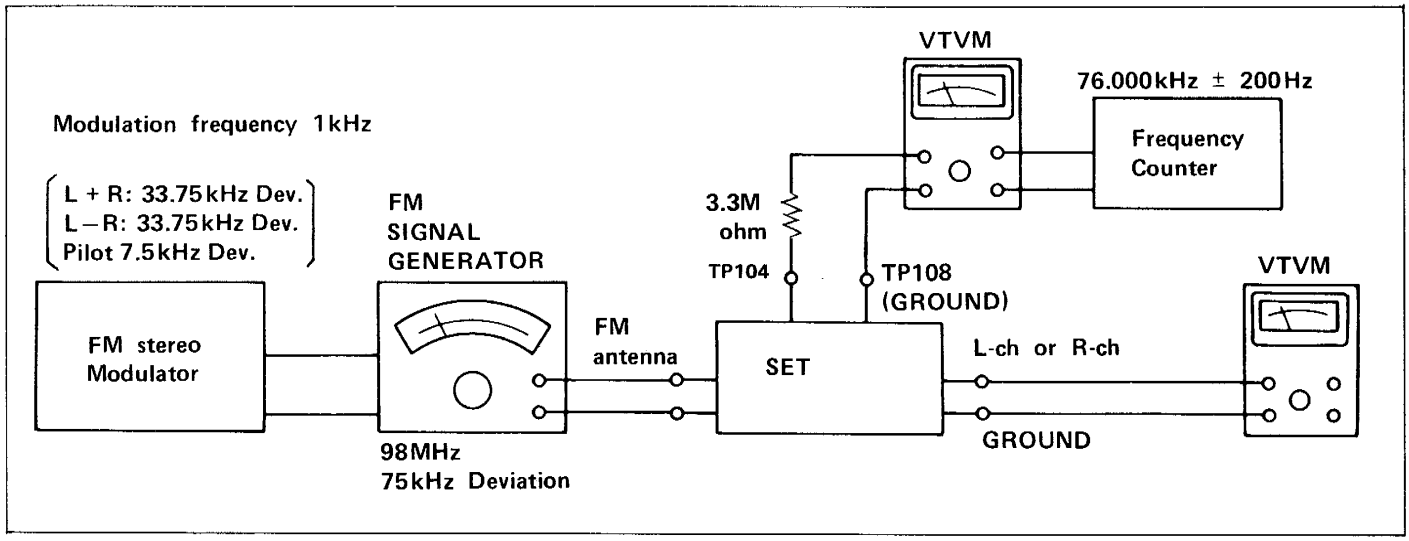


Figure 34 FM STEREO ALIGNMENT EQUIPMENT CONNECTIONS

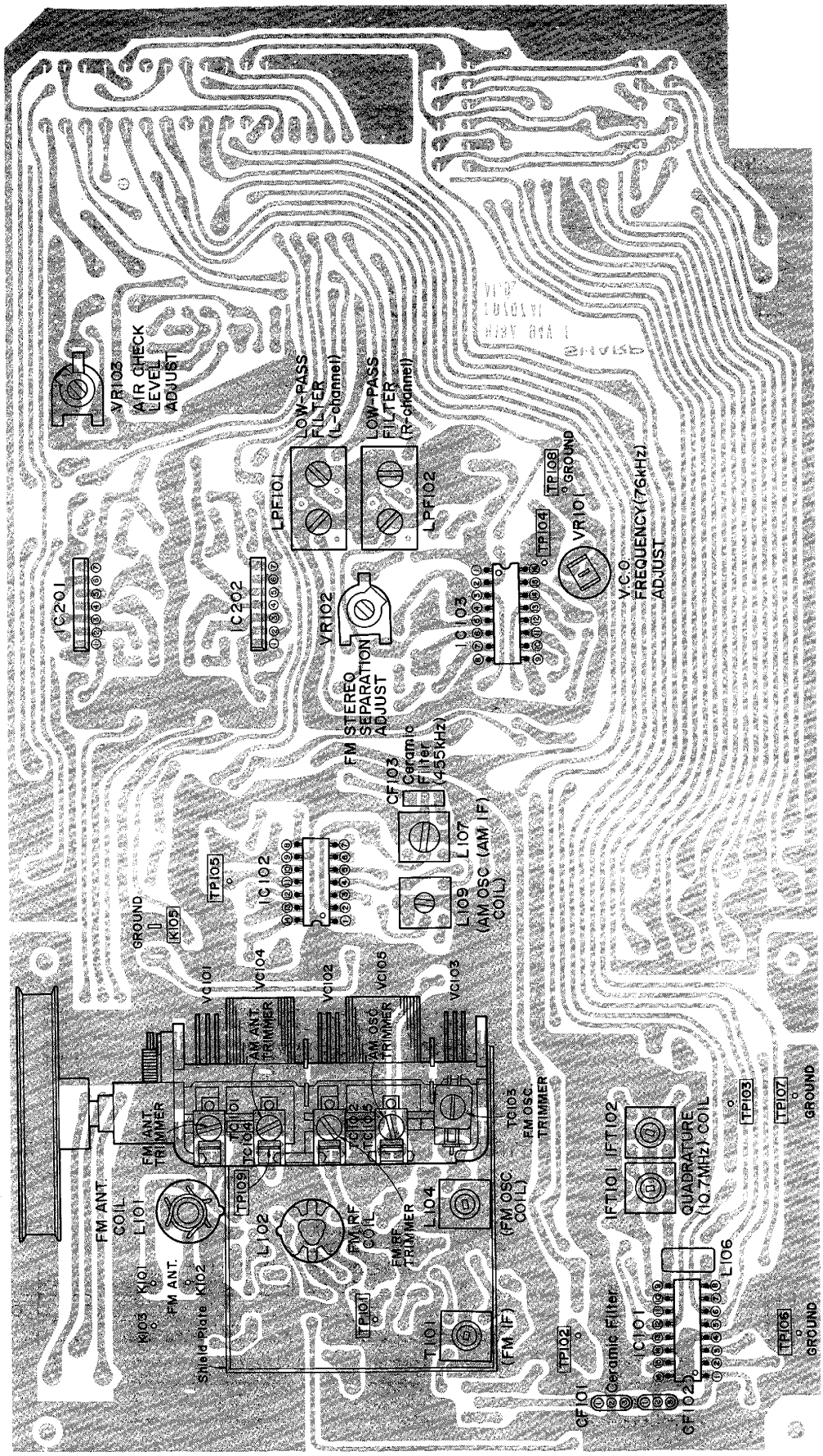
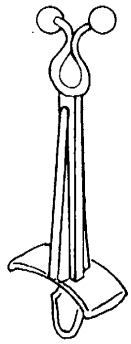
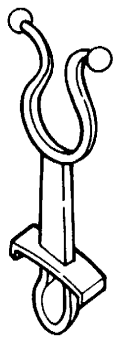


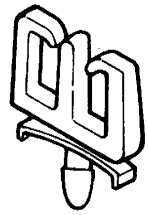
Figure 35 ALIGNMENT POINTS OF RF/IF P.W. BOARD



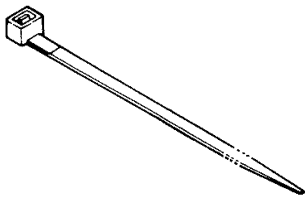
LHLDW1053AFZZ



LHLDW1062AFZZ



LHLDW1060AFZZ



LHLDW1075AFZZ

Figure 36 WIRE HOLDER

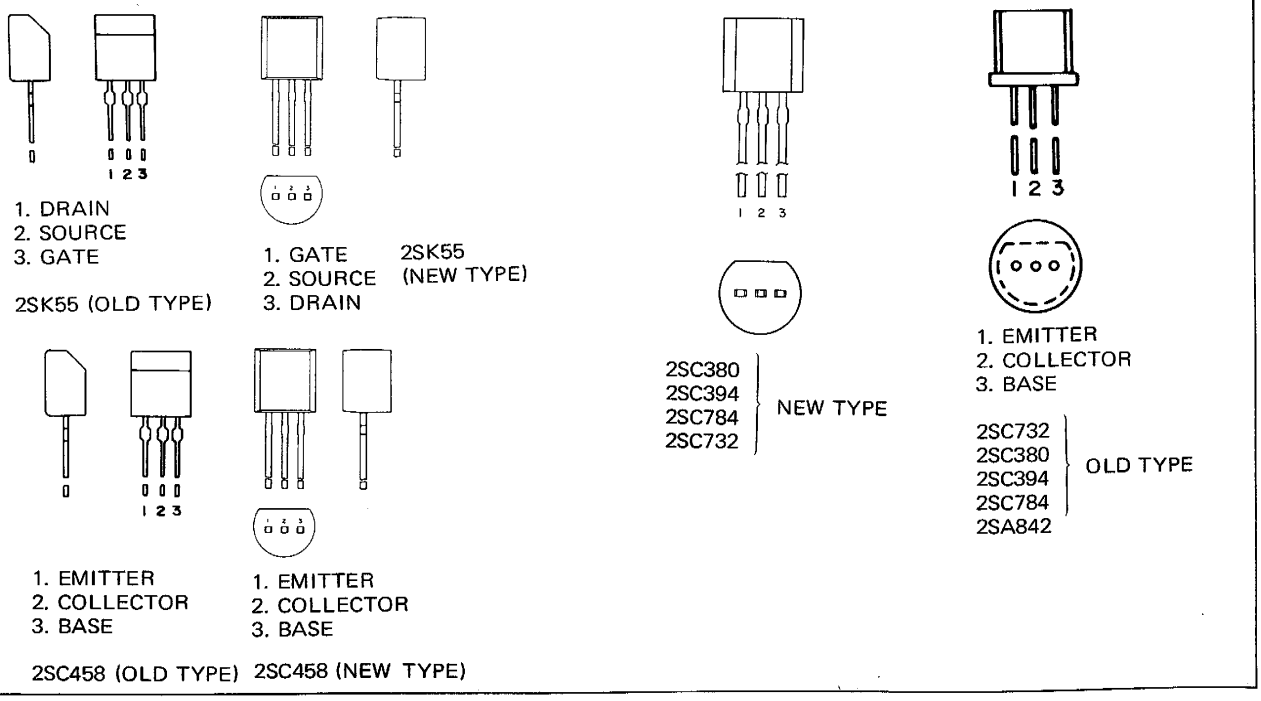


Figure 37 TRANSISTOR TYPES

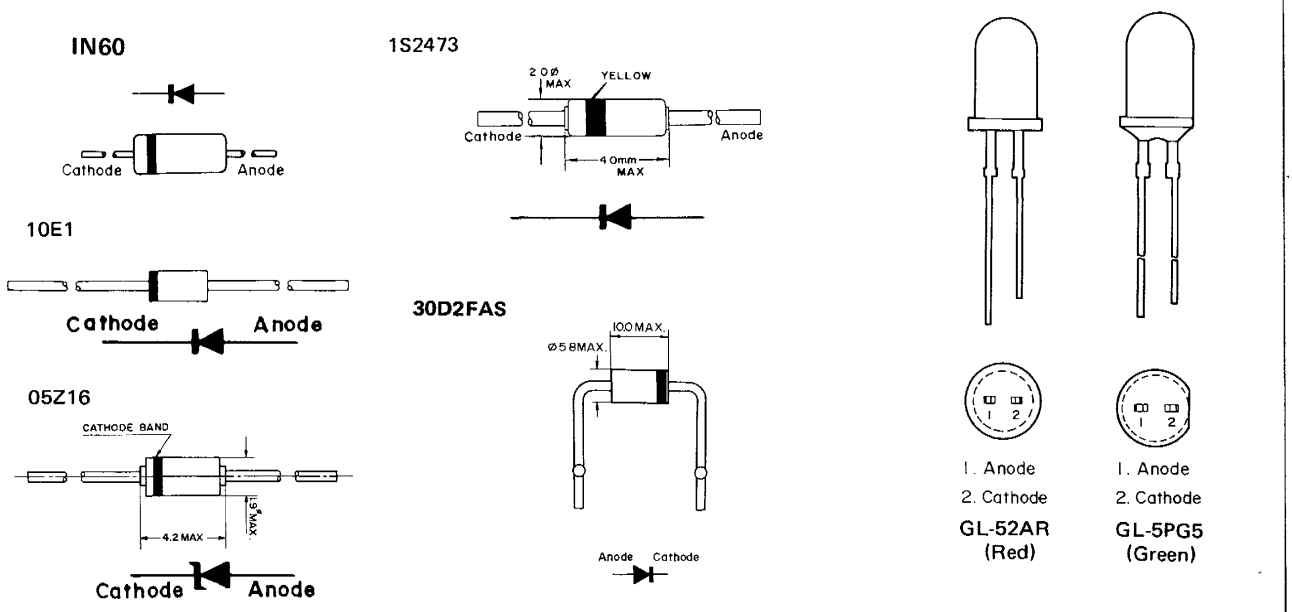


Figure 38 DIODE TYPES

REPLACEMENT OF POWER AMPLIFIER IC (IC501 and IC502)

To replace the Power amplifier IC with a new one, remove the two screws retaining the Power amplifier IC and its legs from the printed wiring board.

Then apply silicon grease to a new Power amplifier IC (at the surface which will be in contact with the heat sink) and insert its legs to the printed wiring board and tighten it by using the two screws. After that, solder the said legs to the printed wiring board.

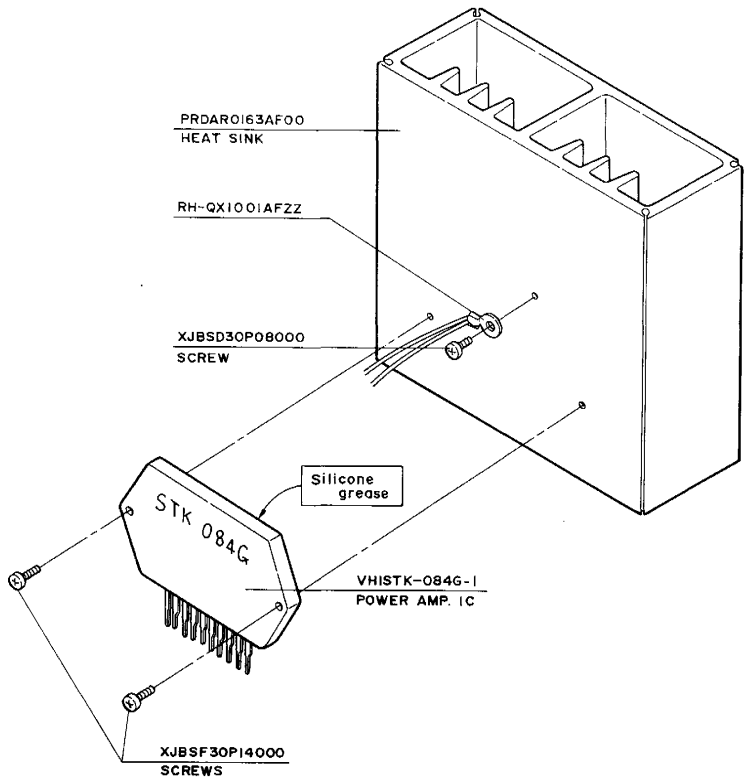


Figure 39 POWER AMPLIFIER IC REPLACEMENT

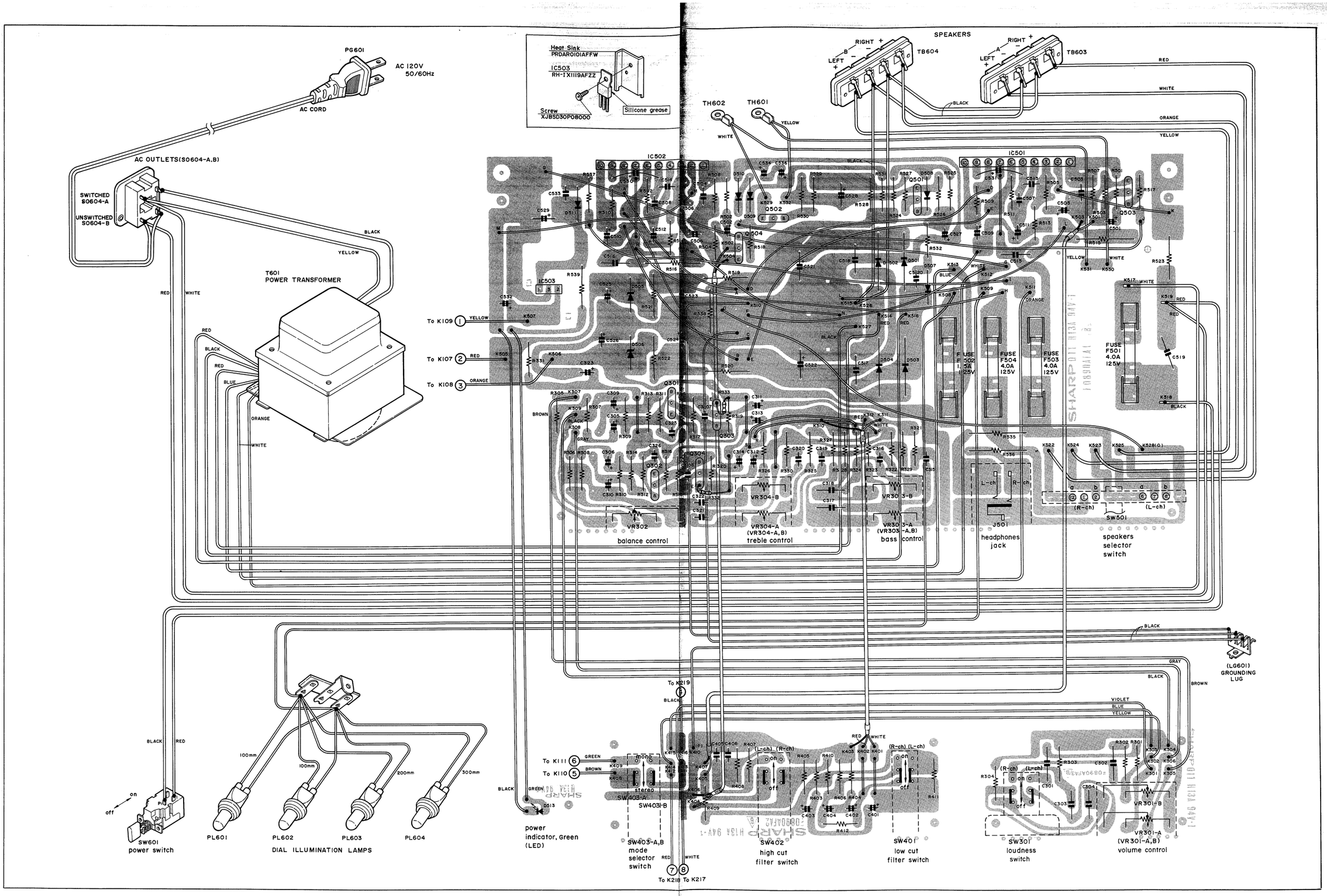


Figure 40 WIRING SIDE OF AUDIO AMPLIFIER CIRCUIT BOARD

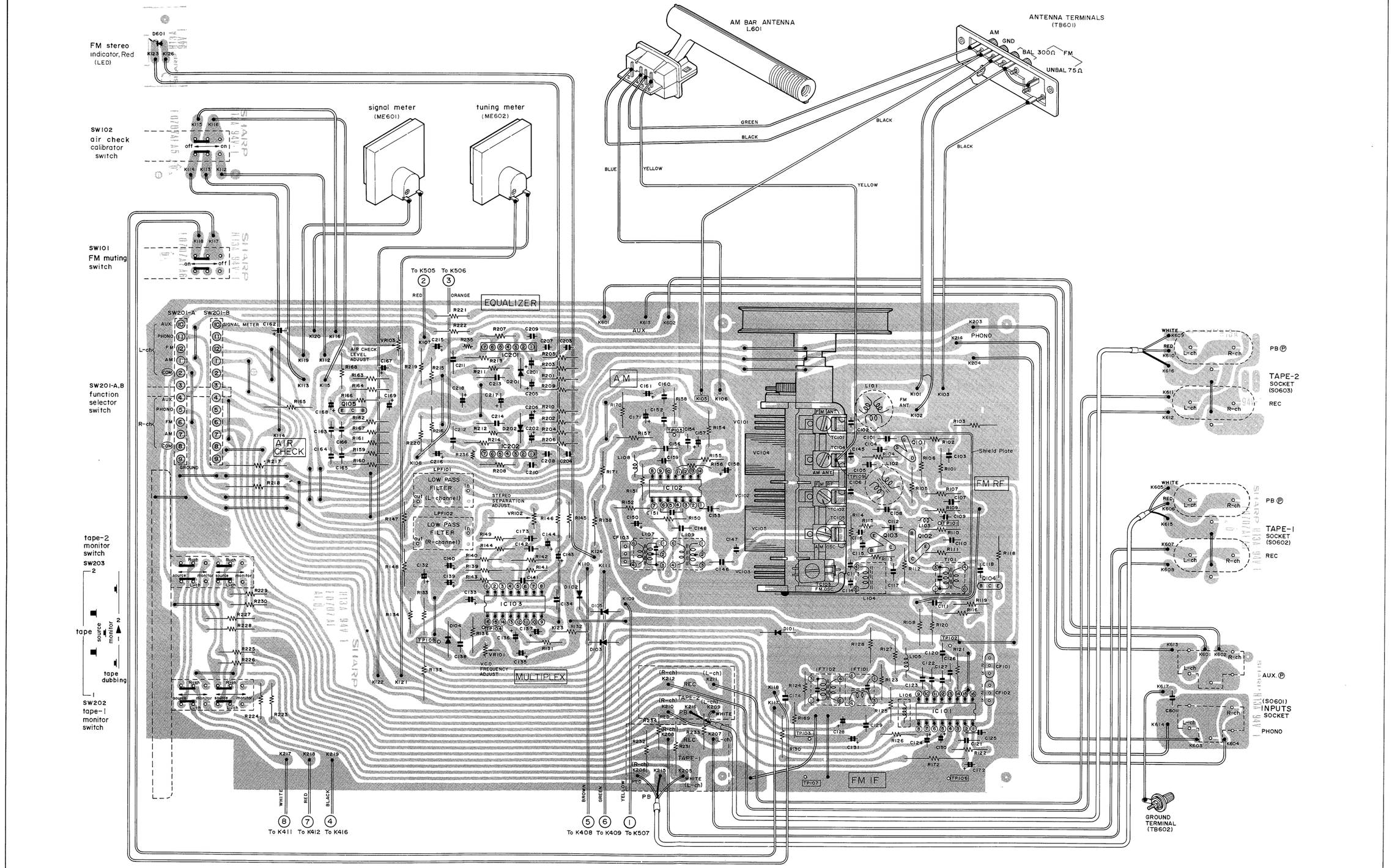
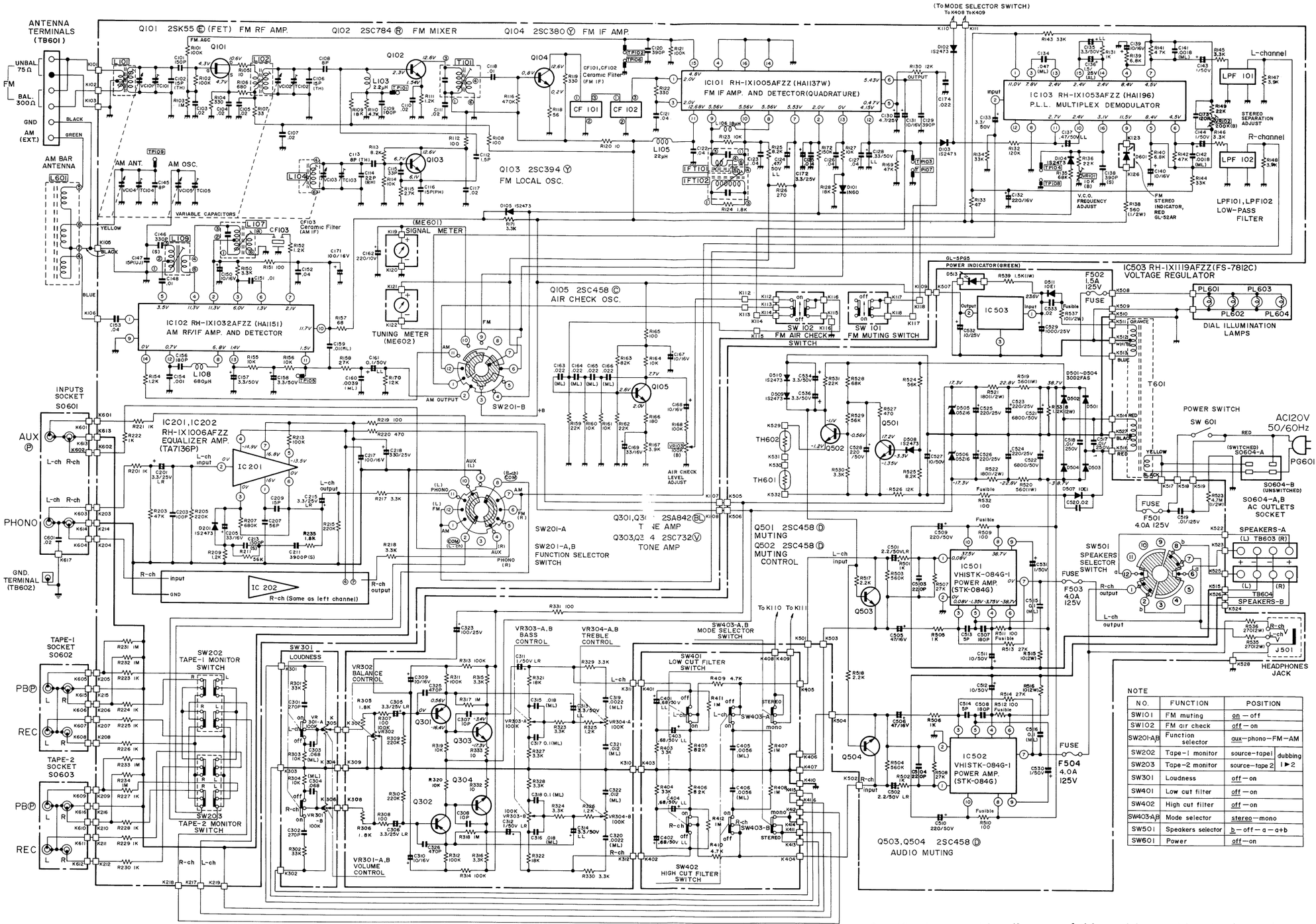


Figure 41 WIRING SIDE OF RF/IF/MULTIPLEX CIRCUIT BOARD



NOTE

NO.	FUNCTION	POSITION
SW101	FM muting	on — off
SW102	FM air check	off — on
SW201-AB	Function selector	aux—phono—FM—AM
SW202	Tape-1 monitor	source→tape1 dubbing
SW203	Tape-2 monitor	source→tape 2 1►2
SW301	Loudness	off — on
SW401	Low cut filter	off — on
SW402	High cut filter	off — on
SW403-AB	Mode selector	stereo—mono
SW501	Speakers selector	b—off—a—a+b
SW601	Power	off—on

Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.

Figure 42 SCHEMATIC DIAGRAM

NOTES ON SCHEMATIC DIAGRAM

1. Frequency range: FM; 87.6 to 108 MHz
   AM; 520 to 1620 kHz
2. IF: FM 10.7 MHz, AM 455 kHz
3. Resistor: To differentiate the units of resistors, such symbols as K and M are used: the symbol K means 1000Ω and the symbol M means 1000K Ω and the resistor without any symbol is Ω-type resistor. Besides, the one with "Fusible" is a fuse type.
4. Capacitor: To indicate the unit of capacitor, a symbol P is used; this symbol P means pF and the unit of the capacitor without such symbol is μF. As to electrolytic capacitor, the expression "capacitance/withstand voltage" is used. The symbols LL and LR for the electrolytic capacitor respectively mean low-leak type.
5. SW101: It is FM muting (on/off) switch ("on" position).
6. SW102: It is Air check (off/on) switch ("off" position).
7. SW201-A, B: It is Function selector (aux./phone/FM/AM) switch ("aux." position).
8. SW202: It is Tape-1 (source/monitor) switch ("source" position).
   SW203: It is Tape-2 (source/monitor) switch ("source" position).
   (Pushing the switches Tape-1 and Tape-2 at the same time allows the operator to make tape dubbing from the tape deck 1 to the tape deck 2.....in this case, monitoring is to be made through the tape deck 1.
9. SW301: It is Loudness (off/on) switch ("off" position).
10. SW401: It is Low cut filter (off/on) switch ("off" position).
11. SW402: It is High cut filter (off/on) switch ("off" position).
12. SW403-A, B: It is Mode selector (stereo/mono) switch ("stereo" position).
13. SW501: It is Speaker selector (b/off/a/a+b) switch ("b" position).
14. SW601: It is Power (on/off) switch ("off" position).
15. The indicated voltage in each section is the one measured by VTVM between such a section and the chassis with no signal being given.

RH-IX1119AFZZ

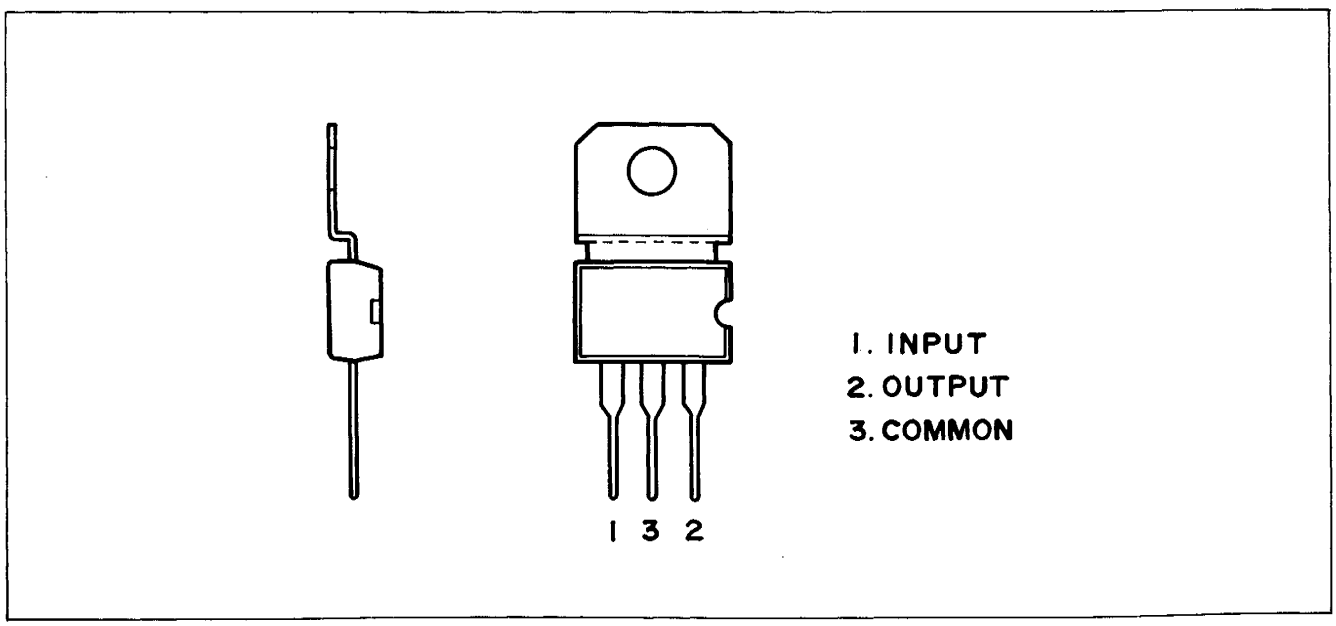


Figure 43 OUTER VIEW OF INTEGRATED CIRCUIT (IC503)

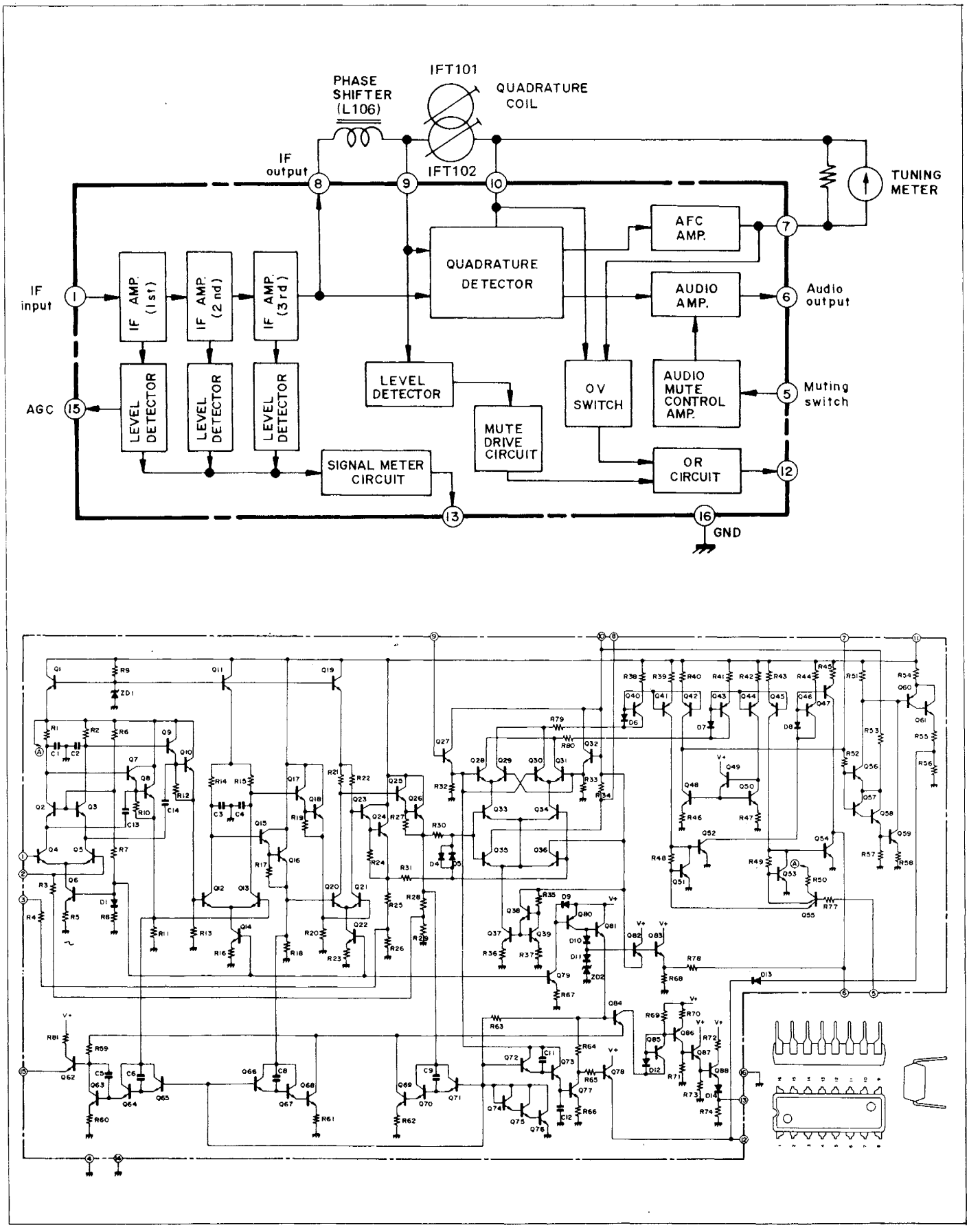
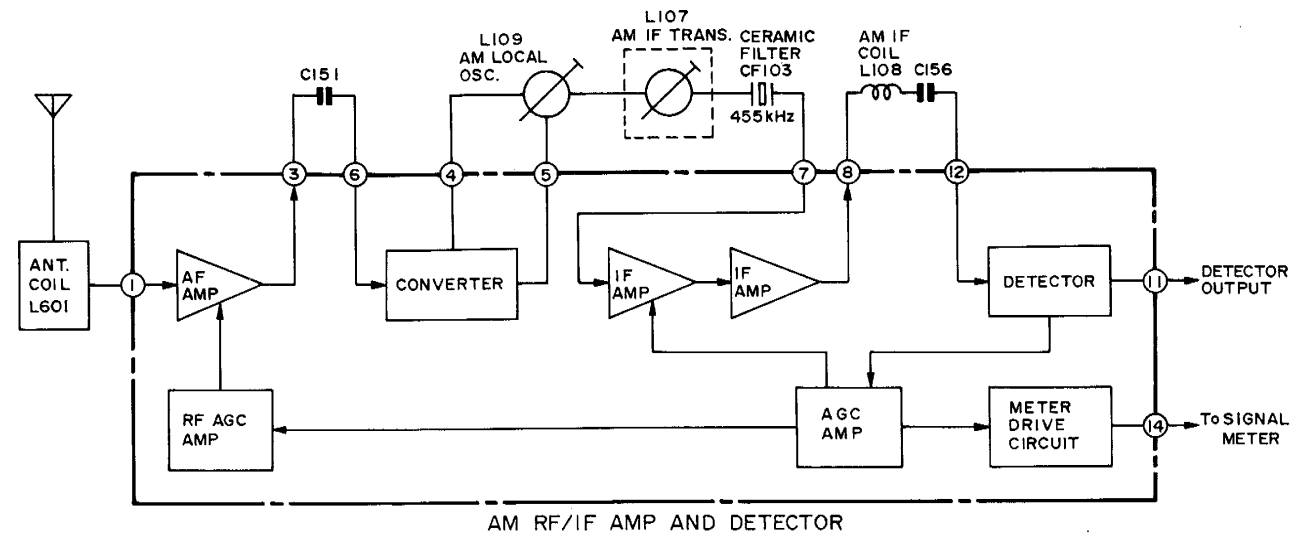
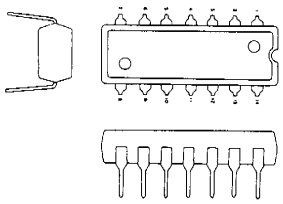


Figure 44 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT (IC101)



AM RF/IF AMP AND DETECTOR



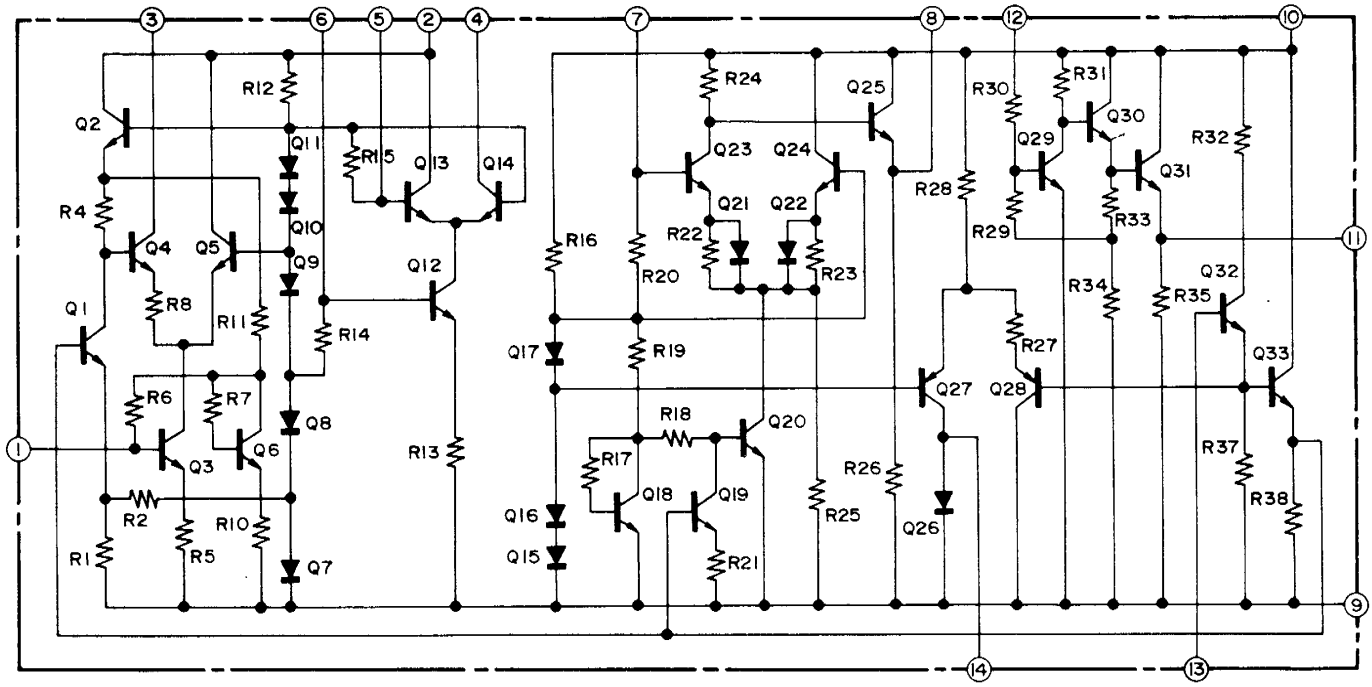
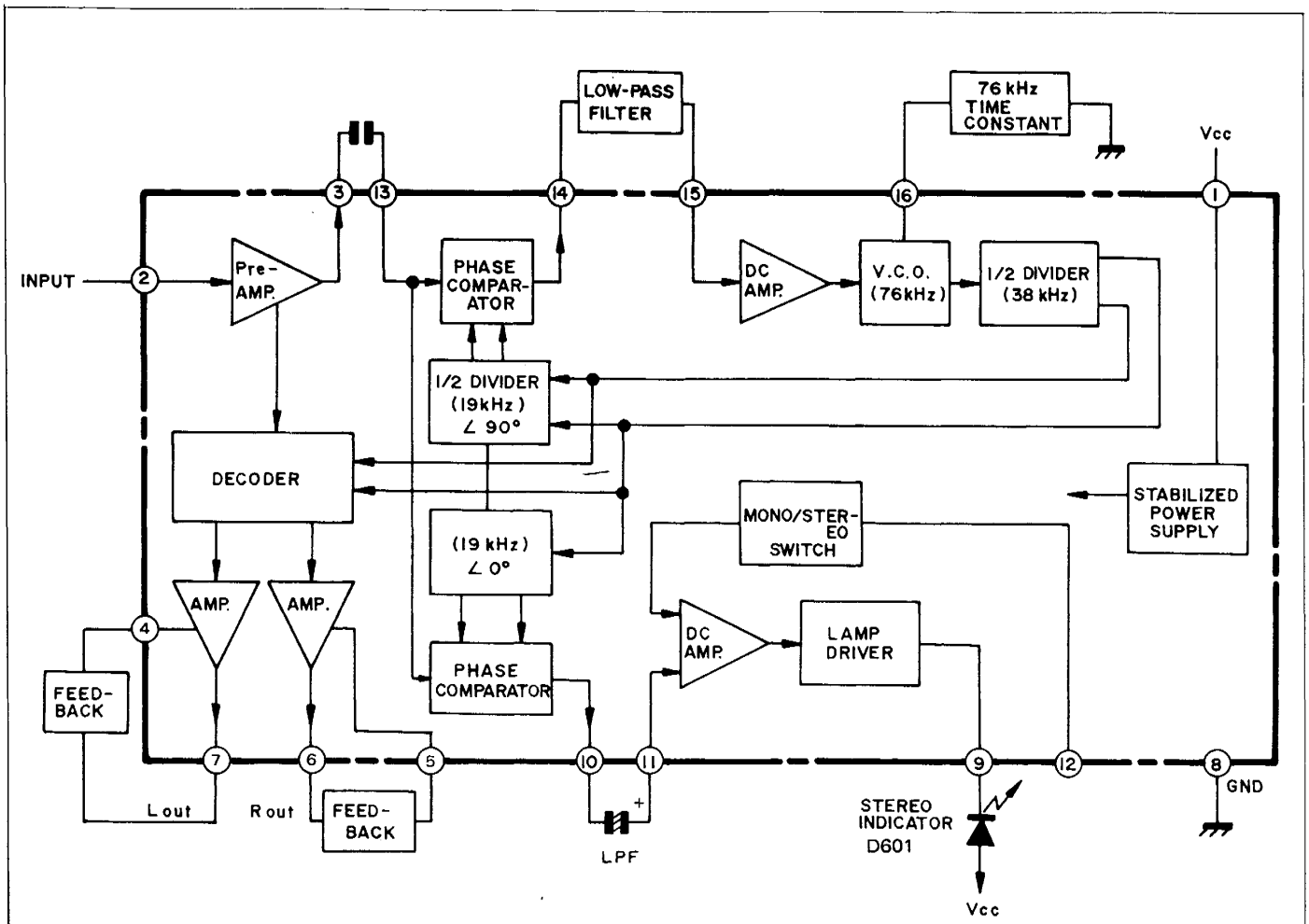


Figure 45 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT (IC102)



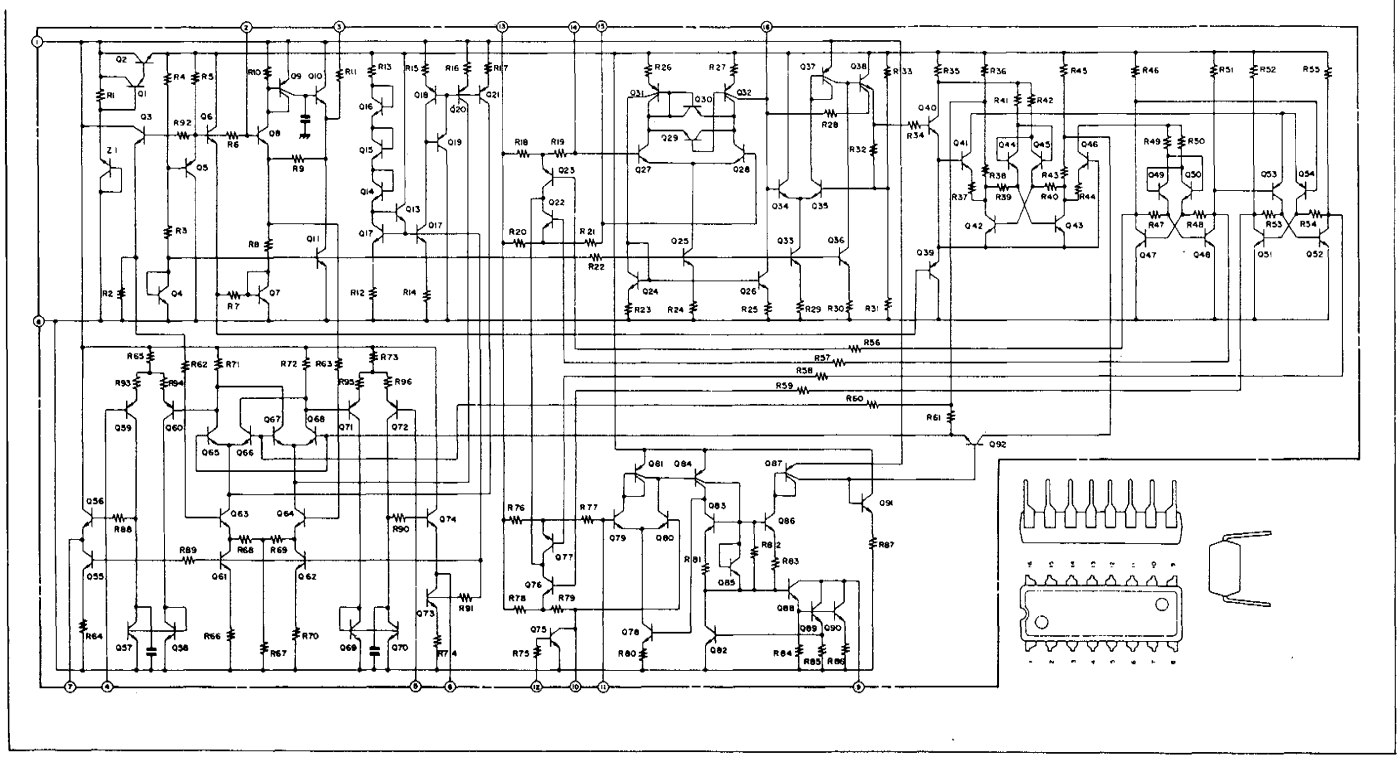


Figure 46 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT (IC103)

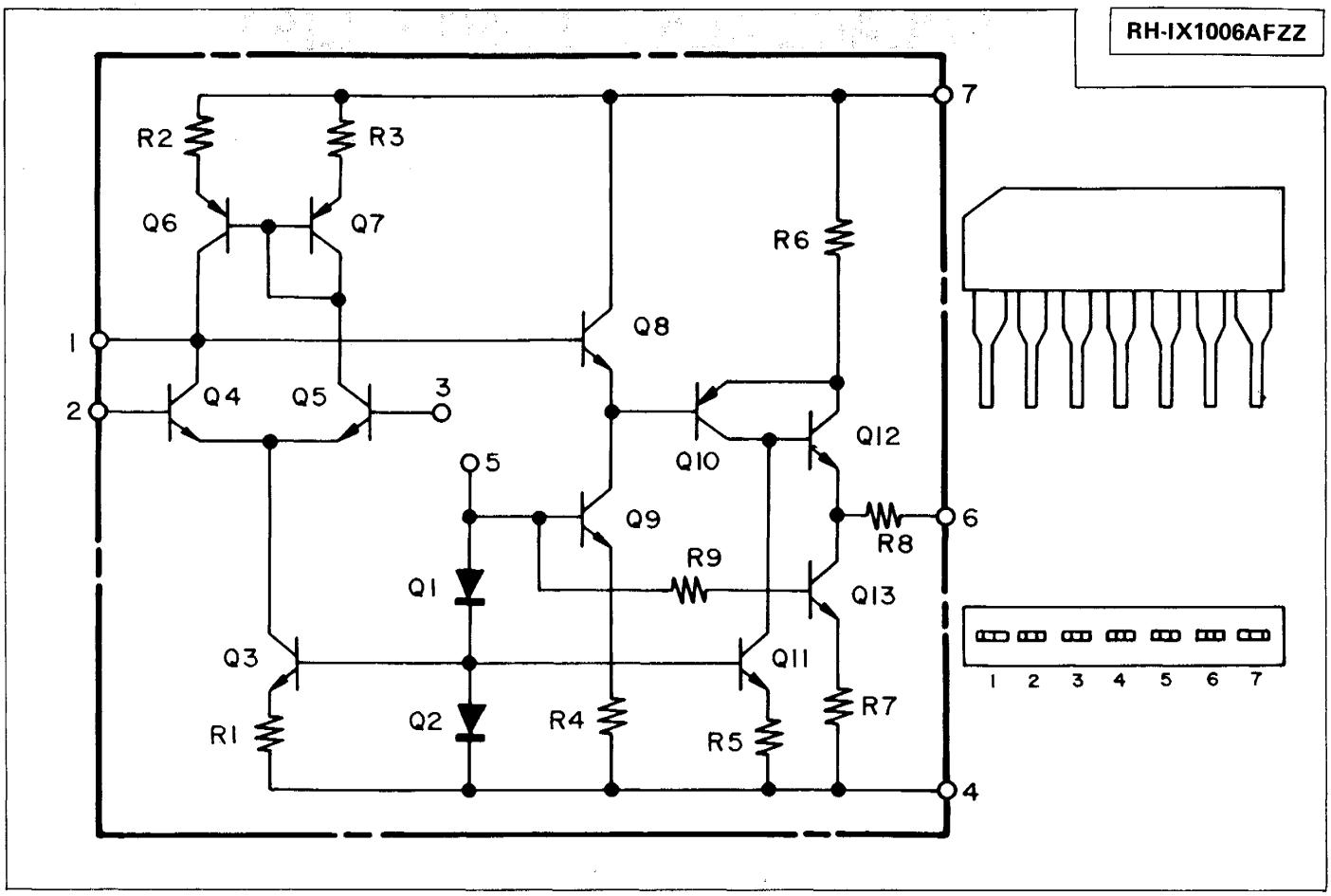


Figure 47 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT (IC201 and IC202)

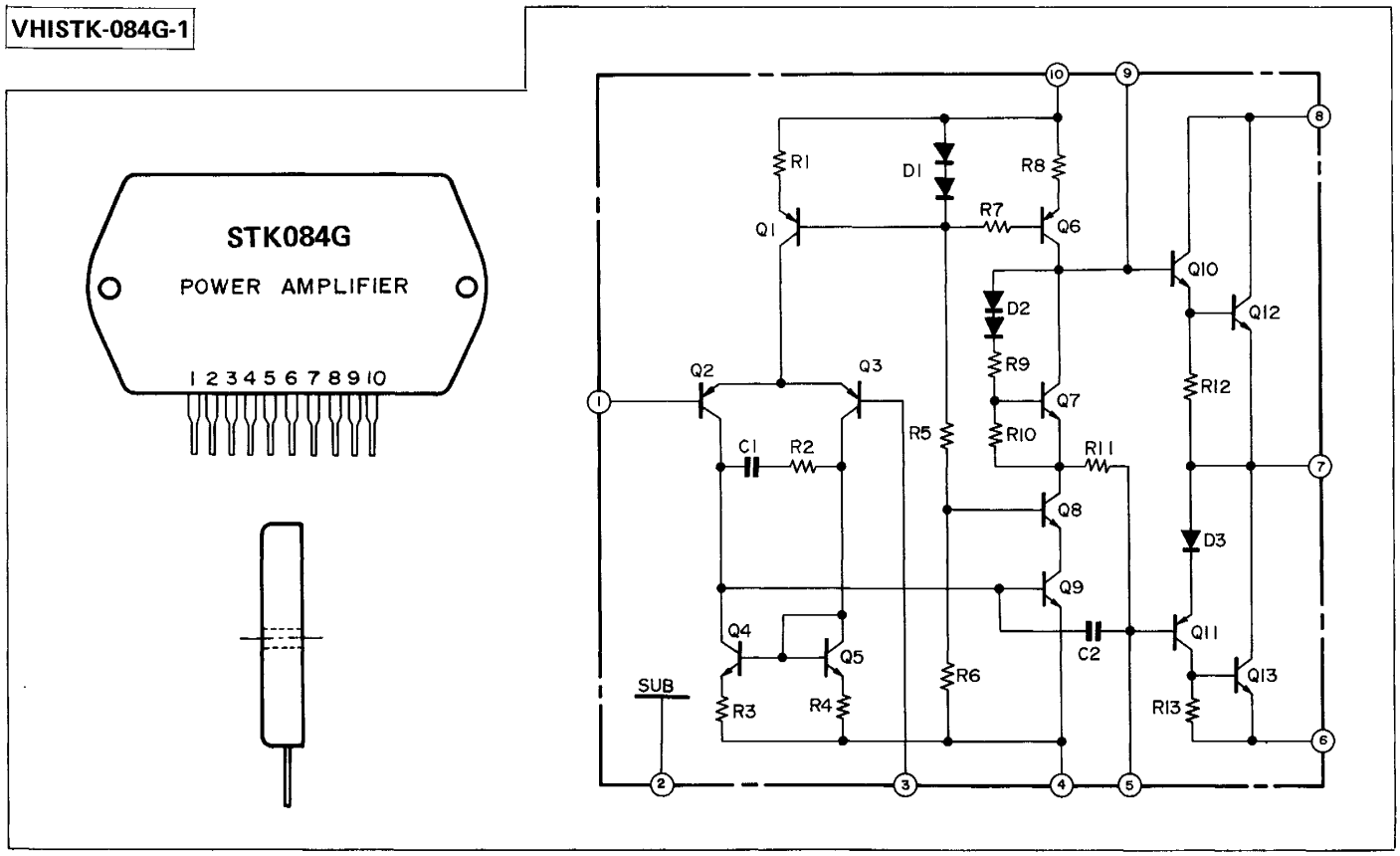


Figure 48 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT (IC501 and IC502)

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.
1. MODEL NUMBER 2. REF. NO.
3. PART NO. 4. DESCRIPTION

Order to : Parts Center
P.O. Box 664 Paramus, New Jersey 07652 (201) 262-9000
P.O. Box 20394 Long Beach, Calif. 90801 (213) 830-4470

REF. NO.	PART NO.	DESCRIPTION	CODE
		INTEGRATED CIRCUITS	
IC101	RH-IX1005AFZZ	FM IF Amplifier and Detector (Quadrature) (HA1137W)	AT
IC102	RH-IX1032AFZZ	AM RF/IF Amplifier and Detector (HA1151)	AK
IC103	RH-IX1053AFZZ	P.L.L. Multiplex Stereo Demodulator (HA1196)	AP
IC201	RH-IX1006AFZZ	Equalizer Amplifier (TA7136P)	AH
IC202	RH-IX1006AFZZ	Equalizer Amplifier (TA7136P)	AH
IC501	VHISTK-084G-1	Power Amplifier, Hybrid (STK-084G)	BA
IC502	VHISTK-084G-1	Power Amplifier, Hybrid (STK-084G)	BA
IC503	RH-IX1119AFZZ	Voltage Regulator, +12V, Tuner Circuit (FS-7812C)	AH
		TRANSISTORS	
Q101	2SK55 Ⓔ	FET (Field Effect Transistor), FM RF Amplifier (VS2SK55-E//-1)	AF
Q102	2SC784 Ⓡ	FM Mixer (VS2SC784-R/1F)	AD
Q103	2SC394 Ⓨ	FM Local Oscillation (VS2SC394-Y/-1)	AD
Q104	2SC380 Ⓨ	FM IF Amplifier (VS2SC380-Y/-1)	AD
Q105	2SC458 Ⓒ	Air Check Oscillation (VS2SC458-C/-1)	AC
Q301, Q302	2SA842 Ⓑⓛ	Tone Amplifier (VS2SA842-BL-1)	AC
Q303, Q304	2SC732 Ⓥ	Tone Amplifier (VS2SC732-V/1F)	AD
Q501	2SC458 Ⓓ	Muting Signal, Discharge, Protection Circuit (VS2SC458-D/-1)	AC
Q502	2SC458 Ⓓ	Muting Control, Protection Circuit (VS2SC458-D/-1)	AC
Q503, Q504	2SC458 Ⓓ	Audio Muting, Protection Circuit (VS2SC458-D/-1)	AC
		DIODES	
D101	1N60	Signal Meter, FM (VHD1N60////-1)	AB
D102	1S2473	Switching (VHD1S2473//-1)	AB
D103	1S2473	FM Muting (VHD1S2473//-1)	AB
D104	1S2473	V.C.O. Frequency Killer (VHD1S2473//-1)	AB
D105	1S2473	Switching (VHD1S2473//-1)	AB
D201	1S2473	Speed-up (VHD1S2473//-1)	AB
D202	1S2473	Speed-up (VHD1S2473//-1)	AB
D501, D502, D503, D504	30D2FAS	Power Rectifier (VHD30D2FAS/-1)	AE
D505	05Z16	Zener Diode, Voltage Regulator, 15.4V ~ 17.1V (VHE05Z-16//-1)	AC
D506	05Z16	Zener Diode, Voltage Regulator, 15.4V ~ 17.1V (VHE05Z-16//-1)	AC
D507	10E1	Power Rectifier (VHD10E1////-1)	AC
D508	1S2473	Protection, Transistor Q501 (VHD1S2473//-1)	AB
D509, D510	1S2473	Protection, Transistors Q503 and Q504 (VHD1S2473//-1)	AB
D511	10E1	Power Rectifier (VHD10E1////-1)	AC
D513	GL-5PG5	Light Emitting Diode, Power Indicator, Green (VHPGL-5PG5/1F)	AD
D601	GL-52AR	Light Emitting Diode, FM Stereo Indicator, Red (VHPGL-52AR/1F)	AD
		THERMISTORS	
TH601	RH-QX1001AFZZ	Positive Characteristic Thermistor	AF
TH602	RH-QX1001AFZZ	Positive Characteristic Thermistor	AF
		COILS	
L101	RCILA0407AFZZ	FM Antenna	AE
L102	RCILR0335AFZZ	FM RF	AE
L103	VP-LH2R2M0000	AF Choke, 2.2μH	AB
L104	RCILB0434AFZZ	FM Local Oscillation	AD
L105	VP-LH220M0000	+B Choke, 22μH	AB
L106	RCILZ0052AFZZ	Phase Shifter, 18μH	AB
L107	RCILI0236AFZZ	AM IF, 455kHz	AD
L108	VP-LH681M0000	AM IF, 680μH	AB
L109	RCILB0395AFZZ	AM Local Oscillation	AD
L601	RCILA0429AFZZ	AM Bar Antenna	AN
		FILTERS	
CF101	RFILF0062AFZZ	FM IF, Ceramic	AF
CF102	RFILF0062AFZZ	FM IF, Ceramic	AF
CF103	RFILA0057AFZZ	AM IF, Ceramic	AD
LPF101	RFILL0051AFZZ	Low Pass Filter	AH
LPF102	RFILL0051AFZZ	Low Pass Filter	AH
		TRANSFORMERS	
T101	RCILI0237AFZZ	FM IF	AE

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
IFT101	RCILD0058AFZZ	Quadrature (10.7MHz)	AD
IFT102	RCILD0059AFZZ	Quadrature (10.7MHz)	AD
T601	RTRNP0601AFZZ	Power	BL
	CONTROLS		
VR101	RVR-B0052AGZZ	10K (B) ohm, V.C.O. Frequency Adjust	AE
VR102	RVR-M0132AFZZ	200K (B) ohm, Stereo Separation Adjust	AC
VR103	RVR-M0131AFZZ	100K (B) ohm, Air Check Level Adjust	AC
VR301-A, B	RVR-B0159AFZZ	100K ohm, Volume Control	AN
VR302	RVR-Z0061AFZZ	100K ohm, Balance Control	AF
VR303-A, B	RVR-C0066AFZZ	100K ohm, Bass Control	AM
VR304-A, B	RVR-C0066AFZZ	100K ohm, Treble Control	AM
VC101, VC102, VC103, VC104, VC105, TC101, TC102, TC103, TC104, TC105	RVC-C0050AFZZ	Variable Capacitors, Tuning with Trimmers TC101; FM Antenna Trimmer TC102; FM RF Trimmer TC103; FM Oscillation Trimmer TC104; AM Antenna Trimmer TC105; AM Oscillation Trimmer	AT
	ELECTROLYTIC CAPACITORS		
C124	VCEALU1HW474M	.47MFD, 50V, ±20%, Yellow	AB
C128	VCEALU1HW334M	.33MFD, 50V, ±20%, Yellow	AB
C130	VCEAAU1EW475A	4.7MFD, 25V, +75 –10%	AB
C131	VCEAAU1CW106Y	10MFD, 16V, +50 –10%	AB
C132	VCEAAU1CW227Y	220MFD, 16V, +50 –10%	AC
C133	VCEAAU1HW335A	3.3MFD, 50V, +75 –10%	AB
C135	VCEALU1HW335M	3.3MFD, 50V, ±20%, Yellow	AC
C136	VCAAAU1EB155K	1.5MFD, 25V, ±10%, Aluminum	AC
C137	VCEALU1HW474M	.47MFD, 50V, ±20%, Yellow	AB
C139, C140	VCEAAU1CW106Y	10MFD, 16V, +50 –10%	AB
C143, C144	VCEAAU1HW105A	1MFD, 50V, +75 –10%	AB
C150	VCEAAU1CW106Y	10MFD, 16V, +50 –10%	AB
C157, C158	VCEAAU1HW335A	3.3MFD, 50V, +75 –10%	AB
C161	VCEALU1HW104M	.1MFD, 50V, ±20%, Yellow	AB
C162	VCEAAU1AW227Y	220MFD, 10V, +50 –10%	AC
C167	VCEAAU1CW106Y	10MFD, 16V, +50 –10%	AB
C168	VCEAAU1CW106Y	10MFD, 16V, +50 –10%	AB
C169	VCEAAU1CW336Y	33MFD, 16V, +50 –10%	AC
C171	VCEAAU1CW107Y	100MFD, 16V, +50 –10%	AC
C172	VCEAAU1EW335A	3.3MFD, 25V, +75 –10%	AB
C201, C202	VCEALU1EC335A	3.3MFD, 25V, +75 –10%, Orange	AC
C205, C206	VCEAAU1CW336Y	33MFD, 16V, +50 –10%	AC
C215, C216	VCEALU1EC335A	3.3 MFD, 25V, +75 –10%, Orange	AC
C217	VCEAAU1CW107Y	100MFD, 16V, +50 –10%	AC
C218	VCEAAU1EW337Y	330MFD, 25V, +50 –10%	AD
C305, C306	VCEALU1EC335A	3.3MFD, 25V, +75 –10%, Orange	AC
C309, C310	VCEAAU1CW106Y	10MFD, 16V, +50 –10%	AB
C311, C312	VCEALU1HC105M	1MFD, 50V, ±20%, Orange	AC
C313, C314	VCEALU1HW335M	3.3MFD, 50V, ±20%, Yellow	AC
C323	VCEAAU1EW107Y	100MFD, 25V, +50 –10%	AC
C401, C402	VCEALU1HW684M	.68MFD, 50V, ±20%, Yellow	AB
C403, C404	VCEALU1HW684M	.68MFD, 50V, ±20%, Yellow	AB
C501, C502	VCEALU1HC225M	2.2MFD, 50V, ±20%, Orange	AC
C505, C506	RC-EZ1038AFZZ	47MFD, 16V, +50 –10%	AB
C509, C510	RC-EZS227AF1H	220MFD, 50V, ±20%, Small Type	AC
C511, C512	RC-EZ1013AFZZ	10MFD, 50V, +50 –10%	AB
C521, C522	RC-EZ1068AFZZ	6800MFD, 50V, +50 –10%	AR
C523, C524	VCEAAU1EW227Y	220MFD, 25V, +50 –10%	AC
C525, C526	VCEAAU1EW227Y	220MFD, 25V, +50 –10%	AC
C527	VCEAAU1HW106Y	10MFD, 50V, +50 –10%	AC
C528	VCEAAU1HW227Y	220MFD, 50V, +50 –10%	AD
C529	VCEAAU1EW108Y	1000MFD, 25V, +50 –10%	AF
C530, C531	VCEAAU1HW105Y	1MFD, 50V, +50 –10%	AB
C532	VCEAAU1EW106Y	10MFD, 25V, +50 –10%	AB
C534	VCEAAU1HW335A	3.3MFD, 50V, +75 –10%	AB
C536	VCEAAU1HW335A	3.3MFD, 50V, +75 –10%	AB
	CAPACITORS (Unless otherwise specified capacitors are 50V, +80 –20%, Ceramic Type.)		
C101	VCCSPU1HL151K	150PF, 50V, ±10%, Ceramic	AA
C102	VCCTPU1HH150J	15PF (TH), 50V, ±5%, Ceramic	AB
C103, C104, C105	VCKZPU1HF203Z	.02MFD	AA
C106	VCCTPU1HH150J	15PF (TH), 50V, ±5%, Ceramic	AB
C107	VCKZPU1HF203Z	.02MFD	AA
C108	VCCSPU1HL8R0C	8PF, 50V, ±0.25PF, Ceramic	AA
C109	VCCSPU1HL101K	100PF, 50V, ±10%, Ceramic	AA
C110, C111	VCKZPU1HF203Z	.02MFD	AA
C112	VCCSPU1HL1R5C	1.5PF, 50V, ±0.25PF, Ceramic	AA
C113	VCCTPU1HH8R0D	8PF (TH), 50V, ±0.5PF, Ceramic	AA
C114	VCCRPU1HH220J	22PF (RH), 50V, ±5%, Ceramic	**
C115	VCCSPU1HL330K	33PF, 50V, ±10%, Ceramic	AA
C116	VCCPPU1HH150J	15PF (PH), 50V, ±5%, Ceramic	AB
C117	VCKZPU1HF203Z	.02MFD	AA
C118	VCKZPU1HF103P	.01MFD, 50V, +100 –0%, Ceramic	AE
C120	VCCSPU1HL391K	390PF, 50V, ±10%, Ceramic	AB

**: Price will be quoted upon receipt of order.

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
C121, C122, C123, C125, C126, C127	VCKZPU1HF403Z	.04MFD	AB
C129	VCCSPU1HL391K	390PF, 50V, ±10%, Ceramic	AB
C134	VCQYSH1HM473J	.047MFD, 50V, ±5%, Mylar	AB
C138	VCQSMU1HS391J	390PF, 50V, ±5%, Styrol	AB
C141	VCQYSH1HM182J	.0018MFD, 50V, ±5%, Mylar	AB
C142	VCQYSH1HM182J	.0018MFD, 50V, ±5%, Mylar	AB
C145	VCCSPU1HL8R0C	8PF, 50V, ±0.25PF, Ceramic	AA
C146	VCQSMU1HS331J	330PF, 50V, ±5%, Styrol	AC
C147	VCCUPU1HJ150K	15PF (UJ), 50V, ±10%, Ceramic	AB
C148	VCKZPU1HF103P	.01MFD, 50V, +100 −0%, Ceramic	AE
C151	VCKZPU1HF103P	.01MFD, 50V, +100 −0%, Ceramic	AE
C152	VCKZPU1HF403Z	.04MFD	AB
C153	VCKZPU1HF403Z	.04MFD	AB
C154	VCKZPU1HF102Z	.001MFD	AA
C156	VCCSPU1HL181K	180PF, 50V, ±10%, Ceramic	AA
C159	VCQYSH1HM103J	.01MFD, 50V, ±5%, Mylar	AC
C160	VCQYKU1HM392J	.0039MFD, 50V, ±5%, Mylar	AC
C163, C164, C165, C166	VCQYSH1HM223J	.022MFD, 50V, ±5%, Mylar	AC
C173	VCCSPU1HL121K	120PF, 50V, ±10%, Ceramic	AA
C174	VCKZPU1HF223Z	.022MFD	AA
C203, C204	VCCSPU1HL101K	100PF, 50V, ±10%, Ceramic	AA
C207, C208	VCCSPU1HL560J	56PF, 50V, ±5%, Ceramic	AA
C209, C210	VCCSPU1HL150K	15PF, 50V, ±10%, Ceramic	AA
C211, C212	VCQSMU1HS392J	3900PF, 50V, ±5%, Styrol	AC
C213, C214	VCQSMU1HS152J	1500PF, 50V, ±5%, Styrol	AB
C301, C302	VCKYAT1HB271K	270PF, 50V, ±10%, Ceramic	**
C303, C304	VCQYSH1HM683J	.068MFD, 50V, ±5%, Mylar	AC
C307, C308	VCCSPU1HL100K	10PF, 50V, ±10%, Ceramic	AA
C315, C316	VCQYSH1HM183J	.018MFD, 50V, ±5%, Mylar	AB
C317, C318	VCQYSH1HM104J	.1MFD, 50V, ±5%, Mylar	AC
C319, C320	VCQYSH1HM222J	.0022MFD, 50V, ±5%, Mylar	AB
C321, C322	VCQYSH1HM123J	.012MFD, 50V, ±5%, Mylar	AB
C325, C326	VCCSPU1HL471K	470PF, 50V, ±10%, Ceramic	AB
C405, C406	VCQYSH1HM562J	.0056MFD, 50V, ±5%, Mylar	AB
C503, C504	VCCSPU1HL221K	220PF, 50V, ±10%, Ceramic	AB
C507, C508	VCCSPU1HL181K	180PF, 50V, ±10%, Ceramic	AA
C513, C514	VCCSPU1HL5R0C	5PF, 50V, ±0.25PF, Ceramic	AA
C515, C516	VCQYSH1HM104K	.1MFD, 50V, ±10%, Mylar	AC
C517, C518	VCKZPU2EE103Z	.01MFD, 250V, +80 −20%, Ceramic	**
C519	RC-KZ020UAFZZ	.01MFD, AC 125V, +80 −20%, Ceramic	AE
C520	VCKZPU1HF203Z	.02MFD	AA
C533	VCKZPU1HF203Z	.02MFD	AA
C601	VCKZPU1HF203Z	.02MFD	AA

RESISTORS

(Unless otherwise specified resistors are 1/4W, ±5%, Carbon Type.)

R101	VRD-ST2EE104J	100K ohm	
R102	VRD-ST2EE104J	100K ohm	
R103	VRD-ST2EE105J	1Meg ohm	
R104	VRD-ST2EE331J	330 ohm	
R105	VRD-ST2EE100J	10 ohm	
R106	VRD-ST2EE681J	680 ohm	
R107	VRD-ST2EE330J	33 ohm	
R108	VRD-ST2EE101J	100 ohm	
R109	VRD-ST2EE183J	18K ohm	
R110	VRD-ST2EE472J	4.7K ohm	
R111	VRD-ST2EE122J	1.2K ohm	
R112	VRD-ST2EE101J	100 ohm	
R113	VRD-ST2EE822J	8.2K ohm	
R114	VRD-ST2EE103J	10K ohm	
R115	VRD-SU2EY272J	2.7K ohm	
R116	VRD-ST2EE474J	470K ohm	
R118	VRD-ST2EE560J	56 ohm	
R119	VRD-ST2EE331J	330 ohm	
R120	VRD-ST2EE100J	10 ohm	
R121	VRD-ST2EE104J	100K ohm	
R122	VRD-ST2EE331J	330 ohm	
R123	VRD-ST2EE103J	10K ohm	
R124	VRD-ST2EE182J	1.8K ohm	
R125	VRD-ST2EE822J	8.2K ohm	
R126	VRD-ST2EE271J	270 ohm	AA
R127	VRD-ST2EE103J	10K ohm	
R128	VRD-ST2EE183J	18K ohm	
R130	VRD-ST2EE123J	12K ohm	
R131	VRD-ST2EE102J	1K ohm	
R132	VRD-ST2EE124J	120K ohm	
R133	VRD-ST2EE470J	47 ohm	
R134	VRD-ST2EE333J	33K ohm	
R135	VRD-ST2EE683J	68K ohm	
R136	VRD-ST2EE223J	22K ohm	
R138	VRD-ST2HD561J	560 ohm, 1/2W, ±5%, Carbon	
R139	VRD-ST2EE682J	6.8K ohm	
R140	VRD-ST2EE682J	6.8K ohm	
R141	VRD-ST2EE473J	47K ohm	
R142	VRD-ST2EE473J	47K ohm	
R143	VRD-ST2EE333J	33K ohm	
R144	VRD-ST2EE333J	33K ohm	
R145	VRD-ST2EE332J	3.3K ohm	
R146	VRD-ST2EE332J	3.3K ohm	
R147	VRD-ST2EE392J	3.9K ohm	
R148	VRD-ST2EE392J	3.9K ohm	
R149	VRD-ST2EE223J	22K ohm	
R150	VRD-ST2EE332J	3.3K ohm	
R151	VRD-ST2EE101J	100 ohm	
R152	VRD-ST2EE122J	1.2K ohm	

**: Price will be quoted upon receipt of order.

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
R154	VRD-ST2EE122J	1.2K ohm	
R155	VRD-ST2EE103J	10K ohm	
R156	VRD-ST2EE103J	10K ohm	
R157	VRD-ST2EE680J	68 ohm	
R158	VRD-ST2EE273J	27K ohm	
R159	VRD-ST2EE223J	22K ohm	
R160	VRD-ST2EE103J	10K ohm	
R161	VRD-ST2EE103J	10K ohm	
R162	VRD-ST2EE223J	22K ohm	
R163	VRD-ST2EE823J	82K ohm	
R164	VRD-ST2EE103J	10K ohm	
R165	VRD-ST2EE101J	100 ohm	
R166	VRD-ST2EE181J	180 ohm	
R167	VRD-ST2EE392J	3.9K ohm	
R168	VRD-ST2EE104J	100K ohm	
R169	VRD-ST2EE473J	47K ohm	
R170	VRD-ST2EE123J	12K ohm	
R171	VRD-ST2EE332J	3.3K ohm	
R172	VRD-ST2EE154J	150K ohm	
R201	VRD-ST2EE102J	1K ohm	
R202	VRD-ST2EE102J	1K ohm	
R203	VRD-ST2EE473J	47K ohm	
R204	VRD-ST2EE473J	47K ohm	
R205	VRD-ST2EE224J	220K ohm	
R206	VRD-ST2EE224J	220K ohm	
R207	VRD-ST2EE684J	680K ohm	
R208	VRD-ST2EE684J	680K ohm	
R209	VRD-ST2EE122J	1.2K ohm	
R210	VRD-ST2EE122J	1.2K ohm	
R211	VRD-ST2EE563J	56K ohm	
R212	VRD-ST2EE563J	56K ohm	
R213	VRD-ST2EE104J	100K ohm	
R214	VRD-ST2EE104J	100K ohm	AA
R215	VRD-ST2EE224J	220K ohm	
R216	VRD-ST2EE224J	220K ohm	
R217	VRD-ST2EE332J	3.3K ohm	
R218	VRD-ST2EE332J	3.3K ohm	
R219	VRD-ST2EE101J	100 ohm	
R220	VRD-ST2EE471J	470 ohm	
R221	VRD-ST2EE102J	1K ohm	
R222	VRD-ST2EE102J	1K ohm	
R223	VRD-ST2EE102J	1K ohm	
R224	VRD-ST2EE102J	1K ohm	
R225	VRD-ST2EE102J	1K ohm	
R226	VRD-ST2EE102J	1K ohm	
R227	VRD-ST2EE102J	1K ohm	
R228	VRD-ST2EE102J	1K ohm	
R229	VRD-ST2EE102J	1K ohm	
R230	VRD-ST2EE102J	1K ohm	
R231	VRD-ST2EE105J	1Meg ohm	
R232	VRD-ST2EE105J	1Meg ohm	
R233	VRD-ST2EE105J	1Meg ohm	
R234	VRD-ST2EE105J	1Meg ohm	
R235, R236	VRD-SU2EY182J	1.8K ohm	
R301, R302	VRD-ST2EE333J	33K ohm	
R303, R304	VRD-ST2EE103J	10K ohm	
R305, R306	VRD-ST2EE182J	1.8K ohm	
R307, R308	VRD-ST2EE101J	100 ohm	
R309, R310	VRD-ST2EE224J	220K ohm	

REF. NO.	PART NO.	DESCRIPTION	CODE
R311, R312	VRD-ST2EE104J	100K ohm	
R313, R314	VRD-ST2EE104J	100K ohm	
R315, R316	VRD-ST2EE332J	3.3K ohm	
R317, R318	VRD-ST2EE105J	1Meg ohm	
R319, R320	VRD-ST2EE103J	10K ohm	
R321, R322	VRD-ST2EE183J	18K ohm	
R323, R324	VRD-ST2EE332J	3.3K ohm	
R325, R326	VRD-ST2EE122J	1.2K ohm	
R327, R328	VRD-ST2EE332J	3.3K ohm	AA
R329, R330	VRD-ST2EE332J	3.3K ohm	
R331	VRD-ST2EE101J	100 ohm	
R332, R333	VRD-SU2EE100J	10 ohm	
R403, R404	VRD-ST2EE333J	33K ohm	
R405, R406	VRD-ST2EE823J	82K ohm	
R407, R408	VRD-ST2EE105J	1Meg ohm	
R409, R410	VRD-ST2EE472J	4.7K ohm	
R411	VRD-ST2EE105J	1Meg ohm	
R412	VRD-ST2EE105J	1Meg ohm	
R501, R502	VRD-ST2EE102J	1K ohm	
R503, R504	VRD-ST2EE564J	560K ohm	
R505, R506	VRD-ST2EE102J	1K ohm	
R507, R508	VRD-ST2EE273J	27K ohm	
R509, R510	VRG-ST2EA101J	100 ohm, 1/4W, ±5%, Fusible	AB
R511, R512	VRG-ST2EA101J	100 ohm, 1/4W, ±5%, Fusible	AB
R513, R514	VRD-ST2EE273J	27K ohm	AA
R515, R516	VRS-PT3DB100K	10 ohm, 2W, ±10%, Oxide Film	AB
R517, R518	VRD-ST2EE222J	2.2K ohm	AA
R519, R520	VRS-PT3AB561K	560 ohm, 1W, ±10%, Oxide Film	AB
R521, R522	VRD-ST2HD181J	180 ohm, 1/2W, ±5%, Carbon	
R523	VRD-ST2HD475J	4.7Meg ohm, 1/2W, ±5%, Carbon	
R524	VRD-ST2EE563J	56K ohm	
R525	VRD-ST2EE822J	8.2K ohm	
R526	VRD-ST2EE123J	12K ohm	AA
R527	VRD-ST2EE471J	470 ohm	
R528	VRD-ST2EE683J	68K ohm	
R529	VRD-ST2EE563J	56K ohm	
R530	VRD-ST2EE332J	3.3K ohm	
R531	VRD-ST2EE223J	22K ohm	

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
R532	VRG-ST2EA101J	100 ohm, 1/4W, ±5%, Fusible	AB
R535, R536	VRS-PT3DB271K	270 ohm, 2W, ±10%, Oxide Film	AB
R537	VRG-ST2HA100J	10 ohm, 1/2W, ±5%, Fusible	AB
R538	VRS-PT3DB122K	1.2K ohm, 2W, ±10%, Oxide Film	AC
R539	VRS-PT3AB152K	1.5K ohm, 1W, ±10%, Oxide Film	AB
		MISCELLANEOUS	
	CPNLC3372AF01	Front Panel Assembly (SA-5202)	**
	HPNLC3372AFSA	Front Panel	BC
	PSPAI0141AF00	Spacer, Fiber	AA
	PSPAS0066AF00	Spacer, Push Switch, Ellipse Type	AA
	PSPAS0008SGSA	Spacer, Loudness Switch, Round Type	AB
	GCOVA1076AFSC	Guide, Lever Switch	AC
	CPNLC3373AF01	Front Panel Assembly (SA-5206)	**
	HPNLC3373AFSA	Front Panel	BC
	PSPAI0141AF00	Spacer, Fiber	AA
	PSPAS0066AF00	Spacer, Push Switch, Ellipse Type	AA
	PSPAS0008SGSB	Spacer, Loudness Switch, Round Type	AB
	GCOVA1076AFSB	Guide, Lever Switch	AC
	CSPRT0386AF08	Dial Cord Assembly	–
	MSPRT0386AFFJ	Spring, Dial Cord	AB
	GCAB-5099AFSA	Cabinet	BD
	GFTAU3073AFZZ	Bottom Plate, Cabinet	AT
	GLEGP0002SG00	Leg	AD
	HDALM0189AFSA	Dial Scale	AM
	HSSND0240AFSA	Dial Pointer	AE
	JKNBM0136AFSD	Knob, Loudness Switch (SA-5206)	AC
	JKNBM0136AFSE	Knob, Loudness Switch (SA-5202)	AC
	JKNBN0316AFSA	Knob, Volume Control (SA-5202)	AK
	JKNBN0316AFSB	Knob, Volume Control (SA-5206)	AK
	JKNBN0317AFSA	Knob, Tuning Control (SA-5202)	AK
	JKNBN0317AFSB	Knob, Tuning Control (SA-5206)	AK
	JKNBN0318AFSB	Knob, Function Selector and Speakers Selector (SA-5206)	AH
	JKNBN0330AFSA	Knob, Function Selector and Speakers Selector (SA-5202)	AH
	JKNBN0338AFSA	Knob, Bass Control, Treble Control and Balance Control (SA-5202)	AH
	JKNBN0367AFSA	Knob, Bass Control, Treble Control and Balance Control (SA-5206)	AH
	JKNBP0070AFSA	Knob, Low Cut Filter Switch, High Cut Filter Switch, Mode Selector, Air Check Calibrator Switch and FM Muting Switch (SA-5202)	AH
	JKNBP0070AFSB	Knob, Low Cut Filter Switch, High Cut Filter Switch, Mode Selector, Air Check Calibrator Switch and FM Muting Switch (SA-5206)	AG
	JKNBP0078AFSA	Knob, Power Switch and Tape Monitor/Tape Dubbing Switch (SA-5202)	AE
	JKNBP0078AFSB	Knob, Power Switch and Tape Monitor/Tape Dubbing Switch (SA-5206)	AC
	LANGF0428AFZZ	Reinforcement Bracket, Chassis, Right and Left Sides (Refer to Fig. 1)	AB
	LANGQ0656AFSA	Rear Panel (SA-5202)	AS
	LANGQ0659AFSA	Rear Panel (SA-5206)	AS
	LANGQ0581AFZZ	Bracket, Power Switch (SW601) and Loudness Switch (SW301)	AB
	LANGR0431AFZZ	Bracket, Power Transformer Retaining	AL
	LANGR0432AFZZ	Bracket, Front Panel	AP
	LANGT0675AFZZ	Bracket, Pulley (Refer to Fig. 2)	AC
	LANGT0676AFZZ	Bracket, Pulley (Refer to Fig. 2)	AB
	LANGT0677AFZZ	Backplate, Dial Scale	AG
	LANGT0678AFZZ	Bracket, Heat Sink Retaining	AB
	LANGT0679AFZZ	Bracket, Chassis, Center (Refer to Fig. 1)	AF
	LANGT0680AFZZ	Bracket, Chassis, Left Side (Refer to Fig. 1)	AE
	LANGT0681AFZZ	Bracket, Chassis, Right Side (Refer to Fig. 1)	AF
	LANGT0699AF00	Bracket, Heat Sink (Refer to Fig. 1)	AC
	LBSHC0007AFZZ	Bushing, AC Cord	AB
	LHLDW1053AFZZ	Wire Holder (Refer to Fig. 36)	AB
	LHLDW1060AFZZ	Wire Holder (Refer to Fig. 36)	AA
	LHLDW1062AFZZ	Wire Holder (Refer to Fig. 36)	AA
	LHLDW1075AFZZ	Wire Holder (Refer to Fig. 36)	AA
	LPLTP0055AFZZ	Acryl Plate, Dial Illumination (Part of PREFL0065AFZZ)	AR
	LX-BZ0211AFZZ	Screw (Special), Acryl Plate of Dial Illumination Lamps	AA
	LX-BZ0220AFFF	Screw (Special), AC Outlets Socket	AA
	LX-HZ0053AFFD	Flange Head Screw, P.W. Board Retaining	–
	LX-HZ0064AFFF	Screw, Cabinet	–
	LX-LZ0055AF00	Push Rivet, LED Printed Wiring Board Retaining	–
	LX-NZ0118AFFD	Nut, Headphones Jack, Speakers Selector Switch Shaft and Function Selector Switch Shaft	AA
	LX-NZ0125AFFW	Hexagon Head Cap Screw, Speakers Selector Switch Shaft and Function Selector Switch Shaft	AD
	LX-WZ0019AFFW	Washer (Special), Ground Terminal	AA
	LX-WZ9056AFZZ	Washer (Special), Acryl Plate of Dial Illumination Lamps	AA
	NDRM-0150AFZZ	Drum, Dial Cord	AF
	NPLYB0001SEZZ	Pulley (Small), Dial Cord	AC
	NPLYB0001SGZZ	Pulley (Large), Dial Cord	AB
	NPLYC0101AFFD	Shaft, Pulley	AA

**: Price will be quoted upon receipt of order.

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
	NSFTD0181AFFW	Tuning Shaft with Flywheel	AN
	PCUSG0094AF00	Cushion (Rubber), RF/IF P.W. Board, 12mm x 12mm x 10t (Black)	AA
	PCOVU3112AF00	Cushion, Bracket of Front Panel, LED	AA
	PCUSU0224AFZZ	Cushion, Meter	AA
	PRDAR0101AFFW	Heat Sink, IC503	AB
	PRDAR0163AF00	Heat Sink, Power Amplifier IC	AW
	PSHEF0114AF00	Felt, Lever Switch	AA
	PREFL0065AFZZ	Dial Illumination Lamps Assembly (PL601 ~ PL604)	–
	PSLDM3106AFZZ	Shield Plate, FM Front-End	AB
	PSPAI0128AF09	Spacer, LED (Light Emitting Diode), D601	AA
	PSPAI0129AF00	Spacer, LED (Light Emitting Diode), D513	AA
	PSPAS0054AFZZ	Spacer, Headphones Jack	AC
	QANTW0051AFZZ	FM Indoor Antenna, T-shape	AH
PG601	QACCU0052AFZZ	AC Cord with Plug	AG
F501	QFS-B402AAGNB	Fuse, 4.0A 125V	AE
F502	QFS-B152AAFNB	Fuse, 1.5A 125V	AE
F503	QFS-B402AAGNB	Fuse, 4.0A 125V	AE
F504	QFS-B402AAGNB	Fuse, 4.0A 125V	AE
	QFSHD1001SEZZ	Holder, Fuse	AA
J501	QJAKJ0057AFZZ	Jack, Headphones	AG
	QLUGL0251AFZZ	Terminal Strip, 2-Lug, Dial Illumination Lamps (Part of PREFL0065AFZZ)	AC
LG601	QLUGZ011AAFZZ	Lug, Grounding	AA
	QLUGZ016AAFZZ	Jumper, AC Outlets Socket	AA
SO601	QSOCZ2472AFZZ	Socket, INPUTS (AUX Ⓟ and PHONO)	AH
SO602	QSOCJ2264AFZZ	Socket, TAPE-1 (REC and PB Ⓟ)	AE
SO603	QSOCJ2264AFZZ	Socket, TAPE-2 (REC and PB Ⓟ)	AE
SO604-A, B	QSOCA0402SGZZ	Socket, AC Outlets	AF
SW101	QSW-B0051AFZZ	Switch, FM Muting	AK
SW102	QSW-B0051AFZZ	Switch, FM Air Check Calibrator	AK
SW201-A, B	QSW-R0153AFZZ	Switch, Function Selector	AR
SW202, SW203	QSW-P0170AFZZ	Switch, Tape Monitor and Tape Dubbing	AN
SW301	QSW-P0139AFZZ	Switch, Loudness	AG
SW401	QSW-B0051AFZZ	Switch, Low Cut Filter	AK
SW402	QSW-B0051AFZZ	Switch, High Cut Filter	AK
SW403-A, B	QSW-B0051AFZZ	Switch, Mode Selector	AK
SW501	QSW-R0140AFZZ	Switch, Speakers Selector	AP
SW601	QSW-P0129AFZZ	Switch, Power	AL
TB601	QTANN0453AFZZ	Antenna Terminals, FM (75 ohms and 300 ohms) and AM	AH
TB602	QTANN0150AFZZ	Ground Terminal	AD
TB603	QTANZ0454AFZZ	Speakers Terminals-A	AG
TB604	QTANZ0454AFZZ	Speakers Terminals-B	AG
PL601, PL602	RLMPM0086AFZZ	Lamp, 8V 0.3A, 100 mm (Part of PREFL 0065AFZZ)	AG
PL603	RLMPM0085AFZZ	Lamp, 8V 0.3A, 200 mm (Part of PREFL 0065AFZZ)	AG
PL604	RLMPM0081AFZZ	Lamp, 8V 0.3A, 300 mm (Part of PREFL 0065AFZZ)	AG
ME601	RMTRL0142AFSA	Meter, Signal Strength	AT
ME602	RMTRL0134AFSA	Meter, Tuning (Center)	AV
	SPAKA0506AFZZ	Packing Add. (Cushion)	AH
	SPAKC1286AFZZ	Packing Case (SA-5202)	AN
	SPAKC1288AFZZ	Packing Case (SA-5206)	AN
	SPAKF0002AGZZ	Packing Material, AC Cord	AA
	SSAKA0007SEZZ	Polyethylene Bag, Owner's Manual	AA
	SSAKZ0055AFZZ	Dust Cover, Set	AG
	TINSE0606AFZZ	Owner's Manual	AG
	TMAPC0564AFZZ	Schematic Diagram	–
	XJBSF30P14000	Screw, Power Amplifier IC Retaining	–
	XWUSE84-08000	Shakeproof Lockwasher Internal Type, Ground Terminal	–

PWB ASSEMBLY (Not Replacement Item)

REF. NO.	PART NO.	DESCRIPTION	CODE
PWB-A1	DUNTM0055AF02 (Combined Assembly)	Audio Amplifier	**
PWB-A2		Filter Circuit	
PWB-A3		Volume Circuit	
PWB-A4		Power Indicator, LED	

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