marantz

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LIST OF ILLUSTRATION

1. INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model CD-400 CD-4 Demodulator.

Servicing information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instruction should be read carefully. No attempt should be made to proceed without a good understanding of the operation in the circuits.

The parts lists furnish information by which replacement part may be ordered from the Marantz Company. A simple description is included for parts which can usually be obtained through local suppliers.

2. SERVICE NOTES

The Model CD-400 is a demodulator which reproduces discrete 4-channel sounds from CD-4 records. The CD-400 is to be connected between a stereo record player provided with a CD-4 cartridge and 4-channel preamplifier. The CD-400 has two sets of input jacks PHONO and AUX and two sets of output jacks 4 CH OUT and 2 CH DIRECT OUT. Main input and output terminals of the CD-400 are the INPUTS PHONO and 4 CH OUT jacks. Composite signal from a CD-4 disc record is applied to the INPUTS PHONO jacks, then the demodulated discrete 4 channel sound signals are obtained at the 4 CH OUT jacks.

By turning the 2 CH DIRECT OUT switch to the ON position the signal applied to the INPUTS PHONO jacks can be directly obtained from the 2 CH DIRECT OUT jacks. This feature is employed in playing usual 2-channel records to use another external equalizer in place of the equalizer incorporated in the Model CD-400. In such a switch setting, the signals applied to the INPUTS PHONO jacks are not connected to the built-in CD-4 disc demodulator circuit.

The INPUTS AUX jacks are used to connect other 4-channel source such as 4-channel tape deck. The INPUTS AUX jacks are provided to connect the 4-channel source through the Model CD-400 4 CH OUT jacks to 4-channel amplifier auxiliary input jacks, to which the 4-channel source it would normally be connected. This connection is set by pushing in the selector push button on the front panel to the AUX position.

The MODE switch on the front panel determines the mode of operation of the built-in demodulator circuit. With the MODE switch set to the 4 CH AUTO position, the composite signal from a CD-4 disc record is demodulated to discrete 4-channel sound signals, and a usual 2-channel record is played back as 2-channel stereophonic signal. When the CD-4 record is being played back, the RADAR indicator will illuminate. When the MODE switch is in the 2 CH position, all records including CD-4 records will be reproduced in the 2-channel mode.

For normal operation of the Model CD-400 in demodulating the CD-4 record, you should adjust the set for proper 30kHz carrier level and the right and left separations using the furnished test record. These adjustments are to be performed for the pickup cartridge used. In the event the pickup cartridge is changed, the set must be readjusted. Follow the instructions on the test record or owner's manual.

3. PRINCIPLES OF CD-4 DISCRETE 4-CHANNEL SYSTEM

3-1 Principles of the CD-4 System

4-channel signals are converted into sum signals and difference signals. As shown in Figure 1, 2 and 3, the sum signals of CH1 + CH2, and CH3 + CH4 are recorded in a conventional 45-45 groove. The difference signals CH1 - CH2, and CH3 - CH4 are converted into modulated signals and superimposed in the same groove. In reproduction, the modulated signals are detected, after which the

$$1/2\ [(CH1 + CH2) + (CH1 - CH2)] = CH1$$
$$1/2\ [(CH1 + CH2) - (CH1 - CH2)] = CH2$$
$$1/2\ [(CH3 + CH4) + (CH3 - CH4)] = CH3$$
$$1/2\ [(CH3 + CH4) - (CH3 - CH4)] = CH4$$

computation is done, and the four original signals come out independently. When a CD-4 disc is played on a conventional stereo player, only the sum signal of the audio frequency range is reproduced.

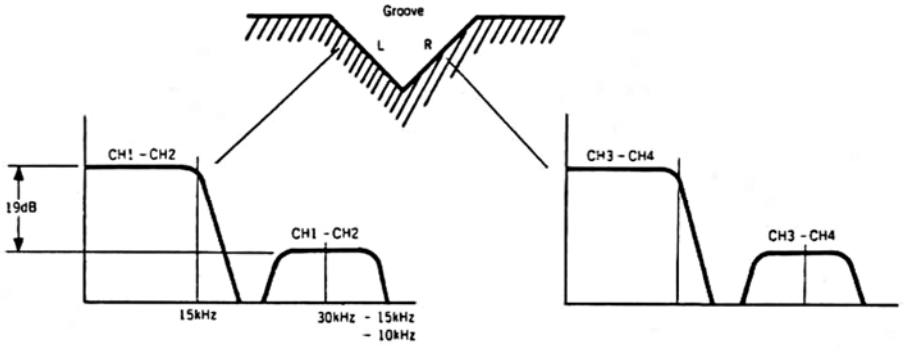

Figure 1. CD-4 Disc

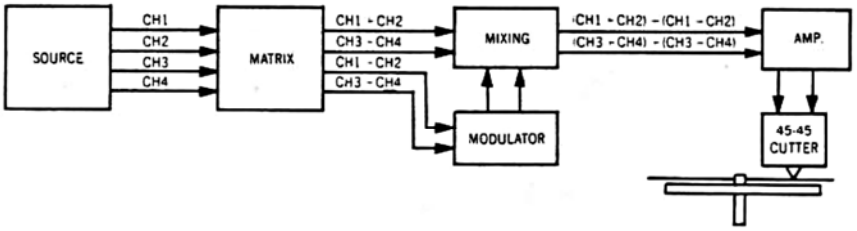

Figure 2. CD-4 Recording

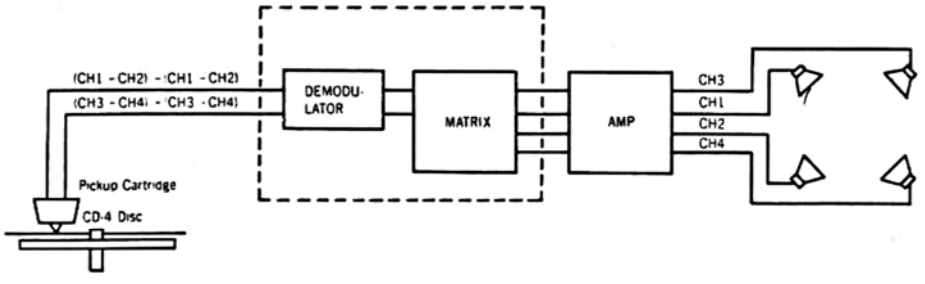

Figure 3. CD-4 Playback

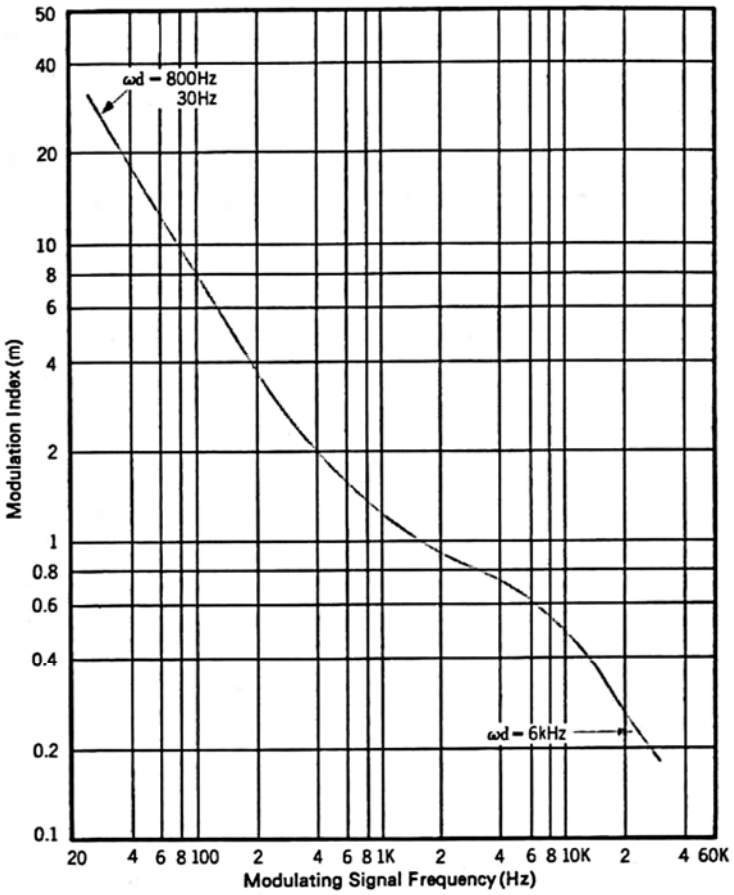

Figure 4. Standard Modulation Curve in CD-4 System

3-2 Automatic Noise Reduction System (ANRS)

ANRS is used in the CD-4 system to reduce interference and noise caused by crosstalk between the left and right modulated carriers; it operates only on the modulated difference signal.

ANRS consists of a compressor in the recording system and an expander in the playback system; the compressor and expander have a complementary relationship with each other. Figure 5 is a basic block diagram of ANRS.

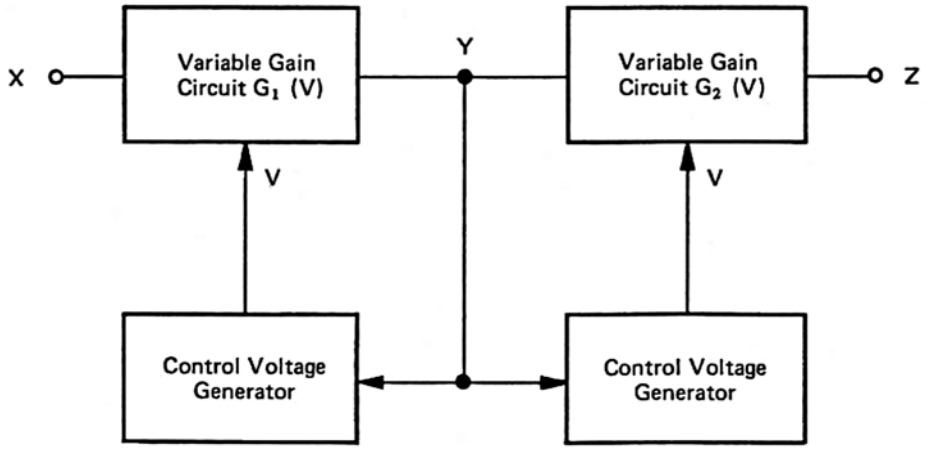

Figure 5. Block Diagram of ANRS

This is the system which is used to eliminate noise and interference, by compression and expansion, always keeping the output signal the same as the original signal. In the CD-4 system ANRS operates on the frequency modulated difference signal in the 700Hz range and above 2kHz to make it more effective. Figure 6 illustrates the ANRS process.

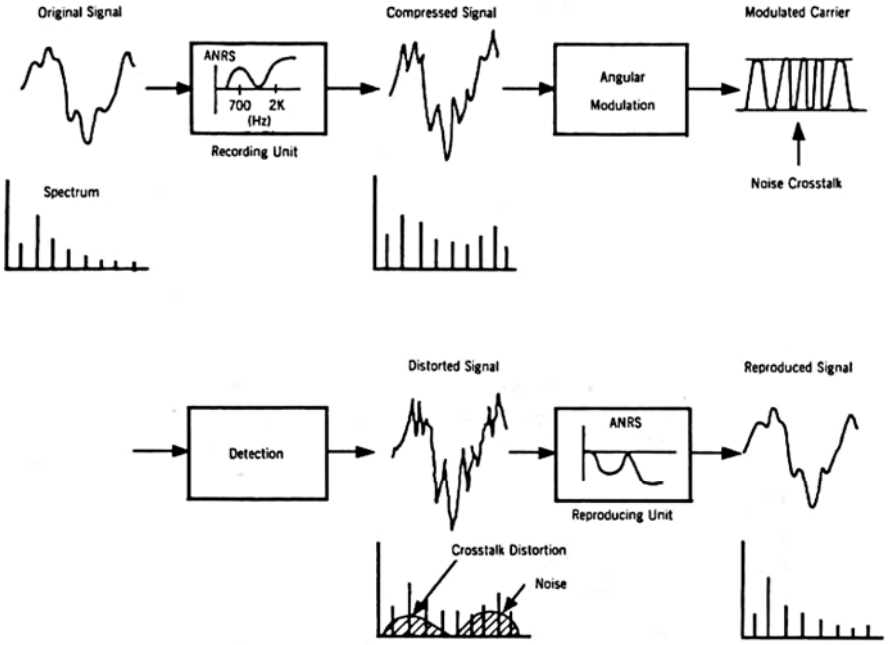

Figure 6. Operating Process of ANRS

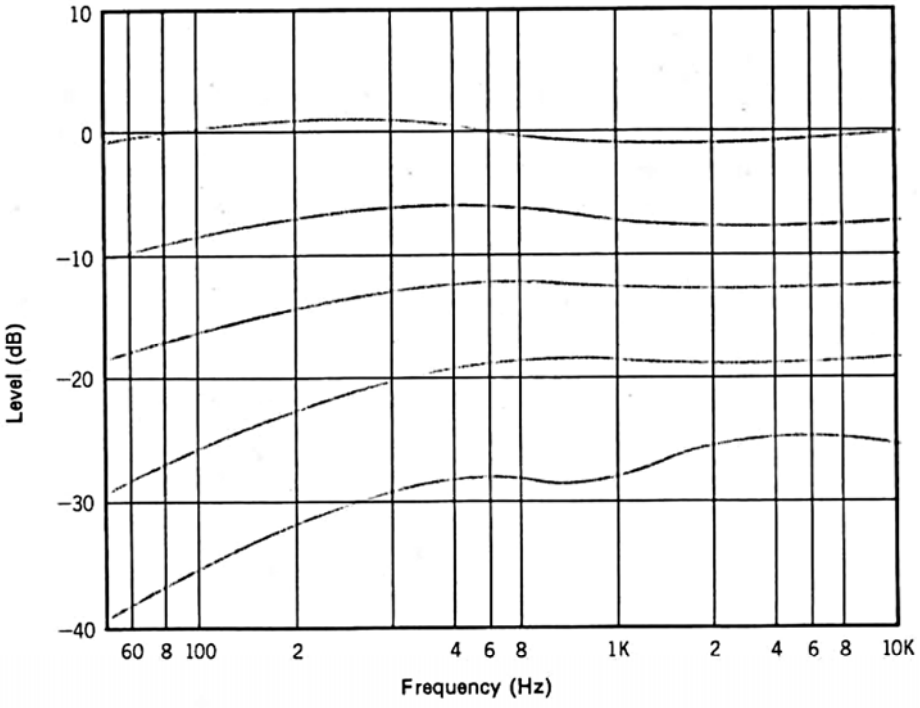

Figure 7. Frequency Characteristics of ANRS (Recording)

4. SERVICING AND ADJUSTING THE MODEL CD-400

There are two ways to provide the signals for testing the Model CD-400 demodulator: either using a purely electrical signal generator or using a test record.

When testing, the measurements will be influenced by the mechanical vibration system of the cartridge stylus assembly; this will reduce the accuracy of your measurements. To precisely measure the performance of a demodulator you must use a standard signal source such as an SCA signal generator or an audio signal generator. When carrying out repairs or replacements or when checking the demodulator's characteristics roughly, it will be convenient to use a test record.

4-1 Test Equipment Required for Servicing

Table 1 lists the test equipment required for servicing the Model CD-400 CD-4 Demodulator.

Item	Manufacturer and Model No.	Use
CD-4 Signal Generator	Meguro, MSG. 321	Signal source.
Distortion Analyzer	Hewlett Packard, Model 331A or 333A	Measures distortion and signal level.
Attenuator	Frequencies higher than 100kHz	Input signal attenuation
Test Record	JVC, RG1256/1257	Signal source.
Audio Oscillator	Krohn Hite Model 4000 or 4024 or equivalent	Sinewave and squarewave signal source.
Oscilloscope	High sensitivity with DC horizontal and vertical amplifiers.	Waveform analysis and trouble shooting.
VTVM	With AC, DC, RF range	Voltage measurements.
Circuit Tester		Trouble shooting.
AC Wattmeter	Simpson, Model 380	Monitors primary power to demodulator.
Record Player	Provided with a CD-4 cartridge.	Plays record.
Line Voltmeter	Commercial Grade (0—150V AC)	Monitors potential of primary power to demodulator.
Variable Autotransformer (0—140V AC, 10 amps)	Powerstat, Model 116B or equivalent.	Adjusts level of primary power to demodulator.
Shorting Plug	Use phono plug with 600 ohm across center pin and shell.	Shorts demodulator input to eliminate noise pickup.
Output Load (100 kohms ±1%)		Provides 100 kohms load for output termination.

Table 1. Test Equipment Required for Servicing

4-2 Checking 1/2 Equalizer Characteristics

Characteristics of the 1/2 equalizer can be checked with either an audio oscillator or test record. The audio oscillator is recommended for a precise testing.

4-2-1 Checking with Audio Oscillator

Signal application point: PHONO INPUT
Signal application level: —40dBs

Measuring point		Representative measured value (0dB = 0.775V)			
(L)	(R)	100Hz	1kHz	10Hz	30kHz
TP109	TP110	+6dBs	−6dBs	−7dBs	−7dBs

4-2-2 Checking with Test Record

Test record: JVC's RG1257 Band 1 or Band 2 (100, 1k, 10kHz) and RG1256 Band 9 (30kHz)
Cartridge: JVC's 4MD-10X or 4MD-20X

Cartridge	Measuring point		Representative measured value (0dB = 0.775V)				Remarks
	(L)	(R)	100Hz	1kHz	10kHz	30kHz	
4MD-10X	TP111	TP112	−40dBs	−40dBs	−28dBs	−	−
	TP109	TP110	−	−	−	−20dBs	Large error
4MD-20X	TP111	TP112	−38dBs	−38dBs	−26dBs	−	−
	TP109	TP110	−	−	−	22dBs	Large error

NOTE:

1. When the test record method is used, the measured values vary to some extent depending upon the cartridge used. Especially the errors in measured values at 10kHz and 30kHz will be large.
2. If the measured values are entirely different from the above listed representative values, there is probably something wrong with the transistors or ICs, or disconnecting or shorting of the wires. If the measured values are different at specific frequencies, the NF circuit is suspect.

4-3 Checking the Characteristics of the 2/2 Equalizer and Operation Circuit

4-3-1 Checking with Audio Oscillator

Signal application level, -40dBs

Signal application point		Measuring point		Representative measured value (0dB = 0.775V)			Remarks
(L)	(R)	(L)	(R)	100Hz	1kHz	10kHz	
TP111	TP112	TP115 (CH1 OUT)	TP116 (CH3 OUT)	−16dBs	−17dBs	−30dBs	The separation pot is set to max.

4-3-2 Checking with Test Record

When this method is used the 1/2 equalizer must operate normally. Therefore the equalizer must be checked in advance according to the method described in 4-2. The same test records are used as in 4-2-2.

Cartridge	Measuring point		Representative measured value (0dB = 0.775V)			Remarks
	(L)	(R)	100Hz	1kHz	10kHz	
4MD-10X 4MD-20X	TP115	TP116	−14dBs −12dBs	−14dBs −12dBs	−14dBs −12dBs	The separation tuning VR is set to max.

NOTE:

Since the measured values vary depending upon the cartridge used, the variation at 100Hz and 10kHz compared to that at 1kHz must be checked.

4-4 Checking the Demodulation Circuit

The demodulation circuit is checked by the wave form developed when the 30kHz signal (Audio oscillator or test record RG1256 Band 9) is applied.

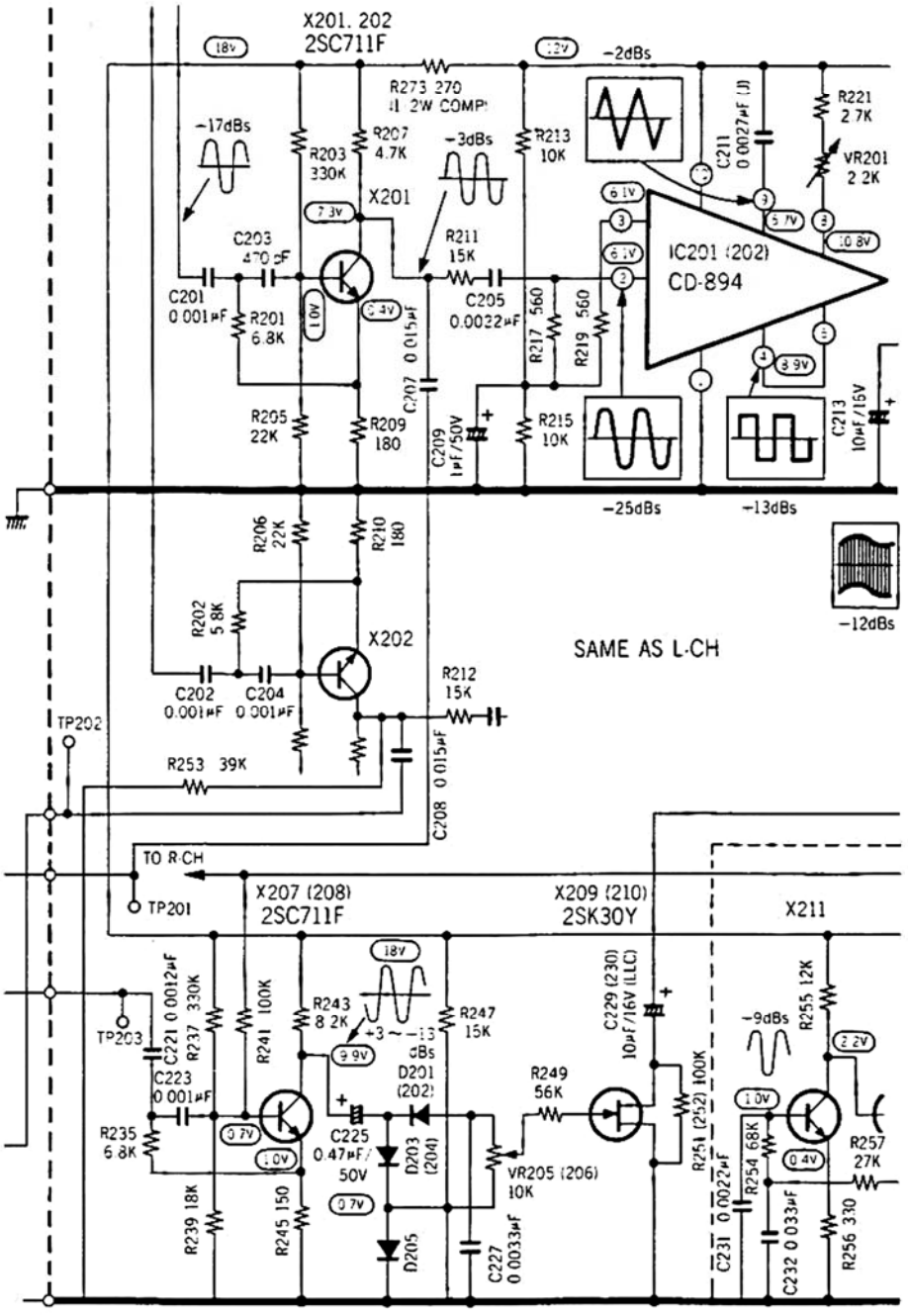

Figure 8. Circuit Diagram of PLL FM Detector Section

4-4-1 Adjusting the VCO

The various wave forms shown in Figure 8 are generated when a -50dBs, 30kHz signal is applied to the PHONO terminal. The wave forms at various sections are almost same when the test record JVC's RG1256 Band 9 is played using cartridge JVC 4MD-10X or 4MD-20X.

The free-running frequency of PLL IC CD-894 must be adjusted correctly to 30kHz. When the IC and its peripheral circuit is repaired, it is necessary that the free-running frequency is readjusted correctly. The adjustment is done in accordance with the so-called zero beat method. An accurate 30kHz signal (Audio oscillator or test record RG1256 Band 9) is applied to the PHONO terminal so that the beat between this 30kHz signal and the free-running frequency can be detected and reduced to zero by adjustment of variable resistor (VR201). When the input is large, the locking range of the PLL is wide so that adjustment becomes impossible. Therefore the PHONO input is attenuated to -110dBs or so. Output is possible at any stage after the LPF (F201), but it will be easier if the adjustment is done listening to the beats through an earphone. In this case it is necessary that the muting circuit is kept ON. (See Note in 4-5).

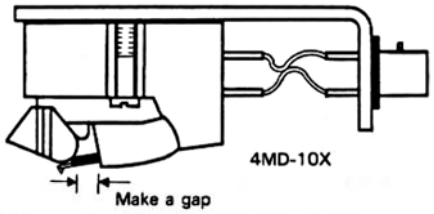

Figure 9. Cartridge Modulation for VCO Adjustment

When adjustment is done using test records, attenuating the input is complicated. For example, when the test record Band 9 is played by using a 2-channel stylus, the 30kHz signal will be attenuated and the adjustment will be achieved easily by making a gap between the stylus and the cartridge body as shown in Figure 9 by not inserting the stylus fully into the cartridge body. In this case the muting circuit must also be kept ON.

NOTE:

1. During the adjustment of the VCO, it is better to apply signals to both channels simultaneously.
2. When the adjustment is made using test records, the gap between the stylus and the cartridge body must be determined empirically. In this case it is necessary that the gap is increased gradually until beats are generated or not, subject to the wow & flutter of the turntable.
3. When VCO is not adjusted, beats will be heard when the stylus is placed on or taken off the record surface. Besides, beats are likely to be heard when the record is worn and the carrier level is diminished.

4-4-2 30kHz Level Control (Lock Range Control)

The 30kHz level is controlled by a variable resistor R001 accessible to the user and a present variable resistor VR205 to absorb unevenness of the circuit from unit to unit. To precisely adjust the preset VR205, it is necessary to use an FM modulator. A simple adjusting method using cartridge 4MD-10X or 4MD-20X and record RG1257 Bands 4, 5 will be explained. First fully turn counter-clockwise the 30kHz level. Then turn it by six clicks in the clockwise direction. While playing RG1257 Band 5 turn the preset variable resistor (VR205) until the sound changes suddenly. At this moment the output wave form becomes as shown in Figure 10 having one or two projections above the sine wave. At this time make sure of the following two points:

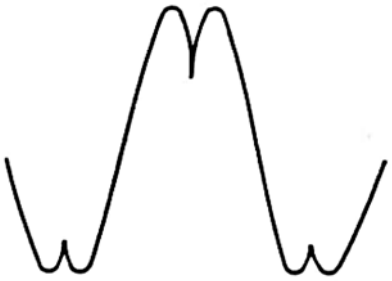

Figure 10. Output Wave Form when Lock Range is Controlled

1) Playing Band 5 the projections disappear when the variable resistor is turned by one graduation in the counter-clockwise direction.
2) On Band 4 no projections appear when the setting variable resistor has been turned by 6 clicks.

NOTE:

1. 30kHz Level Adjusting Signal
   In order to establish a correct lock range for the cartridge being used, a difference signal of 400Hz with ±4kHz deviation is recorded on the adjustment record supplied with the Model CD-400. To get high fidelity sound from CD-4 records, a lock range of ±10kHz is sufficient. This frequency deviation of ±10kHz is, however, not suitable for the signal adjustment because it leads to a high demodulated output. Therefore, the test signal uses a deviation of ±4kHz and has a carrier level 4dB lower than that of the regular record. For example, with a cartridge which picks up a carrier of -50dBs from an ordinary CD-4 record, if the carrier level is set so as to obtain a lock range of ±4kHz when a carrier of -54dBs is applied, the lock range when playing ordinary CD-4 records will be ±10kHz, as understood from Figure 11.
2. When the reproduced wave forms have the shape shown in Figure 12 (a) irrespective of the position of the variable resistor, it shows that the FET is not controlled properly and something is wrong in the R001, X207, D201, D202, VR205 or X209 circuit..
3. When the reproduced wave form becomes a sine wave (Figure 13) irrespective of the R001 position, FET X209 may be regarded as being open.

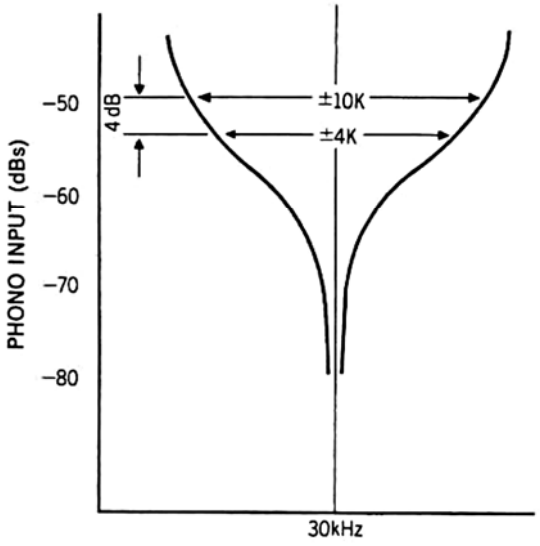

Figure 11. Phono Input Level vs. Lock Range

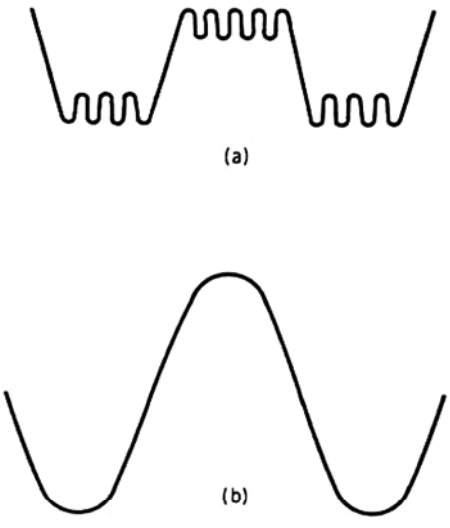

Figure 12. Output Form

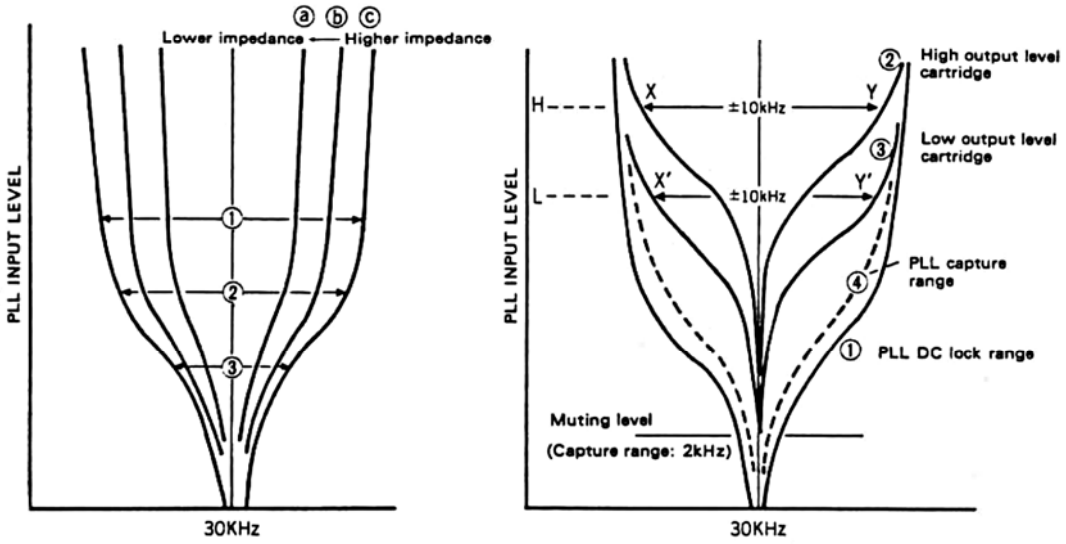

Figure 13. PLL Input Level vs. Lock Range

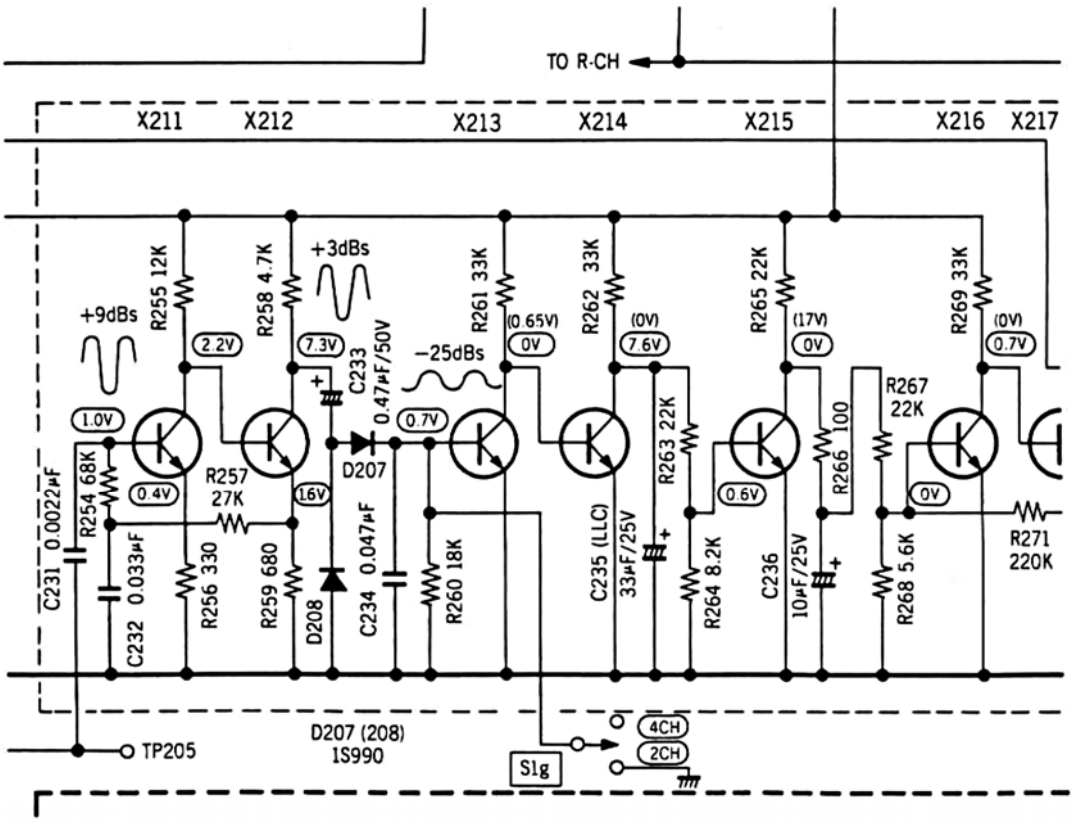

Figure 14. Muting Circuit Diagram

4. Since the rectangular waves at PLL IC pin (4) and pin (5) and the triangle wave at pin (9) are oscillation signals from VCO, they are the unmodulated 30kHz signals when no input is applied. When these waves are not formed, the IC may be defective. However, the wave forms will be out of shape if the measuring system has a large capacity.
5. Actual Circuit
   The operation of the difference signal demodulation circuit will be explained taking the left channel of the Model CD-400 demodulator as an example (see attached circuit diagram). The 30kHz carrier modulated by the difference signal is transmitted to X201 after having been amplified by the 1/2 equalizer. The base circuit of X201 incorporates an active high pass filter with 20kHz cut-off which removes the sum signal at 12dB/oct. The sum signal component which was left unremoved here can be removed by the highly selective PLL which was designed so as to be locked only to the carrier component. There is an attenuator formed by R211 (=15 kohms) and R217 (=560 ohms) at the PLL input. The gain between PHONO input and PLL was designed to be 25dB. X207 is a control signal amplifier stage and has, at its input, a variable resistor (R001) for 30kHz level adjustment and a high pass filter. R001 is used to obtain one of the curves (2) or (3) in Figure 13 according to the cartridge used. The control signal of the FET forms a negative voltage which is rectified after amplification by X207. The source-drain resistance R_{DS} becomes open at a gate voltage of -1.5V. Starting at this voltage, the negative voltage becomes smaller as the input signal decreases.

4-5. Checking the Muting Circuit

Figure 14 shows the waveform and voltage of the Model CD-400 muting circuit. The figure in circles indicates the voltage when the 30kHz carrier is applied; and the voltage in parentheses shows the one when no 30kHz carrier is applied.

The AC wave forms and levels given are the ones when the 30kHz signal at -50dBs is applied to PHONO INPUTS.

NOTE:

1. The muting circuit will not operate without the carrier component. When it is required to keep the muting circuit ON during service checking of the demodulation section, TP206 should be grounded.
2. When the muting circuit is ON, the input level is -85dBs ±5dB at the input terminals PHONO.

4-6 Checking the PM/FM Equalizer

The PM/FM equalizer is at the input of emitter-follower X301. Checking is done using an audio oscillator.

Signal application level: 0dBs

Signal application point		Measuring point		Representative measured value			Remarks
(L)	(R)	(L)	(R)	100Hz	1kHz	10kHz	
TP301	TP302	TP303	TP304	−0.5dBs	−4.5dBs	−22.0dBs	

4-7 Adjusting the Demodulated Output

The ANRS (Automatic Noise Reduction System) in the CD-4 system is constructed so that a complementary relationship exists between the recording system and the playback system and so that a predetermined level of signal must be applied to the expander section to obtain a

predetermined modulated signal. This predetermined level of signal or ANRS expander input at 0 VU in the recording system is set at -15dBs. The adjustment is carried out playing test record RG1256 Band 8.

Input signal	Measuring point	Adjusting point	Adjusting method
Record used: RG1256 Band 8 Cartridge used: 4MD-20X or 4MD-10X	L: CP323 R: CP324 L: TP303 R: TP304 L: 16 R: 18	VR303 VR304 VR203 VR204 R547 R548	The level at the measuring point is adjusted to −15dBs.

4-8 Checking and Adjusting the ANRS Expander

Checking and adjusting the ANRS expander is carried out by using an audio oscillator. Make sure that the separation control variable resistors are set to minimum. Input application and measuring point are as listed in the following table.

Signal application point	Input level measuring point	Output level measuring point
L: TP301	TP303	TP117
R: TP302	TP304	TP118

Properly adjusted the unit has following levels:

Frequency of the input signal	Input level	Output level
High frequency band (15kHz)	−15dBs −25dBs −40dBs	−14dBs ± 2dB −29dBs ± 1dB −54dBs ± 2dB
Medium frequency band (600Hz)	−15dBs −25dBs −35dBs	−14dBs ± 2dB −30dBs ± 1dB −46dBs ± 2dB

Readjustment if necessary is carried out in the following sequence:

1) VR301 (L.ch) and VR302 (R.ch) are turned counter-clockwise and clockwise, respectively prior to adjustment.
2) When the frequency of the input signal is 15kHz and the input level is set to -25dBs at the measuring point, VR303 (L.ch) and VR304 (R.ch) are adjusted so that the output becomes -29dBs.
3) When the input levels are set to -15dBs and -40dBs without changing the input signal frequency, make sure that the output levels become as listed in the above table.
4) When the frequency of the input signal is 600Hz and the input level is set to -25dBs at the measuring point, VR301 (L.ch) and VR302 (R.ch) are adjusted so that the output level becomes -30dBs.
5) When the input levels are set to -15dBs and -35dBs without changing the input signal frequency, make sure that the output levels become as listed in the above table.

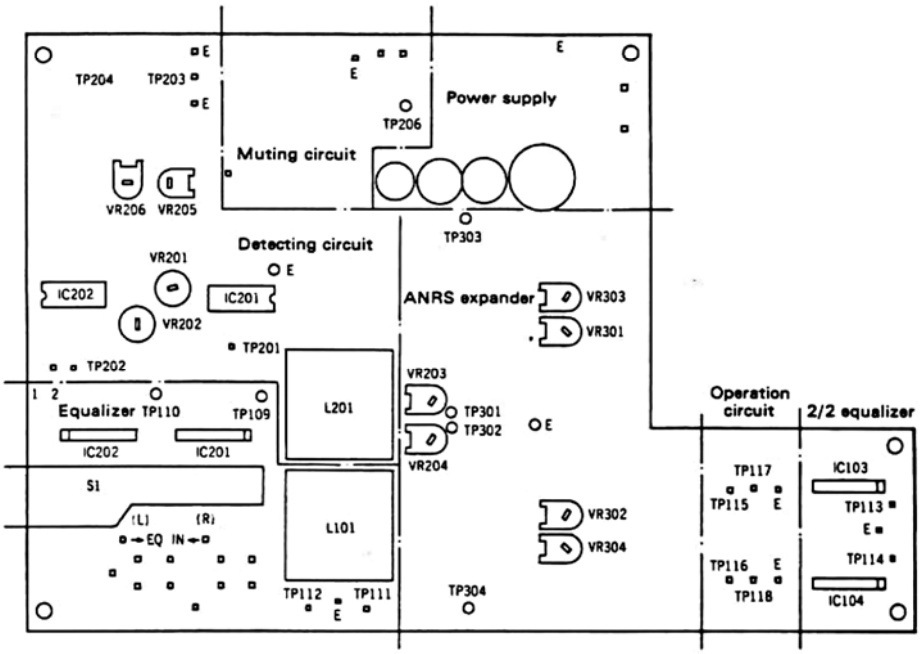

Figure 15. Adjusting Points Locations

5. SERVICE POINTS FOR THE CD-4 PLAYBACK SYSTEM

Malfunctions in the CD-4 playback system can be caused by a wide variety of factors such as trouble with the record, cartridge, stylus, player and demodulator, the connections between these components, and the mishandling of the playback system. Many troubles caused by different factors will present almost the same symptoms. Malfunctions can be traced and corrected conveniently by searching for first large, then small problems. Here, some of the major problems which are liable to occur will be described.

5-1 Noise

1) Dust

Due to the improved compatibility of the demodulator, noise is largely decreased. However, CD-4 records are more easily affected by dust than ordinary stereo records. When the stylus tracks at a frequency as high as 30kHz, a system which can accurately track high frequencies is required. Therefore even fine dust should be eliminated as far as possible.

Dust adheres not only to the record surface but also to the stylus. During tracking along the groove, the stylus collects dust from the record surface and removes record material which may be deposited on the stylus. The record material deposited in this manner will be melted by the heat generated by the friction between the stylus and record surface. Cleaning fluids and water droplets will soften the record material and cause the dust to coagulate, so that they are both useless and harmful.

2) Requirements of the cartridge

It is not easy to pick up the 30kHz signals from the record surface with a mechanical vibrating system. The high frequency characteristics of a cartridge is determined almost entirely by the configuration and structure of stylus used, so that a 2 CH stylus is not sufficient even if the cartridge body is suitable for CD-4. Make sure the cartridge and stylus are both specified for CD-4 use. (With the highly compatible Model CD-400 demodulator, playback is sometimes possible using a 2 CH cartridge.)

The 2 CH cartridge is designed to cover only the audible range so that this type of cartridge cannot be always used in CD-4 playback. Even if playback is possible according to its specifications, many cartridges are magnetized in the wrong polarity and are therefore unsuitable. The polarity of magnetization is no problem in playing back stereo records, but it must be correct for playing back CD-4 records. If the polarity of magnetization is wrong, the front and rear channels will be reversed in playback.

3) Requirements in the player

It is important that the 30kHz signal picked up by the cartridge is sent to the demodulator with as small a loss as possible. The signal cord from the player plays an important role in this. The optimum load of a CD-4 cartridge is 100 kohms, 100pF and the input capacity of the demodulator is in the order of about 50pF, so that the optimum condition is that the signal cord should have a capacity less than about 50pF. A capacity of 50pF is provided by 1.2m of 40pF/meter low capacitance cable.

Care must be taken in cases such as a player switching box used in a store.

4) Noise from the demodulator

Noise is transmitted together with the sum and difference signals. The noise relating to the sum signal and the noise relating to the difference signal are distinguished from each other roughly as follows.

Noise associated with sum signal:

1 Noise which is generated at the 2CH position.
  Noise which disappears when the separation control variable resistor is set to minimum.

Noise associated with difference signal:

1 Noise which is generated even after the separation control variable resistor has been set to minimum.

The noise associated with the sum signal includes comparatively well known transistor noise and other external noises. The noise associated with the difference signal can be distinguished between those appearing before demodulation and those appearing after demodulation depending on whether they are heard only when the muting is turned ON or when it is turned ON and OFF. If the CD-4 radar glows and noise is heard when no record is played back, it may be because of noise from the muting circuit.

5) Noise generated in playing back stereo records

As Model CD-400 incorporates an auto-muting circuit, little noise will be generated even when a stereo record is played back in the 4 CH-AUTO position. However, there are some exceptions. They are stereo records with an unnecessary super-sonic component engraved (non-distortion cutting) on the surface, which have a high frequency oscillator in the cutting process. With such records, set the mode switch to "2 CH" before playback.

5-2 Separation

Separation is so sensitive that the effectiveness of a CD-4 playback system is mainly determined by its separation. If the sum signal and difference signal differ from each other by 1dB immediately before they enter the operation circuit in the demodulator, channel separation will be less than 20dB.

If the difference in phase is 10°, separation will be degradated additionally by 5—6dB. Level may be controlled in the medium frequency range by adjusting the separation, but the disturbance in high frequency characteristics due to the cartridge used cannot be compensated for. Phase is influenced by the frequency characteristics in the audible frequency range of the cartridge used and also by the difference signal transmission system. It is not uncommon that the shift of phase results from mechanical factors such as inclination of the cartridge, stylus pressure, etc.

The largest cause of separation degradation in the demodulator is frequency characteristics at various points. Separation degradation is prevented only by checking and adjusting the various portions of the demodulator carefully.

When no separation can be achieved at all, this shows that either the sum signal or difference signal is not present, so that this must be distinguished clearly from the case of poor separation. It is necessary that the separation of a demodulator should be checked when the characteristics of the various parts are correct. If it is found that the characteristics of the various portions are correct, the cause of the poor separation must lie in some other factor.

5-3 Beats

The Model CD-400 high compatibility demodulator incorporates a 30kHz oscillator. In a normal operation the oscillation is synchronized with the 30kHz input signal. However, when the input level is low and there is a frequency difference between the sum and difference signals, beats will be generated. For example, if the speed of the player differs by 10%, the oscillation frequency of normal 30kHz will become either 27kHz or 33kHz and beats will be generated. When the oscillation frequency of PLL is shifted, the same result will be obtained.

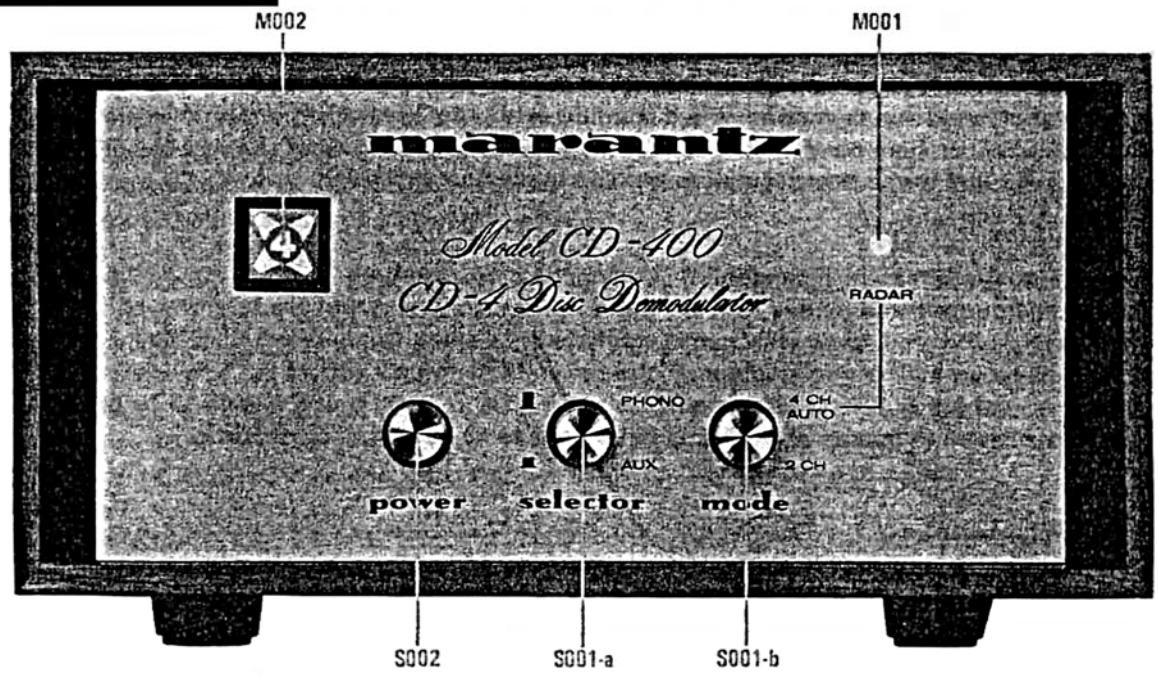

Figure 16. Front Panel Switches and Component Locations

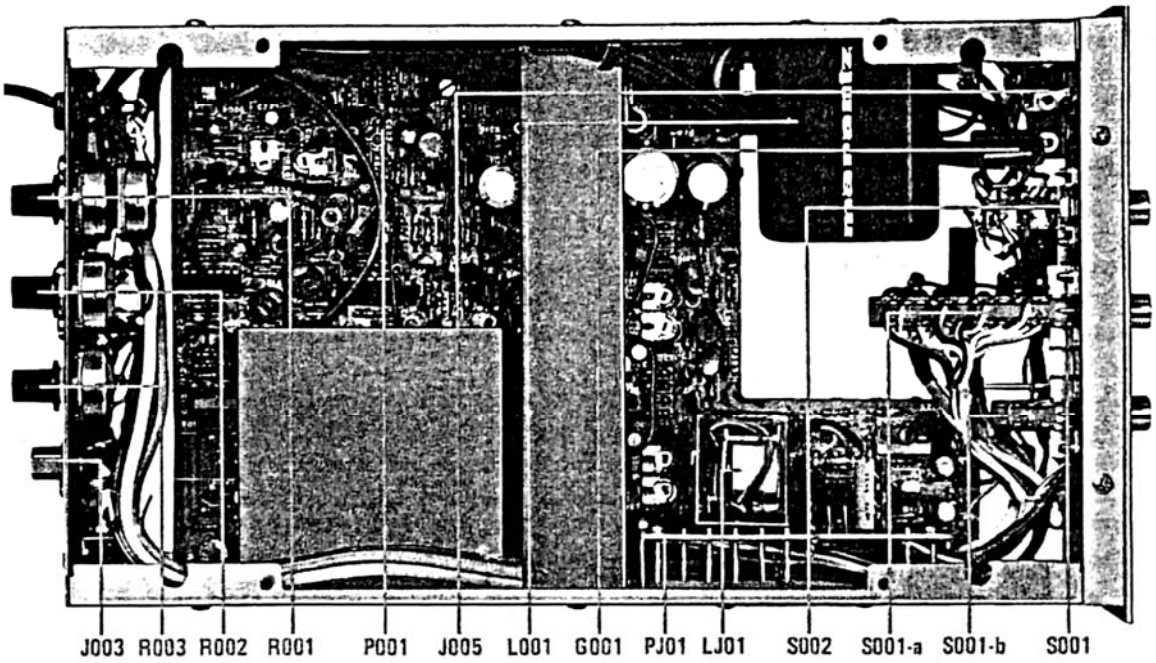

Figure 17. Main Chassis Component Locations (Top View)

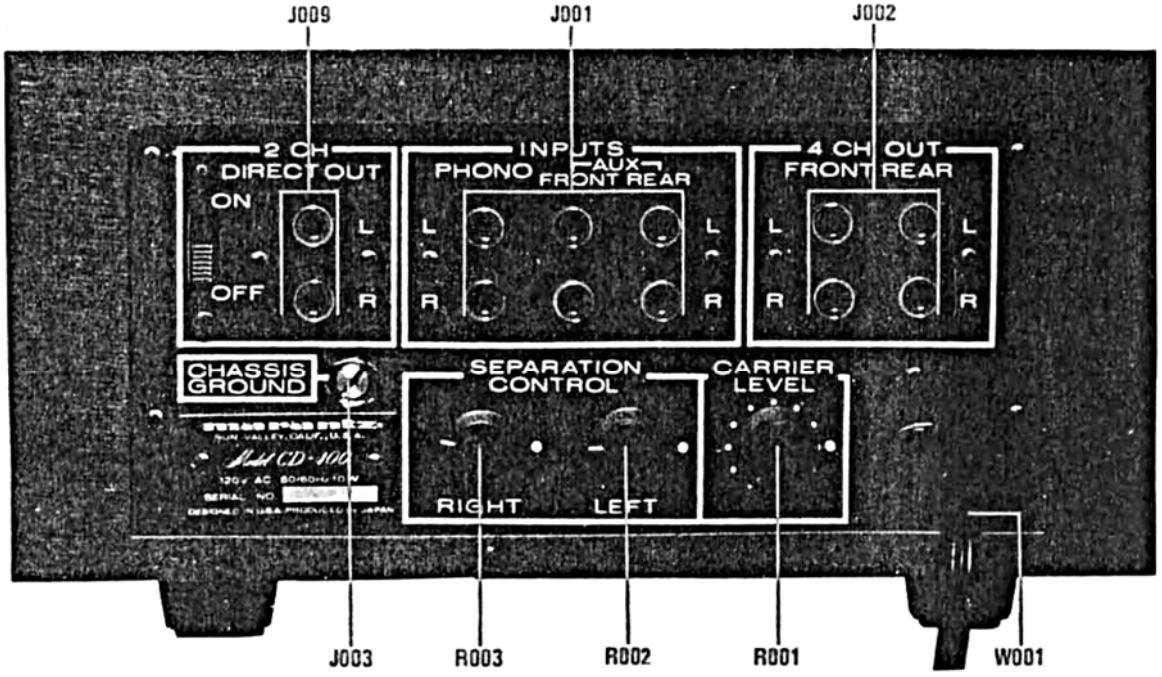

Figure 18. Rear Panel Jacks and Component Locations

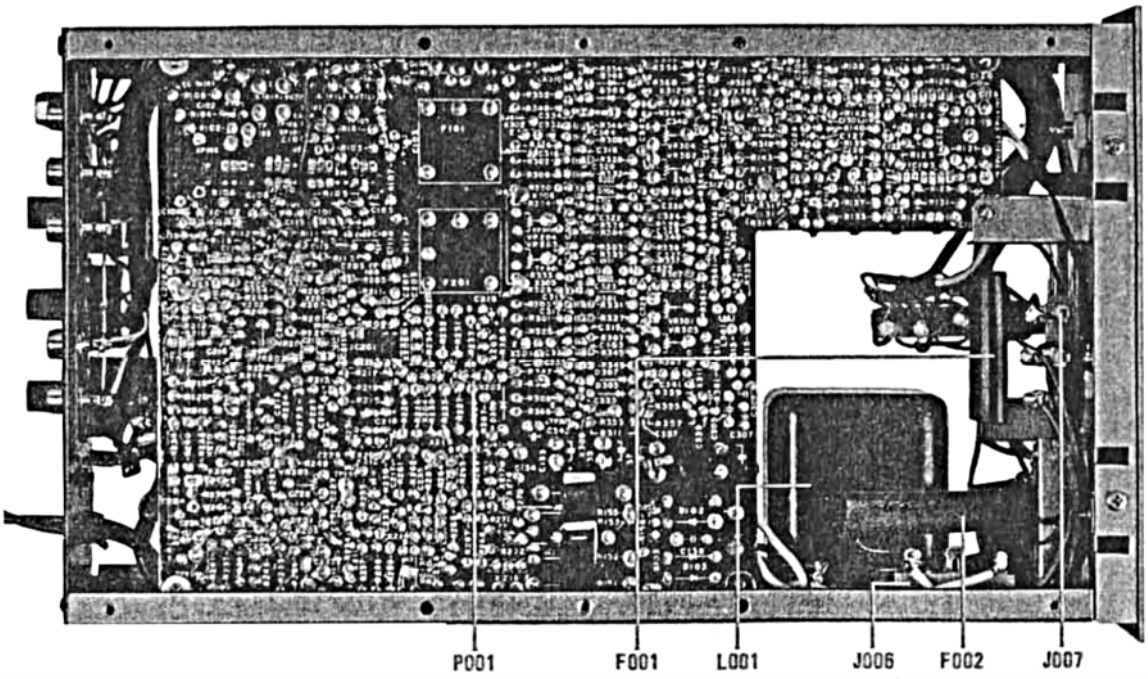

Figure 19. Main Chassis Component Locations (Bottom View)

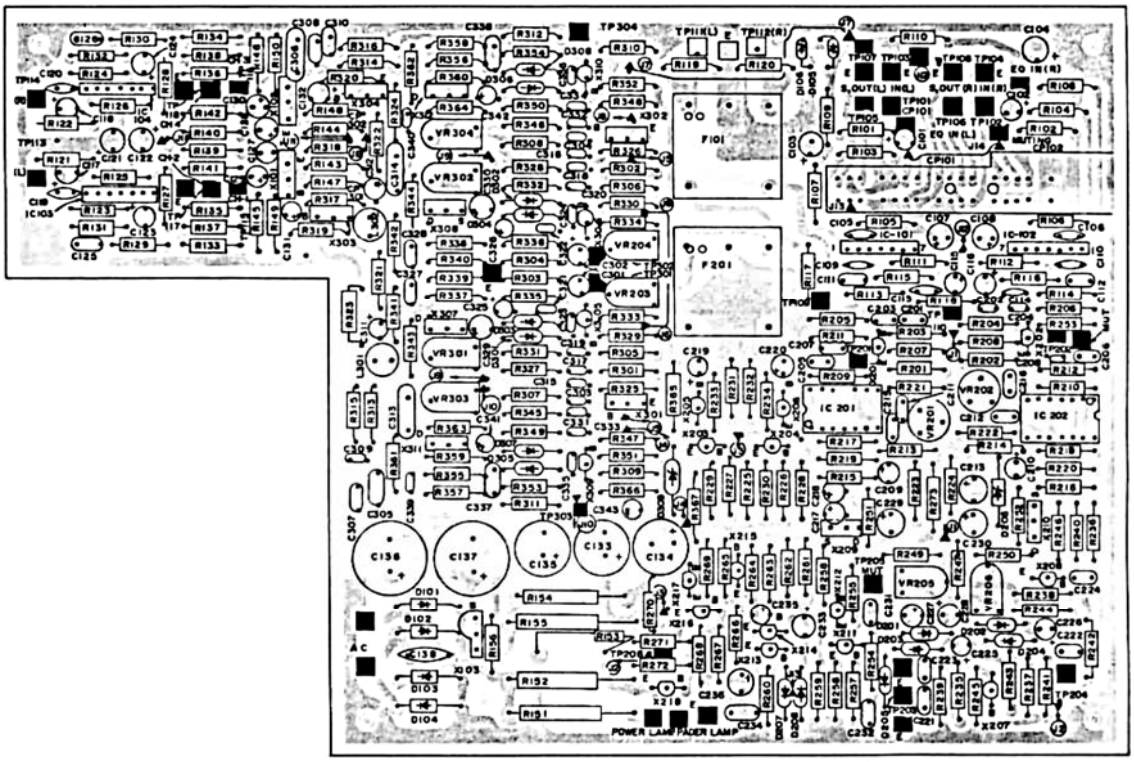

Figure 20. Demodulator Assembly PK01 Component Assembly

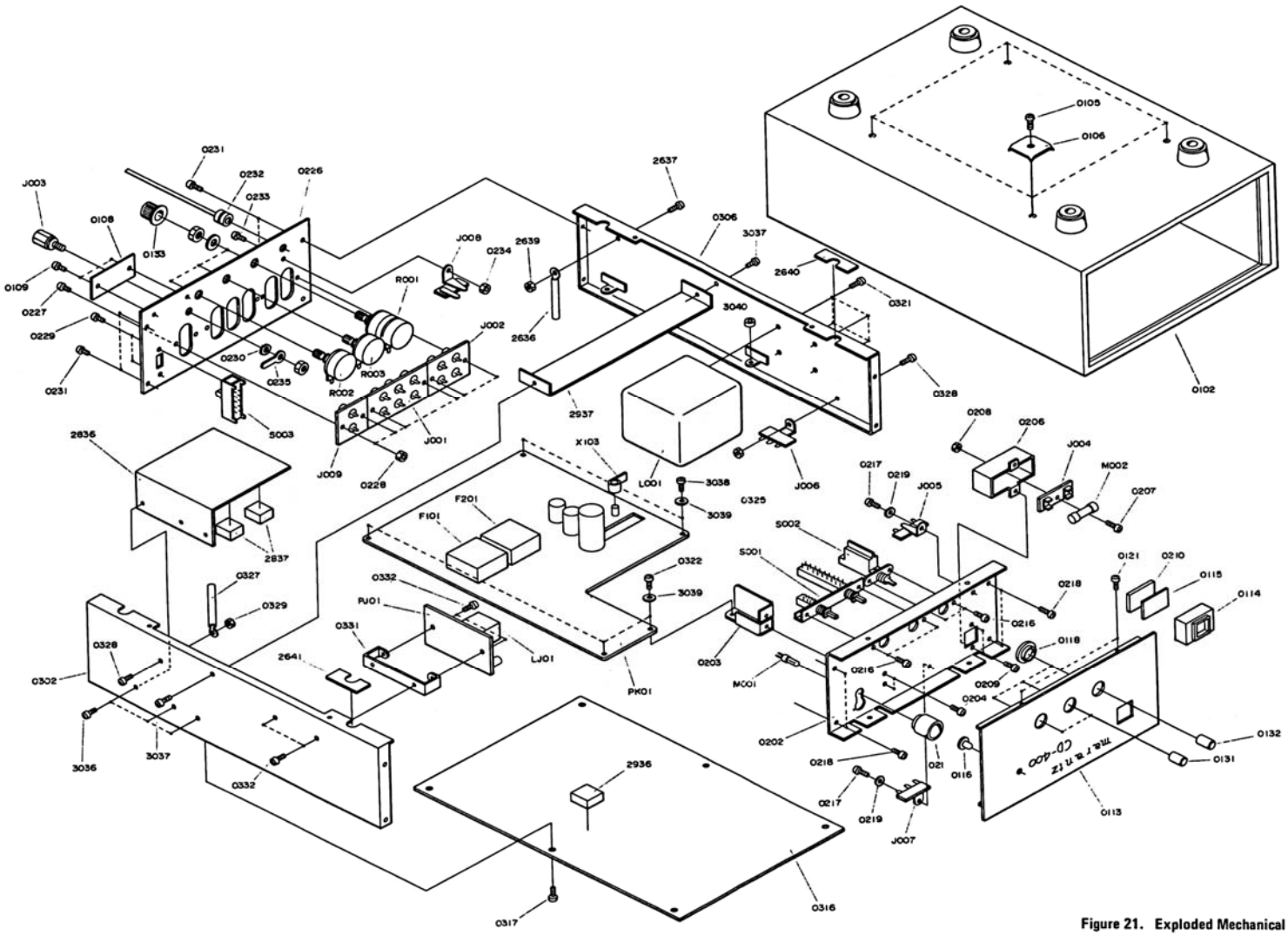

Figure 21. Exploded Mechanical Diagram

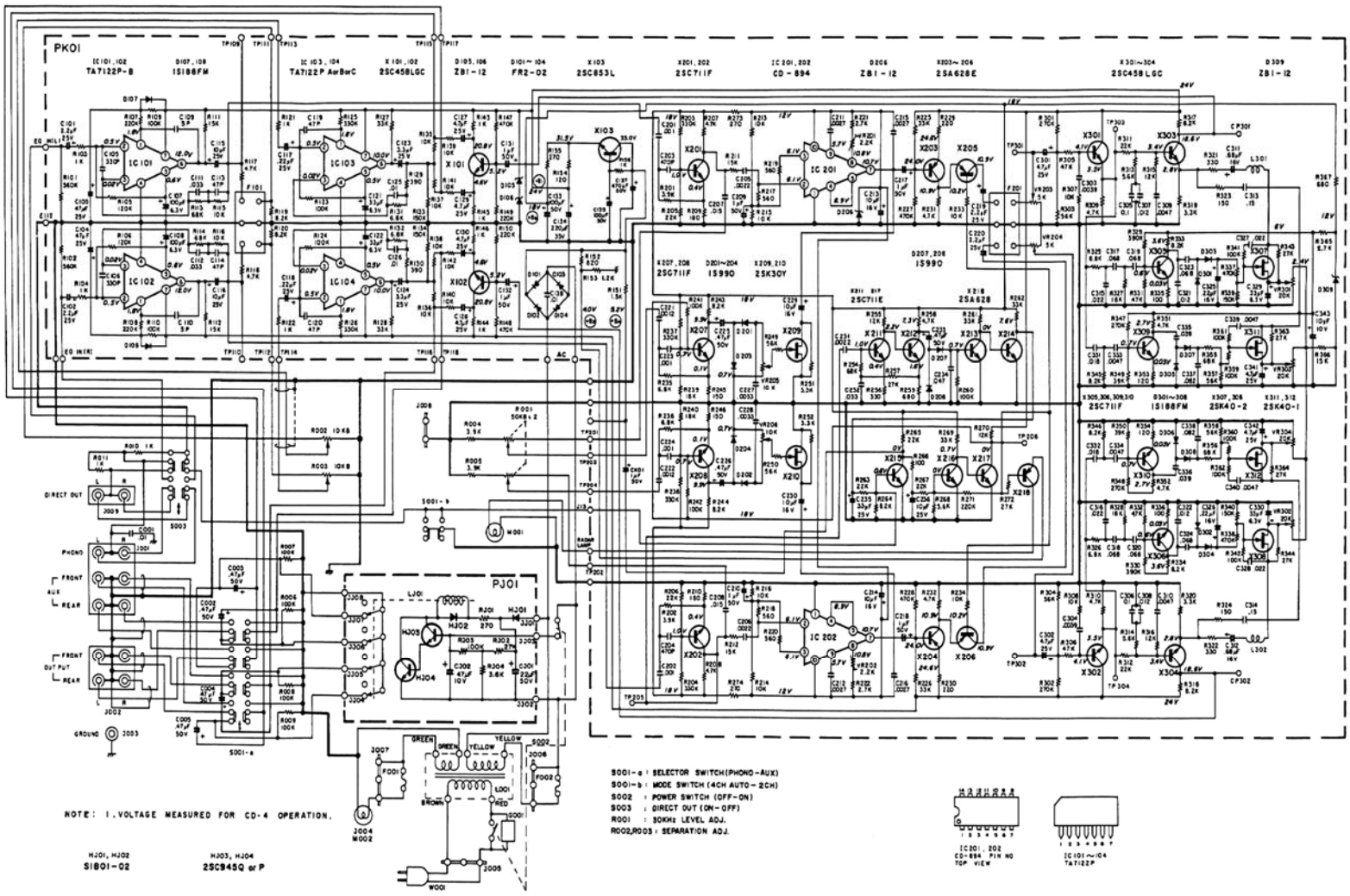

Figure 22. Schematic Diagram

6. PARTS LIST

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
A	291306340	Front Panel Assembly
0113	291306301	Escutcheon
0116	291305301	Cover
0117	59040805P	Washer
0118	281825905	Bush x 3
0114	285105302	Cover
0115	285125101	Badge
0210	285110702	Sheet
		DEMODULATOR CIRCUIT BOARD–P001
P001	YD2913001	P. W. Board, Demodulator (Print Only)
	ZZ2913001	P. W. Board Assembly
		SEMICONDUCTORS, FILTER AND CAPACITORS
IC101	HC1000905	I. C., TA7122AP-B
IC102	HC1000905	I. C., TA7122AP-B
IC103	HC1000505	I. C., TA7122AP-A, B, C
IC104	HC1000505	I. C., TA7122AP-A, B, C
X101	HT304580Y	Transistor, 2SC458LGC
X102	HT304580Y	Transistor, 2SC458LGC
X103	HT308531L	Transistor, 2SC853L
F101	FF3000101	Low Pass Filter
C101	EV2250252	Electroly Cap., 2.2μF ± 20%, 25V
C102	EV2250252	Electroly Cap., 2.2μF ± 20%, 25V
C105	DD1533103	Ceramic Cap., 330PF ± 5%, 50V
C106	DD1533103	Ceramic Cap., 330PF ± 5%, 50V
C109	DD1505001	Ceramic Cap., 5PF ± 5%, 50V
C110	DD1505001	Ceramic Cap., 5PF ± 5%, 50V
C113	DD1547002	Ceramic Cap., 47PF ± 5%, 50V
C114	DD1547002	Ceramic Cap., 47PF ± 5%, 50V
C119	DD1547002	Ceramic Cap., 47PF ± 5%, 50V
C120	DD1547002	Ceramic Cap., 47PF ± 5%, 50V
C138	DK1810305	Ceramic Cap., 0.01μF+100%, –0%, 500V
D101	HD2000513	Diode, FR2-02
D102	HD2000513	Diode, FR2-02
D103	HD2000513	Diode, FR2-02
D104	HD2000513	Diode, FR2-02
D105	HD3004009	Diode, ZB-112
D106	HD3004009	Diode, ZB-112
D107	HD1000303	Diode, IS188FM
D108	HD1000303	Diode, IS188FM
		MISCELLANEOUS
TP101 ~ TP108	YP0600042	Plug, Pin
JP109	YP0600043	Plug, Test Point
JP110	YP0600043	Plug, Test Point
JP111 ~ JP118	YP0600042	Plug, Pin
CP101	YP0600042	Plug, Pin
CP102	YP0600042	Plug, Pin
J101	YP0600041	Plug, Tab

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
J102 ~ J117	YP0600042	Plug, Pin
J118	YP0600043	Plug, Test Point
0925	291312001	Spacer x 6
		SEMICONDUCTORS, FILTER AND CAPACITORS
IC201	HC1000127	I. C., CD-894
IC202	HC1000127	I. C., CD-894
X201	HT307111F	Transistor, 2SC711F
X202	HT307111F	Transistor, 2SC711F
X203	HT106281E	Transistor, 2SA628E
X204	HT106281E	Transistor, 2SA628E
X205	HT106281E	Transistor, 2SA628E
X206	HT106281E	Transistor, 2SA628E
X207	HT307111F	Transistor, 2SC711F
X208	HT307111F	Transistor, 2SC711F
X209	HF200301C	F.E.T., 2SK30-Y
X210	HF200301C	F.E.T., 2SK30-Y
X211	HT307111E	Transistor, 2SC711E
X212	HT307111E	Transistor, 2SC711E
X213	HT307111E	Transistor, 2SC711E
X214	HT307111E	Transistor, 2SC711E
X215	HT307111E	Transistor, 2SC711E
X217	HT307111E	Transistor, 2SC711E
X218	HT106281F	Transistor, 2SA628F
F201	FF3000101	Low Pass Filter
C203	DD1547101	Ceramic Cap., 470PF ±5%, 50V
C204	DD1547101	Ceramic Cap., 470PF ±5%, 50V
C219	EV2250252	Electroly Cap., 2.2μF ±20%, 25V
C220	EV2250252	Electroly Cap., 2.2μF ±20%, 25V
D201	HV0000109	Varistor, IS990
D202	HV0000109	Varistor, IS990
D203	HV0000109	Varistor, IS990
D204	HV0000109	Varistor, IS990
D206	HD3004009	Diode, ZB-112
D207	HV0000109	Varistor, IS990
D208	HV0000109	Varistor, IS990
		RESISTORS & PLUGS
VR201	RA0222005	Trimming Resistor, 2.2KΩ
VR202	RA0222005	Trimming Resistor, 2.2KΩ
VR203	RA0502022	Trimming Resistor, 5KΩ
VR204	RA0502022	Trimming Resistor, 5KΩ
VR205	RA0103028	Trimming Resistor, 10KΩ
VR206	RA0103028	Trimming Resistor, 10KΩ
TP201	YP0600042	Plug, Pin
TP202	YP0600042	Plug, Pin
TP203	YP0600042	Plug, Pin
TP204	YP0600042	Plug, Pin
TP206	YP0600043	Plug, Test Point
		SEMICONDUCTORS, COILS, RESISTORS & PLUGS
X301	HT304580Y	Transistor, 2SC458L,G,C
X302	HT304580Y	Transistor, 2SC458L,G,C
X303	HT304580Y	Transistor, 2SC458L,G,C
X304	HT304580Y	Transistor, 2SC458L,G,C.
X305	HT307111F	Transistor, 2SC711F

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REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
X306	HT307111F	Transistor, 2SC711F
X307	HF200400B	F.E.T., 2SK40(2)
X308	HF200400B	F.E.T., 2SK40(2)
X309	HT307111F	Transistor, 2SC911F
X310	HT307111F	Transistor, 2SC911F
X311	HF200400A	F.E.T., 2SK40(1)
X312	HF200400A	F.E.T. 2SK40(1)
D301	HD1000303	Diode, IS188FM
D302	HD1000303	Diode, IS188FM
D303	HD1000303	Diode, IS188FM
D304	HD1000303	Diode, IS188FM
D305	HD1000303	Diode, IS188FM
D306	HD1000303	Diode, IS188FM
D307	HD1000303	Diode, IS188FM
D308	HD1000303	Diode, IS188FM
D309	HD3004009	Diode, ZB-112
L301	LC2107001	Choke Coil, 100mH
L302	LC2107001	Choke Coil, 100mH
VR301	RA0203008	Trimming Resistor, 20KΩ
VR302	RA0203008	Trimming Resistor, 20KΩ
VR303	RA0203008	Trimming Resistor, 20KΩ
VR304	RA0203008	Trimming Resistor, 20KΩ
TP301	YP0600043	Plug, Test Point
TP302	YP0600043	Plug, Test Point
TP303	YP0600043	Plug, Test Point
TP304	YP0600043	Plug, Test Point
		RESISTORS
		All resistors are ±5% and ¼W, unless otherwise indicated.
R101	RT0556414	560KΩ
R102	RT0556414	560KΩ
R103	RT0510214	1KΩ
R104	RT0510214	1KΩ
R105	RT0512414	120KΩ
R106	RT0512414	120KΩ
R107	RN0522414	220KΩ
R108	RN0522414	220KΩ
R109	RT0510414	100KΩ
R110	RT0510414	100KΩ
R111	RT0515314	15KΩ
R112	RT0515314	15KΩ
R113	RT0568314	68KΩ
R114	RT0568314	68KΩ
R115	RT0510314	10KΩ
R116	RT0510314	10KΩ
R117	RT0547214	4.7KΩ
R118	RT0547214	4.7KΩ
R119	RT0582214	8.2KΩ
R120	RT0582214	8.2KΩ
R121	RT0510214	1KΩ
R122	RT0510214	1KΩ
R123	RT0510414	100KΩ
R124	RT0510414	100KΩ
R125	RT0533414	330KΩ
R126	RT0533414	330KΩ
R127	RT0533314	33KΩ
R128	RT0533314	33KΩ
R129	RT0539114	390Ω
R130	RT0539114	390Ω

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R131	RT0568214	6.8KΩ
R132	RT0568214	6.8KΩ
R133	RT0515414	150KΩ
R134	RT0515414	150KΩ
R135	RT0510314	10KΩ
R136	RT0510314	10KΩ
R137	RT0510314	10KΩ
R138	RT0510314	10KΩ
R139	RT0510314	10KΩ
R140	RT0510314	10KΩ
R141	RT0510314	10KΩ
R142	RT0510314	10KΩ
R143	RT0510214	1KΩ
R144	RT0510214	1KΩ
R145	RT0510214	1KΩ
R146	RT0510214	1KΩ
R147	RT0547414	470KΩ
R148	RT0547414	470KΩ
R149	RT0522414	220KΩ
R150	RT0522414	220KΩ
R151	GJ0515203	1.5KΩ ±5%, 3W
R152	GJ0582103	820Ω ±5%, 3W
R153	GJ0512201	1.2KΩ ±5%, 1W
R154	GJ0512102	120Ω ±5%, 2W
R155	GJ0527103	270Ω ±5%, 3W
R156	RC1012214	1.2KΩ ±10%, ¼W
		CAPACITORS
C103	EA4760259	Electroly, 47μF +100%,–10%, 25V
C104	EA4760259	Electroly, 47μF +100%,–10%, 25V
C107	EA1070109	Electroly, 100μF +100%,–10%, 6V
C108	EA1070109	Electroly, 100μF +100%,–10%, 6V
C111	DF1633301	Film, 0.033μF ±10% 50V
C112	DF1633301	Film, 0.033μF ±10% 50V
C115	EA1060259	Electroly, 10μF +100%,–10%, 25V
C116	EA1060259	Electroly, 10μF +100%,–10%, 25V
C117	EV2240251	Electroly, 0.22μF+40%,–20%, 25V
C118	EV2240251	Electroly, 0.22μF+40%,–20%, 25V
C121	EA3360109	Electroly, 33μF +100%,–10%, 6V
C122	EA3360109	Electroly, 33μF +100%,–10%, 6V
C123	EA3350259	Electroly, 3.3μF +100%,–10%, 25V
C124	EA3350259	Electroly, 3.3μF +100%,–10%, 25V
C125	DF1610301	Film, 0.01μF±10%, 50V
C126	DF1610301	Film, 0.01μF±10%, 50V
C127	EA4750259	Electroly, 4.7μF +100%,–10%, 25V
C128	EA4750259	Electroly, 4.7μF +100%,–10%, 25V
C129	EA4750259	Electroly, 4.7μF +100%,–10%, 25V
C130	EA4750259	Electroly, 4.7μF +100%,–10%, 25V
C131	EA1050509	Electroly, 1μF +100%,–10%, 50V
C132	EA1050509	Electroly, 1μF +100%,–10% 50V
C133	EA1070509	Electroly, 100μF+100%,–10% 50V
C134	EA2270359	Electroly, 220μF+100%,–10% 35V
C135	EA1070509	Electroly, 100μF+100%,–10% 50V
C137	EA4770501	Electroly, 470μF+100%,–10% 50V
		RESISTORS
		All resistors are ±5% and ¼W, unless otherwise indicated.
R201	RT0539212	3.9KΩ
R202	RT0539212	3.9KΩ
R203	RT0533414	330KΩ
R204	RT0533414	330KΩ
R205	RT0522314	22KΩ
R206	RT0522314	22KΩ
R207	RT0547214	4.7KΩ
R208	RT0547214	4.7KΩ

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R209	RT0518114	180Ω
R210	RT0518114	180Ω
R211	RT0515314	15KΩ
R212	RT0515314	15KΩ
R213	RT0510314	10KΩ
R214	RT0510314	10KΩ
R215	RT0510314	10KΩ
R216	RT0510314	10KΩ
R217	RT0556114	560Ω
R218	RT0556114	560Ω
R219	RT0556114	560Ω
R220	RT0556114	560Ω
R221	RT0527214	2.7KΩ
R222	RT0527214	2.7KΩ
R223	RC0000012	Jumper, 0Ω, ½W
R224	RC0000012	Jumper, 0Ω, ½W
R225	RT0533314	33KΩ
R226	RT0533314	33KΩ
R227	RT0547414	470KΩ
R228	RT0547414	470KΩ
R229	RT0522114	220Ω
R230	RT0522114	220Ω
R231	RT0547214	4.7KΩ
R232	RT0547214	4.7KΩ
R233	RT0510314	10KΩ
R234	RT0510314	10KΩ
R235	RT0568214	6.8KΩ
R236	RT0568214	6.8KΩ
R237	RT0533414	330KΩ
R338	RT0533414	330KΩ
R239	RT0518314	18KΩ
R240	RT0518314	18KΩ
R241	RT0510414	100KΩ
R242	RT0510414	100KΩ
R243	RT0582214	8.2KΩ
R244	RT0582214	8.2KΩ
R245	RT0515114	150Ω
R246	RT0515114	150Ω
R249	RT0556314	56KΩ
R250	RT0556314	56KΩ
R251	RT0533214	3.3KΩ
R252	RT0533214	3.3KΩ
R253	RT0512414	120KΩ
R254	RT0568314	68KΩ
R255	RT0512314	12KΩ
R256	RT0533114	330Ω
R257	RT0527314	27KΩ
R258	RT0547214	4.7KΩ
R259	RT0568114	680Ω
R260	RT0510414	100KΩ
R261	RT0533314	33KΩ
R262	RT0533314	33KΩ
R263	RT0522314	22KΩ
R264	RT0582214	8.2KΩ
R265	RT0522314	22KΩ
R266	RT0510114	100Ω
R267	RT0522314	22KΩ
R268	RT0556214	5.6KΩ
R269	RT0533314	33KΩ
R270	RT0512314	12KΩ
R271	RT0522414	220KΩ
R272	RT0527314	27KΩ
R273	RC1027112	270Ω ±10%, ½W

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
		CAPACITORS
C201	DF1610201	Film, 0.001μF ±10%, 50V
C202	DF1610201	Film, 0.001μF ±10%, 50V
C205	DF1622201	Film, 0.0022μF ±10%, 50V
C206	DF1622201	Film, 0.0022μF ±10%, 50V
C207	DF1615301	Film, 0.015μF ±10%, 50V
C208	DF1615301	Film, 0.015μF ±10%, 50V
C209	EA1050509	Electroly, 1μF +100%,−10%,50V
C210	EA1050509	Electroly, 1μF +100%,−10%,50V
C211	DF1527201	Film, 0.0027μF ±5%, 50V
C212	DF1527201	Film, 0.0027μF ±5%, 50V
C213	EA1060169	Electroly, 10μF +100%,−10%,16V
C215	DF1627201	Film, 0.0027μF ±10%, 50V
C216	DF1627201	Film, 0.0027μF ±10%, 50V
C217	EA1050509	Electroly, 1μF +100%,−10%,50V
C218	EA1050509	Electroly, 1μF +100%,−10%,50V
C221	DF1512201	Film, 0.0012μF ±5%, 50V
C222	DF1512201	Film, 0.0012μF ±5%, 50V
C223	DF1610201	Film, 0.001μF ±10%, 50V
C224	DF1610201	Film, 0.001μF ±10%, 50V
C225	EA4740501	Electroly, 0.47μF +100%,−10%,50V
C226	EA4740501	Electroly, 0.47μF +100%,−10%,50V
C227	DF1633201	Film, 0.0033μF ±10%, 50V
C228	DF1633201	Film, 0.0033μF ±10%, 50V
C229	EE1060161	Electroly, 10μF ±20%, 16V
C230	EE1060161	Electroly, 10μF ±20%, 16V
C231	DF1622201	Film, 0.0022μF ±10%, 50V
C232	DF1633301	Film, 0.033μF ±10%, 50V
C233	EA4740501	Electroly, 0.47μF +100%,−10%,50V
C234	DF1647301	Film, 0.047μF ±10%, 50V
C235	EA3360259	Electroly, 33μF +100%,−10%,25V
C236	EA1060259	Electroly, 10μF +100%,−10%,25V
		RESISTORS
		All resistors are ±5% and ¼W, unless otherwise indicated.
R301	RT0527414	270KΩ
R302	RT0527414	270KΩ
R303	RT0556314	56KΩ
R304	RT0556314	56KΩ
R305	RT0547314	47KΩ
R306	RT0547314	47KΩ
R307	RT0510314	10KΩ
R308	RT0510314	10KΩ
R309	RT0547214	4.7KΩ
R310	RT0547214	4.7KΩ
R311	RT0522314	22KΩ
R312	RT0522314	22KΩ
R313	RT0556214	5.6KΩ
R314	RT0556214	5.6KΩ
R315	RT0512314	12KΩ
R316	RT0512314	12KΩ
R317	RT0582214	8.2KΩ
R318	RT0582214	8.2KΩ
R319	RT0533214	3.3KΩ
R320	RT0533214	3.3KΩ
R321	RT0533114	330Ω
R322	RT0533114	330Ω
R323	RT0515114	150Ω
R324	RT0515114	150Ω
R325	RT0568214	6.8KΩ
R326	RT0568214	6.8KΩ
R327	RT0518314	18KΩ
R328	RT0518314	18KΩ

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REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R329	RT0539414	390KΩ
R330	RT0539414	390KΩ
R331	RT0547314	47KΩ
R332	RT0547314	47KΩ
R333	RT0582214	8.2KΩ
R334	RT0582214	8.2KΩ
R335	RT0510114	100Ω
R336	RT0510114	100Ω
R337	RT0547414	470KΩ
R338	RT0547414	470KΩ
R339	RT0515414	150KΩ
R340	RT0515414	150KΩ
R341	RT0510414	100KΩ
R342	RT0510414	100KΩ
R343	RT0527314	27KΩ
R344	RT0527314	27KΩ
R345	RT0582214	8.2KΩ
R346	RT0582214	8.2KΩ
R347	RT0527414	270KΩ
R348	RT0527414	270KΩ
R349	RT0539314	39KΩ
R350	RT0539314	39KΩ
R351	RT0547214	4.7KΩ
R352	RT0547214	4.7KΩ
R353	RT0512114	120Ω
R354	RT0512114	120Ω
R355	RT0568314	6.8KΩ
R356	RT0568314	6.8KΩ
R357	RT0556314	56KΩ
R358	RT0556314	56KΩ
R359	RT0510414	100KΩ
R360	RT0510414	100KΩ
R361	RT0510414	100KΩ
R362	RT0510414	100KΩ
R363	RT0527314	27KΩ
R364	RT0527314	27KΩ
R365	RC1027212	2.7KΩ ±10% ½W
R366	RT0515314	15KΩ
R367	RC1068112	680Ω ±10%, ½W
		CAPACITORS
C301	EA4750259	Electroly, 4.7μF +100%,−10%,25V
C302	EA4750259	Electroly, 4.7μF +100%,−10%,25V
C303	DF1639201	Film, 0.0039μF ±10%, 50V
C304	DF1639201	Film, 0.0039μF ±10%, 50V
C305	DF1610401	Film, 0.1μF ±10%, 50V
C306	DF1610401	Film, 0.1μF ±10%, 50V
C307	DF1612301	Film, 0.012μF ±10%, 50V
C308	DF1612301	Film, 0.012μF ±10%, 50V
C309	DF1647201	Film, 0.0047μF ±10%, 50V
C310	DF1647201	Film, 0.0047μF ±10%, 50V
C311	EV6840251	Electroly, 0.68μF+40%,−20%,25V
C312	EV6840251	Electroly, 0.68μF+40%,−20%,25V
C313	DF1615405	Film, 0.15μF ±10%, 50V
C314	DF1615405	Film, 0.15μF ±10%, 50V
C315	DF1622301	Film, 0.022μF ±10%, 50V
C316	DF1622301	Film, 0.022μF ±10%, 50V
C317	DF1668301	Film, 0.068μF ±10%, 50V
C318	DF1668301	Film, 0.068μF ±10%, 50V
C319	DF1668301	Film, 0.068μF ±10%, 50V
C320	DF1668301	Film, 0.068μF ±10%, 50V
C321	DF1612301	Film, 0.012μF ±10%, 50V

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
C322	DF1612301	Film, 0.012μF ±10%, 50V
C323	DF1668301	Film, 0.·3μF ±10%, 50V
C324	DF1668301	Film, 0.068μF ±10%, 50V
C325	EV2240251	Electroly, 0.22μF +40%,−20%,25V
C326	EV2240251	Electroly, 0.22μF +40%,−20%,25V
C327	DF1622301	Film, 0.022μF ±10%, 50V
C328	DF1622301	Film, 0.022μF ±10%, 50V
C329	EA3360109	Electroly, 33μF +100%,−10%, 6V
C330	EA3360109	Electroly, 33μF +100%,−10%, 6V
C331	DF1618301	Film, 0.018μF ±10%, 50V
C332	DF1618301	Film, 0.018μF ±10%, 50V
C333	DF1647201	Film, 0.0047μF ±10%, 50V
C334	DF1647201	Film, 0.0047μF ±10%, 50V
C335	DF1640301	Film, 0.04μF ±10%, 50V
C336	DF1640301	Film, 0.04μF ±10%, 50V
C337	DF1682305	Film, 0.082μF ±10%, 50V
C338	DF1682305	Film, 0.082μF ±10%, 50V
C339	DF1647201	Film, 0.0047μF ±10%, 50V
C340	DF1647201	Film, 0.0047μF ±10%, 50V
C341	EA4750259	Electroly, 4.7μF +100%,−10%,25V
C342	EA4750259	Electroly, 4.7μF +100%,−10%,25V
C343	EA1060169	Electroly, 10μF +100%,−10%,10V
		MISCELLANEOUS
PK01	OC1003901	F. B. S., TDM-7X
CK01	ED1050509	Electroly Cap.,1μF +100%,−10%,50V
		POPS MUTING CIRCUIT BOARD-PJ01
PJ01	YD2913002	P.W. Board Pops Muting (Print Only)
	ZZ2913002	P.W. Board Assembly
		PJ01−MISCELLANEOUS
RJ01	GU0527112	Resistor, 270Ω ±5%, ¼W
RJ02	RT0527314	Resistor, 27KΩ ±5%, ¼W
RJ03	RT0510414	Resistor, 100KΩ ±5%, ¼W
RJ04	RT0536214	Resistor, 3.6KΩ ±5%, ¼W
CJ01	EA1070359	Electroly Cap., 22μF+100%,−10%,50V
CJ02	EA4760109	Electroly Cap., 46μF+100%,−10%,10V
HJ01	HD2000413	Diode, SIB 01−02
HJ02	HD2000413	Diode, SIB 01−02
HJ03	HT309452B	Transistor, 2SC945Q or P
HJ04	HT309452B	Transistor, 2SC945Q or P
LJ01	LY4024003	Relay, 14V DC, 4 Circuit
JJ01 ∼ JJ08	YP1000113	Plug
		GENERAL MISCELLANEOUS
0202	291316001	Bracket
0203	291316003	Bracket, For Fixing P.W. Board
0204	51100306A	B.H.M.Screw, For Mounting Above Bracket x 2 B 3x6
0209	51100305A	B.H.M. Screw, For Fixing Reflector x 2 B 3x5
0211	291325901	Bush, For Radar Indicator Lamp
0213	951022101	Fuse caution sticked on mounting plate
0214	951061111	Label, Ampere label (0.5A) sticked on front mounting plate
0216	51100306A	B.H.M. Screw, For Mounting Switch x4 B3x6
R208	RT0547214	4.7KΩ

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0217	515703068	P.H.Tapt Screw, For Mounting Lug Board x 2 P 3x6 ST
0219	54050300R	T.L. Washer, For Mounting Lug Board x2
J005	YL0103018	Lug Terminal, 3 Pins
M001	IN1005004	Lamp, Radar Indicator
S001	SP0802002	Pushswitch, Mode Selector
R006	RT0510414	Resistor, 100KΩ ±5%, ¼W
R007	RT0510414	Resistor, 100KΩ ±5%, ¼W
R008	RT0510414	Resistor, 100KΩ ±5%, ¼W
R009	RT0510414	Resistor, 100KΩ ±5%, ¼W
C002	EE4740501	Electroly Cap., 0.47μF, 50V
C003	EE4740501	Electroly Cap., 0.47μF, 50V
C004	EE4740501	Electroly Cap., 0.47μF, 50V
C005	EE4740501	Electroly Cap., 0.47μF, 50V
S002	SP0202011	Pushswitch, Power
G001	BF1040002	Cap. Comp.
J007	YL0103018	Lug Terminal, 3 Pins
F001	FS2005091	Fuse, 0.5A
0206	291327401	Reflector, Mounted on Lamp
0207	51100306A	B.H.M. Screw, Connection of Socket and Reflector B 3x6
0208	53110303A	Hexagon Nut, Connection of Socket and Reflector
M002	IN1008007	Lamp, Pilot
J004	YJ0800019	Socket, Pilot Lamp
0226	291316002	Bracket, Terminal Board
0227	51100306S	B.H.M. Screw, For Fitting RCA Pin x 6 B 3 x 6
0228	53110303A	Hexagon Nut, For fitting RCA Pin x 6
0229	51100304S	B.H.M. Screw, For Fixing Slide SW x 2 B 3x4
0230	54050400R	T.L. Washer Or, For Fixing Chassis Ground
0232	145525903	Bush, For AC cord
0233	51100306S	B.H.M. Screw, For 2-Pin Lug Terminal B 3 x 6
0234	53110303A	Hexagon Nut, For 2-Pin Lug Terminal
R011	RT0510214	Resistor, 1KΩ ±5%, ¼W
J001	YT0206006	Terminal, Input, 6P
J002	YT0204008	Terminal, Output, 4P
J003	YT0101003	Terminal, Ground
J008	YL0102003	Lug Terminal, 2P
J009	YT0202011	Terminal, Direct Out, 2P
W001	YC0240010	AC Cord
R001	RM0503060	Variable Resist., 50KΩ(B), 230 KHz Level
R004	RT0539214	Resistor, 3.9KΩ ±5%, ¼W
R005	RT0539214	Resistor, 3.9KΩ ±5%, ¼W
R002	RK0103026	Variable Resist., 10KΩ(B) Sepa(L)
R003	RK0103026	Variable Resist., 10KΩ(B) Sepa(R)
S003	SS040202B	Slide Switch, Direct Out
R010	RT0510214	Resistor, 1KΩ ±5%, ¼W
0235	62041760W	Lug, Chassis Ground
C001	DK1710301	Ceremic Cap., 0.01μF ±20%, 50V
0302	291310550	Chassis K, Right-side Plate
0327	138200503	Clamper, For Bundling Wires

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0328	51100306A	B.H.M. Screw, For Clamper B 3x6
0329	53110303A	Hexagon Nut, For Clamper
2640	291311002	Spacer,
0306	291310551	Chassis K, Left-side Plate
0309	951061111	Label Ampere (5A)
0324	51100306A	B.H.M. Screw, For Fixing 3-Pin Terminal B 3x6
0325	53110303A	Hexagon Nut, For Fixing 3-Pin Terminal
2636	138200503	Clamper, For Bundling Wires
2637	51100306A	B.H.M. Screw, For Clamper B 3x6
2638	53110303A	Hexagon Nut, For Clamper
2639	291305601	Buffer, Seat for Fixing P.W. Board x 2
2641	291311802	Spacer, Spacer
J006	YL0103018	Lug Terminal, 3 Pins
F002	FS2005091	Fuse, 0.5A
2836	291300501	Clamper, For Mounting P.W. Board
2837	291311801	Spacer, x 2
0316	291325701	Lid
2936	291311801	Spacer, For mounting P.W. Board
2937	291312602	Stay, For Supporting Chassis
2938	138200503	Clamper, For Bundling Wires
2939	51570306B	P.H. Tapt Screw, For Bundling Wires, P 3x6 ST
0218	51100306A	B.H.M. Screw, For Connecting Front Panel with Chassis x 4 B 3x6
0231	51100306S	B.H.M. Screw, For Connecting Front Panel with Chassis x 4 B 3x6
0317	51570306B	P.H. Tapt Screw, For Fixing Lid x 6 P 3x6 ST
0321	51470306A	B.H.M. Screw, For Fixing Transformer x 4 B 3x6
0322	51570306B	P.H. Tapt Screw, For Fixing P.W. Board x 3 P 3x6 ST
3038	51570312B	P.H. Tapt Screw, For Fixing P.W. Board (on rubber spacer side) x2 P 3x12 ST
3039	54020301A	Washer, For Fixing P.W. Board x 5
3040	291305601	Buffer, Seat for above washer x 2
0331	291316005	Bracket, For Fixing Muting P.W. Board
0332	51100305A	B.H.M. Screw, For Fixing Above Bracket x 4 B 3x5
3036	51100306A	B.H.M. Screw, For Fixing P.W. Board Clamper x 3 B 3x6
3037	51100306A	B.H.M. Screw, For Fixing Chassis Support x 2 B 3x6
L001	TS2450101	Power Transf.
0102	291306450	Case K
0105	51100414A	B.H.M. Screw, For Fixing Chassis x 4 B 4x14
0106	291300401	Table, For Fixing Chassis x 4
0108	291326501	Indicator, For Model Code
0109	51100306S	B.H.M. Screw, For Fixing Indicator x 2 B 3x6
0121	51100306A	B, H. M. Screw, For Fixing Display Plate x 4 B 3x6
0126	951110104	Label, UL
0127	257886101	Label, Caution
3136	257886103	Label, See Marking on Bottom
0129	951091102	Label, UL Factory

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REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0131	281815401	Knob, Shadow Switch x 2
0132	290415404	Knob, Power Switch
0133	288615402	Knob, Volume x 3
0333	288686101	Label
3236	257886103	Label
0427	952281501	Serial NO Card x 4
0402	291385101	Instructions
0403	291385601	Schematic Diagram
0406	281885104	Instructions, For Partitioner
0407	282885108	Instructions, For Accessories
0409	257785401	Guarantee Card
0410	257785102	Instructions
0411	257781301	Envelope
0417	291380201	Display Box
0418	291380301	Partitioner x 2
0419	291380502	Master Carton x 1/4
0421	901504001	Polyethylen Bag, For set
0422	901302501	Polyethylen Bag, For Printed Matter
0424	102980401	Sleeve, For Power Code
0425	273182101	Silicagale
0232	906341501	Record

7. TECHNICAL SPECIFICATIONS

SUM SIGNAL

Frequency Response ref. to RIAA 40Hz – 12kHz	±1dB
Total Harmonic Distrotion at 1kHz	0.1%
Input Impedance	100 kohms
Output Impedance	5 kohms

Difference Signal

Total Harmonic Distortion at 1kHz	1%
S/N	50dB
Muting Level	–85dBs
Min. Input Level for ±4kHz Lock Range	–65dBs
Max. Input Level for ±4kHz Lock Range	–44dBs
Channel Sepration	not less than 20dB

GENERAL

Power Requirements	120V AC, 50 to 60Hz
Power Consumption	10 watts
Dimensions	
Width	8-1/4" (210mm)
Height	3-15/16" (100mm)
Depth	12-11/16" (323mm)
Weight-Unit alone	5.9 lbs. (2.9kg)
Weight-Packed for Shipment	7.1 lbs. (3.5kg)

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