STR-7800SD

US Model
Canadian Model

* This set is equipped with DOLBY FM circuit.
'Dolby' and the double-D symbol are the trade marks of Dolby Laboratory Inc. Noise reduction system manufactured under license from Dolby Laboratory Inc.

DOLBY FM FM STEREO/FM-AM RECEIVER

SPECIFICATIONS

GENERAL

Power Requirements: 120 V ac, 60 Hz

Power Consumption: 300 W (US Model)
650 VA (Canadian Model)

AC OUTLET: 3 unswitched, total 200 W

Dimensions: Approx.
490 (w) x 170 (h) x 515 (d) mm
$19\frac{1}{4}$ (w) x $6\frac{9}{16}$ (h) x $20\frac{5}{16}$ (d) inches
Including projecting parts and controls

Weight: Approx.
22.8 kg, 50 lb 4 oz (net)
Approx.
26.6 kg, 58 lb 10 oz (with shipping carton)

FM SECTION

Tuning Range: 87.5 MHz – 108 MHz

Intermediate Frequency: 10.7 MHz

Sensitivity at 50 dB Quieting: 3.5 μV (MONO)
45 μV (STEREO)

Usable Sensitivity: IHF 1.7 μV (MONO)

S/N Ratio: 73 dB (MONO)
68 dB (STEREO)

Harmonic Distortion: at 100 Hz
0.2 % (MONO)
0.3 % (STEREO)
at 1 kHz
0.2 % (MONO)
0.3 % (STEREO)
at 10 kHz
0.2 % (MONO)
0.6 % (STEREO)

IM Distortion: 0.2 % (MONO)
0.3 % (STEREO)

Separation: 35 dB at 100 Hz
40 dB at 1 kHz
35 dB at 10 kHz

Frequency Response: 30 Hz – 15 kHz $^{+0.2}_{-1.5}$ dB

Capture Ratio: 1.0 dB

AM Suppression Ratio: 54 dB

Image Response Ratio: 75 dB

IF Response Ratio: 100 dB

Spurious Response Ratio: 100 dB

RF Intermodulation: 70 dB

– Continued on next page –

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SONY®
SERVICE MANUAL

Alternate Channel Selectivity: 80 dB at 400 Hz

SCA Rejection Ratio: 60 dB

Sub-carrier Product Ratio: 60 dB

Muting Threshold: Approx. 5 μV

FM DISCRI Output Level: 250 mV, 2,500 Ω, at 1 kHz, 100 % modulation

AM SECTION

Tuning Range: 530 kHz – 1,605 kHz

Intermediate Frequency: 455 kHz

Usable Sensitivity: 250 μV/m, built-in ferrite rod antenna
100 μV, external antenna
at 1,000 kHz

S/N Ratio: 50 dB at 50 mV/m

Harmonic Distortion: 0.5 % at 50 mV/m, 400 Hz

Selectivity: 35 dB

Image Response Ratio: 40 dB at 1,000 kHz

IF Response Ratio: 35 dB at 1,000 kHz

AUDIO AMPLIFIER SECTION

Continuous RMS Power Output: (rated output)
Less than 0.07 % THD, both channels driven simultaneously
At 20 – 20,000 Hz
125 + 125 W (8 Ω)

Damping Factor: 40 at 1 kHz (8 Ω)

IM Distortion: (60 Hz : 7 kHz = 4 : 1)
Less than 0.07 % at rated output
Less than 0.05 % at 1 W output

Residual Noise: Less than 0.7 mV

Frequency Response:

PHONO 1, 2	RIAA equalization curve ±0.5 dB
AUX TAPE 1, 2 EXT ADPT	10 – 30,000 Hz $^{+0}_{-2}$ dB

Input Sensitivity, Impedance and S/N Ratio:

	Sensitivity	Impedance	S/N	Weighting network
PHONO1, 2	2.5 mV	50 kΩ	72 dB	A
AUX TAPE1, 2 EXT ADPT	250 mV	100 kΩ	90 dB	A

Note: Measured with rated output power into 8 Ω loads (both channels driven simultaneously) at 1 kHz.

Output Level and Impedance:

	Output level	Impedance	Input level
REC OUT 1, 2 EXT ADPT	250 mV	4.7 kΩ	PHONO 2.5 mV AUX TAPE 1, 2 250 mV EXT ADPT

HEADPHONES: Accepts 8 – 10,000 Ω headphones.

SPEAKER: 4 – 16 Ω speakers are suitable.

Tone Controls:
BASS ±10 dB at 100 Hz
TREBLE ±10 dB at 10 kHz

Filters:
HIGH 6 dB/oct. above 5 kHz
6 dB/oct. above 10 kHz
LOW 6 dB/oct. below 50 Hz
6 dB/oct. below 25 Hz

Acoustic Compensator: (att. 30 dB)
LOW +9 dB at 50 Hz
PRESENCE +3 dB at 1 kHz
LOUDNESS +10 dB at 50 Hz
+3 dB at 10 kHz

MODEL IDENTIFICATION

– Specification Labels –

US model

SONY

FM STEREO / FM-AM RECEIVER
MODEL NO. STR-7800SD
FREQ.RANGE FM 87.5-108MHz AM 530-1605kHz
IF FM 10.7MHz AM 455 kHz
AC 120V 60Hz 300 W
SERIAL NO. MADE IN JAPAN
CERTIFICATION: DESIGN CERTIFIED AS COMPLYING WITH F.C.C. RULES PART 15, IN EFFECT AS OF DATE OF MANUFACTURE.

Canadian model

SONY

FM STEREO / FM-AM RECEIVER
MODEL NO. STR-7800SD
FREQ.RANGE FM 87.5-108MHz AM 530-1605kHz
IF FM 10.7MHz AM 455 kHz
AC 120V 60Hz 650VA
SERIAL NO.
MADE IN JAPAN

SECTION 1
OUTLINE

1-1. DOLBY FM CIRCUIT DESCRIPTION

Today, the use of the Dolby noise reduction system in FM broadcasting has become quite widespread. STR-7800SD has been fully prepared for the reception of Dolby FM by the incorporation of a decoder circuit mounted in the tuner section.

Although the S/N ratio in FM broadcasting is greatly improved by means of the Dolby system, the actual broadcasted program has to pass through many amplification stages, which naturally leads to some increases in noise.

However, the human ear is not readily capable of discerning noise in the low frequency range because it tends to be masked by the actual signal. At high frequencies and at higher volume levels, again the human ear does not readily discern the noise component. In other words, the irritating ear-ringing noise only becomes apparent at low volume levels in the high frequency range.

Fig. 1-1 is a block diagram of the transmitting and receiving systems involved in a Dolby FM broadcast, and as can be seen, the emphasis characteristics have been changed from the former 50 or 75 μsec. to 25 μsec. Consequently, there is less danger of auto-modulation when the modulation level is high, even in the high frequency range. And this has enabled the mean modulation ratio to be raised, and thus improves the S/N ratio.

Also at low modulation levels, there is no deterioration in the S/N ratio with the 25 μsec. de-emphasis because the frequency response in the high frequency range is dropped back as a result of the Dolby circuit on the receiver side.

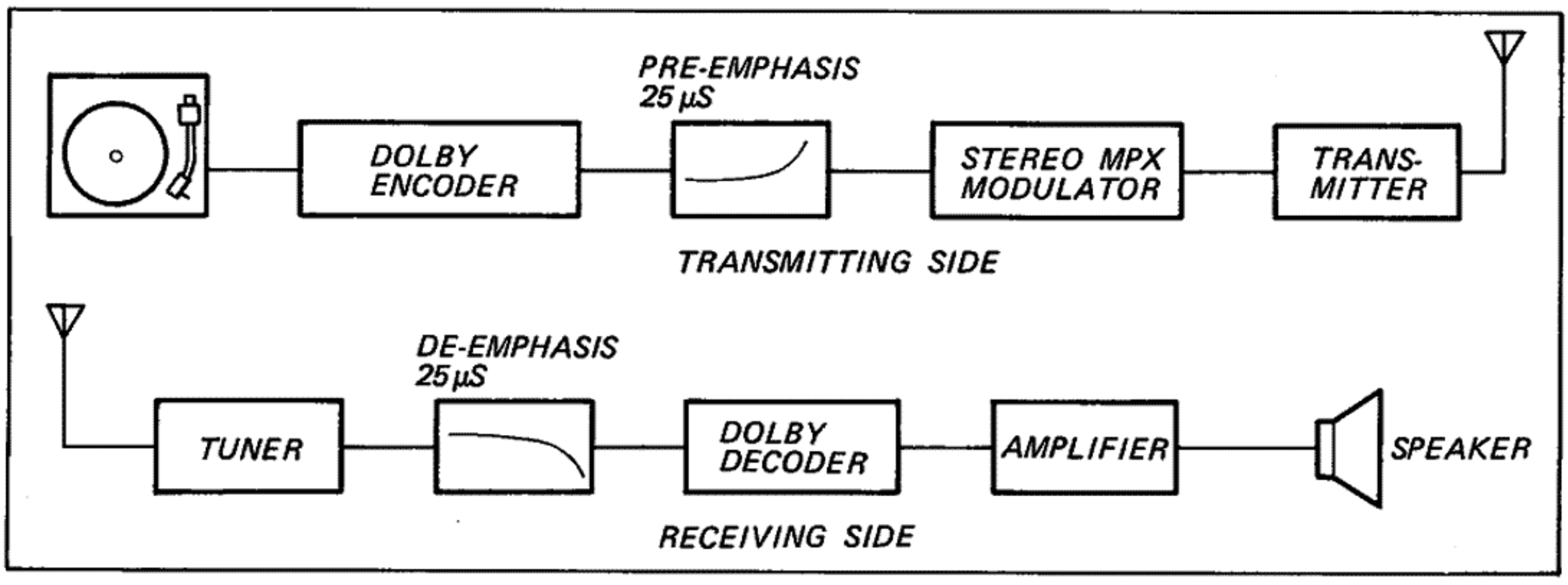


Fig. 1-1.

Fig. 1-2 shows the Dolby encoder and decoder characteristics. On the encoder side, the input level is reduced, thus raising the frequency response in the high frequency range. On the decoder side, the frequency response in the high frequency range is dropped again, so that the frequency response at the final stage are flat again. As a result, noise in the high frequency range is reduced by the same amount as the reduction at the decoder, thus greatly improving the S/N ratio. In Fig. 1-2, the frequency response of the Dolby circuit are flat at levels above 0 dB. This 0 dB level is taken as the base level, and is called the Dolby level. (This also corresponds to the audio level at 50 % modulation in the tuner).

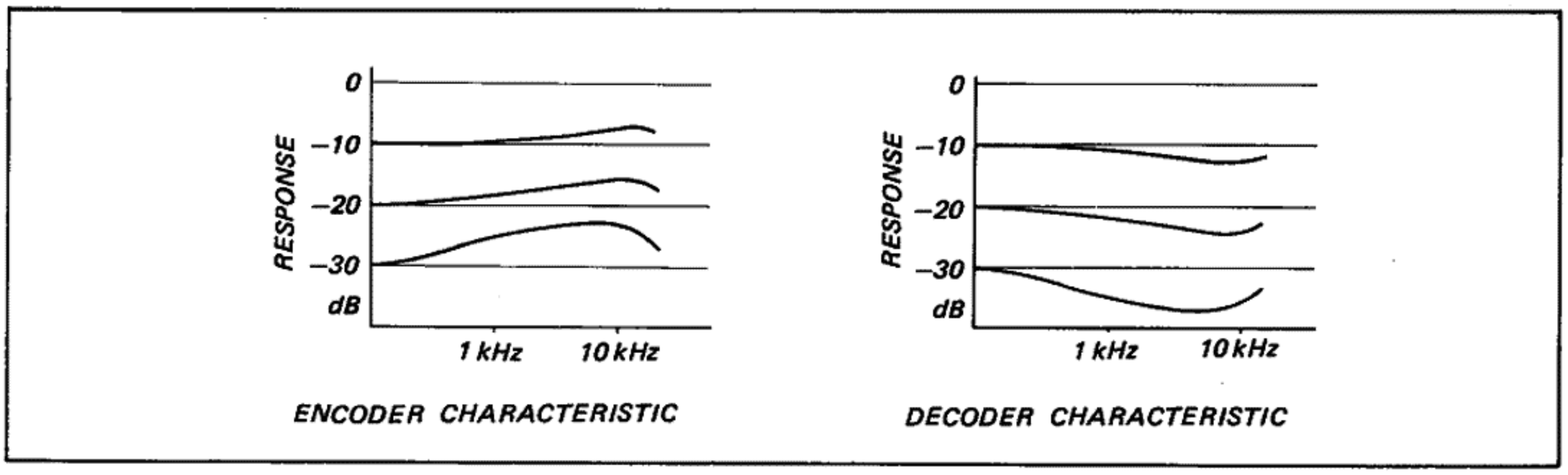


Fig. 1-2.

The Dolby circuit in this set incorporates ICs CX064. Fig. 1-3 is a general circuit diagram of the decoder.

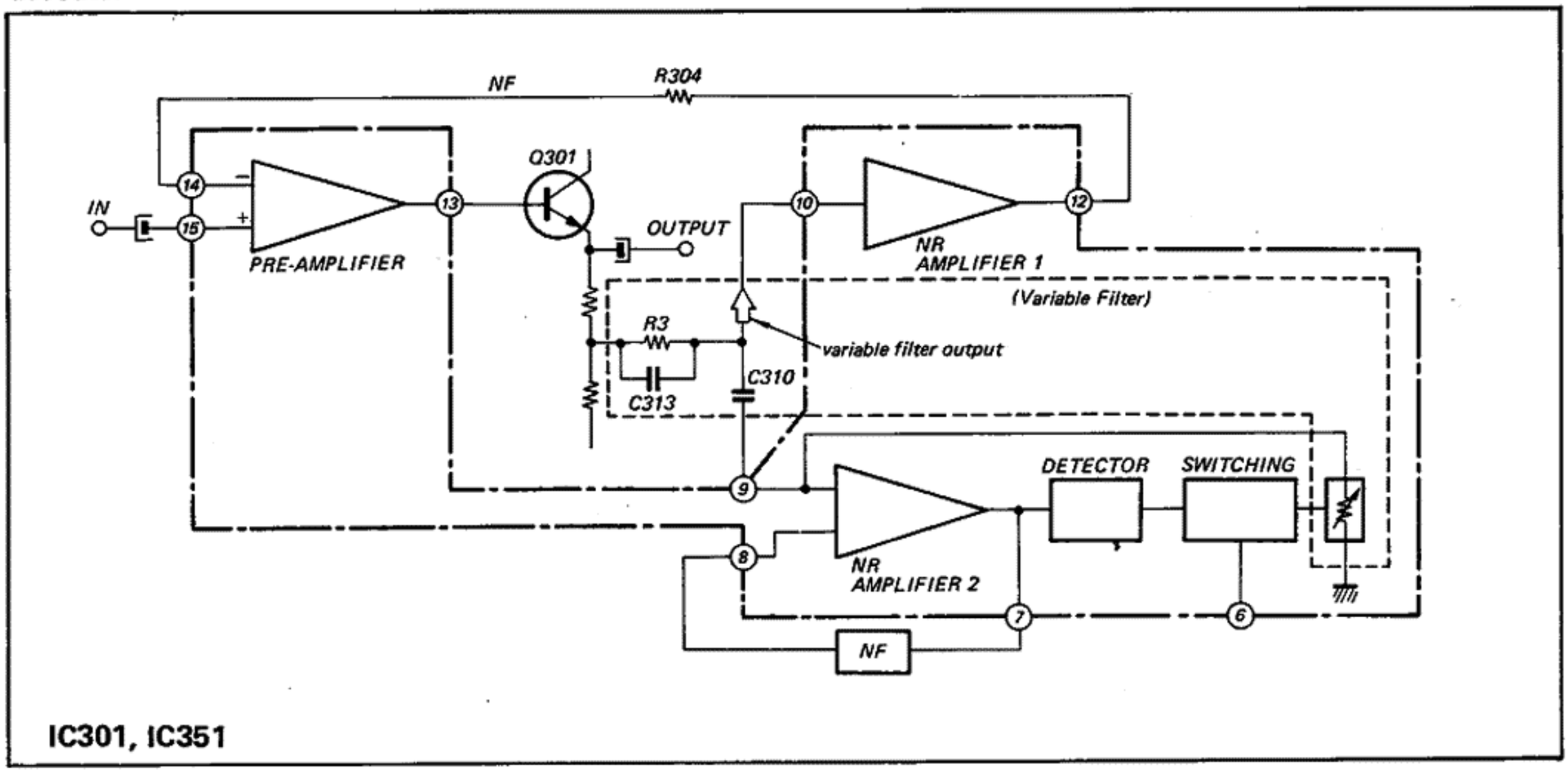


Fig. 1-3.

The input signal is applied to terminal (15) of the IC, passed through the pre-amplifier and the emitter follower Q301 via terminal (13) , and then on to the output terminal. This same input signal is also divided by the Q301 emitter resistor, and passed on to the variable filter. From terminal (10) , it is amplified at NR amplifier 1, and then applied to the ⊖ input (terminal (14)) of the pre-amplifier, forming a negative feedback loop.

The variable filter output (variable filter characteristics), varies in accordance with impedance Z of the variable impedance element (see Fig. 1-4.).

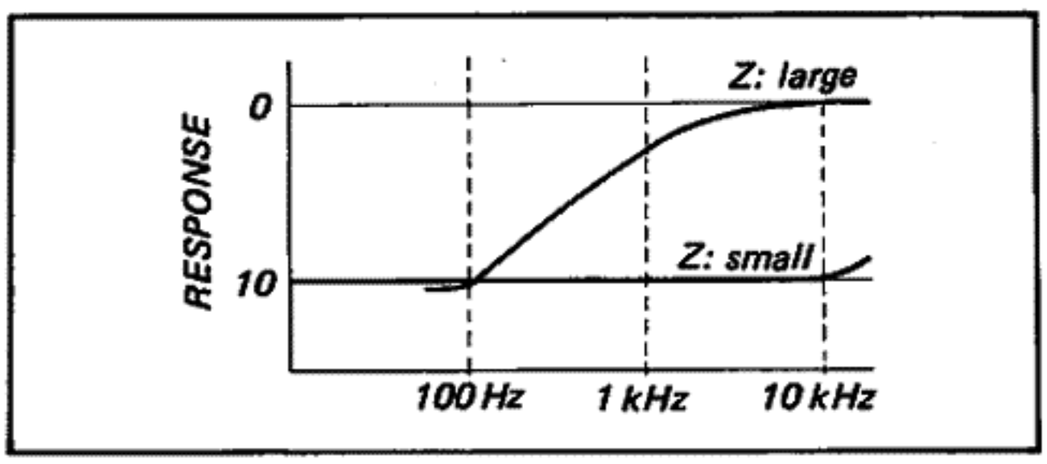


Fig. 1-4.

For large values of Z, the high frequency range of the variable filter output increases to about 10 dB. This output is then fed back to the pre-amplifier, thus causing the high frequency range of the pre-amplifier output to drop. When Z is small, however, the variable filter output remains more or less flat. Consequently, the pre-amplifier output also remains flat.

In other words, when the input level is low, a large variable impedance results in a much improved S/N ratio. The changes brought about in variable filter output (variable filter characteristics) by the variable impedance is explained as follows:

When the signal reaches C313 and C310 (see Fig. 1-5), this block takes on the role of an attenuator, dividing the signal by capacitor partition. The division ratio is dependent on C313 to C310 ratio, irrespective of the signal frequency. Generally, it is about 14 dB (Fig. 1-6).

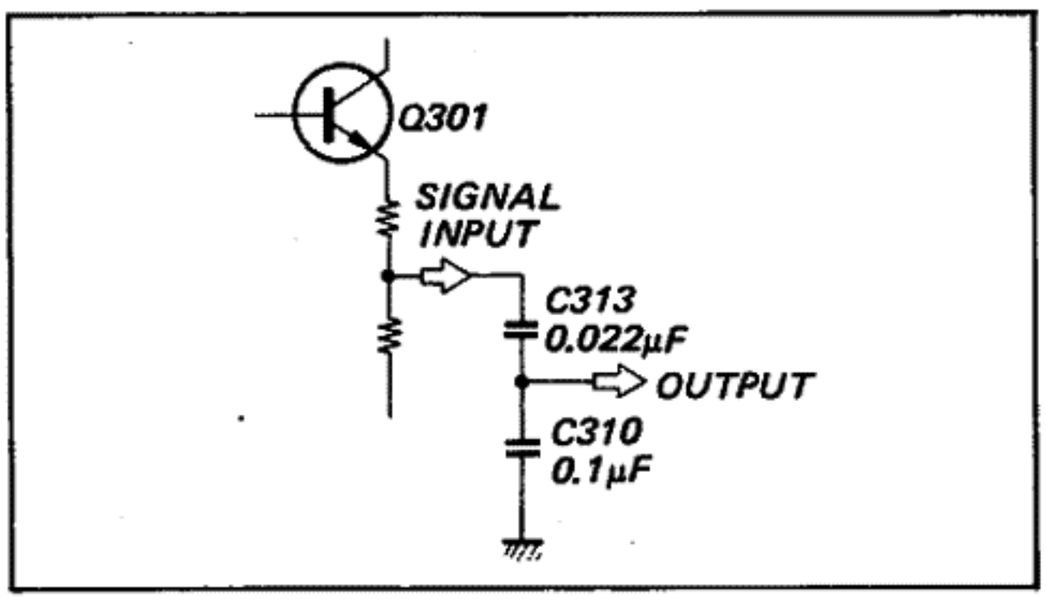


Fig. 1-5.

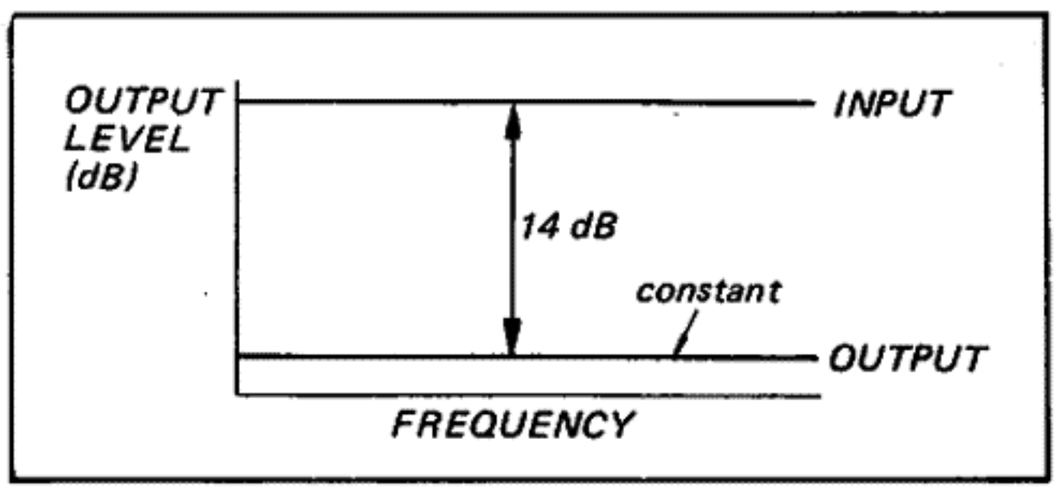


Fig. 1-6.

If R1 (assumed in this case to be variable between 47 and 600 ohm approximately) is then connected to C310 as shown in Fig. 1-7, the circuit will be given high boost characteristics at frequencies where Xc (of C310) equals R1.

For example, frequencies at which Xc = R1 (Fig. 1-8) include;

F1 of about 1.9 kHz when R1 = 600 ohm, and,

F2 of about 30 kHz when R1 = 47 ohm.

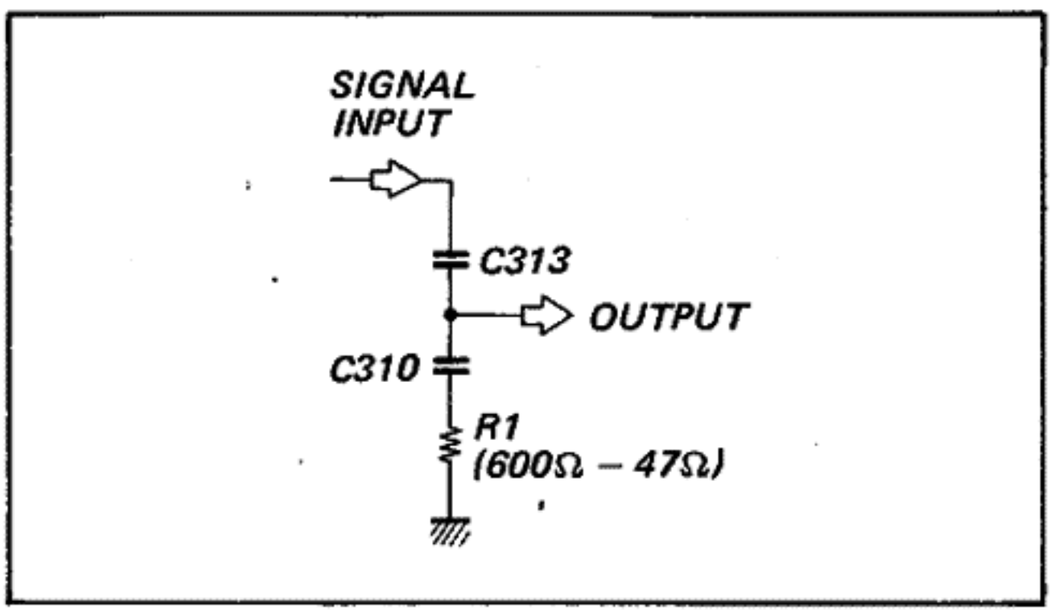


Fig. 1-7.

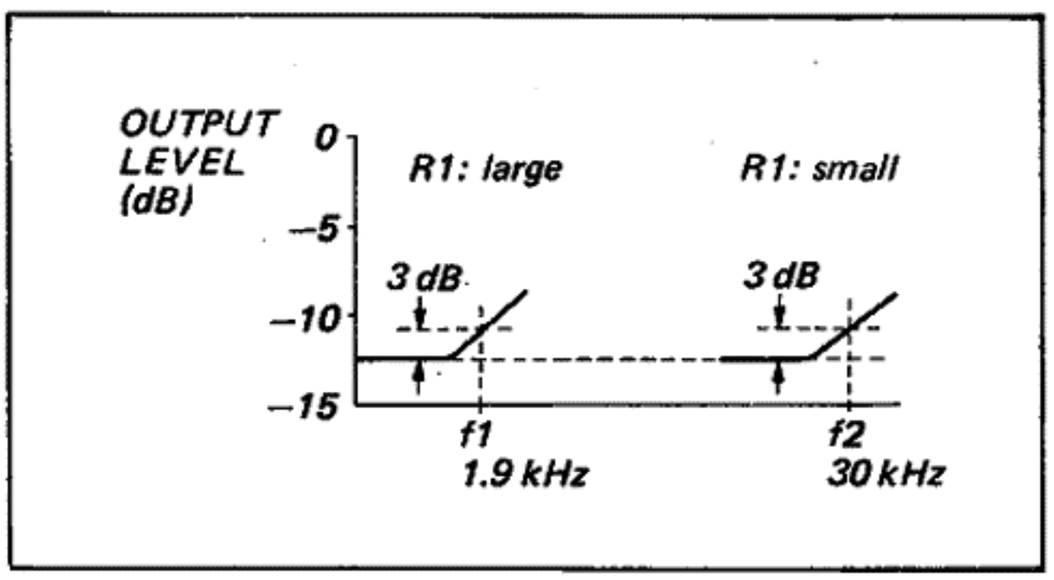


Fig. 1-8.

In the high frequency range when R1 = 600 ohm, the frequency f1 where Xc (of C313) = R1 is 3 dB points, and f1′ equals approximately 14 kHz (Fig. 1-9).

And when R1 = 47 ohm, the curve extends out beyond the audible range, leaving relatively flat characteristics in the audible range.

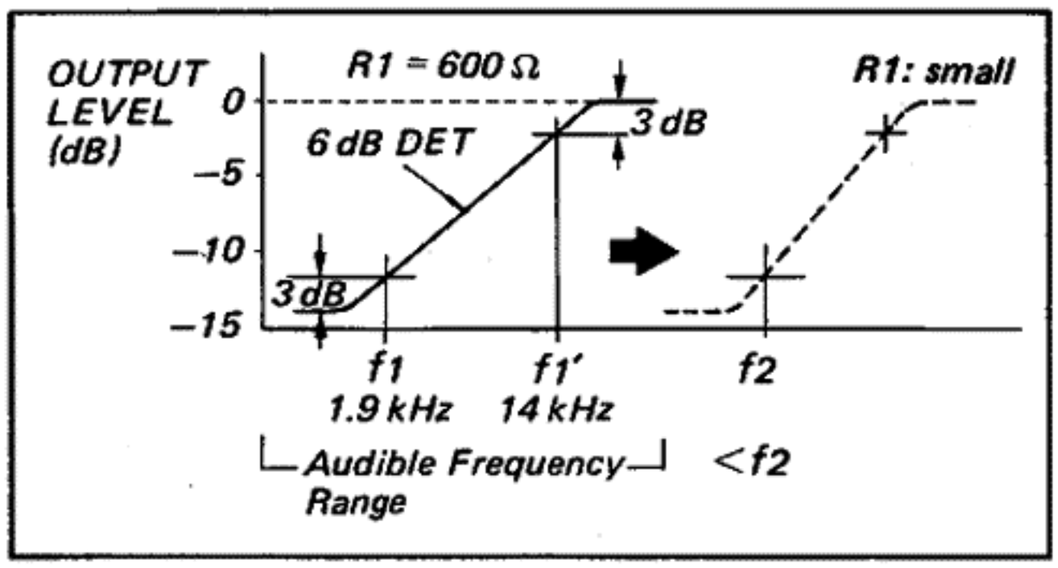


Fig. 1-9.

That is, the portion corresponding to R1 is the variable impedance Z. And the element controlling Z is the NR amplifier 2 (see Fig. 1-3). Since this amplifier is mainly activated by the high frequency signal components, its frequency characteristics will be as shown in Fig. 1-10. The signals passing this stage are rectified at DET, and given a suitable time constant, and thus control the variable impedance Z.

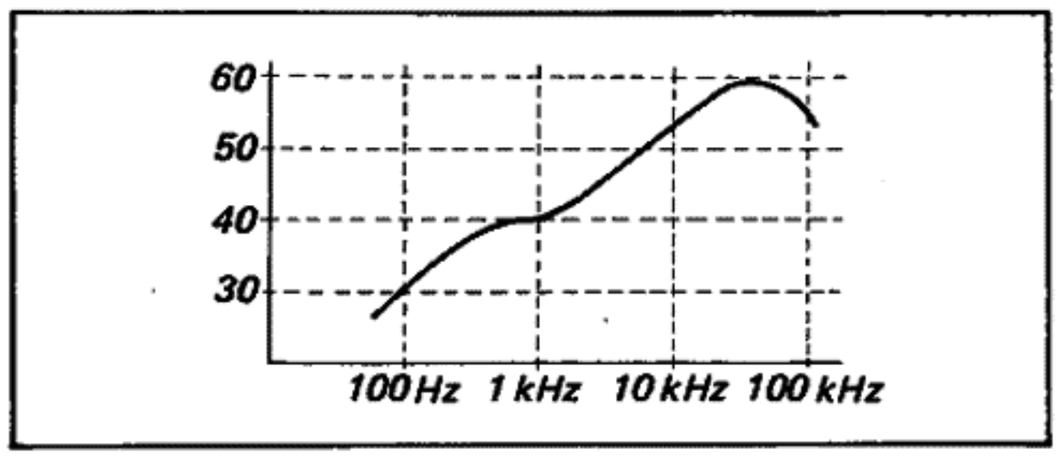


Fig. 1-10.

The level at which signals become subject to noise reduction is dependent on when the NR amplifier 2 drives the DET, and starts to activate the variable impedance Z (at the same value as R1 in Fig. 1-7). The Dolby circuit is turned on and off by the DOLBY FM switch. When the switch is turned off, a positive ⊕ potential is applied to terminal ⑥ , thus reducing the variable impedance Z, and thus switching the Dolby circuit off.

To summarize the above,

1. The reduced signal level is detected at NR amplifier 2.
2. The variable impedance Z is increased by the output of NR amplifier 2.
3. The amount of variable filter high frequency feedback is increased.
4. The frequency response of the high frequency range of the pre-amplifier is reduced, thus improving the S/N ratio.

1-2. FM MPX DECODER

This set uses a PLL (phase-locked loop) IC in the FM MPX decoder circuit, and a very good channel separation and stability are obtained in wide frequency range.

The PLL is a negative frequency feedback circuit. This circuit operates in such a manner that a frequency of the voltage-controlled oscillator in a closed-loop circuit always coincide with an input-signal frequency.

1) Basic Circuit

The PLL circuit is basically composed of a phase comparator (PC), low-pass filter (LPF) and a voltage-controlled oscillator (VCO).

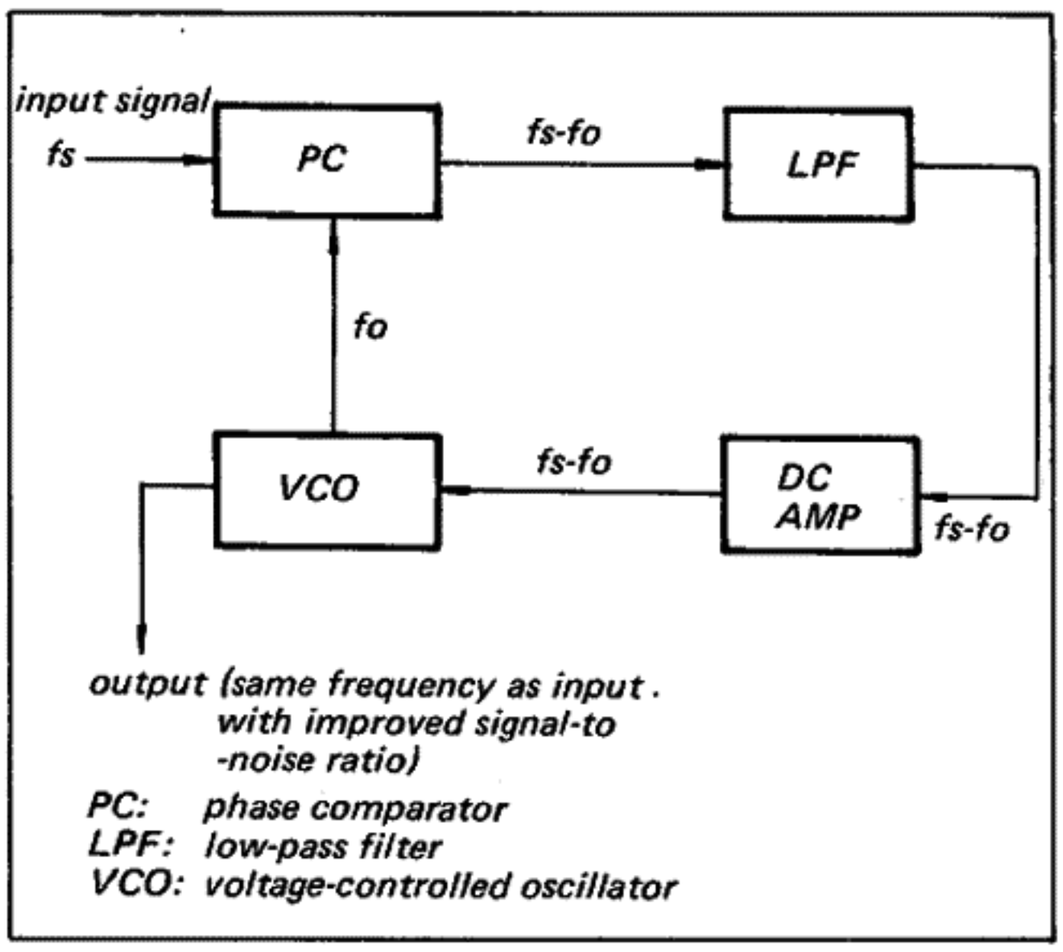


Fig. 1-11

Phase Comparator (PC):

This circuit compares the frequencies or phases of the input signal (fs) and VCO signal (fo), and it outputs voltages depending on the frequency or phase difference.

Low-pass Filter (LPF):

This circuit attenuates high-frequency harmonic components and provides a good interfering-signal rejecting characteristic. This circuit also acts to re-lock the PLL circuit by storing the voltage of the previously-locked condition when the PLL looses its lock by some noise interference.

The locked condition is that the control voltage needed to make the VCO frequency precisely coincides with the input-signal frequency is injected to the VCO, and the voltage holds this condition.

DC Amplifier:

This circuit amplifies the frequency content (fs-fo) and provides an ample loop gain.

Voltage Controlled Oscillator (VCO):

This circuit generates a frequency depending on the amplitude of the voltage made by its input frequency (fs-fo).

When there is no input signal at pin 2, the VCO oscillates at a free-running frequency. When there is an input signal at pin 2, the phase comparator detects the frequency or phase difference between the input signal and VCO frequencies. If there is any frequency or phase difference, the phase comparator detects the difference (fs-fo) as a voltage. This output voltage is smoothed by the low-pass filter and a dc voltage is obtained at the output of the low-pass filter. This dc voltage controls the VCO frequency to coincide with the input signal frequency.

When the VCO frequency coincides with the input signal frequency, the detected output voltage from the phase comparator becomes constant and the PLL becomes in a locked condition. In other words, the VCO frequency becomes the same one as the input signal when the PLL is locked.

2) Outline of Operation

Fig. 1-12 is the block diagram of the PLL IC HA1156. The VCO generates a 76 kHz signal. This 76 kHz signal is divided by two ½ dividers resulting in the 19 kHz (½ x ½ x 76 kHz) signal. This resultant 19 kHz signal next goes to the phase comparator.

When there is a 19 kHz signal (i.e., the pilot signal) at the input terminal pin 2, the 19 kHz signal from the second ½ divider is compared with the pilot signal. If any frequency of phase difference is detected between the two 19 kHz signals, the phase comparator generates voltage. This voltage is smoothed by the low-pass filter, and is next amplified by the dc amplifier. This amplified dc voltage controls the VCO frequency. Thus the VCO frequency synchronizes with the pilot-signal frequency. And the 38 kHz signal from the first ½ divider becomes correctly in phase with the input signal and is applied to the stereo decoder. Thus a good quality FM MPX stereo reception is ensured with no phase shift, less high-frequency harmonic distortion and a good channel separation.

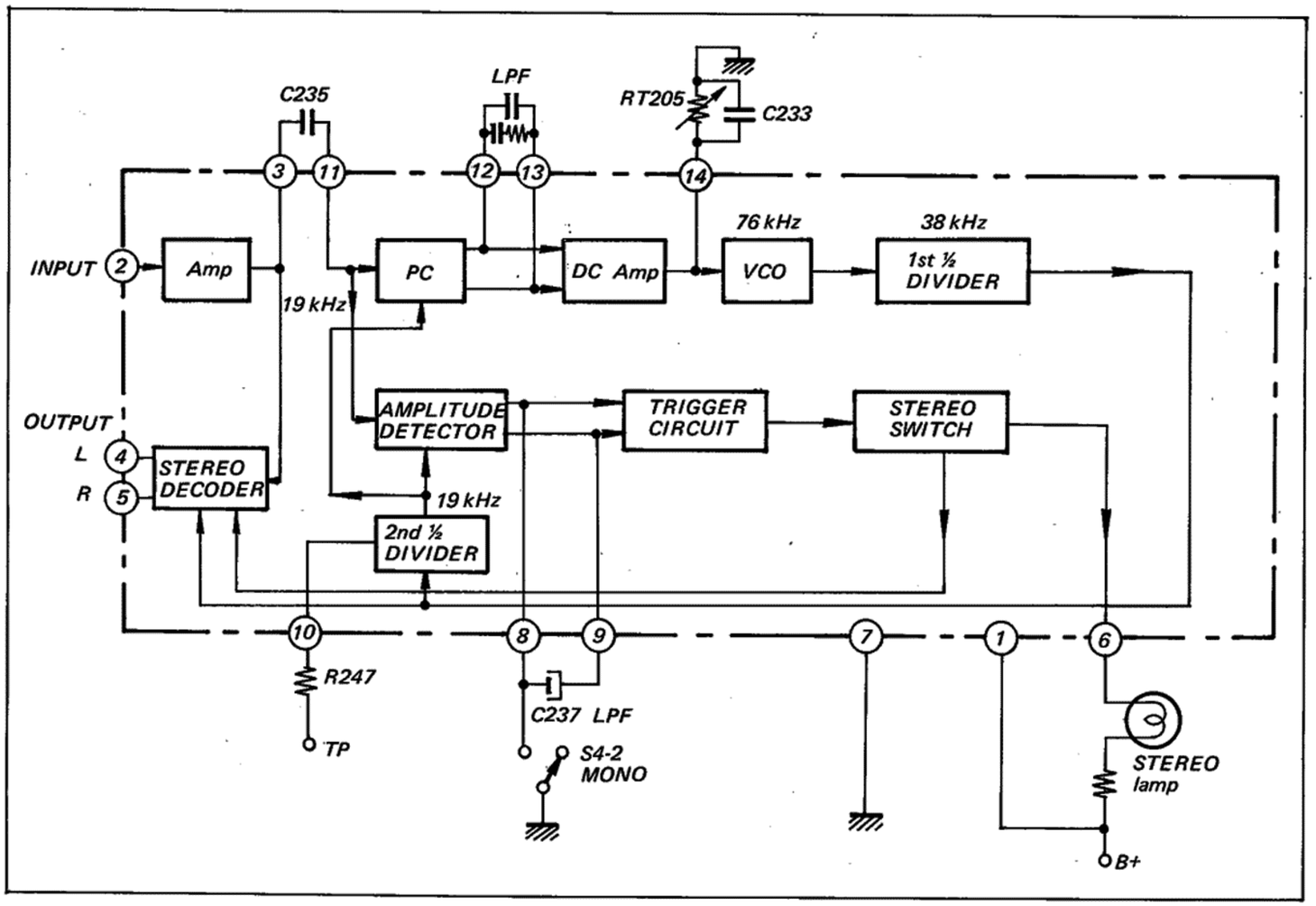


Fig. 1-12

The PLL IC HA1156 also includes a stereo switch and stereo lamp driving circuit. When the input signal is not a stereo or the broadcasting field strength is weak, it is necessary to mute the output. For this purpose, this stereo switch turns on only when the input signal of more than a rated level is received.

The 19 kHz pilot signal and the 19 kHz signal from the second ½ divider which is in-phase with the pilot signal are applied to the amplitude detector. At the output of the amplitude detector, dc voltage in proportion to the amplitude of the pilot signal is obtained. This dc voltage drives the trigger circuit through the low-pass filter. Now the stereo switch turns on and STEREO lamp lights up.

MONO switch is connected to the pin 8. When this switch is turned on, the pin 8 is routed to the ground and the trigger circuit is enabled. Thus the set becomes in the monaural reception mode.

1-3. CIRCUIT BREAKERS

In this set, circuit breakers CB801 and CB802 are used instead of ordinary fuses. The circuit breakers break circuits by turning off themselves automatically when currents of over the rated values happen to flow in the circuits. When the circuit breakers turn off, the white shafts extract from the top of case.

If the circuits are normal, the circuit breakers can be set to ON by pushing the white shafts in. If the circuits are operating abnormally and excessive currents are flowing in the circuits, the circuit breakers cannot be set to ON position even if the white shafts are pushed.

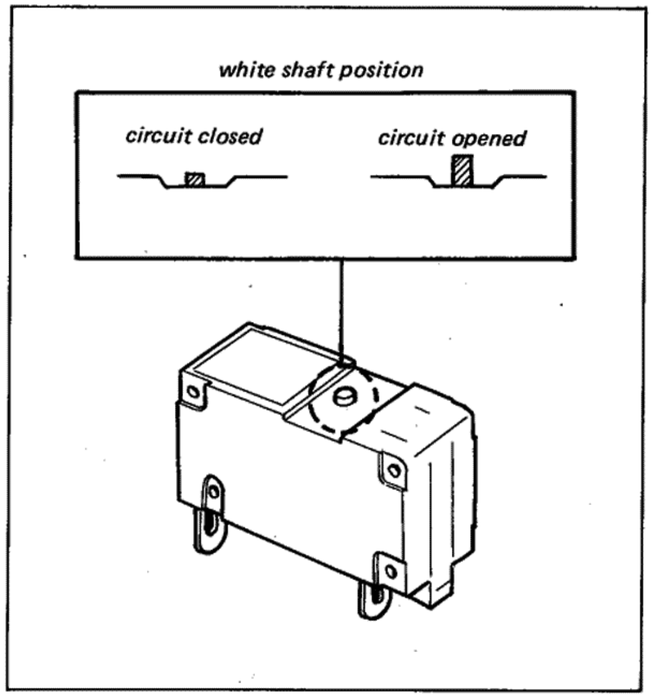
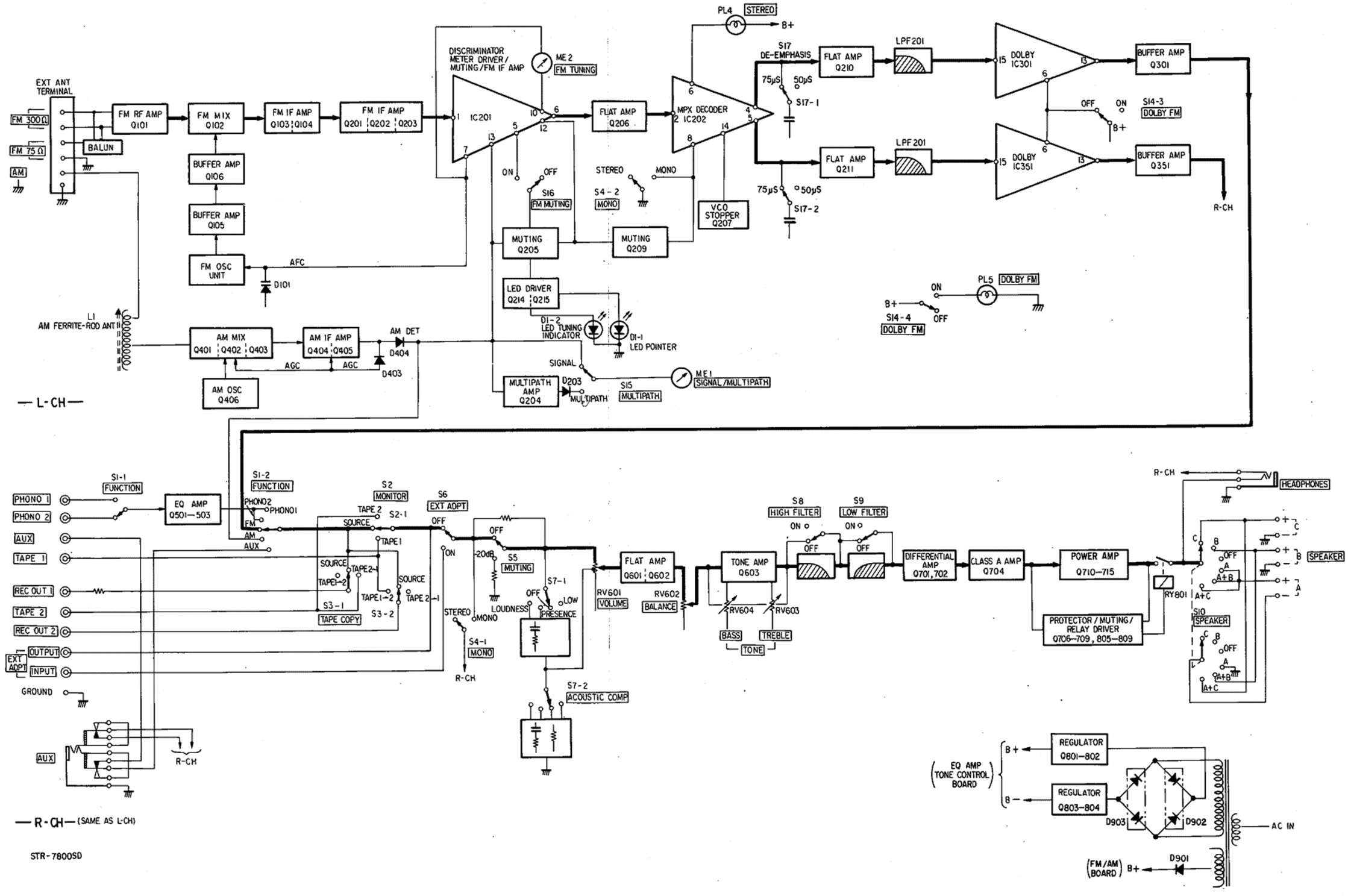


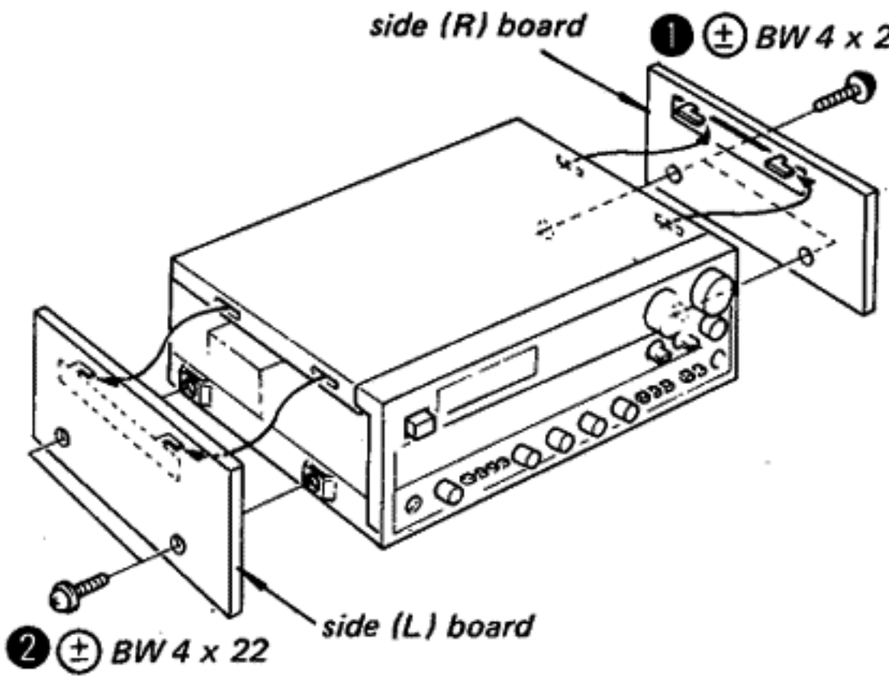
Fig. 1-13


EXT ANT TERMINAL
FM 300Ω
FM 75Ω
AM
BALUN
FM RF AMP Q101
FM MIX Q102
FM IF AMP Q103 Q104
FM IF AMP Q201 Q202 Q203
DISCRIMINATOR METER DRIVER / MUTING / FM IF AMP
IC201
ME2 FM TUNING
FLAT AMP Q206
MPX DECODER IC202
PL4 STEREO
B+
S17 DE-EMPHASIS
75μS
50μS
S17-1
S17-2
FLAT AMP Q210
FLAT AMP Q211
LPF201
LPF201
DOLBY IC301
DOLBY IC351
BUFFER AMP Q301
BUFFER AMP Q351
OFF
ON
S14-3 DOLBY FM
R-CH
BUFFER AMP Q106
BUFFER AMP Q105
FM OSC UNIT
AFC
D101
ON
OFF
S16 FM MUTING
STEREO
MONO
S4-2 MONO
VCO STOPPER Q207
MUTING Q205
MUTING Q209
LED DRIVER Q214 Q215
D1-2 LED TUNING INDICATOR
D1-1 LED POINTER
PL5 DOLBY FM
ON
OFF
B+
S14-4 DOLBY FM
L1 AM FERRITE-ROD ANT
AM MIX Q401 Q402 Q403
AM IF AMP Q404 Q405
AM DET
D404
D403
AGC
AGC
AM OSC Q406
SIGNAL
MULTIPATH AMP Q204
D203
MULTIPATH
S15 MULTIPATH
ME1 SIGNAL/MULTIPATH
— L-CH —
S1-1 FUNCTION
S1-2 FUNCTION
S2 MONITOR
S6 EXT ADPT
PHONO 1
PHONO 2
AUX
TAPE 1
REC OUT 1
TAPE 2
REC OUT 2
OUTPUT
INPUT
EXT ADPT
GROUND
EQ AMP Q501—503
PHONO2
PHONO1
FM
AM
AUX
TAPE 2
SOURCE
S2-1
TAPE 1
SOURCE
TAPE2-1
TAPE1-2
TAPE1
TAPE1-2
SOURCE
TAPE 2-1
S3-1 TAPE COPY
S3-2
OFF
ON
-20dB
S5 MUTING
STEREO
MONO
S4-1 MONO
R-CH
LOUDNESS
S7-1
OFF
LOW
PRESENCE
S7-2 ACOUSTIC COMP
RV601 VOLUME
RV602 BALANCE
FLAT AMP Q601 Q602
TONE AMP Q603
RV604
RV603
BASS
TREBLE
TONE
S8 HIGH FILTER
S9 LOW FILTER
ON
OFF
ON
OFF
DIFFERENTIAL AMP Q701,702
CLASS A AMP Q704
POWER AMP Q710—715
PROTECTOR / MUTING / RELAY DRIVER Q706—709, 805—809
RY801
R-CH
HEADPHONES
SPEAKER
S10 SPEAKER
A
A+B
A+C
B
C
OFF
AUX
R-CH
— R-CH — (SAME AS L-CH)
STR-7800SD
EQ AMP TONE CONTROL BOARD
B+
B−
REGULATOR Q801—802
REGULATOR Q803—804
D903
D902
AC IN
D901
FM/AM BOARD
B+

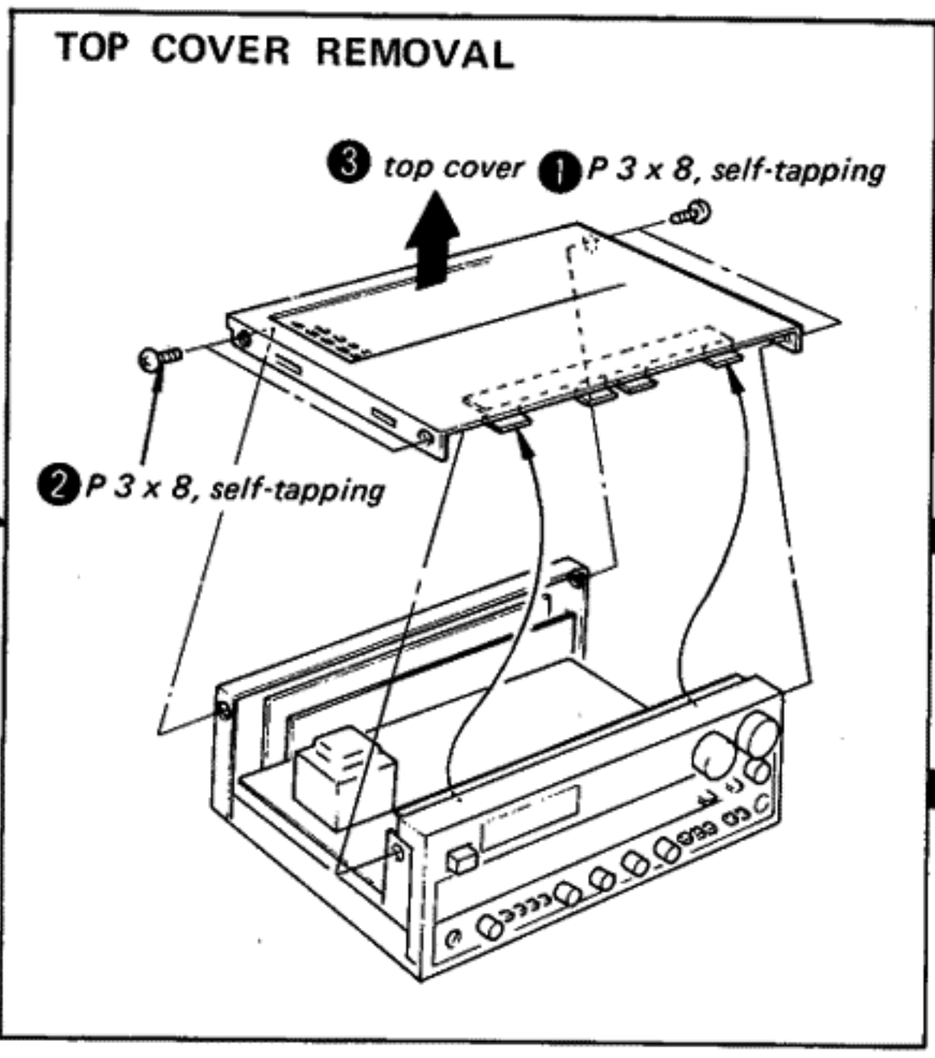
SECTION 2
DISASSEMBLY

2-1. REMOVAL

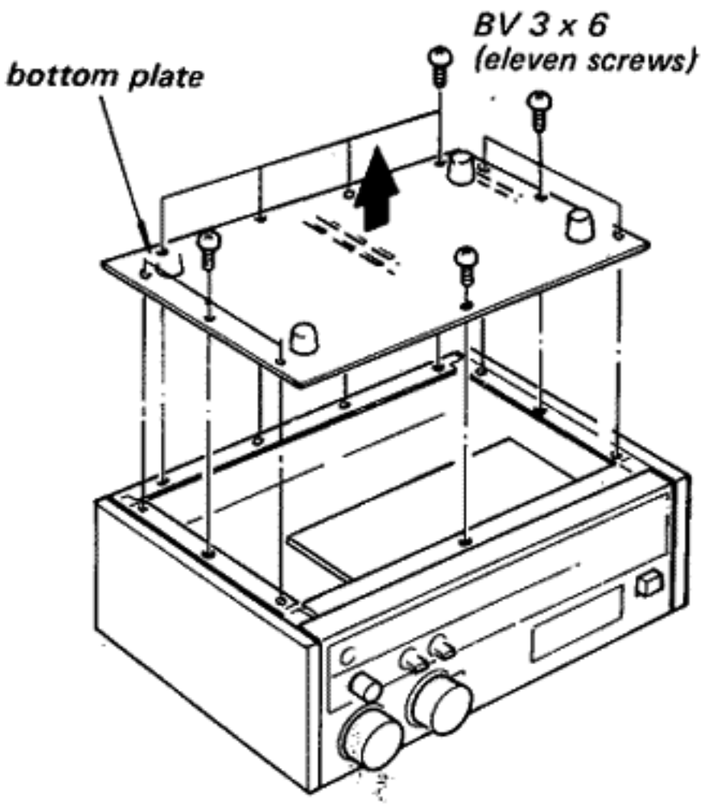
SIDE BOARD REMOVAL



TOP COVER REMOVAL

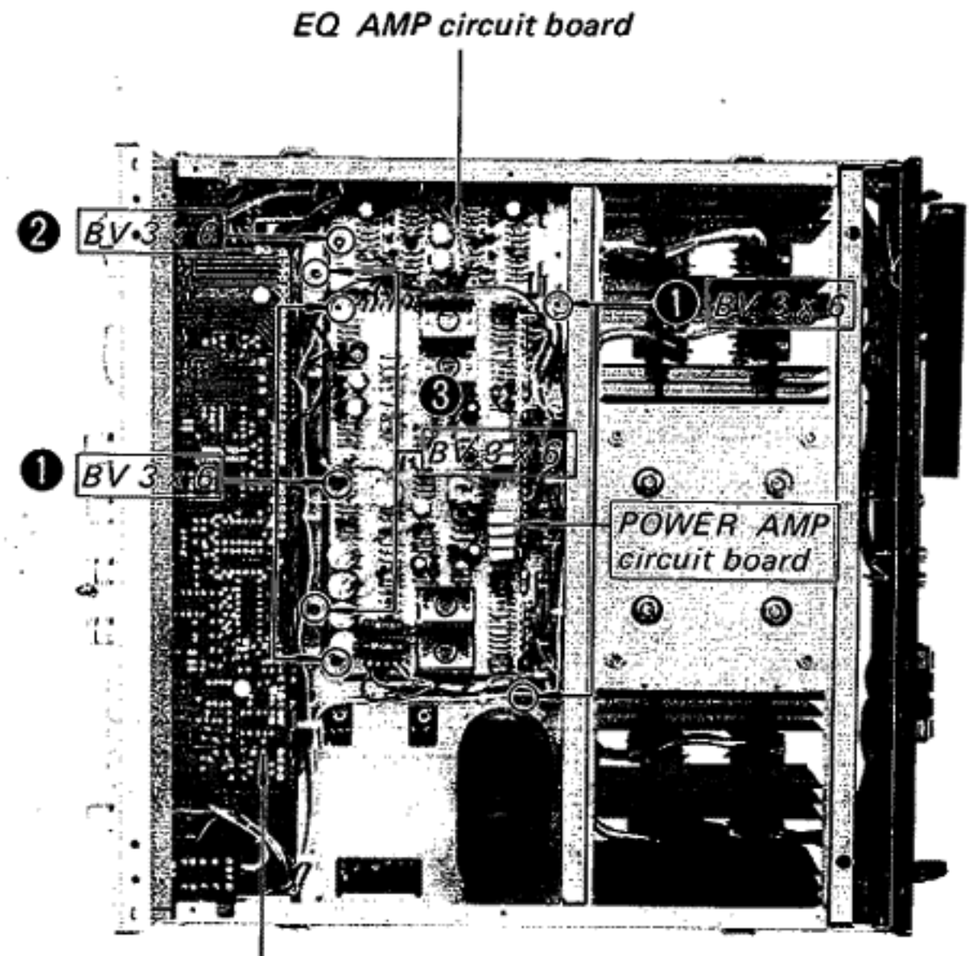


BOTTOM PLATE REMOVAL

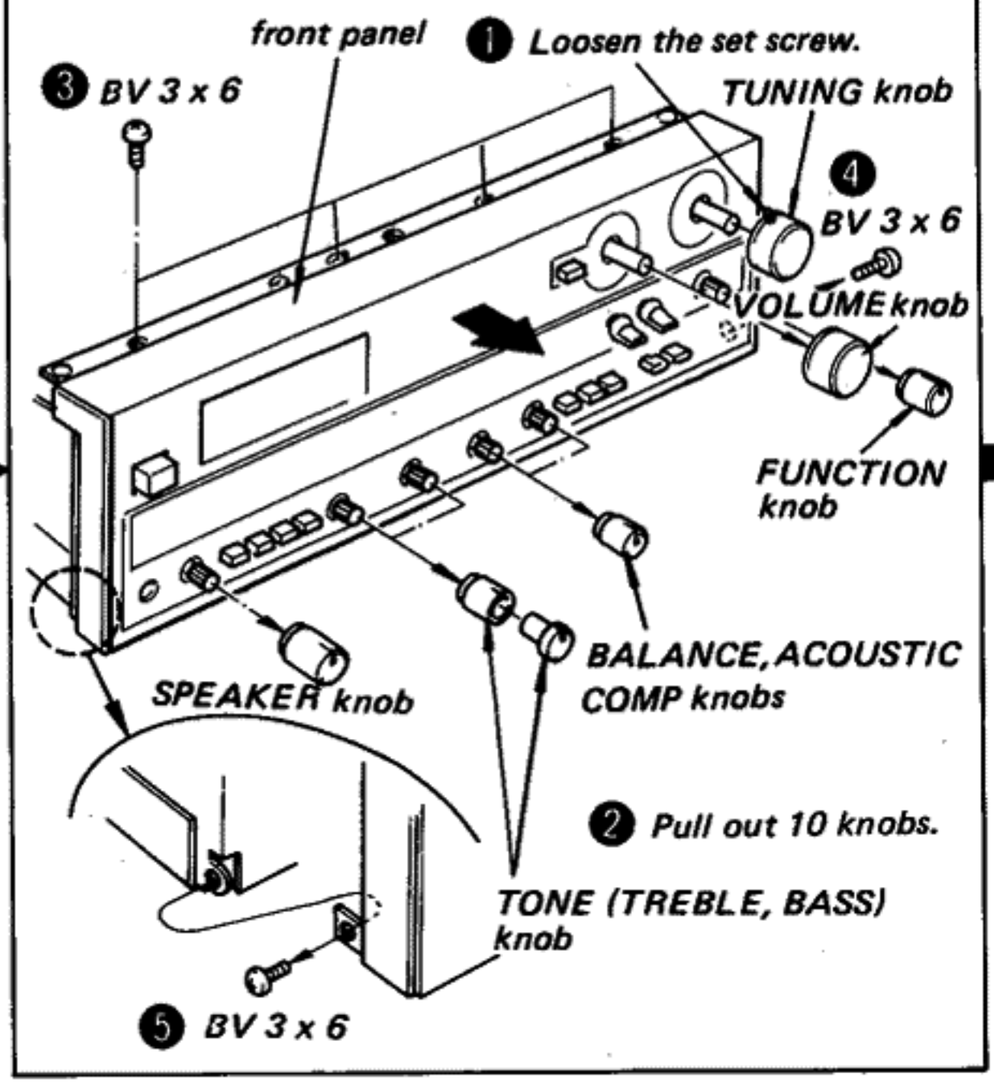


POWER AMP AND EQ AMP CIRCUIT BOARD REMOVAL

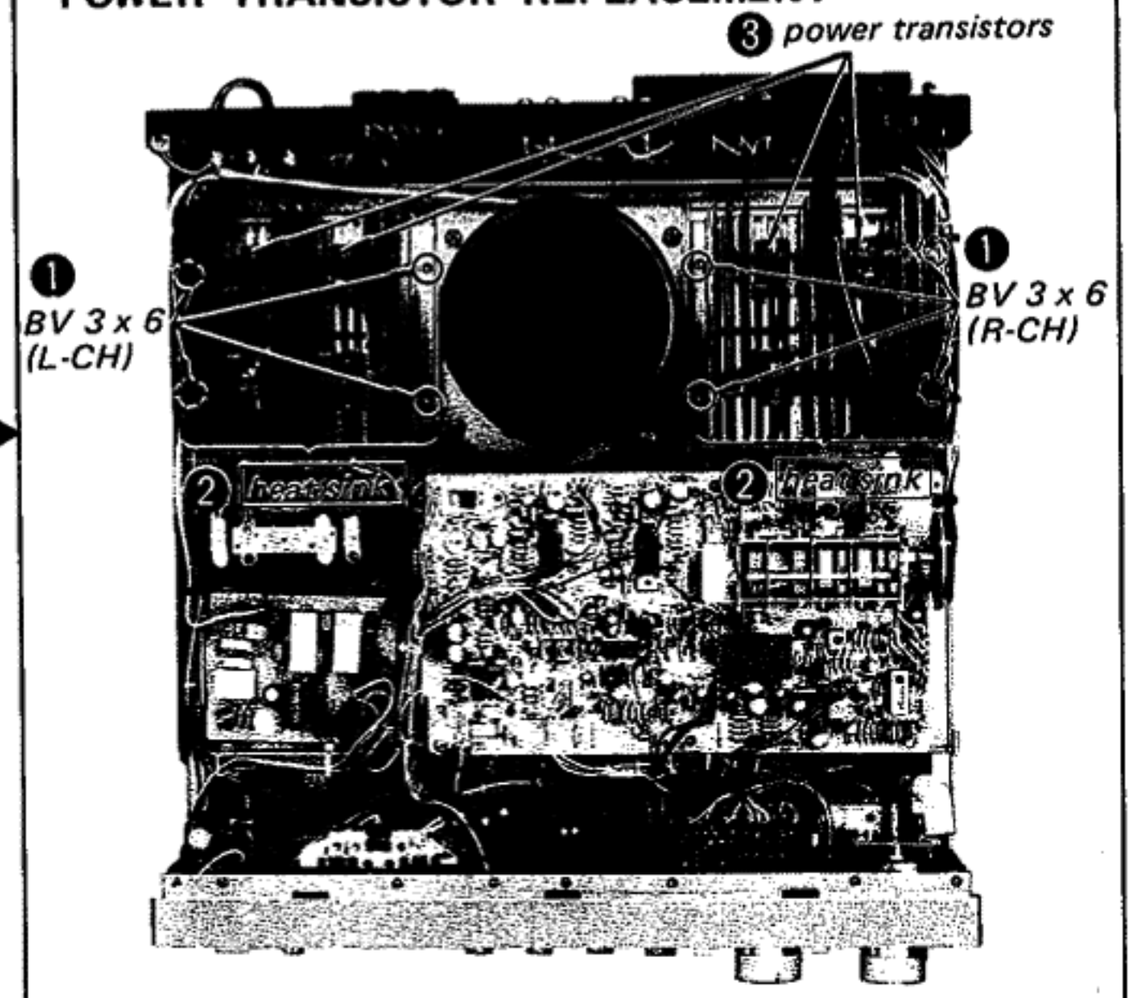
❶: POWER AMP Circuit Board Removal
❷: EQ AMP Circuit Board Removal



FRONT PANEL REMOVAL



POWER TRANSISTOR REPLACEMENT



REPLACEMENT OF THE COMPONENTS ON THE FM/AM CIRCUIT BOARD.

1. Remove two BV 3 x 6 screws ❸ securing the shield plate to the chassis.
2. Remove the shield plate from the chassis.
3. It is possible to unsolder the components on the front-end circuit board.

TONE CONTROL, AUX JACK AND HEADPHONES JACK CIRCUIT BOARD REMOVAL.

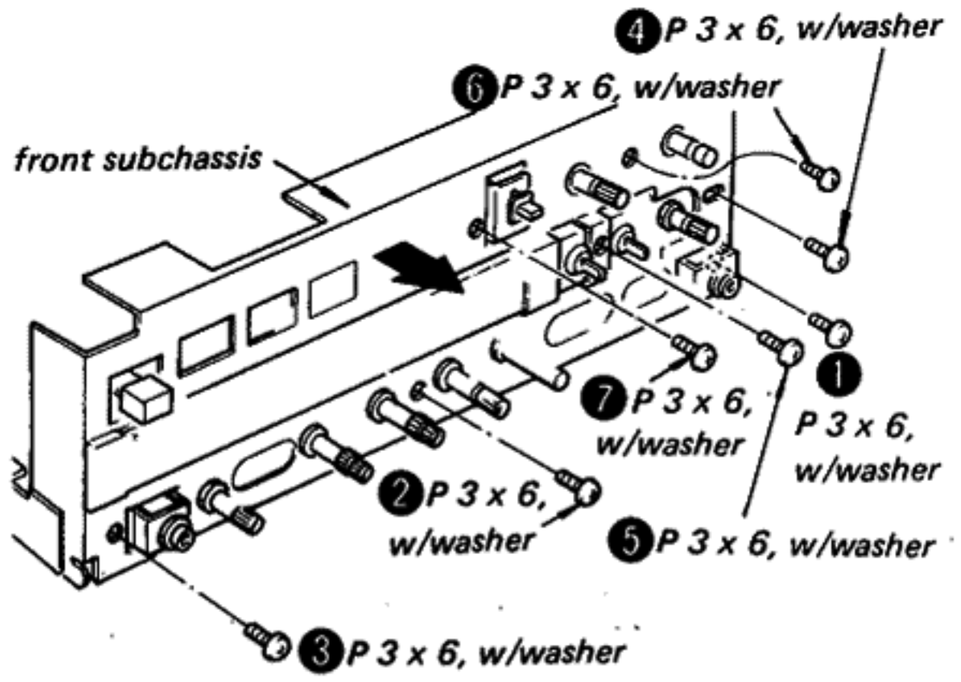
- Remove three screws (❶ – ❸). After removing the circuit boards from the front subchassis, replace the defective switch or jack.

FUNCTION SWITCH CIRCUIT BOARD REMOVAL

- Remove two screws (❹ , ❺). After removing the circuit board from the front subchassis, replace the defective switch.

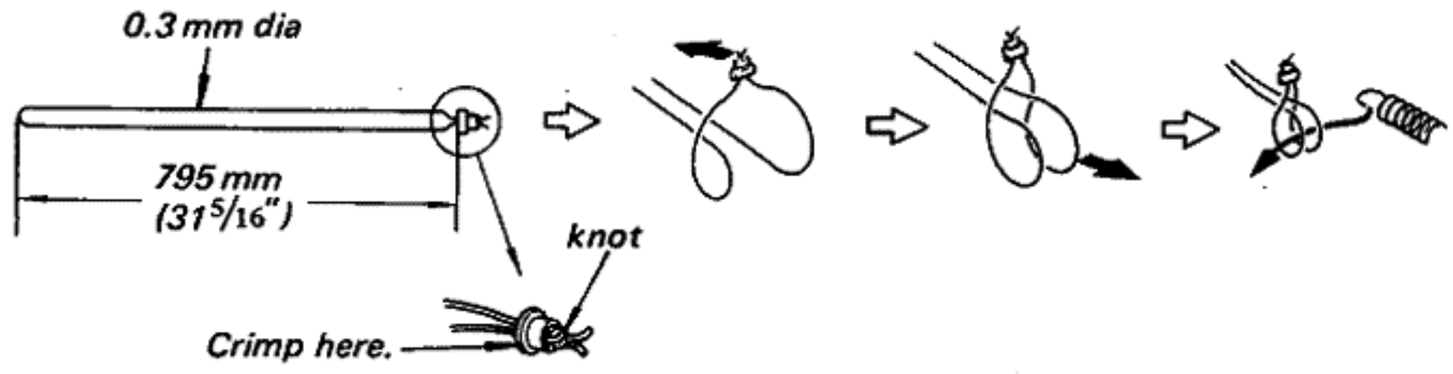
VOLUME CONTROL CIRCUIT BOARD REMOVAL

- Remove two screws (❻ , ❼). After removing the circuit board from the front subchassis, replace the defective control.

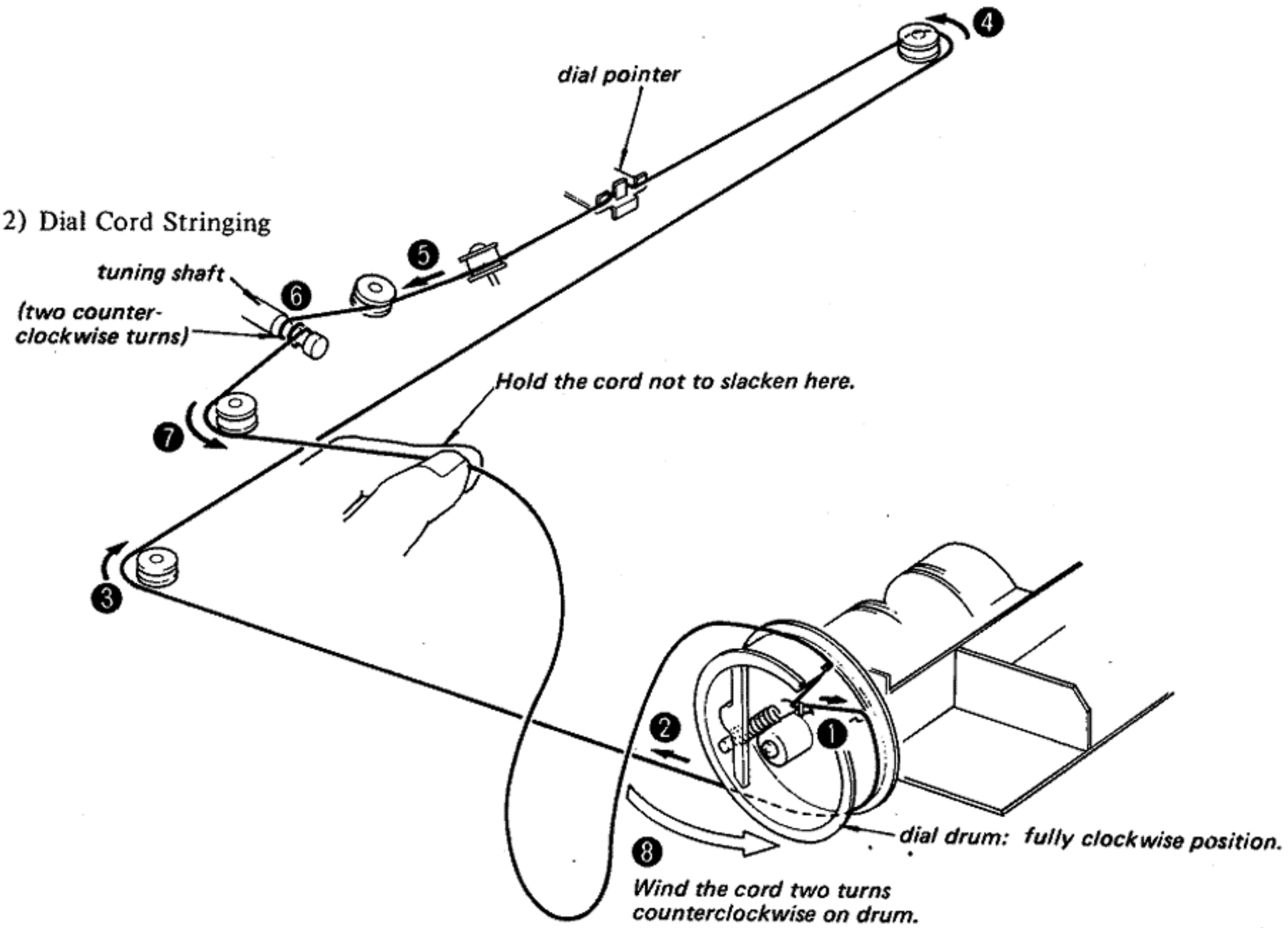


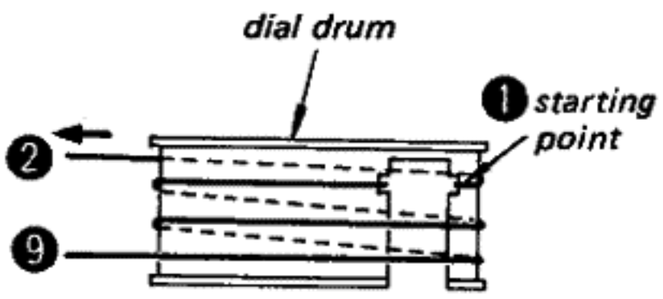
2-2. DIAL CORD STRINGING

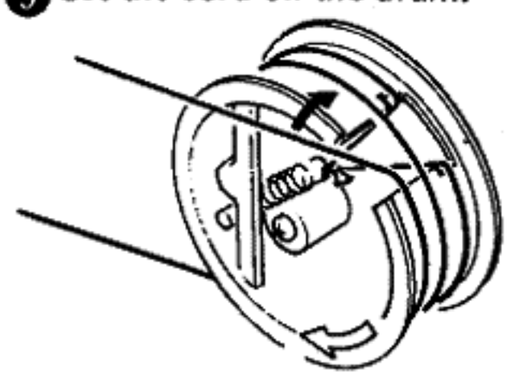
1) Dial Cord Length



2) Dial Cord Stringing





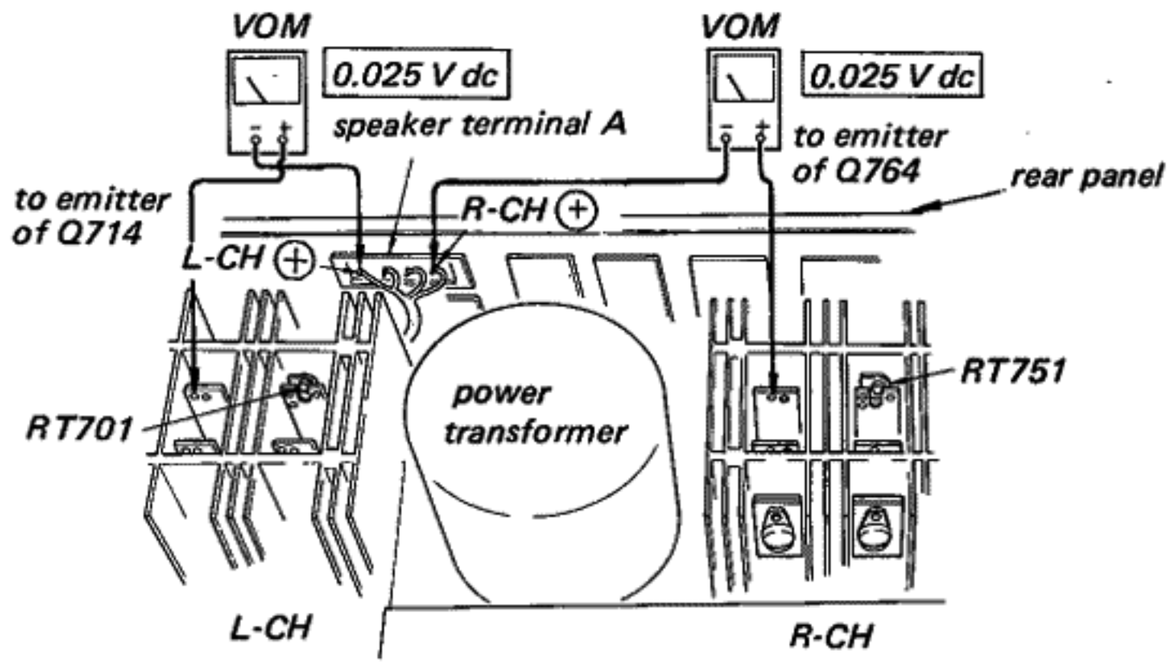


3) Dial Pointer Setting

Tune in a station and set the dial pointer to the frequency of the dial scale.

DC BIAS ADJUSTMENT

1. With no input signal, set SPEAKER switch to A.
2. Adjust RT701 and RT751 for the indicated VOM reading.



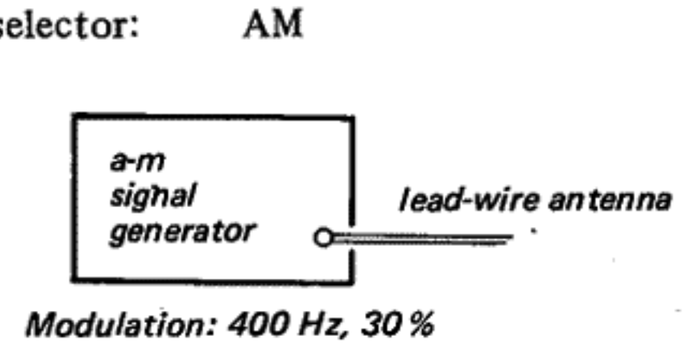
FM FREQUENCY COVERAGE AND TRACKING ADJUSTMENT

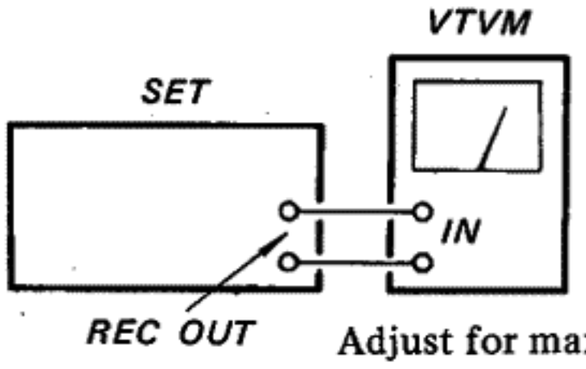
Never attempt alignment of the fm front-end section for the fm frequency coverage and tracking adjustment. If the fm frequency coverage and tracking adjustments are required, consult the factory service center.

AM FREQUENCY COVERAGE AND AM TRACKING ADJUSTMENT

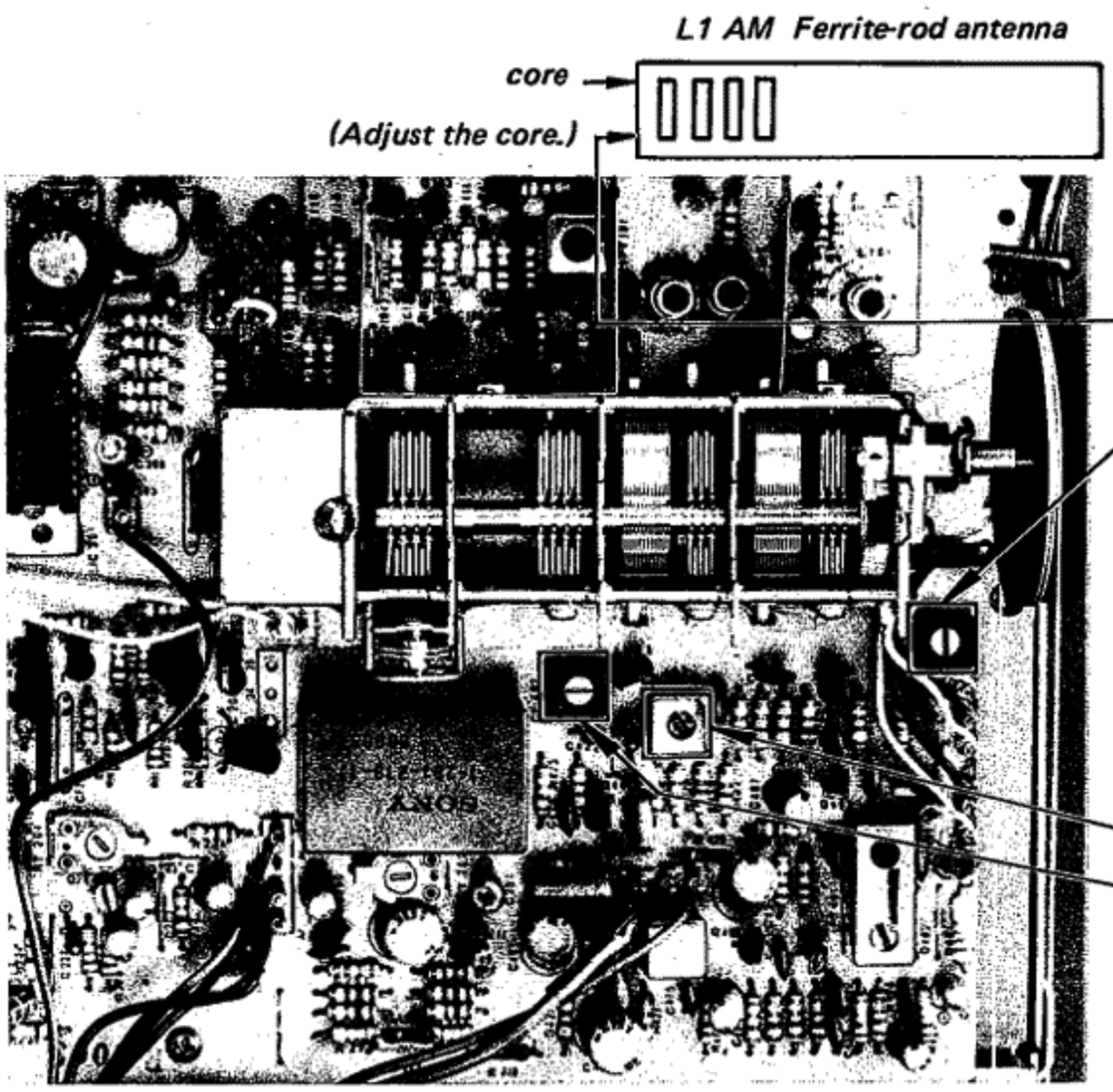
Test setup:

FUNCTION selector: AM





Adjust for maximum reading.



Step	AM TRACKING ADJUSTMENT
1	L1 (600 kHz)
2	CT401 (1,400 kHz)

Note: Repeat steps 1 and 2 several times, and finish the alignment at step 2.

Step	AM FREQUENCY COVERAGE ADJUSTMENT
1	L402 (520 kHz)
2	CT402 (1,680 kHz)

Note: Repeat steps 1 and 2 several times, and finish the alignment at step 2.

– FM/AM board –

SECTION 6

ELECTRICAL PARTS LIST

Ref. No.	*Part No.*	*Description*
		SEMICONDUCTORS
		Transistors
Q101		3SK37
Q102		2SK23A-840
Q103, 104		2SC710
Q105		2SK23A-840
Q106		2SC710
Q201 – 203		2SC710
Q204 – 207		2SC634A
Q209 – 211		2SC634A
Q212		2SC1061
Q214, 215		2SC634A
Q301, 351		2SC634A
Q401, 402		2SC403C
Q403		2SC632A
Q404		2SC403C
Q405, 406		2SC710
Q501, 551		2SC1636
Q502, 552		2SA705-8
Q503, 553		2SA705-8
Q601, 651		2SC1636
Q602, 652		2SA705-8
Q603, 653		2SC632A
Q604		2SA678
Q701, 751		2SA678
Q702, 752		2SA678
Q703, 753		2SA678
Q704, 754		2SC1811
Q705, 755		2SA896
Q706, 756		2SC634A
Q707, 757		2SA678
Q708, 758		2SA678
Q709, 759		2SC634A
Q710, 760		2SA762
Q711, 761		2SC1431
Q712, 762		2SA747A
Q713, 763		2SA747A
Q714, 764		2SC1116A
Q715, 765		2SC1116A
Q801		2SC1475
Q802		2SC634A
Q803		2SA678
Q804		2SA835
Q805 – 809		2SC634A
Q901		2SC634A
		ICs
IC201		HA-1137W
IC202		HA-1156
IC301, 351		CX-064
		Diodes
D1		TX-312
D101		1S2687S-2
D201		1T22A
D202 – 204		1S1555
D205		MV-12N
D206		EQB01-16
D208		10E-2
D401, 402		1S1555
D403, 404		1T22A
D701, 751		MV-12N
D702, 752		1S1555
D703, 753		1S1555
D704, 754		1S1555
D705, 755		1S1555
D706, 756		SV-04F
D801 – 804		EQB01-13
D805 – 806		1S1555

Ref. No.	*Part No.*	*Description*
D901		SIRB10
D902		S5151
D903		S5151R
D904		1S1555

COILS

L1	1-401-635-31	Ferrite-rod Antenna
L101	1-401-662-00	FM Ant
L102	1-425-925-00	FM RF1
L103	1-425-926-00	FM RF2
L104	1-407-172-XX	Microinductor, 180 μH
L201	1-459-152-00	18 μH
L202	1-407-160-XX	Microinductor, 18 μH
L203, 204	1-407-172-XX	Microinductor, 180 μH
L401	1-407-169-XX	Microinductor, 100 μH
L402	1-405-656-00	AM Osc
L403	1-407-182-XX	Microinductor, 2.2 μH
L404	1-407-178-XX	Microinductor, 1 μH
L405	1-407-182-XX	Microinductor, 2.2 μH

TRANSFORMERS

IFT101	1-403-295-12	FM IFT
IFT201	1-404-011-00	FM Discriminator
IFT401	1-404-014-00	AM, triple tune 455 kHz
IFT402	1-403-149-00	AM IFT

CAPACITORS

All capacitors are in μF and ceramic unless otherwise noted.
50 WV or less are not indicated except for electrolytics.
pF = μμF, elect = electrolytic

C101	1-101-981-11	20 p
C102	1-102-257-11	0.0022
C103	1-101-924-11	0.022
C104	1-101-981-11	20 p
C105	1-101-924 11	0.022
C106	1-102-864-11	5 p
C107	1-101-924-11	0.022
C108	1-102-641-11	22 p
C109	1-101-924-11	0.022
C110	1-101-919-11	0.0022
C111	1-101-924-11	0.022
C112	1-102-848-11	180 p
C113	1-101-924-11	0.022
C114	1-101-919-11	0.0022
C116, 117	1-101-924-11	0.022
C118	1-102-502-11	2 p
C120, 121	1-101-924-11	0.022
C122	1-102-503-11	3 p
C123	1-101-924-11	0.022
C201	1-121-415-11	100 16 V elect
C202 – 204	1-101-924-11	0.022
C205	1-101-974-11	20 p
C206	1-101-924-11	0.022
C208	1-108-251-11	0.1 mylar
C209	1-101-925-11	0.047
C210	1-121-450-11	2.2 50 V elect
C211	1-101-924-11	0.022
C212	1-121-726-11	0.47 50 V elect
C213	1-101-925-11	0.047
C214	1-121-726-11	0.47 50 V elect
C215	1-101-884-11	56 p
C216	1-121-726-11	0.47 50 V elect
C217	1-101-924-11	0.022
C218	1-121-415-11	100 16 V elect
C219	1-101-925-11	0.047
C220	1-121-651-11	10 16 V elect
C221	1-121-726-11	0.47 50 V elect
C222	1-121-651-11	10 16 V elect
C223	1-101-924-11	0.022
C224, 225	1-121-651-11	10 16 V elect
C226	1-131-209-11	0.1 35 V tantal
C227	1-121-391-11	1 50 V elect
C228	1-123-068-11	220 16 V elect
C229	1-121-391-11	1 50 V elect
C230	1-121-651-11	10 16 V elect
C231, 232	1-121-915-11	4.7 25 V elect
C233	1-103-717-11	470 p styrol

Note: The components identified by shading are critical for safety. Replace only with part number specified.

Ref. No.	*Part No.*	*Description*		
C234	1-121-726-11	0.47	50 V	elect
C235	1-108-246-11	0.047		mylar
C236	1-123-068-11	220	16 V	elect
C237	1-131-209-11	0.1	35 V	tantal
C238, 239	1-108-569-11	0.0039		
C240	1-121-726-11	0.47	50 V	elect
C241, 242	1-108-571-11	0.0047		mylar
C243, 244	1-108-567-11	0.0033		mylar
C245	1-121-415-11	100	16 V	elect
C246, 247	1-131-212-11	0.33	35 V	tantal
C248, 249	1-101-884-11	56 p		
C250, 251	1-121-651-11	10	16 V	elect
C252	1-123-068-11	220	16 V	elect
C253	1-123-062-11	100	35 V	elect
C255	1-108-228-12	0.0015		mylar
C258	1-101-888-11	68 p		
C301, 351	1-121-912-11	1	50 V	elect
C302, 352	1-121-651-11	10	16 V	elect
C303, 353	1-102-947-11	10 p		
C305, 355	1-131-198-11	6.8	16 V	tantal
C307, 357	1-121-352-11	47	10 V	elect
C308	1-121-912-11	1	50 V	elect
C309, 359	1-108-244-12	0.033		mylar
C310, 360	1-108-603-12	0.1		mylar
C311, 361	1-131-217-11	2.2	35 V	tantal
C312, 362	1-108-585-12	0.018		mylar
C313, 363	1-108-587-12	0.022		mylar
C314, 364	1-121-912-11	1	50 V	elect
C315, 365	1-121-915-11	4.7	25 V	elect
C316, 366	1-108-230-12	0.0022		mylar
C317, 318	1-121-415-11	100	16 V	elect
C401–403	1-101-924-11	0.022		
C405, 406	1-101-924-11	0.022		
C407	1-121-479-11	22	16 V	elect
C408	1-101-924-11	0.022		
C409	1-121-450-11	2.2	50 V	elect
C410	1-101-924-11	0.022		
C411	1-121-450-11	2.2	50 V	elect

Ref. No.	*Part No.*	*Description*		
C412, 413	1-101-924-11	0.022		
C414	1-121-352-11	47	10 V	elect
C415	1-101-924-11	0.022		
C416	1-121-415-11	100	16 V	elect
C417	1-108-227-12	0.001		mylar
C418	1-108-355-12	0.1		mylar
C419	1-108-239-12	0.01		mylar
C420	1-108-249-12	0.068		mylar
C421	1-121-413-11	100	6.3 V	elect
C422	1-102-953-11	18 p		
C423	1-103-714-11	360 p		polystyrol
C424	1-101-924-11	0.022		
C425	1-108-239-12	0.01		mylar
C426	1-101-924-11	0.022		
C427	1-121-409-11	47	16 V	elect
C501, 551	1-131-236-11	1	25 V	tantal
C502, 552	1-102-959-11	22 p		
C503, 553	1-102-114-11	470 p		
C504, 554	1-108-574-11	0.0062		mylar
C505, 555	1-108-352-12	0.0018		mylar
C506, 556	1-121-748-11	10	25 V	elect
C507, 557	1-123-076-11	330	6.3 V	elect
C508, 558	1-121-912-11	1	50 V	elect
C601, 651	1-102-976-11	180 p		
C602, 652	1-108-230-12	0.0022		mylar
C603, 653	1-108-244-12	0.033		mylar
C604, 654	1-108-246-12	0.047		mylar
C605, 655	1-108-227-12	0.001		mylar
C606, 656	1-121-912-11	1	50 V	elect
C607, 657	1-121-414-11	100	6.3 V	elect
C608, 658	1-102-114-11	470 p		
C609, 659	1-102-959-11	22 p		
C610, 660	1-121-748-11	10	25 V	elect
C611, 661	1-108-228-12	0.0015		mylar
C612, 662	1-121-913-11	3.3	25 V	elect
C613, 663 C614, 664	1-108-246-12	0.047		mylar
C615, 665	1-121-748-11	10	25 V	elect
C616, 666	1-102-963-11	33 p		

Note: The components identified by shading are critical for safety. Replace only with part number specified.

Ref. No.	*Part No.*	*Description*		
C617, 667	1-121-915-11	4.7	25 V	elect
C618, 668	1-108-239-12	0.01		mylar
C619, 669	1-121-414-11	100	6.3 V	elect
C620, 670	1-108-251-12	0.1		mylar
C621, 671	1-108-239-12	0.01		mylar
C622, 672	1-108-251-12	0.1		mylar
C641	1-121-651-11	10	16 V	elect
C701, 751	1-102-116-11	680 p		
C702, 752	1-121-912-11	1	50 V	elect
C703, 753	1-123-077-11	470	6.3 V	elect
C704, 754	1-102-959-11	22 p		
C705, 755	1-121-414-11	100	10 V	elect
C706, 756	1-101-059-11	510 p		
C707, 757	1-108-383-12	0.033	100 V	mylar
C708, 758	1-123-084-11	100	100 V	elect
C709	1-121-414-11	100	10 V	elect
C710, 760 C711, 761	1-121-450-11	2.2	50 V	elect
C712, 762	1-101-059-11	510 p		
C713, 763	1-102-936-11	3 p		
C801, 802	1-123-064-11	330	35 V	elect
C803, 804	1-121-940-11	470	25 V	elect
C805	1-123-186-11	47	35 V	elect
C806	1-123-077-11	470	6.3 V	elect
C807	1-123-077-11	470	6.3 V	elect
C808	1-101-004-11	0.01		
C901, 902	1-125-158-11	22000	71 V	elect
C903, 904	1-108-433-12	0.1	200 V	mylar
C905	1-121-945-11	470	35 V	elect
C906	1-123-198-11	220	6.3 V	elect
C907	1-101-004-11	0.01		
C921, 922	1-121-936-11	220	25 V	elect
C931, 932	1-121-940-11	470	25 V	elect
C1001, 1002	1-108-433-12	0.1	200 V	mylar
CT401, 402	1-141-147-XX	Trimmer, 15 p		

Ref. No.	*Part No.*	*Description*		

RESISTORS

All resistors are in ohms. Common ¼W carbon resistors are omitted. Check schematic diagram for values.

R203	1-211-498-11	10		
R216	1-211-524-11	120		
R263	1-211-522-11	100		
R269	1-244-860-11	300	½ W	carbon
R272	1-211-522-11	100		
R316, 366	1-210-871-11	3.6 k		
R320, 370	1-210-873-11	430		
R321, 371	1-210-851-11	910		
R324, 374	1-211-529-11	200		
R401	1-244-891-11	5.6 k	½ W	carbon
R704, 754	1-211-940-11	1.2 k		
R709, 759	1-211-514-11	47		
R710, 760 R711, 761	1-211-538-11	470		
R712, 762 R713, 763	1-211-534-11	330		
R718, 768	1-206-656-11	470	2W	metal
R719, 769	1-202-565-11	470	½ W	composition
R720, 770	1-211-536-11	390		
R721, 771 R722, 772 R723, 773 R724, 774	1-217-158-11	0.47	5 W	metal plate
R725, 775	1-212-368-11	4.7	½ W	carbon
R726, 776	1-212-372-11	10	½ W	carbon
R727, 777	1-213-158-11	18 k	1 W	metal
R729, 779	1-211-498-11	10		
R801, 802	1-207-692-11	680	5 W	wirewound
R901	1-217-303-11	27	5 W	wirewound
R905, 906	1-217-160-11	1	5 W	metal plate
R921, 922	1-211-530-11	220		
R931, 932	1-211-515-11	51		
R1001	1-202-719-21	1.0	½ W	composition

Note: The components identified by shading are critical for safety. Replace only with part number specified.

Ref. No.	*Part No.*	*Description*
RT201	1-224-648-XX	100 k, adjustable; carbon
RT202, 204	1-224-647-XX	47 k, adjustable; carbon
RT205	1-224-645-XX	10 k, adjustable; carbon
RT701, 751	1-224-646-XX	22 k, adjustable; carbon
RV601, 651	1-224-809-00	250 k, variable; VOLUME
RV602, 652	1-224-810-00	10 k, variable; BALANCE
RV603, 653 RV604, 654	1-224-808-00	50 k, variable; TONE (TREBLE, BASS)
RY801	1-515-257-00	Relay
RY901	1-515-278-21	Relay

SWITCHES

S1	1-516-950-00	Rotary, FUNCTION
S2, 3	1-516-603-00	Lever, slide; MONITOR, TAPE COPY
S4	1-516-949-00	Pushbutton; MONO
S5	1-516-685-00	Lever, slide; MUTING
S6	1-516-949-00	Pushbutton; EXT ADPT
S7	1-516-952-00	Rotary Slide; ACOUSTIC COMP
S8, 9	1-516-953-00	Pushbutton, 4-key FILTER
S10	1-516-951-00	Rotary; SPEAKER
S11	1-516-693-00	Push POWER (US model)
	1-516-697-00	Push POWER (Canadian model)
S12, 13	1-516-953-00	Pushbutton; 4-key; FILTER
S14 - 16	1-516-949-00	Pushbutton; DOLBY FM, MULTIPATH, FM MUTING
S17	1-552-130-00	Lever; DE-EMPHASIS

JACKS

J1 – 3	1-507-430-XX	6 p; PHONO1, PHONO2, AUX
J4 – 15	1-507-532-00	4 p; TAPE1, REC OUT1, TAPE2, REC OUT2, EXT ADPT
J16 – 18	1-507-430-XX	6 p; PHONO1, PHONO2, AUX
J19	1-507-411-00	1 p; FM DISCRI OUTPUT
CNJ1 – 3	1-526-528-00	Socket, AC OUTLET
CNJ4	1-507-454-00	HEADPHONES
CNJ6	1-507-453-00	AUX

MISCELLANEOUS

B1	1-417-014-31	BALUN, antenna, matching trans
CB801	1-532-513-11	Circuit Breaker 8 A
CB802	1-532-512-11	Circuit Breaker 1.6 A
CF201, 202	1-527-248-XX	Solid state filter 10.7 MHz
CP901	1-231-326-11	Encapsulated Component
CP902, 903	1-102-355-11	Ceramic, 0.01, 500 V
F1	1-532-496-11	Fuse, thermo 10 A
LPF201	1-231-219-00	Low pass filter
ME1	1-520-237-00	Meter, SIGNAL MALTIPATH
ME2	1-520-236-00	Meter, FM TUNING
PL1, 2, 3	1-518-116-00	Pilot Lamp, 11 V 360 mA; dial scale; METER
PL4	1-518-169-XX	Pilot Lamp, 4.5 V40 mA; STEREO
PL5	1-518-169-XX	Pilot Lamp, 4.5 V40 mA; DOLBY
PT1, 2	1-442-845-11	Transformer, power
TM1 – 3	1-535-057-21	Terminal, push 4 p; SPEAKER
TM4	1-535-132-00	Terminal, push; GROUND
TM5	1-536-506-00	Terminal Strip; ANTENNA
	1-525-186-00	Socket, transistor
	1-534-992-XX	Cord, power
	1-543-060-00	Core
	1-800-340-11	Posistor

Note: The components identified by shading are critical for safety. Replace only with part number specified.

ACCESSORIES AND PACKING MATERIALS

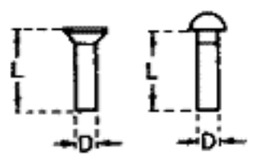
Part No.	*Description*
X-4490-002-1	Cloth Ass'y, polishing
1-501-161-00	Antenna, feeder
1-506-113-00	Short Plug
3-497-291-00	Bag, polyethylene
3-701-020-00	Bag, check sheet

Part No.	*Description*
3-770-105-21	Manual, instruction (US model)
3-770-105-21 3-794-089-31)	Manual, instruction (Canadian model)
4-850-219-00	Carton
4-850-221-00	Frame
4-850-222-00	Cushion, lower
4-850-223-00	Cushion, upper

HARDWARE NOMENCLATURE

Screw: — P 3 x 10

- *L: Length in mm*
- *D: Diameter in mm*
- *Type of head*
- *Indicated slotted-head only. Unless otherwise indicated, it means cross-recessed head (Phillips type).*

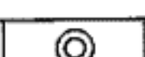
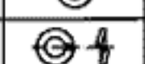
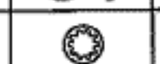


Nut, Washer, Retaining ring:

N 3

- *Diameter of usable screw or shaft*
- *Reference designation*

Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

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