

PIONEER®



SOLID STATE
AM-FM STEREO RECEIVER

MODEL **SX-770**

Thank you for your purchase of Pioneer's Model SX-770. You can be sure it will give you many years of listening pleasure. To get the most from your SX-770, read through this manual and follow its directions. Happy listening!

INSTALLATION, OPERATING AND SERVICE MANUAL

Including PARTS LIST, CIRCUIT DIAGRAMS, TROUBLE SHOOTING AND MOUNTING TEMPLATE.

(KCW)



FEATURES

- **LOW-NOISE FET IN FM SECTION**

Coupled with the use of a low-noise FET, the FM section is designed for a high sensitivity to obtain a sufficient signal-to-noise ratio.

- **EXCELLENT SELECTIVITY**

The IF amplifier stage uses a combination of a low-noise silicon transistor and a monolithic IC to attain an excellent selectivity characteristic.

- **MONOLITHIC IC FOR MPX SECTION**

The MPX section is an IC for a stable, wide frequency band and a sharp channel separation. A sufficient measure is taken against SCA beat.

- **HIGHLY SENSITIVE AM TUNER**

Due to the silicon transistor and ferrite antenna, the AM tuner has a high and stable sensitivity.

- **MICROPHONE TERMINAL FOR A VERSATILITY OF USE**

Input terminals include a magnetic-cartridge turntable terminal and a microphone terminal. Output terminals include a center channel terminal and a preamplifier terminal. Thus Model SX-770 can be used in various ways.

- **WELL DAMPED, CLEAR SOUND**

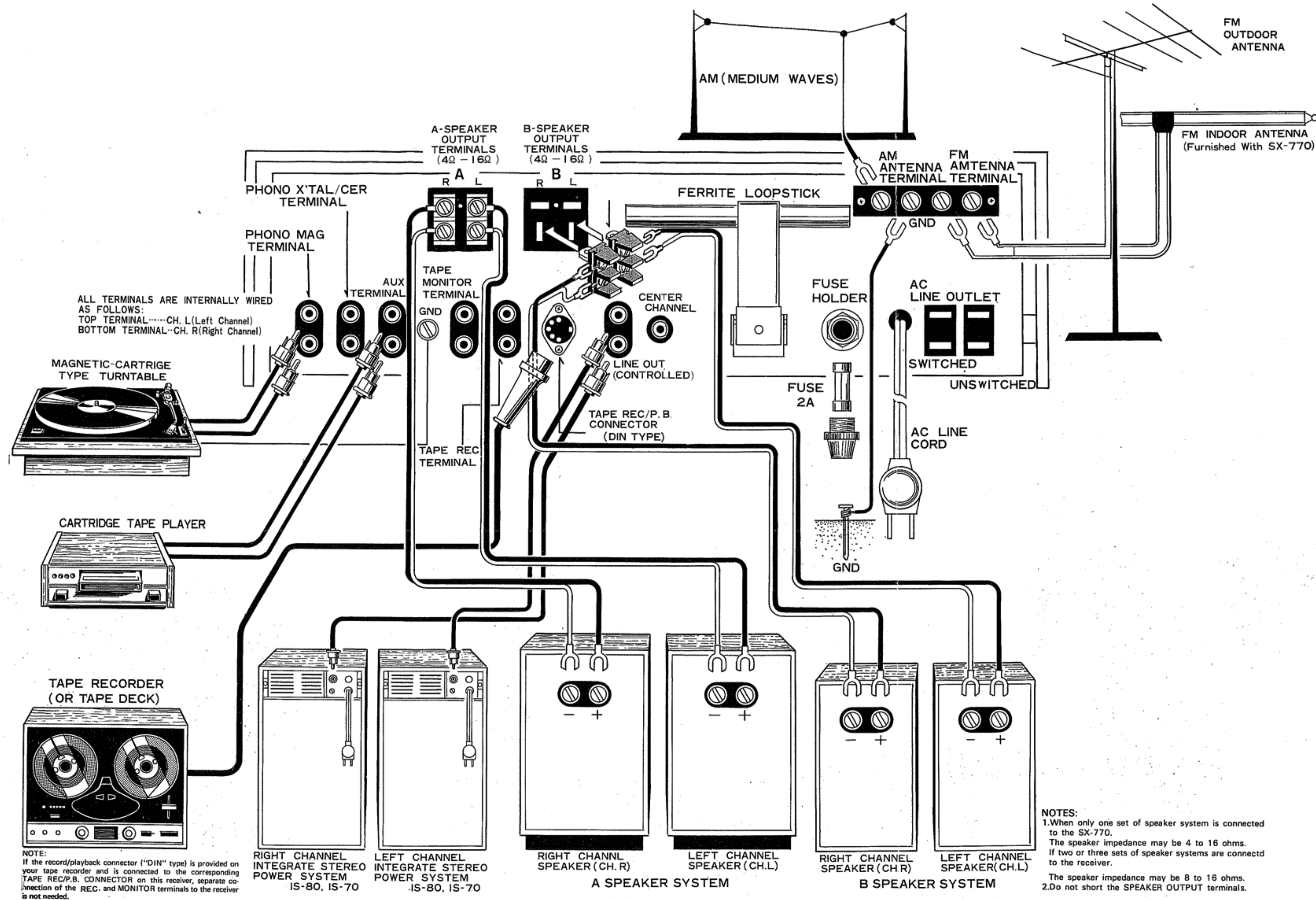
The output stage is a quasi-complementary SEPP circuit using silicon transistors. Model SX-770 reproduces well-damped, clear stereo sound over a wide frequency range from bass to treble.

- **VARIETY OF ACCESSORY CIRCUITS**

Accessory circuits include an FM AFC circuit, muting circuit, high-cut filter, tape monitor, loudness contour switch, etc.



REAR CONNECTIONS



NOTES:
1. When only one set of speaker system is connected to the SX-770. The speaker impedance may be 4 to 16 ohms. If two or three sets of speaker systems are connected to the receiver. The speaker impedance may be 8 to 16 ohms.
2. Do not short the SPEAKER OUTPUT terminals.

Fig. 1

STEREO SYSTEM

This receiver is a general-purpose stereo amplifier. Connect to it the loudspeaker systems (two or four), turntable, tape recorder, etc., which are separately available.

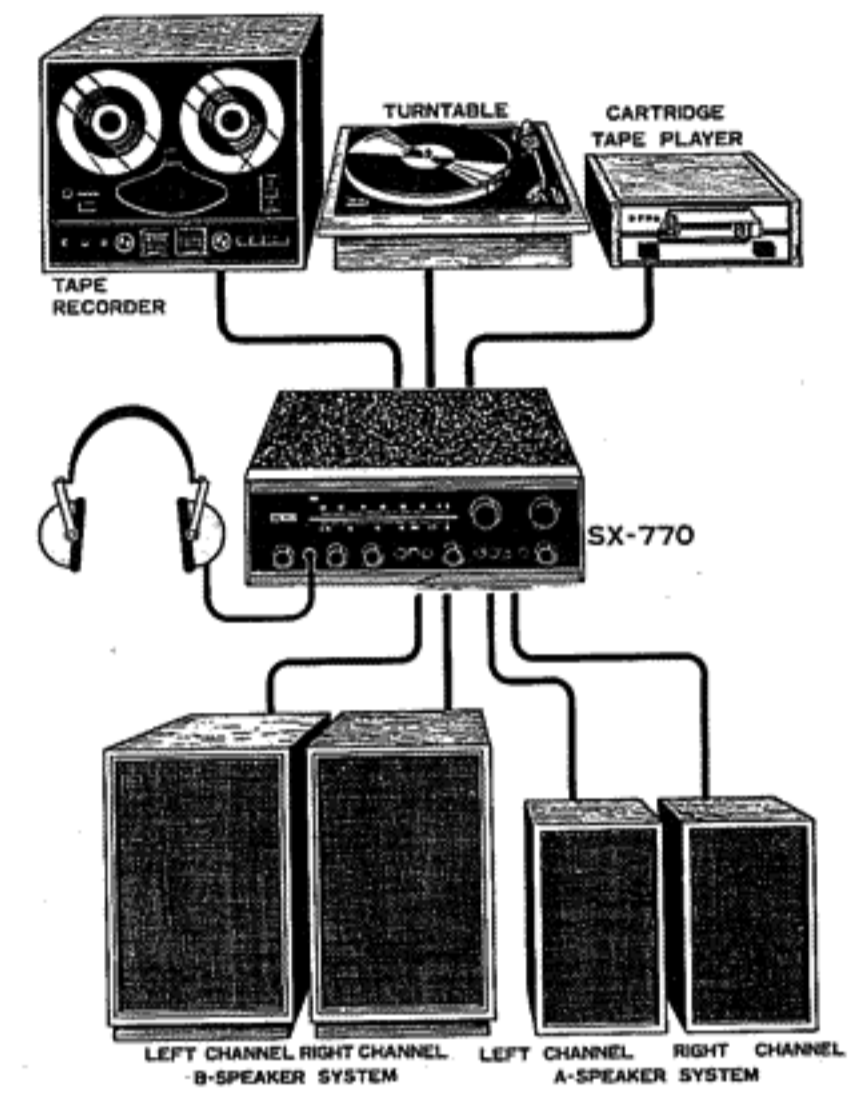


Fig. 2

INSTALLATION

For installation of the stereo system, select a place meeting the following.

- o Well ventilated, and free from moisture and dust.
- o Unexposed to direct sunlight.
- o Far from heat radiators (space heaters, etc)
- o Stable without incurring vibrations.

LISTENING ROOM

- o When the stereo system is installed, listen to music according to the connection and operation instructions described below.
- o The reproduced sound is very different depending on the size of the room, the furniture arrangement in the room, and the materials of walls, floor and ceiling. Generally, the reproduced sound fills the room if the room has a low ceiling and hard floor, or the room has a small length and a hard wall opposing loudspeakers. This undesirable acoustic condition can be much alleviated by laying a carpet on the floor for the former room and by covering the wall with a thick curtain for the latter room. It is also an effective solution to change the arrangement of furniture for irregular reflection of the loudspeaker sound.

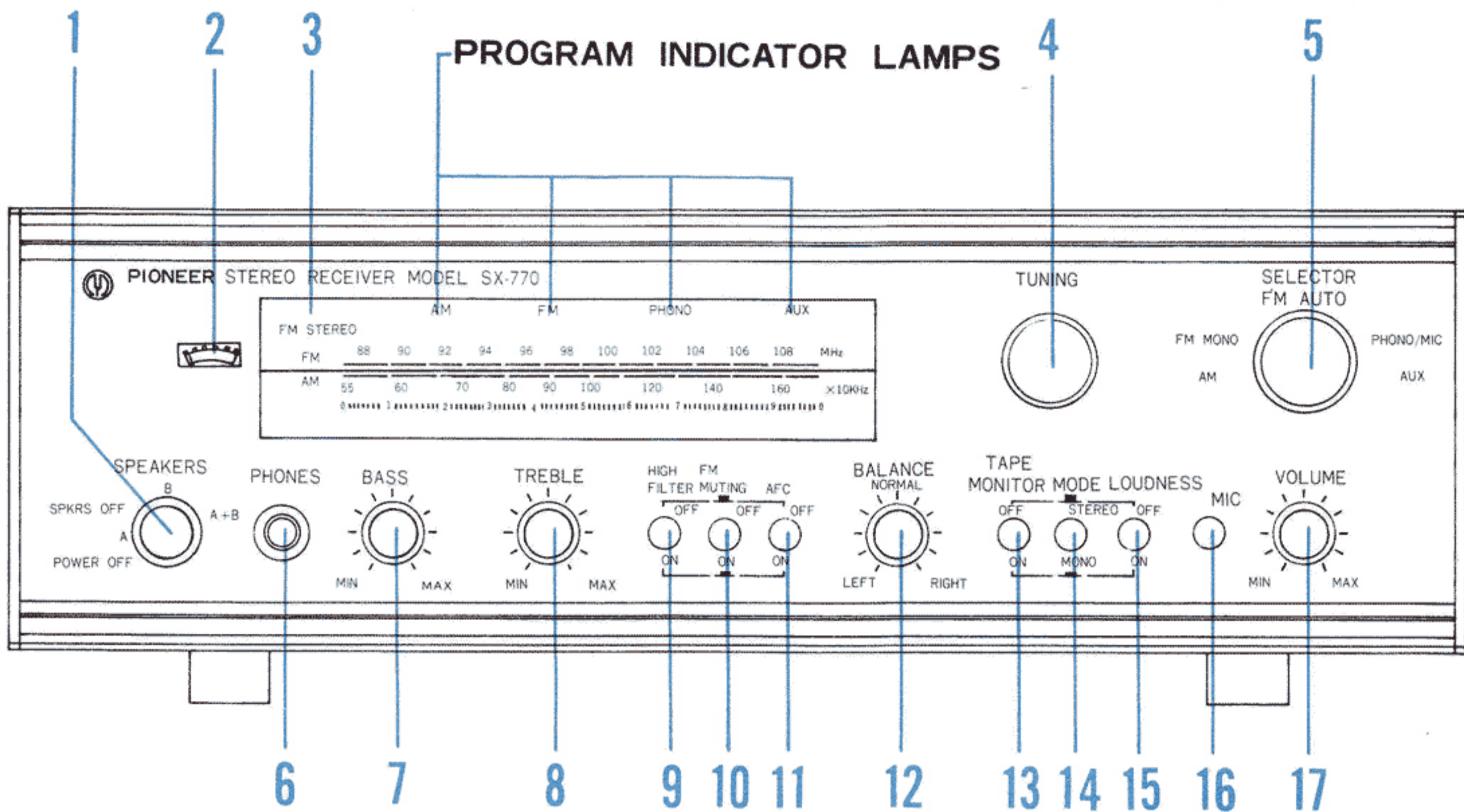


Fig. 3

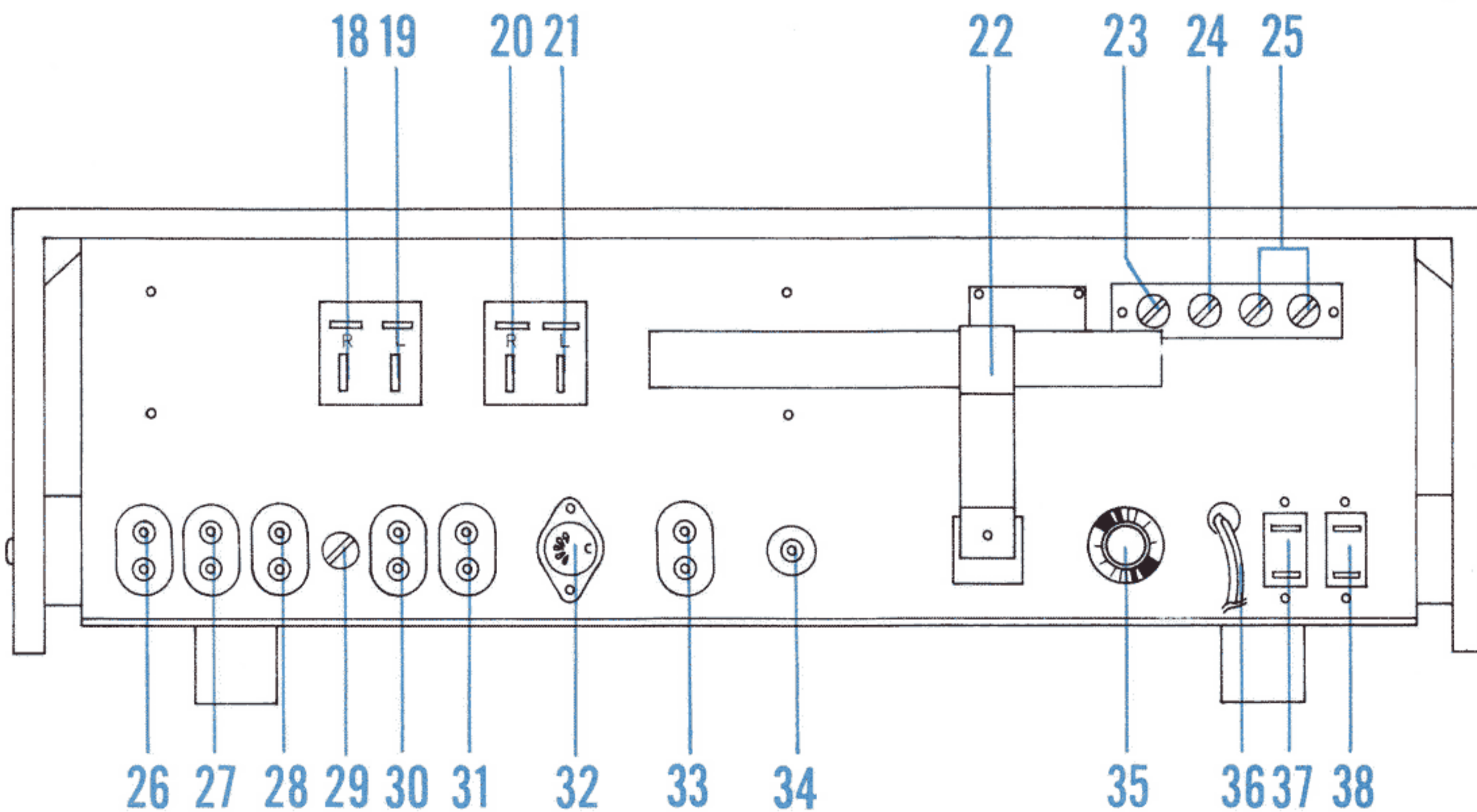


Fig. 4

KNOBS AND SWITCHES ON FRONT PANEL

1. SPEAKERS (POWER SUPPLY AND LOUDSPEAKER) SWITCH

This knob turns off the power supply, and selects the loudspeaker output terminals. The function at each position of the knob is as follows:

POWER OFF	Model SX-770 is deenergized.
SPKR'S A	Loudspeaker output terminals A are operative.
SPKR'S OFF	Both loudspeaker output terminals A and B are inoperative. This position is selected when using a stereo headphone.
SPKR'S B	Loudspeaker output terminals B are operative.
SPKR'S A + B	Both loudspeaker output terminals A and B are operative.

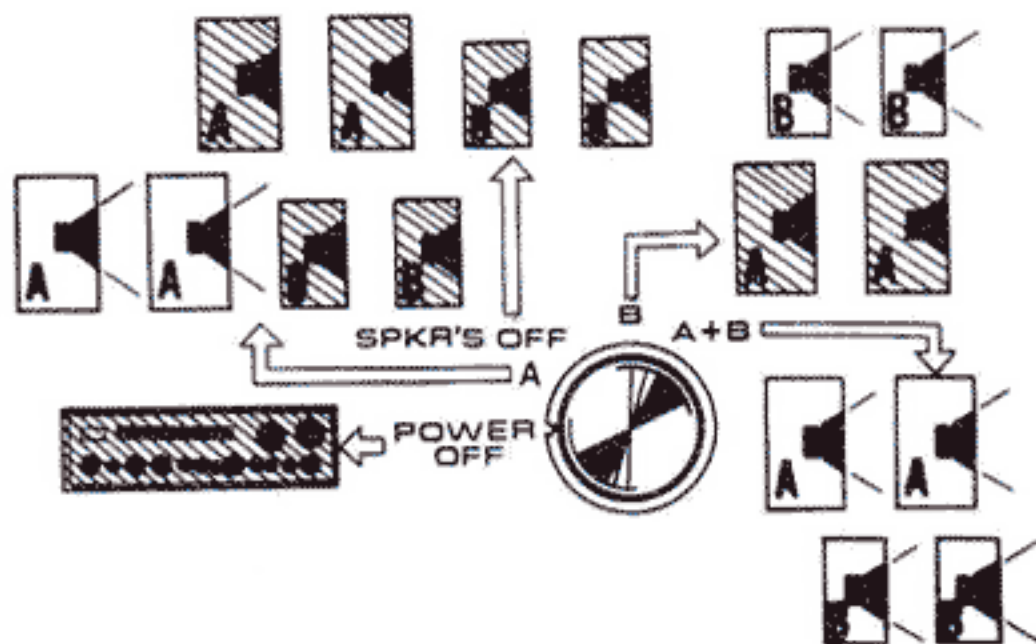


Fig. 5

2. TUNING INDICATOR

When tuning the radio receiver to an FM or AM broadcast station, the TUNING KNOB (4) is adjusted so that the pointer of this meter may deflect to the maximum.

3. FM STEREO INDICATOR

When the receiver receives an FM stereo program, this lamp lights.

4. TUNING KNOB

An AM or FM broadcasting station is tuned in. While observing the pointer of the TUNING INDICATOR (2), set the knob for the best receiving condition.

5. SELECTOR SWITCH

This switch is used to select a broadcast reception mode or the record playing mode:

AM	For reception of an AM (medium wave) broadcast program.
FM MONO	For reception of a monophonic FM broadcast program.
FM AUTO	For reception of an FM broadcast program, automatically switching the receiver for stereo or monophonic mode.
PHONO/MIC	Sets the equipment for playing a disc record and microphone.
AUX	Sets the equipment for reproducing the auxiliary input signal.

When the SELECTOR switch is operated, the program indicator lamp corresponding to the selected source lights.

6. PHONES

Cord plug of a stereo headphone is inserted here for enjoying stereo play without disturbing other people around. Loud-

speakers stop emitting sound then. For the stereo headphone, PIONEER's Model SE-2P, SE-20, SE-30 or SE-50 is recommended.

- o When a longer cord is required for the stereo headphone, use PIONEER's Model JB-23 extension cord separately available.
- o When desiring to connect two stereo headphones, use PIONEER's Model JB-22 "Y" cord separately available.

7. BASS CONTROL

As this knob is turned clockwise, bass is boosted; as turned counterclockwise, attenuated. The control is designed to give a flat characteristic curve when the knob is set to the middle of the rotation range.

- o This knob controls the tone quality of both right and left channels simultaneously.

8. TREBLE CONTROL

Use of this treble control knob is similar to that of the BASS CONTROL KNOB (7).

9. HIGH FILTER SWITCH

When this switch is turned on, high-frequency noise, such as scratch noise, will be cut off.

10. FM MUTING SWITCH

Turn on this switch when desiring to eliminate the noise between stations while tuning in an FM broadcast program. Keep this switch turned off when tuning in a remote station.

11. AFC SWITCH

Keep this switch turned on when listening to an FM broadcast program. To tune in the FM broadcast station more accurately, turn off this switch, tune in the station, then turn on the switch when the station has been tuned in.

12. BALANCE CONTROL

When the knob is turned toward RIGHT, the center of loudspeaker sound moves rightward; when turned toward LEFT, leftward.

13. TAPE MONITOR SWITCH

For ordinary record play or radio reception, keep this switch in the "OFF" position.

Set the switch to "ON" only when playing back a tape by using a tape recorder (or tape deck) or monitoring the recording condition of such equipment. If the switch is set to the "ON" position when conducting disk record play or radio reception, loudspeakers do not sound. Be careful in this respect.

14. MODE SWITCH

When playing a disk record or tape, or receiving a broadcast program, keep this switch in the "STEREO" position. Set the switch to "MONO" only when using a monophonic turntable or tape recorder, or reproducing a tape on which monophonic recording is made.

15. LOUDNESS CONTOUR SWITCH

When the switch is set to the "ON" position while the receiver is operated at a low sound volume, both bass and treble boosted for easy listening. When the equipment is operated at high sound volume, it is recommended to keep the switch in the "OFF" position.



16. MIC JACK

When using a microphone, connect the microphone output to this jack. The loudspeakers stop emitting the sound from the turntable, when the microphone is connected to the jack.

NOTE: Set the VOLUME control (17) to the MIN position before inserting the microphone into the jack.

17. VOLUME CONTROL

The loudspeaker sound volume increases when this knob is turned clockwise; it decreases when the knob is rotated counterclockwise.

TERMINALS AND CONNECTION ON REAR PANEL

18 & 19. SPEAKER SYSTEM A TERMINALS

Two speaker systems A and B can be connected to the receiver, and they can be selectively used by operating the switch (1). Connect the right channel loudspeaker of the first speaker systems to terminals (18) and the left channel loudspeaker to terminals (19).

20 & 21. SPEAKER SYSTEM B TERMINALS

When using two speaker systems, use these terminals (20) and (21) for the second systems. Connect the loudspeaker for the right channel to terminals (20) and those for the left channel to terminals (21).

NOTE: For connection of loudspeakers to these terminals, the plugs contained in the accessory bag must be used. For correct loudspeaker connection, refer to the article "CONNECTION OF LOUDSPEAKER SYSTEMS".

22. AM FERRITE ANTENNA

An AM broadcast receiving antenna accessory to the SX-770. When using the SX-770 where the field intensity is high, reception can be conducted simply by adjusting the direction of this antenna without connecting an external antenna to the AM ANTENNA TERMINAL (23).

23. AM ANTENNA TERMINAL

This terminal is provided for connecting an external AM broadcast receiving antenna.

24. GROUND TERMINAL 1

Connect a ground conductor to this terminal for grounding the receiver.

25. FM ANTENNA TERMINALS

An FM broadcast receiving antenna will be connected to these terminals.

NOTE: For the most suitable FM antenna, AM antenna and grounding, refer to the article "ANTENNA CONNECTION AND GROUNDING".

26. PHONO MAGNETIC TERMINALS

Connect here the output cords of a turntable equipped with a magnetic cartridge. The upper jack is for the left channel; the lower jack, for the right channel. When connecting a monophonic turntable, use the upper jack.

27. PHONO CER TERMINALS

Connect here the output cords of a turntable equipped with a ceramic cartridge. The upper jack is for the left channel; the lower jack, for the right channel. When connecting a monophonic turntable, use the upper jack.

28. AUXILIARY TERMINALS

These jacks are used when connecting the output cords of a cartridge tape player. Also use these jacks for reproducing the audio output of a TV receiver. The upper jack is for the left channel; the lower jack, for the right channel.

29. GROUND TERMINAL 2

If the turntable or other equipment to be used with the receiver has a ground conductor, connect it to this terminal.

30. TAPE MONITOR TERMINALS

Connect to these jacks the playback output terminals (line output) or monitor terminals of the tape recorder (or tape deck) used with the receiver.

31. TAPE RECORDING TERMINALS

Connect to these jacks the recording input terminals (line input) of the tape recorder (or tape deck). The signals outgoing from these terminals cannot be adjusted with the VOLUME (17), BASS (7) or TREBLE (8) controls.

NOTE: For correct connection to the TAPE MONITOR (30) and TAPE RECORDING (31) jacks, refer to the article "CONNECTION OF TAPE RECORDER".

32. TAPE RECORDING/PLAYBACK CONNECTOR (DIN TYPE)

Provided that the tape recorder (or tape deck) to be used has a DIN-type tape recording/playback connector, connection for recording and playback (and monitor) can be completed simply by linking the tape recorder with the receiver through the recording/playback cord that is separately available. When this connector is used, terminals (30) and (31) are not used.

33. LINE OUTPUT TERMINALS (CONTROLLED)

These are the preamplifier output terminals. They are used when using a power system (Model IS-80 or IS-70) of PIONEER's integrate stereo equipment. Also, a high-power stereo system can be composed by connecting other high-power amplifier to these terminals.

34. OUTPUT TERMINAL

This is the output terminal of right and left channels mixed together. To this terminal, a center channel loudspeaker or the monophonic power amplifier for a 3D system will be connected.

35. FUSE HOLDER

This is the fuse holder for glass-tube. If it is necessary to replace the fuse, always use a 2A type fuse.

36. AC CORD

37. AC OUTLET (SWITCHED)

The power obtained from this AC outlet is turned ON and OFF interlinked with the operation of SPEAKER SWITCH (1). A maximum of 120VA can be supplied to the turntable or other equipment connected.

38. AC OUTLET (UNSWITCHED)

An AC outlet having a capacity of 200 VA. This power outlet is not interlinked with the operation of SPEAKER SWITCH (1).

CONNECTION OF LOUDSPEAKER SYSTEMS

- o When connecting loudspeakers, extract speaker connector plug from the accessory bag and connect the speaker wire leads to the plugs as illustrated below. Be sure to connect the positive of the leads to the positive terminal of the plug.
- o When the loudspeakers are connected to the plugs, insert the right channel speaker plug into the speaker system A terminal socket (18) and the left channel speaker plug into the speaker system A terminal socket (19). (Refer to the connection diagram shown in page 2).
- o When using two speaker systems, connect the wire leads of the second speaker system to speaker plugs as described above, and insert the right channel speaker plug of this speaker system into the speaker system B terminal socket (20) and the left channel speaker plug into the speaker system B terminal socket (21).

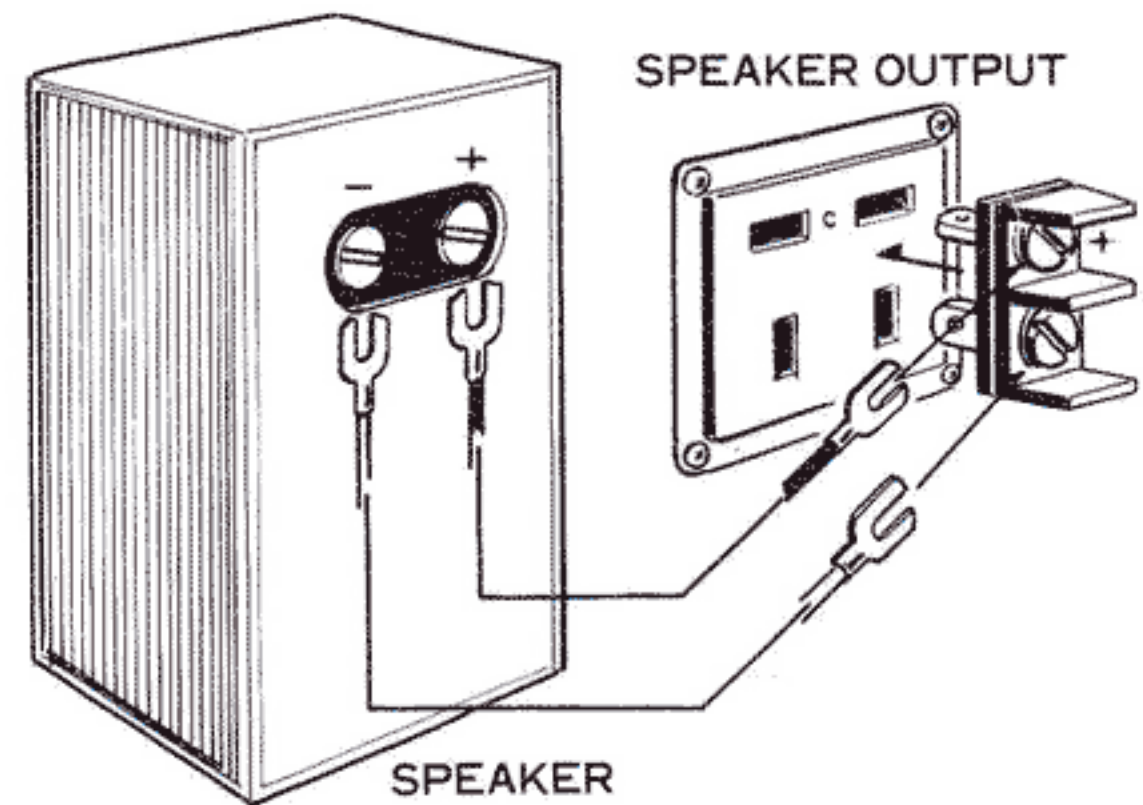


Fig. 6

ANTENNA CONNECTION AND GROUNDING

FM BROADCAST RECEIVING ANTENNA

The field strength of FM broadcast is much attenuated behind mountains and buildings, and in ferroconcrete buildings. This requires to use an FM antenna of different type depending on the area and place where the receiver will be used. Use the most suitable antenna, referring to the following:

- * Employ the T-type indoor antenna accessory to the receiver when using the receiver within a wooden building near the FM radio station. Connect the end of the vertical section of the T-type antenna to the FM ANTENNA TERMINALS (25) as shown in Fig. 7, and expand the horizontal section of the T-type antenna. While actually receiving broadcast, determine the direction of the horizontal section for the best radio reception and fix it on a wall or other place. Refer to the article "RECEPTION OF FM BROADCAST" regarding the determination of the antenna direction.
- * When using the receiver far from the broadcasting station, behind a mountain or within a ferroconcrete building, install an FM radio antenna (or FM/TV common antenna) outdoor and connect it to the FM antenna terminals (25). The FM antenna is various in type, having 3 to 7 elements. Select the most suitable antenna by consulting a nearby radio antenna sales store. (Fig. 8)

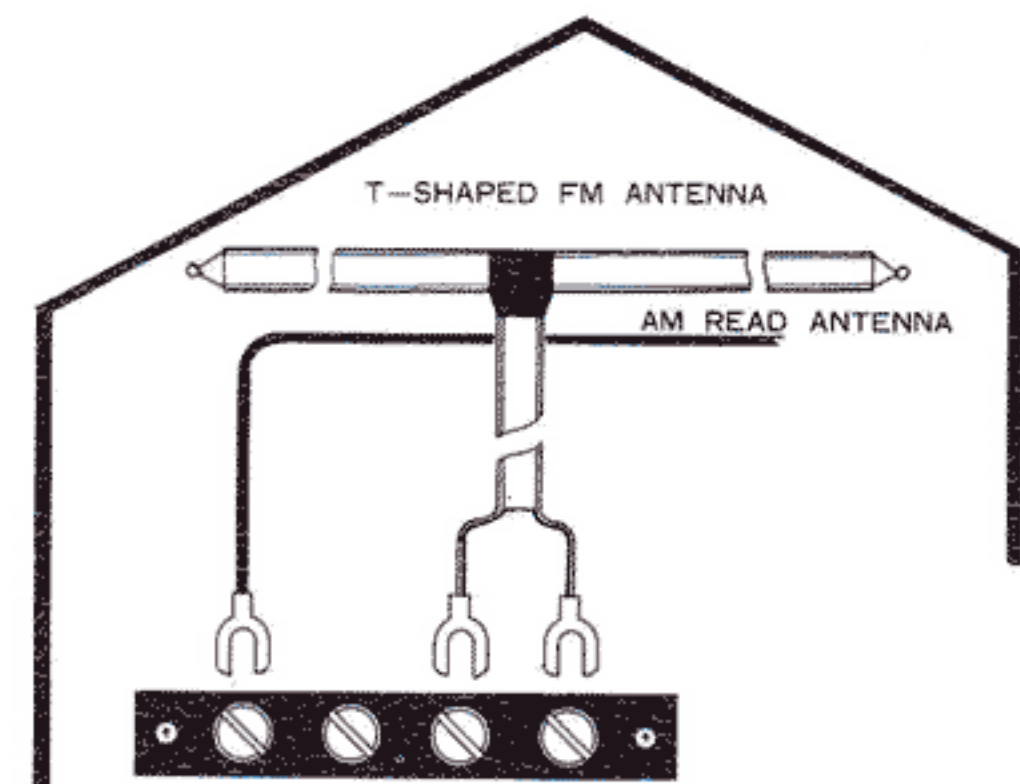


Fig. 7

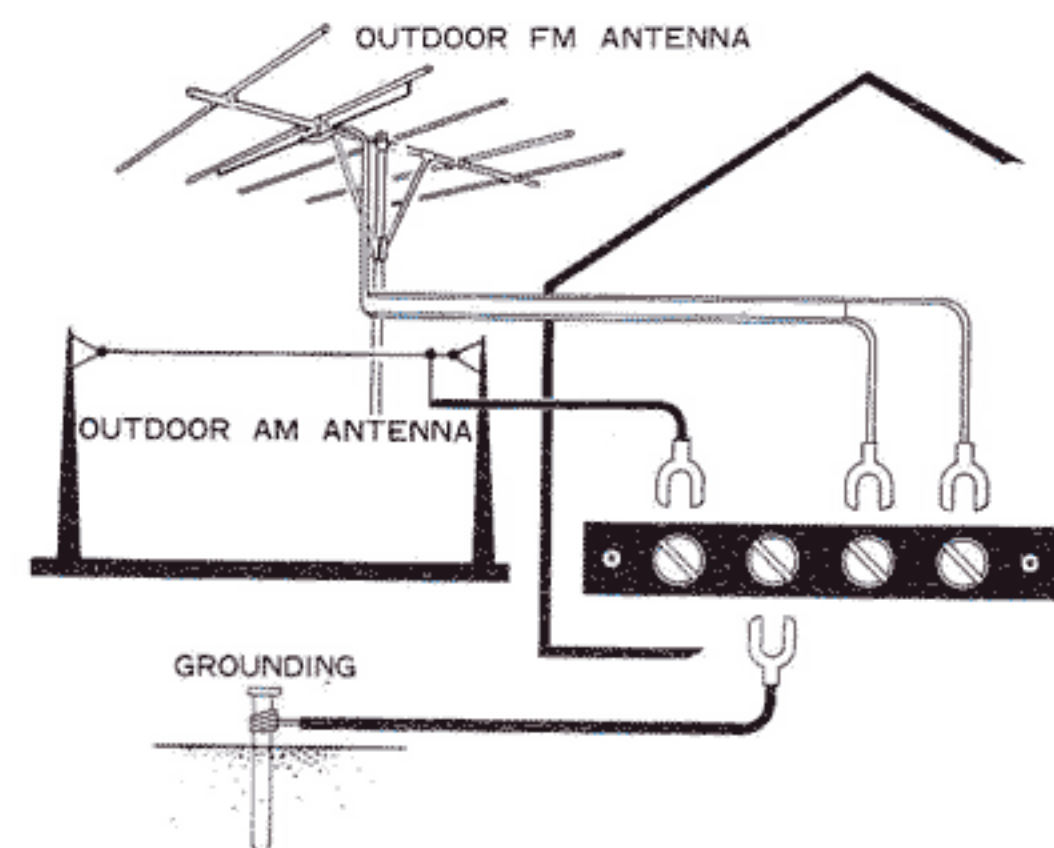


Fig. 8

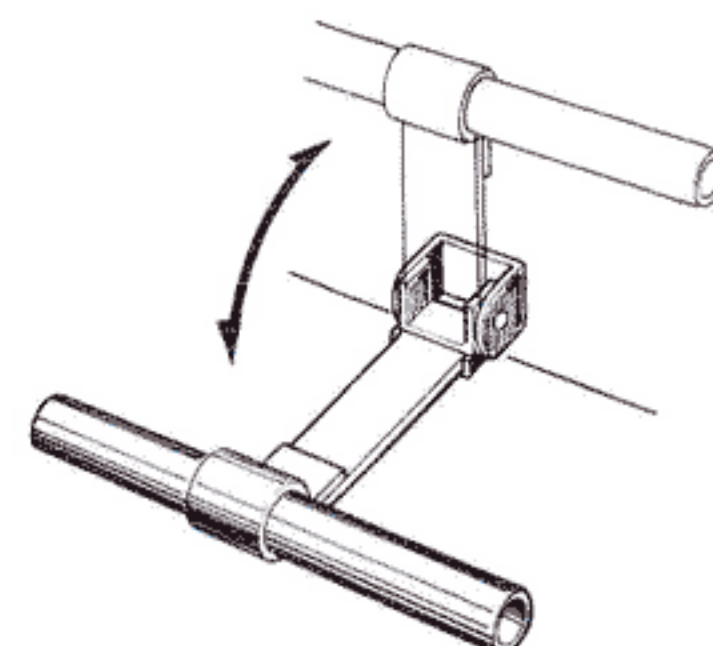


Fig. 9

NOTE: The installation procedure of FM radio antenna is similar to that of TV antennas. For details, follow the instructions accompanying the FM radio antenna purchased.

AM BROADCAST RECEIVING ANTENNA

- * When using the SX-770 near the broadcasting station or inside a wooden building, it is unnecessary to install an AM antenna. In such an area, set the direction of the AM FERRITE ANTENNA for the best radio reception while actually listening to broadcasts. Refer to the article "RECEPTION OF AM BROADCAST". (Fig. 9)
- * If good reception cannot be attained even by properly adjusting the direction of the AM FERRITE ANTENNA, use the accessory AM lead wire antenna. Connect one end of the antenna to the AM ANTENNA TERMINAL (23) and expand the wire along a wall of the room. (Fig. 7)
- * If good reception cannot be attained even when the accessory lead wire antenna is used, install an AM antenna outdoors. Connect the lead-in wire of the outdoor antenna to the AM ANTENNA TERMINAL (23). (Fig. 8)



NOTE:

For the outdoor antenna, a standard AM broadcast antenna can be formed by purchasing PVC wire from an electric appliance shop and installing it 25 feet (7.5m) above the ground for a horizontal length of 50 feet (15m), with a feeder line 30 feet (10m) long. These wire lengths may not be so precise and may be as long as allowed by the place of installation. However, the height of the horizontal section of the antenna should not be too low to attain a good antenna effect.

GROUNDING

- * Grounding or non-grounding the GROUND TERMINAL 1 (24) does not much affect the performance of the receiver. However, it is desirable to ground the terminal from the viewpoint of safety.
- * Connect to the GROUND TERMINAL 1 (24) the ground conductor leading to the earth.

CONNECTION OF TURNTABLE

- * If the turntable to be used with the receiver has a magnetic cartridge, connect the output cords of the turntable to the PHONO MAGNETIC TERMINALS (26); if the turntable has a crystal or ceramic cartridge, connect the output cords to the PHONO CER TERMINALS (27). Insert the output cord plug for the left channel into the upper terminal jack, and that for the right channel into the lower terminal jack. When using a monophonic turntable, connect its output cord to the upper (left channel) terminal.

NOTE:

If the output cord plug of the turntable to be connected does not fit the input terminal jack of the receiver, replace the plug with the pin plug contained in the accessory bag.

CONNECTION OF TAPE RECORDER (OR TAPE DECK)

- * The tape recorder to be used with the receiver should have an output terminal (line output) for connection to external amplifier, or a tape monitor terminal.
- * When using a tape deck, the tape deck should have a recording/playback preamplifier built in. PIONEER's Model T-500, T-600 separately available can be used with the receiver without any problems.

CONNECTION FOR RECORDING

Connect the recording input terminals (line input) of the tape recorder (or tape deck) to the TAPE RECORDING TERMINALS (31) of the receiver. For this connection, use the cords which are normally accessory to the tape recorder. The upper one of the recording input terminals (line input) is for the left channel: the lower one, for the right channel. When the tape recorder is monophonic, connect its input terminal to the upper TAPE RECORDING TERMINAL (31):

CONNECTION FOR PLAYBACK (OR TAPE RECORDING MONITOR)

Connect the playback output terminals (line output or tape monitor terminals) of the tape recorder (or tape deck) to the TAPE MONITOR TERMINALS (30). The connecting procedure is similar to that of the above "CONNECTION FOR RECORDING".

USE OF TAPE REC/P.B. CONNECTOR

If the tape recorder (or tape deck) to be connected to the receiver has a recording/playback connector of DIN type, connect it to the TAPE REC/P.B. CONNECTOR (32) of the receiver. Disregard "CONNECTION FOR RECORDING" and "CONNECTION FOR PLAYBACK".

CONNECTION OF CARTRIDGE TAPE PLAYER

When using the cartridge tape player (PIONEER's Model H-60E), connect its output to the AUXILIARY TERMINALS (28). The connecting procedure is similar to that for turntable connection.

RECEPTION OF BROADCAST

BEFORE TURNING ON THE SPEAKER SWITCH OF THE RECEIVER, CHECK THE FOLLOWING

VOLUME CONTROL KNOB (17) is set to "MIN".
TAPE MONITOR SWITCH (13) is set to "OFF".
MODE SWITCH (14) is set to "STEREO".

RECEPTION OF FM BROADCAST

1. Set the SELECTOR knob (5) to the "FM AUTO" position.
2. Set the AFC switch (11) to the OFF position.
3. While observing the pointer deflection of the TUNING INDICATOR (2), tune the receiver to the desired station by using the TUNING knob (4). The best reception is attained when the pointer of the TUNING INDICATOR (2) largely deflects rightward. If the tuned station is broadcasting a stereo program, the STEREO INDICATOR (3) lights. With the SELECTOR knob (5) in this position, monophonic programs can also be received.
4. Set the AFC switch (11) to the ON position.
5. When the desired station is tuned in, gently turn the VOLUME CONTROL knob (17) clockwise. Adjust the BASS CONTROL (7) and TREBLE CONTROL (8) for the desired tone.
 - * When the receiver is used very far from the broadcasting station, or external noise is intensive, the noise is suppressed and better reception is attained by setting the SELECTOR knob (5) to the "FM MONO" position. When the knob is in this position, however, stereo programs are received as monophonic programs.
6. When good radio reception cannot be attained by the above operating procedures 1 to 5, reconsider the antenna, referring to the article "ANTENNA CONNECTION AND GROUNDING".

RECEPTION OF AM BROADCAST

1. Set the SELECTOR knob (5) to the AM position.
2. While observing the pointer deflection of the TUNING INDICATOR (2), tune the receiver to the desired station by using the TUNING knob (4). The best reception is attained when the pointer of the TUNING INDICATOR (2) largely deflects rightward.
3. When the desired station is tuned in, adjust the VOLUME CONTROL (17), BASS CONTROL (7) and TREBLE CONTROL (8) for desired sound volume and tone.
4. When good radio reception cannot be attained, such as speaker sound is noisy or inferior in tone quality by the above operating procedures 1 to 3, reconsider the antenna, referring to the article "ANTENNA CONNECTION AND GROUNDING". When the receiver is used very near the broadcasting station, the field intensity is sometimes too strong, resulting in low tone quality. If this occurs, shorten or remove the antenna connected to the AM antenna for the best radio reception.



PLAY OF DISK RECORD

1. Set the SELECTOR knob (5) to the "PHONO" position.
2. When using a monophonic turntable, set the MODE switch (14) to the "MONO" position.
3. Adjust the VOLUME, BASS and TREBLE CONTROLS for desired sound volume and tone.

PLAY OF CARTRIDGE TAPE

1. Set the SELECTOR knob (5) to the "AUX" position.
2. The succeeding procedure is similar to its counterpart of the disk turntable operation.

RECORDING AND PLAYBACK WITH TAPE RECORDER (OR TAPE DECK)

The same signals as those emitted from loudspeakers can always be taken out from the TAPE RECORDING TERMINALS (31) of the receiver. Operate the SELECTOR knob (5) and MODE SWITCH (14) according to the program source to be recorded, following the instructions described in articles "RECEPTION OF BROADCAST" and "PLAY OF DISK RECORD".

The VOLUME BASS and TREBLE controls of the receiver cannot be used for the tape recording. The recording level should be adjusted by the control of the tape recorder (or tape deck).

NOTE:

When using a monophonic tape recorder, signals of either left or right channel only can be recorded.

PLAYBACK

Set the TAPE MONITOR SWITCH (13) to the "ON" position. Adjust the VOLUME, BASS and TREBLE CONTROLS for desired sound volume and tone.

- * When the TAPE MONITOR SWITCH (13) is in the "ON" position, the position of the SELECTOR knob (5) is unrelated to the playback operation.

TAPE MONITOR

If the tape recorder used with the receiver is provided with a monitor circuit, monitor can be effected regardless of the tape recorder being two-head or three-head type. Connect the tape recorder to the receiver recording and playback terminals. By setting the TAPE MONITOR (13) from "OFF" to "ON" while making recording, the signals applied to the recording head can be monitored if the tape recorder is of the two head system. If a three-head tape recorder is used, recorded signals can be monitored immediately after recording.

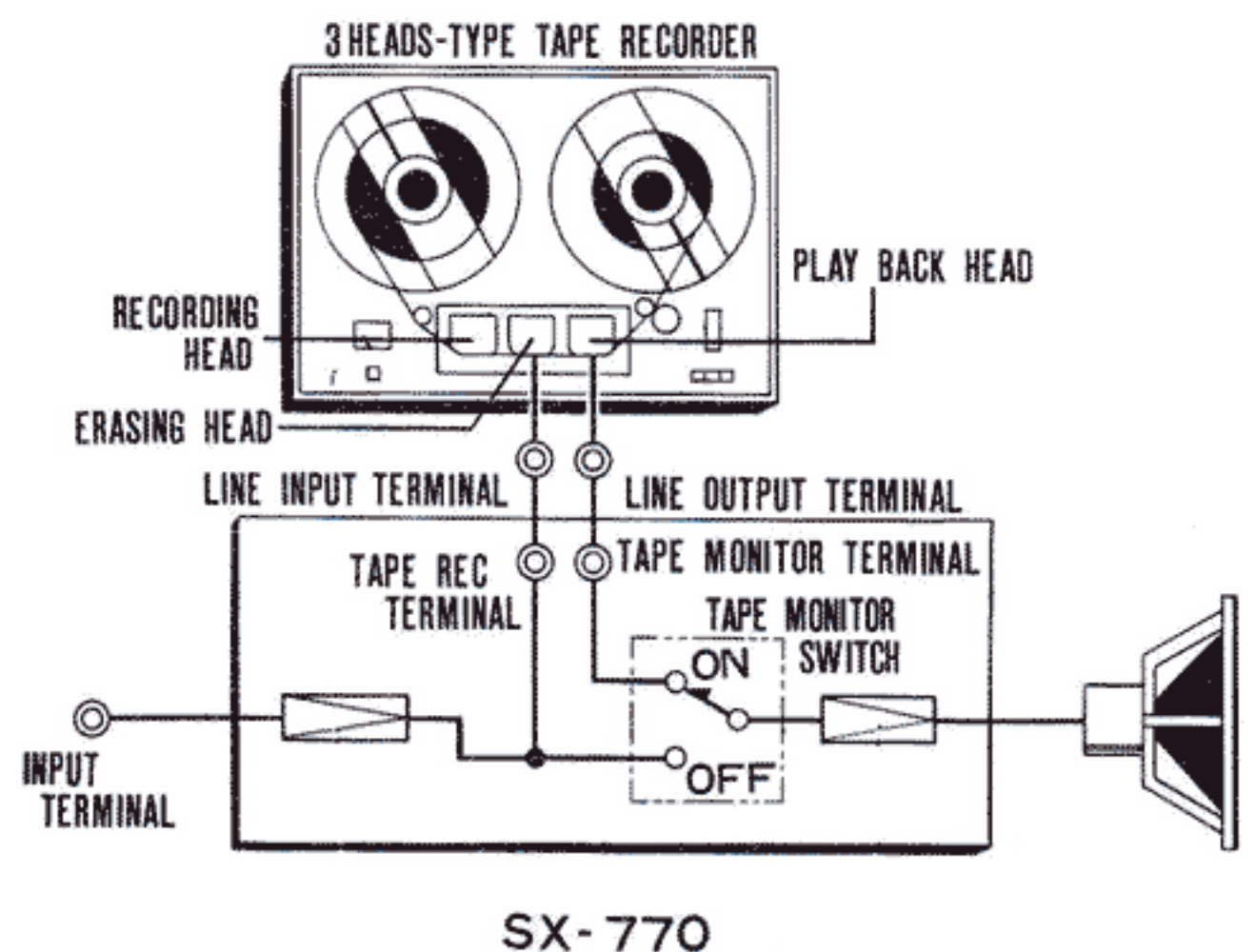


Fig. 10

MODEL SX-770 IS ALSO USABLE AS FOLLOWS

By using the center channel output terminal

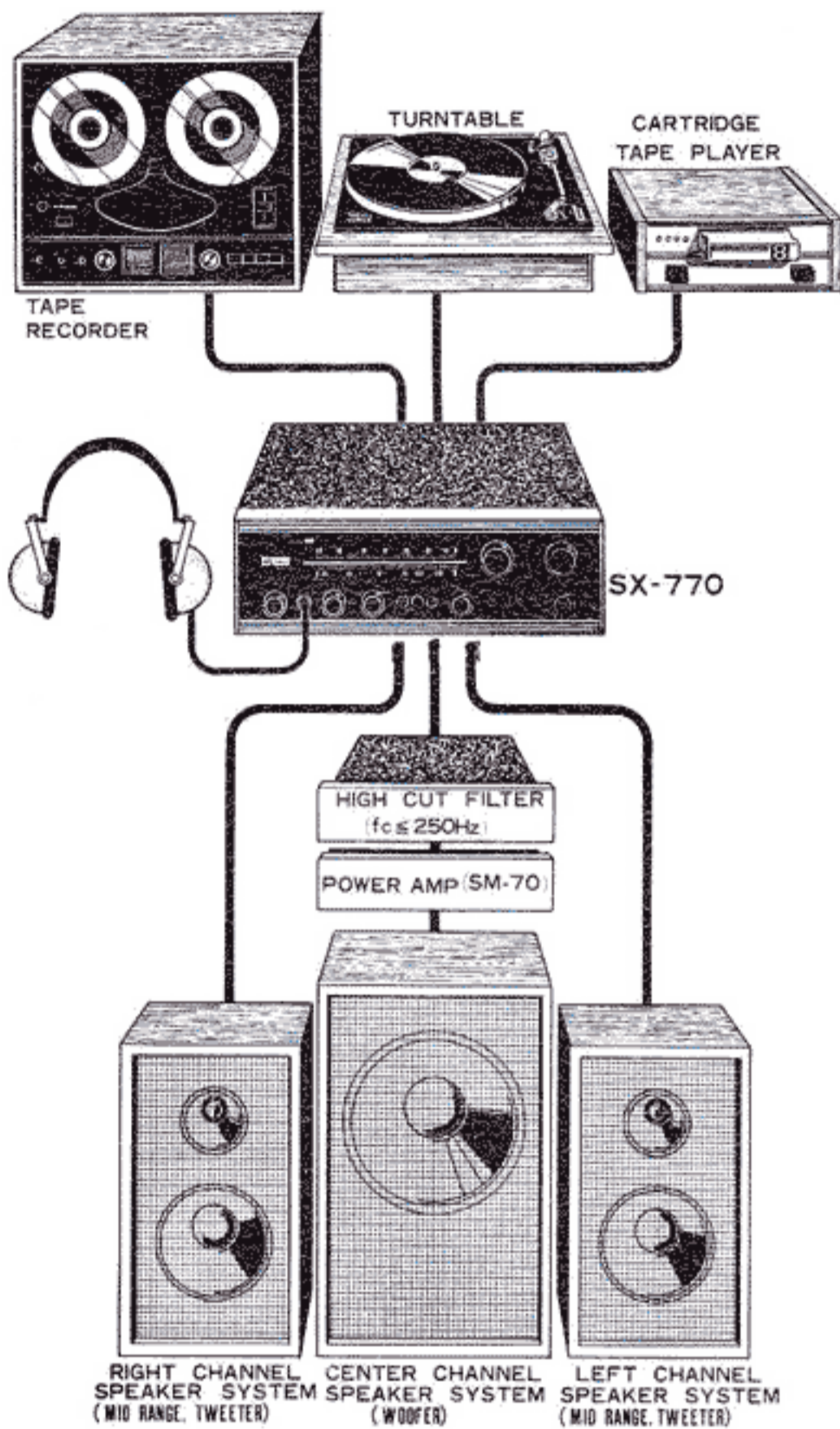
1. For prevention of the hole effect

When employing a three-speaker system to prevent the hole effect which is apt to be caused to the stereo play in a large room, connect an additional power amplifier to this terminal.

2. For bass compensation

A bass-compensated system can be composed by cutting off the part higher than 250 Hz of the center channel output with a high-cut filter.

Fig. 11



By using the line out terminal

Model SX-770 can be used as a preamplifier by connecting Model IS-80 or IS-70 Power System of PIONEER's integrated stereo equipment to this terminal.

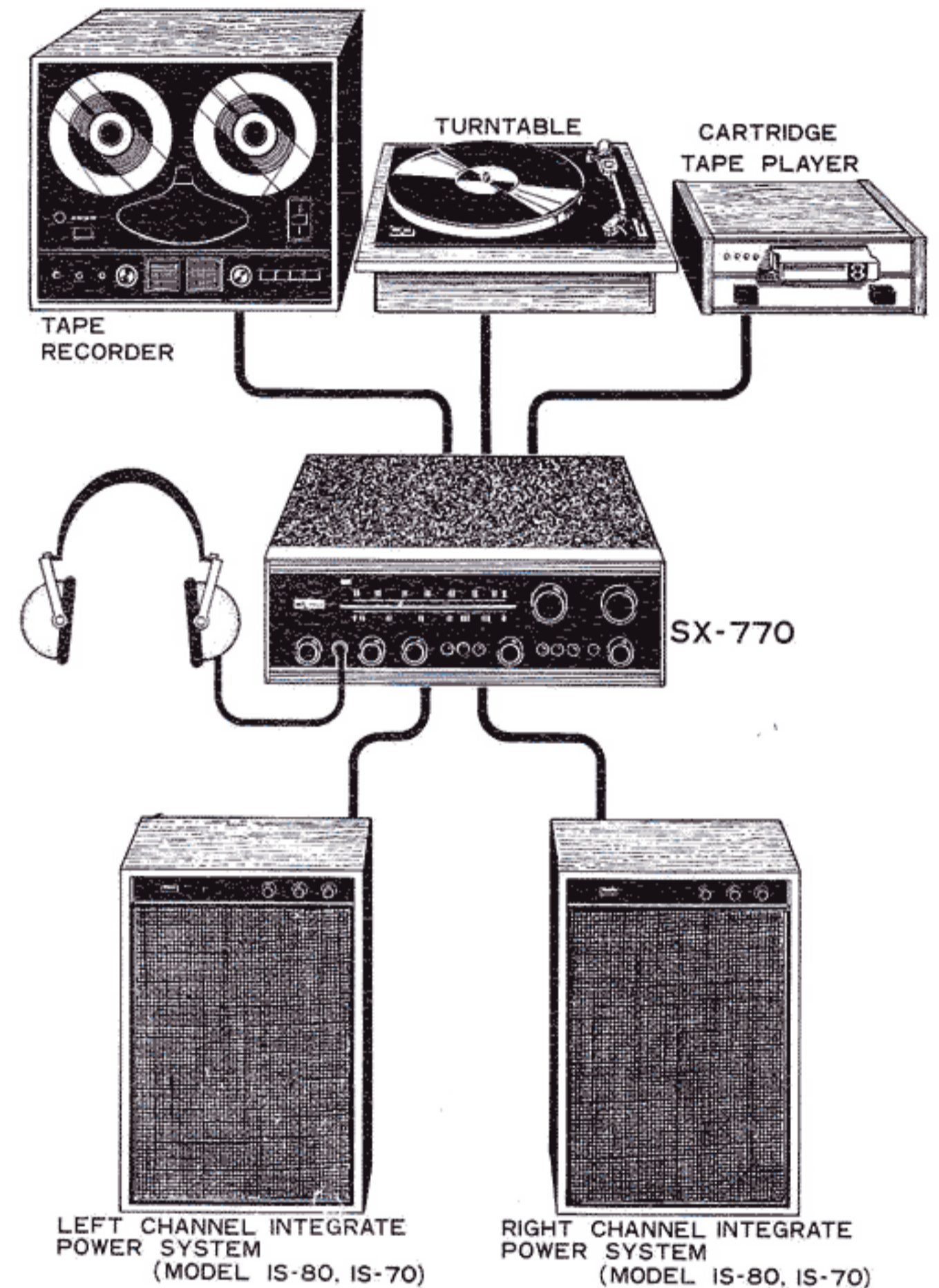


Fig. 12

By connecting a microphone

The output of a microphone can be connected to the microphone jack located on the front panel. The microphone can be used simply after setting the SELECTOR Knob to the PHONO/MIC position. When the microphone is connected to the jack, however, the turntable output is disconnected from Model SX-770.

NOTE:

1. The microphone to be used should have a high impedance.
2. Other output cannot be supplied to the loudspeaker terminals simultaneously with the microphone output.

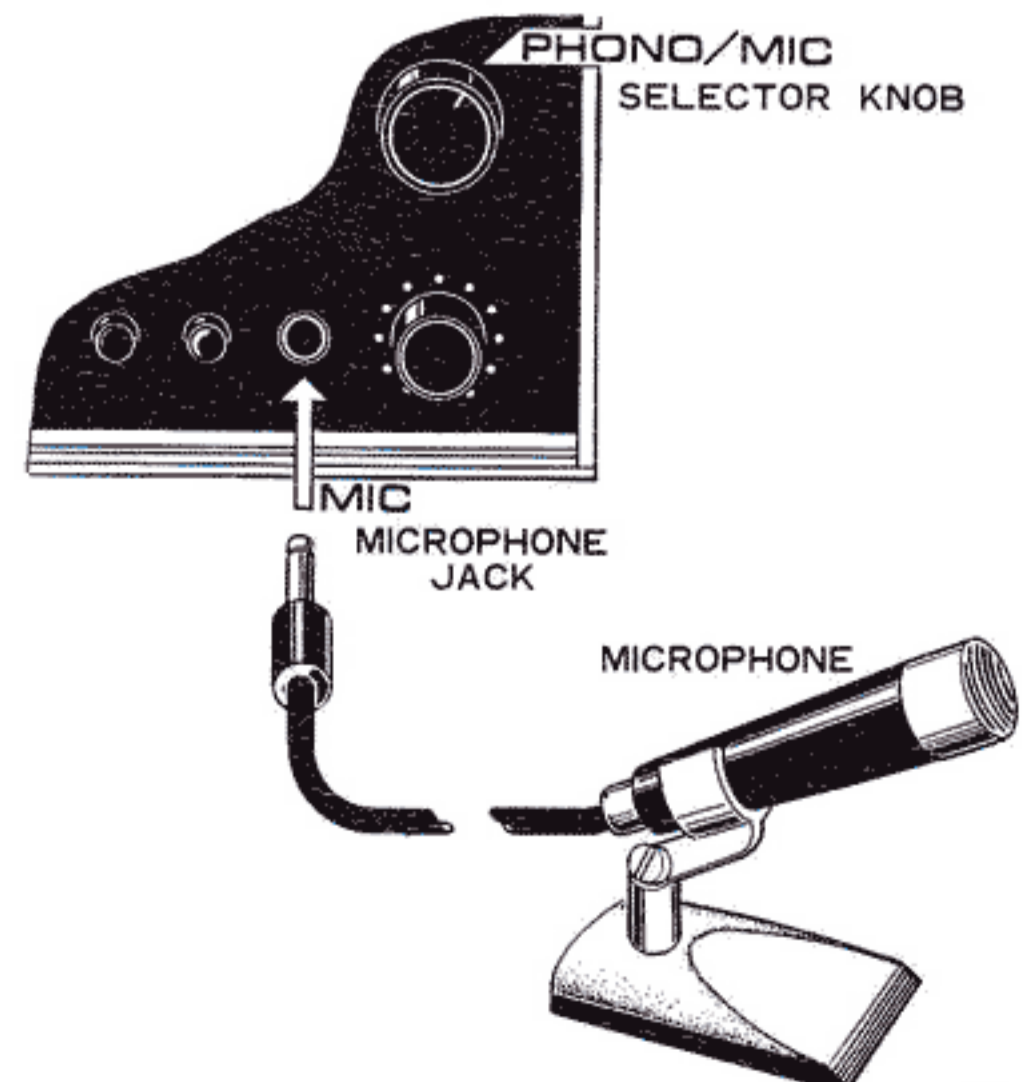


Fig. 13



ALIGNMENT

ALIGNMENT OF FM SECTION

Disconnect output terminal of front end (3, 4) from (3) terminal of Tuner Unit

Position of Switch: Selector FM MONO

AFC..... OFF

Muting.....OFF

Volume Control Setting: Fully counterclockwise

STEPS	Input			Dial Setting	Output Equipment Connections	Alignment	
	Equipment Connections	Frequency	Level			Adjust	Remarks
1	Sweep Generator	10.7MHz	40dB		Oscilloscope	T1 T2 T3	Adjust for maximum sensitivity and symmetrical characteristics.
	3				12		
2	Sweep Generator	10.7MHz	80dB		Oscilloscope		Check symmetry of characteristic curve
	3				12		
3	Sweep Generator	10.7MHz	40dB		Oscilloscope	T4	Adjust the primary core of T4 so that straight portion of "S" curve will become the steepest and adjust the secondary core so that the center of "S" curve will coincide with the center of the marker.
	3				12		
4	Connect output terminal of front end (3, 4) to (3) terminal of Tuner Unit						
5	Signal Generator	90MHz	20dB (400Hz 30%)	90MHz	VTVM Oscilloscope	L3	Adjust for maximum deflection.
	FM antenna terminal				16		
6	Signal Generator	106MHz	20dB (400Hz 30%)	106MHz	VTVM Oscilloscope	CT3	Adjust for maximum deflection.
	FM antenna terminal				16		
7	Repeat STEPS 5 and 6 several times.						
8	Signal Generator	90MHz	20dB (400Hz 30%)	90MHz	VTVM Oscilloscope	T1, T2 L1, L2	Adjust for maximum deflection.
	FM antenna terminal				16		
9	Signal Generator	106MHz	20dB (400Hz 30%)	106MHz	VTVM Oscilloscope	CT1 CT2	Adjust for maximum deflection.
	FM antenna terminal				16		
10	Repeat STEPS 8 and 9 several times						

ALIGNMENT OF MPX SECTION

Position of Switch: SELECTOR FM AUTO
 AFC.....OFF MUTING.....OFF
 Volume Control Setting: Fully Counterclockwise
 Input Signal: Main (L + R) 40.5kHz Deviation (60%)
 19kHz Pilot 7.5kHz Deviation (10%)

STEPS	Circuit to be Adjusted	Input		Connect VTVM	Alignment	
		Connections	Signal		Adjust	Remarks
1	Set the VR1 (in MPX Unit) to minimum					
2	Separation	MPX SG to FM antenna terminal	L or R	A C VTVM 8 or 10	L1	Adjust for minimum deflection of the other channel
3	Separation	MPX SG to FM antenna terminal	L or R	A C VTVM 8 or 10	VR1 L1	Adjust for minimum deflection of the other channel
4	Repeat STEPS 2 and 3 several times					

ALIGNMENT OF AM SECTION

Position of Switch: Selector.....AM
 Volume Control Setting: Fully Counterclockwise

STEPS	Input			Dial Setting	Output Equipment Connections	Alignment	
	Equipment Connectors	Frequency	Level			Adjust	Remarks
1	Sweep Generator Antenna terminal through dummy	455kHz	50dB	Point of no interference as near as 525kHz	VTVM Oscilloscope 10	T5 T6 T7	Adjust for maximum sensitivity and symmetrical characteristics.
2	Signal Generator Antenna terminal through dummy	600kHz	30dB	600kHz	VTVM Oscilloscope 10	T8	Adjust for maximum deflection
3	Signal Generator Antenna terminal through dummy	1,400kHz	30dB	1,400kHz	VTVM Oscilloscope 10	CT2	Adjust for maximum deflection
4	Repeat STEPS 2 and 3 several times						
5	Signal Generator Antenna terminal through dummy	600kHz	30dB	600kHz	VTVM Oscilloscope 10	L1 (Adjusting core)	Adjust for maximum deflection
6	Signal Generator Antenna terminal through dummy	1,400kHz	30dB	1,400kHz	VTVM Oscilloscope 10	CT1	Adjust for maximum deflection
7	Repeat STEPS 5 and 6 several times						



SPECIFICATIONS

* SEMICONDUCTORS

Tuner Section		Audio Section	
F E T	1	Transistors	20
Transistors	11	Diodes, etc.	6
Diodes	17		

* AUDIO SECTION

Circuit	Single ended Push Pull
Music Power Output	4 Ω 70 watts total
	8 Ω 52 watts total (IHF rating)
Continuous Power Output (both channel driven)	4 Ω 17 + 17 watts
	8 Ω 15 + 15 watts
Continuous Power Output (each channel driven)	8 Ω 20 w/20watts
Harmonic Distortion	Less than 0.8% (at 1kHz rated output)
Frequency Response	± 3 dB, from 20 Hz to 40 kHz (Over-all)
Power Bandwidth	15 Hz to 35kHz (AUX)
Damping Factor	35/8 Ω (at 1kHz)
Hum & Noise (at rated output)	MAG: better than 80dB AUX: better than 95 dB
Input Impedance and Audio Sensitivity (for rated output)	MAGnetic PHONO: 2.5 mv. 50k Ω (1kHz) CERamic PHONO: 58 mv. 100k Ω MICrophone: 5mV. 100k Ω (1kHz) TAPE MONITOR: 200mv. 100 k Ω (1kHz) AUXiliary: 200mv. 100k Ω (1kHz)
Output Terminals and Jacks	Speakers: Impedance 4 to 16 ohms, Stereo headphones jack. Simultaneous tape Recording jacks, equipped with TAPE MONITOR switch. Tape recording/playback jack (DIN type)
Equalization Curves	PHONO: RIAA
Tone Controls (each channel)	BASS: boost 13dB, cut 14dB (at 50 Hz) TREBLE: boost 10 dB, cut 9dB (at 10kHz)
Filters	HIGH: cut 9dB (at 10kHz)
Loudness Contour	ON-OFF boost 12 dB at 50 Hz, Boost 7.5 dB at 10kHz, with VOLUME control set at -40 dB

* FM SECTION

Circuit	Front end using F E T
Frequency Range	87.5 - 108 MHz
IHF Usable Sensitivity	1.8 μ v
Image Rejection	60 dB (at 98 MHz)
Signal to Noise Ratio	70 dB (IHF rating)
Antenna Input	300 ohms (balanced)

* MULTIPLEX SECTION

Circuit	Time-switching type demodulator FM Mono Stereo Automatic selection
Channel Separation	40 dB (at 1 kHz)

* AM SECTION

Circuitry	Superheterodyne
Frequency Range	525 - 1605 kHz
IHF Usable Sensitivity	10 μ v
Image Rejection	55 dB (at 1000 kHz)
Antenna Input	Built in Ferrite Loopstick Antenna

* MISCELLANEOUS

Power Requirements	117V	50 - 60 Hz
Power Consumption	117VA,	108 watts (Max)
Dimensions (overall)	16 15/16"	430 mm (width)
	5 11/16"	145 mm (height)
	13 3/4"	349 mm (depth)
Weight	Without package	21 lb 2 oz 9.6 kg
	With package	24 lb 7 oz 11.1 kg

- o Specifications and the design may be subject to modification without notice.

CONDITIONS FREQUENTLY MISTAKEN FOR TROUBLES

Noise: There are a variety of noises relating to the operation of a hi-fi unit. These are generally divided into two types; (1) the unit is faulty (a transistor or part is deteriorated) and (2) an external source of noise gives noise to the unit.

When a hi-fi unit produces an unpleasant noise, it is often judged that the unit is faulty, but statistical records indicate that the majority of noises produced in hi-fi acoustic units result from external sources of noise. Due to the inherent high sensitivity

and the high fidelity in reproduction, the unit amplifies and reproduces extraneous noises, however small, into definite output noise. If your receiver produces a noise, check according to the following table and trace out the source of noise for an appropriate corrective action.

The table includes the conditions that may be mistaken for troubles of the unit.

	Symptom	Suspected Source of Noise	Diagnosis and Remedy
when Listening to Broadcasts	Continuous or intermittent noise like jjjjjj or zzzzzz.	<ul style="list-style-type: none"> ● Statics or listening. ● Fluorescent lamp, motor, or thermostat may be used in house or in the vicinity of the house. 	In many cases, it is very difficult to remove the source of noise. In order to increase the radio input larger than the noise level, set up a good outdoor antenna and make a complete grounding.
	When a station is tuned in, hum is mixed in the program.	<ul style="list-style-type: none"> ● Poor fluorescent lamp, motor, or electric heater may be used in house or near the house. 	Reversing the line plug may occasionally alleviate this noise problem. Usually it is very difficult to eliminate the noise.
	Hissing sound noise in AM (medium wave) reception.	<ul style="list-style-type: none"> ● The frequency of an adjacent station is interfering with that of the station being tuned in (10kHz beat interference). ● TV set is on in the same house with the receiver. 	Impossible to remove such interference. If the cause of such noise is in the TV set, increase the distance between the TV set and receiver.
	Static noise in FM reception (in particular, when automobiles run close to the house).	<ul style="list-style-type: none"> ● White noises generated from automobile engines. ● Radio frequency sewing machine or welding machine being used near your house. 	In an area surrounded by hills or high buildings, the FM input signals are very weak. Thus the noise limiter in the circuit loses its function. Set up an outdoor FM antenna having many reflector elements.
when playing Records	Reception of FM stereo program contains more noise than FM mono program.	<ul style="list-style-type: none"> ● Note that the service area covered by an FM stereo broadcast is about 50% of that of a regular mono broadcast. 	Increasing FM input signal may alleviate this problem. Use an exclusive FM outdoor antenna instead of the indoor T-antenna.
	Hum or buzz. When switched to radio reception, the noise will disappear.	<ul style="list-style-type: none"> ● Poor connection of shielded wire (a) ● Jack connection is loose. (b) ● Line cord or fluorescent lamp is near the shielded wire. (c) ● Poor grounding. (d) ● HAM transmitting station or TV transmitting station is near your house. (e) 	Correct the conditions stated in (a), (b), (c) or (d). In case of (e), report it to an official activity.
	Output tone quality is poor and mixed with noise. Treble is not clear.	<ul style="list-style-type: none"> ● Stylus is worn out. (a) ● Record is worn out. (b) ● Dust adheres to stylus. (c) ● Improper mounting of stylus. (d) ● Stylus pressure is not proper. (e) ● The TREBLE sound level is too high. 	Check (a) through (e) and correct the condition. Lower the TREBLE level.

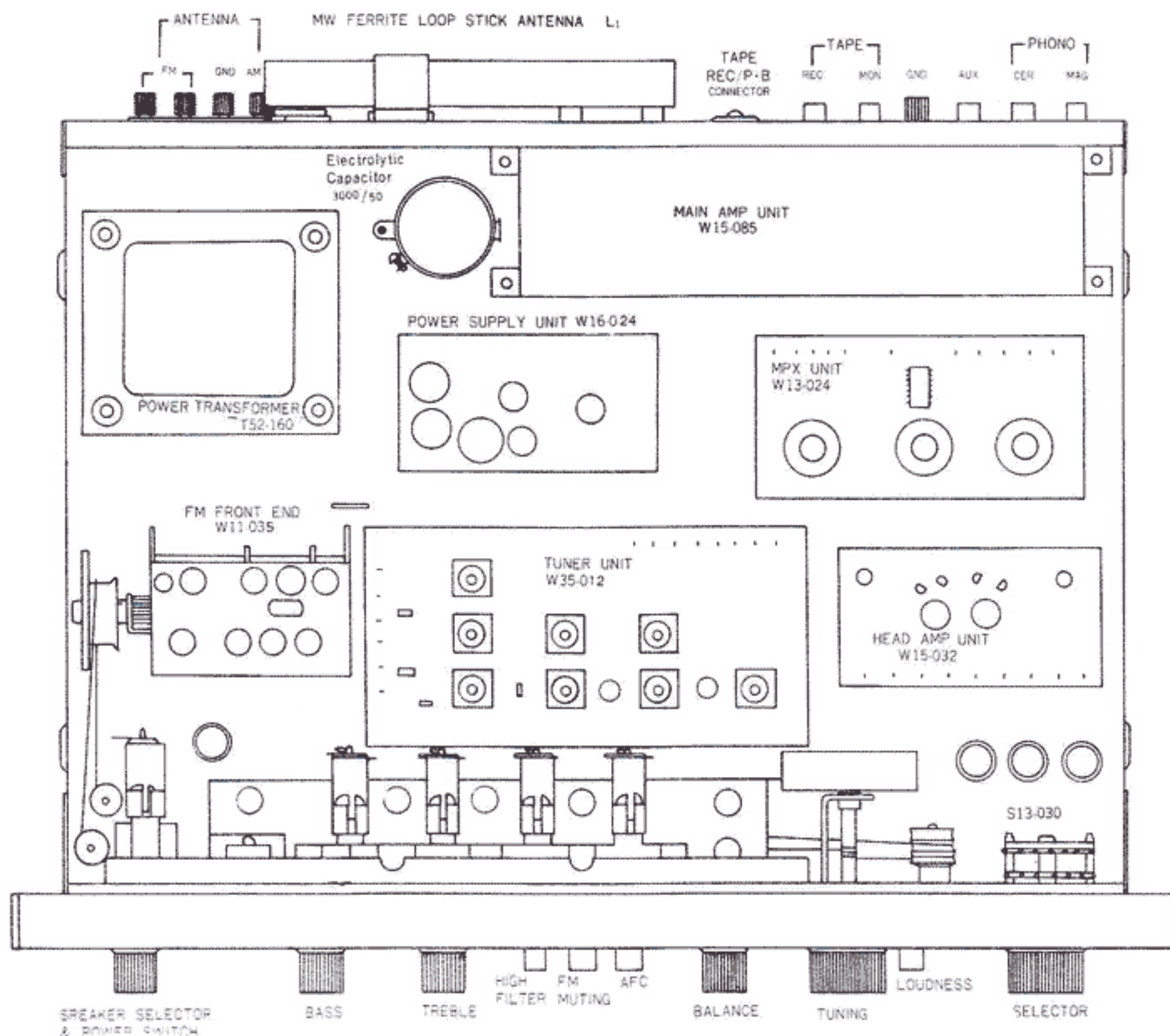
Further, watch the following conditions: These are also apt to be mistaken for troubles of the unit.

	Symptom	Suspected Source of Noise	Diagnosis and Remedy
	Power is not turned on although the power switch is set to ON.	<ul style="list-style-type: none"> ● Fuse is blown. (a) ● Line plug is loose. (b) 	Check (a) and (b) and correct the condition.
	In playing a record, increasing the volume will cause howling.	<ul style="list-style-type: none"> ● Distance between the record player and the speakers is too short. ● The place on which the record player or speakers are set is unstable. 	Change the distance or rearrange the installation positions of the unit and speakers. (Installing the record player on a firm, solid stand may alleviate this problem.) Do not enhance the BASS sound level excessively.



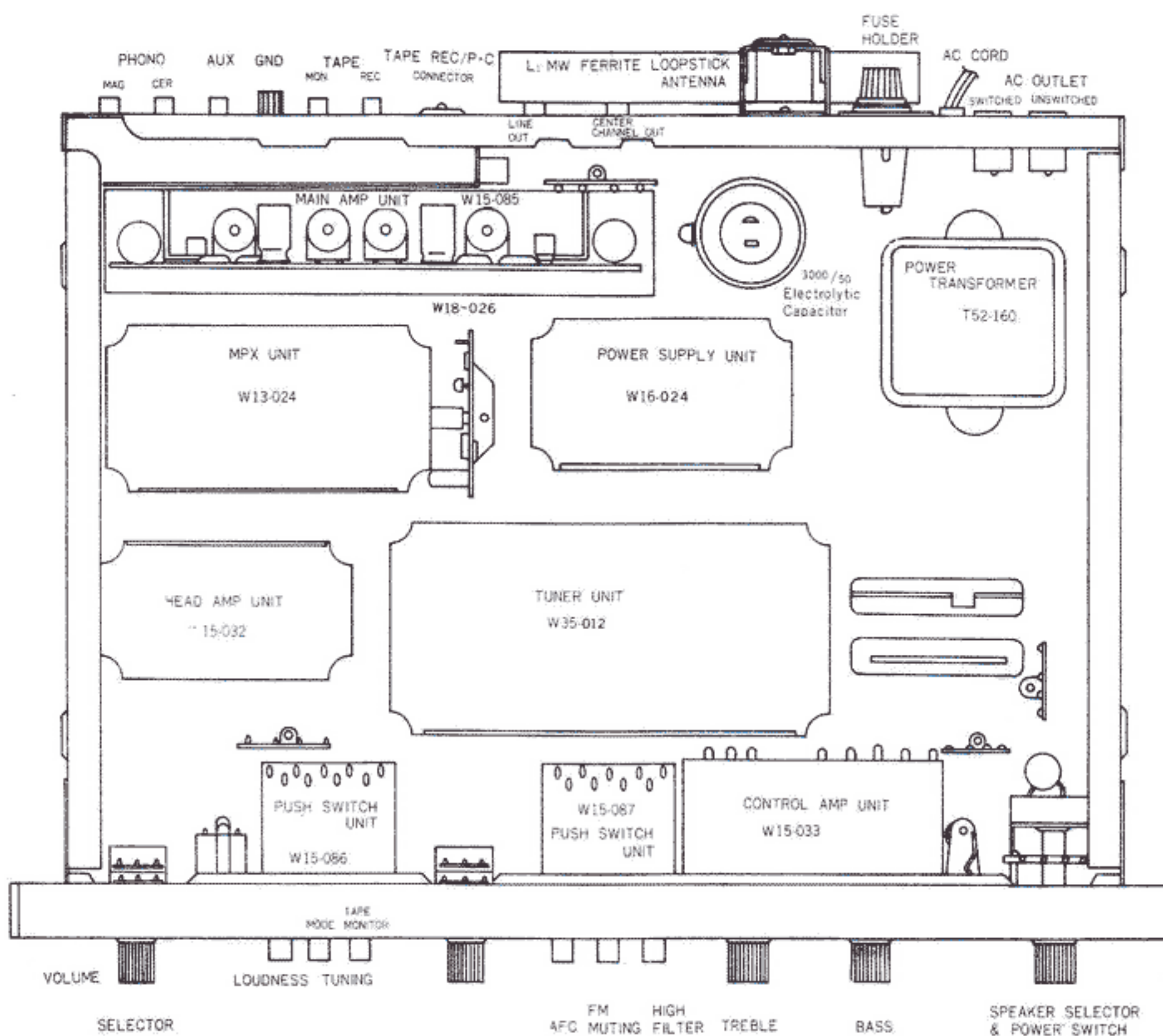
PARTS LAYOUT

(TOP VIEW)



PARTS LAYOUT

(BOTTOM VIEW)



PARTS LIST

CAPACITORS IN μF , 10% TOLERANCE UNLESS OTHERWISE NOTED P: $\mu\mu\text{F}$

Symbol	Description				Part No.
C1	Ceramic	47P		50V	CCDSL470K50
C2	Ceramic	47P		50V	CCDSL470K50
C9	Mylar	0.003		50V	CQMA302K50
C10	Ceramic	220P		50V	CCDSL221K50
C11	Ceramic	220P		50V	CCDSL221K50
C12	Electrolytic	220		3V	CETG220MF3V
C14	Ceramic	0.04		50V	CKDYZ403K50
C15	Electrolytic	3000		50V	C52-066-0
C16	Oil paper	0.01			C15-001-0
C17	Ceramic	0.01	+80% -20%	D.C 1.4KV	C43-003-0
C19	Mylar	0.0018		50V	CQMA182K50
C20	Mylar	0.0018		50V	CQMA182K50
C21	Electrolytic	4.7		16V	CETG4R7MF16V

RESISTORS IN Ω , 10% TOLERANCE. $\frac{1}{4}$ WATT UNLESS OTHERWISE NOTED k: k Ω , M: M Ω , W: WATT

Symbol	Description				Part No.
R1	Carbon film	1M			RF $\frac{1}{4}$ PS 1M-K
R2	Carbon film	1M			RF $\frac{1}{4}$ PS 1M-K
R3	Carbon film	100K			RF $\frac{1}{4}$ PS 100K-K
R4	Carbon film	100K			RF $\frac{1}{4}$ PS100K-K
R5	Carbon film	68K			RF $\frac{1}{4}$ PS 68K-K
R6	Carbon film	68K			RF $\frac{1}{4}$ PS 68K-K
R7	Compound part for REC.terminal				W52-004-0
R8					
R9					
R10					
R11	Carbon film	33K			RF $\frac{1}{4}$ PS 33K-K
R12	Carbon film	33K			RF $\frac{1}{4}$ PS 33K-K
R15	Carbon film	3.9K		$\frac{1}{2}$ W	RF $\frac{1}{2}$ PS 3R9K-K
R16	Carbon film	3.9K		$\frac{1}{2}$ W	RF $\frac{1}{2}$ PS 3R9K-K
R17	Carbon film	1K		$\frac{1}{2}$ W	RF $\frac{1}{2}$ PS 1K-K
R18	Carbon film	1K		$\frac{1}{2}$ W	RF $\frac{1}{2}$ PS 1K-K
R19	Carbon film	39K		$\frac{1}{2}$ W	RF $\frac{1}{2}$ PS 39K-K
R20	Carbon film	39K		$\frac{1}{2}$ W	RF $\frac{1}{2}$ PS 39K-K
R21	Carbon film	150		3W	RO3P 150-K
R22	Carbon film	150		3W	RO3P 150-K
R23	Carbon film	1K		$\frac{1}{2}$ W	RF $\frac{1}{2}$ PS 1K-K
R24	Carbon film	1M			RF $\frac{1}{4}$ PS 1M-K
R25	Carbon film	100			RF $\frac{1}{4}$ PS 100-K
R27	Carbon film	2.2M		$\frac{1}{2}$ W	RF $\frac{1}{2}$ PS 2R2M-K

COILS AND TRANSFORMERS

Symbol	Description	Part No.
L1	AM Ferrite Loopstick Antenna	T42-025-0
L2	Choke Coil	T24-030-0
T1	POWER Transformer	T52-160-C

SWITCHES

Symbol	Description	Part No.
S1	Input Selector	S13-030-0
S2	Output Selector	S11-022-A

POTENTIOMETERS

Symbol	Description	Part No.
VR1	250k Ω dual, Volume	C82-038-0
VR2	50k Ω dual, Balance	C85-052-0

MISCELLANEOUS

Symbol	Description	Part No.
	FM FRONT END	W11-035-0
	TUNER Unit	W35-012-B
	MPX Unit	W13-024-D
	HEAD AMP Unit	W15-032-B
	CONTROL AMP Unit	W15-033-0
	MAIN AMP Unit	W15-085-0
	PUSH SWITCH Unit (A)	W15-086-0
	PUSH SWITCH Unit (B)	W15-087-0
	POWER SUPPLY Unit	W16-024-0
	MUTING Unit	W18-026-0
	Front Panel	M21-303-0
	Plastics Panel	M21-309-A
	Wooden Base	M52-112-0
	Dial Pulley	M49-009-B
	Dial Pulley (for Tuning Capacitor)	M42-041-C
	Dial Glass	A33-088-B
	Dial Pointer	A31-087-A
	Knob, Selector	A12-136-A
	Knob, Tuning	A12-139-A
	Knob, Volume, Balance, Bass Treble, Output Selector	A12-131-A
	Tuning Meter	A91-009-A
	Pilot Lamp (for Dial Glass)	E22-017-0
	Pilot Lamp (for Tuning Meter)	E22-020-0
	Pilot Lamp (for FM Stereo)	E22-015-A
	Pilot Lamp Socket	K42-003-0
	Bracket for FM Stereo	A62-045-0
	Fuse 2A	E21-027-0
	Fuse Holder	K96-007-0
	Microphone Jack	K72-020-0
	Headphone Jack	K72-021-B
	Connector 5P	K93-003-B
	Jack for Speaker	K73-003-A
	Spare AC Outlet	K82-011-0
	Terminal 6P	K22-013-C
	Terminal 4P	K22-010-A
	Terminal 2P	K21-009-C
	Terminal 1P	K21-005-C

FM FRONTEND (W11-035)

CAPACITORS

Symbol	Description				Part No.
C1	Ceramic	15P		50V	CCDSL150K50
C2	Ceramic	100P		50V	CCDSL101K50
C3	Ceramic	3P	$\pm 0.25\text{P}$	50V	CCDSL030C50
C4	Ceramic	0.02	+80% -20%	50V	CKDYZ203Z50



C5	Ceramic	0.02	+80% -20%	50V	CKDYZ203Z50
C6	Ceramic	18P	±5%	50V	CCDSL180J50
C7	Ceramic	2P	±0.25P	50V	CCDSL020C50
C8	Ceramic	10P	±1P	50V	CCDSL100F50
C9	Ceramic	0.001	±20%	50V	CKDYY102M50
C10	Ceramic	0.02	+80% -20%	50V	CKDYZ203Z50
C11	Ceramic	100P		50V	CCDSL101K50
C12	Ceramic	0.02	+80% -20%	50V	CKDYZ203Z50
C13	Ceramic	0.02	+80% -20%	50V	CKDYZ203Z50
C14	Ceramic	6P	±0.5P	50V	CCDSH060D50
C15	Ceramic	1P	±0.25P	50V	CCDSL010C50
C16	Ceramic	10P	±1P	50V	CCDRH100F50
C17	Ceramic	5P	±0.5P	50V	CCDCH050D50
C18	Ceramic	15P		50V	CCDCH150K50
C19	Ceramic	10P	±1P	50V	CCDCH100F50
C20	Ceramic	0.02	+80% -20%	50V	CKDYZ203Z50
C21	Ceramic	0.001	±20%	50V	CKDYY102M50

RESISTORS

Symbol	Description			Part No.
R1	Carbon film	100K		RD¼PS 100K-K
R2	Carbon film	1M		RD¼PS 1M-K
R4	Carbon film	47		RD¼PS 47-K
R5	Carbon film	4.7K		RD¼PS 4R7K-K
R6	Carbon film	15K		RD¼PS 15K-K
R7	Carbon film	1K		RD¼PS 1K-K
R8	Carbon film	1M		RD¼PS 1M-K
R9	Carbon film	10K		RD¼PS 10K-K
R10	Carbon film	3.3K		RD¼PS 3R3-K
R11	Carbon film	10K		RD¼PS 10K-K
R12	Carbon film	100		RD¼PS 100-K
R13	Carbon film	150K		RD¼PS 150K-K

DIODE AND TRANSISTORS

Symbol	Description	Part No.
D1	1S351R Vari-Cap. Diode	
Q1	2SK-19 FET	
Q2	SE3001 Transistor	
Q3	SE3001 Transistor	

COILS AND TRANSFORMER

Symbol	Description	Part No.
L1	R. F Coil	
L2	R. F Choke Coil	
L3	OSC. Coil	
L4	R.F Coil	
T1	ANT Coil	
T2	IF Transformer	

MUTING UNIT (W18-026)

CAPACITORS

Symbol	Description			Part No.
C1	Electrolytic	4.7	16V	CEMX4R7MF16V
C2	Electrolytic	2.2	35V	CEMX2R2MF35V

C3	Mylar	0.0056	±20%	50V	CQMA562M50
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RESISTORS

Symbol	Description			Part No.
R1	Carbon film	33K		RF¼PS33K-K
R2	Carbon film	33K		RF¼PS33K-K
R3	Carbon film	330		RF¼PS330-K
R4	Carbon film	10K		RF¼PS10K-K
R5	Carbon film	1.8K		RF¼PS1R8K-K
R6	Carbon film	10K		RF¼PS10K-K
R7	Carbon film	68K		RF¼PS68K-K
R8	Carbon film	39K		RF¼PS39K-K
R9	Carbon film	4.7K		RF¼PS4R7K-K
R10	Carbon film	2.7K		RF¼PS2R7K-K
R11	Carbon film	22K		RF¼PS22K-K

TRANSISTORS

Symbol	Description	Part No.
Q1	2SC870	
Q2	2SC870	
Q3	2SC870	

POTENTIOMETER

Symbol	Description	Part No.
VR1	2KΩ Semi fixed, Muting level control	C92-057-0

MPX UNIT (W13-024)

CAPACITORS

Symbol	Description			Part No.
C1	Styrol	2200P	50V	CQSA222K50
C2	Electrolytic	1	50V	CEMX 1MF50V
C3	Mylar	0.047	±20% 50V	CQMA 473M50
C4	Styrol	0.01	±5% 50V	C15-010-0
C5	Styrol	0.01	±5% 50V	C15-010-0
C6	Electrolytic	2.2	35V	CEMX2R2MF50V
C7	Styrol	3300P	±5% 50V	C15-011-0
C8	Mylar	2200P	50V	CQMA 222K50
C9	Mylar	2200P	50V	CQMA 222K50
C10	Electrolytic	22	25V	CEMX 22MF50V
C11	Styrol	1500P	50V	CQSA 152K50
C12	Styrol	1500P	50V	CQSA 152K50
C13	Electrolytic	0.47	50V	CEMXR47MF50V
C14	Electrolytic	0.47	50V	CEMXR47MF50V

RESISTORS

Symbol	Description			Part No.
R1	Carbon film	15K		RF¼PS15K-K
R2	Carbon film	15K		RF¼PS15K-K
R3	Carbon film	12K		RF¼PS12K-K
R4	Carbon film	2.2K		RF¼PS2R2K-K
R5	Carbon film	4.7K		RF¼PS4R7K-K
R6	Carbon film	3.3K		RF¼PS3R3K-K
R7	Carbon film	10K		RF¼PS10K-K
R8	Carbon film	10K		RF¼PS10K-K
R9	Carbon film	15K		RF¼PS15K-K

R10	Carbon film	15K			RF½PS15K-K
R11	Carbon film	100			RF½PS100-K

INTEGRATED CIRCUIT

Symbol	Description	Part No.
Q1	MPX IC	MC1304L

COILS AND TRANSFORMERS

Symbol	Description	Part No.
L1	19kHz Coil	T75-018-A
L2	19kHz Coil	T75-018-A
L3	38kHz Coil	T75-019-A
LPF1	38kHz Filter	T75-015-0
LPF2	38kHz Filter	T75-015-0

POTENTIOMETER

Symbol	Description	Part No.
VR1	4.7K, Semi-fixed	C92-051-0

TUNER UNIT (W35-012)

CAPACITORS

Symbol	Description	Part No.
C1	Ceramic 0.01 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ103P25
C2	Ceramic 0.01 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ103P25
C3	Ceramic 5P $\pm 0.5P$ 50V	CCDSL050D50
C4	Ceramic 0.01 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ103P25
C5	Ceramic 0.01 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ103P25
C6	Ceramic 0.04 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ403P25
C7	Ceramic 0.04 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ403P25
C8	Electrolytic 10 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 10V	CEMX10MF10V
C9	Ceramic 0.04 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ403P25
C10	Ceramic 0.04 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ403P25
C11	Ceramic 0.04 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ403P25
C12	Mylar 0.01 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 50V	CQMA103K50
C13	Styrol 450P 50V	CQSA451K50
C14	Ceramic 0.04 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ403P25
C15	Ceramic 27P 50V	CCDSL270K50
C16	Ceramic 12P 50V	CCDSL120K50
C17	Ceramic 560P 50V	CKDZ5P561K50
C18	Ceramic 0.04 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ403P50
C19	Electrolytic 4.7 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 16V	CEMX4R7MF16V
C20	Ceramic 0.04 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ403P25
C21	Ceramic 0.04 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ403P25
C22	Ceramic 3P $\pm 0.25P$ 50V	CCDSL030C50
C23	Ceramic 68P 50V	CCDSL680K50
C24	Ceramic 0.01 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ103P25
C25	Mylar 0.1 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 50V	CQMA104K50
C26	Ceramic 0.01 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ103P25
C27	Ceramic 0.01 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ103P25
C28	Mylar 0.0047 50V	CQMA472K50
C29	Mylar 0.0022 50V	CQMA222K50
C30	Electrolytic 0.47 50V	CEMXR47MF50V
C31	Ceramic 180P 50V	CCDSL181K50
C32	Electrolytic 4.7 16V	CEMX4R7MF16V
C33	Electrolytic 1 25V	CSYA1MF25V
C34	Ceramic 0.04 $\begin{matrix} +100\% \\ -0\% \end{matrix}$ 25V	CKDYZ403P25
C35	Electrolytic 100 25V	CEMX100MF25V
C36	Ceramic 1P $\pm 0.25P$ 50V	CCDSL010C50

C37	Ceramic	0.01	$\begin{matrix} +100\% \\ -0\% \end{matrix}$	25V	CKDYZ103P25
C38	Ceramic	0.04	$\begin{matrix} +100\% \\ -0\% \end{matrix}$	25V	CKDYZ403P25
C39	Ceramic	100P	$\begin{matrix} +100\% \\ -0\% \end{matrix}$	50V	CCDSL101K50
C40	Ceramic	0.04	$\begin{matrix} +100\% \\ -0\% \end{matrix}$	25V	CKDYZ403P25

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 56K	RF½PS56K-K
R2	Carbon film 100	RF½PS100-K
R3	Carbon film 8.2K	RF½PS8R2K-K
R4	Carbon film 1.8K	RF½PS1R8K-K
R5	Carbon film 470	RF½PS470-K
R6	Carbon film 470	RF½PS470-K
R7	Carbon film 4.7K	RF½PS4.7K-K
R8	Carbon film 15K	RF½PS15K-K
R9	Carbon film 2.2K	RF½PS2.2K-K
R10	Carbon film 470	RF½PS470-K
R11	Carbon film 1.5K	RF½PS1R5K-K
R12	Carbon film 1.5K	RF½PS1R5K-K
R13	Carbon film 22K	RF½PS22K-K
R14	Carbon film 470	RF½PS470-K
R15	Carbon film 680	RF½PS680-K
R16	Carbon film 2.7K	RF½PS2R7K-K
R17	Carbon film 39K	RF½PS39K-K
R18	Carbon film 33K	RF½PS33K-K
R19	Carbon film 100	RF½PS100-K
R20	Carbon film 5.6K	RF½PS5R6K-K
R21	Carbon film 2.7K	RF½PS2R7K-K
R22	Carbon film 4.7K	RF½PS4R7K-K
R23	Carbon film 100	RF½PS100-K
R24	Carbon film 220K	RF½PS220K-K
R25	Carbon film 220K	RF½PS220K-K
R26	Carbon film 22K	RF½PS22K-K
R27	Carbon film 10K	RF½PS10K-K
R28	Carbon film 47	RF½PS47-K
R29	Carbon film 820	RF½PS820-K
R30	Carbon film 22	RF½PS22-K
R31	Carbon film 100K	RF½PS100K-K
R32	Carbon film 100	RF½PS100-K

DIODES AND TRANSISTORS

Symbol	Description	Part No.
D1	1S188 Diode	
D2	1S188 Diode	
D3	1S188 Diode	
D4	1S188 Diode	
D5	1S188 Diode	
D6	1S188 Diode	
D7	1S188 Diode	
D8	1S188 Diode	
D9	1S188 Diode	
D10	1S188 Diode	
D11	1S188 Diode	
Q1	2SC460-A Transistor	
Q2	2SC461-A Transistor	
Q3	2SC460-A Transistor	
Q4	2SC460-A Transistor	
Q5	uA703E I. C	
Q6	uA703E I. C	



COIL AND TRANSFORMERS

Symbol	Description	Part No.
T1	FM IF Transformer	T73-030-0
T2	FM IF Transformer	T73-031-0
T3	FM IF Transformer	T73-032-0
T4	FM IF Transformer	T74-009-0
T5	AM IF Transformer	T71-026-0
T6	AM IF Transformer	T71-026-0
T7	AM IF Transformer	T72-019-0
T8	MW OSC Coil	T43-009-A

HEAD AMP UNIT (W15-032)

CAPACITORS

Symbol	Description				Part No.
C1	Electrolytic	10		10V	CEMX10MF10V
C2	Electrolytic	10		10V	CEMX10MF10V
C3	Ceramic	30P		50V	CCDSL300K50
C4	Ceramic	30P		50V	CCDSL300K50
C5	Ceramic	100P		50V	CCDSL101K50
C6	Ceramic	100P		50V	CCDSL101K50
C7	Electrolytic	0.47		50V	CEMXR47MF50V
C8	Electrolytic	0.47		50V	CEMXR47MF50V
C9	Electrolytic	33		6V	CEMX 33MF6V
C10	Electrolytic	33		6V	CEMX 33MF6V
C11	Mylar	0.01	±20%	50V	CQMA 103M50
C12	Mylar	0.01	±20%	50V	CQMA 103M50
C13	Mylar	0.003	±20%	50V	CQMA 302M50
C14	Mylar	0.003	±20%	50V	CQMA 302M50
C15	Electrolytic	100	±20%	35V	CEMX 100MF35V
C16	Electrolytic	100	±20%	35V	CEMX 100MF35V

RESISTORS

Symbol	Description				Part No.
R1	Carbon film	1K			RF¼PS1K-K
R2	Carbon film	1K			RF¼PS1K-K
R3	Carbon film	150K			RF¼PS150K-K
R4	Carbon film	150K			RF¼PS150K-K
R5	Carbon film	180K			RF¼PS180K-K
R6	Carbon film	180K			RF¼PS180K-K
R7	Carbon film	120K			RF¼PS120K-K
R8	Carbon film	120K			RF¼PS120K-K
R9	Carbon film	390			RF¼PS390-K
R10	Carbon film	390			RF¼PS390-K
R11	Carbon film	470K			RF¼PS470K-K
R12	Carbon film	470K			RF¼PS470K-K
R13	Carbon film	15K			RF¼PS15K-K
R14	Carbon film	15K			RF¼PS15K-K
R15	Carbon film	2.7K			RF¼PS2R7K-K
R16	Carbon film	2.7K			RF¼PS2R7K-K
R17	Carbon film	330K			RF¼PS330K-K
R18	Carbon film	330K			RF¼PS330K-K
R19	Carbon film	27K			RF¼PS27K-K
R20	Carbon film	27K			RF¼PS27K-K
R21	Carbon film	56K			RF¼PS56K-K
R22	Carbon film	56K			RF¼PS56K-K
R23	Carbon film	2.2K			RF¼PS2R2K-K
R24	Carbon film	2.2K			RF¼PS2R2K-K

TRANSISTORS

Symbol	Description	Part No.
Q1	2SC871 Transistor	
Q2	2SC871 Transistor	
Q3	2SC870 Transistor	
Q4	2SC870 Transistor	

CONTROL AMP UNIT (W15-033)

CAPACITORS

Symbol	Description				Part No.
C1	Electrolytic	0.47		50V	CEMXR47MF50V
C2	Electrolytic	0.47		50V	CEMXR47MF50V
C3	Ceramic	10P		50V	CCDSL100K50
C4	Ceramic	10P		50V	CCDSL100K50
C5	Electrolytic	100		3V	CEMX100MF3V
C6	Electrolytic	100		3V	CEMX100MF3V
C7	Electrolytic	2.2		35V	CEMX2R2MF35V
C8	Electrolytic	2.2		35V	CEMX2R2MF35V
C9	Mylar	0.003	±20%	50V	CQMA302M50
C10	Mylar	0.003	±20%	50V	CQMA302M50
C11	Mylar	0.01	±20%	50V	CQMA103M50
C12	Mylar	0.01	±20%	50V	CQMA103M50
C13	Mylar	0.01	±20%	50V	CQMA103M50
C14	Mylar	0.01	±20%	50V	CQMA103M50
C15	Mylar	0.1	±20%	50V	CQMA104M50
C16	Mylar	0.1	±20%	50V	CQMA104M50
C17	Electrolytic	47		35V	CEMX47MF35V
C18	Electrolytic	47		35V	CEMX47MF35V

RESISTORS

Symbol	Description				Part No.
R1	Carbon film	470			RF¼PS470-K
R2	Carbon film	470			RF¼PS470-K
R3	Carbon film	220K			RF¼PS220K-K
R4	Carbon film	220K			RF¼PS220K-K
R5	Carbon film	22K			RF¼PS22K-K
R6	Carbon film	22K			RF¼PS22K-K
R7	Carbon film	68K			RF¼PS68K-K
R8	Carbon film	68K			RF¼PS68K-K
R9	Carbon film	8.2K			RF¼PS8R2K-K
R10	Carbon film	8.2K			RF¼PS8R2K-K
R11	Carbon film	1K			RF¼PS1K-K
R12	Carbon film	1K			RF¼PS1K-K
R13	Carbon film	100			RF¼PS100-K
R14	Carbon film	100			RF¼PS100-K
R15	Carbon film	10K			RF¼PS10K-K
R16	Carbon film	10K			RF¼PS10K-K
R17	Carbon film	2.7K			RF¼PS2R7K-K
R18	Carbon film	2.7K			RF¼PS2R7K-K
R19	Carbon film	4.7K			RF¼PS4R7K-K
R20	Carbon film	4.7K			RF¼PS4R7K-K
R21	Carbon film	1.5K			RF¼PS1R5K-K
R22	Carbon film	1.5K			RF¼PS1R5K-K

TRANSISTORS

Symbol	Description	Part No.
Q1	2SC870 Transistor	
Q2	2SC870 Transistor	

POTENTIOMETERS

Symbol	Description	Part No.
VR1	100k Ω dual, TREBLE Control	C82-040-0
VR2	100k Ω dual, BASS Control	C82-040-0

MAIN AMP UNIT (W15-085)

CAPACITORS

Symbol	Description			Part No.
C1	Electrolytic	100	25V	CEMX100MF25V
C2	Electrolytic	100	25V	CEMX100MF25V
C3	Electrolytic	10	10V	CEMX10MF10V
C4	Electrolytic	10	10V	CEMX10MF10V
C5	Electrolytic	22	25V	CEMX22MF25V
C6	Electrolytic	22	25V	CEMX22MF25V
C7	Electrolytic	47	3V	CEMX47MF3V
C8	Electrolytic	47	3V	CEMX47MF3V
C9	Ceramic	150P	50V	CCDSL151K50
C10	Ceramic	150P	50V	CCDSL151K50
C11	Electrolytic	47	3V	CEMX47MF3V
C12	Electrolytic	47	3V	CEMX47MF3V
C13	Electrolytic	100	25V	CEMX100MF25V
C14	Electrolytic	100	25V	CEMX100MF25V
C15	Mylar	0.05 $\pm 20\%$	50V	CQMA503M50
C16	Mylar	0.05 $\pm 20\%$	50V	CQMA503M50
C17	Electrolytic	1000	25V	CETG1000MF25V
C18	Electrolytic	1000	25V	CETG1000MF25V
C19	Ceramic	100P	50V	CCDSL101K50
C20	Ceramic	100P	50V	CCDSL101K50
C21	Ceramic	30P	50V	CCDSL300K50
C22	Ceramic	30P	50V	CCDSL300K50
C23	Ceramic	220P	50V	CCDSL221K50
C24	Ceramic	220P	50V	CCDSL221K50

RESISTORS

Symbol	Description			Part No.
R1	Carbon film	150K		RF $\frac{1}{4}$ PS150K-K
R2	Carbon film	150K		RF $\frac{1}{4}$ PS150K-K
R3	Carbon film	8.2K		RF $\frac{1}{4}$ PS8R2K-K
R4	Carbon film	8.2K		RF $\frac{1}{4}$ PS8R2K-K
R5	Carbon film	220K		RF $\frac{1}{4}$ PS220K-K
R6	Carbon film	220K		RF $\frac{1}{4}$ PS220K-K
R7	Carbon film	22K		RF $\frac{1}{4}$ PS22K-K
R8	Carbon film	22K		RF $\frac{1}{4}$ PS22K-K
R9	Carbon film	4.7K		RF $\frac{1}{4}$ PS4R7K-K
R10	Carbon film	4.7K		RF $\frac{1}{4}$ PS4R7K-K
R11	Carbon film	470		RF $\frac{1}{4}$ PS470-K
R12	Carbon film	470		RF $\frac{1}{4}$ PS470-K
R13	Carbon film	150		RF $\frac{1}{4}$ PS150-K
R14	Carbon film	150		RF $\frac{1}{4}$ PS150-K
R15	Carbon film	82K		RF $\frac{1}{4}$ PS82K-K
R16	Carbon film	82K		RF $\frac{1}{4}$ PS82K-K

R17	Carbon film	6.8K		RF $\frac{1}{4}$ PS6R8K-K
R18	Carbon film	6.8K		RF $\frac{1}{4}$ PS6R8K-K
R19	Carbon film	150		RF $\frac{1}{4}$ PS150-K
R20	Carbon film	150		RF $\frac{1}{4}$ PS150-K
R21	Carbon film	1K		RF $\frac{1}{4}$ PS1K-K
R22	Carbon film	1K		RF $\frac{1}{4}$ PS1K-K
R23	Carbon film	3.3K		RF $\frac{1}{4}$ PS3R3K-K
R24	Carbon film	3.3K		RF $\frac{1}{4}$ PS3R3K-K
R25	Carbon film	220		RF $\frac{1}{4}$ PS220-K
R26	Carbon film	220		RF $\frac{1}{4}$ PS220-K
R27	Carbon film	22		RF $\frac{1}{4}$ PS22-K
R28	Carbon film	22		RF $\frac{1}{4}$ PS22-K
R29	Carbon film	220		RF $\frac{1}{4}$ PS220-K
R30	Carbon film	220		RF $\frac{1}{4}$ PS220-K
R31	Wire wound	0.5	2W	RS2P0R5-K
R32	Wire wound	0.5	2W	RS2P0R5-K
R33	Wire wound	0.5	2W	RS2P0R5-K
R34	Wire wound	0.5	2W	RS2P0R5-K
R35	Carbon film	68		RF $\frac{1}{4}$ PS68-K
R36	Carbon film	68		RF $\frac{1}{4}$ PS68-K
R37	Carbon film	27K		RF $\frac{1}{4}$ PS27K-K
R38	Carbon film	27K		RF $\frac{1}{4}$ PS27K-K
R39	Carbon film	33K		RF $\frac{1}{4}$ PS33K-K
R40	Carbon film	33K		RF $\frac{1}{4}$ PS33K-K
R41	Carbon film	470		RF $\frac{1}{4}$ PS470-K
R42	Carbon film	470		RF $\frac{1}{4}$ PS470-K

VARISTORS AND TRANSISTORS

Symbol	Description	Part No.
D1	STV-3 Varistor	
D2	STV-3 Varistor	
Q1	2SC870 Transistor	
Q2	2SC870 Transistor	
Q3	2SC734-Y Transistor	
Q4	2SC734-Y Transistor	
Q5	2SC904 Transistor	
Q6	2SC904 Transistor	
Q7	2SA569 Transistor	
Q8	2SA569 Transistor	
Q9	2SD91 Transistor	
Q10	2SD91 Transistor	
Q11	2SD91 Transistor	
Q12	2SD91 Transistor	

POTENTIOMETERS

Symbol	Description	Part No.
VR1	50k Ω Semi fixed, Bias Control	C92-044-0
VR2	50k Ω Semi fixed, Bias Control	C92-044-0
VR3	50 Ω Semi fixed, Bias Control	C92-043-0
VR4	50 Ω Semi fixed, Bias Control	C92-043-0

PUSH SWITCH UNIT A (W15-086)

CAPACITORS

Symbol	Description			Part No.
C3	Ceramic	220P	50V	CCDSL221K-50
C4	Ceramic	220P	50V	CCDSL221K-50



C5	Mylar	0.03		50V	CQMA303K-50
C6	Mylar	0.03		50V	CQMA303K-50

RESISTOR

Symbol	Description			Part No.
R13	Carbon film	12K		RF¼PS12K-K
R14	Carbon film	12K		RF¼PS12K-K

SWITCHES

Symbol	Description			Part No.
S3	TAPE Monitor Switch (Push type)			S31-022-0
S4	Mode Switch (Push type)			S31-022-0
S5	Loudness Switch (Push type)			S31-022-0

PUSH SWITCH UNIT B (W15-087)

CAPACITORS

Symbol	Description			Part No.
C7	Mylar	0.01	50V	CQMA103K50
C8	Mylar	0.01	50V	CQMA103K50
C13	Electrolytic	0.47	25V	CSYAR47MF25V

RESISTORS

Symbol	Description			Part No.
R26	Carbon film	220K		RF¼PS220K-K

SWITCHES

Symbol	Description			Part No.
S6	High Cut Filter Switch (Push type)			S31-022-0
S7	AFC Switch (Push type)			S31-022-0
S8	Muting Switch (Push type)			S31-022-0

POWER SUPPLY UNIT (W16-024)

CAPACITORS

Symbol	Description			Part No.
C1	Ceramic	0.01	500V	CKDYZ103K500
C2	Ceramic	0.01	500V	CKDYZ103K500
C3	Ceramic	100P	50V	CCDSL101K50
C4	Electrolytic	100	50V	CEMX100MF50V
C5	Electrolytic	220	25V	CEMX220MF25V
C6	Electrolytic	220	25V	CEMX220MF25V
C7	Electrolytic	100	16V	CEMX100MF16V
C8	Ceramic	0.01	50V	CKDYZ103K50

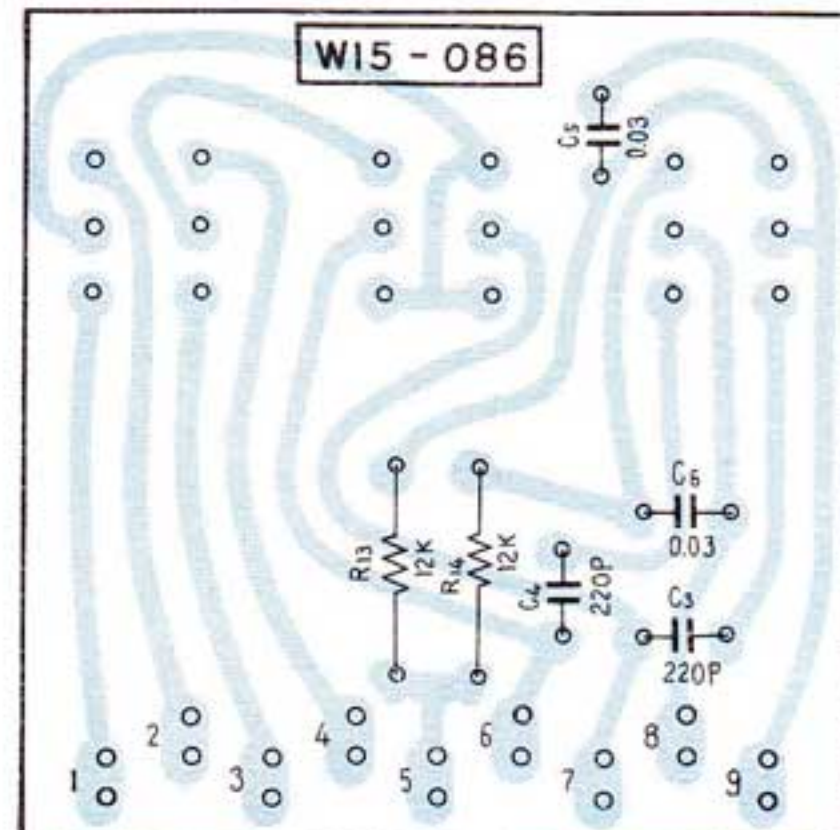
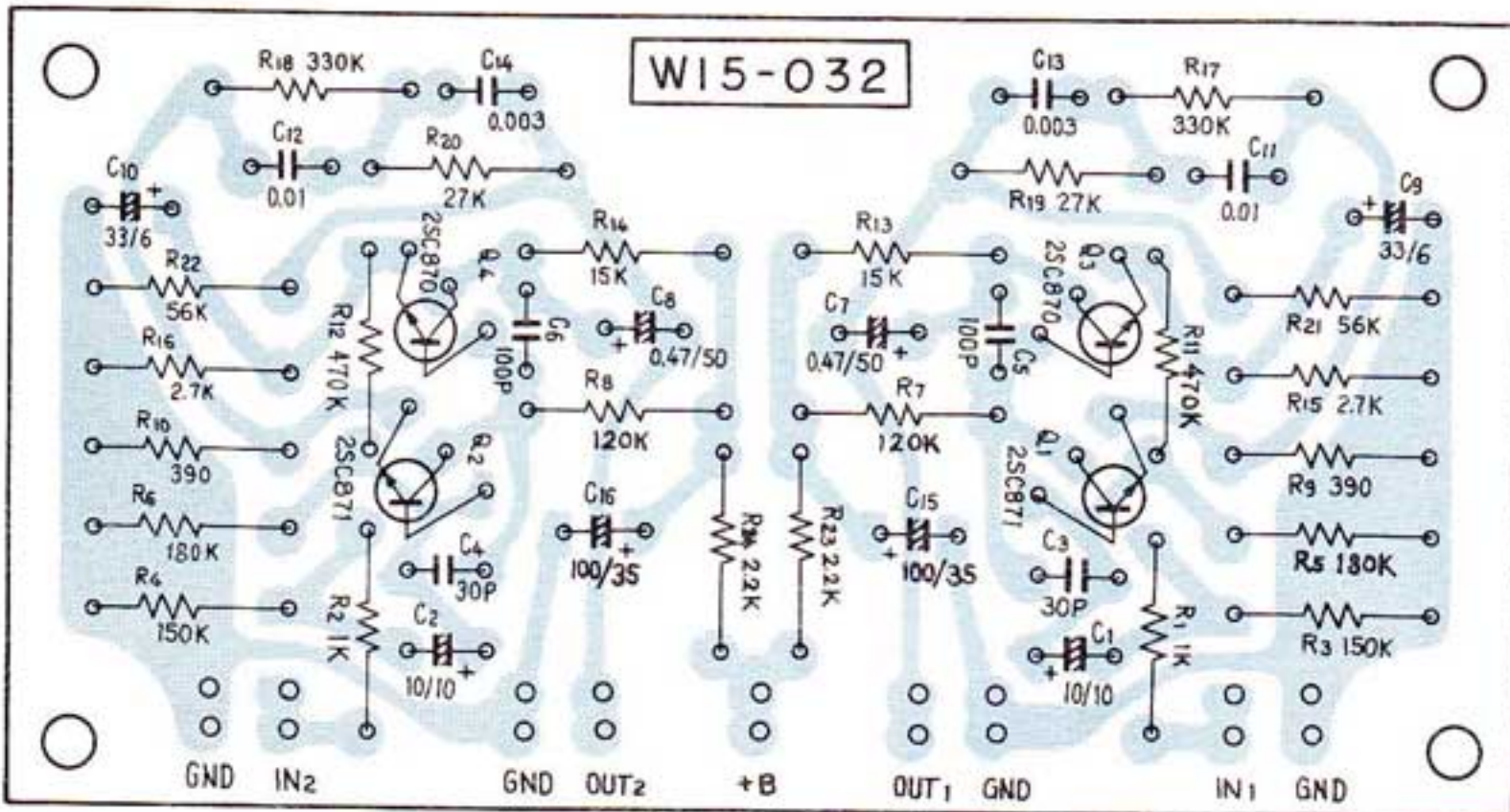
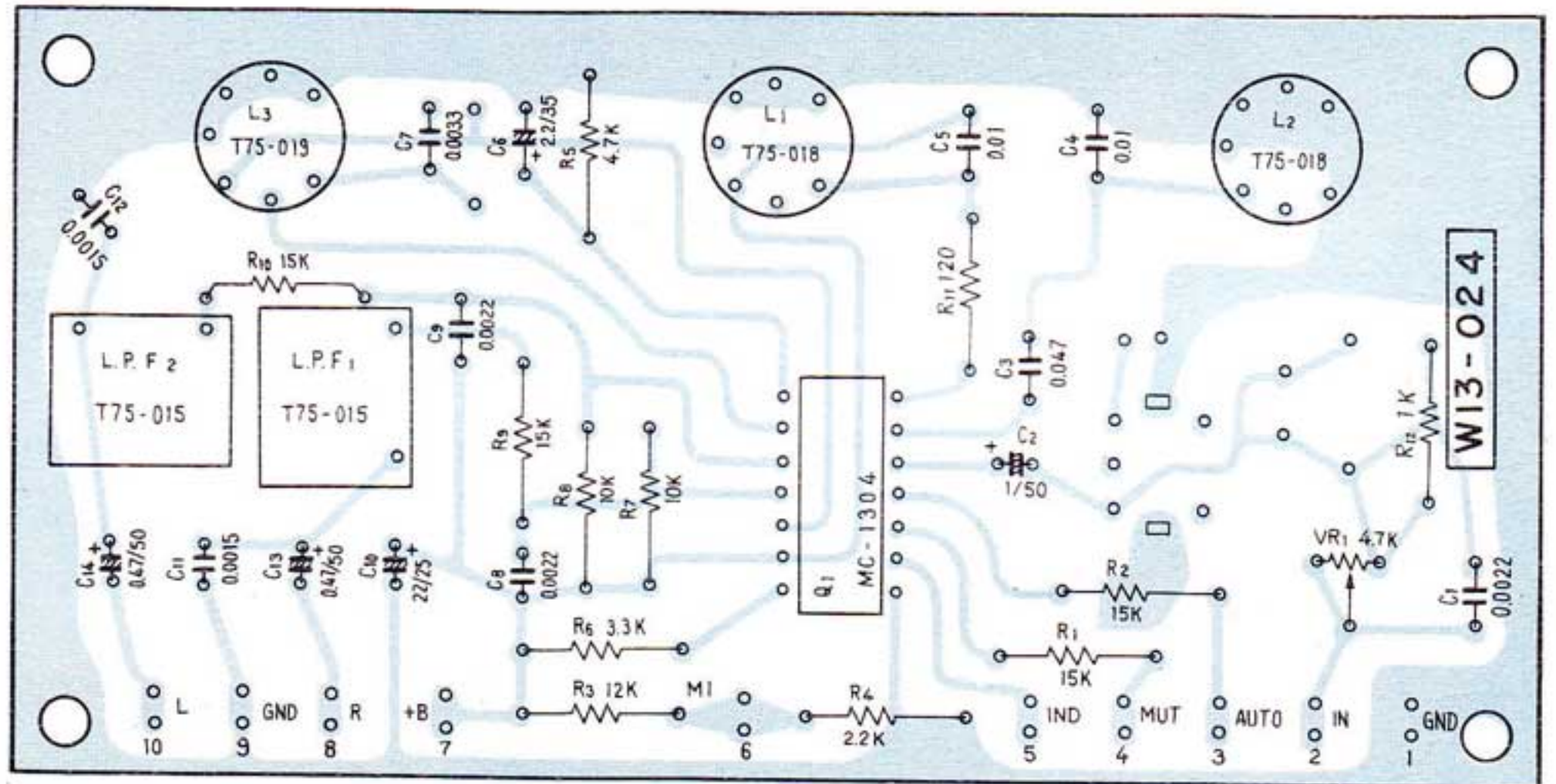
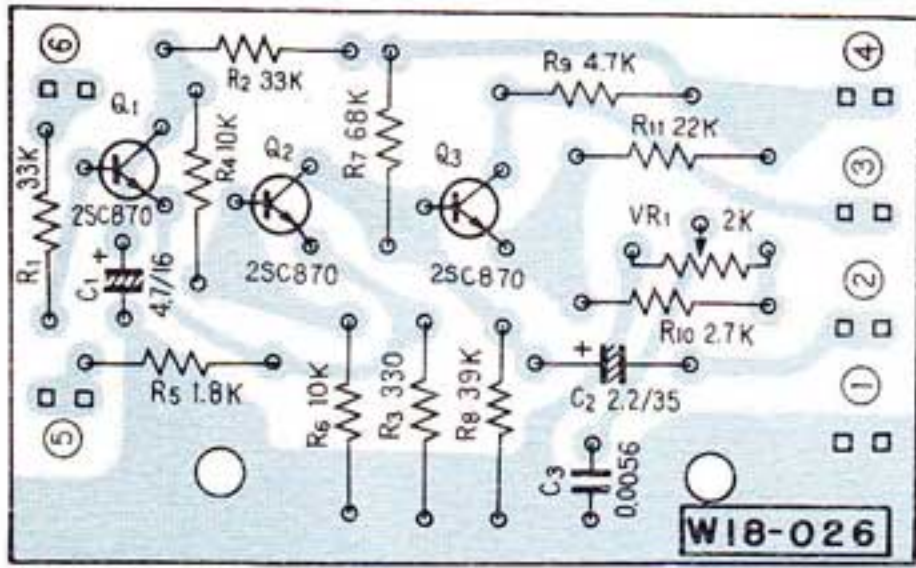
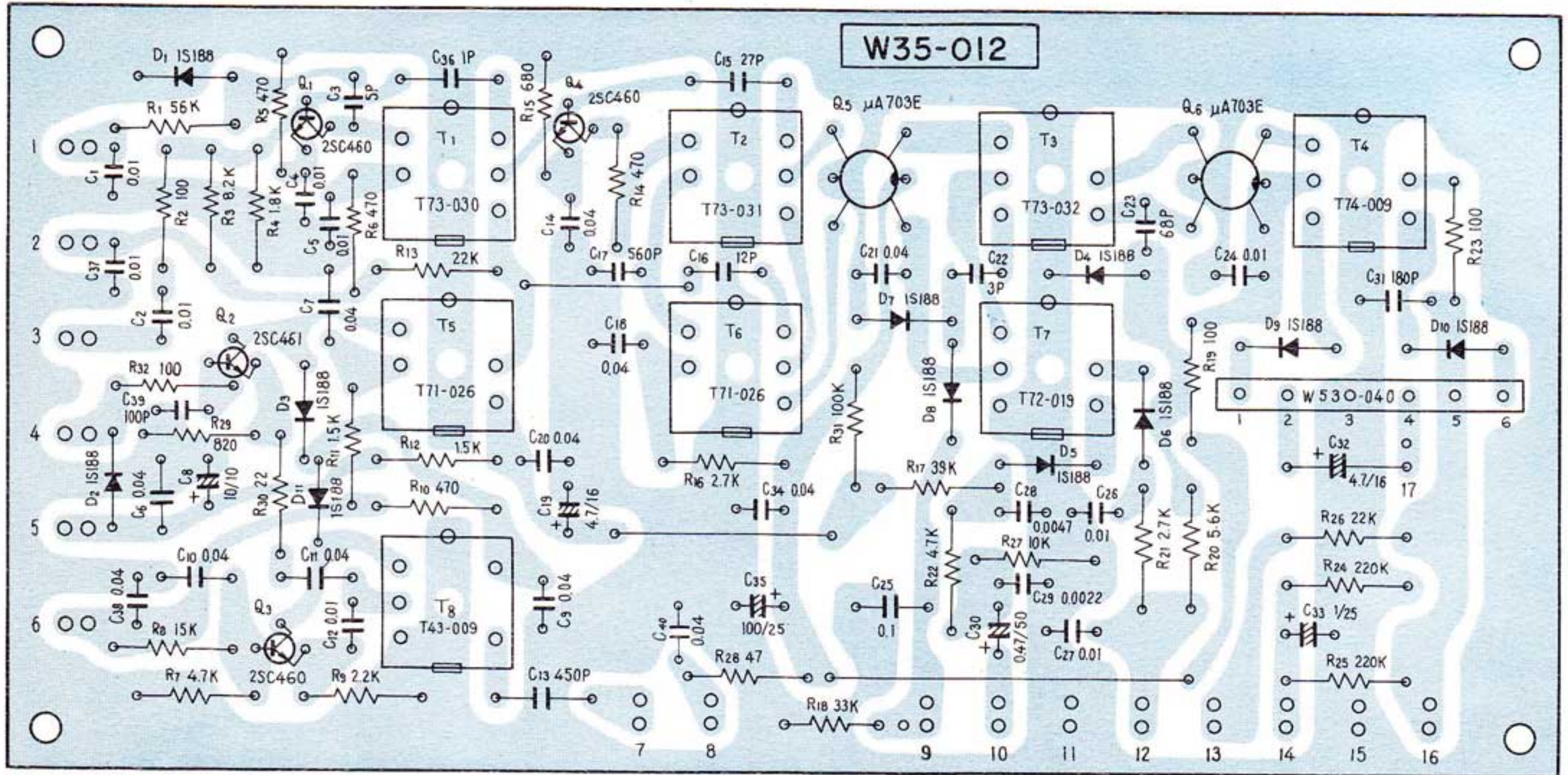
RESISTORS

Symbol	Description			Part No.
R1	Carbon film	3.3K		RF¼PS3R3K-K
R2	Carbon film	22	½W	RF½PS22-K
R3	Carbon film	33K		RF¼PS33K-K
R4	Carbon film	39K		RF¼PS39K-K
R5	Carbon film	2.7K		RF¼PS2R7K-K
R6	Carbon film	560	½W	RF½PS560-K
R7	Carbon film	22	½W	RF½PS22-K
R8	Carbon film	22	½W	RF½PS22-K

DIODES AND TRANSISTORS

Symbol	Description	Part No.
D1	SW-1-02 Diode	
D2	SW-1-02-Diode	
D3	SD-1Z Diode	
D4	SD-1Z Diode	
D5	1S338Q Zener Diode	
Q1	2SC497 Transistor	
Q2	2SC870 Transistor	
Q3	2SC497 Transistor	

PRINTED CIRCUIT BOARD



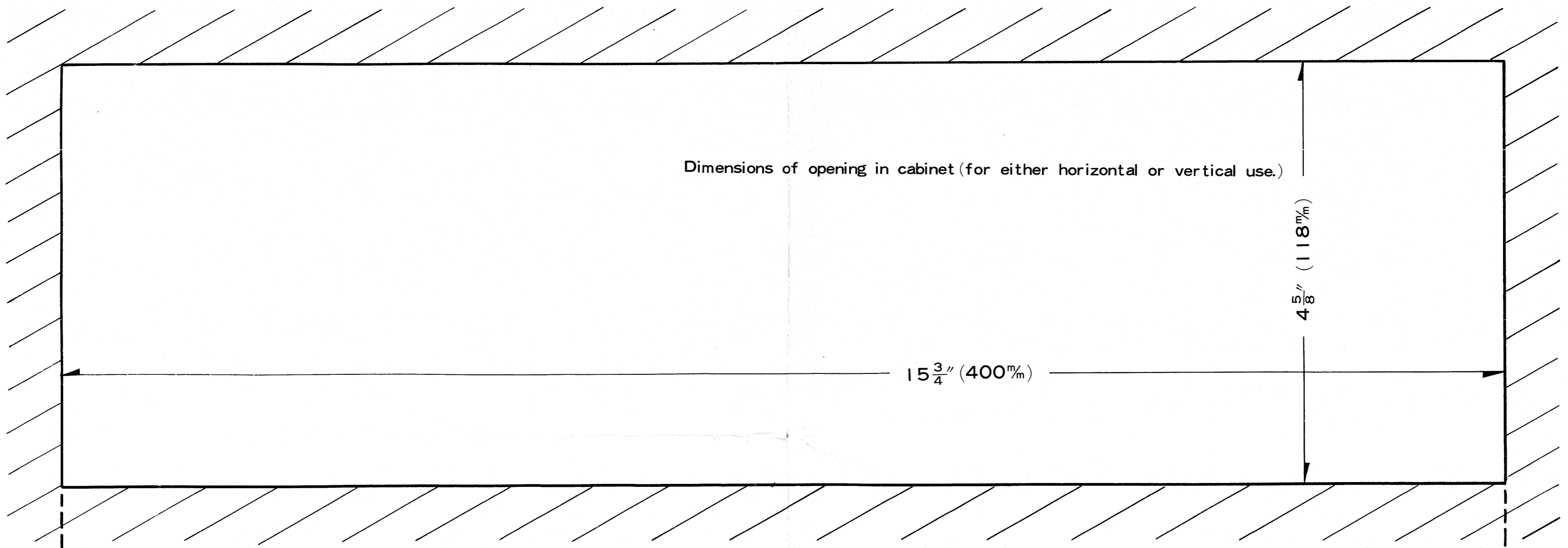


Fig. 1.

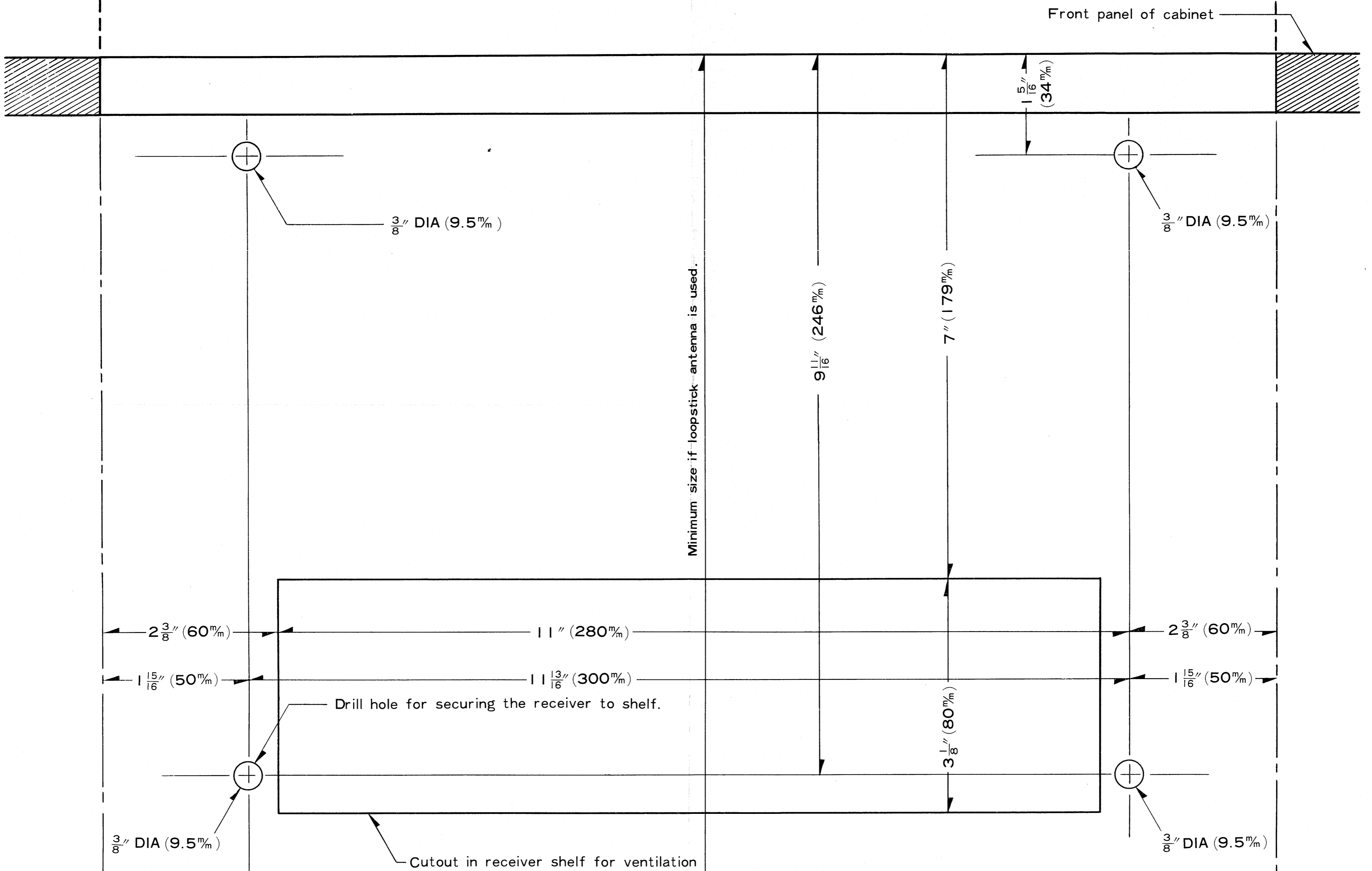


Fig. 2.

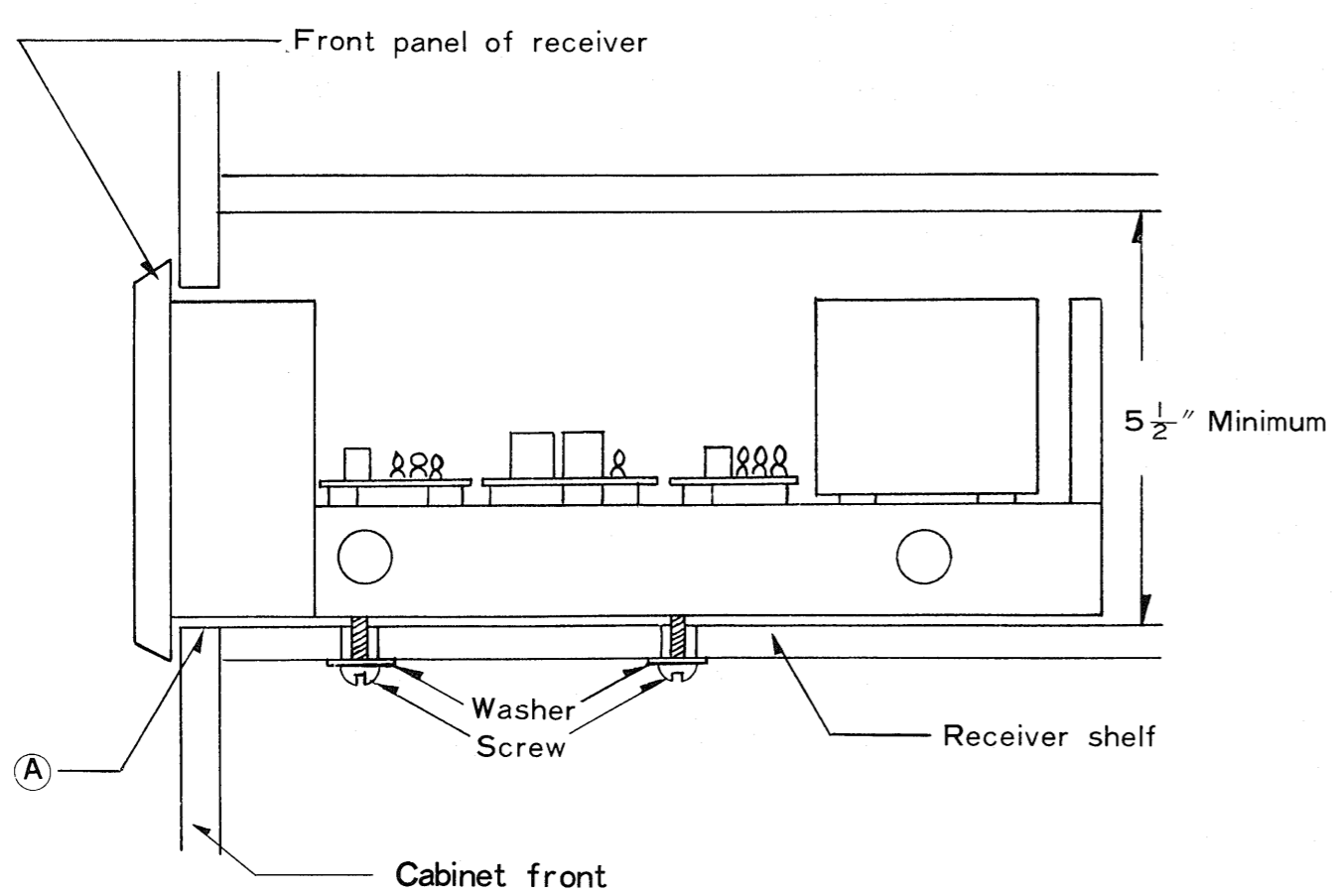


Fig. 3.

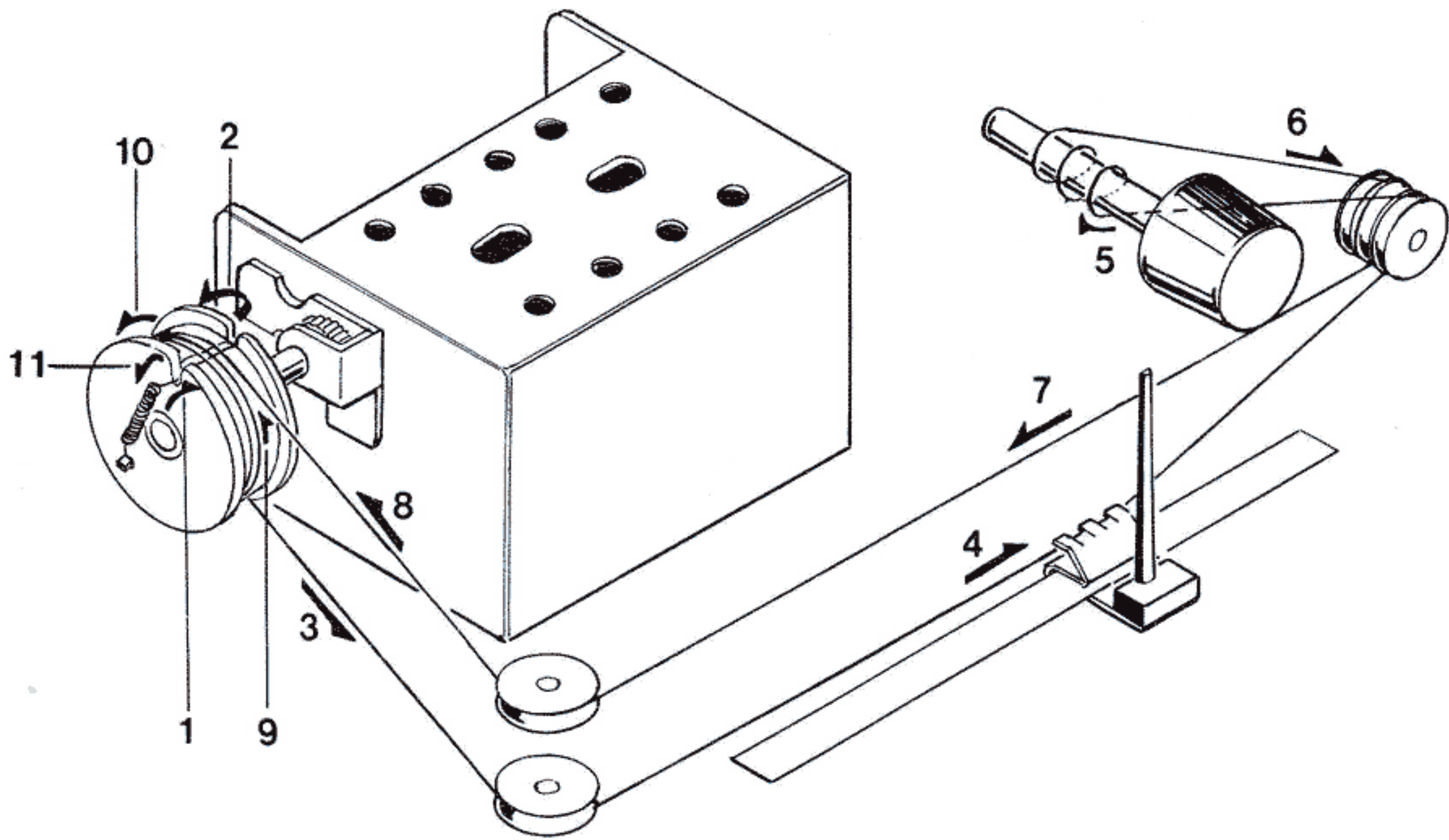
IMPORTANT INSTRUCTIONS

1. Follow the dimensions as shown. Measure template before using because of paper shrinkage.
2. Make an opening for the front of the cabinet. The dimensions should be the same as Fig. 1.
3. The top of the receiver shelf must not be higher than the cut out portion of the cabinet front. (See A in Fig. 3.)
4. Drill holes in the receiver shelf as shown in Fig. 2.
5. Remove the four feet on the bottom plate of the receiver.
6. Secure the receiver in position on the receiver shelf with the screws and washers.
7. If there is a shelf above the receiver, leave a space of at least 5 1/2" above the receiver shelf for air circulation (See Fig. 3.)

PRINTED IN JAPAN

UNIT : inch (mm)

DIAL CORD STRINGING



PIONEER ELECTRONIC CORPORATION

15-5, 4-Chome, Ohmori-nishi, Ohta-ku, Tokyo, Japan

PIONEER ELECTRONICS U.S.A. CORPORATION

140 Smith St., Farmingdale, L.I., N.Y. 11735, U.S.A.

PIONEER ELECTRONIC (EUROPE) AG.

59, Forch Strasse, 8032 Zurich, Switzerland