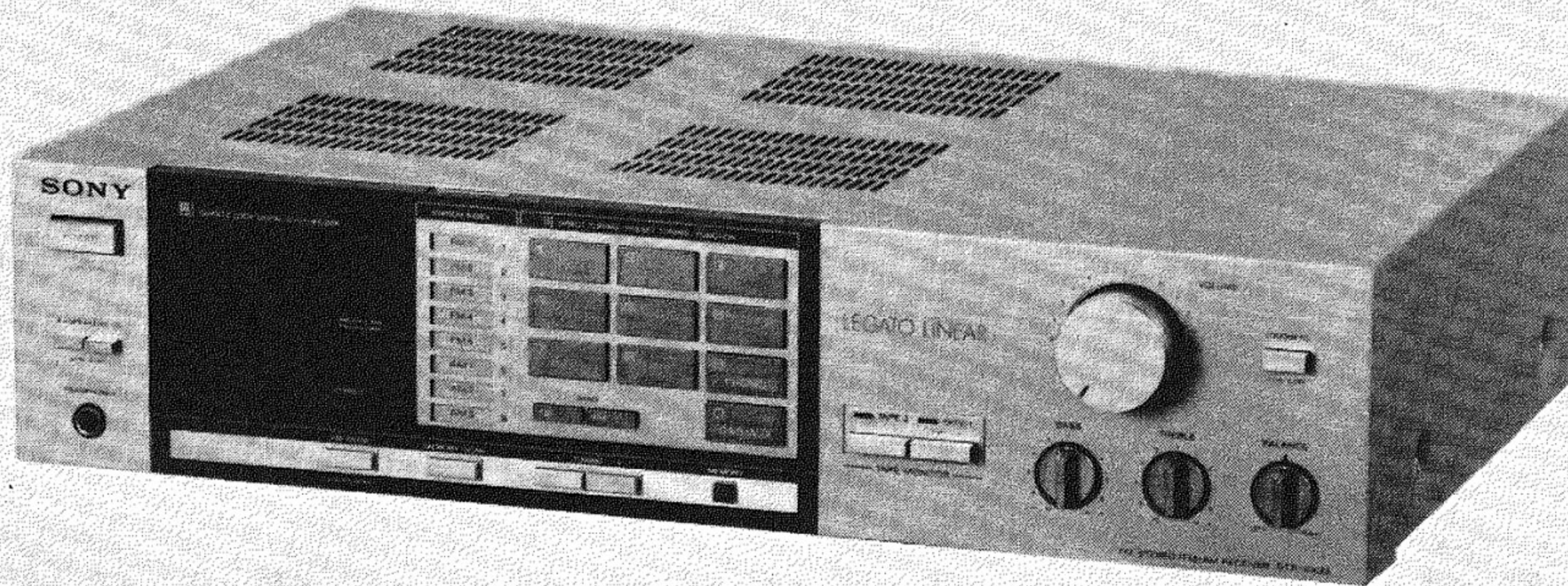


STR-VX33


*US Model
Canadian Model*




FM STEREO / FM-AM RECEIVER

SPECIFICATIONS

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS 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.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

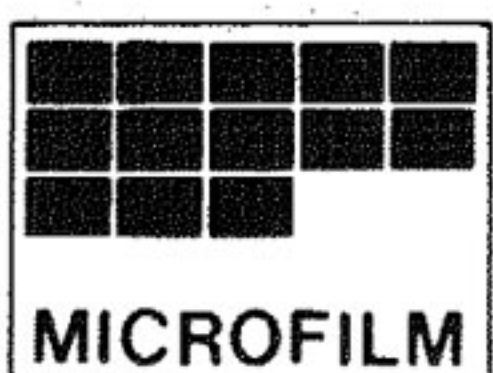
LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE  SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES ÉCLATÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

AUDIO POWER SPECIFICATIONS

POWER OUTPUT AND TOTAL HARMONIC DISTORTION:

With 8 ohm loads, both channels driven, from 20 - 20,000 Hz; rated 40 watts per channel minimum RMS power, with no more than 0.008% total harmonic distortion from 250 milliwatts to rated output.

— Continued on page 2 —



SONY[®]

SERVICE MANUAL

OTHER SPECIFICATIONS

Amplifier section

Dynamic headroom 1.4 dB ('78 IHF)
Harmonic distortion Less than 0.008% at rated output
Intermodulation (IM) distortion
(60 Hz : 7 kHz = 4 : 1) Less than 0.008% at rated output
Frequency response PHONO : RIAA equalization curve ± 0.5 dB
DAD/AUX) 10 Hz - 70 kHz ± 0 dB
TAPE 1, 2) -1
Residual noise Less than 120 μ V (8 ohms, network A)
Damping factor 35 (8 ohms, 1 kHz)
Inputs

	Sensitivity	Impedance	Maximum input capability (1 kHz)	S/N (weighting network, input level)
PHONO	2.5 mV	50 k Ω	150 mV	77 dB 75 dB* (A, 2.5 mV)
DAD/AUX TAPE 1, 2	150 mV	50 k Ω	—	100 dB 80 dB* (A, 150 mV)

* '78 IHF

Outputs REC OUT 1, 2
Voltage 150 mV
Impedance 10 k ohms
SPEAKER A, B
Accepts speakers of 8 to 16 ohms.
HEADPHONES
Accepts low and high impedance headphones.
Tone controls BASS
 ± 8 dB at 100 Hz
TREBLE
 ± 8 dB at 10 kHz
Loudness (att. 30 dB) + 8 dB at 100 Hz
+ 3 dB at 10 kHz

FM tuner section

Tuning range 87.5 MHz - 108 MHz
Antenna terminals 300 ohms, balanced
75 ohms, unbalanced
Intermediate frequency 10.7 MHz
Sensitivity at 50 dB quieting
17.3 dBf, 4 μ V (mono)
38.3 dBf, 45 μ V (stereo)
Usable sensitivity 11.2 dBf, 2 μ V (IHF)
Signal-to-noise ratio 80 dB (mono), 75 dB (stereo)
Harmonic distortion 0.15% (mono), 0.25% (stereo) at 1 kHz
IM distortion 0.15% (mono), 0.25% (stereo)
Separation 45 dB at 1 kHz
Frequency response 30 Hz - 15 kHz ± 0.5 dB
 -2
Selectivity 60 dB at 400 kHz
Capture ratio 1.0 dB
AM suppression ratio 54 dB
Image response ratio 80 dB
IF response ratio 90 dB
Spurious response ratio
70 dB
RF intermodulation 65 dB (IHF)
Auto-tuning threshold
Approx. 45 dBf

AM tuner section

Tuning range 530 - 1,610 kHz (with the AM channel plan selector set at 10 kHz)
522 - 1,602 kHz (with the AM channel plan selector set at 9 kHz)
Antenna Ferrite-bar antenna
External antenna terminal
Intermediate frequency 450 kHz
Usable sensitivity 300 μ V/m, ferrite-bar antenna (at 1,000 kHz)
100 μ V, external antenna (at 1,000 kHz)
Signal-to-noise ratio 54 dB (at 50 mV/m)
Harmonic distortion 0.3% (at 50 mV/m, 400 Hz)
Selectivity 40 dB (10 kHz)

General

System Tuner section : PLL quartz-locked digital synthesizer system
Preamplifier section : low-noise NF type equalizer amp
Power amplifier section : pure-complementary SEPP
Power requirements 120 V ac, 60 Hz
Memory back-up power : 3 V dc, two batteries, size AA (IEC designation R6)
Battery life : approx. 1 year with Sony SUM-3(NS) New Super Batteries (or Eveready Heavy Duty Batteries No. 1215)
Power consumption USA model : 90 watts
Canadian model : 140 watts
Ac outlets One switched (100 watts)
One unswitched (100 watts)
Dimensions Approx. 430 \times 105 \times 305 mm (w/h/d)
(17 \times 4 $\frac{1}{4}$ \times 12 $\frac{1}{8}$ inches)
including projecting parts and controls
Weight Approx. 6.2 kg (13 lbs 11 oz) net
Approx. 7.5 kg (16 lbs 9 oz) in shipping carton

TABLE OF CONTENTS

	(page)
Specifications	1
Handling precautions for MOS ICs	4

SECTION 1 OUTLINE

Features	6
Precautions	6
Operating instructions	
System connections	7
Location and function of controls	8
Battery installation	10
Preparation	10
Broadcast reception	11
Other operating instructions	13
Circuit description	
IC301 (microcomputer)	14
Fluorescent indicator tube (FL Tube)	15
IC401 (CX778A)	18
Block diagram	19

SECTION 2 DISASSEMBLY

Removal	21
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SECTION 3 ADJUSTMENTS

FM section	23
AM section	26

SECTION 4 DIAGRAMS

Schematic diagram	
Tuner/Indicator section	27
Function Switch/Amplifier/Power Supply section	31
Mounting diagram	35
Semiconductor lead layouts	39

SECTION 5 EXPLODED VIEWS AND PARTS LIST

Exploded views	40
Parts list	43
Trouble checks	50

Handling Precautions for MOS ICs

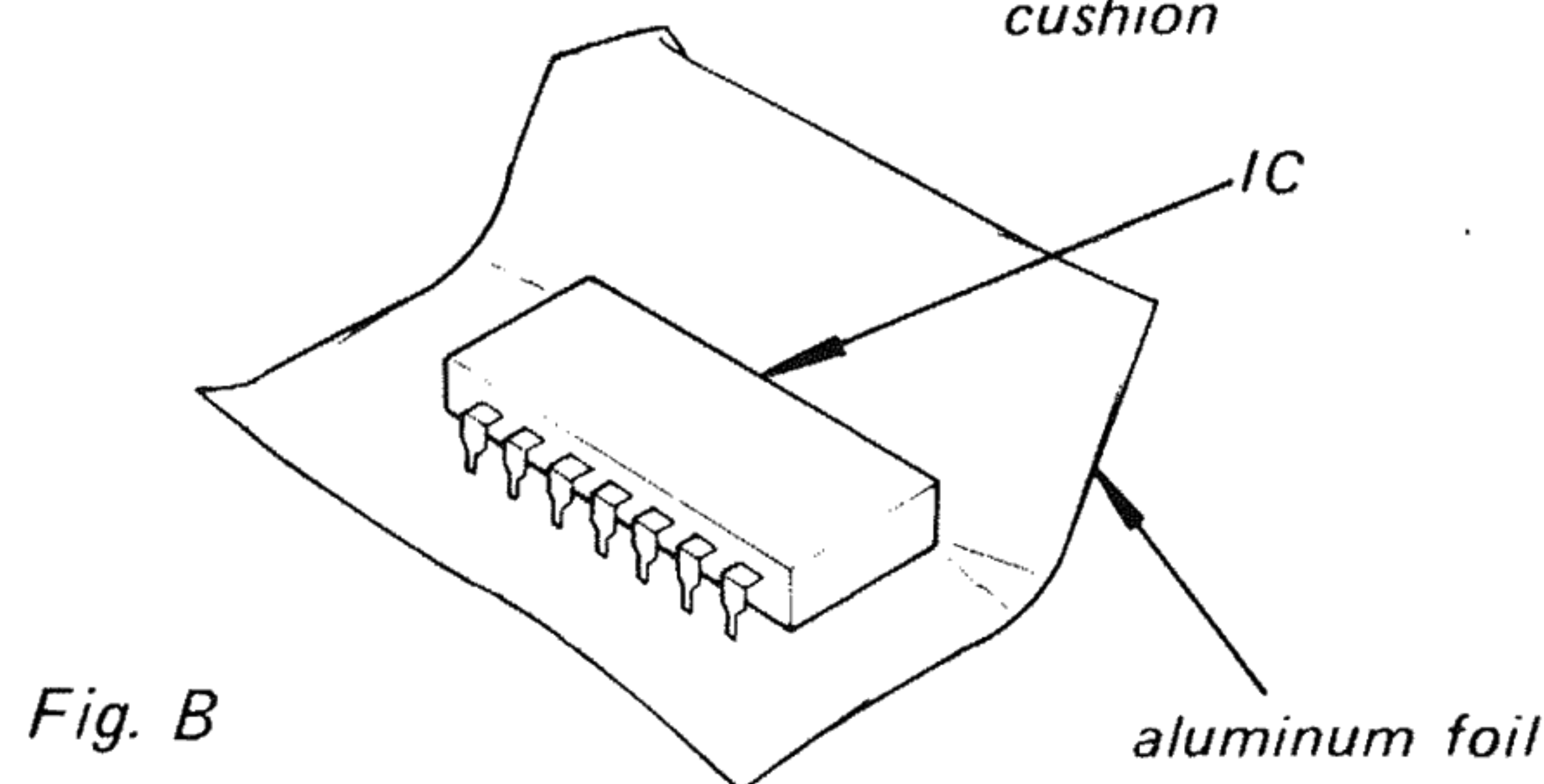
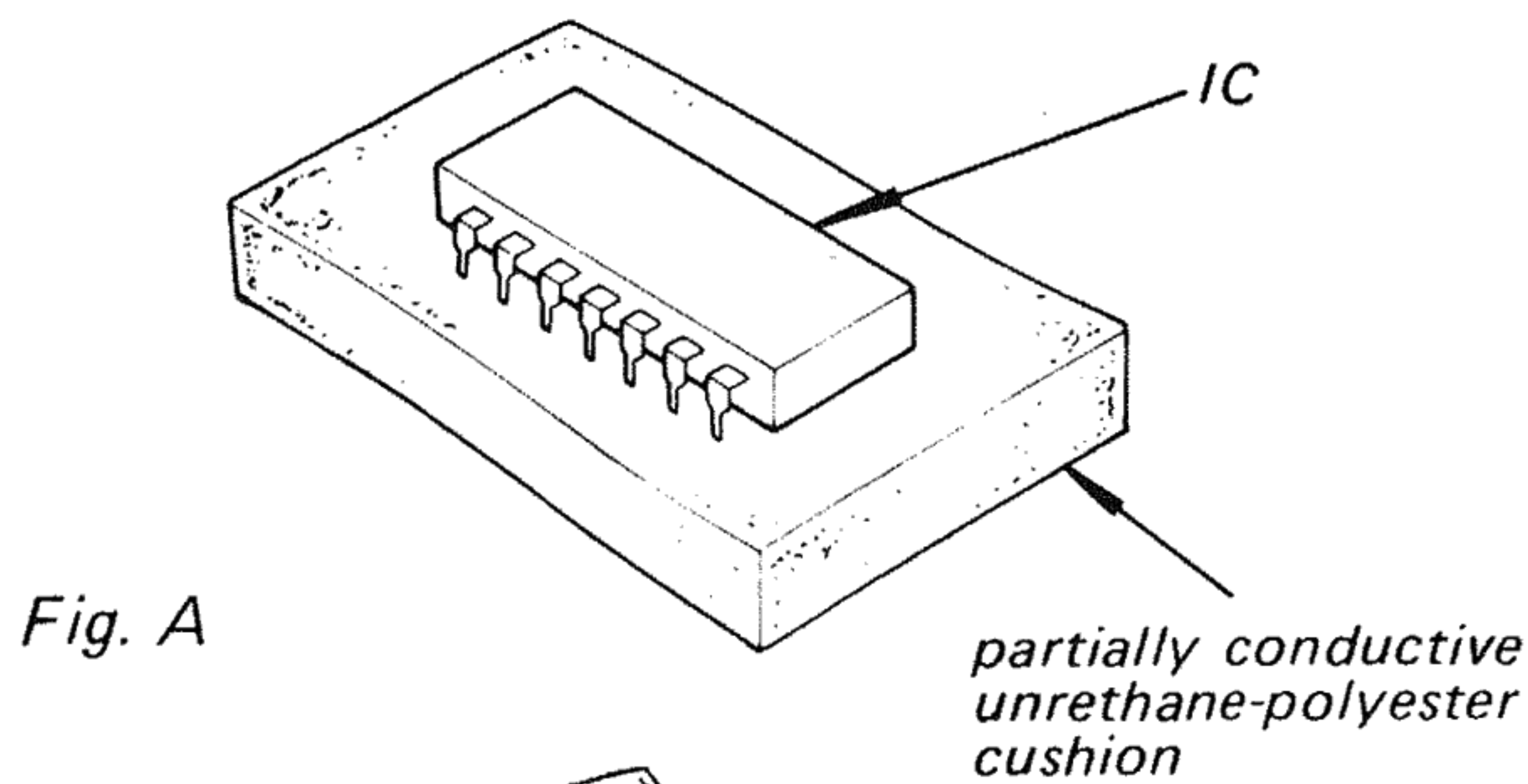
Generally, the insulation resistance of the oxide layer in MOS IC structures is very high, and the oxide layer is very thin. Because of this, it is possible that the static voltages usually present on clothes and the human body will be enough to generate a potential difference across the insulator, high enough to cause a breakdown of the insulating layer.

The following precautions should be taken while handling these ICs.

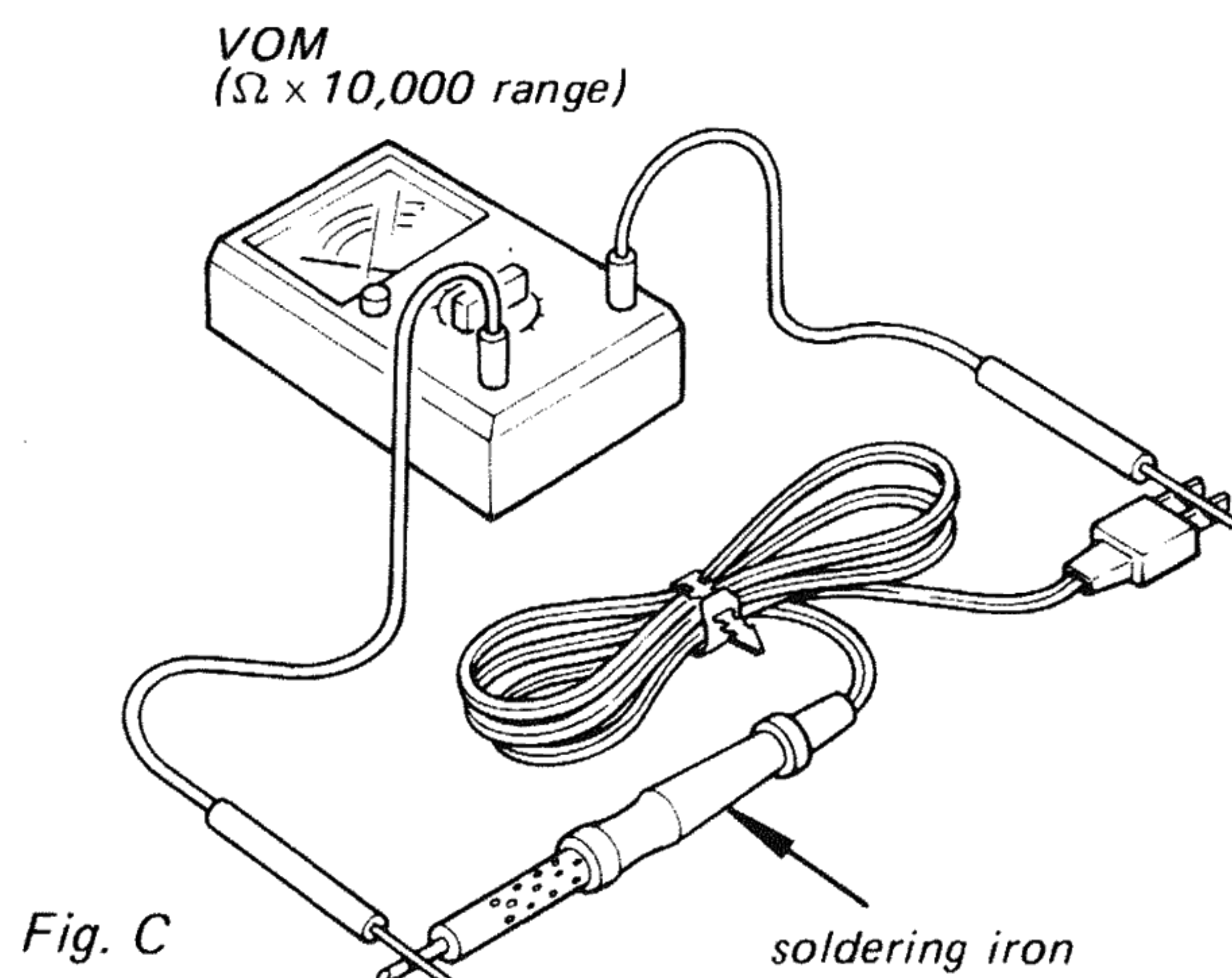
(Particular care should be taken under conditions of low humidity.)

Precautions in Replacing MOS ICs

1. Store new ICs by inserting them into a urethane-polyester cushion (which is somewhat conductive), or wrapping it in aluminum foil, so that all the pins are at the same potential. (The ICs should be stored in that manner until mounted on the circuit board.)



2. Check the soldering iron for possible power-line leakage current. Make sure that there is no leakage path by connecting an ohmmeter to the tip of the soldering iron and the plug as shown in Fig. C. If there is a leakage path, use some other soldering iron.



3. Equalize any potential difference between the clothes, the tools in use, the work bench, the set being worked on, and the packaged IC by touching them all in succession with the hands or a conductive wire or tool.
4. The following are effective methods for handling ICs that remove the potential difference across the oxide layer.
 - Use a paper clip modified by soldering in a wire braid insert.

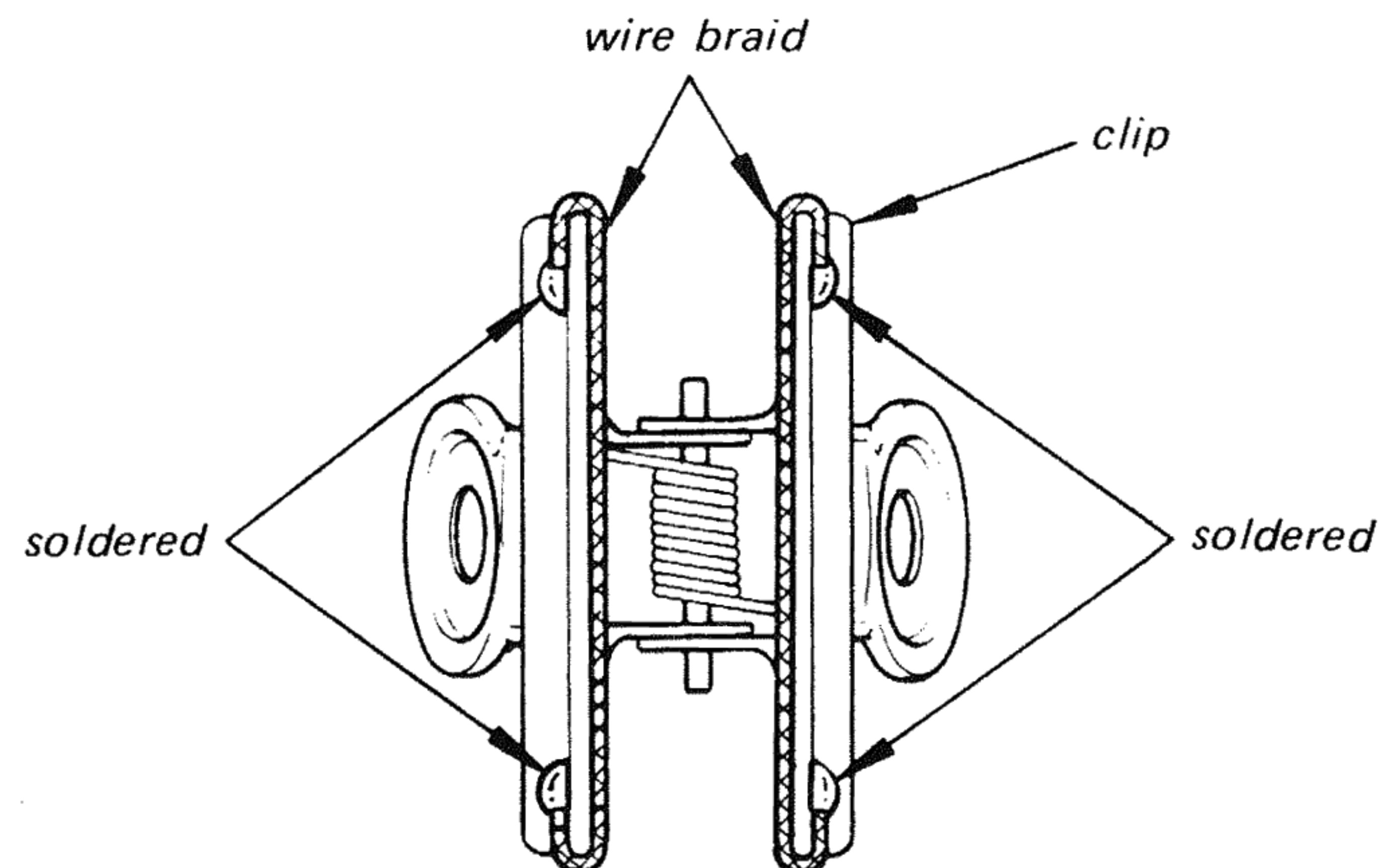


Fig. D

Make sure that there is no solder on the inside.

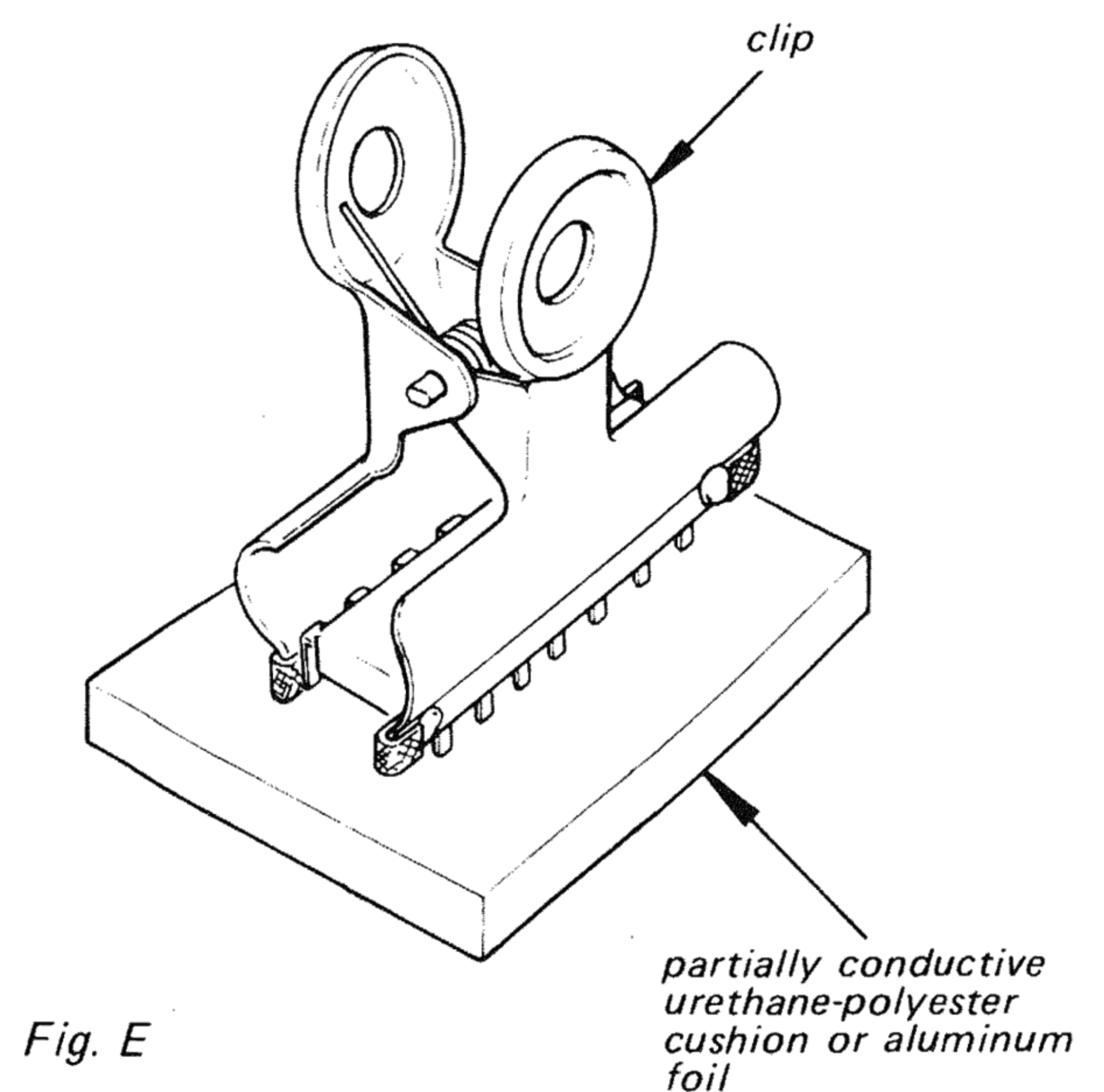


Fig. E

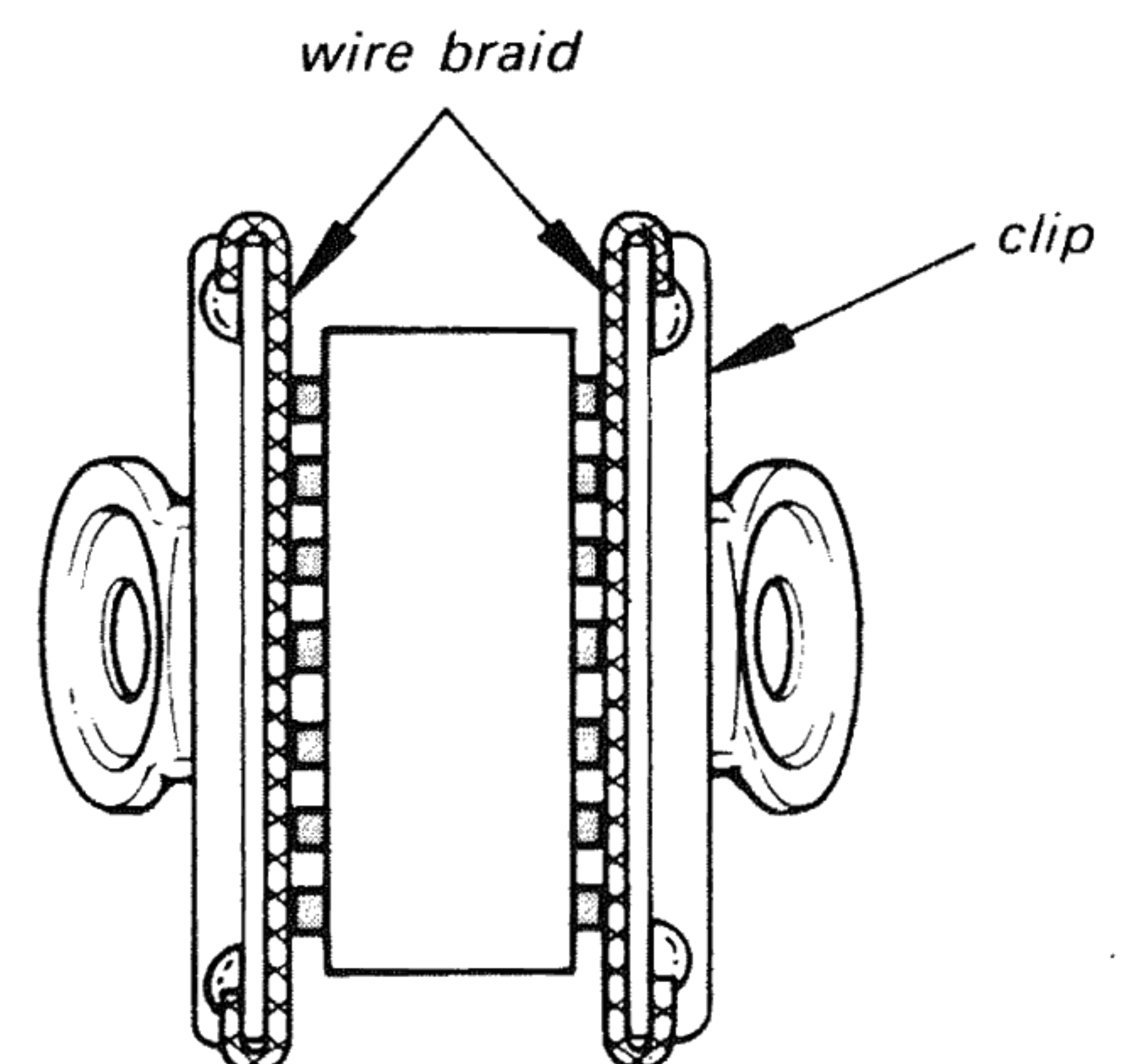


Fig. F

Make sure that all the pins are in contact with the wire braid (all the pins will then be at the same potential.).

- Take a short length of fine bare wire and wind it around the IC so that it shorts all the pins of the IC, while it is still in the urethane-polyester cushion or aluminum foil. This ensures that all the pins are at the same potential.

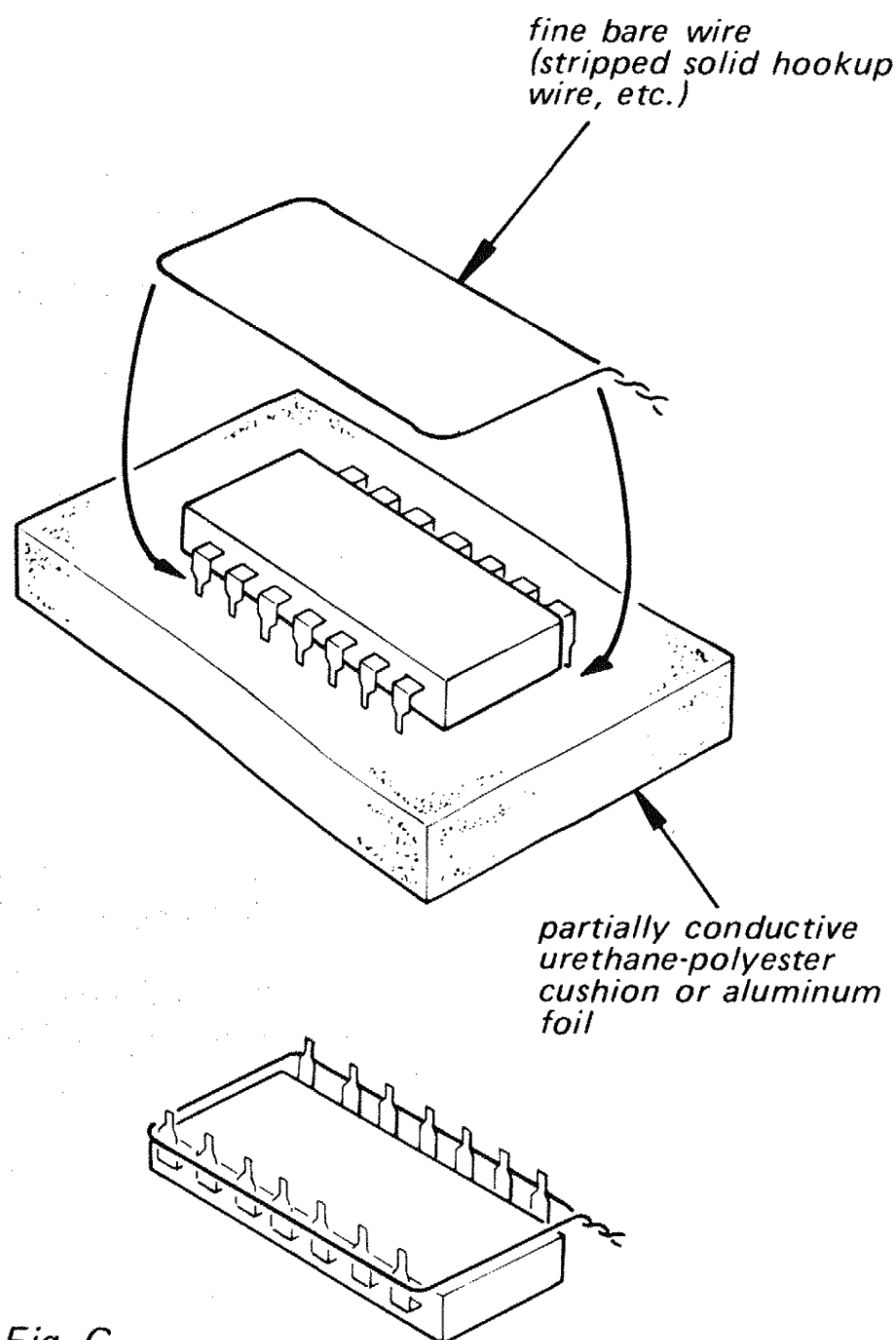


Fig. G

- When it is necessary to handle the IC with the fingers, do not touch any pin, and hold the IC at the ends of its plastic-package case as shown in Fig. H.

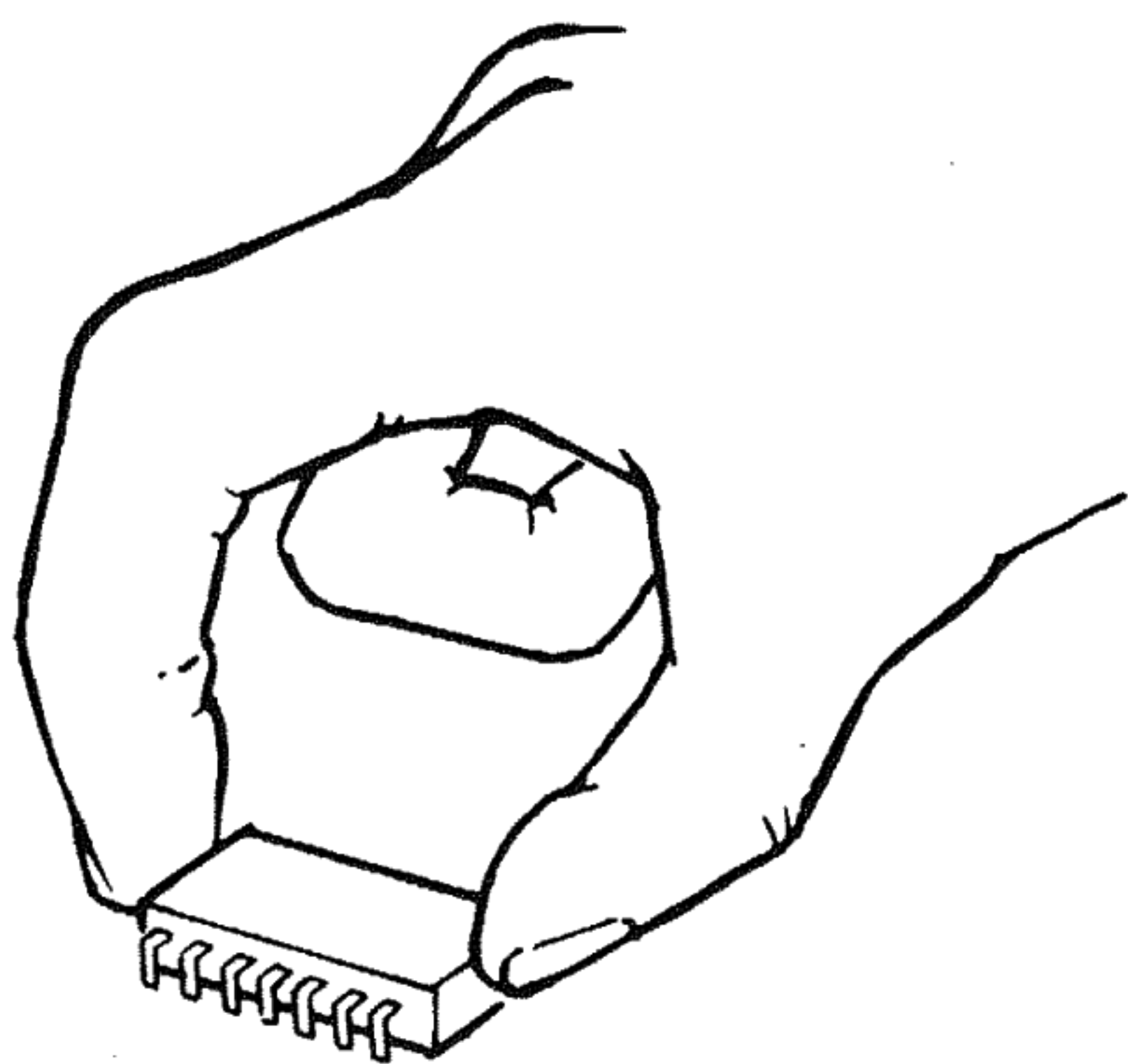


Fig. H

5. Method of Mounting

Insert the IC while holding it with the modified clip, and solder all the pins with the clip still shorting the pins. (Similarly, solder all the pins while the bare shorting wire is still wound around them.). Remove the clip or the bare shorting wire only after all the pins have been soldered.

Precaution while Checking C-MOS ICs

The C-MOS ICs (Complementary MOS) are MOS ICs that have their output sections made up of N-channel and P-channel push-pull stages to increase their speed of operation. If the output terminal of these ICs comes into contact with B+ or B- voltage, then the FET which is ON at that time will either become shorted or open.

This is valid for all the output sections that are connected together by the interconnections. Even the circuits that are physically separated (and not on the same board) can be destroyed simultaneously.

Example:

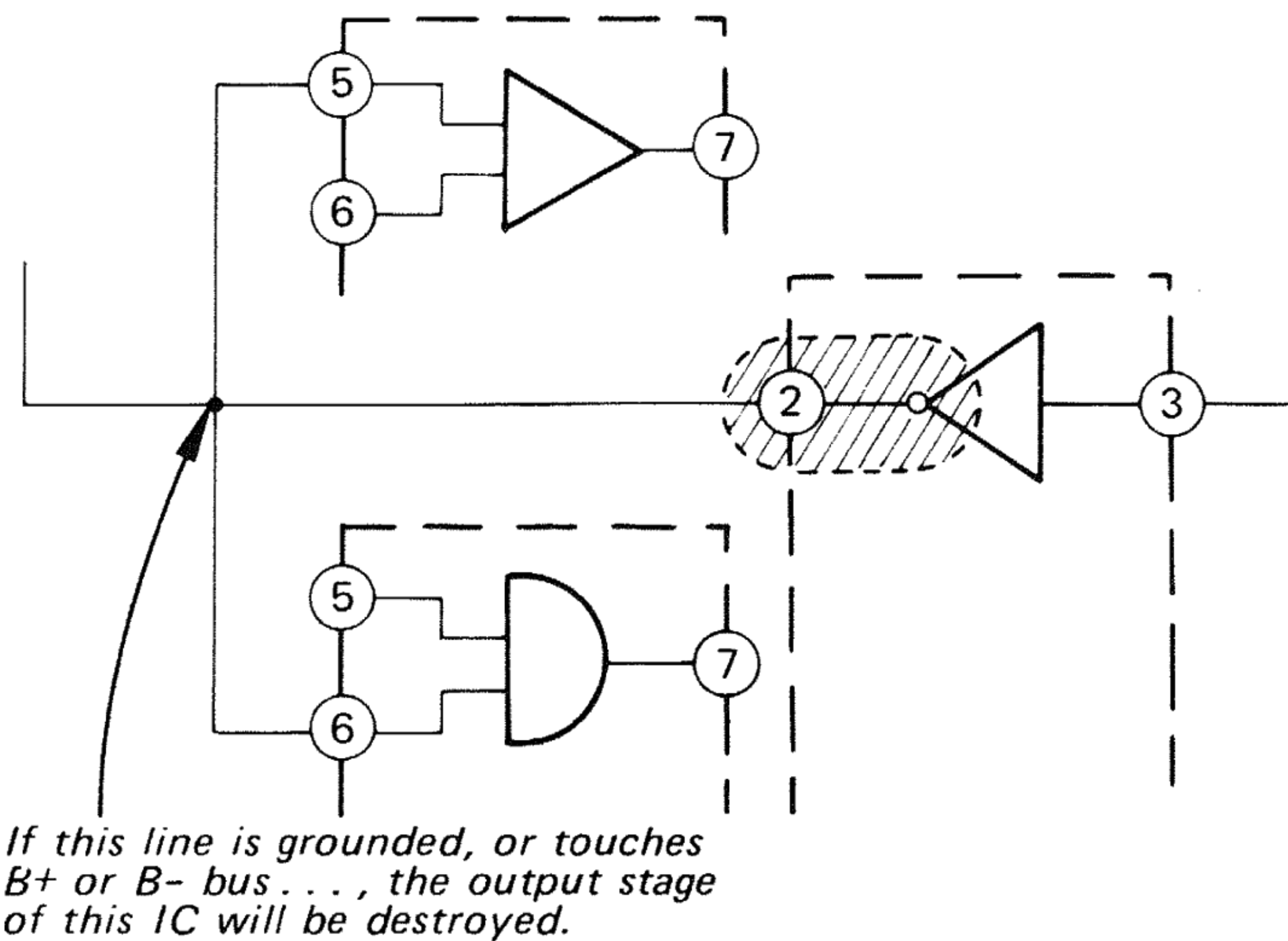


Fig. I

SECTION 1

OUTLINE

1-1. FEATURES

The STR-VX33 with its Direct Access System, makes station selection easier than ever. But the STR-VX33 also includes such features as memory presets, memory scan, function display, a Legato Linear amplifier and many other refinements which make it an outstanding control center for a total music system.

Amplifier section

- The operation of the power amplifier stage is stable without any observable distortion up through the higher frequencies. We call this power amp "Legato Linear" because its switching distortion is very low and its output waveform smooth. The output stage of the Legato Linear power amp employs Hi-fi transistors.
- Tone control stages, which employ an IC, are carefully designed to improve stereo separation and signal-to-noise ratio.
- Protection and power muting circuits are included to avoid annoying thump noise during power switching.

Tuner section

- The quartz-locked digital synthesizer system with a sophisticated Phase Locked Loop (PLL) circuit allows extremely precise tuning of FM and AM stations with an electronic digital readout on the frequency display.
- A new IC recently developed by Sony allows the high comparison frequency, thus eliminating the tendency for a low comparison frequency, which had been previously generally employed, to slip into the audio range and degrade the signal-to-noise ratio.
- Four methods of tuning are available:
- Direct access tuning: FM or AM stations can be directly tuned in by inputting the station frequency with the DIRECT TUNING buttons.
- Automatic tuning: the FM band is scanned automatically until a signal is received.
- Manual tuning: AM tuning can be accomplished either by changing the frequency display reading step by step or slowly to monitor the frequency.
- Memory preset tuning: a desired pre-memorized station can be instantly received by pressing the PRESET TUNING button.
- The pre-memorized stations are retained in memory by two back-up batteries when the power is turned off. These back-up batteries also allow the last station tuned in to be held in memory.

1-2. PRECAUTIONS

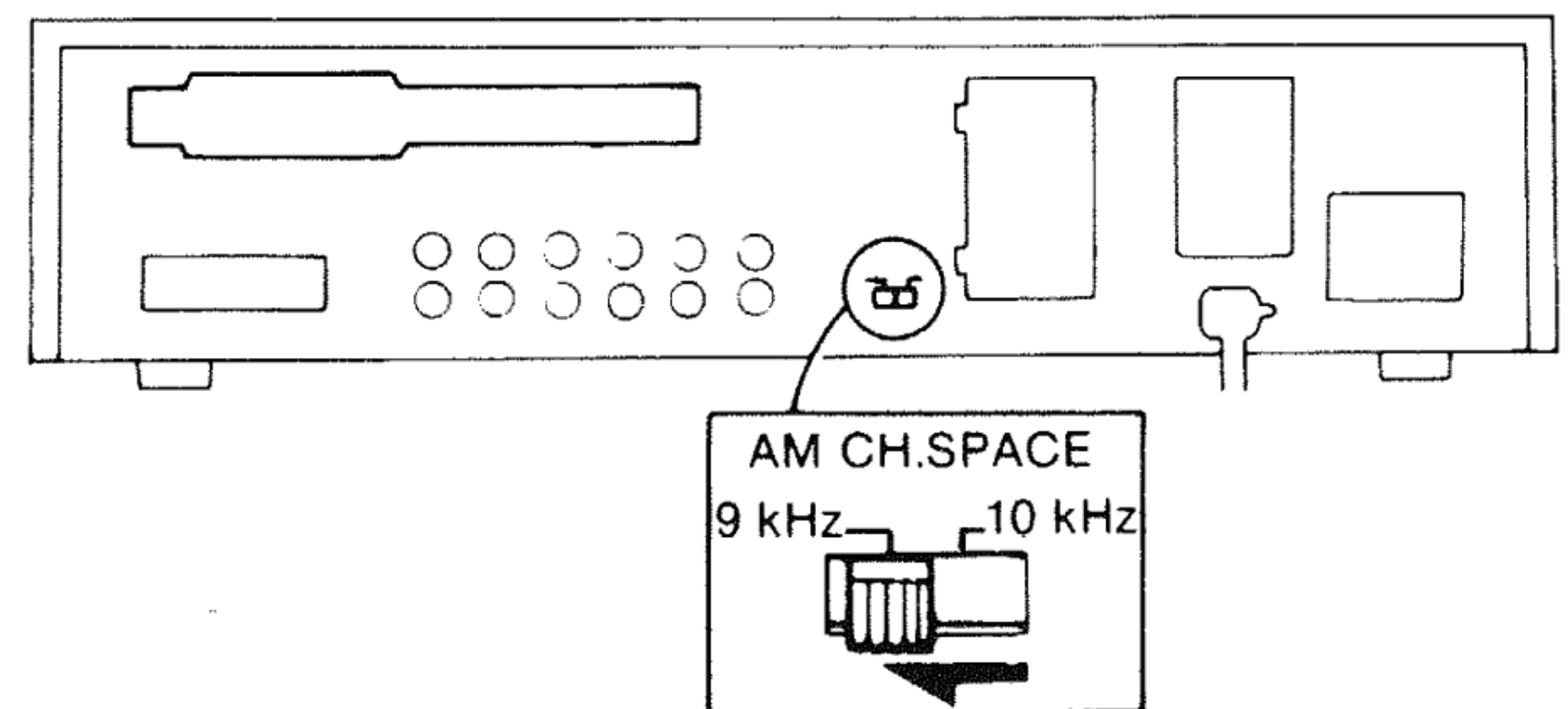
Note about the AM channel plan selector

This receiver has a two-position AM channel plan selector on the rear. To tune in AM stations correctly, the selector should be correctly set according to the AM frequency allocation system of your country.

10 kHz: for countries where the frequencies are allocated at intervals of 10 kHz, for example, the USA and Canada.

9 kHz: for countries where the frequencies are allocated at intervals of 9 kHz.

This selector is factory preset at 10 kHz. If the AM frequencies are allocated at intervals of 9 kHz in your country, the selector should be set to 9 kHz. **Be sure to turn off the power before changing the position of the selector.**



Notes

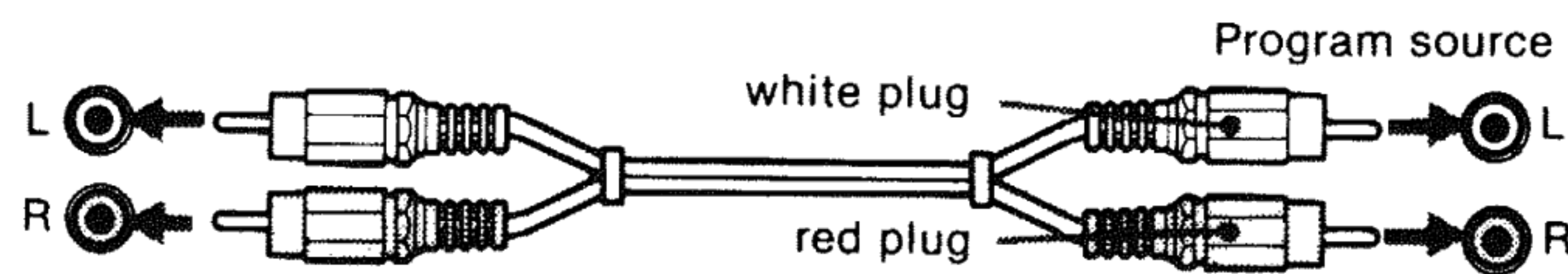
- If the selector is set incorrectly, you cannot tune in AM stations properly.
- When the selector is changed, the preset frequency and the last station memory will be erased. In this case, memorize the frequency again.

SYSTEM CONNECTIONS

CONNECTION NOTES

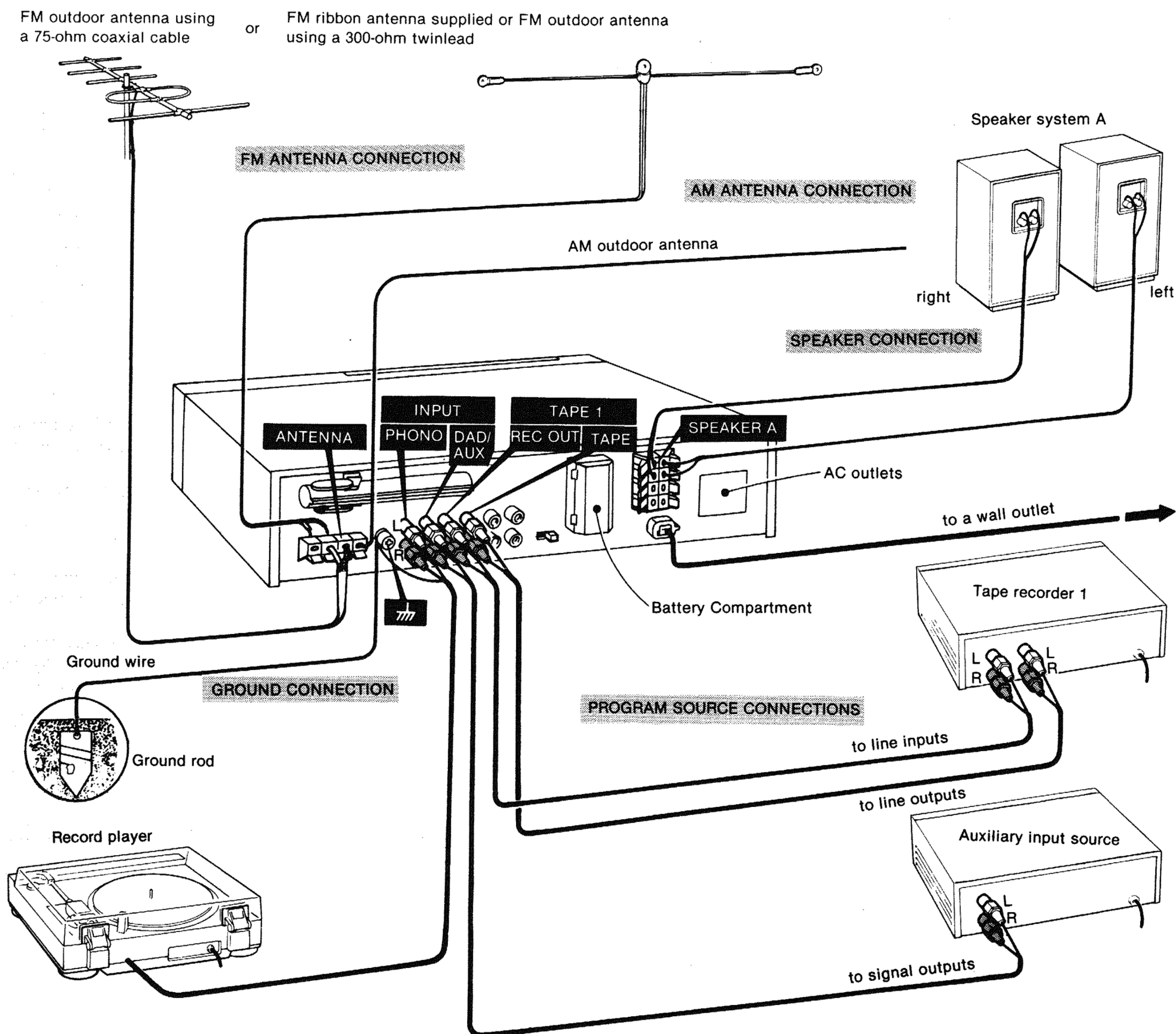
- The power cord should be connected last of all, first making sure that the POWER switch is turned off.
- To assure correct matching at the input and output terminals of your audio system, refer to the "SPECIFICATIONS" on the back cover, and to the specifications given in the instruction manuals provided with the components you wish to connect to the receiver. Generally the output level of a signal source (phono cartridge, tape recorder, etc.) should be equal to or slightly greater than the sensitivity of the corresponding input. Also the output impedance of a signal source should be considerably lower than the impedance of the corresponding input.
- For all program source input and output connections, use a low-capacitance type shielded cable. Keep the cables as short as practicable. Excessively long runs tend to reduce the high frequency response. Also, keep the cables away from the power cord or speaker cords to avoid hum pickup.

- When connecting program sources or tape recorders, note that the red jacks of the receiver are for right-channel connections and the white jacks for left-channel connections.



- The cable connectors should be fully inserted into the jacks. A loose connection may cause hum and noise.
- Since there is a variety of cords—such as speaker cords, power cord, connecting cords—around the rear panel terminals, you should maintain a moderate separation between the bar antenna and the cords. This is because the receiver may produce a noise from the direct touch of the cords on the bar antenna.

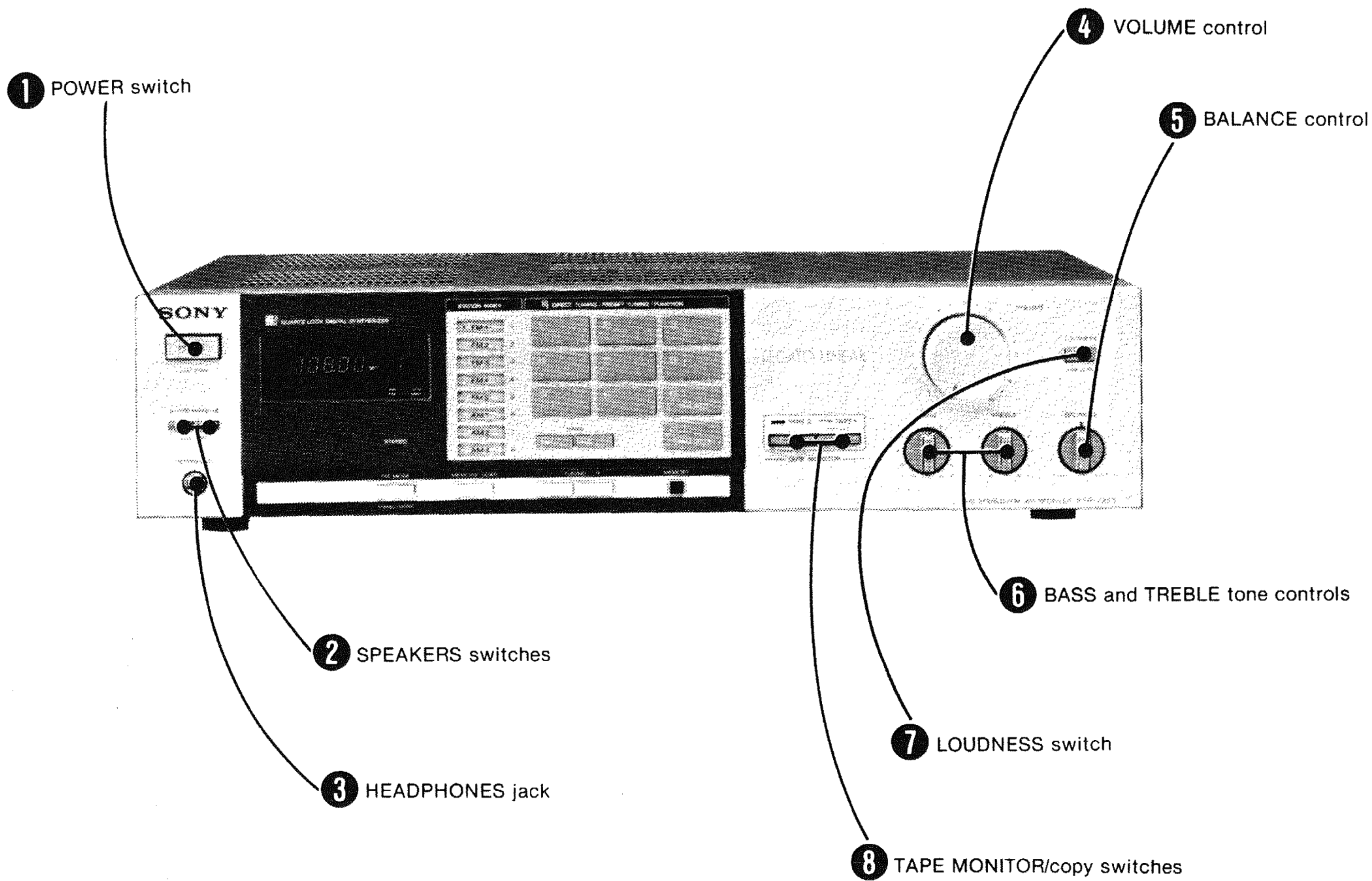
CONNECTION DIAGRAM





LOCATION AND FUNCTION OF CONTROLS

Before plugging in or attempting to operate this receiver, it is suggested that you familiarize yourself with all its switches and the purpose of each. Each number in the photo is keyed to the descriptive text.

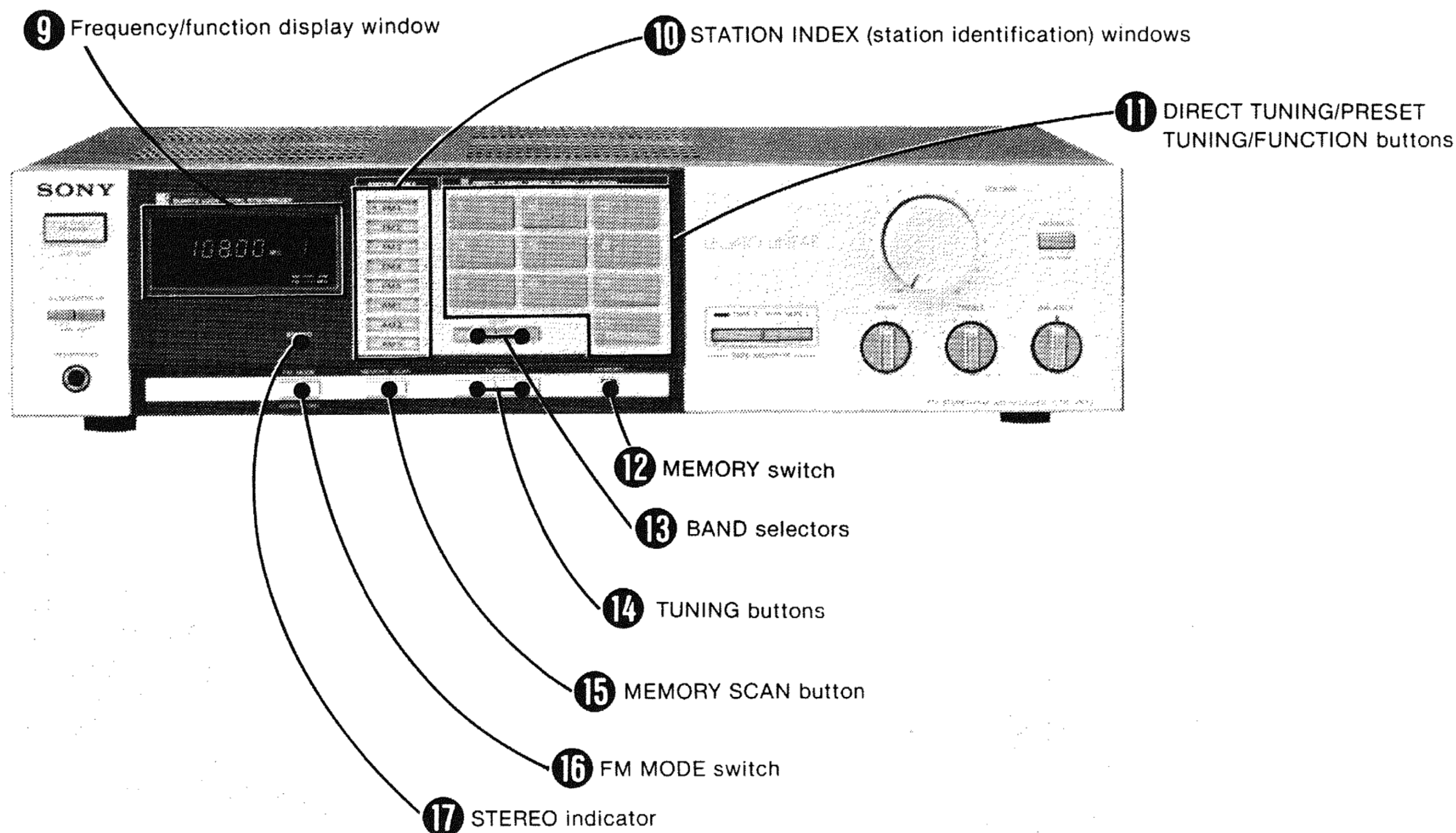
Amplifier section



- 1 POWER switch**
Depress to turn on the power. To turn the power off, press the switch again.
- 2 SPEAKERS switches**
To drive speaker system A, depress the A switch.
To drive speaker system B, depress the B switch.
To drive both speaker systems A and B, depress both A and B switches.
- 3 HEADPHONES jack**
Accepts any low or high impedance stereo headphones.
For headphone monitoring only, keep the SPEAKERS switches OFF.
- 4 VOLUME control**
Regulates the overall sound level.
Clockwise rotation of the VOLUME control increases the sound level and counterclockwise rotation decreases it.
Be sure to lower the volume whenever you turn the receiver on or off, or make system connections.
- 5 BALANCE control**
Governs the amount of sound coming from each paired speaker to get optimum stereo effect. When you turn the BALANCE control to the right, the left channel volume is decreased, and vice versa.

- 6 BASS and TREBLE tone controls**
These knobs control the prominence of bass and treble response. Clockwise rotation increases response ; counterclockwise rotation decreases it. Normally keep these at the "0" position.
Adjust the tone to the acoustic condition of the listening room or to your preference.
- 7 LOUDNESS switch**
Normally keep the switch released ( OFF). When listening to program sources at a low VOLUME control setting, depress the switch ( ON).
This loudness control compensates for the human ear's decreased response to very low and high frequency sound at low volume levels, and provides an apparently uniform response. The effect of this control gradually decreases as the volume is increased by the VOLUME control.
- 8 TAPE MONITOR/copy switches**
To listen to a taped program, depress the TAPE 1 or TAPE 2 switch. The indication—TAPE 1 or TAPE 2 above the switches—will light up, indicating that a playback output from the tape recorder connected to the TAPE 1 or TAPE 2 jacks can be heard.
To dub from tape recorder 1 to tape recorder 2, depress the TAPE 1 (COPY 1 → 2) switch.

Tuner section



9 Frequency/function display window

During broadcast reception



Frequency being received

The PRESET TUNING button at which the frequency is memorized.

During reproduction of record source or auxiliary input source



Program in use

10 STATION INDEX (station identification) windows

Station labels (supplied) identifying pre-memorized stations can be placed in these windows.

11 DIRECT TUNING/PRESET TUNING/FUNCTION buttons

Press the button according to the following desired purposes. The pressed figures will be displayed on the frequency/function display window.

Direct access tuning (the 1 to 0 buttons serve as DIRECT TUNING buttons)

To tune in the frequency directly, press the BAND selector and the buttons.

Memory tuning (the 1 to 8 buttons serve as PRESET TUNING buttons)

To call up a pre-memorized station, press the appropriate button.

Reproduction of record and auxiliary sources (9 and 0 buttons serve as FUNCTION buttons)

Press to select between PHONO (9) or DAD/AUX (0).

12 MEMORY switch

Press to operate memory circuit. The "0" indicator will appear on the frequency/function display window for a few seconds indicating that the memory circuit is standing by.

13 Band selectors

Press the appropriate selector to select the desired band: FM or AM.

14 TUNING buttons

Press either the "+" or "-" button to change the frequency: Press the "-" button to go to a lower frequency and the "+" button to go to a higher.

During FM reception:

Press to start the automatic frequency scanning (in 0.05 MHz steps).

During AM reception:

Press and keep the button depressed to change the frequency continuously in 10 kHz steps (or 9 kHz steps). To change the frequency rapidly, press and release the button immediately.

15 MEMORY SCAN button

Press for automatic scanning of the stations pre-memorized on the PRESET TUNING buttons.

16 FM MODE switch

During FM reception, when a stereo signal of sufficient strength is received, the receiver operates in the stereo mode. (The STEREO indicator will illuminate.)

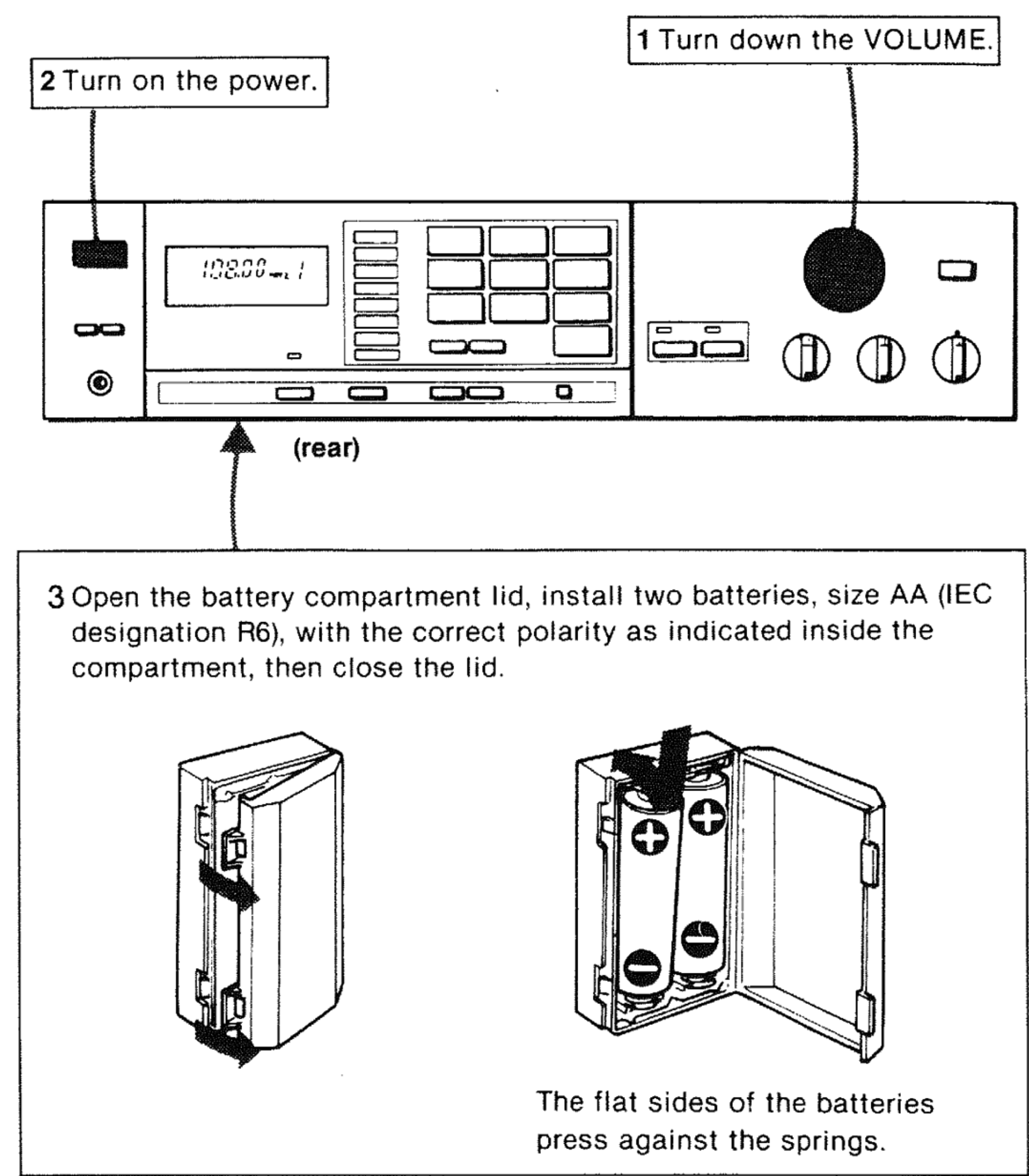
When you want to tune in a very weak FM station, or when an FM program is too noisy, press this switch. (The STEREO indicator illumination will go out.) Press it again to return to the stereo mode. The mode will automatically return to the stereo mode when the frequency is changed.

17 STEREO indicator

This indicator will light when an FM stereo program of sufficient signal strength is tuned in.

BATTERY INSTALLATION

To retain the frequencies memorized on the PRESET TUNING buttons while the receiver is turned off, install two batteries in the battery compartment at the rear as follows.



Battery life

About one year of operation can be expected when using Sony SUM-3(NS) New Super Batteries (or Eveready Heavy Duty Batteries No. 1215). Be sure to replace the batteries once a year to avoid damage from leaking batteries.

Note

Be sure to turn on the receiver before installing or replacing the batteries.

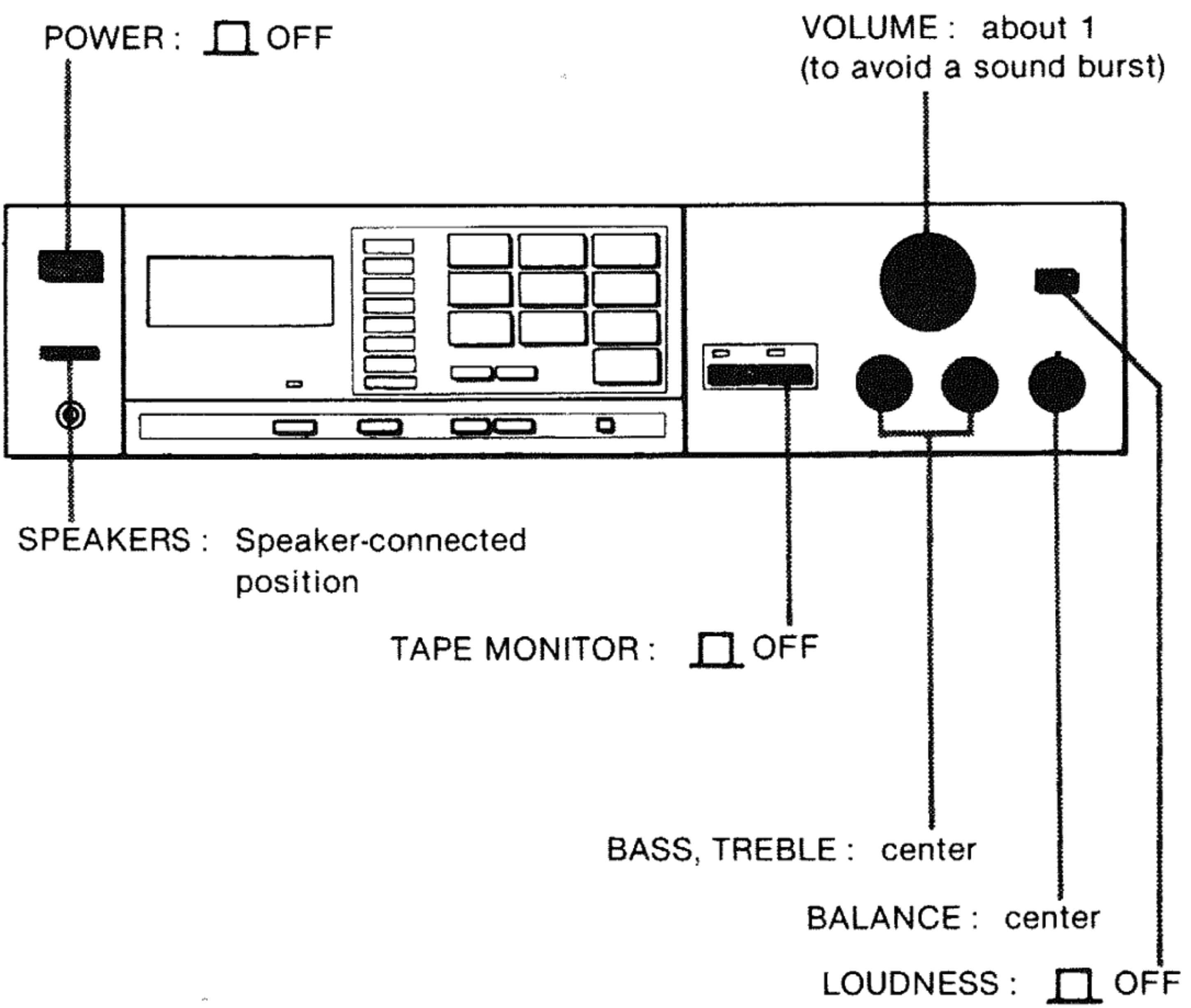
If the batteries are installed or replaced with the power turned off, incorrect figures will appear in the frequency/function display window.

In that case ;

- 1 Leave the unit with power off for 30 minutes.
- 2 Turn on the power.
- 3 Install the two batteries.
- 4 Place the desired frequencies in memory again.

PREPARATION

Before proceeding to any type of operation, set the controls and switches as shown.



BROADCAST RECEPTION

This receiver incorporates the following tuning systems which give the listener a choice of four ways in which to tune in the desired broadcast.

Direct access tuning

If you know the frequency of the station to be received, you can tune in the station easily by this system.

Auto tuning (for FM reception)
Manual tuning (for AM reception)

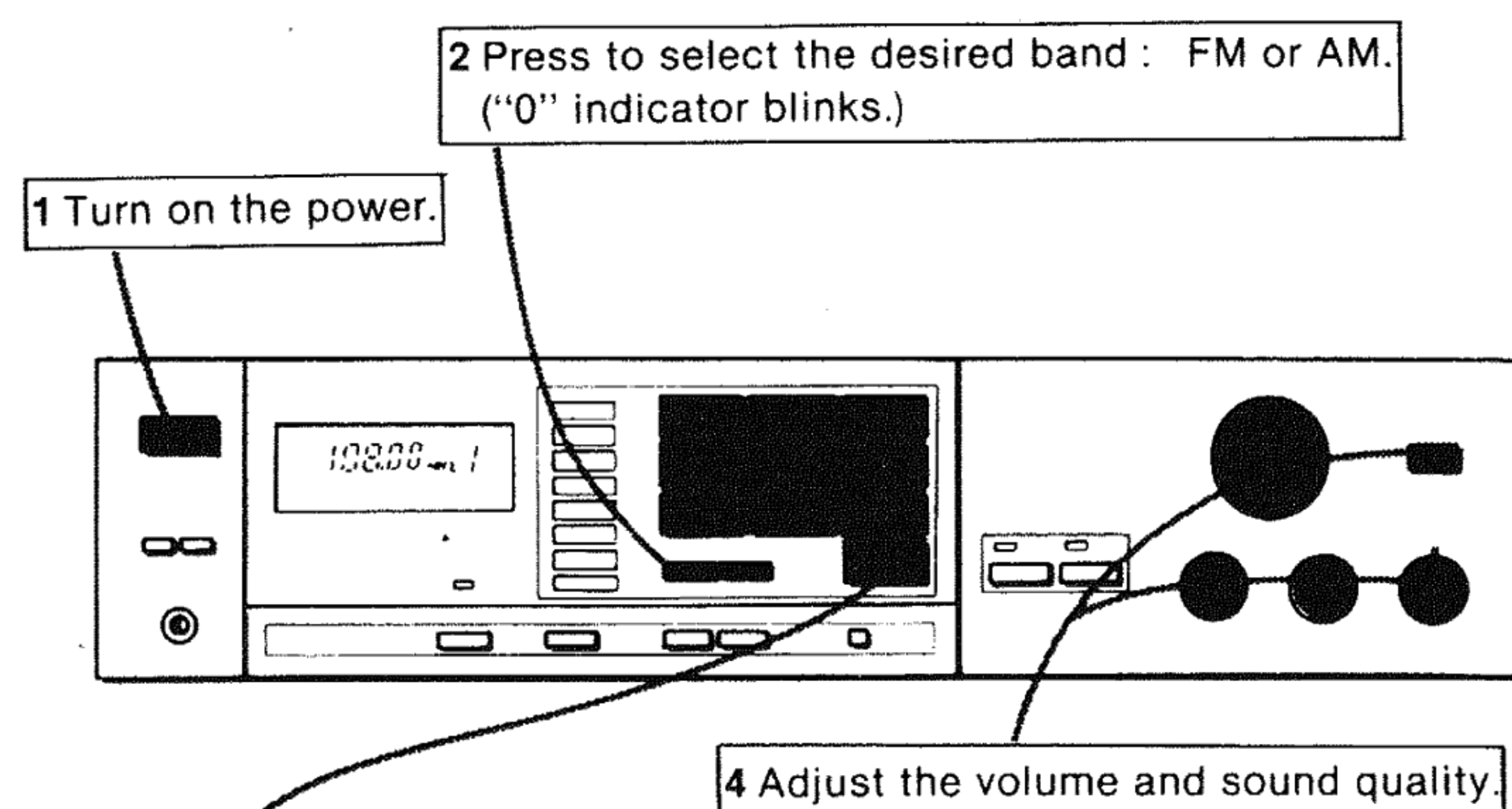
These systems are convenient for receiving a station whose frequency has not been memorized, or to see what kind of programs are on the air.

Memory preset tuning

Once you program the frequencies into the memory, all you need do to tune in a station is to press the appropriate button.

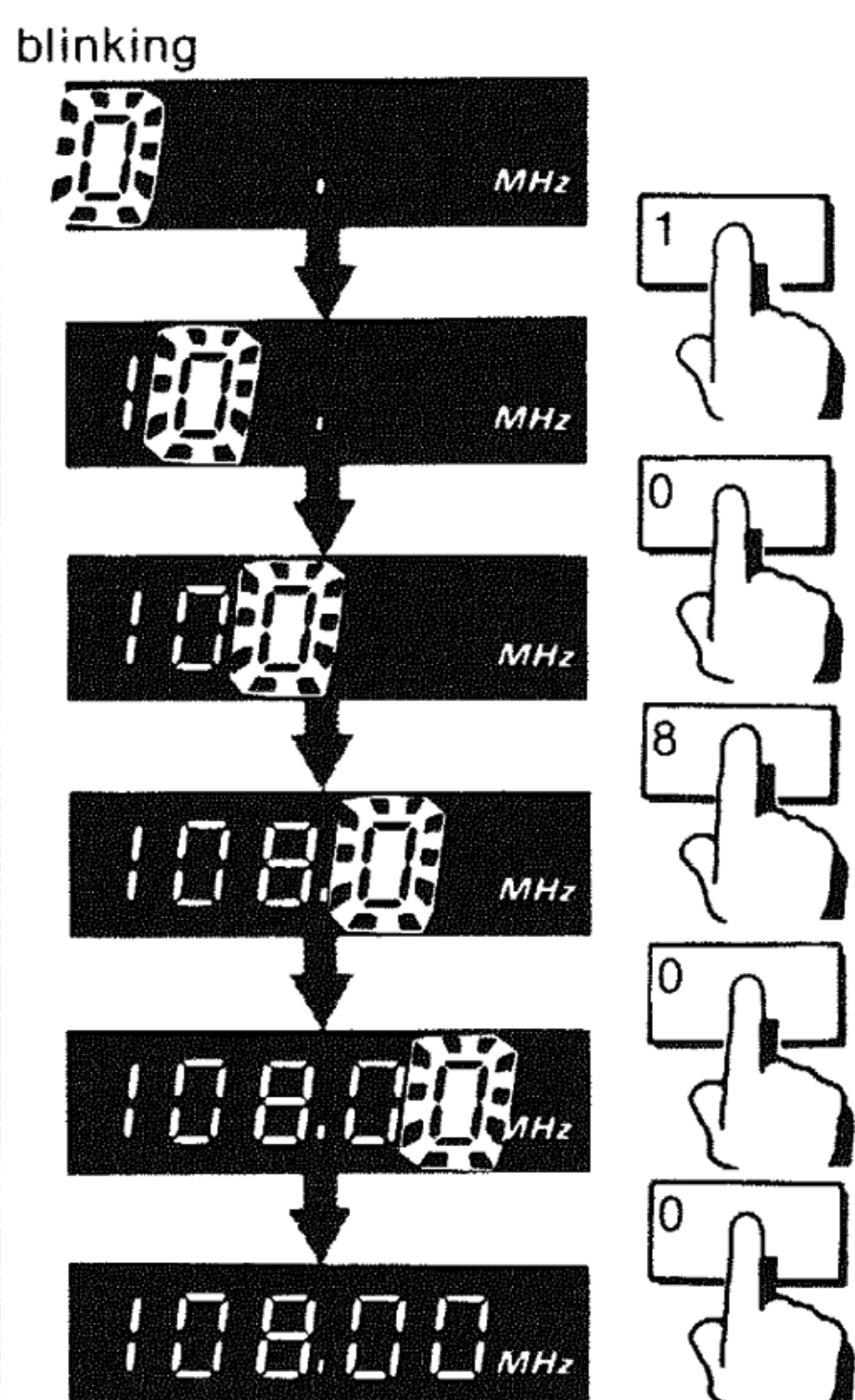
DIRECT ACCESS TUNING

Follow the numbered sequence.

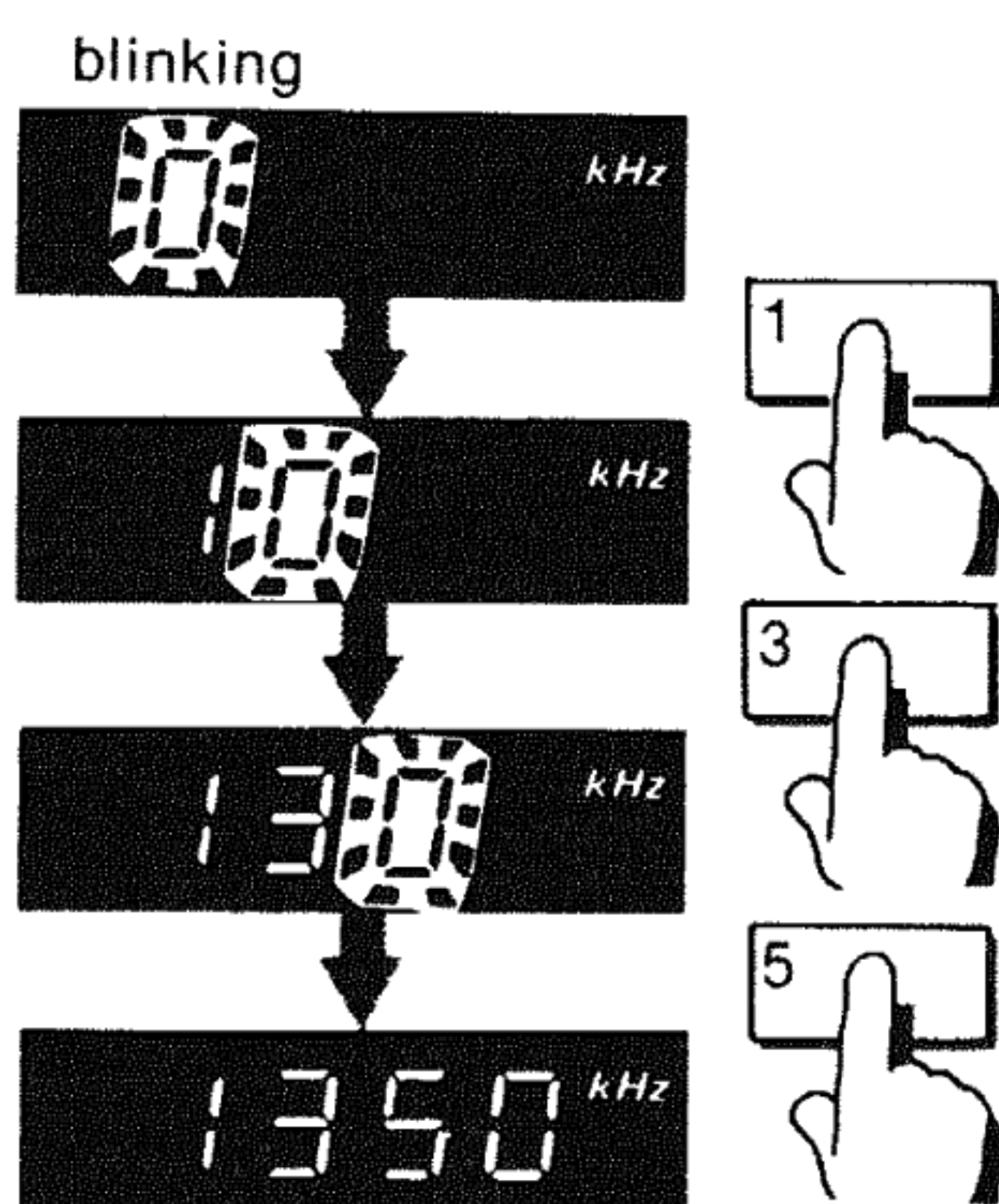


3 Pressing the DIRECT TUNING button, input the frequency of the station to be received.

Example 1: FM 108.00 MHz



Example 2: AM 1,350 kHz
(with AM channel plan selector set to 10 kHz)



The "0" will appear automatically.

You can now hear the station whose frequency you have just input.

Notes on the AM direct access tuning

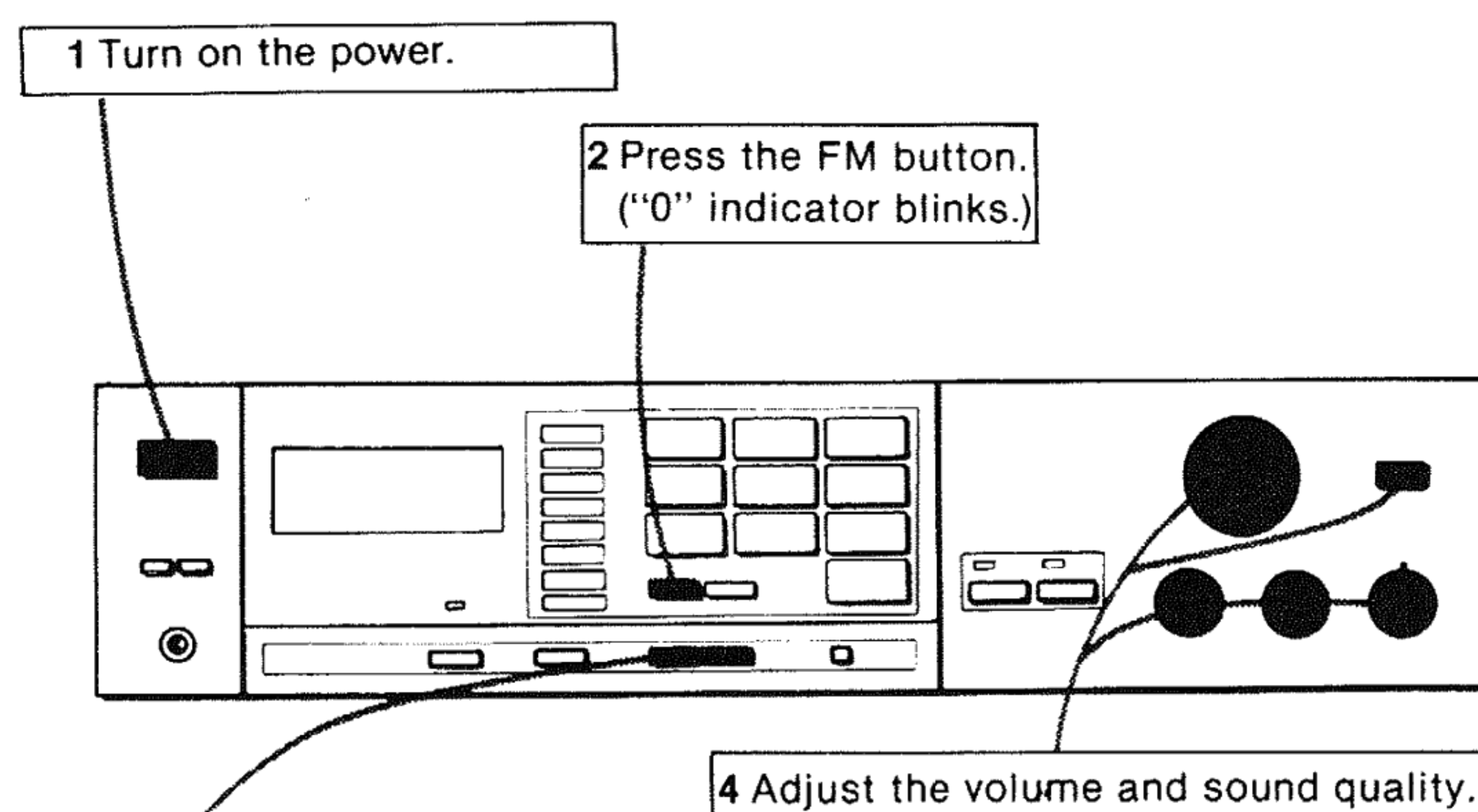
- If the AM channel plan selector is set to 10 kHz, the last digit "0" of the frequency will be automatically set when the first two or three digits are input.
- If the AM channel plan selector is set to 9 kHz, input the frequency to the last digit.

When the wrong frequency is input

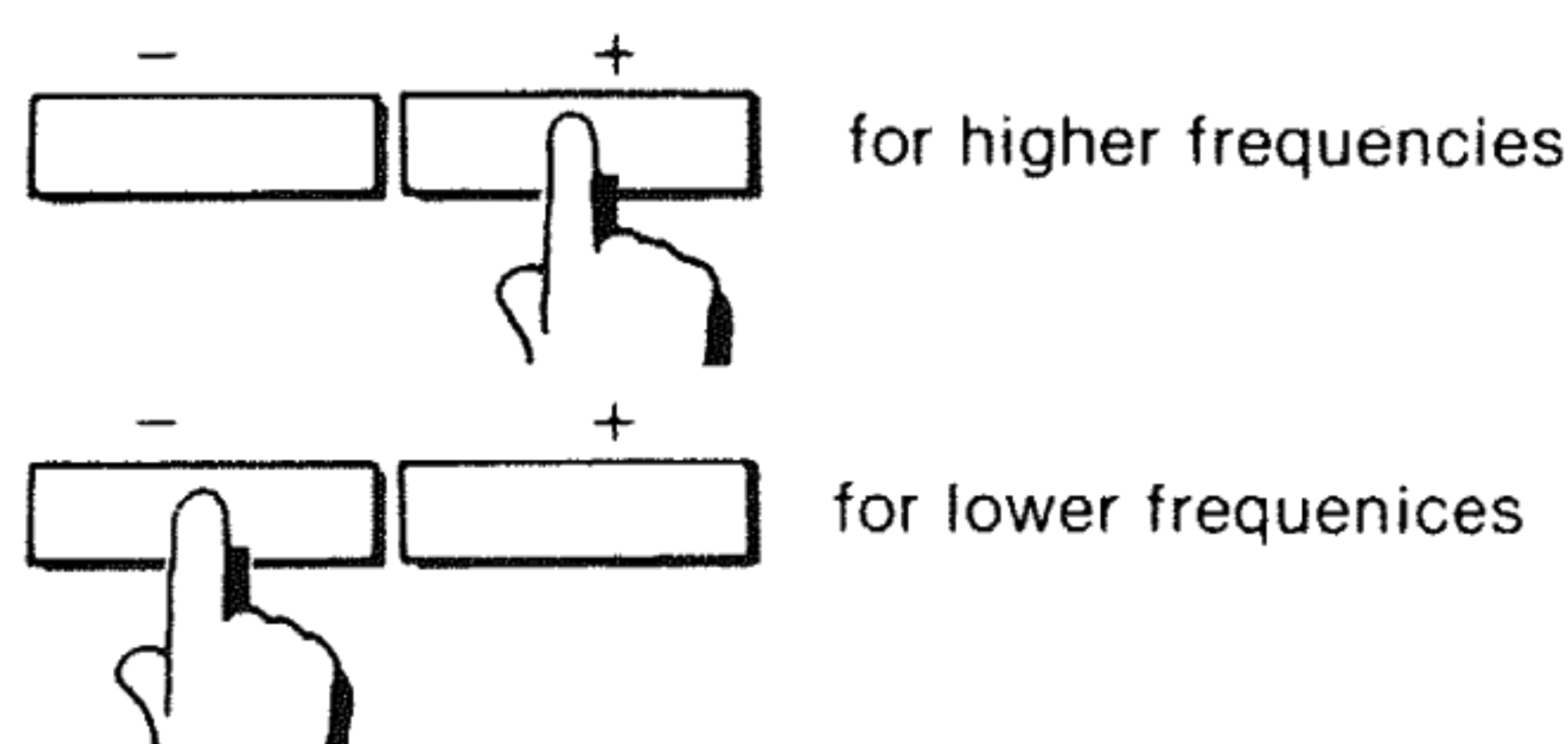
- If you mistakenly press a wrong figure, press the appropriate BAND selector again and input the correct frequency.
- If you input a frequency outside the receiver's frequency range (FM: 87.5 to 108 MHz, AM 530 to 1,610 kHz), the figures will flash on and off in the frequency/function display window. In this case, press the appropriate BAND selector and input the proper frequency.

AUTOMATIC TUNING (for FM reception)

Follow the numbered sequence.



3 Press the "+" or "-" TUNING button to start automatic frequency scanning. There is no need to hold the button down.



The frequency figures will change rapidly and stop when a signal is received. If the received signal is not the desired one, press the button again.

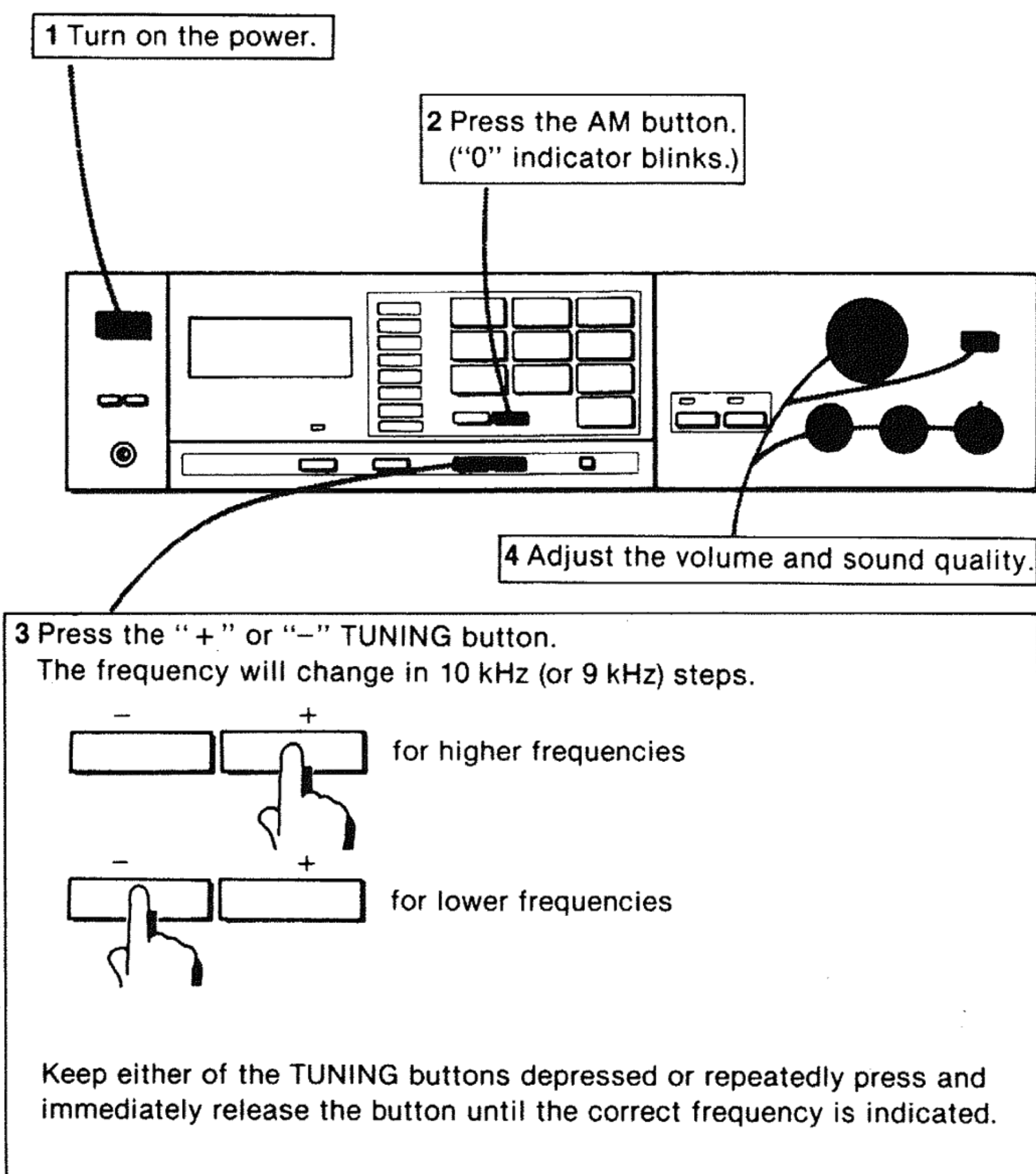
To stop the automatic tuning, press the MEMORY switch.

If the signal strength is weak, the frequency display figures will not stop at the desired frequency. When this happens, adjust the antenna for optimum reception. If the signal strength is still too weak for automatic tuning, tune in the station as described in "DIRECT ACCESS TUNING".

When the frequency figures reach the end of the tuning range of each band, the frequency will then be scanned from the opposite end of the tuning range.

MANUAL TUNING (for AM reception)

Follow the numbered sequence.



To quickly tune in a roughly known frequency

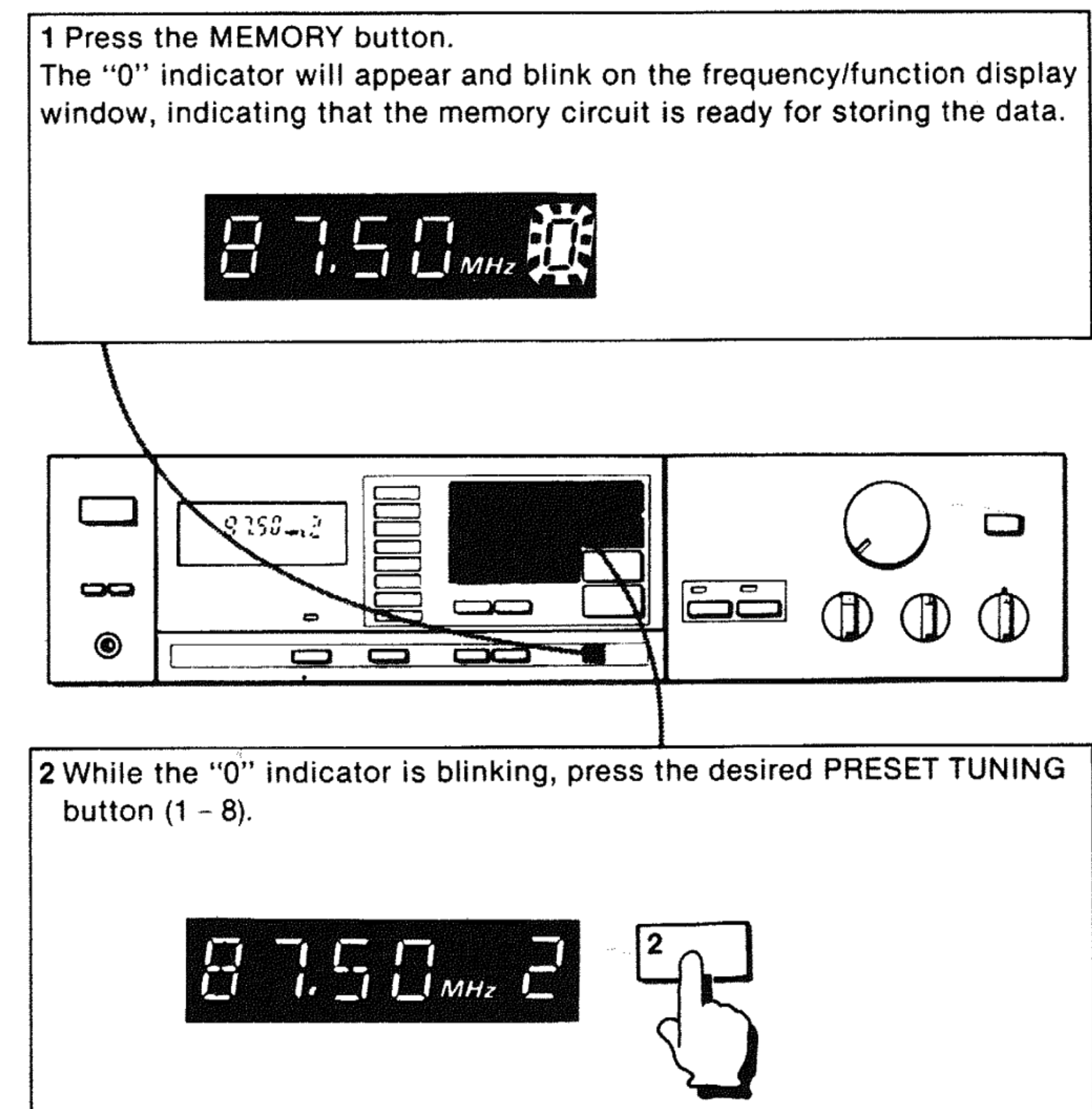
You can quickly tune in an FM or AM station whose frequency is roughly known by combining the TUNING button operation with direct access tuning. Input the approximate frequency with the direct access tuning, then press either the "+" or "-" button. For example, if you believe your station is between 700 and 800 kHz, input 7 and press the "+" button, or input 8 and press the "-" button.

MEMORY PRESET TUNING

A total of eight FM or AM stations or a combination of both can be preset in any sequence.

To memorize station frequencies

To memorize a station, first tune in the station, then follow the numbered sequence.



Repeat these steps for each PRESET TUNING button.

Replace the station labels to conform to the selected pre-memorized stations.

Notes

- The "0" indicator will go off automatically after a few seconds. When the indicator is out, the memory circuit does not operate to memorize the station.
- The previous memory will be erased when a new frequency is programmed in the memory of the same button. An erasure cannot be made without a new input.

To receive a pre-memorized station

Turn the POWER switch on and simply press the desired PRESET TUNING button.

Memory of the last received station

This receiver includes a memory circuit, which is backed up by the batteries, to remember the station which had been received for more than one second just before the power was turned off. This station will be automatically tuned in when the power is turned on again.

This memory system enables you to make a timer-activated recording from the receiver.

Note: If the power is turned off during memory scanning, even if a station had been received for three seconds, this memory circuit will not operate.

OTHER OPERATING INSTRUCTIONS

REPRODUCTION OF PHONO, DAD/AUX AND TAPE PROGRAM SOURCES

Once you familiarize yourself with the operation of FM/AM reception, you can listen to other program sources as follows :

- 1 Set the controls and switches at the initial setting position.
- 2 Select the desired program source as required by using the TAPE MONITOR and FUNCTION switches.

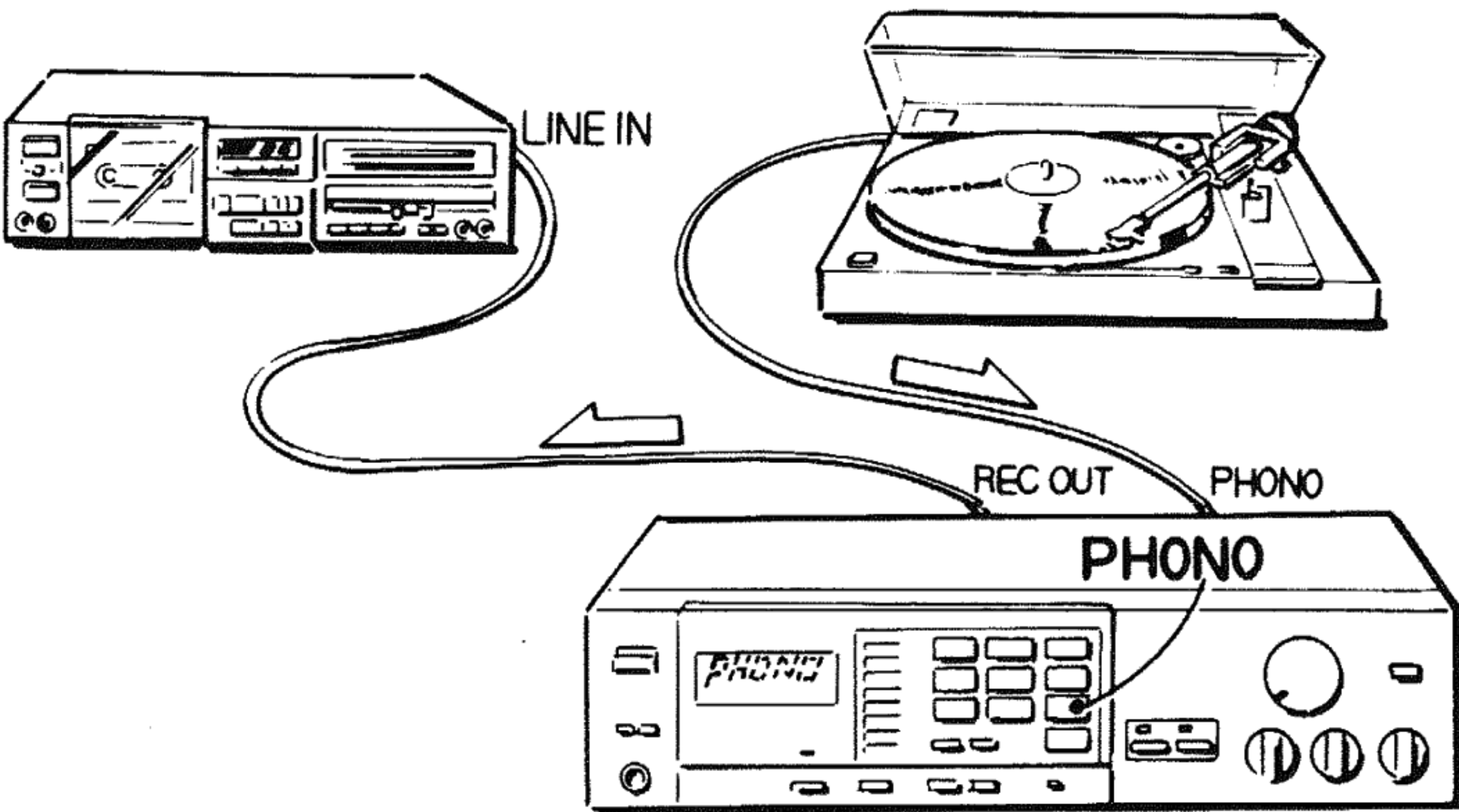
Program	TAPE MONITOR switches	FUNCTION switches
Record playing	All switches released	Press PHONO (9).
Auxiliary source		Press DAD/AUX (0).
Taped program	Depress either TAPE 1 or TAPE 2.	Any

- 3 Play the program source.
- 4 Adjust the sound quality to your preference.

The TAPE 2 switch has priority over the TAPE 1 switch and the FUNCTION switches (PHONO and DAD/AUX) if they are engaged at the same time.
The TAPE 1 switch has priority over the FUNCTION switches.
If the TAPE 2 or TAPE 1 switch is depressed, you cannot listen to the program source selected by the FUNCTION switches.

TAPE RECORDING

- 1 Select the program to be recorded with the FUNCTION switches.
- 2 Release the TAPE 1 and TAPE 2 switches.
- 3 Adjust the recording level.
- 4 Start recording.



Note : The VOLUME, BASS, TREBLE and BALANCE controls and the LOUDNESS switch have no effect upon the recording.

Monitoring of a 3-head tape recorder

If your tape recorder has separate record and playback heads, you can monitor the recording results.
When the tape recorder used for recording is connected to the REC OUT 1 jacks, depress the TAPE 1 switch and you can monitor the recording results. Press the TAPE 1 switch again to release it, and the source sound will be heard. Be sure to keep the monitor switch of the tape recorder in the TAPE position.

TO COPY

If you have two tape recorders, you can copy a taped program from tape recorder 1 (connected to TAPE 1 inputs) to tape recorder 2 (connected to REC OUT 2 outputs). Tape copy from tape recorder 2 to tape recorder 1 cannot be made.

- 1 Insert the recorded tape into the tape recorder 1 and a blank tape into the tape recorder 2.
 - 2 Depress the TAPE 1 COPY 1→2 switch.
 - 3 Adjust the recording level of tape recorder 2.
- Start the playback of tape recorder 1 and the recording of tape recorder 2. Copying will begin.

