National
Technics

FM/AM STEREO RECEIVER
SA-5170
SA-5170K
OPERATING INSTRUCTIONS

*SA-5170K is different in appearance and colour-tone.
*Cabinet colour differs according to area.

Before operating this set, please read these instructions completely.
Dear Stereo Fan

We want to thank you for selecting this product and to welcome you to the growing family of satisfied Technics product owners around the world. We feel certain you will get maximum enjoyment from this new addition to your home. Please read these operating instructions carefully, and be sure to keep them handy for convenient reference.

BEFORE USING THIS UNIT

Be sure to set the voltage selector to agree with the voltage used in the region where the unit is used. The desired voltage can be easily selected by using an ordinary screwdriver. Never forget to always have the voltage selector set to the correct setting because, if the setting is incorrect, this unit could be ruined by using it on incorrect voltage.

ACCESSORIES

- FM feeder antenna .............................................. 1
- Circuit protection fuses ...................................... 2
- Pin plugs .......................................................... 4

FOR UNITED KINGDOM

Important

The wires in this mains lead are coloured in accordance with the following code.

BLUE  NEUTRAL
BROWN  LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows. The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.
The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

For details, refer to page 4 or to the separate sheet.
1 Power pushbutton
Upon pushing this button, the tuning dial and the signal meter/center tuning meter will illuminate, indicating that the receiver is on.
To turn the receiver off, push the button again; the lights of the tuning dial and signal meter/center tuning meter will go off.

2 Headphones jack
Connect headphones to the headphones jack. Use headphones with a voice-coil impedance of 4 to 16 ohms.
When listening only by headphones, set the speaker selection pushbuttons to the "OFF" position.

3 Speaker selection pushbuttons
Pushbutton speaker selection system.
The speakers are selected by pushing one or both buttons, and are turned off by repushing. Only the speaker system which is switched on operates.
It is possible to operate both speaker systems by pushing both buttons.

4 Tone controls
These controls are used to make adjustments of the tone quality which may become necessary as a result of speaker characteristics or listening room characteristics, making it possible to adjust the tone quality to that most agreeable to the listener's preference.
The bass control is for adjustment of the tone quality of the low sound range, and the treble control is for the high sound range. The characteristics can be changed within a range of +10 dB to -10 dB for the bass at 50 Hz, and within the same range for treble at 10 kHz.
The characteristics are "flat" at the "0" position, and are increased by turning the control to the right from the "0" position, or decreased by turning it to the left.

5 Balance control
The left and right volume balance is influenced by the difference, if any, between the efficiency of the left and right speakers, and by the placement of the furniture in the listening room.
In addition, the left and right volume of some program sources is not well balanced. If the control is turned further to the left, beyond the "0" position, the right sound becomes lower.

At the "LEFT" position the right sound cannot be heard at all, and only the left sound is emitted.
If the control is turned to the right, the left sound becomes lower and, at the "RIGHT" position, the left sound cannot be heard at all, and only the right sound is emitted.

6 Volume control
This control is for adjustment of the volume level.
Turning the control clockwise (maximum position is "10") increases the volume. Always set the volume control at "0" before turning on the unit.

7 Loudness control pushbutton
The loudness control compensates for "thinning out" of the sound. Human ears cannot perceive the low-frequency range at low volumes, but this control compensates for this, boosting the bass as the volume decreases. Note, however, that if the volume control is set to a position higher than the "5" indication, the efficiency becomes less.

8 Tape monitor pushbutton
For playback from the tape deck, set the tape monitor pushbutton to the "TAPE" (pressed) position.
For reproduction of the sound from the sound source selected by the input selector, set the tape monitor pushbutton to the "SOURCE" (released) position.

9 FM muting/mode pushbutton
This pushbutton is used for eliminating noises between stations during FM broadcast selection and also for changing FM broadcast reception over to "stereo" or "monaural".

ON/FM AUTO:
Use in this position normally. In this position, unpleasant noises developed between the station peculiar to FM broadcast (inter-station noise) are eliminated, and the stereo broadcast and monaural broadcast are respectively received as "stereo" and "monaural".

OFF/FM MONO:
Use in this position when reception of FM broadcast is affected by frequent noises (in areas where field strength is low, for example, in mountainous regions or "valley" in tall buildings).
Although stereo broadcasts will be received as "monaural", the noises are reduced to a large extent.
Since the inter-station noises are not removed in this position, select the stations with the volume turned low.
Input selector
For selection of the input sound source.
AM: Use this position to listen to radio programs on the AM broadcast band.
FM: Use this position to listen to radio programs on the FM broadcast band.
PHONO: For record player operation.
AUX: For reproduction of the sounds from equipment connected to the auxiliary input terminals.

NOTE:
If the input levels of each program source are not matched and the input selector is inadvertently switched, a large sound output may be applied to the speakers, causing damage to them.
To avoid this, make sure, when switching inputs, either that the input levels are matched, or that the volume is reduced before switching.

Tuning control
Turn the tuning control slowly until the dial indicator indicates the desired FM or AM broadcast frequency. Always tune for the highest possible signal meter/center tuning meter reading, which indicates the optimum receiving position. This will assure clear, undistorted reception, minimum interference from adjacent stations, and maximum left-right channel separation during FM stereo broadcasts.

Stereo indicator
The stereo indicator illuminates in red when the receiver is tuned to a station broadcasting in FM multiplex stereo. If the FM muting/mode pushbutton is set to the "OFF/FM MONO" position, the stereo indicator will not illuminate even though the broadcast is in stereo.

Signal meter/center-tuning meter
This meter functions as a signal meter when receiving AM broadcasts, and functions as a center-tuning meter when receiving FM broadcasts.

Reception of AM broadcasts
For AM broadcasts, this meter indicates the antenna input level of the broadcast signal. The optimum tuning point for best reception is the point at which the indicator needle moves most to the right.

Reception of FM broadcasts
For FM broadcasts, this meter disregards the strength of the signal, and indicates the point at which the sound distortion is minimized and at which tone quality is best. The indicator needle will remain stationary at the center position when no broadcast is being received and then, during tuning to a broadcast, will fluctuate to the left and to the right, finally moving to the center position when the broadcast is perfectly tuned to the best position. If the tuning control is then moved again, the indicator needle will move again to the left or to the right, and then return once more to the center when the indicator needle is completely tuned away from a broadcast.

CONNECTIONS AND OPERATION
Do not plug the receiver into a power outlet until all other connections have been made. Keep the power pushbutton to the "OFF" (released) position.

SPEAKER CONNECTIONS AND OPERATION
This unit has two pairs of speaker terminals, marked "MAIN" and "REMOTE," making connection of two speaker systems possible. Selection of the speaker system to be used is made by pushing one, or both, of the speaker selection pushbuttons on the front panel, thereby activating either the main or remote speaker system, or both speaker systems at the same time.

Impedance of speakers
Use speakers with a voice coil impedance of 4~16Ω with this unit.
If, however, the main and remote speaker systems are both used at the same time, speakers of 4-ohm impedance cannot be used. Use speakers with an impedance of 8~16Ω.

Speaker connection wire
Use medium gauge wire, such as AC power cord, for speaker connections so as not to decrease the damping factor.

Connections
1. Strip off about 3/4 inch (20 mm) of the connection cord insulation and twist the strands together.
2. Turn the screw three or four times counterclockwise.
3. Form the strands of the core wire into a hook shape and connect to the terminal.
4. Tighten the screw snugly clockwise. The connection is then finished.

Speaker placement
In general, it is advisable to place the speakers on a hard wall surface. Soft surfaces can often ruin the deep tones of the bass.
Also avoid placing the speakers facing a solid surface because an echo effect may result and distort the quality of the reproduced sound.
In summary, place the speakers on a very hard surface, and, if a hard surface such as a window or panels faces the speakers, cover it with soft material such as curtains.

NOTE:
Be extremely careful that the terminals or speaker wires do not "short" each other out. Never use the minus speaker terminal for ground connections.
To assure finest reception quality of FM broadcasts, it is necessary to use an antenna which is appropriate to the reception conditions in your area. Select the optimum antenna after referring to the information given below.

A place near the broadcasting station where signals are strong (within sight of the broadcasting station transmission antenna)

If this unit is used in a place which is near the broadcasting station and the signals are quite powerful enough, or in a place such as the outskirts of a city where interference noise is relatively slight, the feeder antenna which is included with this unit may be used to obtain a certain degree of reception, although, in order to obtain the best reception of which this unit is capable, it is recommended that a special outside antenna exclusively for reception of FM broadcasts, consisting of 3 to 5 elements, should be installed.

Feeder antenna

The feeder antenna which is included with this unit is provided so that you can use it to receive FM broadcasts temporarily until a special antenna exclusively for reception of FM broadcasts can be installed.

As shown in the illustration, connect this feeder antenna to the connection terminals of this unit marked “300Ω BALANCED” and, with both horizontal ends extended as shown, rotate the feeder antenna to the left and right and up and down while listening to an FM broadcast in order to determine the position of best reception. When this position has been determined, install the feeder antenna so that it remains in that position.

Connection between the antenna and the receiver

The connection wire which is used between the antenna and the antenna input terminals of the receiver is usually a 300-ohm parallel feeder wire or a 75-ohm coaxial cable. In comparison to feeder wire, a coaxial cable is more resistant to external interference, and also prevents fluctuations of the signal which might be caused by environmental weather conditions. In order to obtain the finest performance from this unit, it is recommended that coaxial cable be used rather than feeder wire. Use coaxial cable of the type 5C-2V or 3C-2V.

Connection to the FM antenna terminals of this unit

This unit includes two pairs of FM antenna input terminals: one pair of the 300-ohm type and one pair of the 75-ohm type. For this reason, connections to the receiver can be made by using either a 300-ohm parallel feeder wire or a 75-ohm coaxial cable.

- If connections are made to the “300Ω BALANCED” terminals

Connections can be made, as shown in figure, by using 300-ohm parallel feeder wire. When this connection is made, the wire between this unit and the antenna should be as short as possible.

- If connections are made to the “75Ω” terminals

These connections should be made by using 75-ohm coaxial cable from the “75Ω” terminals of this unit, and by using a matching transformer between the antenna and this unit in order to match the impedance of the antenna to that of this unit. A 300-ohm parallel feeder wire should be used to connect the matching transformer to the antenna, and the 75-ohm coaxial cable should be used to connect the matching transformer to the receiver. The matching transformer should be installed as near to the antenna as possible.
Note, however, that most multi-element FM antennas which have 5 elements or more include a built-in matching transformer and, therefore, the 75-ohm coaxial cable can be connected directly to the antenna.

1. Strip about 3/4 inch (20 mm) of the outer covering from the cable.
2. Cut away all except about 1/3 inch (10 mm) of the shield layer, and fold the remainder of the shield back over the covering.
3. Then remove all of the insulation except about 1/4 inch (7 mm).
4. After loosening the screw of the ground terminal, insert the end of the cable behind the clip, then secure it by tightening the screw.
5. The connection is completed by connecting the core of the cable to the terminal located just below the clip.

FM outdoor antenna (optional)
75-ohm coaxial cable (optional)
Matching transformer (optional)
300-ohm parallel feeder wire (optional)

**Installation of an antenna exclusively for FM broadcasts**

The location of the exclusive antenna for FM broadcasts is a very important factor in the determination of tone quality, and even the best antenna will not perform satisfactorily if it is installed in a poor location. Carefully consider, therefore, the following information before deciding upon the location of the antenna.

1. It should be located in a place which is in the direct path of the FM broadcast signals, and not where the signals will be obstructed by buildings or other obstacles.
2. In order to be free of ignition noise interference from automobiles, etc., it should be located as high above the ground as possible, and should be as far as possible from neon and other electric signs.
3. It should be installed 6 feet (2 m) or more from a metal roof, a concrete building, or from any other antennas, such as for television.
4. FM antennas have a high directional characteristic. In other words, they are much more sensitive to FM signals from one certain direction more than any other direction. The antenna should, therefore, be located so as to face in the direction of best reception.
5. It is usually true that the higher the antenna the better, although, depending upon the place, it may be that a lesser height would be more advantageous. Unless there are special conditions. Therefore, a height of 4 yards (4 m) or more above the ground is suggested.

**FM broadcast reception**

1. Keep the volume control at the “0” position, press the power pushbutton to the “ON” position.
2. Set the input selector to the “FM” position.
3. Release the FM muting/mode pushbutton to the “ON/FM AUTO” position.
4. Release the tape monitor pushbutton to the “SOURCE” position.
5. Select the desired station with the tuning control while watching the signal meter/center-tuning meter. The stereo indicator illuminates whenever the receiver is tuned to a stereo broadcast.
6. After pinpointing the desired station, increase the volume to the most comfortable listening level.
7. Make other adjustments in accordance with your taste and the acoustics of the room.

**CONNECTION AND USE OF AN AM ANTENNA**

This unit includes a highly sensitive ferrite-bar antenna for reception of AM broadcasts and, therefore, there should be no necessity for connection of an outside antenna except in an area where signals are especially weak.

**AM outdoor antenna**

In weak-signal areas, far from broadcasting stations, or in a reinforced-concrete building, the highly-sensitive built-in ferrite-bar antenna alone may fail to provide good AM reception. If so, connect a length of vinyl-covered wire to the AM antenna terminal (labeled “AM ANT,” on the rear panel).

Then place this antenna outdoors a short distance away from the building. Because the sensitivity of an outdoor antenna varies greatly with its position, someone should listen for the strongest signals as the antenna is oriented. For safety reasons, the antenna should include a lightning arrester.

**AM broadcast reception**

1. Set the input selector to the “AM” position.
2. Release the tape monitor pushbutton to the “SOURCE” position.
3. Select the desired station with the tuning control while watching the signal meter/center-tuning meter.
4. After tuning to the desired station, increase the volume to the most comfortable listening level.
5. Make other adjustments in accordance with your taste and the acoustics of the room.
CONNECTIONS AND OPERATION (continued)

RECORD PLAYER CONNECTIONS AND OPERATION

Connections
Connect the record player to the "PHONO" terminals, being careful to connect the left and right connection wires correctly. If the record player has a ground wire, connect it to the ground (GND) terminal.

Cartridge
Use a magnetic cartridge (moving-magnet type (MM), inducted-magnet type (IM), or high-output moving-coil type (MC)) with an output of 2 mV ~ 10 mV (50 mm/sec.). If a low-output moving-coil type is used, it cannot be connected directly to the phono terminals; a booster transformer or head-amplifier must be used.

Disc performance
1. Set the input selector to the "PHONO" position.
2. Release the tape monitor pushbutton to the "SOURCE" position.
3. Switch the turntable on and select the proper playing speed.
4. Place the tone arm on the record and increase the volume gradually to the most comfortable listening level.
5. Make other adjustments in accordance with your taste and the acoustics of the room.

CONNECTIONS TO THE AUXILIARY INPUT TERMINALS AND OPERATION

These terminals are for connection with the output terminals of a tape deck or 8-track stereo, a semiconductor cartridge with head amplifier, etc.

Reproduction
1. Set the input selector to the "AUX" position.
2. Release the tape monitor pushbutton to the "SOURCE" position.
3. Sound will be heard by operating the sound source and turning the volume control clockwise.

TAPE DECK CONNECTIONS, RECORDING AND PLAYBACK

Connect a stereo tape deck which has a recording/playback amplifier.

Connections
Connect the playback terminals of this unit with the output terminals (LINE OUT) of a tape deck. Connect the recording output terminals of this unit with the input terminals (LINE IN) of the tape deck.

Recording/playback terminal
This is called the DIN connector and is a terminal combining the functions of playback and recording. Recording and playback are possible by simply connecting one DIN cord.
Playback from a tape deck
1. Press the tape monitor pushbutton to the "TAPE" position. (The input selector has no effect in any position).
2. After preparing the tape deck for playback, increase the volume gradually to the most comfortable listening level.
3. Make other adjustments in accordance with your taste and the acoustics of the room.

Recording with a tape deck
In this instance, all operating controls, such as the volume control and the tone controls, have no effect upon the recording.
1. Set the input selector according to the program source which is to be recorded (AM, FM, PHONO, AUX).
2. Prepare the tape deck for recording.
   The program which has been selected with the input selector is then recorded onto the tape.
3. Be sure to adjust the recording level of the tape deck.
4. Recording check.
   You may monitor the signal as it is recorded by pressing the tape monitor pushbutton. By releasing it to the "SOURCE" position, you can check the signal just prior to recording. By pressing it to the "TAPE" position, you can check the signal that has been recorded.

GROUND TERMINAL

This terminal is to be connected with the ground wire of the record player or tape deck. When grounding, use vinyl-covered wire and add a copper strap to the end of the wire, which should either be buried or connected to a water pipe for efficient grounding.
Absolutely never attempt to connect this wire to a gas pipe.

SPEAKER CIRCUIT PROTECTION FUSES

If no sound is heard from one or more speakers when the unit has been installed correctly and the tuning dial is illuminated, turn off the power and check to see if a circuit protection fuse (on the rear panel) has failed.
If a circuit protection fuse has failed, replace it (fuse number XBAZ2C25SSO) after determining the cause of the fuse failure (such as a "shorted" speaker wire) and correcting it. Do not use any fuse except the one included, or fuse number XBAZ2C25SSO.

HOW TO CARE FOR THE CABINET

- If this unit becomes dirty, it can be cleaned by wiping it with a soft, dry cloth. If it is extremely dirty, dip the soft cloth into a soap-and-water solution, wring the cloth out well and then wipe the unit clean. After cleaning, wipe the unit dry once more with a dry cloth.
- Be careful not to allow alcohol, thinner, benzine, insecticide and other similar chemicals to get on the surface of this unit because they may damage its finish by causing the finish to peel off or lose its luster.
- Never use a wet cloth or a chemically-treated cloth for cleaning.

HOW TO USE PIN PLUGS

Use the furnished pin plug when the connection terminal (pin jack) of this unit is different in shape from the connecting cord of the set to be connected to this unit.

1. Shielded cable
2. Shield wires
3. Pin plug
4. Soldering
5. Soldering
OPERATION CAUTIONS

Connection wires
Wires used to connect this unit to other stereo equipment, such as a record player or a tape deck, should be high-quality shielded wire with low electrostatic capacity, and should, moreover, be thick wire and no longer than necessary. Use of this type of wire will minimize the incidence of induction of unwanted noise or hum, and will avoid loss of high-frequency characteristics. Especially note that, the longer the wire, the larger the decrease of high-frequency characteristics. Be sure that the wire is no longer than necessary for best results.

Connection caution
Be sure that the connections to the speakers and the input sources are securely made. If the connections are not secure, the receiver will not operate normally and may produce noise.

Cautions concerning operation and changing connections
After switching on the power, do not attempt to use the controls for a few moments. The output of this unit is large, and, if excessive input is applied, damage to the speakers may result. For this reason, be sure to decrease the volume before making connections or disconnections of the input terminals.

Reproduction cautions
If unwanted noise such as hiss or “howling” occurs while listening to a disc or tape, and the receiver is operating correctly, the noise may be caused by one or more of the following:

1. If the record player is placed directly on or near a speaker, the sound vibration from the speaker may be transmitted, causing “howling.” Move the record player from the speakers or place a flat cushion under the record player, so that the vibration is not transmitted to the player.

2. Hum might be caused if the shield and center core of the connection wire are connected in reverse, or if the motor is not properly grounded.

FOR LONGER AND SAFER USE OF THIS UNIT

In order to receive the best service from this unit, and for safest operation, carefully read the following information.

1. THE POWER SOURCE
   It’s very dangerous to use this unit at a voltage which is different than the rated voltage
   • There is the danger of combustion if the unit is connected to a power source which is different than the rated voltage.
   Be very careful concerning this point.

   Direct current cannot be used.
   • There are some places, such as ships, where direct current is used as the power source. Before connecting this unit, confirm the power source.

2. CONNECTION OF THE POWER CORD
   Wet hands are dangerous
   • Be sure to never touch the power cord with wet hands because there is the danger of electric shock. This is true, of course, of all electric equipment.

   Don’t pull the power cord
   • Never pull the power cord to disconnect it. Always pull the plug of the cord only.

3. LOCATION OF THE UNIT
   • A place which is not in direct sunlight.
   • Select a place which will assure good ventilation: at least 10 cm. from walls and other surfaces, and where curtains or other similar material will not obstruct the ventilation holes on its upper surface.
4. NEVER PLACE HEATING EQUIPMENT NEARBY
Be sure to keep stoves and other sources of heat away from this unit, because heat radiated by such equipment may cause deformation of plastic parts of this unit or damage its cabinet, or, at worst, might cause a fire.

5. KEEP INSECTICIDE AWAY
- If insecticide is sprayed on the cabinet or plastic parts of this unit, "cracks" or "cloudiness" of the material may occur.
- In addition, note that such sprays may be the cause of fire, so great care should be taken.

6. ESPECIALLY FOR FAMILIES WITH CHILDREN
Take care that no small items, such as metal articles, are put inside this unit
- In addition, children should be especially warned not to put anything into the ventilation holes, such as toys or a screwdriver, because these things may cause an electric shock or result in a malfunction of the unit.

7. IF WATER SPILLS ON THE UNIT
If water should happen to spill on the unit, from an overturned vase for example, there is the danger of fire or electric shock. Disconnect the power cord from the electric outlet immediately, and contact the store from which the unit was purchased.

8. RECONSTRUCTION CAN CAUSE ACCIDENTS
Absolutely never try to remodel, reconstruct or repair this unit. Do not attempt to touch any internal parts because to do so may result in an electric shock or other accident.

9. BE SURE THE POWER IS OFF
After you have finished using this unit, check once more to be sure that the power is off. If the unit is left with its power on for a long period of time, it may not only damage the unit and thus shorten its useful life, but may also lead to a dangerous accident.
### AMPLIFIER SECTION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 kHz continuous power (both channels driven)</td>
<td>2×30 W (4Ω) / 2×27 W (8Ω)</td>
</tr>
<tr>
<td>20 Hz ~ 20 kHz continuous power (both channels driven)</td>
<td>2×26 W (4Ω) / 2×25 W (8Ω)</td>
</tr>
<tr>
<td>40 Hz ~ 16 kHz continuous power (both channels driven)</td>
<td>2×26 W (4Ω) / 2×25 W (8Ω)</td>
</tr>
<tr>
<td>Power bandwidth (both channels driven at 4Ω)</td>
<td>7 Hz ~ 50 kHz, −3 dB</td>
</tr>
<tr>
<td>Total harmonic distortion (both channels driven at 8Ω)</td>
<td>7 Hz ~ 50 kHz, −3 dB</td>
</tr>
<tr>
<td>Intermodulation distortion (rated power at 250 Hz: 8000 Hz=4:1, 4Ω)</td>
<td>0.5% (4Ω, 8Ω)</td>
</tr>
<tr>
<td>Intermodulation distortion (rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω)</td>
<td>0.5% (4Ω, 8Ω)</td>
</tr>
<tr>
<td>Damping factor</td>
<td>16 (4Ω), 32 (8Ω)</td>
</tr>
<tr>
<td>Input sensitivity and impedance</td>
<td></td>
</tr>
<tr>
<td>PHONO</td>
<td>2.5 mV/47 kΩ</td>
</tr>
<tr>
<td>AUX</td>
<td>150 mV/33 kΩ</td>
</tr>
<tr>
<td>PLAYBACK, REC/PLAY input</td>
<td>180 mV/39 kΩ</td>
</tr>
<tr>
<td>PHONO maximum input voltage (1 kHz, RMS)</td>
<td>130 mV</td>
</tr>
<tr>
<td>S/N</td>
<td></td>
</tr>
<tr>
<td>rated power PHONO</td>
<td>65 dB (IHF, A: 78 dB)</td>
</tr>
<tr>
<td>AUX</td>
<td>80 dB (IHF, A: 95 dB)</td>
</tr>
<tr>
<td>−26 dB rated power PHONO</td>
<td>55 dB</td>
</tr>
<tr>
<td>AUX</td>
<td>55 dB</td>
</tr>
<tr>
<td>50 mW power output PHONO</td>
<td>55 dB</td>
</tr>
<tr>
<td>AUX</td>
<td>55 dB</td>
</tr>
<tr>
<td>Frequency response PHONO</td>
<td>RIAA standard curve ±0.5 dB</td>
</tr>
<tr>
<td>AUX</td>
<td>20 Hz ~ 20 kHz, ±0.5 dB</td>
</tr>
<tr>
<td>10 Hz ~ 35 kHz, −1 dB</td>
<td></td>
</tr>
<tr>
<td>Tone controls</td>
<td></td>
</tr>
<tr>
<td>BASS</td>
<td>50 Hz, +10 dB ~ −10 dB</td>
</tr>
<tr>
<td>TREBLE</td>
<td>10 kHz, +10 dB ~ −10 dB</td>
</tr>
<tr>
<td>Loudness control (volume at −30 dB)</td>
<td>50 Hz, +10 dB</td>
</tr>
<tr>
<td>Output voltage</td>
<td></td>
</tr>
<tr>
<td>REC OUT</td>
<td>150 mV</td>
</tr>
<tr>
<td>REC/PLAY output</td>
<td>30 mV</td>
</tr>
<tr>
<td>Channel balance (250 Hz ~ 6300 Hz)</td>
<td>±2.0 dB</td>
</tr>
<tr>
<td>Channel separation at 1 kHz</td>
<td>55 dB</td>
</tr>
<tr>
<td>Headphones level and output impedance</td>
<td></td>
</tr>
<tr>
<td>and output impedance</td>
<td>380 mV/330Ω</td>
</tr>
<tr>
<td>Load impedance</td>
<td></td>
</tr>
<tr>
<td>MAIN or REMOTE</td>
<td>4 ~ 16Ω</td>
</tr>
<tr>
<td>MAIN + REMOTE</td>
<td>8 ~ 16Ω</td>
</tr>
</tbody>
</table>

### FM TUNER SECTION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>88 ~ 108 MHz</td>
</tr>
<tr>
<td>Antenna impedance</td>
<td>300Ω (balanced) / 75Ω (unbalanced)</td>
</tr>
<tr>
<td>Sensitivity (±40 kHz deviation)</td>
<td>1.9 μV (IHF; usable)</td>
</tr>
<tr>
<td>20μV (IHF, S/N 46 dB, 75Ω, STEREO)</td>
<td></td>
</tr>
<tr>
<td>1.9 μV (S/N 30 dB, 300Ω)</td>
<td></td>
</tr>
<tr>
<td>1.7 μV (S/N 26 dB, 300Ω)</td>
<td></td>
</tr>
<tr>
<td>1.5 μV (S/N 20 dB, 300Ω)</td>
<td></td>
</tr>
<tr>
<td>1.3 μV (S/N 30 dB, 75Ω)</td>
<td></td>
</tr>
<tr>
<td>1.2 μV (S/N 26 dB, 75Ω)</td>
<td></td>
</tr>
<tr>
<td>0.9 μV (S/N 20 dB, 75Ω)</td>
<td></td>
</tr>
<tr>
<td>Total harmonic distortion</td>
<td>MONO 0.15% (IHF: 0.15%)</td>
</tr>
<tr>
<td>STEREO 0.3% (IHF: 0.3%)</td>
<td></td>
</tr>
<tr>
<td>S/N (±40 kHz deviation)</td>
<td>MONO 58 dB (IHF: 75 dB)</td>
</tr>
<tr>
<td>STEREO 55 dB (IHF: 70 dB)</td>
<td></td>
</tr>
<tr>
<td>Frequency response (20 Hz ~ 15 kHz)</td>
<td>+1.0 dB</td>
</tr>
<tr>
<td>Frequency response (20 Hz ~ 15 kHz)</td>
<td>−2.0 dB</td>
</tr>
<tr>
<td>Alternate channel selectivity (400 kHz)</td>
<td>65 dB</td>
</tr>
<tr>
<td>Capture ratio</td>
<td>1.0 dB</td>
</tr>
<tr>
<td>Image rejection at 98 MHz</td>
<td>65 dB</td>
</tr>
<tr>
<td>IF rejection at 98 MHz</td>
<td>80 dB</td>
</tr>
<tr>
<td>Spurious response rejection at 98 MHz</td>
<td>80 dB</td>
</tr>
<tr>
<td>AM suppression</td>
<td>55 dB</td>
</tr>
<tr>
<td>Stereo separation</td>
<td></td>
</tr>
<tr>
<td>1 kHz</td>
<td>42 dB</td>
</tr>
<tr>
<td>10 kHz</td>
<td>35 dB</td>
</tr>
<tr>
<td>Leak carrier</td>
<td></td>
</tr>
<tr>
<td>19 kHz</td>
<td>−35 dB</td>
</tr>
<tr>
<td>38 kHz</td>
<td>−45 dB</td>
</tr>
<tr>
<td>Limiting point</td>
<td>1.2 μV</td>
</tr>
<tr>
<td>Bandwidth IF amplifier</td>
<td>250 kHz</td>
</tr>
<tr>
<td>FM demodulator</td>
<td>1000 kHz</td>
</tr>
<tr>
<td>Channel balance (250 Hz ~ 6300 Hz)</td>
<td>±1.5 dB</td>
</tr>
</tbody>
</table>

### AM TUNER SECTION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>525 ~ 1605 kHz</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>30 μV, 300 μV/m</td>
</tr>
<tr>
<td>Selectivity</td>
<td>30 dB</td>
</tr>
<tr>
<td>Image rejection at 1000 kHz</td>
<td>45 dB</td>
</tr>
<tr>
<td>IF rejection at 1000 kHz</td>
<td>40 dB</td>
</tr>
</tbody>
</table>

### GENERAL

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>300 W</td>
</tr>
<tr>
<td>Power supply (50 Hz/60 Hz)</td>
<td>110 V/120 V/220 V/240 V</td>
</tr>
<tr>
<td>Dimensions (W × H × D)</td>
<td>420 × 142 × 295 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>16.3 lb.</td>
</tr>
</tbody>
</table>