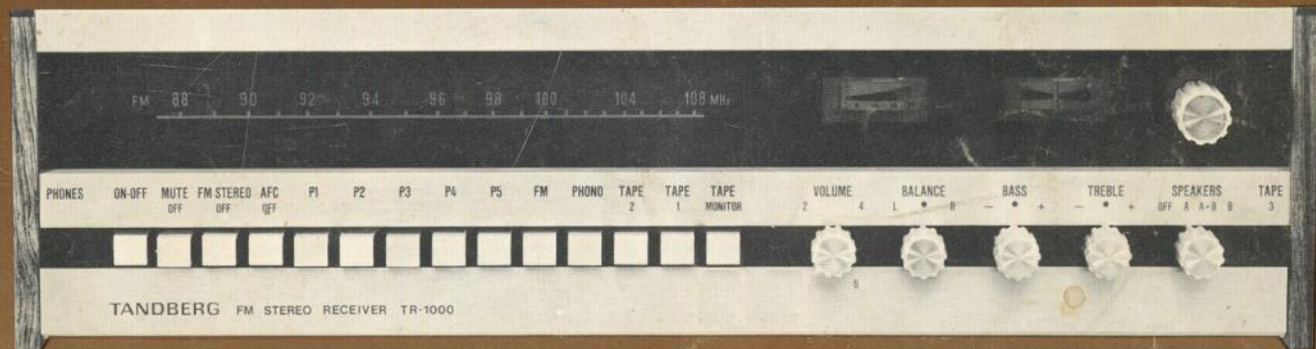


# TANDBERG

FM STEREO RECEIVER TR-1000

FM/AM STEREO RECEIVER TR-1010



Instruction Manual

### Choose the right speaker system.

TR-1000 has the extra power that is needed to reproduce any kind of music without distortion even at a very high volume.

Also at a lower sound volume the ample power rating provides a more correct reproduction of music with a wide dynamic range (large variations in loudness).

It is however not only the desired sound level that will influence your choice of speaker system. The type of music you want to listen to, must also be considered.

Music with loud tones of long duration requires a high average power. Organ music has most of the power concentrated at the lower frequencies and will thus require large bass speakers in large ca-

binets. On the other hand, pop music often has a very high concentration of power at the higher frequencies, and puts therefore severe demands on the power handling capability of the tweeter. Even in large speaker systems this may be a difficult limitation to overcome, because the size of the tweeter is determined by the frequency range to be reproduced and not by the volume of the enclosure.

The safest way to prevent TR-1000 from damaging your speakers, is to keep an eye on the output power indicator (see page 10).

Further information on the Tandberg speaker systems can be found in our main product catalogue.

## TANDBERGS RADIOFABRIKK A/S

KJELSÅSVEIEN 161 - OSLO



Tandbergs Radiofabrikk A/S, Kjelsås.



Tandbergs Radiofabrikk A/S, avd. Kjeller.

## Operating Controls

1. FM-dial (the pointer will light up when the FM-button (20) is depressed).
2. FM-stereo indicator, will light during FM-stereo reception.
3. Tuning indicator. For output power indication, pull out speaker selector knob.
4. Centre mark tuning indicator.
5. FM-tuning knob.
6. Socket for connection of stereo headset.
7. Mains switch.
8. Pretuning of FM-stations, P1.
9. Muting disable button.
10. FM-stereo off.
11. AFC disable button.
12. Pretuning of FM-stations, P2.
13. Push button selection of FM station, P1.
14. Push button selection of FM station, P2.
15. Pretuning of FM-stations, P3.
16. Push button selection of FM station, P3.
17. Push button selection of FM station, P4.
18. Push button selection of FM station, P5.
19. Pretuning of FM stations, P4.
20. Push button selection of FM station, FM-dial.
21. Function selector, record player.
22. Pretuning of FM stations, P5.
23. Function selector, TAPE 2.
24. Function selector, TAPE 1.
25. Tape monitor switch. Must be released for radio listening.
26. Stereo-switch. Depress the button for stereo reproduction. Pilot lamp lights.
27. Volume control.
28. MONO-L button. The left channel programme is fed to both channels when the button is depressed. Pilot lamp lights.
29. MONO-R button. The right channel programme is fed to both channels when the button is depressed. Pilot lamp lights.
- 28.—29. Depress MONO L and MONO R simultaneously for stereo reproduction with the channels interchanged.
30. Balance control.
31. Loudness control with pilot lamp.
32. Low filter, (rumble filter) with pilot lamp.
33. BASS, separate bass controls for left and right channels (outer and inner knobs).
34. High filter 1 (scratch-filter) with pilot lamp.
35. High filter 2 (scratch-filter) with pilot lamp.
36. TREBLE, separate treble controls for left and right channels (outer and inner knobs).
37. PREAMP RECORD. Controls the signal to TAPE 3 output, pilot lamp lights.
38. Speaker selector. If the knob is pulled out, the left tuning meter will indicate output power.
39. Hinged front lid. Conceals operating controls seldom used.
40. Stereo jack for connection of tape recorder (TAPE 3).



## Connection of record player, tape recorders, loudspeakers and headphones.

Equipment to connect	Type of connector
Record player	5 pins DIN, phono sockets + ground
Tape recorders TAPE 1 and TAPE 2	5 pins DIN, phono sockets
Tape recorder TAPE 3	Stereo jack
Speakers	2 pins DIN, terminal screws
Headphones	Stereo jack

The DIN sockets are wired according to the DIN specifications.

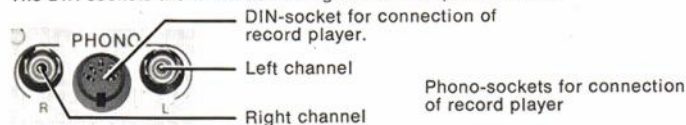


Fig. 2. DIN- and phono sockets for connection of record player.

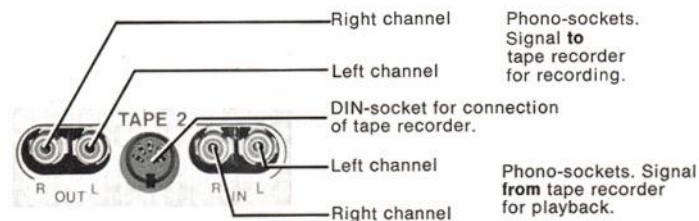


Fig. 3. DIN- and phono sockets for connection of tape recorders. TAPE 1 and TAPE 2.

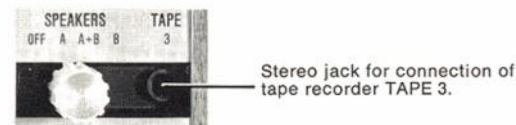


Fig. 4. Connection of tape recorder TAPE 3.

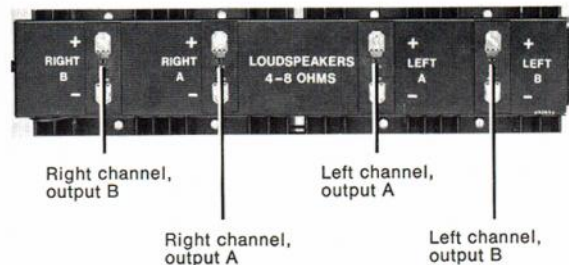


Fig. 5. DIN - sockets for connection of loudspeakers.

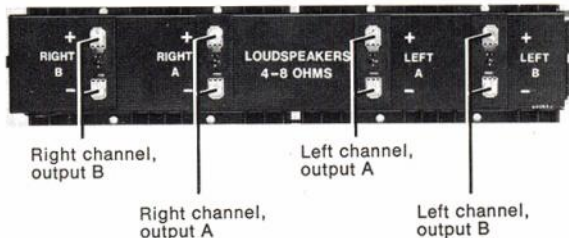


Fig. 6. Terminal screws for connection of loudspeakers. These terminals should be used in installations designed for high output power. Notice the terminal polarity to obtain correct phasing, see page 19.

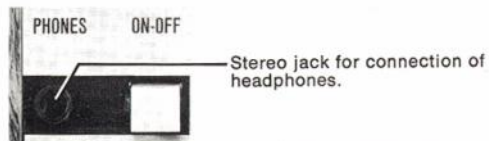
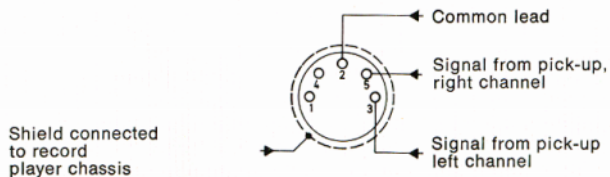


Fig. 7. Stereo jack for connection of headphones.

## Mating plugs for record player, tape recorders, headphones and loudspeakers.

The plugs are seen from the wiring side.

Fig. 8. Record player (PHONO)



The common lead and the shield must not be wired together.

Fig. 9. Tape recorders (TAPE 1 and TAPE 2).

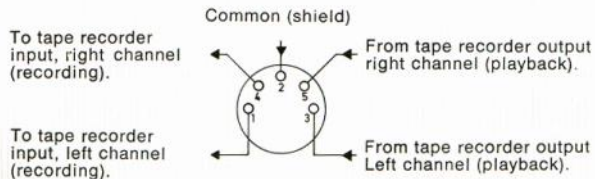


Fig. 10. Tape recorder (TAPE 3) and headphones (PHONES)

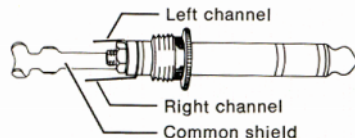
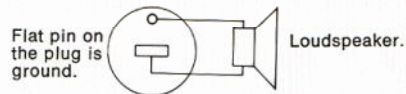


Fig. 11. Loudspeaker (SPEAKER)



### Warning.

A short-circuit in a speaker cable may not necessarily affect the output volume enough to be noticed when playing at low levels. Continued operation under such heavy load may shorten the life of the output transistors. If the output level is raised, an electronic circuit will limit the current to the power amplifiers and thereby limit the output power available. To avoid short-circuiting, take the following precautions when installing speakers:

- Do not strip off more insulation from the wire ends than what is necessary to ensure reliable contact with the plug.
- Twist each wire end.
- Use insulated clamps when fixing the cable to the wall.

## Aerials

### FM-aerials

The receiver is equipped with balanced as well as unbalanced FM aerial input.

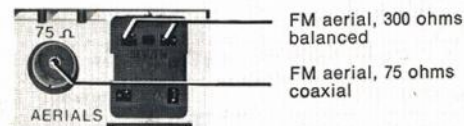


Fig. 12. FM aerial sockets.

The balanced input marked  $300\ \Omega$  is intended for connection of a folded dipole (300 ohm) with balanced feeder. IEC-plug must be used.

The unbalanced input marked  $75\ \Omega$  is intended for direct connection of a coaxial feeder when shielding is necessary. A coaxial plug must be used.

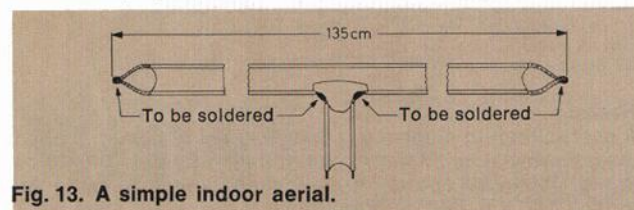


Fig. 13. A simple indoor aerial.

A simple indoor aerial for connection to the balanced input can easily be made from flat twin-lead with an impedance of 240–300 ohms. A 135 cm (53") piece of aerial lead is used for the loop. Strip off appr. 1 cm ( $1/2$ ") of insulation at each end and solder as shown. Cut one of the wires in the middle of the loop and connect another twinlead to feed the aerial input. Solder as shown. The aerial must be mounted with the loop perpendicular to the incoming signal.

To avoid disturbance and to obtain the best possible recep-

tion, the optimal aerial orientation may have to be found experimentally.

In areas with unsatisfactory receiving conditions, better results can be achieved by means of a more complex FM aerial with several elements.

Reception of stereo broadcast requires a stronger input signal to the receiver. A more careful positioning and adjustment of the aerial can then be necessary in order to avoid signal deterioration caused by reflection.

## TR-1010

### Ferrite aerial

For operation on mediumwave, TR-1010 is equipped with a built-in ferrite aerial. This aerial is intended for local reception, but can under good receiving conditions also pick up more remote stations quite efficiently. It should be observed that the ferrite aerial is highly directional, with a sharp minimum around the longitudinal axis of the receiver. The ferrite aerial can never perfectly replace a good outdoor aerial.

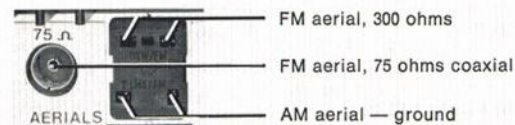


Fig. 14. Aerial sockets TR-1010.

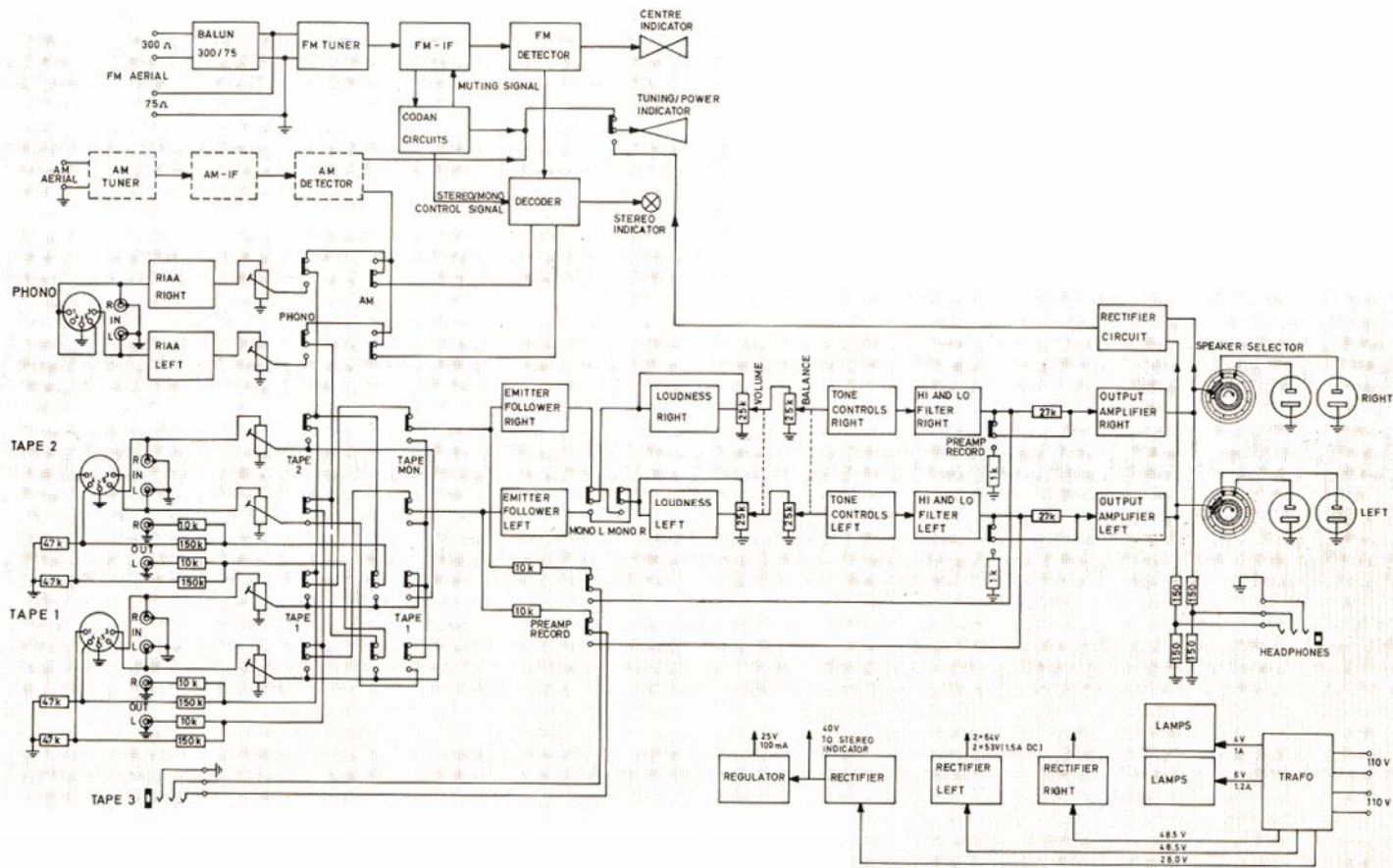
### Outdoor aerial

The receiver is designed for good reception with moderate aerial lengths, but the best result can normally be obtained by using wire 15–20 meters (50–60 feet) long at the highest possible elevation.

### Grounding

A ground wire should be connected from the receiver to the nearest water pipe or grounding point.



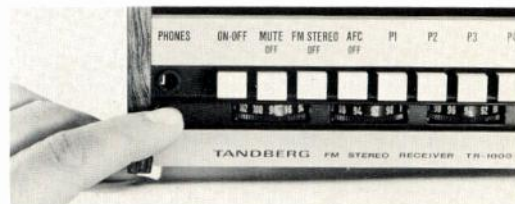


(NORSK TEKST 840649) TEGN NR. 304255  
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Fig. 15. Block diagram TR-1000 and TR-1010.

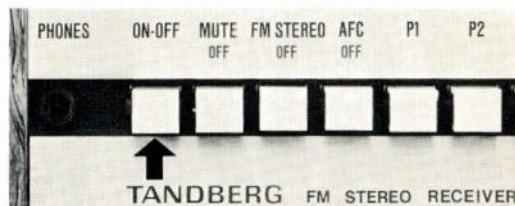
## Operating controls

The operating controls are located at the front of the receiver. The primary controls are easily accessible, while the secondary controls are concealed behind a hinged lid in the lower section of the front panel to prevent unwanted operation. The lid can be easily flipped down with the finger tip as shown. Potentiometers for setting of input sensitivity are located underneath the receiver.



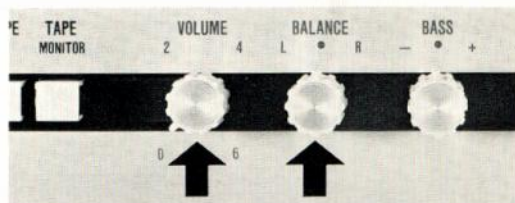
## Power on/off switch

Switch the receiver on by depressing the button marked ON-OFF. Another light push on the button will switch the power off.



## Volume – Balance

The output level is primarily adjusted with the knob VOLUME. The relative output levels of the two channels are set with the BALANCE knob.

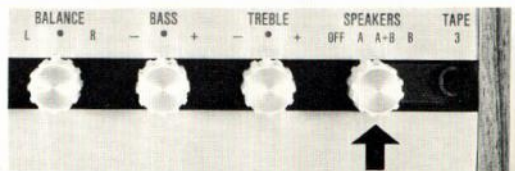


## Speaker selector

The speaker selector switch marked SPEAKERS has the following 4 positions:

- OFF: All speakers are disconnected.
- A: Programme to speaker outputs A only.
- A + B: Programme to all speakers.
- B: Programme to speaker outputs B only.

The programme is fed to the headphones output in any position of the speaker selector.





## Tone controls

Bass and treble can be adjusted independently with the knobs marked BASS and TREBLE. Each control has an inner knob for right channel and an outer knob for left channel.

### Loudness

At low volume, the ear is less sensitive to high and low frequencies. To compensate for this, depress the button LOUDN (behind lid) whereby the bass and treble are boosted as the volume is turned down. The pilot lamp LOUDN will light.

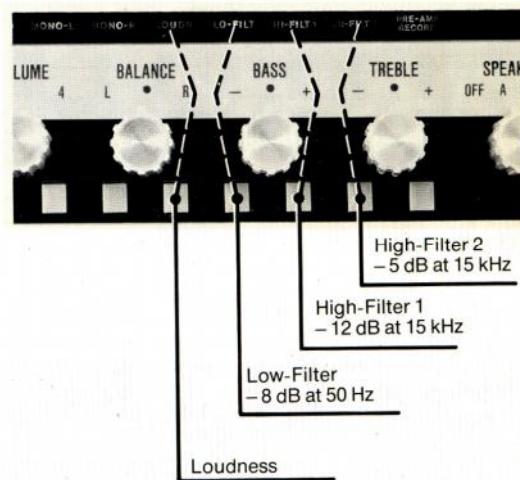
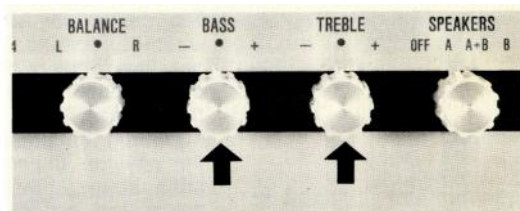
### Rumble filter

Rumble from the record player and acoustical feedback between the speakers and the pick-up can be reduced by depressing the button LO-FILT behind the front lid. A filter then attenuates all frequencies below 70 Hz and the pilot lamp LO-FILT lights.

### Scratch filters

If the programme is accompanied by strong hissing or scratching sounds (old and worn gramophone records) depress the button HI-FILT 1 behind the front lid whereby tones above 8000 Hz are heavily attenuated. The pilot lamp HI-FILT 1 then lights.

A similar effect but less pronounced is obtained by depressing the button HI-FILT 2 behind the front lid. The pilot lamp HI-FILT 2 will then light. To obtain a stronger effect, depress HI-FILT 1 and HI-FILT 2 simultaneously.



## Power indicator

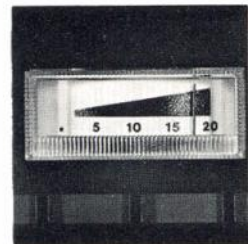
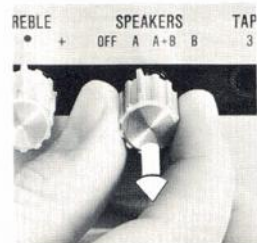
The left meter will act as a power indicator when the speaker selector (SPEAKERS) is pulled out. The meter is peak reading, and indicates output voltage for left or right channel, whichever momentarily has the highest output.

Maximum obtainable output power depends on the speaker impedance (load per channel). The table below shows the relation between output power and meter reading at different load impe-

Meter reading \ Load	7,5	10	12,5	15	17,5
2 ohm	28 W				
4 ohm	14 W	25 W	40 W	56 W	
8 ohm	7 W	12 W	20 W	28 W	38 W
16 ohm		6 W	10 W	14 W	19 W

### Note!

If the receiver is overloaded at too high ambient temperature (insufficient ventilation) a thermal switch will switch off the current to the amplifier. The amplifier will, however, resume normal operation as soon as the temperature inside the receiver has dropped sufficiently.



dances. For instance, from the table we can see that for meter readings of 7,5, 10, 12,5 and 15, the corresponding values of output power with 4 ohm will be approximately 14, 25, 40 and 56 respectively.

The output monitoring function of the meter serves two purposes:

- To avoid overloading of the output amplifier.
- To avoid overloading of speakers that are not rated for the full output power of the amplifier.

## Stereo-mono

Stereo-mono switching is performed with the buttons STEREO, MONO-L and MONO-R behind the front lid. Pilot lamps indicate the activated function.

STEREO button depressed – the two channels are separated for stereo reproduction.

MONO-L button depressed – the left channel programme is fed to both channels.

MONO-R button depressed – the right channel programme is fed to both channels.

MONO-L and MONO-R simultaneously depressed – the two channels are separated for stereo reproduction with the channels interchanged.



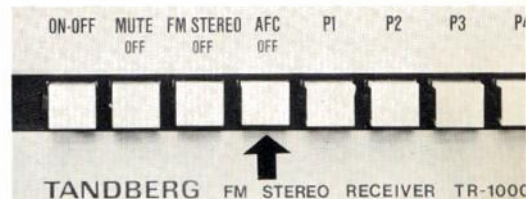
## Tuning

Tandberg TR-1000 has diode tuning, enabling pretuning and pushbutton selection of FM stations. There are six buttons for selection of stations and six tuning knobs. Five of the tuning knobs are located behind the hinged front lid, while the sixth one is the tuning knob on the right hand side of

the dial which is engaged with the dial pointer. Each one of the tuning knobs is furnished with a frequency dial, and covers the entire FM band from 87.5 to 108 MHz.

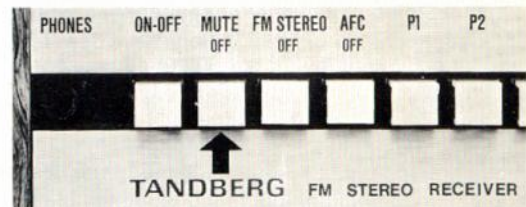
## AFC-automatic frequency control

The tuner has automatic frequency control ensuring accurate tuning. This function can be disabled by pushing the button marked AFC OFF. This may be necessary while listening to a weak FM station operating on a frequency close to a stronger station. In that case the automatic frequency control may lock on to the stronger station.



## Muting

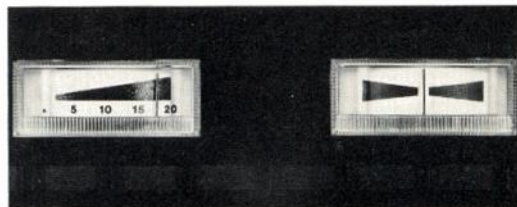
The muting circuit automatically blocks the receiver for FM signals that are too weak to give satisfactory noise suppression. The muting is also effective between the stations and thus ensures a pleasant and noise-free tuning. When it is desirable to receive a station that is not strong enough to cancel the blocking of the receiver, the muting can be manually switched off by depressing the button MUTE OFF.





## Meters

Correct tuning is important, particularly for stereo reception, because distortion might otherwise occur. TR-1000 is therefore equipped with two tuning meters, one indicating the field strength, the other one indicating midscale for correct tuning. When tuning in to a station, adjust to maximum deflection on the left indicator, then carry out the fine tuning to obtain midscale indication on the right meter.



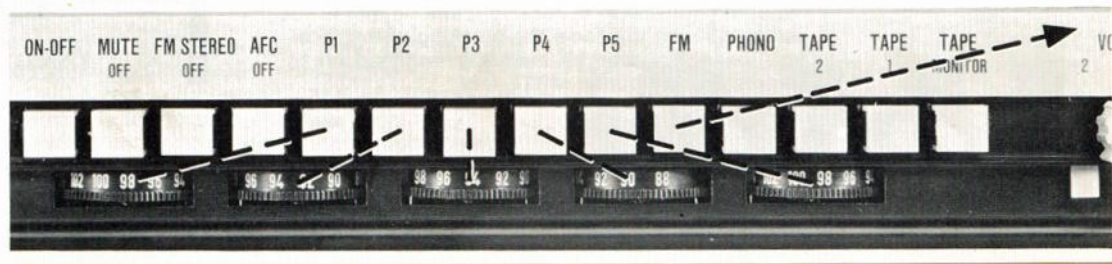
## Pretuning of FM stations

The set should be allowed a few minutes warming up before the pretuning procedure is carried out.

**NOTE:** The TAPE MONITOR button must be released when listening to radio.

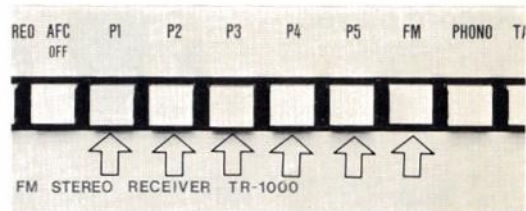
Depress the AFC OFF-button in order to disable the automatic frequency control. Then depress one of the buttons P1, P2, P3, P4 or P5 and tune with the corresponding tuning knob behind the hinged front lid until the desired station has been found. Proceed similarly until all the favourite stations have been tuned in. If the push-button marked FM is depressed, the FM dial pointer will light and

the tuning knob on the right hand side of the dial can be used to search for still another station which can later be selected by pushing the FM button. When the pretuning has been performed, release the AFC button, thereby reactivating the automatic frequency control.



## Pushbutton selection

Assuming that six stations have been pretuned, either one can later be immediately selected by pushing the corresponding programme select button.



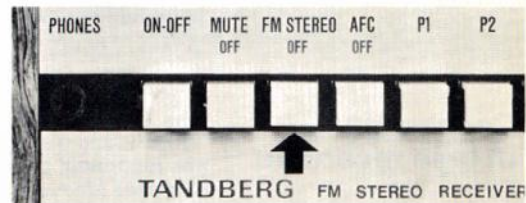
## FM Stereo

The receiver is fully equipped for reception of FM/stereo broadcast.

FM/stereo broadcasting is in several countries based on the pilot tone system which allows the program to be received in mono on mono receivers without impairment of programme quality. It is an inherent property of the system that a stronger signal is needed in stereo to obtain the same noise suppression as in mono.

The FM/stereo decoder has automatic switching to stereo operation when a stereo signal of sufficient strength is being received. If the signal level falls below a preset threshold, the programme will be reproduced in mono. Because stereo reception requires a stronger antenna signal and is more sensitive to multipath distortion, better aerials are needed under difficult conditions and in fringe areas.

If the stereo reception is disturbed by noise and distortion, the stereo decoder can be disabled by depressing the button marked FM STEREO OFF whereby the programme is reproduced in mono with a better noise suppression.



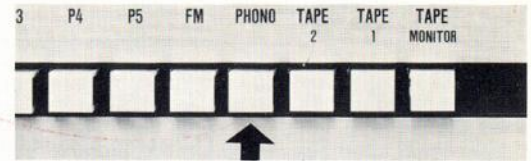
## Record player



Connect record player with magnetic pick-up to either the DIN-socket or to the phono sockets marked PHONO.

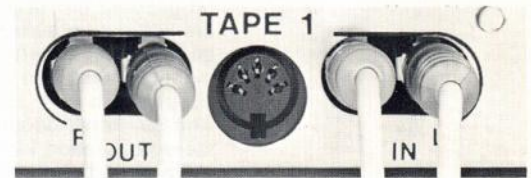
Start the record player and depress the PHONO button.

Note: If hum is picked up by the signal cables, connect a wire from the record player chassis to the ground terminal on the receiver. (To the left of aerial sockets.)



## Connection of tape recorders

The set has three tape recorder inputs, TAPE 1, TAPE 2 and TAPE 3, which offer several features for recording, playback and copying of tape. The different functions will be described later on.





## Recording

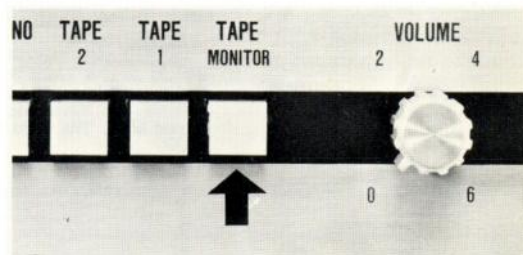
Connect the tape recorder to the TAPE 1. Any programme that is reproduced in the speakers will now be fed to the tape recorder. The volume- bass- and treble controls have no effect on the recording.

## Monitoring of recording on TAPE 1

If the tape recorder has separate heads for recording and playback, the programme can be monitored in playback while recording is going on (B-test) by depressing the TAPE MONITOR button. The tape recorder must be set for B-test.

To return to monitoring of the programme source, switch the tape recorder to A-test (SOURCE) or release the TAPE MONITOR button with another light push.

B-test monitoring can also be performed when recording on TAPE 2. The TAPE MONITOR button should then be in released position, while the TAPE 2 should be depressed. *Note:* The programme select button must be held in its depressed position while the TAPE 2 button is depressed in order to prevent that the programme select button is released.



## Recording from record player

Connect the record player and the tape recorder to the sockets PHONO and TAPE 1 respectively. Set the tape recorder for recording, depress the PHONO button and start the record player. The recording is unaffected by speaker selector, volume, bass- and treble controls.

B-test of the recording can be obtained by depressing the TAPE MONITOR button (see preceding paragraph).



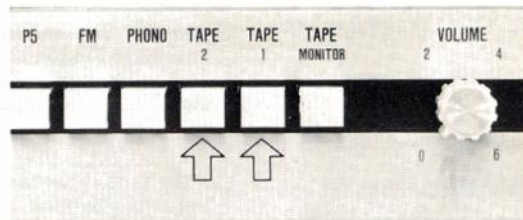
## Playback from tape recorders

Depress buttons TAPE 1 or TAPE 2 for playback from tape recorders connected to the outputs TAPE 1 or TAPE 2 respectively.

For playback from tape recorder connected to TAPE 3, either one of the TAPE selecting buttons or the TAPE MONITOR button must be depressed. The PREAMP RECORD button behind the lid must be in released position.

If the PREAMP RECORD button is depressed, the signal applied to the TAPE 3 connector will be fed direct to the power amplifiers, and consequently the volume — and tone controls will have no influence on the programme being played back. The output volume will be attenuated approx. 30 dB.

For stereo/mono switching, see page 10.



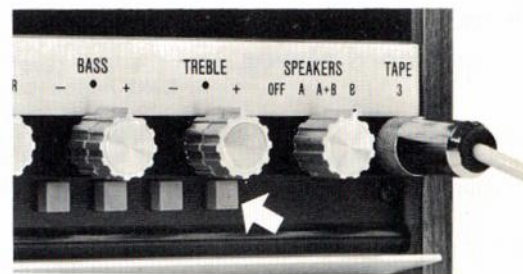
## Recording on more than one tape recorder

Simultaneous recording can be accomplished on tape recorders connected to both TAPE 1 and TAPE 2. The programme can also be recorded on a third tape recorder connected to TAPE 3 provided that the TAPE MONITOR button is not depressed.

## Recording tone-controlled programme on TAPE 3

If it is desirable to feed the programme to TAPE 3 via the tone controls and the volume control, depress the PREAMP RECORD button. The speaker volume will then be attenuated to a suitable monitoring level.

If the PREAMP RECORD button is in released position, the programme to TAPE 3 is unaffected by all operating controls.



## Copying tape

### Copying from TAPE 1 to TAPE 2 and vice versa

If tape recorders are connected to these outputs, copying from either one to the other can be performed. Depress the function selector (TAPE 1 or TAPE 2) corresponding to the master tape recorder. Depress the TAPE MONITOR button for B-test (see page 15).

### Copying from TAPE 1/TAPE 2 to TAPE 3

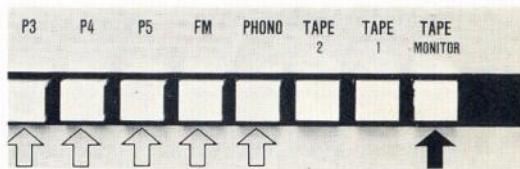
Copying may be performed from a tape recorder connected to either TAPE 1 or TAPE 2, to a tape recorder connected to TAPE 3. Depress the function selector (TAPE 1 or TAPE 2) corresponding to the master tape recorder. B-test monitoring is not possible as depressing of the TAPE MONITOR button would interrupt the programme to TAPE 3. The programme can be tone-controlled if the button PREAMP RECORD is depressed as explained in the preceding paragraph.

## Simultaneous recording of a radio programme and playback from tape

Recording of a radio programme on a tape recorder connected to TAPE 2 can take place while a programme from another tape recorder connected to TAPE 1 is played through the speakers.

The radio programme can only be monitored in headphones connected to the tape recorder. The tape programme that is played back and reproduced through the speakers can be adjusted with the volume- and tone controls.

*Procedure:* Tune in to the desired radio programme and depress the TAPE MONITOR button.



## Headphones

Stereo headphones can be connected to the 3-pole jack, PHONES, on the left hand side of the front. The programme level in the headphones can be set with the volume- and balance controls. For headphone listening without disturbing other people in the room, set the speaker selector to OFF.





## Adjustment of input sensitivity for PHONO, TAPE 1 and TAPE 2 inputs

To match the output signal from the programme sources connected to these outputs and to ensure the same output level when switching from one programme source to another, adjust as follows: Tune the receiver to a strong station and feed programme from the record player and the tape recorder to the appropriate inputs of the receiver. Without operating the volume control, adjust the corresponding input level controls at the bottom of the receiver until all programme sources are reproduced at approximately equal sound levels.



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## Supplement for TR-1010

The TR-1010 is a special version of TR-1000. In addition to the FM band, TR-1010 is equipped with a mediumwave band with a built-in ferrite aerial. The number of pretuning FM stations however, is reduced to 4.

### Operation

#### Aerials

TR-1010 has built-in ferrite aerial for the AM-band. This aerial is intended for local reception but can under good receiving conditions also pick up more remote stations quite efficiently. The best results, however, will normally be obtained by using an outdoor aerial, see page 6.

#### Tuning on mediumwave

Select the AM-band by depressing the button marked AM. The dial pointer will then light, and the tuning can be accomplished with the tuning knob at the right hand side of the dial.

As for the rest of the functions, the TR-1010 is similar to TR-1000.

## Connection of loudspeakers

Connect the speakers to the sockets SPEAKERS at the rear, see fig. 5 and 6. The amplifiers are designed for 4–8 ohms per channel and supply optimal power when the resultant impedance of all speakers connected to each channel is 4–8 ohms. Speakers, or combinations of speakers with higher or lower impedance will give less output power.

### Warning

A short-circuit in a speaker cable may not necessarily affect the output volume enough to be noticed when playing at low levels. Continued operation under such a heavy load may shorten the life of the output transistors. If output level is raised, an electronic circuit will limit the current and thereby the output power available.

To avoid short-circuiting, take the following precautions when installing speakers:

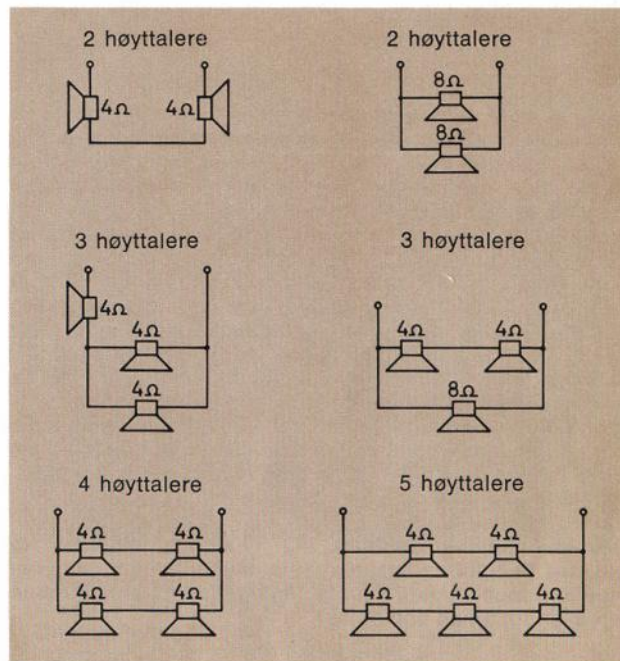
- Do not strip off more insulation from wire ends than what is necessary to ensure reliable contact with the plug.
- Twist each wire end.
- Use insulated clamps when fixing the cable to the wall.

Note: Don't use a common return wire for the two channels as this will impair channel separation and may cause instability.

## Combination of several speakers

Each channel has two outputs, A and B in parallel. If the A outputs are used for the master speakers, both B outputs can be used for remote speakers somewhere else in the house, or vice versa.

As already mentioned, certain precautions must be taken when more than one speaker are connected to the same output socket. Maximum output power is obtained when the combination of load impedances for A and B output of each channel is 4–8 ohms. For that reason, some recommended ways of connecting 2, 3, 4 og 5 speakers to one output socket are shown in the figures.



## Polarity

When the two loudspeakers are placed near each other, the polarity must be correct. In other words, the cones must move forward and backward in phase. If the polarity is wrong, one cone will move forward while the other is going backward, and the result will be a reduction of the bass volume. This can be corrected by reversing the leads to one of the speakers.



## Loudspeakers

**Tonal balance — multispeaker system.** Every speaker has a tone range that is limited by the physical dimensions. The largest speakers reproduce the deepest bass tones and fall off for the higher tones, whereas the small speakers will have maximum radiation of high tones. If the entire Hi-Fi frequency range is to be reproduced with good balance, a combination of smaller and larger speakers is needed. In the Tandberg Hi-Fi speakers systems, the frequency range is divided in two or three ranges, each one with a carefully matched speaker. In systems for high output power there are usually three speakers, one special bass-speaker which has little radiation in the medium frequency range, one speaker for the medium range, and one for the treble.

For moderate output volume, two speakers will give satisfactory result because the smaller bass speaker also will cover the medium range. One small treble speaker in addition takes care of the higher tones.

**Pressure chamber systems.** All Tandberg speakers are mounted in tight enclosures. This method which has been used by Tandberg for 35 years, renders good bass reproduction even for small enclosures.

**Bass resonance — bass response.** Every Hi-Fi speaker system has a resonance frequency which determines the lowest frequency that can be reproduced without distortion and with approximately the same volume as the rest of the tone range. A good bass performance requires a low resonance frequency.

**Size of the enclosure — bass response.** In a pressure chamber speaker, the bass resonance is determined by the size of the enclosure, the diameter and the weight of the speaker cone. Even with a small enclosure and a moderate speaker diameter, the bass resonance can be kept at a low frequency if the weight of the cone is increased. This has been done

in Tandberg Hi-Fi speaker systems 20 and TL 1210. The bass reproduction in these speakers is impressive when considering the small speakers cabinets.

**Efficiency — operating power.** The price which must be paid to obtain a good bass response in a small pressure chamber speaker system, is a lower efficiency. This means that more power must be supplied to the system in order to obtain the same output volume.

**Power limitation.** Dissipation of heat in the moving coil sets an upper limit for the electric power which can be supplied to a speaker. The smaller speaker systems should therefore only be used when a moderate sound volume is needed.

Tandberg Hi-Fi Systems TL 2510 and TL 5010 are designed to match the full output power from TR-1000. These systems are furnished with DOME tweeters, and meet the strongest demands for clarity and tone colour in the entire frequency range.

TL 5010 can be delivered in a special version with a built-in protection circuit for the tweeter unit which otherwise may be damaged when music having a high concentration of power in the treble range is to be played at high output volume.

**Selection of speaker system.** For selection of the right speaker system for a given application we refer to our main product catalogue which contains complete technical specifications and more comprehensive description of the Tandberg Hi-Fi speaker systems.



## Technical Specifications for TR-1000 and TR-1010

Right to alter the specifications is reserved. All specifications are minimum values. All curves represent typical curves.

### Definitions:

DIN: Deutsche Industrie Normen 45 500.

IHF: Institute of High Fidelity.

**Mains voltage:** 220–240 volts AC, 50/60 Hz. Can be rewired for 115 volts.

**Power consumption:** 28–225 watt.

**Dimensions:** Length 43 cm (17") height 12 cm (4<sup>3</sup>/<sub>4</sub>" depth 30,5 cm (12") + knobs 2 cm (3/<sub>4</sub>").

**Weight:** 8,8 kg, 20 lbs.

## FM-section

**Tuning range:** 87,5–108 MHz.

**Frequency range (50  $\mu$ s. deemphasis):** 20–16 000 Hz (–3dB).

**Sensitivity at 26 dB signal/noise (DIN):** 1 $\mu$ V at 75 ohms, 2 $\mu$ V at 300 ohms.

**Sensitivity at 30 dB signal/noise (IHF):** 2 $\mu$ V at 300 ohms.

**Signal/noise at 1mV antenna voltage:**

Unweighted (DIN): 64 dB in mono, 62 dB in stereo

Weighted (DIN): 66 dB in mono, 64 dB in stereo

Unweighted (IHF): 68 dB in mono, 66 dB in stereo

**Distortion at  $\pm$  40 kHz deviation (DIN):** 0,2 %.

**Distortion at  $\pm$  75 kHz deviation (IHF):** 0,3 %.

**IF-rejection (IHF):** 100 dB.

**Image frequency rejection:** 70 dB.

**IF-bandwidth (6 dB):** 210 kHz.

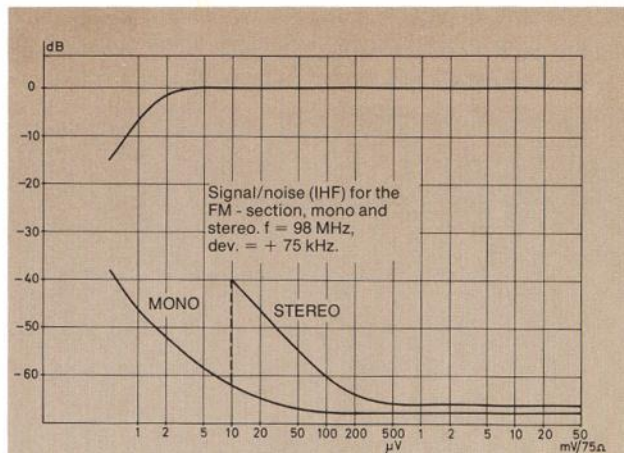


Fig. 16. Signal/noise (IHF) for the FM-section, mono and stereo.  $f = 98$  MHz,  $dev. = \pm 75$  kHz.

**Limiting (3 dB):** 1,5  $\mu$ V at 75 ohms.

**Muting threshold:** 5 $\mu$ V at 75 ohms.

**Capture ratio:** 1,8 dB.

**Static selectivity  $\pm$  300 kHz):** 48 dB

**Channel separation (DIN):** 35 dB at 1 kHz.

**Pilot tone suppression (DIN):** 68 dB.

**38 kHz suppression (DIN):** 50 dB.

## Supplement for TR-1010.

**AM-section.**

**Frequency range (mediumwave):** 518–1600 kHz.

**IF-frequency:** 455 kHz.

**Sensitivity (IHF):** Ferrite Aerial 600  $\mu$ V/m external aerial 60  $\mu$ V at 1000 kHz and 20 dB signal/noise.

**Static selectivity ( $\pm 9$  kHz):** 42 dB.

## Audio section

**Nominal output power (continuous sinus, 0.2% distortion at 1 kHz):** 2 x 50 watts in 4 ohms, 2 x 35 watts in 8 ohms.

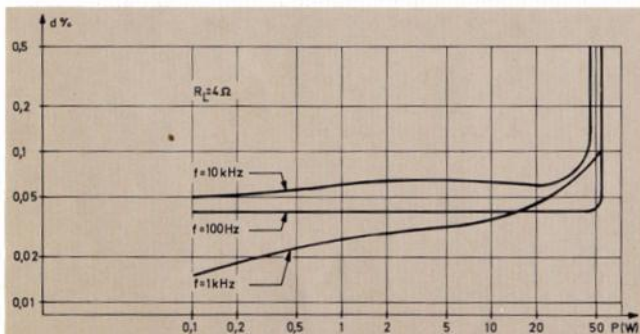


Fig. 17. Distortion curves for the AF-amplifiers, both channels operating.  $R = 4$  ohms.

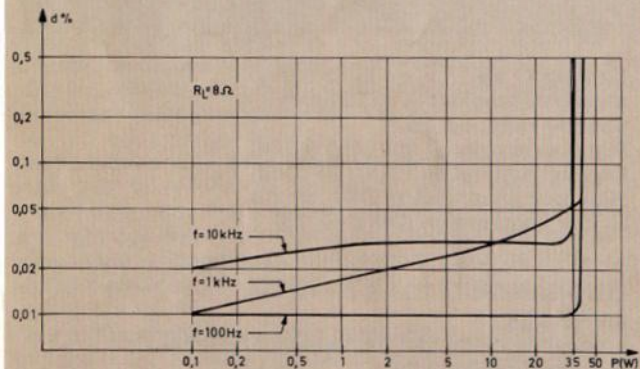


Fig. 18. Distortion curves for the AF-amplifiers, both channels operating.  $R_L = 8$  ohms.

**Max. output power, one channel only (continuous sinus, 0.2% distortion at 1 kHz):** 64 watts in 4 ohms.  
**Music power:** 2 x 70 watts in 4 ohms.

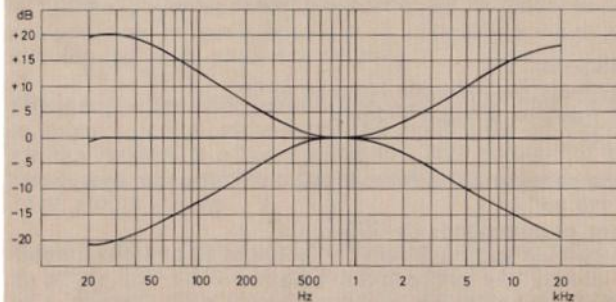


Fig. 19. Frequency curves for the AF-amplifiers with LOUDNESS - switch unoperated. Curves are drawn for centre - and extreme positions of the bass and treble controls.

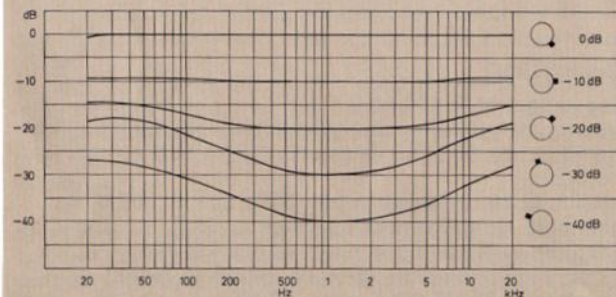
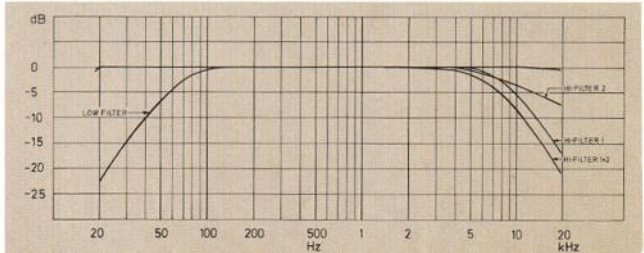


Fig. 20. Frequency curves for the AF-amplifiers showing the effect of the loudness contours at 5 different positions of the volume control. Bass and treble controls in centre positions.



**Intermodulation (250/8000 Hz, 4:1):** Preamplifier 0,2 %, Power amplifier 0,2 %.  
**Damping factor:** 30 at 4 ohms, 60 at 8 ohms.  
**Power bandwidth:** 10–50 000 Hz.  
**Frequency range (linear inputs):** 12–50 000 (– 1.5 dB).  
**Treble control:**  $\pm$  14 dB at 10 000 Hz.  
**Treble loudness:** + 7 dB at 10 000 Hz.  
**Bass control:**  $\pm$  16 dB at 50 Hz.  
**Bass loudness:** + 12 dB at 50 Hz.  
**Low Filter:**  $\div$  8 dB at 50 Hz.  
**High Filter 1:**  $\div$  12 dB at 15 000 Hz.  
**High Filter 2:**  $\div$  5 dB at 15 000 Hz.  
**Channel separation (DIN):** PHONO 52 dB, TAPE 55 dB.  
**Signal/hum and noise (DIN), reference 50 mW in 8 (4) ohms, nominal input signal:** TAPE 1: 56 (53) dB, TAPE 2: 56 (53) dB, PHONO MAGN.: 55 (53) dB.  
**Signal/hum and noise (IHF), reference max. output in 8 (4) ohms, nominal input signal:** TAPE 1: 82 (80) dB, TAPE 2: 82 (80) dB, PHONO MAGN.: 66 (64) dB.

**Sensitivity at nominal output power in 8 ohms, 1 kHz:**  
 TAPE 1: adjustable 130–500 mV.  
 TAPE 2: adjustable 130–500 mV.  
 PHONO MAGN: adjustable 1.8–6 mV.  
**TAPE 1 – and TAPE 2 outputs (unloaded):** 1 volt at phono sockets, 200 mV at DIN-sockets.



**Fig. 21. Frequency curves for the AF - amplifiers showing the effect of the High and Low filters.**

