BEOMASTER 4000

BANG & OLUFSEN



CONGRATULATIONS

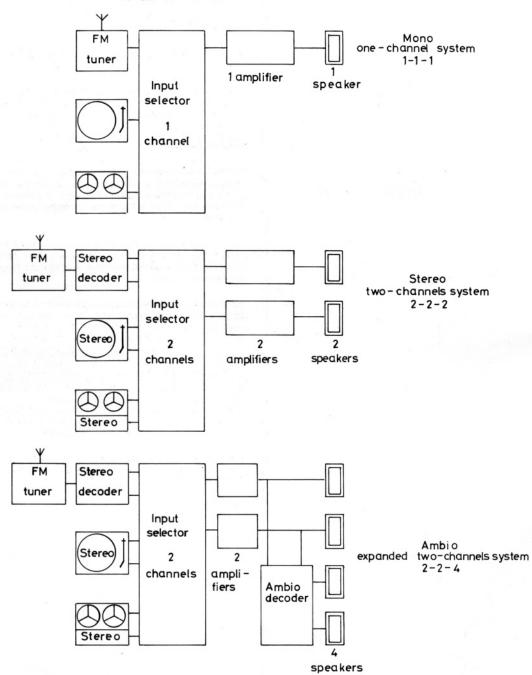
Your purchase of the Beomaster 4000 sets you apart as a discriminating music connoisseur. The Beomaster 4000 is an FM stereo receiver with outstanding specifications. In addition, the ambiophony function will provide expanded stereo reproduction through four speakers.

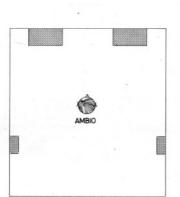
Your Beomaster 4000 will deliver 60 watts of rms power per channel or a total of 200 watts of music power, with less than 0.1 % distortion. It has many connections, loudness function and tone filters, level and balance controls.

The FM tuner uses field-effect transistors and ceramic filters, and has six pre-set controls for push button program selection, lamp indicators and tuning meter.

Low and compact, with black front panel and slide-rule cursors. Even though your Beomaster 4000 is simple to operate, we advise that you read these instructions before doing so. The control facilities and details must be understood to realize the full benefit of your Beomaster 4000 and your entire stereo system.

A BRIEF COMPARISON OF MULTI-CHANNEL SYSTEMS





MORE ABOUT AMBIOPHONY (AMBIO)

Ambio is an expansion of the type of sound reproduction known today as stereo.

Ambio is reproduced through four loudspeakers — two more than required for stereo.

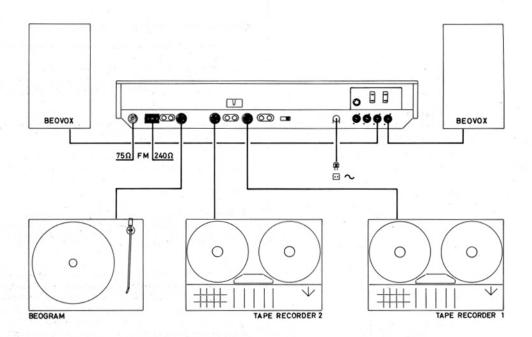
Ambio is sensed as being more spatial and acoustically more life-like than conventional stereo. The sound picture has greater depth because you get added feeling of being present in the concert hall, listening to the actual performance. Ambio is based on the principle that in a concert hall you not only receive sound impressions directly from the performing group, you also get reflections from the wall and ceiling. This spatial sensation is instrumental in providing the auditory experience, and even a two-speaker stereo system will not bring it out fully. And you cannot accomplish the effect by connecting additional speakers to a conventional stereo amplifier because you still have the same left and right front signals merely distributed to more speakers.

In the Beomaster 4000 the left and right channels are subtracted from each other electronically, and the resulting difference signal contains a certain amount of spatial information which is fed to the two new side speakers.

Many existing stereo records, FM stereo broadcasts and tape recordings contain this spatial effect to a greater or lesser extent. In a concert hall, room acoustics will be recorded together with the actual program material, appearing as time-delayed signals in both left and right channels. Recordings made in a strongly damped studio contain few time-delayed signals, and the spatial sensation will therefore depend on how the producer mixed the sounds from the various instruments, perhaps adding acoustical effects by electronic means.

Multichannel records, such as SQ records, which are intended for use in a four-channel matrix system in order to bring out all sound effects, can be played successfully through the Beomaster 4000.

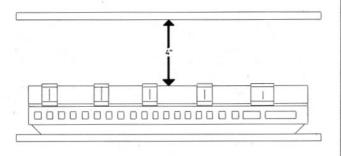
A good-quality stereo turntable will provide ambio reproduction of both stereo and SQ records through your Beomaster 4000.

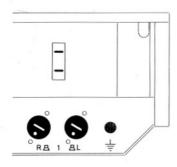


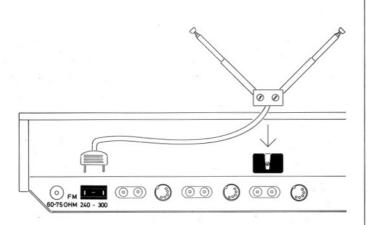
In order to function as an FM-system, the minimum connections that must be made to your Beomaster 4000 are:

two speakers AC power an FM antenna And in order to provide a complete stereo and ambio system with all functions operative you also must connect: a turntable

two speakers for ambio headphones two tape recorders







SETTING UP

After unpacking your Beomaster 4000 you may set it up in the place you have chosen for it.

You can easily place your Beomaster 4000 on a shelf. However, please keep in mind that the amplifier generates heat and must be able to dissipate same. Hence, you should allow at least 4" of clearance above the cabinet as shown.

Avoid placing your Beomaster 4000 directly above a radiator where the temperature is considerably higher than in the rest of the room.

Speakers

A pair of Beovox 5700's or Beovox 4702's are recommended as front speakers for stereo reproduction. These speakers are capable of handling the rated output of your Beomaster 4000 and their response and low distortion are matched to the performance of the amplifier. If you wish to use other speakers you should keep in mind that your Beomaster 4000 is capable of delivering 60 watts RMS and 100 watts music power per channel, measured at 4 ohms. You may use higher space impedance speakers at the expense of a reduced output. The rear panel of the amplifier carries two sockets, marked with the symbol shown. The left speaker lead plugs into the 1 L socket, the right one into 1 R.

Connecting Speakers without DIN Connectors.

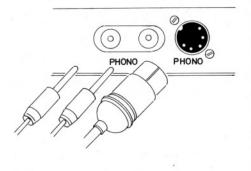
Four DIN speaker plugs with screw terminals are provided to facilitate connection of other types of speakers. To avoid wiring such speakers out of phase, use the round pin for the positive and the flat pin for the ground.

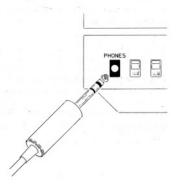
FM Antenna

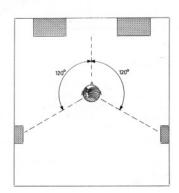
A telescoping, "rabbit ears" antenna (8902010) is available as an optional accessory. This fits the bracket on the rear-center of the receiver and plugs into the 300 ohm antenna input.

This antenna will deliver a good signal to the tuner in all but the most difficult or distant reception areas. In such cases an outdoor antenna is required. A plug is furnished with the receiver to connect this type of antenna.

Your Beomaster 4000 also has a 60-75 ohm input for connection to a community antenna.







Turntable Unit

Your Beomaster 4000 is designed for use with a stereo turntable unit equipped with a high-quality low-impedance pickup, such as is available from the Beogram 4000 or the Beogram 3000. Inputs are duplicated to accommodate either pin plugs or DIN plug. If pin plugs are used, the separate ground lead (4) should be attached to the ground screw.

Headphones

Headphones may be plugged into the PHONES socket on the front of your Beomaster 4000. Headphone impedance is not critical; values between 16 and 2000 ohms will provide normal volume, decreasing volume being obtained at higher impedance values.

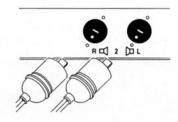
Speakers for Ambio

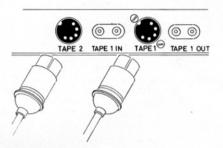
and the right one into 2 R.

The two side speakers for the spatial signals need not be as large as the two front speakers as a relatively small portion of the amplifier output is fed to them. Speakers such as Beovox 2702 are well suited for this purpose, and are easy to place in most listening rooms because of their small size.

The ambio speakers should be placed on opposite side walls, slightly to the rear of the listening area. This sketch shows proper ambio speaker placement relative to the two stereo front speakers. The lead from the left ambio speaker plugs into the 2 L socket

The AMBIO/STEREO switch on the back should be in the AMBIO position.





NOTE: If the two speakers plugged into the 2 L and 2 R sockets are used chiefly for stereo reproduction in another room they should have ratings comparable to those of the Beovox 5700. or Beovox 4702.

Tape Recorder

Your Beomaster 4000 has two tape recorder inputs.

TAPE 1 provides off-the-tape monitoring during recording and is therefore especially suited for large recorders with separate heads for record and playback. The DIN jack labeled TAPE 1 handles both input and output. The pin jacks for TAPE 1 in and out are so labeled.

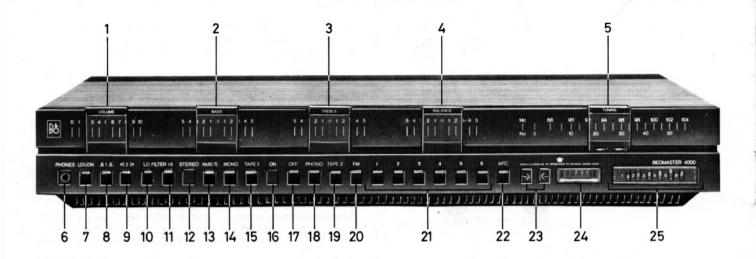
TAPE 2 has both record and playback functions but has no provision for off-the-tape monitoring. It may be used for alle types of recorders with DIN sockets, including cassette models.

It is unimportant whether the tape recorders connected to your Beomaster 4000 are mono or stereo, with or without output amplifiers.

Cable type numbers for connecting Bang & Olufsen tape recorders:

Recording/playback
Off-the-tape monitoring

0961014 6270019



KEY PLAN

VOLUME

2	BASS	Bass control
3	TREBLE	Treble control
4	BALANCE	Balance control
5	TUNING	Slide-rule indicator
6	PHONES	Headphone jack
7	LOUDN	Loudness tone control
8	A 1 A	Front speakers
9	4 2 ▷	Ambio speakers or extension speakers
10	FILTER LO	Rumble or bass filter
11	RILTER HI	Scratch or treble filter
12	STEREO	Stereo lamp indicator
13	AMB ≈	Ambio filter

Volume control

14	MONO	Stereo/mono switch
15	TAPE 1	Tape recorder 1
16	ON	Power-on lamp indicator
17	OFF	Off switch
18	PHONO	Turntable unit
19	TAPE 2	Tape recorder 2
20	FM	Tuning
21	PROGRAM 1 - 6	Six pretuned FM stations
22	AFC	Automatic frequency control
23	TUNING INDICATOR	Tuning lamp-indicator
24	TUNING METER	Signal level meter
25	TUNING 1 - 6	Pretuning of FM stations

INTERNATIONAL GUARANTEE

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Bang & Olufsen International Consumer Division

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Phone: 716400

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Phone: 01/255.42.01

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Phone: 627697-606543

HOLLAND

Bang & Olufsen Nederland B.V.i.o. P.O. Box 36 'S-Graveland

Phone: 02150-61824

HONG KONG

The Radio People Ltd. 25, Chatham Road Kowloon

Phone: 663241-2

IRAN

Golavaz Co. Ltd. Saman Center Elizabeth Blvd. Tehran

Phone: 623087-623088

IRELAND

Bang & Olufsen United Kingdom Limited Gloucester GL4 7DE

Phone: 0452/21591

ISRAEL

Royal Electronics Limited 48 Hanamal Street Haifa

Phone: 624224

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Phone: 9271241

LUXEMBOURG

S.A. Bang & Olufsen N.V. 523 Avenue Louise 1050 Bruxelles

Phone: (02) 648 48 58

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Phone: 02/836485-86-87

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Eastland Trading Company P.O. Box 1128 Singapore 7

Phone: 21021

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Teltron (Pty) Ltd. 17 Faraday Street Village Main P.O. Box 264 Johannesburg

Phone:21-5664

SWEDEN

Bang & Olufsen Svenska AB Grevgatan 58 11458 Stockholm

Phone: 08/631260

SWITZERLAND

Bang & Olufsen Kanalstrasse 27 8152 Glattbrugg

Phone: (01) 8100266

UNITED KINGDOM

Bang & Olufsen United Kingdom Limited Eastbrook Road Gloucester GL4 7DE

Phone: 0452/21591

USA

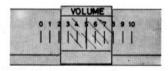
Bang & Olufsen of America, Inc. 2271 Devon Avenue Elk Grove Village III. 60007

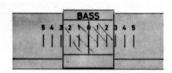
Phone: (312) 595-1320

If you want information about other addresses than the ones listed here you are welcome to write to

Bang & Olufsen a/s International Consumer Division Bomark 7600 Struer Denmark Bang&Olufsen











OPERATION

OFF

Your Beomaster 4000 is switched off when the OFF pushbutton is depressed.

ON

To switch on, depress one of the buttons marked FM, 1 to 6, PHONO, TAPE 1 or TAPE 2, and the ON indicator will light up.

Front Speakers for Mono and Stereo Reproduction

To feed sound to the two front speakers, depress this button. For headphone listening only, the button should be released. To release the button, press it again.

Volume

The VOLUME slider with its 0-10 scale controls amplifier volume.

Low Sounds

The BASS slider controls bass frequencies relative to the mid-range and high frequencies. The mid-scale setting, 0, may be regarded as the normal or flat setting. Sliding the indicator to the right will accentuate bass notes while moving it to the left will attenuate them.

High Sounds

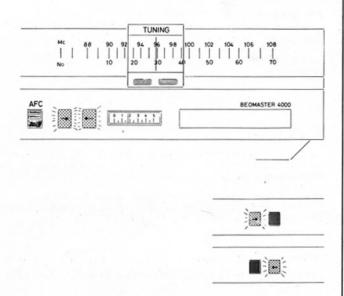
The TREBLE slider controls high frequencies relative to the bass and mid-range. The normal setting is in the middle, at 0, towards the right the high notes are accentuated, bringing the slider to the left will attenuate them.

Loudness

The sensitivity of the human ear to high and low frequencies diminishes at low volume. The loudness button controls a compensation circuit which accentuates these frequencies to create a subjectively flat response at VOLUME settings lower than 4. This effect becomes progressively weaker at VOLUME settings higher than 4.

Balance

The relative strength of the left and right sound channels is adjusted with the BALANCE slider. This may be necessary if the two stereo speakers cannot be placed quite symmetrically in your room. Listen to a mono program from the place in your room where you expect to do most of your listening. The correct setting is where you feel the sound to be coming from a point midway between the two speakers.



FM Tuning

Depress the FM button and set the TUNING slide pointer to the station of your choice. The dial is calibrated both in MHz, 87.5–108, and in a logging scale, 0–70.

The slide pointer has two thumb wheels for fine tuning.

The double-acting lamp indicator is an additional tuning aid; the two red lights will be of equal strength when a station is properly tuned. If one light is stronger, the tuning is not in balance. The meter to the right of these lights indicates the relative strength of the FM station you have tuned.

AFC (Automatic Frequency Control)

Your Beomaster 4000 has an FM automatic frequency control circuit which performs final, accurate tuning and sees to it that the station stays tuned. This feature becomes operative when the AFC button is pressed and can be switched off by pressing the button again. When listening to a weak FM station adjacent to a stronger station you may find it an advantage not to use the AFC feature.

FM Stereo

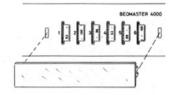
When the station you have tuned in is transmitting a stereo program, this will be indicated by the green STEREO lamp and the program will automatically by reproduced as stereo.

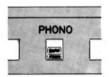
With the MONO button depressed, you will get single-channel reproduction because the two channels are put together, but the indicator will show light as long as an FM stereo program is being received.

Tuning FM Pre-sets

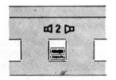
Buttons 1 to 6 permit you to choose instantly among your favorite FM stations. First you must pre-set the vertical dial knobs. These are protected by a removable transparent cover.

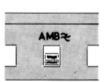
Example: With pushbutton 1 depressed and the AFC button up, set dial knob 1 to the FM station which is your first choice. Use the light indicator and meter.











Similarly set knobs 2 to 6 to your choices.

On completion of the setting of the small dial knobs the transparent cover should be put on and the AFC button depressed.

Playing Records

To play records, depress the PHONO button. The volume, tone and balance controls as well as the loudness button will function as during FM reception.

Your Beomaster 4000 has two tone filters. They are particularly intended for use with records and turntables that are not quite perfect.

LO filter, also called rumble or bass filter. Cuts off rumbling sounds inherent in the recording or turntable. Below 80 Hz the roll-off is 12 dB per octave.

HI filter, also called scratch or treble filter. Provides strong treble cut. Above 4,000 Hz the roll-off is 12 dB per octave. This is useful also to eliminate excessive tape hiss.

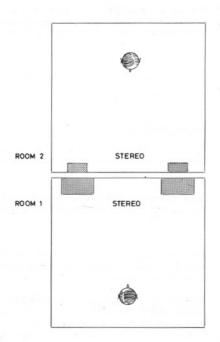
Ambio

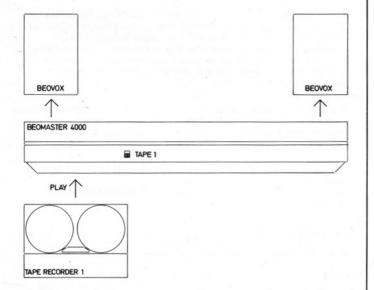
Ambio reproduction, as stated on page 6, requires four speakers. The two side speakers are switched in by depressing the button carrying the symbol shown at left. You will then obtain expanded stereo reproduction of any stereo source. The ambio effect will depend on the conditions under which the music was broadcast or recorded. Live recordings in a concert hall with an audience present will produce the best ambio effect.

The ambio filter button when depressed will attenuate high frequencies on the two side speakers. The attenuation may be desirable, especially for classical music from a concert hall or if your room has pronounced resonance effects.

The two side speakers may be left in circuit while you listen to mono programs, but will not be operative.

Be sure the back panel selector switch is in the AMBIO position for ambio reproduction.





Two Speakers Pairs for Stereo

If, instead of ambio reproduction, you wish to listen to two pairs of stereo speakers in two different rooms, the small slide switch in the back of your Beomaster 4000 should be shifted from the AMBIO to the STEREO position.

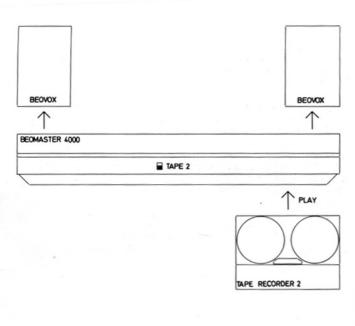
The speakers plugged into the sockets marked 2 L and 2 R will now function as front speakers, pair No. 2, when speaker button 2 on the front panel is depressed.

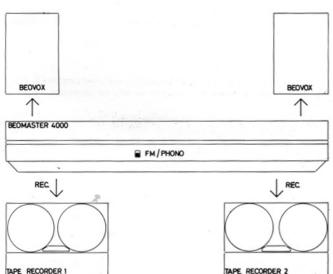
NOTE: With your Beomaster 4000 operated as described here, full output will be delivered to all speakers. Keep this in mind if you use fairly small speakers as pair No. 2. They will not stand being operated at full volume level.

Tape Playback

To play back previously recorded tapes, depress the TAPE 1 button and set the tape recorder to playback.

Operate the volume, tone and balance controls as for FM reception. Depressing the MONO button will cause the left and right channels of a stereo recording to be mixed for mono reproduction, and the STEREO lamp indicator will go out.





Similarly depress TAPE 2 when you wish to play tapes from a second tape recorder connected to your Beomaster 4000.

Making Tape Recordings

Tune or switch your Beomaster 4000 to the program you want to record on tape, FM or record. Otherwise operate the controls exactly as if you just want to listen to the program in question. Do not depress the TAPE buttons. Switch your record to the record function.

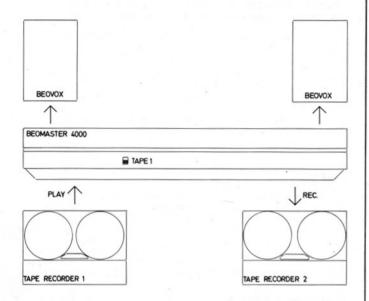
The Beomaster volume, tone and balance controls will have no effect on the recording. Depressing the MONO button will cause a stereo program to be recorded as mono on tape.

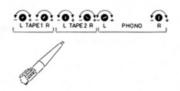
This feature is useful when you wish a recording to occupy only one tape track.

You may record either on tape recorder No. 1, or on No. 2, or on both together.

Off-the-tape Monitoring

With a tape recorder having provision for off-the-tape monitoring plugged into the TAPE 1 socket you can monitor your recording while making them. The TAPE 1 button should be depressed together with either the FM or the PHONO button. Recording level is adjusted on the tape recorder while playback level is adjusted on the Beomaster 4000.





Copying between two Tape Recorders

It is possible to transfer recordings from one tape recorder to another while they are plugged into their separate jacks on your Beomaster 4000.

Assuming the original is on tape recorder No. 1, this recorder should be switched to playback and the TAPE 1 button of your Beomaster 4000 depressed. Load tape recorder No. 2 with a new tape or with a previous recording that you wish to erase, and switch that recorder to the recording function. All other controls on your Beomaster 4000 will not affect the recording and you may monitor it if you like, by advancing the VOLUME control.

The procedure in copying an original recording from tape recorder No. 2 to No. 1 is the same. Depress the TAPE 2 button, switch tape recorder No. 2 to playback and No. 1 to record. In this case, too, you may utilize the off-the-tape monitoring feature if tape recorder No. 1 is so equipped. Both the TAPE 1 and TAPE 2 buttons on your Beomaster 4000 should be depressed together in that case.

SOUND-LEVEL AND BALANCE ADJUSTMENT

When switching between FM, phono and tape it is desirable to maintain constant volume levels.

As supplied to you, your Beomaster 4000 is matched to other B & O components and readjustment will not usually be necessary.

When operating other makes of turntables and tape recorders with your Beomaster 4000 it is possible for differences to occur, and they can be equalized by means of the small level controls located in the bottom of your Beomaster 4000. Using the small screwdriver of insulating material which is provided, you can adjust both the left and right channels for correct volume and balance.

Sound Level

Music from an FM station should be used as a starting point, and you may listen either on the front speakers or on headphones. The VOLUME knob should be set at normal strength and the BASS, TREBLE and BALANCE controls at mid-scale, 0.

Then depress the PHONO button and start your turntable unit playing a record similar to the FM music program you used as reference for setting the VOLUME.

Tilt up the amplifier so you can insert the small screwdriver into the PHONO L hole, which controls the left channel, and PHONO R for the right channel, until it delivers the same volume as on FM and both channels are equally loud. You may find it necessary to switch back and forth between the FM and PHONO pushbuttons a few times.

Depress the TAPE 1 pushbutton and switch tape recorder No. 1 to the playback function.

Using the screwdriver, adjust TAPE 1, both L and R, until the volume is the same as on FM.

Depress the TAPE 2 button and similarly adjust tape recorder No. 2 with TAPE 2, L and R.

Balance

Optimum adjustment of balance between left and right channels for the turntable unit and tape recorders 1 and 2 can be obtained by employing the ambio speaker sockets.

If you do not use ambio speakers, the two front speaker plugs should be transferred to the sockets carrying this symbol: 1 2 2 2 You cannot use the headphone socket for this adjustment of balance. Start your turntable unit playing a mono record. Depress the PHONO button. Set the AMBIO/STEREO slide switch on the back to AMBIO.

Depress the $\sqrt{2}$ pushbutton. Set the VOLUME knob at normal room level, with the BASS, TREBLE and BALANCE controls at mid-scale, 0. Using the small screwdriver, carefully adjust PHONO R for minimum sound level.

Start tape recorder No. 1 playing a mono program. Depress the TAPE 1 button and, using the screwdriver, carefully adjust TAPE 1 R for minimum sound level.

Similarly start tape recorder No. 2 playing a mono program.

Depress TAPE 2 and adjust TAPE 2 R for minimum sound level.

With these adjustments completed, return the stereo speaker plugs to the sockets marked 1. You may now operate your Beomaster 4000 in the normal manner.

MAINTENANCE

The external surfaces of your Beomaster 4000 can normally be kept clean with a dry cloth. Any grease spots can be removed with a soft cloth moistened in a cold or lukewarm solution of detergent in water, followed by thorough drying with a dry cloth.

FRONT PANEL. Use a soft cloth moistened in a lukewarm solution of detergent in water. Use of alcohol is inadvisable as this may cause damage to the transparent portions of the slide pointers.

TEAK AND ROSEWOOD CABINETS. If the cabinet surfaces seem grey and dry you may apply a thin film of teak or rosewood oil but not more than once or twice a year.

Use a thin grade of oil, especially for rosewood.

BLOND OAK CABINET. Do not use oil at all — even non-oil detergent or wax can cause discoloration of the untreated surface. The removal of dark spots should be left to an expert.

	BEOMASTER 4000
A STATE OF THE STA	type 2408
Amplifier Section	
Frequency response	40-20,000 Hz
Minimum continuous RMS power per channe	el 60 watts
Speaker impedance	4 ohms
Maximum total harmonic distortion	0.4%
ntermodulation	< 0.3%
Damping Factor 1000 Hz	> 20
nput pickup low impedance	3 mV/47 kohm, min
Tape recorder	250 mV/1000 kohms
Signal-to-noise ratio linear	
Pickup low impedance	> 62 dB
Tape recorder	> 75 dB
Channel separation 1000 Hz	> 45 dB
250 - 10,000 Hz	> 35 dB
Output tape recorder DIN	100 mV at 100 kohms
Output tape recorder RCA	170 mV at 4.7 kohms
Bass Control at 40 Hz	± 17 dB
Treble Control at 12,500 Hz	± 14 dB
FM Tuner	
Range	87.5 - 108 MHz
Sensitivity 26 dB, ± 40 kHz	< 1.4 µV at 75 ohms
Sensitivity IHF	< 2 µV at 75 ohms
Signal-to-noise Ratio	> 65 dB
requency Range ± 1.5 dB	20-15.000 Hz
Harmonic Distortion	< 0.4%
Channel Separation 1000 Hz	> 35 dB
Pilot Suppression 19 kHz	> 40 dB
not ouppicoolon to kitz	> 40 dB
88 kHz	
88 kHz	117 volts AC 60 Hz
88 kHz Other data	117 volts AC 60 Hz 20 - 275 watts
St kHz Other data Power Supply	