

# NEW PHILIPS HIFI



**PHILIPS**

# New Philips Hi-Fi

## **Towards pure sound**

There is a special satisfaction in knowing that the music you hear at home is as faithful as possible to the original live performance.

This calls for equipment that must recreate every nuance of sound in its original form, free of colouration or distortion, adding nothing, removing nothing.

Producing such equipment is a very demanding art, presenting sound engineers with highly complex problems which can be solved only by big investments in brainpower and capital. The high level of success that has now been achieved by sound engineers, despite the daunting problems, can be seen in the equipment shown on the following pages. Whether from radio, record or cassette, the sound reproduced is the nearest yet to perfection.

## **Philips HiFi range**

To achieve a place in this range, each model had to meet the most stringent requirements.

There could be no compromise over performance, only the best possible was acceptable.

The design had not only to be aesthetically pleasing but also practical to use, with controls intelligently grouped, and, where possible, operation automated.

A future capability also had to be built in, so that equipment would not be rendered obsolete by developments currently at an early stage. In one product, for instance, a capability is offered for both of the major systems still competing for supremacy in four-channel sound.

The achievement of the design objectives called for intensive research and development, much innovation, and extensive testing in probably the best-equipped sound laboratories in

Europe. The loudspeakers alone came out of an elaborate test programme employing over a million pounds' worth of equipment. The quality of the innovation is most clearly seen in the Motion Feedback loudspeakers, which employ a whole new principle to ensure the most faithful reproduction ever heard from a loudspeaker enclosure. One of the added benefits of this advance is that huge speaker cabinets are no longer necessary to achieve true bass response in correct proportion to the rest of the tonal range. This is a great space-saver especially with four-speaker systems. Also, with high output power amplification built into each MFB speaker, it can be used with just a control pre-amplifier.





Such a control pre-amplifier is the RH551 ;  
it typifies the care that goes into

the design of Philips Hi-Fi models in the range  
of controls available to the user to recreate in  
the home the true sound and ambience of  
the original performance. Innovation of a  
high order is also evident in the RH832  
4-channel pre-amplifier system. Never  
has so much high-quality sound capability  
been built into so beautifully compact  
a unit. Designed with an eye on the future,  
obsolescence can truly be said to have been  
built *out*. Innovation is again to the fore in the  
elegantly simple GA209 record deck.

All the functions have been automated.

Just put on a record and special  
sensors operate to start the turntable  
motor, select the correct speed and  
record diameter and play the record ;  
at the end of the record the arm lifts  
and returns to rest, *all* automatically.

Uncompromising quality of

design and construction ensures  
every facet of sound contained in  
the groove is reproduced – clean  
and free from all audible

distortion. The RH831 amplifier/

tuner/cassette deck is

an object lesson in building

a wealth of electro-

mechanical features

into a beautifully

compact cabinet.

DOLBY\* noise

reduction system,

automatic switching

from CrO<sub>2</sub> to

Fe<sub>2</sub>O<sub>3</sub> cassettes

and a full range

of features that,

to the initiated,

spell quality

and versatility.

It is the blend

of technical

excellence,

aesthetic appeal

and operational

convenience

that separates

Philips HiFi

from all that

is ordinary in

the world of Hi-Fi.

\*Trademark of DOLBY  
Laboratories Inc.

RH 832



The RH 832 is the outstanding example of Philips high fidelity musical equipment designed with the future very much in mind. This four channel control unit with AM/FM tuner, pre-amplifier and electronic record deck contains a truly impressive list of facilities.

First and foremost, it is a 4 channel pre-amplifier with built in SQ decoder. There is a connection for CD4 demodulator. These two facilities between them cater for any immediate direction that quadrphony may take be it matrix or discrete. It offers the capability of playing mono, stereo, double stereo and 4 channel reproduction thereby satisfying all stages of sound development to the present time.

There are two DIN output sockets, each with  $2 \times 1$  volt output signal, for use with Motion Feedback loudspeakers (RH 532)—which feature 2 power amplifiers within each enclosure! The RH 832 comes complete with two of these 60W (r.m.s.) MFB loudspeakers. Despite having to accommodate 2 amplifiers providing a full sized power output, these enclosures are a quarter the size of many comparable conventional loudspeakers. The big saving in space is doubly rewarding when the time comes to convert to a 4 speaker system.

The AM/FM tuner is fully equipped for stereo FM and four channel (SQ) FM transmissions and has touch sensitive controls for FM pre-selection. The two speed record deck is electronically controlled and is supplied with the GP422 super M magneto-

dynamic cartridge which is suitable for CD4 records. The RH832 is the finest example of Philips' intensive development programme which provides quality high fidelity equipment for the connoisseur. It can be said to have built-out obsolescence in that it will take new developments in its stride. The RH832 is the new standard for high fidelity equipment, a combination worthy of closer inspection.

#### Features:

##### Tuner

The Hi-Fi tuner with LW, MW, SW and VHF wavebands is fully equipped for stereo FM and four channel (SQ) FM transmissions.

FM tuning is by electronic touch controls for six pre-set stations.

Switchable automatic frequency control prevents tuning drift on FM.

Switchable silent tuning reduces inter-station noise when tuning on FM.

An FM stereo muting switch reduces noise on weak stereo signals.

Visible tuner function controls include AM/FM tuning and FM frequency indicator and automatic FM stereo decoder with indicator.

##### Pre-Amplifier

The Hi-Fi pre-amplifier handles mono, stereo, double stereo and 4 channel reproduction and illuminated indicators show the operation mode. Slide potentiometers control volume, left/right balance, front/rear balance and bass and treble.



A contour control switch gives 2 degrees of "physiological compensation" so that music can be played at a low volume without apparent loss of quality.

Four power meters provide indication of output per channel.

Microphone/headphone sockets and switch are conveniently concealed behind a sprung flap at the front of the unit.

Connections are provided for two channel recorder (Stereo or SQ) and four channel recorder (for discrete 4 channel reproduction).

Two DIN output sockets each with 2 x 1 volt output signal cater for RH 532 Motional Feedback (MFB) loudspeakers.

Output can be mono, stereo, double stereo or 4 channel and it is possible to connect up to fifteen MFB speakers per channel!

### Record Deck

The RH 832 includes a Hi-Fi two speed electronically controlled record deck.

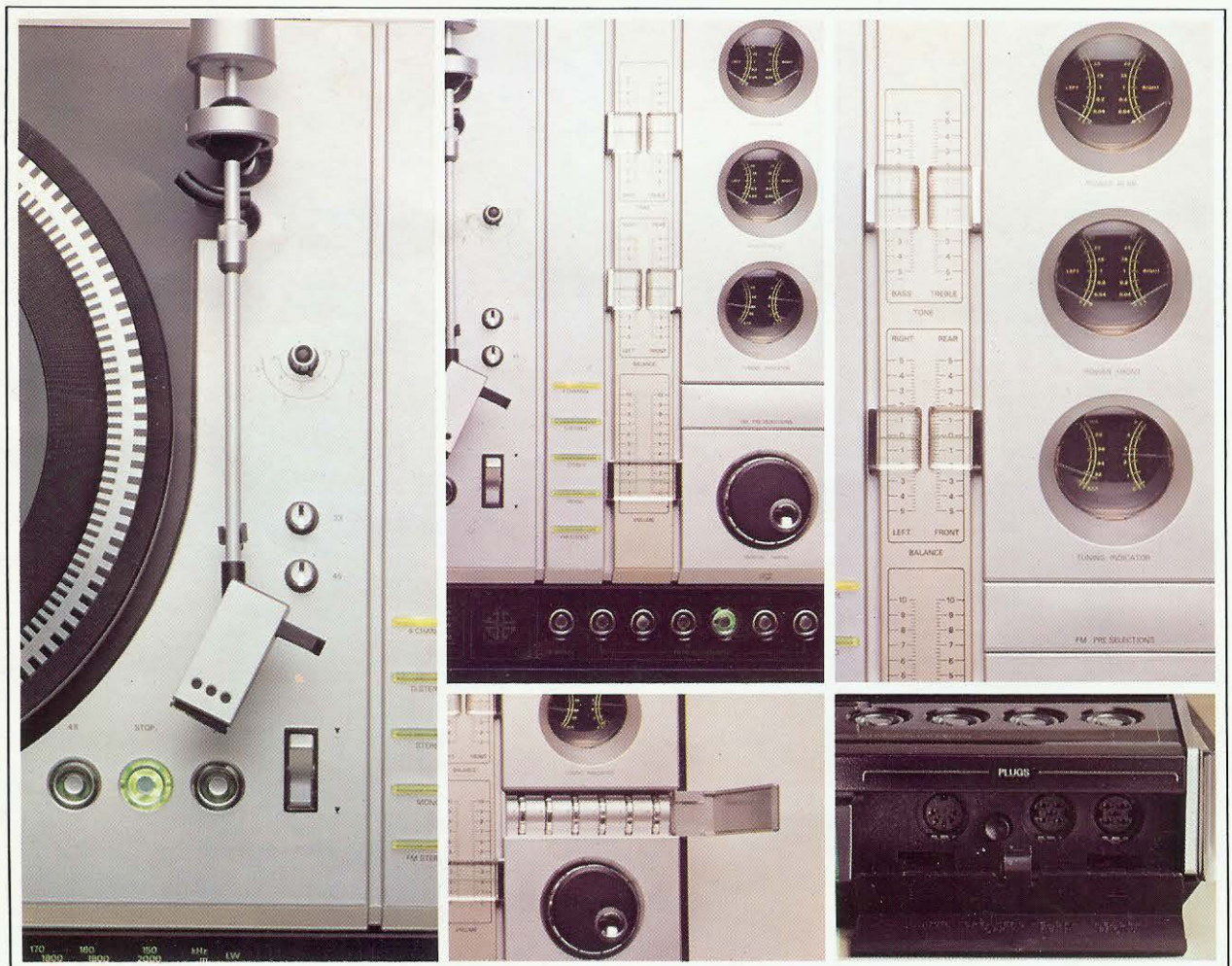
The three electronic touch controls are for 45, 33 rpm or Stop.

The unit has a photo electric off switch.

The pick-up lift is hydraulically damped for gentle, accurate cueing.

Side thrust compensation is adjustable (for both conical and elliptical styli).

GP 422 four channel cartridge.



# specification

## RH832 TUNER SECTION

**Wave ranges:** LW: 150-345kHz (2000-870m); MW: 520-1605kHz (577-187m); SW: 5.95-9.78MHz (50.4-30.7m); FM: 87.5-104MHz. **Aerials:** IEC input sockets for FM dipole aerial (300 Ohms balanced) and AM aerial/earth plus 75 Ohms coaxial FM aerial input. **Sensitivity:** On AM: 90µV EMF for 26dB signal/noise ratio; On FM: 2µV terminal voltage, measured for 26dB S/N at 40kHz deviation across 300 Ohms. **Selectivity:** On AM: 80× for 9kHz off resonance; On FM: 300× for 300kHz off resonance; **FM performance. Distortion:** ≤ 0.8% at 75kHz deviation. **Pilot suppression:** -35dB at 19 and 38kHz. **Crosstalk:** -45dB at 1000Hz.

## PRE-AMPLIFIER SECTION

**Output voltage:** 1V line output per channel; 240mV for 8 Ohm headphones. **Distortion:**  $D \leq 0.1\%$  for 1V output voltage. **Frequency response:** 15-30,000Hz, linear +0.5-3dB. **Signal to noise ratio:** Better than -70dB (with respect to 1V output voltage). **Crosstalk (in 4-channel mode, discrete):** Better than -45dB at 1000Hz; Better than -35dB between 250-10,000Hz. **Balance control:** From 0 to max. per channel. **Tone controls: Bass:** from +15 to -15dB at 50Hz. **Treble:** from +12 to -15dB at 10,000Hz. **Contour control:** Contour 1: +7dB at 50Hz and +3dB at 10,000Hz. Contour 2: +14dB at 50Hz and +6dB at 10,000Hz. **Inputs:** DIN sockets for: 2-channel recorder; 4-channel recorder or CD4 demodulator; Microphone (at the front). **Input sensitivity:** (For 1V per channel 1000Hz) Recorder 250mV at 100k Ω; Microphone 1.5mV at 10k Ω. **Outputs:** DIN sockets for: 2 × 2 MFB boxes (or power amplifier); CD4 demodulator (pick-up Output); Headphones (4-channel) (at the front). **Output impedance:** 100 Ohm for line output; 8-600 Ohm for headphones.

## RECORD PLAYER (GC012)

**Turntable speeds:** 33 $\frac{1}{3}$  and 45 r.p.m. **Wow and flutter:** ≤ 0.1%. **Rumble:** ≤ -40dB (DIN A); ≤ -62dB (DIN B). **Stylus pressure:** 0.75-4g adjustable. **Pick-up cartridge:** GP 422, suitable for 4-channel discrete reproduction.

## GENERAL

**Semiconductors:** 4 IC's, 109 transistors and 16 diodes. **Lamps:** 10 touch control, 4 dial and 8 indicator lamps. **Mains Supply:** 110, 127, 220, and 240V AC 50 or 60Hz. **Power consumption:** 32 Watt. **Dial:** Linear, prism illuminated. **Pointer stroke:** 275mm approx. (11"). **Cabinet:** Metal, with silver finish top-deck and black front. **Dimensions:** 590 × 146 × 432mm (23 $\frac{1}{4}$ " × 5 $\frac{3}{4}$ " × 17 $\frac{1}{4}$ "). **Weight:** 14Kg (31lbs). **Loudspeaker enclosures:** 2 × RH532 MFB.

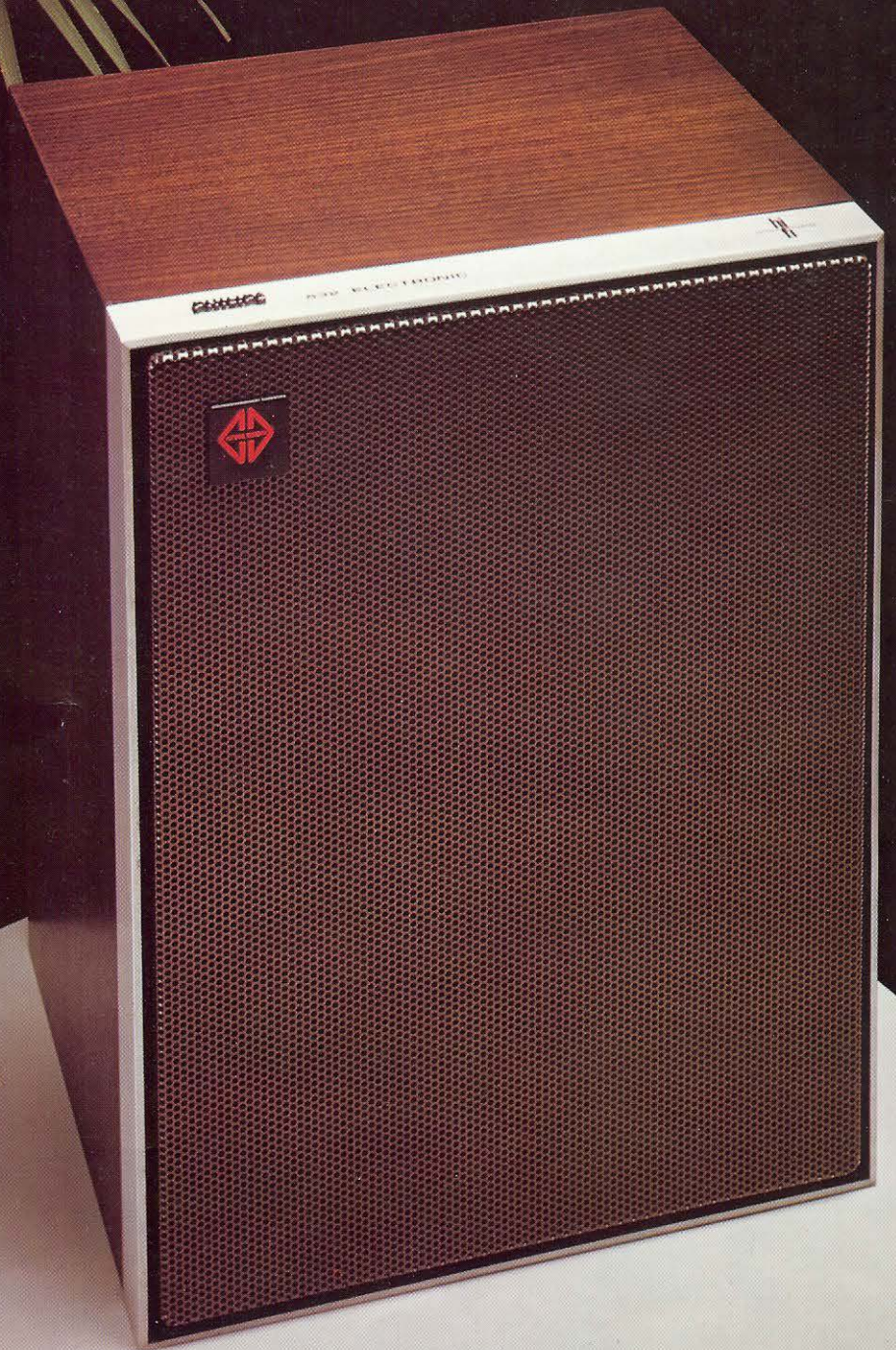


# RH532

The motional feedback loudspeaker is an entirely new concept in top quality loudspeaker design. This remarkable development overcomes the restrictions imposed by the original 1920's design of loudspeaker which has continued largely unchallenged in basic

style until now.

Philips MFB speakers use modern day electronics to reproduce undistorted sound. In solving the main problem associated with loudspeakers Philips have also overcome the ever increasing disadvantage of



bulky enclosures. Reproducing bass tones without distortion has always been the most serious problem for loudspeaker designers, as translating large amounts of electrical power into air pressure variations without distortion requires very large loudspeakers mounted in very bulky cabinets. This produces enclosures that are too large for domestic use. The answer lies in eliminating any unwanted influence from either the enclosure or from the bass loudspeaker cone – which is precisely what the Philips motional feedback system does. A piezo-electric sensing device on the speaker diaphragm vibrates together with the speaker. The electrical signal it generates is instantly fed back and compared with the original signal. Any difference, and corrective action is immediately taken. The cone is therefore almost *incapable* of distorting the sound. The result, amazingly faithful reproduction of frequencies from 35 Hz to 20,000 Hz and, because each enclosure contains its own power amplifier, an output as great as 60 watts can be achieved from a cabinet only 15 litres (0.5 cu.ft) in volume. As an amplifier, it lets you upgrade the power output of your existing system, or it can be used simply with pre-amplifier units such as the Philips RH832 or RH551. The MFB speaker is an exciting development which points Hi-Fi in a new direction.

**Features: RH532**

The enclosure despite its 15 litre (0.5 cu.ft) volume can out perform speakers four times its size. The RH532 is small enough to fit easily into a

modestly sized room and yet powerful enough to suit a concert hall.

The enclosure comprises two compartments: A sealed one of 9 litres ( $\frac{1}{3}$  cu.ft) which contains a woofer, sealed mid range unit and a tweeter for full coverage of the 35 to 20,000 Hz. range of frequencies. The other compartment with easy access at the rear contains automatic sensing and switching devices plus two amplifiers, one giving 20 watts R.M.S. through the squawker and tweeter and the other giving an output of 40 watts R.M.S. through the low note woofer. Total output is therefore 60 watts R.M.S.

Up to eight enclosures can be linked to each channel of a power amplifier to give a total power output of 960 watts stereo or 1,920 watts quadrophonic.

Up to fifteen enclosures per channel can be connected to a pre-amplifier unit for a total output of 1,800 watts stereo or 3,600 watts quadrophonic.

Each unit is provided with a mains on/off switch, but power is automatically switched to "standby" if no audio signal is received for two to three minutes. The enclosure is then automatically switched on again immediately an audio signal appears. Each enclosure is a powerful amplifier in its own right so it either lets you upgrade an existing system or can be used simply with a pre-amplifier unit such as the Philips RH 832 or RH 551. Alternatively, it may be used for multi room applications as in hotels or hospitals.



# RH541

## Features: RH541

The volume of the enclosure is only 8 litres including amplifier. An integrated power amplifier provides 30 watts (continuous rating).

Separate bass and treble speakers give full coverage of 35 to 20,000 Hz range of frequencies.

Choice of three input sensitivities allows optimum matching with almost any pre or power amplifier. In addition to the mains on/off switch, each unit is provided with automatic switch-over to "standby" if no signal is received for two to three minutes.



## RH532 MOTIONAL FEEDBACK LOUDSPEAKER ENCLOSURE.

### AMPLIFIER SECTION

**Power output:** Bass amp: 40W r.m.s.; Mid/Treble amp: 20W r.m.s. **Distortion:** Bass amp:  $\leq 0.1\%$  at 30W; Mid/Treble amp:  $\leq 0.1\%$  at 15W. **Frequency response:** Bass amp: 5-2000Hz + 0.5dB - 3dB. Mid/Treble amp: 500-60,000Hz + 0.5dB - 3dB. **Power bandwidth:** Bass amp: 10-3,000Hz. Mid/Treble amp: 100-50,000Hz. **Filters (non-switchable):** High pass electronic filter to suppress any low-frequency interfering signals, -12dB/octave below 35Hz. Electronic crossover filter at 500Hz at input of bass and mid/treble amplifiers. Passive crossover filter at 3,500Hz to feed mid-range and treble drive units. **Electronic On/Off switch:** Rise time:  $\leq 1$  sec at input level of  $\geq 1.5$ mV. Fall-off time:  $\geq 2$  min. **Signal input socket (5-pin 180° DIN):** 3-position input sensitivity switch. **Pos. 1:** 1V into 3k  $\Omega$  (input from suitable pre-amplifier). **Pos. 2:** 7.5V into 25  $\Omega$  (input from loudspeaker sockets of amplifier with output  $\leq 14$  Watts r.m.s.). **Pos. 3:** 19V into 25  $\Omega$  (input from loudspeaker sockets of amplifier with output  $\geq 14$  Watts r.m.s.). **Signal output socket (5-pin 180° DIN):** Connected in parallel with input socket to feed additional MFB loudspeaker(s) (supplies left and right channel signals). **Channel selection:** 2-position switch to select left or right channel reproduction.

### LOUDSPEAKER SECTION

**Frequency response:** 35-20,000Hz. **Drive units:** 8" bass (with motional feedback); 5" mid-range; 1" treble. **Internal acoustic volume:** 9 litres (0.32cu.ft).

### GENERAL

**Mains Supply:** 110, 127, 220, 240V 50 or 60Hz AC only, 150W.

**Dimensions:** 380 x 283 x 220mm (15" x 11 1/8" x 8 3/4").

**Weight:** 11 1/2 Kg (25 1/2 lbs).

# specifications

## RH541 MOTIONAL FEEDBACK LOUDSPEAKER ENCLOSURE.

### AMPLIFIER SECTION

**Power Output:** 30W r.m.s.  $\pm 1$ dB; 40W Music Power. **Distortion (Harmonic):**  $\leq 1\%$  @ 30W;  $\leq 0.1\%$  @ 20W. **Cross Over Frequency:** 1400Hz. **Input Sensitivity:** 1V/10k  $\Omega$  (for pre-amplifier). **(3 Position Switch):** 7.5V/100 ohm (for power amp  $\leq 14$ W/4 ohm); 19V/100 ohm (for power amp  $\geq 14$ W/4 ohm). **Electronic On/Off Switch:** Rise time:  $\leq 1$  sec. with input signal  $\geq 1.5$ mV. Fall off time  $\geq 2$  minutes. **On/Off switch.** Left/Right switch. 3-position input sensitivity switch. 5-pin DIN input socket. 5-pin DIN output socket. Captive mains lead. Mains voltage adjuster.

### LOUDSPEAKER SECTION

**Frequency Response:** 35-20,000Hz (DIN). **Drive Units:** 7" for bass notes (with motional feedback); 1" dome for treble notes. **Volume:** 8 litres (.28cu.ft.) (4.5 litres acoustic).

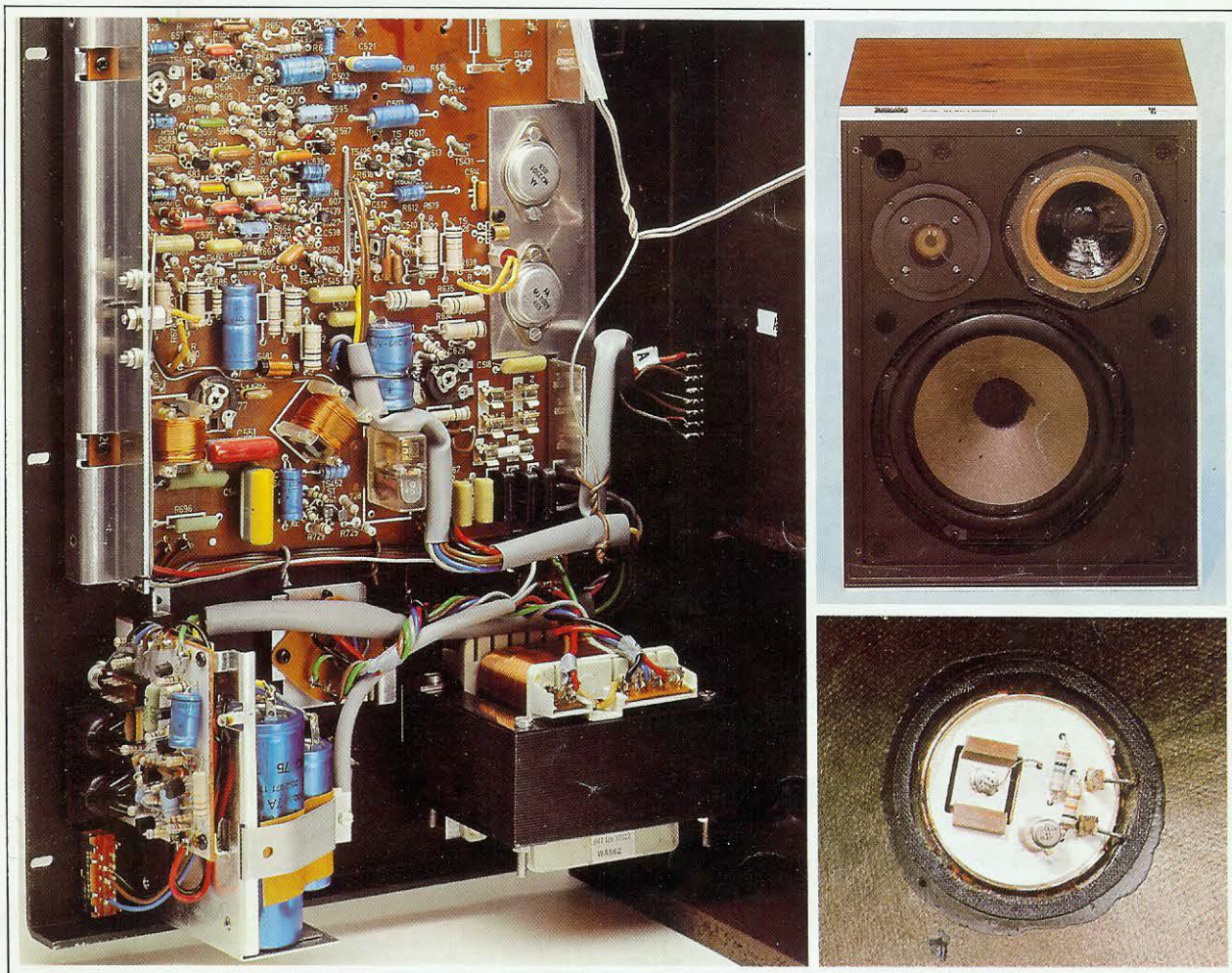
### GENERAL

**Mains Supply:** 110, 127, 220, 240 AC, 50 or 60Hz @ 65W max.

**Dimensions:** 229 x 294 x 184mm (9" x 11 3/4" x 7 1/4").

**Weight:** 6.8Kg (15lbs).

RH532 power amplifiers on rear panel, disposition of drive units and Motional Feedback sensor.



RH551



The RH 551, pre-amplifier/control unit has been specifically designed to complement the Philips motional feedback loudspeaker systems. It is a versatile and comprehensively designed unit which easily surpasses the DIN 45 500 Standard for high fidelity sound equipment. Its versatility is apparent in its ability to allow you to personally create the required sound output characteristic. Its extensive filter controls and six inputs including two tape inputs plus sliding potentiometers for smooth control of balance, bass, treble and presence put you very much in control of the resulting sound.

#### Features

4 Position 'contour' switch together with a double-tapped volume control gives six degrees of 'physiological compensation'. This enables the output response curve to be finely adjusted and low level background music played without apparent loss of quality. Six programme sources are provided for by input sockets that include two recorder inputs. Precise control of unwanted noise is made possible by the inclusion of scratch and rumble filter switches. Slider controls are for adjustment of balance, bass, treble and presence, and the large rotary control is coupled to calibrated illuminated output meters for precise setting of the volume level. Microphone and Headphone sockets are conveniently placed at the front and are easily accessible behind a sprung flap. Smartly styled in black ash and matt aluminium with matching etched polystyrene end caps.

## specification

#### RH551

**Outputs:** Line: 1V per channel @ 1,000Hz (5 pin 180° DIN socket) (impedance  $\geq 1,000$  Ohm). **Headphones:** 250mV/8 ohms (5 pin 360° DIN socket) (will accept 8-600 Ohm 'phones).

**Tape:** 2mV/20k  $\Omega$ . **Distortion:** (for  $2 \times 1V$  output. **Harmonic:**  $\leq 0.1\%$ . **Intermodulation:**  $\leq 0.1\%$  (250-8000Hz, 4:1).

**Frequency Response:** 20-20,000Hz  $\pm 0.5$ , -1dB. **Signal/Noise Ratio:**  $\geq -70$ dB (w.r.t.  $2 \times 1V$  output). **Crosstalk:**  $\geq -45$ dB @ 1,000Hz;  $\geq -30$ dB from 250-10,000Hz. **Rumble Filter:**

Switchable: 12dB/octave; -3dB @ 80Hz. **Scratch Filter:** Switchable: +12dB/octave; -3dB @ 7,000Hz. **Bass Control:**

+14, -14dB @ 50Hz. **Treble Control:** +14, -16dB @ 10,000Hz. **Presence Control:** +6, -6dB @ 2,000Hz. **Contour Filter** (4 position rotary switch). (Volume control potentiometer has two taps at -24 and -43dB). POS. 0: off. POS. 1: +4 and

+10dB @ 50Hz; +3 and +5dB @ 10,000Hz. POS. 2: +6 and +15dB @ 50Hz; +4 and +7dB @ 10,000Hz. POS. 3: +10 and +20dB @ 50Hz; +5 and +9dB @ 10,000Hz. **Inputs:** (5 pin 180° DIN sockets): 1. Magnetic pick-up: 2mV/50k  $\Omega$ ; 2. Tuner:

100mV/100k  $\Omega$ ; 3. Monitor: 250mV/100k  $\Omega$ ; 4. Microphone: 1mV/2k  $\Omega$ ; 5. Recorder 1: 250mV/100k  $\Omega$ ; 6. Recorder 2: 250mV/100k  $\Omega$ . Tape output coupled with recorder 1 socket = 2mV/20k  $\Omega$ .

**GENERAL**

**Mains Supply:** 110, 127, 220 or 240V AC, 50 or 60Hz @ 12W max.

**Dimensions:** 473 x 120 x 300mm (18½" x 4¾" x 11¾")

**Weight:** 6.7kg (15lbs).



# RH831

The **RH831** is a top quality instrument comprising a powerful amplifier, a tuner and a cassette deck which features the DOLBY\* noise reduction system. This impressively specified item is designed to match the other high quality pieces of musical equipment contained within this brochure. The cassette section has facilities for playing all types of cassettes currently available ranging from standard  $Fe_2O_3$  to DIN standard Chromium Dioxide. A sensing device detects which type of cassette has been inserted and automatically switches to the correct playing mode. There is visual indication when chromium dioxide tapes are being played. The amplifier delivers  $2 \times 25$  watts R.M.S. with harmonic distortion less than 1%. The unit contains "STEREO 4" facilities as described below, plus a highly sensitive and selective Hi-Fi tuner. The FM wave band has five pre-set selectors as well as manual tuning. There is an automatic FM stereo decoder,

indicator and F.M. pre-set indicator. Switchable automatic frequency control is also included. The RH831 offers a wealth of features and forms an ideal system together with the GA209 and RH427 loudspeakers shown in the illustrations.

## Features: Cassette Section

The Hi-Fi cassette recording deck offers DIN Hi-Fi performance when used with chromium dioxide cassettes. There is a DOLBY\* noise reduction system and an "on" light indicates when the DOLBY\* circuit is in use. An indicator light also shows when chromium dioxide tapes are in use and these or standard  $Fe_2O_3$  cassettes may be used, there being an automatic switch over when mixed types are in use. The recording level is set by a switchable automatic control or a VU meter with manual control. A three digit tape counter, with automatic switch off at zero, simplifies selection of tracks.



### Amplifier Section

The Hi-Fi amplifier delivers  $2 \times 25$  watts R.M.S. into 4 ohms. Harmonic distortion is less than 1%, the frequency response range is from 20 to 20,000 Hz  $\pm 1$ db. STEREO 4 circuitry allows for two pairs of loudspeaker enclosures for luxurious "surround sound" from stereo records or the facility for stereo in either of two separate rooms. The volume, balance, bass and treble controls are precise sliding potentiometers. A switchable contour control ensures good quality listening even at low volume settings. There is a headphone socket conveniently placed at the front which is concealed by the sprung flap. There is electronic short circuit protection.

### Tuner Section

The Hi-Fi tuner is highly sensitive and selective. There are selector buttons for long wave, medium wave, short wave (30.7 to 50.4 metre band) and VHF/FM. There is an automatic stereo decoder and FM stereo indicator. Variable capacitance diode tuning allows instant selection of FM stations, by use of the five pre set selectors. There is a combined AM/FM tuning meter, a large clear tuning scale and fly wheel tuning on manual to simplify station selection. There is silent tuning on FM and switchable automatic frequency control for stable reception on FM.

Sockets are provided for magnetic P.U., tape, Aux/Ceramic P.U./Mic, headphones and front and rear loudspeakers. A co-axial socket together with the usual I.E.C. sockets cater for aerial inputs.

# specification

### RH831 AMPLIFIER SECTION

**Power Output:**  $2 \times 25$ W into 4 ohms;  $2 \times 35$ W Music Power.  
**Harmonic Distortion:**  $\leq 1\%$  for  $2 \times 25$ W +1dB. **Intermodulation Distortion:**  $\leq 1\%$  250-8000Hz (4:1). **Frequency Response:** 15-30,000Hz +1dB-3dB; 20-20,000Hz  $\pm 1$ dB. **Power Bandwidth:** 20-30,000Hz (at -3dB points). **Signal to noise ratio:**  $\geq -58$ dB w.r.t.  $2 \times 25$ W. **Crosstalk:**  $\geq -40$ dB at 1KHz;  $\geq -30$ dB between 250-10,000Hz. **Tone Controls: Bass:**  $\pm 14$ dB at 50Hz. **Treble:**  $\pm 12$ dB-15dB at 10KHz. **Contour (Switchable):** +8dB at 50Hz; +4dB at 10KHz. **Input Sockets:** (5-pin 180° DIN). **Tape IN/OUT:** Input 180mV into 100k  $\Omega$ ; Output 2mV into 20k  $\Omega$ . **Mag. P.U.:** 1.5mV into 50k  $\Omega$ . **Aux/Cer. P.U./Mic:** 100mV into 1 M  $\Omega$ ; 1mV into 10k  $\Omega$ . **Output Sockets:** Loudspeakers:  $2 \times 2$  pin DIN (System 1)  $2 \times 2$  pin DIN (System 2 & "Stereo-4"). **Headphones:** 5-pin 360° DIN; 2V into 600  $\Omega$ ; 550mV into 8  $\Omega$ .

### TUNER SECTION

**Wavebands:** LW: 150-345kHz (2000-870m); MW: 520-1605kHz (577-187m); SW: 5.95-9.78 MHz (50.4-30.7m); FM: 87.5-104MHz with automatic stereo decoder and switchable AFC. **Sensitivity:** AM: 90 $\mu$ V EMF for 26dB signal to noise ratio; FM: Terminal voltage at 40kHz deviation for 26dB signal to noise ratio: 2 $\mu$ V at 300  $\Omega$ ; 1 $\mu$ V at 75  $\Omega$ . **Selectivity:** AM: 80  $\times$  for 9kHz off resonance; FM: 300  $\times$  for 300kHz off resonance. **Distortion:** FM:  $\leq 0.8\%$  at 75kHz deviation. **Crosstalk:**  $\geq -40$ dB at 1kHz. **Pilot Suppression:**  $\geq -40$ dB at 19 and 38kHz. **Aerials:** I.E.C. input sockets for FM dipole (300  $\Omega$ ) & AM Aerial/earth; Coax socket for FM dipole (75  $\Omega$ ); Wire aerial for FM/SW.

### CASSETTE PLAYING SECTION

**Tape Speed:** 4.76cm/sec (1  $\frac{7}{8}$  in/sec). **Wow & Flutter:**  $\leq \pm 0.2\%$   
**Signal to Noise Ratio:**  $\geq 48$ dB for CRO tape;  $\geq 45$ dB for Fe<sub>2</sub>O<sub>3</sub> tape; 10dB improvement with DOLBY\* noise reduction circuit.

### GENERAL

**Mains Supply:** 110, 127, 220, 240V 50 or 60Hz AC only 140W.  
**Dimensions:** 603  $\times$  330  $\times$  125mm (23  $\frac{3}{4}$   $\times$  13"  $\times$  5") (plus 40mm (1  $\frac{5}{8}$ " depth for plugs on rear). **Weight:** 13  $\frac{1}{2}$  Kg (29  $\frac{3}{4}$  lbs).



GA209



The elegantly simple GA 209 record deck has been designed around a simple belief that people who buy records wish to preserve them. By making the GA 209 fully automatic the human element is practically eliminated as is the risk of accidental damage to your records.

Once the mains switch has been pushed it is possible to play for hours one record after another without the necessity even to start the record player another time. Place a standard 7", 10" or 12" record on the turntable and leave it to the GA 209! It automatically starts rotating, automatically selects the correct speed and automatically moves the stylus to the run in groove of the record. It automatically stops at the end of the record and finally automatically moves the pick-up arm back to its rest position. Even the mains switch has an automatic feature. If, by mistake, the mains button is switched off during the automatic stop cycle, the mains is only disconnected after the pick-up arm has come back to its rest position.

However if you like to feel that you are in control slide open the semi-transparent cover and the recessed manual operating centre becomes visible and ready for your direction.

The word MANUAL is illuminated. Three push buttons select either 33 $\frac{1}{3}$ , 45 rpm or STOP and rotary controls provide fine speed and side thrust compensation adjustment. Illuminated touch-sensitive controls in conjunction with a DC motor allow damped pick-up lifting and lowering.

The GA 209 is fully automatic for those who want it to be. Switch it to manual and you take over!

#### Features

Five automatic functions controlled by electronics: As the record is placed on the turntable, sensors detect its presence and diameter, and automatically set the turntable rotating (1) at the correct speed (2). The pick-up arm (actuated by a SERVO motor) moves across and lowers onto the record (3). At the end of the record it returns to rest (4) and the turntable stops (5).

The new system of electronic speed control with tacho generator and frequency discriminator means that speed accuracy is very high and wow or flutter are practically non-existent.

The 294mm (11 $\frac{5}{8}$ " ) dia turntable is provided with stroboscopic rings on the turntable mat for accurate speed adjustment.

Turntable and pick-up arm have been mounted on a free floating sub-chassis, a construction that in combination with a belt drive system virtually eliminates rumble.

Pick-up arm friction is also very low so that perfect tracking is possible at a very low stylus force. Stylus force adjustment is simple by means of an integrated measuring instrument that allows a direct reading of the stylus force each time the arm returns to rest. The damped lift/lower mechanism for the pick-up arm, responding to electronic "touch" controls, is driven by a separate motor so that this player has been equipped with three motors in total; one for



driving the turntable, one for the automatic lateral movements of the tone arm and one for the manual lift/lower mechanism.

The low mass aluminium pick-up arm is ready fitted with the GP 412 magnetic cartridge with bi-radial stylus. In this stereo pick-up the moving mass is very low due to the application of new magnetic materials. In spite of this it has a high sensitivity well above 1.2 mV/cm/sec. Its bi-radial diamond stylus is precision ground. Moreover the wide frequency range, resonance damping and extremely low intermodulation distortion make it an ideal cartridge for brilliant high fidelity reproduction. The pick-up arm, and sliding counterbalance weight, together with the direct-reading stylus force gauge provide easy and accurate adjustment of the playing weight. The pick-up arm may be locked in position on its rest, by operating a small lever at its base. A pop-up 45 rpm large spindle adapter is fitted into the turntable, and may be raised or lowered as required. The plinth is finished in black and matt finished aluminium and has a hinged, friction-damped, tinted acrylic cover.

# specification

## GA 209

**Wow & Flutter:**  $\leq 0.08\%$ . **Rumble:**  $\leq -43\text{dB}$  (DIN A);  $\leq -65\text{dB}$  (DIN B). **Tracking Error:**  $0^\circ 10'$ /cm. **Arm Friction:**  $\leq 10\text{mg}$  Force horizontal and vertical; **Side Thrust Compensation:** Tension spring principle. Adjustable for spherical and elliptical styli. **Stylus force:** 0.75-3g adjustable, calibrated. **Turntable Speeds:**  $33\frac{1}{3}$ , 45 rpm; Belt driven. **Speed Adjustment Range:**  $\pm 3\%$ . **Turntable Diameter:** 294mm ( $11\frac{5}{8}"$ ). **Turntable Weight:** 1.17Kg (2.56lbs). **Turntable Motor:** DC, combined with Tacho-Generator and Electronic Speed Control. **Headshell:** Slide-in carrier for standard  $\frac{1}{2}"$  fixing cartridges. **Cartridge:** GP 412 Magnetic, with diamond elliptical L/P stylus. **Signal Output:** 1.2mV/cm/sec. **Controls:** Mains on/off; PU Lift & PU Lower illuminated touch-sensitive controls; Automatic/Manual Play (sliding cover);  $33\frac{1}{3}$ , 45, Stop: Push Buttons;  $33\frac{1}{3}$ , 45: Fine speed controls; Side-Thrust compensation; Stylus force. **Servo Motors:** 2  $\times$  DC motors for automatic and manual movement of PU arm.

## GENERAL

**Mains Supply:** 110, 127, 220, 240V 50 or 60Hz AC only. 10W. **Dimensions:** 445  $\times$  340  $\times$  165mm ( $17\frac{1}{2}" \times 13\frac{3}{8}" \times 6\frac{1}{2}"$ ); 380mm ( $15"$ ) height with lid open. **Weight:** 9Kg (19 $\frac{1}{2}$ lbs).



# accessories

**THE N6302 HEADSET** has been specially designed by Philips for Hi-Fi enthusiasts who seek the ultimate in sound perfection.

Equipped with a stereo sound dimension control, these headphones let you adjust the stereo effect exactly to your own taste. They ensure crystal-clear reproduction of every sound the recording engineers meant you to hear.

The 5-pole 360° DIN plug can be inserted in a suitable socket in two different ways. Inserting it one way will mute the loudspeakers during playback. Inserting it after turning the plug 180° will allow the loudspeakers to continue playing.

#### Technical data

**Frequency response:** 16-20,000 Hz.

**Impedance:**  $2 \times 600$  ohms. **Sensitivity:** 112dB at 1mW.

**Nominal power input:**  $2 \times 1$ mW. **Maximum power input:**

$2 \times 20$ mW. **Weight:** 450gm.

Connecting cord:  $6\frac{1}{2}$  ft curled.

\*For connection to a 240° DIN headphone socket an adapter is available under code number 4822 263 50054.

\*Available only from Combined Electronic Services, 604 Purley Way, Waddon, Croydon CR9 4DR

#### MAGNETO DYNAMIC PICK-UP HEADS

The signal from the pick-up cartridge plays a major role in determining the sound quality of a HiFi system. So we designed a range of cartridges that would seek out every nuance of sound in the groove, give a relatively high output with an absolute minimum of interference between one stereo channel and another, and at the same time protect records from wear by operating at a very low tracking force.

This was achieved by reducing the moving mass of the cartridge and producing a high output signal by means of a specially developed magnet of high-energy material. High sensitivity gives a high signal level compared with the background noise inherent in any electronic system i.e. a high signal to noise ratio, giving clean crisp sound reproduction.

The next task was to produce a frequency response as wide as that of the disc cutter with no accentuation of either high or low notes. This was achieved by a highly compliant suspension and rigidly controlled manufacturing tolerances – in spite of the microscopic dimensions required to keep the moving mass low. The result is that no distortion, or colouration, is added to the signal by the cartridge.

Finally, the effects of elastic and plastic record deformation have been reduced to a minimum by the extreme flexibility and low tracking force of the stylus, thus reducing to a minimum tracing distortion which results from the inability of the stylus to maintain contact with the groove walls.

#### GP400 SUPER M PICKUP CARTRIDGE

**Type:** Stereo magnetic  $\frac{1}{2}$ " fixing. **Stylus:**  $.7 \times 18 \mu\text{m}$  diamond profiled for Super Sonic Tracking. **Compliance:**  $32 \times 10^{-6}$  cm/dyne. **Separation:**  $\geq 25$  dB at 1 KHz. **Sensitivity:** 0.7 mV/cm/sec at 1 KHz. **Stylus pressure:** 0.75–1.5 gms. **Weight:** 6.9 gms.

#### GP401 SUPER M PICKUP CARTRIDGE

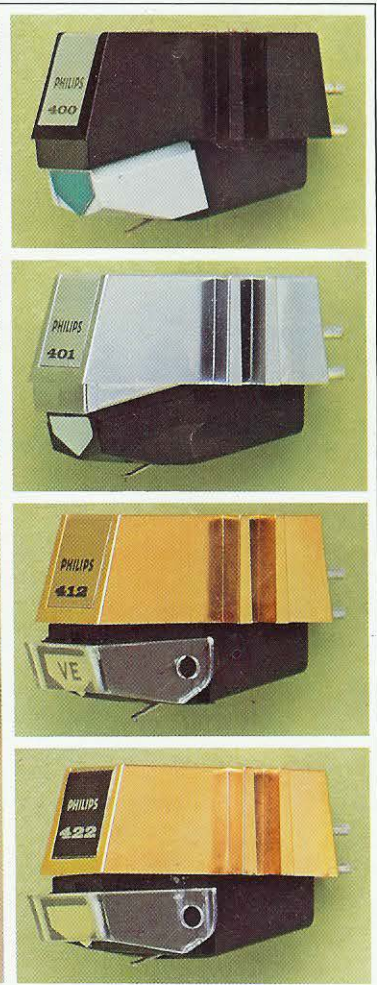
**Type:** Stereo magnetic  $\frac{1}{2}$ " fixing. **Stylus:**  $7 \times 18 \mu\text{m}$  diamond (elliptical). **Compliance:**  $\geq 20$  mm/N lateral.  $\geq 16$  mm—N vertical. **Separation:**  $\geq 24$  dB. **Sensitivity:** 1.2 mV/cm/sec at 1 KHz. **Stylus pressure:** 1.5–3 gms. **Weight:** 7 gms.

#### GP412 SUPER M PICKUP CARTRIDGE

**Type:** Stereo magnetic  $\frac{1}{2}$ " fixing. **Stylus:**  $7 \times 18 \mu\text{m}$  diamond (elliptical). **Compliance:**  $\geq 30$  mm/N lateral.  $\geq 20$  mm/N vertical. **Separation:**  $\geq 25$  dB at 1 KHz. **Sensitivity:** 1.2 mV/cm/sec at 1 KHz. **Stylus pressure:** 0.75–1.5 gms. **Weight:** 7 gms.

#### GP422 SUPER M PICKUP CARTRIDGE

**Type:** Stereo magnetic  $\frac{1}{2}$ " fixing. **Stylus:**  $.7 \times 18 \mu\text{m}$  diamond profiled for Super Sonic Tracking. **Compliance:**  $32 \times 10^{-6}$  cm/dyne. **Separation:**  $\geq 25$  dB at 1 KHz. **Sensitivity:** 0.7 mV/cm/sec at 1 KHz. **Stylus pressure:** 0.75–1.5 gms. **Weight:** 6.9 gms.





Clothes by Yves Saint Laurent.  
Furniture by Waring and Gillow, Albrizzi Ltd.

# PHILIPS

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