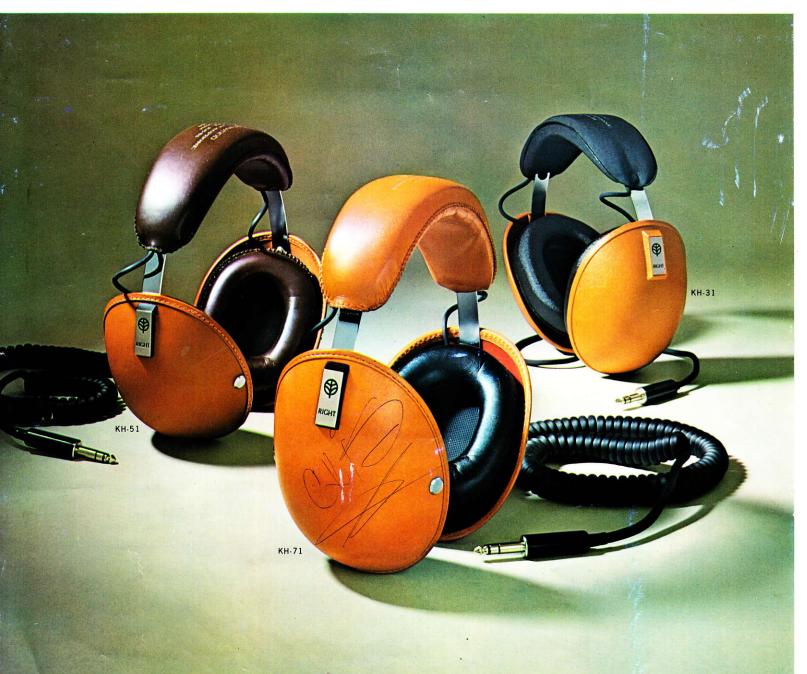
KENWOOD STEREO HEADPHONES



Some stereo headphones take all the pleasure out of Hi-Fi listening. But KENWOOD's three new stereo phones — KH-71, KH-51 and KH-31 — make stereo listening an absolute joy. That's because KENWOOD's engineers have provided phones which accurately transmit natural sound quality in all its marvelous dimensions. They fit comfortably — snug but not tight — and are ready-made for hours and hours of enjoyment. Listen with KENWOOD's KH-71, KH-51 or KH-31. The pleasure all yours.

the sound approach to quality



KENWOOD OPEN AIR TYPE STEREO HEADPHONES KH-71/51/31

SPECIAL FEATURES

1. Exclusive "Opened Back" System

In order to increase bass reproduction, conventional headphones completely seal the inner space from outside. The ear cushions, therefore, must be pressed to the head while listening, which brings fatigue instead of the pleasure. KENWOOD, who consider the phones as an independent member of the hi-fi system, now present quite new, really human like KH series headphones. KENWOOD's original "opened back" system (see the drawing below) achieves true hi-fi enjoyments. Lengthy periods of listening produce no fatigue or discomfort. Also if desired, it is possible to converse quite naturally while wearing these phones.

2. Special Speaker Unit

The specially developed speaker unit employed in the KH headphones has ultra low f_0 so that it can naturally reproduce the heavy bass sound. Its "opened back" system is the result of this unit.

3. Beautiful & Rational Design

Having no needless accessories, the KH series headphones are lighter than most other phones. Thanks to their easy—to— wear outside design they can fit anybody. The beautifully finished outside will enhance the listening pleasure. Now the KH series should rather be called the second speaker system, not subsidiary instruments.

SPECIFICATIONS

	IMPEDANCE	FREQUENCY RESPONSE	MAXIMUM INPUT	SPEAKER UNIT	CORD	WEIGHT (without cord)
KH-71	Ω8	20 ∼ 20,000 Hz	0.5 WATTS	3"	3 m Cloth Cord (10 ft)	1.0 lbs (460 g)
KH-51	8 Ω	20 ∼ 20,000 Hz	0.5 WATTS	3"	2 m Vinyl Cord (6.5 ft)	0.97 lbs (440 g)
KH-31	8 Ω	20 ∼ 20,000 Hz	0.5 WATTS	3"	1.8 m Vinyl Cord (6 ft)	0.92 lbs (420 g)



KENWOOD ELECTRONICS, INC.

15777 South Broadway, Gardena, California 90248 72-02 51 st Avenue, Woodside, N.Y. 11377

TRIO-KENWOOD ELECTRONICS, S. A. 482 Chaussee de Haren 1800 Vilvoorde Belgium. 6056 Heusenstamm Am Goldberg 5 West Germany

TRIO ELECTRONICS, INC.

6.5. 1 CHOME, SHIBUYA, SHIBUYA, KU, TOKYO, JAPAN

SANSUISS35

STEREO MONITOR HEADPHONES



Sansui's SS-35s are designed with an eye (and an ear) for high quality "personal" sound reproduction and lightweight comfort. Here is a high-performance high fidelity accessory that may well become the most important component in your stereo system. Its extraordinarily high efficiency (a big 108dB) means you enjoy strain-free high volume performance even when the set is driven directly from the phones jack of a tape deck or

tuner. Use the SS-35s to monitor live recording sessions using your tape deck, or check out the performance of other components without switching on the receiver, preamplifier or main amplifier.

This solidly-built Sansui model is also distinguished by its double-housing structure to very effectively shield out ambient sounds, its low distortion, its oversized, detachable, double-layered earpads which reduce weight and provide a more

comfortable fit for better sound, and its easily-adjusted headband and earcup holders for further convenience and comfort.

For private, late-night high fidelity enjoyment, or top-quality monitoring use, the SS-35s outperform many others in this price range. It's a new and fresh approach to the world of "personal" high fidelity. From Sansui, where it's all hi-fi.



THE SS-35: REVOLUTIONARY DESIGN FOR MONITOR USE

Sansui-Exclusive Double-Housing Design

Inside the burnished aluminum cover on the back of each earpiece is a double-layered speaker housing filled with acoustical insulation and designed to firmly hold the speaker driver and isolate it from outside noise. This lightweight, sturdy Sansui-exclusive construction (Pat. Pend.) is hermetically sealed to provide further isolation for better sound.

Inner/Outer Earpad Arrangement

Extra isolation is assured with the novel two-part earpad arrangement in each earpiece of the SS-35s; the flat-profile outer pad. detachable in home use, is softly covered for further isolation while the inner pad is designed to rest lightly on your ear. Sansui has created the ideal inner-pad shape and material to (1) always maintain the proper amount of acoustic space between the speaker diaphragm and your ear while retaining maximum comfort, (2) provide optimum suppression of harmful resonance inside the unit, and (3) help reproduce clear midrange sounds free of the muffled characteristics found in many fullysealed headphones.

Superlight and Thin Polyester Film Diaphragms

One of the reasons why the SS-35 is unusually light is that its newly-designed, full-range speaker units have a superlight, yet solid diaphragm made of specially-treated 50μ-thin polyester film. Results include a very low distortion figure (less than 1.0% total harmonic distortion to inputs up to an ear-shattering level of 120dB). The distortion factor is lower still (0.15%) at the 90dB level at which we usually listen to music. The elimination of highfrequency resonance further improves performance.

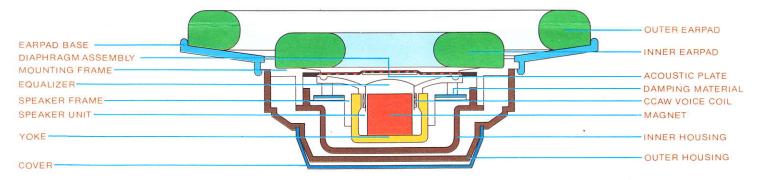
Very High Sensitivity/Efficiency

Many stereo headphones have the weakness that when driven directly from a low-output amplifier (such as in a tape deck or other program source component) they produce insufficient volume. The efficiency (or sensitivity) of such units is low-a problem you don't have with the SS-35s. Thanks to the unusually high sensitivity or efficiency of 108dB at 1 milliwatt, you are assured of enjoying high-level musical reproduction at all times, even while monitoring

your tape deck or other source components directly. When you use your preamplifier, receiver or main power unit, the reproduction is even more dynamic. This advantage is made possible in part by the use of the lightweight diaphragms and an advanced CCAW (Copper-Clad Aluminum Wire) voice coil design to reduce the moving mass of the speakers.

Lightweight Comfort

Stereo headphones are preferred by people who enjoy listening to good music "up close." The weight and inconvenience of some headphones, however, can be a major distraction, so we've built the SS-35s to avoid these problems. The total weight of the unit is only 302 grams (10.6 oz.), and the special inner/ outer earpad arrangement, duplex headband, sliding endpieces and other design considerations stress fatigue-free wearing comfort without compromising good sound. Try on a pair for a new experience in "personal" high fidelity-the Sansui SS-35s.



SPECIFICATIONS

SPEAKERS

5 cm (2") dynamic, full-range type

MATCHING AMPLIFIER IMPEDANCE

4-32 oh
RATED IMPEDANCE 25 ohms -32 ohms

FREQUENCY RESPONSE RANGE

MAXIMUM INPUT POWER

300 milliwatts SENSITIVITY

CORD LENGTH WEIGHT OF HEADPHONES ONLY

108dB/1 milliwatt (150Hz) 2.0 m (6.5 ft.)

302g (10.6 oz.) without outer earpads 347g (12.2 oz.) with outer earpads

Design and specifications subject to change without notice for improvements.





OPERATING GUIDE

4-CHANNEL STEREO HEADPHONES

PIONEER

SE-0404

We are pround to count you as another user of the Pioneer 4-channel stereo headphones model SE-Q404.

We are sure that you will soon find yourself enjoying a new exciting world of the 4-channel sound through this model which is available as 2-channel headphones, of course. This features the adoption of all two new driver elements in each ear cup, being superior in quadraphonic performance to conventional fully-enclosed type headphones ever marketed.

For maximum use, please read this guide carefully and follow the directions indicated.

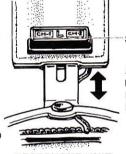
FEATURES

- New dynamic speakers with 75 μ thick polyester-film diaphragms
- Easy-to-handle Volume controls make fine tuning adjustment speedier, completely balancing left and right sound
- Clear reproduction ranging from booming mid- and bass to silky highs
- One-touch slide knobs of head band adjustment
- Comfortable feeling of leatherette ear pads no fatigue
- Applicable to easy check of recording and playback monitoring

SPECIFICATIONS

Volume controls.2-CH/4-CH selector switch Weight 550g/1lb. 3 oz. (without connection cord) 670g/1lb. 8 oz.

NOTE: Specifications and the design subject to possible modification without notice due to improvements.



SLIDE KNOB

ADJUSTMENTS

For the easiest-to-use headphone units adjust the headphone units up and down.



HOW TO USE THE SE-Q404

The SE-Q404 plug can be inserted directly into the 4-channel (FRONT-REAR) PHONES jack of your amplifier or receiver (Fig. 1).

- First set the selector switch to either 4 CH or 2 CH according to your preference.
- Be sure to turn down the volume control of your amplifier all the way to a minimum before inserting the plug into the PHONES iacks.
- Be sure to place the ear cup with the parallel cord on your left ear.
 - For easy identification LEFT and RIGHT are marked on each ear cup in order to avoid reversing channels, which would otherwise sound unnatural.
- When the selector switch is set to 4 CH, only the FRONT (CH-1, CH-3) volume can be adjusted.
 Switching over to 2 CH, both the FRONT and REAR (CH-2, CH-4) volume adjustments are possible (Table1).
- Use the volume controls to adjust fine tuning only after the volume control of your amplifier or receiver has been set to a proper position. Table 2 and Fig. 2 show how to use the SE-Q404 volume controls properly.

POINTERS FOR PROPER USE

- Always keep the volume control of your amplifier moderate. The SE-Q404 would be damaged by sound distortion arising from the excessive amplifier volume.
- * The ear pads are detachable. Clean off with a soft cloth moistened with neutral detergent from time to time.

NOTE:

The SE-Q404 has wire-wound volume control units. If left unused for a long period of time, a peculiar electrical noise may be heard. A few twists of the Volume controls will eliminate the noise.

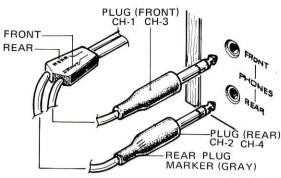
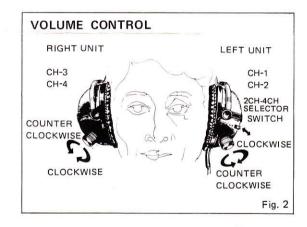


Fig. 1

For Quick, Easy Indentification

OPE- CH. RATION	2 CH. STEREO	4 CH. STEREO
SWITCH	2 CH. POSITION	4 CH. POSITION
PLUG	Insert only into FRONT	Insert both into FRONT and REAR
VOLUME CONTROL	Left and right channels adjustable	Only FRONT (CH-1, CH-3) adjustable

Table 1



VOLUME CONTROL	LEFT CH-1, CH-2	RIGHT CH-3, CH-4	
MIN	CLOCKWISE	COUNTER	
MAX	COUNTER	CLOCKWISE	

Table 2

PIONEER ELECTRONIC CORPORATION

4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
U.S. PIONEER ELECTRONICS CORPORATION
75 Oxford Drive, Moonachie, New Jersey 07074, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V.
Luithagensteenweg no.9, 2030, Antwerp, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY, LTD.
178-184 Boundary Road, Braeside, Victoria 3195, Australia

Printed in Japan <SRB-091-A>

PRO-B VI SPECIFICATIONS

Frequency Response:

Impedance:

4-16 Ohms (for standard jack).

15-22,000 Hz.

Maximum Music Power:

2 Watts.

Dynamic, with double-chamber acoustic suspension

15 foot extended length, with clothing clip and stand-

ard molded stereo plug.

Resistive-inductive, printed circuit.

Ceramic, coaxially mounted.

and damping.

Double-post and yoke, fully adjustable with vinyl

Tweeter: Woofer:

Crossover: Cable:

Headband:

Cushions:

Color:

Price:

\$60.00

Cordovan Headband and Shells, Brown Cushions and

Vinyl-covered foam type, removable and replaceable.

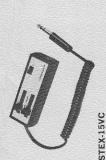
"Conform" comfort.

cover and pad.

PRO-B VI-H Specify Impedance: 600, 2,000 or 15,000 Ohms.

Price: \$65.00.

ACCESSO







MODEL SC-3 CONTROL BOX

A compact Audio Control Box for use with Stereo receivers and amplifiers that do not have phone jacks built in.

Can be used with one or two stereo-phones.

The Audio Control Box switches from speakers to phones and balances the level of the left and right channels. Provides proper attenuation of the outbut to protect the phones from overload.

Price: \$9.95

Easy to attach.

MODEL ECC CUSHION COVERS

Price: \$4.50

Sanitary, washable cotton-knit ear cushion covers for all SUPEREX stereo and other phones. Easily slip on phones and are fully transparent to sound. Ideal for institutions or schools where many people use the same equipment.

Price: 60c per pair

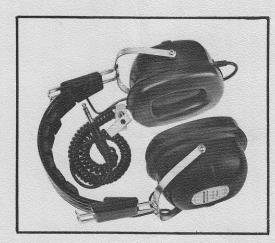
The Stex-15VC offers fingertip control of any stereophone while practically doubling cable length. Comes equipped with volume, mono/stereocontrols and retractable 15 foot cord terminated with standard stereoplug and jack. Twenty foot extension cord for stereo-phones, terminated with standard stereo plug and jack. MODEL STEX-10 R EXTENSION CORD Fifteen foot extension coil cord for stereophones, terminated with standard stereo plug and jack. MODEL STEX-20 EXTENSION CORD MODEL STEX-15VC CHAIRSIDE CONTROL CENTER

Price: \$7.95

OPEREX

CT INFORM

PROFESSIONAL MODEL PRO-B VI



Whatever your requirements are, be it as diversified as your personal stereo listening or aircraft communications, you will find a SUPEREX headphone and/or accessory designed for that specific application. It is our aim to bring to you the newest and finest products the "State of the Art" permits. You can look to SUPEREX when you require something better than the best.

151 LUDLOW STREET, YONKERS, NEW YORK 10705

400 - 05008

Price: \$5.50

PROFESSIONAL MODEL PRO-B VI

This new concept in stereophones has a frequency range and smoothness second only to electrostatic systems. The PRO-B VI will reproduce the complete audio range of the finest music systems without the coloration and distortion often found in most speakers. They are termed "The Professionals" due not only to their highly regarded characteristics, but because of the many TV, Radio and recording companies using them.

The PRO-B VI consists of a separate woofer and coaxial tweeter with a full crossover network in each earcup. It also has an inner acoustic chamber to control the woofer excursion so that it takes full advantage of its acoustic suspension design.

In short, here are truly professional stereophones that will give years of listening perfection.

CONNECTING THE PHONES

SUPEREX Stereophones are equipped with a molded-on stereo plug designed to fit any standard stereo jack that comes as part of most modern equipment.

ADJUSTING THE PHONES

Place phones on head so the headband rests on top of the head. Adjustment of the earpieces may be made upward or downward so that they comfortably enclose the entire ear. It is important that the cushions be snugly fitted against the head in order to exclude outside noise and provide proper bass response. The cord should be worn so that it hangs from the left ear.

COIL CORD WITH CLOTHING CLIP

For greater comfort and freedom this Stereophone comes equipped with a special 15 foot coil cord. The upper three feet are straight with a clip attached to the cord at the start of the coiled section. By clipping onto a shirt or belt, the weight and pull of the cord from the headset will be relieved. The clip can be easily unsnapped to be moved, reversed or eliminated entirely.

Extra clips are available from SUPEREX as part #20033 at 50c postpaid.

ADJUSTING THE PRESSURE

SUPEREX Stereophones are designed to fit snugly and comfortably over the ears to insure excellent low frequency response. Since the phones are used by men, women and children, they are adjusted for medium tension before packing. If the lateral pressure against the ear is too tight, making them uncomfortable, they can be adjusted as follows:

- 1. Grip the phones firmly in both hands at the center of the headband with both thumbs on top of the band and fingers underneath.
- 2. Apply pressure pushing down with thumbs and upwards with fingers.
- Make this adjustment in small increments, until the phones fit comfortably yet snugly over the ears. The weight of the earphones should be distributed over the headband and not the earcups.

The spring steel headband cannot be adjusted by pulling outward on the earcups. The above procedure will put a new "Set" in the center of the headband permitting a custom fit for complete comfort.

A NOTE ON STEREOPHONES

When first listening to stereophones, notice how much more there is to hear from familiar recordings. In listening through phones there are many sounds and details that were missing when listening to speakers. Phones will show up every sound, whether produced by tape, recording, or the amplifier itself. In many cases a hiss will be noticed. This may be caused by wear of the record or tape or can be noise emitted by the reproducing equipment. The earphones are completely passive and will only reproduce the signal that is being sent to them. They generate no sound of their own. If this type of noise is found, have your equipment checked by a service technician. Selective adjustment of the tone controls will also help in many instances.





CONNECTOR BOX

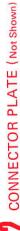
phone jack. Provides private listening by up to 5 people at one time. Walnut-like finish. \$12.95 14' cord with phone plug that fits standard head-A junction box that accepts 5 sets of stereophones. people at one time. Walnut-like finish.





SPEAKER/HEADPHONE/TRANSFER SWITCH

ceiver. Adds low impedance jack to system for wide Provides a speaker on/off switch and a stereophone jack. Connects to speaker terminals of amplifier or rerange performance of stereophones.



For units that have no headphone jack. Connect to any speaker output terminals.





MONITORING ADAPTER

Adapter contains matching transformers to match 600 to 10,000 ohm outputs down to 4 ohms. 2 output For monitoring tapes from high impedance sources. jack for phones, 2 pin-type jacks for inputs.



Connect stereophones to phonographs with plug-in speakers. Stereophone jack and 2 monaural pin-plugs. \$3.75 STEREO PIN-TYPE ADAPTER



Connects 2 stereophones to single headphone jack. Cord 3' long. \$5.95 2 PHONE EXTENSION CABLE



















25' COILED EXTENSION CORD Can be used with any stereophones fitted with 3 conductor, standard

EC.20 STEREO EXTENSION CORD 25' long. Straight cord fitted with stereo plug and jack. \$5.95

Not Shown) phone plug.

100 FLUID-FILLED REPLACEMENT EAR CUSHIONS Replacement for PRO & ESP models.

95 FOAM-FILLED REPLACEMENT EAR CUSHIONS Replacement for KO-727B. 85 FOAM-FILLED REPLACEMENT EAR CUSHIONS Replacement for K-6, K-6LC, SP-5SM, SP-3XC. Pair \$1.95

16-168 STEREOPHONE CARRYING CASE Accepts any headphone and has compartment for energizer and/or extention cord. High impact plastic with liner. \$9.95

4129 N. PT. WASHINGTON AVE./MILWAUKEE, WIS. 53212 CABLE: STEREOFONE COSS S.F.L., VIA VALTORTA 21, 20127 MILAN, ITAL' KOSS CORPORATION

FORM 65-0100



KRD-711 & K-711

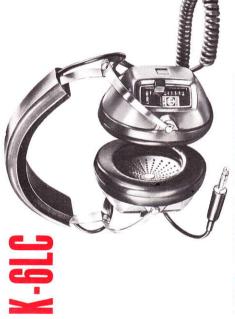


LIGHTWEIGHT STEREOPHONES

black head and ear cushions. 10' coiled cord. \$29.95 where series resistors are used, slightly higher volume phones and it weighs only 12 ounces. Soft PVC foam ear cushions that seal out ambient noise and promote strength polypropylene headband that conforms to 10-17,000 Hz. Distortion is less than 1% at maximum extended linear base that can be felt as well as heard. Rugged shockproof construction of a flexible high comfortable listening pleasure. Frequency response: output of 110 dB-SPL. Designed to work directly from amplifier outputs with between 3.2 ohms and 600 ohms internal impedance. Headphone jacks, The hottest new sound around in lightweight stereoany head size. With sponge foam head cushion for settings are required. Comes in a devil red color with

Same as above except in jet black color.

\$29.95



LEVEL CONTROL STEREOPHONES

make fine adjustments in volume as well as balance All new slider balance and volume controls on each earcup - convenient for remote listening positions, without leaving your chair. Wide response range. 10' coiled cord. Impedance: 4-16 ohms.



STEREOPHONES

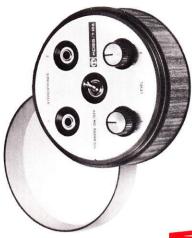
quency response. Big 3½ inch dynamic reproducer. trols. Spring-steel headband and foam filled cushions form an effective seal to make possible the wide fre-Features of the K-6LC above, except the level con-



STEREOPHONES

31/2" reproducers deliver excellent low and mid-range headphone listening by Koss in 1958. Highly efficient tones. Vinyl covered foam ear cushions, headband \$19.95 The basic stereophone design that started the art of adjusts to any head size.





CHAIRSIDE LISTENING STATION

trols for phones only. Speaker on/off switch. Wires directly to amplifier or receiver. Handsome walnut-Accepts 2 sets of stereophones. Separate volume conlike finish and cover.

ELECTROSTATIC STEREOPHONES





ELECTROSTATIC STUDIO MONITOR

circuitry to give fatigue-free listening. Elements cansponse for critical controlled monitoring of finest ESP-9 complete with E-9 energizer, ac line cord with wide cushion. No special amplifiers required noise isolation. Adjustable stainless steel headband fort, uses fluid-filled ear cushions for high ambient cel all second harmonic distortion. Lightweight comprecision electrical balancing of push-pull acoustical recording sources. Delivers all 10 audible octaves, polar distribution problems. Super, wide-range respeaker systems. Eliminates all room reflections and 10 octaves ± 2 dB range exceeding the best loud bias or ac line energizing. Controlled monitoring with Offers a new tool for improved audiometry with self connects to low impedance speaker terminals. Mode headphones. Virtually distortion-free performance 10-19,000 Hz ± 5 dB, 4 octaves beyond ordinary machine-run response curve, instructions. \$150.00





ELECTROSTATIC STEREOPHONES

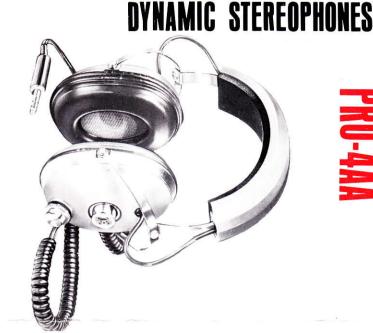
ear. Completely self-energized and self-contained stereo from wall and ceiling reflections. Spurious music lover at 10% of the price of the finest speakers. sonal listening is now available to the discriminating contained electrostatic stereophones. Reproduces 9 of range frequency response never before possible in Breakthrough in design gives distortion-free wide Frequency response: $30-19,000 \text{ Hz} \pm 5 \text{ dB}$. Model ESP-6 complete with 10' coiled cord, T-3 connector listening environment exactly tailored to the human tions and machine-run response curve. box and speaker on/off switch, carrying case. instrucroom resonances are banished by the controllec Sound is heard as originally recorded, without lost through electrostatic stereophones. A new era in per-10 audible octaves. This wide range is reachable only headphones. The World's only self-energized and self-



4 CHANNEL DYNAMIC QUADRAFONES

volume controls fitted into the earcups. Frequency array: left front and left rear, channels 1 and 3, and sound" from four-channel amplifiers. The assembly 4 separate driver elements - deliver proper "surround a dual 10' coiled cord, carrying case. arately adjusted (for spatial balance) by means of of four matched, high quality elements in a headresponse: 10-20,000 Hz. Fluid-filled ear cushions and parallel, giving nearly double the bass radiating area driver elements feeding each ear are connected in channel operation from the new four-channel amplidriver elements are situated in standard four-channel phone no larger than conventional stereophones. The The volume levels of both front channels can be sepfiers. With the switch in "Stereo" position, the two four-channel position the headphone delivers fourright front and right rear for channels 2 and 4. In the

PRO-44





PROFESSIONAL WIDE RANGE

veloped to complement amplifier gain so that hum and noise are inaudible. \$60.00 coiled cord. Frequency response: 10-20,000 Hz. Detion of deep sonorous organ tones below 32 Hz. Soft phones. New, efficient element was designed to minisound never before possible with dynamic head headband cushion, fluid-filled ear cushions and 10' Oversize diaphragm compliance ring allows reproducmize weight and give uniform extended high range. improved driver. You get full range, uncolored stereo 2 octaves beyond ordinary dynamics. Rugged reliable For exacting professional use — ideal for the discern ing music-lover. Gives smooth, fatigue-free response

ohms characteristic impedance. Special order. \$65.00 impedance for matching audio transmission lines 600 Same as above except nominally 600 ohms voice coil

DUAL VOLUME/BALANCE CONTROLS

response: 30-20,000 Hz. 10' coiled cord. with monaural sources; such as conventional radio and flick of a switch, into monaural headphones for use stereo-monaural switch into the left earcup so that noise. Additionally, the KO-747 unit combines a listening for hours on end. This close, yet comfortable returning to his receiver or amplifier control center each cup. These controls allow the wearer to make with the added convenience of a volume control in television sets, electronic organs, etc. Frequency Koss quality Stereophones can be changed, with the fit, also accounts for high cancellation of ambient The adjustable headband is combined with vinyl fluid fine adjustments in both level and balance without Koss sound and comfortable, efficient fit together KO-747 Stereophones are a combination of the famous filled ear cushions to furnish comfortable private



WIDE RANGE STEREOPHONES

comfortable fit also accounts for the exceptionally private listening - for hours on end. This close, discriminating music listener. Highly sensitive sound sure. The dynamics of concert hall realism in the comcomplements ear sensitivity to enhance listening pleahigh cancellation of external noise. 10' coiled corc source. The adjustable headband is combined with reproducers will furnish excellent listening with only standing realism. This is sound to delight the truly vide breathtaking, full dimensional stereo with outelements for superior bass response. Designed to proing music lover. Frequency response characteristic Wide range dynamic stereophones for the discriminat plugs directly into most amplifiers. foam filled ear cushions to furnish comfortable 30 milliwatts per channel from any music program fort of your living room. Large 3½" diameter driver