

 **PIONEER®**



HI-FI STEREO 1979/80

Sound is a mechanical, radiant energy with three dimensions: pitch, intensity and duration. At any point in time, this energy will have a specific frequency (pitch) and a specific intensity (loudness). And a moment later, all these "variables" will have shifted in relation to one another, with the energy distributed into new patterns.

THE TASK OF HIGH FIDELITY

All of these changes register to the ear the way the modulations of a landscape, with mountains and valleys, abrupt drops and rises, register to the eye. It is the task of hi-fi to transform this constantly-changing energy from mechanical form to electromagnetic form and back again while preserving all the subtleties of the original.

Because certain areas of performance—frequency, noise and distortion—can be objectively verified in the lab using sine waves and other controlled inputs, they have become the major focus of nearly all hi-fi technology today. But these are chiefly static measures which have

little relation with actual music. The signals measured contain less audio information—less "data density"—than actual musical inputs do.

To improve hi-fi significantly, the Pioneer engineers have gone beyond the static parameters and developed a more creative approach to circuit design which takes into account the transient, pulsive and musical inputs introduced when hi-fi equipment is put to work in your listening room. By basing their research of electronic circuitry on a continual comparison with real sound, they have determined three technical parameters—frequency range, dynamic range and time response—which relate directly to the three dimensions of sound. They have thus been able to duplicate with unprecedented accuracy the dynamic qualities, or "thrust" of live music.

VISUALIZING THE INVISIBLE

The diagram at the left is one way of visualizing the non-visual energy of sound. It illustrates how dependent each of the dimensions is upon the others and makes it clear that there is no sense in treating only one dimension at a time. When all the instruments of an orchestra are filled in, the three-dimensional diagram quickly begins to look like a model of a mountain range, with peaks and valleys corresponding to the

In the first millisecond, most of a note's energy is concentrated in its fundamental frequency. But more quickly than one can think about it, the energy becomes redistributed among the several secondary vibrations.

modulations of sound over time. It is on the basis of such a mental image of sound that Pioneer have conceived their electronic designs. Like an ideal cube embracing all three dimensions of sound, harmoniously—a cube with elastic sides capable of "closing in" on a rapid

Mountains, like sound, exist in two dimensions only on paper.

transient note, or of expanding suddenly to cover an orchestral crescendo. With these parameters to guide their choice of components and circuitry, the Pioneer engineers have gone beyond the two-dimensional reproduction of sound and achieved a true three-dimensional sound image with all the relief, the range and the contrasts of a spectacular visual landscape. What you hear with Pioneer is the dynamic release of radiant energy.

To please the ear, hi-fi equipment must embrace all 3 dimensions of sound harmoniously; never exaggerate one over the others.

PIONEER AND THE IDEAL BALANCE OF THE THREE DIMENSIONS OF SOUND

OPEN REEL TAPE DECKS

Extended frequency response is the major advantage of the open reel format. Technically, because the tape runs more quickly, more data can be packed into a given moment. Which means a richer musical spectrum. In practical terms, the large reels afford longer play than discs and cassettes, with an exceptional sound quality. As the traditional "favorite tool" of audio professionals, open reel decks have always been equipped with a maximum of recording controls.



Inside the RT-909: several ICs to handle the electronic counter and the peak display.

OPEN REEL DECKS THAT LOOK LIKE CASSETTE DECKS

Pioneer have long furnished open reel decks to the audio experts. Witness the paragon of versatility, the RT-2022, which can even be transformed by the user from a

2-track, 2-channel system into a 4-track, 4-channel system simply by switching head assemblies and adding an amplifier (sold as separate acces-



The RT-909's super reliable tape transport system.

sories). Now, we present two decks that combine the operational ease of cassette decks with the professional capabilities of open reel: the RT-909 and the RT-707. They even **look like** cassette decks! But they offer even longer play than with conventional open reels, thanks to auto-reverse, and a truly exceptional sound. The RT-707 was the first professional-type deck created which can be rack-mounted alongside other hi-fi components. And the RT-909 brings all the advanced electronics used to boost the quality of cassette sound right into the open reel world. Each of these decks is liable not only to draw cassette enthusiasts toward open reel, but also to change the habits of quite a few open reel traditionalists.

RT-909 Auto Reverse Direct-Drive Stereo Tape Deck. Two-speed, 3-motor, 4-head design giving you a professional standard frequency response from 20 to 28,000 Hz (DIN) with all the operational ease of a hi-fi cassette deck. Features a 24 segments fluorescent meter switchable for peak or average level reading and

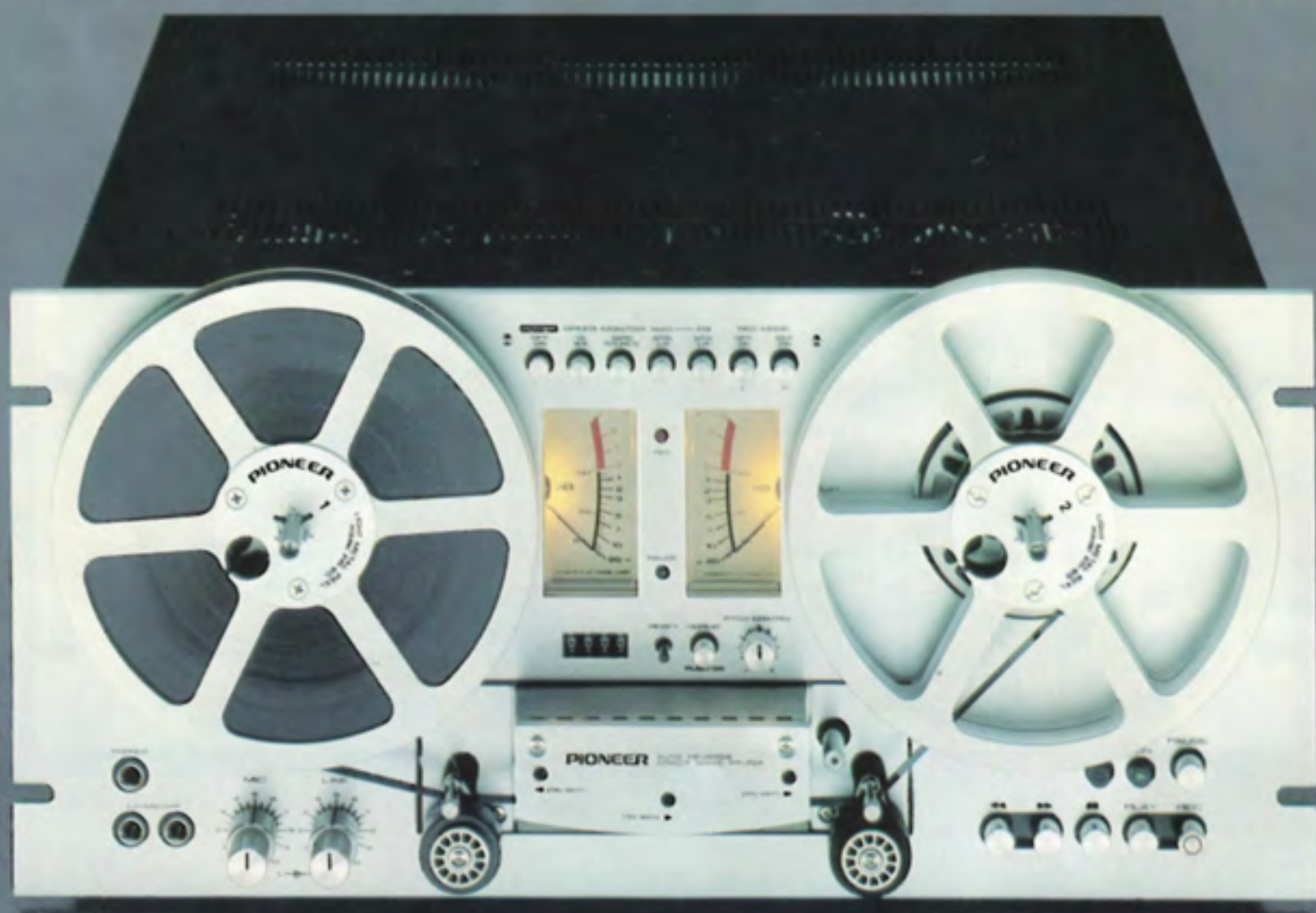
a 4-digit electronic counter. Closed loop dual-capstan tape transport works with a frequency-controlled DC motor and two other logic controlled reel motors to achieve wow and flutter of $\pm 0.1\%$ (DIN) at high play speed (19 cm/sec.). Permits

monitoring of recording and accomodates professional 26.5 cm \varnothing reels for extra long play, even without using the repeat.



RT-707 Auto Reverse Direct-Drive Stereo Tape Deck. Three-motor, 4-head system with FG Servomotor for capstan drive and 2 6-pole special induction motors for reel drive. Two playback heads, auto-reverse and repeat, combined with 4-track format, make continuous play possible—at 9.5 or 19 cm/sec. Features 4 bias/equalizer values, $\pm 6\%$ pitch control, electronic switching, line/mic mixing, independent L/R chan-

nel recording, and pause indicator light. Frequency response: 30 to 24,000 Hz (DIN, at 19 cm/sec.). Wow and flutter: $\pm 0.14\%$ (DIN, 19 cm/sec.).



RT-707

RT-2022 High-Speed Belt-Drive Professional Deck. Three-motor, 3-head system with separable amplifier, tape transport and head units. Tape heads can be easily replaced with JT-2044 T unit for quick switch from 2-track to 4-track and even to 4-track, 4-channel format with an extra TAU-11 amplifier. Record heads also "play" for monitoring of perfect sync during multi-tracking with unit's synchromonitor mechanism.

Tape speeds: 19 and 38 cm/sec. High speed offers extended frequency response and dynamic range, and reduced wow and flutter (thanks to increased flywheel effect). Features variable bias, NAB and IEC equalization, lock-type pause and cueing for easy editing, independent line/mic mixing controls for sound on sound, sound with sound, and echo recordings, delayed logic function buttons, expanded dynamic range meters, built-in test oscillator for checking of record and playback conditions, and full remote control

mechanism for use with optional accessory. Frequency response: 30 to 35,000 Hz (DIN, at 38 cm/sec.). S/N ratio: 55 dB (DIN). Wow and flutter: $\pm 0.06\%$ (DIN). Takes 26.5 cm \varnothing professional reel.



RT-1011 L Four-Track Belt-Drive Stereo Tape Deck. Three-motor, 3-head system with built-in mixing amplifier and autorecord facility for use with preset timer. Four-track format offers up to four hours of playing time with professional 26.5 cm reel. That's why construction is extra rugged, with 5 mm thick front chassis panel and diecast framework. Features solenoid-operated direct-changeable function buttons, hyperbolic permalloy heads, 2-speed hysteresis synchronous motor for 19 cm/sec. and 9.5 cm/sec. capstan

drive and two special induction motors for reel drive. Ultra-stable motor is coupled with a large (100 mm \varnothing) flywheel and precision (0.2 μ error) capstan. Offers two bias and two equalization values and lockable pause for recording and editing. Frequency response: 30 to 24,000 Hz (DIN, 19 cm/sec.). S/N ratio: 50 dB (DIN).



RT-1011L

REEL-TO-REEL TAPE DECKS	RT-909	RT-707	RT-2022	RT-1011L
Drive system	3-motor Solenoid operation	3-motor Solenoid operation	3-motor Solenoid operation	3-motor Solenoid operation
Tape heads	4 track/2 ch. PB × 1 4 track/2 ch. REV PB × 1 4 track/2 ch. REC × 1 4 track/2 ch. Erase × 1	4 track/2 ch. PB × 1 4 track/2 ch. REV PB × 1 4 track/2 ch. REC × 1 4 track/2 ch. Erase × 1	2 track/2 ch. PB × 1 — 2 track/2 ch. REC × 1 2 track/2 ch. Erase × 1	4 track/2 ch. PB × 1 — 4 track/2 ch. REC × 1 4 track/2 ch. Erase × 1
Tape speeds	19 cm/sec. 9.5 cm/sec.	19 cm/sec. 9.5 cm/sec.	38 cm/sec. 19 cm/sec.	19 cm/sec. 9.5 cm/sec.
Wow and flutter 38 cm/sec. (DIN) 19 cm/sec. (DIN) 9.5 cm/sec. (DIN)	— ±0.1% ±0.16%	— ±0.14% ±0.18%	±0.06% ±0.15% —	— ±0.15% ±0.19%
Frequency response at 38 cm/sec. (DIN) 19 cm/sec. (DIN) 9.5 cm/sec. (DIN)	— 20 Hz–28 kHz 20 Hz–18 kHz	— 30 Hz–24 kHz 30 Hz–16 kHz	30 Hz–35 kHz 30 Hz–26 kHz —	— 30 Hz–24 kHz 30 Hz–16 kHz
Signal-to-noise ratio (DIN unweighted)	>60 dB —	58 dB 52 dB	60 dB 55 dB	58 dB 50 dB
Total Harmonic Distortion	<1%	<1%	<0.8%	<1%
Inputs (sensitivity/max. input/impedance)				
Mic	0.316 mV/80 mV/27 kΩ	0.25 mV/125 mV/27 kΩ	0.11 mV/100 mV/27 kΩ	0.25 mV/80 mV/20 kΩ
Line	50 mV/25 V/50 kΩ	50 mV/25 V/100 kΩ	34 mV/25 V/100 kΩ	50 mV/25 V/100 kΩ
DIN Jack	—	16 mV/8 V/1.3 kΩ	—	15 mV/1.5 V/1.5 kΩ
Outputs (max. level/impedance)				
DIN Jack	—	700 mV/50 kΩ	—	316 mV/50 kΩ
Line	900 mV/2.6 kΩ	700 mV/50 kΩ	900 mV/50 kΩ	316 mV/50 kΩ
Headphones	100 mV/8 Ω	70 mV/8 Ω	133 mV/8 Ω	40 mV/8 Ω
Dimensions (W × H × D) mm	480 × 340 × 318	480 × 230 × 356	460 × 552 × 274	428 × 431 × 227
Weight (kg)	21.5	20	28.5	18.6

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THE PIONEER SYSTEMS

Pioneer have composed five different coordinated systems of separate components. The professional-style metal rack and the three handsome wood and glass cabinets with matching speakers each contain the most ideal combination of Pioneer separate components for its price category. And Pioneer offer flexible system-cabinet combinations for the X-99, X-77 and X-55 systems. First you select the sound system best suited to your listening tastes; then the particular cabinet construction which matches your needs as a user and decorator.

For example, the most serious audio connoisseurs can build a veritable hi-fi studio around the professional, EIA (Electronics Industry Association of America) standard rack: JAR-2S. The vertical cabinet, CB-900, on the other hand, may look best surrounded by tall bookshelves in a study. And the two shorter cabinets may be exactly what the decorator ordered for a living-room with stylish, low furniture.

Notice that each system has all the



Pioneer's special accessory tray.

components of an extended hi-fi system: not just an amplifier, tuner and turntable, but also a cassette deck, the

whole needing only a single AC wall outlet. And how many other makes offer a direct-drive turntable powered by a DC servomotor in a system as low-priced as the X-55? Or the advanced power monitoring convenience provided by high-speed fluorescent level meters in the Pioneer amplifiers?

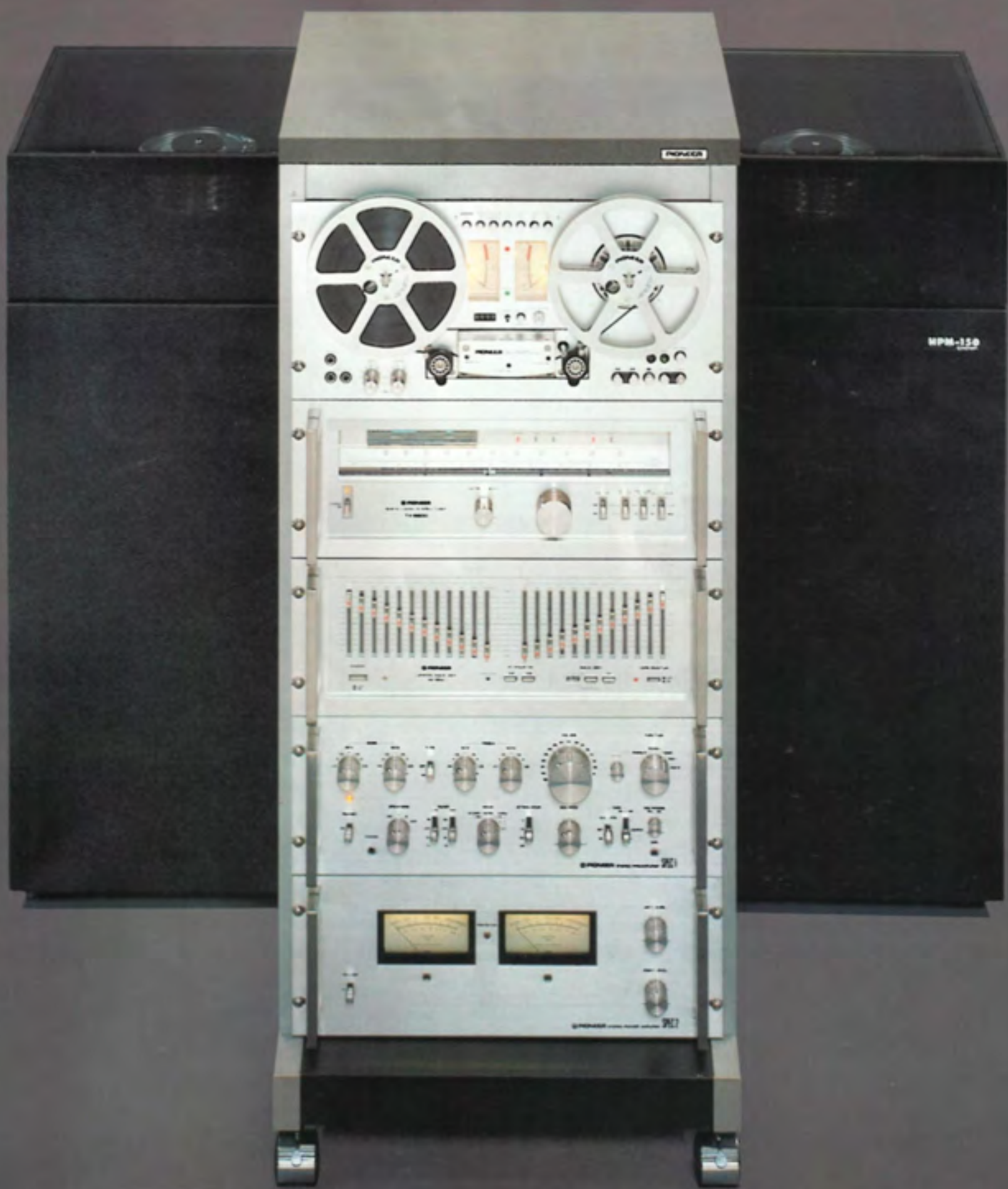
... AND THE PIONEER SYSTEMS ARE MOBILE

The Pioneer systems give you more than a dust-proof storage compartment for records, tapes and components. They also have special compartments for optional audio accessories and for a timer clock (DT-400). And best of all, they have wheels for ultimate convenience. Yes, pass the word along: the Pioneer systems are mobile!



High-speed and precise fluorescent tube level meters of CT-F 600 cassette deck.

Pioneer Professional Standard Rack JAR-2S. A high-class installation combining Pioneer's SPEC-1 preamplifier, SPEC-2 power amplifier, TX-9800 Quartz-Lock tuner, RT-707 Auto-Reverse tape deck and SG-9800 graphic equalizer in EIA-standard iron rack.



PIONEER ACCESSORIES

"During the week, I only get to listen to music in the morning and at night, before going to sleep. So I only listen to my clock radio. . ." We have heard this plaint before. You may even have uttered it at some time. But is that a reason not to enjoy real hi-fi? We suggest that you plug your Pioneer amplifier and cassette deck into the AC outlets of the DT-400 Timer Clock and listen to clock hi-fi. The sleep timer will turn off your stereo after you fall asleep, and wake you with music in the morning.

Like all the other Pioneer accessories, DT-400 can be an indispensable complement to a



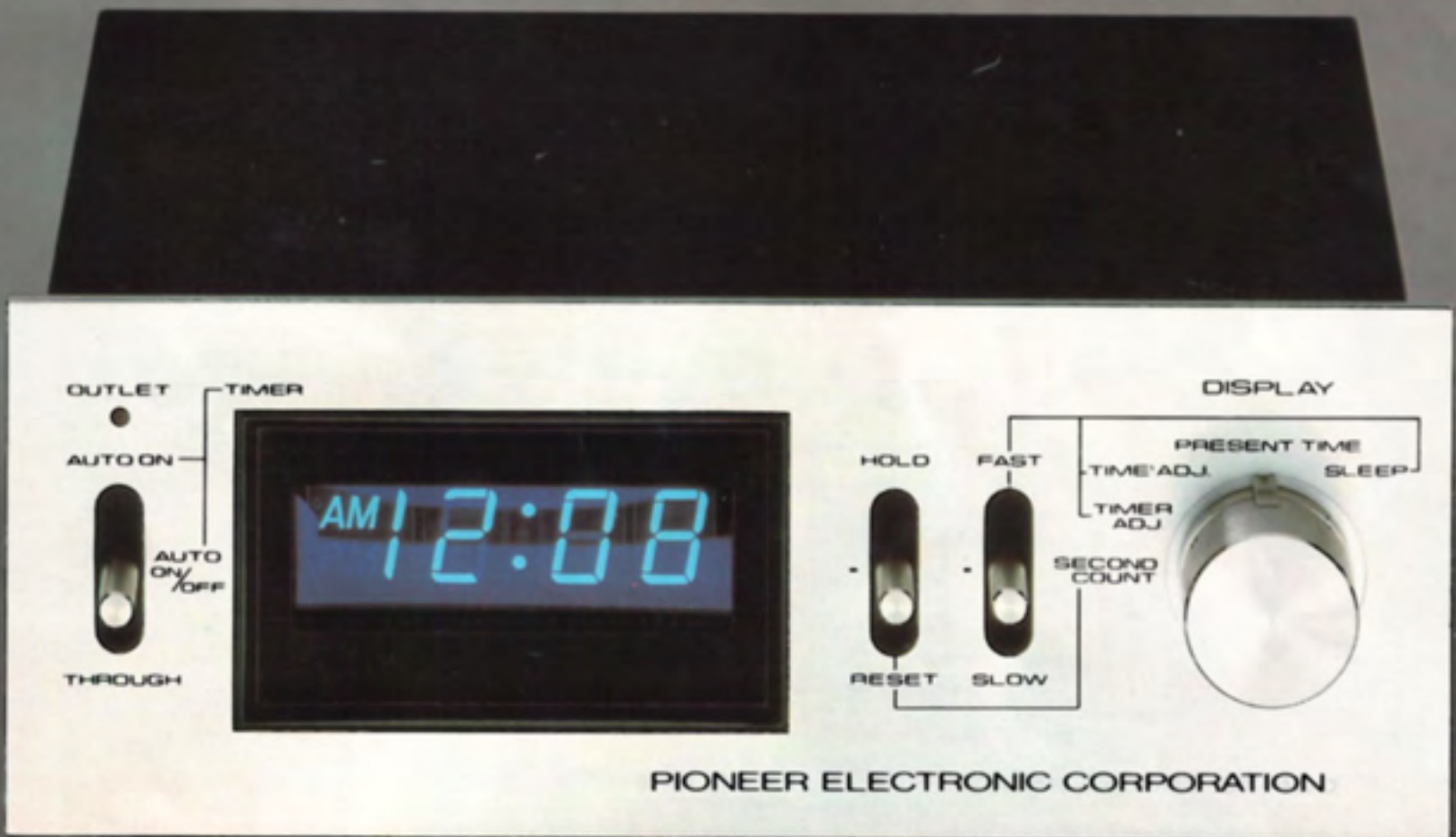
Even the lowest-priced Pioneer cartridge, PC-110/II, is delivered in a handsome container with all the necessary equipment for correct mounting.

hi-fi system. Like the DT-400, all the Pioneer accessories have an important role to play in increasing the flexibility of your system or improving its performance, for a relatively negligible additional expenditure. Some, like the PA-5000 tone arm and the PC-1000/II phono cartridge, can bring as much improvement as a new pair of speakers. Another, the MA-62 A Disco Mixer, is the first step toward professional use of hi-fi equipment. The others are simply high quality "additionals" to make your hi-fi system more complete. So that people who start with Pioneer can stay with Pioneer all the way.

DT-400 24-Hour Electronic Timer. Especially designed for use with Pioneer's cassette and open reel tape decks when making unattended recordings. Time is displayed on a blue fluorescent tube in 4 digits, switchable to show hours and minutes or seconds. Accuracy is guaranteed by synchronization with line fre-

quency. The DT-400 can be set to go on and stay on, or to go off again in up to 59 minutes. Can be used as wake-up alarm with hi-fi receiver or cassette deck. Two AC outlets on back for connecting components. Reliable LED "ON" display with power failure indication. Dimensions: 190x75x163 mm. Same

brushed aluminum front panel as Pioneer hi-fi components.



MA-62 A Portable Mixing Amplifier. Compact 6-channel-in unit with multi-purpose control capability for phono/mic/line mixing, panning and attenuation and subsonic phono filtering. Four mic inputs, 4 mono line inputs, 4 mono phono inputs (for two stereo pairs each) allowing up to six combinations. Permits multi-mic mixing with tape system. Features convenient top

panel connections and "scratch board" for channel identification. Phono signal-to-noise ratio: 60 dB. Channel separation: more than 70 dB (1 kHz).



MA-62 A

PR-85 Light weight 17.5 cm metal reel for use with the RT-707 open reel tape deck.

PR-100 NAB standard 26.5 cm metal reel for RT-909, RT-2022 and RT-1011 L decks.

CM-220/S Electret condenser one-point stereo microphone with hypercardioid directivity characteristics. Frequency response: 40 to 18,000 Hz. S/N ratio: 47 dB. Sensitivity: -65 dB (at 1 kHz). Output impedance: 1 k Ω . Weight: 310 g (including cord).

CM-530 Electret condenser type microphone with omnidirectional/cardioid switchable directivity. S/N ratio: 40 dB. Frequency response: 30 to 20,000 Hz (cardioid), 20 to 19,000 Hz (omni). Output impedance: 600 Ω . Weight: 415 g (with cord).

PR-100



CM-220/S



CM-530



PR-85

