

EQUIPMENT REPORTS

THE CONSUMER'S GUIDE TO NEW AND IMPORTANT HIGH FIDELITY EQUIPMENT



FROM INDIANA COMES A STEREO AMPLIFIER THAT SHATTERS ALL PREVIOUS PERFORMANCE RECORDS

EQUIPMENT: Crown DC-300, a stereo basic or power amplifier. Dimensions: 19 inches wide (standard rack mount), 7 inches high, 9 $\frac{3}{4}$ inches deep. Weight: 40 pounds. Price: \$685. Manufacturer: Crown International, 1718 Mishawaka Road, Elkhart, Indiana 46517.

COMMENT: If the Crown DC-300 amplifier were rated by the methods used by many high fidelity companies today (music power into a 4-ohm load and doubling that figure to express both stereo channels), it could be spoken of as—hold your breath—an “800-watt” amplifier. (We shudder to think what this figure might become at the hands of nonhigh fidelity manufacturers who use the EIA rating to express “peak power”—1,600 watts? 2,000 watts?) Even by the more conservative, more rigorous, and more valid rating method we use (continuous, rms power into an 8-ohm load), the DC-300 turns out to be a 380-watt (190 watts per channel) amplifier. These are legitimate, ultraclean watts—by which token the DC-300 becomes, as far as we know, the top-ranking stereo basic amplifier on the consumer market today. It is also, at \$685, the highest priced, a fact that apparently has not deterred a surprising number of buyers—well-heeled perfectionists and professionals. The unit has, in addition to home music system use, several studio, laboratory, and p.a. applications which are explained in the owner's manual.

This sonic Samson emanates from Elkhart, Indiana—a town most commonly known for its prolific

output of musical instruments. Actually, the confluence of major producers of musical instruments and the manufacturer of what may well be the world's greatest amplifier happens to be pure coincidence. The Crown firm—which by the way has absolutely no connection with Crown of Japan—is a division of International Radio & Electronics Corporation, since 1947 a builder of short-wave radio stations and related equipment. The name of Crown was chosen to designate its tape recorder line—also professional and ultrahigh quality—which actually started as one custom-built unit assembled in 1951 for a Brazilian missionary who requested it. A year later Crown became the firm's tape recorder division and has since then enjoyed a slow and orderly growth, maintaining its independence, its quality image, and its key personnel.

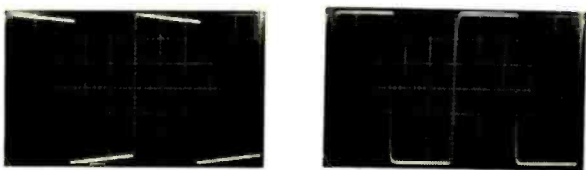
Something of this intransigence and sense of permanence surrounds the DC-300 amplifier. It is built like the proverbial Sherman tank, and its performance is so good, it seems to mock the measuring equipment used for evaluating it. Distortion in this amplifier which averages a mere few hundredths of a per cent over most of the audio band, is more of a theoretical “must be there” concept than an actual measurable phenomenon. Response is literally a ruler-flat line from below to far beyond the normal audio band. Its power reserves are unprecedented in consumer audio, and the unit has excellent stability. The CBS Lab data taken on the DC-300, detailed in

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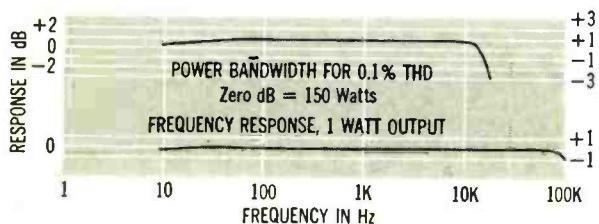
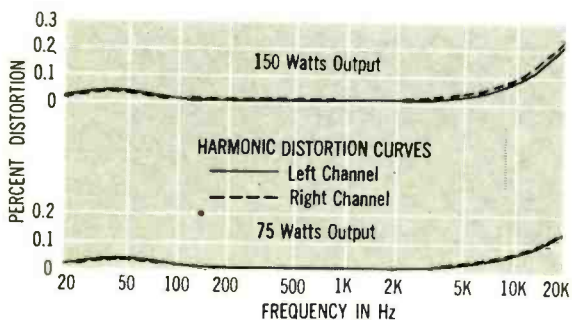
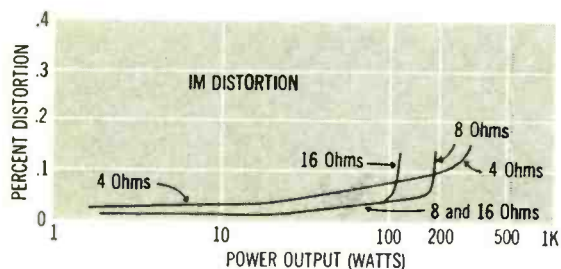
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the accompanying chart and graphs, represents in sum the highest performance yet encountered in an amplifier. What this means from a listening standpoint can only be appreciated if you use the DC-300 with the highest quality associated equipment: very low rumble turntable, clean preamp, and wide-range speakers. Serving as the powerhouse in such a system the DC-300 can be depended on to offer no spurious contributions of its own while at the same time it provides an unprecedented amount of clean power and high damping to accurately control the speakers. Among the comments we have heard while using the DC-300 in a stereo system were: "an open, clearer sound," "better bass definition," "nuances I never heard before in that recording." We might add that the DC-300 is hum-free and noise-free as well as distortion-free.

Interestingly enough, the DC-300 was designed originally as a laboratory tool for industrial and professional use. Almost with tongue in cheek, Crown



Square-wave response to 50 Hz, left, and to 10 kHz.



introduced it at the 1967 New York high fidelity show. Consumer reaction was so favorable, and continued to build up so strongly during the following year, that the firm finally decided to enlarge its production of the unit and offer it formally as a consumer product this past December. And, encouraged by the reception accorded the DC-300, Crown plans to launch its own preamp-control unit and a similar, though lower priced, basic amplifier later this year.

For the premium performance of the DC-300, the stereo enthusiast must of course pay a premium price. In addition, there are certain ground rules to observe when using this sonic giant. Any speaker system (regardless of size or type of design) that can handle a continuous power of 30 watts can take on the DC-300—but, counsels Crown, you should fuse the lines to the speakers as per the chart provided in the owner's manual. Additional speakers are safe to run off the DC-300 so long as the total impedance per channel does not go below 4 ohms. The DC-300's

Crown DC-300 Amplifier

Lab Test Data

Performance characteristic	Measurement
Power output (at 1 kHz into 8-ohm load)	
1 ch at clipping	180 watts at 0.027% THD
1 ch for 0.1% THD	190 watts
r ch at clipping	180 watts at 0.021% THD
r ch for 0.1% THD	190 watts
both chs simultaneously	
1 ch at clipping	180 watts at 0.027% THD
r ch at clipping	180 watts at 0.021% THD
Power bandwidth for constant 0.1% THD,	
150 watts	below 10 Hz to 17 kHz
Harmonic distortion	
150 watts output	either channel, under 0.25%, 20 Hz to 20 kHz
75 watts output	either channel, under 0.15%, 20 Hz to 20 kHz
IM distortion	
4-ohm load	under 0.1% to 200 watts output
8-ohm load	under 0.05% to 180 watts output
16-ohm load	under 0.04% to 100 watts output
Frequency response, 1-watt level	+0, -1 dB, below 10 Hz to 100 kHz
Damping factor	higher than 80 (beyond limit of test equipment)
Input characteristics for 150 watts output	Sensitivity 1.72 V S/N ratio 106.5 dB

REPORTS IN PROGRESS

Ampex Model 1450 Tape Recorder

Marantz Speaker System

line cord should not be connected to the convenience outlets found on preamps, amplifiers, and receivers; its power drain may prove too much. Instead, the line cord should be connected to its own AC wall outlet, and its center pin grounded—either directly if you have a three-pin AC outlet, or by a three-to-two-pin socket adapter, with the pig-tail lead from the line cord then attached to the holding screw on the AC outlet. The DC-300 should not be turned on before, or at the same time as, the system preamp. Turn the preamp on first, pause a second or two, then switch on the DC-300.

As for electrostatic speakers, the DC-300 is ideal, as long as you follow the recommendations in the

manual. Not only does its stability enable it to handle capacitive loads unerringly, but its ability to clip cleanly will prevent sparking effects among the electrostatic elements even at extremely high power demands. In fact, at the New York high fidelity show Crown was using the DC-300 to drive six full-range electrostatics (three per channel hooked in parallel) with the greatest of ease.

If you are willing to put up with the pampering the DC-300 needs, if you have other components of a quality to match it, and if you have \$685 to spend on a basic amplifier, the Crown was made for you.

CIRCLE 141 ON READER-SERVICE CARD

**HIGH PERFORMANCE, MEDIUM
PRICE FOR NEW TAPE DECK**



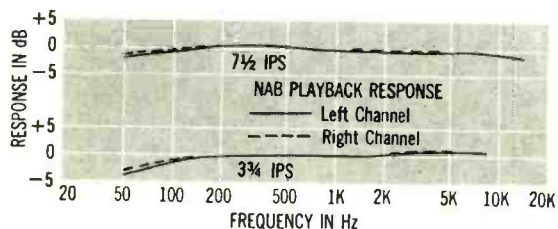
THE EQUIPMENT: Teac A-1200, a stereo tape deck with built-in record/playback preamps. Dimensions: 17 by 15½ by 9¾ inches. Supplied in walnut case. Price: \$299.50. Manufacturer: Teac Corp. of America, 2000 Colorado Ave., Santa Monica, Calif. 90404.

COMMENT: If subsequent products from this firm resemble the A-1200 in terms of what it offers vis-à-vis what it costs, the name of Teac—which recently has expanded its U.S. operations—will become increasingly one to reckon with in high fidelity circles. The present model combines very creditable performance with numerous features in a neatly styled format that is—for tape equipment as good as this—very attractively priced.

The A-1200 is a three-head, three-motor, two-speed (7½ and 3¾ ips) record/playback machine. The head arrangement permits direct monitoring while you record. The unit also offers the facilities for multitrack dubbing and echo effects. Independent line and mike inputs also permit mixing while recording, using the deck's front panel level controls. The signal output, on playback, must be connected to an external amplifier and speakers (the A-1200 has no built-in power amps or speakers). In the event your own system amplifier (or receiver) lacks the tape monitor function, there's a suitable switch for it on the A-1200.

The transport section is controlled by a series of push buttons for rewind, stop, fast forward, regular forward (play), and record. To record, you must push this last button, colored red, together with the play button while you release a third "safety" control. This arrangement provides an unusual degree of protection from accidental erasure of a recorded tape. Atop and centered on the transport is a four-digit tape counter with reset button. Tape speed controls are at the right, below the take-up reel.

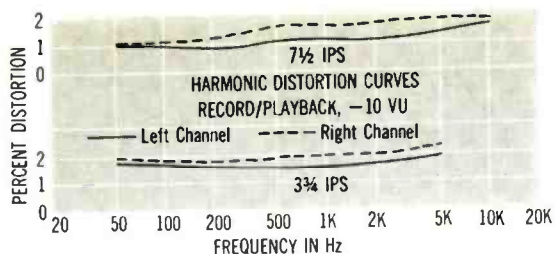
The electronic controls include additional push buttons to engage the head response for stereo, mono, and the special effects mentioned earlier. Each input



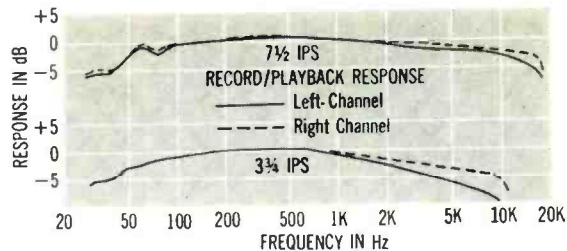
Teac A-1200

Lab Test Data

Performance characteristic	Measurement
Speed accuracy, 7½ ips	105 VAC: exact 120 VAC: exact 127 VAC: exact
3¾ ips	105 VAC: exact 120 VAC: exact 127 VAC: exact
Wow and flutter, 7½ ips	playback: 0.08% record/playback, 0.11%
3¾ ips	playback: 0.13% record/playback: 0.17%
Rewind time, 7-in., 1200-ft. reel	1 min. 9 sec.
Fast forward time, same reel	1 min. 10 sec.
NAB playback response	
7½ ips	l ch: +0.5, -2.25 dB, 50 Hz to 15 kHz r ch: +0.5, -1.5 dB, 50 Hz to 15 kHz
3¾ ips	l ch: +1, -3.75 dB, 50 Hz to 7.5 kHz r ch: +1, -3 dB, 50 Hz to 7.5 kHz
Record/playback response (-10 VU recorded signal)	
7½ ips	l ch: +1, -6 dB, 26 Hz to 16 kHz r ch: +1, -6 dB, 25 Hz to 18 kHz
3¾ ips	l ch: +0, -7 dB, 27 Hz to 6 kHz r ch: +0, -7 dB, 29 Hz to 10 kHz
S/N ratio (ref 0 VU, test tape)	
playback	l ch: 51.5 dB r ch: 46 dB
record/playback	l ch: 51.5 dB r ch: 46 dB
Erasure (400 Hz at normal level)	68 dB
Crosstalk (400 Hz)	
record left, playback right	53.5 dB
record right, playback left	52 dB
Sensitivity (for 0 VU recording level)	
line input	l ch: 120 mV r ch: 125 mV
mic input	l ch: 0.26 mV r ch: 0.25 mV
Accuracy, built-in meters	left: exact right: reads 1 dB high
IM distortion (record/play)	
7½ ips, 0 VU	
record level	l ch: 5.5% r ch: 6.0%
-10 VU	l ch: 5.5% r ch: 6.0%
record level	l ch: 5.5% r ch: 6.0%
3¾ ips, 0 VU	l ch: 6.0% r ch: 7.0%
-10 VU	l ch: 6.0% r ch: 7.0%
THD, record/playback (-10 VU)	
7½ ips	l ch: under 1.6%, 50 Hz to 10 kHz r ch: under 1.8%, 50 Hz to 10 kHz
3¾ ips	l ch: under 1.9%, 50 Hz to 5 kHz r ch: under 2.3%, 50 Hz to 5 kHz
Maximum output, line	l ch: 1.3 V r ch: 1.3 V



channel has separate level controls for line and mike, and the output level has its own dual controls (six controls in all). On the center of the electronic panel is a dual-channel VU meter which proved to be one of the most accurate yet tested and certainly better than the meters usually found on home recorders. Speed accuracy, as tested at CBS Labs, was the best yet seen in any tape recorder: no measurable error at any line voltage setting for either of the deck's two speeds. The A-1200 also had negligible wow and flutter—the values measured in the lab actually were lower than those claimed by the manufacturer. These, and other, data are listed in the accompanying chart. The NAB playback response was practically perfect. The record/playback response—while expectedly



showing a little more variation—was very smooth at 7 1/2 ips, and capable of capturing highs with little distortion to beyond 15 kHz. Record/playback response at the slower speed was only adequate for noncritical recording. Harmonic distortion was somewhat better than average, signal-to-noise definitely better than average, for this price class. The crosstalk measurement shows ample channel separation for excellent stereo. Ample erasure is provided to wipe clean a previously recorded tape.

The Teac A-1200 looks good, sounds good, and "works easy." It's hard to imagine how a tape recorder in its price range could be made much better.

CIRCLE 143 ON READER-SERVICE CARD

DELUXE PREAMP SPORTS TWO METERS



THE EQUIPMENT: Sony TA-2000, a preamplifier-control unit. Dimensions: front panel, 15 3/4 by 5 1/2 inches; chassis depth, 11 inches. Price: \$329.50. Manufacturer: Sony Corporation of America, 47-47 Van Dam St., Long Island City, N.Y. 11101. Optional walnut cabinet, \$24.50.

COMMENT: Very high performance, more than usual versatility, and high-quality construction characterize Sony's TA-2000, a separate preamp-control unit aimed at critical stereo listeners, hobbyists, and probably some professional users too. Its most obvious feature is the brace of VU meters on the front panel; these may be used to set channel balance of all signals, to measure frequency response and channel separation of phono pickups, to correct tape-head alignment when using a tape deck that lacks its own playback preamp, and to check on the frequency response of any tape deck.

The full roster of controls and features is impressive indeed. The top row of the front panel contains a volume control, the two meters, treble and bass tone controls, a mode selector, and a function selector. The tone controls, each of which operates on both channels simultaneously, are calibrated and stepped so that exact settings may be repeated for special purposes. In addition, a defeat switch enables you to cancel all tone control effects at once and return the system to flat response. The mode selector has positions for normal stereo, channel reversal, left only, right only, and balancing left and right channels.

The function selector is divided between a lever switch and a knob.

Across the bottom of the front panel there's the power off/on switch, a line output jack, a headphone jack with its own level control, a channel-balance knob, low and high frequency filter switches, three phone-jack inputs for auxiliary signals and for left and right channel microphones, and a tape monitor switch.

The front panel signal jacks can be ignored (they all are duplicated at the rear), or used as a convenience in making quick or temporary hookups, or—to an extent—used together with some of the rear panel jacks for special applications, including the hookup of three tape recorders at once, or listening on headphones while piping stereo to two completely different amplifier/speaker setups, and so on. The rear inputs include: tape head, phono 1, phono 2, tuner, auxiliary 1, and tape (amp). Each of these stereo pairs has its own level adjustment; in addition, one phono jack has a level switch that lets you connect the lowest signal-output phono pickups (moving-coil types) directly without the need for an intervening booster. There's also a five-pin DIN socket for hooking up a tape recorder that uses the unitized type of signal cable, common on recorders built abroad. The rear panel also contains two sets of stereo signal outputs and a mixed-signal ("center channel") output. The stereo outputs may be adjusted for signal values of 0.3 and 1 volt (to suit the input needs of different power amplifiers); the mixed-channel output is regulated by its own variable level control. The AC line



Square-wave response to 50 Hz.



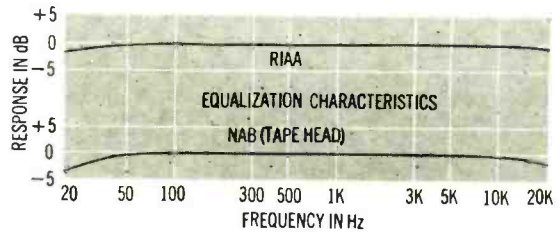
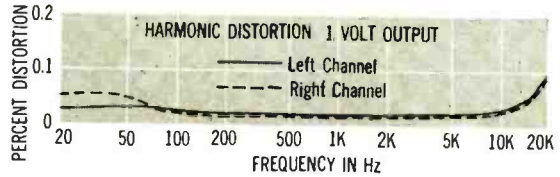
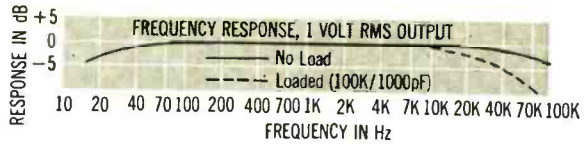
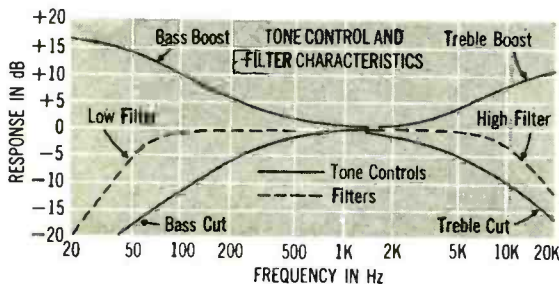
Square-wave response to 10 kHz with full IHF loading (100 K/1000 pF), left; without loading, right.

cord, four convenience outlets (three switched), and a grounding post complete the rear complement. Like all Sony components we've tested, the TA-2000 is extremely well built, showing evidence of high-grade parts, careful circuit layout, excellent shielding, and attention to details.

In CBS Lab tests, the TA-2000—under the maximum or "most strenuous" load used for preamp testing (the IHF load of 100 K, 1000 pF, which corresponds, roughly speaking, to about 36 feet of ordinary shielded signal cable)—furnished better than three times its rated output voltage at extremely low distortion. Frequency response at the very high end also varied somewhat with the degree of loading; under maximum load it still remained flat within plus zero, minus 3 dB from 20 Hz to beyond 20 kHz; under more normal loading conditions (corresponding, say, to up to twelve feet of audio cable between it and the power amp it is driving), the response was down only 3 dB out at 90 kHz. These, and other performance data are detailed in the accompanying graphs and chart. Note the very low distortion figures, and the excellent input sensitivities and signal-to-noise ratios. Equalization characteristics were virtually ruler-flat across the audio band; tone controls operated effectively; filter action was very good, showing fairly sharp cutoffs that could reduce a good deal of noise without degrading too much of the musical portion of a signal.

Incidentally, the headphone jack on the front panel is rated for 600 ohms or higher impedance headsets. We tried listening with low impedance headphones connected to this jack by turning the headphone level adjustment to maximum, and then using the master volume control to reach a comfortable listening level. It worked fine. If you try it, just remember not to turn the latter control up full—the signal meter needles will "peg"—that is, swing over suddenly to the extreme right.

CIRCLE 144 ON READER-SERVICE CARD



Sony TA-2000 Preamplifier

Lab Test Data

Performance characteristic	Measurement
Output (at 1 kHz into 100 K/1000 pF load)	
l ch at clipping	3.11 volts at 0.06% THD
center ch at clipping	8.3 volts at 0.28% THD
r ch at clipping	3.18 volts at 0.05% THD
both chs simultaneously	
l ch at clipping	3.10 volts at 0.057% THD
r ch at clipping	3.15 volts at 0.046% THD
Harmonic distortion, 1-volt output	left ch: under 0.095%, 20 Hz to 20 kHz right ch: under 0.086%, 20 Hz to 20 kHz
IM distortion, 1-volt output	0.05%
Frequency response, 1-watt level	with max load: +0, -3 dB, 20 Hz to 27 kHz with min load: +0, -3 dB, 20 Hz to 90 kHz
RIAA equalization	+0, -2 dB, 20 Hz to 20 kHz
NAB equalization	+0, -2 dB, 27 Hz to 20 kHz
Input characteristics for 1-volt output	
Tape head	Sensitivity 1.2 mV S/N ratio 58 dB
Phono 1	1.1 mV 63 dB
Phono 2 (normal)	1.1 mV 63 dB
Phono 2 (low)	0.17 mV 43 dB
Tuner	129.0 mV 80 dB
Aux 1	146.0 mV 80 dB
Aux 2	150.0 mV 80 dB
Tape in	132.0 mV 80 dB
Mike	1.1 mV 60 dB