

plugging the headphone stops the tape. A Hold button keeps you from accidentally turning the unit on or changing a station. Scan and Seek tuning make it easier to find radio stations. Dual headphone jacks let a friend listen in. Some models have a remote control.

Buying advice

Most walkabouts produce surprisingly good sound, roughly equivalent to what you would hear with a low-priced home audio system. When you pay more than \$75, you get such conveniences as digital

tuning with station-presetting capability, Dolby noise suppression, and a bass booster. Higher-priced walkabouts also tend to be more compact.

Don't buy more than you need. If radio reception where you live is weak, you may be better off with a unit that just plays tape. Or if you never listen to tapes, a radio-only model can save both money and considerable weight.

Sports models are typically bulkier than other walkabouts, but their cases provide some protection against water and occasional bumps and jolts.

Audio tape

► Ratings on page 55.

The beneficiary of countless improvements over the last 30 years, the best audio cassettes can handle the recording demands of a CD or other high-quality source.

In the years ahead, however, conventional cassette tape will have to compete with two new and inherently superior products—digital compact cassettes (DCC) and Mini Discs. DCC may represent the most immediate threat, because the new decks play conventional cassettes as well as the new type, so people with extensive tape libraries don't have to start all over. Both DCC and Mini-Disc recorders are still more expensive than a good analog cassette deck, and digital sound quality isn't essential for lots of situations, so the traditional cassette tape is likely to be around for years. Three brands dominate the U.S. market—*Maxell*, *TDK*, and *Memorex*, accounting for about two-thirds of sales.

The choices

The three main types of cassettes differ in the type of coating applied to the tape

and the strength of the signal—known as the bias—needed for a tape deck to control distortion:

Type I ("normal"). This is the oldest type sold, as well as the lowest quality and, at \$1 to \$2.50 per tape, the lowest priced. Its ferric-oxide coating is easily overwhelmed by louder sounds and, when sounds are soft, it produces a background hiss. Type I tape is best for speech, nondemanding music such as background music, or recordings that will be played under less than ideal conditions, such as in a boom box.

Type II ("high bias"). This type, which uses a high-energy ferrite or chromium dioxide coating, minimizes tape hiss and handles higher frequencies better than Type I. Use this type to record FM broadcasts, to make tapes for the car from CDs, or to make tapes for a walkabout. Expect to pay \$2 to \$4 per cassette.

Type IV ("metal"). This is the highest grade of tape. Not all tape decks can produce a strong enough bias signal, when recording, to take advantage of its capabil-

ities, but all should be able to play back tapes already recorded. Type IV tape is best for the most demanding applications, such as a live concert or music from a compact disc for listening at home. Prices range from about \$3 to as much as \$14 per tape.

Within the above types, manufacturers offer several grades of tape. Sony, for example, offers no less than five grades of Type II tape. Fancy, high-powered names, such as Turbo or Super, imply superior performances. Based on our tests, we wouldn't take the names too seriously.

Other considerations

Playing time. The time is indicated by the "C" number—C-60, C-90, and so forth. A C-90 tape plays 45 minutes per side. Tapes longer than C-90 haven't performed well in our tests, although they may be useful for recording two CDs or minimizing interruptions when taping a long speech.

Heat resistance. While the tape itself is reasonably tolerant of heat, the plastic carrying case may warp or come apart if it gets too hot. Temperatures inside a car can reach 130°F on a sunny day. We found that cassettes specifically designed to with-

stand such temperatures performed as advertised. Price: about \$12 on average.

The tests



We use laboratory instruments to gauge each tape's ability to render sounds both loud and soft. We also measure how much distortion strong signals produce, check for dropouts (a measure of quality control) and verify the tape's ability to respond to the standard bias signal. Heat resistance tests are performed at temperatures ranging from 104° up to 221°.

Buying advice

There's no point wasting money on a fancy tape when you're just recording speech or making tapes for a boom box. Just about any Type I tape will do.

For reasonably high quality recordings—FM broadcasts, copying high-quality cassettes or LPs, or for playback in a walk-about player or a good car deck—higher-rated Type I and Type II tapes are fine. Save Type IV tapes for recording live music and copying CDs. And don't assume that the highest-priced brand is the best—in our tests, it wasn't.

HOW TO USE THE RATINGS

- Read the **article** for general guidance about types and buying advice.
 - Read **Recommendations** for brand-name advice based on our tests.
 - Read the **Ratings order** to see whether products are listed in order of quality, by price, or alphabetically. Most Ratings are based on estimated quality, without regard to price.
 - Look to the **Ratings table** for specifics on the performance and features of individual models.
 - A model marked  has been discontinued, according to the manufacturer. A model marked  indicates that, according to the manufacturer, it has been replaced by a successor model whose performance should be similar to the tested model but whose features may vary.
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RATINGS AUDIO TAPES



▶ See report, page 34. From Consumer Reports, January 1993.

Recommendations: Just about any Type I tape will do for recordings for a cheap cassette deck in a noisy car, for a boom box, or for an answering machine. Choose higher-rated Type I and Type II tapes for recordings of a radio program, an LP record, or a CD to play in a quiet car, or to play in a walkabout. Higher-rated Type II and Type IV are for copying high-quality LPs, capturing live concerts, or copying CDs for critical listening. Under no circumstances, however, is the *TDK MA-XG* a good value; it cost us \$14 apiece.

Ratings order: Listed by types; within types, listed in order of overall score. Differences in score of 10 points or less were judged insignificant. List price is the manufacturer's suggested retail price for a single tape. Paid is the manufacturer's suggested retail and the average price we paid. **Notes to table:** Key to **Bias shift:** + or ++ means higher-than-normal bias; a - or -- means lower than normal bias. Symbols to **Sensitivity shift** indicate how different the playback level will be than with "standard" tape at the same recording level. Increased sensitivity is indicated by +. □ indicates model discontinued.

Brand and model	Price, list/paid	Overall score	Midrange	Treble	Distortion	Uniformity/ dropouts	Bias shift	Sensitivity shift	Comments
TYPE I ('NORMAL') TAPES									
Fuji DR-1	\$1.99/\$2.00	77	⊖	⊖	⊖	⊖	++	0	F,G
Sony ES 1 □	3.49/ 2.25	77	⊖	⊖	○	⊖	++	0	C,F
Maxell UDI* □	3.50/ 2.50	74	○	○	⊖	⊖	+	0	F
Maxell XLI-S* □	4.00/ 3.00	74	○	○	⊖	⊖	+	0	—
TDK DS-X	2.99/ 2.25	73	○	⊖	○	○	0	0	F
TDK D	1.99/ 1.50	68	○	○	⊖	○	+	0	—
BASF Ferro Extra I	0.99/ 1.00	67	○	○	○	⊖	+	0	—
Maxell UR	1.79/ 1.75	67	⊖	○	○	⊖	0	0	—
Scotch CX	1.50/ 1.25	67	○	○	○	⊖	0	0	—
Sony HF	1.69/ 1.75	67	○	○	○	⊖	0	0	—
Realistic Supertape XR	1.99/ 2.00	66	○	○	○	○	+	0	D
Denon DX1	2.25/ 1.75	65	⊖	○	○	⊖	0	-	C
Memorex MRXI	2.29/ 2.50	64	⊖	○	○	○	0	0	—
Scotch BX	1.25/ 1.50	64	⊖	○	○	○	0	0	—
JVC GI	1.55/ 1.50	62	⊖	○	○	⊖	0	0	—
Memorex dbs	1.59/ 1.50	61	⊖	○	○	⊖	-	0	—
Realistic Supertape LN	1.20/ 1.25	59	⊖	○	○	⊖	-	0	D
K Mart KMC 90* □	—/ 1.00	56	⊖	○	⊖	⊖	-	0	E
Certon HD	1.79/ 1.25	44	⊖	⊖	⊖	⊖	0	+	E
Certon C/90 LN	0.80/ 0.50	41	⊖	⊖	⊖	⊖	---	+++	E
TYPE II ('HIGH-BIAS') TAPES									
TDK SA-X	4.49/ 3.75	87	⊖	⊖	⊖	⊖	+	0	F

Ratings continued ▶

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▶ Ratings continued

Brand and model	Price, list/paid	Overall score	Midrange	Treble	Distortion	Uniformity/ dropouts	Bias shift	Sensitivity shift	Comments
Fuji DR-II	\$2.99/\$2.00	84	⊗	⊗	⊗	⊗	0	-	F,G
BASF Chrome Maxima II Ⓛ	3.99/ 2.75	83	⊗	⊗	⊗	⊗	0	-	—
Maxell XLII-S	4.39/ 3.25	83	⊗	⊗	⊗	⊗	+	0	B,F
Sony ES II	3.99/ 2.25	83	⊗	⊗	⊗	⊗	0	0	F
Sony UX Turbo	3.99/ 2.50	82	⊗	⊗	⊗	⊗	0	0	A,F
Sony UX-Pro	4.29/ 4.00	81	⊗	⊗	⊗	⊗	0	0	—
BASF Chrome Super II	2.99/ 2.25	79	⊗	⊗	⊗	⊗	+	-	—
Maxell XLII	3.79/ 2.75	79	⊗	⊗	⊗	⊗	0	0	F
Fuji FR-IIx	3.99/ 2.00	78	⊗	⊗	⊗	⊗	0	0	F,G
Maxell UDII* Ⓛ	4.00/ 2.75	78	⊗	⊗	⊗	⊗	0	0	F
TDK SD	2.99/ 2.50	78	⊗	⊗	⊗	⊗	0	0	F
Fuji FR-IIxPro	4.99/ 1.75	76	⊗	⊗	⊗	⊗	0	0	A
TDK SA	3.79/ 2.75	76	⊗	⊗	⊗	⊗	0	0	F
Denon HD6	3.25/ 2.25	75	⊗	⊗	⊗	⊗	0	0	F
Realistic Supertape M-II	4.79/ 4.75	75	⊗	⊗	⊗	⊗	0	-	D
Denon S-Port High (C-100)	2.50/ 2.25	74	⊗	⊗	⊗	⊗	0	0	F,G,H
Realistic Supertape HD	2.99/ 1.75	74	⊗	⊗	⊗	⊗	0	0	D
Sony ES II (C-100) Ⓛ	4.49/ 3.25	74	⊗	⊗	⊗	⊗	+	0	—
TDK SA (C-100)	4.39/ 2.75	74	⊗	⊗	⊗	⊗	0	0	F
3M Black Watch 2020	3.99/ 3.50	73	⊗	⊗	⊗	⊗	0	-	—
Denon HD8	4.75/ 3.25	72	⊗	⊗	⊗	⊗	0	0	F
Sony CDit II (C-94)	2.99/ 2.00	72	⊗	⊗	⊗	⊗	0	0	F,G
Sony UX	3.19/ 2.75	71	⊗	⊗	⊗	⊗	0	0	—
Denon HD7	4.00/ 3.00	69	⊗	⊗	⊗	⊗	0	0	F
Memorex HBS II	2.59/ 2.25	68	⊗	⊗	⊗	⊗	0	0	—
TYPE IV ('METAL') TAPES									
Sony Metal-ES Ⓛ	4.95/ 4.00	94	⊗	⊗	⊗	⊗	+++	-	—
Sony Metal Master	11.00/ 7.00	93	⊗	⊗	⊗	⊗	+++	-	B
TDK MA-XG	18.99/14.00	93	⊗	⊗	⊗	⊗	++	0	B
Fuji FR Metal	5.99/ 4.25	92	⊗	⊗	⊗	⊗	+	-	F,G
Maxell MX-S	5.29/ 4.00	89	⊗	⊗	⊗	⊗	++	0	B,F
Maxell Metal Vertex	14.99/13.25	89	⊗	⊗	⊗	⊗	++	0	B
TDK MA-X	5.29/ 4.50	88	⊗	⊗	⊗	⊗	++	0	—
Realistic Supertape M-IV	5.99/ 6.00	86	⊗	⊗	⊗	⊗	+++	0	D
Sony CDit IV Ⓛ	3.49/ 2.75	86	⊗	⊗	⊗	⊗	+	0	F,G
Sony Metal-SR	3.49/ 3.00	86	⊗	⊗	⊗	⊗	+	0	—
TDK MA	3.99/ 3.50	86	⊗	⊗	⊗	⊗	+++	0	F
Denon S-Port Metal (C-100)	3.50/ 3.50	83	⊗	⊗	⊗	⊗	0	0	F,G,H
Maxell MX	3.99/ 3.00	83	⊗	⊗	⊗	⊗	++	0	—

Brand and model	Price: list/paid	Overall score	Midrange	Treble	Distortion	Uniformity/ dropouts	Bias shift	Sensitivity shift	Comments
3M Black Watch 4040	\$4.59/\$4.50	82	⊕	⊕	○	⊕	+	0	—
Denon HD-M	5.50/ 3.25	82	⊕	⊕	○	⊕	+	+	F
Memorex CDX IV	2.99/ 2.75	82	⊕	⊕	○	○	+	0	—
Denon MG-X (C-100)	9.95/ 9.00	81	⊕	⊕	○	⊕	+	0	B

Performance Notes

Except as noted, all: • Cassettes and carrying cases were average in heat-resistance.

Key to Comments

A—Cassette and case much better than average in heat-resistance.

B—Cassette much better than average in heat-resistance.

C—Cassette better than average in heat-

resistance.

D—Cassette worse than average in heat-resistance.

E—Cassette much worse than average in heat-resistance.

F—Cassette case has rounded edges.

G—"Slimline" case, somewhat thinner than most.

H—According to mfr., formulation has changed since we conducted our tests.



RATINGS UNIVERSAL REMOTE CONTROLS

Better ← → Worse
 ⊕ ⊖ ○ ⊙ ●

▶ See report, page 21. From Consumer Reports, December 1992.

Recommendations: To control video devices, consider *One For All 3 Big Easy* (\$30) or *Sole Control SC-500* (\$60); both remote controls were easy to program and the *Sole Control* even controlled complex functions. For controlling both video and audio products, look first at the top four: the *Memorex CP8 Turbo* (\$90); the *Fox 600* (\$60); the *One For All 12* (\$99); the *RCA System Link RCU 100*, (\$50). Models that are discontinued may still be available but hard to find.

Ratings order: Listed by types; within types, listed in order of overall score. Models with equal scores are listed alphabetically. Price is the manufacturer's suggested retail; actual retail may be lower. [S] indicates tested model has been replaced by successor model; according to the manufacturer, the performance of new model should be similar to the tested model but features may vary. See page 58 for new model number and suggested retail price, if available. [D] indicates model discontinued.

Brand and model	Keypad											
	Overall score	Price	Components	Accessibility	Grouping	Differentiation	Visibility	Programming	Owner's manual	Code-entry	Learning	Comments
VIDEO ONLY												
One For All 3 Big Easy	88	\$30	4	⊕	⊕	⊕	⊕	⊕	✓	—	—	B,E,N
Sole Control SC-500 	84	60	6	⊕	○	⊕	○	⊕	✓	—	—	A,B
Zenith MBR 3020 	84	60	3	⊕	⊕	⊕	⊕	⊕	✓	—	—	I
Gemini Easy3	83	15	3	⊕	⊕	⊕	⊕	⊕	✓	—	—	I,N,W

Ratings continued ▶