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Nakamichi
680/680ZX
2-Speed Cassette Decks

680 Two-Speed Cassette Deck
The world's first high-fidelity, half-speed cassette recorder! Manual alignment achieves the same specs and the same performance as the highly acclaimed 680ZX—in a more economical version.

680ZX Auto Azimuth Alignment
"...simply superb... cannot be surpassed in any significant respect by any deck we know of. Indeed it's a good deck that can match at 1-7/8 ips what the Nakamichi can do at 15/16." (HIGH FIDELITY, May 1980)
"...advances the state of the art in a meaningful way...an historic event..." (MODERN RECORDING, April 1980)

15/16 ips or 1-7/8 ips—Your Choice!

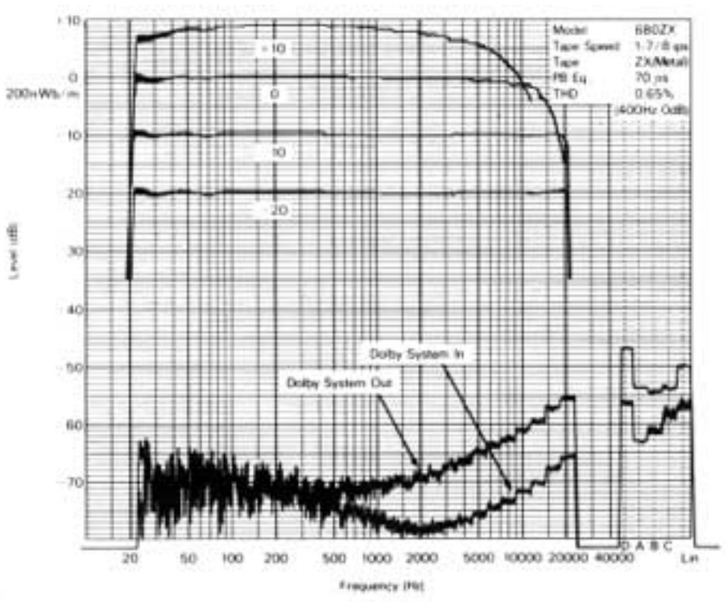
The Choice Is Yours

Why settle for a choice of tape when Nakamichi gives you a choice of *speed* as well? The 680 and 680ZX are the world's *first*, and *finest*, cassette decks to record at both *half* speed and *standard* speed. Three hours of music—a full opera, four or more LPs—on a single C-90! Half-speed performance that rivals that of many decks at full speed—15-kHz bandwidth sufficient for any FM broadcast and most records. Switch to standard speed, and the bandwidth extends to 22-kHz for the most demanding live recording!

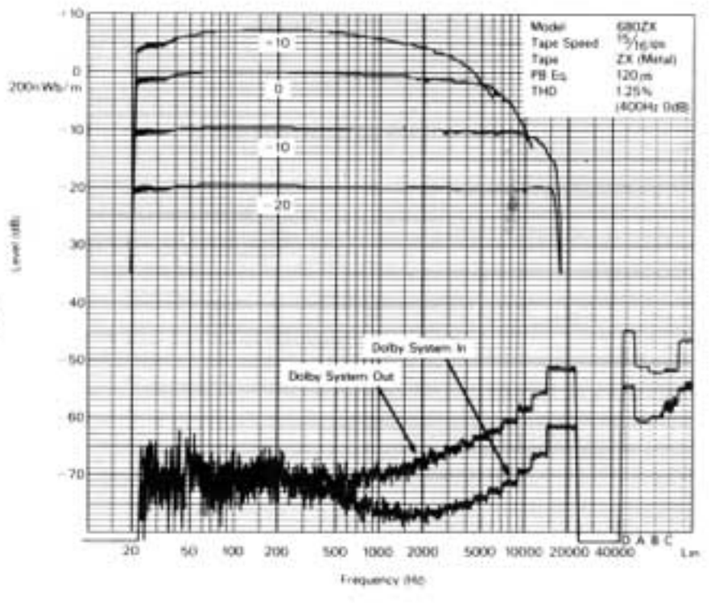
Choose the sophisticated 680ZX with Auto Azimuth Alignment or the economical 680 with manual control; both have *identical specifications*. With the 680ZX, errors in record-head azimuth—caused by cassette imperfections—are corrected at the flick of a switch. With the 680, *you* manipulate an azimuth-correcting control while observing the reading on the FL display.

What Makes It Possible?

Response to 15 kHz at 15/16 ips is equivalent to 30-kHz response at 1-7/8. With a 1.6-micron wavelength, more than 60 complete cycles fit within the thickness of this paper! To resolve the information, the P-9F Crystalloy head with critically-formed 0.6-micron gap (equivalent to one wavelength of light) was developed. To record these wavelengths requires a wider but equally precise gap with a sharp "critical recording zone" so the 3.5-micron R-8L Crystalloy record head was developed. Record and play head gaps must be aligned with absolute precision; a 0.1-degree error causes a loss of more than 5 dB! The solution is the Nakamichi Azimuth-Alignment system—manual in the 680, automatic in the 680ZX. The erase head is critical to ultra-short-wavelength recording. It must be powerful to erase metal tape but retain no magnetism during playback or short wavelengths will be partially obliterated. The E-8L Dual-Gap, Direct-Flux head is the answer—more efficient than a bulk eraser, absolutely safe for use at half speed.



Frequency Response/Noise Analysis (Standard Speed)



Frequency Response/Noise Analysis (Half Speed)

The transport must guide the tape with absolute precision to prevent tape skew and dynamic azimuth misalignment. The 680/680ZX drive is a highly refined Asymmetrical, Diffused-Resonance design. Dual capstans isolate the tape from the housing, and dissimilar capstan and pressure-roller diameters, together with different flywheel inertias, prevent resonance reinforcement—a common problem of other two-capstan machines. A pressure-pad lifter eliminates this source of tape skew, scrape flutter, and modulation noise; vibration is damped by special plastics and aluminum alloys; and, a Motor-Driven Cam replaces vibration-producing solenoids facilitating remote control and cueing.

This sophisticated technology benefits full-speed operation too. Response breaches the 20-kHz barrier; S/N is an outstanding 66 dB with THD under 0.8%. Recording headroom is unprecedented, and wow and flutter are virtually non-existent. Half-speed or full speed, a Nakamichi 680 or 680ZX boldly breaks the bounds of the "state-of-the-art."

That's Not All

Nakamichi advanced technology is not confined to transport and heads; it is evidenced in the DC recording amplifiers with Double-NF circuitry, in the 18-program Random Access Music Memory (RAMM), and in the exclusive high-resolution, 50-dB, dual-range/dual-speed Fluorescent-Meter (FL) display.

The FL display is no common "bar-graph" suffering from restricted range and crude resolution. HIGH FIDELITY calls it "unequivocally the most useful display available for the amateur recordist." Spanning a 50-dB range with 50 segments, resolution approaches ½ dB from −13 to +10 dB—four to six times finer than typical! When adjusting record-calibration and (on the 680) azimuth alignment, the resolution is even better. Choose between "peak-responding" and "VU" ballistics; in either case, a bright cursor "holds" the maximum level for a few seconds.

With the Nakamichi RAMM, you can skip over 1 to 18 programs in FF or REW to find the one you want. Programming the RAMM and creating interprogram breaks (REC MUTE) is accomplished with the normal control buttons so you can program remotely via the RM-200 accessory which also accesses the special Nakamichi cueing feature.

The 680/680ZX is loaded with other features: unattended operation via any accessory timer, tape-start memory, high-speed auto-shutoff, automatic slack tape takeup, ±6% pitch control, separate bias and eq selectors, Dolby NR with front-panel calibration and defeatable MPX filter, 400 Hz and 15-kHz test tones, high-output headphone jack and output-level control, individual record-level controls with master fader, removable rack-mount flanges, and DC power for Nakamichi Blackbox accessories.

Specifications:

Standard Speed (1-7/8 ips)

Frequency Response	10–22,000 Hz ±3 dB (−20 dB Rec. Level)
Signal-to-Noise Ratio	Better than 66 dB (400 Hz, 3% THD, A-WTD w/Dolby NR, ZX Tape, 70 μs Eq)
Total Harmonic Distortion (400 Hz, 0 dB)	Less than 0.8% (ZX Tape) Less than 1.0% (SX, EXII Tape)
Wow-and-Flutter	Less than 0.08% WTD Peak, 0.04% WTD RMS

Half Speed (15/16 ips)

Frequency Response	10–15,000 Hz ±3 dB (−20 dB, ZX Tape)
Signal-to-Noise Ratio	Better than 60 dB (400 Hz, 3% THD, A-WTD w/Dolby NR, ZX Tape, 120 μs Eq)
Total Harmonic Distortion	Less than 1.5% (400 Hz, 0 dB, ZX Tape)
Wow-and-Flutter	Less than 0.14% WTD Peak, 0.08% WTD RMS

General

Erasure	Better than 60 dB below saturation level (1 kHz, ZX Tape)
Separation	Better than 37 dB at 1 kHz, 0 dB
Crosstalk	Better than 60 dB at 1 kHz, 0 dB
Bias Frequency	105 kHz
Input	50mV, 50k ohms
Output Level	1V (400 Hz, 0 dB, Output Level at Max)
Headphone	45mW
Power Source	100, 120, 120/220-240, 220 or 240V; 50/60 Hz (according to country of sale)
Power Consumption	30W Max
Dimensions	482(W) x 143(H) x 340(D) millimeters 19(W) x 5⅝(H) x 13⅜(D) inches
Approximate Weight	9 kg, 19 lb 13 oz

*Specifications and appearance subject to change without notice.
*Dolby NR under license from Dolby Laboratories
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