X-1/Z-1 2-/4-CHANNEL CARTRIDGES

JVC has established a new and dynamic relationship between the cartridge design and quality by inventing the Pulse-Train Analytical Method. (Read more about this in the box.) The X-1 was the first product designed with the new method, while the Z-1 has the same structure as the X-1, but is priced less. For 2-channel and 4-channel use, both feature a wide range, clear definition and transparent tone quality. They faithfully reproduce silence, however transient, between notes and add tremendous presence to the reproduction of music.

0.15mm Square Shibata Stylus
The Shibata Stylus gives less load on record grooves than the elliptical stylus, and thus tracks wriggling groove contours more faithfully and improves frequency response. Because of the low-mass moving structure, the response is extended to 60kHz with the X-1 and 50kHz with the Z-1.

Beryllium Cantilever
The cantilever is made of beryllium, a material that is far lighter and stronger than widely-used aluminum or titanium. It has a greater velocity of sound propagation, and its flat response extends into the super high frequency range.

	Beryllium	Aluminum	Titanium
Density (gr/cm)	1.84	2.69	4.54
Young Modulus (kg/mm)	28,000	7,400	11,000
Velocity of Sound Propagation (m/sec)	12,600	6,420	5,990

One-Point Suspension
A very thin wire, mounted to the center-hold bushing, suspends the moving structure. Since this design clearly defines the fulcrum of the moving structure, intermodulation distortion is reduced.

Samarium Cobalt Magnet
JVC has used samarium cobalt for the magnet piece, a material that has low specific gravity and high energy product. Thanks to this new alloy formation, the moving structure is lightweight, and offers improved tracking ability and stable output.

Laminated Core Pole Pieces
Pole pieces are made of laminated core permalloy. This superior construction leads to improved frequency response. Loss of information in the super high frequencies, often experienced with high-impedance MM-type cartridges, is avoided.

SPECIFICATIONS

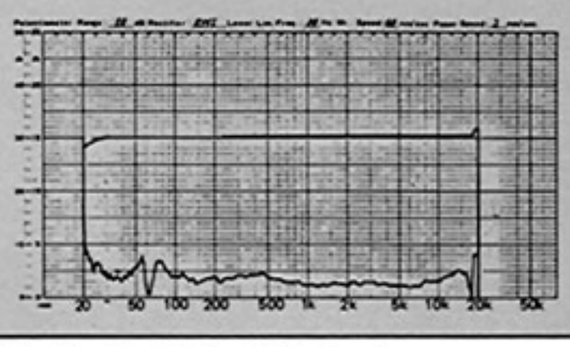
X-1

Type:	Moving-magnet
Stylus:	Shibata Stylus with 0.15mm square diamond tip, DT-X1
Output (1kHz):	More than 2.7mV (5cm/sec.)
Output Balance:	Less than 1.0dB
Channel Separation:	More than 25dB (1kHz) More than 20dB (30kHz)
Impedance:	2.2k ohms (1kHz)
DC Resistance:	470 ohms
Compliance (Dynamic):	12×10^{-6} cm/dyne (at 10QHz)
Load:	47–100k ohms
Optimum Tracking Force:	1.7 ± 0.15 grams
Frequency Response:	10–60,000Hz
Weight:	6.0 grams

Z-1

Type:	Moving-magnet
Stylus:	Shibata Stylus with 0.15mm square diamond tip, DT-Z1
Output (1kHz):	More than 4.0mV (5cm/sec.)
Output Balance:	Less than 2.0dB
Channel Separation:	More than 25dB (1kHz) More than 20dB (30kHz)
Impedance:	2.4k ohms (1kHz)
DC Resistance:	510 ohms
Compliance (Dynamic):	10×10^{-6} cm/dyne (at 100Hz)
Load:	47–100k ohms
Optimum Tracking Force:	1.7 ± 0.15 grams
Frequency Reponse:	10–50,000Hz
Weight:	5.5 grams

FREQUENCY RESPONSE (X-1)



FREQUENCY RESPONSE (Z-1)

Pulse-Train Analytical Method
A JVC-developed method used for measuring and analyzing the hitherto unmeasureable group-delay and phase characteristics of a transducer (speaker, cartridge, etc.) with the assistance of a specially-cut record containing pulsive signals, coupled with a computer data processing system. This new analytical method is largely responsible for the exceptional tonal performance of the X-1/Z-1 as it has helped JVC find ways to cope with transient distortion and group delay distortion. It showed that a cartridge should be lightweight, which in turn has led to the use of a shortened cantilever made of superlight beryllium and a one point suspension in the X-1/Z-1.

Microscopic view of Pulse-Train Test Record

(NOT AVAILABLE IN U.S.A. AND CANADA)