

QS 4-CHANNEL SYNTHESIZER/DECODER

SANSUI QSD1/2

QS
4-CHANNEL STEREO



world masterpieces

Sansui

QSD1

QS 4 Channel Synthesizer/Decoder

Raised in the professional world

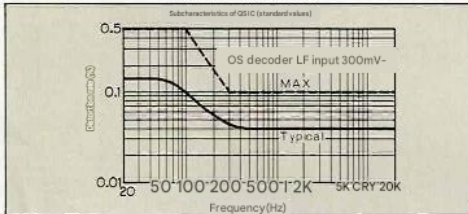
Standard price ¥79,800

The QS4 channel has undergone repeated technological development and improvement in the rigorous professional world. Professional QS encoders/decoders are already in use in recording studios and FM stations around the world, including Japan, and have achieved favorable results in comparison listening tests with discrete 4-channel master tapes. This QS variomatrix technology, developed in the professional world, has been made into an IC and is now installed in the QS4 channel synthesizer/decoder QSD-1. We are confident that this high quality sound can be delivered to audiophiles and professionals alike.

Features of QSD-1

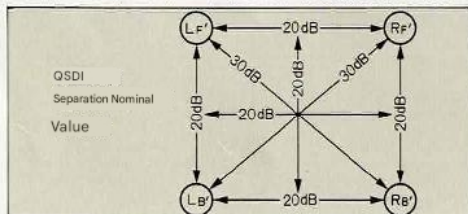
① Realizes Hi-Fi 4-channel with distortion rate of 0.1% or less (1kHz)

In designing the circuitry of the QSD-1, we gave top priority to a tone policy that emphasizes sound quality. There is no reason to accept that the physical characteristics of 4-channel playback are inferior to those of 2-channel playback. For this reason, the QSD-1 pursues characteristics that are at least as good as the grade of the high-end audio equipment connected to it, achieving low distortion and a wide dynamic range. In addition, we analyzed the results of listening to various program sources to achieve a satisfactory tone policy.



② Channel separation: 20-30dB (standard value)

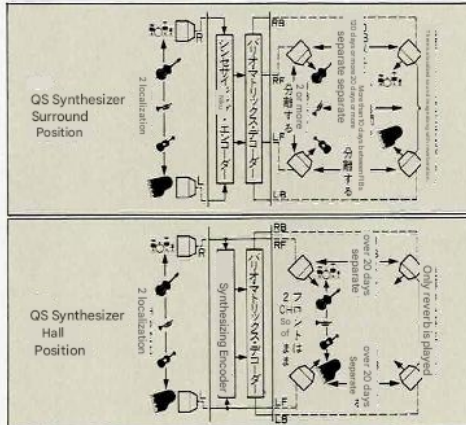
The matrix system has the image of having poorer separation than the discrete system, but by applying QS Vario-Matrix technology, theoretically infinite separation can be obtained, and the optimum value is set for the auditory sense, resulting in a discrete sound with clear positioning.



3. Equipped with high-performance synthesizer function

The main feature of the QS system is the synthesizer function. This synthesizer function does not just make a 2-channel source sound like a 4-channel source, but also creates a multi-sound field from the 2-channel source.

The QSD-1 has two effect positions, "Surround" and "Hall", that can be selected to suit the music.



●Surround

Like Separation between speakers is done by the decoder each, it achieves more than 20 dB of gain, placing the sound images all around the listener, as if playing a discrete 4-channel source.

●Hall

The two front speakers play the two-channel signal as is. The reverberation components contained in the source are reproduced from the rear, recreating a wonderful hall tone.

4. Functions as a professional monitor/decoder

The QSD-1 is a professional-grade 480mm standard rack panel size unit that can also be used as a monitor decoder in studios, etc.

The simple design adds elegance to your listening room.

New technology of IQSD-1

① QS Variomatrix Technology

The QS Vario Matrix circuit installed in the QS-1 provides separation comparable to that of discrete playback. However, in order to increase separation, many 4-channel devices change the volume of specific channels, narrow the playback band, or lose intermediate positioning, thus sacrificing the requirements of Hi-Fi devices.

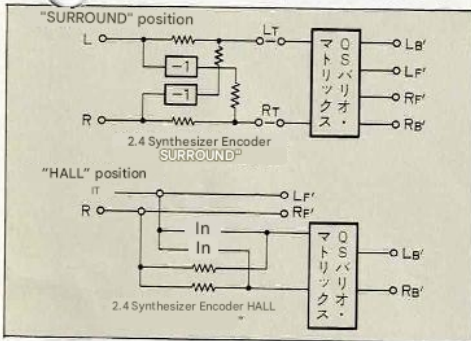
The matrix circuit skillfully utilizes psychoacoustic phenomena to meet the requirements of Hi-Fi equipment. The human ear has a "loudness masking effect" in which it becomes difficult to hear quiet sounds when there is a loud sound. On the other hand, when there are sounds arriving simultaneously from multiple directions, the ear exhibits good directional detection ability for high-level sounds, but conversely, when the level is low, it becomes difficult to determine the direction; this is called "directional masking". However, the ear also reacts extremely sensitively to the presence or absence of low-level sounds. This is because even small sounds that cannot be distinguished by "loudness masking" can be detected if they are in a different direction from the main sound source.



"QS4 channel



It is possible to sense the direction of a sound. For example, the soft, resonant sound heard in a hall is a collection of small signals from an infinite number of directions, and even though the direction is unknown, this is a major factor in determining sound quality. The QS Vario-Matrix circuit cleverly utilizes this phenomenon. This operation detects information related to directionality from the left and right input signals (LT, RT) encoded by the QS encoder or synthesizing encoder, and creates a control signal. These signals are fed into the matrix constant control section, which then controls the large level of the instantaneous directional audio signal.



The matrix constants are automatically determined so that maximum separation is given to the signal levels and the direction of the sound source in the playback sound field is clearly conveyed. Also, due to the "directional masking phenomenon," even for relatively small levels, the sound is perceived as four-channel sound with sufficient separation.

IC. QS technology has been well

The QSD-1 uses a newly developed highly integrated received in professional equipment, and based on this technology of professional monitor decoders, we have realized the IC of the vario-matrix circuit in order to stabilize and equalize the characteristics. This IC consists of three types of ICs: a phase discrimination IC (HA1327), a control IC (HD3103P), and a matrix IC (HA1328).

Phase discrimination IC (HA1327)

The HA 1327 consists of 43 transistors and 14 diodes, and serves to detect the direction of the sound source by phase discrimination of the input signals (LT, RT). The control signal obtained here is sent to the matrix IC (HA1328) via the control IC (HD3103P).

●For control IC (HD3103P)

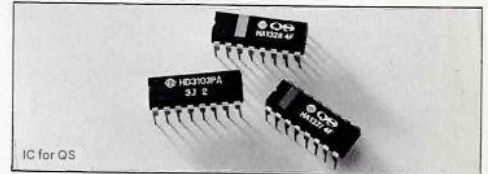
HD3103P is a MOS type FET array consisting of five FETs.

The internal resistance of the HA 1327 is changed by a control signal, which in turn changes the matrix coefficient of the HA 1328.

●Matrix IC (HA1328)

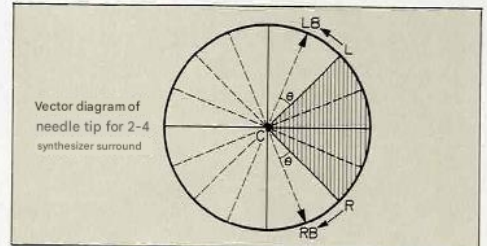
The HA 1328 consists of 50 transistors, and it matrices the input signals (LT, RT) and outputs four output signals (LF, RF, LB, RB).

At the same time, by combining it with the HD3103P, the matrix coefficients are changed to obtain a nominal inter-channel separation of 26 dB.



③ New QS synthesizer function

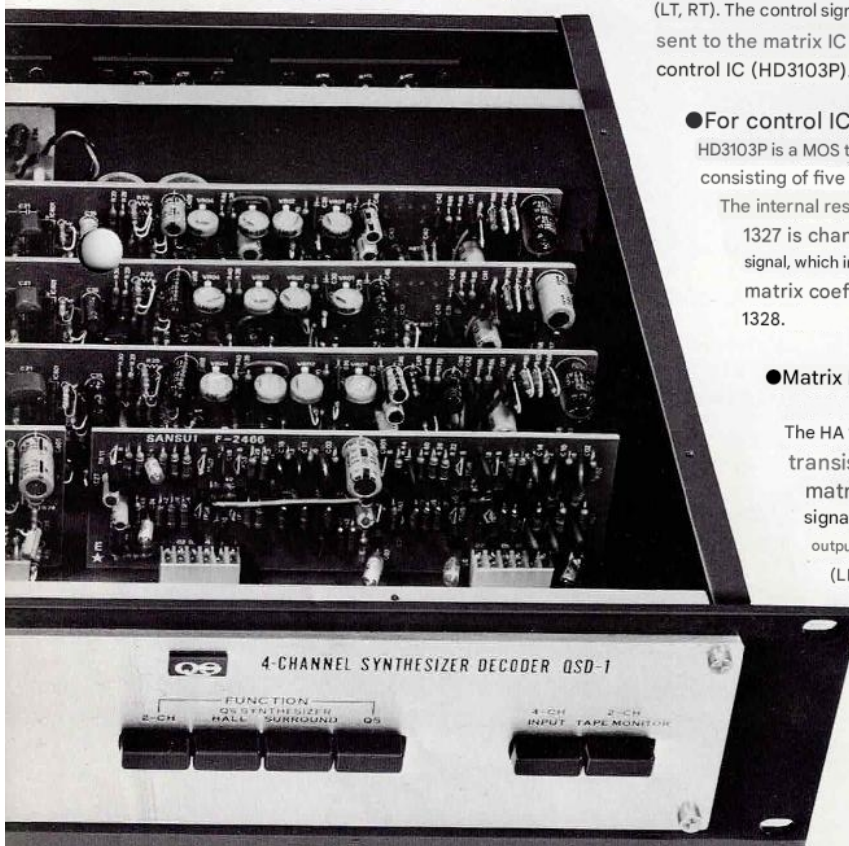
Sound field reproduction is possible not only with 4-channel sources, but also with 2-channel sources. The QSD-1 synthesizer passes the 2-channel signal through a synthesizing encoder circuit as shown in the figure, converts it into a spectrum close to the encoded signal as shown in the figure, and then passes it through a vario matrix circuit to obtain separation between speakers. The effect of this new QS synthesizer is so good that it is indistinguishable from a 4-channel discrete source, and it can be used to reproduce a 2-channel source. It's hard to believe.



④ Band-split vario-matrix circuit The QSD-1 uses multiple

The QSD-1 has a built-in decoder, which allows it to provide high quality sound. These QS technologies have been presented in papers and demonstrated at general meetings of the AES (Audio Engineering Society) in the United States and Europe, where the validity of the theory has been confirmed and the technology has been well received. Many basic patents have been applied for regarding the QSD-1, and U.S.PAT3825684, 3836715, and other patents have been granted.

Specifications (4 channel decoder section)	
QS decoder separation	20dB (adjacent channel) 30dB (opposing channel)
変率 (1kHz) Frequency Response QS Synthesizer	Less than 0.1% 20Hz ~ 30kHz
Separation Distortion (1kHz) 異相歪み特性	Equivalent to QS decoder section Equivalent to QS decoder section
Input sensitivity	100mV
20H input	140mV
TAPE MONITOR (2CH) 100mV 4CH input	140mV
[Maximum allowable input, 25V, level set minimum, THD 0.5%]	
output vol tage	300mV
4CH output noise level	250V or less (Level control maximum)
Fixed consumption power	10W
size	482 (W) , 88.5 (H) , 304 (D)mm
weight	6.6 kg



QSD2

QS 4 Channel Synthesizer/Decoder

Standard price ¥33,800

The fun of 4 channels

Beautifully reproduced.

The QS4 channel is based on Sansui's unique QS Vario Matrix technology and is used in the professional industry. Following the QSD-1, a machine for music enthusiasts that incorporates this excellent technology into an IC, we have developed a sister model, the QSD-2, in response to strong requests from music fans. In addition to the QS decoder that plays QS (RM) records, it also has a QS synthesizer function that not only reproduces your 2-channel source as 4 channels, but also clarifies the musical components contained in the source and improves the sound quality itself.

Features of QSD-2

1. Built-in QS synthesizer function that doubles the appeal of 2-channel sources

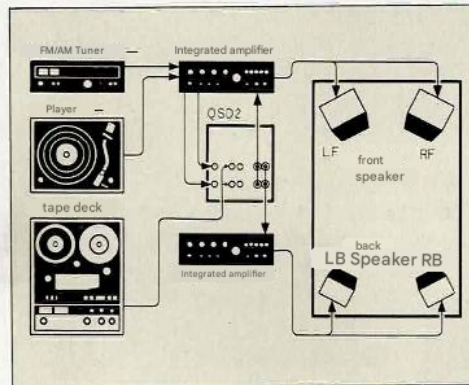
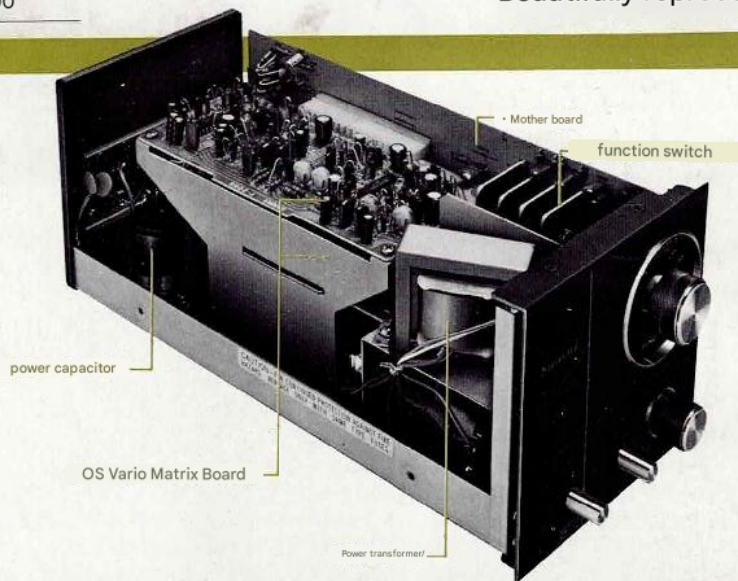
The QS Vario Matrix circuitry can convert your stereo records, tapes, and FM stereo broadcasts into four-disc discs. This function also allows you to select from two different effects to suit the type of music and your preferences.

<SURROUND>: Sound approaches from all around, as if it were a 4-channel discrete sound.

<HALL>: The reverberation components are actively reproduced through the rear speakers, giving the feeling of being in a hall.

② High quality playback of QS (RM) and SQ records QS (RM) 4-channel records are played back using the well-established QS decoder, and SQ records are played back at the same level or better than with the SQ semi-logic circuit using a unique phase matrix circuit.

③ Emphasis on musicality such as accurate positioning, with channel separation set to 20-30dB (standard value) ④ This is a Hi-Fi 4-channel device that achieves low distortion characteristics of 0.1% or less (1kHz).



Specifications	
<4-channel decoder section>	
QS decoder separation	20dB (adjacent channel) 30dB (opposing channel)
Distortion rate (1kHz)	Less than 0.1%
Frequency response	20Hz-30kHz
OS synthesizer separation	
Sub (kHz) frequency characteristics	Equivalent to QS decoder section
SQ Position (PHASE MATRIX) Separation (LF-RF) (CF-CB)	
	20dB 12dB
sensitivity	
20Hz input input	130mV
TAPE MONITOR (2CH) Output voltage (1kHz)	130mV
Rated output (FRONTE/BACK)	730mV / 730mV
Maximum output (FRONTE/BACK)	5V / 5V (0.5% THD)
Fixed consumption power	4.5W
size	126 (W) x 120 (H) x 288 (D)mm
weight	2.5kg

From QS-1 to QSD-2

History of QS4 Channel

In the summer of 1970, the QS-1 was released, a four-channel stereo system. The era of LEO began. It was a big event in the history of audio, just like the transition from mono to stereo. However, Sansui had been pursuing technological innovation in pursuit of "better sound" even before that. They had many achievements that anticipated the 4-channel era, such as the adoption of acoustic control functions based on sound field theory, the development of MD speakers, and the adoption of their own T.T.C. to increase the richness of reproduced sound. And now the QSD-1 and QSD-2 have been completed. The progress of the OS over the past four years is the culmination of Sansui's technology that leads the 4-channel stereo field.

June 1970

Announcement of the world's first four-channel device, the QS-1. The focus of attention was on the new four-channel sound that had never been experienced with previous stereo systems.

October

QS-1 released. QS 4 channel demo record produced.

November

FM Tokyo begins broadcasting QS4 channel programs.

April 1971

Experimental broadcasting begins on channel QS4 at WFMT in Chicago, USA.

Released the professional encoder QSE-1.

May

Four full-frequency channels including FM Tokyo and three other commercial stations.

The program "Sansui Channel 4 Golden Stage" begins broadcasting.

May

Three 4-channel separate stereo models, the Q-2400, 2200, and 2000, are released.

August

ABC in the United States adopted the QS method.

October

AES publishes QS 4 channel paper. During 1971, ABC Command, Audio Treasury, UK's Pye, France's Berkeley and other well-known labels adopt the QS method one after another.

April 1972

The Recording Industry Association of Japan established the QS 4-channel format and other standards as RM standards.

May

Published the theory of QS variomatrix at AES in September.

April 1973

AES announces the professional encoder and decoder QSE-4 and QSD-4, and the QS4 channel system attracted attention in the software industry.

Exhibited and performed professional QS equipment at the All Japan Audio Fair.

By 1972, many well-known labels both in Japan and abroad, including Teichiku, Toshiba, Nippon Crown, Opaton, A&M, Impulse, and Era, had adopted the QS system.

April 1973

New 4-channel products equipped with QS Vario Matrix: QA-7000, QSC-9050, QRX-3500,

With the release of the 3000, the variety of devices offering high-quality four-channel sound has increased.

July to December

We are working with HiBach to convert the QS Vario Matrix circuit into an IC, which

is being completed in stages.

The RIAA (Recording Industry Association of America) approves the QS

method as the correct standard.

Labels that adopted the QS (RM) system by 1973

The number of labels released has reached 60, both domestic and international.

The number of records has also increased significantly.

1974

Released the QRX-2000, a popular 4-channel receiver equipped with a QS Vario Matrix.

Professional grade, QS Vario Matrix IC adopted Synthesizer/Decoder QSD-1 and its

The QA-pre amplifier inherited the same concept as the original. The 6000, 5000 and Receiver QRX-5001 are now on sale.

April 1975

QS synthesizer with QS Palio matrix "Decoder QSD-2 released.

May

The first incredible sound system to appear in a film. The QS quintaphonic system was adopted for the "Tommy".

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