

SANSUI QRX7001

ALL-SOURCE FM/AM 4-CHANNEL RECEIVER



QS
4-CHANNEL STEREO

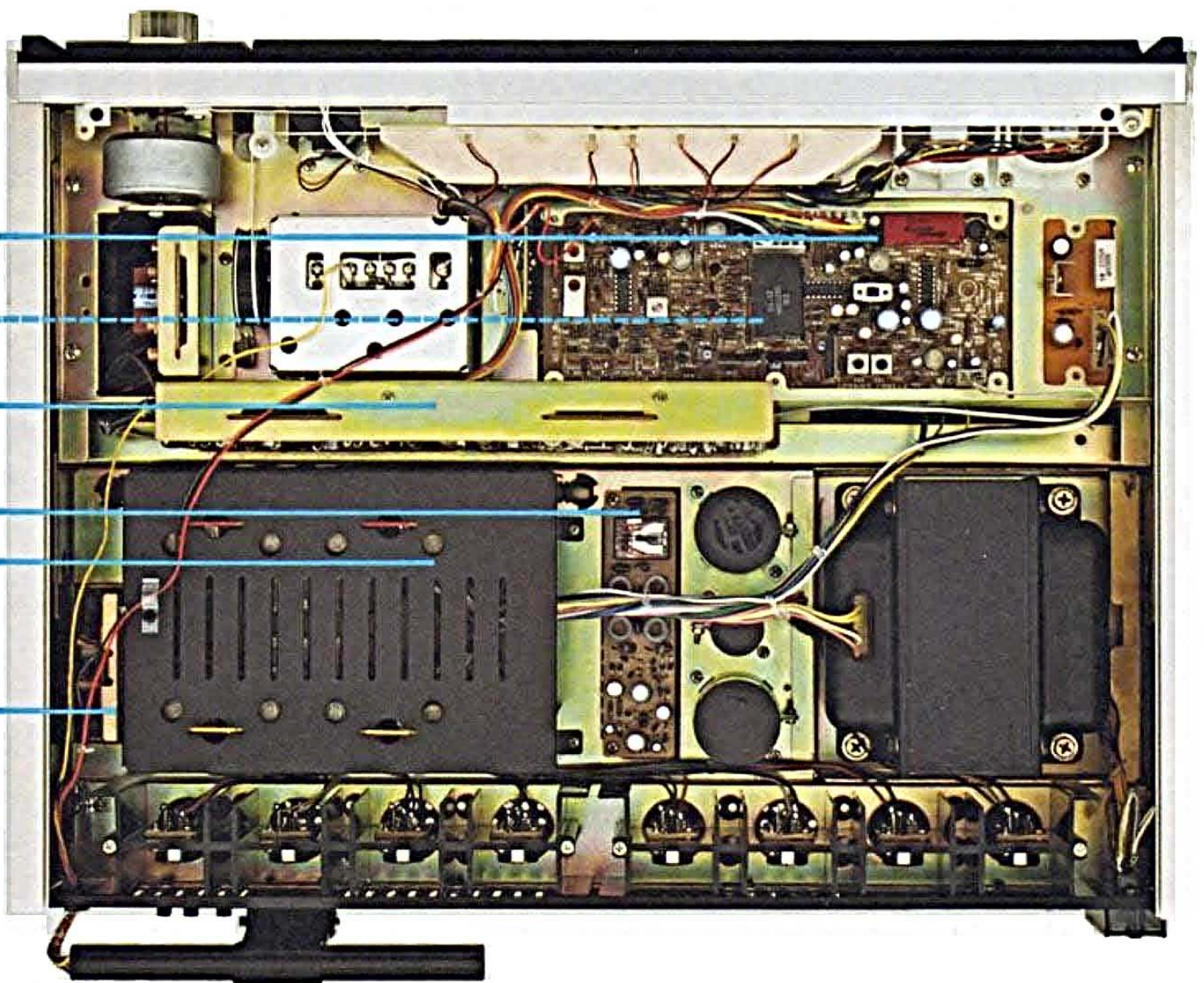
Sansui's QRX-7001 is a complete, all-source 4-channel receiver of extremely high performance standards. It plays all 4-channel music sources with true fidelity in addition to providing wide versatility, as an FM/AM stereo music control center. Its Type-A QS* vario-matrix decoder with just-developed Sansui QS ICs provides unequalled 20–30dB inter-channel separation from all QS matrix sources, as well

as affording the unique chance to enjoy 4-channel sound from your 2-channel sources in QS Synthesizer operation. A phase-matrix application of the QS vario-matrix also decodes SQ** matrix sources with superb front/back separation. Then we've included a CD-4† demodulator plus inputs for discrete tapes. Minimum RMS power is huge—35 watts per channel at 8 ohms, all

channels driven, with distortion held to 0.4% or less from 20 to 20kHz—thanks to its all-stage direct-coupled OCL power amplifier. The price is practical, however, due to Sansui's use of CBM construction and ICs. The new QRX-7001—best of its breed from Sansui, the 4-channel high fidelity people.

*QS TM Sansui **SQ TM CBS Inc. †CD-4 TM JVC Inc.

Sansui



IC EQUIPPED FM/AM TUNER

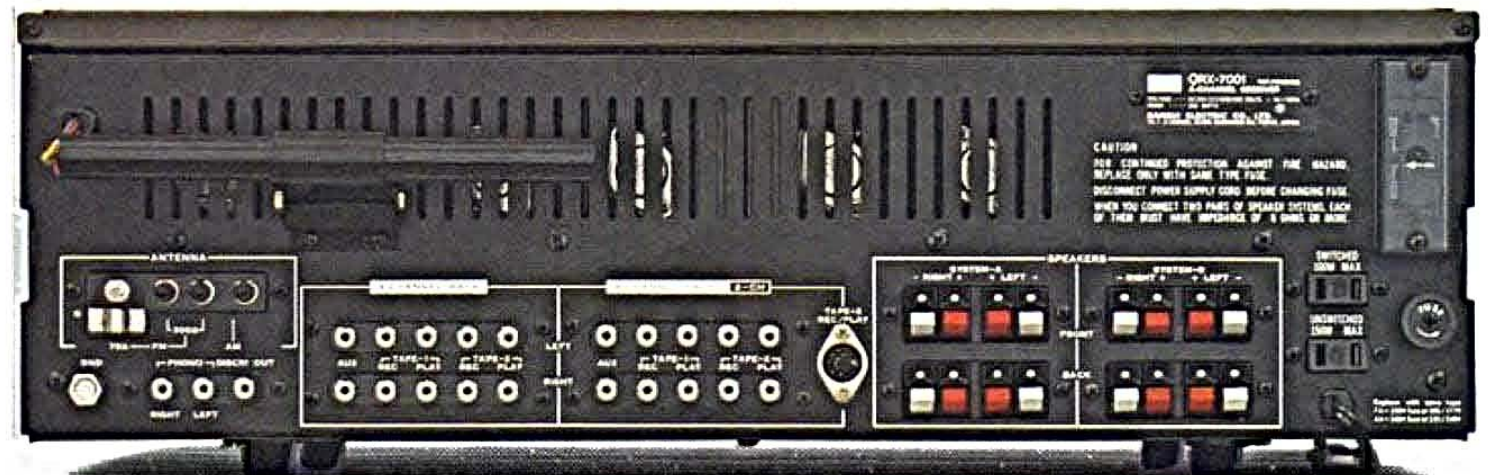
BUILT-IN CD-4 DEMODULATOR

TYPE A QS VARIO-MATRIX DECODER

PROTECTION CIRCUIT

DIRECT-COUPLED OCL 4-CHANNEL POWER AMPLIFIER

3 STAGE DIRECT-COUPLED PHONO EQUALIZER

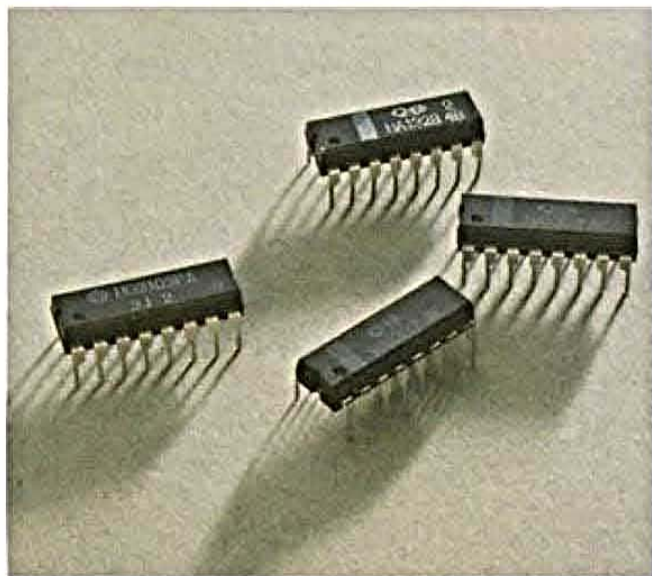


Sansui's all-source 4-channel receiver— IC-equipped Type-A QS vario-matrix decoder and CD-4 demodulator.

4-CHANNEL DECODER SECTION

ICs Improve QS Decoding

The QRX-7001 offers the latest and best IC-equipped 4-channel QS vario-matrix decoder (Type A), and a CD-4 demodulator, to provide all-source 4-channel capabilities without compromise. The QS vario-matrix decoder is created from four IC (integrated circuit) chips developed especially for "discrete" matrix decoding by Sansui. The decoder offers three outstanding 4-channel functions: (1) decoding QS 4-channel music, (2) decoding SQ 4-channel music, and, (3) a QS Synthesizer to convert your 2-channel stereo sources into 4-channel. Thanks to its ICs, the QS vario-matrix does all three with greater inter-channel separation characteristics than ever (see the back of this leaflet for technical details). In fact, the QS 4-channel separation you enjoy is theoretically equivalent to that of discrete 4-channel tapes.



Pushbutton Mode Selection

The seven pushbuttons beneath the dialpanel of the QRX-7001 select playback mode instantly:

QS is for decoding and reproducing QS-encoded 4-channel records, tapes and FM "quadricasts."

QS SYNTHESIZER-SURROUND creates a 4-channel sound field spread in a full 360-degree circle around the listener from conventional 2-channel sources.

QS SYNTHESIZER-HALL preserves original stereo sound "on-stage" while adding concert-hall ambience from the back channels from conventional 2-channel sources.

SQ is used to decode and reproduce SQ matrix 4-channel music. The phase matrix section of the QS vario-matrix

actually decodes SQ signals with proper front/back separation.

CD-4/4-CH DIRECT is used for playing CD-4 (and Quadradisc) records in 4-channel. Use it also when listening to any discrete 4-channel TAPE or AUX source.

2-CH DIRECT channels regular stereo signals to the front two speaker systems.

PLUS BACK additionally feed regular stereo signals to the two back speaker systems. (NOTE: If you push this button, you get stereo music of acoustically double power—left sounds come from the front and back left speakers, right sounds come from the front and back right speakers.)

4-Channel Control Convenience

There are individual treble and bass tone controls (4 in all) for the front and back channels. These operate from a 2-stage direct-coupled negative feedback amplifier for minimum distortion and a maximum signal-to-noise ratio. Each of the four tone controls has click stops for easy and correct calibration.

High and low filters (pushbuttons) are provided to cancel undesirable high or low-frequency sounds such as surface noise from a worn record, tape hiss or turntable motor rumble.

Then, for accurate channel-to-channel balancing, three separate controls are available—one for the relative left/right balance of the front channels, another for the back channels, and a third for balancing the front against the back channel output level.

There is a mode indicator with large, illuminated "4" and "2" symbols to show at a glance your playback mode.



Built-in CD-4 Demodulator

Sansui engineers designed their own demodulator from scratch. This has allowed a number of significant improvements in addition to such technical advancements as PLL, ICs, FETs and ANRS circuits. Some of such improvements are completely "beat-free" reproduction of 4-channel sound by the use of

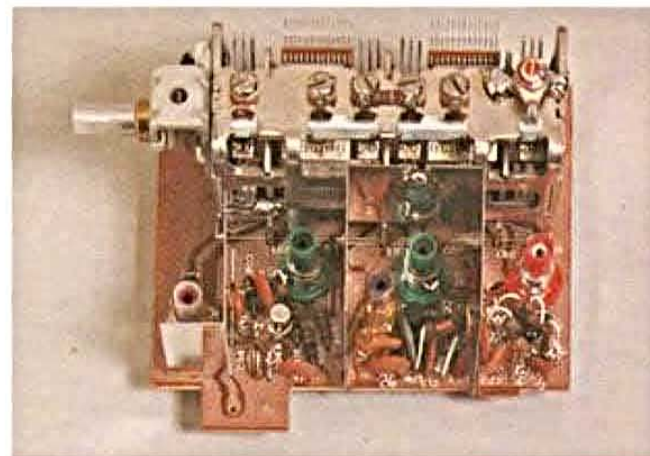
a sharp cut-off (by more than 50dB at 13kHz) 2-stage LC high-pass filter in the difference signal channels. In 4-channel sound, this makes a great difference since clean and transparent sound is assured. The CD-4 Demodulator is *bypassed entirely* when not in use. Another important convenience is the location of the CD-4 carrier level control and separation controls on the front panel of the QRX-7001. This placement saves you the trouble of moving the receiver to reach the rear panel whenever you adjust these controls. By the way, a free CD-4 Adjustment Record comes with the QRX-7001 as standard equipment.



FM/AM TUNER SECTIONS

Highly Sensitive FM Tuner

The FM frontend combines an elaborate 4-gang tuning capacitor and a dual-gated MOS FET (hand selected and tested for lowest noise). The frontend thus is able to pull weak as well as strong FM signals with outstanding sensitivity and high signal-to-noise ratio. The FM IF amplifier, too, is all new. It combines three newly-developed bi-resonator ceramic filters with a matching 2-stage differential amplifier and three limiter ICs. Together these make possible higher selectivity, improved capture ratio and better IF performance.



DDC FM Multiplex Demodulator

A special DDC (Differential Demodulator Circuit, Sansui patent pending) FM multiplex demodulator is used to maintain superior FM stereo separation well into the high frequencies. A special 2-stage low-pass filter is included to cut out all possible FM MPX carrier leakage, allowing you to record off the air directly into your tape deck without the possibility of beat interference from the deck's bias signal.

Other FM Features

Thanks to a special "adder circuit," the signal strength meter on the QRX-7001 is able to respond in precise proportion to the strength of incoming FM signals up to around a high 60dB. It is not easily flooded or saturated, and thus less easy to fool than are conventional meters. The center-of-channel meter for FM facilitates tuning at the lowest-distortion, best separation point of an incoming FM broadcast.

The FM muting circuit operates from a separate IC and is activated the moment the tuner is off-signal by $\pm 60\text{Hz}$.

There is $50\mu\text{S}/75\mu\text{S}$ FM de-emphasis switch for worldwide use.

The attractive blackout dialpanel has a linear FM scale, calibrated into equal sections of 250kHz each for quick and error-free use.

Finally, terminals for FM 4-CH OUT are provided on the rear panel to make expensive modifications to your receiver unnecessary when (and if) 4-channel discrete FM demodulators come on the market.

High-Integration IC AM Tuner

An IC of the high-integration type (containing the equivalent of 22 transistors and 11 diodes), along with a bi-resonator Jaumann ceramic filter, improves AM reception, sharpens selectivity and eliminates AM whine. The tuner features increased stability and reliability, and includes a space-wound, extra-length ferrite bar antenna for ideal input.

4-CHANNEL PRE AND POWER AMPS

3-Stage Direct-Coupled Phono Equalizer

The all-important phono equalizer amplifier is of a NPN-PNP-NPN 3-stage direct-coupled configuration employing extremely low-noise transistors. Driven by an exclusive, stabilized power supply, it delivers RIAA standard equalization with

minimal deviation from incoming phono signals for top transparency and dynamic range. Overload capacity is 150mV RMS with total harmonic distortion of 0.5% or less—meaning that the sound of your records will be clean and undistorted at all times.

Other Pre-Amp Features

Two 4-channel tape record/playback circuits, one 4-channel AUX circuit, one 2-channel DIN record/playback socket, a loudness contour circuit with push-button, two headphone jacks for 2- or 4-channel listening, and a speaker selector with a choice of A (four speakers), B (four speakers) or A+B (eight speakers) are provided.

High-Power Direct-Coupled Power Amplifier

An advanced all-stage direct-coupled semi-complementary OCL amplifier is included in an in-line connection after a constant-current differential amplifier. Driving your speakers with outstanding results, it delivers 35 watts per channel in continuous minimum RMS power over the receiver's entire 20–20,000Hz power bandwidth, with all channels driven simultaneously into an 8-ohms load at the rated total harmonic distortion figure of 0.4% or less.

To make sure that this enormous OCL amplifier does not damage your speakers, Sansui has included quadruple protection: (1) a relay-equipped electronic protector circuit detects any possible DC current content in output signals and cuts off the speaker terminals. (This also works to provide a slight lag between power-on and signal-delivery time to your speakers to avoid "popping" and possible damage.); (2) a thermal sensor circuit to detect overages in heat sink temperature and cut off the input stage in case of danger; (3) four quick-acting fuses to protect speakers the moment any short circuits appear at terminals, and

(4) a temperature compensator circuit for power transistors to keep them under tolerable temperature ranges and protect them from possible overloads or damage.

Giant Power Supply

One of the keys to Sansui's extremely stable and low-distortion high fidelity performance is the use of large power supplies wherever possible. The QRX-7001 has a central power supply circuit using an oversized transformer and a pair of 10,000 μF capacitors. It is of a dual-supply system, with two separate positive power supply circuits to provide a high power to all four channels over an extended operational period. It never gets "tired" and you never notice power irregularities.

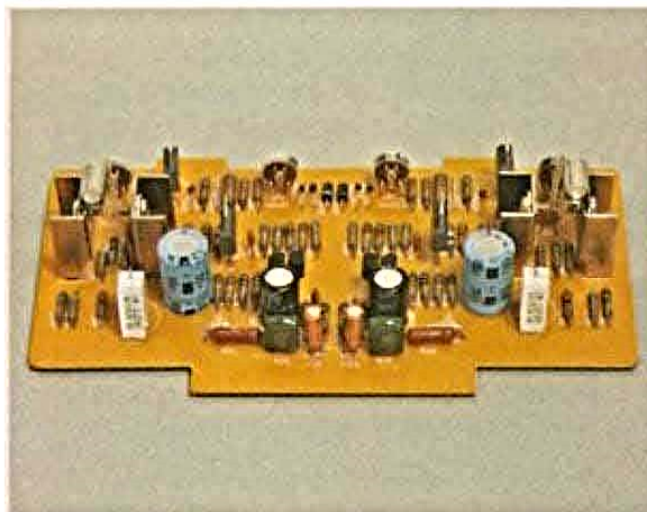


CONCEPT DESIGN

Eye-Appeal and Long-Life Design

The QRX-7001 features a handsome walnut finished top board, elegant blackout dialpanel and a sturdy, die-cast aluminum dial frame and front panel. Thick extruded aluminum side panels and double-strength interior bracing and durability.

The functional front and rear panel layouts, as well as interior circuit layouts, are designed for maximum convenience.



20–30dB 4-channel separation with Sansui's Type-A QS vario-matrix decoder.

The QRX-7001 incorporates the latest Type-A IC (integrated circuit) QS vario-matrix decoder.

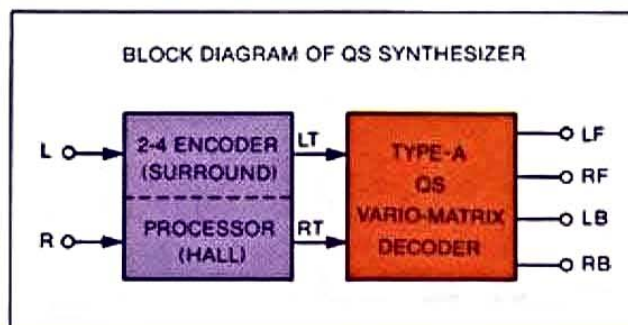
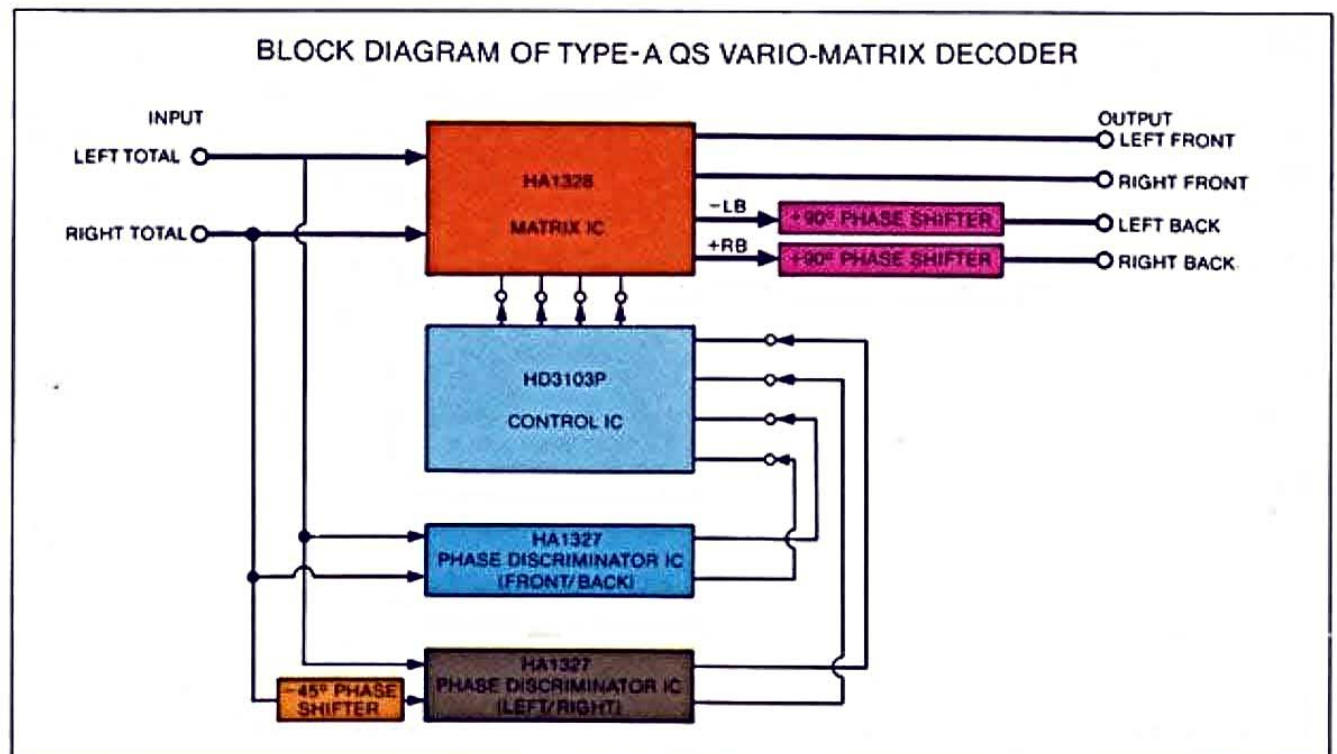
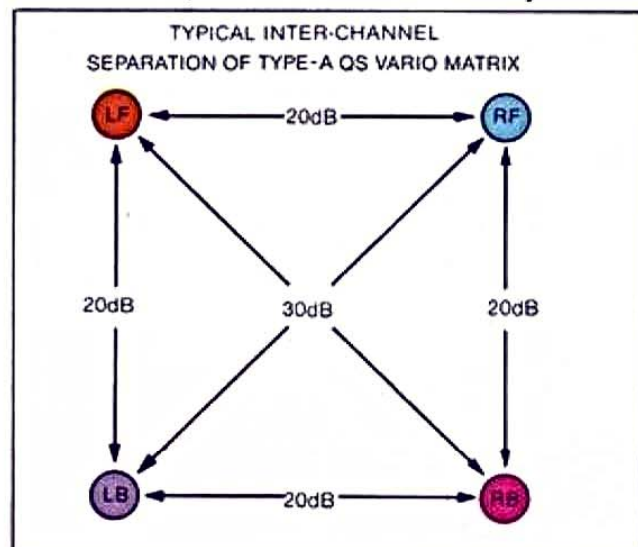
A special circuit associated with the QS vario-matrix works as a phase matrix decoder to handle SQ 4-channel sources. Still another circuit (QS Synthesizer) works as the *best* 2-channel-to-4-channel synthesizer on the market today. Following is a brief technical discussion of the new Type-A QS vario-matrix.

Type-A QS Vario-Matrix Decoder for 20–30dB Separation

Sansui was the first in the world to perfect and market a total 4-channel matrix encoding/decoding system. We called it the "QS and introduced System" it to the public in 1970. Since then, the system has undergone a significant improvement—QS vario-matrix. Today the entire QS 4-channel concept is complete, and called, simply, the "Type-A QS vario-matrix 4-channel decoder."

Four Sansui-developed IC chips for the Type-A QS vario-matrix decoder in the QRX-7001 provide 20–30dB inter-channel separation, higher reliability and better cost-to-performance ratio than ever before.

Specifically, the new Type-A QS vario-matrix decoder employs two phase-discriminator ICs, one matrix IC and one control IC. The first phase discriminator IC detects the phase relationship of the encoded signals to determine whether the predominant sound source(s) is in the front or back, and the second phase discriminator on the left or right of the original sound field at each and every moment. The resulting signals are then fed to the control IC (FET array) and then to matrix IC (hence the name vario-matrix) in such a way that the directionality of the predominant sound source(s) is most sharply defined. In so doing, the crosstalk is entirely eliminated. Maximum inter-channel separation is theoretically infinite,



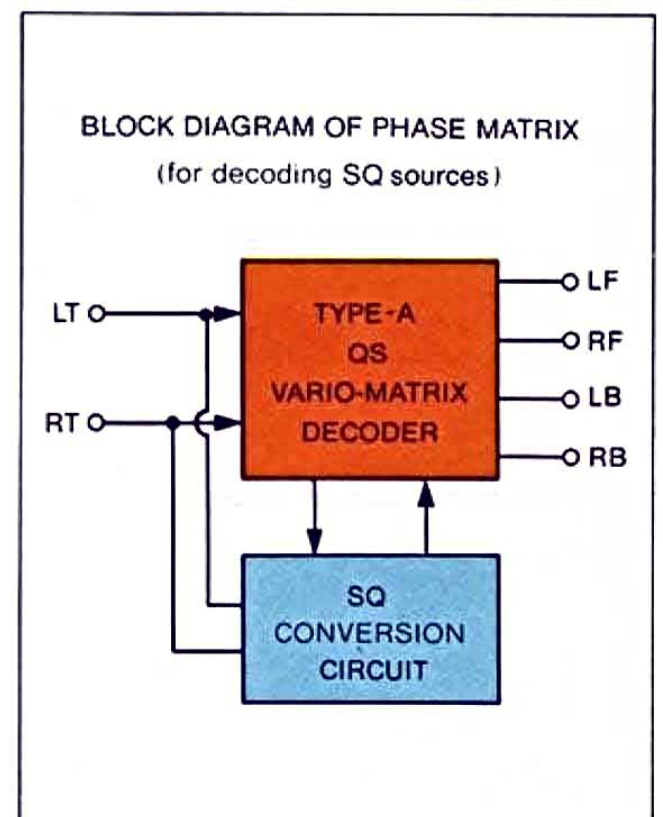
right on a par with discrete 4-channel recorded tapes. And since only the crosstalk is cancelled, not any of the signals, the content and expression of music do not change, a very distinct advantage of the QS system.

QS Synthesizers for Conventional Stereo Sources

Among the several so-called "synthesizers" available today, none is as effective as the QS Synthesizer. Like the others, the QS Synthesizer works to create 4-channel sound from conventional 2-channel stereo sources on the principle that such sources contain audio information which is "hidden" in conventional 2-channel playback.

In the QS Synthesizer, however, an exclusive "2-4 Synthesizer Encoder" at "Surround" position or a special "processor" at "Hall" position pre-processes the 2-channel signals and adjusts their signal configurations so that they are later converted most effectively into 4-channel by the QS vario-matrix decoder itself.

The results are indeed surprising. You will discover that the majority of the stereo records and tapes you now own, as well as most stereo FM music, is decoded with very high inter-channel separation as if they were made for such purposes originally.



Phase Matrix for SQ Decoding

The QS vario-matrix decoder has yet another unique advantage. With an conversion circuit added, it decodes SQ 4-channel sources encoded with the CBS-developed matrix system. We call it the "phase matrix function" of the QS vario-matrix decoder.

Basically, SQ differs from QS in two ways. One, SQ uses a matrix configuration different from that of QS. Two, unlike QS, matrix SQ depends solely on phase relationships in its encode-decode process. It therefore essentially requires some type of control logic in its decoder to obtain proper front-back separation. The phase matrix application of the QS vario-matrix decoder provides equal or even better front/back separation from SQ-encoded sources than an SQ decoder with front/back logic.

SPECIFICATIONS

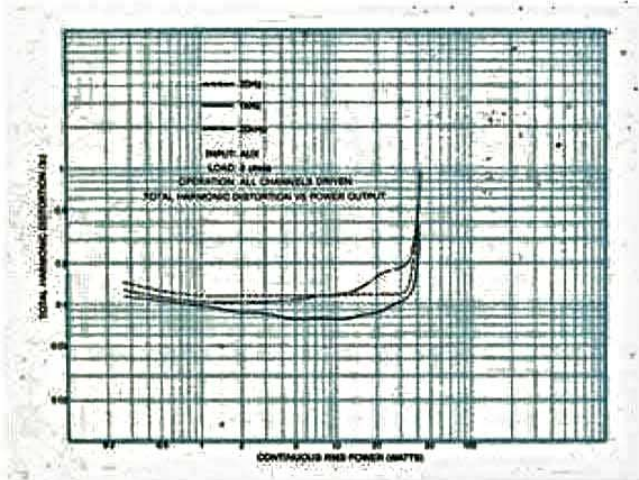
AUDIO SECTION POWER OUTPUT*

35 watts per channel, min. RMS, all channels driven into 8 ohms from 20Hz to 20kHz, with no more than 0.4% total harmonic distortion

43 watts per channel, min. RMS, all channels driven into 8 ohms at 1kHz, at rated total harmonic distortion

TOTAL HARMONIC DISTORTION*

OVERALL (AUX to speaker terminals)
less than 0.4% at or below rated min. RMS power output

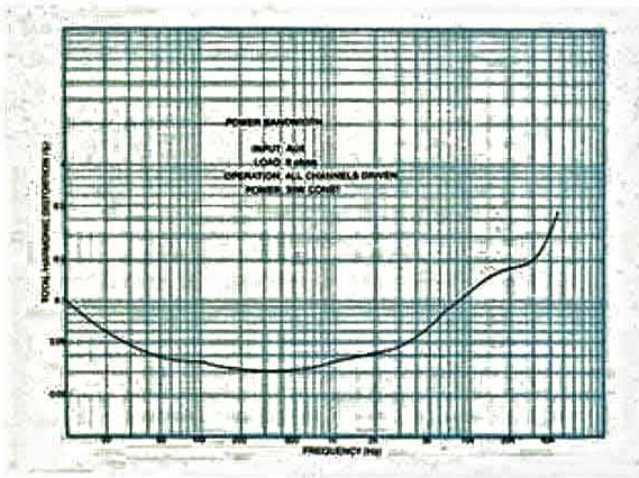


INTERMODULATION DISTORTION

(70Hz:7,000Hz=4:1 SMPTE method)
OVERALL (AUX to speaker terminals)
less than 0.4% at rated min. RMS power output

POWER BANDWIDTH*

20 to 20,000Hz at or below rated min. RMS power output and total harmonic distortion



LOAD IMPEDANCE* 8 ohms

FREQUENCY RESPONSE

OVERALL (AUX to power output)
15 to 30,000Hz ± 1.0 dB

EQUALIZATION (at REC OUT)

RIAA Curve
30 to 15,000Hz ± 1.0 dB

DAMPING FACTOR

approximately 10 at 8 ohm load

CHANNEL SEPARATION

(at rated output 1,000Hz)
PHONO better than 50dB
AUX better than 50dB

HUM and NOISE (IHF)

PHONO better than 70dB
AUX better than 80dB

INPUT SENSITIVITY (at rated output 1,000Hz)

PHONO 2.5mV 50k ohms
max. input capability more than 150mV RMS at 0.5% distortion

AUX (2-ch, 4-ch) 100mV 50k ohms
TAPE-1
PLAY Pin (2-ch, 4-ch) 100mV 50k ohms
REC/PLAY DIN (2-ch) 100mV 50k ohms
TAPE-2
PLAY Pin (2-ch, 4-ch) 100mV 50k ohms

RECORDING OUTPUT

TAPE-1
REC Pin (2-ch, 4-ch) 100mV
REC/PLAY DIN (2-ch) 30mV
TAPE-2
REC Pin (2-ch, 4-ch) 100mV

TONE CONTROLS

BASS ± 10 dB at 50Hz
TREBLE ± 10 dB at 10,000Hz

LOUDNESS

+8dB at 50Hz
+3dB at 10,000Hz

FILTERS

LOW (Front and Back)
-10dB at 50Hz (6dB/oct)
HIGH (Front and Back)
-10dB at 10,000Hz (6dB/oct)

4-CHANNEL DECODER SECTION

(TYPE-A QS VARIO-MATRIX)

FREQUENCY RESPONSE

20-30,000Hz
less than 0.1% (at 1,000Hz)

DISTORTION SEPARATION

QS Decoder 20dB (adjacent channels)
30dB (diagonal channels)
QS Synthesizer equivalent to QS Decoder
SQ Function (Phase Matrix) 20dB (front left/right channels)
12dB (center front/back channels)

CD-4 DEMODULATOR

FREQUENCY RESPONSE

(STD Test Signal at REC OUT)
30-15,000Hz Main-ch.

SEPARATION (STD Test Signal)
40dB (left/right channels)
25dB (front/back channels)

TUNER SECTION

FM:

TUNING RANGE 88 to 108MHz
SENSITIVITY (IHF) 1.9 μ V
max. input capability more than 120dB

TOTAL HARMONIC DISTORTION

MONO less than 0.3%
STEREO less than 0.5%

SELECTIVITY better than 70dB

CAPTURE RATIO (IHF)

less than 1.5dB

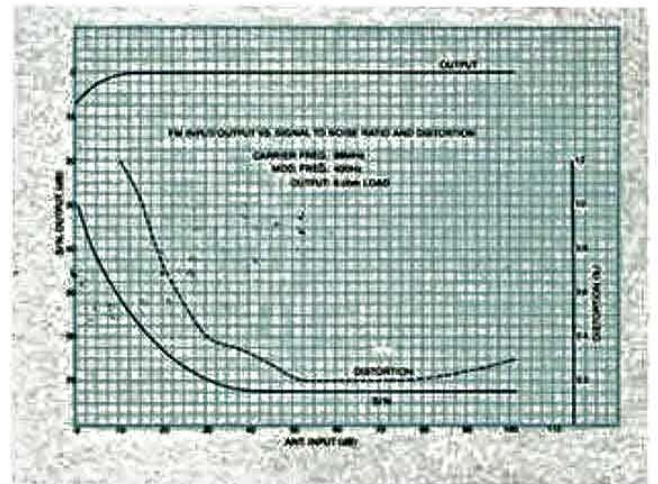
IMAGE REJECTION better than 75dB at 98MHz

IF REJECTION better than 90dB at 98MHz

SPURIOUS RESPONSE REJECTION better than 80dB at 98MHz

SIGNAL TO NOISE RATIO (MONO)

better than 70dB



STEREO SEPARATION

better than 40dB at 1,000Hz

FREQUENCY RESPONSE

30 to 15,000Hz
+0.5dB, -3.0dB

ANTENNA IMPEDANCE

300 ohms balanced,
75 ohms unbalanced

AM:

TUNING RANGE 535 to 1605kHz

SENSITIVITY (Bar Antenna) 53dB/m at 1,000kHz

SELECTIVITY better than 30dB at 1,000kHz ± 10 kHz

IMAGE REJECTION better than 80dB/m at 1,000kHz

IF REJECTION better than 80dB/m at 1,000kHz

GENERAL

SEMICONDUCTORS

107 Transistors, 9 FETs,
56 Diodes,
8 Zener Diodes, 9 ICs

POWER REQUIREMENTS

VOLTAGE 100, 117, 220, 240V, 50/60Hz
CONSUMPTION 220 watts (rated)
530 watts (max.)
610 VA (max.)

DIMENSIONS

540mm (21 $\frac{1}{8}$ " W
161mm (6 $\frac{3}{8}$ " H
403mm (15 $\frac{7}{8}$ " D

WEIGHT

23.8kg (52.5lbs) Net
26.5kg (58.4lbs) Packed

*Power specifications measured pursuant to U.S. Federal Trade Commission trade regulation on power output claims for amplifiers. Design and specifications subject to change without notice for improvements.