

# 4-CHANNEL RECEIVER SANSUI QRX5500



QS<sup>†</sup> REGULAR MATRIX  
4-CHANNEL STEREO

**4-CHANNEL FM/AM STEREO RECEIVER WITH QS<sup>†</sup> VARIO-MATRIX, 220 WATTS** Sansui's latest 4-channel techniques transform music listening into an art form. Only the pure, uncolored sound field of an original live musical performance will do for some music lovers. To others, perfect control over various aspects of the sound of music is a creative experience. Now the exciting new QRX-5500 satisfies purists and perfectionists alike. This professional-class 4-channel FM/AM receiver with QS vario-matrix and other Sansui-patented techniques reproduces any and all matrix-encoded program sources with virtually unlimited inter-channel separation—Sansui's own QS 4-channel records and 4-channel FM broadcasts, SQ,<sup>\*</sup> and all other matrixed sources. Its exclusive 2-4 Synthesizer Encoder converts all 2-channel sources into brilliant 4-channel sound more effectively than ever. To top off its complete 4-channel capabilities, the QRX-5500 features separate inputs to handle any and all discrete 4-channel sources as well. Four large, professional VU meters, separate bass/treble controls for all four channels, front/rear high and low filters, loudness and many other control circuits provide maxi-

imum versatility. There's a mic mixing amplifier with easy-to-use level control, tape circuits for a stereo and TWO 4-channel tape decks, TWO 4-channel AUX, (one for connecting a CD-4<sup>\*\*</sup> disc demodulator) TWO phono inputs and a 4-channel Direction switch to turn the sound field direction to any of four directions. The advanced tuners have MOS FET and IC circuitry, two tune meters and superb FM multiplex stereo separation and much more. Unparalleled tonal quality and exceptionally low-distortion performance of the QRX-5500 is assured by its all-stage direct-coupled OCL pure complementary power amplifier, elaborate plus/minus dual power supply and complete protection circuit. The art of music listening has a brand-new creative medium—the formidable 4-channel QRX-5500 receiver. From Sansui, of course. † TM Sansui. \*TM CBS, Inc. \*\*TM JVC, Inc.

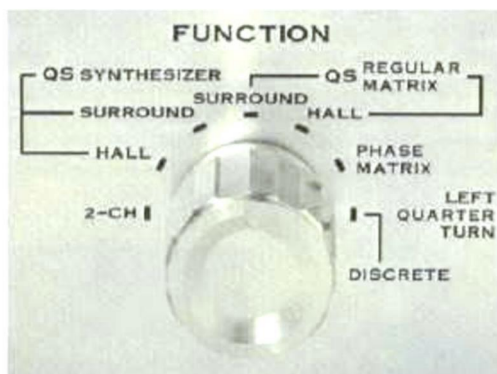
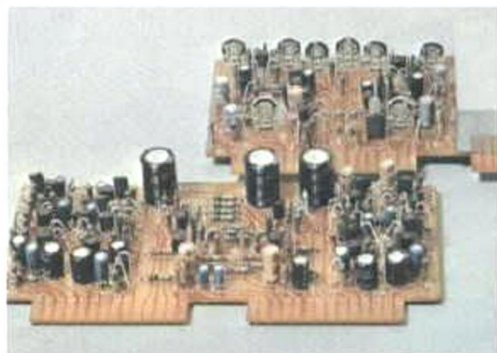
**Sansui**



# Another Sansui Exclusive— Virtually Unlimited Inter-channel Separation— Plus Pure Sound Field Reproduction of All 4-channel Sources

## SANSUI'S EXCLUSIVE QS 4-CHANNEL TECHNIQUE

Together they are called the QS regular matrix system—a simple way to present the entire range of elaborate 4-channel innovations developed by Sansui, originator of the world's only fully-approved regular matrix 4-channel technology. The QRX-5500 features all the latest developments in this exciting system: 1) a square decoding matrix and plus/minus 90° phase shifters; 2) new QS vario-matrix circuit which brings inter-channel separation in 4-channel use to a par with discrete tape; 3) Sansui's unique 2-4 Synthesizer Encoder to convert any 2-channel source into 4-channel, and, 4) the Phase Matrix circuit which takes advantage of the QS vario-matrix to decode SQ records with excellent front-rear separation in 4-channel. To simplify the use of this advanced circuitry, the QRX-5500 has a handy 7-position Function Control:



2-CHANNEL position is used when reproducing any conventional stereo program source in 2-channel from the front speaker systems only.

QS SYNTHESIZER—HALL position brings 4-channel realism to 2-channel sources. Natural concert hall ambience is recreated from the rear channels; "on stage" sounds are directed from the front channels with exactly identical location to 2-channel reproduction.

QS SYNTHESIZER—SURROUND position creates a 4-channel sound field from 2-channel sources with sounds appearing to come from all around the listener as if he were in the middle of ensemble.

QS REGULAR MATRIX—SURROUND position is usually best for full-circle listening to pop, rock, mood music and live recordings. The rotationally symmetrical configuration of the square matrix is ideal, enabling the recording engineer to place any particular sound in any specific part of the sound field which surrounds the listener.

QS REGULAR MATRIX—HALL position is used for decoding QS and some other matrix-encoded 4-channel sources (discs, tapes, FM) for full concert hall richness. Best for large orchestras, big band jazz, etc.

PHASE MATRIX position provides excellent front/rear separation for reproduction of CBS SQ matrix-encoded discs.

DISCRETE position allows you to hear whatever 4-channel sound source fed into one of the multiple discrete 4-channel inputs (AUX-1, -2 or Tape-1, 2) is selected.

## 4-CHANNEL CONTROL CONVENIENCE

Next to the Function Control is a 4-position Direction switch which turns the sound field around 90° at a time. No matter which way the listener faces, the "front" sound can be shifted to appear in front of him. To further enhance its creative control capabilities, Sansui designers insisted that the QRX-5500 be equipped with the finest tone control system available. No "all-in-one" controls here—the tonal response of each of the four channels can be tailored to your liking with separate friction-coupled left/right/front/rear tone controls for bass and treble. These are driven by a new amplifier with four low-noise PNP-NPN transistors using the NF

(negative feedback) design to bring wider dynamic range and much less distortion even at peak output. Each of the friction coupled control knobs has click stops for easy and correct calibration. A set of high and low filter push-buttons are provided for the front channels and another set for the rear. Naturally, separate left/right balance controls are included for the front and for the rear channels, with a main balance (front/rear) control for extra convenience. Four large, self-lighting VU meters let you monitor input signal levels precisely and the separate level control next to the meters prevent an excessive signal from entering the decoder amplifier.

## PROFESSIONAL MIC MIXING

A separate microphone input jack and a unique mic level control allow you to mix live sounds with any program source, reproduce mic-only or mic-mixed sounds through the front speakers and even record them. As the Direction switch changes so does the direction from which mic sounds are reproduced accordingly. The Sansui-developed, low-noise, FET-equipped mic amplifier has unique capabilities: as the mic level control is boosted, line input is proportionately reduced, and vice versa. This feature is highly appreciated by those who enjoy creating voice-over tapes for personal or professional use.







#### FM/AM TUNER SECTIONS

**Highly Sensitive FM Frontend:** Substantially higher sensitivity to distant FM transmissions, and very wide-margin station selectivity to assure accurate reception of individual transmissions, even in FM-crowded areas. These important qualities are guaranteed by the use of a dual-gated MOS FET and a 4-gang FM tuning capacitor in the FM frontend. To further enhance performance and achieve complete image frequency rejection, the mixer and RF stages are double tuned.

**Phase-Linear IF Amplifier:** For absolute phase linearity, the FM IF amplifier combines an extremely stable 3-stage differential amplifier, three bi-resonator ceramic filters and a 2-stage IC amplifier/limiter circuit. Additionally, a special phase-compensating circuit eliminates all possible phase deviation over an extremely wide bandwidth.

**IC-Equipped FM Multiplex Demodulator:** Optimum stereo separation of FM multiplex broadcasts is achieved—even in the delicate high-frequency ranges—through the use of an extremely stable IC in the FM multiplex demodulator. Amplification of the 19kHz multiplex pilot signal by completely-sealed LCs further improves stability and separation, while the 2-stage, sharp-cutting LC-type carrier leak filter eliminates any possible beat interference

caused by the bias frequency of any tape deck operated from the receiver.

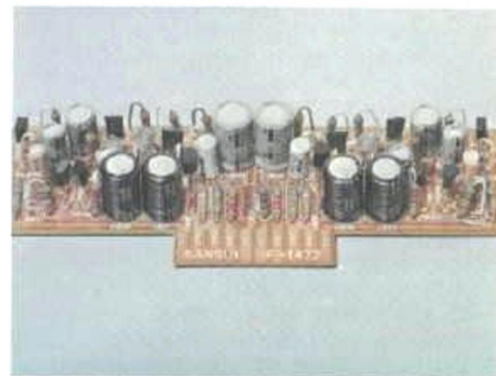
**Wide-Range AM Tuner:** The AM stage of the QRX-5500 lives up to the high standards set by Sansui engineers for the receiver's overall operation. A newly-developed, Jaumann-type filter combining a coil and ceramic filters improves noise characteristics. And to heighten AM sensitivity and widen reception range, the built-in ferrite bar antenna is space-wound and perfect for maximum performance.

**Extremely Easy Tuning:** The TWO tune meters in the QRX-5500 facilitate FM tuning as follows: the Signal meter on the left indicates when an FM (or an AM) transmission is tuned to maximum signal strength. Its indicator is well damped to deflect relatively slowly to avoid false indication. The Tune meter (FM only) is a center-of-channel indicator, balanced to register in the center of its easy-to-read scale when the FM tuner is tuned to the exact center of its discriminator output where distortion is minimum and stereo separation are maximum. In addition to these convenient meters, the dial scale is the FM-linear type, brightly illuminated, extremely easy to read and equipped with self-lighting indicator adjusted with a well-damped, solidly-mounted tuning control with a unique, new tune-tension mechanism for incredibly smooth, fast operation. The FM muting push-

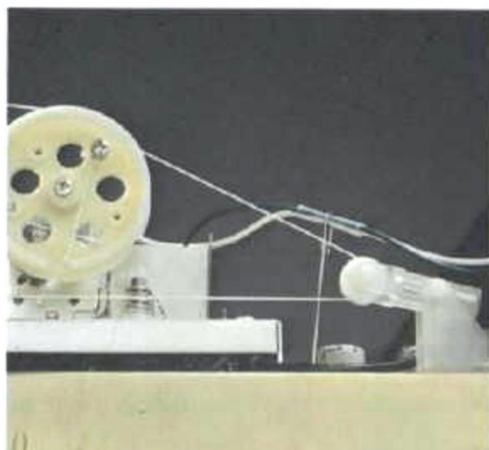
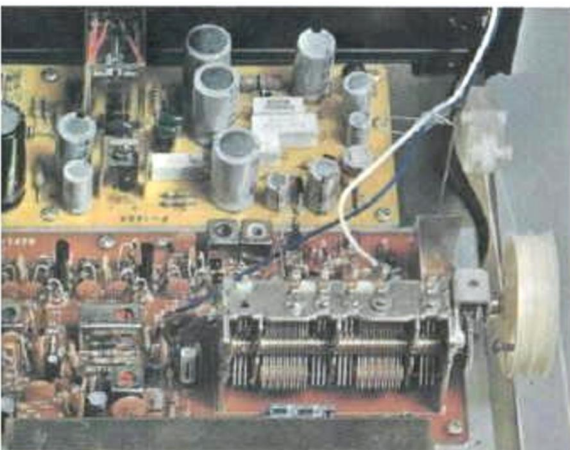
button can be locked on to cancel inter-station noise during tuning or switched off to facilitate tuning of very weak stations. And as an extra convenience, the "FM STEREO" indicator in the dial panel lights whenever the automatic mono/stereo changeover circuit in the tuner switches to an FM multiplex broadcast. FM antenna terminals are provided both for 75-ohm and 300-ohm type antenna leads.

#### ADVANCED 4-CHANNEL PRE-AND POWER AMPLIFIER SECTIONS

**Three-Stage Phono Equalizer:** The phono equalizer amplifier in the QRX-5500 is a 4-transistor, 3-stage circuit with low-noise PNP transistors in its initial stage and a complementary SEPP circuit in the final stage to achieve significantly better signal-to-noise ratio and wider dynamic range. Overload capacity is 250mV(1kHz, THD 0.5%). Because deviation from the RIAA curve severely affects the accurate reproduction of disc recordings, the QRX-5500's equalizer amplifier provides for only nominal deviation ( $\pm 1.0\text{dB}$ ) over the disc's nominal frequency



range of 30 to 15,000Hz. The equalizer's separate, constant-voltage power supply ensures high stability. Two separate stereo phono input sets are provided. A CD-4\*\* disc demodulator can be connected through either of the two sets of 4-channel auxiliary inputs. Naturally, these auxiliary inputs are also available for connecting a 4-channel cartridge tape player (freeing the tape circuits for cassette and openreel deck use) or one of the yet-to-be-marketed discrete 4-channel components of the future.



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Archiv Michael-Orto





Optional remote 4-channel balance/volume controller QBL-100

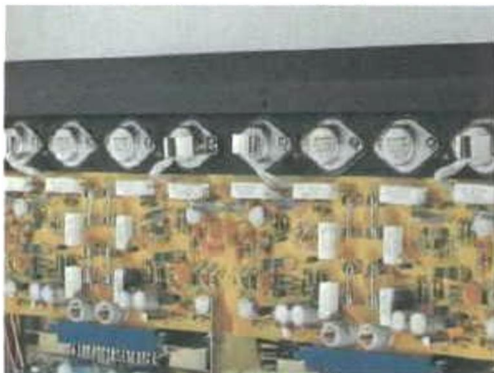
Optional 10 k $\Omega$  high quality dynamic microphone SDM-2

#### Versatile Tape Deck Record/Playback Facilities:

There are no less than three tape record/playback circuits in the QRX-5500, one for a conventional stereo cassette or open-reel deck and two for full 4-channel decks. Together they enable: 1) 2-channel recording and playback of stereo tapes in stereo or synthesized 4-channel use; 2) copying (reprinting) of one 2-channel tape from one deck to another; 3) complete 4-channel recording and playback on either of the two connected 4-channel decks (also capable of 2-channel recording/playback); 4) copying (reprinting) of a 4-channel tape from one 4-channel deck to the other, and, 5) simultaneous recording in 2- or 4-channel of any program source onto any two decks.

#### Direct-Coupled OCL Pure Complementary

**Power Amplifier:** As the technology of solid-state electronics continues to expand, and as new and better ways to use it are perfected, a seemingly endless string of "improvements" in high fidelity audio equipment are made possible. However, in some cases, "improvements"



in one direction can produce new problems in other directions, such as adding to distortion, reducing stability or impairing overall tonal quality in the name of better specification figures or simply in the name of "progress." Sansui engineers are extremely sensitive to such problems, and a great deal of thought, planning and actual testing went on before the power output section of the all-new QRX-5500 was approved. But now, thanks to its pure complementary push-pull circuitry, the phase and

crossover distortion factors of the QRX-5500 are so small that no human ear can detect them at any volume. Total harmonic distortion (T.H.D.) and intermodulation distortion are also inaudible, held to below 0.3% at rated RMS output of 30W/30W/30W/30W (or 220 watts peak). At the heart of this powerful new circuitry is a design which does away with the output coupling capacitor by coupling all stages directly. Thus we call it an all-stage direct-coupled OCL (output capacitorless) pure complementary amplifier. And ever a better demonstration of what it does to emphatically improve tonal quality, you'll call it amazing.

#### Highly Stable Power Supply and Complete

**Power Protection:** Its elaborate plus/minus dual power supply system employing a pair of oversized 10,000 $\mu$ F capacitors and a Zener diode to stabilize center voltage and hold distortion to a minimum distinguish the QRX-5500 from ordinary receivers. This type of extra-quality circuitry—which also includes a super-large power which is derived from the separate stabilized power supplies for each section and a ripple filter to improve stability, signal-to-noise ratio and distortion factors at low output levels in the 2-stage differential amplifier—results in exceptionally fine tonal quality and long, stable performance. The life of the power circuitry is further protected by an elaborate electronic team of quick-acting fuses and a relay, plus a 520mm long jumbo (1kg) heat sink. This double protection circuit also works to eliminate speaker "popping" when speaker systems are turned on or off.



**Other Features:** The QRX-5500 is equipped with two stereo headphone jacks (one for front, one for rear channels), loudness contour circuits with a pushbutton switch for all four channels, an attractive, easy-to-clean aluminum die-cast metal front panel, black-out acrylic tuning dial, function indicator lamps and a beautiful walnut finished all-wood cabinet. The rear panel has an adaptor socket for the Sansui QBL-100 4-channel Balance/Volume Control.



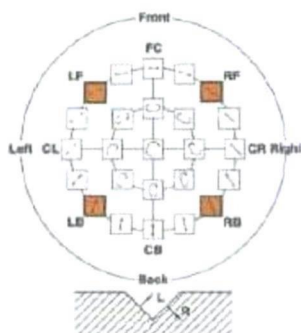
# Sensational Sound Field Reproduction and 4-channel Separation

—The Secrets in Sansui's All-New QS Vario-Matrix Circuit—

Can the matrix approach to 4-channel sound reproduction equal the reproduction of original sound image locations of discrete? Up until recently this was a very difficult question to answer. But now the answer is a big, resounding YES! And it's all because of Sansui's revolutionary QS vario-matrix technique.

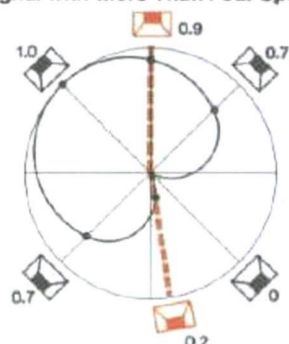
This exciting new improvement to the Sansui QS regular matrix system—upon which the worldwide standard for regular matrix systems is based—does away with the problem of inter-channel separation. And the best part is that it doesn't compromise tonal quality a bit. Here's an example of how this is accomplished.

Stylus Tip Movements on QS-encoded Disc

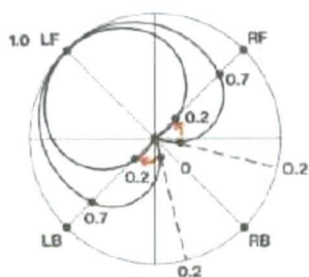


The original QS regular matrix system was able to reproduce a 360° sound field far superior to conventional 2-channel stereo. But it unfortunately allowed a crosstalk or leakage of sound from one channel into its neighboring channels of up to 0.7. Naturally, this made it difficult to locate sounds exactly and precisely within the 360° listening area.

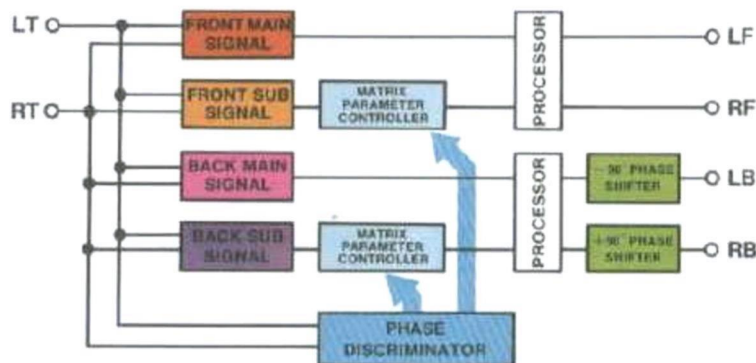
Hypothetical Reproduction of LF Signal with More Than Four Speakers



Improved Sound Pressure Response Curve by QS Vario-Matrix



Block Diagram of QS Vario-Matrix Decoder



To eliminate crosstalk, the new QS vario-matrix technique controls the operating parameter of the QS regular matrix according to the input signals it receives. It is therefore possible to preset the sound pressure response curve (see illustration) for a certain signal, say the LF (left front) signal, anywhere one chooses since, in a matrix 4-channel system, it is possible to obtain an output signal from any given point on the response curve itself. In this way, the reproduction of LF (left front) and LB (left back) signals are derived from two points close to the RB (right back) position where there is no leakage of sound whatsoever from the LF (left front) signal.

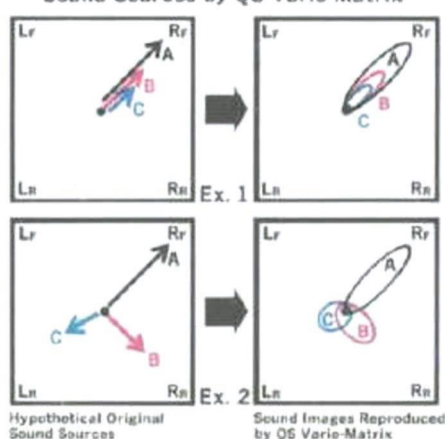
What would happen if multiple input signals entered the matrix simultaneously? Actually, the QS vario-matrix would continue to operate in much the same manner. But if these multiple input signals were of different levels and directionalities, the directionalities of the weaker signals would be somewhat obscured, at least in terms of physical measurement. However, and this is important, the human ear does not sense the obscuring of the directionalities of the weaker signals. This is because, when a number of sounds arrive at our ears simultaneously from different directions, our sense of hearing is momentarily attracted

by the loudest of those sounds. And it is insensitive to the directions from which the weaker sounds come. In the terminology of psycho-acoustics, this phenomenon is called "directional masking." Thus, to our ears, the 4-channel sound field reproduced by the QS vario-matrix circuits sounds almost identical to the original, live, multi-dimensional sound field. Equally important is another fact: The QS vario-matrix strictly preserves the total sound volume in the original sound field. And this is unlike some other matrix systems which control the amplifier gain in the neighboring channels to hide crosstalk. With the QS vario-matrix, the content or expression of your music does not change.

## QS Vario-Matrix Circuit

In terms of electronics, the QS vario-matrix consists primarily of a phase discriminator, a pair of matrix parameter controllers, and two special-purpose processors. These components work together in a unique way. As an example, let's look at the front channel signals. The front sub signal—part of the total sound derived from a QS-encoded 4-channel record—is controlled in level through a variable gain amplifier in the matrix parameter controller, according to a controls signal. This controlled sub signal then joins the main signal in the processor to separate the reproduced LF and FR signals. It is the phase discriminator that produces the control signal from an inter-relationship of the input signals.

Faithful Reproduction of Original Sound Sources by QS Vario-Matrix



## Other 4-Channel Functions of the QS Vario-Matrix

The QS regular matrix system 4-channel decoder—unlike any other matrix decoder—also provides a synthesizing function—the ability to convert conventional 2-channel stereo signals to 4-channel sound. We call this a QS Synthesizer and its operation has been further improved by the addition of the QS vario-matrix circuit. In all QRX receivers, a 90° phase shifter and a pair of special phase shifters are added to the QS vario-matrix circuit to perform the same decoding matrix function as that of an SQ matrix decoder. This means that the QRX-5500 is able to reproduce the CBS SQ program sources with impressive front-back separation.



# Specifications

## AUDIO SECTION

### POWER OUTPUT (at rated distortion)

MUSIC POWER (IHF) (at 1,000Hz)

220W (4 $\Omega$ )

160W (8 $\Omega$ )

### CONTINUOUS POWER

each channel driven (at 1,000Hz)

45W  $\times$  4 (4 $\Omega$ )

30W  $\times$  4 (8 $\Omega$ )

four channels driven (at 1,000Hz)

25W  $\times$  4 (8 $\Omega$ )

four channels driven (at 20—20,000Hz)

22W  $\times$  4 (8 $\Omega$ )

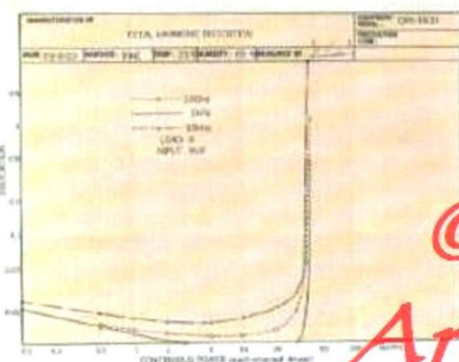
### TOTAL HARMONIC DISTORTION

(at rated output)

OVERALL (from AUX)

less than 0.3%

(FUNCTION: DISCRETE)



### INTERMODULATION DISTORTION

(at rated output,

70:7,000Hz=4:1 SMPTE method)

OVERALL (from AUX)

less than 0.3%

(FUNCTION: DISCRETE)

### POWER BANDWIDTH (IHF)

10—30,000Hz

### LOAD IMPEDANCE

4—16 $\Omega$

### DAMPING FACTOR

approx. 40 at 8 $\Omega$  load

### INPUT SENSITIVITY AND IMPEDANCE

(1kHz for rated output)

PHONO 2.5mV 50k $\Omega$

MAX. PHONO INPUT CAPABILITY

more than 250mV

at 0.5% distortion

MIC 2.5mV 10k $\Omega$

AUX (2-ch, 4-ch) 100mV 50k $\Omega$

TAPE MONITOR

(pin)(2-ch, 4-ch) 100mV 50k $\Omega$

(DIN)(2-ch) 100mV 50k $\Omega$

### RECORDING OUTPUT

TAPE REC

(pin)(2-ch, 4-ch) 100mV 50k $\Omega$

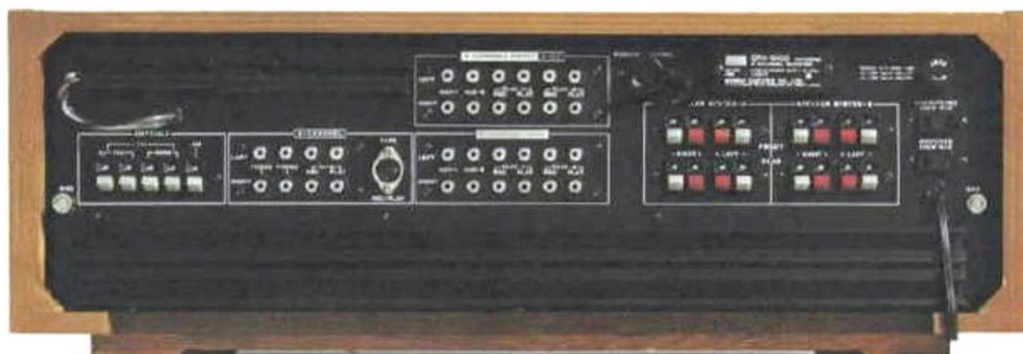
(DIN)(2-ch) 30mV 50k $\Omega$

### FREQUENCY RESPONSE (at 1W power output)

OVERALL (from AUX)

30—30,000Hz

+1.0dB, -1.5dB



### EQUALIZATION (RIAA Curve)

30—15,000Hz, within

$\pm 1.0$ dB at REC OUT

### CROSSTALK (FUNCTION: 2-ch)

better than 50dB at 1kHz

### HUM AND NOISE (IHF)

PHONO

better than 70dB

AUX

better than 80dB

### CONTROLS

BASS

+12dB, -12dB, at 50Hz

TREBLE

+12dB, -12dB, at 15,000Hz

LOUDNESS

+8dB at 50Hz, +3dB

at 10,000Hz

### FILTERS

LOW (Front & Rear)

-10dB at 50Hz (6dB/oct.)

HIGH (Front & Rear)

-10dB at 10,000Hz

(6dB/oct.)

### SYNTHESIZER/DECODER

QS regular matrix system

with QS vario-matrix circuit

### TUNER SECTION

#### FM:

TUNING RANGE 88—108MHz

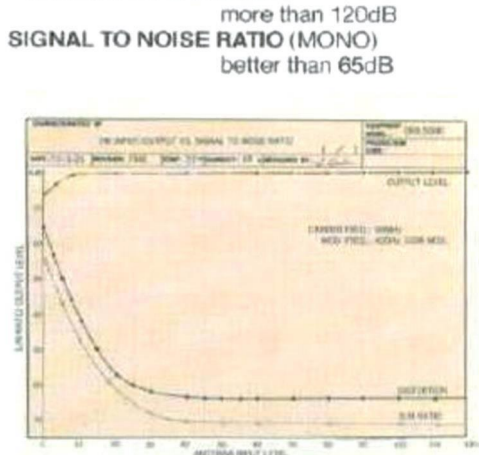
SENSITIVITY (IHF) 1.9 $\mu$ V

MAX. INPUT CAPABILITY

more than 120dB

SIGNAL TO NOISE RATIO (MONO)

better than 65dB



### CAPTURE RATIO (IHF)

better than 2.0dB

IMAGE REJECTION better than 75dB at 98MHz

IF REJECTION better than 90dB at 98MHz

### SPURIOUS RESPONSE REJECTION

better than 80dB at 98MHz

SELECTIVITY better than 60dB

TOTAL HARMONIC DISTORTION

MONO less than 0.3%

STEREO less than 0.5%

### STEREO SEPARATION

better than 37dB at 1,000Hz

### FREQUENCY RESPONSE

30—15,000Hz,

+1.0dB, -3.0dB

### ANTENNA IMPEDANCE

300 $\Omega$  balanced,

75 $\Omega$  unbalanced

### AM:

TUNING RANGE 535—1,605kHz

SENSITIVITY (Bar Antenna)

50dB/m at 1,000kHz

IMAGE REJECTION better than 80dB/m

at 1,000kHz

IF REJECTION better than 80dB/m

at 1,000kHz

SELECTIVITY better than 25dB at 1,000kHz

$\pm 10$ kHz

### SEMICONDUCTORS

136 Transistors, 5 FET's

80 Diodes, 6 Zener Diodes,

3 IC's

### POWER REQUIREMENTS

100/117/220/240V 50/60Hz

### POWER CONSUMPTION

110W (rated), 300VA (max.)

DIMENSIONS

594mm (23 $\frac{1}{2}$ ")W  $\times$  203mm

(8")H  $\times$  370mm (14 $\frac{5}{8}$ ")D

### WEIGHT

21.6kg (47.5 lbs.) Net

24.8 kg (54.6 lbs.) Packed

Design and specifications subject to change without notice for improvements.