YAMAHA CR600

STEREO FM/AM RECEIVER WITH DUAL TUNING METERS AND MIC MIXING

Sensitive tuner, precision pre-amp and two direct-coupled power amp channels—all in one value-oriented receiver.

The CR-600 combines three professional quality stereo components into one beautiful and rugged chassis:

A superbly sensitive, low-distortion tuner section featuring two tuning meters and Yamaha's exclusive auto-touch tuning.

A preamp-control section offering unusual precision and control flexibility, built-in microphone mixing, wide dynamic range and ultra-low noise and distortion.

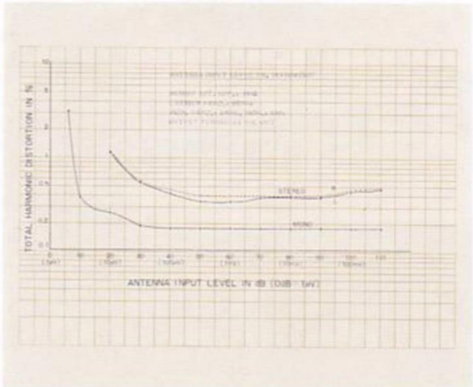
Two direct-coupled power amplifier channels, each conservatively rated at 35 continuous RMS watts.

FM TUNER SECION

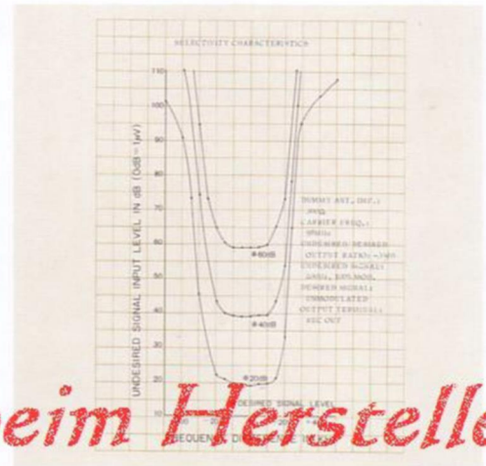
Sensitive FM Front End with Dual-Gated MOS FETs & Frequency-Linear 4-Gang Tuning Capacitor

Highly advanced electronic components add up to richly satisfying FM performance: a pair of super-low-noise dual-gated MOS FETs in the FM RF amplifier and mixer stage. IHF sensitivity is 2.0μV; image frequency rejection is better than 90dB. These figures assure an extraordinary response to each input signal, no matter how feeble the FM transmissions reaching your area may be.

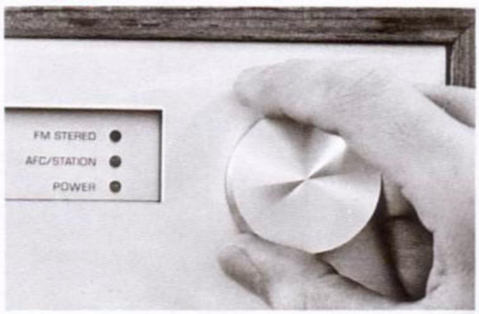
IC IF Amplifier with 3-Stage Differential Amplifier and Six Ceramic Filters



The IF amplifier in the FM tuner is constructed of an IC and three bi-resonator ceramic filters. Superb phase linearity and extraordinary band-pass characteristics are further improved with the selection of an IC design which houses an advanced 3-stage differential amplifier. These features result in outstanding 75dB FM selectivity, a 1.5dB capture ratio, and very low distortion of 0.3% at 400Hz in FM mono mode or 0.5% in stereo. The station you select will be received free of interference by neighboring transmissions, and free of discernible distortion, too.



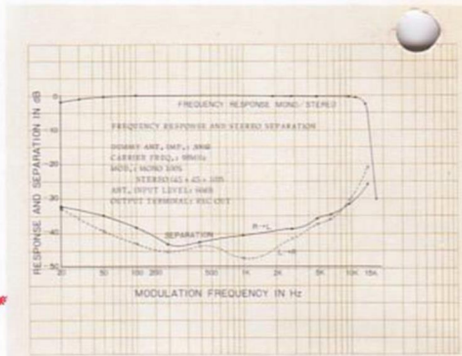
Yamaha-Exclusive Auto-Touch Tuning



Bull's-eye FM tuning has never been so easy. Simply touch the Tuning knob—which shuts off the built-in AFC (Automatic Frequency Control) circuit—and dial your favorite station. As soon as you release the Tuning knob, the AFC is re-activated, eliminating FM drift and guaranteeing steady, sharp FM reception regardless of fluctuations in power supply voltage or changes in tuner circuitry temperature.

Yamaha-Developed IC Multiplex Stereo Demodulator

High-frequency phase distortion and SCA interference is completely canceled by the unique balanced integrated circuitry in the FM multiplex demodulator of the CR-600. This maintains maximum stereo separation throughout the entire audio spectrum, even in the often blurry high frequencies. In addition, a special LC-type active filter—which needs absolutely no adjustment—minimizes carrier leakage and holds it to less than 40dB which contributes substantially to reduce beat interference and intermodulation distortion.



Permanent, Solid-State Diode Indicator Lights

The lamp indicators which tell you the status of the CR-600's power, FM stereo and AFC/Station operation, are of the LED (Light-Emitting Diode) type which last a lifetime.

Wide-Dynamic-Range Signal Strength Meter and Precise Center-Tune Meter

Unlike conventional meters, the exclusive circuit which controls the signal strength meter is an AGC (Automatic Gain Control) circuit able to indicate input signal strengths up to 100dB on the graduated meter scale. The Center-Tune Meter in the CR-600 is a center-of-channel type which registers at the center of its scale when the FM tuner is receiving a transmission at the center of its FM discriminator output. This position is where distortion is minimal and stereo separation is at its maximum.

Effective and Practical "Switched" FM Muting

The annoying inter-station noise found on all FM bands is completely eliminated by the FM muting circuit in the CR-600. It employs a special narrow-band ceramic filter and genarates no noise or dis-

tortion of its own as a station is tuned in or out.

Wide Slide-Rule Dial for Ultra-Smooth Tuning

Yamaha has used an oversized, extra-heavy tuning flywheel and a specially-designed precision tuning mechanism to prevent backlash or vertical wobbling of tuning indicator on the slide-rule type dial.

300-Ohm & 75-Ohm FM Antenna Terminals

Three-Stage Direct-Coupled IC Equalizer Amplifier

The sophisticated phono equalizer amplifier in the CR-600 is of an advanced 3-stage direct-coupled design employing high-performance monolithic ICs. High signal-to-noise ratio, low distortion, and a phono equalizer curve very close to those recommended as perfect by the RIAA are achieved by this design.

Diret-Coupled Low-Noise Tone Control and Filter Amplifiers

The amplifier which governs the tone controls (bass and treble) in the CR-600 uses Yamaha's unique collector-to-emitter negative feedback technique to achieve optimum tone control curves. The (low) filter amplifier offers a sharp 12dB/octave cut-off characteristic. Each of these advanced amplifier circuits is of the same direct-coupled type normally used for quality phono equalizers and each guarantees high signal-to-noise ratio and low distortion.

Continuously-Adjustable Loudness Control

As most stereo enthusiasts are aware, a loudness control on an amplifier or receiver allows the user to boost the bass and treble output responses of the instrument independently of the main volume control. This "tone-supercharger," as it is sometimes called, enhances listening enjoyment at low-volume listening volumes, and is normally a simple ON/OFF type switch. The *continuously-adjustable* loudness control in the CR-600 has been custom-designed by Yamaha with your speakers, your ears *and* your neighbors in mind. It is extremely simple to use: you first set it to FLAT. The main volume control is then adjusted to the loudest volume you usually desire. When you wish to reduce overall output volume—late at night, for instance—you do so by tuning the *loudness*, not the main volume, control. In this way, your ears always sense the same balance of lows, midranges and highs no matter what the overall output volume may be.

Specialized Microphone Mixing Amplifier

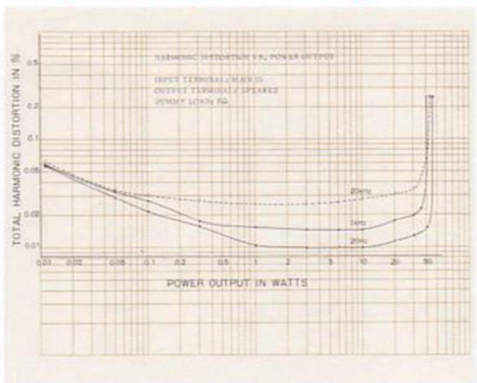
The high-performance (100-10,000Hz +0.5dB, −6dB) microphone amplifier in the CR-600 makes it possible to create hi-fi live recordings by connecting a microphone to the mic jack provided. It's also easy to mix microphone sounds with music, sing-along, by your own disc jockey—and record these effects into a tape deck, or broadcast them over your speakers, or both.

Twin Tape Record/Playback Circuits for Tape-to-Tape Dubbing

The CR-600 features two stereo tape record/playback circuits. You may record any program source into one or both simultaneously, reproduce or monitor either deck, and copy a pre-recorded tape from one deck to the other without having to change connector cords.

POWER AMPLIFIER SECTION

Direct-Coupled OCL Pure Complementary Power Amplifier



The powerhouse amplifier in the CR-600 direct-couples a differential amplifier and output-capacitor-less (OCL) complementary Darlington amplifier. The former assures the stability of operation and safety of the latter, while this advanced design allows negative feedback to be evenly applied from DC to above the audio spectrum. This reduces distortion and expands the power bandwidth to 5 to 70,000Hz with total harmonic distortion of 0.5% or less.

4,700 Micro-Farad Power Supply Capacitors for High Power

A closely-regulated, oversized power transformer and a pair of big 4,700μF capacitors are employed in the power supply circuit. These enable the power transformer to deliver 90 watts in dynamic power (0.1% THD at 8 ohms), or 35 watts per channel RMS continuous power (also 0.1% THD at 8 ohms). All tuner and amplifier stages, except of course for the power amplifer, are driven by a constant-voltage power supply and are thus immune to fluctuations in line voltage. Here again the amplifier's excellent transient response and stability in the low frequency range is greatly benefited.

Relay-Operated Speaker/Power Protection Circuit

The built-in speaker protection circuits work automatically the instant DC voltage of ±2V appears at the speaker terminals. This occurs no matter what abnormal condition may have caused the voltage. Your speakers are always protected against accidental damage for a relay operates to cut off the output and automatically restores itself to normal the instant DC voltage disappears. This protector circuit also works as a muting circuit, eliminating the "popping noise" which normally occurs when you turn on or off an amplifier.

4-Channel Ready IF Output Jack

Separable Preamplifier and Power Amplifier

Terminals for Two Complete Stereo Speaker Systems

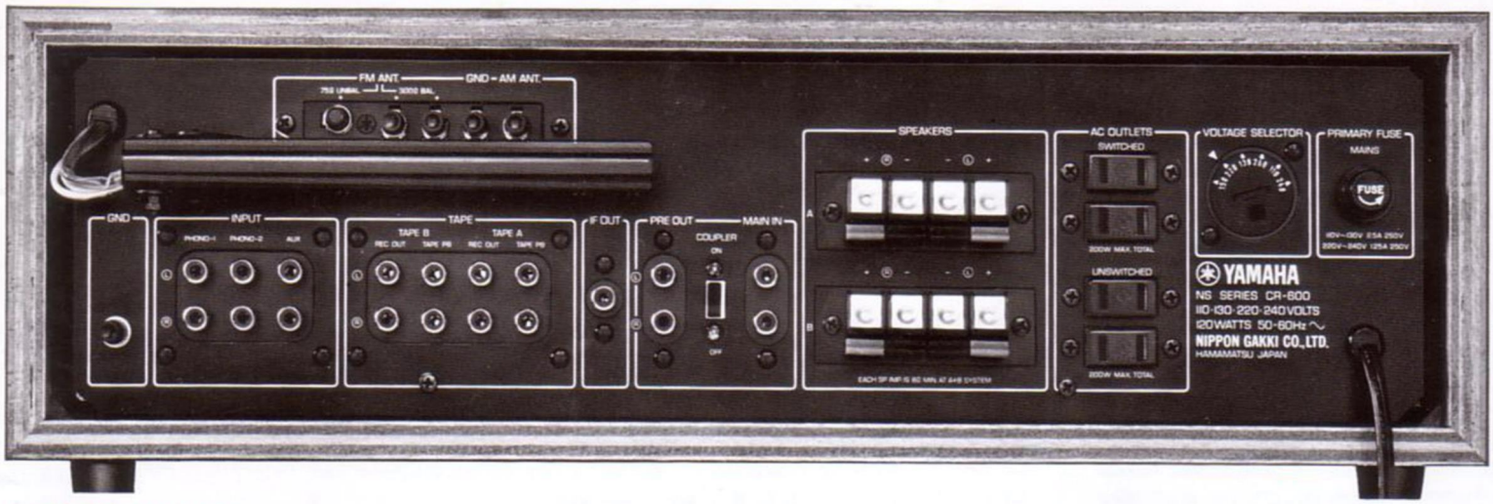
Two Phono Input Circuits

Four Convenient AC Outlets,

Large, Fumble-Free Ground Peg

Stereo Headphone Jack

One-Touch Speaker Terminals



SPECIFICATIONS

AUDIO SECTION

POWER OUTPUT
- **Dynamic Power** (IHF) 140 watts (4Ω)
  100 watts (8Ω)
- **Continuous RMS Power** (each channel driven)
  50/50 watts (4Ω) at 1,000Hz
  40/40 watts (8Ω) at 1,000Hz
- **Continuous RMS Power** (both channels driven)
  45+45 watts (4Ω) at 1,000Hz
  35+35 watts (8Ω) at 1,000Hz
- **Continuous RMS Power** (both channels driven)
  35+35 watts (4Ω) at 20 to 20,000Hz
  30+30 watts (8Ω) at 20 to 20,000Hz

TOTAL HARMONIC DISTORTION
- **Power Amplifier Only**
  less than 0.1% at rated power
  less than 0.04% at 1 watt
- **Preamplifier Only** (PHONO to PRE OUT)
  less than 0.1% at rated power
  (AUX to PRE OUT)
  less than 0.02% at rated power
- **Overall** (AUX to Power Output)
  less than 0.1% at rated power

INTERMODULATION DISTORTION
(70Hz : 7,000Hz=4:1 SMPTE method)
- **Power Amplifier Only**
  less than 0.1% (8Ω) at rated power
  less than 0.05% (8Ω) at 1 watt
- **Overall** (AUX to Power Output)
  less than 0.1% (8Ω) at rated output

POWER BANDWIDTH (IHF, distortion 0.5% const.)
5 to 70,000Hz

FREQUENCY RESPONSE (at 1 watt)
- **Overall** (AUX, TAPE PB to Power Output)
  10 to 50,000Hz +0.5dB, −1dB
- **Overall** (MIC to Power Output)
  100 to 10,000Hz +0.5dB, −6dB
- **Power Amplifier Only**
  10 to 100,000Hz +0dB, −1dB
- **Deviation from RIAA** (30 to 15,000Hz)
  +0.5dB, −0.5dB

LOAD IMPEDANCE 4 to 16Ω

DAMPING FACTOR (8Ω) 70 at 1,000Hz

CHANNEL SEPARATION (at rated power, 1,000Hz)
- **Power Amplifier Only** 60dB
- **Overall from PHONO 1, 2** 50dB
- **Overall from AUX, TAPE PB** 50dB
- **Overall from MIC** 50dB

HUM AND NOISE (IHF, Closed Circuit A Network)
- **Overall from PHONO 1, 2** better than 75dB
- **Overall from MIC** better than 70dB
- **Overall from AUX, TAPE PB** better than 90dB
- **Power Amplifier Only** better than 100dB
- **Volume at Minimum** better than 90dB

INPUT SENSITIVITY AND IMPEDANCE
(at rated power, 1,000Hz)
- **PHONO 1** 3mV (50kΩ)
- **PHONO 2** 3mV (50kΩ)
- **PHONO 1, 2 Max. Input Capability**
  135mV (T.H.D. 0.1%)
- **MIC** 3mV (50kΩ)
- **MIC Max. Input Capability**
  450mV (T.H.D. 0.3%)
- **AUX** 150mV (45kΩ)
- **TAPE PB A, B** 150mV (45kΩ)
- **Power Amplifier Input**
  775mV (45kΩ)

OUTPUT LEVEL AND IMPEDANCE
(at rated power, 1,000Hz)
- **TAPE REC OUT A, B** 150mV (2kΩ)
- **PRE OUT** 775mV (2kΩ)
  3,000mV (Max. Output T.H.D. 0.1%)

TONE CONTROLS
- **BASS** +10dB, −10dB at 50Hz
- **TREBLE** +10dB, −10dB at 10,000Hz

FILTERS
- **LOW** −3dB at 50Hz (12dB/oct.)
- **HIGH** −3dB at 8,000Hz (6dB/oct.)

LOUDNESS CONTROL
(Continuous Loudness Volume at Minimum)
+10dB at 100Hz, +5dB at 10,000Hz

TUNER SECTION

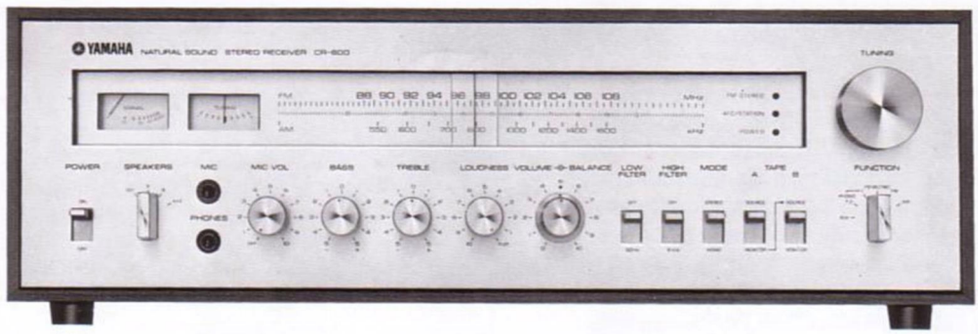
FM:
- **Tuning Range** 88 to 108MHz
- **Usable Sensitivity** (IHF) 2.0μV
- **Quieting Slope** 55dB at 5μV
  60dB at 10μV
- **Image Frequency Rejection** 90dB
- **IF Rejection** 95dB
- **Spurious Response Rejection** 95dB
- **AM Rejection** 55dB
- **Capture Ratio** 1.5dB
- **Alternate Channel Selectivity** (IHF) 75dB
- **Signal-to-Noise Ratio** 70dB
- **Total Harmonic Distortion**
  - **MONO** 0.3% at 400Hz
  - **STEREO** 0.5% at 400Hz
- **Stereo Separation** 40dB at 400Hz
  28dB at 50 to 10,000Hz
- **Frequency Response**
  +1.0dB, −1.0dB at 50 to 10,000Hz
  +1.5dB, −3.0dB at 20 to 15,000Hz
- **Sub-Carrier Suppression** 40dB
- **Muting Override Signal Level** 10μV
- **Antenna Impedance** 300Ω balanced
  75Ω unbalanced
- **IF Out Level and Impedance** 400mV/1kΩ

AM:
- **Tuning Range** 525 to 1,605kHz
- **Usable Sensitivity** (IHF) 52dB/m
- **Signal-to-Noise Ratio** 45dB at 80dB/m
- **Image Frequency Rejection** 80dB at 1,000kHz
- **Selectivity** 30dB at 1,000kHz
- **IF Rejection** 60dB at 1,000kHz
- **Spurious Response Rejection** 70dB at 1,000kHz
- **Total Harmonic Distortion** 0.8% at 80dB/m

GENERAL

- **Semiconductors**
  4 IC's; 2 MOS FET's; 59 Transistors; 3LED's; 33 Diodes; 3 Zener Diodes
- **Power Source** AC 117V, 50/60Hz
- **Power Consumption**
  - **Max.** 200 watts
  - **Rated** 120 watts
- **AC Outlets**
  - **Switched** 2 (total 200 watts)
  - **Unswitched** 2 (total 200 watts)
- **Dimensions** 474mm (18¾") W×158mm (6¼")H ×300mm (11¾")D
- **Weight** 12.5kg (27.5 lbs)

Design and specifications subject to change without notice for improvements.



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