YAMAHA CR800

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

In the medium-powered stereo receiver line, few products match Yamaha's CR-800 in terms of features and price. As an impressive version of elite Yamaha stereo without frills, the CR-800 is a perfect package of solid state capability that includes a sensitive FM/AM tuner, direct-coupled OCL complementary power amplifier with wide power bandwidth, and typical Yamaha stereo versatility.

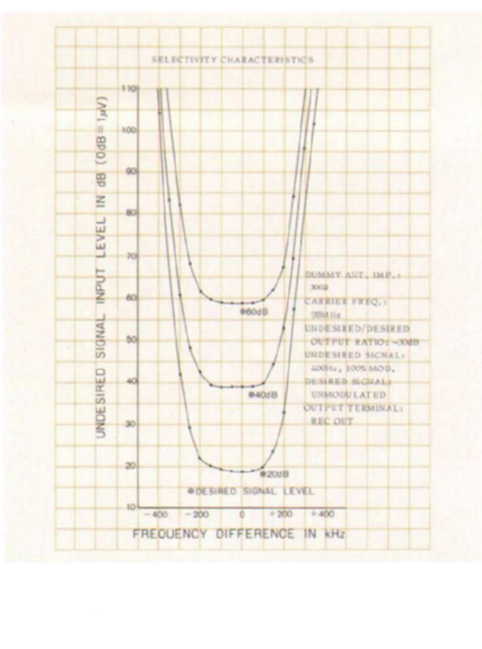
FM TUNER SECTION

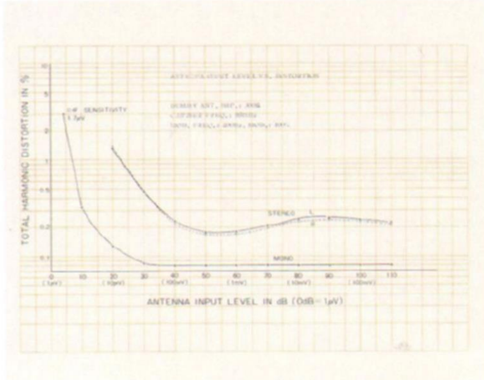
Sensitive FM Front End With Dual-Gated Mos FET's and Frequency-Linear 4-Gang Tuning Capacitor

This important section employs a pair of super-low noise dual-gated MOS FET's in the FM RF amplifier and mixer stage. These components add up to striking FM tuner sensitivity, along with impressive performance specifications.

IC IF Amplifier With 6-Stage Differential Amplifier and Six Ceramic Filters

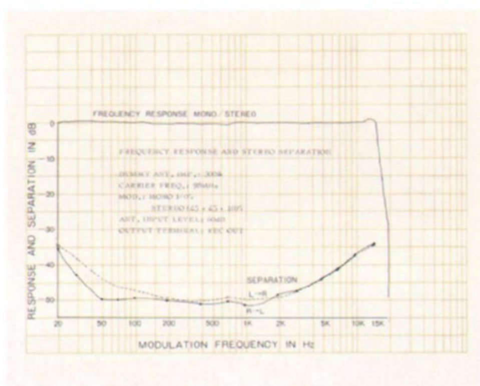
Another technical triumph is the FM IF amplifier. Its components include a discrete differential amplifier, two high-gain integrated circuits housing six differential amplifiers, plus three ideally phase-linear bi-resonator ceramic filters. From these components results superb phase linearity and extraordinary band-pass characteristics in the IF amplifier, a striking 80dB selectivity, 1.0dB capture ratio, and low distortion of 0.15% at 400Hz when used in FM mono reception, or 0.3% at 400Hz in FM stereo reception. The imporant thing here is that your favorite FM stations will be received without interference from neighboring stations, virtually free of distortion, even in difficult urban areas.





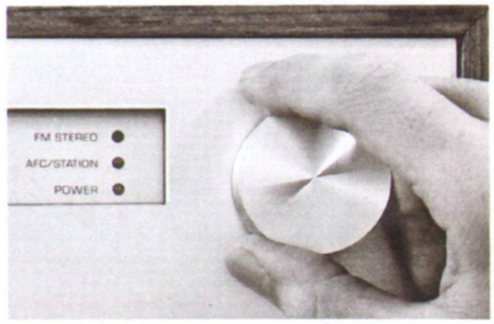
Yamaha-Exclusive Multiplex Demodulator with Negative-Feedback-Applied Transistor Switching circuit

FM stereo reception in the CR-800 is without parallel for its FM demodulator. For, for the first time in stereo technical history, it adopts negative feedback in its transistorized switching circuit (patent pending). It eliminates the need for a conventional SCA filter that invariably degrades high-frequency FM stereo separation. There is also a sharp-cutting active carrier leak filter that reduces carrier leakage to less than 60dB, while extending the tuner's flat frequency response curve well over 15KHz. To judge this aspect of the tuner's performance, one does well to review the unit's stereo separation figures: 45dB at 400Hz, 35dB at 10KHz. Exceptional by any standards of stereo excellence. Understandably, the tuner is also virtually free from beat interference and intermodulation distortion.



Yamaha-Exclusive Auto-Touch Tuning

To choose your favorite FM station, simply touch the Tuning Knob. This shuts off the built-in AFC (Automatic Frequency Control) circuit for accurate tuning. Once you have "tuned in" the station, the AFC circuit activates as soon as you release the knob, guaranteeing steady, drift-free reception regardless of changes in the tuner circuitry temperature or humidity.



Permanent Light-Emitting Diode Indicators For Power, FM Stereo and AFC/Station

Wide-Dynamic-Range Signal Strength Meters & Precise Center Meter

The exclusive meter circuit for the signal strength meter is an AGC (Automatic Gain Control)-equipped amplifier circuit able to indicate input signal strengths up to 100dB on the graduated master scale. The center-of-channel meter deflects to the center of its scale when the tuner is precisely tuned to the center of the FM discriminator output. This position is where distortion is minimal and stereo separation is maximized.

Click-Free, Switched, Double FM Muting

The input and output stages of the FM multiplex demodulator are doubly muted to achieve a striking 80dB-or-more muting of unpleasant inter-station noise that is common to the FM band. This system is smooth and entirely avoids the unpleasant click noise as stations are tuned in and out.

Wide, Precise, Ultra-Smooth Tuning Dial

The wide, frequency-linear FM dial with slide rule type design is precise, durable and smooth.

300-ohm and 75-ohm Antenna Terminals

PREAMPLIFIER SECTION

Four-Stage Direct-Coupled Phono Equalizer Amplifier For Transparent Tonal quality

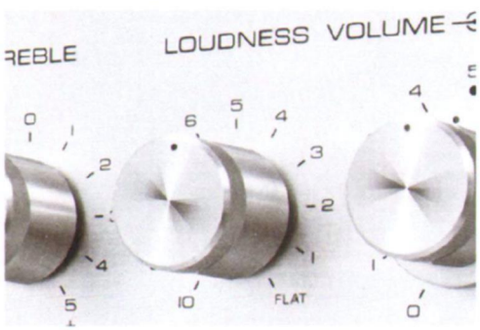
Its virtues are three-fold: One, it is capable of handling a phono input signal of up to 240 millivolts which is 80 times

greater than necessary to drive it to full output (since input sensitivity is 3 millivolts). This nearly exceeds the wide dynamic range of the most advanced disc cutting techniques and the new phono cartridges. Two, it provides an excellent signal-to-noise ratio of 75dB or better, which adds to the transparency of reproduced sound. And three, absolute accuracy in stereo record reproduction is assured since the phono equalizer amp has an almost identical facsimile of the RIAA disc playback characteristic, with deviations kept to within ±0.5dB.

Three-Stage Direct-Coupled, Low-Noise, Low-Distortion Tone Control and Filter Amplifiers

The tone control amplifier uses Yamaha's unique collector-to-emitter negative feedback to achieve optimum tone control curves. The filter amplifier—the advanced three-stage direct-coupled design—has a sharp 12dB/octave cut-off characteristic. The cut-off frequency for the low filter is selectable between 20Hz and 70Hz; the high filter has a cut-off frequency of 8KHz, and also serves as a High Blend switch to cancel high-frequency noise in all stereo program sources without affecting their frequency characteristics.

Continuous Loudness Control



This control compensates for the inability of the human ear to perceive low-level bass and treble signals according to the actual sound volume sensed by the ear. To design it, Yamaha paid special attention to the efficiency of speakers, room acoustics and other factors. To operate this control, you first set the loudness control to the FLAT position. The volume control is then set to the loudest volume you usually desire. The volume is then reduced by turning the *loudness control* (NOT the volume control) whenever you wish to listen at a lower volume than that for which the volume control has been set. This way, your ears always sense the same balance of the lows, midranges and highs at all volume levels.

Specialized Microphone Amplifier For Mic Mixing

The CR-800 has a high-performance microphone amplifier. You can make hi-fi live recordings by connecting a microphone to the MIC jack on the front panel. Also possible is to mix microphone sounds with music, sing-along, be your own disc jockey—and record these effects into a tape deck.

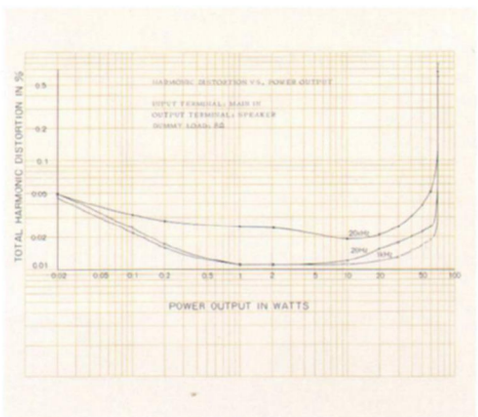
Two Tape Record/Playback Circuits For Dubbing

The CR-800 has two stereo tape record/playback circuits. You may record into one or both simultaneously, reproduce or monitor on either, and copy a recorded tape from one to the other.

POWER AMPLIFIER SECTION

Direct-Coupled OCL Pure Complementary Power Amplifier

The CR-800's power amplifier direct-couples a differential amplifier and an output-capacitor-less complementary amplifier. The direct-coupled OCL complemetary design allows negative feedback to be evenly applied from DC to above the audio spectrum. It reduces distortion and expands the power bandwidth to 5—70,000Hz with total harmonic distortion of 0.5%. It also helps to steady the damping factor and output characteristics of the power amplifier through the very low frequencies, contributing excellent transient response.



Two 6,800 Micro-Farad Power Supply Capacitors For High Power

The power supply circuit uses a closely regulated, oversized power transformer and two large 6,800μF capacitors. The power amplifier delivers, in the critical 20-20,000Hz range, 45 watts per channel into 8 ohms, both channels driven, at 0.1% T.H.D. All tuner and amplification stages, except the power amplifier, are driven by a constant-voltage power supply, which means the supply voltage is always the same regardless of the output voltage or fluctutions in the household line voltage, and thus the tonal quality is never affected.

Relay-Operated Speaker Protection Circuit

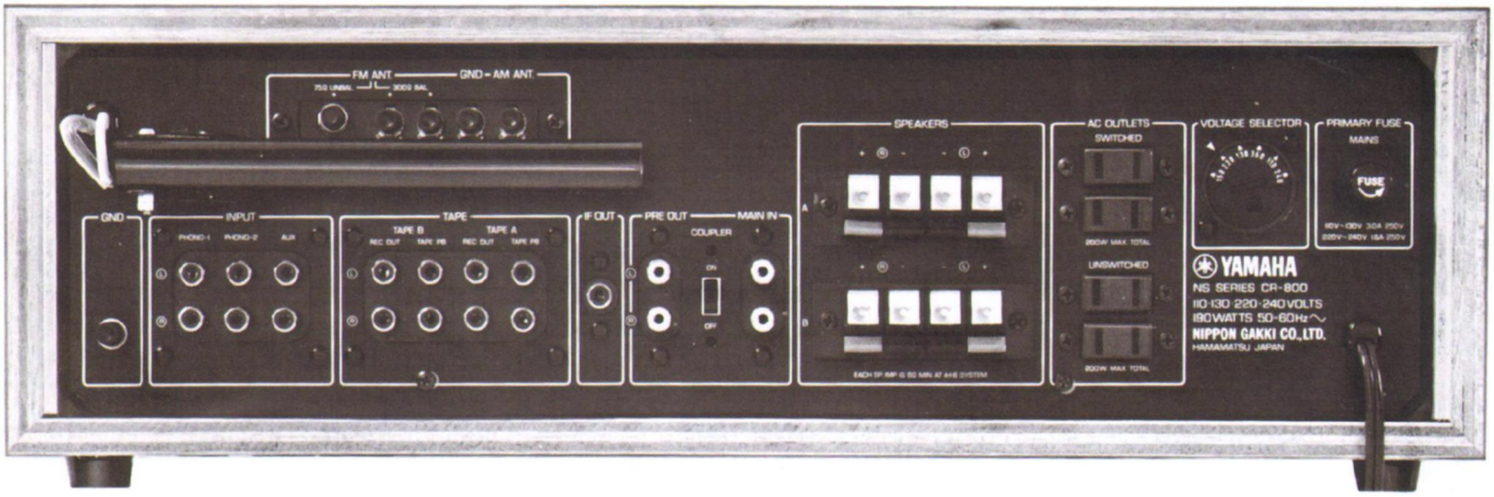
The built-in speaker protection circuit works automatically the moment a DC voltage of ±2V appears at the speaker terminals, no matter what abnormal condition may have caused this voltage. Your speakers are always protected against accidental damage as a relay operates to cut off the output circuit, and automatically returns to normal the instant the DC voltage disappears. The protector circuit also serves as a muting circuit, eliminating the undesirable "popping noise" that normally is generated as you turn the amplifier's power switch on or off.

All-Electronic Power Transistor Protection Circuit

The CR-800's all-electronic protection circuit—provided before the output stage—instantly protects the important and expensive silicon power transistors, whenever the load impedance at the speaker terminals decreases below 4 ohms, or should ever those terminals be accidentally short-circuited. This is a limiter-type circuit that regulates the input power momentarily, so that the output signal waveform itself will not be clipped even when the protector circuit has operated.

OTHER FEATURES

- IF Output for 4-Channel Capability
- Separable Preamplifier and Power Amplifier
- Connects Two Pairs of Speaker Systems
- Two Phono Input Circuits
- Four AC Outlets
- Large Grounding Terminal
- Headphone Jack
- −20dB Audio Muting Switch
- One-Touch Speaker Terminals
- Professional-Feel Switches and Controls, Arranged for Easy Operation



SPECIFICATIONS

AUDIO SECTION

POWER OUTPUT
- **Dynamic Power (IHF)** 150 watts (4Ω)
  130 watts (8Ω)
- **Continuous RMS Power** (each channel driven)
  70/70 watts (4Ω) at 1,000Hz
  55/55 watts (8Ω) at 1,000Hz
- **Continuous RMS Power** (both channels driven)
  60+60 watts (4Ω) at 1,000Hz
  50+50 watts (8Ω) at 1,000Hz
- **Continuous RMS Power** (both channels driven)
  50+50 watts (4Ω) at 20 to 20,000Hz
  45+45 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	240mV (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 (50kΩ)

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** +15dB, −15dB at 50Hz
- **TREBLE** +10dB, −10dB at 10,000Hz

FILTERS
- **LOW** −3dB at 20Hz, 70Hz (12dB/oct.)
- **HIGH** −3dB at 8,000Hz (6dB/oct.) HIGH BLEND

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)	1.7μV
Quieting Slope	55dB at 5μV
	60dB at 10μV
Image Frequency Rejection	100dB
IF Rejection	100dB
Spurious Response Rejection	100dB
AM Rejection	55dB
Capture Ratio	1.0dB
Alternate Channel Selectivity (IHF)	80dB
Signal-to-Noise Ratio	75dB
Total Harmonic Distortion	
MONO	0.15% at 400Hz
	0.3% at 50 to 10,000Hz
STEREO	0.3% at 400Hz
	1.0% at 50 to 10,000Hz
Stereo Separation	45dB at 400Hz
	35dB at 50 to 10,000Hz
Frequency Response	+0.5dB, −0.5dB at 50 to 10,000Hz
	+1.5dB, −1.5dB at 20 to 15,000Hz
Sub-Carrier Suppression	60dB
Muting Override Signal Level	10μV
Antenna Impedance	300Ω balanced
	75Ω unbalanced
IF Out Level and Impedance	400mV/1kΩ

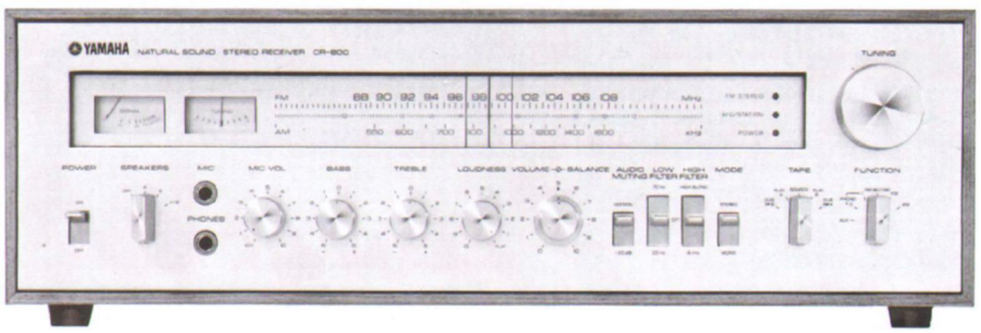
AM:

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**
  2 IC's; 3 MOS FETs; 98 Transistors;
  3 LED's; 60 Diodes; 6 Zener Diodes
- **Power Source** AC 117V, 50/60Hz
- **Power Consumption**
  - **Max.** 300 watts
  - **Rated** 190 watts
- **AC Outlets**
  - **Switched** 2 (total 200 watts)
  - **Unswitched** 2 (total 200 watts)
- **Dimensions** 474mm (18¾") W×158mm (6¼")H ×300mm (11¾")D
- **Weight** 14kg (31 lbs)

Design and specifications subject to change without notice for improvements.



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