

ADVANCED AND EVER ADVANCING **MITSUBISHI ELECTRIC**



Medallion[®]

*A Wide Selection of Units With
Advanced Features and Consistently
Outstanding Audio Performance*



THE MITSUBISHI TRADITION OF AUDIO

The four receivers of this series are perfect examples of

Mitsubishi's audio philosophy in action.

Their clean, functional and distinctive styling gives a hint of the elegant simplicity of the electronic circuitry within.

Each member combines high-performance features developed for the separate component—tuner, preamplifier and power amplifier—into a single attractive unit.

Without compromise, but at a surprisingly modest cost, they offer everything that is best in the Mitsubishi Electric tradition.

A tradition that refuses to follow fads or offer gimmicks and seeks only the closest possible approach to the original sound.



DA-R35, DA-R25, DA-R15 and DA-R8 Receivers

ENGINEERING



THE LATEST IN AUDIO TECHNOLOGY FOR UN AUDIO REPRODUCTION

A Real Family Likeness In Each Receiver

These receivers have more in common than identical size and styling; all represent a successful attempt to offer state-of-the-art audio engineering at a highly competitive cost. Each combines superb sound quality and sheer, old-fashioned value for money. We believe that both feature-by-feature comparisons and listening tests will prove every one of them unbeatable in its class.

True Frequency-Synthesizer Tuning

One important feature common to all four receivers is an unusually high-performance tuner section—digital in the R35, R25 and R15; analog in the R8. Unlike so-called "synthesizer" tuning systems that merely synthesize in accurate or inadequate station selection—the R35, R25 and R15 use a quartz crystal and phase-locked loop (PLL) circuit under microcomputer control to synthesize the actual station frequency.

Incredible Accuracy

The quartz crystal oscillator generates an amazingly accurate reference frequency, guaranteeing absolutely precise tuning. In fact, it is impossible to mistune these three receivers; they only receive the frequencies US stations are allowed to broadcast: 200kHz apart on FM (i.e., 88.1 MHz, 88.3, 88.5, etc.) and 10kHz apart on AM. The R8 uses touch-sensitive lock tuning to achieve similar reliability and ease of station selection.

Accurate tuning ensures the best possible reception, particularly of the FM band, where the slightest mistuning causes extra distortion and noise.

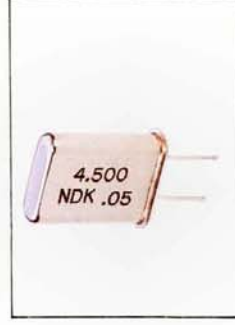
Mitsubishi Electric has completely solved one problem that still affects conventional frequency-synthesizer circuits: low S/N ratios in the FM band. This is because the new receivers do not use conventional fixed prescalers.

Prescalers are used to reduce the inconveniently high FM signal frequencies (typically about 100MHz) to a more manageable 5MHz. Unfortunately, fixed prescalers achieve the 200kHz "steps" in FM tuning by

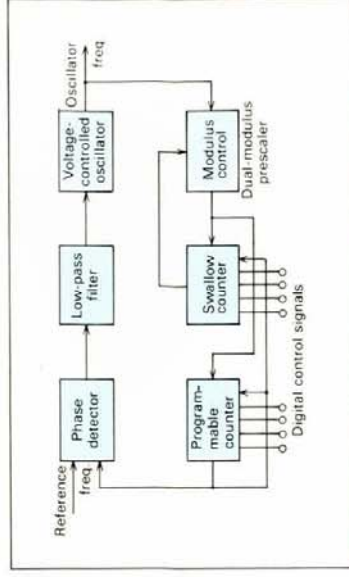
using a reference frequency right in the middle of the audio spectrum—and this generates a lot of noise.

The pulse-swallow counter with dual-modulus prescaler shown in the block diagram dramatically improves the FM S/N ratio. The high-frequency pulses are "swallowed," and used to

ultralow distortion under favorable reception conditions, and narrow where extra filtering can rescue the signal for enjoyment despite nearby interference. Switching between the two is either manual (R15) or automatic (R25/35: with manual override).



The quartz crystal element, heart of the incredibly accurate tuning system.

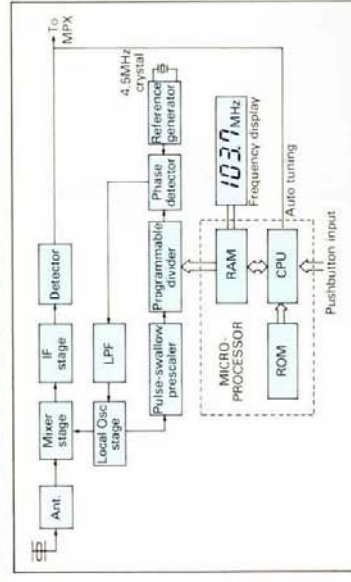


Block diagram of the frequency synthesizer circuit.

Completely New "Pulse-Swallow" Counter Circuit Gives High S/N Ratio

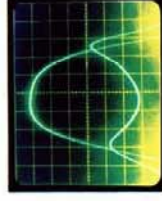


The "computer-on-chip" and the smaller "pulse-swallow" counter.



Block diagram of microprocessor control.

Conventional



Flat group delay

Vert: 1dB/div., 0.1µsec/div., 75kHz markers

Comparison between conventional ceramic filters and the flat group delay filters that contribute to low FM distortion.

switch between two different prescaler factors, just as in our top-of-the-line F30 separate component tuner. The result lifts the reference frequency—and its associated noise—right out of the audio spectrum, and gives an impressive S/N ratio of 84dB for quieter backgrounds and a cleaner, clearer signal. (The R8, of course, uses a conventional analog tuning system to achieve similar high performance.)

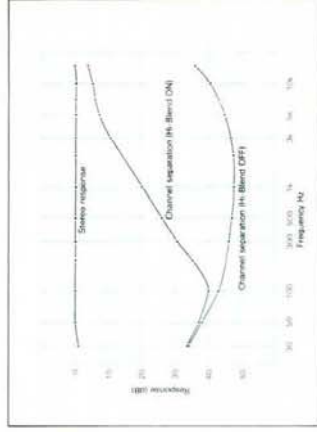
Auto IF Bandwidth Switching

The R15, 25 and 35 are unusual in having two selectivities, wide for

Automatic Hi-Blend

This special circuit trades a slight reduction of stereo separation at high frequencies for reduced FM stereo hiss noise whenever necessary; indicator light and manual override

SURPASSED HIGH-FIDELITY



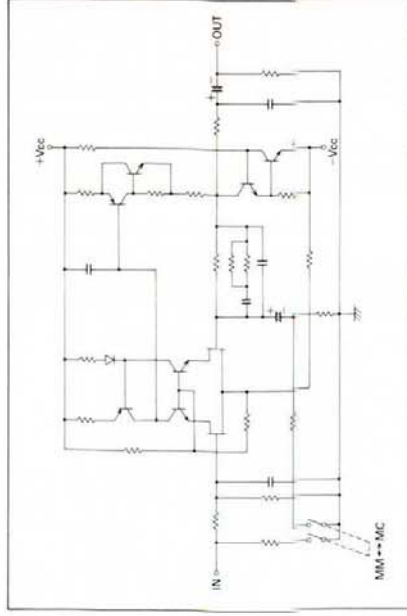
Effect of the Hi Blend function on channel separation

provided. (R25/35 only: manual Hi Blend switch on R15).

Computerized Tuning, Digital Frequency Display...

The full list of tuner features would fill this catalog; please refer to the individual receiver descriptions for some of the more important details.

Amplifier Sections Worthy of Separate Components



Equivalent circuit of the new equalizer amp with its switched gains for MM/MC cartridges.

These receivers are packed with features and circuits normally never found outside high-ticket separate components.

Take the equalizer amp, secret of high quality disc listening, its high Gm, dual FET first stage, with differential amplification, ultralow distortion, high gain, and extremely high signal-to-noise ratio, allow direct connection of low-output moving-coil (MC) cartridges, letting you enjoy the high quality that the best of these cartridges offer

without the added cost of a separate booster amp or transformer (only on R25/R35: front-panel MC/MM switching).



The ultralow-noise, high Gm dual FET, heart of the equalizer amp.

High-Speed Circuitry with Constant NFB

Two more features make a real contribution to sound quality. One is the choice of circuits and components for rapid, faithful response to the original signal.

The other is the consistent use of minimal negative feedback (NFB) at all frequencies (heavy NFB can seriously degrade audio quality).

DC-Servo Amplification (R25/35)

DC-servo circuitry is used in both the poweramp and tone-amp sections, and the non-DC-servo active filter amp can be completely isolated from the

signal path. This eliminates all capacitors—input, coupling, and output—from the signal path between the high level inputs and the speaker outputs, and leaves only one capacitor between the phono input and the speaker outputs.

Free from the unfortunate effects of capacitors on sound quality, response is flat to DC (or 0Hz) for deep, firm bass and absolute waveform fidelity, giving clear, unsullied reproduction of the original source. (Note: DC power amp configuration in R8/R15)

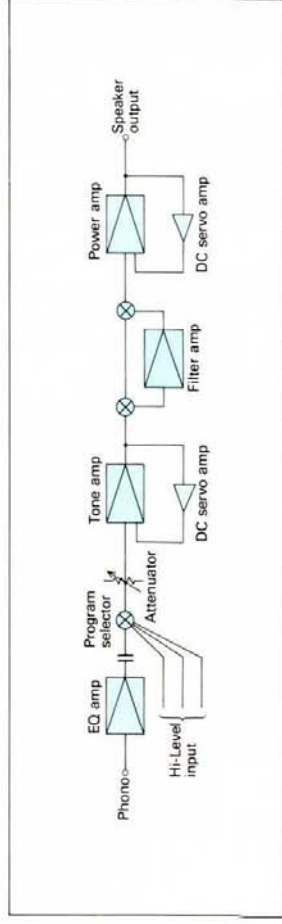
Linear Switching (R25/35)

Another important feature is linear switching. This retains the advantages of Class B amplification—cool, efficient, cost-effective operation—while extending the region of Class A operation. The result is ultralow harmonic distortion more like Class A, but without its uneconomic inefficiency!

Generously Rated Power-Supply Sections

The power sections of each receiver are designed to deliver the full rated power—continuously. Large, powerful transformers and massive filter capacitors (12,000 μ F in R25/35 and 10,000 μ F in R8/R15) make tremendous reserves of power always available, for a clearly audible advantage over systems that only switch in the necessary power at peak demand. This also enables the output stage to handle 4-ohm impedances, so that you aren't limited to unrealistically high impedances in a second pair of speaker systems...

Separate windings for the heavy-current output stages and the sensitive preamp stages also help to reduce transient intermodulation, keeping the output signal clear and precisely detailed even in a grand orchestral crescendo (R25/R35).



Block diagram of the amplifier section

THE R35: SHOWING THE WORLD A COMPLETE RECEIVER PERFORMANCE

The Pleasures Of Computerized Tuning

The R35 has fully automatic tuning. Just press the "up" or "down" button and the builtin microcomputer will tune across the dial. Of course, you can also tune manually either one step at a time or at high speed.

Accurate Digital Frequency Display

This is a really useful aid to tuning; just set the frequency to the station you want...specially helpful when the band is crowded. And if you have a list of station frequencies, you don't have to wait for a station break to identify the station, just read it off the display.



The digital frequency display and LED indicators

Seven Preset Stations on Both Wavebands

Up to seven stations on each band can be memorized for instant, pushbutton recall. Thanks to easily replaceable memory-backup dry cells, the selected frequencies, and the frequency of the last station you were listening to, will be preserved indefinitely.

Sensitive and Stable "Front End"

Dual-gate MOS-FET elements and a high-precision four-ganged varactor

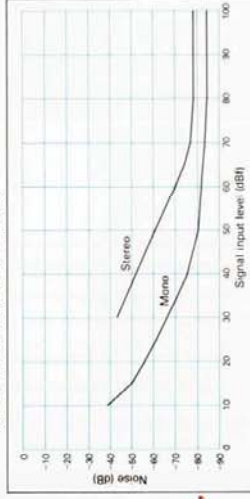
diode—a solid-state variable capacitor—are responsible for the tremendous station-getting power and the ability to resist "swamping" by strong local stations.

High S/N Ratio and Low Distortion

Two important technical developments lie behind the truly remarkable S/N ratio and ultralow distortion of the R35. One is a revolutionary new FM quadrature demodulator, exploiting the latest semiconductor technology. The other is a new ceramic filter that equals the linear-phase flat-group delay performance only previously attainable with LC-type filters.

Automatically Switched Selectivities

The two selectivities on the R35—wide for ultralow distortion and narrow where interference from other nearby stations would otherwise spoil enjoyment—are selected automatically, with indicator light and manual override.



FM quieting characteristics

Automatic Hi-Blend

This special circuit retains good stereo separation even in the "blend" position. The manual override lets you check the effect on stereo hiss noise yourself.

Pilot-Signal Cancellation

Unlike the filters often used to cut out the 19kHz pilot signal on FM stereo, a special circuit cancels out the signal completely—leaving the whole audible broadcast frequency range flat.

Multipath & Signal-Strength Meter

The signal-strength meter can be switched to measure interference from harmful multipath signals, so that the best antenna orientation can easily be found.

Good AM Reception

A high-performance integrated circuit with a four-element IF filter and a detachable loop antenna (easily located for optimum reception) give surprisingly good AM reception with excellent selectivity.

Superb Audio Amplifier

As detailed on the two previous pages, the audio circuitry ideally complements the tuner section. Coupling capacitors, with their baneful influence on audio quality, have been eliminated. High Gm dual FETs in the first stage of the equalizer amp, plus differential amplifier configuration throughout, give basic amplifier performance so good that negative feedback can be reduced to the



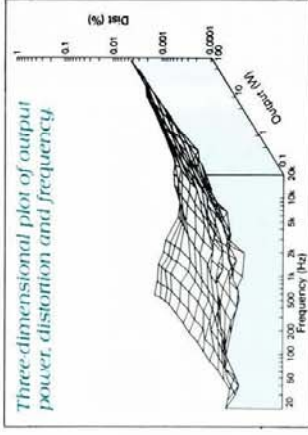
LY NEW STANDARD FOR

DA-R35

Receiver

minimum and kept constant at all frequencies. This contributes to stability and audio quality.

Minimum RMS power is 85 watts per channel with both channels driven into 8 ohms, from 20Hz to 20kHz, and with no more than 0.01% total harmonic distortion.

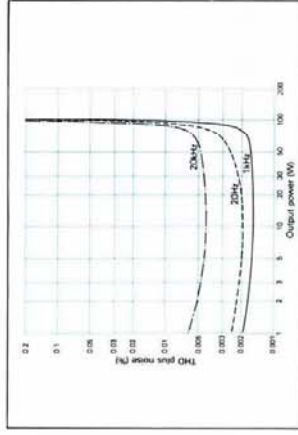


Rapid Response DC-Servo Amplifier

Both the tone-control amp and the power amp sections feature DC-servo circuitry, ensuring a steep cutoff in frequency response at a fraction of a Hz—improving stability, waveform fidelity, and therefore audio quality.

Another unusual feature is the "skived" aluminum heat-dispersion fin configuration. Specially machined from solid aluminum in an energy-effective process, the high dispersion efficiency ensures cool transistor operation for long-term reliability.

Slow rate, the measure of an amplifier's ability to follow fast-changing musical signals, is a healthy 100V/μsec. Distortion, particularly the switching distortion associated with Class B operation, is reduced to lower, Class A levels even when handling high output powers.

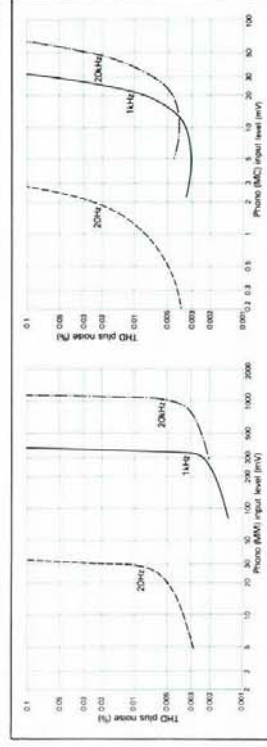


MC & MM Phono Cartridge Selection

The equalizer amp—with its dual FET differential input—has such high gain and low noise that it can be used directly with low-output moving-coil (MC) phono cartridges; a convenient front-panel switch lets you select either.



The ultralow-noise, high gain dual FET, heart of the equalizer amp.



Continuous Loudness Control

The R35 features a continuous loudness control, unlike the on-off controls on most receivers. It allows the same tonal balance to be retained from normal listening levels right down to a whisper. Since it attenuates the mid frequencies, rather than boosting the low and high frequencies, it can never give rise to the distortion and even signal clipping of booster-type controls.

Steep Cut-Off Filters

Both high and low cut-off filters are provided, with unusually steep, 12dB/octave slopes. These, and the carefully chosen cut-off points, allow unwanted subsonic or high-frequency hiss noise to be eliminated with the minimum effect on the musical signal. In the off position, the filter circuits are completely bypassed (a most unusual refinement on a receiver).



The special "skived" aluminum high-efficiency heat-dispersion fins that keep output transistors cool.

Separate Pre-Out, Main-In Terminals

No isolating switch is needed if you use the pre-out and main-in terminals to drive another power amp with the R35's preamp section or vice versa. Plugging in another amplifier automatically disconnects the two sections internally. Use this feature for connecting a graphic equalizer or an electronic crossover unit, etc.

Other Important Features

Independent program and recording selectors: Allow you to listen to any source while recording from any other.

Heavy-duty

relays control speaker switching; Two relays, mounted very close to the output transistors, are controlled by switches on the front

panel, eliminating long loops of high-current wiring to and from the switches. The only resistance in the output signal path is that of the relay contacts. Low resistance here means high damping factor—and therefore more faithful tracking of the signal waveform by the speaker systems' voice coils.



Separate program and recording selector switches

Rec Off position on the recording selector: Isolates other input circuits from the effects of tape-deck input impedance (often very low when the tape deck is switched off, with a correspondingly severe effect on sound quality).
Peak LED indicators: Show clipping levels.

The special "skived" aluminum high-efficiency heat-dispersion fins that keep output transistors cool.

THE R25: AN IMPRESSIVE DEMONSTRATION IN RECEIVER DESIGN

A Magnificent Center for Your Audio System

The R25 has the three essentials for the fullest enjoyment of all audio program sources: it has the pre- and power amp circuit configuration and tonal quality of separate components. It has the latest and most sophisticated tuner section. And it has comprehensive control functions and features to cope with the widest range of auxiliary equipment—turntable units with MM or MC cartridges, two tape cassette decks (and dubbing between them in either direction), two sets of speaker systems... And finally, of course, it is surprisingly affordable.

A Distinctive Mitsubishi Blend of Conservative and Ultramodern Design

The R25 contains some very new technology, but absolutely nothing new has been introduced without completely satisfying our engineers that it contributed significantly to an improvement in audio quality, greater ease and convenience in use, or a reduction in cost with no compromise on quality.

That's why the R25 has generously designed power-supply circuits. Frankly, cost-cutting power circuits that have nothing in reserve, needing to be supplemented at peak power levels, fail on the first and most

important count—audio quality. So the R25 uses a massive power-supply transformer with separate windings for the heavy-current output stages and the sensitive preamp stages, and 12,000 μ F filter capacitors. You can hear the difference.

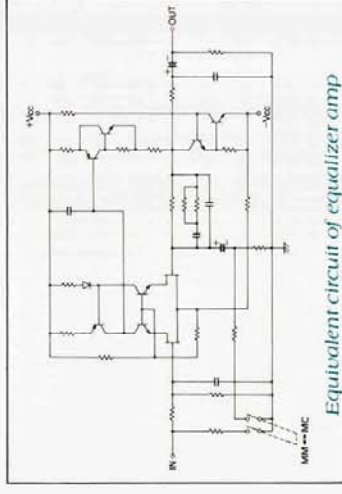
That's also why we have remained faithful to our original vision of an amplifier as the proverbial "straight wire with gain," adding nothing to the original signal, and taking nothing away. So we eliminate coupling capacitors, using direct interstage coupling. We extend frequency response down to DC (0Hz). And add DC-servo circuitry in the R25's power-amp and tone-amp sections for added stability and waveform fidelity at ultralow subsonic frequencies.

These additional design features pay off in listening pleasure—music reproduction that reveals all the subtle nuances of the program source without resorting to artificial "ambience" effects or signal manipulations never present in the original performance.

Listening to Discs

One glance at the equalizer circuit and its performance characteristics will show how important we think discs are. High Gm dual FETs in the first stage. Differential amplifier configuration. S/N and gain so high that we provide for low-output MC cartridges by just switching the gain

on the front panel! And minimal negative feedback at all frequencies for stability and high audio quality.



Equivalent circuit of equalizer amp

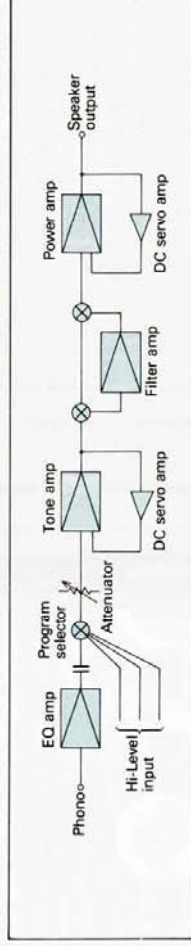
Note: THD vs. input levels for MM/MC cartridges are given in the description of the R35, see preceding pages.

Plenty of Power, Low Distortion

The R25 provides ample power, and because of the Class B linear-switching design, it operates coolly and comfortably right up to its considerable maximum power with the low total harmonic distortion of a Class A amplifier.

Minimum RMS power^{*} is 60 watts per channel with both channels driven into 8 ohms, from 20Hz to 20kHz, and with no more than 0.015% total harmonic distortion.

Slew rate, the measure of an amplifier's ability to follow fast-changing musical signals, is a healthy 100V/ μ sec.



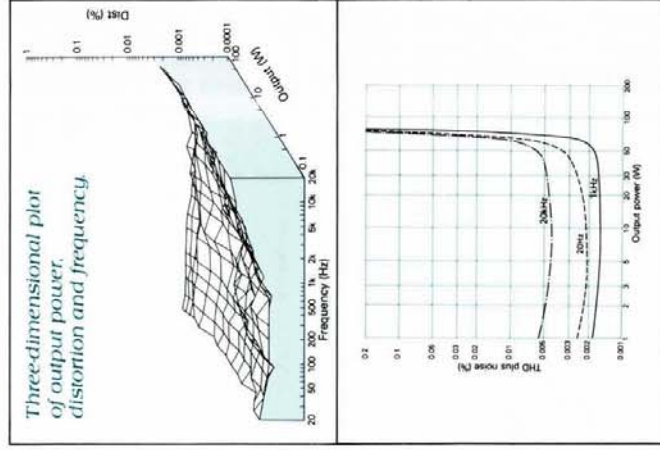
Block diagram of the amplifier section



ALL THAT'S BEST

DA-R25

Receiver



Independent program and recording selectors: Allow you to listen to any source while recording from any other.

Heavy-duty relays control speaker switching: Two relays, mounted very close to the output transistors but controlled from the front panel, reduce resistance in the output signal path, giving a high damping factor—and therefore more faithful tracking of the signal waveform by the speaker systems' voice coils.

Rec Off position on the recording selector: Isolates other input circuits from the potentially harmful effects of tape-deck input impedance. "Skived" aluminum heat dispersion fins; machined from solid aluminum for new, high efficiency in keeping output transistors cool, ensuring optimum operating conditions and long-term reliability.

Leave the Tuning To the Computer

Just press the "up" or "down" button for automatic or manual tuning. The accurate digital frequency display is a really useful aid to tuning, showing station frequencies on both FM and AM bands at a glance.



The digital frequency display and LED indicators
The manual/auto tuning pushbuttons and signal strength meter

Continuous Loudness Control

Like all members of the Mitsubishi receiver lineup, the R25 features a continuous loudness control, retaining the same tonal balance right down to a whisper without boosting distortion.

Steep Cut-Off Filters

The R25 is unusual in having active, high and low cut-off filters, with steep, 12dB/octave slopes. Completely bypassed in the "off" position when not needed, they can rescue a signal for enjoyment by removing subsonic or high-frequency noise.

Separate Pre-Out, Main-In Terminals

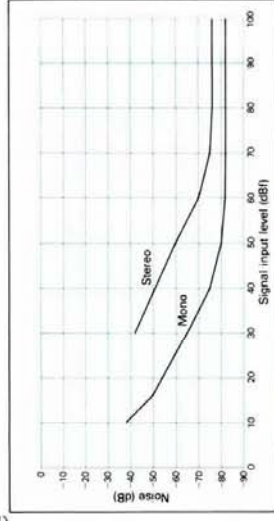
Like the R35, the R25 has separate pre-out and main-in terminals. Internal disconnection between preamp and power-amp sections is automatic, not requiring a switch.

Other Important Features



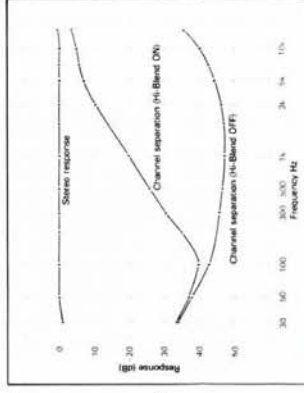
Separate program and recording selector switches

are thanks to a revolutionary new FM quadrature demodulator, exploiting the latest semiconductor technology, and new ceramic filters that equal the linear-phase flat-group delay performance previously attainable only with LC-type filters.



Auto Switched Hi-Blend and Selectivity

The R25 has two selectivities—wide for ultralow distortion and narrow where interference from other nearby stations would otherwise spoil enjoyment—and switches between them automatically, with indicator light and manual override. If you wish, it will also automatically blend the high frequencies to reduce FM stereo hiss on remote stations (while maintaining adequate stereo channel separation).



Pushbutton Station Selection

A total of 14 stations, seven stations on each band, can be memorized for instant, pushbutton recall. And easily replaced memory-backup dry cells ensure that the computer "remembers" the selected frequencies, and the frequency of the last station you were listening to, as long as necessary even with the power off or unplugged.

Tremendous Station-Getting Ability

The high-performance electronic tuning unit is the secret of the sensitivity and selectivity of the R25. The truly remarkable S/N ratio and ultralow distortion, on the other hand,

Good AM Reception

A high-performance integrated circuit with a four-element IF filter and a detachable loop antenna (easily located for optimum reception) give surprisingly good AM reception with excellent selectivity.

Pilot-Signal Cancellation

Unlike the filters often used to cut out the 19kHz pilot signal on FM stereo, a special circuit cancels out the signal completely—leaving the whole audible broadcast frequency range flat.

THE R15: AN UNCOMPROMISING STRESS ON CONVENIENT FEATURES

Design Policy That Puts First Things First

Audio quality is undoubtedly the most important "feature" of your receiver. It's a lasting source of pleasure long after the attractive, modern design has merged unobtrusively into your room decor, and the novelty of the many controls and functions has passed. And that's as it should be: audio quality was the most important design concept when Mitsubishi Electric audio engineers and music lovers were developing the R15.

Literally Everything You Need for Full Enjoyment

A superb tuner section, identical in almost every detail to that on the R35 and R25, brings you stations near and far with incredible clarity. Preamplifier power-ramp circuitry gives you audio quality better than most separate components. And a full range of control functions and features lets you get the best from turntable units, tape-cassette decks (two of them, so that you can dub recordings from one to the other), and speaker systems (two of these too...). At the price, it's a remarkable combination of modern technology and sheer, old-fashioned value for money.

A Built-In Computer To Do the Tuning...

The "computer-on-a-chip" and the smaller "pulse swallow" counter.



True, frequency-synthesizer tuning—as described in the first few pages of this catalog—with an ultra-accurate quartz crystal oscillator and its own microcomputer to find the stations for you, make the R15 unique in its class. Just press "up" or "down" buttons for automatic tuning across the dial, or tune manually—one step at a time or at high speed.

Accurate Frequency Display

No doubts over which frequency you're listening to: the digital read-out makes it unmistakable. Specially useful when the band is crowded.



The digital frequency display that simplifies tuning.

14 Stations Instantly Selected by Pushbuttons

Seven stations on each waveband can be memorized, and easily replaced dry cells ensure that the computer "remembers" these frequencies until you change your mind—even if it's years later...

Stations Near and Far

A special three-ganged semiconductor capacitor and an all-electronic tuning stage help boost sensitivity and selectivity, bringing in weak or distant stations with surprising quality. A revolutionary FM quadrature demodulator, on the other hand, exploits the latest semiconductor technology to give remarkably low distortion and high S/N. New ceramic filters play their part too, equalling the

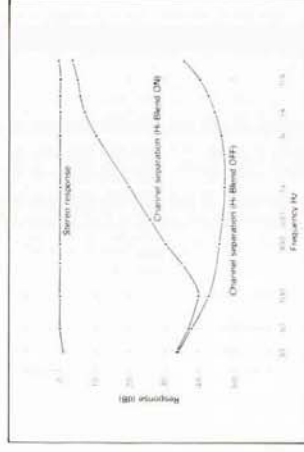
performance previously only attainable with LC-type filters.

Switched IF Bandwidth

The IF bandwidth—which determines how sharply you can tune between adjacent stations—can be switched to wide or narrow; wide for ultralow distortion where conditions are good, and narrow where another nearby station would spoil enjoyment. It's like having two tuners...

Hi-Blend Function

This switch lets you trade some of the stereo channel separation for greatly reduced "hiss" noise when listening to weak or remote FM stereo stations. (Since only high frequencies are affected, stereo enjoyment is unimpaired).



Effect of the Hi-Blend function on channel separation

Pilot-Signal Cancellation

In the R15, a special circuit cancels out the unwanted 19kHz pilot signal on FM stereo, instead of using filters that could affect the high-frequency musical signal.



MITSUBISHI DA-R15 STEREO RECEIVER

QUARTZ FREQUENCY SYNTHESIZER

UDIO QUALITY AND USEFUL,

DA-R15

Receiver

Good AM Reception

A high-performance integrated circuit with a four-element IF filter and a detachable loop antenna (easily located for optimum reception) give surprisingly good AM reception with excellent selectivity.

Generous Power-Supply Circuits

Massive power-supply transformer, 10,000 μ F filter capacitors. Rated to provide the full audio power all the time—not just at brief peaks. These are one open secret of high audio quality, lending solidity and depth to the bass and keeping complex orchestral textures clean and unclouded.

Minimum RMS power is 45 watts per channel with both channels driven into 8 ohms, from 20Hz to 20kHz, and with no more than 0.015% total harmonic distortion.

Dual Relays for High Damping Factor

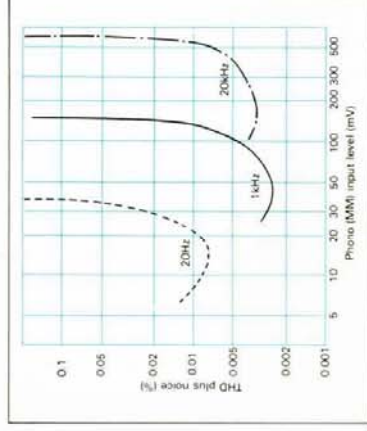
Most receivers have long leads running from the power transistors to the speaker switches on the front panel and then back to the speaker terminals on the back panel. This degrades damping factor—important because it determines how faithfully the speaker voice coil will follow the output from the amplifier. Remote control relays eliminate these long loops of wire in the R15, boosting damping factor to 110. Fast-acting relays also protect the speakers from stray DC potentials and the output transistors from overloads.

DC Amplification

Unusual for receivers, the power-amp section is completely free of all capacitor elements that could degrade the low frequency response. All stages are directly coupled, and amplification continues right down to 0Hz, giving deep, firm bass response. Slow rate, the measure of an amplifier's ability to follow fast-changing musical signals, is a healthy 50V/ μ sec.

Great for Discs

A direct-coupled, three-stage equalizer circuit configuration with low



Maximum permissible input levels vs. THD plus noise

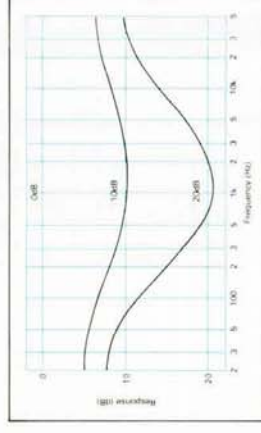
impedance negative feedback gives excellent S/N ratio, faithfully reflecting the individual tonal characteristics of different phono cartridges and recapturing every nuance of the original performance.

High and Low Filters

The unusually steep, 12dB/octave slope of the low filter cuts out all power-sapping non-musical subsonic signals, while the 6dB/octave high filter removes high-frequency noise.

Continuous Loudness Control

The R15 features a continuous loudness control, retaining the same



Loudness control characteristics

tonal balance right down to a whisper without boosting distortion.

Independent Recording and Program Selectors

You can listen to any program source while recording from any other—even dubbing from one tape cassette deck to another. The Rec Off position on the recording selector isolates other input circuits from the potentially harmful effects of tape-deck input impedance.



Separate program and recording selector switches

DR-730

System Cabinet



The ideal home for your audio system—showing it at its beautiful best.

THE R8: UNRIVALLED PERFORMANCE AND RIGHT AT THE TOP OF ITS CLASS

How is Such Astonishing Value for Money Possible?

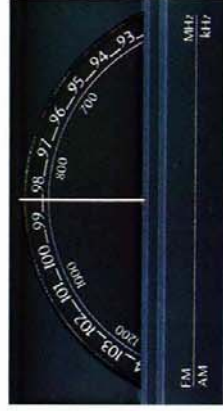
This is the first question that most enthusiasts will want to ask when they read the performance specifications and note the long list of useful features. The pleasure—and the puzzlement—are likely to grow stronger at a first audition.... Although the price is surprisingly low, the R8 was designed "up" to Mitsubishi's exacting audio standards, not "down" to the price. Some of the more unusual refinements are almost never found on other receivers in this price class, and certainly not all on the same receiver!



The signal strength meter and LED indicators

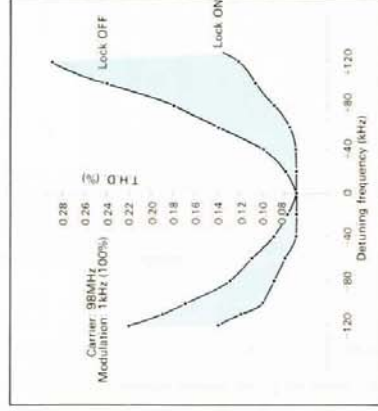
Touch-Sensitive Lock Tuning

Special, powerful circuits "lock" the R8 to the frequency you have selected, eliminating the distortion caused by frequency drift in conventional designs. But these circuits only come into action as your hand leaves the tuning knob. So just tune in normally: red, LED arrow-type indicators show which way to tune, and a green LED shows when you have zeroed in on station dead-center. Release the knob, and let the locked tuning take over: the LED "lock" indicator shows when it has gone into action, just as the "stereo" LED indicates FM stereo broadcasts.



The long easy-to-read tuning dial.

Five more LEDs line up to indicate signal strength, and the easy-to-read circular dial, with its long effective length, can be spun quickly from one end of the band to the other. In fact, the R8 has everything to make tuning a simple pleasure.



The reduction in distortion achieved by touch-sensitive lock tuning

High FM S/N Ratio and Low Distortion

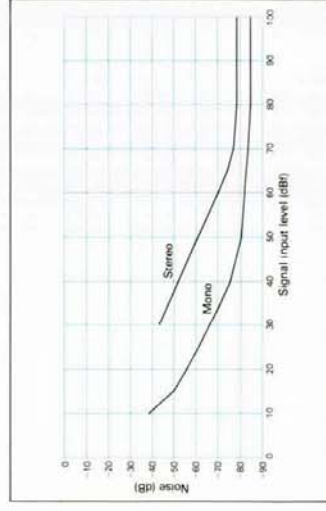
An important technical development lies behind the truly remarkable S/N ratio and low distortion of the R8. It is the revolutionary new FM demodulator quadrature IC—the same high-performance unit used in the

R35, R25 and R15—based on our latest semiconductor technology.

Sensitive and Stable Front End

Dual-gate MOS-FET elements and a high-precision three-ganged tuning capacitor are responsible for the tremendous station-getting power and the ability to resist "swamping" by strong local stations.

Twin ceramic filters help to give the R8 its high selectivity, rescuing a signal for enjoyment despite nearby stations that would otherwise cause interference.



FM quieting characteristics

Pilot Signal Cancellation for Wide, Flat Frequency Response

Many FM tuners have filters to get rid of the unwanted 19kHz stereo pilot signal and 38kHz carrier signal, but these can also affect the higher frequencies in the musical signal. In the R8, a special circuit cancels out the 19kHz pilot signal, leaving the whole audible broadcast frequency range flat. The special molded, two-channel one-block low pass filter used to remove the 38kHz carrier has no effect on the audio response.



T-PERFORMANCE PUT IT

Muting/Mode Selector

This lets you opt for mono reception of stations too weak—or too far away—for good stereo reception. (Mono reception does not suffer from the “hiss” noise that affects FM stereo reception.) In the Auto position the inter-station static is muted, along with stations too weak for good-quality listening.

High-Quality AM Reception

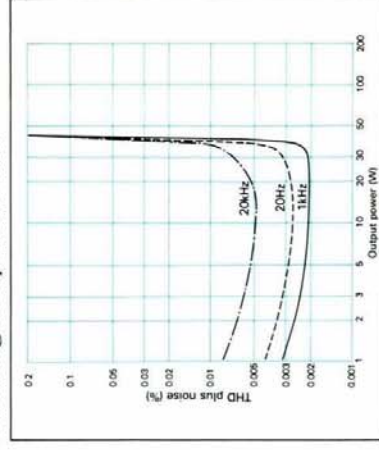
A high-performance integrated circuit with a four-element IF filter and a detachable loop antenna (easily located for optimum reception) give surprisingly good reception even on the crowded AM band.

Final Mark of Excellence

A direct-coupled buffer amplifier is used in the output stage of the tuner to safeguard its outstanding audio quality. Its rapid-response circuitry gives tremendous “get-up-and-go” to the sound, and its ideal output impedance protects the audio signal from degradation of the high-frequency response by tape decks or other components connected to the Rec Out terminals.

Ample Power for All Domestic Listening

Nothing has been skimped on the R8's power supply circuits—there's a transformer rated high enough to supply the full current load at maximum output power continuously, not just at brief peaks, and huge 10,000 μ F filter capacitors. The difference from circuits that run most of the time on components designed for half the rated power—and switch in others for the peaks—is so audibly unmistakable that no-one should miss a hearing comparison test!



Output power vs. THD plus noise

Minimum RMS power is 35 watts per channel with both channels driven into 8 ohms, from 20Hz to 20kHz, and with no more than 0.015% total harmonic distortion.

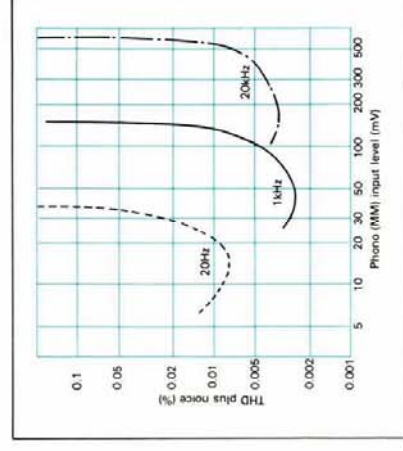
This is more than enough for dramatically impressive listening levels in most domestic environments. It is also enough to drive two separate pairs of speaker systems.

Full Protection of Speakers and Output Transistors

The protection circuit safeguards both speakers and output transistors from damage in three ways. First, it detects potentially harmful DC potentials and isolates them from the speakers. Second, it detects high power dissipation and protects output transistors from damage. Third, it mutes the speakers briefly when switching on and off, preventing “click” noise and power surges from damaging speakers or transistors.

True, Low-Distortion DC Amplification

The DC amplifier technique used in the R8 achieves excellent waveform fidelity, approaching the Mitsubishi ideal of a “straight wire with gain,” adding nothing to the signal, and taking nothing away.



Maximum permissible input levels vs. THD plus noise

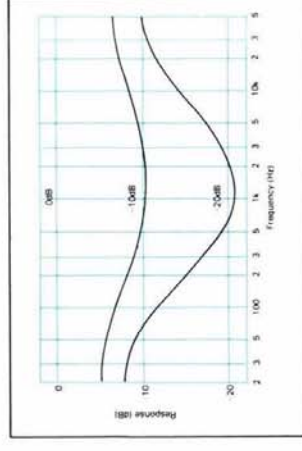
High-Performance Equalizer for Disc Reproduction

The quality of the equalizer amp is what decides the quality of audio reproduction from discs. In the R8, a

DA-R8

Receiver

direct-coupled three-stage circuit configuration with low-impedance negative feedback gives an astonishing 94dB S/N ratio (10mV input) and ultralow distortion. The result is a faithful recreation of the original performance.



Loudness control characteristics

Continuous Loudness Control

Unlike simple on/off loudness controls, the R8 features a continuous loudness control. The same tonal balance will be retained from your normal maximum listening level right down to a whisper.

Since the Mitsubishi system attenuates the mid-range frequencies, it can never result in the distortion or signal clipping that affect some systems that boost low and high frequencies for loudness compensation.

The continuous loudness control.



Separate program and recording selectors

Steep-Cut Subsonic Filter

The 12dB/octave low filter effectively cuts out power-sapping subsonic frequencies without affecting the musical signal.

Specifications

Receivers

Min. RMS output power per channel, both channels driven into 8 ohms, from 20Hz to 20kHz
Min. RMS output power per channel, both channels driven into 4 ohms, from 20Hz to 20kHz

DA-R35

85 watts with no more than 0.01% total harmonic distortion
110 watts with no more than 0.05% total harmonic distortion

DA-R25

60 watts with no more than 0.015% total harmonic distortion
75 watts with no more than 0.05% total harmonic distortion

Dynamic headroom

Damping factor
Power bandwidth (IHF)
Slew rate

Input sensitivity/impedance
Phono MC
Phono MM
Aux. Play

Main in
Phono MC
Phono MM

Maximum input level

Output level/impedance (Rec out)
Frequency response
Phono MC
Phono MM
Aux. Play
Main in

Total harmonic distortion (20Hz - 20kHz)
Phono MC/MM, Aux. & Play
Main in (at half power)

Intermodulation distortion
Main in (at half power)

Signal to noise ratio (input level)

Phono MC
Phono MM
Aux. Play
Main in

Residual noise (IHF)

Tone controls (bass & treble)
Filters (12dB/octave)

FM SECTION

Tuning range

50dB quieting sensitivity

Mono
Stereo (Auto Hi-Blend on)
Stereo (Auto Hi-Blend off)

Usable sensitivity

Image response ratio

IF response ratio

Spurious response ratio

AM suppression ratio

Capture ratio

Alternate channel selectivity

Signal to noise ratio

Mono

Total harmonic distortion

Stereo

Stereo separation

Subcarrier product ratio

Stereo separation

100Hz

1kHz

10kHz

Stereo separation with Auto Hi-Blend on

100Hz

1kHz

Frequency response

AM SECTION

Tuning range

Usable sensitivity

Selectivity

Image response ratio

IF response ratio

Signal to noise ratio

Total harmonic distortion

GENERAL

Power consumption

Dimensions (W X H X D)

Weight

90 watts into 8 ohms at 1kHz with 0.01% THD
120 watts into 4 ohms at 1kHz with 0.01% THD

2.0dB
1.30 (20Hz - 20kHz)
10Hz - 80kHz
100V/μsec

0.1mV/100 ohms
2.5mV/50k ohms, 100pF
150mV/50k ohms
1V/50k ohms

20mV
250mV
150mV/600 ohms

±0.3dB, 20Hz - 20kHz (RIAA)
±0.2dB, 20Hz - 20kHz (RIAA)
±0.2dB, -2dB, 1Hz - 100kHz
+0.2dB, -2dB, 1Hz - 100kHz

0.005%
0.005%
0.005%

76dB (500μV) 75dB (new IHF)
96dB (10mV) 78dB (new IHF)
106dB (150mV) 87dB (new IHF)
115dB (1V) 95dB (new IHF)

0.1mV
±10dB at 100Hz & 10kHz
18Hz and 8kHz

87.9 - 107.9MHz

3.0μV (15.0dB)
25μV (33.2dB)
38μV (36.8dB)
1.8μV (10.3dB)-300 ohm
0.9μV (10.3dB)-75 ohm

85dB
100dB
100dB
60dB
1.5dB
55dB (wide) 75dB (narrow)

84dB at 85dB, 82dB at 65dB
78dB at 85dB, 74dB at 65dB

0.08% (wide) 0.1% (narrow)
0.1% (wide) 0.2% (narrow)
60dB

42dB (wide) 36dB (narrow)
46dB (wide) 40dB (narrow)
43dB (wide) 40dB (narrow)

37dB
20dB
±0.5dB, 50Hz - 15kHz
+0.5 - 1dB, 30Hz - 16kHz

530 - 1,620kHz
300μV/m
40dB
40dB
50dB
52dB
0.5%

230 watts
470 X 135 X 436mm (18 1/2 X 5 1/2 X 17 1/2")
14.2kg (31 lb 4oz)

65 watts into 8 ohms at 1kHz with 0.015% THD
80 watts into 4 ohms at 1kHz with 0.015% THD

2.0dB
1.30 (20Hz - 20kHz)
10Hz - 80kHz
100V/μsec

0.1mV/100 ohms
2.5mV/50k ohms, 100pF
150mV/50k ohms
1V/50k ohms

20mV
250mV
150mV/600 ohms

±0.3dB, 20Hz - 20kHz (RIAA)
±0.2dB, 20Hz - 20kHz (RIAA)
+0.2dB, -2dB, 1Hz - 100kHz
+0.2dB, -2dB, 1Hz - 100kHz

0.005%
0.005%
0.005%

76dB (500μV) 75dB (new IHF)
96dB (10mV) 78dB (new IHF)
106dB (150mV) 87dB (new IHF)
115dB (1V) 97dB (new IHF)

0.1mV
±10dB at 100Hz & 10kHz
18Hz and 8kHz

87.9 - 107.9MHz

3.0μV (15.0dB)
25μV (33.2dB)
38μV (36.8dB)
1.8μV (10.3dB)-300 ohm
0.9μV (10.3dB)-75 ohm

85dB
100dB
100dB
60dB
1.5dB
55dB (wide) 75dB (narrow)

84dB at 85dB, 82dB at 65dB
78dB at 85dB, 74dB at 65dB

0.08% (wide) 0.1% (narrow)
0.1% (wide) 0.2% (narrow)
60dB

42dB (wide) 36dB (narrow)
46dB (wide) 40dB (narrow)
43dB (wide) 40dB (narrow)

37dB
20dB
±0.5dB, 50Hz - 15kHz
+0.5 - 1dB, 30Hz - 16kHz

530 - 1,620kHz
300μV/m
40dB
40dB
50dB
52dB
0.5%

210 watts
470 X 135 X 436mm (18 1/2 X 5 1/2 X 17 1/2")
12.5kg (27 lb 8oz)

Receivers

DA-R15

Min. RMS output power per channel, both channels driven into 8 ohms, from 20Hz to 20kHz
Min. RMS output power per channel, both channels driven into 4 ohms, from 20Hz to 20kHz

45 watts with no more than 0.015% total harmonic distortion
60 watts with no more than 0.05% total harmonic distortion

DA-R8

35 watts with no more than 0.015% total harmonic distortion
45 watts with no more than 0.05% total harmonic distortion

50 watts into 8 ohms at 1kHz with 0.015% THD
65 watts into 4 ohms at 1kHz with 0.015% THD

2.0dB
1:10 (20Hz - 20kHz)
10Hz - 80kHz
50V / μ sec

38 watts into 8 ohms at 1kHz with 0.015% THD
50 watts into 4 ohms at 1kHz with 0.015% THD
2.0dB
40 (20Hz - 20kHz)
10Hz - 80kHz
50V / μ sec

Dynamic headroom

2.5mV/50k ohms, 100pF
150mV/50k ohms

2.5mV/50k ohms, 100pF
150mV/50k ohms

Damping factor

140mV
150mV/220 ohms

140mV
150mV/220 ohms

Power bandwidth (IHF)

\pm 0.3dB, 20Hz - 20kHz (RIAA)
 \pm 0.5dB, -3dB, 5Hz - 100kHz

\pm 0.3dB, 20Hz - 20kHz (RIAA)
 \pm 0.5dB, -3dB, 5Hz - 100kHz

Input sensitivity/impedance

0.01%
0.01%

0.01%
0.01%

Intermodulation distortion

Signal to noise ratio (input level)
Aux. Play (at half power)

94dB (10mV) 78dB (new IHF)
106dB (150mV) 87dB (new IHF)

94dB (10mV) 78dB (new IHF)
106dB (150mV) 87dB (new IHF)

Residual noise (IHF)

0.1mV

0.1mV

Tone controls (bass & treble)

\pm 10dB at 100Hz & 10kHz

\pm 10dB at 100Hz & 10kHz

Filters

18Hz (12dB/oct)
8kHz (6dB/oct)

18Hz (12dB/oct)

FM SECTION

Tuning range

50dB quieting sensitivity

Mono

87.9 - 107.9MHz

87.5 - 108MHz

Stereo

3.0 μ V (15.0dB)

3.5 μ V (16.0dB)

Stereo

25 μ V (33.2dB) (Hi-Blend on)

38.8 μ V (37.0dB)

Usable sensitivity

38 μ V (36.8dB) (Hi-Blend off)

1.8 μ V (10.3dB) - 300 ohm

Image response ratio

0.9 μ V (10.3dB) - 75 ohm

0.9 μ V (10.3dB) - 300 ohm

IF response ratio

55dB

55dB

Spurious response ratio

90dB

90dB

AM suppression ratio

80dB

80dB

Capture ratio

50dB

55dB

Alternate channel selectivity

1.5dB

1.5dB

Signal to noise ratio

55dB (wide) 75dB (narrow)

65dB

Mono

84dB at 85dBf, 82dB at 65dBf

82dB at 85dBf, 82dB at 65dBf

Stereo

78dB at 85dBf, 74dB at 65dBf

76dB at 85dBf, 74dB at 65dBf

Total harmonic distortion

0.08% (wide) 0.15% (narrow)

0.08%

Mono

0.1% (wide) 0.2% (narrow)

0.2%

Stereo

60dB

60dB

Subcarrier product ratio

42dB (wide) 36dB (narrow)

45dB

Stereo separation

1kHz

40dB

1kHz

46dB (wide) 40dB (narrow)

40dB

10kHz

43dB (wide) 40dB (narrow)

40dB

Stereo separation with Hi-Blend on

100Hz

37dB

1kHz

20dB

20dB

Frequency response

\pm 0.5dB, 50Hz - 15kHz

\pm 0.5dB, 50Hz - 15kHz

\pm 0.5 - -1dB, 30Hz - 16kHz

\pm 0.5 - -1dB, 30Hz - 16kHz

AM SECTION

Tuning range

Usable sensitivity

Selectivity

Image response ratio

IF response ratio

Signal to noise ratio

Total harmonic distortion

GENERAL

Power consumption

Dimensions (W X H X D)

Weight

530 - 1,620kHz

525 - 1,605kHz

300 μ V/m

300 μ V/m

40dB

30dB

40dB

40dB

50dB

50dB

52dB

52dB

0.5%

0.5%

160 watts

470 X 135 X 436mm (18 $\frac{1}{2}$ X 5 $\frac{1}{2}$ X 17 $\frac{1}{2}$ "

11.2kg (24lb 10oz)

120 watts

470 X 135 X 436mm (18 $\frac{1}{2}$ X 5 $\frac{1}{2}$ X 17 $\frac{1}{2}$ "

9.5kg (20lb 14oz)

 **MITSUBISHI ELECTRIC SALES AMERICA, INC.**

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