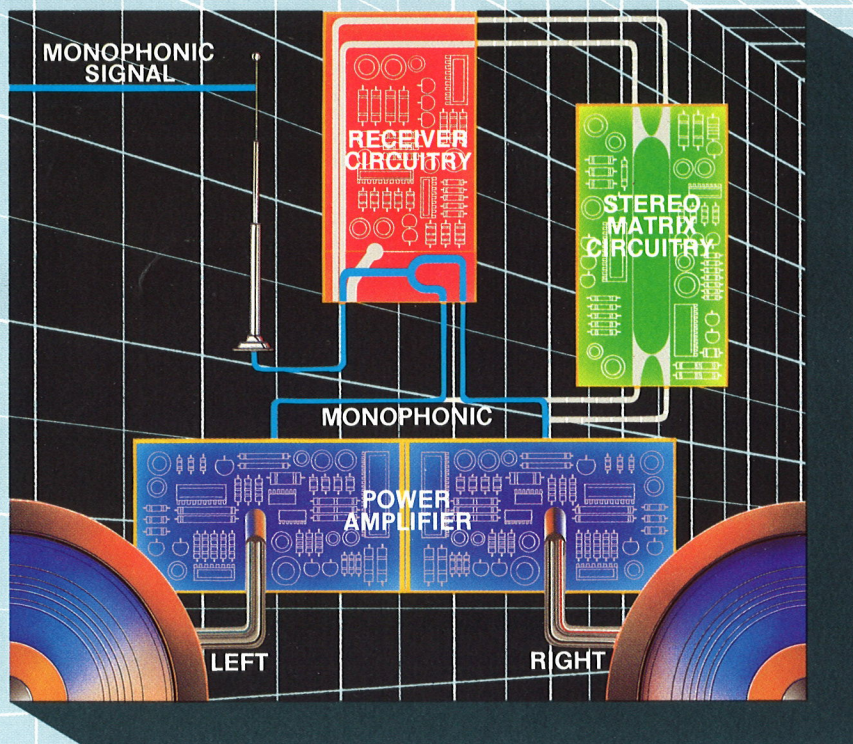


HIGH TECHNOLOGY

FROM BUICK

AM STEREO
RADIO



AM STEREO RADIO

In the quest to offer the latest high technology products, Buick Motor Division of General Motors, introduces AM Stereo radio, developed for Buick by Delco Electronics Division of General Motors.

AM radio has a decided advantage in automotive applications. AM signals have a much greater broadcasting range than FM, which is especially desirable in areas removed from urban centers.

There are over 200 stations broadcasting AM stereo currently, and the number is growing rapidly as AM stereo is gaining acceptance. Four major signal formats are on the air, with C-QUAM being the most popular, used in nearly 50% of all applications.

Buick and Delco Electronics, after conducting extensive tests and evaluations, have decided that the C-QUAM format gives the best reception and stands the best chance of becoming the industry standard.

STATE OF THE ART

This AM stereo is truly state-of-the-art electronics. Conventional AM radios are equipped to receive a monaural (monophonic) AM signal. The Delco-developed stereo radio has this circuitry, plus an additional circuit to receive another signal (L/R in C-QUAM terminology), which is broadcast simultaneously in C-QUAM transmission.

L/R is the carrier of stereo information which, when matrixed with the monophonic signal, produces the stereo effect.

Most conventional AM radios currently on the market utilize envelope detectors in their decoding circuits to receive monophonic AM signals.

In addition to this method for detecting monophonic signals, the Buick radio also employs a synchronous detector for AM stereo signals (L/R). A phase lock loop (PLL) is utilized in the stereo decoder, which locks onto an incoming intermediate frequency (IF) signal.

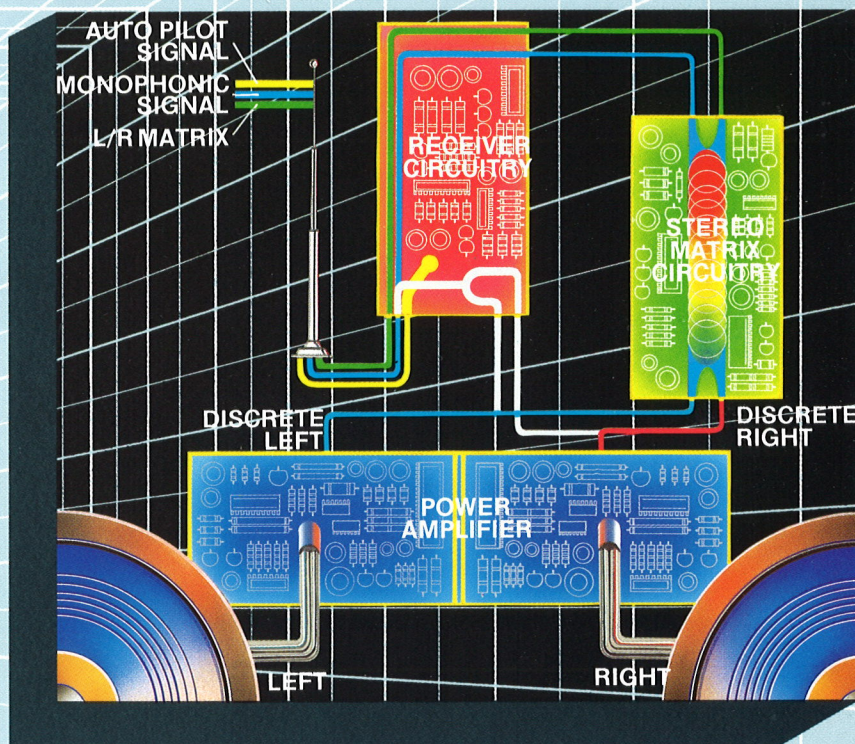
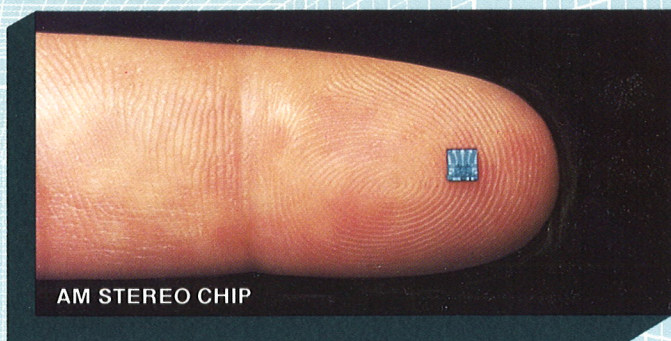
This produces a sine wave that is used to simultaneously align the incoming L/R and monophonic signal, and allow them to be synchronously decoded, producing a stereo effect.

AUTOMATIC SIGNAL DETECTION

Automatic signal detection is also a built in feature. C-QUAM stations mix a pilot tone in along with their L/R signals to activate the stereo circuitry in receivers. In an area with good reception, if a pilot tone of 25 Hz is detected for seven consecutive cycles, the decoder will switch to stereo.

If signal conditions are bad, 37 continuous cycles are required. This feature reduces the possibility of false stereo triggering due to signal level fluctuation or noise. Switching back and forth between stereo and monaural would produce sound distortion.

If the PLL goes out of lock, or interference is detected by a protection circuit before seven cycles are counted, the decoder goes into the long count mode. Each disturbance resets the counter to zero.



FULL FEATURE

All of the circuitry for AM stereo decoding, including envelope detection for monophonic signal, PLL for detection of L/R signal, and detection system for the pilot signal, are contained in one silicon chip, (Silicon Monolithic Integrated Circuit).

The use of this high technology semiconductor enables a large amount of complex electronics to occupy a minimum of space within the vehicle.

In addition, the semiconductor is superior for precision electronic circuitry in that it never needs adjustment, contains no coils, requires few peripheral components, and contains an internal level detector which can be used as an automatic gain control to prevent volume fluctuations.

In addition to the innovative stereo capability, the new Buick radio has many other features. In the audio technology department, the radio has a switchable dual band width mode.

Utilizing the wide band position, the fidelity of output is expanded, boosting bass and treble. In weak signal areas, switching to the narrow band reduces unwanted noise and interference.

Other features incorporated in the new Buick radio are seek and scan buttons for automatic station tuning. Depressing the seek button causes the radio to find the next signal in ascending frequency. The button must be depressed again in order to move to another signal.

Depressing the scan button causes the radio to ascend the frequency scale automatically, stopping at only strong signals, for a five second interval. Utilizing either button, when the top of the AM frequency scale is reached the radio automatically cycles to the bottom, and begins the search again.

The radio has four push buttons that can be set to select four AM and four FM stations at a touch.

There are no internal mechanical moving parts in the Delco radio.

Tuners and servo-mechanisms are eliminated, and station tuning is accomplished through integrated circuitry. The operator selects the station by turning the selection button until the desired frequency number is displayed. Counters within the circuitry confirm that the oscillator is at the desired frequency through a feed-back loop.

Conversely, the operator can search until a desirable station is found by turning the button which activates the oscillator, and the counters and feed-back loop will calculate the correct display. Tuning is nearly instantaneous, occurring in 30 to 50 milliseconds. A small indicator light confirms that the unit is receiving and playing a stereo signal.

By depressing the upper (volume) button, the time is displayed in digital characters in the station display position. The time-keeping function is accomplished by electronically stimulating a quartz crystal to induce oscillation. The number of oscillations per second is used as the reference point for calculating larger units of time.

In sound systems and all other applications of high technology, Buick continues to strive for engineering innovation and precision.



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