

AUDIO UPDATE

The evolution of car stereo



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THE FEATURES, FUNCTIONS, AND CAPABILITIES of today's autosound equipment are remarkable—and were certainly undreamed of when I did car-audio repairs and installations at a Delco-Radio warranty station in Queens, New York. It was my first civilian job after an 18-month stint in the U.S. Army Signal Corps.

The new car radios that I handled in 1949 were impressive by the standards of the day. Push-pull 6V6 or 6K6 output tubes provided 8 to 10 watts of power—which was about as high as you were likely to find in the typical home console radio. All of the sets had vibrator-driven transformer power supplies that were a sort of mechanical version of today's solid-state switching power supplies. The supplies provided 250 volts or so to the plates and screen elements of the output tubes, while the tube filaments were directly heated by the car's 6-volt battery. As many as seven tubes were found in the higher powered sets with their extra RF stages and push-pull output circuits. Although primitive by today's standards, the radios were the end product of a long evolutionary process that started during the late 1920's.

The first "car" radios were actually big battery-operated sets in wooden cabinets that were wrested out of their normal living-room locations and into the back seats of cars. Of course, the separate horn had to come along, too, unless you were content with headphone listening. Despite all

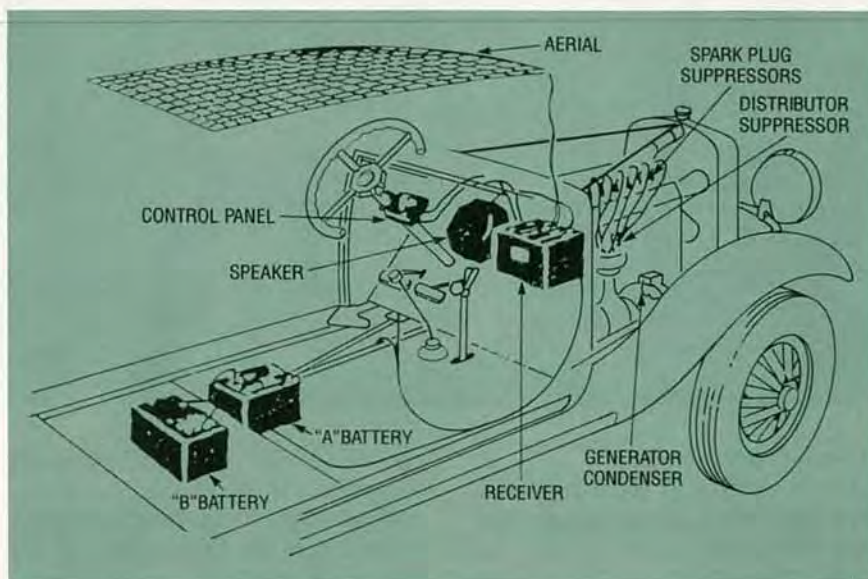


FIG. 1

the effort, the electrically noisy automotive ignition systems of the day eliminated any possibility of music on the move. But if you were parked with your motor off in an area of reasonable reception, and if your antenna was good enough, you could usually find something to listen to. Some of the early photos show home-grown antennas strung high over a car on front and back T-bars that bear a striking resemblance to backyard clotheslines.

Dedicated car radios

Since radio in those days was very much of a build-it-yourself hobby, it wasn't long before some drivers began assembling and installing sets designed specifically for car use. Their task, I imagine,

was not too much different from that faced by today's autosound installers dealing with high-powered triamplified multi-speaker systems. In other words, where do you fit all the parts?

The radio's electronic components were housed in a metal cabinet about the size of a large bread box, and it was connected to a separate enclosed speaker the size (and shape) of a hat box. The volume and tuning controls were usually housed in a separate small module, which was clamped to the steering column and *mechanically* linked to the electrical components within the chassis box. The "aerial" might be a large grid of chicken wire hidden beneath the car's cloth-covered roof. The separate tube-filament

"A" batteries, high-voltage "B" batteries, and bias "C" batteries were installed, if possible, under the car's floorboards. To ease the installation task, companies such as Chrysler, Studebaker, Pierce-Arrow, and others shortly began building cars with built-in-roof antennas and the required floor-cut-out battery compartments (see Fig. 1).

Eventually, shielding techniques and "suppressors" were developed that reduced electrical-ignition noise to an acceptable level for music on the go—and OEM car-radio installation took off. In a promotional effort late in 1929, the Automobile Radio Corporation joined forces with a large New York City Dodge dealer in a successful 30-day showroom demonstration. By 1930, 34,000 units had been sold, and the car radio was slowly evolving from a novelty to a necessity. Despite magazine articles claiming that radios kept drivers awake and alert, more than one locality tried to pass ordinances against them on the grounds that they caused loss of attention and drowsiness and could even distract the drivers of other cars. The Radio Manufacturers Association (RMA)—now the EIA—successfully fought all such efforts to outlaw car radios.

When cars with solid-steel tops appeared in 1934, the chicken-wire grid in the roof was suddenly no longer a feasible antenna option. All sorts of alternative locations for the antenna were tried, including a wire strung under the running board. As radios became more sensitive, the whip antenna became a practical and easy-to-install alternative, and it's been in use ever since.

Car-radio sales really took off during the post-WWII boom. In early 1947, the National Association of Broadcasters (NAB) reported that there were over seven million sets on the road. Of course, they all used tubes and were AM only. FM was barely off the ground as a broadcasting media, and the invention of the transistor was about a year away. In the late fifties, FM was finally judged sufficiently popular to warrant its use in a car. It first appeared as an optional below-dash adaptor de-

signed to be connected to the existing radio. By that time, the AM radio itself had evolved into a sleek unit, only a little larger than a cigar box.

Hybrid radios

In the mid-1950's, transistors began to appear in consumer products, but it took several more years before they found their way into car radios. A 1960 Lafayette radio catalog offered several models with "transistor powered" chassis. The sets were actual "hybrids" in that the transistors were used only in the output circuits and the rest of the functions were handled by tubes. The advantage of such a configuration was that the newly developed RF tubes, like the output transistors, could work directly from the car's 12-volt battery, thus eliminating the need for a high-voltage supply with its trouble-prone vibrator.

The transistor-output circuits had the virtues of cool operation and very low current drain, but they did result in lower power-output ratings and some strange output impedances. I remember installing a hybrid AM/FM Motorola that required a 32-ohm speaker. In the early 1960's, stereo came to FM, but not yet to the car radio. Considering the barely adequate specs of the typical FM set, it's likely that the engineers found that a stereo FM radio had excessive multipath and signal-fluctuation problems in a moving vehicle. In fact, it was well into the 1970's before AM/Stereo FM car radios became commonplace.

Tape players appeared somewhat earlier, particularly on the West Coast. A 4-track Fidelity-based machine made a brief showing but was shortly swamped under by the proliferation of the 8-track format. It was only after the early success of 8-track car players that North American Philips decided that cassettes might also be a viable source of mobile music.

Future formats

Judging from the number of prototypes I saw in Japan, the Japanese at one time were seriously considering making the microcassette a hi-fi medium for both home and car. But either the

task proved too difficult (which I doubt) or they were diverted by other formats that they considered more promising. Speaking of promising formats—despite all the promotional efforts, I'm not optimistic about widespread public acceptance of CD car players—and I feel only slightly more positive about DAT.

As to convenience, the DAT format has more going for it than CD, but I doubt that the typical car-sound buff will rush to trade in a high-quality cassette player for a DAT machine whose only real advantage is extra playing time and convenient random access—particularly considering how costly it will be to buy and feed. As with CD, the genuine sonic advantages of DAT are unlikely to be heard in a moving vehicle. Within a year or so, we should know whether CD and DAT were able to successfully take their shows on the road. **R-E**

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