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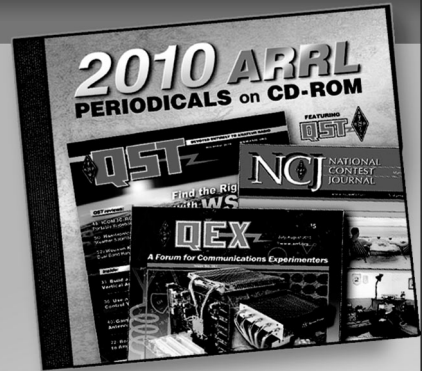
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**QST Issue:** Dec 1986

**Title:** More on the Balanced Grid Circuit for the SB-200

**Author:** Mark Tyler, K5GQ

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as near to the vehicle-body side as possible.

B) Mount one-piece transceivers under the dash or on the transmission hump, where they do not interfere with vehicle controls or passenger movement.

#### Antenna Installation

A) Use a permanently mounted antenna located in the center of the roof or rear-deck lid. Keep glass-mounted antennas as high as possible in the center of the rear window or windshield. If a magnetic-mount antenna must be used, carefully place it in a location recommended for a permanently mounted antenna. If a disguise-mount antenna is used, shield the matching network from vehicle electronics and wiring or mount the matching network in an area completely clear of vehicle electronics and wiring.

B) Radio-frequency energy affects each vehicle model and body style differently. When dealing with an unfamiliar vehicle, use a magnetic-mount antenna to check proposed antenna locations for unwanted effects. (Antenna location is a major factor in these effects.)

#### Antenna-Cable Routing

A) Always use high-quality coaxial cable (at least 95% shield coverage), and route it away from the Engine Control Module and other electronics modules.

B) Do not route feed line next to any vehicle wiring.

#### Antenna Tuning

A) It is important to properly match the antenna so that reflected power is kept to a minimum (keep SWR less than 2:1).

#### Radio Wiring and Connection Locations

A) Transceiver power leads: Power connections, including the ground, should be made directly to the battery (or to the jump-start block on vehicles so equipped). Transceiver power leads should be no. 10 AWG or larger, installed as a twisted pair if possible. The ground lead should not be attached to the body at any point. Place appropriate fuses, as near the battery as possible, in both positive and ground leads. (A fuse in the transceiver ground lead prevents possible transceiver damage should the battery-to-engine-block ground be disconnected.)

Where ignition-switch control of dc power is desired for one-piece transceivers, install a 12-V power contactor in the transceiver positive lead. Install the contactor near the vehicle battery, and drive the contactor coil through an appropriate fuse from an available accessory or ignition circuit that is not powered during cranking. The contactor-coil ground should return directly to the negative battery terminal.

B) Handset or Control-Unit Battery and Ground:

Any ground lead from a handset or control unit should return directly to the negative battery terminal. The positive lead of a handset or control unit should be connected directly to the positive battery terminal. Fuse the handset or control unit power leads separately from the transceiver power leads. If the radio dc power must be controlled with the ignition switch, the handset or control-unit positive lead may be connected, through an appropriate fuse, to an available accessory or

ignition circuit not powered during cranking.

C) Connections for multiple transceivers and receivers:

If multiple transceivers or receivers are installed in the vehicle, install heavy power conductors to the trunk or dash and terminate them in covered, insulated bus bars. Connect all radio power leads to the bus bars. (This makes a neater installation and reduces the number of wires running under the hood.)

#### Wire Routing

A) Bring radio power leads into the passenger compartment through a grommet in the driver's side of the firewall. For trunk-mounted transceivers, continue the cables along the driver's-side door sill(s), under the rear seat, and into the trunk through the rear bulkhead. If the battery is located on the passenger side, power leads should cross the vehicle in front of the engine. Maintain as much distance as possible between radio power leads and vehicle electronic modules and wiring.

B) For police vehicles, route radio power leads in the conduit provided with the option package.

#### Troubleshooting

A) Should vehicle problems develop following installation, the source of the problem should be determined prior to further vehicle operation.

B) Possible causes of vehicle problems include:

- 1) Power connections to points other than the battery.
- 2) Antenna location.
- 3) Transceiver wiring located too close to vehicle electronic modules or wiring.
- 4) Poor shielding or poor connections in the antenna feed line.

#### Contact and Feedback

A) GM vehicles have been designed and extensively tested for immunity to known sources of RF energy. It is impossible, however, to test every combination of RF source and installation. If you encounter a persistent condition in a GM vehicle, contact your local GM representative. If no solution is found locally, write to: EMC Dept—Mr, Bldg 40, General Motors Proving Ground, Milford, Michigan 48042-2001.

<sup>1</sup>Surprisingly little information is available about proper installation of two-way radios in vehicles containing microprocessors. The GM recommendations are all that I have seen to aid those who wish to make competent, interference-free installations of amateur gear in today's electronically sophisticated automobiles.

Conversations with technicians who install police radios in Chrysler products have yielded some unofficial information. The microprocessor is usually in the passenger-side kick panel. Police cruisers come equipped with a steel cable housing welded to the frame on the driver's side from the firewall to the rear bumper. RF cables are routed inside the housing to the antenna at the rear of the vehicle. Power cables are kept as far as possible from the computer.

I would appreciate copies of any additional official information. Send them to Bob Schetgen, KU7G, Hints and Kinks Editor, 225 Main St, Newington, CT 06111.

#### FLASH! VCR CURES TVI!

□ Here is a tip on the use of a VHS videotape recorder. I live in the weak-reception area of several Los Angeles television stations. When the signals from those stations are very weak, my 7-MHz amateur transmissions produce a light cross-hatch pattern on Channel 5. I have found that the interference is eliminated when the received TV signal is passed through my operating VCR. I do not know the gain of the VCR front end, but it seems significant. —K. C. Jones, W6OB, Hemet, California

#### LIVING WITH TVI

□ I live in a small apartment building at a summer resort area. During the colder half of the year, I am the only occupant and have no TVI worries. As warm weather approaches, however, the other apartments start filling up. Three tenants have hand-me-down TV sets with poor antennas that are particularly susceptible to TVI. (My own set is free of TVI even when I use my amplifier. Thus, my station emissions are clean. That doesn't cut any ice with the neighbors, however, who want to see their programs.) For my part, it is good practice to keep my neighbors happy. So, do I go QRT during all TV-viewing hours? Not on your life! I have set up a TV detector to determine when the neighbors are watching TV.

If you live in an apartment building, perhaps you have noticed that your AM broadcast receiver is little better than useless when your (or your neighbor's) TV is on. This is the result of interference from the TV horizontal-sweep oscillator, and it is especially prevalent near the low end of the AM-broadcast dial. Such interference is much worse on longwave frequencies (150-300 kHz). All I do is tune my receiver near 150 kHz (the 10th harmonic of the sweep frequency) and a loud roaring noise can be heard when a neighboring TV is on.

My discovery does not cure TVI, but it does allow me to operate many hours when I would otherwise have to stay off the air.—Robert J. Panknen, K4SYP/EASCHT, Murcia, Spain

#### MORE ON THE BALANCED GRID CIRCUIT FOR THE SB-200

[In Mark Tyler, K5GQ's hint (Aug 1986 QST) about the SB-200, he replaced C29, a fixed capacitor, with an 8- to 50-pF variable capacitor. Here is Mark's adjustment procedure for the new capacitor.—Ed.]

□ The variable capacitor determines the amount of ALC sent to the exciter. To determine the variable capacitor setting:

1) Set the new component for maximum capacitance.

2) Momentarily increase the exciter to maximum RF output. (ALC through the new capacitor should limit the exciter output.)

3) Decrease the capacitance until maximum amplifier output is reached. (Decreasing the capacitance should increase amplifier drive and output by reducing the ALC signal.)

I installed a 20-pF fixed capacitor in NM5I's SB-200 because he does not use the ALC line.—Mark Tyler, K5GQ, Katy, Texas