Low cost rally counters

By A. C. SNYDER
Los Angeles Region

This article will assist you in building a set of electrical counters at an economical price. The data is basically on counters to fit a Porsche; changes will be required for other makes of cars.

Here is a list of parts and materials required:

COUNTERS—2 required, used Veeder Root $4 to $6.
DRIVE ADAPTERS—1 requ'd, F. W. Stewart Corp., $7.
MICRO SWITCH — 1 requ'd, miniature size with leaf and roller actuator—2 pole (approx. ¾ in by ½ in by ¼ in).
PLATE TO MOUNT MICRO SWITCH — 1 requ'd, 3/6 in by 1 in by 2 in dural
ELECTRICAL WIRE—6 to 8 ft, 16 or 18 ga.
CONNECTOR (CANNON PLUG) — Minimum of 3 contacts
ELECTRICAL BOX — 1 requ'd, Aluminum box 5 in by 4 in by 3 in (See text)
TOGGLE SWITCH — 1 requ'd, 3 pole (OFF in neutral position)
TOGGLE SWITCH — 1 requ'd, 2 pole
INSTRUMENT LIGHT & SOCKET — 6 or 12 volt
ALUMINUM OR STEEL SHEET—8 in by 3¾ in—20 ga.

Counters

A search of surplus stores and electronic supply houses should provide a set of 4 or 5 digit electrical counters with reset dials. Surplus electrical Veeder Root is the most common. The manual reset feature is a must. Most of these counters will have 24 coils. These must be rewound to 6 or 12 v to match your car's electrical system.

Drive adapters

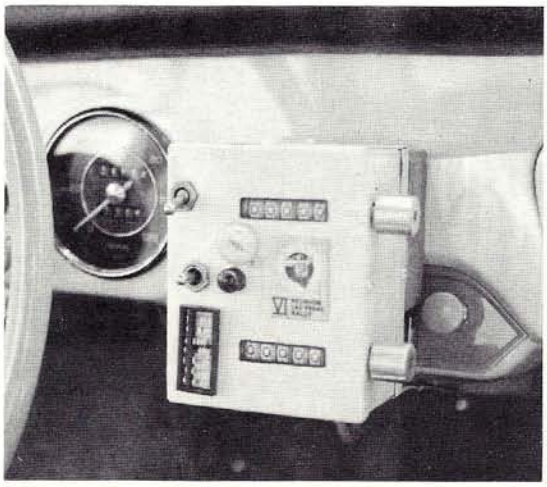
A drive adapter is required so that the power from the speedometer cable can also be utilized for the new counters. The drive adapter required is determined by the number of revolutions per 1/100th of a mile; this ratio can be doubled by the use of a double-lobed cam on the drive adapter. The drive adapter tee used on a Porsche is a 16 to 1 ratio, fitted with a double cam. The drive adapter is a F. W. Stewart Corporation Part 9046-C, 16:1.

The adapter must have a double-lobed cam secured to one of its drives, also it must have the existing "B" nut changed to one to match the Porsche speedometer. This can be accomplished by Paul Sullivan, 4311 Sunset Boulevard, Los Angeles.

Micro-switch plate

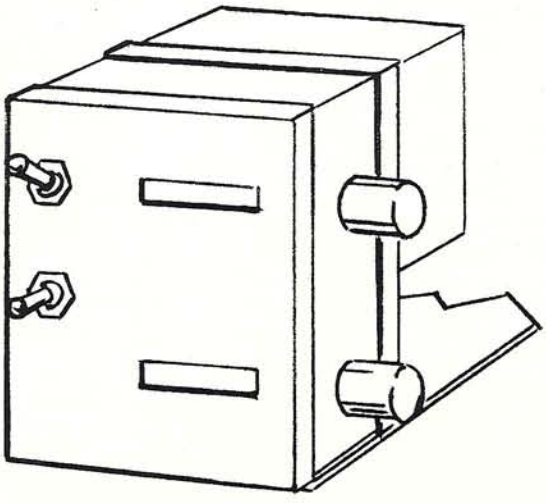
I used a ⅛ in piece of dural, since it is easy to work. A hole was drilled and tapped in one end of the plate to match the threads on the output drive of the adapter. The plate is then screwed down onto the adapter, the micro switch positioned so that the rotation of the cam will actuate the micro switch. The location is marked and the plate removed from the adapter.

The adapter is drilled to allow attaching the micro switch with small instrument screws and nuts, later in the assembly. The plate is reinstalled on the adapter and when screwed onto plate, it should be staked with center punch.



Electrical box

An aluminum box, 5 in high by 4 in wide by 3 in deep, was selected. It is designed so that both the front and back could be removed. This is the 5 in by 4 in dimension. One-half an inch was removed from the depth of the box to make it fit the exact height of the counters. The counters were located on one of the removable covers, in such a manner as to allow the installation of the counter toggle switch between them, on the front cover as well as the small instrument light. The knobs to reset the counters should be considered when locating counters. They must have their reset knobs extending from one side of the box. Extensions of the counter shafts can assist in this problem. After the exact location is determined, mount the counters with small screws; the base legs can be tapped to



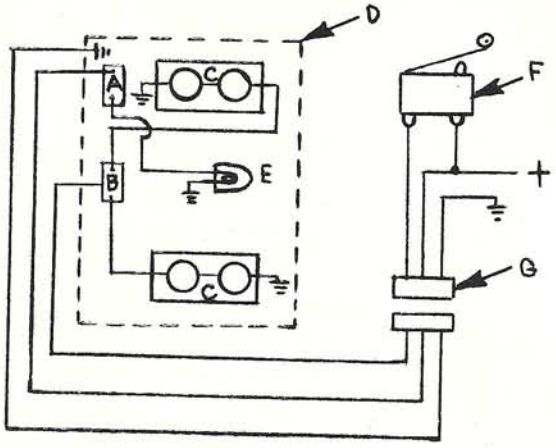
receive the screws, or nuts and bolts may be used.

The opposite cover, which will be the front of the box, must have small windows cut in it to match the counter windows. These can be started with a drill after the exact location is determined, and trimmed to size with a file.

The light and the counter coils are grounded to the box and a ground wire is connected to the box and is run back through the Cannon plug and grounded to the instrument panel. A hole is drilled in the bottom of the box and fitted with a rubber grommet to provide an outlet for the wires. See mounting instructions.

Electrical circuit

Power to the micro switch and counters can be tapped off from the fuse panel.



A — Two-pole toggle switch
B — Three-pole toggle switch
C — Counters
D — Box
E — 6-volt instrument light
F — Micro switch
G — Cannon plug

Light

A small 6 v instrument light was installed between the 2 counters and near the counter faces, to provide an internal light on the counters for night rallies. The bulb was painted with blue lacquer to reduce its brightness.

Switches

The 3-pole, double-throw switch was mounted on the face of the box on the left-hand side, and between the counters. The switch is so wired that when it is operated upward the top counter is in operation, in the neutral position both counters are off, and downward the lower counter is operating.

The double-pole, single-throw switch was installed on the face of the box on the upper left-hand side. This switch is connected to the internal 6v instrument lamp.

Mounting

A piece of 16 gauge dural sheet, cut 8 in long and 3¾ in wide, provides the required support for the counters. This plate is bolted or riveted to the base of the box, and the edges are smoothed, so that it will slide into the ashtray slot of the Porsche, after removing the ashtray. A 5/16 in hole is drilled through the plate and box after attaching the plate to the box to provide an outlet for the electrical wires.

A 1½-in. layer of sponge rubber was cemented to the back side of the box. This provides the necessary thickness to hold the box from contacting radio push buttons and also protects the instrument panel.

I cut a small metal bracket, slightly larger than the connector (Cannon plug) and mounted this on the lower flange of the instrument panel, at a location between the steering wheel and counter box. It is so located that when the lower half of the electrical connector is removed (when counters are not in the car), the bracket and upper portion are not visible. Some minor details like covering the wire loom with Surco tubing, and adding clips to secure the loom to base of counters and spraying the counters to match the dash panel, are left to the individual's taste.

Curing transmission leaks in 1962 models

By JOHN KENT
Connecticut Valley Region

My transmission, a 1962 50,000 type is superb, but it leaked oil during the winter. The first winter I had no problem because my garage was heated. In '62-'63, I discovered oil on the garage floor starting with cold weather. The leak was coming from the breather. Apparently when the oil is very viscous it is whipped and froths out of the breather. I had no trouble with a '57 644 type.

The breather was checked and found to be open and properly installed. The oil level was not overfull. After checking with POAC and several oil company technical service men I took their advice which was: add ½ pint of Type A automatic transmission fluid. These have a high concentration of anti-foam agents. The Type A is equivalent to about EP40-45 so this small quantity does not adversely affect lubrication. I made the change late in Feb., 1963 with good results. No troubles were encountered during the summer. I had no leaks during the December cold spell in New England.

When I had the transmission changed, the clowns neglected to follow instructions and I noticed the leak immediately. Since adding the Type A fluid no leak has been observed in the last 60 days of cold weather.

ALL COPY AND MATERIAL FOR THE JUNE ISSUE IS DUE MAY 10

The real league-winner, pace-setter and standard by which all the others should be judged, is the Porsche Super 75 with its drag coefficient of 0-32. Here is a car which not only *is* aerodynamically efficient but which *looks* aerodynamically efficient as well! The appearance and the aerodynamic efficiency of the Porsche suggest that a well-designed, rounded, smoothly curved body will have a lower drag coefficient than a well-designed boxy body.

Whether a body does or does not look aerodynamically efficient is essentially trivial; the important thing is the effect of aerodynamic efficiency upon performance and economy. In the case of the Porsche this effect is marked. It includes, for example, a top speed of 106-6 mph, which is high for a car with the by no means small frontal area of 17-9 sq. ft. and the by no means large net power output of 75 bhp. Consider the performance and petrol consumption of other low-drag cars such as the Lotus Elite and you will be forced to concede the vital importance of aerodynamics in car body design.

For those who believe that aerodynamic efficiency is of little interest to the ordinary family motorist, each of the 15 drag coefficients has been used to calculate the power required to propel a car having that particular drag coefficient and a standard frontal area of 20 sq. ft., at a speed of 60 mph. Although the power thus calculated does not include that required to overcome the rolling resistance of the tires, the difference between the 8-9 bhp required by a car with the 0-32 drag coefficient of the Porsche, and the 16-1 bhp needed for a car with the 0-56 drag coefficient of a Jaguar 3-4 (keeping to closed cars), is striking, and the influence on petrol consumption obvious.

Clearly, the aerodynamic efficiency of cars is a matter of profound importance to us all. Equally clearly manufacturers do not pay nearly enough attention to this aspect of design. In my opinion, once matters like headroom, legroom and luggage space have been settled, the overriding factor governing body styling should be aerodynamic efficiency. If, after extensive wind-tunnel testing, the designer finds that an alteration can be made which gives a large improvement in appearance with only a small increase in drag, then it would be only sensible to put such a change into effect. Unfortunately, rather than pursue this design philosophy, some manufacturers seem to prefer to pay large fees to foreign designers in a manner more appropriate to the world of Balmain and Dior than to the world of Lotus and Rolls-Royce.

Make and Model	Mean max. Speed in m.p.h.	R.p.m. at Max. speed	Net b.h.p.	B.h.p. at driving wheels	Weight laden as tested in cwt	Tyres	B.h.p. absorbed by tyres	Available b.h.p.	Frontal area in sq. ft.	Drag Coefficient
Porsche Super 75 ...	106·6	5,250	73	65·7	21·25	Road-Speed	19	46·7	17·9	0·32
Fiat 1500	92·3	5,630	65·5	59·0	22·75	Standard	20·5	38·5	18·4	0·40
Renault R8	80·5	5,380	41	36·9	17·06	Standard	11·1	25·8	18·0	0·41
Volvo 122	94·7	4,500	78	70·2	24·4	Standard	24·4	45·8	20·0	0·41
Ford Taunus 17M TS	90·1	4,700	68·6	61·7	22·5	Standard	19·1	42·6	20·1	0·43
Peugeot 403B ...	82·4	4,650	52·7	47·5	23·75	Road-Speed	12·2	35·3	20·6	0·46
Hillman Minx IIIC ...	79·8	4,650	51	45·9	23·5	Standard	15·3	30·6	19·6	0·46
Rover 3-litre	96·9	4,150	104	93·6	36·0	Road-Speed	25·2	68·4	23·4	0·48
Vauxhall VX 4/90 ...	88·4	4,960	67·9	61·1	23·25	Standard	18·6	42·5	19·1	0·48
Lancia Flavia	92·6	5,100	72·0	64·8	28·0	Road-Speed	17·8	47·0	18·2	0·49
Ford Zodiac Mk. III ...	100·5	5,060	102	91·8	28·75	Road-Speed	21·5	70·3	21·2	0·50
BMW 700	70·4	5,160	31·5	28·4	16·0	Standard	8·0	20·4	16·6	0·53
Simca 1000	73·8	4,800	38·4	34·6	17·75	Standard	9·6	25·0	17·3	0·56
Jaguar 3·4 Mk. II ...	119·9	5,600	194	174·6	34	Road-Speed	49	125·6	19·5	0·56
Morgan 4/4	80·3	5,200	55·5	50·0	18·25	Standard	12	38	12·60	0·88

Drag Coefficients of 15 Modern Cars

Make and Model	Drag Coefficient	Equivalent b.h.p. 60 m.p.h. (20 sq. ft. frontal area)
Porsche Super 75 ...	0·32	8·9
Fiat 1500	0·40	11·5
Renault R8	0·41	11·8
Volvo 122		
Ford Taunus 17MTS	0·43	12·4
Peugeot 403B ...	0·46	13·2
Hillman Minx IIIC		
Rover 3-litre ...	0·48	13·9
Vauxhall VX 4/90 ...		
Lancia Flavia ...	0·49	14·1
Ford Zodiac Mk. III	0·50	14·4
BMW 700	0·53	15·2
Simca 1000	0·56	16·1
Jaguar 3·4 Mk. II ...		
Morgan 4/4	0·88	25·2

Equivalent Power Required to Propel Car of 20 sq. ft. Frontal Area at 60 m.p.h.

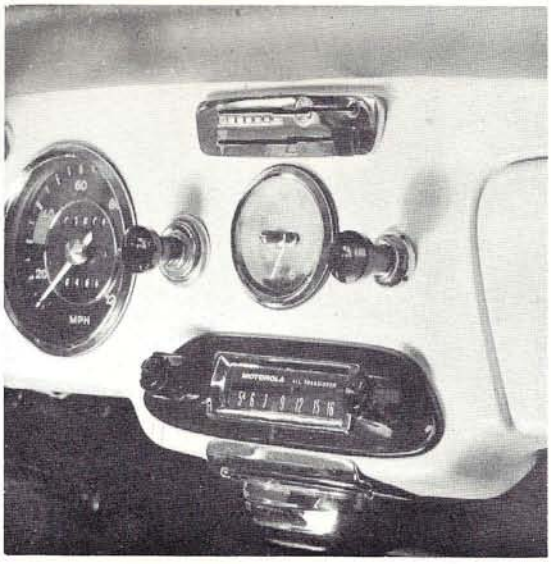
Dash plate adaptation

By GORDON F. RIETVELD
Arizona Region

I recently purchased a transistor radio only to find that the dash plate required for Porsche installation was a rare bird in Phoenix. I think I found quite a satisfactory solution by adapting the Porsche nameplate which comes in place on all new cars. The photo shows this nameplate in the completed installation.

The plate is actually plastic material with a flat black backing, and it's simple to enlarge the grommet holes to accommodate the control shafts. I used a coping saw to cut out the window opening for the dial, after drilling several starter holes for the saw. A little finishing with a file assures a snug fit.

The tuning knobs become inconspicuous on a field of black.



Brakes are for stopping

By E. D. WELLS
Los Angeles Region

The Porsche is a car that demands to be driven well. But the Porsche, more than any other car, rewards the apt pupil by multiplying driving pleasures as new skills are developed.

The budding Porschephile, aspiring to an improved and smoother style, soon learns that the sprint and brake technique doesn't utilize the Porsche's unique handling capabilities. Competitive events reveal to the analytical observer that cars which at times appear to go slower often finish ahead of the tire squealers. Impulsive bursts of speed often place a car in a position tangential to the course while an apparently slower car "finds the line" and uses its power sanely to outdistance the more erratic, less sensitive driver.

These observations prompted a more critical analysis of my own driving practices. I drove over familiar, ideal Porsche roads, carefully noting at various points: 1) entrance and exit speeds; 2) speed maintained; 3) gear used; 4) braking employed; 5) line followed. Reactions were analyzed. Experience taught new skills. Times improved and a smoother style evolved.

Capitalizing on the sense of unity with the car that only a Porsche driver can experience because (among other advantages) he sits at the exact center of gravity, I discovered that, by a combination of judicious steering, gearing, and power application, bends and curves which formerly required considerable braking could now be negotiated safely with less and less braking; some now required no braking. Orientation was with the exit point, rather than present position.

Rapport increased. My acquired ability to more closely coordinate throttle, gearing, and steering now enables me to negotiate first time curves and bends with much less braking than I would have formerly employed. I've concluded that, to a great degree, the skill of a Porsche driver can be judged by the *in*frequency of brake application. Brakes are for stopping, not driving!

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