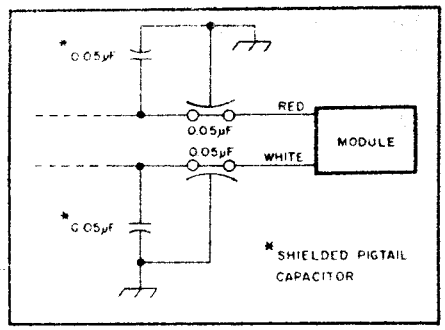

Fig. 13 — When rf from a 130-watt mobile transmitter upset the ignition system in a 1980 Ford police car, Morris Hall, N4MH, installed bypass capacitors as shown in this drawing. The remedy effectively eliminated the problem.

Since I took these corrective measures, the RFI no longer affects the ignition when the transmitter is being operated. — *Morris E. Hall, N4MH*

ANTI-TVI MODIFICATION FOR THE T-4XB

In the Hints and Kinks section of June 1979 *QST*, J. H. Mehaffey described a TVI problem with his TR-4 very similar to one that had plagued me for some time. I have a Drake T-4XB. His simple and successful modification of the TR-4 to clear up the harmonic output of the 9-MHz carrier oscillator clearly pointed the way for me.

Unlike the TR-4 with a 9-MHz oscillator, the T-4XB carrier oscillator is at 5.645 MHz, so different values of components are required to make the fix. In my case, those used were "junk box" values, ones at hand close enough to what seemed to be needed. Fig. 14 is drawn in a manner to match that of the Drake manual.

There is sufficient chassis room for the few required parts under and around R4, the carrier-balance potentiometer of the T-4XB. L_a, the slug-tuned coil, is easily mounted in the extra hole of the left-rear chassis apron. With the adjustment screw on the outside, access to it is easy, although this is a seldom-needed tuning adjustment. L_b and the two capacitors are supported by a small double tiepoint and the respective leads. The short ground connections are made to the socket frame of V1.

I also took Mr. Mehaffey's suggestion regarding linearizing the final by disconnecting C53 and C58, the 470-pF cathode bypass capacitors of the 6JB6 output tubes. L_a can be peaked with a dip meter. Touch-up tuning for maximum drive, as shown by increased final-amplifier plate current, should follow. To complete the adjustment, realignment of the carrier oscillator ought to be carried out using the procedure in the Drake manual.

Lacking the proper test equipment to measure harmonic attenuation, I cannot tell you how much those obnoxious harmonics were reduced. I'd guess reduction is comparable to the amounts shown in Mr. Mehaffey's report. I do know, however, that the TVI problem is cured. — *Hank Brown, W6HB*

CURING HIGH-POWER TVI

I completely eliminated a very serious TVI overload problem that affected my XL-100 TV set whenever I operated my 2-kW PEP rig in the 20-meter band. There has been no problem, however, with low power. My method may help other amateurs faced with a similar situation.

With a dip oscillator meter set in the absorption mode and tuned to the band causing the greatest TVI, turn the transmitter on and "sniff" along the TV antenna with the dipper. Start near the TV set. No doubt you will find a very noticeable indication on your meter as a result of the standing wave developed on the TV lead.

Add approximately 1/4 wavelength (based on the band you have chosen) of twin-lead to your TV line and reconnect it to the TV set. Now sniff along the line until you find a minimum reading on the meter. This will indicate a low-voltage point of the standing wave. Cut the line at this point and reconnect the TV set. You should find the overloading minimized or eliminated. Be sure the antenna is connected to the TV set whenever you sniff with the dip meter. — *Sam Peck, W6CQR*

BLAME IT ON THE PIPES

Whenever TVI turns up, a rather natural reaction is to point an evil finger at the transmitter. But the rig may not be at fault. An interesting case in point was described in Technical Correspondence in June 1978 *QST*. Al Slater, G3FXB, explained how he went to great lengths following good technical practices to eliminate the interference. Each attempt to pin down the cause seemed to lead to a blind alley until a friend came forward with a portable detection device, tunable from 40 MHz upward. The device provided both visual and audible indications. With the help of this instrument the path of detection led straight to a greenhouse behind the Slater home. It was there that two rusty iron heating pipes of a defunct heating system were found to be at fault: With removal of the pipes went the TVI. — *Stu Leland, W1JEC*

CLOTHES-DRYER QRN

☐ For quite some time I'd been having electrical noise interference on the 10- and 15-meter bands. The noise would be on for about six seconds and off for about 20 seconds. It repeated this pattern for many hours. It was present some days for most of the day, lasting well into the night. On other days it was totally absent. I enlisted the help of the local power company to track it down. They used a receiver with a directional antenna.

It turned out to be an old gas clothes dryer with a gas pilot, located about 300 feet from my station. A defective solenoid was the cause; when the dryer would call for heat, the voltage would arc across the open solenoid coil! The main burner would still operate. A large family with lots of clothes to dry was the reason that the noise was present for such extended periods. — *George C. Alich, WØLNT*

S9 NOISE — WELL-BAKED

At last! After two years of frustration it was finally solved . . . S9-plus noise throughout the spectrum when our electric stove was operated in the BAKE position. The cure for the problem was provided by the service manager of the Gibson Stove Company in Providence, RI. He informed me that most stoves have a

TUNE L_A TO 5.645 MHz + RETUNE OSCILLATOR.

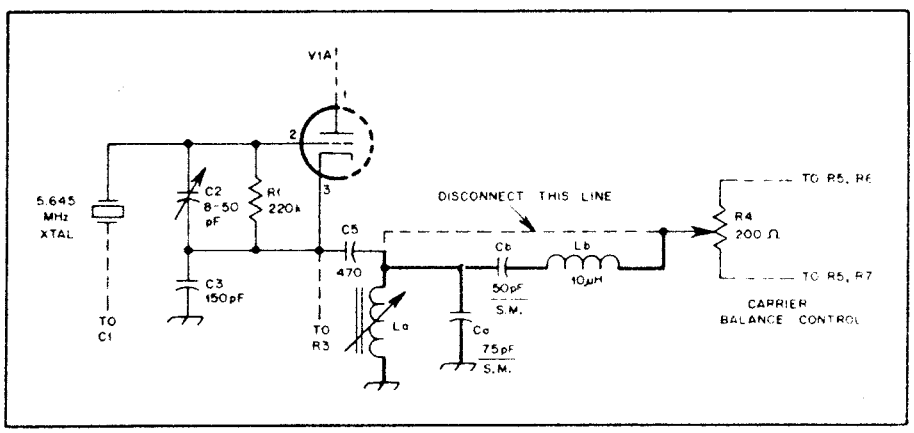

Fig. 14 — The W6HB anti-TVI modification for the Drake T-4XB. Heavy lines show added circuitry.
C_a — 75-pF silver mica, 5 %.
C_b — 50-pF silver mica, 5 %.
L_a — 24 turns, no. 24 enameled wire, close spaced on open end of Miller coil form no 4400-2.
L_b — 10-μH Miller coil no. 4612

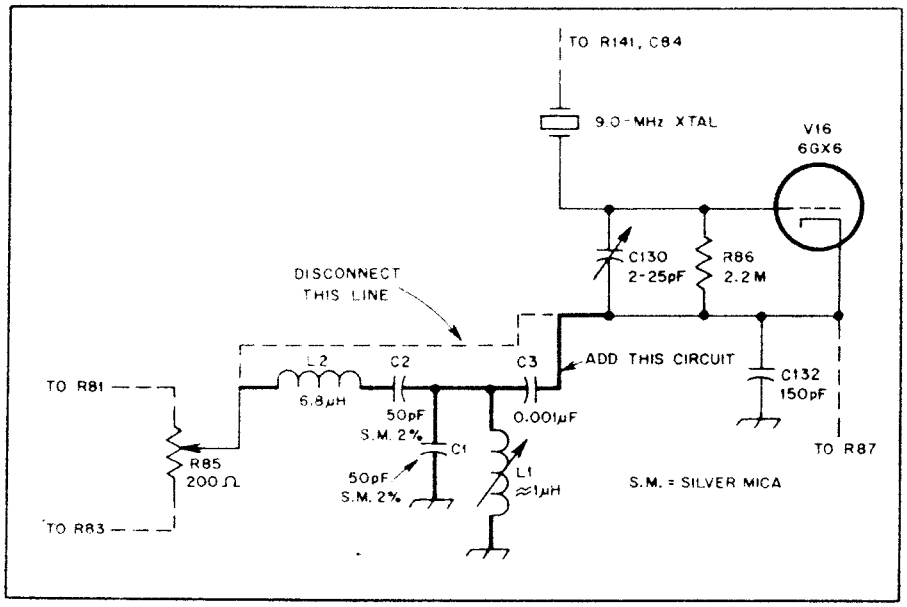

Fig. 1 — This filter circuit is designed to eliminate TVI from Drake TR-4 transceivers. The heavy lines show circuit changes. With the aid of a loosely coupled dip meter placed near L1, tune L1 to resonate at 9.0 MHz. Tuning is not critical.

Harmonic Radiation from Drake TR-4

	f_o	$2f_o$	$3f_o$	$4f_o$
Before Modification	0 dB (ref)	– 38 dB	– 42 dB	– 43 dB
After Modification	0 dB (ref)	– 55 dB	– 60 dB	– 60 dB

shielded cable. No improvement!

Then I ran across an article in June 1966 *QST*, by James R. Balmer, W8KRS, describing the 425-RF network. I called Southern Bell and asked for one of these and found there is a newer edition for the 500-series telephones, a model 500J. Southern Bell installed the 500J filter and it completely eliminated my trouble. — *Bill Asbury, WB4GYZ*

☐ Fortunately there is no telephone interference while my transmitter is operating on 10, 15 and 20 meters. But when it is on 40 meters, strong RFI occurs. After the telephone company tried rf chokes and bypass filters with no success, I reasoned that the telephone line might have a resonance at some multiple of a quarter-wavelength at 7 MHz. The phone company then added 15 feet of line to their circuit. This resulted in detuning the telephone line and eliminating the RFI. — *Sam Peck, W6CQR*

DRAKE TR-4 TVI PROBLEM SOLVED

I've experienced a TVI problem with my Drake TR-4. For the benefit of others who may have this difficulty, I wish to offer my explanation of the cause and cure.

Problem: Harmonic interference appeared on TV channel 2 when my TR-4 was operating on 14 MHz and on channel 4 when the transceiver was on 21 MHz. Use of a low-pass filter at the output of the transmitter and high-pass filters on the TV sets partially eliminated the TVI. Further steps had to be taken for a complete cure.

Cause: Strong radiation on the 2nd, 3rd and 4th harmonics was noted. A low-pass filter effectively reduced interference received via the transmitting antenna. With the help of a search loop and spectrum analyzer, I established that undesirable harmonic radiation was coming from the chassis. Further investigation disclosed the presence of relatively strong harmonics at the grids of the 6JB6 final amplifiers. These unwanted signals passed right through [or perhaps *around* — Ed.] the 9.0-MHz sideband crystal filter. Correcting this condition and eliminating harmonic content in the final amplifier by adjusting the amplifier for proper linearity brought the matter to a successful conclusion.

Cure: Oscillator distortion was corrected by installing a 9.0-MHz parallel-resonant circuit (Fig. 1) from the wiper of the carrier balance potentiometer to the cathode circuit of V16. This circuit is tuned to approximately 9.0 MHz with the aid of a dip oscillator. Final adjustment is accomplished by observing an oscilloscope connected to the grids of the 6JB6 amplifiers while tuning for maximum amplitude. The transmit-gain potentiometer should be set in the linear region (about the nine o'clock position) for this adjustment. Realignment of the 9.0-MHz oscillator according to instructions in the Drake manual is also required.

Linearizing the final amplifiers is done simply by providing for additional cathode degeneration. To do this merely remove the 470-pF capacitors from pin 3 of the 6JB6 amplifiers. The power reduction is not noticeable.

Results: Harmonic radiation from my TR-4 was reduced on 14 MHz as indicated in the table. Measurements were taken at the output connector. — *J. H. Mehaffey, Vice President, Engineering, Solid State Systems, Inc., Marietta, Georgia*

SWITCH TO SAFETY AND PREVENT TVI, TOO

I've had a problem with a 20-dB-over S9 buzzing noise interrupting my QSOs and phone patches. My XYL reported that this same noise wiped out our stereo. It could also be heard in all of our portable radios. Not being able to pinpoint the problem myself, I called on the assistance of the Pacific Gas and Electric Company, our local power company. A man was sent out to see what he could find. After climbing two poles on our street and checking all connections he could find nothing wrong so frustration set in. We started ringing doorbells to inform neighbors that their power would be off for a short time to conduct some tests. At the second house, pulling the main switch stopped the buzzing. The problem was then isolated to the contacts behind a fuse in the main power panel.

In the fuse holder, a screw-in type, there is a cork washer held in place by the screw. This washer was burnt and quite brittle, allowing an arc to jump from the center (hot) contact to the surrounding housing (ground). According to the power-company man, this type of problem is an extreme fire hazard, especially in older homes where the electric service does not pass through a metal conduit.

What made this problem so difficult to isolate was that the buzzing noise was intermittent. It would come on for one second to perhaps ten seconds and last for upwards to four hours each evening. Speculations were that the cause might be an electric heater for a tropical fish tank, electric blanket or other type of heating device.

Should anyone have this type of interference, you might have the fuse holders checked by an experienced electrician. Most power companies will investigate and even in some cases, the cause of the QRN, free of charge. They may not have any better