

TV ADD-ON DO THEY R

As we strive for improved TV reception, we are offered innumerable gadgets that promise us a near-perfect picture. Not all work as well as the sellers claim that they do.

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WE ARE ALL TEMPTED—AT ONE TIME OR ANOTHER—BY THE quick-and-easy-remedy syndrome: Gas-tank additives, pill-popping medication, flea collars, spray deodorants. Even the family TV set is besieged with handy accessories that promise fantastic results for a minimum investment in time and money.

The TV gadget syndrome began soon after World War II, when small-screen black and white TV was just catching on, and families, friends and neighbors clustered for hours around the magic box, squinting at teeny-tiny pictures.

A few enterprising souls decided to capitalize on the small screen problem by selling attachable magnifiers: A clear, convex cell of mineral oil was braced in front of the tiny screen; if the viewer sat directly in front of the screen, he could view an enlarged (albeit blurry) picture. The hapless souls who had to view the magnified image from an angle were plagued by incredible distortion. The magnifiers finally went the way of the dinosaurs!

Another item that appeared was the color-filter adapter, an incredible hoax consisting of alternating horizontal bands of colored plastic film stuck to the face of the picture tube. True, your black and white TV set could then show color . . . if you didn't mind seeing Ed Sullivan with red eyes, green nose, blue lips and a yellow chin!

Accessory gadgets are still in popular demand, but do they really work? I decided to find out. A trip to my local electronic store provided several devices intended to improve TV picture quality. Interestingly enough, *none* carried a guarantee of any kind!

The devices were tested on two separate TV sets in two different locations, and the results were disturbing. Here's what I found:

TV interference filters

These devices are advertised as being effective against neon signs, fluorescent lights, auto ignition noise, airplanes, appliances, amateur radio transmitters, medical and X-ray equipment, electric razors, and oil burners. I purchased the filter shown in Fig. 1 and tested it using a CB transceiver; the filter did not reduce the interference on either set. Further experiments using an RF signal generator radiating local interference on TV channels also resulted in no improvement with the filter attached. The filter was then tested for its effectiveness in

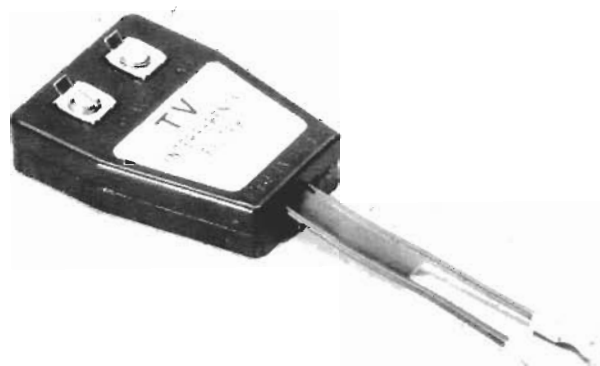


FIG. 1—TV INTERFERENCE FILTER is inserted in the antenna lead-in.

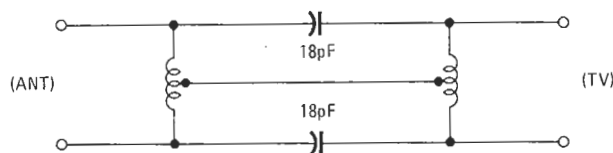


FIG. 2—INTERFERENCE FILTER is a high-pass filter that attenuates signals below 54 Hz.

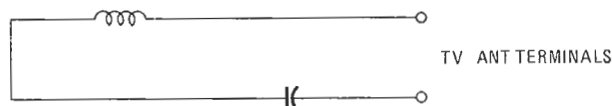


FIG. 3—CB TRAP is a series filter that eliminates 27-MHz CB signals.

suppressing the spark-tearing of the picture caused by electrical appliances; again, no improvement.

Internally, the TV interference filter is a constant-k high-pass filter, attenuating all signals below 54 MHz (Channel 2). The schematic diagram is shown in Fig. 2. It should be effective in preventing front-end overload from signals below 54 MHz, but it has no effect on interfering signals *in* the TV frequency bands, which is where the majority of interference originates!

CB interference trap

Turning the CB transceiver on transmit next to the antenna

GADGETS— EALLY WORK?

feedline for coupling had no effect. Interference bars were again apparent on several TV channels, with or without the CB filter attached. The trap circuitry is a series L-C filter, designed to short-circuit much of the 27-MHz CB signal, but it has no effect at TV frequencies. The schematic is shown in Fig. 3. Similar to the filter described above, it would be effective only in preventing front-end overload by a powerful 27-MHz CB signal. In fact, if an interference filter were designed to attenuate interfering signals on TV channels, it would also diminish the TV signals since they occupy the same frequencies.

Ghost eliminator

Phantom borders that accompany the TV picture as a smear or additional outline alongside the primary image are due to phase delay—two identical picture signals arriving slightly apart in time. As a result, the sweep lines that draw the picture on your screen trace two sets of images; one is usually weaker because ghosts are caused by a reflection of the signal from nearby objects, arriving at the antenna both weaker and at a later time than the direct signal from the broadcasting station.

The ghost eliminator shown in Fig. 4 was installed and adjusted as directed; the ghosts were unaffected. Suspecting that the unit was labeled backwards, I reversed the leads, but the ghosts remained.



FIG. 4—GHOST ELIMINATOR is inserted in antenna lead-in and adjusted for best picture.

The ghost eliminator is an L-pad (see Fig. 5) consisting of carbon resistances that remain essentially noninductive throughout the VHF range; UHF performance is unpredictable. Because the device is a variable attenuator, it makes signals weaker; and weaker signals are more vulnerable to electrical

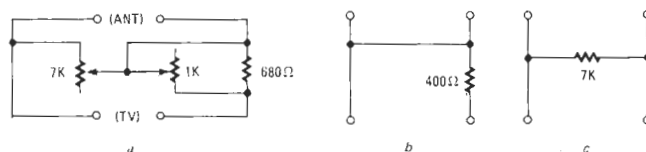


FIG. 5—GHOST ELIMINATOR is actually an L-pad attenuator as shown in *a*. Equivalent circuit when adjusted for minimum signal is shown in *b*. When adjusted for maximum signal, equivalent circuit is shown in *c*.

interference. Although it is stated on the eliminator's blister pack that the unit remains at a constant 300 ohms, it does not; the resistance of the device I tested varied from 300 to 7000 ohms at the TV terminals.

While it is dangerous to make generalizations, no inexpensive add-ons can take the place of a good antenna system; an outside antenna is always better than an inside antenna; interference is best eliminated at its source.

This article is not meant to be a blanket indictment of all TV accessories. High-quality picture-enhancing devices such as antenna preamplifiers, cavity wavetraps, etc., are available but at a substantially higher cost. However, the bottom line is: Use a good antenna and transmission line, and additional gadgets will rarely be necessary.

TV/FM splitters

A splitter is a coupling device that permits you to hookup two sets to one antenna. Since most TV antennas are rather broadband in nature, they work quite well on the FM broadcast band as well as on TV channels; so why not use this feature for your benefit? Since most stereo receivers have a 300-ohm (two screws) antenna input, it is a simple matter to run a length of TV twin-lead from the receiver to the TV antenna splitter and enjoy greater quieting, stronger distant reception, and less flutter and fade. Of course, the FM reception is enhanced in the same direction as the TV antenna is pointed. The TV reception will be virtually unaffected, since splitter loss is minimal. Acceptable units are mass-produced for most retail outlets and large chain discount houses. They are all fairly identical (see Fig. 6) so shop for price; the average price for a typical two-set coupler is from \$3.50–\$4.00. (Be aware that some of the better TV antennas are designed to trap out FM signals—thus eliminating them as a source of interference.—*Editor*)

Privacy earphone attachments

Although not all TV sets come with earphone jacks, many imported portable sets do. Make sure that the plug size is compatible with the jack on your set (most measure 1/8 inch, and adapters are available). If there's no earphone jack on your set, it is a relatively straightforward procedure to cut off the speaker



FIG. 6—TYPICAL TV/FM SIGNAL SPLITTER manufactured by the Finney Company.

lead inside the TV set and attach the adapter; before undertaking this minor surgery make sure instructions are included with the adapter. (Modern TV sets frequently do not have power transformers and, therefore, have a "hot" chassis. The audio output stages are similarly transformerless and the speaker leads can present a potentially dangerous shock hazard.—*Editor*)

Such units are sold for convenience, not hi-fi quality. They are available from the same sources as TV/FM splitters.

Antenna boosters

These little preamplifiers make a weak signal stronger, and strong signals stronger. They improve a snowy picture. Outdoor antenna-mounted preamplifiers are recommended over indoor antenna boosters, since you want a stronger signal to come down the antenna transmission line and don't want to amplify the



FIG. 7—TYPICAL ANTENNA BOOSTER that is mounted on the antenna mast itself. Made by Channel Master.

interference picked up by the lead-in itself. A typical booster is shown in Fig. 7.

If you are plagued with weak-signal reception, a booster will probably help. Make sure that you purchase one that is weather-proof, with all-channel capability (if you watch UHF transmissions), and that you cover the terminals with a good lacquer or silicone rubber caulk to retard corrosion after you have installed and tested the booster. Unit prices vary from \$30 to \$70.

Line-noise filters

Noise from motors, fluorescent lights and dimmers, and other sources of AC line interference constantly arrive at the TV line plug as voltage spikes. These interfering electrical pulses may not get filtered out by the TV set's power-supply circuitry and, as a result, show up as a tearing of the picture, or may be even heard through the speaker.

Inexpensive (\$1.50–\$6.00) filters usually consist of a plug and receptacle housing containing a capacitor or two. The TV line plug is inserted into the receptacle, and the unit is plugged into the wall. The line-noise filters are almost always either totally ineffective or inadequate because most electrical interference arrives through the antenna. An external ground should always

be present (and rarely is); more sophisticated (and more expensive) units containing inductor coils are more likely to provide some relief from power-line noise.

Color purifiers

Color TV pictures are very sensitive to magnetic fields. Iron picture-tube envelopes, nearby steel hardware, etc., all may cause potential color distortion. If a TV set has been recently moved, transported for repair, exposed to strong electric motor fields, exposed to a nearby lightning strike or a host of other unexpected sources of magnetic energy, its components may have become magnetized and could degrade the purity of color distribution on the face of the picture tube. Color purifiers (also called *degaussers*) are simply multiturn loops of wire which, when plugged into the AC power line, produce a strong, fluctuating magnetic field capable of neutralizing the vestigial magnetism on the chassis parts.

At a cost of \$5 or \$6, this device is not a bad investment if it is properly designed and can deliver a strong enough demagnetizing field. Only a test of the unit will confirm this.

Wall-plate terminals

Many houses are built with TV lead wire "stubbed in"—i.e., twin-lead is left dangling through a hole in the wall for connection. Alternately, a more cosmetic plastic cover plate is connected to the lead-in and affixed to the wall to cover the hole. Connections are then made to the TV set by a short length of twin-lead that is either attached to screw terminals or plugged into the wall plate.

The wall-plate terminals offer very little loss to the TV signals, and are relatively inexpensive. They are worthwhile if you want to give a finished look to the TV installation. Some wall plates contain internal splitters for FM reception as well.

Wall-through tubes

There are many ways to bring a transmission line into a house from an external antenna: through a louvered vent, a hole under the eaves, or via a hole in the wall. But along with the hole comes another problem: How do you keep bugs, rain, or even intemperate air from penetrating the house? The wall-through tube provides a seal. (See Fig. 8.) Consisting of a plastic tube with



FIG. 8—THROUGH-WALL TUBES serve a dual purpose—they protect the lead-in at the point of entry into the house, while covering the hole in the wall. Available from several sources.

finished and adjustable ends, the unit is used to line the hole drilled for the lead-in. Of course, a larger hole must be drilled than would be required for the wire alone, but the device provides isolation and insulation from both the wall and the outside. At a cost of \$2, it is a worthwhile investment.

Lightning arresters

Solid-state TV sets are far more vulnerable to failure from high-voltage spikes than the old tube sets. Even a nearby lightning stroke can induce enough voltage in a TV antenna line to destroy tuner components. A lightning arrester probably won't protect your set from a direct hit, but it should guard it from nearby lightning during an electrical storm.

A variety of arresters are available for \$3–\$5. Make sure to follow directions to insure both TV protection and efficient signal transfer. A well-grounded antenna mast is mandatory in any TV installation! If your reception seems to be a little weaker than usual, check the lightning arrester, perhaps even replace it after a stormy season.

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