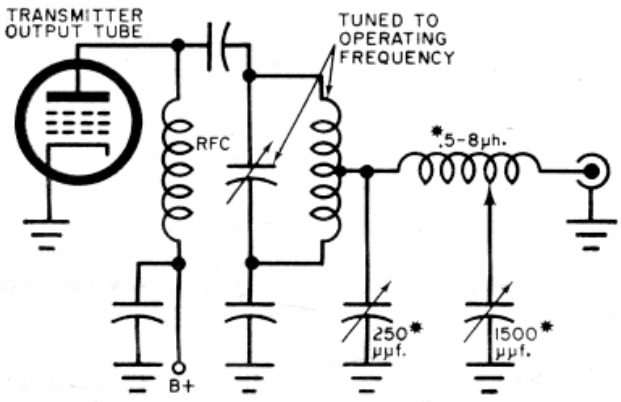
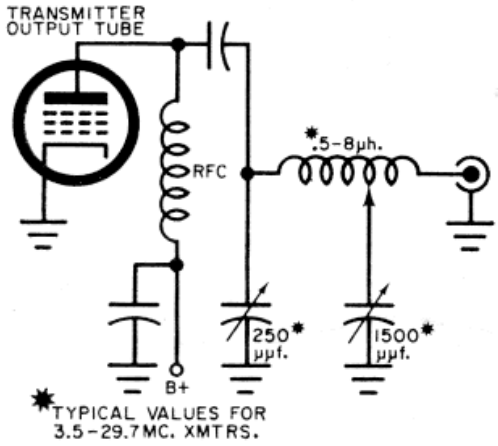
to the added third terminal. Bypass the terminal to the chassis through a 0.01-μf. ceramic capacitor, and solder a short length of wire between the terminal and the junction of resistors *R5* and *R6* and the filter capacitor. Solder the connections, and the job is done.

This change removes the pentode section of the 6BH8 tube from the OB2 voltage regulator; the critical B+ voltages on the oscillator section are still regulated, however. Incidentally, while you *can* take the first step in the modification without taking the second, *don't* reverse the procedure.



The diagram above shows how the classic pi-network circuit was first used in amateur transmitters in conjunction with a parallel-tuned tank circuit as an antenna-matching network. The modern, simplified arrangement below employs a pi-network combination plate tank circuit and antenna-matching network.



CLASSIC HAM CIRCUITS

Have you ever tried to visualize what modern band-switching amateur transmitters would be like if the universally used *pi*-network tank circuit had never been developed? Without it, they certainly would be bulkier, more complicated, and more expensive. In addition, they would probably be slightly more difficult to tune; and—other things being equal—their emitted signals would contain just a bit more undesired harmonic energy.

Pi-Network Tank Circuit. Probably the first use of the *pi*-network in amateur transmitters was described in the article "A Universal Antenna Coupling System for Modern Transmitters," by Arthur A. Collins, W9CXX, in *QST*, February, 1934, page 15. Art claimed that the new circuit (see diagram at left) would feed power into virtually any antenna, with increased transmitter efficiency and decreased harmonic output.

For some months after the publication of the article, almost every ham seemed to be building a "Collins Coupler," and they were loading up all sorts of unlikely metallic articles like bedsprings and window screens as antennas. But after its novelty wore off, the Collins Coupler was soon forgotten by the average ham.

Some time later, Frank C. Jones, W6AJF, described a low-power, portable transmitter which used a *pi*-network combination output tank circuit and antenna-matching network in the *Jones Amateur Radio Handbook*, the predecessor of the *Radio Handbook*. W6AJF's circuit (diagram at left) was identical to that used in many transmitters today.

In spite of its claimed advantages, however, the *pi*-net tank circuit did not gain much popularity up to the start of World War II. But during the war practically every ham was involved in defense electronics work, or was in the Armed Services, and many were directly concerned with mobile and portable communications transmitters. Such equipment was more useful if it could feed r.f. energy into almost any random length of wire in an emergency. It also had to be light and compact, without sacrificing efficiency and reliability.

As a result of their wartime experience, these hams came home convinced that an amateur transmitter, even the "full-gallon" size, did not have to be a rack-and-panel monster, forever condemned to inhabit the attic or basement. The idea of the compact, table-top-cabinet transmitter caught on strongly, stim-

(*Continued on page* 104)