

of the headphone/extension loudspeaker socket. Do not despair. This brings me to another facet of RTTY:

Hash

This is a very individual problem in that the amount of RF interference varies greatly from motor to motor and no two solutions are the same. The first step to take is to listen to all the bands that are going to be used, while the motor is running, to see if there is a problem at all — a quiet motor is best left alone, but should RFI prove a problem, here are ten suggestions, some of which may result in a remedy, or at least an improvement.

- 1) Clean the governor contacts using emery paper and reset the gap to .020-.025 inches. Only use a file if the contacts are badly pitted.
- 2) Clean the governor slip rings — use Brasso, Brillo pad etc.
- 3) Wire a disc capacitor (10nF 1kV) across the governor brushes and fit small ferrite cored chokes (TV suppressor types) in the leads between the brushes and the existing governor filter.
- 4) Clean the commutator using fine emery paper and thoroughly swill out with spirit. But do be careful not to overdo it as the insulation may suffer.
- 5) Replace the capacitors inside the motor with disc ceramics. Wire the new capacitors across the brushes and between each brush and the motor chassis. At this point, if there is enough room, fit small chokes (as per the governor) in the leads between the brushes and the field windings.
- 6) If the machine has any kind of metal silence cover or dust cover, make sure that the machine chassis, cover and base plate are all properly earthed. Use short lengths of copper braid.
- 7) For ground level stations, place a large sheet of expanded metal or foil on the floor (under the carpet, linoleum etc) to form a capacitance to earth. Connect this to the teleprinter chassis by as short a lead as possible — wide copper braid or strip is most suitable. Don't forget to connect the sheet to mains earth as a safety measure.
- 8) If not already in use, use an isolation transformer between the mains and the motor.

9) Use a screened cable between the terminal unit and the teleprinter, and include small decoupling capacitors.

10) Use coaxial cable to feed the antenna and site the antenna as far away from the teleprinter as possible.

All this may seem a great deal of work but, in my experience, I have never found it necessary to use more than two or at the most, three of the suggestions. They are given to you as various alternatives.

Speed

Most Creed Model 7s are designed for a motor speed of 3000 rpm which corresponds to a teleprinting rate of 50 bauds, as I discussed in the previous article. This is the speed of most commercial transmissions, but is not of great use when copying amateurs, except perhaps on VHF where the practice of using 50 bauds is spreading. However, this does not pose a great problem as the Creed Model 7 governor can easily be adjusted for the lower speed of 2727 rpm necessary for copying amateurs using 45.45 bauds. However, whichever baud rate is used, it is necessary to arrange some scheme for measuring the motor speed. A newly bought machine therefore, unless the seller was an amateur who had used it on 45.45 bauds, (see my comment above about the 'Equipment Availability List'),

should first be checked to see that it is running properly at 50 bauds by using the following method. Stick a piece of white adhesive tape about a quarter of an inch wide from the centre of the governor face to the rim so as to give the appearance of a single 'Spoke'. Start the motor and watch the face of the governor in a darkened room by the light of a neon lamp connected to the 50 Hz mains. A 2 bladed butterfly shaped fan will be seen. If the motor is running fast the fan will appear to rotate in the same direction as the motor, but if the motor is slow the fan will appear to rotate in the opposite direction. Switch off the machine and adjust the screw seen through the hold in the rim of the cover until the fan appears stationary. This will, of course, mean that the motor will have to be switched on and off a few times to adjust the screw. When the fan appears stationary the motor is running at 3000 rpm. The governor screw should now be turned seven and a half turns in an anti-clockwise direction to reduce the speed to 2727 rpm for 45.45 bauds. An important thing to remember is the fact the machine prints correctly on local copy is no evidence that the speed is correct since the motor is common to both the transmitter and receiver of the teleprinter.

Operating

Having got so far the time has come to see the results of all your work and switch on... First tune

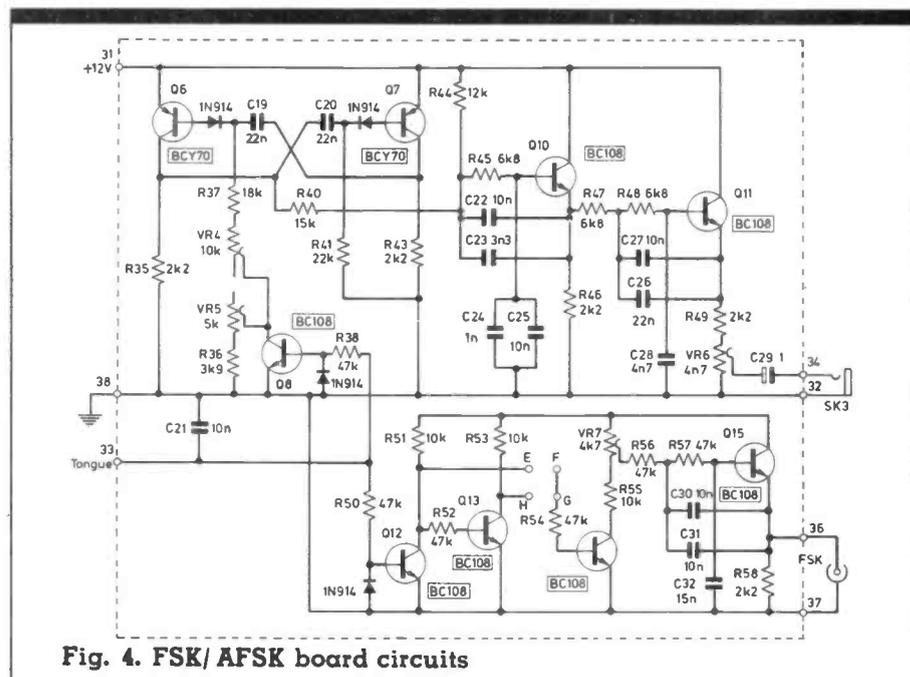


Fig. 4. FSK/AFSK board circuits