on the outer of the coax — because the feeder does not come away from the aerial at right angles for some distance — (ie RF pickup) is the real bugbear for aerials at low heights. A balun at the feedpoint cannot do much for that.

My preferred method of overcoming RF pickup is to wrap the coax around a ferrite ring just inside the house in the same way you would deal with RF on the outer of a TV aerial feedline (**Fig. 3**). This seems to cure any problems without any of the side effects of ferrite baluns. Where the feeder enters the house, put in an in-line spark gap which will earth the outer braid at that point and not only stops current coming down the outer but also provides some protection against lightning too, as shown in **Fig.4**.

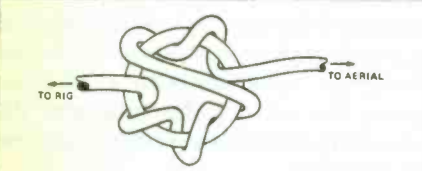

Fig. 3 A 'poor man's balun' use as many turns as possible.

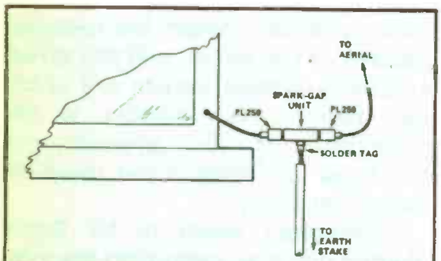

Fig. 4 Lightning protection from an in-line spark gap. The earth lead can be made from 13A core 'flat' mains cable.

Parallel Dipoles

A simple way to get a multi band dipole is to put two, or more, in parallel on the same feeder (**Fig. 5**). The general idea for the case of a 20, 15 and 10m dipole is shown, but any other combination will work in much the same way. Initially, I spent a great deal of time and effort setting up parallel dipole arrangements, but over the years, I have evolved a systemmatic approach which cuts down on the time taken quite considerably.

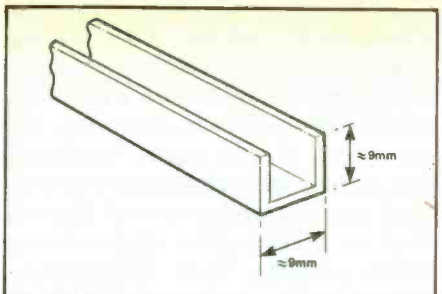

Fig. 6 Plastic sliding door track is an ideal material for spacers in parallel dipoles and open wire feeder.

Being inherently idle, the first time I ever made parallel dipoles I used 300 ohm ribbon cable so that I would be spared the task of constructing suitable spacers. This proved unsatisfactory on two counts: the first being that the wire broke repeatedly in the wind. The main problem though was that the VSWR on each band changed considerably whenever it rained, a now well known characteristic of 300 ohm ribbon. Having found out that "well known fact" the hard way, it seems as well to point out that in recent years a version of 300 ohm ribbon with slots in the insulation has become available which is supposed to change its properties far less in the wet. Since it seems to be more substantial too, it should not break so easily and might well be worth trying.

Even so, I came to the conclusion that a minimum of 100mm spacing between each pair of dipoles was needed, if reliable results were to be obtained. I also came to realise that there was no need to tension up all of the dipoles, just let the lower ones hang on the spacers underneath the longest one. If stiff wire is used for the lower dipoles this stops them flapping about in a gale, as does a maximum of 300mm between each spacer.

The spacers can be made of any insulating material, but after trying strips cut from perspex sheet and bakelite rods I opted for plastic sliding door track as shown in **Fig. 6**. This is readily available at reasonable prices and can be cut easily with a kitchen knife. It also has the highly desirable feature of not rolling away from you when you try to cut it. The soft plastic does not seem to go brittle on exposure to sunlight and the "U" section is quite rigid. It is also ideal for the spacers in open wire feeder. Furthermore, the thinner coaxes available are a push fit inbetween the legs of the "U". So fixing a length to the shack wall with the legs sticking out is an ideal way of restraining coax runs and is advantageous when replacing the coax. Readers using the larger diameter coaxes could use plastic cable trunking found in computer rooms — although this is rather expensive.

Having got the parallel dipoles into the air it then remains to resonate them all. Hopefully they will all initially be too long since they do tend to 'load' one another. The important thing is to firstly adjust the *shortest* dipole, with this done, it will have shifted the resonance of the others slightly higher. Now adjust the next longest dipole, the 15m one in my example, which will again shift the resonance of the 20m dipole, but not that of the 10m dipole since you have been trimming beyond its ends. Finally adjust the 20m dipole and the arrangement is set up for three band operation.

There must be some readers who are wondering how 3 dipoles

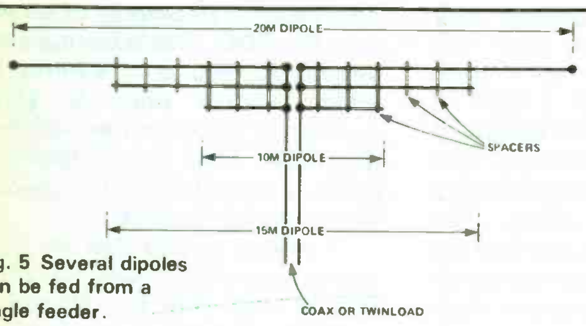

Fig. 5 Several dipoles can be fed from a sngle feeder.

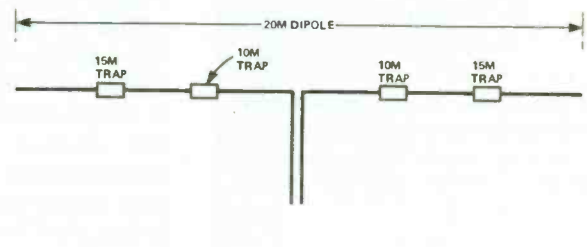

Fig. 7 Layout of a typical 20/15/10m trap dipole.