AERIAL VIEW:

a Helical Beam for 40 metres

Do you live in a suburban semi? Frank Ogden shows that it is possible to get a couple of quarts worth of aerial into a pint plot.

There can be few people who are not familiar with the 'rubber duck' type of aerial, a helically wound structure which provides resonance in a physically 'short' element. At 144MHz the helical comprises little more than a self supporting steel spring in a plastic rubber sleeve.

The aerial type is useful at higher frequencies where pocket portable equipment demands mini aerials. However, a much neglected use is at lower frequencies where several helical elements can be combined to form a compressed yagi beam. With this in mind, we have provided details for the construction of a helical quarter wave aerial for 2m so that scaling can be carried out for other bands. As a rule of thumb, a quarter wave helical element requires about a half wave length of wire wound into an element with a length ranging from between an eighth and a twelfth of a free space wavelength.

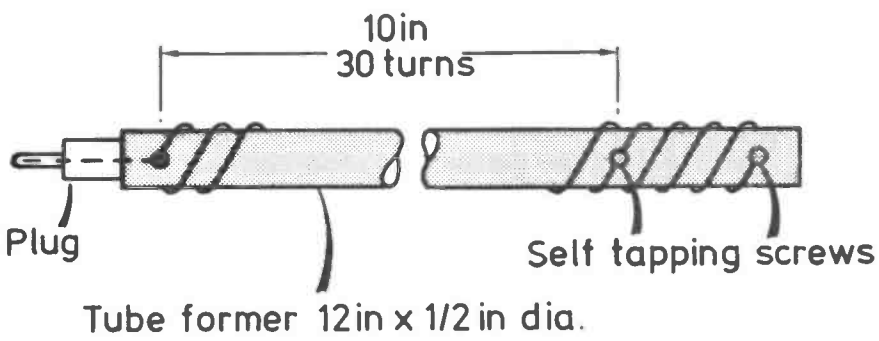

Fig.1. 144 MHz ¼ wave antenna.

Two joined end to end produce a half wave element which can be coupled to an unbalanced feeder by joining the braid of the feeder to the electrical centre and tapping the centre conductor a few turns up to one side. Resonance can be achieved by coupling a GDO (grid dip oscillator, a device which detects the resonant frequency of a tuned circuit) to the centre turns of the aerial element. Needless to say, the resonant frequency of the element needs to be determined before the feeder is attached. Once resonance is found – the adjustment is carried out by adding or removing turns to the element ends – any feeder impedance can be matched by tapping the centre conductor of the feeder at the appropriate point on the element. This is best found with an SWR box connected in the feeder line and the application of a bit of RF.

Multi element yagis are manufactured by mounting several elements on a boom. The resonance of the