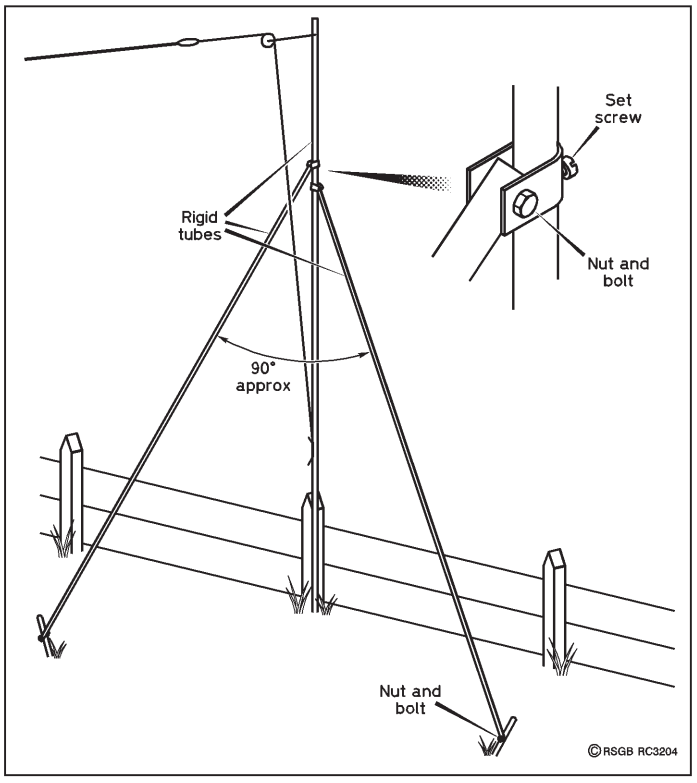

Fig 5: G3KKD's rigid stayed mast permits the mast to be erected at the boundary of the property.

N4KG's article has stimulated Professor Alan Christman (K3LC, formerly KN8I) to explore with computer simulation this reverse-fed, elevated-radials approach for MF broadcasting: 'Using Elevated Radials With Grounded Towers' (*IEEE Trans on Broadcasting,* Vol 47, No 3, September 2001). He gives, as background, the following note: "More than a decade ago, the author was contacted by an amateur radio operator in Texas, who asked if it was possible to utilise elevated radials with a grounded tower. After constructing several computer models, it appeared that such an arrangement could work, although the efficiency was less than that of a classical AM broadcast-style antenna. Later, experimental work by others [reference N4KG article] indicated that the performance of this type of antenna was deemed acceptable by members of the ham-radio community. Although not widely used for commercial purposes thus far, this antenna design may be suitable for certain AM-broadcast applications."

It should be appreciated that the standard form of American monopole broadcast antenna is based on the use of 120 buried radials and is expected to achieve extremely high radiation efficiency. In his paper, Al Christman states "computer analysis indicates that the radiation efficiency of a quarter-wave grounded tower with elevated radials can be within one decibel of that of a conventional base-insulated quarter-wave tower with an extensive buried-radial ground system."

He notes that his calculations are based "on the assumption that all conductors were composed entirely of zinc. Since most tower sections are actually made from zinc-coated steel, it is very important to maintain the integrity of the zinc coating. Further, when adjacent tower sections are joined together, a low-resistance connection is necessary. The use of conductive grease is helpful, along with tight mechanical bonding. The elevated horizontal radials carry considerable current (especially when they are few in number and the transmitter output is significant), so their electrical conductivity should be as high as possible."

RIGID STAYED MAST

A note from Ian Waters, G3KKD, describes a mast-staying tip that he has found useful. He writes: "Sometimes there is a need to have an antenna support right on the limits of your property without using a free standing tower or having the facility to install the conventional guys behind the mast. This situation is common where it is required to make full use of the length of the garden for an HF wire antenna.

"A solution is to use a rigid stayed mast as in **Fig 5.** It uses two tubular rigid stays roughly at right angles. The stays are joined to the mast by straps made from strips of 14- or 16-gauge galvanised steel. The set-screw makes things more rigid. The stays are attached to stakes driven into the ground. A good source of rigid tubes is a scrap yard which often has water, gas or steam pipe from demolished industrial sites, etc. Lengths may be joined by finding or turning steel dowels of suitable diameter which are driven in to the ends, then bolted or pinned."

THE STEPP-IR ANTENNA

David Williams, G3CCO, draws attention to an ingenious, if rather costly, form of antenna element that can form resonant dipoles or Yagi arrays, continuously tunable between 14 and 50MHz with an SWR of nearly 1:1 and is claimed to provide virtually the gain of a monoband array throughout the range. The new microprocessor-controlled SteppIR antenna marketed by Fluidmotion of Bellevue, Washington, USA (**www.fluidmotion.ws**) is being advertised in *QST* and appears as a 'New Product' in the January 2002 issue.

QST notes that "Each antenna element consists of two spools of flat copper strip conductor mounted in the antenna housing. The copper strips are perforated to allow a stepper motor to drive them simultaneously with a sprocket. Stepper motors are well known for their ability to index accurately, thus giving precise control of the antenna length. In addition, the motors are brushless and said to provide extremely long service life. The copper strip is driven out into hollow, lightweight fibreglass support elements, forming an element of any desired length up to 36ft long. The fibreglass poles are telescoping, lightweight and very durable. When fully collapsed, each element measures 48in in length, making the system an ideal choice for either permanent or portable installation. The antenna is connected to a microprocessor-based controller via cable."

The system is being offered as a single-element antenna ($439.95), two-element Yagi ($739.95) or three-element Yagi ($995.95). The design of the Yagi offers several unique features, including a 180º mode, which reverses the direction of the antenna by changing the lengths of the reflector and director in under three seconds, and also a bidirectional mode which allows the user to have gain in two different directions simultaneously. However, there seems to be no facility to change the element spacing to obtain optimum possible gain. The controller has push-button control for setting to the various amateur bands, but it is possible to create antenna modes etc and save to memory.

'LIQUID' ANTENNAS

Alan Messenger, G0TLK, reported in the March 'The Last Word' on his successful experiment in using some 43ft of string soaked in strong brine connected to a 30ft portable mast as an end-fed sloper antenna with an extensive ground system. His purpose seems to have been to prove the old adage that, in good conditions, "a piece of wet string" is all you need to work the world.

While few would recommend such an arrangement as a permanent antenna, Dr Steve Bunting, M0BPQ, draws attention to an Internet article 'Ever Heard of a 'Liquid Antenna'?', by N9ZRT (**www.wireservices.com/n9zrt/**) describing his 'ionic fluid antenna (IFA)'. This reports the successful contact in March 2001 of a first 'liquid antenna' to 'liquid antenna' contact between WH2AAT in Orange Park, Florida and N9ZRT in Green Bay, Wisconsin. Both stations were operating on 18MHz with 10ft tall x 2in