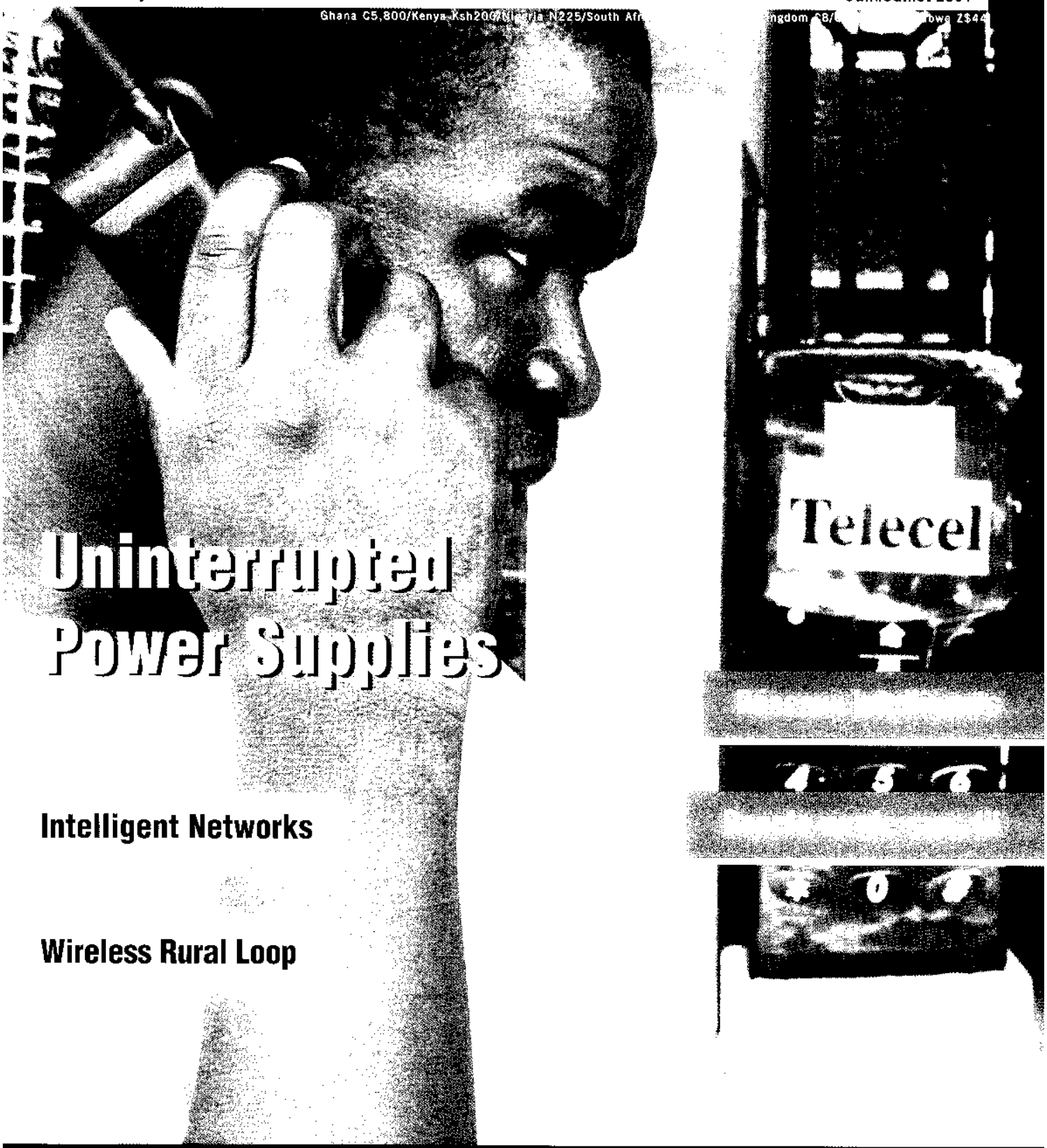
Communications Africa

Communications Afrique

June/July 2001

Juin/Juillet 2001



Uninterrupted Power Supplies

Intelligent Networks

Wireless Rural Loop

● Réseaux intelligents ● Intelligent Networks ● VSAT - le sauveur de l'Afrique ● VSAT - Africa's saviour
● La croissance des données mobiles ● Poised for mobile data growth

Rural pursuits

Wireless internet and telecom access into remote areas is now a cost effective reality for a single remote user - or a small village

Dan Thomas

WIRELESS LOCAL Loop has generated much interest and excitement over the last few years. Many developing countries, however, have come to realise that products designed for WLL applications are not properly suited to the special requirements of rural areas.

Wireless Rural Loop (a relatively new term), however, tries to address the wireless rural telephony requirements of developing countries. Here, population distribution and teledensity over a specific geographic area don't necessarily match the business plan and models generally laid out by the WLL producing companies.

Wireless Local Loop is described by *Newton's Telecom Dictionary* as "a means of provisioning a local loop facility without wires". The definition goes on to specify capacities up to T1 and data rates as much as 1Gbit. It fails, however, to properly address or define the unique requirements of people in rural areas.

Wireless Rural Loop (WRL) can be thought of as a subset within WLL, specifically addressing a small number of subscribers over a large geographic area.

The traditional and original WLL concept was more of an answer to fixed cellular phone requirements in cities where the existing wire line infrastructure could not be built out fast enough. The projects that have been started and the equipment used to address these requirements, however, were somewhat lacking due to the limited bandwidth for the ever increasing demand for faster and more seamless internet access. Many WLL equipment suppliers have continued their product research along these lines and have developed the LMDS Local Multipoint Distribution Systems for higher capacity and higher bandwidth requirements.

High speed

The original frequency designations and channel allocations of VHF (136-300MHz) and UHF (300-520MHz) did not provide sufficient bandwidth to extend the higher speed data services. The new technologies have therefore migrated to higher and higher frequencies including 5GHz, 8GHz, 23GHz and so on.

Higher frequencies allow more data to pass between the wireless point - but there is a series of trade offs in any new development. With the higher frequencies you start to limit your effective range (distance to remote point) in addition to having to consider the effect of small obstructions (trees, foliage etc) and the effects of dew, fog and rain.

There are many advancing technologies for short range intercity communications, building-to-building microwave, infra-red beams, spread spectrum technology etc ideally suited for high capacity, short range local applications. When wireless infrastructure requirements extend beyond city boundaries, however, and start to reach the rural areas and villages of developing countries these 'newer' technologies are not cost effective - nor are they the right application for the technology.

The ideal wireless rural communication solution is one that utilises the lower frequency spectrum at moderate radio power levels to extend the signal from its point of origin to the required service location. Again, there are more trade offs here in that the lower frequencies mentioned above were not originally allocated for higher speed data services. Many developing countries have hundreds of sustaining villages with dirt floors and no electricity or telephone and while it is an ideal goal to provide 'universal service' for telephone and internet access to all locations the internet access speed does not need to be DSL or E1 capacity.

When most of us first experienced the internet and web browsing, speeds of 9.6Kbps or 14.4Kbps were acceptable and close to the practical limit for personal use.

ability objective its PCC control system has clocked-up over 250,000 hours MTBF (Mean Time Between Failures), with over 30,000 systems currently in service. It is also the industry's only system to combine a microprocessor-controlled generating set with switching, paralleling equipment and controls all designed by the same manufacturer. The system uses a fault-tolerant, distributed-logic design that eliminates single points of failure.

With internet host sites costing between £50 million and £80 million per site, significant investment in the motive power behind power generation is demanded. Currently two, possibly three, engine manufacturers are likely to qualify. To meet the design criteria companies must be multinational or global in their presence with factories, offices and distributors in countries throughout the USA, Europe, Africa, the Middle East and the Far East.

Global support

Global geographical support services are essential with generating set technical expertise not just on diesel engines but also the electrical ability to solve alternator and power control system problems. Rapid response to a host site within a guaranteed time frame is likely to be a precondition of any contract placed with a power service provider.

The ability of an engine with an output of 2MW to start, run up to speed and accept 80 per cent load in a single step all within 15 to 20 seconds is limited to a few diesel engines.

Engines that start easily from cold are essential. Making sure that in-built heaters are fitted so that peak output can be safely reached quickly should be part of the standard specification. Twin starter motors are beginning to be specified. Likewise any starter batteries provided, either of the normal heavy-duty lead acid version or the more expensive but longer lasting nickel cadmium, are probably the biggest cause (up to 90 per cent) of starting failures.

In Africa, Nigeria, Tanzania and Mauritius are currently installing generating sets in data centres or extended telephone exchanges. NITEL (Nigerian Telecommunications Limited) has just installed two 800kW generating sets for mutual standby. Tanzania Telecom has gone for six 150kW and 200kW sets also on mutual standby, while Mauritius is using eight 100kW generating sets for its telecom system.

A number of Telecom Egypt telephone exchanges around Cairo have recently been protected with 200kW to 300kW standby sets and installed in soundproofed plant rooms. ✆