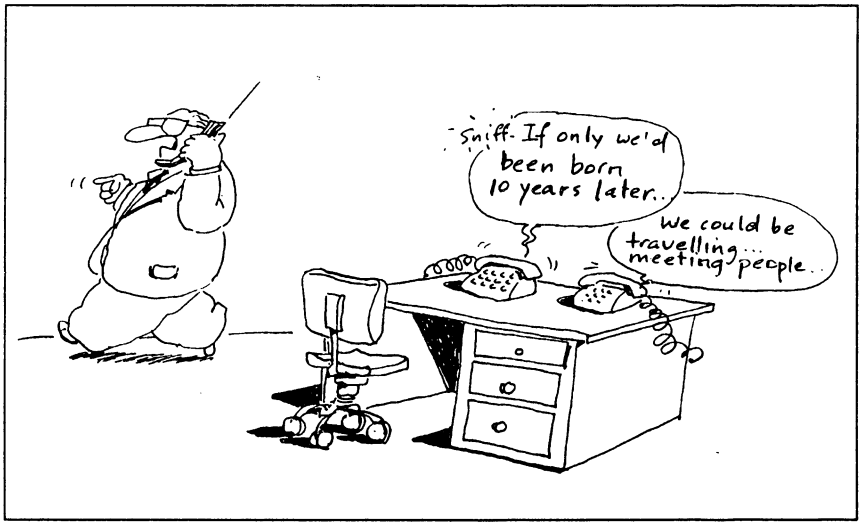
the near future by the SMA.

Professor Coutts stated that as DCS 1800 has three times the amount of spectrum available as GSM, it would create a wider number of possibilities for targeting and tariffing services.

Planning the 1.9 GHz band for cordless

Geoff Hutchins, the SMA's Manager of Spectrum Planning, outlined the SMA's spectrum arrangements for cordless technologies.

AUSTEL's 1993 inquiry into the emerging technologies for the delivery of PCS recommended that Australia adopt every emerging PCS technology. This included DECT, DCS 1800, US PCS, D-AMPS, CDMA and FPLMTS. In 1990, the SMA anticipation this situation by placing embargoes on new entrants into frequency bands that might later be occupied by these technologies. However, while consistent with the SMA's policy of 'technological neutrality', implementation of AUSTEL's recommendation would have required the reservation of a large amount of spectrum, which would necessarily inhibit other uses of the spectrum besides mobile telephones.



The SMA's peak research body, the Radiocommunications Consultative Council (RCC) then consulted with industry and other interest groups and, in late 1994, made a number of recommendations in response to AUSTEL's report. It recommended:

- immediate planning for DECT in the 1.9 GHz band;
- continued embargoes in the 1.8 GHz band in anticipation of DCS 1800;
- removal of embargoes in the 2.1 GHz band, but new licensees warned that the band may be required for FPLMTS around 2000; and
- removal of embargoes in spectrum allocated to US PCS.

It also recommended that further planning of PCS be deferred pending the Government's review of the post 1997 environment. Since that time, the SMA has commenced planning the 1.8 GHz band.

The SMA has decided that the band 1880-1900 MHz should be allocated for cordless services, according to a band plan whereby cordless services co-exist (on a non-interference basis) with existing fixed links occupying the band. DECT systems must therefore be coordinated with existing fixed links that elect to continue operating on the band. DECT handsets and private base stations will be class licensed (meaning that they are given a standing authority to operate providing they comply with the standards). DECT public base stations will operate under apparatus licences. If sufficient public demand for cordless services is demonstrated, the SMA may consider clearing the band of fixed links.

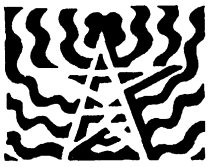
A remaining issue is whether the Japanese technology PHS can operate within this band. It will be permitted to do so providing it does not interfere with DECT systems. In Japan, PHS operates in the band 1895-1918.1 MHz. Experimental trials have been conducted are said to be encouraging.

When questioned by *Exchange* magazine's Stewart Corner about the viability of operating PHS in this band, Hutchins observed that if manufacturers consider dual mode GSM/PHS so important, they should produce a saleable product - noting that Europe, the other market using GSM, had not allocated to PHS the bandwidth it occupies in Japan. He also commented that a side effect of adopting a technology neutral approach to spectrum planning is that each technology wants its own band allocation.

Auctioning spectrum

Ian Hayne, Manager, Spectrum Marketing, SMA, introduced the spectrum licence auction process as a radical, world first approach to spectrum planning and allocation. It will creates property rights in spectrum and devolve much of the SMA's functions to the proprietor.

The approach to spectrum licensing approach differs, he said, from apparatus licensing in radically different ways. First, under the new process, an apparatus may be sited anywhere, subject to licence conditions. Because planning within lots will be a matter for the licensee, issues of interference occur only at the boundaries of spectrum space, not within the space itself. Lots may be aggregated or subdivided without SMA approval, which may lead to the creation of sub-licensees and new licensees by assignment. Licensees



may even act as resellers in direct competition with the SMA. Licensees will have the freedom to change their use of the spectrum at any time and in any way they see fit, for market or technological reasons.

Hayne argued the benefits associated with price-based allocation systems. They are faster than allocations made by way of public hearings, and more efficient than 'first come, first served' allocations. Market forces are the best method of determining the most effective and efficient use of spectrum space. On top of this, the preferred 'simultaneous ascending multiple bid' auction process is the most transparently equitable of all the auction processes. Not only has this method has created spectacular windfalls for governments (the FCC raised $17 billion), he said, but 'industry doesn't mind paying the money - they can see it's fair'.

The 1.8 MHz auction

Professor Coutts estimated that the government could raise in the order of $1-2 billion from the sale of spectrum licences in the 1.8 GHz band. Although a direct comparison with amounts paid for similar licences in similar auctions in the US yields an estimate of $2.4 billion, the Australian industry structure and the greater amount of spectrum available makes this figure unlikely. When using the prices paid for existing licences on the GSM and AMPS bands, the estimate is $931 million. Professor Coutts thinks that the auction revenue will fall somewhere between these two figures. The estimates are based on 10 year licence terms, the limit imposed by section 65 of the Radiocommunications Act. If, however, the government acts on the SMA's recommendation to allow for 15 year licence terms, estimate revenue will rise accordingly.

AUSTEL regards developments in number portability for UPT as complementary to the aim of PCS of developing a seamless integration of technologies and services across fixed and wireless networks.

A major issue remains which amount of the band to release at the auction. Currently, the SMA intends to release the frequencies 1710-1785 and 1805-1880 Mhz, leaving a mid-band gap of 20 MHz. Within this gap, the band 1800-1805 has been designated internationally for providing telephone services to aeroplanes in flight. Also, one fixed link incumbent currently straddles one of the borders of the gap and the upper band. The SMA is seeking comments on whether to allocate the entire band from 1710-1880 Mhz, to leave the existing 20 Mhz gap, or to limit the gap to the 5 MHz reserved for air traffic.

UPT

John Haydon, General Manager, Industry Affairs, AUSTEL, spoke of developments in universal personal telephony (UPT), as part of a larger presentation on number portability issues. A UPT service allocates a telephone number to a person rather than a service. The UPT number then acts as an umbrella covering particular services, such as mobile, voicemail or pager services. The customer then selects, at any time, which service is to be the call destination. UPT is not number portability, but more akin to call forwarding.

AUSTEL regards developments in number portability for UPT as complementary to the aim of PCS of developing a seamless integration of technologies and services across fixed and wireless networks.

This raises a number of interrelated pricing issues. Australia's National Numbering Plan, managed by AUSTEL, has designated the '05' number range as reserved for UPT services. This range, together with the '04' range reserved for mobile telephone services, could be used to accommodate PCS. AUSTEL has already allocated 300,000 '05' numbers to Telstra for its trial of UPT services under the product name 'Telepath'.

However, AUSTEL's Policy on Allocation of Numbers contains a guiding principles that a number prefix should serve to inform callers about the type of service being called and, thereby, the charge being incurred. UPT services have the potential to frustrate this ideal, because:

- different UPTs will connect to different services;
- an individual UPT can transfer to any one of the services under its umbrella, in any case; and
- charges for UPT services may differ between competitors.

A major challenge will be how to inform UPT callers of the call charge prior to transferring them to the 'terminating service', to enable them to abort the call if they wish. Of course, this is based on the presumption that the caller is to pay for the call.

Jim Facey, Managing Director PCS, Telstra, stated that Telstra's market research suggested that may be less prepared to pay for UPT than for mobile services. If market resistance develops, Australia could consider a split regime, as in Singapore, where the call charge is shared between the caller and receiver. Mr Facey accepted that number portability was an integral part of PCS, but warned that rules alone will not be sufficient to guarantee these outcomes. Industry cooperation will be essential.

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