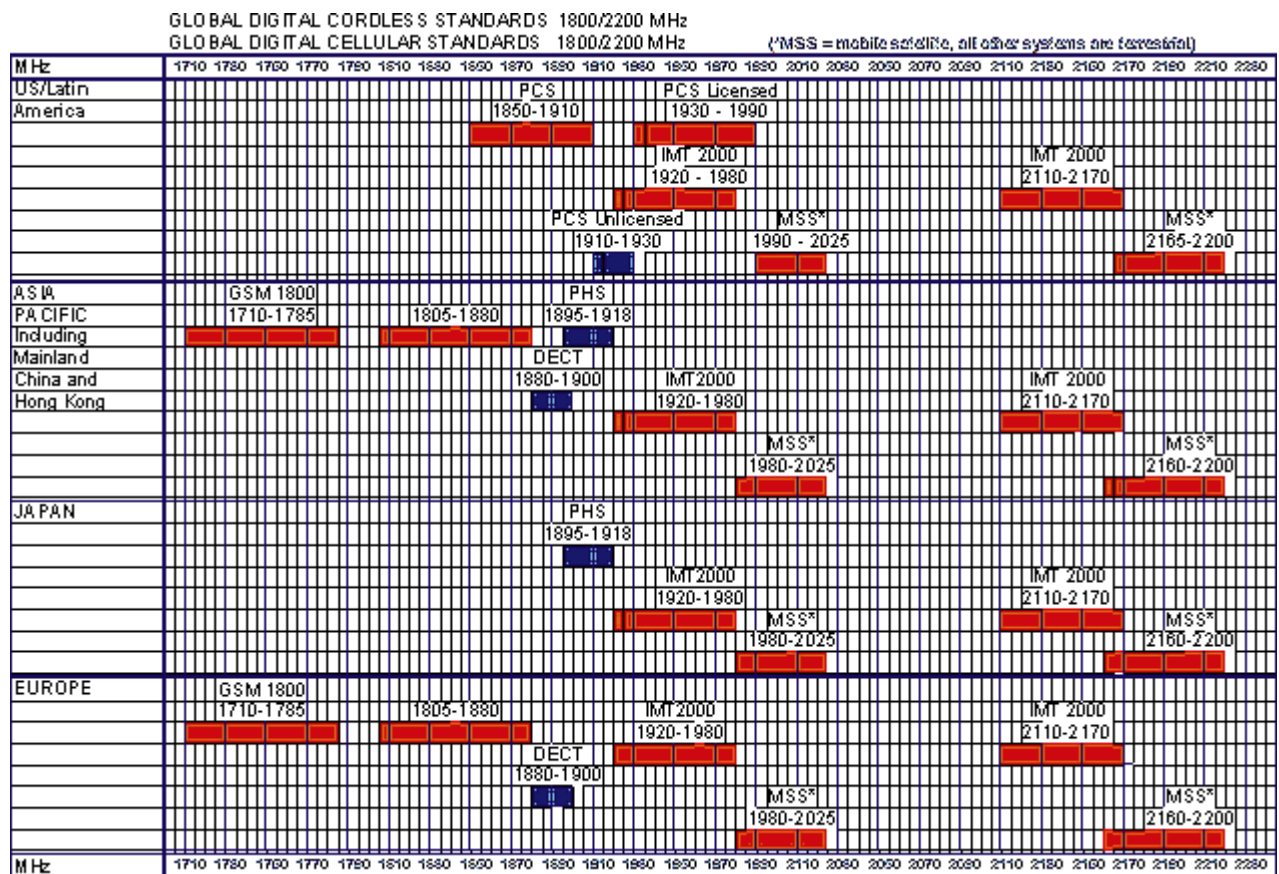




**RTT TECHNOLOGY TOPIC**  
**March 1999**

**WCDMA and GSM**

A dichotomy exists between the US and rest of the world in terms of IMT2000 spectral allocation. In the US the lower band of IMT2000 has already been allocated/auctioned for use as the upper band for PCS1900. In the rest of the world, governments are presently preparing to allocate or auction the full 120 MHz of IMT2000 bandwidth to existing cellular incumbents and/or to new market entrants (for example wireline operators previously excluded from cellular service provision).



Given that a substantial spectral surplus already exists, (less than 10% of the 150 MHz of GSM spectrum of 1800 MHz is presently used), you might expect a reluctance on behalf of network operators (or prospective network operators) to bid for yet more spectrum. In practice, bids will be placed and money will be spent partly through vanity, partly as a defensive gesture (to exclude new market entrants) and partly because the investment community still perceives and values spectral allocation as an asset (against which money can be borrowed) rather than a liability (an asset declining in value through over supply).

So now let us assume there are 4 or 5 IMT2000 operators in each country in Europe and

Asia, each owning 10 or 15 MHz of spectrum (uplink and downlink access). The immediate fiscal imperative is to deploy a network and access technology which can provide a return on the spectral 'investment'.

The present mainstream options are either CDMA2000 or W-CDMA – differences between the two technology options include the chip rate (and multiples thereof), the clock rate (and multiples thereof), the frame structure, the pilot channel (or pilot symbol) deployment, cell to cell synchronisation and network architectures (GSM-MAP and/or ANSI 41).

W-CDMA is presented as a logical choice for existing GSM network operators partly because of the compatibility between the multi-frame and super-frame structure, partly because of the integration of the GSM beacon channel and W-CDMA pilot symbols, partly because of the clock rate and chip rate multiples and partly because of the evolution route from existing GSM MAP network architectures (and associated legacy network investment).

#### GSM/W-CDMA FRAME STRUCTURE COMMONALITY

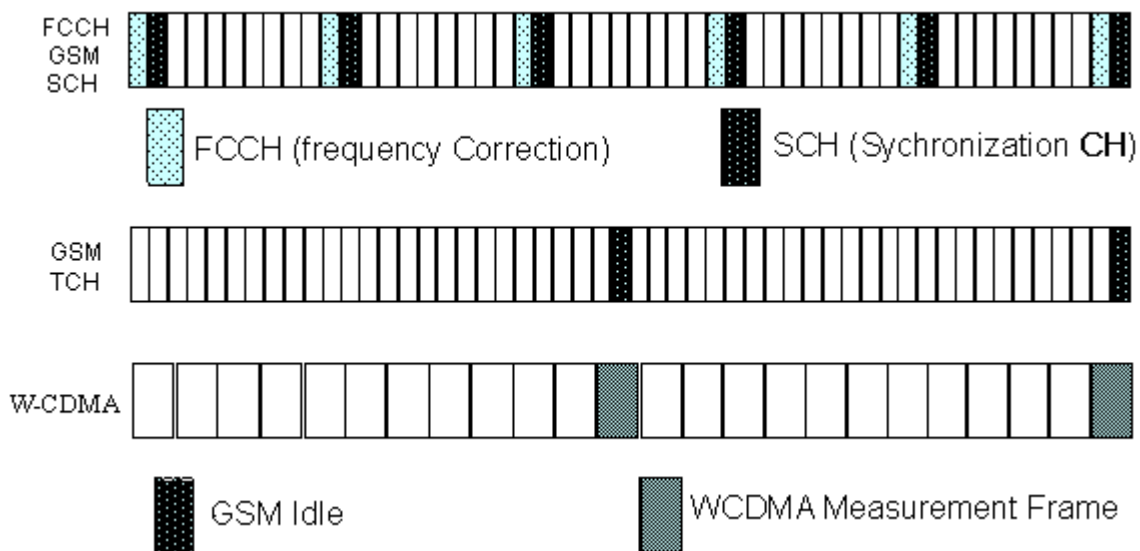


FIG 2

Note also that the IMT2000 bandwidth, although allocated in 5 MHz bandwidths, retains a 200 kHz channel spacing raster providing sub-sampling commonality across GSM and W-CDMA.

In practice, it would not be impossible (or even particularly difficult) to make CDMA2000 compatible with existing GSM networks but for the time being, W-CDMA is presented as a better option for European and Asian operators, particularly operators who already own a GSM network or who derive significant revenues from GSM roaming arrangements.

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