

# Where will GMPCS lead?



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Global Mobile Personal Communications by Satellites (GMPCS) lives up to its name; a system within which handheld (personal and mobile) satellite communications systems operating on a global or wide area regional basis enable the user to roam throughout the service area and use a handset. In developed areas (cities and along major routes of commerce) this handset will default to the local cellular or PCS operator. If there is no (or no compatible) terrestrial service the call will be placed through a satellite.

Figure 1 shows the competing technologies for these services. At the left are the 'Little LEO' services as exemplified by OrbComm. These handle messages like e-mail or telegrams using a store-and-forward system for the collection and distribution. These are generally considered to be non-real time services. Like mail and telegrams they provide a special and useful function for many applications at a relatively low cost. The projected uses cover all economic economies (from pipeline monitoring, reports of the fishing catch, data distribution and collection, information queries and mail). These functions can be carried out with virtually no new infrastructure. The typical data rates are in the hundreds of bits per second. The terminals will cost a few hundred dollars.

The middle portion of Figure 1 is populated by the 'Big LEO' satellites (including highly elliptical – HEO, and medium Earth orbit – MEO) and the 'Super GEO' regional mobile satellite systems. Many of these systems will be entering commercial services in 1998 through 2000. The typical voice data rates are 2.4 kbps with some

facsimile services as high as 9.2 kbps. See Space Business International (1998, Q1) for further information.

On the extreme right is the non-geostationary, non-voice (NGNV) class which provides high speed data systems from LEO to fixed Earth stations. The bit speeds are in the multi-megabit range. Not shown are existing C and Ku-band services (or the new Ka and V-band proposals).

## 'We Have Built It, Now Please Buy'

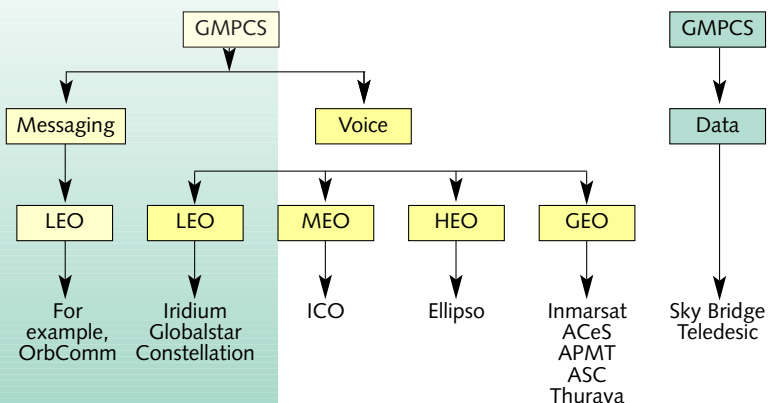
There is little question about the availability of GMPCS services in the next few years or where the operators expect to find users. Now, after expending billions of dollars, comes the critical phase of introducing these services and turning millions of hypothetical consumers that lurk behind every spreadsheet into real, revenue producing subscribers in sufficient quantities to turn a profit. The good news is that only a small percentage of the user universe is needed.

The marketing of GMPCS is not a simple matter. Figure 2 illustrates a generic supply chain between the Satellite System Operator (see Figure 1) and the End User (the subscriber or rate payer). Actual charts are more complex, especially with regard to the connections to the Gateway Operators, Terrestrial Operators (often PTTs) and Cellular/PCS Operators (again, often PTTs).

Working from the bottom up, the End User may be the owner (or lessee) of a handset, the user of a phone card operated solar powered village pay phone or a customer of a teleshop. All of these services are provided at retail. Billing is either in real time or monthly via a billing organization acting on behalf of the 'Local' Service Provider. In reality, 'local' turns into a misnomer when the subscriber is roaming outside its 'local' area, but this is really little different than GSM, AMPS or PCS roaming.

The Local Service Providers serve as the interface with the End Users. These are the marketing retailers (department stores, electronics dealers and sellers/lessors of handsets). Their

Figure 1: Forms of Personal Satellite Service



**TABLE 1: HANDSET MANUFACTURING ARRANGEMENTS**

Satellite System	Handset Providers
AceS	Ericsson
APMT	Hughes Network Systems & a joint venture in China
Globalstar	Ericsson, Qualcomm & Telital
ICO	Mitsubishi, NEC & Samsung*
Iridium	Motorola & Kyocera
Thuraya	Hughes Network Systems* & Ascom**

Key: \* Initial contract to Samsung let in 1997; \*\* Includes GPS capability

revenue comes from the hardware, registration, repairs and part of the monthly service charge. In return they are expected to sign up new subscribers using advertising, promotions, etc. and keep the customer happy and active. They are the services' face and voice to the End User.

National Service Providers could be the local PTT or the cellular/PCS provider(s) and act as wholesalers. Since the handsets default to terrestrial services, these providers reap revenues regardless of the location of the subscriber. Using GPS or other means, the Satellite Systems Operator can determine the subscriber's location to allocate a share of the tolls for all calls from the calling territory and another share to the home NSP. The SSO can also use this function to deny service to a subscriber in a country that has requested to be 'blacked out'.

There may also be Regional Service Providers that control or have arrangements with multiple NSPs. The Gateways are the landing points for the satellite connections.

The number of Gateways varies among the systems. In some systems the connection to another part of the world is via the Gateway nearest (politically or geographically) to the user and then via normal terrestrial connections to the destination. In other systems (due to the use of a higher orbit or inter-satellite links), the link may stay in space until it reaches a Gateway closest to the destination, thus bypassing many terrestrial charges. Routing may be more dependent on cost than distance or time delay.

### Competition (?) and Pricing

Many of the Regional and National Service Providers will be the local PTTs or cellular/PCS operators. From their point of view this manages the question of bypass and price competition between services. This may forestall the introduc-

tion of true competition. Depending on how the service is priced, cross-subsidization may help or hurt GMPCS. At least in the beginning GMPCS may be considered a rich man's toy and thus will be priced high. Since these PTTs may have an investment in at least one system (possibly ICO) there may be other strange pricing structures, at least in the beginning. In theory, the World Trade Organization agreements should prevent preferential pricing, but strange things do happen.

At each level in Figure 2 there is a step up of prices (a spread). These spreads will become opportunities. We expect that low cost GMPCS 'Local' Service Providers will emerge, probably from some strange places on Earth, offering discounted services via advertisements in travel magazines, the Internet, etc. Price will be the eventual discriminator. This is not to say that the lowest will win. Airlines offer First Class, Business and Coach fares. All passengers get to their destination at the same time, but some pay more for a higher grade of service or less discomfort. GMPCS, if allowed to grow naturally, will be an all-round winner.

*First barrier? Handset costs. But high initial costs (likely to vary from state to state, under long-term contracts) will eventually fall.*

**Figure 2: GMPCS supply chain**

