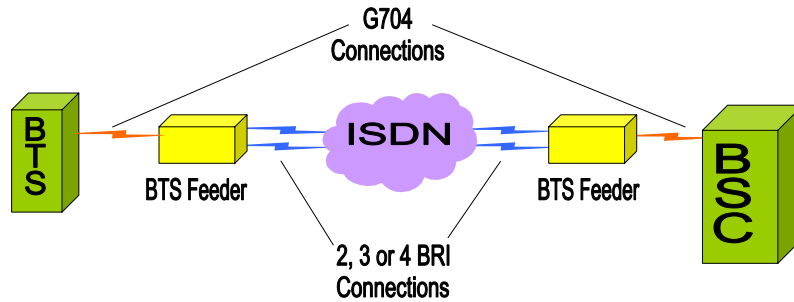


Application Note

Date:	25/9/02	Reference:	AN-002	By:	EMR
Product(s):	BTS Feeder				
Application:	Replacing Leased Lines in deployment of GSM Micro-cells.				
Summary:	The BTS Feeder range uses ISDN BRI lines as replacements for 2Mbit/s leased lines in GSM networks, reducing implementation times, and giving improved network coverage ahead of competitors and in inaccessible places.				

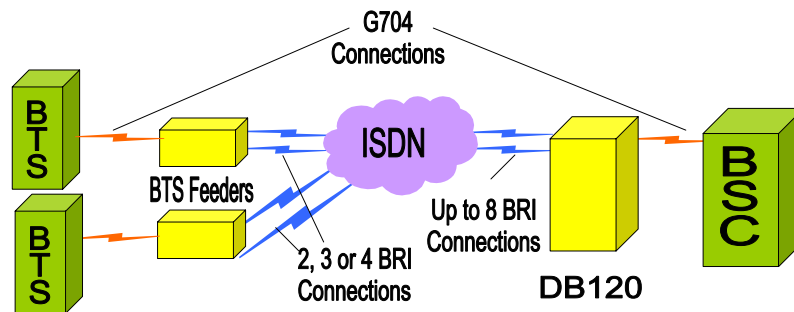
1. In its simplest form the BTS Feeder can connect a GSM Base Transceiver Station (BTS) to the Base Station Controller (BSC) using 2, 3 or 4 BRI calls. The BTS & BSC units take care of passing the GSM signals by multiplexing them into separate 64 kbit/s B channels. Usually, one B channel is used for signalling (in LAPD format), the voice signals being passed in the form of 16kbit/s data.



The BTS Feeder passes these 64kbit/s channels within a G704 channelised leased line connection, with a maximum number of 8 B Channels (4 BRI) used. The BRI connections are usually “nailed up” permanent connections. It is possible to programme “time of day” connections, giving different capacities to match varying demand during the day and which will enable testing of the ISDN lines and enable management calls for reporting purposes. Alternatively, we can permanently allocate a single B channel for management configuration and reporting.

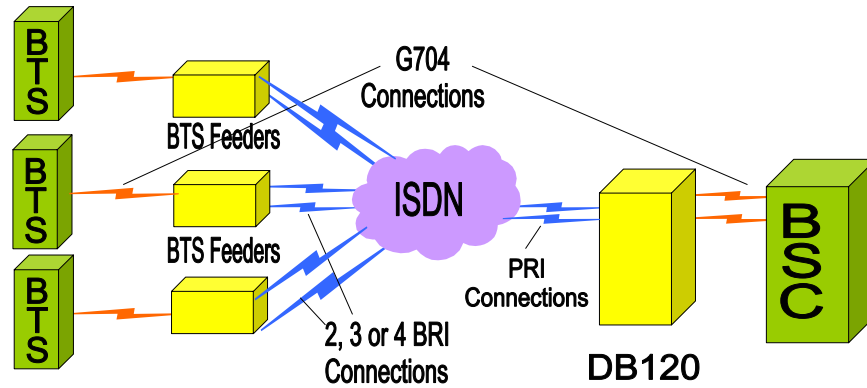
Application Information:

2. As networks grow, you can make use of the high capacity of the Databand DB120 chassis, which houses up to 14 modules from the Databand range. In the example below, the BTS Feeder unit at the BSC site is replaced by a Databand DB120 with Quad BRI cards and an SGD card.



The use of the SGD card allows additional BTS Feeder Units to be connected to the BSC using the same G704 connection, in any mix up to the maximum of 31 B Channels. This uses the expensive G704 port on the BSC much more effectively.

3. Further growth can easily be accommodated, allowing many BTS Feeder units to be connected to the Databand DB120 chassis. Below, the chassis is fitted with a Dual PRI card and two SGD cards. Depending on the country, the use of PRI is often more cost effective in most situations when more than 12 B channels are required.



Additional SGD cards enable the flexibility of allocating B channels from the same BTS to different G704 connections, potentially increasing resilience. Alternatively, the SGDP can be used, which has an on-board Primary Rate connection. This is a lower cost option, providing higher capacity in the DB120, but all the B channels must be passed over the G704 connection for that card. You are not limited to one choice, SDD and SGDP cards can both be fitted in the same chassis – we can truly provide the “made to measure” solution for the GSM operator.

4. Future applications could allow the use of LL30 units as alternatives to the BTS Feeders where leased line backup is useful. We also plan in the future to enable bandwidth top up for GSM networks. In addition, you should remember that spare capacity in the DB120 can also be used for standard backup and Primary to Basic Rate conversion applications for this customer.
5. **Benefits: GSM Operators face intense competition, not just from other Mobile Network Operators, but also from existing fixed network operators. There are many reasons why Micro-cells improve the profitability of the GSM operators.**
- *Micro-cells allow them to fill in gaps in their network coverage. Customers who get “no signal” are likely to change networks, so micro-cells can reduce customer churn. Retaining existing customers is much more profitable than acquiring new ones.*
 - *Micro-cells are relatively low-cost and fast to install, but building the traditional fixed network infrastructure to support them can take too long. The Patapsco solution overcomes these delays at low cost.*
 - *Micro-cells are also very easy to install and can easily be used to provide temporary network coverage. This can be useful for periods of high traffic (extreme busy hour), or for special events such as exhibitions and shows.*
 - *The Patapsco solution fits into existing GSM networks without any change of technology or management systems. This is a major benefit for network operators.*
 - *In some cases, the terrain can make the construction of large cells impracticable, and micro-cells can come into their own. One GSM operator uses a digital microwave network for most of its backbone, but in the centre of large cities, the “line of sight” requirement can be impossible to achieve. Here again the Patapsco solution enables fast and easy network coverage.*
 - *Micro-cells are also very useful inside large buildings which can be a problem for receiving radio signals from external aerials. For example, large shopping centres are an excellent application for the Patapsco solution.*
 - *GSM operators also encourage large corporate customers to use GSM phones inside the*

office as an alternative to a PBX. Here is another situation where the Patapsco technology can be ideal.

- *The public is becoming increasingly sensitive to environmental issues, including the erection of cellular aerials. Micro-cells can be made “almost invisible” including the Patapsco equipment.*
- *There have been a number of examples of operators having difficulty in obtaining planning permission for external cellular aerials – in these cases, Micro-cell can be the only way to provide service.*
- *In some locations, leased circuits are difficult and expensive to obtain, whereas ISDN is readily available and cost effective – here the Patapsco solution comes into its own.*

In summary, it is fast, easy to install and increases profitability.

**Contact: Patapsco Communications, Passfield Oak, Passfield Common, Near Liphook,
Hampshire, GU30 7RL, England**

Tel +44 1 428 752900; email info@patapsco.co.uk