

The PRX and the UK

During the early part of the 1970's, the PRX development was directed largely to satisfy the requirements of KPN, the Netherlands PTT. However, there was an ambition in Philips to 'globalize' the PRX product because it was an opportunity to enter the profitable world of an international manufacturer such as the larger and more successful exporters such as Ericsson and Siemens.

The British market was initially identified as a possible marketing opportunity, since the Post Office had recently been given more freedom of movement since the splitting off of the Postal Services. It was decided to open up a PRX research department in the Philips subsidiary company PyeTMC located at St Mary Cray.

PyeTMC had a development and manufacturing plant at St Mary Cray which was used by Philips to establish a research and marketing department with the intention of selling PRX to the Post Office. Philips recruited two respected engineers to head up their new facility, Dr Keith Warren and Chris Barrow. Further engineers were recruited including Harry Constantine, Dave Hay, Graeme Orton, Arthur Wraight, Harry Milton, Terry Druce and Keith...

A marketing department was also established which began negotiations with the Post office for the possible introduction of PRX alongside the existing reed-technology of the PO TXE2 exchange system, then being manufactured by Plessey.

The initial talks were quite encouraging. The PO was interested in a competitive system, especially if it was more space efficient and potentially offered more economy in maintenance. A group was set up by POHQ to investigate the PRX system.

The discussions continued for some time, the main stumbling block, however, was the PO's procurement policy. They insisted that there should be more than one manufacturer source for the Philips reed insert and the relay assemblies. Philips were reluctant to share their patent with other manufactures, the Philips reed was smaller and more reliable than the ones currently used by British manufactured reed exchange systems. This proved to be an insurmountable obstacle.

In the meantime, however, the recently formed States of Jersey Telecommunications Board, which had taken over from the States Telephone Department on acquisition of the trunk telephone network in Jersey, had recently released a new specification for a telephone switch to replace their last remaining manual exchange. The PyeTMC sales team started negotiations with the States and were officially invited to tender for the new switch for West exchange located at St Ouen, Jersey with an initial capacity of 2000 lines. The specification was extended to a relief exchange for the Central Exchange Strowger switch in St Helier with an initial capacity of 2500 lines.

Philips saw this as an opportunity to prepare the groundwork for entering the UK market as the Jersey network was based on the same principles and technologies as the UK system. Apart from a few minor local adaptations, the Jersey telephone system was a microcosm of that generally used in most UK towns.

Negotiations were started between the PyeTMC marketing team and the States. The specification was enhanced to include the advanced features promised by PRX and the contract price was adjusted to be favourable if the site could be used as a development platform for UK systems. The States Telecommunication Board presented a recommendation to the controlling committee that the contract for the new exchanges be placed with PyeTMC and the contract was duly awarded and signed during 1974.

The new relief exchange for Jersey Central was originally to have been a crossbar switch manufactured by FACE Standard of Italy. The Italians were in the process of installing two Pentaconta exchanges at sites nominated Jersey East and Jersey North, and the original concept was that the West exchange and Central relief contract would be awarded to FACE. A new equipment floor was required for the installation and this was prepared on the ground floor of the building which currently housed the trunk switching equipment for both STD and international traffic. This building had been specially built in 1964/5 for the introduction of STD on the former workshop and stores site between the Central exchange building, next to the Old Market in Minden Place, and the Telephone Department office and Manual Trunk Switchboard building on the corner of Minden Place and Cattle Street. The ground floor had previously been used for various offices and the carpenters shop but it was always intended as an equipment area. At the time of the contract award, there was an existing temporary relief switch housed in a trailer

situated on the car parking area next to the standby-generator power building in Cattle Street. This was a Mobile Non-Director Exchange (MNDX) rented from the Post Office Bournemouth Area – see Figure 1. The advantage from the point of view of the Telecommunications Board was that the available space on the ground floor could ultimately house more PRX lines than a crossbar switch. The space saving advantage of the PRX was a key factor in the award of the contract.



Fig 1. MNDX

During the latter part of 1974, PRX equipment began to be shipped to Jersey for installation in both new sites. The West exchange was to be housed in a new building

behind the existing manual exchange. The new switchroom had initially been built to house a crossbar exchange and so was quite spacious. A new exchange earth had been provided for the new building, and considerable difficulty had been found in obtaining the correct ground resistance. This was because of the soil structure in that part of the island.

A team of installation engineers was despatched from Philips in Hilversum for the construction of the new exchanges and these were overseen by a contract manager from PyeTMC, a Mr Renouf, a Jersey name, although this particular individual had no direct links with the island. The MDF and power equipment were provided by the States Telecommunication Board. A fundamental error was made during the selection of the MDF in that no lightning protection was specified. This was apparently because the Post Office standard was currently not to provide this as standard. Because of its situation on the north-west of the island, the West exchange area is particularly prone to lightning strike and with the installation of a processor controlled switch it is bizarre that lightning protection was not provided. It was later retrofitted at some expense. The power provision was a standard PO power plant designed for small exchanges and manufactured by GEC.

The initial installation process is much the same as for any exchange with the standing of racks, assembly of suites and cabling to the MDF and Trunk Distribution Frames. Soon after the installation commenced, a team of software developers was sent to the island by PyeTMC, including Harry Constantine, Graham Orton and Terry Druce. Some of the staff was accommodated by the States Telecommunication Board themselves, as housing is always a problem in Jersey.



Meanwhile, back at St Mary Cray, there was considerable development required on the hardware necessary for interfacing a PRX with a UK environment. The major differences between the Netherlands system and the UK system was encapsulated in the Loop-Disconnect signalling system developed by the PO. This incorporated special signalling solutions not met elsewhere, particularly with reference to operator assistance control, metering over two-wire junction circuits and the special provisions for the PO standard. In addition, additional operator oriented features such as Service Interception (SVI) presented a new challenge to both the hardware and software development teams. The most complex solution to be solved was that of the UK Pay on Answer (POA) Callbox (Fig 2) which required a transmission bridge to separate the caller from the called party during coin insertion. The system also had to be capable of assessing the value of the inserted coin and calculating the call period purchased.

Fig 2. POA Callbox

In addition, when the caller called the assistance operator, further functions to enable the operator to control the insertion of coins were necessary. The problem was ingeniously solved by the use of a serially-trunked sender/receiver device.

While development was continuing in the St Mary Cray laboratory, the software was being tested on site in Jersey. Jersey Central relief exchange was brought into service on the due cut-over date 6 March 1976. All the requirements for an integrated UK style telephone exchange were required for

West exchange. The existing exchange had been installed in 1949 and was



Fig 3. West Exchange, Jersey



The Jersey West manual exchange switchroom showing the Ericsson of Beeston board.

based on an Ericsson Manual Switchboard switch (Figure 4). The upgrade would be to the latest available technology, a fully processor controlled space switch.

The Central relief exchange was cabled to the existing MDF in the Strowger exchange. This caused something of a problem since the Strowger exchange had no differentiation between equipment and subscriber

Fig 4. West manual board

numbers. The PRX, on the other hand, worked on a binary base with each logical unit consisting of 1024 equipment numbers which could be mapped in software to any directory number in the range allocated to the switch. This meant that the arrangement of the MDF exchange side did not match the wiring requirement and that the numbering had to be adapted to the PRX format. A similar issue had arisen at West, but since this was a new frame, the problem was not so obvious.

A special development for the Central switch was the provision of 3-wire incoming and outgoing junctors for the PRX to interface directly with the Strowger equipment. This

simplified the requirement as far as the Strowger switch was concerned as no interconnecting junction relay sets were required. This was a critical space saving issue as the Central Strowger exchange was already at near capacity and there was little room for additional equipment. As part of this requirement, cabling was terminated on the Equipment Intermediate Distribution Frame (EIDF) for interfacing with the Central Strowger unit while junctions to other exchanges were terminated on the MDF as usual.

Some of the features of Strowger were emulated on PRX through software rather than hardware. For example, subscriber transfer services could be managed by the subscriber himself, rather than having to invoke the assistance of the local operator as on Strowger. Similarly, other services, such as SVI could also be realized in software so that there was none of the complex wiring changes necessary that had been the case with the old Strowger system.

PRX also boasted a number of new services, which although technically feasible and implemented on exchanges in other jurisdictions, were never implemented on the Jersey system, for example, such features as Calling Line Identity and conference calling.

The Central PRX was cut over on 1 November 1975 and an immediate order for extending the exchange by 2500 lines was placed. The demand for telephone lines was gathering pace in Jersey as the financial industry was expanding. The MNDX which it was designed to replace remained on the island for a number of years after the cut-over as it was used elsewhere as a temporary relief.