



Forging new links

The photo on this page of a radio-relay site could have been taken anywhere. In fact it was taken from an SFOR helicopter in Bosnia-Herzegovina and we give it prominence as a token of Phare's success in establishing telephone links between the ethnic communities there - Muslims, Serbs and Croats. In a country where cooperative ventures among the communities are still rare, the Phare telecoms project is a welcome achievement. We recount the main phases of the project in this issue of TelePhare. New linkages are also the theme of other articles in the present issue. The main feature highlights Phare's efforts to help to provide international connectivity for academic R&D networks in 11 beneficiary countries of central and eastern Europe. In another article, a Phare consultant presents a detailed analysis of a multi-country project to improve postal transport and logistics. At several points, he stresses the importance of human links and mutual confidence between consultants and beneficiaries as prerequisites for success. It is a lesson from which we can all learn.

The Editor

In this issue

Phare opens the phone lines in Bosnia-Herzegovina	2
Phare funds academic connectivity	4
1996 multi-country programme contracts	6
Postal transport: the road ahead	6
Bulgaria prepares SDH link to Greece	7
In Brief	8
Your Phare contacts	8

Phare opens the phone lines in Bosnia-Herzegovina



Bijeljina - one of the nerve centres for the inter-entity links

After nearly five years of silence, people living in the two entities which now make up Bosnia-Herzegovina are able to speak to each other by telephone. On September 19th, Donato Chiarini, head of the EC Representation Office in Sarajevo, made the first direct call from the Federation (the Muslim and Croat part of the country) to the Republika Srpska (the Serb entity). He did so over an inter-entity telephone link which was financed and put in place by the Phare programme. Mr Chiarini's call to Bijeljina in the Republika Srpska - vindicated the European Commission's decision to go ahead with this controversial project, which from the outset faced enormous political and technical obstacles.

Opposition to the project came not only from within Bosnia-Herzegovina, where each side doubted the other's good faith. It also came from within the international donor community where doubts were expressed concerning the European Commission's ability to honour its commitment to deliver the project.

The project has enabled families and friends in the Federation and the Republika Srpska to talk to each other again. It is also helping to foster business contacts between the ethnic communities in support of the economic recovery of Bosnia-Herzegovina. Given that physical travel between the entities remains limited, the significance of the project should not be underestimated.

The phone link marks a step - the only significant one so far - towards the integration of telecoms networks between the entities. This was a requirement of the 1995 Dayton agreement which brought the present fragile peace to Bosnia-Herzegovina.

The project is also one of the few in Bosnia-Herzegovina that have succeeded in getting the two entities to cooperate at a political and practical level. Engineers and technicians at the Federation and RS PTTs work together to provide the service.

The number of calls made on the new link shows it is extremely popular with local people. Unfortunately capacity is limited for the time being and congestion frequently occurs. This will be eased in coming months when switching capacity within the Republika Srpska is expanded to handle the demand. For technical reasons, possibly linked to a local act of sabotage, the inter-entity link was out of service during the month of November. But it was restored in time for the Christmas and end-year holiday period.

The project, part of Phare's eight million ecu 1996 programme for BiH, consisted in rebuilding a long-distance radio-relay network in the Republika Srpska, using synchronous digital hierarchy (SDH) technology. As the reconstruction work advanced, three inter-entity links with the Federation were installed, enabling subscribers in all parts of the Federation to contact all parts of the RS and vice-versa.

The project connects more than 30 stations in an arc around the Republika Srpska with links into the Federation at Tuzla, Sarajevo and Mostar.

The contract for the supply, delivery and installation of the SDH network was the object of an international tender in February 1997 which was won by the Alcatel group. Alcatel engineers and technicians began work in April. Considerable preparatory work was required at a number of sites, heavily damaged or destroyed during the war. This task was managed for the EC by SFOR, the Nato Stabilisation Force, via agreements with local contractors. Project coordination on the ground in BiH was carried out on behalf of the Commission by Eurostrategies, the Brussels-based consultancy.

As the project advanced, it ran into major - but manageable - technical problems. These resulted from the harsh climate, the rugged mountainous terrain and extensive war damage. The greatest difficulty was to keep politics and technology apart. Because of mutual distrust it was hard to get the two sides to accept the project in the first place. Either they did not want to interconnect their networks or wanted to do so in ways rejected by the other side.

To overcome this obstacle, the Commission drew up a memorandum of understanding binding all parties to a common set of rules for establishing and operating the inter-entity connections. The project was already five months old before both entities had signed the MoU.

The project came to a virtual standstill on several occasions. It was nearly cancelled in mid-1997 when the international donor community decided to freeze all non-humanitarian assistance to the Republika Srpska. But it was revived because of its inter-entity dimension.

Alcatel teams had to suspend installation work in the north of the RS in July and August because of fears

for their safety following action by SFOR to move against two suspected Serb war criminals in Banja Luka and Prijedor. Access to several sites was restricted for Alcatel and Telekom Srpske engineers from October onwards when SFOR took control of TV transmitters co-located there with the SDH backbone.

The project coordinator had to resort to shuttle diplomacy to work out with PTT Sarajevo and Telekom Srpske provisional numbering and routing plans to enable the inter-entity traffic to go ahead when high-level political negotiations between the international donor community and the BiH authorities on an overall regulatory framework for the telecoms sector were suspended in July. This was not part of the coordinator's original terms of reference. But, then, neither was helping to secure the release of a colleague from a Serb jail after his involvement in a road accident near Pale.

In addition to the SDH network and the inter-entity links, the 1996 programme included management training for the three PTTs - PTT Sarajevo and PTT Mostar for the Federation and Telekom Srpske for the RS - and the re-establishment of local access networks in priority areas of the Federation. The tender for the training programme was won by Development Dynamics Limited (DDL) of the UK, who have been fully operational for several months. Tenders are being prepared for the access networks.

Once the 1996 programme is completed, the commission will begin finalising the tenders for the 1997 programme in Bosnia-Herzegovina. This programme is worth seven millions ecu. It will also focus on rehabilitating local access networks - but this time in all parts of the country. ■ ■



The blue rectangle on the antennae dishes is the EU logo (with the yellow stars).

Phare funds academic connectivity

Since 1991, the Phare programme has been financially supporting the development of R&D networking. Its most recent programme covered the period 1994 to 1997. In this article, Tomaz Kalin, who worked in eastern Europe, looks at the benefits of the programme and assesses its influence on the development of

In evaluating the benefits of the Phare 1994 R&D Networking Programme, we have to take into account the global trends in the development of the Internet and the applications running over it. There is no doubt that the participating countries would have expanded their networks in any case. But it is equally clear that Phare increased the pace of development appreciably, in particular in those countries where the programme was launched early on.

R&D networking between the Phare countries and western Europe and the rest of the world has been influenced by the rapid changes taking place in networking worldwide. One major influence has been the development of a high-speed infrastructure in western Europe.

The Phare 1994 programme showed more flexibility in the way Internet services could be supplied using Phare funds than the previous Phare/Cosine project. This resulted in a new management structure being created for the programme. The

countries involved had national representatives, who became members of a Programme Advisory Committee (PAC) together with the EC Phare project officer. DANTE was appointed managing contractor. The PAC met every six months; external parties were invited to attend as observers.

In the national part of the project, the aim was to deploy a set of basic hardware and software components required by the partner countries such as routers, modems, workstations and network management software. Albania, Estonia, Latvia, Lithuania and Slovenia benefited from the national supply element of the project. The other six - Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia - had already received funding under the previous programme. The equipment was tendered according to EU rules.

The second, international, element of the project was to extend and/or to upgrade east-west connectivity to the rest of the European research Internet.

Type and capacity of connections

Albania	Tirana-Amsterdam	64kb/s	satellite	planned
Bulgaria	Sofia-Amsterdam	2 x 64kb/s	terrestrial	planned
Czech Rep.	Prague-Amsterdam	512kb/s	terrestrial	operational
Czech Rep.	Prague-Banska Bystrica	128kb/s	terrestrial	operational
Estonia	Tallin-Helsinki	256kb/s	terrestrial	operational
Estonia	Tallin-Riga	64kb/s	terrestrial	operational
Hungary	Budapest-Amsterdam	2Mb/s	terrestrial	operational
Latvia	Riga-Tallin	64kb/s	terrestrial	operational
Latvia	Riga-Stockholm	384kb/s	terrestrial	operational
Lithuania	Kaunas-Stockholm	512kb/s	satellite	operational
Poland	Warsaw-Vienna	256kb/s	terrestrial	operational
Poland	Warsaw-Stockholm	2Mb/s	satellite	operational
Romania	Bucharest-Amsterdam	64kb/s	satellite	terminated*
Romania	Bucharest-Budapest	64kb/s	terrestrial	operational
Romania	Bucharest-Vienna	64kb/s	satellite	operational
Slovakia	Prague-Banska-Bystrica	128kb/s	terrestrial	operational
Slovenia	Ljubjana-Amsterdam	2Mb/s	terrestrial	operational

* This circuit has been replaced by a 256kb/s satellite circuit Bucharest-Stockholm which is funded independently of Phare.

**the central and eastern European countries (CEEC).
as a consultant on networking projects in central and
research networking in the 11 beneficiary countries**

Another important parameter, indicative of recent developments in national academic networking as well as of the impact of the Phare project, is the growth of incoming and outgoing international traffic with the respective countries. Contrary to widespread assumptions that traffic would be largely inbound, actual results show a more balanced picture even if incoming traffic still dominates.

These results can be attributed to the excellent WWW sites operated by most academic networks and their customers, which attract attention from all over the world. Another conclusion to be drawn when analysing the raw data is the completeness of the traffic statistics; this is due to the measurement techniques introduced as part of the Phare project.

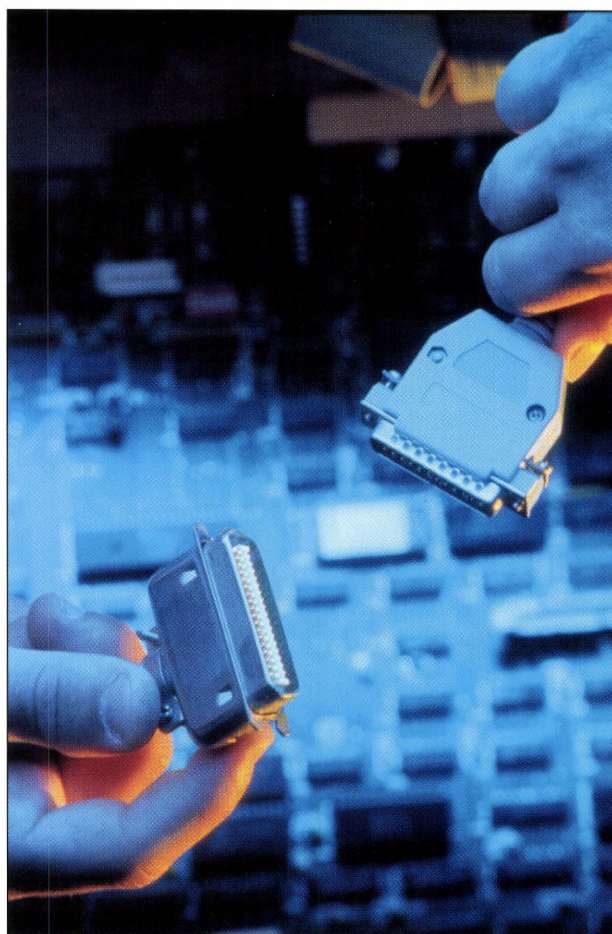
It is obvious that the huge increase in international traffic over the past two years can only be absorbed if the national infrastructure is being adequately developed. Data analyses show that in most Phare countries, by far the largest number of hosts belong to the academic community. The highest level is Poland with 94% of all hosts, followed by Lithuania with 87% and Latvia with 84%.

An analysis of the type of users served by academic networks reveals interesting trends. The first users were universities and government research organisations. As a result of increased contacts with colleagues elsewhere and a growing awareness of the benefits of networking, members of universities were the first to demand international connectivity. This is also true of government research establishments which still show a steady, if more moderate, growth in the number of connections.

The most remarkable growth is in the increase in the number of secondary schools which currently have access to the Internet. But none of them surpasses the growth in the number of commercial organisations which are connected to some national academic networks.

About half the Phare countries do not accept commercial customers; these are the ones where commercial service providers are available. In the others, academic networks are either the only substantial providers of Internet access or they have to serve commercial customers in order to share the costs of the network infrastructure.

Everyone knows that the high cost of international telecommunications circuits in Europe makes Internet networking a costly affair. This is even truer of central and



Plugging in to east-west connectivity.

east European countries where national and international links can be twice as dear as in the west. This prohibits timely upgrading of internal and international connections to the required level of throughput. Therefore the support of international connectivity by the Phare 1994 R&D networking programme was the right type of help, in the right place, at the right time.

In sum, the Phare project's contribution to the development of academic and research networking in central and eastern Europe has been a success. Relatively modest funds have helped bring about big changes in a large part of Europe. In some countries, the Phare funds were a major part of the networking budget. In others, it had a more catalytic effect. In all cases, participation in the project made substantial knowledge transfer possible and helped make national authorities aware of the importance of networking activities.

For the future, it will be important to find a form for continuing the collaboration with academic networks in central and eastern Europe and to help them follow technological developments in other European countries. ■ ■

Phare 1996 multi-country programme

Overview of contracts awarded

Project title	Contractor	Ecu Value	Duration
Interconnection of telecoms networks	Eurostrategies	299.816	12 months
Introduction of new telecoms services	OY Telecon (SF)	350.000	26 months
Strategic training for telecoms operators	ETNO (B)	397.548	18 months
Organisation of seminars	Development Dynamics (UK)	357.856	18 months
Spectrum management & frequency monitoring	Andersen Management International (DK)	555.000	12 months
International postal service quality	Price Waterhouse (DK)	359.648	12 months
Direct mail and mail order services	PE-International (UK)	649.329	20 months
Strategic training for postal operators	Eurostrategies	279.945	9 months
Postal service regulation and market monitoring	British Postal Service Consultancy	329.776	9 months
National regulatory authority	Eurostrategies	149.365	8 months
Assistance in drafting models for licensing	Telecom Danmark	316.757	11 months
Obstacles to investment	Coopers & Lybrand (B)	569.315	14 months
P-interface for frequency databases	Cril Ingénierie (F)	349.290	12 months
Monitoring of the P-interface	European Radio-communications Office (DK)	49.754	12 months
PCU support & management training	Development Dynamics (UK)	447.691	24 months

Postal transport: The road ahead

The Phare 1996 multi-country programme included a wide ranging project on the development of transport methods. The project involved postal organisations in Bulgaria, the Czech Republic, Lithuania and Romania. Graham Stubbs of the British Postal Consultancy Service (BPCS) reports.

The seven-strong consulting team for this project was drawn from the BPCS and the logistics division of P-E International, an independent management consultancy. The two organisations had worked together on previous projects.

The project started during the summer of 1996 with a small team carrying out a two-week tour of the countries involved. The objective was to gain an understanding of the transport issues, the structures, the development plans already in place, and of course to start to build the necessary relationships with the project team members in each country.

The visits were followed by a joint workshop held at P-E's offices near London. The workshop was attended by representatives of all four countries. It was the occasion to

explain and discuss best practice within transport operations, both postal and otherwise. It also offered the opportunity to explain the details of the project plan and the requirements from each country. Finally it was moment to make any outstanding introductions between country representatives and consultants.

Two external visits were arranged during the workshop. The British Post Office organised a visit to the busy sorting office and vehicle base at Watford, north of London. The other was to a modern transport operation where the group observed methods and equipment used for planning national vehicle deliveries to a wide range of customers.

The next and critical stage of the project was to carry out detailed fact-finding visits in each participating country. The



Mail delivery has come a long way since the Pony Express.

visit workload was shared among the consulting team. All were impressed by the efforts made by the individual countries to make people and information available. At the same time, preparations were made for a pilot study in Romania into vehicle route planning by computer.

The project diversified into three streams at this stage with some team members working on moving countries towards best transport practice, others working on defining a cost-allocation system and a third group moving ahead with route planning work. The work within the first two streams was carried out at the team offices in the United Kingdom, but the vehicle scheduling work was very different.

In order to route vehicles using computer programmes, the relevant road network map must be in digital form, and there must be an understanding of the typical speeds which can be achieved for each type of road. Once this is available, delivery and collection points can be located and times and distances calculated as input for the computer programme.

Maps were a problem. They are available but are seldom of sufficient detail to plan urban postal operations. The project had therefore to create such maps and to check their accuracy. Having done this, road speeds must be calculated while the existing routes must be checked against the computer's attempts to replicate them. The process is demanding and requires careful and accurate work. There is also an important need at this point to respond to the concerns of staff, who are not normally keen to see their work planned for them by computer.

As the project moved towards a close, an interim workshop was held in the Czech Republic. Attended by all participants, the objective was to enable the consulting team to present provisional thoughts and recommendations and to receive feedback. It is always useful to ensure that all members of the project know where it is heading and what recommendations it is likely to reach. Surprise recommendations at the end of a

project should be avoided if at all possible since they are much less likely to be accepted - and therefore implemented.

The final recommendations were presented at a workshop in Romania. They are aimed at improving the effectiveness of transport operations. Since making the best use of available money is absolutely crucial in all four countries, minimising transport expenditure has a high priority. The recommendations ranged from relatively easy changes, to be achieved without significant investment, to those which will inevitably require expenditure and which will be implemented over a longer period. The consulting team has high hopes that the project will yield substantial benefits. ■ ■

Bulgaria's SDH link

The Bulgarian Telecommunication Company (BTC) has begun the final technical appraisal before launching an international tender for a Phare-funded project to create a cross-border optical fibre link with neighbouring Greece. This link will be integrated into the existing and planned European fibre optic networks. Besides providing an alternative route between the two countries, the project will be part of the trans-European network designed to provide new traffic routes between northern and southern Europe and the Middle East.

The section covered by the project will be the 120 kilometres from Haskovo in southern Bulgaria to the Greek border near the town of Kavala. The transmission system will be based on synchronous digital hierarchy (SDH), the same as that used in the inter-entity project in Bosnia-Herzegovina. The tender for the project is expected to be launched and awarded during the first half of 1998. ■ ■

In Brief

The Management Committee approved the Phare 1997 Multi-country programme for telecommunications and posts (MPTP) at its session at Varna, Bulgaria, in October. The programme is due to become operational in early 1998. The three principal chapters in the 1997 programme are

- Telecoms policy and legislative procedures
- A comprehensive regulatory framework
- Institutional and human resources.

The projects in the 1997 programme are worth a total of 6.5 million ecus.

Summit sets enlargement programme

On December 13th in Luxembourg, EU heads of state and government set the procedures for the coming enlargement of the Union. All candidates from central and eastern Europe will attend a first meeting of the so-called European Conference in London in March 1998. They will then be divided into two groups for the actual membership negotiations - one for the fast-track applicants and the other for the not-so-fast-trackers. However, a country in the slow group which shows promise can "graduate" during the negotiating process to join the first group. The approach selected by EU leaders is more flexible than the one devised by the European Commission last summer.

Now is perhaps a good time to list again the main items of telecoms legislation with which candidate countries will have to comply as part of the conditions for membership. These fall into two categories: liberalisation directives and harmonisation directives.

Sector specific telecoms legislation at EU level

Liberalisation Directives

Terminal equipment	88/301/EEC
Value-added services	90/388/EEC
Satellite services	94/46/EC
Cable TV networks	95/51/EC
Mobile communications	96/02/EC
Full competition	96/19/EC

Harmonisation Directives

Licensing	97/13/EC
Interconnection	97/33/EC
ONP* voice telephony	95/62/EC
ONP leased lines	97/.../EC
ONP framework	97/.../EC
Data protection	(to be published)

*ONP = Open Network Provision. ■ ■

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Publisher: G. Burghardt Editor: H. Van Maele European Commission · Directorate General External Relations:
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