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TELECOMMUNICATIONS POLICY,
RESEARCH AND DEVELOPMENT

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WORLDWIDE REPORT
TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

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CONTENTS

ASIA

AUSTRALIA

Commercial Media Representatives Removed From Aussat Board (Margot O'Neill; THE AGE, 15 Jul 83)	1
Issue of Who Will Control Domestic Satellite Splits Experts (THE WEST AUSTRALIAN, 18 Jul 83)	2
Alice Springs Conference View of Outback Residents	
Long-Range Prospects for Telecom Reviewed by Official (Don Maddocks; THE AGE, 26 Jul 83)	4
Locally Made Computer System Being Marketed Worldwide (THE AUSTRALIAN, 19 Jul 83)	6
Government's Inattention to Telecommunications Decried (Harry Douglas; THE AUSTRALIAN, 19 Jul 83)	8

INDONESIA

Briefs	
No TV Advertisements	10

PEOPLE'S REPUBLIC OF CHINA

Development of Satellite Communications in China Surveyed (Bao Yucheng; DIANXIN KUAIBAO, No 5, 1983)	11
International Telecommunications Seminar Opens in Guangzhou (XINHUA, 26 Aug 83)	16

New Hangzhou Television Station (Zhejiang Provincial Service, 19 Aug 83)	17
SINGAPORE	
Briefs	
Multiprocessor Computers	18
LATEIN AMERICA	
COSTA RICA	
Briefs	
Communications Congress	19
External Broadcasts; News Agency Studied	19
NEAR EAST/SOUTH ASIA	
INDIA	
Briefs	
Interference Suppression System	20
Bombay Electronic Exchange	20
Orissa Stations Planned	20
Telephone Industries' Production	21
Patna, Ranchi Television Stations	21
New Transmitters Proposed	21
Bengal Television Centers	21
Nonaligned Media Conference Rescheduled	21
Strengthening All India Radio	22
PEOPLE'S DEMOCRATIC REPUBLIC OF YEMEN	
News Exchange With TASS Found Successful (14 UKTUBAR, 3 Jul 83)	23
Briefs	
Satellite Communications With Eastern Bloc	25
SUB-SAHARAN AFRICA	
ZAMBIA	
Briefs	
Electronically Controlled Telephone System	26

WEST EUROPE

EUROPEAN AFFAIRS

France, FRG Oppose UK's 'MAC-C' Satellite TV Standard
(AFP SCIENCES, 21 Jul 83) 27

CYPRUS

Television Link With Greece Planned
(O AGON, 20 Jul 83) 28

FEDERAL REPUBLIC OF GERMANY

Briefs
Siemens Fiberoptics 30

NORWAY

Communications Minister Jakobsen on Future Developments
(Johan J. Jakobsen; AFTENPOSTEN, various dates) 31

Role in ECS Satellite Project
Country Must Take International Role

SWEDEN

Tele-X Contracts Written; Satellite To Be Launched in 1986
(NY TEKNIK, 28 Jul 83) 36

Many Advantages Detailed, by Christer Larsson
Suppliers, Technical Features Identified,
by Anders Wallerius

COMMERCIAL MEDIA REPRESENTATIVES REMOVED FROM AUSSAT BOARD

Melbourne THE AGE in English 15 Jul 83 p 3

[Article by Margot O'Neill]

[Text]

CANBERRA. — The Federal Government yesterday dropped from the board of Aussat five directors who represented commercial television and newspaper organisations.

The minister for Communications, Mr Duffy, said the directors would have faced continual conflicts of interest because they were senior directors of potentially large customers of Aussat, the government-owned satellite company.

Mr Duffy announced that the new chairman of Aussat's board would be Mr David Hoare, a Sydney merchant banker.

Telecom has picked up a place on the board with its managing director, Mr William Pollick, named as a new director.

The directors dropped from the Aussat board are: Mr Robert Graham, group general manager and director of Consolidated Press Holdings Ltd., Mr Richard Searby, chairman of News Corporation, Mr Thomas Farrell, assistant general manager of John Fairfax Pty. Ltd., Mr John Gleeson, chairman

of Telecasters North Queensland Ltd., and Mr John D'Arcy, deputy general manager of Queensland Newspapers.

The decision, which was approved by Cabinet in Wednesday, follows the Government's go-ahead for the communications satellite. The Government is yet to decide whether to incorporate Aussat into Telecom or whether to sell nearly half of the satellite company to private enterprise.

Telecom's inclusion on the board is seen as an indication the Government is moving toward Mr Duffy's stated preference, incorporating Aussat into Telecom.

This is being vigorously opposed by the big media organisations. The federal director of the Federation of Australian Commercial Television Stations, Mr James Malone, said commercial broadcasters would be very concerned if Telecom controlled the satellite.

"Telecom is not flexible enough to meet the needs of commercial broadcasters," Mr Malone said.

The other new members of Aussat's board are: Mr John Carden, executive director of CRA Ltd, Mr

William Dix, managing director of Ford Motor Company of Australia, Professor Helen Hughes, executive director of the School of Development Studies at the Australian National University, and Mr Reginald Robin, formerly general manager and commissioner of the Australian National Line.

The 10-member board also includes: Mr Harold Cottey, a Sydney businessman, Professor Morris Gunn, professor of electrical engineering at the University of Queensland, Mr Rory Treweeke, federal president of the Isolated Children's Parents' Association, Mr Richard Wiesener, a chartered accountant, and Mr Hugh Payne, the deputy secretary of the Department of Communications.

One of the dropped directors, Mr John D'Arcy, said the action was a sop to the ALP Left wing and unions.

But Mr D'Arcy said the number of private enterprise representatives on the new board suggested the Government would keep Aussat an independent body.

CSO: 5500/7592

ISSUE OF WHO WILL CONTROL DOMESTIC SATELLITE SPLITS EXPERTS

Alice Springs Conference

Perth THE WEST AUSTRALIAN in English 18 Jul 83 p 12

[Text]

ALICE SPRINGS: A national conference on Australia's domestic communications satellite ended at Alice Springs yesterday with delegates polarised on the question of who should control the project.

More than a third of the 100 delegates abstained from a motion recommending to the Federal Government that control of the satellite be vested in Aussat Pty Ltd.

This Government-owned company was set up in November 1981 to own and manage the satellite system due to be launched from the NASA space shuttle in 1985.

Delegates who abstained from voting were included on a 10-member team nominated by the conference to present the resolution to the Federal Minister for Communications, Mr Duffy in Canberra.

Representatives from Aussat, Telecom, the Communications Department and the Australian Telecommunications Employees' Association were among those who abstained.

The ATEA argued for Telecom control of the project.

Telecom and Aussat said that any decision about the control of

the satellite project was a matter for the Federal Government.

The organiser and conference chairman, the NT Minister for Community Development, Mr Ian Tuxworth, said yesterday that a delegation with split views would not be a disadvantage at any meeting with Mr Duffy.

"The fact that we have both sides of the argument is healthy," he said.

ATEA federal secretary Bill Mansfield said that his union had opposed the establishment of Aussat in submissions to the previous and present Federal Governments.

He said ATEA feared that the satellite would be used to undermine the services of Telecom and that it would not be economically viable.

Also, the satellite would not be used to provide better telecommunication services for people in remote areas and that it could have a detrimental impact on the viability of regional television and radio ownership and control.

"Our anxiety is highlighted by the fact that the Government has not released an interim report on the financial viability of

the satellite project prepared by the Department of Finance," Mr Mansfield said.

Aussat general manager G. Gosewinckel told the conference that the company would not be a drain on the taxpayer.

The director of business development for Telecom, Mr E. R. Banks, defended Telecom's record on remote areas and said that Telecom planned to make automatic telephone services available to all Australians by 1990.

View of Outback Residents

Perth THE WEST AUSTRALIAN in English 18 Jul 83 p 12

[Text]

The WA Opposition spokesman for the North-West, Mr Ian Laurance, said the Alice Springs seminar showed conclusively that the Australian outback people did not want Telecom to control the satellite system.

The outback interests

at the seminar, including many people from WA, looked for an independent, small and efficient organisation to run the satellite.

In a motion to be put to the Federal Minister for Telecommunications, Mr Duffy, the seminar moved that Aussat be given that

control.

Mr Laurence said the West Australian people from outback stations and north-west shires at the meeting considered that they would derive more benefit from the satellite if it was owned, managed and controlled by Aussat.

CSO: 5500/7592

LONG-RANGE PROSPECTS FOR TELECOM REVIEWED BY OFFICIAL

Melbourne THE AGE in English 26 Jul 83 p 31

[Article by Don Maddocks]

[Text]

BY 1990, every Australian will have access to an automatic telephone.

That's the goal Telecom Australia has set for itself.

At present Australia ranks seventh in the world in terms of subscribers per head of population: more than eight out of every 10 homes are on the phone.

Considering the size of Australia and its fairly widespread population base, that's quite an achievement — even by international standards.

Despite this, according to Telecom's director of business development, Roger Banks, Australia's biggest public 'corporation' is poised to step up its telecommunications services.

At the moment, apart from moves to digitise Australia's telephone exchanges — which would make them more efficient — and setting up solar-powered microwave links in the outback, Telecom is positioned ready to provide new services using videotex and the communications satellite.

If the Minister for Communications, Mr Duffy, gave Telecom the go-ahead with videotex, Mr Banks says Telecom could provide a national service within eight or nine months of placing an equipment order with a supplier.

"We've always believed that videotex is as significant as an information service as the telephone itself," he said. "It means that anyone with a telephone

would be able to access hundreds to thousands of pages of information. And that's got to be important."

It is generally recognised in the communications industry that Telecom's involvement in the two-way computer-based communications service is not only logical, but would also provide the much-needed fillip to really get videotex off the ground in Australia.

Telecom's equivalents in Britain, France and West Germany are already heavily involved in establishing national services.

Mr Banks said Telecom had learned a lot from British Telecom's experience, and added that Telecom Australia, if involved, would take a different approach.

Like West Germany, he said, it would provide a central database, as well as providing gateways to other private data-bases.

According to Mr Banks, estimates indicate that the service would be self-supporting. "We would be looking at a gate-wayed, single-database operation that could be extended as needed. And our calculations show that it could stand on its own two feet."

Telecom, he said, had also taken a close look at France's electronic telephone directory, and although it had no plans to duplicate it at this stage, was monitoring its success.

At present Telecom Australia is spending about \$136 million a year to print, publish and dis-

tribute telephone books Australia-wide. Most of that expenditure, however, is subsidised from revenue from the Yellow Pages.

In the long-term, a switch over to electronic directories could save a lot of money and provide an instantly updateable service.

A decision on Telecom's involvement in a national videotex service is believed to be imminent.

Apart from a new videotex service, Telecom is keen to see Australia's communications satellite go aloft because the link would complement its existing national telecommunications network.

"We believe it ought to go ahead. We're supporting it. In fact we've already placed orders for Earth stations and other ground equipment," Mr Banks said.

He said the recent pressure from the Australian Telecommunications Employees' Association (ATEA) to stop the satellite on the grounds that it was too expensive, would duplicate services, and would cost jobs, ignored its potential to deliver broadcast television services to the outback.

"That point was brought home to the union very clearly last weekend in Alice Springs," he said. "They have seen it only in terms of telephony. The satellite is not a telecommunications system in its own right. It is a celestial microwave link."

Mr Banks said he thought the ATEA was trying to read too much into the satellite move.

Fears that the satellite would cost jobs were simply not well founded, he said.

"We're not about to retrench people as a result of the satellite going up. That's not so."

Another thing Telecom is doing to speed up the flow of information around Australia, is the establishment of special digital exchanges.

These exchanges not only require lower maintenance than manual exchanges, they provide more sophisticated services and provide the basis for a national data network.

The first digital exchanges were installed earlier this year.

By the end of this financial year, Telecom expects to have more than 30 new exchanges in operation — mainly in Melbourne and Sydney.

GSO: 5500/7592

LOCALLY MADE COMPUTER SYSTEM BEING MARKETED WORLDWIDE

Sydney THE AUSTRALIAN in English 19 Jul 83 p 20

[Text] AN Australian-designed and manufactured retail hospitality computer system is now being marketed world-wide following its international debut at the recent World Fair in Hanover, West Germany.

Overseas sales have already been made to South Africa, Sweden, the UK, Cyprus, Canada and Israel.

Called the "Servit" system, it is manufactured at the Brisbane research and development division of the Sydney headquartered Hotel Restaurant and Club Group (HRC), consultants to the hospitality industry.

According to Mr Bryan Wickens, a director of the company, Servit is a pioneering concept in hospitality computing because of the power placed in the point-of-sale (POS) terminal.

"The advanced communications capabilities and software designed by HRC to allow the POS to communicate bidirectionally with a host computer, via either a cable transmission or modem, are also of major interest," he said.

Its adaptability enabled the system to operate on whatever computing power could be afforded by a business.

HRC's system was designed to provide intelligence and standalone operation in the component most vital to the hospitality retail industry--the POS terminal.

Mr Wickens said the terminals were designed to suit different retail applications with provision for customisation for specialised needs.

Additional hardware incorporated a central computer, located either in-house or off the premises.

Software was transportable allowing any size or type of hardware to be used, ranging from a personal floppy disc model to hard disc micros and minis.

Existing installations used Sanyo, IBM PC, Onyx, Wang, DEC and ICL PC hardware.

An intelligent multiplexer, also designed and manufactured by HRC, allowed access to peripheral data collection devices (such as PABX) and a simple cable network connected the computer and POS or data devices to the multiplexer.

Communications and hospitality inventory and management applications software were written and supplied by HRC.

The communications software allowed bidirectional communications among the computer, multiplexer and all sales locations.

Applications software was interfaced to the communications software and provided facilities for managing and controlling inventory, reporting on profits, and a wide variety of functions relevant to the needs of hospitality retail management.

"The computer is not tied to the system during trading periods and allows utilisation of a variety of other software packages to perform tasks such as debtors, creditors and general ledger, word processing, budgeting, direct mail, job costing and payroll."

The operational principle of the system was the recording of all sales by a stock number in the POS terminal.

The registers held as few as 300 stock lines items, expandable to over 10,000.

Pricing of the items was stored in the registers with provision for multiple price levels in all registers.

The software allowed a business to be divided into numerous marketing areas each able to support up to 16 registers.

A total of 256 registers could be operated at one or more sites.

CSO: 5500/7592

GOVERNMENT'S INATTENTION TO TELECOMMUNICATIONS DECRIED

Sydney THE AUSTRALIAN in English 19 Jul 83 p 19

[Article by Harry Douglas]

[Text]

I AM constantly amazed at the way successive Governments play down the importance of the Ministry of Communications.

It is not accorded a position in Cabinet by either Coalition or Labor Governments — except when Mr Ian Sinclair was Minister, and that was only because of his seniority in the Country Party.

But worse still, Ministers for Communications always seem to be called on to do two jobs.

This means the Ministry falls largely into the hands of public servants — draining all the innovation out of a policy area which deals with one of the world's most volatile and fast-developing industries.

Of recent Ministers for Communications, Mr Eric Robinson was also extremely busy as Minister Assisting the Minister for Finance, Mr Ian Sinclair was also Leader of the House, and Mr Neil Brown spent a good deal of time doubling as Acting Attorney-General.

Only Mr Tony Staley was a full-time Minister and it is no coincidence that of all the Ministers in recent years he was the best able to understand the industry and promote constructive developments in line with the growth and expansion of the high technology involved.

Now we have not only a Minister for Communications, but also a Minister Assisting the Minister for Communications — and the Minister Assisting the Minister is the Leader of the Government in the Senate and a Cabinet Minister, whereas the Minister for Communications is not a member of Cabinet.

It is hoped, between them, the

two Ministers will produce the kind of leadership and the policies the industry needs.

But it may become a somewhat unwieldy relationship.

In the long run the more rational and more desirable solution would be for communications to be accorded more senior status than now, and always to be regarded as a full-time responsibility.

This becomes all the more important if it is realised major change is taking place in world trends.

There is now good reason to believe that the industrial era has ended — or is ending.

Futurologists like Alvin Toffler, Daniel Bell, and the late Herman Kahn are putting a strong case that advanced societies are undergoing massive transition away from the industrial era towards one which they variously call the post-industrial era, or the information age or era.

I have been reading James Martin's "Communications Satellite Systems" and also two other James Martin books I can thoroughly recommend, "The Wired Society" and "The Telematic Society".

Martin calls the new generation of communications satellites multiple-access facilities capable of carrying all types of signals on a demand basis, and he argues they can be cost-effective performing this multiple function over relatively short terrestrial distances.

If the Australian satellite communications systems are used effectively, and the policy for this has not yet really been made clear, then from 1985 we can expect the development of a whole range of new communications services which will be of benefit to all Australians, not just those living

in isolated communities.

The satellites represent a tremendous innovation and as is often, and paradoxically, the case with these great leaps forward, they seriously threaten the livelihoods of those people and organizations still busily and painstakingly doing things the old-fashioned way.

The telecommunications unions in Australia are fighting a series of battles against the implementation of various information and communications systems which cause their members to either radically change their occupations and work relationships, or which eliminate them entirely.

The present campaign by the Association of Telecommunications Employees (ATEA) to stop the satellite project is in fact a move to stop, or at least delay, the implementation of a major change to the occupational base of their members, and is indirectly a move to counter the possible destruction of the union entirely.

The industrial era lasted for about 200 years, and its end could mean the end of trade unions as we know them.

At the very least they will be changed beyond recognition by the new forces at work.

The impact of technology, and by that I mean technology as human processes, is causing so many changes to take place in the workplace and within the workforce, that the old trade unions are in danger of complete disintegration unless they can either stop the innovations, or delay them, or somehow force the technologies to operate in such a way as not to interfere with existing labor structures.

Unfortunately, there is a belief that technological innovation breeds winners and losers, and much of the political manoeuvring now occurring is like the jockeying that goes on in the home turn before the run to the post — nobody wants to be left in the tail of the field. This is one reason why the ATEA is pushing vigorously the view that the satellite project should be stopped altogether.

It is easy to portray the unions as being bloody minded, even Luddite, about these changes, but that is not entirely the case.

There is a very real and enlightened concern in many unions about the social and occupational effects of technology, and the more progressive unions are arguing that while the changes can't really

be prevented, there should be a concerted attempt on the part of the entire community to plan the implementation of change in a way which causes the least amount of grief.

We can make this transition into the information age particularly difficult for ourselves if we don't attend to its educational and social aspects.

The main difficulty with innovating technological changes is the task of changing people's perceptions of technology generally.

The biggest popular misconception about technology — and this is one which causes a lot of heartburn — is that technology is exclusively to do with machines.

When people talk about television and microcomputers and space shuttles they frequently think they're talking about technology.

The fact is that technology is about human processes. It is about different ways of thinking, acting, communicating and relating to each other.

By forgetting the human element when we think about technology, we are overlooking the most important part.

When we talk about satellite systems, the image which immediately springs to mind is one of the satellites themselves, floating in space thousands of kilometres above the earth.

The satellites and earth stations can be viewed as the hardware in the system.

There are software components as well, made up of the TV, video and computer programs which are distributed by the satellites as electronic impulses and come alive to us in the form of visible images on screens and as sounds.

But easily the most important components in such systems are human beings.

We design and build them in the first place to improve our lives, and we maintain them, interact with them, and feed and develop them.

In the Australian satellite system we can expect millions of people to become participants in these ways, some regularly and some intermittently.

Once we start taking a holistic view we can see that each of the components in a technological system is influential on the others.

Perhaps, along with computing and keyboard manipulation, we should teach systems theory at primary school level.

BRIEFS

NO TV ADVERTISEMENTS--In no way will TVRI /Television Indonesia/ broadcasts be opened up to advertisements because television does not need them, Information Minister Harmoko said on Monday afternoon /18 July/ at the President's Office, in accordance with a report submitted to President Suharto concerning efforts to improve the quality of electronic media broadcasts, particularly TVRI and RRI /Radio Indonesia/ broadcasts. The information minister also explained that the government will not grant licenses for private television broadcasting while transmitters are being built in Cimanggis, Jakarta and Medan, totaling 250 kilowatts, to improve the quality of RRI broadcasts. He reminded his listeners that RRI still uses equipment dating from 1948 which should be scrapped but apparently is still being used. The minister said RRI now has 49 stations while non-RRI broadcasters have 569 so, of course, the quality of RRI broadcasts must be improved. He said regulations governing non-RRI broadcasters will be strictly enforced, especially those governing the relay of national programs, because some non-RRI broadcasters have not yet relayed any national news. It is important, Harmoko said, that the number of rural broadcasting groups (SIPEDES groups) be increased. At present there are only 39,000 of these groups while there are some 65,000 villages in Indonesia. /Excerpt/ /Jakarta MERDEKA in Indonesian 19 Jul 83 pp 1, 11/ 6804

CSO: 5500/4360

DEVELOPMENT OF SATELLITE COMMUNICATIONS IN CHINA SURVEYED

Shanghai DIANXIN KUAIBAO [TELECOMMUNICATIONS INFORMATION] in Chinese No 5, 1983 pp 20-21, 30

[Article by Bao Yucheng [0545 5940 2052]: "A Survey of Satellite Communications Development in China"]

[Text] Satellite communications is a modern form of communications which developed in the 1960's. In the last 10-odd years it has developed rapidly and has penetrated into every area of modern life. Today, satellite communications has been extensively applied in international and domestic communications; it has taken on more than two-thirds of all international transoceanic communications work. Starting in the 1970's, national satellite communications also developed extremely rapidly, and more than 20 countries and areas throughout the world have now established domestic satellite communications systems.

In order to adapt to the development of socialist construction, starting in the early 1970's we began to establish and develop satellite communications. China's development of satellite communications has passed through the following stages: importation of foreign equipment, establishment of ground stations and development of international satellite communications work; independent development of ground station equipment and establishment of experimental satellite communications stations; use of foreign-supplied communications satellites for transmission testing of experimental ground stations, providing technical data for rental of satellites, construction of stations, developing and launching our own satellites and establishing stations for them; completion of thorough technical preparations, and gradual realization of a network of stations based on rented satellite facilities and on Chinese-launched satellites.

Starting in 1972, China's first satellite communications ground station (a 10-meter mobile station) was established at Hongqiao, Changhai, and began to make use of international satellite communications. Starting in 1973, by importing international satellite communications ground station equipment, we established three standard ground stations with 30-meter antennas in Beijing and Shanghai, and began international satellite communications activities. Starting in late 1974, relevant units began to develop equipment for satellite communications ground stations. As a result of several years' work, China has

independently developed ground station equipment and established experimental ground stations in Shanghai, Nanjing and Shijiazhuang. In recent years we have also developed small-size ground stations with 5-meter and 6-meter antennas, thus providing the necessary technical equipment for establishing and developing Chinese domestic satellite communications system.

From May 1978 to June 1979, on the basis of a Sino-German agreement, we utilized the Symphonie experimental communications satellite jointly developed by Germany and France for a variety of communications tests. Before carrying out these tests, we conducted in-orbit tests of the Symphonie's repeaters, (including determination of effective isotropically radiated power (EIRP), input saturation flux density, repeater gain, satellite carrier frequency stability, and satellite input sensitivity $(G/T)_s$), as well as television transmission and telephone conference tests, time-synchronization transmission tests, PCM [pulse code modulation]/PSK [phase shift keying]/SCPC (DAMA) [single channel per carrier (demand-assigned time-division multiple access)] transmission experiments, newspaper facsimile tests, 60-channel FM/FDM [frequency modulation/frequency division multiplex] telephone tests, data transmission tests, 120-channel PCM/PSK telephone tests and the like. These tests and measurements were all carried out at a satellite EIRP of 32 dBW [decibels above 1 watt].

In June-October 1982, in order to test the feasibility of China's domestic satellite communications transmission technology program and to test the technological capabilities of our domestically-developed ground station equipment, the Ministry of Posts and Telecommunications utilized extra repeaters for the eastern hemisphere beam of IV-A and V satellites, which the International Communications Satellite Organization provides free of charge at the equator above the Indian Ocean at longitude 60° E, for communications and television transmission tests. The eastern hemisphere beams from the IV-A and V satellite cover our entire national territory; in the border areas, the eastern-hemisphere beam from the IV-A has an EIRP of 26 dBW, while in areas in the center of its beam (such as Zhanjiang) the power is as high as 34 dBW; in the most remote northern areas it is about 30.7 dBW. The eastern hemisphere beam of satellite V gives more uniform power coverage of the country; the EIRP at the edge of the beam is about 29 dBW, while in areas near the center of the beam it is 33 dBW (somewhat less than for satellite IV-A).

Currently there are 10 ground stations taking part in our domestic satellite communications transmission experiment, at Beijing, Shanghai, Hohhot, Urumqi, Shijiazhuang, Nanjing, Shijingshan and Chengdu, with antenna radii of 5, 6, 7, 10, 11, 15 and 30 meters, seven of these stations were independently developed by China.

The entire test is divided into four stages: testing and verification of the capabilities of ground station equipment, testing of transmission by various signal paths, various types of operating tests (including on-the-spot performance demonstrations) and the like. The tasks included in the testing are as follows: television transmission, SCPC PCM telephony, companded FM SCPC telephony, 50-Baud PCM teletypewriter and telegraph, photograph facsimile, character facsimile, 200-Baud data transmission, newspaper photo transmission,

time-division multiuser 15.36 Mbit/sec synchronous signals, 24-channel FM weather map transmission, standard time synchronization signals, long-distance automatic dialing signal transmissions and the like.

Four months' measurements and tests have shown that our domestically developed ground station equipment has excellent characteristics, and all of its parameters have met the design values for $(G/T)_G$ [ground station sensitivity]; Beijing-Urumqi and Beijing-Hohhot television transmissions had excellent quality with clear images; all of the functional tests between Beijing and Hohhot achieved the design characteristics. This test made it clear that renting international communications satellite repeaters for domestic communications and television broadcasting is technically feasible.

Our country is vast and populous, with great disparity in natural environment and population distribution. For example, the population is dense on the east coast, while in such border regions as Nei Monggol, Xinjiang and Xizang the population is sparse and natural environment is complex. Line-of-sight communications, cables or microwave would not only be expensive and difficult to maintain, but under our present technical and economic conditions the difficulties involved would be great. Therefore, before we launch our own working communications satellites, it is reasonable to rent extra repeaters on international communications satellites as a temporary measure to provide for communications and television broadcasting for our border areas, tourist areas and new coastal cities.

The Ministry of Posts and Telecommunications plans to begin renting repeaters on international communications satellite V, located over the equator above the Indian Ocean at 60° E, at the end of 1983 for domestic-satellite communications. Its eastern hemisphere signal will cover our entire territory and its EIRP for our border areas will be 29 dBW or more. But use of the 6/4 GHz band will pose new requirements for ground stations, because the antenna feed must use double circular polarization.

In addition to renting repeaters on international communications satellites, in the future we will gradually set up ground stations on a stage-by-stage basis in Beijing and Shanghai and in border areas, tourist areas and new coastal cities; the initial plan is shown in Fig. 1. The stations shown in the map can be divided into three categories: the central station, regional centers, and local stations.

(1) The Central Station. This station will be located in Beijing and will have a G/T of at least 32 dB/K. Its main tasks are: to provide telephone, telegraph and other services to regional centers and local stations throughout the country, and to broadcast television programs nationwide, with the additional capability of broadcasting the various regional centers' television programs. At the same time, it will provide communications links and signal monitoring for all stations nationwide.

(2) The Regional Centers. These centers are located in capitals of provinces, autonomous regions, and centrally-subordinate municipalities, and have G/T values of at least 32 dB/K. Their main tasks are to conduct telephone

and telegraph service with the central station and local stations, and to broadcast or relay television programs from the central station.

(3) The Local Stations. These stations will be located in tourist areas, border areas and new coastal cities (such as special zones) and will have minimum G/T values of 23.5 dB/K. Their main tasks will be to carry on telephone and telegraph service with the central station and regional centers, and to receive and relay television programs from the central station and the regional centers.

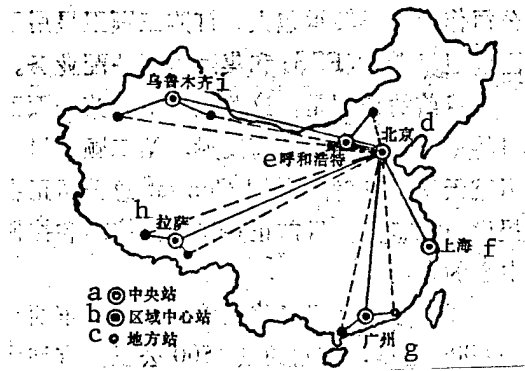


Fig. 1. China's Domestic Posts and Telecommunications Satellite Communications System (partial representation)

Key:

- a. Central station
- b. Regional centers
- c. Local stations
- d. Beijing
- e. Hohhot
- f. Shanghai
- g. Guangzhou
- h. Lhasa
- i. Urumqi

Based on China's population distribution, topography, area, and user requirements, the main characteristics of our domestic satellite communications system will be multiple users and low service load. The delta modulation SCPC method is currently being considered for our near-term modulation technique.

In addition, such industrial departments as the petroleum, hydropower and coal industries will establish special-purpose ground stations and organize their own special satellite communications systems.

China's satellite telecommunications is still in the beginning stage, but it is developing rapidly. As ground stations are gradually established

and put into operation throughout the country, they will form the beginnings of a domestic satellite communications network. In the not-too-distant future, we will launch our own working communications satellites, and at that time our domestic satellite communications will undergo further development; a rapid national satellite communications which reaches everywhere will be rapidly implemented here.

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8480

CSO: 5500/4176

INTERNATIONAL TELECOMMUNICATIONS SEMINAR OPENS IN GUANGZHOU

OW261738 Beijing XINHUA in English 1438 GMT 26 Aug 83

[Text] Guangzhou, August 26 (XINHUA) -- China's first international seminar on telecommunications technology and equipment opened today in Guangzhou, capital of Guangdong Province.

The seminar is sponsored by the Guangzhou branch of the Chinese Academy of Sciences, the Guangzhou Scientific and Technological Center for Exchange With Foreign Countries and AVP Expositions Co., Ltd.

Attending the seminar are over 100 representatives of 44 organizations from Britain, France, the Federal Republic of Germany, Italy, Japan, Sweden, the United States, and Hong Kong. Also present are scientists and technicians from the Chinese Academy of Sciences, the Ministry of Posts and Telecommunications, the Ministry of Radio and Television and universities and institutes and representatives from 16 localities including Shanghai and Tianjin, and Jiangsu and Liaoning Provinces.

On show are 1,296 pieces of advanced telecommunications apparatus, from telephone sets to urban communication systems. The systems are demonstrated on the spot through films, slide shows and video displays. Twenty-four Telex and facsimile circuits from Guangzhou to London and Hong Kong have been rented for on-the-spot operations.

Trade talks will be carried out and orders taken during the seminar, which is scheduled to conclude on September 3.

CSO: 5500/4186

PEOPLE'S REPUBLIC OF CHINA

NEW HANGZHOU TELEVISION STATION

OW200634 Hangzhou Zhejiang Provincial Service in Mandarin 1030 GMT 19 Aug 83

[Excerpts] At the seventh press conference sponsored by the Hangzhou Municipal Party Committee and the municipal people's government this afternoon, (Yang Zhaodi), member of the Standing Committee and head of the propaganda department of the municipal party committee, announced that the municipal party committee and the municipal government have decided to set up the Hangzhou television station.

Comrade (Yang Zhaodi) said that the Hangzhou Municipal Party Committee and the municipal people's government, with the support of the provincial broadcasting enterprise, recently decided to establish the Hangzhou television station. The Ministry of Radio and Television has allotted Channel 11 of the metric wave to the Hangzhou television station, which will primarily be an education station for the propagation of scientific and general knowledge.

(Yang Zhaodi) said that with the support of provincial departments concerned, the station will relay the programs transmitted by the Shanghai television station on Channel 8, previously Channel 5, during the initial stage. When conditions permit, the station will then have its own local news program during the second stage. During the day time, the Hangzhou television station will work in coordination with other departments concerned in sponsoring various kinds of televised lessons for cadres, staff members, workers, young people and students. At present, the Hangzhou broadcasting enterprise is actively making preparations for the establishment of the television station in the hope that people in Hangzhou will be able to watch the televised programs broadcast by the Shanghai television station by the Spring Festival.

Comrade (Yang Zhaodi) also announced this afternoon that the municipal party committee has made a 6-point decision with regard to the cultural relics and books confiscated in Hangzhou during the cultural revolution that have not yet been returned to their original owners.

CSO: 5500/4187

BRIEFS

MULTIPROCESSOR COMPUTERS--Singapore, Aug. 4--Singapore will be the first country in Asia, besides Japan, to manufacture large multi-processor computers when a joint venture among the republic, India and the United States begins its operations here by the end of the year. Tata-Elxsi, the manufacturer, was incorporated in 1981 as a joint venture. Tata, a diversified Indian industrial group, holds 55 per cent, the US firm Elxsi owns 25 per cent while the remaining stake is shared between the government-controlled Temasek Holdings and the Development Bank of Singapore. The chairman of Tata-Elxsi, Mr Ratan N. Tata, told a new conference here yesterday that the company was in the process of defining its manufacturing activities in the republic. He said the firm's intention was to eventually build a full-fledged independent computer company engaged in manufacturing, marketing and research and development. He added that they were planning to sell five to six Elxsi systems next year with the simplest system costing around S\$1.6 million to as much as a few million dollars for more sophisticated versions. The market includes the Asean region, the US, India, Australia and New Zealand. Mr Tata said negotiations were under way with interested parties from Malaysia, Singapore, India and Australia--Bernama [Text] [Kuala Lumpur BUSINESS TIMES in English 5 Aug 83 p 2]

CSO; 5500/4365

COSTA RICA

BRIEFS

COMMUNICATIONS CONGRESS--San Jose, 12 Aug (DPA)--The International Telecommunication Union (ITU) 5-day congress held in San Jose, Costa Rica, ended this afternoon. Among the major agreements reached are: 1) Governments should plan and carry out projects on the basis of international integration; 2) Governments should provide the funds for technical cooperation programs; 3) ITU contacts with the World Bank should be expanded; and 4) The ITU and its member governments should contribute to increased understanding of the socio-economic aspects of telecommunications. Delegates from 28 different countries attended. [Summary] [PA180136 Hamburg DPA in Spanish 0000 GMT 13 Aug 83]

EXTERNAL BROADCASTS; NEWS AGENCY STUDIED--Costan Rican Minister Armando Vargas yesterday reported that the image of Costa Rica will be considerably improved abroad when the radio station "Costa Rica Internacional" starts operation. In a report to the Government Council which was completely approved yesterday, the minister stated that Radio Reloj will transmit on shortwave, and the government has accepted an offer in this regard from Roger Barahona [not further identified]. Two books on Costa Rica will be edited, one about the peace which prevails here and other dealing with "a democracy without arms." Five thousand copies of each will be printed. Vargas reported that the U.S. magazine NEWSWEEK will publish a supplement this week on Costa Rica, financed by several organizations. He also reported the government's agreement to have the Servicio Costarricense de Noticias [Costa Rican News Service] (1,500 words a day) distributed abroad, and the possibility of opening a news agency as of January 1984, with a contribution from the government of the FRG. [Text] [PA180001 San Jose LA REPUBLICA in Spanish 7 Jul 83 p 4]

CSO: 5500/2093

BRIEFS

INTERFERENCE SUPPRESSION SYSTEM--Bangalore, 12 Jul--The Electronics and Radar Development Establishment (LRDE), Bangalore, has evolved a system for suppressing interference while communicating from a wireless equipment inside a moving vehicle. The LRDE director, Dr. Ramadas P. Shenoy, said the system would act as an effective shield against sound and other emitters of a moving vehicle from interfering with the wireless communication operating from inside. The scientists at the LRDE had solved the problem of extremely feeble and disturbed communication on account of interference caused by power-line carriers faced by the defence forces in the forward areas. The LRDE had dispatched the first batch of the equipment system to the forward areas which would minimise disturbances for communicating over the telecommunication system without hindrance. Dr. Shenoy said the LRDE was now engaged in evolving suitable suppression of interference while communicating from inside one battlefield armoured tanker to another in motion. It was coordinating with other R and D laboratories of defence in the field of electromagnetic interference (EMI) for evolving systems of electromagnetic compatibility (EMC). [Madras THE HINDU in English 13 Jul 83 p 9]

BOMBAY ELECTRONIC EXCHANGE--Bombay, 12 Jul--Mr P.C. Jauhari, General Manager, Bombay Telephones, told pressmen here that the first electronic exchange with 10,000 lines would start functioning from October in Bombay this year. He said that at the World exchange, which would be completed by March next, the department would instal for the first time digital electronics equipment. The exchange would have 30,000 lines. [Madras THE HINDU in English 13 Jul 83 p 16]

ORISSA STATIONS PLANNED--Cuttack, 10 Jul--A low-power station for the All-India Radio will be established in Keonjhar district before the end of the Sixth Plan, reports UNI. Stating this to reporters yesterday, the Orissa Information Secretary, Mr A.N. Tiwari, who attended the just concluded conference of State Information Ministers in New Delhi, said a high-power station would be set up in Kalahandi district sometime later. Mr Tiwari said work on the television centre at Bhubaneswar would be started soon as the Centre had agreed to take up construction of studios on a priority basis in places where land was readily available. [Calcutta THE STATESMAN in English 11 Jul 83 p 9]

TELEPHONE INDUSTRIES' PRODUCTION--New Delhi, 17 Jul--The Indian Telephone Industries (ITI) broke all previous records in production performance in 1982-83. According to official sources here, ITI's production units manufactured 1.87 lakh lines of strowger equipment, 78,000 lines of crossbar exchanges, 5.8 lakh telephone instruments and Rs. 56.4 crores worth of transmission equipment. All the divisions of the Bangalore complex performed at near rated capacity, the sources added. Significant production achievements in capacity utilisation and manufacture of equipment were reached at Naini and Rae Bareli. The Srinagar unit manufactured 63,000 telephones for the first time since its inception. [Madras THE HINDU in English 18 Jul 83 p 16]

PATNA, RANCHI TELEVISION STATIONS--Patna, 13 Jul--The people all over Bihar will be able to watch television clearly by 1985, according to an official spokesman, reports PTI. Both Patna and Ranchi will have a TV station of 10 KW each with a reception range of 79 to 100 km and having studio facilities by the same period. Besides the Muzaffarpur TV relay station, eight more such stations would be set up at Jamshedpur, Bokaro, Gaya Monghyr, Bhagalpur, Purnia, Bettiah and Darbhanga, the spokesman said adding that the State Government was in touch with the Centre for opening stations at Dumka, Hazaribagh, Chapra and Saharsa. The State Government has already provided 1.70 acres for the Patna TV centre and 2.80 acres for the Ranchi centre, he said. [Calcutta THE STATESMAN in English 14 Jul 83 p 9]

NEW TRANSMITTERS PROPOSED--New Delhi, 20 Jul (PTI)--The information and broadcasting ministry yesterday announced locations of 139 new high and low power T.V. transmitters covering practically all the major towns and 70 per cent of the country's population. The number of transmitters is proposed to be raised from the existing 41 to 180 by the end of 1984. Of the 139 transmitters, 26 will be high-powered and 113 low-powered. [Bombay THE TIMES OF INDIA in English 22 Jul 83 p 19]

BENGAL TELEVISION CENTERS--New Delhi, 20 Jul--Highpower transmitters are to be set up in West Bengal's Asansol, Kurseong and Murshidabad, and low-power transmitters in the State's Kharagpur, Burdwan, Siluguri and Balurghat. These are to be set up by the end of next year under what is described as a crash programme for the expansion of TV facilities. In all, there will be 26 additional TV centres with high-power transmitters in the country and 113 with low-power transmitters. In a letter to all the Chief Ministers, Mr H.K.L. Bhagat, Minister of State for Information and Broadcasting, has sought their cooperation in arranging the necessary infrastructural facility for the new centres. [Calcutta THE STATESMAN in English 21 Jul 83 p 1]

NONALIGNED MEDIA CONFERENCE RESCHEDULED--New Delhi, 3 Aug--A four-day media conference of the non-aligned will begin in New Delhi on 9 December. Originally to be held in September, it has been rescheduled to enable wider participation. [Madras THE HINDU in English 4 Aug 83 p 7]

STRENGTHENING ALL INDIA RADIO--New Delhi, 22 Jul--The question of strengthening the All India Radio, Jullundur, by replacing the present 50kW transmitter there with a 100 kW transmitter, was discussed yesterday between the Union Minister for Information and Broadcasting, Mr H.K.L. Bhagat and the State's Information and Public Relations Minister, Mr Joginder Pal Pandey. The need to make the Jullundur AIR station more powerful has arisen because it has to compete with Lahore radio, across the border. Mr Pandey welcomed the Centre's step to sanction a high power transmitter at Bhatinda as a part of the expansion of TV facilities. Mr Bhagat told him that the Bhatinda transmitter will have a range of 70 km, and he also agreed to consider a Punjab Government demand for installation of TV transmitters at Fazilka, Ferozepur and Pathankot. During the meeting, the Punjab Minister requested Mr Bhagat for TV recording facilities at Chandigarh as the Doordarshan centre, Jullundur, is located 150 km from Chandigarh, the capital of two States. Often, State Government leaders had to address the public on a mass scale on vital issues of communal harmony and national integration. The State Government would provide the necessary facilities for this purpose at Sahibzada Ajit Singh Nagar, near Chandigarh, Mr Pandey said. [Calcutta THE STATESMAN in English 23 Jul 83 p 7]

CSO: 5500/7182

NEWS EXCHANGE WITH TASS FOUND SUCCESSFUL

Aden 14 UKTUBAR in Arabic 3 Jul 83 p 2

[Article: Successful Operation of Direct Line To Exchange News Between Aden News Agency and TASS"]

[Text] Tests of the direct line for the exchange of news reports between the Aden News Agency and the Soviet agency TASS were successfully completed the day before yesterday, by means of the satellite that was officially turned on in Aden on 5 June 1983. This was in implementation of the agreement signed between the two news agencies in March 1983.

Comrade Muhsin 'Ali Haydarah, director of the Foreign Communications Office in the Aden News Agency, stated that the opening of this line would lead to very important results with regard to the dissemination and of news of the accomplishments of economic, cultural, political and social development of Democratic Yemen on both the Arab and international levels. This is due to the agreement by which TASS will rebroadcast these reports in various languages to different nations of the world, in addition to the 24-hour exchange of news between the two agencies, which will enable the Yemen and Soviet peoples to learn about developments in both countries. It will also help to strengthen and develop the ties between the two friendly peoples, parties and countries.

He added that this step was the crowning achievement of previous steps in the agency, represented by overseas radio broadcasting to various parts of the world in both Arabic and English, in implementation of the directions of our Yemeni Socialist Party to publicize the struggles of Arab national and international liberation movements.

He praised the tireless and mutual efforts by the Aden News Agency, the Yemeni Wire and Wireless Communications Boards and the State Telephone Company in achieving this accomplishment.

The director of TASS in Aden, Mr Anatoly, in a statement to the Aden News Agency, emphasized that the opening of the line came after the agreement was ratified between the two agencies in March 1983. He said that it would be an important step in sending and exchanging news in a timely fashion, as a means of strengthening and developing Yemeni-Soviet relations.

It is worth noting that the duplex line between Moscow and Aden, passing through Rome via the Intelsat satellite, and operating 24 hours a day at a speed of 50 [baud?], is considered to be one of the technological developments in the area of communication services for news agencies.

7005

CSO: 5500/4539

PEOPLE'S DEMOCRATIC REPUBLIC OF YEMEN

BRIEFS

SATELLITE COMMUNICATIONS WITH EASTERN BLOC--A second new station for satellite communications will be established with the "Intersputnik" system, through which our country will be able to communicate with the Socialist nations and with any other nation that participates in this system. The Soviet Union will build this station in accordance with an agreement recently signed between our country and the Soviet Union. It was signed on behalf of Yemen by Kamal 'Abd al-Rahim, director general of the Communications Board, and on behalf of the Soviet side by the representative of the Soviet (Barumash) Export Company in Aden. This project, costing 1,900,000 dinars, will be completed by the end of 1984. [Text] [Aden AL-MASAR in Arabic No 7, Jul 83 p 5] 7005

CSO: 5500/4539

BRIEFS

ELECTRONICALLY CONTROLLED TELEPHONE SYSTEM--ITT has started installing an electronically controlled PABX telephone system throughout Zambia. ITT sales administration manager Mr Emanuel Banda said in Ndola that the system was a tailor made telephone exchange and the best means of communication. ITT staff have been trained overseas and inside Zambia on maintenance and installation of this equipment. The relative simple operation using micro processor controlled circuitry increases the facilities available to the public but needs less maintenance. The equipment can be serviced regularly as an automatic test programme is built into the basic design. The standard programmes are built into the system by permanent memories (PROMS) which cannot be erased even by mains failure and specifically designed programmes for each individual customer are stored in reprogrammable memories (RAMS) which are safeguarded from power failure but can be altered at customers' will to suit any requirements. [Text] [Lusaka TIMES OF ZAMBIA in English 8 Aug 83 p 2]

CSO: 5500/198

FRANCE, FRG OPPOSE UK'S 'MAC-C' SATELLITE TV STANDARD

Paris AFP SCIENCES in French 21 Jul 83 p 19

[Text] The FRG and France want to avoid any unilateral decision by a member country of the European broadcasting union regarding a new European standard of television by satellite, so indicates a communique issued on 15 July at Bonn at the conclusion of a talk between the French and West German ministers of posts and telecommunications, Messrs Louis Mexandeu and Christian Schwarz-Schilling.

For observers, this means that Paris and Bonn have decided to put forward a demurrer to the MAC-C standard, developed by Great Britain, which would like to launch it as soon as possible on the European market.

The communique specifies on this subject that "both parties have agreed that no new standard may be adopted which does not take into account:

the need to have costs as low as possible for the TV viewer;

compatibility, of equal quality, with telecasts on cable networks;

equal access by industrialists to industrial property.

The French and West Germans feel in fact that the adoption of the MAC-C system would force expensive modifications to all television sets while the present ground system (PAL and SECAM) could be used for television broadcasting by satellite without new expenditures. The general assembly of the European broadcasting union is currently meeting in Luxembourg, it is reported in Bonn, to discuss the problem of a possible future new European standard of television by satellite.

9436

CSO: 5500/2758

TELEVISION LINK WITH GREECE PLANNED

Nicosia O AGON in Greek 20 Jul 83 p 1

[Text] The director general of ERT-1 [Greek Radio and Television], Mr. Romaios, has granted me an exclusive interview regarding the Greece-Cyprus television link. Mr. Romaios told me: "A few days ago a large meeting took place, which was attended by the deputy ministers for Press, Mr. Maroudas; Foreign Affairs, Mr. Kapsis; Communications, Mr. Validakis; the director generals of ERT, Mr. Romaios, and RIK [Cyprus Broadcasting Corporation], Mr. Andreas Khristofidis; and the president of ERT-2, Mr. Apostolopoulos.

At the meeting it was decided to lease a satellite circuit in order to effect the television link between Greece and Cyprus. There are two ways to implement this link:

For a direct link to operate from the OTE [Greek Telecommunications Organization] station at Thermopylae. In that case, the link can be effected immediately. However, we received a negative answer to a previous request of ours; that is, that there were no available circuits.

We then decided to make a second attempt upon the initiative of RIK and of SYTA [Cyprus Telecommunications Authority]. If the answer is again negative, we will proceed to the second solution, by leasing an auxiliary circuit either from a Pacific satellite or from an Atlantic one.

Mr. Romaios added: "For the second solution there will be need of satellite installations both in Greece and in Cyprus in order to enable the telecasts of the programs to take place. This will require some time, but in order to expedite it we have decided to form a committee of representatives of the two channels, ERT-1 and ERT-2; the deputy ministers of Press and Communications; and the minister of National Economy.

This committee will prepare the financial and technical specifications and will investigate the purchase of satellite installations in the most expeditious manner.

To a question of what all this would cost, Mr. Romaios said: "With regard to the second solution, the installations in Greece and in Cyprus are estimated to cost 50 million drachmai for each terminal. The yearly expense for the lease of the circuit will amount to 60 million drachmai and the greater part of it will be paid by Greece.

"The estimated completion of this study is set for August of the current year, when we will be able to tell the exact time for the beginning of the telecasts. This circuit will operate for the entire 24 hours. Consequently, we will be able to telecast for as many hours as Cyprus wishes. In addition to ERT-1, Cyprus will be able to receive the ERT-2 programs."

Mr. Romaios also told me that Greece will telecast to Cyprus, free of charge, not only the programs, but will undertake the payment of the 50 million drachmai for the installation and part of the yearly lease of the circuit.

Finally, he told me, "I had a great desire to visit Cyprus to which I am bound by old ties of friendship. I am touched that it fell to me to implement this effort that had been discussed since 1978 and I would be happy to be in Cyprus on the first day of the linking of the two channels."

9731

CSO: 5500/2759

BRIEFS

SIEMENS FIBEROPTICS--Another telecommunications milestone for optical transmission was established in Berlin at the end of January 1983. Field testing of 140 Mbit/s transmission in the 1300 nm wavelength range began on an 18 km long optical waveguide link without regenerative repeaters. With this project the groundwork has been laid for widespread use of fiber-optic systems in the supraregional long-haul network of the Deutsche Bundespost. Several projects, seven of which were completed by Siemens, have already been operating for some years in regional and local networks. For this new project in Berlin, using transmission equipment which has already been standardized, Siemens laid optical waveguide cables in individual lengths of up to 2000 metres. The fiber joints were easily and quickly established using a new fusion splicer. With it, a mean splice attenuation of 0.15 dB was achieved; the overall attenuation is 17 dB. The 18 km long route is bridged by using laser diodes in the 1300 nm wavelength range, without regenerative repeaters. Using an optical waveguide system for 140 Mbit/s, up to 1920 telephone calls or--depending on the encoding--several TV programs can be transmitted simultaneously. [Munich DATA REPORT in English Jun3 83 p 29]

CSO: 5500/2760

COMMUNICATIONS MINISTER JAKOBSEN ON FUTURE DEVELOPMENTS

Role in ECS Satellite Project

Oslo AFTENPOSTEN in Norwegian 10 Aug 83 p 2

[Article by Johan J. Jakobsen, Communications Minister of Norway]

[Text] In this and a subsequent article, Communications Minister Johan J. Jakobsen will examine the future possibilities of telecommunications.

We are entering a new era of telecommunications and data processing. In the coming years, new technology will make it possible for us to create an entirely new telecommunications system. This will cause considerable changes, for both the individual and society as a whole. The changes will not occur overnight, but during the course of just a few years the effects will be considerable. Just as oil changed our society most during the 1970's, there are strong indications that developments within telecommunications will be of great significance to us during the coming decade. What will these changes be? What political questions must be answered in this connection? I will try to discuss these matters in connection with their social and industrial implications and the role of the Telecommunications Service in these developments.

Changes can occur both for better and for worse. Most of us fear the unknown. The technology on which the future changes in the telecommunications sector are based are seen by many as unknown territory. For this reason, we must not expect everyone to look forward to these developments. We must realize that some people will be concerned over the ways in which these changes may affect our future.

In the near future the Communications Ministry will decide which company will produce the first digital telephone exchanges for the Telecommunications Service. According to plans, within the next few years over 600,000 of the 2.7 million telephones in Norway will be served by these exchanges. Digital transmission means that speech is encoded into numbers at one end of the network and then conducted in the form of a numeric code.

The transfer of information as measured numeric values instead of electrical oscillations opens up a number of new prospects. This will mean that the

speech will not be distorted and that the capacity of the network will be increased considerably. In the long run, this latter fact will make telecommunications services more reasonable. Even more important, however, is that the multiservice digital telecommunications network can be used for much more than verbal communications. Both data and pictures could be transmitted by this type of network. For this to occur most efficiently, the present cables must be replaced by optical fibers. They are capable of transmitting much larger quantities of information than the present cables. They also will be more reliable. The telecommunications network of the future will consist of thin glass fibers through which light signals will pass at a high speed. Such fibers have an enormous capacity. An optical fiber as thick as a hair, for example, can transmit about 10,000 telephone calls at once.

Construction of the future telecommunications network will have consequences in many areas. An office building could have its own internal network with cables for transmitting all types of information, such as calling services, telephone, data, telex, and closed-circuit TV. There hardly is any sector of society that will be unaffected by these developments. In the area of office work, business correspondence, archive work, and information processing could occur electronically. By connecting their internal networks to the telecommunications network, office workers in government agencies and businesses throughout the country will have access to each other's information, just as they have access to their own. Private households also will have access to these same services. By installing a multipurpose terminal in the home, the occupant can be in direct contact with his office. This would make it possible to work at home. This will make it possible, especially, for the parents of small children to use home terminals both professionally and for private use.

Considerable travel costs will be saved through teleconferences. Presumably, the introduction of TV conferences will stimulate this trend.

The new telecommunications network also will be significant in the field of televised education. By providing two-way communications on the future broad-band network, "school classes" for specialized training can be set up without taking geographic considerations into account. Lectures by experts who are much in demand will reach large numbers of people. The new media also will broaden the possible range of educational opportunities for the handicapped.

And this is not all. The government recently decided that Norway should have the option to place a transponder in the new ECS satellite that will be launched in 1984. This satellite capability could be used both for business communications and television broadcasts. By connecting the telecommunications network to the increased satellite capacity, direct communications across national boundaries would be possible. In principle, the uses of the future telecommunications network will be limited only by our imagination.

Perhaps most of us feel that we should stop here and take a closer look at the consequences of these developments. Many questions arise: What type of

traffic will be transmitted by the new telecommunications network? How much of the information transmitted will be entertainment and how much will be of practical value? Will the enormous possibilities of the telecommunications network be realized at the expense of human contact? What possibilities does a country such as Norway have to shape--and carry out--its own policies in the telecommunications sector? In my opinion, this latter question is of primary importance. It is impossible to answer this question satisfactorily, but one thing is certain: The best way to cut ourselves off from the possibility of influencing these developments is to say to ourselves, "It is no use. We lack the resources needed to compete with the giants in this field." If we assume this posture, then in a few years we truly will be powerless when we look at everything that has occurred with no input whatsoever on our part.

Country Must Take International Role

Oslo AFTENPOSTEN in Norwegian 11 Aug 83 p 2

[Article by Johan J. Jakobsen]

[Text] If we are to control our own usage of the future telecommunications technology, we must take the offensive.

The technological developments within the telecommunications sector are so complicated and multifaceted that even the most advanced industrial nation does not have full command of the field. New technological breakthroughs are constantly being made in various areas. If we in Norway feel that we cannot master the entire field, we are in good company.

In most of the Western industrialized countries, there is basic agreement that industry should develop on its own. In reality (and this is particularly true in telecommunications technology) the governments of more and more industrialized nations are supporting their industries actively. This is done by taking various steps, such as providing direct support for industrial research, granting loans, subsidies, and preferential treatment for government purchases, and especially by expanding education and public service institutions.

The decisive question is not whether we should keep up with these developments, but how we should do it. We do not have many choices.

What we should do as a nation is to select several special areas and concentrate on them. These areas should be ones that are particularly important to us and in which it will be possible for us to develop competitive expertise. This is not an impossible task. The Norwegian electronics and data industry already has shown that in certain areas it can compete with the very best.

A strong industry is an important tool we must utilize to meet our national goals in the telecommunications sector. Here we must remind ourselves that our so-called relative priorities are not given to us, but we must continually develop them through a concentrated effort.

It will be extremely difficult for Norwegian industry to compete with the large, multinational corporations in specialized areas of the electronics and data industry in which they already possess expertise. Most of the international companies spend sizable sums on research and development over a broad spectrum, especially in the development of public telephone exchanges. In this area, Norwegian companies must work together with the international corporations.

In choosing future systems, it is necessary to cooperate with the leading companies in the development of new systems. One absolute prerequisite, however, is that the Norwegian firm must gain full understanding of the system. This will provide a basis for developing related products.

The merging of telecommunications and data technology offers great possibilities for domestic product development in Norway in fields such as business communications. This includes digital, in-house exchanges, intelligent user terminals, and fiber-optic cables. This is a rapidly expanding market and should be of great interest to the Norwegian electronics industry.

The strength of a small industrialized nation is its ability to concentrate on a specialized sector of a field, perhaps even more so than an industrial giant that must spread its research effort over a broad area. By following a specialized strategy, Norwegian companies can remain in the forefront of developments in selected areas. This is a realistic goal, but we will not achieve it without paying the price. Norwegian companies with this goal must be prepared to fight on the front line in tough competition with multinational companies. Our strength must lie in effective cooperation between industry and public agencies and among the various companies.

Participating in the development of a future Norwegian telecommunications network is an historic challenge to Norwegian industry. We must not let this challenge pass us by. To reach our goal, we must make industry and the public agencies work actively together and not view each other as opponents. This would be a waste of resources which we cannot afford if we are to compete in this field.

Role Of Telecommunications Service

Much is expected of the Telecommunications Service in connection with the construction of future telecommunications systems.

In order for the Telecommunications Service to meet the demands of new technology, it must be permitted to upgrade its level of competence. This must be a political goal of high priority.

The Telecommunications Service must bear the main responsibility for future developments in Norwegian telecommunications, but this does not mean that this agency will have sole responsibility for meeting the overall political goals. In order to achieve effective social management of developments in this area, it is important for the experts to be divided among the Telecommunications

Service, other government agencies, and industry.

So far, the role of the Telecommunications Service in developing the future telecommunications network has not been established in detail. The second Telecommunications Committee, which presented its report last spring, explored the future role of the Telecommunications Service and other institutions. There was disagreement within the Telecommunications Committee on several points. These include the following:

Should the subscriber and local network be seen as customer equipment and be marketed with open competition by both the Telecommunications Service and private manufacturers?

Should the Telecommunications Service act as both competitor and authoritative body in developing the future telecommunications network, or should we make a greater distinction between the agency's administrative and business functions?

The Communications Ministry and parliament must resolve these and other important questions on the telecommunications network in the relatively near future.

9336
CSO: 5500/2761

TELE-X CONTRACTS WRITTEN; SATELLITE TO BE LAUNCHED IN 1986

Many Advantages Detailed

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[Article by Christer Larsson: "Now the Nordic Countries Will Have TV Satellites--Despite No to Nordsat"]

[Text] Now the industry contracts are being written for Tele-X, the Nordic experimental satellite for telecommunications. Sweden will pay 85 percent, at least one billion kronor, and Norway 15 percent. In 1986 Tele-X will begin to send TV, data and video. Work on the large Nordic satellite program for TV and other transmissions is being pushed in government offices. Previously the Riksdag said no to satellite transmissions via Nordsat, partly to stop mass consumption of TV. Now everything is ready for Tele-X, which is first in the line of telecommunications satellites. Everything indicates that Nordsat will be a reality, although in steps. This is what Jan Stiernstedt of the government's space delegation said: "Obviously we are not investing one billion in a system which has no continuation." NY TEKNIK's Christer Larsson and Anders Wallerius describe the Tele-X project and the future plans.

Tele-X opens the way for mass consumption of TV, data and video between the Nordic countries. Agreements are being written today to begin to build the experimental satellite. Tele-X will begin to transmit in 1986. Then the Swedish taxpayers will have coughed up at least one billion kronor.

Plans are already being made for one or more successors with greater capacity.

It is hoped that Tele-X will open the way for increased international cooperation. And thereby Swedish export chances.

In only a few days Tele-X will pass from words to actions. The industrial contracts will be signed.

The investment will amount to 1,250 million kronor. Thereby the Swedish space industry breakthrough becomes a fact. At least as important is that continued Nordic satellite cooperation is directed toward a model which Tele-X represents--data and video traffic which is transmitted simultaneously with live TV programs.

Tele-X opens the way for mass consumption of TV data and video traffic via satellite. Three TV channels and three data and video transmissions with a large number of channels which will be expanded from space.

Larger Programs Waiting

The interest in Tele-X means that the industries which are now active in the project are also going to have key roles in the very larger satellite program which now at a fast pace is being forced through the Nordic Council and the government offices.

Most outspoken on the issue is Jan Stiernstedt, who is chairman of the government delegation for space activity, DFR:

"It is obvious that Sweden is not investing a billion in Tele-X if 2 or 3 years later another satellite is coming along which would use another system. That is naturally excluded."

Tele-X is a satellite for data and video communication and live TV transmission. All simultaneously. It is a model which DFR wants to see also for the coming satellites which the Nordic Council is preparing.

Already Tele-X is a large industrial project for Nordic conditions. It costs 1,250 million kronor. Sweden will pay 85 percent of the cost, Norway will pay 15 percent. Negotiations are taking place on Finland's share, which is expected to be between 3-5 percent. Denmark and Iceland are not participating.

Half Returned

Of the funds, 450 million goes to Swedish industry. Almost as much, 440 million, goes to French and West German firms. Norwegian industry will take back 75 million. The rest, 295 million, goes to the Ariane rocket which will send the satellite into its orbit in 1986.

Tele-X is purely an industrial-political investment by the Swedish government. It means learning money for a growing and hungry Swedish space industry in the skill of managing a large and complicated project from beginning to end. From drawings and specifications to launching and control.

In Orbit 1986

Up there in orbit, Tele-X will extend its enormous solar panels and enter its second industrial-political phase. The year is 1986.

It is then that the satellite's transmitters and receivers will begin to send back TV programs and data traffic to and from and between the Nordic countries.

Here the Telecommunications Administration is expecting new business possibilities for data traffic, video conferences and direct TV transmissions via satellite.

The Nordic radio and TV companies are speaking more often and louder of the need for common Nordic program production. That type of production would be made for transmission by a Nordic communication satellite. It can surely happen that the Tele-X can go together with that very economically.

"That is our hope," said Jan Stiernstedt at DFR.

Possible Export Goods

A third industrial-political motive for Tele-X is to lay the foundation for increased international space cooperation with Nordic participation and to create competence for Swedish technology export.

The business idea behind Tele-X is built on simple and inexpensive ground receivers for mass consumption of satellite services. That means much larger demands on the satellite and need for high power output.

Tele-X will be like a foghorn in space compared with the whispers coming from today's communications satellites.

Tele-X is going to transmit with many times greater power output than today's largest international Intelsat.

Then the antenna diameter on the ground will be limited to one meter for TV reception in the home. Data and video traffic will need 2.5 meter ground antennas, and receivers costing between 300,000 and 400,000 kronor for subscribing businesses.

The leadership of Tele-X does not feel threatened by the highly successful, much cheaper optical fiber technique.

"It will not be 'one or the other' but rather 'both together'" said Jan Stiernstedt at DFR. "We see no end for satellite technology in the Nordic countries, only a beginning."

Nordsat Still Lives

The continuation beyond Tele-X is being planned just now at a rapid pace at the Nordic Council and in government offices.

By April 1984 the council has requested a plan on the table for a new Nordic TV satellite project. Nordsat lives despite everything, although with a new designation. The extent is not clear, but the direction is established.

In the directive it said that experience and competence will be drawn from Tele-X. In 1986 the Nordic Council will decide on the new Nordsat project. That will be at the same time as Tele-X begins to transmit. Three years later, 1989, the new satellite will be ready.

"Time is working for the project," said Ake Pettersson, who is the presiding secretary at the Nordic Council of Ministers in Stockholm.

"There is a clear technical connection with Tele-X. It will show the way for a purely Nordic satellite system which we are only seeing the beginnings of."

Suppliers, Technical Features Identified

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[Article by Anders Wallerius: "Swedish Kit With Mostly Foreign Parts"]

[Text] Tele-X is really a technical and industrial experiment for Swedish firms with their eyes on space. But there are not very many parts in the satellite which can be marked "Made in Sweden." One-third of the hardware (counted in cost) is manufactured by Swedish firms. The rest is made mainly by French and West German firms. The main supplier is French Aerospatiale, together with Saab-Scania. Tele-X is largely an amalgamation of satellite parts which, at least in the short term, can be bought across the counter. The same parts will also be in the French-German satellites TV-SAT/TDF-1. That will give lower costs, fewer risks and a more certain time plan, it is hoped.

The Communications System

This is produced by LM Ericsson, but most of the hardware comes from Thomson-CSF. The hull comes from Saab-Scania. Tele-X has two separate repeaters; one for TV transmission and one for data traffic (and digital video). One repeater is the unit which receives signals from the ground and sends them back. Each repeater has three transponders (repeater channels) of which one is in reserve.

The TV repeater can provide two ordinary TV programs (in the 27 megahertz wavelength) simultaneously.

The frequency of the link between the earth and the satellite (uplink) is about 17 gigahertz. Before sending back to earth (downlink) the frequency is transposed to the 12 gigahertz band (channels 26, 32 and 40). The traveling wave tube delivers 230 watts.

The data repeater transmits digital modulated signals via two transponders which are equipped with the same type of transmitting tube as the TV repeater. But only one-fifth of the maximum power is utilized so the tube will not be nonlinear and destroy the quality of the signals. The one transponder can transmit 500 channels, each with 64 kilobits per second (kb/s) or 20 channels of 2 megabits per second (Mb/s).

Two Mb/s is sufficient to send a black and white video picture. The other transponder can be used for 25-2 Mb/s channels, 6-8 Mb/s channels (enough for color video), 2-34 Mb/s channels or 1-140 Mb/s channel. The frequency of the uplink is 14 gigahertz, which is converted to 12 gigahertz before the downlink.

The Platform

This is basically the same construction as used in the French-German satellite TV-SAT/TDF-1. It contains a drive module and a service module with diverse aid systems. The main supplier is French Aerospatiale, and West German Messerschmitt-Bolkow-Blohm (MBB). The hull, however, comes from Saab-Scania.

The drive system comes from MBB and makes all the changes in the speed and attitude of the satellite after it leaves the launch rocket Ariane.

At the bottom there is a large rocket engine of 400 newtons which places Tele-X in the correct orbit. Besides there are 14 microrockets of 10 newtons each for holding the satellite in position during its entire lifetime (5-7 years). The fuel (N_2O_2 and monomethylhydrazine) is contained in four tanks.

The control system comes from MBB, except for the onboard computer which comes from Saab-Scania. The system makes sure that Tele-X keeps itself within 0.1 degrees from its place (5 degrees east) in the geostationary orbit. The control system also points the satellite's "nose" to within 0.3 degrees of the right place on earth. The satellite turns itself one revolution per day around a north-south axis, aided by a gyroscope and microrockets. An infrared sensor on the platform keeps track of the location of the earth.

The telemetry system comes from Saab-Scania and LM Ericsson. It has three functions; partly to send down the measuring value of the satellite's attitude to the earth, partly to receive commands from satellite control on earth and partly to return distance signals. With normal operation a parabolic antenna is used for these signals.

The heat control system is produced by Aerospatiale and will hold the temperature within a few tens of degrees. Temperature differences are the primary reason for the limited lifetime of satellites.

The Antenna System

This comes from LM Ericsson in Molndal and is outside the framed tower of carbon fiber reinforced plastic and titanium which is made by Saab-Scania. The antennas are of a special so-called double reflector type. That means that the microwaves from the feeder horn are first reflected against a movable subreflector before they are sent out toward the earth via the main reflectors. An antenna point mechanism on the subreflectors finely adjusts the antenna lobes to within 75 thousands of a degree. (The center of the lobes is in the forest near Bollnas.) The receiver antenna (1.7 x 0.8 meters) is common for all transponders, as is the transmitting antenna (2.4 x 1.15 meters).

The Solar Panels

These are supplied by Aerospatiale, but the solar cells themselves are made by AEG. There are a total of 43,200 cells on the 8 panels which comprise the two "wings." Each wing is 8.5 meters long and 3.6 meters wide. The wings are turned one revolution per day around a north-south axle by a step-motor. They are thereby always at right angles to the sun. The solar cells supply the entire satellite with electricity, and deliver between three and four kilowatts.

The electrical system, from AEG and MBB, contains three different circuits. The regulated main circuit gets its current directly from the solar panels and delivers 50 volts direct current during "daytime." The regulated permanent circuit also delivers 50 volts direct current, but gets its current partly from the solar cells, and also from 28 nickel-cadmium cells. Besides there is a reserve circuit.

Weight and Power

The difference between the satellite's empty weight (1,017 kg) and the lift capacity of the Ariane rocket (2,130 kg) corresponds to fuel for operation for more than 7 years.

The available power after 5 full years (3,497 watts) gives a margin of 173 watts to the necessary power (3,324 watts).

<u>Item</u>	<u>kg</u>	<u>watts</u>
Communication	123.5	2,100
Antenna	40.1	31
Drive	108.0	37
Steering	49.3	137
Telemetry	41.5	55
Solar Panels	163.6	31
Power aggregate	134.4	99
Heat control	87.7	612
Other (hull, mechanical)	269.2	
Losses		222
Total	1,017.3	3,324

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