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CABINET

MINISTERIAL COMMITTEE ON ECONOMIC STRATEGY

REPORT ON CABLE SYSTEMS BY THE
INFORMATION TECHNOLOGY ADVISORY PANEL

Note by the Secretaries

1. The attached report is relevant to the Committee's consideration of the memoranda by the Secretaries of State for the Home Department and for Industry on Direct Broadcasting by Satellite (E(82)13) and on Cable Systems and Broadcasting Policy (E(82)14).
2. The Prime Minister has approved the publication of the report and instructed that the issues raised by it should be examined by officials, under Cabinet Office chairmanship, prior to substantive consideration by Ministers later in the year.

Signed: ROBERT ARMSTRONG
P L GREGSON
D J L MOORE

Cabinet Office
19 February 1982

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INFORMATION TECHNOLOGY ADVISORY PANEL

REPORT ON CABLE SYSTEMS

January 1982

Rt Hon Margaret Thatcher MP
Prime Minister
10 Downing Street

We were appointed in June 1981 to advise the Government on matters relating to Information Technology. Since then we have individually and collectively given views to the Minister for Information Technology and to officials from different Departments.

We have also undertaken one longer study, whose report we now submit. This concerns the potential role of cable systems in the United Kingdom and the desirability of a major programme of cable installation. The study was carried out by a Working Group but this report has been endorsed by the whole Panel.

We are convinced that there are powerful economic and industrial arguments for encouraging cable systems in the United Kingdom. Further, we believe that, given the right conditions, these could be entirely financed from private sources. Our report sets out our reasoning and makes specific recommendations for steps which we think should be taken by Government in order to implement such a policy in the fastest possible timescale. We emphasise the need for urgent decision and action. The opportunities which such a policy offers to the United Kingdom will be irretrievably lost if our timescales are not met. A delayed decision will be the same as a negative decision. It would further be most appropriate for the Government to adopt the creative policy which we recommend during IT Year 1982.

We have expressed our views on the implications of such a policy for broadcasting and other activities but in the brief time available to us we have not been able to explore such issues in the depth that they require. Further examination is required, but this too must be undertaken urgently.

We think it would be desirable for our report to be published in order to stimulate and inform the public debate on cable systems.

Finally, we wish to record our appreciation of the great deal of assistance given to the Working Group by officials from the Home Office and Departments of Industry and by its secretary from the Cabinet Office Information Technology Unit.

Signed	M J ALDRICH*
	I H COHEN
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Cabinet Office
January 1982

REPORT ON CABLE SYSTEMS

CONTENTS

SUMMARY

1. THE UK SITUATION
2. FUTURE POTENTIAL
3. OVERSEAS DEVELOPMENTS
4. RELATIONSHIP BETWEEN CABLE SYSTEMS AND DBS
5. ECONOMIC AND INDUSTRIAL CONSIDERATIONS
6. IMPLICATIONS OF CABLE TV FOR BROADCASTING
7. OTHER IMPLICATIONS
8. CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

1. Modern cable systems, based on coaxial cables or optical fibres, can provide many new telecommunications-based services to homes and businesses. The initial attraction for home subscribers would be the extra television entertainment channels. However, the main role of cable systems eventually will be the delivery of many information, financial and other services to the home and the joining of businesses and homes by high capacity data links.
2. The United Kingdom currently has cable technology capable of providing economically a wide variety of interactive services, but commercial cable operations, based on the relay of conventional TV broadcasts, are declining and unless firm policy decisions towards cable are taken in 1982, there is a high risk of overseas technological dominance. A further reason for early decision is the possible introduction of direct broadcasting by satellite (DBS) in 1986; if new cable systems can be operating by then, they will provide subscribers with cheaper access to satellite transmissions than is possible with individual aerials, thus improving the market for satellite services, while the DBS programmes will offer an incentive for cable connection. Cable systems and DBS thus complement each other; they are not in opposition.
3. The capital investment required to provide half the United Kingdom population (ie those living in urban areas) with modern cable services is of the order of £2500 million. Subsequent economic activity could be of the order of £1000 million annually. The consumer electronics industry would benefit greatly, as would optical fibre interests. The indirect effects would include a large stimulus to the office technology industry, whose products would be greatly aided by agreement on cable system standards and the mass production of related components, and for which there are potentially immense world markets.

4. Private sector finance is available for investment in cable systems - there need be no call on public funds. However, it will only be forthcoming if the Government lifts the present constraints on the programmes that may be distributed by cable operation and allows a full range of programmes and services to be provided. Moreover, this decision must be made quickly to allow prospective operators and investors sufficient time to plan future systems before a change in Government policy can occur. This again points to a decision in 1982.

5. Because the initial attraction of cable systems centres on new channels for broadcast entertainment, news, sport etc, the implications for current and future broadcasting services have to be considered. Our view is that, while there are dangers which must be guarded against, there are no fundamental reasons for delaying the introduction of new cable services. The regulatory arrangements appropriate for cable systems have, though, to be developed.

6. Our recommendations are -

i. The Government should announce as soon as possible its approval for an early start on DBS services.

It should explicitly recognise the role of existing cable systems in providing an immediate market for DBS programmes and should give an undertaking that these will be allowed to distribute DBS transmissions, where necessary - and subject to making suitable alternative arrangements - releasing them from the obligation to distribute terrestrial services. This will be a sign to cable interests that the Government sees a future for commercial cable systems; it may possibly help to retard current withdrawal strategies, but it will do nothing for their short-term prospects.

ii. The Government should announce, by mid-1982, the broad outlines of its future policy towards cable systems, in order to allow the private sector to start planning new systems.

We recommend that that policy should be to license new systems conforming to set technical standards without the present restrictions on programming (apart from obvious requirements on decency, sedition, etc, on which representatives of cable operators have already offered an undertaking). Such licensing could take place initially under existing legislation and administrative arrangements.

iii. The Government should urgently review the implications of cable systems for the financing and regulation of broadcasting and should consider the need for a new statutory body to be the "broadcasting authority" for cable systems. On the basis of this review, and investigation of the effects of different regulatory arrangements on potential private sector investment in cable systems, the Government should formulate and announce its detailed administrative and regulatory proposals. This announcement should be made as soon as possible and in any case by early 1983.

iv. The Government should urge cable operators and programme providers to set up effective means of self-regulation, after the manner of the advertising or newspaper industries. This would help to create public confidence and might well simplify any new regulatory arrangements.

v. The Department of Industry should establish a technical working group with representatives of cable operators, the electronics industry and BT. This group would -

- a. examine alternative approaches to cable network design and recommend design standards for the United Kingdom;
- b. define the necessary detailed engineering standards, consistent with commercial viability, for that network.

It should complete its work during 1982.

The recommended design standards should offer maximum potential to United Kingdom manufacturers and operators and should anticipate, and be compatible with, developments in communications technology. In particular, they should require systems to operate within the relevant constraints on usage and allocation of frequencies set by the Home Office, (including FM radio channels in the 88-108 MHz band) and to be capable of incremental expansion beyond a defined minimum number of channels (perhaps 30) without disturbance to the final distribution network. Systems should be able to support a wide range of interactive services and should link with the packet switched service of BT and other services offered by BT and alternative telecommunications networks. But the standards set should not prejudice commercial operations.

vi. The Department of Industry should create an effective forum in which all those interested in cable systems can come together to unify their efforts to the benefit of the United Kingdom. To assist in this, the Department should rationalise its internal arrangements for considering cable issues which at present are spread over several divisions.

7. Finally, we are concerned about the present split of regulatory responsibilities for cable systems - and for IT generally - among the Home Office, Department of Industry and British Telecom. This must hinder policy formulation and administration. We intend to investigate these regulatory arrangements.

1. THE UK SITUATION

1.1 About 2.6 million households, or 14 per cent of those with television sets, receive their television services by means of cable systems. About 1.5 million (about 8 per cent) are connected to the systems provided by some 440 commercial operators; the remainder are connected to 'non-commercial' systems operated by local authorities, housing associations etc. It is estimated that further 2 million homes are passed by cable systems. In recent years there has been a slow decline (140,000 over 5 years) in the number of subscribers to commercial systems and a rise in those receiving signals from non-commercial systems. Often the latter are small, many covering just one block of flats with a communal aerial on the roof.

1.2 Originally established in the 1930s to distribute radio broadcasts, cable systems were adapted and extended in the post-war years to provide TV programmes also. The principal benefit to subscribers was the improved quality of reception in areas not adequately covered by conventional off-air transmissions. However, the broadcasting authorities have for some years pursued a collaborative policy of improving signal reception for all but the smallest communities, with the result that the three TV channels now have virtually national coverage and the principal incentive for subscribers to connect to a cable system has disappeared. Planning restrictions prohibit external aerials in some areas, but the relay of conventional broadcast services has in general no commercial future.

1.3 The current annual charge to subscribers on commercial cable networks is approximately £15 including VAT. The networks have been unable to raise their charges substantially, since this would precipitate a faster decline, and at the same time have been constrained by the terms of their licences from offering very much in the way of additional programmes (only an out-of-area ITV service). The viability of cable systems has therefore fallen and the major commercial companies are expecting to move into substantial deficit in the next few years. All are pursuing withdrawal strategies; some systems have closed already. Rediffusion, for example, are in the process of closing a 22,000 subscriber system in the North East. Industry spokesmen estimate that in five years time the number of commercial subscribers may have fallen to 20 per cent of the present figure, with the shedding of perhaps 5000 jobs.

1.4 Some experiments in 'community cable television' took place in the late 1970s. In these, the cable operator produced a few hours of local interest programmes each week. They were the video equivalent of the local newspaper. Only one local TV service is still in operation, at Greenwich, but this has been reorganised and the programmes are now produced by enthusiasts under the auspices of the 'Greenwich Television Society' and without subsidy from the cable system. The other community television services were not economically viable; they did not attract sufficient new subscribers to justify their cost. Local advertising was allowed on these services, with mixed success. In Greenwich, it covered its costs and produced useful business for some small firms. A survey showed that more than half the subscribers viewed the local advertisements regularly.

1.5 Cable systems which receive and relay broadcasting services have to be licensed by the Home Secretary under Section 1 of the Wireless Telegraphy Act 1949. In general, the licences require the distribution of BBC services and the regional ITV service and permit the distribution of an out-of-area ITV service. The Home Secretary has discretion over the terms of the licences and these requirements could be changed without further legislation.

1.6 If a cable system distributes programmes other than those of the broadcasting authorities, it requires a licence under Part IV of the Post Office Act 1969. The experiments in community television were authorised under Part IV licences. Any system that wished to offer 'value added' services to subscribers, for example information services, would also need a licence from British Telecom (BT) or the Secretary of State for Industry for that service, but this time under Section 15 of the British Telecommunications Act 1981.

1.7 Since cable operators (with the exception of BT) are not 'statutory undertakers', they have to seek wayleaves from local authorities and other land owners before cables can be installed. Assembling the requisite wayleaves for a new cable system can be a time consuming activity.

1.8 The most significant recent development in cable television has been the decision by the Home Secretary to license 13 pilot schemes of subscription TV, each of which will run for two years. The cable systems participating in these pilot schemes currently serve about 110,000 homes. The first started operation in October 1981 but some have yet to start. In these pilot schemes, an additional programme will be provided to homes that wish to receive it for an extra charge in the range £6-12 monthly. The aim is to investigate the market at various price levels for an additional programme service, to see the effect on viewing habits and therefore on other programme services, and to put the Home Secretary in a position to judge whether subscription TV should continue on a permanent basis, and if so what arrangements should be made for its supervision and operation.

1.9 Although the licences for the pilot schemes do not restrict the subscription TV channel to feature films, in practice there are strong pressures on the programme providers (which include the BBC) to include a large element of such films. The short timescale (and limited coverage) of the pilot schemes, with no guarantee of permanent operation, inhibits the production of new programme material, and subscribers are most easily attracted by films which have already demonstrated their public appeal. There is criticism from the cable industry and from other entertainment interests that the current pilot schemes are too limited in both number and scope and that the timescale for decisions on the future of subscription TV is too slow.

1.10 The other main feature of the UK situation is the prospect of additional TV services. The 'fourth channel' will start in late 1982. Breakfast-time television starts the following year. Of more significance to cable systems, satellite broadcasting could start in 1985 or 1986; the relationship between direct broadcasting by satellite (DBS) services and cable systems is explored in detail in Chapter 4. However, many existing cable systems (serving perhaps 70 per cent of subscribers) employ 'twisted pair' cables with four or six pairs of wires and can only transmit four or six channels simultaneously. These networks will not be able to distribute subscription TV and the new services unless they are released from the requirement to distribute established United Kingdom terrestrial broadcast services. Such systems are technologically

obsolescent but still operate and represent a considerable investment. The operators of these systems have even more reason than the rest of the industry to think that, unless their licence conditions are amended, they are part of a dying trade.

2. FUTURE POTENTIAL

2.1 In a modern cable system, subscribers are linked to a central transmitting point by means of coaxial cable or optical fibres. Coaxial cable is about 10 mm diameter and consists of a central copper wire surrounded by polythene insulation and a copper mesh conducting screen, all contained in a protective outer covering. High frequency electromagnetic signals may be transmitted down such cable with much less attenuation than would occur if 'twisted pair' cables of the type found in the telephone system were used. Optical fibres are hair-like threads of exceedingly pure glass able to transmit light pulses without severe attenuation. At present, they are more suited to the 'trunk' sections of cable systems; their use in individual subscriber links would be uneconomic. This situation may, however change in the next few years as the costs of fibres and associated electronics reduces.

2.2 The key to the performance of a cable system lies in the concept of 'bandwidth'. The greater the bandwidth of a communications system, the more information can be transmitted in any given time. Bandwidth is a measure both of the frequency range over which the system can operate, and of its information carrying capacity. A TV picture contains much information and in the United Kingdom is effectively renewed 25 times each second; each 625 line TV channel requires about 8 MHz of bandwidth. By contrast, the information flow in a telephone conversation is much smaller; most subscriber line plant allows a bandwidth of around 4kHz and the rate at which information may be transmitted over the telephone system is correspondingly limited. The introduction of electronic exchanges, such as System X, will increase the carrying capacity of the telephone system, but for most users the gap between it and cable systems will remain.

2.3 A cable system is therefore essentially a wide bandwidth telecommunications system, the bandwidth available in the systems now being installed in the USA being about 350 MHz. In the United States, this permits about 50 TV channels to be transmitted; for technical and regulatory reasons, this figure would not be achieved with American technology in the United Kingdom; a more realistic figure would be in the range 15-24 channels. As well as TV pictures, cable systems also carry high quality sound transmissions. A moving video

transmission will occupy the full bandwidth allocated for a channel; a service where movement is not required (eg a teletext channel) would not need as much bandwidth. Hence individual channels may be subdivided into different services, all apparently (to the user) on different channels. Some systems now being planned in the USA carry 80 or 100 different services.

2.4 The normal structure of a cable system is that of a tree - with a trunk, at the base of which the signals are input, and branches which successively split and serve each subscriber. Each link in the system then has to be capable of taking the whole range of services, ie the bandwidth capacity is the same at any point. Individual subscribers select the service required by tuning their TV sets to the frequency range occupied by that channel. This traditional approach becomes progressively less economic as the bandwidth required increases. Moreover, as each subscriber (whether in a home or a business) only needs simultaneous access to, at most, a few channels, there seems little need to provide all channels down the final links all the time.

2.5 Technology has been developed in the United Kingdom for switching channels to subscribers, each group of 50-100 subscribers being connected to a local switching point housed in a box beside the road. The 'trunk' links to the switching points could be of 350 MHz bandwidth or more (and could well employ optical fibres), but the individual links connecting the switching point to each subscriber need only carry 30-40 MHz of bandwidth, with consequent economy in cable specification and in subscriber equipment. The channel selection process would take place at the switching point, controlled by signals from the home. This technology has not been applied in the United Kingdom because current cable systems have no use for it. Similar technology is being developed in Japan and France. American cable systems, however, seem to be retaining the traditional tree structure.

2.6 It is estimated that switching becomes competitive with conventional cable technology when more than 24 channels are provided, and particularly if two-way communication is envisaged. Viewdata services, for example, require information to be passed both ways across the system. A switched system can marshal frame selection signals from subscribers in a more controlled manner than a conventional system.

2.7

Two-way communications capability is now being provided on American cable networks and, under Federal Communications Commission (FCC) regulations, is mandatory for all new systems. It is not, however, a two-way video capability - ie the systems do not permit video pictures to be transmitted from homes (although the cable itself could carry such pictures). Rather, it is the American equivalent of the interactive capability available in the United Kingdom through Prestel, ie it enables instructions to be sent at a slow rate to a computer. Virtually all the extra services now being promoted on American cable systems are in fact based on viewdata or teletext principles. Since the United Kingdom has both types of service already (Prestel and Ceefax/Oracle), there might seem to be no case for introducing interactive capability on a cable system here. However, the provision of such a capability allows the development of new types of services that cannot be provided over telephone lines, even when the data transmission rate of ordinary subscriber lines is raised (over the next 20 years) from its present 1200 bits/sec or less to 64,000 bits/sec through the introduction of System X exchanges. These new services would combine an act of selection by the subscribers with a video transmission from the head end of the cable; they could include new ways of selling (a videotaped tour of a house for sale or a prospective holiday location, perhaps) or of instruction (eg how to carry out a piece of car maintenance).

2.8

There are, moreover, advantages in providing viewdata services via a cable rather than a telephone line. High quality graphics can be used without imposing an unacceptable delay in building up the picture. The present graphics capability of Prestel is unsuited to many purposes, including most mail order applications. Picture quality graphics are required (and will come) but even with enhanced telephone links, the time taken to build up a picture may be excessive. With a cable system, it is provided virtually instantaneously.

2.9

In addition, the number of frames available with reasonable access time on Ceefax/Oracle is severely limited by the fact that they are broadcast on a few "spare" lines in conventional TV transmissions. A channel devoted entirely to teletext information would be able to provide more than 100,000 frames, while keeping access time to a second or so.

2.10 The increased bandwidth available in a cable system may be exploited by the business community as well as home subscribers. It enables information to be exchanged between computers, word processors, etc at a much faster rate than the telephone system allows. Moreover, in serving homes and businesses alike, a cable system makes possible new work relationships, aided by the decreasing cost of microelectronics, the growing popularity of home computers, the development of combined computer/viewdata terminals etc. As with viewdata services, the telephone system can offer the same form of communications, but at a lower standard of performance.

2.11 The possible applications of a cable system for which a wide bandwidth is essential may be set out below -

(1) It can provide a large choice of "conventional" TV programmes, ie channels with general programme material. Both terrestrial and DBS transmissions could be relayed down the one cable, probably at lower cost to the subscriber than the use of individual aerials (see Chapter 4). Programmes produced specially for cable companies and not for off-air transmission could also be supplied. Video cassettes (and, in time, discs) can, of course, extend the consumer's choice of video entertainment in a similar way, but probably at greater cost.

(2) It can provide channels for minority or specialised interests - often referred to as "narrowcasting". Different subjects could have much more coverage than at present, and ethnic, religious or cultural minorities, for example, could have specific channels. Again, this sort of service could be provided on video cassettes, but less effectively (because cassettes cannot be as topical), and with no interactive facility.

(3) It can provide local programmes. One channel could be the video equivalent of the local newspaper. (In the USA, some cities have required the cable company to provide one or two channels for city council business as a condition of the cable franchise.) While local off-air TV broadcasts are technically feasible, the pressure on the radio frequency spectrum in the United Kingdom makes their introduction most unlikely. Again, a local news service could be provided on video cassettes (after the model of 'newspapers for the blind' on audio cassettes) but it would not seem an attractive commercial proposition.

(4) It can provide education and training 'at a distance'. Much is possible using audio cassettes, viewdata and new aids such as the Open University's 'Cyclops' (which enables diagrams to be transmitted down a telephone line and displayed on a TV screen). However, the capacity for motion adds greatly to the effectiveness of a teaching medium. Cassettes are an alternative but do not allow 'branching' according to the pace of the student, or the opportunity for interactive tuition. Video discs could be more flexible in that respect.

(5) It allows new ways of selling, as outlined above (paragraph 2.7)

(6) It could enable 'film request' services to be developed - ie the subscriber requests a film from the cable company, either for immediate viewing or to be recorded on his VCR, rather than buying a cassette or disc (if available).

(7) It allows digitised data to be transmitted rapidly. The data transmission rate of a cable system and the greater flexibility of information type that it can handle, compared with the telephone system, means that it could be an important communications channel between businesses, especially if the cable system were linked to BT services. (Some developments in business communications using teletext technology and out-of-hours broadcasting are also in the offing.) The communications needs of homes and businesses appear to be converging, and cable based communications systems could serve both.

2.12 These are the services for which a cable link is essential. Once installed, however, it permits any other service based on viewdata or teletext technology to be provided and can be an alternative to the telephone system for services such as home security, where the high data transmission rate of a cable system allows almost continuous monitoring of the security system itself. This service is proving popular in the USA. Annex B provides further examples of the services that might be provided on a cable system.

2.13 In summary, then, modern cable systems are capable of providing not only a wide range of general TV services but also specialised services of interest to minority audiences and information and data transfer services unrelated to broadcasting as currently understood. They represent a new form of communications medium. Video cassettes and discs can compete for some types of service, and allow the viewer more freedom in selecting programmes, but cannot provide the same range of services or the same potential for interactive activities. Satellite transmissions can widen the range of programme material, and can also operate interactively (the telephone system being used to request the services or information required); however the number of channels available is restricted, with a corresponding constraint on the range of services that can be provided.

TABLE 1

CABLE PENETRATION

Country	Number of Subscribers	Percentage of TV households
Austria	50,000	2.5
Belgium	1,700,000	64.1
Denmark	800,000	50
Finland	50,000	3
France	*6-8,000,000	37
West Germany	*8,000,000	35
Ireland	666,000	23
Netherlands	2,000,000	55
Norway	250,000	22.7
Sweden	1,400,000	46
Switzerland	680,000	36.8
United Kingdom	*2,546,000	14
Canada	1,326,000	57
USA	17,400,000	22.4

Source: "ITV must respond to satellite opportunities" by J Shaw
Intermedia, July 1981, pp 42-47.

*These figures include 'master aerial' systems where more than one subscriber, eg in a block of flats, shares the use of a single aerial. They thus overstate the penetration of cable systems; other sources suggest 2.3 million cable subscribers in West Germany and only 65,000 in France.

3. OVERSEAS DEVELOPMENTS

3.1 Table 1 shows that the proportion of United Kingdom households receiving their TV programmes via a cable (14 per cent) is low by comparison with many other major industrialised countries. The principal driving force for the growth of cable in other countries has been the extra choice of programme material available, although poor reception of conventional transmissions has contributed (for example in American towns away from major cities). Subscribers, particularly in smaller countries, may sometimes wish to view the programmes produced in neighbouring countries and a cable system obviates the need for multiple roof-top aerials. Moreover, not all countries have planned their broadcast transmission arrangements as thoroughly as the United Kingdom (where the two broadcasting authorities share transmission sites and the national system is engineered for four TV channels) and viewers may need a multiplicity of aerials just to receive domestic services.

United States

3.2 The most spectacular growth in cable systems in recent years has been in the USA. Until 1975, the FCC closely regulated the programmes that cable systems could show, for example limiting their showing of films to those more than three years old. However, most of the regulations were withdrawn in 1975. Simultaneously, the introduction of satellite communications services meant that a programme could potentially be received by cable systems across the country. "Home Box Office" started satellite transmissions of feature films in 1975 and now between 1500 and 2000 cable systems have ground receiving dishes. Cable subscribers have grown from 9 million or so in 1975 to the present 18 million, and there is no sign of this rise ceasing. There is intense competition for cable franchises in the cities that are not yet cabled (which include some of the biggest - Boston, Chicago, Detroit etc).

3.3 Home Box Office is a subscription TV service - viewers pay a supplementary charge of perhaps \$7-10 monthly. The growth in such services has outpaced the growth in cable generally. Starting from a negligible base in 1975, the number of subscribers now approaches 10 million. Some households subscribe to more than one service, providing children's programmes, sport etc. Some cable companies offer different 'tiers' of programmes, so that the receiver can select to suit his tastes (and pocket).

3.4 New American cable systems offer two way communications facilities. Such services at present are comparable with Prestel or Ceefax/Oracle, although new types of services may well emerge in time. Of particular note is the 'Qube' experiment in Columbus, Ohio, where the two-way facility has been used to allow viewers to react to TV programmes and to vote in referenda. This has proved popular and similar systems are to be installed in other cities.

3.5 City authorities in the US have sold franchises for cable systems to the highest bidder. The price that cable companies have paid has recently included free access for the authority to broadcast debates, information services etc. A few authorities have decided to run the cable system themselves. Firms competing for franchises - and willing to invest up to \$100 million with no prospect of an early return - are doing so because they believe that cable will form the all-purpose communications system of the future. Thus newspaper groups have been prominent, protecting their future position; and banks and credit card companies, attracted by the potential of cable for conducting financial transactions, have also been very active. The sums at stake are huge. The cable industry estimates its future capital requirements at \$14,000 million in the next ten years, with annual revenues rising by 1990 to \$5,400 million.

Europe

3.6 In Europe also there is considerable interest in cable and satellite developments, although these are taking a different course from the USA. At least five direct broadcasting satellites, allowing reception by individual households, are under consideration or being constructed. The first in space will be the joint Franco-German satellites but the United Kingdom, Switzerland, Luxembourg and the Nordic countries have all announced plans or are giving the subject serious consideration. In addition, the national communications satellite planned by France and the L-SAT programme of the European Space Agency will result in satellites which could carry TV signals. (Italy plans to use L-SAT for a pre-operational DBS service.) A feature of broadcasting satellites is that their transmissions, although aimed at a particular geographical area, 'spill over' into other areas. The result is that countries such as Belgium and Switzerland will be able to receive satellite broadcasts from a number of sources. Areas nearer the periphery of Europe, notably the United Kingdom, will also be able to

receive these transmissions although a larger dish, perhaps 2m diameter, will be needed and the aiming point will not be the same as for the United Kingdom satellite. There is thus likely to be a stimulus to cable systems in those countries accustomed to receiving TV broadcasts from more than one source, and potentially more programme material available in all countries.

3.7 Clearly, Europe-wide transmissions will have to cope with the language differences, but it is possible to put a number of audio channels on a single TV channel, and sub-titling can also be added using teletext. There is therefore the potential, across Europe, for the national broadcasting services to become international, and in doing so to give a great boost to cable distribution systems. At a subscription of £5 monthly, even existing cable systems in Europe could generate an additional income for programme producers of £1500 million annually, and it has been estimated that extra advertising revenue of £2000 million would be forthcoming if sufficient video outlets were available.

3.8 Both France and West Germany have announced large scale trials of optical fibre communications in specific localities. In France, the town of Biarritz is to be provided with optical fibres, with eventually 10,000 subscribers. In Germany, seven towns are to be equipped, with six companies being concerned. Some subscribers will have video cameras. The emphasis is on improved voice and data communications rather than on increasing choice in broadcasting services.

Japan

3.9 Some notable experiments in cable communications are taking place and a pre-operational DBS service has been in existence for about 18 months. The most well known experiment is the Hi-Ovis project, in which some 350 km of optical fibres have been installed in a small community, connecting about 170 homes, offices, schools etc. The system provides national and local TV programmes and some interactive information services. The experiment has placed emphasis on the local production of programmes and some of the homes have video cameras and associated transmission equipment enabling two-way video communications. The experiment is reportedly popular with users but its future - and the way in which the experience gained will be applied - is not known.

4. RELATIONSHIP BETWEEN CABLE SYSTEMS AND DBS

4.1 The response of commercial interests to the Home Office report on DBS* published in May 1981 has, we understand, been very positive. There has been strong support for the 'modest early start' option put forward in the report and there seems a good chance of a two-channel UK satellite broadcasting service commencing in 1986. Private sector finance for the necessary satellite channels and offer programmes. Current BBC plans include one channel of 'the best of BBC1 and BBC2' and a second, subscription TV channel showing predominantly feature films. Market research by the BBC has shown that perhaps 10 per cent of households would install individual DBS receivers by 1990.

4.2 In the USA, as we have already described, the recent surge of interest in cable TV has been largely the result of satellite transmissions, which have enabled cable systems (but not individual households) across the country to receive the same programmes and thus have greatly increased both the range of programmes available and the prospective audience for individual programmes. The American experience demonstrates the close and supportive relationship that can be established between satellite and cable TV services, to the benefit of both.

4.3 The DBS report considered this relationship in the British context. In particular, it discussed whether DBS transmissions should be restricted to power levels that would only permit reception by communal aerials (ie dishes 3 metres or so across serving cable systems) or should be at a power level that allowed reception by individual householders using dish aerials of 0.9 metres diameter or less. The former approach would reduce the cost of the space segment, and would probably stimulate the growth of cable systems (but only, in our view, if they were able to offer also other types of service). However, the report came down in favour of the higher powered transmissions for the following reasons -

* "Direct Broadcasting by Satellite - report of a Home Office study" (HMSO, 1981)

i. Only 14 per cent of TV households receive programmes via cables. The immediate market for communal reception is thus limited; the growth rate of DBS subscribers would be constrained, and some areas will never be able to justify communal systems.

ii. There would be no stimulus to the creation of a home market for equipment for individual reception. If high power DBS services were to become the international norm, this would put United Kingdom manufacturers at a disadvantage.

iii. If other countries employed high power transmissions, United Kingdom services would be more subject to interference.

4.4 We do not dispute the conclusion that high power services should be provided. Given the present low penetration of cable systems in the United Kingdom, it is clear that any prospective supplier of DBS programmes will want high power transmissions in order to have the largest number of potential subscribers. And we note the industrial arguments for this course. It seems to us, however, that the prospective contribution of cable systems to the success of DBS services received insufficient recognition in the report, and that - provided action is taken in time - both cable and DBS stand to gain considerably from a policy of encouraging cable.

4.5 We base this view on three considerations. First, we think that the report gives too optimistic an impression of the likely cost of individual DBS aerials and adaptors. It provides a figure only for the cost of these items in volume production (although acknowledging that costs will be higher initially) and does not distinguish clearly between production cost and final price to the consumer. We have heard widely varying estimates of the initial price to the consumers, and must express concern that the figures originating from UK manufacturers seem higher than those from prospective overseas suppliers. There will, of course, be an international market in such consumer items, and the introduction of DBS services in France, Germany and Japan will stimulate manufacturers in those countries to lay down production lines. Thus, the price to the consumer will not depend strongly on the level of UK demand. It will,

though, depend quite critically on the marketing policies of rental companies, who may be expected to take a large share of this market as they have done when other new consumer electronics products, eg colour TVs and VCRs, have been introduced. Indeed, the commercial success of DBS is fundamentally not in the hands of the providers of either the satellite or the programmes; it will be determined by the policies of rental companies and - if they are permitted to distribute DBS signals - of cable operators.

4.6 Our information suggests that the probable initial price to the consumer of a 0.9m dish aerial and its associated electronics is of the order of £400. The cost of installation would clearly vary depending on whether the dish was at ground level or roof-mounted, but might add up to £100. The structural stability required in the mounting, if a 0.9m dish is to be kept pointing in the correct direction under severe wind or snow loading, is not trivial. Maintenance costs must also be expected. It is, of course, possible that advances in technology will allow a reduction in the size of dishes (or even a completely different type of aerial) and so reduce costs further, but with current technology it would seem that cable systems could supply DBS signals to many subscribers at a lower cost than individual reception.

4.7 Our second reason for emphasising the mutual dependence of DBS and cable is that we suspect that more households will have problems mounting a dish in a suitable position than the DBS report implies. (The dish must point at the satellite - which is between 17 degrees and 28 degrees above the horizon, depending on location - to an accuracy of half a degree and be unobscured by trees, tiles etc.) Some local authorities, for example, are said to be considering restricting dishes to below eaves level because of their visual impact. The DBS report quotes the results of a very simple study by the BBC, which concluded that only $\frac{1}{4}$ per cent of homes had no suitable point at which to mount the dish. Other studies have concluded that the figure might be up to 25 per cent. The truth no doubt lies in between but, particularly in urban areas, there would seem both practical and aesthetic reasons for favouring cable distribution of DBS signals.

4.8 Thirdly, and more positively, the introduction of DBS services would provide cable systems - either new or existing - with a very valuable marketing asset. For it is generally agreed that the principal incentive for subscribers to seek connection to a cable system is the extra choice of popular television programme services (eg feature films). Minority interest and local programmes, teletext and viewdata-type information services are attractive extras but will not by themselves tempt subscribers in sufficient numbers. Thus not only, in our view, does DBS need cable, particularly in the early years following the introduction of DBS services, but DBS can provide cable systems with some of the extra programmes that they need. In order, though, for this substantial support to be established on a significant scale, existing cable systems need to be licensed to receive and distribute DBS services and planning for new systems should start early enough for them to be operational when DBS services are launched. We discuss the implications of these steps below.

4.9 We stated above our view that DBS transmissions should be at a power level that permitted reception by individual households. But clearly if existing cable systems were to offer DBS services, an immediate market of 2½ million subscribers (with a further 2 million passed by the cable) is potentially opened up. Not all subscribers will choose to receive the services, but those that do can expect to obtain them at a price markedly lower than the cost of erecting an individual aerial. Obviously the cable companies will seek to charge what the market will bear, but they will also be seeking to maximise their revenue from DBS services. The cost of the large (3m or so) dish used by the cable company will not be vast, and the decoders at the individual set will be mass produced consumer items with, we estimate, a maturity cost in the range £40-£80 for a switched system and £100-£150 for a 'tree' system (with an initial cost, prior to volume production, of £200-£250).

4.10 Many existing cable systems are severely limited in channel capacity, often having only 4 channels. In order to carry DBS signals, they would need to be released from their current obligation to relay conventional broadcast signals. This change has already been agreed in respect of some of the current trials of subscription TV, the cable company concerned providing subscribers with suitable receiving equipment for off-air transmissions. We see no reason

why this should not be allowed in respect of DBS broadcasts provided off-air reception were satisfactory; and if completely freed from the requirement to distribute conventional services, even a 4 channel system would have some spare capacity for new services as well as DBS. This must be regarded purely as an interim step, allowing commercial cable companies the opportunity of making best use of their existing investments. We would expect all new systems to have ample capacity for conventional broadcasts, while existing limited capacity systems would be progressively renewed.

4.11 However, as we pointed out in Chapter 1, the prospects for commercial cable operators in the absence of a change in regulatory policy are not good. Without such a change, it is virtually certain that many of the existing commercial systems will cease operation by 1986. If this should happen, a significant group of potential DBS subscribers, who could obtain the service at relatively low cost, will be lost.

4.12 Existing cable systems can serve at most $4\frac{1}{2}$ million homes. It takes several years to design, negotiate wayleaves, install and commission a cable network. Relayed DBS signals could be a key element in the growth of new systems, but only if such systems can start operating before DBS reception by individual homes is well established. (We do not doubt that DBS services will establish themselves eventually, but the growth may be slow at first unless aided by new cable systems.) How do these considerations fit in with the present Government policy? The pilot schemes of subscription TV are each due to run for two years and not all have yet started. It would be prudent to assume that consideration of future policy towards subscription TV will take at least a further year, and we are bound to point out that there must be a General Election before May 1984, with consequent extra uncertainty over future policy. It is possible that legislation will then be required, (eg to establish a cable TV authority if one were thought desirable) with further delay before new systems can be planned. The conclusion from this is that if the present timescale is followed, not only will many existing cable systems have ceased to function, but no new systems will be in operation until towards the end of the decade, for no one will be willing to risk the investment required in conditions of such uncertainty. Thus there will be no new systems - and few existing systems - able to distribute DBS signals in the all-important early years of DBS services.

4.13 There is a further reason for rapid consideration of policy towards cable systems. Should no action be taken now, and DBS services become well established through individual reception (particularly if the number of channels increases to the five permitted by international agreement), the attraction of the further entertainment channels which cable could offer is likely to be seriously diminished. By that time also (in the 1990's perhaps) the market for DBS antennae and adaptors might have matured, with costs possibly approaching the levels suggested in the DBS report. The market opportunities for new cable systems will be correspondingly reduced. If, therefore, cable systems are to have a place in the communications structure of the country, the time to encourage them is now, when the prospect of new programme services from DBS gives a clear incentive for connection. Delay could mean both a slower route to viability for DBS and a much more difficult introduction of cable eventually.

4.14 Our conclusions on the relationship between the introduction of United Kingdom DBS services and cable systems are, therefore -

i. There is no need to regard DBS and cable as alternatives or opponents, rather they complement each other. Existing cable systems, assuming they are still operating in 1986, can provide DBS with a substantial audience. New systems could enable many subscribers to receive DBS programmes at a lower cost than individual reception, while the DBS programmes would help to attract subscribers. And for an unknown number of people, particularly in urban areas, cable may be the only practicable means of receiving DBS transmissions.

ii. No decisions on cable affect any of the planning for DBS. Cable systems, like video cassette recorders, offer the consumer more choice and therefore could affect the market for DBS services. But they also reduce the cost of DBS reception. High power transmissions are still necessary and there will remain a substantial market for receiving equipment for individual homes. Thus no DBS expenditure is rendered abortive by a decision to encourage cable systems; on the contrary, such a decision would provide an extra incentive for DBS programme providers.

iii. Without policy decisions in a timescale much faster than at present envisaged new systems cannot be installed in time to distribute DBS transmissions from the start, and the growth of both cable and DBS subscribers will be correspondingly inhibited. Moreover, without such decisions, many existing cable systems will have ceased operation by 1986.

iv. Once DBS services are well established, and a significant proportion of households have individual receivers, it will be increasingly difficult for new cable systems to be established. There is therefore a finite period, extending perhaps into the early 1990's, when new cable systems can successfully be launched.

v. The Government's future policy towards cable systems needs therefore to be developed and announced by the middle of 1982 if cable is to offer DBS significant support from the start. If this timescale is not met, not only will many existing commercial cable systems cease to function, but the viability of DBS could be prejudiced.

5. ECONOMIC AND INDUSTRIAL CONSIDERATIONS

5.1 Any major expansion of cable systems in the UK would require expenditure on a large scale. The estimated cost of providing a cable service to a medium sized community (100,000 population or so) is in the range £200-300 per house, of which perhaps £150 represents the cost of the decoder at the TV set. The actual network would cost about £50 per house and the central station and transmission equipment about £20. These costs are inevitably subject to some uncertainty and would depend, for example, on whether existing BT cable ducts were utilised. The investment required to provide access to a modern cable system for half the homes in the country (ie those in the larger urban areas) is thus in the region of £2500 million. This, of course, would not be a single investment programme (still less is it a public investment programme); it would be the sum of the expenditure on local cable systems made over a period of years.

5.2 The economic activity generated by a decision to encourage the growth of cable systems could thus be very large. Not only would there be the initial £2000-3000 million of capital investment, there would be the additional investment stimulated by the information services, security services etc on offer from the new systems and the extra programming activity. A viewdata decoder might cost £100 and a set of security sensors £200; thus if 50 per cent of subscribers elected to take those services, an additional £1500 million of expenditure would be generated. The annual programming activity cannot be judged until the pattern of services has been established, but present expenditure on broadcasting is about £1000 million annually and so even a fractional increase as a result of cable systems represents a substantial sum. Naturally, this would not be wholly additional expenditure - cable services lie in the area of discretionary consumer expenditure and therefore some at least of the money would be displaced from other "leisure" activities. However, we suggest that (a) there would be a net employment generating effect, which could be substantial, (b) that insofar as manufactured products are involved, these

would at present (see below) more likely be British made than if the same consumer expenditure were devoted to cars, video cassette recorders etc, and (c) that the resulting stimulus to programme and information producers would result in products that had significant international markets, given the high reputation of UK broadcasting and information services.

5.3 The figures in Paragraph 5.1 are based on the costs of current American cable technology and coaxial cables. We have already pointed out the advantages of switched system technology, which could be introduced without significant cost penalty and indeed with savings in more complex systems. Of more significance for costs would be the widespread introduction of optical fibres. At present, it would be highly uneconomic to use optical fibres for the final link to individual subscribers, but a large scale programme of cable installation could provide the optical fibre and electronics industries with the opportunity to bring the cost of fibres and associated equipment down rapidly, thus making optical fibre systems comparable in price with coaxial cable systems within a few years. We would certainly wish to see optical fibres used to the greatest extent that could be economically justified in order to produce large-scale support for this new technology, in which the United Kingdom is up with the world leaders. However, we would not want this aim to prejudice the attractiveness of cable systems to investors and we would expect coaxial cable to be used at present for the final links to subscribers. This should not be regarded as a 'second best' solution - such cable is quite capable of providing the necessary standard of service and there should be no need to replace it before the end of its useful life merely because optical fibres became cheaper.

5.4 A decision to encourage cable systems would therefore provide a large stimulus to developments in optical fibre technology, as well as in the industries associated with consumer electronics and the supply of programme material. There are, though quite separate - and equally important - industrial and economic benefits to be derived from the promotion of modern cable systems in the United Kingdom. These relate to the general stimulus given to many parts of the IT industry from the establishment of a United Kingdom standard for wideband communications links and the development of low-cost, mass-produced pieces of equipment to work with such links.

5.5 The potential world market for office technology systems is huge. Many types of systems founded on different communications technologies, are starting to appear and the eventual technological direction of office systems is not yet clear. But all systems have a need to interconnect different types of workstations (word processors, copiers, facsimile machines, advanced telephones etc) in a 'local area network' and to handle different forms of communications media - voice, data, text, images etc. Only one type of technology can accomplish this at high data rates, allowing users a high quality service. It is currently referred to as 'broadband' technology but is in fact very similar to cable technology. It offers high bandwidth and multiple channels separated by frequency division. One eminent United States office system supplier has recognised the potential of cable technology and has released a broadband local area network constructed largely out of standard components produced by the United States cable TV industry. A number of other companies are also pursuing this strategy.

5.6 The creation of a United Kingdom cable industry producing standard systems would provide major opportunities for United Kingdom computer and office system industries. Given an agreed broadband local area network standard based on the cable system standard and backed by locally manufactured, readily-available low-cost hardware, United Kingdom products would easily inter-connect enabling United Kingdom manufacturers in aggregate to defeat foreign competitors and open significant export opportunities for comprehensive systems. The timing for the establishment of broadband local area networks is fortuitously similar to that of cable systems. A widespread and growing realization of the limitations of pre-broadband local area network technologies is leading to close examination and initial development of broadband systems. The major United Kingdom market window will probably be 1984-1987 - a time when the cable industry could, given appropriate decisions, be in full production.

5.7 The natural convergence of cable and local area network technologies, aided by Government-led moves towards standardization, would encourage the development of new relationships between home and work activities, and a reduction in the need to travel (which seems consistent with national needs in a

world of increasing energy costs). It would also stimulate the growth of home communications systems, in which environmental control (again, conserving energy), security and information systems are combined and linked to the outside world.

5.8 Finally, cable systems themselves would offer a substantial market for the computer industry. For fail-safe operation, each would require two computers to control the transmissions and operate subscriber billing. Total expenditure might be £100 million, split between hardware and software elements.

5.9 At present, the United Kingdom has industrial capacity that could supply the components of cable systems and - as we discussed in Chapter 2 - technology as advanced as anywhere in the world. Provided appropriate standards suited to United Kingdom expertise and conditions were established, expenditure on cable systems could remain within the country and would help to give United Kingdom firms a base from which to attack export markets. This position will not last. We have commented previously on the poor prospects for commercial cable operators. Were they and their corresponding suppliers to disappear, their technical expertise would be dissipated and subsequent cable systems would have to be founded on foreign (probably American) technology. This would be bound to lead to a growth in imports. It is significant, we think, that since the announcement of the subscription TV trials, representatives of some 30 North American cable interests have visited the offices of the Cable TV Association to find out what is happening in the UK. Coming at a time when American cable companies are heavily engaged in competing for franchises at home, and then installing the resulting systems, this suggests that they have a keen interest in the UK as a potential area for future expansion. Once the main projects in the USA are completed, this interest is bound to increase.

5.10 Minimising imports is, though, the negative aspect of industrial policy on cable systems. All advanced countries are considering the implementations of new communications technologies. A large market for advanced cable technology is very likely to develop since the combination of interactive entertainment and information services which cable can offer would seem as attractive in other countries as in the United Kingdom. Some countries have

indigenous cable industries and may be expected to protect these, particularly if their cable systems are closely associated with their telecommunications authorities. However, there will be sizeable export opportunities, not only for cable hardware but for programme makers and service providers, and one policy objective should be to ensure that the administrative arrangements laid down for United Kingdom cable systems provide the greatest assistance to export efforts.

Employment

5.11 It is difficult to quantify the net employment effect of a decision to promote cable systems, partly because consumer expenditure on cable services would be to some extent taken from other consumer areas and partly because many factors would affect the competitive position of United Kingdom firms in this industry. Clearly the construction industry would benefit, perhaps to the extent of 2000 jobs. And because of its links with the TV rental industry, the United Kingdom consumer electronics industry would supply the majority of decoders and other consumer items. Cable manufacturers and suppliers of studio and transmission equipment could also benefit. We have pointed out that the computer and office technology industries would receive a substantial stimulus.

5.12 Distinctly clearer, however, are the employment consequences of a decision not to promote such systems. Some 5000 or so jobs would disappear if commercial cable operations ceased, and the preference for TV sets manufactured in the UK would also go, with consequent impact on indigenous manufacturers. In current circumstances, these losses would be unfortunate, even if marginal by comparison with total unemployment.

5.13 But British TV manufacturers face larger threats, which cable can help overcome. Competition from the far East in the production of colour TV sets has been severely inhibited by the terms of the PAL licences under which sets suitable for the United Kingdom are made. However, PAL patent protection will expire at the end of 1983. This will open the United Kingdom to much more intense competition, with consequent threat to the approximately 20,000 jobs in colour TV manufacture. The view of the set manufacturers is that they are much better able to compete in more complex TV sets, incorporating teletext, viewdata, cable or DBS decoders because these do not offer the same potential

for very high volume manufacture. They look for an early introduction of both cable and DBS services, but we believe they would have a much quicker stimulus from the growth of cable systems. The impact of Prestel has been disappointing; teletext services are proving more popular; but the extra complexity of cable decoders would provide a valuable competitive element for United Kingdom manufacturers.

5.14 In fairness, we must acknowledge that a decision not to encourage cable systems, coupled with the introduction of DBS services, could create in time a large market for individual DBS dishes and adaptors, which are more complex than the cable equivalents and offer even more 'value added' to manufacturers. But we believe this process to be much slower - and consequently less beneficial to manufacturers - if individual reception of DBS transmissions is the only option for most of the population. Moreover, United Kingdom DBS transmissions will not start at least until 1986, whereas new cable services could be in operation before then. There will, though, remain a substantial market for individual DBS receivers, since many homes will remain unconnected to cable systems, and others may choose not to be connected. This should allow United Kingdom manufacturers a suitable domestic base.

Finance

5.15 Our investigations have revealed considerable interest by private firms (not only from established cable companies) in the possibility of participating in cable systems, and we have no doubt that funds would be available from commercial sources to finance the installation of cable systems. There is little information available in the United Kingdom on the market for additional services supplied via TV screens, whether entertainment, instruction or information. Some companies are currently engaged in market research. But the rapid growth in the United Kingdom market for VCR's and cassettes demonstrates the substantial sums that consumers are prepared to pay for additional video material.

5.16 If experience in the USA is any guide, households will pay upwards of £10 monthly for additional TV services. (This charge is the sum of a 'basic' fee of perhaps £5 monthly and a subscription service at £8 or more - some US

networks have as many as five tiers of service.) In addition, many cable operators in the USA make a connection charge for installing the service and charge separately either on a cash or rental basis for equipment such as the decoder required at the set. Additional income could come from advertising and perhaps sponsorship. Even with less than 100 per cent take-up of the system, there would appear to be sufficient income from subscribers to give a reasonable return on capital. This is, though, a judgement that prospective cable operators must make. Cable systems offer large business opportunities with good chances of profit. We see no need for any public funds to be used to establish them.

5.17. This conclusion runs counter to a widespread impression that cable systems must be publicly funded and therefore, at a time of great pressures on public expenditure, will not be developed rapidly in the United Kingdom. For that reason, we think many are attracted first to the new opportunities offered by DBS services, which appear to have greater potential for private sector funding. In part, this impression comes from misconceptions over the relative magnitudes of 'central' and 'consumer' expenditure in DBS and cable services. The 'central' expenditure required to establish a two-channel operational DBS service, ie the cost of the satellite and associated transmitting equipment, is about £150 million. If 10 million households were each to spend £300 on receiving equipment, the 'consumer' expenditure would be £3000 million. Thus DBS undoubtedly puts the main burden of investment onto individual consumers. By contrast, cable systems are seen as having high 'central' costs which can only be funded from public sources, and low 'consumer' costs. Yet the cost estimates quoted at the beginning of this chapter do not bear this out. The equipment required by the individual subscriber accounts for at least half of the total system cost, and the cost of final link to the network can be charged directly to the subscriber. Thus again funding is dominated by consumer decisions, and the expenditure required to establish the service is a minor proportion of the total (although admittedly greater than the corresponding figure for DBS).

5.18. Thus private sector funding of cable systems is feasible - and the scale of the investment required for any particular system is, of course, much less than that associated with DBS. More sources of finance can thus be tapped. We must emphasise, though, that private sector funding will only be available if the range of programmes and services permitted on cable systems offers sufficient revenue-earning potential. There is thus a direct connection between the degree of broadcasting 'liberalisation' established for cable systems and the possibility of private sector investment in them.

National network

5.19. We conclude this chapter with a note on long term issues. Many expect that video communications links will one day replace the audio links now available in the telephone system. Few, however, would be prepared to say when this might happen and we have some doubts about the economic viability, even in the long term, of a video communications system. Nevertheless, with suitable commonality in technical features, local cable systems could be the building blocks from which such video links evolve. This would enable private sector finance to be brought in to provide some elements of a possible national communications network of the future without many of the institutional problems associated with other routes. However, we would not want possible long-term considerations to delay the investment required now if United Kingdom industry is to benefit from cable systems. The technical standards developed for cable systems should ensure the interconnection of local networks and should not pay undue regard to any eventual integration into the national telecommunications network. The role of BT in standards formation therefore requires careful consideration. They have much to contribute, but should not be dominant, otherwise there is, in our view, a risk of 'over-engineering' and consequent reduction in commercial attractiveness. We might add that we favour a competitive but not dominant role for BT in cable systems generally.

6. IMPLICATIONS OF CABLE TV FOR BROADCASTING

6.1 The United Kingdom is justly proud of its public broadcasting services. These are widely considered to be superior to those in any other country and are a source of national prestige, international influence and some overseas income. The traditions, standards and reputation of our broadcasting services - built up over more than 50 years - are national assets which we must preserve.

6.2 However, technological developments and a rising public demand for choice in entertainment and information services means that the broadcasting world is changing. The history of broadcasting is one of ever increasing choice for the listener or viewer. Radio services multiplied initially, then television was introduced, and later BBC2 and ITV services were started. This process is continuing with the decision to establish a second commercial channel in 1982 and perhaps the introduction of a two channel DBS service in 1986 or so. Three more DBS channels could potentially follow. The introduction of modern cable systems carrying a wide range of programmes would take this process a stage further.

6.3 At every stage in the expansion of broadcasting services, concern has been expressed at the possible effect on the range and quality of the programmes available. This has centred around (a) the availability of funding from commercial or non-commercial services to support the production of high quality (and therefore often expensive) programmes, (b) the supply of talent amongst programme producers and artists and (c) the 'lowest common denominator' effect, ie the tendency of all channels to seek the largest audience through, in the words of the Annan* report, 'homogenised fare'. History shows that these concerns can be met; television has certainly changed since the introduction of competition to the BBC in 1955, but few would argue that the overall range and quality of programming is now inferior, and the choice for the viewer is much increased. This has not occurred by chance; it is to a substantial extent the result of the care taken by successive Governments over the funding and regulation of new broadcasting services.

* "Report of the Committee on future of Broadcasting" (Cmnd 6753) 1977

Broadcasting finance 6.4

The two sources of finance for broadcasting at present are the BBC licence fee and advertising income. The current trials of subscription TV, in which viewers pay a supplementary fee in the range £6-12 monthly in order to receive an additional channel, are intended to demonstrate whether this method of charging could provide a new source of revenue. The BBC aim to derive some of their income from DBS services from subscription TV and the DBS report discusses the matter in paragraphs 13.26-13.30. Another way of funding television is the sponsorship of programmes or channels by commercial companies, as is increasingly the case in sports and the arts.

6.5
The licence fee has provided the BBC with an assured income which has secured its independence of government, and we see no reason why this should change if cable systems were to become widespread. We understand that some viewers who never watch BBC channels consider that they should not have to pay the licence fee. This pressure would no doubt rise as more alternatives to BBC programmes became available. However, we find it difficult to believe that it would ever become significant, given the place of the BBC in British life - and the Corporation would indeed be failing the public if its programmes appealed only to a small minority. Moreover, we expect the terrestrial services of the BBC and IBA to provide the backbone of broadcasting for many years - and particularly in rural areas they may (with DBS) be the only service that can be received. We therefore cannot see cable systems as a serious threat to the BBC's licence income.

6.6
As for the Corporation's potential subscription income, we discussed the relationship between cable systems and DBS in Chapter 4 and concluded that they were mutually supportive. Existing cable systems could provide DBS with a readily accessible subscriber base, particularly valuable in the service's early years, while new systems would make DBS services available at lower cost than individual reception. Cable systems would therefore increase the BBC's income from DBS services.

6.7 A further source of income for the Corporation would arise from its vast stocks of programme material. Either through its own subscription services, or through making material available to other programme providers, it stands to earn considerable sums. Cable systems thus present the BBC with a totally new revenue opportunity which can only be realised if additional channels of communication are brought into existence. Additional income might arise from training and consultancy activities.

6.8 The financial implications for existing and projected commercial services are less clear. A long established feature of United Kingdom broadcasting policy has been the avoidance of competition between channels for the same source of finance. This has led, for example, to the decision to fund the fourth channel by means of subscriptions from ITV programme contractors, rather than establishing it as a competitive advertising medium. This policy is difficult to sustain as the number of channels increases. The introduction of cable systems carrying advertising channels would offer advertisers a wider choice of medium, and would establish direct competition to off-air commercial services. It would also reduce the audience for commercial TV. ITV companies could thus be faced both with competition for TV advertising and a reduction in the rates that they could charge, because of reduced audiences. This could force a cut in programme expenditure and consequently a decline in the range and quality of output.

6.9 On the other hand, the introduction of cable systems would enable far more firms to participate in TV advertising. These might either be firms with a local customer base, for whom national or regional advertising is irrelevant, or with a specialised market, who would wish to advertise on channels directed to that market. Smaller firms could advertise not only in 'local' programmes, but also on any 'national' channels that were relayed over the local system, thus providing income to the main programme contractors. There could well be an impact on other advertising media (local newspapers or specialised journals), and we discuss this elsewhere. But it is not clear that the introduction of cable systems would necessarily have a large adverse effect on the advertising revenue base of off-air commercial TV services.

6.10 Cable systems would, of course, be in direct competition with local radio, which also draws on local advertising for its income. But, just as national radio services have established a new role in relation to TV, so we would expect local radio stations, with their low operating costs, to survive because radio can reach audiences - at work, in cars, or occupied in tasks - that TV cannot serve. However, the exact relationship between local radio stations and cable systems would need to be examined in the context of the regulatory arrangements for cable.

6.11 In considering the effect of cable systems on the finances of broadcasting, there is no relevant United Kingdom experience on which to draw. However, we observe that the growth of cable systems in the USA has been accompanied by a rise in advertising income for the national networks. We note also that the programmes that have caused American television to have a poor reputation - the soap-operas, 'chat' shows, etc - have been the product of the national TV networks with access to large advertising income (although in competition for the same sources of revenue) while the better programmes have originated from more specialised networks or stations without the same degree of advertising support.

6.12 Advertising is, though, only one source of income for extra TV channels. Subscription income is likely to be significant, if experience in the USA and preliminary take-up figures from the current United Kingdom trials are any guide, and commercial sponsorship of programmes could also be considered. This again has dangers (as does the commercial support of any broadcasting service) but we see no reason why it should not result in high quality programmes, just as the commercial sponsorship of Covent Garden productions provides high quality opera. And with local cable systems, sponsorship need not be confined to national firms.

6.13 Further income could accrue to the independent TV companies from exploiting their stocks of programme material. While not as extensive as those of the BBC, they are nevertheless a marketable asset.

6.14 Any discussion of cable finances must be somewhat speculative in the absence of United Kingdom experience with modern cable systems. There is widespread agreement that the main attraction of a cable system will be its additional popular programme channels and that other services, while possibly self-supporting, could not carry the basic costs of the system. But we conclude from the above considerations that there is no case for believing that the introduction of cable systems would necessarily undermine the finances of broadcasting in the United Kingdom, and so we do not see an inevitable threat on financial grounds to the quality and range of programmes provided by the public broadcasting services.

6.15 We recognise that this conclusion runs counter to "accepted wisdom" on broadcasting as set out, for example, in the sixth chapter of the DBS report. Clearly, there is a need for Government to consider the financial implications of cable systems more thoroughly. But we emphasise that, commercially, cable systems are an opportunity, not a threat; they would provide new sources of income for broadcasting, they could enable programme producers to make better use of their accumulated material, and they offer the possibility, with their interactive facilities, of wholly new types of programmes. We would hope that the Government would approach the subject in that light.

Other considerations

6.16 Turning to the other elements in the potential threat to the range and quality of programmes, we note the growth in recent years of the independent producers of TV programmes, with their eye on the fourth channel and the video cassette and disc markets. We see no reason why the pool of creative talent should be considered to be totally exploited by the introduction of the fourth channel. New production enterprises, often involving publishing houses, are being established to tap the market for video cassettes. Market forces apply in artistic endeavours as much as in more conventional enterprises. Besides which, we expect information and entertainment to flow more freely across national barriers as technology eases problems of translation, subtitling etc. (Cable systems would assist the process by simplifying the reception of overseas broadcasts, if the Government permitted this.) This will enable the United Kingdom to draw on a wider range of international talent, as well as offering our producers opportunities overseas.

6.17 As for the 'lowest common denominator' effect, this is a legitimate concern but we wonder whether the United States experience provides support for these fears. The Annan Committee pointed out the similarity of programmes on many United States channels. But the main offenders are the national networks, and in the United Kingdom we see these - with the addition of DBS - continuing to provide a varied selection of programmes. We envisage that most of the other channels to be provided on cable system would provide for more specialised or local needs, or would be devoted to information and data transfer services.

6.18 The Annan report also commented that many would not be able to take advantage of subscription TV services, either because they could not afford them or because they lived in rural areas that are unsuitable for cable. It expressed concern that, if cable systems adversely affected public broadcasting services, those dependent on the latter services would have their programme choice restricted. This is an important point, but as we have made clear above, we see no reason why public broadcasting services should necessarily decline in quality as a result of cable systems. Moreover, video cassettes and DBS services will increase programme choice in rural areas.

6.19 We recognise the risk, however, that successful cable companies might be able to outbid other broadcast services for the rights to specific sporting and national events, thus depriving those not connected to the cable system. Taken to an extreme, this could clearly be undesirable, but suitable definition of the events concerned, and the existence of a body to whom appeal could be made in case of dispute, should enable the problem to be overcome. Representatives of commercial cable interests have already offered the Government an undertaking on major events. The converse, of course, is that cable systems could provide extra income for some activities, for example, local football clubs, in exchange for local broadcasting rights.

iii. What classes of persons or firms should be allowed to (i) operate cable systems, (ii) supply programmes? Should overseas companies be permitted? And who makes the choice?

iv. What should be the policy towards monopoly or quasi-monopoly situations - would it matter if, say, one firm operated (or provided programmes for) half the cable systems in the country?

v. What should be the penalties for infringing the terms of a licence - they can hardly include withdrawal of all cable services from an area. And who would be licensed - the operator or the programme providers?

vi. What is the role of BT? Their existing wayleaves ought to give them a large advantage over other potential operators. Would it matter if they operated most or all systems?

6.22 From the discussion of economic and industrial issues in the previous chapter, and the discussion of the relationship between cable systems and DBS, it is clear that answers must be found quickly if cable systems financed by the private sector are to have any significant role in the United Kingdom. We confine our comment to one point. It seems to us that speedy investment decisions can only be made if a single individual or organisation is permitted to take overall responsibility for providing cable services, including both the physical infrastructure and the programme material, in one area. Only then can an appropriate business plan for the enterprise be drawn up. If the body responsible for the actual cable has to deal with an independent body responsible for programmes, neither can judge their commercial prospects as effectively. The choice of a single cable operator with total responsibility for the service does not, of course, preclude sub-contracting by that operator of some or all of his activities - installation and maintenance of the cable, programme provision, subscriber billing etc - but these will be normal commercial decisions taken in the context of his overall control. We recognise that there are regulatory arguments for the separation of the transmission and programming functions; this may be appropriate once cable is well established, but it would, we think, inhibit the development of industry in its critical formative years.

Radio frequency allocation

6.23 Our final note in this chapter is on the implications of cable systems for radio frequency allocation. Some have suggested that cable systems and DBS will eventually obviate the need for terrestrial broadcasting services, and have welcomed this because of the frequency spectrum that would be released. Certainly, there is intense pressure on the part of the radio spectrum used by broadcasting services, and any moves to provide more frequency spectrum for other uses would be welcome. However, we cannot see terrestrial services being replaced for many years, if ever. New technology may enable costs to be much reduced - the incorporation of optical fibres in the insulation of power cabling has, for example, been suggested. But with present technology, it would be highly uneconomic to cable isolated communities or households, although it could be done for social reasons, as with rural electrification and telephone services. Ending terrestrial services would prevent the use of portable radio or TV receivers, and DBS cannot provide the regional variation that is a feature of current United Kingdom broadcasting. The only national channel at present is BBC 2; this is therefore the only service that could be transferred to DBS once sufficient receiving aerials were in place. But with the experience of the protracted timescale for phasing out 405 line services, we cannot see this happening for many years. While, therefore, cable systems can offer new services without making further demands on the frequency spectrum, our view is that they are most unlikely to lead to any reduction in these demands.

7. OTHER IMPLICATIONS

7.1 Cable systems are local communications networks serving particular communities, although links could be established between local systems. Even if they eventually provided a national communications system, they would retain their local programme content. Cable systems therefore have implications for existing local communications media.

7.2 In particular, local newspapers would need to examine carefully their future role in a situation in which immediate news coverage of local events, guides to local activities and information on purchasing opportunities would be available on TV screens. It is significant that newspaper interests have been prominent participants in US cable enterprises. Local television can certainly provide more topical coverage of events than the weekly (or even daily) newspaper, but seems unlikely through these technical abilities to put local newspapers out of business. The basic business of newspapers is the assembly and presentation of news; these skills will be required even if one part of the final product appears in video form. Moreover, the TV screen is unsuited to the scanning of a large quantity of information such as is presented on a newspaper page.

7.3 However, the financial implications of a new advertising medium must be of some concern to the local Press. A large proportion of any local paper's income comes from display and classified advertising. Some of this could be transferred to the cable operation. The viewer could be easily guided on a cable system to the categories of goods on offer through a viewdata service and might therefore find the cable medium more attractive. Local newspapers, already face competition from 'free sheets', they appear at the moment to be surmounting that challenge, but cable could be a more powerful rival.

7.4 The nature of the future relationship between the local Press and cable systems is not easy to see. Some newspaper groups will see cable as an extension to their operations, just as they have taken a role in local radio (or at national level, in commercial TV). They may seek to operate cable systems; this would present regulatory issues over local dominance of information media. But we doubt whether the local newspaper would disappear. It would supplement the immediate news and information available on the cable system in a way that only the printed word can.

7.5 Similarly, cable systems would supplement printed magazines that cater for specialist interests, providing much greater coverage and more detailed guidance or instruction than current TV programmes can hope to achieve. Again, we think the printed word would survive, but the extra information that can be provided through the video medium would be valuable. Video cassette publishers are already taking advantage of this, and starting to compete with magazines.

7.6 The impact of cable on a local community - in terms of improving information flows and creating a community spirit - could be considerable. The experiments in local programming that have been conducted in the United Kingdom have shown that substantial interest exists in such programmes. However, those experiments could not cover their costs. It remains to be seen whether, in the context of an extended range of cable services, with correspondingly greater opportunities for subsidy of one channel by another, it will be possible to carry a full range of local news and information.

7.7 For local shops and service firms, the introduction of cable could provide a new way of operating. New advertising opportunities would be opened, but equally new ways of selling, with many more firms entering the 'shop-at-home' business. Some, of course, might actually deliver their product - a video film or piece of software - down the cable.

7.8 Not only local retail outlets would be attracted by cable; at least one national mail order company is actively investigating the potential of cable systems for its business. Of course, visual comparison and direct inspection of many products will still be needed but the success of discount warehouses has shown that many consumer goods can be sold without such facilities. Local stores will face new competition - but from a medium that they themselves can also use.

7.9 Advertising interests clearly stand to gain from the introduction of cable systems, since these would provide a new advertising medium for smaller and more specialised firms. Representatives of the advertising industry have also commented that cable would remove the present monopoly of the independent TV contractors and the resulting competition could lead to a fall in advertising rates. But, as discussed in the previous chapter, the financial implications of such competition have to be considered in the context of broadcasting generally.

7.10 Education and training institutions would find a new outlet for their skills if a channel were devoted to such programmes. The productions could cater for specific needs of the local community (for example, language instruction for local minority groups) as well as more general needs. Colleges might specialize, according to their particular strengths, and national institutions such as the Open University could have much to contribute in guiding prospective programme makers - as well as producing their own programmes.

7.11 One of the most popular applications of cable systems in the USA is security services. With a cable system it is possible to monitor a security system almost continuously, either to detect faults or unauthorised entry, and has proved attractive to subscribers. There is evidence of the willingness of householders to spend considerable sums on security and it is likely that the same service would prove attractive in the United Kingdom. As we pointed out in Chapter 5, this would stimulate demand for security equipment.

7.12 The implications of cable for the film industry are less clear. On the one hand, there could be an upsurge in demand for films made specially for the cable audience. And certainly the expertise of film and video producers (and their studio facilities) will be in demand for other productions. On the other hand, there could be a growth in imported film material since the USA generates so much television. The ultimate effect on the film industry could therefore depend on the limits (if any) imposed on imports. The Interim Action Committee of the film industry have noted that in the USA cable appears to have increased cinema audiences.

7.13 One aspect of film production discussed in the DBS report is that of copyright. This directly affects the producers of programme material broadcast by satellite, since such broadcasts may be received in other countries, thus reducing the potential paying audience in those countries, and the fee agreed between the broadcasting authority and the film producer has to reflect this. The introduction of cable systems in the United Kingdom would not, therefore, significantly affect this problem; suppliers of programme material would make the necessary financial arrangements with cable operators. It would, however, simplify arrangements for any overseas broadcasters whose signals were distributed in the United Kingdom since the potential audience for overseas broadcasts would be more easily calculated.

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 In previous chapters, we have summarised the present state of cable operations and associated industrial interests in the United Kingdom, described the sorts of services that modern cable systems can provide, examined the relationship between cable and DBS services, set out the industrial and commercial consequences of investment in cable systems and considered, in varying degrees of detail, the implications for current broadcasting services and other parts of our social and commercial life. Some economic themes have stood out:

- i. The prospects for existing commercial cable systems in the United Kingdom are bleak unless present regulatory controls on programming are lifted. The relay of BBC and ITV services, which has been the mainstay of cable operations in the past, provides no base for future activities. Their technological and operating expertise is therefore at risk.
- ii. The prospects for indigenous manufacture of standard colour TV sets are similarly poor, owing to the expiry of PAL patent protection at the end of 1983. Low cost producers (unless restricted in some way) threaten to take over the market. However, they are less able to compete with more complex sets, produced at lower volumes, such as those required for DBS or cable services.
- iii. Cable systems and DBS are complementary developments, each capable of providing income for the other. Cable distribution of DBS signals has many advantages and could be cheaper than individual reception for subscribers in urban areas.
- iv. Timely and vigorous development of cable systems could potentially generate a great deal of economic activity, much being in high technology industries, with consequent benefit to the telecommunications (especially optical fibres), consumer electronics and service sectors.
- v. The indirect benefit to the office technology industry could be substantial, leading to enhanced competitiveness in world markets, provided appropriate standards were established quickly.

8.2 There are thus powerful economic and industrial arguments for encouraging the growth of cable systems in the United Kingdom. They relate to -

- a. The direct markets for equipment and services, which could total £3000 million or more.
- b. The stimulus to overseas sales of programme material, information services and expertise, based on the high reputation of United Kingdom broadcasting.
- c. The adverse consequences for present cable operators and their suppliers if no action is taken, and the probable consequences for our balance of payments eventually.
- d. The growing connection between the technologies and products used in consumer and business electronics, and the stimulus which a fast growing consumer market could give to a wide spread of United Kingdom industrial interests, provided an early technological lead were established.
- e. The improved market prospects for DBS services, should these commence in the mid-1980s.
- f. The possibility in the long term of extensive wideband links between homes and businesses, and the role of cable systems as an initial stage in the development of such links.

8.3 We are therefore in no doubt that cable systems could be a source of much profitable commercial activity. In this, we are supported by the evident interest of the private sector in cable and the apparent willingness of both existing cable companies and companies at present unconnected with cable to invest in new systems. We can say quite categorically that we see no need of any public subsidy to cable systems - but the necessary finance will not be forthcoming until there is a change in Government policy that would enable cable systems to offer a wide variety of programmes and services.

8.4 We are also in no doubt that the United Kingdom will have cable systems eventually. Having examined the possible alternative ways of providing a full range of electronic services, whether for entertainment or information, we conclude that cable systems can complement and enhance all the new types of electronic media that are now becoming available. We doubt whether they will supplant any of these - previous chapters have shown how they each have their uses; in any case cable systems will not reach every household and business for many years, if ever. But only cable can provide through one link a complete range of entertainment and interactive communication services - and the cost of supplying that link is, for many premises, quite reasonable. Thus if no decision is taken now to encourage the growth of cable systems, it will have to be taken later as public and business demand for wideband communications, fuelled by knowledge of the systems installed in other countries, increases. And the likelihood is that we will then become dependant on overseas cable technology and will offer foreign firms a rich market.

8.5 We have therefore a paradox. We believe cable to be an essential component of future communications systems, offering great opportunities for new forms of entrepreneurial activity and substantial direct and indirect industrial benefits. However, the initial financing of cable systems will depend upon none of these things, but upon estimates of the revenue from additional popular programming channels. We consider the long term potential of cable systems for providing new sorts of services to be much more important, but have to accept that cable systems will go through an initial phase when their attraction will be based on "entertainment" considerations. It is, though, essential that the technical specifications set for new cable systems should not preclude the transition from this initial phase to a subsequent phase when cable really does provide a full range of interactive services.

8.6 Because of the initial emphasis on entertainment, news services etc, we have considered at some length the implications of the introduction of cable systems for broadcasting and other activities. On broadcasting, our view is that there need be little effect on public broadcasting finances or programme standards. Indeed, we would go further and stress the new opportunities that cable systems offer to broadcasting authorities, both from the better exploitation

of existing programme material and the demand for new programmes, training and consultancy services. Present TV programme providers, particularly the BBC, stand to gain considerably from cable systems. We see no reason why the introduction of cable systems should necessarily lead either to unsuitable programme material or to a reduction in the range and quality of programme services on the public broadcasting network. Similarly, while cable would have an impact on many other activities, it also presents great opportunities.

8.7 Our timetable and resources have, though, been limited and more thought must be given to the structure and regulation of cable systems, and the implications for broadcasting. But we cannot stress too highly the need for speed. The formulation of broadcasting policy in the past has been a protracted process, with major enquiries extending over three or four years and consultations and discussions then occupying a similar period. This is wholly inadequate for the present situation; a delayed decision is, in this case, the same as a negative decision. There is a very limited time in which industrial capability and market opportunity will exist in the UK. Beyond this time, the chance of creating a strong UK presence in cable systems will have disappeared, and with it some thousands of jobs and prospects of substantial export earnings.

8.8 If cable systems are to be established, they need to be coming into operation at about the same time as DBS services. We assume that the Government will shortly give approval for a 'modest early start' to DBS, ie a two-channel service starting in 1986, and we encourage them to do so. This implies that planning for new cable services should start no later than 1983, and preferably earlier. Finance will only be forthcoming if the future prospects for cable systems are sufficiently certain. We refer again to the General Election that has to be held by May 1984. Unless a positive decision on the future regulatory environment for cable systems is forthcoming well before then, and in practice that means mid-late 1982, there is in our view little prospect of a modern cable industry being established in the UK.

8.9 That does not mean that all the policy details have to be worked out by then, but the broad policy outlines should be sufficiently clear for potential cable operators and investors to begin serious planning and negotiations in the knowledge that a reasonable period of regulatory stability lies ahead. We have in mind the example of the liberalisation of telecommunications, which we regard as a crucial element in the development of IT in this country. The Government was committed to that step, and announced its broad policy, well before all the details could be filled in. This gave confidence to potential providers of telecommunications products and services that there would be an eventual market and persuaded them that planning and investment were justified. We see a similar need in respect of cable. The aims must be to remove the barriers to private investment in cable systems that at present exist, to allow reasonable (although not absolute) freedom for entrepreneurial flair and in so doing to give a great stimulus to large parts of the IT industry during IT Year.

8.10 We recognise that this is an tight timetable. We recognise also the demands that will be placed on those who have the task of developing the new institutional arrangements. But this is a price to be paid for failing to prepare some years ago for the rapid changes in the broadcasting scene now being driven by technological developments. It would be more comfortable to follow the timescale envisaged in the current trials of subscription TV - one would feel more confident about consequences of policy decisions - but to do so would almost certainly mean abandoning UK cable developments to overseas interests. The subscription TV trials are, frankly, three years too late.

8.11 Our detailed recommendations are therefore -

- i. The Government should announce as soon as possible its approval for an early start on DBS services.

It should explicitly recognise the role of existing cable systems in providing an immediate market for DBS programmes and should give an undertaking that these will be allowed to distribute DBS transmissions, where necessary - and subject to making suitable alternative arrangements - releasing them from the obligation to distribute terrestrial services. This will be a sign to cable interests that the Government sees a future for commercial cable systems; it may possibly help to retard current withdrawal strategies, but it will do nothing for their short-term prospects.

ii. The Government should announce, by mid-1982 the broad outlines of its future policy towards cable systems, in order to allow the private sector to start planning new systems.

We recommend that that policy should be to license new systems conforming to set technical standards without the present restrictions on programming (apart from obvious requirements on decency, sedition, etc, on which representatives of cable operators have already offered an undertaking). Such licensing could take place initially under existing legislation and administrative arrangements.

iii. The Government should urgently review the implications of cable systems for the financing and regulation of broadcasting and should consider the need for a new statutory body to be the "broadcasting authority" for cable systems. On the basis of this review, and investigation of the effects of different regulatory arrangements on potential private sector investment in cable systems, the Government should formulate and announce its detailed administrative and regulatory proposals. This announcement should be made as soon as possible and in any case by early 1983.

iv. The Government should urge cable operators and programme providers to set up effective means of self-regulation, after the manner of the advertising or newspaper industries. This would help to create public confidence and might well simplify any new regulatory arrangements.

v. The Department of Industry should establish a technical working group including representatives of cable operators, the electronics industry and BT. This group would -

a. examine alternative approaches to cable network design and recommend design standards for the United Kingdom;

b. define the necessary detailed engineering standards, consistent with commercial viability, for that network.

It should complete its work during 1982.

The recommended design standards should offer maximum potential to United Kingdom manufacturers and operators and should anticipate, and be compatible with, developments in communications technology. In particular, they should require systems to operate within the relevant constraints on usage and allocation of frequencies set by the Home Office, (including FM radio channels in the 88-108 MHz band) and to be capable of incremental expansion beyond a defined minimum number of channels (perhaps 30) without disturbance to the final distribution network. Systems should be able to support a wide range of interactive services and should link with the packet switched service of BT and other services offered by BT and alternative telecommunications networks. But the standards set should not prejudice commercial operations.

vi. The Department of Industry should create an effective forum in which all those interested in cable systems can come together to unify their efforts to the benefit of the United Kingdom. To assist in this, the Department should rationalise its internal arrangements for considering cable issues which at present are spread over several divisions.

8.12 We further think that the overall regulatory structure in which cable systems have at present to operate is inappropriate for their widespread development. It involves two independent Departments, the Home Office and Department of Industry, and British Telecom, all of whom could be concerned in licensing one system. The potential for confusion and lack of co-ordination precludes the speedy decisions that we see as essential. But this issue is not confined to cable - it extends into many aspects of IT. We note that the Government has not taken up the proposal in the ACARD Report on IT that the regulatory arrangements for IT should be drawn together in a more coherent fashion. Cable systems exemplify perfectly the inappropriateness of present arrangements. We therefore intend to examine the regulatory structures that impinge upon developments in IT and specifically the relative roles of, and the interaction among, the three bodies mentioned above.

8.13 We believe that only through a set of speedy, positive and radical regulatory changes can the United Kingdom obtain the benefits offered by developments in cable technology. We must repeat, though, that for British industry a late decision is the same as a negative decision.

ANNEX A

List of organisations from which views were received.

British Telecom

BBC

IBA

Electricity Council

NEDO Consumer Electronics Sector Working Party

Open University

BICC

Birmingham Post & Mail

Boase Massimi Pollitt Partnership

Cable Television Association of Great Britain

Thomas Cook

Debenhams

Great Universal Stores

Greenwich Cablevision

Ladbrokes

Logica

Plessey

Tesco

Thomson Data

Thomson Regional Newspapers

Warner Amex Inc

SERVICES POTENTIALLY AVAILABLE ON CABLE SYSTEMS

Terrestrial TV and radio channels (from UK or overseas)

Satellite TV and radio broadcasts (also from UK or overseas)

Subscription TV (films, sport, arts etc)

Specialised subject channels, eg news

education

religious programmes

health

Specialised audience channels, eg for particular ethnic groups

for different age groups - children, aged etc

for people with impaired hearing

Local channels, eg

local and national government information

'What's on'

consumer information

programmes by and about community groups

Other services

fire and burglar alarms

control of heating systems

remote meter reading

shopping, banking, betting etc from home

opinion polling

video games

electronic mail/messaging

interactive computer-assisted learning

general videotex information

software supply to home computers

access to national and international
communications

wideband business communications