

LIST OF TELECOMMUNICATIONS
CONSULTING PROJECTS
CARRIED OUT BY
PHILIP A. LAPP LIMITED

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Given below are some typical consulting projects relating to the broad field of telecommunications carried out by PHILIP A. LAPP LIMITED. A selection of both large and small projects have been given to show the range of our telecommunications operations.

A Study for DND on the Capability of the Common
Carriers and Telecommunications Equipment Manufacturers
to Satisfy Unique Military Requirements for Strategic
Communications

The purpose of this study, carried out for DND-DCEM in 1981 fiscal year was to identify key telecommunications trends likely to affect Canada's military strategic networks in the future. These trends included, but were not limited to, the use of communications satellites, scrambling and other security methods, video/Teletext services and teleconferencing. The study also included the determination of the capability of the Canadian telecommunications industry to supply hardware and software incorporating these trends to the Canadian Armed Forces; to make a preliminary assessment of the cost of implementing these new trends; to make conclusions as to the advantages and disadvantages to be derived from such changes; and to make recommendations to DCEM in relation to these findings.

The Atmospheric Environment Service Communications Study

PHILIP A. LAPP LIMITED acted as program director in this detailed study carried out during 1981 to evaluate the national telecommunications network requirements to the Atmospheric Environment Service, and to recommend systems and equipment. Particular emphasis was given to the use of the Domestic Satellite system, including a possible future DBS system.

The Atmospheric Environment Service Communications Study

Subject to the completion of the above project PHILIP A. LAPP LIMITED was commissioned to provide advice and assistance in planning the future communications system for the Atmospheric Environment Service based on the previous study carried out by Spar Aerospace Products Limited and PHILIP A. LAPP LIMITED.

CTRI Submission to the Department of Revenue

The purpose of this submission was to provide sufficient information on the purpose, structure and activities of the Cable Telecommunications Research Institute (CTRI) to permit the Minister to approve the CTRI as a research institute used for scientific research related to the business of Broadcast Receiving Undertakings (Cabletelevision).

Radarsat User Requirement Study

An Ice and Ocean User Requirement Definition Study for RADARSAT was carried out for the Department of Energy, Mines and Resources during 1981 and 1982. Tasks in this study included the determination and validation of the user requirements; development of data presentation products; trade-off analysis of appropriate platform, sensor and communications mixes; policy alternatives for consideration by the Government in respect of levels and types of service to users; plan for phasing in services as aircraft and satellite platforms are put into place; comprehensive benefit and value analysis of RADARSAT data capabilities in respect of various instrumentation options and of interdependencies with planned satellites including ESA, U.S. programs and Japanese programs to determine the options most appropriate to Canadian ice/ocean information requirements.

The Study and Design of an Optimum Data
Transmission System

This study carried out for Hunttec ('70) Limited in 1981/82, involved the study and design of an optimum data transmission system to carry telemetry from a towed deep ocean vehicle over co-axial cable to a towing vessel. The system is required to operate under extreme environmental conditions.

A Study of the Categorization of Cable TV New
Services with Particular Reference to Data Transmission

This study, carried out for Premier Communications Limited, analysed a very wide range of data transmission and other services capable of being transmitted through a broadband co-axial communications network. It has subsequently been put to considerable use both nationally and internationally.

Analysis and Development of the WETA/TELIDON System

This project, carried out for the Department of Communications in 1981, involved the analysis and further development of the Telidon Canadian Teletext system currently being implemented for the WETA Public Service television station in Washington, D.C. The project involved the full time use of a senior consultant for approximately six months.

Compilation of a Canadian Telecommunications Industry
Inventory

This project, carried out in 1981 for SPAR Aerospace Limited, involved research into and the compilation of, an inventory giving information on all Canadian Telecommunications manufacturing companies, Canadian Cable Television companies and Canadian broadcasting companies.

The Compilation of Program Plan for Data Capture
in the Canadian Post Office

This work carried out in 1981 provided a program plan and implementation advice to the Canadian Post Office on a wide range of data capture applications.

The Provision of General Consulting Services to the
Canadian Cable Television Association

Provided for six months in 1980, this service included the drafting of Canadian Cable Television Industry submissions to a number of major telecommunications hearings, including the initial Pay Television hearings and the hearings on the Extension of Service to Northern and Remote Areas, and the attendance at the hearings to present the submissions, and, on occasion, the provision of expert witnesses.

Revision of the Shared Structure Survey for the
Canadian Cable Television Industry

This project carried out in 1980 involved the detailed revision of a survey of all the shared structure agreements between members of the Canadian Cable Television Industry and hydro and telephone companies throughout the country.

The Assessment of the Financial Impact of New Cable
Television Services

This study, which was carried out for the Bank of Montreal in 1980, involved the detailed review of the likely financial needs of cable television companies planning to provide new services over their cable television networks.

Cable Television Proofs of Performance

These projects, carried out for a number of cable television companies, involved the engineering supervision of complete cable television system proofs of performance to Department of Communications requirements.

Microwave Feasibility Study

This 1981 project involved the study, profiling, analysis and evaluation of some forty potential microwave paths for a major cable television company.

Microwave License Application

This 1980 project involved the planning, calculation and submission of applications for specific broad-band microwave paths for Skyline Cable Television of Ottawa.

Satellite Earth Station Application

This 1981 project involved the planning, calculation and submission of an application for a privately owned 12GHz satellite Earth station operating with Telesat's Anik-B Satellite.

The Implementation and the Management Information
Service for the Telidon Project

This work, carried out in 1980 for the Department of Communications, involved the provision of a detailed management information system covering all aspects of the Telidon program.

Preliminary Assessment of a Home Information Service
Business in Canada

An analysis of the wide range of options available within the cable television based Home Information System concept. This study for MacMillan Bloedel Limited identified services showing the greatest business potential. Recommendations were made as to the strategy and course of action for development of these services.

Assessment of the Potential Market for a Space Program
Oriented Remote Manipulator System

This was a market survey of the potential applications for the technologies and hardware which would be developed as a result of Canada's participation in the U.S. Space Shuttle program. The scope of this study included identifying the markets for remote manipulator systems, reviewing their relevance to the work on the Shuttle RMS, describing the present status of each market, and estimating the opportunities for Canadian industry, and particularly for Spar. Carried out for the Department of Industry, Trade and Commerce and for Spar Aerospace Limited.

Study into the Efficient Use of Spectrum

A study of the views, needs and problems of users of the radio spectrum including common carriers, utilities, government and regulatory agencies, broadcasters and cable television operators. Carried out for the Federal Department of Communications.

Space Agency Supplier Assessment

An assessment of environmental testing philosophies related to space components, systems and complete spacecraft among U.S. and Canadian contractors and space agencies. Carried out for the European Space Agency of Paris, France.

Ontario Centre for Remote Sensing Evaluation

An evaluation was carried out for the Government of Ontario of the cost benefit of the Ontario Centre for Remote Sensing to users in the Ontario Remote-Sensing Industry. The study emphasized remote sensing from satellites.

Canada's Communications Satellite Systems

An analysis was carried out in 1980 of Canada's DBS and other communications satellite systems activities and capabilities for General Technology Systems Limited, United Kingdom. This included technical and cost analyses, and a comparison of systems.

Communications Technology Satellite Program

PHILIP A. LAPP LIMITED provided consultant services to the Deputy Minister (Department of Communications) on special assignments related to the HERMES program. This followed an earlier study of the goals and objectives of the Communications Research Centre on this subject for the Assistant Deputy Minister, Research.

Responses to Satellite Earth Station Licensing Policy

Responses of the Canadian Cable Television and the Atmospheric Environment Service to a Gazette Notice regarding 'Proposed Simplification of Receive Only Satellite Earth Station Licensing Policy' were submitted by PHILIP A. LAPP LIMITED to the Department of Communications. These responses included the clients' interest, opinions and recommendations on the subject.

Application of the Communications Technology Satellite
to the Native People of Remote Ontario

This project, for the Ontario Educational Communications Authority, involved the provision of consulting and advisory services related to the application of the communications technology satellite (HERMES) to the native people of remote Ontario. It was a study of the technologies likely to impact the services provided by Ontario Educational Communications Authority, and of those which provided potential for new services in the future. A long range technological planning framework for OECA was recommended.

Feasibility Study on the Design and Fabrication
of a Commercial Communications Satellite in Canada

Carried out for the Department of Industry, Trade and Commerce, this study was an analysis of the requirements for a future Canadian communications satellite and an evaluation of Canadian capabilities and facilities for satellite development work. The report includes an assessment of the economic impact of increased Canadian content in a future communications satellite.

Study of Technical and Economic Consequences
of Scrambled TV Services
Offered by Direct Broadcast Satellite

Carried out for the Department of Communications, this study involved producing a report and recommendations of technical and economic trade-offs and consequences of the offering of scrambled TV service by DBS. The specific aspects covered were: Technical Considerations; Economic Considerations; Alternate System Configurations; and Policy Sensitive Issues.

Study of the Role of the Department
of Communications in Standardization

Carried out for the National Telecommunications Branch of DOC in 1982, this study involved the investigation, analysis and reporting on the effective development and implementation of national standards including office automation and computer communication aspects to allow for the orderly development of Canadian Telecommunications. This report was widely distributed by DOC and subsequently used as a basis for setting up a new CSA steering committee on Telecommunications.

Study of Multi-Level Pulse Amplitude
Modulation for Telidon

Carried out for the Telidon Systems Development Directorate of DOC in 1982, this study analyzed and made recommendations on the use of multi-level PAM in Broadcast Telidon.

Study and Review of Technical Aspects
of Scrambled TV Service
Offered by Direct Broadcast Satellite

Carried out for the Department of Communications, this project followed through on recommendations made by the Company in a previous report to DOC. The tasks included a study of technical aspects of audio-only scrambling, a technology-base study, and a study of the problems of synchronization of DBS scrambling systems.

Submission to the Newfoundland PUB for a
Reduction of Pole Rates

This project, carried out for a Consortium of Cable Television licencees, involved the development of position, the analysis of information, and the presentation of a submission to the Newfoundland Public Utilities Board for a cessation of, or reduction of increases in pole, strand and duct rates.

Study of Key Legislation and Industry Trends in
Telecommunications and Cable Television in
Four Foreign Countries

This study, carried out for the Institute for Research on Public Policy, involved ascertaining the key legislative mechanisms and industry trends in the fields of telecommunications and cable television in:

- . United States of America
- . United Kingdom
- . France
- . Japan.

This information will be analysed and will form the basis of a detailed report for the Government of the Province of Quebec.

Submission to the CRTC on Telesat Canada's
Joint Tariff CRTC 8501

This project, carried out for Atlantic Television System Limited, in early 1982, involved the development of a submission to the CRTC concerning Telesat's proposed tariff for satellite services for GTE Satellite Corporation. This followed a review of the agreements and tariff filings involving use of Canadian satellites for American DBS use, and an assessment of the impact of this use on Canadian broadcasting, particularly as it affects the Atlantic provinces.

Attestations of Subscriber-Owned
Telecommunications Equipment

This project, carried out on a routine basis for Bytown Communications Limited, involves the evaluation and attestation of conformity to interconnection approval listings of subscriber-owned telecommunications equipment.

Planning Services in Relation to the Implementation
of the Long Term Communications Plan of the
Atmospheric Environment Service

Carried out for the Atmospheric Environment Service, this project involved wide-ranging assistance in planning the implementation of a new integrated national communications network. The long-term strategic goals, derived during previous contracts, were documented to guide the implementation of specific projects, and future planning.

Pay Television Service Implementation

Carried out for Star Channel Services Limited, this work included the evaluation of suitable cable TV distribution channels for Pay TV service in the Atlantic provinces.

Pay Television Studio Requirements

Carried out for Star Channel Services Limited, this study involved detailing the requirements for setting up a studio suitable for the transcription and production of pay television programming.

AES New Communications System

Following on from a previous contract, this work for the Atmospheric Environment Service involves the provision of consulting services on the direction for current proposed communications projects directly associated with the implementation of AES's New Communications System.

Summation of Impairments Feasibility Study

Completed in November 1982 for the Department of Communications, this project involved the analysis of work carried out throughout the world on impairment units and their summation to determine the usefulness and cost effectiveness of impairment unit techniques and their summation in evaluating all types of video systems, including digital systems.

Space Station Project

A major study carried out for NRC through their contractors, Spar Aerospace, to ascertain likely Canadian Applications for a permanent low earth orbit space station planned for launch by NASA in the early 1990's. The work carried out by PHILIP A. LAPP LIMITED involved a detailed study of the requirements for Canadian applications for such a station, within a wide range of Canadian industries, coast to coast. The objective of the study was to provide NRC with sufficient information to allow a decision to be made on whether or not Canada should participate in this international venture.

Télécâble Laurentien Inc. Applications

This project involved the preparation, on behalf of Télécâble Laurentien Inc. and for submission to the Department of Communications, of an Application and Technical Note respecting a change of location of TVRO headend site, and a Technical Brief and Application to introduce augmented channel capacity in super band, introduce Pay-TV and scrambling, and make certain improvements to the distribution system.

Comparison of Scrambling Systems

This project involved the evaluation and physical testing of various scrambling systems suitable for direct-to-home reception of the signals distributed on ANIK D by Canadian Satellite Communications Inc.

Feasibility Study for Transmission of Radio
Programming as Sub-Carriers on ANIK D Video Channels

This feasibility study, carried out in early 1983 for Telemedia Broadcast Services Inc. (TBS), involved a detailed evaluation of the feasibility of carrying radio signals as low-level sub-carriers on the CHCH video channel distributed by Canadian Satellite Communications Inc. (CANCOM).

The network plan consists of conditioned, dedicated land lines from TBS's Toronto studios to Telesat's Brampton uplink; transmission via ANIK D, reception by TVROs owned by cable television companies in towns and cities in which there are TBS affiliates; and finally, distribution to these affiliates by conditioned land lines. The system planned would be capable of carrying two 7.5 kHz radio signals, either as two separate channels or as a stereo pair.

Island Cablevision Hearing

This project for Island Cablevision Ltd. involved the preparation of a rebuttal of a pole rate increase application by Maritime Electric Company and Island Telephone Company, and the appearance as a witness at the subsequent hearing.

Windsor RX Sites Analysis

This project, carried out in Spring 1983 for Canadian Satellite Communications Inc., consisted of a detailed evaluation of a receive site outside Windsor, Ontario, to assess its capability of receiving the four U.S. networks at a suitable signal level and quality for subsequent distribution over the ANIK D satellite from a satellite uplink station situated at the same site.

4 GHz/RX Comparison

Carried out for Canadian Satellite Communications Inc. (CANCOM), this project involved the comparison of 4GHz satellite receivers, suitable for use by CANCOM affiliates, including direct-to-home reception.

Preliminary Analysis of the Requirements to Carry a Single 8 kHz Radio Channel as a Subcarrier on an ANIK C Video Transponder

The purpose of this preliminary assessment, carried out for CKO News Radio, was to outline the concept of carrying a single 8 kHz radio channel as a subcarrier on an ANIK C video transponder; identify the various responsibilities and equipment required; give a preliminary assessment of the technical, business and regulatory risks of such a concept; and identify as far as possible the incremental and fixed costs of adding on such a radio subcarrier to an already in place 12 GHz video system.

Implementation of the DOC Role in Telecommunications and
Information Technology Standardization

The overall objective of this project, carried out for the Department of Communications, was to assist DOC in its coordinating role for National and International standards development with the newly formed Canadian Standards Association (CSA) Steering Committee on telecommunications by reflecting industry and user requirements in the area of telecommunications within the overall framework of information technology. A number of recommendations were made for reorganization within the Department.

Technical Audit of Satellite Distribution System

This project, carried out for Canadian Press/Broadcast News, consisted of the detailed technical system, policy, technical and financial audit of a satellite distribution network planned by Canadian Press/Broadcast News.

The planned network made use of a full transponder of ANIK D to distribute a complex digital bitstream, consisting of ten digital audio channels and a data channel multiplexed into a single bitstream.

The system consists of one or more uplinks and approximately 300 dedicated receive-only satellite earth stations.

AES Communications Networks Standards and Protocols

Carried out for the Atmospheric Environment Service, Environment Canada, this project involved the production of a comprehensive manual relating to the impact of specifications and standards on computer communications equipment and services. The manual also provides a list of the available reference material and a list of contacts in Governments and industry for further reference to those users who may wish to seek more in-depth information directly. As well, a seminar was given to brief interested users on the latest developments in standards and protocols and how to make best use of the manual.

Subjective Evaluation of Impaired Television
Pictures and Statistical Analysis

During this project, carried out for the Department of Communications, 100 volunteers subjectively rated television pictures which had been impaired by noise and interference. The interference is representative of the type to be expected in Direct Broadcast Satellite (DBS) systems, caused by simultaneous reception of adjacent channels on the same satellite or the same channel on another satellite. A viewing laboratory was set up and tests conducted within CCIR guidelines. Data collected was subjected to statistical analysis. The results are to be used by DOC in the planning of the Canadian DBS system and in negotiations with other administrations in Region 2.

Preliminary Technical Program Planning for Telemedia
Broadcast Services Inc. Satellite Distribution Network

This project, following on from a feasibility study carried out earlier, involved the detailed technical planning of the overall system, including uplink requirements, specifications for the space segment, and specifying, planning and negotiating the multiple receive segments.

Comparison of Video Signal Source Encoding and
Bandwidth Compression Techniques

This project, carried out for INTELSAT, involved performing a survey and a study of colour video signal source encoding and bandwidth compression techniques to provide INTELSAT with an in-depth view of the most suitable techniques for international exchange of TV programs via digital satellite links. Results were presented in the form of a Reference Manual on television signals and standards, including a detailed review of the various applicable encoding and bandwidth compression techniques available, together with advantages, disadvantages and comments on current availability and other relevant factors.

Definition Phase for the Data Collection System
for CANOPUS

The Company acted as a major subcontractor to SED Systems Inc. on the definition phase of the Data Collection System (DCS) of the NRC Canadian Auroral Network for Origins of Plasma in Earth's Neighbourhood (CANOPUS). Tasks included: confirmation of the performance requirements of the DCS, in terms of the recovery of instrument data; carrying out a very detailed communications tradeoff and cost analysis leading to a recommendation on the most cost-effective means of recovering site data and delivering it to the analysis network; provision of a preliminary design for the DCS; and the preparation of a DCS implementation plan.

Federal Business Development Bank Study

Carried out for the Federal Business Development Bank, this study involved a technical and viability assessment of a proposal submitted by a major telecommunications company.

Technical Assessment and Evaluation of a Cable TV
Company

This project, carried out for Télécâble Laurentien Inc., involved the valuation of the technical assets of three cable television systems. Methodologies for evaluation of systems containing a wide variety of equipment of varying ages and generations were worked out and implemented.

Submissions to the Department of Communications for
the Purchase of Cable Television Systems and
Interconnection of Networks

This project currently being carried out for Télécâble Laurentien Inc., involves the preparation of documentation for submission to the Department of Communications for CRTC approval of the interconnection of a number of adjacent cable television systems, and for the purchase of these adjacent systems.

Technical Assessment of Cable TV Companies

This project, carried out for Télécâble Laurentien Inc., involved the assessment of needs for upgrading three small cable television systems to 35 channel capacity.

Definition of Methodology for the Integration of a
Number of Adjacent Cable Television Systems

Currently being carried out for Télécâble Laurentien Inc., this project involves the technical integration of three small systems to an adjacent major system. This work includes the rationalization of headends, definition of new trunk systems, and the design of an across-water major trunk link.

Feasibility Study for a Canadian Communications,
Informatics and Space Research and Development Institute

This major study, carried out by a consortium consisting of PHILIP A. LAPP LIMITED and two other consulting

companies, involved an in-depth evaluation of the feasibility of modifying the mandate and operational methodology of the Communications Research Centre of the Department of Communications. The project involves detailed investigation of the needs of the Federal Government, Provincial Governments, and industry for research and development in the communications, information technology and space fields. Detailed recommendations for the future of the Communications Research Centre are called for, as are the preparation of business and implementation plans.

Development of Specifications for an
Airborne Microwave Radiometer

This project, carried out for the Atmospheric Environment Service of the Department of the Environment, involved the development of detailed functional specifications for a sophisticated ice reconnaissance airborne microwave radiometer operating in the 37.5 GHz and 90 GHz bands. This system takes advantage of state of the art developments in radiometer scanning and presentation techniques. In addition, the contract called for participation in the activities of AES's project steering committee.

Radarsat Economic Analysis

This project expanded on the previous study to provide ice and ocean economic inputs to a Price Waterhouse study covering potential economic benefits of Radarsat from both the ice/water, and land environments.

AES Graphics Requirements Survey

This project, carried out for the Computers and Communications Services Branch of AES, involved assessing the needs for a trans-AES standard graphics service, using the new National Computer Communication System. This assessment was achieved through detailed interviews of all AES senior personnel affected.

From these inputs National and Regional needs were identified; concerns were elucidated and varying views analysed. Conclusions were then drawn. A total of nine recommendations resulted from this work.

Communications Requirements Analysis for
the Ice Centre of AES

This analysis, completed in March 1984, was carried out to determine the data communications requirements of the Ice Centre over the next five to ten years and to compare various strategies and alternatives for meeting these requirements. This objective was achieved by determining the various types and volumes of data to be received and transmitted under various scenarios, the format of this data, the sources and end points for data and the purpose to which the data is being used.

Implementation of the Telemedia Broadcast Services
E.T.S. Satellite Distribution System

Currently being carried out for TBS this project involves radio distribution via the Anik D uplink at Brampton to 50 receive sites across the nation. A number of unique concepts are being implemented to maximize cost-effectiveness.

A Preliminary Technology Assessment of a
New Microwave Communications System

Carried out for IDEA Corporation, this project involved an in-depth technical review of a developmental microwave communications system, and a theoretical and practical assessment of its capabilities.

Study to Ascertain Canadian User Requirements
in Space Biology Applicable to a Space Station

Currently being carried out for the National Research Council of Canada, the purpose of this project is to make the best judgement at this time of the programs in space biology that should be pursued by Canada. The work involves carrying out a large number of interviews and holding a seminar for peer assessment, to provide verification of project requirements and permitting the recommendation of an effective and integrated program.

Cable TV Industry Rebuild Topics Document

This project, carried out for the Cable Telecommunications Research Institute, consisted of the detailed review, editing and reformatting of a wide range of research documents to form a book on the technical aspects of Cable System Rebuilds, reflecting the latest technology in the industry.

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