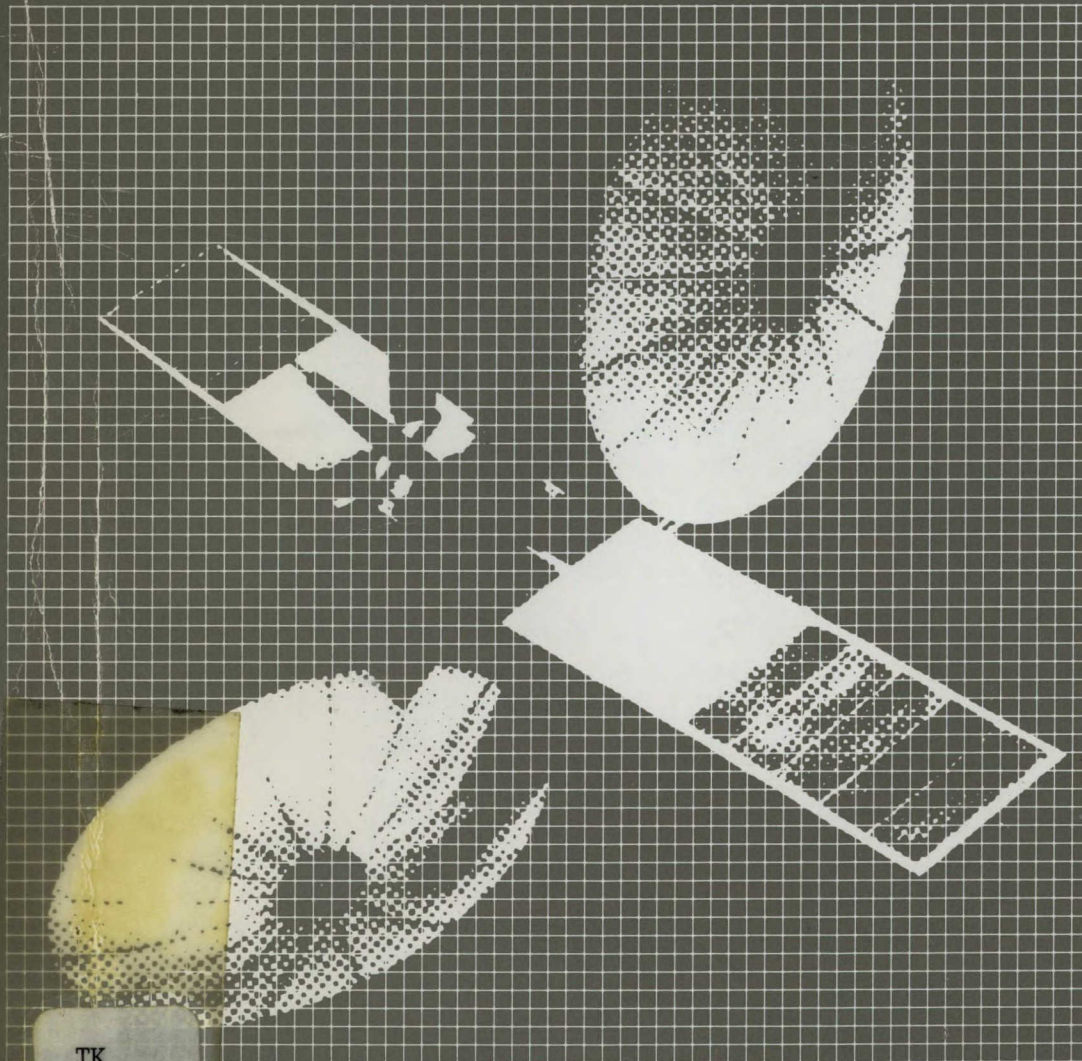




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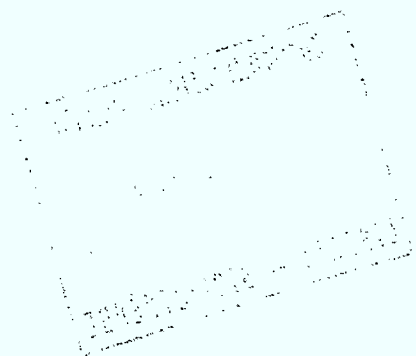
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1. Objectives and Background

The primary strategic objective of the MSAT Program is to foster the development of new mobile telecommunications services in Canada. In particular, the program is aimed at satisfying urgent national needs for improved public and civil government mobile communications to under-served areas of Canada, including resource development activities in remote areas.

As originally planned, this objective was to be accomplished in four major phases:

Phase A Concept Feasibility
Phase B Program and System Definition
Phase C/D Implementation
Phase E Post Launch Communications Program

MSAT Phase A Concept Feasibility

In September 1980, Cabinet approved a program of studies for FY1980/81 and FY1981/82 at a cost of \$2.2M to explore the use of satellites to improve mobile communications in Canada, and to define concepts and plans for a demonstration mobile communications satellite system (MSAT) for mobile users.

Twenty-three contracts were subsequently awarded to 16 Canadian firms to carry out Concept Feasibility studies. Results of Phase A studies indicated technical feasibility, the existence of a substantial market for satellite-assisted mobile communications services and significant user benefits. The MSAT demonstration program was to develop the services, markets, policies, technologies and industrial capabilities required to satisfy the need for improved communications in rural and remote areas. It was expected that the commercial system to follow MSAT in the 1990s would prove economically viable.

Phase B Program and System Definition

On 3 December 1981, Cabinet approved Phase B of the DOC element of the MSAT Program at a cost of \$8.0M in FY1982/83 and \$9.0M in FY1983-84. This was approved by Treasury Board on 29 July 1985. In late 1982 extension of MSAT Phase B was approved, with a modified cash flow of \$6.0M in FY 1982/83, \$7.5M in FY1983/84, and \$3.9M in FY 1984/85. In July 1983 Treasury Board approved a further revised cash flow of \$3.9M for FY 1982/83, \$9.6M for FY 1983/84, and \$3.9M for FY 1984/85. In March 1984, Treasury Board approved a \$450K cash flow rephasing from FY 1983/84 to FY 1984/85.

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| <p>The main objectives of MSAT Phase B were to define and design the first generation commercial MSAT system, develop the required technology conduct commercial viability and socio-economic benefit studies, define the post launch MSAT communications program, develop cooperative arrangements, define communications policy and regulatory issues, and prepare a proposal with class B cost estimates for the government costs in the implementation phases. The change in the original MSAT Program to a commercial-led program scenario and inherent delays for approval of phases in major contracts resulted in a need for a Bridging Phase of 17 months between the originally scheduled end of the major industrial contracts in July 1984 and the start of contracts for the Implementation Phase in December 1985. Major Bridging Phase objectives included the development of an MSAT policy, licensing and regulatory plan, proof of concept for critical technology items, demonstration of the quality of service, spectrum negotiations with the U.S., negotiations of cooperative agreements with Telesat, NASA and U.S. industry, and plans for submissions for the Implementation Phases.</p> <p>In June 1984 Treasury Board approved the MSAT Bridging Phase with funding of \$2.9M for FY 1984/85 and \$1.0M for FY 1985/86. However, significant delays in the expected completion of Phase B socio-economic studies and of the Telesat Commercial Viability Study and Business Proposal delayed completion of Phase B work by approximately six months. In addition, the FCC delayed issue of the U.S. Notice of Proposed Rule Making by about six months. The effect of these delays prevented an early start on technical development tasks in the Bridging Phase. This in turn resulted in a Treasury Board submission requesting approval to re-phase \$2.7M of MSAT Bridging Phase funds from FY 1984/85 to FY 1985/86, thereby increasing the FY 1985/86 budget to \$3.7M.</p> <p>Phase C/D Implementation</p> <p>The MOSST Interim Space Plan submission concerning the Space Station and MSAT was approved by the Cabinet Committee on Economic and Regional Development (CCERD) in March 1985. This approval included government support to MSAT Implementation Phases (C/D) with funding of \$6.7M for FY 1985/86 subject to the negotiation of cooperative business arrangements by the private sector and to final funding approval at the end of 1985. Therefore, DOC is proceeding with MSAT Phase C/D government support activity at the start of FY 1985/86. This supercedes the remaining Bridging Phase activity whose key elements will be incorporated as part of Phase C/D.</p> | | | |

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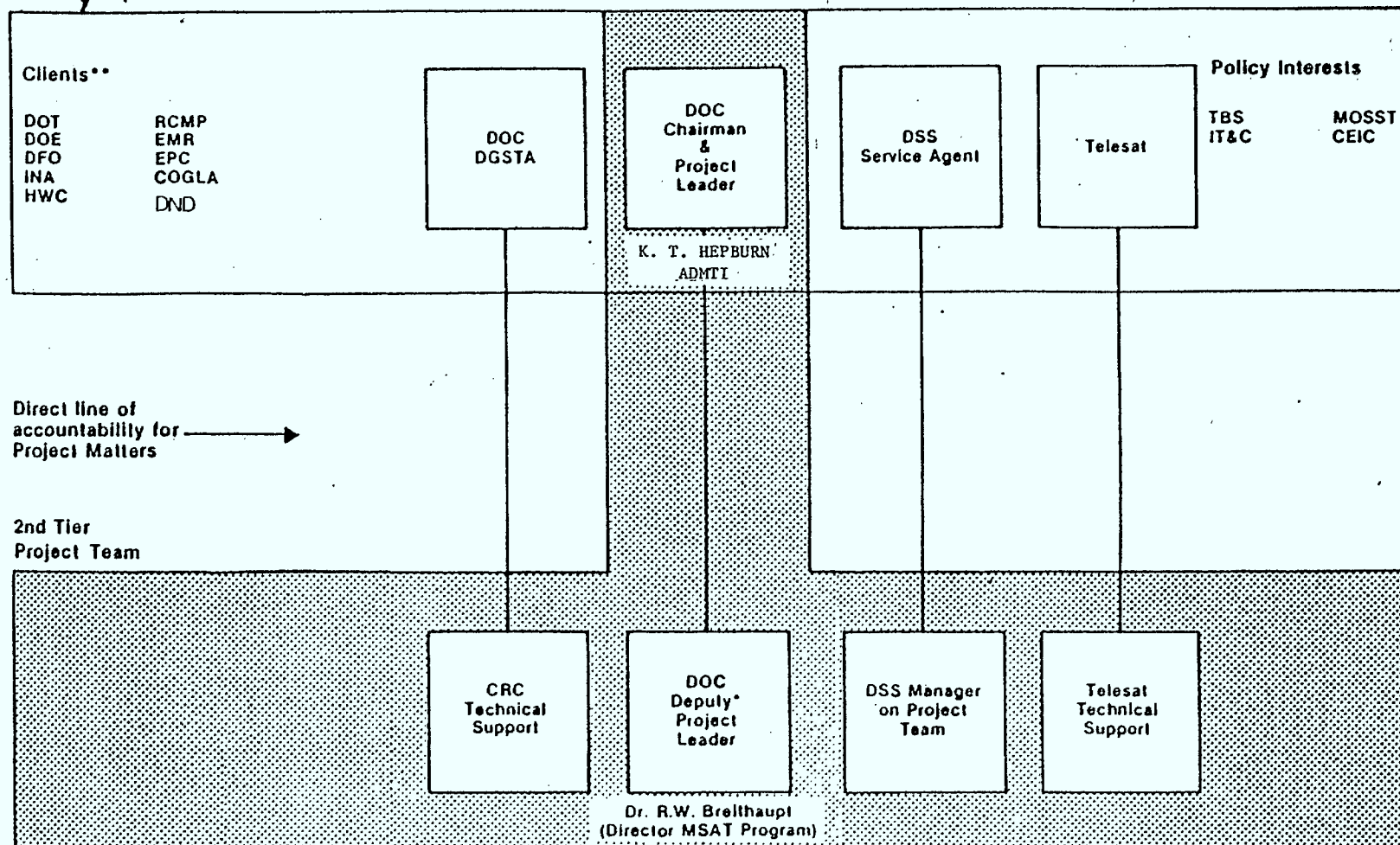
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MSAT Project Organization Structure

1st Tier
Planning/Implementation Committee



* See subordinate organization

** Major clients will also be represented on the project team through the working groups

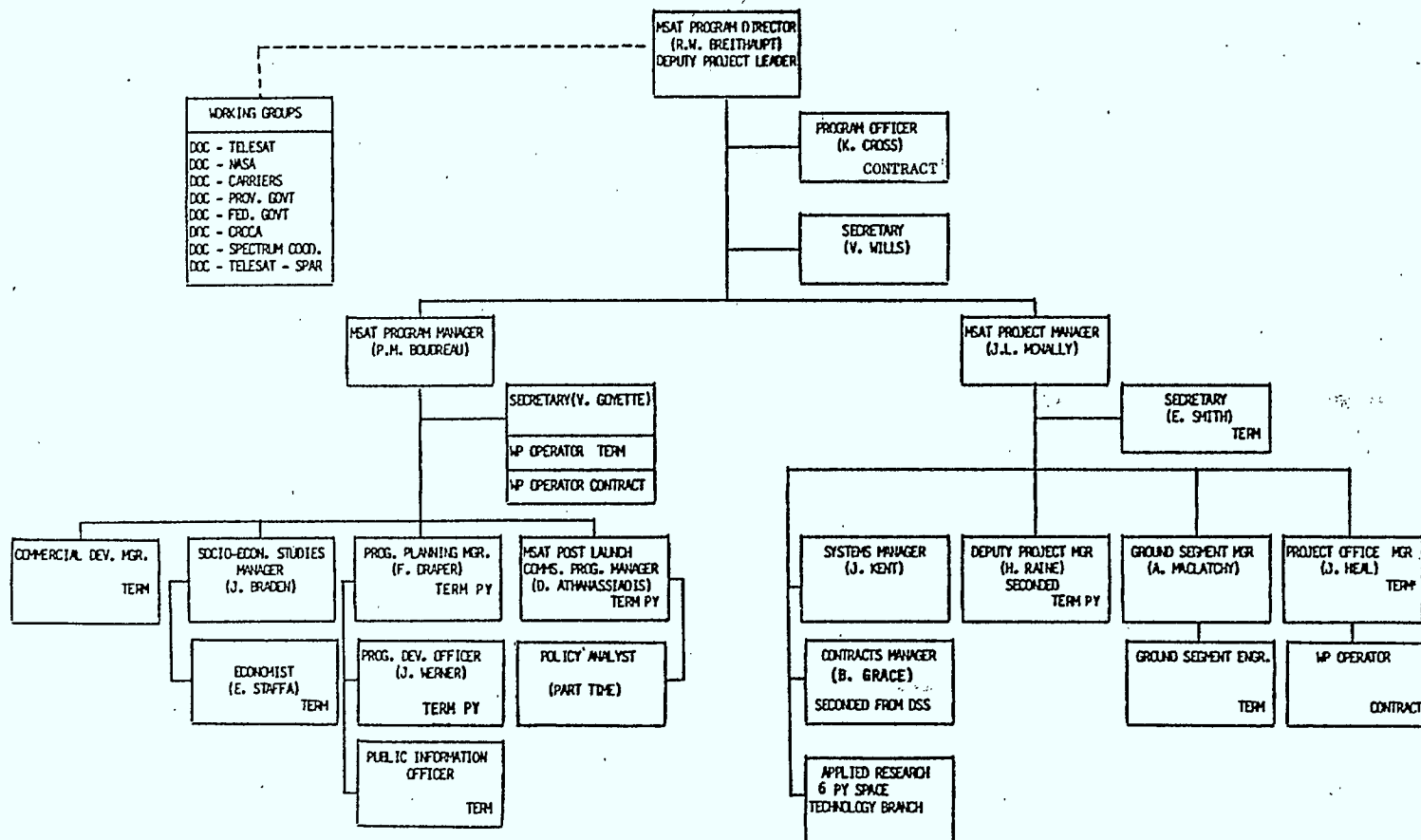
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MSAT PROJECT TEAM ORGANIZATION

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2. NARRATIVE SUMMARY AND OUTLOOK

Major effort during August/September was focussed on preparation of a draft MSAT Annex to the MOSST Space Plan. Copies of the draft document were tabled at the September MSAT Planning/Implementation Committee meeting for comment by members. Alternate forms of Telesat financial support were investigated and DRIE has confirmed in writing that DRIE can provide financial support in the ground segment development area from existing DIPP funds. The revised Telesat system requirements were received and the DOC MSAT study assumptions were revised accordingly. The updated assumptions were distributed to all socio-economic contractors and revised socio-economic benefits have been calculated and incorporated in the MSAT Annex revision process. Following DOC receipt of the revised Telesat business Proposal in late October, the MSAT Annex to the MOSST space Plan is planned for submission to MOSST in early November 1985.

In September 1985, the Ministers of DOC and DRIE agreed to the release of funds for major Spar contracts. Following Ministerial approval, \$1.236M in contracts were awarded to Spar: \$750K for further space technology development and \$486K for a cooperative spacecraft antenna testing program with Aerospatiale of France. On 18 September 1985 an industrial briefing was held at CRC on the 5 RFPs for the development of mobile ground terminals. 40 people attended, representing 15 Canadian Companies. The verbal responses from industry indicate that design, scheduling and pricing may be completed in FY85/86 but no hardware supplied. These delays in the placement of major MSAT contracts in the space and ground segment areas will result in an under spending of MSAT budgeted funds for FY85/86. A subsequent review of MSAT commitments and expenditures for FY85/86 has disclosed that a roll-over into FY86/87 of approximately \$1.0M will be required. The matter was discussed at the September PIC meeting and Mr. B. Corcoran of TBS assured the Committee that he could foresee no problems concerning the roll-over of MSAT FY85/86 funds.

Discussions are proceeding with NASA on the comparative costs and service at L-band. Both formal and informal discussions are also continuing with the FCC concerning domestic allocations and Canada/U.S. sharing issues.

The MSAT Program office will become severely understaffed by the end of October 1985 as the MSAT Program Manager (ENG-6) and a Space Systems Engineer (ENG-5) are assuming new duties elsewhere in DOC. These positions will take time to fill and secondments from other DOC areas are being explored to provide some relief during the transition period.

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During the next two months effort will be focussed on:

- exploration of alternate financial arrangements with Telesat and financial institutions
- pursue spectrum allocation and sharing discussions with the FCC to assure Canadian spectrum availability
- assessment of results of economic study contracts
- initiation of further development contracts for terminals.
- DOC issue of MSAT Spectrum Policy
- DOC issue of MSAT Telecommunications Policy
- MSAT PIC meeting 21 November 1985
- Completion of Phase B report (low priority)
- MSAT Policy Steering Committee meeting on 6 November 1985
- DOC/Telesat/Spar Senior Management meeting on 6 November, 1985
- Finalize MSAT Annex to MOSST space Plan Submission and submit to MOSST
- Participation in NASA/JPL Industry Briefing on 13-14 November 1985
- Extend DOC-Telesat MOU
- Prepare draft DOC/NASA MOU for long term cooperation.

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3. PROBLEM SUMMARY
(see previous reports for closed items)

| <u>Problem</u> | <u>Implications</u> | <u>Options</u> | <u>Action Taken</u> |
|--|--|---|--|
| 8. FCC may decide to coordinate no spectrum with Canada for satellite mobile service in 806-890 MHz band or may decide to allocate both UHF and L band frequencies. Canada-U.S. sharing of these bands is unknown. | <ul style="list-style-type: none"> - no commercial satellite mobile service in the 806-890 MHz band in Canada and/or the U.S. - many regional benefits lost if FCC assigns spectrum in a different band than DOC for mobile satellite services - Canada may have to consider a hybrid spacecraft option to achieve full Canada/US compatibility at UHF and L band - Canada may not achieve the needed equal sharing of the 800 MHz band (2 plus 2MHz for Canada) | <ul style="list-style-type: none"> - define overall strategy to obtain spectrum for MSAT - interact with US State Dept. through External Affairs - negotiate with or lobby the FCC to obtain equitable Canada-US sharing - support NASA and other initiatives with FCC - Spectrum Coordination Sub-Committee formed to coordinate a large number DOC activities for MSAT spectrum. - Study implementations of use of L band - press for early DOC-FCC sharing negotiation by DOC-FCC Technical Liaison Committee | <ul style="list-style-type: none"> - all options proposed |
| 13. Unknown timing of selection of US satellite operator. | <ul style="list-style-type: none"> - Telesat unable to negotiate final arrangement with US entity until FCC selection of US operator. - NASA unable to develop joint endeavour agreement - Uncertainty on final arrangements and system concept will persist until US operator selected. | <ul style="list-style-type: none"> - Telesat to proceed with discussions with present FCC applicants pending FCC decision. - Telesat to develop preferred regional scenario with National system fallback. - Final negotiations between Telesat and US entity to take place after government approval - Telesat to release principles of cooperation to US entities | <ul style="list-style-type: none"> - All options proposed. - FCC selection of U.S. entity expected by July 1986. |

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3. PROBLEM SUMMARY (CONT'D)

| <u>Problem</u> | <u>Implications</u> | <u>Options</u> | <u>Action Taken</u> |
|--|---|---|---|
| 17. Heavy work load prior to Space Plan Submission in November, and loss of key Program Office personnel in October. | <ul style="list-style-type: none">- difficulty in preparation for Space Plan Submission- late issue of contracts with technical development objectives not met- other program activities jeopardized by lack of PYs | <ul style="list-style-type: none">- immediate staffing of term appointments as planned- expedite contract requisition processing in DOC and DSS- obtain support from Telesat where feasible- seek secondments from other DOC areas for relief during transition period | <ul style="list-style-type: none">- first option denied- all other options |

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4. RESOURCE SUMMARY

FY 85/86 - MSAT Phase C/D

Funds

Collator 5183
Title

| | Project No. | Allotment | Outstanding Commitment \$K | Expenditure \$K | Free Uncommitted Balance \$K | FY 85/86 Estimated Expenditure \$K |
|-----------------------------|-------------|-----------|----------------------------------|--------------------|------------------------------------|---|
| MSAT Director | 65700 | 660 | 150 | 440* | 70 | 660 |
| MSAT Program - Management | 65701 | 100 | 16 | 56 | 28 | 100 |
| MSAT Telesat Proposal | 65705 | 120 | 116 | 4 | | 120 |
| MSAT PLCP | 65706 | 30 | | | 30 | 30 |
| MSAT Benefits | 65707 | 325 | 241 | 76 | 8 | 325 |
| MSAT FREQ-COORD/Public Info | 65708 | 100 | 25 | 28 | 47 | 100 |
| MSAT Spacecraft | 65710 | 2840 | 2604 | 266 | -30 | 2840 |
| MSAT Systems | 65720 | 100 | 19 | 12 | 69 | 100 |
| MSAT Ground | 65730 | 1570 | 1320 | 165 | 85 | 1570 |
| MSAT Applied Research | 65750 | 355 | 236 | 54 | 65 | 355 |
| MSAT Project Management | 65770 | 500 | 382 | 113 | 5 | 500 |
| TOTAL | | 6700 | 5109 | 1214 | 377 | 6700 |

* Includes \$295K for term salaries

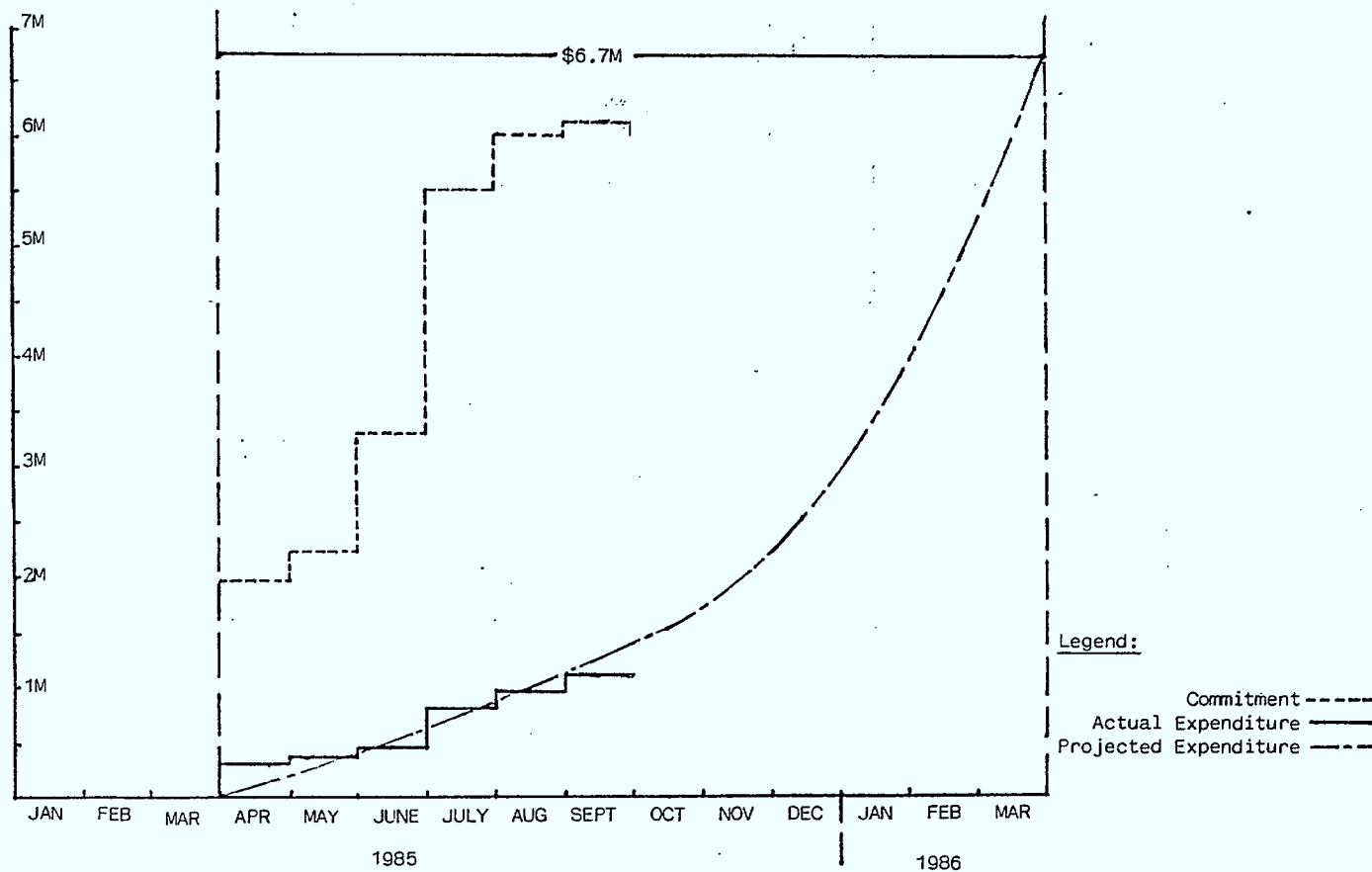
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MSAT PHASE C/D COMMITMENT AND EXPENDITURES



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STAFF

FY 85/86 Phase C/D Implementation

Total Person-Month Effort For - August/September 1985

| | Actual | | | | Planned Allocation | | | |
|-------------------------------|----------|------|----------|----------|--------------------|------|----------|-------|
| | Indet. | Term | Contract | Total | Indet. | Term | Contract | Total |
| MSAT DIRECTOR | 4.0 | - | 1.25 | 5.25 | 2.0 | 1 | | 3.0 |
| MSAT PROJECT Team | 12.1 (2) | 3.0 | 3.0 | 18.1 | 2.0 | 5.0 | 2 | 9.0 |
| MSAT PROGRAM Team | 6.0(1) | 11.0 | 3.3 | 20.3 | 3.0 | 6.0 | 1 | 10.0 |
| TOTAL | 22.1 (1) | 14.0 | 7.55 | 43.65 | 7.0 | 12.0 | 3 | 22.0 |
| DOC DGSTA support (Part time) | | | | 17.20(3) | | | | |

- Notes
1. Includes secondments with term backfill
 2. Includes 3.0PM of DGSTA and 3.1PM of SSC support. Total DGSTA support for August/September was 20.20 PM. (See Note 3)
 3. Includes 1PM recovered from MSAT Program for J. Sydor and 2 PM for Co-op students.

The variation of Person-Month consumption with time, for MSAT Phase B is shown on the following graph.

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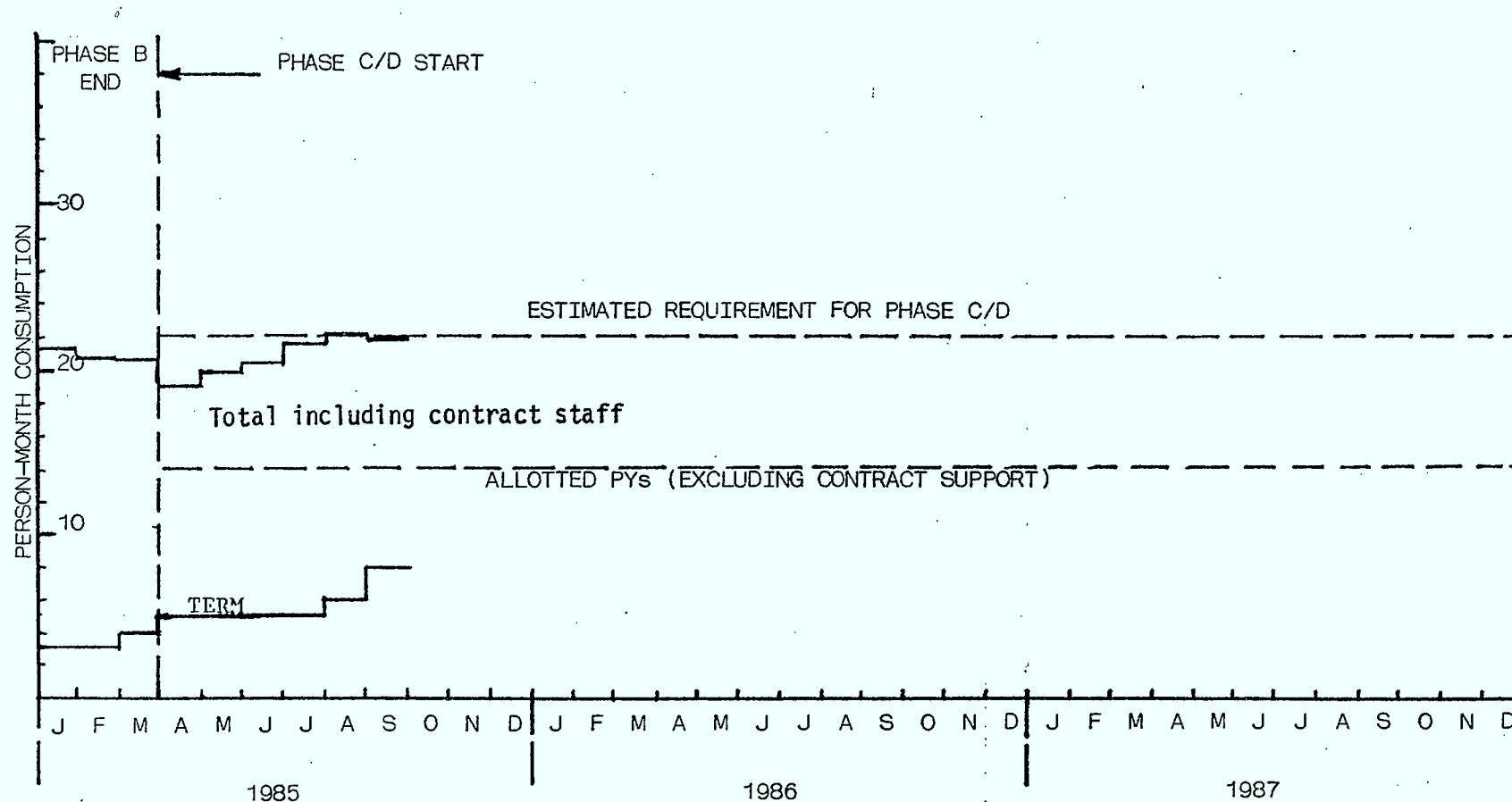
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MSAT PHASE C/D PROJECT PERSON-MONTH EFFORT



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| <p data-bbox="793 431 1306 467">5. <u>Progress and Schedule Summary</u></p> <p data-bbox="793 526 1696 620">This section provides an assessment of progress and schedule for individual work module elements as defined in the MSAT Phase C/D Project Brief.</p> <p data-bbox="793 652 1696 837">An overview of progress against milestones is shown on the following graphs. The first shows major events and the remainder show milestones for each Work Module element. Progress made on these work module elements during August/September is described in the remainder of this section.</p> | | | |

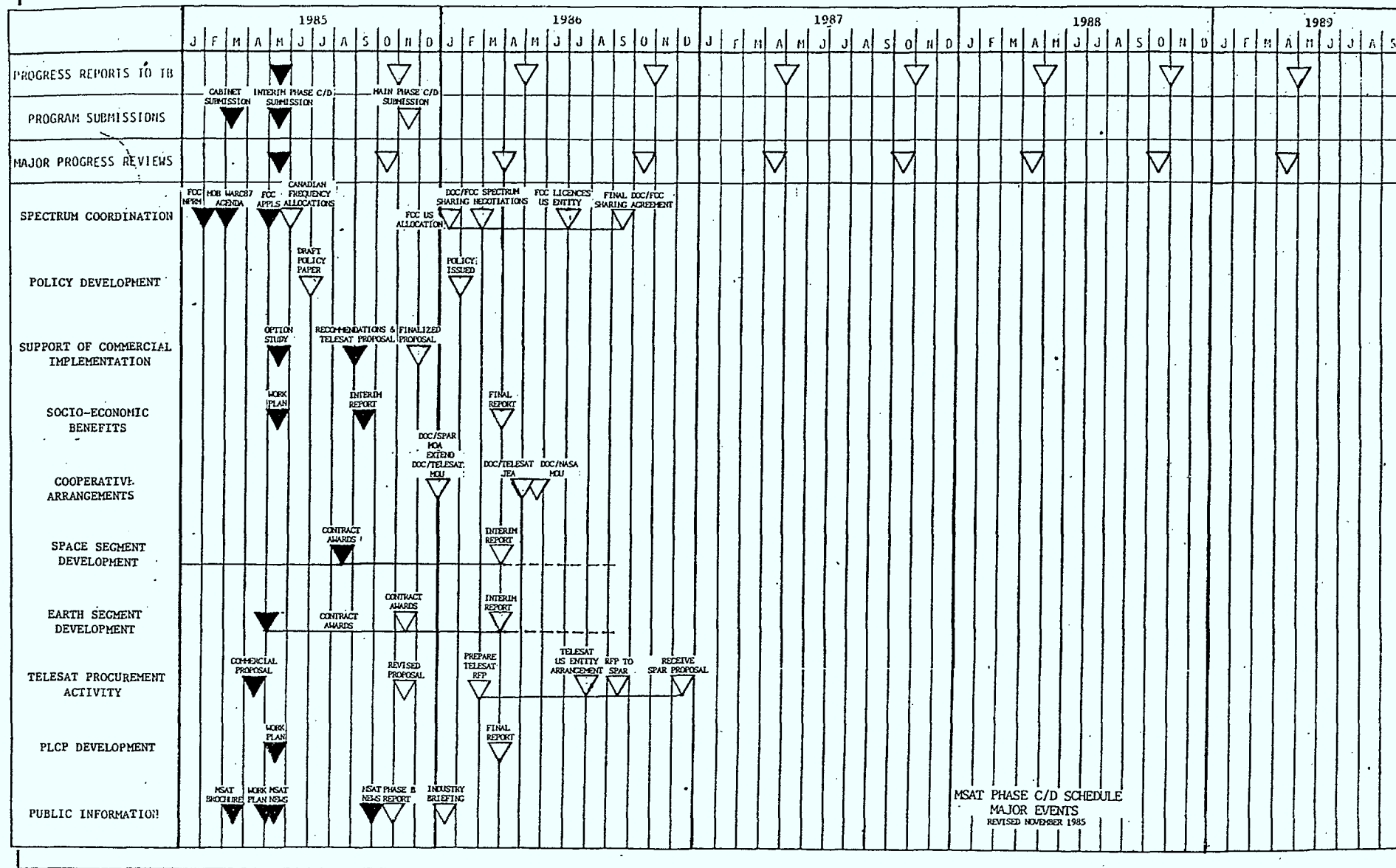
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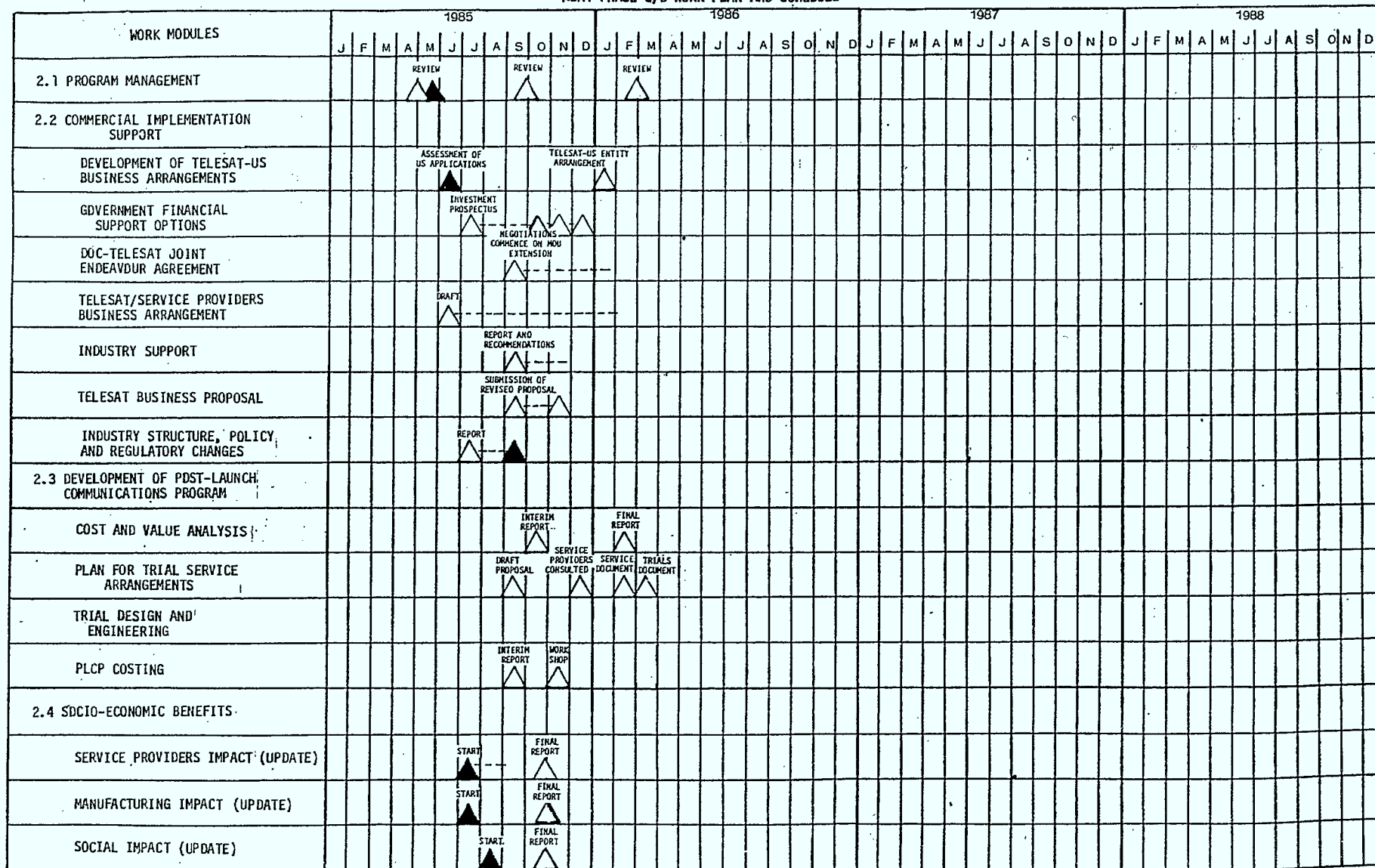
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MSAT PHASE C/D WORK PLAN AND SCHEDULE-



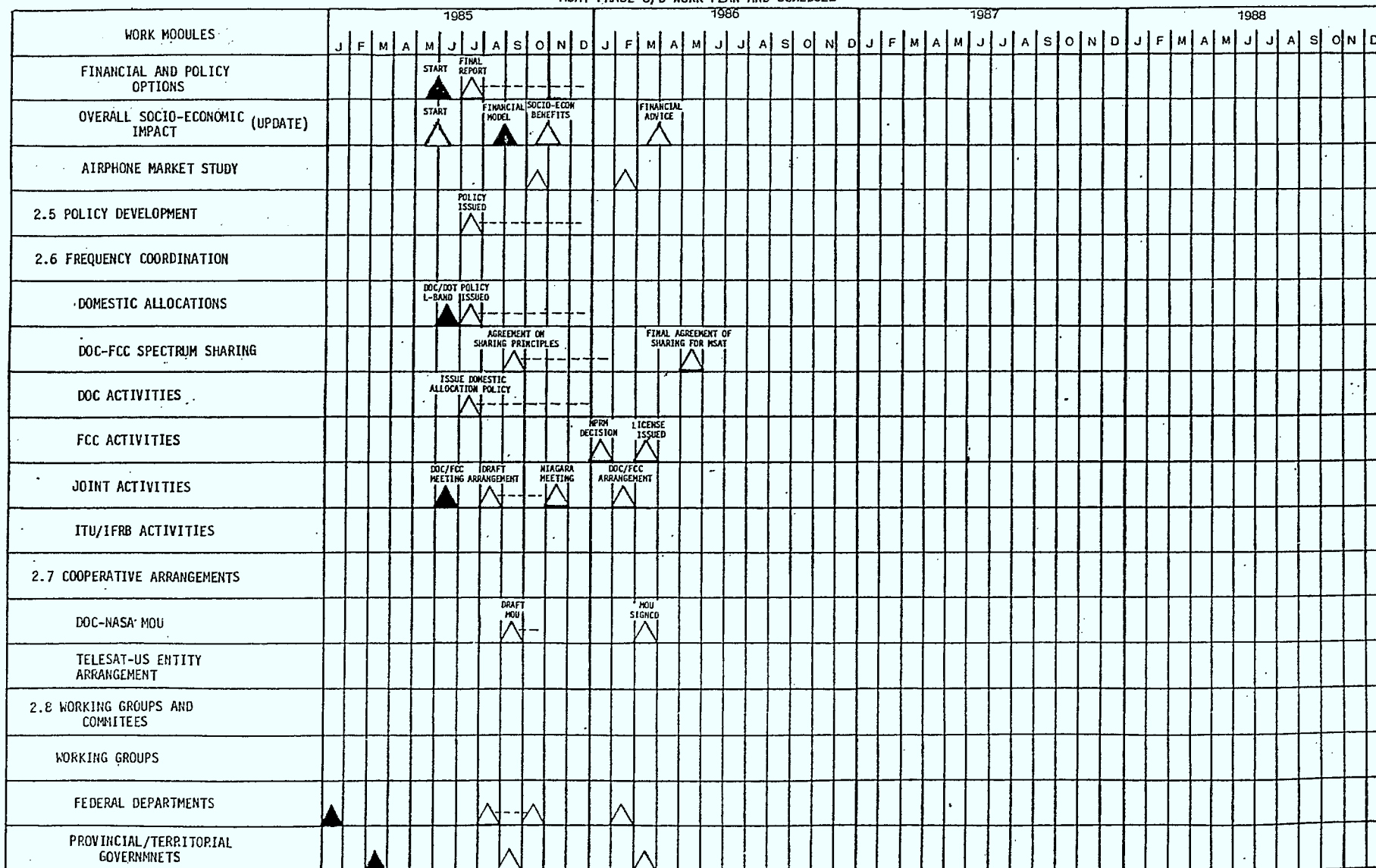
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| MSAT PHASE C/D WORK PLAN AND SCHEDULE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------|---|---|---|---|---|---|---|---|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|--|--|
| WORK MODULES | 1985 | | | | | | | | | | | | 1986 | | | | | | | | | | | | 1987 | | | | | | | | | | | | 1988 | | | | | | | | | | | | | |
| | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | | |
| TELECOM CARRIERS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RADIO COMMON CARRIERS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INDUSTRIAL USERS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DOC-NASA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DOC/TELESAT/SPAR SENIOR MANAGEMENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COMMITTEES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INTERDEPARTMENTAL PLANNING/IMPLEMENTATION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DOC POLICY STEERING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPECTRUM COORDINATION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.9 PROGRAM SUBMISSIONS: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TB SEMI-ANNUAL PROGRESS REPORT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CABINET SUBMISSIONS (FDR MOSST SPACE PLAN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TB SUBMISSIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.10 PUBLIC INFORMATION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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WM 2.0 MSAT PROGRAM DEVELOPMENT

WM 2.1 Program Management

Program management priorities during August to September were preparation of the MSAT input to the MOSST Long Term Space Plan, study of a new MSAT baseline scenario, and the development of spectrum options for discussion with the FCC.

The MSAT Phase B Report is nearing completion.

A francophone engineer began work on 14 August 1985.

WM 2.2 Commercial Implementation Support

D. Ford Associates provided a report on regulatory and rate setting issues regarding Telesat's provision of MSAT services. The appropriate format of Telesat's prom-forma financial statements has been discussed with Telesat. Financial analysis of possible arrangements between Telesat and private industry, with or without government support, remains to be completed under this contract.

Econosult Inc. has completed development work on a major portion of a model of the financial impacts of MSAT on Telesat. This model will portray all financial impacts of the different financial options, varied tax environments, and various financial management strategies.

WM 2.3 Post-Launch Communications Program

A methodology is being developed for analyzing the technical and market requirements by application sector and arriving at overall usage conclusions. Planning of applications engineering of participant's PLCP trials is continuing.

WM 2.4 Benefits and Industry Development

Phase C/D contractors (KVA, Woods Gordon and Econanalysis) have delivered the results of the modelling of the new baseline scenario. This scenario assumes joint Canada/U.S. procurement of dual-band satellites, primed by Spar. Significant markets are assumed under this scenario in the U.S. L-band only portion of the North American MSAT system. Results, when compared with Phase B, indicate a significant improvement in Telesat's NPV, due to increase in the expected life and capacity of the new baseline spacecraft.

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WM 2.5 Policy Development

The Telecommunications Policy on the provision of Mobile Satellite Services is still pending. Strong pressures have developed for the issue of this document in order to affirm DOC's commitment to MSAT.

WM 2.6 Frequency Coordination

Recent technical studies have demonstrated that service at L-band would cost 15-25% more than equivalent service at 800 MHz. Many major potential Canadian users are opposed to such a prospect. Inputs from the U.S. reveal that the FCC has misinterpreted Canada's silence on spectrum issues as a sign of indifference towards MSAT. A series of activities has been planned for November and December to ensure that the Canadian position on spectrum is clearly understood by the U.S.

WM 2.7 Management of Cooperative Arrangements

A meeting with NASA in Washington is planned for October 1985 to discuss technical and policy issues impacting spectrum allocation and to coordinate the appropriate timing of the signing of the DOC-NASA MOU scheduled for the first half of 1986.

WM 2.8 MSAT Working Groups and Committees

A DOC-Federal Departments working group meeting is planned in the next two months to discuss the details of the MSAT submission to the Long Term Space Plan.

WM 2.9 Program Submissions

The MSAT Annex to the MOSST Space Plan is being revised due to new proposals submitted by Telesat. The draft document is now expected to be submitted to MOSST in October with the final draft submitted in late November 1985.

WM 2.10 Public Information

MSAT Newsletter #5 has been issued and the Newsletter mailing list has been updated. Two large MSAT models are being made, with one to be displayed in the Minister's office. The design of the MSAT desk top model has been approved and 100 models are being ordered for use in MSAT promotional activities. The MSAT Shotel Exhibit Package has been sent to all Regional Offices. This package will enable Regional Offices to promote MSAT at regional shows and exhibitions.

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WM 3.0 MSAT Technology Development

WM 3.1 Project Management

In August the Telesat Engineering support Contract was amended to provide additional Engineering support through 31 March 1986. The Telesat L-Band Study results are being revised with contract completion now scheduled for the end of September.

The Project Office Manager position has been converted from a contract to Term status.

Finalization of DGSTA support Statements of Requirements has been further deferred because of other priorities; DGSTA is continuing to fulfill MSAT requirements.

WM 3.2 System Engineering Support

In September a Spar/Telesat/DOC meeting was held to coordinate effort on MSAT. This meeting is to be followed up with monthly gatherings, with the next meeting scheduled just prior to the NASA/JPL Industry Briefing on 13-14 November 1985.

Mr. Gary Noreen of Transit Communications Inc. (TCI), one of the FCC NPRM filers, met with DOC representatives to discuss mobile satellite services. TCI is proposing an L-Band only system and are considering a possible pilot project with Inmarsat, followed by a piggyback payload to initiate service.

A meeting was held with Telesat in September 1985 to discuss progress on the tasks assigned under the Engineering Support contract.

WM 3.3 Space Technology Development

The agreement of the DOC and DRIE Ministers has released funds to proceed with major Spar contracts. Spar is proceeding with Phase C development and is negotiating with Aerospatiale on the antenna testing contract for \$487K.

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The Spar/DOC/Telesat coordination meetings have assisted in establishing a basic understanding of the potential spacecraft requirements. Spar is working to improve the linearity and efficiency of the high power amplifier. Efficiency will become more important in the dual-band concept, as bandwidth may no longer be a constraint.

Spar's assessment of the U.S. proposals indicate that Skylink and HCI are the most technically viable.

WM 3.4 Earth Segment Technology Development

Although the contract expired in June 1985, the Final Report on the ADGA/CMC HCSSB Mobile Terminal contract has still not been received. The Report is now expected in October 1985.

On 16 September 1985, a bidders conference was held for a briefing to industry on the five RFPs for ground terminal development. A total of 40 people attended representing 15 interested companies. Industry expressed concern at pushing to meet the extremely tight delivery date. The Statements of Work for the RFPs and associated specifications were to be made available in both official languages.

WM 3.5 Applied Research

The ACCSSB and LPC voice test tapes were demonstrated at the September PIC meeting under different fade conditions and received a favourable response. BNR has commenced subjective tests with the test tapes developed at CRC and preliminary results are expected in November 1985.

In-house antenna, ACCSSB and LPC prototype radio development is proceeding at CRC with good progress to date. A contract requisition (\$136K) has been awarded to CMC for Phase 2 of the Road Vehicle Antenna contract.

During the report period a Swedish Telecom Radio delegation was given a presentation on MSAT at CRC and on 19 September Arianespace met with DOC personnel at CRC for discussions on launch vehicles.

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|--|--------------------------------|---|------------------------|
| <u>PHASE C/D EXPENDITURES BY WORK MODULE</u> | | | |
| | | | |
| WM | Item | FY85/86 (Estimated) (000s) | |
| 1.0 | <u>DIRECTOR</u> | | |
| | DSS Contract Fees | 130 | |
| | Term Salaries | 295 | |
| | Contract Salaries | 99 | |
| | Misc. | 136 | |
| | Sub Total | <u>660</u> | |
| 2.0 | <u>PROGRAM DEVELOPMENT</u> | | |
| | Management | 100 | |
| | Commercial Implementation | 120 | |
| | PLCP | 30 | |
| | Socio-Economic | 325 | |
| | Public Information | 100 | |
| | Sub Total | <u>675</u> | |
| 3. | <u>PROJECT DEVELOPMENT</u> | | |
| | Space Segment | 2840 | |
| | System Support | 100 | |
| | Ground Segment | 1570 | |
| | Applied Research | 355 | |
| | Management & Technical Support | 500 | |
| | Sub Total | <u>5365</u> | |
| | TOTAL | <u>6700</u> | |

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MSAT CONTRACT PLAN

| ITEM | FY 85/86 | | LATER FYs | SOURCE | PROV. | NOTES/COMMENTS |
|-----------------------------|---------------|---------------|--------------|--------|-------|----------------|
| | PRIORITY 1 | PRIORITY 2 | | | | |
| DIRECTOR 65700 | 660 | | | | | |
| 65701-65708 PROGRAM | 675 | | | | | |
| | | | | | | |
| 65710 SPACE SEGMENT | 2840 | 750 | | | | |
| 65720 SYSTEM SUPPORT | 100 | 350 | | | | |
| 65730 GROUND SEGMENT | 1570 | 275 | | | | |
| 65750 APPLIED RESEARCH | 355 | 70 | | | | |
| 65770 PROJECT MANAGEMENT | 500 | 100 | | | | |
| | | | | | | |
| TOTALS | 6700 | 1545 | | | | |

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MSAT CONTRACT PLAN

DIRECTOR 5183-65700

| ITEM | FY 85/86 | | LATER FYs | SOURCE | PROV. | CONTRACT STATUS | NOTES/COMMENTS |
|--|---------------|---------------|--------------|-----------------------|-------|-------------------|---|
| | PRIORITY 1 | PRIORITY 2 | | | | | |
| CONTRACT SUPPORT | 99 | | | SHARON | ONT. | CONTRACT IN PLACE | CONTRACT EXTENDED FROM 1 SEPTEMBER '85 TO 31 MARCH '85 |
| OFFICE SYSTEMS EQUIPMENT | 50 | | | CANADIAN COMPANIES | | | |
| DSS FEES | 130 | | | | | | |
| TERM SALARIES | 295 | | | | | | |
| TEMPORARY HELP, TRAVEL, PRINTING, MISC. | 86 | | | | | | |
| | | | | | | | |
| TOTAL | 660 | | | | | | |

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MSAT CONTRACT PLAN

PROGRAM 65701-65708

| ITEM | FY 85/86 | | LATER FYs | SOURCE | PROV. | CONTRACT STATUS | NOTES/COMMENTS |
|--|---------------|---------------|--------------|---------------------------|--------------|----------------------------------|--|
| | PRIORITY 1 | PRIORITY 2 | | | | | |
| MSAT BUSINESS PROPOSAL | 120 | | | TELESAT | ONT. | CONTRACT IN PLACE | EXISTING CONTRACT |
| SERVICE PROVIDER IMPACT | 15 | | | KVA | ONT. | CONTRACT IN PLACE | UPDATE OF PHASE B CONTRACT RESULTS.(SEPARATE CONTRACT, SAME CONTRACTOR) |
| MANUFACTURING IMPACT STUDY | 30 | | | WOODS GORDON | ONT. | CONTRACT IN PLACE | UPDATE OF PHASE B CONTRACT RESULTS.(SEPARATE CONTRACT, SAME CONTRACTOR) |
| SOCIAL IMPACT STUDY | 10 | | | WESCOM | B.C. | CONTRACT IN PLACE | UPDATE OF PHASE B CONTRACT RESULTS.(SEPARATE CONTRACT, SAME CONTRACTOR) |
| OVERALL SOCIO-ECONOMIC STUDY | 100 | | | ECONANALYSIS ECONOSULT | ONT. QUE. | CONTRACT IN PLACE | UPDATE OF PHASE B CONTRACT RESULTS AND EXAMINE TAX IMPLICA- TIONS.(SEP.CONT,SAME CONTRACTOR) |
| PUBLIC INFORMATION CONTRACTS | 110 | | | CANADIAN COMPANIES | | | |
| PROGRAM MANAGEMENT CASUAL SUPPORT, TRAVEL, PRINTING, MISC. | 170 | | | | | | |
| AIRPHONE MARKET STUDY | 25 | | | SKYTEL | | REQUISITION IN PREPARATION | |
| INSTITUTIONAL/REGULATORY ANALYSIS | 15 | | | D. FORD ASSO. | ONT. | CONTRACT IN PLACE | |
| TELCO IMPACT STUDY | 80 | | | TELECOM CANADA | ONT. | CONTRACT IN PLACE | EXISTING CONTRACT |
| <u>TOTALS</u> | 675 | | | | | | |

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MSAT CONTRACT PLAN

| ITEM | FY 85/86 | | LATER FYs | SOURCE | PROV. | CONTRACTS(S) STATUS | NOTES/COMMENTS |
|---|---------------|---------------|--------------|-----------------------|-----------------|--|---|
| | PRIORITY 1 | PRIORITY 2 | | | | | |
| SPACE SEGMENT 65710 | | | | | | | |
| SPAR PHASE C/D | 1436 | 350 | | SPAR | QUE. | CONTRACT IN PLACE | ESTIMATE/D WORK \$400-500K MORE THAN AVAILABLE FUNDS. INADEQUATE FUNDING. MAY HAVE TO DE-SCOPE. |
| SPAR/AEROSPATIALE | 486 | 200 | | SPAR/ AEROSPATIALE | QUE./ FRANCE | CONTRACT IN PLACE | \$250K TO AEROSPATIALE (NO SPAR MARKUP) |
| PIM TEST FACILITY | 420 | 100 | | CANADIAN COMPANIES | | REQUISITIONS PLACED FOR \$150K OF HDWRE. \$150K REQUIRED FOR HPA | MAINLY HARDWARE, INCLUDES 5K FROM PHASE B |
| ALTERNATE PAYLOAD DEVELOPMENT | 488 | 100 | | COMDEV | ONT. | CONTRACT IN PLACE | |
| MISC. | 10 | | | CANADIAN COMPANIES | | | HARDWARE |
| TOTALS 65710 | 2840 | 750 | | | | | |
| SYSTEM SUPPORT 65720 | | | | | | | |
| COMMUNICATIONS SIMULATION AUGMENTATION | 23 | 50 | | CANADIAN COMPANIES | | REQUISITIONS RAISED FOR \$24K | HARDWARE |
| PHASE NOISE SIMULATOR | 17 | | | CANADIAN COMPANIES | | REQUISITIONS FOR \$15K WITH ADMTI FOR APPROVAL | HARDWARE |
| DAMA SIMULATION DEVELOPMENT | 60 | 125 | | CANADIAN COMPANIES | | SOW AWAITING INPUT FROM TELESAT | INPUT FROM TELESAT TASK WILL NOT BE RECEIVED UNTIL END OF FY85/86 |
| FREQUENCY CONTROL PLAN & SIMULATION | | 175 | | | | | |
| TOTALS 65720 | 100 | 350 | | | | | |

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MSAT CONTRACT PLAN

| ITEM | FY 85/86 | | LATER FYs | SOURCE | PROVINCE | CONTRACT STATUS | NOTES/COMMENTS |
|--|--------------------------|---------------|------------------------|--------------------|----------|---------------------------------|--|
| | PRIORITY 1 | PRIORITY 2 | | | | | |
| GROUND SEGMENT 65730 | | | | | | | |
| VOICE QUALITY STUDY | 68 | 50 | | BNR | ONT. | CONTRACT IN PLACE | EXISTING CONTRACT |
| ROAD VEHICLE ANTENNA HI-GAIN | 382 | 50 | | CMC COMDEV | ONT. | CONTRACT IN PLACE | PHASE I \$130K. ON COMPLETION OF PHASE I, PHASE II WILL BE IMPLEMENTED AT COST OF \$252K |
| GROUND SEGMENT DEVELOPMENT | 400 (LPC) 400 (ACSSB) | | MODELS AT L-BAND | COMPETITIVE BID | | OUT FOR BIDS | DEVELOPMENT OF LPC & ACSSB PROTOTYPE VOICE TERMINALS |
| DATA TERMINAL DEVELOPMENT | 200 | 175 | | COMPETITIVE BID | | OUT FOR BIDS | 3 TERMINALS INCLUDING DATA COLLECTION PLATFORM & PAGING |
| MCGEEHAN ACSSB BOARDS | 75 | | | MCGEEHAN | ENGLAND | CONTRACT IN PLACE | EXISTING CONTRACT |
| RADIOS FOR EVALUATION AND DEMONSTRATION | 45 | | | | | REQUISITIONS SUBMITTED | HARDWARE |
| TOTALS 65730 | 1570 | 275 | | | | | |
| APPLIED RESEARCH 65750 | | | | | | | |
| IN-HOUSE ANTENNA DEVELOPMENT AND TEST | 100 | 70 | | | | \$100K FOR CRC LAB EQUIPMENT | |
| MOBILE TEST PLATFORM | 22 | | | | | AT DSS FOR ACTION | |

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MSAT CONTRACT PLAN

| ITEM | FY 85/86 | | LATER FYs | SOURCE | PROV. | CONTRACT STATUS | NOTES AND COMMENTS |
|---|---------------|---------------|--------------|----------------------------|--------|--|--|
| | PRIORITY 1 | PRIORITY 2 | | | | | |
| DIGITAL TERMINAL DEVELOPMENT (PARTS) | 70 | | | | | | HAROWARE |
| DIGITAL TERMINAL DEVELOPMENT (CONTRACT) | 35 | | | SIMON FRASER UNIVERSITY | B.C. | CONTRACT IN PLACE | |
| LPC RADIO ENCRYPTION | 37 | | | UNIVERSITY OF WATERLOO | ONT. | CONTRACT IN PLACE | |
| ACSSB TERMINAL DEVELOPMENT | 85 | | | | | | HARDWARE |
| ANTENNA ROAD TESTING | 6 | | | | | | REQUIREMENT TBD |
| TOTALS 65750 | 355 | 70 | | | | | |
| PROJECT MANAGEMENT 65770 | | | | | | | |
| TELESAT ENGINEERING SUPPORT | 425 | 100 | | TELESAT | ONT. | APPROVED CRB 21 JUNE WITH MINISTER | INCLUDES FCC PROPOSAL EVALUATION EXISTING CONTRACT FOR \$120K FROM PHASE B |
| ESA/ESTEC SUPPORT | 9 | | | ESTEC | EUROPE | CONTRACT IN PLACE | EXTENSION OF EXISTING CONTRACT |
| TRAVEL, PRINTING, MISC. CASUAL TEMP. SUPPORT | 66 | | | | | | |
| TOTALS 65770 | 500 | 100 | | | | | |

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ANNEX B

4. RESOURCE SUMMARY

Funds

FY 80/81 - Phase A Studies

| Title | Project No. | Allotment | O/S Commitment | Expenditure | Free. Balance |
|----------------------|-------------|-----------|----------------|-------------|------------------|
| MSAT Project Studies | 4726-65605 | 430,000. | | 430,000. | |
| MSAT Program Studies | 4182-37310 | 70,000. | | 70,000. | |

FY81/82 - Phase A Studies

| Title | Project No. | Allotment | O/S Commitment | Expenditure | Free Uncommitted Balance |
|---------------------------|-------------|------------|----------------|-------------|--------------------------------|
| MSAT Project Studies | 4726-65605 | 1,274,760. | 0 | 1,221,228. | |
| NIP (MSAT related items) | 4458-37170 | 58,339. | 0 | 53,300. | |
| ARAD (MSAT related items) | 4458-37170 | 920,000. | 0 | 805 000. | |
| MSAT Program Studies | 4182-37310 | 340,000. | 1,800.07 | 344,929.62 | -4,929.62* |
| Term Salaries (3PY) | | 85,240. | | 85,240. | |

Total MSAT Phase A Allocation \$2,200,000.

* covered by surplus in MSAT Project Studies

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ANNEX C

RESOURCE SUMMARY

FY 82/83 - Phase B Studies

Funds

Collator 5182 NCRFS Data

| | Project No. | Allotment | Outstanding Commitment \$K | Expenditure \$K | Free Uncommitted Balance \$K | FY83/84 Estimated Expenditure \$K |
|--|-------------|-----------|----------------------------------|--------------------|------------------------------------|--|
| MSAT Director | 65700 | 910* | | 682* | 228 | 658 |
| MSAT Project - Spacecraft | 65710 | 4360 | | 2703 | 1657 | 2646 |
| MSAT Project - Systems | 65720 | 680 | | 152 | 528 | 152 |
| MSAT Project - Ground | 65730 | 415 | | 4 | 411 | 61 |
| MSAT Project Product & Assurance | 65740 | | | | | |
| MSAT Project Technology development | 65750 | 420 | | 37 | 383 | 57 |
| MSAT Project Management | 65770 | 465 | | 113 | 352 | 129 |
| MSAT Program Management | 65701 | 30 | | 81 | -51 | 67 |
| MSAT Program Commercial Viability | 65702 | 480 | | 25 | 455 | 25 |
| MSAT Program Communications Prog. & Policy | 65703 | 130 | | 50 | 80 | 50 |
| MSAT Program Development | 65704 | 110** | | 48 | 62 | 55 |
| TOTAL DOC | | 8000** | | 3895 | 4105 | 3900 |

Collator 0870

| | | | | | |
|--------------------------------|-------|-----|-------|------|-----|
| MSAT EHF Space Segment - Comm. | 65760 | 285 | 130.0 | 155. | 0 |
| MSAT EHF RF | 65761 | 110 | 3.0 | 107. | 0 |
| MSAT EHF Space Segment TTCC | 65762 | 105 | 105.0 | 0. | 0 |
| MSAT EHF Ground Control TTCC | 65763 | 65 | 0. | 0. | 65 |
| MSAT EHF System Engineering | 65764 | 60 | 0. | 0. | 60 |
| MSAT EHF Management | 65765 | 75 | 0. | 11. | 64 |
| TOTAL DND | | 700 | 238. | 273. | 189 |

* Includes \$380K for term salaries

** Includes \$37.5K transfer to DGIS

See Annex A for MSAT Phase B fund allocations by work plan and year.

*** FY82/83 Allotment to be reduced from \$8M to 3.9M by cash flow change Submission to TB in June 1983.

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APPENDIX D

4. RESOURCE SUMMARY

Fy 83/84 - Phase B Studies

Funds

| Collator 5182 Title | Project No. | Allotment | Outstanding Commitment \$K | Expenditure \$K | Free Uncommitted Balance \$K |
|--|-------------|-----------|----------------------------------|--------------------|------------------------------------|
| MSAT Director | 65700 | 707* | 0 | 799 | -92 |
| MSAT Project - Spacecraft | 65710 | 4912 | 0 | 4864 | 48 |
| MSAT Project - Systems | 65720 | 338 | 0 | 315 | 23 |
| MSAT Project - Ground | 65730 | 1244 | 0 | 1234 | 10 |
| MSAT Project Product & Assurance | 65740 | | | | |
| MSAT Project Technology development | 65750 | 130 | 0 | 129 | 1 |
| MSAT Project Management | 65770 | 412 | 0 | 424 | -12 |
| MSAT Program Management | 65701 | 103 | 0 | 114 | -11 |
| MSAT Program Commercial Viability | 65702 | 1180 | | 1151 | 29 |
| MSAT Program Communications Prog. & Policy | 65703 | 32 | 0 | 32 | 0 |
| MSAT Program Development | 65704 | 92 | 0 | 88 | 4 |
| TOTAL DOC | | 9150** | 0 | 9150 | 0 |

* Includes \$420K for term salaries. This was underspent by 71K

** Of the original \$9.6M allocation, \$450 was rolled over to FY 84/85.

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4. RESOURCE SUMMARY

FY 84/85 - Phase B Studies

ANNEX E

Funds

Collator 5182
Title

| | Project No. | Allotment | Outstanding Commitment \$K | Expenditure \$K | Free Uncommitted Balance \$K |
|--|-------------|-----------|----------------------------------|--------------------|------------------------------------|
| MSAT Director | 65700 | 363* | | 433* | -77 |
| MSAT Program - management | 65701 | 100 | | 121 | -23 |
| MSAT Program Commercial Viability | 65702 | 957 | | 714 | 233 |
| MSAT Program Communications Prog. & Policy | 65703 | | | | |
| MSAT Program Development | 65704 | 25 | | 42 | -17 |
| MSAT Project - Spacecraft | 65710 | 1746 | | 2066 | -320 |
| MSAT Project - Systems | 65720 | 282 | | 286 | -6 |
| MSAT Project - Ground | 65730 | 588 | | 435 | 148 |
| MSAT Project - Technology Development | 65740 | | | 91 | -91 |
| MSAT Project Management | 65770 | 289 | | 136 | 153 |
| TOTAL DOC | | 4350 | 0 | 4350 | 0 |

* Includes \$220K for term salaries

See Annex A for MSAT Phase B fund allocations by work plan year

See Annexes, for financial resource summaries of previous FYs.

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4. RESOURCE SUMMARY

FY 84/85 - Bridging Phase

Funds

| Collator 5183 Title | Project No. | Allotment | Outstanding Commitment \$K | Expenditure \$K | Free Uncommitted Balance \$K | FY 84/85 Estimated Expenditure \$K |
|-----------------------------|-------------|-----------|----------------------------------|--------------------|------------------------------------|---|
| MSAT Director | 65700 | 310 | 2 | 214* | 94 | 10 |
| MSAT Program - Management | 65701 | 40 | 1 | | 39 | |
| MSAT Telesat Proposal | 65705 | 340 | | | 340 | |
| MSAT PLCP | 65706 | 50 | | | 50 | |
| MSAT Benefits | 65707 | 80 | | | 80 | |
| MSAT FREQ-COORD/Public Info | 65708 | 90 | | | 90 | |
| MSAT Spacecraft | 65710 | 1005 | | | 1005 | |
| MSAT Systems | 65720 | 200 | 2 | 2 | 196 | |
| MSAT Ground | 65730 | 515 | | | 515 | |
| MSAT Applied Research | 65750 | 250 | | 40 | 210 | |
| MSAT Project Management | 65770 | 20 | | 6 | 14 | |
| | | 2900 | 5 | 262(1) | 2633 | 10 |

* Includes \$200K for term salaries

(1) \$262K expenditure, \$52K to be charged to collator 5182



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