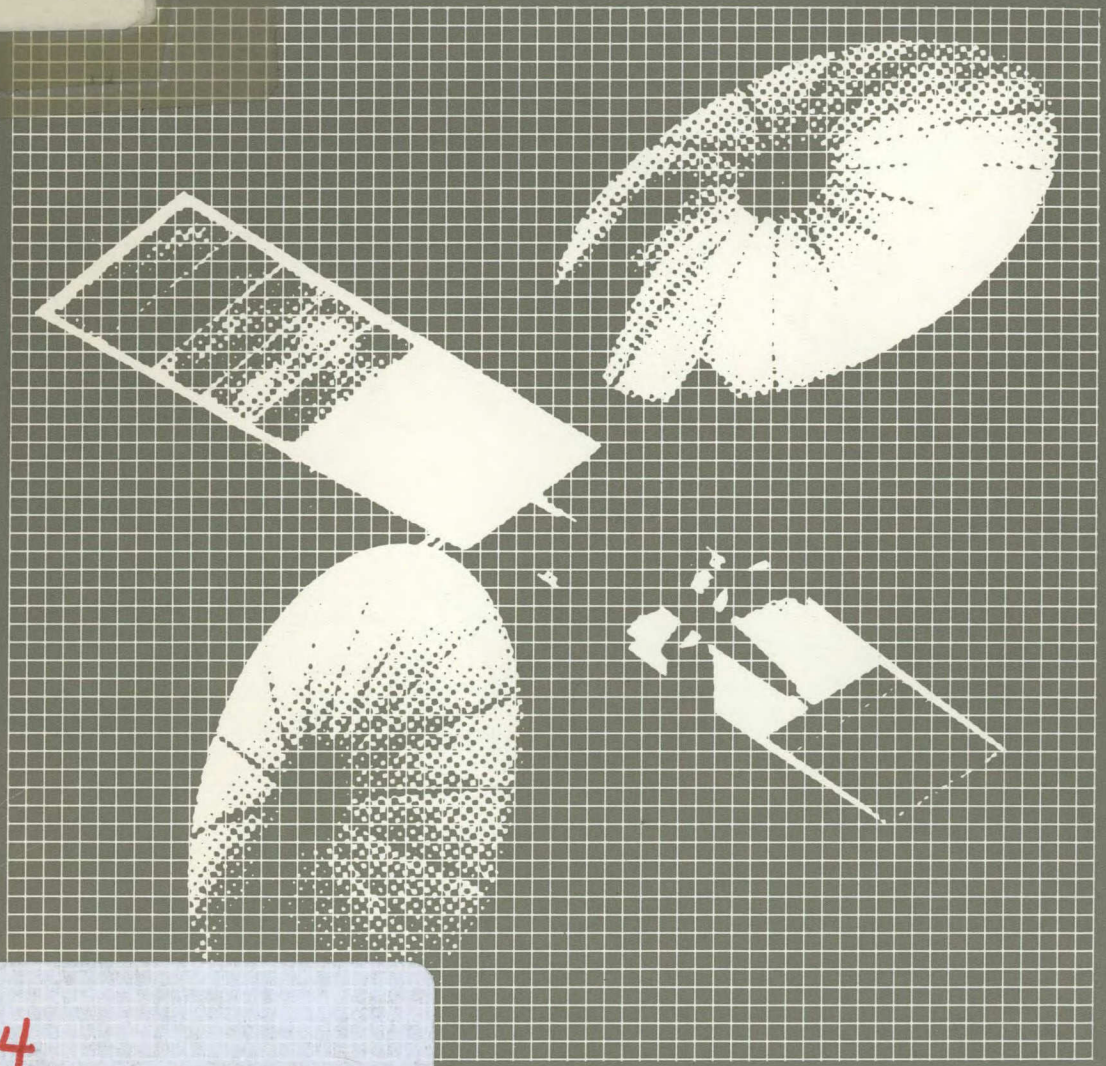

MSAT LEVEL I REPORT

REPORT PERIOD: APRIL - JUNE 1989

MSAT Program Level I Report

MSAT

Canada

DEPARTMENT OF COMMUNICATIONS	

MSAT LEVEL I REPORT

REPORT PERIOD: APRIL - JUNE 1989

MSAT LEVEL 1 REPORT

APPROVED BY: _____
Director MSAT Program

RELEASED: _____
Director General
Communications Technologies Research

DATE: 11 Sept 1989.

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1. EXECUTIVE SUMMARY

A significant milestone was passed during the Report period. On 31 May 1989, the FCC issued exclusive licence to AMSC as the provider of mobile satellite services in the U.S.A. The decision clears the way for AMSC and TMI to embark on joint discussions on spectrum sharing and business arrangements. The issue of a joint RFP for two satellites and related ground control equipment, the first order of business, is expected in early July 1989.

TMI's two way mobile data service, scheduled to be available in May 1990, received positive support recently when final agreement was reached with Teleglobe Canada and Inmarsat on a five year lease for satellit capacity on the MARISAT-F1 satellite which is to be restationed to 106.5° WL.

The DOC trials program, commencing in the fall of 1989, will be conducted by means of agreements between DOC, service providers and government agencies having public safety and resource management responsibilities. The first such agreement is expected to be signed in early July with SeaLink Ltd. of St. John's Nfld, a marine communications company, to develop a two-way fleet messaging, dispatch and control service trials with the fishing fleet and an onshore station.

Following completion of the personnel service request analysis of the 10 term positions assigned the MSAT Program, staffing action was intiated and three positions filled. The personnel shortage problem which has been endemic to MSAT for many years, shows signs of being alleviated.

The Department issued a Canada Gazette notice for comment on the proposed allocation of MSAT feeder links in the 11 GHz and 13 GHz bands. June 16, 1989, was the closing date. The cable TV interests have objected both in response to the notice and through contacts with DOC officials.

Actions in the near term include:

- TMI/AMSC joint RFP issue for two domestic mobile satellites.
- DOC/SeaLink Ltd. trials agreement sign off.
- Staffing completion of 10 PY term positions.
- Commencement of DOC trials program.
- Initiation of TMI's mobile data service.
- International frequency coordination with USSR and INMARSAT.
- DOC spectrum policy on MSAT feeder links

2. PROBLEM SUMMARY

PROBLEM	IMPLICATIONS	ACTION
A. Program/Project Offices manpower shortages.	Delay in staffing due to lack of approved PY classifications/levels and inability by DOC to deliver the program and to meet its commitments.	Obtain early classification approval of 10 PY's provided MSAT from the S & T PY pool. Obtain contract support in the interim.
B. MSAT feeder link spectrum policy	A delay in announcing officially the assignment of feeder link frequencies will delay satellite contracts.	Decide on and announce the relevant spectrum policy immediately.

3. PROGRESS REPORT

WM 2 MSAT PROGRAM DEVELOPMENT

WM 2.1 Program Management

Action to classify the 10 term PY's assigned to the MSAT Program from the Space Plan pool is 90% complete. Staffing those positions directly supporting the Communications Trials program are to receive priority attention.

WM 2.2 Commercial Implementation Support

FCC awarded a MSS licence to the AMSC in the U.S., on 31 May 1989. This action will be followed by the release of a TMI/AMSC joint RFP for two spacecraft in early July. It is hoped a contract will be signed by end 1989. In the meantime, TMI reached final agreement with INMARSAT for a five year lease of capacity on the MARISAT-F1 satellite, to be restationed to 106.5° WL. Its two-way mobile data service to truckers etc. is scheduled to be available in May 1990.

WM 2.3 Communications Trials Program

Satellite airtime, in support of the DOC trials program (1989-93), has been contracted with INMARSAT, through Teleglobe and TMI, and is to be available commencing September 1989 for limited voice and data trials with federal and provincial government agencies. Cooperative agreements between DOC and private sector organizations, specializing in mobile communications, is a key element in the plan to conduct trials. Such an agreement will soon be negotiated with SeaLink Ltd. St. John's Nfld. to conduct specialized marine data messaging trials between fishing vessels off the East coast and the fleet owner, starting in May 1990 based on TMI's early mobile data service. A document entitled "Description of Pre-channels Voice/Data trials using the Skywave Electronics Briefcase Terminals" has been published to provide potential trials participants with sufficient information to determine their involvement in the trials program and help them define their requirements.

WM 2.4 Policy Development

Public comments on the proposed assignment of MSAT feeder link frequencies have been received and are under evaluation within the department. A Canada Gazette notice was issued advising the public of the opportunity to participate in limited trials for the development of mobile data services.

WM 2.5 Frequency Coordination

MSAT will use frequencies in L-band (1.5 GHz). International frequency coordination initiated several months ago with other agencies and countries, such as INMARSAT and USSR, continue apace satisfactorily. A tentative draft agreement has been reached with INMARSAT. Resolution of the MSAT feeder link spectrum policy with DGTP, required in the near future, is currently under discussion with DGTP staff.

WM 2.6 Management of Cooperative Arrangements

DIPP funding support approval for Phase II B of the SPAR space segment proposal received TB approval. An update version of the "MSAT Ground Element: An Industry Strategy Paper" is currently under review.

WM 2.7 MSAT Working Groups and Committees

The Steering Committee, planning the International Mobile Satellite Conference in June 1990 in Ottawa, met with the NASA/JPL members in Vancouver on June 26/27, 1989.

WM 2.8 Program Submissions

The MSAT Progress Report #13 for the period 1 April - 30 September 1988 received Treasury Board approval. Progress Report #14 1 Oct. 1988 - 31 March 1989 was initiated and is undergoing departmental review.

WM. 2.9 Public Information

Copies of the recently completed video tape entitled "A New Era in Communications" were distributed to the public and are now available to potential participants in the forthcoming MSAT trials program.

WM. 3 MSAT TECHNOLOGY DEVELOPMENT

WM3.1 Project Management

The classification and staffing continued on an urgent basis. The SOQ's were written for the System and Trials Manager (EN-ENG-05 positions) and sent to Personnel. J.-G. Dumoulin continued as Field Trials Implementation manager under a secondment agreement with DFL pending completion of staffing action. Three of the four MSAT engineering positions for DSAT to support development have been staffed. Richard Young and Ravi Datta are now on strength and S. Crozier is scheduled to start in September. An RFP for the MSAT spacecraft is due out early in July.

WM3.2 System Engineering Support

System design work was carried out to support the trials. The communications links do not have much margin and additional antenna gain and power amplifiers will be required to demonstrate some of the services. Other system engineering tasks currently not addressed due to the lack of personnel are: (1) overall MSAT system analysis based on TMI, Spar and AMSC concepts; (2) system designs for all field trials and demonstrations; and (3) coordination with AMSC and INMARSAT, The successful completion of staffing action on the MSAT system manager position will allow some of this critical work to get started.

CCIR system engineering activities are undertaken by Mr. Maclatchy in preparation for upcoming CCIR meetings this fall.

WM3.3 Space Segment Technology Development

During this period, Spar continued work on MSAT. Funding was finally approved by DIST for the remaining $6.1M. The lack of DIST funding on the MSAT program has again caused SPAR to compromise their competitive position. It is now expected that SPAR will get into high gear in anticipation of the RFP for MSAT Spacecraft.

ComDev Ltd. continued work under contract during this period to engineer the Spar concept for high power switches. Eight switches are scheduled for delivery later this year.

C.A.L. continued work on a contract for a study phase re: PIM and multipactor testing.

WM 3.4 Ground Segment

Progress by Glenayre on the development of voice radio sets for MSAT was satisfactory during this period. A system specification was produced and reviewed during this period. The RF portion of the radio designed by "Narrowband Telecommunications Ltd." has now been integrated with the remainder of the radio.

Nexus Engineering progress has been slow. A Review was held by the project manager which showed that Nexus had assigned two engineers to the program.

The order for the six terminals from Skywave has been increased to 13. The company will now deliver 3 fixed channel units, five terminals with antennas and five terminals less antennas. The units can carry either voice or 2.4 Kb data. Also slow speed signalling, a rudementry DAMA and an increase in the P.A.'s to 20 watts has been ordered.

The situation with Network Inc. remains unchanged. The company ran into financial difficulties and are now being reviewed for a grant from the Newfoundland Offshore Development Fund for the second time.

Canadian Marconi presented a proposal to DRIE for MSAT antenna development. Negotiations have not been successful and Marconi does not want to contribute more than 25% to the development.

Narrowband Telecommunications Research Ltd. of Vancouver have submitted a proposal to develop DACS units. This would pick up on the earlier Bristol Aerospace work. Possible trials involving DACS units is being considered where MSAT would purchase DACS for trials.

WM 3.5 Applied Research Development

The air ambulance trials became an interim operational service during this period. A second terminal is under construction at CRC scheduled for completion in mid-1989.

Work continued in the CRC laboratories to engineer and furnish the MSAT LX terminal. This unit complete with its antenna pointing controller is scheduled for completion by late 1989.

The ACSSB voice processor continues to be developed at CRC. The latest TMS 320-25 versions include work on voice activation and other performance enhancements.

The high gain steerable antenna continues to be improved. Four of the 12 antennas have been assembled including a control circuit board which fits on the bottom of the array for control of the parasitic elements.

WM3.6 Communications Trials Program

The contract with Seimac continued in this period. The first 5 reports were received. The company is working with marine users on both the East and West coasts in their trials study. They are also working with MPR of Vancouver planning an MSAT trials for the marine towing industry.

The Sea Link Ltd. (an associate company of UltimateEast) agreement was signed by Mr. John Crosbie on behalf of the Minister of Communications to participate in MSAT trials. A separate contract from DOC to UltimateEast to engineer, furnish, install and maintain the trials equipment for Sea Link is being finalized by SSC.

Three hundred MDS (Mobile Data Service) radios are now on order from Telesat Mobile Inc.. DOC purchased the units via TMI who are responsible for ensuring the system operational aspects of MDS.

Ten portable briefcase terminals are on order from Skywave together with 3 fixed channel units for the hub station.

Twelve high gain antennas are under construction at CRC. These may be used with either the Skywave terminals or the CRC LX terminal.

Glenayre have been requested to quote on a quantity of 60 (sixty) voice terminals for use in a West coast MSAT trial. Delays in determining the signalling specification has delayed receipt of the quote.

A hub station for the trilas is being set up in building 14. The Symphonie trailer antenna and equipment is being moved. A new antenna base is scheduled to be poured in August and the C- band back-haul should be operational by mid-September.

4. FINANCIAL RESOURCE UTILIZATION - FY 89/90

Title	Project No.	Budget $K	YTD Commitment $K	Expenditure $K	Free Balance $K
5183 - Management					
MSAT Director	65700	100.0	19.3	48.5	80.7
MSAT Program Office	65701	125.0	77.4	13.9	47.6
MSAT Project Office	65710	260.0	122.8	30.5	137.2
		485.0	219.5	92.9	265.5
4183					
MSAT Director	65700	16.1	9.8	1.6	6.3
5189 - Communications Trials					
Voice Trials	65711	675.0	85.9	Ø	589.1
Equipment Contracts	65712	500.0	790.1	26.1	(290.1)
Service Contracts	65713	300.0	35.9	Ø	264.1
Teleglobe Lease	65714	500.0	480.9	1.1	19.1
		1,975.0	1,392.8	27.2	582.2
5173 - Administration					
Director	65700	525.0	Ø	Ø	525.0

4. HUMAN RESOURCE UTILIZATION (PM)

	1988			1989					
	O	N	D	J	F	M	A	M	J
MSAT PROJECT TEAM:	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
CRC SUPPORT TO MSAT TEAM:	8.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0
TOTAL HUMAN RESOURCE UTILIZATION:	24.0	25.0	25.0	25.0	24.0	24.0	24.0	24.0	24.0
TOTAL MSAT TEAM REQUIREMENT:	26	26	26	26	26	26	26	26	26
VARIANCE (-)	12	1	1	1	2	2	2	2	2

DISTRIBUTION

SADM
ADMSM
ADMTT
ADMCM
DGTA
DGFP
DGEP
DGIR
DGTP
DGGT
DSIS
DGSTA
DSRS
DGBR
DGRC
DPM

DGC
DGO
DGQ
DGA
DGP
DDE
DPC
DMG
DMS
DFL
DSAT
DSE
DSM
DLS
DPT
DMSAT
J. McNally
D. Athanassiadis
J. Braden
H. Reekie
A. Aldworth
J. Carson
E. Thompson/Telesat
M. Zuliani/TMI
D. Sward/TMI
PIC Members
Canadian Embassy (Wash D.C.)
External Affairs - URE Section

PROGRAM OBJECTIVES AND BACKGROUND

OBJECTIVES

The primary strategic objective of the Mobile Communications Satellite (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.

BACKGROUND

The major phases of the MSAT program are:

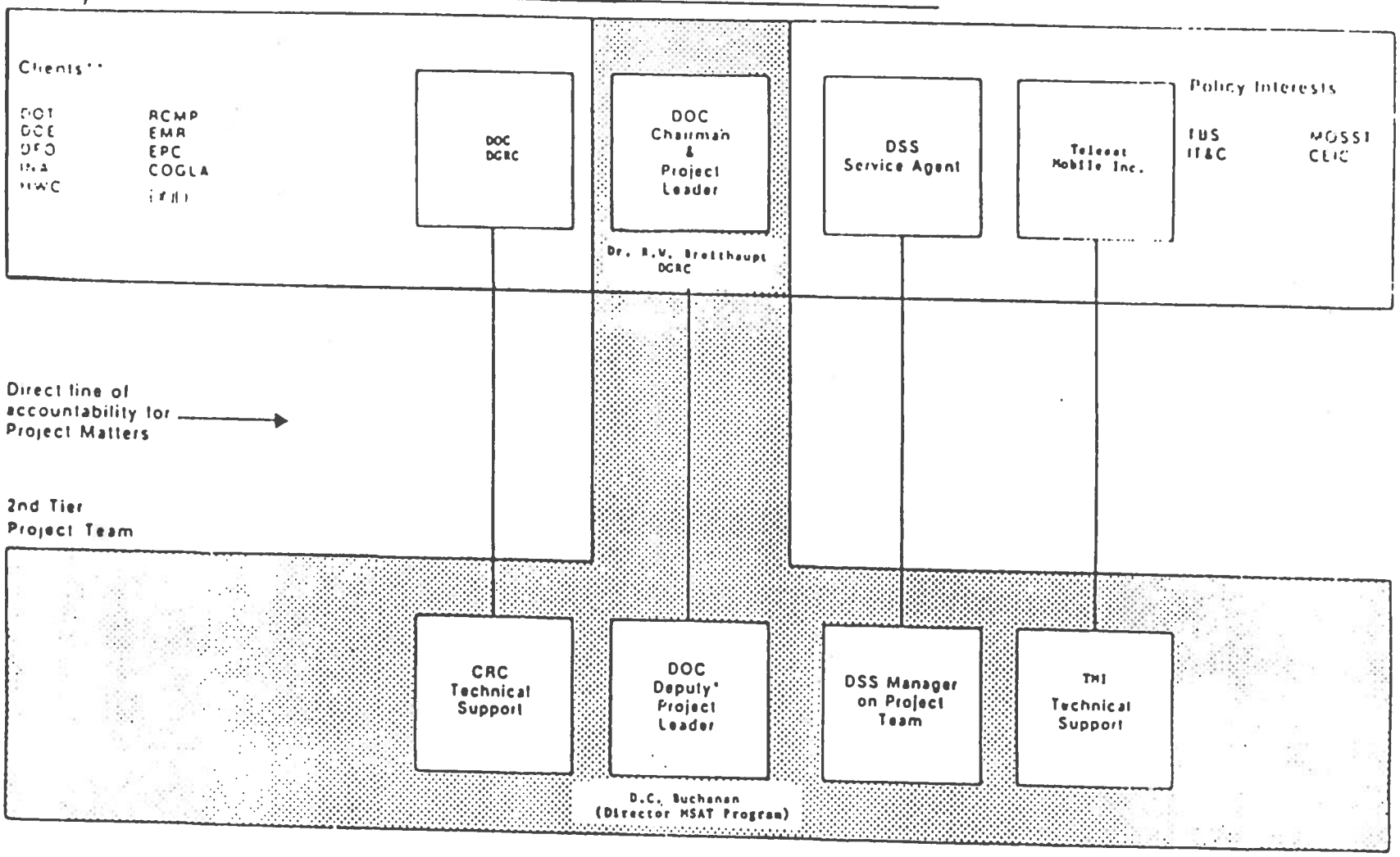
Phase A:	Concept Feasibility
Phase B:	Program and System Definition
Phase C/D:	Implementation including pre-launch trials program
Phase E:	Operations and MSAT Communications Trials Program

In September 1980, Cabinet approved a program of Phase A concept studies 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 an MSAT demonstration mobile system for mobile users. The results of these studies indicated technical feasibility, the existence of a substantial market for satellite-assisted mobile communications services and significant user benefits.

In December 1981, Cabinet approved Phase B system definition studies of the MSAT Program at a cost of $17.4M for FY's 1982-84. Two years later, in November 1983, a DOC/NASA Arrangement substantially altered the direction of the MSAT program from a government led to a commercial Telesat led program in Canada. The Phase B studies, which extended to March 1985, conclusively showed that the commercial program scenario provided sufficient economic and technical prospects to continue into Phase C/D of the program, albeit with continued government support to alleviate the inherent risk factors.

On 29 April 1986, Cabinet approved the Long Term Space Plan, including $176 million full funding for MSAT. That funding included $25 million over the next seven years to provide technology and product development support, $20 million to sponsor service trials for the program and $4.5 million for management costs. In addition, the government entered into a service contract with Telesat to lease satellite capacity for government users, valued at $126 million, payable in installments over a five-year period beginning in the early 1990's.

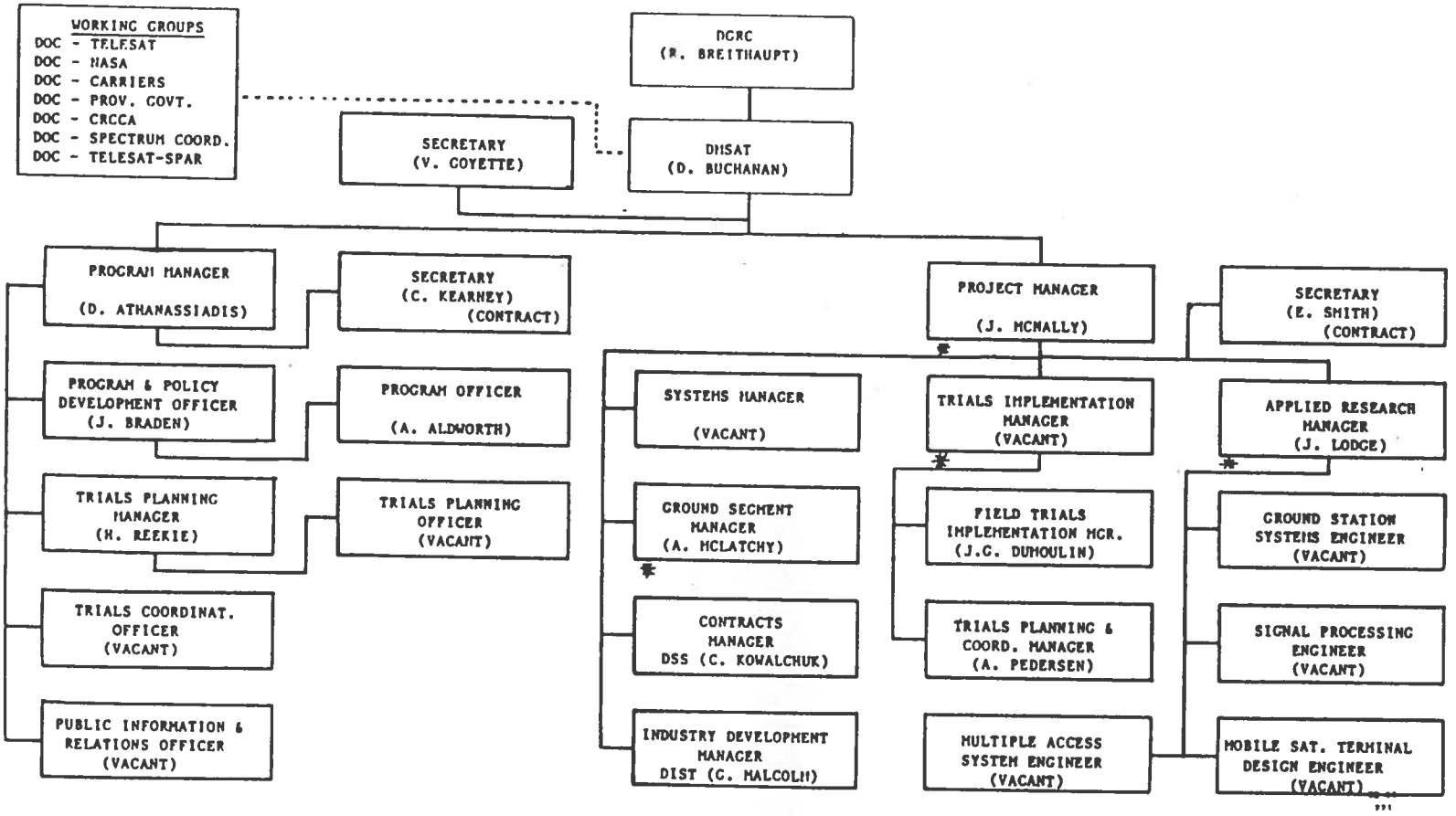
MSAT Project Organization Structure



* See subordinate organization

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

MSAT PROJECT TEAM ORGANIZATION



* administratively responsible to DSAT

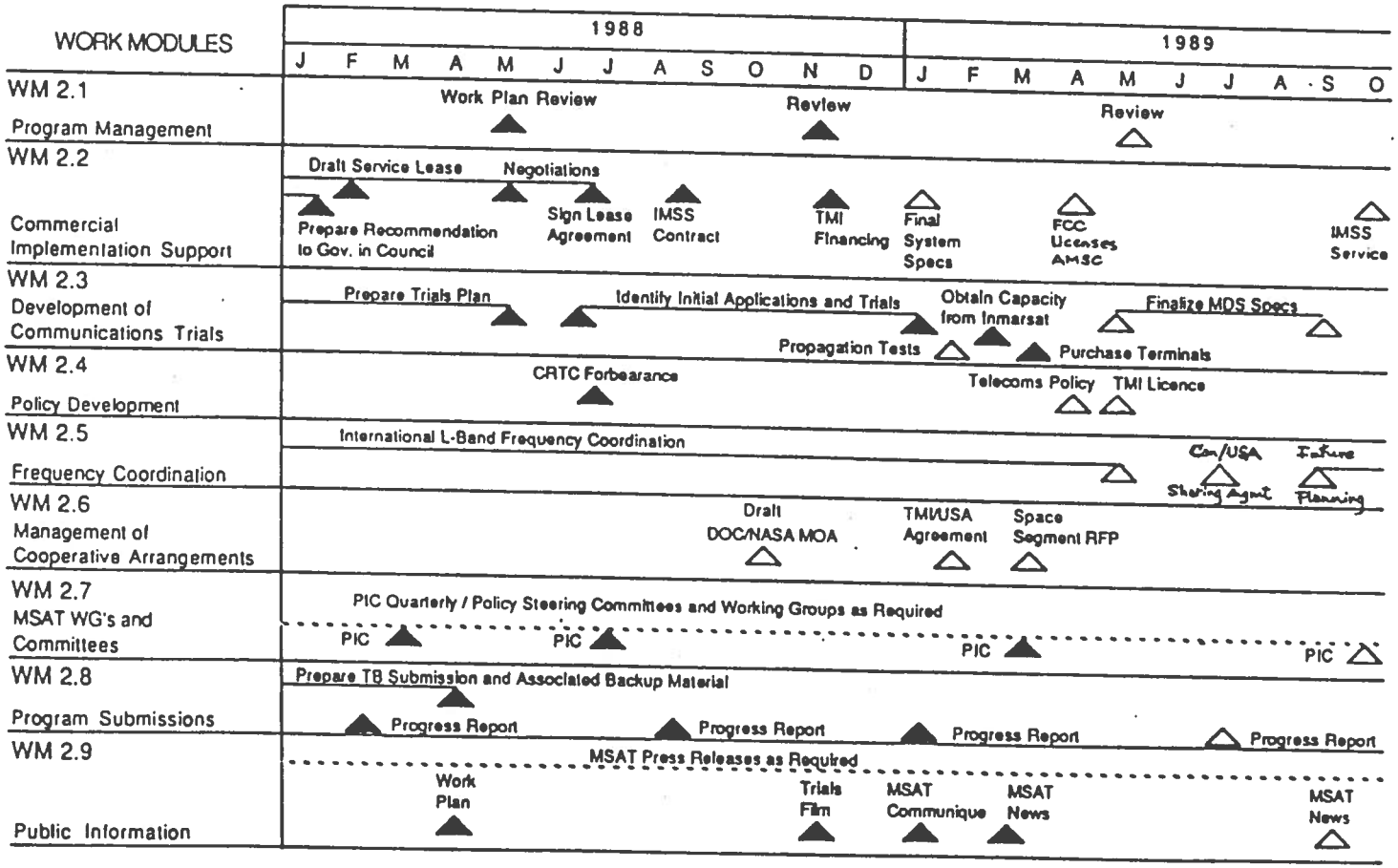


FIGURE 5.1: MSAT PROGRAM DEVELOPMENT SCHEDULE

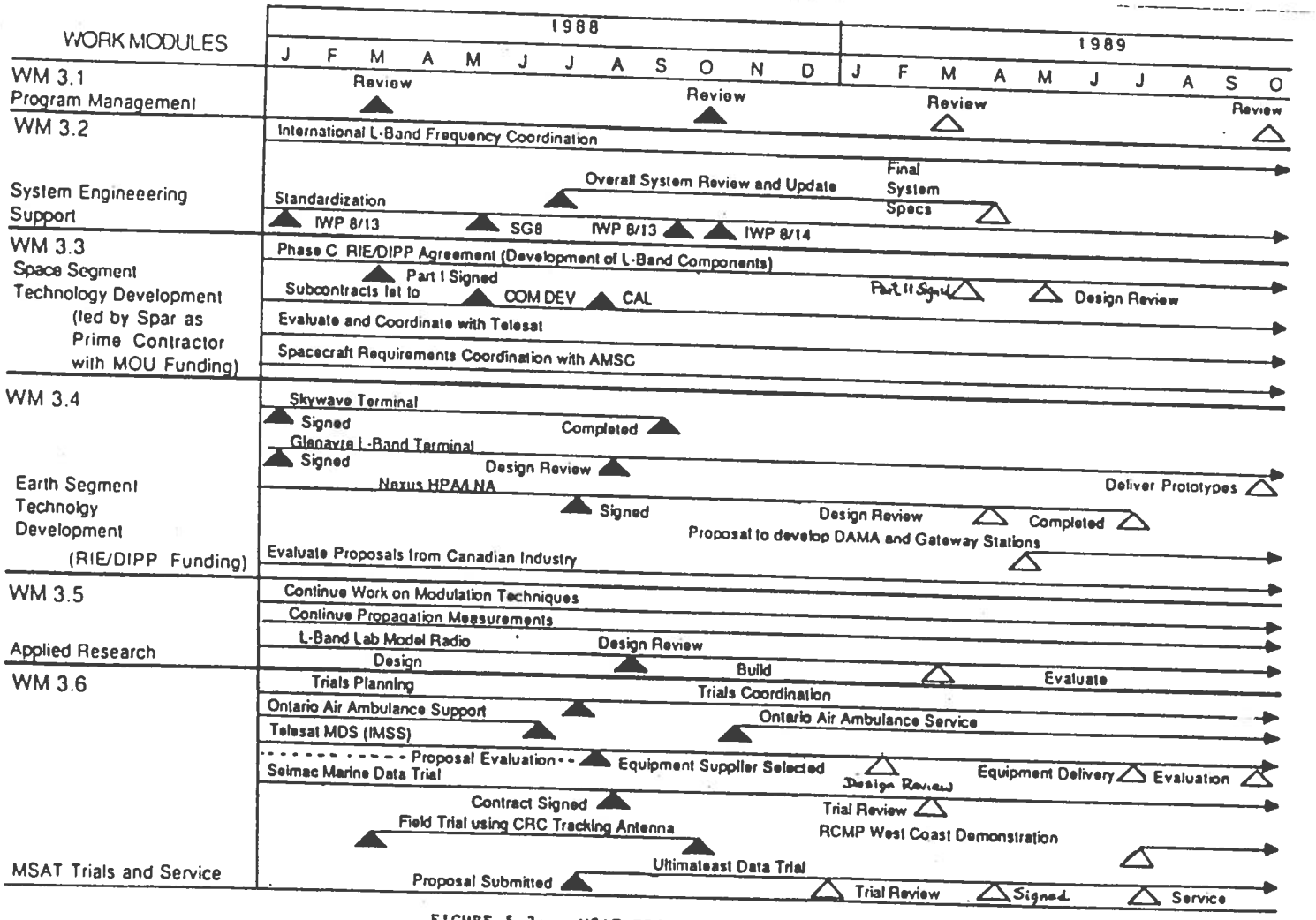


FIGURE 5.2: MSAT TECHNOLOGY DEVELOPMENT SCHEDULE