ATTACHMENT A

Subcontractor Task Schedule

1. Continuing Research Tasks

1.1) Restructuring of Traffic Control.

Starting date: 1 July 1976
Duration: 2 to 6 months

1.2) Separating of Page Control and Segment Control Functions
within the Active Segment Table.

Starting date: 1 July 1976
Duration: 3 to 5 months

1.3) Study of Multics System Initialization.

Starting date: 1 September 1976
Duration: 2 to 4 months

1.4) Provision of "Breakproof" Environment for User Programming.

Starting date: 1 July 1976
Duration: 2 to 5 months

1.5) Restructuring of Page Control.

Starting date: 1 July 1976
Duration: 1 month

1.6) Support of User Defined Object Types.

Starting date: 1 July 1976
Duration: 2 to 4 months

1.7) Study of System Reliability and Recovery from Errors.

Starting date: 1 July 1976
Duration: 1 to 2 months

2.1)   Study Definition, Network Interface Studies

Completion date: 31 December 1976

Studies to be completed by 30 June 1977

ATTACHMENT B

Subcontractor Data Requirements List (SDRL)

Item Number	Description	Submittal Date
SDRL 0001	Monthly Fiscal Report	5th of each month
SDRL 0002	Monthly Technical Review Meeting	1st of each month
SDRL 0003	Abstract of New Technology	As required
SDRL 0009	Technical Notes	As required by this SOW or others as mutually agreed upon by HIS and the subcontract
SDRL0010	Subcontractor Task Schedule	Initial upon contract award; Revision, as requir
SDRL 0022	Semi-Annual Technical Meeting	15 January 15 July
SDRL 0005	Final Report	15 July 1977

The subcontractor will prepare the above data in accordance with the attached backup and data item description sheets.

Copies of all reports will be distributed as follows:

1. One copy to Contract Administrator, issuing office.

2. One copy to Project Manager:

        Honeywell Information Systems, Inc.
        7900 Westpark Drive
        McLean, Va. 22101
        Attention: L. Verdery

3. One copy to Technical Coordinator:

        Honeywell Information Systems, Inc.
        575 Technology Square
        Cambridge, Massachusetts 02139
        Attn: N. Adleman

SDRL Backup sheets

1. Monthly Fiscal Report

2. Abstract of New Technology DI-A-3028A

3. Technical Notes DI-S-3591A

4. Technical Report - DI-S-3591A

5. Monthly Technical Review Meeting

   The (Principal Investigator) will schedule a technical review meeting each month with presentations of each MIT task in progress. A Honeywell representative(s) will attend these meetings for progress status information.

6. Semi-Annual Technical Meeting

   Honeywell will schedule a technical interchange meeting to assemble information for the semi-annual technical report.

7. Final Report

   A retrospective final report will be prepared that reviews all of the engineering proposals made or tested in the course of the kernel design project, to assess their cumulative impact on the size, performance, structure, and simplicity of the kernel necessary to support security requirements. The report will include a similar discussion of work performed under Section 2.0 of the SOW.

but that work is not yet complete?

ATTACHMENT C

Candidate Network Interface Tasks

The following tasks are directed toward identification of technical/operational issues and development of basic concepts for interconnecting the secure Multics and its SFEP with other processing systems and terminals via communication networks.

1. Study System Definition of Network Connections

This task will investigate the security and performance-related requirements necessary to interface a kernel-based Multics system to an operational network. This task includes the study of the various issues involved in determining the necessary protocols for the network interface to the Secure Front-End Processor (SFEP). The network technology shall be a packet-switched network such as the ARPANET but a generalized system approach shall be developed so that connection can be made to any similar type of operational network.

The results of this task shall be documented in a technical report which presents the results of the system studies, the security requirements, the performance requirements, and the system level impact upon the SFEP security kernel.

2. Study Network Connection Impact on I/O Approach in Secure Multics

This task will study the various alternatives for the I/O connect of the secure Multics to the operational network. The network connection will be through the SFEP. This task will define the impact of implementing a network connection in addition to the terminal handling requirements of the SFEP. If the SFEP can be used to handle both terminal traffic, as well as network traffic, the system approach to combining these functions into a single SFEP must be defined.

If this study defines an alternative approach that requires separate SFEP's for supporting both terminal traffic and the network traffic, then the impact of multiple SFEP's on the secure Multics must be assessed, especially the impact upon the Multics kernel itself.

A technical report will be prepared which defines the trade study data used to determine the I/O approach for handling the network connection and terminal support.

3. Experimental investigation of Multics/SFEP Division of Network Function

This task will experimentally investigate the division of functions between the Multics host and the SFEP for the alternative I/O approach which is chosen as a result of Task 2.2. This division of function is to take into account such criteria as (1) interface to a local network or long-haul data communications network; (2) impact upon the complexity of both the Multics security kernel and the SFEP kernel; (3) impact upon the complexity of the network control program required to implement this network connection.

A technical report which defines the division of function between the Multics host and its SFEP will be prepared from this task.

4. Investigation of the Multics/SFEP interface

This task will experimentally investigate the interface between the Multics host and its SFEP with respect to the transfer of network data to and from the host system. Interface (both hardware and software) techniques that minimize the complexity of the security kernels are to be identified. The interface protocol will be experimentally investigated with the optimized results being documented in a technical report. The outputs of Task 2.1 and Task 2.2 will be used as the baseline for establishing the host to SFEP interface with respect to network connection and data paths.

5. Reduction of the Network Control Program (NCP) in the Secure Multics

The current ARPANET interface for host computers to the backbone network requires a rather complex NCP to be resident in Multics. This NCP adds significant complexity to the host's function. If the NCP could be moved to the SFEP, complexity and overhead would be off-loaded from the host and perhaps improve overall system performance.

This task will investigate the reduction of the present Multics ARPANET network control program within Multics with as much of the resultant NCP being resident in the SFEP as possible. Such issues as system performance, impact on security kernels, and complexity of host/SFEP/network interfaces shall be addressed. A technical report which provides recommendations as well as trade study data shall be generated as the output of this task. Detailed descriptions of a recommended restructure of the present Multics NCP to the new method of interconnection are necessary to implement the selected design.

6. Network Connection Impact on Multics User Interface

A desirable goal of this program is to maintain the present Multics user interface in the kernel-based Multics. Since Multics users require operational interfaces to both Multics as well as the connection to a network, this area should be investigated to determine the system requirements.

This task will investigate the requirements and corresponding design which must be incorporated into the secure Multics terminal users to also connect to the operational network. Various alternatives will be studied and described to permit these selected designs to be implemented in an operational demonstration. Functionality in both the Multics host as well as the SFEP must be determined. A technical report which defines the issues involved, the trade study data for the various alternatives and the selected design will be prepared as the output of this task.