Introduction

This document summarizes the final development plan for the Knowledge Worker System, Version 1.0 (KWS). The final plan is composed of the short term development plan, the testing plan, and the specifications checklist. This plan will describe the steps that will be undertaken by the Georgia Institute of Technology during the process of developing and testing a working version of the Knowledge Worker System. Version 1.0 will be based on a prototype version that was developed for CERL in 1988. This document will describe the changes that will be made in the prototype and the general plan for development until February 1991. The plan will cover such issues as the software platforms that will be needed to run the Knowledge Worker, the hardware platforms, changes that must be made since the development of the prototype, the user interface, user help facilities, the organization of documents, communications and networking, scheduling, the series of events which will constitute the delivery and set up of the product, and the procedure and forms used in the testing process. Information for this report was compiled from a review of the JAD Workshop, a report describing the lessons learned from the prototype, a presentation given by George Olive of Georgia Tech, and previously submitted documents describing the short term development plan, the testing plan, and the specifications.

Hardware Platform

The hardware required to run the Knowledge Worker System can be classified into three categories: 1) hardware required by each individual workstation, 2) hardware required at the central server location, and 3) hardware required for communications between the knowledge worker (workstation) and the central database site.

Each KWS user must have a 386 class machine (Compaq 386/20e) with 5 megabytes of memory. In addition, a KWS workstation should include a hard disk with at least a 60 megabyte memory capacity, a mouse for the use of windowing utilities, and a VGA monitor. A math co-processor is recommended for speed considerations. A server database will be maintained at a central location; a Unisys 386 machine with 14 megabytes of memory will be used. The server machine will need at least a 330 megabyte hard disk, a tape backup unit, and an uninterruptable power supply. For communications purposes, a second Unisys 386 will be used as a gateway machine.

Software Platform

The software used for KWS will be used to integrate a variety of functions, including the user interface, data base utilities, and communications. KWS will run under Microsoft Windows version 3.0 and use customized windows software developed in the C programming language by Georgia Tech. For communications, KWS uses TymComm or VistaComm communications software, as well as 3+Open, 3+Open Internet, and 3Com TCP/IP (DDN Protocol). For accessing data base functions from a window environment, KWS will use Gupta SQL/Windows and Oracle. SCO Unix is required for the data base server.

User Interface

KWS runs under Microsoft Windows 3.0 and uses the windowing environment for the graphical user interface. The graphical viewing facility allows and provides for the ability to view KWS data in a hierarchical fashion, as well as the schedule data and attached documents. While viewing the scheduling data, the user will have the ability to group the data and view it by week, month, year, etc. While KWS is running, the keyboard will be set up to activate "hot keys." Hot keys will provide the user with the ability to invoke an often called
KWS function at the touch of a single program key.

Help

The help that is available to the KWS user will take in a variety of forms. First, a corpus of hard copy manuals will be provided with the delivery of the software. These will include a users' manual, training guides and a technical manual. In addition to the printed manuals, on-line help will also be available to the user. This help will be context sensitive, and the messages provided will depend upon the current mode of KWS. There will also be provisions made for human aided help. For the two weeks after installation of version 1.0 (February, 1990), a Georgia Tech representative will be on-site to provide support and answer questions. Subsequently, for an additional four week period, Georgia Tech will provide support by electronic mail and telephone.

Automatic Execution

One major goal of KWS is to perform many of the repetitive tasks that are currently done by individual knowledge workers. Since many of the tasks a user must do are cyclical, or must be done periodically, KWS will provide a facility for the automatic invocation of programs. This facility will allow a knowledge worker to start external programs and supporting software from within the Knowledge Worker System environment. McClendon Automation will also provide a facility which will automatically write PAX reports. In addition KWS will eventually provide methods for automating the process of entering the steps required to performing a subtask, as well as to automate the production of documents and reports.

Communications

The Knowledge Worker System consists of a data base server/host machine which can be accessed by different Kws with PCs in (possibly) different office locations over a 3+Open local area network. The communications provided by KWS will allow Kws to access all of the centralized data base information as well as communicate with any other KW. The Knowledge Worker System will also accommodate Kws working from a remote site by using 3Com and 3+Open communications software. The ability to access other computers will be provided by simple terminal sessions, as well as the file transfer capability. The users will be able to communicate with one another by the way of an electronic message facility. At first, only a notification daemon (message) will inform the user when a remote job is completed or an important task is added to the ToDo list. A more complicated electronic mail facility will be added in future versions.

Document Organization

In contrast to the prototype, KWS Version 1.0 will provide a less structured way of handling documents. KWS will provide the facility to relate any document to any task (event, task, subtask, or step) in the system. Besides providing a more flexible interrelated document structure, KWS will also provide automatic version control for documents whenever a new version of an existing document is created. KWS will also provide the ability to search for any document in the system based upon a keyword. A document search by similarity of
tasks (to the current task) and the ability to archive documents are planned for future versions.

Prototype Technical Changes

According the reviews of the prototype and its usability, there are four main issues that must be changed when developing the actual KWS. These have already been discussed in some detail. The four issues are 1) addition of a distributed database, 2) generalization of the hypertext structure, 3) implementation in a compiled language, and 4) the elimination of DOS as the underlying operating system.

The database chosen to support KWS is a completely distributed database. The data will be placed in a central location and will be accessible to all KWS users. The hypertext structure will be implemented as described in the preceding section on document organization. In the prototype, documents and programs could only be linked to steps. This restriction is not necessary and will be removed in Version 1.0. KWS will provide the ability to link documents and programs to steps, tasks, subtasks, and events. To increase the usability and speed of the system, the production version of KWS will be implemented in the C programming language. A customized interface to Microsoft Windows (version 3.0) will be provided, thus eliminating the need for users to directly access DOS while allowing them to execute DOS programs.

Implementation Milestones

The following are the major milestones for implementation of Knowledge Worker System, Version 1.0.

- First-cut of KWS Version 1.0 
  November 19, 1990

- Three one-week testing periods (CERL) 
  (CERL) 
  (CERL at GaTech) 
  November 19, 1990
  December 17, 1990
  January 15, 1991

- KWS, Ver 1.0 Demonstration to CERL 
  January 15, 1991

- Installation of KWS, Ver 1.0 at HQUSACE 
  February 16, 1991

- KWS, Ver 1.0 Turnover Demonstration 
  February 18, 1991

- Training of KWS users 
  February 20-21 91

- Support periods 
  (2 weeks on-site; 4 weeks remote) 
  February 20 - April 03, 1991
Testing Plan for KWS Software

This section summarizes the testing plan to be followed by CERL and GaTech in evaluating the Knowledge Worker System. The first-cut of KWS Version 1.0 will be ready November 19, 1990. CERL will review the KWS software at GaTech between November 19 - 23, 1990. On December 17th, GaTech will deliver a second-cut of KWS, which will include the Scheduler. CERL will test KWS at GaTech between December 17-21, 1990. GaTech will demonstrate the completed KWS, Version 1.0 to CERL on January 15, 1991. CERL will spend the period of January 15 - 18, 1991 at GaTech in order to conclude software testing and verify that KWS, Version 1.0 is ready for installation at Headquarters, US Army, Corps of Engineers (HQUSACE) offices.

The process of reporting changes and bugs will proceed as follows. When a CERL representative recognizes an item that must be reported, the appropriate report form must be filled out. There is a separate form for changes, and a separate form for errors (bugs). On the change form, the CERL representative must fill in the date, the name of the CERL representative requesting the change, the software version number, and a description of the change. On the error report form, the representative must fill in the date, the name of the CERL representative reporting the error, the software version number, a description of the error, and a list of steps that produced the error. These reports will be physically handed to a GaTech representative during the testing dates specified above. The GaTech representative must sign and date the form after the correction was made, as well as provide a description of the correction on the error report form. GaTech will respond to the requests from the testing period by the beginning of the following period. Any requests that are submitted by CERL during the final period will be attempted to be corrected by the installation date. Any requests that cannot be implemented by the installation date will be processed during the support period that follows. A sample of the change and error (bug) reporting forms are attached in the appendix.

Following installation at HQUSACE and prior to release of KWS, Version 1.0 to users, GaTech will conduct a "Turnover Demonstration" for CERL and other Government representatives, e.g., members of the KWS User Group. The purpose of this formal demonstration is to assure the Government that the software is successfully installed and ready for daily use.
Knowledge Worker System Specifications Checklist

This section presents a checklist of specifications for the Knowledge Worker System, Version 1.0. The specifications have been divided into 12 categories which describe the functionality, hardware, and software of the system. These categories are: Help, Communications, User Interface, Data Organization, Automatic Operation, Todo list, Modifications to the master schedule, Viewing the master schedule, Task schedule, Control issues, the Software platform, and the Hardware platform.

A. Help

[ ] Context sensitive
[ ] Electronically submitted
[ ] On-line tutorial
[ ] 4 week phone support

B. Communications

[ ] Terminal sessions
[ ] File transfer capability
[ ] Electronic notification of schedule changes
[ ] Remote access to messages from other knowledge workers
[ ] Remote access to all KWS functionality

C. User Interface

[ ] View Todo list
[ ] Colors used as visual clues to important information
[ ] 'Hot keys' to invoke KWS functions
[ ] Require user acknowledgement on important changes
[ ] Pop-up reminders to be used
[ ] Notes available from any window

D. Data Organization

[ ] Version control for multiple versions of attached documents
[ ] Document can be searched by keyword
[ ] Automatic backup of data

E. Automatic Operation

[ ] Automatic invocation of supporting software

F. Todo List

[ ] Show tasks for which each knowledge worker is responsible
[ ] Show when tasks are due
[ ] Show priority of each task
[ ] Show status of each task
[ ] Show tasks that are in danger of becoming late
[ ] Identify tasks that have a due date that is simply an estimate
[ ] Show how much of task has been completed
[ ] Show when a task should be started
[ ] Allow scheduling of personal items
[ ] Show "work drivers" (why and for whom the work is to be done)
[ ] Allow entry of private tasks

G. Viewing of Master Schedule
Tabular display showing event, tasks, and subtasks
View predecessor tasks and status in STEP window

H. Modification of Master Schedule
- Separate user interfaces
- Add/Delete/Modify capability
- Automatically maintain logic of schedule
- Convert ad hoc tasks to routine tasks
- Cyclical tasks need to be entered only once

I. Status
- Maintained by knowledge workers
- Subtask priority will be maintained
- Latest start time will be sorting criteria
- Knowledge workers can view predecessor task status
- Color will be used to show important information
- Temporarily reassigned subtasks can be seen on both knowledge workers' Todo lists

J. Control
- Knowledge workers will be able to add private items to Todo list
- Meeting/Appointment management will be left to existing packages
- Automatic backup of servers will be supported
- All knowledge workers will be allowed to make schedule changes

K. KWS Software Platform
- Microsoft Windows 3.0
- Customized Scheduler
- VistaComm or TymComm
- Custom windows software written in C
- 3+Open
- 3+Open Internet
- Gupta SQL/Windows/Oracle for SCO Unix
- SCO Unix

L. KWS Hardware Platform
- Compaq 386/20e with 5 megabytes of memory
- Unisys 386 with
  - 14 megabytes memory
  - 330 megabyte hard disk
  - Tape backup unit
  - Uninterruptable power supply
- Gateway machine - Unisys 386
THE KNOWLEDGE WORKER SYSTEM
Change Report Form

Report Date: ____________ Name: ________________
Software Version #: ______ Priority: CRITICAL HIGH MEDIUM LOW
Description of change: ____________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

Handled at GT by: ________________ Date of Change: ________________

THE KNOWLEDGE WORKER SYSTEM
Error Report Form

Report Date: _____ Software Version #: _____ Name: ________________
Description of error: _____________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

List steps that produced the error: ________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

Handled at GT by: ________________ Date of Correction: ________________
Description of correction: __________________________________________