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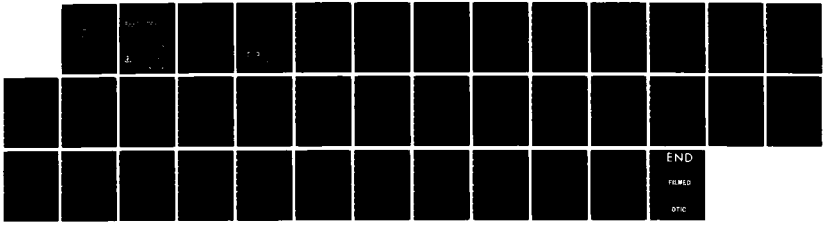

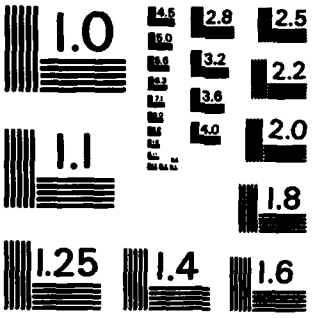

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NSWC-NADC INTERACTIVE COMMUNICATION LINKS FOR AN/UYS-1 LOADTAPE CREATION AND RETRIEVAL

BY DOROTHY M. GREATHOUSE

UNDERWATER SYSTEMS DEPARTMENT

28 SEPTEMBER 1984

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This report contains an alternative method of communication (interactive vs. remote batch) with the Naval Air Development Center for the creation and retrieval of AN/UYS-1 Advanced Signal Processor (ASP) operational software loadtapes.

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FOREWORD

This technical report documents the research involved in creating, submitting and retrieving files over various computer networks located at the Naval Surface Weapons Center, White Oak, Maryland, and the Naval Air Development Center, Warminster, Pennsylvania. The ultimate goal of this report is to present the user with a systematic approach to interactive communications with the Naval Air Development Center's Central Computer System in the development and testing of Digital Acoustic Sensor Simulator (DASS) operational software on the AN/UYS-1 Advanced Signal Processor.

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Approved by:

A. M. JOX, Head
Surface ASW Division

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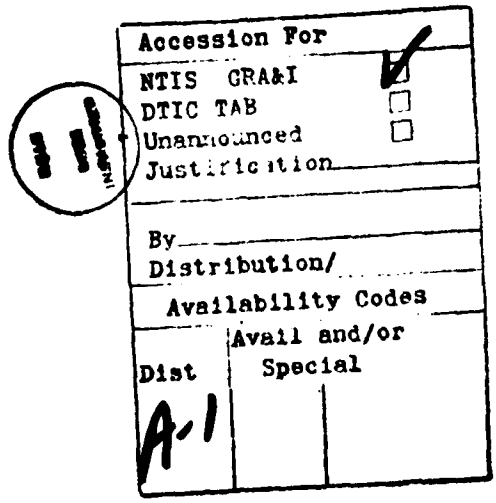

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CHAPTER 1

INTRODUCTION

Operational software for the Digital Acoustic Sensor Simulator (DASS) program is developed and maintained at the Naval Air Development Center (NADC). The Facility for Automated Software Production (FASP), an NADC-resident software generation facility, provides the support tools necessary for data base creation, software development and maintenance, and loadtape generation. Once a loadtape file is generated at NADC, it must be retrieved via telephone transmission and placed in a format suitable for loading into the AN/UYS-1 Advanced Signal Processor (ASP).

Previous methods of communication with NADC (1977 through early 1984) included the use of punched card decks to develop software and create loadtapes. These card decks were submitted via a 731 Remote Batch Terminal (RBT) to NADC's Host Remote Batch (EXPORT) system using the KRONOS operating system. Loadtapes were retrieved from NADC via a CDC 200 User Terminal emulator, a program resident on the Signal Processing Branch's AN/UYK-20 computer.

In November 1981, NADC added a Front End Processor (FEP), a CDC CYBER 170 Model 730 computer, to the Central Computer System (CCS) to act as a load management center for the four Host computers (Systems A through D). In addition, two new subsystems of the FEP were installed: the Remote Batch Facility (RBF) and the Interactive Facility (IAF). On 1 October 1983, the operating system of the FEP was upgraded to NOS Version 2.1.

In February 1984, the 4800 Dataphone modem which was connected to the 731 Remote Batch Terminal (RBT) at the Naval Surface Weapons Center (NSWC) was replaced with a Racal-Vadic modem. Communication errors over the telephone link became increasingly abundant.

In April 1984, telephone numbers previously used to connect to NADC's Central Computer System via EXPORT were changed. Submitting batch jobs now required dialing into the Remote Batch Facility subsystem of the FEP. The FEP then routed the jobs to the Central Computer System for processing. The Remote Batch Facility uses a different command set than EXPORT. Different login procedures in addition to the RBF command set made obsolete the CDC 200 User

Terminal emulator. Extreme revisions would have been necessary to make this emulator operable under the above changes. As a result, the interactive communication techniques presented in this report were developed to accommodate loadtape creation and retrieval.

The following chapters represent the communication links necessary to obtain a loadmap listing and permanent file containing ASP operational software. Information contained in Chapters 2 through 8 is written for use on a Zenith 29 video display terminal, although this information could be adapted to fit almost any terminal.

Outlined below are the names of the computer systems referenced in this report.

Naval Surface Weapons Center Computers

Computer Branch VAX 11/750	(MILNET VAX)
Surface ASW Division VAX 11/780	(ASW VAX)
Signal Processing Branch AN/UYK-20	(UYK-20)
Signal Processing Branch AN/UYS-1	(ASP)

Naval Air Development Center Computers

Front End Processor	(FEP)
Central Computer System	(CCS)
System A CDC 6600	
System B CDC CYBER 170 Model 760	
System C CDC CYBER 170 Model 175	
System D CDC CYBER 170 Model 760	
DEC VAX 11/780	(ARPANET VAX)

CHAPTER 2

TERMINAL SETUP

The Zenith 29 video display terminal must be correctly configured before communication over the networks (MILNET and ARPANET) can take place. To check the terminal configuration, depress the SET UP key found on the upper left-hand side of the terminal. Menu A will be displayed at the bottom of the screen. To check other menus, depress the letter corresponding to the menu. Each menu has from one to four options. To change an option, depress the number corresponding to that option. One of the options that may require changing is the baud rate on Menu B. To do this, depress 'SET UP', 'B' to get Menu B, and then toggle the '1' key until the desired baud rate is displayed. The configuration for the Zenith 29 terminal should be set up as follows:

a. ** SETUP MENU A ** (Ver 1.05) on line MENUS -A- to -G-

b. MENU B BAUD 1200 PARITY space DUPLEX full HANDSHAKE software

c. MENU C PORT normal MODE ansii HOLD SCRN MONITOR off

d. MENU D SET CLOCK STATUS LINE on WRAP off SCREEN SAVER off

e. MENU E KEYPAD SHFT off KEYPAD ALT off REPEAT on CLICK on

f. MENU F AUTO CR off AUTO LF off CURSOR blnk line FREQ 60 Hz

g. MENU G CHAR SET normal FILL SCREEN ATTRIBUTES TEST

CHAPTER 3

LOGIN PROCEDURES

Connected to the Zenith 29 terminal is a terminal switching mechanism (Black Box) and a modem. The Black Box has two settings. Setting A is for direct hookup with the ASW VAX. Setting B is for communication with other networks. Unless otherwise noted, this switch should be set to B.

With CAPS LOCK key depressed, type 'ATE1F1'. This command gets the attention of the modem. The terminal response is 'OK'.

With CAPS LOCK key depressed, type 'ATDT43273'. This command gets the attention of the dial tone and dials x43273. This is the telephone number of the MILNET VAX. The terminal response is 'CONNECT'. If the telephone line is busy, typing 'CRTL/C' will abort.

The MILNET VAX and ARPANET VAX both use the UNIX operating system. UNIX, unlike the VMS operating system on the ASW VAX, is case sensitive. Therefore, all system commands are to be typed in lower case.

After successful connection is achieved to the MILNET VAX the following message will appear on the terminal: (NOTE: A ficticious account name of 'nswc' is used in all examples. The password, when typed in, is not echoed to the terminal.)

```
MILNET HOST "nswc-wo" (VAX 11/750:UNIX:4.1bsd)
For login or problems call Bob Archer 394-1909

login: nswc
Password:
Last Login:  day date time on ttyxx
WELCOME to the Naval Surface Weapons Center-White Oak Network Front End

1->
```

To connect to the ARPANET VAX, type 'telnet nadc' at the 1-> prompt. The following message will appear on the terminal:

```
Trying...
Open
Remote echo


NADC CCS VAX/UNIX 4.1BSD

login: nswc
Password:
Last Login: day date time on ttyxx

ARPANET users should use the command "ccs" to access the CCS
Host computers

%
```

It should be pointed out that UNIX prompts on the MILNET VAX (#->) and ARPANET VAX (%) are different. Also note that the .login files at both sites should contain the following two commands:

a. set term=vt100

b. stty 1200 dec

These commands identify the terminal as type VT100, the baud rate as 1200, and set the Digital Equipment Corporation control sequences (i.e. CTRL/C to interrupt, CTRL/U to kill, and DELETE to erase). To display the terminal setting and environment, issue the following commands:

a. stty all (or stty everything for a full listing)

b. printenv

CHAPTER 4

UNIX FILE CREATION

File creation for execution of certain FASP procedures is done on the ARPANET VAX using either the "cat" command or the "vi" editor. The "cat" command is similar to the VMS command CREATE. This method can be used when creating short input file streams. The "vi" editor has full-screen editing capabilities and should be used to create lengthy files or to make modifications to existing files. Appendix A contains a brief summary of the vi editor commands. Once an input file is created, an NADC-resident program entitled USRDTF is used to submit the file to the Central Computer System (CCS) for FASP processing.

The input job streams created for execution on the Central Computer System simulate batch job processing. A sample input stream to obtain a source listing of a FASP data base program using the "cat" command follows:

```
% cat > ltext              (directs output to a file entitled ltext)
/JOB
DASS,CM42000,T20.
ACCOUNT,NSWC,xxxxx.       (xxxxx to be replaced with password)
GET,FASP/UN=SC3024.
FASP(LTEXT) ID=DS,TEXT=SL
/EOR
*COMPILE PARAMS
/EOF
CTRL/D                    (CTRL/D denotes end of file)
%
```

NOTE: The /JOB record denotes that this is a batch job. The /EOR and /EOF records replace the 7/8/9 and 6/7/8/9 cards from batch decks respectively.

The following is a partial listing of an input stream used to create an operational software loadtape. After this file has been submitted via USRDTF to the CCS for processing, two output files are created. One file contains loadmap information. This file is the output file created when the submit option from USRDTF is selected. The other output file is a direct access permanent file which

contains encoded operational software. The contents of this permanent file will eventually be loaded into the Advanced Signal Processor (ASP) for testing and debug purposes. The naming conventions used for loadtape permanent file names consists of the two-letter FASP data base identifier (i.e. ID=DS) and a five-digit date in the form: ymmdd. (DS40911 would be the name of a loadtape created on the DS data base on 9/11/84.)

```
/JOB
DASS,CM42000,T50.
ACCOUNT,NSWC,xxxxx.
GET,FASP/UN=SC3024.
FASP(GENLDMD) ID=DS,PFNAME=DS40911
ATTACH,LOADTP=DS40911.
FASP(ENCODTP) VSN=NA,PFNAME=DS40911
/EOR
LINKEROFF
/EOR
PHASE DASSAP,STORAGE=AP,0
HEADER FG=2,FN=2,RN=1
INCLUDE DSMCRS
PHASE DASSSGP,STORAGE=CP,0
ACTION DOUBLE
HEADER FG=2,FN=2,RN=2
INCLUDE GDAU$C
SEG 512
INCLUDE SNAP
INCLUDE MJFTASK
INCLUDE MJFMJFO
.
.
.
SEG
INCLUDE AUEXIHOC
INCLUDE CPMEM
INCLUDE DSMCRS
ENTRY AUEXSTRT
EOF
EOF
/EOF
```

CHAPTER 5

INTERACTIVE FASP PROCESSING

Chapter 4 outlined the creation of sample FASP batch jobs. FASP can also be accessed interactively from the ARPANET VAX by issuing the command 'ccs c' at the % prompt. This command is used to gain access to the Central Computer System (CCS) C System host computer. The following login sequence to the CCS C System appears on the terminal.

NOTE: After typing the 'ccs c' command, the Zenith 29 terminal configuration must be changed from full to half duplex. To do this, depress 'SET UP', 'B' to get to Menu B, and then toggle the '3' key.

```
% ccs c
Trying access to ccc0
[1] 635
Connected (type " ." for immediate disconnect)
#call ccc0
#CALL COMPLETED TO CCC0,3


84/09/28  14.47.09.
KRONOS 2.1.1-SYS-CMR25-NADC.
USER NUMBER: NSWC
PASSWORD: XXXXX
TERMINAL:     146, TTYS
HASH: FMJI, MASTER DEVICE  3
RECOVER /SYSTEM: BATCH
/
```

To access FASP, the following two commands are typed at the KRONOS prompt (/). A login message will then appear on the screen. The FASP prompt is F?. The User and Key parameters are similar to account and password parameters.

```
/GET,FASP/UN=SC3024.
/FASP.
NADC FASP VERSION 4.1.9  ENTER LOGON OR HELP
F? LOGON FASP=ASP,USER=nnn,KEY=xxxxxx
  ASP FASP VERSION 04 RELEASE 13.0
  BULLETIN AVAILABLE

F?
```

There are two types of FASP commands available: immediate and procedural commands. Immediate commands serve to support interactive usage. Procedural commands operate directly on FASP data bases. Immediate commands are executed immediately while procedural commands are placed on a stack. Sequential stack execution is initiated after receipt of an end-of-command-sequence (eocs) input (a null carriage return). After a procedure on the stack has been activated, FASP will prompt the user for any input data records. FASP's text editor, FATE, is used for extensive input data. Listed below is a sample input stream which modifies an arithmetic processor microcode program entitled SRFFT. The TAB command is used to set up column alignment. The tab character, TC, is defined as #. The MP command moves the pointer to line 65 of the source code. The I command inserts the next two lines of code after line 65. The null carriage return terminates the insert mode. L *,NOLID lists the entire program minus line identifiers. EE ends the editing session and continues processing the MODSW procedure. Once the procedure completes, the output file is examined and saved as a permanent file entitled OSRFFT. The EF command ends FASP processing.

```
F? MODSW ID=DS,LS=CADIME,XLAT=xxxxx
 001 ADDED
 DATA RECORD MODSW    REQUIRED
F? <CR>

 BEGIN PROCEDURE MODSW
 FASP TEXT EDITOR  VERSION 1.5
 NAME OF *IDENT TO BE CREATED? SEP254ADG
 LIBRARY DIRECTIVE? MOD SRFFT
 COMMAND? TAB 9,17,50,72
 COMMAND? TC,#
 COMMAND? MP SRFFT.65
 COMMAND? I
 [.    4 ? #AECW#TOARIR.2#CCR# 18
 [.    5 ? #AECW2#ARIR.2C,SF.OH#MCCR=-CCR# 19
 [.    6 ? <CR>
 COMMAND? L *,NOLID
 COMMAND? EE
 END EDITOR
```

```
 COMPLETED PROCEDURE MODSW
 OUTPUT IS AVAILABLE
F? EXAMINE
 COMMAND? FS /ERRORS/
  0 ERRORS FLAGGED IN THIS TRANSLATION
 COMMAND? SAVE,OSRFFT
 COMMAND? EE
 END EDITOR
F? EF
```

After FASP has terminated, the FASP dayfile is printed and the KRONOS prompt (/) is issued. Type 'bye' at the prompt to disconnect from the CCS C System and return to the ARPANET VAX.

NOTE: After typing 'bye', the Zenith 29 terminal configuration must be changed back to full duplex. To do this, depress 'SET UP', 'B' to get to Menu B, and then toggle the '3' key.

CHAPTER 6

USER DATA TRANSFER FILE (USRDTF)

To submit an input stream to the CCS for processing, the following command is issued at the % prompt:

a. usrdtf

USRDTF is a menu-driven routine. In response to the above command, the following menu appears on the terminal:

```
(1)  Transfer a file downline from CCS-to-VAX
(2)  Transfer a file upline from VAX-to-CCS
(3)  Submit a job (VAX File) to the CCS or FEP
(4)  Retrieve job output from the CCS or FEP
(5)  Get a CATLIST of files on a primary CCS account
(6)  Get a CATLIST of files on an alternate CCS account
(7)  Get a CATLIST of files on the current VAX account
(8)  List a VAX file on the terminal
(9)  Exit from the menu
(10) Help (additional information)
```

Assuming that the loadtape input stream is on an ARPANET VAX file entitled 'loadtape', submission of that file to the CCS is accomplished by typing '3' at the SELECT: prompt. The following sequence will appear on the terminal:

```
SELECT: 3

CCS Account Number: nswc
VAX file containing job input: loadtape
ENTER CCS PASSWORD:
BEGIN UPLINE JOB SUBMITTAL
>>>>>>>
TOTAL NUMBER OF BLOCKS TRANSMITTED = 7
TOTAL NUMBER OF DATA BYTES TRANSMITTED = 1438

Job successfully submitted -- jobname is #ACUF @DASSCUF
```

The jobname is listed twice; the first name (#ACUF) is associated with the Front End Processor (FEP), the second name (@DASSCUF) is associated with the CCS. It is generally helpful to write down the second jobname at this point. Depending on the length of the job and the system usage, turnaround could take an hour or two. Normally turnaround time is about 10 to 15 minutes. There are two ways to find out if the job has executed. The first way is to type '4' at the SELECT: prompt. If the output file exists, the following sequence will appear on the terminal:

```
SELECT: 4

CCS Account Number [nswc]: <CR>
VAX file to contain job output:  ds40911.map
Name of job output file to retrieve (name must begin with
"#" or "@" [default is highest priority]:  @dasscuf
ENTER CCS PASSWORD:
BEGIN DOWNLINE FILE TRANSFER
<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
<<<<<<
TOTAL NUMBER OF BLOCKS TRANSMITTED = 263
TOTAL NUMBER OF DATA BYTES TRANSMITTED = 58362

Output from job #ACUF @DASSCUF is in VAX file ds40911.map in current
directory
```

If the output file does not exist (i.e. the job has not yet completed processing), the following sequence will appear on the terminal:

```
SELECT: 4

CCS Account Number [nswc]: <CR>
VAX file to contain job output:  ds40911.map
Name of job output file to retrieve (name must begin with
"#" or "@" [default is highest priority]:  @dasscuf
ENTER CCS PASSWORD:
ERROR--CCS file does not exist
```

A second way of testing to see if the job has been executed (and a helpful way to find out the jobname if you have forgotten it) is to type '5' at the SELECT: prompt.

```
SELECT: 5

CCS Account Number [nswc] : <CR>
Send CATLIST to (f)ile or (t)erminal [t]? : <CR>
(l)ocal or (c)ommon permfiles [c]? : <CR>
ENTER CCS PASSWORD:
BEGIN DOWNLINE TRANSFER
<
TOTAL NUMBER OF BLOCKS TRANSMITTED = 1
TOTAL NUMBER OF DATA BYTES TRANSMITTED = 207

Symbol meanings: # or @--Queue File/Job Output, *--Indirect Permfile.
When output pauses: <SPACE> to continue, <RUB> or <DEL> to abort.

-------------------------------------------------------------------------
#ACUF     *CITS024     *CITS025     *CLTS000     *DCTS000     @DASSCUF
DS40911
-------------------------------------------------------------------------
```

Once the output file, @DASSCUF, has been successfully retrieved from the CCS, the file ds40911.map resides on the ARPANET VAX. The permanent file, DS40911, on the CCS account must also be retrieved using USRDTF. To do this, type '1' at the SELECT: prompt.

```
SELECT: 1

CCS Account Number [nswc]: <CR>
CCS File Name: ds40911
VAX File Name [ds40911]: <CR>
(d)irect or (i)ndirect access [i]: d
(l)ocal or (c)ommon permfiles [c]: <CR>
Character set (a,b,d,h,k,p,q,s) [d]: <CR>
ENTER CCS PASSWORD:
BEGIN DOWNLINE TRANSFER
<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
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<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
TOTAL NUMBER OF BLOCKS TRANSMITTED = 444
TOTAL NUMBER OF DATA BYTES TRANSMITTED = 99329

Successful Transfer
```

To list to the terminal the file just transferred, type '8' at the SELECT: prompt.

SELECT: 8

Name of VAX file [ds40911]: <CR>

When output pauses: <SPACE> to continue, <RUB> or <DEL> to abort.

The output file is printed here.

Once all of the files have been transferred from the CCS to the ARPANET VAX, type '9' at the SELECT: prompt to exit USRDTF.

NOTE: USRDTF uses brackets [ ] to denote defaults at the various prompting levels. To use the default supplied, depress the carriage return key, designated as <CR> in the above examples.

CHAPTER 7

FILE TRANSFER PROTOCOL (FTP)

Once USRDTF has successfully retrieved a FASP output file from the CCS to the ARPANET VAX, a method was required to transfer files between sites. File Transfer Protocol (FTP) provides the capability of transferring ASCII and core-image files between network hosts. Appendix B lists the various FTP commands available and gives a brief description of each command.

FTP can be implemented from either the MILNET VAX or ARPANET VAX to send and retrieve files. All messages sent by the remote host begin with a three-digit number and generally indicate successful completion or failure of a given command. The prompting character for local FTP commands is >.

Below is a sample FTP session used to transfer a file from the ARPANET VAX to the MILNET VAX.

```
% ftp nswc-wo
TCP trying 26.0.0.24
Connections established

220 nswc-wo Server FTP
> log
Username:  nswc
331 Enter PASS command
> pass
Password:
230 User logged in
> send
Local file: ds40911
Remote file: ds40911
200 OK
125 Storing "ds40911" started okay
226 File transfer completed okay
> quit
221 Disconnect received, closing connections
Transferred 21661 bytes in 5 secs (34657 bps, 4332 bytes/sec)
%
```

After the user has transferred the loadmap file and direct access permanent file from the ARPANET VAX to the MILNET VAX, connections with these two systems can be closed as follows:

```
% logout
(Remote close.) Killed

2-> logout
S %@*#0
NO CARRIER
```

At this point, network communications which required the terminal switching mechanism to be at Setting B on the Black Box have now been completed. To return the terminal to its original configuration of 9600 baud, depress SETUP, 'B' to get to Menu B, and toggle the '1' key until 9600 baud appears. Return the switching mechanism to Setting A.

CHAPTER 8

KERMIT

KERMIT is a protocol developed by Columbia University for reliable file transfers between computers over terminal (tty) ports. KERMIT is *not an acronym*. It was *named* after Kermit the Frog, star of the television series The Muppet Show.

Since the ASW VAX has no communications network of its own, KERMIT is employed to retrieve files resident on the MILNET VAX. In order for KERMIT protocol to occur, a KERMIT program must be running on each end of the communication line -- one on the ASW VAX and one on the MILNET VAX. The two KERMIT programs exchange message packets. Each packet is in a special format that the other KERMIT can understand.

The terminal port characteristics on the ASW VAX over which connection to the MILNET VAX is made are as follows:

Interactive	Echo	Type_ahead	No Escape
No Hostsync	TTsync	Lowercase	No Tab
Wrap	Scope	No Remote	No Holdscreen
Eightbit	No Broadcast	No Readsync	No Form
Fulldup	Modem	No Local_echo	Autobaud
Hangup	No Brdcstmbx	No DMA	No Altypeahd
Set_speed	No ANSI_CRT	No Regis	No Block_mode
No Advance_video	No Edit_mode	No DEC_CRT	

In addition to these characteristics, the terminal speed must be set to 1200 baud. If the terminal port is not configured in this manner, see the ASW VAX system manager to make the changes.

The ASW VAX uses the VMS operating system ($ prompting). The following protocol is necessary for the ASW VAX and the MILNET VAX to communicate using KERMIT. TTA4: is the terminal port over which these communications will take place. After this sequence completes, the direct access permanent loadtape file, ds40911, that was created in Chapter 6 and transferred to the MILNET VAX in Chapter 7, will reside on the ASW VAX. Appendix C contains a listing of the VAX-11 KERMIT commands obtained by issuing the VMS command, HELP KERMIT.

```
Username: NSWC
Password:

         Welcome to VAX/VMS version V3.6 on node VAX

$ KERMIT
VMS Kermit-32 version 3.0.051
Default terminal for transfers is _TTC1:

Kermit-32> SET INCOMPLETE_FILE_DISPOSITON KEEP
Kermit-32> CONNECT TTA4:
[VAX::Connecting to _TTA4:  Type CRTL/]C to return to VAX/VMS Kermit-32]
ATE1F1
OK
ATDT43273
CONNECT

MILNET HOST "nswc-wo" (VAX 11/750:UNIX:4.1bsd)
For login or problems call Bob Archer 394-1909

login: nswc
Password:
Last Login:  day date time on ttyxx
WELCOME to the Naval Surface Weapons Center-White Oak Network Front End

1-> tty
/dev/tty05
2-> kermit sbl 1200 /dev/tty05 ds40911
)S %@*#0
CRTL/]C

[VAX::Returning to VAX/VMS Kermit-32]

Kermit-32> RECEIVE DS40911.DAT
Receiving: filename as ddcu:[NSWC]DS40911.DAT   [OK]
Kermit-32> EXIT
$
```

CHAPTER 9

FILE TRANSFER AND LOADTAPE GENERATION

The information contained in all previous chapters represents the steps necessary to create and retrieve to a "hands-on" system (ASW VAX) an operational software loadtape file. The next step in this process involves copying the loadtape file from the ASW VAX disk to 9-track magnetic tape. This tape will then be copied onto a UYK-20 disk file. Appendix D contains the source listing of the Fortran routine which performs the copy from disk to 9-track tape. The following five commands are necessary to perform the copy. After invoking the RUN command, the Fortran program prompts the user for the name of the ASW VAX file to be copied.

```
$ ALLOCATE MTA0 TAPE:
$ MOUNT/FOREIGN/DENSITY=800 TAPE
$ RUN UYKTAPE
$ DISMOUNT MTA0:
$ DEALLOCATE MTA0:
```

The 9-track magnetic tape is then mounted on the UYK-20 tape drive and copied onto disk. In the following sequence, the NADC disk is mounted, input is assigned to the tape drive (K1), and output is assigned to a temporary disk file, SGPHC/DS. The UYK-20 system service routine, SG, is used to perform the copy.

```
?:>*MT
MOUNT USER VOLUME
ENTER UNIT NUMBER:>0
USER VOL ID-NADC
  ?:>*AS IN K1
  ?:>*AS OT SGPHC/DS
  ?:>*RW IN OT
  ?:>*SG
READY
?:>COPY
READY
?:>MARK
READY
?:>TERM
```

Next, a UYK/20 resident program, LTGEN/DSF, is executed which converts the ASCII source file (SGPHC/DS) into an absolute loadtape image file. This absolute loadtape image file, DS40911/DS, contains the operational software that will be executed on the AN/UYS-1 Advanced Signal Processor.

```
  ?:>*CF DS40911/DS,,120/400
  ?:>*AS F1 LTGEN/DSF
  ?:>*LTGEN=F1
ASSIGN IN TO ASCII SOURCE AND OT TO LOAD TAPE DEVICE.
HIT BLANK RETURN WHEN DONE.
:>*AS IN SGPHC/DS
:>*AS OT DS40911/DS
:>*RW IN OT
:> <CR>
JOB COMPLETED OK
```

The final step in producing an executable operational software loadtape is the addition of header information describing the ASP hardware to the front end of the loadtape file. A UYK-20 resident program, ALTP/OCT080, provides the capability of concatenating front-end header information with the absolute loadtape image file. After the following sequence is executed, a 9-track magnetic tape containing the final output loadtape will be produced.

```
  ?:>*AS IN FRONTEND/DS
  ?:>*AS OT K1
  ?:>*RW IN OT
  ?:>*AS F2 ALTP/OCT080
  ?:>*ALTAB7=F2
COMMAND<
:>COPY IMPL IPL
 NO. OF FILES<
:>11
 LAST ELEMENT COPIED 0001
COMMAND<
:>*AS IN DS40911/DS
COMMAND<
:>*RW IN
COMMAND<
:>COPY 2201 2202
 END OF TAPE
 LAST OUTPUT ELEMENT IS 2202
 COMMAND<
:> <CR>
STOP
  ?:>*RW K1
  ?:>*DM
DISMOUNT -NADC
```

CHAPTER 10

RESULTS AND RECOMMENDATIONS

The preceding chapters document the steps necessary to interactively (vs. remote batch) create and retrieve operational software loadtapes from NADC for testing on the AN/UYS-1 Advanced Signal Processor. This interactive method of communication took approximately two man months to develop.

Excluding FASP data base changes, presently the nominal time from submission of the loadtape input stream to final retrieval of a 9-track tape containing executable operational software is three hours. Depending on the complexity of data base changes made before loadtape creation, this process can take as much as eight hours. Further, the handshaking protocol between various operating systems (UNIX, KRONOS), editors (VI, FATE), and utility programs (USRDTF, FTP, KERMIT), in addition to the slower transfer rates, makes any type of change a complicated process.

The problems encountered are not only local to NSWC. Each remote user of FASP has to design a method of interacting with FASP by whatever means is available. Some type of standardization to relieve user costs and improve efficiency is needed.

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ASP FASP User Manual, NADC, 15 May 1984.

CCS NALCON/VAX System Users Manual, NADC Technical Memorandum 85-8383, 7 Dec 1983.

User's Handbook for AN/UYK-20 (V) Computer Support Software (Volume 1), NAVELEX PX11079-1, 9 Apr 1979.

VAX/VMS Command Language User's Guide, Digital Equipment Corp., May 1982.

APPENDIX A

VI EDITOR COMMANDS

i text <CR>	Insert text before cursor
I text <CR>	Insert text at beginning of line
a text <CR>	Append text after cursor
A text <CR>	Append text at end of current line
h	Move cursor one character to left
l	Move cursor one character to right
j	Move cursor down one line
k	Move cursor up one line
0	Move cursor to beginning of current line
$	Move cursor to end of current line
G	Move cursor to end of file
nG	Move cursor to line n
w	Move cursor forward one word
b	Move cursor backward one word
e	Move cursor to end of word
)	Move cursor to the next sentence
(	Move cursor to the previous sentence
+ or <CR>	Move cursor to next line
-	Move cursor to previous line
H	Home cursor
L	Move cursor to last line on screen
M	Move cursor to middle of screen
CTRL/F	Move cursor forward one screen
CTRL/B	Move cursor backward one screen
CTRL/D	Move cursor forward 1/2 screen
CTRL/U	Move cursor backward 1/2 screen
CTRL/L	Refresh screen
x	Delete one character under cursor
X	Delete one character to left of cursor
dw	Delete one word
de	Delete one word leaving punctuation
dd	Delete one line
3dd	Delete three lines
D	Delete remainder of current line
o	Open a line below the cursor
O	Open a line above the cursor
/pat <CR>	Forward string search
?pat <CR>	Backward string search
n	Find next occurrence of pattern

N	Reverse direction and find next occcurrence
Y	Yank current line
p	Put yanked text after current line
P	Put yanked text before current line
u	Undo last change made
U	Restore current line
.	Repeat last change made

APPENDIX B

FILE TRANSFER PROTOCOL (FTP) COMMANDS

!	Invoke shell
abort	Debugging aid: take a core dump
account	Specify account on foreign host
acct	Specify account on foreign host
append	Append local file to foreign file
bye	Close connection and exit
cd	Change directory on local host
chdir	Change directory on local host
cmd	Submit a command to the other host's shell
cmdget	Retrieve file from foreign host into filter
cmdsend	Send command output to foreign host
command	Submit a command to the other host's shell
cwd	Change directory on foreign host
delete	Remove a file from the foreign host
get	Retrieve a file from the foreign host
help	Briefly describes commands
list	Get a directory listing to a local file
log	Log onto a foreign host
mget	Multiple retrieve
mkdir	Make a directory on the foreign host
mode	Specify transfer mode (STREAM or BLOCK)
mretrieve	Multiple retrieve
msend	Multiple store
mstore	Multiple store
msend	Get a directory listing to a local file
password	Tell foreign host your password
port	Tell foreign host which port to use
quit	Close the connection and exit
quote	Send quoted string to ftp server
rate	Print accumulated transfer rate and optionally reset
rename	Rename a file on the foreign host
retrieve	Retrieve a file from the foreign host
rmdir	Remove a directory on the foreign host
send	Store a local file on the foreign host
structure	Specify structure of files (RECORD or FILE)
type	Specify representation type (ASCII, IMAGE or LOCAL)
user	Tell the foreign host your name

APPENDIX C

VAX-11 KERMIT COMMANDS

KERMIT
  BYE

This command will cause Kermit-32 (when in local mode) to tell the other Kermit (which should be in server mode) to exit from Kermit and, if applicable, terminate its job (or process, etc.). When Kermit-32 receives the acknowledgement that this is being done, it will exit to VMS.

```
Kermit-32>BYE
```

KERMIT
  CONNECT

The CONNECT command will allow you to connect in as a virtual terminal over the line that was specified by the SET LINE command, or to the terminal line specified in the command. The terminal line must be one which is accessible to the users process. This means that the applicable protection code for the terminal must have been set to allow your process to access it (done by the system manager). If a session log file was previously specified, a new version of the file will be created, and all typeout logged in the file. The file will be closed when the command is completed (by use of an escape-character "C" command). The format of the CONNECT command is:

```
Kermit-32>CONNECT
```

or

```
Kermit-32>CONNECT TTcn:
```

where TTcn: is the terminal line name to be used.

KERMIT
  EXIT

The EXIT command will cause Kermit to return to command level. This command is the same as the QUIT command. An example of this command is:

```
Kermit-32>EXIT
```

KERMIT
  FINISH

This command will cause Kermit-32 (when in local mode) to tell the other Kermit (which should be in server mode) to exit from Kermit. After receiving the acknowledgement that this is being done, Kermit-32 will prompt for another command.

```
Kermit-32>FINISH
```

KERMIT
  GET

The GET command is used to have a local Kermit-32 request a file from the remote Kermit. Kermit-32 must be running as a local Kermit (i.e., a SET LINE command must have been done). Kermit-32 will then request the other Kermit (which must be running in server mode) to transfer the specified file (or set of files) to Kermit-32. The file specification must be in the format of the system on which the server Kermit is running. The format of the command is:

```
Kermit-32>GET file-specification
```

Where "file-specification" is any valid file specification on the system on which the server Kermit is running.

KERMIT
  LOCAL

This command allows the user of Kermit-32 to perform various actions on the user's system. These commands provide for listing the contents of a directory, deleting files, typing files, displaying the amount of disk space used, etc. Many of these commands are performed by spawning a subprocess to execute the corresponding DCL command; therefore, the standard parameters and qualifiers which DCL allows may be used.

```
Kermit-32>LOCAL keyword arguments
```

Where keyword is the name of the command, and arguments are the optional arguments for the command.

Additional information available:

```
COPY   CWD   DELETE   DIRECTORY   DISK_USAGE   HELP   HOST   RENAME
SEND_MESSAGE   TYPE   WHO
```

KERMIT
LOG

The LOG command allows the user to specify the file names to be used for the various log files Kermit is capable of creating. A LOG command without a file specification will cause no log file of that type to be created.

Kermit-32>LOG keyword filespec

Where keyword is DEBUG, SESSION, or TRANSACTION, and filespec is the file specification to use for that type of log file. If filespec is not present, that type of logging is disabled.

Additional information available:

DEBUG SESSION TRANSACTION

KERMIT
LOGOUT

This command will cause Kermit-32 (when in local mode) to tell the other Kermit (which should be in server mode) to exit from Kermit and, if applicable, terminate its job (or process, etc.). When Kermit-32 receives the acknowledgement that this is being done, it will prompt for another command.

Kermit-32>LOGOUT

KERMIT
QUIT

This command will cause Kermit to return to command level. This is the same as the EXIT command.

Kermit-32>QUIT

KERMIT
  RECEIVE

The RECEIVE command is used to put Kermit-32 into remote mode waiting for a single file transfer transaction. This is most useful if the other Kermit does not support local server commands. If no file specification is given, Kermit-32 will use whatever file specification is supplied by the other Kermit (suitably altered to conform to VMS standards). If a file specification is given, Kermit-32 will use that file specification instead of that supplied by the other Kermit. This is most useful when the file name on the other system is such that it does not map well into a VMS file specification. Note that the other Kermit sends more than one file, the same name will be used for all of them. Only the version numbers will be different. Therefore, it is best to use a file-specification on this command only when transferring a single file. The format of the command is:

```
Kermit-32>RECEIVE
```

or

```
Kermit-32>RECEIVE file-specification
```

Where "file-specification" is any valid VMS file specification.

KERMIT
  REMOTE

This command allows the user of Kermit-32 (in local mode) to give various commands to the other Kermit (which must be in server mode). These commands provide for listing the contents of a directory, deleting files, typing files, displaying the amount of disk space used, etc. Note that not all server Kermits support all commands, but all server Kermits should repsond with a message saying the command is not implemented if it does not support it.

```
Kermit-32>REMOTE keyword arguments
```

Where keyword is the name of the command, and arguments are the optional arguments for the command.

Additional information available:

```
COPY   CWD   DELETE   DIRECTORY   DISK_USAGE   EXIT   HELP   HOST
LOGIN   LOGOUT   RENAME   SEND_MESSAGE   STATUS   TYPE   WHO
```

KERMIT
  SEND

The SEND command will allow you to send a file(s) to the other Kermit. The SEND command will allow file wild card processing as is found in VMS. If Kermit-32 is running in remote mode, the file will be sent on the controlling terminal line after waiting the number of seconds specified by the SET DELAY command. This gives the user time to escape back to the other Kermit and issue a receive command. If Kermit-32 is running in local mode, the file will be sent immediately on the terminal line specified by the SET LINE command.

The command format is:

Kermit-32>SEND file-specification

Where "file-specification" is any normal VAX/VMS file specification.

KERMIT
  SERVER

This command will cause Kermit-32 to enter server mode. The other Kermit can then issue server commands to send and receive files without having to give SEND or RECEIVE commands to Kermit-32. Kermit-32 may be put into SERVER mode while running as either a remote Kermit (transmitting over the controlling terminal line), or as a local Kermit (transmitting over a terminal specified by a SET LINE command). Note that in order to correctly receive binary files while in SERVER mode, a SET FILE TYPE BINARY must be done first. At this time there is no way for Kermit-32 to determine whether an incoming file is ASCII or binary.

The format of the command is:

Kermit-32>SERVER

KERMIT
  SET

The SET command is used to set various parameters in Kermit.

Additional information available:

BLOCK_CHECK_TYPE DEBUGGING DELAY ESCAPE FILE IBM_MODE
INCOMPLETE_FILE_DISPOSITION LINE LOCAL_ECHO MESSAGE
PARITY PROMPT REPEAT_QUOTE RETRY RECEIVE SEND

KERMIT
  SHOW

The SHOW command will allow you to show the various parameters that are set with the SET command.

Additional information available:

ALL BLOCK_CHECK_TYPE COMMUNICATIONS DEBUGGING DELAY ESCAPE FILE_PARAMETERS FILE_TYPE INCOMPLETE_FILE_DISPOSITION LOCAL_ECHO PACKET PARITY SEND RECEIVE RETRY

KERMIT
  STATUS

The current status of Kermit-32 will be displayed. This includes the number of characters that have been sent and received from the remote Kermit. Also included is an estimate of the effective baud rate of the transfer. This number is not intended to be exact, but only an indication of what range of throughput has been provided.

APPENDIX D

UYKTAPE FORTRAN SOURCE LISTING

```
C
C     THIS PROGRAM GENERATES AN UNLABELED CARD IMAGE TAPE
C
      IMPLICIT INTEGER (A-Z)
      CHARACTER*132 CARD
      CHARACTER*30  FILENAME
C
      WRITE (6,10)
10    FORMAT ('$ENTER LOADTAPE FILENAME TO BE COPIED TO TAPE: ')
      READ (5,20) FILENAME
20    FORMAT (A30)
C
      OPEN (UNIT=4,NAME=FILENAME,TYPE='OLD',
     1     CARRIAGECONTROL='NONE',ERR=100)
      OPEN (UNIT=3,NAME='TAPE',TYPE='NEW',
     1     CARRIAGECONTROL='NONE')
C
30    READ (4,40,END=50) CARD
40    FORMAT (A)
      WRITE (3,40) CARD
      GO TO 30
50    CLOSE (UNIT=3)
      CLOSE (UNIT=4)
      CALL EXIT
C
100   WRITE (6,110) FILENAME
110   FORMAT (' NO SUCH FILE ',A30)
      CALL EXIT
      END
```

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