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Program Listings
for SWF-D:
The Signal Waveform
File Demon.

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10 Joanne Z. Sattley

9 Technical Report, CCA-79-10

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Program Listings for SWF-D:
The Signal Waveform File Demon

Joanne Z. Sattley

Technical Report CCA-79-10

January 31, 1979

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1. Introduction

This document contains listings of the SWF-D program source-code and data definitions. ⁹ it is intended to serve as a companion document to the Report on the Implementation and Test of SWF-D: The Signal Waveform File Demon, which is distributed as CCA Technical Report #CCA-79-09.

The source-code is divided here into sections, each of which represents a separately compiled program module and, to facilitate referencing, subsection numbers have been assigned to several of the more interesting routines within the modules. Global data definitions, constants and variables are listed in the Appendix. 

Two pre-existing CCA-developed programs which were created as parts of other projects are not included here. These are:

- . DCSTAT, the Datacomputer status checking program, and
- . BDSUBR, a package of utility routines for interfacing to the Datacomputer.

DCSTAT is a free-standing program which is loaded dynamically by the SWF-D program; the status information is transmitted between the two programs via a Tenex file. The BDSUBR package, on the other hand, is loaded into core as an integral part of the SWF-D program, permitting Datacomputer communications to be handled as ordinary subroutine calls. Listings are readily available from CCA upon request.

The SWF-D program is written in the BCPL programming language. The resultant code, though quite readable for the most part, requires considerable knowledge of the language's unusual treatment of data types for complete comprehension -- and, thus, cannot be recommended to the casual reader. The program maintainer, however, should find the contents rather useful even though the most up-to-date versions are to be found online.

SWF-D, Program Listings
Introduction

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Section 1

Generating an executable SWF-D program involves compiling each module, loading together all the REL files using the Tenex LINK10 loader, and then saving the resultant core image. The operating characteristics are covered in the implementation and test report.

2. The Main Control Module .

```

// SWF-D Program: Main Module
get    "<CCA-SWF>SWFHEAD.BCP"
external { CheckDC }
external { CheckL }
external { EVENTS }
external { GAVAIL }
external { MARK }
external { MOVES }
external { OKGOQ }
external { RportL }
external { UPDAT }

static {stat
dcstatBCPL      :      vec      512
dcstatBUFF     :      vec      1000
dcstatJFN      :      nil
dcstatPTR      :      nil
RdateSTR       :      vec      15
smJFN          :      nil
smFRKH         :      nil
JsACS          :      vec      10
MsgsBuffer     :      vec      512
loadlbl       :      nil
loadlvl       :      nil
datelbl       :      nil

```

SWF-D, Program Listings
The Main Control Module

```
datelvl      :      nil
wrkvec       :      vec      10

jstat

let Start() be
{st
JSYS(jsRESET)
jsAcs!1 := #636746, #154400      // program ID
JSYS(jsSETNM, jsAcs)

RportL("NEW SESSION")

// Create fork & load with DC status checker. Problems encountered
// here should be checked out and the error condition corrected prior
// to restarting SWF-D.

jsAcs!1 := #200000, 0      // capabilities = thisfork
if JSYS(jsCFORK, jsAcs) eq failed then {forkerr
  RportL("CFORK failure; restart SWF-D")
  finish
}forkerr
smFRKH := jsAcs!1
jsAcs!1 := #100001, 0      // old file
jsAcs!2 := POINT(7, '<SUBSYS>DCSTAT.SAV')
if JSYS(jsGTJFN, jsAcs) eq failed then {jfnerr
  RportL("GTJFN failure; restart SWF-D")
  finish
}jfnerr
smJFN := jsAcs!1
jsAcs!1 := smFRKH, smJFN
JSYS(jsGET, jsAcs)
```

SWF-D, Program Listings
The Main Control Module

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Section 2

```
// set up interrupt programs
let cntllchan := FreeTlCh()           // set up int for ^L
ATI($"^L,cntllchan)
PSISetCh(1,cntllchan,LoadWorkSchedule)
let cntlSchan := FreeTlCh()         // set up int for ^S
ATI($"^S,cntlSchan)
PSISetCh(1,cntlSchan,SetStationData)
PSION()

// set wake-up control bits

jsACs!1 := INPUT
JSYS(jsRFMOD,jsACs)
(jsACs!2)<<TT.WAK := #77
JSYS(jsSFMOD,jsACs)

loadbl := SWFTop
loadlv1 := Level()
datebl := SWFTop
datelv1 := Level()

// Check for existence of SWF-D.WORK%SCHEDULE file;
// This is a clue which indicates whether the program is
// starting (and needs initializing) or restarting.

// jsACs!1 := ofOldFile
// jsACs!2 := POINT(7,'SWF-D.WORK%SCHEDULE')

// if JSYS(jsGTJFN,jsACs) ne failed then {restart
//   TaskJFN := rh jsACs!1
//   goto SWFTop
//   }restart
```

SWF-D, Program Listings
The Main Control Module

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Section 2

```
//TaskJFN := CreateOutput("SWF-D.WORK%SCHEDULE",7)

// initialize working parameters

SetStationData()
LoadWorkSchedule()
dcstatJFN := 0
DCicp := false
MARK(TaskStatus,InitCompleted)
RportL("Initialization complete")
Logpg>>Log.NextTask := TopoftheQueue

// Wait 1 hour before performing any tasks. This serves two
// purposes: (1) it allows the Datacomputer to restart itself
// and to perform its directory cross-checking more rapidly, and
// (2) it provides for resetting the program work schedule, the
// station data, and/or other task-dependent data by means of the
// interrupt processing routines.

LIMBEAUX(1)
RportL("Beginning task processing")

SWFTop:
OKGoQ()
let nt := Logpg>>Log.NextTask // check working conditions
switchon nt into {ntask // pick up first;next task in queue

case TopoftheQueue:
case Restart:
    Logpg>>Log.Taskix := 0
    RportL("Top of the task queue")
    endcase

case Limbo:
    Logpg>>Log.Taskix := Logpg>>Log.Taskix + 1
    LIMBEAUX(Logpg>>Log.Taskix)
    endcase
```

SWF-D, Program Listings
The Main Control Module

```
case GetArrivals:  if ~ EVENTS() then {gaf
                  LIMBEAUX(2)
                  goto SWFTop }gaf.
                  endcase

case AppendSWF:   if ~ MOVES() then {mof
                  LIMBEAUX(2)
                  goto SWFTop }mof
                  endcase

case UpdateESF:  if ~ UPDAT() then {upf
                  LIMBEAUX(2)
                  goto SWFTop }upf
                  endcase

case GenSegAvailMap:  if ~ GAVAIL() then {gaf // wait 2 hrs
                  LIMBEAUX(2)
                  goto SWFTop }gaf // & try again
                  endcase

default:
}ntask

// When task has completed a self-appointed quota, Taskix is
// bumped & the next time through the loop, another task will
// be selected.

Logpg>>Log.Taskix := Logpg>>Log.Taskix + 1
if Logpg>>Log.Taskix > Logpg>>Log.Tasklim then Logpg>>Log.Taskix := 1
Logpg>>Log.NextTask := Logpg>>Log.Task~(Logpg>>Log.Taskix)
RportL("Next task:")
goto SWFTop

}st
```

2.1 LoadWorkSchedule, Control-L Interrupt Processor

```
// LoadWorkSchedule is the control-L interrupt processor.  
// It maintains the SWF-D.WORK%SCHEDULE Tenex file and creates one  
// as part of the program initialization sequence if one does not exist.  
  
and let LoadWorkSchedule(1,v,lvpc) be  
  
  llws  
  
  RportL("Loading work schedule")  
  // set wake-up control bits  
  
  jsACs!1 := INPUT  
  JSYS(jsRFMOD,jsACs)  
  (jsACs!2)<<TT.WAK := #77  
  JSYS(jsSFMOD,jsACs)  
  
  let WorkJFN := nil  
  
  let Tch,tix,numb := nil,nil,nil  
  
  jsACs!1 := ofOldFile\ofAssignOnly  
  jsACs!2 := POINT(7,'SWF-D.WORK%SCHEDULE')  
  
  if JSYS(jsGTJFN,jsACs) ne failed then !is  
    WorkJFN := rh jsACs!1  
    jsACs!2 := #440000,#303000  
    if JSYS(jsOPENF,jsACs) eq failed then !  
      RportL("Check SWF-D.WORK%SCHEDULE file and restart program")
```

SWF-D, Program Listings
The Main Control Module

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Section 2

```
finish }

SIN(WorkJFN,POINT(36,Logpg),512)

// Check for updates if processing interrupt - else
// return to calling program.

if numbargs < 3 then {  CLOSF(WorkJFN) ;  return }

    jsACs!1,jsACs!2 := WorkJFN,0
    JSYS(jsSFPTR,jsACs)
    goto QueryL
}is

WorkJFN := CreateOutput("SWF-D.WORK%SCHEDULE",36)

LWSInit:

WriteS("#nReady to initialize work schedule*n")

// Initialize default values but save old ESFCurrentDate
{lwsinit

let tvec := vec 5
CopyString(lv(Logpg)>>Log.ESFCurrentDate),tvec)

for ix := 1 to 512 do Logpg!ix := 0

Logpg>>Log.Taskix := 0
Logpg>>Log.Tasklim := 0
Logpg>>Log.LoadLimit := 3.0
Logpg>>Log.NextTask := TopoftheQueue
```


SWF-D, Program Listings
The Main Control Module

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Section 2

```
// Reset ESFCurrentDate only if virgin Logpg
CopyString(tvec,lv (Logpg)>>Log.ESFCurrentDate))
if Logpg>>Log.ESFCurrentDate eq 0 then
  { Logpg>>Log.ESFCurrentDate := 1978,#1001 }
Logpg>>Log.Interval := 1
}lwsinit
QueTop:
WriteS("Task := ")
Tch := PBIN()
switchon Tch into {t1p
case $?:
  tqmk
  Writetech($*n) => Display list of tasks*n")
  WriteS("**t? => Scan ESF for arrivals*n")
  WriteS("**tE => Generate segment availability map*n")
  WriteS("**tG => Move waveforms*n")
  WriteS("**tM => Update ESF*n")
  WriteS("**tU => Wait (program delay) n hours*n")
  WriteS("**tW => Go to top of task queue*n")
  WriteS("**tT => Restart at top of task queue*n")
  WriteS("**tR => View current task queue*n")
  WriteS("**tV => Clear current task queue*n")
  WriteS("**tC => Quit [review SWF-D control variables]*n")
  WriteS("**tQ =>
}qmk
endcase
```

SWF-D, Program Listings
The Main Control Module

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Section 2

```
case $r:
case $R:
case $t:
case $T:
    WriteS("tStart at top of queue*tlOKJ*n")
    tix := Logpg>>Log.Tasklim + 1
    Logpg>>Log.Task`tix := Restart
    Logpg>>Log.Tasklim := tix
endcase

case $e:
case $E:
    WriteS("SF scan for arrivals*tlOKJ*n")
    tix := Logpg>>Log.Tasklim + 1
    Logpg>>Log.Task`tix := GetArrivals
    Logpg>>Log.Tasklim := tix
endcase

case $g:
case $G:
    WriteS("enerate segment map*tlOKJ*n")
    tix := Logpg>>Log.Tasklim + 1
    Logpg>>Log.Task`tix := GenSegAvailMap
    Logpg>>Log.Tasklim := tix
endcase

case $m:
case $M:
    WriteS("ove waveforms*tlOKJ*n")
    tix := Logpg>>Log.Tasklim + 1
    Logpg>>Log.Task`tix := AppendsSWF
    Logpg>>Log.Tasklim := tix
endcase

case $w:
case $W:
    WriteS("ait n hours*tlOKJ*n")
    tix := Logpg>>Log.Tasklim + 1
    Logpg>>Log.Task`tix := Limbo
    tix := tix + 1
```

SWF-D, Program Listings
The Main Control Module

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Section 2

```
WriteS("# hours = ")
{ let numb := ReadN(INPUT)
  Logpg>>Log.Task`tix := numb }
Logpg>>Log.Tasklim := tix
endcase

case $u:
case $U:
  WriteS("pdate ESF*tLOKJ*n")
  tix := Logpg>>Log.Tasklim + 1
  Logpg>>Log.Task`tix := UpdateESF
  Logpg>>Log.Tasklim := tix
endcase

ViewTQ:
case $v:
case $V:
  WriteS("view task queue*tLOKJ*n*Task-index*tTask*n*n")
  {plp
  let nt := nil
  for tix := 1 to Logpg>>Log.Tasklim do {dplp
    Writech($*t) ; WriteN(tix) ; Writech($*t)
    {ntlp nt := Logpg>>Log.Task`tix + #60
    switchon nt into {
      case $1: WriteS("Limbo*t")
        tix := tix + 1 // to get n hours
        WriteN(Logpg>>Log.Task`tix)
        WriteS(" hours*n")
        endcase
      case $2: WriteS("Get Arrivals*n")
        endcase
      case $3: WriteS("Append to SWF*n")
        endcase
```

SWF-D, Program Listings
The Main Control Module

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Section 2

```
case $4: WriteS("Update ESF*n")
endcase

case $6:
case $5: WriteS("Transfer to top of task queue*n")
endcase

case $7: WriteS("Generate SPDET Map*n")
default: endcase

} }ntlp
}dplp
Writech($*n)
WriteS("Current task index = ")
WriteN(Logpg>>Log.Taskix); Writech($*n)
WriteS("Current task limit = ")
WriteN(Logpg>>Log.Tasklim); Writech($*n)
}plp
endcase

case $c:
case $C:

case $q:
case $Q:
default:

}tlp
goto QueTop
QueryL:

WriteS("uit*tlOK - on to review control variables]*n")
goto QueryL
endcase
```

```
WriteS("Select item to print!update: ")
Tch := PBIN()
switchon Tch into lpulp

case $?:
  Writech($*n)
  WriteS("**t? => Display items*n")
  WriteS("**tI => Set Interval for automatic program delay*n")
  WriteS("**tL => Set load limit*n")
  WriteS("**tC => Clear task chain*n")
  WriteS("**tN => Next task check*n")
  WriteS("**tA => Append to task queue*n")
  WriteS("**tE => Set ESF Current Date*n")
  WriteS("**tW => Set work schedule*n")
  WriteS("**tV => View current task queue*n")
  WriteS("**tQ => Quit lreturn to task processingJ*n")
  endcase

case $i:
case $I:
  livl WriteS("nterval = ")

SetINT:
  WriteN(Logpg>>Log.Interval)
  WriteS("**tChange it? LYiNJ ")
  let ch := PBIN()
  if (ch eq $N \ ch eq $n) then { WriteS("o*n") ; endcase }
  if (ch eq $Y \ ch eq $y) then {
    WriteS("es*nOKJ*tNew Interval = ")
    let numb := ReadN(INPUT)
    Logpg>>Log.Interval := numb }
  WriteS("Interval reset to: ")
  goto SetINT
  endcase
  livl
```

SWF-D, Program Listings
The Main Control Module

```
case $l:
case $L:
SetLL:
    {ll
    WriteS("oad limit = ")
    jsACs!1 := OUTPUT ; jsACs!3 := 0
    jsACs!2 := Logpg>>Log.LoadLimit
    JSYS(jsFLOUT,jsACs)
    jsACs!1 := INPUT
    WriteS("tChange it? LY!NJ*t")
    let ch := PBIN()
    if (ch eq $N \ ch eq $n) then { WriteS("o*n") ; endcase }
    if (ch eq $Y \ ch eq $y) then {
    WriteS("es*n\OKJ*tNew load limit: ")
    if JSYS(jsFLIN,jsACs) eq failed then {
    WriteS("nBad value - try again:*t")
    goto GetLL }
    Logpg>>Log.LoadLimit :=jsACs!2
    WriteS("Load Limit reset to: ")
    goto SetLL
    }
    endcase
    }ll
case $c:
case $C:
    WriteS("lear task chain*n")
    goto LWSInit
    endcase
case $n:
case $N:
    lntk WriteS("ext task = ")
SetTSK:
    WriteN(Logpg>>Log.NextTask)
    WriteS("#n1 = Limbo, 2 = GetArrivals, 3 = AppendSWF, ")
    WriteS("#4 = UpdateESF*n")
```

SWF-D, Program Listings
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Section 2

```
WriteS("5 = TopoftheQueue, 6 = Restart, 7 = GenSegAvailMap*n")
WriteS("tChange it? LY|N| ")
let ch := PBIN()
if (ch eq $N \ ch eq $n) then { WriteS("o*n") ; endcase }
if (ch eq $Y \ ch eq $y) then {
WriteS("es*n|OKJ*tNext task = ")
let numb := ReadN(INPUT)
Logpg>>Log.NextTask := numb }
WriteS("Next task reset to: ")
WriteN(Logpg>>Log.NextTask) ; Writech($*n)
endcase
}ntk

case $a:
case $A:
WriteS("ppend task*n")
WriteS("Ready to append to task queue*n")
goto QueTop
endcase

case $v:
case $V:
goto ViewTQ
endcase

ESFDate:
case $e:
case $E:
{ WriteS("SFCurrentDate |day month year| = ")
WriteN(Logpg>>Log.ESFCurrentDate.Day)
Writech($-)
WriteN(Logpg>>Log.ESFCurrentDate.Mo)
Writech($-)
WriteN(Logpg>>Log.ESFCurrentDate.Yr)
WriteS("nChange it? LY|N|*t")
let ch := PBIN()
if (ch eq $N \ ch eq $n) then { WriteS("o*n") ; endcase }
if (ch eq $Y \ ch eq $y) then {
```

SWF-D, Program Listings
The Main Control Module

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Section 2

```
WriteS("es*tlOKJ*tNew date := ")
numb := ReadN(INPUT)
Logpg>>Log.ESFCurrentDate.Day := numb

numb := ReadN(INPUT)
Logpg>>Log.ESFCurrentDate.Mo := numb

numb := ReadN(INPUT)
Logpg>>Log.ESFCurrentDate.Yr := numb
Writech($E)
goto ESFDate
}
endcase
}

case $w: WriteS("ork schedule*n")
case $W: // interactively determines when SWF-D will!will not work
// and reprograms the task queue accordingly. <<< unimplemented
endcase

case $q:
case $Q: WriteS("uit lresume task processing!*n")
        goto LWSout
default: endcase

}pulp
goto QueryL
LWSout:
SOUT(WorkJFN,POINT(36,Logpg),512)
CLOSE(WorkJFN)
if numbargs < 3 then return
LongDebrk(lvpc,loadlbl,loadlvl)
}lws
```


2.2 SetStationData, Control-S Interrupt Processor

```
// SetStationData is the control-S interrupt processor but it can
// also be called as a simple subroutine to reload station data. It
// maintains the SWF-D.STATION%DATA Tenex file and will create it as
// part of the program initialization sequence if one does not exist.
// This program provides for:
//
// . acquiring information by station about SRO data stored on
//   the Datacomputer,
//
// . printing current station data (i.e., station name, period
//   of the data stored for the station on the Datacomputer
//   (as advised by messages from ASL), and the date of the
//   last short-period detections file generated for the station.
//
// . updating the station data per ASL advice,
//
// . adding a new station, and
//
// . deleting a station.
//
//
and let SetStationData(1,v,lvpc) be
tssd
RportL("SWF-D acquiring Station data")
// set wake-up control bits
```

SWF-D, Program Listings
The Main Control Module

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Section 2

```
jsACs!1 := INPUT
JSYS(jsRFMOD,jsACs)
(jsACs!2)<<TT.WAK := #77
JSYS(jsSFMOD,jsACs)

// If the Tenex file SWF-D.STATION%DATA exists, SetStationData will
// initialize the StationData structure from the file. Otherwise,
// it will interactively construct the dataset and create a new file.

let StationDataJFN := nil
let OPch := nil

jsACs!1 := ofOldFile\ofAssignOnly
jsACs!2 := POINT(7,'SWF-D.STATION%DATA')

if JSYS(jsGTJFN,jsACs) ne failed then !is
// Open file:

StationDataJFN := rh jsACs!1
jsACs!2 := #440000, #303000
if JSYS(jsOPENF,jsACs) eq failed then !
  RportL("Check SWF-D.STATION%DATA file and restart program")
  finish }

// Read in data and construct the StationData dataset.
SIN(StationDataJFN,POINT(36,Stations),512)

// Check for updates if processing interrupt: - else
// return to calling program.

if numbargs < 3 then { CLOSF(StationDataJFN) ; return }

jsACs!1,jsACs!2 := StationDataJFN,0
JSYS(jsSFPTIR,jsACs)
goto UpdateQ
```

SWF-D, Program Listings
The Main Control Module

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Section 2

```
jis
// Create new SWF-D.STATION%DATA file,
StationDataJFN := CreateOutput("SWF-D.STATION%DATA", 36)
// then initialize dataset:
WriteS("nReady to initialize data for Stations")
SetTop:
{inits
for i:= 1 to 512 do Stations[i] := 0
let ix := 1
let numb := nil
Stations>>StationData.AllStationsASLDate := 1978, #1001
InitStations:
for i := 1 to 10 do wrkvec[i] := 0
WriteS("nStation name: ")
ReadWord(wrkvec)
CopyString( wrkvec, lv (Stations>>StationData.Station~ix.SName~1) )
WriteS("nFrom date lday month year]: ")
numb := ReadN(INPUT)
Stations>>StationData.Station~ix.FromDate.Day := numb
numb := ReadN(INPUT)
Stations>>StationData.Station~ix.FromDate.Mo := numb
numb := ReadN(INPUT)
Stations>>StationData.Station~ix.FromDate.Yr := numb
```

SWF-D, Program Listings
The Main Control Module

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Section 2

```
WriteS("nTo date [day month year]: ")
numb := ReadN(INPUT)
Stations>>StationData.Station`ix.ToDate.Day := numb

numb := ReadN(INPUT)
Stations>>StationData.Station`ix.ToDate.Mo := numb

numb := ReadN(INPUT)
Stations>>StationData.Station`ix.ToDate.Yr := numb

Stations>>StationData.Stationix := ix
ix := ix + 1

WriteS("nMore? |Y|N|*t")
let`ch := PBIN()
if ( ch eq $Y \ ch eq $y ) then { WriteS("es*n") ; goto InitStations }
if ( ch eq $n \ ch eq $N ) then { WriteS("o*n") }
}inits

// STATION%DATA now in core. Check caller options to update, print, etc.

UpdateQ:

WriteS("nSelect operation (? for options):*n")

OPch := PBIN()
switchon OPch into {oplp

case $?:
    {qmark
    Writech($*n)
    WriteS("t? => Display menu of operations*n")
    WriteS("tP => Print current info*n")
    WriteS("tC => Change ASL date for all Stations*n")
    WriteS("tS => Set SPDET date for all Stations*n")
```

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```
WriteS("**TU => Update ASL data by Station*n")
WriteS("**TA => Add a new Station*n")
WriteS("**TD => Delete a Station*n")
WriteS("**TI => Initialize data by Station*n")
WriteS("**TQ => Quit lreturn to task processingJ*n*n")
Jqmark
endcase
```

case \$c:
case \$C:

```
WriteS("hange ASL date for all Stations to lday month yearJ: ")
{ let numb := ReadN(INPUT)
  Stations>>StationData.AllStationsASLDate.Day := numb
  numb := ReadN(INPUT)
  Stations>>StationData.AllStationsASLDate.Mo := numb
  numb := ReadN(INPUT)
  Stations>>StationData.AllStationsASLDate.Yr := numb }
}
```

```
WriteS("**tLOKJ*n")
WriteS("**nAllStationsASLDate = ")
WriteN(Stations>>StationData.AllStationsASLDate.Day)
Writech($*s)
WriteN(Stations>>StationData.AllStationsASLDate.Mo)
Writech($*s)
WriteN(Stations>>StationData.AllStationsASLDate.Yr)
Writech($*n)
endcase
```

case \$s:
case \$\$:

```
WriteS("et SPDET date for all Stations to lday month yearJ: ")
{ let numb := ReadN(INPUT)
  Stations>>StationData.AllStationsSPDETDate.Day := numb
  numb := ReadN(INPUT)
  Stations>>StationData.AllStationsSPDETDate.Mo := numb
  numb := ReadN(INPUT)
  Stations>>StationData.AllStationsSPDETDate.Yr := numb }
}
```

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```
WriteS("tL0KJ*n")
WriteS("nAllStationsSPDEtDate = ")
WriteN(Stations>>StationData.AllStationsSPDEtDate.Day)
Writech($*s)
WriteN(Stations>>StationData.AllStationsSPDEtDate.Mo)
Writech($*s)
WriteN(Stations>>StationData.AllStationsSPDEtDate.Yr)
Writech($*n)
endcase
```

case \$u:
case \$U:

```
WriteS("pdate ASL data*n")
{ulp
for ix := 1 to Stations>>StationData.Stationix do {
WriteS(lv (Stations>>StationData.Station`ix.SName`1))
WriteS(":*told date = ")
WriteN(Stations>>StationData.Station`ix.ToDate.Day)
Writech($*s)
WriteN(Stations>>StationData.Station`ix.ToDate.Mo)
Writech($*s)
WriteN(Stations>>StationData.Station`ix.ToDate.Yr)
WriteS(":*tnew date [day month yearJ = ")
let numb := ReadN(INPUT)
Stations>>StationData.Station`ix.ToDate.Day := numb
numb := ReadN(INPUT)
Stations>>StationData.Station`ix.ToDate.Mo := numb
numb := ReadN(INPUT)
Stations>>StationData.Station`ix.ToDate.Yr := numb }
}ulp
endcase
```

case \$p:
case \$P:

```
WriteS("rint*n")
{lp
WriteS("s*s*sStation*tFrom:*tTo:*tSPDEt-Date:*n*n")
```

```
for ix := 1 to Stations>>StationData.Stationix do
  WriteS("s*s*s*s")
  WriteS(lv (Stations>>StationData.Station`ix.SName`1))
  Writech($*t)
  WriteN(Stations>>StationData.Station`ix.FromDate.Day)
  Writech($-)
  WriteN(Stations>>StationData.Station`ix.FromDate.Mo)
  Writech($-)
  WriteN(Stations>>StationData.Station`ix.FromDate.Yr)
  Writech($*t)
  WriteN(Stations>>StationData.Station`ix.ToDate.Day)
  Writech($-)
  WriteN(Stations>>StationData.Station`ix.ToDate.Mo)
  Writech($-)
  WriteN(Stations>>StationData.Station`ix.ToDate.Yr)
  Writech($*t)
  WriteN(Stations>>StationData.Station`ix.SPDEtDate.Day)
  Writech($-)
  WriteN(Stations>>StationData.Station`ix.SPDEtDate.Mo)
  Writech($-)
  WriteN(Stations>>StationData.Station`ix.SPDEtDate.Yr)
  Writech($*n)
}

PrintAllASLDate:
  WriteS("#nAllStationsASLDate = ")
  WriteN(Stations>>StationData.AllStationsASLDate.Day)
  Writech($-)
  WriteN(Stations>>StationData.AllStationsASLDate.Mo)
  Writech($-)
  WriteN(Stations>>StationData.AllStationsASLDate.Yr)
  Writech($*n)

PrintAllSPDEtDate:
  WriteS("#nAllStationsSPDEtDate = ")
  WriteN(Stations>>StationData.AllStationsSPDEtDate.Day)
  Writech($-)
```

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```
WriteN(Stations>>StationData.AllStationsSPDETDate.Mo)
Writech($-)
WriteN(Stations>>StationData.AllStationsSPDETDate.Yr)
Writech($*n)

!plp
Writech($*n)
endcase

case $a:
case $A:

WriteS("ddd new Station: Name = ")
! for i := 1 to 10 do wrkvec[i] := 0
ReadWord(wrkvec)
let ix := Stations>>StationData.Stationix + 1
CopyString(wrkvec,lv (Stations>>StationData.Station`ix.SName`1))
WriteS("nFrom date [day month year]: ")
let numb := nil
numb := ReadN(INPUT)
Stations>>StationData.Station`ix.FromDate.Day := numb

numb := ReadN(INPUT)
Stations>>StationData.Station`ix.FromDate.Mo := numb

numb := ReadN(INPUT)
Stations>>StationData.Station`ix.FromDate.Yr := numb

WriteS("nTo date [day month year]: ")
numb := ReadN(INPUT)
Stations>>StationData.Station`ix.ToDate.Day := numb

numb := ReadN(INPUT)
Stations>>StationData.Station`ix.ToDate.Mo := numb

numb := ReadN(INPUT)
Stations>>StationData.Station`ix.ToDate.Yr := numb
```



```

    Stations>>StationData.Stationix := ix
  }
endcase

case $d:
case $D:
    WriteS("elete Station Name: ")
    {dplp
    let si := nil
    for i := 1 to '10 do wrkvec! := 0
    ReadWord(wrkvec).
    }outl
    }lookl
    for ix := 1 to Stations>>StationData.Stationix do {
        if ( Eqstr ( wrkvec,
        ( lv (Stations>>StationData.Station`ix.SName`1))) ) then {
            si := ix ; goto DeleteStation }
        } }lookl
        WriteS("nStation "); WriteS(wrkvec) ; WriteS(" not found*n")
        endcase }outl

DeleteStation:
    if si < Stations>>StationData.Stationix then {replp
    let rix := Stations>>StationData.Stationix
    CopyString(lv (Stations>>StationData.Station`rix.SName`1),
    lv (Stations>>StationData.Station`si.SName`1))
    Stations>>StationData.Station`si.ToDate.Day :=
    Stations>>StationData.Station`rix.ToDate.Day
    Stations>>StationData.Station`si.ToDate.Mo :=
    Stations>>StationData.Station`rix.ToDate.Mo
    Stations>>StationData.Station`si.ToDate.Yr :=
    Stations>>StationData.Station`rix.ToDate.Yr
    }replp
```

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```
Stations>>StationData.Stationix :=  
  Stations>>StationData.Stationix - 1  
}dlp  
endcase  
  
  WriteS("nitialize all Stations*n")  
  goto SetTop  
endcase  
  
  WriteS("uit*n")  
  goto WhichExit  
endcase  
  
  goto UpdateQ  
endcase  
  
}oplp  
goto UpdateQ  
WhichExit:  
  // Write out new or updated SWF-D.STATION%DATA file page.  
  SOUT(StationDataJFN,POINT(36,Stations),512)  
  CLOSF(StationDataJFN)  
  if numbargs < 3 then return  
  LongDebrk(lvpc,datelbl,datelvl)  
}ssd
```

2.3 MARK, Record Task Progress

// MARK maintains the SWF-D task chain. This information is used
// to start and restart the various tasks.

and let MARK(ent,svc) be

{mark

switchon ent into {mi

```
// case TaskStatus:
//   { let ix := Logpg>>Log.Taskix + 1
//     if ix le Tix then {
//       Logpg>>Log.Taskix := svc
//       Logpg>>Log.Taskix := ix
//       return // }
//     }
//   }
```

case StationsStatus:

```
{ let jfnx := nil
  jsACs!1 := ofOldFile\ofAssignOnly
  jsACs!2 := POINT(7,'SWF-D.STATION%DATA')
  if JSYS(jsGTJFN,jsACs) eq failed then {fl
    RportL("Cannot find SWF-D.STATION%DATA")
    finish }fl
  jfnx := rh jsACs!1
  jsACs!2 := #440000, #303000
```

```
if JSYS (jsOPENF,jsACs) eq failed then {
RportL("Cannot open SWF-D.STATION%DATA file")
finish }

Stations>>StationData.AllStationsSPDEtDate := svc

for ix := 1 to Stations>>StationData.Stationix do {
Stations>>StationData.Station`ix.SPDEtDate := svc }
SOUT(jfnx,POINT(36,Stations),512)
EndWrite(jfnx)
jsACs!1 := jfnx
JSYS(jsRLJFN,jsACs)
endcase }

case ESFStatus:
{ let jfnx := nil
jsACs!1 := ofOldFile\ofAssignOnly
jsACs!2 := POINT(7,'SWF-D.WORK%SCHEDULE')

if JSYS(jsGTJFN,jsACs) eq failed then {fl
RportL("Cannot find SWF-D.WORK%SCHEDULE")
finish }fl

jfnx := rh jsACs!1
jsACs!2 := #440000,,#303000

if JSYS (jsOPENF,jsACs) eq failed then {
RportL("Cannot open SWF-D.WORK%SCHEDULE file")
finish }

Logpg>>Log.ESFCurrentDate := svc
SOUT(jfnx,POINT(36,Logpg),512)

EndWrite(jfnx)
jsACs!1 := jfnx
```

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```
JSYS(JSRLJFN,JSACS)  
endcase }
```

```
default: endcase
```

```
}mi
```

```
}mark
```

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2.4 LIMBEAUX, Wait n Hours

```
// LIMBEAUX
and let LIMBEAUX(hrs) be
{lx
  RportL("Program in limbo")
  let time := 24*60 // hrs to mins
  if numbargs > 0 then time := hrs * 60
  jsacs!1 := time * (1000*60) // mins to millisecs
  JSYS(jsDISMS,jsacs)
  OKGoQ()
}lx
```

2.5 OKGoQ, Wait for Low System Load

```
// OKGoQ is called whenever it is feasible to wait voluntarily  
// for a low Tenex load average. The program will wait until  
// the load average is less than LoadLimit, checking it at two-  
// minute intervals. The initial value of LoadLimit is 3.0; it  
// may be reset interactively by typing control-L while the  
// program is running.
```

```
and let OKGoQ() be
```

```
{okg
```

```
Dumdeedum:
```

```
if ~ CheckL() then {  
    Wait(2*1000*60) ; goto Dumdeedum } // 2 mins
```

```
}okg
```

2.6 CheckL, Check Tenex Load Average

```
// CheckL is called to check the 1-minute load average. It returns  
// true if false to the caller according as the load average is below above  
// the pre-set maximum.
```

```
and let CheckL() := valof  
{checkl  
  jsACs!1 := #637163, #644164 // SYS, TAT  
  JSYS(jsSYSGT, jsACs)  
  jsACs!1 := #14, rh jsACs!2 // 1-minute load average  
  if JSYS(jsGETAB, jsACs) eq failed then {  
    RportL ("GETAB failed on load average")  
    finish }  
  if jsACs!1 ge Logpg >> Log.LoadLimit then result is false  
  result is true  
}.checkl
```


2.7 CheckDC, DC-203 Datacomputer Status Checker

```
// CheckDC is used to check the status of the DC-203 Datacomputer  
// operating on CCA-Tenex. It calls the DCSTAT program which has  
// been loaded into a sub-fork during SWF-D program initialization;  
// interprets the response; and returns true if false to its caller  
// according as the Datacomputer is available or not.
```

```
and let CheckDC() := valof  
  {ckdc  
    RportL("Checking Datacomputer status")  
    if dcstatJFN ne 0 then {xold  
      jsACs!1 := dcstatJFN  
      JSYS(jsRLJFN, jsACs)  
    }xold  
    jsACs!1 := ofOldFile\ofAssignOnly  
    jsACs!2 := POINT(7, 'DCSTAT.OUT')  
    if JSYS(jsGTJFN, jsACs) eq failed then {fl  
      dcstatJFN := CreateOutput("DCSTAT.OUT", 7)  
      goto CallDCSTAT }fl  
    dcstatJFN := rh jsACs!1  
    jsACs!2 := #070000, #303000
```

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```
if JSYS (jsOPENF, jsACs) eq failed then {
  RportL("Cannot open DCSTAT.OUT file")
  finish }

CallDCSTAT:

jsACs!1 := smFRKH
JSYS(jsGPJFN, jsACs)
rh jsACs!2 := dcstatJFN
JSYS(jsSPJFN, jsACs) // set fork's primary JFNs
jsACs!2 := 0
JSYS(jssFRKV, jsACs) // start fork using entry vector
JSYS(jswFORK, jsACs) // wait for it to finish

CLOSE(dcstatJFN)
jsACs!1 := #636746, #154400 // program ID
JSYS(jsSETNM, jsACs)

dcstatJFN := FindInput("DCSTAT.OUT", 7)

ReadDCSTAT:

let statchr, slvc, elvc, whycode := nil, nil, nil, 0
for i := 1 to 1000 do dcstatBUFF!i := 0
dcstatPTR := POINT (7, dcstatBUFF)
SIN(dcstatJFN, dcstatPTR, 5000, $*1)

// Check first line of status data for special error messages:
// If the first character is not "J" then CheckDC will proceed
// to check the specific advice (enclosed in parentheses);
// it may be a notice of Tenex preventive maintenance, or
// a message indicating that the system is HEAVILY or SEVERELY
// LOADED, or that some hardware is OFF-LINE. If any of these
// conditions is true, CheckDC indicates to its caller that it
// would be better to wait for better operating conditions than
// to proceed, and records the reason on the operations log.
```

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```
statchr := ILDB(lv dcstatPTR)

if statchr ne $J then {msgck

CheckMSG:
  whycode := TenexLoad
  ASCIIToString(dcstatBUFF,dcstatBCPL)
  if findsubstr(dcstatBCPL,"HEAVILY",lv slvc,lv elvc,1) then goto FAILOUT
  if findsubstr(dcstatBCPL,"SEVERELY",lv slvc,lv elvc,1) then goto FAILOUT
  whycode := HardwareProblem
  if findsubstr(dcstatBCPL,"OFF-LINE",lv slvc,lv elvc,1) then goto FAILOUT
  dcstatPTR := POINT (7,dcstatBUFF)
  SIN(dcstatJFN,dcstatPTR,5000,$*1)
  statchr := ILDB(lv dcstatPTR) // check for
  if statchr ne $J then goto CheckMSG // more error messages

}msgck

// Check external Datacomputer job status: If the string "EXISTS"
// does not appear, CheckDC assumes that that status of the Data-
// computer is "DOWN" or that system work is in progress.

whycode := DCQuestionable
ASCIIToString(dcstatBUFF,dcstatBCPL)
if ~ findsubstr(dcstatBCPL,"EXISTS",lv slvc,lv elvc,1) then goto FAILOUT
dcstatPTR := POINT (7,dcstatBUFF)
SIN(dcstatJFN,dcstatPTR,5000,$*1)

// Check for suspension of TBM operations: If the character "%"
// appears, CheckDC assumes that TBM operations on one or more drives
// has been suspended. The program is not capable of determining
// whether the particular drives needed by SWF-D are usable and that
// the right tapes are mounted. After noting the condition, program
// operation continues.
```

```
whycode := TBMstatus
ASCIZToString(dcstatbuff,dcstatbcpl)
if findsubstr(dcstatbcpl,"%",lv slvc,lv elvc,1) then {continuing
    RportL("TBM operations on some drives are suspended")
    dcstatptr := POINT (7,dcstatbuff)
    SIN(dcstatjfn,dcstatptr,5000,$*1)
    ASCIZToString(dcstatbuff,dcstatbcpl)
}continuing
// Check for Datacomputer-going-down message: If the character "!"
// appears, CheckDC assumes that the Datacomputer will be halted for
// a length of time. The program checks the scheduled down-time against
// the current time; if the difference is less than 1 hour, it will
// inhibit starting up a Datacomputer session.
whycode := NotEnoughTimeLeft
if findsubstr(dcstatbcpl,"!",lv slvc,lv elvc,1) then {cktime
    if ~ findsubstr(dcstatbcpl,"AT",lv slvc,lv elvc,1) then goto FAILOUT
}cktime
// Check internal Datacomputer job state: If the string "Normal
// Operation" does not appear, CheckDC will prevent initiating
// Datacomputer sessions.
whycode := AbnormalDCState
if ~ findsubstr(dcstatbcpl,"NORMAL",lv slvc,lv elvc,1) then goto FAILOUT
// CheckDC does not scan or interpret the DCSTAT Operator Status Message.
// Check socket status information for LISTENING!NOT LISTENING.
// If the Datacomputer is NOT LISTENING, CheckDC returns immediately
```

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```
// to its caller so that the caller can check again after a brief
// interval.

whycode := NotListening
until EofFlg do {notq

dcstatPTR := POINT (7,dcstatBUFF)
SIN(dcstatJFN,dcstatPTR,5000,$*1)
ASCIZToString(dcstatBUFF,dcstatBCPL)
if findsubstr(dcstatBCPL,"NOT",lv slvc,lv elvc,1) then goto FAILOUT
}notq

// OK to connect to Datacomputer

RportL("OK to connect to Datacomputer")
CLOSEF(dcstatJFN) ; resultis true

// Wait for better operating conditions

FailOUT:

RportL("Not OK to connect to Datacomputer:")
switchon whycode into {whynot

case TenexLoad:   RportL("Tenex load is too high.")
                  endcase
case HardwareProblem: RportL("Some hardware is off-line.")
                  endcase
case DCQuestionable: RportL("Datacomputer is not up.")
                  endcase
case TBMstatus:   RportL("TBM operations are suspended.")
                  endcase
case NotEnoughTimeLeft: RportL("Datacomputer is going down soon.")
                  endcase
case AbnormalDCState: RportL("DC job is not in NORMAL state.")
```

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```
endcase  
case NotListening: RportL("Datacomputer is in NOT LISTENING state.")  
endcase  
}whynot  
CLOSF(dcstatJFN) ; resultis false  
}ekdc
```

2.8 RportL, Write Operations Log

```
// RportL maintains a reliable record of SWF-D operations on the
// SWF-D.OPERATIONS Tenex file. The file format is: date/time-stamp
// followed by space followed by ASCII string followed by CRLF.
// SWF-D.OPERATIONS may be examined, listed, and deleted as often
// as desired. New versions are created automatically.

and let RportL(istg) be

  {rptl

let RportLJFN := nil
jsACs!1 := ofOldFile\ofAssignOnly
jsACs!2 := POINT(7,'SWF-D.OPERATIONS')

if JSYS(jsGTJFN,jsACs) eq failed then {crl

    RportLJFN := CreateOutput("SWF-D.OPERATIONS",7) ; goto MakeNote }crl

RportLJFN := rh jsACs!1
jsACs!2 := #070000, #121000

if JSYS (jsOPENF,jsACs) eq failed then Help ("RportL problems")

MakeNote:
// get current date/time
MakeDate(RDateSTR,0) // current date
```

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```
// output date/time space istg CRLF
WriteS(RportLJFN,RDateSTR) ; Writech(RportLJFN,$*s)
WriteS(RportLJFN,istg) ; WriteS(RportLJFN,"*c*1")

EndWrite(RportLJFN)
jsACs!1 := RportLJFN
JSYS(jsRLJFN,jsACs)

}rpt1
```


3. The PESF-Checking Module

```
// SWF-D Program: EVENTS Module
// EVENTS is responsible for sifting PESF files for arrivals marked by SDAC

get      "<CCA-SWF>SWFHEAD.BCP"
external {
external { CheckDC
external { CheckL
external { DCLOOK
external { EVENTS
external { MARK
external { OKGOQ
external { RportL
}
}
}
}
}
}
}

static {stat
findany
ndays
ESFfrag
ArrJFN
ArrPTR
ArrPORT
Tick
ESFMint
ESFDint
ESFYint
:
:
:
:
:
:
:
:
:
:
nil
nil
vec
nil
nil
"REQ"
nil
nil
nil
nil
100
}
```

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```
ESFyear      : "0000"  
ESFmonth     : "00"  
ESFday       : "00"  
LOGINstr     : "Login SDAC.CCA.SWF;*n"  
DTLbuff      : vec 1000  
BCPLstr      : vec 1000  
MsgsBuffer   : vec 512  
Arrival      : vec 512  
BasicESFName : "%TOP.SDAC.VELANET.PESF."  
ESFname      : vec 100  
DCESfname    : vec 100  
  
jsACS        : vec 10  
sumcount     : nil  
morearrivals : nil  
  
}stat  
  
let EVENTS() := valof  
{events  
  
MARK(TaskStatus, InGetEvents)  
  
let edp := lv Logpg>>Log.ESFCurrentDate  
let adp := lv Stations>>StationData.AllStationsASLDate  
Tick := 0  
  
// Adjust for valid next Event Summary File date  
  
jsACS12 := (edp>>Date.Yr), ((edp>>Date.Mo) - 1)  
jsACS13 := ((edp>>Date.Day) - 1), 0  
jsACS14 := 0, 5
```

```
if JSYS(jsIDCNV,jsACs) eq failed then {fixdate
    edp>>Date.Day := 1           // new month
    edp>>Date.Mo := edp>>Date.Mo + 1
    if edp>>Date.Mo > 12 then {hnewyr
        edp>>Date.Yr := edp>>Date.Yr + 1           // new year
        edp>>Date.Mo := 1
    }hnewyr
}fixdate
ESFYint := edp>>Date.Yr
ESFMint := edp>>Date.Mo
ESFDint := edp>>Date.Day
// Check for whether there is work to do.
let DeltaYear := adp>>Date.Yr - edp>>Date.Yr
let DeltaMonth := adp>>Date.Mo - edp>>Date.Mo
if DeltaYear > 0 then DeltaMonth := DeltaMonth + 12
if DeltaMonth ge 1 then {
    ndays := ((DaysPerMonth!(edp>>Date.Mo)) - edp>>Date.Day) + 1
    goto DoESF
}
ndays := adp>>Date.Day - edp>>Date.Day
if ndays > 0 then goto DoESF
NoWork:
MARK(TaskStatus,EndGetArrivals)
RportL("ESF scanning is up-to-date")
```

```
resultis true

DoESF:
RportL("Scanning for arrivals")
if ~ DCicp then {
    OKGoQ()
    if ~ CheckDC() then {
        RportL("Waiting to check for ESF arrivals")
        resultis false }
    ScriptJFN := CreateOutput("SWF-D.SCRIPT",7)
    startdc(ScriptJFN)
    RportL("Beginning Datacomputer session")
    senddc(LOGINstr)
    senddc("OPEN REQ;*c*1")
    DCicp := true
}

inttotxt (ESFYint, ESFyear) // integer to text conversions
inttotxt (ESFMint, ESFmonth)
inttotxt (ESFDint, ESFday)

let rstg := vec 100
append(rstg,"Starting day.mo.yr = ",rstg)
append(rstg,ESFday,rstg) ; addch($.,rstg)
append(rstg,ESFmonth,rstg)
append(addch($.,rstg),ESFyear,rstg) ; append(rstg," for ",rstg)
let nstg := vec 5
RportL(append(append(rstg,inttotxt(ndays,nstg),rstg)," days",rstg))

// Construct arrivals file name
```

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```
for i := 0 to 100 do ESFname|i := 0
for i := 0 to 100 do ESFfrag|i := 0
  addch($Y,ESFfrag)
  append(ESFfrag,ESFyear,ESFfrag)
  append(ESFfrag,".M",ESFfrag)
  if ESFMint < 10 then | addch($0,ESFfrag) |
  append(ESFfrag,ESFmonth,ESFfrag)

append(append(ESFname,BasicESFName),ESFfrag,ESFname)

// Ready now to loop through ESF day files.

for esi := ESFDint to (ESFDint + ndays - 1) by 1 do |esfl

// Construct specific day filename

append(ESFname,".D",DCESFname)
append(ESFfrag,"%D",TenexFile)
if ESFDint < 10 then | addch($0,DCESFname); addch($0,TenexFile) |
append(DCESFname,ESFday,DCESFname)
append(TenexFile,ESFday,TenexFile)
ESFDint := ESFDint + 1
inttotxt(ESFDint, ESFday)

// Check that file exists

senddc("LIST "); senddc(DCESFname); senddc(";*c*1")

if ~ DClook() then | morearrivals := false; break esfl |

// Open day file: OPEN %TOP.SDAC.VELANET.PESF.Ynnnn.Mnn.Dnn,SYN=ESF;

senddc("OPEN "); senddc(DCESFname); senddc(" , SYN = ESF;*c*1")
```

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```
if ~ DClook() then { morearrivals := false ; break esfl }
// cannot proceed if there are file problems
// Send Datalanguage to scan for arrivals
scriptdc(0) // inhibit scripting
findany := true
if ~ GetEvents() then findany := false
scriptdc(ScriptJFN) // resume scripting
senddc("CLOSE ESF;*c*1")
// Quit voluntarily after processing of 10 ESF day files if load average
// is high or Datacomputer is busy.
Tick := Tick + 1
if Tick < 10 then loop esfl
Tick := 0
if ~ CheckL() then { morearrivals := true ; break esfl }
if ~ CheckDC() then { morearrivals := true ; break esfl }
}esfl
// End Datacomputer session
if ~ findany then { RportL("No flagged arrivals.") ; goto EndESF }
RportL("Found some!")
EndESF:
```

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```
senddc("CLOSE %OPEN;*c*1")
RportL("Ending Datacomputer session")
quitdc()

EndWrite(ScriptJFN)
DCicp := false
let edp := lv Logpg>>Log.ESFCurrentDate
edp>>Date.Day := edp>>Date.Day + 1
MARK(ESFStatus,Logpg>>Log.ESFCurrentDate)
resultis ~ morearrivals

}events
```

3.1 GetEvents, Retrieve Flagged Requests from Datacomputer

```
// GetEvents is called with the appropriate ESF open; it merely  
// fields the data between the Datacomputer and a Tenex file.  
// Tenex files are created as needed; each Tenex filename is keyed  
// to the relevant Datacomputer filename by means of the filename  
// -extension field. For Datacomputer filename "Ynnnn.Mnn.Dnn",  
// the corresponding Tenex filename is "ARRIVALS.Ynnnn%Mnn%Dnn".
```

```
and let GetEvents() := valof  
{  
  gete  
  
  RportL("Scanning for arrivals in:")  
  RportL(DCESfname)  
  let rstg := vec 100  
  
  sumcount := 0  
  ArrJFN := 0  
  
  opendc(ArrPORT,36)  
  if not senddc("Inhibit 100,5 ;*c1") then resultis false  
  
  senddc("FOR ESF WITH ANY ARRIVALS WITH WAVEFORMAVAIL EQ *'T*', *c1")  
  senddc("tFOR REQ,ARRIVALS WITH WAVEFORMAVAIL EQ *'T*', *c1")  
  senddc("BEGIN EINDEX=EINDEX ")  
  senddc("tEVENTNUM=EVENTNUM AINDEX=AINDEX STA=STA*c1")  
  senddc("tCHANATYPE=CHANATYPE RATE=RATE CHANID=CHANID*c1")  
  senddc("tGAIN=GAIN COMP=COMP DATASEGSTART=DATASEGSTART*c1")  
  senddc("tPHASEARR=PHASEARR PHASEID=PHASEID AMP=AMP END;*c1")  
}
```


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```
!morearr

ArrPTR := POINT(36,Arrival)
let retcount := getfromdc(0,ArrPTR,512,$~z)
sumcount := sumcount + retcount
if retcount eq 0 then break morearr

// Work to do!
// write out arrivals
// Create Tenex file for arrivals

if ArrJFN eq 0 then {
append(rstg,"ARRIVALS.",rstg)
TenexFile := changesubstr(TenexFile,".","%")
append(rstg,TenexFile,rstg)
ArrJFN := CreateOutput(rstg,36)
}
SOUT(ArrJFN,ArrPTR,512,$~z)

!morearr repeatwhile dcgetstate

Logpg>>Log.ESFCurrentDate.Yr := ESFYint
Logpg>>Log.ESFCurrentDate.Mo := ESFMint
Logpg>>Log.ESFCurrentDate.Day := ESFDint - 1
MARK(ESFStatus,Logpg>>Log.ESFCurrentDate)

if sumcount eq 0 then resultis false
if ~ DCLOOK() then resultis false
CLOSE(ArrJFN)
jsACs!1 := ArrJFN
JSYS(jsRLJFN,jsACs)
RportL(append(rstg,"*screated",rstg))
resultis true
!gete
```

4. The Waveform-Copying Module

```

// SWF-D Program: MOVES Module

// MOVES is used to append waveforms to the SWF and to
// simultaneously update the ESF. The Datlanguage requests
// are "driven" by pre-processed lists of waveform segments.

get      "<CCA-SWF>SWFHEAD.BCP"

external      |      CheckDC
external      |      CheckL
external      |      DCLook
external      |      MARK
external      |      MOVES
external      |      OKGoQ
external      |      PrReq
external      |      PrPutL
external      |      PrPutS
external      |      RportL

static {stat

Component      :      nil
compcount      :      nil
stindex        :      nil
SPDETopen      :      nil
BasicNLPFname  :      "%TOP.SDAC.VELANET.NLPP."
BasicNSPFname  :      "%TOP.SDAC.VELANET.NSPF."

```


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```
LPBytesMoved : nil
SPBytesMoved : nil

}stat

let MOVES() := valof
{moves
// Check for input ARRIVALS.* Tenex files. If found, CRInput will create
// input files for moving available LP & SP data
if ~ CRInput() then { RportL("No new waveforms to move") }
// But old requests may not yet have been processed -
// Check for LP-ARRIVALS.* Tenex files;
// if none, there's no work to do on long-period files.
jsACs!1 := #001101,0 // #100101,,0 ?
jsACs!2 := POINT(7,LParrivalsFiles)
if JSYS (jsGTJFN,jsACs) eq failed then {
RportL("No LP waveforms to move")
goto CheckSP
}
}doInLP

MARK(TaskStatus,AppendingSWF)
RportL("Moving waveforms")

LParrivalsJFN := rh jsACs!1
```

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```
if ~ DCicp then {
  OKGoQ()
  if ~ CheckDC() then {
    RportL("Waiting to move LP waveforms")
    resultis false }

  ScriptJFN := CreateOutput("SWF-D.SCRIPT",7)
  startdc(ScriptJFN)
  RportL("Beginning Datacomputer session")
  senddc(LOGINstr)
  DCicp := true }

jsACs!1 := POINT (7,CFname)
jsACs!2 := LPArrivalsJFN
jsACs!3 := #000100,0
JSYS(jsJFNS,jsACs)

ASCIZToString(CFname,CFnameBCPL)
let rstg := vec 100
append(rstg,"Working from file: ",rstg)
RportL(append(append(rstg,"LP-ARRIVALS.",rstg),CFnameBCPL,rstg))

// construct variable portion of current file, a name of the form Ynnnn.Mnn.Dnn
// from the form Ynnnn%Mnn%Dnn

changesubstr(CFnameBCPL,"%",".")
append(SWF,BasicSWFname,SWF)
append(SWF,CFnameBCPL,SWF)

append(PESF,BasicPESFname,PESF)
append(PESF,CFnameBCPL,PESF)
```

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```
if debugging then
{
    SWF := "SWF"
    PESF := "ESF%UNINVERTED"
}

MovesNLPF:

// Construct NLPF name

for i := 1 to 50 do NXPF{i := 0
append(NXPF, BasicNLPFname, NXPF)
append(NXPF, CFnameBCPL, NXPF)

senddc("OPEN ") ; senddc(NXPF) ; senddc(" READ, SYN=NLPF;*c*1")
senddc("OPEN ") ; senddc(PESF) ; senddc(" WRITE, SYN=PESF;*c*1")
senddc("OPEN ") ; senddc(SWF) ; senddc(" APPEND, SYN=SWF;*c*1")

    senddc("OPEN PUTL;*n")
    opendc(SWFportL, 36)

// Datalanguage is sent to update the PESF and to append to the
// PSWF simultaneously. These are done together to ensure that the
// PESF and the PSWF files will remain in synch.

// The request as formulated assumes that the NLPF window is
// quantized to minutes and it will work for a day's worth of
// NLPF data if the waveform is not split across a day boundary.

// The Datalanguage request uses one PORT and three FILES.
```

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```
senddc("BEGIN FOR X IN PUTL.ESFPUT*c*1")
senddc("**tUPDATE Y IN PESF WITH Y.EINDEX EQ X.EINDEX*c*1")
senddc("**tUPDATE Z IN Y.ARRIVALS WITH Z.AINDEX EQ X.AINDEX*c*1")
senddc("**tBEGIN Z.DATASEGSTART=X.DATASEGSTART Z.AMP=0*c*1")
senddc("**tZ.WAVEFORMAVAIL='Y' END*c*1")
senddc("APPEND A IN SWF, B IN PUTL.SWFPUT*c*1")
senddc("BEGIN A.EVENTID=B.EVENTID*c*1")
senddc("**tA.STA=B.STA A.CHANTYPE=B.CHANTYPE*c*1")
senddc("**tA.RATE=B.RATE A.CHANID=B.CHANID*c*1")
senddc("**tA.GAIN=B.GAIN A.COMP=B.COMP*c*1")
senddc("**tA.START=B.START A.DATAFORMAT='G'*c*1")
senddc("**tA.SCALEFACTOR=B.SCALEFACTOR*c*1")
senddc("**tFOR C IN NLPF WITH C.STA EQ B.STA*c*1")
senddc("**tFOR D IN C.DATA WITH D.INDEX GE B.STARTI AND D.INDEX LE B.ENDI*c*1")
senddc("**tFOR E IN A.TIMESERIES, F IN D.TIMESERIES WITH B.TYP EQ F.TYPE*c*1")
senddc("**tE.DATUM=F.DATUM END *c*1")

jsacs!1 := LParrivalsJFN
jsacs!2 := #440000, #303000
if JSYS(jsOPENF, jsacs) eq failed then {
  RportL("Failure opening LP-Arrivals input file")
  resultis false
}

LPBytesMoved := 0
!lputl
for i := 1 to 512 do A!i := 0
SIN(LParrivalsJFN, POINT(36,A), 24, $~z)
let BytesSent := puttodc(0, POINT(36,A), -24)

LPBytesMoved := LPBytesMoved + BytesSent
!lputl repeatwhile dcpstate & ~ Eofflg
```

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```
endputc()

senddc("CLOSE SWF;CLOSE PESF;CLOSE NLPF;*c*1")
// check LPBytesMoved
RportL("End LP moves")
// Close and delete LP-Arrivals file
CLOSE(LPArrivalsJFN)
}doInLP
// NSPF next
CheckSP:
// check for SP-ARRIVALS.* Tenex files
// if none, there's no work to do on short-period files
jsACs!1 := #001101,0 // #100101,0 ?
jsACs!2 := (POINT7x0,,SPArrivalsFiles)
if JSYS (jsGTJFN,jsACs) eq failed then {
  RportL("No SP waveforms to move")
  goto EndMOVES }
}doInSP
SPArrivalsJFN := rh jsACs!1
if ~ DCicp then {
  OKGoQ()
  if ~ CheckDC() then {
```


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```
RportL("Waiting to move short-period data")
resultis false }

ScriptJFN := CreateOutput("SWF-D.SCRIPT",7)
startdc(ScriptJFN)
RportL("Beginning Datacomputer session")
senddc(LOGINstr)
DCicp := true }

jsACs!1 := POINT (7,CFname)
jsACs!2 := SPArrivalsJFN
jsACs!3 := #000100,0 // get extension field only
JSYS(jsJFNS,jsACs)

ASCIZToString(CFname,CFnameBCPL)
let rstg := vec 100
append(rstg,"Working from file: ",rstg)
RportL(append(append(rstg,"SP-ARRIVALS.",rstg),CFnameBCPL,rstg))

// construct variable portion of current file, a name of the form Ynnnn.Mnn.Dnn
// from the form Ynnnn%Mnn%Dnn

changesubstr(CFnameBCPL,"%",".")
append(SWF,BasicSWFname,SWF)
append(SWF,CFnameBCPL,SWF)

append(PESF,BasicPESFname,PESF)
append(PESF,CFnameBCPL,PESF)

if debugging then
{
SWF := "SWF"
PESF := "ESF%UNINVERTED"
}
```

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```

MovesNSPF:
// Construct NSPF name
for i := 1 to 50 do NXPF{i} := 0
append(NXPF,BasicNSPFname,NXPF)
append(NXPF,CFnameBCPL,NXPF)

senddc("OPEN ") ; senddc(NXPF) ; senddc(" READ, SYN=NSPF;*c*1")
senddc("OPEN ") ; senddc(PESF) ; senddc(" WRITE, SYN=PESF;*c*1")
senddc("OPEN ") ; senddc(SWF) ; senddc(" APPEND, SYN=SWF;*c*1")
senddc("OPEN PUTS;*n")
opendc(SWFports,36)

// The following Datalanguage should work for a day's worth of
// NSPF data if the data are not split across a day boundary.
// The request uses one PORT and three FILES.

senddc("BEGIN FOR X IN PUTS.ESFPUT*c*1")
senddc("**tUPDATE Y IN PESF WITH Y.EINDEX EQ X.EINDEX*c*1")
senddc("**tUPDATE Z IN Y.ARRIVALS WITH Z.AINDEX EQ X.AINDEX*c*1")
senddc("**tBEGIN Z.DATASEGSTART=X.DATASEGSTART*c*1")
senddc("**tZ.AMP=0 Z.WAVEFORMAVAIL='Y' END*c*1")
senddc("APPEND A IN SWF, B IN PUTS.SWFPUT*c*1")
senddc("BEGIN A.EVENTID=B.EVENTID A.STA=B.STA*c*1")
senddc("A.CHANTYPE=B.CHANTYPE A.RATE=B.RATE A.CHANID=B.CHANID*c*1")
senddc("A.GAIN=B.GAIN A.COMP=B.COMP A.START=B.START*c*1")
senddc("A.DATAFORMAT='G' A.SCALEFACTOR=B.SCALEFACTOR*c*1")
senddc("FOR C IN NSPF WITH C.STINDEX EQ B.STINDEX*c*1")
senddc("FOR D IN C.DATA WITH D.DATE = B.DSDATE
AND D.TIME GE B.DSTIME AND D.TIME LE B.DETIME*c*1")
senddc("FOR E IN A.TIMESERIES, F IN D.TIMESERIES*c*1")
senddc("E.DATUM=F.DATUM END;*c*1")

```

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```
jsACs!1 := SPArrivalsJFN
jsACs!2 := #440000, #303000
if JSYS(jsOPENF, jsACs) eq failed then {
  RportL("Failure opening SP-Arrivals input file")
  resultis false }

SPBytesMoved := 0
!sputl
for i := 1 to 512 do Ai i := 0
SIN(SPArrivalsJFN, POINT(36, A), 27, $~z)
let BytesSent := puttodc(0, POINT(36, A), -28)

SPBytesMoved := SPBytesMoved + BytesSent
!sputl repeatwhile dputstate & ~ Eofflg
endputdc()

senddc("CLOSE SWF;CLOSE PESF;CLOSE NSPF;*c*1")
// check SPBytesMoved
RportL("End SP moves")
// Close and delete SP-Arrivals file
CLOSEF(SPArrivalsJFN)
!doInSP

senddc("CLOSE %OPEN;*c*1")
```

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```
EndMOVES:
// When all done with ARRIVALS file, delete it.
// terminate Datacomputer connection
quitdc()
DCicp := false
EndWrite(SCRIPTJFN)
resultis false
}moves

// Each ESF day file can have up to 100 events, and up to 999
// arrivals per event (average of 500)
and let CRInput() := valof
{crinp
let failmark := false
RportL("Setting up to move waveforms")
if ~ CRInputL() then failmark := false
if ~ CRInputS() & failmark = false then resultis false
resultis true
}crinp
```

4.1 CRInputL, Create Long-Period-Copy Driver File

```
and let CRInputL() := valof
|crinpl
// check for ARRIVALS.* Tenex files
// if none, there's no work to do
jsACs!1 := #001101,,0 // #100101,,0 ?
jsACs!2 := (POINT7x0,,EventsFiles)
if JSYS (jsGTJFN,jsACs) eq failed then resultis false

let CEventsFileName := vec 50
for i := 1 to 50 do CEventsFileName!i := 0
EventsJFN := rh jsACs!1

jsACs!1 := (POINT7x0,,CFname)
jsACs!2 := EventsJFN
jsACs!3 := #000100,,0 // get extension field only
JSYS(jsJFNS,jsACs)

ASCII2ToString(CFname,CFnameBCPL)
let rstg := vec 100
append(append(CEventsFileName,"ARRIVALS.",CEventsFileName),CFnameBCPL,CEventsFileName)
append(rstg,"Working from file: ",rstg)
RportL(append(rstg,CEventsFileName,rstg))
```

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```
let lstg := vec 50
LoutJFN := CreateOutput(append(lstg,"LP-ARRIVALS.",lstg),CFnameBCPL,lstg),36)

jsACs!1 := EventsJFN
jsACs!2 := #440000, #303000

if JSYS(jsOPENF,jsACs) eq failed then
  {
    RportL("Failure opening LP-ARRIVALS file")
    resultis false
  }

// clear ESFPut & SWFPut buffer areas
for i := 1 to csize EsfL do ESFPut!i := 0
for i := 1 to csize SwfL do SWFPut!i := 0

until EofFlg do {loutl
LoutL:
let STimeStr := vec 1
let ETimeStr := vec 1

// clear R (Request Area) & P (debugging Put Area)
for i := 1 to 512 do R!i := 0
for i := 1 to 512 do P!i := 0

SIN(EventsJFN,POINT(36,R),19,$`z)
if EofFlg then endblock loutl

// set up byte pointers to buffers
```

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```
Rptr := (POINT7x0,,R)
Pptr := (POINT7x0,,P)

/* The patime (phase arrival time) field is used by SDAC to transmit the
arrival time of a waveform which is to be copied into the SWF. The SWF-D
program computes the window within which timeframe it will attempt to
locate the segment of long-period data which represents the desired
waveform. The left-edge of the window (earliest chronologically) is
computed by subtracting the value found in the dsdate (datasegment date)
field from the patime field. The right-edge of the window is computed
by adding the value found the the amp (amplitude) field to the patime
field.
*/

for c := 1 to 8 do STimeStr>>TD.digit^c := R>>Req.patime^c
*/

CSecInDay := TimetoInt(STimeStr)

if CSecInDay < 0 then
  { RportL("CRInputL: Bad time-string input")
  // gather data sufficient to identify problem request for operator <<<
  loop lout1
  }

/* Check for waveform being recorded after midnight. This case needs
special handling because part of the waveform is in the next day's
SRO data.
*/

let padayvec := vec 1
let evdayvec := vec 1
*/
```

```
for c := 2 to 6 do padayvec>>string.c^(c-1) := R>>Req.padate^c
padayvec>>string.n := 5
for c := 1 to 5 do evdayvec>>string.c^c := R>>Req.eventnum^c
evdayvec>>string.n := 5
if ~ Eqstr(padayvec, evdayvec) then loop lout1
```

/* The dsdate field is used by SDAC as a temporary holding place for the amount, in seconds, by which the window should precede the arrival time. */

```
let NumStg := vec 3
for c := 1 to 6 do NumStg>>string.c^c := R>>Req.dsdate^c
NumStg>>string.n := 6
PrecedingCSeconds := TxtToInt(NumStg)*100
```

```
let WhenStart := CSecInDay - PrecedingCSeconds
if WhenStart < 0 then
  { RportL("Window overlaps previous day")
  // set up special input file for overlapping day cases
  loop lout1
  }
```

```
if ~ InttoTime(WhenStart, STimeStr) then
  { RportL("CRInputL: Bad time value")
  // need to gather more info for operator intervention
  loop lout1
  }
```


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```
// StimeStr holds left-edge window time

/* The amp field is used by SDAC to indicate the number of seconds
to add to the arrival time to determine the right-edge of the
window.
*/

for c := 1 to 7 do NumStg>>string.c`c := R>>Req.amp`c
NumStg>>string.n := 7
FollowingCSeconds := TxtToInt(NumStg)*100

let WhenEnd := (CSecInDay + FollowingCSeconds + 5999)/6000

if WhenEnd > 1439 then
{ RportL("Window overlaps following day")
// set up special input file for overlapping day cases
loop lout1
}

// If not known SRO station, ignore request
lcksta

let wrkvec := vec 2

for c := 1 to 4 do wrkvec>>string.c`c := R>>Req.sta`c
wrkvec>>string.n := 4

for ix := 1 to Stations>>StationData.Stationix do
{
if (Eqstr (wrkvec, (lv (Stations>>StationData.Station`ix.SName`1))))
then endblock cksta
}
```

```
loop loutl          // station name not recognized
}cksta
compcount := 1     // initialize # of components to move
switchon R>>Req.comp into
{
  case $V:          // maybe "V" for vertical
  case $V:
  case $Z:
  case $Z:
                    Component := vertical
                    endcase

  case $n:
  case $N:
                    Component := north
                    endcase

  case $e:
  case $E:
                    Component := east
                    endcase

  case $a:
  case $A:
                    Component := all
                    compcount := 3
                    endcase

                    loop loutl
  default:
}
if debugging then
```

```
{debug
for lx := 1 to compcount do
{fillup
// ready now to fill PutL structures
FillPutL:
P>>PutL.Esf.EsfCount := P>>PutL.Esf.EsfCount + 1
P>>PutL.Esf.eindex := R>>Req.eindex
P>>PutL.Esf.aindex := R>>Req.aindex
// The ESF file datasegment start date is set from the phase arrival date field
for c := 1 to 6 do P>>PutL.Esf.dsdate`c := R>>Req.padata`c
// The datasegment start time, as computed above, is copied from STimeStr
for c := 1 to 8 do P>>PutL.Esf.dstime`c := STimeStr>>TD.digit`c
P>>PutL.Swf.SwfCount := compcount
if Component = all then Component := vertical // move first comp
for c := 1 to 5 do P>>PutL.Swf.evdate`c := R>>Req.eventnum`c
for c := 1 to 4 do P>>PutL.Swf.evnum`c := R>>Req.eventnum`(c+5)

for c := 1 to 5 do P>>PutL.Swf.sta`c := R>>Req.sta`c
P>>PutL.Swf.chantype := R>>Req.chantype
for c := 1 to 2 do P>>PutL.Swf.rate`c := R>>Req.rate`c
```

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```
for c := 1 to 4 do P>>PutL.Swf.chanid^c := R>>Req.chanid^c
P>>PutL.Swf.gain := R>>Req.gain
P>>PutL.Swf.comp := R>>Req.comp
// The SWF file datasegment start date is set from the phase arrival date field
for c := 1 to 6 do P>>PutL.Swf.dsdate^c := R>>Req.padate^c
// The SWF file datasegment start time is the computed value in STimeStr
for c := 1 to 8 do P>>PutL.Swf.dstime^c := STimeStr>>TD.digit^c

/* The SWF file scalefactor field is set from the ESF file datasegment
start time field, used by SDAC as a temporary holding place for the
value.
*/
for c := 1 to 8 do P>>PutL.Swf.scalefactor^c := R>>Req.dstime^c
for c := 1 to 5 do P>>PutL.Swf.staname^c := R>>Req.sta^c
P>>PutL.Swf.starti := WhenStart/6000
P>>PutL.Swf.endi := WhenEnd
P>>PutL.Swf.typ := Component
Component := Component + 1
// reflect next component to move
// if all have been requested
if (compcount eq 1 \ (compcount eq all & Component eq 2)) then
```

```
{firstcomponent
SOUT(LoutJFN, POINT(36, P), 24)
  {
    PrReq(#101)
    PrPutL(#101)
  }
{firstcomponent
}{fillup
}{debug
unless debugging then
}{forreal
FILESF:
let eix := ESFPut>>EsfL.EsfCount + 1
ESFPut>>EsfL.Esf`eix.eindex := R>>Req.eindex
ESFPut>>EsfL.Esf`eix.aindex := R>>Req.aindex
// The ESF file datasegment start date is set from the phase arrival date field
for c := 1 to 6 do ESFPut>>EsfL.Esf`eix.dsdate`c := R>>Req.padate`c
// The datasegment start time, as computed above, is copied from STimeStr
for c := 1 to 8 do ESFPut>>EsfL.Esf`eix.dstime`c := STimeStr>>TD.digit`c
FillSWF:
if Component = all then Component := vertical // move first comp
```

```
for lx := 1 to compcount do
  {fillswf
let six := SWFPut>>SwfL.SwfCount + 1
SWFPut>>SwfL.SwfCount := six
for c := 1 to 5 do SWFPut>>SwfL.Swf`six.evdate`c := R>>Req.eventnum`c
for c := 1 to 4 do SWFPut>>SwfL.Swf`six.evnum`c := R>>Req.eventnum`(c+5)

for c := 1 to 5 do SWFPut>>SwfL.Swf`six.sta`c := R>>Req.sta`c
SWFPut>>SwfL.Swf`six.chantype := R>>Req.chantype
for c := 1 to 2 do SWFPut>>SwfL.Swf`six.rate`c := R>>Req.rate`c
for c := 1 to 4 do SWFPut>>SwfL.Swf`six.chanid`c := R>>Req.chanid`c
SWFPut>>SwfL.Swf`six.gain := R>>Req.gain
SWFPut>>SwfL.Swf`six.comp := R>>Req.comp
// The SWF file datasegment start date is set from the phase arrival date field
for c := 1 to 6 do SWFPut>>SwfL.Swf`six.dsdate`c := R>>Req.padata`c
// The SWF file datasegment start time is the computed value in STimeStr
for c := 1 to 8 do SWFPut>>SwfL.Swf`six.dstime`c := STimeStr>>TD.digit`c

/* The SWF file scalefactor field is set from the ESF file datasegment
start time field, used by SDAC as a temporary holding place for the
value.
```

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```
for c := 1 to 8 do SWFPut>>SwfL.Swf`six.scalefactor`c := R>>Req.dstime`c
*/
for c := 1 to 5 do SWFPut>>SwfL.Swf`six.staname`c := R>>Req.sta`c
SWFPut>>SwfL.Swf`six.starti := WhenStart/6000
SWFPut>>SwfL.Swf`six.endi := WhenEnd
SWFPut>>SwfL.Swf`six.typ := Component
Component := Component + 1
}fillswf
}forreal
}loutl repeatuntil EofflG
CLOSEF(EventsJFN)
// if for real, then output ESF & SWF buffers
EndWrite(LoutJFN)
resultis true
}crinpl
```

4.2 CRInputs, Create Short-Period-Copy Driver File

```
and let CRInputs() := valof
{crinps
// check for ARRIVALS.* Tenex files
// if none, there's no work to do
jsACs!1 := #001101,,0 // #100101,,0 ?
jsACs!2 := (POINT7x0,,EventsFiles)
if JSYS (jsGTJFN,jsACs) eq failed then resultis false
let CEventsFileName := vec 20
for i := 1 to 20 do CEventsFileName!i := 0
EventsJFN := rh jsACs!1
jsACs!1 := (POINT7x0,,CFname)
jsACs!2 := EventsJFN
jsACs!3 := #000100,,0 // get extension field only
JSYS(jsJFNS,jsACs)
ASCIZToString(CFname,CFnameBCPL)
let rstg := vec 100
append(append(CEventsFileName,"ARRIVALS.",CEventsFileName),CFnameBCPL,CEventsFileName)
append(rstg,"Working from file: ",rstg)
RportL(append(rstg,CEventsFileName,rstg))
// extract Ynnnn.Mnn from CFnameBCPL and
// construct SPDET filename of the form %TOP.SDAC.SPDET.Ynnnn.Mnn
```


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```
let wrkvec := vec 4
CopyString(CFnameBCPL,wrkvec)
wrkvec>>string.n := 9 // discard day portion of name
changesubstr(wrkvec,"%",".")
append (BasicSPDEtname,wrkvec,SPDEtname)

let lstg := vec 50
SoutJFN := CreateOutput(append(lstg,"SP-ARRIVALS.",lstg),CFnameBCPL,lstg),36)

jsACs!1 := EventsJFN
jsACs!2 := #440000, #303000

if JSYS(jsOPENF,jsACs) eq failed then
  {
    RportL("Failure opening SP-ARRIVALS file")
    resultis false
  }

until EofFlg do {souts
SoutS:
let STimeStr := vec 1
let ETimeStr := vec 1
// clear R (Request Area) & P (Put Area)
for i := 1 to 512 do R!i := 0
for i := 1 to 512 do P!i := 0
SIN(EventsJFN,POINT(36,R),19,$~z)
if EofFlg then endblock soutS
```

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```
// set up byte pointers to buffers

Rptr := (POINT7x0,,R)
Pptr := (POINT7x0,,P)

/* The patime (phase arrival time) field transmits the arrival time
of a waveform which is to be copied into the SWF. The SWF-D
program will attempt to locate the segment of short-period data
which represents the desired waveform.
*/

for c := 1 to 8 do STimeStr>>TD.digit`c := R>>Req.patime`c
CSecInDay := TimetoInt(STimeStr)
if CSecInDay < 0 then
  | RportL("CRInputS: Bad time-string input")
// gather data sufficient to identify problem request for operator <<<
  loop sout
  |
/* Check for waveform being recorded after midnight. This case needs
special handling because part of the waveform is in the next day's
SRO data.
*/

let padayvec := vec 1
let evdayvec := vec 1

for c := 2 to 6 do padayvec>>string.c"(c-1) := R>>Req.padata`c
padayvec>>string.n := 5
for c := 1 to 5 do evdayvec>>string.c`c := R>>Req.eventnum`c
evdayvec>>string.n := 5
```

```
if ~ Eqstr(padayvec, evdayvec) then loop sout

/* The dsdate field is used by SDAC as a temporary holding place for the
   amount, in seconds, by which the window should precede the arrival time.
   */

let NumStg := vec 3
for c := 1 to 6 do NumStg >> string.c`c := R >> Req.dsdate`c
NumStg >> string.n := 6
PrecedingCSeconds := TxtToInt(NumStg)*100

let WhenStart := CSecInDay - PrecedingCSeconds
if WhenStart < 0 then
  { RportL("Window overlaps previous day")
  // set up special input file for overlapping day cases
  loop sout
  }

if ~ InttoTime(WhenStart, STimeStr) then
  { RportL("CRInputS: Bad time value")
  // need to gather more info for operator intervention
  loop sout
  }

// STimeStr holds left-edge window time

/* The amp field is used by SDAC to indicate the number of seconds
   to add to the arrival time to determine the right-edge of the
   window.
   */
```

```
for c := 1 to 7 do NumStg>>string.c`c := R>>Req.amp`c
NumStg>>string.n := 7
FollowingCSeconds := TxtToInt(NumStg)*100

let WhenEnd := (CSecInDay + FollowingCSeconds + 5999)/6000

if WhenEnd > 1439 then
  { RportL("Window overlaps following day")
  // set up special input file for overlapping day cases
  loop sout
  }

{cksta
// If not known SRO station, ignore request

let wrkvec := vec 2

for c := 1 to 4 do wrkvec>>string.c`c := R>>Req.sta`c
wrkvec>>string.n := 4

for ix := 1 to Stations>>StationData.Stationix do
  {
  if (Eqstr (wrkvec, (lv (Stations>>StationData.Station`ix.SName`1))))
  then endblock cksta
  }

loop sout
}cksta
// station name not recognized

if debugging then
```

```
{debug
{fillup
// ready now to fill PutS structures
FillPutS:
P>>PutS.Esf.EsfCount := P>>PutS.Esf.EsfCount + 1
P>>PutS.Esf.eindex := R>>Req.eindex
P>>PutS.Esf.aindex := R>>Req.aindex
// The ESF file datasegment start date is set from the phase arrival date field
for c := 1 to 6 do P>>PutS.Esf.dsdate`c := R>>Req.padate`c
// The datasegment start time, as computed above, is copied from STimeStr.
// The time may be adjusted by the SPThere routine after inspection of the
// SPDET file.
for c := 1 to 8 do P>>PutS.Esf.dstime`c := STimeStr>>TD.digit`c
P>>PutS.Swf.SwfCount := P>>PutS.Swf.SwfCount + 1
for c := 1 to 5 do P>>PutS.Swf.evdate`c := R>>Req.eventnum`c
for c := 1 to 4 do P>>PutS.Swf.evnum`c := R>>Req.eventnum`c(c+5)
for c := 1 to 5 do P>>PutS.Swf.sta`c := R>>Req.sta`c
P>>PutS.Swf.chantype := R>>Req.chantype
```

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```
for c := 1 to 2 do P>>PutS.Swf.rate`c := R>>Req.rate`c
for c := 1 to 4 do P>>PutS.Swf.chanid`c := R>>Req.chanid`c
P>>PutS.Swf.gain := R>>Req.gain
P>>PutS.Swf.comp := R>>Req.comp
// The SWF file dataset segment start date is set from the phase arrival date field
for c := 1 to 6 do P>>PutS.Swf.dsdate`c := R>>Req.padate`c
for c := 1 to 6 do P>>PutS.Swf.DSdate`c := R>>Req.padate`c
// The SWF file dataset segment start time is the computed value in StimeStr
for c := 1 to 8 do P>>PutS.Swf.dstime`c := StimeStr>>TD.digit`c

/* The SWF file scalefactor field is set from the ESF file dataset segment
start time field, used by SDAC as a temporary holding place for the
value.
*/
for c := 1 to 8 do P>>PutS.Swf.scalefactor`c := R>>Req.dstime`c

}fillup
}debug

unless debugging then
{forreal
```

```
FillESF:
let eix := ESFPut>>Esfl
ESFPut>>Esfl.Esf`eix.eindex := R>>Req.eindex
ESFPut>>Esfl.Esf`eix.aindex := R>>Req.aindex
// The ESF file dataset start date is set from the phase arrival date field
for c := 1 to 6 do ESFPut>>Esfl.Esf`eix.dsdate`c := R>>Req.padata`c
// The dataset start time, as computed above, is copied from STimeStr
// for c := 1 to 8 do ESFPut>>Esfl.Esf`eix.dstime`c := STimeStr>>TD.digit`c
FillSWF:
for lx := 1 to compcount do
{fillswf
let six := SWFPut>>Swfl.SwfCount + 1
SWFPut>>Swfl.SwfCount := six
for c := 1 to 5 do SWFPut>>Swfl.Swf`six.evdate`c := R>>Req.eventnum`c
for c := 1 to 4 do SWFPut>>Swfl.Swf`six.evnum`c := R>>Req.eventnum^(c+5)
for c := 1 to 5 do SWFPut>>Swfl.Swf`six.sta`c := R>>Req.sta`c
SWFPut>>Swfl.Swf`six.chantype := R>>Req.chantype
for c := 1 to 2 do SWFPut>>Swfl.Swf`six.rate`c := R>>Req.rate`c
for c := 1 to 4 do SWFPut>>Swfl.Swf`six.chanid`c := R>>Req.chanid`c
```

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```
SWFPut>>SwfL.Swf`six.gain := R>>Req.gain
SWFPut>>SwfL.Swf`six.comp := R>>Req.comp
// The SWF file datasegment start date is set from the phase arrival date field
for c := 1 to 6 do SWFPut>>SwfL.Swf`six.dsdate`c := R>>Req.padata`c
// The SWF file datasegment start time is the computed value in STimeStr
// for c := 1 to 8 do SWFPut>>SwfL.Swf`six.dstime`c := STimeStr>>TD.digit`c

/* The SWF file scalefactor field is set from the ESF file datasegment
start time field, used by SDAC as a temporary holding place for the
value.
*/
for c := 1 to 8 do SWFPut>>SwfL.Swf`six.scalefactor`c := R>>Req.dstime`c
// for c := 1 to 5 do SWFPut>>SwfL.Swf`six.staname`c := R>>Req.sta`c
// SWFPut>>SwfL.Swf`six.starti := WhenStart/6000
// SWFPut>>SwfL.Swf`six.endi := WhenEnd
SWFPut>>SwfL.Swf`six.typ := Component
}fillswf
}forreal
for c := 1 to 8 do P>>PutS.Swf.scalefactor`c := R>>Req.dstime`c
if SPThere() then {
  RportL("Short period data")
}
```


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```
}  
// SOUT(FailJFN, POINT(36, R), 19) // from Req area  
}souts  
CLOSF(EventsJFN)  
EndWrite(SoutJFN)  
// EndWrite(FailJFN)  
resultis true  
}crinps
```

4.3 SPThere, Check Short-Period Detections Map

```
// SPThere fills station index, detection date, start time  
// and end time if check of SPDET  
// file indicates that data ought to be available.
```

```
and let SPThere() := valof  
{spthere  
if ~ DCicp then {  
    OKGOQ()  
    if ~ CheckDC() then {  
        RportL("Waiting to check SPDET data")  
        resultis false  
    }  
    ScriptJFN := CreateOutput("SWF-D.SCRIPT",7)  
    startdc(ScriptJFN)  
    RportL("Beginning Datacomputer session")  
    senddc(LOGINstr)  
    DCicp := true  
    }  
if ~ SPDETopen then {openspdet  
senddc("OPEN ") ; senddc(SPDEtname) ; senddc(" READ, SYN = SPDET;*c*1")  
if ~ DClook() then resultis false  
SPDETopen := true
```

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```
senddc("OPEN %TOP.SDAC.CCA.SWF.SSPDET, SYN = SPDETP;*c*1")
openc("SPDETP",36)

}openspdet

let padayvec, psdayvec, pedayvec, padayn := vec 1, vec 1, nil
for c := 2 to 6 do padayvec>>string.c^(c-1) := R>>Req.padate*c
padayvec>>string.n := 5

padayn := TxtToInt(padayvec)
inttotxt(padayn-1,psdayvec)
inttotxt(padayn+1,pedayvec)

let pstimevec := vec 3
for c := 1 to 8 do pstimevec>>string.c*c := P>>PutS.Swf.dstime*c
psitimevec>>string.n := 8

let petimevec := vec 3
for c := 1 to 8 do petimevec>>string.c*c := P>>PutS.Swf.dstime*c// <<<fix time
petimevec>>string.n := 8

let stavec := vec 2
for c := 1 to 4 do stavec>>string.c*c := R>>Req.sta*c
stavec>>string.n := 4

// senddc("SPDETP = SPDET WITH SDATE GE ") ; senddc(psdayvec)
senddc("SPDETP = SPDET WITH SDATE = ") ; senddc(padayvec)
// senddc(" AND SDATE LE ") ; senddc(pedayvec)
senddc(" AND STA = ") ; senddc(stavec)
senddc("";*c*1")

let sumdets := 0
}moredets
let detBUFF := vec 50
let detPTR := POINT (36,detBUFF)
```

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```
let spdets := getfromdc(0,detPTR,5,$~z)
if spdets eq 0 then break moredets
sumdets := sumdets + spdets
// pick out detection and fill PutS structure

P>>PutS.Swf.stindex := detBUFF>>SSPDET.stindex

for c := 1 to 8 do P>>PutS.Swf.Dstime^c := detBUFF>>SSPDET.stime^c
for c := 1 to 8 do P>>PutS.Swf.dstime^c := detBUFF>>SSPDET.stime^c
for c := 1 to 8 do P>>PutS.Swf.dstime^c := detBUFF>>SSPDET.stime^c

for c := 1 to 8 do P>>PutS.Swf.Detime^c := detBUFF>>SSPDET.etime^c

if debugging then { PrReq(#101); PrPutS(#101) }
SOUT(SoutJFN,POINT(36,P),28)
}moredets repeatwhile dcgetstate

if sumdets eq 0 then resultis false // no detections for that day

if ~ DCLook() then {problem
    RportL("Trouble with SPDET")
    senddc("CLOSE %OPEN;*c*1")
    RportL("Ending Datacomputer session")
    quitdc()

EndWrite(ScriptJFN)
DCicp := false
resultis false
}problem
resultis true
}spthere
```

5. The SPDET File Generator

```
// SWF-D Program:  GAvail Module

// GAvail constructs and maintains a map of the short-period SRO
// detections on the Datacomputer.  It is by means of this information
// that we are able to determine whether requested waveforms may be
// expected to be available.  The data are constructed as monthly
// files under the %TOP.SDAC.VELANET.SPDET node with the year and month
// used as pathname keys to the period covered.  The complete pathname
// is of the form: %TOP.SDAC.VELANET.SPDET.Ynnnn.Mnn -- and the first
// file generated is for January, 1978.
```

```
get      "<CCA-SWF>SWFHEAD.BCP"
external {      CheckDC      }
external {      CheckL      }
external {      DCLook      }
external {      GAvail      }
external {      MARK        }
external {      OKGoQ       }
external {      RportL      }

static {stat
Tick      :      nil
Basicpath :      "%TOP.SDAC.VELANET."
LOGINstr  :      "Login SDAC.CCA.SWF;*c*1"
spdetNAME :      vec      100
nspfFRAG  :      vec      100
nspfNAME  :      vec      100
```

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```
DCnspfNAME      :      vec      100
MsgsBCPL        :      vec      512
MsgsBuffer      :      vec      512
GAYear          :      "0000"
GAMonth         :      "00"
GADay           :      "00"
GAYint          :      nil
GAMint          :      nil
GADint          :      nil
ndays           :      nil
moredetections :      nil
jsACS           :      vec      10
```

```
}stat
```

```
let GAvail() := valof
```

```
{GAvail
```

```
MARK(TaskStatus,GeneratingSegMap)
```

```
Tick := 0
```

```
let sdp := lv Stations>>StationData.AllStationsSPDETDate
let adp := lv Stations>>StationData.AllStationsASLDate
```

```
// Adjust for valid next short-period file date
```

```
jsACSi2 := (sdp>>Date.Yr),((sdp>>Date.Mo) - 1)
jsACSi3 := ((sdp>>Date.Day) - 1),0
jsACSi4 := 0,,5
// JAN = 0
// Day 1 = 0
// 5 seconds past midnight
// to ensure right day
```

```
if JSYS(jsIDCNV,jsACs) eq failed then {fixdate
sdp>>>Date.Day := 1
sdp>>>Date.Mo := sdp>>>Date.Mo + 1
if sdp>>>Date.Mo > 12 then {hnewyr
sdp>>>Date.Yr := sdp>>>Date.Yr + 1
sdp>>>Date.Mo := 1
}hnewyr
}fixdate
GAYint := sdp>>>Date.Yr
GAMint := sdp>>>Date.Mo
GADint := sdp>>>Date.Day
// Check for how much work there is to do.
let DeltaYear := adp>>>Date.Yr - sdp>>>Date.Yr
let DeltaMonth := adp>>>Date.Mo - sdp>>>Date.Mo
if DeltaYear > 0 then DeltaMonth := DeltaMonth + 12
if DeltaMonth ge 1 then {
  ndays := ((DaysPerMonth!(sdp>>>Date.Mo) - sdp>>>Date.Day) + 1
  goto DoSPD
}
ndays := adp>>>Date.Day - sdp>>>Date.Day
if ndays > 0 then goto DoSPD
NoWork:
MARK(TaskStatus,EndGenSegMap)
RportL("SPDET files are up-to-date")
resultis true
```

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```
DoSPD:
RportL("Generating segment availability map")
// Check whether Datacomputer session is already in progress -
// and if not, initiate the connection.
if ~ DCicp then {
    OKGoQ()
    if ~ CheckDC() then {
        RportL("Waiting to generate segment availability map")
        resultis false }
    ScriptJFN := CreateOutput("SWF-D.SCRIPT",7)
    startdc(SCRIPTJFN)
    RportL("Beginning Datacomputer session")
    senddc(LOGINstr)
    DCicp := true }

inttotxt (GAYint, GAYear) // integer to text conversions
inttotxt (GAMint, GAMonth)
inttotxt (GADint, GADay)

let rstg := vec 100
append(rstg,"Starting day.mo.yr = ",rstg)
append(rstg,GADay,rstg) ; addch($.,rstg)
append(rstg,GAMonth,rstg)
append(addch($.,rstg),GAYear,rstg) ; append(rstg," for ",rstg)
let nstg := vec 5
RportL(append(append(rstg,inttotxt(ndays,nstg),rstg)," days",rstg))

// Construct detections file name
```


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```
for i := 0 to 100 do spdetNAME|i := 0
for i := 0 to 100 do nspfFRAG|i := 0
  addch($Y,nspfFRAG)
  append(nspfFRAG,GAYEAR,nspfFRAG)
  append(nspfFRAG,".M",nspfFRAG)
  if GAMINT < 10 then { addch($0,nspfFRAG) }
  append(nspfFRAG,GAMONTH,nspfFRAG)
append(spdetNAME,BASICPATH,spdetNAME)
append(spdetNAME,"SPDET.",spdetNAME)
// append(spdetNAME,"%TOP.SDAC.CCA.SWF.TEST%SPDET.",spdetNAME) // for debugging
append(spdetNAME,nspfFRAG,spdetNAME)

// If the starting day = 1, (new month) then create a new SPDET file.
if GADINT eq 1 then {nu
  senddc("DELETE ") ; senddc(spdetNAME) ; senddc(";*c*l")
  senddc("CREATE ") ; senddc(spdetNAME)
  senddc(" FILE LIKE %TOP.SDAC.VELANET.PROTOTYPES.SPDET;*c*l")
// Then close it.
senddc("CLOSE ") ; senddc(spdetNAME) ; senddc(";*c*l")
let rstg := vec 100
append(rstg,"Created ",rstg)
RportL(append(rstg,spdetNAME,rstg))
}nu
// Open LIST1, a Datacomputer file used only for Datalanguage loop control.
```

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```
senddc("OPEN %TOP.SDAC.VELANET.PROTOTYPES.LIST1;*c*1")
// Construct nspf day filename root
for i := 0 to 100 do nspfNAME{i} := 0
append(nspfNAME,Basicpath,nspfNAME)
append(nspfNAME,"NSPF.",nspfNAME)
append(nspfNAME,nspfFRAG,nspfNAME)
// Ready now to loop through day files.
for api := GADint to (GADint + ndays - 1) by 1 do {apl
// Construct specific day filename
append(nspfNAME,".D",DCnspfNAME)
if GADint < 10 then { addch($0,DCnspfNAME) }
append(DCnspfNAME,GADay,DCnspfNAME)
GADint := GADint + 1
inttotxt(GADint, GADay)
// Check that file exists
senddc("LIST ") ; senddc(DCnspfNAME) ; senddc(";*c*1")
if ~ DClook() then { moredetections := false ; break apl }
// Open day file: OPEN %TOP.SDAC.VELANET.NSPF.Ynnnn.Mnn.Dnn,SYN=SPF;
senddc("OPEN ") ; senddc(DCnspfNAME) ; senddc(" , SYN = SPF;*c*1")
if ~ DClook() then { moredetections := false ; break apl }
// Check that file is on-line
```

```
senddc("LIST SPF %STATUS;*c*1")
while degetstate do getfromdc (0,POINT(7,MsgsBuffer),-2560)
// search substring for "online" status
ASCIIzToString(MsgsBuffer,MsgsBCPL)
let stch,endch := nil,nil
if ~ findsubstr(MsgsBCPL,"STAT=ONLINE",lv stch,lv endch,1) then {offday

    let rstg := vec 100
    append(rstg,"Off-line file: ",rstg)
    RportL(append(rstg,DCnspfNAME))
    break aplp
// option here to continue instead

}offday

// Open detections file

senddc("OPEN ") ; senddc(spdetNAME)
senddc(" APPEND DEFER, SYN = SPDET;*c*1")
if ~ DClook() then break aplp // cannot proceed if there are file problems

// Send Datalanguage to transfer detections from day file to detection file

scriptdc(0) // inhibit scripting

senddc("BEGIN DECLARE F INT F=1*c*1")
senddc("UNTIL F<0 DO BEGIN*c*1")
senddc("FOR SPF WITH FLAG EQ F AND STA NE *'XXXXX*' BEGIN*c*1")
senddc("tDECLARE ODATE INT DECLARE OTIME INT DECLARE ODEX INT*c*1")
senddc("tDECLARE PDATE INT DECLARE PTIME INT*c*1")
senddc("tDECLARE CSTADEX INT DECLARE CCOUNT INT*c*1")
senddc("tDECLARE CSTA STR(5) CSTA=STA*c*1")
senddc("tCSTADEX=STINDEX CCOUNT=COUNT*c*1")
senddc("FOR DATA BEGIN*c*1")
```

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```
senddc("**tIF INDEX EQ 1 THEN*c*1")
senddc("**tBEGIN ODATE=DATE OTIME=TIME ODEX=1 END*c*1")
senddc("**ELSE IF DET EQ 1 THEN*c*1")
senddc("**FOR SPDET,LIST1 BEGIN *c*1")
senddc("**tSTA=CSTA STANDEX=CSTADEX*c*1")
senddc("**tSDATE=ODATE STIME=OTIME SINDEX=ODEX*c*1")
senddc("**tEDATE=PDATE ETIME=PTIME EINDEX=INDEX-1*c*1")
senddc("**tODATE=DATE OTIME=TIME ODEX=INDEX END*c*1")
senddc("**tPDATE=DATE PTIME=TIME END*c*1")
senddc("**FOR SPDET,LIST1 BEGIN*c*1")
senddc("**tSTA=CSTA STANDEX=CSTADEX*c*1")
senddc("**tSDATE=ODATE STIME=OTIME SINDEX=ODEX*c*1")
senddc("**tEDATE=PDATE ETIME=PTIME EINDEX=CCOUNT END*c*1")
senddc("**END F-F-1 END END;*c*1")

scriptdc(ScriptJFN) // resume scripting

// Close both detections and NSPF files

senddc("CLOSE SPF; CLOSE SPDET;*c*1")

let rstg := vec 100
RportL(append(append(rstg,DCnspfNAME,rstg)," [OK]",rstg))
Stations>>StationData.AllStationsSPDETDate.Yr := GAYint
Stations>>StationData.AllStationsSPDETDate.Mo := GAMint
Stations>>StationData.AllStationsSPDETDate.Day := GADint - 1
MARK(StationsStatus,Stations>>StationData.AllStationsSPDETDate)

// Quit voluntarily between processing of NSPF day files if load average
// is high or Datacomputer is busy.

//
Tick := Tick + 1
```

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```
if Tick < 3 then loop aplp
Tick := 0
if ~ CheckL() then { moredetections := true ; goto EndSPD }
if ~ CheckDC() then { moredetections := true ; goto EndSPD }

}aplp

// Create Tenex file for detections <<< not doing it yet
// }outf
//
// let rstg := vec 100
// append(append(rstg,"SPDET.",rstg),changesubstr(nspfFRAG,".", "%"),rstg)
// let detJFN := CreateOutput(rstg,36)
//
// senddc("OPEN ") ; senddc(spdetNAME) ; senddc(" READ, SYN = SPDET;*c*1")
// senddc("OPEN %TOP.SDAC.VELANET.PROTOTYPES.SPDETP, SYN = SPDETP;*c*1")
// opendc("SPDETP",7) <<< define new port
// senddc("SPDETP = SPDET;*c*1")
//
// {moredets
//
// let detBUFF := vec 512
// let detPTR := POINT(36,detBUFF)
// let spdets := getfromdc(0,detPTR,512,$~z)
// if spdets eq 0 then break moredets
// SOUT(detJFN,detPTR,512,$~z)
//
// }moredets repeatwhile dcsetstate
// CLOSF(detJFN)
// RportL(append(rstg,"*screated",rstg))
// }outf
```

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```
// End Datacomputer session
EndSPD:
// Get status of detection file
senddc("LIST "); senddc(spdetNAME) ; senddc(" %INFO;*c*1")
if ~ DCLook() then {
    RportL("Trouble with SPDET" ) }
senddc("CLOSE %OPEN;*c*1")
RportL("Ending Datacomputer session")
quitdc()
EndWrite(SCRIPTJFN)
DCicp := false
// set up starting SPDET date for next cycle
let sdp := lv Stations>>StationData.AllStationsSPDETDate
sdp>>Date.Day := sdp>>Date.Day + 1
// OK if it goes over
// month boundary
MARK(StationsStatus,sdp>>Date)
resultis ~ moredetections
}GAvail
```

5.1 DCLook, Check Messages from Datacomputer.

```
// DCLook returns true|false according as any Datacomputer messages
// are not|are indicative of errors

and let DCLook() := valof
{dclook
while dcgetstate do {mlp
let MsgsPtr := POINT(7,MsgsBuffer)
let mbytes := getfromdc(0,MsgsPtr,512,$*1)
if mbytes eq 0 then loop mlp
let mch := ILDB(lv MsgsPtr)
switchon mch into {mchck
case $- : // #55
case $+ : // #53
case $? : // #77
case $*" : // #42
case $*' : // #56
resultis false
}mchck
}mlp repeatwhile dcgetstate
resultis true
}dclook
```

6. The Utility Programs Module

```
// SWF-D Program: SWUtil Module
// Contains utility & debugging display routines

get      "<CCA-SWF>SWFHEAD.BCP".

external {
    PrReq      {
    PrPutL     {
    PrPutS     {
    RportL     {
}
}
}
}

static {stat
    dJFN      :      #101
}stat
```


6.1 TimetoInt, Convert Time from ASCII String to Integer Value

```
/* TimetoInt converts a string of 8 ASCII digits into an integer.  
   Tptr must be the address of the first of 2 words containing 8 9-bit  
   ASCII digits, taken to be in the format HHMMSSCC. code tells the  
   units of the returned value.  
   */
```

```
let TimetoInt(Tptr,code) := valof  
{timetoint  
  if numbargs < 2 then code := CSecsCode  
  let Tmps := vec 1  
  for d := 1 to 8 do  
    {checkloop  
      let nch := Tptr>>TD.digit^d  
      if nch < $0 \ nch > $9 then  
        {ierr  
          RportL("ERROR: TimetoInt found non-numeric data!")  
        }  
      // option here to quit or to construct defaults  
      nch := $0
```

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```
      Jierr
      TmpS>>TD.digit`d := nch - #60
    }checkloop
    let hours := (TmpS>>TD.digit`1)*10.+ TmpS>>TD.digit`2
    if hours > 23 then { RportL("ERROR: TimetoInt Hours > 23") ; hours := 12 }
    let minutes := (TmpS>>TD.digit`3)*10 + TmpS>>TD.digit`4
    if minutes > 59 then { RportL("ERROR: TimetoInt Minutes > 59") ; minutes := 0 }
    let seconds := (TmpS>>TD.digit`5)*10 + TmpS>>TD.digit`6
    if seconds > 59 then { RportL("ERROR: TimetoInt Seconds > 59") ; seconds := 0 }
    let csecs := (TmpS>>TD.digit`7)*10 + TmpS>>TD.digit`8
    let val := ((hours*60+minutes)*60+seconds)*100+csecs // val is in centiseconds
    switchon code into
    {scaleoutput
      case HoursCode: val := val/60
      case MinutesCode: val := val/60
      case SecondsCode: val := val/100
    }scaleoutput
    resultis val
  }timetoint
```

6.2 InttoTime, Convert Integer into Selected Time Units

```
/* InttoTime takes 3 arguments:
   (1) val - an integer
   (2) Tptr - location of at least 2 words of space to put the output into
   (3) code - tells how to interpret val:
       3 => val is a number of hours
       2 => val is a number of minutes
       1 => val is a number of seconds
       0 => val is a number of centiseconds
*/

let InttoTime(val,Tptr,code) := valof
{inttotime
  if val < 0 resultis false
  let hours,minutes,seconds,csecs := 0,0,0,0
  let result := true
  if numbargs < 3 then code := CsecsCode
  switchon code into
  {whereput
    case CsecsCode: csecs := val ; endcase
    case SecondsCode: seconds := val ; endcase
```

```
      case MinutesCode:      minutes := val ; endcase
      case HoursCode:      hours := val ; endcase
    }whereput
    if csecs > 99 then { seconds := csecs/100 ; csecs := csecs rem 100 }
    if seconds > 59 then { minutes := seconds/60 ; seconds := seconds rem 60 }
    if minutes > 59 then { hours := minutes/60 ; minutes := minutes rem 60 }
    if hours > 23 then
      {ierr
      RportL("ERROR: InttoTime found bad input time")
      // option here to quit or to continue with default values
      hours := 23
      minutes := 59
      seconds := 59
      csecs := 99
      result := false
      }ierr
```

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```
Tptr>>TD.digit^1 := (hours/10) + #60  
Tptr>>TD.digit^2 := (hours rem 10) + #60  
Tptr>>TD.digit^3 := (minutes/10) + #60  
Tptr>>TD.digit^4 := (minutes rem 10) + #60  
Tptr>>TD.digit^5 := (seconds/10) + #60  
Tptr>>TD.digit^6 := (seconds rem 10) + #60  
Tptr>>TD.digit^7 := (csecs/10) + #60  
Tptr>>TD.digit^8 := (csecs rem 10) + #60
```

resultis result

!inttotime

6.3 Print Routines

```
// Utility print routines
// Print <string> = <value>
let MOSTr ( dJFN,string,value) be
{mostr
  WriteS(dJFN,string);   WriteS(dJFN," = ")
  WriteS(dJFN,value);    Writech(dJFN,$*n)
}mostr

// Print <string>(<index>) = <string>
let MOSTix ( dJFN,string,index,value) be
{mostix
  WriteS(dJFN,string);   WriteS(dJFN,"("); WriteN(dJFN,index)
  WriteS(dJFN,") = ");   WriteS(dJFN,value); Writech(dJFN,$*n)
}mostix
```

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```
// Print <string> = <octal number>
let MONum ( djfn,string,octnum) be
{octnum
  WriteS(djfn,string); WriteS(djfn," = #"); WriteOct(djfn,octnum)
  Writech(djfn,$*n)
}octnum

// Print <string> = <decimal number>
let MODEc(djfn,string,decnum) be
{decnum
  WriteS(djfn,string); WriteS(djfn," = ")
  WriteN(djfn,decnum); Writech(djfn,$*n)
}decnum
```

6.4 PrReq, Display Req Structure

```
// PrReq * Display Req structure
let PrReq(dJFN) be
{prreq
  WriteS(dJFN,"*nReq --*n")
  MODec (dJFN,"EINDEX",R>>Req.eindex)
  WriteS(dJFN,"EVENTNUM = ")
  for c := 1 to 9 do Writech(dJFN,R>>Req.eventnum`c)
  Writech(dJFN,$*n)
  MODec (dJFN,"AINDEX",R>>Req.aindex)
  WriteS(dJFN,"SIA = ")
  for c := 1 to 5 do Writech(dJFN,R>>Req.sta`c)
  Writech(dJFN,$*n)
  WriteS(dJFN,"CHANTYPE = ") ; Writech(R>>Req.chantype)
  Writech(dJFN,$*n)
  WriteS(dJFN,"RATE = ")
  for c := 1 to 2 do Writech(dJFN,R>>Req.rate`c)
  Writech(dJFN,$*n)
  WriteS(dJFN,"CHANID = ")
  for c := 1 to 4 do Writech(dJFN,R>>Req.chanid`c)
  Writech(dJFN,$*n)
  WriteS(dJFN,"GAIN = ") ; Writech(R>>Req.gain)
  Writech(dJFN,$*n)
  WriteS(dJFN,"COMP = ") ; Writech(R>>Req.comp)
  Writech(dJFN,$*n)
  WriteS(dJFN,"DSDATE = ")
  for c := 1 to 6 do Writech(dJFN,R>>Req.dsdate`c)
```


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```
Writech(djfn,$*n)
WriteS(djfn,"DSTIME = ")
for c := 1 to 8 do Writech(djfn,R>>Req.dstime~c)
Writech(djfn,$*n)
WriteS(djfn,"PADATE = ")
for c := 1 to 6 do Writech(djfn,R>>Req.padate~c)
Writech(djfn,$*n)
WriteS(djfn,"PATIME = ")
for c := 1 to 8 do Writech(djfn,R>>Req.patime~c)
Writech(djfn,$*n)
WriteS(djfn,"PHASEID = ")
for c := 1 to 6 do Writech(djfn,R>>Req.phaseid~c)
Writech(djfn,$*n)
WriteS(djfn,"AMP = ")
for c := 1 to 7 do Writech(djfn,R>>Req.amp~c)
Writech(djfn,$*n)
```

!prreq

6.5 PrPutL, Display PutL Structure

```
// PrPutL * Display PutL structure
let PrPutL(dJFN) be
{prputl
  WriteS(dJFN,"*nPutL --*n")
  MODEC (dJFN,"EsfCount",P>>PutL.Esf.EsfCount)
  MODEC (dJFN,"EINDEX",P>>PutL.Esf.eindex)
  MODEC (dJFN,"AINDEX",P>>PutL.Esf.aindex)
  WriteS(dJFN,"DSDATE = ")
  for c := 1 to 6 do Writech(dJFN,P>>PutL.Esf.dsdate~c)
  Writech(dJFN,$*n)
  WriteS(dJFN,"DSTIME = ")
  for c := 1 to 8 do Writech(dJFN,P>>PutL.Esf.dstime~c)
  Writech(dJFN,$*n)
  MODEC (dJFN,"SwfCount",P>>PutL.Swf.SwfCount)
  WriteS(dJFN,"EVDATE = ")
  for c := 1 to 5 do Writech(dJFN,P>>PutL.Swf.evdate~c)
  Writech(dJFN,$*n)
  WriteS(dJFN,"EVNUM = ")
  for c := 1 to 4 do Writech(dJFN,P>>PutL.Swf.evnum~c)
  Writech(dJFN,$*n)
  WriteS(dJFN,"STA = ")
  for c := 1 to 5 do Writech(dJFN,P>>PutL.Swf.sta~c)
  Writech(dJFN,$*n)
  WriteS(dJFN,"CHANTYPE = ") ; Writech(P>>PutL.Swf.chantype)
  Writech(dJFN,$*n)
  WriteS(dJFN,"RATE = ")
```

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```
for c := 1 to 2 do Writech(dJFN,P>>PutL.Swf.rate`c)
Writech(dJFN,$*n)
WriteS(dJFN,"CHANID = ")
for c := 1 to 4 do Writech(dJFN,P>>PutL.Swf.chanid`c)
Writech(dJFN,$*n)
WriteS(dJFN,"GAIN = ") ; Writech(P>>PutL.Swf.gain)
Writech(dJFN,$*n)
WriteS(dJFN,"COMP = ") ; Writech(P>>PutL.Swf.comp)
Writech(dJFN,$*n)
WriteS(dJFN,"DSDATE = ")
for c := 1 to 6 do Writech(dJFN,P>>PutL.Swf.dsdate`c)
Writech(dJFN,$*n)
WriteS(dJFN,"DSTIME = ")
for c := 1 to 8 do Writech(dJFN,P>>PutL.Swf.dstime`c)
Writech(dJFN,$*n)
WriteS(dJFN,"SCALEFACTOR = ")
for c := 1 to 8 do Writech(dJFN,P>>PutL.Swf.scalefactor`c)
Writech(dJFN,$*n)
WriteS(dJFN,"STANAME = ")
for c := 1 to 5 do Writech(dJFN,P>>PutL.Swf.staname`c)
Writech(dJFN,$*n)
MODEC (dJFN,"STARTI",P>>PutL.Swf.starti)
MODEC (dJFN,"ENDI",P>>PutL.Swf.endi)
MODEC(dJFN,"TYP",P>>PutL.Swf.typ)
Writech(dJFN,$*n)
}prputl
```

6.6 PrPutS, Display PutS Structure

```
// PrPutS * Display PutS structure
let PrPutS(dJFN) be
{prputs
  WriteS(dJFN,"*nPutS --*n")
  MODEC (dJFN,"EsfCount",P>>PutS.Esf.EsfCount)
  MODEC (dJFN,"EINDEX",P>>PutS.Esf.eindex)
  MODEC (dJFN,"AINDEX",P>>PutS.Esf.aindex)
  WriteS(dJFN,"DSDATE = ")
  for c := 1 to 6 do Writech(dJFN,P>>PutS.Esf.dsdate~c)
  Writech(dJFN,$*n)
  WriteS(dJFN,"DSTIME = ")
  for c := 1 to 8 do Writech(dJFN,P>>PutS.Esf.dstime~c)
  Writech(dJFN,$*n)
  MODEC (dJFN,"SwfCount",P>>PutL.Swf.SwfCount)
  WriteS(dJFN,"EVDATE = ")
  for c := 1 to 5 do Writech(dJFN,P>>PutS.Swf.evdate~c)
  Writech(dJFN,$*n)
  WriteS(dJFN,"EVNUM = ")
  for c := 1 to 4 do Writech(dJFN,P>>PutS.Swf.evnum~c)
  Writech(dJFN,$*n)
  WriteS(dJFN,"STA = ")
  for c := 1 to 5 do Writech(dJFN,P>>PutS.Swf.sta~c)
  Writech(dJFN,$*n)
  WriteS(dJFN,"CHANTYPE = ") ; Writech(P>>PutS.Swf.chantype)
  Writech(dJFN,$*n)
  WriteS(dJFN,"RATE = ")
}
```

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```
for c := 1 to 2 do Writech(dJFN,P)>>PutS.Swf.rate`c)
Writech(dJFN,$*n)
WriteS(dJFN,"CHANID = ")
for c := 1 to 4 do Writech(dJFN,P)>>PutS.Swf.chanid`c)
Writech(dJFN,$*n)
WriteS(dJFN,"GAIN = ") ; Writech(P)>>PutS.Swf.gain)
Writech(dJFN,$*n)
WriteS(dJFN,"COMP = ") ; Writech(P)>>PutS.Swf.comp)
Writech(dJFN,$*n)
WriteS(dJFN,"DSDATE = ")
for c := 1 to 6 do Writech(dJFN,P)>>PutS.Swf.dsdate`c)
Writech(dJFN,$*n)
WriteS(dJFN,"DSTIME = ")
for c := 1 to 8 do Writech(dJFN,P)>>PutS.Swf.dstime`c)
Writech(dJFN,$*n)
WriteS(dJFN,"SCALEFACTOR = ")
for c := 1 to 8 do Writech(dJFN,P)>>PutS.Swf.scalefactor`c)
Writech(dJFN,$*n)
MODEC (dJFN,"STINDEX",P)>>PutS.Swf.stindex)
WriteS(dJFN,"DSdate = ")
for c := 1 to 6 do Writech(dJFN,P)>>PutS.Swf.DSdate`c")
for c := 1 to 8 do Writech(dJFN,P)>>PutS.Swf.DETIME`c)
Writech(dJFN,$*n)
Writech(dJFN,$*n)

lprputs
```

SWF-D, Program Listings
SWF-D Program Data

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Appendix A

A. SWF-D Program Data

A.1 SWFHEAD, Global Data Definitions

```
// SWF-D Program Header File  
get "<BCPL>HEAD.BCP"  
get "<BCPL>JSHEAD.BCP"  
get "<BCPL>UTILHEAD.BCP"  
get "<BCPL>BDSUBRHEAD.BCP"  
get "<BCPL>STRINGHEAD.BCP"  
get "<BCPL>PSIHEAD.BCP"  
get "<BCPL>OPENFILEHEAD.BCP"  
  
global {gl  
  
CopyString:8135  
TaskJFN:2000  
EventJFN:2001  
ScriptJFN:2003  
Logpg:2004  
CurrentFile:2008  
TenexFile:2009  
DCicp:2010
```

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SWF-D Program Data

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Appendix A

Stations:2011
WorkSchedule:2012
DaysPerMonth:2013
InttoTime:2014
TimetoInt:2015
R:2016
P:2017
ESFPut:2018
SWFPut:2019

}gl

```
manifest      {ma
// generally useful constants
failed        := 1
ofOutputNew  := ofOutput\ofNewFile
POINT7x0     := #440700 // to avoid expense of BCPL POINT routine
POINT7x6     := #350700 // e.g., instead of ptr := POINT(7,stgvec,6)
POINT8x0     := #441000 // write ptr := (POINT7x6,,stgvec)
POINT8x7     := #341000
POINT36x0    := #444400

// time <-> integer conversion codes
HoursCode    :      3
MinutesCode  :      2
SecondsCode  :      1
CSecsCode    :      0
```

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// Waveform Component Constants

vertical : 1
north : 2
east : 3
all : 4

// Task Status Constants

InitCompleted := 2
InGetEvents := 3
InGetArrivals := 5
AppendingSWF := 1
UpdatingESF := 9
InLimbo := 4
GeneratingSegMap:= 8
EndGenSegMap := 6
EndGetArrivals := 7

// NextTask encodement

Limbo := 1
GetArrivals := 2
AppendSWF := 3
UpdateESF := 4
GenSegAvailMap := 7
TopoftheQueue := 5
Restart := 6

// CheckDC error status codes

TenexLoad := 1
HardwareProblem:= 2
DCQuestionable := 3
TBMstatus := 4

SWF-D, Program Listings
SWF-D Program Data

```
NotEnoughTimeLeft:= 5  
AbnormalDCState:= 6  
NotListening := 7
```

```
// structure limits
```

```
Tix := 100 // limit of task queue  
Esfix := 999  
Swfix := 999
```

```
// MARK program driver constants
```

```
TaskStatus := 1  
StationsStatus := 2  
ESFStatus := 3  
UPDATStatus := 4
```

```
// StationData structure limits.
```

```
StationMax := 100
```

```
lma
```

```
structure { string { n byte; c^511 byte } overlay { stringword^128 word } }
```

```
structure { TD { digit^8 byte } }
```

SWF-D, Program Listings
SWF-D Program Data

```
// Date structure definition
structure { Date {
  Yr      bit 18
  Mo      byte
  Day     byte } }

// Logpg vector structure
structure { Log {
  Taskix  word
  Tasklim word
  TaskTix word
  LoadLimit word
  Interval word
  NextTask word
  ESFCurrentDate { Yr      bit 18
                  Mo      byte
                  Day     byte } }
  EventsYear  word
  EventsDay0  word
} }
```

```
// Stations vector structure
structure { StationData {
Stationix word
AllStationsASLDate { Yr bit 18
Mo byte
Day byte
AllStationsSPDETDDate { Yr bit 18
Mo byte
Day byte
}
Station^StationMax { SName^2 word
FromDate { Yr Mo
ToDate { Yr Mo
SPDETDDate { Yr Mo
Day
} }
} }
```

SWF-D, Program Listings
SWF-D Program Data

```
structure      { Req {  
  eindex      word  
  eventnum~9  char  
              fill word  
  aindex      word  
  sta~5       char  
  chantype    char  
  rate~2      char  
  chanid~4    char  
  gain        char  
  comp        char  
  dsdate~6   char  
  dstime~8   char  
  padate~6   char  
  patime~8   char  
  phaseid~6  char  
  amp~7      char  
              fill word  
              }  
              }  
              // datasegstart date  
              // phase arrival date
```

SWF-D, Program Listings
SWF-D Program Data

```
structure { Esfl {  
  EsfCount word  
  EsfEsfix {  
    eindex word  
    aindex word  
    dsdate~6 char  
    dstime~8 char  
    fill word  
  }  
}
```

```
structure { SwfL {  
  SwfCount word  
  SwfSwfix {  
    evdate~5 char  
    evnum~4 char  
    sta~5 char  
    chantype char  
    rate~2 char  
    chanid~4 char  
    gain char  
    comp char  
    dsdate~6 char  
    dstime~8 char  
    scalefactor~8 char  
    staname~5 char  
    fill word  
    starti word  
    endi word  
    typ word  
  }  
}
```

SWF-D, Program Listings
SWF-D Program Data

```
structure { PutL {  
  Esf { EsfCount word  
        index word  
        aindex word  
        dsdate~6 char  
        dstime~8 char  
        fill word  
  }  
  Swf { SwfCount word  
        evdate~5 char  
        evnum~4 char  
        sta~5 char  
        chantype char  
        rate~2 char  
        chanid~4 char  
        gain char  
        comp char  
        dsdate~6 fill word  
        dstime~8 char  
        scalefactor~8 char  
        staname~5 char  
        starti fill word  
        endi word  
        typ word  
  }  
}
```

SWF-D, Program Listings
SWF-D Program Data

```

structure { Puts {
  Esf { EsfCount word
        eindex word
        aindex word
        dsdate~6 char
        dstime~8 char
        fill word }
  Swf { SwfCount word
        evdate~5 char
        evnum~4 char,
        sta~5 char
        chantype char
        rate~2 char
        chanid~4 char
        gain char
        comp char
        dsdate~6 fill word
        dstime~8 char
        scalefactor~8 char
        stindex fill word
        DSdate~6 word
        DSTime~8 char
        DETime~8 char
        fill word }
} }

```


SWF-D, Program Listings
SWF-D Program Data

// Structure definition for handling SSPDET port records

```
structure { SSPDET {  
  standex word  
  stime`8 char  
  etime`8 char }  
}
```

```

// Structure declarations for JFN Mode Word and CCOC words
structure
{
  TT
  {
    OSP bitb // Q suppress output SFMOD
    MFF bitb // Q has mechanical form feed STPAR
    TAB bitb // Q has mechanical tab STPAR
    LCA bitb // Q has lower case STPAR
    LEN bit 7 // page length STPAR
    WID bit 7 // page width STPAR
    WAK bit 6 // wakeup control SFMOD
    overlay
    {
      bit 2 // Q wakeup on:
      {
        WKF bitb // (not used)
        WKN bitb // formatting control character
        WKP bitb // non-formatting control char
        WKA bitb // punctuation character
        bitb // alphanumeric character
      }
    }
  }
  ECH bit 2 // (echoing) Tenex: values 0-3 SFMOD
  overlay
  {
    ECO bitb // Tops-20 only: SFMOD
    ECM bitb // (F|T) => (deferred|immediate) STPAR
  }
  ALK bitb // Q accept links TLINK
  AAD bitb // Q accept advice TLINK
  DAM bit 2 // terminal data modes (see codes) SFMOD
  UOC bitb // UC output control (Q indicate as 'X) STPAR
  LIC bitb // Tenex: LC output ctrl (Q indicate as %X) STPAR
  DUM bit 2 // LC input control (Q cnvt LC to UC) STPAR
  PGM bitb // duplex mode (see codes) STPAR
  CAR bitb // Q page mode output STPAR
  // Tenex: Q Repeat Last Character (BKJFN)
  // carrier state (Q dataset & carrier on) ---
}

```

A.2 SWFALO, Storage and Work Areas

```
// SWFALO - storage & working areas
get "<CCA-SWF>SWFHEAD.BCP"
static lstat // best aligned on page boundary
ESFPut : vec 6000 // max length really 5995
SWFPut : vec 16000 // max length really 15985
CurrentFile : vec 100 // a BCPL string of the form
TenexFile : vec 100 // Ynnnn.Mnn.Dnn
TaskJFN : 0 // a BCPL string of the form
EventJFN : 0 // Ynnnn%Mnn%Dnn
ScriptJFN : 0
DCicp : nil
Stations : vec 512 // true|false => connected to DC
// mapped into via the StationData
// structure
Logpg : vec 512 // mapped into via the Log structure
DaysPerMonth : table nil, 31, 29, 31, 30, 31, 30, 31, 31, 30, 31, 30, 31
// Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
R : vec 512 // request area for arrivals
P : vec 512 // put area - mapped from R
lstat
```

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