

NSSDCA Document B56523-000A

Apollo ARCSAV Level 1b (Raw Cleaned Binary) File Processing Programs and Supplementary Input Files

<b>Experiment</b>	<b>Program <sup>1</sup></b>	<b>Description</b>	<b>Main Input Files <sup>2</sup></b>	<b>Supplementary Input Files</b>	<b>Output Files <sup>3</sup></b>	<b>Last Revision Date</b>
HFE	asr2L1bHFE.f	L-0a to L-1b conversion	asr.*.*		hfel1b.*.*	6/28/17
	asr2L1bHFEcorr.f	Corrected L-0a to L-1b conversion	asr.*.*	11bcor.HFE	hfel1b.*.*	4/5/18
	asr2L1bHFEcorr2.f	Corrected L-0a to L-1b conversion, repeat	asr.*.*	type in station & date	hfel1b.*.*	4/6/18
LEAM	asr2L1b LEAM.f	L-0a to L-1b conversion	asr.*.*		leaml1b.*.*	6/21/17
	asr2L1b LEAM corr.f	Corrected L-0a to L-1b conversion	asr.*.*	11bcor. LEAM	leaml1b.*.*	4/6/18
	asr2L1b LEAM corr2.f	Corrected L-0a to L-1b conversion, repeat	asr.*.*	type in station & date	leaml1b.*.*	4/6/18
LSG	asr2L1bLSG.f	L-0a to L-1b conversion	asr.*.*		lsgl1b.*.*	6/21/17
	asr2L1bLSGcorr.f	Corrected L-0a to L-1b conversion	asr.*.*	11bcor. LSG	lsgl1b.*.*	4/5/18
	asr2L1bLSGcorr2.f	Corrected L-0a to L-1b conversion, repeat	asr.*.*	type in station & date	lsgl1b.*.*	4/6/18
LSM	asr2L1b LSM.f	L-0a to L-1b conversion	asr.*.*		lsml1b.*.*	7/1/17
	asr2L1b LSM corr.f	Corrected L-0a to L-1b conversion	asr.*.*	11bcor. LSM	lsml1b.*.*	4/6/18
	asr2L1b LSM corr2.f	Corrected L-0a to L-1b conversion, repeat	asr.*.*	type in station & date	lsml1b.*.*	4/6/18
SIDE	asr2L1b SIDE.f	L-0a to L-1b conversion	asr.*.*		sidel1b.*.*	7/19/17
	asr2L1b SIDEcorr.f	Corrected L-0a to L-1b conversion	asr.*.*	11bcor.SIDE	sidel1b.*.*	4/5/18
	asr2L1b SIDEcorr2.f	Corrected L-0a to L-1b conversion, repeat	asr.*.*	type in station & date	sidel1b.*.*	4/6/18

<b>Experiment</b>	<b>Program <sup>1</sup></b>	<b>Description</b>	<b>Main Input Files <sup>2</sup></b>	<b>Supplementary Input Files</b>	<b>Output Files <sup>3</sup></b>	<b>Last Revision Date</b>
SWS	asr2L1b SWS.f	L-0a to L-1b conversion	asr.*.*		swsl1b.*.*	7/19/17
	asr2L1b SWS corr.f	Corrected L-0a to L-1b conversion	asr.*.*	11bcor. SWS	swsl1b.*.*	4/6/18
	asr2L1b SWS corr2.f	Corrected L-0a to L-1b conversion, repeat	asr.*.*	type in station & date	swsl1b.*.*	4/6/18

<sup>1</sup> These Fortran (\*.f) programs were provided by the data provider, Yosio Nakamura, for documentation purposes only. The programs are provided in alphabetical order on pages 3-38 of this document. The Supplementary Input Files used by these programs are listed in alphabetical order on pages 39-44.

<sup>2</sup> The Main Input files are grouped into four Level 0a (raw binary, cleaned) data collections by Apollo mission and archived at the NASA Space Science Data Coordinated Archive (NSSDCA) under these collection identifiers: PSPG-00917 (Apollo 12); PSPG-00918 (Apollo 15); PSPG-00919 (Apollo 16); and PSPG-0920 (Apollo 17). The data provider, Yosio Nakamura, determined there were no viable data in the Apollo 14 Level 0 ARCSAV files, and therefore he did not produce Level 0a products. Please note the NSSDCA renamed the files contained in the Level 0a collections to “arcsav\_ap\*\_yyyddd\_cleaned” where \* is Apollo mission number and yyyddd is the acquisition year and day.

<sup>3</sup> The Output files are grouped into eight Level 1b (raw binary, cleaned) data collections by Apollo mission and instrument and archived at the NASA Space Science Data Coordinated Archive (NSSDCA) under these collection identifiers: PSPG-00921 (Apollo 15 HFE); PSPG-00922 (Apollo 17 HFE); PSSB-00675 (Apollo 17 LEAM); PSPG-00923 (Apollo 17 LSG); PSFP-00715 (Apollo 16 LSM); PSFP-00742 (Apollo 12 SIDE/CCIG); PSFP-00743 (Apollo 15 SIDE/CCIG); and PSFP-00714 (Apollo 12 SWS). Please note the NSSDCA renamed files in the Level 1b collections to “a\*\_eeee\_yyyddd\_11\_arcsav.bin” where \* is Apollo mission number, eeee is the experiment, and yyyddd is the acquisition year and day. Level 1b data formats are described in NSSDCA document B56517, <https://nssdc.gsfc.nasa.gov/misc/documents/b56517.pdf>.

**asr2L1bHFE.f**

```
      program asr2L1bHFE
c ars.* to level 1b for HFE
c **22-Jun-17**
      character stdy*6
      integer*2 in(3200),out(7,128)
      data stdy(3:3)/'..'/
c
      write(*, "('station: '$)")
      read(*, '(a2)') stdy(1:2)
      if (stdy(1:2).eq.'15') then
         khfe=17
      else
         khfe=-7
      end if
      write(*, "('days: '$)")
      read(*,*) id1,id2
      do id=id1,id2
         write(stdy(4:6), '(i3)') id
         if (stdy(4:4).eq.' ') stdy(4:4)='0'
         open(1,file='.././cleanup/asr'//stdy(1:2)//'/asr.'//stdy
& ,access='direct',form='unformatsed',recl=6400,status='old',err=29)
         write(*,*) stdy
         open(7,file='../hfellb'//stdy(1:2)//'/s/hfellb.'//stdy
& ,access='direct',form='unformatted',recl=1792)
         nr=1
         mr=0
         mf=1
10      read(1,rec=nr,end=19) in
         do k=1,45
c check frame count first
            j0=k*48+140
            ina=in(j0+3)
            kf=or(and(rshift(ina,5),'78'x),and(rshift(ina,3),7))
            if (kf.le.15) then
c time & data sync status
                i0=k*4+4
                out(1,mf)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
                out(2,mf)=and(rshift(in(i0+2),10),'f'x)
                out(3,mf)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
                out(4,mf)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
                do j=1,4
                   if (and(in(i0+j),'8080'x).ne.0) out(2,mf)=or(out(2,mf),'4000'x)
                end do
c sync & frame count
                out(5,mf)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
                out(6,mf)=or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& kf)
                do j=1,3
                   if (and(in(j0+j),'8080'x).ne.0) out(2,mf)=or(out(2,mf),'2000'x)
                end do
```

```

c HHFE data
  k0=k*16+2332
  if (khfe.gt.0) then
    ina=in(j0+khfe)
  else
    ina=in(k0-khfe)
  end if
  out(7,mf)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
  if (and(ina,'8080'x).ne.0) then
    out(7,mf)=or(out(j+6,mf),'8000'x)
    out(2,mf)=or(out(2,mf),'1000'x)
  end if

c output
  if (mf.eq.128) then
    mr=mr+1
    write(7,rec=mr) out
    mf=1
  else
    mf=mf+1
  end if
end if
end do
nr=nr+1
go to 10
19 close(1)
  if (mf.ne.1) then
    do nf=mf,128
      do i=1,9
        out(i,nf)=0
      end do
    end do
    write(7,rec=mr+1) out
  end if
  close(7)
29 end do
stop
end

```

**asr2L1bHFEcorr.f**

```
      program asr2L1bHFEcorr
c corrected ars.* to level 1b for HFE
c **5-Apr-18**
      character stdy*6
      integer*2 in(3200),out(7,128)
      data stdy(3:3)/'..'/
c
      open(2,file='../lists/l1bcor.HFE',status='old')
100  read(2,*,end=99) is,id
      write(stdy(1:2),'(i2)') is
      if (is.eq.15) then
         khfe=17
      else
         khfe=-7
      end if
      write(stdy(4:6),'(i3)') id
      if (stdy(4:4).eq.' ') stdy(4:4)='0'
      open(1,file='../cleanup/asrcor2/asr.'//stdy
& ,access='direct',form='unformatted',recl=6400,status='old',err=29)
      write(*,*) stdy
&  open(7,file='../l1bcorrs/hfellb.'//stdy
& ,access='direct',form='unformatted',recl=1792)
      nr=1
      mr=0
      mf=1
10  read(1,rec=nr,end=19) in
      do k=1,45
c check frame count first
         j0=k*48+140
         ina=in(j0+3)
         kf=or(and(rshift(ina,5),'78'x),and(rshift(ina,3),7))
c time & data sync status
         i0=k*4+4
         out(1,mf)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
         out(2,mf)=and(rshift(in(i0+2),10),'f'x)
         out(3,mf)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
         out(4,mf)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
         do j=1,4
            if (and(in(i0+j),'8080'x).ne.0) out(2,mf)=or(out(2,mf),'4000'x)
         end do
c sync & frame count
         out(5,mf)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
         out(6,mf)=or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& kf)
         do j=1,3
            if (and(in(j0+j),'8080'x).ne.0) out(2,mf)=or(out(2,mf),'2000'x)
         end do
c HHFE data
         k0=k*16+2332
```

```

        if (khfe.gt.0) then
            ina=in(j0+khfe)
        else
            ina=in(k0-khfe)
        end if
        out(7,mf)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
        if (and(ina,'8080'x).ne.0) then
            out(7,mf)=or(out(j+6,mf),'8000'x)
            out(2,mf)=or(out(2,mf),'1000'x)
        end if
c output
        if (mf.eq.128) then
            mr=mr+1
            write(7,rec=mr) out
            mf=1
        else
            mf=mf+1
        end if
    end if
end do
nr=nr+1
go to 10
19 close(1)
    if (mf.ne.1) then
        do nf=mf,128
            do i=1,9
                out(i,nf)=0
            end do
        end do
        write(7,rec=mr+1) out
    end if
close(7)
29 go to 100
99 stop
end

```

**asr2L1bHFEcorr2.f**

```
      program asr2L1bHFEcorr2
c corrected ars.* to level 1b for HFE - repeat
c **6-Apr-18**
      character stdy*6
      integer*2 in(3200),out(7,128)
      data stdy(3:3)/'..'/
c
100  write(*, "('station day:$)")
      read(*,*) is,id
      write(stdy(1:2),'(i2)') is
      if (is.eq.15) then
         khfe=17
      else
         khfe=-7
      end if
      write(stdy(4:6),'(i3)') id
      if (stdy(4:4).eq.' ') stdy(4:4)='0'
      open(1,file='../../cleanup/asrcor2/asr.'//stdy
& ,access='direct',form='unformatted',recl=6400,status='old',err=100)
      write(*,*) stdy
      open(7,file='../../l1bcorrs/hfellb.'//stdy
& ,access='direct',form='unformatted',recl=1792)
      nr=1
      mr=0
      mf=1
10  read(1,rec=nr,end=19) in
      do k=1,45
c check frame count first
         j0=k*48+140
         ina=in(j0+3)
         kf=or(and(rshift(ina,5),'78'x),and(rshift(ina,3),7))
c time & data sync status
         i0=k*4+4
         out(1,mf)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
         out(2,mf)=and(rshift(in(i0+2),10),'f'x)
         out(3,mf)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
         out(4,mf)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
         do j=1,4
            if (and(in(i0+j),'8080'x).ne.0) out(2,mf)=or(out(2,mf),'4000'x)
         end do
c sync & frame count
         out(5,mf)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
         out(6,mf)=or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& kf)
         do j=1,3
            if (and(in(j0+j),'8080'x).ne.0) out(2,mf)=or(out(2,mf),'2000'x)
         end do
c HHFE data
         k0=k*16+2332
```

```

        if (khfe.gt.0) then
            ina=in(j0+khfe)
        else
            ina=in(k0-khfe)
        end if
        out(7,mf)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
        if (and(ina,'8080'x).ne.0) then
            out(7,mf)=or(out(j+6,mf),'8000'x)
            out(2,mf)=or(out(2,mf),'1000'x)
        end if
c output
        if (mf.eq.128) then
            mr=mr+1
            write(7,rec=mr) out
            mf=1
        else
            mf=mf+1
        end if
    end if
end do
nr=nr+1
go to 10
19 close(1)
    if (mf.ne.1) then
        do nf=mf,128
            do i=1,9
                out(i,nf)=0
            end do
        end do
        write(7,rec=mr+1) out
    end if
close(7)
stop
end

```



**asr2L1bLEAM.f**

```
      program asr2L1bLEAM
c ars.* to level 1b in binary for LEAM
c **21-Jun-17**
      character day*3
      integer*2 in(3200),out(10,45)
      integer leam(4)
      data leam/-25,2,8,9/
c
      write(*, "('days: '$)")
      read(*,*) id1,id2
      do id=id1,id2
        write(day,'(i3)') id
        if (day(1:1).eq.' ') day(1:1)='0'
        open(1,file='../cleanup/asr17/asr.17.'//day,access='direct'
& ,form='unformatted',recl=6400,status='old',err=29)
        write(*,*) day
        open(7,file='../leaml1bs/leaml1b.'//day,access='direct'
& ,form='unformatted',recl=900)
        nr=1
10      read(1,rec=nr,end=19) in
        do k=1,45
          i0=k*4+4
c time & data sync status
          out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
          out(2,k)=and(rshift(in(i0+2),10),'f'x)
          out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
          out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
          do j=1,4
            if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
          end do
          j0=k*48+140
c sync & frame count
          out(5,k)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
          out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
          do j=1,3
            if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
          end do
c HK, CV & LEAM data
          k0=k*16+2332
          do j=1,4
            if (leam(j).lt.0) then
              ina=in(j0-leam(j))
            else
              ina=in(k0+leam(j))
            end if
            out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
            if (and(ina,'8080'x).ne.0) then
              out(j+6,k)=or(out(j+6,k),'8000'x)
              out(2,k)=or(out(2,k),'1000'x)
```

```
        end if
        end do
        end do
c output
        write(7,rec=nr) out
        nr=nr+1
        go to 10
19      close(1)
        close(7)
29      end do
        stop
        end
```

**asr2L1bLEAMcorr.f**

```
      program asr2L1bLEAMcorr
c corrected ars.* to level 1b in binary for LEAM
c **5-Apr-18**
      character day*3
      integer*2 in(3200),out(10,45)
      integer leam(4)
      data leam/-25,2,8,9/
c
      open(2,file='../lists/l1bcor.LEAM',status='old')
100  read(2,*,end=99) is,id
      write(day,'(i3)') id
      if (day(1:1).eq.' ') day(1:1)='0'
      open(1,file='.././cleanup/asrcor2/asr.17.'//day,access='direct'
& ,form='unformatted',recl=6400,status='old',err=29)
      write(*,*) day
      open(7,file='../l1bcorrs/leaml1b.'//day,access='direct'
& ,form='unformatted',recl=900)
      nr=1
10  read(1,rec=nr,end=19) in
      do k=1,45
          i0=k*4+4
c time & data sync status
      out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
      out(2,k)=and(rshift(in(i0+2),10),'f'x)
      out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
      out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
      do j=1,4
          if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
          end do
      j0=k*48+140
c sync & frame count
      out(5,k)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
      out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
      do j=1,3
          if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
          end do
c HK, CV & LEAM data
      k0=k*16+2332
      do j=1,4
          if (leam(j).lt.0) then
              ina=in(j0-leam(j))
          else
              ina=in(k0+leam(j))
          end if
      out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
      if (and(ina,'8080'x).ne.0) then
          out(j+6,k)=or(out(j+6,k),'8000'x)
          out(2,k)=or(out(2,k),'1000'x)
      end if
```

```
        end do
    end do
c output
    write(7,rec=nr) out
    nr=nr+1
    go to 10
19   close(1)
    close(7)
29   go to 100
99   stop
    end
```

**asr2L1bLEAMcorr2.f**

```
program asr2L1bLEAMcorr2
c corrected ars.* to level 1b in binary for LEAM - repeat
c **6-Apr-18**
  character day*3
  integer*2 in(3200),out(10,45)
  integer leam(4)
  data leam/-25,2,8,9/
c
  write(*, "('day: '$)")
100  read(*,*) id
  write(day,'(i3)') id
  if (day(1:1).eq.' ') day(1:1)='0'
  open(1,file='.././cleanup/asrcor2/asr.17.'//day,access='direct'
& ,form='unformatted',recl=6400,status='old',err=100)
  write(*,*) day
  open(7,file='../l1bcorrs/leaml1b.'//day,access='direct'
& ,form='unformatted',recl=3960)
  nr=1
10  read(1,rec=nr,end=19) in
  do k=1,45
    i0=k*4+4
c time & data sync status
    out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
    out(2,k)=and(rshift(in(i0+2),10),'f'x)
    out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
    out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
    do j=1,4
      if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
    end do
    j0=k*48+140
c sync & frame count
    out(5,k)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
    out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
    do j=1,3
      if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
    end do
c HK, CV & LEAM data
    k0=k*16+2332
    do j=1,4
      if (leam(j).lt.0) then
        ina=in(j0-leam(j))
      else
        ina=in(k0+leam(j))
      end if
      out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
      if (and(ina,'8080'x).ne.0) then
        out(j+6,k)=or(out(j+6,k),'8000'x)
        out(2,k)=or(out(2,k),'1000'x)
      end if
    end do
  end do
end
```

```
        end do
    end do
c output
    write(7,rec=nr) out
    nr=nr+1
    go to 10
19   close(1)
    close(7)
    stop
    end
```

## asr2L1bLSG.f

```
program asr2L1bLSG
c ars.* to level 1b in binary for LSG
c **9-Jun-17**
character day*3
integer*2 in(3200),out(44,45)
integer lsg(38)
data lsg/25,-2,4,5,6,8,10,12,13,14,15,16,17,18,19,20,21,22,23,24,
& 26,27,28,29,30,31,33,35,37,38,30,40,41,-15,43,45,47,48/
c
write(*,"('days: '$)")
read(*,*) id1,id2
do id=id1,id2
write(day,'(i3)') id
if (day(1:1).eq.' ') day(1:1)='0'
open(1,file='../cleanup/asr17/asr.17.'//day,access='direct'
& ,form='unformatted',recl=6400,status='old',err=29)
write(*,*) day
open(7,file='../lsg11bs/lsg11b.'//day,access='direct'
& ,form='unformatted',recl=3960)
nr=1
10 read(1,rec=nr,end=19) in
do k=1,45
i0=k*4+4
c time & data sync status
out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
out(2,k)=and(rshift(in(i0+2),10),'f'x)
out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
do j=1,4
if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
end do
j0=k*48+140
c sync & frame count
out(5,k)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
do j=1,3
if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
end do
c HK, CV & LSG data
k0=k*16+2332
do j=1,38
if (lsg(j).gt.0) then
ina=in(j0+lsg(j))
else
ina=in(k0-lsg(j))
end if
out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
if (and(ina,'8080'x).ne.0) then
out(j+6,k)=or(out(j+6,k),'8000'x)
```

```
        out(2,k)=or(out(2,k),'1000'x)
        end if
    end do
end do
c output
    write(7,rec=nr) out
    nr=nr+1
    go to 10
19    close(1)
    close(7)
29    end do
    stop
end
```



**asr2L1bLSGcorr.f**

```
      program asr2L1bLSGcorr
c corrected ars.* to level 1b in binary for LSG
c **5-Apr-18**
      character day*3
      integer*2 in(3200),out(44,45)
      integer lsg(38)
      data lsg/25,-2,4,5,6,8,10,12,13,14,15,16,17,18,19,20,21,22,23,24,
& 26,27,28,29,30,31,33,35,37,38,30,40,41,-15,43,45,47,48/
c
      open(2,file='../lists/l1bcor.LSG',status='old')
100  read(2,*,end=99) is,id
      write(day,'(i3)') id
      if (day(1:1).eq.' ') day(1:1)='0'
      open(1,file='../cleanup/asrcor2/asr.17.'//day,access='direct'
& ,form='unformatted',recl=6400,status='old',err=29)
      write(*,*) day
      open(7,file='../l1bcorrs/lsgl1b.'//day,access='direct'
& ,form='unformatted',recl=3960)
      nr=1
10  read(1,rec=nr,end=19) in
      do k=1,45
         i0=k*4+4
c time & data sync status
         out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
         out(2,k)=and(rshift(in(i0+2),10),'f'x)
         out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
         out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
         do j=1,4
            if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
            end do
         j0=k*48+140
c sync & frame count
         out(5,k)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
         out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
         do j=1,3
            if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
            end do
c HK, CV & LSG data
         k0=k*16+2332
         do j=1,38
            if (lsg(j).gt.0) then
               ina=in(j0+lsg(j))
            else
               ina=in(k0-lsg(j))
            end if
            out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
            if (and(ina,'8080'x).ne.0) then
               out(j+6,k)=or(out(j+6,k),'8000'x)
               out(2,k)=or(out(2,k),'1000'x)
```

```
        end if
      end do
    end do
c output
    write(7,rec=nr) out
    nr=nr+1
    go to 10
19   close(1)
    close(7)
29   go to 100
99   stop
    end
```

**asr2L1bLSGcorr2.f**

```
      program asr2L1bLSGcorr2
c corrected ars.* to level 1b in binary for LSG - repeat
c **6-Apr-18**
      character day*3
      integer*2 in(3200),out(44,45)
      integer lsg(38)
      data lsg/25,-2,4,5,6,8,10,12,13,14,15,16,17,18,19,20,21,22,23,24,
&      26,27,28,29,30,31,33,35,37,38,30,40,41,-15,43,45,47,48/
c
100  write(*, "('day: '$)")
      read(*,*) id
      write(day,'(i3)') id
      if (day(1:1).eq.' ') day(1:1)='0'
      open(1,file='.././cleanup/asrcor2/asr.17.'//day,access='direct'
&      ,form='unformatted',recl=6400,status='old',err=100)
      write(*,*) day
      open(7,file='../l1bcorrs/lsgl1b.'//day,access='direct'
&      ,form='unformatted',recl=3960)
      nr=1
10  read(1,rec=nr,end=19) in
      do k=1,45
         i0=k*4+4
c time & data sync status
         out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
         out(2,k)=and(rshift(in(i0+2),10),'f'x)
         out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
&         and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
&         and(rshift(in(i0+3),4),3))
         out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
&         and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
         do j=1,4
            if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
         end do
         j0=k*48+140
c sync & frame count
         out(5,k)=or(or(and(in(j0+1),'3f00'x),
&         and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
         out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
&         and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
&         and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
         do j=1,3
            if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
         end do
c HK, CV & LSG data
         k0=k*16+2332
         do j=1,38
            if (lsg(j).gt.0) then
               ina=in(j0+lsg(j))
            else
               ina=in(k0-lsg(j))
            end if
            out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
            if (and(ina,'8080'x).ne.0) then
               out(j+6,k)=or(out(j+6,k),'8000'x)
               out(2,k)=or(out(2,k),'1000'x)
```

```
        end if
      end do
    end do
c output
    write(7,rec=nr) out
    nr=nr+1
    go to 10
19   close(1)
    close(7)
    stop
    end
```

**asr2L1bLSM.f**

```
      program asr2L1bLSM
c ars.* to level 1b in binary for LSM @16
c **29-Jun-17**
      character day*3
      integer*2 in(3200),out(15,45)
      integer lsm(9)
      data lsm/-25,-37,1,4,5,6,11,12,13/
c
      write(*, "('days: '$)")
      read(*,*) id1,id2
      do id=id1,id2
        write(day,'(i3)') id
        if (day(1:1).eq.' ') day(1:1)='0'
        open(1,file='../cleanup/asr16/asr.16.'//day,access='direct'
& ,form='unformatted',recl=6400,status='old',err=29)
        write(*,*) day
        open(7,file='../lsml1b16s/lsml1b.'//day,access='direct'
& ,form='unformatted',recl=1350)
        nr=1
10      read(1,rec=nr,end=19) in
        do k=1,45
          i0=k*4+4
c time & data sync status
          out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
          out(2,k)=and(rshift(in(i0+2),10),'f'x)
          out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
          out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
          do j=1,4
            if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
          end do
          j0=k*48+140
c sync & frame count
          out(5,k)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
          out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
          do j=1,3
            if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
          end do
c HK, CV & LSM data
          k0=k*16+2332
          do j=1,9
            if (lsm(j).lt.0) then
              ina=in(j0-lsm(j))
            else
              ina=in(k0+lsm(j))
            end if
            out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
            if (and(ina,'8080'x).ne.0) then
              out(j+6,k)=or(out(j+6,k),'8000'x)
              out(2,k)=or(out(2,k),'1000'x)
```

```
        end if
        end do
        end do
c output
        write(7,rec=nr) out
        nr=nr+1
        go to 10
19      close(1)
        close(7)
29      end do
        stop
        end
```

**asr2L1bLSMcorr.f**

```
      program asr2L1bLSMcorr
c corrected ars.* to level 1b in binary for LSM @16
c **5-Apr-18**
      character day*3
      integer*2 in(3200),out(15,45)
      integer lsm(9)
      data lsm/-25,-37,1,4,5,6,11,12,13/
c
      open(2,file='../lists/l1bcor.LEAM',status='old')
100  read(2,*,end=99) is,id
      write(day,'(i3)') id
      if (day(1:1).eq.' ') day(1:1)='0'
      open(1,file='../cleanup/asrcor2/asr.16.'//day,access='direct'
& ,form='unformatted',recl=6400,status='old',err=29)
      write(*,*) day
      open(7,file='../l1bcorrs/lsm11b.'//day,access='direct'
& ,form='unformatted',recl=1350)
      nr=1
10  read(1,rec=nr,end=19) in
      do k=1,45
          i0=k*4+4
c time & data sync status
      out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
      out(2,k)=and(rshift(in(i0+2),10),'f'x)
      out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
      out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
      do j=1,4
          if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
      end do
      j0=k*48+140
c sync & frame count
      out(5,k)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
      out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
      do j=1,3
          if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
      end do
c HK, CV & LSM data
      k0=k*16+2332
      do j=1,9
          if (lsm(j).lt.0) then
              ina=in(j0-lsm(j))
          else
              ina=in(k0+lsm(j))
          end if
          out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
          if (and(ina,'8080'x).ne.0) then
              out(j+6,k)=or(out(j+6,k),'8000'x)
              out(2,k)=or(out(2,k),'1000'x)
          end if
      end do
end if
```

```
        end do
    end do
c output
    write(7,rec=nr) out
    nr=nr+1
    go to 10
19   close(1)
    close(7)
29   go to 100
99   stop
    end
```



**asr2L1bLSMcorr2.f**

```
      program asr2L1bLSMcorr2
c corrected ars.* to level 1b in binary for LSM @16 -repeat
c **6-Apr-18**
      character day*3
      integer*2 in(3200),out(15,45)
      integer lsm(9)
      data lsm/-25,-37,1,4,5,6,11,12,13/
c
100  write(*, "('day: '$)")
      read(*,*) id
      write(day,'(i3)') id
      if (day(1:1).eq.' ') day(1:1)='0'
      open(1,file='.././cleanup/asrcor2/asr.16.'//day,access='direct'
&      ,form='unformatted',recl=6400,status='old',err=100)
      write(*,*) day
      open(7,file='.././l1bcorrs/lsm11b.'//day,access='direct'
&      ,form='unformatted',recl=3960)
      nr=1
10   read(1,rec=nr,end=19) in
      do k=1,45
          i0=k*4+4
c time & data sync status
      out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
      out(2,k)=and(rshift(in(i0+2),10),'f'x)
      out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
&      and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
&      and(rshift(in(i0+3),4),3))
      out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
&      and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
      do j=1,4
          if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
      end do
      j0=k*48+140
c sync & frame count
      out(5,k)=or(or(and(in(j0+1),'3f00'x),
&      and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
      out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
&      and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
&      and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
      do j=1,3
          if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
      end do
c HK, CV & LSM data
      k0=k*16+2332
      do j=1,9
          if (lsm(j).lt.0) then
              ina=in(j0-lsm(j))
          else
              ina=in(k0+lsm(j))
          end if
          out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
          if (and(ina,'8080'x).ne.0) then
              out(j+6,k)=or(out(j+6,k),'8000'x)
              out(2,k)=or(out(2,k),'1000'x)
          end if
      end do
end if
```

```
        end do
    end do
c output
    write(7,rec=nr) out
    nr=nr+1
    go to 10
19    close(1)
    close(7)
    stop
    end
```

**asr2L1bSIDE.f**

```
      program asr2L1bSIDE
c ars.* to level 1b in binary for SIDE @12 & 15
c **01-Jul-17**
      character st*2,day*3
      integer*2 in(3200),out(13,45)
      integer side(7)
      data side/-25,-37,3,8,10,15,16/
c
      write(*, "('station: '$)")
      read(*, '(a2)') st
      write(*, "('days: '$)")
      read(*,*) id1,id2
      do id=id1,id2
        write(day, '(i3)') id
        if (day(1:1).eq. ' ') day(1:1)='0'
        open(1,file='../cleanup/asr'//st//'/asr.'//st//'. '//day
& ,access='direct',form='unformatted',recl=6400,status='old',err=29)
        write(*,*) day
& open(7,file='../sidellb'//st//'/s/sidellb.'//st//'. '//day
& ,access='direct',form='unformatted',recl=1170)
        nr=1
10      read(1,rec=nr,end=19) in
        do k=1,45
          i0=k*4+4
c time & data sync status
          out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
          out(2,k)=and(rshift(in(i0+2),10),'f'x)
          out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
          out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
          do j=1,4
            if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
          end do
          j0=k*48+140
c sync & frame count
          out(5,k)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
          out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
          do j=1,3
            if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
          end do
c HK, CV & SIDE data
          k0=k*16+2332
          do j=1,7
            if (side(j).lt.0) then
              ina=in(j0-side(j))
            else
              ina=in(k0+side(j))
            end if
            out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
            if (and(ina,'8080'x).ne.0) then
```

```
        out(j+6,k)=or(out(j+6,k),'8000'x)
        out(2,k)=or(out(2,k),'1000'x)
    end if
end do
end do
c output
    write(7,rec=nr) out
    nr=nr+1
    go to 10
19    close(1)
    close(7)
29    end do
    stop
end
```

**asr2L1bSIDEcorr.f**

```
      program asr2L1bSIDEcorr
c corrected ars.* to level 1b in binary for SIDE @12 & 15
c **5-Apr-18**
      character stdy*6
      integer*2 in(3200),out(13,45)
      integer side(7)
      data stdy(3:3)/'. '/,side/-25,-37,3,8,10,15,16/
c
      open(2,file='../lists/l1bcor.SIDE',status='old')
100  read(2,*,end=99) is,id
      write(stdy(1:2),'(i2)') is
      write(stdy(4:6),'(i3)') id
      if (stdy(4:4).eq.' ') stdy(4:4)='0'
      open(1,file='../..../cleanup/asrcor2/asr.'//stdy
& ,access='direct',form='unformatted',recl=6400,status='old',err=100)
      write(*,*) stdy
      open(7,file='../l1bcorrs/sidel1b.'//stdy
& ,access='direct',form='unformatted',recl=1170)
      nr=1
10  read(1,rec=nr,end=19) in
      do k=1,45
         i0=k*4+4
c time & data sync status
         out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
         out(2,k)=and(rshift(in(i0+2),10),'f'x)
         out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
         out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
         do j=1,4
            if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
            end do
         j0=k*48+140
c sync & frame count
         out(5,k)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
         out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
         do j=1,3
            if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
            end do
c HK, CV & SIDE data
         k0=k*16+2332
         do j=1,7
            if (side(j).lt.0) then
               ina=in(j0-side(j))
            else
               ina=in(k0+side(j))
            end if
            out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
            if (and(ina,'8080'x).ne.0) then
               out(j+6,k)=or(out(j+6,k),'8000'x)
               out(2,k)=or(out(2,k),'1000'x)
```

```
        end if
      end do
    end do
c output
      write(7,rec=nr) out
      nr=nr+1
      go to 10
19    close(1)
      close(7)
      go to 100
99    stop
      end
```

**asr2L1bSIDEcorr2.f**

```
      program asr2L1bSIDEcorr2
c corrected ars.* to level 1b in binary for SIDE @12 & 15 - repeat
c **6-Apr-18**
      character stdy*6
      integer*2 in(3200),out(13,45)
      integer side(7)
      data stdy(3:3)/'. '/,side/-25,-37,3,8,10,15,16/
c
100  write(*, "('station day: '$)")
      read(*,*) is,id
      write(stdy(1:2),'(i2)') is
      write(stdy(4:6),'(i3)') id
      if (stdy(4:4).eq.' ') stdy(4:4)='0'
      open(1,file='.././cleanup/asrcor2/asr.'//stdy
&      ,access='direct',form='unformatted',recl=6400,status='old',err=100)
      write(*,*) stdy
      open(7,file='../l1bcorrs/sidel1b.'//stdy
&      ,access='direct',form='unformatted',recl=1170)
      nr=1
10   read(1,rec=nr,end=19) in
      do k=1,45
         i0=k*4+4
c time & data sync status
         out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
         out(2,k)=and(rshift(in(i0+2),10),'f'x)
         out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
&         and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
&         and(rshift(in(i0+3),4),3))
         out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
&         and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
         do j=1,4
            if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
            end do
         j0=k*48+140
c sync & frame count
         out(5,k)=or(or(and(in(j0+1),'3f00'x),
&         and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
         out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
&         and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
&         and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
         do j=1,3
            if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
            end do
c HK, CV & SIDE data
         k0=k*16+2332
         do j=1,7
            if (side(j).lt.0) then
               ina=in(j0-side(j))
            else
               ina=in(k0+side(j))
            end if
            out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
            if (and(ina,'8080'x).ne.0) then
               out(j+6,k)=or(out(j+6,k),'8000'x)
               out(2,k)=or(out(2,k),'1000'x)
```

```
        end if
      end do
    end do
c output
      write(7,rec=nr) out
      nr=nr+1
      go to 10
19    close(1)
      close(7)
      stop
      end
```



**asr2L1bSWS.f**

```
      program asr2L1bSWS
c ars.* to level 1b in binary for SWS @12
c **01-Jul-17**
      character day*3
      integer*2 in(3200),out(12,45)
      integer sws(6)
      data sws/-25,-37,2,7,9,14/
c
      write(*, "('days: '$)")
      read(*,*) id1,id2
      do id=id1,id2
        write(day,'(i3)') id
        if (day(1:1).eq.' ') day(1:1)='0'
        open(1,file='../cleanup/asr12/asr.12.'//day,access='direct'
& ,form='unformatted',recl=6400,status='old',err=29)
        write(*,*) day
        open(7,file='../swsl1b12s/swsl1b.'//day,access='direct'
& ,form='unformatted',recl=1080)
        nr=1
10      read(1,rec=nr,end=19) in
        do k=1,45
          i0=k*4+4
c time & data sync status
          out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
          out(2,k)=and(rshift(in(i0+2),10),'f'x)
          out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
          out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
          do j=1,4
            if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
          end do
          j0=k*48+140
c sync & frame count
          out(5,k)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
          out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
          do j=1,3
            if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
          end do
c HK, CV & SWS data
          k0=k*16+2332
          do j=1,6
            if (sws(j).lt.0) then
              ina=in(j0-sws(j))
            else
              ina=in(k0+sws(j))
            end if
            out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
            if (and(ina,'8080'x).ne.0) then
              out(j+6,k)=or(out(j+6,k),'8000'x)
              out(2,k)=or(out(2,k),'1000'x)
```

```
        end if
        end do
        end do
c output
        write(7,rec=nr) out
        nr=nr+1
        go to 10
19      close(1)
        close(7)
29      end do
        stop
        end
```

## asr2L1bSWScorr.f

```
program asr2L1bSWScorr
c corrected ars.* to level 1b in binary for SWS @12
c **5-Apr-18**
  character day*3
  integer*2 in(3200),out(12,45)
  integer sws(6)
  data sws/-25,-37,2,7,9,14/
c
  open(2,file='../lists/l1bcor.SWS',status='old')
100 read(2,*,end=99) is,id
  write(day,'(i3)') id
  if (day(1:1).eq.' ') day(1:1)='0'
  open(1,file='../cleanup/asrcor2/asr.12.'//day,access='direct'
& ,form='unformatted',recl=6400,status='old',err=29)
  write(*,*) day
  open(7,file='../l1bcorrs/swsl1b.'//day,access='direct'
& ,form='unformatted',recl=1080)
  nr=1
10 read(1,rec=nr,end=19) in
  do k=1,45
    i0=k*4+4
c time & data sync status
    out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
    out(2,k)=and(rshift(in(i0+2),10),'f'x)
    out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
    out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
    do j=1,4
      if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
    end do
    j0=k*48+140
c sync & frame count
    out(5,k)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
    out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
    do j=1,3
      if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
    end do
c HK, CV & SWS data
    k0=k*16+2332
    do j=1,6
      if (sws(j).lt.0) then
        ina=in(j0-sws(j))
      else
        ina=in(k0+sws(j))
      end if
      out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
      if (and(ina,'8080'x).ne.0) then
        out(j+6,k)=or(out(j+6,k),'8000'x)
        out(2,k)=or(out(2,k),'1000'x)
      end if
    end do
end if
end if
```

```
        end do
    end do
c output
    write(7,rec=nr) out
    nr=nr+1
    go to 10
19    close(1)
    close(7)
29    go to 100
99    stop
    end
```

## asr2L1bSWScorr2.f

```
program asr2L1bSWScorr2
c corrected ars.* to level 1b in binary for SWS @12 - repeat
c **6-Apr-18**
  character day*3
  integer*2 in(3200),out(12,45)
  integer sws(6)
  data sws/-25,-37,2,7,9,14/
c
100 write(*, "('day: '$)")
  read(*,*) id
  write(day, '(i3)') id
  if (day(1:1).eq.' ') day(1:1)='0'
  open(1,file='../cleanup/asrcor2/asr.12.'//day,access='direct'
& ,form='unformatted',recl=6400,status='old',err=100)
  write(*,*) day
  open(7,file='../l1bcorrs/swsl1b.'//day,access='direct'
& ,form='unformatted',recl=3960)
  nr=1
10 read(1,rec=nr,end=19) in
  do k=1,45
    i0=k*4+4
c time & data sync status
  out(1,k)=or(and(lshift(in(i0+1),1),'7070'x),and(in(i0+1),'707'x))
c time
  out(2,k)=and(rshift(in(i0+2),10),'f'x)
  out(3,k)=or(or(or(and(lshift(in(i0+2),6),'c000'x),
& and(lshift(in(i0+2),8),'3f00'x)),and(rshift(in(i0+3),6),'fc'x)),
& and(rshift(in(i0+3),4),3))
  out(4,k)=or(or(and(lshift(in(i0+3),12),'f000'x),
& and(rshift(in(i0+4),2),'fc0'x)),and(in(i0+4),'3f'x))
  do j=1,4
    if (and(in(i0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'4000'x)
  end do
  j0=k*48+140
c sync & frame count
  out(5,k)=or(or(and(in(j0+1),'3f00'x),
& and(lshift(in(j0+1),2),'f0'x)),and(rshift(in(j0+2),10),15))
  out(6,k)=or(or(or(or(and(lshift(in(j0+2),6),'c000'x),
& and(lshift(in(j0+2),8),'3c00'x)),and(rshift(in(j0+3),4),'300'x)),
& and(rshift(in(j0+3),5),'78'x)),and(rshift(in(j0+3),3),7))
  do j=1,3
    if (and(in(j0+j),'8080'x).ne.0) out(2,k)=or(out(2,k),'2000'x)
  end do
c HK, CV & SWS data
  k0=k*16+2332
  do j=1,6
    if (sws(j).lt.0) then
      ina=in(j0-sws(j))
    else
      ina=in(k0+sws(j))
    end if
    out(j+6,k)=or(and(rshift(ina,4),'3f0'x),and(rshift(ina,2),15))
    if (and(ina,'8080'x).ne.0) then
      out(j+6,k)=or(out(j+6,k),'8000'x)
      out(2,k)=or(out(2,k),'1000'x)
    end if
```

```
        end do
    end do
c output
    write(7,rec=nr) out
    nr=nr+1
    go to 10
19    close(1)
    close(7)
    stop
    end
```

**11bcor.HFE**

15 105  
15 117  
15 135  
17 99  
17 116  
17 131  
17 164

**11bcor.LEAM**

17 99  
17 116  
17 131  
17 164



**11bcor.LSG**

17 94  
17 99  
17 103  
17 114  
17 115  
17 116  
17 130  
17 131  
17 164

**11bcor.LSM**

16 99

16 145

**11bcor.SIDE**

12 96  
12 114  
12 135  
12 139  
12 152  
12 181  
15 105  
15 117  
15 135

**11bcor.SWS**

12 96  
12 114  
12 132  
12 135  
12 139  
12 141  
12 142  
12 143  
12 147  
12 148  
12 155  
12 181