**** TSO FOREGROUND HARDCOPY ****
DSNAME=XRPAS.MCDREQST.TEXT ($$WISH)

Basic Functions which would be useful in designing a 3081 -> work-station environment.

- A System Manager which can completely manage several different "bodies of work" at the same time.

  1) A "body of work" is all computer oriented steps which relate to fulfilling a request, whether the request has many parts, or few, (A sample request is included with this write-up.) and includes a documentation/notes capability. A "body of work" (BOW) may have very different kinds of data products, for ex. time-history plots and spectrum plots.

     The system manager should provide an "initial request date tag" for all work relating to the original request, but should also have at least one other tag field which allows work additions, deletions, and allows data from other "bodies of work" to be associated and unassociated with each other for purposes of plotting and other possible scientific study.

  2) The manager should provide a method of formulating and submitting all necessary jobs to achieve the end products. It should allow, optionally, for stop points where intermediate results can be examined.
     These points will be well defined (I think). It will be at one of these points, for ex. that a background correction will be applied, if needed. In the data pathway it should also be possible to insert other steps or pick up the data production from these stop points.

     The system manager should allow for "redoing" segments of the work. For ex. FMCD requested many LET proton spectra and , after seeing the results, decided that the response table geometry factors needed revision. After they were revised, the spectra needed to be regenerated. (This regeneration means that, effectively, if the database was fluxes already, the database would need to be remade before the spectra could be reextracted.)
     This work could be handled by calling the revised spectra generation a new BOW, and using the tag fields to associate the new data with the older BOW.)

     The following 2 segments are very important for larger BOW such as the included example (see member zcomment):

     a. If for any reason a subset of any step fails, the failures (or alternatively, the dif. between steps started and ended) should be easily discerned, and restartable.

     b. This activity includes assigning result datasets in some systematic way and correlating their use in all parts of the path toward the final products.

        Since data plots and listings are usual products,

the manager must allow for reruns of plots with varied plot program input, and for random or systematic formulation of data input for plots.

Listings of data should always be available in any of the intermediate points.

3) The manager should provide a facility whereby selected data can be saved and cataloged for future reference. The manager should also provide a way to delete a BOW in all or selected aspects of it.

4) The manager should create automatically a commentary BOW segment which shows exactly how the data products were generated, and if special steps (background, revised geometry factors, etc.) were done. The commentary should be user editable, so other relevant facts can be added, if desired. (see example attached.)

5) Ideally a BOW catalog/log, or some other facility, would be formulated with certain KEYWORDs which could be used in a menu system showing " this is what we did " and " this is how you do this function " and "this is how you reference data in this BOW (for associating) "

6) The system needs a backup facility for its logs and for the data it is managing.

**** TSO FOREGROUND HARDCOPY ****
DSNAME=XRPAS.MCDREQST.TEXT ($AWISH)

Specific functions needed: IBM 3081 segment

Two categories of work are apparent:
1) database generation ; monthly updates for live satellites must be built in.
2) PC/workstation downloads;

Details of main database sizes are: (taken from census info)

More detailed description of 1):

If the FLUXPLOT function and main databases are kept on the 3081:

- see member $lists for problems that must be addressed concerning the FLUXPLOT programs themselves, totally apart from post-FLUXPLOT processing which may be needed or modification to add CROSS type output database generation.
  - P/H V/I FLUXPLOT eccentricites should be fixed into a manager system which handles them for the user.
  ?? (can all data be accessed by FLUXPLOT output/PC format)
  - IMP times should be redated in some generalized way (primitive REDATE program only exists, for plot type datasets)
    To access other IMP rates, the RATEPLOT program is needed (see below)

- ANY databases to be downloaded to the PC/workstation should be reproducable, with all flux/rate quantity problems solved (especially, data spike elimination and bad time eliminations, or other unusual data situations such as NOV 77 time) except possibly for background subtraction and potential exclude times . A complete database of selected bins and rates will be generated. Other supplemental data can be made into a second database, or more.

  For quiet time studies, the relative quietness needed for a given type of study is energy/statistics dependent. I believe we should create a quiet time criterion such as Bob McGuire has done for IMP, perhaps 3 levels of quietness for each satellite's lifetime and use it to determine exclude times. A table of excludes is probably the most realistic solution; see member excludes where primitive lists for very quiet times exists. That table would be on the PC for application to total flux sums for spectra and quiet time time-history data generation.
  It may be best to create quiet time databases, as well as to make a complete database, transfer to PC, and then have a PC step redo fluxes after excludes are applied.
  We would need a complete database on the PC, as would have been able to handle the 90AGU work (no excludes were used for most of that work)

- data products on the 3081 would be FLUXPLOT FT33 output from

FT31,32 processing thru XTAPE of Nand; alternative data product would be PCFLUX and PCRATE (possible PCPHA) verse databases like the CROSS system databases developed by D.Reames

- An evaluation of IMP pathways is needed. Can the TIMSUM function for ex, be done on the PC - is it desirable?

- This member will assume the D.Reames -like databases are to be available on the PC/workstation.

  It will enumerate steps needed to generate data on the 3081 for FMCD requests. The System Manager concept described in member $$wish could manage these steps/programs. It could do automated FLUXPLOT submits managed in at least the way suggested in $$wish 2);

- Assuming the problems in $list have been handled in some way (system manager or code fixes) these mods still are needed:
  FLUXPLOT modifications:
  - PCFLUX and PCRATE capability exists for ISEE only
  - Modify Pioneer/Helios FLUXPLOT to make PC verses
  - Modify Voyager to create PC verses
  ?? - Modify IMP FLUXPLOT to create PC verses (if possible) (Rateplot makes PCRATE only;
  - IMP VLET work accessed thru Kristin/Henry software in progress
  - Evaluate the desirability of PCPHA databases for MED and LED data in IMP and data in P/H/V; all require software.

- Other software needed:
  - A FLUXPLOT front end which sets up cards and output dataset names; submits jobs ; it should know about all bin cards relevancies/ excludes and for ex. when to request Pioneer-10 data as 6250 versus PENC, etc.
  - IMP software which will provide a list of include times from a start & stop time and a list of excludes and/or includes from a standard setup such as 26 day averages for the spectrum option.
  - IMP software mod/(new?) to FLUXPLOT to provide correct start times for spectrum option quantities formed to make 26 day averages, etc. alligned to be compatible with other satellites.

- Other steps needed:

  - eliminate data spikes via excludes, which implies a data survey noting all spikes; these may be energy dependent. (also other peculiarities) Keep ongoing list of spike/exclude time updates

  - list of modes/bins; including MEANs if desired and notes on when bins become invalid, such as the loss of a HET PHA analyzer, etc. which can be coordinated with scientific data study requests

  - Formal trajectory parameter -> database procedures

for V1,V2,P10,P11 ; HA,HB ??
for generation on 3081 and download to PC/workstation

More detailed description of 2):

- automated downloads to PC of large or small work segments from
  - first choice : network
  - second choice : PCTRANS type function
  - third choice : tape -> workstation

  - (?) these should be referenced by a BOW tag as driver

PC software needed: see member $awishpc

****
In my opinion, if we cannot supply some kind of management
to PC applications, the effort of moving to PC does not gain
anything substantial in making our work easier.
****

PC databases:

- If PCFLUX and RATE type -

full flare LET and HET spectra bins		daily averages 6 hr averages 15 min averages
quiet time LET and HET spectra bins		daily averages 6 hr averages
quiet time galactic bins	<-	daily averages 26 day averages

particles, P,He,Ox,C

- trajectory data:

- Background corrections:

P10 30-56 Mev P : This method uses the response tables with the FLUXPLOT program. It should be more automated at the very least. FLUX System limitations will determine exactly how much easier this can become.

**** TSO FOREGROUND HARDCOPY ****
DSNAME=XRPAS.MCDREQST.TEXT ($AWISHPC)

Specific functions needed for Workstation assuming Reames type databases

PC software needed:

- Multisatellite comparison plots are the norm, whether for time-history, spectra, or other functions.
- Drafting Quality plots are the norm.
- PC databases must have merging capability on a monthly basis

****
In my opinion, if we cannot supply some kind of management to PC applications, the effort of moving to PC does not gain anything substantial in making our work easier.
****

If we do a management system:

$$wish management system which creates BOW managed data.
and carries out the rest of the functions listed there.
Databases are assumed to exist on the Workstation.
The same programs/.bat files would be used in a no management system.

If no management system: functions analagous to 3081 now

Time-history data pathways:

- a .bat system to replace the CLIST system we have now for making mass produced plots. We typically utilize over 12 positional parameters and of that order of Keyword parameters in a multi-level CLIST tree.

- 5 day moving average software rewritten for Workstation

- PL3800; all 3081 functions in it moved to PC/Workstation, preferably utilizing a run-time device driver concept, so that preliminary plots can be made on the display; and also thru .bat files mass produced to laser printer

- software to extract out of main bin databases the standard FMCD stuff we do on a monthly basis, such as the plots of 26 day averages, creating small plot files; This should allow an averaging capability for fluxes/rates and renormalization.
  - excludes

- ADD background correction facility for 30-56 Mev p
  (For p10 30-56 background, the background determination must be on the 3081, unless the response tables and flux calculation are moved to the PC. That method must be made easier on the 3081 at minimum)
- ADD background correction facility for selectable bins

Spectrum pathways:

- a .bat system to replace the CLIST system we have now for making mass produced plots. We typically utilize from 12 to 44 positional parameters and about 20 or so Keyword parameters in a multi-level CLIST tree.

- PL3810; all 3081 functions in it moved to PC/Workstation, preferably utilizing a run-time device driver concept, so that preliminary plots can be made on the display; and also thru .bat files mass produced to laser printer

- software to extract out of main bin databases the standard FMCD stuff we do on a monthly basis, such as the plots of 3-26 day averages, creating small plot files; This should allow an averaging capability for fluxes/rates and renormalization.
  - excludes

If we use a CROSS type of database and directory system:
- Replace FSUM/VERT (Don Reames spectrum pathway) spectrum generation facility if spectra are to be built from time history databases (excludes necessary)

- ADD background correction facility for 30-56 Mev p (For p10 30-56 background, the background determination must be on the 3081, unless the response tables and flux calculation are moved to the PC. That method must be made easier on the 3081 at minimum)
- ADD background correction facility for selectable bins

PC databases: Each set done for each satellite implies
P10,P11,V1,V2,IMP8,IC,Ha,Hb * 7 = 56 databases to maintain (min)

- If PCFLUX and RATE type -

complete LET and HET standard bins		15 min averages
		daily averages
		6 hr averages
quiet time LET and HET spectra bins		daily averages
		6 hr averages
quiet time galactic bins	<-	daily averages
		26 day averages

particles, P,He,Ox,C

- trajectory data:

Generate fluxes from somewhere: probable ft33 downloads from
IBM 3081
If we do not use a CROSS type of database and directory system:
?? - Replace PIOPLOT function; (does ft30 take care of hs2 bg)
- ADD background correction facility for 30-56 Mev p
" selectable bins
- Replace GETDATA function;
- create bat type file system for handling mass produced
plots
- interactive plotting should be output device run-time
specifiable.

**** TSO FOREGROUND HARDCOPY ****
DSNAME=XRPAS.MCDREQST.TEXT ($LIST)

Member to enumerate standard mcd requests

General Problems in FLUXPLOTs :

- This is noticed in voyager (implies v/i ; not sure about p/h) Sometimes wrong fluxes are generated by FLUXPLOT due to a strange circumstance. One case where i cant remember if a malfunction was the cause- Nov 77 time period where no counts were accumulating but live time was adding up incorrectly. The correct fluxes were found by excluding a segment of time .

- There is some restriction on requesting fluxes over ???? boundary. (is this status change boundaries?)

In FLUXPLOT(P/H & V/I) versions:

-there are t/f/yn / type conflicts between mode,bin and si cards; and LSIZE/npoints JCL implications, all which cause abends

-If the time-history plot flag is enabled, the ft07 time statement reflects the alligned start time, rather than the si card time

-if the energy bin request crosses MODE boundaries, a separate step after FLUXPLOT is required to obtain a flux from its two component fluxes

-Exclude times must always be used, where necessary (quiet time reqs)

-Different sets of bin cards are necessary for parts of satellite lives for v1,v2,p10 (possibly others ; the exact card input desired is not documented for the satellite lifetimes- depends on the instrument health

-Background corrections are done differently for different data and must now be done is a step subsequent to FLUXPLOT

In FLUXPLOT(P/H) versions:

-there is no MEAN facility in P/H version

-LP2 mode card for p10 must be first, if bin energy range is used

-for p10, a portion of the early data is requested by 6250 vs PENC on the S card

-pioneer/helios fluxplot ft07 output fluxes are carried over to the subsequent entry even if that bin had 0 counts

-pioneer/helios fluxplot ft07 output fluxes are sometimes an absurd number if that bin had 0 counts

-special LET analysis for pioneer is available only thru the FT06 dd card (?) (are other data also limited to FT06??)

-pioneer/helios et 2 and 3 must be added for ft07 output fluxes

for high energy protons

-pioneer-10 hs2 bg mode must be subtracted for its energy range in a separate step

-P10 30-56 p (and sub-bins if used) must be corrected for background in a separate step

In FLUXPLOT(IMP) version:

-IMP time history data must be "redated" to get summary start times compatible with other satellites. The REDATE code must be modified depending on the data input.

-IMP uses the concept of 'include' times, only; there is no 'exclude' card. 'include card' times must be refigured, taking into account excluded times, for each type of time-history average desired, or for spectra.

-Other data problems exist in IMP, such as the LED C detector element problem, which are not known by Pam (except Bob knows these)

Other common considerations :

-Sometimes data are requested to be renormalized by some factor and plotted with other data, after a fluxplot run has already been made.

-Background correction data are used when requested, and apply only to selected data- The determination of the background is not done in the same way for all data.

-the ft30 -> ft31,ft32 conversion program only works for time history data and where more than one record has been written (related to npoints i think) . (there are other bugs too)

-The primary output of MAVPLOT (5 day moving averages) is no longer used; rather the sysout dataset is used and reformatted to produce plot datasets. The reform program can only handle one input bin situations.

-Input to MAVPLOT is intimately connected to certain FLUXPLOT input.

-Also, there are character data location differences among the ft31,ft32 formats for isee,imp,voyager at least, as noticed from the past.

-FLUXTNNN does not handle rates titles properly in its output

-Trajectory information is often needed on plots, and is currently handled by two versions of a program which has hard coded numbers which are added with each special request (for time-history). For spectra, trajectory info. if used is a plot program input.

Plots and/or listings are final deliverables.
(Drafting quality)

--------alpha,proton spectra p10,p11,v1,v2,i8,(i3,ha,hb)
oxygen spectra p10,v1,v2,(p11)

Spectra may be many individual time periods, or quarterly spectra for year time ranges, multiple satellite/time comparisons;
(For the 1990 agu meeting, FMCD requested proton spectra for 78 time periods in 1989- 1990 for V1,V2,P10,P11. Later he added helium spectra.)
Kristin does 3-26 day sums which go forward in time by one 26 day period

--------26 day average time-historys p10,p11,v1,v2,i3,i8,(ha,hb)
pen rates + std a,p,o

--------5 day moving averages p10,p11 r2a+r3a
(v1,v2 low he, high he

--------hysteresis p10,v1,v2,i8 (uses same datasets as 26 day time-history plots)
Option of changing symbol for each year requires separate program;
also th format precludes p13810

--------daily averages p10,p11,v1,v2 "modified low sets"
pen rates v1,v2 (low & high gain)

--------6 hour averages v1,v2 4-9 mev electrons
v1,v2 "standard low sets"

--------radial gradients p10,v1,v2,i8,i3
--------latitudinal gradients p10,v1,v2

--------trajectory data listings p10,p11,v1,v2

**** TSO FOREGROUND HARDCOPY ****
DSNAME=XRPAS.MCDREQST.TEXT ($PATHS)

Current pathways for making standard type listings/plots -----

Fluxes/Rates are the most common data products requested.
To obtain these quantities, the FLUXPLOT programs are normally run.
Additional post-FLUXPLOT processing is frequently required, as for
example, oxygen fluxes whose energy renge crosses a MODE card
boundary, where an additional step is required to calculate the
final flux from its components. Background correction is another
example. These additional steps are most often done after a
plot dataset has been created from original FLUXPLOT output.
With the exception of IMP, the plot capabilities of
these programs are no longer used.

FLUX generation programs: FLUXPLOT + the IMP FLUXPLOT

	PROGRAM		OUTPUT DATASET FORMATS USED
1)	Pioneer/Helios	version	ft30,ft07
2)	Voyager/ISEE	version	ft30,ft3132,ft07
3)	IMP	program	ft3132

Although IMP produces ft3132, its input is completely
different from V/I/P/H input cards.

Our most heavily used plot programs require character input datasets of
very simple format, with data input by FORTRAN reads.
These programs plot data on the IBM 3800 laser printer and are called
PL3800 (time-history plots) and PL3810 (spectrum/rigidity etc. plots)

PATHS:

26-day time historys:

Versl. FLUXPLOT (ft30) -> FT303132 (ft3132) ->
FLUXTNNN (plot data set as member of PO) ->
PL3800

Vers2. FLUXPLOT (ft3132) ->
FLUXTNNN (plot data set as member of PO) ->
PL3800

IMP. FLUXPLOT (ft3132) ->
FLUXTNNN (plot data set as member of PO) ->
REDATE (plot dataset as a PS dataset) ->
PL3800
(pen rates must be renormalized before plotting)

5-day moving averages:

Versl.,2. FLUXPLOT (ft30) -> MAVPLOT (outmav) ->
REFORM (plot data set as PS dataset (REFORM very limited)
-> PL3800
(I dont remember that IMP can still make ft30; older version can)

Spectrum plots:

```
   Versl.  FLUXPLOT (ft07) -> PIOPLOT
              (plot data set as PS dataset)
                       -> PL3810

   Vers2.  FLUXPLOT (ft07) -> PIOPLOT          (hardly ever used)
              (plot data set as PS dataset)
                       -> PL3810
           FLUXPLOT (ft3132) -> GETDATA         (mostly done now)
              (plot data set as PS dataset)
                       -> PL3810


   IMP.    FLUXPLOT (ft3132) -> GETDATA
              (plot data set as PS dataset)
                       -> PL3810
```

Radial Gradients:

```
      trajectory info +
      ft07,ft3132,other -> MODUGRAD (listings output and hand plotted)
```

Latitudinal Gradients:

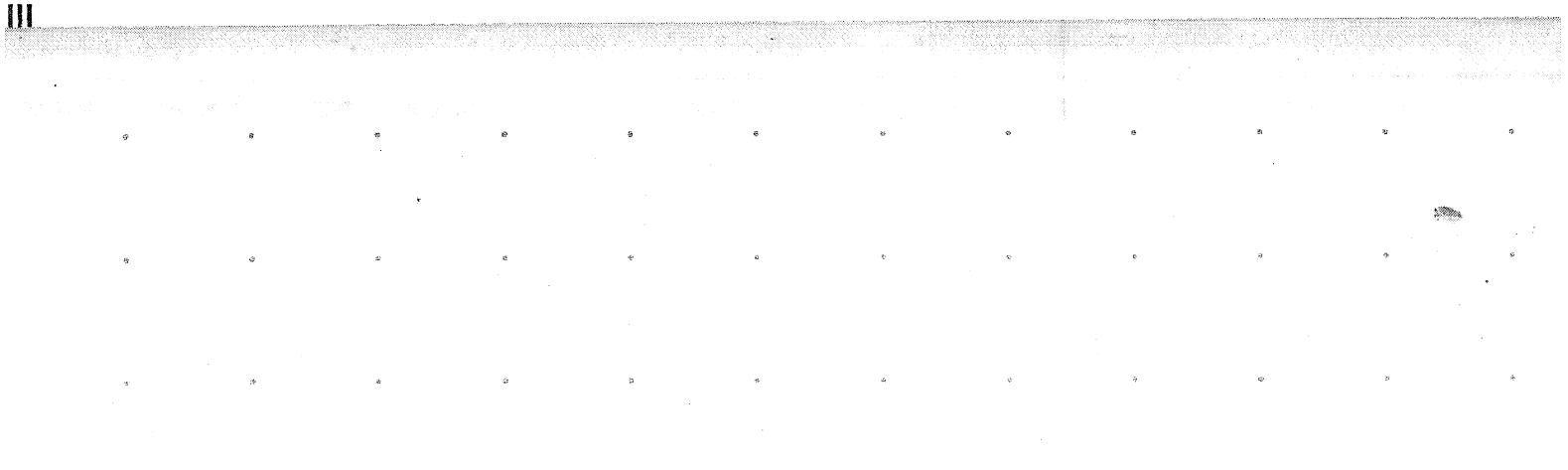
```
      radial gradient fit pl0/v2 +
      V1,V2 ft3132  +  trajectory information
                  -> ACTRGRAD  (listings output and hand plotted)
```

Trajectory data:

```
      Pioneer    CLIST traject submits a small program specifically
                 requesting certain parameters, which are listed to
                 SYSOUT or a dataset.
      Helios     Mostly complete listings exist of certain parameters,
```

```
**** TSO FOREGROUND HARDCOPY ****
DSNAME=XRPAS.MCDREQST.TEXT                              (BINS    )

   standard bincard sets for FLUXPLOT are as follows:

   For spectrum plots: helium and proton (HET only)
         Voyager-1  pre  1981 data   xrpas.mcdv1003.data(v1bins)
         Voyager-1  post 1981 data   xrpas.mcdv1003.data(v1bins82)
                                     xrpas.mcdv1003.data(v1nwbins)
                                     (current spectrum bins- 1/89)
                      oxygen         xrpas.mcdv1005.data(oxyspect)
                      oxygen         xrpas.mcdv1005.data(oxyspec)
                                     (mean HET I,II)

         Voyager-2  pre  1982 data   xrpas.mcdv1003.data(v2bins)
         Voyager-2  post 1982 data   xrpas.mcdv1003.data(v2binssp)
                                     (elim ET 6 ; 23sept86 )
                                     xrpas.mcdv1003.data(v2nwbins)
                                     (current spectrum bins- 1/89)
                      oxygen         xrpas.mcdv1005.data(oxyspect)

   For spectrum plots: helium and proton (HET and standard LET only)

      Card order matters for PIOPLOT for pioneer and helios
         Pioneer-10 pre  mid 1973 data  (none- but use LS3 and 6250)
         Pioneer-10 post mid 1988    sb#pr.fluxplot.data(pfbins)
                    post mid 1973    xrpas.mcdpf001.data(allpf)
                      oxygen         xrpas.mcdpf001.data(oxyspect)
         Pioneer-11                  xrpas.mcdpf001.data(allpg1)
                      oxygen         xrpas.mcdpg001.data(oxyspect)

         Helios-A                    xrpas.lib.cntl(specab2)
         Helios-B                    xrpas.lib.cntl(specab2)
         ISEE-3                      xrpas.mcdic003.data(allicmc)

   For spectrum plots: helium and proton (MED and LED only)

         IMP-8                       xrpas.mcdi8001.data(specboxs)


   For standard 26 day average datasets:
         Voyager-1  pre  1981 data   sb#vg.lib.data(  ?     )
         Voyager-1  post 1981        sb#vg.lib.data(mcd26v19)
                         oxygen      xrpas.mcdoxy01.data($$jclv1)
                         (multistep job adding 2 modes)
         Voyager-2  pre  1982        sb#vg.lib.data(  ?     )
         Voyager-2  post 1982        sb#vg.lib.data(mcd26v29)
                         oxygen      xrpas.mcdoxy01.data($$jclv2)
                         (multistep job adding 2 modes)
         Pioneer-10 pre  mid 1973    sb#pr.lib.data(sp26bins) +6250
         Pioneer-10 post mid 1973    sb#pr.lib.data(sp26bina) +penc
                         oxygen      xrpas.mcdoxy01.data($$jclpf)
         Pioneer-11                 cant find yet
         Helios-A                     sb#hl.lib.data(sp26bins)
         Helios-B                       (never done yet by pam)
         IMP-8                        xrpas.mcdi8026.data($thbins3)
         ISEE-3                       sb#ic.lib.data(ic26davg)
```

```
  For other standard time-history bin requests:
       see  sb#vg.lib.plot($monflx1)  ($monflx2)
 (May end 1990 - john has broken my whole jobs down into their
            component parts as mcgovern did ! so the above is no
            longer current. )
            sb#pr.lib.clist(list26dy) pl0,l1
            sb#pr.lib.clist(loadr2a) pl0

    2/22/89 FMCD WANTS THIS ADDED TO MONTHLY PLOTS:
    -  PIONEER-10   FLUXPLOT JOBS AND CREATION OF PLOT DATASETS          :
                      SB#PR.LIB.DATA($P10LOW)  STAB SUBMIT
                    PLOTS ARE MADE BY EXECUTING:
                      xrpas.mcdplt03.data($pfglow)   example


   For other time-history bin requests:

/* LATE 1989 ADDITIONAL  PLOTS WHICH FMCD HAS BEEN REQUESTING
/*
    -  PIONEER-10   5 DAY MOVING AVGS, R2A+R3A  (FLUXPLOT BY KRISTIN)
                    PLOTS ARE MADE BY EXECUTING:
                      SB#PR.PLOT.DATA($$RPLOT)
    -  PIONEER-11   5 DAY MOVING AVGS, R2A+R3A  (FLUXPLOT BY KR          ISTIN)
                    PLOTS ARE MADE BY EXECUTING:
                      SB#PR.PLOT.DATA($$RGPLT)

  MODIFIED 'LOW' ENERGY REQUESTS:

    -  VOYAGER-1    FLUXPLOT AND PLOT JOBS COMBINED :
                SB#VG.LIB.PLOT($ZSPV189)  STAB SUBMIT
    -  VOYAGER-2    FLUXPLOT AND PLOT JOBS COMBINED :
                    SB#VG.LIB.PLOT($ZSPV289)  STAB SUBMIT

    -  PIONEER-10   FLUXPLOT JOBS AND CREATION OF PLOT DATASETS          :
                     SB#PR.LIB.DATA($ZSPPF89)  STAB SUBMIT
                     PLOTS ARE MADE BY EXECUTING:
                     SB#PR.PLOT.DATA($$TPLOT)

    -  PIONEER-11   FLUXPLOT JOBS THROUGH PLOTS:
                      SB#PR.LIB.DATA($ZSPPG89)  STAB SUBMIT


    -  PIONEER-11   FLUXPLOT JOBS AND CREATION OF PLOT DATASETS          :
                      SB#PR.LIB.DATA($P11LOW)  STAB SUBMIT
                     PLOTS ARE MADE BY EXECUTING:
                      xrpas.mcdplt03.data($pfglow)   example

    -  Voyager-1,-2    sb#vg.lib2.plot($monflx1)  ($monflx2)
                     PLOTS ARE MADE BY EXECUTING:
                      xrpas.mcdplt03.data($pfglow)   example

  ------------------------------------------------------------        ********
  ------------------------------------------------------------        ********


    For standard radial gradients
```



```
        Voyager-1  pre  1981
                     gradient (rad) xrpas.mcdv1003.data(gradbins) orig.
        Voyager-1  post 1981
                     gradient (rad) xrpas.mcdv1003.data(gradv1sp)
                                    (calcs after 1982; HET I prob.)

        Voyager-2  pre  1982
                     gradient (rad) xrpas.mcdv1003.data(gradbins) orig.
                                    (calcs prior to 23sept86 )
        Voyager-2  post 1982
                       oxygen (rad) xrpas.mcdoxy01.data(vbins)
                     gradient (rad) xrpas.mcdv1003.data(gradv2sp)
                                    (elim ET 6 ; 23sept86 )
        Pioneer-10 pre  mid 1973
        Pioneer-10 post mid 1973
                     gradient       xrpas.mcdpf001.data(gradbins)
                     gradient       xrpas.mcdpg001.data(oxygrads)
        Pioneer-11
                     gradient       xrpas.mcdpg001.data(gradbins)
                     gradient       xrpas.mcdpg001.data(oxygrads)
        IMP-8
                     gradient       xrpas.mcdi8001.data($i87778g)
                                    (example of bins)
        ISEE-3
                     gradient       xrpas.mcdic003.data(gradbins)

 For standard latitudinal gradients
        Voyager-1  pre  1981
        Voyager-1  post 1981
                     gradient (lat) xrpas.mcdv1005.data(v1spgrad)
        Voyager-2  pre  1982
        Voyager-2  post 1982
                     gradient (lat) xrpas.mcdv1005.data(v2spgrad)
```

For the gradient work, bin card order and number must be consistent for other needed software to work properly.

**** TSO FOREGROUND HARDCOPY ****
DSNAME=XRPAS.MCDREQST.TEXT (CATEGORY)

Categories of data for a DBASE4 type system:

****
****

A REQUEST form 'catalog' of requests, for use in pulling out
data from this database for standard and/or specialized plotting
and listing. The DBASE4 language interface should be able to add
to and read this section of the database management system

****
****
Spectral data, standard detailed energy spectral bins of FMCD

!!!
IBM3081 FLUXPLOT bincard definitions:
Particle proton and helium
+ FLUXPLOT bincard location(s) yy/mm/dd to yy/mm/dd validity; pd 1
+ FLUXPLOT bincard location(s) yy/mm/dd to yy/mm/dd validity; pd 2
.
.
+ FLUXPLOT bincard location(s) yy/mm/dd to yy/mm/dd validity; pd n
Particle oxygen
+ FLUXPLOT bincard location(s) yy/mm/dd to yy/mm/dd validity; pd 1
+ FLUXPLOT bincard location(s) yy/mm/dd to yy/mm/dd validity; pd 2
.
.
+ FLUXPLOT bincard location(s) yy/mm/dd to yy/mm/dd validity; pd n
Particle carbon
+ FLUXPLOT bincard location(s) yy/mm/dd to yy/mm/dd validity; pd 1
+ FLUXPLOT bincard location(s) yy/mm/dd to yy/mm/dd validity; pd 2
.
.
+ FLUXPLOT bincard location(s) yy/mm/dd to yy/mm/dd validity; pd n

!!!
Data categories of compiled spectra:

Quiet time spectra
* quarterly spectra by year and quarter (91 day averages)
- proton and helium together, stopping and penetrating data
- oxygen A and B stopping low gain data
- carbon A and B stopping low gain data
- proton stopping data only (may include VLET data)
- helium stopping data only (may include VLET data)
- VLET spectra only
* general spectra by start time yy/mm/dd to stop time yy/mm/dd
- same subcategories as immediately above

Flare activity spectra
* varying short average samples
- proton and helium together, stopping and penetrating data
- oxygen A and B stopping low gain data
- carbon A and B stopping low gain data

- proton stopping data only (may include VLET data)
- helium stopping data only (may include VLET data)
- VLET spectra only

* general spectra by start time yy/mm/dd to stop time yy/mm/dd
- same subcategories as immediately above

****
****
Time History data, standard energy bins of FMCD

!!!
IBM3081 FLUXPLOT bincard definitions:

!!!
Data categories of compiled time histories:

Quiet time TH data (fluxes and/or rates may be mixed)
* 1 day averages of selected 'monthly' bins (H, HE, OX)

* 26 day averages of standard galactic bins (H, HE, OX)

* 91 day averages of standard galactic bins (H, HE, OX)

* 5 day moving avgs,selected 'monthly' bins (H, HE, OX)

* 6 hour averages of selected 'monthly' bins (H, HE, OX)

****
****
Gradient data, standard energy bins of FMCD

!!!
IBM3081 FLUXPLOT bincard definitions:

!!!
Data categories for gradients:

Quiet time radial gradient flux files for point yy/mm
* includes trajectory information

Quiet time latitudinal gradient flux files for point yy/mm
(method used actual radial gradients of p10/v2)
* includes trajectory information

Quiet time latitudinal gradient flux files for point yy/mm
(method used a fit of radial gradients of p10/v2)
* includes trajectory information

Quiet time radial gradient flux values, running averages for
yy/mm to yy/mm as nn day averages

* includes trajectory information

Quiet time latitudinal gradient flux values, running averages for
yy/mm to yy/mm as nn day averages

* includes trajectory information

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Hysteresis data, standard energy bins of FMCD

!!
IBM3081 FLUXPLOT bincard definitions:

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Trajectory data, standard information of FMCD

!!
IBM3081 FLUXPLOT bincard definitions:

```
**** TSO FOREGROUND HARDCOPY ****
DSNAME=XRPAS.MCDREQST.TEXT                          (EXCLUDES)

This member lists exclude time locations, or for the case in IMP, the
FLUXPLOT include times.

Voyager-1          xrpas.mcdoxy01.data(v1ox26,26a,.......)
                   sb#vg.lib.data(badtime1) bad time segment
                   sb#vg.lib.data(mcd26v19) current year
Voyager-2          xrpas.mcdoxy01.data(v2ox26,.....
                   sb#vg.lib.data(badtime2) bad time segment
                   sb#vg.lib.data(mcd26v29) current year
Pioneer-10                  "          (pfox26,......
ISEE-3             xrpas.mcd26day.data($icexcl)  used to generate
                        initial 26 day averages
Helios-1           xrpas.mcd26day.data($hlexcl)        "
                            "
IMP-8              xrpas.mcdi8026.data($gcrl) parikh gcr times
                            "        ($thb... members ; 1977- mid 89
                                       include card lists for 26
                                       day averages, s run option
                         other times from bob havent been typed in yet
```

```
**** TSO FOREGROUND HARDCOPY ****
DSNAME=XRPAS.MCDREQST.TEXT                                  (ZCOMMENT)

EXAMPLE OF DOCUMENTING MEMBER FOR A BOW.

THIS WORK GENERATED:
   236 V1,V2 FLUXPLOT JOBS -> 472 FT31,32 OUTPUT DATASETS
                              236 FT07 DATASETS
    77 PF,PG FLUXPLOT JOBS ->  56 FT07 OUTPUT DATASETS AND
                               21 FT06 OUTPUT DATASETS
   GETDATA2 STEP  V1,V2    -> 236 OUTPUT PLOT FORMAT DATASETS
   PIOPLOT2 STEP  PF,PG    ->  56 OUTPUT PLOT FORMAT DATASETS
   PF,PG FT06-> PLOT SEG.  ->  21 PLOT SEGMENT DATASETS
   PF,PG BACKGROUND CORR.  ->  21 BACKGROUND CORRECTED SEGMENT DATASETS
   DOYMRG 'COLLECT/EDIT'   ->  21 FINAL PLOT DATASETS , PF,PG (SUBSET)

 APPROXIMATE STORAGE REQUIREMENT FOR DATASETS:

    FT31,32               ABOUT 10-20 RECORDS OF 132 BYTES MAX  *236
   (FT07 DATASET V1,V2    120 LINES * 137 BYTES/LINE (MAX)      *236)
    FT07 DATASET PF,PG     60 LINES * 137 BYTES/LINE (MAX)      *56
    FT06                   10 LINES * 137   "        (MAX)      *21
    PLOT RELATED           20 LINES * 80  BYTES/LINE (MAX)      *355

    TOTAL STORAGE = 623040 +(3,879,840)+ 460320 + 287700 + 568000
                  IS 1.8 MBYTES (5.5 MBYTES) (ACTUALLY LESS BECAUSE
                  FT07 & FT06 ARE VBA NORMALLY; PERHAPS 2/3 OF 1.8)

THE LARGE NUMBER OF DIFFERENT DATASET NAMES REQUIRED ARISES BECAUSE
THE INITIAL REQUEST WAS ADDED TO AS TIME WENT ON, AND REVISIONS/ AND
BACKGROUND CORRECTIONS, FOR EX. WERE NEEDED; ALSO FMCD WANTED TO SEE
INDIVIDUAL LET DATA AND MEAN OF LET DATA PLOTTED WITH DIFFERENT
SYMBOLS FOR STUDY PURPOSES.


------------------ XRPAS.MCD90AGU.DATA -------------------------------

THIS MEMBER ATTEMPTS TO DOCUMENT WORK DONE IN PREP.  FOR THE 1990
AGU MEETING FOR DR. MCDONALD

TRAJECTORY DATA FOR POSTER TITLES WAS MADE USING MCDPLT02.DATA
MEMBER DISTNSP  AND RDISTNSP. THIS VERSION WRITES 3 MONTH TRAJ. DATA
USING THE ARRAY POSITIONS AS DEFINED BY THE SOURCE.

THIS DATASET WAS USED IN CONJUNCTION WITH MEMBERS IN DATASET  XRPAS.
LIB.CLIST WHICH WERE TRANSFERRED TO MCD90AGU AFTERWORDS. ALSO USED:
XRPAS.MCDPLT03.DATA  AS FOLLOWS:

 $$MULTYR        |                                                        00000020
 $$PLOTAP        |                                                        00000030
 $$PLTKAP        |                                                        00000040
 $$PL38D4        | - >  MAIN CLISTS FOR SUBMITTING PL3810 AND PL3800      00000050
 $$SPC38A        |      PLOT JOBS                                         00000090
 $$SPC38B        |      PLOT JOBS                                         00000090
 $$SPECAP        |                                                        00000100
 $$SPEC38        |                                                        00000110
 $$SPEKAP        |                                                        00000120
 $NOBOX                                                                   00000150
 $PLOTDOY      |                                                          00000170
```

```
$PLOTDO2      | - >  SEE DOYSPC4 MEMBER WHICH UTILIZES THESE            00000180
$PLOTDO3      |      PLOT THE SPECTRA                                   00000190
$PLOTDO4      |                                                        00000200
$PLOTLA2      |                                                        00000200
$303132      TRY TO GET SPECTRA THRU FT30 FAILED -> MERGEP             00000300
$90EL                                                                  00000330
$90MAY31                                                               00000340
$90MA31A                                                               00000350
$90TH                                                                  00000360
BCKCORSP       BACKGROUND CORRECTION PROGRAM                           00000370
BCKPF1         |                                                       00000380
BCKPF2         | - >   BACKGROUND CORRECTIONS PF, PG                   00000390
BCKPG1         |                                                       00000400
BCKPG2         |                                                       00000410
CARDIN                                                                 00000420
DOYBINPF    |                                                          00000440
DOYBINPG    |                                                          00000450
DOYBINS1    |                                                          00000460
DOYBINS2    |                                                          00000470
DOYBIN2A    |  -  >    FLUXPLOT BIN CARDS                             00000480
DOYBNPFA    |                                                          00000490
DOYBNPFB    |                                                          00000500
DOYBNPGA    |                                                          00000510
DOYBNPGB    |                                                          00000520
DOYBNV2A    |                                                          00000520
DOYBNV2C    |                                                          00000520
DOYBNV2D    |                                                          00000520
DOYDATA                                                                00000530
DOYDATA1                                                               00000540
DOYDATA2                                                               00000550
DOYDATE     CONVERT DOY REQUESTS TO DATE REQUESTS FOR FLUXPLOT SI CARDS 00000560
DOYDUMMY                                                               00000570
DOYDUMM1                                                               00000580
MERGEP         REFORMAT FLUXPLOT FT06 INTO PLOT DATASET FORMAT         00000590
MODLTIME    |                                                          00000610
MODLTIMP    | - >  MODEL EXEC AND TIME CARD INPUT FOR CLIST DRIVERS    00000620
MODLTIPP    |      (METHOD ASSUMES NO SE CARD INPUT)                   00000630
```

STAGE 1 WORK WAS DEFINITION OF ABOUT 30 V2 (ABOUT 2 V1) TIMES THRU 1989- 1990 EOD.
THE CLIST FLUXPLOT SUBMIT METHODOLOGY AND GETDATA/ PL3810 CLIST METHODOLOGY WAS DEVELOPED FOR THESE TIMES.

STAGE 2 WORK WAS DEFINED BY FMCD FOR ABOUT 25 PF,PG TIMES AND ABOUT THAT MANY V2,V1 TIMES . SEE MEMBER DOYDRIVE FOR THE SPECIFIC TIMES USED. AFTER THE INITIAL ¬45 TIMES WERE RUN, FMCD WANTED THE SAME SPECIAL LET ANALYSIS DONE WHICH WAS USED FOR THE PIONEER ENCOUNTER PERIODS. HE PROVIDED A LISTING OF THE FLUXPLOT INPUT CARDS. THE OUTPUT DID NOT COME ONTO FT07, AND NAND WROTE THE MERGEP PROGRAM TO TRANSFORM FT06 OUTPUT INTO PLOT TYPE DATASET FORMAT, SO IT COULD BE INCLUDED VIA CLIST INTO THE EXISTING PLOT DATASETS.
THE PF,PG FLUXPLOT RUNS WERE DONE AGAIN SPECIFYING FT06 AS A DATASET. THEN THE MERGEP PROGRAM WAS RUN. THEN THE CLIST DOYMRG WAS RUN TO MERGE THE LET ANALYSIS INTO THE EXISTING PROTON SPECTRA DATASETS.

AT THE LAST MINUTE, FMCD DECIDED THAT A BACKGROUND CORRECTION TO THE LET ANALYSIS DATA NEEDED TO BE DONE. THE CORRECTION FACTORS FOR THE 4 ENERGY BINS WERE DETERMINED BY 4 QUIET TIME PERIODS. SEE ABOVE FOR MEMBER NAMES WHERE THESE CORRECTIONS

ARE WRITTEN. THE FT06 REFORMED DATASETS WERE INPUT, ALONG WITH THE BACKGROUND CORRECTIONS TO A SMALL CORRECTION PROGRAM, AND THE Z6N DATASETS WERE THE CORRECTED DATA. THEN THE DOYMRG STEP WAS RERUN , AFTER RENAMING THE ORIGINAL U DATASETS TO V DATASETS.

A LOOSELEAF PAPER RECORD OF REQUESTS EXISTS IN THE FMCD NOTEBOOK FOR THIS TIME. JOHN AND KRISTIN DID CERTAIN OTHER OF HIS TIMEHISTORY AND FULL SPECTRA REQUESTS.

THE NORMAL SEQUENCE OF CLIST EXECUTION WAS:

DOYDRIVE	SUBMIT THE VARIOUS FLUXPLOT JOBS
DOYGET	TRANSFORM FLUXPLOT OUTPUT TO PLOT DATASETS
DOYSPEC6	TRANSFORM FT06 OUTPUT TO PLOT DATASET FORMAT
(DOYBCKSP)	BACKGROUND CORRECT FT06 OUTPUT PLOT DATASETS
DOYMRG	MERGE FT06 DATA SETS WITH ORIGINAL PLOT DATASETS
DOYSPC4	MAKE THE VARIOUS PLOTS REQUESTED

DATASETS WERE SYSTEMATICALLY NAMED ACCORDING TO THE DATE AND DOY SPECIFICATION FOR FLUXPLOT RUNS AS FOLLOWS:

&DSN = V1,V2,PF,PG		
&DSN&DOY.T	PF,PG	FT07 FLUXPLOT OUTPUT = PIOPLOT2 INPUT
O&DSN&DOY	PF,PG	PIOPLOT2 OUTPUT
P&DSN&DOY	PF,PG	EDITING PIOPLOT2 OUTPUT AS REQUESTED/NEEDED IN TITLE CARDS, OR DATA
&DSN&DOY.Z	PF,PG	ORIGINAL FT06 DATASETS
&DSN&DOY.Z6	PF,PG	REFORMATTED FT06 DATASETS (MERGEP OUTPUT)
&DSN&DOY.Z6N	PF,PG	BACKGROUND CORRECTED Z6 DATASETS
U&DSN&DOY	PF,PG	FINAL PLOT DATASETS
(V&DSN&DOY	PF,PG	PLOT DATASETS BEFORE BACKGROUND CORRECTIONS)
&DSN&DOY.A	V1,V2	FT31,FT32 FLUXPLOT OUTPUT DATASETS
&DSN&DOY.AA		"
O&DSN&DOY	V1,V2	GETDATA2 OUTPUT
P&DSN&DOY	V1,V2	FINAL PLOT DATASETS
LA&DSN&DOY	V1,V2	FT31,FT32 FLUXPLOT OUTPUT DATASETS
LA&DSN&DOY.A		LA,LC,LD, LM FOR LET DATA
OLA&DSN&DOY	V1,V2	GETDATA2 OUTPUT , ETC LET DATA
PLA&DSN&DOY	V1,V2	FINAL PLOT DATASETS , ETC LET DATA

EACH OF THESE DATASETS SHOULD BE COPIED AS A MEMBER OF LIKE NAME INTO THE MCD90AGU.DATA DATASET.

ABOUT AUG 1, 1990 FMCD WANTED TO REVISE THE RESPONSE TABLE GEOMETRY FACTORS FOR THE VOYAGER LETS. THIS WAS DONE, AND NEW FLUX RUNS WERE MADE. THE WORK IS DOCUMENTED IN DOYDRIVE AS DOYDRA2L, DOYGET AS DOYGEA2L,DOYGEB2L AND IN DOYSPC4 AS $PLOTLAN. THE DATASETS CREATED FOR PLOTTING WERE:

LX&DSN&DOY	V1,V2	FT31,FT32 FLUXPLOT OUTPUT DATASETS
LX&DSN&DOY.A		LA,LC,LD, LM FOR LET DATA ETC AS LX
		| | | |
		LW,LY,LZ, LV FOR LET DATA
OLX&DSN&DOY	V1,V2	GETDATA2 OUTPUT , ETC LET DATA
PLX&DSN&DOY	V1,V2	FINAL PLOT DATASETS , ETC LET DATA +HET
QLX&DSN&DOY	V1,V2	FINAL PLOT DATASETS , ETC LET DATA ONLY

THE NEXT PHASE OF THIS WORK INVOLVED GENERATING HELIUM SPECTRA
ANALAGOUS TO THE PROTON SPECTRA. P10,11,V1,V2 SPECTRA WERE MADE:

```
   &DSN.A&DOY1     V1,V2  FLUXPLOT OUTPUT FT31,32 DATA
   &DSN.A&DOY1.A
   O&DSN.A&DOY1    V1,V2  GETDATA2 OUTPUT
   P&DSN.A&DOY1    V1,V2  FINAL HET HELIUM DATA


   LET DATA NAMED SYSTEMATICALLY AS ABOVE FOR PROTON LET : &DET
     EXCEPT THAT THE LETTER W IS FIRST, EX WL FOR LW = LA
                                          XL,YL,ZL,VL
   &DET&DSN&DOY1   V1,V2  FLUXPLOT OUTPUT FT31,32 DATA
   &DET&DSN&DOY1.A
   O&DET&DSN&DOY1 V1,V2  GETDATA2 OUTPUT
   Q&DET&DSN&DOY1 V1,V2  FINAL LET HELIUM DATA

   &DSN.A&DOY1.T   P10,11 FLUXPLOT FT07 OUTPUT
   P&DSN.A&DOY1           FINAL HELIUM DATA
```

FOR THE HELIUM WORK, CLISTS HAVE NOT BEEN ENUMERATED YET. 9/10/90
OR TRANSFERRED TO MCD90AGU.DATA