

# YOHKOH TOHBAN DUTIES MANUAL

Alphonse Sterling

21 August 1999

## 1 Introduction

This manual is for Yohkoh Tohban duties at ISAS. It contains both an overview of the daily, weekly, and monthly tohban duties in the “Overview of the Tohban Week” section, and a more detailed description for many of the operations in later sections. Experienced tohbans may want to just use the Overview to remind them of the duties to be done, while first- or second-timers may want to read through some of the other chapters. Some of the longer commonly-used workstation-related procedures are only outlined in the main text, with full sample sessions reserved for the Appendices.

In compiling this manual, many parts were taken from the original English manual (Sterling, Bentley, Lemen, and Pike, ver. 3 Oct. 1992), which we call **Manual\_1**. (By the way, the original version of that manual was largely made from J-side material. See manual\_1 for references to them and their English translations.) We also have used material from the Japanese manual by Ichimoto san which the J-side now currently uses. Jim Lemen has also directly contributed to many portions of this manual.

Many of the original tohban duties are now done by Seko san of NEC (for example, making the AOSLOSGD plot), and by the OP\_FIRST\_GUESS software. (Seko san replaced Katano san—who was with Yohkoh for five years—in September 1996.) The procedures for those operations are not included in this manual. If needed, many of those procedures are in manual\_1, and the various documents translated from Japanese and bound in the “Yohkoh Tohban Documents & Translations” folder in B-toh.

All tohban manuals go out of date very quickly. Also, the current version will certainly need to be improved in several places. Please help us to develop new up-to-date versions of this one by doing the following:

1. Write in by hand updates and corrections directly into the manual. Be sure to include date of entry and your name with the note.

Also, please do not hesitate to suggest contributions and improvements to this manual's form and/or content. We hope that this manual helps your tohban week to be trouble free (or, more realistically, trouble reduced). Your input is vital for making future tohban weeks smooth and easy.

This document (ssoc\_tohban\_manual\_asYYMMDD.tex) is stored in /ys/gen/doc, and is written in L<sup>A</sup>T<sub>E</sub>X.

History:

Version1: 1-Jul-1993  
Revised : 12-Nov-1993  
Revised : 4-Feb-1994  
Revised : 1-Aug-1994  
Revised : 1-May-1995  
Revised : 16-Oct-1995  
Revised : 12-Feb-1996  
Revised : 16-Sep-1996  
Revised : 11-Feb-1997  
Revised : 15-May-1997  
Revised : 17-Nov-1997  
Revised : 4-Sep-1998  
Revised : 1-Feb-1999  
Revised : 21-Aug-1999

## Contents

## 2 Overview of the Tohban Week

### 2.1 Daily Duties

**Check DSN File Status and Generate OP for the day.** Work from the `~yohkoh/wallops` account on the flare22 workstation. Check DSN files by FTPing to Wallops, ftp 128.154.46.34 (username “isas”, get the password, “xxxxxx,” from the previous week’s Tohban). Do “cd out” and “dir \*w###” to be sure you have the most recent version of the `7dayss.w###` final schedule. Read the README file in the `yohkoh/wallops` directory on the flare machine for more info. Corrections and updates to that file should be reported to Hugh Hudson.

**Check Calibrations and Table Uploads.** You need to know if some special operations are going to occur before filling out the pass sheets or finalizing the OP. If an instrument group wants to do something special they will contact you. But you should be alert at the Monday meeting for probable plans. Expect a few SXT table uploads each week, and BCS calibrations every two to three weeks. See Section ?? for more details.

**Prepare Pass Sheets.** Most of the daily routine work of preparing these is done by J. Lemen’s `OP_FIRST_GUESS` code. The sheets are printed out when the prototype OP is generated. There may still some additions that have to be made by hand though. See Section ?? for a list of items to be on the lookout for. Sakao-san has a Japanese-language manual on the details of filling out pass sheets.

**Transmission of OP to KSC.** See Section ??.

Don’t forget to send the OP to KSC!!

**Check and Save Flare1 yohkoh-account Mail.** Two or three times a day you should check mail on the yohkoh account on flare1. Many standard messages—and sometimes critical messages—to the tohbans from, e.g., KSC, the SXT Chief Observer, and DSN are sent there. Save important messages in flare1 yohkoh account file `/yohkoh/mail_99/mail_99_w###`, where `w###` is the week number. To do this, while in mail, input `& s NN ~yohkoh/mail_99/mail_99_w###`, where NN is the number of the mail message. The first time this is done the file `/yohkoh/mail/mail_99_w###` will be created. When this is done when the file already exists, the new messages will be appended to the end of the file. Do not put the daily Yohkoh KSC Operation Report in this file, though. It goes in its own directory. To file it, while in mail, input `& s NN ~yohkoh/ops.rep/1999/99_w###`, where again `w###` is the week number and NN is the number of the mail message of the operations report.

**Record Incoming/Outgoing DSN FAXes in DSN Communication Log Book.** Record each FAX (and relevant EMAIL) in the DSN Logbook. File each in the DSN folder for the appropriate week number. Playback data reports from DSN go in the file of the week they are received, i.e., the current week’s folder, which is not necessarily the file corresponding to the week the data were dumped. Similarly, FAX forms for data retransmission requests go in the current week’s folder also.

**Update Pass Schedule on Whiteboard.** Refer to the Pass Sheets for the information.

## 2.2 Additional Duties for Specific Days of the Week

Note that these are GENERAL GUIDELINES. Some days or weeks will have extra duties, or duties in a different order than presented here.

### 2.2.1 Monday

**Attend Operations Meeting.** Specifically note the Hikitsugi items and the plans for the week.

**Verify the STT Timer set time.** This is usually done on Tuesday (which means you may have to put it into the OP you make today), but the day can vary from week-to-week. See Section ??.

**Prep DSN Logbook and Files.** Look on the tohban desk for the log book. Start a new set of pages for the current week. In the numbering system, “I” stands for incoming and “O” means outgoing FAXes (or EMAIL). Cycle the numbers on the DSN files (four binders on the tohban desk labeled “DSN FILE” and having week numbers attached) so that the file for the previous week becomes the file for the current week+3. Store the contents of that file in the “DSN Old Files” folder, which should be lurking somewhere around the tohban desk or Seko san’s desk.

### 2.2.2 Tuesday

**Check STT Timer Tracking.** Do this by running the IDL stt\_plot routine (Section ??).

**Delete and Condense FACOM Files.** Use the PFD 3.1 FACOM command to delete and condense the unneeded members of the files SR0001.OPSEQ.INFILE. See Section ??.

**Take out garbage.** Besides the stt check and the two tidying-up items, no additional (i.e., non-daily) operations duties can be done until the orbital elements arrive.

### 2.2.3 Wednesday

**Verify arrival of New Orbital Elements and perform associated duties.** The elements usually arrive on Wednesday evening. Around that time (or you may try earlier) check for them and do the following Wednesday evening or Thursday morning (Section ??):

- Verify arrival of elements (Section ??).
- Log elements in the mainframe (Section ??).
- Generate AOSLOS printout for the next 10 days (Section ??).

## 2.2.4 Thursday

**Think about how you are going to do the weekend OPs.** The method you choose may influence the OP you create today. See Section ??.

### Next week's Week Visible Diagram.

- After it arrives via FAX from KSC (usually Wednesday evening) make a copy and make an initial guess at usable passes for the week, ignoring conflicts with other satellites for the moment. See Section ?? for guidelines.
- Meet with ASUKA, HARUKA, AKEBONO, and Planet-B team members to work out who will get which of the conflicting KSC passes. The meeting is run by the ASUKA persons, who are Nagase san (X8351, A-toh room 1611) (try him first), or Ishida san (X8135). Generally the meeting is held on Thursday at 13:30 in the room in front of Nagase-san's room on the sixth floor of A-toh. It may be held on a different day if, e.g., Thursday is a national holiday.
- Mark final pass selections on diagram. Make sure that five passes are clearly allocated for each day, even if the the first one or two passes are not used. Then, (a) FAX the sheet to KSC, (b) Fax (or carry) it to D-toh, (c) give two copies to Shuuto san (upstairs in room 2301, opposite operations room) (d) and give a copy to the ASUKA group (in the room next door).

**Next week's DSN Final Schedule via FTP to Wallops.** May not arrive until Friday; check last week's arrival time to get an idea of arrival time. Mark the DSN contacts on the color AOSLOSGD plots. FAX the final schedule to KSC.

If the final schedule is not satisfactory, then make requests for pass cancelations using CANCEL\_DSN, and send them by email and FTP if there is time to check the request by FTP to wallops before the scheduled downlink, or by FAX to the DSN scheduler and Real-Time ops, along with a telephone call to the Ops chief (Section ??). See Section ?? for more details. Requests for additional passes should be sent via FAX. Be alert to update any additions/cancelations (after confirmation) on AOSLOSGD (color) and notify KSC. See Section ??.

You may want to keep a copy of the latest final schedule and next week's Week Visible Diagram near the flare22 workstation for future reference.

## 2.2.5 Friday

**Get Preliminary and Strawman schedules from Wallops via FTP.** "Preliminary" means the week-after-next (NNW), and "Strawman" means the week after that (NNNW). Either or both of these may arrive on either Friday OR Saturday (check arrival times of previous week's to get an idea). Mark NNW and NNNW DSN passes on black & white AOSLOSGD plots. Use CANCEL\_DSN to modify if needed. Consider requesting pass additions to the Preliminary schedule if coverage is sparse. FTP and EMAIL cancelation or addition requests to Wallops. (Section ??.)

**ASUKA DSN Conflicts Meeting.** Held with Paul Hilton (or Ishida san). Seko san generally represents Yohkoh, but you will have to go if she is away! See Appendix ?? for information on the meeting. Section ?? gives information on your actions before and after the meeting [but first contact Paul to get the latest word on what preparations you must do; (x8136, email: paul@astro.isas.ac.jp)].

If for some reason the strawman scheduling cannot be done on Friday (e.g., one of the key scheduling persons is ill), be sure to alert Wallops of the delay by email (“mail wallops” on the flare22 yohkoh account). Suggested text: “Due to unforeseen circumstances, the Yohkoh strawman cancelation for week N will not be available until MMM DD,” where MMM and DD are the month and day.

### 2.2.6 Saturday

**Create DSN Check Sheet.** Do this after checking to see that you have the latest version of the final schedule from Wallops. See Section ??.

**Finish leftover business.** For example, are all the DSN FAXes logged in the log book?

**Write report for the Monday morning Operations Meeting.** See Section ??.

**Corrections and Updates to this document.** Mark changes/updates in the manual. Changes to the corresponding Tohban checksheet should also be noted in the corresponding section of this manual. Please add the date of entry and your name to the note.

**Tidy Up Yohkoh Account.** Delete all personal files that have accumulated in the yohkoh directories on flare22 and flare1. You can get a list of them by doing, e.g.,  
“flare22% ls -lt | more”

### 2.2.7 Sunday

**Day off.** But the holiday could be canceled for emergencies and/or special operations.

### 2.2.8 Monday

**Deliver Tohban Report at Operations Meeting.**

**Circulate Tohban Report via EMAIL and Save in File.** See Section ??.

**Assist new Tohbans in getting started on their week.** Remember, you now know better than anyone else what the current tohban procedures are!

## 2.3 Monthly Duties (FACOM Password Update)

**Reset the password on all the Tohban accounts.** Do this on the first of the month. This should be the *first thing* you do at the start of the month. Some of the software you will use depends on having the correct password for the month.

To make the change, login to each SSOC account in turn (three of them in all: S88239, S80670, and S80671) and when asked for the password, enter OLD\_password/NEW\_password. The old password will be SOLARnn where nn = last month's number (01 for January, 11 for November, etc.) and the new password will have the number suffix incremented by one (except in January!). You will be asked to confirm the new password.

## 2.4 Sporadic

**FACOM Startup** You may sometimes find that the mainframe FACOM computer is not responsive. This very possibly may be due to the system being down (as sometimes happens on Saturdays, Sundays, and national holidays). Contact "someone in the know" (if you don't know who this might include, first try asking someone nearby who has substantial tohban experience) if this is the case. Sometimes it may be necessary to kill a FACOM process that gets stuck. See Section ??.

### 3 OP Generation and Checks

The OP is a list of instructions which tell the spacecraft what and when to do specified operations over a set period of time. For example, before entering radiation belts Yohkoh should turn off the high voltage supplies on instrument detectors. Yohkoh also has to know when DSN contacts will begin so that it can dump data at the proper time, etc. These instruction lists must be prepared in the form of an OP each day in response to the operations required over the next 24 hours. In order to construct the list, information such as the final schedule of DSN stations to be used (which may be revised daily), plans for special instrument observations, etc., are vital. Here we describe the SSOC tohban's duties for obtaining that information, constructing the OP, and doing the very important checks of the OP before it is sent up to the spacecraft. This section contains an outline of how to run the various codes, parameters to input, etc, in the OP. If needed, the appendix contains sample sessions.

#### 3.1 Checking DSN Files with FTP

Each day you have to check to see if DSN has made any changes to their coverage plan for the day of the OP you are about to work on.

To check the file transfers, logon to the tohban workstation (flare22) with the yohkoh account (e.g., flare22). Then do:

```
flare22% cd ~/yohkoh/wallops <CR>
flare22% ftp 128.154.46.34 <CR>
flare22% isas <CR>
flare22% xxxxxx <CR>
flare22% ftp> cd out <CR>
flare22% ftp> dir *w###* <CR>
```

If there is a new file, then do:

```
flare22% ftp> get 7dayss.w### <CR>
(or flare22% ftp> get 7dayss.w###.# <CR>, if there is a version number)
```

To quit FTP,

```
flare22% ftp> quit <CR>
```

To process the file:

```
flare22% idl <CR>
flare22% IDL> fmt_wallops,'7dayss.w###' <CR>
(or IDL> fmt_wallops,'7dayss.w###.#' <CR>, if there is a version number)
```

The file types that you will see in the wallops FTP out directory are 7dayss.w###, forecast.w###, and strawman.w###, which contain information on, respectively, the current week's schedule, the next week's schedule, and the following week's schedule (see Section ??). **(If these files have been updated beyond the initial version, a version number will be attached, e.g., 7dayss.w05.1 or 7dayss.w05.2 instead of 7dayss.w05 – in that case, the files listed in this paragraph should be referred to by the extensions .w###.# instead of**

.w###) These files contain DSN scheduling information for several satellites. For creating the daily OP you only need the Yohkoh information. For the current week, that information is stripped out of the 7dayss.w### file and put into a file named solass.w###. Later in the week (Thursday and Friday), you will similarly run fnt\_wallops on the forecast.w### to make a solarsf.w### file. You will not run fnt\_wallops on the strawman.w### file, however. The solass.w### file is used in the OP-making software, op\_first\_guess to be discussed below in Section ???. The strawman file is used as is by Seko san in planning operations for two weeks hence (see Section ??). In summary:

- 7dayss.w### (or 7dayss.w###.#) —> solass.w###  
This is the final schedule
- forecast.w### (or forecast.w###.#) —> solarsf.w###  
is the preliminary schedule
- strawman.w###  
is the strawman schedule

Anytime a change to one of the DSN files occurs, FTP the new file over to the wallops directory, and run fnt\_wallops (except on the strawman). Print out the schedule via, e.g.,  
flare22% **lpr solass.w###**

and file the output files solass.w### and change\_file.w### in the DSN folder for the current week.

Just because a new schedule for the current week appears in the FTP area, it does not mean that there have been changes to the Yohkoh schedule (the change could have been to any one of many satellites being tracked by DSN). If there is a new schedule, you should:

- Check to see if the pass schedule is any different from the previous schedule you received. If there are differences, you may have to modify the current and/or next day's OP appropriately based on the new DSN schedule.
- FAX the new final schedule to the KSC tohbans (but only if there are changes from the previous schedule).
- File the output files solass.w### and change\_file.w### in the DSN folder for the current week.

Hugh Hudson has summarized the DSN procedures in the ~yohkoh/wallops/README file on the flare machines. Please notify Hugh Hudson san of updates or changes necessary for that file.

## 3.2 OP Generation with OP\_FIRST\_GUESS

You make the first draft of the OP on the workstation using the idl code, op\_first\_guess, by Jim Lemen san. At the end of this process you will transfer it to the FACOM, print it out, check it, and modify it on the FACOM if necessary. Here we present an outline of the procedure for making the first draft. Your responses are in **bold**, and comments are preceded by a semicolon. Appendix ?? contains a sample session, and the document “OP\_FIRST\_GUESS Reports” in the Figures Section of this manual binder contains more details on the code.

The standard tohban workstation is flare22. You should do all op-creation work from the wallops directory of the yohkoh account.

```
flare22% cd ~yohkoh/wallops
flare22% idl          ;can run from other machines also if they have a high enough
                    ;version of IDL (not Flare 1).
```

```
IDL> .run op_first_guess
```

- \* Enter index of the desired file <CR>  
;orbital elements file – default generally ok.
- \* Enter output filename path <CR>  
;default again.

```
Start Time:27-jul-1994 14:00 ;UT time (not JST!!) a few minutes before first pass
End Time: 28-jul-1994 18:30 ; UT time just after end of 2nd pass on next
                          ;day. If the second pass is canceled due to
                          ;conflicts with other satellites this should be
                          ;the 3rd pass. Anyway two passes are
                          ;needed on the next day. Weekends are
                          ;handled differently. see Section ?? .
```

```
; DSN passes will be listed
```

- \* Enter doy, time, (or <CR> to quit): <CR>
- \* Enter <CR> if finished entering DSN contacts:

```
;generally respond with <CR>. Cross check with DSN
;schedule plan. Respond as requested if changes are needed.
```

- \* Eliminate KSC contacts for a certain time period?  
;Generally **no**, except for Sunday. See Section ?? . But careful!!  
;This is for passes skipped because of holidays,  
;not for passes which have been given to other satellites (see  
;the second \* below for that).

- \* Change any standard op\_first\_guess options?  
;generally **n**. Answering yes will allow you  
;to alter the SAA medium rate switches, the BDR optimization,

;or the number of allowed SXT terminators. You should only  
;fool with these if you are told to do so (or know what you're  
;doing!).

- \* Do you want to eliminate any contacts?  
;yes, for example, if some passes are to go to another satellite. Otherwise, no.

;Next is some information about terminators:  
Number of terminators before rule 5 = 4 \*\*\*  
Number of terminators before rule 6 = 4 \*\*\*  
Number of terminators before rule 7 = 1 \*\*\*  
Terminator: 15-MAY-97 05:28:12 Downlink: 15-MAY-97 17:14:20 U

;And here are the output files:  
\* Write ascii output file? <CR>  
\* Write hex output file? <CR>  
\* FTP the .hex to the mainframe? <CR>  
;this last step sends the OP to the FACOM.  
**;If this last step fails,**  
;it will say:  
;"Requested action not taken:specified MEMBER already exists"  
;meaning a file with the same filename already exists on the  
;FACOM. In that case, first delete the old file on the FACOM  
;using PFD 3.1, (see Section ??) and then retry sending the  
;file from the workstation via:  
;op\_facom\_ftp,"\$DIR\_GEN\_ORBIT/opog/opymmddp.hex"

IDL> exit  
flare22%

The OP and the relevant command sheets are printed out on the flare1 printer. The OP is stored in the workstation in the directory

~yohkoh/opog/

and it is stored in the FACOM in the file  
sr0001.opseq.infile(*opymmddp*)

where *ymmdd* are for the year (e.g., 8 for 1998, 9 for 1999), month, and day, and *p* is a hex number representing the pass number of the first pass. Look for the value of *p* (1-f) on the op printed out on the flare1 printer.

### 3.3 Loading, Editing, and Printing the OP

After the OP is generated and sent to the mainframe computer, you must load the OP into the OP editor, where it can be edited and printed out. Then you check it, and re-edit it if necessary. Finally, you send it down to KSC via computer transfer and FAX. Those steps are outlined in this Section.

Login to the tohban account on the Mainframe computer (this is the GS8400 computer). You can either do this by sitting at the mainframe terminal in the tohban room (ask someone if you don't know which it is), or you can do it remotely from a workstation—see Section ?? for details. After logging in, at the login prompt enter

**HERE ENTER** the following two lines

**LOGON TSS S88239**  
**SOLARmm**

;This is the password, where mm is the two  
digit number of the month; 07 for July, 11  
for November, etc.

NOTE: It is the duty of the tohban to change  
the password of all the tohban related accounts  
on the mainframes at the start of a new month.  
For the procedure for doing this, see  
Section ??

READY

**HERE ENTER** the following three lines:

**EX OP(OPOGEDT)<ENT>**

;Initiates Kosugi's OP, OG edit program  
If this command is not recognized, try typing  
PROF PRE(S88239), and then reentering the command

**2<ENT>**

;Selects the OP editor

**PF4**

;Press PF4. This alters the file names of OPs made  
on previous days (1 -> 2, 2 -> 3, etc.), and opens  
up slot 1. If you only need to edit the last file  
saved, enter '0' here.

SELECT NO. =>

**HERE ENTER "8"**

8. OP\_FIRST\_GUESS MEMBER NAME =>

**HERE ENTER "opymmdd#",** where ymmdd are 30620 for 20 Jun 93,  
and # is a hex number. The full name is on the printout from  
op\_first\_guess for the full name

;At this point the OP will appear. Next

**HERE ENTER <ENT>**

;and the slots for the times for  
;the various commands will appear.  
;Check that there are no time  
;conflicts by pressing pf1/pf2 to  
;move the left-hand side of the  
;screen down/up. If one or more  
;of the time slots are filled with

```

;hashes (#####), it means
;that there is some timing mis-match.
;The point is that the op editor
;only logs times in quantized
;intervals of 32 seconds, but
;the op_first_guess does not have
;this restriction. In any case, the
;simple remedy is to overwrite the
;hashes with blanks and subtract 1 from
;the INVL number of the instruction
;immediately preceding the line with
;the hashes. Then press the ENTER key
;again.
; To insert lines, go to the line
;before the insert location. Move cursor
;to column marked "c" in header, type
;"i", and press ENTER.
;To delete a line, type "d" in the first
;column (marked C in header) on the line to
;be deleted, and press ENTER.

```

After all the hashes are removed, the next steps are to save and print out the OP list:

**HERE ENTER the following lines:**

```

PF5           ;This saves the OP --- VERY IMPORTANT
PF4           ;This is to generate the OP print file. All text
              ;will be red if you are on the graphics terminal,
              ;and it will be green on the G-150 terminal.
              ;Keep hitting ENTER until the normal editor screen
              ;returns.

PF3
PF3
5
<ENT>         ;exit the editor.
READY

```

Now you can print out the OP from the workstation. From flare22, just do

IDL> **print\_op**

This wonderful code is from Sakurai san.

---

**(In case print\_op fails.** If the above print out procedure on the workstation fails for some reason, continue on with the old method as follows:

**LOGON TSS S88239**

PASSWORD

XXXXXX

```

;Have to exit once and logon again before printing out

```

READY

OUT S88239(Tnnnn) NEW(D)

;Tnnnn should appear on the screen when you log in.

;This step actually spools out the printout.

Collect the printout from the printer on the second floor. Ask someone how to access the printer the first time.)

### 3.4 Checking the OP

These are general steps to follow:

- Make a copy of the OP onto a single A4 page. If the printout is on two pages, attach the second page to the bottom of the first and use size reduction on the copier.
- Using the AOSLOSGD color plot, verify line-by-line of the OP that all command times are generally correct (within about 30 seconds), including DAY OGs and SAA passage times. The set of rules used by OP\_FIRST\_GUESS should appear with the OP printout.
- Verify that all requested KSC and DSN passes are included in the OP.
- DSN REP requires 12 time intervals during DAY, and 13 time intervals during night (one time interval is 32 seconds).
- Use the AOSLOS printout to verify antennas used, antenna switch times, and elevation. The maximum elevation must be greater than or equal to  $7.0^\circ$  for the DSN passes. The AOSLOS printout is generated by the tohbans each week on Wednesday or so, after the new orbital elements arrive (Section ??). At the start of your tohban week, the printout from the previous week's tohbans should be somewhere on the tohban desk. Wallops passes are collected at the last part of the AOSLOS printout, after the information for the other three DSN stations.
- Unless you supersede the standard `op_first_guess` routines, QT M and QT H commands will appear at various places throughout the OP. These selections are based on BDR (Yohkoh's on board recorder) usage optimization algorithms drawn up by Yoshida san and implemented by Lemen san. They cannot be checked very easily, and unless something obviously peculiar turns up, it is best to just trust the `op_first_guess` selections. Two things to check, though, are:
  - KSC contacts (but not necessarily DSN contacts!) *must* start with the BDR in QT H (high) mode in the OP
  - When the amount of daylight until the next contact (DSN or KSC) is greater than about 130 minutes the BDR mode should be QT M for most of the time.

See the documents by James Lemen san and Figure 12 in the Figures Section of this manual for more details on BDR optimization in `op_first_guess`.

- First-time SSOC tohbans should seek assistance when checking their first few OPs.
- Make any corrections using the OPOGEDT editor (Section ??).
- If some instrument group has special operations to be added to the OP (e.g., BCS source calibrations), make the modifications at this time using the OPOGEDT editor. Generally, it is the instrument group's responsibility to notify you if they are planning something.
- After completing all modifications, printout the OP again and recheck it. It is a good idea to have your fellow SSOC tohban check it also. KSC will check it later too, but it will mean extra work for you (and maybe a late night) if they find errors that you missed!
- Make a final copy of the OP after verifying that it is correct.

### 3.5 Transmitting the OP to KSC

The OP (and OG table) must be transmitted from the ISAS mainframe to the KSC computer. To do this, again use the opogedt editor (Your inputs in bold):

```
READY
ex op(opogedt)
2
0 ;then press ENTER to get last edited file
PF6 ;start the transmission process
1 ;the twenty most recent files,
;and their "storage compartment"
;numbers will be displayed. Note the number of the
;most recently sent file. By revising file, you store
;the new OP in the next number (or in 01 if the most
;recent is 20). Remember that number (we call it "nn").
;after hitting ENTER until a menu screen returns, enter
ENTER OP/OG FILE NO. ==> nn
;where nn is the number above. Hit ENTER.
PASSWORD: #####
;and hit ENTER
;get password from previous tohban. DO NOT ENTER ANYTHING
;ON THE LINE ASKING ABOUT CHANGING THE PASSWORD!!!!

;this writes the new OP into the nn storage slot.
2 ;Initiate the actual transfer to KSC
;Hit <CR> once to mover to the correct line.
ENTER FIRST FILE NO. ==> nn
;the same storage file number.
ENTER LAST FILE NO. ==> nn
;same. Hit ENTER.
PASSWORD: #####
;and hit ENTER
;password is same as above. Again, DO NOT ENTER ANYTHING
;ON THE LINE ASKING ABOUT CHANGING THE PASSWORD!!!!

;this sends the OP and OG to KSC. The new OP name
;should appear with a "sent" next to it.
PF3, PF3, 5 ;get out of the editor.
READY
```

Note down the time of file transmission on the OP sheet. If, for some reason, the transmission fails to reach KSC (they should let you know if this is the case), this transmission time will be needed to track down the reason for the problem.

### 3.6 Delete and Condense Mainframe Files

At least once each week (probably on Tuesday), you should clean out OP-related files on the FACOM that are no longer being used, and condense those that you don't want to throw away yet. These files are all in the SR0001.OPSEQ.INFILE directory, and the full file specification is SR0001.OPSEQ.INFILE(opymmddp), where ymmddp is as described in Section ?? .

1. Type PFD 3.1 termlang(e) at the FACOM READY prompt.
2. Input SR0001, OPSEQ, and INFILE as shown in Figure 9b, and press ENTER.
3. A list of file member names (what FACOM calls filenames) will appear. You want to delete those OP files that are no longer of use. For example, you do not need those for OPs that have already been uploaded to the spacecraft. To get rid of the ones you don't want, press the carriage-return key (big key with a bent arrow on it, above the enter key) until reaching the line of the first file to be deleted. There, input "d". Make sure you do not change the column you are in, or else you may lock-up the terminal. (If that happens, press the reset key in the lower-left portion of the keyboard, and then use arrow keys to get to correct column. Ask someone if you need help.) You can then press the carriage-return key again until you get to the line of the next unneeded file. Put a "d" there too. Repeat until all the unneeded files have a "d" next to them. Then press ENTER. All the marked files will be deleted.
4. Do PF3 once to return to previous page
5. Condense the remaining files by pressing PF12 to jump to the command line—See Figure 9b. Input a "c" there. Press enter. That should complete the procedure. Press the PF3 key several times until you return to the FACOM READY prompt.

## 4 Calibrations and SXT Table Uploads

Some calibrations and SXT table uploads are routine operations, generally being done every day or week or so, while others are special operations requested by specific instrument groups. In the latter case, you must learn from the individuals requesting the operations what has to be done. Here we discuss SXT table uploads, terminator offpoints, and BCS calibrations.

### 4.1 SXT Table Uploads

The SXT group uploads tables—usually every day—to instruct SXT to perform a specific set of observations. Usually the person in charge will be the week’s SXT Chief Observer. The Chief Observer should have a good idea at the time of the Monday meeting what tables will be loaded during the week. Generally, when table upload requests come in, the SSOC tohban has two duties:

1. Add the table upload instructions to the pass sheets to be sent to KSC (Section ??). Look back at recent uploads for examples, and also to see if there is any special custom in vogue at the current time.
2. Data sheets regarding the table will be FAXed to KSC and to B-toh by the SXT Chief Observer. Check that the table name is the same as that you used in the command sheet. File the table data sheets with the command sheet for the day (and pass) of the upload.
3. If you notice, or receive notification of, a problem with the table upload or an inconsistency with the table upload setup, contact the SXT Chief Observer ASAP.

### 4.2 BCS Calibrations

BCS calibrations are performed once every two or three weeks, and are requested by the week’s BTP (which you may think stands for something like “Better Than Perfectly-fine-individuals, but actually just means “BCS Tohban Person”). Currently, the BTP will be Alphonse Sterling, Josef Khan, or Tetsuya Watanabe. Bob Bentley can also be contacted in emergencies if he is in Japan at the time. Contact one of these persons should you have some difficulties. (Bob Bentley can be contacted in cases of real emergencies with BCS whether or not he is in Japan. But don’t call him up in England if you’re just having trouble inputting a CAL, for example! If you are really having trouble loading the CAL and no BTP is available, cancel the CAL for that day.) There are two types of standard BCS calibrations, Stim Cals and Source Cals. The SSOC tohban’s responsibilities in each case are:

- Stim Cals: (Done in real-time during KSC passes.) Add appropriate commands to the pass sheets. The procedure differs somewhat between night and day passes. The BTP should discuss with you the selection of the pass to be used, give you a detailed request sheet for the cal (showing what commands are to be added to the pass sheets), and give you the date of a past stim cal so that you can see an example of how to write up the pass sheets.

- Source Cals: (Done in the OP.) You have to add the appropriate commands to the OP. The BTP will give you a detailed request sheet showing the commands to be added and showing the start time of the operation, and will give you the date of a previous source cal so that you can see an example of how the OP should look. At the bottom of the OP request sheet that the BTP gives you will be written a set of conditions the CAL setup must fulfill, e.g., it should start and be completed during night, be well away from SAAs (the number of minutes is written on the request sheet), etc. In selecting the cal start time, the BTP should have checked that all the conditions have been fulfilled. But check again by comparing the start time on the request sheet, the AOSLOSGD plots, and the conditions listed on the request sheet. (This check should not take more than about two minutes.)
- Be sure to notify one of the above BTPs if there is some problem, mis-operation, or general question.

## 5 Preparing Pass Sheets

Much of the pass sheet preparation is done by the OP\_FIRST\_GUESS program, but several commands still have to be added by hand, including the following:

- OP STOP, OPSTART, and the OP name.
- Antenna switches  
(B to A or A to B)
- Antenna rotation During Zenith Passes  
Done when the maximum elevation is 80° or higher (if close to 80°, use the elevation given on the weekly visible diagram rather than that generated on the Command Sheets by op\_first\_guess).
- BCS Stim Cal See Section ??
- SXT Table Uploads See Section ??
- The commands RST BAD BANK and DP DC EXEC are now added routinely to the Command Sheets just prior to the end of the pass. The purpose is to try to recover a part of the on-board memory on the satellite lost due to a glitch in January 98 (during pass number 980106-0411).

And be on the lookout for the following confusing cases (among many others....)

- Passes when antenna changes occur shortly after AOS; OP\_FIRST\_GUESS may select AOS with the first antenna, but if there is not enough time to do anything else before it is necessary to do an antenna change, you might as well just start the pass using the second antenna. Be sure that the antenna at AOS times match on the pass sheets and in the OP.
- Passes when the antenna change is about 2 minutes into the pass, so that AOS must be done with the first antenna, but TMX REP could be started after the antenna switch.
- There is a tricky situation when there is a night to day change during a pass with an OP write. In such passes, the OP is stopped near the beginning of the pass, so the DAY OG (ROG 37 Hex, <55 Dec>) must be entered on the pass sheet as a real-time OG (provided that DAY OG is to occur prior to the OP START time). A sample pass sheet is shown in Figure 11 in the Figures section of this manual.
- Be sure that the KSC-AOS Night or Day on the Command Sheet agrees with the OG for that time in the OP. There can sometimes be a tricky situation with the timing of KSC AOS and the DAY OG, where there is an KSC-AOS NIGHT one step before the DAY OG; in such a case, normally the order of the two commands can simply be interchanged, and the KSC-AOS NIGHT command switched to KSC-AOS DAY.
- Etc. (I can't list them all, plus there are certainly several cases I'm not familiar with.)

In order to see how to do the actual preparations, it is probably best to look at recent past examples. Details of many of the commands and their meaning are given the Japanese-language manual by Sakao san.

Beginners will have to have their work checked by a more experienced person. In particular, if you think you might have one of the above “confusing cases,” and the above explanations are not clear, please have someone show you—these points can be difficult to explain in a manual.

## 6 Data Transmission from DSN

We receive data transmissions from DSN on a regular basis. Virtually all of the logging and handling of these data are now done for us by Seko san, but the tohbans do have some minor responsibilities. These include preparing the sheet Seko san uses to log the incoming data, and filing reports of the data transmissions sent by FAX from DSN for Seko san's use.

### 6.1 DSN Check Sheet

You must generate the check sheets. This contains a listing of the DSN passes for the new week, which Seko san uses to check the arrival of the data dumps in Sagamihara. This duty is done on Saturday because hopefully by then the final schedule for the next week is close to that which will actually be used (i.e., any cancellations by you or DSN will hopefully have been taken care of by then).

To generate the sheet, (after you have obtained the latest version of next week's final schedule has come in), just do the following:

```
flare22% idl  
IDL> dsn_check,##
```

where ## is the week number. You will be asked if you want a printout of the sheet on the flare1 laser printer. Take the default, i.e., YES.

```
IDL> exit
```

Leave the sheet on Seko san's desk so that she can find it on Monday.

### 6.2 Post-Pass Transmission Reports

DSN typically sends us several "post-pass transmission reports" by FAX each week, giving information on what data sets were sent when, etc. Figure 3 (back of the manual) gives an example of one of these. These reports arrive from DSN sporadically throughout the week. Your job is to simply log the sheet's arrival in the DSN log book, giving the sheet an appropriate number, write that number on the top of the sheet, and file it in the DSN folder. Seko san will take care of the rest.

## 7 Checking for and Updating the New Orbital Elements

### 7.1 Verify Arrival of Elements in the SIRIUS Data Base

The Yohkoh orbital elements are automatically loaded into the SIRIUS data base when they are received from NASDA. They normally arrive Wednesday afternoon/evening. To check the epoch of the latest elements proceed as follows:

1. Login to S88239
2. Type the command SRS INF
3. select option 1 (Satellite and planet data)
4. select option 5 (Solar-A, Yohkoh)
5. select option 21 (orbital elements data)
6. You should now see a list of available orbital element sets, together with their epochs. *Before preparing the weekly plots and listings, ensure that the start date of the epoch of the latest elements is no earlier than the previous weekend.*
7. Press PF3 three times until you get to the main (red) menu. Then input 'x' and press ENTER to return to the READY prompt.

### 7.2 Updating Mainframe Orbital Elements File

This section describes how to submit a job which will update the FACOM file S88239.ORBIT.DATA with the new orbital elements.

While logged onto the tohban account on the mainframe, do the following:

1. At the READY prompt, type

```
PFD 2
```

(or PFD 2 TERMLANG(E) for english display).

2. Input

```
PROJECT ==> S88239  
LIBRARY ==> SA  
TYPE ==> CNTL  
MEMBER ==> ELEMENT
```

Then press ENTER.

3. Then the FACOM editor page will be displayed. At the command line, type SUB as follows:

```
COMMAND ==> SUB
```

and press enter.

4. Press PF3 three times and you return to the READY prompt.

## 7.3 Check Orbital Elements Transmission

Each week the orbital elements are supposed to be E-mailed out to JPL, the flare1 yohkoh account, and others, from isass0 automatically. After verifying the arrival of the elements, check to see that this message was actually sent out by verifying that the message has arrived on the flare1 yohkoh account; it may take one hour or so for the message to arrive on flare1. If so, then you can assume that the message also got through to JPL (unless someone tells you otherwise!) and your check is completed.

- If the Above Check Fails...

If the mail message seems to have failed for some reason, then you must printout the new orbital elements and FAX them to JPL (with a coversheet explaining that you do not think the E-mail system worked). For this unusual case, this is the procedure to follow. To print out the elements, log onto the S88239 account and do the following:

1. At the READY prompt, enter TRAJ
2. select 23 ORBIT ELEMENT LIST(ALL)
3. select 8 (YOHKOH)
4. enter 1
5. enter 1 again
6. hit the PF3 key several times until your return to the READY prompt.
7. type LOGON TSS S88239, to logon again. Your jobname will appear as Tnnnn at the top.
8. type OUT S88239(Tnnnn) NEW(D) to print out the list on the 2nd floor printer.

FAX all pages *except* page 2 (7 pages in all) to three JPL locations. To do this, press F3 on the FAX machine to set up for multiple destination FAXing. With the pages in place on the FAX sending tray, press presets 03 (JPL), 05 (JPL Len Efron), and 06 (JPL M-M Navigation). Then press the start button.

## 7.4 Generate AOSLOS Listing

### 7.4.1 Overview

This listing gives information regarding all passes (both KSC and DSN) for the requested time interval (generally about ten days), and is to be used in checking the OP each day. Make the listing after the new orbital elements arrive.

### 7.4.2 Procedure

To get the listing, you must run a code to calculate all the quantities for the times of interest. This code runs on the FACOM mainframe, and the input parameters for the run are input to the job from a control file.

1. To edit the control file, logon to the mainframe computer using the Yohkoh tohban's account S88239.

2. Enter PFD 2 termlang(e) to begin editing the control file in English.
3. input the dataset name as follows:

```
PROJECT ==> S88239
LIBRARY ==> SA
TYPE     ==> CNTL
MEMBER   ==> AOSLOS
```

first, and then hit the ENTER key. When the file listing appears, advance the screen (PF7/8), if necessary, until you see a screen like Figure 5a at the back of this manual (past the divider). On the lines labeled START TIME and END TIME, enter the required start and stop times and check that the time resolution (on the line labeled INTERVAL) is 16 seconds. Have the range cover at least 10 days to be sure you overlap well into the following week.

4. After the desired parameters are input, press PF12 to jump to the command line at the top of the screen. Then type SUB, and press ENTER.
5. Press PF3 to exit. *If you think you may have input something incorrectly, or want to restore the code to the status prior to your modifications, type "CANCEL" on the command line, followed by "ENTER."* Then do two PF3s. You may cancel out of editing the control card without disrupting the submitted job.
6. Press PF3 repeatedly (two or three times... I don't recall exactly) until you return to the READY prompt (or can do =x PF4).
7. At the READY prompt, type ST and press ENTER to check the job status. Keep checking until the job stops executing (it may take about 30 minutes). When the job finishes, type XST and press ENTER to display the job name. Then enter

```
OUT S88239n NEW(D)
```

where the n digit will be obvious from the listed job name.

8. (I don't know who added this item, but thanks — ACS.) If you have a problem printing out the AOSLOS listing, it may be due to the presence of two lines with the new orbital elements when running SRS INF (§7.1). If this is the case follow the procedure shown in Figs. 5b—5e.

## 8 STT Timer

The STT is the star tracker system used for guiding Yohkoh. It uses Canopus as a guide star. We must inform the STT when the occultations of Canopus by the Earth start and end in order to avoid tracking problems we had early in the mission. (The STT confused Canopus with other lights it detected near the Earth's limb, resulting in mis-guiding and consequent satellite roll drift.) This is done with the weekly timer set, using the latest orbital elements. Using the following procedure, you calculate the eclipse times and send them to KSC (in hex!) for uploading during a KSC pass. Consult Figure 7 for some examples.

### 8.1 STT Timer Set

Wording for this Section originally done by Dave Pike. Suga san has done the main manual for the STT timer setting (in Japanese).

Points 1—14 of this procedure (i.e., the printing out of the hardcopy of the timer plan) is now normally done by Seko san. Just give her the time that you want the timer set to take place (generally a couple of minutes or so before the 10-degree level of the end of the pass during which the timer set is to be uploaded). If she is absent, however, you will have to do points 1—14 of the procedure yourself also.

1. Logon to S88239 on a graphics terminal.
2. Give the command: EX 'PSK239.SAOCS.CLIST(GO)' – including quotes (which is usually the shift/7 one).
3. Select option 4 and press enter.
4. Use PF8 to go to page 2, and check that the data there are the same as Figure 7a
5. Use PF7 to return to the previous page.
6. Fill in the “Command execute time” field with THE date and time at which you propose to **actually load** the new values (i.e. during a suitable realtime pass) – press enter.
7. Press PF4, which will automatically update the orbital elements if necessary. Check the date to be sure the elements are up to date (Fig. 7b).
8. Use PF1 to return to the command select menu.
9. Select option 2 and press enter.
10. Check that on the RHS of the screen the command time and orbital elements' epoch are as you require. - then answer Y (upper case only) and press enter.
11. A plot similar to Figures 7c and 7e will now appear so select the start and end times (for when Canopus is visible) by positioning the cursor so that END time is at the bottom of the clear time window and START is at the top (this may mean that the END occurs higher up on the screen than START in some cases!). (Figs. 7h and 7i are special cases—see ?? below.) At the end of each cursor input you are asked to confirm that it is OK. Confirm with uppercase Y.

12. When you are asked 'INPUT END?', answer 'Y', press ENTER, make sure the printer is on, and take a hard copy of the screen - in that order! Input ALT HCOPI for the hardcopy (HCOPI is located on the keypad on the LHS; look for the name on the front of the key, not the top!).
13. The hardcopy should look like Figure 7c and 7e where the information in the box at lower right has now been inserted.
14. When you get the 'COMMAND DATA OK?' prompt, just enter END. Exit from the main menu with the 0 option.
15. The pass sheet should be filled out as in Figures 7d and 7f, noting differences for DAY or NIGHT (see next point below). The relevant information is extracted from the screen hardcopy. The ET1 and ET2 values are the decimal equivalents (times 2!) of the pairs of Hex values given under 'eclipse time block command' and you should work these out. Check the result because it should be within  $\pm 1$  (or so) of the times given beneath the Hex values on the plot!
16. ACS MOD H mode is always necessary for setting the timer. So when the timer set is done during day, on the pass sheet add ACS MOD H before the operation and MOD CNL AT after the operation, as shown in Fig. 7f. For night operation, the DP mode is already ACS MOD H, so these two commands are not necessary.
17. Fax a copy of the screen hardcopy to the KSC tohbans, and file another copy into the "STT Eclipse Timer Set Manual (Japanese) & File" folder. Note that these commands are sent in ACS High mode. If the pass is at night then the spacecraft will be in that mode, but if the pass is during the day, then the ACS MOD H command must be sent prior to these and the MOD CTL AT command afterwards.

## 8.2 Stopping the STT Timer (Figs. 7h and 7i)

There are about four periods during the year when Canopus is continuously occulted by the Earth. During these periods, which last about a week, the STT timer must be made inoperative, else it will try to find Canopus through the Earth or something. This could result in the tracker locking onto some other light source (a UFO perhaps, potentially resulting in Yohkoh's pointing being led astray by some goony aliens). These complete occultation periods last for about a week, but there may be other periods where it is not possible to set the STT start and finish parameters for more than the fifteen revolutions covering a single day. In these cases too, the timer has to be left off for a day.

NEC has come up with a series of commands that will achieve the goal of making the timer inoperative indefinitely (i.e., until it is instructed to start again). Basically, these commands tell the timer that the first occultation period begins 8000 seconds from the start of an orbit (defined by sunrise). This is longer than the time for one orbit to be completed. So basically what happens is that the timer starts at the first sunrise after the commands are issued and starts counting down 8000 seconds, when it has been told to start observing Canopus. Before the 8000 seconds is up, however, another sunrise occurs, restarting the 8000 second countdown. Therefore the observation period never begins.

An example of the commands to issue to initiate this STT OFF status is given in Figure 7g. Put these commands on the command sheet for the time you want to stop the timer. Figures 7h and 7i show examples where it is necessary to do a timer stop.

To restart the timer, issue the standard STT Timer Set commands as discussed above in Section ??.

### 8.3 Confirming STT Timer Set

This task is normally done once a week. It is not necessarily linked to the timer set(s) that you do for the week, you are merely checking to see that the star tracker (STT) is tracking Canopus correctly in the most recent data sets. To do the confirmation, in idl on the tohban workstation, enter

```
IDL> stt_plot
```

(This useful code was written by Kyo Akita san.) Select a recent file from the menu that comes up on the screen. The result will be a plot showing the variation of the intensity being detected by the STT's CCD. During the time of observation, this value will vary between up and down. During times of non-observation (e.g., during night, or during times when data are not yet available), the level will be constant. The values for STT Signal Level over the entire period should be in the range of about 400—1000. If so, take this to mean that Canopus is being tracked properly. You should check two or three of the most recent passes.

If you suspect that tracking may not be correct, consult with someone “in the know.” (Tetsuya Watanabe san is a good person to try first.) If tracking is not occurring properly, notify Kosugi san, Watanabe san, or other PI-level person immediately.

## 9 Week Visible Diagram

The Week Visible Diagram will be FAXed to B-toh from KSC sometime after the new orbital elements come in. Probably on Wednesday afternoon. In planning the passes that will be used, you must consider the passes that conflict with other satellites.

Here is one procedure for working with the week visible diagram:

1. Make a copy of the diagram to work with.
2. Make a guess at when the spacecraft holiday will be for the following week. Generally, the spacecraft holiday is Sunday (JST), unless there are some special operations to shift it. You will find out for sure when the holiday is at the meeting with Nagase san discussed below.
3. Make a first selection of which passes will be used each day during the following week. (KSC may have done this step for you two. If so, double check their selections.) Some guidelines for choosing:
  - Pick five passes each day.
  - Do not consider any passes with maximum elevation less than  $10^\circ$ .
  - If six (or more) passes satisfy this criterion, then favor the earlier pass, so that the sixth pass can be used if there are emergency operations to be performed.
  - Mark boxes around the draft selected passes as in Figure 4. Almost certainly, several of these passes will be removed after the meeting described in the next step.
4. With this draft copy of next week's schedule in hand, attend the meeting to discuss the final selection of passes that will be used for ASUKA (and other satellites) and which passes will be used for Yohkoh. Generally the meeting is at 13:30 on Thursday in the room in front of Nagase-san's room (his room is number 1611) on the sixth floor of A-toh. If necessary, ASUKA contact persons are Nagase san (X8351), (try to reach him first), and Ishida san (X8135).

Nagase san will come equipped with suggestions for resolving the conflicts. Generally newer satellites get priority.
5. The Asuka team brings the current week+3 schedule to the meeting. This can be used in doing the strawman planning, and in planning future holidays. [This does not seem to be a standard practice currently—Jan 99.]
6. Using a clean copy of the diagram, box the final selections for the passes to be used with a red marker. Make sure you box off the five passes for Yohkoh for each day (as determined at the Nagase meeting), and then cross out the passes that are to be given to other satellites. In some cases, the first one or two passes may be crossed off, but it is important that they be included in your red box anyway, since those passes are still counted as passes one and two, even if they are not used.
7. FAX a copy of the final schedule to KSC and ask them to double check your selections. FAX a copy to D-toh, and give two copies to Shuuto san (On 3-rd floor in B-toh, room 2301 which is opposite the operations room) and to the ASUKA group. Post the original (with red markings) on the whiteboard with the current week's.

8. File the conflict sheets for next week and for the current week+3 that you got from Nagase san in the folder titled "Yohkoh KSC DSN Pass Conflict with ASCA," which should be located around the tohban desk somewhere.

## 10 Weekend OP

By “Weekend OP” we mean the OP (or OPs) made just prior to off-days. The normal Yokkoh off-day is Sunday, but the day can change due to special requests for extended operations. Any such requests are generally made a few weeks ahead of time, and in any case should be known and discussed at the time of the Monday meeting the week before, except in really exceptional circumstances. The problem is that doing all operations by OP between Saturday Pass 1 and Monday Pass 2 (assuming a Sunday off-day) would require more commands than the 128 limit of the OP. So the OP has to be split into two somehow. There are two ways in which this is commonly done.

- Method 1. Write long OPs on Friday and Saturday.  
In this method the Friday OP covers Friday pass 1 to Saturday pass 5, and the Saturday OP covers Saturday pass 4 (or the second pass from the last if there is no fifth pass that day) through Monday pass 2. The Friday OP is uploaded on pass 1 Friday and the Saturday OP is uploaded on Saturday pass 4 (or the second from the last pass).
- Method 2. Write two OPs for Saturday.  
In this case the Friday OP is normal, i.e., it covers Friday pass 1 to Saturday pass 2. The first of the Saturday OPs covers Saturday pass 1 through Monday pass 2 (but you may have to throw out several of the DSN passes scheduled for use in that OP so that all the commands can fit), and is uploaded on Saturday pass 1. The second Saturday OP covers Saturday pass 4 through Monday pass 2 (this time including all the scheduled DSN passes), and is uploaded on Saturday pass 4. Note that by making the first Saturday OP good until Monday you ensure that the OP will run until Monday even in the (unlikely) event that there is trouble uploading the second Saturday OP on Saturday pass 4 and 5 (and 6).

Which of the two methods is used seems to vary with the tohbans. What the tohbans are concerned with is:

1. Making long OPs. This is done by, as usual, using `OP_FIRST_GUESS`. You just pick the start and end times to cover the period of time necessary, e.g., just before Friday pass 1 to just after Saturday pass 5. `OP_FIRST_GUESS` also inquires whether you want to eliminate some KSC passes. You must select “yes” (not the default) when making the OP covering Sunday (or the off-day), and enter the times of the KSC passes to be eliminated in response to the queries.
2. Generating the Pass sheets. In using method 1, the pass sheets generated by `op_first_guess` (for making the OP to be uploaded Saturday pass 4) will not be what you need – they will start with Saturday pass 4 instead of Saturday pass 1. To get the latter, you have to rerun `op_first_guess`, this time putting in a start time before the first pass on Saturday. (You can make the end time either Sunday or Monday – you’re not going to use the OP generated this time anyway.) Respond YES to making the ASCII file, but NO to making the HEX file.  
If you use method 2, the pass sheets generated when you make the OP for Saturday pass 1 will be the ones you need. Throw out the pass sheets generated when you make the OP for Saturday pass 4—they are not correct.
3. Modify the Pass Sheets as appropriate. So, for example, take care to include “OP WRITE” in pass 4 instead of pass 1 on Saturday if using Method 1, etc.

## 11 DSN Final, Preliminary, and Strawman Schedules

Late in the week, schedules for the next week (NW, referred to as the FINAL schedule for that week, week+1, where “week” is the current week), the following week (NNW, PRELIMINARY for week+2), and the week after that (NNNW, STRAWMAN for week+3) will appear in the FTP site at Wallops. This means more work for the tohbans!! In this section we describe what you must do.

### 11.1 Planning Future DSN Schedules

These are the general items to be taken care of regarding DSN planning:

1. Check to see if the schedules are out yet.

To do this, enter the wallops FTP site as described in Section ???. These files should show up on about Thursday morning Japan time.

The names of the files for the **FINAL schedule**, the **PRELIMINARY schedule**, and the **STRAWMAN schedule** that you will see in the wallops “out” directory are named **7dayss.w###**, **forecast.w###**, and **strawman.w###**, respectively. After you run run\_wallops (see below), the first two of these will be renamed **solass.w###** and **solasf.w###**, respectively.

**Important Note:** If these files are updated beyond the first version, there will be a version number attached to the end; e.g., 7dayss.w###.#; forecast.w###.#, etc. In these cases you have to include the version number in the FTP ‘get’ commands below.

2. FTP the preliminary and strawman schedules as done with the 7days schedule:

```
flare22% cd ~yohkoh/wallops <CR>
flare22% ftp 128.154.46.34 <CR>
flare22% isas <CR>
flare22% xxxxxx <CR>
flare22% ftp> cd out <CR>
flare22% ftp> get 7dayss.w### <CR>
flare22% ftp> get forecast.w### <CR>
flare22% ftp> get strawman.w### <CR>
```

Remember, 7dayss.w###.# or forecast.w###.# if the files are updated versions.

3. Run fmt\_wallops on the final or forecast schedule:

```
IDL> fmt_wallops,'7dayss.w###' <CR>
IDL> fmt_wallops,'forecast.w###' <CR>
```

The output final and forecast schedules will be named solass.w### and solasf.w###, respectively (nb., no version number will be generated in this output, even if the original file is 7dayss.w###.# or forecast.w###.#).

Do not run fmt\_wallops on the strawman schedule.

4. Printout the schedules.

```
flare22% ftp> lpr solass.w### <CR>
flare22% ftp> lpr solasf.w### <CR>
flare22% ftp> lpr strawman.w### <CR>
```

5. Give the strawman schedule to Seko san.
6. Receive from Seko san results from the Yohkoh-ASUKA DSN conflicts meeting held on Friday afternoon. See Section ?? for procedure if Seko san is not available.
7. Mark AOSLOSGD plots

There are two different sets of plots in the AOSLOSGD book, one set in color, the other in black and white (b/w). The difference between these two sets is that the color plots are made from the set of orbital elements that will actually be used during that week, while the b/w plots are made from elements two or more weeks prior to the week of the plots. Thus the color plots are the final sets of plots to be used for a given week, and the b/w plots are rougher estimates of the pass times, etc., for those passes. Both sets of plots are in the same “AOSLOSGD” file on the tohban desk. You mark the plots differently depending on if they are for the Final, Preliminary, or Strawman schedules:

**Final Schedule:** Mark the passes assigned in the final schedule for next week on the color AOSLOSGD plots using a color hi-lighter pen. Also mark the KSC passes on these plots, but using a hi-lighter pen of a different color from that you use to mark the DSN passes with. Get the KSC pass information from the Weekly Visible Diagram.

**Preliminary Schedule:** Again using a color hi-lighter pen, mark all the passes assigned in the preliminary schedule on the black & white AOSLOSGD plots. (Take note of where the KSC station passes are, but do not mark them for them for the preliminary schedule – this is because you do not know for sure which KSC passes will be used until the Thursday of the prior week.)

**Strawman Schedule:** Using a pen or pencil—but NOT a hi-lighter pen—mark the passes assigned to Yohkoh on the strawman schedule (the Yohkoh passes are labeled “SOLA TKG”). (Again, do not mark the KSC passes.)

8. Fax the final schedule to KSC
9. Select passes to keep and passes to cancel.

Currently, JPL gives us as many passes as they can afford at the time in the strawman schedule. From those, as best as possible the tohbans weed out the ones that Yohkoh will not need. You should have the largest number of cancelations to do for the strawman schedule. The preliminary schedule should be in nearly final form, although some adjustments may still be needed. Indeed, it is also possible that you will have to adjust the final schedule, so be on the lookout.

You use the marked AOSLOSGD plots to select the passes to cancel. Deciding just which passes to keep and which to cancel takes some intuition. The general philosophy is that we would like to have as continuous coverage of data as possible in Yohkoh daylight. Although it would be nice to dump data every 40 minutes of daylight (which is about the limit of the memory while in high telemetry rate), only about 12 DSN contacts can fit in the OP between OP writes on normal days. In any case, DSN isn’t going to be able to give us all the passes we want all the time, but we can request passes from them if it would even out our coverage or if they are desired for some special

observation plan; such requests are not commonly made, however. Some guidelines for selecting, deleting, and requesting passes are:

- Plan to use at most 12 passes (or so) per day, but on average about 6 passes.
- Delete passes that have elevation less than  $7.0^\circ$ . This really applies only to the final schedule. For one, there is no easy way to accurately check the elevation of the passes before the final schedule (since you normally do not have the AOSLOS printout until you have the final schedule). Generally DSN does not include very low passes in the list of passes they initially suggest for us in the strawman stage. Moreover, if a pass is a little low at the strawman or preliminary stage, it may just make it over the  $7.0$  level at the time of the final schedule (when the orbital elements are updated).
- Try to roughly space out passes evenly.
- You can use the current week+3 information on conflicts with ASUKA determined at the Thursday meeting (Section ??) as a guide in scheduling the strawman.
- Try to avoid having more than 130 minutes of daylight between contacts. If there is over 130 minutes, `op_first_guess` will automatically program quiet-rate medium modes. (Only 42 minutes of data can fit into the memory running in quiet-rate HI mode.)
- If you have a choice between using a Wallops pass and a pass from one of the other stations (Goldstone, Madrid or Canberra) where you would get approximately the same coverage, strongly favor using the Wallops pass and delete the other pass. Seko san makes a mark next to the Wallops passes on the black and white AOSLOSGD pages at the strawman stage.
- In the strawman schedule, you should not delete any Wallops passes. The unnecessary Wallops passes should be deleted after receiving the Preliminary schedule with JPL/DSN deletions. Wallops passes are canceled by NASA less frequently, so by doing this we avoid days with almost no coverage.
- Favor selecting DSN contacts during night. This is because real-time data cannot be collected during the DSN dumps (not true, by the way, for KSC passes). So if a flare goes off during a DSN pass during day, we still could not get any data from it. You will probably have to include some day DSN passes though. Nonetheless, using Wallops passes over the other DSN stations is a higher priority than this item.
- There is probably little need to have contacts with less than 40 minutes daylight between them unless there is a fairly long gap until the following (a 3rd) contact. (If there is an up-coming long gap, you may choose to empty out the memory at the 2nd contact so that you can get as much of the data in between the 2nd and 3rd contacts as possible.)

#### 10. Pass Cancellation and Addition Requests

If there are cancellations to be made, you must notify DSN using the following procedures. If there are no cancellations (which is not unusual for the preliminary schedule), then it is not necessary to notify DSN. To generate the forms for **pass cancellations**, enter `idl` from `flare22`:

```
flare22% idl
IDL> cancel_dsn,##,/strawman
```

for strawman cancelations,

```
flare22% idl
IDL> cancel_dsn,##,/prelim
for preliminary schedule cancelations
```

```
flare22% idl
IDL> cancel_dsn,##,/final
for final schedule cancelations.
```

In these examples, ## is the number of the week of the cancelation. A menu will appear on the screen, from which you click on the passes to be canceled. (The eventual number of passes the code will report as being canceled will be approximately twice the number you select because it cancels both tracking and playback passes. You never see the latter.)

After exiting from the cancel\_dsn code cancelation request forms are printed out. (In the case of final schedule cancelations you FAX this form to DSN Real Time Ops.) It also writes the information to a file which you can use to check your requested deletions and then file in the DSN book for the week the requests correspond to. In the case of last-minute changes to the final schedule, this form can be FAXed to wallops (see below). Upon leaving idl, the files are created and have names:

```
solass_del.w##      ;final schedule cancelation.
solasf_del.w##      ;preliminary schedule cancelation.
strawman_del.w##     ;strawman schedule cancelation.
```

These are all in the wallops directory (/home/flare/com/yohkoh/wallops). For preliminary and strawman cancelations, send the requests via EMAIL and FTP to wallops. To email to wallops, on flare22, cd to the /home/flare/com/yohkoh/wallops directory, and do

```
mail -s 'PRELIMINARY Schedule Request' wallops < solasf_del.w##
```

for preliminary deletions, and

```
mail -s 'STRAWMAN Schedule Request' wallops < strawman_del.w##
```

for strawman deletions.

Send **preliminary and strawman cancelations** by FTP to wallops, using the “in” directory (instead of the “out” directory that you use every day before running op\_first\_guess), i.e.,

```
flare22% cd ~/yohkoh/wallops <CR>
flare22% ftp 128.154.46.34 <CR>
flare22% isas <CR>
```

```
flare22% xxxxxx <CR>
flare22% ftp> cd in <CR>
flare22% ftp> put filename <CR>
```

**Final schedule cancelations** are done differently, depending on how close the current time is to the scheduled pass times. If it is still “some time in advance” of the pass, then the procedure is the same as that of the preliminary and the strawman cancelations (only the file names are changed). By “some in advance” means that there is enough time to get the information to JPL during their working hours (Monday—Friday 0700 - 1645 JPL time) for them to make the cancelations. You should also have time to get notification from wallops of the cancelations via FTP to wallops *before* the scheduled DSN pass time. If there is not enough time for these communications, then you have to telephone and FAX DSN with the information. (If you are not confident of your English, you can request help from a native speaker—check in D-toh.)

Specifically, for cancelations “some time in advance” of the actual scheduled pass time, send the request via FTP to the “in” directory:

```
flare22% cd ~yohkoh/wallops <CR>
flare22% ftp 128.154.46.34 <CR>
flare22% isas <CR>
flare22% xxxxxx <CR>
flare22% ftp> cd in <CR>
flare22% ftp> put solass_del.w### <CR>
flare22% ftp> quit <CR>
```

and send email as follows:

```
mail -s 'Current Schedule Request' wallops < solass_del.w###
```

You should get an email on the flare1 yohkoh account in response to your FTPed cancelation request. Make sure you receive that message in order to **verify the FTP cancelation request**.

For final schedule cancelations “very close” to the time of the the actual scheduled pass time, telephone the Wallops Ops Chief (See Section ??) and let her know that an FTP and an email is on the way with some last-minute changes to the coverage schedule. Ask the ops chief if they would like the changes to be sent in some other fashion, e.g., FAX. (If they want a FAX, send the sheet generated by the cancel\_dsn,#,/final command noted above.)

For requests for **Pass Additions**, there is an add\_dsn code which is similar to the cancel\_dsn code. See the README file in the wallops directory (/home/flare/com/yohkoh/wallops/README) for the latest information on the procedure. In selecting passes to for addition requests, look at the passes that were canceled at the STRAWMAN stage for the week in question. In principle, we would like to request additions of passes a previous tohban deleted (from the STRAWMAN), if those passes are near ones that the previous tohban wanted but didn't get because DSN/Wallops canceled them. Make sure that the passes you request were deleted by

the previous tohban due to coverage, not ASUKA conflicts! These addition requests are most relevant for the preliminary schedules, but can also be used in the final schedule also. In the case of addition requests “very close” to pass time, telephone wallops before sending the requests by FTP and email.

So, in **SUMMARY**

- Preliminary and Strawman Cancelations
  - Send by FTP
  - Send by E-mail
- Final and Real-Time Cancelations “Some Time in Advance”
  - Send by FTP
  - Send by E-mail
- Final and Real-Time Cancelations “Very Close to Downlink Time”
  - Telephone Ops Chief
  - Send by FTP
  - Send by email
- Preliminary, Strawman, and “Some Time in Advance” Final Additions
  - Send by FTP
  - Send by email
- Real-Time (“Some Time in Advance”) Additions
  - Select candidate passes by above criteria
  - Send by FTP
  - Send by email
- Real-Time (“Very Close to Downlink Time”) Additions
  - Select candidate passes by above criteria
  - Telephone Wallops Ops Chief
  - Send by FTP
  - Send by email

11. File and log the requests.

File the FAX sheets and printouts for cancelation/additions in the appropriate week’s DSN file on the Tohban desk. Log the FAXes in the DSN LOG notebook.

12. Verify changes.

The next day, check the wallops FTP site to see if the previous day’s requests have been accepted or not. If requested deletions do not show up before the time of the scheduled pass, *telephone the Ops Chief* (Section ??) to let DSN know that the previously scheduled passes will not be used. Otherwise, they will set up their antennas to look for Yohkoh data when none are being sent, wasting money, time, and maybe a chance for some other satellite to use the canceled Yohkoh pass. If the change requests are accepted, log in by hand the new passes in the appropriate location on the DSN check sheet (Section ??). If you don’t do this, poor Seko san will be confused when the data come in unexpectedly!

13. Inform KSC of changes to final schedule.

## **11.2 DSN Contact Numbers**

### **11.2.1 Wallops Contact Numbers**

The Wallops Operations' Chief's number is:  
001-1-757-824-2186,  
from 0800-1630 US Eastern Time. US Eastern Time is UT-5 (JST-14) hours for Standard  
Time, UT-4 (JST-13) hours for "Daylight" (Summer) Time .

The Wallops 24-hour number is:  
001-1-757-824-2375.

### **11.2.2 DSN Contact Numbers**

Generally we always go through Wallops now. JPL numbers are included below, just in case  
you can't get through to Wallops in an absolute emergency situation.

The numbers for the NOCC DSN Real Time Operations Ops Chief are:  
(NOCC stands for Network Operations Control Center)  
FAX: 001-1-818-393-0612  
Phone: 001-1-818-393-7990

The numbers for the DSN Scheduler are:  
FAX: +1-818-584-4561  
Alt. Fax: +1-818-584-4480  
Phone: +1-818-584-4413

### **11.2.3 Re-Transmission Request Numbers**

Questions regarding retransmission requests are to be directed to the NOCC Real-Time  
(R/T) Scheduler at:  
FAX: +1-818-393-0612  
Phone: +1-818-393-7922  
Alt. Phone: +1-818-393-7926

## 12 ASUKA-YOHKOH DSN Conflicts

ASUKA and Yohkoh share the same DSN downlink stations, and often the DSN passes available to one of the spacecraft are also available to the other at about the same times. These conflicts must be worked out between the two teams via negotiation. These negotiations take place in a meeting on Friday afternoon (2:00 pm) between Seko san, who prepares a first-cut at the Yohkoh passes to be kept, and a representative from ASUKA. For details on the contents of these negotiations and pass selection procedures see the discussion in the Appendix by Jim Lemen (Appendix ??). If Seko san is out the week you're tohbaning, you can use the Lemen notes to prepare for the meeting yourself. The ASUKA team members in charge of the DSN scheduling are Paul Hilton (x8136, email: paul@astro.isas.ac.jp), and Manabu Ishida (x2612, email: ishida@astro.isas.ac.jp).

**Tohban Work Before the Meeting.** You should note whether there are any campaigns scheduled during the strawman week. If so, Yohkoh may want to keep certain passes during the campaign period if at all possible. Information about such campaigns should be discussed at the Monday meeting. You should contact someone who is in charge of scheduling the campaign on the Yohkoh side in this case (try the SXT Chief Observer, Watanabe san or Hudson san if you are not sure who's in charge). That person should let Seko san know about important time periods *well before* the meeting time. They may want to participate in the negotiations meeting themselves.

**Tohban Work After the Meeting.** Seko san will give the tohbans the black-and-white AOSLOSGD plots for the strawman week with the passes marked as per the decisions of the meeting. She will have marked in pencil circles on all the passes given to us from DSN. Passes that are conflicting with ASUKA will have an "a" character in hiragana next to the circle. If the circles with the "a" have a cross over them, then this pass was given to ASUKA at the negotiation meeting. If it has an "a" but no cross over it, then this pass was given to Yohkoh at the negotiation meeting. Passes with circles and crosses, but no "a" are passes that Seko san finds have to be removed for some other reason, typically because they are Santiago passes that occur at times when Santiago is not doing tracking operations. Double-check Seko san's selections for Santiago (the hours of operation of Santiago should be posted somewhere in the B-toh operations room).

Results of the ASUKA/Yohkoh conflicts negotiation meeting are generally final. You *must* not use passes that have been given to ASUKA unless they are renegotiated with the ASUKA team.

You will probably have to remove other passes from the strawman schedule besides those noted by Seko san. Check carefully the AOSLOSGD black-and-white pages for the strawman week and make additional pass cancelations based on the principles outlined in Section ??.

## 13 Tohban Report

1. Write up a summary of the week's activities, using previous weeks' as a guide.
2. You can get information for the week's activities from the daily KSC tohban report and/or from the GBO mail log. For the latest information on where to find the latter, look in the `~yohkoh/ssoc_report/whereis.gbomail` file.
3. Include information about status of DSN post-transmission data by copying in the flare1 file: `/home/flare1/yohkoh/dsn_corrupt/99_##`, where `##` is the current week number. This file is kept up-to-date by Seko san. During the week, Seko san should have let you know if there had been any particular problem with the DSN data or communications with DSN. Add relevant concerns to the tohban report for discussion at the meeting in necessary.
4. Can generate a summary of the week's solar activity by running on flare22

IDL> **goes\_summary**

or, to print it out on the printer:

IDL> **goes\_summary,/hc**

If you want a listing of flare events, use

IDL> **pr\_gev,'dd-mmm-yy','dd-mmm-yy'**

where the dates are the starting and ending dates for the output.

Also, can get a nice image of the Sun via:

IDL> **lastsfd,/obs,/nar,/text**

5. After the Weekly meeting on the Monday ending your tohban week, make a final version of the tohban report (e.g., adding notes from the meeting, etc.), and store the report in the `ssoc_report` directory on the flare1 yohkoh account (i.e., in directory `/home/flare1/yohkoh/ssoc_report/1999/`), using the file name `w##_99`.
6. Send out the report via email from the flare1 yohkoh account using:

flare1% **mail -s "Week ##\_99 SSOC Tohban Report" ops < filename**

## 14 FACOM Issues

This section contains some topics related to interacting with the FACOM mainframe computer.

### 14.1 FACOM Access from Workstations

You can do several FACOM operations from the flare workstations. This is useful, e.g., if someone is sitting at the FACOM terminal in the Tohban room. From the flare22 workstation, for example, you just do:

```
flare22% telnet mainf1 <CR>
```

```
Trying 133.74.191.201\ldots
Connected to mainf1.
Escape character is '^]'.
```

```
PLEASE KEY IN 'TERMINAL TYPE' (E:END,%X:XTERM6683,NULL:HELP) --->
```

Here you can enter, for example, 12 if you are at an xterm, or 17 (or hit return for other options). If you select 17, the FACOM keyboard PF# keys will correspond to esc-# on the workstation's keyboard. If you use the "12" option on an xterm, then the FACOM keyboard PF# keys will correspond to the keyboard F# keys, *except* for the PF1 key, which you will have to use esc-1 for.

From the workstation, the delete key does not work, but you can delete by using the keyboard's arrow key to backup, and then overstrike the unwanted characters. Also, you will have to use the arrow keys to move around in the OP(OPOGEDT) editor. Experiment around a little until you become familiar with the general movements inside the editor before you do any critical operations.

### 14.2 FACOM: Killing Processes

It may happen that the terminal you are using gets locked up while you are using it, due to some mistake in procedure perhaps. This situation sometimes occurs to the SXT Chief Observer, for example, when trying to print out tables on the FACOM. If you get in this situation, you will not be able to log on to the account you were using originally until you kill the process. To do this,

1. Log onto the same mainframe workstation from a different account, and a different terminal (if necessary).
2. Input the following commands (your inputs are in **bold**, and the system prompts are in normal type):

```
READY
OPER <RET>
OPER
C U=account_name <RET>
```

**OPER**  
**END**  
READY  
**LOGOFF**

where `account_name` is the name of the hungup account. This should clear up the account.

## A Resolving ASUKA-YOHKOH DSN Conflicts (J. Lemen)

(This Section written by Jim Lemen)

Generally, Seko san does all of the duties described in this section. If she is not available some week, you should meet with her before hand if possible to get detailed procedure instructions.

Conflicts between Yohkoh and ASUKA for requests of DSN passes specified in the Strawman schedule must be negotiated by the SSOC with the responsible individuals from the ASUKA team. A meeting is held on Friday afternoons at 2 PM in the ASUKA room on the 2nd floor of B-tou. The ASUKA team members in charge of the DSN scheduling are Masayuki Itoh (x2610) and Paul Hilton (x8136, email: paul@astro.isas.ac.jp). Before the meeting you should: (1) check the FTP directory to see if the latest strawman file has been FTPed over from wallops, and then (2) run the program `IDL> .run dsn_conflict` which will generate a check sheet. The program will ask only two questions, the first one to confirm the file name and the second see if you want to print the file on the flare1 printer. The checklist is called `dsn_conf.w##` where `##` is the DSN week number. Print out a copy for Seko san. Generally you should bring four copies of the printout to the meeting. (Hilton san may generate and print out the file for Seko san.)

The `dsn_conflict` program was being developed at the time of preparation this manual. An example output of the program with some hand-written annotations can be found at the end of this manual. Some important points to note:

**DSN conflict definition.** The DSN ground stations need a minimum of **30** minutes between the LOS (or EOT in DSN terms) of the first spacecraft and the AOS (or BOT) of the next spacecraft. Note that this is longer than the 15 minute definition we follow for KSC passes.

**Strawman pass selection.** The `dsn_conflict` routine tries to make a first guess at selecting the passes we want to delete from the strawman schedule. It does this for both ASUKA and Yohkoh using different rules. The idea is that if we automatically select the passes we want to keep, that this might remove some of the conflicts that would otherwise exist between the two spacecraft. This procedure has not been very well tested for Yohkoh selections. The algorithm used by the program is fairly simple and may need enhancements. A short description of the algorithm is found in the back with the example printout. As you make selections, please feel free to make suggestions for how to improve the algorithm.

**Meeting objectives.** The Friday meetings have two objectives. The first is to try to determine a good way to resolve the conflicts that will increasing exist between the two spacecraft. The second is to resolve any actual conflicts that may exist for the strawman week that you are dealing with.

## B OP\_FIRST\_GUESS Session Example

```
flare22:17% idl
IDL> .run op_first_guess
***** op_first_guess (V4.3) 11-Mar-97 *****

0 /yd43/ydb/orbit_raw/970423-0503_16s.ascii (Orb. el.: 1997/ 4/22 10: 0: 0)
1 /yd43/ydb/orbit_raw/970430-0510_16s.ascii (Orb. el.: 1997/ 4/29 7:59:59)
2 /yd43/ydb/orbit_raw/970507-0517_16s.ascii (Orb. el.: 1997/ 5/ 6 6: 0: 0)
3 /yd43/ydb/orbit_raw/970514-0524_16s.ascii (Orb. el.: 1997/ 5/13 21: 0: 0)

* Enter index of the desired file [Default: 3 ]

OG lookup table: $DIR_GEN_ORBIT/og_lookup.ascii
OP rules        : $DIR_GEN_ORBIT/op_first_guess.rules
AOSLOS file     : /yd43/ydb/orbit_raw/970514-0524_16s.ascii

* Enter output filename path [Default: $DIR_GEN_ORBIT/opog ]

OP rules read from /yd43/ydb/orbit/op_first_guess.rules

-2.00 (min) offset for AOS-DAY
-2.00 (min) offset for AOS-NT
 1.00 (min) offset for LOS
-7.00 (min) offset for RB HV RDCT ON
 3.50 (min) offset for RB HV RDCT OFF
 2.00 (min) offset for DAY
 0.00 (min) offset for NIGHT
 9.00 (deg) Min Antenna Elv-KSC
-0.80 (min) offset for NOP bef Min Ant Elv-KSC
 2.93 (min) offset for NOP (after Max)
 2.00 (min) Min time for valid KSC contact
 0.00 (deg) Min Antenna Elv-DSN
 0.00 (min) Min time for valid DSN contact
-2.67 (min) offset for DSN REP-DAY (max Elv)
-3.50 (min) offset for DSN REP-NT (max Elv)
 6.50 (min) DSN los after REP (Day)
 7.00 (min) DSN los after REP (Night)
 4.60 (min) DSN Rep time to allow A/B switch
 5.00 (min) DSN requested contact window
130.00 (min) Sunlight-time threshold for los (QT M)
 6.93 (min) offset from SAA to change to Med
 5.00 (min) Min SAA time to make Med change
 1.50 (min) KSC AOS / antenna change margin.
* Enter start time [Default: 14-MAY-97 05:14:17 ] 16-may-97 17:00
* Enter end time [Default: 16-MAY-97 17:00:00 ] 17-may-97 20:00
Closest KSC contact begins at: 16-MAY-97 17:33:44
Start time =16-MAY-97 16:33:36
Stop time =17-MAY-97 19:59:59
```

Contact Information for Yohkoh. Program Run: 14-May-1997 14:16:32.00

Kagoshima Space Center Contacts		Minutes of				
Starts	Ends	Day	Ngt	Tot		
JST	(UT)	JST				
17-MAY-97 02:33:44	(16-MAY-97 17:33:44)	02:43:14	2.0	7.5	9.5	970516-1136
17-MAY-97 04:15:44	(16-MAY-97 19:15:44)	04:26:44	8.5	2.5	11.0	970516-1239
17-MAY-97 05:58:29	(16-MAY-97 20:58:29)	06:09:44	11.2	0.0	11.2	970516-1342
17-MAY-97 07:41:14	(16-MAY-97 22:41:14)	07:52:59	11.8	0.0	11.8	970516-1446
17-MAY-97 09:24:29	(17-MAY-97 00:24:29)	09:35:14	10.8	0.0	10.8	970517-0101
17-MAY-97 11:10:29	(17-MAY-97 02:10:29)	11:13:44	3.2	0.0	3.2	970517-0205
18-MAY-97 01:10:59	(17-MAY-97 16:10:59)	01:18:14	0.0	7.2	7.2	970517-1033
18-MAY-97 02:51:44	(17-MAY-97 17:51:44)	03:02:14	3.5	7.0	10.5	970517-1136
18-MAY-97 04:34:14	(17-MAY-97 19:34:14)	04:45:29	9.8	1.5	11.2	970517-1240

\* Re-enter the times? [Default: N ] ?

Reading file /yd43/ydb/orbit\_raw/970514-0524\_16s.ascii ...

There are 6175 times

Orbit parameters: 1997/ 5/13 21: 0: 0

Enter DSN AOS times to within 5.0 min

Reading RASM file: /yd43/ydb/orbit\_raw/solass.w18

Reading RASM file: /yd43/ydb/orbit\_raw/solass.w19

Reading RASM file: /yd43/ydb/orbit\_raw/solass.w20

Requested DSN Station times:

[1]	S	136	16-MAY-97	20:01:00
[2]	M	137	17-MAY-97	05:02:00
[3]	C	137	17-MAY-97	05:45:00
[4]	C	137	17-MAY-97	07:29:00
[5]	G16	137	17-MAY-97	09:45:00
[6]	G16	137	17-MAY-97	13:10:00
[7]	G16	137	17-MAY-97	14:53:00
[8]	G16	137	17-MAY-97	16:35:00

Enter DSN requested stations

Enter as doy, time, such as 137, 2:33

Note that 137 corresponds to 17-MAY-97

\* Enter doy, time (or <cr> to quit):

Requested DSN Station times:

[1]	S	136	16-MAY-97	20:01:00
[2]	M	137	17-MAY-97	05:02:00
[3]	C	137	17-MAY-97	05:45:00
[4]	C	137	17-MAY-97	07:29:00
[5]	G16	137	17-MAY-97	09:45:00
[6]	G16	137	17-MAY-97	13:10:00

[7] G16 137 17-MAY-97 14:53:00  
[8] G16 137 17-MAY-97 16:35:00

- \* Enter A to add more stations,
- \* Enter S to start over,
- \* Enter D to delete an entry,
- \* Enter <cr> if finished entering DSN contacts:

- \* Eliminate KSC contacts for a certain time period?  
\* (Normally, ONLY answer yes for Sat-Sun table load) [Default: N ]
- \* Change any standard op\_first\_guess options? [Default: N ]

Selected DSN Station times:

DSN 17-MAY-97 04:59:59 M  
DSN 17-MAY-97 05:43:27 C  
DSN 17-MAY-97 07:26:23 C  
DSN 17-MAY-97 09:43:27 G  
DSN 17-MAY-97 13:07:11 G  
DSN 17-MAY-97 14:50:07 G  
DSN 17-MAY-97 16:33:19 G  
DSN 16-MAY-97 19:58:56 S

- \* There are 5 first day KSC passes and 2 second day KSC passes
- 1 U 970516-1136 17:33:28 16-MAY-97 - 17:44:08 N/D at 17:41:
- 2 U 970516-1239 19:15:36 16-MAY-97 - 19:27:20 N/D at 19:18:
- 3 U 970516-1342 20:58:16 16-MAY-97 - 21:10:32 N/D at 20:55:
- 4 U 970516-1446 22:41:11 16-MAY-97 - 22:53:43 DAY
- 5 U 970517-0001 00:24:23 17-MAY-97 - 00:36:07 DAY
  
- 6 U 970517-1136 17:51:35 17-MAY-97 - 18:03:03 N/D at 17:58:
- 7 U 970517-1240 19:34:15 17-MAY-97 - 19:45:59 N/D at 19:35:

- \* Do you want to eliminate any contacts? [Default: N ]

y

- \* Enter the station number(s) to eliminate (separated by blanks or commas):
- \* Enter between 1 and 7, or 0 to keep all contacts:

3

Remove the following station contact(s):

KSC 16-MAY-97 20:56:16 U

Number of terminators before rule 5 = 4 \*\*\*  
Number of terminators before rule 6 = 3 \*\*\*  
Number of terminators before rule 7 = 3 \*\*\*

\*\*\*\*\*

\*\* Warning identical times for the following:

40 050324- 19- DSN REPRO  
41 050324- 55- DAY (SUNRISE)

\*\*\*\*\*

(will move the DAY OG 32 sec later: 050356)

\*\*\*\*\*

```
** Warning identical times for the following:
   84 140828- 27-    RB HV RDCT OFF
   85 140828- 64-    SXT CNTL MAN
```

```
*****
      (you must fix with opogedt)
```

```
* Enter <cr> to continue:
```

```
*****
** Warning identical times for the following:
   84 140828- 27-    RB HV RDCT OFF
   85 140828- 64-    SXT CNTL MAN
```

```
*****
      (you must fix with opogedt)
```

```
* Enter <cr> to continue:
```

```
Number of OG slots used = 119
```

```
* Write ascii output file? [Default: Y ]
```

```
* Write hex   output file? [Default: Y ]
```

```
* FTP the .hex to the mainframe? [Default: Y ]
```

```
Will attempt to transfer to: 'sr0001.opseq.infile(op70516b)'
```

```
If nothing happens after a few seconds, enter CTL-C and then .cont
```

```
Ascii file: $DIR_GEN_ORBIT/opog/op70516b.txt
```

```
Hex   file: $DIR_GEN_ORBIT/opog/op70516b.hex
```

```
[** If "nothing happens," or if the transfer fails, it may mean that  **]
[** a hex file with the same name already exists on the FACOM. In that **]
[** case, try deleting the file from the FACOM using PFD 3.1, and then **]
[** rerun op_first_guess using the default inputs. The transfer should **]
[** then work. **]
```