From: STSCIC::DOXSEY 21-AUG-1992 13:35:27.71
To: @TTRB.DIS
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Subj: Draft plan for activation of FOS GIMP capability

The work on the FOS GIMP enhancement has reached the point where we must consider some of the practical aspects of making it operational. This memo outlines the SESD plan for bringing this capability into routine use.

Use of the new FOS GIMP flight software capability requires changes to the commanding of the FOS and changes to the amount of alignment time allocated to FOS exposures. Unfortunately, the time required goes up, not down, which will complicate the process. The TRANS OPR (#TBD) has been filed and documents the details of the changes. This OPR will result in changes to the alignment times for ALL FOS modes except peak-up and peak-down. The alignment time is used in many secondary calculations by TRANS, so many PMDB fields are affected. In addition, there will be one new quesi-parm which indicates whether the GIMP correction should be applied or not.

The proposed plan is as follows:

- The TRANS OPR will be included in TRANS build X, number not yet determined but probably a 22.x or 23.0. We will have to consider two categories of proposals, those TRANSed before build X and those TRANSed after build X.

The instructions will be a part of IM build Y, number not yet determined. The instructions in build Y will default to NO GIMP, if the qesi-parm is not there. The current instructions already ignore the GIMP qesi-parm.

There will be a GIMP flight test required before the routine use of GIMP is allowed. This test will exercise the new FSW features as well as the ground system. The proposal is not yet submitted, I will refer to it as YGIMP. GO/GTO/CAL Proposals using the GIMP feature should not appear in flight SMSs until at least 4 weeks after the YGIMP proposal.

1.) TRANSing of GO/GTO proposals.

- Proposals transed before build X will properly execute with the current, pre-build Y, instructions. The build Y instructions will default to NOT use GIMP, if the GIMP qesi-parm is not present. Therefore, proposals transed before build X will execute properly with the build Y instructions, but they CANNOT invoke the GIMP correction because the timing will be incorrect. It is NOT feasible to use a data base blast to upgrade proposals transed pre-build X to match the build X requirements. This situation has four implications:

a.) SPB and TIB must determine whether there are cycle 1 or cycle 2 proposals which have been transed with pre-build X software and should or must have GIMP applied to them. These will have to be RE-TRANSED with build X.

b.) Any FOS cycle 1 or cycle 2 proposals which require use of the GIMP and have not yet been transed, should be held until TRANS build X is available.

c.) SPSS operations must NOT use PMDB edits to set the GIMP qesi-parm for proposals transed before build X.

d.) Proposals transed with build X can be executed before the instructions of build Y are available, as long as the proposal does not require GIMP activation.

2.) Instruction installation.

The instructions in build Y can be used with proposals transed with either pre-build X or build X. However, once the build Y instructions are installed, all proposals transed with build X and later builds will automatically use the GIMP feature. A method is needed to prevent inadvertant execution of these proposals before the YGIMP test and before the "waiting period" of 4 weeks after the YGIMP test. There are two approaches to this problem:

a.) After build Y instructions are installed, the calendars can be checked for the appearance of any SUs transed with Build X or later. A PMDB edit request can be filed to change the qesi-parms for these exposures to no GIMP.

or

b.) We can use the basetime activation feature in SCS to control which instructions are expanded for which SMSs. The week of the test would use the build Y instructions, the next weeks would use the old instructions, and the 5th week would use the build Y instructions again. This would require PMDB edit requests for the qesi-parms only for FOS observations using build X in the week of the test.

SESD will be testing method b. and recommending its use, assuming the tests show the feature works.

3.) Flight test.

The YGIMP proposal has just been written. It will be necessary to TRANS this proposal with build X of TRANS. It will obviously be necessary to generate the SMSs using build Y of instructions. Given either of the two steps indicated in item 2 above, there is NO need to avoid scheduling of FOS observations within the period between the test and the end of the waiting period. It will probably be desirable for there to be no FOS observations immediately after the YGIMP test, in case there is a problem encountered. Any such requirement will be documented in the proposal for the YGIMP test.

In order to simplify possible changes to the rules in the future, there should be a set of tunable constants, one for each mode which will be used to set the default value of the GIMP parameter. The default values are as follows:

Mode	GIMP
ACCUM	ON
TAG	ON
ACQ/FIRMWARE	ON
ACQ/BINARY	ON
IMAGE	ON
ACQ/PEAK	OFF
ACQ	ON
RAPID	ON
PERIOD	ON

QESIPARM

A new new qesiparm is needed to turn on/off GIMP correction. Currently, the plan is to have GIMP correction turned on for all modes except ACQ/PEAK.

SI_PAR_NAME	SI_PAR_VALUE	CONDITION
GIMP_CORRECT	ON	if GIMP = ON
	OFF	if GIMP = OFF

Alignment time

The COMTIME part of the alignment time calculation needs additional time to allow for commanding associated with GIMP correction. An additional 45 seconds is needed when it is ON and an additional 3 seconds is needed when GIMP corrections is OFF to send the commanding to make sure it is off.

COMTIME + 45 if GIMP = ON
+ 3 if GIMP = OFF

QALIGNMENT excute_slew

Because the GIMP correction depends on the pointing of the spacecraft, slewing during FOS internals will no longer be allowed. Therfore, in addition to the other conditions on setting the QALIGNMENT excute_slew flag to Y, GIMP must be OFF.

Error Messages

The GIMP commanding and the sync start commanding are incompatible. If Trans sees an exposure which requires the SYNCTIME qesiparm and GIMP = ON, a warning message should be printed out and GIMP should be turned off.

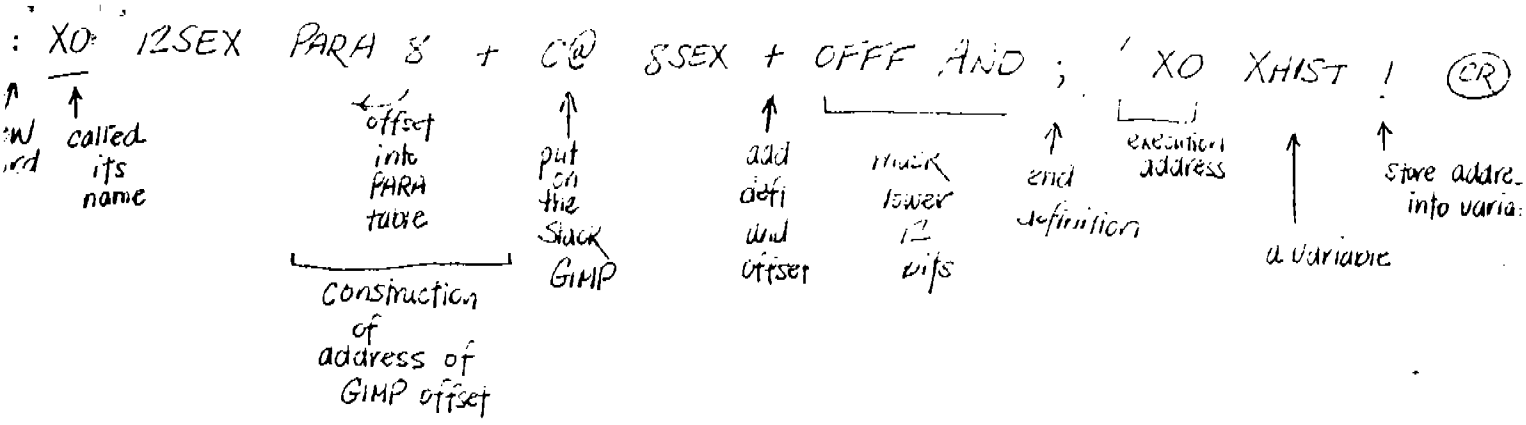
Additionally, any time the default value of GIMP is overridden, a

warning should be issued.

: XO 12SEX PARA 8 + C@ 8SEX + OFFF AND ; ' XO XHIST ! (CR)

- ↑ ew ord
- ↑ called its name
- ← offset into PARA table
- ↑ put on the Stack GIMP
- ↑ add defi and offset
- mask lower 12 bits
- ↑ end definition
- execution address
- ↑ a variable
- ↑ store addre into varia

Construction of address of GIMP offset



HEX = all YKEY interpreted in HEX

DECIMAL = opposite

a XHIST execution time on stack deflection value to go to DAC

12SEX make a 16 bit 2-comp number on stack

8SEX make a 16 bit 2-Comp number on stack

input buffer - 80-characters · interpreter buffer

looked at after (CR) compiles code

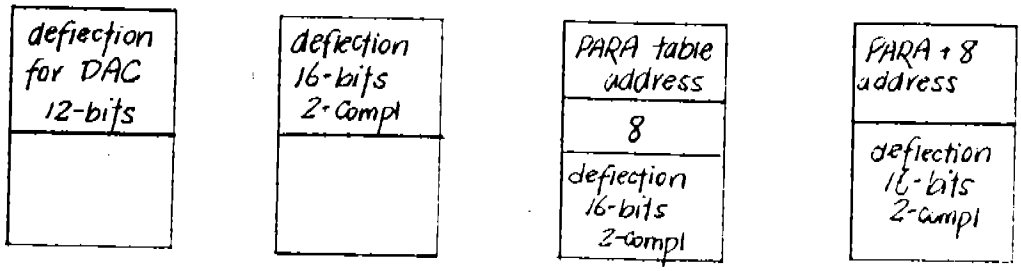
Compile time

message OK (CR) (LF) to status buffer ≃ 1 minute

each byte associated with minor frame

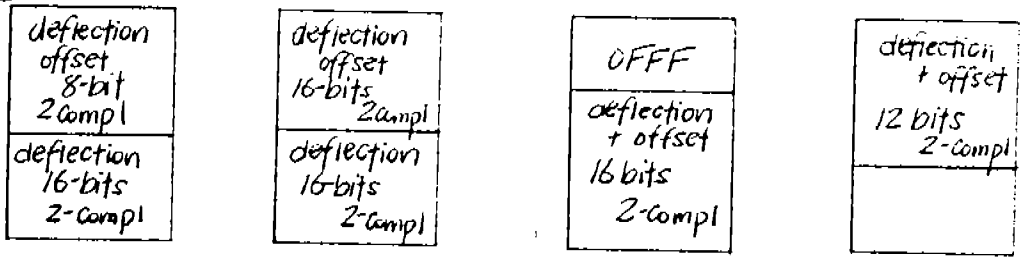
Richard Hier
1-22-93

: XO 12SEX ① PARA 8 ② + ③ C@ ④ 8SEX ⑤ + OFFF ⑥ AND ⑦ ; ' XO XHIST !



at start ① ② ③

the stack



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