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COLOSSUS Memo #70

To: Distribution
From: M. Hamilton
Date: 10 July 1968
Subject: COLOSSUS Revision 220

Revision 220 was BAD with 1 cuss.

Major Changes Incorporated into Revision 220

- 1) B29FLAG was deleted since it is no longer needed for INITVEL.
- 2) Several erasable comments were cleared up.
- 3) END-UE was moved down to the correct location.
- * 4) The new variable OPTIONX was added for the new option code needed in extended verbs. This was added to prevent the erasable conflict caused when extended verb 82 with N06 is running on top of a program displaying N06.
- 5) The erasable conflict between HAPOX and THETA (1) +1 in V82 was solved by defining THETA(1) as a DP variable. It was previously incorrectly defined as a SP variable.
- ** 6) R32 was changed from an extended verb (V84) to a V37 program (P76) according to PCN #468. The following changes were made:
 - A. P76 was hooked up to the V37 PREMM tables and assigned to the RENDEZVU DOWNLIST.
 - B. R32 was unhooked from the extended verb fan table. V84 is now spare. Logic to start up JOBR32 was deleted.
 - C. V80 and V81 no longer check the R32 flag.
 - D. The extended verb displays in R32 were changed to normal displays.
 - E. The NOUPFLAG is no longer set at the beginning of R32 since a targetting program cannot run underneath P76 whereas it could underneath V84.
 - F. P76 exits to GOTOPPOH. R32 used to exit to ENDEXT.
 - G. A restart phase was added to P76 to protect the copy of the state vector. Also the integration restart bit (REINTFLG) was set to go with this phase change.

- H. The VHFRLFLAG is no longer reset at the beginning of R32 since V37 automatically resets this flag.
- I. V80 and V81 no longer reset the NOUPFLAG (This was even unnecessary before).
- 7) Some leftover old V95 (NOUPFLAG) logic was still in the program. This was deleted.
- 8) Restart spot 1.13 has been corrected to go to R40ENABL instead of R41ENABL.
- 9) The incorrect resetting of a non-existent bit called CM/FLAGS was deleted from the P40s.
- 10) A redundant TC to SETMAXDB was deleted from P40CLK.
- 11) Several comments were cleared up in the P40s.
- 12) An interpretive instruction (GOTO QTEMP) was located in the middle of the S40.8 comment section. It is hard to say how long it's been there or what trouble it could have caused. It was deleted.
- 13) Optics are no longer re-enabled in TVCZAP. GOTOPOOH automatically sets OPTIND to -1 which disables the optics.
- 14) PCR #439.1 was implemented in P52. Alarm 215 and its display are no longer sent out if the preferred flag is not set on the preferred option.
- 15) The ENTRY flag CM/DSTBY is now reset at the end of SERVICER in AVGEN. This will deactivate the ENTRY DAP calculations in SERVICER.
- 16) The stroke test restart capability was deleted (PCR #209). This is consistent with the rule that extended verbs are not restartable. V68 should be selected again after a restart to do the stroke test.
- 17) A DISPLAY routine restart bug was fixed. Previously every type of display (mark, normal and priority) set up the register RESTREG for restarts whereas RESTREG should only be set up by normal displays. Since RESTREG contains the SUPERBNK information, it was possible for a restarted display to go to the wrong SUPERBNK.

Known Problems in Revision 220

- 1) Several program writeups are obsolete.
- 2) V56 should do a STOPRATE.
- 3) NOFLASH should check for a zero in NVWORD1 before going to REGODSP. Otherwise an interrupt can set NVWORD1 to zero while CLOCKJOB is still going. CLOCKJOB then does a CLEANDSP at the wrong time which returns to the return address leftover from the last flashing display.

- ✓ 4) An erasable conflict exists between R52 in the W-MATRIX and gyro compassing.
- ✓ 5) OPTIONX in V82 is sharing with midcourse erasables. This should be moved in order that V82 is not restricted at this time.
- ✓ 6) 6.5 SPOT needs to be added to the restart table for P27.
- 7) Some extended verbs have mark displays and normal displays mixed. If a normal display occurs after a mark display the bit 1 of FLAGWRD4 which is set by a mark display will lock out a normal display.
- * 8) Extended V82 does a V04N06 display and so do P21, P52, P38 and P37. This results in an erasable conflict because both the extended verbs and the normal programs use the same erasables for N06.
- ✓ 9) RTEVGAM, PBIAS and YBIAS (10 words) are now in fixed memory but the GSOP specifies them as erasables.
- 10) PINBALL does not wake up displays sleeping due to astronaut use on any loads. Either a change should be made to PINBALL or ASTRONAUT decks will have to be changed.
- 11) The polynomial fit for T(X) in TFF should be changed to include a wider hyperbolic range.

Potential Problems

- 1) If a coarse align is made to a middle gimbal angle of 65° followed by V42 driving into gimbal lock, a keyed in monitor freezes for a while (STL).
- 2) A restartable CLEANDSP exists in R56 without a CAF ZERO before the TC BANKCALL.
- ✓ 3) The optics stops test in T4RUPT does not initialize Z1 on the first pass (RG).

Statistical Summary for COLOSSUS 220

1) Number of modification changes	14
2) Number of cards	120
3) Total fixed memory change	-24

✓* The new noun 12 should be added to PINBALL for OPTIONX.
Also, extended verb V82 now displaying N06 should display
N12 instead of N06.

** The following things should be done to go along with this
change:

- ✓ A. P76 should set the TRACKFLG.
- ✓ B. R22 should no longer check the NOUPFLAG.
- ✓ C. R32FLAG should be deleted.
- ✓ D. NOUPFLAG should be deleted.
- ✓ E. R32 erasables should be moved from the extended
verb area to the targetting area.