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COLOSSUS Memo #56

To: Distribution
From: M. Hamilton
Date: 2 May 1968
Subject: COLOSSUS Revisions 197, 198, 199 and 200

Revision 200 was BAD.

Major Changes Incorporated into Revisions 197, 198, 199 and 200

- 1) Logic was added to V37 to restore the deadband to the deadband last set up in R03. (PCR #151)
- 2) A change was added to prevent P27 if P01 or P03 is running.
- 3) Logic was added to R03 to set MAXDBFLG if the maximum deadband was selected and to reset this flag if the minimum deadband was selected. (PCR #151)
- 4) Some initialization was moved from SLAP1 to DOFSTART since DOFSTART was not initializing everything correctly.
- 5) A fix was put into GOPROG to initialize FLAGWRD5, bit 14 if there is no permanent integration going.
- 6) Several flags from P40 are now being initialized in CANV37. This is a temporary change until the general flag initialization routine is incorporated into V37.
- 7) A change was put into the Display routines to paste V97 as a please perform verb for ENGFAL.
- 8) Several clean up changes were put into P27 to save coding and clear up erroneous comments.
- 9) A fix was put into the common routine R32 to reset the NOUPFLAG only for COLOSSUS and not LUMINARY.
- 10) A correction was put into the end of INITVEL to copy RTARG1 back into RTARG, not RTARG1.
- 11) LANDMARK was inserted into the P22 DOWNLIST. (PCN #108)

- 12) FLAGWRDS 10 and 11 were added to the DOWNLINK list now that they are defined.
- 13) Verb 96 was hooked up again.
- 14) A change was added to P11 to zero AK's when the FDAI att. error display is disabled.
- 15) P22MKFLG was added for PCR #169. This is set when DOWNLINK in P22 is good.
- 16) Remarks pertaining to the RCS DAP were updated.
- 17) An error in RELINUS was fixed to set the TARG1FLG since V37 resets this flag and a V37 request in R60 would prevent R52 from working in P20.
- 18) Alarm code 1410 for thrust too low was deleted along with the new P40 ENGFAIL changes.
- 19) V97 was hooked up to the extended verb fan table to allow a please perform V97 for the new ENGFAIL routine.
- 20) V95 was unhooked from the verb fan table since the astronaut does not have the option of setting this flag.
- 21) V80 and V81 were corrected to check for R32 before touching the VEHUPFLG flag.
- 22) A check was added to P22 for the negative square root when the line of sight vector approaches 90° from the normal at the landmark. In this case the value is set equal to zero.
- 23) A change was put into R22 to check for the NOUPFLAG at the same time the UPDATFLG is tested.
- 24) New log sections for RESTART TABLES and P40-P47 were brought into COLOSSUS from MOLASSES. These sections included the new ENGFAIL routine (PCN #98), restarts for the P40s, and several coding improvements in the P40s.
- 25) If a V37 request is made during an SPS burn, the RCS DAP is now turned on instead of the idle DAP.
- 26) A correction was made to P00 to prevent LM integration when the SURFFLAG is set.
- 27) The V82 JOB priorities were all lowered to 7 in order that the V16N44 display (in a NOVAC) is withheld until the calculations (in a FINDVAC) are performed.
- 28) In the V82 case when Average G is on a CCS NEWJOB has been added in place of the DELAYJOB. This will save 1 DELAYJOB at a time when there could be too many DELAYJOBS.
- 29) A change was put into the INTERPRETER to make it possible for an RTB instruction to use a routine which returns via a TC Q.

- 30) QUICTRIG was made into a TC Q return routine in order that it can be called in interrupt as well as by an RTB instruction.
- 31) A correction has been made to clear the V94FLAG and the R57FLAG at the beginning of P23.
- 32) STARS~~AV2~~ and ~~US~~ are now equated in P23.
- 33) TRUNBIAS was changed from 2's to 1's complement in P23.
- 34) RTARG and ECSTEER were moved to be in consecutive locations with LAT(SPL), DELVSLV, TIG and DELLT4 for updates. (PCR 157). It was necessary for RTARG to be moved to unshared locations which this change also accomplished.
- 35) RTARG1 was moved from its temporary assignment of VAC5USE to RTARG's former location in E7.
- 36) Some R57, CONICS and KEPLER storage were moved from E7 to E3 to make room for RTARG and ECSTEER in E7.
- 37) Lambert was changed from a 2 to 4 sec cycle to a 2 to 2n sec cycle. (PCN #115)
- 38) INITVEL was rearranged to provide for separate entrances into the routine.
- 39) Unswitched erasables were shuffled to conform to NASA requirements.

Known Problems in Revision 200

- 1) Sometimes when the astronaut is using the DSKY at the time the R60 priority displays are being requested, the R60 display will never get up.
- 2) If CLOCKJOB has a display going at the time of an extended verb with displays, any keystroke selected after a response to the mark display and before ENDEXT will cause a 1206 ABORT.
- 3) R32 should check for the SURFFLAG and do an ALM/END if it is on.
- 4) There is an erasable conflict between POINTEX in P20 and VVECT in CONICS.
- 5) Serious core set overflow problems exist during CLOCKJOB in P40 when V82 or V83 are selected.
- 6) DOWNRUPTS are lost frequently during burns.
- 7) The VHF mark counter should be set in R32 for COLOSSUS only.
- 8) There could be 3 DELAYJOBS going on during P34 with P20 in the background. If V82 were selected at this time an ABORT would result since only 3 DELAYJOBS are allowed at a time and V82 has 1 DELAYJOB. The number of DELAYLOCS should be increased by one.
- 9) The PROCEED on the V16N45 display in P35 does not recompute a new TIG. This coding does not conform to the GSOP.

- 10) Several obsolete flag bits are in COLOSSUS. These should be deleted.
- 11) The new FLAGWRDS should be initialized in FRESH START.
- 12) XSMD is sharing with UPBUFF erasables which are in location 272. The update program does not allow updates to be made below the value in ENDSAFE which is 1063. Either ENDSAFE should be changed or a new spot will have to be found for XSMD.
- 13) The terminate on the V51 display in SXTMARK now goes to GOTOPOOH. This leaves extended verbs locked out, MARKSTAT set, etc.
- 14) The two verb lights appear on the DSKY during UPLINK when all displays should be locked out.
- 15) The position of XSMD in the UPBUFF area will have to be moved to prevent XSMD from being clobbered by P27 when XSMD is being uplinked.
- 16) The DRIFTFLG is not being initialized in FRESH START.
- 17) V41 and V42 both do a TC TESTXACT before doing a legality check on an active modes change. This means no other extended verb can get in.
- 18) The polynomial fit for T(X) in TFF should be changed to include a wider hyperbolic range.
- 19) V45 has been selected for the new W-MATRIX display in DANCE. To be consistent, a new verb should be assigned for the resetting of the SURFFLAG.
- 20) If a restart takes place 8 secs after coming out of STANDBY the restart logic will detect the AGC warning light and cause a FRESH START. This logic should be deleted since there is another way of getting a FRESH START (push ERROR RESET and MARK REJECT) if it is needed.
- 21) V46 for a non SATURN DAP should clear Bit 9 of Channel 12 to prevent garbage from going into the SATURN error counters.
- 22) The state of all moon flags after a FRESH START in the MOON vicinity should be looked into. Presently they are reset to indicate earth.
- 23) S11.1 has not been written for a Lunar environment. It has scaling problems now that P47 is using it.
- 24) It is possible for R53 to be doing a mark display at the same time R52 comes up with a prio display. The terminate on R52 goes to GOTOPOOH (V37 is a normal display). Since the R53 mark is a higher priority display the V37 display will go to sleep until the mark is answered.

Statistical Summary for COLOSSUS 200

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| 1) Number of modification changes | 67 |
| 2) Number of cards | 5000 |
| 3) Total fixed memory changes | +152 |

The following are versions of COLOSSUS:

<u>Rev.</u>	<u>Version</u>	<u>Testing Area</u>
183	BOBSCOL2	ENTRY
168	JALOSSUS	DAP
186	MOLASSES	P40s
186	ZELOSSUS	LAMBERT
190	MARRIAGE	Erasables

Note: There are no new contemplated changes or program notes this week.