Sealev
AG 255-70

THE CHARLES STARK DRAPER LABORATORY
A DIVISION OF MASSACHUSETTS INSTITUTE OF TECHNOLOGY
68 ALBANY STREET
CAMBRIDGE, MASSACHUSETTS 02139

MEMO

To: R. O'Donnell
From: D. Bowler
Date: 6 Oct. 1970
Subj: AGC Voltage Stress

Summary ± 40 volt ACE CNTRL1 - CNTRL2 inputs (W-910, W-911).

1. Tests run by Raytheon indicate power supply saturate

a. 4 Volt Supply

-40 volts	0.5 volt
+23 volts	5.3 volt
+40 volts	5.3 volt

b. 14 Volt Supply

-40 volts	3 volts
-20 volts	3 volts
+15 volts	18.1 volts
+40 volts	18.1 volts

a1. The 5.3 volts is not felt to be high enough to affect the micrologic (power dissipation wise). Breakdown voltages in Erasable driver VBE of 6320 are not stressed as breakdown is >5 volts and has a large resistor in series so that at worse (5.3-5)/2K ≐ 150 μamps.

a2. The 0.5 volt level will not keep the erasable drivers on (A14-STEK) as MYCLAMP or START2 will force them off when the 4 volts drops.

b1-2 There are no recognizable problems with the 14 volts increasing to 18 or decreasing to 3 volts.

2. It is difficult to picture the possibility of ± 40 volts being applied to the AGC in that it sounds like a double failure - one to have the high voltage another to not have a resistor in series with it.

3. A third consideration is - what kind of protection could the AGE equipment employ. A zener (assuming one could agree on a voltage) could burn out if there is no series resistance.

4. It might be possible to try this out on an AGC but unless something catastrophic happened one would have to go through a degradation study. The latter could be quite expensive and involved.

In summary, it doesn't look like the AGC will be damaged by the voltage stresses, it doesn't seem likely that the stress can happen and there does not seem to be any easy fix.

The recommendation is to leave the equipment alone.

Dist.
Ken Kido

THE CHARLES STARK DRAPER LABORATORY
A DIVISION OF MASSACHUSETTS INSTITUTE OF TECHNOLOGY
68 ALBANY STREET
CAMBRIDGE, MASSACHUSETTS 02139

25 September 1970

Mr. William Hefner
12214 Lakewood Blvd.
Downey, Calif. 90241

Dear Mr. Hefner:

Regarding our phone conversation relative to the possibility of the ACE equipment putting ±40 volts onto the W-910, W-911 power supply control lines.

At that time I indicated that I didn't think there was a problem and since then it has been pointed out that my analysis was incomplete.

Further analysis has indicated that there still is no problem. Some transistors could be stressed beyond their breakdown voltages but there are resistors in series with their bases that limit the current.

The circuitry involved in the ACE equipment is not very well defined in my own mind as it sounds like it would take two failures to get the 40 volts.

Everything considered to date would tend to support my initial statement that there is no problem.

Sincerely,

Donald J. Bowler

Donald J. Bowler

DJB:ms
cc: E.C. Hall
R. O'Donnell
R. Zagrodnick - Ray.
G. Silver
H. Howard EG