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5th July, 1960

I do not think it would be worthwhile publishing a  
daily report for Infuse at the moment while we are  
out war plugboards. It should be possible to  
see as the machine becomes operational.

The Director,  
G.C.H.Q.  
Cheltenham

(attention Mr. G.C. Kingsley)

I would be very interested to know how many are  
operational.  
Your recent letter on Colorob and Infuse has been  
received and your suggestions studied by both DX (Miss Dora  
Hills) and myself.

2. We have not completed the plugboard project so that  
Infuse at the moment is not operational; however, we are running  
at the moment a comprehensive set of test programs, one for each  
board. These tests have brought to light many faults, some  
caused by faulty wiring, others by component deterioration,  
whilst others have turned out to be design faults.

3. Monthly Maintenance Reports

The idea of exchange of reports on maintenance is I  
think a good one; and we would certainly wish to receive the  
W64A reports. If they were sent, I think the two copies as  
sent at present would be sufficient, a suitable distribution  
being (i) D.S.B. (file) 8/10/45 (ii) QB2. I am, however, a  
little uncertain about the column headings which are used in the  
W64A report. If we were to exchange reports on a regular basis  
I think precise definitions of how the figures were to be derived  
would be necessary; otherwise we may mean one thing, whilst you  
would interpret our figures in a different fashion.

I have been studying some figures supplied by  
MPRO-2, N.S.A. on their computer statistics; the columns they  
use may be of interest, myself I feel that they quite a good  
summary of their computer operation.

- A) Number of shifts worked
- B) Length of work week
- C) Scheduled maintenance
- D) Unscheduled maintenance
- E) Down time for modification, training, research
- F) Program assembly, debug, program modification, etc.
- G) Lost time. Time lost because jobs did not produce  
the desired results. The cause may be machine  
failure, operator error, program failure, etc.
- H) Effective running time. Time spent in pure  
production

I realise that this compilation represents both an  
operational and a maintenance report, but at times I wonder  
whether it is really possible to separate them.

-2-

I do not think it would be worthwhile publishing a detailed monthly report for Infuse at the moment while we are still sorting out our plugboards, it should be possible to publish one as soon as the machine becomes operational.

3. Colorob Staff

I would be very interested to know how many are permanently employed on Colorob, both Programmers and Engineering staff. On Infuse our Engineering staff is very small - one Engineer (QE2), and two Technical Officers. As you will appreciate, this is very small, as this staff has to carry out all the machine maintenance, and all the wiring necessary to finish off the plugboard project. We hope to recruit within a few months one Senior Technical Officer grade 2 and one grade 1.

4. Magnetic Drum

We have always had synchronising troubles, the drum occasionally going out of synch., for no obvious reason. Recently we put on the spare drum and found that it was far worse than the older drum. This has been cured by reducing the voltage applied to the motor transformer from 235 volts down to 205 volts; it was found that this voltage was rather critical.

All drum cables (except synch. tracks) now pass through plugboards, one plugboard for the Read circuits, the other for the Write circuits. Intense oscillation was experienced, but by extensive earthing of the cables on the plugboard it has been stopped.

5. Counters

We have recently had similar trouble to you with our counter resets, and will be carrying out your suggested modification in the next few days.

6. Tape Reader

Recently whilst examining marginal operation of this circuitry, we found that + 300 volts regulated derived from chassis 12 and used in both the Tape Reader and chassis 09 was actually only 220 volts. This was found to be caused by chassis 09 drawing far too much current from the regulated supply (50 m.a. through a 1 watt 2.2K resistor). For the moment the +300 volts in chassis 09 is derived from the machine 300 volts general supply; it seems to be working satisfactorily.

7. Plugboards

I don't think we have described to you in detail how we have accomplished this modification, so some information on our layouts etc. I think would be in order.

~~SECRET~~

23C

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We have 8 plugboards, each 64 x 40, mounted one at each end of each face. On each of these boards are terminated 50 way cables coming via DD50 miniature plugs from the back of the chassis direct to pins on the back of the plugboard, leaving the chassis face clear of cables, except for the clocks, and clock repeaters.

The rack nearest the plugboard has two cables per chassis position, practically all other positions having only one cable. Two cables being used on chassis such as OR gates.

No interference troubles due to coupling between wires in the 50 way cables has been experienced, peak capacitive clamping on terminated cables conveniently preventing this.

A 50 way cable from each plugboard, to every other plugboard has been provided for interboard connections only 34 wires being used. A certain amount of heavy ringing has appeared on some of these cables, but only seems to be serious if the pulse has to travel very long distances, in and out a number of boards.

A centralised control unit has been installed, enabling the operation of the machine, and all switching except chassis switching to be done from a bank of 60 keys. These keys are all terminated on one plugboard where they are distributed to the solenoids of 12 relays on each plugboard. These relays enable much quite sophisticated switching to be done from the central position. It is hoped that this will greatly reduce operators errors in running the machine.

In addition to the lever keys four 6-position rotary switches and two eleven-position on the control panel, are to be terminated on a plugboard, and should be very useful.

Shortly we plan to rebuild the existing output table arranging all the Input Output controls together (including GO) cabling being taken from the back of chassis 28, 30, 31 to the control position for this purpose. One key will be provided to change from the High Speed Punch to the Typewriter. Another key is to be provided to change the Typewriter from the machine output, to an electromechanical tape reader; enabling all the results to be produced on the High Speed Punch if required, and typed out at the control position as necessary.

The neons and lamps on chassis 31 are being reproduced on the control position. No thought has been given to including more neons as register indicators, and I would be interested to know what circuits you used for this, are they the same as in chassis 31?

Our chassis arrangement seems now partly fixed, the

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28 July, 1960

**Drum Read and Write chassis and chassis 28 and 30 now being on face B, leaving face A clear for chassis which can indicate the state of the program, for for chassis with often used switch controls.**

Attention: Mr. S. G. [unclear]

Your recent letter on [unclear] and [unclear] has been received and your suggestions **Yours sincerely,** (Miss Dora Hills) and myself.

2. We have not completed the plugboard project so that [unclear] at the moment is not over [unclear]. However, we are running at the moment a comprehensive series of test programs, one for each board. These tests have brought to light many faults, some caused by faulty wiring, others by component deterioration, whilst others have turned out to be design faults.

**R.A. Bailey**

### 3. Monthly Maintenance Reports

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- A) Number of jobs worked
- B) Length of work cost
- C) Scheduled maintenance
- D) Unscheduled maintenance
- E) Down time for modification, training, repairs
- F) Program changes, testing, program modification, etc.
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