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MH file

: CHELTENHAM 5321 EXT.....

Room No.....



OAKLEY,

YOUR REFERENCE.....

PRIORS ROAD,

G.C.H.Q. REFERENCE A.C.E-28

CHELTENHAM, GLOS

20th November, 1956

Mr R.N. Thompson.
Director D.S.B.
(Attention M.H.) *MB*

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information removed.

Dear Sir,

Although Ricky has gone you may like answers to some of the questions in his last letter, MH/HCR/087. Glass' letter of 9th November deals with some of the topics raised and Bob discussed others while he was here.

IWP

2. Para 3. G.C.H.Q.'s delivery timetable is governed partly by your assembly plans. They are prepared to store some of the equipment which you won't need immediately rather than send it out now and clutter up your comparatively small working space. Therefore, they need your installation programme so they can despatch the right equipment at the right time. The matter appears to be under control at present as Glass has just written to Robinson and the latest IWP report should arrive next week. Your success in getting the machine assembled between April and August will obviously depend on the competence and experience of the recruits for the wiring job. The estimate of five months was based on the time taken by three skilled craftsmen so perhaps it is a little optimistic to expect B.S.B. to take no longer.

Glass is watching Singleton's progress and will let us know what he considers to be the best time for his return. Singleton himself is adamant that he should be back when assembly begins. He considers that only by "growing up with the machine" can he become completely familiar with it and expert in its maintenance.

IWP

3. Para 4. Glass is writing about test equipment. How much do you envisage working through G.C.H.Q. for components e.g. transformers type 82? Trevor should be able to make a good guess at this.

The programmers will need an oscilloscope when checking programs or fault-finding so, if possible, it would be better to get them one of their own rather than have them borrowing from the engineers.

Dispersed by SA of H.M. 2 JWS

4. Para 6. I have heard no more about this subject officially and next to nothing unofficially.

5. Para 7. No work has been done on the plug board for months and I should be very surprised if any is done before Colorob is commissioned. I should also be very surprised if we start work at D.S.B. with a plugboard. Nothing definite has been decided about the size, shape or number of boards but the most popular idea at present is to have 2 to 4 smaller boards rather than one large one. This would be more convenient from an engineering point of view and also, probably, for the programmers.

MHT

6. Para 8. No news of when you'll get the Letchworths: I bring this subject up every few weeks. The whole batch of typewriters was in far worse condition than was thought and no one can be spared at present to fix them. Shall I try to get the Infuse typewriter sent out early as was originally suggested?

MAWP

7. Para 9. (a) Although a defrmary output would be more convenient the present one is fairly flexible and should present no great difficulties. An output of x binary bits can be divided into a number of characters of from 1 to 5 bits each. Hence if the characters are of 3 bits each, the octal output could be expressed by the digits 0-7 (or any other combination of letters or digits) or if the characters are of 5 bits the 32 teleprinter characters could be used. The number of bits per character and the number of characters per answer are set up for each program on the dials of an output chassis. There are several additions to the

to the machine which should be considered before a denary output, and anyway it can be programmed if really needed.

(b) There would be little advantage in using Infuse for day to day decryption of [redacted] because of the time required to prepare tapes, plugup and check out programs. Infuse wasn't really designed for this type of job but if there were a large backlog of [redacted] messages it might be worth writing a program although it would not be easy.

MAWP

8. Para 10. I agree that it would be better to have Overheu learning something about Infuse than teaching himself crypt and that it is wise to have someone who can assist Robinson should the need arise. G.C.H.Q. has undertaken to supply D.S.B. with information about testing based on their experience with Colorob. Overheu could spend his time studying the G.C.H.Q. information when it arrives, but I should hesitate to recommend he be allowed to start designing his own testprograms at that stage. I think Trevor is in a better position than I to advise in this matter and, indeed, I thought that this is the type of work Trevor would be doing himself.

MAWP

Perhaps Overheu could design a fast multiplying unit for Infuse: it would be very useful as, at present, multipliers have to be programmed from standard units thus greatly reducing the number of units available for other functions. I think Robinson did some work on multipliers while he was here so he could be consulted if you want to follow up the idea.

9. Para 12.

NOTE

(a) Grouse has the right qualifications and his experience should help him to pick up programming quickly.

Note

(b) If we can get operators of Miss Hills' standard we must consider ourselves lucky. She used to run what is now W65d which controls the Colossi, Robinsons, Johnson etc, in fact all the older machines; she did all the programming and supervised the operators. Her qualifications, I believe, are a general degree in two maths and physics and a special degree in maths, both from Reading University.

10. Para 13. I discussed this paragraph with Singleton and he has sent me his recommendations which I am quoting verbatim:

completing statement

"After making enquiries from W 64, it seems that D.S.B. ^{need} used technical staff with a knowledge far in advance of that to be expected from a Technician/Senior Technician grade.

The maintenance here, on all machines, is divided into two parts.

1. Diagnosis, and correction, of operational faults.
2. Routine preventive maintenance.

Part one is the responsibility of an Experimental Officer, with the assistance of one or two Assistant Experimental Officers.

Part two is usually in the hands of two Technical Works Engineer grades, with the assistance of one or two skilled Craftsmen.

The whole is supervised by a Senior Engineer grade (S.E.O.) assisted by one other engineer, responsible for all the machines.

Apart from this; the installation, and operation for a period of at least six months, is carried out and supervised by the team of design engineers, who are always available should a major calamity occur. (We have Robinson & possibly Overheu)

* The engineer in charge of all "W" Division maintenance, has told me that he intends to start off Colorob with one E.O., two A.E.O., and two T.WE.3 grades; [5]

Now to D.S.B. problems. If one of the programme staff is also an engineer, prepared to diagnose and isolate faults, then I suggest two Senior Supt.Tech. grades, and two junior Supt.Tech. grades. This is definitely NOT excessive. All these people will have to be of the right type, with a strong interest in, and good knowledge of, electronic principles; and will need at least six months familiarisation on the machine, or wide experience on other computers. The High Speed Checker will give excellent experience and invaluable knowledge if staff can be recruited now, even though it is a D.C. machine and much smaller.

You will continued

* (prob. only 3 - see note at end) ~~TOP SECRET~~

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G.C.H.Q. REFERENCE A.C.E.28 cont.

CHELTENHAM, GLOS.

You will see from the foregoing that one Technician in addition to myself is totally inadequate, and though I have full confidence that we shall operate the machine successfully, I do feel that D.S.B. must appreciate the work involved, and recall the grades allotted to ML Technicians on the ground of Technical responsibility. Infuse is physically six times as big as the high speed checker, and technically much more complex.

I trust you will verify these facts, and try to impress on D.S.B. that they must have a technical staff of high quality and sufficient quantity. They cannot call in the reserves that G.C.H.Q. can.

I would point out that though G.C.H.Q. use Experimental Officer grades a lot on maintenance, I don't think it a suitable grade for D.S.B. Mainly because this is a junior scientific grade, consisting of younger people with an eye to promotion. Here, scope is wide enough, and they can remain in touch with their machine, but at D.S.B. it would mean training staff to lose them to a larger organisation.

The following is a suggestion to work from.

- One Engineer. Preferably a skilled programmer.
- Two Senior Supt.Tech.grades.
- Two junior Supt.Tech.grades.

It is foreseeable that this team could be flexible, and with the amount of electronic equipment at D.S.B. continually increasing, would create no disadvantage.

I think the estimated timetable for installation is very ambitious to say the least. If possible I would like to return as soon as work starts, so that if staff is by then recruited, I could perhaps pass to them, something of the learning I have amassed; and in any case, I want to see the growth of the complicated cableforms and overcome any snags as they occur.

Qualification
Please try to insist that any maintenance staff recruited are keenly interested in electronic equipment as opposed to FMG exchanges, etc. , and ask who ever may be conducting interviews to make sure that successful applicants know what a "trigger" and a "gate" do, and how a counter works."

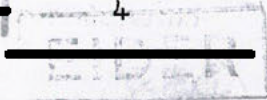
Eastway
On the whole, my own findings support Singleton's and, indeed, all the senior engineers to whom I've spoken are sure that D.S.B (in "Infuse Staffing Requirements - 12/9/56) is underestimating the grade of engineer required for maintaining Infuse.

rough sketch of what we want
The team suggested by Singleton may be a little large - perhaps to the extent of one junior Supt.Tech.grade. However I think we do need a graduate engineer and the matter hinges on the type of man we get. Perhaps the professional engineer you're hoping to recruit will be able to cope if the rest of his duties are not too arduous. Singleton was a TWE III when he was at G.C.H.Q. and TWE III is the lowest grade G.C.H.Q. wants to use on Colorob maintenance; I don't think we should recruit anyone with lower qualifications. He, of course, will have considerably more experience than most TWE III's by the time he returns. An important point is to get the staff now so Singleton won't have to spend too much of his time training them.

knowledge?
Singleton's findings
is not
next.
I hope that all programmers, not only those who are engineers (if we ever have a spare engineer to train as a programmer), will be able to diagnose faults and pin them down to a particular chassis. If this proves to be the case it will greatly reduce the strain on the diagnostic maintenance engineer for it will mean that a dud chassis can be switched immediately for a good one and sent to the workshop for repair. But the assistance of a professional engineer would still be needed to isolate some of the more obscure faults.

11. continued

~~TOP SECRET~~



Order cancelled 3/12/56
11. Para 14. I shall be getting "Principles of Numerical Analysis" at the first opportunity. If you haven't already bought "Theory of Matrices", & have no immediate need of it at D.S.B. I should like to get it out here.

12. The present drum price of £1950 may well be exceeded as Ferrantis are renowned for bumping up early estimates. The information may be of little use or comfort to you but I thought I'd pass it on.

Yours
Tony

* Take information from Glass suggest that because of the shortage of staff it is unlikely that his complement will be reeled even initially. Once the machine has proved itself it is hoped that a team of 3 will suffice to keep it going. Of course at GCHQ other engineers are always on call should a serious fault develop & can stand in when members of the regular team are absent. A.H.

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