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IL 4015-A
Report #P 111
7 November 1944

SUBJECT: Fish Notes
TO : CO, SSA, War Dept.

1. Enclosed is Sixta non-Morse report for week ending 2 November 1944 sent to E Branch.

2. Regular weekly Dragon reports are now being prepared. The first two of these are enclosed. The term "inexplicable failures" in the second report is perhaps a bit strong. However, a message is not considered "failed" until at least 6 cribs have been dragged through without success. The cribs used are all fairly good and the probability that none of them is in the message is very small. The most probable causes of failure are:- (1) Error in chi settings; (2) Textual corruption; (3) None of cribs in message; (4) Mechanical defect; (5) Error in setting patterns on Dragon; (6) Improper deletion. There are other possibilities such as error in plugging up the crib, error in preparing dechi tape, error in hand-testing stops - but all of these are most unlikely. Item (6) is more likely with low dottage messages (for which Dragon is principally being used) but the probability is only $6\frac{1}{2}$ per cent for a 10-letter crib even when the number of dots is only 15. For 22 dots it is 1.8 per cent and for 28 about $\frac{1}{4}$ per cent. The formula is simply $9(1-b)^{28}$ and $(1-b)$ is $\frac{37-n}{74-n}$

the number of $\sqrt{37}$ dots. Low dottage also leads to increased likelihood of failure due to (1).

Walter J. Fried
Capt. Signal Corps

Encl. - 8 pages
1 page
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*This is an approximation. True probability is $1-[1-(1-b)^5]^9$.

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Annex 2

COPY
DRAGON

REPORT NO. 1

Week beginning Friday, 20 October 1944

1. Production.

7 messages broken. The machine was out of order for two complete days and one day was unprofitably used on messages of very high dottage.

2. The organising of supply has been improved and a list of instructions for DRAGON workers has been compiled. More operators and breakers have been trained.

3. Notes on the Proposal to Fit an Electromatic Typewriter.

After consulting the engineers, I oppose this on the following grounds:-

(a) It will probably not stand the strain and much time will be lost over breakdowns.

(b) DRAGON running time will be wasted for the carriage return operation every 31 letters.

(c) If the typewriter is used actually to print a de X as was suggested, it will be unchecked and without marked pauses and therefore less reliable than a Newmanry de X. If an old de X is fed into it, objections (a) and (b) still hold, together with the difficulty of irregular line spacing in the de X being fed in.

(d) The manipulation of the de X sheet and the tape for each new drag-run would waste further time.

Alternative suggestion. A thoroughly good electrical comptometer in the scale of 31 which can be returned to zero by a switch. This I am having made by our engineers - it appears to be an easy job and the material is to hand.

4. A short but adequate daily test-run is being devised.

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Major TESTER
Mr. MASTERS
Capt. MCINTOSH

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DRAGON

REPORT NO. 2

Week beginning Friday, 27 October 1944

1. Production.

16 messages broken. The machine was not used during the equivalent of two complete days, owing to (a) mechanical defects (b) test runs (c) lack of breakers (three shifts missed)

2. On October 25 steps were taken at a meeting to ensure that all external information about the contents of messages to be run on DRAGON shall be delivered to Dragon-room along with the message. At present such information is being used very rarely and we are relying on standard common words. In future it is hoped to make more profitable specialised runs on the basis of this external information.

3. The Electromatic Typewriter (see Report 1, para. 3). It was decided at a meeting on Oct. 25 to shelve the idea of an electromatic typewriter chiefly on the grounds outlined in Report 1.

4. The standard daily test tape has been perfected and used; if the machine is in order the whole test should not take more than 15 minutes.

5. An analysis of the log book up to and including the 1st November reveals the following numbers of messages broken and failed on the various dottages involved:

15	16	17	18	19	20	21	22	23	24	25	26	27	28
B	F	B	F	B	F	B	F	B	F	B	F	B	F
17	12	7	8	0	9	0	11	0	0	6	11	8	2
1	12	3	5	3	2	1	12	3	5	3	2	1	6
1	1	6	1	2	1	0	0	0	4				

Total broken = 57
" failed = 75
" run = 132

8 of the messages under "failed" were broken by hand before the DRAGON runs were completed. At least 19 others

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Annex 3

were marked as being probably off on one or more X settings. The number of inexplicable failures is therefore 48 and not 75. Where a message is known to be off on a particular impulse it is profitable to run it on four impulses with long drag-words (though only two such messages have been broken thus. A doubtful message where no particular impulse is suspected is a time-wasting proposition.

6. In addition to the electrical comptometer mentioned in Report 1, para. 4, a dashboard is being fitted on which appear (in teleprinter alphabet) the last 5 de X letters of any break at which the DRAGON stops. This cuts out the delay in inspecting the de X tape and saves wear and tear on the tape as well.
10. We have now a good statistical analysis of GURNARD language.

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4th November 1944.

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