ALBATROSS STECKER

When we assume a fixed stecker distance there are, in general three possible steckers for any letter x, viz. x - d, x, and x + d. Where d is the distance assumed. When x is near the beginning or end of the alphabet the number of possible steckers may reduce to two.

STRENGTH OF MENUS

(i) For each letter on the menu whose steckers are restricted the reduction factor is,

$$\frac{26}{3} \cong 9 \quad \text{for 3 possible steckers}$$

$$\frac{26}{2} \cong 13 \quad \text{for 2 possible steckers}$$

(ii) Closures give a reduction factor of 26 in the usual way.

(iii) If there is on the menu a pair of letters distant d apart in the alphabet this also reduces steps because of the chance of a confirmation between them. An approximate value for the reduction can be obtained by assuming that NO STOP (except of course the right one) has a confirmation. For chart chains this is very clearly true.

(iv) The diagonal board has practically no effect on the number of stops, and so menus should normally be run DUMMY LETTER to decrease the number of commons needed (when Coupling Plugs are used). Subsidiary chains, with no input on them, are almost useless and should not be included (except for throwing out stops).

If we do not want to make any assumptions at all about certain letters, (e.g. if the man starts going haywire at the end of the alphabet), then such letters will of course give no reduction. Keys will only be useful, therefore, if they help to join up letters whose stecker are restricted, and will be useless at the ends of outgoing links.

(v) The total number of possibilities - which has to be reduced by the above reduction factors – is,

$26^4 \approx 450{,}000$ for S.I.

$26^5 \approx 12{,}000{,}000$ for D.I.

(vi) The number of stories is almost equal to the number of stops – because of the small number of letters on the menu.

(vii) It is much better for each producer of a menu to work out for himself the number of stops it will give. It would be difficult to compile a comprehensive table.

e.g.
5_0 stops per w.o. =

6_0 stops per w.o. =

4_0+3_0 stops per w.o. =

4_0+2_1 stops per w.o. =

etc.

N.B.

$2^2 = 4$	$3^2 = 9$	$26^2 = 676$
$2^3 = 8$	$3^3 = 27$	$26^3 = 17,576$
$2^4 = 16$	$3^4 = 81$	$26^3 = 17,576$
$2^5 = 32$	$3^5 = 243$	
$2^6 = 64$	$3^6 = 729$	
$2^7 = 128$	$3^7 = 2187$	

PREPARATION OF MENUS

As stops are rather difficult to throw out try to produce menus giving about ▯ stop per w.o. rather than 1 stop per w.o.

N.R. COPY

(i) Give the legal steckers for every letter of the alphabet, marking with an asterisk the letters on the menu.

(ii) Provide plenty to throw out on – i.e. either the crib, or, for cilli menus, extra constatations not used on the menu.

BOMBE COPY

A. For O.B.'s – with Coupling Plugs.
Write out as follows::-
P plug in all except M P S
V plug in all except S V Y
etc.

For the letters P, v. etc. on the chain.

In EITHER case give also the legal steckers of the letters ON the chain as well as the above plugging instructions A or B. This makes things easier for the Wren checkers.

One Coupling Plug is needed for each letter on the menu (whose stecker is restricted). At present the distribution of plugs is,

B.P. 6 Wavendon 12 Stanmore 24

Most Bombes will run these jobs with Coupling Plugs, though it is probably best to stick to the same ones as far as possible. It is better to run the jobs on O.B.'s rather than on the Stecker knock-out Jumbos.

O.H.L.

4/9/43