



Le Batco

Par Daniel TANT

Voici une variante du slidex utilisé par de nombreux pays pendant la Seconde guerre mondiale. Son nom est une contraction de « Battle Code ». Il était utilisé par l'armée britannique à partir de 1984.

Il se présente sous la forme d'un petit classeur vert à 2 anneaux, au format de 21 X 14,5 cms. Il comporte deux pochettes transparentes souples dans les couvertures et une pochette rigide équipée d'un curseur numéroté, fendu d'une fenêtre de lecture horizontale pour laisser apparaître les caractères.

L'opérateur dispose de documents ayant une durée d'utilisation de 24 heures :

Une carte Batco.

Plusieurs cartes de vocabulaire.

La carte Batco se compose en haut des informations générales : « Diffusion restreinte », édition, N° de page, période d'utilisation du Au....

En dessous à gauche, les « settings », rectangle vertical composé de 5 colonnes. Chaque colonne est numérotée en haut d'un chiffre de 2 à 6 et chacune dispose d'un alphabet dans un ordre aléatoire. Une septième colonne est encadrée de 2 traits. Cette dernière est réservée aux messages urgents ou si l'ordre est donné par une autorité supérieure.

A droite du rectangle « settings », les alphabets chiffrés disposés en 13 groupes de 2 lettres. Chaque ligne représente un alphabet aléatoire et l'on ne peut trouver deux fois la même lettre sur la même ligne. Le tout se présente sous la forme de colonnes numérotées de 0 à 9. Il existe deux colonnes 00, chiffre qui revient souvent, pour éviter les compromissions.

Sous le rectangle settings, le rectangle spelling Box, c'est une boîte d'épellation qui permet de coder les lettres de l'alphabet une par une. Il ne comprend qu'un alphabet dans un ordre aléatoire.

Chaque ligne du message ainsi codé commence par un ensemble d'un chiffre et une lettre. Dans le premier exemple cité en annexe APPX3 to Annex A, il suffit de descendre la règle amovible jusqu'à ce que le R (au bas de la colonne) apparaisse dans la colonne numérotée 2 à gauche. Le premier groupe chiffré est composé de la lettre Q que l'on trouve sous le chiffre 3 et du R situé sous le 9 : ce qui donne 39. Le choix des lettres est laissé à la discrétion de l'opérateur. Dans ce cas, 39 peut correspondre à QR, QL, YR ou YL.

L'opérateur ne peut coder que 22 nombres au maximum dans un message et changer de clé à chaque nouveau message.

L'ensemble Batco comporte également des cartes de vocabulaire comprenant chacune un certain nombre de mots ou groupes de mots correspondant à un nombre à 2 chiffres. Chaque feuille comporte des formules numérotées de 00 à 99. les numéros 35 et 68 sont réservés au changement de feuille, certaines ayant des numéros valides pour y inscrire préalablement des informations adaptées aux circonstances particulières.

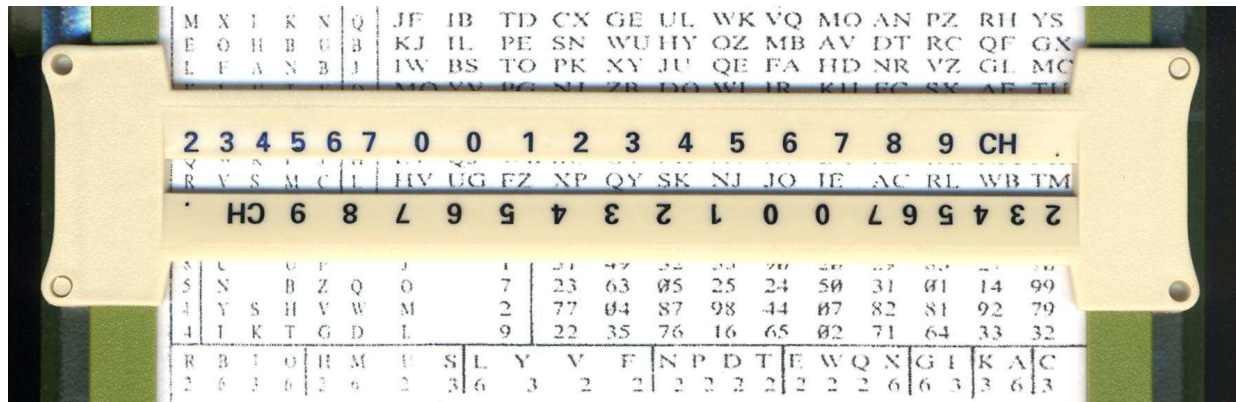
Il est interdit de transmettre en clair les noms de militaires, les indications de lieux, les noms de régiments ou d'unités. Pour épeler, le message doit indiquer par un nombre qu'un mot commence à être épelé, suivi des lettres CH à la fin.

CH remplace un point dans les nombres décimaux qui sont souvent utilisés pour les fréquences radio.

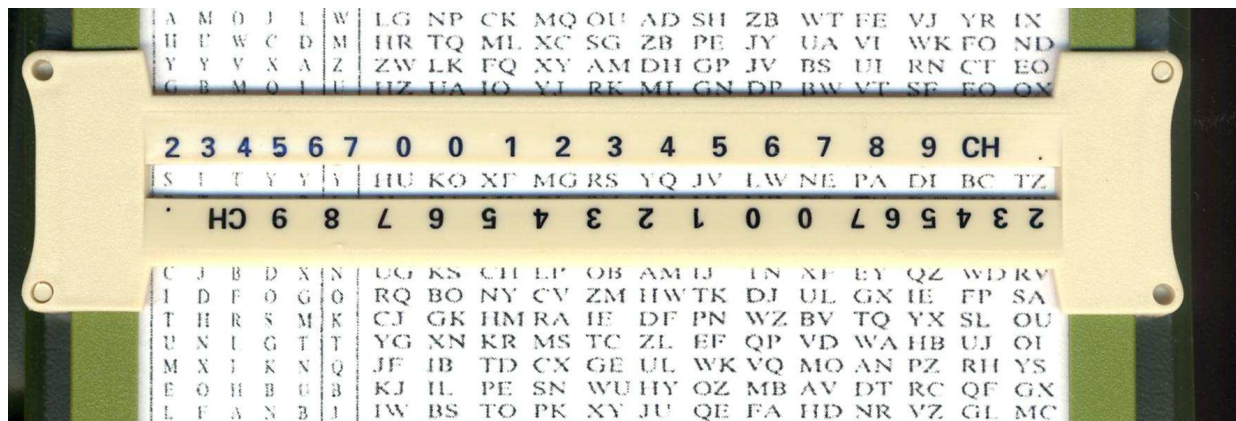
Pour indiquer le codage d'un nombre indéfini, il doit se trouver entre « figures » au début, et « CH » à la fin.

L'indicateur de bas de page Batco permet d'authentifier la station émettrice, ce qui évite de prendre en compte les faux messages ennemis.

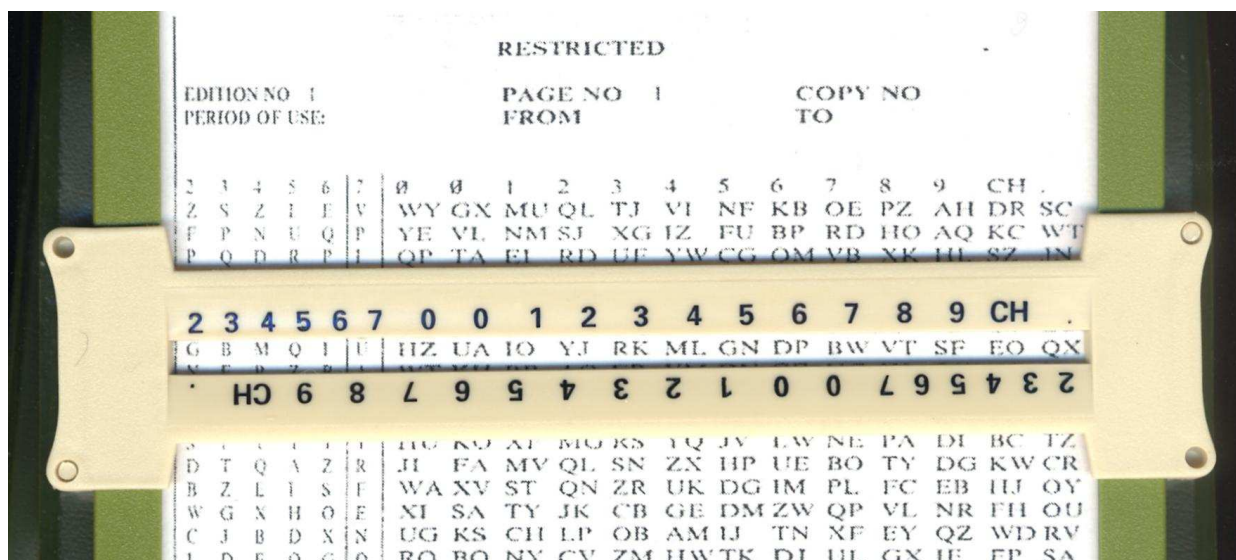
Dans un système de camouflage comme le slidex, seuls les mots principaux sont codés, ce qui fragilise la sécurité de la transmission. Dans le Batco, tous les mots et nombres sont codés. De plus, le système des « settings » correspond à une clé de départ, ce qui diminue les risques de compromission.



1^{er} exemple cité dans le manuel ci-après



2^{ème} exemple cité dans le manuel



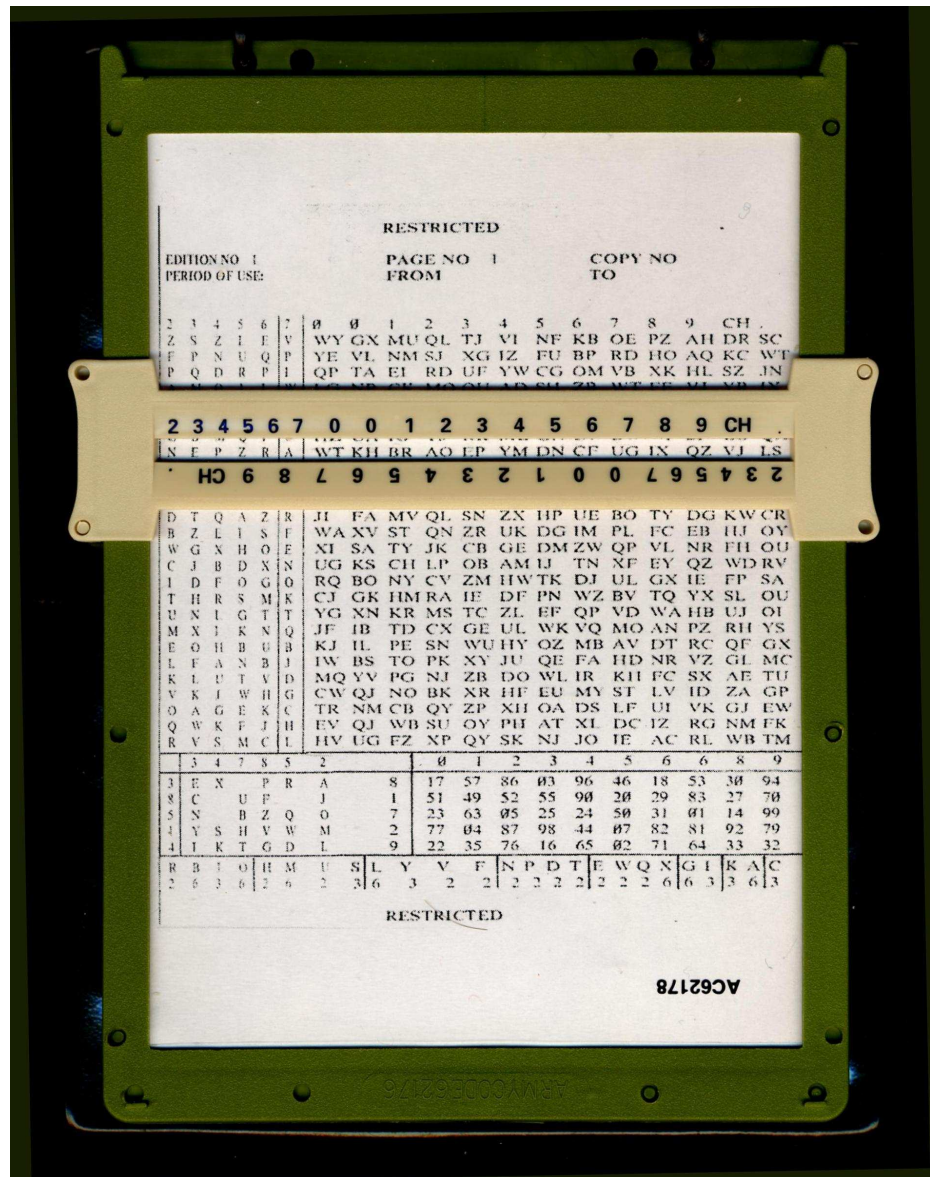
3^{ème} exemple



La pochette du Batco fermée.

La fermeture est assurée par une bande velcro.

Vue générale de la grille de codage prête à l'emploi.



**SIGNAL COMMUNICATIONS
IN THE ARMY**

VOLUME IV

COMMUNICATIONS PROCEDURES

PAMPHLET No. 2

VOICE PROCEDURE

This pamphlet supersedes
Pamphlet No. 2 Voice Procedure dated Nov 78 and
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MINISTRY OF DEFENCE
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BATCO

Introduction

1. BATCO is a paper numerical code. It has been specifically designed for ease of use, therefore the security protection it provides depends on strict adherence to the rules of use. Unauthorized adaptation of these rules weakens the code and is forbidden.

Description

2. BATCO is printed in sheet form which fits into a purpose-made wallet; the latter also incorporates a sliding cursor to aid use. A single page is normally valid for one day or 24 hour period. In addition to the code, an authentication table and callsign indicators are printed on the page.

3. An example of a BATCO page is given at **APPENDIX 1**. The sheet consists of four main parts which are:

- a. *Heading*. The heading gives the edition, page and copy numbers and space in which to record the period of use. An edition consists of 36 pages.
- b. *Settings*. On the left-hand side are the cursor settings consisting of six numbered columns each comprising a scrambled alphabet. A column number and letter, eg '3D', sets the row of cipher alphabet to be used (this is the same row set by '2I', '4F', '5O', '6G' and '7O').
- c. *Cipher Alphabets*. On the right-hand side are the cipher alphabets, comprising 26 horizontal lines of scrambled alphabet with the letters printed in pairs. The plain text numbers 0 to 9 and two symbols are printed at the top with 0 repeated. The cursor has the column numbers and plain text numerals and symbols engraved on it.
- d. *Spelling Box*. The spelling box provides a method of spelling with BATCO.

4. *Vocabulary Cards*. Vocabulary cards are used to send plain text phrases or formats. Each phrase, etc is allocated a 2-digit number between 00 and 99 inclusive, and that number is encoded to send the phrase. Examples of vocabulary cards are given at **APPENDIX 2**.

5. *Code Compartment*. Unless otherwise directed by commands the same code sheet will be used on all nets in the unit or battle group.

Method of Use

6. The row of cipher alphabet to be used is indicated by the number and letter from the column as explained in sub-paragraph 3b above, and the cursor set accordingly. The first setting to be used on the net is dictated by the combination of the primary callsign indicator (CI) in use on the net and the number printed below it. For example, if the primary CI for the unit command net is 'T' then the starting setting would be '2T'; if, within the same unit, the primary CI on a company net was 'M' then the starting setting for that net would be '6M', and so throughout the unit nets. Subsequent settings are taken alphabetically within columns, continuing through the columns 2 to 6

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ANNEX A

numerically. In the first example, the next settings would be '2U', '2V', '2W', '2X', '2Y', '2Z', '3A' etc, continuing through columns 3, 4, 5, 6, and 2 to '2S'. Normally a sheet is exhausted when the starting point is reached again and should not be used further. Subject to command authorization, if there is a small number of messages, less than five for example, to be sent before the time the sheet would normally expire, then column 7 may be used. It is emphasized that this would be an exceptional procedure and is not to be treated as a matter of routine.

7. The plain text is encoded by reading off *either* of the two letters underneath the digit or symbol. Where there is repetition of a digit or symbol the alternative letter should be used. Plain text is recovered from an encoded message by the reverse process.

Message Procedure

8. General Rules.

- a. Unless the proword GRID or NICK is used (*see* paras 9 and 10), the first bi-gram of a BATCO message encodes a vocabulary number from the primary card in use on the net (this card will be detailed in the CEI). On certain nets, eg artillery and formation nets where a large number of cards are in use, the first bi-gram is the card number—instructions will be given in the CEI. From this, the application of succeeding bi-grams will be clear, being either numbers or vocabulary number. Confusion may arise when, in the same message, BATCO encoded information is interspersed with plain text. If it is not possible to avoid this situation by re-structuring the message, it must be assumed that the first bi-gram of each BATCO portion refers to a vocabulary number.
- b. Some vocabulary numbers introduce simple formats like 'move to GRID (6 figs)'. The missing figures are sent, encoded, immediately following the vocabulary number (*see Example 2* in APPENDIX 3). On decoding the numbers are inserted in the appropriate place in the format.
- c. Vocabulary numbers also introduce more complex formats, eg PERS REP, COMBAT REP etc. These formats are sent serial by serial encoding both the random serial number and its contents. Serials which do not apply are omitted. (*See Example 3* in APPENDIX 3).
- d. When an undefined number is being encoded, ie a quantity, the word 'quantity' is extracted from the Vocab Card indicating the start, and the symbol 'CH' is used to denote the end of the number and means that the next bi-gram will be a vocabulary number.
- e. In order to maintain the integrity of the code and hence the protection it provides, the following rules apply:
 - (1) No more than 22 digits (11 bi-grams) must be encoded using one setting; if the message is longer than 22 digits the next setting (or settings) must be used for the balance of the message. Where the combined length of a question and its immediate answer is no more than 22 digits the same row may be used; otherwise the 'safe' rule is to use a new key setting for each message. When a message is longer than 22 digits, the change should be

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made at a suitable point in the text before the 22nd digit, eg if there are four grid references to be sent, two should be sent on each setting.

- (2) The code is strong enough to permit the occasional or accidental repetitive use of the same setting on each net. Consequently, if a station is preparing a long message on one setting and discovers that another station has transmitted a message using the same setting, it may continue with the preparation and transmit the message without changing the setting.
 - (3) Should a station lose track of the progression through the settings, it should ask the control station which setting to use.
- f. Don'ts:
- (1) Do not choose BATCO settings at random.
 - (2) Do not encode more than 22 digits per setting.

9. **Grid References.** Where the only portion of the message to be encoded is a grid reference, then the proword GRID is used followed by the grid reference directly encoded in BATCO. For unit use it will not normally be necessary to use the UTM designating letters to avoid ambiguity of location, but where this is necessary grid references are to be encoded complete, using the vocabulary number for the appropriate designator.

10. **Nicknumbers.** Nicknumbers are encoded in the same way as grid references, using the proword NICK instead of GRID.

11. **Spelling.** Spelling with BATCO is authorized only when no suitable vocabulary is available in vocabulary cards and sending the text clear would give the enemy useful information; for example, names of servicemen, locations which cannot be sufficiently described by a grid reference and items specific to a unit's type or function. Spelling is achieved through the spelling box, where a letter is identified by its column and row number, for example A is 23, P is 83, T is 74 and so on. These are then encoded, introduced by a vocabulary number which means 'Spelling starts', and concluded with the letter representing the 'CH' symbol in the plain text on the BATCO sheet.

12. **Sending.** In order to facilitate decoding and reduce the signature of some formatted texts, BATCO should be sent as follows:

- a. The key setting to be sent immediately before the first bi-gram on that setting.
- b. Where encoded text produces bi-grams, eg a vocab number or encoded grid reference, these are to be sent as bi-grams, eg '123456' would be sent as 'AB CD EF'.
- c. Where the encoded text is a 3,5, etc figure group, then bi-grams are to be sent except for the last three digits which are sent as a tri-gram, eg the number '6,457,320' would be sent as 'AB CD EFG'.
- d. Where CH or a decimal point stands alone it is combined with the preceding bi-gram and sent as a tri-gram, eg the number '47.75' would be sent as 'ABC DE' (where C = decimal point).

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13. *Examples.* Further examples are given in **APPENDIX 3.**

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APPX 1 TO
ANNEX A

SPECIMEN BATCO CARD

Heading

EDITION NO 1
PERIOD OF USE:

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PAGE NO 1
FROM

COPY NO
TO

Column
Numbers

2	3	4	5	6	7	Ø	Ø	1	2	3	4	5	6	7	8	9	CH
Z	S	Z	L	E	V	WY	GX	MU	QL	TJ	VI	NF	KB	OE	PZ	AH	DR
F	P	N	U	Q	P	YE	VL	NM	SJ	XG	IZ	FU	BP	RD	HO	AQ	KC
P	Q	D	R	P	I	QP	TA	EI	RD	UF	YW	CG	OM	VB	XK	HL	SZ
A	M	O	J	L	W	LG	NP	CK	MQ	OU	AD	SH	ZB	WT	FE	VJ	YR
H	U	W	C	D	M	HR	TQ	ML	XC	SG	ZB	PE	JY	UA	VI	WK	FO
Y	Y	V	X	A	Z	ZW	LK	FQ	XY	AM	DH	GP	JV	BS	UI	RN	CT
G	B	M	Q	I	U	HZ	UA	IO	YJ	RK	ML	GN	DP	BW	VT	SF	EO
N	E	P	Z	R	A	WT	KH	BR	AO	EP	YM	DN	CF	UG	IX	QZ	VJ
J	R	Y	V	F	S	GR	BQ	VL	EK	AZ	XH	SP	UC	FD	NI	JM	YO
X	C	C	P	W	X	AH	JD	WE	TK	YL	VU	CN	OP	QS	FZ	IR	MB
S	I	T	Y	Y	Y	HU	KO	XF	MGRS	YQ	JV	LW	NE	PA	DI	BC	TZ
D	T	Q	A	Z	R	JI	FA	MV	QL	SN	ZX	HP	UE	BO	TY	DG	KW
B	Z	E	I	S	F	WA	XV	ST	QN	ZR	UK	DG	IM	PL	FC	EB	HJ
W	G	X	H	O	E	XI	SA	TY	JK	CB	GE	DM	ZW	QP	VL	NR	FH
C	J	B	D	X	N	UG	KS	CH	LP	OB	AM	IJ	TN	XF	EY	QZ	WDRV
I	D	F	O	G	O	RQ	BO	NY	CV	ZM	HW	TK	DJ	UL	GX	IE	FP
T	H	R	S	M	K	CJ	GK	HM	RA	IE	DF	PN	WZ	BV	TQ	YX	SL
U	N	L	G	T	T	YG	XN	KR	MS	TC	ZL	EF	QP	VD	WA	HB	UJ
M	X	I	K	N	Q	JF	IB	TD	CX	GE	UL	WK	VQ	MO	AN	PZ	RH
E	O	H	B	U	B	KJ	IL	PE	SN	WU	HY	OZ	MB	AV	DT	RC	QF
L	F	A	N	B	J	IW	BS	TO	PK	XY	JU	QE	FA	HD	NR	VZ	GL
K	L	U	T	V	D	MQ	YV	PG	NJ	ZB	DO	WL	IR	KH	FC	SX	AE
V	K	J	W	H	G	CW	QJ	NO	BK	XR	HF	EU	MY	ST	LV	ID	ZA
O	A	G	E	K	C	TR	NM	CB	QY	ZP	XH	OA	DS	LF	UI	VK	GJ
Q	W	K	F	J	H	EV	QJ	WB	SU	OY	PH	AT	XL	DC	IZ	RG	NM
R	V	S	M	C	L	HV	UG	FZ	XP	QY	SK	NJ	JO	IE	AC	RL	WB

Plain
Text

Settings

Cipher
Alphabets

Spelling
Box

	3	4	7	8	5	2	Ø	1	2	3	4	5	6	6	8	9
3	E	X		P	R	A	8	17	57	86	Ø3	96	46	18	53	3Ø
8	C		U	F		J	1	51	49	52	55	9Ø	2Ø	29	83	27
5	N		B	Z	Q	O	7	23	63	Ø5	25	24	5Ø	31	Ø1	14
1	Y	S	H	V	W	M	2	77	Ø4	87	98	44	Ø7	82	81	92
4	I	K	T	G	D	L	9	22	35	76	16	65	Ø2	71	64	33

Authenti-
cation Table

Starting
Column
Indicators

R	B	J	O	H	M	U	S	L	Y	V	F	N	P	D	T	E	W	Q	X	G	I	K	A	C
2	6	3	6	2	6	2	3	6	3	2	2	2	2	2	2	2	2	2	6	6	3	3	6	3

Callsign
Indicators

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**APPX 2 TO
ANNEX A**

VOCABULARY CARDS

1. Vocabulary cards are a method of representing plain text by numbers (between 00 and 99) which can then be encoded. Just because a word or phrase is included in a card, it does not mean it must be encoded every time it appears in the text of a message.

2. The derivation and subsequent editing of vocabulary cards is:

- a. G1, G2, G3 and G4 Cards—The General Staff of the theatre/command.
- b. Special to Arm Cards—the appropriate Arm or Service School in consultation with commands.

Cards are numbered and produced centrally under the direction of DSS(A) Signals 36a. A 'Blank' card like Card 03, for nicknames, report lines, routes, etc applicable to a particular operation may also be produced. It should not be used as a routine substitute for the universal cards.

3. Although there are many cards, the needs of each net should be satisfied by three or four appropriate to the function of the net. The primary card referred to in para 8a is the lowest numbered of those in use on each net. Examples of three cards (G2/G3, G1/G4 and unit card) are given on pages A2-2 to A2-4. These cards are used in the *Examples* given in APPENDIX 3.

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**APPX 2 TO
ANNEX A**

BATCO VOCABULARY CARD 01

OPERATIONS (G2/G3)

00	Change to card (2 figs)	34	Spelling starts	67	Figures
01	NOT A DRILL/EX MESSAGE. Real action required	35	Change to card 02	68	Change to card 03
COMMUNICATIONS		DIRECTION		69	Kilometres
02	Impose radio silence	36	North	70	Metres
03	Break radio silence	37	South	71	Minefd from GR (6 figs) to GR (6 figs)
04	Lift radio silence	38	East	72	Move to grid (6 figs)
05	Close down until (4 figs) hrs	39	West	73	My loc GR (6 figs)
06	Start ECCM Plan	40	(3 figs) Northing	74	No/not/nil
07	Stop ECCM Plan	41	(3 figs) Easting	75	O Gp at GR (6 figs)
08	Start anti-jam rebro	42	Left	76	OP
09	Stop anti-jam rebro	43	Right	77	Orders
10	Set up rebro at GR (6 figs)	44	Left flanking	78	Phase (2 figs)
11	Change to f. . . (3 figs)	45	Right flanking	79	Preliminary orders
12	Search for stragglers on f. . . (3 figs)	46	Approach from	80	Ptl
13	Use CI (1 letter from spelling box)	47	Centre/axis (4 figs) mils	81	Reinforcement
14	Authenticate (2 figs)	OPERATIONS		82	Rel pt is GR (6 figs)
15	I Authenticate (2 figs)	48	Adv	83	Rd
NBC		49	Assy area is GR (6 figs)	84	Radio orders at (4 figs) hrs
16	NBC State Low	50	Attack	85	Replen at GR (6 figs)
17	NBC State medium	51	Blown/destroyed	86	Reserve
18	NBC State High	52	Br	87	Res dml
19	NBC State Black	53	Cancel(led)	88	Res dml site (3 figs)
20		54	Cross(ing)	89	R Gp at GR (6 figs)
TIMINGS		55	Defence(sive)/ Defend	90	River
21	At (6 figs) hrs	56	Dismounting area is GR (6 figs)	91	Rly
22	From (4 figs) hrs	57	En	92	RV at GR (6 figs)
23	To (4 figs) hrs	58	FEBA	93	SL from GR (6 figs) to GR (6 figs)
24	ETA (4 figs) hrs	59	Fire base is at GR (6 figs)	94	Tgt/Objective
25	(3 figs) mins notice to move	60	From GR (6 figs) to GR (6 figs)	95	To seize
26	No move before (4 figs) hrs	61	FUP at GR (6 figs)	96	Warning Order
27	H hr is at (4 figs) hrs	62	Grid	97	Wdr
28	Time out (4 figs) hrs	63	Hide is at GR (6 figs)	98	Yes/affirmative
29	Time in (4 figs) hrs	64		99	Z Muster at GR (6 figs)
30		65			
31		66			
32					
33					

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APPX 2 TO
ANNEX A

BATCO VOCABULARY CARD 02

LOGISTICS (G1/G4)

00	Change to card (2 figs)	34	Spelling starts	67	Figures
01	NOT A DRILL/EX MESSAGE. Real action required	35	Change to card 01	68	Change to card 03
COMD AND CON		36	Replen at GR (6 figs)	69	Amb
02	A1 Ech	37	Replace(ment)	70	AFV 434
03	A2 Ech	38	Route GR/GR etc	71	AFV 435
04	Approach from	39	Second line	72	Br layer
05	At GR (6 figs)	40	South	73	CET
06	At (4 figs) hrs	41	Standard load	74	Control Tank
07	B Ech	42	West	75	C Sups
08	Cas	43	Yes/affirmative	76	Dieso
09	Cancel(led)	AMMO		77	Def stores
10	Cfm(ed)	44	Ammo	78	Fox
11	Closed(d)	45	APDS	79	FRT
12	Complete(d)	46	APFDS	80	Gun Tank
13	Day(s)	47	APSE	81	HMLC
14	Demand(ed)	48	Ball	82	IRG
15	Draw(n)	49	Belt	83	Jerrycans
16	Dump(s)(ed)	50	Grenades	84	Litres
17	East	51	HE/HESH	85	Petrol
18	ETA (4 figs) hrs	52	Illum	86	Rat
19	ETD (4 figs) hrs	53	Milan (Missiles)	87	Scimitar
20	Empty(ies)	54	Mines	88	Scorpion
21	Estb(ed)	55	mm	89	Sultan
22	F Ech	56	Smoke	90	Stores
23	First line	57	Tracer	91	Tlr
24	From (4 figs) hrs	VEHS, STORES AND EQPT		92	Ton(s)
25	From	58	APC (Comd)	93	Vehs
26	How many/much	59	APC (Sect)	94	Water (point)
27	Issue(s)	60	APC (Mor)	95	3/4 ton FFR
28	No-not-nil	61	ARV	96	3/4 ton GS
29	North	62	AVRE	97	1/2 ton FFR
30	Ni	63		98	1/2 ton GS
31	Open(s)	64		99	4 ton MK
32	Qty(ies)	65			
33	Require(d)(ment)	66			

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APPX 2 TO ANNEX A

BATCO VOCABULARY CARD 03

UNIT CARD

00	Change to card (2 figs)	34	Spelling starts	67	Figures
01	NOT A DRILL/EX MESSAGE. Real action required	35	Change to card 02	68	Change to card 03
02	(3 figs) Northing	36	(3 figs) Easting	69	CAS REP
03		37		70	COMBAT REP
04		38		71	CONTACT REP
05		39		72	
06		40		73	HELQUEST
07		41		74	JAM REP
08		42		75	
09		43		76	PERS REP
10		44		77	
11		45		78	REPLEN
12		46		79	
13		47		80	
14		48		81	
15		49		82	
16		50		83	
17		51	Wild Oats	84	
18		52		85	
19		53	Route Camel	86	
20	Route Club	54		87	
21	Square Leg	55		88	
22		56		89	
23		57		90	
24		58		91	
25	River Avon	59		92	
26		60	Line Alfa	93	
27		61	Line Bravo	94	
28		62		95	
29		63		96	
30		64		97	
31		65		98	
32		66		99	
33					

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**APPX 3 TO
ANNEX A**

BATCO EXAMPLES

The following examples use the code sheet given at **APPENDIX 1** and Vocabulary Cards at **APPENDIX 2**.

Example 1. Directly encoded grid references:

Plain Text: Two tks at GR 39 12 87
Encoded Text: Two tks at GRID 2R QR ZX AE

Example 2. Use of single vocabulary card:

Plain Text: H hr is at 0430 hrs
Prepared Text: 27 0430
Encoded text: 2S ME UY RK

Example 3. Encoding a formatted message:

Plain Text: PERS REP
63 204
51 02
13 04
27 01

Prepared Text: Stage 1
Change to Card 03. PERS REP 63 204 51 02 13 04 27 01

Stage 2
68 76 63 20 45 10 21 30 42 701

Encoded Text: Stage 3
3B DV BD PR YA LG OZ JI KU MY WHI

Example 4. Use of multiple vocabulary cards:

Plain Text: 18 milan missiles required at GR 193288 at 1600 hrs.
Prepared Text: Stage 1
Change to Card 02. Figures qty 18 milan missiles required at GR 193288 at 1600 hrs.

Stage 2
35 67 18CH 53 33 05 19 32 88 06 16 00

Encoded Text: Stage 3
2T EP HTS NI IE CP MX EA TQ GW MW JK

Example 5. Spelling:

Plain Text: BULLDOG GR 937215
938 LCPL WILSON has broken leg.

Prepared Text: Stage 1
'Spelling starts' BULLDOG GRID 937215
figures 938 CH LCPL WILSON has broken leg.

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**APPX 3 TO
ANNEX A**

Stage 2

BULLDOG GRID 937215 67 938 CH

34 24 38 83 24 51 34 24 41 25 35 has broken leg.

Encoded Text: **Stage 3**

BULLDOG GRID 2U HT VM RF QD BC AJ

TZ MZ CA WT SL 2V EN XH BF HO KU RE has broken leg.

NOTE:

After the eleventh bi-gram (22 letters) a new key setting is selected.

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ANNEX C

UNIT AUTHENTICATION

1. On British Land Forces unit radio nets the method of authentication used is challenge and reply, based on a matrix of numbers like the one below:

	0	1	2	3	4	5	6	7	8	9
8	17	57	86	03	96	46	18	53	30	94
1	51	49	52	55	90	20	29	83	27	70
7	23	63	05	25	24	50	31	01	14	99
2	77	04	87	98	44	07	82	81	92	79
9	22	35	76	16	65	02	71	64	33	32

Method of Use

2. A challenge is made by selecting, at random, a column number and a row number; this 2-digit number is then sent as the challenge.

3. The correct reply is the 2-digit number at the intersection of that column and row.

Example—

Challenge: 38

Reply : 03

4. If the chance of successful intrusion is high the challenge and reply are encoded (see para 448).

Example—

(Callsign Ø requests ØB, who has just joined the net, to 'Authenticate 62')

Ø | Hello ØB this is Ø | 4W MZ JX | OUT

(Callsign ØB decodes the challenge and encodes the reply 'I Authenticate 82')

ØB | Hello Ø this is ØB | 4V FG UY | OUT

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ANNEX D

BG CALLSIGNS AND CALLSIGN INDICATORS

1. BG CALLSIGNS

a. Control Stations

$\emptyset$	$\emptyset A$	$\emptyset B$	$\emptyset C$	$\emptyset D$
HQ*	CO	CV 1	CV 2	CV 3 (INT/NBC)

b. Sqn/Coy Gp Rear Link Stations

CT 1	CT 2	CT 3	CT 4
10 HQ	20 HQ	30 HQ	40 HQ
A Comd	A Comd	A Comd	A Comd
B CV 1	B CV 1	B CV 1	B CV 1
C CV 2	C CV 2	C CV 2	C CV 2
D	D	D	D

c. BG Comd/Admin Stations

11 A CO LR B CO AFV C D	21 RSO A RSWO B Rebro C Rebro D Rebro	31 OC HQ* A 2IC HQ B SSM/CSM HQ C IRG Comd D IRG	41 QM Tech A TQMS B C FRT (Armd) D FRT (Tels)
12 OPS A Adjt B Asst Adjt C Visitor D Visitor	22 2IC A 2IC LR B C DIV COMD D	32 Umpire A Umpire B Umpire C Umpire D Umpire	42 A2 Ech* A A1 Ech* B B Ech* C HQ Ech Veh D See below
13 HQ LAD/ ASM A OC LAD B LAD (434) C LAD (ARV) D	23 QM A A SQMS/CQMS HQ B RQMS C Chief Clerk D	33 RSM A Pro SGT B Pro Sect C Pro Sect D RMP Det	43 LO A LO B LO C FAC D RAMC Sect
14 MO A Regt Med Asst B Amb C RAP D Bde Comd	24 MTO A MTWO B MT SGT C MT D MT	34 Def P1 A Def Sect B Def Sect C Def Sect D Def Sect	44 Int Offr A Int WO B Int Sect C Int Sect D

* COMD NET ONLY. ADMIN NET CALLSIGNS

Ø	—A2 Ech
ØA	—OC HQ
ØB	—A1 Ech
ØC	—B Ech
42D	—BG HQ

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ANNEX D

2. BG SP1 CALLSIGNS

d. Rear Link Stations

<i>Mor</i>	<i>Recce</i>	<i>MILAN</i>	<i>A Tk Mob Pnrs Hels</i>
10 P1 HQ A P1 Comd B P1 2IC	20 Tp HQ A Tp Comd B Tp 2IC	30 P1 HQ A P1 Comd B P1 2IC	40 HQ A Comd B 2IC

e. Control Stations

0 HQ 0A Comd 0B 2IC	0 HQ 0A Comd 0B 2IC	0 HQ 0A Comd 0B 2IC	0 HQ 0A Comd 0B 2IC
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f. Substations

11 1 Sect Comd A MFC B MFC C Mor Det D Mor Det	21 Tp Ldr CVR A CVR B C D	31 1 Sect A Det/FP B FP C Det/FP D FP	41 A Tk Mob Comb A Sect Veh B Sect Veh C Sect Veh D Sect Veh
12 2 Sect Comd A MFC B MFC C Mor Det D Mor Det	22 Tp SSGT CVR A CVR B C D	32 2 Sect A Det/FP B FP C Det/FP D FP	42 Asslt Pnr WO A Sect B Sect C Sect D Sect
13 3 Sect Comd A MFC B MFC C Mor Det D Mor Det	23 CVR A CVR B C D	33 3 Sect A Det/FP B FP C Det/FP D FP	43 Recce/Uty Flt CP A Recce/Uty Hel B Recce/Uty Hel C Recce/Uty Hel D Recce/Uty Hel
14 4 Sect Comd A MFC B MFC C Mor Det D Mor Det	24 CVR A CVR B C D	34 4 Sect A Det/FP B FP C Det/FP D FP	44 ATGW Flt CP A ATGW Hel B ATGW Hel C ATGW Hel D Med/Hy Hel RAF

(continued)

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ANNEX D

BG CALLSIGNS AND CALLSIGN INDICATORS

I. BG CALLSIGNS

a. Control Stations

Ø	ØA	ØB	ØC	ØD
HQ*	CO	CV 1	CV 2	CV 3 (INT/NBC)

b. Sqn/Coy Gp Rear Link Stations

CT 1	CT 2	CT 3	CT 4
1Ø HQ A Comd B CV 1 C CV 2 D	2Ø HQ A Comd B CV 1 C CV 2 D	3Ø HQ A Comd B CV 1 C CV 2 D	4Ø HQ A Comd B CV 1 C CV 2 D

c. BG Comd/Admin Stations

11 A CO LR B CO AFV C D	21 RSO A RSWO B Rebro C Rebro D Rebro	31 OC HQ* A 2IC HQ B SSM/CSM HQ C IRG Comd D IRG	41 QM Tech A TQMS B C FRT (Armd) D FRT (Tels)
12 OPS A Adjt B Asst Adjt C Visitor D Visitor	22 2IC A 2IC LR B C DIV COMD D	32 Umpire A Umpire B Umpire C Umpire D Umpire	42 A2 Ech* A A1 Ech* B B Ech* C HQ Ech Veh D See below
13 HQ LAD/ ASM A OC LAD B LAD (434) C LAD (ARV) D	23 QM A A SQMS/CQMS HQ B RQMS C Chief Clerk D	33 RSM A Pro SGT B Pro Sect C Pro Sect D RMP Det	43 LO A LO B LO C FAC D RAMC Sect
14 MO A Regt Med Asst B Amb C RAP D Bde Comd	24 MTO A MTWO B MT SGT C MT D MT	34 Def P1 A Def Sect B Def Sect C Def Sect D Def Sect	44 Int Offr A Int WO B Int Sect C Int Sect D

* COMD NET ONLY. ADMIN NET CALLSIGNS Ø —A2 Ech
 ØA—OC HQ
 ØB—A1 Ech
 ØC—B Ech
 42D—BG HQ

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ANNEX D

2. BG SP1 CALLSIGNS

d. Rear Link Stations

<i>Mor</i>	<i>Recce</i>	<i>MILAN</i>	<i>A Tk Mob Pnrs Hels</i>
10 P1 HQ A P1 Comd B P1 2IC	20 Tp HQ A Tp Comd B Tp 2IC	30 P1 HQ A P1 Comd B P1 2IC	40 HQ A Comd B 2IC

e. Control Stations

0 HQ 0A Comd 0B 2IC	0 HQ 0A Comd 0B 2IC	0 HQ 0A Comd 0B 2IC	0 HQ 0A Comd 0B 2IC
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f. Substations

11 1 Sect Comd A MFC B MFC C Mor Det D Mor Det	21 Tp Ldr CVR A CVR B C D	31 1 Sect A Det/FP B FP C Det/FP D FP	41 A Tk Mob Comb A Sect Veh B Sect Veh C Sect Veh D Sect Veh
12 2 Sect Comd A MFC B MFC C Mor Det D Mor Det	22 Tp SSGT CVR A CVR B C D	32 2 Sect A Det/FP B FP C Det/FP D FP	42 Asslt Pnr WO A Sect B Sect C Sect D Sect
13 3 Sect Comd A MFC B MFC C Mor Det D Mor Det	23 CVR A CVR B C D	33 3 Sect A Det/FP B FP C Det/FP D FP	43 Recce/Uty Flt CP A Recce/Uty Hel B Recce/Uty Hel C Recce/Uty Hel D Recce/Uty Hel
14 4 Sect Comd A MFC B MFC C Mor Det D Mor Det	24 CVR A CVR B C D	34 4 Sect A Det/FP B FP C Det/FP D FP	44 ATGW Flt CP A ATGW Hel B ATGW Hel C ATGW Hel D Med/Hy Hel RAF

(continued)

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ANNEX D

3. BG SP2 CALLSIGNS

g. Rear Link Stations

<i>Fd Bty</i>	<i>AD</i>	<i>SWINGFIRE</i>	<i>Engr</i>
1Ø BC Veh A BC B BC Asst	2Ø Tp HQ A Tp Comd B Tp 2IC	3Ø Tp HQ A Tp Ldr B Tp 2IC	4Ø Fd Tp HQ A Fd Tp Comd B Fd Tp SSGT C Fd Tp Recce NCO

h. Control Stations

Ø HQ ØA Comd ØB 2IC	Ø HQ ØA Comd ØB 2IC	Ø HQ ØA Comd ØB 2IC	Ø Fd Tp HQ ØA Fd Tp Comd ØB Fd Tp SSGT ØC Fd Tp Recce NCO
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i. Substations

11 FOO A OP Asst B C D	21 Sect 1 A Det 1 B Det 2 C Det 3 D	31 438 A 438 B 438 C D	41 Fd Tp Sect A Fd Tp Sect B Fd Tp Sect C Fd Tp Sect D CET
12 FOO A OP Asst B C D	22 Sect 2 A Det 1 B Det 2 C Det 3 D	32 438 A 438 B C D	42 Armd Engr Tp HQ A Armd Engr Tp Comd B Armd Engr Tp SSGT C Armd Engr Recce NCO D
13 FOO A OP Asst B C D	23 Sect 3 A Det 1 B Det 2 C Det 3 D	33 438 A 438 B C D	43 AVRE A AVRE B AVRE C CET D CET
14 FOO A OP Asst B C D	24 Sect 4 A Det 1 B Det 2 C Det 3 D	34 438 A 438 B C D	44 AVLB A AVLB B AVLB C Mini Plough Tank D M2 Rig

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ANNEX D

4. BG ARMD SQN CALLSIGNS

j. Control Stations

ØA	ØB	ØC	ØD
Comd	MBT 1	MBT 2	

k. Substations

1Ø 1 Tp Ldr A B C D	2Ø 2 Tp Ldr A B C D	3Ø 3 Tp Ldr A B C D	4Ø 4 Tp Ldr A B C D
11 1st Tp SGT A Sqn Ldr LR B C D	21 2nd Tp SGT A Sqn Sigs NCO B C D	31 3rd Tp SGT A B C D	41 4th Tp SGT A Sqn Tech Rep B C D
12 1st Tp CPL A B C D	22 2nd Tp CPL A Sqn 2IC B C D	32 3rd Tp CPL A B C D	42 4th Tp CPL A Ech Veh B C D
13 A LAD (432) B LAD (434) C LAD (ARV) D CO	23 A SQMS B C D	33 A SSM B C D	43 A LO B C FAC D
14 MO A Med Asst B Amb C D CO	24 A B C D	34 A B C D	44 A B C D

(continued)

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ANNEX D

5. BG MECH COY CALLSIGNS

l. Control Stations

Ø	ØA	ØB	ØC	ØD
Control	Comd	CV 1	CV 2	

m. Substations

1Ø 1 P1 HQ A Comd B 2IC C D	2Ø 2 P1 HQ A Comd B 2IC C D	3Ø 3 P1 HQ A Comd B 2IC C D	4Ø A B C D
11 1 Sect A Coy Comd LR B C) ½ Sects D)	21 1 Sect A Coy Sigs NCO B C) ½ Sects D)	31 1 Sect A B C) ½ Sects D)	41 A B C D
12 2 Sect A B C) ½ Sects D)	22 2 Sect A Coy 2IC B C) ½ Sects D)	32 2 Sect A B C) ½ Sects D)	42 A Ech Veh B C D
13 3 Sect A LAD (432) B LAD (434) C) ½ Sects D)	23 3 Sect A CQMS B C) ½ Sects D)	33 3 Sect A CSM B C) ½ Sects D)	43 A LO B C FAC D
14 MO A Med Asst B Amb C D CO	24 A B MT SGT C D	34 A B C D	44 A B C D

(continued)

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ANNEX D

6. ALLOCATION OF CALLSIGN INDICATORS

- a. Callsign Indicators (CIs) are issued on the BATCO sheet for most unit nets, and as part of communications information for formation, formation artillery and RM nets.
- b. CIs are allocated according to SOPs appropriate to the Arm or Service of the unit, reading from the left of the line.
- c. For the All-Arms Battle Group the following rules apply:
 - (1) Unless two sub-units have the same numerical portion of the callsign, ie two 'A' Sqns or two 'C' Coys, primary CIs are to be used.
 - (2) When there is repetition of numbers, the secondary CI is allocated to the sub-unit which joins the net later, irrespective of seniority.
 - (3) If the sub-units join at the same time, CIs are allocated on regimental seniority.
 - (4) Sub-units then retain that CI allocation for as long as they remain on the net.
 - (5) CI Grid. The grid below shows how CIs are allocated; the grid is filled in line by line.

Net	Primary		Secondary	
	Armd	Inf	Armd	Inf
BG	R	B	J	O
A Sqn/Coy Gp	H	M	U	S
B Sqn/Coy Gp	L	Y	V	F
C Sqn/Coy Gp	N	P	D	T
D Sqn/Coy Gp	E	W	Q	X
SP1	G		I	
SP2	K		A	
Spare	C			

NOTE. CIs are taken from the BATCO sheet in **APPENDIX 1 to ANNEX A**.

- d. **Helicopter Joining a Net.** When joining a *unit* net helicopters will make an initial call using the SPARE CI and callsign 43 or 44, whichever is appropriate. Control must then allocate a new CI and callsign from the correct allocation, and the next key setting if required.

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ANNEX E

PROWORDS

<i>Proword</i>	<i>Meaning</i>
ACKNOWLEDGE	Instruction to a station on the net to acknowledge that it has received a message which may or may not have been specifically addressed to it.
ADDRESS GROUP	The group that follows is an address group.
ALL AFTER	} Used with reference to a catchword or phrase when requesting, or giving, repetitions or corrections.
ALL BEFORE	
ALL STATIONS	A call for all the stations on a net.
AM ASSUMING CONTROL ..	Used when a substation takes over all the duties of control.
AND	Used to separate certain stations in multi-station calls.
ANSWER AFTER	Instructing a newly joined station in which order it is to answer calls.
ASSUME CONTROL	Ordering a substation to assume control of the net.
AUTHENTICATE	The station called is to reply to the challenge which follows.
BREAK	Text begins or text ends.
BULLDOG	An Army proword used to distinguish real messages from exercise messages.
CALLSIGN	The group that follows is a callsign.
CANCEL	Used when a sender wishes to cancel a message or a transmission.

(continued)

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ANNEX E

<i>Proword</i>	<i>Meaning</i>
CHARLIE CHARLIE	A collective call to a pre-designated number of stations. The proword CHARLIE CHARLIE will be followed by a figure suffix indicating which collective call is in use.
CHECK BACK	Used by Control after giving a time signal, when he wishes a designated station to check the time back.
CONTACT WAIT OUT	I have made contact and will make a formal contact report as soon as I can.
CONTACT AT	Formal contact report follows.
CORRECT	You are correct.
DIFFICULT	Communication is workable only with difficulty. Care and extra measures are needed.
DIRECTION	Followed by grid bearing from observer to target, when using artillery target indication procedure.
DISTORTED	Incoming signals are distorted.
EXEMPT	The callsigns which follow are excluded from a collective or all stations call.
FETCH	Used, in conjunction with appointment title, to indicate to whom the caller wishes to speak.
FIGURES	Used before groups of figures sent digit by digit, except in the case of callsigns, grid references, time checks, authentication and date-time groups.
FORMAL MESSAGE	Offer of a formal message. (Must be qualified by the 'Precedence' and may be qualified by 'Long'.)

(continued)

RESTRICTED**ANNEX E**

<i>Proword</i>	<i>Meaning</i>
FROM	Used by a relaying station to indicate the station originating the message.
FROM... TO... ..	Used to identify part of a message.
GIVE ME A CALLSIGN	Request for a callsign by a station joining a net which is already functioning.
GRID	Used before any encoded reference or grid reference in clear.
HEIGHT	Used before any height in code or in clear.
HELLO	Used as an introduction in an initial call.
I AUTHENTICATE	The group that follows is the reply to your challenge to authenticate.
I READ BACK	Used by receiving station to satisfy himself he has received a transmission, or portion of it, correctly.
I SAY AGAIN	Used by a sender when making repetitions for emphasis.
I SPELL	Used when spelling out a word or letter group.
INFO	The addressees (callsigns) immediately following are addressed for information purposes.
INTERFERENCE	Used to indicate interference when reporting readability of signals.
INTERMITTENT	Used to indicate intermittent reception when reporting readability of signals.
JOINING	I wish to join your net.

(continued)

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ANNEX E

<i>Proword</i>	<i>Meaning</i>
LONG MESSAGE	Offer of a long unregistered message (one which will take more than 20 seconds to send).
MESSAGE	Offer of an unregistered message that needs to be written down.
MESSAGE PASSED	Used by relaying station to notify originating station that a message has been cleared.
NET NOW	Order to a station, or stations, to start netting.
NICK	The following is a nickname.
NOTHING HEARD	Indication that no signals have been received from a particular station.
OK	Communications satisfactory for working.
ORDERS	Offer of orders; indicates that a responsible person must be fetched to the set.
OUT	This is the end of my transmission. No reply is expected.
OUT TO YOU	This is the end of my transmission to you. No reply is expected and a call to another station follows immediately.
OVER	This is the end of my transmission to you, a reply or acknowledgement is required, go ahead and transmit. <i>or</i> Offer of an unregistered message that does not need writing down.
OVERHEAD	Indication by a ground station to a pilot when overhead.

(continued)

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ANNEX E

<i>Proword</i>	<i>Meaning</i>
RADIO CHECK 	Report how you receive my transmission.
READ BACK 	Order to a station to repeat back a message exactly as received.
READ BACK MESSAGE 	Warning that station(s) must record the message offered and that one will be nominated to read it back.
REBROADCAST CALLSIGN(S)... 	Control orders a technical rebroadcast station to rebroadcast the callsigns named.
REBROADCAST YOUR NET ..	The senior Control orders a sub-unit to arrange tactical rebroadcast between their two nets.
RELAY THROUGH 	Instruction to a station to relay through another.
RELAY TO 	Instruction to a station to relay a message.
REQUEST HOMING 	Request from pilot to ground station for a homing signal.
REQUEST OVERHEAD 	Request to a ground station from a pilot to be informed when overhead.
RETUNE 	Order by Control to a substation to improve his communications by retuning his set.
ROGER 	I have received your last transmission satisfactorily.
ROGER SO FAR 	Acknowledge receipt of what has been sent so far.
SAY AGAIN 	Request for repetition of all, or portions indicated, of a message.

(continued)

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ANNEX E

<i>Proword</i>	<i>Meaning</i>
SEEN	Pilot informs ground station that he has identified a visual homing landmark.
SEND	You have permission to transmit your offered message.
SEND TIME	Request for an exact (accurate on the minute) time signal.
SIGNAL STRENGTHS	Call by Control for substations to report how they hear each other.
SPEAKING	Used, in conjunction with an appointment title and callsign, to indicate who is speaking.
STOP REBROADCAST	Originator orders a rebroadcast station to stop rebroadcast.
SUBJECT CODE	The letters which follow form a Subject Indicator Code (SIC).
THIS IS	Indicates identity of calling station.
THIS IS A DIRECTED NET	All calls must be offered through Control.
THIS IS A FREE NET	Used to cancel a directed net.
THIS IS AN AUTOMATIC REBROADCAST NET	A rebroadcast station tells all stations that he is starting automatic rebroadcast.
THIS IS A MANUAL REBROADCAST NET	A rebroadcast station tells all stations that he is starting manual rebroadcast.
THROUGH ME	Invitation by a station to relay through him.
TIME	The group that follows is the date-time group.

(continued)

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ANNEX E

<i>Proword</i>	<i>Meaning</i>
TUNE ANTENNA(S)	Order by Control for the antenna(s) of self-tuning set(s) to be tuned.
UNKNOWN STATION	The identity of the station I am calling is unknown to me.
UNWORKABLE	Impossible for communications. Traffic cannot be passed until standard has improved.
VERIFY	Verify portion indicated with originator and send correct version.
VISUAL LOOK	Instruction from ground station to pilot to look visually for a landmark which he can use for homing.
WAIT OUT	Your transmission is received; a further transmission on the same subject will follow later.
WORD AFTER	} Used to identify part of a message.
WORD BEFORE	
WRONG	What has been said is wrong; the correct version is ...
YOU ARE REBROADCAST STATION	The sub-unit Control instructs his own rear link station to join their net to the unit net by tactical rebroadcast.
YOUR CALLSIGN IS	Allocation of a callsign to a station which has newly joined a working net, and which has asked for a callsign.

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