

A Course in Cryptanalysis

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S.I.Course, Revised and Enlarged, June, 1942

The background to this exercise is the early part of the British offensive in Libya in January, 1941, culminating in the fall of Bardia. The messages are supposed to be Italian, taken by our Interception Service. The contents are imaginary, but more or less realistic, and the text is English.

You may expect the Italian commanders concerned to use signatures and addresses as a regular practice. The following extracts from the Italian Order of Battle published by the Intelligence Branch of the General Staff may be of assistance:

ANTONELLI	General	Intendant-General(Supplies)	at BENGHAZI
ARGENTINO	General	Commanding Defences	at DERNA
BERGINZOLI	General	Commanding Defences	at BARDIA
GALLINA	General	C.-in-C., Eastern Libya, at advanced G.H.Q.	at TOBRUK
LEO	Lt.-Col.	O.C., Saharan Battalion	at HON
RUFFO	Col.	Second in Command	at DERNA

The Wireless Intelligence Service has provided the following identifications of the Italian W/T stations concerned:

W/T Station	Identification
X	Advance H.Q., E. Libya, near TOBRUK
Y	BENGHAZI area (Probable)
Q	DERNA (Probable)
S	H.Q., BARDIA
N	TOBRUK (Probable)
O	Believed to be a form of C.Q. (all stations) call, since traffic is always to O, and never originates there
P	HON

Write a description of the different processes used and of the indicating systems, and build up the original book or books as far as possible. Describe also the reasoning you used in arriving at a solution.

Messages

#01 1/1 0900 Y DE X

78901 60730 74769 85760 97799 11228 73928 65464 05744 50524
78007 09597 84359 22385 12393 78565 32842 75017 62630 71764
40992 33739 75938 69713 19298 08276 89338

#02 1/1 0930 X DE Y

34567 60730 74769 84260 03391 18187 52608 65464 17243 64171
07778 09597 48828 00755 53504 79786 97224 06828 90818 47758
84147 31012 75938 79319 69898 42339

#03 1/1 1100 X DE Y

23456 51747 33040 45035 92588 93926 02329 56912 57146 73077
56769 67046 94811 51690 43998 23359 04198 80160 09597 19716
38488 39968 26233 15224 21026 14932 04830 92822 18800

#04 1/1 1200 O DE N

00000 21388 75980 09987 18562 54198 11084 46613 11533 42010
73917 31834 77584 25231 53285 88416 00894 34207 09962 55107
00510 94490 43118 28374 10746 36417 62180 44245 55171 39375
98051 90702 26242 84663 85047 90709 26240 44842 55135 42507
93162 61012 08101 22712 33316 71296 65938 22762 33338 47937
75972 22900 56030 84258 50890 09751 47309 53375 30951 59811
50224 96899 07317 72856 36254 50495 35184 40023 48499 99003
74415 11805

#05 1/1 1200 CQ DE X

67890 85486 47842 72346 65464 70505 29830 87014 09597 71500
04932 97336 96649 90441 39903 49020 71683 52245 95650 75938
06160 08357 23453 48538 81390 02576 99476 53296 65187 01785
36730 27130 81966 40334 41596 62200 13486 20413 54299 46827
27509 08884 34096 68086 35763 51971 17318 14421 64417 12223
47187 15415 47831 74294 63677 07102 37759 33428 58806 74165
00369 77177 75296 56788 59874 21793 72055 51552 40147 10058
24017 93636 26300 34722 08346 28735 36404 04985 64758 39284
96522

#06 1/1 1700 Y DE X

12345 79790 06707 10217 63743 40357 60398 11887 47678 55827
51709 95294 75938 26264 42279 05420 42644 76095 54808 08066
43865 38400 68997 36730 41301 30513 40235 79296 23341 95497
41487 60109 56671 75931

#07 2/1 1200 O DE N

00000 21388 75980 44010 88488 04010 80086 89054 39823 79278
26590 39940 43131 83413 41401 89989 55587 59811 50244 85833
54220 08686 18073 31834 77584 25231 53285 58327 02484 24687
66120 33992 00312 24103 53463 44217 99232 61012 08101 22710
33314 71296 65938 22713 33316 85330 02361 39375 98051 90742
26217 84663 85047 90762 26212 36011 92403 14384 54683 06696
74423 95398 39231 23096 32993 50602 86357 98842 55747 00243
55983 08718 92949 94490 43118 00677 45747 79769 18059 08737
71120 42084 15901 42462 93639 39286 19584 68115 02849 24021
63529 19266 83498 30453 91160 86733 66301 44710 88393

#08 2/1 1200 CQ DE X

34567 83185 93757 32758 87550 31934 14969 29692 23363 60274
81885 09597 56195 88927 00084 83234 18783 08863 78992 00915
01348 09118 75938 24194 08438 05789 88902 96446 51788 31508
44590 76924 61728 36730 74908 69899 40415 22223 57276 57896
20323 28133 46827 27509 08884 34096 88868 66886 95886 45027
87152 04412 12133 11021 15415 47831 74200 63686 61738 80503
26026 53883 55341 03734 57191 08894 56788 81671 00454 16951
68942 54137 54707 47383 97777 17927 01109 08346 52660 69815
94749 42416 52566 19857 13846 32538 49485 89015 72296 28563
89954 80941 85636 26488 22813 44911 25161 35910 62200 78968
40436 59777 97021 00194 08563 02651 88039 15573 76585 16901

#09 2/1 1900 X DE Y

45678 27678 86657 85127 09743 50429 52304 42160 62278 10915
35347 89450 72296 49146 98213 25433 01091 92472 67275 70753
76254 77776 68076

#10 3/1 1100 P DE Q

00000 47039 47124 87057 81440 59500 37134 40452 95726 22773
33306 22772 33306 43769 22367 30912 23938 92842 45442 63306
18447 00203 55463 89546 03256 62701 93387 47957 56542 52461
35134 63029 00598 93272 62725 11364

#11 3/1 1200 O DE N

00000 21388 75980 09987 18562 91842 97538 17722 64318 33230
00454 39039 68539 09612 57916 79479 95167 20190 55088 76089
28079 47545 19419 63281 63442 81194 25979 32175 10780 39412
65663 80494 85667 40023 48499 99003 74415 11863

#12 3/1 1200 CQ DE X

23456 88476 26633 34123 40178 62293 83786 64990 78893 89717
38014 02400 56912 57155 47135 70400 87569 84180 00854 12944
18406 34459 79225 09597 73316 05660 16641 31186 37132 26961
65220 60869 71596 65982 75938 45328 08438 11367 53532 99303
10830 02314 75658

#13 3/1 1300 Y DE X

56789 77418 56912 55401 23130 05042 22899 08618 97104 09620
49527 95207 50656 08547 09597 81528 74554 53504 92227 65071
32860 99163 90656 15734

#14 3/1 1600 Q DE X

67890 82825 75938 03447 14724 18774 59512 55925 78320 76911
41828 89803 65060 70915 36730 31382 03546 40424 43631 73327
81818 20387 68171 69152 31762 08884 86724 06233 88907 72116
45883 19701 50827 27298 16468 59362 47831 45300 12829 92523
02090 82206 45042 26325 04697 05236 92941 56788 13846 79249
58757 16784 41738 31940 17632 78394 94186 49689 08346 52660
18029 98855 08999 14665 99640 46021 10956 60770 17815 72296
05306 95232 07828 53760 91315 49149 05595 45609 73039 30727
78968 90194 07645 66919 21177 60802 32317 20881

#15 3/1 1730 X DE Q

12345 93205 29567 49097 61498 79034 57357 57180 20323 23570
81265 59019 08884 34951 35339 11080 39132 97787 91140 04594
39477 99025 85071 47831 22198 55249 15117 43616 26038 31023
82412 00853 89695 17876 56788 32008 20530 35625 01877 90742
49854 49894 38560 43563 52956 28816 08346 96517

#16 4/1 0630 X DE Q

23456 71390 30934 45914 31563 01839 26488 36266 48201 02260
76842 33636 78968 74472 23223 19621 87995 19234 20686 45136
74412 24455 86493 56912 74309 91669 69083 79291 73568 28854
75700 22645 05583 90584 64880

#17 4/1 1200 CQ DE X

45678 06788 67332 09839 20013 09597 92628 58839 43662 22897
17048 60039 01655 84734 74917 69126 75938 25178 96522 43051
15871 31467 17429 93788 14997 65187 19066 36730 19431 89180
02514 26776 14358 22459 35357 34441 09782 34989 08884 52103
39614 39270 08245 94260 10431 48702 12214 83552 52147 47831
67610 63497 14594 75579 89892 12916 97446 04794 72325 25204
56788 07385 83892 75765 45195 72085 49728 24022 50062 27248
95594 08346 04073 68877 30482 96447 52566 86992 41511 99871
29548 17648 72296 57638 93647 68574 08687 17014 39374 56639
22602 40914 70213 78968 32423 90932 75623

#18 4/1 1200 O DE N

00000 21388 75980 74006 15426 64834 89020 31384 99398 08718
92949 94457 43192 91850 90213 58594 30248 28807 49010 23147
97949 25972 53084 29734 16187 26103 43776 54198 11084 03512
93107 98350 30353 31834 77584 98528 95389 33258 41785 91152
67922 44018 88484 11148 10253 37201 66039 83763 89077 67272
69437 99373 33908 44010 88488 78207 06423 82065 69523 37234
66155 10512 22133 79278 26590 39940 43131 30481 05164 33922
22954 84315 44550 23308 67045 18168 55008 76528 10566 49364
97937 40023 48499 99003 77415 11860

#19 4/1 1630 X DE Q

56789 06441 89418 91468 84355 75498 82206 07408 08577 57290
10435 52639 56788 78449 53531 15104 39065 54446 18307 59348
74876 39324 00716 08346 62087 24802 13109 01136 73214

#20 4/1 1700 X DE S

89012 13667 74422 09942 61114 58774 78168 02576 07551 43865
76924 61728 36730 16028 66495 24853 84149 09689 22683 20323
21245 29739 47022 08884 82071 31613 79059 43139 50007 07484
07101 27078 20218 92134 47831 18576 49284 58574 72333 44305
02095 97571 99387 10260 25204 56788 63375 98430 19149 02646
56690 31931 20409 72019 39243 82716 08346 49859 70204 83821
49780 44138 57924 22564 47562 62651 91786 72296 10144 63305
60912 01910 26488 23020 67596 72691 69334 59050 03458 78968
34933

#21 4/1 1830 S DE X

78901 38482 97787 01247 54761 40195 91932 49674 73800 27054
16174 02063 08346 30359 25401 57776 44284 33053 42160 55690
42953 60245 02579 72296 05225 92627 10409 01091 92472 73877
77612 60934 56456 68146

#22 5/1 0700 X DE S

67890 60730 74769 08760 03391 18187 52608 65464 71543 87203
79225 09597 82140 45666 02756 84284 31450 97241 90818 59426
32338 17817 75938 17283 97533 42961 04438 25035 52867 10494
51954 17419 10857 36730 18954 03645 31439 84149 09689 49017
20404 09860 31893 89332 08884 02142 95240 51771 46489 23198
70621 79538 63421 27801 75656 47831 98887 63596 35519 25954
40257 53883 39073 75669 05236 72911 56788 69119 99501 43804
90106 67638 65837 18061 52002 28044 73169

#23 5/1 0730 S DE X

12345 86714 66802 86317 82621 90981 52159 75938 48550 08438
45193 22732 56854 02495 19769 78117 65961 41821 36730 56164
95398 49245 48749 34158 61477 07169 90806 19054 58938 08884
06809 80402 50763 38802 13359 87186 35420 86088 54569 81059
47831 30457 39661 89113 96633 02599 82044 97857

#24 5/1 0830 X DE S

34567 09659 08346 24805 28735 36404 04985 39284 52566 11297
78420 30525 62677 85249 72296 74621 06765 88821 89609 02095
21802 56639 03217 78968 59159 78968 48188 28769 00719 00013
42813 09082 17410 35872 72943 12725 56912 22897 70210 08694
52962 96934 67027 70558 16312 49097 12685 09597 19627 27004
22057 07152 11901 11887 66802 82621 90981 52159 75938 64071
48550 42274

#25 5/1 1200 CQ DE X

23456 83185 93757 33758 87550 50241 67713 14676 96743 83197
33083 09597 82140 45666 02756 84284 31450 97241 47116 34577
89082 04543 75938 97686 56422 92853 88908 78320 64675 22322
65604 56101 63601 36730 79543 73187 19968 44143 30747 84730
00594 56608 19636 41108 08884 34906 80402 04960 51971 12755
59869 26246 80022 97715 95764 47831 45435 40196 26419 80503
74878 26631 88157 90221 05317 02642 56788 28462 48531 93195
08232 56546 14266 49894 39181 55307 79983 08346 52561 08847
27561 07965 52485 42160 39425 58450 78896 02533 12276 72296
49371

#26 5/1 1200 O DE N

00000 21388 75980 06957 12450 22288 60115 55305 00685 16057
74530 22248 60115 20361 17114 18904 54478 63945 63933 73249
91816 39490 43441 29972 54088 25552 16240 77802 16435 23308
67045 47993 11631 91662 51608 12870 75061 44081 55657 34207
09962 36417 62180 33141 99371 20610 51275 08772 40373 83995
24072 28041 41271 83738 37015 02192 58153 02790 53311 20275
44907 10266 85569 42166 93556 45574 11879 92841 69492 22751
35924 35543 52956 04503 59434 30453 91160 86733 66301 44726
88317

#27 5/1 1210 X DE S

For General GALLINA. I have given orders to cease resistance.
General BERGINZOLI. 18.

#28 5/1 1230 CQ DE X

56789 22805 31046 51021 30738 39026 24642 78968 66188 42518
66151 45355 32399 35062 01897 10586 40462 02400 56912 57146
95948 73602 53544 13945 73843 65202 18406 72170 97750 09597
70108 18247 53423 18805 92398 06089 90818 47758 85865 33971
75938 83991 08258 89110 57869 37845 12396

#29 5/1 1230 X DE Q

12345 52487 63198 61691 78601 86447 18244 72350 47851 09597
15600 43783 78345 47196 49230 87871 00154 85903 90641 92132
51777