

Assignment No. 1

- Prob. 1
THIS SHORT CRYPTOGRAM IS GIVEN AS AN EXERCISE IN THE SOLUTION
OF A CIPHER BY INSPECTION
- Prob. 2
WHEN ASKED ABOUT HIS PLAN OF CAMPAIGN GENERAL STONEWALL
JACKSON REPLIED TO AN INQUISITIVE CHAPLAIN CAN YOU KEEP A
SECRET YES THE EAGER CLERIC ANSWERED WELL SO CAN I SAID
THE GENERAL
- Prob. 3
DEVELOPMENT OF MEANS FOR RAPID COMMUNICATION HAS DONE
CONSIDERABLE TOWARD CREATING A BETTER INTERNATIONAL
UNDERSTANDING
- Prob. 4
IN THE GOOD OLD DAYS WORDS WERE CAREFULLY SPACED IN
CRYPTOGRAMS LIKE THIS BUT TODAY WORDS ARE RUN TOGETHER
AND THE TEXT IS DIVIDED INTO GROUPS OF FIVE LETTERS TO
INSURE ACCURACY IN TELEGRAPHIC TRANSMISSION
- Prob. 5
PREPARE TO GET UNDERWAY AT ZERO EIGHT HUNDRED PLUS FIVE
TIME FOURTEEN APRIL PERIOD BE PREPARED FOR MAXIMUM SPEED
TWENTY KNOTS
- Prob. 6
A RECIPROCAL ALPHABET IS ONE IN WHICH ALL THE VALUES IN
THE ALPHABET ARE RECIPROCAL IN PAIRS
- Prob. 7
AT ZERO FIVE HUNDRED DESTROYER DIVISION SEVENTEEN CHANGE
COURSE TO THREE FIVE FOUR

Assignment No. 2

Prob. 1
VISUAL CONTACT NOT YET MADE WITH DESTROYER DETACHMENT
PERIOD ARGONNE DIRECTED REMAIN VICINITY RENDEZVOUS TO MAKE
CONTACT AND DELIVER COPIES ALL SECRET AND PUBLICATIONS

Sys.- Untransposed keyword mixed sequence
Key.- WESTERN UNION TELEGRAPH COMPANY

Prob. 2
ROME INVENTED THE FIRST SUBSTITUTION SYSTEM KNOWN JULIUS
CAESAR USED AN ALPHABET IN WHICH D WAS SUBSTITUTED FOR A
COMMA E FOR B COMMA F FOR C ETC IN HIS CORRESPONDENCE

Sys.- Reversed keyword sequence.
Key.- JANUARY FEBRUARY MARCH where Q(p) is A(c)

Prob. 3
PEARY ARRIVED NAKIN G FIFTEEN HUNDRED THIS DATE FOREIGN
MEN OF WAR PRESENT TWO BRITISH GUNBOATS ONE JAPANESE
DESTROYER AT PRESENT NO APPREHENSION AMONG FOREIGNERS
CITY QUIET

Sys.- Vertical Sequence
Key.- BLACK

Prob. 4
IN THE STUDY OF CRYPTANALYSIS THE INDUCTIVE APPROACH IS
PREFERRED BY THIS METHOD THE STUDENT LEARNS TO MAKE HIS
OWN ANALYSIS AND IS NOT DEPENDENT ON RULES LEARNED FROM
TEXT BOOKS

Sys.- Vert. Sequence
Key.- Cryptograph

Prob. 5
DECIPHERING IS BOTH A SCIENCE AND AN ART IT IS A SCIENCE
BECAUSE CERTAIN DEFINITE LAWS AND PRINCIPLES HAVE BEEN
ESTABLISHED WHICH PERTAIN TO IT IT IS ALSO AN ART BECAUSE
OF THE LARGE PART PLAYED IN IT BY IMAGINATION SKILL AND
EXPERIENCE

Ordinary sequence of alphabet, taken off vertically
in columns 71362548

Assignment No. 2 (con.)

Prob. 6

CIPHER WORK WILL HAVE LITTLE PERMANENT ATTRACTION FOR ONE WHO EXPECTS RESULTS AT ONCE WITHOUT LABOR FOR THERE IS A VAST AMOUNT OF PURELY ROUTINE LABOR IN THE PREPARATION OF FREQUENCY TABLES AND OTHER THINGS BEFORE THE MESSAGE BEGINS TO APPEAR

Sys. Transposed keyword sequence, Alternate Diagonal
starting upper left hand corner
Key. OPERATIONS

Assignment No. 3

Prob. 1
 RECONNOITER AUXCAYES BAY AT DAYLIGHT SEVENTEEN APRIL AND
 THEN PROCEED THRU POINT GEORGE ON COURSE THREE THREE ZERO
 SPEED TWELVE PERIOD REPORT NOON POSITION TOMORROW

Plain alphabet arranged after keyword NEW YORK and all
 letters numbered from one to twenty-six beginning with N#1

Prob. 2
 WEATHER FORECAST THURSDAY PARTLY CLOUDY WITH SCATTERED
 SHOWERS EASTERLY WINDS AT SURFACE AVERAGING TWENTYFIVE
 KNOTS VISIBILITY LESS THAN AVERAGE UNDESIRABLE FLYING
 CONDITIONS PERIOD HEIGHT OF LOWER CLOUDS AT PRESENT
 ABOUT ONE THOUSAND FEET

Keyword MONDAY written in 5x5 square, horizontal and
 vertical columns numbered from 1 to 5 ~~xxxxxxx~~

Prob. 3
 AT FIFTEEN FIFTY ATTACKED BY FIVE LEXINGTON HEAVY BOMBING
 PLANES UNDER ANTI-AIRCRAFT FIRE THREE MINUTES PLANES
 BOMBING POSITION ALTITUDE ONE FOUR THOUSAND FEET NO
 DAMAGE TO SARATOGA

Keyword USNAVY inscribed in 5x5 square, columns and lines
 lettered with vowels.

Prob. 4
 SIGHTED SUBMARINE LATITUDE THIRTY DEGREES TWENTYONE
 MINUTES LONGITUDE ONE HUNDRED FORTY TWO DEGREES SIXTEEN
 MINUTES AT NINETEEN FORTY FOURTEEN MARCH PERIOD POSSIBLE
 THIS IS BASE COVERING GREAT CIRCLE ROUTE TO SANFRANCISCO

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

Diagraphs used interchangeably

Prob. 5
 DESTROYERS OF OFFENSIVE SCREEN WILL FUEL TOMORROW SUNDAY
 BEGINNING AT DAYLIGHT PERIOD OILERS TAKE STATION AS SOON
 AS PRACTICABLE AND COMPLETE ALL NECESSARY ARRANGEMENTS

ABCDEFGHIJKLMNPOQRSTUVWXYZ
ETOANIRSHMETOANIRSHMETOANIRSHM
LUCMPFYWLUCMPFYWLUCMPFYWLU

Digraphs used interchangeably

Assignment No. 4

Prob. 1

SUBMARINE BOMBED ON SURFACE BY NINE FIGHTERS AND TWO SCOUTS WITH TWENTY TWO BOMBS ~~XX~~ ONE HUNDRED SIXTEEN POUNDS EACH AT THIRTEEN FORTY THREE ON BEARING TWO SEVEN FIVE DISTANCE FORTYFIVE MILES FROM FLEET GUIDE PERIOD SUBMARINE SUBMERGED FOR FIVE MINUTES AFTER ATTACK PERIOD ON RETURN TO SURFACE PLANES CONTINUED ATTACK WITH MACHINE GUNS

System: Two alphabets in normal sequence arranged so that A (p) equals US (c)

Prob. 2

AT DAYLIGHT TOMORROW THURSDAY BRANT AND TERN SWEEP NORTHWEST SIDE OF BUOYED CHANNEL FROM NORTHERN BUOYS TO POINT AFIRM PERIOD QUAIL AND TANAGER TAKE STATION AT ENTRANCE BUOY POINT AFIRM PERIOD KINGFISHER REMAIN AT ANCHOR AND DETACHED FROM MINE SWEEPING DETACHMENT TO REPORT TO COMMANDER AIRCRAFT PERIOD WHIPPOORWILL REPORT TO COMMANDER TENDER DETACHMENT UPON COMPLETION OF PATROL

System: Five alphabets in normal sequence
Key: MARCH

Prob. 3

OFFENSIVE SCREEN MADE CONTACT ENEMY SCOUTING LINE YESTERDAY MONDAY AND SARATOGA LEXINGTON BOMBED EACH OTHER PERIOD SARATOGA DAMAGED TWENTYFIVE PERCENT LEXINGTON THIRTYEIGHT PERCENT PERIOD UP TO PRESENT BOMBED ONE HEAVY AND ONE LIGHT CRUISER DECATUR FIRED SIX TORPEDOES AT LIGHT CRUISER TORPEDO PLANES ATTACKED ONE HEAVY CRUISER PENNSYLVANIA FIRED ON ONE LIGHT CRUISER TWENTY MINUTES PERIOD OFFENSIVE SCREEN NOW OPERATION VICINITY ENEMY CRUISER CONCENTRATION COMMA LEXINGTON NOT SIGHTED TODAY PERIOD ONE ENEMY CRUISER REPORTED NINETY MILES TO EASTWARD OF OUR NOON POSITION

System: Ten alphabets in normal sequence
Key: DEPARTMENT

Prob. 4

NO TRACE OF ENEMY MAIN BODY IN SEARCH TO LATITUDE ONE NINE THREE ZERO ON SIXTY MILE FRONT FROM NAVASSA TOWARD GUANTANAMO PERIOD BELIEVE WRIGHT SEAPLANE BASE LOCATED AT GUANTANAMO PERIOD WILL RETIRE ON COURSE TWO ONE THREE DURING DARKNESS RESUMING SEARCH AT DAYLIGHT PERIOD ENEMY RADIO TRANSMISSION HEARD ON FORTYONE HUNDRED KILOCYCLES AT SEVENTEEN HUNDRED NO BEARING OBTAINED

System: Two alphabets. Systematically mixed sequence using keyword NEWMEXICO.
Alphabets set so that A (p) equals NO (S)

ASSIGNMENT NO. 4 (con)

Prob. 5

ENEMY BATTLESHIP BEARING ZERO EIGHT FIVE TRUE PERIOD
BE PREPARED TO LAUNCH PLANES IN ACCORDANCE OPERATION
ORDER NUMBER SIX PERIOD DESTROYERS TAKE STATION TO
LAUNCH TORPEDO ATTACK ON ENEMY MAIN BODY DURING DARKNESS

System: Five systematically mixed alphabets using the
keyword PRUDENTIAL attanged so that A(p) equals
TUNIS (c)

LEVE BLUE WILL CONCENTRATE NEAR
 I LONG SEVENTYFIVE STOP MAIN BODY
 APRIL FOR DECISIVE ACTION USING
 PERATIONS SEVENTEEN APRIL STOP
 DDY STOP SCOUTING AND STRIKING
 ? CONCENTRATE AND RETIRE BEFORE
 ? AT DAYLIGHT EIGHTEEN APRIL

same sequence. Transposed
 FLORIDA KEYS. Vert Trans.

30 AS GUIDE IN LAT ONE NINE DASH
 W ON BEARING ONE ONE FIVE DISTANCE
 NO CONTACT REPORT ON TYPE COM-
 E CHICAGO REPORT POSITION HOURLY
) LAUNCH PLANES AND SEARCH NORTH
 SEVENTEEN HUNDRED AT DARK REJOIN

eyword ARIZONA
 PENNSYLVANIA

SE AND INCREASE SPEED TO TWENTY-
 OF ANTI-AIRCRAFT DEFENSE AT DAWN
 VE PERIOD REPORT ALL CONTACTS TO

E FIVE ZERO DISTANT TEN MILES
 YFIVE HUNDRED COURSE ESTIMATE
 FIRE DUE LOW CLOUDS PERIOD AM

eyword NAVAL RESERVE
 BUREAU NAVIGATION

HMENT AT DUTCH HARBOR SUBDIV
 RIVE WITHIN FORTNIGHT

SIX HUNDRED MONDAY TO JOIN SAURY
 AD TORPEDOES FRIDAY SEALION WHEN

r
 Keyword Rendezvous

Assignment No. 5 (cont.)

Prob. 5

THE SIX SQUADRONS OF ARMY AIRPLANES ON DUTY IN THE SECTOR ARE CREDITED WITH BREAKING UP PLANS FOR A MASS ATTACK ON PESHAWAR IN ONE DAY THE MACHINES DROPPED SIX THOUSAND SMALL BOMBS AND THEN HAVE MADE DAILY ATTACKS ON VARIOUS GROUPS OF AFRIDIS THE AIRFORCE HAS EVACUATED THE WOMEN FROM PARACHINAR EIGHTY MILES FROM PESHAWAR BY AIRLINE KOHAT TWENTYONE MILES TO THE SOUTH OF PESHAWAR IS STILL UNDER ATTACK IT IS BELIEVED THAT THE AFRIDIS WERE NOT REPULSED BY THEIR CASUALTIES AROUND PESHAWAR PROPER BUT MERELY DECIDED THAT THE CITY WHICH IS HEAVILY DEFENDED AS THE GATEWAY TO THE KHYBER PASS WAS IMPREGNABLE

Plain component in normal order

Cipher component derived from Keyword COBENHAVEN set up in 3x5 rectangle and taken off in alternate diagonal manner beginning in upper left hand corner

A (pl) set against ~~KHYBER~~
KHAIBER (c)

Prob. 6

LANDING FORCE WILL COMPRISE ONE BLUEJACKET COMPANY EACH FROM CINCINNATI MARBLEHEAD AND ARTILLERY PLATOON OO CONCORD CINCINNATI DESIGNATE BEACHMASTER MARBLEHEAD PROVIDE PORTABLE RADIO UNIT CONCORE DETERMINE MOST SUITABLE POINT FOR DEBARKING

Plain component derived from Keyword SUBSTITUTION

Cipher component from Keyword ALPHABET

S (pl) set against FOUR (c)

ASSIGNMENT No. 6

Prob. 1

AT TWENTYTWO TWENTYFIVE OPENED FIRE ON STURTEVANT AND DICKINSON FOR SIX MINUTES AT THREE THOUSAND YARDS PERIOD TWENTYTWO THIRTY FIVE OPENED FIRE ON RICHMOND FOR FIVE MINUTES AT FOUR THOUSAND YARDS PERIOD TWENTYTWO FORTYSEVEN OPENED FIRE ON UPSHUR AND TWO ENEMY DESTROYERS FOR THIRTEEN MINUTES AT SIX THOUSAND TO TWO THOUSAND YARDS

Sys: Plain and Cipher components both normal alphabets
Vigenere Table.

Prob. 2

DESTROYERS DICKERSON AND LAMBERT UNDER FIRE SECONDARY BATTERY TWO AND ONE HALF MINUTES EACH AT MEAN RANGE TWENTYSEVEN HUNDRED YARDS COMMA LEARY UNDER FIRE MAIN BATTERY ONE AND ONE HALF MINUTES AT MEAN RANGE FOUR THOUSAND COMMA TARBELL UNDER FIRE SECONDARY BATTERY FOR TWO MINUTES AT MEAN RANGE OF FORTY FIVE HUNDRED YARDS

Sys: Plain and Cipher components both derived from Keyword
RHODEISLAND
Vigenere Table

Prob. 3

AT TWENTYONE TWENTYSIX SARATOGA ATTACKED BY HERBERT SIX TORPEDOES RANGE FIVE HUNDRED COMMA TWO HITS PERIOD AT TWENTYONE TWENTYSEVEN DICKERSON FIRED SIX TORPEDOES RANGE FIVE HUNDRED COMMA TWO HITS

Sys: Plain and Cipher components same sequence. Systematically mixed keyword sequences from Keyword OPERATING written in 3x9 rectangle and taken off vertically starting at lower right hand corner.
Vigenere Table

Prob. 4

AT ZERO SIX HUNDRED FIFTEEN APRIL FORM SCOUTING LINE BEARING ZERO FIVE ZERO DEGREES TRENTON GUIDE IN EAST ANSWERING FIRST REPEATER SCOUTING DISTANCE TWENTY MILES ORDER OF SHIPS FROM EASTWARD DECATUR MEMPHIS TRENTON RICHMOND MARBLEHEAD LITCHFIELD PERIOD HULBERT AND PRESTON JOIN COMAIRRONS SARATOGA IN VICINITY MAIN BODY AS LINKING VESSELS AND DISTANT PLANE GUARDS PERIOD AIRONS OPERATE AT DISCRETION UNDER PROTECTION OF SCOUTING LINE TO LOCATE AND ATTACK LEXINGTON PERIOD COMMENCE SCOUTING AT ZERO SIX HUNDRED SPEED TWENTY COURSE THREE TWO ZERO PARAGRAPH LOCATE AND DESTROY LEXINGTON PERIOD COMAIRRONS AND COMDR BLACK FLEET PLEASE DELIVER TO DESTROYERS

Sys: Plain and Cipher components different sequences of
random selection P1 - AGUOQJMEWNBISZHXDKYLVRTFPC
C - ALGXRJWESCOTVIDNYUFPMBKHQZE

Vigenere Table

ELEMENTARY COURSE IN CRYPTANALYSIS

Assignment No. 7

Problem No. 1

CONTACTED THREE ENEMY DESTROYERS BUT UNABLE
TO ENGAGE DUE TO THEIR JOINING UP WITH MAIN BODY

C O N T A C T E D T H
R E E E N E M Y D E S
T R O Y E R S B U T U
N A B L E T O E N G A
G E D U E T O T H E I
R J O I N I N G U P W
I T H M A I N B O D Y

Problem No. 2

WHEN IN ALL RESPECTS READY FOR SEA PEARY PROCEED
SHANGHAI AND REPORT TO SENIOR OFFICER PRESENT
AFLOAT FOR DUTY AS STATION SHIP SHANGHAI

H N N L H S E T R A Y O S A E R P O E D H N H I
W H I A L E P C S E D P R E P A Y R C H S A G A
N R P H T S N O O P O R R S H A L A P R U Y S
A D E O T O E I H P I E P E E T F O T O D T A
T T O S I S A O A T
S A I N H P H N H I

Problem No. 3

BATTLESHIP DIVISION TWO PROCEED ON SERVICE ASSIGNED

I H S E L T T A B
O I S I V I D P
O H P O W T N
H O D E E C
I V R E S
S A M C
O I S
E N
D

Assignment No. 7

Problem No. 4

PROCEED IN ACCORDANCE WITH OPERATION ORDER NUMBER
ONE PERIOD ON COMPLETION OF ASSIGNED DUTY RETURN
TO BASE AND AWAIT FURTHER INSTRUCTIONS

P O E D N C O D H B I H P R T O O D R U B R H
R O E I A C R A C W T O E A I N R R E N M E O E

P R O O C M L T O O A S G E D T R T R T B S
E I D N O P E I N F S I N D U Y E U N O A E

A D W I P R H R N T U T O S
N A A T U T E I S R C I N

Problem No. 5

UPON THE REPORTING OF HIS RELIEF LIEUTENANT JOHN
H DOLAN U S NAVY DETACHED TENNESSEE PROCEED AND
REPORT TO ROPER FOR DUTY AS EXECUTIVE OFFICER

U O N P O S R N T E T
P T E R I E A J D A E
H R T H L N O Y C E D
K I P I E H V H C A R
N O R T N A E O N E P
O P U H N D R D P O C
L E D S T P R O R B U
I O U E E E R D X T I
L N N E P O U E I F C
A N S O T T S V F E I
K S R T Y A B O R Q U

Problem No. 6

TRANSPOSITION CIPHERS INVOLVE NO CHANGE IN THE
IDENTITY OF THE LETTERS OF THE PLAIN TEXT SEMI-
COLON ONLY THE ORIGINAL ARRANGEMENT IS CHANGED

D E O N A H C S
I T N K M E O N
A R R A L A N I
G I R O R I E H
T Y L N O H O L
O C I M B S T X
E T N I A L P E
H T P O S R E T
T E L E H T P O
Y T I T N E D I
E H T N I E O N
A H C O N E V L
O V N I S R E H
P I C N O I T I
S O P S N A H T

Assignment No. 7

Problem No. 7

ONE OF THE MOST DIFFICULT TASKS BEFORE THE CRYPT-
ANALYST IS THE CORRECTION OF ERRORS WHICH CREEP
INTO CIPHER TEXTS IN THE PROCESS OF ENCRYPTING
AND TRANSMITTING BY TELEGRAPH OR RADIO

M E H T F O E N O
O S T D I P F I C
B S K S A T T L U
E F O R E T H E C
Y L A H A T P Y R
S T I S T H E C O
O N O I T C E R R R
P E R R O R S W H
I P E E R C H C I
N T O C I P H E R
H T N I S T X E T
E P R O C E S S O
R E H P I C H E P
I N G A N D T R A
G N I T T I M S N
B Y T E L E G R A
O I D A R R O H P

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ASSIGNMENT 8

Problem 1

ARRANGE DESTROYER CONVOY FOR DAMAGED CV SIX RETURNING
RENDEZVOUS DOG AND ARRIVING LAT NINE DASH ZERO THREE
NORTH LONG ONE SIXTY NINE DASH ZERO SEVEN AT ZERO ONE
HUNDRED

KEY:- 12 9 3 7 14 10 1 11 5 2 6 13 4 8

Completely filled Rectangle 14 X 10. Text written
in form in columns according to key and removed in
normal English order.

Problem 2

DURING DAYLIGHT MARCH EIGHTEENTH REQUEST PHOTOGRAPHIC
RECONNAISSANCE AND BOMBING ATTACKS BE MADE RENDEZVOUS
FOX OBJECTIVE BOMBINGS AIR FIELDS GUN EMPLACEMENTS

KEY:- 6 1 10 3 7 9 5 2 11 4 8

Incompletely filled rectangle. (5 nulls at end of last
line) Rectangle is 11 X 13. Text inscribed according
to key and removed in normal English order.

Problem 3

Serial 1

BEGINNING MARCH EIGHT CHANGE ARC OF SEARCH TO THAT
BETWEEN LATITUDES THIRTY FIFTEEN AND TWENTY FOUR FORTY
FIVE

Serial 2

HAVE OBSERVED TWO ENEMY SUBMARINES OPERATING UPON SURFACE
TO EAST OF LINE NORTHWARD FROM HIS ADVANCED SUB BASE

Serial 3

ENEMY STRIKING FORCE OF FOUR HEAVY CRUISERS AND TWO
CARRIERS HAS LEFT BASE BAKER ON COURSE TO SOUTH AT HIGH
SPEED

KEY:- 7 3 6 1 4 8 5 2

Double Columnar transposition in incompletely filled
rectangle, 8 X 12. Same key used for both transpositions.

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ASSIGNMENT 8

Problem 4

Serial 1

AT TWELVE FORTY FIVE OBTAINED RADIO BEARINGS ON APPARENTLY
NAVAL TRANSMITTER ON ABOUT FOUR HUNDRED FIFTY FIVE KCS
BEARING THREE FIVE FOUR TRUE

Serial 2

LIGHT CRUISERS SIGHTED FROM TOP BEARING ZERO ZERO FOUR
TRUE PERIOD THEY WILL PROBABLY CLOSE AT SUNSET PERIOD
AT DARK LEAVE FORMATION AND ATTACK

KEY:- Columnar Key - 3 8 4 10 1 5 9 6 7 2
Linear Key - 8 9 2 4 12 5 10 3 6 11 1 7

Two way transposition in completely filled rectangle
10 X 12. Text is inscribed in form according to
columnar key and removed by linear key.

Problem 5

AT ZERO FIVE THIRTY LAUNCH ALL PLANES ON SIGNAL COMMA
SCOUT BY PAIRS BY SHIP UNITS ON COURSE THREE FOUR ZERO
TO LATITUDE SEVENTEEN DASH FIFTY THEN RENDEZVOUS ON
TRENTON WITH ONE THOUSAND FEET OVER NAVASS ALIGHT
AND PROCEED GUANTANAMO

KEY:- 6 1 11 9 4 5 7 2 10 12 8 3

12 X 17 incompletely filled rectangle. Text inscribed
according to key and removed in normal English order.

Problem 6

CRUDIVS FIVE AND SIX JOIN DESFLOT TWO AND CARRY OUT
ASSIGNED MISSION UPON COMPLETION OF SEARCH OPERATIONS
XX SUSPICIOUS VESSEL REPORTED IN AREA DOG NORTH OF LAT
TWENTY SEVEN FORTY NINE LONG SIXTY EIGHT SIXTEEN

KEY:- 8 1 7 12 4 9 2 5 3 6 11 10

Incompletely filled rectangle 12 x 15. Text inscribed
according to key and removed in normal English order.

ASSIGNMENT 9

Problem 1

Serial 1

SHORE PARROLS ENCOUNTERED DIFFICULTY IN MAINTAINING ORDER
ALONG THE WHARF

Serial 2

A FULL REPORT IS REQUESTED FROM THE COMMANDING OFFICER OF
THE VESSELS IN PORT

~~XXXXX~~

Grill used 8 x 8 - numbered in normal English order, the
following cells are open 1-5-12-15-17-22-27-32-36-39-42-
45-49-51-56-62. Rotated counterclockwise.

Problem 2

AT EIGHTEEN HUNDRED SIGHTED FOUR LIGHT CRUISERS BEARING
THREE FOUR SEVEN TRUE FROM FLEET GUIDE ON AN EASTEULY
COURSE XX

Grill used is 10 x 10 with following cells open:
3-10-11-15-18-24-29-32-37-40-41-43-44-48-56-66-68-70-
73-80-81-82-85-87-96. Rotated clockwise.

Problem 3

Serial 1

BATTLESHIPS DEPLOY ON COURSE THREE ONE FIVE DESTROYERS
FORM ANTISUBMARINE SCREEN ON DISENGAGED SIDE OTC IN
TENNESSEE

Serial 2

ONE CRUISER SIGHTED IN POSITION GEORGE HYPO TWO ON COURSE
ONE EIGHT ZERO SPEED TWENTYFIVE APPARENTLY ON DETACHED
DUTY X

Grill which is used is 10 x 10 with the following cells
open: 2-4-7-19-21-23-26-34-39-41-45-47-50-53-59-65-
68-72-77-79-84-86-92-98-100. Rotated counterclockwise.

Problem 4

INFORMATION RECEIVED YOU ARE ON DEPT OF JUSTICE SUSPECT
LIST AND ARE BEING WATCHED STOP IF US DECLARES WAR
PROCEED TO MEXICO CITY AND REPORT TO EMBASSY STOP WATCH
FOR SLEUTHS

Grill used is 12 x 12 with the following cells open:
8-10-14-16-18-24-32-34-38-40-43-48-54-57-61-63-67-70-
72-79-85-87-89-93-95-103-110-112-117-119-126-128-134-
136-142-144

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ASSIGNMENT 9

Problem 5

Serial 1

FORCES PREVIOUSLY REPORTED ARE CHANGING COURSE TO ONE
EIGHT ZERO

Serial 2

FORCES PREVIOUSLY REPORTED AHEAD CHANGED COURSE TO
TWO FOUR ZERO

Serial 3

I AM ATTACKING EIGHT SUBMARINES ON SURFACE BEARING
TWO ZERO SEVEN

KEY:- 9 2 5 6 3 7 1 10 11 8 4

Double columnar transposition in completely filled
rectangle 11 x 5. Same key used for both transpositions.

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ASSIGNMENT 10

PROBLEM 1

Serial 1

OPERATE AT DISCRETION EXCEPT EXECUTE PLAN GEORGE
ONE AT DAYLIGHT EIGHTEEN APRIL

Serial 2

AT FIFTEEN FIFTY ATTACKED BY FIVE LEXINGTON HEAVY
BOMBING PLANES UNDER ANTI-AIRCRAFT FIRE THREE MINUTES
PLANES BOMBING POSITION ALTITUDE ONE FOUR THOUSAND
FEET NO DAMAGE TO SARATOGA

Serial 3

HAVE ORDERED HULBERT PRUITT EXCHANGE MISSIONS PERIOD
PRUITT LOSING WATER AT HIGH SPEED SX

Serial 4

PROCEED INDEPENDENTLY AT DISCRETION TO JOIN MAIN BODY
AT DAYLIGHT EIGHTEEN APRIL PERIOD DECATUR CONTINUE AS
LATE AS PRACTICABLE TO TRACK LEXINGTON AND ATTACK IF
POSSIBLE

Serial 5

MAIN BODY TAKE SPEED THIRTEEN POINT FIVE AT ZERO TWO
HUNDRED EIGHTEEN APRIL PERIOD FLEET CHANGE COURSE TO
ZERO THREE ZERO AT ZERO SIX THIRTY PERIOD LANGLEY
ESTABLISH ANTISUBMARINE PATROL AT DAYLIGHT AND MAINTAIN
FIGHTERS IN READINESS PERIOD AIR SQUADRONS OPERATE AT
DISCRETION KEEPING VISUAL CONTACT

SYSTEM: False digraphic, with first character of each
digraph variable and determined from a square
table and with second character of digraph
having a constant value.

Keyword for cipher component of 1st letter of digraph:
STENOGRAPHY - vertical mixed sequence with
plain component a normal alphabet.

Keyword for cipher component of 2nd letter of digraph:
CRYPTOGRAMS - vertical mixed sequence with
plain component a normal alphabet.

ASSIGNMENT 10

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PROBLEM 2

Serial 1

ONE CRUISER LAT SIXTEEN DASH THIRTY SIX LONG SEVENTY ONE
DASH FORTY TWO COURSE THREE ONE FIVE X

Serial 2

ONE MERCHANT VESSEL LAT SEVENTEEN DASH EIGHTEEN LONG
SEVENTY ONE DASH FORTY EIGHT COURSE ZERO NINE ZERO X

Serial 3

ONE CRUISER LAT SIXTEEN DASH FIFTY FOUR LONG SEVENTY ONE
DASH FORTY TWO COURSE TWO EIGHT FIVE X

Serial 4

AT FOURTEEN HUNDRED SIXTEEN APRIL FORM SCOUTING LINE
BEARING ONE NINE ZERO FROM VICE THREE IN POSITION QUACK
SAIL HYPO SCOUTING DISTANCE TWENTY MILES ORDER FROM NORTH
VICE THREE VICE ONE VICE TWO PERIOD SPEED ELEVEN COURSE
TWO EIGHT ZERO

Serial 5

ENEMY CRUISER PREVIOUSLY REPORTED IS A FRIEND X

SYSTEM:

	2nd letter											
	TUVW	XYZABC	DEFG	HIJKLM	NOPQRS							
K	1001	2345	6789	1101	2345	6789	1201	2345				
L	130		140				150					
M	160		170				180					
N	190		200				210					
O	220		230				240					
P	250		260				270					
Q	280		290				300					
l	R	310		320			330					
s	S	340		350			360					
t	T	370		380			390					
	U	400		410			420					
l	V	430		440			450					
e	W	460		470			480					
t	X	490		500			510					
t	Y	520		530			540					
e	Z	550		560			570					
r	A	580		590			600					
	B	610		620			630					
	C	640		650			660					
	D	670		680			690					
	E	700		710			720					
	F	730		740			750					
	G	760		770			780					
	H	790		800			810					
	I	820		830			840					
	J	850		860			870					

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ASSIGNMENT 10

PROBLEM 3

Serial 1

RECONNOITER WESTERN COAST OF HAITI ENROUTE NEW
SCOUTING STATIONS

Serial 2

ONE MINESWEEPER LAT SEVENTEEN DASH FIFTEEN LONG SEVENTYFOUR
DASH TWENTYSEVEN COURSE THREE THREE ZERO SPEED TEN KNOTS

Serial 3

SANK SANDPIPER BY GUNFIRE AT FOUR THOUSAND YARDS X

Serial 4

TWO LIGHT CRUISERS LAT EIGHTEEN DASH TWENTYONE LONG
SEVENTYFOUR DASH FIFTYFIVE COURSE ONE EIGHT ZERO

Serial 5

TWO ENEMY PLANES LAT EIGHTEEN ZERO ZERO LONG SEVENTYFOUR
ZERO ZERO COURSE ONE ZERO FIVE X

Serial 6

BEARING OF COMMANDER BLUE ZERO TWO FOUR FROM POSITION
LAT EIGHTEEN LONG SEVENTY FIVE FIFTY AT ELEVEN FIFTEEN X

Serial 7

AT ZERO EIGHT FORTY BEARING OF TENNESSEE FROM LANGLEY
SEVENTYTHREE DEGREES

SYSTEM: True digraphic

Note: With the relatively small percentage of digraphs
recovered I was unable to reconstruct a definite
system, however a check of true values of high
frequency letters in first and second positions
gives some indication that a system may have
been employed in making up the cipher component
of the table.

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ASSIGNMENT 11

PROBLEM 1

ONE OF THE GREATEST ADVOCATES OF COMMUNICATION SECURITY WAS GENERAL STONEWALL JACKSON PERIOD HIS RETICENCE OFTEN IRRITATED HIS FELLOW OFFICERS WHO THOUGHT IT IMPLIED A WANT OF CONFIDENCE IN THEM PERIOD HOWEVER MANY OF HIS VICTORIES CAN BE ATTRIBUTED TO HIS SURPRISE ATTACKS AND THE FACT THAT THE FEDERAL FORCES NEVER HAD AN INKLING OF HIS PLANS PERIOD THEN IN SO SMALL A MATTER AS WRITING TO HIS WIFE HE WAS CONSISTENT FOR HE TOLD HER THAT IT WAS UNLIKE AN OFFICER TO WRITE MILITARY NEWS TO ANY ONE

SYSTEM: Diagonal Digraphic Substitution using this table:

	ABCDEEDCBA	
	FGHIKKIHGF	
1st plain	LMNOHPONML	1st cipher
	QRSTUUTSRQ	
	VWXYZZYXWV	
	EDCBAABCDE	
	KIHGFEGHIK	
2nd cipher	PONMLLMNOP	2nd plain
	UTSRQQRSTU	
	ZYXWVWXYZ	

PROBLEM 2

Serial 1

SEVENTEEN APRIL FORM SCOUTING LINE BEARING EAST ORDER OF SCOUTS FROM EAST DECATUR RICHMOND TRENTON MARBLEHEAD LITCHFIELD CARRIER GROUP AS BEFORE TRENTON GUIDE AT POINT CAST SCOUTING DISTANCE TWENTY MILES COURSE THREE THREE ZERO SPEED TWENTY COMMENCE ZERO SIX HUNDRED X

Serial 2

RECONNOITER AUXCAYES BAY AT DAYLIGHT SEVENTEEN APRIL PERIOD PROCEED THRU POINT GEORGE ON COURSE THREE THREE ZERO SPEED TWENTY PERIOD REPORT POSITION NOON TOMORROW X

Serial 3

AT TWELVE HUNDRED SEVENTEEN APRIL FORM SCOUTING LINE BEARING ZERO SIX ZERO FROM VICE THREE AT POINT GEORGE SCOUTING DISTANCE TWENTY SPEED TWELVE COURSE THREE THREE ZERO PERIOD ORDER FROM WESTWARD VICE THREE VICE TWO VICE ONE PERIOD VICE THREE RECONNOITER AUXCAYES ENROUTE NEW STATION X

Serial 4

AT SEVENTEEN HUNDRED MET LEXINGTON CONCORD AND THREE DESTROYERS IN POSITION SAIL HYPO WILLIAM PERIOD ENGAGED THE LEXINGTON WHILE SHE WAS RECOVERING PLANES PERIOD LOST CONTACT ABOUT EIGHTEEN FORTY FIVE IN POSITION SAI

SYSTEM: "Playfair" digraphic substitution. Square formed from Keyword LEXINGTON

LAPZE	LEXINGTO
BQXCR	ABCDEHKM
IDSNF	PQRSUVWY
UGHVT	Z
KWOMY	

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ASSIGNMENT 11

PROBLEM 3

Serial 1

SUBMARINE CRUISING SUBMERGED BEARING TWO EIGHT ZERO DISTANT FORTY FROM FLEET GUIDE AT TWELVE TWENTY PERIOD ATTACKED WITH EIGHTEEN ONE HUNDRED POUND BOMBS WHILE SUBMERGED AT TWELVE SIXTEEN PERIOD WILL CONTINUE TO TRACK AND ATTACK NO DESTROYERS IN VICINITY SUBMARINE Q

Serial 2

DESTROYER ORDERED TO PROCEED AGAINST SUBMARINE REPORTED BY NEW YORK

Serial 3

TAKE ASSIGNED STATIONS AT DAYLIGHT TOMORROW MONDAY PERIOD BE PREPARED TO LAUNCH TWO PLANES FOR TACTICAL SCOUTING AT SUNRISE J

Serial 4

ENEMY SUBMARINE TO SOUTHWARD O(F) FLEET GUIDE DISTANCE TWENTYFIVE MILES PERIOD HAVE SENT PLANES TO ATTACK.

SYSTEM: False digraphic substitution with the first letter of each digraph being taken from a straight keyword cipher component against a normal alphabet plain component. Keyword used for first sequence is BALTIMORE.

The second letter of the digraph is obtained from a viginere table the cipher component of which is derived from a straight keyword sequence using the keyword WASHINGTON. The successive lines of the table are offset one step to the left progressing downward. The plain component of the second letter is a plain alphabet in normal order.

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ASSIGNMENT No. 12

Problem 1

TWO THOUSAND TONS OF AMMUNITION LEAVING NEW YORK AT
MIDNIGHT MONDAY

SYSTEM: Read every 4th word.

Problem 2

PARTIALLY CONFIRMED REPORT ENTIRE FLEET GOING TO SEA
MORNING OF EIGHTEENTH MISSION UNKNOWN QP

SYSTEM: Simple rail fence transposition.

Problem 3

IN FUTURE TAKE CENTRE WORD THEN FIRST AND LAST OF EACH
LINE

SYSTEM: Formed by taking first letter after each break
in word of text.

Problem 4

YOU ARE UNDER OBSERVATION BY UNITED STATES DEPARTMENT
OF JUSTICE PROCEED TO MEXICO THENCE BUENOS AIRES REPORT
TO MILLER

SYSTEM: Simple substitution cipher formed by converting
the letters of the alphabet into their normal
numerical equivalent (order of position in alphabet)
and adding to each number.

Problem 5

NO DEFINITE NEWS USUAL SOURCES NO LONGER ABLE TO LEARN PLANS
STOP THINK NEW CONTACTS MUST BE MADE STOP UNABLE EXPLAIN
PRESENT FAILURE AND NEED FUNDS TO BUILD NEW SYSTEM WHICH
REQUIRE ABOUT TWO MONTHS

SYSTEM: Grill used 6 X 6 with following cells open: 3 - 8 -
10 - 15 - 20 - 24 - 25 - 30 - 31 Rotated counterclockwise.

Problem 6

TOM IS INJURED HE RACED A FORD HE WRECKED IT AND ALICE IS
HURT TOO IN FACT SHE IS DEAD

ASSIGNMENT 12

Problem 7

URGENT BRITISH TROOPS WILL ATTEMPT LANDING SOUTHERN GALLIPOLI PENNINSULA ABOUT MIDDLE OF NEXT MONTH

SYSTEM: Text divided into groups of five, underlined characters combining with others in each group to form a pattern similar to a dot and dash code:

00000	A	00---	H	0--0-	O	-00--	V
0000-	B	0-000	I	0---0	P	-0-00	W
000-0	C		J	0----	Q	-0-0-	X
000--	D	0-00-	K	-0000	R	-0--0	Y
00-00	E	0-0-0	L	-000-	S	-0----	Z
00-0-	F	0-0--	M	-00-0	T		
00--0	G	0--00	N	-----	U		

Problem 8

ONE LARGE TRANSPORT SAILING MONDAY NINE DESTROYERS LEFT AT DAWN ON PATROL ONE DESTROYER IN PORT

SYSTEM: Simple substitution. Text based on order of vowels in message. vowels combined consecutively in pairs and deciphered by means of table. Insufficient text to complete table:

	.A	E	I	O	U
A	.R	T	D	A	
E	.E	S	L	N	F
I	.			P	
O	.I	O	Y		G
U	.			W	