SECURITY CLASSIFICATION

NSA STAFF PROCESSING FORM

TO	EXREG CONTROL NUMBER	KCC CONTROL NUMBER	Z CONTROL NUMBER
DDO			Z-054-98

THRU	ACTION	EXREG SUSPENSE
	[ ] APPROVAL	
SUBJECT: CIA KRYPTOS Sculpture -- The Challenge and Resolution (U)	[ ] ACTION	KCC SUSPENSE
	[X] INFORMATION	ELEMENT SUSPENSE

DISTRIBUTION
Z4 [redacted], Z23 [redacted]

(b)(3)-P.L. 86-36

SUMMARY

1. (U) In response to your request we have put together a package chronologically outlining the events in our decryption (89%) of the CIA courtyard KRYPTOS sculpture. Also attached is a copy of the original memorandum to Adm. McConnell with attachments providing the cipher, the cryptography employed, and the respective decrypts.

2. (U) The initial examination of the cipher revealed that it was likely to consist of three cryptographically distinct sections. Basic computer diagnostic tools confirmed this hypothesis. Subsequent analysis and solution, however, did not require any compute power.

3. (C) Parts 1-3 were solved within two days of receiving the informal tasking from Chief, Z. Another day was spent on the final section and a decision was made to stop any further work. Given the suspected cryptography, the last section is too short to solve without diverting a great deal of effort from operational problems.

(b)(3)-P.L. 86-36

COORDINATION/APPROVAL

OFFICE	NAME AND DATE	SECURE PHONE	OFFICE	NAME AND DATE	SECURE PHONE
Z09	[redacted] 7/22	5043s			
			Drafter	[redacted]	4451s

ORG.	PHONE (Secure)	DATE PREPARED
Z		

[redacted]

Approved for Release by NSA on 05-21-2013, FOIA Case # 61191

FORM A6796 FEB 94
NSN: 7540-FM-001-5465

CLASSIFIED BY: NSA Class Guide 342-97 Dated 29 May 1997
DECLASSIFY ON: X1, X5

Chronological history of NSA personnel and their involvement in the partial decryption of the KRYPTOS sculpture located in the CIA courtyard

- 1988 - The CIA Fine Arts Commission approves James Sanborn's proposal.
- 1990 - The artwork, titled *Kryptos*, is dedicated. A portion of this work of art consists of a classic Vigenere Square and 870 characters of cipher punched through two large copper sheets.
- 1991 - While on a trip to the CIA headquarters, an informal group comprised mainly of Cryptanalysis interns, handwrites the cipher onto sheets of paper , and distributes it to any and all interested cryptanalysts back at NSA.
- 1992 - Official challenge for solution is relayed through DCI at a Gold Bug award ceremony.
- 1992 - Mr. [redacted] is the first person to decrypt a portion of the cipher. The cipher system used is a polyalphabetic substitution using eight alphabets. The decrypted text accounts for the last 373 characters from the first section of 436, but the initial 63 characters resist decryption. Because of this, analysts concede that four distinct sections are likely, with this being the second section. (b)(3)-P.L. 86-36
- 1992 - Mr. [redacted] is the second person to successfully decrypt a portion of the cipher. That portion is the third section involving 337 characters and employing a transposition system using a matrix with dimensions 4 X 86.
- 1992 - As the third successful cryptanalyst, Mr. [redacted] successfully decrypts the initial 63 characters of the cipher, which is the first section. It also uses a polyalphabetic substitution, but with 10 alphabets.
- 1992 - An informal document is produced detailing the solution of the three sections. These three sections comprise the first 773 characters out of 870 total, leaving the last 97 characters unresolved.
- 1993 - A formal letter is sent to Adm. McConnell (DIRNSA) detailing the story, and is returned with a request that it be forwarded to Adm. Studeman at CIA.
- 1998 - There is renewed interest from the CIA, with an eye towards a technical article for an internal publication.

DOCID: 4050989

DONS: EXRS 142-93

UNITED STATES GOVERNMENT

memorandum

DATE: 9 June 1993 Z-043-93

PLS FORWARD TO ADMIRAL STUDEMAN FOR INFO.

REPLY TO ATTN OF: Z

SUBJECT: CIA KRYPTOS Sculpture - Challenge and Resolution ~~(FOUO)~~
INFORMATION MEMORANDUM

TO: DIR

THRU: D/DIR, EXEC/DIR, DDO

Great Story!

1. ~~(FOUO)~~ The KRYPTOS sculpture, located at the entrance and in the courtyard of the new CIA headquarters, consists of a series of stone "pages" containing code which begins as International Morse and increases in complexity as the stonework extends into the courtyard. Inserted between these stone "pages" is a flat copper sheet engraved with letters and symbols - the enciphered message - that is the focus of this challenge.

2. ~~(FOUO)~~ In November, a cadre of cryptanalysts assigned to Z Group enthusiastically responded to the challenge. Within one month, three of the four cipher systems used to encrypt the sculpture's plain text had been diagnosed and completely exploited. The cryptographies employed for the encryption of these three parts involved two periodic polyalphabetic substitution ciphers and a keyed columnar transposition cipher. The exploitation of the sculpture's first three parts constitutes a readability of approximately 89%. The final 97 characters continue to elude solution.

3. ~~(FOUO)~~ Attached, for your review, is a brief description of the employed cryptographies and the plain text derived from the three exploited portions of the KRYPTOS sculpture. If your schedule permits, we would be happy to present a 15-minute briefing on the KRYPTOS sculpture solution and introduce you to the cryptanalysts responsible for the success against this cipher.

[redacted]

(b)(3)-P.L. 86-36

3 Encls:
1. Copy of Sculpture Picture
2. Copy of Cipher
3. Description of Cryptographies

cc: Z4
Z43

OPTIONAL FORM
46695
6-134

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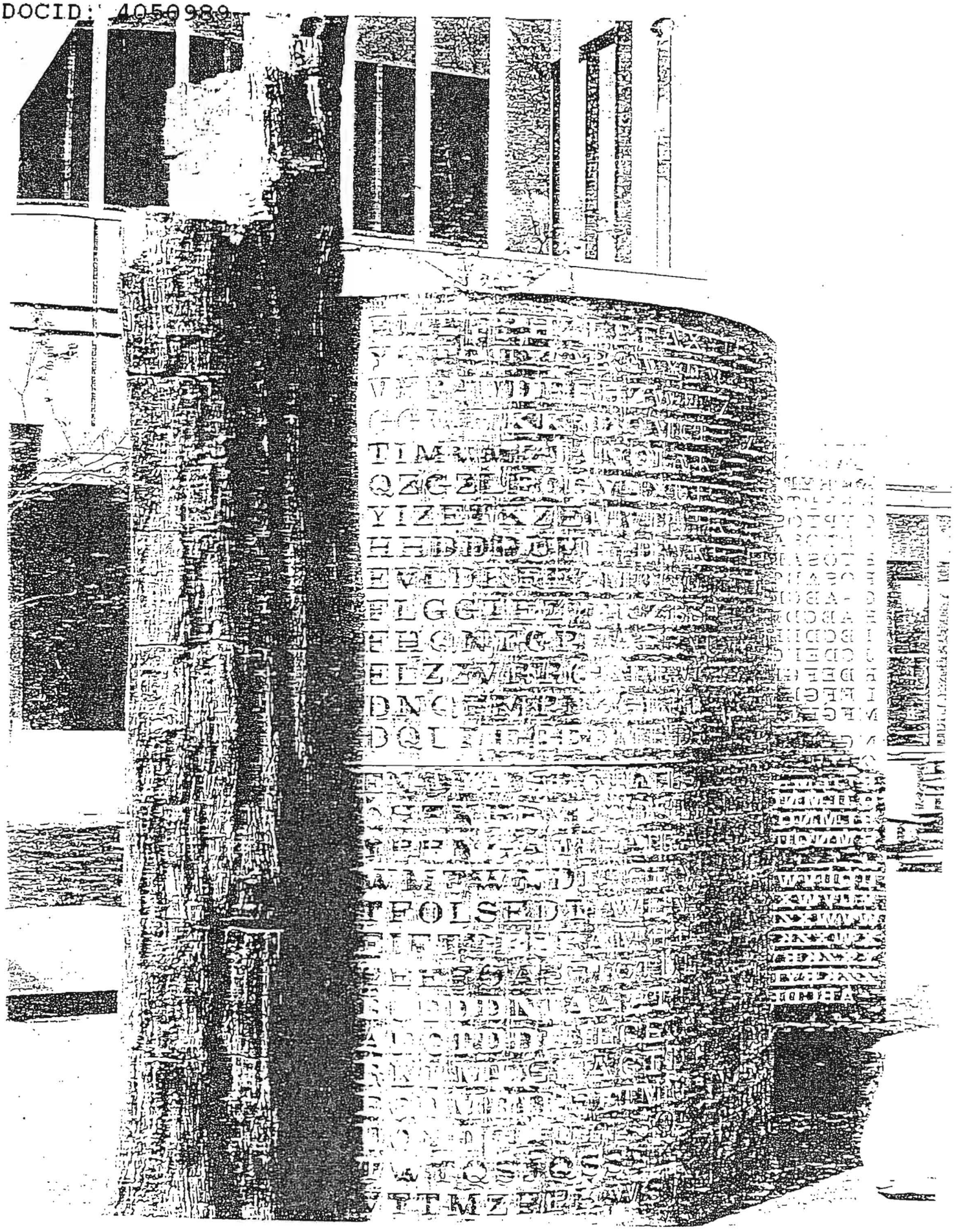
DOCID: 4050989



DOCID: 4050989

THE KRYPTOS SCULPTURE CIPHER

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E M U F P H Z L R F A X Y U S D J K Z L D K R N S H G N F I V J
Y Q T Q U X Q B Q V Y U V L L T R E V J Y Q T M K Y R D M F D
V F P J U D E E H Z W E T Z Y V G W E K K Q E T G F Q J N C E
G G W H K K ? D Q M C P F Q Z D Q M M I A G P F X H Q R L G
T I M V M Z J A N Q L V K Q E D A G D V F R P J U N G E U N A
Q Z G Z L E C G Y U X U E E N J T B J L B Q C R T B J D F H J R R
Y I Z E T K Z E M V D U F K S J H K F W H K U W Q L S Z F T I
H H D D D U V H ? D W K B F U F P W N T D F I Y C U Q Z E R E
E V L D K F E Z M O Q Q J L T T U G S Y Q P F E U N L A V I D X
F L G G T E Z ? F K Z B S F D Q V G O G I P U F X H H D R K F
F H Q N T G P U A E C N U V P D J M Q C L Q U M U N E D F Q
E L Z Z V R R G K F F V O E E X B D M V P N F Q X E Z L G R E
D N Q F M P N Z G L F L P M R J Q Y A L M G N U V P D X V K P
D Q U M E B E D M H D A F M J G Z N U P L G E W J L L A E T G
E N D Y A H R O H N L S R H E O C P T E O I B I D Y S H N A I A
C H T N R E Y U L D S L L S L L N O E S N O S M R W X M N E
T P R N G A T I H N R A R P E S L N N E L E B L P I I A C A E
W M T W N D I T E E N R A H C T E N E U D R E T N H A E O E
T F O L S E D T I W E N H A E I O Y T E Y Q H E E N C T A Y C R
E I F T B R S P A M H H E W E N A T A M A T E G Y E E R L B
T E E F O A S F I O T U E T U A E O T O A R M A E E R T N R T I
B S E D D N I A A H T T M S T E W P I E R O A G R I E W F E B
A E C T D D H I L C E I H S I T E G O E A O S D D R Y D L O R I T
R K L M L E H A G T D H A R D P N E O H M G F M F E U H E
E C D M R I P F E I M E H N L S S T T R T V D O H W ? O B K R
U O X O G H U L B S O L I F B B W F L R V Q Q P R N G K S S O
T W T Q S J Q S S E K Z Z W A T J K L U D I A W I N F B N Y P
V T T M Z F P K W G D K Z X T J C D I G K U H U A U E K C A R
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PART 1

Cryptography: Periodic Polyalphabetic Substitution employing 10 alphabets
Plain component: Keyword mixed sequence based on **KRYPTOS**
Cipher component: Keyword mixed sequence based on **KRYPTOS**
Repeating Key: **PALIMPSEST**
Index letter: **K**

P:	**K**	**R**	**Y**	**P**	***T***	**O**	***S***	**A**	***B***	**C**	**D**	***E***	**F**	**G**	**H**	**I**	**J**	**L**	**M**	***N***	**Q**	***U***	**V**	***W***	**X**	**Z**
C1:	P	T	O	S	A	B	C	D	***E***	F	G	H	I	J	L	M	N	Q	U	V	W	X	Z	K	R	Y
C2:	A	B	C	D	E	F	G	H	I	J	L	***M***	N	Q	U	V	W	X	Z	K	R	Y	P	T	O	S
C3:	L	M	N	Q	***U***	V	W	X	Z	K	R	Y	P	T	O	S	A	B	C	D	E	F	G	H	I	J
C4:	I	J	L	M	N	Q	U	V	W	X	Z	K	R	Y	P	T	O	S	A	B	C	D	E	***F***	G	H
C5:	M	N	Q	U	V	W	X	Z	K	R	Y	***P***	T	O	S	A	B	C	D	E	F	G	H	I	J	L
C6:	P	T	O	S	A	B	C	D	E	F	G	***H***	I	J	L	M	N	Q	U	V	W	X	Z	K	R	Y
C7:	S	A	B	C	D	E	F	G	H	I	J	L	M	N	Q	U	V	W	X	***Z***	K	R	Y	P	T	O
C8:	E	F	G	H	I	J	***L***	M	N	Q	U	V	W	X	Z	K	R	Y	P	T	O	S	A	B	C	D
C9:	S	A	B	C	D	E	F	G	H	I	J	L	M	N	Q	U	V	W	X	Z	K	***R***	Y	P	T	Q
C10:	T	O	S	A	B	C	D	E	***F***	G	H	I	J	L	M	N	Q	U	V	W	X	Z	K	R	Y	P

EMUFPHZLRF AXYUSDJKZL DKRNSHGNFI VJYQTQUXQB
BETWEENSUB TLESHADING ANDTHABSCE NCEOFLIGHT

QVYUVLLTRE VJYQTMKYRD MFD
LIESTHENUA NCEOFIQLUS ION

~~(FOUO)~~ Respaced and punctuated, it reads:

"BETWEEN SUBTLE SHADING AND THE ABSENCE OF LIGHT LIES THE NUANCE OF ILLUSION"

PART 2

Cryptography: Periodic Polyalphabetic Substitution employing 8 alphabets
Plain component: Keyword mixed sequence based on **KRYPTOS**
Cipher component: Keyword mixed sequence based on **KRYPTOS**
Repeating Key: **ABSCISSA**
Index letter: **K**

```
 P:KRYPTOSABCDEFGHIJLMNQUVWXZ
C1:ABCDEFGHIJLMNQUVWXZKRYPTOS
C2:BCDEFGHIJLMNQUVWXZKRYPTOSA
C3:SABCDEFGHIJLMNQUVWXZKRYPTO
C4:CDEFGHIJLMNQUVWXZKRYPTOSAB
C5:IJLMNQUVWXZKRYPTOSABCDEFGH
C6:SABCDEFGHIJLMNQUVWXZKRYPTO
C7:SABCDEFGHIJLMNQUVWXZKRYPTO
C8:ABCDEFGHIJLMNQUVWXZKRYPTOS
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VFPJUDEE HZWETZYV GWHKKQET GFQJNCEG GWHKK?DQM
ITWASTOT ALLYINVI SIBLEHOW STHATPOS SIBLE?THE

CPFQZDQM MIAGPFXH QRLGTIMV MZJANQLV KQEDAGDV
YUSEDTHE EARTHSMA GNETICFI ELDXTHEI NFORMATI

FRPJUNGE UNAQZGZL ECGYUXUE ENJTBJLB QCETBJDF
ONWASGAT HEREDAND TRANSMIT TEDUNDER GROUNDTO

HRRYIZET KZEMVDUF KSJHKFWH KUWQLSZF TIHHDDDU
ANUNKNOW NLOCATIO NXDOESLA NGLEYKNO WABOUTTH

VH?DWKBFU FPWNTDKI YCUQZERE EVLDKFEZ MOQQJLTT
IS?THEYSH OULDITSB URIEDOUT THERESOM EWHEREXW

UGSYQPFE UNLAVIDX FLGGTEZ?F KZBSFDQV GOGIPUFX
HOKNOWST HEEXACTL OCATION?O NLYWWTHI SWASHISL

HHDRKFFH QNTGPUAE CNUVPDJM QCLQUMUN EDFQELZZ
ASTMESSA GEXTHIRT YEIGHTDE GREESFIF TYSEVENM

VRRGKFFV OEEXBDMV PNFQXEZL GREDNQFM PNZGLFLP
INUTESSI XPOINTFI VESECOND SNORTHSE VENTYSEV
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PART 3

Cryptography: Keyed Columnar transposition
Matrix size: Incompletely filled 4 X 86
Specific key: **KRYPTOS**, numerically keyed and repeated 13 times (first 12 columns listed below)
Route: Bottom to top

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SLOWLYDESPARATLYSLOWLYTHEREMAINSOFPASSAGEDE
ASREMOVEDWITHTREMBLINGHANDSIMADEATINYBREACH
OLEALITTLEIINSERTEDTHECANDLEANDPEEREDINTHEH
FLICKERBUTPRESENTLYDETAILSOFTHEROOMWITHINEM
 1      1      1      9      8      7
 2      1      0

BRISTHATENCUMBEREDTHELOWERPARTOFTHEDOORWAYW
INTHEUPPERLEFTHANDCORNERANDTHENWIDENINGTHEH
OTAIRESCAPINGFROMTHECHAMBERCAUSEDTHEFLAMETO
ERGEDFROMTHEMISTXCANYOUSEEANYTHINGQ
 6      5      4      3      2      1
```

"SLOWLY DESPARATLY SLOWLY THE REMAINS OF PASSAGE DEBRIS THAT ENCUMBERED THE LOWER PART OF THE DOORWAY WAS REMOVED. WITH TREMBLING HANDS I MADE A TINY BREACH IN THE UPPER LEFT HAND CORNER, AND THEN, WIDENING THE HOLE A LITTLE, I INSERTED THE CANDLE AND PEERED IN. THE HOT AIR ESCAPING FROM THE CHAMBER CAUSED THE FLAME TO FLICKER, BUT PRESENTLY, DETAILS OF THE ROOM WITHIN EMERGED FROM THE MIST X CAN YOU SEE ANYTHING Q".

Note: The above is a paraphrase from The Tomb of Tut-Ankh-Amen written by Mr. Howard Carter.