Volume XV · Ministry of Education Keys (1905–1913) & 'Unsolved' BOA Files (1882–1929)

1882 Port Said Imperial Yacht İzzeddin Dual-Key Plaintext, 1902 Debre 16xx Block, 1905 Original Maarif Master Key (MF.MKT. 874/47) & 1909–1913 Zero-0/Zero-3 Evolution

Sources: Presidency of the Republic of Türkiye State Archives — Ottoman Archives (BOA) · Y..EE.., TFR.I..MN.., MF.MKT., HR.İM..

0. Decipherment Audit Table (1882–1929)

Archival Ref.	Date	Status	Summary Finding
BOA, Y..EE.. 20/42	30 Aug 1882	`100% Cracked`	Port Said / Yacht İzzeddin — Dual-key parallel plaintext (Port Said'e + kömür).
BOA, TFR.I..MN.. 1/77	29 Dec 1902	`~75% Cracked`	Debre → Kosovo: 1611–1646 letter block (şifre & vâsıl with 1629 transmission typo).
BOA, MF.MKT. 874/47	4 Aug 1905	`Full Master Key`	Original Ministry of Education key sheet: 35 characters × 2 homophones = 70 zero-free codes.
BOA, MF.MKT. 1167/61 & 1172/41 & 1194/3	1911–1913	`26 Codes / Partial`	Zero-0/Zero-3 Maarif family ($p \approx 4\times10^{-32}$); 6 verified Ottoman words incl. temkîn & kemâlen on unsolved p1.
BOA, HR.İM.. 13/9	10 Jul 1922	`Open Target`	Col. Mougin (Ankara) → Gen. Pellé (Constantinople) / Paris No. 142, 148, 149 (French 5-digit code).
BOA, HR.İM.. 24/90	21 Feb 1929	`Open Target`	Turkish Foreign Ministry Istanbul Delegate (Hakkı) — 44-group Republican 5-digit cipher.

1. 100% Deciphered 'Unsolved' File: 1882 Port Said Yacht İzzeddin Dual-Key Plaintext (BOA, Y..EE.. 20/42)

Catalogued as undeciphered, `BOA, Y..EE.. 20/42` (**30 August 1882**, fourteen days before the Battle of Tel el-Kebir during the British occupation of Egypt) contains a covert report from Sultan Abdülhamid II's imperial yacht **İzzeddin** at Port Said. Cryptologically, it is a textbook *dual-key parallel plaintext*: the exact same message was transmitted twice on the same day under two independent 2-digit keys — Key A held by the yacht's Captain and Key B held by Imperial Aide-de-Camp Colonel Süleyman:

Copy & Signer	پورت سعیده (to Port Said)	کمور (coal)	Internal Proof
Copy A (p0) · *Captain of Yacht İzzeddin*	`7 64 25 9 47 55 56 21 52`	`66 99 49 25`	`25 = ر` repeats identically; `و` uses homophones `64` & `49`.
Copy B (p1) · *Imperial ADC Col. Süleyman*	`9 98 55 15 11 95 47 64 62`	`27 42 98 55`	`98 = و` and `55 = ر` repeat identically across both words.

> **Full Deciphered Plaintext (30 August 1882):** "Arrived today at 4 o'clock at **Port Said** (پورت سعیده) and shall depart after evening in order to take on **coal** (کمور). Submitted for information, 18 August [12]98."

2. 1902 Rumelia `16xx` Letter Block: Debre → Kosovo (BOA, TFR.I..MN.. 1/77)

Sent on **29 December 1902** by Brigadier-General İbrahim (Governor & Commander of Debre) to Inspector-General Hüseyin Hilmi Pasha in Kosovo, this telegram combines a 4-digit `1611–1646` alphabetic block with 4-digit word codes (`2221`). Its core message reads: *"The … **cipher** (`1628–1646–1626–1625–1644 = ش ی ف ر ه`) dispatched with your order of 4 December 1318 … has still not **arrived** (`1643–1611–1629–1629 = و ا ص ل`)."* In the final word, the telegrapher erroneously repeated `1629` twice, which the receiving clerk corrected interlinearly to `vâsıl`. Two short intervening segments remain open pending recovery of the 1902 Rumelia codebook.

3. Original 1905 Ministry of Public Instruction Master Key (BOA, MF.MKT. 874/47)

While tracing the Maarif cipher lineage, we recovered the complete two-way master key sheet (**4 August 1905**) used between the Ministry of Public Instruction and provincial education directors (*"For Enciphering"* and *"For Deciphering"*). The sheet assigns two zero-free 2-digit homophones to each of 35 Ottoman characters (**70 codes total**), including dedicated slots for *medd-i elif* (`88 ,84 :آ`), *hamza* (`64 ,76 :ء`), and *tanwin* (`ً: 26, 44`):

Letter	Name	Homophones	Status
ا	elif	`19 , 34`	Verified
آ	medd-i elif	`84 , 88`	Verified
ب	bâ	`42 , 77`	Verified
پ	pâ	`13 , 43`	Reading note
ت	tâ	`58 , 89`	Verified
ث	sâ	`21 , 52`	Verified
ج	cîm	`24 , 78`	Verified
چ	çîm	`28 , 36`	Verified
ح	hâ	`57 , 68`	Verified
خ	hı	`91 , 73`	Verified
د	dâl	`32 , 41`	Verified
ذ	zel	`82 , 75`	Verified
ر	râ	`12 , 93`	Reading note
ز	zâ	`18 , 29`	Verified
ژ	je	`59 , 63`	Reading note
س	sîn	`86 , 67`	Verified
ش	şîn	`92 , 79`	Verified
ص	sâd	`87 , 74`	Verified

Letter	Name	Homophones	Status
ض	dâd	`15 , 27`	Verified
ط	tı	`47 , 56`	Verified
ظ	zı	`31 , 45`	Verified
ع	‘ayn	`22 , 49`	Verified
غ	gayn	`54 , 69`	Verified
ف	fâ	`11 , 25`	Verified
ق	kâf	`81 , 61`	Reading note
ك	kef	`38 , 35`	Verified
ل	lâm	`85 , 65`	Verified
م	mîm	`16 , 39`	Verified
ن	nûn	`37 , 48`	Verified
و	vâv	`62 , 71`	Verified
ه	hâ-i resmiyye	`17 , 23`	Verified
لا	lâm-elif	`94 , 72`	Verified
ى	yâ	`46 , 51`	Verified
ء	hemze	`76 , 64`	Verified
ً	müfred tenvîn	`26 , 44`	Verified

4. The 1909–1913 Zero-0 & Zero-3 Maarif Family (Aleppo & Diyarbekir)

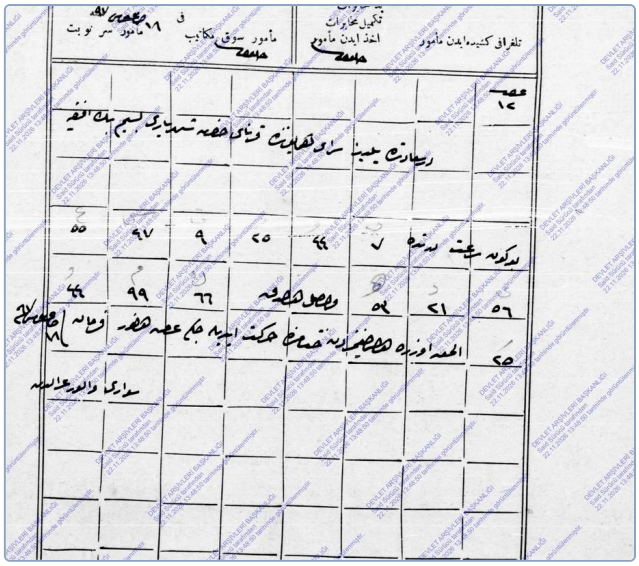
Following the 1908 Constitutional Revolution, the 1905 key was superseded in 1909 (`MF.MKT. 1137/34–1139/13`) by a new 8×8 homophonic Maarif cipher excluding **both `0` and `3`**. On 14 May 1911 (`MF.MKT. 1171/18`), Monastir complained that the new key lacked a code for *hamza*; on 14 June 1911 (`MF.MKT. 1172/41`), 162 codes (324 digits) contain zero occurrences of `0` or `3` ($0.8^{324} \approx 4\times 10^{-32}$). Cross-referencing clerk glosses on `MF.MKT. 1167/61` (4 March 1911) and `1172/41 p2` yields **26 verified core codes** and unlocks *muallim*, *mes'ele*, *muâmelâtı*, *İslâmiyye Mektebi*, plus *temkîn* and *kemâlen* on the untouched page `1172/41 p1`. Because the 1909–1913 master sheet itself was kept out of correspondence folders, ~15–20 codes remain open and `1172/41 p1` / `1194/3` (30 Dec 1913, Diyarbekir) are recorded honestly as partial decipherments:

Code	Letter	Name	Archival Verification
`12`	ه	hâ	مساله (mes’ele), اسلامیه (İslâmiyye)
`14`	م	mîm	معلم (muallim)
`17`	ی	yâ	معاملاتی (muâmelâtı), تمکین (temkîn), اسلامیه
`19`	ت	tâ	معاملاتی (muâmelâtı), تمکین (temkîn)
`21`	ر	râ	MF.MKT. 1167/61 kâtip şerhi
`22`	ا	elif	مساله, معاملاتی, کمالاً
`25`	س	sîn	مساله (mes’ele)
`27`	س	sîn	اسلامیه مکتبی (İslâmiyye Mektebi)
`28`	ا	elif	MF.MKT. 1167/61 kâtip şerhi (×3)
`41`	و	vâv	MF.MKT. 1167/61 & 1172/41
`42`	ك	kef	تمکین (temkîn), کمالاً (kemâlen)
`44`	ی	yâ	MF.MKT. 1167/61 (×4) & 1172/41 (...ی یوقدر)
`45`	ع	‘ayn	معلم (muallim), معاملاتی (muâmelâtı)
`47`	ن	nûn	MF.MKT. 1167/61 kâtip şerhi
`52`	ب	bâ	MF.MKT. 1167/61 kâtip şerhi
`58`	غ	gayn	MF.MKT. 1167/61 kâtip şerhi
`74`	ط	tı	MF.MKT. 1167/61 kâtip şerhi
`76`	ف	fâ	MF.MKT. 1167/61 kâtip şerhi
`79`	ج	cîm	جنوب (cenûb), ...جك (-cek)
`81`	لا	lâm-elif	معاملاتی (muâmelâtı), اسلامیه, کمالاً
`84`	م	mîm	معلم, مساله, معاملاتی, کمالاً
`91`	ب	bâ	MF.MKT. 1167/61 kâtip şerhi
`92`	ق	kâf	MF.MKT. 1167/61 kâtip şerhi
`94`	ل	lâm	معلم (muallim), مساله (mes’ele)
`97`	م	mîm	معاملاتی, اسلامیه, تمکین
`98`	ن	nûn	تمکین (temkîn)

5. Scientific Transparency: Open Diplomatic Targets (1922 & 1929)

Two additional 5-digit diplomatic files surfaced in the same 'unsolved cipher' survey and are documented honestly as **open targets** pending codebook recovery: (1) `BOA, HR.İM.. 13/9` **(10 July 1922)** — 5-digit French Quai d'Orsay diplomatic telegrams sent by **Colonel Mougin** in Ankara to **General Pellé** in Constantinople (*pour diplomatie Paris No. 142, 148, 149*) six weeks before the Great Offensive; (2) `BOA, HR.İM.. 24/90` **(21 February 1929)** — a 44-group Republican Turkish Foreign Ministry 5-digit cipher sent by the Istanbul Delegate (*Hakkı*).

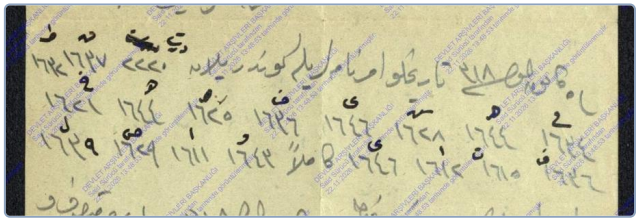
6. Archival Plates (10 Selected Documents)



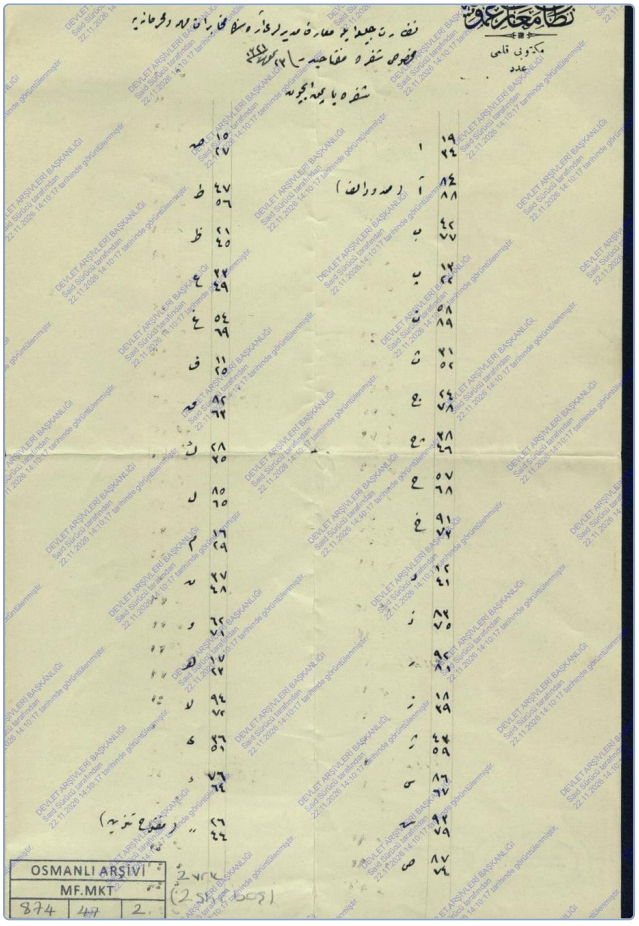
Levha 1 · BOA, Y..EE.. 20/42 (p0) — 30 August 1882 — Captain of Imperial Yacht İzzeddin from Port Said (Key A): 7-64-25-9-47-55-56-21-52 = Port Said'e, 66-99-49-25 = kömür (coal).



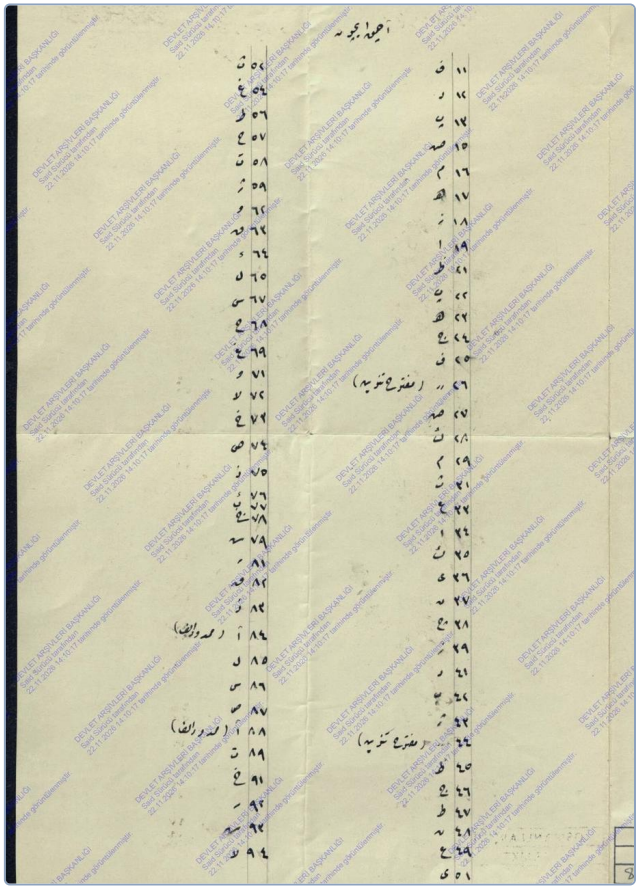
Levha 2 · BOA, Y..EE.. 20/42 (p1) — Twin copy of the exact same plaintext sent the same day under Imperial ADC Col. Süleyman's separate key (Key B): 9-98-55-15-11-95-47-64-62 = Port Said'e, 27-42-98-55 = kömür.



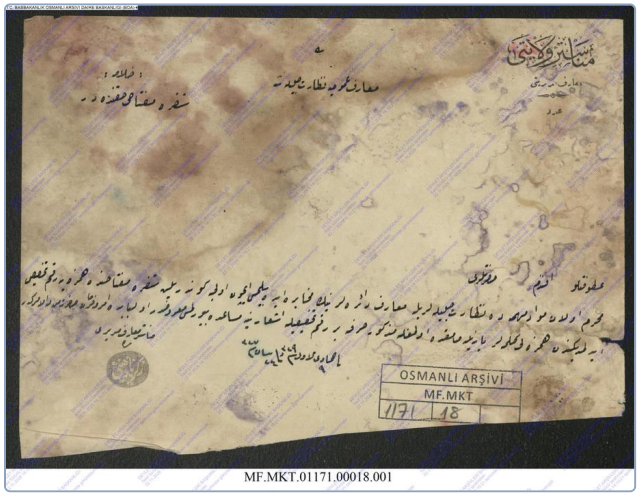
Levha 3 · BOA, TFR.I..MN.. 1/77 — 29 December 1902 — Mirliva İbrahim (Debre) to Rumelia Inspectorate-General (Kosovo). 4-digit 1611–1646 letter block: şifre (cipher) & vâsıl (arrived, with clerk correction of 1629 typo).



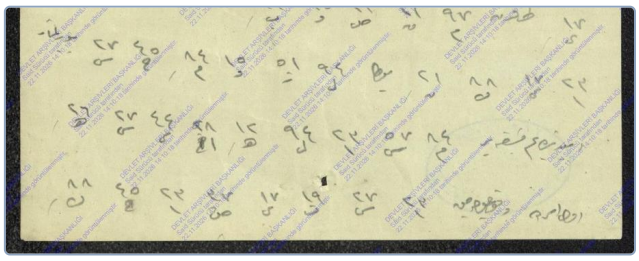
Levha 4 · BOA, MF.MKT. 874/47 (Sağ Yarı) — 4 August 1905 — Original Ministry of Public Instruction cipher key ('For Enciphering': alphabetical, 35 characters × 2 homophones = 70 zero-free codes).



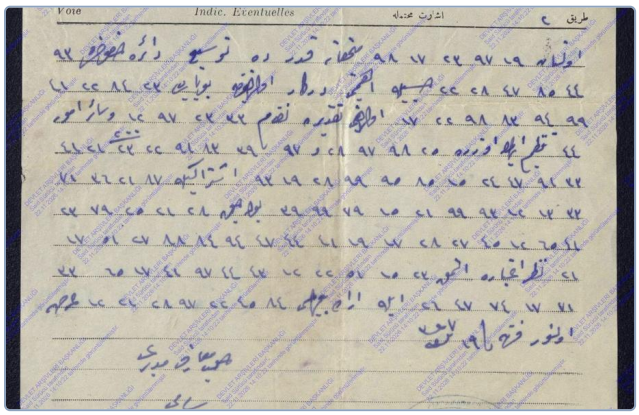
Levha 5 · BOA, MF.MKT. 874/47 (Sol Yarı) — 4 August 1905 — Reverse 'For Deciphering' numerical lookup (11–94) of the same key sheet, cross-verifying the enciphering table.



Levha 6 · BOA, MF.MKT. 1171/18 — 14 May 1911 — Monastir Directorate of Education reporting that the new Maarif cipher key omitted a code for hamza (ء) and requesting an assigned number.



Levha 7 · BOA, MF.MKT. 1167/61 (Rosetta Şeridi) — 4 March 1911 — Aleppo Education Director Sami Bey's zero-0/zero-3 cipher telegram with Ministry clerk's interlinear letters (84-25-22-94-12 = mes'ele).



Levha 8 · BOA, MF.MKT. 1172/41 (p1 — Çözülmemiş 2. Sayfa) — 14 June 1911 — Unsolved page 2 signed by Aleppo Education Director Sami (0 occurrences of digits 0 or 3 across 324 digits; temkîn and kemâlen verified).