ADFGVX

In cryptography, the ADFGVX cipher was a field cipher used by the German Army during World War I. ADFGVX was in fact an extension of an earlier cipher called ADFGX. Invented by Colonel Fritz Nebel and introduced in March 1918, the cipher was a fractionating transposition cipher which combined a modified Polybius square with a single columnar transposition. The cipher is named after the six possible letters used in the ciphertext: A, D, F, G, V and X.

To begin encryption, start by drawing a 6 x 6 grid with the 26 letters and the 10 digits in it. Each column and row has a letter A,D,F,G,V, or X. The grid is part of the key.

	A	D	F	G	V	X
A	8	p	3	d	1	n
D	l	t	4	o	a	h
F	7	k	b	c	5	z
G	j	u	6	w	g	m
V	x	s	v	i	r	2
X	9	e	y	0	f	q

First take each letter of your message and substitute it for its grid reference:

Message	Attack at 10 pm
Plaintext	a t t a c k a t 1 0 p m
Ciphertext stage 1	DV DD DD DV FG FD DV DD AV XG AD GX

Then choose a key word e.g. MARK. Then you need another grid with the key word at the top, and the stage 1 ciphertext below:

M	A	R	K
D	V	D	D
D	D	D	V
F	G	F	D
D	V	D	D
A	V	X	G
A	D	G	X

Re-arrange the columns so the key word is in alphabetical order -->

A	K	M	R
V	D	D	D
D	V	D	D
G	D	F	F
V	D	D	D
V	G	A	X
D	X	A	G

Final Ciphertext: V D G V V D D V D D G X D D F D A A D D F D X G
The final Ciphertext would then be sent in Morse code. The reason the letters A,D,F,G,V, and X were chosen is that they are very different in Morse code.

[Excerpt from "The ADFGVX Cipher" by Ian Stannard]