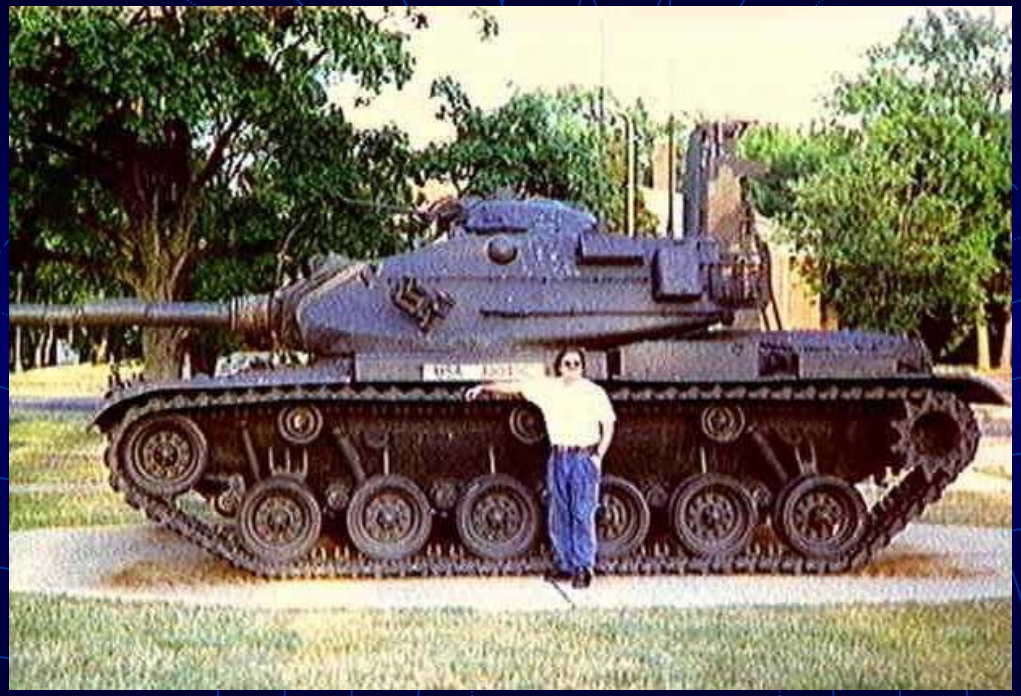
# Logic Regulated Firearms Systems:
## The future of firearms beyond personalized weapons



Sam Nitzberg
www.NitzbergSecurityAssociates.com
www.iamsam.com

# Abstract

The United States appears to be leading much of the world in a very unusual trend. For political, if not humanitarian reasons, many are demanding the introduction and legal mandating of "personalized" weapons systems, i.e. firearms that "know" through some mechanism who is activating them, before they can be fired. Often, the public pressure for laws and studies is devoid of a greater practical or scientific context. This paper seeks to examine the (practical or not) path that firearms development may take should such pressures continue.

# INTRODUCTION

# State of the Technology

State of the art

State of practice

# Personalization

Introduces computer security issues

Not approaching from limited perspective of arms safety, but from informatics, computer, and networking security.

Entirety of theoretical and applied security engineering applies

# STUDIES

# Focus

NJIT

Sandia National Labs

Focus on firearms safety

# Some Infosec. Fundamentals

Authentication

Logging

Control

# GUN LOCKS AND LARIATS

# Gun Trigger Locks

Prevent trigger or hammer action

Mechanical and Electronic key locks

**Additional Hazards:**

False sense of security

Keys or combinations

Improper use in crisis situation

Can allow or cause arm to fire with lock in place

# Simpler mechanisms ?

Rings or Bracelets to be worn

Passive or active radio components

Some countries use loops to connect to personnel’s belts

# LOGGING

# Logging

Classical information security

Even present in some cameras

Logs can be analyzed through databases or rule-based analysis

# Auditable Events

Date and time of each round fired

Date and time of each firearm disassembly, reassembly, or cleaning

Date and time of each possession of handgun by an individual user

recoil / relative power of round

number of rounds fired ?

number of rounds remaining

Who is firing the gun ?

Who or what is being shot at ?

Where is the gun aiming or sighting ?

What is the current wind velocity and direction

What was viewed by the firearm in advance, during, and after the firing of a round?

What audio occurred for several seconds in advance, during, and after the firing of a round?

detection of firearm modification or firing characteristics

correlation with parolee databases; is an ex-felon attempting to fire the arm?

Successful log dumps to “authorized” stations for continued firearms operation

# Integrated Cameras, mics.

Capability to record pre-shot imagery

Subpoena or legal process

Must have strong security in place :

Threat of Trojan horses, logic bombs, network based subversions.

Must protect data veracity

# Log Failure Events

Not operate

Transmit logs (don’t fire if can’t log)

Useful for wargames

Log roll-over capability; classical infosec.

# DIGITAL CONVERGENCE

# Soldiery

"The Army's Land Warrior program will turn even the muddiest-boots soldier into a network node"

– SIGNAL, July 22, p. 33

# Arms Communications Networks

Monitoring by third parties

Subversion of logs and imagery

Friend or Foe identification systems

No fire zones, free fire zones,
restricted fire zones

# GPS

**Lockout (“and “Lockin”) mechanisms**

- Cities
- Countries
- Continents
- Training Grounds
- Shooting galleries
- Proving Grounds
- Time constraints

# Data correlation

Potential to monitor arms networks and identify arms owners

Potential marketing ploys

Correlation of mail or databases could be used to advertise to or annoy arms owners, or send political messages

# Secure Sign On

Must set time and parameters securely

Secure, restricted method for retrieving fire data

Provably sound logs

Key management

Secure features integration

Remote fire and ignition issues

# No-fire and Permitted-fire Mechanisms

GPS

Transponder – Authorized Zone

Transponder – Forbidden Zone

Restricted Zone – by munition or arms class

# Traffic and Centralized analysis

Detect response to robberies

- Banks
- Stores

- Cop needs backup (automatic message)

Note hazards of network subversion

- Monitoring
- Message injection

# Applications “in the large”

# Low-Jack

Gun deactivated out of specified realms

Deactivate arm

Activate camera

Mention my friend’s stolen firearm situation

# Recognizers

Mission-Specific

Profile-Specific

Wargames

Ranging methods

Life Recognition

# CONCLUSION

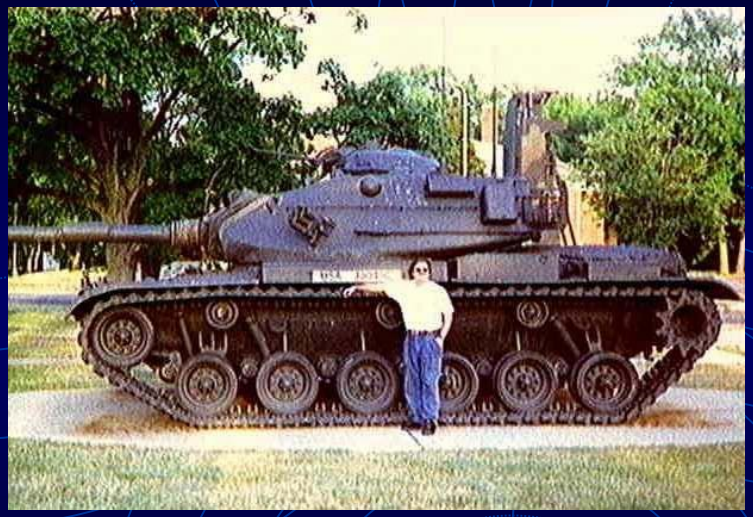
# Trickle-Down Theory

If legislation or true demand does not generate personalized weapons capabilities, the desire and need for communications and accountability in military systems may provide the necessary demand for their development. From there, a trickle-down effect may result in the introduction of these technologies into civilian markets, both American, and international.

# Engineering Problem Solution

At first blush, all we face is a simple "authentication problem." Historically and fundamentally, these have been addressed by "what you know," "what you have," or "what you are" to validate your identity to a system. Delving deeper, we face the potential for information security as a science to be applied to the general problem of firearms and targets as objects. What will remain, however, are issues related to technology, deployment, ethics, and privacy rights.

# Thank you . . .



INFORMATION SECURITY CONSULTING
WWW.NITZBERGSECURITYASSOCIATES.COM

Sam Nitzberg's web site
www.iamsam.com