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Agile Target Effects Data Management Tool— ATE DMT

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Agile Target Effects Data Management Tool—ATE DMT

- Developed under Agile Target Effects Systems (ATES) Science and Technology Objective
- Originally a research tool with a narrow application in directed energy
- Relational database running on Microsoft SQL Server
- Links materiel to directed energy (DE) effects database
- Links materiel to fighting tips
- Allows best-guess inferences based on fundamental technology (“All else being equal....”)
- Links targets to “fighting tips”

→ Multi-use tool:

- > Materiel developer
- > Combat developer
- > Battle staff



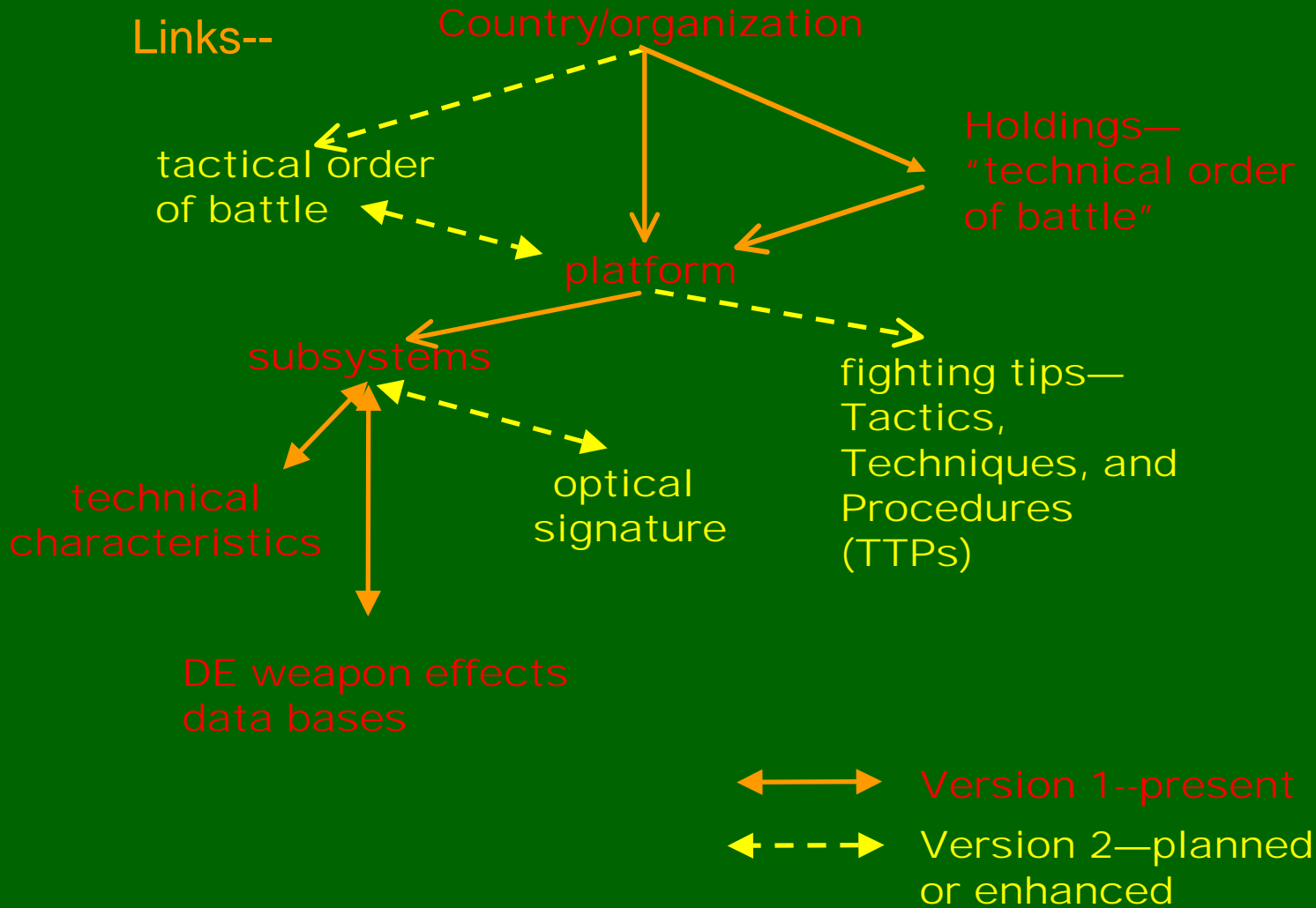
Agile Target Effects Data Management Tool--continued



- Runs on laptop—planning on the fly
- Web based application or standalone
- Web paradigm allows
 - > central management
 - > central configuration control
 - > *fast* update in response to field emergencies
 - > remote access to current info
- Materiel and combat developers can interrogate effects database
- All users can access updated Tactics, Techniques, and Procedures (TTPs)
- Can be used by battle staff to plan and to respond to unexpected technical situations
- Aid to data fusion
- Not limited to DE effects and data
- Version 1 completed; version 2 will include enhancements such as “fighting tips”
- Fighting tips must be cooperative effort between battle staffs, R&D, combat developers



Basic information links





Basic point of entry to database



Agile Target Effects





References
Threat Systems
Advanced Energy Technologies

Countries/Groups

Platforms

Fire Control Systems

Command & Control

Weapons

Computers

Sights

Thermal Imagers

Optics

Range Finders

Radar Systems

Image Intensifiers

Manufacturing Companies

[Add New Platform](#)

Platforms



1999 - USA M1A2 MBT Abrams
 This is the latest Abrams tank which is an upgrade of the M1A1 version. The U.S. Army has ordered 1,150 M1A2SEP (S/tems Enhancement Package) to be in service by 2004

[View Vulnerabilities](#)



1962 - USA M108 105mm Self-propelled gun
 Sister vehicle, M109, has a 155mm gun on the same chassis replacing the Model 108. It has made the M108 obsolete. Both vehicles are highly mobile to avoid enemy counter fire. The M109 is still in widespread use and was very valuable in the Gulf war

[View Vulnerabilities](#)



Infantry Fighting 1981-USA M2A2 Bradley Vehicle (IFV)
 The improved M2A2 is equipped with heavier armor added to the hull sides and bottom increasing the weight, as well as many other changes including improved drive and suspension.

[View Vulnerabilities](#)



1978 - USA M60A3 Main Battle Tank
 Final production model of the M60 series. Has stabilization system for main armament, a more reliable power pack and a fire control computer and laser rangefinder for greater first-round hit probability. Israel continues to carry out improvements to the M60 series.

[View Vulnerabilities](#)

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Can be used to assess impact of technologies

Advanced energy technology → platform or specific effects on that platform—not limited to DE

Agile Target Effects

References Threat Systems Advanced Energy Technologies

Advanced Energy Technologies

Radiation
Radiation is energy that comes from a source and travels through some material or through space. Light, heat and sound are types of radiation. The kind of radiation discussed in this presentation is called ionizing radiation because it can produce charged particles (ions) in matter.

Create Effects Platforms View Effects

Micron Laser
The objective of the proposed research is to develop a high-impact optical component for the telecommunications network. In particular there is a pressing need to identify and define an optical amplifier to serve in the network as a signal "repeater." The purpose of this device is to boost the signal light level in the fiber optic network back up to its original level after the system losses have diminished the intensity substantially, (usually after about 40 kilometers or so).

Create Effects Platforms View Effects

Directed Energy
A system using directed energy primarily for a purpose other than as a weapon. Directed-energy devices may produce effects that could allow the device to be used as a weapon against certain threats, for example, laser rangefinders and designators used against sensors that are sensitive to light.

Create Effects Platforms View Effects

Electro-Magnetic Pulse
The electromagnetic radiation from a nuclear explosion caused by Compton-recoil electrons and photoelectrons from photons scattered in the materials of the nuclear device or in a surrounding medium. The resulting electric and magnetic fields may couple with electrical/electronic systems to produce damaging current and voltage surges. May also be caused by nonnuclear means.

Create Effects Platforms View Effects

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Can be used to investigate platform configurations

platform → detailed technical info on that platform (*not limited to fire control, electronics, etc.*)

Platforms Configuration

Name: AMX-10P

Description: AMX-10P Infantry Light Armored Vehicle

Classification:
 Classified
 Unclassified

Reference:

Manufacturing Company:
Alenia
Allied Signal
Alvis Vehicles
Amcoram
Armscor
Arsenaldul Armetei
Aselsan (Raytheon)

Country/Group: Albania France



Can be used to investigate technical aspects of opposition— planning on the fly

Country → platform → detailed technical info on that platform (*not limited to fire control, electronics, etc.*), and how to exploit or counter them

User's platform data management tool

platform name: M1A1
select platform: M1A1
sel. basic vehicle: M1
manufacturing company: General Dynamics Land
modifying company: unknown
using service 1: Army
using service 2: Marine
laser source: unknown
laser warning receiver: [empty]
radio 1: unknown
radio 2: unknown
ballistic computer: [empty]
tactical/SA/BM co: [empty]

laser based CM: unknown
non-laser CM: smoke grenade
select classification: UNCLASSIFIED
classified by: NA
declassify on: NA
references: countermeasure system is smoke grenade system L8A1, M250 (http://www.fprado.com/armorsite/abrams.htm) Also has engine generated smoke.

platform level effects
fighting tips
FCS
inventory by country
sights

tblAssocFightingTips_Platform subform1

select fighting tips: countering anti-thermal night sight

Ordinary oil based, white phosphorus, or combustion based smoke such as smoke resulting from grass fires does not greatly affect the wavelengths used by either thermal night sights or beams used to jam thermal night sights. Enough will, but the smoke density required from those sources is quite high. Dust from high explosive shell will attenuate these wavelengths somewhat; enough dust will attenuate the beam or obscure the scene quite a lot.

tblAssocPlatform_Sight user version subform

sight ID	sight name	detector	spectrum	las hard?	lo-sig reticle?
1	unknown	unknown	unknown	No	No
201	generic coaxial telescope	unknown	unknown	No	No
210	M939 Gunner's Auxiliary Sight	unknown	unknown	No	No
3	GPC	unknown	unknown	No	No

sight ID	dev. company	dev. country	detector	I2 tech.	TNS tech.
204	unknown	unknown	unknown	unknown	unknown
207	Pilkington	UK	HgCT	unknown	unspecified MC
210	Kollmorgen	USA	unknown	unknown	none
211	Raytheon	USA	NA	unknown	none

(to be added in version 2; Access forms shown here to illustrate functionality)



Can be used to investigate technical aspects of opposition— planning on the fly

Platform → fighting tips, triggered by situation encountered

tblPlatformFightingTipsSelection

platform (modified vehicle) name: M1A1 Platform ID: 114

select platform: M1A1 Refresh

tblAssocFightingTips_Platform subform1

fighting tips selection: countering anti-thermal night sight lasers--glare Refresh

platform vs fighting tips FightingTipsID: 6 Platform ID: 114

114	M1A1	4	defeat of laser homing missiles
116	M1A1D	4	defeat of laser homing missiles
117	M1A2 SEP	4	defeat of laser homing missiles
113	M1	6	countering anti-thermal night sight lasers--glare
114	M1A1	6	countering anti-thermal night sight lasers--glare
115	M1A2	6	countering anti-thermal night sight lasers--glare
117	M1A2 SEP	6	countering anti-thermal night sight lasers--glare

tblFightingTips subform

title/subject: countering anti-thermal night sight lasers--glare Refresh

classification: UNCLASSIFIED declassify on: NA

tips: FightingTipsID: 6 classified by: NA

Some lasers--notably CO2--are in-band to most thermal night sights. They may lase at many wavelengths within this band, most commonly 10.6 micrometers. A thermal night sight whose aperture is flooded with light in this band may be damaged or washed out. Damage can be: catastrophic--the night sight ceases to work--; minor--the sight has elements destroyed, producing dark or white lines in the display, depending on whether the sight is set to white-hot or black-hot, or the sight can be jammed--the scene is washed out or obliterated. If a laser does escape the night sight's "laser filter" back to a section that removes

source:

references:

Record: 1 of 1

Record: 3 of 6

Record: 49 of 105

(to be added in version 2; Access forms shown here to illustrate functionality)



Can be used to investigate technical aspects of opposition— planning on the fly



Platform → fighting tips

Example scenario—

Expeditionary force Task Force Smythe air landed in distant island to bolster indigenous forces against expected air and sea assault

Helicopter gunner reports dazzling green flash just before pilot loses control and crashes

Light armored vehicle commanders report enemy vehicles appear to be Chinese type 98 tanks

Infantry units report dazzling lines of light targeted on missile crews, but missile crews using thermal sights engage successfully

S-2 interrogates ATE DMT terminal on type 98—data base responds that some type 98s were reported on the internet with a directed energy search/blinder countermeasure set
(<http://www.sinodefence.com/army/tank/type98.asp>, accessed 17 May 2005)

Fighting tip—TTP—corresponding advises engagement wit thermal sights, luring enemy engagement with dummy I2 sights to make enemy disclose position, then engage with thermal night sights and conventional rounds or Javelin

S-2 passes info to units

Units report success in destroying enemy tank unit



Summary



The ATE DMT

- Has the potential for drastically reducing the time for an analyst to devise an evaluation plan
- Can substantially aid an analyst or designer in picking through the technological options available
- Has the potential to aid an expeditionary battle staff in countering unexpected technologically sophisticated enemy systems
- Can help battle staff and commanders use their systems to gain the most advantage



Backups





Simplified interface

tblPlatform data management

User's platform data management tool Refresh Close Form 114

platform name laser based CM
 select platform non-laser CM
 sel. basic vehicle select classification
 manufacturing company
 modifying company
 using service 1
 using service 2
 laser source
 laser warning receiver
 radio 1
 radio 2
 ballistic computer
 tactical/SA/BM cc

classified by:
 declassify on
 references
 countermeasure system is smoke grenade system L8A1, M250 (http://www.fprado.com/armorsite/abrams.htm) Also has engine generated smoke.

platform level effects
 fighting tips
 FCS
 inventory by country
 sights

tblAssocFightingTips_Platform subform1

select fighting tips Refresh

Ordinary oil based, white phosphorus, or combustion based smoke such as smoke resulting from grass fires does not greatly affect the wavelengths used by either thermal night sights or beams used to jam thermal night sights. Enough will, but the smoke density required from those sources is quite high. Dust from high explosive shell will attenuate those wavelengths somewhat; enough dust will attenuate the beam or obscure the scene quite a lot.

tblAssocPlatform_Sight user version subform

sight/subsystem name select sight/subsystem

sight ID	sight name	detector	spectrum	las hard?	lo-sig reticle?
1	unknown	unknown	unknown	No	No
201	generic coaxial telescope	unknown	unknown	No	No
210	M939 Gunner's Auxiliary Sight			No	No
2	GPS			No	No

sight ID	dev. company	dev. country	detector	I2 tech.	TNS tech.
204	unknown	unknown		unknown	unknown
207	Pilkington	UK	HgCT	unknown	unspecified MC
210	Kollmorgen	USA		unknown	none
211	Raytheon	USA	NA	unknown	none

Record: of 4 (Filtered)

sight level effects
 sight level signatures
 add/change sights
 add/change effects



Materiel developer tool—sighting subsystems

Sight/subsystem management tool refresh data Close

Name: M938 Commander's Weapon Sight Station select sight/subsystem M938 Commander's Weapon Sight Station

select sight type: Accuracy: II WFDV 1: TNS WFDV: tbAssocSight_Signature subform

classification: unknown Data Output format: II NFDV 2: TNS NFDV: notional optical signature 2-NIR select associated signature notional optical signature 2-NIR

classified by: NA Spectrum: II magnification 1: TNS magnification 1: signature name: notional optical signature 2-NIR link to data ..\..\signature data\Notional optical signature 2 blank

declass. on: NA Gain: II magnification 2: TNS magnification 2: select signature: freq. range: opt./ther. cont.: 10

212 Users: TNST ID: 37 TNS transmission 1: classification: UNCLASSI spectrum: near IR [?] declass. by: comments:

tbAssocSight_Developing Company subform CoolTime_min TNS transmission 2: description: notional optical signature 2-NIR

devel. company: Kollmorgen LaserHard ABC TNS aperture 1: TNS aperture 2: TNS filters, bands, 0:

select company: Kollmorgen Refresh DVD WFDV 1: 21* band 1 (visible)

Record: 1 of 1 Navigation icons DVD NFDV 2: 0 band 2 NIR

tbAssocSight_Developing Country subform Navigation icons DVD magnification 1: 3 band 3 (MWIR)

devel. country: USA change DVD magnification 2: 0 band 4 (Thermal IR)

select country: USA refresh DVD aperture 1: 18 mm

Record: 1 of 1 Navigation icons DVD aperture 2: 0

Application: tank commander uses this to aim .50 MG Navigation icons DVD transmission 1: 0

Description: fixed power monocular periscope Navigation icons DVD transmission 2: 0

reduced signature reticle Navigation icons DVD filters, wavelen: 0

IIT ID: 15

TechIID:

Identification range (m):

Recognition range (m):

Detection range (m):

Notes: MoreInfo Navigation icons References: http://www.eo.kollmorgen.com/pro duct_spec28.html

array: NA

Record: 151 of 157 Navigation icons

tbAssocSights_Effects subform1 Navigation icons effect name: notional visible anti-optic thingie classification:

select effect: notional visible anti-optic thingie classified by:

relevance: 2 comments: declass. on:

effect name: notional visible anti-optic thingie comments:

spectrum: visible classification: UNCLAS:

effects type: unknown classified by: NA

link to data: declass. on: NA reference:

Record: 1 of 1 Navigation icons

Record: 1 of 2 Navigation icons

tblgryAssocSights_OpticalThreat Navigation icons Threat name: surrogate 1 classification: UNCLASSIFIED

select threat: 1 classified by: NA

links to data: declass. on: NA

Record: 1 of 2 Navigation icons

tbAssocSights_Artillery Guided Munitions subform Navigation icons GAM name: none Refresh

select guided art. mun.: none add/change GAM

Record: 1 of 1 Navigation icons

tbAssocSights_ATM subform Navigation icons ATM: none add/change ATM

select ATM: none Refresh

Record: 1 of 1 Navigation icons



Signature search tool

Signature search tool

signature name: spectrum:

select signature: description:

frequency range:

optical cross section/wa: comments:

radar cross section/freq: references:

optical/thermal contrast: classification: link to data:

classified by:

declassify on:

refresh

list of possible platforms

signature ID	spectrum ID	signature name	sight name	platform name	holdings est. 1	holdings est. 2	nation
10	8	notional optical signature 2-NIR	AN/VVS-2	M1	218		Kuwait
10	8	notional optical signature 2-NIR	M939 Gunner's Au	M1A1	4393		USA
10	8	notional optical signature 2-NIR	M938 Commander's	M1A1	4393		USA
10	8	notional optical signature 2-NIR	AN/VVS-2	M1A1	4393		USA
10	8	notional optical signature 2-NIR	AN/VVS-2	M1A2	586		USA
10	8	notional optical signature 2-NIR	M938 Commander's	M1A2	586		USA
10	8	notional optical signature 2-NIR	M939 Gunner's Au	M1A2	586		USA
10	8	notional optical signature 2-NIR	GPS-2nd Gen	M1A2	586		USA
10	8	notional optical signature 2-NIR	M939 Gunner's Au	M1A2 SEP	588		USA
10	8	notional optical signature 2-NIR	GPS-2nd Gen	M1A2 SEP	588		USA
10	8	notional optical signature 2-NIR	AN/VVS-2	M1A2 SEP	588		USA
10	8	notional optical signature 2-NIR	M938 Commander's	M1A2 SEP	588		USA
10	8	notional optical signature 2-NIR	1 meter coincidenc	M-47	8	0	Bosnia-Herzegovina
10	8	notional optical signature 2-NIR	1 meter coincidenc	M-47	78		Jordan

Record: of 12