

Flashpoint Campaigns



Data Structures and Editing

Field Manual FCCW-09/R1

*On Target
Simulations*



Flashpoint Campaigns - Cold War

FM09 - Data Structures and Editing

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1 Introduction

Welcome to FLASHPOINT CAMPAIGNS – COLD WAR

This is a grand tactical combat simulation on the Cold War battlefield. As the force Commander, you will plan and then issue orders and Standard Operating Procedures to your battalion, brigade, or regimental forces, shaping the fight by maneuver and your intent. Your forces will engage the enemy on rendered real-world map locations. Each hex is 500m of militarily significant terrain. Each battle can last 4 to 24 hours of in-game time. Your troops will meet their foes any time of day and in any environment.

The game engine is based on asynchronous WEGO turns. This means you will issue orders and then watch a variable amount of time unfold on the battlefield. Then, issue or adjust orders to react to what has happened as you execute your battle plan.

Flashpoint Campaigns-Cold War is a deep simulation of combat operations where your forces are arranged in maneuver units of companies, platoons, and sections of tanks, infantry fighting vehicles, infantry squads and teams, recon forces, engineers, air-defense and

anti-tank systems, helicopters and more. As the Commander, you must use available off-map assets like long-range artillery, rockets, or airstrikes.

Your efforts in this complex battlespace will be constantly challenged by modeled features like Electronic Warfare, Air Superiority, Realistic Weather, Line of Sight and Fire, Terrain and Elevation, Smoke and Mines, and Human Factors like training, morale, and readiness. All these elements must be considered if you are to be victorious on the battlefield.

The game is packed with information dialogs, map overlays, and range rings to aid you as Commander, master the situation, and understand your force's capabilities.

Flashpoint Campaigns-Cold War is a data-rich simulation where each nation has information on National Characteristics, Command Parameters, and Orders of Battle. Data Tables are packed with era-specific equipment and troops. Weapon Systems of the time, such as guns, missiles, precision munitions, small arms, and much more, are comprehensively modeled.

As a toolkit, you can create your own scenarios and campaigns. You can also dive deeper and create or modify game data, artwork, and sound effects as you see fit. All these modding capabilities are supported by detailed documentation.

1.1 What's in This Document

This document provides the information necessary to edit, create, and validate the National Data Files used in the game. There is a lot of information in this document and users are urged to start small and work up to new data files.

NOTE: All data provided by On Target Simulations LTD is gathered from unclassified, open sources and best-guess estimations from our team.

Do not use information or data from sensitive or classified military sources in your mods.

NOTE: Areas of interest or buttons on form pictures are outlined in red.

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NOTE: Some images in this manual are from other game versions. While your maps and units may differ, all the information and how it is used and displayed will match the information in this manual.

1.2 Manuals

We have chosen to go with many living manuals to cover game interface/play, learning the game, basic tactics, Content Creation, and Game Modding for the Cold War game engine. We also have guides that cover that area of operations. The affected manuals and guides will be updated as the game is updated, and PDFs of these changes will be included with the new patches.

1.2.1 The Field Manuals (FM)

These are the core manuals on how to play, create content for, and modify data for the Cold War game engine. Before jumping into Content Creation, we strongly recommend you review the first three manuals, **Game Operations**, **Battlefield Primer**, and **Tutorial Operations**, if you are new to this type of game and warfare. Returning Red Storm players should review **Game Operations** to get details on new features, as there are many.

These documents are found in the Documents\FMs folder.

- FM01: Game Operations – Detailed information on the game, its interface, and how to use it
- FM02: Battlefield Primer – Fighting in the Cold War
- FM03: Tutorial Operations – How to learn and play the game
- FM04: Scenario Design – How to make or edit scenarios
- FM05: Battle Planning – How to create or edit battle plans. Battle Planning is a unique topic of Scenario Design.
- FM06: Campaign Design –How to make or edit campaigns
- FM07: Map Construction –How to make simple maps for the game
- FM08: Game Engine Modifications - How to Mod elements of the game engine

- FM09: Data Structures and Editing– ***This Manual*** – How to edit or build data sets
- FM10: Weather Setup – How to add in weather from other locales

1.2.2 What's New

The What's New PDFs summarize any changes and fixes when updates are released.

These can be found in the Documents\WhatsNew folder.

1.2.3 FPC Hotkeys

This PDF document lists all the unique game key presses for Function keys and all hotkey definitions. Due to the large number of functions in the game, rebinding is not possible.

This document is in \Documents folder.

1.2.4 FCCW Southern Storm Game FAQ

To stave off forum-clogging threads on various topics we either don't control or can't support, we created this FAQ document with the answers to those specific topics.

Please review the FAQ for answers to several game topics related to the game but not on how to play the game.

This document is in the \Documents folder.

1.3 Gender Pronouns and Inclusion

We understand that users of all genders will play our simulation. We try to keep language in the game and manuals gender-neutral, when possible, but sometimes use the pronoun "he" to refer to the user. This is merely to streamline the writing, not to exclude anyone or note a specific gender.

The On Target Simulations team supports the inclusion of all people in the field of wargaming.

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2 Location of Data Files

All the data files and data tool files are in the games installation location in the ...Modules/Common/Data folder. In that Data folder there are several national folders and in each there are one or more Excel spreadsheets that contain the data of interest for this manual.

Name	Date modified	Type
American	1/19/2025 10:29 AM	File folder
Belgian	1/1/2025 12:07 PM	File folder
British	1/1/2025 12:07 PM	File folder
Canadian	1/1/2025 12:07 PM	File folder
Common	1/1/2025 12:07 PM	File folder
Czechoslovak	1/1/2025 12:07 PM	File folder
East-German	1/1/2025 12:07 PM	File folder
French	1/19/2025 10:26 AM	File folder
NATO	9/29/2024 7:26 PM	File folder
Polish	1/1/2025 12:07 PM	File folder
Soviet	1/1/2025 12:07 PM	File folder
West-German	1/1/2025 12:07 PM	File folder
Air Unit PF and Size Ratings.xlsx	6/6/2024 1:53 PM	Microsoft Excel W...
Data Validation Tool.xlsm	12/20/2024 7:50 AM	Microsoft Excel M...

2.1 Tools to use on the Data Files

To edit the data files, you will need a spreadsheet editing capable program like Excel for Office or equivalent. The files are not protected, but care should be taken to follow the instructions provided in this manual to avoid game crashes.

3 Data File Structure Overview

We will look at each of the tabs found in a National Data File used in this version of the Flashpoint Campaigns game engine. Each entry for a given tab will be noted as to its functionality. Data files have nine tabs. Each has a function for the game. Data files are created and modified in Excel or compatible programs.

CW 80s United States: National Defaults						
Time Frame Start	1980					
Time Frame End	1989					
Hardware Quality Values						
Electronics	95	0 to 100				
Counter-Measures	93	0 to 100				
Equipment	94	0 to 100				
Default Military Unit Values						
Training	73	0 to 100				
Morale	70	0 to 100				
Tactical Initiative	86	0 to 100				
Acceptable Losses	28	0 to 100				
Artillery Values						
Delay: On Call Fire	5	minutes				
Delay: Between Fire Missions	5	minutes				
% CB Detection	8	%				
Max FSCC Age - Static Target	20	minutes				
Max FSCC Age - Moving Target	10	minutes				
FSCC - Min Tubes per Mission	4	subunits				
Engineering Values						
Minor River Bridging Time	15	minutes				
Stream Crossing Time	10	minutes				
Swimming Prep Time	5	minutes				
Blow Bridge	20	minutes				
Clear Mines	15	minutes				
Clear Obstacle	10	minutes				
Clear Improved Position	20	minutes				
Game Defaults						
Unit Counter Background Image	US-BGD.png					
Subunit Stacking Limit	35					
Nationality	American					MUST MATCH FOLDER NAME!
Insignia	National US.png					
Force Name	Team Yankee					
Default Side	Blue					
Equipment Cost Factor	1.5					

3.1 National Tab

The information on this tab relates to values based on the country in question for each of the capabilities listed.

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3.2 Command Tab

This table contains all the factors for in-game leaders and their command parameters. The table covers the command values from Corps down to Squad and has values for Size Symbol, Rank, Rank Abbreviation, Command Radius, and Command Delay (within the local radius). There are reference columns for the US Rank Equivalent, US Rank Abbreviation and NATO Code for each command level. There is an option in the game that allows the selection of native national ranks or to use the US equivalents in game.

3.3 Formations Tab

The formation tab contains information for defining the numerous orders of battle formations for a nation's forces. Also included are any air formations, strategic assets, engineering assets, and low use units. These formations are used in the game's scenario editor to create formations and specify the correct equipment types in those formations.

3.4 Units Tab

This tab contains the data related to each type of unit used by a nation. This includes troops and teams, land vehicles, and air platforms. The data notes the properties and capabilities of the unit via text, numbers, and characteristic codes.

3.5 Systems Tab

This tab contains the data related to each type of system or weapon used by a nation on the units listed in the Units tab. This includes systems like tank guns, ATGMs, mortars, and other systems. The data notes the properties and capabilities of the system via text, numbers, and characteristic codes.

3.6 Munitions Types Tab

This tab provides data for the various types of munitions fired by certain weapon systems found in the game. These types of weapons will have the ability to engage different targets or perform various missions.

3.7 Surnames Tab

One of the tabs added to the National Data File is the Surnames tab. Surnames are used to add a name to the various leaders found in the game. The 200 names are country specific as well.

CW 80s United States: Surnames			
Surname1	Surname2	Surname3	Surname4
Adams	Flores	Lawson	Rivera
Alexander	Ford	Lee	Roberts
Allen	Foster	Lewis	Robertson
Anderson	Fox	Long	Robinson
Andrews	Franklin	Lopez	Rodriguez
Armstrong	Freeman	Marshall	Rogers
Arnold	Garcia	Martin	Rose
Austin	Gardner	Martinez	Ross
Bailey	Gibson	Mason	Ruiz
Baker	Gomez	Matthews	Russell
Barnes	Gonzales	McDonald	Sanders
Bell	Gonzalez	Miller	Scott
Belva	Gordon	Mills	Sethus
Bennett	Graham	Mitchell	Shaw
Berry	Grant	Moore	Simpson
Black	Gray	Morales	Sims
Boyd	Greene	Morgan	Smith
Bradley	Griffin	Morris	Snyder
Brooks	Hamilton	Murphy	Spencer
Brown	Harper	Murray	Stephens
Bryant	Harris	Myers	Stevens
Burns	Harrison	Nelson	Stewart
Butler	Hart	Nichols	Stone
Campbell	Hawkins	Olson	Sugden
Carpenter	Hayes	Ortiz	Sullivan
Carroll	Henderson	Overton	Taylor
Carter	Henry	Owens	Thomas
Chavez	Hernandez	Palmer	Thompson
Clark	Hicks	Parker	Torres
Cole	Hill	Patterson	Tucker
Coleman	Holmes	Payne	Turner
Collins	Howard	Perez	Wagner
Cook	Hoyer	Perkins	Walker
Cooper	Hudson	Perry	Wallace
Cox	Hughes	Peters	Ward
Crawford	Hunt	Peterson	Warren
Cruz	Hunter	Phillips	Washington
Cunningham	Jackson	Pierce	Watkins
Daniels	James	Porter	Watson
Davis	Jenkins	Powell	Weaver
Diaz	Johnson	Price	Webb
Dixon	Jones	Ramirez	Wells
Duncan	Jordan	Ramos	West
Dunn	Kelley	Ray	Williams
Edwards	Kelly	Reed	Willis
Elliott	Kennedy	Reyes	Wilson
Ellis	King	Reynolds	Wood
Evans	Knight	Rice	Woods
Ferguson	Lane	Richardson	Wright
Fisher	Lawrence	Riley	Young

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3.8 Credits Tab

Other than the naming convention for the top cell and some color tweaks the new and RS Credit's tab contain the same information.

CW 80s United States: Credits		
The following people contributed to this spreadsheet:		
OTS Team		
Date:	Sunday, December 29, 2024	
Revised:		

3.9 Notice Tab

This tab is used to provide the following information about the data file. The information states:

- Game Engine
- Nation/User of Data File
- Creator of Data File
- Copyright reflects the full On Target Simulations LTD name and is dated for the year the work was done.

**FLASHPOINT CAMPAIGNS:
COLD WAR**

**80s United States Data File
OTS Version**

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4 Platform Types

This section will cover the basic types of unit platforms found in the game. Subunit Types are predefined and used in the game code for various functions.

WARNING: Users *cannot* add their own types directly.

4.1 Air Platforms

These 19 platforms cover everything from Aircraft, Airships, and Helicopters to Large Ballistic Missiles.

Sub-Unit Type	Class (Bit Use)	Description
AIRAT	AIR	A Jet or Prop CAS Aircraft (not dive)
AIRDB	AIR	A Jet or Prop Dive Bomber
AIRGL	AIR	A Glider/Unpowered Aircraft
AIRGS	AIR	A Prop or Jet Gunship
AIRLB	AIR	A Jet or Prop Level Bomber
AIRRK	AIR	Rocket Powered Aircraft
AIRSC	AIR	A Jet or Prop Scout
AIRSD	AIR	A Jet or Prop SEAD Aircraft
AIRUT	AIR	A Jet or Prop Transport
DRNAIR	DRONE	Unmanned Air Unit
HELOAT	HELO	An Attack Helicopter
HELOSC	HELO	A Scout Helicopter
HELOUT	HELO	A Utility Helicopter
SSMSL	SSM	Surface to Surface Missile

4.2 Ground Troop Platforms

These 26 platform types cover all leg infantry units and crew served towed weapon systems.

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Sub-Unit Type	Class (Bit Use)	Description
FLAK	AD	Towed Flak
ARTY	ARTY	Towed Artillery
MTRWS	ARTY	Towed Mortar Weapon System
RKTWS	ARTY	Towed Multi-Rocket Weapon System
ATWS	AT	Towed Anti-Tank Weapon System
DRNGTP	DRONE	Drone Ground Troop
ENGR	ENGR	Engineering Unit
INFAC	INF	A Forward Air Controller Unit
INFAG	INF	A RPG Infantry Unit
INFAM	INF	An ATGM Infantry Unit
INFAT	INF	An Anti-Tank Infantry Unit
INFBK	INF	A Bike Infantry Unit
INFCV	INF	A Cavalry Unit
INFFO	INF	A Forward Observer Unit
INFGL	INF	A Grenade Launcher Unit
INFHQ	INF	A Headquarters Unit
INFLG	INF	A Leg Infantry Unit
INFMC	INF	A Motorcycle Infantry Unit
INFME	INF	A Mechanized Infantry Unit
INFMG	INF	A Machine Gun Unit
INFMO	INF	A Motorized Infantry Unit
INFMP	INF	A Military Police Unit
INFMR	INF	A Mortar Infantry Unit
INFMT	INF	A Mountain Infantry Unit
INFNV	INF	A Naval Infantry Unit
INFSC	INF	A Scout Unit
INFSM	INF	A SAM Infantry Unit

4.3 Land Platforms

These 40 platform types cover all land-based vehicle systems.

Sub-Unit Type	Class (Bit Use)	Description
ACAR	ACAR	An Armored Car
ABAD	AD	Airborne Air Defense Vehicle
MOBSAM	AD	A Mobile SAM System
SAMWS	AD	Fixed SAM Weapon System
SPFLAK	AD	Self-Propelled Flak
SPSAM	AD	Self-Propelled SAM
ABVT	APC	Airborne Vehicle Tracked
ABVW	APC	Airborne Vehicle Wheeled
APCT	APC	A Tracked APC
APCW	APC	A Wheeled APC
ABARTY	ARTY	Airborne Artillery Gun (Air Droppable)
SPARTY	ARTY	Self-Propelled Artillery
SPMTR	ARTY	Self-Propelled Mortar
ABAT	AT	Airborne Anti-Tank Vehicle
SPAT	AT	Self-Propelled Anti-Tank
ABCV	COMV	Command Vehicle
COMV	COMV	Command Vehicle
ABCS	CSV	Airborne Combat Support Vehicle
CMSV	CSV	Combat Support Vehicle
DRNLND	DRONE	Drone Vehicle
ENGV	ENGV	Engineering Vehicle
IFVT	IFV	Infantry Fighting Vehicle Tracked
IFVW	IFV	Infantry Fighting Vehicle Wheeled
SNSR	SENSOR	A Fixed Sensor Site
SPSNR	SENSOR	Self-Propelled Sensor
OBSV	RECON	A Dedicated Spotting Vehicle
RECCE	RECON	A Recon Unit

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Sub-Unit Type	Class (Bit Use)	Description
SPRKT	RKT	Self-Propelled Rocket
ABTK	TANK	Airborne Tank (Air Droppable)
TANK	TANK	Tank (Light to MBT)
TANKAM	TANK	Amphibian Tank
TANKFL	TANK	Flame Tank
TANKSG	TANK	Self-Propelled Gun
UTYA	UTY	Artillery Towing Vehicle
UTYO	UTY	Utility Transport Organic-Wagon
UTYT	UTY	Utility Transport Tracked
UTYW	UTY	Utility Transport Wheeled

4.4 Land Based Logistical Sites

There is currently one Land-Based Logistical Site. Others are being looked at for future additions.

Sub-Unit Type	Class (Bit Use)	Description
FARP	LOG	FARP for Helicopters/VTOLS (Fixed)

4.5 Additional Sub-Unit Types

As we expand the game, more Sub-Unit types will be added to the lists and we will update the documentation.

WARNING: You cannot mix CompIDs and Codes in the same line or it will crash the game. Data Validation will catch most of these errors when used.

5 Platform Characteristics

Characteristics define certain special abilities or capabilities for Units, Systems/Munitions, and Munitions Only in the game. Characteristics are broken down into Types and then further separated into Sub-Types.

5.1 Unit Level Characteristics

The following classes of characteristics can be found in the three lists (Abilities, Defenses, and Equipment) found on the Units tab of a national datasheet.

- **ab-en: Abilities-Engineering** - For engineering platforms, giving them abilities, such as bridging, mine laying, demolition, etc.
 - EGBL: Bridging (Engr) - Long Span. Pontoon type unit, longer to assemble.
 - EGBS: Bridging (Engr) - Short Span. AVL B type units, 10-20 minutes to drop/pickup.
 - EGMR: Mine Removal (Engr). Units can remove mines.
 - EGDM: Demolitions (Engr). Blowing up bridges, obstacles, hardened shelters, etc.
 - EGIP: Improved Positions (Engr). Trenches, improved positions, ramped locations, fox holes, etc. Extra protection to units.
 - EGML: Mine Laying (Engr). Units can lay mines.
 - EGPO: Place/Create Obstacle (Engr). Units can build roadblocks, hedgehogs, dragons teeth, trenches, etc., impeding movement.
- **ab-gn: Abilities-General** - For any unit. Things like Mast Mounted Sights, Forward Observer, Unmanned platform, and so on. There is no common theme for this family.
 - ADP: Flak / Air Defense Platform. The unit is designed to engage air targets.
 - AVS: Avionics. Flavor text for air units stating electronic instrumentation.

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- ECR: Extended Command Range. Ability to work at longer ranges from local HQ, recon units mainly.
 - ICR: Infinite Command Range. Unit can operate at any distance from local HQ without penalty, spec-ops/LRPs.
 - RDS: Command and Control Radio Systems. Sources of radio signal traffic, too much activity can generate a detectable source point.
 - IDY: Inflatable Decoy. An inflatable or static mockup of a decoy platform.
 - MMS: Mast Mounted Sights. Sensors/designators in mast, unit harder to spot/shoot, etc.
 - MMW: Mast Mounted Weapon System. Unit can fire weapons while crew/vehicle remain in full cover.
 - PSS: Periscope Sighted System. Unit can be turret down and search/track targets, harder to spot in cover.
 - UPA: Unmanned Platform - Autonomous. No pilot/crew on the platform, AI operated.
 - UPP: Unmanned Platform - Programmed. No pilot/crew on the platform follows pre-programmed route.
 - UPR: Unmanned Platform - Remote. No pilot/crew on the platform, remote operated.
 - UPS: Unmanned Platform - Semi-Autonomous. No pilot/crew on the platform, remote operated or AI, can switch types.
 - TLM: Tube Launched Missile (ATGM from the main gun barrel). Unit can fire an ATGM in place of a cannon shot-Must count as SFR shot.
 - RCP: Recon Platform. Unit has better spotting, reduced spottable, and stealthier movement.
 - WAFP: Wide Area Fire Platform. Saturate a target area with fire, center hex and surrounding ring of hexes.
 - FARP: Forward Arming and Resupply Point. In-game, but not fully coded as a logistical type. Allow Helos on Ships.
- **ab-tr: Abilities-Transport** - This family encompasses abilities not only related to transport, but movement as well. Things like Tow Capable (towing a gun or trailer), Very High Altitude, and Quick Scoot Platform.
 - ABLD: Landed Altitude Band. Air Unit is landed on the ground.
 - ABNE: Nap of Earth Altitude Band. Nap of Earth flying/ground masking for helos and drones.
 - ABEL: Extremely Low Altitude Band. Dash flying for helos and drones, maybe some aircraft.
 - ABVL: Very Low Altitude Band. Very Low flight for Close Air Support (CAS) aircraft.
 - ABLW: Low Altitude Band. Low flight for CAS aircraft.
 - ABMD: Medium Altitude Band. Medium flight for Bombers and SEAD aircraft.
 - ABHG: High Altitude Band. High level flight profile for Bombers, SEAD, and Recon aircraft.
 - ABVH: Very High Altitude Band. Very High flight for Recon aircraft.
 - ABEH: Extremely High Altitude Band. Extremely High flight for Recon/Hypersonic aircraft.
 - ABSP: Space/Orbital Altitude Band. Platforms operating in space or suborbital.
 - AMP: Amphibious Unit. Units can traverse water obstacles at a greatly reduced speed.
 - MNL: Movement Not Limited. Units (motorcycles) are not slowed in any ground terrain.
 - NNF: Nimble NOE Flight. Helo capable of very low (close NOE), bonus defense/reduced spotting.
 - TWL: Towed Weapon Leg. Weapon systems can be moved by leg troop/team.

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- TWS: Towed Weapon System. Weapon systems can only be moved by vehicle.
- HLP: Heavy Lift Platform. Units can carry or move large, heavy items like field guns or light vehicles or troops.
- SLP: Sling Load Platform. "Towing" for Helos with cargo hooked up under the helicopter.
- TCP: Tow Capable Platform. Can tow/move TWS (Towed Weapon Systems).
- AWL: All Weather - Limited. Air/Helo - Operate in bad weather with reduced spotting accuracy.
- AWN: All Weather - Normal. Air/Helo - Operate in bad weather without penalties.
- NOL: Night Ops Limited. Operate at night with reduced spotting accuracy.
- NON: Night Ops Normal. Operate at night as day for spotting and movement.
- **ab-ig: Abilities-Logistical** - This family encompasses abilities related to various static logistical facilities to be used in the game. Currently, only FARP is active.
 - FARP: Forward Arming and Resupply Point. VPs and data for FARPs - Helo, Drone and VTOL Aircraft refuel and rearming.
- **df-ab: Defense-Abilities** - This is rather a catch-all for defense related characteristics that don't fit well into either countermeasures or Protection Factor enhancers. You will find things like Body Armor, Mine Resistant Design, and Hull to Turret Ratio here.
 - HTR1: Hull to Turret Ratio, Type 1. Ratio is $<.60$ for Hull PF / Turret PF rating, -50% to PF adjustment for hull hits.
 - HTR2: Hull to Turret Ratio, Type 2. Ratio is $.60$ to $.75$ for Hull PF / Turret PF rating, -30% to PF adjustment for hull hits.
 - HTR3: Hull to Turret Ratio, Type 3. Ratio is $.75$ to $.90$ for Hull PF / Turret PF rating, -15% to PF adjustment for hull hits.
 - HTR4: Hull to Turret Ratio, Type 4. Ratio is $.90$ to 1.10 for Hull PF / Turret PF rating, no adjustment for hull hits [0.95].
 - HTR4A: Hull to Turret Ratio, Type 4A. Ratio is $.90$ to 1.10 for Hull PF / Turret PF rating, no adjustment for hull hits [1.0].
 - HTR5: Hull to Turret Ratio, Type 5. Ratio is 1.10 to 1.25 for Hull PF / Turret PF rating, +15% to PF adjustment for hull hits.
 - HTR6: Hull to Turret Ratio, Type 6. Ratio is 1.25 to 1.40 for Hull PF / Turret PF rating, +30% to PF adjustment for hull hits.
 - HTR7: Hull to Turret Ratio, Type 7. Ratio is >1.40 for Hull PF / Turret PF rating, +50% to PF adjustment for hull hits.
 - NBCB: NBC Basic/MOPP. MOPP.
 - NBCL: NBC Limited Protection. Centralized filtration system.
 - NBCP: NBC Protected. Over pressure/liner.
- **df-cm: Defense-Countermeasures** - These characteristics generally affect the Ph of an attacker. Here we've put legacy countermeasures such as smoke, chaff, and flares. We also include ECCM type systems.
 - ADCR1: Air Defense Counter Measure Resistance. $x = 1$ (low) to 5 (very good).
 - ADCR2: Air Defense Counter Measure Resistance. $x = 1$ (low) to 5 (very good).
 - ADCR3: Air Defense Counter Measure Resistance. $x = 1$ (low) to 5 (very good).
 - ADCR4: Air Defense Counter Measure Resistance. $x = 1$ (low) to 5 (very good).
 - ADCR5: Air Defense Counter Measure Resistance. $x = 1$ (low) to 5 (very good).
 - DCM: Defensive Counter Measures (Chaff and Flares). Basic anti-missile countermeasures, tech level delta's for effectiveness.
 - ECM: Electronic Counter Measures. jamming radar uses tech levels for effectiveness.

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- SDMS: Smoke Discharger - Multi-Spectral. blocks Line of Sight (LoS) of visual, TI, and Radar systems.
- SDN: Smoke Discharger-Normal. Smoke blocks visual line of sight.
- SDT: Smoke Discharger - Thermally Blocking. blocks LoS of both visual and TI systems.
- TIJ: Thermal-Optical Jamming System. System used to jam EO/Laser based weapons (jams PGL/PGO). Like the Soviet Shtora-1 system.
- AFC: Advanced Field Camouflage. SOF/Sniper/Long Range Recon (LLR) if not moving very hard to spot in hex, reduced visual spot on move.
- IRSUP: IR Suppression System. Platform is slightly harder to detect with Thermal systems and IR weapon seekers.
- LOP: Low Observable Platform. Difficult to detect by radar and IR systems.
- MSAC: Multi-Spectral Applied Camouflage. Greatly reduces IR, Thermal, Radar Signature, small reduction to optical.
- STP: Stealth Platform. Very hard to detect by radar and IR systems.
- USC: Unit Stealth Capability. Ground troops with added ability to mask signature and hide from sensors.
- **df-pr: Defense-Protection** - These mainly serve to attenuate anti-armor attack strength. In this family, you will find Explosive Reactive Armor, Advanced Composite Armor, Active Protection Systems. Skirt armor, and more.
 - ACAH1: Advanced Composite Armor (Effectiveness 1). <1.25 ratio, Hull, Aspect Coded (F/S/R/T).
 - ACAH2: Advanced Composite Armor (Effectiveness 2). <1.25 : 1.5 ratio, Hull, Aspect Coded (F/S/R/T).
 - ACAH3: Advanced Composite Armor (Effectiveness 3). <1.5 : 1.75 ratio, Hull, Aspect Coded (F/S/R/T).
 - ACAH4: Advanced Composite Armor (Effectiveness 4). <1.75 : 2.0 ratio, Hull, Aspect Coded (F/S/R/T).
 - ACAH5: Advanced Composite Armor (Effectiveness 5). >2.0 ratio Hull, Aspect Coded (F/S/R/T).
 - ACAH1FSRT: Advanced Composite Armor (Effectiveness 1), Hull; Front, Side, Rear, Top. <1.25 ratio, Hull, Aspect Coded (F/S/R/T).
 - ACAH2FSRT: Advanced Composite Armor (Effectiveness 2), Hull; Front, Side, Rear, Top. 1.25 : <= 1.5 ratio, Hull, Aspect Coded (F/S/R/T).
 - ACAH3FSRT: Advanced Composite Armor (Effectiveness 3), Hull; Front, Side, Rear, Top. 1.5 : <=1.75 ratio, Hull, Aspect Coded (F/S/R/T).
 - ACAH4FSRT: Advanced Composite Armor (Effectiveness 4), Hull; Front, Side, Rear, Top. 1.75 : <=2.0 ratio, Hull, Aspect Coded (F/S/R/T).
 - ACAH5FSRT: Advanced Composite Armor (Effectiveness 5), Hull; Front, Side, Rear, Top. >=2.0 ratio, Hull, Aspect Coded (F/S/R/T).
 - ACAH1FSR: Advanced Composite Armor (Effectiveness 1), Hull; Front, Side, Rear. <1.25 ratio, Hull, Aspect Coded (F/S/R).
 - ACAH2FSR: Advanced Composite Armor (Effectiveness 2), Hull; Front, Side, Rear. 1.25 : <= 1.5 ratio, Hull, Aspect Coded (F/S/R).
 - ACAH3FSR: Advanced Composite Armor (Effectiveness 3), Hull; Front, Side, Rear. 1.5 : <=1.75 ratio, Hull, Aspect Coded (F/S/R).
 - ACAH4FSR: Advanced Composite Armor (Effectiveness 4), Hull; Front, Side, Rear. 1.75 : <=2.0 ratio, Hull, Aspect Coded (F/S/R).
 - ACAH5FSR: Advanced Composite Armor (Effectiveness 5), Hull; Front, Side, Rear. >=2.0 ratio, Hull, Aspect Coded (F/S/R).

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- ACAT1: Advanced Composite Armor (Effectiveness 1). <1.25 ratio, Turret, Aspect Coded (F/S/R/T).
- ACAT2: Advanced Composite Armor (Effectiveness 2). <1.25 : 1.5 ratio, Turret, Aspect Coded (F/S/R/T).
- ACAT3: Advanced Composite Armor (Effectiveness 3). <1.5 : 1.75 ratio, Turret, Aspect Coded (F/S/R/T).
- ACAT4: Advanced Composite Armor (Effectiveness 4). <1.75 : 2.0 ratio, Turret, Aspect Coded (F/S/R/T).
- ACAT5: Advanced Composite Armor (Effectiveness 5). >2.0 ratio Turret, Aspect Coded (F/S/R/T).
- ACAT1FSRT: Advanced Composite Armor (Effectiveness 1), Turret; Front, Side, Rear, Top. <1.25 ratio, Turret, Aspect Coded (F/S/R/T).
- ACAT2FSRT: Advanced Composite Armor (Effectiveness 2), Turret; Front, Side, Rear, Top. 1.25 : <=1.5 ratio, Turret, Aspect Coded (F/S/R/T).
- ACAT3FSRT: Advanced Composite Armor (Effectiveness 3), Turret; Front, Side, Rear, Top. 1.5 : <=1.75 ratio, Turret, Aspect Coded (F/S/R/T).
- ACAT4FSRT: Advanced Composite Armor (Effectiveness 4), Turret; Front, Side, Rear, Top. 1.75 : <=2.0 ratio, Hull, Aspect Coded (F/S/R/T).
- ACAT5FSRT: Advanced Composite Armor (Effectiveness 5), Turret; Front, Side, Rear, Top. >=2.0 ratio, Hull, Aspect Coded (F/S/R/T).
- ACAT1FSR: Advanced Composite Armor (Effectiveness 1), Turret; Front, Side, Rear. <1.25 ratio, Turret, Aspect Coded (F/S/R).
- ACAT2FSR: Advanced Composite Armor (Effectiveness 2), Turret; Front, Side, Rear. 1.25 : <=1.5 ratio, Turret, Aspect Coded (F/S/R).
- ACAT3FSR: Advanced Composite Armor (Effectiveness 3), Turret; Front, Side, Rear. 1.5 : <=1.75 ratio, Turret, Aspect Coded (F/S/R).
- ACAT4FSR: Advanced Composite Armor (Effectiveness 4), Turret; Front, Side, Rear. 1.75 : <=2.0 ratio, Hull, Aspect Coded (F/S/R).
- ACAT5FSR: Advanced Composite Armor (Effectiveness 5), Turret; Front, Side, Rear. >=2.0 ratio, Hull, Aspect Coded (F/S/R).
- ERAH1FSRT: ERA - Hull, Type 1, Aspect (Front/Side/Rear/Top). Explosive reactive armor, early type, CE only - Kontakt-1, Hull, Aspect Coded (F/S/R/T).
- ERAH2FSRT: ERA - Hull, Type 2, Aspect (Front/Side/Rear/Top). Explosive reactive armor, early type, CE only - Kontakt-3, Hull, Aspect Coded (F/S/R/T).
- ERAH3FSRT: ERA - Hull, Type 3, Aspect (Front/Side/Rear/Top). Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Hull, Aspect Coded (F/S/R/T).
- ERAH4FSRT: ERA - Hull, Type 4, Aspect (Front/Side/Rear/Top). Explosive reactive armor, late type, CE/KE - Relikt (06+), Hull, Aspect Coded (F/S/R/T).
- ERAH1FSR: ERA - Hull, Type 1, Aspect (Front/Side/Rear). Explosive reactive armor, early type, CE only - Kontakt-1, Hull, Aspect Coded (F/S/R/T).
- ERAH2FSR: ERA - Hull, Type 2, Aspect (Front/Side/Rear). Explosive reactive armor, early type, CE only - Kontakt-3, Hull, Aspect Coded (F/S/R/T).
- ERAH3FSR: ERA - Hull, Type 3, Aspect (Front/Side/Rear). Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Hull, Aspect Coded (F/S/R/T).
- ERAH4FSR: ERA - Hull, Type 4, Aspect (Front/Side/Rear). Explosive reactive armor, late type, CE/KE - Relikt (06+), Hull, Aspect Coded (F/S/R/T).

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- ERAH1FST: ERA Type 1, Hull; Front, Side, Top. Explosive reactive armor, early type, CE only - Kontakt-1, Hull, Aspect Coded (F/S/R/T).
- ERAH2FST: ERA Type 2, Hull; Front, Side, Top. Explosive reactive armor, early type, CE only - Kontakt-3, Hull, Aspect Coded (F/S/R/T).
- ERAH3FST: ERA Type 3, Hull; Front, Side, Top. Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Hull, Aspect Coded (F/S/R/T).
- ERAH4FST: ERA Type 4, Hull; Front, Side, Top. Explosive reactive armor, late type, CE/KE - Relikt (06+), Hull, Aspect Coded (F/S/R/T).
- ERAH1FS: ERA Type 1, Hull; Front, Side. Explosive reactive armor, early type, CE only - Kontakt-1, Hull, Aspect Coded (F/S/R/T).
- ERAH2FS: ERA Type 2, Hull; Front, Side. Explosive reactive armor, early type, CE only - Kontakt-3, Hull, Aspect Coded (F/S/R/T).
- ERAH3FS: ERA Type 3, Hull; Front, Side. Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Hull, Aspect Coded (F/S/R/T).
- ERAH2S: ERA Type 2, Hull; Side. Explosive reactive armor, early type, CE only - Kontakt-3, Hull, Aspect Coded (F/S/R/T).
- ERAH3S: ERA Type 3, Hull; Side. Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Hull, Aspect Coded (F/S/R/T).
- ERAH3F: ERA Type 3, Hull; Front. Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Hull, Aspect Coded (F/S/R/T).
- ERAT1FSRT: ERA - Turret, Type 1, Aspect (Front/Side/Rear/Top). Explosive reactive armor, early type, CE only - Kontakt-1, Turret, Aspect Coded (F/S/R/T).
- ERAT2FSRT: ERA - Turret, Type 2, Aspect (Front/Side/Rear/Top). Explosive reactive armor, early type, CE only - Kontakt-3, Hull, Aspect Coded (F/S/R/T).
- ERAT3FSRT: ERA - Turret, Type 3, Aspect (Front/Side/Rear/Top). Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Turret, Aspect Coded (F/S/R/T).
- ERAT4FSRT: ERA - Turret, Type 4, Aspect (Front/Side/Rear/Top). Explosive reactive armor, late type, CE/KE - Relikt (06+), Turret, Aspect Coded (F/S/R/T).
- ERAT1FSR: ERA - Turret, Type 1, Aspect (Front/Side/Rear). Explosive reactive armor, early type, CE only - Kontakt-1, Turret, Aspect Coded (F/S/R/T).
- ERAT2FSR: ERA - Turret, Type 2, Aspect (Front/Side/Rear). Explosive reactive armor, early type, CE only - Kontakt-3, Hull, Aspect Coded (F/S/R/T).
- ERAT3FSR: ERA - Turret, Type 3, Aspect (Front/Side/Rear). Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Turret, Aspect Coded (F/S/R/T).
- ERAT4FSR: ERA - Turret, Type 4, Aspect (Front/Side/Rear). Explosive reactive armor, late type, CE/KE - Relikt (06+), Turret, Aspect Coded (F/S/R/T).
- ERAT1FST: ERA Type 1, Turret; Front, Side, Top. Explosive reactive armor, early type, CE only - Kontakt-1, Turret, Aspect Coded (F/S/R/T).
- ERAT2FST: ERA Type 2, Turret; Front, Side, Top. Explosive reactive armor, early type, CE only - Kontakt-3, Hull, Aspect Coded (F/S/R/T).
- ERAT3FST: ERA Type 3, Turret; Front, Side, Top. Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Turret, Aspect Coded (F/S/R/T).
- ERAT4FST: ERA Type 4, Turret; Front, Side, Top. Explosive reactive armor, late type, CE/KE - Relikt (06+), Turret, Aspect Coded (F/S/R/T).
- ERAT1FS: ERA Type 1, Turret; Front, Side. Explosive reactive armor, early type, CE only - Kontakt-1, Turret, Aspect Coded (F/S/R/T).

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- ERAT2FS: ERA Type 2, Turret; Front, Side. Explosive reactive armor, early type, CE only - Kontakt-3, Hull, Aspect Coded (F/S/R/T).
- ERAT3FS: ERA Type 3, Turret; Front, Side. Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Turret, Aspect Coded (F/S/R/T).
- ERAT4FS: ERA Type 4, Turret; Front, Side. Explosive reactive armor, late type, CE/KE - Relikt (06+), Turret, Aspect Coded (F/S/R/T).
- ERAT3SR: ERA Type 3, Turret; Front, Side, Rear. Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Turret, Aspect Coded (F/S/R/T).
- ERAT3F: ERA Type 3, Turret; Front. Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Turret, Aspect Coded (F/S/R/T).
- ERAT2S: ERA Type 2, Turret, Side. Explosive reactive armor, early type, CE only - Kontakt-3, Hull, Aspect Coded (F/S/R/T).
- HRAH1: HEAT Resistant Armor-Hull, Type 1, Aspect (F/S/R/T). Reduced HEAT - >3 and ≤ 6 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH2: HEAT Resistant Armor-Hull, Type 2, Aspect (F/S/R/T). Reduced HEAT - >6 and ≤ 9 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH3: HEAT Resistant Armor-Hull, Type 3, Aspect (F/S/R/T). Reduced HEAT - >9 and ≤ 12 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH4: HEAT Resistant Armor-Hull, Type 4, Aspect (F/S/R/T). Reduced HEAT - >12 and ≤ 15 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH5: HEAT Resistant Armor-Hull, Type 5, Aspect (F/S/R/T). Reduced HEAT - >15 Ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH1FSRT: HEAT Resistant Armor, Type 1, Hull; Front, Side, Rear, Top. Reduced HEAT - >3 and ≤ 6 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH2FSRT: HEAT Resistant Armor, Type 2, Hull; Front, Side, Rear, Top. Reduced HEAT - >6 and ≤ 9 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH3FSRT: HEAT Resistant Armor, Type 3, Hull; Front, Side, Rear, Top. Reduced HEAT - >9 and ≤ 12 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH4FSRT: HEAT Resistant Armor, Type 4, Hull; Front, Side, Rear, Top. Reduced HEAT - >12 and ≤ 15 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH5FSRT: HEAT Resistant Armor, Type 5, Hull; Front, Side, Rear, Top. Reduced HEAT - >15 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH1FSR: HEAT Resistant Armor, Type 1, Hull; Front, Side, Rear. Reduced HEAT - >3 and ≤ 6 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH2FSR: HEAT Resistant Armor, Type 2, Hull; Front, Side, Rear. Reduced HEAT - >6 and ≤ 9 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH3FSR: HEAT Resistant Armor, Type 3, Hull; Front, Side, Rear. Reduced HEAT - >9 and ≤ 12 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH4FSR: HEAT Resistant Armor, Type 4, Hull; Front, Side, Rear. Reduced HEAT - >12 and ≤ 15 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAH5FSR: HEAT Resistant Armor, Type 5, Hull; Front, Side, Rear. Reduced HEAT - >15 ratio (C/K), Hull, Aspect Coded (F/S/R/T).
- HRAT1: HEAT Resistant Armor-Turret, Type 1, Aspect (F/S/R/T). Reduced HEAT - >3 and ≤ 6 ratio (C/K), Turret, Aspect Coded (F/S/R/T).

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- HRAT2: HEAT Resistant Armor-Turret, Type 2, Aspect (F/S/R/T). Reduced HEAT - >6 and <= 9 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT3: HEAT Resistant Armor-Turret, Type 3, Aspect (F/S/R/T). Reduced HEAT - >9 and <= 12 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT4: HEAT Resistant Armor-Turret, Type 4, Aspect (F/S/R/T). Reduced HEAT - >12 and <= 15 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT5: HEAT Resistant Armor-Turret, Type 5, Aspect (F/S/R/T). Reduced HEAT - >15 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT1FSRT: HEAT Resistant Armor, Type 1, Turret; Front, Side, Rear, Top. Reduced HEAT - >3 and <= 6 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT2FSRT: HEAT Resistant Armor, Type 2, Turret; Front, Side, Rear, Top. Reduced HEAT - >6 and <= 9 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT3FSRT: HEAT Resistant Armor, Type 3, Turret; Front, Side, Rear, Top. Reduced HEAT - >9 and <= 12 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT4FSRT: HEAT Resistant Armor, Type 4, Turret; Front, Side, Rear, Top. Reduced HEAT - >12 and <= 15 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT5FSRT: HEAT Resistant Armor, Type 5, Turret; Front, Side, Rear, Top. Reduced HEAT - >15 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT1FSR: HEAT Resistant Armor, Type 1, Turret; Front, Side, Rear, Top. Reduced HEAT - >3 and <= 6 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT2FSR: HEAT Resistant Armor, Type 2, Turret; Front, Side, Rear, Top. Reduced HEAT - >6 and <= 9 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT3FSR: HEAT Resistant Armor, Type 3, Turret; Front, Side, Rear, Top. Reduced HEAT - >9 and <= 12 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT4FSR: HEAT Resistant Armor, Type 4, Turret; Front, Side, Rear, Top. Reduced HEAT - >12 and <= 15 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- HRAT5FSR: HEAT Resistant Armor, Type 5, Turret; Front, Side, Rear, Top. Reduced HEAT - >15 ratio (C/K), Turret, Aspect Coded (F/S/R/T).
- SKTHL: Armored Skirt Hull sLats. Used for slat style hull skirts that degrade AP and HEAT weapons.
- SKTHP: Armored Skirt Hull Plate. Used for plate style hull skirts that degrade AP and HEAT weapons.
- SKTHS: Armored Skirt Hull Spaced. Used for spaced plate style hull skirts that degrade AP and HEAT weapons.
- SKTHW: Armored Skirt Hull Wire. Used for wire style hull skirts that degrade AP and HEAT weapons.
- SKTTL: Armored Skirt Turret sLats. Used for slat style turret skirts that degrade AP and HEAT weapons.
- SKTTP: Armored Skirt Turret Plate. Used for plate style turret skirts that degrade AP and HEAT weapons.
- SKTTS: Armored Skirt Turret Spaced. Used for spaced plate style turret skirts that degrade AP and HEAT weapons.
- SKTTW: Armored Skirt Turret Wire. Used for wire style turret skirts that degrade AP and HEAT weapons.
- **eq-rc: Equipment-Receiver** - Various sensors – acoustic, radar warning, laser warning, NBC detection, ESM, etc. These are passive systems.
 - LWR1: Laser Warning Receiver Class 1. Detects Laser Range Finders and Designators. Small defensive boost. Smoke dischargers can be used for the defensive boost.

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- LWR2: Laser Warning Receiver Class 2. Detects general direction (arcs) of LRF/LDS, defensive boost, can use smoke dischargers versus attacks for defensive boost.
- LWR3: Laser Warning Receiver Class 3. Detects direction (arcs) of LRF/LDS, defensive boost, can use smoke dischargers versus attacks for defensive boost, boost to spot/attack shooter.
- LWR4: Laser Warning Receiver Class 4. Detects direction (arcs) of LRF/LDS, defensive boost, can use smoke dischargers versus attacks for defensive boost, boost to spot/attack shooter.
- LWR5: Laser Warning Receiver Class 5. Detects direction (arcs) of LRF/LDS, defensive boost, can use smoke dischargers versus attacks for defensive boost, boost to spot/attack shooter.
- RWR1: Radar Warning Receiver Class 1. Detects Radar emissions and alerts crew, Small Defensive Boost, ECM can be used for Defensive Boost.
- RWR2: Radar Warning Receiver Class 2. Detects general direction (arcs) of Radar, defensive boost, can use ECM versus attacks for defensive boost.
- RWR3: Radar Warning Receiver Class 3. Detects direction (arcs) of Radar, defensive boost, can use ECM versus attacks, boost to spot/attack shooter.
- RWR4: Radar Warning Receiver Class 4. Detects direction (arcs) of Radar, defensive boost, can use ECM versus attacks for defensive boost, boost to spot/attack shooter.
- RWR5: Radar Warning Receiver Class 5. Detects direction (arcs) of Radar, defensive boost, can use ECM versus attacks for defensive boost, boost to spot/attack shooter.
- **eq-sn: Equipment-Sensor** - These are active and passive sensors used to gain non-target detection information or for fire control.
 - SOR: Search Only Radar. Spot targets, but not fire on them unless weapons can track the target.
- STC: Stadia Coincidence Sight. Rangefinder that uses mechanical/optical principles to determine the distance to an object.
- STR: Stadia Reticule Sight. Rangefinder that uses graduated marks on a telescopic sight to determine target distance.
- LFCS: Laser Range Finder (LRF). Laser system used to determine range to target, greatly improves shot accuracy.
- LRFM: LRF Manual Input (MLI). Laser system used to determine range to target, improves shot accuracy, time to input.
- eq-ta: Target Acquisition Sensors - These are active and passive and are used for target acquisition and fire control systems. Search radars, sights of various flavors (optical, IR, light amplification, Thermal).
- **eq-ta: Equipment Target Acquisition** - These are active and passive systems used for target acquisition and fire control systems. Search radars, sights of various flavors (optical, IR, light amplification, Thermal).
 - ASRA: Air Search Radar - Advanced. Radars used to find air targets.
 - ASRC: Air Search Radar - Common. Radars used to find air targets.
 - ASRL: Air Search Radar - Limited. Radars used to find air targets.
 - GSRA: Ground Search Radar - Advanced. Radars used to find ground targets.
 - GSRC: Ground Search Radar - Common. Radars used to find ground targets.
 - GSRL: Ground Search Radar - Limited. Radars used to find ground targets.
 - IRSL: IR Search Light. Allows equipped units to see in darkness.
 - IRWS: IR Weapon Sight. Allows equipped units to see in darkness.

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- MNR: Marine Navigation Radar. Simple short-ranged radar for sea navigation that sees other ships or land.
- NOPT: No Optical Sensing. Platform does not have standard human vision for spotting.
- NVA: Night Vision Sights/System - Advanced. Advanced light amplification systems (Gen3).
- NVC: Night Vision Sights/System - Common. Common light amplification systems (Gen2).
- NVL: Night Vision Sights/System - Limited. Limited/early light amplification systems (Gen1).
- OPT: Optical/Low Magnification Visible Spectrum. Covers CQB rifle sights and such. Also, EO low mag sensors, Mk1 Eyeball.
- OPZ: Optical Sight with Zoom. Binoculars or 3-10x telescopic sights.
- OGS: Optical Gunsight. aircraft/helo optical sights (gyro types).
- OGZ: Optical Gunsight with Zoom. Covers 3x-5x zoomed gun sights.
- AGS: Advanced Gun Sight(s). Guns/weapons targeting bonus for advanced sensors, spotting bonus.
- TISA: Thermal Imager Sights - Advanced. Advanced thermal imaging allows sighting of objects through smoke/night via heat/ir.
- TISC: Thermal Imager Sights - Common. Common thermal imaging allows sighting of objects through smoke/night via heat/IR.
- TISL: Thermal Imager Sights - Limited. Limited thermal imaging allows sighting of objects through smoke/night via heat/IR.
- TIVA: Thermal Imager Viewer - Advanced. Advanced thermal imaging allows sighting of objects through smoke/night via heat/IR.

- TIVC: Thermal Imager Viewer - Common. Common thermal imaging allows sighting of objects through smoke/night via heat/IR.
- TIVL: Thermal Imager Viewer - Limited. Limited thermal imaging allows sighting of objects through smoke/night via heat/IR.
- **eq-wl: Weapon Location Sensors** - These are active and passive systems used for detection and location of weapon launching systems like arty, mortars and rockets.
 - NWLS: NATO Weapon Locating Radar System. Cold War based NATO weapon locating radar systems used for generating counter-battery missions for the Fire Support Control Center (FSCC).
 - PWLS: Warsaw Pact Weapon Locating Radar System. Cold War based Warsaw Pact weapon locating radar systems used for generating counter-battery missions for the Fire Support Control Center (FSCC).

5.2 Systems/Munitions Level Characteristics

The following classes of characteristics can be found in the three lists (Capabilities, Defenses, and Guidance) found on both the Systems and Munition Types tabs of a national datasheet.

- **wp-cp: Weapon-Capabilities** - These encompass capabilities other than working to prevent a munition soft or hard kill and are also not related to weapon/munition guidance. These characteristics may enhance range or lethality.
 - ADL: Air Defense Capable Limited Targets. Weapons can be used against hovering helos/low speed drones, low ph/pk.
 - ADW: Air Defense Weapon. no penalties shooting at air targets (not SSMs/ORVs).
 - FFR: Fast Fire Rate. ROF=2 min (MGs, Acs, GATs, AIR-MG/CN, AAGs<50mm) Clip fed guns/mortars.
 - SAL: Salvo fire of rockets. unit unloads rockets in a barrage/single ammo type loaded.

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- SFR: Slow Fire Rate. cut ROF by 50 percent - heavy/cumbersome loading or hand tracking.
- DFA: Direct Fire Artillery. Arty gun with ap/heat ammo, can DF close targets 1500m or less (min range?).
- IFG: Indirect Fire Gun. Guns or RCLs that have an indirect HE(SA) mode - max is IDF max, effective range is max for DF and min is effective for DF, Gun-mortar systems.
- SAW: Small Arms Weapon. pistols, rifles, assault rifles, SMGs, etc.
- SPW: Infantry Support Weapon or Squad Weapon. usually MGs or AGLs, extra firepower beyond small arms.
- SPWA: Anti-Armor Infantry Support Weapon. RPGs, satchel charges and other anti-tank support weapons.
- TAM: Top Attack Munition. Weapons attack the top armor of a land platform.
- TDA: Terminal Diving Attack. The weapon dives at a high angle to target, negates AFV APS, limits gun/CIWS engagements.
- **wp-ds: Weapon-Defensive Systems** - These protect either the weapon system or the munition. Smoke dischargers, armor on the munition, jammers, ECCM systems in the munition, reduced launch, firing signature, etc.
 - SMMS: Smoke - Multi-Spectral Blocking. Blocks LOS, Thermal, and radars (GSRs).
 - SMN: Smoke - Normal. blocks LOS not thermals.
 - SMT: Smoke - Thermal Blocking. blocks all LOS except radar.
 - CMR1: Counter Measure Resistance (x = value 1-5). needs to be tech level shifted when used.
 - CMR2: Counter Measure Resistance (x = value 1-5). needs to be tech level shifted when used.
 - CMR3: Counter Measure Resistance (x = value 1-5). needs to be tech level shifted when used.
 - CMR4: Counter Measure Resistance (x = value 1-5). needs to be tech level shifted when used.
 - CMR5: Counter Measure Resistance (x = value 1-5). needs to be tech level shifted when used.
- **wp-gd: Weapon Guidance** - These cover the various means of munition guidance capabilities for all weapon systems.
 - HRSA: Home on Radiating Source Active Only. Homes in on Active Air Defense Radar systems, loses lock if emitter is off.
 - HRSL: Home on Radiating Source Active and Location. Homes in on Air Defense Radar systems, Low % hit on turned off emitter.
 - NLOS: Non-Line-of-Sight Capable Guidance System. Can be guided by designator or engaged via active homing.
 - PGC: Command Guided via Radio.
 - PGG: GPS Guidance System. No DCM, only ACM2 defends.
 - PGGL: Precision Guided GPS mid-course/Laser terminal homing. Can do static target GPS homing.
 - PGI: Inertial Guidance System. no DCM, only ACM2 defends.
 - PGIL: Precision Guided INS mid-course/Laser terminal homing. Can do static target INS homing.
 - PGIR: IR Homing Guidance systems. used on IR guided missiles (SAM/AAM).
 - PGL: Laser Guided Weapon. use with LDS for indirect attack.
 - PGM: MCLOS Guidance. manual guide of weapons, accuracy highly degraded under fire.
 - PGO: Optical Guided Systems (TV). Uses locked on TV/optical image to guide to target.
 - PGR: Radar Homing Guidance. Uses radar for terminal homing to a target.
 - PGS: SACLOS Guidance. manual guide of weapon, accuracy degraded under fire.

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- PGT: Thermal Sight Guided System (FLIR). optical through normal smoke.

5.3 Munitions Only Level Characteristics

The following class of characteristics can be found in the three lists (Abilities, Defenses, and Equipment) found on the Type column in the Munition Types tab in the national data file.

- **am-cp: Munition Capabilities** - These are used to define the type of munition being defined in the table. These codes tell the program how to handle the munitions in the combat model.
 - ARBT: Air Burst Capable Rounds. Weapons fire rounds that detonate in air a small distance from a target.
 - ABIO: Artillery Biological Round. IDF round with some form of biological weapon payload.
 - ACHN: Artillery Chemical Non-Persistent Round. IDF round with some form of non-persistent chemical weapon payload.
 - ACHP: Artillery Chemical Persistent Round. IDF round with some form of persistent chemical weapon payload.
 - ANCR: Artillery Nuclear Round. IDF round with some form of nuclear weapon payload.
 - CAN: Cannister Rounds/Beehive. Units carry a small number of Anti Personal rounds (15%).
 - FAE: Fuel Air Explosive. Warhead type with explosive overpressure effect from dispersed gas/detonation.
 - HEBB: High Explosive Base Bleed. Warhead type with a HE blast and extended base range of +25%.
 - HEDP: High Explosive Dual Purpose. Rounds that can reduce cover/concealment and damage targets.
 - HEP: High Explosive Plastic. HESH type rounds instead of HEAT.
 - HERA: High Explosive Rocket Assisted [RAP]. Warhead type with a HE Blast and rocket extended range of 67%.

- HVR: High Velocity Rounds. Unit carries a small number of harder hitting AP rounds (30%).
- ICM01x040: Improved Conventional Munitions, 40 submunitions. Sensors for target/fusing use.
- ICM01x080: Improved Conventional Munitions, 80 submunitions. Sensors for target/fusing use.
- ICM01x180: Improved Conventional Munitions, 180 submunitions. Sensors for target/fusing use.
- ICM01x650: Improved Conventional Munitions, 650 submunitions. Sensors for target/fusing use.
- ICM01x950: Improved Conventional Munitions, 950 submunitions. Sensors for target/fusing use.
- ICM_NoUXO: Improved Conventional Munitions (placeholder-300 subs). Test case for ICM that leaves no unexploded munitions after the attack.
- ICM: Improved Conventional Munitions (placeholder-300 subs). Basic ICM setup for older data/scenarios with default submunitions.
- IED: Improvised Explosive Device. Makeshift explosive fixed or mobile with command detonation.
- ILIR: Illumination - Infra-red. Weapon emits IR spectrum light to light up night settings for IR/NV/TI sights.
- ILL: Illumination - Visible. Weapons emit bright light to light up night settings.
- ILUV: Illumination - Ultra-Violet. Weapons emit UV spectrum light to light up night settings for UV sights.
- JLR: Jacketed Long Rod. A Long Rod KE PEN round with a jacket over the monoblock for yaw resistance.
- KKV: Kinetic Kill Vehicle. Weapons use speed and mass versus explosive force to destroy a target.
- NED: Neutron Enhanced Detonation. Nuclear weapon with more soft kill radiation, but lower explosive effects.

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- SCM: Scattered Mines Warhead. Creates a surface mine field obstruction in the target hex.
- SLR: Segmented Long Rod. Long Rod KE PEN, multiple segment body for better NERA Penetration effect.
- TBW: Thermobaric Warhead. Massive damage to structures and non-NBC protected units.
- TDW: Tandem Warheads. Multicharged warhead meant to defeat ERA armor.
- TPW: Triple Warheads. Multicharged warhead meant to defeat advanced ERA armor.

6 Weapon/System Types

The new game engine has five classes of weapons/systems used to represent the multitude of weapons systems and equipment that can be found on any of the platforms in the game.

6.1 Ballistic Class

Any type of weapon or system that fires projectiles to damage a target.

Type Tag	New Description
AAA	Anti-Aircraft Gun
ACN	Aircraft Cannon
AGL	Automatic Grenade Launcher
AMG	Aircraft Machine Gun
ARK	Air Launched Rocket
ATK	Anti-Tank Gun
AUCN	Auto Cannon
FGN	Artillery Gun
ISW	Infantry Support Weapon
MGN	Machine Gun
MTR	Mortar
RKT	Rocket
RPG	Rocket Propelled Grenade

Type Tag	New Description
SMA	Light Small Arms
TGN	Light Tank Cannon
VSW	Vehicle Support Weapon

6.2 Energy Class

These weapons/systems use created energy to damage targets.

Type Tag	New Description
ACM	Cluster Munition
AIB	Iron Bomb
EXP	Explosive Device
FLM	Flame Weapon

6.3 Guided Class

These weapons/systems used onboard guidance to engage targets.

Type Tag	New Description
AARM	Anti-Radiation Missile
AGM	Guided Missile
ATGM	Anti-Tank Guided Missile
SAM	Surface to Air Missile

6.4 NBC Class

These weapons/systems are weapons of mass destruction/casualties.

Type Tag	New Description
BIOW	Biological Weapon
CWN	Chemical Warhead Non-Persistent
CWP	Chemical Warhead Persistent
NCW	Nuclear Warhead (kT)

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7 Munition Types

These types are used to tell the code what type of munition is being fired. This value needs to be entered into column E on the Munition Types tab of the national data file.

- AP: Armor Piercing. Munition used versus armor.
- ATGM: Anti-Tank Guided Missile. Gun tube fired ATGMs.
- CAN: Canister/Flechette. Close-In, short range, widespread, soft target round.
- HE: High Explosive. Munition warhead is a blast fragmentation type.
- HEAT: High Explosive Anti-Tank. Munition warhead with a formed HE penetrator.
- HESH: HESH/HEP. Munition with an explosive squash head warhead.
- HVR: Hyper Velocity Round. Munition is used versus armor with higher velocity design.
- ILL: Illumination. Munition with capability to illuminate and area for a short duration.
- MINES: Scattered Mines. Munition with AP/AT mine submunitions.
- NCHEM: Non-persistent Chemical. Munition with a chemical dispersion warhead.
- NUKE: Nuclear. Munition with a nuclear warhead (Tactical Yields).
- PCHEM: Persistent Chemical. Munition with a chemical dispersion warhead.
- SMKMS: Smoke - Multi-Spectral. Munition that dispenses visual/thermal/radar blocking smoke.
- SMKN: Smoke - Normal. Munition that dispenses visual blocking smoke.
- SMKT: Smoke - Thermal. Munition that dispenses visual/thermal blocking smoke.
- TDW: Heat - Tandem Warhead. Munition warhead with dual formed HEAT penetrators.

- TPW: HEAT- Triple Warhead. Munition warhead with triple formed HEAT penetrators.

8 Weapon List Codes (New-Provisional)

These small number of codes are going to be introduced to extend certain capabilities to weapon-platform interactions. In other words, a weapon or system may have a different behavior depending on what platform it is on. More codes will also be added in the future.

NOTE: This listing is currently in discussion with the Development team as to the need and feasibility of these items as they require a fair amount of codework to revise and add to existing code.

Codes	Weapon List Special Descriptions
Ry	<i>Ready Rack Rounds (ammo)</i>
WFD	Weapon Full Defilade
WIT	Weapon Independent Turret
WMC	Weapon Manual Control
WMM	Weapon Mast Mounted
DMW	Dismountable Weapon

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9 Task Force Type Filters

A new addition to the Formation Table is a column named Mission Filters. These filters are codes used to group like formation functions when in the scenario editor to aid the user in finding certain types quicker.

Task Type	Task Type Description	Notes
MAIR	Off-Map Manned Air Assets	Any type of aircraft unit that operates from off-map
MAMB	Air Mobile/ Air Assault Forces	Forces moved a distance by vertical lift systems (Helos/VTOLs)
MDCY	Decoy Forces	Forces set up as decoys static of moving
MDRN	On or Off-Map Drone Assets	These are the larger drones shown on-map in the game
MENG	Engineering Assets	Units tasked with engineering support functions
MGND	Ground Maneuver Forces	Default Mission - Does not need to be added at this time
MHLO	Helicopter Forces	Used for helicopters, mainly scout, attack, and HQ units
MPAT	Parachute Assault	Forces that are dropped into an area via parachute/pallet(?)
MSOF	Special Operations Forces	Used for independently operating commandos
MSUP	General Support Assets	These are larger general support assets of Recon, Arty, AD, AT, etc.
MWMD	NBC Assets	Any platform that can deliver an NCB strike on the map

NOTE: The filters above are currently not operational in the scenario editor. We are evaluating the need for this level of operation.

10 Formation Roles

The codes are found in the Formation Table and related to the overarching AI behavior, the units in that formation will act in the simulation. There is a Role call "CIV" that we may use in the future is civilians become more than "markers" in the game engine. There is also a value called "Supply" that is used internally as an error trap for the code and should not be utilized in the formation tables by users.

Role	Description of Primary Formation Function
Air	Any air unit type, functionality dictated by mission types (CAS, SEAD, Standoff, etc.)
AntiTank	Towed systems or man portable weapons, utilize good terrain/cover to snipe armored units, standoff, must account for limber/unlimber times to move (forward or back)
Arty	Towed Arty units, standoff range, stay within range of forward elements for support, must account for limber/unlimber times to move (forward or back)
Engineer	Units with engineering capabilities only
Flak	Overwatch units that provide anti-air fire versus helos and strike aircraft, NOT first line fighters and should retreat if lead elements are gone, if engaged some SPAAGs can engage ground forces,
Helo	Depending on class (Attack, Scout, Utility) they will Hunt, Recce, or avoid contact to do their missions. This is for Helos only.
HQ	Generates orders for attached ground units, communicates up the command chain, maintains contact with sub-units, fights as necessary
HQArty	Generates orders for attached Arty/Air units, communicates up the command chain, maintains contact with sub-units, fights as a last resort
Inf	Pure ground troops, maybe APCs but not IFVs (MechInf), engage enemies, take objectives, utilize covered movements.

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Role	Description of Primary Formation Function
Logistical	For sites like FARPs, Supply depots, POL, Maintenance, Coms/HQ, etc.
MechInf	A combination of IFVs and Infantry units used to fight and seize objectives
Obsrv	Units with observation ability, standoff, not engaging, move only to track a target, usually looking at an AOI
Recce	Scout out and find the enemy, standoff based, fight if pressed
SPArty	Mobile Arty units, standoff range, stay within range of forward elements for support
SPAT	Self-propelled weapons, utilize good terrain/cover to snipe armored units, standoff, should be overwatch types and not front-line units
Supply	<i>Dummy Role for Error Trapping - Do not use in Formation Roles</i>
Tank	Armor forces used to kill other units and help with securing objectives, lead elements of an assault
Truck	Formations providing utility transport, standoff, support type units
WMD	Units with NBC weapons, must have a scripted release state for players and AI use

11 Battle Planner Template (BPT) Codes

These codes are found in the Formation Table in the BPT Defaults column and relate to specific AI behaviors the units in that template type/area will perform during the simulation.

NOTE: This feature is currently in development and not fully implemented in code. The Data Validation Program is up to date with these codes and will flag missing or bad/unneeded codes in the table.

NOTE: Codes in italics are in use currently, but will be replaced soon with the more detailed codes seen in the sections below.

11.1 Independent Air Defense

- *AD Support – ADSUP*
- *AD Overwatch – ADOVW*
- Off Map Support – ADFSUP
- Off Map AD (Overwatch) – ADFOVW
- On Map Support – ADOSUP
- On Map AD (Overwatch) – ADOOVW

11.2 Air Operations

- Off Map Ground Support (Air Ops) – AIRGSF
- On Map Ground Support (Air Ops) – AIRGSO
- Support (Trans/HQ/EW) – AIRSUP
- Stand Off (LB) – AIRSTO
- CAS – AIRCAS
- SEAD (WW) – AIRSED
- Recon – AIRREC

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11.3 Independent Artillery Operations

- *Artillery Support* – ARTSUP
- *Artillery* - ART
- Off Map Support – ARTFSUP
- Off Map Artillery – ARTFM
- On Map Support – ARTOSUP
- On Map Artillery – ARTNM
- Observer (for on or off map) – ARTOBS

11.4 Ground Maneuver/Engineering

- Reserve Line – MANRES
- Overwatch AD – MANOAD
- Reserve Line – MANRES
- Flank Security Element – MANFS1
- Variables – MANVAR
- Support – MANSUP
- Overwatch AT – MANOAT
- Line 2 (Mech Forces) – MANLN2
- Line 1 (Armor Forces) – MANLN1
- FSE (Forward Security Element) – MANFSE
- Recon (FO/FAC) – MANREC
- Reserve Line – MANRES
- Bridging (Engineering) – MANBDG
- Organic Artillery – MANART
- Flank Security – MANFS2
- Engineering Efforts (not bridging) – MANENG

11.5 Helo Operations

- Off Map Ground Support (Helo Ops) – HELGSF
- On Map Ground Support (Helo Ops) – HELGSO
- Support (Trans/HQ/EW) – HELSUP
- Stand Off – HELSTO
- Hunt – HELHNT
- Recon – HELREC

11.6 NBC/SSM Operations

- *NBC Support* – NBCSUP
- *NBC Ops* – NBC
- Off Map Support – NBCFSUP
- Off Map NBC – NBCFM
- On Map Support – NBCNSUP
- On Map NBC – NBCNM

11.7 Generic (Catch All)

- Off Map Generic – GENOFM
- On Map Generic – GENONM

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12 Mobility Types

These are the specific movements recognized by the game engine to perform unit movement on or across the map. These identifiers must be used for the Mobility column of the Units tab of a National Data File and the letter in parenthesis is seen on the counter in the game.

- NONE (-) – Used for Towed Weapon systems (Field Guns)
- STATIC (S)– Used for Fixed Sites (SA-2, Hawk)
- *BOAT (B) – Used by boats using wind or oars, non-engine based
- *SCREW (C) – Used for motorized ships and submarines
- *HOVER (V) – Air-cushioned vehicles that move over water and land
- LEG (L) – Used for all ground troops
- HORSE (O) – Used for animal-based transport (Cavalry, Wagons)
- WHEEL (W) – Used for all wheeled vehicles
- *HALFTRACK (H) – Used for vehicles with both wheels and tracks
- TRACK (T) – Used for all tracked vehicles
- *LOCOMOTIVE (M) – Vehicles with rail-based movement
- GLIDER (G) – Used for all unpowered air systems
- ROTOR (R) – Used for all Helicopter like systems
- PROP (P) – Used for all Propeller based air systems
- JET (J) – Used for all Jet engine type air systems
- ROCKET (K) – Used for all Rocket engine type air/space systems
- *ORBITAL (I) – used for hyper-sonic glide or reentry vehicles

* **NOTE:** This mobility type is not currently active in the game engine and there are more that will be added to cover other land, sea, and air/space types as features are added or expanded during development of the product.

13 Getting Started with Data Editing

Before you dive head long into a project you should take some time to get your ducks (or other regionally specific animals) in a row. This chapter of the guide breaks down a few of the key decisions and works on getting you ready to work on the database modification (Mod) you want to make.

13.1 Deciding What You Want to Make

It may sound like a silly question, but sometimes you may not really know what you want to mod or how far or deep you want to go. Starting small and simple in many cases is a good idea. If you really want to change many things you should really take a minute and map out all the things you need to do the job. Another factor involved is the end user. Is this something for you only or are you going to make this for other users to use too. In some cases, it helps to be familiar with the process or tools required to make data edits.

13.2 New or Derived Content

Where do you want to start? It is no doubt easier in almost every area of the game to derive/edit existing content than to start from scratch. If you are new to data editing/modding, I would strongly suggest starting a derived type of project first. Having data or a format in front of you helps reduce the chance of making a mistake. Once you are comfortable with all the ins and outs of creating the content you want from existing materials, you can switch over to making it from scratch. If you are going to create items from scratch, make sure you are aware and following the rules or guidelines for formats, sizes, and ranges. Failure to stay within the set boundaries of an object can lead to game crashes and the headaches of debugging what you have done.

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13.3 Gathering Source Information

Before you launch into a project, take the time to gather up supporting source information that can help you with what you are planning to do. This could range from images to maps to specifications and documents. This will be less of an issue with sounds and some art items, but a downright necessity for scenarios and data work.

13.4 Safeguarding Sensitive or Classified Data

Please review all policies about the use, transmission, and markings of any files where sensitive (CUI) or Classified information is used in any of the related data files in the game system. The game has an open database with Excel spreadsheets, and it is easy for information to be passed to others.

13.5 Third Party Tools and Other Assets

Modding a game takes time, effort, and tools. Modding the items found here requires having 3rd party software tools. Here is a breakdown of what you need.

- Data Files – Microsoft Excel or equally capable spreadsheet software and knowledge of how to copy, paste and rename files and folders.

If you want to edit data, you will need to have software to do so.

13.6 Working with User Feedback

Once you place content out there for others to use, you will need to deal with both positive and negative feedback and suggestions. The best advice I can give on the subject is to be polite in your responses. If possible, take the good suggestions and work them in where you can. At the end of the day, it is your work and your vision and there is nothing wrong with telling someone to use the tools to mod it the way they like. It is what we are doing!

14 Editing the Data

One of the deepest areas of modding found in Flashpoint Campaigns: Red Storm is the ability to crack open the codex of ones and zeros (and many other alpha-numeric values) to mod or add data to the game. By editing data, you can do everything from changing the range of a tank gun to adding entire new nations or time periods to the game engine. The ability to edit the data files places a lot of firepower at your command to build the game you want to play or even have others play.

14.1 The Hell of Spreadsheet Editing

Data editing is some powerful stuff when done right. You can make new content that others can use. You can also crash the game in a heartbeat as well with an errant comma (something we have done a few times ourselves). Being this deep into the numbers takes more thought and care than any other editing/modding you can do in the game. Changes here can affect how the rest of the game plays. That impacts others who may use your work to make scenarios, analyze data, or create variants of your data files.

14.2 Save Early, Save Often, and Have Backups

As much as it has probably been said three or four times already, save! Anytime you get through a major section or add new data make sure to save it. It is also a good idea to have backups of original files and save versions of files as you go so you can revert if something blows up or gets lost or overwritten. Have several backups for the game info and code on hard drives, portables, and memory sticks. Paranoid? Yes, but safe from most disasters.

14.3 Words of Wisdom...

Before editing a user data file, we recommend you make a copy of the data file you intend to edit and then rename it so that you do not lose the original. You will find that the original OTS data file to be most helpful in locating examples of things you want to do and in trouble shooting problems that come up.

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Before, during, or after altering a data file, you can tailor the looks to fit your force or informational display needs. You can change the name, color, graphics like the flag. Feel free to experiment.

15 National Defaults

These values represent certain abilities or game engine defaults which are specific to a given country in the game. Changes made to many of the values on this tab of the spreadsheet will impact on the overall play of units from this country.

CW 80s United States: National Defaults			
Time Frame Start	1980		
Time Frame End	1989		
			
Hardware Quality Values			
Electronics	95	0 to 100	
Counter-Measures	93	0 to 100	
Equipment	94	0 to 100	
Default Military Unit Values			
Training	73	0 to 100	
Morale	70	0 to 100	
Tactical Initiative	86	0 to 100	
Acceptable Losses	28	0 to 100	
Artillery Values			
Delay: On Call Fire	5	minutes	
Delay: Between Fire Missions	5	minutes	
% CB Detection	8	%	
Max FSCC Age - Static Target	20	minutes	
Max FSCC Age - Moving Target	10	minutes	
FSCC - Min Tubes per Mission	4	subunits	
Engineering Values			
Minor River Bridging Time	15	minutes	
Stream Crossing Time	10	minutes	
Swimming Prep Time	5	minutes	
Blow Bridge	20	minutes	
Clear Mines	15	minutes	
Clear Obstacle	10	minutes	
Clear Improved Position	20	minutes	
Game Defaults			
Unit Counter Background Image	US-BGD.png		
Subunit Stacking Limit	35		
Nationality	American		MUST MATCH FOLDER NAME!
Insignia	National US.png		
Force Name	Team Yankee		
Default Side	Blue		
Equipment Cost Factor	1.5		

15.1 Time Frame Start/End

Sets the time frame reflected by this data set. Scenarios created in the editor must be set for this period. These are usually in ten-year increments, but in the case of recent modern data may cover a larger span of years.

15.2 Hardware Quality Values

Relative measure of the technical competency of a country's electronics and mechanical equipment. These values are used during certain engagements as a minor adjustment to characteristics found in the systems and units data tables.

Hardware Quality Values

Electronics	95	0 to 100
Counter-Measures	93	0 to 100
Equipment	94	0 to 100

15.2.1 Electronics

Quality of electronic equipment such as sensors, radios, etc. used by a force (Quality set as on a scale of 0-100 with 100 being the best).

15.2.2 Countermeasures

Quality of electronic countermeasures equipment for a force (Quality set as on a scale of 01-100 with 100 being the best).

15.2.3 Equipment

Quality of general equipment not covered above for a force (Quality set as on a scale of 0-100 with 100 being the best).

15.3 Default Military Unit Values

These are relative measures of a country's general/average fighting force soft factors (human element of the force). These factors influence several variables during simulation dealing with combat, orders, and

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command. These values can be set to different values for units in the Scenario Editor to reflect better or worse than average forces.

Default Military Unit Values		
Training	73	0 to 100
Morale	70	0 to 100
Tactical Initiative	86	0 to 100
Acceptable Losses	28	0 to 100

15.3.1 Training

An identifier representing the average amount of training received. Scale of 0 (Untrained) to 100 (Elite) with 100 being the best.

15.3.2 Morale

A number from 0 to 100 (best) represents the mental state of the unit at the beginning of the scenario. This value can drop during a battle and recover to a maximum of the preset value.

15.3.3 Tactical Initiative

An indication of the unit's freedom and initiative to assess the situation and act on their own at times in opposition to their given orders. The values range from 0 (No local initiative-stick with given orders) to 100 (total freedom locally). Unit SOPs (Standard Operating Procedures) can override this global setting.

15.3.4 Acceptable Losses

Sets the force's determination and ability to stand and fight and accept losses. The values range from 0 (No loss acceptance) to 100 (fight to the last man). Unit SOPs (Standard Operating Procedures) can override this global setting.

15.4 Artillery Values

There are several settings to control the overall mechanics of a nation's artillery support system. Values apply to both human control of support assets and the AI's FSCC role if automated.

Artillery Values		
Delay: On Call Fire	5	minutes
Delay: Between Fire Missions	5	minutes
% CB Detection	8	%
Max FSCC Age - Static Target	20	minutes
Max FSCC Age - Moving Target	10	minutes
FSCC - Min Tubes per Mission	4	subunits

15.4.1 Delay: On Call Fire

Additional Delay in minutes for the arrival of on call fire mission beyond the the delay for the command loops of spotter to battery.

15.4.2 Delay: Between Fire Mission

Delay in minutes between fire missions. This time reflects the time required to set the target locations of a new fire mission.

15.4.3 % CB Detection

The chance that an enemy fire mission will be detected, located, and possibly attacked by counter battery. This is your chance to be detected by the enemy and engaged based on SOP and shoot and scoot tactics.

NOTE: This parameter is going to be replaced in the future with actual counter battery capability with sensors and then passed to artillery units set to counter-battery operations.

15.4.4 Max FSCC Age-Static Target

The time that a static (non-moving) target will remain in the FSCC queue once it is detected. The shorter the time, the more fresh the target mission calls will be.

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15.4.5 Max FSCC Age-Moving Target

The time that a moving target will remain in the FSCC queue. The shorter the time the more up to date the mission targets will be and the less likely rounds will hit an empty target hex.

15.4.6 FSCC-Min Tubes per Mission

The minimum number of artillery tubes that an artillery battery must have available (not knocked out or destroyed) in order to execute an FSCC attack request.

15.5 Engineering Values

These values cover various engineering functions and the length of time to perform these actions by capable Engineering type units.

Engineering Values		
Minor River Bridging Time	15	minutes
Stream Crossing Time	10	minutes
Swimming Prep Time	5	minutes
Blow Bridge	20	minutes
Clear Mines	15	minutes
Clear Obstacle	10	minutes
Clear Improved Position	20	minutes

15.5.1 Minor River Bridging Time

This is the time it takes in minutes to lay a bridge of a hex side water obstacle with a short-span bridge.

15.5.2 Stream Crossing Time

This is the time it takes in minutes to find and ford a shallow stream.

15.5.3 Swimming Prep Time

This is the time it takes in minutes to prepare vehicles to swim a water obstacle.

15.5.4 Blow Bridge

This is the time it takes in minutes to prepare a bridge for demolition and render the crossing impassable.

15.5.5 Clear Mines

This is the time it takes in minutes to clear lanes in a minefield hex or edge obstacle so units can pass without loss.

15.5.6 Clear Obstacle

This is the time it takes in minutes to clear obstacles (wire, logs, abatis, etc.) in a hex or edge so units can pass without delay.

15.5.7 Clear Improved Position (IP)

This is the time it takes in minutes to remove and enemy improved position so it cannot be used by the enemy for added defense.

15.6 Game Defaults

Important game related values that set certain use defaults or global parameters used by the game engine.

Game Defaults		
Unit Counter Background Image	US-BGD.png	MUST MATCH FOLDER NAME!
Subunit Stacking Limit	35	
Nationality	American	
Insignia	National US.png	
Force Name	Team Yankee	
Default Side	Blue	
Equipment Cost Factor	1.5	

15.6.1 Unit Counter Background Image

The default graphic file in the [Nations's Data]/Backgrounds folder used as the counter background in-game for all units.

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15.6.2 Subunit Stacking Limit

The maximum number of subunits that the Nation's forces are allowed to place in a single hex as a volume control measure.

15.6.3 Nationality

This must be a unique name for a given Nationality and MUST be the same name of the Nation's Folder in the Modules/Common/Data folder of the simulation. You may have any number of National XLS data files in the folder as you like as long as they have a unique filename and have the correct Nationality entry (see below).

Name	Date modified	Type
American	12/20/2024 7:50 AM	File folder
Belgian	12/20/2024 7:50 AM	File folder
British	12/20/2024 7:50 AM	File folder
Canadian	12/20/2024 7:50 AM	File folder
Common	12/20/2024 7:50 AM	File folder
Czechoslovak	12/20/2024 7:50 AM	File folder
East-German	12/20/2024 7:56 AM	File folder
French	12/20/2024 7:50 AM	File folder
NATO	9/29/2024 7:26 PM	File folder
Polish	12/20/2024 7:50 AM	File folder
Soviet	12/20/2024 7:50 AM	File folder
West-German	12/20/2024 7:50 AM	File folder
Air Unit PF and Size Ratings.xlsx	6/6/2024 1:53 PM	Microsoft Excel W.
Data Validation Tool.xlsm	12/20/2024 7:50 AM	Microsoft Excel M.

WARNING: The Nationality entry MUST match the name used for the folder or the game engine will not see or use the data file or possibly crash the game.

15.6.4 Insignia

Default Graphic file in the Country's Data folder for this force's insignia. Insignia can be changed in the scenario editor.

15.6.5 Force Name

Default name for the user's Force. The name can be changed in the scenario editor.

15.6.6 Default Side

Select "Blue" for Player 1 and "Red" for Player 2. This determines the "side" the National data files will show up on in the scenario editor.

NOTE: The number of available sides is a feature we plan to increase in the future and this value may change or be deprecated.

15.6.7 Equipment Cost Factor

This factor is multiplied with the cost of equipment/subunit for that side to determine the victory points that are awarded for the lost of said equipment/subunit. Most NATO (Blue) Nations will be above 1.0 and most Op-For (Red) countries will be below 1.0. This is a global VP cost multiplier and can be used to balance out force cost ratios.

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16 Command

These values represent certain size, naming, or command and control parameters which are specific to a given country in the game. Changes made to values on this tab of the spreadsheet will impact the overall command cycle of units from this country.

HQ Level	Size Symbol	Rank(s)	Rank Abr	Radius (m)	Delay (min)	US Rank Name	US Rank Abr	NATO Code
Corps	XXX	Lt. General	LGN	75000	60	Lt. General	LGN	OF-8
Division	XX	Major General	MG	50000	45	Major General	MG	OF-7
Brigade	X	Colonel	COL	30000	30	Colonel	COL	OF-6
Regiment	III	Colonel	COL	20000	25	Colonel	COL	OF-5
Battalion/Squadron	II	Lt. Colonel	LTC	10000	12.5	Lt. Colonel	LTC	OF-4
Company/Troop	I	Captain	CPT	5000	5	Captain	CPT	OF-2
Platoon	...	Lieutenant	1LT	2500	2	Lieutenant	1LT	OF-1
Section	..	Staff Sergeant	SSG	1000	1	Staff Sergeant	SSG	OR-6
Squad	.	Sergeant	SGT	500	0	Sergeant	SGT	OR-5

16.1 HQ Level

Size of the formation with respect to the HQ used to control it. The simulation covers Sections (smallest) up to Corp level HQ formations.

16.2 Size Symbol

This is the type of NATO standard size symbol related to the size of the formation the HQ units' commands.

16.3 Rank(s)

This is the Nation's most common rank for the person in charge of the HQ at the specific level/size.

16.4 Rank Abr

This is the abbreviation of the rank for this size of HQ and is used in game with the Commander's name (randomly generated from the Surnames Table).

16.5 Radii (m)

This is the basic command and control radius of the particular HQ on the map in game. Units outside of this radius can suffer additional delays in orders or supply.

16.6 Delay (Min)

This is the basic orders delay time in minutes from local HQ to units. The further a unit needs to move out of its radius (5.5) the delay increases as orders need to flow to a next higher HQ. Delay can also be impacted by electronic warfare and readiness (fatigue of forces and HQs).

16.7 US Rank Name

Added a column for the US Rank Name equivalent. This can be toggled on/off in the game options to choose between the native language rank name and US rank name. Not shown in the picture.

16.8 US Rank Abr

Added a column for the US Rank Abbreviation equivalent. This can be toggled on/off in the game options to choose between the native language rank name and US rank name. Not shown in the picture.

16.9 NATO Code

The values match up to the NATO standard code for the level of command/rank. Shown for reference only.

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17 Formations

This is where the whole process comes together. The Formations Tab is where you assemble the units and formations that will be used in the scenario editor to build your orders of battle.

CW 80s United States: Formations									
Description	Code	Type	Composition (Type - 1A111R or RG name)	Role	Unit Size	Is HQ Or	WFT Default	Tank Force Type	
<Division 86 Formations (86+)>	<1								
Mixed Brigades	<2								
AD Recon	USV1	(name)	USV1, USV1, USV1, USV1	Recon	X				
AD Balanced	USV2	(name)	USV2, USV2, USV2, USV2	MechInf	X				
AD Recon	USV3	(name)	USV3, USV3, USV3, USV3	Recon	X				
AD Mechanized	USV4	(name)	USV4, USV4, USV4, USV4	MechInf	X				
Brigade Assets	<2								
>Brigade HQ	US21		COMV'S, INFANTRY, JEEP	HQ	I	X	MANUSP		
Battalions/Squadrons (M2 J Series)	<2								
Armored Bn (Tank Pure)	US11	%d	US11, US11, US11, US11	Tank	II				
Armored Bn (Tank Heavy)	US12	%d	US12, US12, US12, US12	Tank	II				
Armored Bn (Balanced)	US13	%d	US13, US13, US13, US13	Tank	II				
Mech Inf Bn (Mech Pure)	USM1	%d	USM1, USM1, USM1, USM1	MechInf	II				
Mech Inf Bn (Mech Heavy)	USM2	%d	USM2, USM2, USM2, USM2	MechInf	II				
Mech Inf Bn (Balanced)	USM3	%d	USM3, USM3, USM3, USM3	MechInf	II				
Cav Squadron (Div Cav)	USC1	%d	USC1, USC1, USC1, USC1	Recon	II				
Cav Squadron (ACV)	USC2	%d	USC2, USC2, USC2, USC2	Recon	II				
Company/Troops (M2 J Series)	<2								
Tank Company	USCT1	%d	USCT1, USCT1, USCT1, USCT1	Tank	I				
Tank Heavy Co/Tm	USCT2	%d	USCT2, USCT2, USCT2, USCT2	Tank	I				
Mech Inf Company	USCM1	%d	USCM1, USCM1, USCM1, USCM1	MechInf	I				
Mech Heavy Co/Tm	USCM2	%d	USCM2, USCM2, USCM2, USCM2	MechInf	I				

17.1 Description (Format Use)

This field has several uses for providing OOB formation names, names for formation elements, cues for node indenture, visible separators between main and subgroups of formations and elements and identifiers or names for major groups in the formation spreadsheet table. All these elements are used to provide the layout of selectable formations and elements of formation in the game's scenario editor. These primary types are as follows:

17.1.1 Major Formation Identifiers

Found in the chevron brackets " < > " These are major formation group names that form major OOB elements like "<Division 86 Formation>" or "<OMG/Brigade (86+)>" or "<Brigade Assets>". They have no other information in the row apart from Mission Filters. If the major formation has a date of use, you can add it in brackets as the "(86+)" above to help players choose the correct formations based on scenario date.

NOTE: The scenario date selected does not cause the formations list to filter in any way. The user must remember and use the correct formations if there are date-based options.

17.1.2 Type Formation Identifiers

If you need to have an additional descriptive breakdown such as "Battalions" or "Squadrons", you can add those identifiers in the description field. This also has no other information except for the option of a Mission Filter (when available).

17.1.3 Major Group Separators

This is a string of equal signs "=====" in the Description field and "<1" in the Code field that shows up in the scenario editor to separate major groups of formations. The "<1" code will place this marker at the top node level. There is no [+] for expansion on this separator.

17.1.4 Minor Group Separators

This is a string of minus signs "-----" in the Description field that shows up in the scenario editor to separate minor groupings of formations. There needs to be a single minus sign ("-") in the Code field alongside the string in the description field.

17.1.5 Blank Lines

A fully empty row used for the readability of the Formation Table. Optional, but helpful to stay organized. Not visible in the Scenario Editor. Any stray text in any field can cause a problem with the Scenario Editor look and data parsing.

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17.2 Description (Information Use)

Description	Code	Tag	Composition (Tags = 1A1/BR or RG name)
Armoured Cavalry Squadron	USE1	%d/	USE2, USE3*3, USE8
>Squadron HQ	USE2		TANK*2, COMV*2
Armoured Cavalry Troop	USE3	%C/	USE4, USE5*6, USE6*2, USE7
>Troop HQ	USE4		TANK, COMV
>Scout Section (Platoon Element)	USE5	%d/	RECCEM2*2, INFCMV2*2
>Tank Platoon	USE6	%d/	TANK*4
>SP Mortar Section	USE7	Mtr/	SPMTR*2, COMV
Tank Troop	USE8	%C/	USE9, USE10*3
>Troop HQ	USE9		TANK*2
>Tank Platoon	USE10	%d/	TANK*4

To put together an OOB, the names and use of the node indent symbols ">", ">>", and ">>>" allow the Scenario Editor to generate an indented list based on the indents and the names. The above MRB is comprised of a ">" Battalion HQ, ">" Motor Rifle Company, ">" Mortar Battery, ">" AA Section, and ">" Tank Company. The MRC and TC both have a third level breakdown with the ">>" noted company element entries.

17.3 Code

This **MUST** be a unique identifier for each formation element in the formations table that has information in the Composition Field of the table. It can be an alphanumeric construction with symbols but no spaces. These tags are used in formation compositions so keeping them short, but identifiable is helpful.

These Codes are also used in formation compositions to build larger formation groups.

17.3.1 Indented Node Code

The ability to control the level of indenture of the collapsible nodes in the OOB section of the Scenario Editor has been added. This improves both grouping and readability of the data. There are eight levels of indenture that are usable, and they are "<1" through "<8". They must be placed in the Code field of a Major or Type Formation Identifier field.

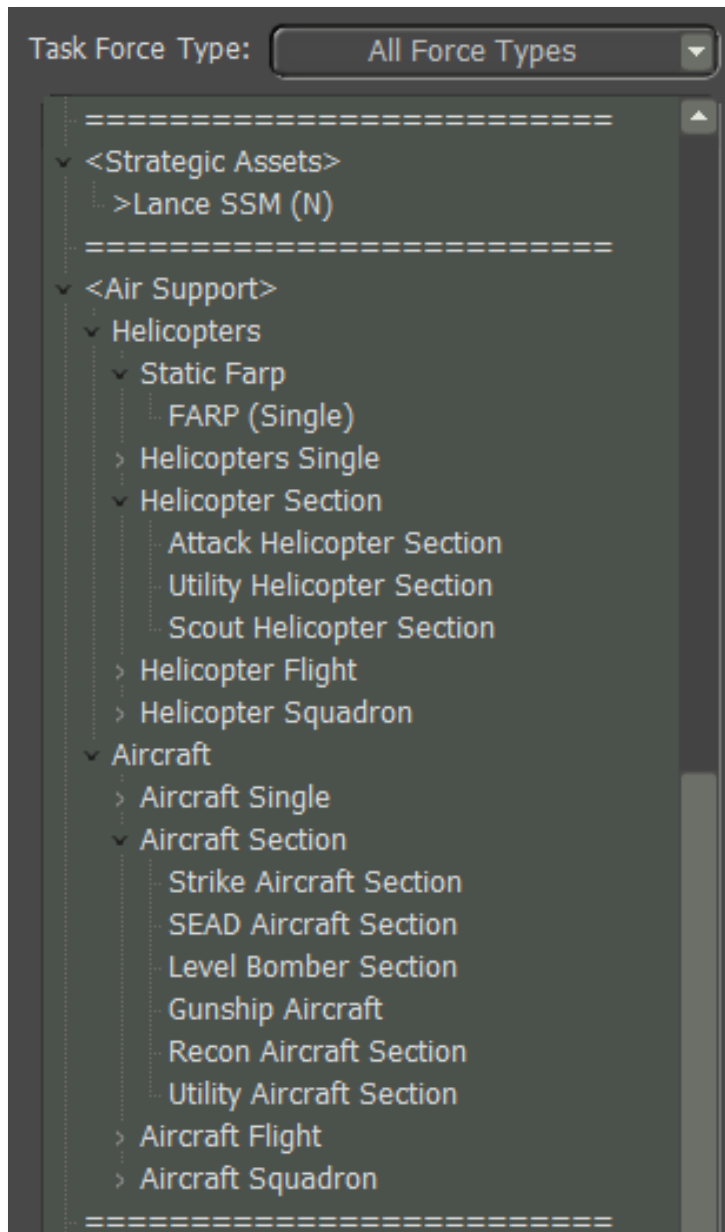
In the example below, the indent codes of "<1", "<2", and "<3" are placed to create the indented open/close node points for the various formations. In this case, the Air Support formations. The Indent Codes are circles in red.

<Strategic Assets>	<1		
>Lance SSM (N)	USG16	%d/	SSM
=====	<1		
<Air Support>	<1		
Helicopters	<2		
Static Farp	<3		
FARP (Single)	LG4	%d	FARP*8, TRUCK*8, INFHQ*1, COMV*1, JEEP*2, INFSM*2
Helicopters Single	<3		
Attack Helicopter	1HA	AH	HELOAT*1
Utility Helicopter	1HU	UH	HELOUT*1
Heavy Utility Helicopter	1HUH	UH	HELOUTH*1
Scout Helicopter Section	1HS	OH	HELOSC*1
Helicopter Section	<3		
Attack Helicopter Section	2HA	AH	HELOAT*2
Utility Helicopter Section	2HU	UH	HELOUT*2
Utility Helicopter Section	2HUH	UH	HELOUTH*2
Scout Helicopter Section	2HS	OH	HELOSC*2
Helicopter Flight	<3		
Attack Helicopter Flight	4HA	%d/	2HA*2
Utility Helicopter Flight	4HU	%d/	2HU*2
Heavy Utility Helicopter Flight	4HUH	%d/	2HUH*2
Scout Helicopter Section	4HS	%d/	2HS*2
Helicopter Squadron	<3		
Attack Helicopter Squadron	16HA	%C/	4HA*2
Utility Helicopter Squadron	16HU	%C/	4HU*2
Heavy Utility Helicopter Squadron	16HUH	%C/	4HUH*2
Scout Helicopter Section	16HS	%C/	4HS*2
Aircraft	<2		
Aircraft Single	<3		
Strike Aircraft	1AT	A/C	AIRAT*1
SEAD Aircraft	1SD	A/C	AIRSD*1
Level Bomber	1LB	A/C	AIRLB*1
Gunship Aircraft	1GS	A/C	AIRGS*1
Recon Aircraft	1SC	A/C	AIRSC*1
Utility Aircraft	1UT	A/C	AIRUT*1
Aircraft Section	<3		
Strike Aircraft Section	2AT	A/C	AIRAT*2
SEAD Aircraft Section	2SD	A/C	AIRSD*2
Level Bomber Section	2LB	A/C	AIRLB*2
Gunship Aircraft	2GS	A/C	AIRGS*2
Recon Aircraft Section	2SC	A/C	AIRSC*2
Utility Aircraft Section	2UT	A/C	AIRUT*2
Aircraft Flight	<3		
Strike Aircraft Flight	4AT	%d/	2AT*2
SEAD Aircraft Flight	4SD	%d/	2SD*2
Level Bomber Flight	4LB	%d/	2LB*2
Gunship Aircraft	4GS	%d/	2GS*2
Recon Aircraft Flight	4SC	%d/	2SC*2
Utility Aircraft Flight	4UT	%d/	2UT*2
Aircraft Squadron	<3		
Strike Aircraft Squadron	16AT	%C/	4AT*4
SEAD Aircraft Squadron	16SD	%C/	4SD*4
Level Bomber Squadron	16LB	%C/	4LB*4
Gunship Aircraft	16GS	%C/	4GS*4
Recon Aircraft Squadron	16SC	%C/	4SC*4
Utility Aircraft Squadron	16UT	%C/	4UT*4

Next is an image of how that structure appears in the game's Scenario Editor.

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17.4 Tag

These are alphanumeric names that appear as part of a unit's identification in-game. Such as "4/A/2-5 Cav". These names can be renamed in the scenario editor if they do not auto generate in a way that works for your scenario. There are two special codes you can use.

- %C/ - This will provide an incrementing capital letter. This is good for adding the Company Identifier for most NATO style units such as the "A/" in the example above.
- %d/ - This will provide an incrementing number starting at "1" and is good for most NATO Platoon Identifiers. This would be the "4/" in the example above.

Reviewing the various data file entries will give you a sense of what can be done. These unit identifiers should be as short as practical to be seen on a counter. The full name will appear in other information sources/panels (like the Subunit Inspector and Staff Reports) in full.

17.5 Composition

The Composition entry is used to generate the various orders of battle for a given nation's forces. There are two types of Composition constructs: Units and Formations.

To build a Unit Composition, you will need to use the CompID of a particular unit and then a "*" symbol with the count of those units (if there is only a single unit, the "*1" can be omitted).

To build a Formation Composition, you will need to use the Code in column two of a particular formation element and then a "*" symbol with the count of those formation elements (if there is only a single Code, the "*1" can be omitted).

WARNING: You cannot mix CompIDs and Codes in the same line or it will crash the game. Data Validation will catch most of these errors when used.

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CW 80s United States: Formations			
Description	Code	Tag	Composition (Tags = 1A1/BR or RG name)
Squadrons	<2		
Armoured Cavalry Squadron	USE1	%d/	USE2, USE3*3, USE8
>Squadron HQ	USE2		TANK*2, COMV*2
Armoured Cavalry Troop	USE3	%C/	USE4, USE5*6, USE6*2, USE7
>Troop HQ	USE4		TANK, COMV
>Scout Section (Platoon Element)	USE5	%d/	RECCEM2*2, INFCMV2*2
>Tank Platoon	USE6	%d/	TANK*4
>SP Mortar Section	USE7	Mtr/	SPMTR*2, COMV
Tank Troop	USE8	%C/	USE9, USE10*3
>Troop HQ	USE9		TANK*2
>Tank Platoon	USE10	%d/	TANK*4

17.6 Role

The Role identifier is a set value that describes the overall use of the particular formation element and is used by the game's AI to control behavior. Refer to Section 10 above, for a list of all valid Roles.

17.7 Unit Size

This is the NATO size symbol corresponding to the size of the formation element in the row, not the overall size of the whole formation. These symbols will show up on the counters in-game.

NOTE: For a Platoon, it is three periods and not an ellipse. Excel is extremely helpful in turning three periods into an ellipse for you. This will not work in the game and will get flagged in the Validation Program. To change this behavior, go into Excel's Options, Proofing, click AutoCorrect Options, scroll the Replace Text as you type window and find the three periods replaced with the ellipse and Delete that entry. You are good to go now.

17.8 Is HQ Of

If your formation row entry is an HQ structure, you will then need to assign a NATO size symbol for the size of the formation it commands (not the size of the unit itself, which is covered in the Size field).

17.9 BPT Default

These codes are used by the game engine to set various AI parameters and behaviors based on the composition of the formation this code is used on. A list of valid codes can be found in Section 11 above.

NOTE: This feature is currently under implementation and the full effect may not be present in game code, but the Data Validation Program has the current list of codes and can detect bad or unneeded codes in the formation table.

17.10 Task Force Type

These codes are used by the Scenario Editor to filter out certain mission types of units. This allows the user to zero in on certain formations they need to add to the scenario. Valid Task Force Types can be found in Section 9 above. Task Force Types should be used on all formations you want to group and the Formation Identifiers and separators to keep the look and information clear.

You can assign more than one filter to a row if they are comma-delimited. This allows for certain formations to appear in multiple Task Force Types. Check the supplied data files to see examples of Task Force Type use.

NOTE: This feature is not currently active in the game, and we may at some point remove it.

18 Units

The Units tab is where each specific platform (aircraft, tank, infantry squad, etc.) is defined by a list of values, characteristics and pointers to other data used by the game engine to operate in the simulation.

18.1 SUTag

The SUTag is an alphanumeric entry that must be a unique identifier for each entry. Our basic format is a two-character letter code for the country and then an integer value like "WG23", or "UK357".

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WARNING: Once you set these values for a dataset and use it in the scenario editor, any edits, or reorders of the SUTags that break the initial SUTag-Platform relationship will cause existing scenarios to load bad data if you update a scenarios data with a corrupted dataset with remapped SUTags. If you need to add more platforms between entries (for data consistency/appearance) You should add to the code with additional alphanumeric characters. For example, if you had "UK357" and "UK358" in your list and wanted to add in two more variants, you can add rows to the spreadsheet in between them and use SUTags like "UK357A" and "UK357B". You could also add a new value greater than the largest one in the SUTag list.

18.2 Name

This is the given identification of a specific platform or squad as used by its nation. For example, "M1A1 Abrams", "T-80BV", "Challenger", etc.

18.3 NATO Designation

This is a platform's specific NATO designation, if one exists. For example, SA-3 Goa (for an S-125 Neva). This field is included to allow for most OpFor hardware of Russian origin to carry its given NATO designated code and name. It can also be used for alternate names used by countries for other countries' hardware.

18.4 PICID

This is the filename of the unit's silhouette image or NATO standard icon for squads. The images are in Modules\Common\Data\Common Folder. Images specifications can be found in the Game Engine Modifications document.

18.5 NATOPIC

This is the filename for the NATO standard icon for all units. The images are in Modules\Common\Data\NATO Folder. Images specifications can be found in the Game Engine Modifications document.

18.6 Description

This is a concise description explaining the platform's type and function. For example, "Main Battle Tank", "Wheeled APC", etc. This description is displayed in the Sub-Unit Inspector and in several other information panels.

For aircraft, drones, and helicopters, the description is followed by a dash and then a list of weapon types carried to help the user see the various loadouts. As an example, the US F-16D Close Air Support aircraft has a Description of "CAS Aircraft - Can/FAE/IB" denoting the aircraft has a Cannon, Fuel Air Explosive bomb, and Iron Bombs as its weapons.

18.7 SU Type

The Platform Type (Subunit Type or SU Type) is the unique classification of the unit based on the values found in Section 4 above.

WARNING: A unit *MUST* have one of these codes for the game to recognize it and employ it properly. Users cannot add their own SU Types to the game as it requires supporting code.

18.8 CompID

Composition ID or CompID is a user generated value used to help define types and subtypes of platforms that are used in the creation of formations. In most cases, this is the same as the SU Type.

In certain cases, if you need to highlight or set apart a platform unit(s) you can make your own alphanumeric identifier. This CompID then can be used in a formation composition and only those units with the particular CompID will show in the selection screen in the Scenario Editor.

18.9 First Year Avail

This is the year in which the unit entered service in useful numbers. Based on scenario start date, any unit whose start date is greater than the scenario date will not display in the selection window.

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18.10 Last Year Avail

This is the last year in which the unit served in useful numbers. Based on scenario start date, any units whose end date is less than the scenario date will not display in the selection window.

18.11 Crew

This is the number of personnel used to man a particular platform or system. This does not include passengers.

18.12 Mobility

This value indicates the type of propulsion/movement used by a particular unit. Refer to 12 above for the valid types. This value is used in several movement calculations and ability checks when units move in the game.

18.13 Speed

This is the top speed (in km/hr) of the platform. Movement on the ground for most types of movement orders is much less than the maximum speed entered as the game considers slower movement rates when in a combat area and based on the type of movement order the units are following. Speed for aircraft, drones, and helicopters will factor in its defensive capability in combat engagements.

18.14 Transport (Organic)

For a positive value, this is the number of passenger units that can be loaded on a particular platform. For a negative number, this is the relative amount of space taken up by the unit to be transported. To see if a unit can be loaded on a transport, you add a positive transport value to the negative transport value(s) and must be greater than or equal to zero. For example, you can load a US HMMWV (Transport = 2) with two Sniper Teams (Transport = -1) or one Scout unit (Transport = -2).

NOTE: Organic Transport is used for mechanized forces to keep IFVs and troops in a cohesive unit. We have added a Tactical Transport (TT)

feature for ad-hoc transport of troops and also to support air assault operations.

18.15 Size

This factor is a relative measure of volume for the unit in question. Size is used in both spotting and combat to modify certain calculations.

For leg units this is equal to 0 for 1-4 Crew, 1 for 5-8, and an additional +1 for every 4 Crew.

For vehicles and weapon systems, find a unit of similar size in an existing listing and use that number.

For Air Units, please use the Aircraft Values Spreadsheet to get the size rating.

NOTE: This new attribute is still being worked on and may see some values change as we improve the method of calculations (especially for ground vehicles).

18.16 Mass

Mass is the weight of the vehicle or squad in pounds (US). Squads are based on 250 pounds per person, weapon, and engineering teams at 300 pounds a person, and vehicles based on empty weights rounded to the nearest 100 pounds. This value is used to determine if the unit can be carried by a transport vehicle (via Tactical Transport) or how many can be carried based on the transport's Internal and External Weight limits. All Units require a Mass value.

18.17 IntTrp

Internal Troops (IntTrp) is the maximum number of troops that a transport can carry internally. This value is only used on units that are using the Tactical Transport feature and not an organic transport unit type.

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18.23.3 Equipment List

These Shared Characteristic Codes are broken down into two functional groups and the lists and descriptions of these codes can be found in Section 5.1 above. These groups are Equipment-Receivers, Equipment-Sensors, Equipment-Target Acquisition, and Equipment-Weapon Locating Sensors. If your unit in question has any of the equipment found in the lists, you add them a comma delimited list in the Equipment List spreadsheet field.

18.24 Integrated Weapons List

This final list is different from the other three as it is a listing of the weapons/systems carried and the amount of ammunitions/uses each weapon/system has, in a comma delimited list. There are two types of entries for the weapons list depending on is a weapon/system has variable munition or not. The setup of the information is as follows.

18.24.1 System with Single Ammo Allocation

The format is the WEAPTAG code and then the "*" sign and a value for the amount of ammunition. The amount of ammunition is rounds for items that fire single shot (artillery guns, tank guns, PGMs, ATGMs, etc.) or in bursts for multi-round shooting weapons.

The following is an example of an AH-64A Apache Attack Helicopter. In this case, with an autocannon with 58 bursts and 4 Hellfire mounts with 4 ATGMs on each mount:

AUCN9*58, ATGM10*4, ATGM10*4, ATGM10*4, ATGM10*4

18.24.2 System with Munitions

The format is the WEAPTAG code and then the ":" sign followed by a semi-colon (;) separated listing of munitions with AmmoTypeID followed by the "*" sign and number of rounds carried of that type of munition. This gun system is separated by a common to other systems in the listing such as the machine guns in this example.

The following is an example of a M551 Sheridan with multiple rounds for the tank gun. In this case, with a tank gun with three types of munitions

for the gun (6 HE rounds, 12 HEAT rounds, and 11 ATGM rounds) for the TGN14M weapon system and two machine guns (AAA11 and VSW3) with single ammo allocations:

TGN14M: TGN14M_HE*6; TGN14M_HEAT*12; TGN14M_ATGM*11, AAA11*90, VSW3*120

18.25 PF (Protection Factor)

Depending on the type of unit, the Protection Factor (PF) represents the unit's basic armor or toughness when hit with weapons fire. There are several Characteristics that augment the PF rating of certain units, and the determination of those Characteristics is covered in more detail in Section 19 below.

18.25.1 PF for Soft Units

If the unit is leg mobile (squads and teams), towed or crew served weapon (Field gun, anti-tank gun, etc.), static weapon system (SAMWS), or Decoy the PF rating for the unit is 0. These units gain protection based on the cover they are in and their orders state.

18.25.2 PF for Air Units

All Air units have a PF generated by a secondary spreadsheet called Air Unit PF Ratings. You will need to know the Empty Weight in pounds, number of Exhaust Ports (engines or engines and VTOL exhaust ports), is the unit a Transport (they have larger size per pound since they carry cargo), and Engine Type (p-Prop, r-Rotor, j-Jet/Rocket). You can add more air units to the spreadsheet as needed. See Section 20 for more detailed instructions.

18.25.3 PF for Ground Vehicle Units

The new game engine works on a 1 PF per 10mm of RHA equivalent kinetic armor protection. For most lightly armored vehicles this will be 1 to 5 (10 to 50mm protection). To calculate a PR rating for a more heavily armored AFV you will want to have data on the frontal thickness of hull and turret armor versus kinetic rounds in millimeters of RHA. Chemical/HEAT and ERA/NERA type augmentations will be covered in

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Section 19 below of this document. You may need to make some estimation of the value if the data is more detailed by area information. With values for both turret and hull frontal in millimeters or just hull if no turret is present, divide by 10 to get the base PF ratings. If there is a turret, use the turret value for the base PF, else use the Hull PF value for the PF Rating. Hold on to the Hull PF value if a turret present as it will be used in Section 19 below calculations.

19 Defining Armor Value and Specials

Based on the value(s) obtained in Section 18.25.3 above either a Hull PF or a Turret PF and associated Hull PF was generated. In the case of a pure hull design the Hull PF rating was entered in the data sheet. If a turret was present on the AVF platform the Turret PF rating was entered in the data sheet. This is a very basic kinetic resistance value, and we use several Characteristics to account for the other more advanced aspects of armor coverage. The following sections will cover these additional aspects.

19.1 Hull to Turret Ratio (HTR)

The HTR Characteristics are located in the Defensive Abilities listing and are defined in the following table. This code allows the game engine to calculate a PF for the hull based on the Turret PF and this code.

Code	Unit Special Description	Notes
HTR1	Hull to Turret Ratio, Type 1	Ratio is <.60 for Hull PF / Turret PF rating, -50% to PF adjustment for hull hits
HTR2	Hull to Turret Ratio, Type 2	Ratio is .60 to .75 for Hull PF / Turret PF rating, -30% to PF adjustment for hull hits
HTR3	Hull to Turret Ratio, Type 3	Ratio is .75 to .90 for Hull PF / Turret PF rating, -15% to PF adjustment for hull hits
HTR4	Hull to Turret Ratio, Type 4	Ratio is .90 to 1.10 for Hull PF / Turret PF rating, no adjustment for hull hits
HTR5	Hull to Turret Ratio, Type 5	Ratio is 1.10 to 1.25 for Hull PF / Turret PF rating, +15% to PF adjustment for hull hits

Code	Unit Special Description	Notes
HTR6	Hull to Turret Ratio, Type 6	Ratio is 1.25 to 1.40 for Hull PF / Turret PF rating, +30% to PF adjustment for hull hits
HTR7	Hull to Turret Ratio, Type 7	Ratio is >1.40 for Hull PF / Turret PF rating, +50% to PF adjustment for hull hits

To determine which value to use, calculate Hull PF / Turret PF and consult the range in the Notes Field. If the value falls into the range of HTR4 (near 1.0) you do not need to add this special to the Defenses List of the unit.

19.2 Advanced Composite Armour (ACA)

The ACA Characteristics are in the Defensive Protection listing and are defined in the following table. This code allows the game engine to augment the PF rating against HEAT based rounds based on location (hull or turret) and aspect (Front, Side, Rear, and Top).

NOTE: You can assign more than one of these codes in the Defenses List of a unit if there is a variable level of coverage based on location and aspect.

Code	Unit Special Description	Notes
ACAH1	Advanced Composite Armour (Effectiveness 1)	<1.25 ratio, Hull, Aspect Coded (F/S/R/T)
ACAH2	Advanced Composite Armour (Effectiveness 2)	<1.25 : 1.5 ratio, Hull, Aspect Coded (F/S/R/T)
ACAH3	Advanced Composite Armour (Effectiveness 3)	<1.5 : 1.75 ratio, Hull, Aspect Coded (F/S/R/T)
ACAH4	Advanced Composite Armour (Effectiveness 4)	<1.75 : 2.0 ratio, Hull, Aspect Coded (F/S/R/T)
ACAH5	Advanced Composite Armour (Effectiveness 5)	>2.0 ratio Hull, Aspect Coded (F/S/R/T)
ACAT1	Advanced Composite Armour (Effectiveness 1)	<1.25 ratio, Turret, Aspect Coded (F/S/R/T)
ACAT2	Advanced Composite Armour (Effectiveness 2)	<1.25 : 1.5 ratio, Turret, Aspect Coded (F/S/R/T)

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Code	Unit Special Description	Notes
ACAT3	Advanced Composite Armour (Effectiveness 3)	<1.5 : 1.75 ratio, Turret, Aspect Coded (F/S/R/T)
ACAT4	Advanced Composite Armour (Effectiveness 4)	<1.75 : 2.0 ratio, Turret, Aspect Coded (F/S/R/T)
ACAT5	Advanced Composite Armour (Effectiveness 5)	>2.0 ratio Turret, Aspect Coded (F/S/R/T)

To determine which value to use, a calculation of the ratio of the HEAT resistance to Kinetic resistance for the location and aspect needs to be done and then compared to the table to get the correct basic ACA code. To complete an ACA code, add the Aspect Letters after the 1-5 effectiveness value.

For example, if you have an "ACAH3" (hull ACA with a ratio between 1.5 and 1.75) and it covers front and side only the full code will be "ACAH3FS".

19.3 Explosive Reactive Armour (ERA)

The ERA Characteristics are located in the Defensive Protection listing and are defined in the following table. This code allows the game engine to augment the HEAT or Kinetic AP penetration value of an incoming round based on location (hull or turret) and aspect (Front, Side, Rear, and Top). You can also use these codes for NERA protection as well.

NOTE: You can assign more than one of these codes in the Defenses List of a unit if there is a variable level of coverage based on location and aspect.

Code	Unit Special Description	Notes
ERAH1	ERA - Hull, Type 1, Aspect (Front/Side/Rear/Top)	Explosive reactive armor, early type, CE only - Kontakt-1, Hull, Aspect Coded (F/S/R/T)
ERAH2	ERA - Hull, Type 2, Aspect (Front/Side/Rear/Top)	Explosive reactive armor, early type, CE only - Kontakt-3, Hull, Aspect Coded (F/S/R/T)

Code	Unit Special Description	Notes
ERAH3	ERA - Hull, Type 3, Aspect (Front/Side/Rear/Top)	Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Hull, Aspect Coded (F/S/R/T)
ERAH4	ERA - Hull, Type 4, Aspect (Front/Side/Rear/Top)	Explosive reactive armor, late type, CE/KE - Relikt (06+), Hull, Aspect Coded (F/S/R/T)
ERAT1	ERA - Turret, Type 1, Aspect (Front/Side/Rear/Top)	Explosive reactive armor, early type, CE only - Kontakt-1, Turret, Aspect Coded (F/S/R/T)
ERAT2	ERA - Turret, Type 2, Aspect (Front/Side/Rear/Top)	Explosive reactive armor, early type, CE only - Kontakt-3, Hull, Aspect Coded (F/S/R/T)
ERAT3	ERA - Turret, Type 3, Aspect (Front/Side/Rear/Top)	Explosive reactive armor, late type, CE/KE - Kontakt-5 (85+), Turret, Aspect Coded (F/S/R/T)
ERAT4	ERA - Turret, Type 4, Aspect (Front/Side/Rear/Top)	Explosive reactive armor, late type, CE/KE - Relikt (06+), Turret, Aspect Coded (F/S/R/T)

In order to determine which value to use, select the type that best matches the performance of the listed types for the location (hull or turret) and aspect. To complete an ERA code, add the Aspect Letters after the 1-4 effectiveness value.

For example, if you have an "ERAH4" (hull ERA with a performance like Relikt) and it covers front and side only the full code will be "ERAH4FS".

19.4 HEAT Resistant Armour (HRA)

The HRA Characteristics are located in the Defensive Protection listing and are defined in the following table. This code allows the game engine to augment the HEAT PF value of the armor for systems with enhanced HEAT protection versus a lighter kinetic protection (hull or turret) and aspect (Front, Side, Rear, and Top). This type of armor is mainly found on IFVs and APCs.

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NOTE: You can assign more than one of these codes in the Defenses List of a unit if there is a variable level of coverage based on location and aspect.

Code	Unit Special Description	Notes
HRAH1	HEAT Resistant Armor-Hull, Type 1, Aspect (F/S/R/T)	Reduced HEAT - >3 and <= 6 ratio (C/K), Hull, Aspect Coded (F/S/R/T)
HRAH2	HEAT Resistant Armor-Hull, Type 2, Aspect (F/S/R/T)	Reduced HEAT - >6 and <= 9 ratio (C/K), Hull, Aspect Coded (F/S/R/T)
HRAH3	HEAT Resistant Armor-Hull, Type 3, Aspect (F/S/R/T)	Reduced HEAT - >9 and <= 12 ratio (C/K), Hull, Aspect Coded (F/S/R/T)
HRAH4	HEAT Resistant Armor-Hull, Type 4, Aspect (F/S/R/T)	Reduced HEAT - >12 and <= 15 ratio (C/K), Hull, Aspect Coded (F/S/R/T)
HRAH5	HEAT Resistant Armor-Hull, Type 5, Aspect (F/S/R/T)	Reduced HEAT - >15 ratio (C/K), Hull, Aspect Coded (F/S/R/T)
HRAT1	HEAT Resistant Armor-Turret, Type 1, Aspect (F/S/R/T)	Reduced HEAT - >3 and <= 6 ratio (C/K), Turret, Aspect Coded (F/S/R/T)
HRAT2	HEAT Resistant Armor-Turret, Type 2, Aspect (F/S/R/T)	Reduced HEAT - >6 and <= 9 ratio (C/K), Turret, Aspect Coded (F/S/R/T)
HRAT3	HEAT Resistant Armor-Turret, Type 3, Aspect (F/S/R/T)	Reduced HEAT - >9 and <= 12 ratio (C/K), Turret, Aspect Coded (F/S/R/T)
HRAT4	HEAT Resistant Armor-Turret, Type 4, Aspect (F/S/R/T)	Reduced HEAT - >12 and <= 15 ratio (C/K), Turret, Aspect Coded (F/S/R/T)
HRAT5	HEAT Resistant Armor-Turret, Type 5, Aspect (F/S/R/T)	Reduced HEAT - >15 ratio (C/K), Turret, Aspect Coded (F/S/R/T)

To determine which value to use, a calculation of the ratio of the HEAT resistance to Kinetic resistance for the location and aspect needs to be done and then compared to the table to get the correct basic HRA code.

To complete an HRA code, add the Aspect Letters after the 1-5 effectiveness value.

For example, if you have an "HRAT3" (turret HRA with a ratio between 9.0 and 12.0) and it covers front, side, and top, the full code will be "HRAT3FST".

19.5 Skirt Armour (SKT)

The SKT Characteristics are located in the Defensive Protection listing and are defined in the following table. This code allows the game engine to augment the HEAT or Kinetic AP penetration value of an incoming round based on location (hull or turret) and considered to be Side and Rear only aspects.

NOTE: You can assign more than one of these codes in the Defenses List of a unit if there is a variable level of coverage based on skirt type and location of coverage.

Code	Unit Special Description	Notes
SKTHL	Armoured Skirt Hull sLats	used for slat style skirts that degrade AP and HEAT weapons
SKTHP	Armoured Skirt Hull Plate	used for plate style skirts that degrade AP and HEAT weapons
SKTHS	Armoured Skirt Hull Spaced	used for spaced plate style skirts that degrade AP and HEAT weapons
SKTHW	Armoured Skirt Hull Wire	used for wire style skirts that degrade AP and HEAT weapons
SKTTL	Armoured Skirt Turret sLats	used for slat style skirts that degrade AP and HEAT weapons
SKTTP	Armoured Skirt Turret Plate	used for plate style skirts that degrade AP and HEAT weapons
SKTTS	Armoured Skirt Turret Spaced	used for spaced plate style skirts that degrade AP and HEAT weapons
SKTTW	Armoured Skirt Turret Wire	used for wire style skirts that degrade AP and HEAT weapons

To determine which value to use, select the type of skirt that best represents the setup on the unit.

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19.6 Values for Side and Top/Rear

There are two internal global values used in the game. For a side aspect shot the basic PF value is multiplied to 0.46 and for the top and rear time 0.21. Both numbers are based on looking at many post WW2 tanks and these were the majority breakpoints for those aspects.

20 Air Unit Size and PF Rating Calculator

As noted earlier in this document. The Size and PF rating for Air Units is derived from some input parameters and some calculations to put both factors into values that work within the game engine. You can use this table one of two ways. The first is to see if your platform is already on the list of over 600 aircraft, drones, and helicopters on our existing list (We will be adding more entries over time of course). Alternately, you can add more entries into the spreadsheet by supplying a few key parameters as noted below.

Aircraft, Drone, and Helo PF Ratings						
AIR UNIT ID	Empty Wt LBs	Engines/ Exhaust Ports	Trans	Engine Type	Final PF	Final Size
A-1 Skyraider	11968	1	n	p	10	8
A-10 Warthog	24949	2	n	j	10	15
A-1N Skyraider	11968	1	n	p	10	8
A-20 Havoc	16693	2	n	r	11	11
A-26 Invader	22850	2	n	p	13	11
A-26B Invader	22850	2	n	p	13	11
A-37B Dragonfly	6211	2	n	p	9	6
A400M Atlas	168154	4	y	p	19	40
A-6E Intruder	26660	2	n	j	10	16
A-7D Corsair II	19127	1	n	j	8	14

20.1 Adding More Data

- Go to the bottom of the table and add in a new row by dragging the table corner marker (in the bottom left side of the table) down to add in new rows.

- In the Air Unit ID field, add the name of the platform you wish to add.
- In the Empty Wt LBs field, enter the empty weight of the platform in pounds (US).
- In the Engine/Exhaust Ports field, enter the number of engines/power plants on the platform. Also include additional VTOL exhaust ports (For example, the Harrier has a 4-port system but no main power plant exhaust so a value of 4 will be used).

NOTE: For any Glider based platform you must enter "1" in the Engines field for the calculations to work. The Glider functionality will be resolved by the platform AIRGL SU Type.

- In the Trans field, place a "y" if the platform is a transport of some kind and "n" if it is not. A transport is defined as any platform that carries internal cargo beyond its operating crew. So, a Mi-24 Hind is a transport (carries troops), but a Mi-28 Havoc is not.
- In the Engine Type field, place "r" if the primary engine system is a Rotor, "p" if it is a Propeller, and "j" if it is a Jet/Rocket.

NOTE: for a Glider enter "p" so the program calculates properly.

NOTE: In cases of a hybrid engine setup, choose Jet over Rotor and Propeller, or choose Rotor over Propeller.

- A value for the Final PF Rating and the Final Size will be shown in the last two fields. Transfer these results to the Units Data sheet for the platform you added.
- You may wish to sort the table by the Air Unit ID once you have recorded the new entries.

WARNING: There are calculations hidden between column G and O in the spreadsheet. If you want to change or experiment on matching up the Sizes and PFs in a different way you are free to edit things. Make a backup first.

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21 Systems

The Systems tab is where each specific weapon or system (Precision Guided Munition, Tank Gun, and Anti-Tank Guided Missile) is defined for a number of characteristics.

21.1 WEAPTAG

The WEAPTAG is an alphanumeric entry that must be a unique identifier for each entry. Our basic format is the weapon type character code (See Section 6 above) and then an integer value to create values like "ATGM4", or "ISW8".

WARNING: Once you set these values for a dataset and use it in the scenario editor, any edits, or reorders of the WEAPTAGs that break the initial WEAPTAG-Weapon relationship will cause existing scenarios to load bad data if you update a scenario's data with a corrupted dataset with remapped WEAPTAGs. If you need to add more weapons between entries (for data consistency/appearance), you should add to the code with additional alphanumeric characters. For example, if you had "ATGM3" and "ATGM4" in your list and wanted to add in two more variants, you can add rows to the spreadsheet in between them and use WEAPTAGs like "ATGM3A" and "ATGM3B". You could also add a new value greater than the largest weapon type the WEAPTAG list.

21.2 Name

This is the given identification of a specific weapon or system used by its nation. For example, "AGM-114K Hellfire II", "9M330 Tor", "120mm L11A5", etc.

21.3 NATO Designation

This is a weapon's or system's specific NATO designation, if one exists. For example, "SA-15 Gauntlet" for the "(9M330 Tor)". This field is included to allow for most OpFor hardware of Russian origin to carry its given NATO designated code and name. It can also be used for alternate names used by countries for other countries' hardware.

21.4 Description

This is a short description explaining the Weapon's function/type. For example, "Auto Cannon", "Medium Tank Cannon", etc. This description is displayed in the Sub-Unit Inspector and in several other information panels when weapon information is shown.

21.5 Type

This is the weapons type and listed in Section 6 above as the Type Tag. Examples are "ATGM", "ISW", and "AGM".

21.6 Role

Weapon Role codes are used in the game engine to help the AI determine use versus targets. Weapons can have more than one role. In those cases, a comma delimited list in the Weapons Role field is required.

Role	Description
AA	Anti-All: Affects all types
AD	Air Defense: Target Airborne Threats
AP	Anti-Personnel: Target Ground Troops
AT	Anti-Tank: Target Land Based Threats

The current list of Role based on Weapon Type Tag Follows:

Type Tag	New Description	Role
AAA	Anti-Aircraft Gun	AD,AP
ACN	Aircraft Cannon	AT,AP,AD
AGL	Automatic Grenade Launcher	AP,AT
AMG	Aircraft Machine Gun	AP,AT,AD
ARK	Air Launched Rocket	AT,AP
ATK	Anti-Tank Gun	AT
AUCN	Auto Cannon	AT,AP,AD
FGN	Artillery Gun	AP,AT
ISW	Infantry Support Weapon	AP
MGN	Machine Gun	AP

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Type Tag	New Description	Role
MTR	Mortar	AP,AT
RKT	Rocket	AP,AT
RPG	Rocket Propelled Grenade	AT
SMA	Light Small Arms	AP
TGN	Light Tank Cannon	AT,AP
VSW	Vehicle Support Weapon	AP,AT
ACM	Cluster Munition	AT,AP
AIB	Iron Bomb	AP,AT
EXP	Explosive Device	AP,AT
FLM	Flame Weapon	AP,AT
AARM	Anti-Radiation Missile	AL
AGM	Guided Missile	AP,AT,AL
ATGM	Anti-Tank Guided Missile	AT,AL
SAM	Surface to Air Missile	AD
BIOW	Biological Weapon	AP
CWN	Chemical Warhead Non-Persistent	AP,AT,AL
CWP	Chemical Warhead Persistent	AP,AT,AL
NCW	Nuclear Warhead (kT)	AA

21.7 Accuracy

Weapon accuracy comes in two types, Guided/Smart Weapons with their own means to engage a target (these will have one or more Guidance List Characteristic (see Section 5.2 above) or a basic accuracy related to the type of weapon system in use (primarily gun-based systems).

21.7.1 Guided/Smart Weapons

The accuracy for weapon systems like AARM, AGM, ATGM, NCW, RKT (guided), or SAM. The range is 0 to 20 and each point of value is worth 5%. Set this value to at or near the weapons rated accuracy for use against its standard target type. Other weapon related characteristics and enemy systems will adjust this base accuracy in combat.

21.7.2 Non-Guided Weapons

For all of the other non-guided weapons use the value found in the table below for the type of weapon and in some cases size/caliber to get the basic accuracy number. These weapons will factor in fire control, crew capability and other effects to determine a final hit probability in combat.

Type	Description	Accuracy
AAA	Anti-Aircraft Gun >= 12.7mm	4
AAA	Anti-Aircraft Gun < 12.7mm	3
ACM	Cluster Munition	5
ACN	Aircraft Cannon	6
AGL	Automatic Grenade Launcher	4
AIB	Iron Bomb (Air launched, free fall)	1
AMG	Aircraft Machine Gun	5
ARK	Air Launched Rocket(s)	5
ATG	Anti-Tank Gun (Recoilless Rifles)	2
AUCN	Chain Gun	6
EXP	Explosive Device (Grenade, IED)	5
FGN	Artillery Gun (All sizes)	1
FLM	Flame Weapon	5
ISW	Infantry Support Weapon	3
MGN	Machine Gun	3
MTR	Mortar (All Sizes)	1
RKT	Unguided Ground Launched Rockets	1
RPG	Rocket Propelled Grenade	2
SMA	Medium Small Arms (Assault Rifles)	3
SMA	Light Small Arms (Rifles, SMGs)	2
SMA	Light Small Arms (Pistols)	1
SMA	Small Arms (Sniper Rifles)	10
TGN	Tank Cannon – Smoothbore per 2500m of Range	1

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Type	Description	Accuracy
TGN	Tank Cannon – Rifled per 2500m of Range	2
VSW	Vehicle Support Weapon	3

21.8 Range

This is the maximum range of the weapon system in meters.

21.9 Effective Range

Depending on weapon type, the Effective range is calculated by taking the maximum range in meters times the Range Multiplier. This range is used in combat calculations as a factor for hit percentage and also the base point for the weapons AP penetration calculated in Section 21.12 below.

Weapon Type(s)	Range Multiplier
AAA, AMG, AUCN, FGN, ISW, MGN, MTR, SMA(not Sniper), TGN, VSW	0.33
ACN, AGL, AIB, ARK, EXP, FLM, RKT(Unguided), RPG, SMA(Sniper only),	0.5
ACM	0.7
AARM, AGM, ATGM, NCW, RKT(Guided), SAM	1

21.10 Min Range

Certain weapon systems have a minimum range which must be traveled or is unreachable. Primarily this will affect artillery systems, ATGMs, SAMs, and some PGMs. IF there is no minimum range restriction set the value in this field to 0.

21.11 SA Value

SA or Small Arms value is a relative measure of small high-speed projectiles from a gun, machine gun or other ballistic firing weapon

system or from blast fragmentation warheads on artillery shells or missile warheads (ATGMs, SAMs, and Rockets). The following charts show the calculated SA value for the various types of weapons that have this value. The size if the bore size of the barrel or diameter of the shell in millimeters.

21.11.1 SA Value for Artillery Guns

Use these values for tube artillery based on the shell size in millimeters. If the size is not on the table, you can use the formula in the header cell after the dash to calculate the value.

HE: Arty Guns - mm/15	
Size tube(mm)	SA
0	0
40	3
50	3
60	4
81	5
82	5
105	7
120	8
122	8
130	9
152	10
155	10
160	11
175	12
203	14
227	15
240	16
300	20

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21.11.2 SA Value for Mortars

Use these values for mortars based on the shell size in millimeters. If the size is not on the table, you can use the formula in the header cell after the dash to calculate the value.

HE: Mortars - mm/20	
Size tube(mm)	SA
0	0
40	2
50	3
60	3
81	4
82	4
105	5
120	6
122	6
130	7
152	8
155	8
160	8
175	9
203	10
227	11
240	12
300	15

21.11.3 SA Value for Rockets

Use these values for rockets based on the size in millimeters of the rocket diameter. If the size is not on the table, you can use the formula

in the header cell after the dash to calculate the value. If the rocket is a Fuel Air Explosive type (FAE), use the FAE column.

HE: Rockets - mm/15		
Size tube(mm)	SA	FAE
0	0	0
40	3	10
50	3	13
60	4	15
81	5	20
82	5	21
105	7	26
120	8	30
122	8	31
130	9	33
152	10	38
155	10	39
160	11	40
175	12	44
203	14	51
227	15	57
240	16	60
300	20	75
400	27	100
750	50	188

21.11.4 SA Value for Small Arms

Use these values for small arms and anti-aircraft guns based on round size in millimeters. If the size is not on the table, you can use the

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formula in the header cell after the dash to calculate the value. If the gun system has multiple barrels, use the modifier at the bottom of the table to adjust the SA value to get a final data value.

Small Arms/AAG - 0.0915mm + 0.6393	
Size tube(mm)	SA
0	0
4	1
5	1
7.62	1
9	1
12.7	2
14	2
20	2
25	3
30	3
35	4
40	4
50	5
60	6
80	8
105	10
120	12
125	12
2 to 3 barrels = +1 to SA	
4 to 6 barrels=+2 to SA	

21.11.5 SA Value for Tank HE Rounds

Use these values for tank HE rounds based on the shell size in millimeters. If the size is not on the table, you can use the formula in the header cell after the dash to calculate the value.

HE: TGNs - mm/20-1	
Size tube(mm)	SA
0	0
40	1
50	2
60	2
81	3
82	3
105	4
120	5
122	5
130	6
152	7
155	7
165	7
175	8
203	9
227	10
240	11
300	14

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21.12 AP Pen

The AP Pen value represents the best AP round for a given weapon system and is calculated by taking the weapon's penetration value in millimeters of RHA at effective range (may vary with a weapon but roughly a range equal to muzzle velocity) divided by 10. This value assumes long rod penetrators for tank guns and AP type rounds for other kinetic weapon systems. The penetration value will be increased or decreased by an in-game engine calculation based on actual range to target.

21.13 HEAT Pen

The HEAT Pen value represents the best HEAT round for a given weapon system and is calculated by taking the weapon's penetration value in millimeters of RHA divided by 10. HEAT values do not change over range. Do not degrade or decrement the full value of the HEAT penetration for any special conditions (top attack, tandem or triple warheads, standoff probes, etc.), those items will be accounted for in the various Characteristics lists in Section 5.2 above.

21.14 Weapon Lists

There are three columns in the data file devoted to lists of parameters. They deal with Abilities, Defenses, and Equipment Platform Characteristics. As you can see from the image below, these lists are sparsely populated and very type dependent.

CW 80s United States: Systems							
WEAPTAG	Name	NATO Designation	Description	Type	Capabilities List	Defenses List	Guidance List
AAA1	12.7mm M85		Anti-Aircraft Gun	AAA	ADL, FFR		
AAA2	20mm M168		Anti-Aircraft Gun	AAA	ADW, FFR		
AAA3	20mm M168		Anti-Aircraft Gun	AAA	ADW, FFR		
AAA4	20mm M168		Anti-Aircraft Gun	AAA	ADW, FFR		
AAA5	20mm M168		Anti-Aircraft Gun	AAA	ADW, FFR		
AAA9	40mm Bofors		Anti-Aircraft Gun	AAA	ADW, FFR		
AAA11	.50 cal M2		Anti-Aircraft Gun	AAA	ADL, FFR		
AAA13	.50 cal M3P		Anti-Aircraft Gun	AAA	ADL, FFR		
AAA15	7.62mm M240		Anti-Aircraft Gun	AAA	ADL, FFR		
AAA16	7.62mm M60		Anti-Aircraft Gun	AAA	ADL, FFR		
AGL2	40mm M203		Grenade Launcher	AGL	SPW, SPWA, SFR		
AGL3	40mm M75		Automatic Grenade Launcher	AGL	SPW, SPWA, FFR		
AGL4	40mm M79		Grenade Launcher	AGL	SPW, SPWA, SFR		
AGL6	40mm Mk19		Automatic Grenade Launcher	AGL	SPW, SPWA, FFR		
AARM3	AGM-45 Shrike		Anti-Radiation Missile	AARM			HRSA
AARM1	AGM-78 Standard		Anti-Radiation Missile	AARM			HRSA
AARM2	AGM-88 HARM		Anti-Radiation Missile	AARM			HRSL
ACN1	105mm M102		Aircraft Cannon	ACN	SFR		
ACN4	20mm M51A1		Aircraft Cannon	ACN	ADW, FFR		
ACN5	25mm GAU-12		Aircraft Cannon	ACN	ADW, FFR		
ACN7	30mm GAU-8		Aircraft Cannon	ACN	ADW, FFR		
ACM1	CBU-100 (AP)		Cluster Munition	ACM	ICM01x180, SAL		
ACM2	CBU-24 (HE)		Cluster Munition	ACM	ICM01x650, SAL		
AGM5	AGM-65D Maverick		Guided Munition	AGM			PGT
AGM2	GBU-10 Paveway		Guided Munition	AGM			PGL

21.14.1 Capabilities List

These Shared Characteristic Codes for Weapons-Capabilities can be found in Section 5.2 above. If your weapon or system has any of the Capabilities found in the lists, you add them to a comma delimited list in the Capabilities List spreadsheet field.

21.14.2 Defenses List

These Shared Characteristic Codes for Weapons-Defenses can be found in Section 5.2 above. If your weapon or system has any of the Defenses found in the lists, you add them to a comma delimited list in the Defenses List spreadsheet field.

21.14.3 Guidance List

These Shared Characteristic Codes for Weapons-Guidance can be found in Section 5.2 above. If your weapon or system has any of the Guidance systems found in the lists, you add them to a comma delimited list in the Guidance List spreadsheet field. You may have more than one guidance system on the weapon.

21.15 Sound Effect

Each weapon has an associated sound effect when it is fired/used. These "*.WAV" files are based on weapon type as noted in the table below. You can add in your own weapon sound effects and that information is covered in the Game Engine Modification document.

CW 08 United States: Munition Types											
ArmoType	Wtype	Name	Description	Type	Weight	Length	Dia	Wgt	Length	Dia	Wgt
FGH1 AP	FGH1	165mm M101A1	Armor Piercing	AP	AP	11250	3750	0	0	0	0
FGH1 HE	FGH1	165mm M101A1	High Explosive	HE	AP	11250	3750	0	0	0	0
FGH1 HEAT	FGH1	165mm M101A1	High Explosive Anti Tank	HEAT	AP	11250	3750	0	0	140A	0
FGH1 SMN	FGH1	165mm M101A1	Smoke Visual	Other	AP	11250	3750	0	0	0	0
FGH1 WPK	FGH1	165mm M101A1	White Phosphorus	Other	AP	11250	3750	0	0	0	0
FGH1 ACPH	FGH1	165mm M101A1	Persistent Chemical	Other	AP	11250	3750	0	0	0	0
FGH1 HE	FGH1	165mm M115	High Explosive	HE	AP	13300	4250	0	0	0	0
FGH1 ANCR	FGH1	175mm M115	Nuclear Warhead	Other	AP	40000	15330	0	0	0	0
FGH1 AP	FGH1	203mm M201	Armor Piercing	AP	AP	25000	8250	0	11	0	0
FGH1 HE	FGH1	203mm M201	High Explosive	HE	AP	25000	8250	0	11	0	0
FGH1 HEAT	FGH1	203mm M201	HE Rocket Assisted	HE	AP	25000	8250	0	11	0	0
FGH1 ACPH	FGH1	203mm M201	Persistent Chemical	Other	AP	25000	8250	0	11	0	0
FGH1 ANCR	FGH1	203mm M201	Non-Persistent Chemical	Other	AP	25000	8250	0	11	0	0
FGH1 ANCR	FGH1	203mm M201	Nuclear Warhead	Other	AP	25000	8250	0	11	0	0
FGH1 CM	FGH1	203mm M201	Improved Conventional Munition	Other	AP	25000	8250	0	11	0	0
FGH2 AP	FGH2	155mm M119	Armor Piercing	Other	AP	113700	4250	0	0	0	0
FGH2 HE	FGH2	155mm M119	High Explosive	HE	AP	113700	4250	0	0	0	0
FGH2 HEAT	FGH2	155mm M119	High Explosive Anti Tank	HE	AP	113700	4250	0	0	0	0
FGH2 HEAT	FGH2	155mm M119	HE Rocket Assisted	HE	AP	113700	4250	0	0	0	0
FGH2 HEAT	FGH2	155mm M119	High Explosive Anti Tank	HEAT	AP	113700	4250	0	0	0	0
FGH2 SMN	FGH2	155mm M119	Smoke Visual	Other	AP	113700	4250	0	0	0	0
FGH2 CM	FGH2	155mm M119	Improved Conventional Munition	Other	AP	113700	4250	0	0	0	0
FGH2 ANCR	FGH2	155mm M119	Nuclear Warhead	Other	AP	113700	4250	0	0	0	0
FGH5 HE	FGH5	155mm M114	High Explosive	HE	AP	14800	4800	0	0	0	0
FGH5 HE	FGH5	155mm M114	High Explosive	HE	AP	14800	4800	0	0	0	0
FGH5 SMN	FGH5	155mm M114	Smoke Visual	Other	AP	14800	4800	0	0	0	0
FGH5 WPK	FGH5	155mm M114	White Phosphorus	Other	AP	14800	4800	0	0	0	0
FGH5 ACPH	FGH5	155mm M114	Persistent Chemical	Other	AP	14800	4800	0	0	0	0
FGH5 HE	FGH5	155mm M185	High Explosive	HE	AP	20000	6660	0	0	0	0
FGH5 ACPH	FGH5	155mm M185	Persistent Chemical	Other	AP	20000	6660	0	0	0	0
FGH5 ANCR	FGH5	155mm M185	Nuclear Warhead	Other	AP	20000	6660	0	0	0	0
FGH5 CM	FGH5	155mm M185	Improved Conventional Munition	Other	AP	20000	6660	0	0	0	0
FGH5 LL	FGH5	155mm M185	Bluntener	Other	AP	20000	6660	0	0	0	0
FGH5 SCM	FGH5	155mm M185	Scatterable Mines	Other	AP	20000	6660	0	0	0	0
FGH5 SMN	FGH5	155mm M185	Smoke Visual	Other	AP	20000	6660	0	0	0	0
FGH5 WPK	FGH5	155mm M185	White Phosphorus	Other	AP	20000	6660	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	7557	7557	0	0	0	0
FGH7 PGL	FGH7	155mm M199	High Explosive Laser Guided	HE	AP	18	20000	7667	0	0	0
FGH7 HEAT	FGH7	155mm M199	HE Rocket Assisted	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 SCM	FGH7	155mm M199	Scatterable Mines	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	0
FGH7 HE	FGH7	155mm M199	High Explosive	HE	AP	72000	7667	0	0	0	0
FGH7 ANCR	FGH7	155mm M199	Nuclear Warhead	Other	AP	72000	7667	0	0	0	0
FGH7 CM	FGH7	155mm M199	Improved Conventional Munition	Other	AP	72000	7667	0	0	0	

[Role](#)
[Accuracy](#)
[Range](#)
[Effective Range](#)
[Min Range](#)
[SA Value](#)
[AP Pen](#)
[HEAT Pen](#)
[Capabilities List](#)
[Defenses List](#)
[Guidance List](#)

If a munition type does not use one or any of the values for SA Value, AP Pen, or HEAT Pen, place a zero (0) in the field.

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Be sure to only apply those Characteristics that apply to the type of round/munition being designed. This is different from the Systems tab where the older data covers all munition cases and is parsed out internally in the code for capability.

22.3 Columns for the Munition Types

CW 80s United States: Munition Types				
AmmoTypeID	WpnID	Name	Description	Type
FGN1_AP	FGN1	105mm M101A1	Armor Piercing	AP
FGN1_HE	FGN1	105mm M101A1	High Explosive	HE
FGN1_HEAT	FGN1	105mm M101A1	High Explosive Anti Tank	HEAT
FGN1_SMN	FGN1	105mm M101A1	Smoke-Visual	Other
IFGN1_WPR	FGN1	105mm M101A1	White Phosphorous	Other
FGN1_ACHP	FGN1	105mm M101A1	Persistent Chemical	Other

These new columns have the following definitions.

22.3.1 AmmoTypeID

The AmmoTypeID must be a unique name that must start with the Weapon ID (WpnID) of the Weapon from the Systems Tab. In the information above, the weapon ID is FGN1 that is a 105mm M101A1 field gun. After the WpnID add an underscore and then add any alpha numeric name or code. This could be "AP", "AP1", "XM896", "bob42", etc.

Adding a "!" in front of the AmmoTypeID will cause this munition to NOT be loaded in the game. This is helpful for munitions with non-implemented code or effect.

22.3.2 WpnID

This must be the unique WEAPTAG value of the particular weapon as seen in the Systems Tab.

In the image above, the WpnID is "FGN1" from the Systems tag.

22.3.3 Name

This is the name of the munition type. This can be any alpha-numeric identifier. Try to keep the name to 24 characters to be visible in the Ammo dialogs in game.

In the image above we just used the name of the Weapon System. A better name may have been "105mm AP Round" for the first entry.

22.3.4 Description

This describes the basic Type of Munition and is used in the Ammo dialogs found in game. This should be a basic description of the function of the round.

In the image above the first munition type is an "Armor Piercing" round.

22.3.5 Type

These codes tell the code how to apply the round when fired. Codes in *Italic* are provisional and may be added later.

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Munitions Types 'Type Code'	Munition Description	Notes
AP	Armor Piercing	Munition used versus armor
ARR	Anti-Radiation	Munition that homes in on radar emitters
ATGM	Anti-Tank Guided Missile	Gun tube fired ATGMs
BIO	Biological	Munition that dispenses biological agents
CAN	Canister/Flechette	Close-In, short range, wide spread, soft target round
DECOY	Decoy Munitions	Munition that releases decoys to confuse/overwhelm AD systems
DEMO	Demolition Charge	Munition used to remove obstacles
DRONE	ISR Drone	Munition with short duration situational awareness boost
EMP	Electromagnetic Pulse	Munition warhead creates a EMP pulse that can damage electronics
FAE	Fuel Air Explosive	Munition warhead is a Thermobaric type of explosion
HE	High Explosive	Munition warhead is blast fragmentation type
HEAT	High Explosive Anti Tank	Munition warhead with a formed HE penetrator
HESH	HESH/HEP	Munition with an explosive squash head warhead
HVR	Hyper Velocity Round	Munition used versus armor with higher velocity design
ICM	Improved Conventional Munition	Munition with dual purpose/sensor fused submunitions
ILL	Illumination	Munition with capability to illuminate and area for a short duration
ILLIR	Illumination - Infra Red	Munition with capability to illuminate and area for a short duration
ILLUV	Illumination - Ultra Violet	Munition with capability to illuminate and area for a short duration
JCOMS	Jam Comms	Munition with short duration communication jamming submunitions
MINES	Scattered Mines	Munition with AP/AT mine submunitions
NCHEM	Non-persistent Chemical	Munition with a chemical dispersion warhead
NUKE	Nuclear	Munition with a nuclear warhead (Tactical Yields)
PCHEM	Persistent Chemical	Munition with a chemical dispersion warhead
PMD	Precision Munition - Designated	Munition homes in on a designated target, usually laser
PMG	Precision Munition - Guided	Munition uses on-board guidance to home in on a target
SENSR	Sensor(s) Munition	Munition used to gain intel via onboard sensors
SMKMS	Smoke - Multi-Spectral	Munition that dispenses visual/thermal/radar blocking smoke
SMKN	Smoke - Normal	Munition that dispenses visual blocking smoke
SMKT	Smoke - Thermal	Munition that dispenses visual/thermal blocking smoke
TDW	Heat - Tandem Warhead	Munition warhead with dual formed HEAT penetrators
TPW	HEAT- Triple Warhead	Munition warhead with triple formed HEAT penetrators
WPR	White Phosphorous	Munition with choking smoke/fire, Visual and thermal blocking

These codes must be typed in as shown to function in the game.

NOTE: New custom types will not function in game and require coding to work. Contact the developers if new items are required.

22.4 Setting Up Munition Types

The following image shows how to add defined Munition types in the Units Tab in the Integrated Weapons List with other weapons.

CW 80s United States:			
SU Tag	Name	SU Type	Integrated Weapons List
US715	M1 Abrams	TANK	TGN6: TGN6_AP*20, TGN6_HE*5, TGN6_HEAT*30, VSW7*120, AAA11*90, AAA15*90
US716	M1 Abrams	TANK	TGN6: TGN6_AP*20, TGN6_HE*5, TGN6_HEAT*30, VSW7*120, AAA11*90, AAA15*90
US718	M1 Abrams	TANK	TGN5: TGN5_AP*20, TGN5_HE*5, TGN5_HEAT*30, VSW7*120, AAA11*90, AAA15*90
US726	M1A1 Abrams	TANK	TGN10: TGN10_AP*20, TGN10_HEAT*20, VSW7*120, AAA11*90, AAA15*90
US728	M1A1(HA) Abrams	TANK	TGN10: TGN10_AP*20, TGN10_HEAT*20, VSW7*120, AAA11*90, AAA15*90
US747	M1IP Abrams	TANK	TGN6: TGN6_AP*20, TGN6_HE*5, TGN6_HEAT*30, VSW7*120, AAA11*90, AAA15*90
US748	M1IP Abrams	TANK	TGN6: TGN6_AP*20, TGN6_HE*5, TGN6_HEAT*30, VSW7*120, AAA11*90, AAA15*90
US770	M48A3 Patton	TANK	TGN27: TGN27_AP*15, TGN27_HVR*15, TGN27_HE*10, TGN27_HEAT*26, VSW3*120, AAA11*90
US772	M48A5 Patton	TANK	TGN6: TGN6_AP*24, TGN6_HE*6, TGN6_HEAT*24, VSW3*120, AAA11*90, AAA15*90
US773	M48A5 Patton	TANK	TGN4: TGN4_AP*24, TGN4_HE*6, TGN4_HEAT*24, VSW3*120, AAA11*90, AAA15*90
US774	M48A5 Patton	TANK	TGN5: TGN5_AP*24, TGN5_HE*6, TGN5_HEAT*24, VSW3*120, AAA11*90, AAA15*90
US781	M551 Sheridan[M]	TANK	TGN14: TGN14_HE*6, TGN14_HEAT*12, ATGM13*11, AAA11*90, VSW3*120
US783	M551A1 Sheridan[M]	TANK	TGN14: TGN14_HE*6, TGN14_HEAT*12, ATGM13*11, AAA11*90, VSW3*120

22.4.1 Munition Type Entry

Any number of weapon systems can be added to a unit, and they can be a mix of regular weapons from the systems tab or Munition Type weapons that are further defined by round type in the Munition Types Tab.

Here are the rules to follow to format a valid Integrated Weapons List:

- Each Weapon System or Full Munitions entry **MUST** be separated by a comma and single space.
- Weapon Systems are denoted by a WEAPTAG, then "*", and then the number of rounds/bursts for the weapon. In the data excerpt above, these Weapon Systems are entries like "VSW7*120", "ATGM*13", or "AAA11*90".
- A Munitions based Weapon entry has the following format.
 - Starts with just the WEAPTAG value and then a ":".
 - Then any number of defined munition types by AmmoTypeID then "*" and then the number of rounds
 - Each Munition Type **MUST** be separated by a ";".
 - The last or only Munition Type must be followed by a comma if another weapon entry follows.

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23 Surnames

For each nation there is a Surname tab, which has a list of 200 common surnames, which the game will use for naming various leaders at random. The Surname table is four columns, with 50 entries in each column. These are text entries, and special characters in names may be used.

24 Credits

The Credits tab allows the user to note who worked on the file and allows for any revision tracking. This tab is optional and not read by the program.

25 Notice

The Notice tab states the specific game engine and data file name, as well as noting the "On Target Simulations LTD" copyright. This tab is optional and not read by the program.

26 Data Folder Setup

The location of the National Data Files and supporting files is found in [Game Setup Location]\Modules\Common\Data\[Your Country File Name*]. Within this Country Named location you need to have the following sub-folders for supporting materials: Backgrounds, Badges, Dialogs, Unit Images. See the image below.

Name	Date modified	Type	Size
Backgrounds	6/12/2024 7:30 PM	File folder	
Badges	6/12/2024 7:30 PM	File folder	
Flags	6/12/2024 7:30 PM	File folder	
Unit Images	6/1/2021 10:53 AM	File folder	
CW 80s West-German.xls	2/14/2025 12:35 PM	Microsoft Excel 97...	318 KB

As seen above, you may have any number of Excel files (*.xls) in a National folder if their names are different.

* = Within each file on the National Tab, the Nationality entry under Game Defaults **MUST** match the "Your Country File Name" for the game to find and sort data files in the scenario editor.

27 Using the Data Validation Tool

Included in the Data Folder is an Excel Macro enabled file (*.xlsm) called Data Validation Tool. This spreadsheet has a VBA code form that can be used to review each tab of a National Data Spreadsheet and tell you about any detected errors. While it is not 100% foolproof, the tool does find 95% of the typical errors that can take time to find without the tool.

We are still in the process of improving the tool as well and any feedback or suggestions for other typical editing faults to cover is appreciated.

The spreadsheet itself also contains instructions like the ones shown here for easy reference when using the tool. The spreadsheet code and supporting internal tables are hidden and locked at this time to avoid any possible support issues.

WARNING: The current Data Validation Tool is not updated to handle the new Tactical Transport data files and if run on a TT based files it will damage the Units tab of the spreadsheet and other areas. **We are working on a revised tool and hope to have that ready later this year. Sorry for any editing issues this may cause in the interim. Please follow the steps below to build a Data Check File for your data.**

27.1 Make a Data Check File

As noted in the Warning above, the current version of the Data Validation program will damage a standard data file if processed and lead to game crashes. Fortunately, we have a work-around that we use to validate all the game's data files. That process is as shown below.

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27.1.1 Steps to Follow

1. Select the data file from the Nation that you want to verify any changes or additions (or if it is a new file). In this example from the Belgian Nation Data Folder.

Name	Date modified	Type	Size
Backgrounds	2/18/2025 4:32 PM	File folder	
Badges	12/20/2024 7:50 AM	File folder	
Flags	6/6/2024 1:53 PM	File folder	
Unit Images	6/6/2024 1:53 PM	File folder	
CW 80s Belgium.xls	1/1/2025 12:07 PM	Microsoft Excel 97...	315 KB
CW 80s Belgium-Check.xls	12/25/2024 7:03 PM	Microsoft Excel 97...	339 KB

2. Make a copy of the file and name the file as [Filename]-Check.xls. this will be an exact copy of the existing data file.

Name	Date modified	Type	Size
Backgrounds	2/18/2025 4:32 PM	File folder	
Badges	12/20/2024 7:50 AM	File folder	
Flags	6/6/2024 1:53 PM	File folder	
Unit Images	6/6/2024 1:53 PM	File folder	
CW 80s Belgium.xls	1/1/2025 12:07 PM	Microsoft Excel 97...	315 KB
CW 80s Belgium-Check.xls	12/25/2024 7:03 PM	Microsoft Excel 97...	339 KB

3. Open the Check file and click on the Units Tab.

CW 80s Belgium: Units							
SUtag	Name	NATO Designation	PICID	NATOPIC	Description	SU Type	CompID
BG24	FN AS24 Trike		FNAS24.png	NS-ABRWV.png	Airborne Wheeled APC	ABRWV	JEFPA8
BG1	Alpha Jet		ALPHA.png	NS-AIRAT.png	CAS Aircraft - Can/B	AIRAT	AIRAT
BG10	CM-170 Magister		FMAG.png	NS-AIRAT.png	CAS Aircraft - Can/Rkt	AIRAT	AIRAT
BG11	Mirage 5		MIRAGES.png	NS-AIRAT.png	CAS Aircraft - Can/Rkt	AIRAT	AIRAT
BG12	Mirage 5		MIRAGES.png	NS-AIRAT.png	CAS Aircraft - Can/CBU	AIRAT	AIRAT
BG13	Mirage 5		MIRAGES.png	NS-AIRAT.png	CAS Aircraft - Can/CBU	AIRAT	AIRAT
BG14	Mirage 5		MIRAGES.png	NS-AIRAT.png	CAS Aircraft - Can/IB	AIRAT	AIRAT
BG2	Alpha Jet		ALPHA.png	NS-AIRAT.png	CAS Aircraft - Can/CBU	AIRAT	AIRAT
BG3	F-104G		F104.png	NS-AIRAT.png	CAS Aircraft - Can/CBU	AIRAT	AIRAT
BG4	F-104G		F104.png	NS-AIRAT.png	CAS Aircraft - Can/CBU	AIRAT	AIRAT
BG5	F-104G		F104.png	NS-AIRAT.png	CAS Aircraft - Can/Rkt	AIRAT	AIRAT

4. Scroll the data until you can see columns P (Mass) through T (ExtWt) on the screen.

O	P	Q	R	S	T	U
Size	Mass	IntTrp	IntWt	ExtTrp	ExtWt	FC/RF
2	500					0
9	7800					4
7	4700					4
12	15700					4

5. Select columns P through T.

O	P	Q	R	S	T	U
Size	Mass	IntTrp	IntWt	ExtTrp	ExtWt	FC/RF
2	500					0
9	7800					4
7	4700					4
12	15700					4

6. Use the spreadsheet program's tools to delete the selected columns.
7. After deleting the unneeded columns, your sheet should like the image below with column O (Size) now next to column P (FC/RF)

O	P	Q	R
Size	FC/RF	Stab	Abilities List
2	0	0	ABN, TCP
9	4	5	ABLW, AVS, NON
7	4	5	ABLW, AVS
12	4	5	ABLW, AVS, NON
12	3	5	ABLW, AVS, NON
12	3	5	ABLW, AVS, NON

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- Click on the National tab and save.
- You are now ready to Validate the new Check File!

27.2 How to use this Tool

- If the Data Validation Tool dialog is not showing, click the Run Tool button.

How to use this tool:

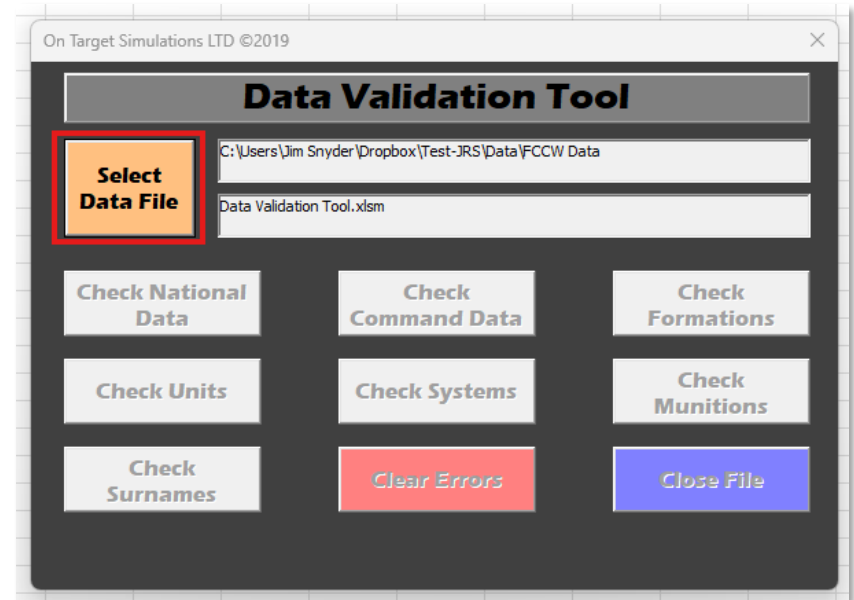
- If the dialog is not showing, click the Run Tool button below.
- Once the dialog is showing, click the Select Data File button and navigate to the data folder with you data file to check.
- Select the data file you want to validate and click Okay.
- Move the opened data file to another screen or minimize it so you can see the dialog.
- Click on any or all Check "X" buttons to have the validator check over the sheet and report any errors. You may need to maximize the spreadsheet if you don't have it open on another screen. Some sheets may take several seconds to process and the tool will show "Processing..." at the bottom of the dialog if the sheet is being worked on.
- You can edit any mistakes in the spreadsheet, save them, and then rerun any check you wish. You can also hit the Clear Errors button to clean out the errors before rerunning your checks.
- When your checks are complete and the all pages show green (no errors), you can click the Clear Errors button to remove the validation information.
- Click Close File and then save your spreadsheet when the dialog pops up.
- From here you can either close the program or open a new file to validate.

Tool Updated on: 3Mar25-JRS

On Target
Simulations

Run Tool

- Once the dialog is shown (image below), click the Select Data File button and navigate to the data folder with your data file to validate. The top text box will show the drive location of the games data folder based on its installed location on your system.



- Select the [Filename]-Check data file you want to validate and click Okay.

WARNING: DO NOT use the regular game data file or you can crash your game when the validation breaks the file.

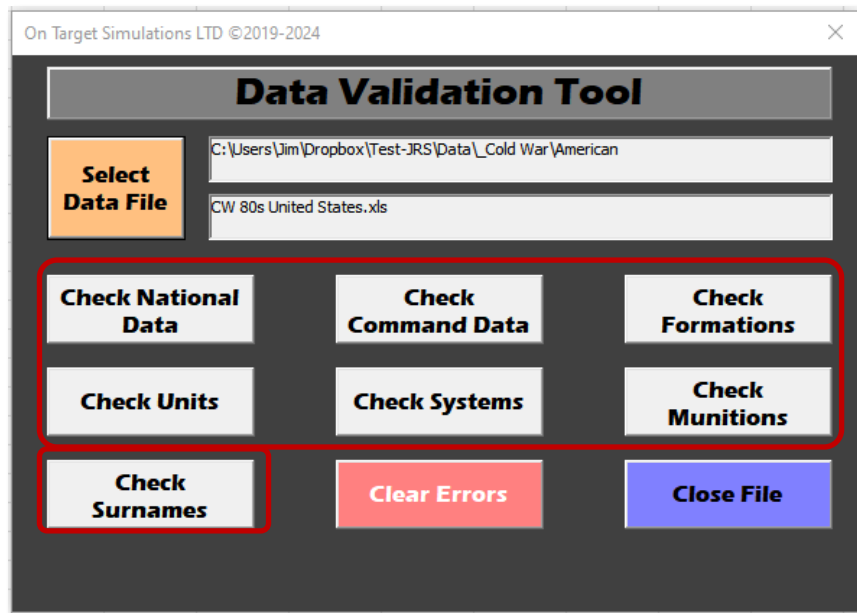
Name	Date modified	Type	Size
Backgrounds	2/18/2025 4:32 PM	File folder	
Badges	12/20/2024 7:50 AM	File folder	
Flags	6/6/2024 1:53 PM	File folder	
Unit Images	6/6/2024 1:53 PM	File folder	
CW 80s Belgium.xls	3/5/2025 12:42 PM	Microsoft Excel 97...	315 KB
CW 80s Belgium-Check.xls	3/5/2025 12:42 PM	Microsoft Excel 97...	339 KB

- Move the opened data file spreadsheet to another screen or minimize it so you can see the dialog.

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5. Click on any button to have the validator check over the stated tabs on the data sheet and report any errors.
 - a. You may need to maximize the spreadsheet if you do not have it open on another screen.
 - b. Some sheets may take several seconds to process, and the tool will not "Processing..." at the bottom left if the sheet is being worked on. In particular, the Formations and Units tab can take time to process if there are many entries or you have an older processor.



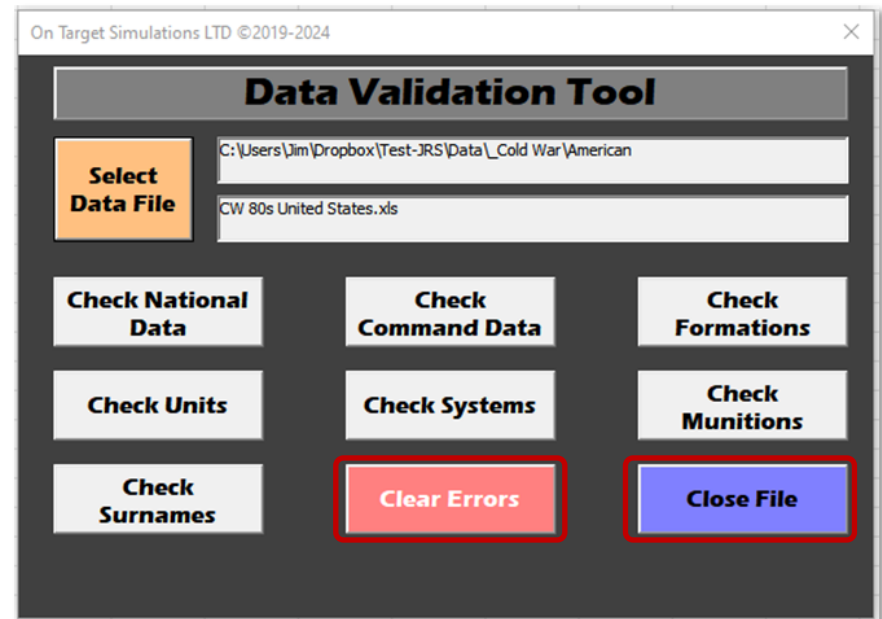
6. You can edit any mistakes in the spreadsheet and save them and then rerun the check without reloading the file.
 - a. Any field with an error in it will turn pink and there will be a red colored Errors column off to the right of the information in the spreadsheet tab.
 - b. The specific type of error, what information is bad, and the cell ID are shown if known. There are some cases where the error

will be detected, but the cause may not be relayed in the error message. In those cases, there is usually a missing comma, wrong symbol in a formation or weapon system entry, or a typo in a name or ID tag value.

- c. If there are no errors on the sheet the background for the Error cell will be green. The only exception to this is the current Munitions tab. There are several entries that are not fully active in the game, and they will show as an error, but will not affect the game. These are munition entries starting with the "!" symbol.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
CW 80s Soviet OMG: Systems																			
WEAPTAG	Name	NATO Designation	Description	Guidance List	Sound Effect	Errors													
AAA1	59 Quad		Anti-Aircraft Gun	XYZ	flak gun.wav														
AAA11	4x23mm 2A7		Anti-Aircraft Gun		flak gun.wav														
AAA13	7.62 SGMB		Anti-Aircraft Gun		flak gun.wav														
AAA2	12.7 DSHK		Anti-Aircraft Gun		flak gun.wav														
AAA3	12.7 NSVT		Anti-Aircraft Gun		flak gun.wav														

7. When your checks are complete, and all pages show green for errors you can click the Clear Errors button to remove the validation information.



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- Click Close File and then save your Check spreadsheet when the dialog pops up.
- From here you can either close the program or open a new Check file to validate and repeat the process.

27.3 Updating the Main Data File

Now that you have a validated Check file and the original National data file in the folder, we need to update the Check file into a new National file and archive the older National file in case we need it in the future. Here are the steps to perform this action.

- Rename the existing National file to old-[Filename].xls in file explorer. For example, old-CW 80s Belgium.xls.
- Open both old-[Filename].xls and the [Filename]-Check.xls files.
- In your Check data file, go to the Units tab, select column P and add in five new columns as shown below.

	O	P	Q	R	S	T	U
	Size	Colu	Colu	Colu	Colu	Colu	FC/RF
1	2						0
0	9						4
0	7						4
0	12						4
0	12						3
0	12						3
0	12						3
0	9						4

- Go to the old-[Filename].xls file and go to the Units tab. Select cell range P2 through T? (the last table entry in column T) as seen below and then select copy.

	O	P	Q	R	S	T	U
	Size	Mass	IntTrp	IntWt	ExtTrp	ExtWt	FC/RF
4		7900	8	5300	0	5500	0
4		20900	16	11000	0	22000	0
4		24300	20	15000	0	33000	0
2		2200	2	1100	0	1500	0
2		2200	2	1100	0	1500	0
2		3200	5	1500	0	2200	0
2		3200	5	1500	0	2200	0
4		11600	12	5000	0	18700	0
2		3200	7	1500	0	2200	0
3		2200	10	2200	0	2200	0

- Return to [Filename]-Check.xls and select cell P2 as seen below and then select paste.

	O	P	Q	R	S	T	U
	Size	Colu	Colu	Colu	Colu	Colu	FC/RF
1	2						0
0	9						4
0	7						4

- Review the Units data sheet to make sure that all the data has been pasted to the correct cells and fills all the entries to the bottom of the table as seen in the image below.

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	O	P	Q	R	S	T	U
Size	Mass	IntTrp	IntWt	ExtTrp	ExtWt	F/C/RF	
	2200	2	1100	0	1500	0	
	2200	2	1100	0	1500	0	
	3200	5	1500	0	2200	0	
	3200	5	1500	0	2200	0	
	11600	12	5000	0	18700	0	
	3200	7	1500	0	2200	0	
	2200	10	2200	0	2200	0	

7. Save the file.
8. Go into file explorer and change the [Filename]-Check.xls file to read [Filename].xls.
9. The folder should now have the game required [Filename].xls and a backup called old-[Filename].xls.

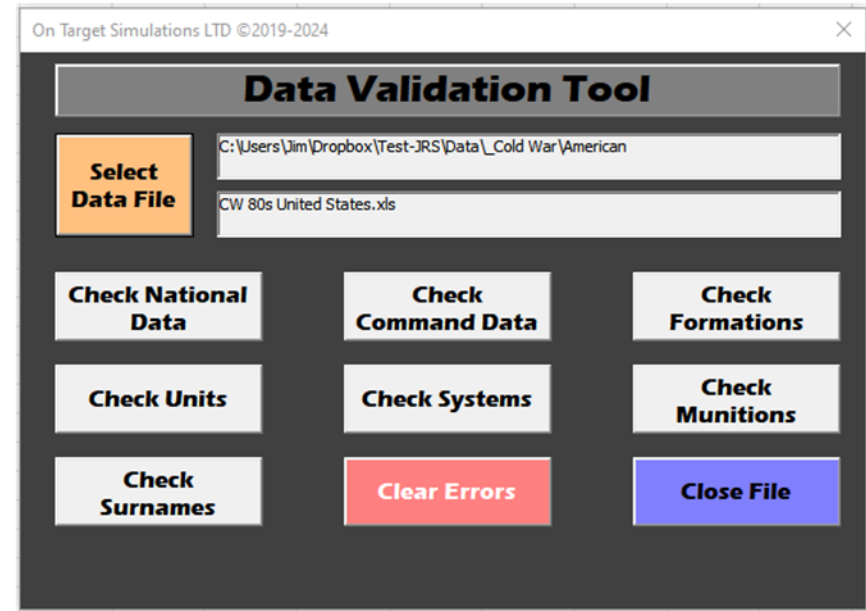
If you need to process new edits to the National data file, you can make a new Check file as outlined above and delete or archive the old-[Filename].xls file as you repeat the process.

27.4 Additional Tool Features

This section will cover features of the Data Validation Tool and any new features or capabilities.

27.4.1 Worksheet Header Check

The Validation Program checks all the names used as headers for each of the main datasheet tabs in the workbook. If any are incorrect, they are automatically replaced, and the repair is noted in the lower right of the Tools dialog box. If all is correct the lower right notification notes the sheet's headers have been checked.



27.4.2 Data Elements Check

The Data Validation Tool is updated to include checks for the newly added/removed characteristics and any other new data types referenced in the data sheets.

27.4.3 Formation Tab Checks

The tool checks for the valid range of Indented Nodes via the "<1" through "<8" codes in the Formation Code Data Field.

27.4.4 Units Tab Checks

The Data Validation Tool checks both the Common and NATO folders in the Data folder for matching image callouts from the Units tab for the counter silhouette filenames used in the data files. This is the PICID and NATOPIC entries in the Units data tab.

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Name	Date modified	Type	Size
American	1/19/2025 10:29 AM	File folder	
Belgian	3/5/2025 8:00 PM	File folder	
British	1/1/2025 12:07 PM	File folder	
Canadian	1/1/2025 12:07 PM	File folder	
Common	2/27/2025 7:31 AM	File folder	
Czechoslovak	1/1/2025 12:07 PM	File folder	
East-German	1/1/2025 12:07 PM	File folder	
French	1/19/2025 10:26 AM	File folder	
NATO	3/3/2025 12:36 PM	File folder	
Polish	1/1/2025 12:07 PM	File folder	
Soviet	1/1/2025 12:07 PM	File folder	
West-German	1/1/2025 12:07 PM	File folder	
Air Unit PF and Size Ratings.xlsx	6/6/2024 1:53 PM	Microsoft Excel W...	111 KB
Data Validation Tool.xlsm	12/20/2024 7:50 AM	Microsoft Excel M...	241 KB

27.4.5 Unused Units Check

The Data Validation Tool also performs a check to see if there are any Units not called out in the Formations tab. This is based on scanning the COMPIDs used and those in the Units tab. A red error field will pop up on the right side of the table and note any missing units.

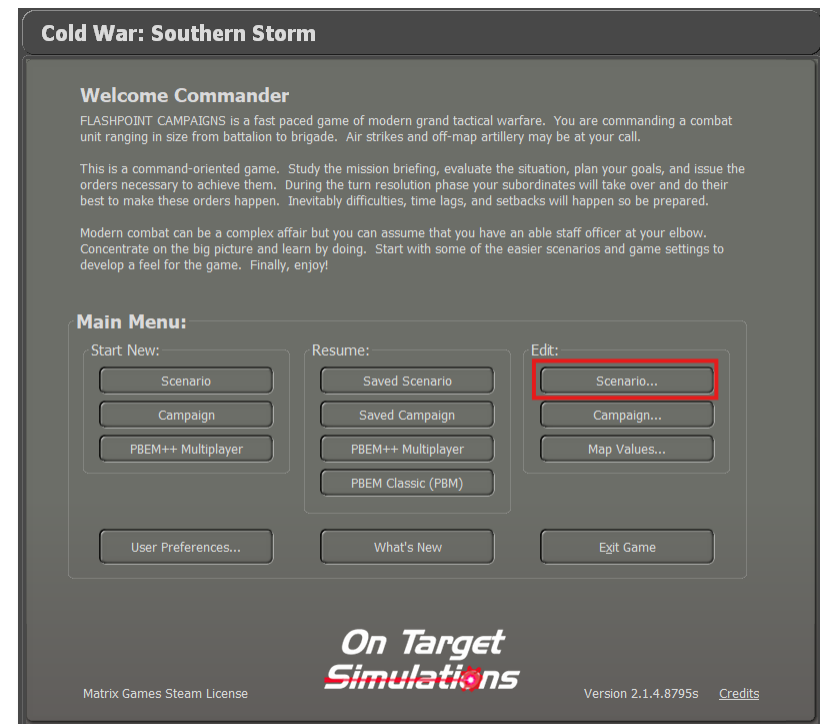
28 File XLS Import/Export Editing

Being able to both export certain key scenario data, edit it via an Excel file and then import changes back into a scenario file is a powerful tool for advanced users. Like anything data edit related, you can also break the scenario with a bad data element input.

WARNING: Right now, there is no tool like the Data File Validation Tool to sweep for bugs and typos. We strongly advise that you make well understood small changes. Also, it is a particularly good idea to have your scenario backed up in case something breaks.

28.1 Exporting Scenario Data

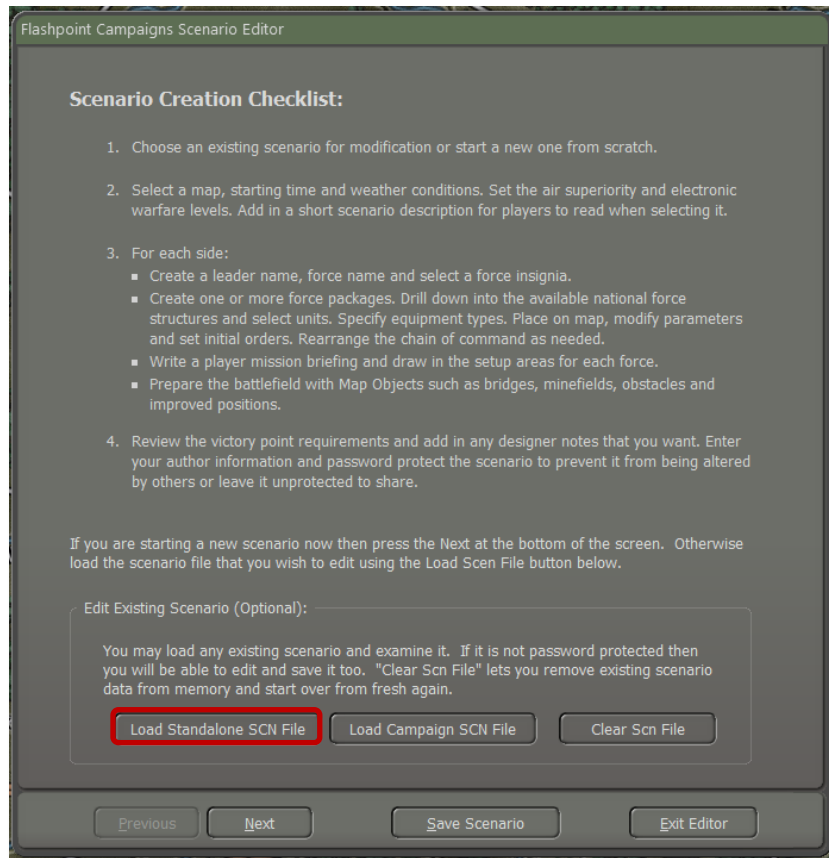
First, we must enter the Scenario Editor from the Main Menu screen. Click on the "Scenario" button in the Edit section.



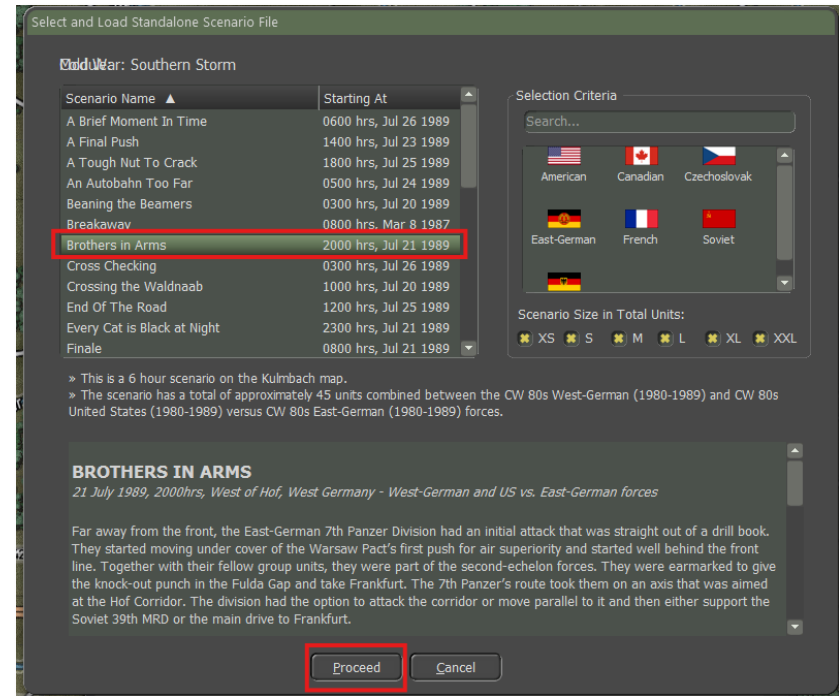
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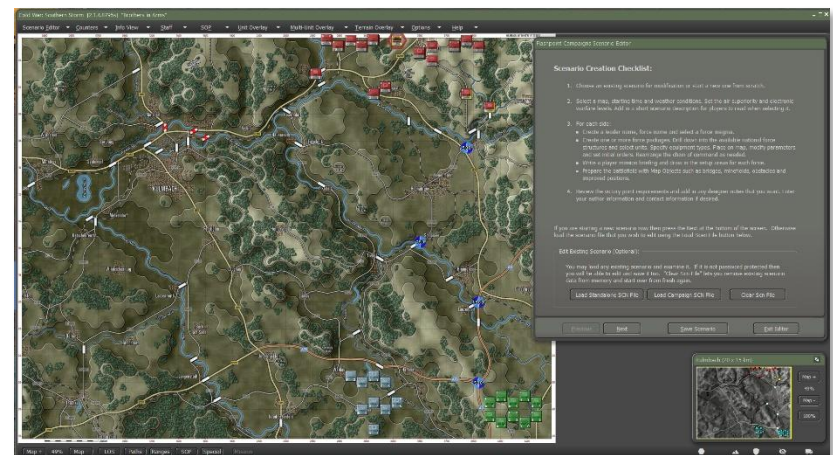
Next, we need to load a scenario that we want to make a change in. Click on the "Load Standalone SCN File" button.



For this example, I am going to edit a scenario called "Brothers in Arms". As the information notes, it is a small scenario featuring Cold War American, West-German and East-German units. Click "Proceed" to load the scenario.



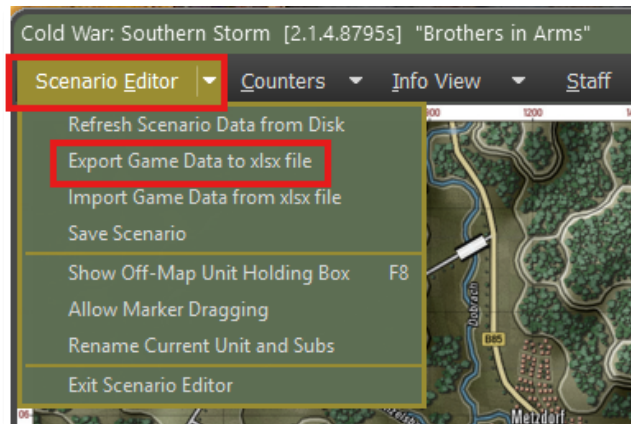
Here is the scenario after loading.



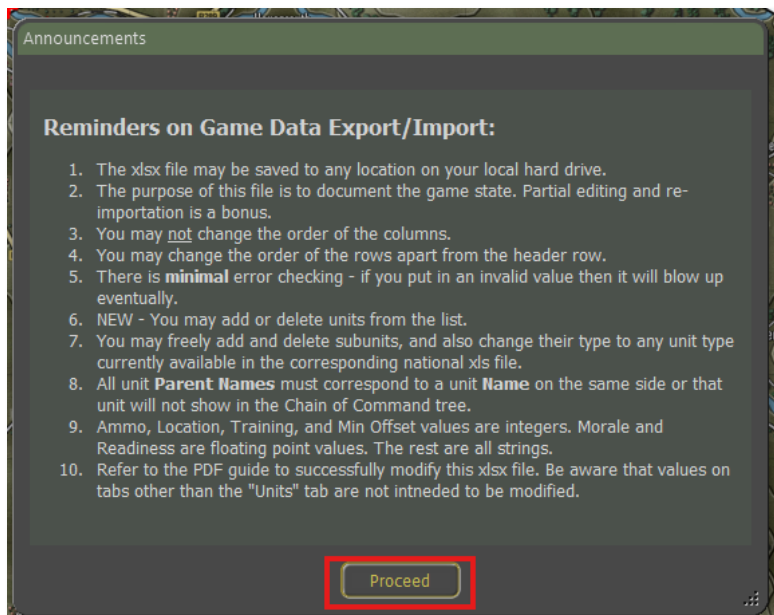
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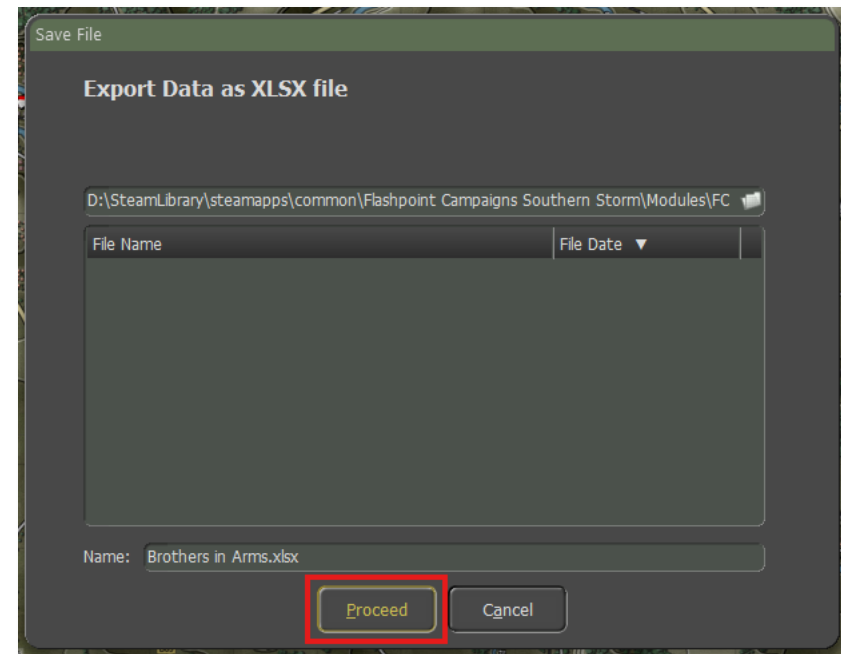
Now, go to the Top Menu and click on "Scenario Editor" and then click on "Export Game Data to XLSX file".



An Announcements dialog will pop up with some important information about using the XLS Export/Import tool. Worth a quick review.

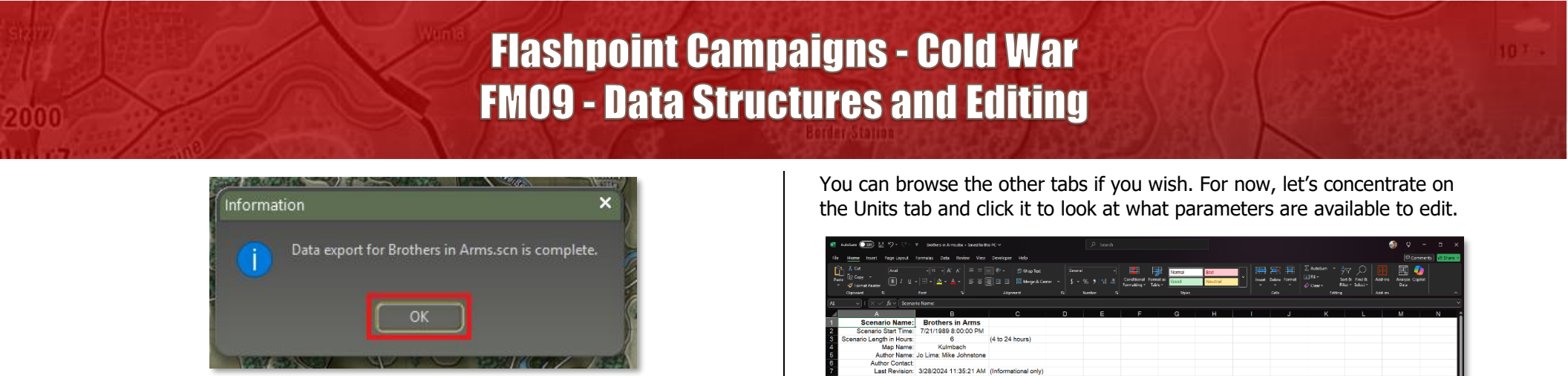


Hit "Proceed" and you are presented with the Save File screen for the exported XLSX file. By default, the game uses the scenario name. You can use that or change it to something else. It may be a good idea to export the file twice and name one with "_Original" or something similar in case you wish to revert changes back to the original scenario information.



Click "Proceed" to save your export file. If all goes well with the export, you will see the following dial box. Hit "OK". If you are exporting to the same file after the first time, you will get a confirmation dialog to overwrite the existing file.

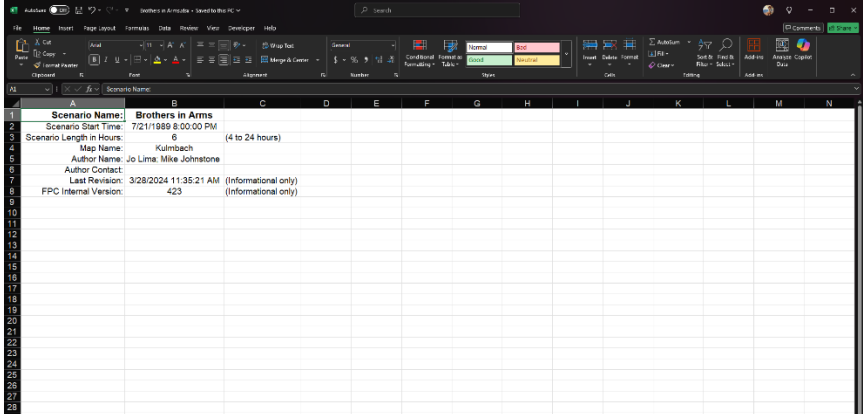
Flashpoint Campaigns - Cold War FM09 - Data Structures and Editing



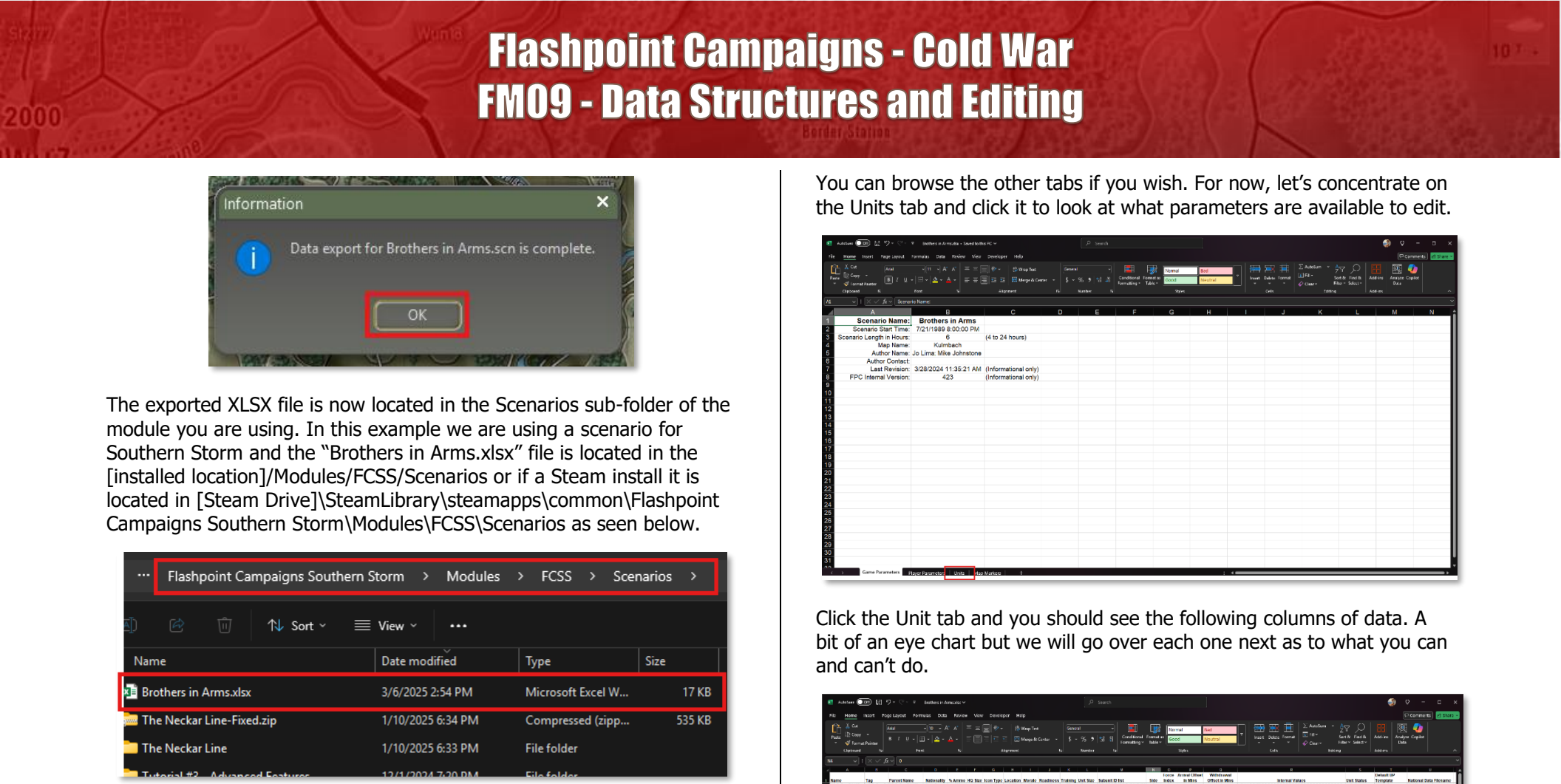
Flashpoint Campaigns - Cold War FM09 - Data Structures and Editing



The exported XLSX file is now located in the Scenarios sub-folder of the module you are using. In this example we are using a scenario for Southern Storm and the "Brothers in Arms.xlsx" file is located in the [installed location]/Modules/FCSS/Scenarios or if a Steam install it is located in [Steam Drive]\SteamLibrary\steamapps\common\Fashpoint Campaigns Southern Storm\Modules\FCSS\Scenarios as seen below.



Scenario Name	Scenario Start Time	Scenario Length in Hours	Map Name	Author Name	Author Contact	Last Revision	PPC Internal Version
Brothers in Arms	7/21/1989 8:00:00 PM	6 (4 to 24 hours)	Kulmbach	Jo Lima, Mike Johnstone		3/28/2024 11:35:21 AM	423



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You can browse the other tabs if you wish. For now, let's concentrate on the Units tab and click it to look at what parameters are available to edit.

The exported XLSX file is now located in the Scenarios sub-folder of the module you are using. In this example we are using a scenario for Southern Storm and the "Brothers in Arms.xlsx" file is located in the [installed location]/Modules/FCSS/Scenarios or if a Steam install it is located in [Steam Drive]\SteamLibrary\steamapps\common\Flashpoint Campaigns Southern Storm\Modules\FCSS\Scenarios as seen below.

Click the Unit tab and you should see the following columns of data. A bit of an eye chart but we will go over each one next as to what you can and can't do.

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You can browse the other tabs if you wish. For now, let's concentrate on the Units tab and click it to look at what parameters are available to edit.

Click the Unit tab and you should see the following columns of data. A bit of an eye chart but we will go over each one next as to what you can and can't do.

The exported XLSX file is now located in the Scenarios sub-folder of the module you are using. In this example we are using a scenario for Southern Storm and the "Brothers in Arms.xlsx" file is located in the [installed location]/Modules/FCSS/Scenarios or if a Steam install it is located in [Steam Drive]\SteamLibrary\steamapps\common\Falshpoint Campaigns Southern Storm\Modules\FCSS\Scenarios as seen below.

Next is the discussion on editing the file in Excel (or comparable program).

28.2 Editing Scenario Data

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You can browse the other tabs if you wish. For now, let's concentrate on the Units tab and click it to look at what parameters are available to edit.

The exported XLSX file is now located in the Scenarios sub-folder of the module you are using. In this example we are using a scenario for Southern Storm and the "Brothers in Arms.xlsx" file is located in the [installed location]/Modules/FCSS/Scenarios or if a Steam install it is located in [Steam Drive]\SteamLibrary\steamapps\common\Fashpoint Campaigns Southern Storm\Modules\FCSS\Scenarios as seen below.

Next is the discussion on editing the file in Excel (or comparable program).

28.2 Editing Scenario Data

First, we need to open the exported scenario data as noted above with Excel or compatible program. Once opened in Excel, there are four tabs of various data in the exported file.

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3/2/77
Wm3
2000
107

Information
Data export for Brothers in Arms.scn is complete.
OK

The exported XLSX file is now located in the Scenarios sub-folder of the module you are using. In this example we are using a scenario for Southern Storm and the "Brothers in Arms.xlsx" file is located in the [installed location]/Modules/FCSS/Scenarios or if a Steam install it is located in [Steam Drive]\SteamLibrary\steamapps\common\Flashpoint Campaigns Southern Storm\Modules\FCSS\Scenarios as seen below.

Flashpoint Campaigns Southern Storm > Modules > FCSS > Scenarios >

Name	Date modified	Type	Size
Brothers in Arms.xlsx	3/6/2025 2:54 PM	Microsoft Excel W...	17 KB
The Neckar Line-Fixed.zip	1/10/2025 6:34 PM	Compressed (zipp...	535 KB
The Neckar Line	1/10/2025 6:33 PM	File folder	
Tutorial #2 - Advanced Features	11/14/2024 7:30 PM	File folder	

Next is the discussion on editing the file in Excel (or comparable program).

28.2 Editing Scenario Data

First, we need to open the exported scenario data as noted above with Excel or compatible program. Once opened in Excel, there are four tabs of various data in the exported file.

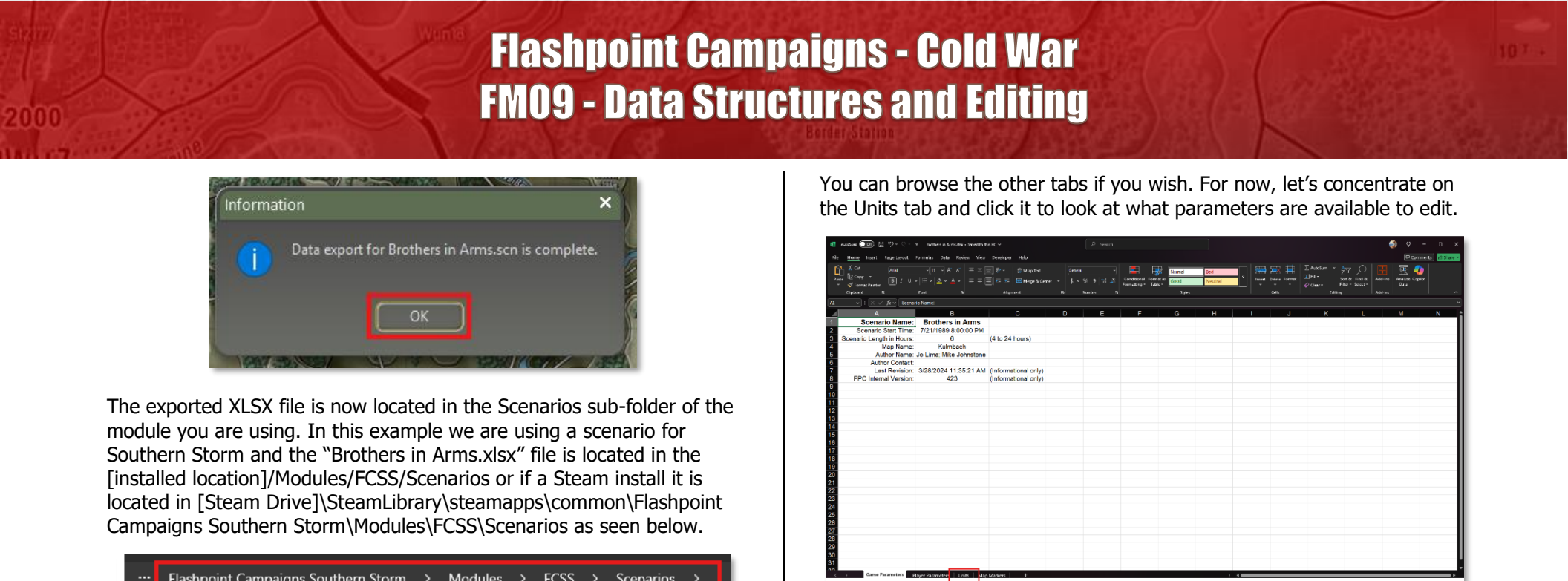
NOTE: Currently, the only data that can be edited and imported back into a scenario is in the Units tab. In the future we will be working to make all four tabs full import/export capable.

You can browse the other tabs if you wish. For now, let's concentrate on the Units tab and click it to look at what parameters are available to edit.

Click the Unit tab and you should see the following columns of data. A bit of an eye chart but we will go over each one next as to what you can and can't do.

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Information X

Data export for Brothers in Arms.scn is complete.

OK

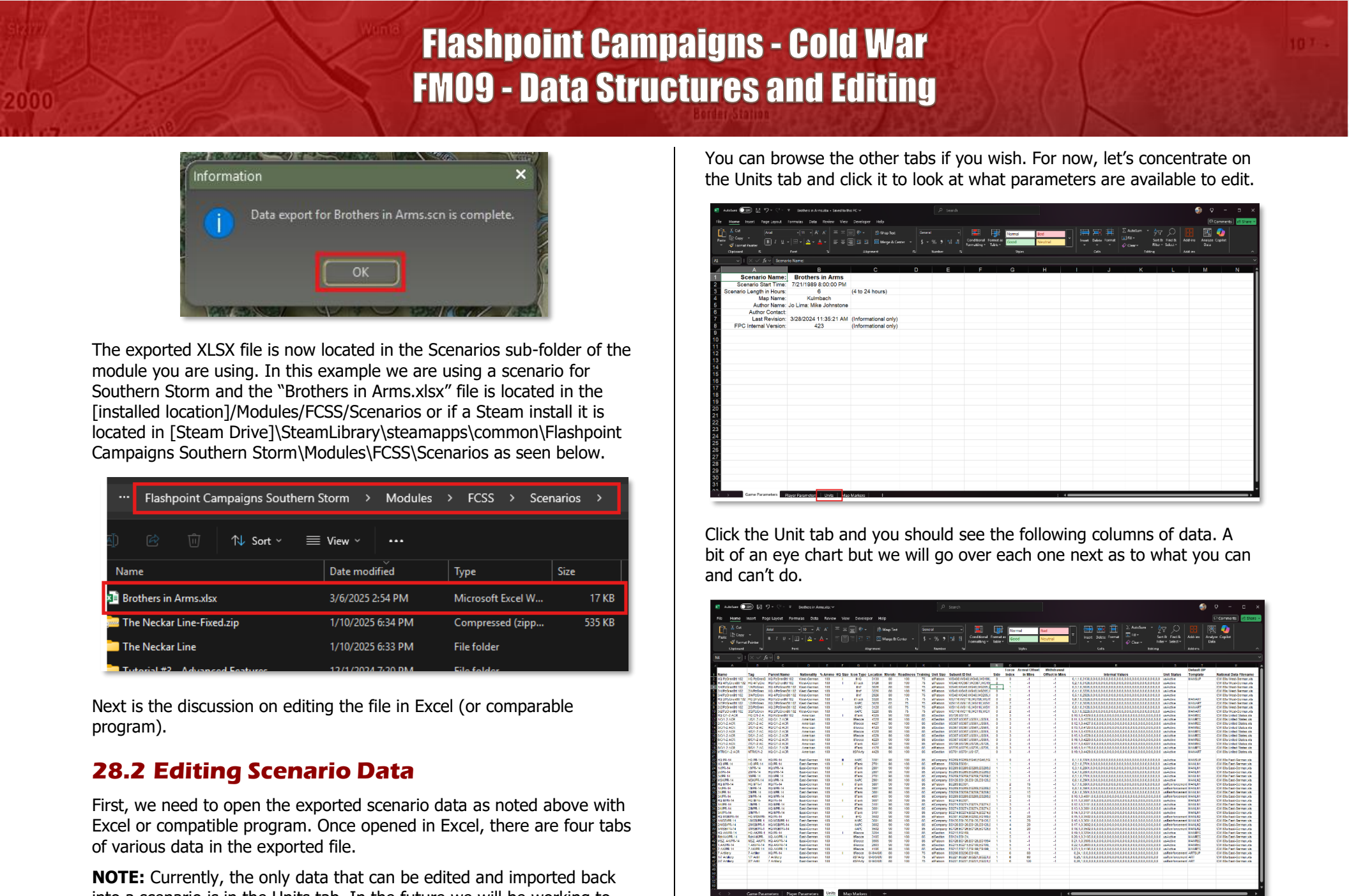
The exported XLSX file is now located in the Scenarios sub-folder of the module you are using. In this example we are using a scenario for Southern Storm and the "Brothers in Arms.xlsx" file is located in the [installed location]/Modules/FCSS/Scenarios or if a Steam install it is located in [Steam Drive]\SteamLibrary\steamapps\common\Flashpoint Campaigns Southern Storm\Modules\FCSS\Scenarios as seen below.

Flashpoint Campaigns Southern Storm > Modules > FCSS > Scenarios >

Name	Date modified	Type	Size
Brothers in Arms	7/21/1989 8:00:00 PM	6	(4 to 24 hours)
Map Name:	Kulmbach		
Author Name:	Jo Lima, Mike Johnstone		
Author Contact:			
Last Revision:	3/28/2024 11:35:21 AM	(Informational only)	
FPC Internal Version:	423	(Informational only)	

You can browse the other tabs if you wish. For now, let's concentrate on the Units tab and click it to look at what parameters are available to edit.

Click the Unit tab and you should see the following columns of data. A bit of an eye chart but we will go over each one next as to what you can and can't do.



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- A. Name: This is the name of the unit seen on the counter and in any of the dialogs where a unit name is shown. This can be edited freely.
- B. Tag: This is the generated Tag ID from the Formation creation, and it is generally the same as the Name field. Edit to match the Name field if changed.
- C. Parent Name: This field tells which unit a sub-unit is subordinate too. To match up to an HQ unit this field needs to be the same as the Tag field of the commanding HQ.
- D. Nationality: This is the data folder name of the National Data Filename found in column "U". If you are adding new units from a new National folder the name in column "D" and the XLS Filename in "U" must be named exactly as they are in the folder and file or the game will crash when it can't find the data. You can mix units from any number of nations in this manner. The subunits in column "M" must ALL come from the same national data file.
- E. % Ammo: You can set the percentage of ammo units in the scenario here. 0 to 125% are valid integer values to use.
- F. HQ Size: This is the same HQ size value found in the data editing information of Data Files. This represents the command level of the HQ, not the actual size of the HQ.

NOTE: the "... " symbol for a platoon is 3 periods and **NOT** the ellipse symbol. Excel will auto correct this if you do not change it in the Options/Proofing/Autocorrect Settings. Find the Ellipse correction, highlight it and then delete it.

- G. Icon Type: This is an internal value, and it should not be changed. If you are adding new units, you will want to add this in and try to match existing values seen in the scenario. For example, if you add and new Tank Company, you will want to use the "itTank" reference.
 - a. Valid Icon Types are the following: itRecce, itHelo, itTank, itMechInf, itInf, itSPAT, itAntiTank, itHQ, itEngineer, itFlak, itSPArty, itArty, itTruck, itAir, itWMD, itDrone
- H. Location: This is a 4-digit map coordinate or a "0" if the unit is off-map followed by /North(-) or South(+) distance in kilometers, /West(-) or East (+) distance in kilometers, and /0/0.

NOTE: It is possible to place a unit out of effective range adjusting these numbers and that can lead to a crash. Using the in-game Off-Map Asset Placement dialog is a safer way to make these adjustments in the Scenario Editor.

- I. Morale: You can change the Morale value of any unit in this field. Valid integer values are 0 to 100.
- J. Readiness: You can change the Readiness value of any unit in this field. Valid integer values are 0 to 100.
- K. Training: You can change the Training value of any unit in this field. Valid integer values are 0 to 100.
- L. Unit Size: This is the actual size of the unit based on the number of subunits.
 - a. Valid Unit Sizes are the following: stArmy, stCorps, stDivision, stBrigade, stRegiment, stBattalion, stCompany, stBattery, stSquadron, stPlatoon, stSection, stSquad
- M. Subunit ID List: This is the most edited column in many cases. This lists all the subunits by Tag ID from the National Data File referenced in Column "U". You can add or remove any number of units in this field if they are from the noted data file. The last unit MUST have a trailing comma.
- N. Side: Units are either Side 0 (Blue) or Side 1 (Red). No other sides are currently supported.
- O. Force Index: Be careful editing this field. It matches up to the Force package in the scenario editor at an N+1 value. For example, a force index of 0 will be the Force 1 listing in the scenario editor. If you add units to an existing Force, they will inherit the Battleplanes of that force (if they have any). New Forces if created have no Battle Plans until they are created in the Scenario Editor.
- P. Arrival Offset in Mins (Minutes): A "-1" indicates that the unit starts on the map or off-map at the start of the scenario. Any integer time in minutes within the play time of the scenario can be used to set the arrival time of a reinforcement.
- Q. Withdrawal Offset in Mins (Minutes): A "-1" indicates that the unit stays on the map or off-map for the duration of the scenario. Any

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integer time in minutes within the play time of the scenario can be used to set the withdrawal time "X" minutes into the scenario.

- R. Internal Values: **DO NOT** edit or attempt to add for new units. The game will import any new units and not look for this field. We may try to move this to its own tab in the future.

WARNING: changing ANY values in this field or adding or removing values will cause the game to crash if this file is imported with adjusted values.

- S. Unit Status: This is the game state of the unit. "usActive" is the default state of any unit that is in the scenario. You can also set to "usInactive". This unit will not act until fired on or until it spots an enemy unit. Units set to come on as reinforcements will have a "usReinforcement" code in this field.
- T. Default BP Template: This is from the Formation's tab of the National Data file.
- U. National Data Filename: As noted earlier, this is the XLS filename of the datafile related to the Subunit IDs seen in Column "M". The file must also reside in the Nationality Folder noted in Column "D". This relationship is critical for proper data values to be read in during the import of the modified XLSX file.

28.3 Best Use Cases for the Tool

The following list provides several uses for this Import/Export tool for the game.

- You can easily rename units and the displayed Tags seen in the scenario.
- You can resubordinate units to new HQs by changing the Parent Name to another different Parent Name.
- You can quickly adjust the starting ammo levels for all the units in the scenario.
- You can quickly adjust the Morale, Readiness, and Training levels of all the units in the scenario.
- You can add or remove subunits from the units in the scenario.

- You can swap subunits in a unit. This is useful to change a unit's subunits from one type of platform to another. For example, change M1A1s to M-60s.
- You can remove unwanted units from the scenario by deleting the row.
- If you are very careful, you can add new units to the scenario. Great care must be used to properly add values for the Internal values. It is a good idea to copy an existing similar cell and then change the second value to be one greater than the highest value for a side and match the location value with the fifth value in the string.
- You can change or add units from another nation by changing the Nationality and National Data Filename and then adding the correct units in the subunit list and also making the Name, Tag, and Parent Tag correct.

After you have done all the edits on the Exported Data File, save, and close it. In the next section we will go over the Import Data File steps.

28.4 Importing Scenario Data

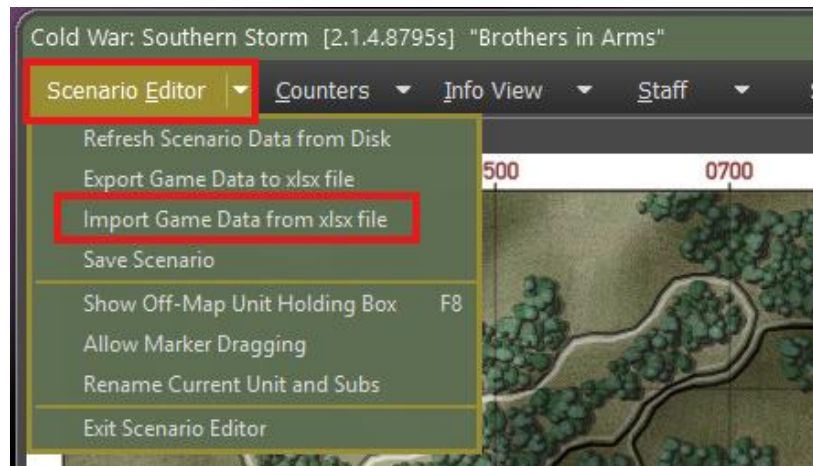
After saving the edited date file, the next step is to import the modified data back into the scenario.

Click on the "Scenario Editor" menu item and then select "Import Scenario from XLSX" item.

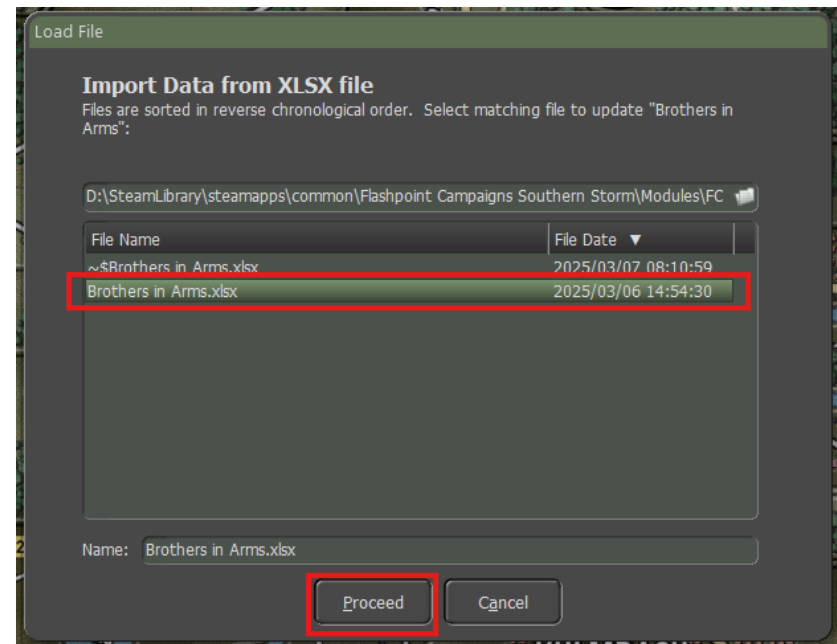
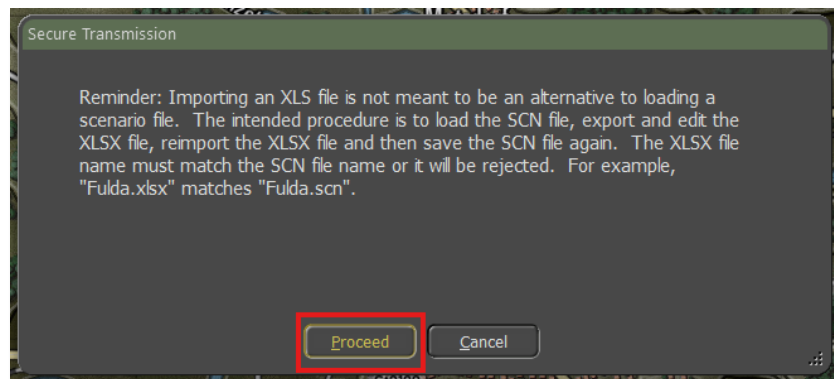
WARNING: It is important to load up the correct scenario for the datafile that you are trying to import. The import will replace the unit's data with a different scenario/map combination. The best way to avoid an issue is to leave the scenario up while the editing to the Excel file is being done. That also helps see units, locations, and other items helpful to the editors.

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The following dialog box will pop up warning about loading the wrong file into your scenario. Click proceed to get to the Import Data from XLXS file dialog.



Select the correct XLSX data file to import in the list, in this case "Brothers in Arms.xlsx" and then hit "Proceed" to have the data imported into the scenario. Currently there are no indicators that things are done. Give the process a few seconds and then look for your modifications.

Save your scenario by clicking the Save Scenario button in the Scenario Editor dialog if all the changes appear to be made and are as intended.

NOTE: If you made alterations to an existing scenario, we strongly suggest changing or altering the scenario name to note the new file so it can be understood when loading all scenarios for game selection.

28.5 Limitations/Uses of this Tool

As noted in the previous sections, there are several possible pitfalls doing this export/import shuffle, but this tool does give the user the ability to make several scenario changes on the fly without having to rebuild a scenario from scratch or even using saved packages. If the

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simulation is being used as a training tool, the ability to make rapid changes to adjust force balance and soft factors is a time saver.

29 Future Updates

As we continue working on the game engine and adding more features, we will update our documentation and include the latest versions with new builds.

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30 Flashpoint Campaigns Credits

30.1 On Target Simulations Team

- Lead Programmer and Head Honcho: **Robert "Ironman" Crandall**
- Data, Programming, Graphics, and Sound: **Jim "Cap'n Darwin" Snyder**
- Programming, Data, Models, and Research: **Jeff "Iron Mike" Sugden**
- Map Master, Programmer, AI, and Graphics: **William van der Sterren**
- Quality Czar and Testing Lead: **Charles "The Whip" Belva**
- Programming: **Kevin "SgtZDog" Zemon, Will Jackson, Alex Kriesel**
- Testing: **Tomasz Niedzinski**
- Scenario and Campaign Design Lead: **Joao Lima**

30.2 Cold War Contributors/Testers

- Alexander "Stimpak" Schwarz, Bryan "Tazak" Jones, David "22sec" Whitt, Mike "MikeJ19" Johnstone, Jurrie van der Zwaan, John "JohnO" Osborne, Jorgen "Jotte" Torgersson, Jo van der Pluym, Scott "WABAC" Gibbs and Steve "Mad Russian" Overton

30.3 Cold War Beta Testers

- Alexander "Lomo7j" Shestakov, Bas "Baskaatje" Kreuger, Calvin Breaker, ||CptMiller||, Craig "CTCharger" Truesdell, Dario Miroli, Dave Duckett, David "ultradave" Anderson, Don "Dovs" Lazov, Doug Miller, Durkik "gucciflocka97" Koth, Eemeli "Kurrestan" Sorri, Eric Estes, Exsonic01, Gary Bezant, Gary Heintz, Harry "harry_vdk" van der Kooij, Henry Simpson, Howard Rigg, Hoyt Burrass, Ian Strauss, Jack Herling, James Cleeter, Jing "cristianwj" Wang, Jonas Solberg, Jonathan (Yogdog) Brown, Justin Wonderlick, Kamyar Ashfar, Marc Bellizzi, MadGuard, Mark "nelmsm" Nelms, Maxime Lemieux, Nefron, Panta "Panta_slith" Astiazaran, Patrick Walker, PullG, Reto "rgeiger" Geiger, Richard "The Plodder" Lloyd, Ringtailhawk, Robert "rsallen64" Allen, Searry, Shannon "ObfuscatedJava" Morgan, Stas "StasSche" Schebetov, Steve (CV90) Lohr, TarkError, Terry Barnes, Todd "sfbaytf" Fong, Todd Bergquist, Tommi "Tomcatter" Saarainen, Tyler "daddywarlord" Knapp, Ai "Xavier Jot" Zhang

30.4 Matrix Production Manager

- **Erik Rutins** – The man behind the curtain keeping us on task!

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OTS on the Web

Matrix Games Forum: <https://www.matrixgames.com/forums/viewforum.php?f=10149>

Check Us Out on Steam: https://store.steampowered.com/app/2366530/Flashpoint_Campaigns_Southern_Storm/

Check Us Out on Discord: <https://discord.com/channels/911711314051739659/911711314257248331>

OTS Facebook Page: <https://www.facebook.com/ontargetsimulations>

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