Panzerkrieg for Windows

Acknowledgements

Manual Revision 2.00

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Introduction

Panzerkrieg for Windows (PFW) is a two-player tactical-level simulation of land combat in the era of World War II. Each player directs a number of units of varying types and capabilities. The "winner" of the simulation is the player who best accomplishes the victory conditions spelled out in the scenario that is being run.

PFW is intended to be a two-player game with the two players taking opposing sides in a contest of strategy and tactics. The game operates under "hidden movement" rules which means that each player will be able to see only those opposing pieces which are "visible" to their own playing pieces. Whether or not an opposing piece is visible depends upon distance, concealing terrain and whether or not there are any intervening blocks to line of sight (LOS).

PFW runs under Microsoft Windows™ 3.0 or later and requires that Windows be operating either in standard or 386 enhanced mode. PFW will not run under Windows 3.0 real mode. This means that the computer must have, as a minimum, a 80286 CPU and one megabyte of memory. For best performance, the computer should have an 80386SX CPU, or better, and two megabytes of memory. PFW also requires that you have a mouse or compatible pointing device.

PFW runs in 16 color mode and requires a minimum of EGA quality graphics. It is preferable to run PFW using VGA graphics or better. You'll obtain the best results running PFW in 1024 X 768 resolution.

If your computer has a sound card, PFW can use sound to convey some additional information about what is happening during combat and movement.

PFW acts a referee between the opposing players. It resolves movement, sighting and combat results; also, it allows the players to communicate with each other via a simple messaging system. While PFW can be played on one machine, it is best played between two machines using a communications link. This communications link can be either a serial connection using a Null Modem cable, a Local Area Network that supports the NETBIOS protocol or a modem using the commercial telephone system. The modem and NETBIOS options allow you to play against other players who are located across town or across the country.

PFW is a thinking game - it requires much thought and planning, and provides no rewards for merely typing quickly.   PFW games take time - an average of 3 hours per game; however, you can stop a game at any time, and continue it at a later date.

PFW really consists of 2 parts: the game driver and a number of different scenarios. Each scenario actually is a complete game.

What is a scenario?

A PFW scenario is a description of a game to be played. You can think of it as a specific "mission" to be accomplished. PFW includes a number of scenarios, which really makes it a number of different games.

Each scenario contains three elements: a map, a list of forces available to each side, and objectives to be accomplished by each player. PFW then has a number of different flavors depending on the scenario you choose.

You can also use the PFW Scenario Assembler to create your own scenarios. You can create maps both smaller and larger than those used by the standard scenarios included with the game. Also, all standard PFW scenarios use no more than 16 units per side while the Scenario Assembler allows you to create scenarios with up to 40 units per side.

Basic Concepts

This section of the manual will explain the concepts involved in a PFW game.

PFW is a game played between two people. Your computer is not your opponent, but only a tool to handle the bookkeeping in the game. In a complex game like PFW, a human player is a more skilled, creative and interesting opponent than a computer can be. When you are playing PFW you are usually playing the role of a commanding officer with the rank of Lieutenant Colonel.

Communications Between the Players

Your computer and your opponent's computer must be able to communicate with each other. The computers exchange information about:

☞   The position of your units.

☞   The position of enemy units that you have located.

☞   Damage done to your opponent's units by your attacks, and damage done to your units by your opponent's attacks.

☞   Location and direction of both friendly and enemy fire. In the case of enemy fire, you may receive only approximate information as to the origin and direction of the fire.

☞   Messages exchanged between you and your opponent.

There are several ways the two computers can communicate:

☞   Through a serial cable.

☞   Through phone lines with modems.

☞   Through a Local Area Network.

Two players can also use PFW by sharing one computer. (This mode is not recommended because game play will be very slow.)

Scenarios

Each scenario consists of 4 parts:

☞   A terrain map on which the scenario will be played.

☞   An order of battle (i.e. the roster of units participating in the battle).

☞   A list of specifications which determine:
●   Visibility
●   Time Limit
●   Names of the opposing teams

☞   Scenario Documentation including:
●   Scenario Description
●   Tactical Advice

The **map** is a graphic representation of the terrain on which the scenario will be played. Some maps are fairly simple, representing mostly open, level terrain. Figure 1 is a simple PFW map. Others can be considerably more complex, as in Figure 2.

The **order of battle** is a list of units that each team will command. This list also includes the location of each unit at the start of the scenario (if its position is fixed), or the area of the map where the player may deploy the unit.

Among the scenario **specifications**, the *visibility* determines the maximum range (in meters) at which a friendly unit will be able to detect an enemy unit if the Line of Sight (LOS) is not obstructed. The *time limit* sets the maximum amount of time (in game time; not real time) that the game will run before it terminates automatically. It is also possible for a scenario not to have a time limit. The *team names* usually are the names of one of the major participants of World War II. These include the Americans, Russians, Germans, French, British, and Japanese. For the most part, the team name provides some indication of the types of military units the player will be using.

Scenario **documentation** provides information that the player will find necessary or useful when playing the scenario. The *description* of the scenario details the background of the scenario setting, the goals of the two players, and victory conditions which define the "winner" of the scenario. *Tactical advice* provides suggestions as to how each player might best employ their forces to achieve their victory conditions. The players should remember that the tactical advice is just one point of view and is not the only, or even necessarily the best, way to play the scenario.

Units

Each team in a scenario is assigned a group of units with which to accomplish its mission. For the most part, these units represent weapons and other equipment that generally were available during World War II. Typically, each team commands 10 to 20 units.

Each of these units represents a platoon to company size entity. One tank unit represents a group of tanks; normally it will be either a platoon (4-5) or a company (10-12) of tanks. One mortar unit is a battery of mortars. This distinction isn't very important in playing PFW, but it does give you a better feel for the units you are commanding.

Complete details on all of the unit types you may encounter in PFW are contained in Appendix A of this manual.

Each unit type is described by a number of characteristics. The interaction of these characteristics between units is one of the elements that makes PFW an interesting simulation. The characteristics that PFW knows about each unit include:

☞ The speed at which the unit can move.

☞ The type of drive mechanism (full tracks, wheels, etc.) the unit uses, and the movement restrictions this implies. Some units have no independent ability to move at all. Most of these can, however, be carried from one location to another by a transport unit.

☞ The power and range of the unit's weapon.

☞ The type of weapon (armor piercing, mortar, etc) the unit mounts, and the special characteristics this implies.

☞ The amount of armor the unit possesses, if any.

Some units in PFW have extra capabilities which allow them to perform special functions.   These include:

☞   **Transport Units**
These units can pick up *passenger* units, carry then to another map location and then disembark
them into the new map location.

There are three categories of transport units.

> *Halftrack* units have good road speed. In addition they can travel efficiently overland
> and can keep up with most main battle tanks through any kind of terrain that the tanks
> can traverse.

> *Truck* units have excellent road speed, but are seriously hampered in their ability to travel
> off-road. Trucks can enter woods, but unlike tanks and halftracks, they cannot travel
> from woods to woods. Trucks can move through rough terrain and gullies, but only very
> slowly.

> *Wagon* units are included in PFW mostly because they did play a major transport role
> during WW II.   While they are sometimes useful for shifting the location of guns in a
> localized area, they are *much* too slow to keep up with any other vehicle. They can also
> move a passenger over a fair distance during the course of a typical scenario provided
> they have unobstructed access to a well-secured road (usually in your rear area.) Like
> trucks, wagons can enter woods but cannot move from woods to woods. Scenario
> designers sometimes include wagons in a scenario's order of battle as an expression of a
> perverted sense of humor.

☞   **Passenger Units**
Transport and *Passenger* units are natural buddies. Almost by definition, a passenger unit either
cannot move on its own or has only a very limited ability to move. Their ability to get where they
are needed depends on their ability to climb aboard a halftrack, truck or even a wagon.

Almost all passenger units are either infantry or towed guns. Command Post, Forward Observer
and Depot units also have passenger capability.

☞   **Engineer Units**
In PFW, *Engineers* are a special type of combat infantry which can enhance the effect of close
assault and combined arms attacks. See the **Combat** section for details.

☞   **Forward Observer Units**
Forward Observers are a special type of infantry-class unit which has no combat capability of its
own and is virtually helpless on defense. Its special abilities are its *only* reason for existence. The
Forward Observer can direct the fire of long-range artillery. In addition, these units have the
ability to remain *invisible* on the battlefield. An invisible Forward Observer will be exposed if a
moving enemy unit runs into it or if it comes adjacent to an enemy unit which is in *search* mode.
If a Forward Observer becomes exposed, it can regain its special invisibility by successfully
hiding out of sight of any enemy unit for one turn. See the sections on **Indirect Fire** and **Unit
Commands/Search** for more details.

☞   **Guerrilla Units**
These are a particularly nasty type of combat unit which has the special invisibility of a Forward
Observer combined with the ability to move rapidly and attack with a heavy punch. Their only
weakness is their very short attack range and their weak defensive strength once they have been
exposed. A Guerrilla unit loses its special invisibility when it opens fire. It can regain its special
invisibility in same manner as a Forward Observer.

☞   **Reconnaissance Units**

Sometimes also called *Scout Units*. These are generally very fast units which enjoy an enhanced ability to *search*. Most mobile combat units can use *search* mode to locate concealed enemy units, but only in the four directly adjacent mapcells. *Scout* units can *search* all eight adjacent map cells simultaneously. It is for this reason that *Scout* units are particularly dangerous to Forward Observer and Guerrilla units.

Time

PFW is played in turns. During each turn, players give orders to their units. Once they are finished giving these orders, PFW exchanges information between the players, determines the results of any combat, processes units that are moving, plots any friendly and/or enemy fire and does other checks. The results are then made available to both players.

Each turn represents 20 seconds of game time. This doesn't mean you have only 20 seconds to give your orders - you have as much time as you need.

Some scenarios have specific time limits. These time limits are also specified in terms of game time, not real time. If a scenario has a time limit you have as long as you need to give your orders, but these orders must accomplish the scenario objectives in a time-efficient manner for you to be victorious.

Movement

A number of different elements come into play when units attempt to move from one location to another.

The first element to be considered is how fast the can unit move. The units in PFW are capable of speeds in the 0-90 km/hour range. This range is generally less than the "top speed" of the units, but represent numbers that were realistically achievable under normal service conditions. Some units, such as towed guns, depots, etc., cannot move at all and need to be carried by another unit in order to get from one place to another on the map. Some units (e.g. infantry and some light mortars) can move on their own, but do so very slowly. These units can get about the map much more rapidly if they are picked up by a fast transport unit. Note, however, many units (e.g. other vehicles) cannot be carried by transports.

The next element to be considered is the type of terrain the unit is traversing. It is easier (and therefore faster) to move through clear terrain than it is through woods or across the slopes of hills.

Finally, the movement capabilities of the vehicle must be related to the terrain. For example, infantry units can move through swamps; vehicles can't - they get stuck (permanently). Infantry can move through dense woods easily, tanks less easily, and trucks not at all.

There are a few instances when movement is blocked entirely. It is not possible to move up or down a cliff; that is, directly between hilltop and ground level terrain without moving through intermediate slope terrain. In addition, all movement is blocked by any wreck from either team. A wreck is produced when an armored unit is destroyed in combat. Wrecks can, however, be moved out of the way by any full-tracked vehicle.

PFW takes all of these factors into account when handling movement.

Sighting

One of the most important elements of a battle is information. Many times the side with the weaker force has triumphed because they were better informed than the enemy, and correctly used this advantage. As in any well-designed computer based wargame, PFW provides the "fog of war" by using a hidden movement system. In PFW, you only know about enemy units that you can currently see. Or more specifically, you only know about enemy units that can currently be seen by one or more of your units. There are four elements that affect the ability of your units to see the enemy units:

☞　　　Not all of your units can report what they see to you. If a tank of yours spots an enemy unit, you can be sure you'll know about it pretty quickly. However, if your truck spots an enemy unit, you probably won't know about it. The truck doesn't have a radio, and so has no way of letting you know what it has seen. In PFW, only combat units can report what they see, and trucks and wagons are not considered to be combat units. (If the truck was carrying an infantry unit, however, the infantry could report what they see.)

☞　　　Visibility is limited by distance. Sometimes it's foggy, sometimes it's clear. When enemy units are at the limit of visibility, it's not possible to make them out exactly. You see there's something there, but you can't make out what kind of unit it is until it gets closer. Visibility remains constant during a scenario.

☞　　　Visibility is limited by terrain. You can't see over high hills, or through large towns or woods, for example.

☞　　　Some types of terrain hide enemy units. For example, enemy units can sit in towns or woods, and you won't know they're there unless you get right next to them. On the other hand, an enemy unit concealed in woods or a town .can still see *your* units if they are sitting in the open

☞　　　Guerrilla and Forward Observer units enjoy a special ability to remain invisible even when they are sitting in open terrain. The only way they can be exposed to view is if a moving enemy unit runs into them or they come adjacent to an enemy unit that is operating in *search* mode. Guerrilla units also become visible if they open fire. See the section on **Units** for more information on these unit types.

Combat

To win a PFW scenario, you'll probably have to destroy enemy units. To this end, most of your units are equipped with weapons. Some are also equipped with armor protection which (hopefully) helps prevent them from being destroyed. The effectiveness of a weapon depends on the weapon's "type" (i.e. what kind of projectile it fires) and whether or not the target has armor protection. If the target is armored, then the shooting range also influences the effectiveness of the fire. In addition, the kind of terrain occupied by the enemy unit can have a major influence on a weapon's effectiveness. For details on the effect of target type and terrain on weapon effectiveness see Appendix B (**Weapon Effectiveness Table**) and Appendix C (**Terrain Effects Table**.)

There are two basic types of targets in PFW: Armored Units and Unarmored Units. Armored Units include tanks, tank destroyers, self-propelled artillery, scout cars, and halftracks. Unarmored Units include infantry and cavalry, towed guns, trucks and wagons, and various specialized types of units such as Forward Observers, guerrillas, and depots.

There are also four types of weapons available: Armor Piercing, High Explosive, Mortars, and Infantry Weapons.

Armor Piercing (AP) weapons are direct fire only and are very large versions of the standard shoulder rifle used by infantry. Armor piercing weapons fire solid shot (essentially oversized bullets) which depend on their high velocity to damage the target. They also can fire specialized shells called High Explosive Anti-Tank (HEAT) rounds. A HEAT round is a relatively low velocity shell which contains a carefully shaped explosive charge. When the shell strikes the target, the shaped charge explodes and sends a high velocity jet of superheated plasma into the target. This jet is hot enough and moving fast enough to vaporize a hole through steel armor. It also can vaporize anyone unfortunate enough to be located behind the armor plate at the site of penetration.

Normally tanks and tank destroyers are armed with AP weapons. The towed anti-tank gun also falls into this class. While AP weapons are very effective against armored targets, they are much less effective against unarmored targets.

High Explosive (HE) weapons make up the most diverse category of armament in PFW. These weapons fire a shell which contains a high explosive charge. It is this charge, rather than the kinetic energy of the projectile, that damages the target. As a matter of fact, most HE projectiles are fired at relatively low

velocity. High explosive weapons are most effective against unarmored targets, but they can also be effective against armored targets, especially if fired at relatively close range.

In PFW, a wide variety of units are armed with HE weapons. These range all the way from light scout cars armed with 20 mm cannon to long range 170 mm howitzers. In a number of scenarios, you will find that a tank force will include an HE-armed assault tank such as the American M4-105 or the German StuH-42. This weapon is just the ticket for helping the AP-armed tanks deal effectively with anti-tank gun positions and infantry that they may encounter during their mission.

Mortars (M) are also a kind of high explosive weapon. They are placed in a category by themselves, however, because they have special attributes that need to be treated separately.

Strictly speaking, a mortar is not a gun. It is a bomb-throwing device. A mortar does not fire its projectile so much as it "lobs" it, much as one would lob a grenade. A mortar throws its bomb in a very high angle arc so that the bomb plunges into its target from above. As a result, the mortar is very good at attacking enemy units that are sitting on hilltops or anywhere else that an enemy is trying to hide in defilade.

Since a mortar fires a high explosive bomb, it is very effective against soft targets such as enemy towed guns and infantry. Mortars are not especially effective against armored vehicles especially if those vehicles are moving. However the heavy mortars (120 mm) can be effective against lightly armored targets such as scout cars and halftracks.

Infantry class weapons (I), include pretty much everything that infantry use in combat. Mostly it refers to small caliber weapons such as rifles and machine guns, but it also includes heavier weapons such as grenades and short-range rockets. For engineer infantry it also can include specialized weapons such as bangalore torpedoes, limpet mines, and satchel charges. Unlike all other weapon types, infantry class weapons in PFW have no effect on armored targets unless used in a *close assault* attack. For details on this kind of attack, see below.

These differences seem to make the business of destroying enemy units pretty complex. However, we've only begun to scratch the surface. When shooting, you also have to consider how the terrain you're fighting on will effect the outcome: Where are you shooting *from*, and where are you shooting *to*?

A simple example is an enemy unit in a town. It's harder to shoot a unit in a town (than one on a flat, open plain) because the buildings provide both cover (protection from fire) and concealment (protection from view). The same goes for woods; the trees block both your sight and your projectiles.

It's also hard to hit an enemy target if it is "in defilade." Being in defilade means that the target has taken a position where it is mostly shielded from fire by uneven terrain. For infantry, this generally means the individual soldiers have hidden behind rocks, trees, or taken cover in foxholes. Vehicles can do much the same thing if the unevenness of the terrain is great enough to let the vehicle place most or all of itself out of the line of fire. When tanks move into defilade, they generally do it in such a way as to have their hull out of the line of sight, but their turret and gun exposed enough to allow them to fire at the enemy. Because of this, a tank in defilade usually is referred to as being "hull down."

In PFW, units go into defilade when they are located in slope or hilltop terrain. In such terrain, your units often are located *above* the enemy so that you can shoot *down* at them while they have to shoot *up* at you. In most cases, this gives your units the advantage of being in defilade and therefore less likely to be damaged by enemy fire.

Even if you can see the enemy, and you're on his level (topographically speaking), things can be difficult. If the enemy is on clear ground, near misses you fire might damage him when they explode. But if the enemy is in the water or in a swamp, the effects of near misses will be dampened considerably.

Of course, if your attacking unit is extensively damaged, it will not be as effective a weapon as it was when undamaged.

Depending on the type of unit you're attacking with, you might be presented with several choices for the type of shooting you wish to do. These are:

<u>Direct Fire</u>

Direct Fire is a normal attack. The attacking unit must have a clear line of fire to the location it's attacking. Most of your attacks will be made using Direct Fire.

<u>Indirect Fire</u>

Most mortars and HE guns are capable of long range fire over obstacles. This is called Indirect Fire. Because the gun battery cannot see the target directly, it must have an associated Forward Observer who can see the target. The Forward Observer locates and identifies targets for its associated gun. As the gun fires at the target, the Forward Observer reports back to the gun crew as to the accuracy and effectiveness of the fire. The Forward Observer also gives the gun crew directions on how to correct and adjust their fire. To use Indirect Fire in PFW, the following conditions must be met:

1. The attacking unit must be a weapon type that can use indirect fire.

2. The attacking unit must be associated with a spotting Forward Observer unit. To associate an indirect fire weapon with a Forward Observer select "Shoot" from the gun's Unit Command menu. A submenu will appear with the option to "Range for Indirect Fire." When you select this option, PFW will let you pick a Forward Observer for the gun.

3. The Forward Observer must have a clear line of sight to the target location.

4. The weapon must have been ranged with respect to the Forward Observer.

Due to the delay communicating between the Forward Observer and the battery, indirect fire is less effective against moving vehicles than stationary targets.

So far, we have considered only simple attacks. There are other ways in which you can attack and damage enemy units. In fact, the most effective way of attacking is to combine different forms of attack so as to produce more damage than any simple attack could do alone. Other ways of attacking enemy units are as follows:

Close Assault is a form of attack that is unique to infantry and cavalry. A close assault attack can be made when the target is adjacent to the infantry/cavalry unit launching the attack. In PFW an infantry/cavalry attack is automatically thrown as a close assault if the required conditions for the attack are met.

During Close Assault attacks, infantry units can bring <u>all</u> of their weapons into play. Against tanks, close assault means the infantry will be stuffing a satchel charge into the engine grill of the tank or getting close enough to fire a rocket propelled grenade into the running gear or sometimes even tossing a hand grenade into an open hatch. Against other infantry it means closing with the enemy enough to use grenades, bayonets, rifles/handguns at point blank range and (hopefully) making some of the enemy soldiers break and run so that you can shoot them in the back.

Close Assault has a greater chance of damaging the target than does a comparable direct fire attack; also, there is a modest chance that the damage will be greater. Close assault can be used against any target type. *However, Close Assault is the only way that infantry/cavalry can successfully attack armored targets.* This is because the only weapons in the "I" category that are effective against armor (short range rockets, grenades etc.) can only be used when the infantry have closed with the armored target.

Close Assault attacks can become very deadly if they are combined with other types of attacks. These combinations can overwhelm the defending units and can result in their taking massive damage or being destroyed. Effective attacks *in combination with* an infantry close assault are:

☞ An Engineer unit using close assault tactics.

☞ Direct or indirect fire support from other units.

All of the effects are additive. Strong infantry positions can be nasty for tanks to deal with. Strong infantry positions supported by fire can be *deadly* for tanks to deal with.

Engineer Assisted Close Assault is an enhanced form of close assault which is much more damaging than simple close assault. Combat engineers have specialized weapons and training which lets them greatly enhance the effect of normal combat infantry. For this type of close assault to be used, it is necessary to have at least one engineer unit participating in a close assault *in conjunction with* at least one normal infantry unit against the same target.

Fire Supported Close Assault is the most effective and damaging form of attack in PFW. This occurs when a close assault is combined with supporting direct fire against an enemy unit. The supporting fire must be of a type that has at least the potential to damage the target in direct fire mode. In other words, if the target is unarmored, then *any* weapon type can provide effective supporting fire. If the target is armored, then the supporting fire must be from type "AP", "HE", or "M" weapons since type "I" weapons cannot damage armored targets in direct fire mode.

Note that the supporting fire does not actually have to damage the target, it merely has to be a viable threat to the target. The supporting fire *suppresses* the target so that the friendly infantry can close with, and attack the target more effectively. Of course, if the supporting fire successfully damages the target, then so much the better.

Overrun is used by vehicles (usually armored) against unarmored targets that have been caught in open terrain. It can be used only by vehicles armed with machine guns. Overrun is a particularly devastating form of attack which consists of the armored vehicles driving through the enemy position causing disruption both by their passage and by the firing of their machine guns. Of course, if tanks are overrunning an infantry position, the infantry also have the opportunity to retaliate with close assault tactics.

To summarize: When attacking an enemy, you have to consider what type of unit you're attacking (if you know), what type of weapon(s) you're attacking with, the condition of the attacking unit(s), the terrain the target is on, and the terrain you're attacking from. Remember that from the infantry's perspective, it is always better to fight tanks in woods or towns where the tanks have to come in close in order to attack your infantry. Trying to root infantry out of woods or towns, especially if that infantry has effective fire support, is the tanker's worst nightmare. Conversely, the tanker *loves* to catch enemy infantry out in the open where it can be effectively overrun.

Reconnaissance By Fire/Discretionary Fire

It's not necessary to see a target to shoot at it. You can fire into any location you like anytime you like (provided, of course, that you have a line of fire into that location.) *If* there's an enemy unit there, this fire *may* do some damage. In any event, the damage won't be as severe as it would be if you could see what you were shooting at. You can also use this as a reconnaissance tactic: Fire at a location, and if you see smoke and flame, you've found and hit a unit there. (If you don't see smoke and flame, *either* there's no enemy there, *or* there is, but you missed him.) On the other hand, even if you don't hit the concealed unit, you may induce it to return fire which would let you know that the unit is there. Of course, when you fire, you make a lot of noise, and there's a flash - and an enemy may see that and discover *you*.

Trading Movement for Fire

The weapons of the era represented in PFW couldn't be fired accurately while the units possessing them

were moving. Shooting accurately requires stopping, firing, and moving again.

How to Play Panzerkrieg for Windows

This section of the manual will take you through the steps of actually playing a PFW game.

Choosing a Scenario

The first step in using PFW is to choose a scenario and team to play. This choice must be agreed upon with your opponent before you begin. You both need to decide which scenario you want to try and which team each of you will command. Obviously you must both pick the <u>same</u> scenario and <u>different</u> teams.

Once you and your opponent have agreed upon the scenario and sides to be played, you each need to choose the New… option from the Files menu. A list of scenario files will be displayed. Choose the appropriate scenario. Next you'll choose the team you wish to command.

You'll then be presented with a dialogue box like the one in Figure 3.

Connection Options

You'll next be asked to choose how you'll communicate with your opponent. There are several options available.

No communications - just looking at Panzerkrieg for Windows

This option allows you to enter PFW without having an opponent or a second computer. You'll be able to use all the usual options, except that you won't have an opponent. You won't find any enemy units. This option is intended to allow you to look at and explore the scenarios available in PFW at your leisure, without the need for a second person.

Through a serial cable

This option is used when you have two computers that are located within 50 feet of one another and are connected through a null modem serial cable.

Through phone lines with modems

This option is used where the two computers are more distant from each other, or it's not possible to run a wire. PFW can communicate through modems and can operate intelligent modems that follow the Hayes™ command set.

Through a NETBIOS Local Area Network

If your computers are connected to a Local Area Network that supports the NETBIOS protocol[1], they can use that network for their communications. This option is unavailable if PFW does not detect a NETBIOS LAN connected to your computer.

Via DDE on this machine

Two players can play against each other sharing one machine. Two copies of PFW are started (one per player), and the players alternate use of the machine during each turn. This allows you to use PFW with only one computer, albeit at a slower pace. No special hardware or connections are needed for this option.

How to use a Serial Cable to Connect Two Computers.

PFW can communicate over a serial cable connecting two computers. These computers must be in relatively close proximity to each other; in general, distances of 50 feet or less will work reliably. You'll need to supply a null modem cable to connect the serial ports of the two computers together. When you choose this option, you'll be presented with the dialogue in Figure 4. All you need to do is indicate which serial port on your computer you're using for the connection.

How to Connect Two Computers using Modems

PFW can communicate through modems at speeds from 1200 baud up to 19,200 baud. If your modem understands the Hayes command set, PFW can handle the connection process automatically. If your modem doesn't understand the Hayes command set, you can still use the modem by manually making the connection to the other modem.

PFW uses the Carrier Detect (CD) signal to monitor the status of your connection to your opponent. Your modem should be configured to toggle the CD signal as your connection progresses (rather than just clamping CD high), and the cable you use to connect your modem to your computer should properly carry CD.

When you decide to use modems to establish the connection, PFW will show you the dialogue in Figure 5.

Before connecting to the other computer, you and the other player will have to agree on who will place the call (and initiate the connection).

If your modem is Hayes-compatible: Choose Hayes-compatible as your Modem Type. Set Dialing Mode, the Dialing Type, the Modem Speed, the Modem Port, and the Phone Number items as appropriate. Click OK, and wait for the connection to complete.

If your modem is not Hayes-compatible: Choose Other as your Modem Type. Set the Modem Speed and Modem Port items as appropriate. Manually make the connection between the 2 modems. Click OK when the connection is complete.

How to Connect Two Computers using a Local Area Network

If PFW detects that your computer is connected to a NETBIOS LAN, it allows you to communicate with others PCs connected to that LAN. NETBIOS depends upon you and your opponent choosing names to be known by on the network (see Figure 6).

You can play PFW with an opponent located across the country or around the world using the Internet. To play PFW over the Internet you'll need a NETBIOS implementation that supports the RFC1001/1002 standards.

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[1]NETBIOS is a popular protocol used on PC LANs. Most PC local area network products, including those from vendors such as Novell, Banyan, and Microsoft, support the NETBIOS protocol.

PFW supplies the scenario team names as the default session names. You may use these default names if you are sure that you and your opponent are the only persons on the network currently playing PFW. However, it is recommended that you and your opponent each use a unique "nom de guerre" as your respective session names. This will reduce the likelihood of collisions with other players. Whatever names you choose *must* be properly coordinated between the two machines. That is, the name of your *Local* session must exactly match the name of your opponent's *Remote Session* and vice versa.

When you finish or cancel your current network game, note that the session names that you used are *still active* so long as PFW is still loaded in your computer's memory. This means that you cannot start or resume a new game using the same Local/Remote session names. If you try to do so, the two halves of the scenario will never connect because each side "thinks" the other side is still involved in the previous game. To start a new game you must either use new session names or terminate PFW and then restart it from the program manager. If you terminate and restart PFW then you can successfully use the same session names.

How Two Players Can Share One Computer

Two players can share one computer by using a Windows feature known as Dynamic Data Exchange (DDE). This allows two copies of PFW - one per player - running on the same computer to communicate. The players alternate using the computer, each commanding their own team through their own running copy of PFW.

What's to keep an unscrupulous enemy from spying on your team while they are using the computer? When you use DDE you will have the option of setting a password to protect your copy of the game. This password will prevent your opponent from opening your copy of the game to spy on (or worse yet, give false commands to) your units.

Use of passwords is completely optional. If you really trust your opponent, just click OK without setting a password.

Once you have established the electronic connection to your opponent, PFW makes sure your scenario and side choices are compatible with those of your opponent. If they are compatible, the game continues.

Placing Your Units

Some scenarios initially place your units on the map for you. As in war, sometimes you have to fight with what you're given.

Other scenarios allow you to choose where to position some or all of your units initially. If the scenario you've picked is one of these, PFW will show you a list of the units you need to position as shown in Figure 7. To place a unit:

1.   Select a unit from the To Be Positioned list by clicking on its name in the box.

2.   Click the spot on the map you want the unit to start. This spot must be within the setup area for the unit highlighted on the map.

When you have placed all of your units on the map, click the Done button and PFW will ask you to select/create a game save file. You may elect not to use a game save file, but if you do not create a save file then your game will be lost as soon as you leave it. After you have decided upon your game save file the game begins.

You can change your mind as you set up your units. You can reposition one or more of your units anytime before you click the Done button. To do this place the cursor on the unit you wish to reposition and then double click the left mouse button. The unit will leave the map and return to the **To Be Positioned** box.

Resuming a Previously Stored Game

If you wish to resume a game which you have stored, then select the **Open**... option from the **Files** menu. PFW will show you a list of stored games (if any) in the save directory. Choose the game you wish to resume. Next you will select the communications mode exactly as you did when starting a new game. If you are connecting to an opponent at another machine then PFW will restore the terrain map and unit positions exactly as they were when you saved the game.

It is important to remember that the stored game file contains only the unit data (current position, accumulated damage, current movement orders), and the name of the scenario. It does *not* contain an image of the map itself. To restore the terrain map, PFW must open the original scenario file. If PFW cannot find the original scenario file it will pause, open a directory map and ask you to show it where to find the scenario file so that it can retrieve the map.

If you open a stored game and choose the "No Communications" option then PFW will open the game for you and it will allow you to move your own units around the map. This can be useful if you wish to check sighting/shooting fans or if you wish to map out and plan future movement orders. The enemy units, however, will not appear on the map. Also, you will not be allowed to update the disk copy of your stored game. This is protect you from putting your half of the stored game out of sync with your opponent's stored half of the game.

The Panzerkrieg for Windows Gameboard

Figure 8 illustrates a typical screen display during a PFW scenario.

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The Map Window

This window displays the scenario name in the Title Bar. In this case the scenario is "Bastogne." The main part of the window displays the scenario terrain map. In this case, as with most of the standard scenarios included with the game, the full map represents an area 7.5 kilometers by 3.75 kilometers. The map indicates:

☞ The terrain and topography

☞ The location of your units.

☞ The location and approximate type of enemy units (that you know about.)

Your units are shown in blue while any identified enemy units are shown in red.

The appearance of various types of terrain are shown in Figure 9. This figure is black and white, but the actual terrain graphics are colored to help make their identity apparent. For example, woods are green, water is blue, swamps are cyan (light blue), rough terrain is brown and towns are black.

All friendly units are displayed on the map as unit counters. In addition, counters are shown for all spotted enemy units as well as wrecks (of either side) are shown as well. The counters used for units are:

Tank:	Tank Destroyer:
Self-Propelled Artillery:	Scout Car:
Truck:	Halftrack:
Wagon:	AntiTank Rifle:
Mortar:	Infantry Gun:
Light Flak Gun:	Fort:
Infantry:	Cavalry:
Forward Observer:	Ammunition or Fuel Depot:

Friendly units are BLUE in color. Enemy units are RED in color.

There are variations on these symbols. The first variation is for a hard unit that has been killed. This leaves a wreck, which is displayed like this .

The second variation is for a unit that is towing a trailer. This can look like (a truck towing a trailer), (a halftrack towing a trailer), or (a wagon towing a trailer). When a gun is being transported, the transporting unit will appear to have a trailer. When men are being transported, they will not show up as a trailer - they could well be inside the transporting unit, and therefore invisible.

Finally, several other symbols may appear on the map. An is displayed when you see *something* on the map, but it is too far away to make out distinctly. Note that your *own* wrecks look like this when you see them, but they are too far away to identify. Large-calibre high-explosive fire arrives with a large bang - it's smoke and flames are displayed like this .

If your fire into a map location strikes an enemy unit and causes damage, you'll see these secondary explosions displayed as . (Your units which *receive* damage also display this characteristic.)

The Unit Windows

There are two units windows displayed on the game board: One window reports information on units on

your team (Figure 10) and the other reports about enemy units.

Each row entry corresponds to one unit on the map.   Each column entry displays some aspect of the status of that unit as shown in Figure 10.

The Friendly Unit Box

The **Unit Icon** shows what the unit looks like on the map as illustrated in the list of unit counters shown in the previous section.   The **Current Terrain** shows you the type of terrain currently occupied by the unit.   The **Current Damage** column contains an eight-sectored box for each unit.   Every time a unit takes a hit in battle damage, one of the sectors is filled in.   For example, a unit that had accumulated five hits of damage would have a damage box that looks like this: When all of the sectors are filled in, the unit is destroyed.   When four to seven sectors are filled in, the unit's attack strength is cut to one-half.

The **Firing/Transport Status** column is used to show a complex variety of information about the unit.   Normally, a unit is ready to fire at any time either at a sighted target or at a suspected hiding place where an enemy unit might lie in wait.   When a unit is in this state, the symbol shown in this column is a gunsight centered on an enemy tank .   If the unit is ordered to fire, the **ready-to-fire** symbol is replaced with a **firing** symbol .   After the unit has fired, there is a period of time when it cannot fire again.   This represents the passage of time required to load the next round and to prepare the weapon to fire.   As the weapon is readied, a series of **reloading** symbols are shown.   These symbols depict a new shell being loaded into the breech of the weapon.,   ,.On the turn after this final symbol is shown, the **ready-to-fire** symbol reappears and the unit is ready to shoot again.

For units which can function as passengers (mostly towed guns and infantry), this column will indicate when the unit is being transported by a halftrack, truck or wagon.   A towed gun displays this symbol when it is being towed by a transport vehicle.   An infantry displays and a depot shows when they are being transported.   Note that neither towed guns nor infantry can fire when they are being transported so there is no conflict with the firing symbols which appear in this same column.

The final type of symbol that can appear in this column shows the status of **wreck clearing**. Full-tracked vehicles can push wrecks out of the way.   When the process is started, the **wreck clearing** symbol .   With the passage of each turn, the wreck in the symbol is pushed further to the right until it is pushed out of the symbol entirely after which the wreck on the map will be moved.   Note that a unit cannot fire while clearing a wreck so that there is no conflict with the firing symbols in this column.

The **Search Status** column indicates whether or not the unit is in **Search** mode and if so whether or not it is capable of doing a four-way or an eight-way search.   The eight-way search can be performed only by units which have **recon** capability.   **Search** mode allows the unit to discover adjacent enemy units which are concealed.   Such concealed units include Forward Observers and Guerrillas (which can conceal themselves even in open terrain) as well as infantry and towed guns which have concealed themselves in towns or woods.   A unit conducting a four-way search displays the symbol while units conducting an eight-way search show the   symbol.   Units in **Search** mode move at half their normal rate because they are spending much of their time looking for concealed enemy units.   Also, units in search mode cannot use the road bonus while moving.   If they are traveling along a road through woods, they not only move at half their basic rate, but move as though they were traveling through woods where there was no road.

The **Movement Status** column indicates whether the unit now has pending movement orders which it is attempting to complete or whether it is halted and waiting for movement orders.   Units with movement orders display the symbol, while units awaiting movement orders display the symbol.

The **Unit Name** column displays the name of the unit.   For most of the units in PFW, the name is based on some type of historical weapon, usually from the WW II era.   A few of the units in PFW are from the Cold War era and a few are purely generic.

The **Current Activity** column tells you when a transport vehicle is picking up, transporting or disembarking a passenger.   For passenger units, the corresponding information is displayed.

The Enemy Unit Box

The Enemy Unit Box is an abbreviated version of the Friendly Unit Box. Enemy units that you currently have spotted *and identified* are listed in this box. Unlike the Friendly Unit box, however, the listings in the Enemy Unit Box will come and go as you identify and lose track of enemy units. On the other hand, if you *kill* an enemy unit and that kill is confirmed, then the destroyed enemy unit is listed permanently for the remainder of the game.

PFW Turns

A PFW game is divided into turns. Each turn is composed of several phases:

1. You give orders to any of your units you wish.

2. You indicate you're done giving order by choosing No more orders for now from the Options menu or by pressing Control-n.

3. PFW waits for your opponent to complete his orders. Of course, your opponent might be finished before you are. It doesn't matter.

4. PFW performs the orders you've given - for shooting, movements, transport, etc. - and your opponents orders.

5. PFW determines which enemy units you can see and which of your units your enemy can see.

6. PFW displays the results of the orders and sighting calculations.

How to Give Orders to Your Units

You give orders to your units through a simple 2-step process:

1. Choose the unit you want to command.

2. Give a command.

You choose a unit by clicking on either its name in the Units List box or its picture on the map. Both the unit name and the unit picture will be highlighted.

You give a command to the unit by choosing the appropriate option from the Unit Commands menu. (There are also shortcuts available - these will be described later.)

How to Move Units

When you pick the Move option from the Unit Commands menu, you canindicate the path you want that unit to follow. Click on the map where you want the unit to move to. You can pick several points in a row and the unit will follow that path. Click Done in the Move Your Unit dialogue when you're satisfied with your move or Cancel to abort the move.

You will probably want to make your moves in several steps rather than just clicking on the destination map point. PFW chooses the most direct path to the point you indicate. It probably won't be the optimum path - it might go through a lake or into a swamp.

Because you will be using the movement option so often there is a shortcut available: Instead of choosing the unit and then picking Move, you can double-click on the unit counter on the map. You can then enter your move immediately.

You'll want to consider your moves carefully. Different units can move over different terrain types at different rates. At one end of the spectrum, all units can move quickly down roads. At the other end, most units can only move into swamps - they can never move out.

There are six different mobility classifications in PFW (See the **Terrain Movement Costs** chart in Appendix A): Full-Track, Half-Track, Scout Car, Truck, Wagon, and Infantry. If you know the mobility classification of the unit, and the type of terrain to be crossed, you can predict how this will effect the speed of the unit.

An example: An M4 76 Sherman (which is classified as Full-Track) is rated at 27 km/hour. If it's going down a road (Road - Road), it can do 54 km/hour. If it's going through woods (Woods - Woods), it can do only 13 km/hour.

The chart also indicates that Trucks and Wagons can't go through woods (unless they're on a road). If you order them to go through woods, they'll try valiantly, but won't make much progress.

PFW represents different speeds by the number of turns on which a unit can move. In other words, a unit moving quickly may move every turn, while a unit moving more slowly may move only once every several turns.

The units in PFW were incapable of firing accurately while moving. They had to stop, shoot, and move again. So if a unit shoots, it will stop moving for a turn or two.

How to Attack Enemy Units

There are two methods of assigning friendly units to attack enemy units. The first of these is to choose the Shoot option from the Unit Commands menu. In this method, you select friendly units, one at a time, and assign them to their targets.

After choosing Shoot, a targeting cursor will appear. Move the cursor to your intended target location, and click the mouse. This will lock the units weapons on that location. You can change your mind and change the location you're shooting at any time until you choose No more orders for now.

Your shooting orders (as well as your opponents) will be carried out after you choose No more orders for now.

Anytime before choosing No more orders for now you can cancel your shooting orders for a specific unit. Choose the Cancel Shooting menu item to do this.

Ranging for Indirect Fire

Before a weapon can use Indirect Fire it must "range" or "register" with a Forward Observer (FO). Ranging is simply the process of firing a few rounds so that the Forward Observer can see where they land. This process compensates for the differences in location of the weapon and the FO, as well as compensating for errors where units aren't located quite where they think they are.

To range a weapon, choose the Shoot option for that weapon during a normal turn and choose the Range option. PFW will ask you to select a Forward Observer to observe fire; you can do this by clicking on the FO of your choice. The weapon will fire a ranging shot at the end of the turn. The unit and FO will then be properly coordinated, and you can use Indirect Fire from then on. However, when either the FO or the weapon move, ranging must be established again.

Shooting is a common option in PFW. You'll frequently want to attack an enemy unit with several of your units (often as many as you can). The second method of attack is a shortcut to make this procedure easier called **Shoot By Example** (Figure 11.)

To use Shoot By Example, click the **right** mouse button on the map location you wish to fire at. The dialogue box on the right will be displayed. It will list all of your units now capable of firing at that location. You can select the units you want to shoot with from the list on the left. If you then move them to the list on the right by pressing the >> Shoot >> button, they will fire. Or, to do the most damage you can, press the >> Shoot With Everything >> button.

The **Current Odds** display in the Shoot by Example box indicates the effective ratio of attack factors vs.. the defense factor of the target. In general, the more weapons you have firing at the target, the higher this ratio will be. As the ratio increases, so does the amount of damage that the target is likely to suffer. For details on the relationship between combat odds and damage inflicted, see Appendix D (**Combat Results Table**.)

You can make as many changes in the dialogue as you like - no orders are sent to the units until the OK button is pressed.

How to Transport Units

Many units can't move on their own. For example, towed guns can't move unless there is a vehicle to tow them. Other units such as infantry can move, though slowly. Both of these types of units can benefit by being transported by other units. The guns can be towed and infantry can be moved in vehicles such as trucks and halftracks.

To transport a unit:

☞ The transporting unit must have transport capability. Generally, trucks and halftracks do; other units don't.

☞ The transported unit must be capable of being a passenger. Troops and guns can be passengers; vehicles can't.

☞ The transporting and transported units must be adjacent so that the passenger can be loaded.

Once the passenger unit has been loaded, it will move with the transporting unit. The two units now share some experiences:

☞ If the transporting unit could not report what it sees, it can when carrying a passenger. For examples, trucks don't have radios to report in, but if they're carrying troops, the troops do have radios.

☞ If the transporting unit takes enemy fire and is damaged, the passengers also take damage. If half of your halftrack company is destroyed by enemy fire, half of the troops riding in them are killed as well.

☞ Note that passengers can't fight while they're being transported. They must be unloaded to fight.

How to Clear Wrecks

Some units - tanks, for example, don't disappear when they die. Rather, they leave large, nasty wreckage. Frequently this wreckage is merely a monument to the battle you have fought. Sometimes though it's a problem because it blocks a road you need to use, or occupies a location you want for one of your units. If that's the case you'll have to push the wreck out of your way. You can also move wreckage for other purposes - for example, you might want to move a wreck so it blocks your opponents path of advance.

You need to keep several things in mind when moving a wreck:

☞   Wrecks can only be moved full-tracked vehicles. Wrecks are typically tanks, and they can't be moved by trucks or infantry.

☞   The unit clearing the wreck must be next to the wreck to move it.

☞   Wrecks can't be moved too far at one time. You can only shove a wreck to an adjacent location. Of course, you can then move next to the wreck's new location and shove it some more.

How to Use Sighting

After each turn in PFW, the enemy units that you can see will automatically be displayed on the map and listed on the Enemy Units list.

You might want to send out scouting units to gather information. You'll want to position these units where they have a good view of the surrounding terrain. There are two options in PFW to help determine good scouting locations.

First, you can use the Display Sighting Range Maximum option on the Commands menu to see the sighting range for any unit (Figure 12.) Using the option, the outer circle is the range at which you can see the enemy 'fuzzily'; the inner circle is the range at which you can clearly make him out.

Second, you can use the Display Sighting Range Actual to see the exact locations that are visible to the sighting unit (Figure 13.) The difference between these two options is that the "Actual" sighting range displays the limitations on sighting due to line of sight blocks.

Remember that units can hide in some types of terrain - in towns and woods, for example. The only way to see such units is to move a unit right next to them.

Some units are even more difficult to locate. Forward Observers are typically one or two soldiers with a radio who try very hard not to be discovered. Guerrilla units by their nature readily blend into the local populace. If these units fire at you, they betray themselves and become visible to you. There are also two other ways to discover these types of units:

☞ You'll discover those units if you stumble across them while moving your units. You must move right over them however - if you're merely close to them, you still won't see them.

☞ You can move next to them and issue a Search command to your unit. This command will cause your unit to temporarily halt and intensely search the immediately adjacent terrain looking for concealed enemies.

Summary of Commands

File Menu

New...
Selects a scenario for starting a new game.

Open...
Resumes a game in progress that you previously saved.

Save As...
Saves the state of the game currently in progress in a new file. This option provides a convenient way to store the game in progress at various points for later review.

Close
Closes the game currently in progress but leaves you in PFW.

Exit
Closes any game in progress and exits PFW.

Options Menu

No more orders for now
Signals the end of a turn. All orders (movement, shooting, etc.) are processed.

Cancel All Shooting Orders
Cancel all pending fire orders you've just given. This allows you start over with a new fire plan.

Read Scenario Description
Displays the written description of the scenario you're currently playing. The Scenario Description will tell you what you must do in order to win the scenario.

Read Tactical Advice
This provides some brief suggestions on how each team might best pursue victory in the current scenario.

See Game Information
Displays information about the scenario you're playing including the time limit, elapsed game time, and visibility limits.

Display Time Remaining
This gives you a scenario clock in the form of a progress bar. It can be dragged to somewhere on the screen and left running so you can keep track of how much time remains in the scenario.

Send a Message to Your Opponent
Allows you to write a message that will be displayed on your opponents screen. This is useful for chatting during a game and goading your opponent.

Surrender Options
Allows you to offer your surrender to your enemy, demand his surrender, or request that the scenario be declared a draw..

Sights and Sounds Menu

Display a 1Km Grid
Overlays the map with a 1Km grid as is standard in most military maps.

Map Scale

Small Map
Displays the map in its smallest size. This is most suitable for 640 X 480 displays.

Larger Map
Displays a larger map most suitable for a 800 X 600 display.

Still Larger Map
Displays the map in a scale suitable for 1024 X 768 displays.

Replot Map
Redraws the map on the screen.

Redisplay Last Turn
This option gives you an instant replay of the last turn. Useful for reviewing and analyzing complex events during battle.

Display All Shooting Ranges
Graphically displays the shooting ranges of all of your units.

Display All Sighting Ranges
Graphically displays the sighting ranges of all of your units.

Enable Combat Sounds
Toggles on/off the sounds of weapons firing during combat. The sounds indicate the number of weapons fired and distinguish between the sounds of armor piercing and high explosive weapons. The sound effects also indicate when damage is done to the target. Both friendly and enemy fire are indicated by the combat sound effects.

Enable Movement Sounds
Toggles on/off a generic motor sound to indicate when any unit (either friendly or enemy) is moving.

Unit Commands Menu

These options operate on the currently selected unit only.

Display Shooting Range
Displays the maximum shooting range of that unit. Also shows one-half of the maximum range.

Actual
Takes into account the effect of terrain on the unit's Line of Fire (LOF); this provides an accurate display of what the unit can actually shoot at.

Maximum
Ignores the effect of terrain on Line of Fire (LOF); useful for plotting the maximum range of the unit's weapon.

Display Sighting Range
Displays the limit of visibility for that unit. Also shows the range at which the unit can see things clearly.

Actual
Takes into account the effect of terrain on the unit's Line of Sight (LOS); this provides an accurate display of what the unit can actually see.

Maximum

Ignores the effect of terrain on Line of Sight (LOS), useful for plotting the viewing distance as set by the scenario.

Load a Passenger

Allows the currently selected transport unit to load or unload a passenger unit.

Move

Activates the movement orders routine for the current unit. This lets you enter a movement path up to twenty segments in length.

Search

Orders the current unit to search adjacent areas looking for concealed enemies such as Guerrillas and Forward Observers. Search mode slows the unit down to half its normal movement rate and deprives it of the ability to use the road movement bonus.

Shoot

Orders the currently selected unit to shoot. The secondary menu presents the following options:

Direct Fire

Orders the unit to attack using direct fire.

Indirect Fire

Orders the unit to attack using indirect fire.

Range for Indirect Fire

Range the unit to set up for future indirect fire.

Close Assault

Close assault an enemy unit.

Cancel Shooting Order

Cancel the current shooting order.

Clear a Wreck

Allows the currently selected unit to move an enemy or friendly wreck out of the way.

Overrun

Allows the currently selected unit to overrun an enemy unit.

Show Move In Progress

Plots the current path that the unit has been ordered to follow.

Unit Information...

Displays detailed information about the currently selected friendly unit. A detailed graphic of the unit will be displayed if available from PFWUNITS.DLL.

Help Menu

Commands

Documents the commands available from the PFW Menu Bar.

Procedures

Documents the methods (shooting, moving units, etc.) used in PFW.

Symbols
Documents the graphic elements (terrain, units, etc.) used in PFW.

About Panzerkrieg for Windows...
Displays information about this version of Panzerkrieg for Windows.

Tactics

This section of the manual will explain tactics you might employ in a PFW game.

The secret of winning a PFW scenario is to apply good tactics in using the forces assigned to you. This means that you must understand the strengths and weaknesses of each of your units. You must understand how to use your units together is such a way that their strengths are combined into an effective force that can achieve whatever victory conditions have been set by the scenario.

The units used in PFW fall into a number of categories based on what kind of function each unit is best equipped to serve.

Reconnaissance units are used primarily to gather information. Typically they are lightly armed and highly mobile. They may be lightly armored to provide protection from infantry class weapons and light artillery fire. For the most part, they are expendable units whose main purpose is to let you discover where the enemy is located, and which direction they are moving. Reconnaissance units depend mostly depend upon their speed to get them out of trouble, but they may expend themselves as a delaying force if needed in order to give you more time to marshal your main forces to meet the enemy threat.

The various scout cars and light tanks, such as the Puma and the Stuart or BT-5, are typical reconnaissance units.

Transport units do exactly what their name implies. They can pick up non-mobile or very slow-moving units and carry them to another part of the map. Naturally, the unit that they pick up must be eligible to function as a passenger. The typical passenger for a transport unit will be either a towed gun or an infantry unit. The use of transport lets you concentrate these units, usually for a defense, or to withdraw them from an enemy advance.

PFW uses three types of transport units: trucks, halftracks and wagons.

Trucks are the fastest transport unit providing you have an unobstructed road available. On the other hand, trucks have rather poor off-road mobility. They are particularly useful for moving reserves behind your own lines where you have control of the road net and trucks can travel without being exposed to enemy observation and fire. Trucks *can* be used for moving troops in the battle area, but only at very great risk. Remember that while loaded onto transport, a combat unit depends on the *transport's* defense factor for protection, and trucks are very vulnerable to anything that shoots.

Halftracks are excellent all-purpose transport. While not as fast as trucks when on a road, halftracks have much better off-road mobility. In addition, halftracks are armored which makes them resistant to enemy small arms fire. Halftracks also are armed with light machine guns which makes them a superb transport for infantry who are going into combat against enemy infantry. In the defense, a halftrack deployed immediately behind your infantry position provides excellent fire support against attacking infantry or cavalry. In the offense, the halftrack is perfect for carrying your infantry into the attack against enemy infantry or enemy gun positions. The halftrack can disembark your infantry and then provide fire support for that infantry as it attacks the enemy position.

Wagons are what you use for transportation when you desperately need transportation and there are neither halftracks nor trucks available. The horse-drawn wagon is included in PFW mainly because it played a major role as transport in World War II. Wagons are very slow compared both to trucks and halftracks, but sometimes having a wagon at a critical location can make the difference between victory and defeat. Perhaps the wagon's greatest value, though, is its expendability. Wagons are nearly as valuable as a temporary road obstruction (it would be a misrepresentation to refer to them as road*blocks*) as they are as transport. Of course wagons are prized, after a fashion, by scenario designers who have a perverted sense of humor.

Assault units are those units which are equipped to spearhead an attack against an organized enemy defense. In

PFW this translates pretty much into *main battle tanks*, *tank destroyers* and *assault guns*. These units characteristically are equipped with heavy armor, fair to good mobility and powerful guns. When massed into a sufficiently large strike force, these units can assault an enemy position, withstand heavy defensive fire, and destroy the defenders with their own heavy firepower. Of course, doing this usually is expensive. The strike force is likely to be considerably weaker following such an assault, so it is critical to launch such an assault at a time and place where the rewards are great enough to justify the cost.

Main battle tanks are armored fighting vehicles (AFVs) equipped with a heavy caliber main gun mounted in a rotating turret. The World War II main battle tank was exemplified by the American M4 (Sherman), the German PzKw V (Panther), and the Russian T34/85.

Tank destroyers were AFVs built on a standard tank chassis but without a rotating turret. The main gun was mounted directly into the chassis. These vehicles had the advantage of being cheaper to build, and mechanically simpler than tanks (and therefore easier to maintain.) Because tank destroyers lacked a turret, they also enjoyed a lower profile than tanks; this made them harder to hit by enemy fire. On the other hand, the tank destroyer had to turn its entire chassis in order to aim its main gun; the vehicle could only fire directly to its front. This was a major disadvantage, especially when the tank destroyer was used offensively. Tank destroyers are exemplified by the American M-36, the German Stu-III, and the Russian SU-85. Since PFW does not directly model the effect of vehicle facing, there is no great practical difference between tanks and tank destroyers. The difference between these two types of vehicles is partially reflected in the fact that the tank destroyer usually has a slightly lower attack factor than does the corresponding tank.

Both tanks and tank destroyers fired mostly armor piercing ammunition. The assault gun typically was a tank destroyer equipped with a howitzer as a main gun. The weapon fired a low velocity, heavy caliber high explosive round. Assault guns accompany tanks and tank destroyers into the attack in order to provide the HE firepower to deal effectively with enemy infantry and defensive gun positions. Because the howitzer was carried in the same type of mount as the tank's armor piercing gun, the howitzer could be used in direct fire mode only; it was not an indirect fire weapon. In PFW, the American M4-105, the German StuH-42, and the Russian SU-152 are typical assault guns.

Blocking units typically are relatively stationary and sometimes completely non-mobile. They serve to deny a piece of terrain to the enemy by occupying that terrain themselves. Typically, a blocking unit will take up a position on a critical road or hilltop and fight to the death to prevent the enemy from occupying/using that piece of terrain. Blocking units and Fire Support units are natural partners. Used properly in combination, they can make a formidable defensive barrier. The Fire Support units cover the Blocking unit's position with defensive fire and the Blocking units prevent the enemy from reaching the Fire Support units.

The classic Blocking units are Infantry and Fortified Gun Emplacements. Such units are tough defensively so they are difficult to kill. Often they are, themselves, well armed with short range weapons which makes them very dangerous when the enemy moves into close contact.

Fire Support units are used both defensively and offensively to provide heavy firepower in support of friendly units who are, or soon will be, in direct contact with the enemy. There are a wide variety of units that fall into this category. Mostly, they are armed with two main categories of weapons.

First are the towed guns which mostly are used defensively to provide fields of defensive fire against attacking enemy units. When supplied with adequate transport, however, they can be used to support attacks by friendly forces. The best known of these weapons are the American 90mm gun, the German 88mm gun, and the Russian 76mm and 85mm guns. Second are the heavy caliber long-range indirect fire weapons such as the howitzers and heavy mortars whose fire is directed by Forward Observers. Typical of these weapons were the American 105mm and 155mm (Long Tom) howitzers, the German 105mm, 150mm and 170mm howitzers, and the Russian 152mm howitzer and 120mm Mortar. Two rather exotic members of this category also were the German Nebelwerfer and Russian Katuysa weapons. Both of these were ballistic rockets fired in great volleys. While not especially accurate, they did have an especially damaging effect on enemy morale.

For what it is worth, the German word "Nebelwerfer" means "Cloud-Thrower" (a good descriptive term for the swarm of rockets fired by this weapon) and "Katuysa" means "Katy" or "Kathy" (presumably a reference to

Catherine the Great.) The Nebelwerfer (the self-propelled version of which appears in PFW as the Maultier) was also given the name "Screaming Meemie" by American troops because of the ear-splitting shriek produced by incoming the swarm of rockets. The Russian Katuysa enjoyed the delightfully ambiguous name of "Stalin's Organ." The word "Organ" here presumably is, again, a reference to the deafening sound produced by a swarm of rockets in flight.

Fire support units typically were armed with very powerful, long-range weapons. However, these units were generally ill-equipped to fight in direct contact with the enemy as they lacked either the defensive armor or the low-profile necessary to survive long in the battle area itself. Some of these weapons were self-propelled and sometimes were even lightly armored. Those that did possess armor had little more protection than did halftracks. Unlike halftracks, however, all of these weapons were in the category of "high-value targets." Had they been spotted in the battle area by the enemy, they would have immediately drawn heavy fire.

More than anyone else, the Germans excelled at inventing some exotic forms of self-propelled fire support weapons. Perhaps the most interesting of these was the Nashorn (Rhinoceros). This armored vehicle carried a long-barreled 88mm gun equipped with special optical sights that made it accurate and deadly at very long range.

This classification should be viewed as little more than a rule of thumb rather than a strict definition of what kinds of units can be used in what roles. Tactics is an exercise in pragmatism. You can, and must, use whatever you have available to do whatever job needs to be done. Tanks can be, and often are, used in a fire support role. Scout cars sometimes *do* engage tanks directly, depending on their speed and maneuverability rather than their armor for protection. A Nashorn sometimes *does* get into the thick of battle, albeit usually when the battle area comes to the Nashorn rather than the other way around. The successful PFW player will be the one who most imaginatively and skillfully applies the available resources to the problem at hand.

Defensive Tactics

If you are defending against an expected enemy assault or reconnaissance in force, your first priority is to discover your opponent's plan of attack. This means that your first need is for information. You must find out as much about the disposition and movement of enemy forces while revealing as little as possible about the disposition of your own forces. This is especially true when the enemy can approach you over a wide front where there is a wide choice of alternate avenues of advance. Typically, you would place reconnaissance units at each approach with, perhaps, a small blocking/ambushing force to delay the enemy advance while you move to counter the enemy advance. Of course, you must remember that the enemy will usually launch one or more feints to keep you uncertain as to the route of the main attack.

In a mobile defense, you assemble most of your armor into a counterstrike force located in some central position so that it can move quickly to where you think the main battle will take place. The attacker has the advantage of the initiative, but the skilled defender usually can choose when and where the decisive battle will take place. The sooner you can understand the attacker's plan, the more time you will have to position your forces for the decisive battle and the wider will be your range of choices as to where that decisive battle will be fought.

If your units have the advantage of superior mobility, then a mobile delay can be very effective. In a mobile delay, you constantly harass and ambush the enemy as they advance while at the same time retreating just fast enough to prevent the enemy from closing with you for a decisive attack. This means that you have to balance firing and moving very carefully. In a mobile delay, it is always tempting to stay long enough to fire one more time before retreating. An extra round of firing now can mean that your units will get caught by the advancing enemy a couple of turns later. The need to plan ahead constantly during a mobile delay makes this tactic one of the most difficult to execute successfully. However, if you are successful, you will have both slowed the enemy advance and inflicted considerable damage with little cost to yourself.

The goal of a mobile delay is to keep the enemy more or less under constant fire during their advance while denying them the chance to damage you seriously in return. The damage you inflict is never very serious at any one time, but it accumulates over a period of time. Often, a mobile delay ends with a final defensive stand in which you try to inflict a final defeat on the enemy. If your mobile delay has successfully inflicted a large amount of

cumulative damage on the enemy, they may be weakened enough so that they can be broken decisively in a final battle.

Offensive Tactics

When you are on the offense, you have to expect that at first you will take more damage than you inflict on the defender. After all *you* are the one that has to come out in the open while the enemy can hide and fire at you from cover. Also, you are usually attacking into the enemy's territory where they have had the chance to place their units so as to gain the maximum advantage provided by the terrain. The first secret to success in the offense, then, is to have a significantly larger force than the enemy. This permits you to take more damage and still be strong enough to defeat them when you finally do close with them.

There are, however, ways to limit the amount of damage that you receive while attacking. Perhaps a more accurate way of stating it is that there are ways of making sure that you get a worthwhile return on the damage that you take when assaulting an enemy position. It is a common error for a novice to advance cautiously with only one or two units when they approach an enemy position. By exposing only a small part of your force there is a false sense that you are not risking as much. The truth is that this approach is always a mistake. If the enemy is seriously defending, they will destroy the small force you have sent forward and you will have gained nothing in return. If you are going to attack an enemy position, you should expose *none* of your force until you are ready to strike; and then you should, if possible, expose *the entire strike force* at once.

The point is that even in a strongly defended position, the enemy has only so much firepower. They can fire effectively at only so much of your force at one time. While they are smashing part of your attacking force, the remainder of your units are advancing on the enemy position unmolested. While you will be taking all of the damage at first, once you close with the enemy it will be *your* turn to use your superior numbers and firepower to inflict even greater damage on the defender. If you are facing a mobile delaying action, it is even a good idea to tempt the enemy to stay just one more round to get in another shot at you while you are in the open. If you can sucker the enemy into staying just a little too long before withdrawing, then you can catch him as he tries to retreat. If you successfully force, or trick, the enemy into a decisive engagement before they are ready, the damage and even destruction that you inflict will be well worth the extra damage you took during the assault.

These basic principles of attack and defense are simple enough to state, and understand, in the abstract. The key to victory depends on how skillfully one puts these principles into practice. PFW provides a theater in which you can safely explore some of the nuances of tactical planning and execution.

You should always look for opportunities to use combined arms attacks. In defense, this means providing infantry with covering support fire. If you are on a mobile offensive with infantry, then you should always have one or more guns along to provide fire support. If you are attacking enemy infantry or gun positions, then it can be a great advantage to transport your infantry into the attack in halftracks. The halftracks are armed with light machine guns that can provide the necessary fire support after disembarking their attacking infantry.

Finally, when attacking an undamaged enemy unit you should throw as much fire at it as you possibly can. Piecemeal attacks against a lot of individual enemy units is rarely as effective as a massive attack against a single target. That single target usually should be the one that is the most immediate threat to you. Usually it will be the enemy unit that is at the head of an advancing column or the one that is the first to reach your defensive position. Other things being equal, it is usually the side that inflicts the most damage in the shortest amount of time that wins a firefight. As both of you take damage, you are both becoming weaker. You must make sure that your enemy grows weaker faster than yourself.

Appendix A - Terrain Movement Costs

	Full Track	HalfTrack	Scout Car	Truck	Wagon	Infantry
Clear - Clear	1	1	1	2	1	1
Clear - Road	1	1	1	2	1	1
Road - Road	½	½	½	½	½	½
Slope - nonSlope	2	2	2	3	2	1
Slope - Slope	3	3	3	4	3	1
Woods - Woods	2	3	3	No	No	1
Gully - nonGully	3	3	3	4	3	2

Appendix B - Weapons Effectiveness Table

Weapons Type	Target Type			
	Armored		Non-Armored	
	<= ½ range	> ½ range	<= ½ range	> ½ range
A	double AF	normal AF	half AF	half AF
H	normal AF	half AF	normal AF	normal AF
M	half AF	half AF	normal AF	normal AF
I	no effect[2]	no effect	normal AF	normal AF

AF = Attack Factor
A   = Armor Piercing
H   = High Explosive
M   = Mortar
I   = Infantry

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[2]Infantry/Cavalry may attack armored targets successfully only by Close Assault if adjacent.

Appendix C - Terrain Effects Table

Attacking unit on:	Defending Unit On:						
	Ground	Slope[3]	Hilltop	Woods	Town[4]	Swamp	Water
Ground	normal AF	half AF	half AF[5]	dieroll +1	dieroll +2	dieroll +1	dieroll +2
Slope	normal AF	half AF	half AF	dieroll +1	dieroll +2	dieroll +1	dieroll +2
Hilltop	normal AF	half AF	normal AF	dieroll +1	dieroll +2	dieroll +1	dieroll +2

[3]Normal Attack Factor if attacker is adjacent.
[4]Close Assault attacks are exempt from woods/towns dieroll modification.
[5]Indirect Fire onto hilltops is not halved. Howitzers are considered to use indirect fire if their fire is directed by a Forward Observer. Mortar fire is always exempt from this terrain effect.

Appendix D - Combat Results Table[6]

Modified Dieroll	Combat Odds[7]						
	1:4	1:3	1:2	1:1	2:1	3:1	4:1
-1	(■)	■(■)	■■(■)	■■(■)	■■(■)	■■(■)	■■(■)
0		(■)	■(■)	■(■)	■■(■)	■■(■)	■■(■)
1		(■)	(■)	■(■)	■■(■)	■■(■)	■■(■)
2			(■)	(■)	■(■)	■■(■)	■■(■)
3				(■)	■(■)	■■(■)	■■(■)
4					(■)	■(■)	■■(■)
5					(■)	■(■)	■■(■)
6						(■)	■■(■)
7						(■)	■(■)
8						(■)	■(■)

[6]Combat results are shown as the number of damage boxes filled in. One damage box is filled in for each "■ ." The "(■)" result is added to the total damage when the Combined Arms Effect is invoked. That is, when a Close Assault is combined with friendly supporting fire (either direct or indirect) The damage in parenthesis is added to whatever other damage is done by the Close Assault. This addition is made regardless of whether the supporting fire does any damage on its own.

[7]Combat Odds = Total attack factors (as modified by Weapons Effectiveness Table and Terrain Effects Table) divided by Defense Factor of the target unit and then rounded down to the nearest integer value. Attacks are divided into the maximum number of 4:1s plus a residual attack. For example, if the total modified attack factors = 30 and the defense factor of the target = 3 then the Combat Odds is 10:1 (i.e. 30:3.) The combat is resolved as two 4:1 attacks followed by one 2:1 attack. If there is no combined arms effect then the most likely result will be five (■■■■■) damage boxes filled in.

Appendix E - The Units of Panzerkrieg for Windows

Unit	Nationality	Era	Speed KM/Hr	Mobility Type	Attack Range (Meters)	Weapon Type	Relative Attack	Defensive Type	Relative Defense	Primary Function
T-34C	Soviet	WW II	33	Full-tracked	1750	Armor Piercing	75	Armored	56	Assault
T-34/85	Soviet	WW II	33	Full-tracked	2250	Armor Piercing	93	Armored	68	Assault
SU-76	Soviet	WW II	27	Full-tracked	1250	Armor Piercing	75	Armored	50	Assault
SU-85	Soviet	WW II	33	Full-tracked	2250	Armor Piercing	93	Armored	68	Assault
KV-85	Soviet	WW II	30	Full-tracked	2250	Armor Piercing	93	Armored	75	Assault
SU-100	Soviet	WW II	24	Full-tracked	2500	Armor Piercing	100	Armored	87	Assault
JSU-122	Soviet	WW II	21	Full-tracked	2750	Armor Piercing	112	Armored	93	Assault
SU-152	Soviet	WW II	21	Full-tracked	2500	High Explosive	281	Armored	100	Assault
JS-II	Soviet	WW II	24	Full-tracked	2500	Armor Piercing	112	Armored	81	Assault
JS-III	Soviet	Cold War	24	Full-tracked	3000	Armor Piercing	112	Armored	100	Assault
T-26B	Soviet	WW II	18	Full-tracked	750	Armor Piercing	31	Armored	31	Blocking
BT-5	Soviet	WW II	39	Full-tracked	750	Armor Piercing	31	Armored	31	Recon
BT-8	Soviet	WW II	39	Full-tracked	1250	Armor Piercing	62	Armored	31	Recon
KV-1	Soviet	WW II	30	Full-tracked	1500	Armor Piercing	75	Armored	81	Assault
KV-2	Soviet	WW II	24	Full-tracked	2000	High Explosive	250	Armored	62	Assault
T-35	Soviet	WW II	18	Full-tracked	1500	High Explosive	62	Armored	56	Blocking
T-10	Soviet	Cold War	24	Full-tracked	2500	Armor Piercing	125	Armored	87	Assault
T-55	Soviet	Cold War	33	Full-tracked	2000	Armor Piercing	106	Armored	75	Assault
T-62	Soviet	Cold War	30	Full-tracked	2000	Armor Piercing	112	Armored	81	Assault
Snapper	Soviet	Cold War	30	Half-tracked	2500	Armor Piercing	187	Armored	37	Fire Support
Halftrack	Soviet	WW II	30	Half-tracked	500	Infantry	12	Armored	18	Transport
Rifle	Soviet	WW II	3	Infantry	1000	Infantry	18	Non-Armored	43	Blocking

Name	Nationality	Era		Type		Ammo		Armor		Role
Guards	Soviet	WW II	3	Infantry	1250	Infantry	25	Non-Armored	50	Blocking
Submachine Gun	Soviet	WW II	3	Infantry	250	Infantry	37	Non-Armored	37	Blocking
Engineer	Soviet	WW II	3	Infantry	500	Infantry	25	Non-Armored	37	Blocking
Recon Infantry	Soviet	WW II	6	Infantry	500	Infantry	12	Non-Armored	25	Blocking
Cavalry	Soviet	WW II	12	Infantry	500	Infantry	62	Non-Armored	50	Blocking
12.7 mm.	Soviet	WW II	0	Passenger Only	1000	Infantry	25	Non-Armored	12	Fire Support
45 mm.	Soviet	WW II	0	Passenger Only	1000	Armor Piercing	43	Non-Armored	12	Fire Support
57 mm.	Soviet	WW II	0	Passenger Only	1000	Armor Piercing	56	Non-Armored	12	Fire Support
76.2 mm.	Soviet	WW II	0	Passenger Only	1250	Armor Piercing	75	Non-Armored	12	Fire Support
76.2 mm Infantry Gun	Soviet	WW II	0	Passenger Only	2500	High Explosive	18	Non-Armored	12	Fire Support
122 mm Howitzer	Soviet	WW II	0	Passenger Only	6250	High Explosive	250	Non-Armored	6	Fire Support
82 mm. Mortar	Soviet	WW II	3	Infantry	3000	Mortar	12	Non-Armored	12	Fire Support
82 mm.	Soviet	WW II	3	Infantry	3000	Mortar	18	Non-Armored	12	Fire Support
120 mm	Soviet	WW II	0	Passenger Only	4500	Mortar	156	Non-Armored	12	Fire Support
85 mm.	Soviet	WW II	0	Passenger Only	4000	Armor Piercing	125	Non-Armored	6	Fire Support
152 mm.	Soviet	WW II	0	Passenger Only	6250	High Explosive	375	Non-Armored	6	Fire Support
PzKw III E	German	WW II	24	Full-tracked	750	Armor Piercing	31	Armored	37	Blocking
PzKw III J	German	WW II	24	Full-tracked	1000	Armor Piercing	50	Armored	37	Blocking
PzKw III M	German	WW II	27	Full-tracked	1500	Armor Piercing	50	Armored	43	Assault
PzKw IV D	German	WW II	24	Full-tracked	2000	High Explosive	31	Armored	43	Assault
PzKw IV(W)	German	WW II	24	Full-tracked	2000	Armor Piercing	62	Armored	43	Assault
PzKw IV SS	German	WW II	24	Full-tracked	2000	Armor Piercing	87	Armored	50	Assault
Panther(w)	German	WW II	30	Full-tracked	2750	Armor Piercing	75	Armored	81	Assault
Panther(ss)	German	WW II	30	Full-tracked	2750	Armor Piercing	93	Armored	87	Assault
Tiger I	German	WW II	24	Full-tracked	3000	Armor	93	Armored	68	Assault

						Piercing				
King Tiger	German	WW II	18	Full-tracked	3000	Armor Piercing	112	Armored	93	Assault
Marder III	German	WW II	24	Full-tracked	2250	Armor Piercing	75	Armored	43	Assault
Hetzer	German	WW II	21	Full-tracked	2000	Armor Piercing	75	Armored	68	Assault
StuG III	German	WW II	24	Full-tracked	2000	Armor Piercing	75	Armored	68	Assault
StuH 42	German	WW II	24	Full-tracked	2500	High Explosive	87	Armored	62	Assault
JdgPz IV	German	WW II	24	Full-tracked	2750	Armor Piercing	93	Armored	50	Assault
JdgPz V	German	WW II	27	Full-tracked	3000	Armor Piercing	112	Armored	93	Assault
JdgPz VI	German	WW II	15	Full-tracked	3000	Armor Piercing	156	Armored	112	Assault
Light Scout	German	WW II	48	Scout Car	1000	High Explosive	18	Armored	18	Recon
Puma	German	WW II	45	Scout Car	1250	Armor Piercing	50	Armored	18	Recon
Heavy Scout	German	WW II	42	Scout Car	2000	Armor Piercing	75	Armored	18	Recon
Pz II	German	WW II	36	Full-tracked	750	Armor Piercing	12	Armored	25	Recon
Lynx	German	WW II	30	Full-tracked	1000	High Explosive	18	Armored	37	Recon
Rifle	German	WW II	3	Infantry	500	Infantry	18	Non-Armored	50	Blocking
SMG	German	WW II	3	Infantry	250	Infantry	37	Non-Armored	37	Blocking
Engineer	German	WW II	3	Infantry	500	Infantry	18	Non-Armored	43	Blocking
Security	German	WW II	3	Infantry	500	Infantry	12	Non-Armored	31	Blocking
50 mm.	German	WW II	0	Passenger Only	1000	Armor Piercing	50	Non-Armored	12	Fire Support
75 mm.	German	WW II	0	Passenger Only	1750	Armor Piercing	87	Non-Armored	12	Fire Support
88 mm.	German	WW II	0	Passenger Only	5000	Armor Piercing	137	Non-Armored	6	Fire Support
20 mm.	German	WW II	0	Passenger Only	2250	High Explosive	25	Non-Armored	12	Fire Support
20 mm. QUAD	German	WW II	0	Passenger Only	2250	High Explosive	87	Non-Armored	12	Fire Support
37 mm.	German	WW II	0	Passenger Only	2750	High Explosive	37	Non-Armored	12	Fire Support
75 mm. Infantry Gun	German	WW II	0	Passenger Only	3000	High Explosive	12	Non-Armored	12	Fire Support

75 mm. Howitzer	German	WW II	0	Passenger Only	7000	High Explosive	125	Non-Armored	12	Fire Support
105 mm. Howitzer	German	WW II	0	Passenger Only	8000	High Explosive	250	Non-Armored	12	Fire Support
150 mm. Infantry Gun	German	WW II	0	Passenger Only	3000	High Explosive	125	Non-Armored	12	Fire Support
150 mm. Howitzer	German	WW II	0	Passenger Only	9000	High Explosive	375	Non-Armored	12	Fire Support
170 mm.	German	WW II	0	Passenger Only	20000	High Explosive	312	Non-Armored	12	Fire Support
81 mm.	German	WW II	3	Infantry	2500	Mortar	18	Non-Armored	12	Fire Support
120 mm.	German	WW II	0	Passenger Only	4500	Mortar	112	Non-Armored	12	Fire Support
Nebelwerfer	German	WW II	0	Passenger Only	4000	High Explosive	375	Non-Armored	6	Fire Support
Wirbelwind	German	WW II	24	Full-tracked	2500	High Explosive	75	Armored	37	Fire Support
GW 38(M)	German	WW II	18	Full-tracked	3500	High Explosive	100	Armored	31	Fire Support
Maultier	German	WW II	30	Half-tracked	3500	High Explosive	250	Armored	25	Fire Support
Wespe	German	WW II	24	Full-tracked	9000	High Explosive	250	Armored	31	Fire Support
Hummel	German	WW II	24	Full-tracked	9000	High Explosive	375	Armored	37	Fire Support
Nashorn	German	WW II	24	Full-tracked	5000	Armor Piercing	137	Armored	37	Fire Support
88mm (FORT)	German	WW II	0	Non-mobile	5000	Armor Piercing	137	Armored	112	Fire Support
75mm (FORT)	German	WW II	0	Non-mobile	2500	Armor Piercing	81	Armored	112	Fire Support
50mm (FORT)	German	WW II	0	Non-mobile	1250	Armor Piercing	50	Armored	112	Fire Support
Halftrack	German	WW II	30	Half-tracked	750	Infantry	12	Armored	25	Transport
M4 75 Sherman	Allied	WW II	24	Full-tracked	2000	Armor Piercing	68	Armored	56	Assault
M4 76 Sherman	Allied	WW II	27	Full-tracked	2500	Armor Piercing	81	Armored	56	Assault
Sherman (UK)	Allied	WW II	24	Full-tracked	2000	Armor Piercing	62	Armored	50	Assault
M47 Patton	NATO	Cold War	39	Full-tracked	2000	Armor Piercing	100	Armored	68	Assault
AMX 13	NATO	Cold War	33	Full-tracked	3000	Armor Piercing	125	Armored	50	Assault
Char B	Allied	WW II	18	Full-tracked	750	Armor Piercing	31	Armored	43	Blocking
Cromwell	Allied	WW II	21	Full-tracked	2000	Armor Piercing	56	Armored	50	Assault

Flamethrower	Allied	WW II	15	Full-tracked	250	High Explosive	250	Armored	68	Blocking
M4 105	Allied	WW II	27	Full-tracked	2500	High Explosive	100	Armored	56	Assault
Sherman Flail	Allied	WW II	24	Full-tracked	2000	Armor Piercing	56	Armored	50	Blocking
M24	Allied	WW II	33	Full-tracked	2000	Armor Piercing	68	Armored	43	Assault
M10	Allied	WW II	27	Full-tracked	2500	Armor Piercing	81	Armored	37	Assault
M16	Allied	WW II	30	Half-tracked	1000	Infantry	50	Armored	18	Transport
M18	Allied	WW II	36	Full-tracked	2500	Armor Piercing	81	Armored	31	Assault
M36	Allied	WW II	27	Full-tracked	3000	Armor Piercing	93	Armored	37	Assault
Achilles	Allied	WW II	27	Full-tracked	2750	Armor Piercing	93	Armored	37	Assault
Scout Car	Allied	WW II	42	Scout Car	500	Infantry	12	Armored	12	Recon
M20	Allied	WW II	45	Scout Car	1000	Infantry	12	Armored	18	Recon
M8 Greyhound	Allied	WW II	45	Scout Car	1250	Armor Piercing	18	Armored	18	Recon
Daimler	Allied	WW II	48	Scout Car	1000	Armor Piercing	18	Armored	18	Recon
Stuart	Allied	WW II	33	Full-tracked	1500	Armor Piercing	31	Armored	31	Recon
Rifle	Allied	WW II	3	Infantry	500	Infantry	18	Non-Armored	37	Blocking
Arm. Infantry	Allied	WW II	3	Infantry	500	Infantry	25	Non-Armored	62	Blocking
Machine Gun	Allied	WW II	3	Infantry	500	Infantry	12	Non-Armored	25	Blocking
Engineer (US)	Allied	WW II	3	Infantry	500	Infantry	12	Non-Armored	37	Blocking
Engineer (UK)	Allied	WW II	3	Infantry	500	Infantry	18	Non-Armored	50	Blocking
57 mm.	Allied	WW II	0	Passenger Only	1000	Armor Piercing	56	Non-Armored	12	Fire Support
17 lbr	Allied	WW II	0	Passenger Only	2500	Armor Piercing	87	Non-Armored	12	Fire Support
76 mm. AT	Allied	WWII	0	Passenger Only	2500	Armor Piercing	75	Non-Armored	12	Fire Support
90 mm.	Allied	WW II	0	Passenger Only	4500	Armor Piercing	112	Non-Armored	6	Fire Support
40 mm.	Allied	WW II	0	Passenger Only	2250	High Explosive	50	Non-Armored	12	Fire Support
76 mm.	Allied	WW II	3	Infantry	2000	Mortar	18	Non-Armored	12	Fire Support
107 mm.	Allied	WW II	0	Passenger	3750	Mortar	62	Non-	12	Fire Support

				Only				Armored		
25 lbr Howitzer	Allied	WW II	0	Passenger Only	8750	High Explosive	218	Non-Armored	12	Fire Support
105 mm. Howitzer	Allied	WW II	0	Passenger Only	8000	High Explosive	250	Non-Armored	12	Fire Support
155 mm. Howitzer	Allied	WW II	0	Passenger Only	9000	High Explosive	375	Non-Armored	12	Fire Support
6-inch Gun (empl)	Allied	WW II	0	Non-Mobile	9000	High Explosive	375	Armored	62	Fire Support
8 inch Howitzer	Allied	WW II	0	Passenger Only	10000	High Explosive	500	Non-Armored	12	Fire Support
Sexton	Allied	WW II	24	Full-tracked	9000	High Explosive	218	Armored	43	Fire Support
Priest	Allied	WW II	24	Full-tracked	9000	High Explosive	250	Armored	43	Fire Support
Bren Carrier	Allied	WW II	30	Half-tracked	500	Infantry	12	Armored	12	Transport
Halftrack M3	Allied	WW II	30	Half-tracked	500	Infantry	12	Armored	18	Transport
Command Post	Generic	Generic	0	Passenger Only	0	None	0	Non-Armored	6	Special
Depot (fuel)	Generic	Generic	0	Passenger Only	0	None	0	Non-Armored	6	Special
Forward Observer	Generic	Generic	9	Infantry	0	None	0	Non-Armored	6	Special
Communications Ctr.	Generic	Generic	0	Non-Mobile	0	None	0	Non-Armored	6	Special
Depot	Generic	Generic	0	Passenger Only	0	None	0	Non-Armored	6	Special
Amphibious Tank	Generic	Generic	21	Full-tracked	1500	Armor Piercing	62	Armored	37	Assault
DUCK (Amphib)	Generic	Generic	24	Half-tracked	1500	Armor Piercing	37	Armored	31	Transport
DUCK II (Amphib)	Generic	Generic	27	Half-tracked	1750	Armor Piercing	68	Armored	50	Transport
Fire Support Team	Generic	Generic	30	Full-tracked	2500	High Explosive	100	Armored	68	Fire Support
Mobile Rifle	Generic	Generic	9	Infantry	1000	Infantry	25	Non-Armored	50	Blocking
Assault Infantry	Generic	Generic	9	Infantry	750	Infantry	25	Non-Armored	62	Blocking
Ranger	Generic	Generic	30	Infantry	750	Mortar	62	Non-Armored	68	Special
Guerrilla	Generic	Generic	33	Infantry	500	Mortar	250	Non-Armored	12	Special
Guerrilla Cadre	Generic	Generic	24	Infantry	500	Mortar	250	Non-Armored	25	Special
Convoy Truck	Generic	Generic	36	Truck	0	None	0	Non-Armored	6	Special
Wagon	Generic	Generic	9	Wagon	0	None	0	Non-	6	Transport

								Armored		
Truck	Generic	Generic	36	Truck	0	None	0	Non-Armored	6	Transport
Truck	Generic	Generic	42	Truck	0	None	0	Non-Armored	6	Transport

Appendix F - Files

PFW creates and maintains a number of different files on your hard disk. Here are a list of the files you'll see:

PFW.EXE   The main PFW program file.

PFW.HLP   This file contains the text for the help system. This must reside in the same directory as PFW.EXE.

PFWUNITS.DLL   This file holds the enhanced unit graphics. These graphics are available during the game on the Unit Information page (available off the Unit Commands menu.) This file is *optional*. If you do use this file, it must reside in the same directory as PFW.EXE.

PFWSOUND.DLL   The combat and moving sounds effects are contained in this file.

FWASSEM.EXE   This is the PFW Scenario Assembler program.

PFWASSEM.HLP   This file contains the help information for the scenario assembler.

*.PKA   Files with a .PKA extension hold scenario files being created by the scenario assembler. Once the scenario is completely assembled a .PKS file is created. The .PKA file must be retained if further changes are to be made to the scenario using the assembler.

*.PKS   Files with a .PKS extension are scenario files. These hold the descriptions of the scenarios available for you to play.

*.PKG   Files with a .PKG extension are game files. They hold the current status of your games in progress. When you complete a game, you may delete the .PKG file for that game if you wish.

We suggest that you place all of these files in one directory on your hard disk (for example, in C:\PFW). However, you may choose place them in different directories (one directory for the game, one for the scenario files, one for games in progress, etc.) That's fine. The only requirement is that PFW.EXE, PFW.HLP, and PFWUNITS.DLL must all reside in the *same* directory.