0.1 How to use the converter

- Download the zip file: `https://github.com/kingofmen/VickyToHoI3/archive/master.zip`.
- Unpack it.
- Ignore the source code unless you intend to modify it.
- Copy the Vicky savegame you intend to convert into the release directory.
- Start the VickyToHoI3 executable.
- Go to File-¿Load file and select your savegame.
- Wait for it to load - it will take a minute or two. If it takes more than five minutes, you have either a very slow computer, or a problem - go to Troubleshooting, below.
- Go to Actions-¿Convert to HoI. Wait until it says "Done writing". If the output stops for more than a few minutes with any other message, especially one starting 'Error', go to Troubleshooting.
- Conversion is now done. Go to the Output directory. It should contain 'converted.hoi3'. Move this to your HoI savegames folder; on my machine this is on C:
  Users
  UserName
  My Documents
  Paradox Interactive
  Hearts of Iron III, but installations differ.
- Start HoI3 as usual. The converted game should appear as a regular saved game; select your country and play. If it crashes or hangs on loading, or within a few days of starting, go to Troubleshooting.
- Conquer *All* the Pixels!

0.2 Troubleshooting

Upload your Victoria savegame somewhere, then send me ("King of Men") a PM on Paradox, Ederon, or ("King_of_Men") reddit with a link to the upload. I'll run the debugging version of the converter and try to fix the problem. If you are skilled at C++ development in Windows you can also try to compile in debug mode and run gdb on it.

0.3 Resources

Resources convert from Vicky RGOs. In particular, the `crude_oil`, `metal`, `rare_materials`, and `energy` fields of `config.txt` regulate how much weight each Vicky resource has for the eponymous HoI resource; each RGO then has this weight (if not listed, it is zero) times its `last_income` field.

0.4 Manpower and leadership

All POPs listed in the `fightingClasses` object have a redistribution weight for manpower equal to their size, *unless* they work in an RGO type listed in the `manpower` object, in which case their weight is calculated as for a resource. Notice that by default the `manpower` object contains RGOs that have nonzero weights for resource, and the weights in it are all zero. The effect is that labourers who work in resource-giving RGOs do not give manpower.

Leadership is redistributed according to the ratios of the POP types listed in the `officerClasses` object. The first number is the optimal ratio (from Vicky); the second is the weight for the class. The leadership weight of a nation equals its ratio of the listed classes, times their weights, capped at the optimal ratio. This is then multiplied by a factor that depends on how powerful the country is; for Great Powers it is 1, for secondary powers 0.9, and for everyone else 0.1. Note that the definition of Great and Secondary power varies somewhat from Victoria's, because the military and industrial scores are not stored directly in the savefile. In particular, the countries are sorted by their HoI industry, and the first eight are considered Great Powers; there is a huge bonus to industry if the `last_greatness_date` of the nation is within 100 days of the save date, which should put all countries that Victoria thinks are Great Powers into these first eight. To become a secondary power the country must have rank 9 through 16, and must also have at least one-tenth the industry of the next greater power; this is to prevent three-province minors from being secondary powers (and getting lots of leadership) just because there aren't very many powerful nation. So, for example, if Sweden is ranked 12th and has 100 industry, and Afghanistan is 11th at 9 industry, then Sweden is a secondary power, but Afghanistan and all subsequent countries are minors. Finally this leadership is distributed within the nation according to where the listed POP types are.

0.5 Industry

Vicky factories convert to HoI industrial capacity with a weight proportional to their revenue, which is given by production times the price of the good produced. The world total of IC remains what it is in the input file. Unemployed and subsidised workers count as making `minimumProfitRate` for weighting purposes, but the IC they create starts damaged. Employed workers who

make a positive revenue less than `minimumProfitRate` count as making it; this means that it is never useful to close a profitable factory, though there is some advantage to having factories that are only just barely profitable. Production that would exist if not for war exhaustion is created as damaged IC; the conversion here is not entirely exact, accounting only for throughput bonuses from technology, but not from inventions or governments. Naval bases count as factories employing `navalBaseWorkers` per force-limit contribution, and making `minimumProfitRate` for each of them. War and heavy industries get a small bonus to their weight.

0.6 Governments

Each converted nation gets the government of the historical nation it most closely resembles, provided no other nation resembles it even more. That is, a resemblance is calculated for each pair of converted and historical nations. The highest resemblance is then assigned, then the next highest for which neither converted or historical nation has already been used, and so on until all converted nations have a government. For example, suppose the converted nations are SWE, DEN, and NOR; and the historical nations are GER, ENG, and FRA. Suppose further that the resemblances are thus:

```
SWE - GER: 10
SWE - ENG: 8
SWE - FRA: 3
DEN - GER: 9
DEN - ENG: 7
DEN - FRA: 2
NOR - GER: 2
NOR - ENG: 4
NOR - FRA: 3
```

Sorting this list from highest to lowest, we get:

```
SWE - GER: 10
DEN - GER: 9
SWE - ENG: 8
DEN - ENG: 7
NOR - ENG: 4
NOR - FRA: 3
SWE - FRA: 3
DEN - FRA: 2
NOR - GER: 2
```

Thus, SWE gets the historical GER government, and SWE and GER are struck from the list, leaving:

```
DEN - ENG: 7
NOR - ENG: 4
NOR - FRA: 3
DEN - FRA: 2
```

Then, DEN gets the historical ENG government and these tags are struck, leaving only the final resemblance, from which NOR is assigned the FRA government.

Resemblance is calculated from the `govResemblance` object in the configuration file. For example, consider the resemblance object to Sweden:

```
SWE = {
  scale = 0.5
  government = {
    fascist_dictatorship = 0
    proletarian_dictatorship = 0
    presidential_dictatorship = 0
    bourgeois_dictatorship = 0
    absolute_monarchy = 0.1
    prussian_constitutionalism = 0.8
    hms_government = 0.5
    democracy = 0.8
  }
}
```

This says that a Victoria nation gets 0.8 resemblance points to Sweden for having the `prussian_constitutionalism` government, 0.5 for `hmc_government`, and so on. Resemblances are multiplied by the `scale`, which is 1 by default and smaller for historically-minor countries like Sweden; this means that a country which equally resembles Germany and Sweden will get the German government if it is available. In addition, human countries get a bonus of `humanFactor` to all resemblances listed in the config file, to advantage them over AI minors in the scramble for interesting governments. There is also a tiny random factor to break ties.

Fields marked 'numerical', such as plurality, create a resemblance of their `value` key times the number in the Victoria country. Fields with a 'target' keyword look in the nested sub-object of the Victoria nation rather than the top level.

0.7 Leaders

Active leaders are redistributed randomly, weighted by the size of army, navy (including bases), and air force. To ensure that releasable nations have a minimum amount of officers, the sizes are calculated as the real size plus `minimum`

`Weight` from the config file.

0.8 Buildings

HoI naval bases are redistributed weighted by the Vic ones. Forts convert directly except that the level is reduced by two, with coastal provinces gaining both sea and land forts; the coast detection algorithm is heuristic (specifically, it looks first for a naval base in the input, then in the positions file to see if coordinates are given for a naval base) and may miss some coastal provinces.

Infrastructure converts "urbanisation", defined as the ratio of clerks to labourers or farmers, plus the railroad value times `infraWeight` from the config file. The Victoria provinces are sorted by urbanisation and assigned the input infrastructure in order, so that the highest urbanisation Victoria province gets the highest infrastructure in the input. Capitals have their urbanity doubled. No province can convert with less than 2 infra unless it has no railroads in Vicky and level-1 infrastructure in the input save.

AA batteries convert like infrastructure, in the most urbanised provinces, on the assumption that large cities get such protection.

Air bases - vexed issue that they are - convert similarly to infrastructure, but the weighting is the number of workers in airplane factories, plus 100 times the naval-base level, plus 100 times the urbanisation. In addition, every capital gets at least a level-1 airbase if it doesn't get one by other means.

0.9 Orders of Battle

Land units are created in numbers equalling the vanilla setup, so that each nation gets a number of HoI units proportional to the amount of the corresponding Victoria units it has. For example, all four kinds[1] of Vicky cavalry (cavalry, dragoon, hussar, and cuirassier) correspond to HoI cavalry. Consequently, if a nation has 25 Victoria cavalry regiments (all kinds) and the total of such units in Victoria is 100, then it gets HoI cavalry equal to one-fourth of the amount that exists in the input save. The unit correspondences are listed in the `unitTypes` object of the config file. Notice that reserve units (from mobilisation) do not count as infantry; notice also that not every HoI unit type has a corresponding Victoria one.

In some cases additional units will be created. For example, the 1936 setup has only two armoured brigades (as opposed to light armour), which is experentially a somewhat absurd constraint to impose on a Victoria game in 1936. Consequently additional armoured brigades are created in accordance with the `extraUnits` field:

```
extraUnits = {
```

[1] And really, does any game need four kinds of cavalry?

```
  armor_brigade = { tank 5 10 15 20 25 35 50 75 100 125 150 175 200 225 250 300 35
}
```

which says that if the world contains 5 tank units, an additional armoured brigade is created, another at 10, and so on up to 600; after 600 there is one for every 100, the difference between the last and the second-last entries.

A sufficient amount of divisions, corps and higher formations, with headquarters, are created to house the lower formations; so three (identical) brigades form a division, three divisions (identical or not) form a corps, and so on. Any formations at loose ends are attached to the single theatre that is created for each nation.

Brigades have a chance of being created as reserve; the chance is equal to the percentage of their brigade type that is reserve in the input. Reserve brigades are created at full strength in nations that are mobilised in Victoria, otherwise at the strength indicated by the HoI conscription law. Note that HoI immediately mobilises nations at war; a Victoria nation that is at war, but not mobilised, will therefore begin the game with reserve units at low strength but rapidly reinforcing up to 100%.

Ships are redistributed at random, weighted by the naval strength of nations. Naval strength is defined as the sum of the weights given in the `vicShips` field (that is, a dreadnought is 60, a cruiser 20, and so on), averaged with the naval support limit (which comes from naval bases), *unless* the former is higher than the latter, in which case the naval force limit is used. Thus, suppose my naval force limit is 100. If I build a single dreadnought (weight 60) my naval strength is 80 (average of 60 and 100). If I build another dreadnought (bringing the total weight to 120) my naval strength is 100 (the force limit).

0.10 Techs

Most human players will be fully teched by 1936, so there is little to distinguish nations on this point. The tech conversion is therefore intended mainly to activate the obvious stuff, so players don't sit about unable to build infantry divisions in 1936. The config file's `techConversion` object contains fields of this form:

```
vicTech = { hoiTech hoiTech ... }
```

where each `hoiTech` is increased to level one if the nation has the `vicTech`. Otherwise all HoI techs start at zero.

Practicals are gained from units, as regulated by the `practicals` object. For example, the field

```
  infantry_practical = { infantry }
```

indicates that Vicky infantry, as one might expect, gives the HoI `infantry_practical`. In particular, the nation with the most Vicky infantry gains the highest practical that exists in the input save; everyone else gets an amount proportional

to their infantry. Thus if the highest practical in historical 1936 is 10, and Russia has 1000 infantry regiments in Victoria, a nation with 500 infantry regiments will get 5 infantry practical. For this purpose forts and naval bases are weighted by level, and factories by the number of employees.

0.11 Laws

Law conversions are given by the `laws` object. Laws convert in one of three ways:

- Points-based. The fields listed in `vicKeys` are examined, and the value gives the number of points listed in the `points` object. The total amount of points is then compared with the `hoiValues` object, and the law with the highest value less than the number of points is selected.
- Ratios. The `numerator` field is divided by `denominator` (note that many of these values do not exist in a Vicky save, but are calculated by the converter) and the selection then proceeds as for points - the law with the highest value less than the ratio is selected.
- By Victoria field: The `keyword` is examined and each possible value directly translates to a HoI law.

0.12 Diplomacy

Wars, alliances, and vassalisations convert one for one; wargoals are ignored. Factions are removed - no nation is a member of Axis, Allies, or Comintern.

Neutrality is linear in revanchism; it is 100 at 0 revanchism and `minimumNeutrality` at full revanchism. It is adjusted by the weighted number of casualties the nation has taken; the weight of a casualty is 2^{-n} where n is the number of years since the battle. The rate of neutrality change per weighted casualty is given by the `neutralityPerCasualty` field in the config file. For nations actively at this is subtracted from neutrality; for those at peace, it is added.

Diplomatic influence converts one-for-one from diplomacy points.

Relations convert directly. Threat is calculated from the relative army sizes by a stepwise function which is best summarised by code:

```
if      (armyRatio < 0.5) threat = 0;
else if (armyRatio < 1.0) threat = (armyRatio - 0.5)*0.33;
else if (armyRatio < 1.5) threat = (0.5*0.33 + armyRatio-1);
else                      threat = (0.5*0.83 + (1-0.5*0.83)*(2/M_PI)*atan(armyRati
```

where `armyRatio` is the amount of infantry of the threatening nation divided by that of the threatened one. This gives a number between zero and one, which is then multiplied into `maxWarThreat` or `maxPaxThreat` from the config

file, depending on whether the nations are at war or not. If they are at peace, this is further modified by a factor

$$P = \frac{2}{\pi} \arctan\left(\frac{1 + B_t}{1 + B_o} - 1\right)$$

where B_t is the badboy of the threatening nation and B_o that of the threatened nation. To summarise, this means that a nation only feels threat from a country it is at peace with if that country has a larger badboy than itself.

0.13 Miscellanea

Manpower, officers, and resource stockpiles are distributed from the input, proportionally to the quantities listed in the `stockpiles` object. The first entry indicates where in the HoI country object the field is placed; the second, in what sub-object to look for the Vicky quantity; the third, a minimum amount to serve as an initial buffer; and the fourth and subsequent, the Vicky keywords. In both cases `country` refers to the top-level nation object. Note that for HoI, `cap_pool` is not present in the input save; it is constructed by the converter, and moved to the nation's capital province after resources have been distributed.

Unity is linear in average militancy; it is 100 at 0 militancy and `minimumUnity` at 10 militancy.

Dissent is equal to the percentage of Vicky population that belongs to a rebel faction, multiplied by `rebelWeight`, plus average militancy.

Terrain can only be modified by changing terrain.bmp, and the converter therefore leaves it alone even though this means historical placement of urban provinces. However, it does print out a list of the 100 provinces with the highest population of clerks, craftsmen, and bureaucrats, for use in modding. Note that this list is only printed if the debug stream labeled 50 in the config file is set to 'yes'.

Victory points convert similarly to infrastructure: Victoria provinces are weighted, and the highest weight receives the highest VP value in the input save, and so down the list until there are no more input VPs. In this case the weights are given by the `victoryPoints` object in the config file; factory types are interpreted as the number of workers in that kind of factory in the province. The `navalBase` and `isCapital` fields are special; the former is a multiplier for the force-limit contribution of any naval base in the province, the second a multiplier applied to capitals. In addition, all HoI provinces listed in `strategic_provinces`, and all capitals, get at least one victory point.