

A Japanese Production Primer – Updated July 3, 2013

This is Version 1-1 based on feedback from the forum. Huge thanks to everyone that gave feedback. All updates are in this color.

This document is based off the official patch 1108r9 and the beta 1123j2 dated 4/27/2013. The beta should not impact the information here, but wanted it noted in case it did.

The document is meant to cover, in a single location, how Japanese production, including R&D, works. Most people play as the Allies because understanding Japanese production is neither simple nor intuitive. Plus it does have a major impact on the game, positive if done properly, bad if not. Unfortunately, the game will be in late '43, early '44 before the impacts of what was done in '42 are truly realized. So unlike many other games there is no real way to try and correct things other than restating. Needless to say, this turns off many players from even trying to play Japan. Hopefully this document will help with this.

The information here is based on both 'real' games against both the Allied AI and PBEM as Japan and data scattered across many different forum posts. Any mistakes/errors/etc. are my own. If anyone has corrections to the information here, please PM me through the Matrix Games forum, user name numdydar.

BEFORE STARTING A GAME AS JAPAN

I strongly suggest that regardless of whether you are playing against the AI or a PBEM game, open up the editor and repair all of Japan's R&D factories. I have not been able to find any reason these should be all damaged at the start of the game. Japan's research just did not suddenly start up once Japan was at war with the Allies. If this was done for play balance, I see no reason for this 'balance' given the current state of how R&D now works in the game. Maybe this was needed when the game was first released as WitP, but it certainly is not needed now.

This was discussed extensively in the forum at this thread <http://www.matrixgames.com/forums/tm.asp?m=3350910> . I just want to stress this is just my opinion and it is TOTALLY OPTIONAL. I am definitely NOT advocating this to be part of a patch or any official release. Personally, I would have no issue playing as the Allies against a Japanese player that started with these repaired. However, as with any PBEM game, this option should be discussed and decided on prior to the game starting. Of course against the AI, you can do whatever you want.

A NOTE ON TRACKER

You really should use Tracker when playing as Japan. However, this adds another roadblock to playing as Japan as this is a separate tool outside the game itself, which requires installation, setup, etc. The information in Tracker is actually in the game too, it is just not as clearly and easily accessible as what is available in Tracker. I use Tracker extensively myself.

Tracker has its own web site so will not be covered here. This Primer will just cover how you can use the in game systems to figure out what is going on. So if you do not want to bother with Tracker, you can at least see how to access the information.

STARTING AS JAPAN

Congratulations. You took the plunge.

A couple of points to ALWAYS remember as Japan:

1) BEFORE touching ANY production values, save the damn game. ALWAYS. There is NO undo button here. So if you screw up, it is restarting the turn time.

2) ALWAYS use the industry screen to change ANYTHING. ALWAYS. I mean it. You can change the values by selecting the icons on the base screen, just don't do that. If you do, it will DOUBLE whatever the value currently is. So if you have a shipyard with a value of 100 and you do NOT use the industry screen to expand and use the icon instead, you now have a 200 value shipyard, (100)100. Have I done this? Yes. Have I done this after a four hour turn? Yes. Did I save the game before I did this? No. It was just going to be a small quick adjustment, right? No need to save at all. Did I tell you to save the game before changing ANY production values?

PART I - THE INDUSTRY SCREEN

As Japan, unlike as the Allies, the Industry screen will be your constant friend. This is shown below:

All Industry	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	Engines	Air	RD Air	NavSY	MerSY	RepSY	No minimal requirement filter			
Requirements															AI Base			
Base	Type	Upd	Repair	Prod	Size	producing	Failed	Fuel	Res	Oil	HI	Supply	Fuel	Res	Oil			
Alkita	Manpower	-	Yes	-	2(0) - 10 MP	-	0	0	0	0	0	501	1369	6902	7919			
Alkita	Resources	-	Yes	-	60(0) - 1200 Res	-	0	0	0	0	0	501	1369	6902	7919			
Alkita	Oil	-	Yes	-	32(0) - 320 Oil	-	0	0	0	0	0	501	1369	6902	7919			
Alkita	Refinery	-	Yes	Yes	40(0) - 360 Fuel, 40 Sup	-	0	0	400	0	0	501	1369	6902	7919			
Alkita	Light Industry	-	Yes	-	20(0) - 20 Sup	-	0	300	0	0	0	501	1369	6902	7919			
Akyab	Manpower	-	Yes	-	1(0) - 5 MP	-	0	0	0	0	0	20	1	1	1			
Amami Oshima	Resources	-	Yes	-	20(0) - 400 Res	-	0	0	0	0	0	4148	13778	16400	0			
Ankang	Resources	-	Yes	-	20(0) - 400 Res	-	0	0	0	0	0	5	1	522	1			
Anshan	Manpower	-	Yes	-	7(0) - 35 MP	-	0	0	0	0	0	1141	2794	56605	0			
Anshan	Resources	-	Yes	-	360(0) - 7200 Res	-	0	0	0	0	0	1141	2794	56605	0			
Anshan	Heavy Industry	-	Yes	Yes	100(0) - 200 HI, 200 Sup	-	200	2000	0	0	0	1141	2794	56605	0			
Anshan	Light Industry	-	Yes	-	40(0) - 40 Sup	-	0	600	0	0	0	1141	2794	56605	0			
Anshung	Manpower	-	Yes	-	1(0) - 5 MP	-	0	0	0	0	0	334	2001	0	0			
Totals	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	Engines	Air	RD Air	NavSY	MerSY	RepSY				
In Pool	753103	174290	8329	3133	1.630M	1091M	94036	2243	1633	2278	0	18444	74167	6164				
Max Prod	4640	14882	11140	32175	31640	342800	620	400	1382	832	475	1417	812	970				
Disabled Prod	150	62	159	2088	3230	6440	0	0	31	0	297	13	5	111				
Shut Off Prod	0	0	0	0	0	0	0	0	40	60	0	0	0	0				
Actual Prod	4490	14820	10981	30087	28410	326360	620	400	1311	772	75	1404	807	839				
Supply Req	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Fuel Req	0	14820	0	0	0	0	0	0	0	0	0	0	0	0				
Oil Req	0	0	0	33430	0	0	0	0	0	0	0	0	0	0				
Res Req	0	148200	164715	0	0	0	0	0	0	0	0	0	0	0				
HI Req	0	0	0	0	0	0	3720	2400	22800	14976	0	4212	2421	0				
Sup Prod	0	14820	10981	3343	0	0	0	0	0	0	0	0	0	0				
Fuel Prod	0	0	0	30087	0	0	0	0	0	0	0	0	0	0				
Turn ON repairs Turn OFF repairs Turn ON production Turn OFF production Exit																		

Wow that is a lot of numbers. Yes, some very important, others not so much. The top menu, like the other WitP AE menus are toggles and the columns can be sorted. The top portion shows a list of bases and what is available at that location. However the bottom half is where the real value lies. As this shows you what is going on a global scale.

Before we start looking at the above numbers in more detail, let's review some basics of the inputs needed for Japan to produce. This way you will have a better understanding of what the screen is showing you.

Manpower – This is produced in Manpower locations and does not need any inputs to be produced.

Resources – Produced at Resource locations and needed for both Light Industry (LI) and Heavy Industry (HI) in order to produce anything.

Oil – Produced at Oil locations and is used by refineries to produce fuel. This is the ONLY use for oil.

The above three items are the only inputs to the entire Japanese production. Pretty simple yes? Get enough Oil and Resources and there is nothing Japan can't do.

Now let us see how Oil and Resources are consumed.

Light Industry – Produces 1 supply point/turn for a cost of 15 resources.

Refinery – Produces 9 fuel AND 1 supply point/turn for a cost of 10 oil

This covers all the primary consumers of the inputs. But what about HI? HI is different of course as shown below.

HI – Produces 2 supply AND 2 HI points/turn for a cost of 2 Fuel and 20 resources

There are only three outputs from the Japanese production system as noted above. To summarize them:

Fuel – Used for moving ships and HI inputs. That is it for Fuel.

Supply points – Used for

- Combat
- Fuel Tanks for planes to extend their ranges
- Replacements
- [Expanding factories/facilities](#)
- Etc. [The manual has a lot of details on supply use that I will not repeat here](#)
- Basically supply is the universal product of the game and is used for anything and everything that does not need Fuel or HI Points which are discussed next

HI Points - these are what actually builds the various weapon systems the game uses for operations according to the following formulas

- *Aircraft engines* – 18 HI Points/engine
- *Planes* – also 18 HI points * number of engines the plane needs
 - o So a four engine plane will take 144 HI points to build (4 engines x 18 HI + 4 x 18 HI for the 4 engine fuselage. This compared to a single engine plane which only takes 36 HI)
- *Vehicle points* – 6 HI/point. These are needed to build any ground device with a motor. Tanks/some AA/Art/Etc.
- *Armament points* – 6 HI/point – These are used to build most Devices along with either Manpower and/or Vehicle points as well
- *Naval points* – 3 HI/point – These are used to build (not repair as only supply is used for refits and repairs) combat ships
- *Merchant points* – Also 3 HI/point - These are used to build (not repair as only supply is used for refits and repairs) merchant ships (xAKs/TKs/etc.)

So you can see why HI is critical for Japan since without it nothing (and I mean nothing) gets built. Plus it gives 2 supply points in addition so it is much more effective in producing supply than LI is. Especially since supply is the only output of LI. Although the LI supply output could be valuable depending on where the LI is located.

There is one important distinction to make between Armaments and supply. Armament points are used to BUILD devices. They have nothing to do with rearming planes/ships/CVs/etc. All on map arming/rearming is done using supplies with ONLY one exception, Mines. Armament points are used to

build mines, not supply. Of course why only mines and not torpedoes/16" shells/etc. too was a design decision for the game.

So now we have a basic understanding of the inputs and output of Japan's production, let us see what all those numbers mean on the Industry screen. As HI is so important, let us look at that column first as highlighted below. We will be ignoring Manpower since Japan always has enough and it has little to no impact on the production system.

All Industry	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	Engines	Air	RD Air	NavSY	MerSY	RepSY	No minimal requirement filter		
Base	Type	Upd	Repair Prod	Size - producing	Failed	Fuel	Res	Oil	HI	Supply	Fuel	Res	Oil		At Base		
Anshan	Heavy Industry	-	Yes	Yes	100(0) - 200 HI, 200 Sup	-	200	2000	0	0	1141	2794	56605	0			
Bangkok	Heavy Industry	-	Yes	Yes	40(0) - 80 HI, 80 Sup	-	80	800	0	0	8881	11819	33096	4250			
Batavia	Heavy Industry	-	Yes	Yes	20(1) - 40 HI, 40 Sup	-	40	400	0	0	1366	6533	31598	1			
Canton	Heavy Industry	-	Yes	Yes	20(0) - 40 HI, 40 Sup	-	40	400	0	0	7966	5948	28822	0			
Changchun	Heavy Industry	-	Yes	Yes	20(0) - 40 HI, 40 Sup	-	40	400	0	0	7997	754	30796	0			
Changsha	Heavy Industry	-	Yes	Yes	27(2) - 54 HI, 54 Sup	-	54	540	0	0	5400	1018	47178	1			
Chengdu	Heavy Industry	-	Yes	Yes	53(27) - 106 HI, 106 Sup	-	106	1060	0	0	3654	2007	56426	1			
Chunnampon	Heavy Industry	-	Yes	Yes	50(0) - 100 HI, 100 Sup	-	100	1000	0	0	0	17630	22154	109			
Chungking	Heavy Industry	-	Yes	Yes	181(0) - 362 HI, 362 Sup	-	362	3620	0	0	33042	5896	85553	1			
Fukuoka	Heavy Industry	-	Yes	Yes	140(0) - 280 HI, 280 Sup	-	280	2800	0	0	5211	15410	151808	2222			
Georgetown	Heavy Industry	-	Yes	Yes	60(0) - 120 HI, 120 Sup	-	120	1200	0	0	312	4007	9130	0			
Hamamatsu	Heavy Industry	-	Yes	Yes	20(0) - 40 HI, 40 Sup	-	40	400	0	0	19555	1760	38106	0			
Harbin	Heavy Industry	-	Yes	Yes	40(0) - 80 HI, 80 Sup	-	80	800	0	0	17097	1518	46052	0			
Totals	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	Engines	Air	RD Air	NavSY	MerSY	RepSY			
In Pool	753103	174290	8329	3133	1630M	1091M	94036	2243	1633	2278	0	18444	74167	6164			
Max Prod	4640	14882	11140	32175	31640	342800	620	400	1382	832	475	1417	812	970			
Disabled Prod	150	62	159	2088	3230	6440	0	0	31	0	297	13	5	111			
Shut Off Prod	0	0	0	0	0	0	0	0	40	60	0	0	0	0			
Actual Prod	4490	14820	10981	30087	28410	396360	620	400	1311	772	75	1404	807	839			
Supply Req	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Fuel Req	0	14820	0	0	0	0	0	0	0	0	0	0	0	0			
Oil Req	0	0	0	33430	0	0	0	0	0	0	0	0	0	0			
Res Req	0	148200	164715	0	0	0	0	0	0	0	0	0	0	0			
HI Req	0	0	0	0	0	0	3720	2400	25860	14976	0	4212	2421	0			
Sup Prod	0	14820	10981	3343	0	0	0	0	0	0	0	0	0	0			
Fuel Prod	0	0	0	30087	0	0	0	0	0	0	0	0	0	0			

Here is the same area blown up for better clarity.

Totals	Manpower	HI
In Pool	753103	174290
Max Prod	4640	14882
Disabled Prod	150	62
Shut Off Prod	0	0
Actual Prod	4490	14820
Supply Req	0	0
Fuel Req	0	14820
Oil Req	0	0
Res Req	0	148200
HI Req	0	0
Sup Prod	0	14820
Fuel Prod	0	0

In Pool - It shows we have 174,290 HI points saved up. This means if we went to zero Resources, we could still build new planes/Devices/ships using the HI points we have saved up. HOWEVER, if your

Heavy and Light industry is not producing, then you are not making ANY supply points. So having a lot of HI saved is not going to do much good if you do not have a lot of supply points saved up too.

Max Prod - This show what the most HI points you could produce if all your HI locations were fully functional. So the max HI points I could produce when the turn runs is 14,882/day.

Disabled Prod – This is HI locations that are damaged and are not producing. Where are these locations?

I used the top menu on the Industry screen to only show HI locations. Below is an expanded view of that. The highlighted sections show the damaged HI locations. There are 30 plus 1 more off screen for a total of 31 damaged. 27(1), 27(2), and 53(27). Number(s) in () are damaged. So $1+2+27+ 1$ off screen = 31

Base	Type	Upgd	Repair	Prod	Size - producing
Anshan	Heavy Industry	-	Yes	Yes	100(0) - 200 HI, 200 Sup
Bangkok	Heavy Industry	-	Yes	Yes	40(0) - 80 HI, 80 Sup
Batavia	Heavy Industry	-	Yes	Yes	20(1) - 40 HI, 40 Sup
Canton	Heavy Industry	-	Yes	Yes	20(0) - 40 HI, 40 Sup
Changchun	Heavy Industry	-	Yes	Yes	20(0) - 40 HI, 40 Sup
Changsha	Heavy Industry	-	Yes	Yes	27(2) - 54 HI, 54 Sup
Chengdu	Heavy Industry	-	Yes	Yes	53(27) - 106 HI, 106 Sup
Chunnampo	Heavy Industry	-	Yes	Yes	30(0) - 100 HI, 100 Sup

But it says 62 in the Disabled Prod slot. Very good. I see you paid attention in your math classes. Remember a HI location produces 2 HI points per operational factory. So if I have 31 factories damaged, I have 62 HI points I am losing.

Looking at this number and then checking the damaged locations is a great way to determine where you need supply. Since you need 20K or higher supply points to repair or have a chance to repair any damaged locations at a base.

Shut Off Production – This is production you have manually turned off for whatever reason you deem necessary. Obviously, HI is NOT something you would ever turn off so the number is showing 0.

Actual Production – This is simply Max Prod – Disabled Prod – Shut Off Production. Using the numbers we have $14,882 - 62 - 0 = 14,820$ HI points. Which matches what the screen above shows. Amazing huh?

Now that we have the maximum of what we CAN produce, we can see if we have all the necessary inputs to actually produce the full amount of HI we could. The same screenshot has been reproduced below for easy reference.

Totals	Manpower	HI
In Pool	753103	174290
Max Prod	4640	14882
Disabled Prod	150	62
Shut Off Prod	0	0
Actual Prod	4490	14820
Supply Req	0	0
Fuel Req	0	14820
Oil Req	0	0
Res Req	0	148200
HI Req	0	0
Sup Prod	0	14820
Fuel Prod	0	0

Supply Req – As HI does not need supply as an Input to produce it shows 0 here

Fuel Req – As HI does require 2 Fuel points/2 HI points it shows we need 14,820 Fuel. If we did not have that much fuel, then we would not maximize our HI production for the day.

Oil Req – As HI does not need Oil as an Input to produce it shows 0 here

Res Req – As HI does require 20 Resource points/2 HI points it shows we need 148,200 Resources. If we did not have that many Resources, then we would not maximize our HI production for the day.

HI Req – Obviously HI does not require itself to produce, it shows 0

Sup Prod – Since HI produces 2 Supply points in addition to HI points, this shows that Japan will get 14,820 Supply points from HI production

The important thing the HI column tells us is Japan maximizing its HI (and supply) production or not. If not, then why not. Since this shows Japan is only 62 HI points from Max Prod, she is in pretty good shape right now.

Also very important is that the Fuel/Resources needed for HI production have to be ‘available’ at the Base the HI factories are located in. So even if you have enough Fuel overall, if there is not enough available locally, then the HI factories will not fully produce there. This will show up in the Operations report as ‘Not enough fuel at ... to produce HI’. You will get to see a lot of these messages as it gets later into the war.

As an example, if you look at Chengtu (the 53(27)) in the list above, it tells you that the base is producing 106 HI and Supply points, 2×53 undamaged HI factories = 106. This means that 106 Fuel points and 1,060 resources were available to this Base in order for the factories to work. If either the Fuel and/or the Resource availability were 0, then it would say 0 HI and 0 Supply was produced. Plus the message on the Ops report would say “Not enough fuel at Chengtu to produce HI” as normally Fuel is the limiting factor in HI production and not Resources.

You will notice the major difference in Disabled Prod number row in this screenshot versus the earlier ones. This is due to bombing raids. You will also note the smaller numbers some of the pools due to production/replacement needs.

The other columns in this section use these rows the same way HI does. But as Fuel is very important to HI production (and HI production is very important to everything else), let's take a detailed look at that column as shown below.

Totals	Manpower	HI	LI	Refinery	Oil
In Pool	753103	174290	8329	3133	1630M
Max Prod	4640	14882	11140	32175	31640
Disabled Prod	150	62	159	2088	3230
Shut Off Prod	0	0	0	0	0
Actual Prod	4490	14820	10981	30087	28410
Supply Req	0	0	0	0	0
Fuel Req	0	14820	0	0	0
Oil Req	0	0	0	33430	0
Res Req	0	148200	164715	0	0
HI Req	0	0	0	0	0
Sup Prod	0	14820	10981	3343	0
Fuel Prod	0	0	0	30087	0

Why do I have a number under In Pool for Refinery? No idea. It does not match up with other numbers here or in the Intelligence screen. But as it has no impact on production as far as I can tell, we can ignore it and move one.

But to understand Fuel production, we need to look at the Oil column briefly. We see that there is a total of 323 damaged Oil locations on the map (since each Oil well produces 10 points of oil, $3,230/10 = 323$ damaged oil wells). We can find these the same way we found the damaged HI locations earlier. Obviously this reduces our maximum oil production down to 28,410.

Just like HI production, having all this oil floating around is not going to do anything to help production, much less fuel our ships, unless it actually gets to a refinery location. Fortunately, a lot of oil locations also have a matching set of refineries to maximize the fuel production at that base. However, other locations, like Japan HI, have a lot of refinery capacity, but little to no oil at the bases in Japan to refine. So oil needs to be shipped in to be converted to the all-important Fuel.

The down side is that refining capacity at a base can limit the maximum amount of oil that can be converted (mainly though damage by bombing). Assuming of course every refining location has received all the oil it can use in a turn. Of course the extra oil that is not used does not get 'lost'. It is stored up to

the capacity that the base can hold (where you get Ops messages that say 'Oil storage capacity at ... has reached maximum'). As shown above we have close to 1,630,000 (1.620M) oil in the pool. Not a lot.

So now let's move over to the Refinery column and see what impact not having the Oil production at maximum is going to have.

Here things are not good either. It shows Japan has a Max Prod of 32,175. How did we get that number? Just like the other columns, this is the total number we *could* produce if everything was working. Since we have 2,088 that are damaged, if we add that to what we did produce you can see we would get the 32,175 number. Isn't math fun?

Since we know we have damaged refineries due to the 2,088 number in the Disabled Prod row, we filter the upper list to just show Refineries. See the screenshot below. This is from the Intelligence – Industry and Resource screen. The same data is on the Industry screen too, but this view allows all the damaged locations to be shown. Adding up the damaged locations (anything in parens) we come up with 232 refineries that will not produce fuel.



Industry and Resource Availability

All Industry Manpower HI LI Refinery Oil Resources Armament Vehicle Engines Air RD Air
Nav SY Mer SY Rep SY

Location	Type	Amount
Lanchow	Refinery	87(3)
Magwe	Refinery	89(11)
Medan	Refinery	130(70)
Miri	Refinery	218(82)
Niigata	Refinery	50
Osaka/Kyoto	Refinery	200
Palembang	Refinery	1020
Port Arthur	Refinery	120
Rangoon	Refinery	200
Shimonoseki	Refinery	160
Sian	Refinery	20
Soerabaja	Refinery	110(60)
Tarakan	Refinery	86(4)
Tjepoe	Refinery	28(2)
Tokuyama	Refinery	5
Tokyo	Refinery	200
Urumchi	Refinery	20
Wakayama	Refinery	50

We then look at the right side of the screen above (shown below) and see we own a total of 3,343 refineries across the map that are NOT damaged. Also shown is the 3,133 number again that serves no purpose I can find.

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Totals:    Date: Aug 30, 1942
Supply: 3,410,348 (321,530)
Fuel: 2,892,103
Manpower: 898 (753,103)
Heavy Industry: 7410 (174,290)
Light Industry: 10981 (8,329)
Refinery: 3343 (3,133)
Resources: 16818 (10,912,413)
Oil: 2841 (1,630,296)
Naval Shipyard: 1404 (18,444)
Merchant Shipyard: 807 (74,167)
Shipyard Repair: 839
Armament: 620 (94,036)
Vehicles: 400 (2,243)
Aircraft Engines: 1270 + (81 -rd)
Aircraft Assembly: 832 + (75 -rd)

```

So now we have the numbers we need. Remember, refineries require 10 oil to produce 1 Supply and 9 Fuel points. We take the total number of refineries we own that are NOT damaged, 3,343, that 'could' produce fuel if oil was available at their location and plug the numbers in.

$3,343 \times 10 = 33,430$ Oil is needed as shown on the Oil Req line. But wait, we only are producing 28,410 Oil as we discussed above. Fortunately we have a stockpile of Oil that we can draw from.

As we have a 5,020 shortage Oil to maximize Fuel production, the Oil stockpile will be drawn down that much. Where is the 5,020 number found? Nowhere in the game unfortunately. You have to take the 33,430 Oil needed and subtract the 28,410 Oil produced from it to get the 5,020 number. But you do not need to calculate this. As you can easily look at the Oil column, see how much you produced and compare that to the Oil Req row in the Refinery column. If the Oil produced is higher, congratulations, your fuel production is in good shape (fuel usage may not be, but that is a different issue). If it is not, as in this example, then more Oil locations need to be captured if possible or the damaged locations need supplies and ENG to help with the repair. Otherwise the oil will run out, so no Oil equals no Fuel equals no HI equals no more Japan.

How did that 2,088 number come into all of this? We subtracted that out when we did the HI calculations before. We did not have to here since we already knew that we had 3,343 undamaged refineries. So that was removed before we started. The 2,088 number comes from 232 damaged refineries which uses the same formula for fuel production as the undamaged refineries. Except no Oil is used since the refineries are damaged.

Now we have figured out how to tell if we have enough Oil or not, what do I get for all of this? Fuel and Supply. How much? We took in 33,430 Oil of which 90% is converted into fuel. So $33,430 \times 0.9 = 30,087$

which matches nicely with the Fuel produced number in the refinery column. Supply is simply 1 for 1 so 3,343 supplies are also produced.

Using the same Fuel calculation for the Disabled production number we have 232 damaged refineries * 10 amount of oil we would use * 90% for the conversion rate = 2,088. So this is where the Disabled Prod number came from.

So given what we now know, on one hand we want to maximize Fuel production by getting the 232 damaged refineries repaired as soon as possible. However, we would need to use an additional 2,088 Oil to do this and we are already short 5,020 Oil. So this would make our Oil shortage even worse. So before we rush out and repair all the refineries, we need to fix the Oil wells first. As noted earlier, most locations are paired with Oil wells and refineries so both can be repaired in tandem, assuming enough supply is present of course.

The most Oil that Japan can produce given the locations currently owned is 31,630 (Production + damaged). If all the refineries were repaired we would need 35,750 Oil. So every day Japan will be running an Oil deficit of 4,120. And will obviously reach 0 at some point. For this unpleasant event, we can actually calculate when this will occur.

Remember earlier when we noted we had 1,630,000 surplus of Oil (actually from the Intelligence screen you can get the exact amount which is 1,630,296). Dividing the surplus by the shortage (1,630,296/4,120) which is about 395 days. It will actually be much sooner as we are currently running a higher deficit right now. This example is from a Scenario 1 stock game and the game date is 8/30/1942. So by this time in '43, Japan will have no Oil left given the current status. A few months after that, the fuel stockpile will run out (depending on operational levels). No wonder most games against Japan end in '44 when using Scenario 1.

I want to be clear in that Japan production will NOT completely stop at this point. Far from it. Japan will still be able to produce Oil, Fuel, and all the rest. There will just be nothing left in the stockpile so any disruption to getting all of the inputs to Japan HI will directly impact HI outputs. Let's see what this looks like.

Assuming no additional Oil well locations are captured, no major Allied impact on transportation, and all existing ones are fully operational, Japan will produce 31,630 in October '43 with 0 Oil in the stockpile. This means we will produce 3,163 Supply points and 28,467 Fuel versus 30,087 when we could draw on the stockpile to make up for the Oil shortage.

Assuming no additional HI was added or lost in this time period too, Japan still has 7,410 HI factories (from the above screenshot) at 2 fuel needed to produce 2 HI and 2 Supply, this means we need 14,820 of fuel to continue to maximize HI production. Which of course is the whole point of this exercise.

Since we can produce 28,467 fuel we are saved! We have more than enough fuel to fully run our factories and still have fuel left over to run our navy. Not so fast JFB. Remember, this is looking at production globally to get the big picture. Actual non-HI production, except for the Home Islands, is

always local. So all this excess fuel being produced is generally NOT where the bulk of it is needed. So it must be transported to Japan in order for everything to continue to work smoothly. Any disruption to this chain will also disrupt production at some point.

PART II – HI USE

There is more? My brain hurts. Hang in there for just a little while longer. You do want to know how HI can be used to build all those shiny new ships and planes don't you? The nice thing about HI is it is a global resource. Any HI produced in China can be used in Japan (or anywhere else) without any need to transport it anywhere.

As a review it takes:

- 18 HI to build 1 engine
- To build a
 - o 1 Engine AC - 18 HI for the airframe. For a total of 36 HI
 - o 2 Engine AC – 36 HI for the airframe. For a total of 72 HI
 - o 4 Engine AC - 72 HI for the airframe. For a total of 144 HI
- 6 HI for both Armaments and Vehicles
- 3 HI for both Navy and Merch points

You can tell from the above producing a lot of 4 engines AC as Japan is very costly. So be aware of this when you want to start producing a lot of Mavis' and Emily's.

Planes and engines will be covered in the last section since that is really where the player can make the most impact on the game.

For Armaments and Vehicles, 6 HI points are used to put 1 point into each of the respective pools. So to put 1 point into Vehicles, it takes 6 HI points. Both of these points are used to rebuild units that are bought with Political Points from the destroyed unit pool and for replacements to replace combat losses. Not having enough points in either pool will slow down replacements to the units. There is not much the player can do other than expand the production of factories producing these or reduce land operations for an extended time so the pools can start building up again. These pools have NO impact on ground units coming into the game as reinforcements unless their ToE's are below strength.

Navy and Merchant points and pools are similar to the above, but with an important difference. The player has more control over these. While both are important, I will discuss how the Navy pool works. The Merchant pool works the exact same way. So explaining one also explains the other.

Below is the Navy Shipyard column. This tells us that we have 18,444 points in the pool (which is good). It also tells us that the Max Prod is 1,417. This means that the total number of Naval Shipyards we own is 1,417. We obviously also have some that are damaged as we have 13 listed there. We can determine where they are the same way that was discussed before. These damaged ones are subtracted and leave us with 1,404 Navy points that will be added to the pool in the next day.

Totals	Nav SY
In Pool	18444
Max Prod	1417
Disabled Prod	13
Shut Off Prod	0
Actual Prod	1404
Supply Req	0
Fuel Req	0
Oil Req	0
Res Req	0
HI Req	4212
Sup Prod	0
Fuel Prod	0

Unlike the other columns we discussed, this one actual uses HI so we have 4,212 listed in the HI Req row. This is determined because 3 HI points are needed for every Navy point. So $1,404 * 3 = 4,212$ HI will be used to produce these points.

Well now that I got these points what do I do with them? I'm glad you asked sailor. Below is where you will decide on what to do with them. This screen is reached by going to the Intelligence menu and then selecting Ship Availability. This screen will show you all your naval vessels that are being built or that can be built. These can be sorted and filtered the same way the other WitP AE menus work.

Ship Reinforcement Availability and Arrival Schedule														Date: Aug 30, 1942				
Show	AllShips	CV/CVL	CVE	BB/BC	CA/CL	DD	DE	APD	AP	AK	AO	TK	SS	Aut	Mine	Pat	LS	LC
Type	Name	ETA		Build Rate		Arrival Location		Naval / Merchant yard										
CV	Taiho	29 Jun 43		Accelerated 103		Kobe												
CV	Shunano	26 Nov 44		Normal 157		Yokohama/Yokosuka												
CV	Unryu	14 Aug 44		Normal 61		Yokohama/Yokosuka												
CV	Amagi	14 Aug 44		Normal 61		Nagasaki/Sasebo												
CV	Katsuragi	19 Oct 44		Normal 61		Hiroshima/Kure												
CV	Kasagi	17 May 45		Normal 61		Nagasaki/Sasebo												
CV	Aso	16 Jun 45		Normal 61		Hiroshima/Kure												
CV	Ikoma	15 Jun 45		Normal 61		Kobe												
CVL	Ryuhō	84 days		Normal 47		Yokohama/Yokosuka												
CVL	Ibuki	29 Apr 45		Normal 44		Tokyo												
CVE	Chūyō	89 days		Normal 53		Nagasaki/Sasebo												
CVE	Shinyō	16 Dec 43		Normal 35		Nagasaki/Sasebo												
CVE	Kaiyō	22 Nov 43		Normal 43		Kobe												
CVE	Shimane Maru	27 Feb 45		Normal 27		Tokyo												
CVE	Otakisan Maru	21 May 45		Normal 27		Tokyo												
CVE	Yamashiro Maru	27 Jan 45		Normal 25		Tokyo												
Halt build (0) Normal build (1603) Accelerate build (1) Stop build (0)														Totals: Supply: 3410348 (3215300) Fuel: 2892103 Manpower: 898 Industry: 7410 Resources: 16818 (10912413) Oil: 2941 (1630296) Shipyards Repair: 839 (6164) Naval Shipyard: 1404 (18444) Merchant Shipyard: 807 (74167) Armament: 600 Vehicles: 400 Aircraft Engines: 1270 + (81 -rd) Aircraft Assembly: 832 + (75 -rd) Naval shipyard estimate: 1369 Merchant shipyard estimate: 704				
PT Boats Available: 0(0) Midget Subs Available: 19(1) MGBs Available: 0(0) Barges Available: 124(0)														Back Exit				

Here we can see that the bulk of the production of ships is Normal. The numbers besides the text is the number of points (Navy or Merch) that construction is using. The Taiho construction is being Accelerated which is why the number of Navy points used is much higher. Being Accelerated increases the chance that the ship will be available sooner than historical.

There is one more option not shown and that is Halted. This means just that, no construction is occurring, so no points are being used. Construction can be un-Halted at any point, but however long the construction was Halted is added to the historical availability date. So the ship will appear later than historical. Or not at all if you leave it halted for the entire game. Of course the one thing you never want to do is Accelerate a construction and then Halt it as all the points used so far for Acceleration are lost.

You can change the status of the construction between Normal, Accelerated, and Halted by clicking on the yellow text of the current status. If the text is grey like for the last three above, the status cannot be changed. This is because they have not actually started production yet and are still in the planning stage so no points are being used for them yet.

By changing the different statuses you can use up points quicker or slower depending on your needs. One important thing to know is that once the points are in the pools for Armaments, Vehicles, Navy, and Merchant, they never can get destroyed. So even if Japan does not produce a single HI point, these points can still be applied to their various ends to keep units being rebuilt and ships being constructed.

As a comparison, let's look at a different HI situation as shown below. This is from my Nov 3, 1944 Scenario 2 game.

All Industry	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	Engines	Air	RD Air	NavSY	MerSY	RepSY	Nominal requirement filter			
Requirements															At Base			
Base	Type	Upd	Repair	Prod	Size	producing	Failed	Fuel	Res	Oil	HI	Supply	Fuel	Res	Oil			
Alita	Manpower	-	Yes	-	2(0) - 10 MP	-	0	0	0	0	0	3503	1360	6900	1426			
Alita	Resources	-	Yes	-	60(0) - 1200 Res	-	0	0	0	0	0	3503	1360	6900	1426			
Alita	Oil	-	Yes	-	32(0) - 320 Oil	-	0	0	0	0	0	3503	1360	6900	1426			
Alita	Refinery	-	Yes	Yes	40(0) - 360 Fuel, 40 Sup	-	0	0	0	400	0	3503	1360	6900	1426			
Alita	Light Industry	-	Yes	-	20(0) - 20 Sup	-	0	0	300	0	0	3503	1360	6900	1426			
Amami Oshima	Resources	-	Yes	-	20(0) - 400 Res	-	0	0	0	0	0	10255	7401	39398	0			
Ankang	Resources	-	Yes	-	20(0) - 400 Res	-	0	0	0	0	0	3557	1	921	0			
Anshan	Manpower	-	Yes	-	7(0) - 35 MP	-	0	0	0	0	0	1962	58	58399	0			
Anshan	Resources	-	Yes	-	360(0) - 7200 Res	-	0	0	0	0	0	1962	58	58399	0			
Anshan	Heavy Industry	-	Yes	Yes	100(0) - 200 HI, 200 Sup	-	0	200	2000	0	0	1962	58	58399	0			
Anshan	Light Industry	-	Yes	-	40(0) - 40 Sup	-	0	0	600	0	0	1962	58	58399	0			
Antung	Manpower	-	Yes	-	1(0) - 5 MP	-	0	0	0	0	0	333	2000	0	0			
Arshaan	Manpower	-	Yes	-	1(0) - 5 MP	-	0	0	0	0	0	243	0	0	0			
Totals	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	Engines	Air	RD Air	NavSY	MerSY	RepSY				
In Pool	2149M	662	242	9865	827628	3873M	7544	74	3760	6179	0	0	0	0	29713			
Max Prod	4490	14910	11000	24930	22750	331800	690	300	3620	2234	106	1455	1040	1012				
Disabled Prod	95	208	48	5328	110	3720	0	0	0	0	32	4	43	111				
Shut Off Prod	0	0	0	0	0	0	690	200	2620	546	0	981	997	0				
Actual Prod	4395	14702	10952	19602	22640	328080	0	100	1200	1688	62	470	0	901				
Supply Req	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Fuel Req	0	14702	0	0	0	0	0	0	0	0	0	0	0	0				
Oil Req	0	0	0	21780	0	0	0	0	0	0	0	0	0	0				
Res Req	0	147020	164280	0	0	0	0	0	0	0	0	0	0	0				
HI Req	0	0	0	0	0	0	4140	1800	68220	40212	0	4353	2991	0				
Sup Prod	0	14702	10952	2178	0	0	0	0	0	0	0	0	0	0				
Fuel Prod	0	0	0	19602	0	0	0	0	0	0	0	0	0	0				
⚡ Turn ON repairs ⚡ Turn OFF repairs ⚡ Turn ON production ⚡ Turn OFF production																		

Notice the Red X and number. The X means that my HI in Anshan did not produce any HI in the last turn. This was due to the lack of fuel as noted by the red 58 in the Fuel column. You will notice that I have 9,865 Fuel in the pool. However, it is locally available resources that factories use to produce, not what is available in some other location. The Blue numbers mean that those items are being stockpiled at those bases, i.e. the stockpile flag at those bases is set to 'Yes' for those items.

PART III – PLANES AND ENGINES

This is where the most impact someone playing Japan can have on the game and the future of the Empire. Do not misunderstand though; you will still lose no matter what you do here. All this can do is delay the end longer than the historical. Plus it is fun. You will spend a lot of time in this area.

Plane production is split into two sections, the aircraft itself and the engine. Both of these have two different types of factories, Production and R&D. As there is not that many engine types, Production and R&D factories for engines are on a single menu. Aircraft Production and R&D factories are divided into two menus as shown below.

All Industry	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	Engines	Air	RD Air	Nav SY	Mar SY	Rep SY	No minimal requirement filter		
											Requirements		At Base				
Base	Type	Upd	Repair	Prod	Size	- producing	Failed	Fuel	Res	Oil	HI	Supply	Fuel	Res	Oil		
Alkita	Manpower	-	Yes	-	200	- 10 MP	-	0	0	0	0	501	1369	6902	7919		
Alkita	Resources	-	Yes	-	6000	- 1200 Res	-	0	0	0	0	501	1369	6902	7919		
Alkita	Oil	-	Yes	-	3200	- 320 Oil	-	0	0	0	0	501	1369	6902	7919		
Alkita	Refinery	-	Yes	Yes	4000	- 360 Fuel, 40 Sup	-	0	0	400	0	501	1369	6902	7919		
Alkita	Light Industry	-	Yes	-	2000	- 20 Sup	-	0	300	0	0	501	1369	6902	7919		
Alkyab	Manpower	-	Yes	-	100	- 5 MP	-	0	0	0	0	20	1	1	1		
Amami Oshima	Resources	-	Yes	-	2000	- 400 Res	-	0	0	0	0	4148	13778	16400	0		
Ankang	Resources	-	Yes	-	2000	- 400 Res	-	0	0	0	0	5	1	529	1		
Anshan	Manpower	-	Yes	-	700	- 35 MP	-	0	0	0	0	1141	2794	56605	0		
Anshan	Resources	-	Yes	-	36000	- 7200 Res	-	0	0	0	0	1141	2794	56605	0		
Anshan	Heavy Industry	-	Yes	Yes	10000	- 200 HI, 200 Sup	-	200	2000	0	0	1141	2794	56605	0		
Anshan	Light Industry	-	Yes	-	4000	- 40 Sup	-	0	600	0	0	1141	2794	56605	0		
Anshung	Manpower	-	Yes	-	100	- 5 MP	-	0	0	0	0	334	2001	0	0		
Totals	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	Engines	Air	RD Air	Nav SY	Mar SY	Rep SY			
In Pool	753103	174290	8329	3133	1.630M	10.91M	94036	2243	1633	2278	0	18444	74167	6164			
Max Prod	4640	14882	11140	32175	31640	342800	620	400	1382	832	475	1417	812	970			
Disabled Prod	150	62	159	2088	3220	6440	0	0	31	0	297	13	5	111			
Shut Off Prod	0	0	0	0	0	0	0	0	40	60	0	0	0	0			
Actual Prod	4490	14820	10981	30087	28410	336360	620	400	1311	772	75	1404	807	829			
Supply Req	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Fuel Req	0	14820	0	0	0	0	0	0	0	0	0	0	0	0			
Oil Req	0	0	0	33430	0	0	0	0	0	0	0	0	0	0			
Res Req	0	148200	164715	0	0	0	0	0	0	0	0	0	0	0			
HI Req	0	0	0	0	0	0	3720	2400	22860	14976	0	4212	2421	0			
Sup Prod	0	14820	10981	3343	0	0	0	0	0	0	0	0	0	0			
Fuel Prod	0	0	0	30087	0	0	0	0	0	0	0	0	0	0			
⚙ Turn ON repairs ⚙ Turn OFF repairs ⚙ Turn ON production ⚙ Turn OFF production																	

☐ Turn ON repairs
 ☐ Turn OFF repairs
 ☐ Turn ON production
 ☐ Turn OFF production

The screenshot below was created by clicking on All Industry (which de-selects all the top menu items) and then clicking on the Air menu. The list of factories was then sorted by clicking on Type which sorted the list by aircraft type.

All Industry	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	Engines	Air	RD Air	Nav SY	Mer SY	Rep SY	No minimal requirement f		
											Requirements						
											At Base						
Base	Type	Upgd	Repair	Prod	Size	producing	Failed	Fuel	Res	Oil	HI	Supply	Fuel	Res	Oil		
Maebashi	A6M2 Zero	Yes	Yes	Yes	100(0)	- 100 AC/Month	-	0	0	0	1800	14219	0	6900	0		
Harbin	A6M2 Zero	Yes	Yes	Yes	60(0)	- 60 AC/Month	-	0	0	0	1080	17097	1518	46052	0		
Osaka/Kyoto	A6M3 Zero	Yes	Yes	Yes	50(0)	- 50 AC/Month	-	0	0	0	900	14131	262805	1.288M	38000		
Hiroshima/Kure	B5N2 Kate	Yes	Yes	Yes	60(0)	- 60 AC/Month	-	0	0	0	1080	19062	107530	103100	0		
Nagoya	D3A2 Val	Yes	Yes	Yes	30(0)	- 30 AC/Month	-	0	0	0	540	23577	21160	267300	52		
Gifu	D3A2 Val	Yes	Yes	Yes	31(0)	- 31 AC/Month	-	0	0	0	558	21236	0	800	0		
Hiroshima/Kure	E13A1 Jake	Yes	Yes	No	30(0)	- 30 AC/Month	-	0	0	0	540	19062	107530	103100	0		
Nagoya	E14Y1 Glen	Yes	Yes	Yes	10(0)	- 10 AC/Month	-	0	0	0	180	23577	21160	267300	52		
Nagasaki/Sasebo	F1M2 Pete	Yes	Yes	Yes	6(0)	- 6 AC/Month	-	0	0	0	108	18902	22356	257807	2		
Maebashi	G3M3 Nell	Yes	Yes	Yes	50(0)	- 50 AC/Month	-	0	0	0	900	14219	0	6900	0		
Nagoya	G4M1 Betty	Yes	Yes	Yes	50(0)	- 50 AC/Month	-	0	0	0	900	23577	21160	267300	52		
Osaka/Kyoto	H6K5 Mavis	Yes	Yes	Yes	30(0)	- 30 AC/Month	-	0	0	0	540	14131	262805	1.288M	38000		
Osaka/Kyoto	H8K1 Emily	Yes	Yes	Yes	30(0)	- 30 AC/Month	-	0	0	0	540	14131	262805	1.288M	38000		
Totals	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	Engines	Air	RD Air	Nav SY	Mer SY	Rep SY			
In Pool	753103	174290	8329	3133	1.630M	10.91M	94036	2243	1633	2278	0	18444	74167	6164			
Max Prod	4640	14882	11140	32175	31640	342800	620	400	1382	832	475	1417	812	970			
Disabled Prod	150	62	159	2088	3230	6440	0	0	31	0	297	13	5	111			
Shut Off Prod	0	0	0	0	0	0	0	0	40	60	0	0	0	0			
Actual Prod	4490	14820	10981	30087	28410	336360	620	400	1311	772	75	1404	807	859			
Supply Req	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Fuel Req	0	14820	0	0	0	0	0	0	0	0	0	0	0	0			
Oil Req	0	0	0	33430	0	0	0	0	0	0	0	0	0	0			
Res Req	0	148200	164715	0	0	0	0	0	0	0	0	0	0	0			
HI Req	0	0	0	0	0	0	3720	2400	22860	14976	0	4212	2421	0			
Sup Prod	0	14820	10981	3343	0	0	0	0	0	0	0	0	0	0			
Fuel Prod	0	0	0	30087	0	0	0	0	0	0	0	0	0	0			
Turn ON repairs Turn OFF repairs Turn ON production Turn OFF production																	

Here is an expanded view of just the Aircraft factories.

Base	Type	Upgd	Repair	Prod	Size - producing
Maebashi	A6M2 Zero	Yes	Yes	Yes	100(0) - 100 AC/Month
Hartlin	A6M2 Zero	Yes	Yes	Yes	60(0) - 60 AC/Month
Osaka/Kyoto	A6M3 Zero	Yes	Yes	Yes	50(0) - 50 AC/Month
Hiroshima/Kure	B5N2 Kate	Yes	Yes	Yes	60(0) - 60 AC/Month
Nagoya	D3A2 Val	Yes	Yes	Yes	30(0) - 30 AC/Month
Gifu	D3A2 Val	Yes	Yes	Yes	31(0) - 31 AC/Month
Hiroshima/Kure	E13A1 Jake	Yes	Yes	No	30(0) - 30 AC/Month
Nagoya	E14Y1 Glen	Yes	Yes	Yes	10(0) - 10 AC/Month
Nagasaki/Sasebo	F1M2 Pete	Yes	Yes	Yes	6(0) - 6 AC/Month
Maebashi	G3M3 Nell	Yes	Yes	Yes	50(0) - 50 AC/Month
Nagoya	G4M1 Betty	Yes	Yes	Yes	50(0) - 50 AC/Month
Osaka/Kyoto	H6K5 Mavis	Yes	Yes	Yes	30(0) - 30 AC/Month
Osaka/Kyoto	H8K1 Emily	Yes	Yes	Yes	30(0) - 30 AC/Month

The columns are described below.

Base - tells us where the factory is located

Type - shows what aircraft is being produced

Upgd – This is a Yes/No toggle which determines if the factory will upgrade automatically to a new type of aircraft *if and only if the existing aircraft has a valid upgrade path*. So a G4M1 Betty factory will automatically upgrade to the G4M2 Betty version if this value is Yes. Otherwise, the factory will continue to produce the G4M1 version until this is changed to Yes or the player changes the factory manually.

Repair – similar to other menus, this determines if the factory will repair if damaged. Yes it will repair, No it will not.

Prod – This is another Yes/No toggle. Yes means the factory will produce this plane type, no it will not. If you have many planes of a certain type in the pool, then it can be useful to turn off production for a while in order to save HI points (or use them for something else).

Size-Producing – This tells you what that location *could* produce. So the first row for the A6M2 Zero shows us that the factories could produce 100 of this plane/month. Because we have Prod set to Yes, then we actually are producing 100 planes/month. Again if Prod was No then we would not produce any planes that day. Any damage would appear in the parentheses. So a 50(20) would indicate we could produce 50 planes/month and 20 factories are damaged. Factories repair at 1/day is enough supplies are available. So in 20 days we would be producing 70 planes/month.

As most factory expansion occurs for planes and engine factories, this would be a good time to cover how we do that.

Let's say we want to expand our Zero A6M3 factories in Osaka by 10. If we clicked on Osaka and then selected the Zero factory and try to expand it that way, we would only be able to increase it by 50, not just 10. So we want to use the Industry as this allows a much finer control over expansions of any factory.

We select the Osaka Zero factory by clicking on the plane name in the Type column as shown below.

All Industry	Manpower	HI	LI	Refinery	Oil	Resource	Armament	Vehicle	Engines	Air	RD Air	Nav SY	Mer SY	Rep SY	No minimal requirement filter			Expand A6M3 Zero at Osaka/Kyoto		
Base	Type	Upd	Repair	Prod	Size - producing	Failed	Fuel	Res	Oil	HI	Supply	Fuel	Res	Oil						
Maebashi	A6M2 Zero	Yes	Yes	Yes	100(0) - 100 AC/Month	-	0	0	0	1800	14219	0	8900	0						
Hartlin	A6M2 Zero	Yes	Yes	Yes	60(0) - 60 AC/Month	-	0	0	0	1080	17097	1518	46052	0						
Osaka/Kyoto	A6M3 Zero	Yes	Yes	Yes	30(0) - 30 AC/Month	-	0	0	0	900	14131	262605	1288M	38000						
Hiroshima/Kure	B2N2 Kate	Yes	Yes	Yes	60(0) - 60 AC/Month	-	0	0	0	1080	19062	107530	103100	0						
Nagoya	D3A2 Val	Yes	Yes	Yes	30(0) - 30 AC/Month	-	0	0	0	540	23577	21160	267300	52						
Gifu	D3A2 Val	Yes	Yes	Yes	31(0) - 31 AC/Month	-	0	0	0	558	21226	0	800	0						
Hiroshima/Kure	E13A1 Jake	Yes	Yes	No	30(0) - 30 AC/Month	-	0	0	0	540	19062	107530	103100	0						
Nagoya	E14Y1 Glen	Yes	Yes	Yes	100(0) - 10 AC/Month	-	0	0	0	180	23577	21160	267300	52						
Nagasaki/Sasebo	F1M2 Pete	Yes	Yes	Yes	60(0) - 6 AC/Month	-	0	0	0	108	18902	22356	257807	2						
Maebashi	G3M3 Nell	Yes	Yes	Yes	30(0) - 30 AC/Month	-	0	0	0	900	14219	0	8900	0						
Nagoya	G4M1 Betty	Yes	Yes	Yes	30(0) - 30 AC/Month	-	0	0	0	900	23577	21160	267300	52						
Osaka/Kyoto	H6K5 Mavis	Yes	Yes	Yes	30(0) - 30 AC/Month	-	0	0	0	540	14131	262605	1288M	38000						
Osaka/Kyoto	H8K1 Emily	Yes	Yes	Yes	30(0) - 30 AC/Month	-	0	0	0	540	14131	262605	1288M	38000						
Totals	Manpower	HI	LI	Refinery	Oil	Resource	Armament	Vehicle	Engines	Air	RD Air	Nav SY	Mer SY	Rep SY						
In Pool	753103	174290	8329	3133	1630M	1091M	94036	2243	1633	2278	0	18444	74167	6164						
Max Prod	4640	14882	11140	32175	31640	342800	620	400	1382	832	475	1417	812	970						
Disabled Prod	130	62	159	2088	3230	6440	0	0	31	0	297	13	5	111						
Shut Off Prod	0	0	0	0	0	0	0	0	40	60	0	0	0	0						
Actual Prod	4490	14820	10981	30087	28410	336360	620	400	1311	772	75	1404	807	839						
Supply Req	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Fuel Req	0	14820	0	0	0	0	0	0	0	0	0	0	0	0						
Oil Req	0	0	0	33430	0	0	0	0	0	0	0	0	0	0						
Res Req	0	148200	164715	0	0	0	0	0	0	0	0	0	0	0						
HI Req	0	0	0	0	0	0	3720	2400	22900	14976	0	4212	2421	0						
Sup Prod	0	14820	10981	3343	0	0	0	0	0	0	0	0	0	0						
Fuel Prod	0	0	0	30087	0	0	0	0	0	0	0	0	0	0						

Turn ON repairs

Turn OFF repairs

Turn ON production

Turn OFF production

Exit

A6M3 Zero mounts

1x Nakajima Ha-35 engine(s)

Aircraft

Engine

AS4M Claude

A6M2 Zero

A6M2-N Rufe

B4Y1 Jean

B5M1 Mabel

B5N1 Kate

B5N2 Kate

CSM2 Babe

D1A2 Susan

D3A1 Val

D3A2 Val

E13A1 Jake

E14Y1 Glen

E7K2 Alf

ERN2 Dave

F1M2 Pete

G3M2 Nell

G3M3 Nell

Nakajima Kotobuki

Nakajima Ha-35

Nakajima Hikari

Mitsubishi Ha-33

Mitsubishi Ha-33

Mitsubishi Ha-33

Hibachi Amakaze

Mitsubishi Ha-31

Nakajima Kotobuki

Mitsubishi Ha-31

Mitsubishi Ha-33

Mitsubishi Ha-33

On the right side of the screen a list of available plane types appear along with some arrows at the top of the screen. An expanded view is below.



The arrows at the top represent Units, Tens, and Max. Max will double the existing factory size just like we can do by going to Osaka on the map and expanding the factory there. Max takes into account damaged factories as well as undamaged ones when determining the maximum expansion of a factory. As an example, if you have a 2(0), selecting the last arrow and approving the expansion, you will now have a 2(2) factory. If you do this again, you will now have a 2(6). Doing it once more you will have a 2(14) and so on.

As we want to expand just by 10, we select the 10s (middle arrow) and click it once as shown below.



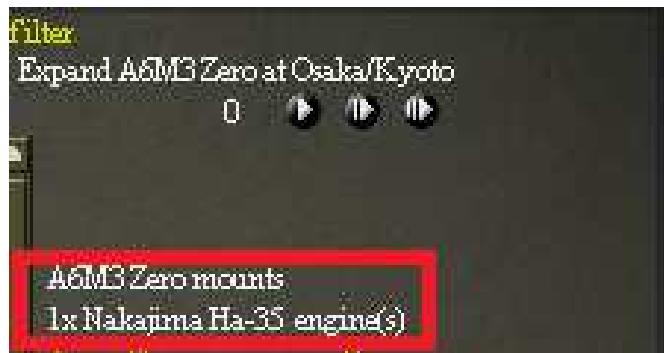
We then click on the Expand now arrow which 'approves' the expenditure of the Supply, HI, and Manpower for the expansion. We can also further adjust the expansion by using the arrows if needed before we approve the expansion. As we like things as they are we click Expand now. Now we have an additional 10 Zero factories that will need to be repaired as shown below.

All Industry	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	E
Base	Type		Upgd	Repair	Prod	Size - producing			
Maebashi	A6M2 Zero		Yes	Yes	Yes	100(0) - 100 AC/Month			
Hartun	A6M2 Zero		Yes	Yes	Yes	60(0) - 60 AC/Month			
Osaka/Kyoto	A6M3 Zero		Yes	Yes	Yes	50(10) - 50 AC/Month			

An important thing to remember when expanding factories is not only is there a cost for the expansion, there is also a cost in additional supplies for the repair. On top of this, these extra 10 plane factories,

once fully repaired will now add an additional 18 HI each, for a total increase of 180 HI used per day to produce these extra 10 planes. This extra HI cost does not include the cost of the engines.

Now that we expanded the plane factories we need to check if we are producing enough engines to support the expansion. We initially clicked on the A6M3, it told us we were using a Nakajima Ha-35 engine as highlighted below.



We can see from the Aircraft and Engine menu under the Intelligence screen shown below we are currently producing 471 of the Ha-35s with 9 more to be repaired. But is this enough with the 10 factory expansion we just did?

Aircraft and Engine Production							Date: Aug 30, 1942	Totals:	
Name	In Pool	Used	Production		Rate	Avail Year	Engine	Aircraft Engines:	
Engine - Hitachi Amakaze	30	100	0	0	0x(0)	41/12	Hitachi Amakaze	1270 +(81-rd)	
Engine - Hitachi (early)	390	96	0	2	0x(0)	41/12	Hitachi (early)	832 +(75-rd)	
Engine - Kawasaki (early)	85	0	0	0	0x(0)	41/12	Kawasaki (early)		
Engine - Mitsubishi Ha-31	198	710	4	122	121 x(0)	41/12	Mitsubishi Ha-31		
Engine - Mitsubishi Ha-32	0	1198	8	249	260 x(0)	41/12	Mitsubishi Ha-32		
Engine - Mitsubishi Ha-33	6	1251	9	239	250 x(0)	41/12	Mitsubishi Ha-33		
Engine - Nakajima Ha-5	122	50	0	34	7x(13)	41/12	Nakajima Ha-5		
Engine - Nakajima Ha-34	0	222	1	31	41 x(9)	41/12	Nakajima Ha-34		
Engine - Nakajima Ha-35	27	2839	15	454	471 x(9)	41/12	Nakajima Ha-35		
Engine - Nakajima Hikari	99	0	0	0	0x(0)	41/12	Nakajima Hikari		
Engine - Nakajima Kotobuki	102	157	0	0	0x(0)	41/12	Nakajima Kotobuki		
ASM4 Claude	190	-144	0	0	0x(0)	41/12	Nakajima Kotobuki		
A6M2 Zero	303	765	5	166	160 x(0)	41/12	Nakajima Ha-35		
B4Y1 Jean	77	-6	0	0	0x(0)	41/12	Nakajima Hikari		
B5M1 Mabel	33	-22	0	0	0x(0)	41/12	Mitsubishi Ha-33		
B5N1 Kate	89	-39	0	0	0x(0)	41/12	Nakajima Hikari		
B5N2 Kate	50	324	2	61	60 x(0)	41/12	Nakajima Ha-35		
D3A1 Val	123	179	0	21	0x(0)	41/12	Mitsubishi Ha-33		

Back Exit

Unfortunately to determine this using in game capabilities, this is not easy to figure out. This is another good reason to use Tracker. The screenshot above was sorted by engine to get the screenshot below.

Name	In Pool	Used	Production		Rate	Avail Year	Engine
			Last turn	This month			
Ki-49-II KAI Helen	0	0	0	0	1 x (2)	43/05	Nakajima Ha-34
Engine - Nakajima Ha-35	27	2839	15	454	471 x (9)	41/12	Nakajima Ha-35
A6M2 Zero	303	765	5	166	160 x (0)	41/12	Nakajima Ha-35
A6M3 Zero	31	76	2	51	50 x (10)	42/06	Nakajima Ha-35
A6M5 Zero	0	0	0	0	21 x (18)	43/08	Nakajima Ha-35
BSN2 Kate	50	324	2	61	60 x (0)	41/12	Nakajima Ha-35
J1N1-C Irving	0	0	0	0	7 x (0)	42/11	Nakajima Ha-35
Toka	0	0	0	0	3 x (1)	45/12	Nakajima Ha-35
Ki-43-Ia Oscar	4	5	0	0	0 x (0)	41/12	Nakajima Ha-35
Ki-43-Ib Oscar	25	-12	0	0	0 x (0)	41/12	Nakajima Ha-35
Ki-43-Ic Oscar	214	329	3	82	80 x (0)	41/12	Nakajima Ha-35
Ki-43-Ib Oscar	0	0	0	0	4 x (1)	43/05	Nakajima Ha-35
Ki-45 KAIb Nick	0	0	0	0	1 x (1)	42/12	Nakajima Ha-35
Ki-48-Ib Lily	131	35	0	0	0 x (0)	41/12	Nakajima Ha-35
Ki-48-IIa Lily	15	183	1	43	40 x (0)	42/04	Nakajima Ha-35
Ki-56 Thalia	52	45	1	16	10 x (0)	41/12	Nakajima Ha-35
Engine - Nakajima Ha-44	0	0	0	0	10 x (0)	43/03	Nakajima Ha-44

The highlighted area shows all the factories that are currently using the Ha-35. By adding these up, we can determine if we need to further expand the production of these engines due to our increase in plane production or not. We do not count the dimmed planes as they are being researched and do not count toward production needs.

Adding these numbers up gives us a need of 410 Ha-35s in order to insure that every plane that uses this engine will get built. Note, we do count any damaged factories as they will eventually be repaired and should be taken into account. A lack of engines for a plane will prevent any planes using that engine from being built above the number of that type of engine available, Ha-35 in this example. So it is critical that plane and engine production match up properly.

As noted earlier we are producing 471 with 9 damaged so eventually we will be making 480. Since we only need 410, we are in good shape and could expand plane production that uses this engine even further. Not quite a good idea yet. The reason is covered in the next section.

Before we move on to R&D though, we have one more topic to cover here. That is how to change plane factories from one type to another. If you noticed earlier, when we clicked on the A6M3 Zero before a list of planes showed up on the right side of the screen. This screen is shown again below.



This is a list of all the aircraft we *could* produce if we wanted. Some of these Japan should never produce, while other types we should produce a lot of. We learned how we could expand factories to increase production but that not only costs us extra HI both for the expansion and for ongoing day to day production as well.

The other way we can expand production of a particular aircraft is to change a factory from producing a model that is no longer wanted into a different one that we want more of. This method does not use any additional HI or Manpower like the expansion does, but it also has a down side, with one very important exception.

Let's say, I wanted more A6M2 Zeros and I wanted to convert my A6M3 factories. Not a really good idea, but just using this as an example. We have already selected the A6M3 factory and have the list of other planes on the right. So all we do is click on A6M2 Zero on the right and we see the following screen.

All Industry															No minimal requirement filter														
Manpower HI LI Refinery Oil Resources Armament Vehicle Engines Air RD Air Nav SY Mer SY Rep SY															Expand A6M2 Zero at Osaka/Kyoto														
															</														

Below is an expanded view.

All Industry	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	
Base	Type	Upgd	Repair	Prod	Size	- producing			
Maebashi	A6M2 Zero	Yes	Yes	Yes	100(0)	- 100 AC/Month			
Osaka/Kyoto	A6M2 Zero	Yes	Yes	Yes	0(42)	- 0 AC/Month			
Harbin	A6M2 Zero	Yes	Yes	Yes	60(0)	- 60 AC/Month			
Hiroshima/Kure	BSN2 Kate	Yes	Yes	Yes	60(0)	- 60 AC/Month			
Nagoya	D3A2 Val	Yes	Yes	Yes	30(0)	- 30 AC/Month			

What just happened? You will notice there was NO chance to confirm the decision or not. You click and it is done. Do you remember we told you to save the game before you do ANYTHING with production? This is just one reason why you need to do that.

We went from having a 50(10) A6M3 factory to a 0(42) A6M2 factory. ANYTIME you change factories to a different plane type, *unless the new type is in the current planes upgrade path* (more on that under R&D), not only are all the factories damaged, but you permanently lose a percentage of the old factories based on the plane type you are changing to.

Changing the number of engines increases the number lost. So as a general rule of thumb, unless you really need it, is to keep the number of engines the same when changing plane production, i.e. single engine type to single engine type versus single engine to multiple engine (or vice a versa).

Using this method does not cost us any HI like the expansion did. However, it will now take 42 days for the factory to be fully functional. So basically we traded time for HI. Whether that is a good trade or not depends on what is occurring in your long term plans as Japan.

We could get the factory back to the 60 level we would have originally had by expanding by 18. However, that would require us to expand the factory using HI, Manpower, and Supplies. Which kind of defeats the purpose of using this method to increase production. However, we will get an increase of 42 additional A6M2s at no extra cost other than supplies for repair. If we expanded to get the same increase it would have cost us 420 HI and Manpower, plus 4,200 Supplies. So we traded a loss of 18 factories and 42 days to fully repair for that. These are the kind of tradeoffs that Japanese players will need to take into account throughout the game.

PART IV – R&D PLANES AND ENGINES

All the previous discussion about factory expansions and changing planes types works the same for R&D. However, R&D has some major differences as you might expect. First of all, R&D factories do not use any supplies, engines, etc. to operate. So they work for ‘free’. However there is a cost (no surprise there), for all this ‘free’ work. R&D factories do NOT repair at the 1/day (with enough supplies of course) rate that production factories do.

The repair rate is based on the difference between the availability date and the current game date. What this effectively means that any plane whose availability date is two or more years ahead of the game date, the repair rate for a R&D factory is going to be almost non-existent. The converse is that the closer the dates are together, the repair rate increases, but it will never reach the 1/day repair rate until it actually switches to a production factory, but the repair rate will come close to that within the last 30 days before the availability date.

The R&D screen is also a little different that the production one so let’s look at it below.

All Industry	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	Engines	Air	RD Air	Nav SY	Mer SY	Rep SY	No minimal requirement filter		
Base	Type	Upgd	Repair	Prod	Size - producing	Failed	Fuel	Res	Oil	HI	Supply	Fuel	Res	Oil			
Maebashi	A6MS Zero	Yes	Yes	Yes	8(6) - rd (8/43)	-	0	0	0	0	14219	0	6900	0			
Maebashi	A6MS Zero	Yes	Yes	Yes	7(2) - rd (8/43)	-	0	0	0	0	14219	0	6900	0			
Nagoya	A6MS Zero	Yes	Yes	Yes	6(10) - rd (8/43)	-	0	0	0	0	23577	21160	267300	52			
Okayama	A6MS Zero	Yes	Yes	Yes	0(3) - rd (8/43)	-	0	0	0	0	466	4000	13000	0			
Yokohama/Yokosuka	A6MS Zero	Yes	Yes	Yes	0(9) - rd (8/43)	-	0	0	0	0	15223	26158	60638	28300			
Tai	A7M2 Sam	Yes	Yes	Yes	0(2) - rd (9/45)	-	0	0	0	0	463	4003	6901	0			
Tai	A7M3-J Sam	Yes	Yes	Yes	0(2) - rd (1/46)	-	0	0	0	0	463	4003	6901	0			
Maebashi	B6N1 Jill	Yes	Yes	Yes	7(7) - rd (5/43)	-	0	0	0	0	14219	0	6900	0			
Tai	B6N2 Jill	Yes	Yes	Yes	0(1) - rd (10/43)	-	0	0	0	0	463	4003	6901	0			
Nagasaki/Sasebo	B7A2 Grace	Yes	Yes	Yes	3(6) - rd (12/44)	-	0	0	0	0	17102	22356	257807	2			
Nagoya	C6N1-S Myrt	Yes	Yes	Yes	0(7) - rd (5/45)	-	0	0	0	0	23577	21160	267300	52			
Fukuoka	D4Y1 Judy	Yes	Yes	Yes	1(7) - rd (4/43)	-	0	0	0	0	5211	15410	151808	2222			
Maebashi	D4Y1 Judy	Yes	Yes	Yes	5(1) - rd (4/43)	-	0	0	0	0	14219	0	6900	0			
Totals	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle	Engines	Air	RD Air	Nav SY	Mer SY	Rep SY			
In Pool	752623	174010	8329	3133	1630M	1091M	94036	2243	1633	2278	0	19444	74167	6164			
Max Prod	4640	14882	11140	32175	31640	342800	620	400	1382	842	475	1417	812	970			
Disabled Prod	150	62	159	2088	3230	6440	0	0	31	60	297	13	5	111			
Shut Off Prod	0	0	0	0	0	0	0	0	40	60	0	0	0	0			
Actual Prod	4490	14820	10981	30087	28410	336360	620	400	1311	722	75	1404	807	839			
Supply Req	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Fuel Req	0	14820	0	0	0	0	0	0	0	0	0	0	0	0			
Oil Req	0	0	0	33430	0	0	0	0	0	0	0	0	0	0			
Res Req	0	148200	164715	0	0	0	0	0	0	0	0	0	0	0			
HI Req	0	0	0	0	0	0	3720	2400	22860	14076	0	4212	2421	0			
Sup Prod	0	14820	10981	3343	0	0	0	0	0	0	0	0	0	0			
Fuel Prod	0	0	0	30087	0	0	0	0	0	0	0	0	0	0			

We still have the planes listed and the toggles, etc. The major difference is the Upgrade toggle determines if the factory switches from an R&D factory to a production factory when that plane type becomes available. Once a factory becomes a production factory, it can never return to being an R&D factory. Once nice feature that has been added, is that the plane’s name will turn blue when it is within 30 days of its availability date. This way you can determine if you want to allow the factory to switch or not.

Let's look at the A6M5 in more detail as an example.

Base	Type	Upgd	Repair	Prod	Size - producing
Maebashi	A6M5 Zero	Yes	Yes	Yes	8(6) - rd (8/43)
Maebashi	A6M5 Zero	Yes	Yes	Yes	7(2) - rd (8/43)
Nagoya	A6M5 Zero	Yes	Yes	Yes	6(10) - rd (8/43)
Okayama	A6M5 Zero	Yes	Yes	Yes	0(3) - rd (8/43)
Yokohama/Yokosuka	A6M5 Zero	Yes	Yes	Yes	0(9) - rd (8/43)

Here we see we have 5 R&D factories producing A6M5s. All of these have damaged factories, which is not a good thing. Why? Unlike production factories, R&D factories produce 'points' which are used to accelerate the availability date of the plane. UNLESS ALL R&D FACTORIES ARE FULLY REPAIRED, THEY WILL PRODUCE ZERO POINTS TOWARD ACCELERATION. This cannot be stressed enough.

The 7(2) factory on the second line is the closest to actually helping to accelerate the availability date since it has only two more factories to be repaired. This is one of the major shocks as playing as Japan is the realization that there will be no '45 planes in '43. However, it is entirely possible, to get planes six months earlier than historical (or even earlier) though the proper use of R&D. This is done by understanding the Japanese upgrade paths for planes.

We will use the Zero line to show how this works. The upgrade paths for other planes work the same way. The Zero line upgrades as follows:

A6M3 -> A6M3a -> A6M5 -> A6M5b -> A6M5c -> A6M8

What about the A6M2? That is a different path which goes as follows:

A6M2 -> A6M2 Sen Baku -> A6M5b -> A6M5c -> A6M8

Both paths are the same with the A6M5b model and later. You have to love the Japanese thought process in designing these planes. But we are going to work on the A6M3 line since we have been using that as our example earlier.

The A6M5 shows an availability date of 8/43 which is a year ahead of the current game turn of 8/42. So the repair rate for these factories is better than it was at the start of the game since the game date and the availability dates are now closer. So we should see the 7(2) factory to be fully repaired in the next few weeks of game time.

Once it is repaired, it will start producing 7 points toward acceleration/month on AVERAGE. It could be a little more or a little less depending on the die rolls behind the scenes. If we assume 7 points/month, then when will I get the A6M5? About a month early. WHAT?

Unfortunately Yes. To accelerate a plane's availability by one month, you need about 100 points to do this, again a little less or more depending on die rolls. If we were just depending on just the 7 point

factory for acceleration, it would take us about 15 MONTHS to gain ONE month of acceleration (100/7). Since we only have about 12 months before the availability date, this is not going to do us much good.

Since we have other factories that will be getting repaired a little quicker since the dates are getting closer, these will be adding extra points too at some point. If we assume they will all be repaired by the beginning of 11/42, we will have 52 points/month towards acceleration (this is very unlikely to happen in game so do not expect all these factories to be repaired this quick).

This means that we will get one month of acceleration every two months. Not quite. The maximum amount of points you can get from R&D factories is fixed at 1/day. So any factories over 30 are not contributing anything to acceleration. So why have so many? Great question.

Two reasons. First as the factories have a random chance on repair, having more factories increases the chance for repair. The second reason is that by having extras, some can stay as R&D factories while others convert to production. When factories convert to production, the conversion is free. No HI, Supplies, etc. is needed. This is a great way to increase plane production for the least cost in the game.

Back to the acceleration example. With the R&D factory points limited to 1/day, this means that approximately every three months or so, one month acceleration occurs. So if we got 1 point/day starting 11/42 that gives us 10 months to accelerate. So by 2/43 the availability date will be 7/43. Three months later in 5/43 we get another month's acceleration to 6/43. We will not get any further acceleration since the next month we will actually get the plane to produce (and the name will turn Blue sometime in May '43)

There has to be something else we can do to speed this up. You are correct, but it is not that easy. If you have 500 or more engines in the pool that the plane being researched uses, you get an additional 1 point/day each day you meet this requirement. This is an all or nothing criteria. If you have 500 or more you get a point. You have 499 you get 0.

Remember so long ago where I mention we were doing well with our Ha-35 engine production so we could expand the production of planes using that engine further. And I said it may not be a good idea? This is why.

Back in that section you could see from the Intelligence screenshot that we currently have 27 Ha-35s in our pool and are producing 480 (once all repaired) and using 410 (once all repaired). This gives us 70/month that we can add to our pool. To get to 500 it will take us 7 months unless we further expand production of this engine WITHOUT increasing ANY additional need for it. Again this is a tradeoff between using HI, Supplies, etc. to expand the engine factories further, not increase current plane production further, in order to possibly get a newer model a few additional months earlier.

Well you said you could get a plane six months earlier. I do not see how that is possible. What gives? Remember the upgrade paths we discussed earlier? The real magic in Japanese R&D is not in researching a single type of plane since you can see how that is not very effective. It is in researching an entire series of plane types like the Zero line.

This is because when you switch factories, whether Production or R&D factories, AND the plane type switched is the NEXT plane in the upgrade path, factories do NOT suffer ANY damage or loss. Pretty amazing. This is what makes Japanese R&D effective since repairing R&D factories is much slower than production ones.

Continuing with our A6M5 example from earlier. As noted we will have 52 (hopefully anyway) R&D factories producing points by 5/43 and the A6M5 will be available 6/43. If all the R&D factories are repaired, we can keep them all as R&D (which would not make much sense since 30 is the max that can contribute points). So let's keep the 1st and third rows in the screen shot (14 and 16 once repaired) and let the rest switch to production.

We switch the factories the same way as we discussed in the production screen. So we select the 14 R&D factory and click on the A6M5b model on the right. Here is what it looks like when I did this in 8/42 just to show how the factory values stay the same.

Base	Type	Upgd	Repair	Prod	Size - producing
Maebashi	A6M5 Zero	Yes	Yes	Yes	7(2) - rd (8/43)
Nagoya	A6M5 Zero	Yes	Yes	Yes	6(10) - rd (8/43)
Okayama	A6M5 Zero	Yes	Yes	Yes	0(3) - rd (8/43)
Yokohama/Yokosuka	A6M5 Zero	Yes	Yes	Yes	0(9) - rd (8/43)
Maebashi	A6M5b Zero	Yes	Yes	Yes	8(6) - rd (8/44)
Tsu	A7M2 Sam	Yes	Yes	Yes	0(2) - rd (9/45)
Tsu	A7M3-1 Sam	Yes	Yes	Yes	0(2) - rd (1/46)

You can see that the factory values did indeed stay the same. It is still the 8(6) it was in the previous screenshot with the only change being the plane type is now the A6M5b versus the A6M5. The reason we want to wait until the last minute to switch factories over is to a) maximize the acceleration of the current plane type and b) to insure that all the factories maximize their chances for repair.

As my game date is 8/42, if I left the A6M5b change in place, the repair rate would be extremely low due to how far away the availability date is. By waiting until it is fully repaired before I switch, I start producing acceleration points right away versus having to wait for the factory to become fully repaired.

So assume it is 5/43 and we converted 30 points of R&D factories to the A6M5b. These are fully repaired so we get the points stating in May. Also assume we still do not have 500 Ha-35s in the pool as we have been using them along the way.

So July 43 we get acceleration to 5/44. Sept 43 another to 4/44, Nov 43, it goes to 3/44 and it is entirely possible to get the actual plane in Feb '44. Four months earlier. Pretty good. Then we can switch to the c model and do the same thing. But you said six months, this is only four. You really want things early don't you?

Remember we can switch factories anytime we want. Even in the same turn. Since we switched to the b model Zero, we can immediately switch to the c one. And the factories are still not damaged or lost. Once we switched to the c, we could then switch to the A6M8!!! See the below.

Base	Type	Upgd	Repair	Prod	Size - producing
Maebashi	A6M5 Zero	Yes	Yes	Yes	7(2) - rd (8/43)
Nagoya	A6M5 Zero	Yes	Yes	Yes	6(10) - rd (8/43)
Okayama	A6M5 Zero	Yes	Yes	Yes	0(3) - rd (8/43)
Yokohama/Yokosuka	A6M5 Zero	Yes	Yes	Yes	0(9) - rd (8/43)
Maebashi	A6M8 Zero	Yes	Yes	Yes	8(6) - rd (8/45)
Tsu	A7M2 Sam	Yes	Yes	Yes	0(2) - rd (9/45)

The conversion above was done in a single turn. Again by following the proper upgrade path, we are now getting full acceleration from the R&D factories towards a 1945 plane starting in 5/43 in our example. Using our same assumptions from before, you could get this plane sometime in Jan or Feb '45. Six to seven months early. Happy now? How about that Allied Fan Boys?

There is one additional reason to have the extra A6M5 R&D factories. Since we are maxed at 1 point per day with 30 or more factories, we can keep them all as R&D and use some towards the A6M8 and others towards the b or c models. Why? Because if we went for just for the A6M8, we would lose out of getting the other Zero models earlier. By using extra factories for the A6M5 model we are setting up acceleration for not just one model of Zero but several models. Just another of the things that the Japanese has to make decisions on.

Of course these example dates did not include the 'bonus' acceleration you can get from the 500 + engines in the pool. So theoretically, the planes in the examples I have used could be accelerated even further if 500 engines could stay in the pool over the entire course of acceleration. But that is not as easy as it sounds to do. At least for the plane types you really want anyway.

So how do I know what my progress is towards acceleration? If you move the mouse over the plane name, a popup will appear that provides you with this information. Please see the example below.

All Industry	Manpower	HI	LI	Refinery	Oil	Resources	Armament	Vehicle
Click to activate change menu for H8K2-L Emily				R&D 9%	Upgd	Repair	Prod	Size - producing
Maebashi	E16A1 Paul				Yes	Yes	Yes	2(6) - rd (4/44)
Okayama	G4M1-L Betty				Yes	Yes	Yes	0(5) - rd (4/44)
Okayama	G4M2 Betty				Yes	Yes	Yes	0(8) - rd (1/44)
Okayama	G4M2 Betty				Yes	Yes	Yes	0(2) - rd (1/44)
Okayama	G4M2a Betty				Yes	Yes	Yes	0(1) - rd (11/44)
Tsu	G4M2a Betty				Yes	Yes	Yes	0(3) - rd (11/44)
Tsu	G4M3a Betty				Yes	Yes	Yes	0(2) - rd (11/44)
Kobe	H8K2-L Emily				Yes	Yes	Yes	1(0) - rd (7/43)
Maebashi	J1N1-C Irving				Yes	Yes	Yes	7(0) - rd (11/42)

As the H8K2-L Emily's R&D factory is fully repaired it is producing points toward acceleration. The cursor is over the plane's name and the popup shown tells us that we are 9% towards a one month acceleration. There will be times where you may see values over 100%. This is due because gaining a month's acceleration is random and the possibility of it occurring only starts when the value is at 100% or greater.

PART V – CONCLUSION

Hopefully all of the above has been helpful in determining how Japanese production works. The major challenge is to keep everything balanced between resource needs, desired outputs, plane types, and engine needs. Expand too fast and the system collapses before the Allies even get going. Too slow, and then you do not have enough (or not enough of the right things) to be able to slow the Allies down.

Against the Allied AI, this is not such a major concern. However against a human Allied player, playing the production 'game' is the only major way Japan can affect when the war ends. Unless they get lucky and sink a bunch of CVs early on. The former is determined by good planning, while the latter is just luck (along with some planning, but nowhere near as much).

I am hopeful this will bring a few more players to the 'dark' side. At least play Japan against the AI if nothing else. Good luck and BANAZI!