**Adding new technology in No Mans Sky**

Adding new technologies in NMS is actually quite easy once you have all the pieces. Only 4 files have to be modified for a new product to be added:

METADATA/REALITY/TABLES/~:

* NMS\_DIALOG\_GCALIENPUZZLETABLE.mbin (optional)
* NMS\_REALITY\_GCTECHNOLOGYTABLE.mbin
* REWARDTABLE.mbin

LANGAUGE/NMS\_LOC1\_ENGLISH.mbin (or which ever language you use)

All of these mbin’s can be decompiled properly using emoose’s fantastic MBINCompiler (<https://github.com/emoose/MBINCompiler>, always make sure you have the latest version. Any version before about 1.0.144 will not work)

There are a few steps to create new technology outlined as follows:

1. Create the GcTechnology data (requires most work potentially)
2. Create custom text enties for the technology to be displayed in the UI.
3. Add the technology as a possible reward (so that you can actually acquire it).
4. (Optional) Modify the GCALIENPUZZLETABLE mbin to give yourself easy access to the technology.

While testing your technology you will probably want to do all 4 steps to give yourself an easy way to acquire the technology. But if it is to be used as part of something larger, you will in all likelihood not need to modify the GCALIENPUZZLETABLE mbin.

Ok, so step 1. This step is still a WIP as there are many variables that can be played with, and I haven’t yet got to figuring out what they do, so if people want to help by messing with them, I can update this tutorial as information comes in until we have a complete picture of how it works.  
First, decompile NMS\_REALITY\_GCTECHNOLOGYTABLE.mbin and open with your favourite xml editor. Every element in this mbin’s data structure is a GcTechnology object, so we will need to create a new one of them. Having a look through the exml you will see quite a bit of variation in the technologies. In this tutorial I will show you how to make a powerful jetpack, but you can give the technology whatever property you want within a certain list.

I’ll give you the full template for a new technology, and then we will look at individual parts and describe them.

The first 5 things we can set easily are *ID*, *Name*, *NameLower*, *Subtitle* and *Description*. The first is the identifier of your technology. Make sure that it is different to all other technologies, and something descriptive. This value will be referenced in other files. The other 4 fields you can put whatever you want in. Again, be descriptive and if possible follow a common naming theme such as what I have used. These 4 values will be given meaning in step 2 later.

The property *Teach* which can be True or False will determine whether the blueprint is pinned or not.

Haven’t figured out what *HintStart* or *HintEnd* do. I think they can have a popup for something. If you figure it out, let me know.

Next, we have the *Icon*. So here you can use one already provided (I was lazy and just used an element), but you can create your own custom icons for the technology.

I haven’t yet played around with *Colour*, so don’t know what this does. Maybe it is the highlight colour? Maybe something else. Either way, not important.

Nothing seems to have *Level* as anything other than ‘1’, so probably leave it as that unless you want to change it to see what happens…

*Chargeable* and *ChargeAmount* can be used to indicate whether something is able to be charged or not. So I could for example make this jetpack of mine require fuel (and amount of fuel required is given by ChargeAmount).  
If you do make the technology chargeable, you will need to include data to tell the game what is used to charge the technology (unless you don’t want it to be able to be recharged). I don’t have the code for that below, but if you search for something that is chargeable, you can easily see how it works. Giving something like a jetpack charge however doesn’t do anything as there is no way for the game to drain it.

We will skip to *TechnologyCategory*. This can have the value of either *Suit*, *Ship,* or *Weapon*, depending on what you want the technology to be for.

*TechnologyRarity* I think doesn’t matter unless you want to make your technology with however it is spawned (eg, if you want it to be rare to be given out randomly from an NPC or something…)

The *Requirements* property is an important one. This lets you decide what the player needs to build the technology. You can look at NMS\_REALITY\_GCSUBSTANCETABLE.mbin to figure out what product is what, but I will add a table here at some point that correlates the two to make it easier. The *InventoryType* can either be a *Product* or a *Substance*, and *Amount* is pretty self-explanatory.

The final property we will look at is *StatBonuses*. This determines what the technology will do. I will need to tabulate the data for what can be put in here, but for now you can play around by looking at other technologies and seeing what they are doing and how they do it.

Phew! Step 1 was long! But don’t worry, all the other steps are far easier!

Step 2: The custom text entries. Remember the 4 values I mentioned earlier? *Name*, *NameLower*, *Subtitle* and *Description?* This is where we define them. Open your preferred language mbin (or multiple ones if creating the text for it in multiple languages).

Create 4 copies of one of the *TkLocalisationEntry* blocks and place them end to end as the rest of the entries are. For each of the 4 data blocks you made, change the *Id* property to whatever you set each of the previous values to be. So, for example if you set *Name* to be *TEST\_TECH*, you need an entry in your language mbin with *Id* of *TEST\_TECH*. Now give the *TkLocalisationEntry* the appropriate data in the appropriate place (ie. value=”stronger gun!!”)

Step 3: Adding the technology as a possible reward. Open up REWARDTABLE.mbin. There are a few options as to where you can modify the file depending on how you want the player to be able to acquire your new technology. At the moment we will just look at having them able to acquire it through being directly given the blueprint.

To do this, add the following inside the *InteractionTable* property (should be at about line 2270 if your file hasn’t been modified by anything…)

<Data template=**"GcGenericRewardTableEntry"**>

<Property name=**"Id"** value=**"TEST\_TECH\_REWARD"** />

<Data name=**"Common"** template=**"GcRewardTableItemList"**>

<Property name=**"EntitlementLinked"** value=**"False"** />

<Property name=**"EntitlementId"** value=**""** />

<Data name=**"RewardChoice"** template=**"GcRewardTableChoice"**>

<Property name=**"Choice"** value=**"GiveAll"** />

</Data>

<Property name=**"List"**>

<Data template=**"GcRewardTableItem"**>

<Property name=**"PercentageChance"** value=**"100"** />

<Data name=**"Reward"** template=**"GcRewardSpecificTech"**>

<Property name=**"TechId"** value=**"TEST\_TECH"** />

</Data>

<Property name=**"LabelID"** value=**""** />

</Data>

</Property>

</Data>

</Data>

The *Id* here is the ID of the reward which is required when you tell the game how to give the player the reward.  
*RewardChoice* I think lets you pick from *GiveAll* or *Select* which probably choses between multiple options (needs to be tested).

The important part of this entry is to set the *Reward*. Above you can see I set the value to the *Id* of the technology that I created in NMS\_REALITY\_GCTECHNOLOGYTABLE.mbin.

*LabelID* I don’t know what it does yet…

Finally, step 4: Giving the player a way to get the technology. I was very lazy when testing this and simply modified all observatories to give the player the technology instead of finding a ruin/monolith. To do this open up NMS\_DIALOG\_GCALIENPUZZLETABLE and replace all instances of *RUINSCAN* with whatever the *Id* of your reward was (so in my case, *TEST\_TECH\_REWARD*).

Now you just need to recompile all the modified mbin files and create a pak. Place in you PCBANKS folder and you should now have a new technology blueprint!

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<Data template=**"GcTechnology"**>

<Property name=**"ID"** value=**"TEST\_TECH"** />

<Property name=**"Name"** value=**"TEST\_TECH\_NAME"** />

<Property name=**"NameLower"** value=**"TEST\_TECH\_NAME\_L"** />

<Data name=**"Subtitle"** template=**"VariableSizeString"**>

<Property name=**"Value"** value=**"TEST\_TECH\_SUBTITLE"** />

</Data>

<Data name=**"Description"** template=**"VariableSizeString"**>

<Property name=**"Value"** value=**"TEST\_TECH\_DESCRIPTION"** />

</Data>

<Property name=**"Teach"** value=**"False"** />

<Property name=**"HintStart"** value=**""** />

<Property name=**"HintEnd"** value=**""** />

<Data name=**"Icon"** template=**"TkTextureResource"**>

<Property name=**"Filename"** value=**"TEXTURES/UI/FRONTEND/ICONS/SUBSTANCES/SUBSTANCE.PRECIOUS.RARE1.DDS"** />

</Data>

<Data name=**"Colour"** template=**"Colour"**>

<Property name=**"R"** value=**"0.03529412"** />

<Property name=**"G"** value=**"0.3607843"** />

<Property name=**"B"** value=**"0.4666667"** />

<Property name=**"A"** value=**"1"** />

</Data>

<Property name=**"Level"** value=**"1"** />

<Property name=**"Chargeable"** value=**"False"** />

<Property name=**"ChargeAmount"** value=**"100"** />

<Data name=**"SubstanceCategory"** template=**"GcRealitySubstanceCategory"**>

<Property name=**"SubstanceCategory"** value=**"Fuel"** />

</Data>

<Property name=**"ChargeBy"** />

<Property name=**"BuildFullyCharged"** value=**"True"** />

<Property name=**"Upgrade"** value=**"True"** />

<Property name=**"Core"** value=**"False"** />

<Data name=**"TechnologyCategory"** template=**"GcTechnologyCategory"**>

<Property name=**"TechnologyCategory"** value=**"Suit"** />

</Data>

<Data name=**"TechnologyRarity"** template=**"GcTechnologyRarity"**>

<Property name=**"TechnologyRarity"** value=**"VeryRare"** />

</Data>

<Property name=**"Value"** value=**"60"** />

<Property name=**"Requirements"**>

<Data template=**"GcTechnologyRequirement"**>

<Property name=**"ID"** value=**"TRADEABLE2"** />

<Data name=**"InventoryType"** template=**"GcInventoryType"**>

<Property name=**"InventoryType"** value=**"Substance"** />

</Data>

<Property name=**"Amount"** value=**"66"** />

</Data>

</Property>

<Property name=**"StatBonuses"**>

<Data template=**"GcStatsBonus"**>

<Data name=**"StatsTypes"** template=**"GcStatsTypes"**>

<Property name=**"StatsType"** value=**"Suit\_Jetpack\_Tank"** />

</Data>

<Property name=**"Bonus"** value=**"10"** />

<Property name=**"Level"** value=**"1"** />

</Data>

</Property>

<Property name=**"RequiredTech"** value=**""** />

<Property name=**"RequiredLevel"** value=**"0"** />

<Data name=**"UpgradeColour"** template=**"Colour"**>

<Property name=**"R"** value=**"0.7450981"** />

<Property name=**"G"** value=**"0.07450981"** />

<Property name=**"B"** value=**"0.1019608"** />

<Property name=**"A"** value=**"1"** />

</Data>

<Data name=**"LinkColour"** template=**"Colour"**>

<Property name=**"R"** value=**"1"** />

<Property name=**"G"** value=**"1"** />

<Property name=**"B"** value=**"1"** />

<Property name=**"A"** value=**"1"** />

</Data>

<Property name=**"RewardGroup"** value=**""** />

</Data>