TITAN IIIE / CENTAUR

VOYAGER 1 & 2

AUG 20 & SEP 5 - 1977

ECOPY @ GITHUB

EMAIL ME

BUILD OVERVIEW

THE PROJECT TOOK ABOUT I MONTH TO COMPLETE. THE BUILD CONSISTS OF TWO SIZES OF POLYCARBONATE TUBES (AMAZON) AND 3D PRINTED PARTS OF MY OWN DESIGN. IT HAS BEEN SIMULATED IN OPENROCKET AND ACCORING TO THE NUMBERS IT 'SHOULD' FLY. (WE SHALL SEE, FINGERS CROSSED. LOL)

TOOLS & RESOURCES I USED

* AI ASSISTANCE USING CHATGPT, GROK, AND CLAUDE. THEY HELPED WITH RESEARCHING ALL THE ORIGINAL DIMENSIONS A MUST HAVE FOR MODELLING SOMETHING REAL) AND UNDERSTANDING HOW THE ORIGINAL ROCKET WAS CONFIGURED.

* OPENSCAD - V2025_09_II - CODE BASED CAD PROGRAM (THE .SCAD FILE IN GITHUB /SOURCE DIRECTORY)

* OPEN ROCKET - SIMULATE AS CLOSE AS POSSIBLE THE SHAPE AND WEIGHTS TO SEE IF IT IS CAPABLE OF FLYING. (IT SAYS IT IS, CROSS YOUR FINGERS) THE OPENROCKET FILE IS IN GITHUB ROOT FOLDER

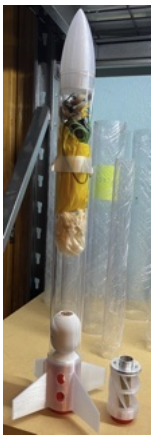
* BAMBU LABS 3D PRINTERS - H2D, XIC - FILAMENTS USED: PC, PCTG, PLA

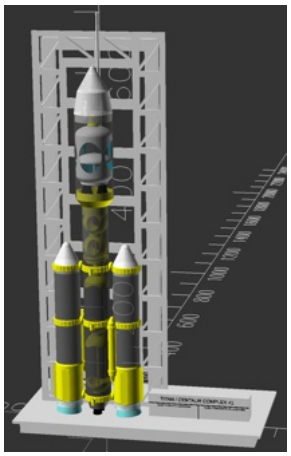
* BAMBU STUDIO FOR SLICING AND PRINTING

* TRIUMPH WORKSHOP - CNC PLAMSA, 3D PRINTERS, LASER CUTTER ENGRAVER, WOOD SHOP.

PART OF THE CRYSTAL MISSILE FAMILY

WHAT STARTED OUT AS A CARGO MOD FOR MY DER MAX, HAS MORPHED INTO A NEW GENRE OF ROCKETS. I SAID TO MYSELF, NOW WHAT AM I GOING TO DO WITH THIS EXTRA BIT OF TUBING LEFTOVER? I KNOW, LET'S BUILD A CLEAR ROCKET. (RABBIT HOLE CREATION COMPLETE) AS YOU CAN SEE, IT HAS GOTTON OUT OF HAND.

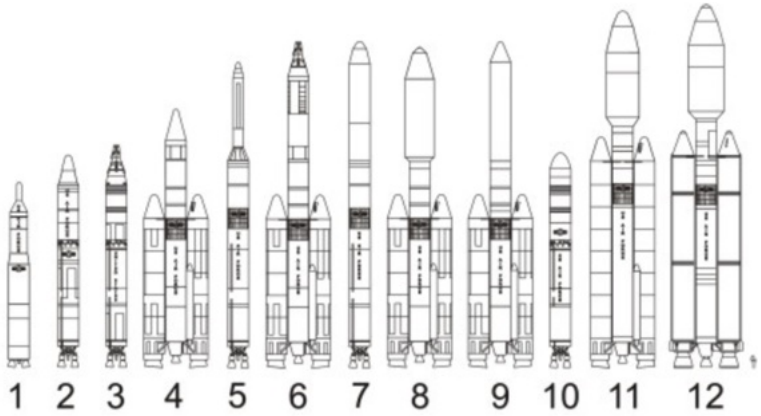

SHOUTOUTS

I THINK THERE IS A HUGE POTENTIAL FOR EASILY ADDING CUSTOM DECALS TO OUR ROCKETS. THEY ARE SO MUCH EASIER THAN THE WATER BASED ONES. LESS THAN $10 ON AMAZON.

KOALA 95% CLEAR STICKER PAPER FOR INKJET PRINTER - WATERPROOF PRINTABLE VINYL STICKER PAPER - 8.5XII INCH, I5 SHEETS, TRANSPARENT GLOSSY - EASY TO USE FOR DIY PERSONALIZED DECALS

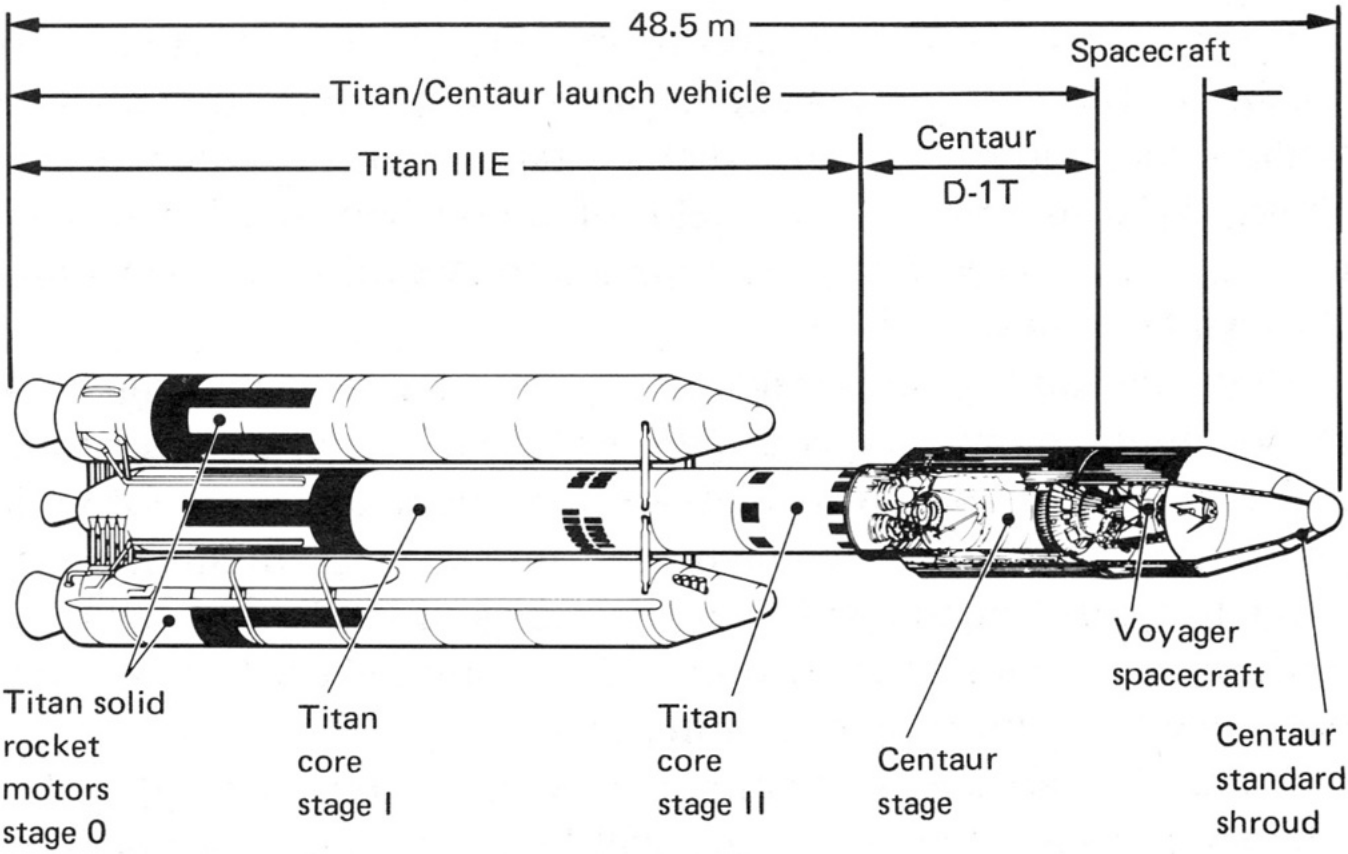
WHAT IS THE TITAN IIIE / CENTAUR?

THE TITAN IIIE OR TITAN 3E, ALSO KNOWN AS THE TITAN III-CENTAUR, WAS AN AMERICAN EXPENDABLE LAUNCH SYSTEM. LAUNCHED SEVEN TIMES BETWEEN 1974 AND 1977, IT ENABLED SEVERAL HIGH-PROFILE NASA MISSIONS, INCLUDING THE VOYAGER AND VIKING PLANETARY PROBES AND THE JOINT WEST GERMANY-U.S. HELIOS SPACECRAFT. ALL SEVEN LAUNCHES WERE CONDUCTED FROM CAPE CANAVERAL AIR FORCE STATION LAUNCH COMPLEX 41 IN CAPE CANAVERAL, FLORIDA.
- WIKIPEDIA



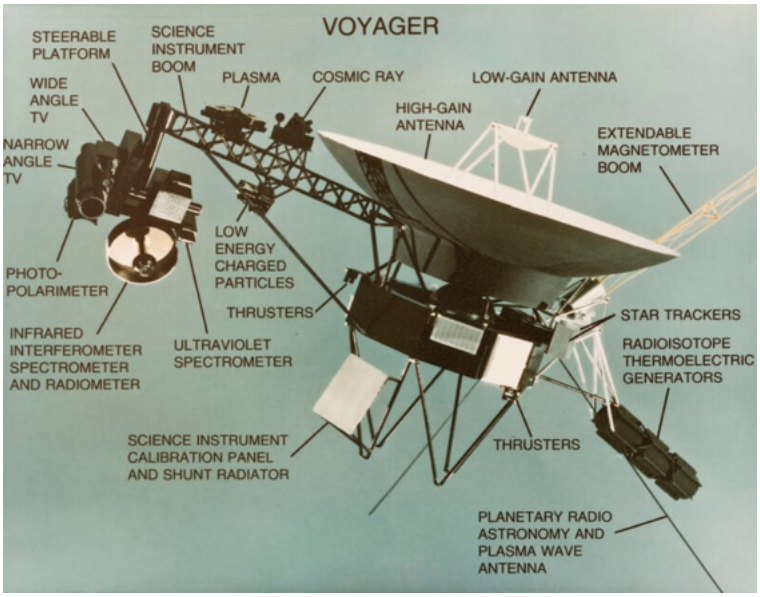
IT WAS PART OF A LARGE FAMILIY OF TITAN ROCKETS

HISTORICSPACECRAFT.COM



WHAT IS VOYAGER?

Voyager 1 is a space probe launched by NASA on September 5, 1977, as part of the Voyager program to study the outer Solar System and the interstellar space beyond the Sun's heliosphere. It was launched 16 days after its twin, *Voyager 2*. It communicates through the NASA Deep Space Network (DSN) to receive routine commands and to transmit data to Earth. Real-time distance and velocity data are provided by NASA and JPL.[4] At a distance of 168.35 AU (25.2 billion km; 15.6 billion mi) as of September 2025,[4] it is the most distant human-made object from Earth.[5] *Voyager 1* is also projected to reach a distance of one light day from Earth in November of 2026.[6]



The probe made flybys of Jupiter, Saturn, and Saturn's largest moon, Titan. NASA had a choice of either conducting a Pluto or Titan flyby. Exploration of Titan took priority because it was known to have a substantial atmosphere.[7][8][9] *Voyager 1* studied the weather, magnetic fields, and rings of the two gas giants and was the first probe to provide detailed images of their moons.

As part of the Voyager program and like its sister craft *Voyager 2*, the spacecraft's extended mission is to locate and study the regions and boundaries of the outer heliosphere and to begin exploring the interstellar medium. *Voyager 1* crossed the heliopause and entered interstellar space on August 25, 2012, making it the first spacecraft to do so.[10][11] Two years later, *Voyager 1* began experiencing a third wave of coronal mass ejections from the Sun that continued to at least December 15, 2014, further confirming that the probe is in interstellar space.[12]

GENERAL INFORMATION:

LAUNCH DATE:	SEPTEMBER 5, 1977
MANUFACTURER:	JET PROPULSION LABORATORY (JPL)
MISSION TYPE:	OUTER PLANETARY AND INTERSTELLAR EXPLORATION
LAUNCH MASS:	815 KG (1,797 LB)
DRY MASS:	721.9 KG (1,592 LB)
POWER:	470 WATTS (AT LAUNCH)
EST. MISSION:	2036 (FOR ENGINEERING DATA)

MISSION MILESTONES:

JUPITER FLYBY
- MARCH 5, 1979
- CLOSEST APPROACH AT 349,000 KM

SATURN FLYBY
- NOVEMBER 12, 1980
- CLOSEST APPROACH AT 124,000 KM

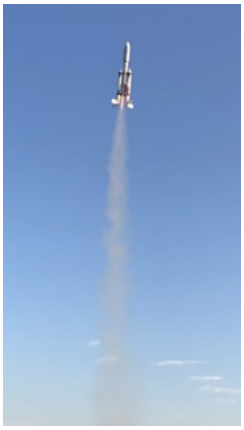
ENTERED INTERSTELLAR SPACE
- AUGUST 25, 2012
- FIRST SPACECRAFT TO DO SO

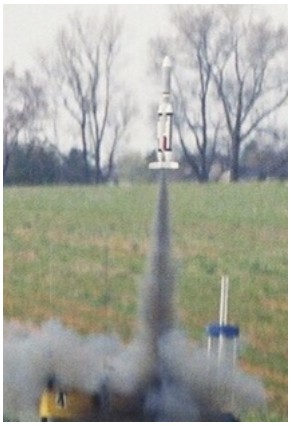
WANT TO KNOW MORE?

SOURCE - WIKIPEDIA

WHAT IS THE ESTES TITAN IIIE?
KIT #2019, PRODUCED 1989-1993

THE ESTES 2019 TITAN III E IS A 1/73RD SCALE MODEL OF THE MID 1970'S VINTAGE MARTIN MARIETTA (NOW LOCKHEED MARTIN) LAUNCH VEHICLE. THE TITAN III E - BASICALLY A TITAN III WITH A CENTAUR UPPER STAGE - HAD A RELATIVELY SHORT SERVICE LIFE WITH ONLY SEVEN LAUNCHED. HOWEVER ITS HISTORICAL SIGNIFICANCE WAS CONSIDERABLE, AS IT WAS USED TO LAUNCH THE TWO HELIOS SOLAR EXPLORATION MISSIONS, THE VIKING I & II MARS LANDER MISSIONS, AND THE VOYAGER I & II MISSIONS TO THE OUTER PLANETS. ESTES DISCONTINUED THIS KIT IN 1993, ALTHOUGH NICE KITS SHOW UP ON EBAY -ON A REGULAR BASIS (AND USUALLY SELL FOR A REASONABLE PRICE).





ORIGINAL INSTRUCTIONS - SPACEMODELING.ORG

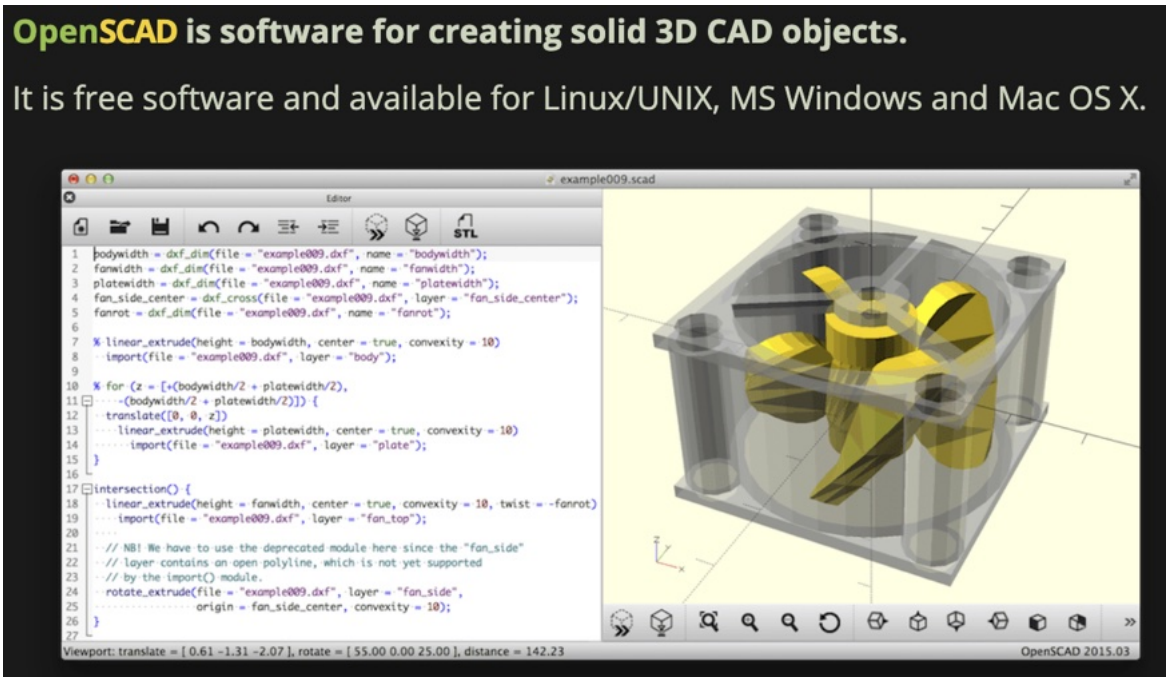
ROCKETREVIEWS.COM

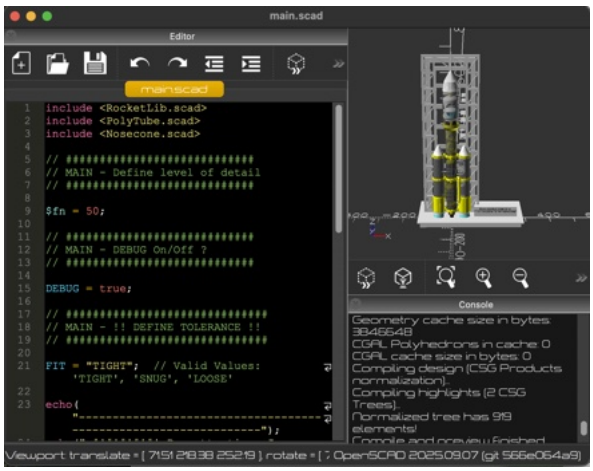
WHAT IS OPEN SCAD?

THIS APPROACH TO CAD IS VERY DIFFERENT FROM UI BASED CAD PACKAGES. IF YOU ARE COMFORTABLE WITH CODING AND FIND REGULAR CAD PROGRAMS HARD TO LEARN, GIVE THIS A TRY. THINK CODE. INSTEAD OF 'CLICK'.

LINK TO CHEATSHEET

THE 'SCAD' LANGUAGE IS C-LIKE. THOUGH IT HAS SOME QUIRKS, THE SYNTAX FOR GEOMETRY CREATION IS BRILLIANT.



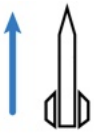


DOWNLOAD THE NIGHTLY BUILD VERSION. THE 2021 VERSION IS SUPER SLOW AND QUITE OUTDATED.

WHAT IS OPEN ROCKET?

Everything you need to design, simulate and fly better rockets

OpenRocket is a free, fully featured model rocket simulator that allows you to design and simulate your rockets before building and flying them.

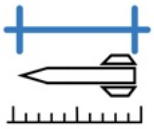


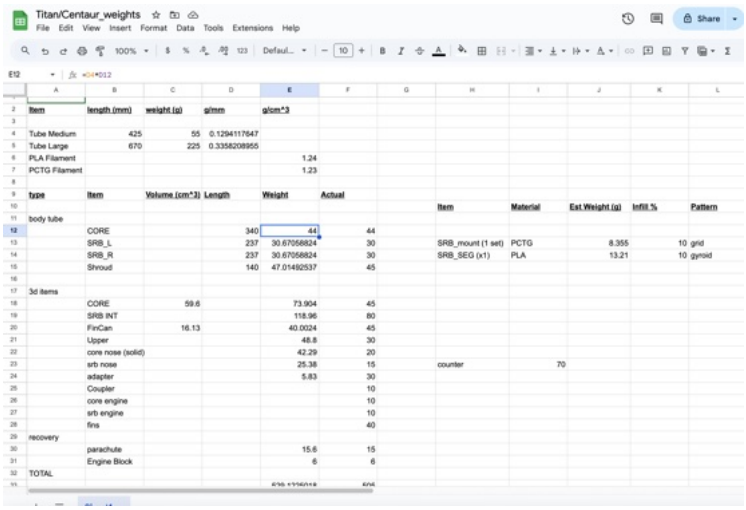
Reliable simulations

Leverage state of the art Six-Degrees-of-Freedom flight simulation with over 50 variables. Analyse all aspects of your simulation with advanced plotting and exporting.

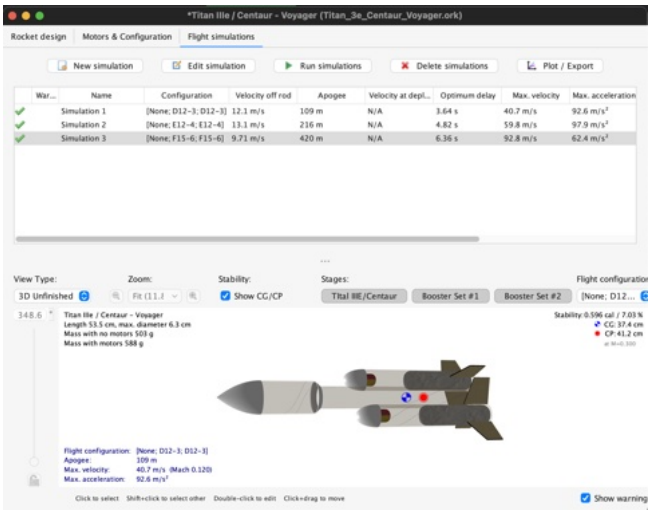
Easily design your models with CAD technology

Replicate all features of your existing model or new design. Everything from the density of materials to the quality of finish on the outside of your model. Choose from a massive catalog of existing components and materials, or make up your own and save for reuse later. You can even export your design drawings to PDF for building.

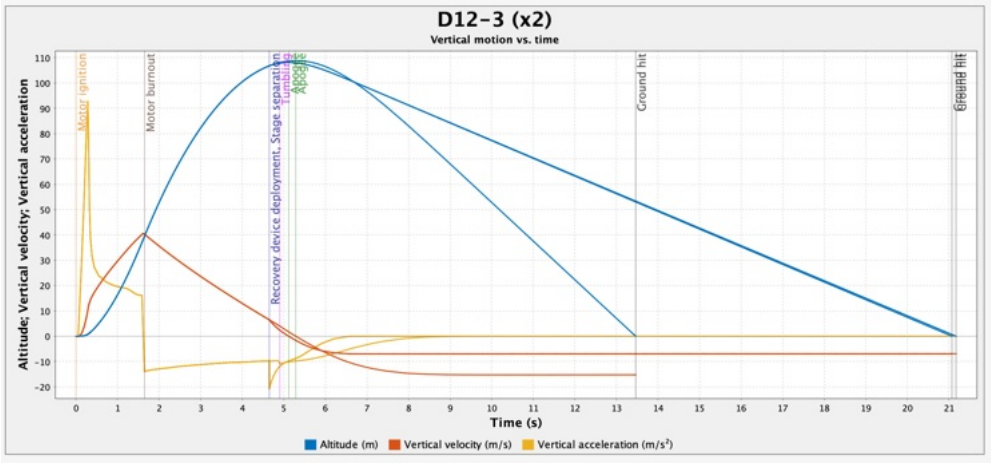




STEP #1 - EVERY ITEM IN THE ROCKET WAS WEIGHED AND PUT INTO A SPREADSHEET



STEP #2 - LAYOUT OF THE ROCKET WAS COMPLETED AND EACH ITEM HAD IT'S MASS OVERWRITTEN WITH THE ACUTAL VALUE. THREE CONFIGURATIONS WERE ADDED WITH INCREASING SIZES OF MOTORS.



OPENROCKET.INFO

STEP #3 - PLOT SIMULATION 1, WHICH CALLS FOR D12-3 (X2) MOTORS. GREEN CHECK MARKS INDICATES THE CONFIGURATION IS VIABLE. MOST IMPORTANT ASPECTS ARE GOOD SPEED OFF LAUNCH ROD AND THAT THE CG (CENTER OF GRAVITY) IS AHEAD OF THE CP (CENTER OF PRESSURE).

** JUST GOT TO GET THOSE TWO ENGINES TO LIGHT AT THE SAME TIME..

WHAT IS THE TRIUMPH WORKSHOP?

Triumph Workshop provides the tools, knowledge, and connections to foster a community of creation, innovation, and success.

Triumph WORKSHOP

FOR THIS BUILD I UTILIZED...

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* CNC PLASMA
* MIG WELDING
* I30W THUNDER LASER (CUTTING/ENGRAVING)
* BAMBU LABS X1C 3D PRINTERS
* WOODSHOP EQUIPMENT

TRIUMPHWORKSHOP.COM

BEEN A MEMBER OVER TWO YEARS
WORK THERE ON A CONTRACT BASIS AND TEACH..

* LASER CUTTING
* CNC PLASMA
* 3D PRINTING
* ELECTRONICS (ARDUINO, ETC)
* SOFTWARE/CAD - ONSHAPE, OPENSCAD, TINKERCAD, INKSCAPE, ETC)
* HOST SATURDAY MORNING MEETUP-LIKE GET TOGETHERS ON THE TOPICS I TEACH FORMALLY.

TW FACEBOOK PAGE