Mobile Asteroid

Team #37

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Executive Summary

The problem that we had was basically how to calculate how far the asteroid is from earth. Then we needed to move the asteroid toward earth, and eventually get the asteroid into the earth's orbit. After this is accomplished then the asteroid is available for mining of precious metals, research, and testing. We got some equations to help us achieve this goal. one of them was: F= M * A. This equation gave us the force that would be needed to move this asteroid. The other equation was: V=V + A * T. This then gave us the velocity that we needed to move the asteroid. We will then slow the asteroid down by using an opposite thrust. When we have the asteroid located where we wanted it, we will then position the asteroid 150 kilomenters above the earth's atmosphere. After that, we will proceed to thrust the asteroid at a horizontal direction at 8,000 m/s (meters per second). Having done this, the asteroid then is in the earth's orbit.

Statement of Problem

The problem we were faced with was to get an asteroid, detemine its distance from earth, and it's acceleration, and eventually get it into the earth's orbit so we could mine it for precious metals, and do different types of testing on it.

Description

First we took the mass of the asteroid, in Kilograms. Then we proceeded to calculate approximately how much thrust (force) it would take to move the asteroid. After we had figured out how much force it would take, we then determined how fast we would like to move the asteroid. After moving the asteroid we divided the distance by the accleration. The result of this calculation gives us how many hours, or minutes, till the asteroid has reached its destination. if we divide the result by 2, two more times it will then give us how long to apply thrust, how long the asteroid will cost before we much apply an opposite thrust, to stop the asteroid. As soon as the asteroid's distance is above Earth's atmosphere, we then thrust the asteroid out with an acceleration of 8,000 meters per second. At this point the asteroid is now orbiting approximately 25,000 miles above Earth's atmosphere, safe and sound.

Results

The result of our stuides was that we found that it takes an extremely strong force to move an asteroid from one point to another. We have found that to move an asteroid from the asteroid belt it will take more complex mathematical formulas, in order to avoid the gravitational pull. The calculations showed the gravity will become a problem, but with our program we can calculate approximately how long we need to thrust, cost, and decelerate the asteroid.

Conclusion

We have concluded that moving an asteroid in space is very possible but takes a large amount of energy. With more advanced technology we could possibly move an asteroid with great ease through space, and position it so that it orbit's Earth. Using our equations we found that it is possible to move an asteroid in space and that we solved the problem we were faced with With better space positioning, moving

an asteroid through different obstacles would be an easy task.

Program Code:

```
#include "stdafx.h"
#include<iostream>
#include<time.h>
using namespace std;

int main(int argc, char* argv[])
{
	float mass, rnds, accel, force, sforce;
	float totaltime;

	cout << "Please enter a mass of the asteroid, that is GREATER than 10,000 tons, that you would like to transport." << endl;
	cin >> mass;
	if (mass<10000)
	{
		cout<<"Please read the directions stated above."<<endl;
		cout<<"Try again."<<endl;
		cout<<"...Program Terminated..."<<endl;
		cout<<endl;
		return 0;
	}
	cout << endl;
	cout << "A random distance is being generated..." << endl;
	srand(time(NULL));
	rnds=rand()%36000;
	if (rnds < 3000)
	{
		rnds=rand()%36000;
	}
	else
	{
	cout << "The random distance is: " << rnds << endl;
	}

	cout << endl;
	cout << "Please insert an acceleration, that is higher than 10 thousand but lower than 64 thousand." << endl;
	cin>> accel;



	if (accel<=64000 && accel>=10000)
	{
		cout<<endl;
		totaltime=rnds/accel;
		force=mass*accel;
		sforce=mass*8000;
```

```
                cout<<"Total Time:" <<totaltime<<endl;

        }
        else
        {
                cout<<"Please read the directions stated above."<<endl;
                cout<<"Try again."<<endl;
                cout<<"...Program Terminated..."<<endl;
                return 0;
        }

        system("cls");


        cout<<endl;
        cout<<endl;
        cout<<"Congradulations!"<<endl;
        cout<<"The asteroid is now orbiting 150 Kilometers above Earth's atmosphere."<<endl;
        cout<<endl;
        cout<<"The statistics are as follows:"<<endl;
        cout<<endl;
        cout<<"Average Travel Time:   " << totaltime << " Hours" << endl;
        cout<<"Mass:                  " << mass << " Kilograms"<< endl;
        cout<<"First distance from Earth: " << rnds << " Meters"<< endl;
        cout<<"Final distance from Earth: " << "150 KiloMeters (Approximatly)"<<endl;
        cout<<"Initial Force:         " << force << " Neutons"<<endl;
        cout<<"Second Force:          " << sforce << " Neutons"<<endl;
        cout<<"Approximate Orbital Velocity: " << "25,000 meters/second"<<endl;

        cout<<endl;
        cout<<endl;
        cout<<endl;
return 0;
```

The significant achievement of our project

The most significant achievement of our project was, that we were able to get the equations to calculate all of the factors that we wanted. We thought the calculations were going to give us the most problems, which they did. but in the end, with all of the help and support we received, we were able to accomplish this task at hand.

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