

Using A/B Testing

to improve our apps

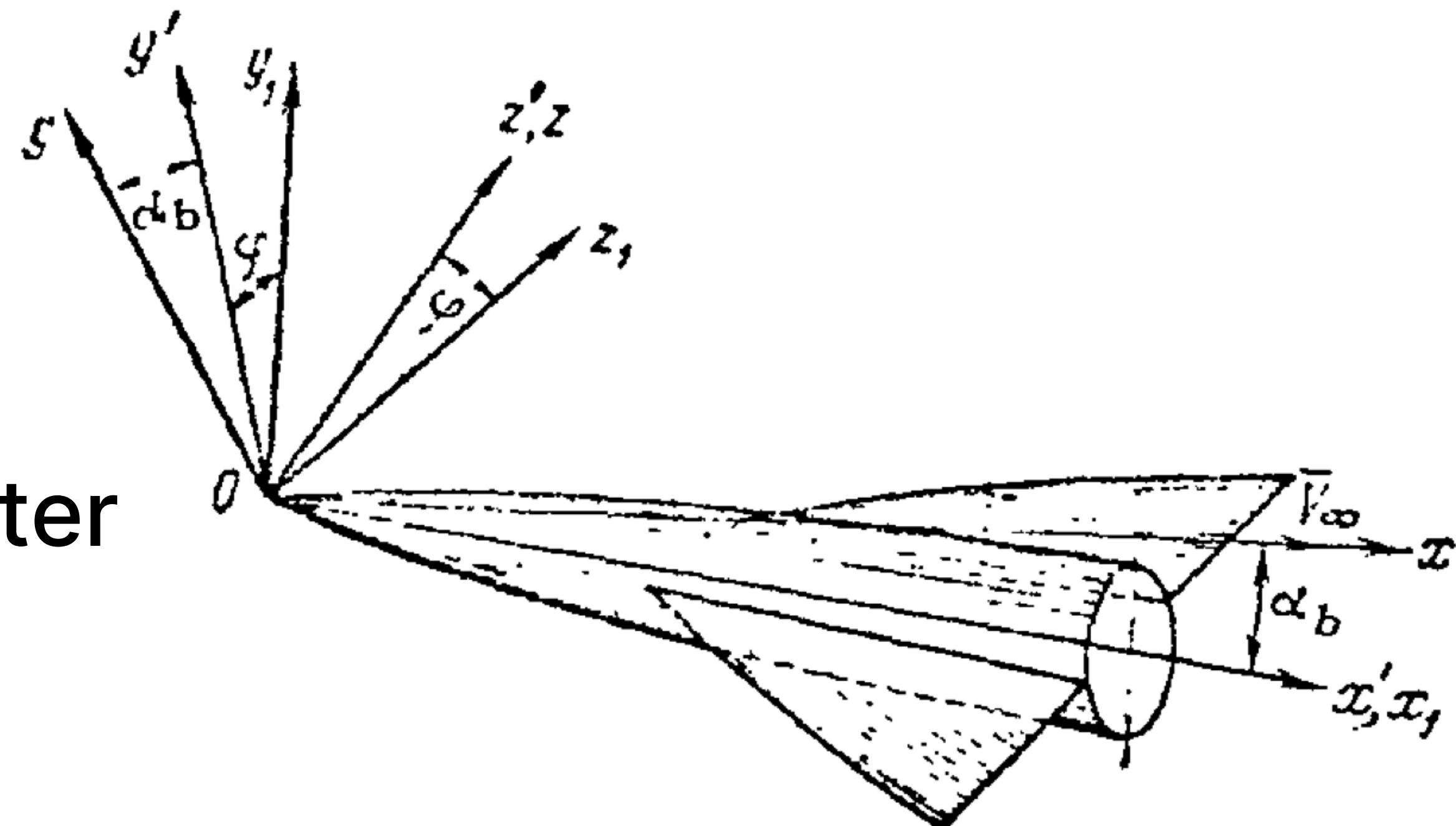
Hi!

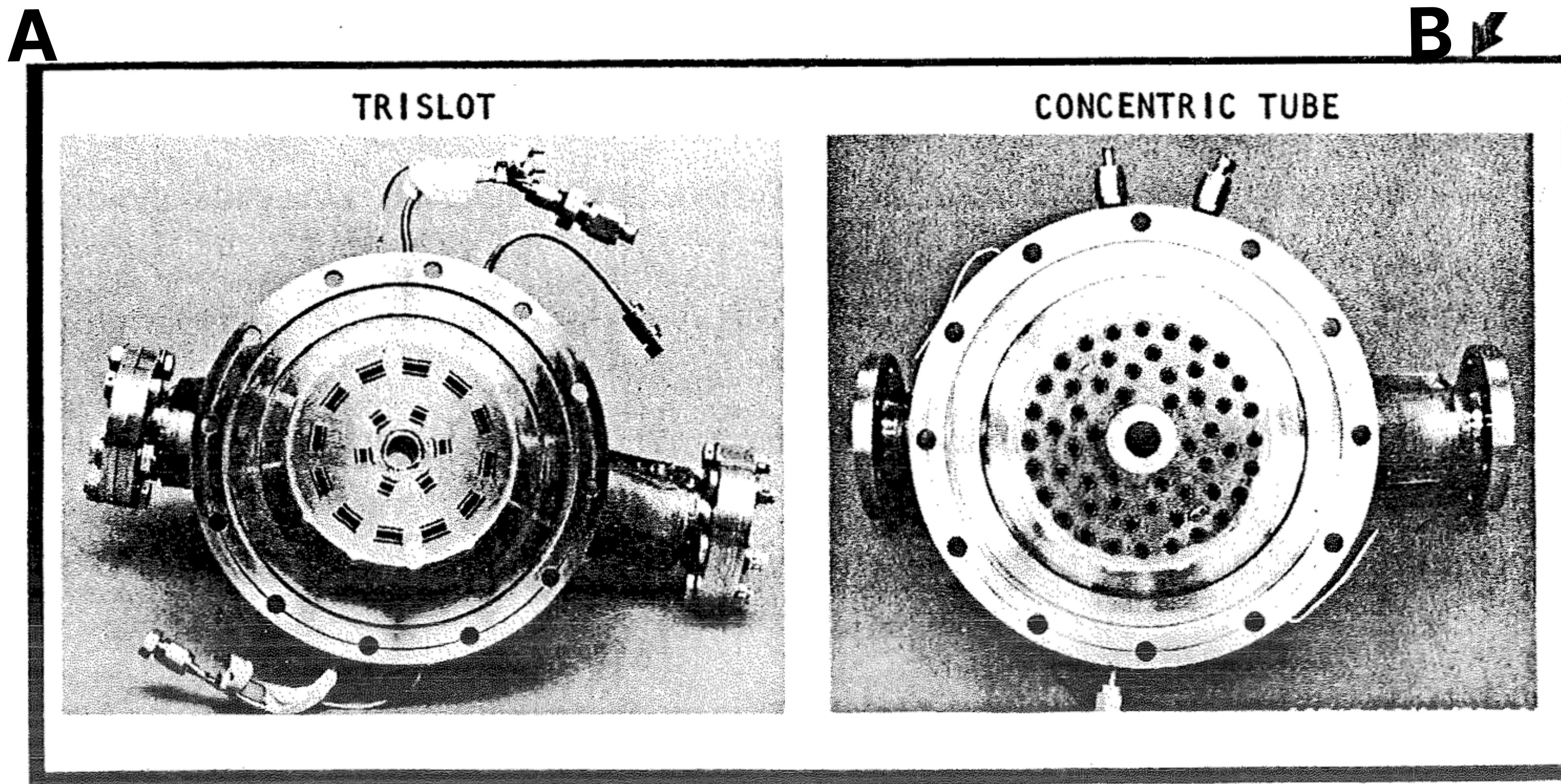
Making our apps better

The Theory

Some Code

Common Pitfalls





Sources, slides and text

github.com/TelemetryDeck/ab-testing-talk

ORIGINAL PAGE IS
OF POOR QUALITY



Fig. 25. Air-breathing cosmic aircraft.



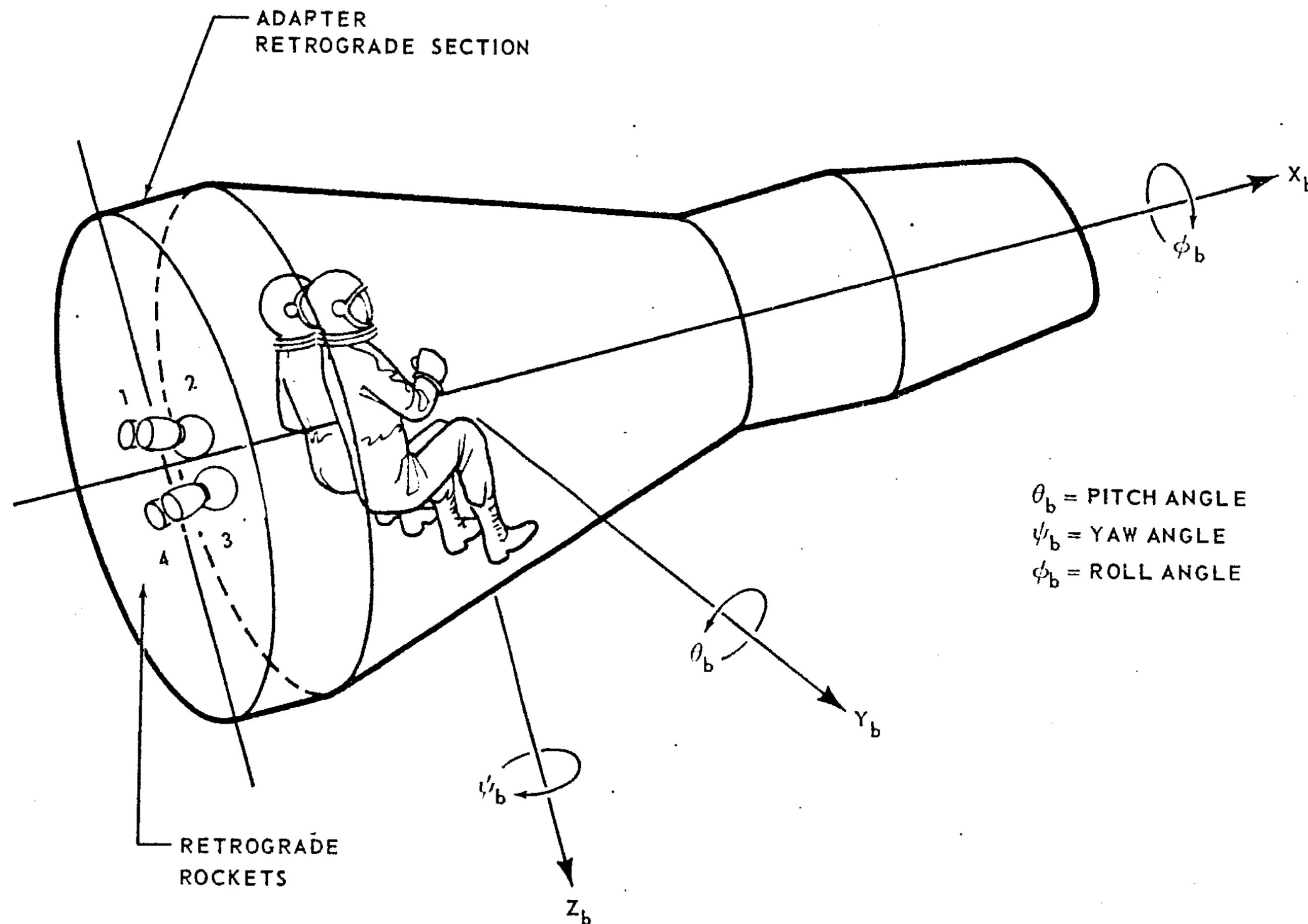
 Telemetry**DECK**

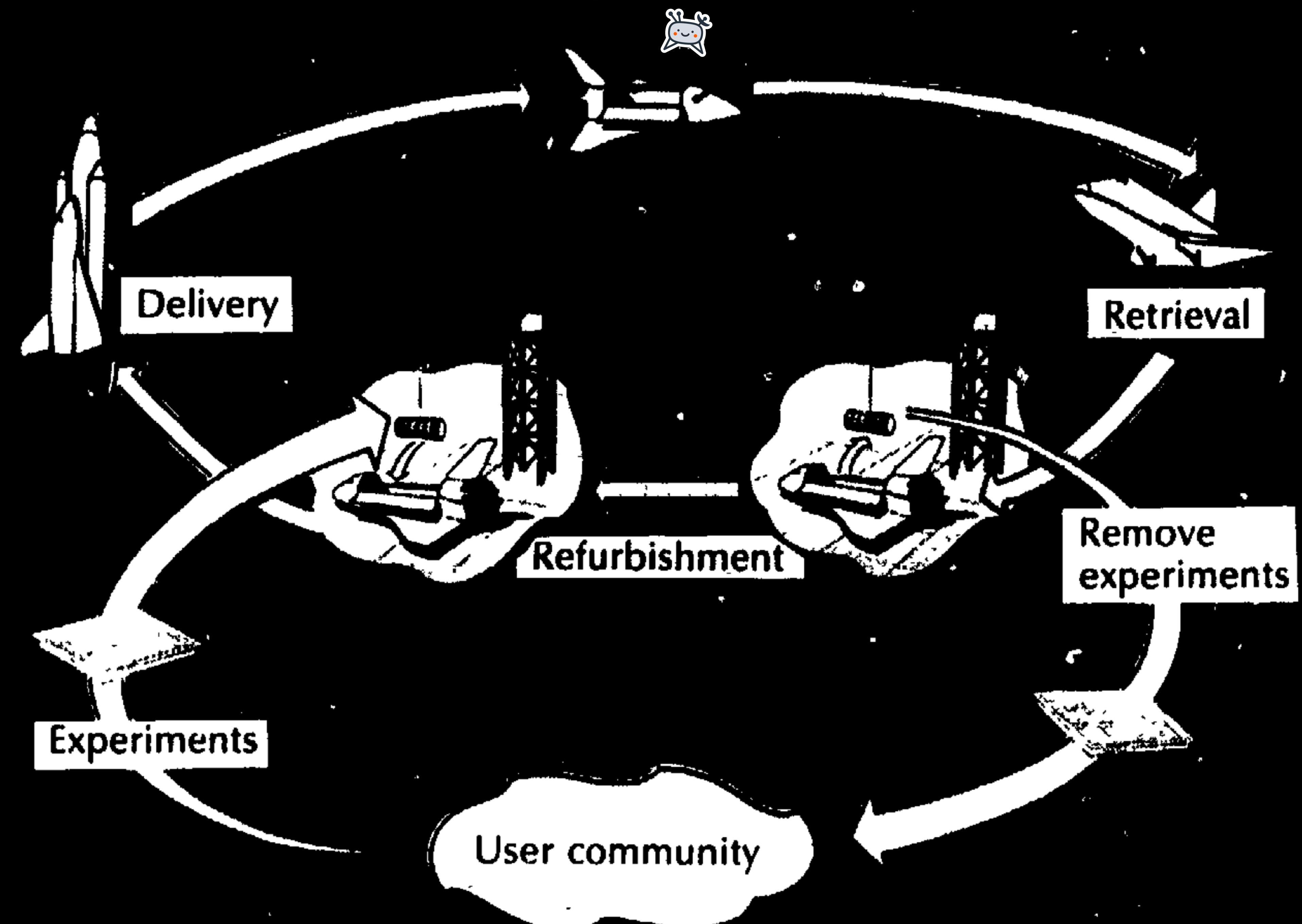
Make App Better = Good

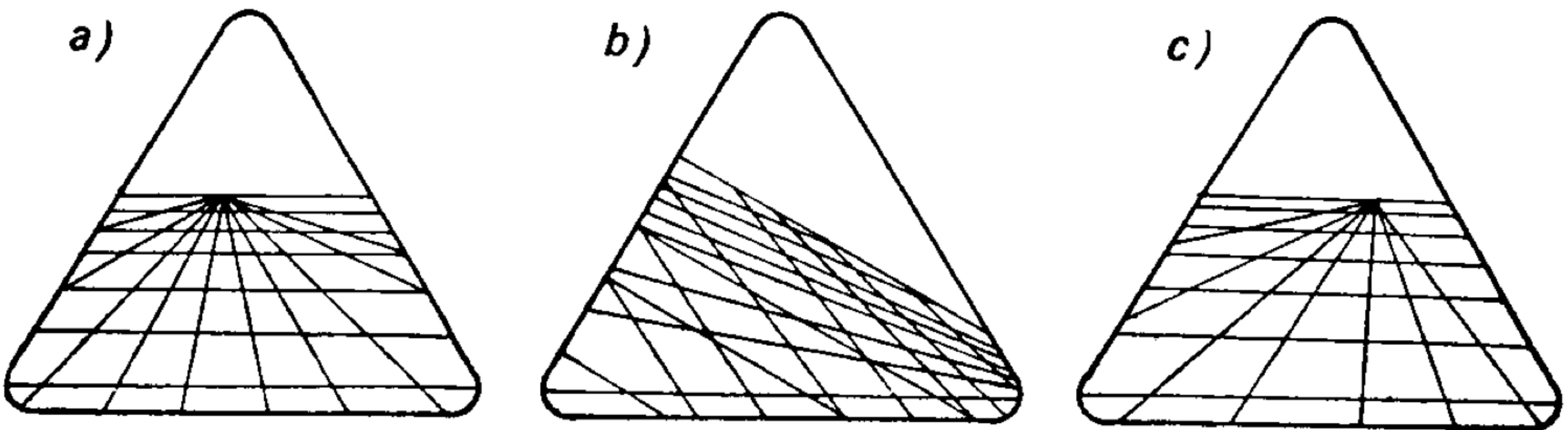
Revenue

Work load

Happiness





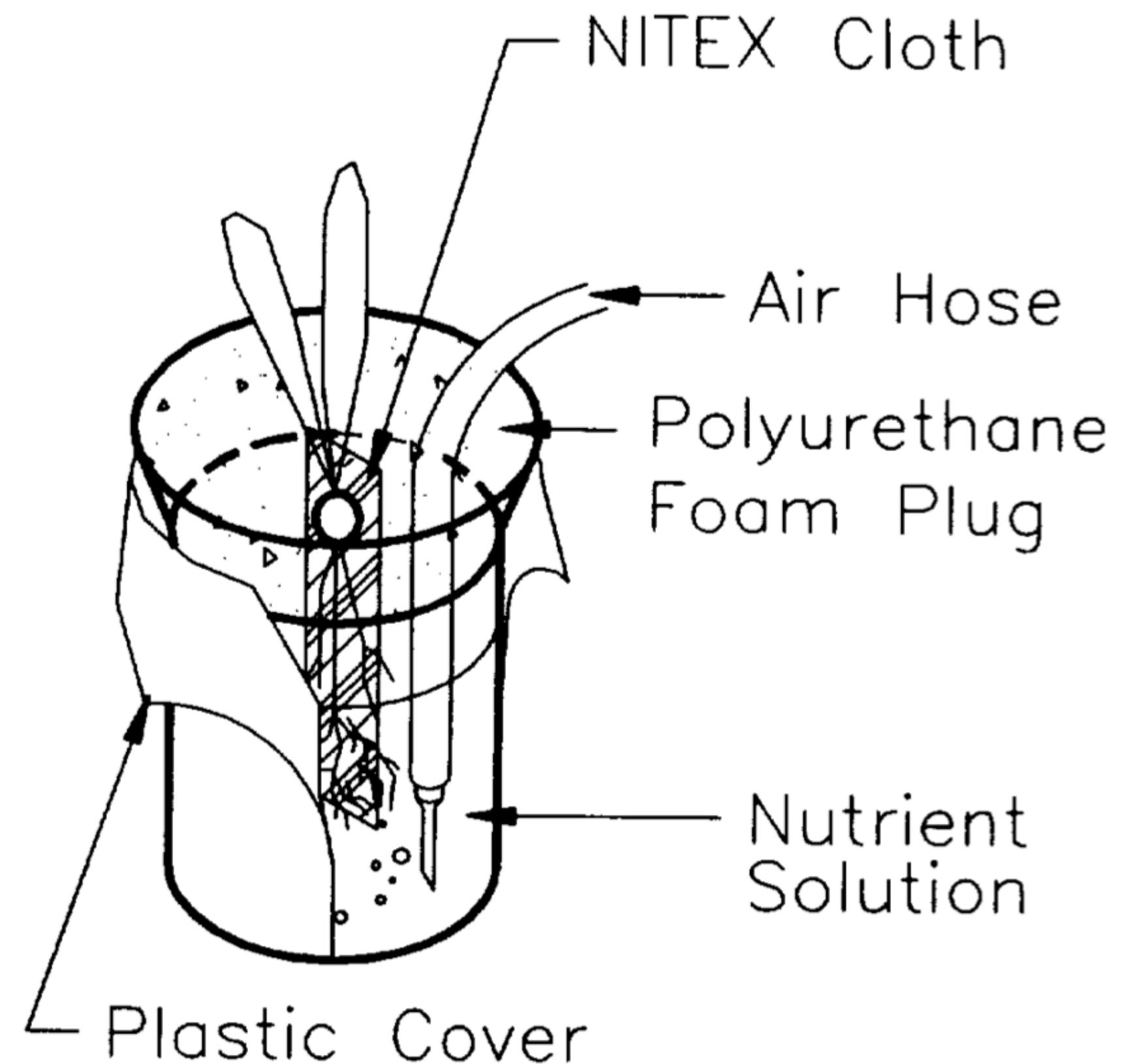


Concepts

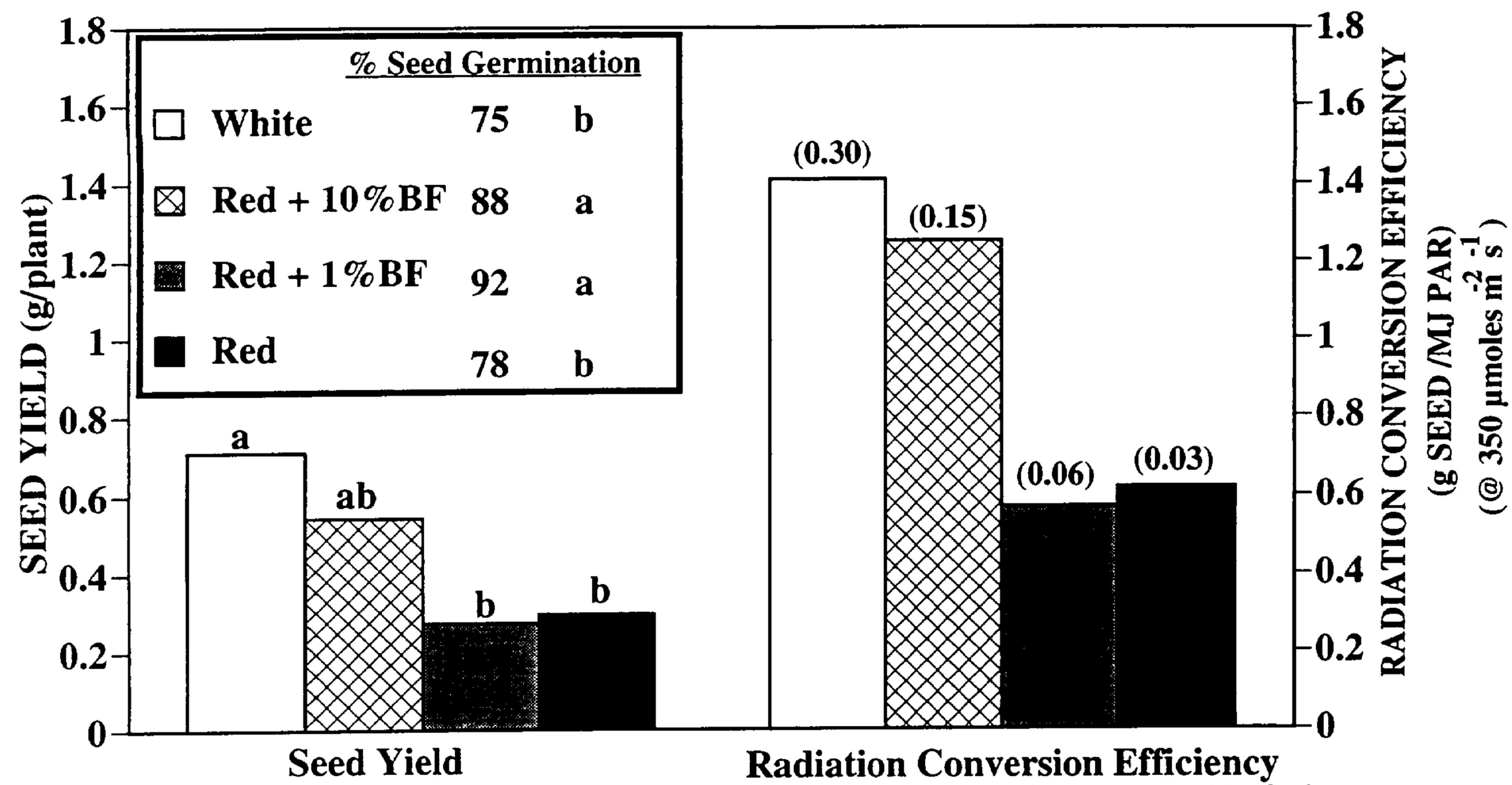


Fig. 2. Superdwarf wheat plants growing under an array of red LEDs.

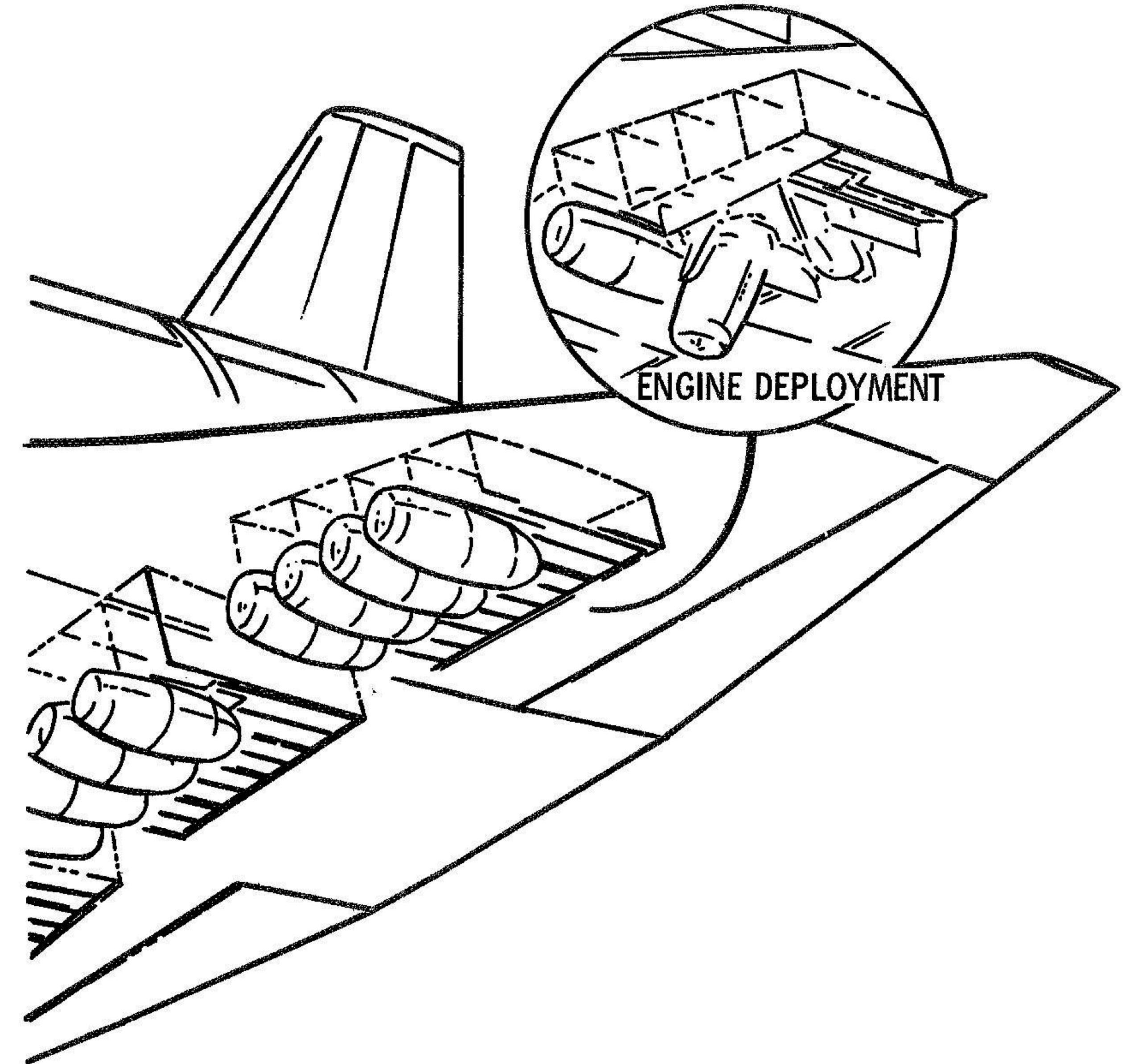
H_0 – “A and B are equal”



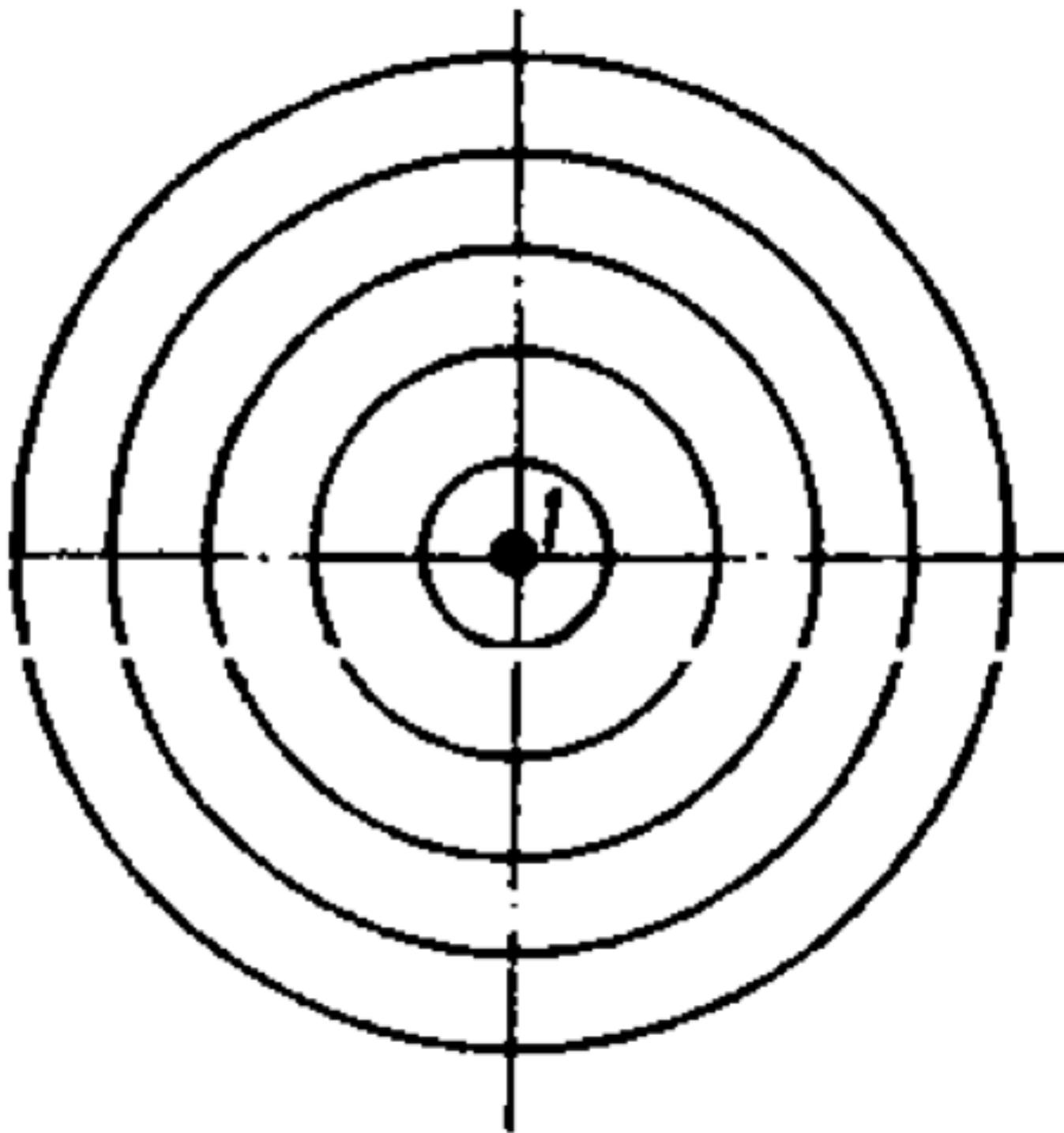
p – Likelihood that H_0 is true
(given the statistical distribution of test data)



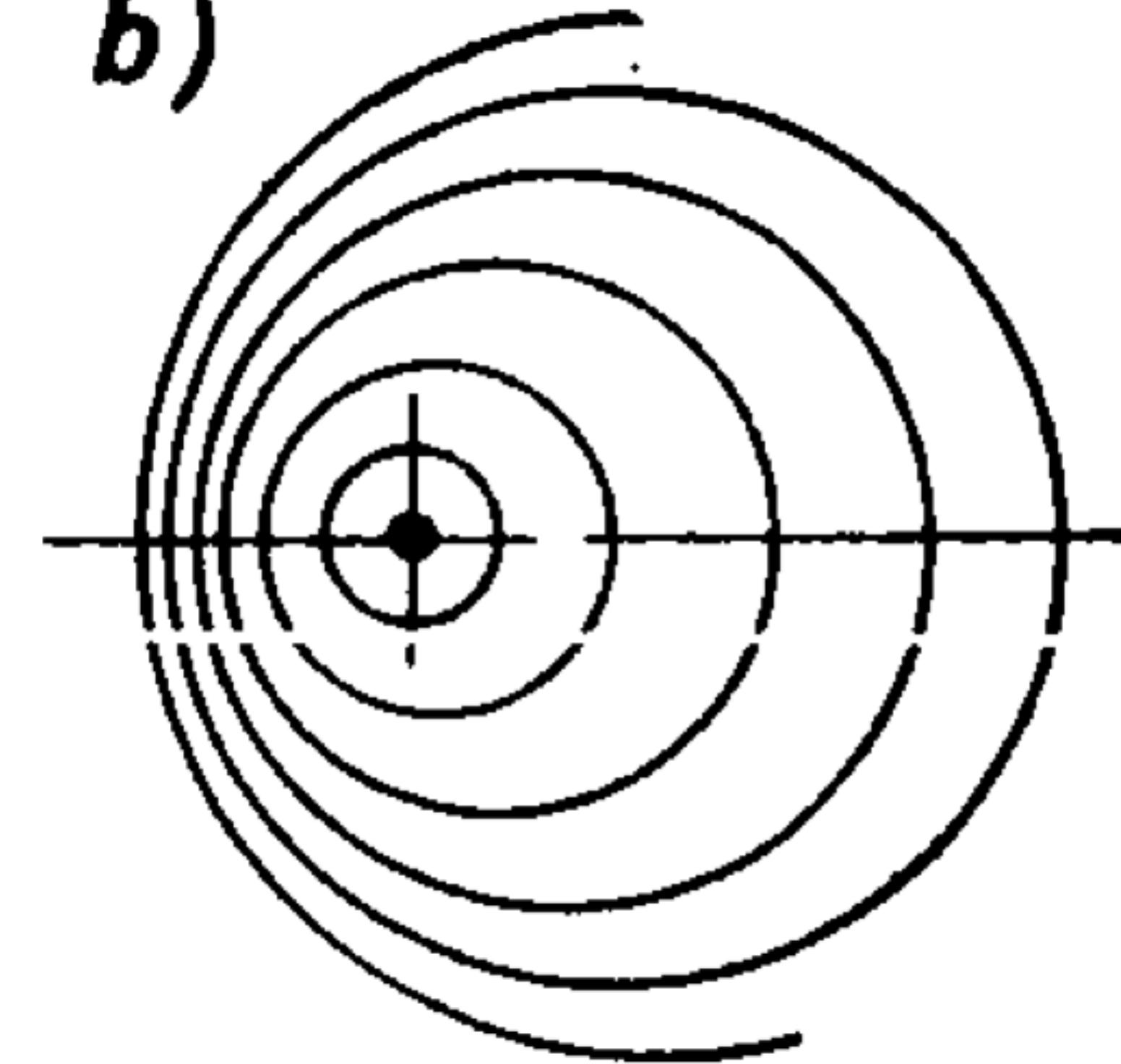
A/B Testing Apps



a)



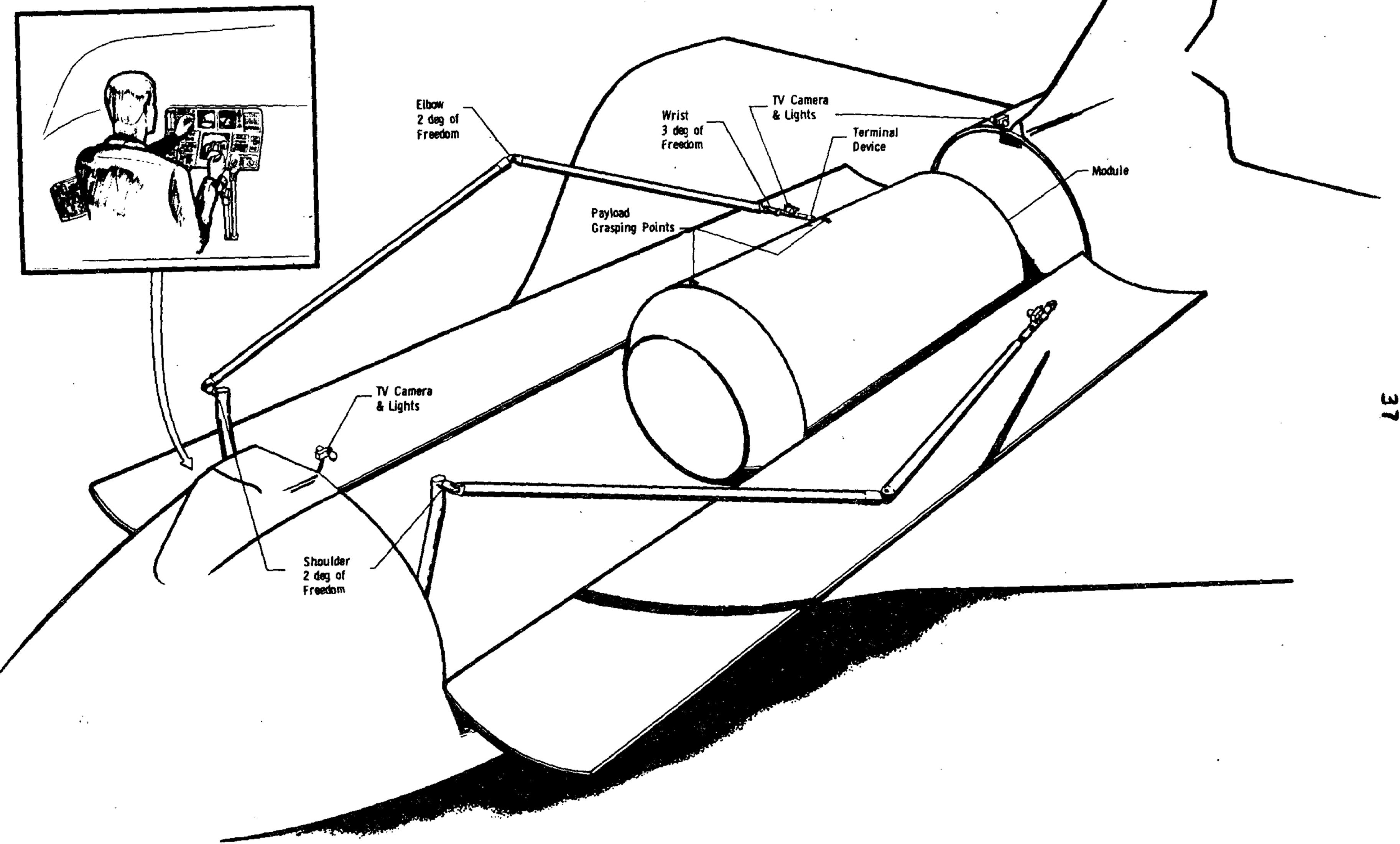
b)

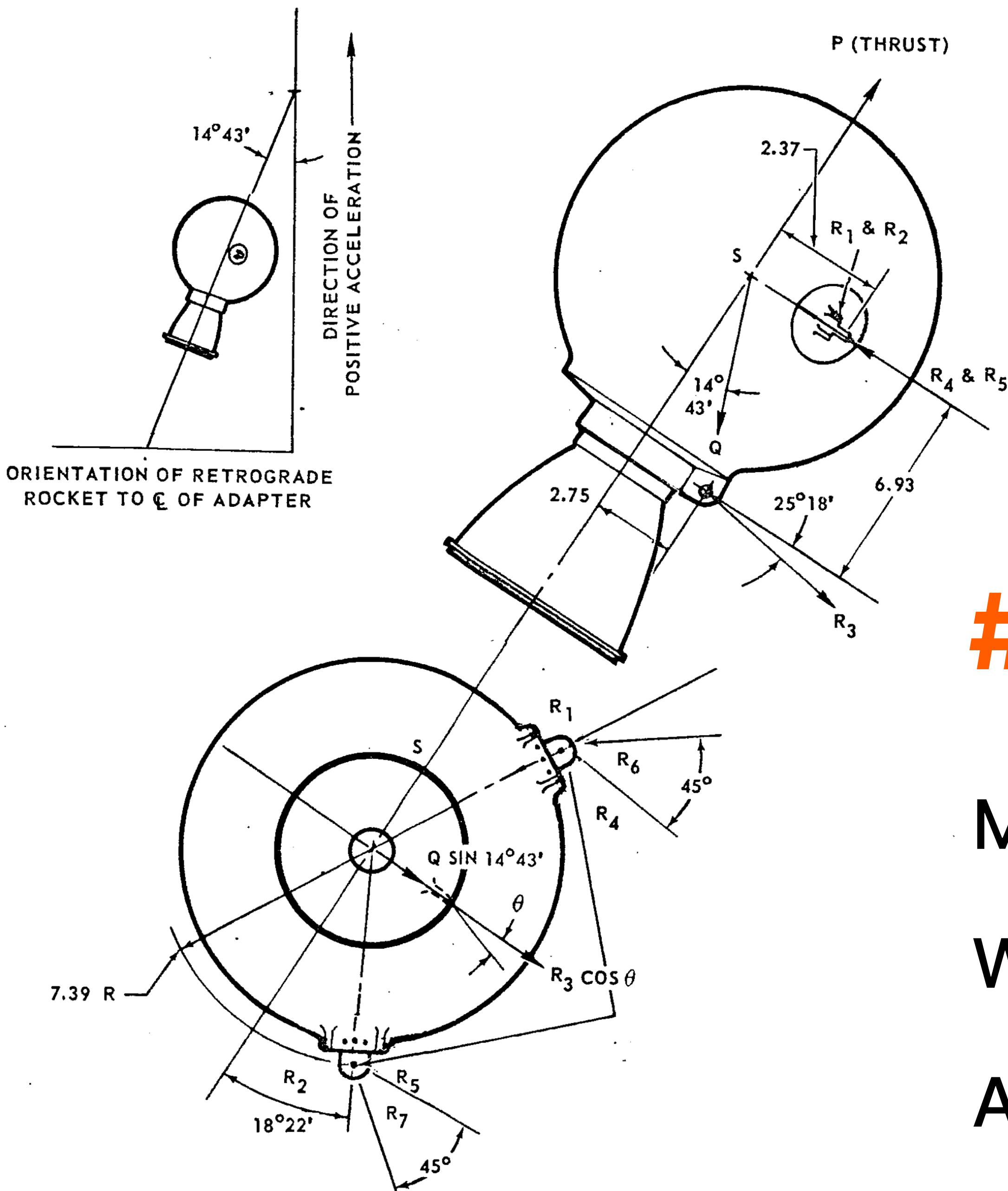


Control

Experiment

Cohort A





#goals

Measurable
Well-Defined
Attainable

Hypotheses

Measurable

Success Criteria

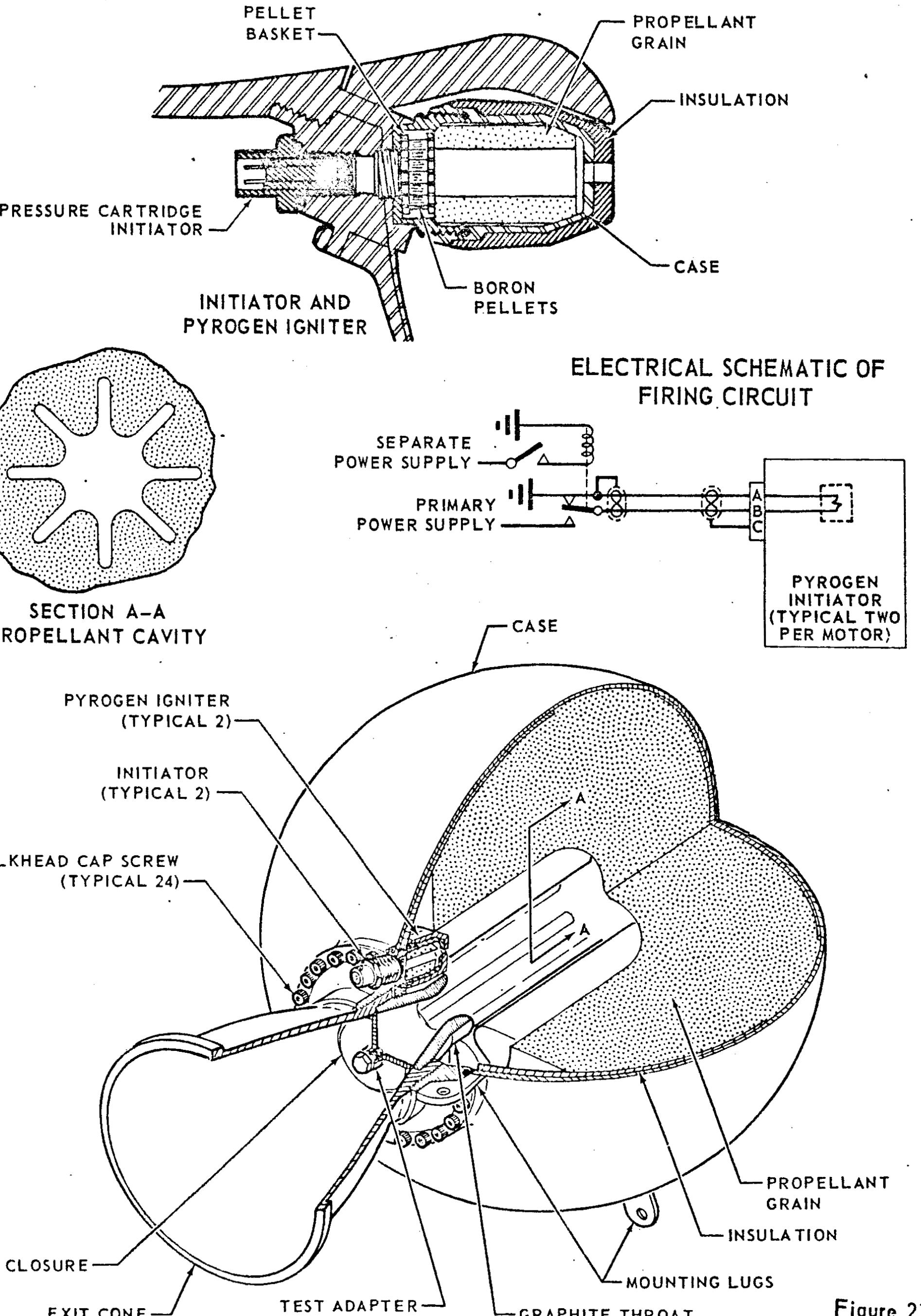
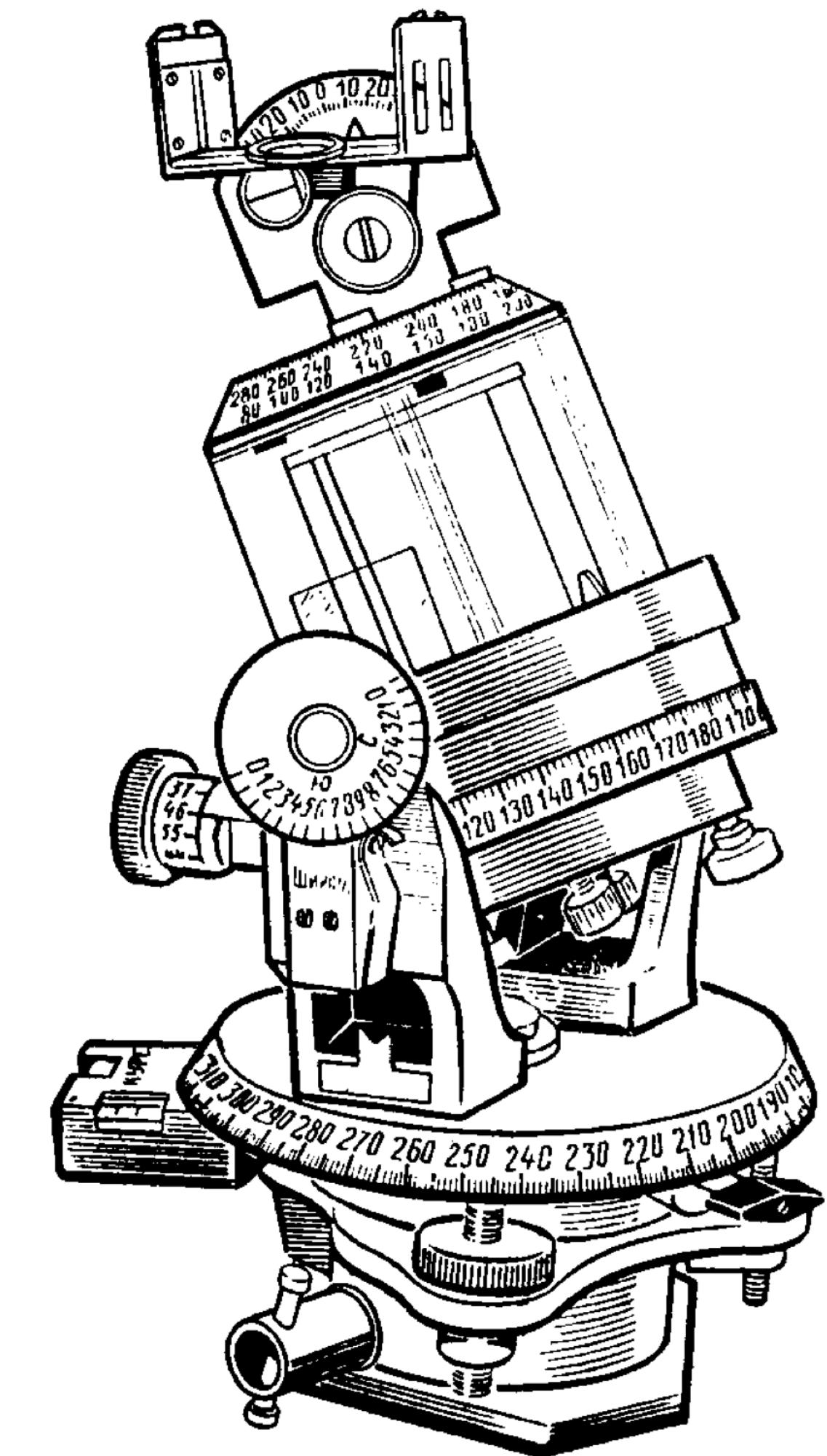


Figure 21

Measure at the end



Code

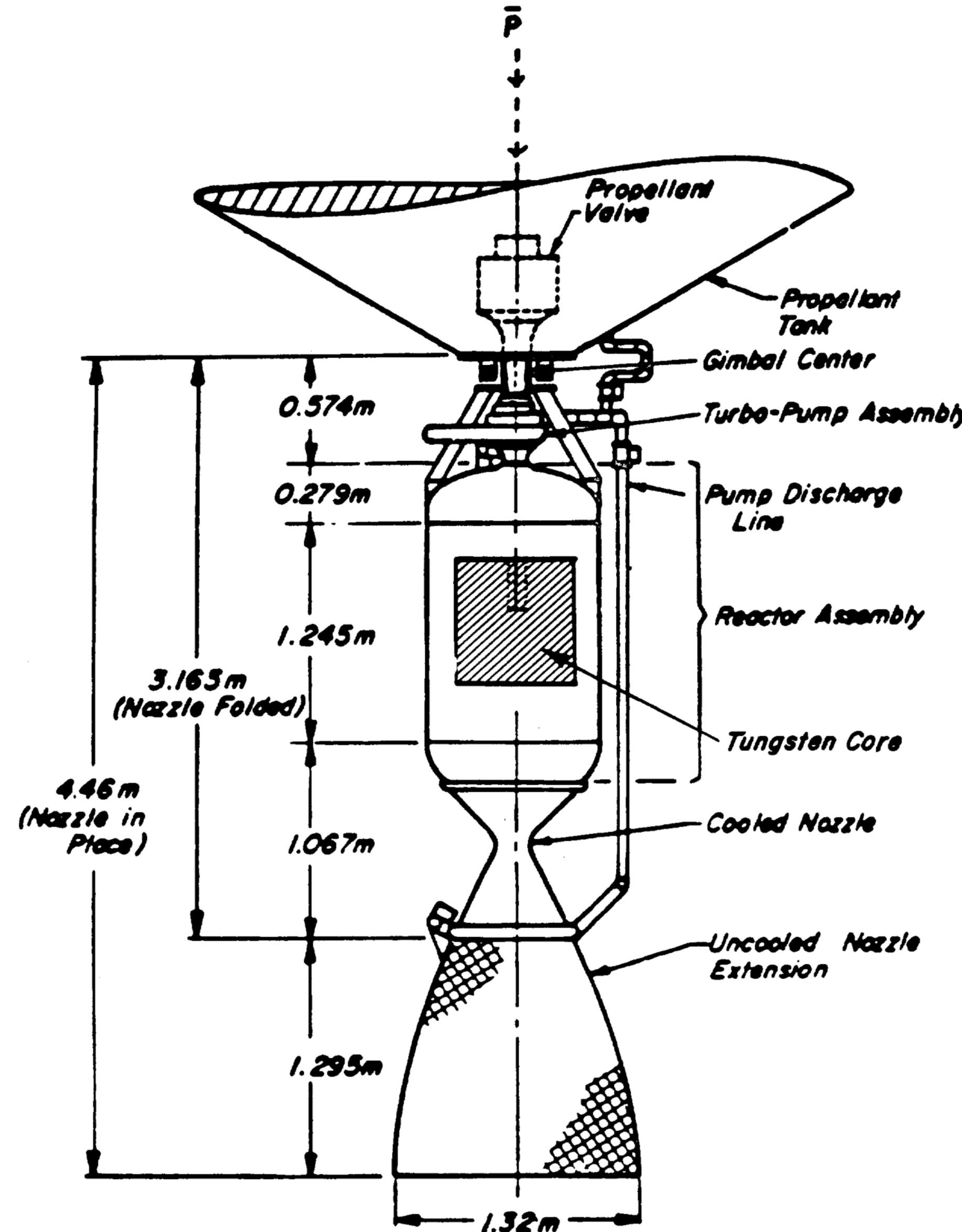
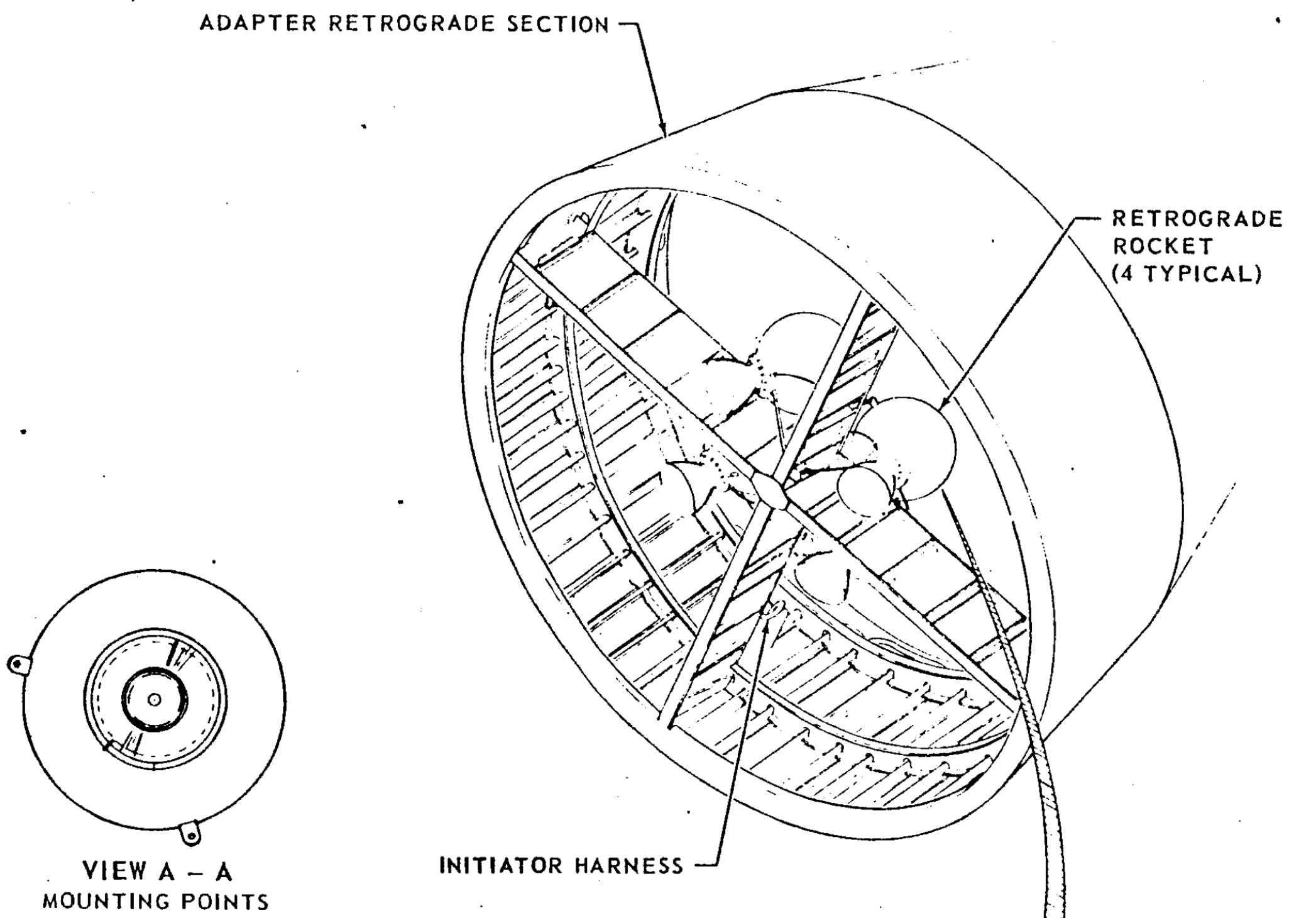
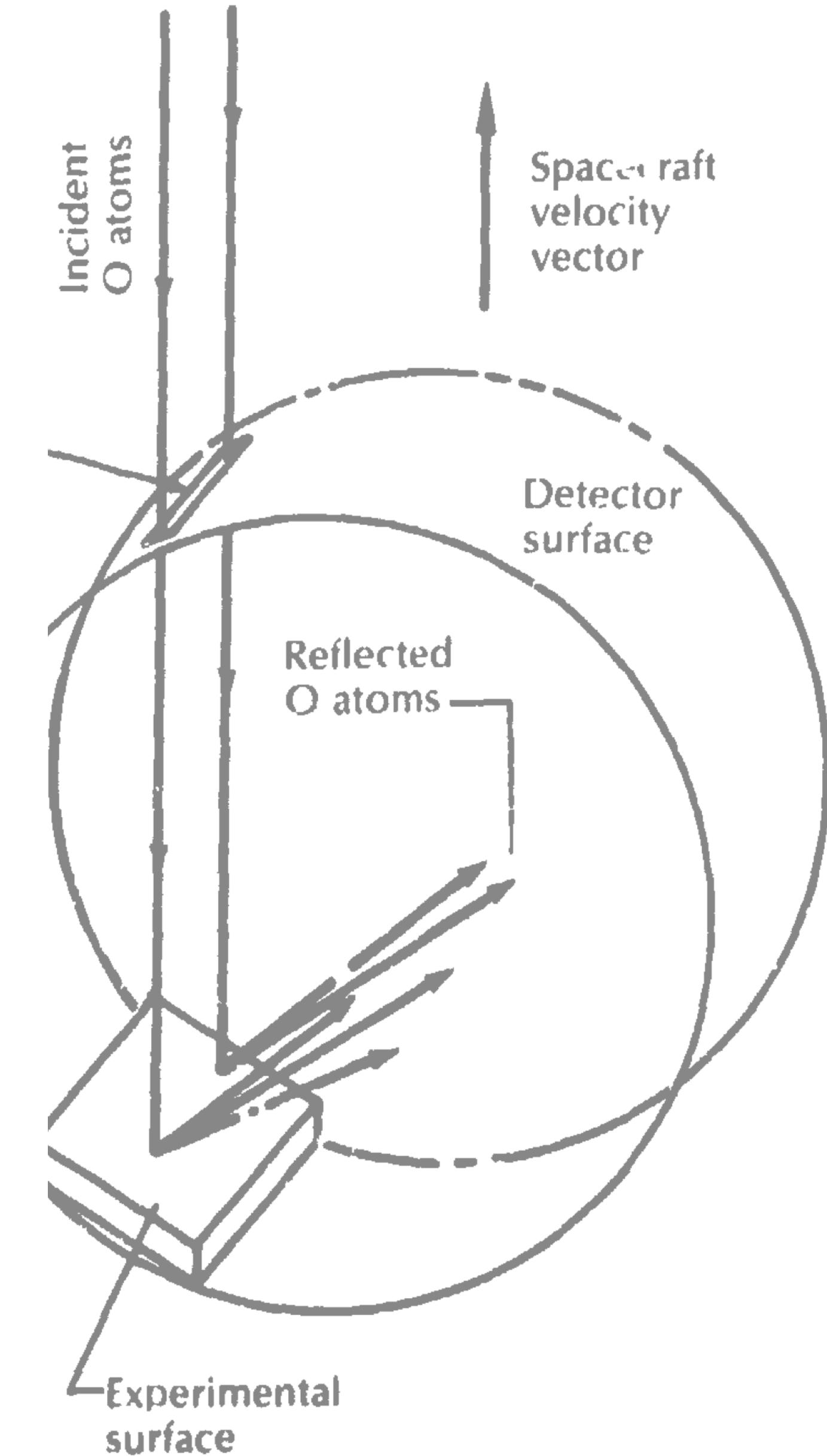


Fig. 2. Schematic diagram of the Small Nuclear Rocket Engine designed during the NERVA program. The nuclear reactor core has been replaced with a possible configuration of the metal-honeycomb used to convert the antimatter annihilation energy into heat.

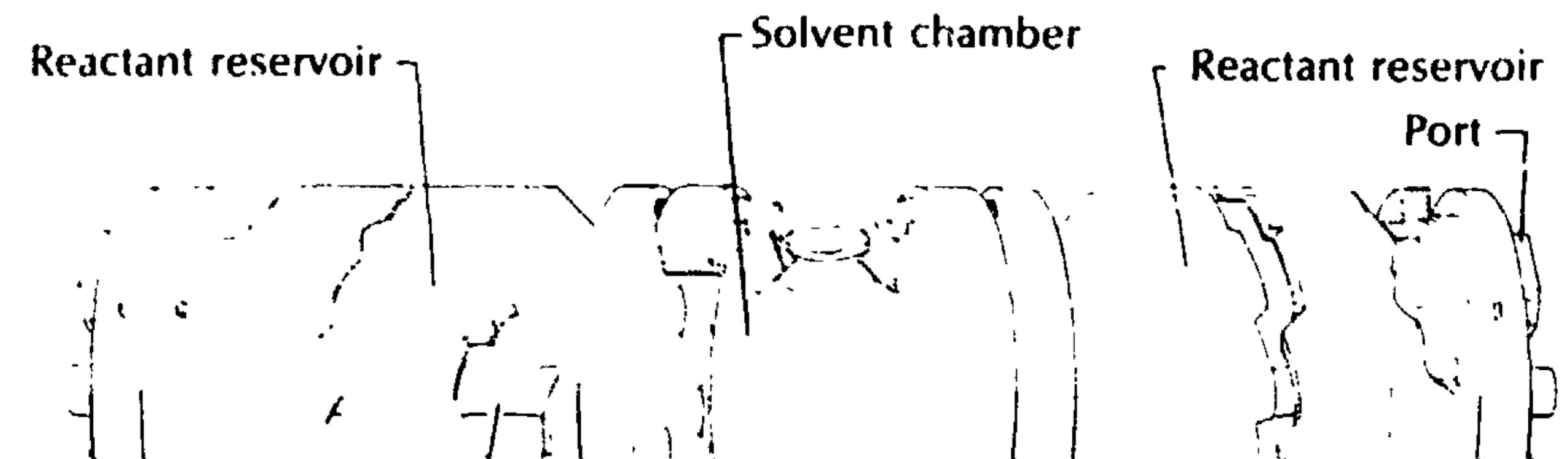
```
@AppStorage("welcomeScreenCohort") var welcomeScreenCohort: String = {  
    if Bool.random() {  
        return "B"  
    } else {  
        return "A"  
    }  
}()
```



```
// If we're in the experiment cohort,  
// show an alternative image  
var welcomeImagePath: String {  
    if welcomeScreenCohort = "B" {  
        return "newWelcomeImage"  
    }  
  
return "appIcon"  
}
```



```
WelcomeView {  
    // ...  
}  
.onAppear {  
    TelemetryManager.send("WelcomeViewAppear", with:  
        ["welcomeScreenCohort": welcomeScreenCohort])  
}
```



```
Button("Register") {  
    TelemetryManager.send("RegisterSuccess", with:  
        ["welcomeScreenCohort": welcomeScreenCohort])  
  
    // Register the user  
    // ...  
}
```

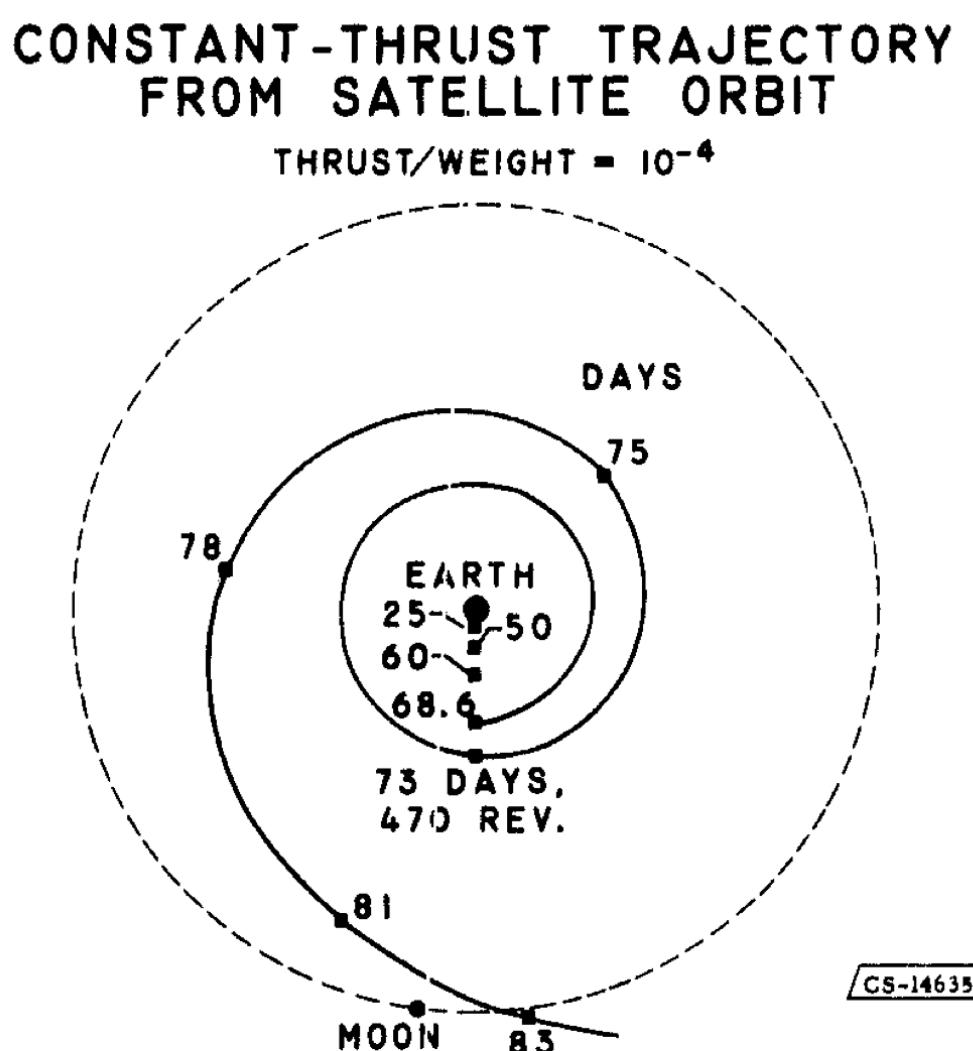


Figure 1

Cohort A

All of the following conditions
must match:

type =
WelcomeViewAppear

welcomeScreenCohort =
A

Cohort B

All of the following conditions
must match:

type =
WelcomeViewAppear

welcomeScreenCohort
= **B**

Success Criterion

type = **RegisterSuccess**

Success A

Number of Users
in Cohort A who
were successful

divided by

Number of Users
in Cohort A

=

0.53

Success B

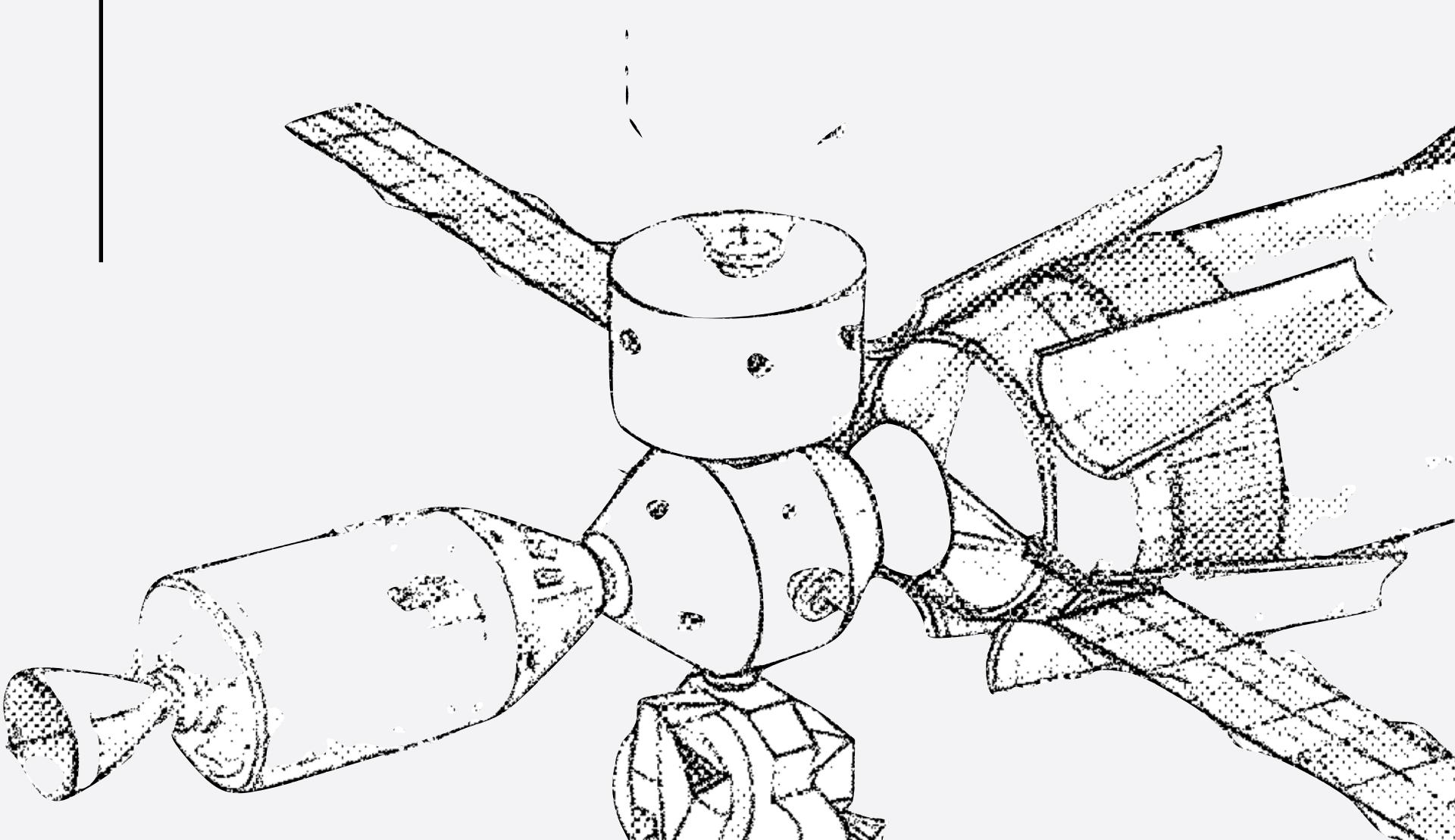
Number of Users
in Cohort B who
were successful

divided by

Number of Users
in Cohort B

=

0.62



$p = 0.09$

Welcome Screen Variant

Edit ← →

App Icon  53.64%

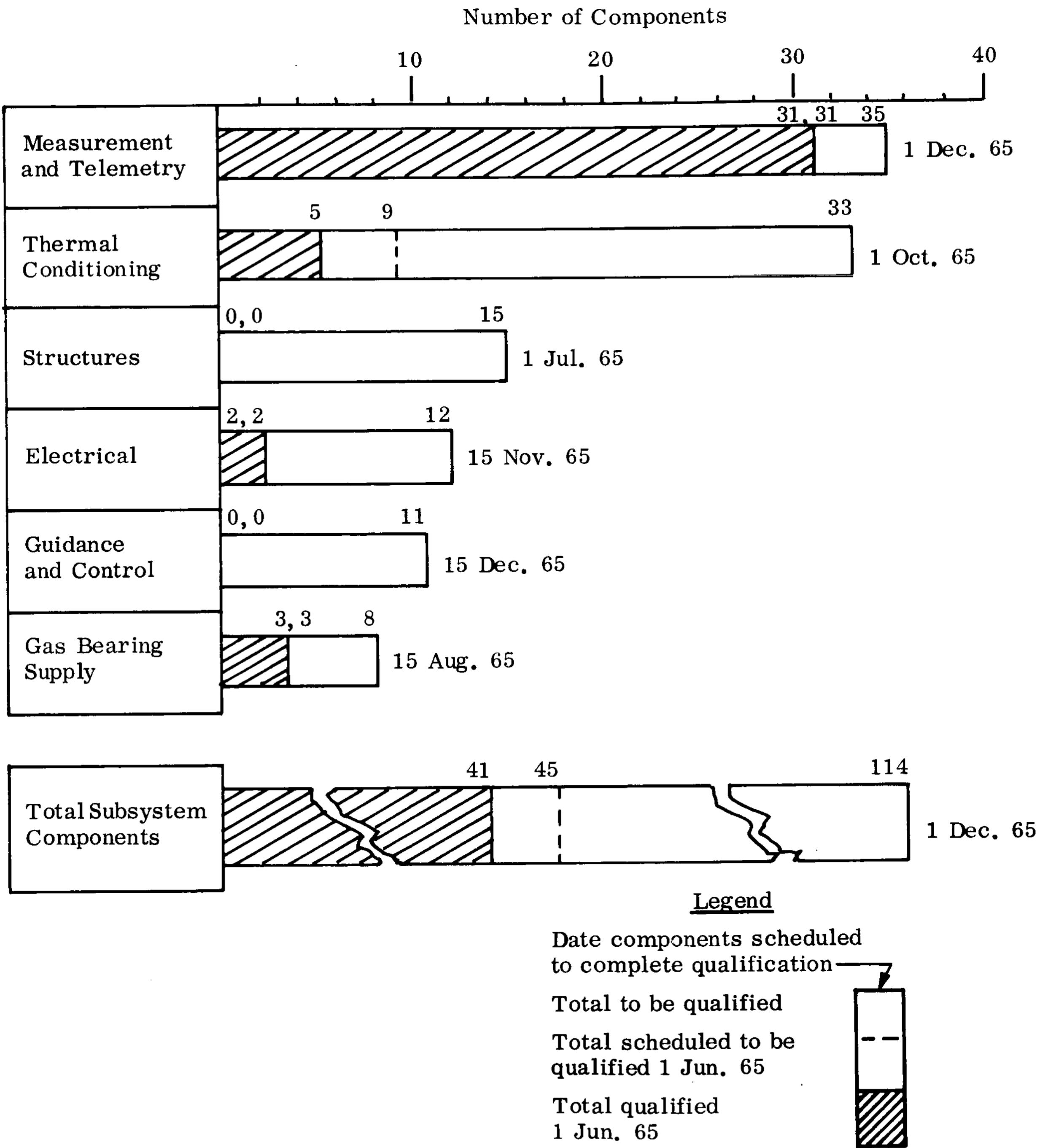
New Welcome Image  62.03%

Users Total: **338** Z-Score: **1.696** P-Value: **0.09** Confidence: **91.02%**

We are reasonably sure
that **New Welcome Image**
is slightly better
compared to App Icon.



Updated just now

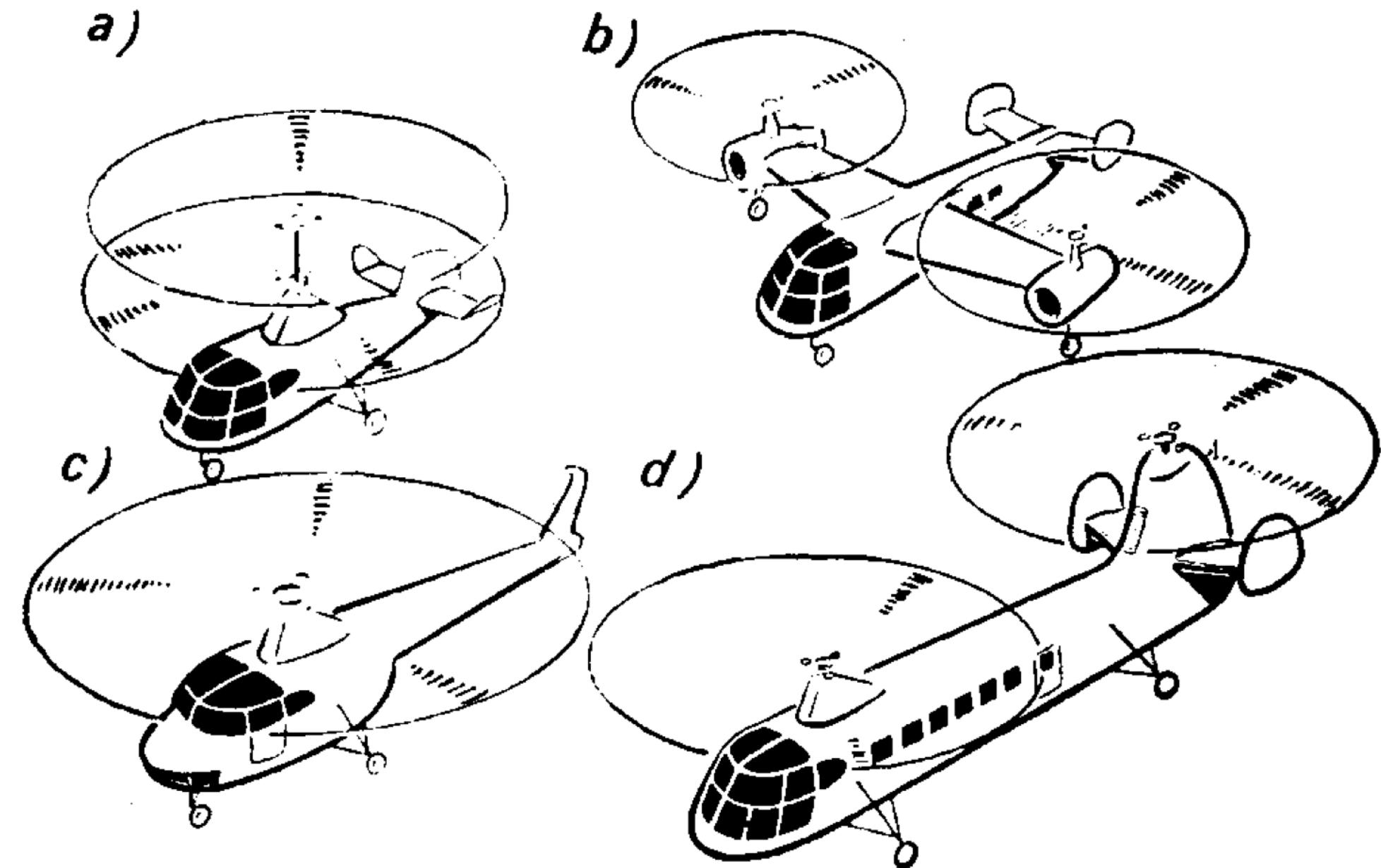


● Best Practices

Test the important parts

LEGEND

TCA	THRUST CHAMBER ASSEMBLY
	CONNECTED
	NOT CONNECTED
$T_1, T_2 \text{ & } T_3$	TEMPERATURE (TRANSMITTED TO INSTRUMENT PANEL INDICATOR)
$P_1 \text{ & } P_2$	PRESSURE (TRANSMITTED TO INSTRUMENT PANEL INDICATOR)
	MANUAL VALVE
	CARTRIDGE-ACTUATED VALVE (NORMALLY CLOSED)
	CARTRIDGE-ACTUATED VALVE (NORMALLY OPEN)
	PRESSURE TRANSDUCER
	RELIEF VALVE
	SOLENOID VALVE (NORMALLY CLOSED)
	PRESSURE SWITCH
	BURST DIAPHRAGM
	CHECK VALVE
	FILTER
	GROUND TEST CONNECTION
	MOTOR OPERATED VALVE
	FLOW LIMITING ORIFICE



Pick a large sample size

Randomize Users & Avoid Biases

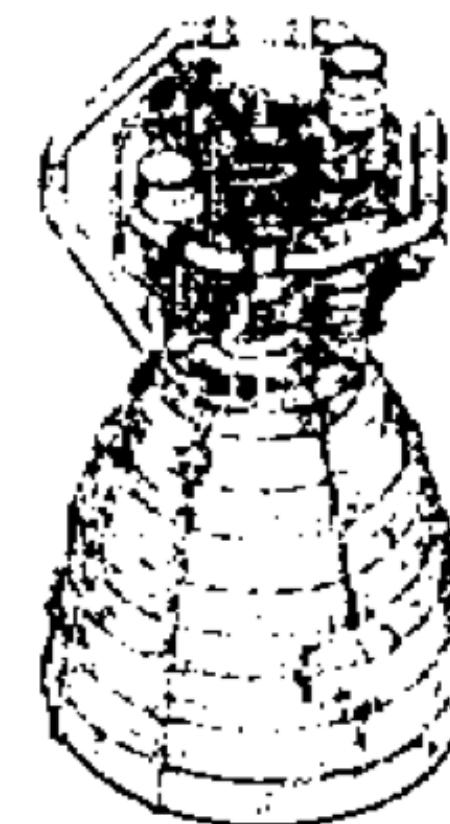
Phase II
Return-to-Flight



Block I



Block IA

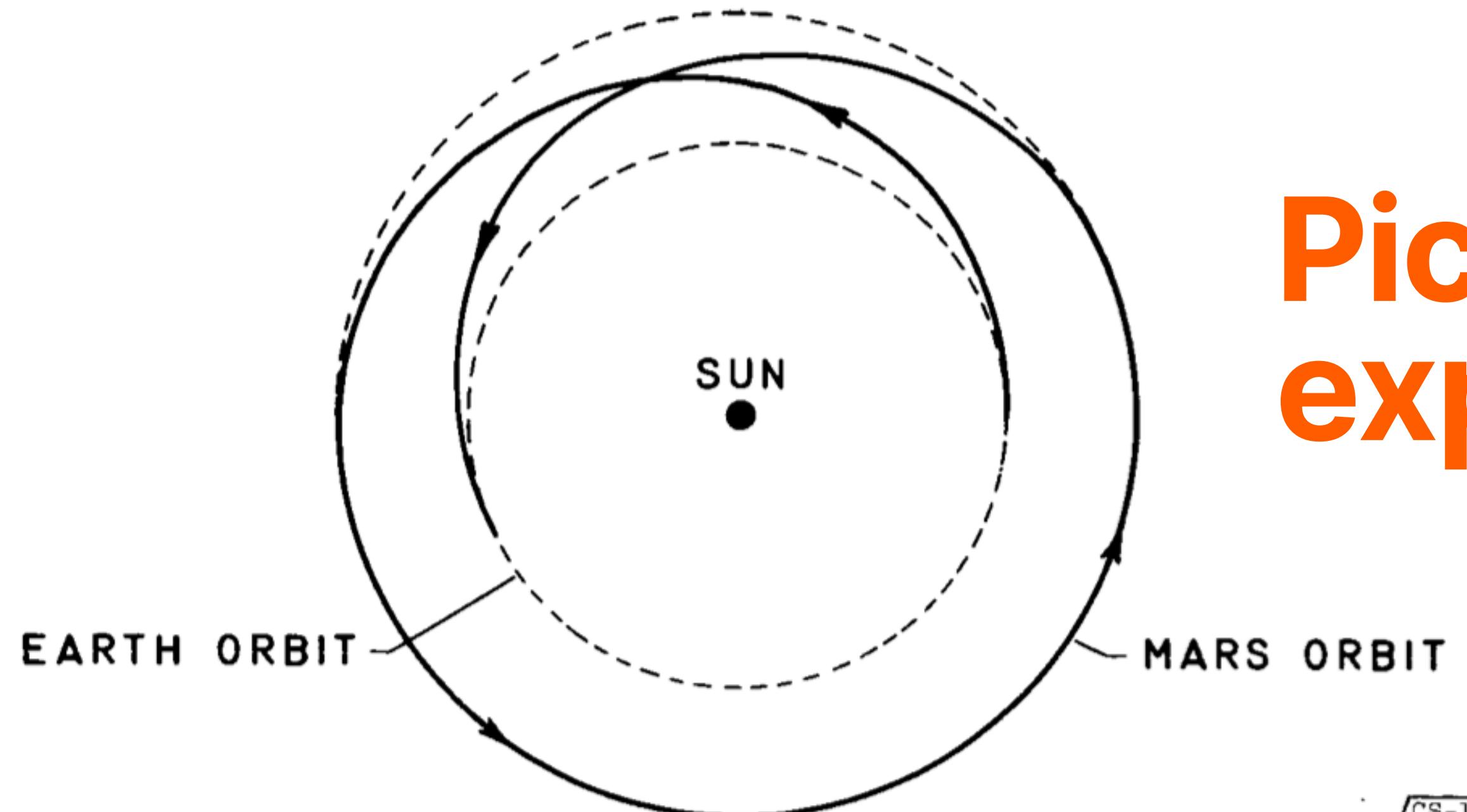


Block IIA



Block II





Pick a sufficient experiment duration

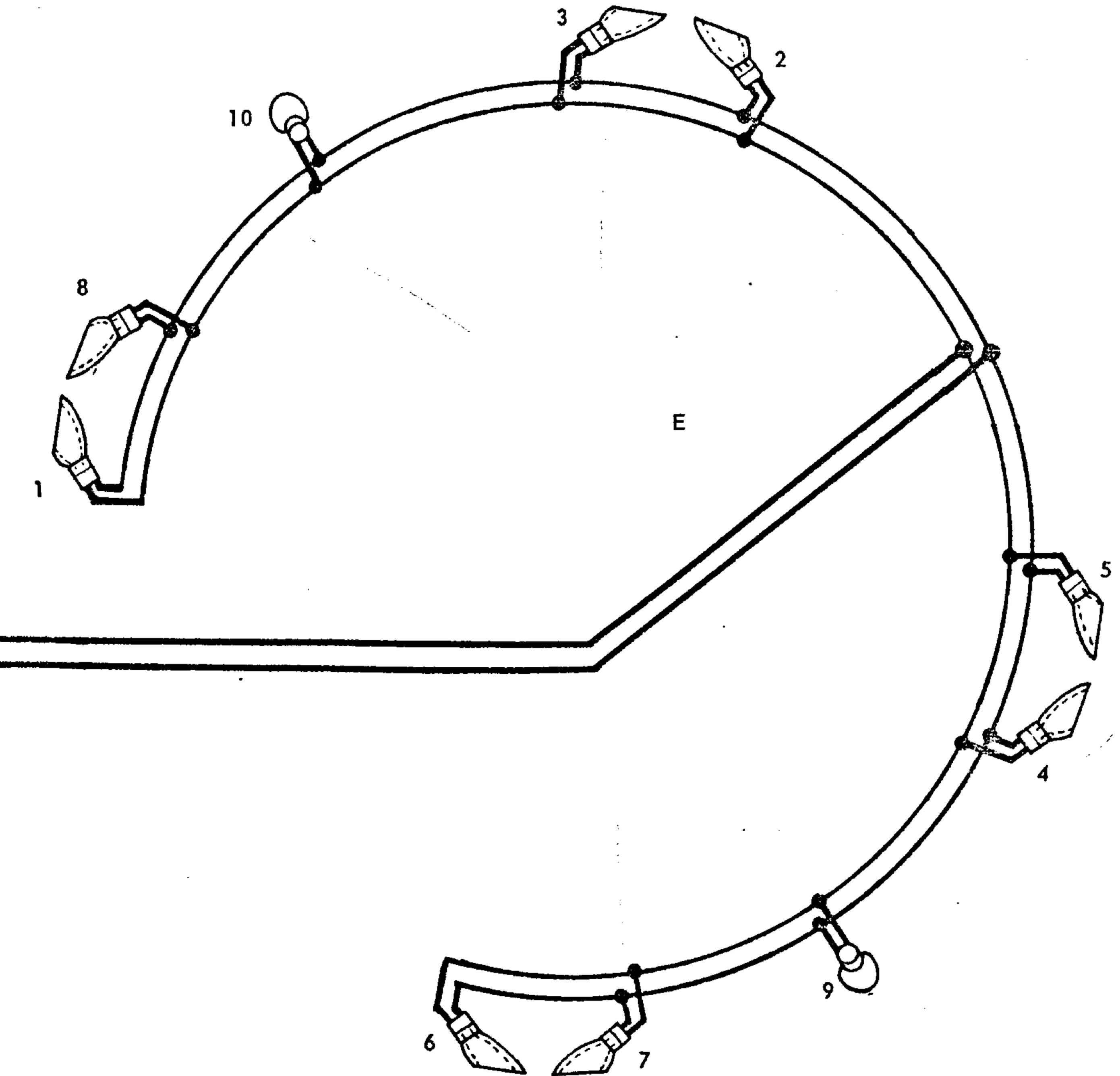
TIME IN DAYS FOR MARS JOURNEY

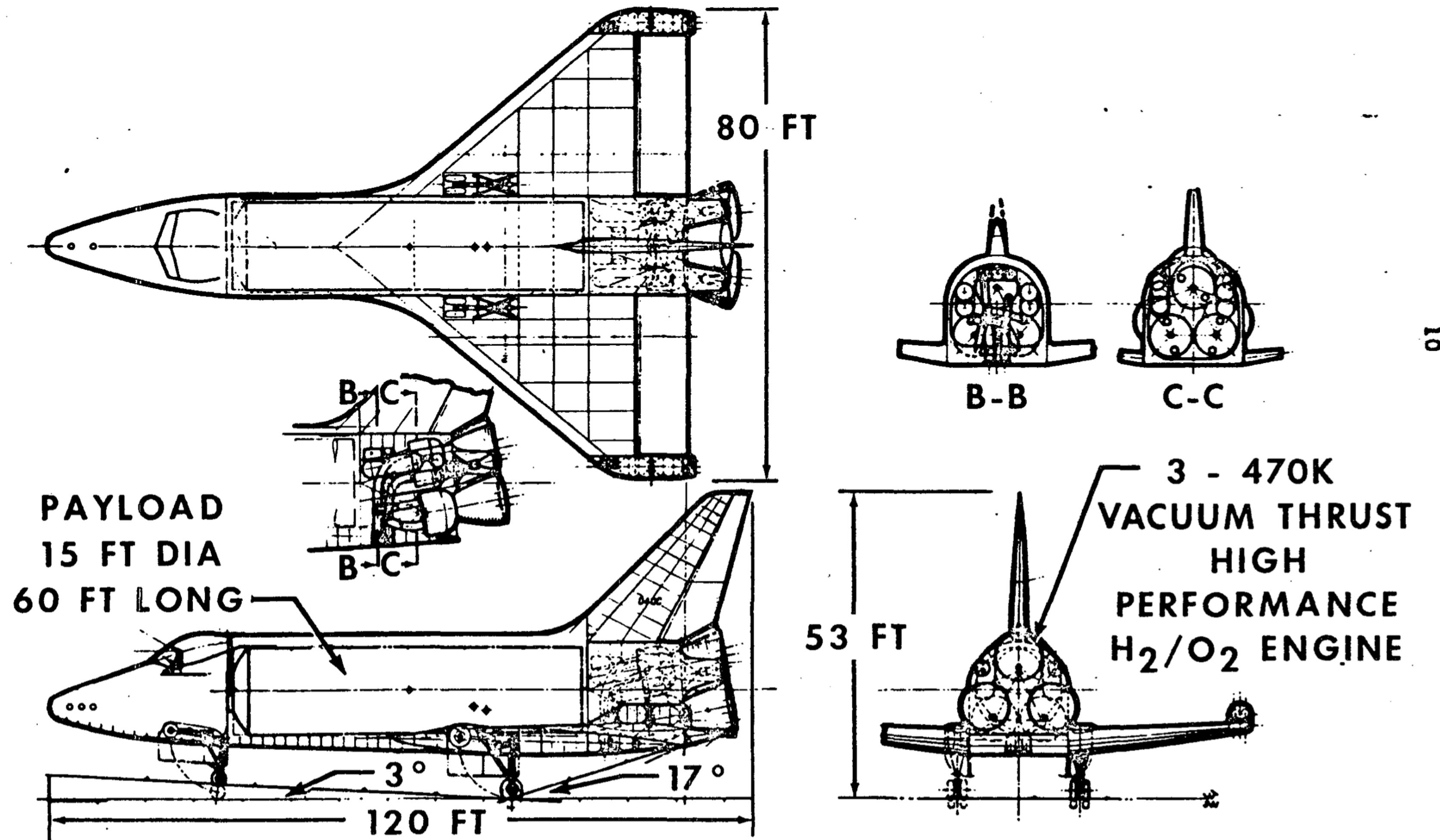
SYSTEM	ESCAPE FROM EARTH ORBIT	COAST	DESCENT TO MARS ORBIT	WAIT	TOTAL
LOW THRUST $(F/W_0 = 10^{-4})$	127	268	85	245	1205
IMPULSE ROCKET	-	268	-	415	951

[CS-14638]

Figure 2. - Flight path to Mars.

If you peek,
you'll get
wrong data





Lets make our apps awesome

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Sources, slides and text
github.com/TelemetryDeck/ab-testing-talk