

# HUMPHREY

## CASTINGS INC

# HUMCO BULLETIN E-2

3944 RILEY STREET • SAN DIEGO 10 • CALIFORNIA    PHONE CY 6-6173 • CABLE HUMCO

## HUMCO COCKPIT CONTROL COMPONENTS

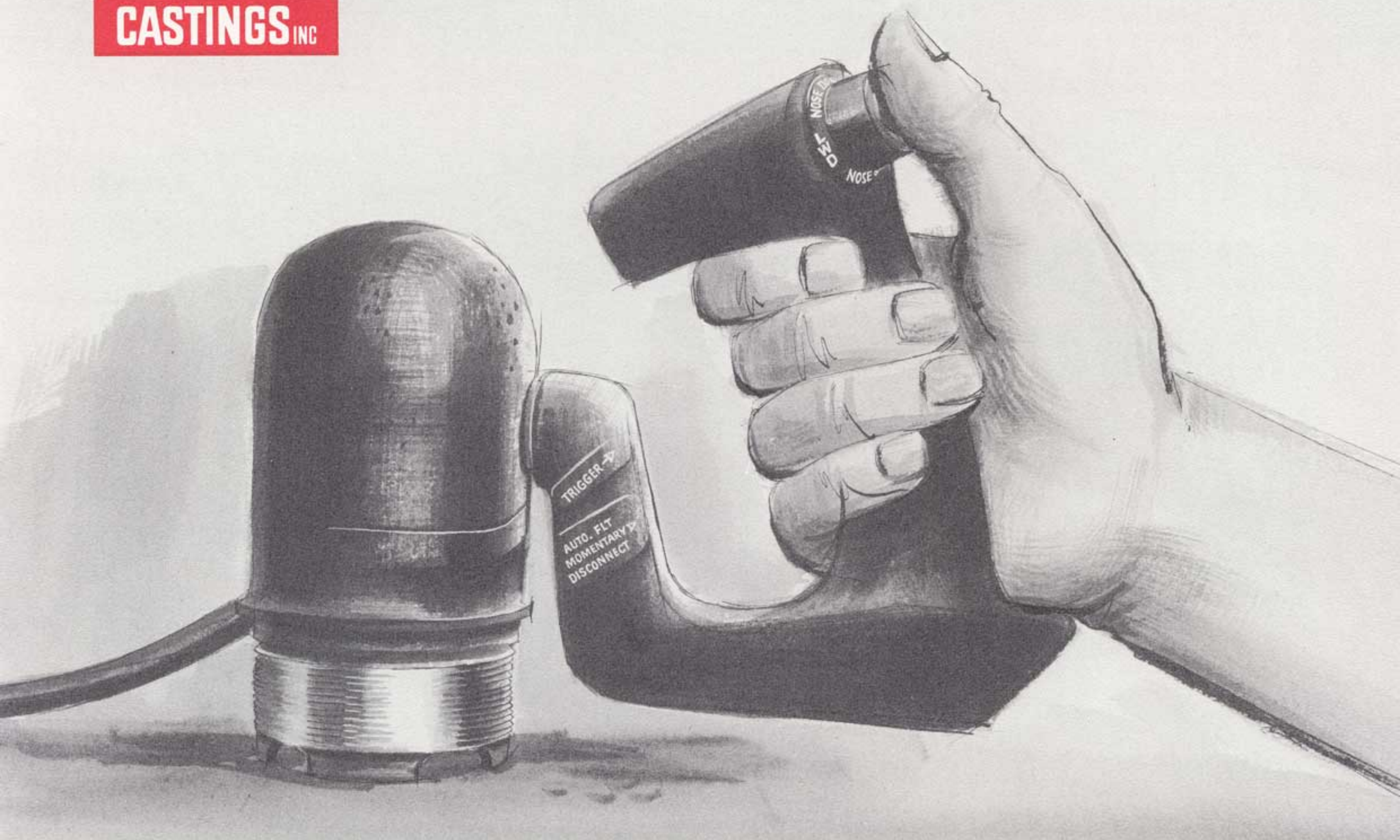
**MARK I:** This compact HUMCO control grip was first used on Convair's F-102A, an all-weather interceptor.



**MARK II:** Selected by extensive tests, this grip made first flight on one of nation's advanced design aircraft.





**HUMPHREY****CASTINGS<sub>INC</sub>**

*Button placement on Mark II Grip affords sure, instant response.*

**TODAY'S FAST-MOVING AIRCRAFT** demand fast-moving advances in *flight control*. Humphrey Castings is assuming an important role in this vital area by fostering new concepts in control performance—and by setting new standards of efficiency in development and production.

New methods of casting, new quality control techniques and many hours of research and development have gone into HUMCO's proprietary line of cockpit control devices. In 1955 HUMCO began making finished castings for aircraft control systems—then, working in close cooperation with a leading aircraft manufacturer, HUMCO designed an entire grip assembly to include new concepts in comfort and performance. Final configuration of the Mark II grip was determined by experienced test pilots in blindfold tests employing 6 standard, semi-standard and radical designs. They found the Mark II compact, easy to handle and efficient.

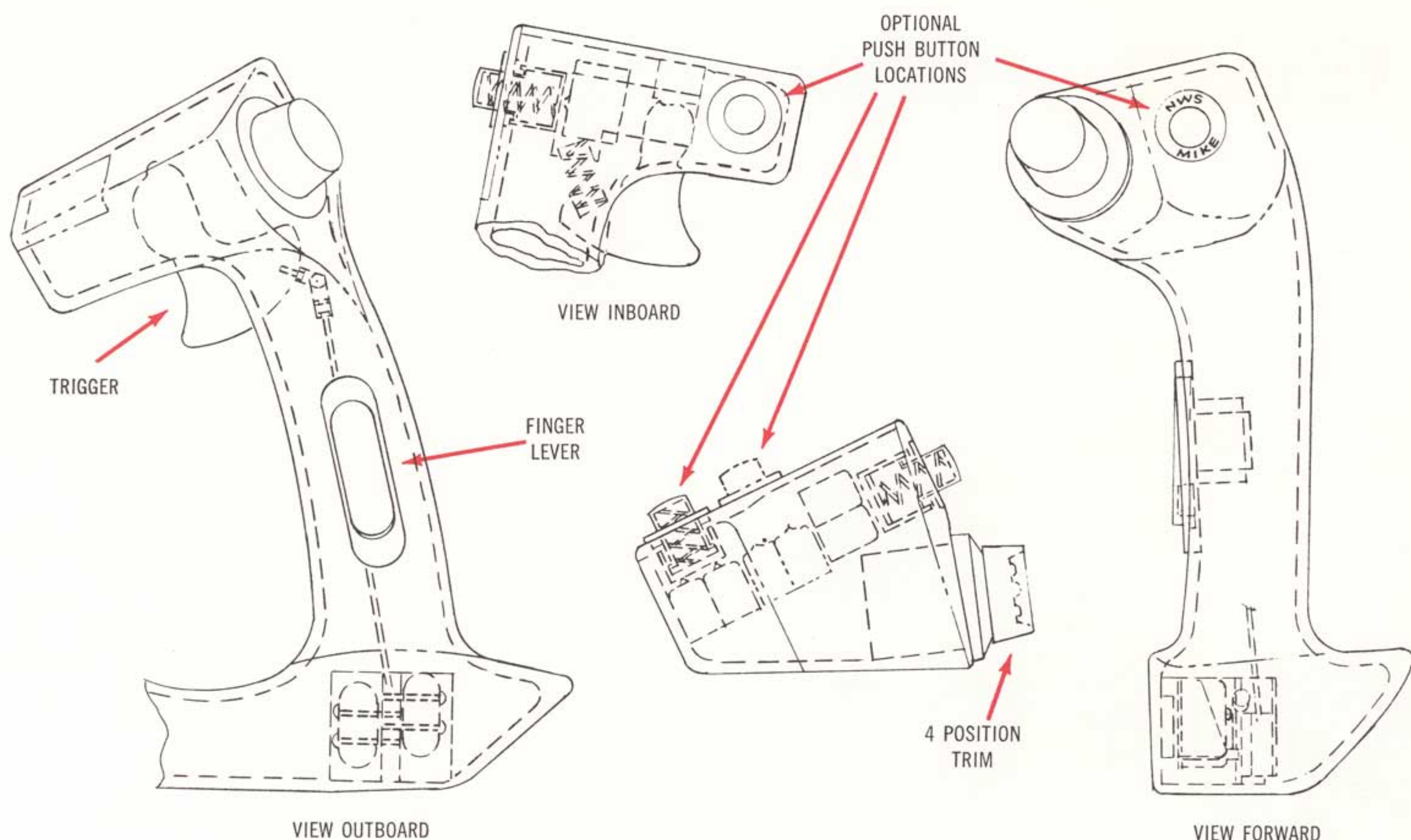
Only HUMCO grips have completely hermetically sealed switches — making them ideally suited for high altitude

flight, and for use under severe temperature and atmospheric extremes. The grip is cast from thin-walled aluminum or magnesium alloys for lightness and structural strength. Button placement affords sure, instant response; design of switches is such that maximum travel is ten-thousandths of an inch. Button travel ranges from ten-thousandths to one-half inch. Pre-travel and over-travel distances are adaptable to customer's needs. Sub-miniature, hermetically sealed relays make it possible to control several switches with one button by using varying degrees of button pressure.

Specially trained HUMCO research and development engineers are available *now* to design and produce intricate control devices to your specifications—for almost any weapons system, flight control system or propulsion system.

**PRECISION INVESTMENT CASTINGS**, made in highly complex shapes from hard-to-work metals and high alloys, figure importantly in the design of today's advanced aircraft and missiles. They are being used by almost every manufacturer of aircraft and aircraft components to produce high





*Typical Mark II Grip Configuration.*

quality parts too intricate for conventional machining methods—and to help realize many important savings in production time and costs.

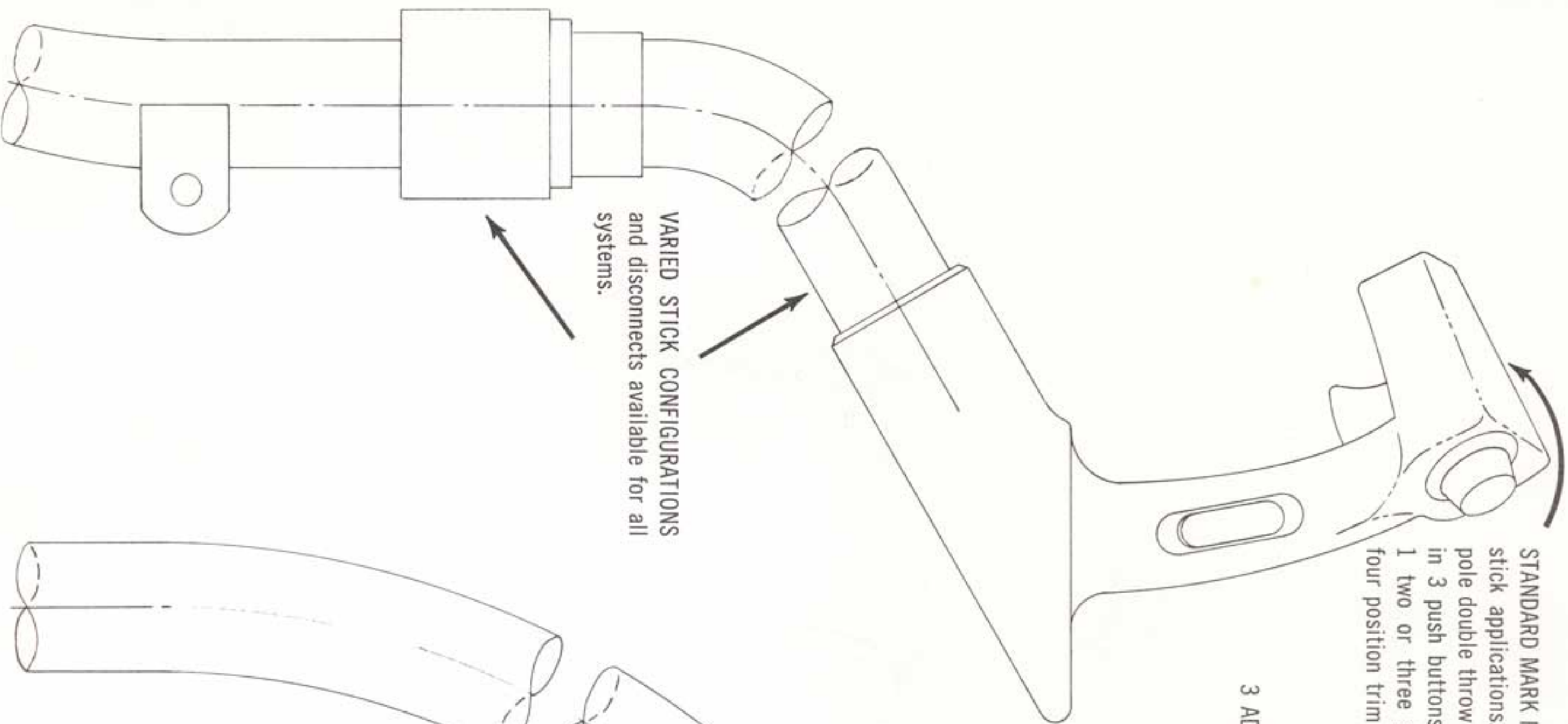
The elimination of secondary machining operations is only one of the advantages of HUMCO's casting process. Experienced design engineers can produce intricately shaped parts for the most exacting cockpit control requirements—from alloys best suited for the job. And HUMCO's extensive production team can translate quality castings into almost any type of package assembly, such as control devices, latch mechanisms, recorder and power transmission gear boxes, testing equipment and cable mechanisms.

**COMPLETE SERVICES** are available at Humphrey Castings—from basic design to precise, top-quality production. Production facilities are available for prototype as well as high-volume runs. For more information on how HUMCO can help solve your particular design and production problems write to Humphrey Castings, Inc., 3944 Riley Street, San Diego 10, California.

### **HUMCO COCKPIT CONTROL DEVICES**

HUMCO cockpit control devices include complete stick assemblies, rudder pedal assemblies, control wheel and column assemblies, trim control gear boxes and throttle quadrants and consoles. All parts and assemblies are precision engineered. All are built to withstand stringent service conditions. And HUMCO cockpit control designs have been proven by long periods of continued service in leading advanced design aircraft.





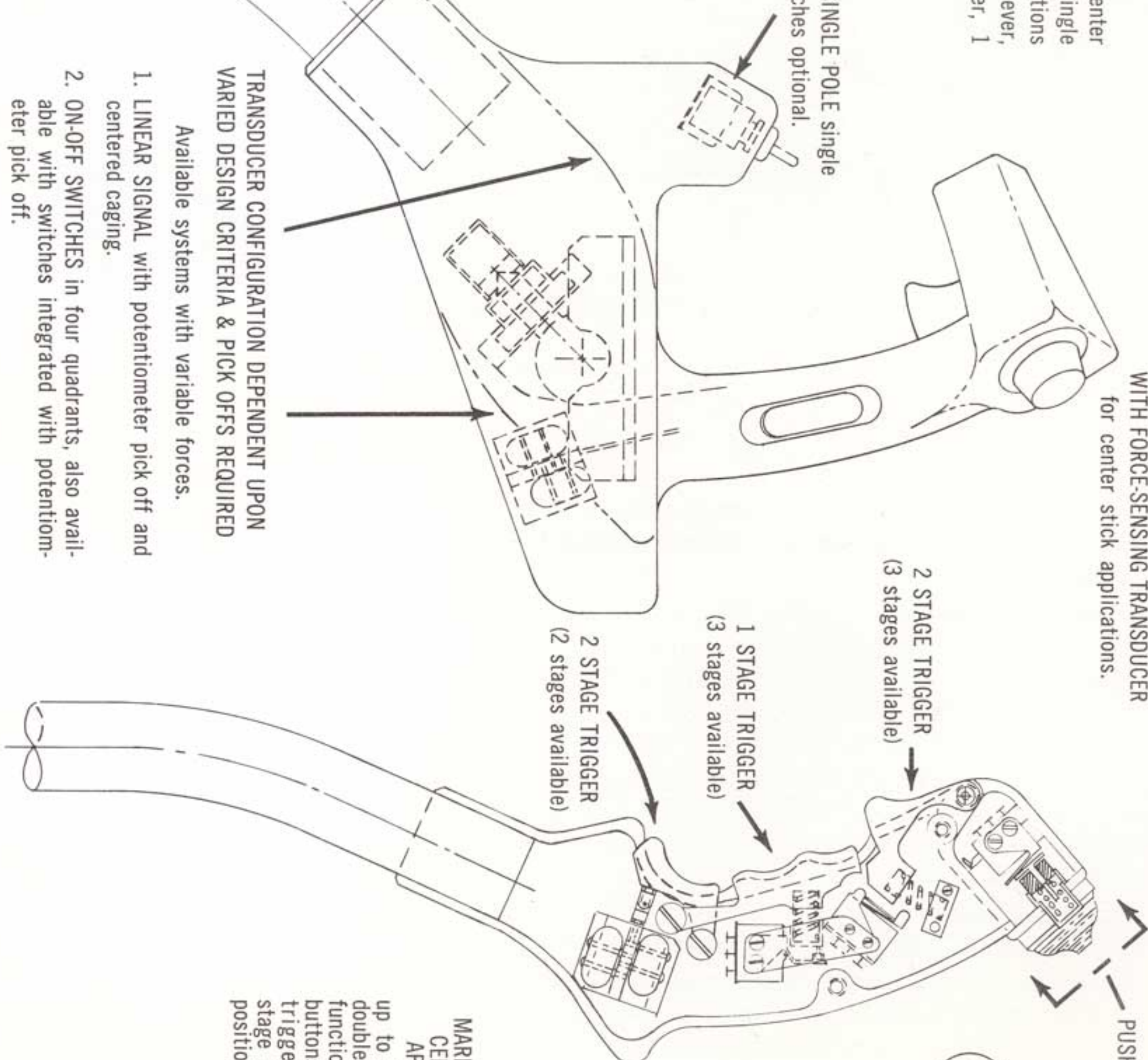
STANDARD MARK II GRIP for center stick applications. Up to 8 single pole double throw switch functions in 3 push buttons, 1 finger lever, 1 two or three stage trigger, 1 four position trim switch.

3 ADDITIONAL SINGLE POLE single throw switches optional.

VARIED STICK CONFIGURATIONS and disconnects available for all systems.



MARK II GRIP WITH FORCE-SENSING TRANSDUCER for center stick applications.



TRIM SWITCH, 4 position spring return to center.

PUSH BUTTONS

1 STAGE TRIGGER (3 stages available)

2 STAGE TRIGGER (2 stages available)

TRANSDUCER CONFIGURATION DEPENDENT UPON VARIED DESIGN CRITERIA & PICK OFFS REQUIRED

Available systems with variable forces.

1. LINEAR SIGNAL with potentiometer pick off and centered caging.
2. ON-OFF SWITCHES in four quadrants, also available with switches integrated with potentiometer pick off.
3. VARIABLE RELUCTANCE COIL pick off with limited travel, also integrated with limited or override switches if required.

MARK I GRIP FOR CENTER STICK APPLICATION up to 10 single pole double throw switch functions in 2 push buttons, 2 three stage triggers and 1 two stage trigger, 1 four position trim switch.

## GRIP ASSEMBLY CONFIGURATIONS

**HUMPHREY**  
**CASTINGS INC**



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Mr. George Wilson  
Humphrey Inc. San Diego  
California

Hello George !

Here is the information which you requested, I sincerely hope that you can help us with this project.

Label of CF 105 "Joystick":  
GRIPSTICK, FORCE TRANSDUCER

MFD BY HUMPHREY INC. SAN DIEGO CAL.

MFR MODEL NO: FT 01-0101-1

AVRO AIRCRAFT LIMITED DWG. NO. 7-1552-383

+ MASON ELECTRIC  
PART # 21405

On the following pages are drawings from Les Wilkinson's book ARROW published by The Boston Mills Press, and a photo courtesy of Les Wilkinson former RCAF pilot.

*P.S. How is the weather?*

*Looks like I'm going to be shoveling snow tomorrow!*

*Mike McAllister*

**Aerospace Heritage  
Foundation of Canada**

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Number

1994

