REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. **PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.**

1. REPORT DATE *(DD-MM-YYYY)*
06-07-2020

2. REPORT TYPE
TIM

3. DATES COVERED *(From - To)*
March 2020

4. TITLE AND SUBTITLE
COMPARISON OF EYE-TRACKING, RHINO-POINTING, AND TRADITIONAL HUMAN SYSTEM INTERFACE (PROJECT HAVE RHINO)

5a. CONTRACT NUMBER
012100

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
D. Isaiah Harp, Ross H. Armstrong, Harrison H. Whiting, Zachary N. Purser, Scott C. Dold, Shawn E. Nevala, and Chiawei Lee; *United States Air Force Test Pilot School*

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) AND ADDRESS(ES)
United States Air Force Test Pilot School
220 Wolfe Ave. Edwards AFB, CA 93524

8. PERFORMING ORGANIZATION REPORT NUMBER
412TW-PA-20302

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
412th Test Wing
195 E Popson Ave
Edwards AFB CA 93524

10. SPONSOR/MONITOR'S ACRONYM(S)
N/A

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for public release A: distribution is unlimited.

13. SUPPLEMENTARY NOTES

14. ABSTRACT

This report documents results from Have Rhino, a comparison of three HSI methods. Testing was requested by the Air Force Research Laboratory, Wright-Patterson AFB, Ohio. The lead developmental test organization was the Air Force Test Center, Edwards AFB, California. The executing test organization was class 19B of the USAF Test Pilot School, Edwards AFB. Testing was conducted from 8 to 20 March 2020 and consisted of 14.5 ground test hours and 14 sorties totaling 21 flight test hours. The overall test objective was to compare eye-tracking, rhino-pointing (a form of head-tracking), and traditional tactile input as components of a large area display HSI. All test objectives were met. The test program was organized as a series of trials, each consisting of a task and a maneuver. There were three specific tasks and three sets of maneuvers. Operators from a variety of backgrounds flew all tasks and all maneuvers using each of the three HSI methods. These trials used an evaluator station in the rear cockpit of an experimental L-29 Delfín and control room to gather quantitative metrics about the performance of the HSI methods, and augmented that data with operator comments and surveys. After HSI performance metrics were gathered, a separate task was flown to mimic an operational intercept, yielding additional qualitative data about the utility of the HSI methods.

15. SUBJECT TERMS
Human System Interface (HSI), Rhino-Pointing (RP), Eye-Tracking (ET), Traditional HSI (TH), multi-function display (MFD), head tracking, flight helmet, designation, expand, touchscreen, L-29, workload, operator performance

16. SECURITY CLASSIFICATION OF:
Unclassified

a. REPORT	b. ABSTRACT	c. THIS PAGE
Unclassified	Unclassified	Unclassified

17. LIMITATION OF ABSTRACT
None

18. NUMBER OF PAGES
212

19a. NAME OF RESPONSIBLE PERSON
412 TENG/EN (Tech Pubs)

19b. TELEPHONE NUMBER *(include area code)*
661-277-8615

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18