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AIR--TO--AIR VISUAL TARGET ACQUISITION

PILOT INTERVIEW SURVEY

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PILOT INTERVIEW SURVEY

BACKGROUND

Pilots and NFOs in the Naval Aviation community indicate that a critical element in achieving a tactical advantage in the air combat environment is the early visual detection and tracking of airborne targets. Although precise data are not available, it is clear that initial acquisition of airborne targets occurs at ranges which are inferior to calculated visibility ranges. Once a target aircraft is detected, it is often reported to "disappear" or the observer is unable to relocate it after glancing away momentarily. Based on interviews, there appears to be (1) great variability among pilots and NFOs in acquisition and tracking performance, and (2) "top" performers in visual detection and tracking are identifiable by one's peers (fellow aircrew members).

As a result of these informal interviews, a peer ranking technique has been selected for use in an initial research effort to identify "top" performers in initial visual target acquisition capability. The present study was conducted to obtain information from selected Navy pilots which could be used to design a peer ranking format and to document pilot comments relative to the initial visual target acquisition problem.

METHOD

Subjects: Eight pilots, located at Naval Air Station, Pensacola, Florida, were selected for evaluation. The pilots selected averaged 2.5 years of operational flying experience. Three of the pilots flew F-4s, three A-7s, and two F-8 aircraft.

Interview Survey: The questions used during the interviews are identified in
Appendix A. These interview questions were based upon previous informal dis-
cussion with fleet pilots and analysis of background information pertinent to the initial
acquisition problem.

Interview Survey Administration: Each pilot was provided with a brief description
of the role of the Naval Aerospace Medical Research Laboratory (NAMRL) and a des-
cription of NAMRL's charter with Naval Air Systems Command (03). Pilots were
interviewed separately, and then responses to specific questions were recorded.

Data Analysis: Data were analyzed by comparing the percent of eight pilots
responding "yes" vs "no" for the first of six (6) questions of Appendix A. Responses
to questions 7 and 8 were summarized and presented in discussion form on pages
4 and 5.

RESULTS AND DISCUSSION

Data presented in Table I indicate that the pilots reached general agreement
in the following areas:

- Seven of 8 pilots interviewed indicated that they believed they could
  identify the top 5 pilots in Air-to-Air visual target acquisition in their
  squadron.

- Seven of 8 pilots interviewed agreed that the term "acquisition" was as
  meaningful as other terms, such as "spotting" "seeing", in an ACM environ-
  ment.

- Six of 8 pilots interviewed responded negatively to the question "Would/
  could you rank all squadron pilots on the basis of their visual target acqui-
  sition capability?"

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- All pilots interviewed indicated that they believed that there is a minimum number of observations required for confidently identifying those "good" in initial visual target acquisition.

- Six of 8 pilots interviewed indicated that they believed the initial air-to-air target acquisition problem is as significant for the attack as for the fighter aircraft community.

- Seven of 8 pilots interviewed indicated that pre-operational training for the initial target acquisition task is presently inadequate.

Table I

Pilot Responses for Survey Questions

Questions		1	2	3	4	5	6
	% YES	87.5	87.5	25	100	25	12.5
	# YES	7	7	2	8	2	1
Pilot							
Responses							
	% NO	12.5	12.5	75	0	75	87.5
	# NO	1	1	6	0	6	7

In addition to "yes/no" responses to the interview questionnaire, the pilots questioned in this study were able to provide a number of additional pertinent comments. These comments are summarized as follows:

- The pilots interviewed would identify the "top" 5 squadron performers in initial acquisition, but be reluctant to rank order all pilots.

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- The terms "acquisition," "visual contact," "seeing," and "spotting" were all equally meaningful for expressing "eyeball" contact with an aircraft. However, "visual contact" was described by 3 of the pilots as a more exact term.

- Pilots agreed that there was a minimum number of observations necessary to confidently identify pilots "good" in initial target acquisition. During discussion, the number of observations required for confident identification was expressed in qualitative terms ranging from "a couple" to "as many as possible".

- Pilots agreed that the F-4 community should be the primary target for the project because of their ACM mission.

- Pilots indicated that formal training in initial target acquisition was minimal. However, three points in the pipeline cited as providing some training were: a) Aviation Physiology Training, b) Replacement Air Group, and c) Fighter Weapons School.

- Pilots indicated that approximately 40% of ACM was a function of early visual acquisition.

The following is a summary of comments made by the pilots during the course of the interview which are pertinent to the initial visual acquisition problem. These comments reflect pilot reaction to interview questions 7 and 8, which elicited opinions on the importance of initial target acquisition in air combat maneuvers, and a general evaluation of the interview project.

- Lookout doctrine is important to the target acquisition process.

- Accuracy in judging a pilot's initial acquisition capabilities is related to time in squadron.

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. Qualities and strategies of pilot's "good" in initial target acquisition.

　　. good vision.

　　. mentally alert.

　　. knowing what to look for (cues; e.g., smoke.)

　　. use peripheral vision

　　. use sun.

　　. good scan pattern.

　　. concentration.

　　. focus on "cloud" or distant object before searching.

　　. focus eyes to infinity.

. Other comments.

　　. NFOs better judge of pilot performance.

　　. F-8 pilot at distinct disadvantage because radar is usually down, which
requires much larger search area.

APPLICATION

This information was used in the development of the peer ranking form shown
in Appendix B.

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APPENDIX A

INTERVIEW SURVEY

1.   If I were to ask you to, "name the 'top' 5 pilots in air-to-air visual target acqui-
sition in your squadron," would/could you do it?

             yes   no

Comment:

2.   Is the term "acquisition" as meaningful as "spotting" and "seeing" in the con-
text of visually detecting a "bogey" or another aircraft?

             yes   no

Comment:

3.   Would/could you rank all squadron pilots on the basis of their visual target
acquisition capability?

             yes   no

Comment:

4.   Is there a minimum number of observations required for confidently identify-
ing those "good" in initial visual target acquisition?

             yes   no

Comment:

5.   Is the initial air-to-air visual target acquisition problem as significant for the attack as for the fighter aircraft community?

                    yes   no

Comment:

6.   Is adequate training provided for initial acquisition prior to operational flying?

                    yes   no

Comment:

7.   How important is initial visual target acquisition in air combat maneuvering?

Comment:

8.   What are your general comments about the project?

Comment:

APPENDIX B

AIR-TO-AIR VISUAL TARGET ACQUISITION

All information will be used exclusively for research purposes

INSTRUCTIONS

Order the "top" five pilots with respect to performance in Air-to-Air Visual Target Acquisition. Air-to-Air Visual Target Acquisition refers to how well pilots establish initial visual contact with target aircraft.

Make your judgements as accurately as possible.

NAMES	NFOs record approximate number of flights with each pilot ranked.
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____

PILOTS: Out of a total number of _____ pilots, I rank number _____ in initial Air-to-Air Acquisition performance.

High

I have (circle one)   Med   confidence in the above rankings.

Low

If low, why? _____

_____

_____

_____

Personal information is CONFIDENTIAL and will only be used to assess ranking data.

Name: _____   Soc.Sec.No.: _____   Officer Rank: _____

(LAST)   (First)   (Mid. Init.)

No. of Months in Squadron: ☐☐   No. of Fleet Tours: ☐☐   PILOT? ☐   NFO? ☐

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AIR-TO-AIR VISUAL TARGET ACQUISITION

All Information Will BE Used Exclusively for Research Purposes

INSTRUCTIONS

Order the "top" five NFOs with respect to performance in Air-to-Air Visual Target Acquisition. Air-to-Air Visual Target Acquisition refers to how well pilots establish initial visual contact with target aircraft.

Make your judgements as accurately as possible.

NAMES	PILOTS record approximate number of flights with each NFO ranked.
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____

NFOs: Out of a total number of _____ NFOs, I rank number _____ in Initial Air-to-Air Acquisition performance.

High

I have (circle one)   Med   confidence in the above rankings.

Low

If low, why?   _____

_____

_____

_____

_____

Personal information is CONFIDENTIAL and will only be used to assess ranking data.

Name: _____   Soc.Sec.No.: _____   Officer Rank: _____

(LAST)   (First)   (Mid. Init.)

No. of Months in Squadron: ☐☐   No. of Fleet Tours: ☐☐   PILOT? ☐   NFO? ☐