

NCSU/Aptima – NASA NRA-09 Research

Checkout for MMADC Y3 Experiment

5/15/09

Participants: Alexander, Arthur, Kaber, Kaufmann, Naylor, Norman, Prinzel, Stelzer, Williams

Agenda:

10:30a-11:30a Verify simulator display content and control behavior:

Out-of-cockpit

Training – VMC, day

Testing – IMC, night; visibility 0/0 (dense moisture); breakout at 500 AFL

Brownout

Go-around - Starting at 150 ft. with 5% opacity and transitioning to 100% opacity by 100ft.

Land - Starting at 150 ft. with 5% opacity and transitioning to 50% opacity by 100ft.

Ground objects

Ensure clear visual cues from ground in land condition

Ensure realistic appearance

Review positioning of objects relative to pad

PFD

Terrain – “brown”

Background – “blue” sky

Symbology – “white”

Sink rate display (below airspeed indicator)

VSI arrow (to right of airspeed indicator)

Commanded sink rate – “Magenta” circle leading VSI arrow

SVS – “green” wireframe only

EVS – “green”

Tunnel - “magenta”

Tunnel present during descent and removed at 450 AFL

No “dog bones”

ND

Guidance cue (“white” circle) absent in descent; appears at 450 AFL (when tunnel disappears)

Control mode – HdotManual

Lateral control inputs with stick

Velocity control with hat-switch

12:30p-1:30p Conduct sample training session(s)

Verify display configuration – VMC, day

One (1) part-task training trial

Control mode – MANUAL+HdotAuto

Two (2) whole-task training trials

Control mode – HdotManual

1:45p-2:45p Conduct sample test sessions

Confirm display features, guidance failures, and brownout conditions for each case identifier

Eight (8) trials including the following conditions:

Trial No.	Display clutter	Display Feature			Phase 1 Guidance Failure		Phase 2 Brown out	Case Number	
		SVS	EVS	Tunnel	Position	Direction		Phase 1	Phase 2
A-1	HC1	1	1	1	Early	Left	100%	case 1208	case 3028
A-2	LC2	0	0	0	Early	Right	50%	case 1101	case 3011
A-3	LC1	1	0	0	Early	Right	50%	case 1105	case 3015
A-4	MC3	0	0	1	Early	Right	100%	case 1102	case 3022
A-5	MC2	1	0	1	Early	Right	100%	case 1106	case 3026
A-6	HC3	0	1	0	Early	Left	50%	case 1203	case 3013
A-7	MC1	1	1	0	Early	Left	50%	case 1207	case 3017
A-8	LC1	1	0	0	Early	Left	100%	case 1205	case 3025

(Note: These eight trials all include early guidance failures. They should occur at 1.5 min into the test runs. The first trial (A-1) is to be presented as a “first trial” for pilots assigned to detect a novel guidance failure under a “high clutter” display condition. The failures should extend to 1 dot of lateral deviation over 1 min. period.)

Review data output from sample test sessions:

Verify data for selected performance measures

3:00p-4:00p Conduct sample test sessions

Confirm display features, guidance failures, and brownout conditions for each case identifier

Eight (8) trials including the following conditions:

Trial No.	Display clutter	Display Feature			Phase 1 Guidance Failure		Phase 2 Brown out	Case Number	
		SVS	EVS	Tunnel	Position	Direction		Phase 1	Phase 2
B-1	MC3	0	0	1	Late	Right	100%	case 2102	case 4022
B-2	LC2	0	0	0	Late	Right	50%	case 2101	case 4011
B-3	LC1	1	0	0	Late	Right	50%	case 2105	case 4015
B-4	MC2	1	0	1	Late	Right	100%	case 2106	case 4026
B-5	HC3	0	1	0	Late	Left	50%	case 2203	case 4013
B-6	MC1	1	1	0	Late	Left	50%	case 2207	case 4017
B-7	HC2	0	1	1	Late	Left	100%	case 2204	case 4024
B-8	HC1	1	1	1	Late	Left	100%	case 2208	case 4028

(Note: These eight trials all include late guidance failures. They should occur at 3 min into the test runs. The first trial (B-1) is to be presented as a “first trial” for pilots assigned to detect a novel guidance failure under a “low clutter” display condition. The failures should extend to 1 dot of lateral deviation over 1 min. period.)

Review data output from sample test sessions:

Verify data for selected performance measures

4:00p-5:00p Discussion of preparations for experiment

- Pilot briefing packet
 - Configuration of displays and controls
 - Training procedure
 - Test procedure and interaction with confederate PNF
- Forms for test trials
 - Pilot background survey
 - Clutter rating forms
 - Experimenter observation form
- Post-experiment interview and debrief
 - Questionnaire and additional rating forms