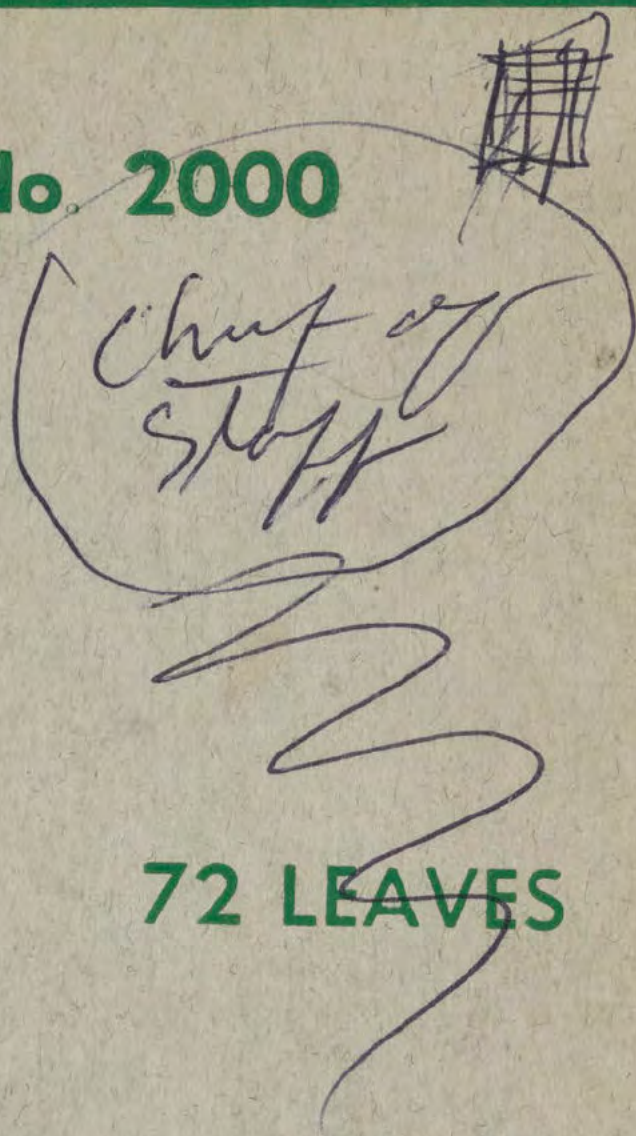


EYE-TINT No. 2000



72 LEAVES



REGISTERED IN U. S. PATENT OFFICE

EASEL

Stenographic Note Book

BOOK NO. _____ FROM _____ TO _____

)
[AuTisTic]

EXHIBIT NO. 5000

T-T-D

- bet with Chapman on winning their propellers lab to get some sort of apples vs apples trade in turn vs single engine

MOE

- MEAD and location in R&B
- Inert limit load factor constant and well as lower and upper limit for best maneuverability
- Get specific range, generalized range and range / profiles accounted for
- * Place & Persistence for turn advantage for superior turning a/c for its combat persistence

Radford

I-T-1

- Pate's & Mack - 3 paper
- Campbell's simultaneous synchronization
- Brown's energy storage
approximation
- Campbell's on board computer
idea
- Johnson's Dry Thrust a/c
- Talk about vectored thrust
without gear

$$\begin{aligned} \dot{\theta} \text{ with } P_{\text{max}} &\leq \dot{\theta}_{\text{max}} \text{ with } P_{\text{max}} \\ P_s \text{ with } \dot{\theta}_{\text{max}} &\leq P_{\text{max}} \text{ with } \dot{\theta}_{\text{max}} \end{aligned}$$

Each $P_{\text{max}} \text{ with } \dot{\theta} \geq P_{\text{max}} \text{ with } \dot{\theta}_{\text{max}}$

$$\dot{\theta}_{\text{max}} \text{ with } P_s \Rightarrow \dot{\theta}_{\text{max}} \text{ with } P_{\text{max}}$$

$$\dot{\theta}_{\text{max}} \text{ with } P_{\text{max}} \leq P_s \text{ with } \dot{\theta}_{\text{max}} \leq P_{\text{max}} \text{ with } P_{\text{max}}$$

$$\dot{\theta}_{\text{max}} / P_s \geq \dot{\theta}_{\text{max}} \text{ with } P_{\text{max}}$$

$$P_{\text{max}} / \dot{\theta} \geq P_{\text{max}} \text{ with } \dot{\theta}_{\text{max}}$$

$\bar{O}_1$ with $P_{smax,1} \leq \bar{O}_{max}$ at $P_{smax,1}$

$P_{s,1}$ with $\bar{O}_{max,1} \leq P_{smax}$ at $\bar{O}_{max,1}$

Foray $\bar{O}$ at $P_{smax,1} \leq \bar{O}_{max}$ at ~~P_{smax}~~ same P_{smax}

Foray P_s at $\bar{O}_{max,1} \leq P_{smax}$ at ~~same~~ ^{equal} $\bar{O}_{max}$

since ^{as} ~~same~~ $\bar{O}_{max}$ at P_{smax} ~~must~~ ^{will} ~~be~~ ^{converged}

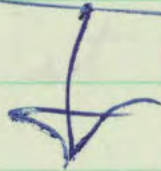
T & at some P_{smax}

$\bar{O}_{max}$ at some $P_{smax} \leq \bar{O}_{max}$ at

DTF7

Ant Von

Mg Nikolai Nicolai



Propose provide rationale
pertaining to LWF both
for students and faculty

Sam Lallu

SN-5500

Benjamin Gyalat

Drabant

- Run 1.2 @ 9, ACC and G for weight penalty.
- Run persistence for all birds absolute at 6.5 G
- Give Drabant weight addition and G/F for operational suitability. - 2 cases
 - Constant wing area
 - Constant wing loading
- * Give Drabant SCL on $N=1, 2$ and Kelly based for new performance
- Provide 1.61 and 1.66 on $N=1$ and $N=2$ for calculations
- (A-G) $\rightarrow$

Chuparr

- GF for constant μ/S and Area } 1.82
- Find out if number or additional volume needed for goods then 2 growth factor for both constant μ/S and constant area

Need volume

- Starter
- PRR and Single Point
- Foam
- Tray Arrow

T-T-N

* • A-Steer will bounce in

• Steers to check to slow
beam down

- Fatigue - 9000 hours
6000 - 8000 hours

- Limit load factor

- Check on armament
weights (all off
accounted for)

- Have $\frac{1}{2}$ on underway
of simulations

- Have Return mission
planned on internal
fuel not just
mission fuel.

- Off design missions

- L-56 precedence for
all candidates

- A-6

• 5 Range bomb load

• 2 Range bomb load

• Angular rate bombing

• etc

Notes

• Nervous Areas

•

GD -	CL Pod/gear	interference
LTV -		

• 4-56 persistence for all candidates

• Parkway

• Shookie

• Check ferry range after addition
of weights for

• weight correction

• weight + operational suitability

• See if PDC can handle this
one.

• Check Bouary and see if capacity
based upon JP-5 or JP-4

- $DW = 1500^{GF} \text{ t key } 8\%$
 - Structural weight - $\boxed{11\%}$ GF
 - weight 800 lbs in proposal
-

Load factor Limits

- Using primary element for establishing loads
-

CCV

- $\left[\begin{array}{l} 20\% \text{ reduction in } 1.2 \text{ Mack} \\ \text{to if CCV does not work} \end{array} \right]$

- Allowed considerable drag movement in proposal for base drag - However incomplete

* Idea - Use up a/c in combat - impact on fatigue

* VN not a realistic setting for such an endeavor

* Tail hook weight and structure in

* Aerial Refuel
- Equipment weight not accounted for 58 #s

* HE laser to destroy Tornados

* Two additional hardpoints
35 to 50 pound Dead Weight

* 150 gal tank centerline on wheel.

* 330th of structure in for 8.16 at SL

* Performance - Get off in
mfg. tolerances
to reduce costs.

* What effect would inadvertent
pitcher loss of canopy on the
pilot?

* Ball of air has negative static
stability for early flight.

Northrup

A-6

- A-6 munitions -
 - Handpoints stress
 - Weapons
- Search/Track radar -
what radar size.
- Potentials for nose gear
- Base pay and impact
upon performance

	(fuel)	
600	-	4800 - 5600 + 5900
610	-	3960 - 4506 + 0

- Need radicals and nuts
to get those suggest
ideas to move ahead
- However must incorporate
these ideas into a

a Disciplined mission oriented system

b .05 model in Wind-tunnel

• Relocation of Vertical Sails
(or extension of aft fuselage) reduced
* interference at high
lift in supersonic
flight - Also beneficial
subsonic flight

c New approach provides
basis for jumping ahead
of foreign competition.

d Over 100% less fuel
in projected improvements

e Operational based upon
M&T engine

- F-100 should be time correlated with J-101 for apples vs apples argument.

Cockhead

A

- Growth factor - did not have to account for increased gear weight - gear weight held constant.
- Push up cooling requirements to improve HPRF.
- P-100 → \$880K now
F-100 → ?
- Fuel control on F-100 - big issue.

* It is clear that we will have to look into engine trade offs in the future.

- Distortion $\rightarrow \alpha, \beta$
- scrambled 5 A/C from different countries and put back together again — producibility
- Epidemic thru canopy
saves canopy weight
— 20-30 pounds
- 12 γ birds

T-T-D

✓ • Redo weights for X check

* • What is GF if 8% additional fuel is included

New GF from Chapman

* $w/s = 60$

• $w/s = 1K$	, GF = 2.2
• $S = 1K$	, GF = 1.85 (volume increase)
• $S = 1K$	, GF =

• $w/s = 55$

• $w/s = 1K$	, GF =
• $S = 1K$	, GF =
• $S = 1K$	, GF =

• $w/s = 70$

• $w/s = 1K$	, GF =
• $S = 1K$	, GF =
• $S = 1K$	, GF =

- Check Bill Heller weights estimation.
 - Compute Range on grown aircraft
 - ✓ • Base Drag Risk
 - GD
 - Northrop Twin
 - Lockheed
 - ✓ • Rolling G- Get it.
 - ✓ • Have Evaluators looked at contractor related data
-

- LTV on - 1 calculations
MMD, AB17 Proximity
- Lockheed on - 2 new leading edge schedule

T-T-0

- What is GF if 8% additional fuel included
- Get Range data from Strickland
- Have Probert Do. History on -3 for back-up
- What is GF without additional volume added. - Get from Chaprin
- Briefing Outline Performance
 - Proposal
 - Weights
 - Operational Suitability
 - Unattended / population
- Performance Summary at the end of each performance correction.
- Get rolling pull-out from Strickland

T-T-D

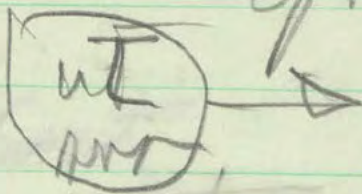
* • Describe unique features
for each best - technology

* Add judgment to
Evaluation Goals

• What are prototypes
equipped with errors
• erroneous

• Performance - 15 minutes
Introduction - 2/8
Lyle 7/8

• Start / weights
4 charts - 9 points
Proposal / By
arts / Pro
operational



- Representative Equipment
- Bring
- Pull middle of road
ofc to show shrinkage
of performance

- Pretexture - ~~Team~~
 - Introduction or draw
down of performance
for one ofc
-

- Chart with Advanced
Technology
 - Why Overst
 - Super critical
 - ducts
 - strokes

- Strong Point / AF concern
+ W Tunnel

- Get
 - 1 chart with exposure

— 300 flying cost

Other factors

Ben Stewart time

0830

— 30 minutes

1100

— POW Brunch

- What about telemetry for Edwards Range
- Refuelable Fast tanks
- G-D — Nad Ocean
- Kelly — Make note of his remarks pertaining to inadequate cost

1-5

<u>C</u>	<u>1</u>	<u>0.9</u>	<u>ACACC</u>	<u>G</u>
LTV	9.5	11.2	37	4.0
N-2	8.9	11.3	46	5.2
GD	8.4	10.5	46	5.3
B	8.2	10.2	39	4.1
LOC	6.4	8.5	54	3.7
MCD	6.5	8.5	50	3.8

IFC

<u>LTV</u>	<u>N-2</u>	<u>GD</u>	<u>B</u>	<u>LOC</u>	<u>MCD</u>
4000	5600	5700	5000	9075	11,200

2-5

<u>C</u>	<u>1.2</u>	<u>0.9</u>	<u>ACC</u>	<u>G</u>
LTV	8.7	10.4	45	3.8
N-2	7.9	10.4	57	4.8
GD	7.8	9.6	50	5.0
B	8.0	9.0	42	4.0
LOC	6.0	8.1	68	3.5
MCD	6.5	8.5	50	3.8

3-5

<u>C</u>	<u>1-2</u>	<u>0.9</u>	<u>ALL</u>	<u>G</u>
LTV	8.2	9.8	48	3.6
N-2	7.6	10.0	59	4.6
G-D	7.5	9.2	52	4.8
B	7.7	8.7	43	3.9
LOC	5.8	7.8	71	3.4
MCD	6.45	8.5	50	3.8

1-B-5

<u>C</u>	<u>PP</u>	<u>P</u>	<u>O</u>
LTV	15,600	16,756	17,842
N-2	18,800	20,465	21,077
G-D	16,960	18,099	18,844
B	16,940	17,490	18,097
LOC	19,543	20,402	21,146

Open Notes

• Reduced Order Techniques

- generality
- Design Integration
- macro understanding

• ~~Full~~

•

CJSS

- What is Fear - Definition!
- How do you beat logs?
- Radio is God - most significant for rescue
 - suggests means for monitoring activity
 - manual - fac
 - automatic

6

Incidents of Natural Disturbance
in the water - report to
command post

•

paper Towels

80

Murph

- Find out - did we or
did we not
find -

T-T-O

- How to we get around the word ^{and} concept associated with requirements?

- Why do we want to get around it -
rigidity!

Interesting Books

• The World of Ideas - Cross

↓
[Check Base Library]

~~General Card~~

~~Per diem for PJSS~~

~~398~~

~~Travel voucher for last trip~~

• On Building Theories

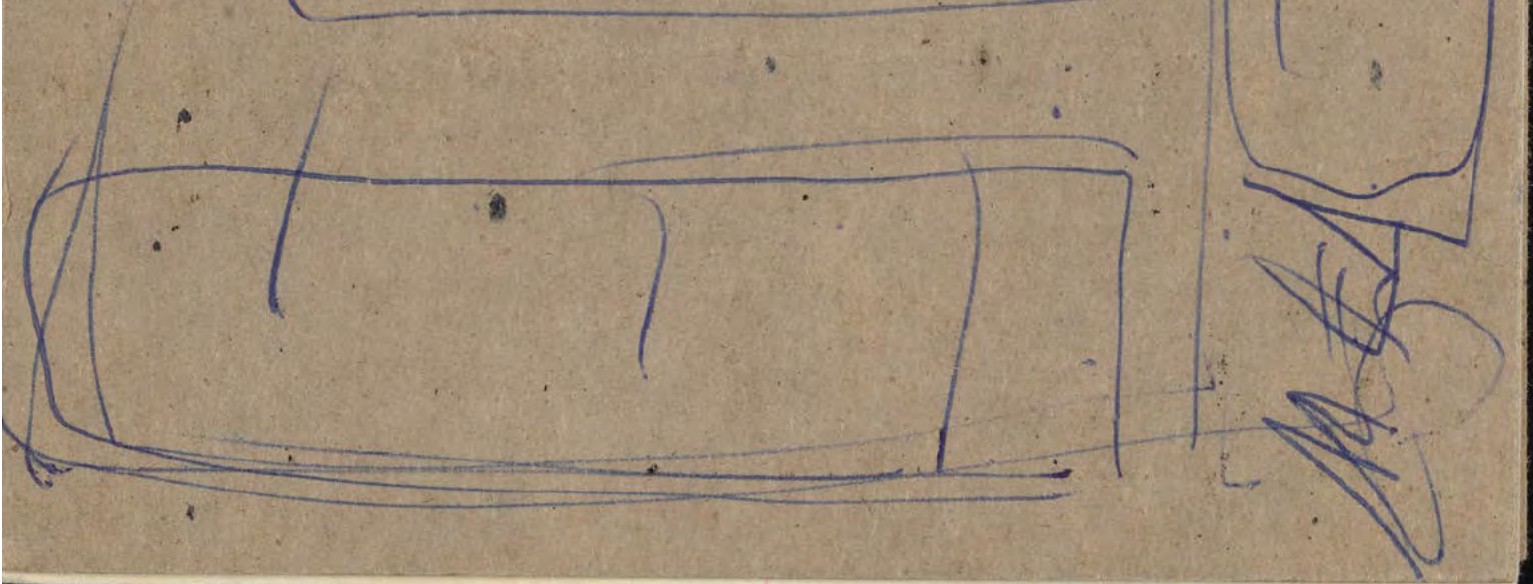
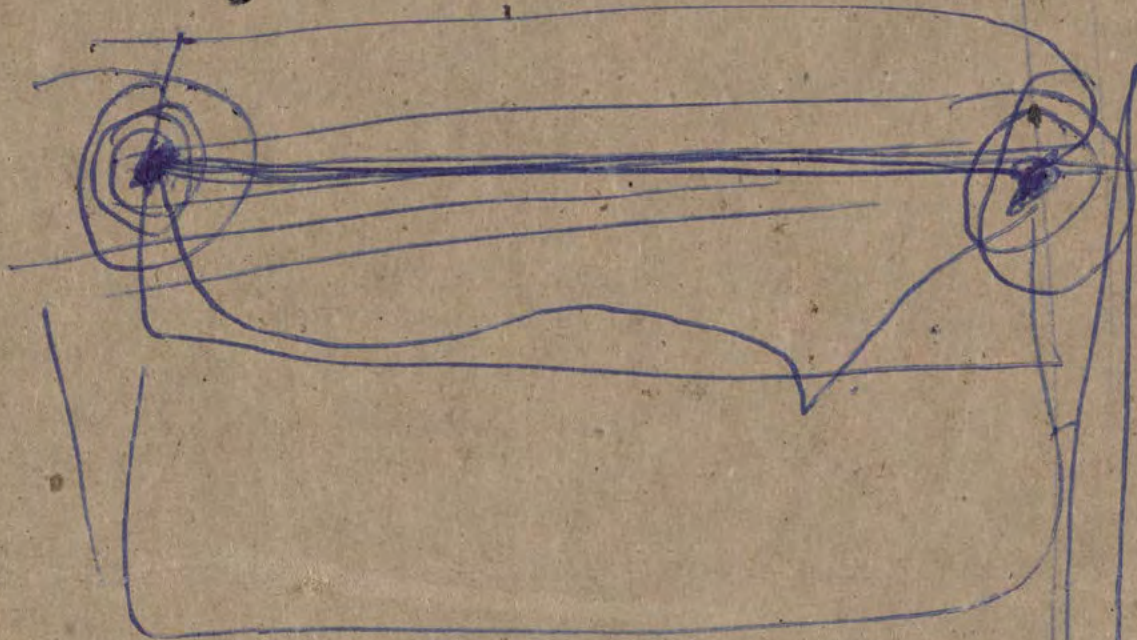
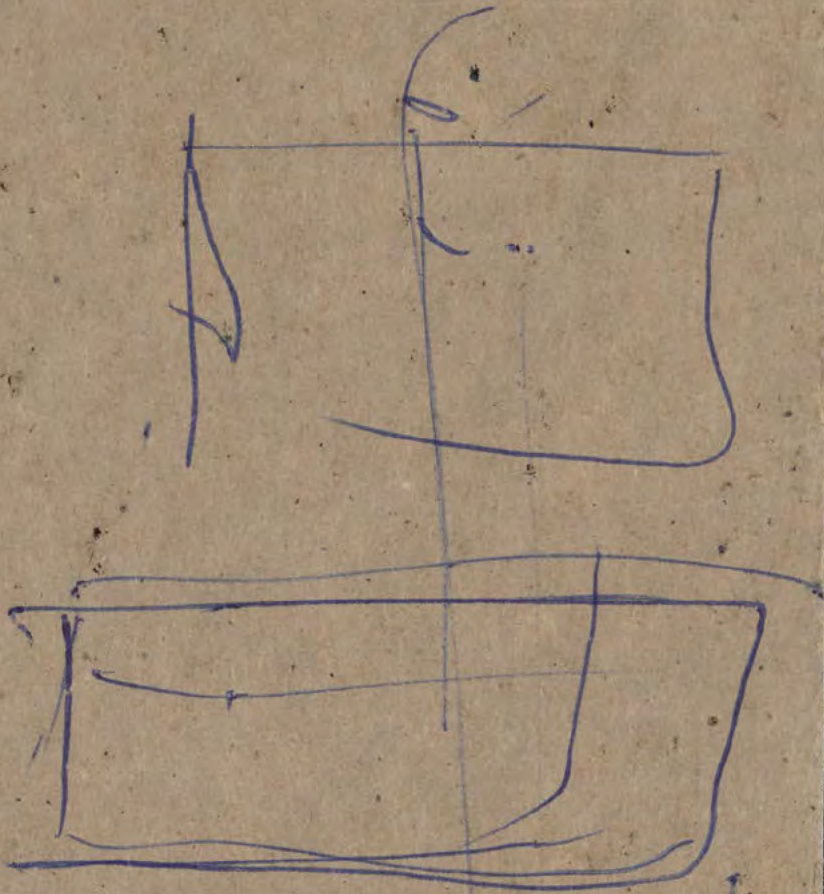
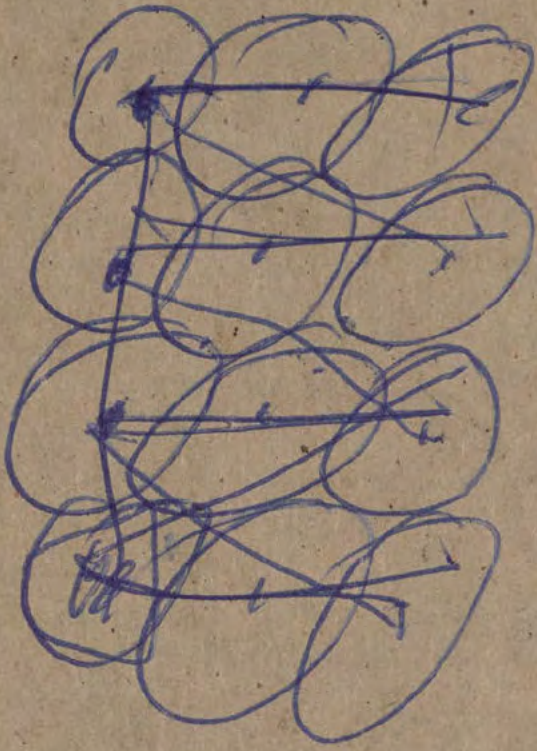
By

Harry Koett (Master Chess)

World of Ideas / George L Cross
et al 1968

U of Okla Press
\$ 4.95

U. of Oklahoma Press
Norman, OK 73069



• Speech —

• Freeborn y info

• 2004 makes

• Ambiguity

Comments

• CG/RO interface —
• regarding
• recommendation about

✓
Did we handle this
correctly or not

What about the
va graphs

6

Genlly
↓

Director
Genl Cook
Col Goldie

Dr Shuman

Shuman
(Tedman)

S Meeting 15 July 75

- Power Program Review - Set up

- Chief - reports good but in at 11th hour

- Write papers - Chief likes these.

- Put baronto, buy up good appearances

- Objectives for the
Ar Force.

- Each officer have a combat task

- Chief - For Productivity
of people

• RDP people —
transition period

• Watch Travel

|

R-102
423

(BR)
B-102

B-102
423

B-102
423

B-102
423



- Legion of Merit
- Air Medal
- AF Commendation
- Army Commendation
- Bureau Citation (campaign)
- Asiatic-Pacific Citation
- WW II Victory
- WW II Occupation
- National Defense
- Korean Service
- AF Longevity
- R of Korea ~~press~~ unit citation
- United Nations

Spares

• Initial spares

- AF vs. Navy.

- components

- ~~44~~ \$950M AF RDT&E

⇒ Lost our Navy

- 8 aircraft

~~•~~

•

•

GPU-7

•

ADM-82

not separate
line item

*

Enough money to produce
overrun

• Navy FCS - Phx funded line item

• Navy funded significant part out
of production

- RT finding hardware and test effort out of RDT & E
- May 1st flight before production
 - May some risk for schedule slippage and cost overrun
 - Reduce risk by having a lack of concurrency

- 1st gen of test aircraft have PpRT engine
 - 7 of 12 CMT I fully qualified engine
 - all CMT II fully qualified

- Reduce risk
- Lower cost retrofit

looked at the Phase T1B

- Stub pylon on fuselage
roughly 9ft long and
will rail launch aspect

- What happens to sparrow
~~is the~~ to the rear is
less clear

 - MR - BSR

 - But looks okay

- Of possible locations is
13 ~~Ed~~ Bent -

 - Performance

 - FOV

 - Maintainability etc



Lockheed / Northrup



Complement F-14B
(not as a support role)
[proceed]



$$C_0 = C_{00} + \frac{C_1}{T/PRE}$$

$$.058 = C_{00} + \frac{0.84}{T/PRE}$$

$$.058 = C_{00} + \frac{.068}{T/PRE}$$

$$C_{00} = .058 - .068 =$$

T-T-D

ATM-82

I Analysis of ATM-82

- Defensive
- offensive
- anti-parallel
- parallel

I Defensive

- if attacker maneuverability superior unable to use OBS
- if defender maneuverability superior OBS can be used

• Offensive

HMS

- If attacker maneuverability superior OBS not needed
- If defender maneuverability superior then OBS can be useful

• Anti-Parallel

- If not side-by-side then best tactic aspect below and to one side
OBS (HMS) ~~is expensive~~ (if it works) since 1st shot can be secured with better position for reattack options (very cheap)
- If side-by-side then maneuverability is key - with wide margin OBS it can be used but not needed

Parallel

- If maneuver margin is wide OBS not needed, can be used
- If maneuver margin is narrow or equal OBS useful

Summary:

- If Friendly enjoys superior maneuverability
- If friendly does not enjoy maneuver margin

$\perp B$

$$\overset{a}{B} = \kappa_R B$$

$$\overset{a}{R} = \kappa_B R$$

$$\kappa_R = P_R \left(\frac{R}{B} \right)^a$$

$$\kappa_B = P_B \left(\frac{B}{R} \right)^a$$

P_R δ_R ΔP_S $\delta \sigma$

$$\frac{\partial P_{SD}}{\partial \delta_R} = - \frac{P_{SR}}{\delta_R}$$

$$\frac{P_S}{\delta_R} = - \frac{\partial P_{SD}}{\partial \delta_R}$$

$$\begin{array}{r} 4200 \\ 1000 \\ \hline 5200 \end{array}$$

$$16648.95$$

$$5200$$

$$11448.95$$

$$8000$$

$$3448.95$$

$$.22$$

$$689790$$

$$689.790$$

$$758.7690$$

$$2468.78$$

$$2352.64$$

$$\underline{\$116.14}$$

$$1380.00$$

$$758.77$$

$$2138.77$$

$$213.87$$

$$\underline{2352.64}$$

T-T-D

- See Pat Murray about ~~Performance~~ ~~Organization~~
- Call Nelles and Edwards and make appointment for new brief
- Read Rand position paper
- Get messy set-up with H₂ DTSC and H₂ assets

F-T-D

28 May 70

- Threat parameter analysis
 - If possible use existing parameter design programs. eg. NPS47, ASB, and Contractors.
- Suspension date
 - looks like it should be relaxed

Issue

* People who approve
and responsible for
product.

* ^{sets} 4 prototypes for cost

• All through 3 times
as may explain

• If in investment this
knows get below 25K

• Design.

• Show Ben Rodgers the Lockheed data

• Structure

• ~~Have~~ set analytical or by experience

• $270^\circ/\text{sec}$ at reduced value — Check out this

• Gun feed system not accounted for

• Specs — No speed really built in

* $F-x^2$ / $V-F-x^2$ cannot be built another existing system.

Briefing
 $F-X^2 / VF-X^2$

- Humane (Guin's/muscles)
- Fighter Pilot | RED Control
Issue - Disagreement
- Historical
Issue - Trade dominance
- Threat
 - Issue - Do not justify new aircraft
 - Need to look at new Soviet possibilities -
Lg out parametric design
- Design Philosophy -
[Issue - Design philosophy]

T-T-0

13 Apr 70

~~B~~

•

Log F-14B

At H same

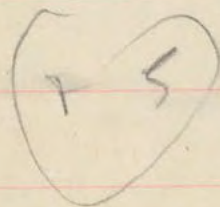
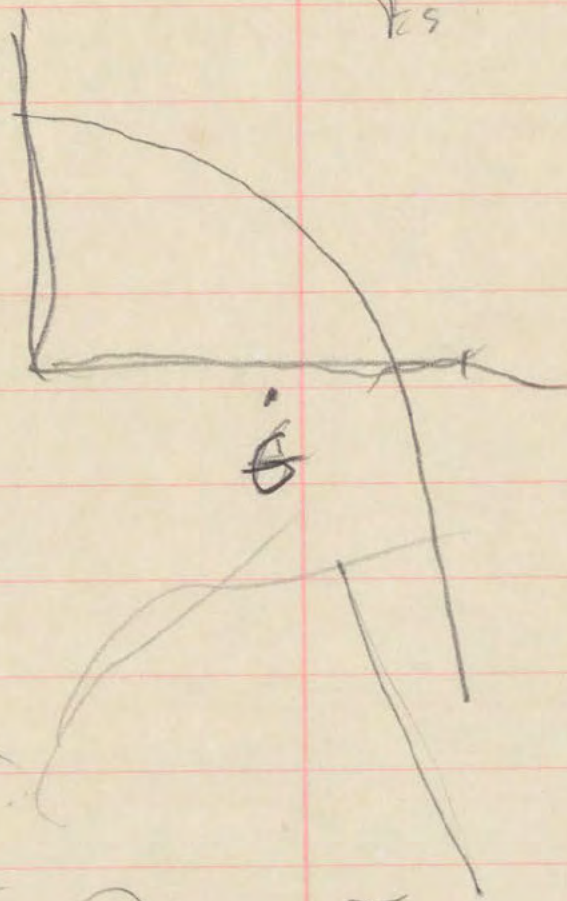
Way Mission

1.2



$\mathbb{R}^2$

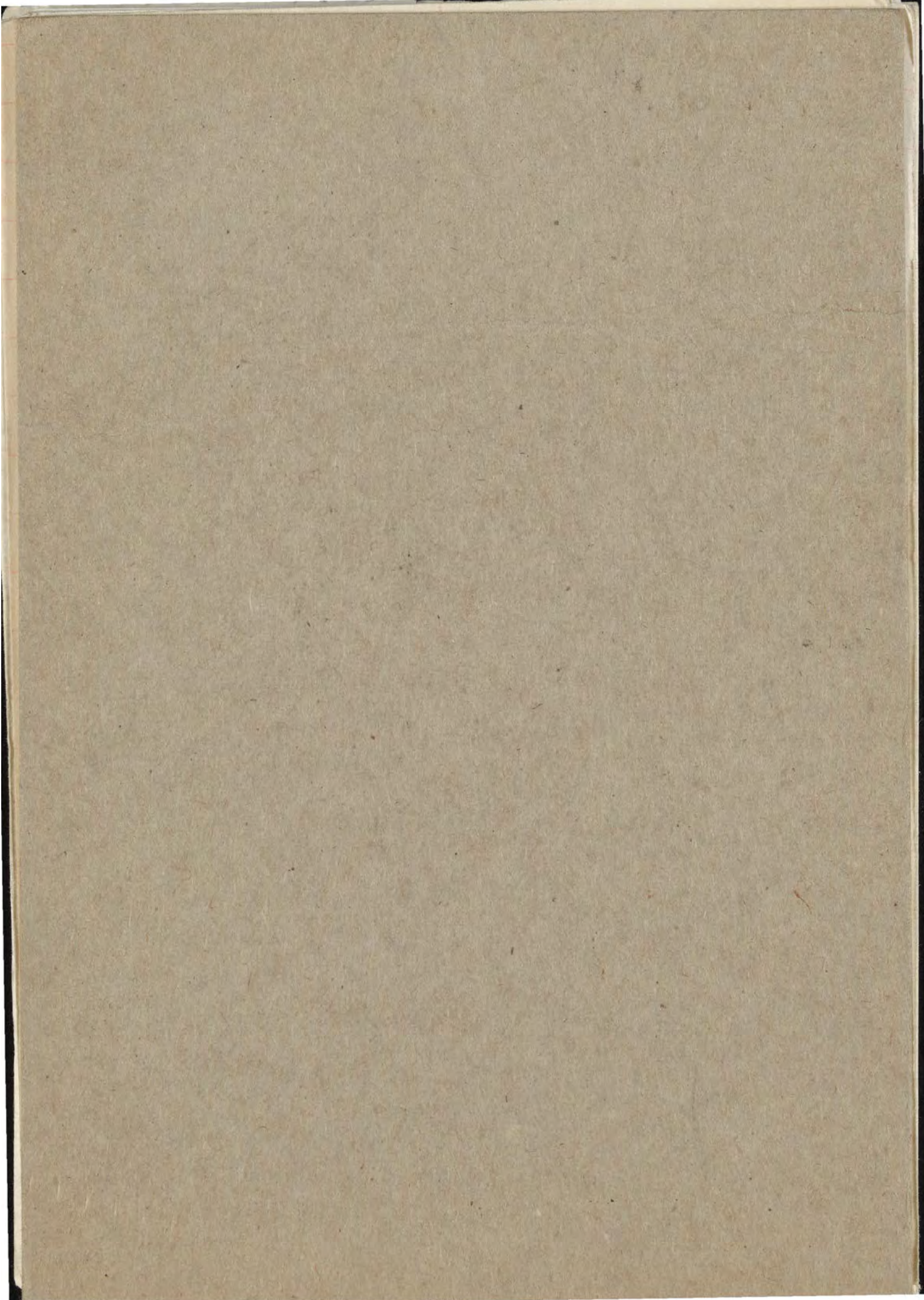
$\mathbb{R}^3$

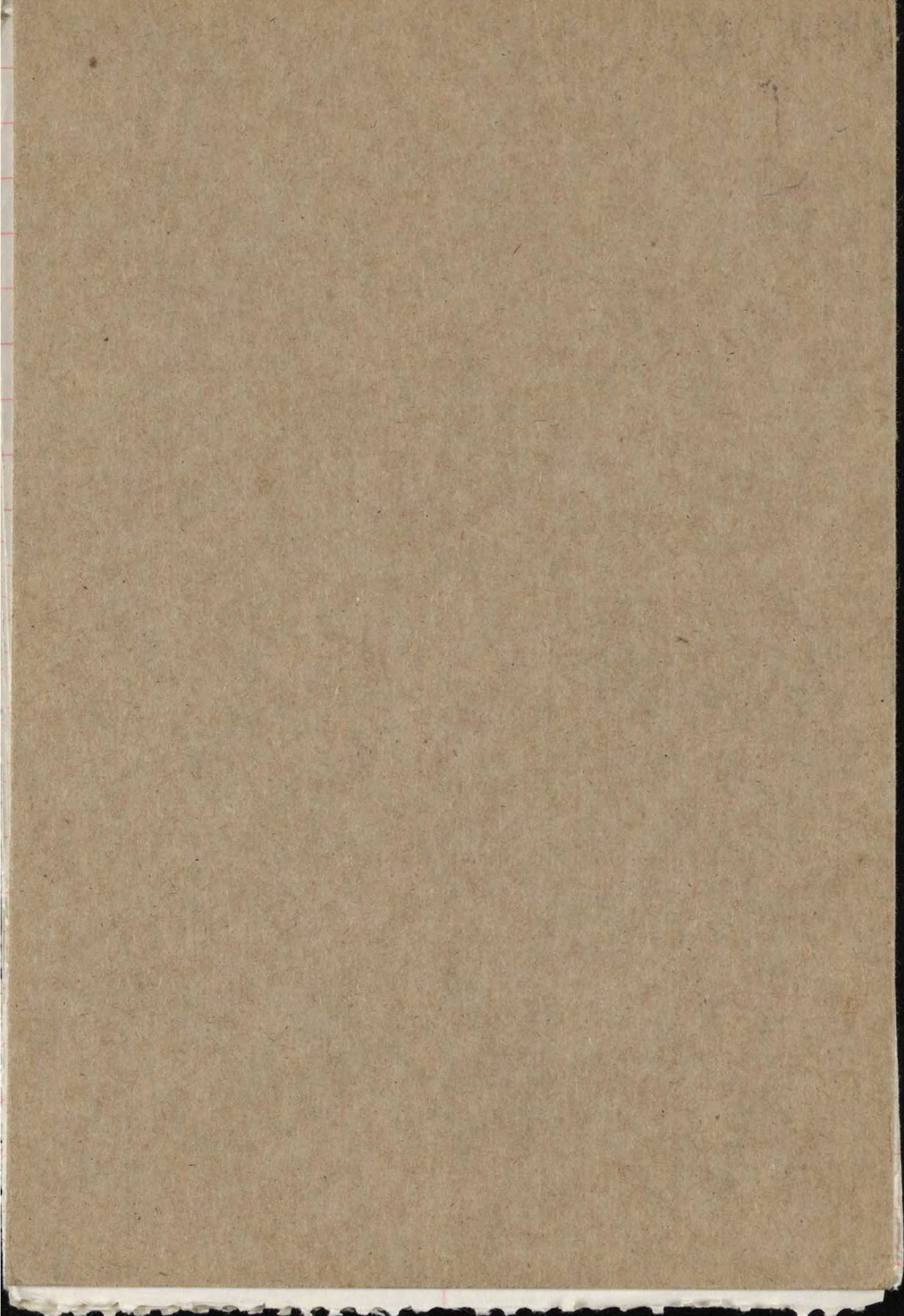


$\mathbb{R}$

$\mathbb{R}$

4





- Δ A/K killed in SAM's report
— not realistic if Base not
consider remaining resources,
or cost of resources lost

- Also improve:

4.8 ^R	130	F-15	$\Rightarrow$	570	LWF
4.0	200	"	$\Rightarrow$	800	"
3.6	265	"	$\Rightarrow$	950	"
5.0	75	"	$\Rightarrow$	370	"

- Above results based on Δ kills
without considering ^{that} forces remaining

- Better measure would be
remaining forces over cost
% of forces remaining over
Threat % of forces remaining

T-T-D

*

- Answer — Henry Enslin has been asked by W Cancer Inst. to provide a funded cost benefit analysis of whatever programs should be funded by the National Cancer Institute.

- How many bases used for generally — ~~DIS~~
— ~~LWF~~
 - F-15 life cycle costs
 - LWF life cycle costs

Sana Kishin

done

* Does (I-PK) desire to remain engaged ~~linear~~ develop least improvement for LWF in shifting from a non GCT to a GCT environment

* How would reduction in Stand off missile PK's reshape results

- ECM could do this
- ARM missile

- ✓ *
- Wouldn't radar info be reduced?
 - Wouldn't Standoff shooting possibilities

be reduced } Wouldn't
much be reduced }

* Reduction of kill probability as
admission the ~~the~~ Brezner
model is not correctly
accounting for turn advantage
or disadvantage

* If used BCR against ground
targets same why not
against ~~AA~~ for an AA
enemy

• Did you investigate defense
allocation of airspace when
attacking force was made
up of different A/C (ie
standoff vs non Standoff)

Continued

25 June 73

• If uniform distribution
how are multiple
✓ engagement considered

• How were mixed force
✓ afc distributed in the
raid.

• What were the results of
✓ 2 wings of LWFs (B A R)
— H — How did 2 wings
compare to F-9E
and F-5E

• How many Base Force F-9Es
✓ shot down as compared to
F-15, LWF, F-5Es

• Small numbers of that and
run (NVA) obtain favorable
✓ exchange ratios over large
numbers of US.

— Lack of Radar or
GC

— Poor training.

✓ How do we explain how
well the F-8 performed
vs. A-1 vs. the F-4.

• How each side the
numbers ~~fall~~ lost
fall off - Why

- Would different threat
~~scenario~~ counter scenario
counteraction against
~~B~~ in Blue Attack Red
scenario reshape the
results? How.

- One multiple (202, 201
404, 402 etc)
✓ engagements considered?
spot how? spot ^{engagements be addressed} how can impact of

- When using mixed
force as the presence
* of radar by F-15 & F-4
✓ and ^{related threat} information ~~it~~
gains applied by the
F-5E or LWTF? How

~~the~~
✓ - Is ECM addressed or
wagged within model.
How?

* - What is the impact
✓ of additional info
(radar, etc) that is
difficult to sort or
that can not be
sorted (distractor or confusion
or interference factor)

* = What impact would
✓ do-it our own bias
x ~~Would~~ How would
employment of it to
our own design
results

* Desires to remain engaged
(1-PK) coupled with lag
persistent overdrive the model
toward the weaker of c

APC Dinger Pcs

VI.

* Lead, Lag Pure Pursuit -
How do these trajectories
around PK (offensive,
defensive, neutral) for
equal and unequal a/c.

✓ Does SAM, Stand off, and
Close-in interaction

* consider what ~~should~~
actions (Tactics & strategies)
should be generated or
what actions can be
generated (modeled)?

✓ If model(s) cannot address
future realistic preferred actions by both
friend and foe - How can

* results be used to predict
outcomes?

- If future outcomes can
✓ not be predicted of
what use ~~are~~ the results?

Or

- What was the real purpose
✓ of the "analysis" and
related results.
-

- Explain results }
 { Blue attacks Red }
 { Red attacks Blue } •

- ✓ • Why does the LWF
experience the lowest
improvement when it
has GLT? (if (1-4) diam)

- ✓ • Would end runs by Threent
cancel F-15 heritage
results (B attack Red)?

Contingent
SJF

25 June 73

— Issues —

II. Order of Events

- — SAM
- — Stand-off
- — Close-In

?

• Does the sequential structure drive the results? ~~Would~~

• Is this structure in accord with reality? FV For reality, ~~Would a more appropriate~~

• Is this structure biased ~~too~~ in favor of NATO or Pact Forces?

#1. Why was this structure set up? Basis (because it could be calculated)

• Should ~~a~~ different structures be used? — one for NATO, one for Pact.

II How are stand-off & SAM
✓ * and close-in PKs developed?

III How many aircraft are
✓ killed by SAMs?
* Stand-off and close-in }

IV Would a different fact
response strategy alter
the results significantly?

V Why was the model set
up this way? —

VI

Assumptions

- ✓ Check all
- ✓ Why equal distribution?
- ✓ Why should ^{which strategy} leave to remain engaged $(1 - PK)$?
- How do these enter into calculations,

- Call Roy Inman about visit with Piper

- Check with Sam about Procurement values between 4.5 - 7.5 - ~~How~~ What basis

- Also only in A-10 in approved program

- TTR Engage
- CI — combat time
- 5 min
- 3 min
- 1 min

- Senter Patel

• Differential Game models
results are rejected because too
many considerations are left
out. — yet Jac
Engager ^{results are accepted} ~~is accepted~~
~~employed~~ ^{when} ~~many~~
real world considerations
are not addressed in
a way or way
engagement

• Aggregation of data

Slappinety notes

24 Aug 23

- Input from me
 - Reviewed Sabre jet footprint -
 - at this point must be a disaster
 - will be glad to provide details
- C-47 Dwyer needed much considerable improvement if it is to be useful
 - need sled
 - attach as well as log
 - fuel must be accounted for
 - missile envelope

- Can provide briefing on fundamentals of A-to-A combat
 - Where
 - How
 - Type of attack beam
-
-
-

- The Engager
 - Combat time 1 min
 - 3 min
 - 5 min
 - Sortie rate
 - Lanchester Equations

ACM

• Relative positioning most important for decisions

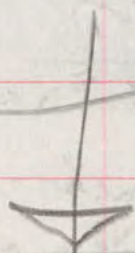
• Strategy must be embedded into maneuvers
Relative position

• Relative position determines specific type of maneuver and relative orientation of specific maneuver type

• Max Maneuver region and related strategy determine attitude / airspeed domain where specific maneuvers provide maximum changes in direction for any attitude / airspeed change or vel. vector

• Aerial strategy

- Note no energy gain
no energy gain and
energy loss maneuvers and
how they behave in
map maneuver region



compare to Road Logic

- Use MMR to determine
a/a domain where specific
maneuvers should be applied
- Use GMS to determine
~~how~~ ^{in which} ~~where~~ how the
specific maneuvers

as a bones

- Use GMS ~~to~~ ^{preferred} determine ~~for~~ ^{when} ~~the~~ ^{the} ~~orientation~~ and the general ~~central~~ logic that should be applied to ~~the~~ specific maneuvers
 - Use Relative position ^{and movement} as the basis for identifying the specific type of maneuver (to employ) and relative orientation ^(aaa) of ~~specific~~ ^{these} maneuvers ~~type~~ ;
-

- Proven hard at bottom soft at top is bad

READY
READY / MMC

- Have you addressed maneuver implied by GMS?
- Has Rand addressed maneuver implied by maneuver strategy?
- Have you proven (or shown suggested) that soft at top hard at bottom is inferior?
- Have you looked at vertical maneuvers accomplished by Paterno and colleagues?

- ~~Does~~ maneuvers produced by ⁽¹⁾ Patterns and colleague and the maneuvers used by ⁽²⁾ Rand Tactics II logic consider the benefits of rolling to gain advantage in sort of plane maneuvers
 - Vertical permeate
 - Barrel roll attack

- If not, bonus for developing maneuver scheme preferred maneuver scheme is inadequate

- Have a parametric investigation of maneuvers been employed to counter Rand logic.

- Up / Down Vertical
- turn in with speed to get out of plane

maneuver,

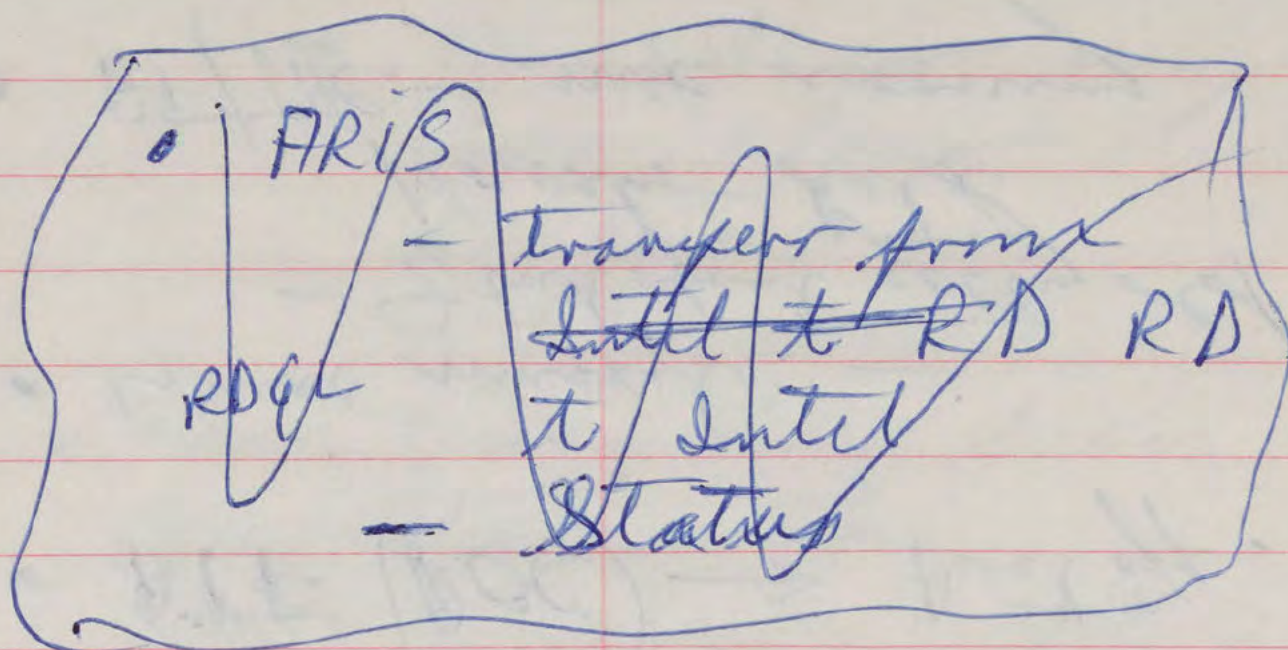
- turn into or away
above / below
horizon

* Has turn radius been
correlated with
various maneuver options
and relative location of
adversary.

T-T-D

11 Sept 73

- Where a cut is approved
- lets not undermine it?
- No commitment, or
any implication, about
available R & D funds
- Orientation for unclassified
- Reg. Process
- ATF (ROC) → Dist off.
- Cruise missile —
- What about getting old
Navaho data
- AF/THE — nice warning.



✱

- Joint service cooperation
 - exag - combine the test pilot school

• Modular plan - (T.I.)

• Community

- Fratericide
- Navaho
- See Dr Lawell about meeting

Staff Meeting

25 Sept 73

~~12~~

- Scenarios - cruise missile
- COR - Who's got the action?

T-T-B

26 Sept 13

• RDGL - Action

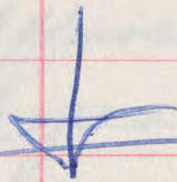
• Who rides herd
on all ROC's ?
* Tactical over

*

- Detail Plan.

= Direction *

- Goal



Overall Plan

- Include summary
of Pces

- Organizations
involved

• Cy Hunt, Ed Mayak

□ Goal

□ Rationale

• Threat $\begin{matrix} \rightarrow & \text{economic} \\ \leftarrow & \text{Technical} \end{matrix}$

• Friendly $\begin{matrix} \rightarrow & \text{economic} \\ \leftarrow & \text{Technical} \end{matrix}$

□ Strategic

• Offense } munitions
• Defense }

□ General Purpose - Tactical

• A-A $\begin{matrix} \rightarrow & \text{weapons} \\ \leftarrow & \text{vehicles} \end{matrix}$
Offense
Defense

• A-G $\begin{matrix} \rightarrow & \text{weapons} \\ \leftarrow & \text{vehicles} \end{matrix}$

I-T-D

- Put in for Commanders course at Nellis DFB — on Monday
- Analysis
 - Call Dr. Last
 - ST Foxtrat
- Briefing A-Tc-D Combat
- See about getting money for optimization programs

MISC

- Utility theory for Decision Making (RAE-R-105) 229P
- Military Pay - [SD-236]
- Jerry O'Rourke
21717 } SE389
55382 }

$$\frac{V}{u} \Delta u$$

$$u = \frac{(SFC)(w)}{4/D}$$

$$\frac{V(4/D)}{(SFC)} \left(\frac{\Delta u}{w} \right)$$

11/11/11

- Finers/Bachfris = increasing numbers
- Question: = Are Soviets increasing these numbers across the board or in certain specific areas, (at the expense of others)
- If in specific areas ~~there~~ = = at the expense of what?
- ~~FEB~~ FEBH in fast paced operations
- * Dynamics (radar, fire control etc) becoming more elaborate.
- Foxbat — — with (LEX) for ~~for~~ what?
- Less rigid type of C & C (as: Broadcast/air control)

~ Afghanistan

- How do you account for the fact that Afghanistan has not gone under even tho the Soviets with characteristics as bribe, seem so awesome?

- Describe what they have, ~~not~~
~~what they can do~~, with
general characteristics, not
what they can do (against
an adaptable adversary)

• If Society, ^{or allies} are increasing their
S-T-A capabilities (SAM, AAA,
etc) are we responding correctly
or ~~playing~~ playing into their hands

- So far $\rightarrow$
 $\leftarrow$ numbers
 $\leftarrow$ general features

Comment

yesterday we heard general
~~characteristics~~ characteristics with
symbols or widgets we have
to face - - Today we will
address ways widgets can be
employed

Strategy

- F-15 for anti-satellite launch
-- (fixed thrust/camber) compromised

- ~~State~~ Up to Strategy we have
-- Numbers (weapons/forces)
-- Very limited characteristics
(Range/speed/equipment)

- Stop at the FEBA -- Negotiate
one mentality

- Emphasize on 2nd echelon
(Feba again)

- 2nd Echelon vulnerability
assembly areas

- Nucleability → Take don't
fight at nite → If concentrate
only at nite → then push
into at high noon

- Surge sortie rates ~~→~~
 - peacetime } what about
 - wartime } adaptability of energy?

→ ~~Is~~ this included in these calculations?

- With these points in mind
 - What about countmeasures

- Can we hit mobile as well as (obvious) fixed targets in more or obscure way,

- Many envelopes shown but no idea on weapon capability against adaptable adversary with countmeasures

- ~~DI~~ EW and countermeasures as indicated ~~as~~ suggests its importance $\propto$ ~~however~~, not tied into what happens to weapon envelop

- Strategy ~~is~~ represents scheme or design directed toward some end.

Q / A

• Regard to advancing work
We not take initiative to
change the shape as
well as language the
situation.

~~Interoperability can be degraded~~
by too much as well as
too little (as confusion and
disorder) communications.

"The Plan"

Do a Counter enemy?

- Respond to adversary and
Why not take initiatives to
~~leverage~~ the shape as
well as leverage the
situation??

~~Interoperability can be degraded~~

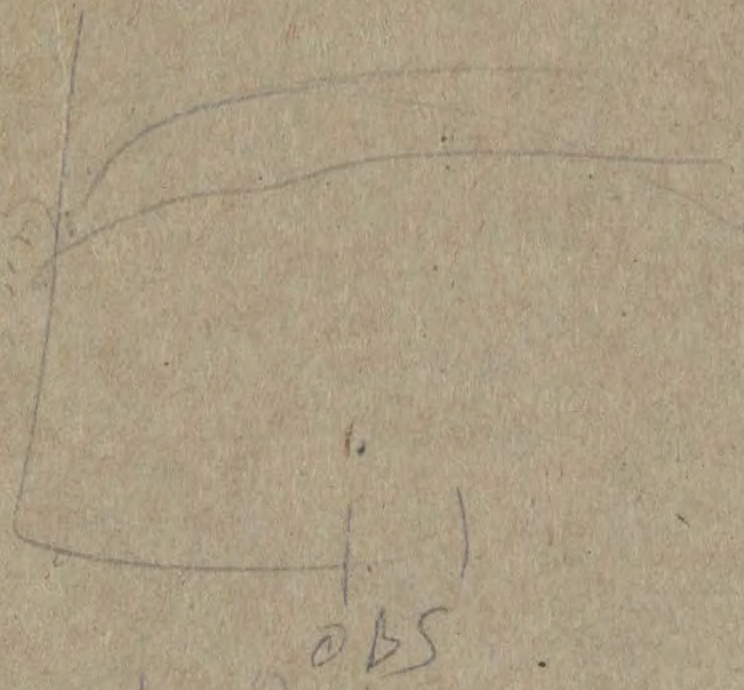
- Interoperability can be degraded
by too much as well as
too little (as confusion and
disorder) communications.

Kurt Gungor

- Gain a conceptual understanding of conflict
- Ultimate purpose or goal in conflict
 - Mechanism for realizing that goal

-
- Alternatives ways of doing business
 - I have M-M-P brief - moral - mental - physical

-
- The fact that the Germans did not have a Fubenzpunkt shows that they did not understand British system
 - The fact that the British understood Schwerpunkt in a narrow sense as a main effort rather than a broader sense as implying glue shows British did not understand German system.



$$\sin \alpha = \frac{V_p}{V_{in}} \sin \theta$$

$\frac{V_p}{V_{in}} = \frac{1}{2}$
 $\sin \alpha = \frac{1}{2}$
 $\alpha = 30^\circ$

$\frac{V_p}{V_{in}} = \frac{1}{2}$
 $\alpha = 30^\circ$

$\frac{V_p}{V_{in}} = \frac{1}{2}$
 $\alpha = 30^\circ$

T-T-D

A312

- Get memo on IFF
- Get memo on NBC and
R 3.0/TC 4.0
- ~~Get~~ Get OD report for
Bob Thompson
- See Gen. Rodgers about
money
- Call Fred Hall (now-MOS)
- Call John Paterno about
Hansby qualities

RN # 8169
on package from
Eglin DFB

Ann 82 / Agile

- No judgement in terms of cost

1. Put small group together to establish baseline costs

2. Make careful qualitative assessment versus costs

- * - Rent
- Road
- etc
- * - Inhouse *

- Joint document with Day on cost agreement for various components - also performance
- if agreement then proper payoff +

13

Way/AT
Sulthier

15 July

Cost -

Performance -

Schedules -

Ops. Eval:

See Mr. Packard by
15 July 70

Way → TVC Dyke

125° Lookangle 341

75° 1.85 3

• High Gimbal angle good for
poor maneuver

• Front shot not stressed

• Relative Range not stressed

• Length 84

Diam 8"

Weight 250 #

• No ~~shaken~~ or ~~missile~~

• Possibility of HAS for
tracking.

• 30 ~~hrs~~ by/see May 85⁰

A 4000 GNC

400 lat A 5000 including cost of
GNC

-) Cost, Performance, Schedule
-) Operational capability and
-) Need to see ~~some~~ flight tests on OBS numbers
-) 30 days → from 6 July 20

Air Force

?

Ben Fergueson

- The AF proposed to use AIM-9K instead of AIM-82.

- What are Ben Ryan giving up to get AIM-9K
 - F-15
 - F-4
- F4 maybe more important

• Background

• Threat

• FA

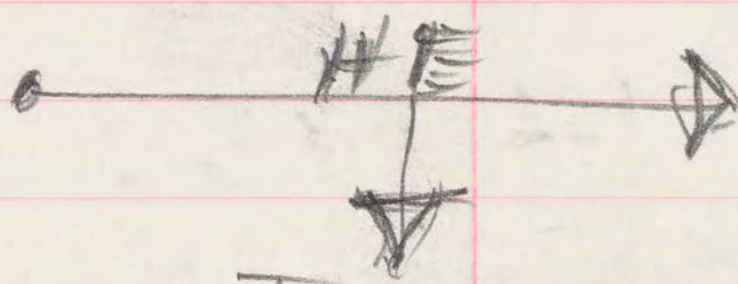
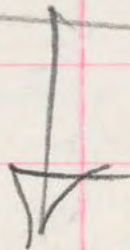
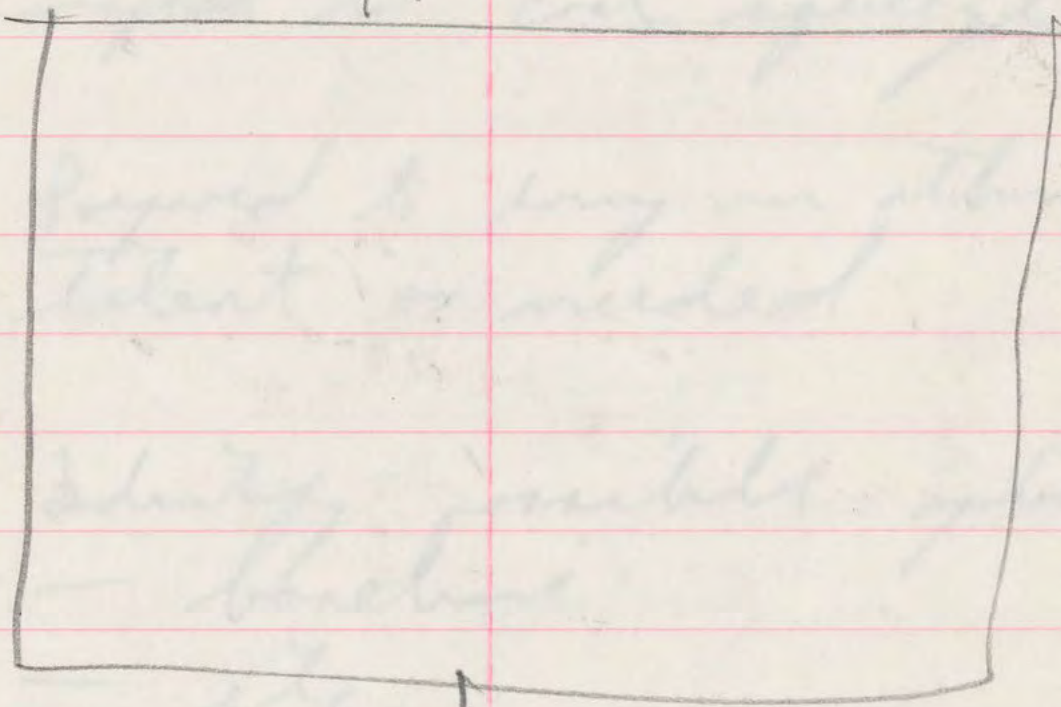
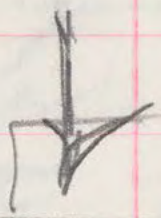
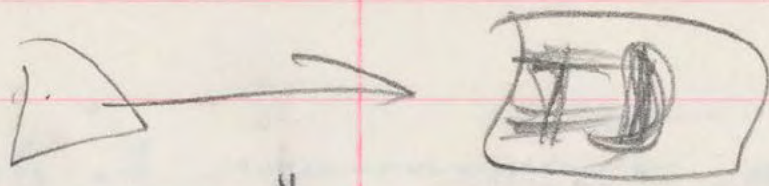
• W-15 Threat

• F-15 not computer
proof

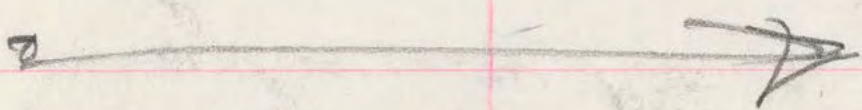
* Naval Warfare *

- Attack Geometry Options
- Initial conditions
- Evaluation of Options
- Best Attack Option(s)
- Correlation of test conditions with best options and other options that may be necessary (~~necessary~~)
 - Analytic
 - Simulation } will be used to test sensitivity for employing proposed options
- Use lowest number to select proposed options

- Correlation of Attack options with F-15 performance and threat
- Identify functional missile characteristics needed to employ most likely attack options
- Identify missile characteristics presently identified
- Cost out above two missiles
- Recommend best missile
- Recommend supporting armaments



option



199

- Look at requirements and trade-offs - particularly with respect to cost squeeze
- Prepared to bring in other talent as needed
- Identify possible options
 - baseline
 - etc.

Briefing

* • Worst case for a scenario
was not the reason

- Growth impact on
D/C known

-

* • DWG-10 - 2/10

- What is HTBF

- What is Nose-Born-Tail
Aspect capability.

* • $2m^2$ target?

- What Fighter can

= $2m^2$ not $\begin{cases} \text{Nose} & 30 \text{ NM} \\ \text{Tail} & 12 \text{ NM} \end{cases}$

- LC Sight - 2nd order

* • FCS - What about noise
to properly account
for dB & AT

- Are there any trades on
TWS — Cont vs drift rate
— Cont vs temp spec.
— All three above.

• Mil STD - 781

• Interesting Areas

* Radar

- radar look down
- radar beacon
- radar range

* ASKAS

- Automating
- A-B

M Display

- VSD
- HUD

ADI
Scan conversion

~~✱~~ Identification

- TIŠEO

- great utility
- resolution requirements

- resolution requerrante

• Electronic DFF

- operational

* Kensington

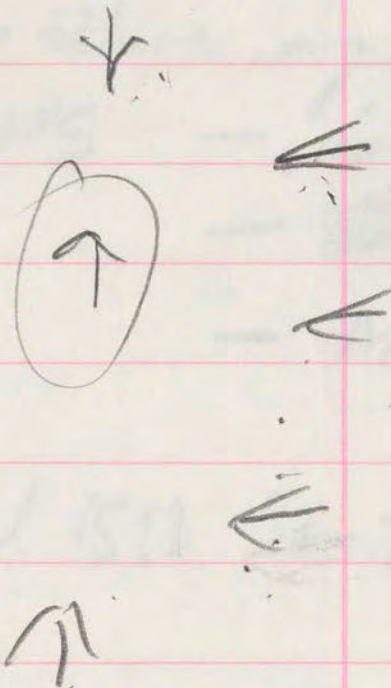
- Accuracy

- start - up

- weight

~~1~~

A-82 #



FCS

~~ATTACK Radar~~

FCS

* Components

- Attack Radar
- Bracket
- Lead computation Gyr
- ISSOLS

* Assessment Criteria

- Risk
- Cost
- Weight
- Interface (compatible or not?)
- MTBF

• Mission Effectiveness

- Fight functions/performance
- Mission functions/performance

* Options (to be evaluated)

•

• ~~1000000~~

• ~~1000000~~

• ~~1000000~~

• ~~1000000~~

• ~~1000000~~

• ~~1000000~~

* ~~1000000~~

• ~~1000000~~

• ~~1000000~~

• ~~1000000~~

• ~~1000000~~

* ~~1000000~~

~~1000000~~

•

•

~~1000000~~

W Bosaght ? (1

- What does it take to get reliability in Q120 (Kines)
 - Pulse }
 - AFEC }
 - Contraband

- How do we know if Q94 can be used to accept TISED

$$\sin 1 = \frac{.9}{1.8}$$

$$\sin 1 = \frac{.5 \sin 1}{3}$$

• Do we need this 270°
roll requirement in
radar? ?

• What determines 50° off
boresight for ATN-82?

$$\dot{\phi}_n = \frac{V_0 \sin \theta}{s} [1 - AK] - \frac{A \dot{s} \sin \theta + A \theta \dot{\cos} \theta}{\sqrt{1 - K^2 \sin^2 \theta}}$$

$$\dot{\phi}_n = \frac{V_0 \sin \theta}{s} [1 - AK] [$$

$$\frac{V_p}{\omega} = \lambda$$

$$y_{\text{unk}} = A \sin t$$

$$\dot{x} \cos \theta = \dot{A} \sin \theta + A \dot{\theta} \cos \theta$$

$$x = \frac{\dot{A} \sin \theta + A \dot{\theta} \cos \theta}{\sqrt{\quad}}$$

1

- * What were the initial conditions?
- What was the basis for selecting these conditions
- How were these weighted
- What rationale was used to establish weighting
- What types of attack scenarios were employed
- What rationale was used to justify use of the above scenarios
- * Did you review the countermeasures to an IR missile (eg harcob)?

$$\frac{V_o}{V_R}$$

$$\frac{N_2}{N_D} = \frac{A/A_0 \sin \theta + \cos \theta}{\sqrt{\quad}}$$

$$\frac{N_A}{N_D} = \frac{\cancel{Z} \sin \theta + \cos \theta}{\sqrt{\quad}}$$

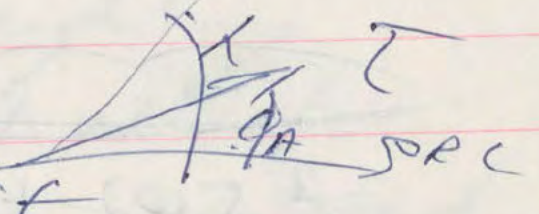
$$\dot{t} = 0 = \frac{U_D \sin \theta - V_D \sin \chi}{S}$$

$$\sin \chi = \frac{\dot{A}}{A} \sin \theta$$

$$\dot{\chi} \cos \chi = A \dot{\theta} \sin \theta + A \theta \cos \theta$$

$$\dot{\chi} = \frac{\dot{A} \sin \theta + A \theta \cos \theta}{\cos \chi}$$

$$\frac{\dot{\chi}}{\dot{\theta}} = \frac{\dot{A}/\theta \sin \theta + A \cos \theta}{\cos \chi}$$



$$\textcircled{\dot{\chi} \cos \chi = \dot{\chi} = 0}$$

$$\frac{f_{NA}/V_A}{f_{ND}/V_D} = \frac{N_A}{N_D} = \frac{\dot{A}/\theta \sin \theta + A \cos \theta}{A}$$

$$\frac{N_A}{N_D} = \frac{\dot{A}/\theta \sin \theta + A \cos \theta}{A}$$

• AIM-7E-2 V AIM-7F

• Chart to show how
hardly ~~each~~ threat
with each missile's
option

• Effect of long range
detection capability.

• What is mission
of F-15

Argument

- Measure of Effectiveness on one chart per missile
- History of Corvus with missiles
- Off-bore sight vis-a-vis HOF
- Quantify utility of Radar missile
- Highlight threat — my 21's — Foxbat
- Radar detection at long range.
consider doppler and no doppler

20 July 70

Panel Meeting

$$S_{\text{int}} = A \sin \theta$$

$$\dot{L} \cos \theta = \dot{A} \sin \theta + A \dot{\theta} \cos \theta$$

$$\dot{L} = \frac{\dot{A} \sin \theta + A \dot{\theta} \cos \theta}{\sqrt{1 - \sin^2 \theta}}$$

$$\frac{\dot{L}}{\theta} = \frac{\dot{A}/\dot{\theta} \sin \theta + A \cos \theta}{\sqrt{1 - \sin^2 \theta}}$$

$$\frac{f N_0 / v_0}{g N_0 / v_0} \cdot \frac{N_A}{N_0} = \frac{\dot{A}}{A \dot{\theta}} \sin \theta + \cos \theta$$

$$\frac{N_A}{N_0} = \frac{\sin \theta + \cos \theta}{\sqrt{1 - \sin^2 \theta}}$$

$$\sin \theta = 1 - R_1 \sin \theta$$

$$\frac{1 - R_1 \sin \theta}{\sin \theta} = N$$

$$1 - R_1 \sin \theta = R_2 \sin \theta$$

$$1 = (R_2 - R_1) \sin \theta$$

~~Rel S~~
FCS

• Reliability is 20 to 25%
of cost

• $54C = 20C$ can save
\$ 7 M on reliability testing
program

•

• 298-

Arrival Time 1715

Be There 1645

Unit Production

- Difference in weight
- Solving W my sophistication
- FCS sophistication
- engines scaled on learning curve
- Did not go there
project focus
AF where 1.5 million

Technical Requirements

• \$99M delta for CWT
for 1st May if AIM-7F
is dropped.

• Radar - Attach (options)

- ASG-26 LCOS from TFR

- APG-94 (from TFR)

improvement in TI.

- Brought ^{steering} ~~error~~ for use
use of AIM-9 missile

- APG-94 requirements
VFR only baseline

• What is cost of AIM-9
steering launch compatibility

• What is performance degradation

• What is risk of employing
this location

- How would results shift if parallel start-off not used?
- If parallel start-off used
 more sequential shots required
 to account for relative
 range or appeared to ~~create~~
 aerodynamic range.
 (Tag flight)
- What other conditions evaluated
 beside parallel start-off?

700
100
81 x 10

$$\begin{array}{r} 322 \\ 7 \\ \hline 2254 \end{array}$$

$$\begin{array}{r} 81 \times 10 \\ \hline 225.4 \end{array}$$

$$\begin{array}{r} 3100 \\ 225 \overline{) 810000} \\ \underline{675} \\ 1350 \\ \underline{1350} \\ 0 \end{array}$$

(7)

$$1 - \frac{V_k}{V_p} =$$

$$212 = 10520$$

9600

• Can AIM-9 be employed,
or launched from fuselage?

• What is cost per modifying
aircraft to do this?

• What is risk?

- missile damage
- engine flame-out

• ~~tested~~ out 2 people who
will return hull air

• See what cost comparison
SPB has with Way down

AIM-82 915

- Why min range goals?

- Why lag goal of 50%?

- Whyt kind of simulation

- Bonus for AIM-82 goals

- Can we simulate air
battles - instead of 1v1

- Basis for parallel start-
off

- Countermeasures

- How is parallel start-off
related to actual world?
- How much is result

$$V = \frac{U \& V}{32 \times 10^9}$$

9M

$$W = \frac{81 \times 10^9}{32 \times 10^9}$$

1.2

$$N = \frac{1.2 \times 10^9}{32}$$

$$N = \frac{229}{32} =$$

1000
1000
1000

Gates

Steno Notebook

Green

Gregg Ruled

80 Sheets

6 in. x 9 in.

No. 880

from _____ to _____ no. _____

We showed the FIS/LWF down their throats; We'll ram the next one up (Slay's) ass"

- Port truth, port fist
- Sensitivity to comment, rather than challenge indicates nature of truth.
- Not knowing how the airplanes were shoved down their throats makes it likely that it could happen in the future. How
- For support I would point out: ~~When~~ Slay, as my immediate supervisor made comments to at least one of my subordinates that I was a "bad influence" upon them -- yet he did nothing to remove me which shows he is without character; he is not decisive, and he is not a leader, hence he is not fit to command

• When

- Could it be that resentment comes from Slays inability to understand (or stigmatized refusal to understand) the moral-mental-physical processes by which to accomplish results.

Entropy	}	combine
Distinction		connection
Consistency	}	relation
coherency		association
harmony	}	unity
beauty		

Notes

- Reference to "bottom lines" and not the "guts" of evidence and interactions that make a "bottom line" possible reveal a narrowness that cannot survive against many ambiguous - ambivalent - acceptable possibilities (Swain; Danks, Wilson, Bateson!)

American colonists ... ~~used~~ ~~structure~~ exploited background,
mobility/fluidity of small bands, and common cause
~~against~~ for variety-speed-horizon to loose ...

~~American~~ ... exploited variety associated with immigrant
background, speed associated with mobility/fluidity of
small bands, and ~~deserving~~ of common cause as basis
to ~~~~~

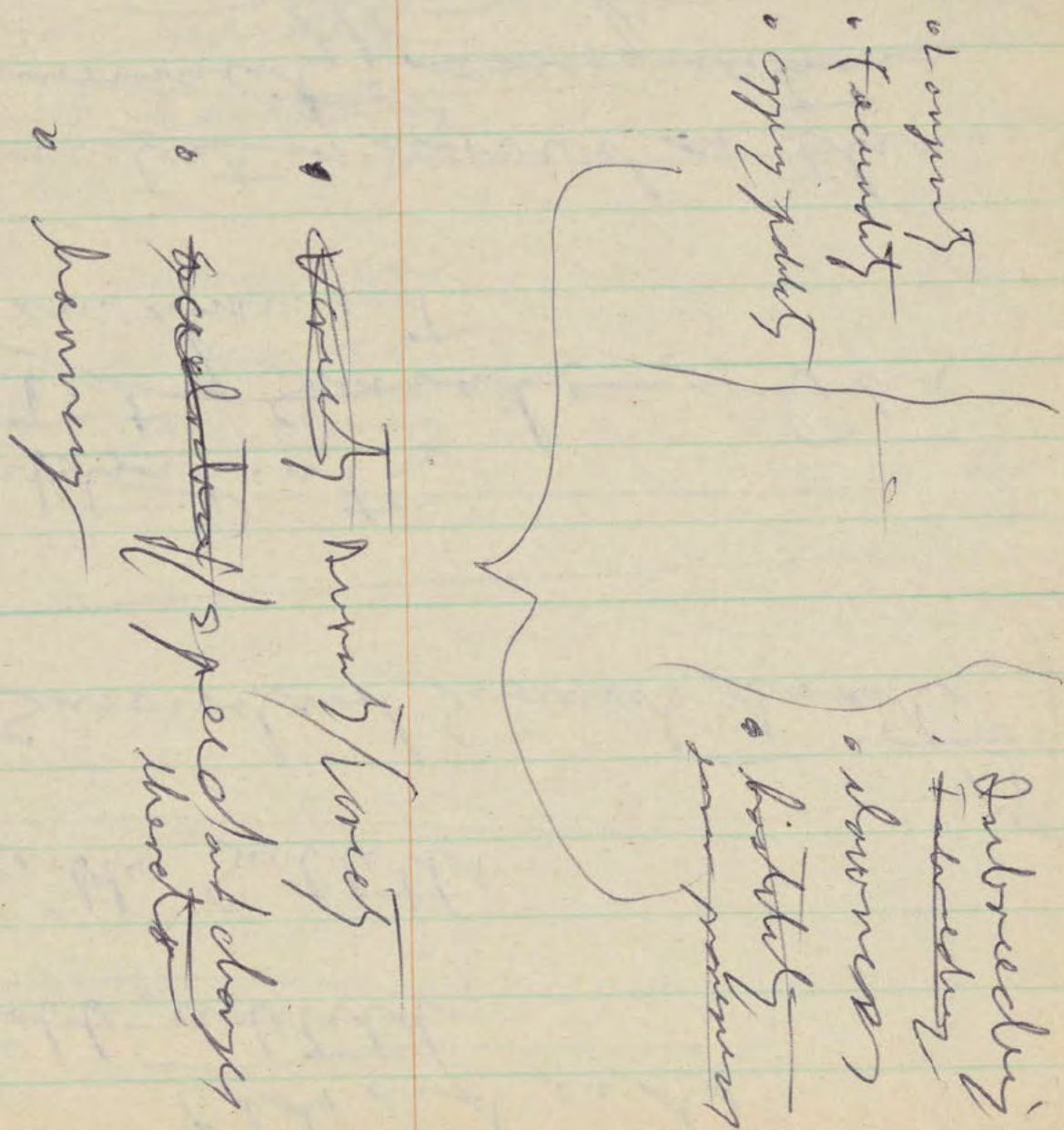
September 1, 1814

... on the other hand emphasized immigrant
background (T, W, L, friendly population, etc), m/f of small
bands, and common cause against tyranny/tyrants for
~~variety, speed, ~~horizon~~~~ Dan C (as well as V 9, 14
variety - adaptation - horizon to Horass ...

Imperative
Survival

• How did it arise?

Interaction of genes and
environment (physical and cultural)



Odd and ends

• Possible subtitle

• Possible Subtitle

Survival and Survival Trait

• ~~Important~~

Test of Survival: The environment

• Survival test of survival in the environment; raises question

Survival test of survival is the environment itself ^{is the} ~~raises~~ the question: does simulation duplicate accurately the environment fully and accurately enough to constitute a test ~~for~~ of fitness for survival

Odd and Ends

Traits of Surroundings

• Molecular Level (Surround)

- Longevity
- rapidity of replication
- fidelity of replication

• Species Level (human)

- Diversity/Variety.
- rapidity
- harmony

- Sameness
- slowness
- consistency

Darwin	Flight	TOD	TOD
	198	6 <u>05</u>	8 <u>47</u>
20	276	2 <u>36</u>	3 <u>03</u>
	398	5 <u>30</u>	6 <u>19</u>
	139	9 <u>57</u>	5 <u>30</u>
	298	7 <u>25</u>	8 <u>12</u>

Dessche manual trees

• Variety

Many different possibilities

• Rapidity

Time rate of change from one event/state to another -- includes speed, velocity, acceleration, etc.

• Harmony

Interaction of apparently disconnected events/entities in a connected way.

• Complexity

Variety without apparent harmony
(or pattern)

• Initiative

Expenditure of psychic energy
To survive, survive on own
Terms, or improve fitness to
shape and cope with change

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