

~~SECRET/DORIAN~~

cy 2 of 3

IVS  
COMMENTS  
(MOL DIVISION REVIEW)  
9 OCTOBER 1968

HANDLE VIA BYEMAN  
CONTROL SYSTEM ONLY

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SUMMARY

- o IMPLEMENTATION OF PRECISION OPEN-LOOP OPERATION IS DESIRABLE FOR PARTIAL CLOUD COVER AND LOW MODULATION CASES
- o IVS OPERATION UNDER MOST CONDITIONS OF PARTIAL CLOUD COVER APPEARS FEASIBLE - STUDY NEEDED TO EVALUATE VARIOUS METHODS AND POTENTIAL VALUE
- o RELAXATION OF RATE SPEC UNDESIRABLE SOLUTION TO DYNAMIC NULL PROBLEM
- o WORK TO DATE INDICATES IMPROVEMENTS ARE NEEDED IN ALL SENSORS, BUT FUNDAMENTAL CONCEPT OF AUTOMATIC OPERATION IS SOUND

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SPECIAL COMMITTEE

- o MET AT GE ON 20, 21 SEPTEMBER
- o PRESENTATIONS BY GE AND EACH VENDOR: ITEK,  
GOODYEAR, HYCON
- o COMMITTEE MADE UP OF:

DR. B. O'BRIEN, CHAIRMAN

DR. B. MCMILLAN

MR. L. CROUCH

DR. M. YARYMOVYCH

MR. W. MCFADDEN

COL. L. ALLEN

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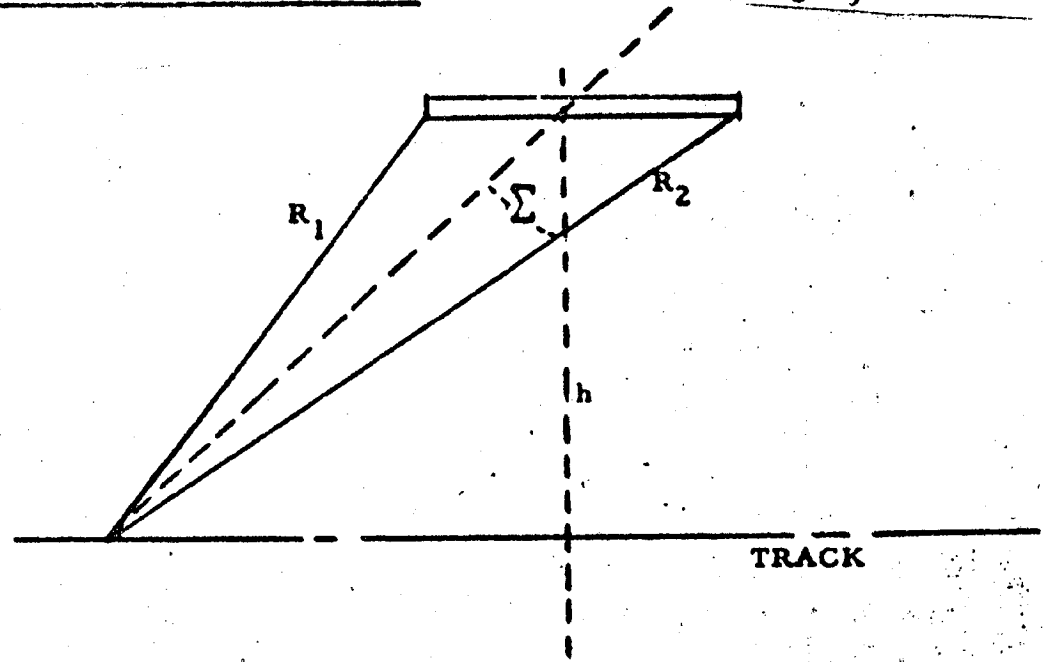
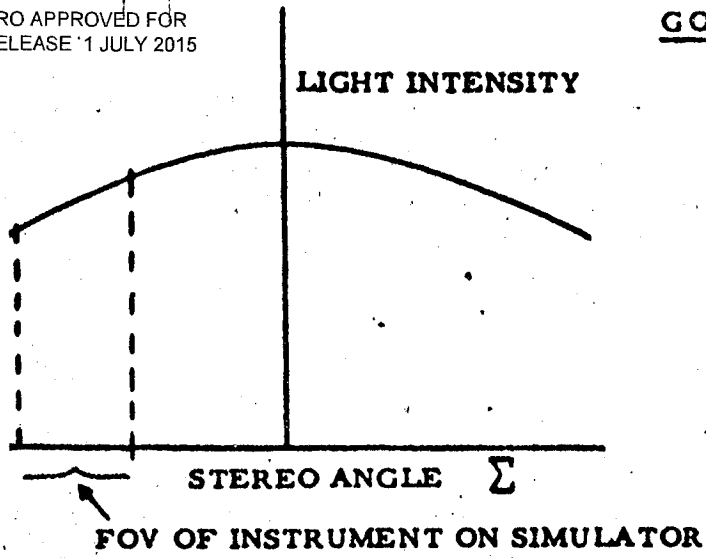
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PRELIMINARY COMMITTEE REPORT SUMMARY

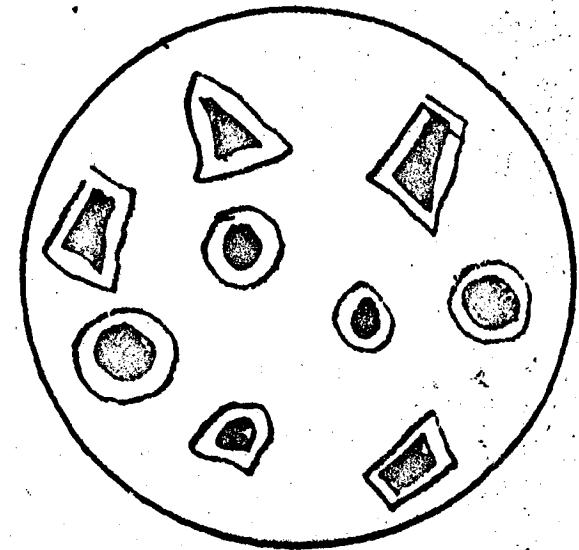
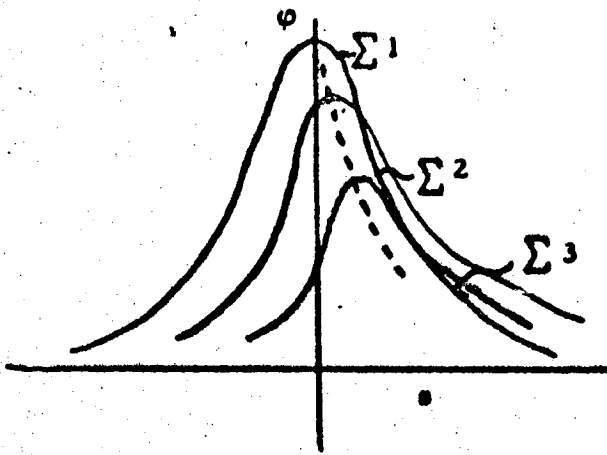
- MAIN POINTS
  - IVS PROGRAM PROCEEDING SATISFACTORILY
  - HIGH CONFIDENCE OF SUCCESS WITH GOODYEAR OR HYCON
- IVS SELECTION RECOMMENDATIONS (GOODYEAR AND HYCON)
  - COMPLETE TEST AND EVALUATION
  - UNDERSTAND AND ANALYZE IVS PRIOR TO SELECTION
  - CAREFULLY REVIEW PAST DEFICIENCIES
  - UPON SUCCESSFUL COMPLETION SELECT ONE IVS
- ITEK IVS RECOMMENDATIONS
  - COMPLETE FABRICATION OF UNIT - GE WON'T TEST
  - DELIVER THIS UNIT FOR STUDY TO AVIONICS LAB

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GOODYEAR LIGHT EFFECT

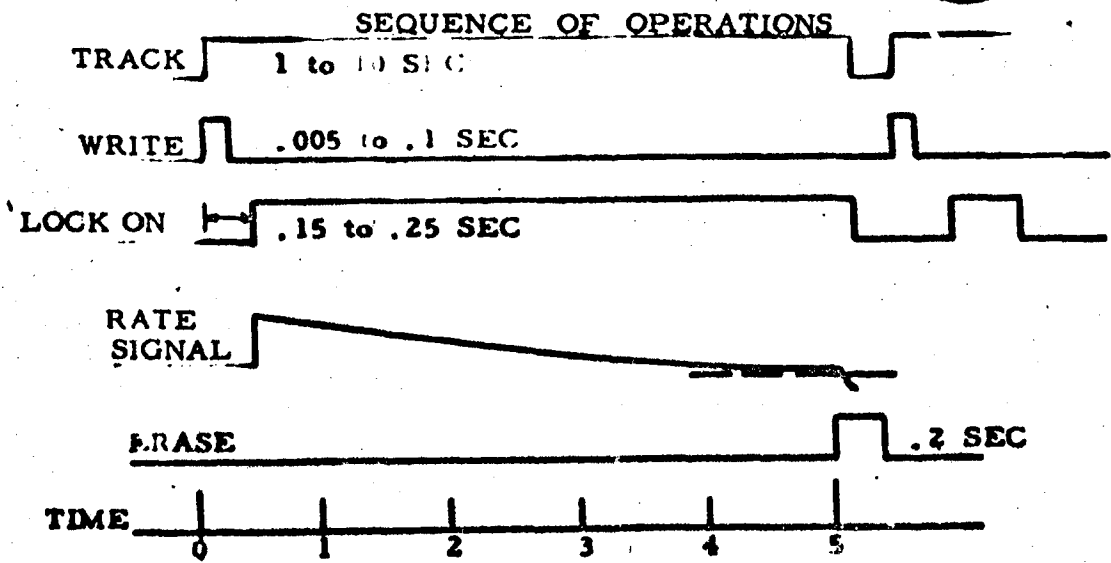
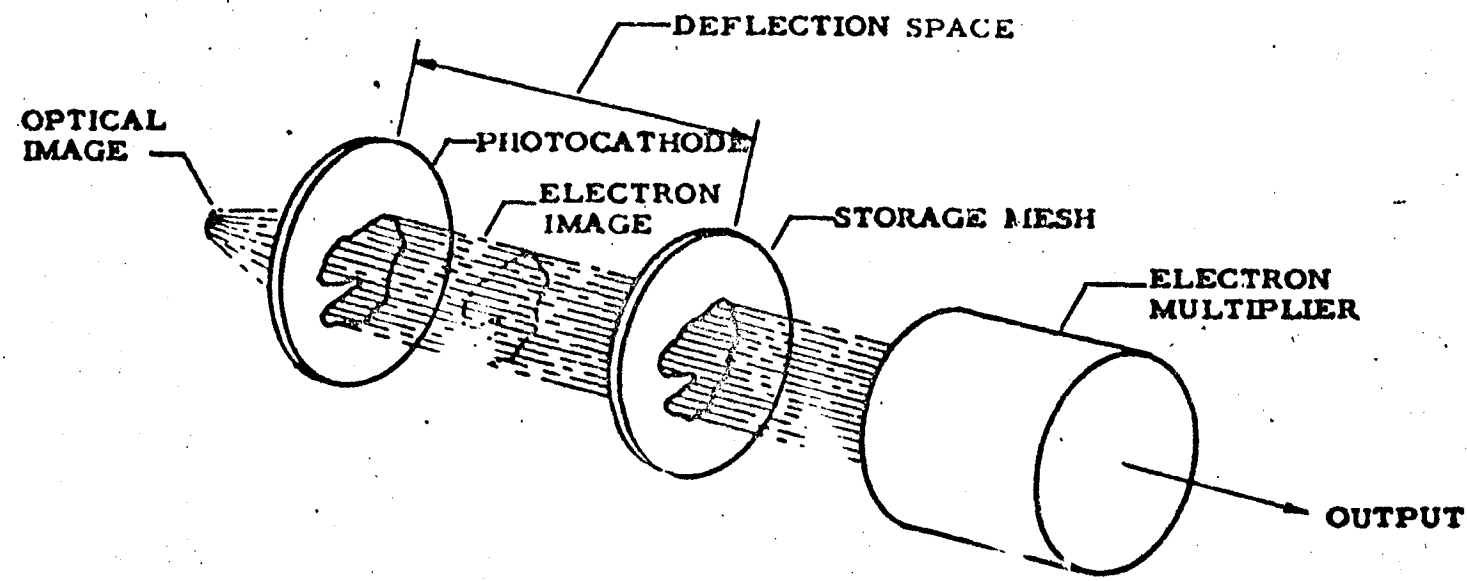


$$\phi = 1/2 X \int_{-X}^X f_1(x) L_2(x, t) f_2(x + a) dx$$



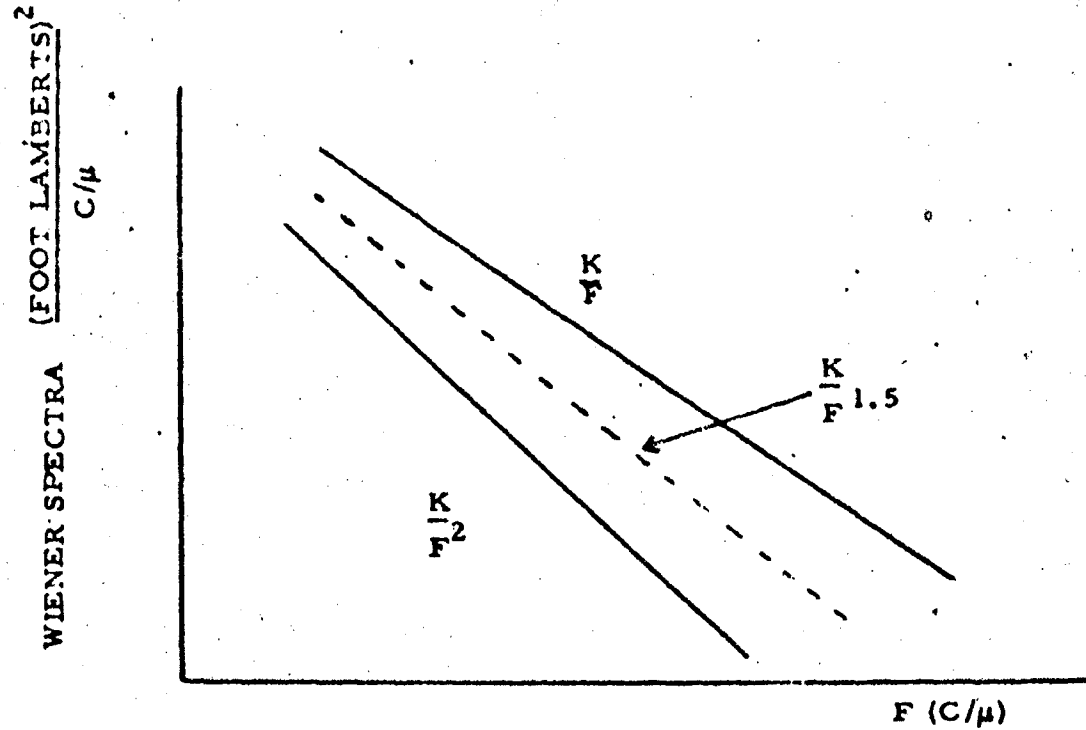
(D) ~~SECRET~~ SPECIAL HANDLING

GOODYEAR IVS (CORRELATRON)



(D) ~~SECRET~~ SPECIAL HANDLING

AVERAGING OF DATA



$$\text{MODULATION} = \frac{\sigma}{DC} = \frac{\left| \int_{F_1}^{F_2} \frac{K}{F^{1.5}} dF \right|^{\frac{1}{2}}}{DC}$$

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IVS SUMMARY

*By Committee*

o **IVS SPECIFICATION QUESTIONS**

- o ARE REQUIREMENTS TOO SEVERE?  
SLIGHTLY INCREASE NULL ACCURACY?  
INCREASE LARGE ERROR GAIN TOLERANCE?
- o IS WIENER SPECTRUM APPLICABLE AT EACH VENDOR'S  
SPATIAL FREQUENCY REGION?
- o ARE UNESSENTIAL COMPLICATIONS BEING INTRODUCED?

o **GE AVE SPECIFICATION RECOMMENDATIONS**

- o DETERMINE A WIENER SPECTRUM ASAP
- o TIGHTEN OPEN LOOP (NO IVS) RATE REQUIREMENT
- o DO NOT NOW REQUIRE IVS OPERATION IN CLOUD PRESENCE

✓  
FUGATE ORE

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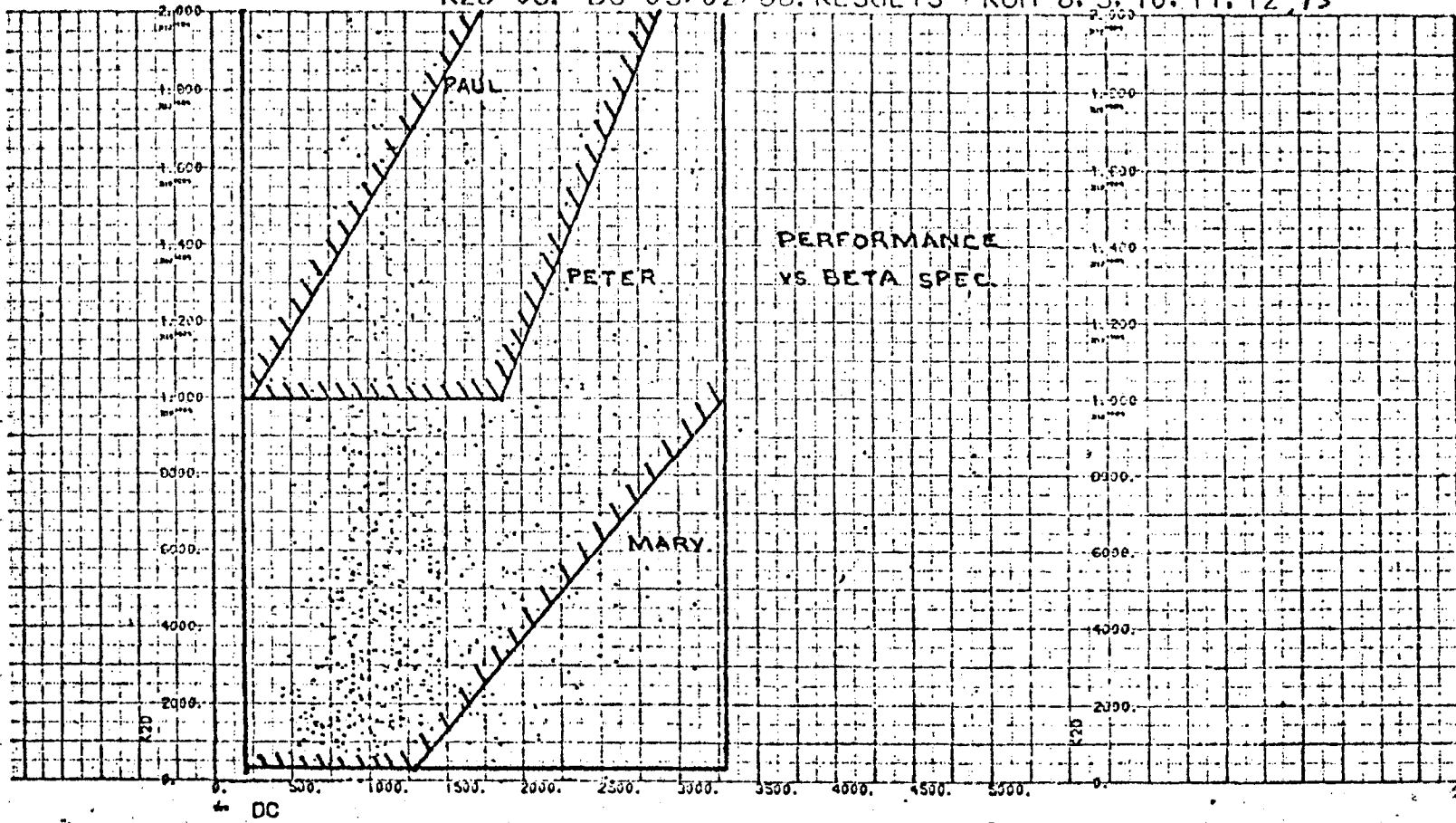
IVS SUMMARY (CONT'D)

- IVS TESTER
  - BASIC DESIGN IS SATISFACTORY
  - GOODYEAR PENALIZED MORE THAN HYCON BY TESTER  
(LARGE TESTER FOV COMBINED WITH FALL-OFF  
IN LIGHT ENERGY WITH STEREO ANGLE BIAS  
CORRELATION FUNCTION UNREALISTICALLY)
  - SPECULAR REFLECTIONS EXIST
- IVS TEST PROGRAM
  - CONTINUE TO USE IVS TESTER
  - USE MATTE PAPER OR PROPERLY PLACED LIGHTS TO  
REDUCE SPECULAR REFLECTIONS
  - TEST ALSO WITH A THREE DIMENSIONAL TARGET
  - INTERPRET TEST RESULTS IN LIGHT OF TESTER  
DEFICIENCIES

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*W. C. ...*

K2D US. DC 05/02/68. RESULTS FROM 8, 9, 10, 11, 12, 13



CEI STATUS OF DISPUTED ITEMS

	<u>AEROSPACE POSITION</u>	<u>GE POSITION</u>
<b>TRACKING MIRROR RATE ACCURACY WITHOUT IVS OR CREW (BY FN COUP)</b>		
- PRESENT SPEC VALUE	[REDACTED]	[REDACTED]
- ON ORBIT CALIBRATION	[REDACTED] WITH 400-FT ALTITUDE ERROR	OUT OF SCOPE
- RATE LEARNING (COUPLED WITH ON ORBIT CALIB.)	[REDACTED] (REMOVE)	OUT OF SCOPE
<b>TM RATE ACCURACY WITH IVS</b>	[REDACTED] FROM 17° to -25° STEREO	[REDACTED] AT NADIR ONLY
<b>TM RATE ACCURACY WITH IVS APPLIES IF:</b>	AVERAGE ALTITUDE DEVIATION IS LESS THAN 50 FEET ON AN AREA BASIS	SAME AS AEROSPACE
<b>"WIENER BOX"</b>	LOWER RIGHT CORNER DELETED WHERE NO TARGETS EXIST	WANTS LARGER CORNER FROM BOX

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CEI AGREED-TO ITEMS THAT ONCE WERE DISPUTED

- o TRACKING MIRROR RATE ACCURACY WITH IVS
  - OVERALL [REDACTED]
  - IVS [REDACTED]
  - DRIVE A [REDACTED]
- \* PROVIDING THAT DRIVE A RSS'ED WITH IVS < [REDACTED]
- o MMSS SHALL DETECT CLOUDS OR OTHER IVS ANOMALIES
- o AFFIRMATIVE CLOUD/ANOMALY INDICATION SHALL DO ANY COMBINATION:
  - INHIBIT PHOTOGRAPHY
  - DISABLE IVS (OPEN LOOP TM OPERATION)
  - ALERT FLIGHT CREW (MA)
  - INDICATE TO TELEMETRY
- o PRIMARY SIGNALS AVAILABLE FROM IVS TO BE PROCESSED IN COMPUTER
- o IVS DOES NOT HAVE TO OPERATE IN PRESENCE OF CLOUDS

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