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This document contains
112 pages

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Contract [REDACTED]

Presentation Charts
for
CCB Quarterly Progress Review Meeting
24 and 25 January 1968

Second Quarter FY-68
30 January 1968

Prepared by:

[REDACTED]

Approved by:


E. L. Green

Date: 16 February 1968

Declassified and Released by the N R C

-1-

In Accordance with E. O. 12958

on NOV 26 1997 [REDACTED]

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30 January 1968

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FOREWARD

The following charts were presented by the contractor during the CCB Quarterly Progress Review Meeting on 24 and 25 January 1968. They are intended as a supplement to the Minutes of the CCB Quarterly Progress Review (document control number [REDACTED] dated 30 January 1968) and are arranged in order of presentation.

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DRUM PRINTER WITH MODULATED CRT SOURCE

PAR 107B

CRT

FUTURE ACTION

- COMPLETE MARRIAGE OF TUBE & PRINTER
- COMPARE TWO PHOSPHORS
- QUICK LOOK AT NON-UNIFORMITY, BANDING, STREAKING, SPEED, RESOLUTION & DODGING

RECOMMENDATIONS

COMPLETE ABOVE TESTS

but MONITOR CLOSELY
AND INFORM CCB IN JAN.

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PAR 107B

STATUS

Received two CRT tubes and electronics from Log E	15 Dec
Installed on printer and mechanically checked out	22 Dec
Started quick-look testing in fixed intensity mode	26 Dec

Comparing two phosphors

Checking non-uniformity, banding, streaking,
speed, and resolution

BUT checkout of electronics by manufacturer is
required before testing of exposure control and
dodging modes can be started

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~~TOP SECRET~~

PRELIMINARY TEST RESULTS: Compromise P 11/GN0F 9768 phosphor
2430 dupe with 1.7 gamma processing
Fixed exposure mode

Non-uniformity	.36		.64 Δ log E
Streaking	.20	.02	.03 Δ log E
Banding	.03 Δ log E		
Speed	7 fpm	(3 fpm with normal processing)	
Resolution	250 l/mm		

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PAR 107B

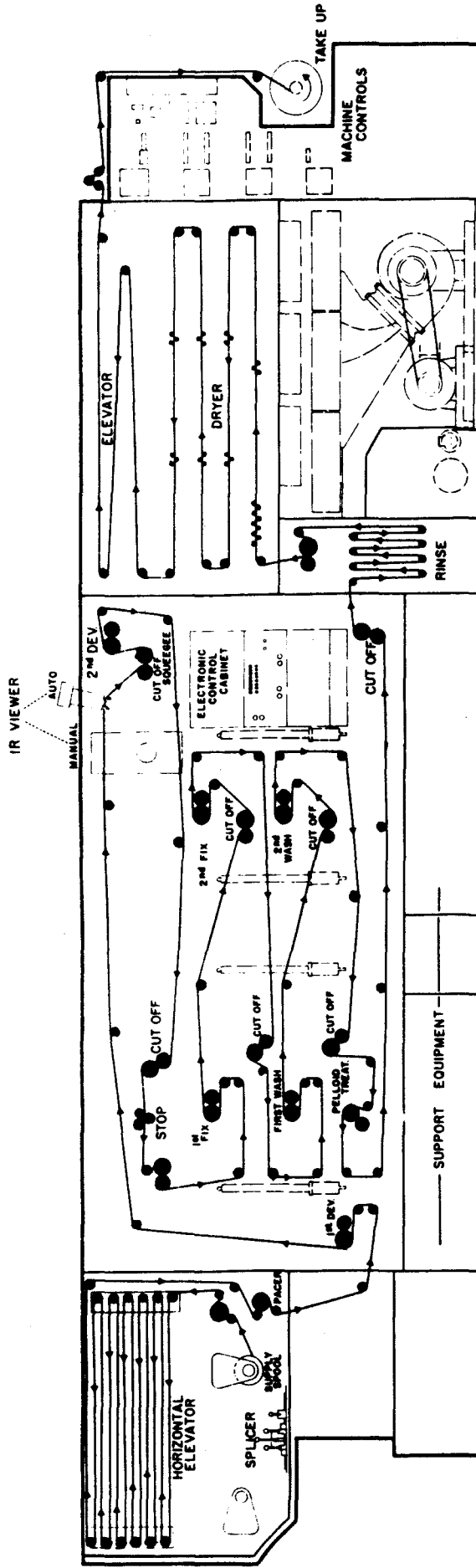
PLANNED ACTIVITY

Complete quick-look testing

Present status report and recommendations at April CCB

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PAR 100-4B All-Viscous Processor

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PAR 100-4B, DEVELOPMENTAL 9.5-INCH ALL-VISCOUS PROCESSOR

ENGINEERING CHECKOUT PROBLEMS

Elevator oscillations

Transport drive hesitations

Constant gorp pumping rate

Waste gorp disposal

Gorp buildup on rollers

SENSITOMETRIC CHECKOUT SCHEDULE

Standard hopper with manual temperature control	8 Jan
Resistive-heated hopper with manual temp. control	29 Jan
Resistive-heated hopper with IR scanner control	26 Feb
Complete sensitometric checkout	25 Mar
Final report	15 Jun

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PAR 153P, ADVANCED STEP-AND-REPEAT DRUM PRINTER FOR UTB FILM

STATUS

Definition of printer specifications

Analysis of logic system requirements

buy or build

Possible transport alternatives

loopers

PAR 137S

strain gages

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~~TOP SECRET~~

DESIGN SPECIFICATIONS

Two modes: Continuous and Selective

Multiple copies of one frame

Density cuts

Skip printing

Accommodates [redacted] J, J/3 and [redacted] formats

Tension control -- UTB capabilities

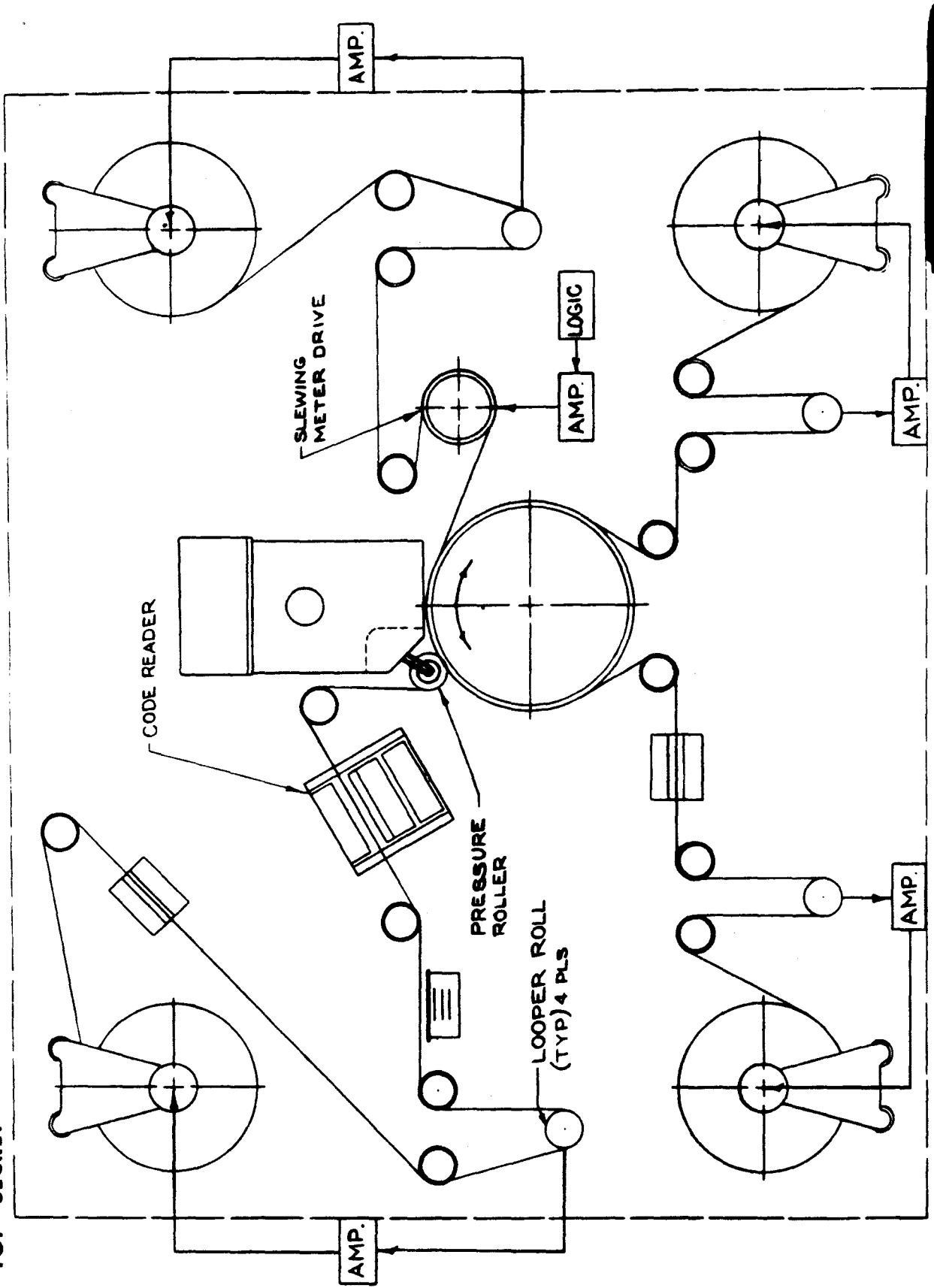
Semiautomatic -- paper tape input and coded frame

Frame number

Number of copies

Exposure settings

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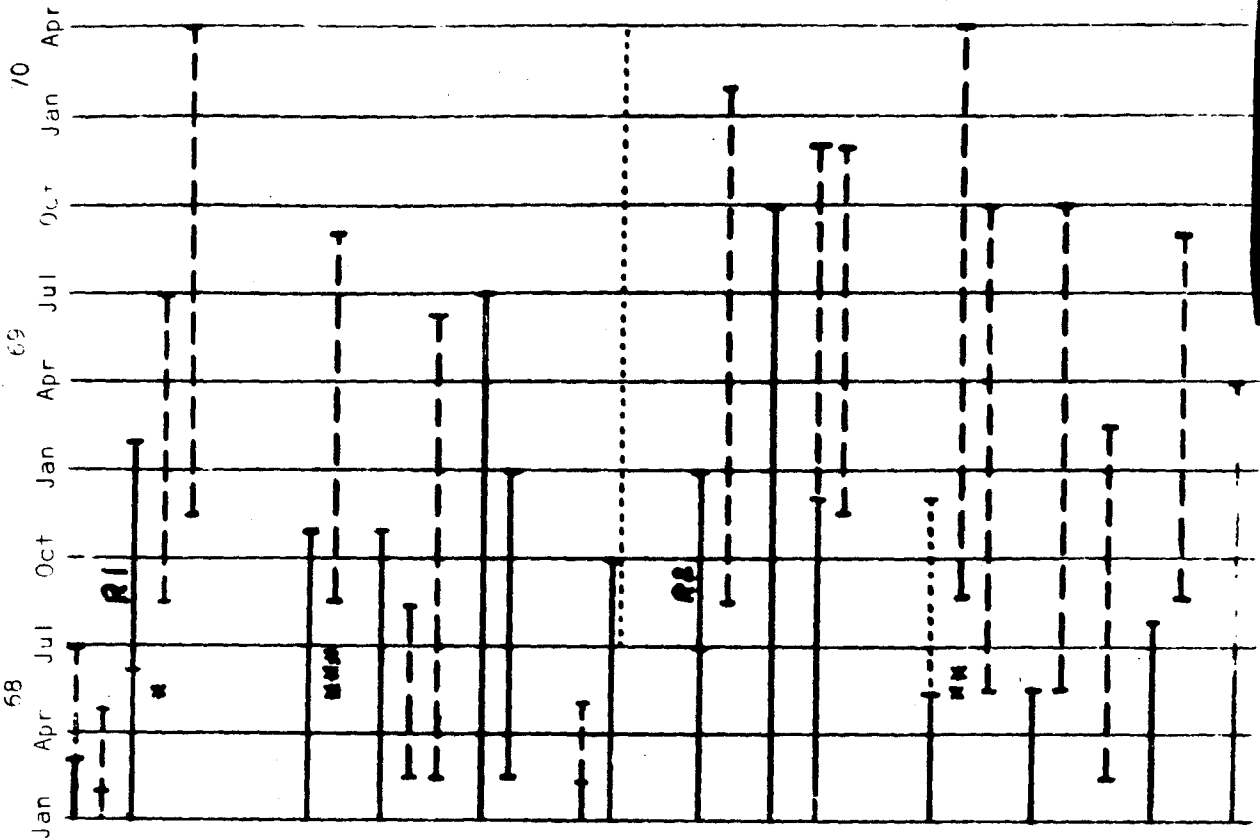


ONE APPROACH TO TENSION CONTROL

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DEVELOPMENT PROGRAM REVIEW



PRESPLICE

- PAP 97S Edge Defect Sensor
- 136S Footage Indicator
- 137S Large Roll Film Handling
- Presplice Breakdown Detector
- Presplice Station

PROCESSING

O NEGATIVE

- 150S Study Optical Titrting on Processor
- Titling Breadboard
- 152S Dual-Gamma Processing Study
- Interim Dual-Gamma Processor
- Production Dual-Gamma Processor
- 149B Yardleigh Data Recorder/Monitor
- 155B Additional Sensors for Yardleigh

DUPLICATE

- 129S/RI Film Transport Control Study
- 148B Viscous-Developer Dupe Processor

REPRODUCTION

- 146S/RI Printing Exposure Modulation Study
- Production Printer
- 153P Advanced S&R UTB Printer
- 24-7-7S/RI Study of Scanning Techniques
- Scanner Breadboard

SYSTEMS SUPPORT

- 143S Production Systems Requirements
- Production Control System
- Inspection/Shipping Center
- 144S/M Pri/Sec Breakdown Station Study
- Pri/Sec Breakdown Center
- Cloud Cover Classification Study
- 154S UTB Splicer-Tape Study
- UTB Splicer Breadboard
- 139B Automatic Continuous Ident Printer

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NEED TO CONFIRM

1. PHYSICALLY DETECTABLE END-OF-PASS MARK
2. LATENT IMAGE FRAME MARK
3. 1/4" FREE EDGE
4. ACCEPTABLE TITLING FORMAT/CONTENT
5. FLASH FEEDBACK REQUIREMENTS
6. PRODUCTION REQUIREMENTS

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DUAL GAMMA PROCESSING REVIEW

A. MISSION PROCESSING

1. 1044 - 9600 FT.

2. [REDACTED]

B. ADVANCES IN DUAL-GAMMA PROCESSING KNOW-HOW

1. MISSION PREPARATION TESTING

2. PAR 152

3. RESEARCH LABS

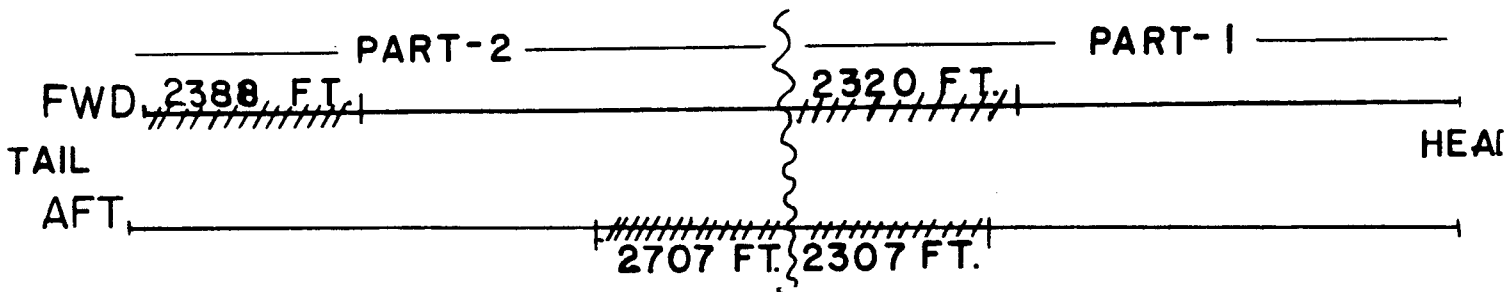
C. FUTURE PLANS

1. PAR 152

2. INTERIM PROCESSING CAPABILITY

3. RECOMMENDATIONS

MISSION PROCESSING 1044



TOTAL FOOTAGE DUAL GAMMA PROCESSED 9722 FT.

B. CONTRACTOR EVALUATION

1. DUAL GAMMA PREFERRED SUBJECTIVELY 67:29:4
2. DUAL GAMMA EDGES/MTF SUPERIOR

C. EVALUATION BY BUILDING

1. FWD RECORD SUPERIOR TO AFT.
2. DUAL GAMMA PREFERRED IN MOST CASES
3. PREFERENCE FOR DUAL GAMMA IN SHADOWS

D. COMMENTS

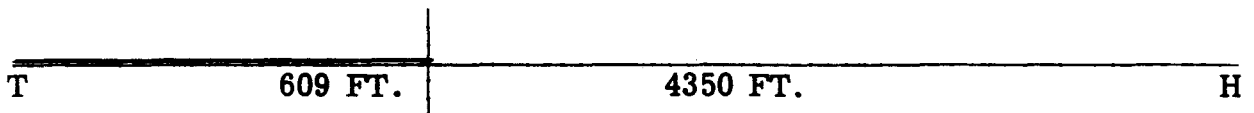
1. HIGH PERCENTAGE OF IMAGERY BELOW "HUMP".
2. DIFFICULT TO SEPARATE PROCESS FROM EXPOSURE.



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MISSION PROCESSING

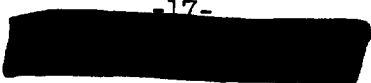
A. DESCRIPTION OF RECORD



B. CONTRACTOR EVALUATION

C. COMMENTS

1. FOCUS AND THERMAL CHANGES COULD CONFOUND EVALUATIONS.
2. GOOD SAMPLE OF IMAGERY



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ADVANCES IN KNOW-HOW MISSION PREPARATION TESTING

1044 SET UP

SET UP

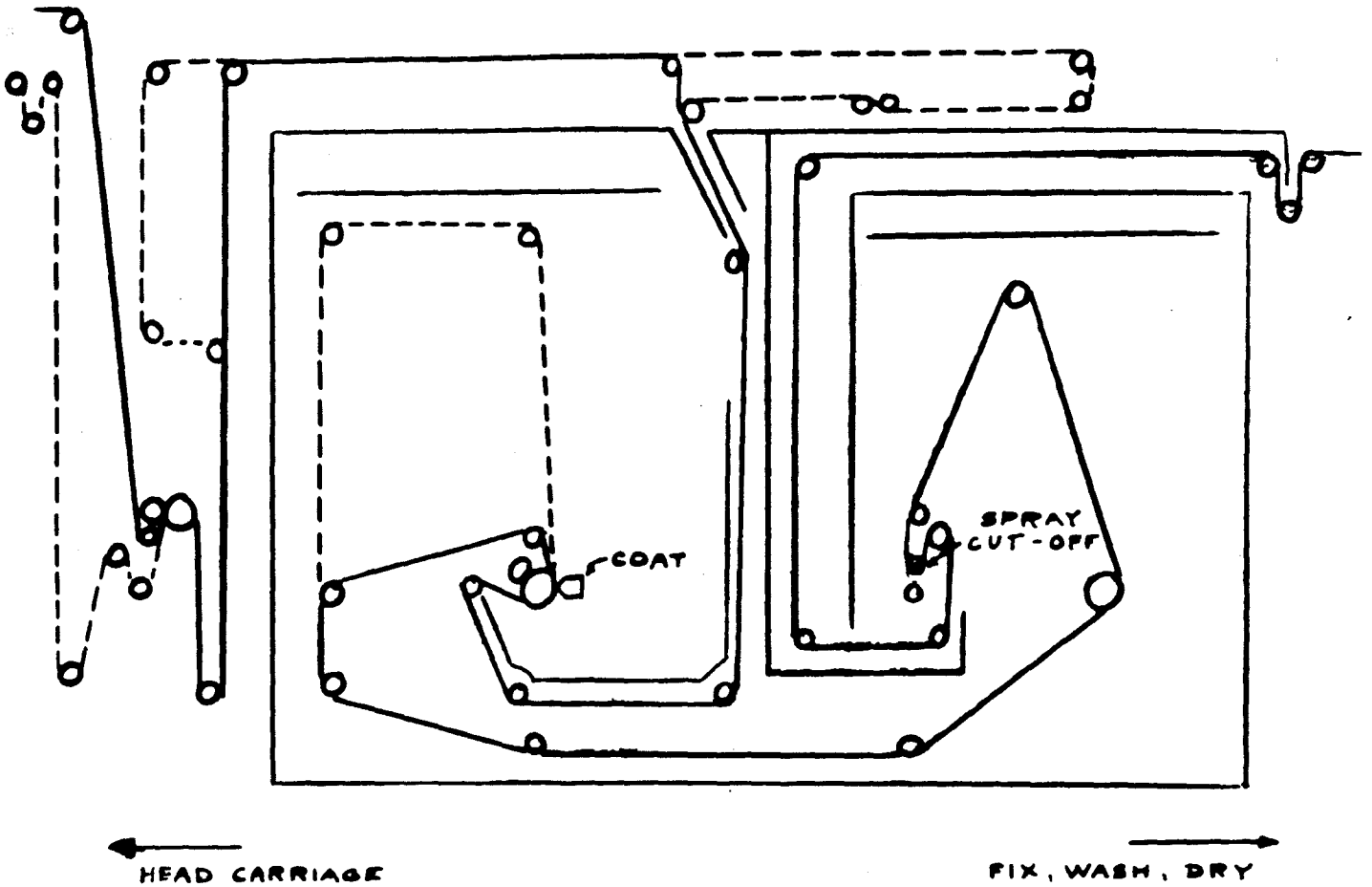
A. DEV. TIME	62 SEC	54 SEC
B. GORP TEMP	95°F	85°F
C. CABINET TEMP	80°F	87°F
D. COATING THICKNESS	.015"	.020"
E. CUT-OFF	SQUEEGEE DISENGAGED	SQUEEGEE ENGAGED
F. COATING ROLLER/ BACK-UP ROLLER	OUT OF PARALLEL IN CONTACT ON ONE END	PARALLEL SPACED UNIFORMLY OUT OF CONTACT

REASON FOR DIFFERENCES

- A, B & C TO ELIMINATE GORP BUILD-UP ON BASE ROLLERS IN CABINET
- D. BETTER DENSITY UNIFORMITY
- E. MORE RELIABLE - REDUNDANT - ACCEPTABLE
- F. MORE UNIFORM BACK COATING

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VISCOUS CABINET



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ADVANCES IN KNOW-HOW MISSION PREPARATION TESTING

1. THICKNESS OF COAT

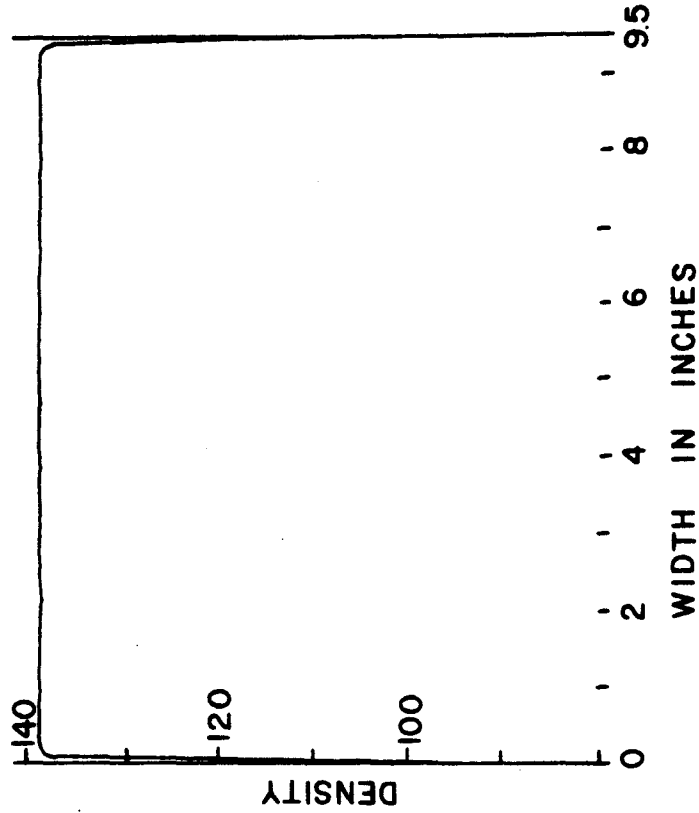
- A. SENSITOMETRY
- B. UNIFORMITY
- C. SIGNIFICANCE OF EDGE THICKNESS

2. DYE REMOVAL-BUILD UP

- A. EFFECT OF TEMP ON BUILD UP
- B. COATING BACK SIDE OF FILM

3. PRE-CLEANING

- A. VACUUM
- B. TACKY ROLL



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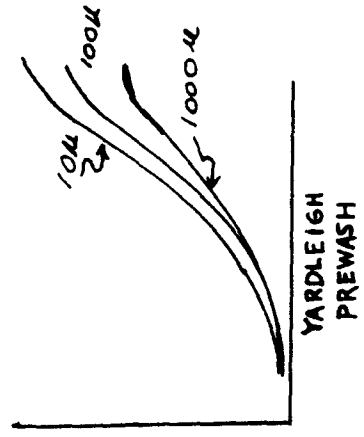
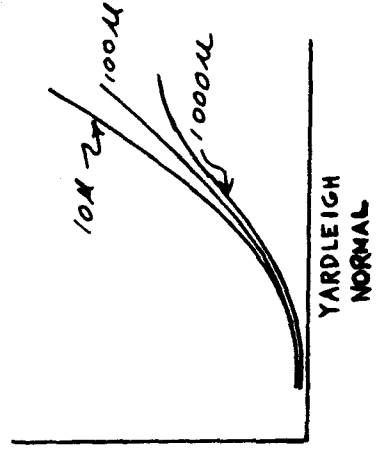
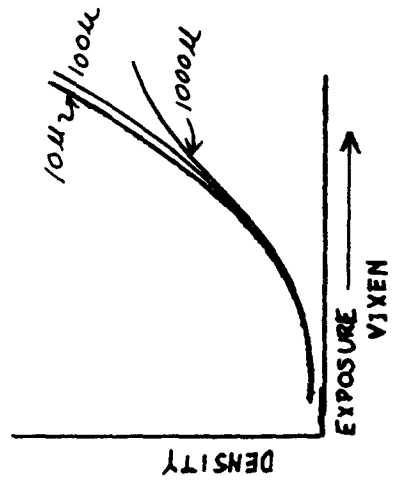
ADVANCES IN KNOW-HOW PAR 152

A. TEMPERATURE/TIME QUALITY RELATIONSHIP

1. CANNOT TRADE TIME AND TEMPERATURE
2. SHORT TIME/HIGH TEMPERATURE SUPERIOR TO LONG TIME/LOW TEMPERATURE

B. PREWASHING EFFECT ON IMAGE QUALITY

PREWASHING CHANGES MICROCONTRAST CHARACTERISTICS



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ADVANCES IN KNOW-HOW

A. CHEMISTRY FOR 3404

1. 6 DEVELOPERS HAVE BEEN TESTED.
2. RESULTS USEFUL TO ESTABLISH CAUSE/EFFECT DATA FOR EXOTIC ADDITIONS.
3. NO IMPROVEMENT TO DATE.

B. CHEMISTRY FOR SO-230

1. PRESENT 3404 DEVELOPER DOES NOT WORK.
2. RESEARCH LABS ARE EXAMINING PROBLEM.

C. OTHER CHEMISTRY

CHEMISTRY FOR 3400 EXPECTED TO REQUIRE ALL NEW FORMULA APPROACH.

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FUTURE PLANS PAR 152 STUDY PLAN

ITEMS OF HIGH PRIORITY:

- A. EVALUATION OF IMPROVED 3404 CHEMISTRY
- B. PRELIMINARY EVALUATION OF SO-230 CHEMISTRY TO ESTABLISH APPROXIMATE TIME/TEMP REQUIREMENTS.
- C. ADVISABILITY OF LOG E SHIFT OF DUAL GAMMA CURVE

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INTERIM CAPABILITY
FOR
DUAL GAMMA PROCESSING

- A. WHEN AVAILABLE
- B. COST
- C. RISK

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INTERIM CAPABILITY FOR DUAL GAMMA PROCESSING

Y-6 TRENTON	APPROACH	SCHEDULE (MONTHS)	COST (ROM)	RISK
Y-6 TRENTON	AS IS (REFERENCE)			6
	SLIGHTLY MODIFIED Y-5	6	[REDACTED]	4
MODIFIED	YARDLEIGH OR TRENTON OR DALTON	16	[REDACTED]	4
	WITH ROLL FILM TRANSPORT MODULE			
MODIFIED	YARDLEIGH OR TRENTON OR DALTON	18	[REDACTED]	7
	WITH BELT FILM TRANSPORT MODULE			
FULTRON	WITH ROLL FILM TRANSPORT MODULE	18	[REDACTED]	5
FULTRON	WITH BELT FILM TRANSPORT MODULE	18	[REDACTED]	8
ADDITIONAL CHEM MIX		6	[REDACTED]	[REDACTED]

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INTERIM CAPABILITY FOR DUAL GAMMA PROCESSING

SLIGHTLY MODIFIED
Y-5

TO INCLUDE:

1. TACKY ROLL CLEANING STATION
2. NEW COATING BACK-UP ROLLER
3. IMPROVED TEMPERATURE/HUMIDITY CONTROL
4. IMPROVED AIR BLEEDER ON GORP PUMP
5. GORP SKIP DETECTION CAPABILITY

ADVANTAGES

1. SHORTEST SCHEDULE
2. LEAST COST
3. EXPERIENCE/CONFIDENCE

DISADVANTAGES

1. DYE REMOVAL MARGINAL
2. FRAME-BY-FRAME PROCESSING ON Y-6 ONLY
3. MAY BE LIMITED TO 3404 ONLY
4. SPEED LIMITED

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INTERIM CAPABILITY FOR DUAL GAMMA PROCESSING

PROVIDE A NEW VISCOUS DEVELOPER CABINET SPECIFICALLY DESIGNED FOR A DUAL
GAMMA PROCESS ON THE TRENTON.

ADVANTAGES

1. FLEXIBILITY
2. HIGHER RUNNING SPEED
3. IMPROVED CUT-OFF CAPABILITY
4. COMPLETE DYE REMOVAL
5. IMPROVED FILM PATH
3. IMPROVED TEMPERATURE/HUMIDITY CONTROL
7. POSSIBLY SUBTLE IMPROVEMENTS IN IMAGE QUALITY.

DISADVANTAGES

1. LONGER SCHEDULE
2. COST
3. REQUIRES ADDITIONAL VISCOUS SUPPORT.

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RECOMMENDATIONS

1. MODIFY Y-5 NOW--

[REDACTED]

6 MONTHS

LOW RISK

2. SUBSEQUENTLY MODIFY 3 TRENTONS

[REDACTED]

16 MONTHS FROM START

LOW RISK

3. DEFER HIGH SPEED MACHINE UNTIL:

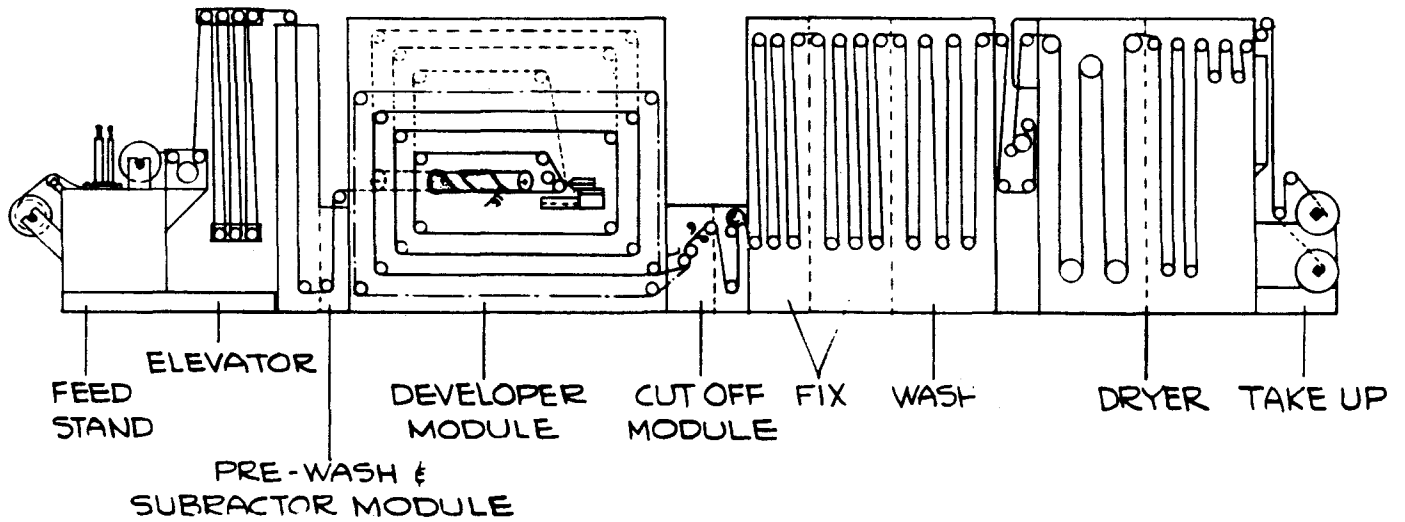
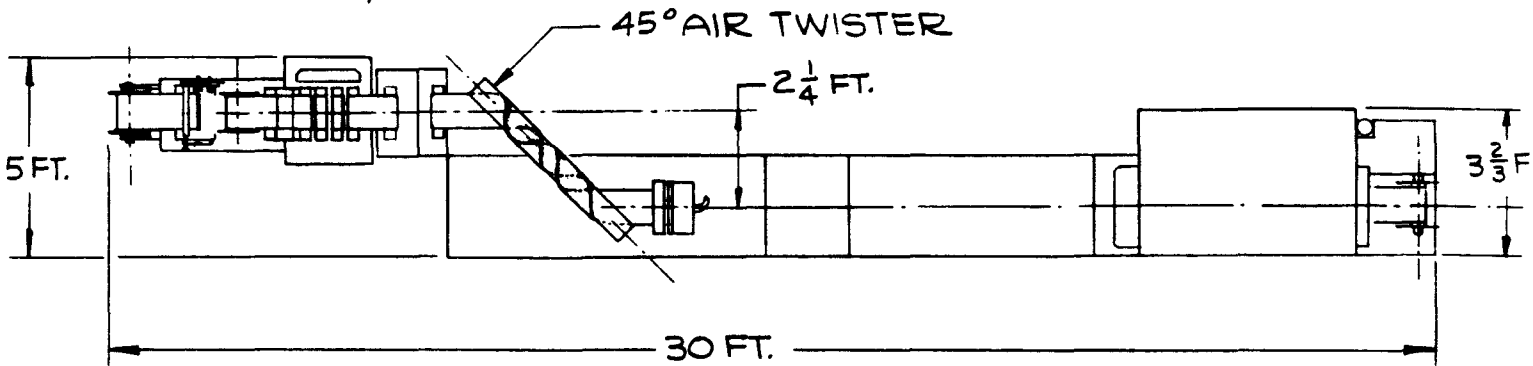
[REDACTED]

REQUIREMENTS CRYSTALIZED

CHEMISTRY OPTIMIZED

SPACE AVAILABLE

PAR 148B
VISCIOUS DEVELOPER DUPE PROCESSOR



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PAR 148B, VISCOUS-DEVELOPER DUPE PROCESSOR

STATUS

Approved design only

Design to utilize Dalton Processor

Design best for Contractor and AFSPFF

Breadboard twister

Proceed with design

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PAR 122B/R1 Processor

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PAR 122B/R1 Processor

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TARGET BRIGHTNESS STUDIES

PAR 24-7-6S/R2

PROJECT SUNNY

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PAR 24-7-6S/R2

PROJECT SUNNY

Objective

Scope

Progress/Reports

Results

Preliminary Recommendations

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PAR 24-7-6S/R2

PROJECT SUNNY

OBJECTIVES

Determine Feasibility of Programming

Exposure For Specific Targets

Compare Exposure & Brightness Data

of Targets With General Mission Photography

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PAR 24-7-6S/R2

PROJECT SUNNY

Scope

* 31 Targets

* 1400 Acquisitions of Targets

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PAR 24-7-6S/R2

PROJECT SUNNY

Target Types

Air Fields

Launch Complexes

ICBM

SAM

Navy Facilities

Radar Installations

Power Plants

Storage Areas

Manufacture & Test Sites

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PAR 24-7-6S/R2

PROJECT SUNNY

Progress and Reports

- * CCB Requested Corrections
- * Weekly TWX
- * Monthly Reports

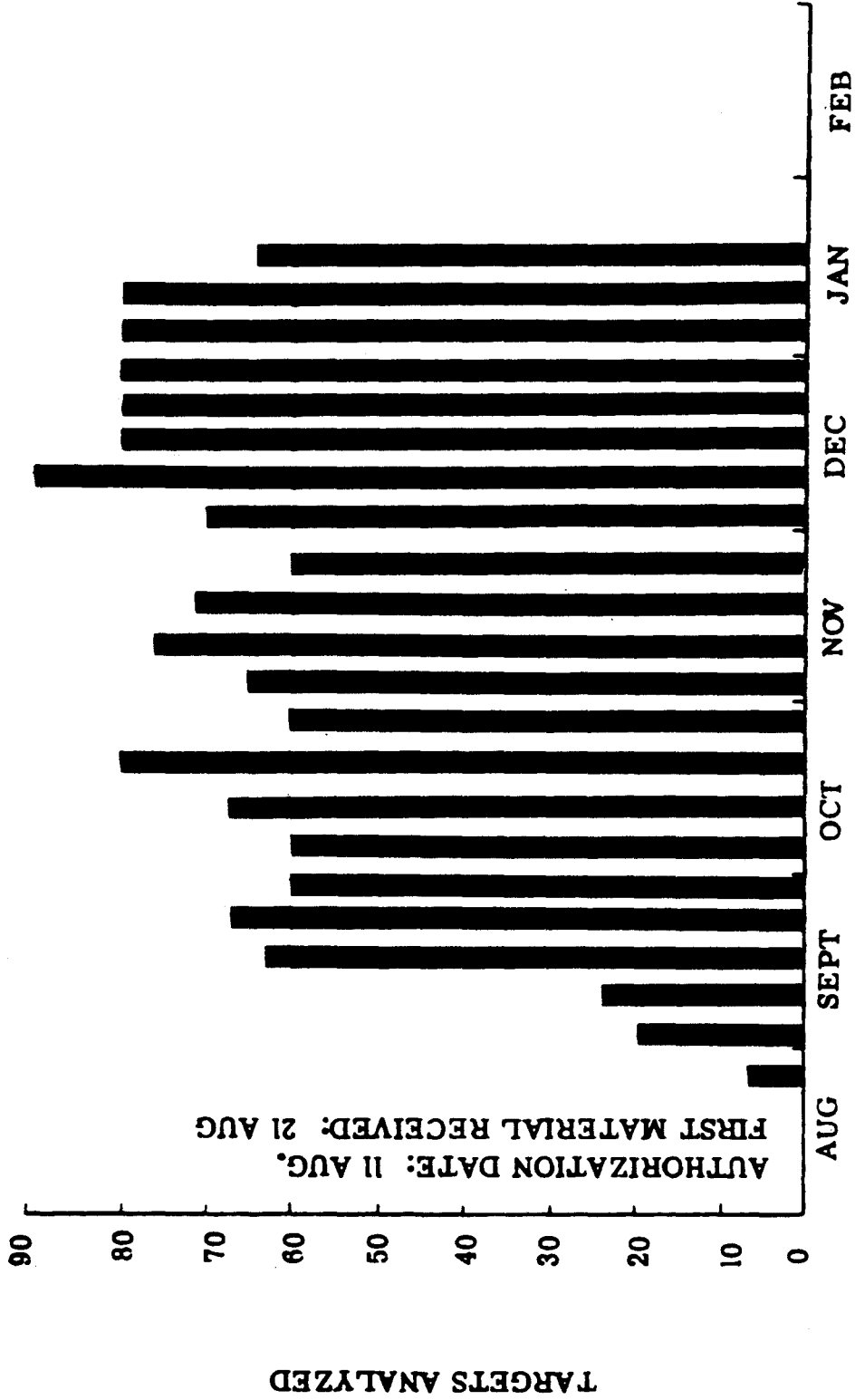
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[REDACTED]

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PROGRESS CHART



[REDACTED]

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PAR 24-7-6S/R2

PROJECT SUNNY

Results

- * Summary of Acquisitions
- * Luminance Variation of Individual Targets
- * Spot Size Comparisons
- * Comparison of Target vs Frame Luminance
- * Distribution of Recommended Exposure Changes

[REDACTED]

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PAR 24-7-6S/R2

PROJECT SUNNY

Summary of Target Acquisitions

* Number of Acquisitions

Corona	636
[REDACTED]	[REDACTED]

* Clear Weather Conditions

Corona	33%
[REDACTED]	[REDACTED]
Weighted Average	[REDACTED]

* Snow Cover or Surround

Corona	14%
[REDACTED]	[REDACTED]
Weighted Average	[REDACTED]

* Affected by Haze or Clouds

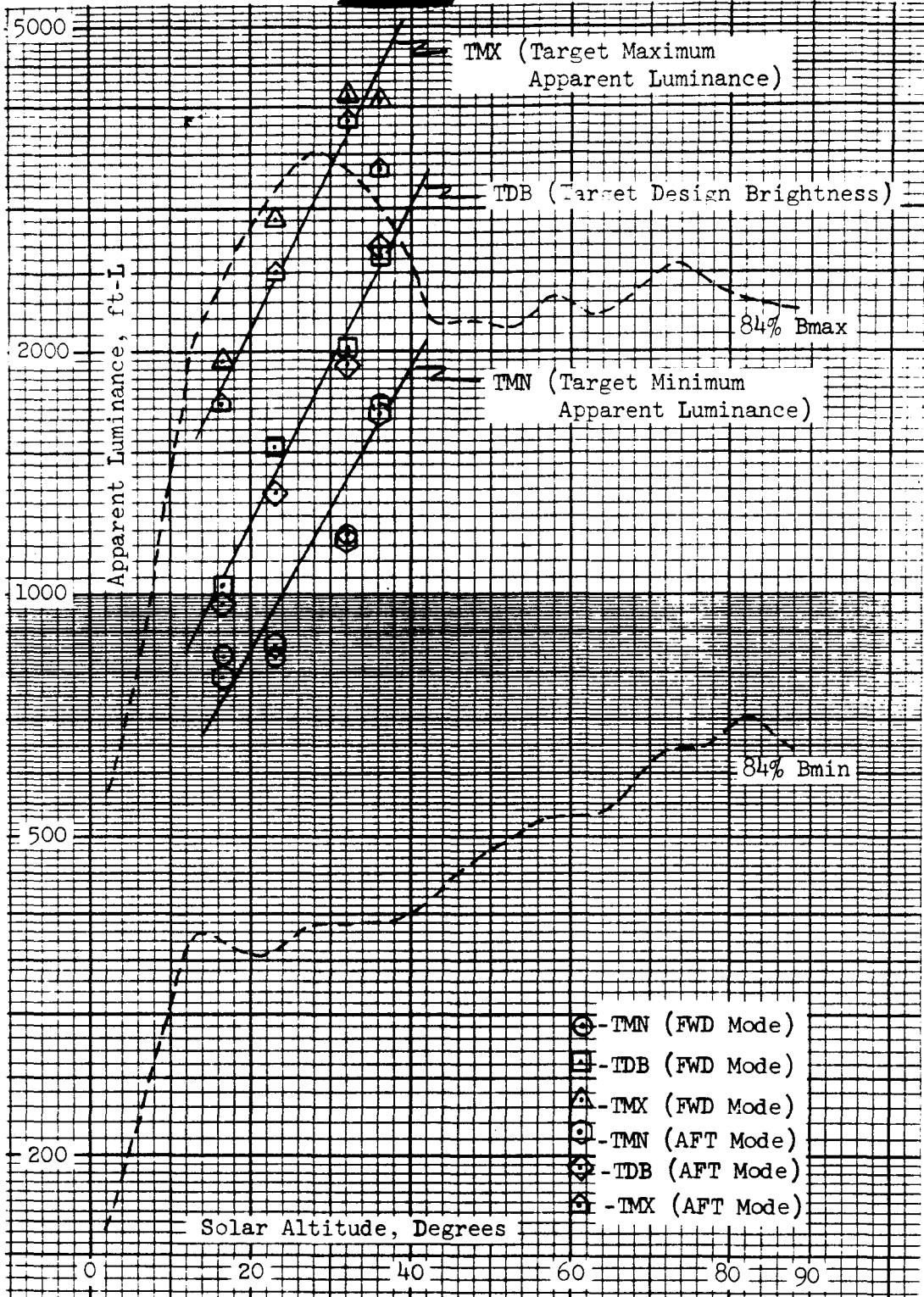
Corona	46%
[REDACTED]	[REDACTED]
Weighted Average	[REDACTED]

[REDACTED]

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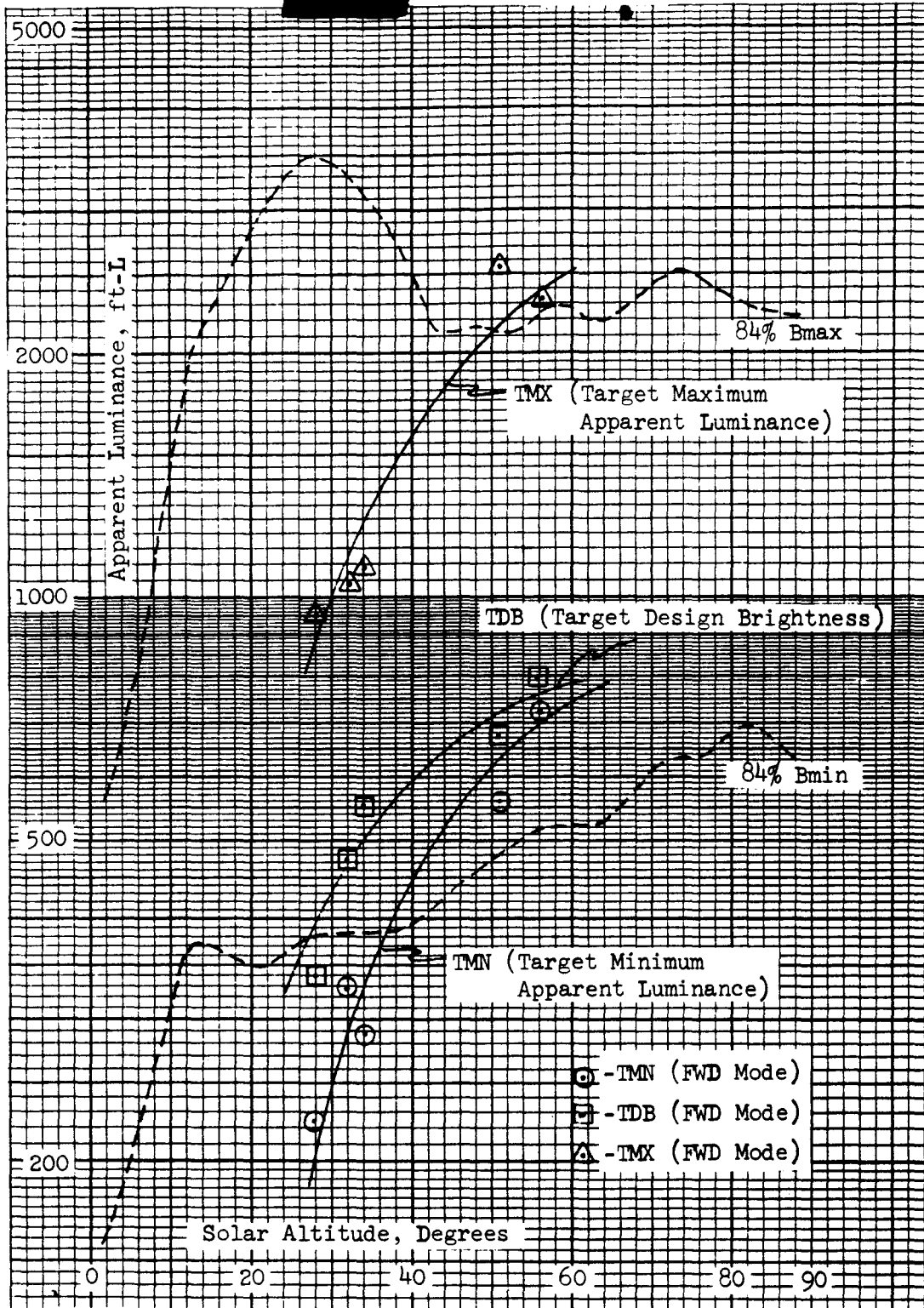
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Apparent Luminance vs Solar Altitude
(Airfield, Target 31 - Snow Covered)
-Series

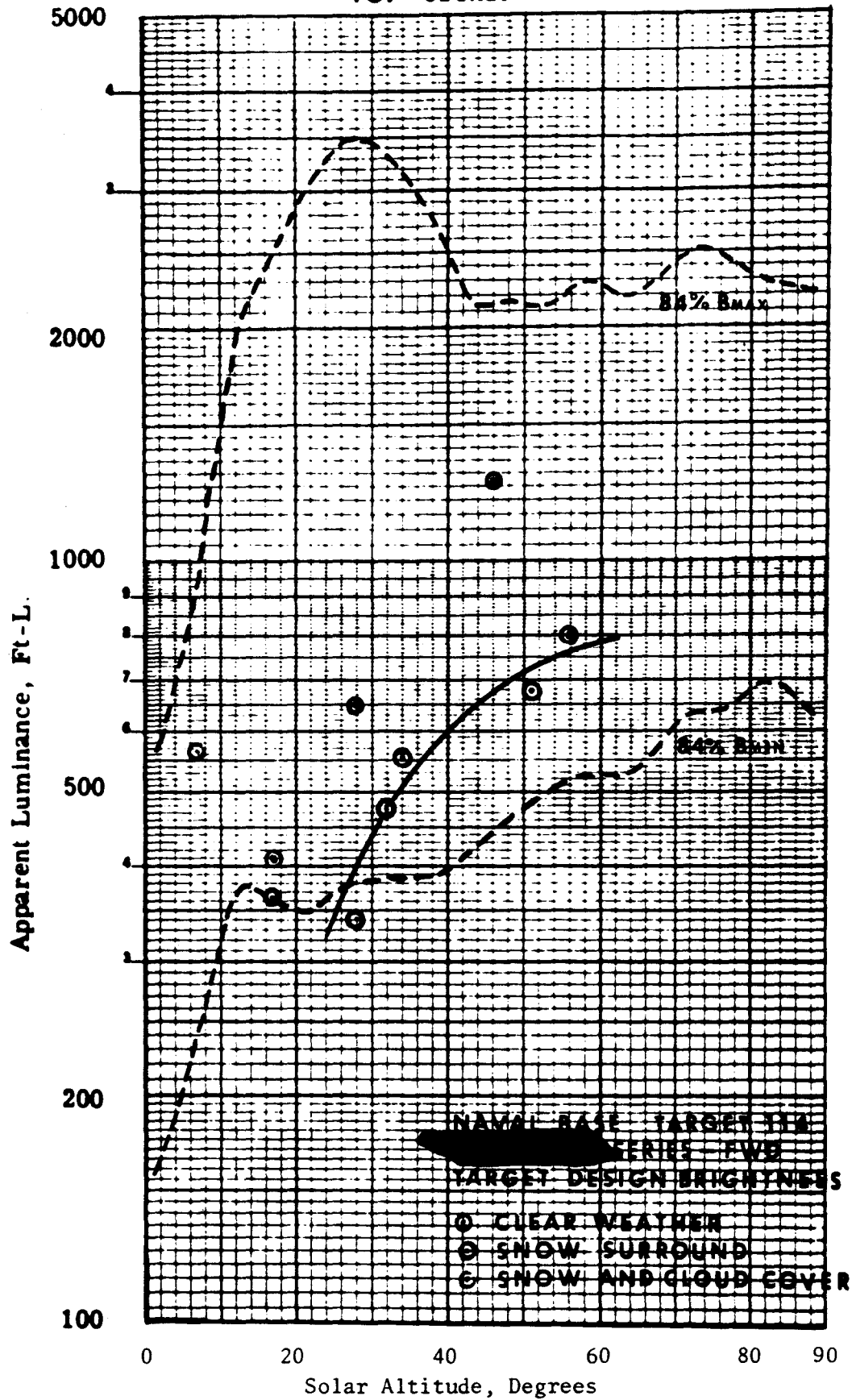


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Apparent Luminance vs Solar Altitude
(Naval Base, Target 114 - Clear Weather)
-Series FWD Mode



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NAVAL BASE TARGET TWO
SERIES FIVE
TARGET DESIGN BRIGHTNESSES

- CLEAR WEATHER
- SNOW SURROUND
- ◐ SNOW AND CLOUD COVER

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[REDACTED]

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PAR 24-7-6S/R2

SPOT SIZE COMPARISON

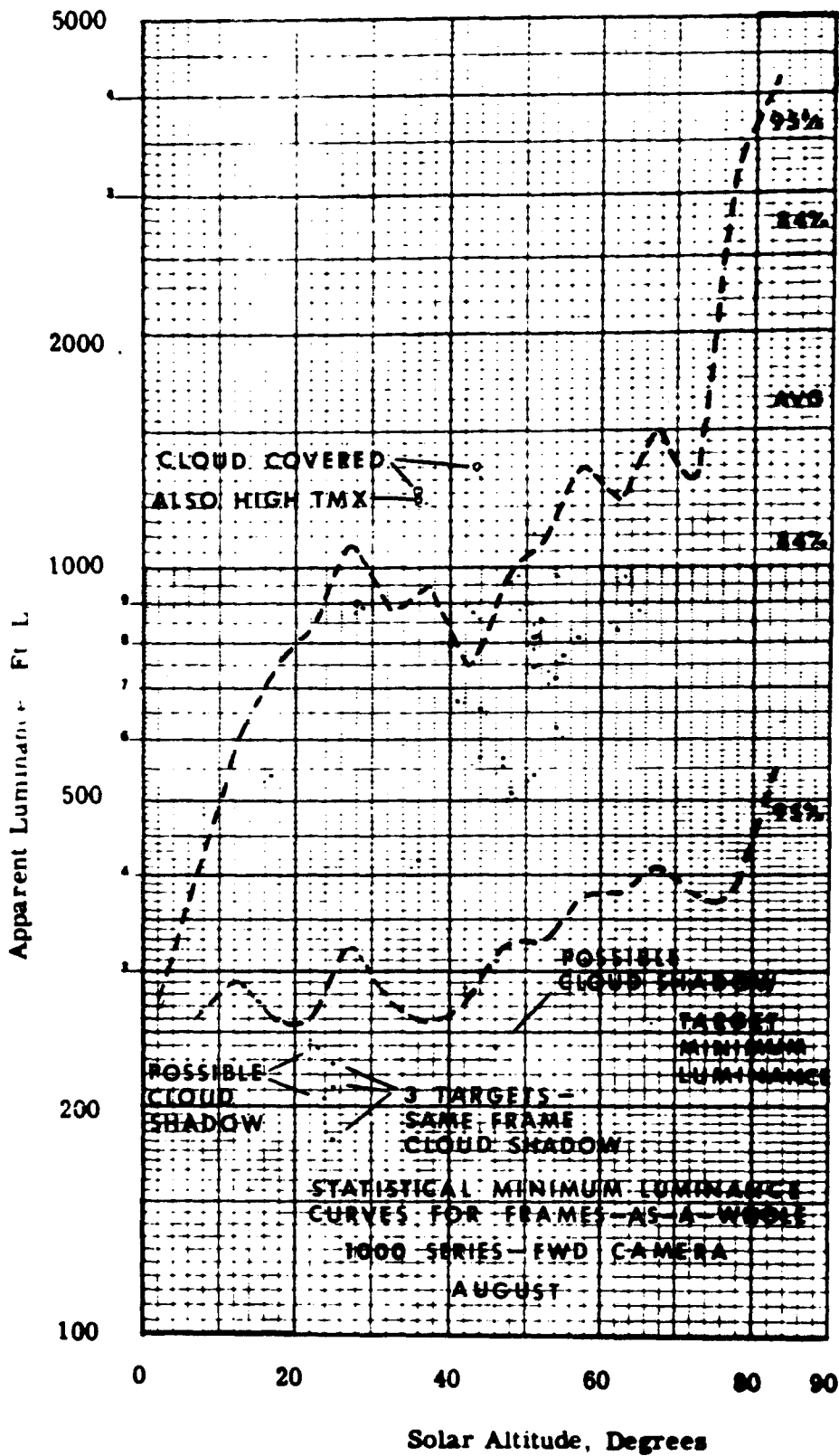
Photography

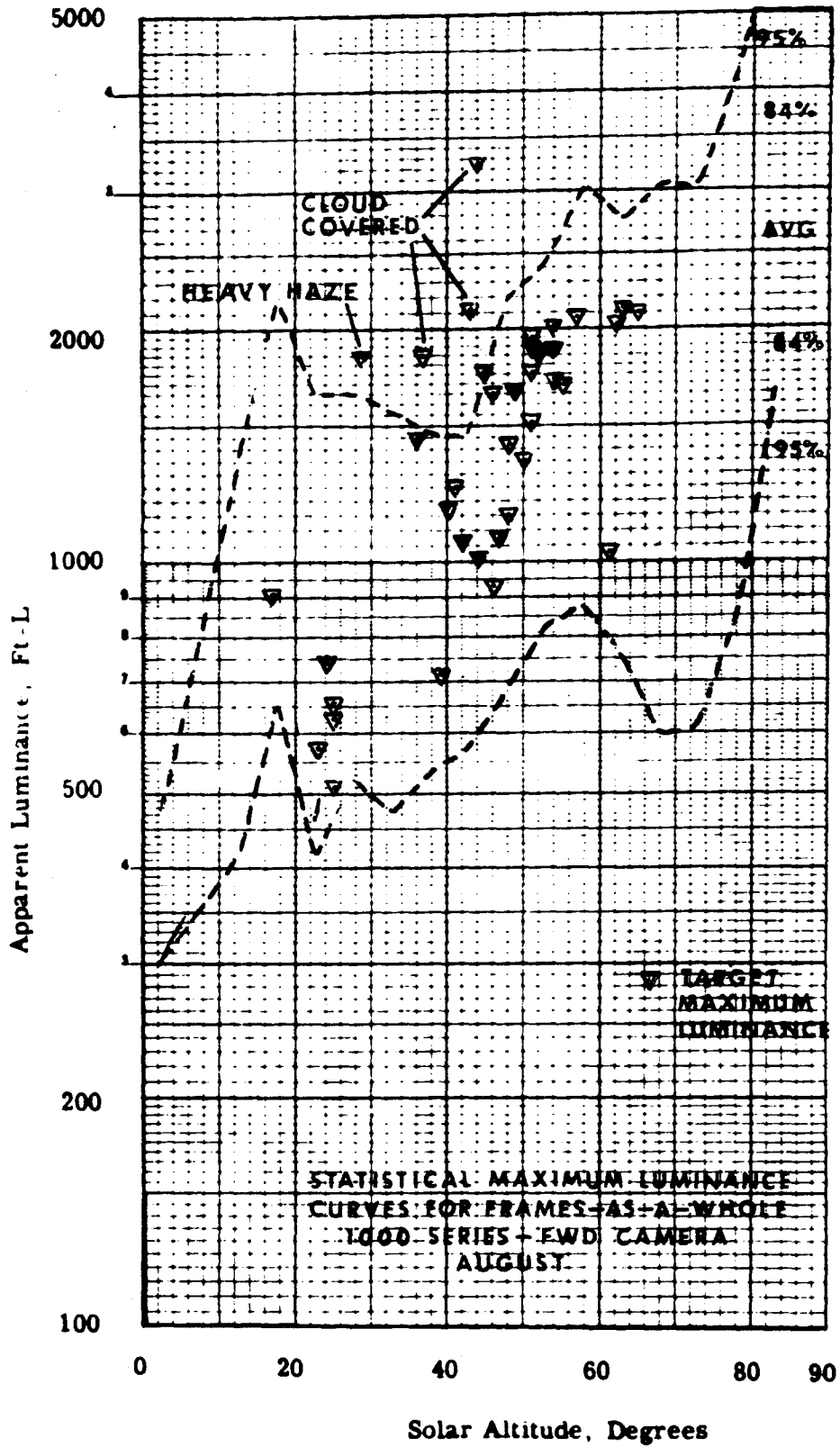
[REDACTED]

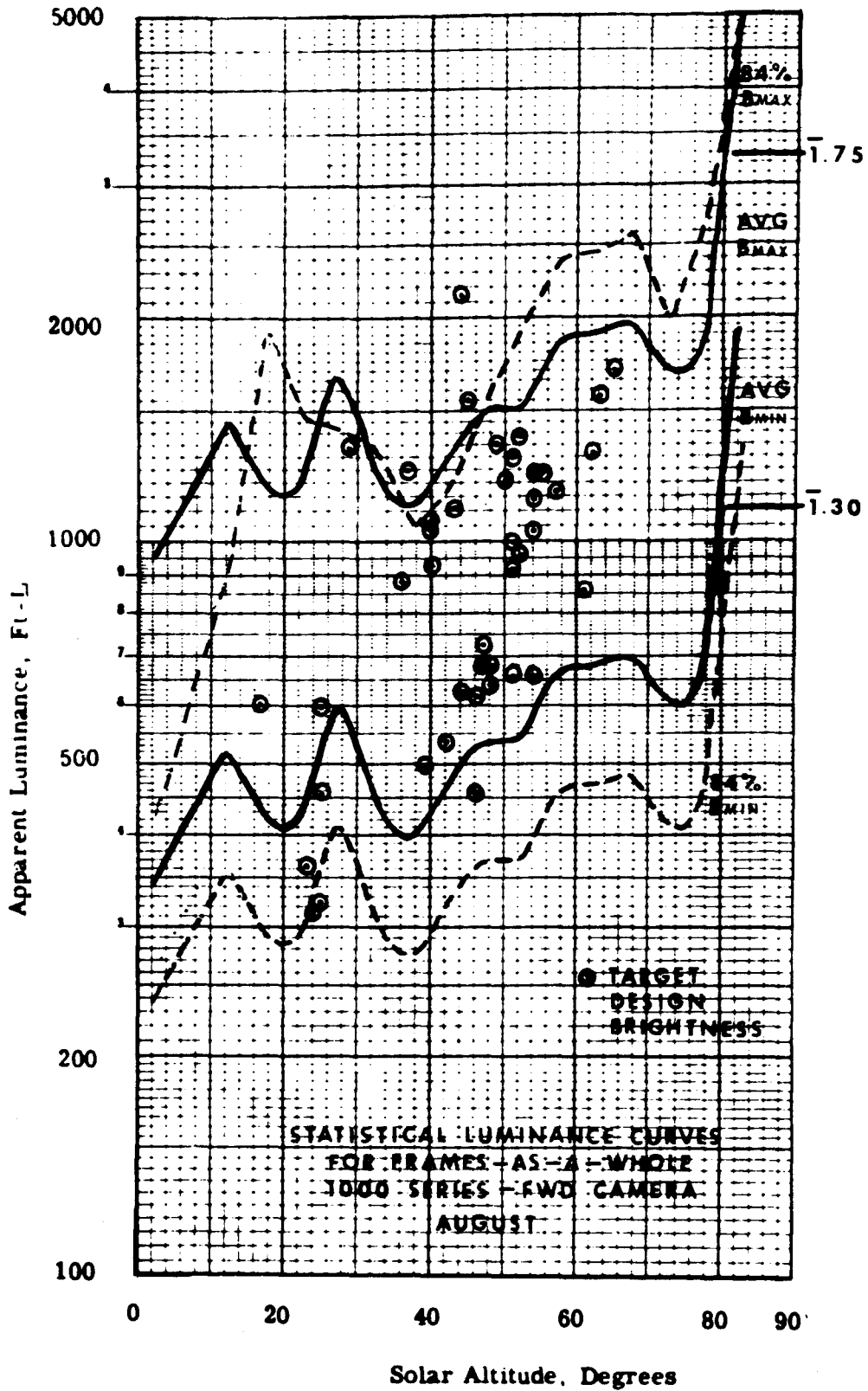
	Standard Conditions	Test Conditions
Microdensitometer spot size	23 μ	11.5 μ 46 μ
Nominal Spot Diameter on Ground	3 ft.	1.5 ft. 6 ft.
Nominal Ground Area Analyzed	7.1 sq. ft.	1.8 sq. ft. 28.3 sq. ft.
Target Design Brightness	A. 1270 B. 1040	1280 1070
Recommended Log E Shift	A. -0.10 B. -0.01	-0.11 -0.02

[REDACTED]

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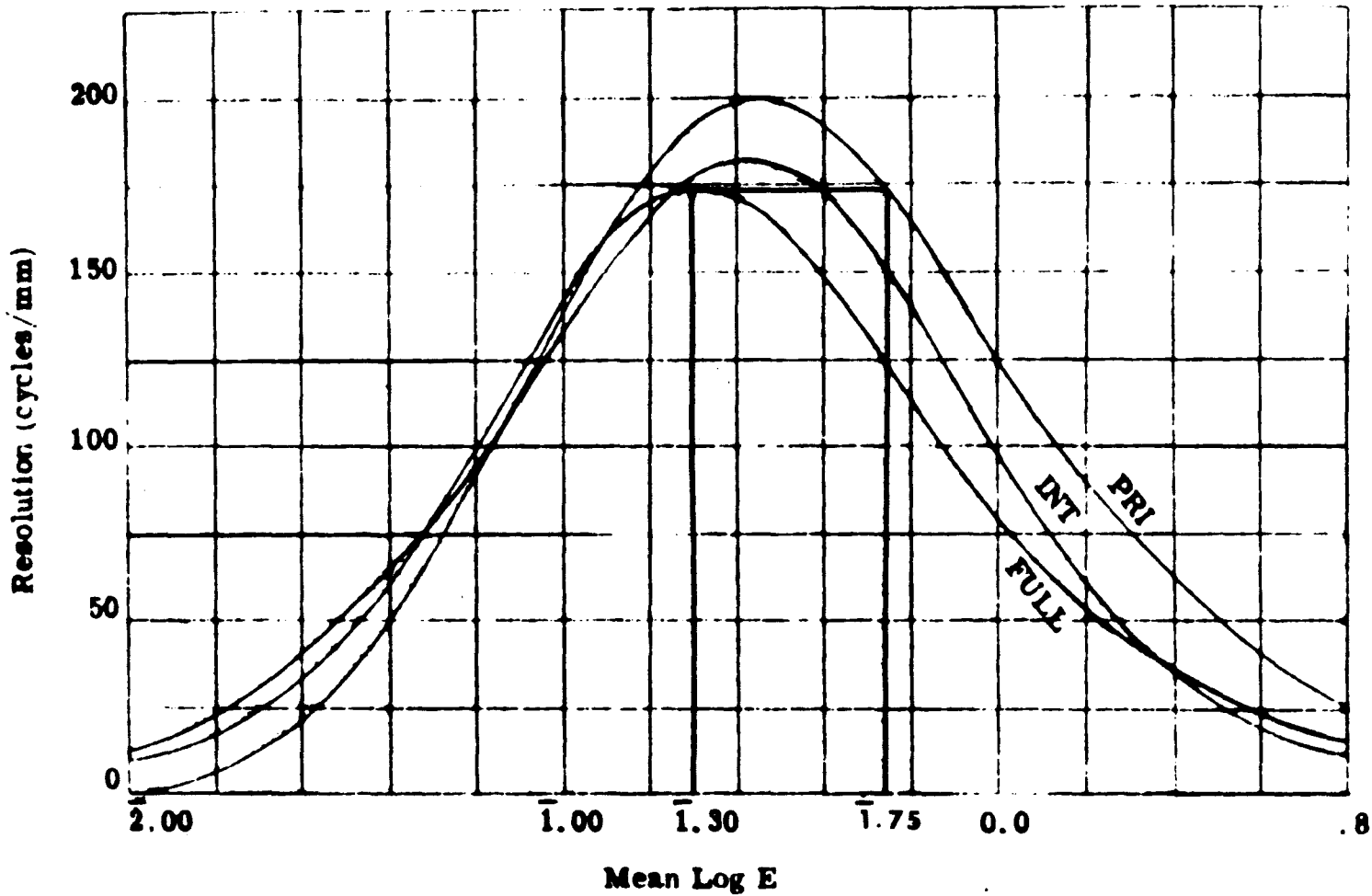






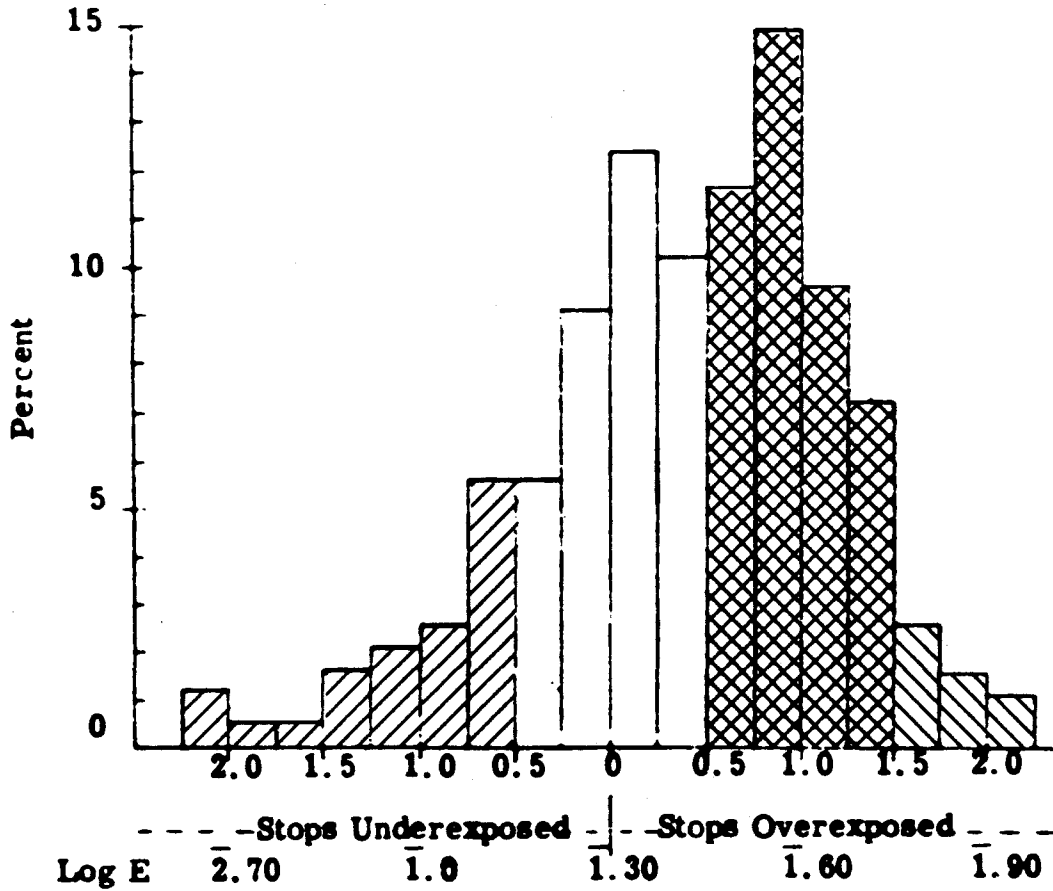
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**Resolution vs Mean Log E
For 3 Process Levels
(1.7.1 TOC)**



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Percentage Frequency
Distribution of Recommended
Exposure Changes for
1000-Series Acquisitions

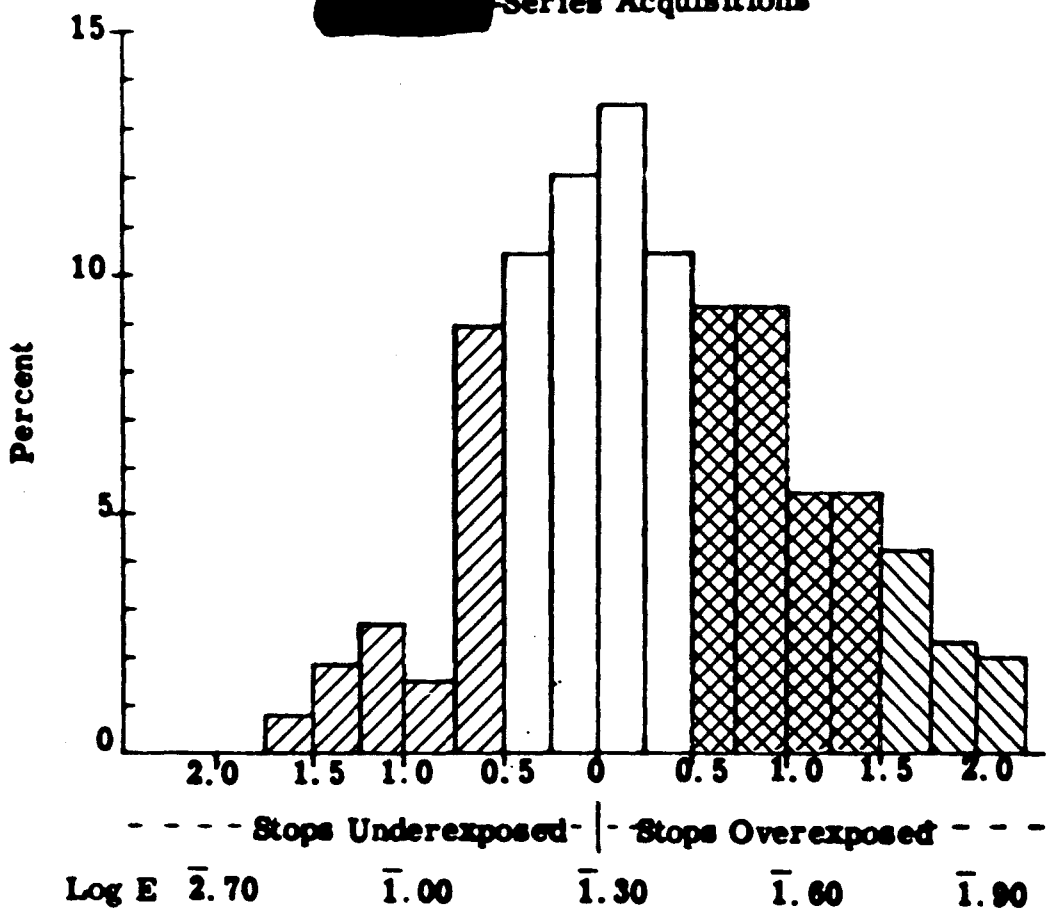






-  Within 1/2 Stop of Desired Exposure
-  Overexposed but within System Capability to Compensate
-  Overexposed Beyond System Capability to Compensate
-  Underexposed Beyond System Capability to Compensate

[REDACTED]

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Percentage Frequency
Distribution of Recommended
Exposure Changes for
[REDACTED] Series Acquisitions



-  Within 1/2 Stop of Desired Exposure
-  Overexposed but within System Capability to Compensate
-  Overexposed Beyond System Capability to Compensate
-  Underexposed Beyond System Capability to Compensate

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[REDACTED]

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Par 24-7-6s/R2

CUSTOMER COMMENTS



Corona

! ?



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PAR 24-7-6S/R2

PRELIMINARY RECOMMENDATIONS

- *Utilize Project Sunny Data for [REDACTED]
 - *CORONA use of Project Sunny dependent on completion of summaries and correlation
 - *Complete current study
 - *Continue PROJECT SUNNY
-
- *Submit Follow-on PAR
 - *Expand target base
 - *Improve ability to use Project Sunny for exposure programming

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PAR 24-7-7S/R1

STUDY OF SCANNING TECHNIQUES

OBJECTIVE

Develop scanning techniques to improve:

Camera Exposures

Negative Processing

Print Level Selection

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EQUIPMENT

PAR 70 SCANNER

Computer Programming

Scan Flexibility

Scanner c/o

PAR 61 SCANNER

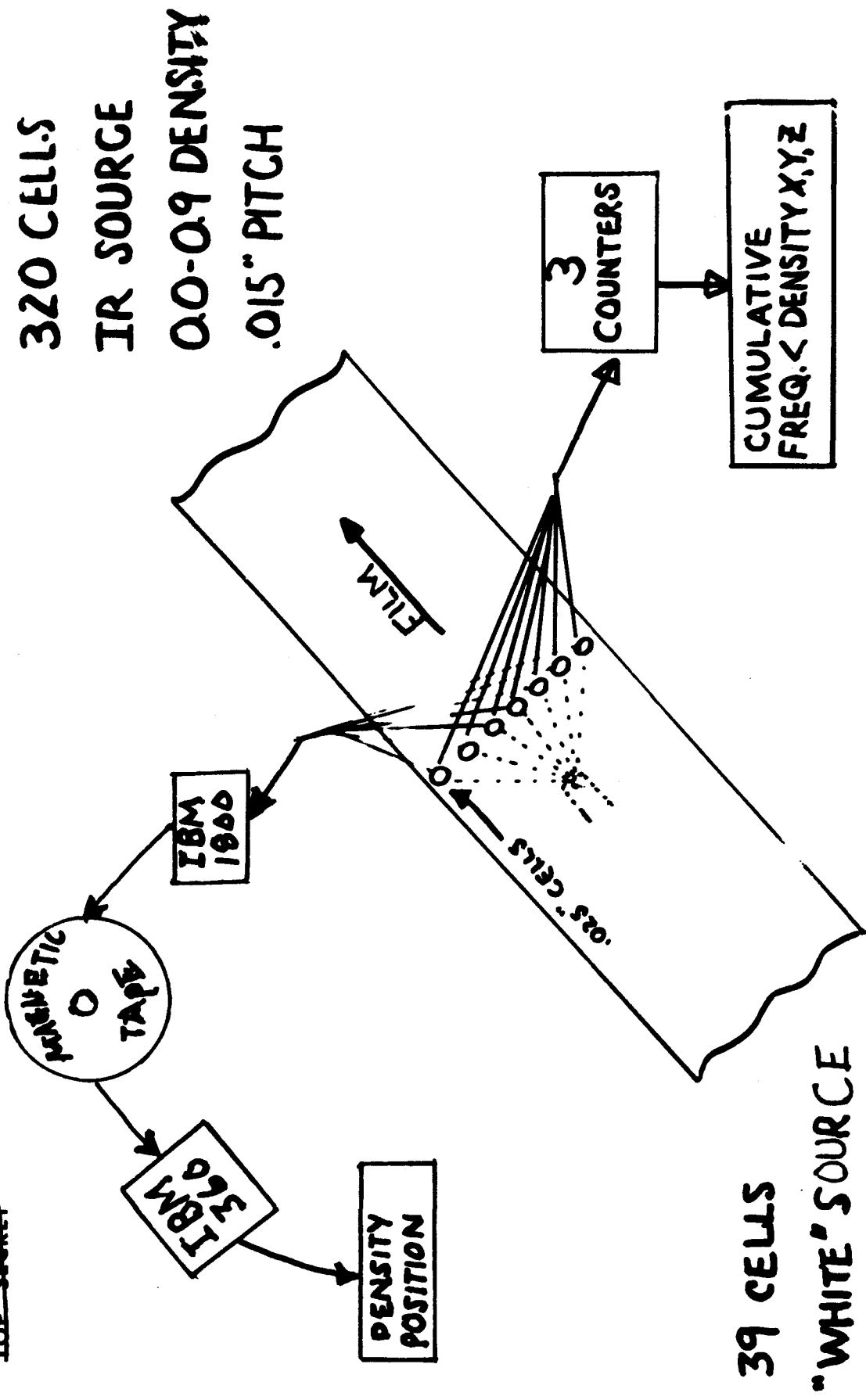
Testbed Operation

Y-6 Installation

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320 CELLS
IR SOURCE
0.0-0.9 DENSITY
.015" PITCH

3
COUNTERS
CUMULATIVE
FREQ. < DENSITY X, Y, Z

39 CELLS
"WHITE" SOURCE
0.0-4.0 DENSITY
0.020-.0200" PITCH

SCANNING TOOLS

PAR 70
PAR 61

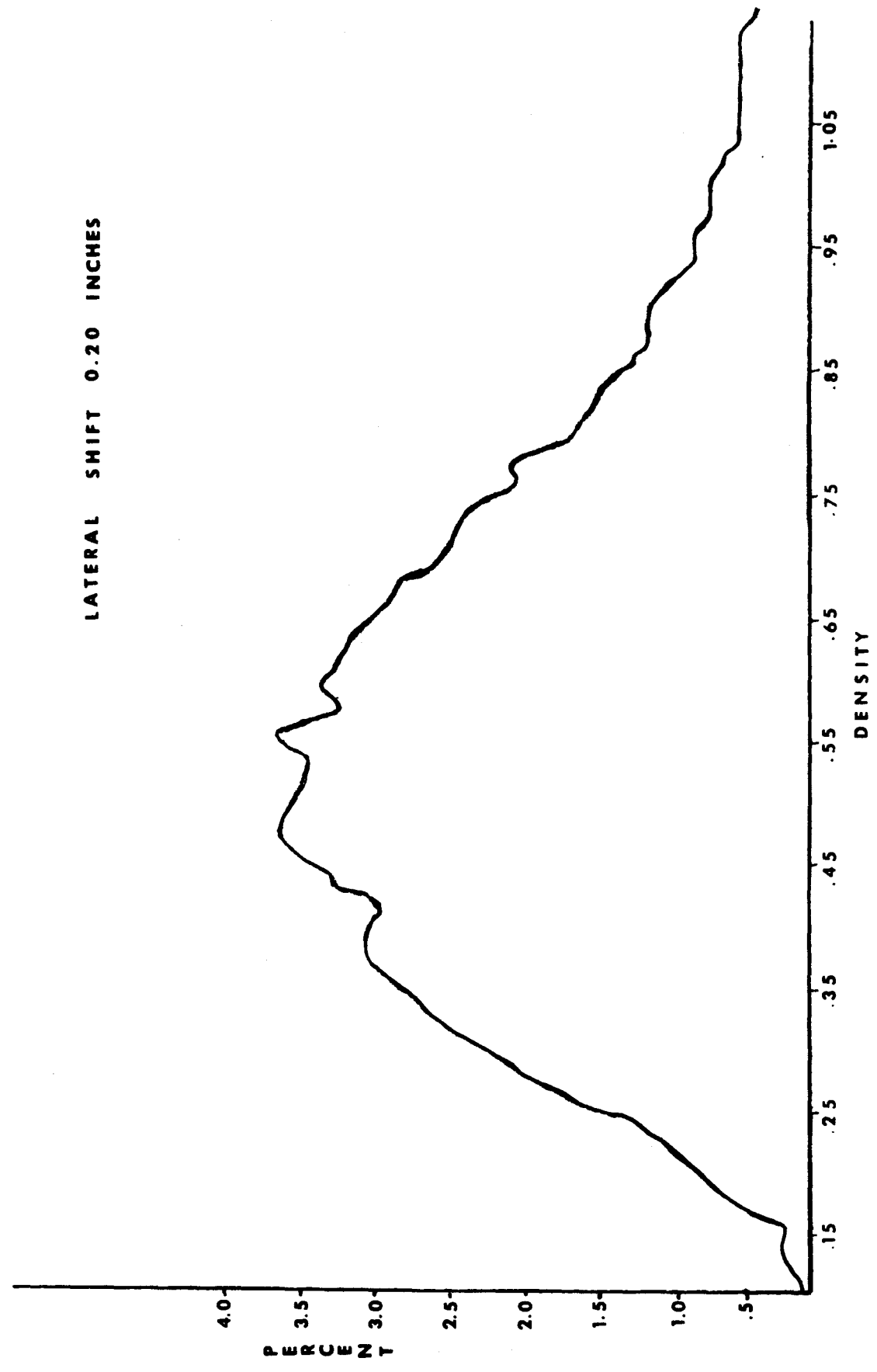
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MISSION [REDACTED]
PASS 32
FRAME 1

LATERAL SHIFT 0.20 INCHES



[REDACTED]

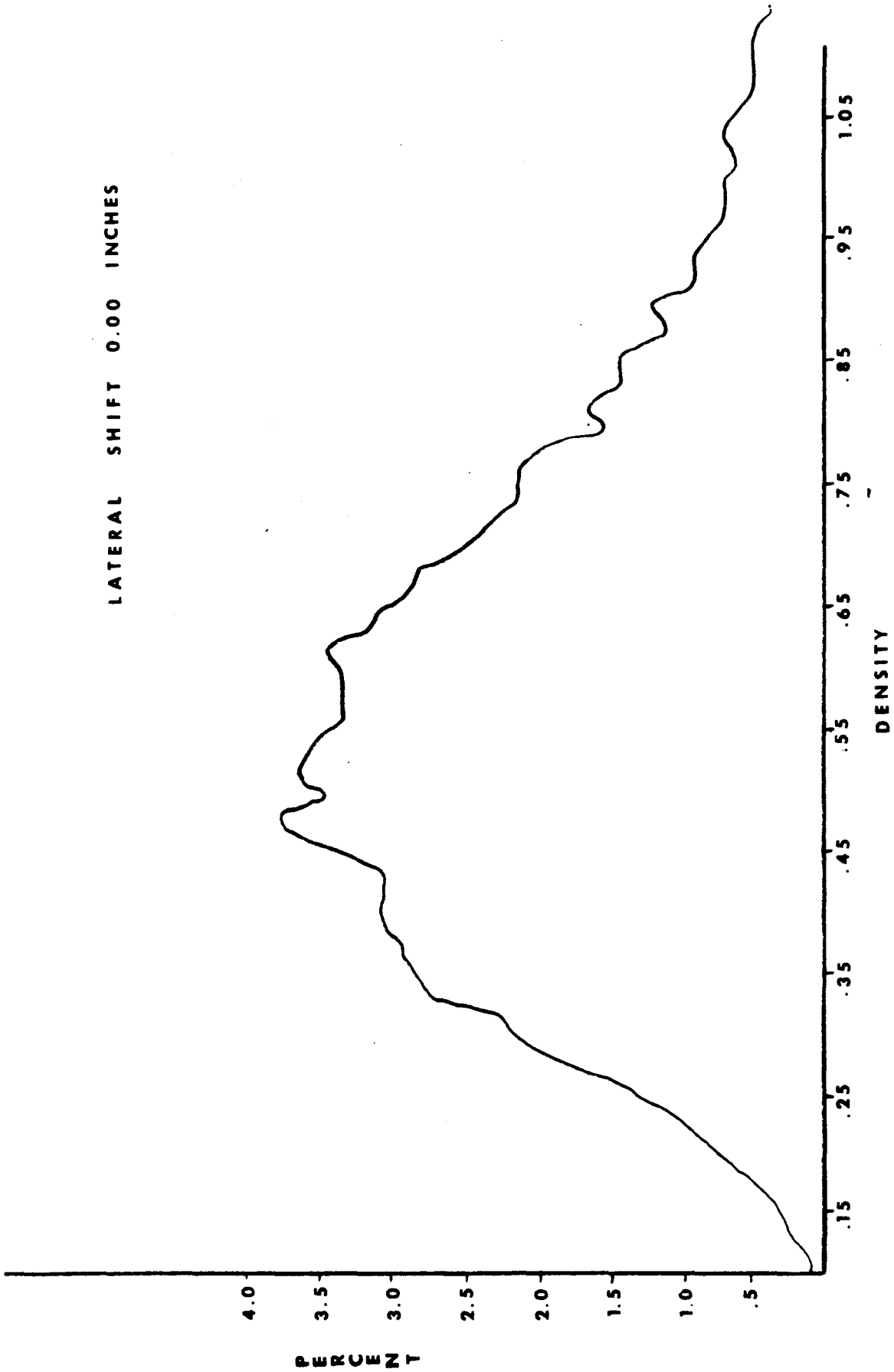
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[REDACTED]

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MISSION [REDACTED]
PASS 32
FRAME 1

LATERAL SHIFT 0.00 INCHES



[REDACTED]

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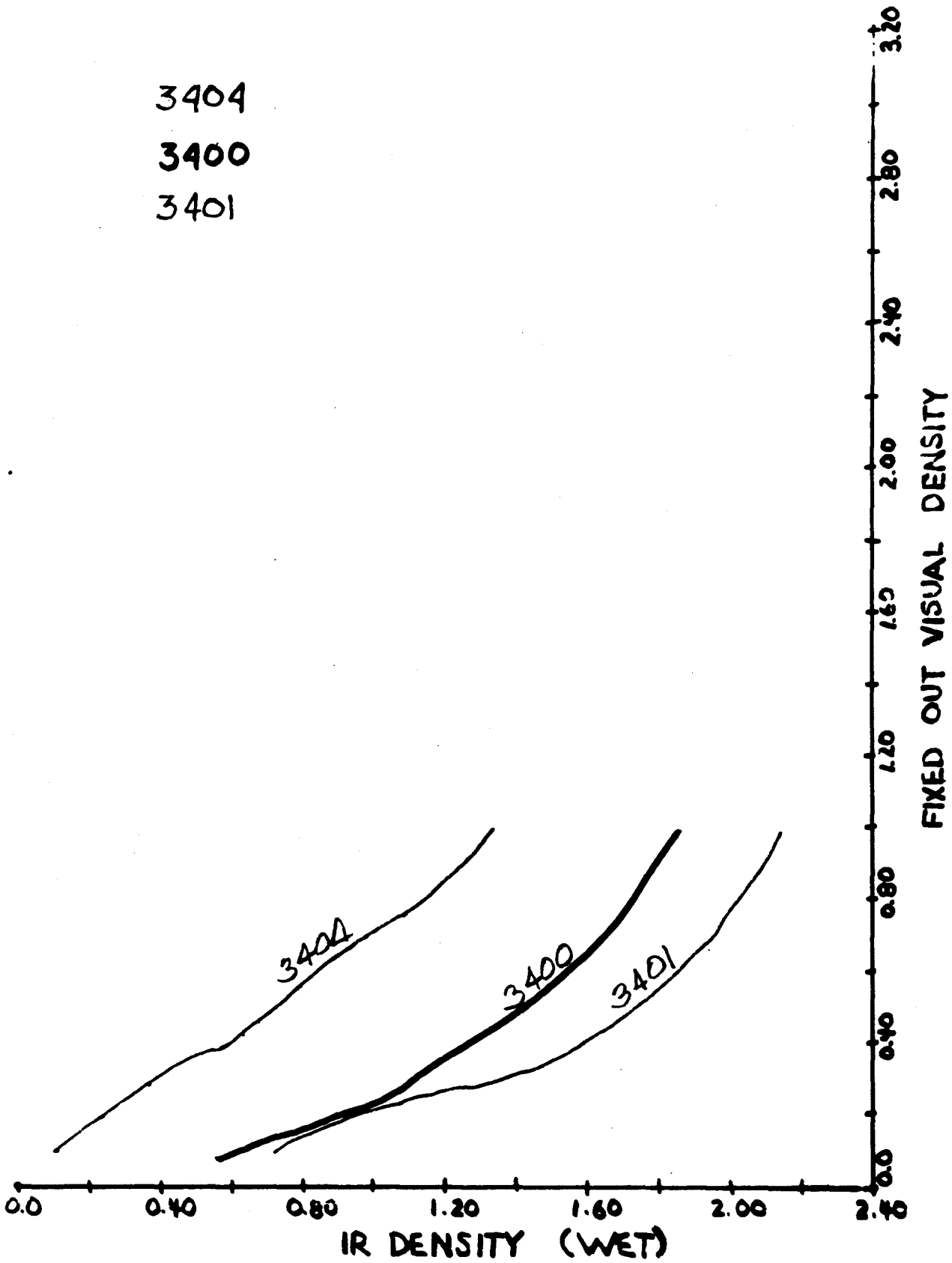


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3404

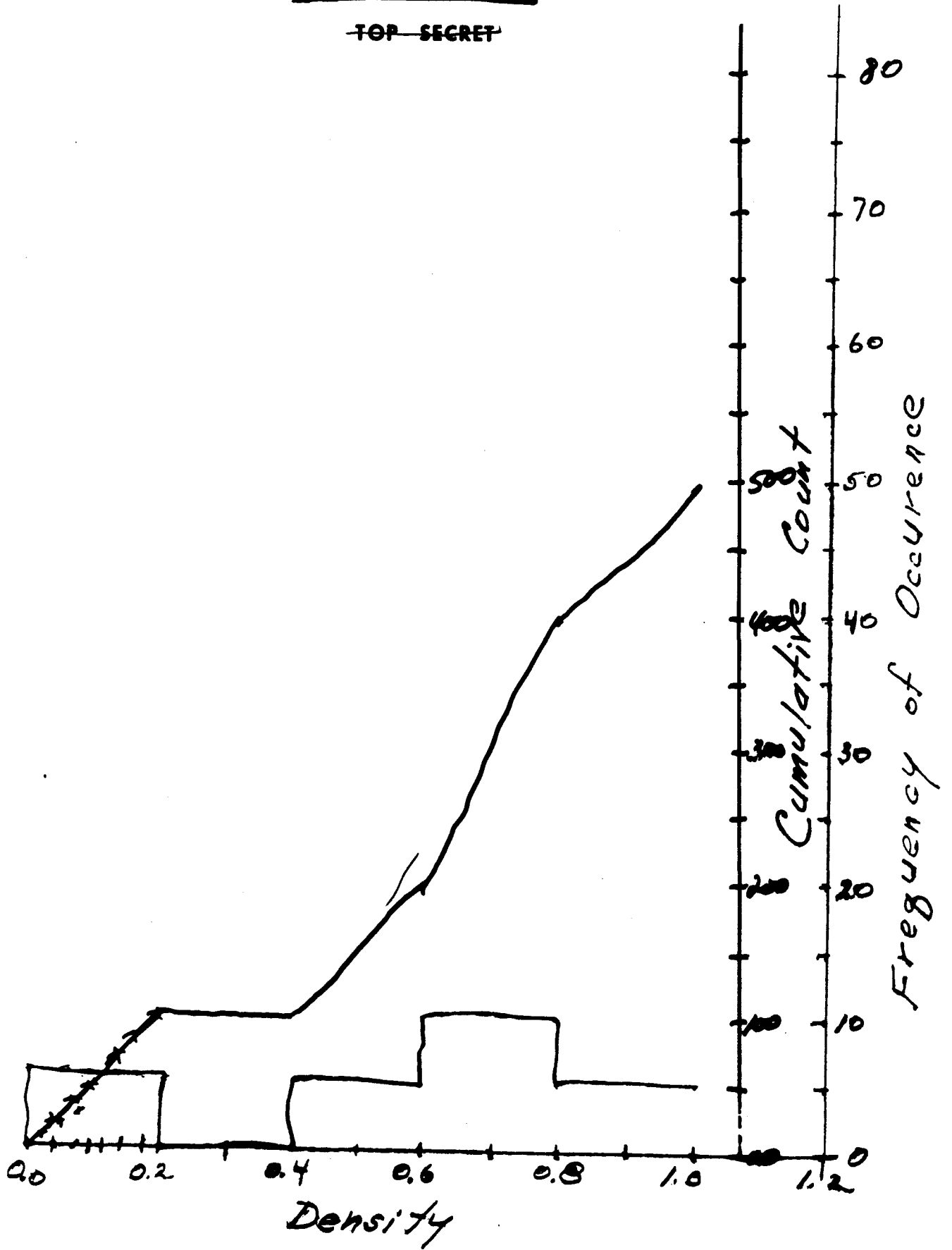
3400

3401



~~TOP SECRET~~

~~TOP SECRET~~



-60-

~~TOP SECRET~~

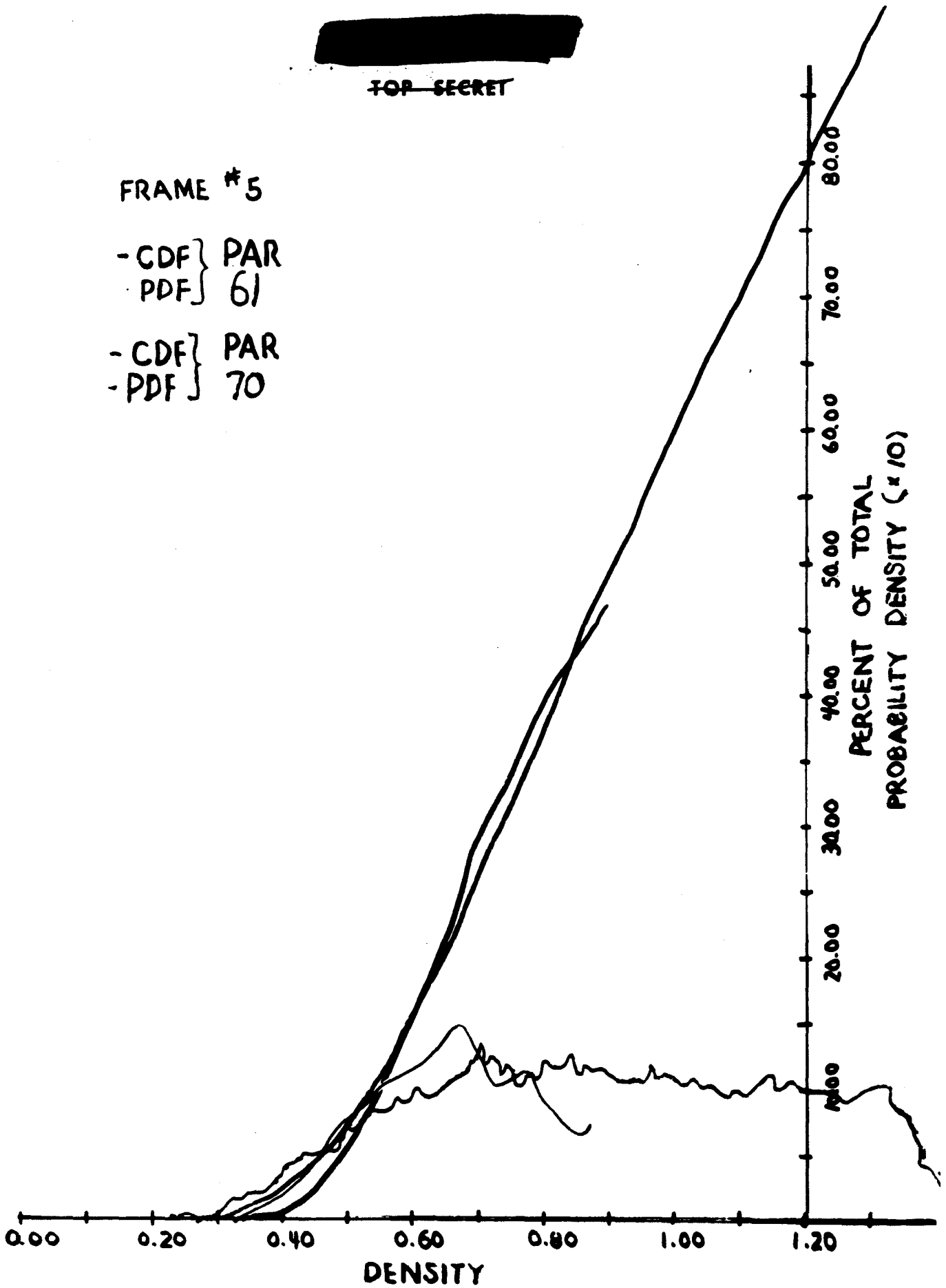
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FRAME # 5

-CDF } PAR
-PDF } 61

-CDF } PAR
-PDF } 70



[REDACTED]

~~TOP SECRET~~

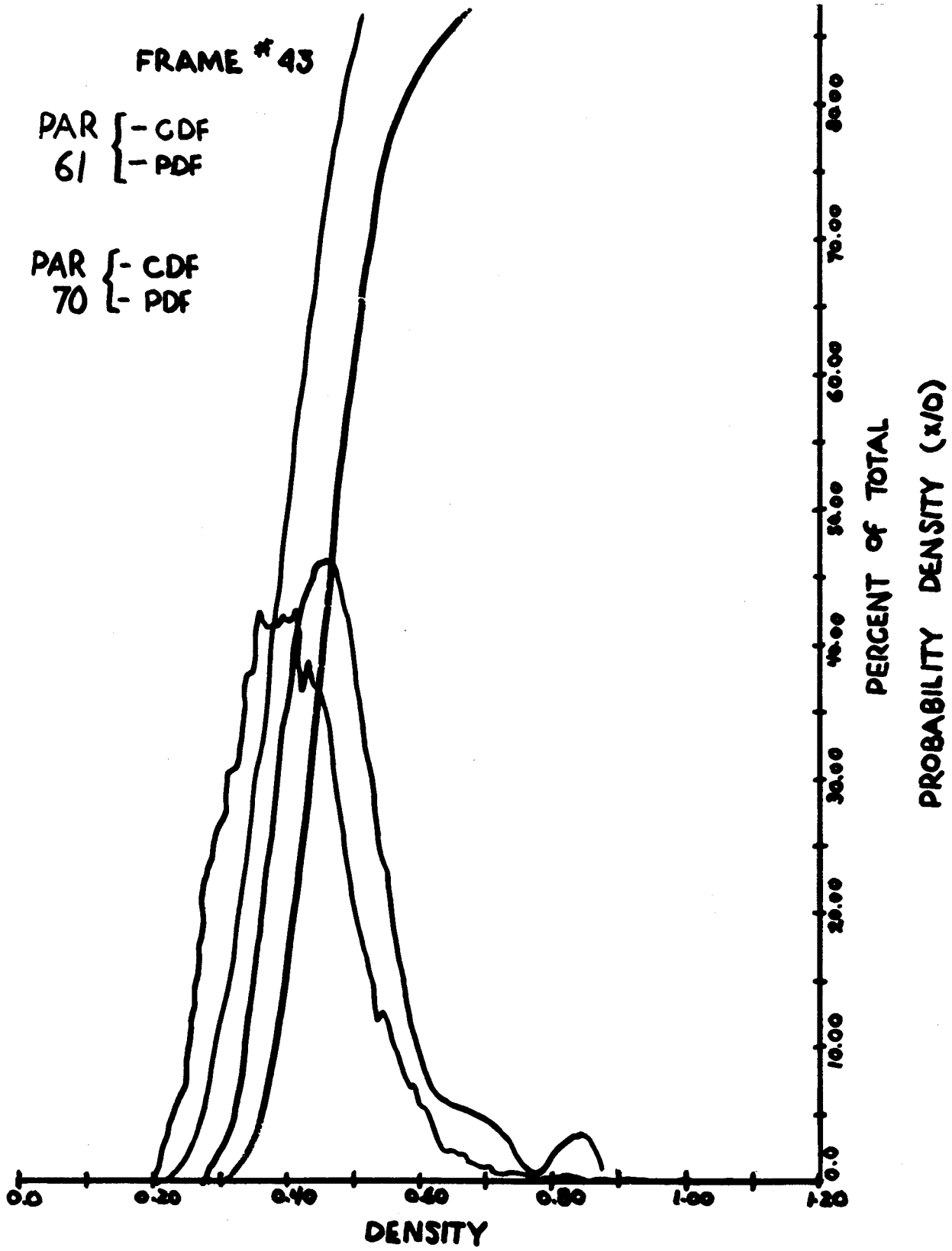
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~~TOP SECRET~~

FRAME # 43

PAR { - CDF
61 { - PDF

PAR { - CDF
70 { - PDF



[REDACTED]

~~TOP SECRET~~

STUDY OF SCANNING TECHNIQUES

PAR 24-7-7S

DATE (1300 RUN)..... 17 3/77

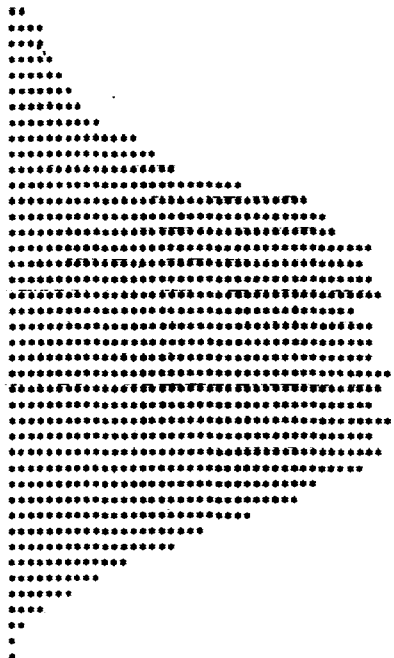
DATE (1100 RUN)..... 12/15/77

70% urban - 15% agricultural - 15% miscellaneous
TTC

SAMPLE NO...8 RUN NO...01 LAL. NO...1 LAST CELL...02 PITCH...02

EACH (*) VALUE = 1/10 OF 1 PERCENT OF TOTAL

0.01	0.02	0.0	0.0
0.03	0.04	0.0	0.0
0.05	0.06	0.0	0.0
0.07	0.08	0.0	0.0
0.09	0.10	0.0	0.0
0.11	0.12	0.0	0.0
0.13	0.14	0.0	0.0
0.15	0.16	0.0	0.0
0.17	0.18	0.0	0.0
0.19	0.20	0.0	0.0
0.21	0.22	0.0	0.0
0.23	0.24	0.0	0.0
0.25	0.26	0.0	0.0
0.27	0.28	0.0	0.0
0.29	0.30	0.0	0.0
0.31	0.32	0.0	0.0
0.33	0.34	0.0	0.0
0.35	0.36	0.0	0.0
0.37	0.38	0.0	0.0
0.39	0.40	0.0	0.0
0.41	0.42	0.0	0.0
0.43	0.44	0.0	0.0
0.45	0.46	0.0	0.0
0.47	0.48	0.303E-22	0.103E-02
0.49	0.50	0.787E-21	0.426E-01
0.51	0.52	0.287E-20	0.377E-00
0.53	0.54	0.464E-19	0.634E-00
0.55	0.56	0.440E-19	0.129E-01
0.57	0.58	0.574E-19	0.187E-01
0.59	0.60	0.665E-19	0.253E-01
0.61	0.62	0.751E-19	0.332E-01
0.63	0.64	0.839E-19	0.422E-01
0.65	0.66	0.105E-18	0.527E-01
0.67	0.68	0.146E-18	0.647E-01
0.69	0.70	0.188E-18	0.785E-01
0.71	0.72	0.231E-18	0.102E-02
0.73	0.74	0.275E-18	0.128E-02
0.75	0.76	0.321E-18	0.160E-02
0.77	0.78	0.368E-18	0.194E-02
0.79	0.80	0.416E-18	0.230E-02
0.81	0.82	0.465E-18	0.269E-02
0.83	0.84	0.515E-18	0.307E-02
0.85	0.86	0.566E-18	0.348E-02
0.87	0.88	0.618E-18	0.387E-02
0.89	0.90	0.671E-18	0.424E-02
0.91	0.92	0.725E-18	0.464E-02
0.93	0.94	0.780E-18	0.504E-02
0.95	0.96	0.835E-18	0.543E-02
0.97	0.98	0.891E-18	0.585E-02
0.99	1.00	0.948E-18	0.626E-02
1.01	1.02	0.341E-17	0.665E-02
1.03	1.04	0.422E-17	0.707E-02
1.05	1.06	0.505E-17	0.746E-02
1.07	1.08	0.607E-17	0.787E-02
1.09	1.10	0.716E-17	0.825E-02
1.11	1.12	0.839E-17	0.859E-02
1.13	1.14	0.970E-17	0.890E-02
1.15	1.16	0.262E-16	0.917E-02
1.17	1.18	0.215E-16	0.938E-02
1.19	1.20	0.180E-16	0.956E-02
1.21	1.22	0.134E-16	0.970E-02
1.23	1.24	0.106E-16	0.980E-02
1.25	1.26	0.732E-16	0.987E-02
1.27	1.28	0.437E-16	0.992E-02
1.29	1.30	0.291E-16	0.995E-02
1.31	1.32	0.193E-16	0.997E-02
1.33	1.34	0.122E-16	0.998E-02
1.35	1.36	0.905E-16	0.999E-02
1.37	1.38	0.649E-16	0.999E-02
1.39	1.40	0.417E-16	0.100E-03
1.41	1.42	0.0	0.100E-03
1.43	1.44	0.236E-16	0.100E-03
1.45	1.46	0.393E-16	0.100E-03
1.47	1.48	0.0	0.100E-03
1.49	1.50	0.393E-16	0.100E-03
1.51	1.52	0.393E-16	0.100E-03
1.53	1.54	0.393E-16	0.100E-03

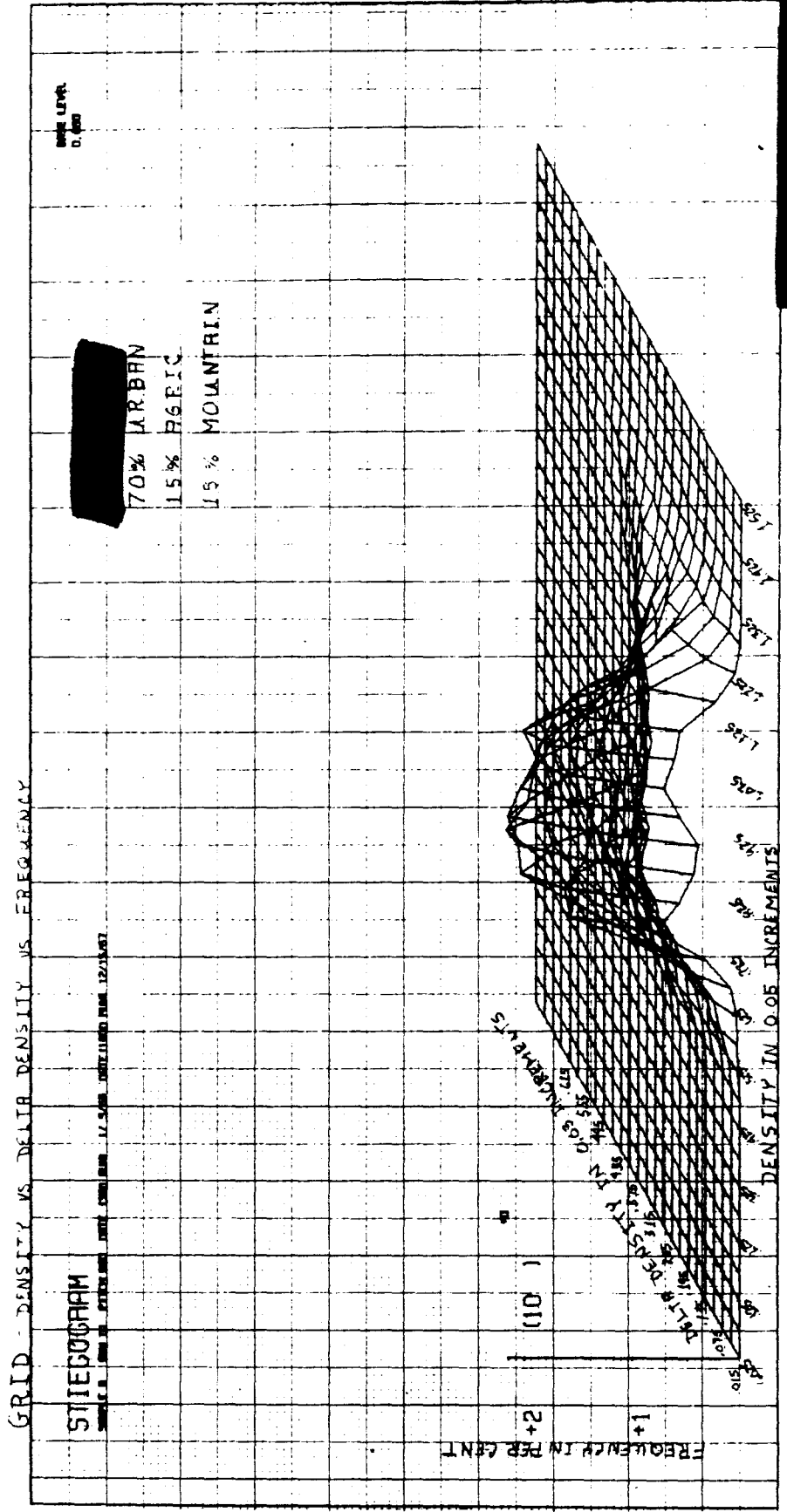


TOTAL OBSERVATIONS = 0.254140000E 05

TOP SECRET

STUDY OF SCANNING TECHNIQUES

PAR 24-7-7S



TOP SECRET

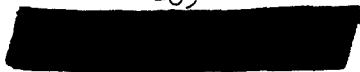
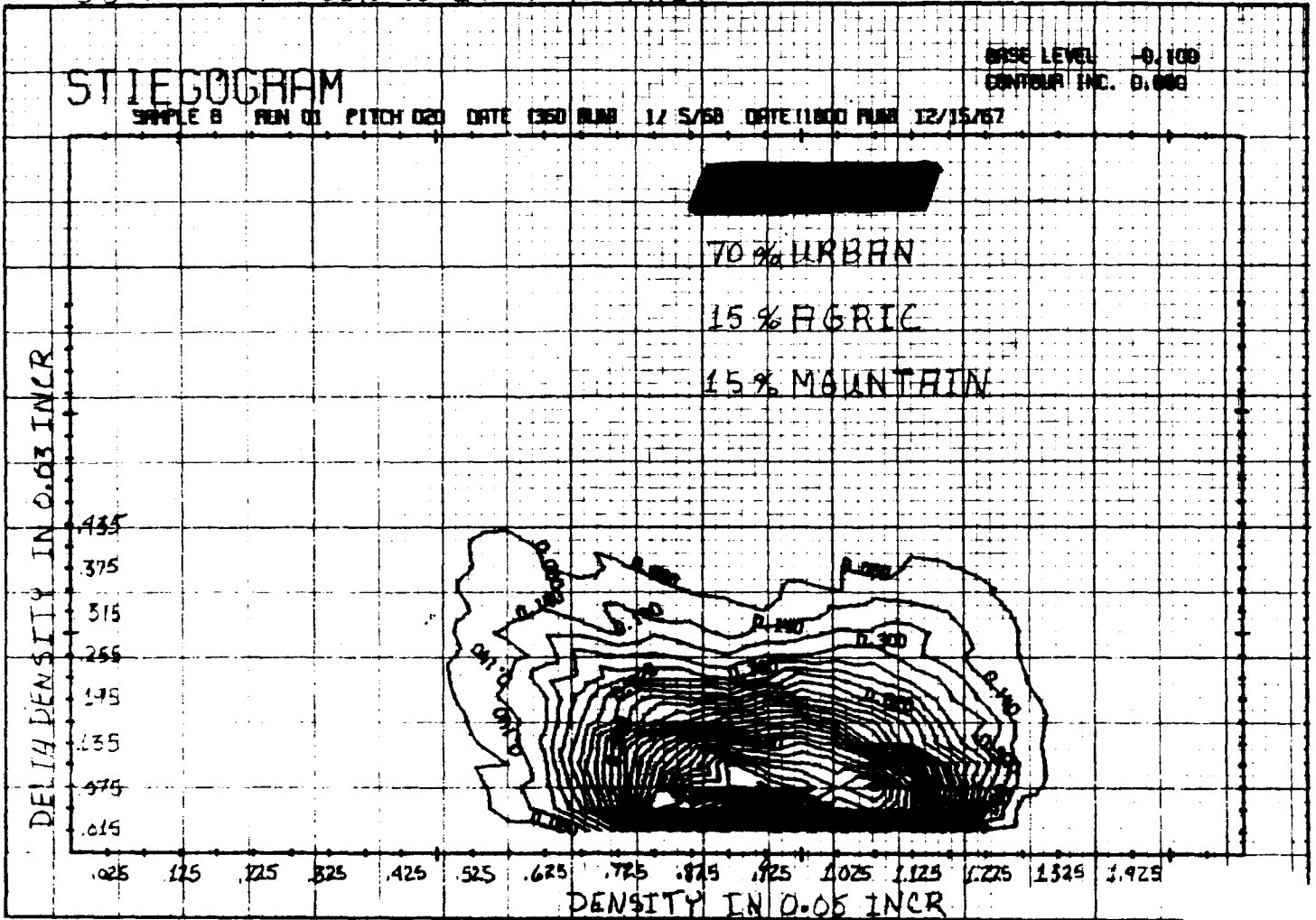


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STUDY OF SCANNING TECHNIQUES

PAR 24-7-75

CONTOUR - DEN VS A DEN VS FREQ



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STUDY OF SCANNING TECHNIQUES

PAR 24-7-7S

DATE (300 RUN)..... 12/31/68
DATE (1000 RUN)..... 12/15/67

*65% water - 15% urban + industry -
20% agricultural*

SAMPLE NO. 0005 RUN NO. 0001 CAL. NO. 0001 LAST CELL. 0049 PITCH. 0020

CELL VALUE = 1% OF 1 PERCENT OF TOTAL

0.01	0.02	0.0	0.0
0.03	0.04	0.0	0.0
0.05	0.07	0.0	0.0
0.07	0.09	0.0	0.0
0.09	0.10	0.0	0.0
0.11	0.12	0.0	0.0
0.13	0.14	0.0	0.0
0.14	0.16	0.0	0.0
0.17	0.18	0.0	0.0
0.19	0.20	0.0	0.0
0.21	0.22	0.0	0.0
0.23	0.24	0.0	0.0
0.25	0.26	0.0	0.0
0.27	0.28	0.0	0.0
0.29	0.30	0.0	0.0
0.31	0.32	0.0	0.0
0.33	0.34	0.0	0.0
0.35	0.36	0.607E-02	0.607E-02
0.37	0.38	0.443E-00	0.443E-00
0.39	0.40	0.019E-01	0.019E-01
0.41	0.42	0.385E-02	0.385E-02
0.43	0.44	0.455E-01	0.455E-01
0.45	0.46	0.123E-01	0.123E-01
0.47	0.48	0.583E-02	0.583E-02
0.49	0.50	0.473E-02	0.473E-02
0.51	0.52	0.766E-02	0.766E-02
0.53	0.54	0.190E-01	0.190E-01
0.55	0.56	0.351E-01	0.351E-01
0.57	0.58	0.574E-01	0.574E-01
0.59	0.60	0.546E-01	0.546E-01
0.61	0.62	0.426E-01	0.426E-01
0.63	0.64	0.324E-01	0.324E-01
0.65	0.66	0.281E-01	0.281E-01
0.67	0.68	0.241E-01	0.241E-01
0.69	0.70	0.213E-01	0.213E-01
0.71	0.72	0.201E-01	0.201E-01
0.73	0.74	0.183E-01	0.183E-01
0.75	0.76	0.142E-01	0.142E-01
0.77	0.78	0.113E-01	0.113E-01
0.79	0.80	0.790E-02	0.790E-02
0.81	0.82	0.940E-02	0.940E-02
0.83	0.84	0.461E-02	0.461E-02
0.85	0.86	0.525E-02	0.525E-02
0.87	0.88	0.461E-02	0.461E-02
0.89	0.90	0.329E-02	0.329E-02
0.91	0.92	0.337E-02	0.337E-02
0.93	0.94	0.267E-02	0.267E-02
0.95	0.96	0.221E-02	0.221E-02
0.97	0.98	0.173E-02	0.173E-02
0.99	1.00	0.170E-02	0.170E-02
1.01	1.02	0.118E-02	0.118E-02
1.03	1.04	0.115E-02	0.115E-02
1.05	1.06	0.118E-02	0.118E-02
1.07	1.08	0.789E-01	0.789E-01
1.09	1.10	0.819E-01	0.819E-01
1.11	1.12	0.516E-01	0.516E-01
1.13	1.14	0.303E-01	0.303E-01
1.15	1.16	0.394E-01	0.394E-01
1.17	1.18	0.212E-01	0.212E-01
1.19	1.20	0.212E-01	0.212E-01
1.21	1.22	0.212E-01	0.212E-01
1.23	1.24	0.910E-02	0.910E-02
1.25	1.26	0.303E-02	0.303E-02
1.27	1.28	0.303E-02	0.303E-02
1.29	1.30	0.0	0.0
1.31	1.32	0.0	0.0
1.33	1.34	0.303E-02	0.303E-02
1.35	1.36	0.303E-02	0.303E-02

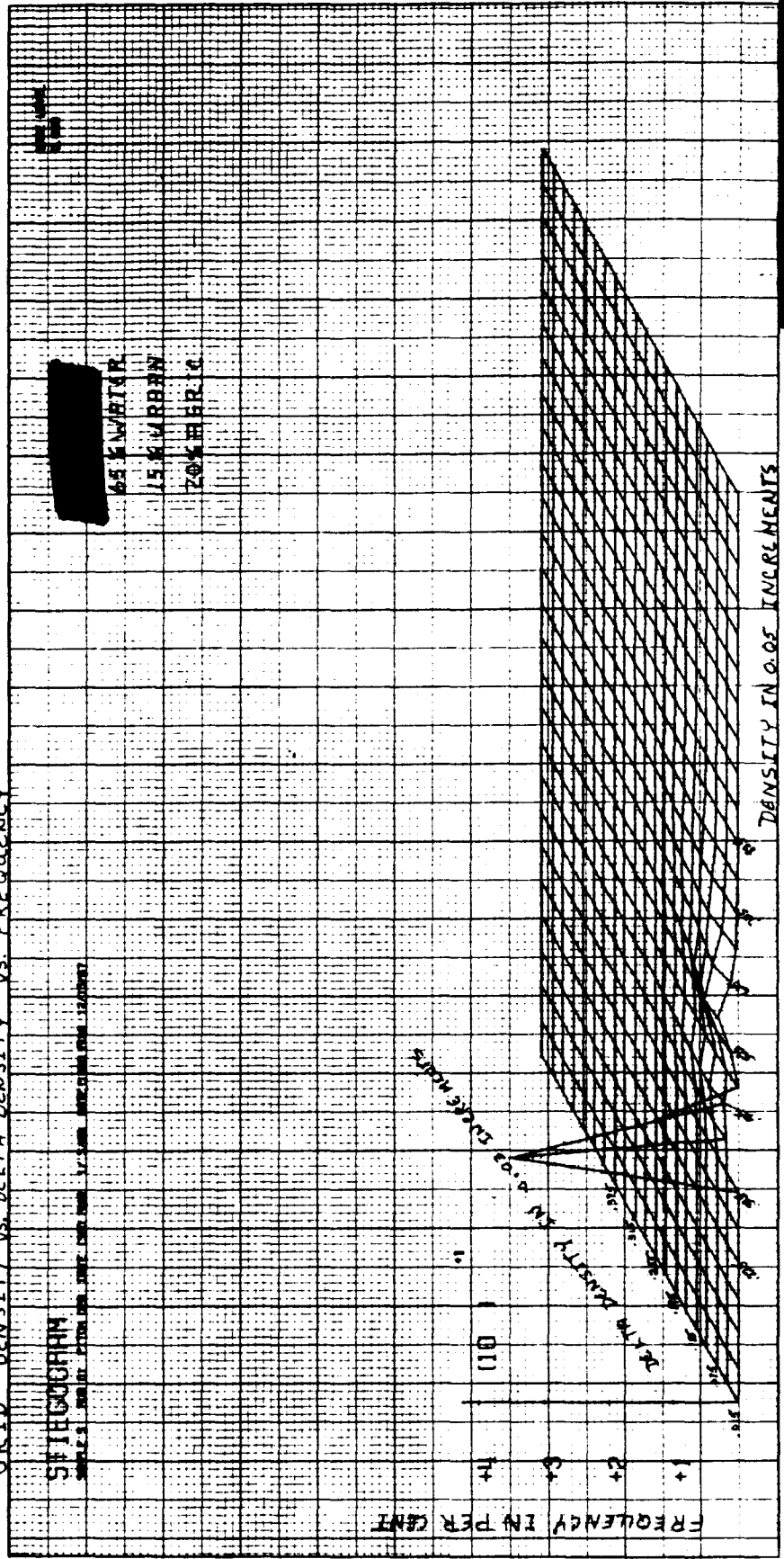
TOTAL INSERVATIONS = 0.329710000E 05

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STUDY OF SCANNING TECHNIQUES

PAR 24-7-7S

GRID - DENSITY VS. DELTA DENSITY VS. FREQUENCY

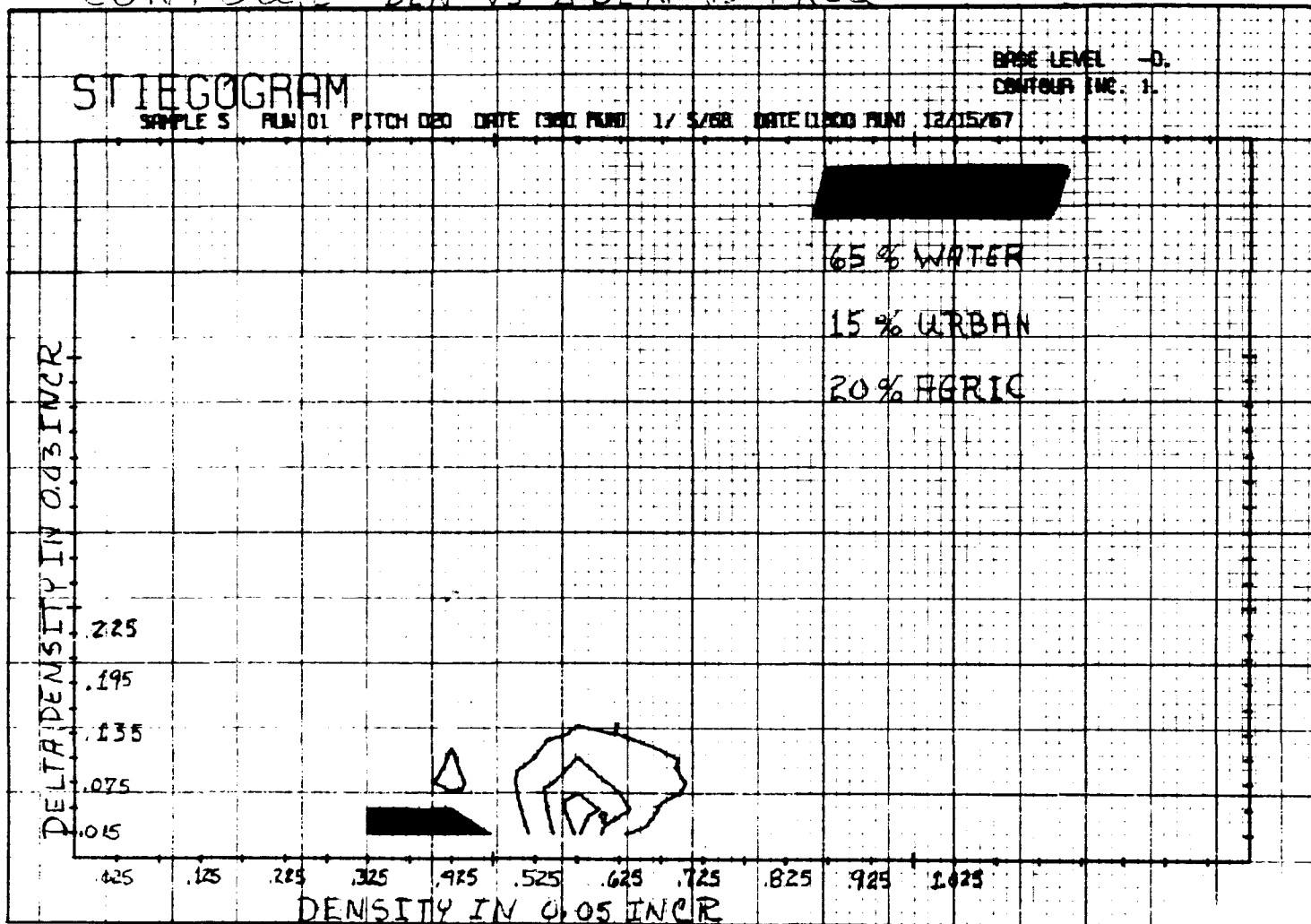


TOP SECRET

STUDY OF SCANNING TECHNIQUES

PAR 24-7-75

CONTOUR - DEN VS A DEN VS FREQ



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STUDY OF SCALPING TECHNIQUES

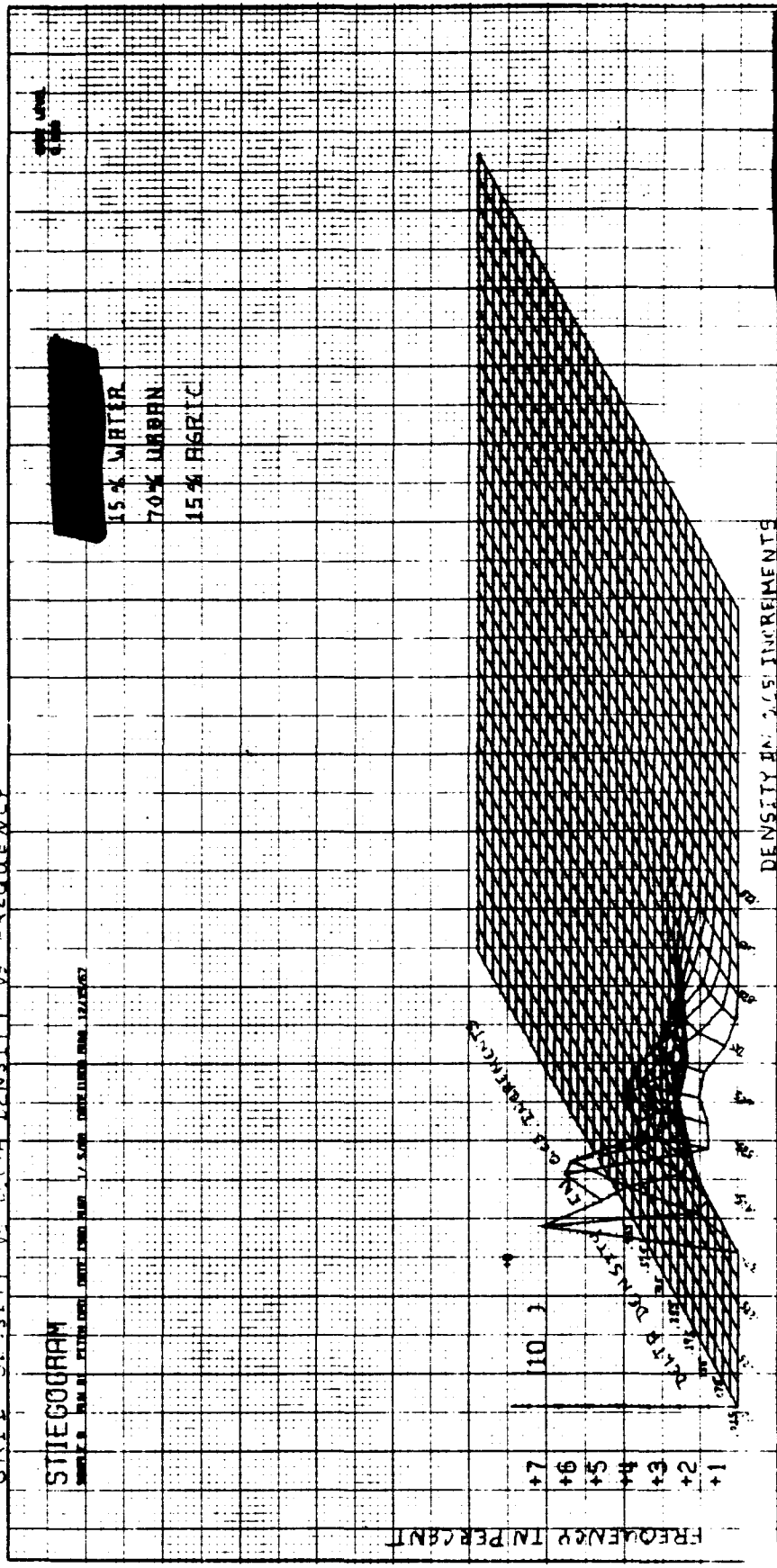
PAR 24-7-7S

GRID DENSITY VS DENSITY VS FREQUENCY

STIEGGRAM

STIEGGRAM, R. B. PETERSON, JR. JUNE 1967. STIEGGRAM, R. B. PETERSON, JR. JUNE 1967.

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15% WATER
70% URBAN
15% AGRIC.



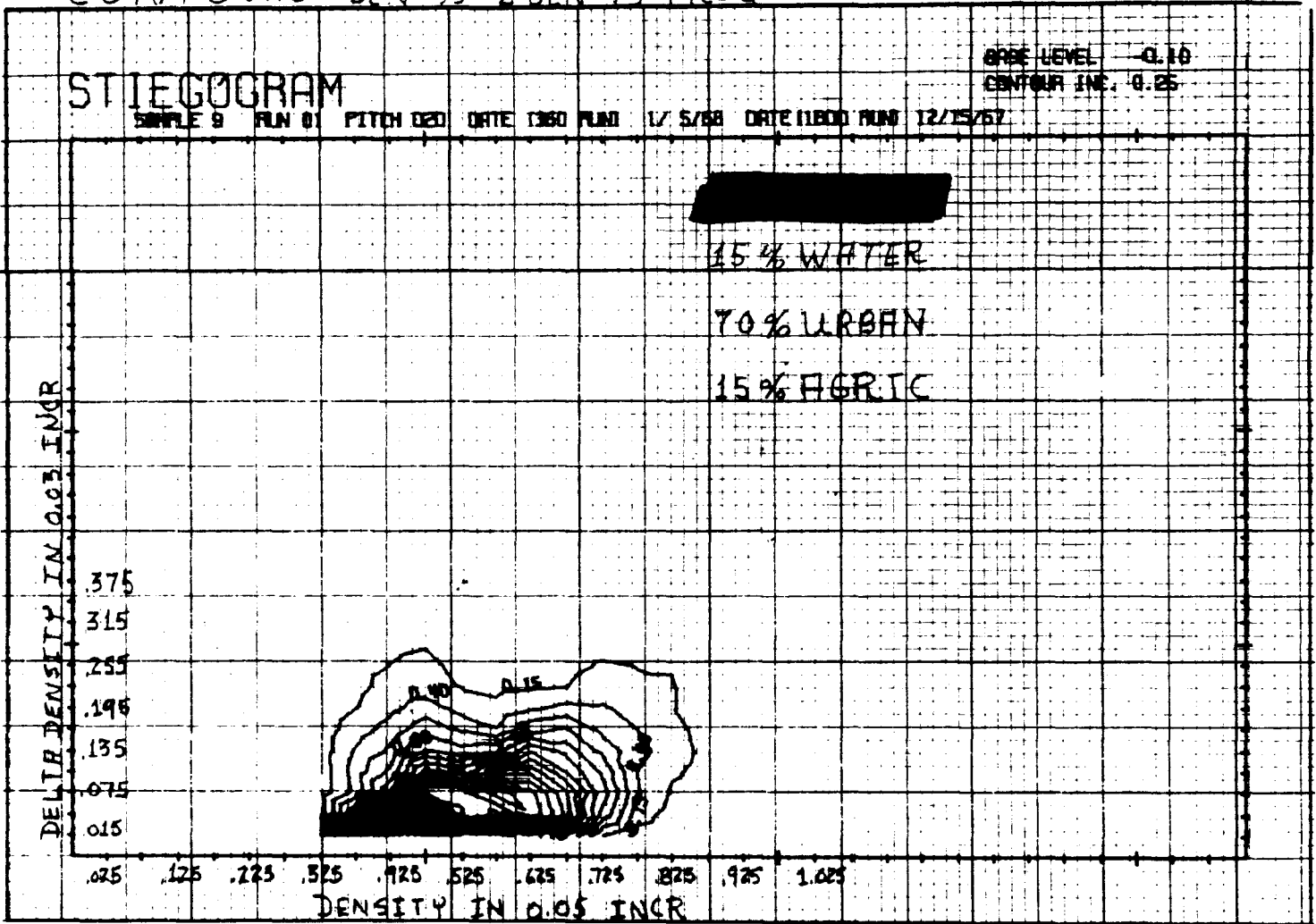
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STUDY OF SCANNING TECHNIQUES

PAR 24-7-75

CONTOUR-DEN VS A DEN VS FREQ



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PAR 116S/R2

DISTORTION IN PHOTO DUPLICATION

PROGRESS REVIEW

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TEST SUMMARY

<u>Quantity</u>	<u>Film</u>	<u>Mode</u>	<u>Description</u>
30	UTB	Inter	4" Cores
30	UTB/2430		4" Cores, Copy 1
30	2430		
50	UTB	Cont	4" Cores, M.S.
50	UTB/2430		4" Cores, Copy 1
15	3404	Cont	2" Cores
15	3404/2430		2" Cores, Copy 1
15	UTB	Cont 1102-1	2" Cores, 3 Rolls
5	UTB/2430	Cont 1102-1	2" Cores, 1 Roll, Copy 1-11
5/2	UTB	Cont	4" Cores, M.S.
5/2	3404	Cont	2" Cores, M.S.
5/2	UTB		4" Cores, 5 of Copy 1, 2 of Copy 2-5, M.S.
5/2	3404		2" Cores, 5 of Copy 1, 2 of Copy 2-5, M.S.



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[REDACTED]

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PAR 116S/R2

Continued

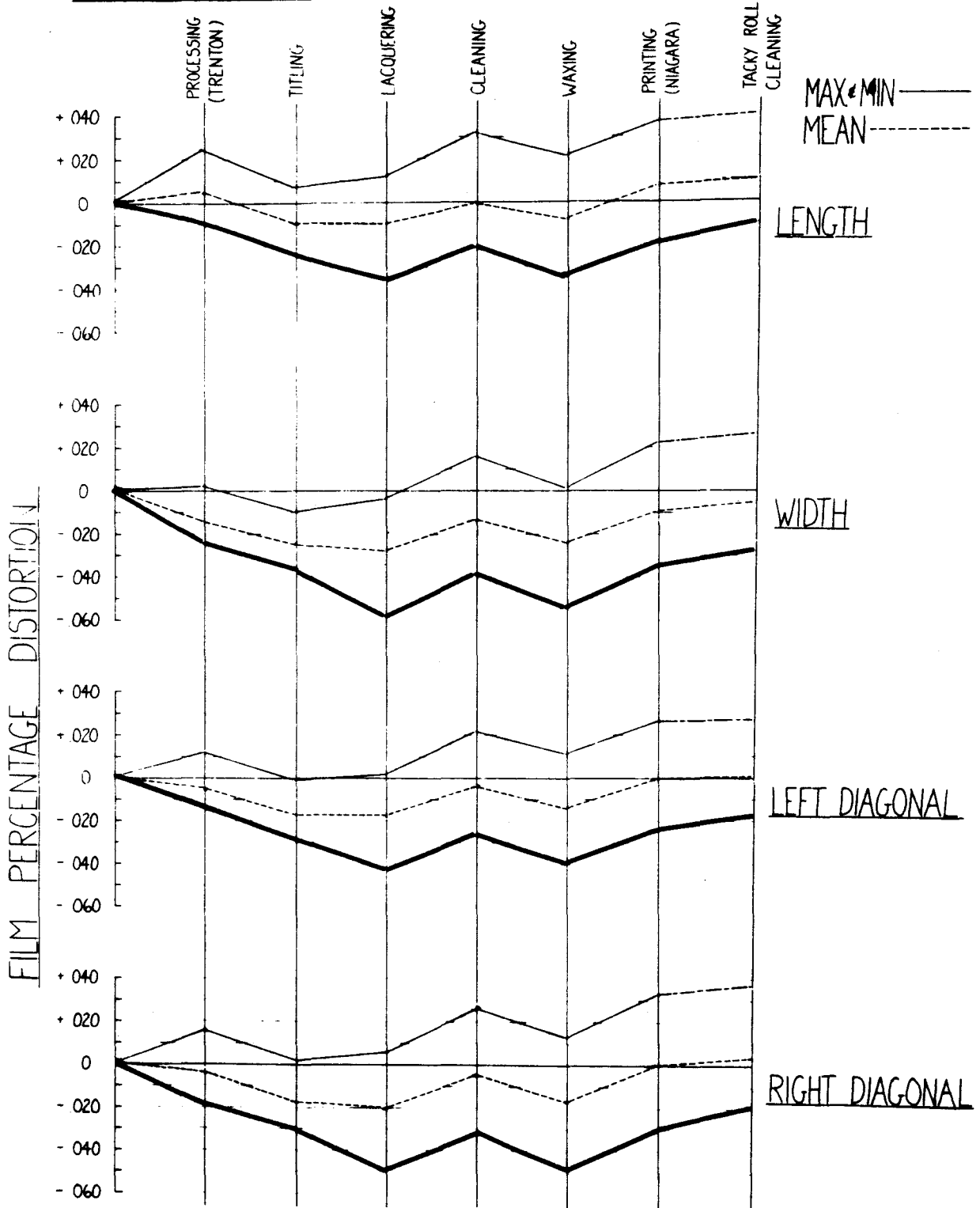
<u>Quantity</u>	<u>Film</u>	<u>Mode</u>	<u>Description</u>
5	UTB	Cont 1102-2	2" Cores
5	3404	Cont 1102-2	2" Cores
5	UTB	Cont 1102-2	4" Cores
5	3404	Cont 1102-2	4" Cores
5	UTB/2430		2" Cores, 20 Copies
5	3404/2430		2" Cores, 20 Copies
5	UTB/2430		4" Cores, 15 Copies
5	3404/2430		4" Cores, 15 Copies

[REDACTED]

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SO 380 FILM DISTORTION (70MM)

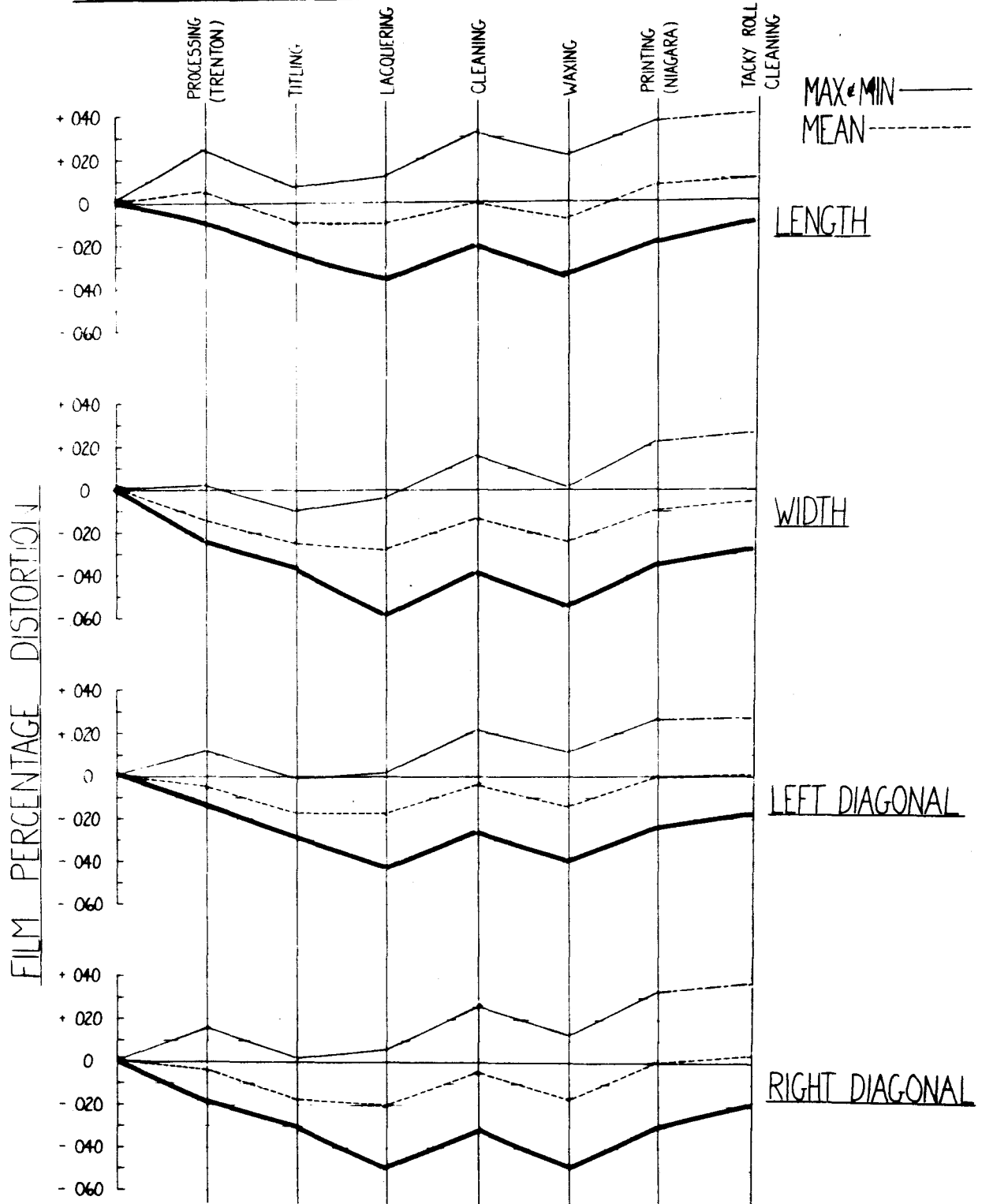
RANGE OF DISTORTION VALUES FOR ALL SAMPLES





~~TOP SECRET~~

50 380 FILM DISTORTION (70 MM) RANGE OF DISTORTION VALUES FOR ALL SAMPLES



~~TOP SECRET~~

~~TOP SECRET~~

FILM DISTORTION DATA

	LENGTH			WIDTH			L.D.			R.D.			SO	
	ADD %	NDD %	Test S.D.	ADD %	NDD %	Test S.D.	ADD %	NDD %	Test S.D.	ADD %	NDD %	Test S.D.		
<u>UTB</u>														
INTER	+ .008	.0031	.0143	- .007	.0050	.0152	+ .001	.0029	.0130	+ .002	.0034	.0157	.0070	
CONT	+ .030	.0012	.0071	+ .016	.0039	.0075	+ .026	.0014	.0070	+ .020	.0021	.0077	.0061	
<u>UTB/2430</u>														
INTER	+ .047	.0051	.0194	- .014	.0150	.0179	- .029	.0176	.0266	+ .050	.0081	.0174	.0377	
CONT	+ .069	.0042	.0128	+ .009	.0147	.0103	- .004	.0174	.0143	+ .068	.0076	.0144	.0359	
<u>3404</u>														
CONT	+ .023	.0012		+ .013	.0038		+ .022	.0020		+ .013	.0026		.0055	
<u>3404/2430</u>														
CONT	+ .044	.0064		- .015	.0187		- .041	.0206		+ .050	.0096		.0412	

ADD - Average Directional Distortion, expressed in percent.

NDD - Non-uniform Directional Distortion, standard deviation of Directional Distortions over several intervals, expressed in percent.

Tests S. D. - Standard Deviation of results from several test samples.

SO - Overall non-uniform distortion, expressed in percent.



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NET DUPLICATING DISTORTION DATA

	LENGTH		WIDTH		L.D.		R.D.		SO
	ADD %	NDD %	ADD %	NDD %	ADD %	NDD %	ADD %	NDD %	
<u>UTB/2430</u>									
INTER	+ .055	.0046	+ .012	.0138	- .013	.0174	+ .068	.0073	.0369
CONT	+ .039	.0040	- .007	.0142	- .030	.0173	+ .048	.0073	.0353
<u>3404/2430</u>									
CONT	+ .021	.0063	- .028	.0183	- .063	.0205	+ .037	.0092	.0408

ADD - Average Directional Distortion, expressed in percent.

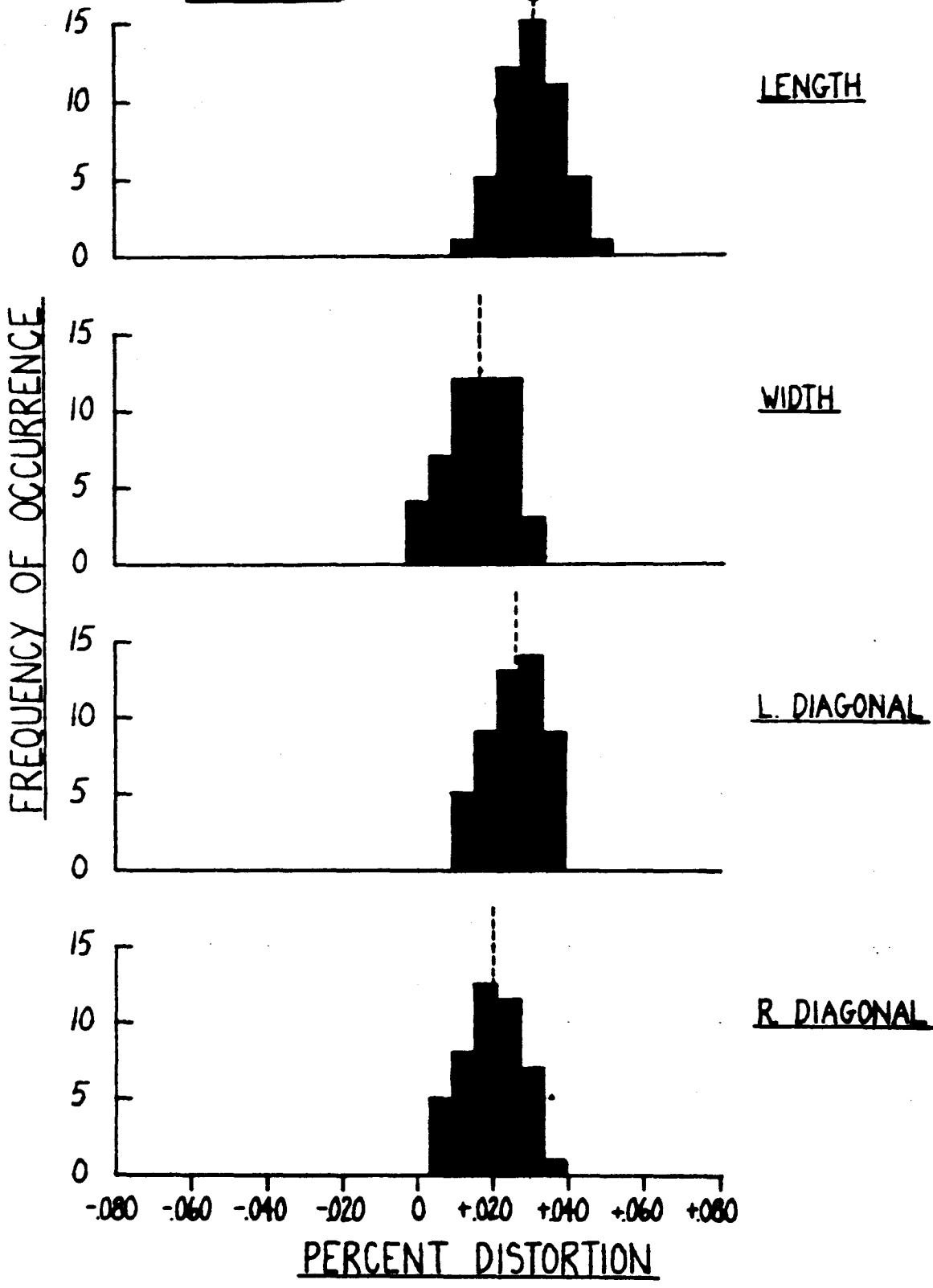
NDD - Non-uniform Directional Distortion, standard deviation of Directional Distortions over several intervals, expressed in percent.

Tests S.D. - Standard Deviation of results from several test samples.

SO - Overall non-uniform distortion, expressed in percent.

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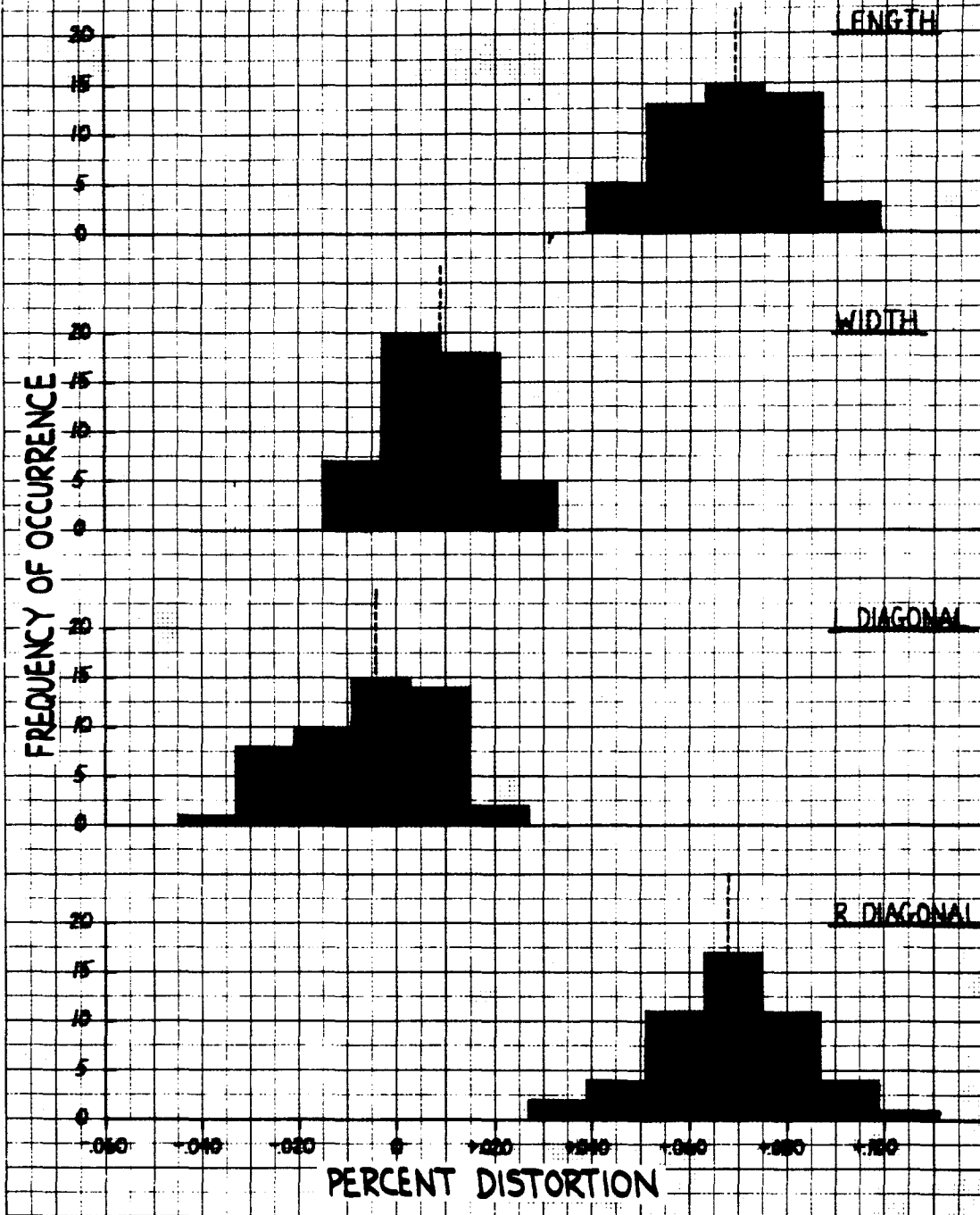
DISTORTION 70mm UTB



727267

DISTORTION DISTRIBUTION OF DUPLS NIAGARA PRINTED
FROM 50 380 COMPOSITE SAMPLES
2430 - 70 MM

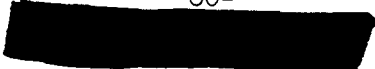
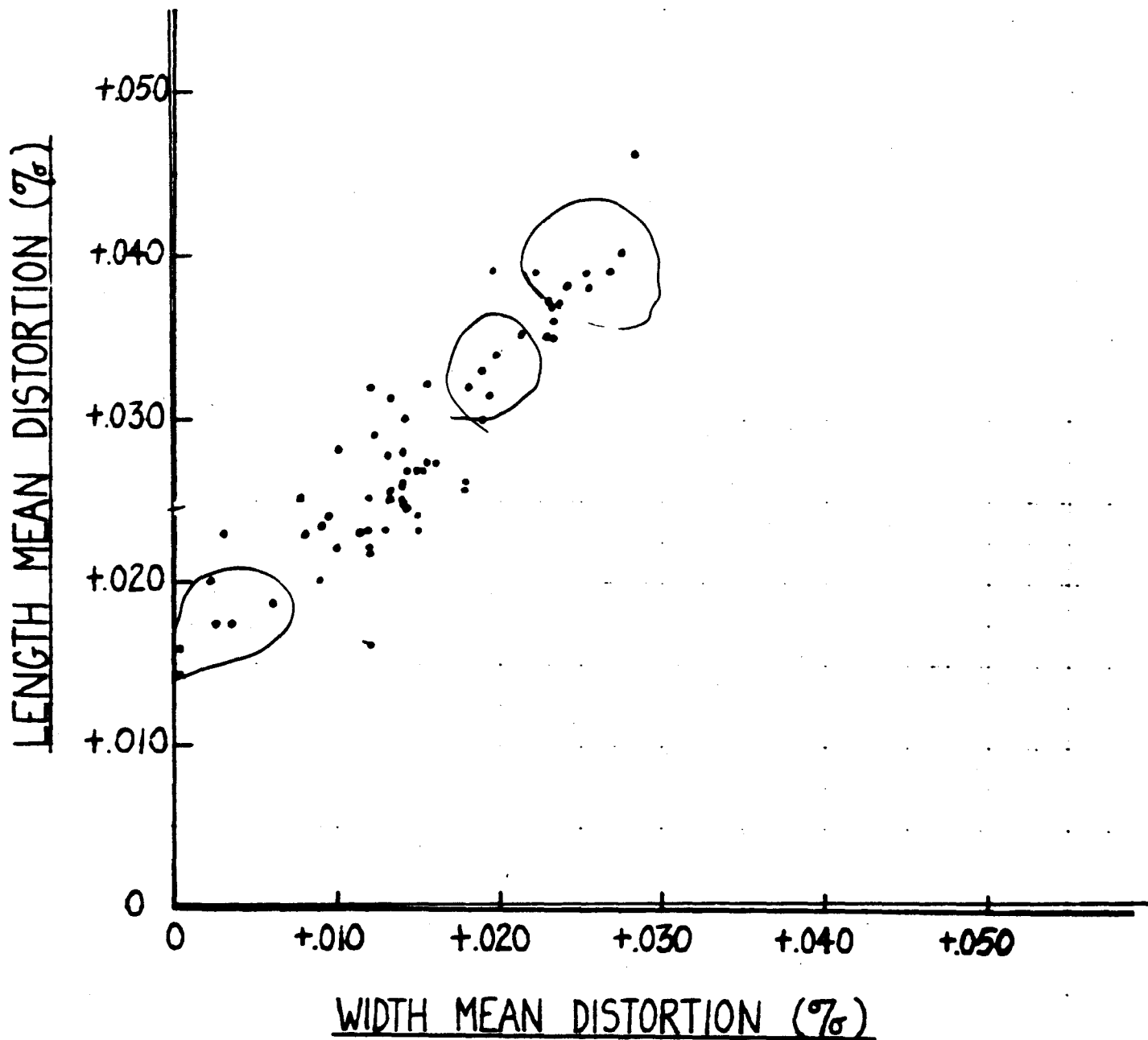
MEAN DISTORTION -----





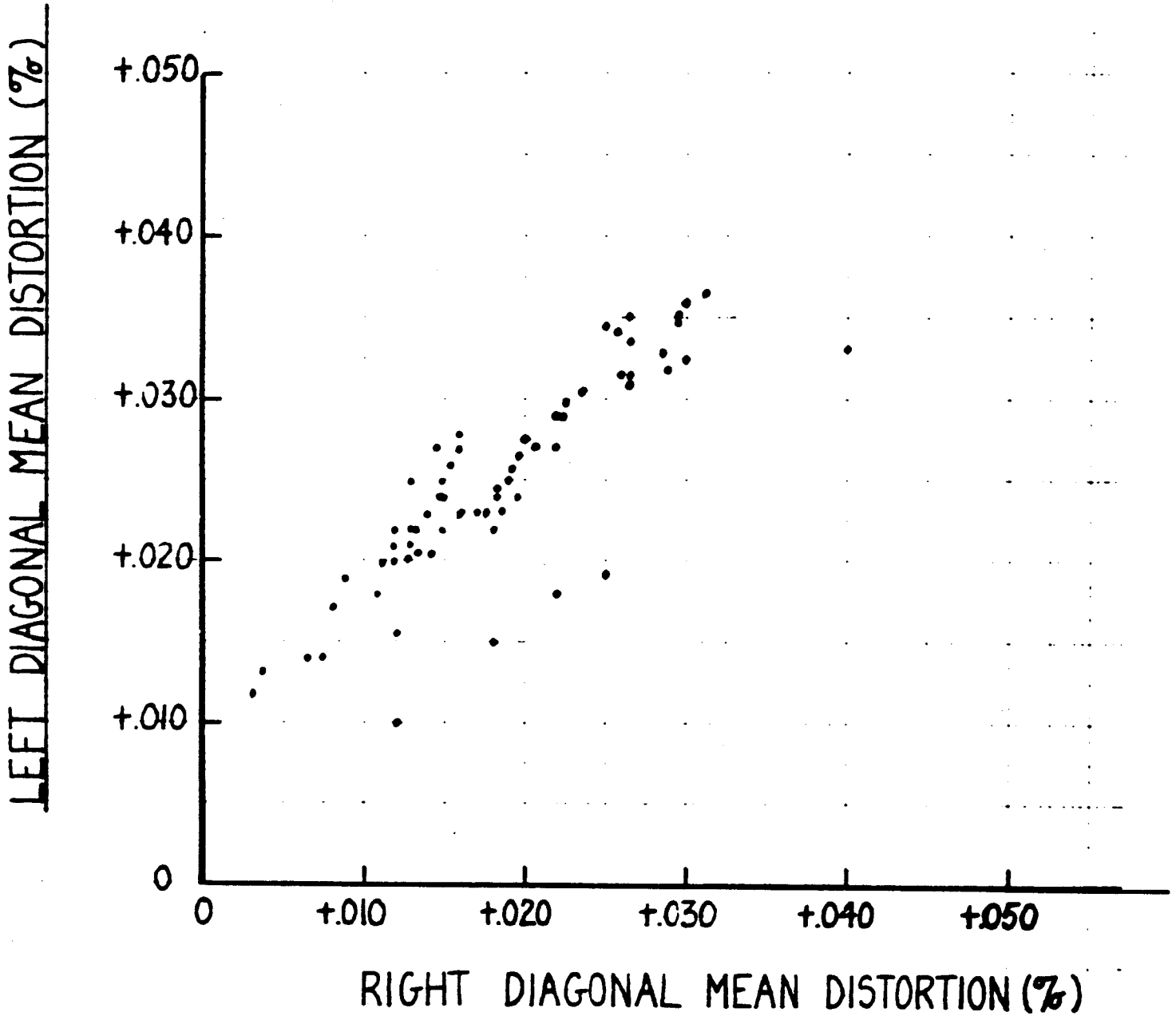
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LENGTH VS. WIDTH DISTORTION OF 50-380
COMPOSITE FILM SAMPLES



~~TOP SECRET~~

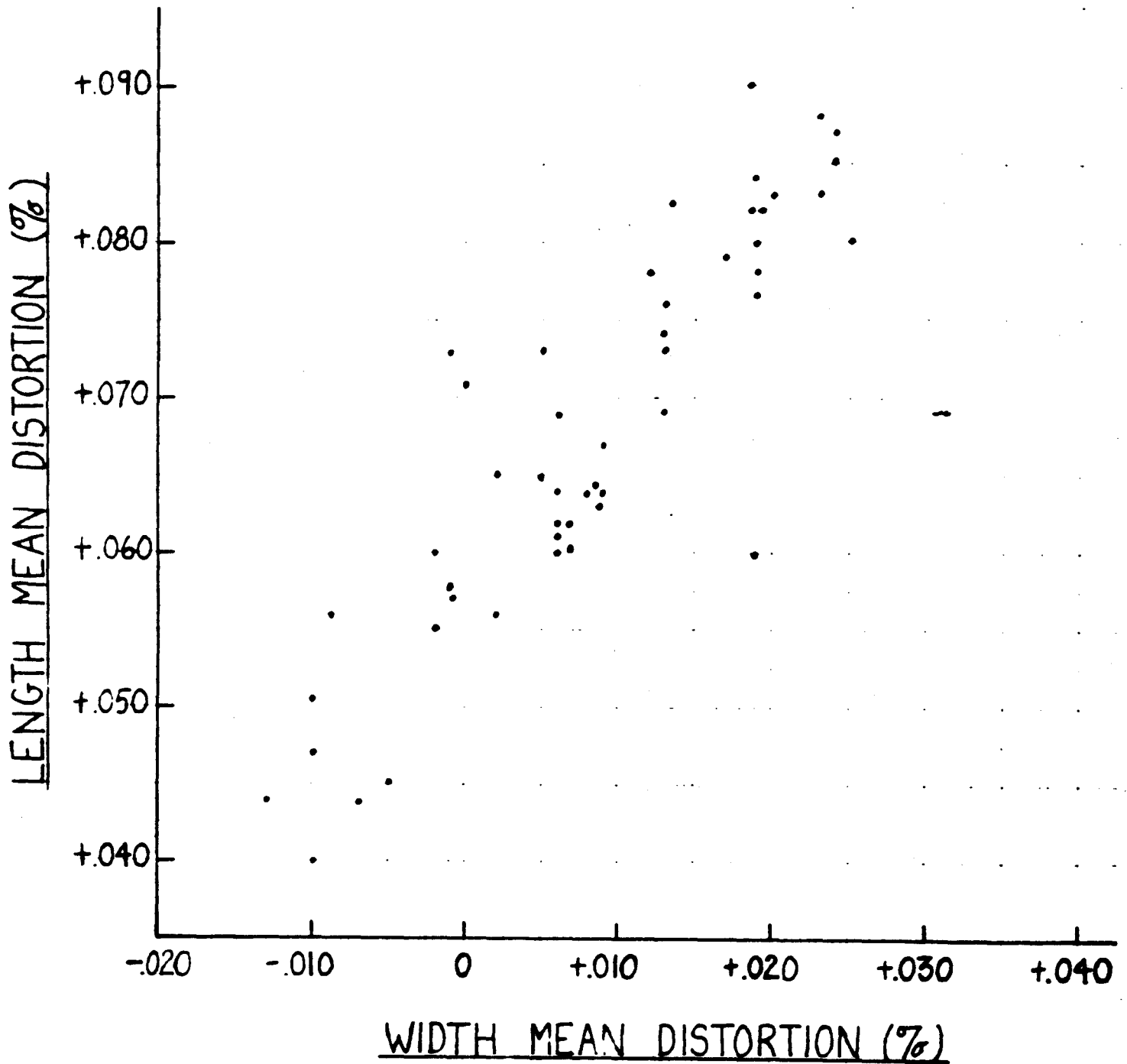
LEFT DIAGONAL VS. RIGHT DIAGONAL
DISTORTION OF 50-380 COMPOSITE
FILM SAMPLES





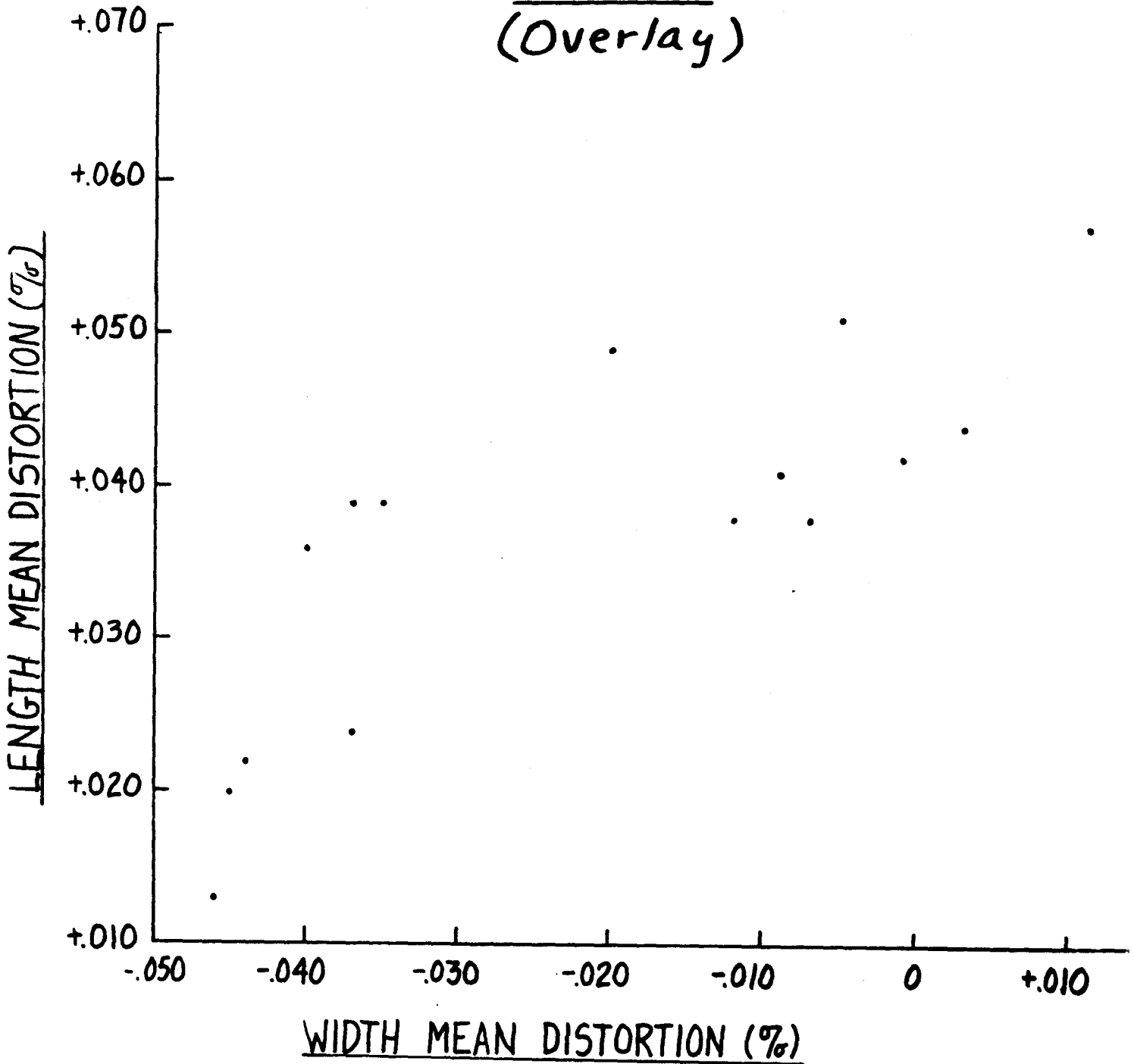
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LENGTH VS. WIDTH DISTORTION OF 2430
NIAGARA DUPES FROM 50-380 COMPOSITE
SAMPLES

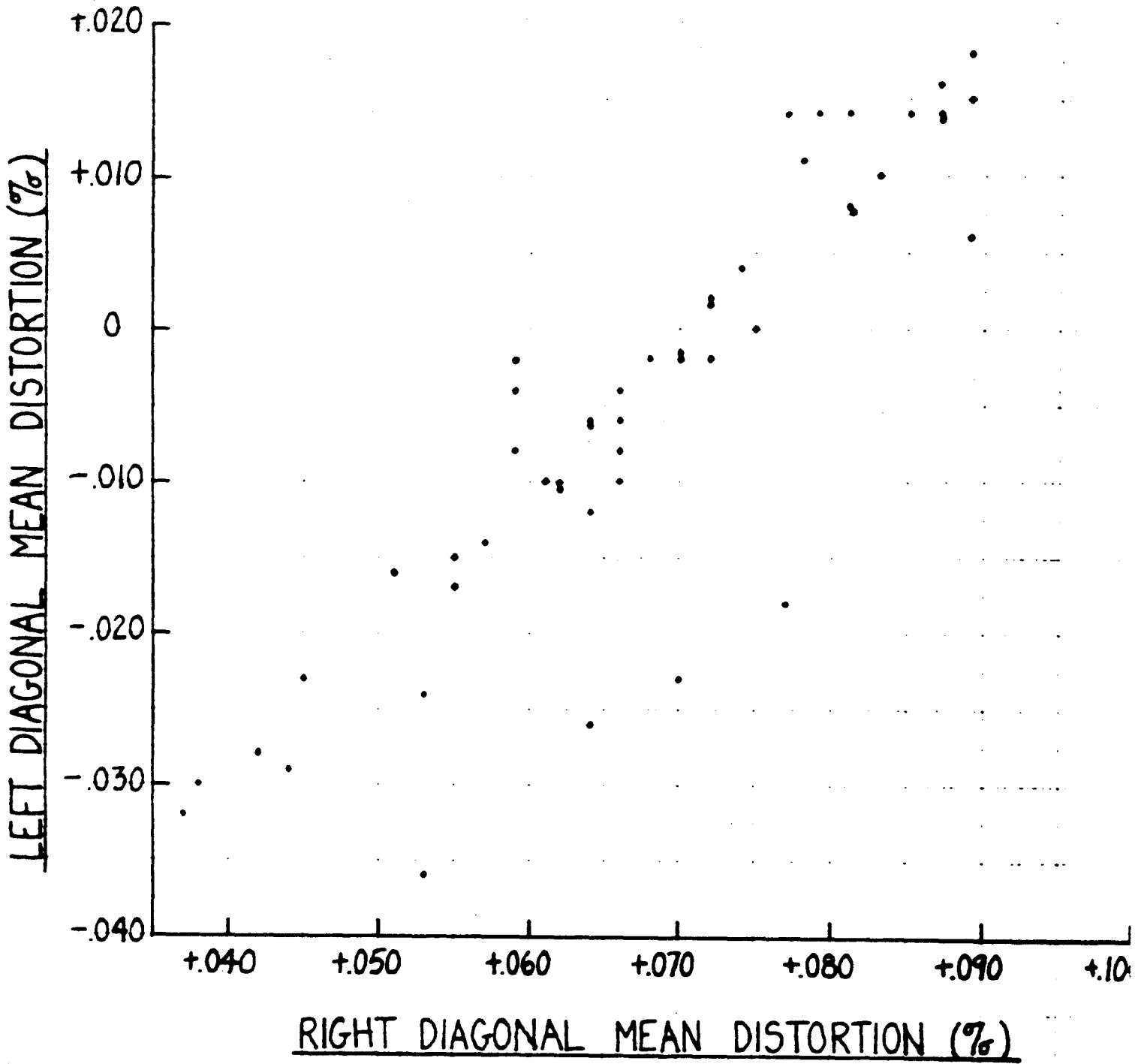


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LENGTH VS. WIDTH DISTORTION OF 2430
NIAGARA DUPES FROM 50-380 COMPOSITE
SAMPLES
(Overlay)



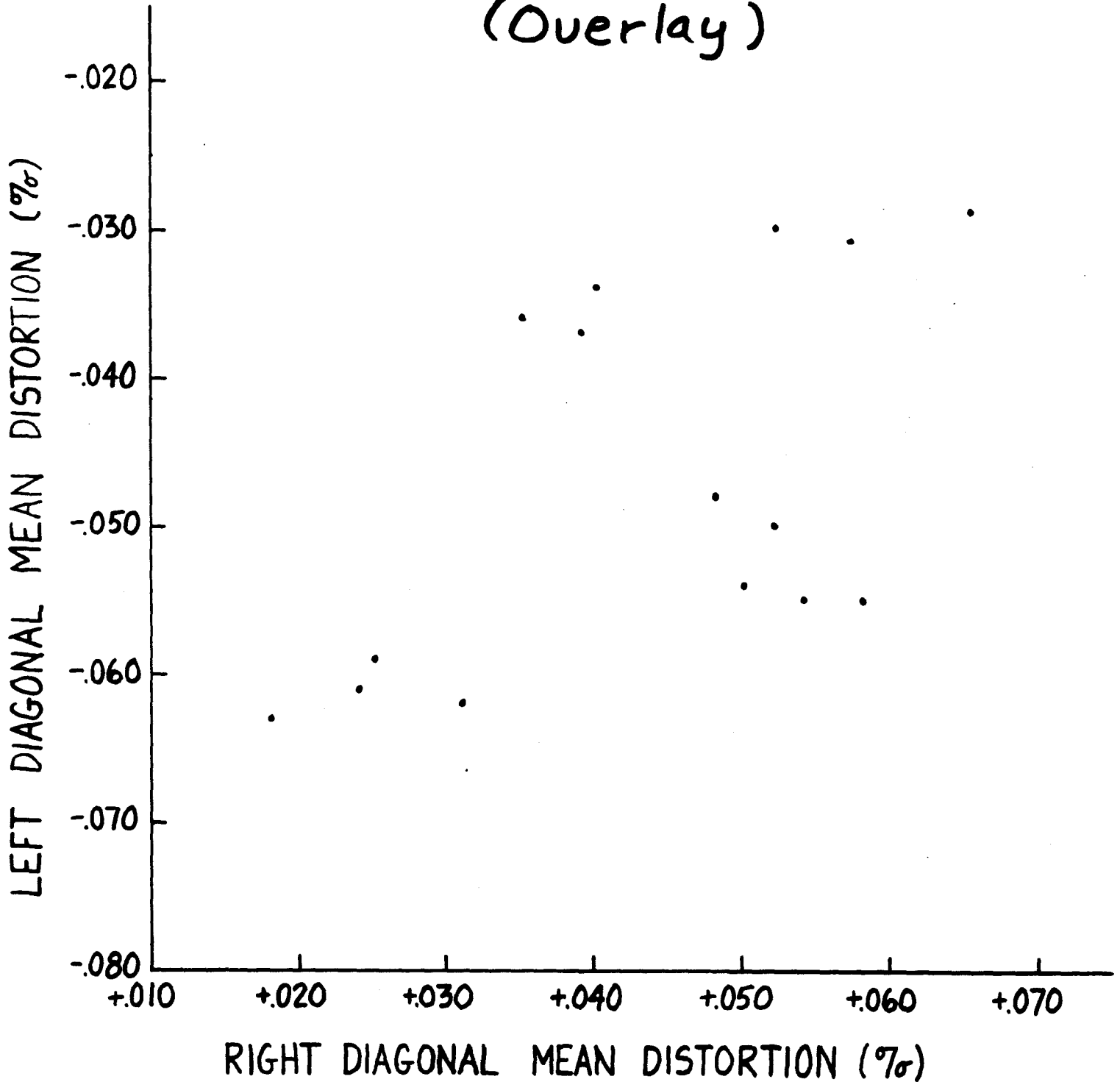
LEFT DIAGONAL VS. RIGHT DIAGONAL DISTORTION
OF 2430 NIAGARA DUPES FROM 50-380
COMPOSITE SAMPLES



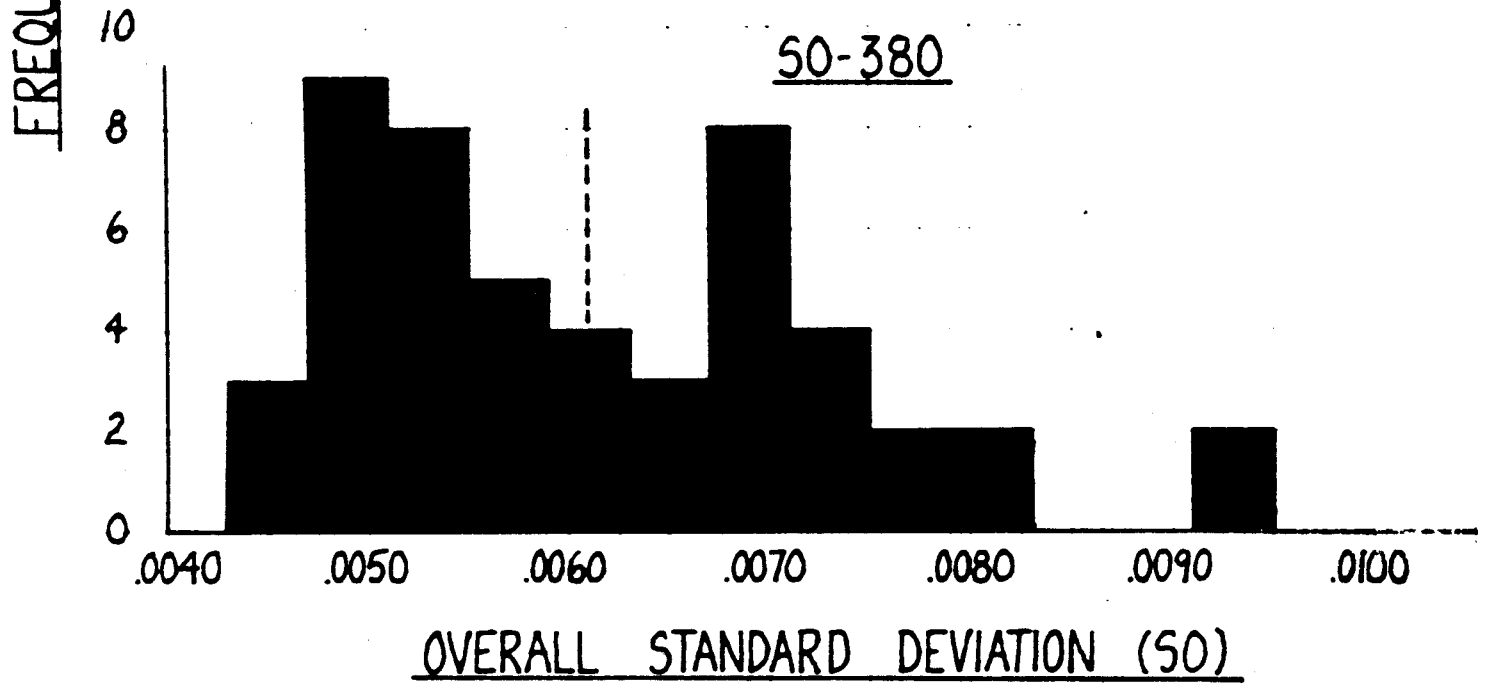
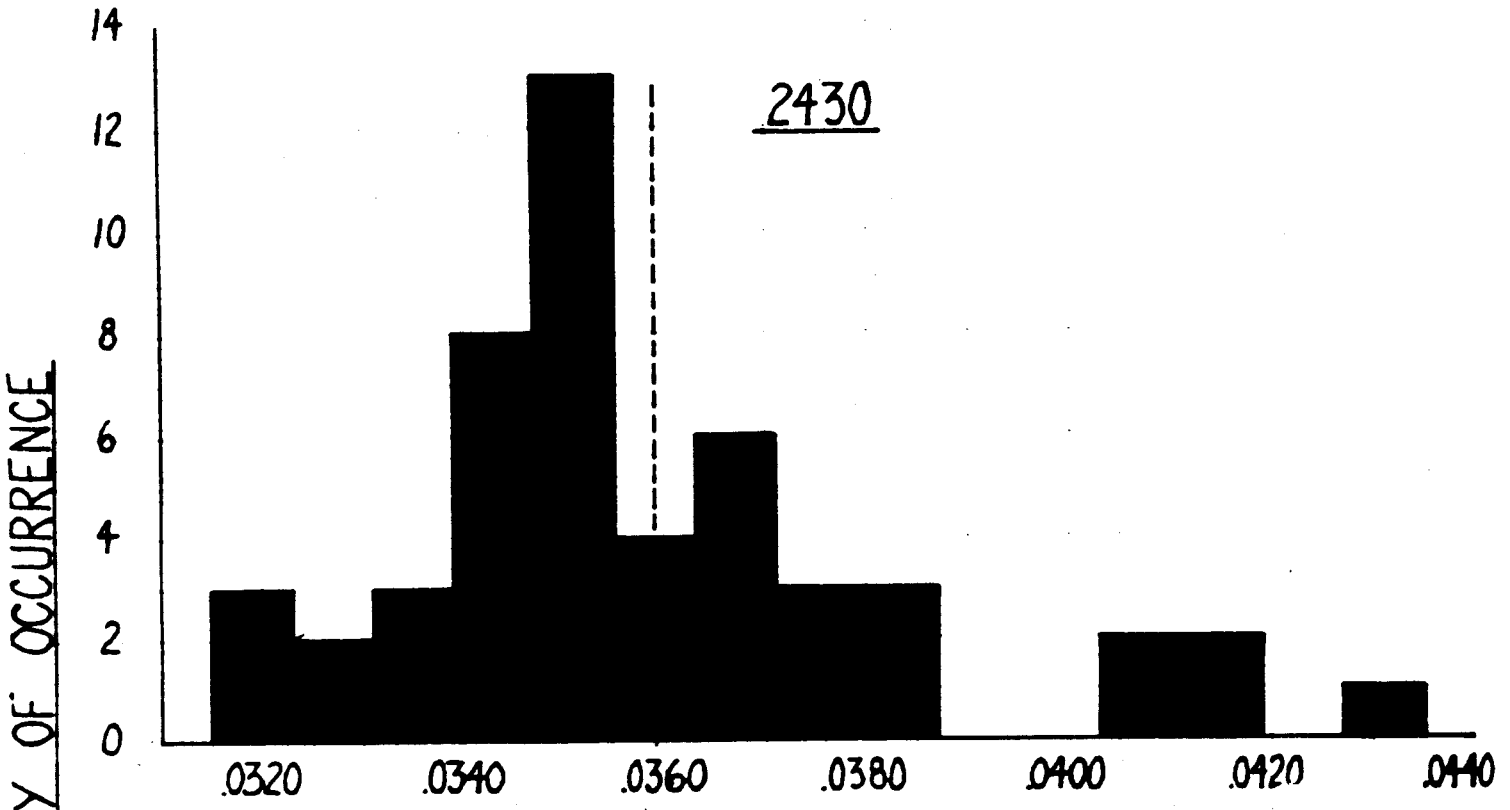
~~TOP SECRET~~

LEFT DIAGONAL VS. RIGHT DIAGONAL DISTORTION
OF 2430 NIAGARA DUPES FROM 50-380
COMPOSITE SAMPLES

(Overlay)



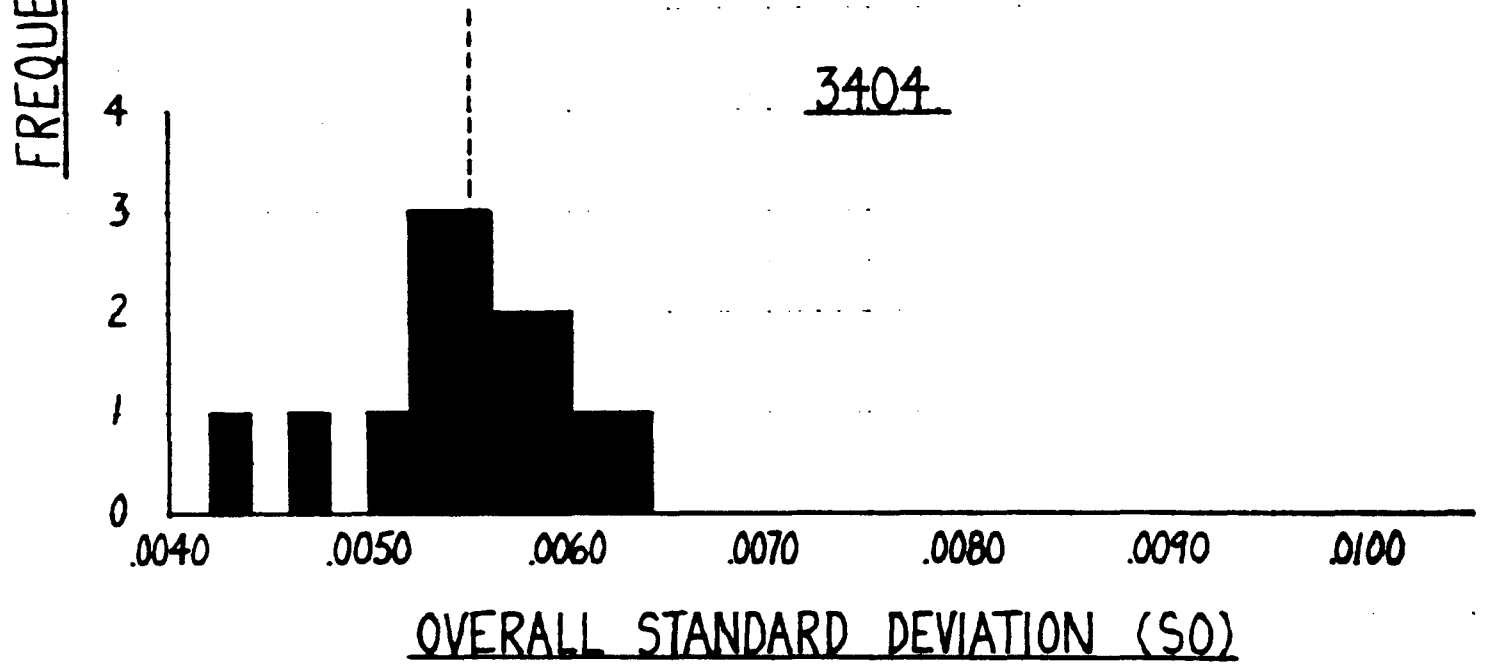
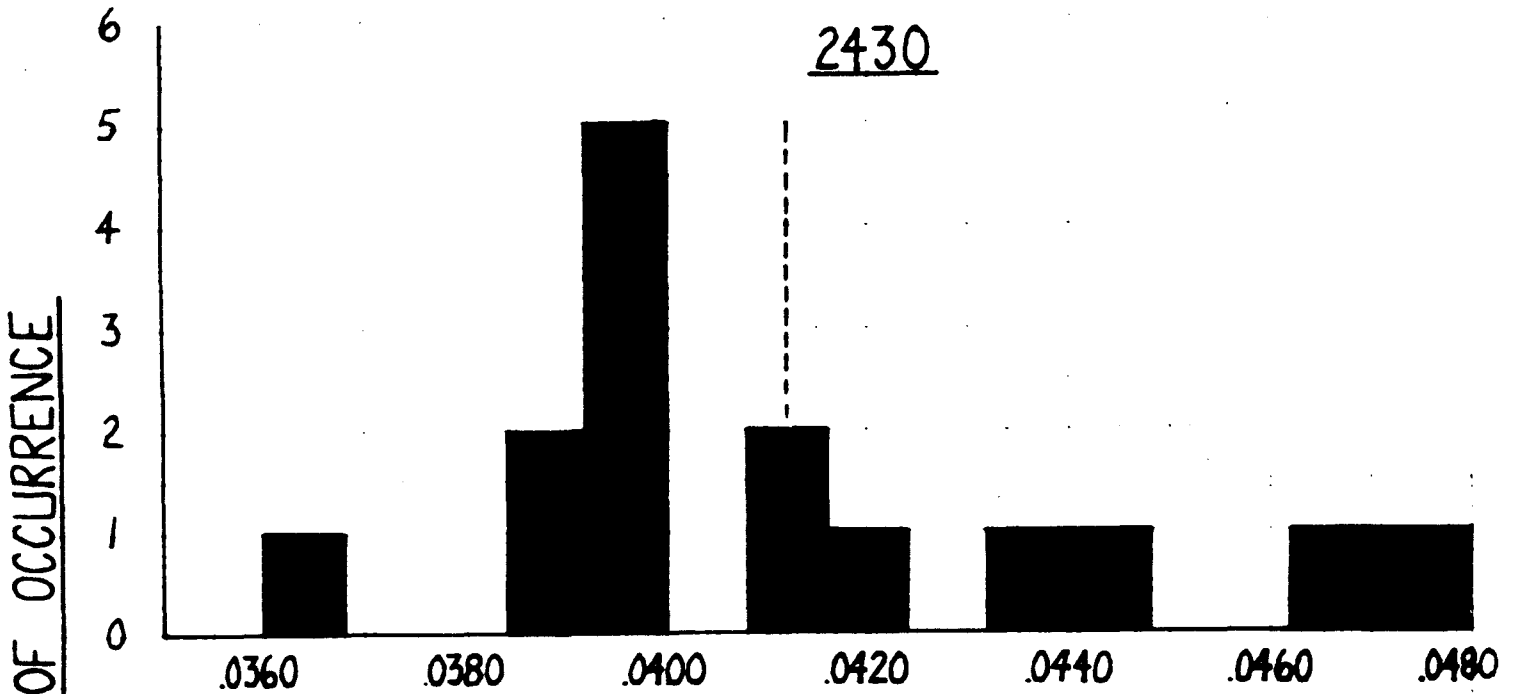
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OVERALL STANDARD DEVIATION (50)

[REDACTED]

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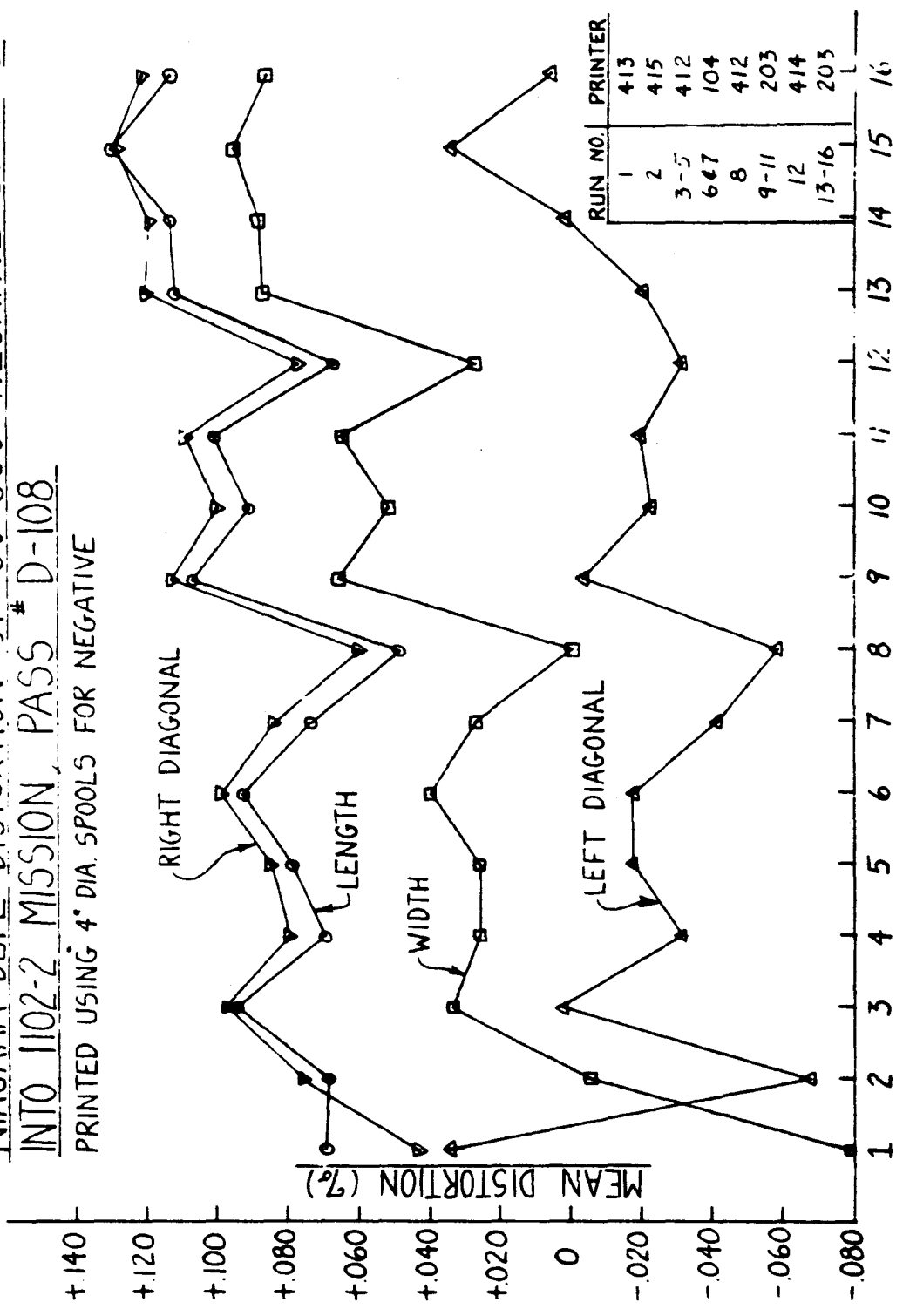
OVERALL STANDARD DEVIATION (SO)

[REDACTED]

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NIAGARA DUPE DISTORTION OF 50-380 NEGATIVE SPLICED
INTO 1102-2 MISSION, PASS # D-108
PRINTED USING 4" DIA. SPOOLS FOR NEGATIVE

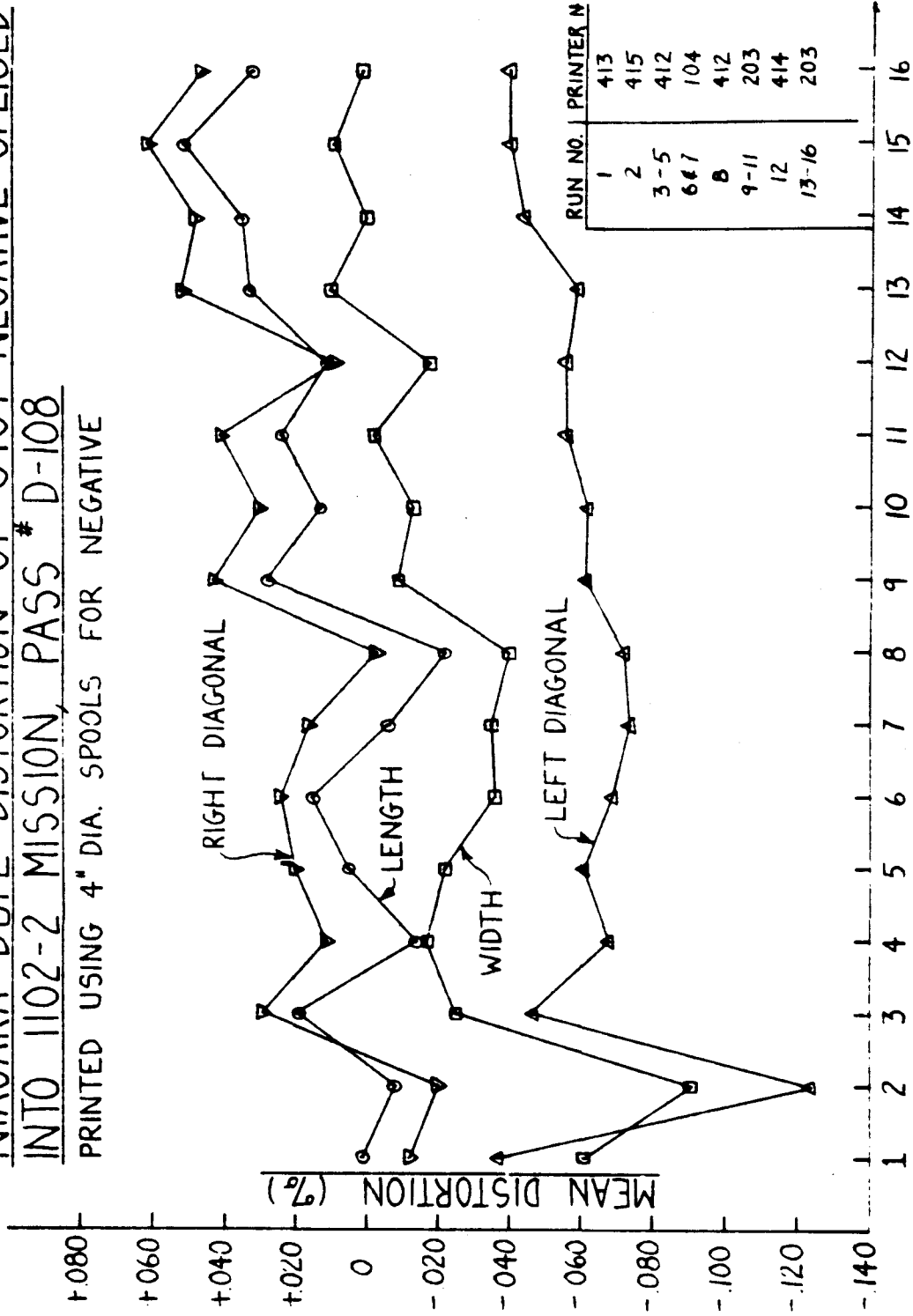


PRINTING RUN (NO.)

~~TOP SECRET~~

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NIAGARA DUPE DISTORTION OF 3404 NEGATIVE SPLICED
 INTO 1102-2 MISSION, PASS # D-108
 PRINTED USING 4" DIA. SPOOLS FOR NEGATIVE

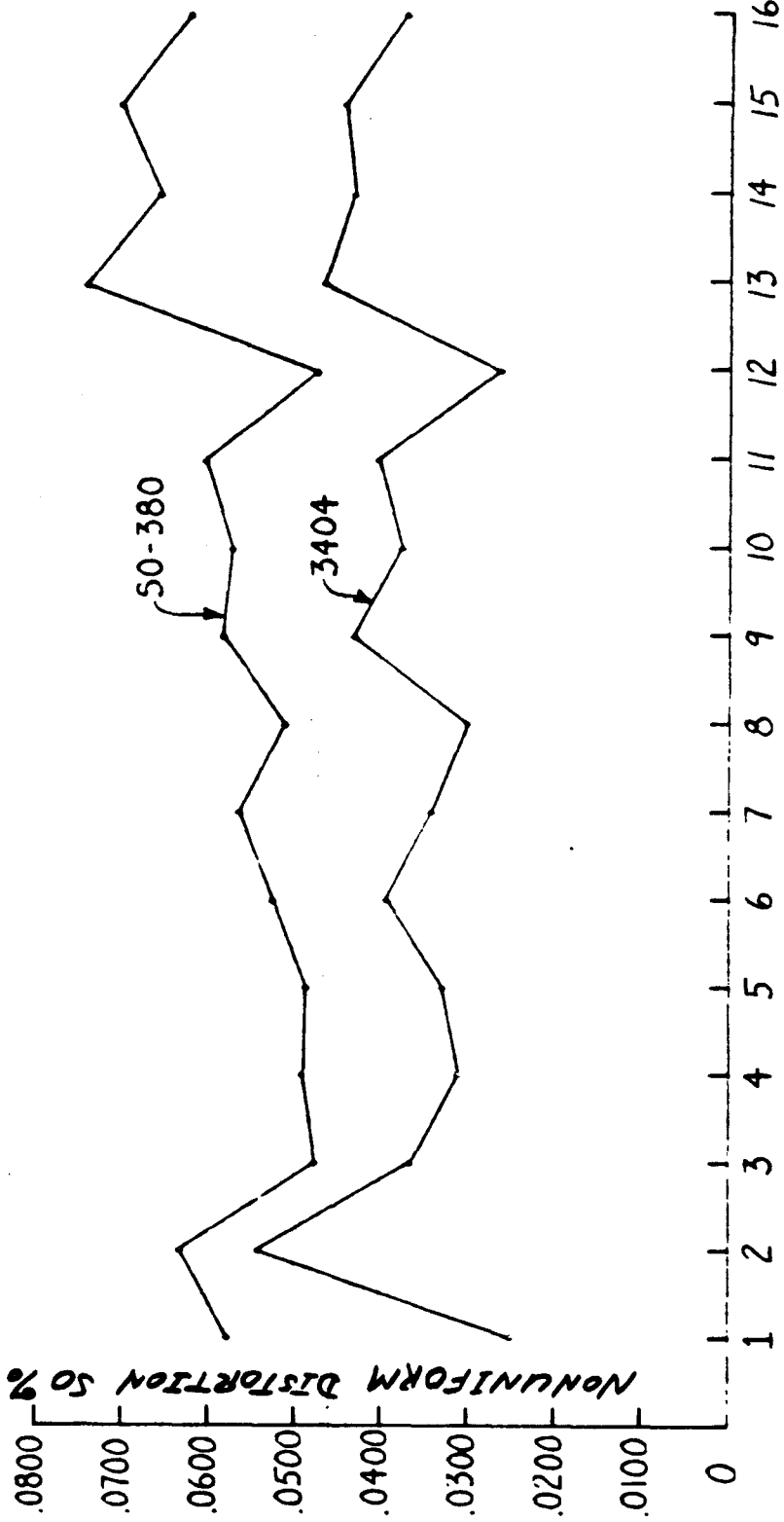


PRINTING RUN (NO.)

~~TOP SECRET~~

COMPARISON OF THE OVERALL DISTORTIONS OF NIAGARA
DUPES PRINTED FROM 50-380 & 3404 NEGATIVES

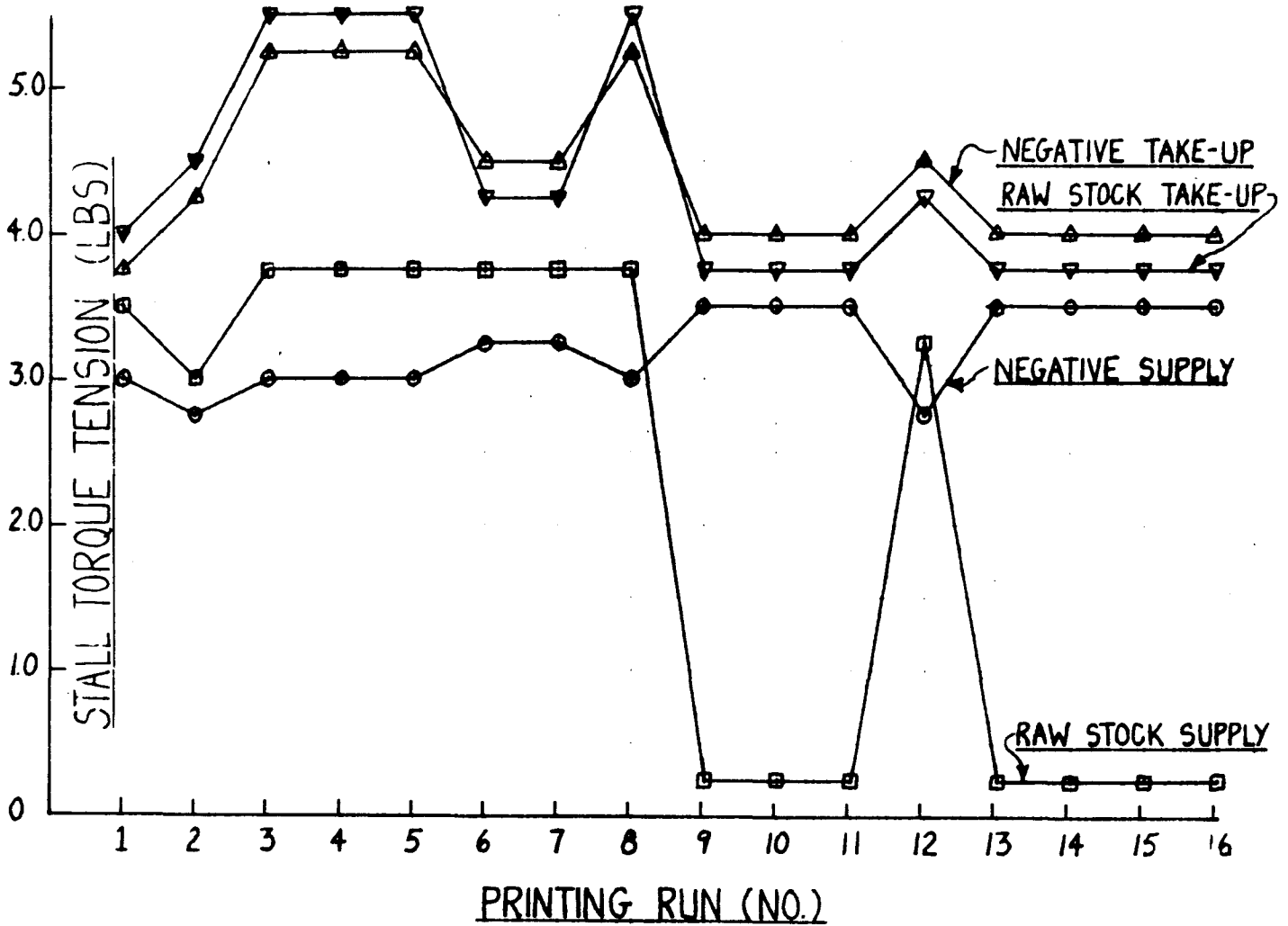
MISSION #1102-2 SPLICED INTO PASS #D-108
4" DIA. NEG. SPOOL



NO. OF PRINTING RUN

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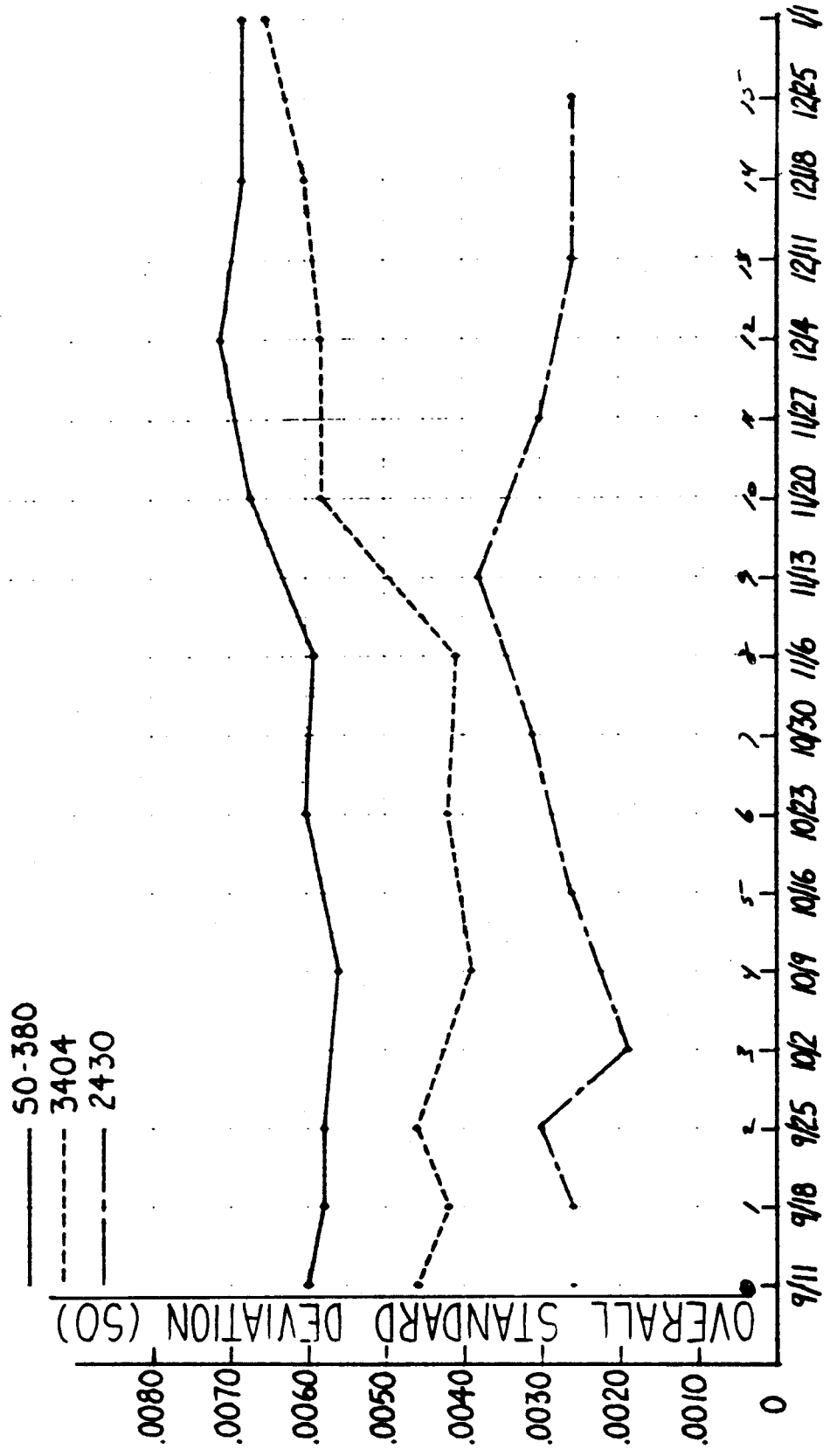
TORQUE MOTOR STALL TENSIONS OF THE NIAGARA PRINTERS USED FOR PASS D-108, MISSION 1102-2



[REDACTED]

~~TOP SECRET~~

OVERALL FILM DISTORTION CHANGE DURING STORAGE TESTS



DATE (WEEK OF)

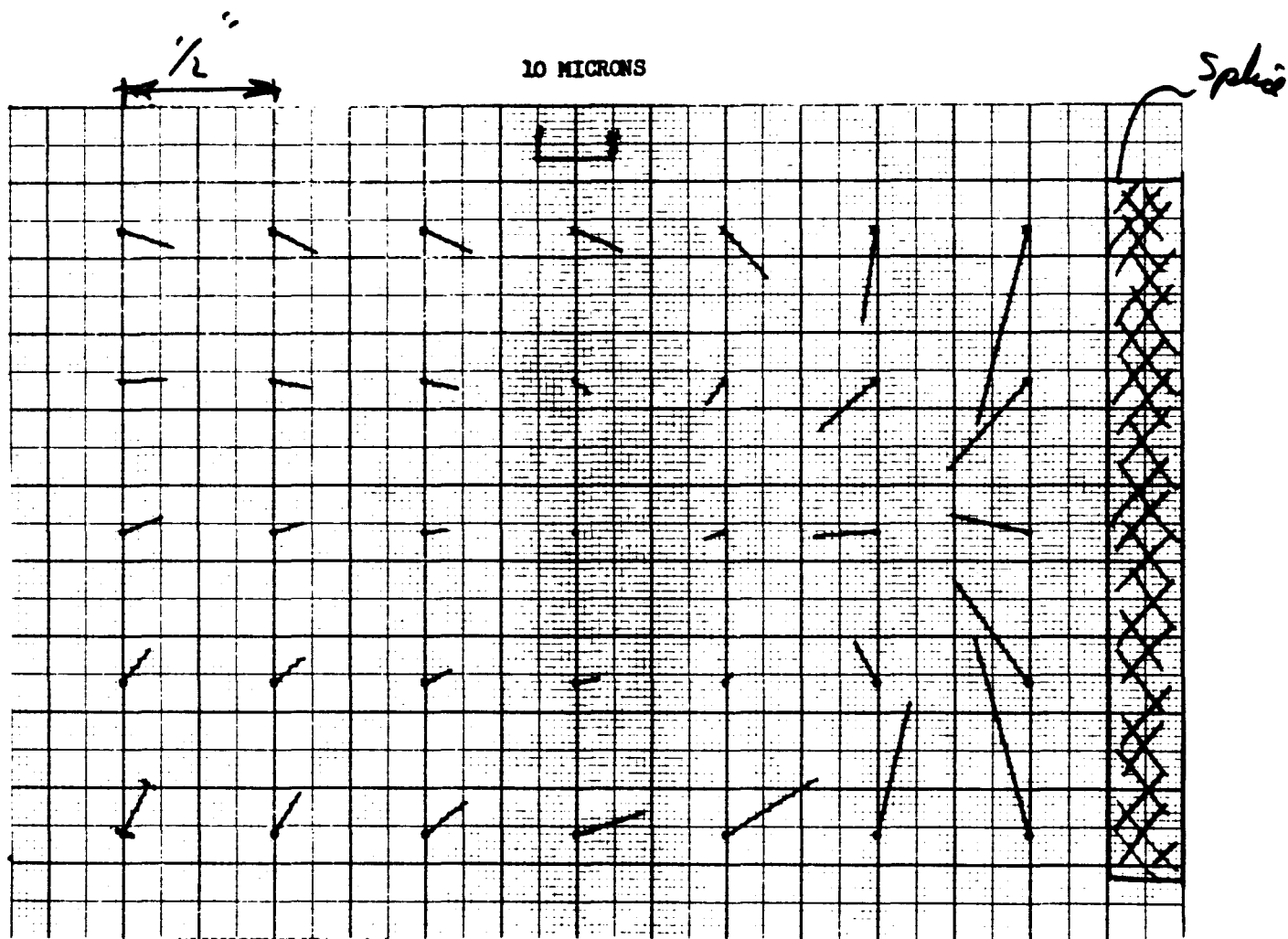
[REDACTED]

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[REDACTED]

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VECTOR DIAGRAM OF A TYPICAL SO 380 HEAT SPLICE DISTORTION



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[REDACTED]

~~TOP SECRET~~

CONTRACTOR/ACIC COMPARISON

UATB

CONTRACTOR

ACIC

CONTRACTOR	ACIC
50% 0.0059 0.0054 0.0056 0.0058 0.0056	$\sigma_{xy} (\mu)$ 3.91 3.08 3.91 3.39 3.24 <u>3.66</u> Ave
$\sigma = .006$ A ✓ 2.28 2.11 2.17 2.26 2.19 <u>2.20</u> Ave	17-25 μ

0.0058	4.80
0.0060	4.49
0.0056	3.67
0.0061	4.87
0.0056	3.89
	<u>4.34</u>

5 mm

15 μ 30



[Redacted]

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ADD — C17B/2430 > 3404/2430 .020%

UTB/2430 — .055% +.020 ⇒ 20M-4
 -.010

3404/2430 — .035% +.010 ⇒ 13M-4
 -.010

Budget

30 < 15
Date Presented
is 1A

COPY VARIATION

DIAGONAL PROB -100%

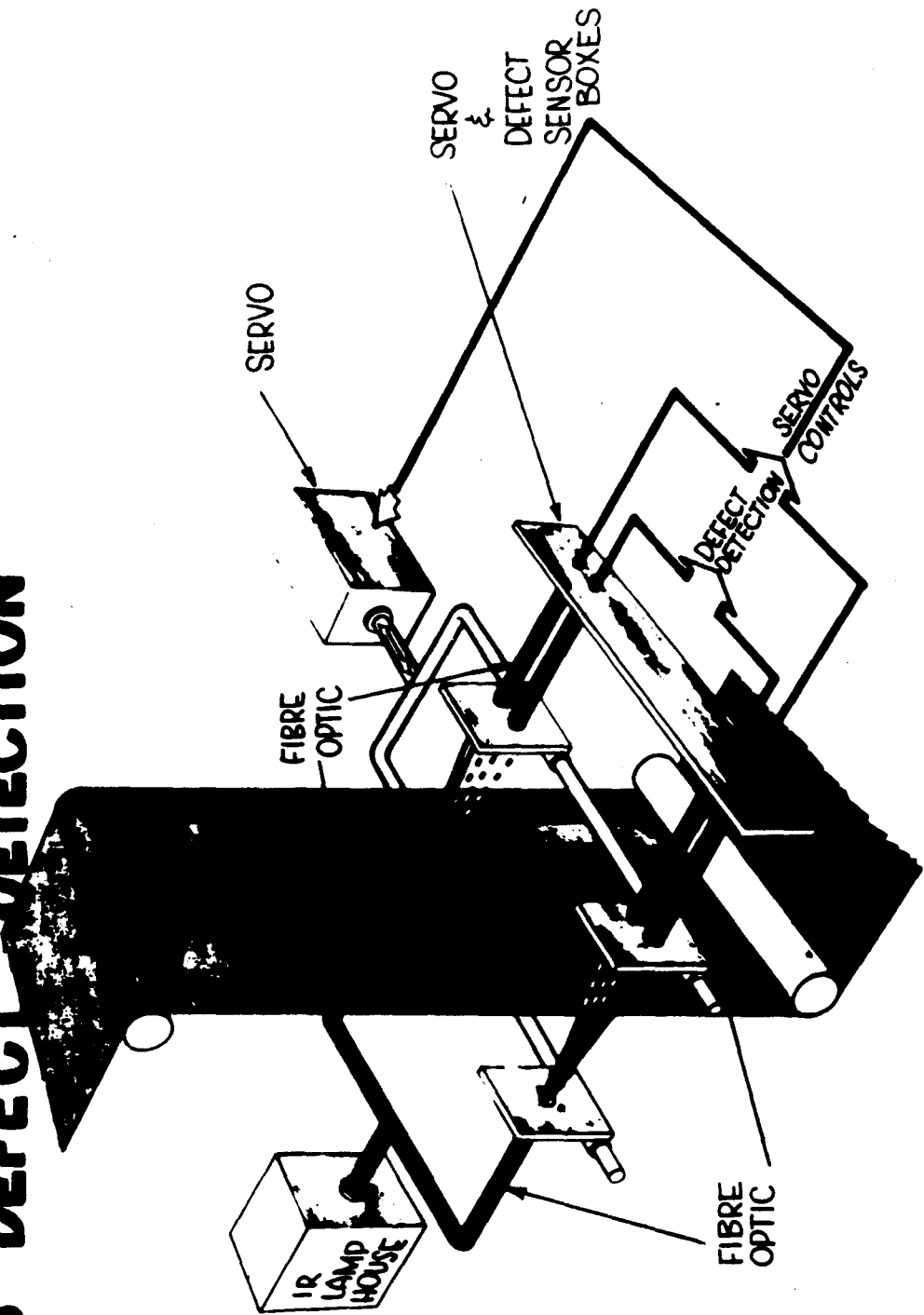
SO VARIATION WITH TIME Not app.

[Redacted]

TOP SECRET

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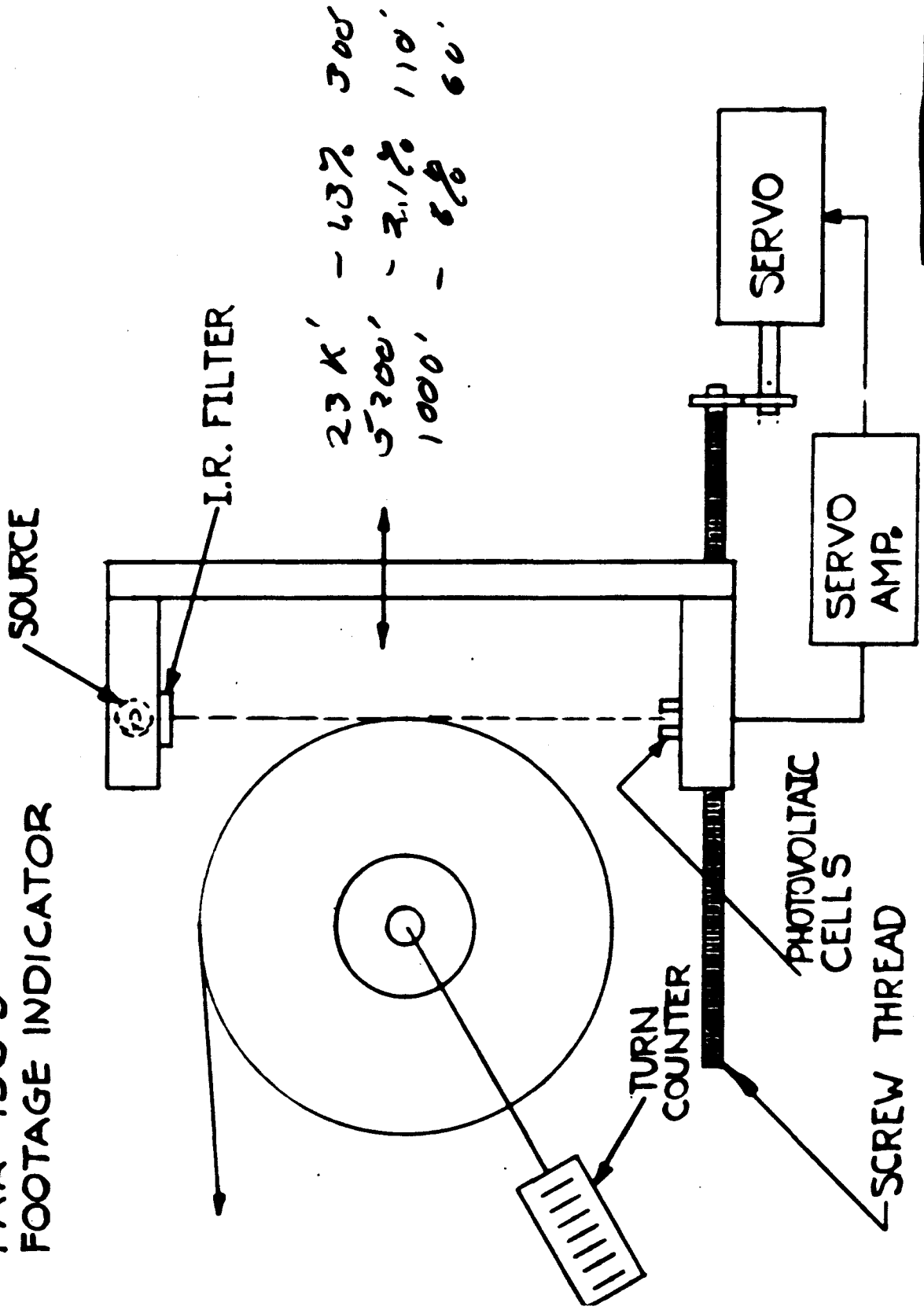
EDGE DEFECT SENSOR PAR 97S MEDIUM RESOLUTION TRANSMISSION OPTICS DEFECT DETECTION



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~~TOP SECRET~~

PAR 136 S FOOTAGE INDICATOR



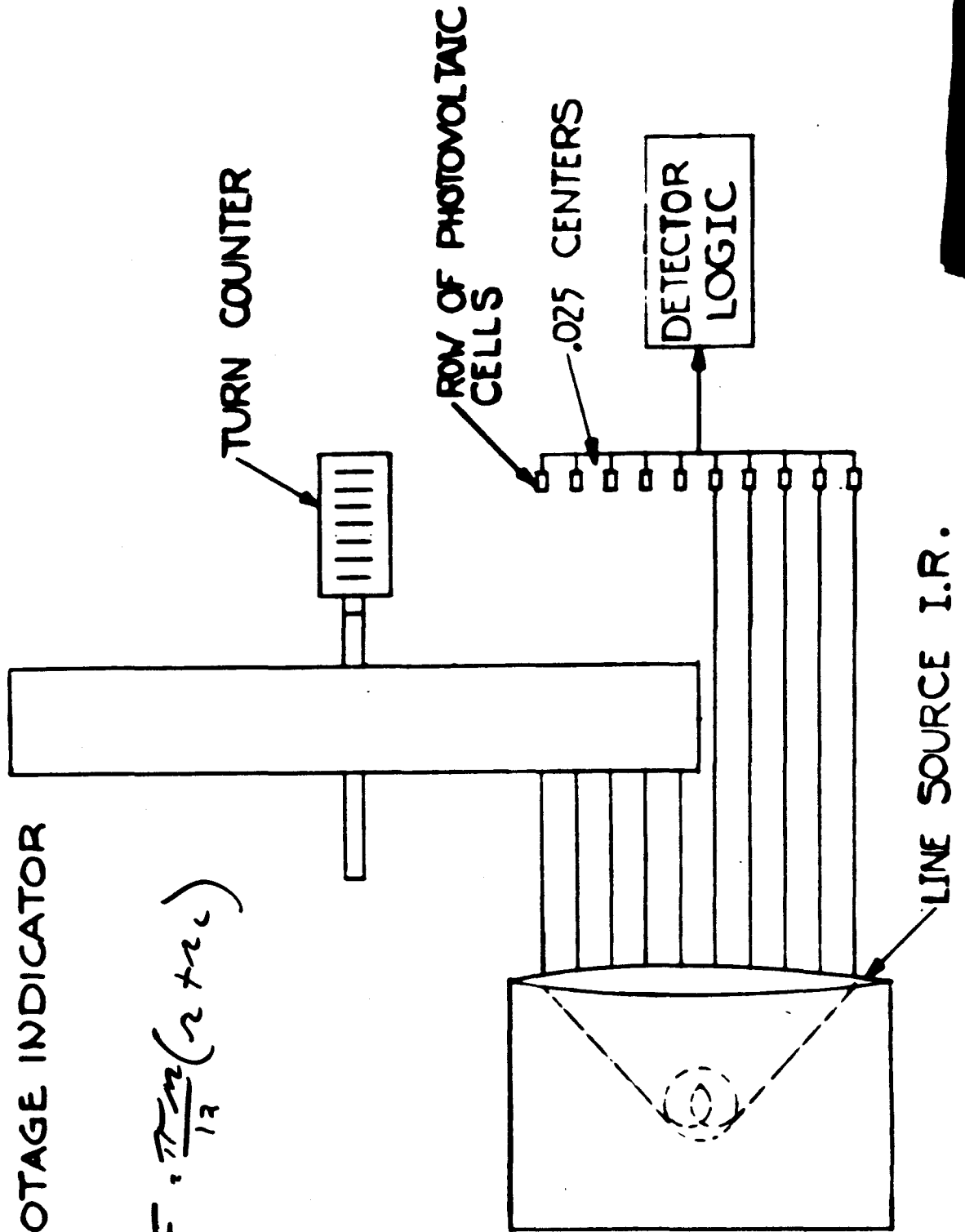
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PAR 136 S FOOTAGE INDICATOR

$$F = \frac{\pi r^2}{12} (2 + r_c)$$

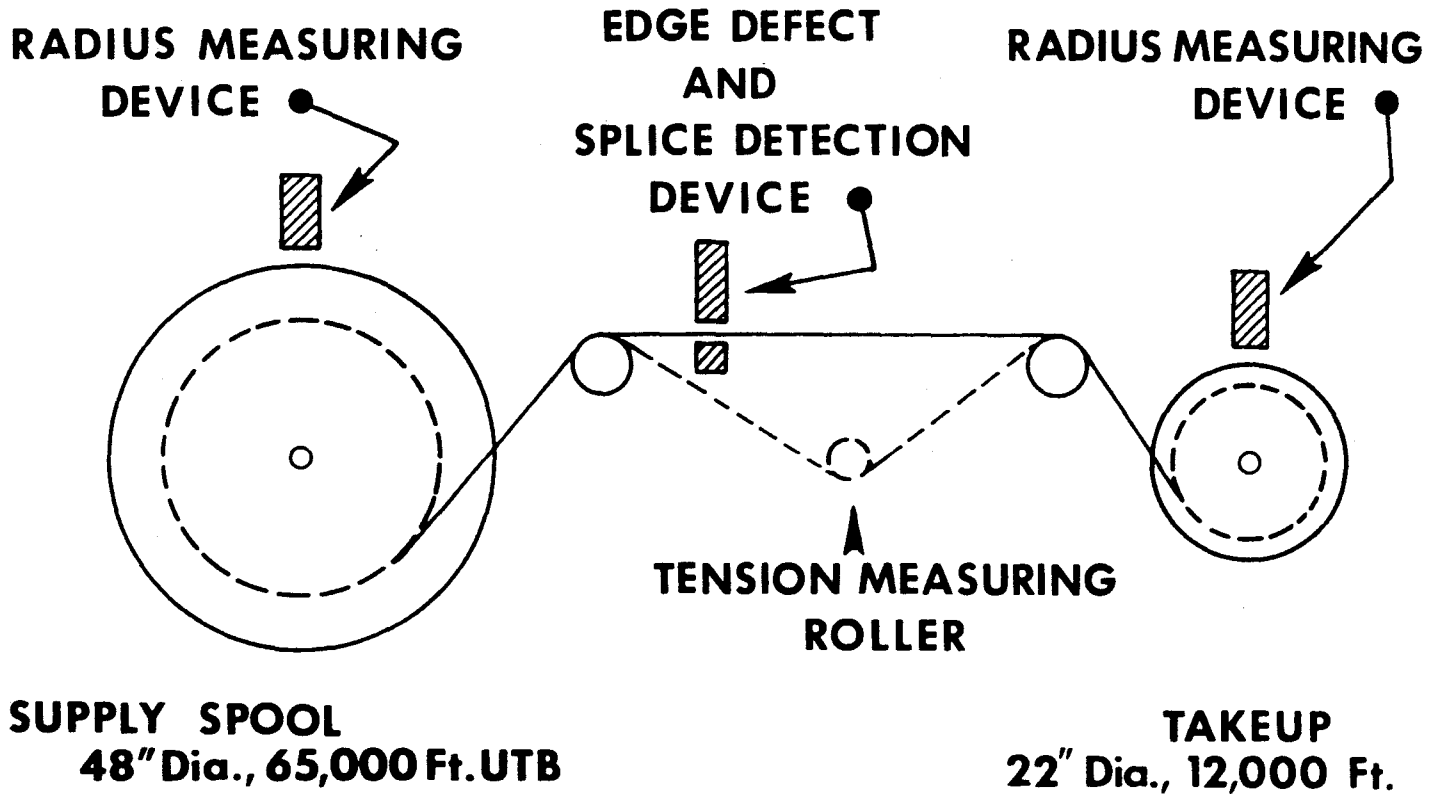


TOP SECRET



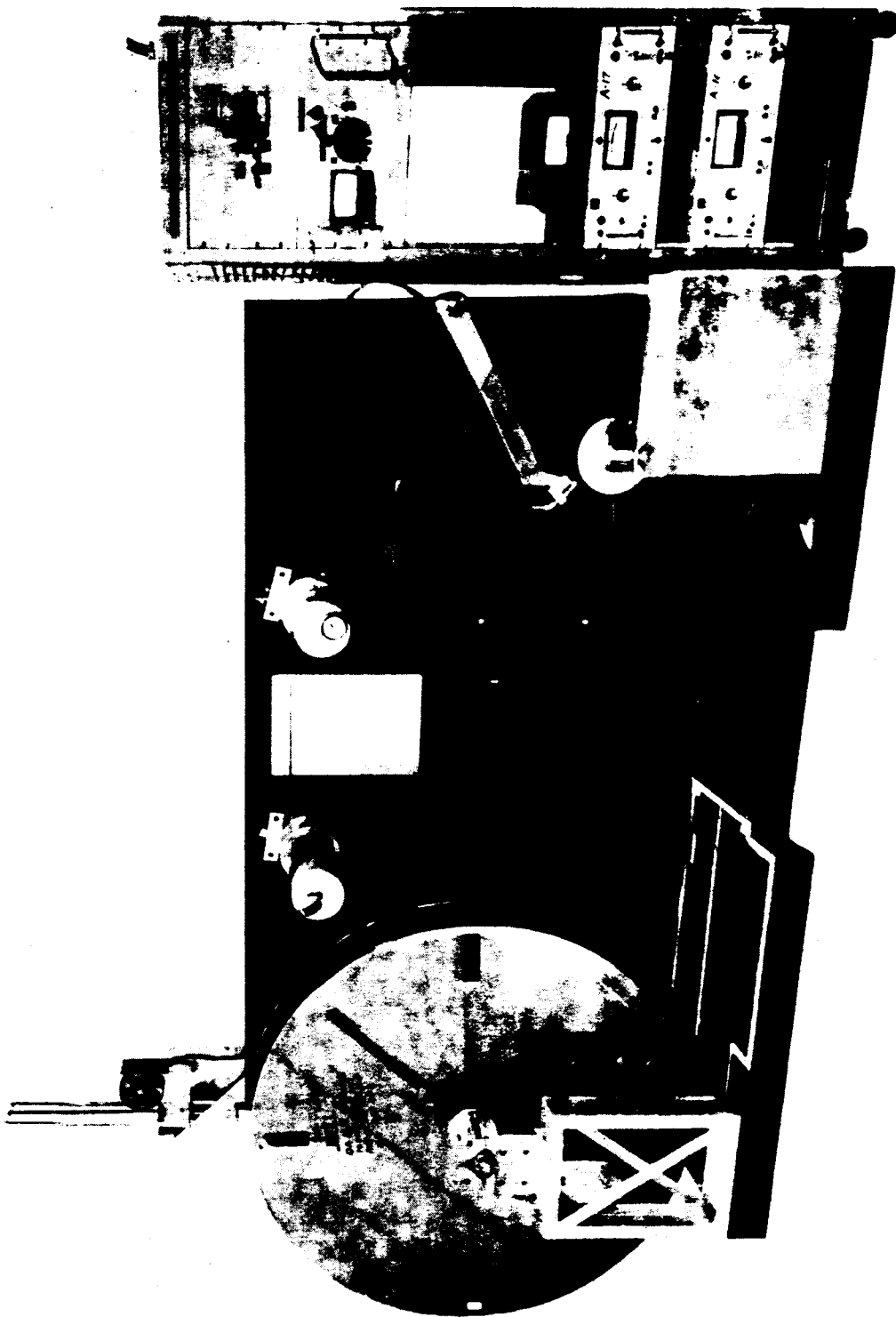
~~TOP SECRET~~

PAR 137 S/R1 LARGE ROLL FILM HANDLING STUDY



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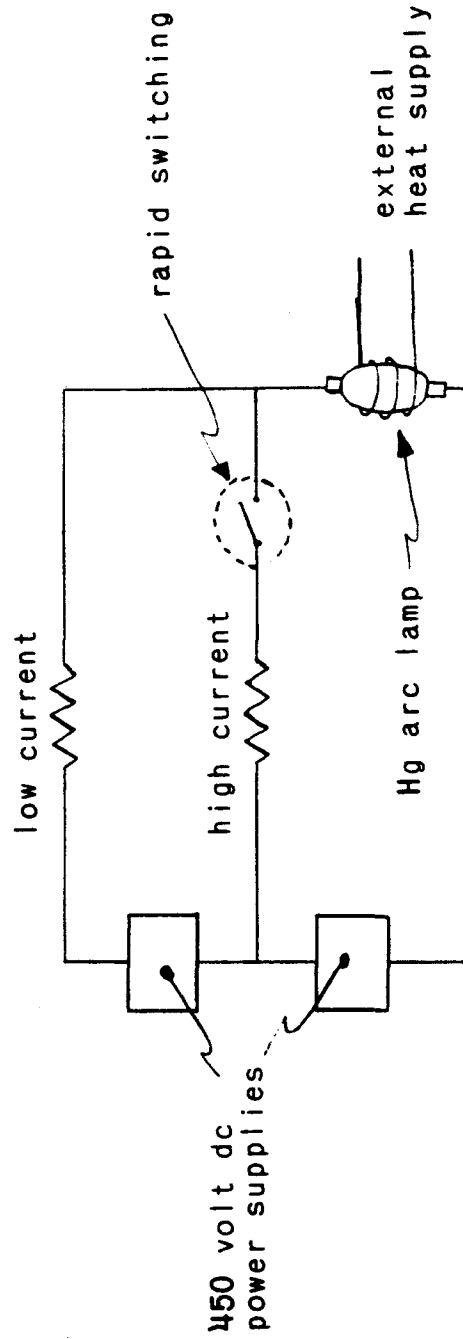
PAR 137S transport System

~~TOP SECRET~~

PAR 146S/R2, PRINTING EXPOSURE MODULATION STUDY

MERCURY ARC MODULATION	---	Performance Aim	100 watt Results	400 watt Results
Log Intensity Range	Δ 1.1		Δ 1.5	Δ 1.9
Response Time	15 millisecc ($\frac{1}{4}$ " @ 100fpm)		Less than 10 millisecc	Less than 10 millisecc

APPROACH



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PAR 146S/R2

PLANNED ACTIVITY

COMPLETE BENCH TESTING OF 400 WATT LAMP

DEVELOP: Feedback intensity control circuit
Temperature control circuit

KLUGE TO A PRINTER

EVALUATE: Stability
Uniformity
Repeatability

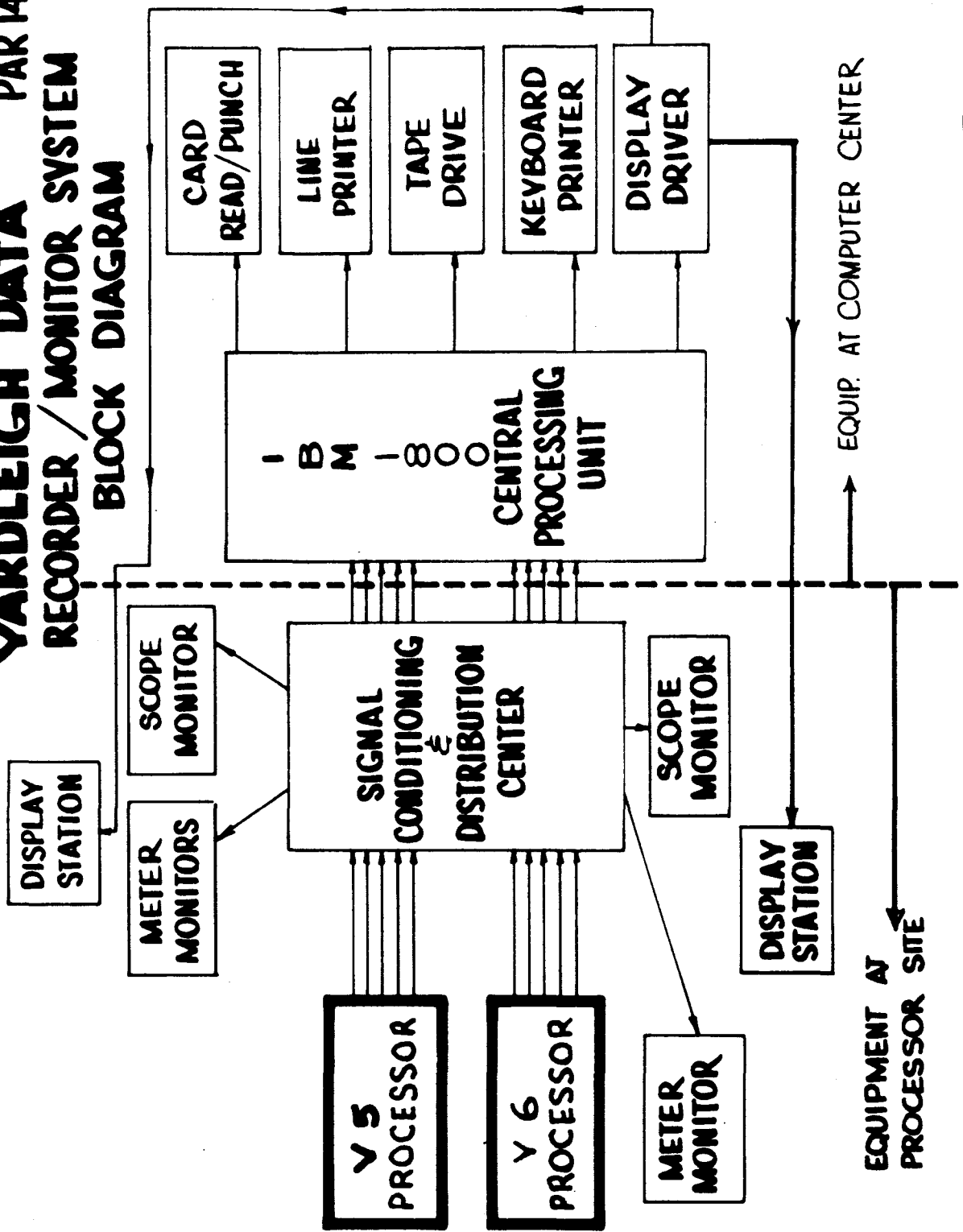
DEVELOP LAMP SPECIFICATIONS

EVALUATE: External heat supply vs custom lamp
DEVELOP: Design specifications for best approach

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YARDLEIGH DATA PAR 149B RECORDER / MONITOR SYSTEM BLOCK DIAGRAM



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PAR 155B, ADDITIONAL SENSORS FOR YARDLEIGH MONITORING

AVAILABLE SENSORS

PROCESS TEMPERATURES

Primary Developer
Viscous Cabinet
Intermediate Hopper
Full Hopper
Fix
Final Wash
Dryer

MACHINE FUNCTIONS

Processor Speed
Footage
Viscous Pump Pressure
Intermediate Hopper Operation
Full Hopper Operation
Intermediate Hopper % Time
Full Hopper % Time
Pass Indicator
Mark Indicator
Viscous Cabinet Humidity
Dryer Cabinet Humidity

SCANNER

Photocell Signals
IR Lamp Current
Reference Cell Voltage
Mode
Level During Frame
Req'd Proc. Level at End of Frame
Tape Transfer Error

FRAME DETECTION

Photocell Signals
Lamp Current
Reference Cell Voltage
Frame Indicator
Left/Right Detector Reference

[REDACTED]

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PAR 155B, ADDITIONAL SENSORS FOR YARDLEIGH MONITORING

ADDITIONAL SENSORS

PROCESS TEMPERATURES

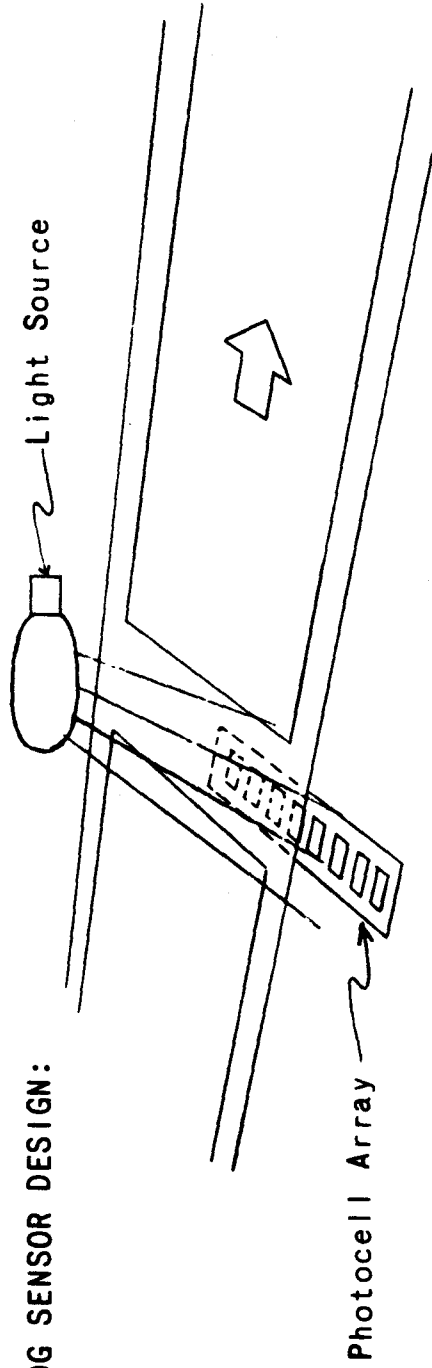
- Primary Developer
- Viscous Cabinet
- Intermediate Hopper
- Full Hopper
- Fix
- Final Wash
- Dryer

SUPPLEMENTAL

- pH Primary Arrest
- pH Secondary Arrest
- Viscosity
- Fog Level

NEW

EDGE FOG SENSOR DESIGN:




[REDACTED]

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OPTICAL TITLING IS SENSITOMETRICALLY FEASIBLE

1. SILVER HALIDE IN FILM TYPE 3404 HAS THE SAME SENSITIVITY WET AS DRY.
2. WITH EXPOSURE USED FOR , FRAME MARK WITH 1/3 - 1/2 PRIMARY DEVELOPMENT PROVIDES ENOUGH DENSITY FOR RELIABLE DETECTION.
3. REMAINING 1/2 - 2/3 PRIMARY DEVELOPMENT MORE THAN ENOUGH FOR WRITING.

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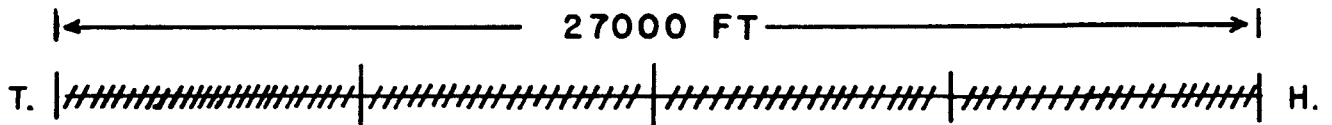
TITLING

GROUND RULES

1. FREE SPACE ALONG ONE EDGE
2. FRAME MARKS
3. END OF PASS OR END OF OPERATIONS MARKS
4. FAIRLY RELIABLE EPHEMERIS
5. FRAME NUMBER SKIPS TOLERABLE OR NO EDITING

APPROACH TO TITLING

1. CUT INTO SEGMENTS



2. ESTABLISH PASS OR OPERATION WHERE CUT WAS MADE

3. PROVIDE OPTICAL TITLER WITH FOLLOWING DATA ON PASS OR OPS BASIS:

- A. PASS/OPERATION NO.
- B. CLASSIFICATION AND CODE WORD
- C. DATE
- D. OTHER

4. USE FRAME MARKS TO:

- A. TRIGGER COUNTER
- B. REGISTER TITLE

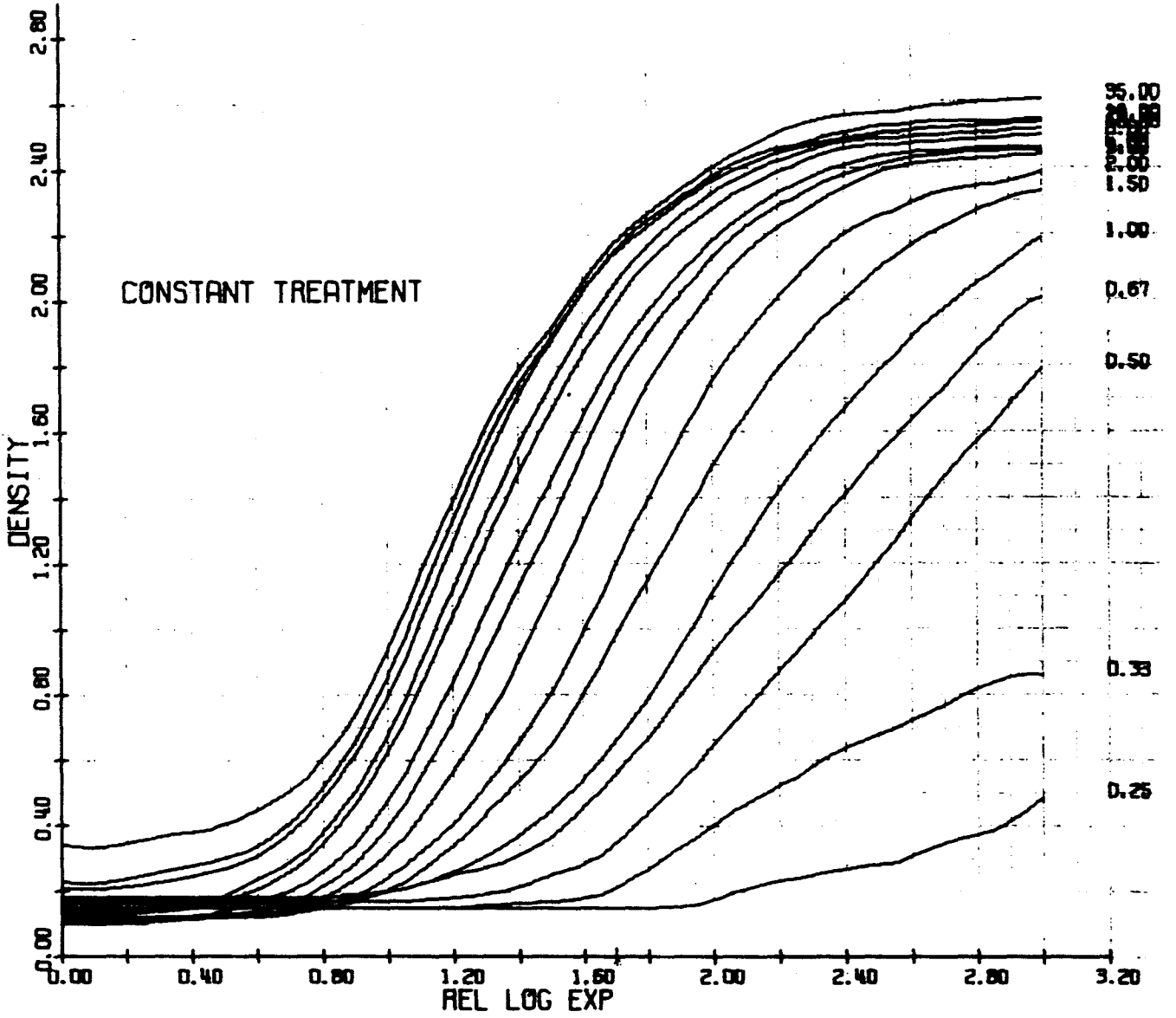
5. TITLE "LEFT OVERS" ON UNIMAK

6. PROVIDE FOR ERRORS

- A. UNIMAK
- B. INSTRUCTIONS ON IDENT

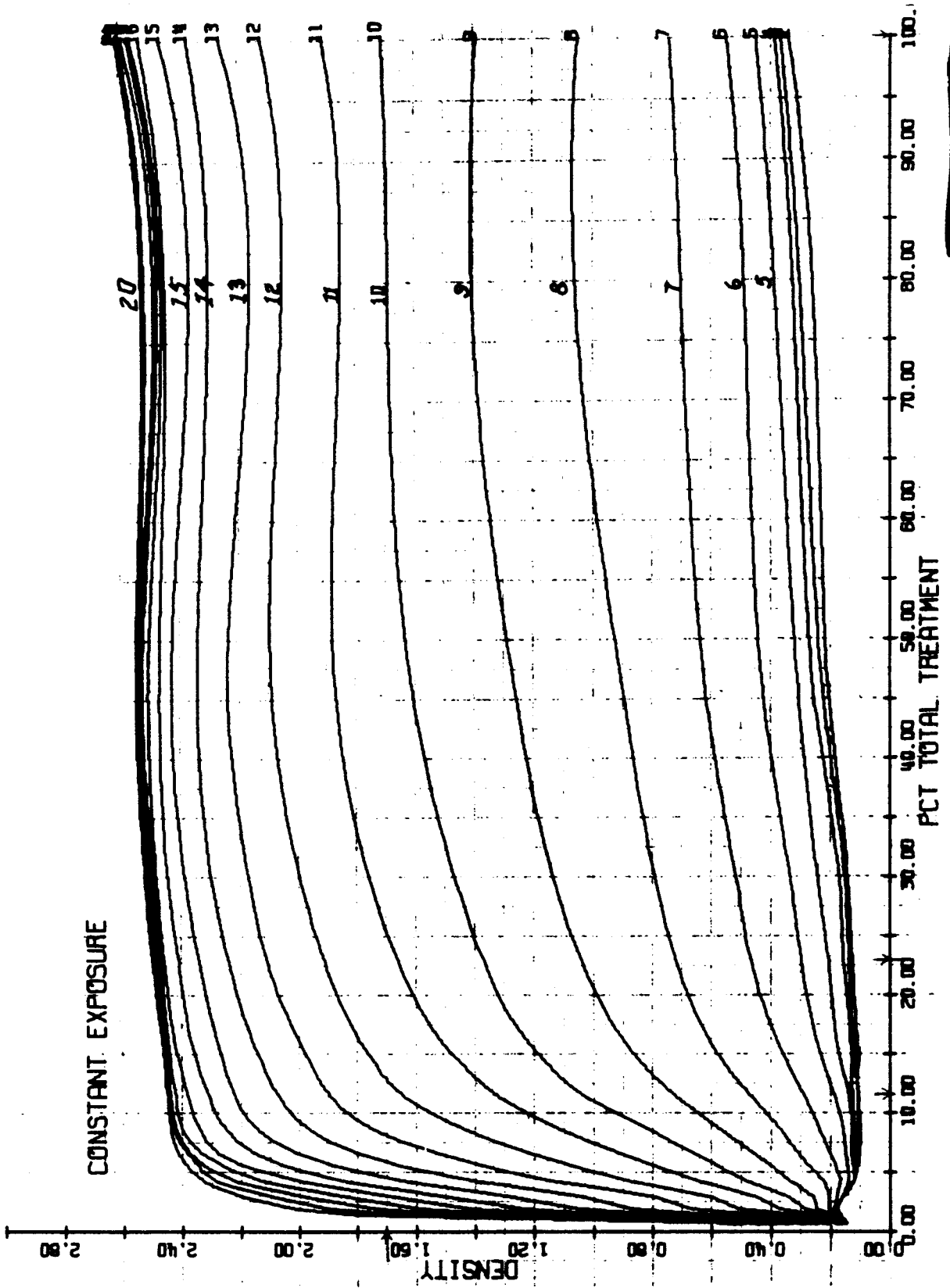


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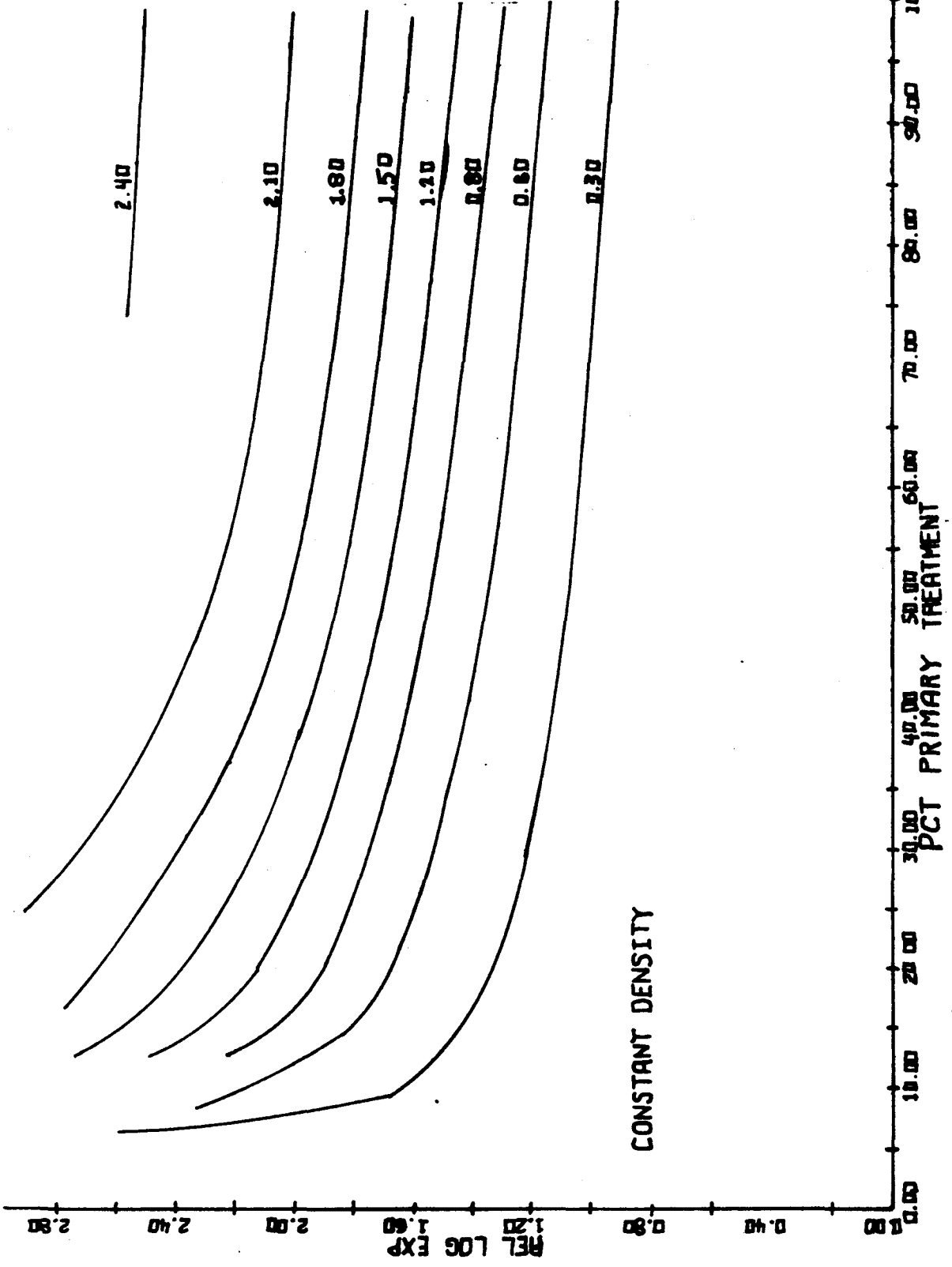
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30 January 1968

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