

BOEING MODELING PROGRAMS

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SPECIALIST ENGINEER

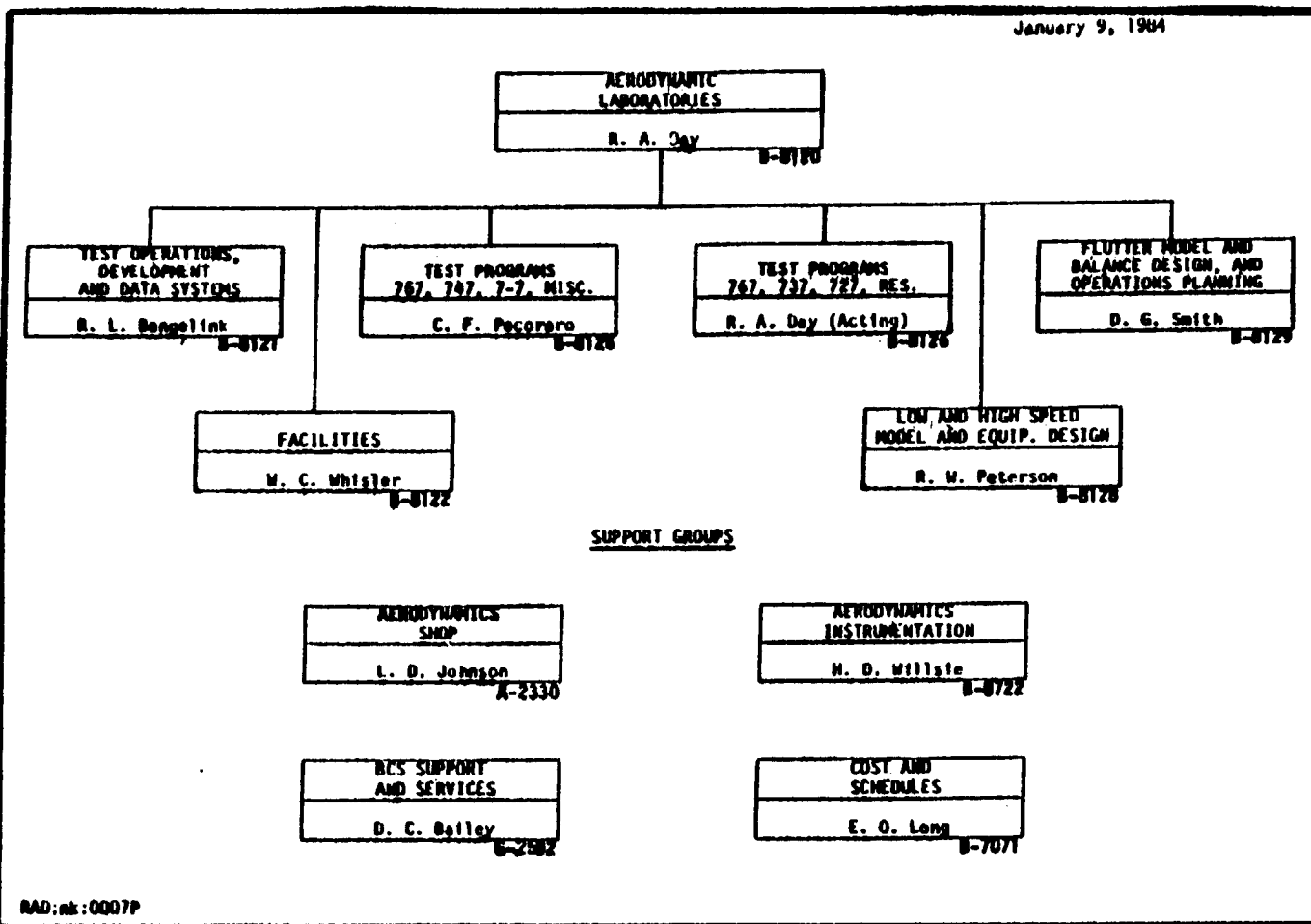
BOEING COMMERCIAL AIRPLANE COMPANY

N 92 - 70488

P. 39

58-09

January 9, 1964



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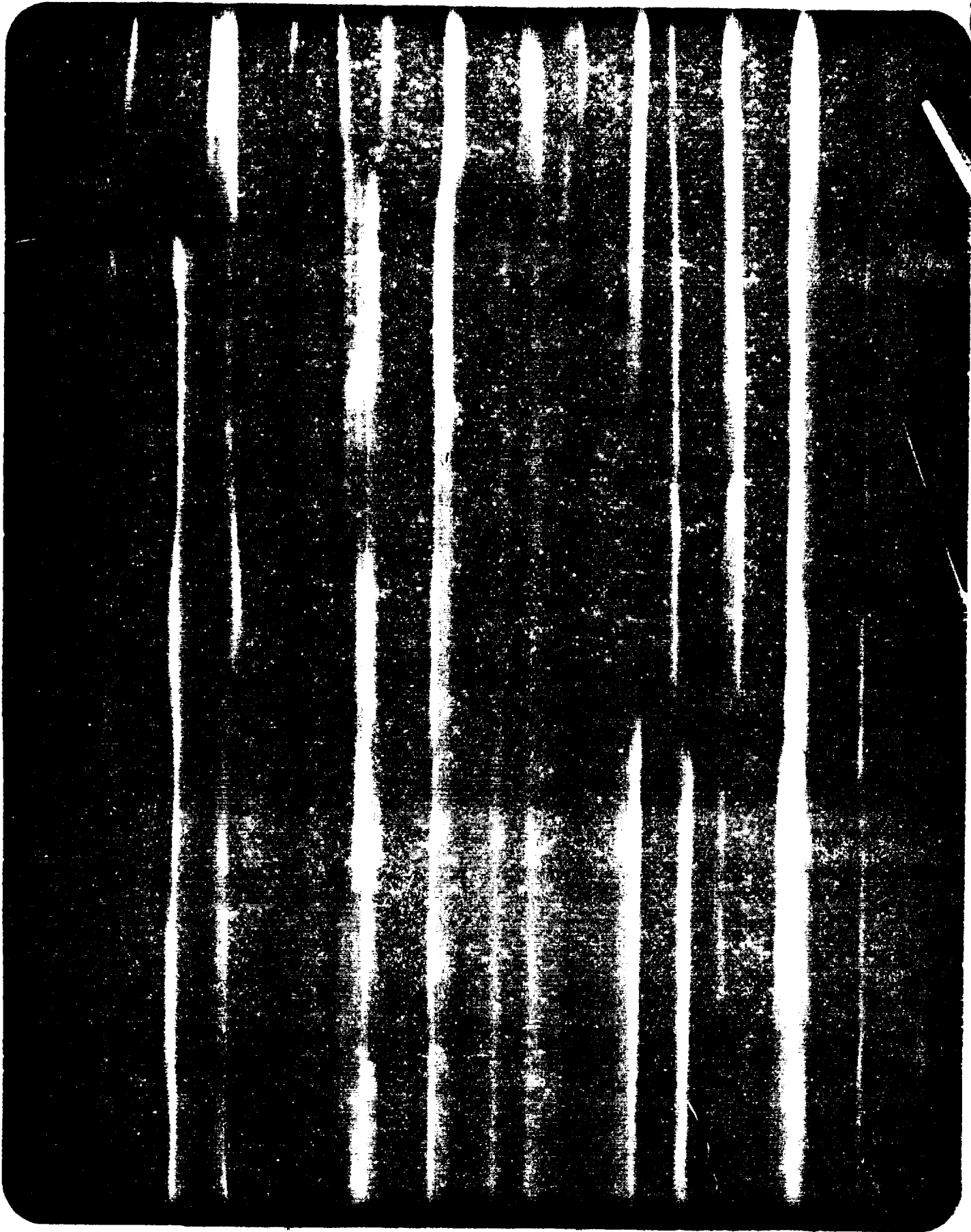
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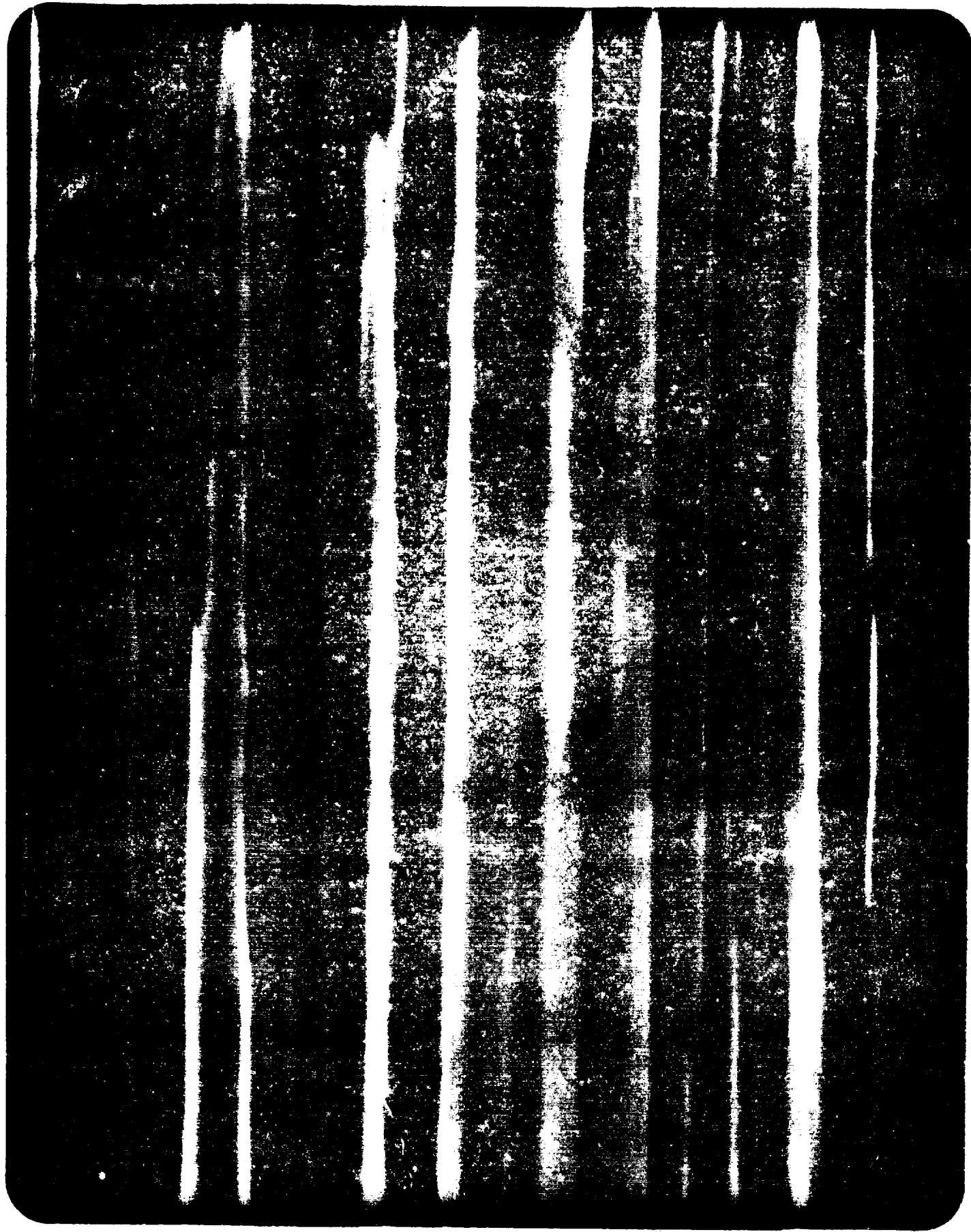
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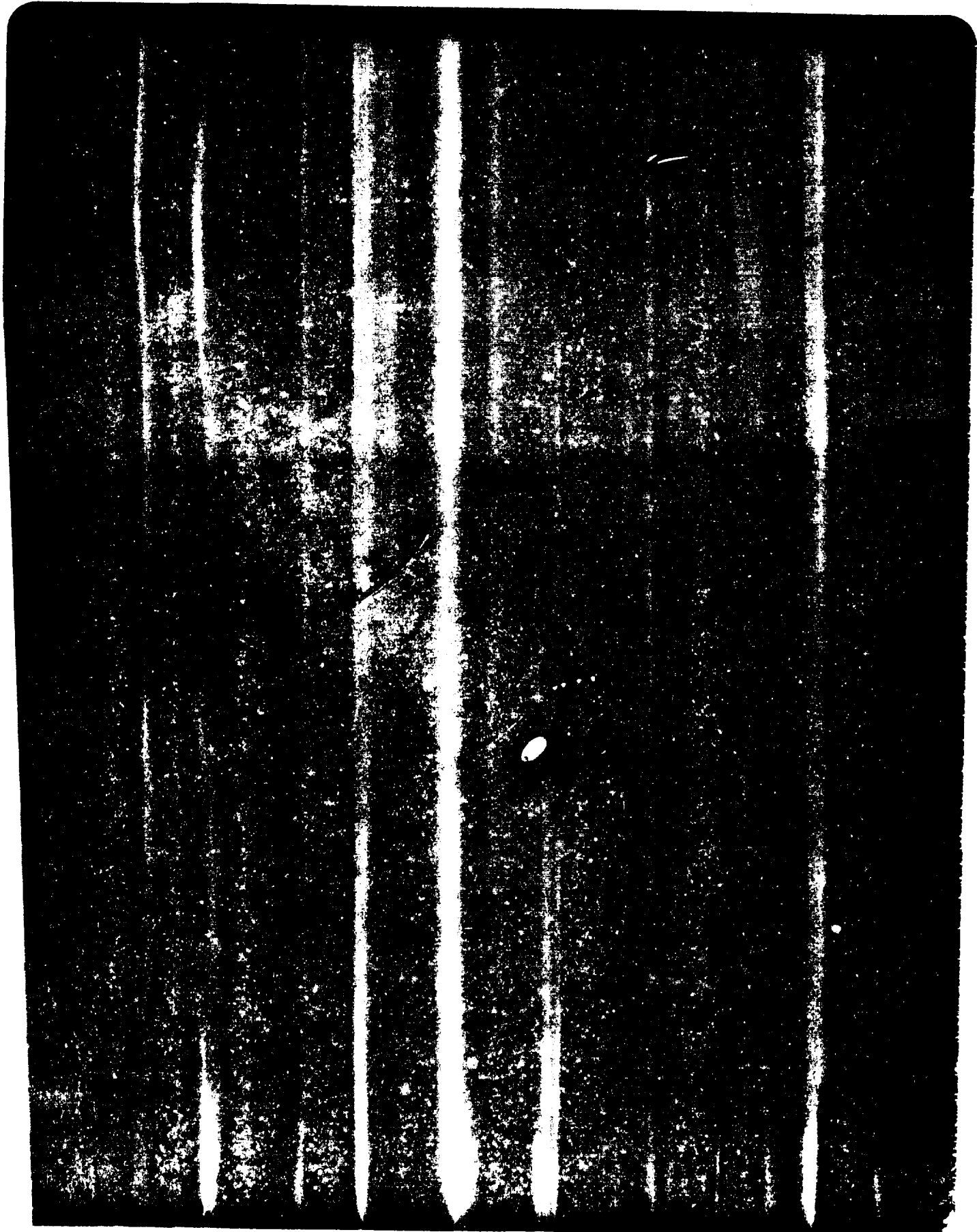
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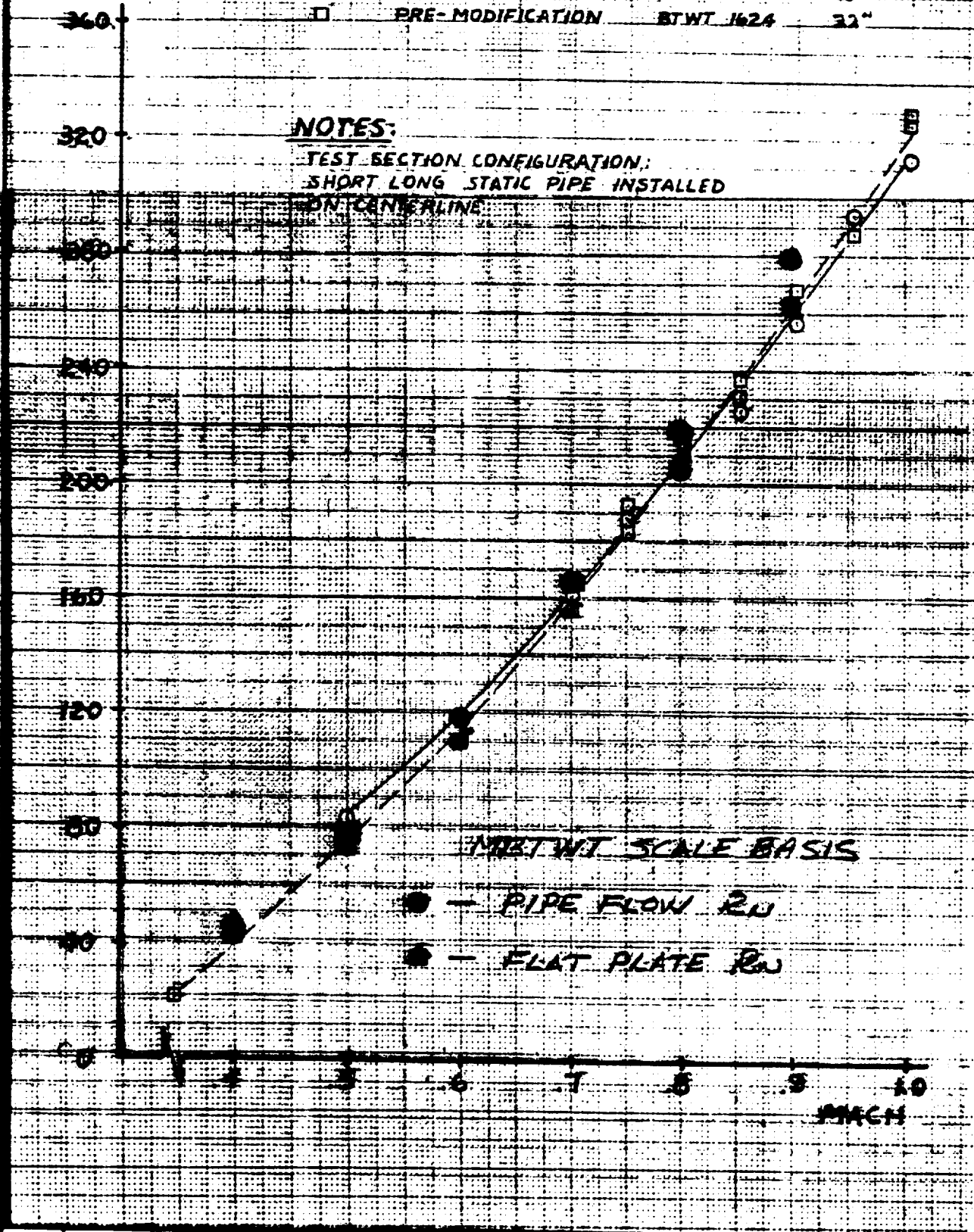
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6-2498M9

HP
A488
(MP/FT²)

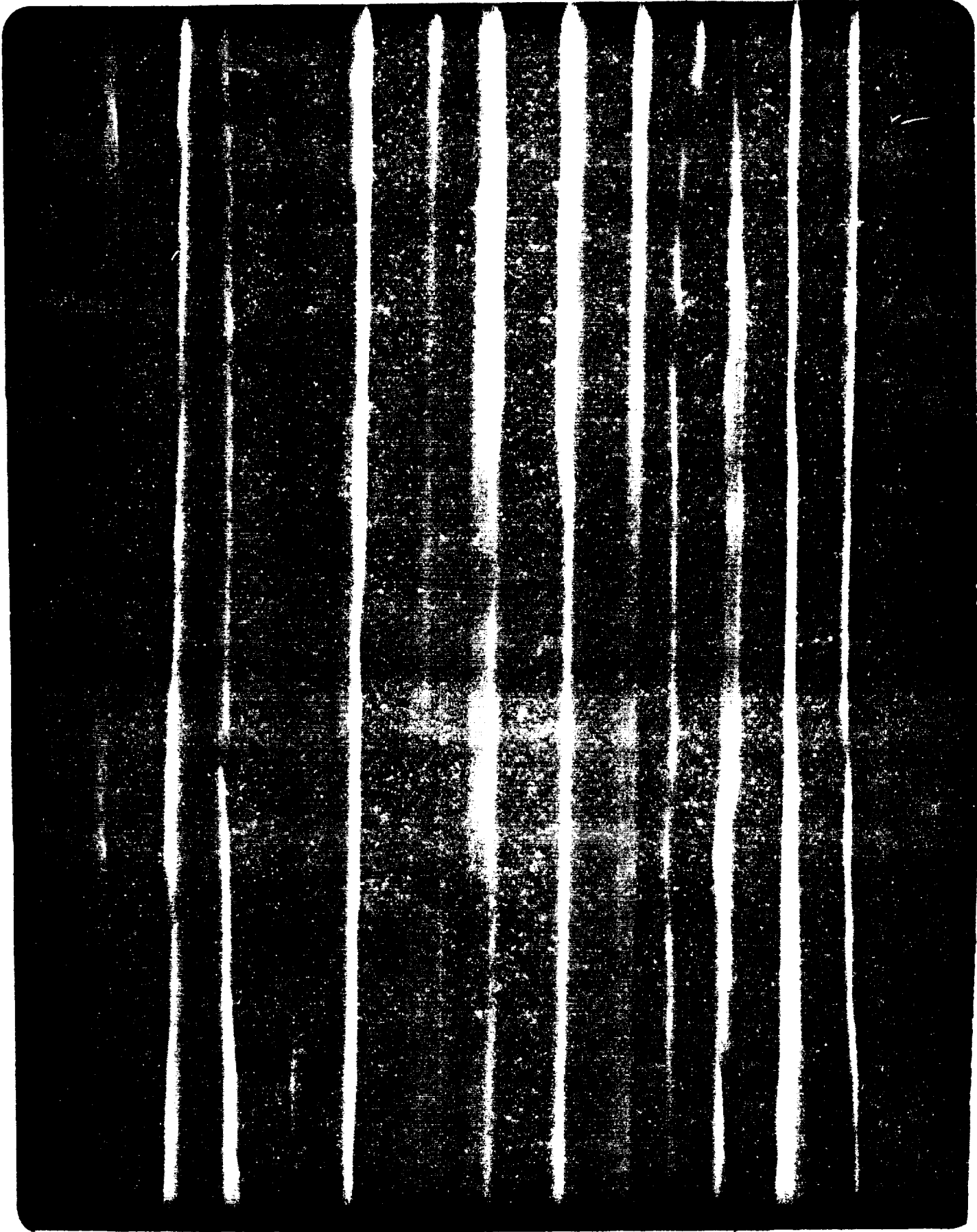
| SYMBOL | TEST | BTWT | CAID |
|--------|-------------------|-----------|------|
| ○ | POST-MODIFICATION | BTWT 1670 | 30" |
| □ | PRE-MODIFICATION | BTWT 1624 | 32" |

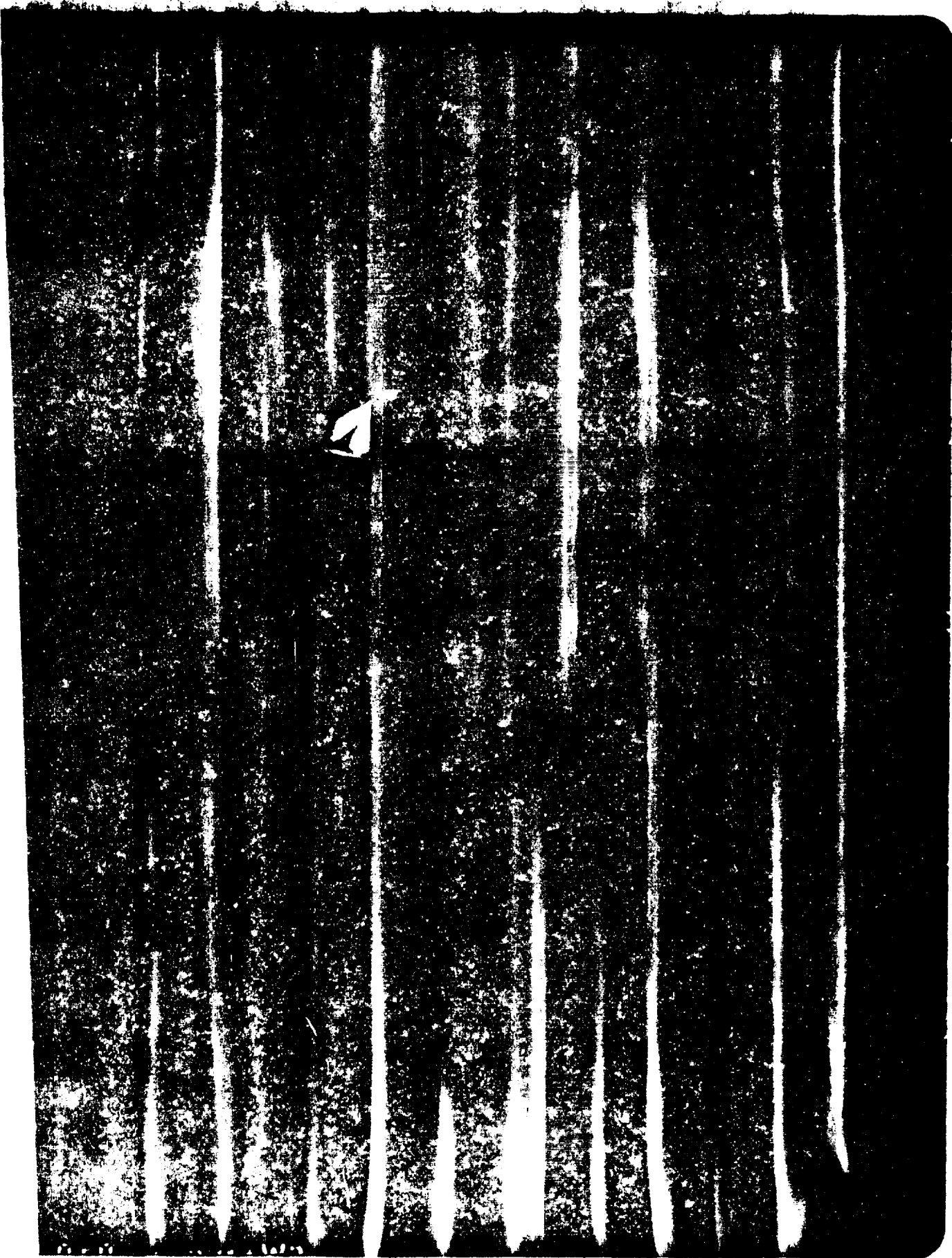
NOTES:
 TEST SECTION CONFIGURATION:
 SHORT LONG STATIC PIPE INSTALLED
 ON CENTERLINE

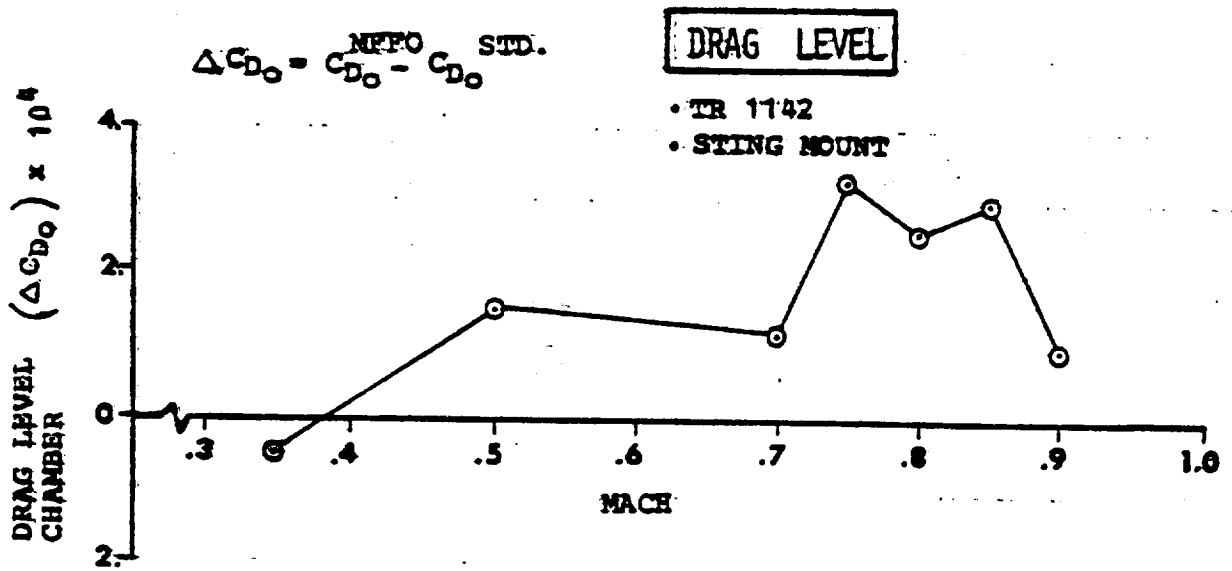
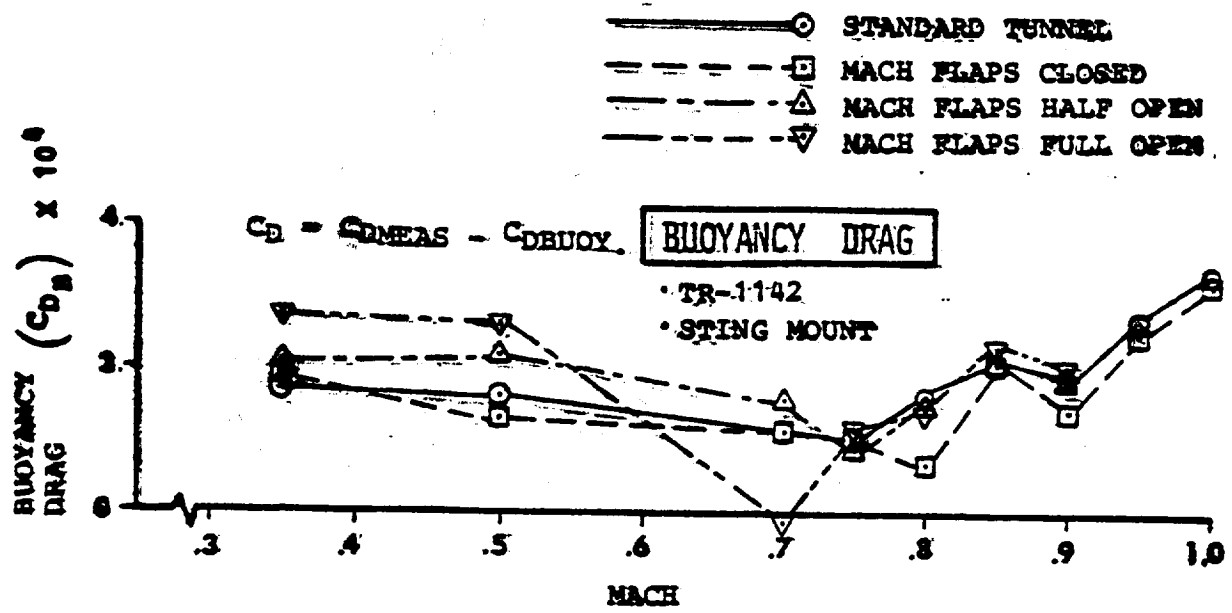


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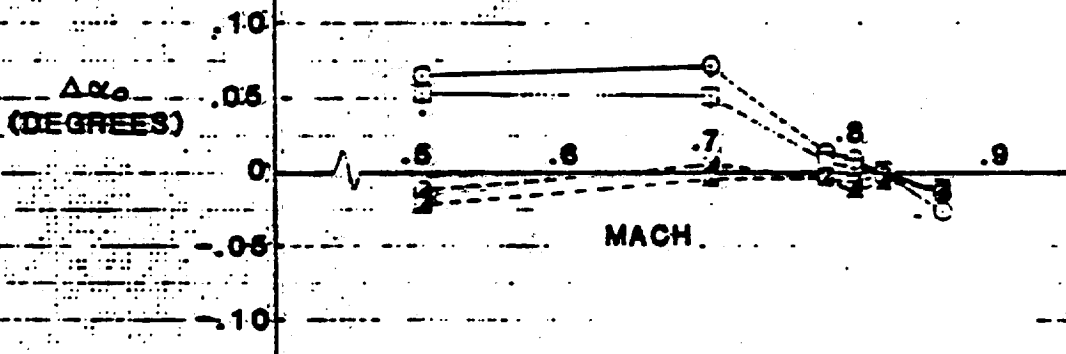
| | | | | | |
|------|-------------------|---------|------|---|--------------------------|
| ORIG | J. H. SEXTON 5/10 | REVISED | DATE | BTWT MACH CONTROL FLAPS DRAG EFFECTS | CTR-67 FIGURE |
| ORIN | 78 | | | | |
| AP | | | | | |

SYMBOL MACH FLAPS

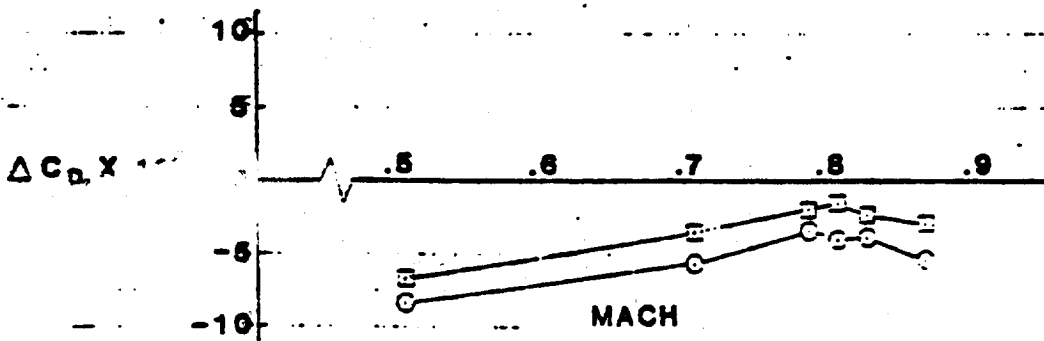
□ 50% OPEN
 ○ 100% OPEN

NOTES:
 757-T-1451 HALF MODEL

FOR $\Delta \alpha_o$ SHADED SYMBOLS $C_L - \alpha$ METHOD
 OPEN SYMBOLS $C_L - C_D$ METHOD



$\Delta = (\text{Mach Flaps Open} - \text{Mach Flaps Closed})$



| | | | | |
|-------|-----|--------|---------|------|
| CALC | MCN | 4/8/78 | REVISED | DATE |
| CHECK | | | | |
| APP | | | | |

EFFECT OF MACH CONTROL FLAPS
 ON MODEL UPFLOW AND C_D SHIFTS
 OF THE 757-T-1451 HALF MODEL

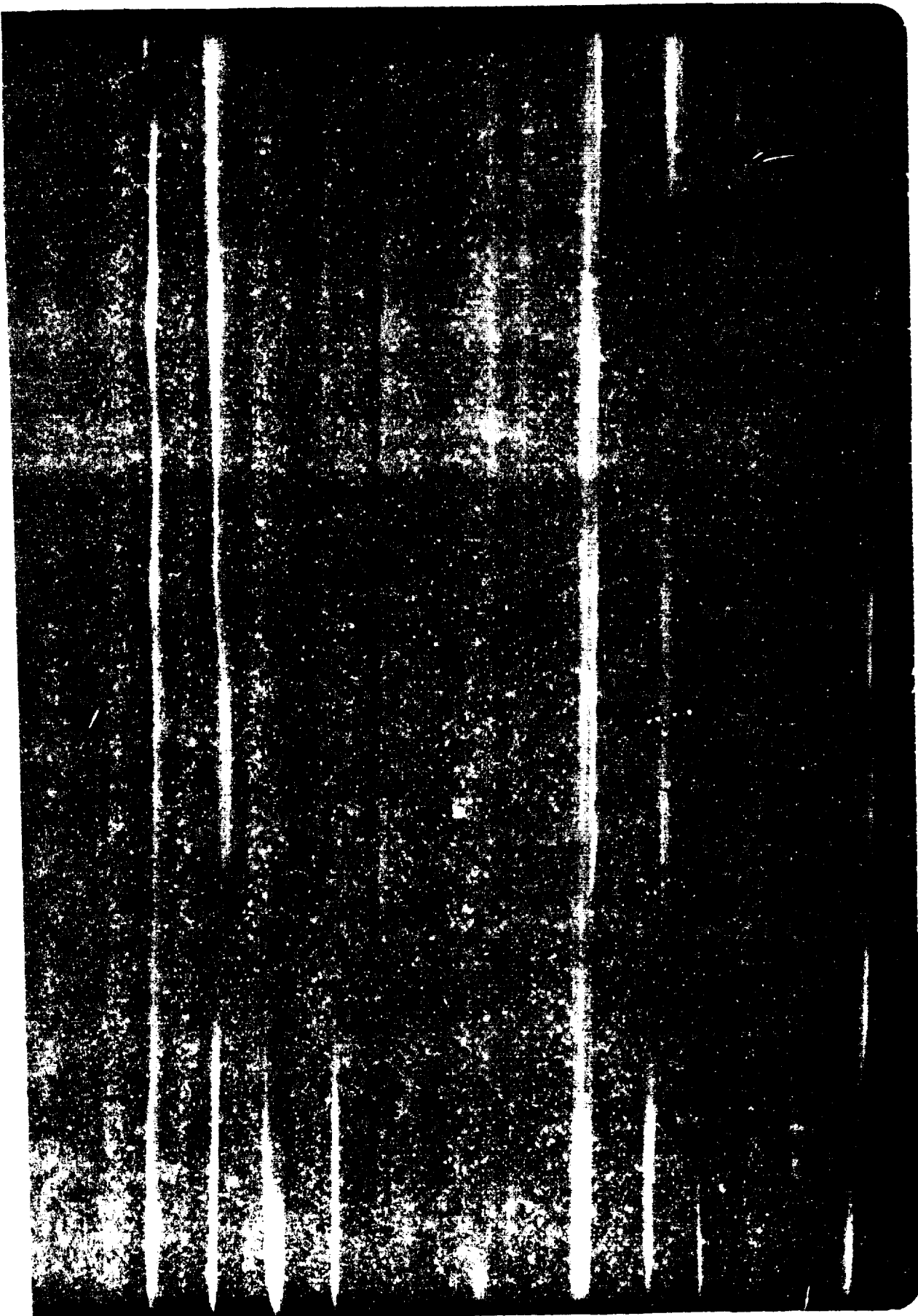
BTWT
 1684

Fig. 1

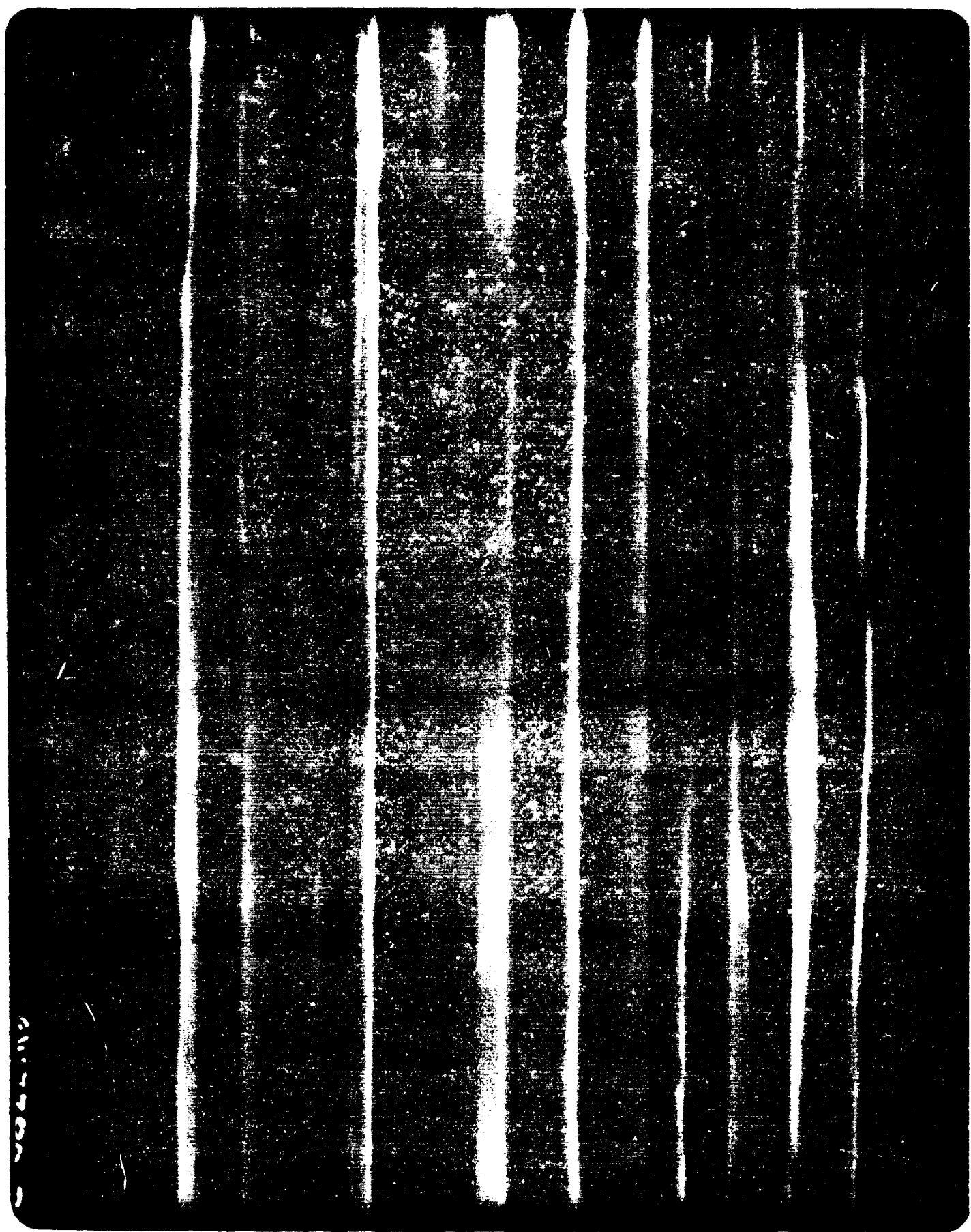
1 00 6R 1092M 9

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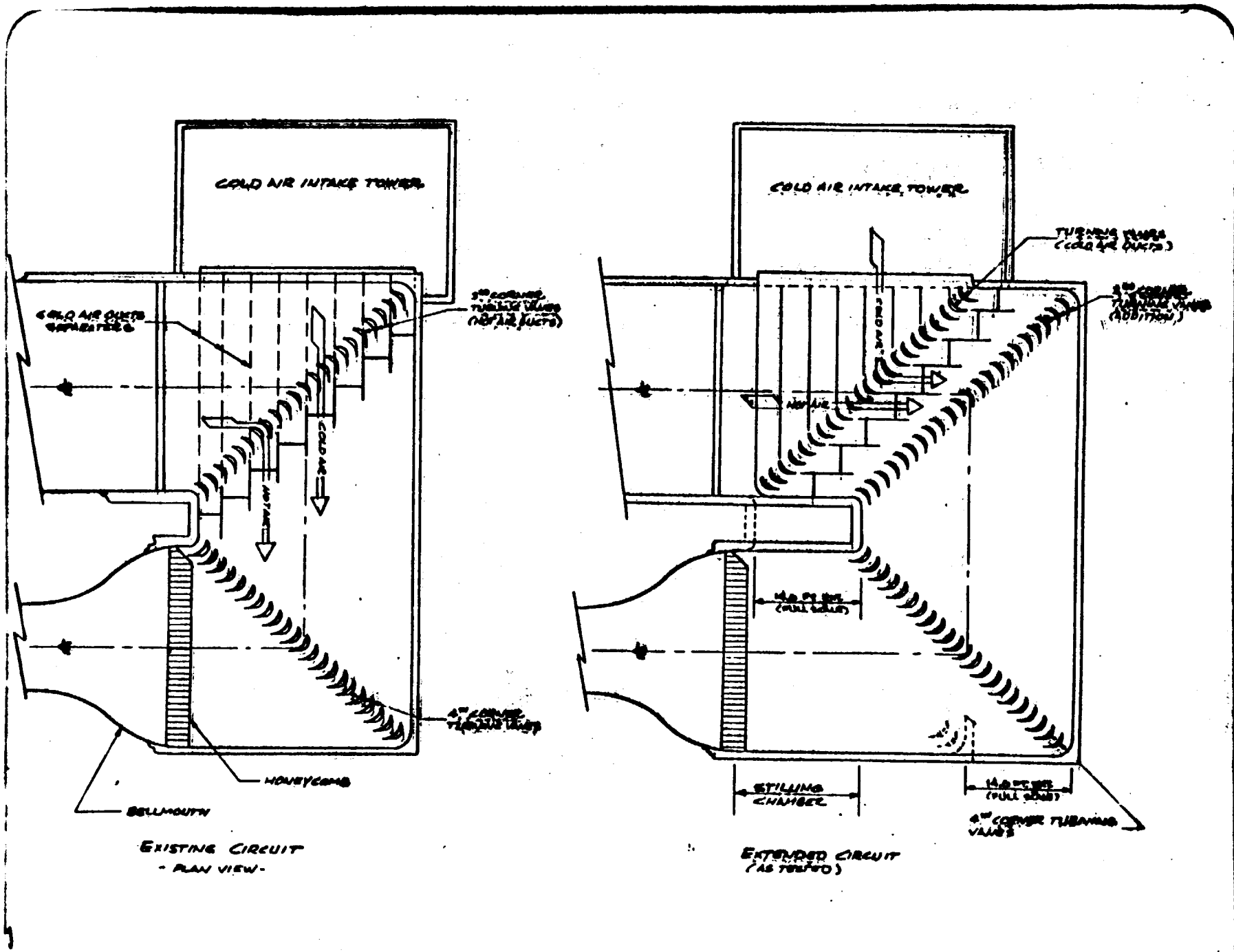




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11.4.60



COLD AIR INTAKE TOWER

COLD AIR INTAKE TOWER

COLD AIR DUCTS SEPARATED

TURNING VANES (COLD AIR DUCTS)

3" CORNER TUBING VANES (AS TRUVO)

3" CORNER TUBING VANES (AS TRUVO)

BELLMOUTH

HONEYCOMB

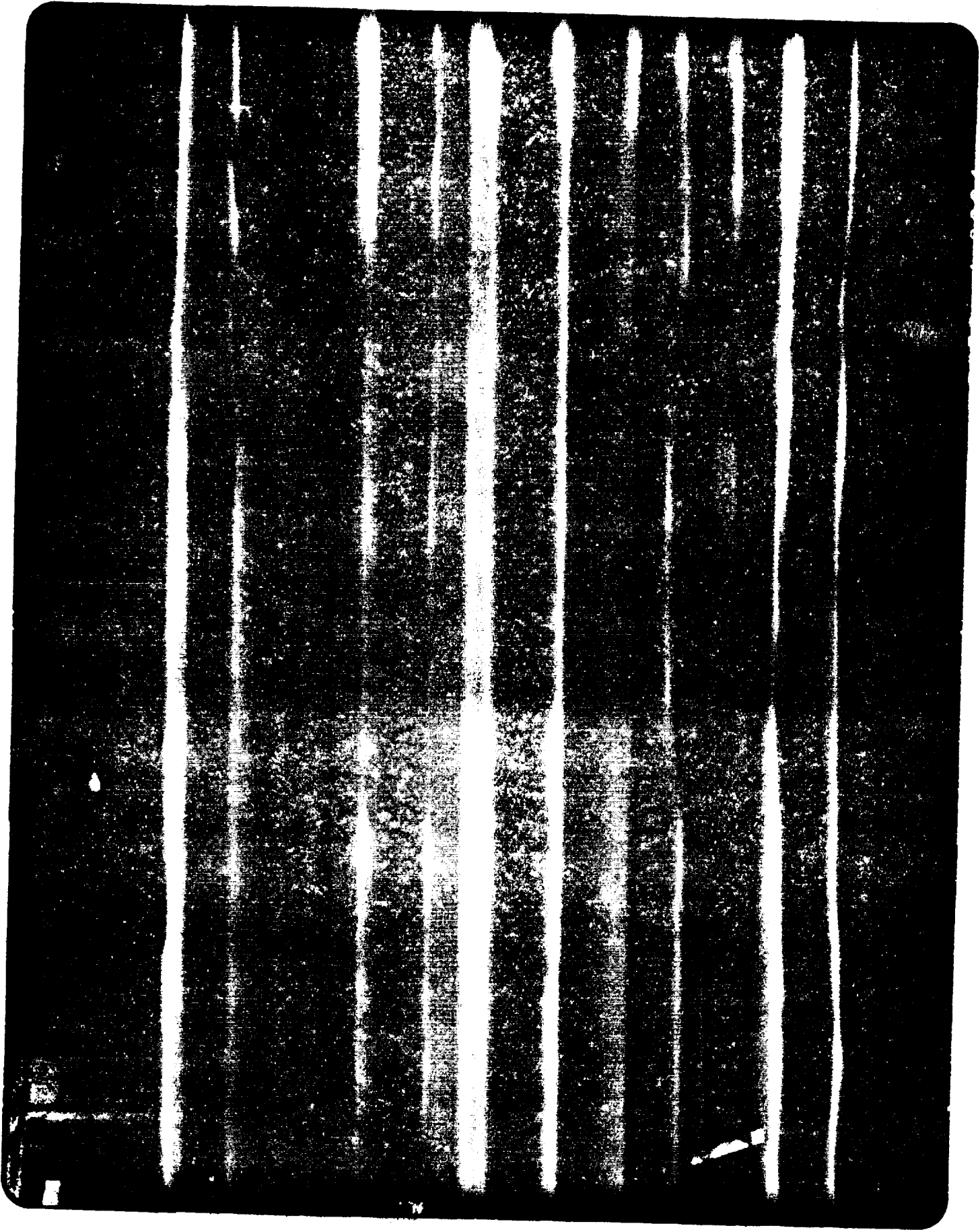
EXISTING CIRCUIT - PLAN VIEW

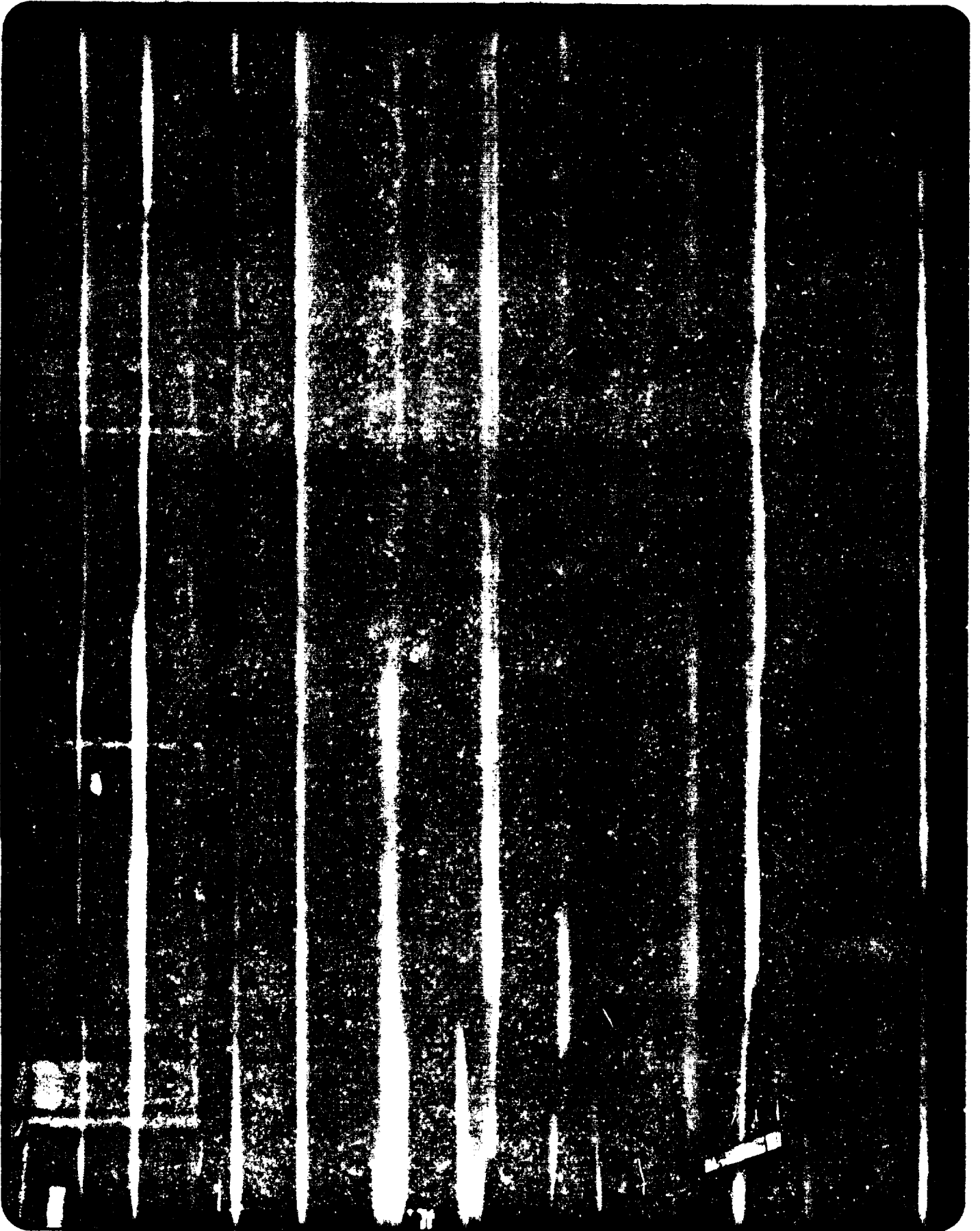
STILLING CHAMBER

14" TUBE (FULL SIZE)

4" CORNER TUBING VANES

EXTENDED CIRCUIT (AS TRUVO)

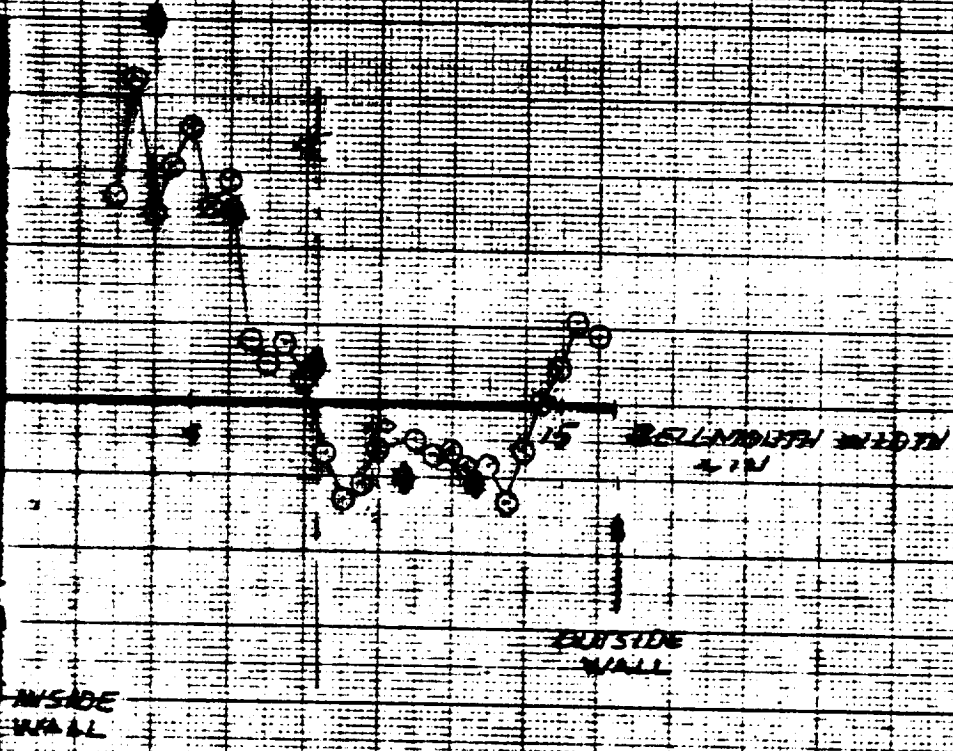




LATERAL TEMPERATURES IN THE FLOW DUCT OF A TURBINE

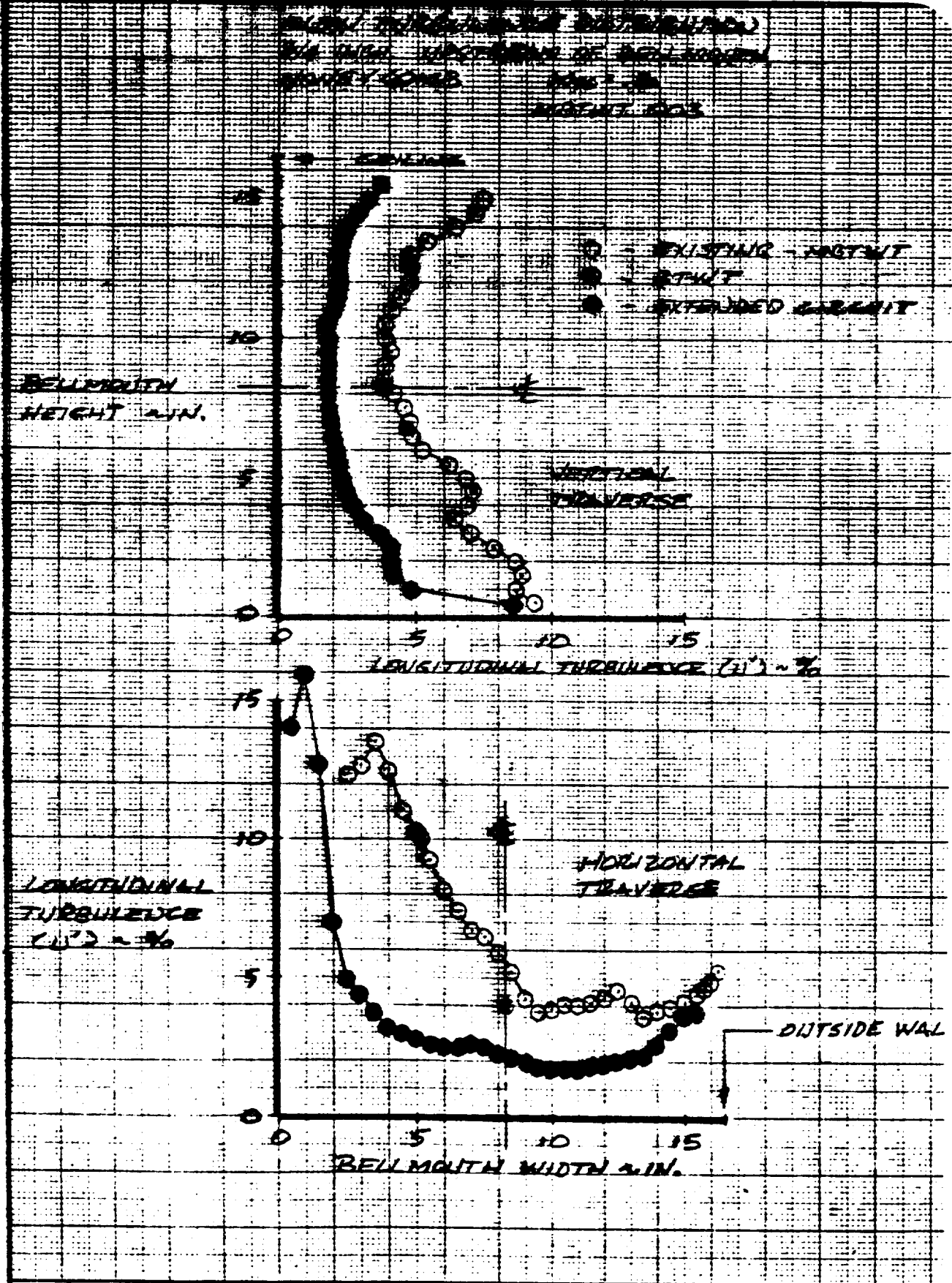
1953-54

LOCAL TEMPERATURE MEASUREMENTS
(T₁ - T₂)



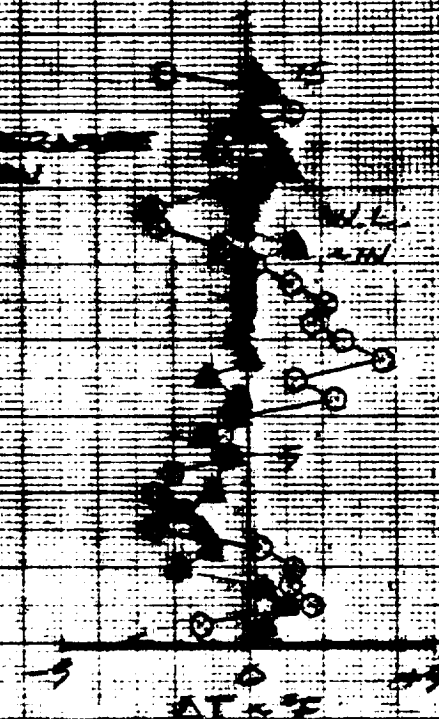
○ - BELLMOUTH ENTRANCE - MBTWT

● - TEST SECTION EXTENDED TO
BELLMOUTH ENTRANCE - BTWT



TEMPERATURE DISTRIBUTION
ON HORIZ. SECTION OF
WINDTUNNEL WALL
AT $\Delta T = 200$

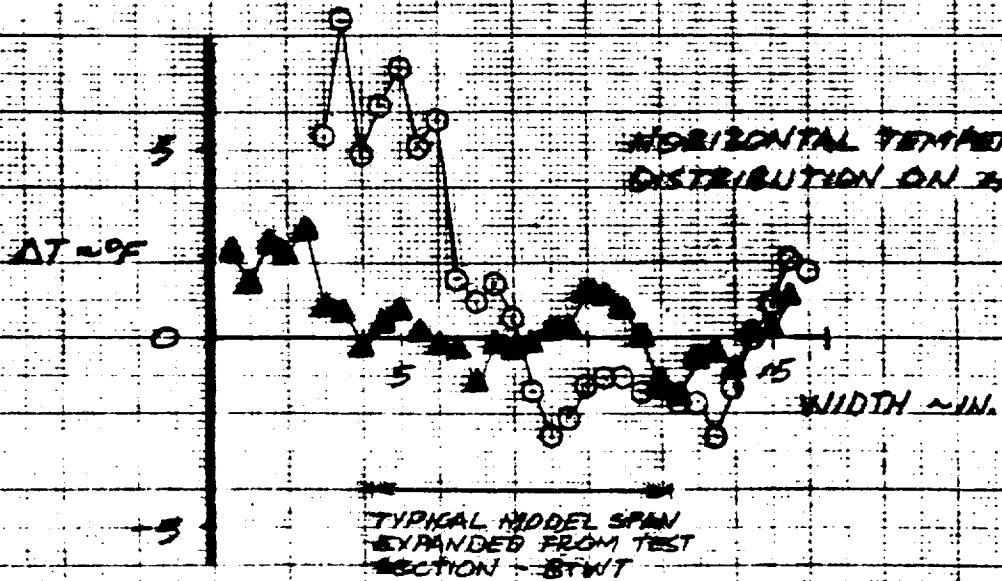
VERTICAL TEMPERATURE
DISTRIBUTION ON
WINDTUNNEL WALL
AT $\Delta T = 200$



\circ - EXISTING CIRCUIT
 \blacktriangle - EXTENDED CIRCUIT

$\Delta T = 200$

HORIZONTAL TEMPERATURE
DISTRIBUTION ON HORIZ. \perp

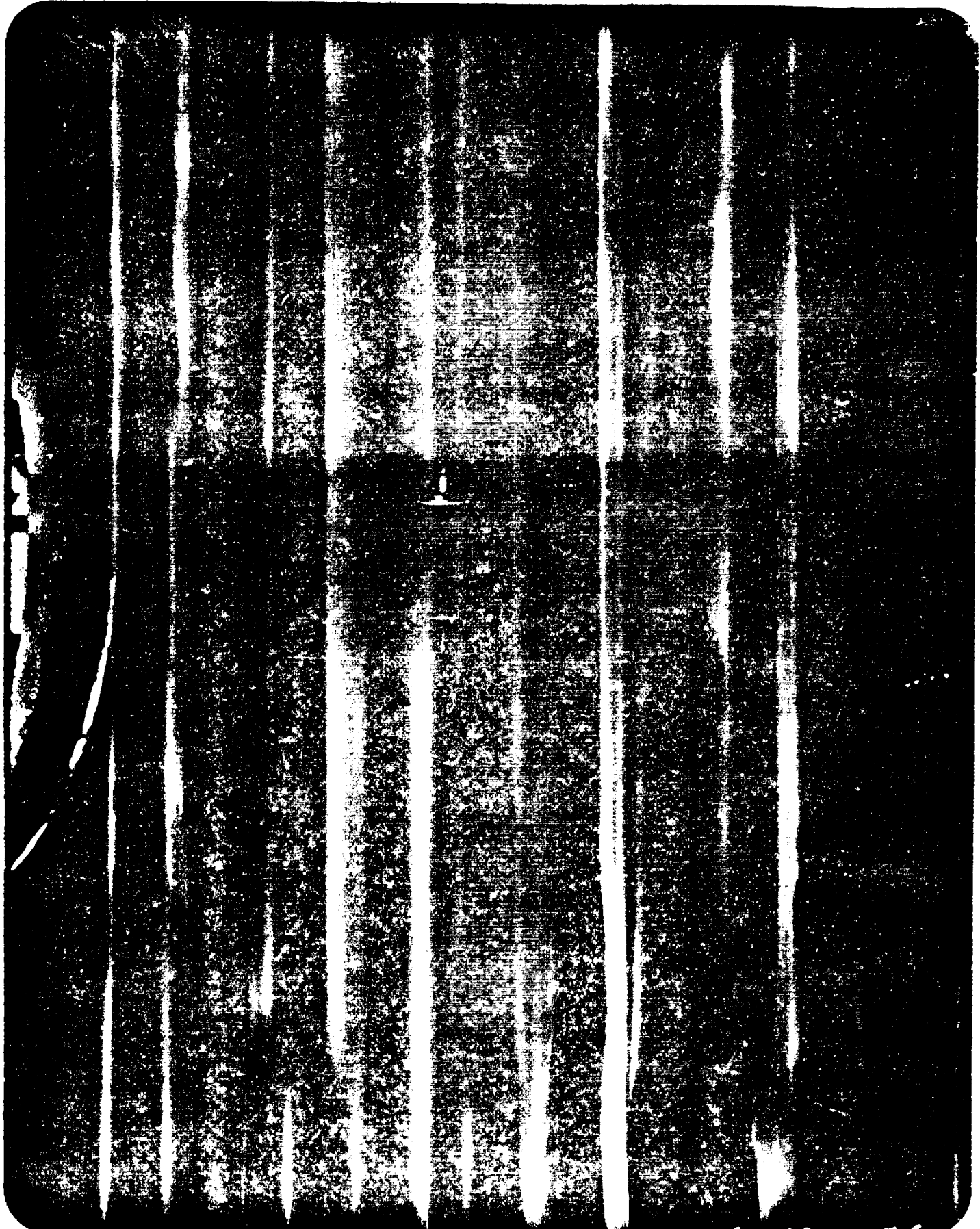


$\Delta T = 200$

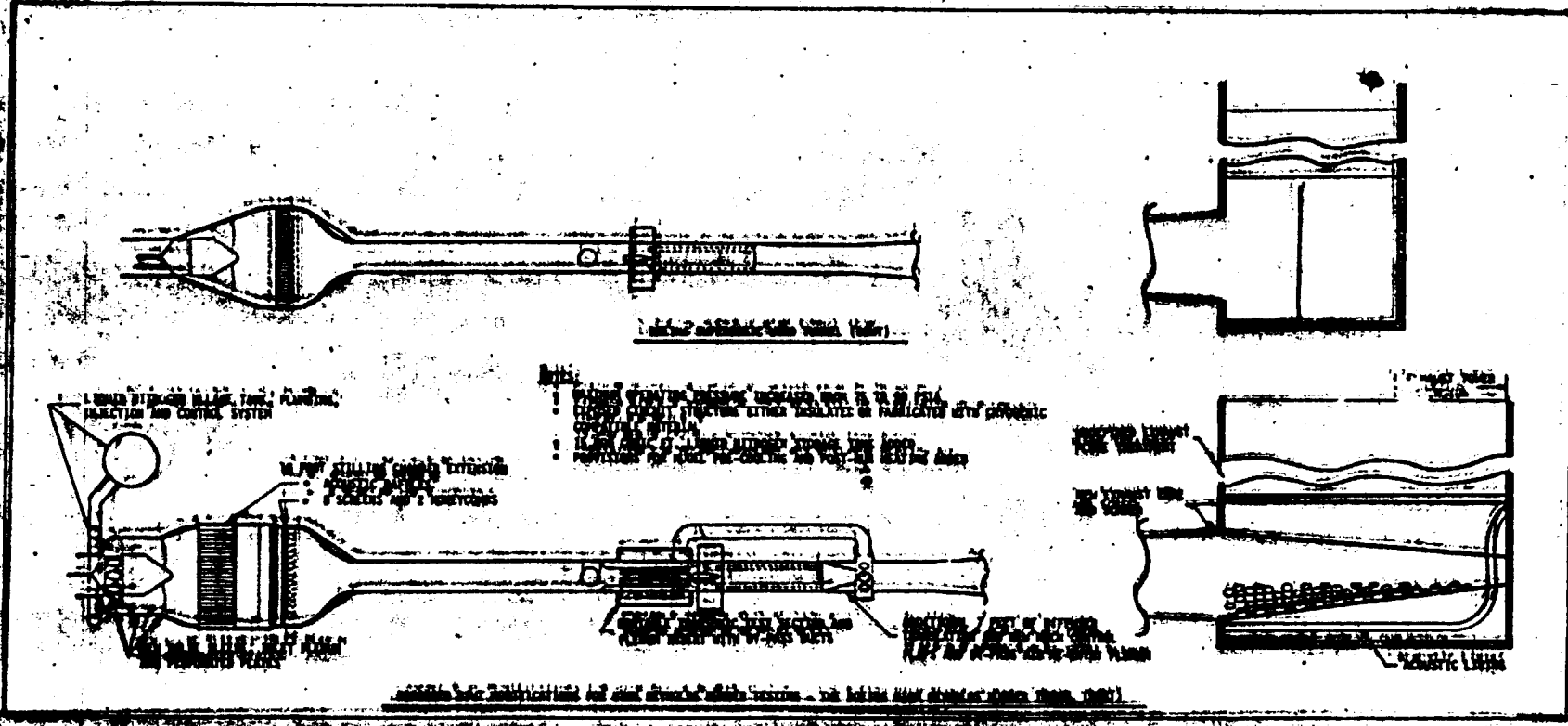
WIDTH ~ IN.

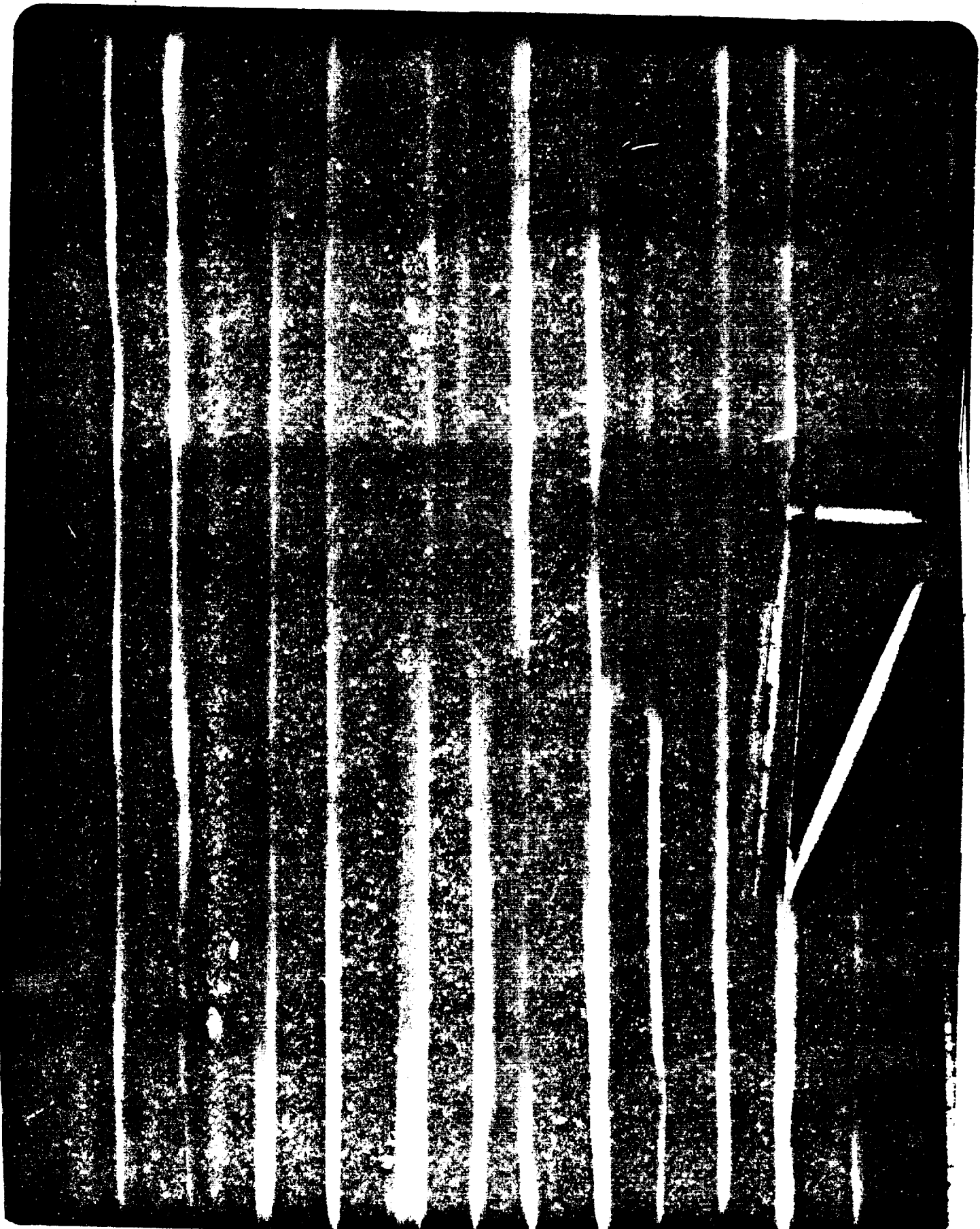
TYPICAL MODEL SPAN
EXPANDED FROM TEST
SECTION - BTWT

$\Delta T = T_{\text{LOCAL}} - T_{\text{BELLMOUTH}}$



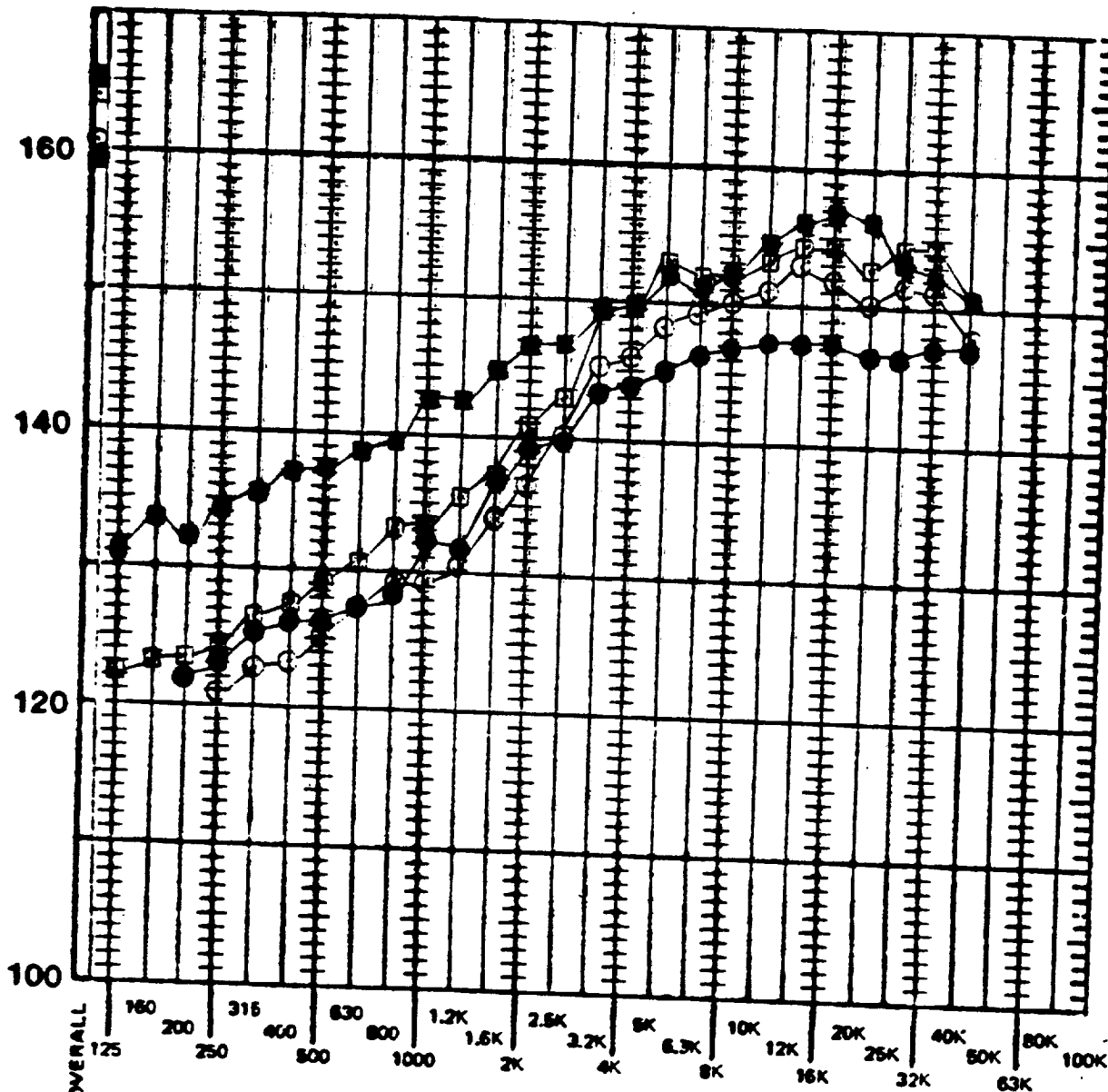
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TEST SECTION ACOUSTICS COMPARISON OF BSWT AND MSWT

ONE-THIRD OCTAVE BAND SPL IN DB RE 2 X 10⁻⁵ N/M²

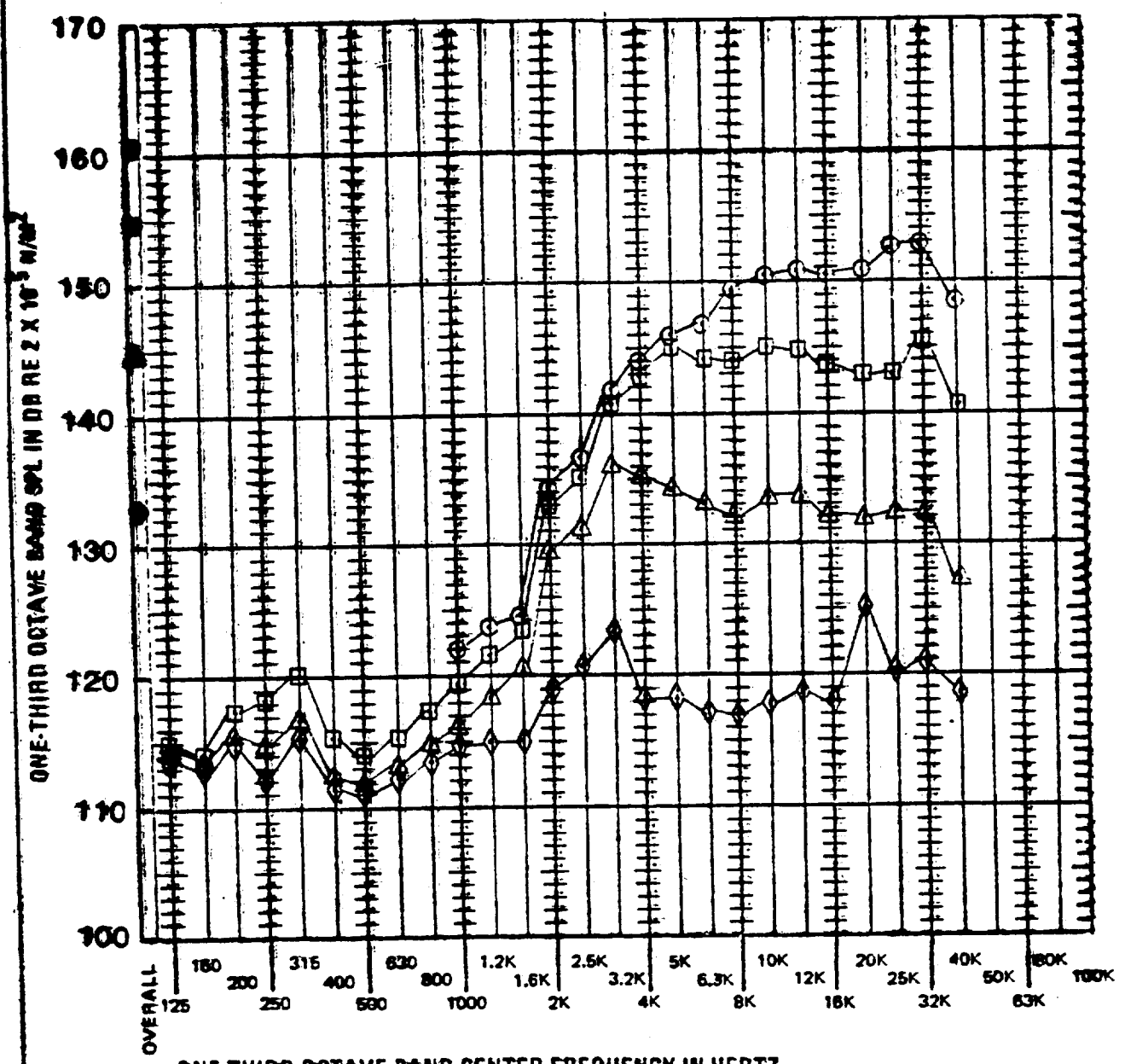


ONE-THIRD OCTAVE BAND CENTER FREQUENCY IN HERTZ

| SYM. | FACILITY | MACH | WEIGHT FLOW (#/SEC) |
|------|----------|------|---------------------|
| ○ | MSWT | 0.95 | 9.17 |
| ● | BSWT | 0.85 | 1000 |
| □ | MSWT | 0.95 | 16.05 |
| ■ | BSWT | 0.85 | 1712 |

1.5

EFFECT OF VALVE PRESSURE RATIO ON TEST SECTION ACOUSTIC LEVEL



ONE-THIRD OCTAVE BAND CENTER FREQUENCY IN HERTZ

| SYM | VALVE PRESSURE RATIO |
|-----|----------------------|
| ● | 7.0 |
| ■ | 2.7 |
| ▲ | 1.45 |
| ◆ | 1.10 |

MACH=0.3

PT=20 PS/A

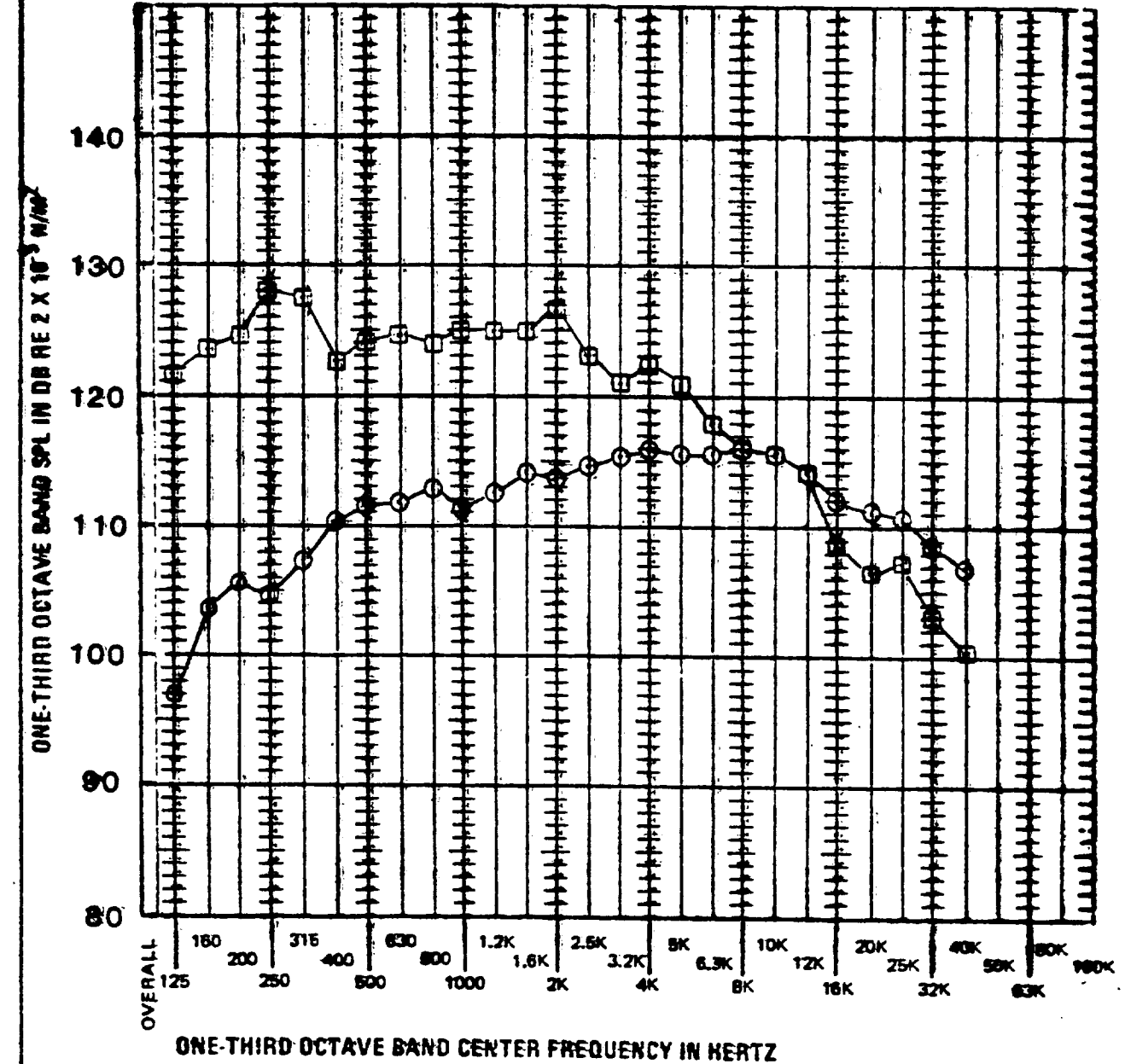
WEIGHT FLOW= 4.86 g/SEC

4149 7748 ORIG. 3/71

Valve Ratio *Pressure Ratio* *Acoustic Level*

SOUND TOWER EXIT NOISE SPECTRUM

COMPARISON BSWT - MSWT



○ BSWT $\dot{w} = 2250 \text{ \#}/\text{sec.}$
 □ MSWT $\dot{w} = 21.8 \text{ \#}/\text{sec.}$

Note: BSWT data shifted in frequency by a factor of 10

1100 7700 ORIG. 3/71

