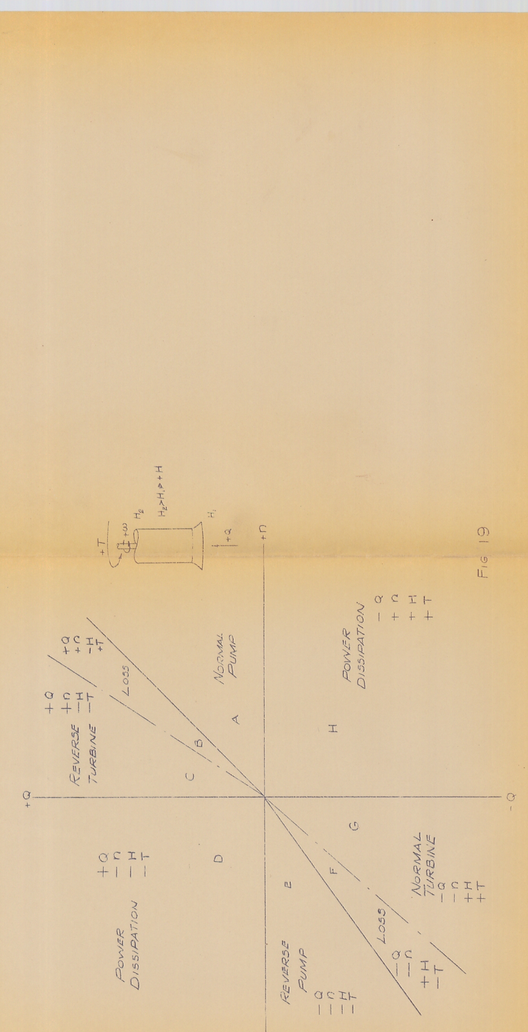
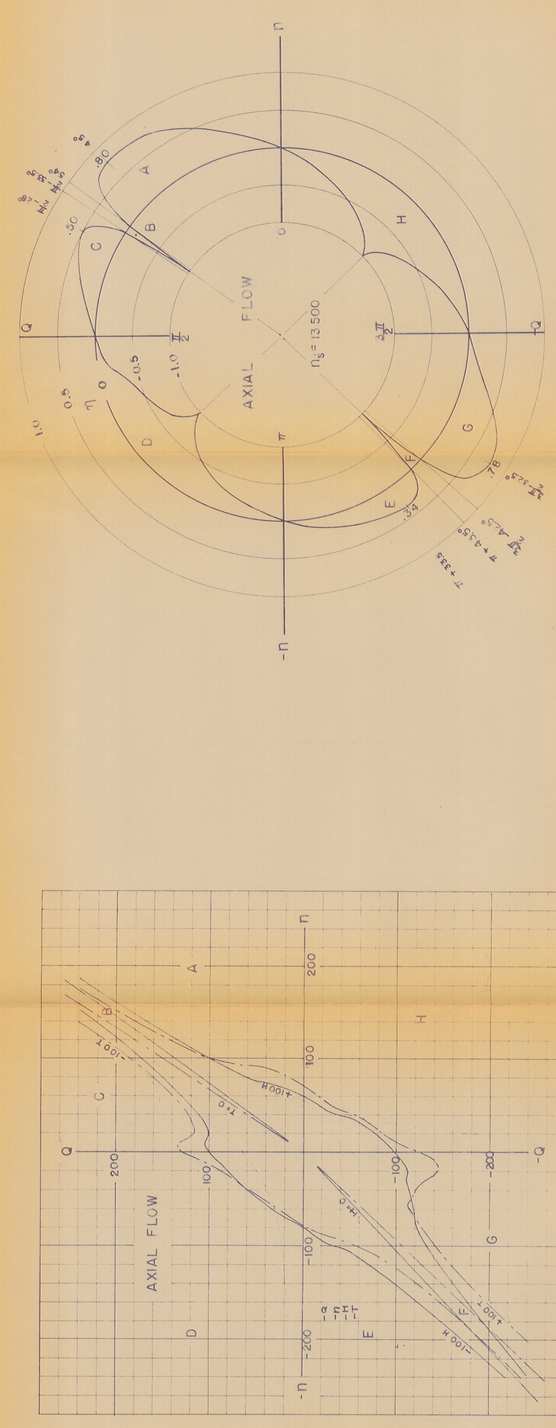
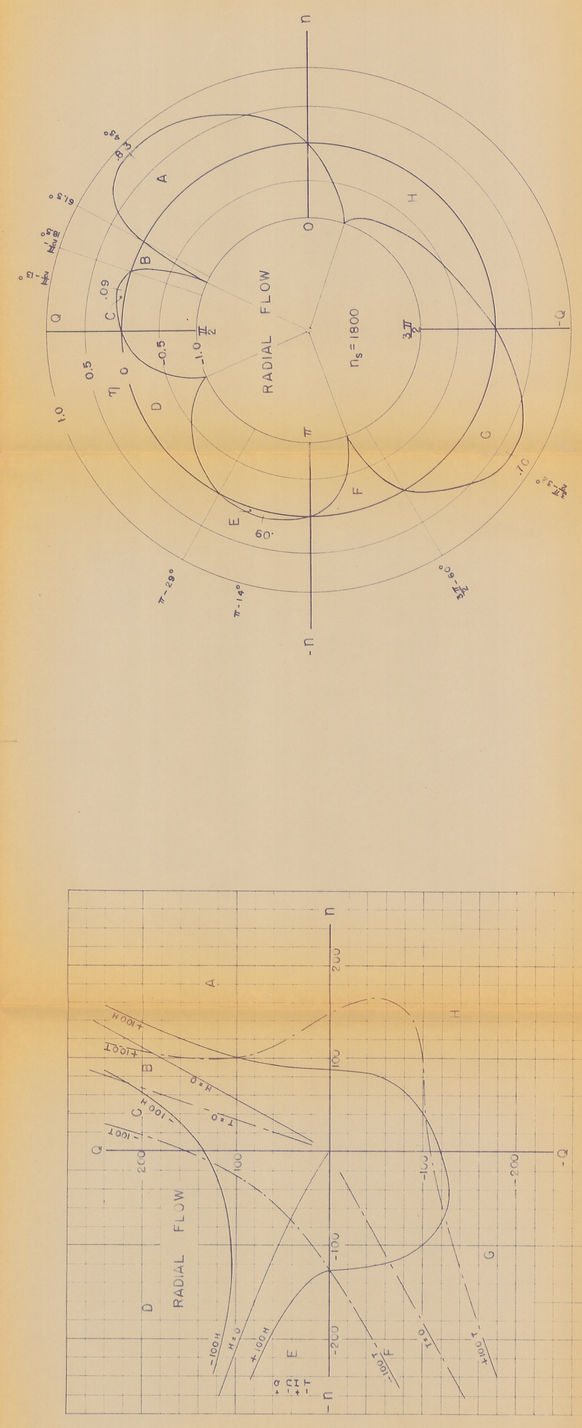
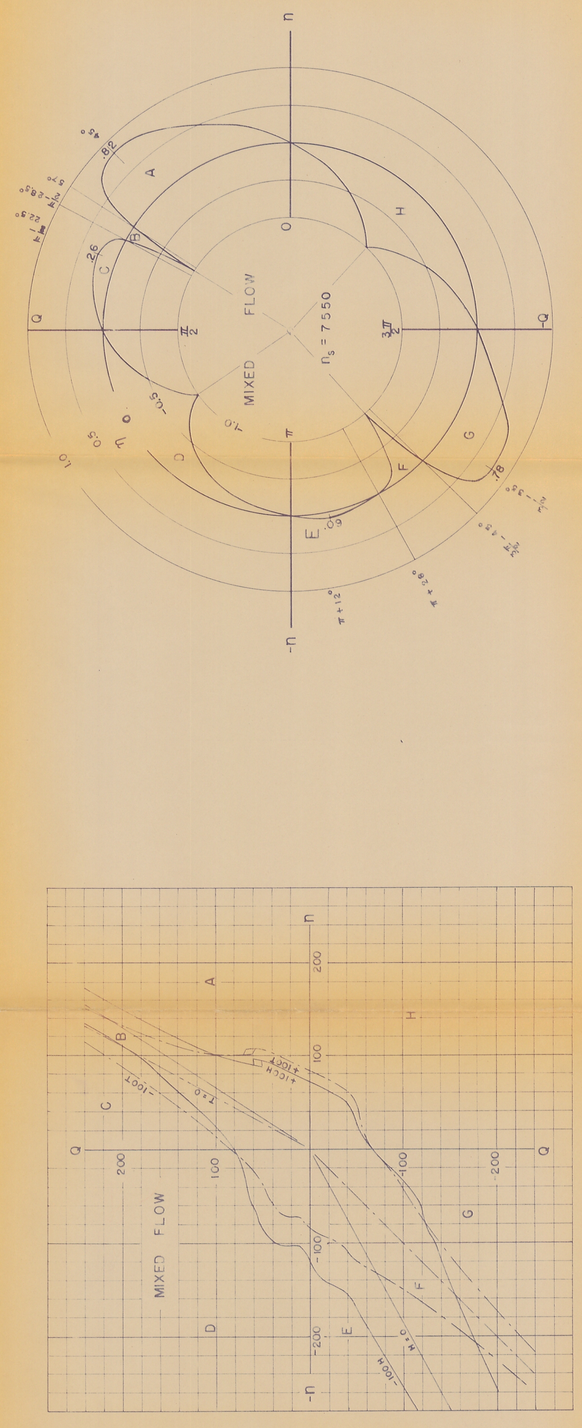

+Q
-Q
+n
-n
REVERSE TURBINE
NORMAL PUMP
REVERSE PUMP
NORMAL TURBINE
POWER DISSIPATION
LOSS
A
B
C
D
E
F
G
H
+Q +n -H -T
+Q +n +H +T
-Q -n +H +T
-Q -n -H -T
POWER DISSIPATION
-Q -n -H -T
+Q +n +H +T
+T
+Q
H₂
H₁
H₂>H₁>+H

FIG 19


AXIAL FLOW
n_s = 13500
η
n
Q
-Q
-n
A
B
C
D
E
F
G
H
0
.50
.80
.35
.78
$\frac{\pi}{2}$
π
$\frac{3\pi}{2}$
-0.5
-1.0
0.5
1.0


RADIAL FLOW
n_s = 1800
η
n
Q
-Q
-n
A
B
C
D
E
F
G
H
0
.82
.09
.09
.07
$\frac{\pi}{2}$
π
$\frac{3\pi}{2}$
-0.5
-1.0
0.5
1.0


MIXED FLOW
n_s = 7550
η
n
Q
-Q
-n
A
B
C
D
E
F
G
H
0
.82
.26
.09
.78
$\frac{\pi}{2}$
π
$\frac{3\pi}{2}$
-0.5
-1.0
0.5
1.0

AXIAL FLOW
Q
-Q
-n
A
B
C
D
E
G
H
200
100
-100
-200
+100T
-100T
T=0
+100H
-100H
H=0

RADIAL FLOW
Q
-Q
-n
A
B
C
D
E
F
G
H
200
100
-100
-200
+100T
-100T
T=0
+100H
-100H
H=0

MIXED FLOW
Q
-Q
-n
A
B
C
D
E
F
G
H
200
100
-100
-200
+100T
-100T
T=0
+100H
-100H
H=0