BIN BIF/055-02269-69

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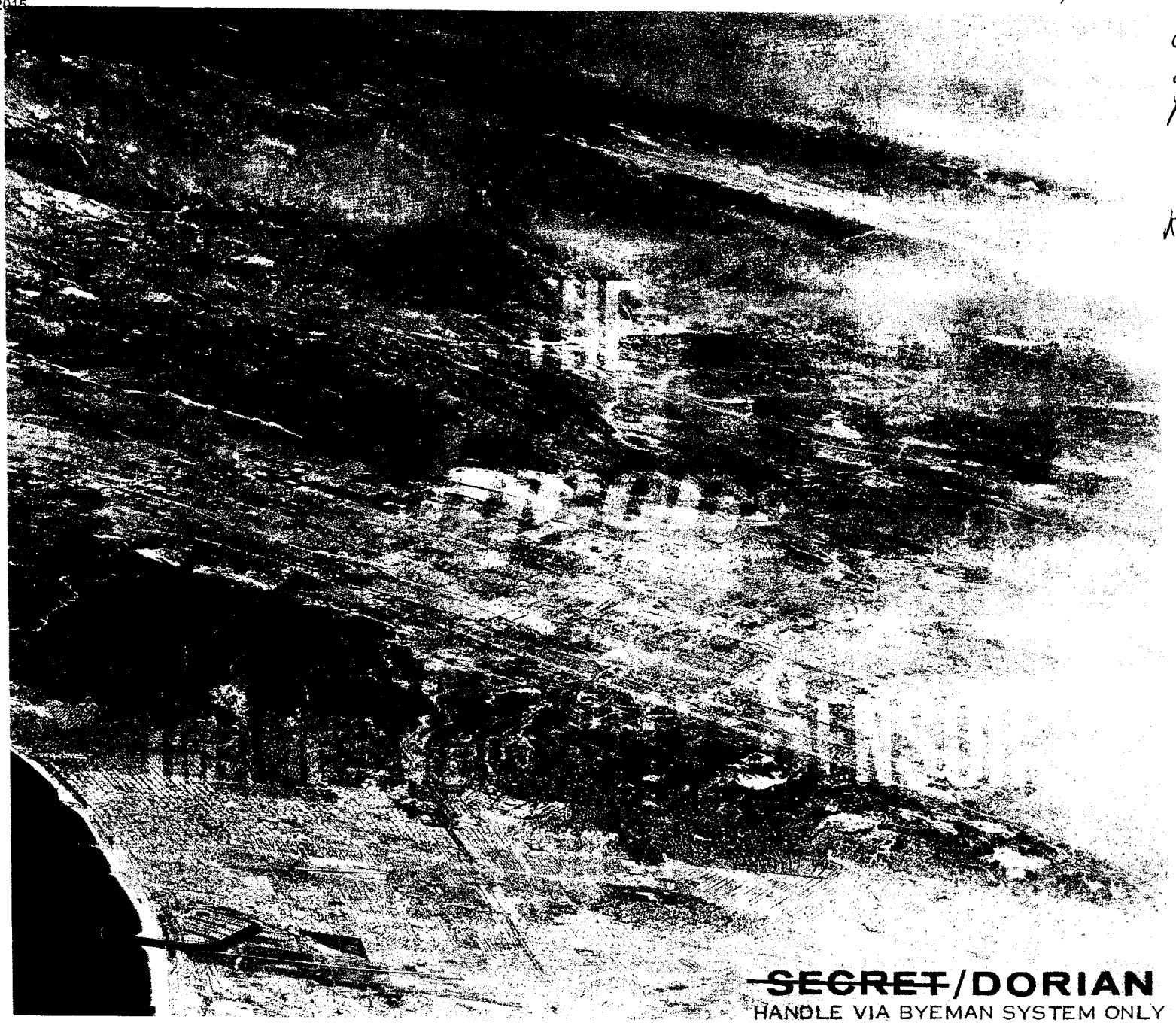
page 27

K. Marratt
OS



~~SECRET~~/DORIAN
HANDLE VIA BYEMAN SYSTEM ONLY

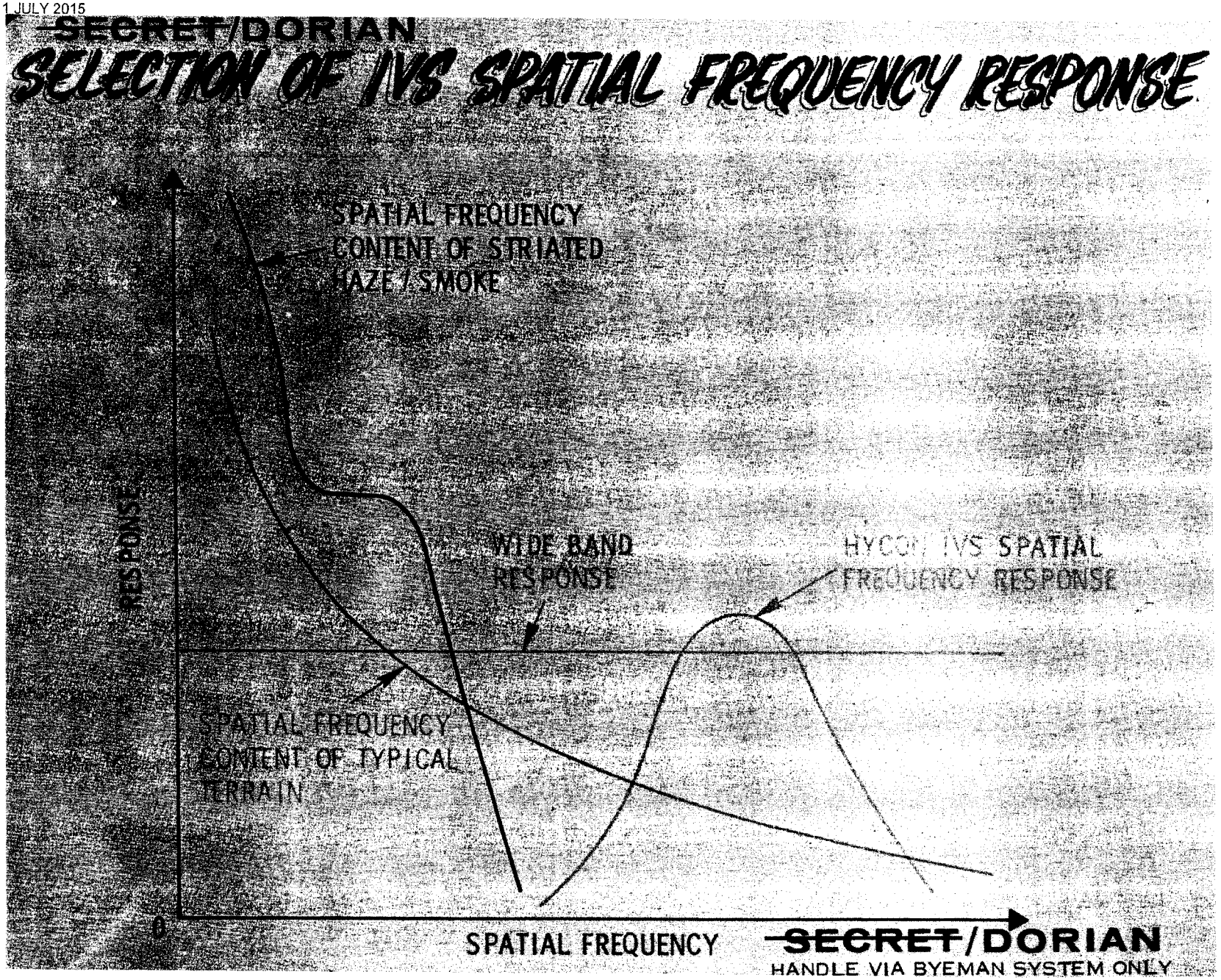
APR 4 - 1969

PURPOSE

TO SENSE IMAGE MOTION THROUGH ATMOSPHERE

~~SECRET/DORIAN~~

SELECTION OF IVS SPATIAL FREQUENCY RESPONSE



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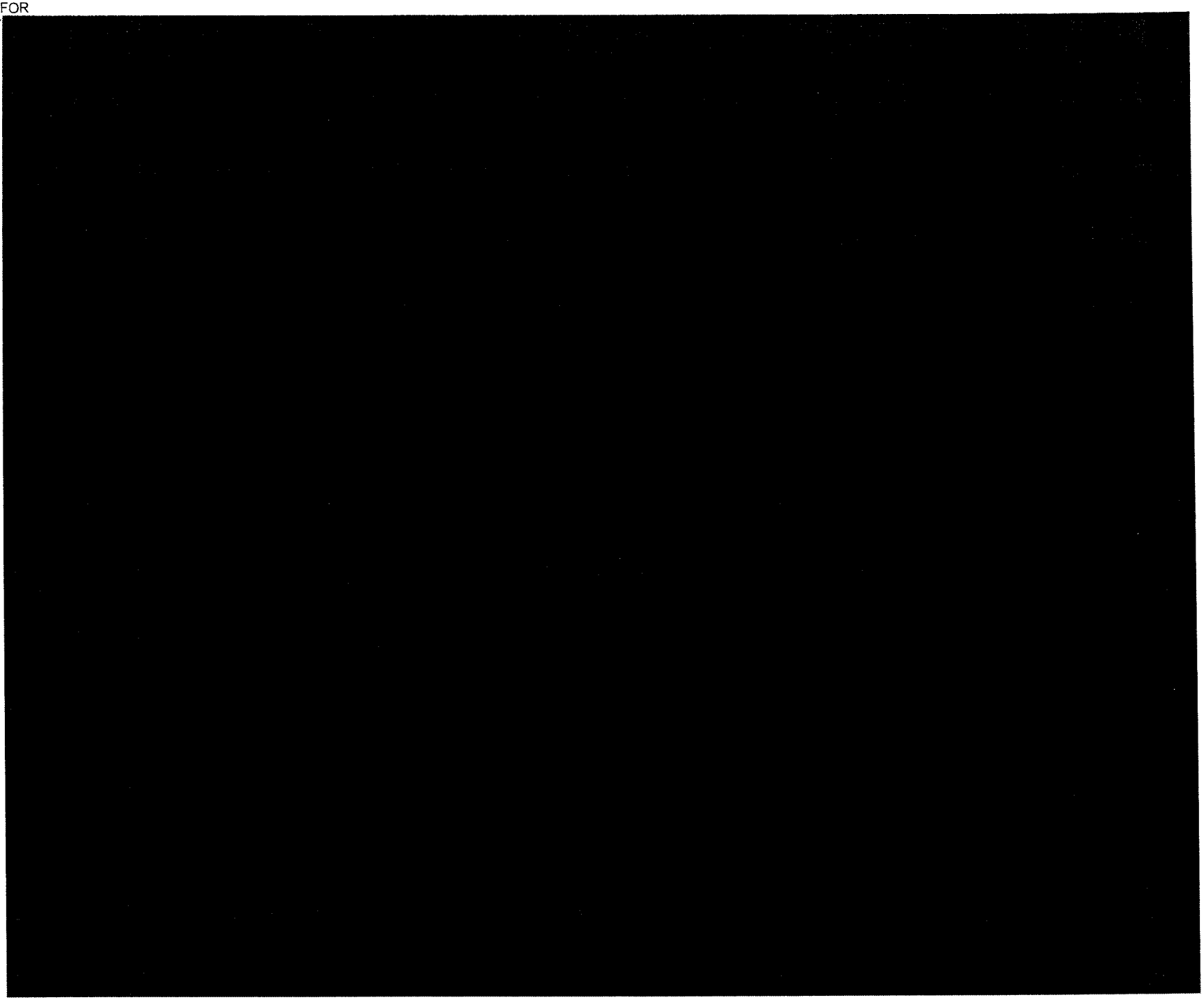
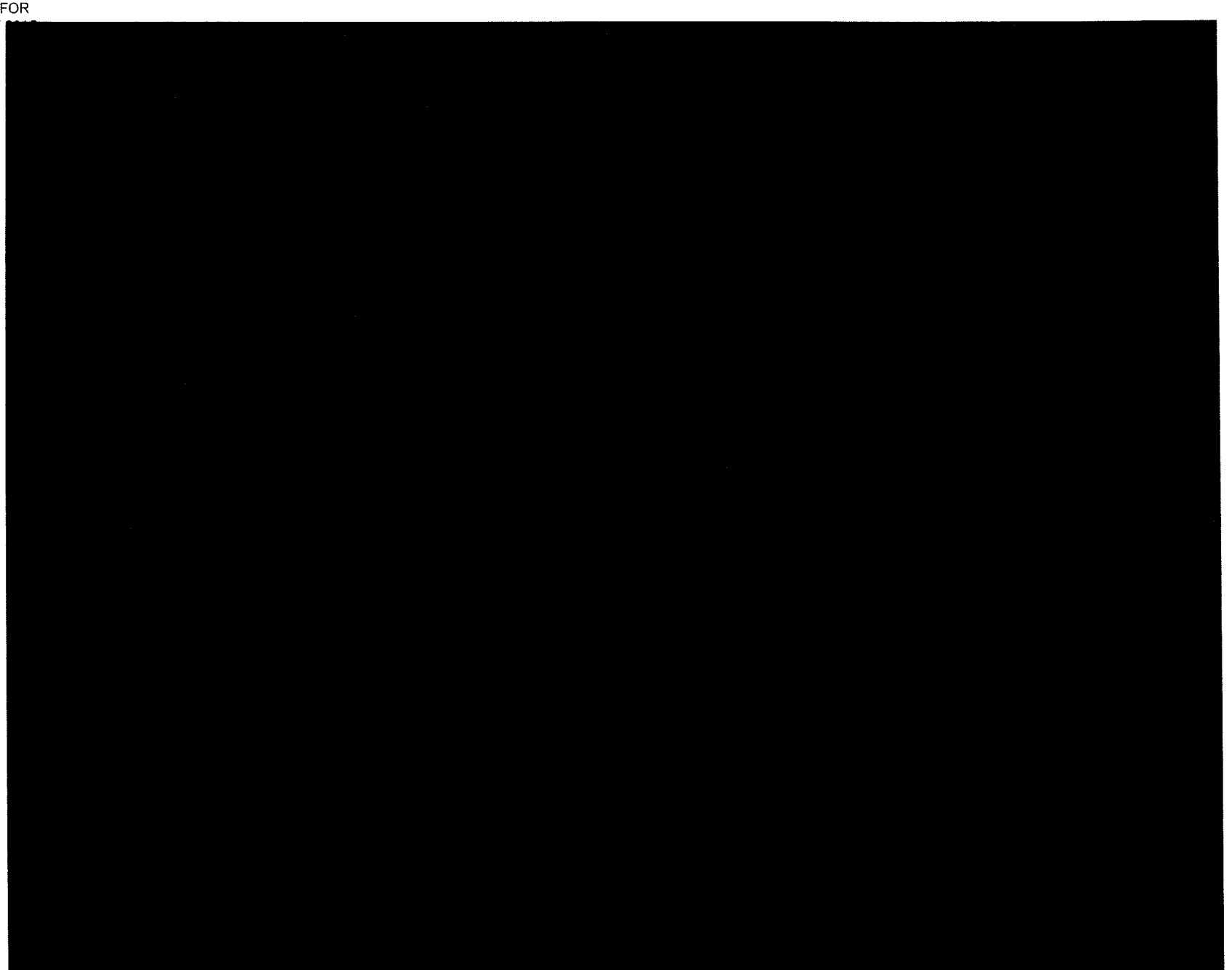
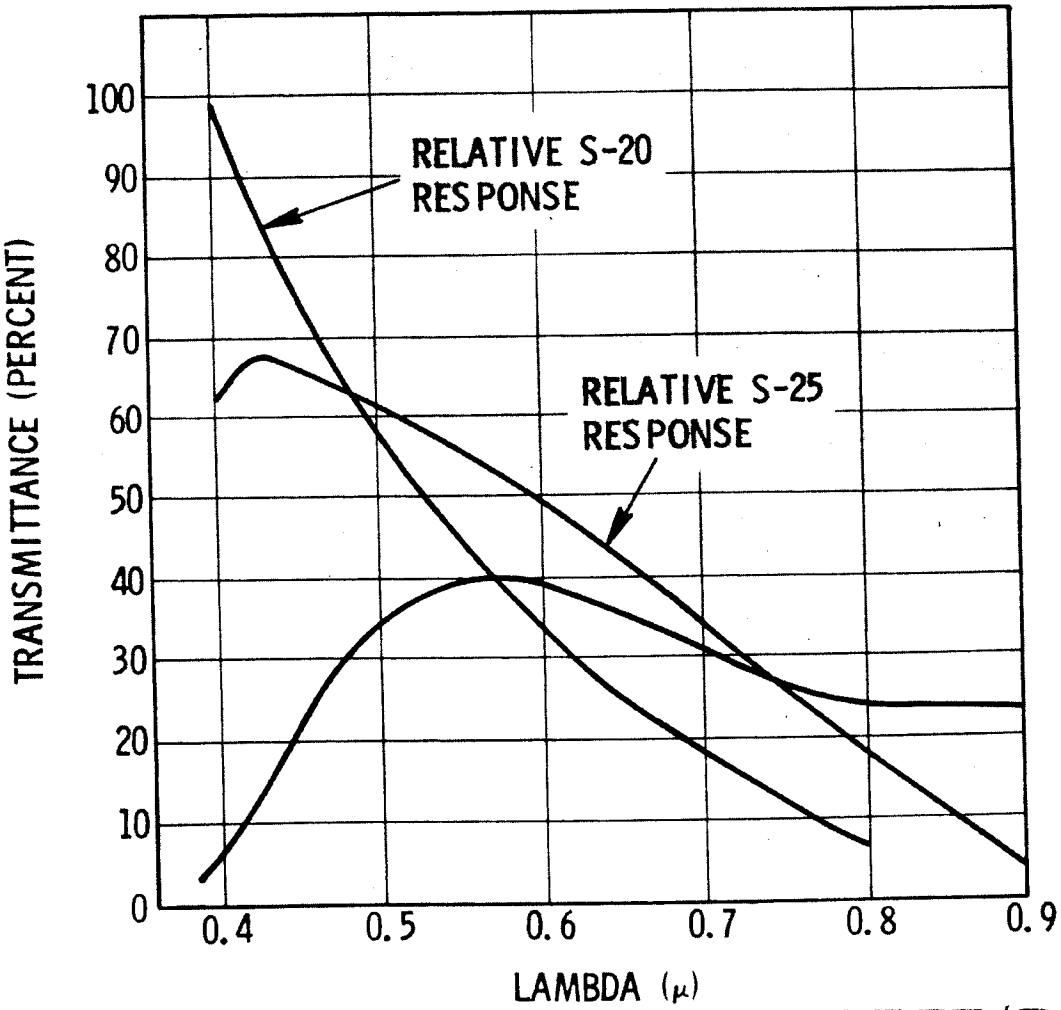


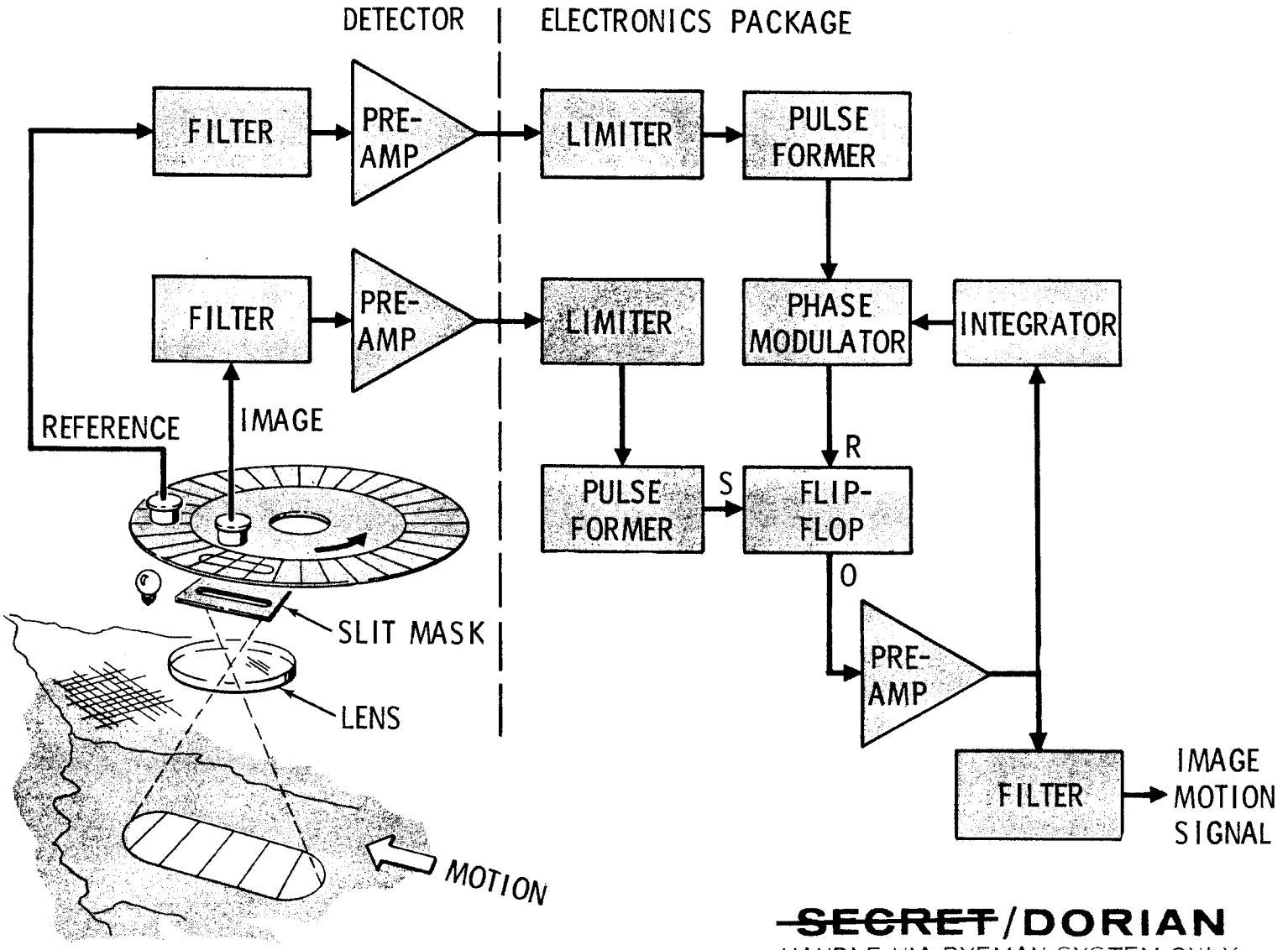


S-20 VS S-25 PHOTOCATHODE



~~SECRET~~/DORIAN

IVS OPERATION



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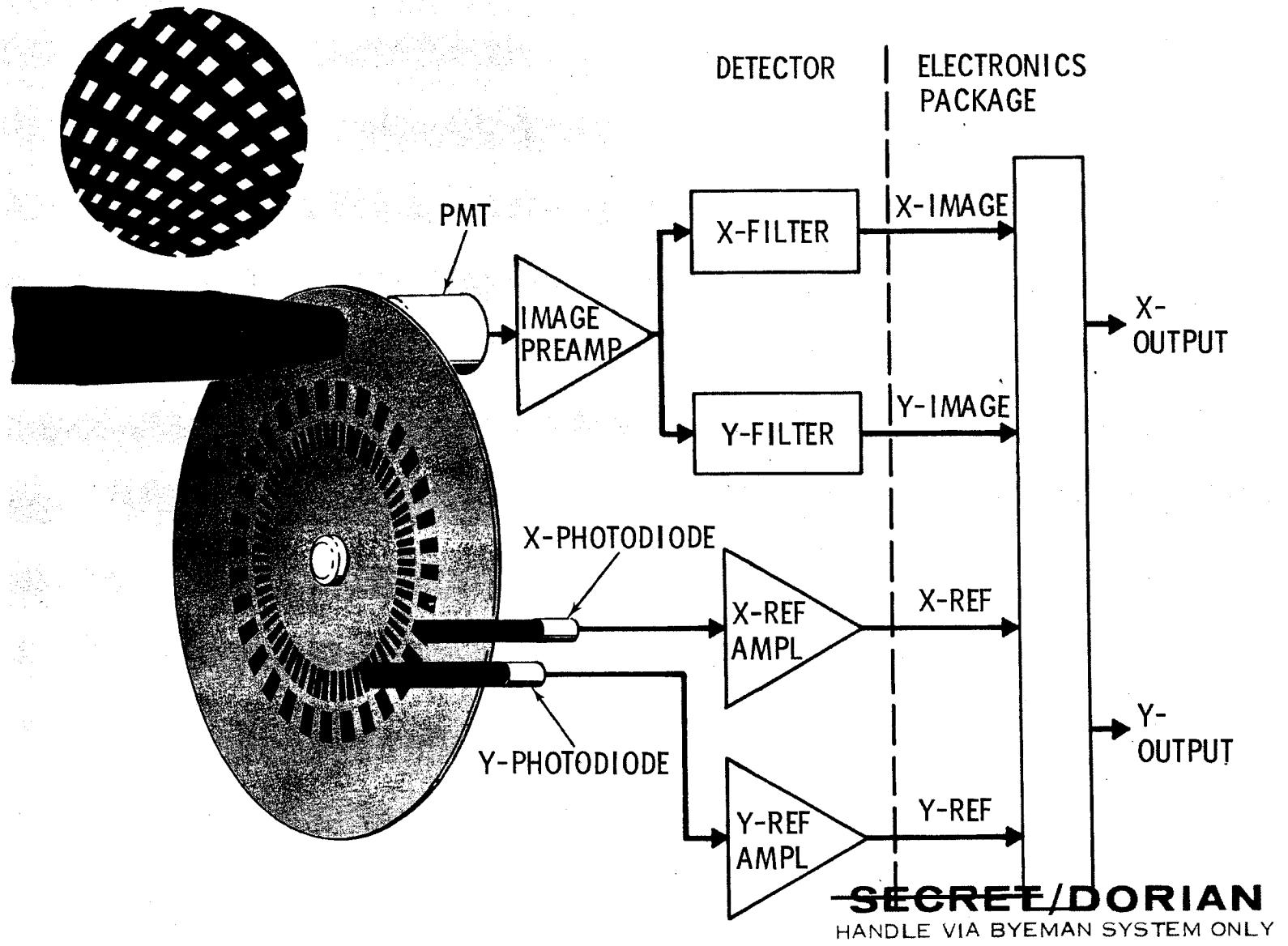
HERRINGBONE X-Y SENSOR



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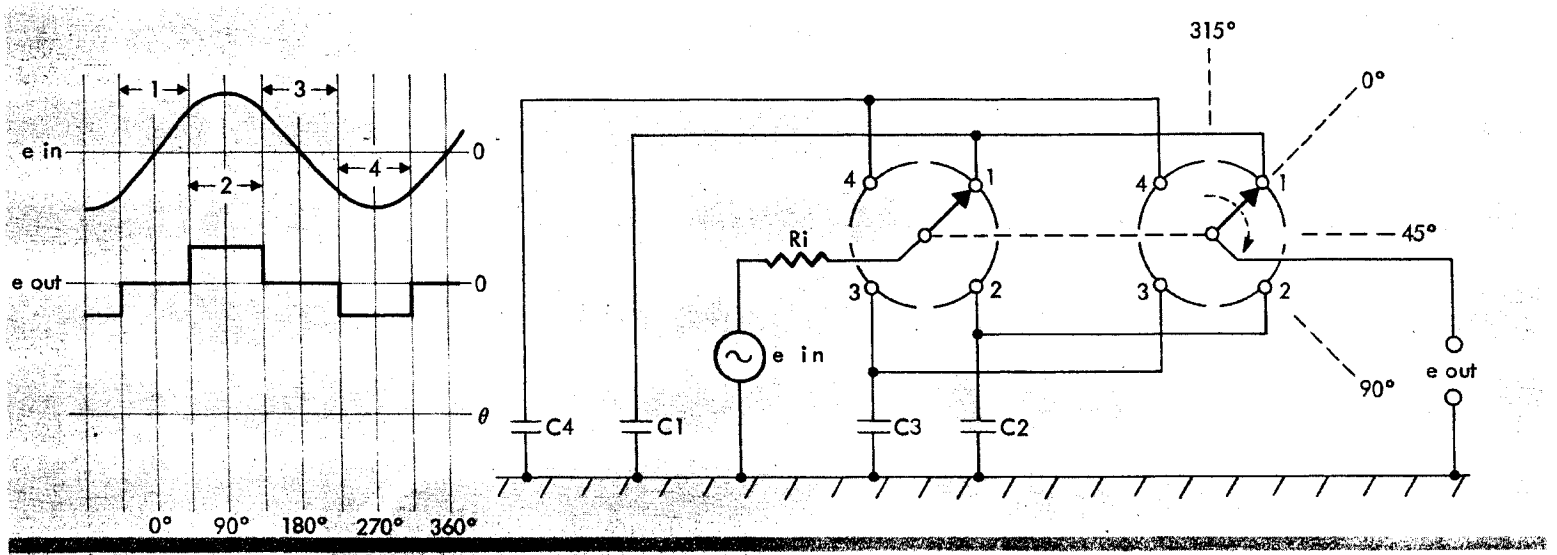
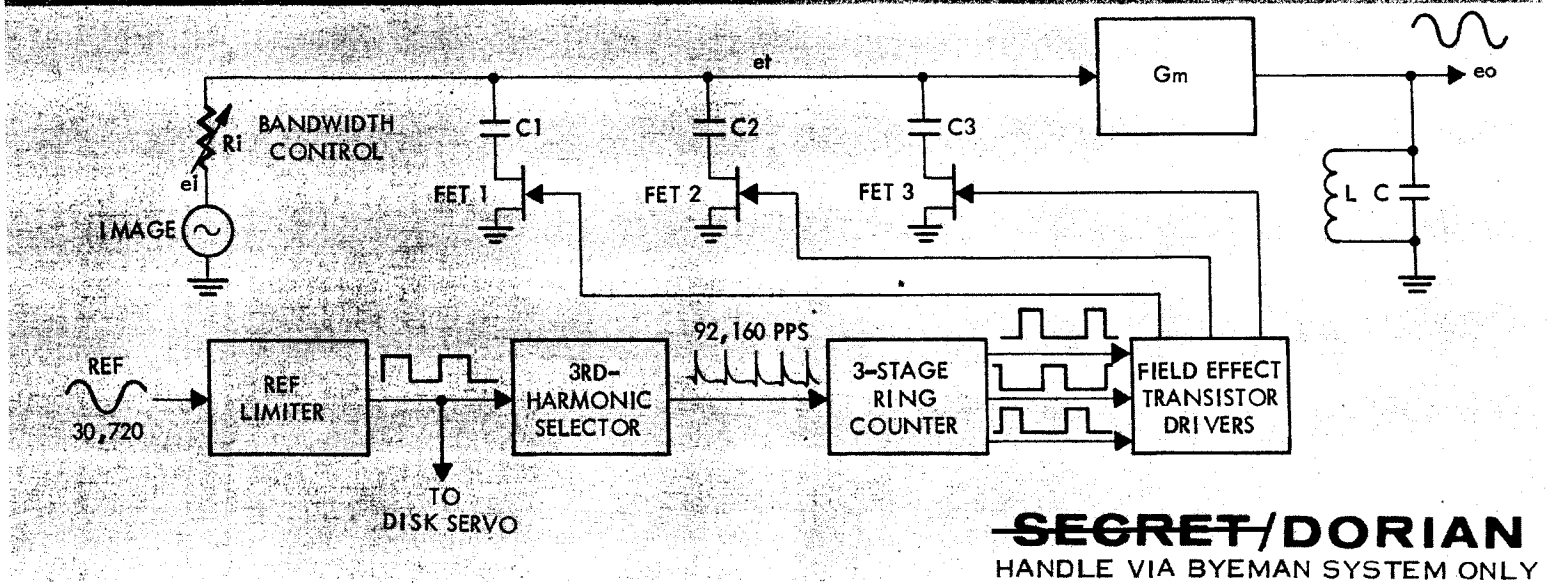
THE COMMUTATING FILTER



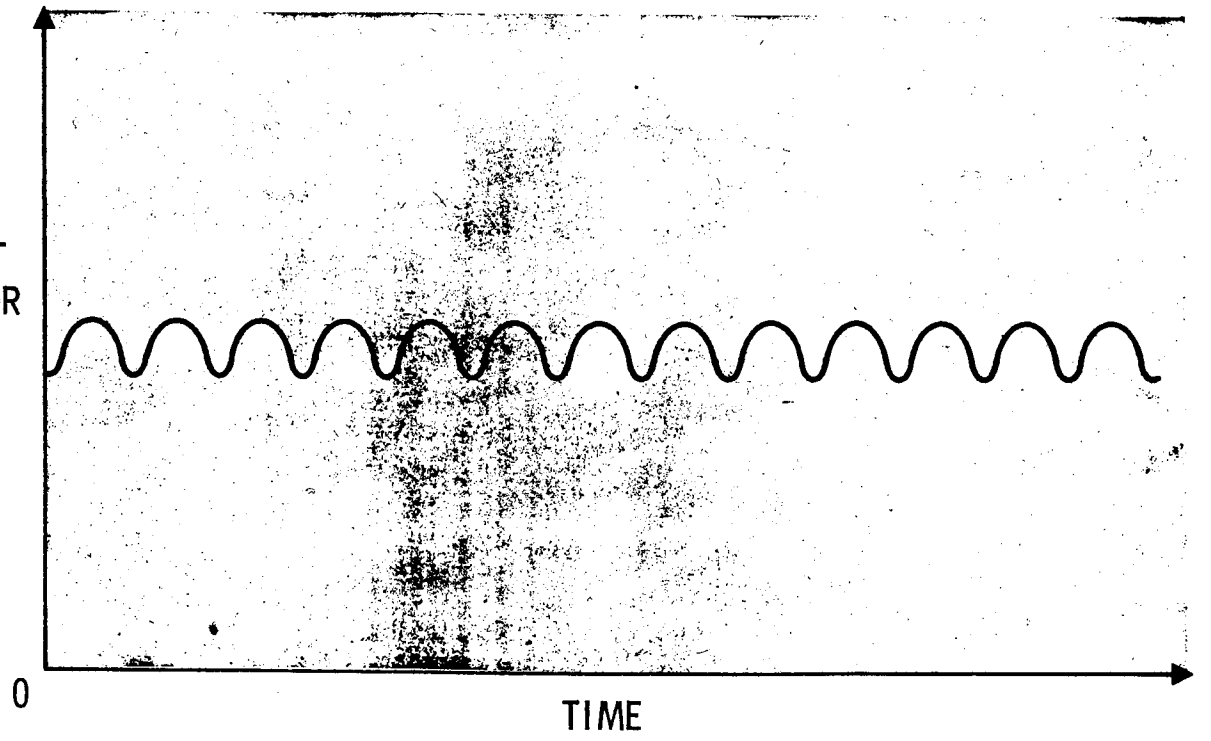


STATUS - APRIL 1968

PROBLEMS AND DESIGN IMPROVEMENTS

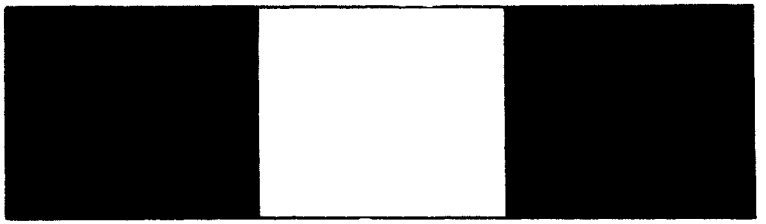
- SCALLOPING
  - APERTURE OPTIMIZATION
- DYNAMIC NULL PERTURBATIONS
  - APERTURE OPTIMIZATION
  - SLOPE LIMITING
- DROPOUTS
  - HERRINGBONE CONCEPT
  - MEMORY CIRCUIT
  - COMMUTATING FILTER

SCALLOPING



~~SECRET~~/DORIAN

SHADED APERTURE



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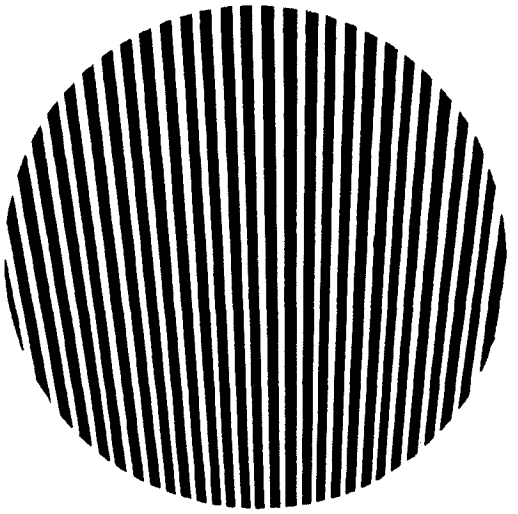
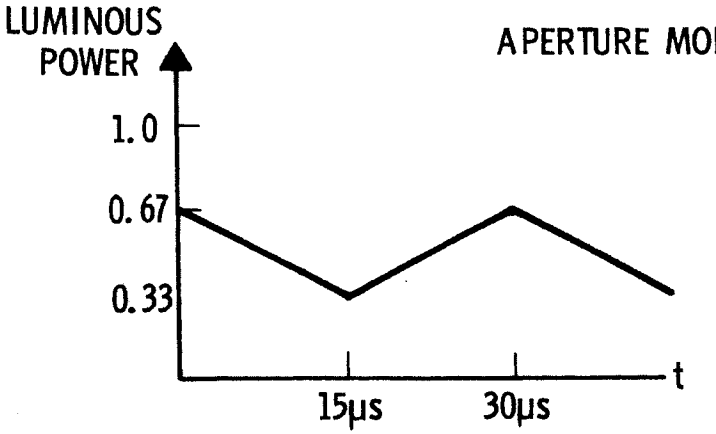
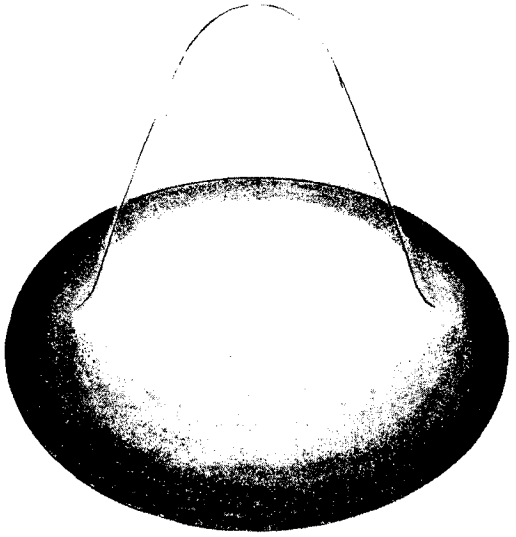
$T_2 = 0.67$





APERTURE MODULATION



11B

CURRENT STATUS

- SCALLOPING

  ELIMINATED BY SHADING

- DYNAMIC NULL PERTURBATIONS

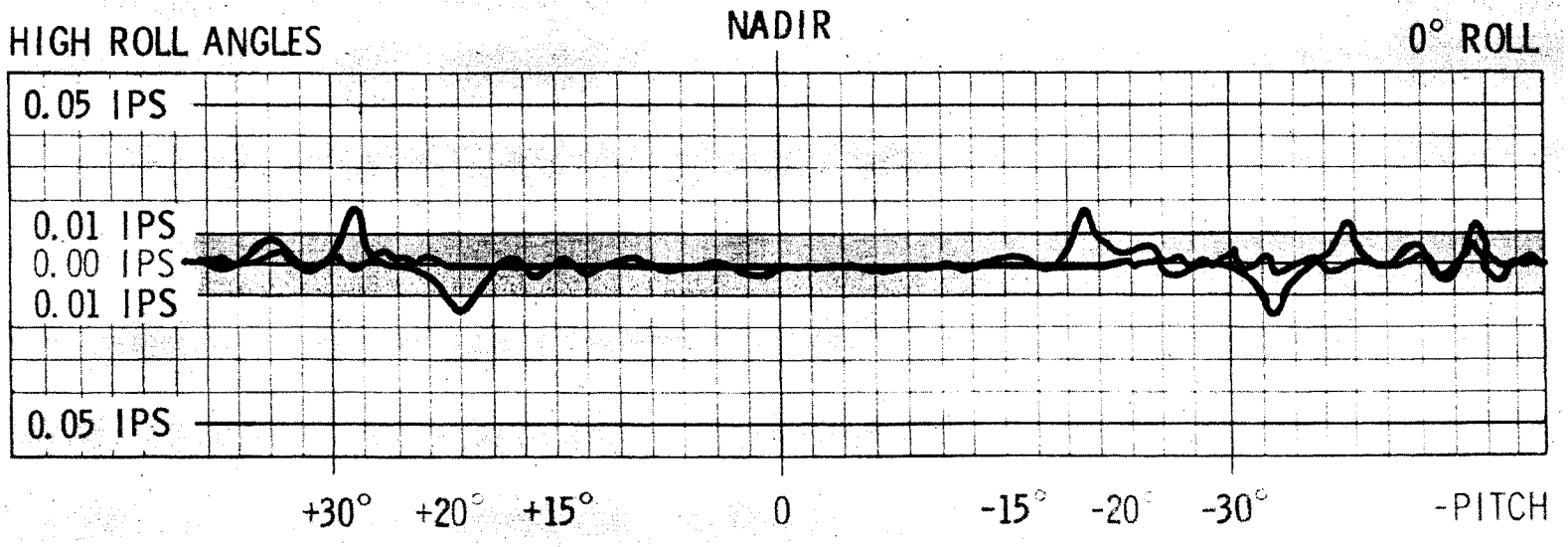
  APERTURE OPTIMIZATION

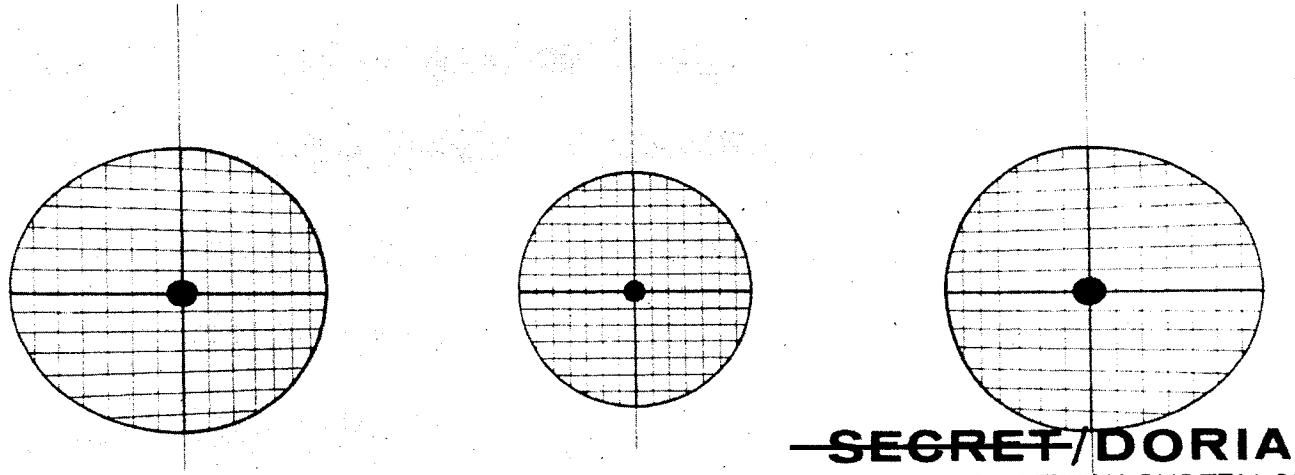
  PROPORTIONAL PLUS DERIVATIVE
  SENSING OF SIGNAL AMPLITUDE

- WEIGHT

  HERRINGBONE IVS

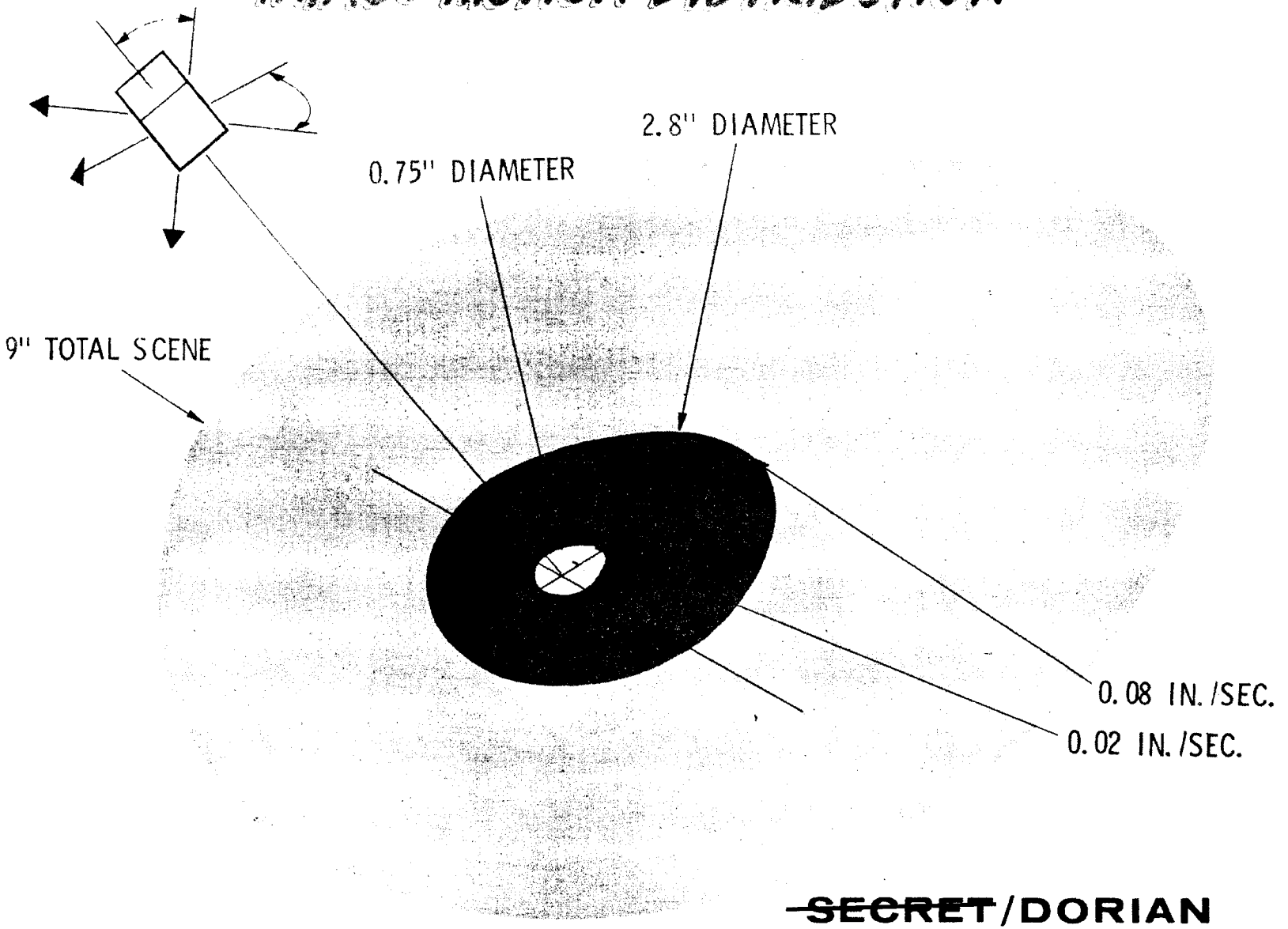
DYNAMIC NULL





~~SECRET~~/DORIAN

IMAGE MOTION DISTRIBUTION



~~SECRET~~/DORIAN
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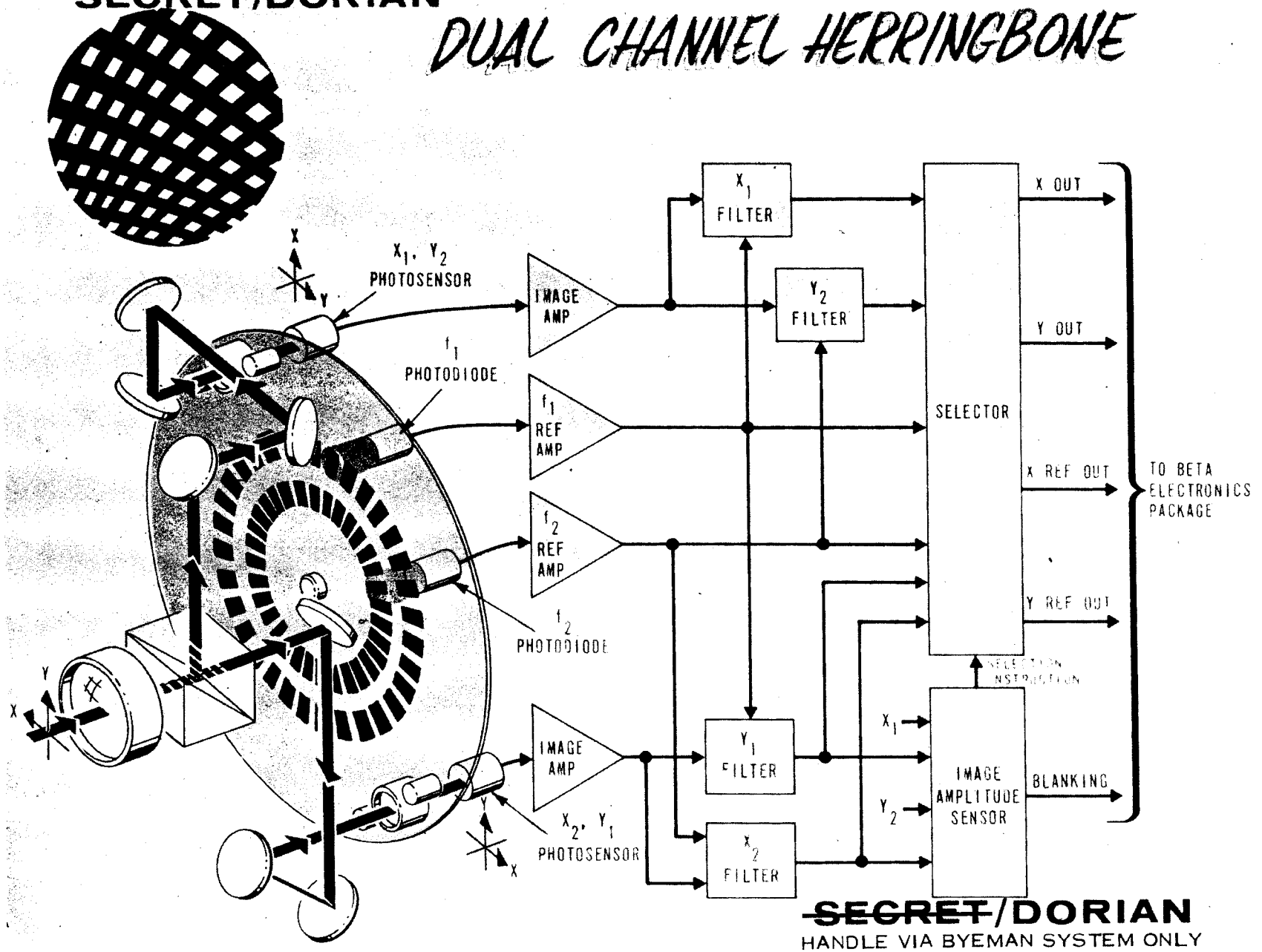
IMPROVED IVS SPATIAL FREQUENCY RESPONSE BY IMAGE SCALE CHANGE

~~SECRET~~/DORIAN

DUAL CHANNEL HERRINGBONE

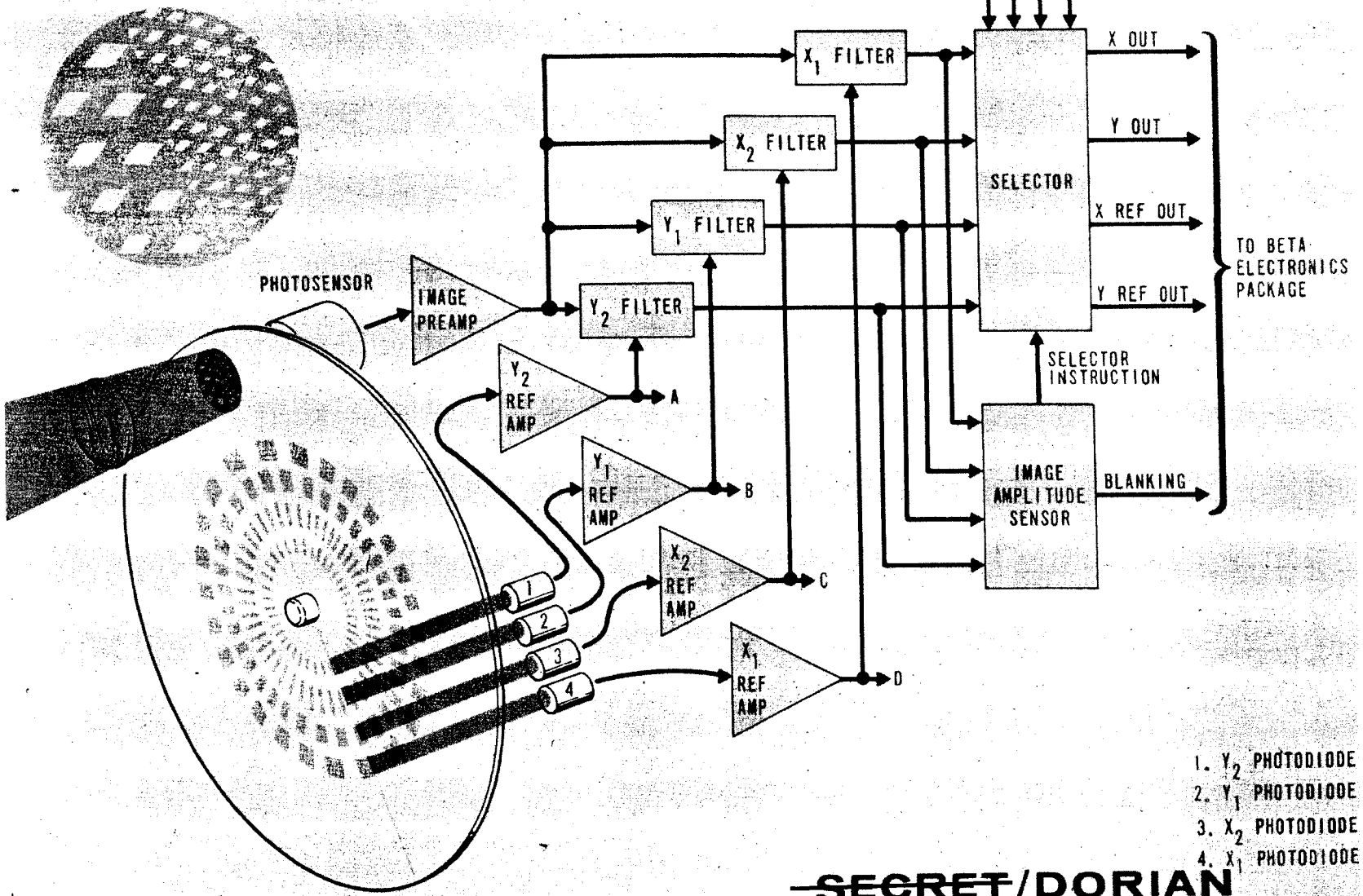


~~SECRET~~/DORIAN

HANDLE VIA BYEMAN SYSTEM ONLY

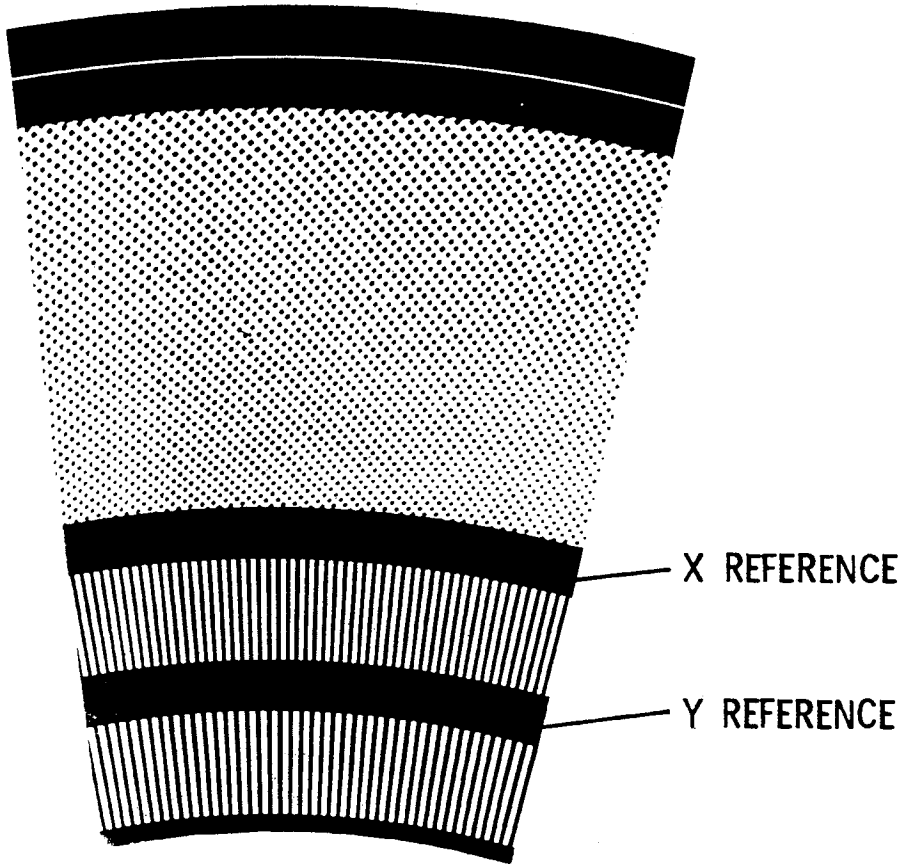
~~SECRET~~/DORIAN

SPLIT HERRINGBONE

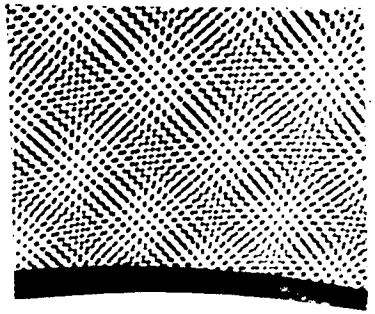


~~SECRET~~/DORIAN
HANDLE VIA BYEMAN SYSTEM ONLY

DISC CONSTRUCTION



SINGLE HERRINGBONE



DUAL HERRINGBONE

EQUIPMENT PERFORMANCE REQUIREMENTS

	REQUIREMENT	PERFORMANCE NOW	PERFORMANCE CDR (EST)
DYNAMIC RANGE	0 - 0.3 IPS	0 - 1.0 IPS	SAME
GAIN FACTOR	16.67 V/IPS	16.67 V/IPS	SAME
LINEARITY			
LARGE SIGNAL	SLOPE LIMITS	SLOPE LIMITS	SAME
	1.0 ± 0.25	1.00 ± <0.10	SAME
NULL	SLOPE LIMITS	SLOPE LIMITS	SAME
	1.00 ± 0.10	1.00 ± <0.05	SAME
SATURATION	5V/0.3 IPS	MEETS REQUIREMENTS EASILY	SAME

EQUIPMENT PERFORMANCE REQUIREMENTS (CONT)

	REQUIREMENT	PERFORMANCE NOW	PERFORMANCE CDR (EST)
NOISE AND BIAS (NULL REGION)	0.010 IPS (2 σ)	≤0.010 IPS (2 σ)	SAME
FREQUENCY RESPONSE	1ST ORDER LAG OVER OUTPUT RANGE 0.001 - 0.25 IPS. BREAK FREQ ≥1 HZ	MEETS REQUIREMENTS	SAME
RECOVERY TIME AFTER SATURATION	IN SATURATION OVER 2 SEC., RECOVERY ≤ 0.5 SEC.; IN SATURATION 2 SEC. OR LESS, RECOVERY ≤ 0.1 SEC.	<0.050 SEC.	SAME

EQUIPMENT PERFORMANCE REQUIREMENTS (CONT)

	REQUIREMENT	PERFORMANCE NOW	PERFORMANCE CDR (EST)
SUB-THRESHOLD IRRADIANCE SIGNAL	FLAT INPUT OF 4×10^{-9} WATTS/CM^2 PER 10 NANOMETERS ($\Delta\tau$) OVER RANGE 400 - 900 NANOMETERS	MEETS REQUIREMENTS	SAME
RELIABILITY	MTBF $\geq$ 10,000 HOURS	21,500 HRS (CAL)	WILL MEET
WARM-UP TIME	$\leq$ 2 MINUTES	$<$40 SECONDS	SAME

EQUIPMENT INTERFACE REQUIREMENTS

	REQUIREMENT	PERFORMANCE NOW	PERFORMANCE CDR (EST)
INPUT POWER			
AVERAGE	< 26 WATTS	27 WATTS	25 WATTS
PEAK	< 50 WATTS	< 30 WATTS	≤ 30 WATTS
WEIGHT			
HEAD	< 14 POUNDS	7.3 POUNDS	7.3 POUNDS
TOTAL	< 23 POUNDS	17.2 POUNDS	17.2 POUNDS
SPACE ENVELOPE			
HEAD	PER DWG 711-03013	MEETS	WILL MEET
E. P.	6 X 9 X 6 INCHES	MEETS	WILL MEET

EQUIPMENT INTERFACE REQUIREMENTS (CONT)

	REQUIREMENT	PERFORMANCE NOW	PERFORMANCE CDR (EST)
● GENERATED DISTURBANCE			
VIBRATION (DURING EXPOSURE)	≤ 3.0 IN-OZ (ANY AXIS)	MEETS	WILL MEET
	≤ 0.01-LB AXIAL FORCE (ANY AXIS)	MEETS	WILL MEET
VIBRATION (DURING SLEW)	2 X ABOVE	MEETS	WILL MEET
RESONANCE	> 55 HZ	MEETS	WILL MEET
ACOUSTIC NOISE	PER 3.2.13 OF DR-1100B	MEETS	WILL MEET

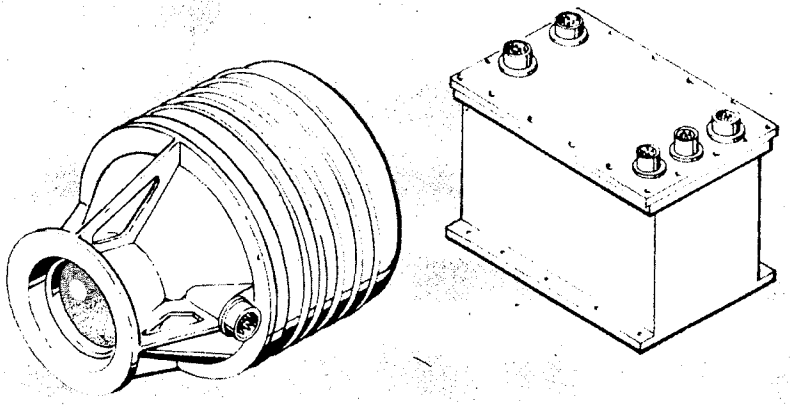
EQUIPMENT INTERFACE REQUIREMENTS (CONT)

	REQUIREMENT	PERFORMANCE NOW	PERFORMANCE CDR (EST)
CG OF HEAD			
DISTANCE FROM CENTERLINE NORMAL TO MOUNTING PLANE	WITHIN 0.25"	X = 0.17", Y = 0.49"	WILL MEET
DISTANCE FROM INPUT IMAGE PLANE	< 7.25"	4.53"	4.43"
THERMAL DISSIPATION HEAD	MINIMUM POSSIBLE DESIGN GOAL ≤3 WATTS	<4 WATTS	<4 WATTS

~~SECRET~~/DORIAN

LIGHT WEIGHT (17 LB)

HIGH
SENSITIVITY
SELECTIVE
SPATIAL
FREQUENCY
RESPONSE



LOW
POWER
(25W)

FAST RESPONSE
(30,000 SAMPLES/SECOND)
CONTINUOUS OPERATION

~~SECRET~~/DORIAN
HANDLE VIA BYEMAN SYSTEM ONLY