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AVAILABLE

DECLASS REVIEW by NGA

501 #104

1. 1 SCREW ATTACHMENT MISSING BOTH SIDES
POSSIBLY STRIKING COVER
2. ~~LEFT~~ LOOSE SOUND (OBJECTIVE ASSEMBLY)
RIGHTSIDE OBJECTIVE LOOSE

RIGHT OBJECTIVE
NO Y₁ ACTION w/ COMBINATION L-YELLOW & A-BLUE ~~LOW PASS~~
NO MOVEMENT IN SLOW MOTOR SPEED RIGHT SIDE

1. RIGHT SIDE H.P. OBJECTIVE STRUCK MID. M.N. COVER
LOWER OBJECTIVE STRIKES CENTER SCREEN

ILLEGIB

Approved For Release 2004/03/26 : CIA-RDP78B04747A002200010018-8

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OPTICAL TRAIN CHECKOUT

Check control of eyepiece assembly for function and operation.

Eyestations	Normal	<u>✓</u>	
	Reversed	<u>✓</u>	
Image Enhancer control operation		<u>✓</u>	
ON - OFF			
Channel Selector	Stereo	<u>✓</u>	
	Superimpose	<u>✓</u>	
Left Image Selector	Off	<u>✓</u>	
	Normal	<u>✓</u>	
	Reversion	<u>✓</u>	
Right Image Selector	Off	<u>✓</u>	
	Normal	<u>✓</u>	
	Reversion	<u>✓</u>	
Image Rotation Dials	Operation	<u>✓</u>	
0° to 360°	Steps	<u>362</u>	<u>361</u>

0° Set Up Check

Eyepiece optics in superimposed mode normal image selector **X** straight edge set up on platen X axis both channels within .001 in 6 inches (use carriage travel and dot to run out straight edge). In turn dial normal, reversion mode, an image of offset straight edges should remain parallel within 1 mil any combinations of normal or reversion modes in either channel.

Interpupillary Adjustment
52mm to 73mm

51-73

With Image Enhancer off, focus eyepiece to obtain sharpest image of fiber bundle pattern on end of fiber cable for both eyepieces. Turn Image Enhancer on. Check fine phasing control for center position with sharpest image of Air Force Resolution Chart at midposition of fine phasing control rotation. Introduce dot reticle into

OPTICAL TRAIN CHECKOUT

Check control of eyepiece assembly for function and operation.

Eyestations

Normal ✓
 Reversed ✓

Image Enhancer switch operation
 ON - OFF

✓

Channel Selector

Stereo ✓
 Superimpose ✓

Left Image Selector

Off ✓
 Normal ✓
 Reversion ✓

Right Image Selector

Off ✓
 Normal ✓
 Reversion ✓

Image Rotation Dials
 0° to 360°

Operation ✓
 Steps 362 361

0° Set Up Check

Eyepiece optics in superimposed mode normal image selector **X** straight edge set up on platen X axis both channels within .001 in 6 inches (use carriage travel and dot to run out straight edge). In turn dial normal, reversion mode, an image of offset straight edges should remain parallel within 1°, any combinations of normal or reversion modes in either channel.

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approximately 4 arc minutes).

1-4 arc minutes required
at all system magnifications

LEFT RIGHT

DOT CENTERING CHECK

Turn on the Enhanced dot (1-4 arc minute dia. dot (1 multifiber) and cross hair reticles at field stops. Is dot on center? Estimate center error in the following modes with center reticles at field stops. Maximum allowable error is to be 4 arc minutes with any combination.

ERROR (ARC MINUTES)
Normal Reversed
Eye Sta. Eye Sta.

Run zoom magnification through range

Left

Right

Rotate Image

Left

Right

With image selectors Normal to Reversal, rotate image in four 90° steps between trial for test.

Left

Right

With channel selector Stereo to Superimpose, judge center distance on dots, in Normal to Reversion, in rotation and at zoom extremes each channel. 4 arc minutes error maximum any combination.

Left

Right

Check intensity control of reticle

Can dot be seen relative to open gate high intensity maximum setting?

Left

Right

Check centering of each objective lens by indexing turret. Use highest magnification objective lens for centering. ± 2 minutes maximum error for other lenses with cross hair reticle set up in field of view.

	<u>ERROR (ARC MINUTES)</u>	
<u>Lens</u>	<u>Left</u>	<u>Right</u>
1.5-6.0X	_____	_____
20X-12X	_____	_____
101-43X	_____	_____
30X-128X	_____	_____

Check zoom control for each magnification.

Image to remain on center and in focus throughout full range of zoom without changing objective focus. See resolution optical system below.

Zoom shall not coast after power cut off.

Zoom shall be capable of manual control.

Zoom dials properly oriented for correct indication of zoom limits.

Check system magnification at low and high ends of each range.

OBJECTIVE LENS RANGE		LEFT		RIGHT	
Low	High	Low	High	Low	High
1.6	6.8X				
2.9	12X				
10.1	43X				
30	128X				

Overlap of magnifications for each range

LEFT

Independent focus control for each objective

Resolution of optical system using Air Force Resolution

Focus objective at high end only. Do not refocus at low end

OBJECTIVE LENS RANGE		LEFT				RIGHT		
Low	High	Low	Req.	High	Req.	Low	Req.	High
1.6	6.8X	3/6	13(3/8)	5/5	34(5/6)	3/6	13(3/8)	5/5
2.9	12X	4/6	24(4/5)	6/11	53(6/4)	4/6	24(4/5)	5/6
10.1	43X		80(6/3)		300(8/5)		80(6/3)	
30	128X		124(8/2)		540(1/5)		224(8/3)	

Eye station capable of adjustment of ± 3 inches in vertical and horizontal planes with lock.

Eye station capable of rotation of 30 degrees about "X" axis with lock.

US AIR FORCE RESOLUTION TARGET

Lines Per Millimeter

Group No.	<u>-2</u>	<u>-1</u>	<u>0</u>	<u>+1</u>	<u>+2</u>	<u>+3</u>	<u>+4</u>	<u>+5</u>	<u>+6</u>	<u>+7</u>
1	.250	.500	1.00	2.00	4.00	8.00	16.0	32.0	64.0	128
2			1.12	2.24	4.49	8.98	18.0	36.0	71.8	144
3			1.26	2.52	5.04	10.1	20.1	40.3	80.6	161
4			1.41	2.83	5.65	11.3	22.6	45.2	90.4	181
5			1.58	3.17	6.34	12.7	25.4	50.7	101.4	203
6			1.78	3.56	7.11	14.2	28.5	56.9	113.8	228

Multiply lines/mm value given in above table by magnification ratio of system to obtain true value of resolution.

CHART OF RESOLVING POWER VALUES WHEN ORIGINAL TARGET, U.S.A.F. 1951
IS OPTICALLY REDUCED 200 TIMES

<u>Group No.</u>	<u>Target No.</u>	<u>Resolving Power (Lines/mm)</u>
-2	1	50.0
	2	56.2
	3	63.0
	4	70.6
	5	79.2
	6	89.0

-1	1	100
	2	112
	3	126
	4	141
	5	158
	6	178

0	1	200
	2	224
	3	256
	4	282
	5	318
	6	356

1	1	400
	2	450
	3	504
	4	566
	5	636
	6	712

ILLUMINATION CHECKS

General illumination levels (ft.-lamberts) measured at film plane

	Low	High
Left	_____	_____
Right	_____	_____

High Intensity illumination (maximum brightness) measured at film plane.

	Left	Right
Color Temperature	_____	_____

High Intensity illumination level (foot-lamberts) measured at eyelens

Left _____ Right _____

Color temperature at 50% level measured at film plane

Left _____ Right _____

Temperature above ambient for film with average density of
2 left in high intensity light path for 30 minutes. Use 30-128X range
at maximum brightness setting and with new lamps in light source

Left	_____	degrees above ambient
Right	_____	

75% N.O. FILTER HITTING (BOTH SIDES)

FILM HOLDDOWN AND TRANSPORT

Vacuum pull down time	_____	5"	9 1/2"
	Left _____	_____	_____
	Right _____	_____	_____
Across both formats	_____	_____	_____

Torque required to operate film transport _____

Two independent systems of film spooling.

Looping capability single film _____

Loop holding capability. Advance film with fixed loop.

		<u>LEFT</u>	<u>RIGHT</u>
Operation of film brakes	Inboard	_____	_____
after high speed film ad-			
vance with fully loaded	Outboard	_____	_____
500 ft. spools			

Operation of looping mechanisms to thread film _____

Customer

Review 687A-104 3/20/67

Missing

Disrupt & noise of lower objective cover

2 Odd sound or vibration 24 turret indexing

No R Y

3 Scanning motion L-Y + R-B combinations

4 No movement any objective combination slow motor speed.

5 Center holds ^{1/4 turn} screw struck by lower RH field lens

6 HILS. RH not centered, odd shape

7 X L coord. counter not function

Y R " " not increase counts

8 Interference, ^{right} center hold rear center film guide

9 75% ^{LH} RH attenuator strikes image enhancer belt.

10 LH outer tailstock very tight

Customer

Review 687A #104 3/20/67

Missing

Disrupt & noise of lower objectives cover

② Odd sound or vibration RH target indexing

No RY

③ Excessive vibration LX + RB combinations

④ No movement any objective combination slow motor speed.

⑤ Center hold down ^{valve} screws struck by lower RH field lens

⑥ HICS. RH not centered, odd shape

⑦ X L coord. counter not function

Y R " " not increase counts

⑧ Interference, ^{right} center hold rear center film guide

⑨ 75% ^{LH} RH attenuator strikes image enhancer belt.

⑩ LH outer coil too very tight