



ELECTRO - OPTICAL
OBSERVATION STATION
«OSDCAM4060»



MAIN INNOVATIVE PRINCIPLES

1 Matrix frame sensor with progressive scan

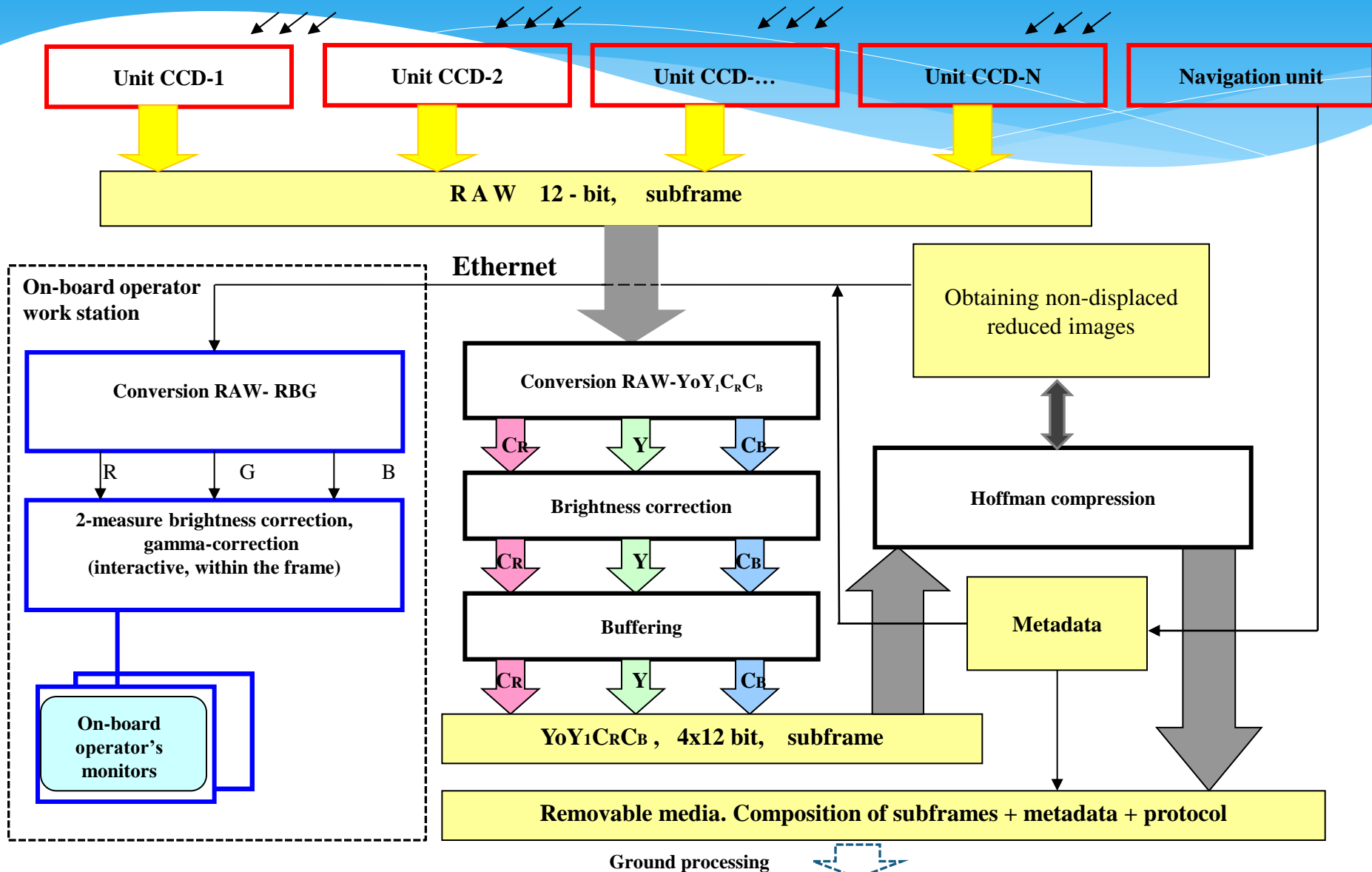
2 Mosaic field of view synthesis (multi-lenses, multi-matrix)

3 Using small high resolution high-aperture optics

4 Digital obtaining equivalent to a central projection frame

5 Hardware implementation of the data processing algorithms

MAIN TECHNOLOGICAL STAGES FOR RECEIVING IMAGING DATA



ELECTRO-OPTICAL OBSERVATION STATION «OSDCAM4060» (VIEW FROM LENS SIDE)



High-altitude channel

10 lenses F100 mm, each with 3 matrix

Medium-altitude channel

18 lenses F50 mm, each with 1 matrix

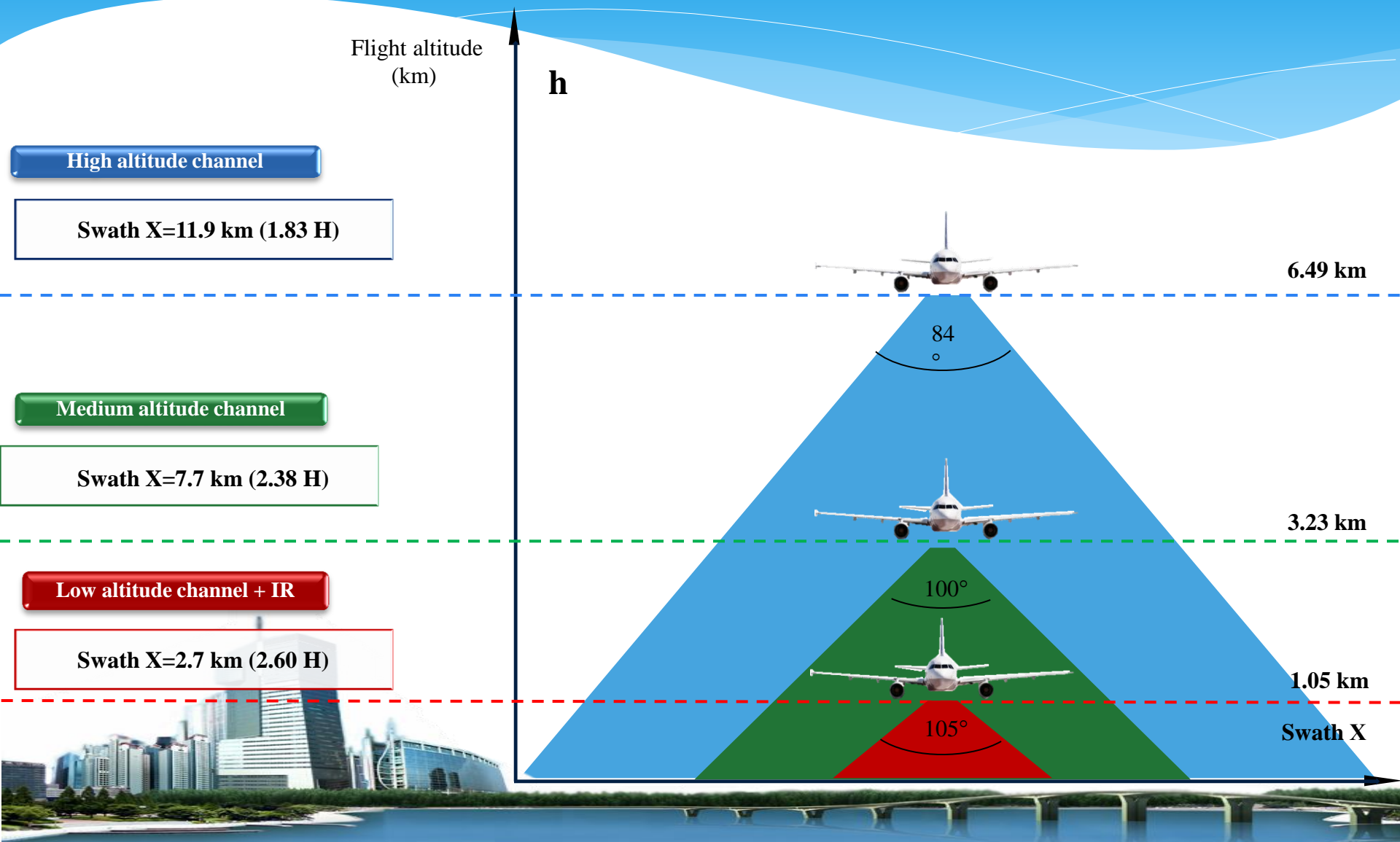
Low-altitude channel

6 lenses F16 mm, each with 1 matrix

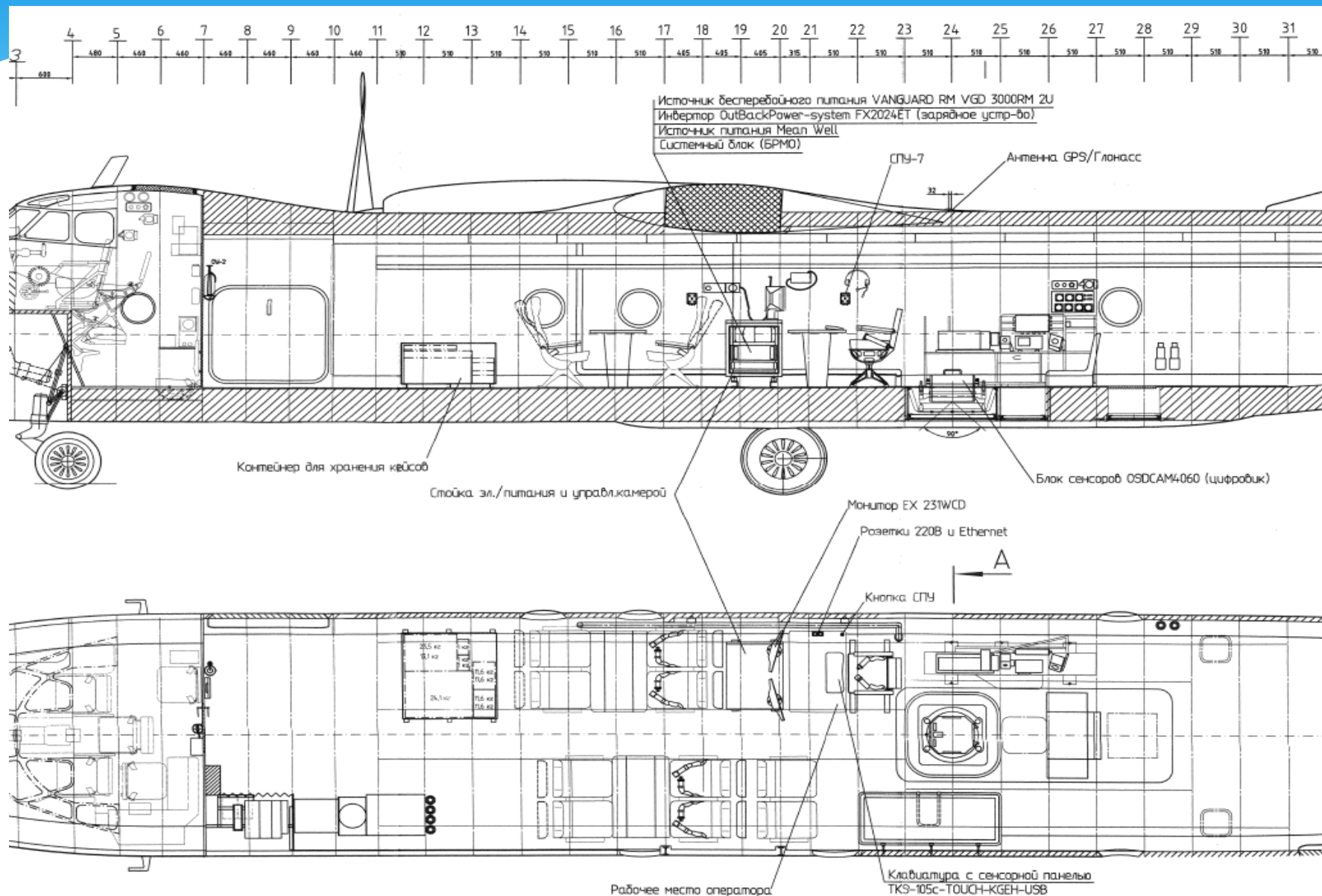
Low-altitude IR channel

6 lenses F16 mm, each with 1 matrix

«OSDCAM4060» SENSORS SWATHS



CABIN VIEW OF AN-30B AIRCRAFT EQUIPPED WITH «OSDCAM4060»



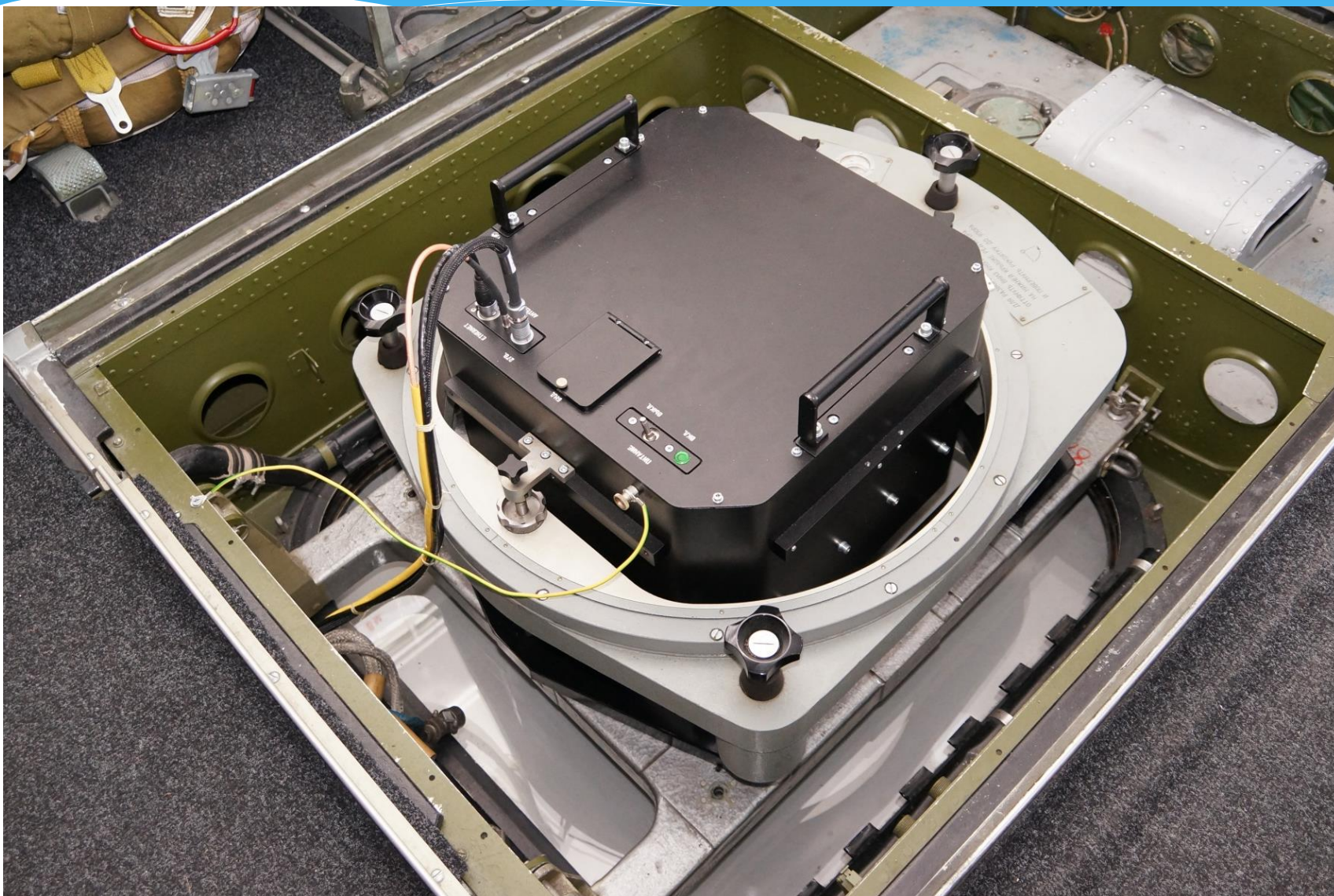
«OSDCAM4060» CABIN PLACEMENT ON AN-30B AIRCRAFT (GENERAL VIEW)



**ON-BOARD OPERATOR
WORK STATION**

SENSOR UNIT

«OSDCAM4060» SENSOR UNIT CABIN PLACEMENT IN AN-30B CAMERA WINDOW



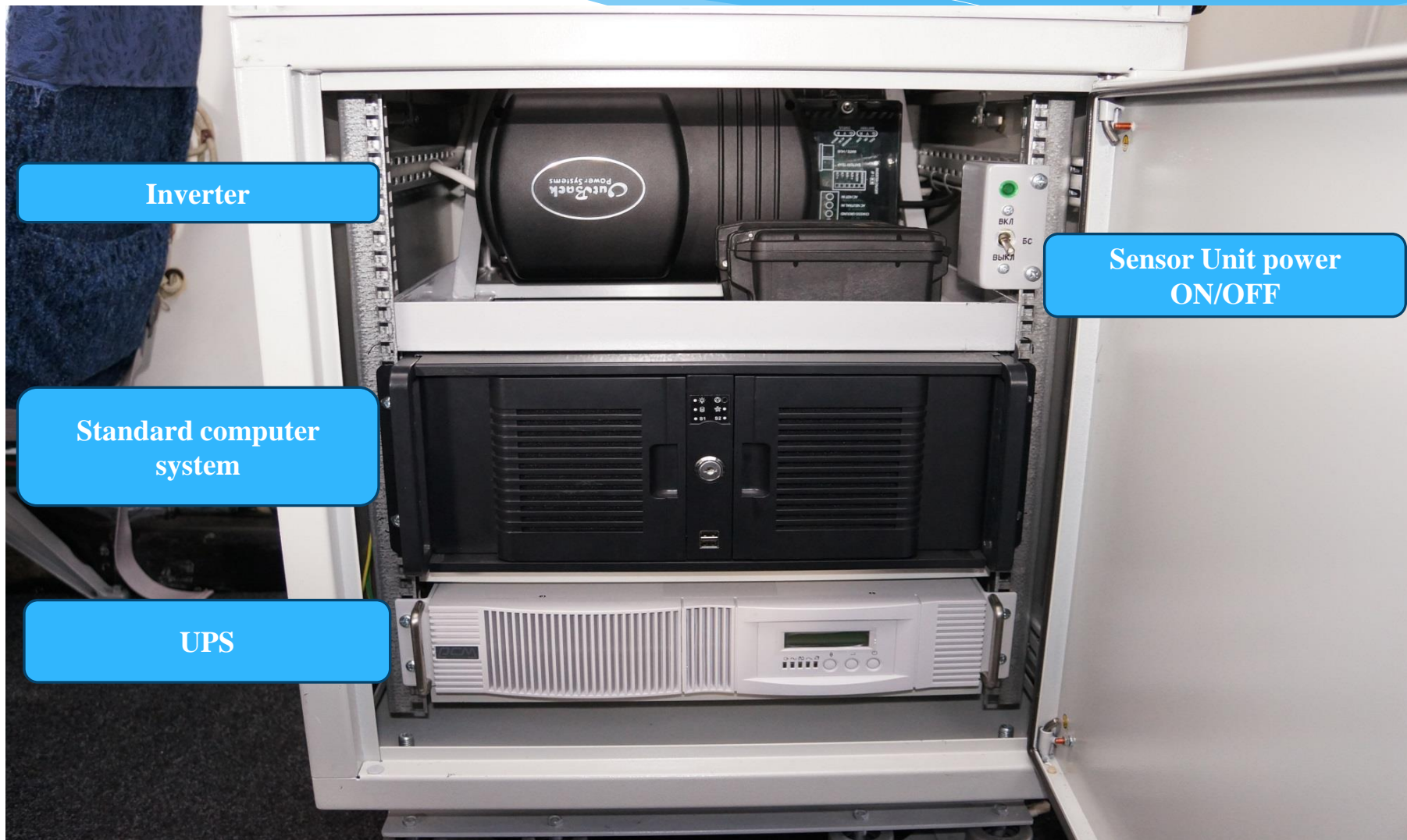
«OSDCAM4060» ON-BOARD OPERATOR WORK STATION



On-board operator's
monitors

Keyboard with touchpad

«OSDCAM4060» POWER AND SENSOR UNIT CONTROL COMPARTMENT



Inverter

Sensor Unit power
ON/OFF

Standard computer
system

UPS

MAIN CHARACTERISTICS OF ELECTRO-OPTICAL OBSERVATION STATION «OSDCAM4060»

Characteristics	Sensor (channel)		
	H	M	L, IR
Pixel across track, $\times 10^3$	56,5	35,9	13,1
Flight altitude with 30 cm resolution, according to the OS Treaty, km	6,49	3,23	1,05/1,1
Angular field of view across track, deg	84	100	105
Capture width to obtain 30 cm resolution, km	11,9	7,7	2,7
Image type	Color, RGB, 12 bit/pixel IR band: panchromatic, 12 bit/pixel		
In-flight gyrostabilization	Not required		

* H- high-altitude sensor
M- medium altitude sensor

L- low-altitude sensor
IR- low-altitude sensor in 0.8-1.0 μm range
(near IR)

COMPARISON WITH FOREIGN FRAMING CAMERAS

Characteristics	DMC II 250	DMC II 230	UltraCam XP	UltraCam XP WA	OSDCAM4060
1. Country	Germany		Austria/USA		Russia
2. Manufacturing company	Intergraph Z/I- Imaging		Vexcel-Microsoft		PO KSI
3. Sensor type	RGB, Nir framing camera with pan-sharpening		RGB, Nir framing camera with pan-sharpening		Multi-lenses framing cameras (NIR+3RGB) combined in a single unit
4. Imaging spectral bands, nm	450 – 740 PAN 600 – 675 R 515 – 595 G 425 – 515 B 695– 830 NIR		450 – 670 PAN 580 - 720 R 480 - 660 G 400 - 600 B, 620-1000 NIR		570 – 680 R 480 – 580 G 400 – 510 B 820– 1000 NIR
5. Types of generated images	PAN, R, G, B, NIR, RGB-pan-sharpening, CIR-pan-sharpening		PAN, R, G, B, NIR, RGB-pan-sharpening, CIR-pan-sharpening		RGB (Bayer tetrad) NIR

COMPARISON WITH FOREIGN FRAMING CAMERAS (cont.)

Characteristics	DMC II 250	DMC II 230	UltraCam XP	UltraCam XP WA	OSDCAM4060		
					L, IR	M	H
6. Frame size, pixel	16768 x 14016 (PAN) 6846 x 6096 (R,G,B,NIR)	15552 x 14144 (PAN) 6846 x 6096 (R,G,B,NIR)	17310 x 11310 (PAN) 5770 x 3770 (R,G,B,NIR)		13064x2032 R,G,B 13152x2056 NIR	35888x2000 R,G,B	56592x1696 R,G,B
7. Angular field of view, deg	45.5 x 38.6	50.7 x 46.6	55 x 37	73 x 52	105 x 14	100 x 4.5	84 x 2.3
8. Swath, m, for GSD = 30 cm	5030 x 4200	4740 x 4300	5200 x 3350	5180 x 3410	2700 x 245	7700 x 256	11900 x 267
9. Expected/Measured altitude Hmin, m	Expected (calculated)				Measured (actual)		
	6000	5000	5000	3500	1054/1093	3229	6491
10. Image stabilization	Digital motion compensation		Digital motion compensation		Not required		
11. Weight, kg	66 – sensor unit		92 – complete set 65 – sensor unit		52 – sensor unit 40 – control unit		
12. Data processing time for 1 workstation, min/km ²	0.3		0.3		0.01		

CAMERAS PERFORMANCE COMPARISON

CAMERA	DMCII250	DMCII230	UC-XP	UC-XP WA	OSDCAM4060		
					L, IR	M	H
Focal length (mm)	112	92	100	70	16	50	100
Pixel size (µm)	5.6	5.6	6.0	6.0	3.3	3.3	3.3
Imaging alt (m) with ground resolution = 30 cm	6000	5000	5000	3500	1054/1093	3229	6491
Ground speed (km/h)	Imaging performance (sq. km/hour)						
300	1590	1422	1560	1554	820/850	2300	3540
450	2385	2133	2340	2330	1230/1280	3460	5320
600	3180	2844	3120	3108	1640/1700	4610	7090
750	3975	3555	3900	3885	2050/2130	5760	8860
900	4770	4266	4680	4662	2460/2560	6920	10630

* Cameras technical parameters are available in open Internet sources, Y. Raizman report “Aerial survey and mapping systems productivity analysis“ and are subject to be changed by developers.