

Celestron NexStar 5 - Meade ETX 125

	Celestron NexStar 5	Meade ETX 125
<i>Design</i>	Schmidt-Cassegrain Catadioptric	Maksutov-Cassegrain
<i>Clear Aperture</i>	127mm (5 inches)	
<i>Focal Length</i>	1250mm (50 inches)	1900mm (76 inches)
<i>f/ratio of the Optical System</i>	10	15
Optical Specifications		
<i>Primary Mirror diameter</i>	127mm (5")	138mm (5.43")
<i>Material</i>	Fine Annealed Pyrex	Pyrex
<i>Coatings</i>	Starbright Coatings - 5 step multilayer	EMC standard
<i>Secondary Mirror</i>		
<i>Material</i>	Hand Figured Fine Annealed Pyrex	None - Reflective coating on internal corrector plate
<i>Coatings</i>	Starbright Coatings - 5 step multilayer process	EMC standard
<i>Central Obstruction</i>	16% by area or 50mm (2 inches), 40% by diameter	9.6% by area or 39.4mm (1.55 inches), 31% by diameter + 2d baffle obstruction, so total of 40% by diameter
<i>Corrector Plate</i>		
<i>Material</i>	Optical Quality Crown Glass	BK7 glass - Grade A
<i>Coatings</i>	A-R Coatings both sides	EMC standard
<i>Amovable corrector plate (for first level service)</i>	No	Yes
<i>Collimation</i>	By tightening the secondary collimation screw(s)	At factory or can be done by the user (warranty ?)
<i>Finder</i>	Star Pointer (1x Laser dot)	8 x 25 with diagonal
<i>Image</i>	Better resolution (M13)	More bright and contrasted diffraction rings (stars, Moon)
<i>Feeling</i>	solid metal and heavy (in reality 50% metal/plastic)	Light and plastic
Magnification Specifications		
<i>Limit magnitude</i>	12.5	
<i>Min.(7mm exit pupil) and Max.useful Magnification</i>	~ 18x - 250x	
<i>Resolution</i>		
<i>Rayleigh Criterion (1)</i>	1.09"	
<i>Dawes Limit (2)</i>	0.91"	
<i>Field of View</i>		
<i>Eyepiece location</i>	Rear cell only (with visual back)	Coude or rear cell (with visual back and mirror flip)
<i>Standard Eyepiece</i>	25mm Plossl (50x)	26mm Super Plossl 4000 (73x)
<i>Standard Eyepiece True field</i>	1°02'	0°42.7'
<i>35mm Camera True field</i>	1°36' x 1°6'	1°05' x 0°45'
<i>35mm Camera with focal reductor</i>	2°30' x 1°45'	1°28' x 1°12'
<i>Linear Field of View (at 1000 yds)</i>	54.6 feet	36.4 feet
<i>Image scale (3)</i>	1°06.1'/ inch	0°45.6'/ inch
<i>Resolution on Moon</i>	1.8 km	
<i>Terrestrial Views</i>	using an Erecting prism	using an Erecting prism + flip internal
<i>Diagonal</i>	plastic box with prism	N/A (coudé)
<i>Eyepiece barrel</i>	1.25" only	
<i>Photographic Resolution</i>	182 lines/mm	
<i>Light Gathering Power</i>	330x the naked eye	
<i>Near Focus</i>	~ 20 feet (6.1m)	~ 15 feet (4.6m)
<i>Focuser</i>	very smooth	not so smooth

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Electronic Specifications		
<i>Drive training</i>	No need : drive is ready as soon it is out of the box	Need once
<i>Input Voltage</i>	12 V DC Nominal	
<i>Voltage range supported</i>	8-18 V DC	
<i>Batteries Required</i>	8 AA Alkaline	
<i>Power Supply Requirements</i>	12 VDC-750 mA (Tip positive)	12 VDC-
<i>AC Adapter / car battery</i>	Yes	
<i>Battery life with Electric focuser</i>		45h
<i>Battery life with GOTO/Autostar</i>		20h
<i>Battery location</i>	from top, center of the base	from bottom, center of the base
<i>Tracking</i>	excellent follow up at 260x for +30min	Irregular tracking
Mechanical Specifications		
<i>Manual motion (without battery)</i>	No	Yes
<i>Motor</i>		
<i>Type</i>	DC Servo motors with encoders, both axes	
<i>Resolution</i>	0.26 arc sec	
<i>Noise level</i>	low, slewing audible at 20 ft, a bit loudly at 6.5°/sec	low
<i>Slew speeds</i>	Nine slew speeds: 6.5° /sec, 3° /sec, 1.5°/sec, 128x, 64x, 16x, 8x,2x,1x	Nine slew speeds from 5° /sec to 1x
<i>Tracking Rates</i>	Sidereal, Solar, Lunar and King (4)	Sidereal only
<i>Tracking Modes</i>	Alt-Az, EQ North & EQ South	
<i>Optional wedge (6)</i>	Yes	
<i>Slow motion</i>		4-speed both axes
<i>Sleep / park mode</i>	No ?	
<i>Hand control characteristics</i>	RED display, 2 lines, 16 character Liquid Crystal Display, 19 fiber optic backlit LED buttons	Smaller, RED display, 2 lines, 16 character Liquid Crystal Display - Longer cord
<i>Aspect</i>	backlit white with black numbering - Short cord - Built-in rest	Backlit white with black numbering - No built-in rest
<i>Options</i>	No, only light on/off	Red flashlight + contrast/ brightness and text scroll speed adjustment
<i>Power off the Star Finder switch</i>	blink to remind	audible
<i>Usage</i>	intuitive	less intuitive
<i>Mount</i>		
<i>Type</i>	1 arm, with integrated hand control receptacle	2 arms
<i>Material</i>	cast aluminum	High-impact ABS (plastic)
<i>R.A. diameter</i>		9"
<i>Decl.diameter</i>		4.3"
<i>Bearing R.A.</i>		Ball bearings
<i>Bearing Decl.</i>		Nylon
<i>Anti-backlash feature (gears) (5)</i>	Yes (programmable)	?
<i>Tube</i>	cast aluminum	cast aluminum
<i>Hard stop</i>	No, you can rotate the OTA and RA 360° in either direction	RA stop due to the power cord
<i>Locks</i>	No RA or Dec locks	Locks on both axes

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Software Specifications		
Software Precision	16 bit, 20 arc sec. calculations	
Communication ports	RS-232	
Alignment Setup Procedures	2-Star Alignment, AutoAlign	Alt-/z easy, Alt/Az 1 star, Alt/Az 2 stars, Polar Easy, Polar 1 star, Polar 2 stars
Database	Total of 18473 objects	Total of 14487 objects
	25 user defined programmable objects. 6 user defined programmable 7840 objects from Revised NGC 110 Messier objects 109 Caldwell objects (NGC+IC) 9 Solar System objects 20 famous Asterisms 10385 SAO Stars Enhanced information on over 100 objects	200 user defined programmable objects 50 earth-orbiting satellites 7840 objects from Revised NGC 110 Messier objects 5386 objects from Index Catalog 8 Solar System objects (no Sun) 26 asteroids 943 SAO stars
Store info of date/time	No	
Store info of location settings	Yes	
In the field accuracy on object positioning using database	Often (dead) centered in 25mm eyepiece field using the Auto-align	?
Undo function	Yes (button)	A more complex variation
Memory for new entries	Yes for both terrestrial and astronomical objects	
Accuracy of time entered	to the minute	to the second
Tracking Software	The Sky	Epoch 2000sk
Firmware upgrade	not yet	upgradable
Dimensions and weight		
Dimensions (Height x Length x Base)	16.5" x 10.9" x 11"	19" x 8.9" x 10.8"
Weight of Telescope	17.6 Lbs (8 Kg)	18.8 Lbs (8.5 Kg)
Optical Tube	14"	14"
Miscellaneous options		
Piggyback possibility	No - use brackets, project of permanent pod	No - use brackets
SCT Visual back 1.25"	Default	Option to buy
SCT Visual back 2"	No suggested, but available if field stop of your optics is not wider than aperture of SCT visual back or diagonal	
Hand controller (other than Goto/Autostar)	No	Yes (with Alt/Az slew rates, electric focusing)
Suggested Price		
OTA	1199\$ (85000 FB)	895\$ (55000 FB)
Hand controller/Autostar		149\$
Field Tripod (standard)	199\$	170\$
Electric focuser	not yet	120\$
Problems		
Mount (without tripod)	no wiggle when focusing and dampen <2sec at 181x - More rigid than ETX	image wiggle even at lower magnification
Slewing quality	1 sec of hesitation before the move, more noticeable in RA	Some hesitation in RA

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<i>Battery</i>	No manual or slow motion without battery	No slow motion but manual without battery
<i>Motion</i>	excellent once aligned	A bit irregular
<i>Locks</i>	N/A	If forced, locks break
<i>Collimation</i>	Often to recollimate at 1st reception	at factory or by the end user
<i>Focus shift</i>	very slight at 181x	No or very low focus shift (7)
<i>Hand controller display</i>	Can be read in daytime	Very problematic even at dusk
<i>Orientation</i>	Don't warn for object below the horizon - Choose the long way to reach an object east of another	
<i>Miscellaneous</i>	Rubber feet don't hold - Loose screw from gear	
Useful tips		
	Intuitive GOTO	Autostar + hand controller
	"Undo" button	Mak design (great optic)
	programmable backlash (with experimentation!)	2 arms
	Laser finder	
	Easy and accurate Autoalign	
	Battery place (top)	
Bad choices		
	SCT optic (collimation & central obstruction)	Too many alignment methods
	Use of AA batteries	Battery place (from bottom) and use of AA batteries
	1 arm (but is robust)	No easy "Undo" using Autostar
	No electric focusing	Mirror flip
	GOTO cord plug falls down	Small finder
		2d baffle introduces a total obstruction of 40% by diameter

Legends.

- (1) to see diffraction pattern (5.5 per inch aperture)
- (2) traditional resolution (4.56 per inch aperture, say nothing about seeing, contrast, etc)
- (3) field in the sky filling one inch on focal plane (or film surface).
- (4) King rate is use to compensate the refraction effect of the atmosphere
- (5) Amount of play between the gears evident when a star move in the eyepiece at the press of hand controller button
- (6) for polar alignment and compensate the earth's rotation
- (7) The first ETX5 had some problems now corrected by Meade