

Updated 2019 Oct 3 by RSM.

Epochs of Spacewatch Equipment on 0.9-meter telescope (MPC Site code 691):

CCD	Optics	Dates	Bits/pix	As/pix	ehp/ADU	Drift/Stare?
Thin 320x512	f/5 prime uncorr., unfilt.	1984 Apr 22 - 1984 Jun 22	12	1.35	25	Mostly D: Nx320
Thin 320x512	f/3.87 xfer lens, unfilt.	1984 Sep 19 - 1988 Apr 19	12	1.73	25	Mostly D: Nx320
Thick 2Kx2K	f/5 prime uncorr., unfilt.	1989 Apr 04 - 1992 Sep 18	16	1.21	10.5	Mostly D: Nx2048
Thin 2Kx2K	f/5 prime uncorr., unfilt.	1992 Sep 19 - 1995 Jun 20	16	1.08	9.6	Mostly D: Nx2048
Thin 2Kx2K	f/5 + coma corr. & OG-515	1995 Jun 21 - 2002 Apr 22	16	1.05	9.6	Mostly D: Nx2048
Thin 4CCD Mosaic	f/3 + lenses & OG-515	2002 Oct 22 - present	16	1.00	2.32-2.90 (8 amps)	All Stare

Epochs of Spacewatch Equipment on 1.8-meter telescope (MPC Site code 291):

CCD	Optics	Dates	Bits/pix	As/pix	ehp/ADU	Drift/Stare?
Thin 2Kx2K	f/2.7 coma corr. & OG-515	2002 Oct 22 - 2005 May 3	16	1.00	6.5	Mostly D: Nx2048
Thin 2Kx2K	f/2.7 coma corr. & OG-515	2005 May 4 - 2011 Oct 01	16	1.00	5.02	Mostly D: Nx2048
Thin FLI2k	f/2.7 coma corr. & OG-515	2011 Oct 02 - present	16	0.62	2.12	All Stare

Epochs of Equipment used by Spacewatch on Mayall 4-m telescope (MPC ^695):

CCD	Optics	Dates	Bits/pix	As/pix	ehp/ADU	Drift/Stare?
Mosaic 1.1	f/3 corr. Prime, VR filt.	2011 May 22 - 2015 Sep 04	18	0.26	1.2	All Stare
Mosaic 3	f/3 corr. Prime, VR filt.	2016 Apr 21 - 2018 Jan 02	18	0.26	2.5	All Stare

Equipment used by Spacewatch on Bok 2.3-m telescope @ prime focus (MPC ^695):

CCD	Optics	Dates	Bits/pix	As/pix	ehp/ADU	Drift/Stare?
90PrimeOne	f/3 corr. prime & OG-515	2010 Mar 26 - 2015 Jul 24	16	0.45	1.5	All Stare

Equipment used by Spacewatch on Bok 2.3-m telescope at Cassegrain focus (MPC ^695):

CCD	Optics	Dates	Bits/pix	As/pix	ehp/ADU	Drift/Stare?
SCC	f/9 Cass, unfiltered.	2015 Sep 27 - 2019 Jun 21	16	0.15	2.12	All Stare
SCC	f/9 Cass, V+R+I filt.	2019 Jun 22 - present	16	0.15	2.12	All Stare

**** NOTE OVERLAP IN CALENDAR OF SITE CODES ^695 AND V00 ****

Equipment used by Spacewatch on Bok 2.3-m telescope @ prime focus (MPC V00):

CCD	Optics	Dates	Bits/pix	As/pix	ehp/ADU	Drift/Stare?
90PrimeAll	f/3 corr. prime & OG-515	2019 May 04 - present	16	0.45 or 0.90	1.5	All Stare

Key to table entries:

Optics:

- "As/pix" = arc seconds per pixel.
- "BBAR" = Broad-band, anti-reflection-coated (imager).
- "Cass" = Cassegrain telescope focus.
- "coma corr." = Coma correcting & field flattening lenses.
- "corr/uncorr" = corrected/uncorrected for coma.
- "filt." = Optical bandpass filter.
- "OG-515" = Schott OG-515 filter, approx. 515 nm to red cutoff of CCD.
- "prime" = prime focus of paraboloid primary mirror.
- "unfilt." = unfiltered CCD spectral response.
- "V+R+I filt." = Tiffen(Wratten) Yellow #12 bandpass 515-950 nm
- "xfer lens" = transfer lens.

CCDs:

- "amps" = amplifiers.
- "Drift" = Drift scans of arbitrary length "N" in RA in which accumulating exposure on CCD is transferred at the rate at which stars drift across the detector.
This rate is usually the sidereal rate but in some cases 1984-1988 the rate was slower than sidereal to get longer exposure times.
- "ehp/ADU" = Electron-hole pairs per analog-to-digital unit (ADU), otherwise known as inverse gain.
- "FLI-2K" = 2048x2048, 15 micron pixels, thinned, backside illuminated, red BBAR coated, Fairchild 3041.

"Mosaic 1.1" = Eight e2v CCDs, 2048x4096 pixels each,
15 micron pixels, thinned, back-illuminated,
BBAR coated. Divided into 16 amps.

"Mosaic 3" = Four LBNL 4096x4096 CCDs, thinned, back-illuminated,
BBAR coated, 15 micron pixels, divided into 16 amps.

"Mostly D: Nx320" = Drift scans of length N pixels in RA and
320 pixels in Dec, where $1024 \leq N \leq 14848$,
plus occasional "stare" images of 512x320.

"Mostly D: Nx2048:" = Drift scans of length N pixels in RA and
2048 pixels in Dec where $4096 \leq N \leq 28672$,
plus occasional "stare" images of 2048x2048.

"SCC" = Spacewatch Cassegrain Camera on Bok 2.3-m telescope,
sensor = e2v CCD230-42, 2048x2048 15 micron pixels,
thinned, backside-illuminated, and red broad-band
antireflection coated (red BBAR).

"Stare" = Telescope driven at sidereal rate or at the rate of
the targeted moving object.

"Thin 320x512" = RCA SID 53612 CCD 320x512, 30 micron pixels,
thinned and backside-illuminated.

"Thick 2Kx2K" = Tektronix 2048-SP 2048x2048, 27 micron pixels,
thick and front illuminated.

"Thin 2Kx2K(0.9m)" = Tektronix TK2048EB-1 2048x2048, 24 micron pixels,
thinned, backside-illuminated, and red broad-band
antireflection coated (red BBAR).

"Thin 2Kx2K(1.8m)" = Scientific Image Technology (SITE) SI424AB4-1,

parameters as above.

"Thin 4CCD Mosaic" = Four E2V Technologies, Model CCD42-90-I-941;
4608 x 2048 pixels each, thinned, backside
illuminated, and red BBAR coated. Divided
into 8 amplifiers.

90PrimeOne = One UA/ITL 4032x4096 CCD, thinned, backside-
illuminated, BBAR.

90PrimeAll = All four UA/ITL CCDs as above.