MAS Observatory Manual

General Information

Preface

This manual is intended especially for the members of the Milwaukee Astronomical Society (MAS) about our Observatory at 18850 W Observatory Rd in New Berlin. It contains information about the grounds, the buildings, and the telescopes along with a bit of history. It is divided into two major sections. The first is General Information intended for all the members and contains some background info. The second section is more detailed information intended for the keyholders of the observatory and is only distributed to those members.

Though we have included some photographs here of the grounds, observatories, and telescopes, many more can be found on the MAS website:

www.milwaukeeastro.org

But we include much more information here about the observatory and the various telescopes including our informal names for them.

As the observatory inevitably changes, this document will need to be updated. Should you find any errors, sections that need updating, new sections to be included, you can pass this information to the Observatory Directors or the Webmaster.

webmaster@milwaukeeastro.org

To get the most current version of the Observatory Manual, you can find it on our website:

www.milwaukeeastro.org/Documents/Observatory_Manual.pdf

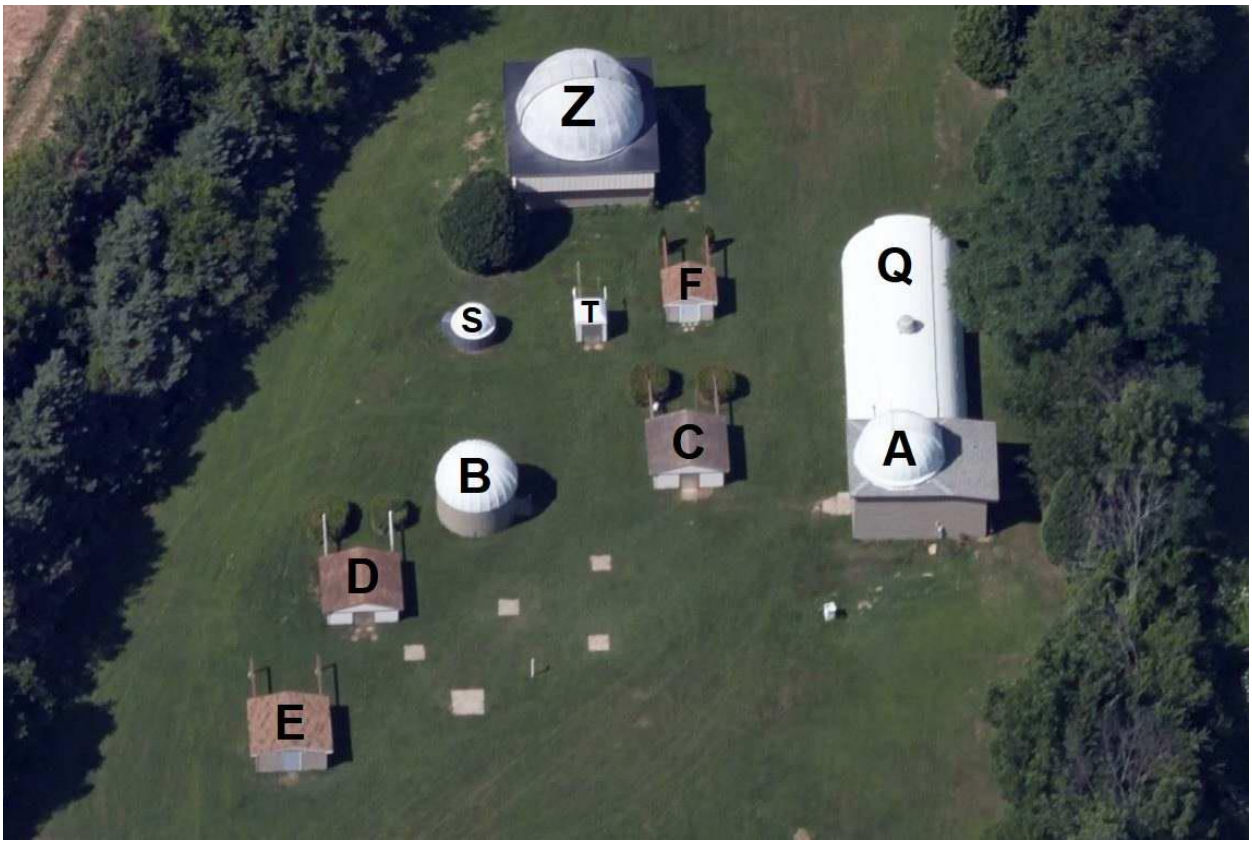
Last Updated: 07/13/2024

The Grounds

The Milwaukee Astronomical Society Observatory occupies 3.1 acres on a hilltop in New Berlin. Our club was founded in 1932 and the original acre was offered by a member in 1934. The observatory was established in 1936, and then formally dedicated in 1938. 2 additional acres were donated in 1963. This is the aerial view of it looking north as seen on Bing Maps.

The parking lot is secured by a swing gate. It is not meant to really secure the grounds, but just to keep cars out. It used to have a single combination padlock, but because it was always problematic (need to know the code, the lock didn't always work well, especially in winter) there is no longer any lock. It just *looks* like it has a padlock.

The Buildings



A – Armfield Observatory

B – Buckstaff Observatory

C – Albrecht Observatory

D – D Shed

Q – Quonset

E – Ray Zit Observatory

S – Solar Observatory

F – Toeller Observatory

T – Tangney Observatory

Z – Z Dome

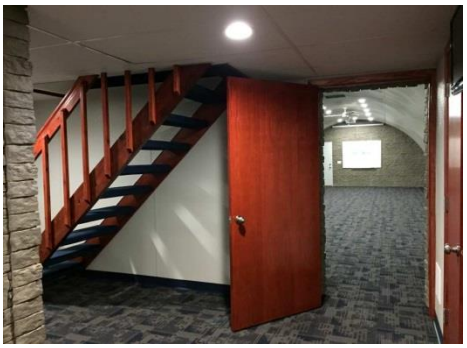
Armfield Observatory / A-Dome

Construction on the Armfield Observatory was started in 1937 and completed the following year. It is named after the founder of the MAS, Luverne Armfield. The telescope (originally a 13 inch with a mirror lent to the MAS by the AAVSO) is upstairs in the dome was called the "A" Scope for many years and in fact is still almost always referred that way. Actually, the telescope was completely rebuilt and rededicated in 1977 to honor Ed Halbach who was the observatory director for 35 years and avid variable star observer who had just retired. From that time forward, technically it was then supposed to be referred to as the "H" scope, but the name "A" scope persists. This observatory is almost always referred to by its informal name, the A-Dome.

The scope itself is a 12.5 inch f/8.86 Newtonian reflector on a massive German mount with large vernier setting circles. It has limited slew ability in both Right Ascension and Declination. The paddle for this function also controls the rotation of the dome. The slit for this dome is not automated; we open and close it by hand and historically it is difficult to move. The trick to opening the dome is to stand on the ladder and push it from nearer the center.

In 2015 the A-Scope was modified by installing a smaller secondary making it an even better planetary telescope. The relatively long focal length and height off the ground (the pier is 12 feet above ground level) already made this a very good planetary scope. Two cameras very donated at the time: a monochrome and a color one for planetary imaging.

The bathrooms were not part of the original observatory, but were added in 1965, along with a darkroom. The darkroom is now a storage closet with a stationary tub. These rooms are obviously plumbed and this means care must be taken in winter. Each of these three rooms has a space heater to keep the room just warm enough to prevent freezing. So in the winter months, it is especially important the doors remain closed.



In 2016-17, the first floor of the A-Dome was extensively remodeled with one of the bathrooms being made handicap accessible. It also has the MAS log book. Whenever you visit the MAS Observatory you should sign this book and note anything you feel is significant. Our log books represent a lot of the club's history!

Quonset Hut

The Quonset Hut is an old military surplus structure that was in Milwaukee before being moved to the observatory site in 1955 and attached to the north wall of the Armfield Observatory (A-Dome). We simply call it the Quonset. They were hoping to place the Quonset between the Armfield and the Buckstaff Observatories, but the height of the Buckstaff was not adequate to make that practical.

We can say we have a love/hate relationship with our Quonset hut, but historically it's mostly hate. What we've always loved is that we have a structure with a wide open space for our meetings. We have a gas heater for the winter months which was converted over from an oil burning furnace.

In 2016-2017, our club fulfilled a long standing dream of either replacing or fixing it. For cost purposes, we chose to completely renovate the Quonset. New interior walls and a new floor were installed, new lighting, carpeting, and the office area removed so that the complete 48X20 foot interior is dedicated as our meeting room, easily accommodating 120 people. The room layout was also flipped so the presentation side is toward the north, leaving the main entrance to the back of the hall so presentations are not interrupted with people entering or exiting.

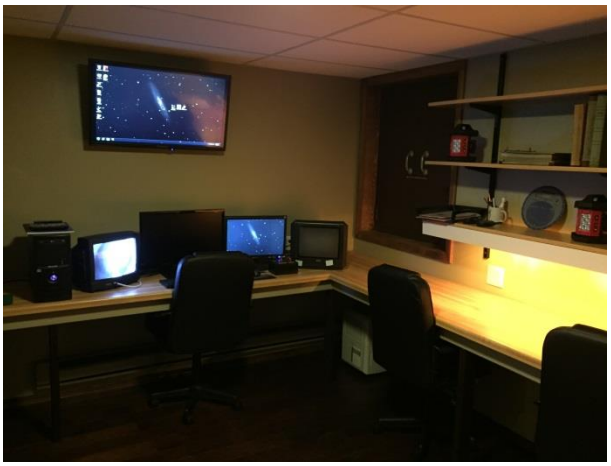
Z-Dome

The Z-Dome houses the G-Scope. The original telescope in this dome was known as the "Z" Scope with the official name of the Zemlock Telescope. That scope was a 26 inch, f/15 Cassegrain reflector. The mirror itself was f/3.0 and was the largest instrument on the observatory grounds. It was built in the early 1980's by MAS members under the direction of Gerry Samolyk. That telescope was disassembled in 2015 and the mirror sold.

The new telescope (the G-Scope) is a Celestron EdgeHD 14" Schmidt-Cassegrain reflector and sits on an Astrophysics 1600GTO Astrophysics mount with complete GOTO capability, especially operation from a computer. This mount sits atop a bridge between the yokes of the old Zemlock Telescope. This scope is for imaging only and the dedicated camera is a CMOS ZWO ASI6200MM Pro.

The dome is 22 feet in diameter and the slit is motorized as well as the dome rotation. Control of the dome was automated in 2018 by installing new motors and hardware that integrate with TheSkyX software which controls this observatory. Doing so now allows the dome to automatically rotate in sync to where the telescope is pointed and/or keep up with the Earth's rotation. The building and the dome itself were built entirely by the MAS membership, again under the direction of Gerry Samolyk.

The second floor is for the telescope. The first floor contains the club's office, library, and control rooms. Modifications within the observatory now allow the telescope to be controlled from the first floor library area. Also, two video cameras have been added, one to see the telescope from the control area and another mounted in the telescope itself looking up so correct dome alignment can be maintained.



The first floor of the Z Dome is the club's office, library, and control rooms. These areas are minimally heated. The dedicated control room is on the SW side of the building and the library & office area is on the NW side.

The office area has a refrigerator, microwave, and where you can find the Intermediate Key (aka C-Shed Key).

Buckstaff Observatory / B-Dome

The Buckstaff Observatory was the second dome on the site. Construction started in 1949 and completed in 1951. It houses the Buckstaff Telescope, almost always referred to as the "B" Scope. It is named for Ralph Buckstaff, one of the original members of the MAS who was a furniture maker living in Oshkosh where he had his own observatory, observing the sun, lunar occultations and variable stars. This was his telescope which he donated because he had completed a 16 inch Cassegrain to replace it. You will notice that where the mount sits on the concrete pad, it is elevated on the south end which compensates for the difference between the latitude of the MAS Observatory and Oshkosh. The structure is usually referred to by its informal name, the B-Dome. The scope which was built in 1921 turned 100 years old in 2021.

The telescope is a 12.5 inch f/7.4 Newtonian reflector on a German mount with large vernier setting circles. The slit on this dome is motor driven. The dome, however, is manually moved.

Note: the setting circles on the B-Scope are very accurate as well as the tracking.

Albrecht Observatory / C-Shed

The Albrecht Observatory (aka C-Shed) has a roll-off roof design and houses the C-Scope. This roll-off roof observatory design is used 4 times on the observatory grounds: for this observatory, the D Shed, the Ray Zit Observatory, and the Toeller Observatory. It is named for Bill and Anne Albrecht who were longtime members of the MAS. Bill joined the MAS in 1933 and met Anne at a MAS open house.

The telescope that sits in this observatory is informally referred to as the “C” scope. Currently, it is an 9.25-inch, f/10 Celestron Schmidt-Cassegrain telescope and sits on a Celestron Advanced VX CG-5 mount which gives it GoTo capability. It is also fitted with a 9X30 finder scope.

The Albrecht Observatory is also known as the C-Shed. Before being dedicated to the Albrecht’s, this observatory was simply called the C-Shed as it was built where the original C-Shed stood. It was labeled “C” as the observatory already had “A” and “B” scopes / observatories. There was also a “D” Shed where the Tangney Observatory now stands. In both cases you can see the concrete strips where the rails were attached. The disadvantage of the previous design was that any amount of snow or ice would make rolling off the sheds almost impossible.

D-Shed

The D-Shed has a roll-off roof design and houses the Kyle Baron Telescope. Though it does not stand where the old D Shed stood, it was the second roll-off roof observatory built so it took this name as the old D Shed had long since been decommissioned.

The telescope is an 18 inch, f/4.5 Obsession Dobsonian reflector. It is named for Kyle Baron who donated this scope to the MAS. It is outfitted with digital setting circles and has a fine collection of Televue eyepieces. This telescope is often referred to by its informal name: "D" Scope.

Since the walls and roof occasionally get in the way, the scope has a set of wheelbarrow handles which allows the scope to be easily moved out of the structure on onto one of the many available concrete pads.

This observatory is opened with an intermediate key, same as the Albrecht Observatory.

Ray Zit Observatory / E-Shed

The Ray Zit Observatory (aka E-Shed) was constructed in 2002. It has a roll-off roof design and is named for Ray Zit who was a long time member who served a term as Observatory Director from 1977-1980. The building was constructed to house Ray's personal scope which he eventually donated to the club.

The informal name of this observatory is the Z2 or E-Shed.

The telescope in this observatory is a Stellarvue SVQ-100 APO f/5.8 astrograph refractor. It sits on an Astro-Physics Mach1GTO. It is permanently mounted and has complete GoTo capability. The informal name of this telescope is the E-Scope.

Tangney Observatory / T-Shed

The Tangney Observatory is a small shed with a flip-top cover. The informal name of this observatory is the T-Shed.

The scope in this observatory is a Meade 10" f/6.7 LX-200 Schmidt-Cassegrain on a CGEM DX computerized equatorial mount. It is permanently mounted and has complete GoTo capability. The scope can be fitted with either a DSLR or a CCD. The informal name of this telescope is the T-Scope.

The observatory is named in honor of Virgil and Mary Tangney, long time members of the MAS.

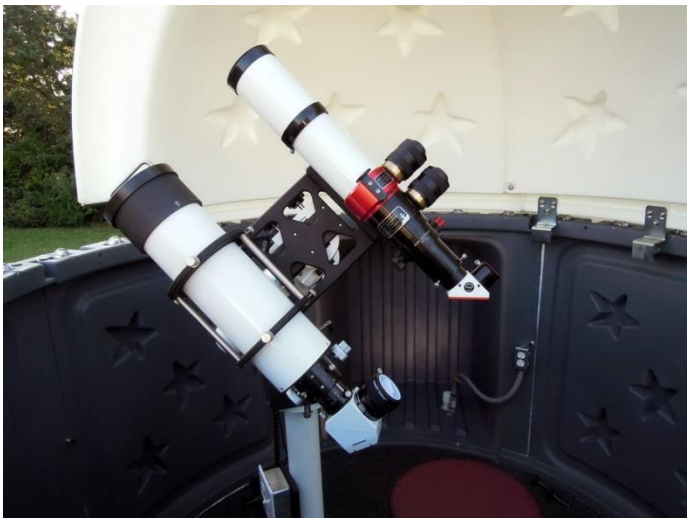
Though this LX200 can theoretically be used visually, this is impractical in this small a structure. The sole purpose of this telescope is for CCD imaging.

Jim Toeller Observatory / F-Shed

The Jim Toeller Observatory is our smallest roll-off roof structure measuring 8X8 in the interior.

It houses the club's F-Scope, currently a Stellarvue SVQ-100 APO f/5.8 astrograph refractor with a ZWO ASI2600MM Pro camera, mounted on an Astrophysics Mach1GTO. The telescope can be controlled right in the observatory or remotely controlled from the lower level of the Z Dome. The observatory is named in honor of Jim Toeller, a long time member of the MAS and is listed as one of the founders. It was completed in 2015.

Solar Observatory



The Solar Observatory is our newest observatory completed in August of 2016. It becomes our 9th observatory structure.

The observatory itself is a SkyShed POD which was purchased by the club solely from donations from our members. In 2018 the dome portion was replaced by a Nexdome to fix leaking problems with the original.

The observatory houses two solar telescopes mounted side by side. The primary instrument is a Lunt 80mm H-Alpha pressure tuned telescope with a Double Stack Module. The second telescope is the so-called White Light telescope which uses a Herschel Wedge for filtering. It is a 5 inch f/5 refractor.

These telescopes may be controlled right in the observatory or remotely controlled from the lower level of the Z Dome.

Unistellar eVscopes

Our club has 2 Unistellar eVscope Smart Telescopes. One is the original model simple called the eVscope and the second is an updated model called the eVscope 2.

These are highly portable but meant to stay strictly on the grounds of our observatory.

The telescope is fully digital and run by an app from any smart phone. It has an eyepiece for “visual” viewing, but it also has imaging capability.

Below we show a couple of images taken with our club owned scopes to highlight their capability.

We have a whole gallery dedicated to images taken with our eVscopes.

https://milwaukeeastro.org/showcase/eVscope.asp

Observatory/Telescope Nomenclature

If you're at the observatory or reading postings from the MAS Google Group, you might notice that our individual observatories and telescopes are most commonly referred to by their informal names. They have been noted in the various descriptions of the observatories, but for some clarity we present them here in table form. As you can see, not every observatory has an "official" designation but every observatory has an unofficial name.

Official Observatory	**Unofficial**
Armfield Observatory	A-Dome
Buckstaff Observatory	B-Dome
(no official name)	Z-Dome
Albrecht Observatory	C-Shed
(no official name)	D-Shed
Ray Zit Observatory	Z2 / E-Shed
Tangney Observatory	T-Shed
Toeller Observatory	F-Shed
Solar Observatory	S-Shed or S-Dome

Official Telescope	**Unofficial**	**Location**
Edward A Halbach Telescope	A-Scope	Armfield Observatory
Ralph Buckstaff Telescope	B-Scope	Buckstaff Observatory
G-Scope	----	Z-Dome
Weisen Telescope	----	Z-Dome
(no official name)	C-Scope	Albrecht Observatory
Kyle Baron Telescope	D-Scope	D-Shed
(no official name)	F-Scope	Toeller Observatory
(no official name)	T-Scope/12" LX-200	Tangney Observatory
(no official name)	E-Scope/10" LX-200	Ray Zit Observatory
(no official name)	Lunt 80mm Ha	Solar Observatory
(no official name)	White Light Scope	Solar Observatory

Equipment Manuals

If you're looking for the various equipment manuals at the observatory, there is a special link to a page on our website that can only be accessed by current MAS members who are logged in. It's on the MAS Documents page that can be accessed through the Member's Page which is also protected. The link is mid-way down the page on the left labeled MAS Documents. You can also get there directly with the following link:

https://milwaukeeastro.org/members/documents.asp

The equipment is listed by the observatory and by the manufacturer.

Adopt A Telescope Program

We started this program back in February of 2011 with a goal to make the buildings and domes more organized and clean and to keep our instruments in better shape. Also, to make the MAS Observatory more presentable and attractive during the Public Observing Nights and tours.

The person who adopts a telescope is responsible for sweeping the floor, removing cobwebs and wasp nests, making sure that the eyepieces are clean and put away after our public meetings. In general to make sure the telescope is in full working condition.

The maintenance is not the adopter's duty (although help from trained and knowledgeable members is welcome), he/she just needs to let the Observatory Director know if an issue is noticed.

This program is an excellent opportunity for new/less experienced members to get familiar with the MAS' equipment.

In the Focal Point (our club's newsletter generally published monthly) you will find a listing of our observatories and members who have signed up. You might also see that an observatory is listed as Vacant which means it's in need of an adoptee.

If you are interested, please contact Lee Keith, Observatory Director.

Keys to the Observatory

There are 3 levels of access to the observatory:

1. Yard Access

For years, any member could gain access to the observatory grounds with a Yard Key. In 2015 it was replaced with a combination padlock which could be changed every year during the winter and more often as needed. All members in good standing could get the combination.

But in 2022 because of the persistent difficulty with the various locks, the gate no longer has a lock. It just looks like there's a lock.

This allows members to use their personal scopes and connect to electricity at the MAS observatory.

In the near future we will have a number of webcams to monitor the grounds.

2. Solar Observatory Key

Members of the MAS can gain access to the Solar Observatory and the two solar telescopes mounted there. Note: you can only gain access to the telescopes. You will not have access to the camera equipment and laptop, but you may supply your own.

In order to secure this key, you must fill out an application (available on our website) and be "checked out" by the Observatory Director or the Assistant Observatory Director, or other qualified member of the MAS Board.

3. Full Key

This key will unlock all of the equipment at the observatory. Full keyholders must have a working knowledge of all of the equipment at the observatory. They need to be available to open the equipment on member's night (on a rotating basis) to teach other members how to use the equipment. They also must help with the maintenance of the observatory. There is a $50 deposit for the key.

In order to secure a full key, you must be a member for at least one year, fill out an application (available on our website), and be "checked out" by the Observatory Director, the Assistant Observatory Director, or a member of the MAS Board. Another important prerequisite is the applicant must demonstrate that they will contribute to the ongoing maintenance of the observatory. Finally, the MAS Board must approve the application.

If you are approved, you will also receive a Solar Observatory key.