

Eyesight, Aging and the Ham or Tinkerer

Extracted from a Presentation by:

Dr. Richard Meetz, Clinical Professor

Indiana University ©2014Meetz Vision Consultant, Inc

This Presentation has been revised and is only to be used for presentation to Non Commercial and Non Medical entities. Such entities would include Hobby Clubs such as Amateur Radio, Vintage Electronics, Model Railroad, Model Vehicles, and Diorama construction, each of which requires close work to Construct, Repair or operate, and where close work is necessary for enjoyment of the particular Hobby.

Adrian M Zeffert AB2IX

2/17/2021

Eyesight, Aging and the Ham or Tinkerer

Maybe you just got that DO138 Scope kit, or that SDR kit or that Audio Interface or, that Network Analyzer kit in the mail. You quickly unwrap all the parts, lay them out carefully and begin to assemble (without reading the instructions). Just about then do you realize that the micro sized components have micro sized writing on them. Bringing a component close to your eye you realize that it is hard to see. So, after cursing every Asian manufacturer known to man/woman & beast, you go to you closet and pull out that old Magnifier lamp, the one with the 8” fluorescent tube.

And so it goes!

Eyesight, Aging and the Ham or Tinkerer

Introduction

Why is this happening, what is wrong with me, or the world!

- **The ability to do prolonged detail work at near distances changes with age.**
- **Mature Tech types must also change how they approach the task either by using vision-aids and lighting, or by changing scales for model railroaders, or component sizes for tech projects.**
- **The goal of this presentation is to show you how to best use the myriad of available lights and magnifiers, to your advantage.**

Eyesight, Aging and the Ham or Tinkerer

Topics in 3 Parts

- **Age and your eyes: Focus Vs Age, Blinking & Tears: Comfort & Vision, Lights & Lighting, Terms & Parts,**
- **Glasses, Magnifiers and Readers,**
- **Computer vision and Eye Health**

Eyesight, Aging and the Ham or Tinkerer

Vision Terms:

The ability to focus on a near object. When we are viewing distant objects our eye should be in a relax state.

When a person works up close the eyes: Accommodate (near focus)

- **Converge (eyes turn in)**
- **Pupils constrict (get smaller)**
- **Blink rate drops (blink less)**

Eyesight, Aging and the Ham or Tinkerer

Continued:

➤ **The closer the near object the greater the muscle effort the eye must use and hold.**

Our eyes can add plus power to see from infinity to near, until about age 40. Then... Presbyopia “Old Vision”

➤ **AKA: Short Arms**

➤ **Age related loss of accommodation ...**

➤ **Will need reading glasses or bifocals**

Eyesight, Aging and the Ham or Tinkerer

Near Focus and “Old Eyes”

- **By early to middle 40s the eye’s lens starts to harden, turn yellow and lose the ability to focus as part of the normal aging process called presbyopia.**
- **We then need to help that focus by wearing Bifocals or reading glasses.**
- **By our mid to late 50s this change is complete with 3 to 4 prescription changes along the way.**

Eyesight, Aging and the Ham or Tinkerer

Convergence:

- **The 2nd most difficult thing for the eyes to do is to converge on a near object.**
- **The eyes must exert muscle power to turn in and hold the near point of focus.**
- **The closer the point of focus the more effort it takes.**
- **The power of your glasses help or hinder:
However, by looking slightly down makes it easier. 4 muscles do the work of two in a slightly down position.**

Eyesight, Aging and the Ham or Tinkerer

Continued:

- **If you are nearsighted you are helped by not having to turn your eyes as much due to a “prism effect” of your lenses.**
- **However, If you are farsighted you are hindered due to the same effect but with the opposite direction.**

Pupils and Depth of Focus:

- **At near distances the pupils become smaller, not because of too much light, but to increase the tolerance of the near focus slightly by the “Pin Hole camera effect”.**
- **This depth of focus helps us at near by increasing our “*depth of field*” allowing us to see more near items in focus at the same time.**

Eyesight, Aging and the Ham or Tinkerer

Pupils, Lights & Lighting:

➤ **To make full use of the “depth of field” effect, the eyes need not only the correct amount of light but also the correct color (blue-white).**

How much light?

➤ **Too much light causes glare. Too little and the pupil will not get small enough to give us the depth of field needed to see details.**

➤ **In addition, as we age, the amount of light reaching the retina decreases by 26% @ 50 years and by 44% @ 80 years old.**

Eyesight, Aging and the Ham or Tinkerer

Task Lighting Layout lighting:

- **Layout lighting is designed like theater lighting.**
- **We change the level and color to tell a story.**
- **Work lighting is designed to maximize the eye's ability to see detail and to work efficiently.**
- **To maximize visual efficiency fully, ANSI "Std. Office" lighting is needed.**

Eyesight, Aging and the Ham or Tinkerer

Lights and Task lighting:

➤ **ANSI standard “office lighting” level for detail work is “120 foot candles” equivalent to two 60 watt or one 150 watt bulb at 18 to 24 inches**

➤ **Most modelers tend to use a 40 – 60 watt lamp, or $\approx 1/2$ what is needed.**

However, more light is not always better due to:

➤ **Spectral sensitivity (wrong color)**

➤ **Glare (too much)**

Eyesight, Aging and the Ham or Tinkerer

Lights and Lighting:

- **Standard lights do not match the spectral (color) sensitivity of the eye.**
- **Incandescent lights tend toward the red-orange spectrum making it harder for the eye to judge distance.**
- **Fluorescent tend toward the blue spectrum, increasing glare.**
- **In order for the eye to see effectively the level, spectrum peak and color discrimination must match the eye's sensitivity.**

Eyesight, Aging and the Ham or Tinkerer

Continued:

Lights and Lighting:

- **Lights are rated by more than just watts**
- **Correlated Color Temperature (CCT)**
- **Describes the apparent “warmth” (redness) or “coolness” (blue cast) of a light.**
- **Full daylight $\approx 5500^\circ \text{K}$ (Degrees Kelvin (K°))**
 - **Varies by time of year & location**

Eyesight, Aging and the Ham or Tinkerer

Continued: **Lights & Lighting**

➤ **Color Rendering Index (CRI)%**

How close the colors are seen as they would in midday sunlight (CRI100%).

➤ **Natural or “Daylight” lights, the type and level which the eye sees best with has:**

- **CCT between 4000° K and 6000° K**
- **CRI > 84%**

Eyesight, Aging and the Ham or Tinkerer

Continued: **Lights & Lighting**

Typical values for standard lights:

- **100-watt incandescent: 99% CRI @ 2600K**
- **Reveal®: 75% CRI @ 2870K**
- **Halogen: 99% CRI @ 3000K**
- **Fluorescent “Warm-white”: 40% CRI @ 3200K**
- **Fluorescent “Cool-white”: 64% CRI @ 4000K**
- **Grow lights: “90% CRI BUT with extra UV!”**

Eyesight, Aging and the Ham or Tinkerer

Pupils & Background Lighting:

Modelers often work with well-lighted work areas but against a dark background.

➤ **When looking up from lighted work to a dark background and back, the pupil will expand, then must contract again.**

➤ **Repeated changes in lighting – looking from the work to a dark background and back – greatly increase eye fatigue.**

Eyesight, Aging and the Ham or Tinkerer

Tears & Vision:

- **Tears are critical for good vision.**
- **They are the first optical surface through which light passes.**
- **Tears supply both oxygen and a clean optical surface.**
- **Poor tears are like looking through a dirty, foggy window.**
- **Tear quality and quantity decrease with age.**
- **Tear drying time drops from 20 seconds as teenagers to 10 or less seconds by age 50.**

Eyesight, Aging and the Ham or Tinkerer

Blink Rate and Tears Tear Facts:

- **Tears must be refreshed every 12 seconds for vision to remain clear.**
- **The average person blinks 15-18 times a minute in order to refresh the tear layer.**
- **However, During concentrated near work that rate drops to 3-5 times a minute!**
- **This means that every 20 to 30 seconds there are dry spots forming.**
- **As the tears dry the quality (sharpness) of vision decreases.**

Eyesight, Aging and the Ham or Tinkerer

Continued: Tears, Tear Facts

- **As these dry spots form and the normal tears can no longer cover them, your eyes will start to “water”**
- **These watery tears are the eye’s reflex tears (reserve) and are not the same as your normal tears. They are meant to wash out things that have gotten in the eye, not to cover dry spots.**
- **The use of the watery reserve tears will actually make your eyes burn and make your eyes feel “heavy” or tired.**

Eyesight, Aging and the Ham or Tinkerer

Continued: Tears, Tear Facts

Dry Eye Syndrome:

➤ **By age 50 tear quantity and quality have decreased by 30+%.**

1 in 3 adults have signs/symptoms of “dry eye”:

➤ **Redness, dry sandy or hazy vision**

➤ **Burning feeling = Dry Eye Syndrome!**

➤ **Common side effect of many medications is drying of the eye.**

➤ **Allergy, blood pressure, anxiety/depression and NSAID medications are the most common.**

Eyesight, Aging and the Ham or Tinkerer

Continued: Tears, Tear Facts, Dry Eye Syndrome

- **If your eyes burn in the morning you may have a serious problem**
- **The eyes burn when the dry area has compromised the tear film all the way down to the tissue layer.**
- **This causes the surface cells to dry & die, Thus exposing the nerve endings**
 - **The eye can heal this in 6 to 8 hrs if rewetted in time**
 - **If left untreated or chronic, it will scar.**
- **SEE your eye doctor for further testing!!!**

Eyesight, Aging and the Ham or Tinkerer

Bifocals & Eyesight Problem #1

The standard reading power used by all eye doctors in prescribing glasses is one with a 40 cm focus (+2.50).

- This works out to a working focus of approximately 16” to 18”.**
- Most modelers need to be able to focus between 8” and 13” for detail work.**
- In order to see at closer distances additional magnification is needed.**

Eyesight, Aging and the Ham or Tinkerer

Bifocals & Eyesight Problem #2

The standard reading powers are placed in the bottom of a prescription pair of glasses.

➤ This requires you to look down (in your lap) to model or Requires a change in head posture to use (chin up), often resulting in a stiff neck or shoulders

Eyesight, Aging and the Ham or Tinkerer

What All This Means

- **You are 45+ years old.**
- **You build electronics kits or model trains.**
- **You can't hold your work close enough.**
- **You have tried magnifiers and they were hard to keep in focus or you were too close for comfort.**
- **Your eyes tire quickly, and they turn red, water, blur and burn in less than an 1/2 hour of Eyesight!**

Eyesight, Aging and the Ham or Tinkerer

What Do You Do? Part 1

- **Use the correct level of lighting when Eyesight.**
- **Use corrected “Full Spectrum” lights. (daylight/sunlight bulbs)**
- **Light up the background**
- **Use a drop of artificial tears before you start Eyesight and reapply each hour.**
- **Use better quality reading glasses/ magnifiers balanced and aligned for your eyes.**

Eyesight, Aging and the Ham or Tinkerer

What Do You Do? Part 2

Lights and Lighting:

➤ **To be labeled “Full Spectrum” or “Daylight” lights must have:**

➤ **CRI (Color rendering) rated $\geq 85\%$**

AND

➤ **CCT (Color Temperature) must be $\geq 4000^{\circ}\text{K}$**

Eyesight, Aging and the Ham or Tinkerer

Full Spectrum Lighting: Layouts

- LED Light strips
- 10-12 volt, 1.2 amp / 3 feet
- 2800K - 6000K
- Flat, low heat output
- eBay, Amazon



Eyesight, Aging and the Modeler or Kit Builder

Lights and Lighting Caveats CRIs:

- **You can only use the CRI to compare lights of equal color temperature.**
- **A light with 90% CRI @ 5000 K is NOT the same as a light with 90% CRI @ 3000 K**
- **The eye can not detect a difference in CRI of less than 5%.**
- **Thus a \$6 light with 91% CRI \approx \$20 96% CRI light**

Lights and Lighting Caveats Color Temperature:

- **The peak color temperature for the eye is between 4000 & 6000K.**
- **Productivity will increase as the light level increases up to 150 candle power, afterwards glare becomes a degrading factor.**
- **That glare level is reached at color temperature levels over 6000K.**
- **Older eyes the glare level lower.**

Eyesight, Aging and the Ham or Tinkerer

This live presentation will stop at this point.

Please go to the CMARA Website, CMARA.org to view the complete presentation.

The following slides provide information on type of products available to improve vision and comfort for close-in work and Eye maladies.

Note: Recommendations are given for guidance only in searching for similar products. The products shown are from 2014 when the presentation was first developed by Dr Meetz and would certainly have been complemented with newer products since 2014.

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Artificial Tears

To work efficiently you should use artificial tears as you work, but Which one ?



Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Readers and Magnifiers:

Reading Glasses:

Reading glasses are the easiest inexpensive tool we have to help your Eyesight demands for working with fine details.

▪However, Picking the correct pair can be a very frustrating trial and error task.

•Further, Lenses are all rated in a unit called “Diopters”



Eyesight, Aging and the Ham or Tinkerer

Finding Products

Reading Glasses:

Lens Power

“Diopters”

- **Diopter = 1 meter / lens’s focal length in meters.**
- **Ex: a lens that focuses at 0.5 meters (50 cm or $\approx 20''$) is a $(1\text{m}/0.5\text{m}) = + 2\text{D}$ lens. This number is what you see on all glasses prescriptions and Reading glasses.**
- **Glasses can be either “plus” power or “minus” power.**
- **Plus magnifies or pulls the focus closer.**
- **Minus minifies or pushes the focus out.**

All readers are in plus power!

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Reading Glasses:

The Right Reading Glasses

How to find your working distance and range:

- **Measure from the bridge of your nose to the center of the distances that you would like to work at and convert it to meters (= WD)**
- **Then divide it by $1/WD = \text{lens power needed}$**
- **Or use the following chart showing the range of focus that can be expected with a given lens power.**

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Reading Glasses:

The Right Reading Glasses, Continued:

Working Distance Chart

•Needed lens power (reading glasses) to accommodate different working ranges:

Power Min Dist" Max Dist"

+1.25 17.3" 31.2"

+1.50 15.6" 26.0"

+1.75 14.2" 22.3"

+2.00 13.0" 19.5"

+2.25 12.0" 17.3"

+2.50 11.1" 15.6"

+2.75 10.4" 14.2"

+3.00 9.8" 13.0"

+3.50 8.7" 11.1"

+4.00 7.8" 9.8"

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Reading Glasses:

The Right Reading Glasses, Continued:

Bifocal Caution: most of you already are looking through a +2.00 to +2.50 lens if you have bifocals or PALs “no-lines”

- Look at your spectacle prescription slip that your eye doctor gave you with your glasses**
- Look under the “ADD” power for the diopters of your reading power (the last # to the right)**
- Bifocal Caution: ADD Powers**
- You will need to subtract that power from your “hobby power” if you are going to add a reading lens ovetop of your glasses.**
- If you do not reduce the power, you will pick a power too high and will end up working too close.**

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Reading Glasses:

The Right Reading Glasses, Continued:

Working with Add Powers

- Example: You wish to work at 10” that works out to a +4.00 lens but you have bifocals, a +2.00 add, what will happen?**
- With bifocals the two powers combine and you will find yourself working too close at 7”.**
- $+4.00 + (+2.00) = + 6.00 \text{ D}$**
- You will need to subtract the “ADD” power from the “Hobby Power” to determine the additional power to get you to 10” over your glasses.**
- $+4.00 - (+2.00) = + 2.00 \text{ D}$**

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Reading Glasses:

The Right Reading Glasses, Continued:

If you are confused by all of this: Test Drive!

- 1) Take a model to the drug store or Mart and try them out.**
- 2) Talk to your eye doctor or optician.**
- But, If faced with the choice of two powers pick the lesser.**
- Range is more important than Magnification.**

Lens Power vs Magnification:

You say: But I don't want to work closer, I just want it bigger! Can't I just use a magnifier?

Although Lens power is NOT the same as magnification they are directly related.

The higher the magnification the closer the focus.

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Reading Glasses:

The Right Reading Glasses, Continued:

Magnification

□ **Lens power “Diopter” is a focus point, magnification is the apparent size at that point.**



Eyesight, Aging and the Ham or Tinkerer

Reading Glasses:

The Right Reading Glasses, Continued:

Magnification

- The higher the lens power the more magnification**
- However, this magnification comes with tradeoffs**
 - 1) a closer focus or working distance,**
 - 2) a reduced depth of focus and**
 - 3) a more exacting alignment.**

Example;

- a +2D lens has a magnification of 1.50X with a focus (working distance) at 1/2 meter or 20”**
- A +5D lens has a magnification of 2.25X and a focus (working distance) of 1/5 meter or 8”**

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Reading Glasses:

The Right Reading Glasses, Continued:

Magnification power of common lenses

Power Mag Working Distance

+2D 1.50X 20"

+3D 1.75X 14"

+4D 2.00X 10"

+5D 2.25X 8"

+7D 2.75X 6"

+10D 3.50X 4"

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Reading Glasses:

The Right Reading Glasses, Continued:

Magnification Caveats Magnification is a trade-off!

- The higher the magnification the
- Closer and
- Steadier you **MUST** hold your work
- Harder to fuse, more distortion and more eye strain**

Getting More „Power“ If you have

- Astigmatism**
- unequal eye powers,**
- need to see at two different distances,**
- or readers cause you eye strain, these simple readers will not work.**
- You have two options.**

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Reading Glasses:

The Right Reading Glasses, Continued:

More „Power“ #1 See your eye doctor or optician and have a set of glasses with your prescription made for your Eyesight needs

- Corrected & Balanced**
- Aligned (PD) with extra prism help**
- Eyesight bifocals with high plus bottom and the top set for arm's length**

#2 Use Fixed Magnifiers

- Stand magnifiers**
- Head worn / Visors**
- Clip-on**

Eyesight, Aging and the Ham or Tinkerer

Safety

Remember! Safety Safety Safety! Always Use safety glasses when working with power tools !!

Safety Glasses NEED TO BE POLYCARBONATE, not glass or regular plastic !



Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Magnifiers, Think about using:

- Clip-on & flip-up magnifiers**
- Slip-in & press-on magnifiers**
- Visor magnifiers**
- Stand magnifiers**
- Flip-up magnifiers**
- Bernell & MicroMark**



Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Magnifiers, Continued:

- Clip-on magnifiers**
- Opticaid (Bernell)**



Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Magnifiers, Continued:

- Visor magnifiers**
- Open vs Closed Headband**



Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Magnifiers, Continued:

- OptiVISOR®**
- Donegan Optical Co, Kansas**
- Cost \approx \$50**
- Advantages:**
 - Closed top to shield the the eyes from glare.**
 - Optical Glass lenses**
 - + 2 to +10D powers**
 - Prismatic compensated lenses...?**
 - Less distortion...?**
 - More scratch resistant**

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Magnifiers, Continued:

OptiVISOR®

Disadvantage:

- 1. Shield does not allow full pupil constriction, reducing depth of field.**
- 2. Tunnel vision: Requires constant head movement (lifting to look under) to look at other objects in field. Front heavy.**
- 3. Pupil distance & “Eye relief” set at awkward distance, making it difficult to use with glasses of moderate powers. (35-45mm & 4.5mm)**

©2014Meetz Vision Consultant

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Magnifiers, Continued:

OptiVISOR®

Disadvantage:

4. Working distance with std +5D is at 8” (2½ X).

Watch code on box “DA-4” = +4D lenses = 10”

•Power code is also on lenses (#4 = +4D)

Extra powers cost extra (\$30ea)

•Professional set with all lenses & LED \$350

•“SALE Price from Micro-Mart \$200(9/5/14)”

Lenses are screw mounted, slow to change!

5. POOR lenses alignment! Vertical center off!

6. NON-SAFTEY GLASS!

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Magnifiers, Continued:

MagEyes® & OptiSIGHT™ magnifiers ≈ \$35

Advantage: Open system

1. Open without a shield allows full pupil constriction (increased depth of field)

2. Open system allows eye to change gaze without head movement to look at other objects outside field. Little to no head movement.

3. “Eye relief” set at a further distance, making it easier to use with glasses of moderate powers and increasing the working distance.

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Magnifiers, Continued:

- MagEyes® & OptiSIGHT™ magnifiers ≈ \$35**
- Advantage: Open system**
- 4. Comes with 2-3 lens powers**
 - +2D/20" & +4D/10" (+3D/14", +4D/10", +5D/8")**
- 5. Lighter weight ≈ 2 oz**
- 6. Slip-on headband**
- 7. Adjustable viewing angle!**
 - Up or down**

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Magnifiers, Continued:

MagEyes® & OptiSIGHT™ magnifiers

Disadvantage:

1. Plastic lenses

- **Scratches easily**

- **Optics?**

 - **Powers closer, as sharp?**

 - **Not prism corrected**

 - **However, vertical centers molded = zero prism error**

2. Not safety plastic

Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Magnifiers, Continued:

Stand magnifiers:

- Advantage:**
- Stays aligned with work.**
- Do not have to look around or over to see other objects.**
- Disadvantage:**
- Must hold model to lens and lens to eye alignment exactly.**
- Working distance is relatively close with poor depth of focus.**
- Most optics are of poor quality.**
- Price**



Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Magnifiers, Continued:

Stand magnifiers:

- **Ott-Lite® with magnifiers**



Eyesight, Aging and the Ham or Tinkerer

Finding Products

Hobby Magnifiers, Continued:

Stand magnifiers:

- Daylight™ magnifiers**
- Best optics!**



Eyesight, Aging and the Ham or Tinkerer

Computers and Vision

Computers and Vision Computer use, like reading, is one of the most demanding tasks the eyes can do but the user must modify his/her working environment (ergonomics) much differently than with other tasks.

Those of us who are serious or office users (2+ hrs) run an increased risk of:

- Eye strain / dry eyes (52%/ 76%)**
- Headaches (82%)**
- Skeletal or muscle problems (24%)**
- Blood clots (12%) 1987 OSHA Reports**

Women are at increased risk (70%)

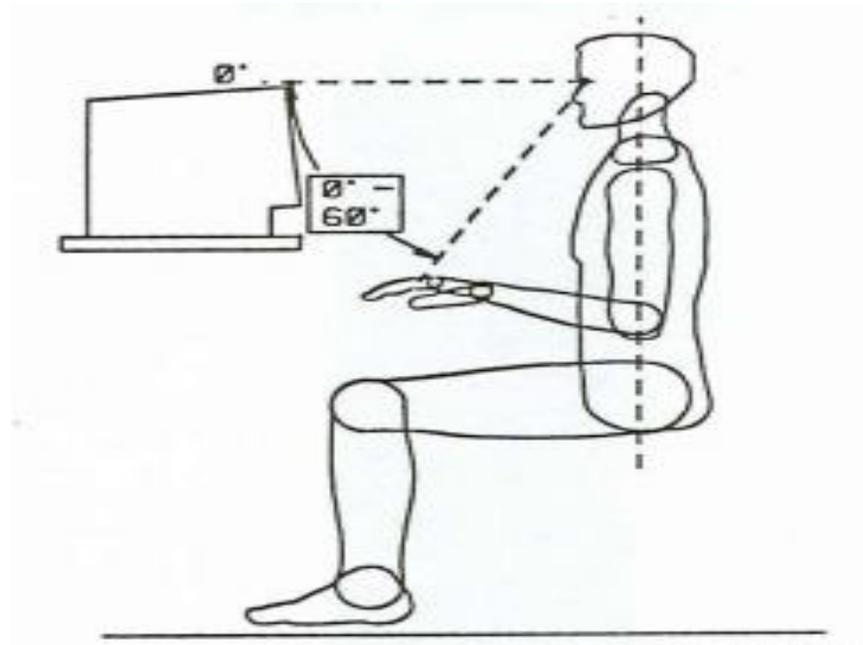
Eyesight, Aging and the Ham or Tinkerer

Computers and Vision

Computer Ergonomics In order to work comfortably the user must

- Reduce the lighting (indirect)
- Have good seating with
- Arms at right angles
- Support for the wrists
- Screen height must be below the “line of sight”
- Use glasses made for your working distance from “nose to screen”
- Use artificial tears often

Computer ANSI Standards



Eyesight, Aging and the Ham or Tinkerer

Computers and Vision

Computer Ergonomics Most computer use symptoms (headache, fatigue, stiff neck and back) are caused by poor ergonomics. The user must have:

- Good computer/office seating with positive back support & waterfall seat.**
- Support for the arms that places them at right angles.**
- Support for the wrists with no more than 10° flexion.**

Computers and Eyes For the mature user who is trying to see the screen through bifocals or no-lines

- Screen height must be below the “line of sight” in order for us to use our reading power**
- ANSI Std 0° to 60°, with 10° recommended**
- 10° \approx the width of your hand at arms length**

For serious users (2+ hrs)

- Use glasses made for your working distance from “nose to screen”**
- A bifocal can be added to this for closer source distances**
- Remember to use artificial tears**

Eyesight, Aging and the Ham or Tinkerer

Eyesight for a Lifetime

Eyesight for a Lifetime The average life expectancy is 75 years for males.

- If you survive to age 75 in good health you can then expect 8 to 10 additional years.**
- However will they be Eyesight years?**

Will your eyes make it? How can you help them?

- 1) If you are 60+, have an eye exam every year.**
- 2) If you smoke, Stop!**
- 3) If you have high blood pressure, control it.**
- 4) If you have diabetes keep your sugar tightly controlled.**
- 5) Eat right and protect your eyes from UV. ©2014Meetz Vision Consultant, Inc**

Eyesight, Aging and the Ham or Tinkerer

Eyesight for a Lifetime

Eyesight for a Lifetime Remember as both your mother and your doctor have always said:

- Don't Smoke! Eat Right!**
- Smoking**
- Increases dry eye symptoms**
- Speeds cataracts growth**
- Is a leading risk factor in age related macular degeneration. (ARMD)**

Cataracts:

- Can start as early as age 50**
- Most progress slowly causing glare and a slow drop in vision**
- Smoking, diabetes and excessive UV exposure cause earlier and faster changes**
- Treated by surgical removal when....**
- Vision drops to 20/50 best corrected**
- Drops to 20/50 with glare**
- Sees double vision**
- “Makes you feel unsafe”**

Eyesight, Aging and the Ham or Tinkerer

Eyesight for a Lifetime

Glaucoma:

- Most often (90%) a slow painless loss of vision**
- Usually associated with an increase in eye pressure which damages the optic nerve**
- Highest risk is for those who**
- Have a close family member (parent) with glaucoma (30%)**
- Eye pressure greater than 21 (10% chance)**
- Older >75 years old (15% chance)**
- African American ancestry**
- Very farsighted or very nearsighted**
- Can only be detected by having a full eye examination by an Optometrist or Ophthalmologist**
- Three tests are usually required to make a diagnosis**
- Eye pressure (blue light, air puff, etc)**
- Visual fields (side vision)**
- Dilated inspection of the optic nerve**
- New technology: Laser scanning imaging**
- Treatment is usually drops to reduce the pressure**

Eyesight, Aging and the Ham or Tinkerer

Eyesight for a Lifetime

Diabetic eye disease:

- Weakens blood vessels causing them to leak, this leakage leads to scar tissue; the scar tissue then can pull the retina off (detachment)**
- This can occur in as little as 15 months in poorly controlled diabetics**
- Treated with laser surgery by burning away scarred retina**
- Requires constant monitoring by having a dilated eye examination by an Optometrist or Ophthalmologist EVERY YEAR!**

Age related macular degeneration. (ARMD):

A non-reversible deterioration of the central vision.

- Risk factors in ARMD**
- Genetic (family member with ARMD)**
- Smoking**
- High blood pressure**
- Diabetes**
- High UV light exposure**

Eyesight, Aging and the Ham or Tinkerer

Eyesight for a Lifetime

Retinal Degeneration Age related macular degeneration. (ARMD)

A non-reversible deterioration of the central vision.

- Risk factors in ARMD**
- Genetic (family member with ARMD)**
- Smoking**
- High blood pressure**
- Diabetes**
- High UV light exposure**

ARMD There are two types of Age Related Macular Degeneration.

1. Wet ARMD

- Bleeding into and beneath the retina**
- 10% of ARMD**
- Can lead to near total blindness**
- Only treatment presently is eye injection**
- One dose \$2000.00, 4 to 12 doses needed**
- 60% successful at holding vision...?**

Eyesight, Aging and the Ham or Tinkerer

Eyesight for a Lifetime

ARMD 2. Dry ARMD

- Loss of support (nutritional) tissue beneath the retina**
- 90% of ARMD**
- Usually leads to slow loss of central vision (reading, face recognition)**
- No known treatment..... prevention..?**

Nutritional Supplements & ARMD

The retina of the eye requires a special mix of vitamins & trace minerals to stay healthy.

•Antioxidants (vitamin A, C, E)*

•Zinc & copper oxide*

–*2002 NIH; AREDS “Preserver” formula

•Lutein

–Not part of the AREDS study but recent studies indicate protective factor

•Caution: high doses of Vitamin A a risk

–Very recent studies link high doses of Vit A with increase advancement of ARMD

Eyesight, Aging and the Ham or Tinkerer

Eyesight for a Lifetime

Nutritional Supplements & ARMD CAUTION...NIH studies...

☐ Nutritional Supplements can preserve or delay loss of what vision if you have early to moderate signs.

☐ However, if you have NO signs or risk factors taking vitamin and nutritional supplements can increase your risk of other health disorders

Eyesight, Aging and the Ham or Tinkerer

Finding Help

Where To Find Help:

- Artificial tears & nutritional supplements
- Non prescription at local drug stores
- Ask your Eye doctor or Pharmacist



Eyesight, Aging and the Ham or Tinkerer

Finding Help

- Full spectrum lights**
- Daylight Lamps: www.daylightcompany.com**
- BlueMax & UltraLux: www.fullspectrumolutions.com**
- Ott-Lites: www.ottlite.com**
- Jo Anne Fabrics, Hobby Lobby, Office Depot**
- Verilux: www.verilux.net or www.fullspectrumolutions.com**
- Bed Bath and Beyond, Lowe's Home Improvement Stores, Menard's**
- Readers, clip-ons & flip-ups, press-ons**
- For Readers: OTC most drug stores, "Marts" & the web**
- For Clip-on & Flip-up magnifiers; (\$8 to \$28+S&H)**
- www.micromark.com**
- www.bernell.com**
- www.onlinereaders.com/selectionsclips.htm**
- www.visionenhancers.com/**
- For press-on / stick-on magnifiers(\$12 to \$30)**
- www.bernell.com**
- Walgreens**

Eyesight, Aging and the Ham or Tinkerer

Finding Help

Readers, clip-ons & flip-ups, press-ons

- For Readers: OTC most drug stores, "Marts" & the web**
- For Clip-on & Flip-up magnifiers; (\$8 to \$28+S&H)**
- www.micromark.com**
- www.bernell.com**
- www.onlinereaders.com/selectionsclips.htm**
- www.visionenhancers.com/**
- For press-on / stick-on magnifiers(\$12 to \$30)**
- www.bernell.com**
- Walgreens**

Eyesight, Aging and the Ham or Tinkerer

Finding Help

- Visors**
- Train Show Look for “B&B Hobby Supplies”**
- www.iwannatool.com**
- Most hobby stores & the web**
- \$15 to \$50+S&H**
- www.micromark.com**
- www.doneganoptical.com**
- www.mageyes.com**
- “SE” and other Knock off products**
- At the Train Show or Ham Fair, look for the “Toolman”**

- Still having near focus problems?**
- Dry burning eyes?**
- Can’t figure out what what reader would be best for you?**
- Need prescription quality glasses?**
- TMI?**

See your local Optometrist or Optician

Eyesight, Aging and the Ham or Tinkerer

Credits:

Extracted from a Presentation by:

Dr. Richard Meetz, Clinical Professor,

Indiana University ©2014Meetz Vision Consultant

Dr Meetz original Presentation was 115 slides. The revised version is 70 slides of which 29 are used in the Live Presentation, the balance to be reviewed on the Club Website.

No part of this Presentation may be used for any Commercial purpose without permission from Dr Meetz or his assigns.

This Presentation has been revised and is only to be used for presentation to Non Commercial and Non Medical entities. Such entities would include Hobby Clubs such as Amateur Radio, Vintage Electronics, Model Railroad, Model Vehicles, and Diorama construction, each of which requires close work to Construct, Repair or operate, and where close work is necessary for enjoyment of the particular Hobby.