THE HANDOUTS

All of Mark Bakula and Don Caldwell's handouts
from their talks in 2000, 2001, 2002 and 2003

Includes:
2003: Digital Repair for Your Playfield
2002 Basic Pinball Photography
2001 Polishing Mylar Playfields and Clear Ramps
2000 Framing Translites and Backglasses

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PinballSurvey.com

Where you can vote on your favorite games
from the 1990s and help Mark and Don write
their new book.

Pinball Expo 2003
Chicago, Illinois

Digital Repair – *for Your Playfield!*
The Mark and Don Show – Pinball Expo 2003, Chicago, Illinois

Please visit: *PinballSurvey.com*

Now it is possible for you to use your home computer, printer, digital camera and a little knowledge and practice to create repairs for "worn to the wood" areas on your playfields.

MATERIALS: Digital Camera, 2.0 Megapixels or higher recommended; 6" scale, Computer; Photo editing software (we use Adobe Photoshop™), Color printer, Avery™ self adhesive labels (glossy white 2"x4" labels #8763; glossy full sheet label #8765; matte full sheet #5265; clear full sheet #8665), glossy white paper, plain paper.

Getting Set Up:
1. Remove the playfield glass and clean the area of the playfield to be repaired.
2. Position the playfield for lighting and photography: you must be able to hold the camera steady and close to the playfield (recommend a tripod); camera flash or other lighting can be used.
3. Position the scale in the camera frame, but not too close to the repair.
4. The camera should be directly "straight on" to the playfield, to avoid distortion. Frame the area including the scale and check for reflections or shadows.
5. Set the camera to its highest resolution, then take several more exposures at various light conditions, focus and zoom settings.

Prepping the Playfield:
1. Worn area such as scoops may need physical repair. Several people make aftermarket metal protectors for holes. Install one of these protectors to re-establish the edge of the hole.
2. Fill the gaps with putty such as <u>JB Weld</u> or <u>Durham's Rock Hard Water Putty</u>, then allow it to dry for 24 hours, then sand smooth.

Types of Repairs:
1. Color Fill: Use this in worn or scratched areas of solid color. This repair will match and fill an area of missing color by copying the color from another area of the playfield.
2. Pattern Replace: This repair involves copying and matching pattern from another area of the playfield.
3. Adding Shapes: Using the photo software, you can re-draw missing lines and shapes, including curves.

Color Fill:
1. Import the image of the damaged area into the photo editing software. Zoom in on the damaged area.
2. Decide on the technique and brush to use- in Photoshop™, load the image, click on the "Pallette" icon and the "COLOR PICKER" opens. Click on the color in the image you want to copy, this loads the color from the image into the palette. You can use the "BRUSH" to paint with the new color.
3. An alternative: Use the "COPY" and "PASTE" tools to copy sections of the color from the undamaged area and fill in the damaged areas.

Pattern Replace:
1. Import the image of the damaged area into the photo editing software. Zoom in on the damaged area.
2. Find an area on the image that contains the pattern used in the damaged area. Use the "STAMP" tool to pick up a section of the pattern.
3. Now us the "STAMP" tool to place the pattern image in the damaged area.
4. Use the "BLUR" tool to soften edges or abrupt changes in the pattern.
5. You can also use the "COPY" and PASTE" tools instead of the "STAMP" tool.

Adding Shapes:
1. Import the image of the damaged area into the photo editing software. Zoom in on the damaged area.
2. Select the proper drawing tool: there are various tools for straight lines, circles, arcs, other shapes.
3. Select a line width that matches the remaining areas of the artwork.
4. Select a color for the shape you are using.
5. Place the line or shape on the area(s). You will probably need a few tries to get it right as you learn the various drawing tools. Colors can be selected from the software palette or copied from other areas of the image. Use the "ZOOM" to get accurate work, pixel by pixel, if needed.

Scaling the Digital Photo to the Playfield:
1. In the editing software, bring up the repaired image so that the scale is visible.
2. In the photo editing software, there is a function to place a ruler on the edge of the screen image. Then put guidelines on the image to align one inch on the scale in the image with the ruler from the software.
3. Using the software ruler, read off how large "one inch" is on the image of the scale.
4. Example: Using the software ruler, the 1" on the scale is 1 ¼", or 1.75". This means the image needs to be made smaller. Calculate the ratio by 1/1.75=.57, or 57%.
5. Use the "Zoom" function and input the .57 factor and change the image size.

Printing and Applying:
1. Determine the type of printing media you will use: matte finish, glossy or clear.
2. If you are using adhesive labels, be sure they are large enough for the repair.
3. Open the printing software: we have used MS Word™, Powerpoint™ and Avery™ Label. There are others that will also work well. Some software will set up by the product number of the label. You can download Avery™ Label Printing Software free from www. avery.com
4. Set up the printer and print settings: Color on, Highest resolution (minimum 300 dpi), Paper type.
5. Before loading the label sheet, make a print on plain paper. Cut out the repair image.
6. Match the repair image to the actual playfield. Compare color and size. Make any corrections to the colors, image or scale factor. Reprint, trim and compare again.
7. When satisfied, set the printer for the label type you are using, load a sheet of the labels and print.
8. Wait an adequate time to be sure the inks are thoroughly dry- overnight is recommended.
9. Clean the playfield and allow to dry.
10. Cut out the repair to the size and shape that matches the image on the playfield.
11. Remove backing, align with the playfield image and apply. Smooth out firmly.
12. Use a sharp razor knife to trim around holes, if needed.
13. For wear resistance, cut out a Mylar patch to completely cover the repair, remove backing and apply.

Color Matching Technique

1. If you are having trouble with your color matches, here is another technique.
2. Obtain a Pantone™ color chart- they are expensive new, but used ones show up on e-Bay.
3. Match the problem color on the playfield to the Pantone™ color chart.
4. In Photoshop™, enter the Pantone™ Color Number when selecting the color to be used (Custom color/Pantone).
5. Print a color sample on the glossy paper and check the color match.
6. If still incorrect, try another close Pantone™ number and check it against the playfield.

Applying a Special Graphic on an Image

1. Scan or photograph the image you want to use as a base, such as a plastic. Then scan or photograph the image you want to apply to the base.
2. Load both images into your photo editor software, and select the image you want to apply to the base.
3. Copy the image you want to apply (you can cut out just the section you want to use).
4. Select the base image and perform a paste. Then size the applied image and drag it into position.
5. Print the new composite image as described above. You can use transparent, self adhesive print media to make your own plastics.

BASIC PINBALL PHOTOGRAPY - THE HANDOUT

Don Caldwell-Mark Bakula
Pinball Expo 2002 – Chicago USA

Section 1 - *General Tips, Tricks and Suggestions for Better Photos with Any Type Camera*

Remove the Playfield Glass - and replace the lockbar. <u>Do this every time</u> you shoot a pinball. It is the best way to get a good quality shot, sharp and clear, without reflections.

Tripod - This is the best tool for good photos and very economical. A descent one costs about $25.00 US.

Lighting - Depends on the film or digital camera setting you use. Outdoors with daylight type film (ordinary print film) use open shade- a shaded area lit by open blue sky, not direct sunlight. White cardboard reflectors or fill-in flash can help with shadows. Indoors - Photoflood lamps (expensive) or Halogen worklights (cheap) pointed at a white diffuser above the game will light it evenly, without shadows. Use a white ceiling or white bedsheets for a diffuser. **DANGER – Risk of fire** *– keep lights well away from flammable surfaces, turn off lights when you are not in the room.* Halogen work lights require a special camera filter (Type 80A) to work with daylight type film, or use Tungsten type slide film. Many digital cameras have a "white balance" adjustment to compensate for different light types, see the instruction manual of your camera. Try to avoid fluorescent lights for photography – everything will be green. Flash - If you have to use flash, avoid "straight-on" angles that will reflect the flash directly back into the lens.

Background - Make it non-distracting. Use sheets, photographic background paper or plain, light colored walls.

Framing- Center the game or other subject, avoid extreme angles that distort the shape of the game. Look carefully though the viewfinder or digital display to look for "hotspots" of light, dim areas, reflections and distracting background items. Look through the viewfinder and have an assistant rock the lights back-and-forth a *little bit*- this will make lighting problems like hotspots and reflections show up. "Point and Shoot" camera viewfinders may not exactly match what is on the film frame .

Playfield Shots- For an easy set-up, take off the front legs and set the front of the game on the ground.

Polarizing Filter- If your camera can use filters, ALWAYS use a polarizing filter, indoors or out. It will reduce reflections and glare, and intensify colors- especially outdoors.

Cable Release or Self Timer- Use these, especially on long exposures, to minimize camera vibration.

Depth of Field- For dramatic close-ups of playfields, use a small aperture (f-stop number) setting to get near and far objects in sharp focus. This will require lots of light, a long exposure (slow shutter speed) and a tripod.

Section 2 – *Film Camera Types: the SLR and the Automatic*

SLR – 35 mm Single Lens Reflex. Advantages: Interchangeable lenses (wide angle lenses, about 30mm, are best for pinball photos, use macro lenses for close-ups); can use filters; complete control of aperture and shutter; wide choice of films, can use cable release. Disadvantages: Expensive and complex; cover the viewfinder when using a tripod and the internal meter, light coming in the viewfinder disrupts the exposure.

Automatic Cameras – "Point and Shoot" (NOTE: these cameras can have widely varying features and quality – get a good one with some exposure controls, if possible.) Advantages: Inexpensive and widely available; take most types of 35mm film; zoom lens built-in; flash built-in; self timer built-in. Disadvantages: autofocus can be fooled by shooting through glass; autoexposure makes it difficult to do shots requiring great depth of field; most can't use a cable release; flash can cause reflections; viewfinder may not exactly represent the frame.

Section 3 – Digital Cameras

Method of photography – The same general rules and methods for shooting pictures still hold true for digital photography. Digital photography allows the images to be highly modified and displayed in numerous ways. Resolution is one of the most important factors to understand and use properly in a digital photography. The higher the resolution the better the image, however this will make the image's file size larger, requiring more storage space. While high resolution makes excellent prints, file transfer and display on the Internet will be slower.

Here is the general rule of thumb for resolution:

1280 X 960 pixels (1.32Mb) has the quality of a **4 X 6** film picture
1600 X 1200 pixels (1.9Mb) has the quality of an **8 X 10** film picture
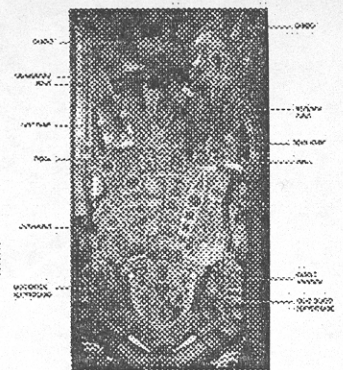**1920 X 1600 pixels (3Mb)** has much greater quality than that of an
8 X 10 film picture

Remember that sending images over the Internet for Ads, information, etc. requires that the images be taken at very low resolution, and that the file be saved in a compressed file format such as JPEG (*.JPG). This will assure speed of transmission over the Internet in emails or on web pages. Some people take low resolution images at 640 X 480 (307K) or less, which when saved as a JPEG will create a file that reduces to approximately 35K to 75K for transmission.
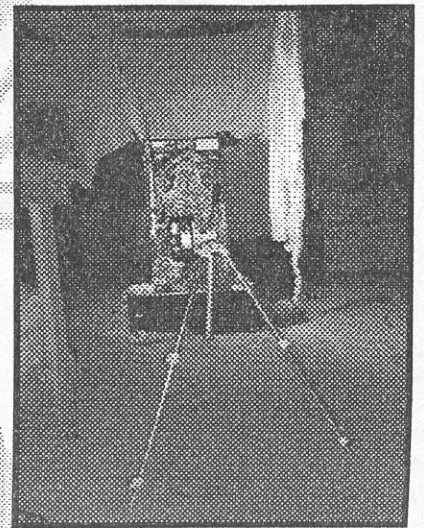
Section 4 – Uses for Your Digital Images

MEDIEVAL MADNESS
PLAYFIELD SHOT MAP

Shot Maps – Take a shot of the whole playfield - remember to use diffused or soft, even light. Add arrows to the areas of interest on the playfield using photo editing software or PowerPoint. Add text to the end of the arrows. Create a one-page set of game rules and type them up. Print the color page of the shot map and a copy of the rule set you wrote. Put them back to back and laminate.

Business Cards, Sales Brochures, Calendars, Invitations, Greeting Cards
and more – Software such as Microsoft Publisher (about $90) can take your digital images and produce a wide variety of useful publications. You can create business cards and other items with images and designs that show how pinball is your hobby or business. Digital images from your camera or from other sources such as the Web can be used.

Don's Pinball Palace
Don Caldwell
Milwaukee, WI
djcaldwell@ameritech.net
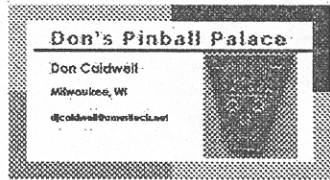
Section 5 – Useful Links & Products

Marco Rossignoli's SILVERBALL PHOTOGRAPHY – This site covers much of what we covered in our talk, with emphasis on various artistic shots and angles: http://users.hunterlink.net.au/~maavmr/silverba.htm
Instruction Cards - Go to the web site for blanks. - www.pinballrebel.com/game/pins/card/card.htm
Software- Microsoft: PowerPoint, Publisher, Word; Adobe Photoshop.

Playfield Polishing Tool

Used to polish Mylar™ covered surfaces on pinball playfields.

Materials:

3M™ brand 2-Inch Diameter Sanding/Finishing Disc Holder for Drills, model # 9101NA Lambs wool polishing bonnet, such as Vermont American™ model 16915 or equivalent Cotton t-shirt material or thin terrycloth Contact cement Duct tape	Variable speed drill, ¼ chuck or larger. Auto rubbing compound Novus™ #1 and #2 Pen Scissors Safety glasses or goggles

Construction: *WARNING! : WEAR EYE PROTECTION! WORK SAFELY!*

Disc Holder: To make the polisher easier to maneuver on the playfield, reduce the diameter to approximately 1.4". Use a lathe or chuck the holder in a drill, removing material with a file. Also, thin out the outer diameter to about .062" to make it more flexible, and round the outer edge.

Lamb's wool: Use the disc holder to trace a circle on the back of the lamb's wool polishing bonnet, the use a scissors to cut out the circle.

Cement: Apply contact cement to the back of the lamb's wool circle and the flat surface of the disc holder, and allow it to dry. Then attach the lamb's wool to the disc holder.

T-shirt: Cut a circle of cotton t-shirt material large enough to cover the lamb's wool and come up the sides of the disc holder (about 5" dia.). Use a strip of duct tape to wrap around the material and hold it to the shank of the disc holder. Trim off excess t-shirt material with a scissors.

Polishing: *WARNING! : WEAR EYE PROTECTION! WORK SAFELY!*

First Step: Rubbing Compound: Load up the polishing tool as you would a paintbrush. Use a finger or spreader stick to apply the compound to the t-shirt material, getting a supply down into the lamb's wool. Not so much that the tool will fling out the compound, but enough so that you can polish for several minutes without drying out.

Hold the drill with one hand on the handle, your finger on the trigger. Use the other hand to steady the drill. Bend over the drill and use the weight of your upper body to stabilize and control the work. Trigger the drill, using the slowest speed you can. Touch the polishing tool to the Mylar™ and work in a small area, about 2x the size of the polishing tool. Use your weight and the trigger to control the polishing. You can tilt the tool slightly to put more pressure on one edge and get a better bite. Do not allow heat to build up to damaging levels. If you stray briefly onto non-Mylared areas of the playfield, it will not damage a playfield in good condition.

Keep the tool moist by stopping and applying more compound. Polish several minutes in one area- you will notice the friction begin to decrease as the Mylar™ gets smoother. Stop and wipe the area clean with a paper towel moistened with a little Novus 1™. Look at the reflection of an overhead lightbulb to determine how much you have polished the area. A clearer image of the bulb indicates that the surface is getting smoother. There may be a small amount of "swirl" marks at this stage; the next step should minimize these. Work carefully until you have a good feel for the process. If your tool gets ratty or goes flat, tear it apart and replace the lamb's wool and the t-shirt material. Re-load with the rubbing compound.

Second Step: Novus 2™: Start with a fresh, clean piece of lamb's wool and t-shirt material. Apply Novus 2™ to the tool just as you did with the polishing compound. Use the same technique as the rubbing compound and go over the entire Mylar surface again.

Third Step: Novus 1™: Go over the Mylar™ area following the directions on the package, do not use the polishing tool.

Cleaning Clear Ramps

Materials:

Electric buffer	Cotton buffing wheel	Novus™ #1 and #2	Cotton t-shirt	Paper towels	Safety glasses

Procedure: *WARNING! : WEAR EYE PROTECTION! WORK SAFELY! DO NOT WEAR LOOSE CLOTHING OR JEWELRY!*

Cleaning and preparation: Get off the gross amount of dirt using your favorite technique: some people use window cleaner and paper towels, some people use the dishwasher. It's your choice. Remove any parts that can be caught by the buffing wheel, such as wiring and switches. Smooth out any decals so their edges are not lifted.

Apply Novus™ 2: Use a paper towel to apply a generous amount of Novus™ 2 to a section of the ramp, top bottom and sides. Scrub it in good and allow it to start to dry.

Buffing: Use the buffing wheel to clean off the Novus™ and polish the surface. Don't add Novus™ to the wheel itself. Hold the work securely, working only below the wheel. When going over decal edges, brackets and the like, be sure to orient the ramp so that the wheel does not catch the edge and lift the decal or pull the ramp out of your hands. Don't use a lot of pressure, which will slow the wheel down. Use the speed of the wheel to do the polishing. For ball tracks and scratches, you will need to apply more Novus™ and buff again. These steps can be repeated until you are satisfied.

Final cleaning: Apply Novus™ 1 and buff with t-shirt material, following the directions on the package.