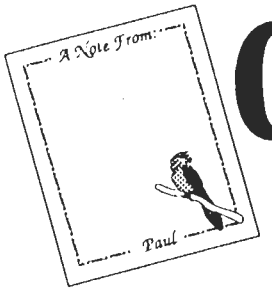
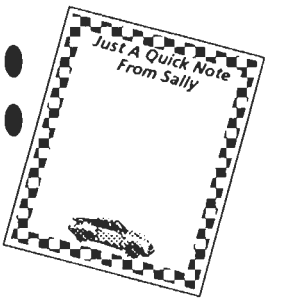
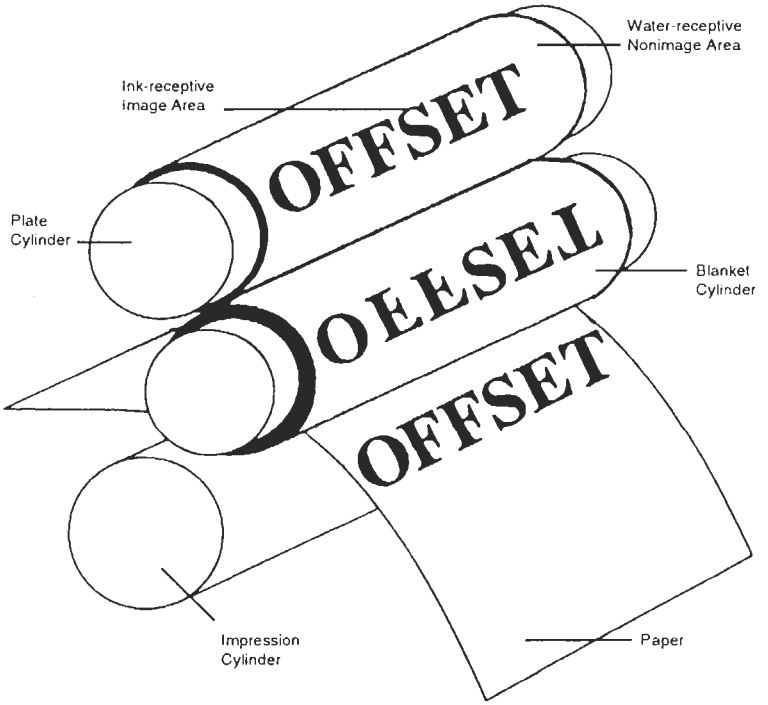



# Offset Printing: Notepad Production




## Introduction

***Lithographic***, or ***planographic*** printing is often called ***offset printing*** because the image is offset on a rubber blanket (see diagram). Offset printing prints from a flat surface using the principle that ***grease*** (ink) and ***water*** do not mix. The printing, or image, areas of the plate have a special coating which allows the ink to adhere. Water is applied to the non-image areas, which will then repel the ink. This method produces a high quality, finely detailed print at high speeds. Since paper does not directly contact the printing plate, many copies may be made from one plate, thus reducing cost of long-run projects.



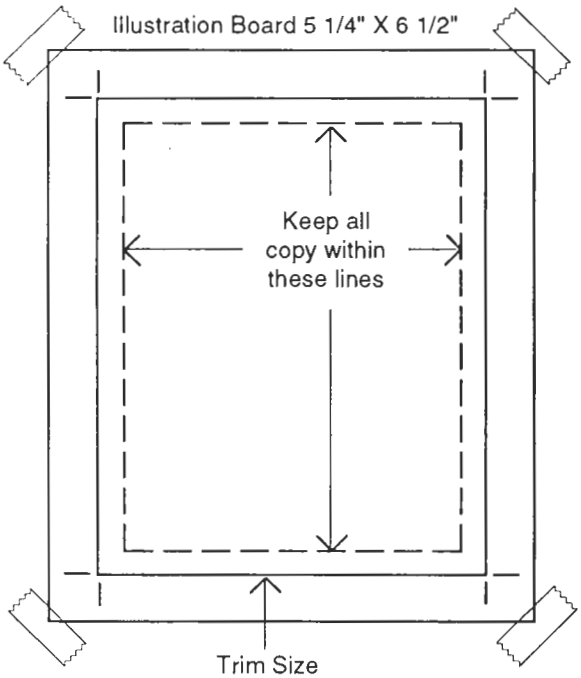

## Activity Description

This activity package discusses the design, layout, and production of a note pad using the offset printing press. Notepads come in many shapes and sizes. In this activity, the notepads will be cut to 1/4 of an 8 1/2" x 11" sheet of paper. This will allow four students working together to each produce their own notepad. The design or theme of your notepad should reflect your own personality. After designing the notepad, you will complete a ***paste-up***, shoot a negative, strip the negative, and process a plate. You will then use the offset press with your group to print. After printing, you will cut to size and bind your notepad.

## Materials and Supplies

To complete this activity, you will need the following materials:

clip art books
scale
non-photo blue pencil
transfer letters or
lettering machine
burnishing tool
T-square
masking tape
illustration board
tracing paper
X-acto knife
border tape
ortho film
film developing chemicals
lithographer's tape
opaque
small brush
subtractive plate
plate developing chemicals
cotton pads
paper, 8 1/2" x 11"
printing ink
fountain solution
blanket wash
padding compound
2" padding brush
tag board, 5 1/4" x 6 1/2"




## Preparing the Design

The first step in the design process is to draw thumbnail sketches of your notepad.. Several sketches should be completed to insure a pleasing design. Use the form provided to draw your ***thumbnail sketches***.

If you are going to use artwork in your design, now is a good time to look at ***clip art***. Clip art is available from many sources. Check with your teacher or visit the local art supply store, which will usually have books at low cost. Hand drawn line art may be used and is a great way to personalize your notepad. Remember to draw with a black pen or marker on white paper for greatest contrast.

After selecting your favorite thumbnail sketch, begin your rough layout. The ***rough layout*** is drawn to actual size, and should be considerably more detailed than your thumbnail sketch. Large type is roughly sketched in, and the position of clip art indicated.

The next step is the ***comprehensive layout***. This stage of the design process will serve as a guide showing exactly how the paste-up will look. ***Type font*** and ***point size*** should be indicated, as well as ***type style*** (**Bold**, *Italic*, Outline, etc.).

The ***mechanical layout***, or final paste-up, is the most important part of the design process as it serves as the original for the job to be printed. Before you begin this stage of your design, make sure your tools, work area, and hands are clean.

1. Using the T-square, align and tape a 5 1/4" x 6 1/2" piece of illustration board to a drawing board or table.

2. Using a ***non-photo reproducing*** pencil, lay out a 4 1/4" x 5 1/2" (finished size) rectangle by measuring in 1/2" from all four sides of your illustration board.

3. Measure in 1/4" from all sides of this rectangle and draw a second rectangle. All copy must be within this rectangle to prevent it from being cut off during the cutting process.

4. Using the blue pencil, draw guide lines to assure proper alignment of type and border tape.

5. Line up the transfer letter sheet on your guide lines so that the desired character is positioned properly. Then rub the end of the ***burnishing tool*** or ball point pen over the surface of the sheet. Carefully lift the sheet and position the next letter to be transferred. Note: There are many other ways of generating type. Industry has brought us many hand-operated and electronic lettering machines. They are simple to use and produce high quality letters on transparent tape. If you have created your letters on a lettering machine, peel off the backing and align the tape using guide lines. Computers may also be used to generate your type.

6. Carefully lay out border tape where needed. Cover your finished paste-up with tracing paper to protect the surface from becoming damaged.

☞ **Use all cutting tools (scissors, X-acto knife) very carefully.**

## Process Photography

A ***line negative*** is needed to produce a ***plate***. This is done using the ***process camera***. Align your paste-up in the center of the ***copyboard*** so that the image is facing the ***lensboard***. Place a ***sensitivity guide***, commonly known as a ***gray scale***, in a non-image area of your paste-up. Make sure the camera is set to make a 100 % reproduction. Set the timer according to your teacher's instructions.

Working with safelights only, place a piece of ***ortho film*** on the ***filmboard*** with the ***emulsion*** side (usually the light side) facing the lensboard. Turn the vacuum on to keep the film in position and close the camera. Expose the film. Remove the film and develop using the following steps.

1. Develop in A & B developer to a solid step 4 on the gray scale.
2. Rinse in stop bath for 10-15 seconds.
3. Place in fixing bath for 2-4 minutes.
4. Wash 5-10 minutes.
5. Hang to dry or use a commercial film negative dryer.

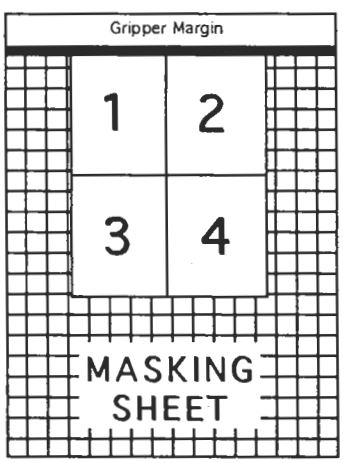
Note: Always handle your negative carefully, as it will scratch easily.

☞ **Tongs or rubber gloves should be used in handling film and paper during the developing process.**

## Stripping

Once the film negative is completed, the film image must be transferred to a printing plate. The method of positioning and fastening these film negatives on a ***masking*** (goldenrod) ***sheet*** to produce a flat is known as ***stripping***. Most masking sheets have a 1/4" grid pattern to aid in alignment of the film negative.

1. Lay out your paper size (8 1/2" x 11") on the masking sheet. Most masking sheets have measurements already marked on them.
2. Locate the center of the 8 1/2" x 11" sheet and divide the sheet into 4 parts, one for each notepad. (See diagram.)
3. Carefully trim your negative to a size of 4 1/4" x 5 1/2" using an X-acto knife.
4. Tape the film negative on a light table readable side up.
5. Align one of the four areas over your negative.
6. While holding the masking sheet in place, cut an oval in center of your area and tape the negative in place using lithographer's tape.




7. Carefully untape your negative from the light table. Turn the masking sheet over and securely tape your negative to the masking sheet.
8. Turn right side up, and using an X-acto knife, cut out windows needed to unmask all the image areas.
9. Use ***opaque*** and a small brush to carefully touch up all pinholes and scratches.

## Platemaking

In this activity we will describe the method of exposing and developing a presensitized ***subtractive*** aluminum offset plate. Your teacher will let you know if this method is not applicable at your school.

1. Remove plate and place it in the vacuum frame of the platemaker.
2. Align your flat using the registration marks on the masking sheet.
3. Close the cover of the platemaker and turn on the vacuum. Check for proper alignment of the registration marks.
4. Expose the plate for ___ seconds; ask your teacher.
5. Develop your plate according to manufacturer's directions.
6. Rinse the plate and coat it with gum until ready for the press run.

☞ **Do not look into platemaker as it may harm your eyes.**

## Printing

Because of the many sizes and brands of printing presses, demonstration on the operation of the offset printing press in your school will be done by your teacher. However, the following steps will be needed on all presses.

1. Place the desired 8 1/2" x 11" paper on the paper table.
2. Raise the table to the desired height and adjust all press settings (buckle, air, vacuum, etc.) according to weight of the paper being used.

3. Fasten your plate to the plate cylinder and dampen the plate with fountain solution.

4. Run the press until the desired number of copies have been printed.

☞ **Your instructor will provide specific instructions and safety concerns for your particular printing press. Beware of rollers and gears; keep the covers and guards in place at all times.**

## Cutting to Size

The 8 1/2" x 11" printed papers will be cut for the four separate notepads. Before cutting, draw lines on one sheet to show where the actual cuts are needed. Get your instructor's permission before you operate the paper cutter; then cut the stack of papers for the four 4 1/4" x 5 1/2" pads.

☞ **Keep hands clear of the blade at all times. Under no circumstances should the blade ever be touched.**

## Padding the Notepad

Before padding the notepad, you will need to cut a 4 1/4" x 5 1/2" backing sheet using illustration board, heavy card stock, or tag board.

1. Jog papers to the top of your notepad.

2. Place sheets into the padding press and clamp tight. If a padding press is not available, lay a board the size of the notepad on the stack; then place a weight (brick) on it.

3. Use a paint brush to apply padding compound.

4. Rinse the brush with water.

5. Allow the padding compound to dry completely before unclamping your pad.

## Vocabulary

| | |
|---|---|
| lithographic printing | plate |
| planographic | font |
| masking sheet | copyboard |
| thumbnail sketch | lensboard |
| rough layout | ortho film |
| comprehensive | filmboard |
| mechanical | gray scale |
| process camera | stripping |
| subtractive plate | goldenrod |
| type style | offset |
| non-photo reproducing pencil | flat |
| transfer type | opaque |
| line negative | paint |

## On Your Own

1. There a number of career opportunities available in the graphics industry. During this activity, we have explored areas such design and layout, process photography, stripping, platemaking, offset printing, and binding. Using the classified advertising section of the newspaper, see how many job openings you can identify that are related to these areas. Cut out these advertisements, glue them to a sheet of paper, and label the job title.

2. Write a letter to a local printing company requesting information about the requirements for employment. You can use the Yellow Pages of your phone book to identify printing companies in your area.

## Ecology

Read all labels on the materials you are using. Many materials will need to be used in a well-ventilated area. Follow proper disposal techniques for all solvents. Recycle used paper and paper scraps whenever possible.

Office of Vocational, Adult, Career, and Community Education
Technology Education
Dade County Public Schools • Miami, Florida

**TEACHER GUIDE**
**OFFSET PRINTING: NOTEPAD PRODUCTION**

**Objectives:** Upon completion of this assignment, students will be able to:

- Describe lithographic printing.
- Give examples of thumbnail, rough, and comprehensive layouts.
- Prepare a mechanical layout, including thumbnail, rough, and comprehensive layouts.
- Expose, develop, and strip a line copy negative.
- Expose and develop an offset plate.
- Use the offset press to print a notepad.
- Properly cut and finish the notepad using padding compound.

**Helpful Hints:**

1. Have samples of completed paste-ups for students to review. A good idea to increase interest is to make a bulletin board display showing the design steps, from thumbnails to mechanicals, as well as the flat for the four notepads, the metal plate, and the printed copy before and after cutting.

2. Have small clip art samples for student use. Make photocopies on a quality machine so that students don't cut up the originals.

3. This activity is a good opportunity for students to learn how to use transfer type. However, if you have a computer with a laser printer, you may want to have students generate their written copy on the computer to save the expense of the rub-on type.

4. Have a magnifier available when applying opaque to films.

5. Make sure the working surface of the light table is clean before stripping begins.

6. Remind students that thin metal offset plates can cause severe cuts and should be handled with care.

7. The type of plate used will determine how it is to be processed. Make sure students are aware of the manufacturer's recommendations for products used in your lab.

8. Have copies of offset press operation manuals available for students who want to learn more about the press operation.

**LANGUAGE ARTS APPLICATION**
**OFFSET PRINTING: NOTEPAD PRODUCTION**

_____
Student Name

In all types of jobs you will find that you need the ability to communicate your ideas effectively. Writing skills are necessary in all occupations. Here are a few examples of how writing skills are related to this activity.

In this activity package you will be designing a notepad. Notepads often contain messages, lines of copy related to the design, or even humorous quotations. Messages can be as simple as "A Note From Paul" or "Just a Quick note From Sally", like the examples on the front of the activity package.

1. Before you begin your designs, write down several messages you might want to use on your notepad.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

2. Since your notepad can also contain artwork, locate a clip art book. Consider the messages you have written above. What types of illustrations can you come up with that would match the messages above?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

**MATH APPLICATION**
**OFFSET PRINTING: NOTEPAD PRODUCTION**

_____
Student Name

In all types of jobs and occupations, you will need the ability to apply mathematics effectively. People who work in print shops are concerned with many types of math applications. The printer must be able to figure what supplies will be needed before the job is started. Many times the size paper required for the job will not be the same as the paper on hand, and the paper will need to be cut. If the printer is not careful with the math calculations, supplies may be wasted.

Employees need to be able to add their time cards and calculate their total weekly wages. At the end of the week, the profits need to calculated. Yearly records will be needed for filing income taxes. Both small and large print shop use math daily.

PROBLEMS: (Show your work.)

1. If a printing job cost $431.25 to produce and you charged the customer $500.00, what is the amount of profit?

   Answer: _____

2. The receipts of a printing office for a certain year amounted to $90,325.37, and the expenses were $68,123.25. What were the profits?

   Answer: _____

3. George printed 16,250 sheets on Monday, 13,400 on Tuesday, and 23,175 on Wednesday. How many sheets were printed those three days?

   Answer: _____

4. On Tuesday Maria printed 23,000 sheets, and Mike printed 19,250 sheets. How many more sheets did Maria print than Mike?

   Answer: _____

**MATH APPLICATION**
**OFFSET PRINTING: NOTEPAD PRODUCTION (Cont'd.)**

5. If an offset press feeding at a rate 2250 impressions per hour ran continuously for 7 hours, what would be the total number of impressions?

   Answer: _____

6. If a ream of 17" x 22" paper weighs 24 pounds, how much would 30 reams weigh?

   Answer: _____

7. If 12 notepads can be cut from one ream of paper, how many notepads can be cut from 17 reams of paper?

   Answer: _____

8. How many reams (500 sheets per ream) are in a lot of 365,750 sheets?

   Answer: _____

9. If one pound of ink costs $8.60, how many pounds can be purchased for $129.00?

   Answer: _____

10. How many reams of 8 1/2" x 11" paper can be bought for $75.60, if one ream costs $4.20?

    Answer: _____

**QUIZ**
**OFFSET PRINTING: NOTEPAD PRODUCTION**

_____
Student Name

1. The four steps in the design process are:
   a. _____
   b. _____
   c. _____
   d. _____

2. Lithographic printing works on the principle that _____ and _____ do not mix.

3. Printing from a flat surface is known as _____ printing.

4. The method of positioning and fastening film negatives on a goldenrod sheet is known as _____ .

5. The distance between the top (lead) edge of a sheet of paper and where the printing begins is known as the _____ .

6. Tiny pinholes and scratches on film negatives are touched up using _____ .

7. Preprinted drawings and illustrations are called _____ _____ .

8. Copy that is black or white, with no shades of gray, is called _____ .

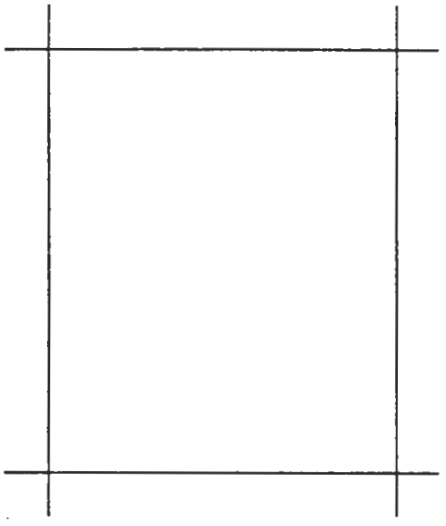
9. Openings cut in masking sheets that allow light to pass through image areas are called _____ .

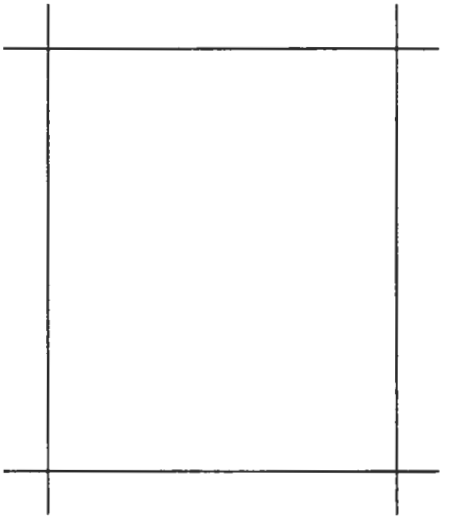
10. The special pencil used in layout work is called a _____ .

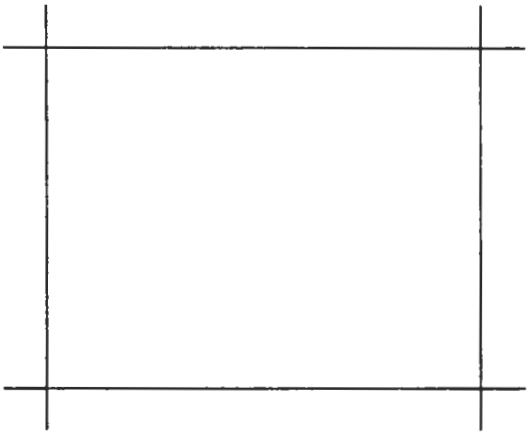
# Offset Printing of a Notepad

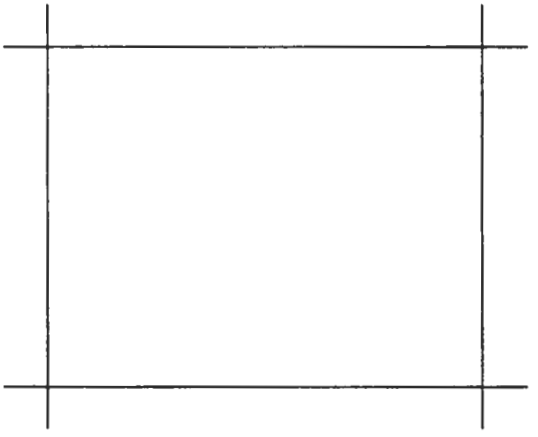
Name: _____ Date: _____ Per: _____

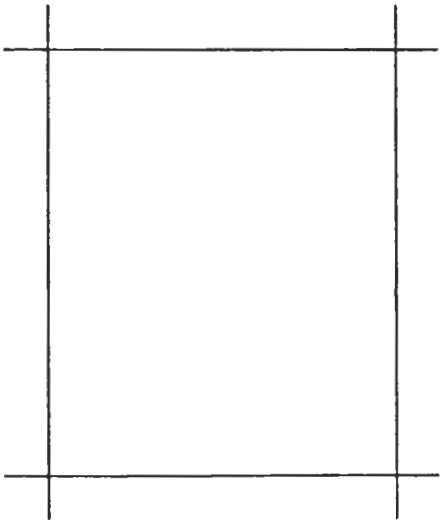
**Place Thumbnail Sketches Here:**

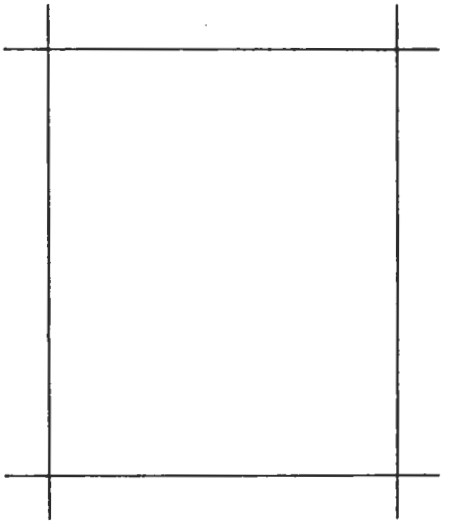












# TYPESTYLE WORKSHEET

Name _____ Period _____

Directions: Tell which group each typestyle belongs to;
**T** - Text, **R** - Roman, **SS** - Sans Serif, **SQ** - Square Serif, **C** - Script, **D** - Decorative

_____ 1. Avante Garde
_____ 2. **BAZOOKA**
_____ 3. Birch
_____ 4. Bookman
_____ 5. *Bookman Italic*
_____ 6. **Boulder**
_____ 7. **Calligrapher**
_____ 8. **Calligrapher Bold**
_____ 9. *Chaucer*
_____ 10. Courier
_____ 11. **CUTOUT**
_____ 12. DELPHIAN
_____ 13. *DELPHIAN ITALIC*
_____ 14. **Don Casual**
_____ 15. **Don Casual Bold**
_____ 16. **FILLMORE**
_____ 17. **Frutiger Bold**
_____ 18. ***Frutiger Bold Italic***
_____ 19. Garamond Narrow
_____ 20. **Heather**
_____ 21. Helvetica
_____ 22. **Helvetica Black**
_____ 23. **Helvetica Compressed**
_____ 24. Jester
_____ 25. Jester Outline
_____ 26. Librarian
_____ 27. Lubalin Graph
_____ 28. **Lubalin Graph Bold**
_____ 29. Lucinda Bright
_____ 30. **MACHINE**
_____ 31. Moderne
_____ 32. *Moderne Italic*
_____ 33. **Myriad Headline**
_____ 34. Myriad Tilt
_____ 35. *Nadianne*
_____ 36. New York
_____ 37. New Zurica
_____ 38. *New Zurica Oblique*
_____ 39. Old English
_____ 40. Onyx
_____ 41. *Oxford*
_____ 42. Palatia
_____ 43. **Palatia Bold**
_____ 44. *Palatia Italic*
_____ 45. Quake
_____ 46. **Sherwood**
_____ 47. Stage Coach
_____ 48. *Swing*
_____ 49. ***Tubular***
_____ 50. Utopia Headline