

JOB SHEET #1

COURSE : Daisy Wheel Printers

UNIT 3 : Daisy Wheel II Printer Lab

OBJECTIVE :

1. To familiarize the technician with the Mechanical and Electrical adjustments of the DWII printer.
2. Upon completion of this lab assignment, the technician will be able to perform most of the mechanical and electrical adjustments necessary to optimize the print quality of the DWII printer.

EQUIPMENT AND MATERIALS REQUIRED:

1. Daisy Wheel II Service Manual
2. DVM
3. Oscilloscope
4. Tool Kit
5. Daisy Wheel Alignment tools

### Introduction

The final judgment of any printer is determined by its print quality. In this lab assignment you will perform a few checks and adjustments to optimize the print quality of the DWII printer.

The first adjustments to be performed will be for the Space and Select encoded signals. The Offset and Gain settings of the Space and Select Encoder amplifiers will be checked and adjusted to maintain the printing performance of the printer.

The next section will involve the setting of the printer's left and right margins by correctly positioning the Home sensor assembly. The Bullet Assembly will then be adjusted. Finally, vertical and horizontal adjustments of the Platen will be performed to ensure straight printing across the page.

A detailed outline on how to perform these checks and adjustments follows.

Use your service manual at all times.

## GENERAL INFORMATION

The Select and Space sensor circuits in the DWII are electrically identical. Both boards have five potentiometers. On each of the boards, two of the pots will be used to set the Offset and Gain of the Phase A signal, two other pots will be used to set the Offset and Gain of the Phase B signal, and the remaining pot will be used to set the PT (Pulse Timing) period.

The electrical performance of the printer will greatly depend on the accuracy of these adjustments. Improper adjustments will degrade the Select and Space servo action. Thus, the speed of the Select and Space motors will be affected. The result could cause the printer to operate erratically or not at all. Don't try for a specific speed-- only adjust for the proper phase. (Remember to make the adjustments with the print wheel installed.)

Performance Steps	Key Points
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### I. Initial Set-up Procedure:

1. Check that the power to the printer is off.
2. Remove the platen.
3. Remove the top cover of the printer and set the case on the left side of the printer. (The control cable will be left connected)

**CAUTION!** Since the control panel cable is connected to the cover, be careful.

Insure that Print switches are set in the 10 Pitch mode and "Off Line".

4. Remove the perforated shield that covers the circuit boards.

**Note:** This shield is required for RFI suppression. Always replace the shield!

5. Remove Ribbon Cartridge.

6. Position the "HAM"mer switch that is on Power Board to OFF.

Self Test will be used for all adjustments except PT. Since we are only concerned with the servo systems, it is not necessary for the hammer to strike the printwheel. The ribbon was removed to prevent unnecessary ribbon usage.

Note: The pins of Power Board connector CN11 will be used as test points for all of the adjustments. Connector CN11 is numbered from 1 to 10 from right to left when you look from the front of the printer. Attach the probe ground to the stud labeled "LG" (logic ground) located to the left of connector CN11.

7. Apply Power to the printer.
8. Pull the printer Interlock Switch UP.

CAUTION! Ties and similar objects should always be kept clear of the carriage while the printer is in motion. The Neck you save may be your Own!

## II. SELECT SENSOR BOARD ADJUSTMENTS

Note: Refer to your manual to pages 51-52 (figures 78, 79, and 80) for the correct figure illustrating the Select Sensor Board layout and proper waveforms.

### Oscilloscope Settings

Ch A: 5V/cm; X1 Probe;  
DC Coupled  
Mode: Ch A; DC Coupled  
Sweep Speed: .5 Millisec  
Trigger Mode: Auto;  
Internal, Ch A

\*\*\* BE SURE to ALWAYS VERIFY \*\*\*  
\*\*\* GROUND IS EXACTLY 4 cm \*\*\*

Hint: You may prefer to look  
at 1 Second or 1  
millisec sweep speed.

- A. Connect Ch A probe to pin 2 of connector CN11.
- B. Position the Self Test switch located on the rear of the printer to "TEST".

(Select A Offset)

Reminder: The Select Sensor Board is located on the top right corner of the Power Board (pots on top).

- C. Adjust Select A Offset pot VR2.

- 1. Center Signal Exactly Above and Below ground reference.
- 2. Measure Peaks only.

- D. Adjust Select A Gain pot VR4.

- 1. Amplitude 15 Volts.
- 2. Measure Peak to Peak.

- E. Repeat steps C and D as necessary until specifications are met since these adjustments affect each other.

- F. Connect probe to Pin 1 of connector CN11.

(Check Ground reference and readjust to zero.)

- G. Adjust Select B Offset pot VR1.

- 1. Center Signal Exactly Above and Below ground reference.
- 2. Measure Peaks only.

H. Adjust Select B Gain pot VR3.

1. Amplitude 15 Volts.
2. Measure Peak to Peak.

I. Repeat steps G and H until the Select B Offset and Gain requirements are met.

### III. SPACE SENSOR BOARD ADJUSTMENTS

A. Turn OFF self test.

B. Connect Ch A probe to pin 5 of connector CN11.

C. Position the Self Test switch located on the rear of the printer to "TEST".

**Note:** The Space Sensor Board is located on the right side of the Power Board (pots on the side).

D. Adjust Space A Offset pot VR2.

1. Center Signal Exactly Above and Below ground reference.
2. Measure Peaks only.

E. Adjust Space A Gain pot VR1.

1. Amplitude 15 Volts.
2. Measure Peak to Peak.

F. Repeat steps C and D as necessary until specifications are met since these adjustments affect each other.

G. Connect probe to Pin 4 of connector CN11.

(Recheck ground reference and adjust if necessary.)

H. Adjust Space B Offset pot VR4.

1. Center Signal Exactly Above and Below ground reference.
2. Measure Peaks only.

I. Adjust Space B Gain pot VR3.

1. Amplitude 15 Volts.
2. Measure Peak to Peak.

J. Repeat steps G and H until the Space B Offset and Gain requirements are met.

K. Turn OFF Self Test.

#### IV. PT ADJUSTMENTS

Oscilloscope settings

Ch A: 2V/cm; X1 Probe  
Mode: Ch A; DC Coupled  
Sweep Speed: 5 Millisec/div  
Trigger Mode: Normal:  
Negative: Internal,  
Ch A

A. Key in the following program:

84  
1 LPRINT CHR\$(61);CHR\$(8);:GOTO 1

(This program rotates the  
printwheel 18 degrees.)

B. **SELECT PT ADJUSTMENT**

1. Connect Scope probe to pin 3 of CN11.
2. Run the program.
3. Adjust Select pot VR5 so that the period of T1 is 24 millisec.
4. Stop the program.

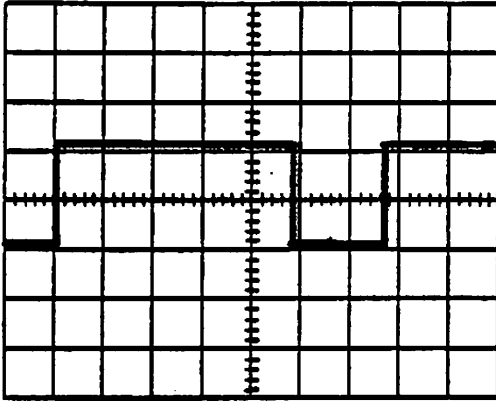
C. **Change** scope sweep speed to 2  
millisec/cm. and Trigger  
Positive

D. **SPACE PT ADJUSTMENT**

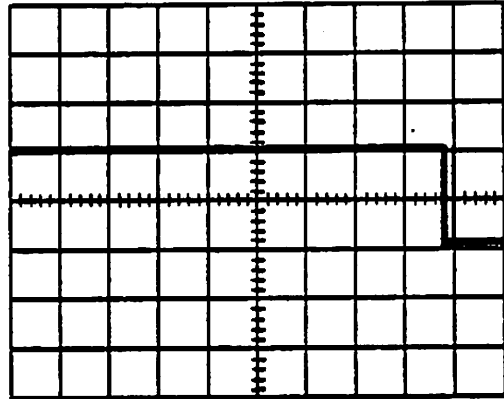
1. Connect Scope probe to pin 6 of CN11.
2. Either RUN the program or SELF-TEST.
3. Adjust VR5 for a period of 17.3 millisec.
4. Stop the printer and turn

off power.

**SELECT P. T. 5 ms/cm**



**SPACE P. T. 2 ms/cm**



This concludes the electrical adjustment section.

## V. MECHANICAL CHECKS AND ADJUSTMENTS

### A. Space Wire Adjustment.

1. Make sure that the power is off and position the carriage to its mid range of travel.
2. Check the Printer.
  - a. Refer to page 88 figure 151 in the new service manual
  - b. The left corner of the idler bracket should be within the diameter of the circular depression located on the impression switch bracket.
3. Adjust
  - a. Loosen Nut "A".

(Page 85 figure 146 in the old service manual)

b. Rotate Screw "A" clockwise to increase the tension of the Space wire. Increase the tension of the space wire until the left corner of the idler bracket is just at the limit line for initial set.

4. Tighten Nut "A" and move the carriage back and forth. The carriage movement should be taut, but smooth.

**B. Left Sensor Adjustment**

1. With power off, position the carriage assembly to its mid range of travel.
2. Apply power to the printer.

Check that the carriage restores to the correct Home position.

Note: The Home position for the carriage assembly is four spaces to the right of the Home sensor. Initially, the carriage travelled to the left until the tab located on the carriage assembly blocked the light beam of the Home Sensor. The beam blockage is used as a signal to notify the printer's processor that the carriage has arrived at Home. Upon receipt of this signal, the processor stopped and then reversed the Space motor to step the carriage four spaces to the right. This fourth Space position not only sets the left margin of the printer, but also allows the tab on the carriage to clear the Home Sensor and "restore" the light beam. Refer to figure 152 in the service manual. There are two ways to



adjust the left margin. (Old p.86  
fig.147)

3. Preferred Method

- a. Take the Hammer Adjustment tool and place the end against the carriage base.
- b. The Idler Pulley Bracket should fit in the groove in the handle of the Hammer Adjustment Tool.
- c. Adjust the shutter on the bottom of the Head Carriage by loosening the phillips screw which secures the tab to the carriage assembly, turn off power and repeat the procedure until specification is met.

4. Alternate Method

- a. Check that the distance between the carriage base and the inside casting of the main chassis is one (1) inch.
- b. Adjust the shutter on the bottom of the Head Carriage by loosening the phillips screw which secures the tab to the carriage assembly, turn off power and repeat the procedure until specification is met.

C. Hammer Gap Adjustment

(Refer to figure 154 page 9 in  
the service manual; fig. 155 of  
old)

1. Reset Position

- a. Using the Hammer Adjustment tool, check that the 0.67 tip (green) passes through the top gap between the hammer armature and hammer lever armature.
- b. The 0.73 tip (red) should not pass.
- c. Adjust the Return Damper to obtain the correct gap.

2. Print Position

- a. Press the hammer forward
- b. The gap should be from 0.0 inches to 0.002 inches (0 to 0.05 mm).
- c. Adjust the Print Damper screw to get the correct gap.

NOTE: After adjusting the hammer you must adjust the following:

1. Setter and Bullet Hammer positions
2. Platen Gap adjustment
3. Ribbon Guide adjustment

D. Setter and Bullet Hammer Position Adjustment

(Refer to page 91 in your Service manual; page 89 in old)

1. Remove the Wheel Protector by pulling toward platen.
2. Lightly place the Bullet Setter Tool on the Setter
3. The Red Mark side should Not touch the Bullet.
4. The Blue Mark side should

(rubber part out).

touch the bullet.

5. Adjust, if necessary, by loosening the two screws that hold the hammer magnet and move the entire assembly to the proper position.

#### E. Platen Gap Adjustment

(Refer to page page 92 in your service manual; 87 in old)

1. Replace the Platen.
2. Place the copy control lever to the first position.
3. Place the Platen Gap Tool on one side of the platen.
4. Adjust, if necessary, so that the bullet lightly touches the high section of the Platen Gap tool.
5. Measure at both left and right sides of the platen and adjust if needed.

#### F. Ribbon Guide Adjustment

(Refer to page 94 in your service manual; 91 of the old)

1. Check to insure that the ribbon guide just touches the low section of the Platen Gap tool.
2. Check at both the left and right sides of the ribbon guide.
3. Adjust by loosening the two lock screws and move the position of the ribbon guide.
4. Replace the Wheel Protector.

#### G. Platen Height Adjustment

(refer to page 93 in your service manual; page 88 of old)

1. Use six sheets of wide "Green Bar" paper.
2. Turn the "HAM"mer switch back on.

3. Replace the Ribbon Cartridge
4. Perform Self Test to check print quality.
5. Adjust the eccentric nuts so that the printer prints evenly on the lines.

#### VI. FINISH UP

- A. Replace the perforated RFI shield over the driver and Space Boards.
- B. Replace the printer cover.
- C. Perform "Self Test" once more to ensure that the printer is still operating properly.

Check that the control panel connector is securely in place and reconnect the ground termination.