

OLYMPIA ELECTRONIC COMPACT

Training Program

SBXMPT010

**Prepared by:
XEROX CORPORATION
Xerox Service Business
Service Education & Customer Support
1341 W. Mockingbird Lane
Dallas, Texas 75247**

February 1984

Table of Contents

Program Overview	Page i
Introduction and Operation	Page 1-1
Technical Overview	Page 2-1
Service Documentation	Page 3-1
Troubleshooting	Page 4-1

PROGRAM OVERVIEW

The purpose of this training program is to provide you with a familiarization of the Olympia Electronic Compact, an electronic typewriter utilizing Daisy Wheel technology which can also be used as a slave printer for a host microcomputer. While completing this program you will learn about the Electronic Compacts' basic capabilities and about the documentation which will be available for you when service is necessary.

This training program is made up of the following sections or **MODULES**:

MODULE 1 INTRODUCTION AND OPERATION

In this module you will become acquainted with the installation of the unit as well as with its general characteristics such as print speed.

MODULE 2 TECHNICAL OVERVIEW

Here you will be presented with information concerning the actual operation of the printer.

MODULE 3 SERVICE DOCUMENTATION

Provides a description of the documentation you will actually use to service the unit as well as some practical application in its use.

MODULE 4 TROUBLESHOOTING

Discusses the troubleshooting approach supported by the service documentation.

PREREQUISITES

There are no prerequisites for this training program.

ESTIMATED TIME TO COMPLETE THIS TRAINING

Approximately 3 hours

REQUIRED RESOURCES

Olympia Service Spare Parts Catalogue
Olympia Service Description of Function (Service Manual)

OLYMPIA ELECTRONIC COMPACT

TRAINING PROGRAM DIRECTIONS

This training program is self-paced and does not require the need of a Course Monitor. The estimated module times are approximate and should be used to pace yourself.

Due to your previous training on Daisy Wheel printers it will not be necessary to have an Electronic Compact available at the time you go through this program. Complete the program as time becomes available, and refer to it for review when a unit comes in for repair.

This manual is reusable. Do not write in it. Answer all questions on a piece of scratch paper. Feedback (answers) to the questions will be found at the end of each module. Proceed through each module sequentially and follow all directions.

MODULE 1

INTRODUCTION AND OPERATION

MODULE OVERVIEW

This module will introduce you to the Olympia Electronic Compact and its basic capabilities. You will be given information concerning the units operation, component location, and installation.

PREREQUISITES

Completion of the COURSE OVERVIEW

MODULE OBJECTIVE

Upon completion of this module you will be able to answer, in writing, five questions relating to the Electronic Compacts installation, operation, and basic features.

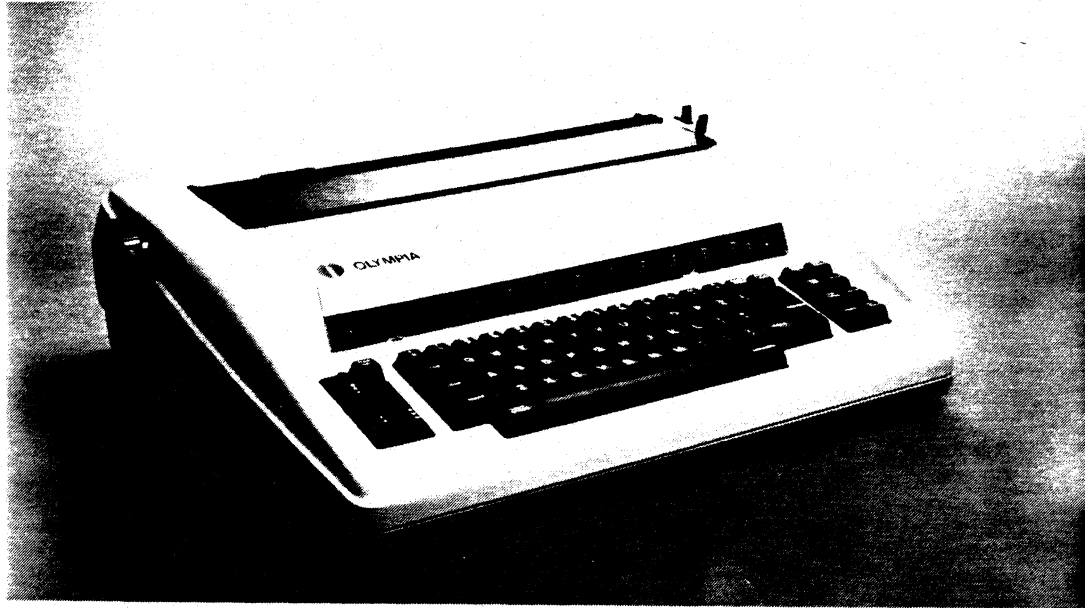
ESTIMATED TIME TO COMPLETE THIS MODULE

30 MINUTES

OLYMPIA ELECTRONIC COMPACT

SECTION I - INTRODUCTION

The Olympia Electronic Compact typewriter utilizes Daisy Wheel technology and can also be used as a slave printer.



Product Specifications for the Electronic Compact are:

Size	Length 376 mm Width 491 mm Height 137 mm
Weight	9 kg
Print Characteristics	11 CPS speed 96 or 100 character printwheel 10/12/15 characters per inch Repeat feature for all keys Correction feature Stencil capability
Feeder Characteristics	Paper injector Paper end guage Variable line spacing
Memory	46 character correction memory 16 setting tab memory
Options	RS232C serial interface

PRINT CHARACTERISTICS

The Olympia Electronic Compact will print at the rate of 11 CPS in 10, 12, or 15 characters per inch pitch. When used as a typewriter it affords the operator error correction and an ability to make any key operate in a "repeat" mode.

The ribbons are a special correctable carbon ribbon housed in a cassette for easy loading. A separate correction ribbon is also required for correction capability.

It is also possible to create stencils by disabling the ribbon lift function through a simple keyboard command.

FEEDER CHARACTERISTICS

When inserting or ejecting paper the operator is aided by the paper injector function which causes the platen to be driven by the index motor when the injector lever (bail bar lever) is pulled fully toward the operator. Additional features include variable line spacing set by means of a keyboard control, and a paper end gauge to provide a visual indication when the last available line is being typed on.

MEMORY CHARACTERISTICS

The Electronic Compact has the capacity to store the last 46 keystrokes typed and perform a correction anywhere in this range. Also, up to 16 tabs may be recorded for a document in the tab memory.

OPTIONS

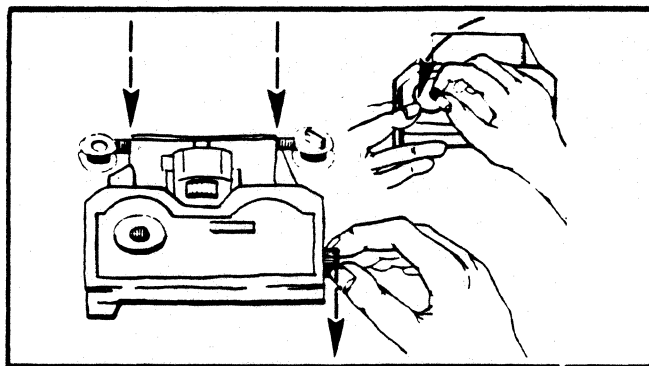
The unit may be equipped with an RS232C serial interface allowing it to be used as a slave printer for a host microcomputer.

SECTION II - INSTALLATION

Installing the Electronic Compact for use as a typewriter is quite simple. You should first check the carriage for free movement from a full left to a full right position, the unit is shipped with a rubber tube cut in two sections placed around the carriage rail. If this tube is present remove the left section first and after moving the carriage to its full left position remove the right section.

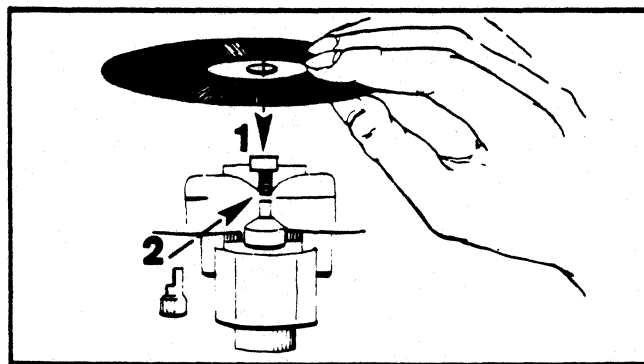
You may also find a rubber band holding the ribbon cassette in place on the carriage which should be removed.

At this time a print wheel should be installed. If one is not already in place, begin by removing the ribbon cassette. First push the cassette release lever on the right of the ribbon cassette toward the platen as far as it will go. Note that as the lever was moved the ribbon was lifted by the Left & Right Center Guides to a position above the print wheel for easier removal. Now lift the ribbon straight up and free from the unit.



Next grasp the Print Wheel Release Lever located directed behind the Left Hand Center Guide and pull it toward you as far as possible. This will cause the Printer Head to pivot back for print wheel installation.

Install the print wheel by first orienting the characters toward the platen, then aligning the round center hole in the print wheel with the print wheel motor drive shaft and the elongated hole in the print wheel with the locating pin mounted on the print wheel motor drive shaft. As the print wheel is pushed onto the shaft a positive locking effect should be felt.



Now lower the Printer Head back into its operating position. Prior to seating the ribbon cassette in place take up any slack in the ribbon by manually winding it in the direction of the arrow on the top of the cassette. Now set the ribbon cassette in place on the carriage assembly making sure to position the ribbon on the Left and Right Hand Center Guides as noted in the removal procedure. Complete the ribbon installation by moving the Cassette Release Lever toward the keyboard as far as it will go.

The AC power cord should now be plugged into a standard 115VAC outlet and the unit turned on with the ON/OFF Switch located on the left side of the unit directly below the platen knob.

When the unit is turned on the carriage will return to the full left position and then move right to the left margin setting.

SECTION III - OPERATION

USE AS A TYPEWRITER

While the Electronic Compact is now ready for use as a typewriter, there are some keys that provide special functions which should be reviewed prior to actually operating the unit.

On the left side of the space bar is a key marked **Half Space**, and as the term implies use of this key causes the carriage to move right one half space instead of a full space.

On the right side of the space bar is a key labeled **Express**. The Express key causes the carriage to be returned to the left margin, but does not cause the paper to be indexed (advanced).

At the right of the keyboard is a special key pad containing several special function keys. The key marked **RELOC** (2nd key from the top right hand side) is used after making a correction which involved backspacing several characters. When the RELOC key is struck it returns the carriage to return to its last position prior to entering a correction mode.

The other special function keys such as the Correction Key, Margin Release, and Tab Clear are very similar to those on a Memorywriter so will not be covered specifically at this time.

It is of interest to note that the Carriage Position Indicator lights to provide the operator with a clearly visible means of monitoring the carriage position at all times.

If you have an operational Electronic Compact available, install it at this time following the directions given in this module. After installation, type several lines of text and make some corrections using the correction and RELOC keys.

USE AS A SLAVE PRINTER

In order to use the Electronic Compact as a slave printer it must be equipped with the D80 Serial Printer Interface. While many units already have this interface, there are also a great number that do not. As a result, you may be asked by the customer to install the interface which they will obtain and bring to you along with the Electronic Compact.

If you are completing this training program with an Electronic Compact that has the D80 Interface already installed, proceed to the heading "**SLAVE PRINTER OPERATION**" on Page 1-8. If you are completing this training program with a unit that is to have the D80 Interface installed, proceed with the instructions in the next heading "**OLYMPIA D80 INTERFACE INSTALLATION**". In the event that you are completing this program with an Electronic Compact that does not have the D80 Interface installed, and it is not to be installed at this time read the rest of this module for information purposes.

OLYMPIA D80 INTERFACE INSTALLATION

The following instructions will direct you through the installation of the D80 Serial Printer Interface in the event that you are asked to do so by a customer.

1. Disconnect AC power by unplugging the power cord from the wall outlet, or the unit itself. Remove upper housing of the Electronic Compact by removing two screws on the rear of the bottom housing. Remove the platen knob by pulling it straight off. Remove the upper housing by pressing in on both sides of the housing while at the same time, lifting straight up.
2. Remove the two screws which hold down the Keyboard assembly.
3. Turn the keyboard assembly upside down to access the main logic board.
4. Carefully remove the large 40 pin integrated circuit (IC4) from its socket. (See Figure 1), and insert it into the vacant socket on the D80 Interface board (location marked U16). Be sure that you install the IC with the small notch on one end oriented in the same direction as the notch on the socket.
5. Carefully remove the left hand flat keyboard cable from the Keyboard plug socket marked Cone 1 on the main logic board. Also remove the plug connector marked Cone 4.
6. Locate the three threaded studs where the main logic board is mounted to the keyboard assembly. On the exposed threads of each of the three studs, install one of the threaded standoffs which is supplied with the D80 interface kit.
7. The D80 interface board has pins which protude from its bottom side. These pins are designed to insert into the now vacant sockets of IC4, and the left hand keyboard plug of the main logic board. Carefully position the D80 interface board over the main logic board, and align it such that the two sets of pins will insert into the 40 pin and 10 pin sockets, and then press firmly to seat the pins into the connectors.
8. Plug the left side flat keyboard cable into the plug socket marked P1 on the D80 interface board.
9. Plug the Cone 4 plug into the main logic board through the square hole in the D80 interface board.
10. Install the 3 machine screws through the D80 interface board and into the threaded standoffs which were installed in step #6. Do not over tighten these screws or the PCB may be cracked or damaged.

OLYMPIA ELECTRONIC COMPACT

11. Now the power supply wires must be connected. These are the two loose wires (one gray and one blue) which are soldered to the D80 interface board. They will be connected using the two red clamps provided. Locate the plug connector which attaches to the main logic board at a point marked Cone 6. The gray wire on the Cone 6 cable attaches to the gray wire on the D80 interface. Likewise, the blue wire on the Cone 6 cable attaches to the blue wire on the D80 interface board. When applying the wire clamps, be sure that the wires are contacting the metal points inside the clamps so that the insulation will be pierced by clamp. The clamp should be squeezed together until it locks using a pair of pliers.
12. It is now time to install the data cable on the D80 interface board. First it will be necessary to route the cable through the rear of the lower housing. Use a pair of pliers to twist out one of the louvers on the lower housing and route the data cable through the opening. Be sure to route the cable around the printer chassis so that there can be no interference with printer operation. Plug the data cable connector onto the D80 interface board.

This completes the installation. At this time turn to the **ELECTRONIC COMPACT OPTION SETTINGS** heading on Page 1-9. The instructions there will guide you through the steps required to verify proper operation of the Electronic Compact as a slave printer connected to the 820 II.

SLAVE PRINTER OPERATION

Once proper operation in the typewriter configuration has been confirmed the Electronic Compact may be used as a slave printer for microcomputers with a serial printer interface. The following instructions will enable you to attach the Electronic Compact to an 820 II to verify its performance in this area.

1. Begin by connecting the data cable from the Electronic Compact to the printer port of the 820.
2. Turn on both the 820 and Electronic Compact.
3. Load a CPM Diskette in the 820. When the A> prompt appears on the 820 display type **CTRL P**. This will direct the 820 to print whatever appears on the display from this time on until another CTRL P is entered.
4. Now type **DIR** followed by a carriage return on the 820. The directory of your CPM Diskette should be displayed on the screen, and at the same time be printed by the Electronic Compact.

Correct printing of the Diskette Directory verifies the Electronic Compact's ability to function as slave printer, and concludes this portion of the module. If the Directory printed properly turn to the Module Conclusion on Page 1-10.

However, if following the above directions did not produce the expected results it is possible that either the CPM Diskette, or the Electronic Compact, or both will have to have certain options reconfigured. The option settings of the Electronic Compact should be checked first, so that the CPM Diskette can be reconfigured to match it. Continue through the following instructions to determine the option settings for both units and make required changes to the settings.

ELECTRONIC COMPACT OPTION SETTINGS

1. Disconnect AC power by unplugging the power cord from the wall outlet, or the unit itself. Remove upper housing of the Electronic Compact by removing two screws on the rear of the bottom housing. Remove the platen knob by pulling it straight off. Remove the upper housing by pressing in on both sides of the housing while at the same time, lifting straight up.
2. Remove the two screws which hold down the keyboard assembly.
3. Turn the keyboard assembly upside down to access the main logic board.
4. Check the position of the jumper which controls the Baud Rate (Fig. 1). The proper setting for use with an 820 is 1200 Baud, however if the unit is set for another Baud Rate to match the customers needs it should be left there. Later on in these instructions you will be told how to match the 820 to the Electronic Compact, at this time simply make a note of the Baud Rate the Electronic Compact is set for.

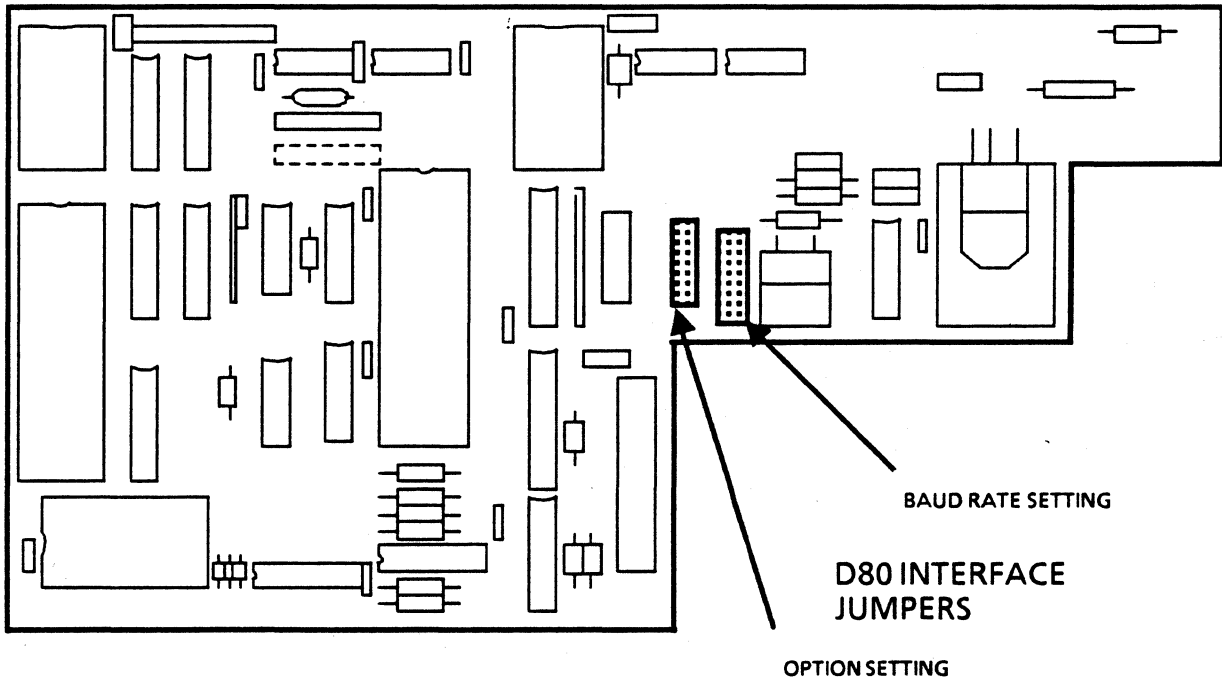


Figure 1

5. Just to the left of the Baud Rate jumpers are the Option Jumpers. Only positions A and E are used. Check the position of the jumpers, for use with an 820 there should be **NO** jumpers present at A or E. If there are jumpers at position A or E, remove them and set them aside for reinstallation prior to returning the unit to the customer.

OLYMPIA ELECTRONIC COMPACT

6. This completes the option setting for the Electronic Compact. Reposition the keyboard assembly and reinstall the two screws which secure it. Do not reinstall the upper housing at this time.

CPM DISKETTE CONFIGURATION

It is now time to check the configuration of the CPM Diskette. Load the CPM Diskette into the 820. When the A > prompt appears type **CONFIGUR** and a carriage return.

The system will display:

Enter SOURCE disk name (or RETURN for this disk):

Touch the Return Key once.

The system will display:

Enter DESTINATION disk name (or RETURN for same disk):

Touch the Return Key once.

The system will display:

Enter number of function to be executed. Upon completion of the selected function the program will return to this menu. Touch ESC when all desired selections have been made.

- 1) Record Restart Command
- 2) Select Printer Port Options
- 3) Select Comm Port Options
- 4) Select I/O Device Assignments
- 5) Select Keyboard Data Format
- 6) Select Screen Attributes
- 7) Select Floppy Disk Head Step Rate

Touch the 2 Key once.

The system will display:

Move cursor to option and <SPACE >to cycle through valid parameters. Touch <ESC >to exit or <R >to reset to original values.

OPTION	PRINTER
Baud Rate	1200
Stop Bits	1
Word Length	7
Parity	Even

Clear-to-Send Ignore
Carrier Detect Ignore
Protocol XON / XOFF

If the BaudRate option is not set for the same Baud Rate that you determined the Electronic Compact was set for use the cursor to highlight it, and then use the space bar to change the setting until it is the same as the Electronic Compact.

No other options will require setting. At this time touch the ESC key two times.

The system will display:

The selections you have made are not yet in effect.

Please enter one of the following:

- <S> = Save and activate the selections permanently.**
- <Q> or <ESC> = Quit without making any changes.**
- <T> = Temporarily activate the selections - but do not save them.**

If you **Did Not** change the Baud Rate, or any other setting touch escape. If you **Did** change the Baud Rate or any other setting touch the S key. Remember that if you changed any Option Settings they are now permanently recorded on the diskette, and that to change them again this procedure will have to be repeated.

Now that both the 820 and the Electronic Compact have the same option settings the Diskette Directory should print properly. Again, from the A> prompt on the 820 type CTRL P, and then DIR. The result should be simultaneous display, and printing of the Diskette Directory. If the units are still not producing the expected results continue with this training program to it's conclusion, after which you will be better prepared to troubleshoot any remaining problems.

MODULE CONCLUSION

In this module you have been given information on the Olympia Electronic Compact. You have read about its capabilities and how to install it for use as a typewriter. Now proceed to the test questions on the next page.

This page intentionally left blank

MODULE 1 - Introduction

TEST

DIRECTIONS:

Answer the following questions on a separate sheet of paper. Do not write in this book. When you are finished, verify your answers with the feedback sheet located on the next page.

1. What aid is provided for the operator when loading paper?

2. How many previously typed characters are stored in memory for correction as necessary?

3. What is the function of the Express Key?

4. What means is provided to use the Electronic Compact as a slave printer?

5. How is the RELOC key used in the correction process?

MODULE 1 - Introduction

TEST - Feedback

1. What aid is provided for the operator when loading paper?

Paper ejector feature indexes platen

2. How many previously typed characters are stored in memory for correction as necessary?

46

3. What is the function of the Express Key?

Return carriage w/o line feed

4. What means is provided to use the Electronic Compact as a slave printer?

DB25 Serial Plug

5. How is the RELOC key used in the correction process?

Returns carriage to original position

MODULE 2
TECHNICAL OVERVIEW

MODULE OVERVIEW

In this module you will be introduced to the major components of the Electronic Compact and their purposes.

PREREQUISITES

Completion of the INTRODUCTION AND OPERATION Module.

MODULE OBJECTIVE

After completing this module you will be able to answer five questions, in writing, relative to Electronic Compact component functions and locations.

ESTIMATED TIME TO COMPLETE THIS MODULE

1 HOUR

OLYMPIA ELECTRONIC COMPACT

HARDWARE CONFIGURATION

The following six major assemblies make up the Electronic Compact, and they will be discussed in the order listed here:

1. Chassis and platen Assembly
2. Keyboard Assembly
3. Printer Assembly
4. Power Pack Assembly
5. Print Control Circuit Board
6. Housing Assembly

CHASSIS and PLATEN ASSEMBLY

The function of this assembly is to properly position and hold the paper. Major components of this assembly are the Platen, Index Motor, and Feed Rollers.

KEYBOARD

In the typewriter mode the keyboard provides the unit with the operator input used to determine which characters should be struck, when to execute a line feed, etc. When used as slave printer this information primarily comes from the host microcomputer, but it is important to note that the keyboard is not disabled and the unit will respond to its commands.

PRINTER ASSEMBLY

This assembly has the most visible functions with sub- assemblies such as the printwheel motor, hammer solenoid, and ribbon feed motor combining to produce the actual output of the Electronic Compact, the printed page.

POWER PACK

The purpose of the Power Pack is to provide regulated DC voltages, transformed from AC line voltage, to the various electrical and electronic components within the unit.

PRINT CONTROL CIRCUIT BOARD

While monitoring inputs from various sources within the unit and from the operator this circuit board controls all functions such as hammer fire, print wheel movement, paper indexing, and carriage positioning.

Major components located on the Print Control Circuit Board include:

- IC 1 Keyboard Buffer
- IC 4 CPU
- IC 10 Inverter for Driver Circuits
- Drivers for all motors as well as the hammer solenoid.

HOUSING

The purpose of this assembly is to efficiently lodge all of the components necessary for operation of the Electronic Compact.

ELECTRONIC COMPACT OPERATIONAL DESCRIPTION

At power on the Power Pack transforms the AC line voltage and produces the following DC voltages for use by the unit:
36V--12V--6V--5V

The transformer T1 is protected by a thermal fuse rated at 125 degrees C, and a 1.25A delay fuse.

Also at power on all control lines (CPU Outputs) are set to logic 0. Visible indication of this is movement of the carriage to the left stop. After reaching the full left position the carriage is moved, by the horizontal step motor, 20 steps (spaces) to the right which corresponds to the default setting for the left margin. The printwheel and ribbon drive motors are positioned in their home positions at this time as well.

Upon completion of the preceding steps, the Electronic Compact will remain in a standby mode awaiting input from the keyboard. The Print Control Circuit Board monitors the keyboard for such input, and upon its receipt, will cause the appropriate output to be performed.

As an example, we will consider the unit's response to a keyboard input of the letter M. When the M key is depressed the Print Control Circuit Board must first position the print wheel so that the M spoke is directly in front of the hammer. At the same time the ribbon lift mechanism must be activated to insure the ribbon will be placed between the print wheel and the paper.

Next, the necessary print density must be determined. This is done by varying the time that power will be applied to the hammer fire solenoid. Three levels of print density are possible and the appropriate one is selected by the CPU. In our example, the longest duration hammer fire would be effected due to the width and size of a M.

After the hammer fire solenoid has been energized for the correct amount of time the ribbon lift mechanism will be deenergized and the print wheel will be returned to the home position. If another key had already been struck the print wheel would move in the direction requiring the least movement to reach the next location and the entire process would repeat itself until all characters which had been struck at the keyboard were printed.

The Print Control Circuit Board will continue to look for and respond to external and internal inputs until the unit is turned off.

This concludes this module. You may now proceed to the next page and complete the module questions. When finished, check your answers with the feedback sheet at the end of the module.

This page intentionally left blank

MODULE 2 - Technical Overview

TEST

DIRECTIONS:

Answer the following questions on a separate sheet of paper. Do not write in this book. When you are finished, verify your answers with the feedback sheet located on the next page.

1. What electrical protection is provided for T1?
2. State the purpose of the power pack?
3. How is even print density for all size characters insured?
4. True or False? The keyboard is disabled when the Electronic Compact is used as a slave printer.
5. What is a visual indication at power on that CPU output control lines were reset to logic 0?

MODULE 2 - Technical Overview

TEST - Feedback

1. What electrical protection is provided for T1?

A 125 degree thermal fuse and a 1.25A fuse

2. State the purpose of the power pack?

Transforms AC line voltage to necessary DC voltages

3. How is even print density for all size characters insured?

By varying the time the hammer fire solenoid is energized

4. True or False? The keyboard is disabled when the Electronic Compact is used as a slave printer.

FALSE

5. What is a visual indication at power on that CPU output control lines were reset to logic 0?

Carriage restores full left and moves right to margin

MODULE 3
SERVICE DOCUMENTATION

MODULE OVERVIEW

In this module you will work with the available Service Documentation for the Olympia Electronic Compact.

PREREQUISITE

Completion of the Introduction and Operation, and Technical Overview Manuals.

MODULE OBJECTIVE

Upon completion of this module you will be able to answer, in writing, four questions about the Olympia Electronic Compact Service Documentation.

ESTIMATED TIME TO COMPLETE THIS MODULE

30 Minutes

DESCRIPTION OF FUNCTION MANUAL

The Description of Function Manual contains information on the installation, repair, and maintenance for the Olympia Electronic Compact and is divided into 9 sections as described below.

SECTION 1 TECHNICAL DATA

In this section information such as voltage requirements, power consumption, and brief descriptions of major components such as the keyboard is found.

SECTION 2 GENERAL CHARACTERISTICS

Listed here are the six major assemblies of the Electronic Compact.

SECTION 3 DESCRIPTION of FUNCTION

Principals of operation are covered in this section with short descriptions of such things as the Switching on Routine and Character Printing.

SECTION 4 ADJUSTMENTS, MEASUREMENTS

Using line drawings in addition to written instructions this part of the manual will be used to perform mechanical adjustments to manufacturers specifications.

SECTION 5 DISASSEMBLY and ASSEMBLY

Provides written instructions supported by some exploded views to guide you in removing and installing major components such as the Keyboard with Control PCB.

SECTION 6 LUBRICATION

Identifies components to be lubricated as well as the type of lubricant to be used.

SECTION 7 TROUBLESHOOTING

Presents a troubleshooting flow chart and a diagram indicating the pins for each IC Chip to be tested for input voltage and ground.

SECTION 8 ACCEPTANCE CHECK

A checklist of items to review when installing the Electronic Compact. This checklist should also be used when servicing a previously installed unit as a type of "Call Management" procedure.

SECTION 9 FOLDOUTS, CIRCUIT DIAGRAMS, LAYOUTS

Additional reference items such as the layout of components on the Control PCB and an exploded view of the Printer Head Assembly are given in this section.

DESCRIPTION OF FUNCTION MANUAL USAGE

Locate and read the Power Pack Removal/Replacement Procedure in Section 5. Note that as with most of the procedures in Section 5 there is no diagram or drawing to aid you in locating the components you are working with. It is recommended that you use the Spare Parts Catalogue to locate exploded parts views with which you can identify components when necessary.

Turn to Printer Adjustments in Section 4 and review the Printer Head, Hammer Solenoid procedure. Each adjustment procedure in this section is presented in the same way, with a line drawing on the left and a written description with specifications, if any, on the right of the page.

Look through Section 9 to familiarize yourself with the various graphic aids provided for your use whether installing, troubleshooting, or repairing the Electronic Compact.

SPARE PARTS CATALOGUE

This separate book provides you with detailed exploded view diagrams for each area of the unit for which parts might be needed, as well as the Olympia part number and description.

The Spare Parts Catalogue is divided into Sections A and B, one for each of two versions of the Electronic Compact available.

In Section A of the Spare Parts Catalogue turn to the appropriate page for the Printer Head Mechanism to see how the replaceable parts for the Printer Head Mechanism are illustrated.

When part replacements are required you will locate the needed part in the Spare Parts Catalogue, obtain its Olympia Part Number, and order it in accordance with standard procedures in effect at your Service Center. If you would like further information about current procedures for obtaining Olympia parts contact your Zone Manager.

You have now completed the Service Documentation Module. If you feel comfortable with the information presented proceed to the next page and answer the questions presented. If you are not yet comfortable with the usage of the Service Documentation review those areas you are not comfortable with and then answer the questions on the next page.

This page intentionally left blank

MODULE 3 - Service Documentation

TEST

DIRECTIONS:

Answer the following questions on a separate sheet of paper. Do not write in this book. When you are finished, verify your answers with the feedback sheet located on the next page.

1. What section of the Description of Function manual contains information on lubrication points?
2. Instructions on specifications for mechanical adjustments can be found in _____.
3. What is the Olympia Part number for a Printer Head Assembly?
4. The 5V input voltage for IC1 could be tested at pin _____.

MODULE 3 - Service Documentation

TEST - Feedback

1. What section of the Description of Function manual contains information on lubrication points?

Section 6

2. Instructions on specifications for mechanical adjustments can be found in _____.

Section 4

3. What is the Olympia Part number for a Printer Head Assy.?

330-52005

4. The 5V input voltage for IC1 could be tested at pin _____.

Pin 20

MODULE 4
TROUBLESHOOTING

MODULE OVERVIEW

In this module you will be provided information necessary to systematically approach troubleshooting situations for the Olympia Electronic Compact.

PREREQUISITE

Completion of the Service Documentation module.

MODULE OBJECTIVE

After completing this module you will be able to answer, in writing, four questions relative to troubleshooting the Electronic Compact.

ESTIMATED TIME TO COMPLETE THIS MODULE

20 Minutes

OLYMPIA ELECTRONIC COMPACT

Troubleshooting of the Olympia Electronic Compact will be to the level of Field Replaceable Units as determined by the Spare Parts Catalogue. Determination of the problem will be aided by use of the units Self Test feature and the Troubleshooting Diagram in Section 7 of the Description of Function Manual.

SELF TEST

The Self Test feature of the Electronic Compact provides you with a means of verifying printer operation without requiring that you know how to type. The use of Self Test is described in Step 6, Print of the Acceptance Check in Section 8 of the Description of Function Manual. Read this procedure at this time, and if you have an Electronic Compact available run Self Test to become familiar with its function.

TROUBLESHOOTING DIAGRAM

This problem solving aid is designed to provide you with a systematic approach to repair of a nonfunctioning unit. It is divided into steps for mechanical or electrical problems. Note that the Diagram does not mention use of the Self Test feature. It is strongly recommended that prior to using the Diagram you use the Self Test feature to observe visual symptoms that may be used to respond to questions in the Diagram.

OTHER TROUBLESHOOTING AIDS

Additional troubleshooting assistance may be obtained by using the circuit diagrams in Section 9 and the Description of Function in Section 3.

After servicing an Electronic Compact, you should check the Lubrication Points as described in Section 6 and perform the appropriate steps of the Acceptance Check in Section 8. If the unit is to be used as a slave printer, it should be connected to an 820 II following the instructions in Module 1 to confirm that it can interface with a host microcomputer properly.

You have now completed the Troubleshooting Module. Proceed on to the next page and answer the written questions.

MODULE 4 - Troubleshooting

TEST

DIRECTIONS:

Answer the following questions on a separate sheet of paper. Do not write in this book. When you are finished, verify your answers with the feedback sheet located on the next page.

1. How is Self-Test begun?
2. The troubleshooting diagram is located in what section?
3. What help for troubleshooting can be found in section 9?
4. True or False? Self-Test is the first step of the troubleshooting diagram.

MODULE 4 - Troubleshooting

TEST - Feedback

1. How is Self-Test begun?

Hold margin release and turn power on

2. The troubleshooting diagram is located in what section?

Section 7

3. What help for troubleshooting can be found in section 9?

Circuit diagrams and PWB component layout

4. True or False? Self-Test is the first step of the troubleshooting diagram.

FALSE

PUBLICATION COMMENT SHEET

Please use this comment sheet to assist with identification of errors or needed improvements in this publication. For specific errors, include specific page numbers.

Date _____

NAME _____

JOB TITLE _____

MAILING ADDRESS _____

PUBLICATION NAME - OLYMPIA ELECTRONIC COMPACT Technical Training Program

PUBLICATION NUMBER - SBXMPT010

PAGE NO.	DESCRIPTION OF ERROR OR IMPROVEMENT
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Please mail this form to the following address.

XEROX CORPORATION
1341 W. MOCKINGBIRD LANE
MS301
DALLAS, TEXAS 75247

ATTEN: DAVID LEESE, MANAGER, XSB SERVICE EDUCATION & CUSTOMER SUPPORT



file

OLYMPIA
ELECTRONIC COMPACT
INTERFACE

The D80 interface board is available in serial or parallel configuration. Customized data cables to connect with a wide variety of micro computers are also available. Detailed information is contained in this package.

To install the D80 interface in your Olympia Electronic Compact Typewriter you need a screwdriver and needle nose plier. Then follow the attached instructions which cover:

- Installation
- Set-up Instructions
- Computer Hook-up
- To Change Defaults
- Code Chart
- Cable Reference Charts



Installation and Setup Instructions
Olympia Electronic Compact Interface Board
Serial or Parallel Version

Installation

1. Remove upper housing of the Olympia Electronic Compact Typewriter by removing two screws on the rear of the bottom housing. Remove the platen knob and unsnap the upper housing.
2. Remove the two screws which hold down the keyboard assembly.
3. Turn the keyboard assembly upside down to access the main logic board.
4. Carefully remove the large 40 Pin integrated circuit (IC4) from its socket, (See illustration #1), and insert it into the vacant socket on the D80 interface board (Location Marked U16 on illustration #2). Be sure that you install the IC with the small notch on one end oriented in the same direction as indicated in illustration #2.
5. Carefully remove the left hand flat keyboard cable from the keyboard plug socket marked Cone 1 on the Electronic Compact logic board, and the plug connector marked Cone 4. (See illustration #1)
6. Locate the three threaded studs where the Electronic Compact logic board is mounted to the keyboard assembly. On the exposed threads, of each of the three studs, install one of the threaded standoffs which is supplied with the D80 interface.
7. The D80 interface board has pins which protrude from its bottom side. These pins are designed to insert into the now vacant socket of IC4 and also into the left hand vacant keyboard plug socket of the Electronic Compact interface board. Carefully position the D80 interface board over the typewriter logic board, and align it such that the two sets of pins will insert into the 40 pin and 10 pin sockets and then press firmly to seat the pins into the connectors.
8. Plug the left side flat keyboard cable into the plug socket marked P1 on the D80 interface board. See illustration #2.
9. Plug the Cone 4 plug into the Electronic Compact logic board through the square hole in the D80 interface. (See illustration #2)
10. Install the 3 machine screws through the D80 interface board and into the threaded standoffs which were installed in step #6. Do not over tighten these screws or the PCB may be damaged or cracked.



11. Now the power supply wires must be connected. These are the two loose grey and blue wires which are soldered to the D80 interface board. This is done using the two red connector clamps. Locate the plug connector which attaches to the Electronic Compact at a point marked Cone 6 (See illustration #1). The grey wire on the Cone 6 cable attaches to the grey wire on the D80 interface and the blue wire on the Cone 6 cable attaches to the blue wire on the D80 interface.

To accomplish this connection, the wires on the Cone 6 connector are fed through the wire clamp and the wire on the D80 interface is inserted into the opposite side of the clamp which is then pressed together with a pair of pliers, and snapped closed. Be sure that the wires are aligned such that they will be pinched by the metal crimp when you squeeze the clamp with the pliers.

12. Installation of Leader Cable

SERIAL

To install the leader cable, it is necessary to remove one louver from the typewriter housing in order to accommodate an exit hole for the cable. Facing the rear of the machine, break out one louver on the left side lower housing. Insert the leader cable through the hole and route it around the printer chassis.

PARALLEL

To install the leader cable, it is necessary to remove two louvers from the typewriter housing in order to accommodate an exit hole for the cable. Facing the rear of the machine, break out two louvers on the left side lower housing. Insert the leader cable through the hole and route it around the printer chassis and plug it into the parallel cable header on the D80 board (see illustration #2). Be sure that all 26 pins are plugged in and that the cable exits away from the D80 PCB.

Data cables are provided as optional items for the Electronic Compact. Please refer to the attached Cable Reference Chart to select the cable required for your computer.



SETUP INSTRUCTIONS

SERIAL

The Electronic Compact serial interface board has the following features:

- * RS 232 Compatible
- * Baud Rates from 75 to 19,200 Baud
- * Selectable Handshake Polarity
- * Selectable CR-LF logic
- * Xon/Xoff Protocol supported
- * ETX/ACK Protocol supported
- * Approximately 70 character buffer

Computer Hookup

Refer to the operating instructions of the host computer to determine which pins should be connected for proper operation. Normally only three wires are needed. These are usually Ground, RTS (Handshake) and RXD (Receive Data). The above wires on the D80 interface connect to ground, Handshake (CTS-RTS-DTR, etc.) and TXD Transmit data on the host computer.

Optional interface cables are available in these configurations (see also attached cable reference chart).

	<u>20X</u>	<u>4X</u>	<u>5X</u>
RTS (Handshake)	Pin 20	Pin 4	Pin 5
RXD (Receive Data)	Pin 3	Pin 3	Pin 2
TXD (Transmit Data)	Pin 2	Pin 2	Pin 3
GND (Signal Ground)	Pin 7	Pin 7	Pin 7

In an application which uses Xon/Xoff or ETX/ACK protocol, the RTS (Handshake) is not used, and the TXD (Transmit Data) is connected to the RXD (Receive Data) on the host computer. If ETX-ACK Protocol is used, the Block length must not exceed 64 characters.

The Electronic Compact interface board is delivered with the baud rate preset to 1200 baud and the handshake polarity high ready. The carriage return and line feed logic is set such that a CR=Carriage Return plus Line Feed and LF is ignored.

Provisions are made for changing the defaults as shown on page 5, "To change defaults".



PARALLEL

Pin Assignments

The pin assignments on the Electronic Compact leader cable plug are as follows:

Data Strobe	Pin # 1
Data Bit 0	Pin # 2
Data Bit 1	Pin # 3
Data Bit 2	Pin # 4
Data Bit 3	Pin # 5
Data Bit 4	Pin # 6
Data Bit 5	Pin # 7
Data Bit 6	Pin # 8
Data Bit 7	Pin # 9
Acknowledge	Pin #10
Busy	Pin #11
Paper Out (GND)	Pin #12
Select (+5V)	Pin #13
ERROR (+5V)	Pin #15
GROUND	Pin #18-26

The optional parallel cables map these signals to a variety of different connectors for direct attachment to your computer. Please refer to the attached cable reference chart.



TO CHANGE DEFAULTS

1. Setting of jumpers on header marked A thru H:
See illustration #2 (Option Setting)

a.	<u>Code</u>	<u>Jumper "A" Not Installed</u>	<u>Jumper "A" Installed</u>
	CR	Carriage Return + Line Feed	Express
	LF	Ignored	Carriage Return + Line Feed

- b. For Radio Shack Computers install a jumper on Position "C". This causes a CR+LF (Carriage Return + Line Feed) to occur when either a CR (Carriage Return) or LF (Line Feed) is sent from the host computer.

Note: Installing a jumper on "C" supersedes the setting of the "A" jumper above.

- c. For Parallel operation be sure that there is a jumper installed on position "F".

Note: Jumpers B-D-E-G and H are not used in parallel operation.

2. Once you have made the proper connections above, it is time to reposition the keyboard assembly.

Position the keyboard assembly and reinstall the two mounting screws.

3. Replace upper housing and platen knob and reinstall the two screws on the lower housing.

The D80 interface is now setup. Turn on the typewriter and test it for proper operation from its keyboard. If it performs properly, proceed with the hook up to the host computer.

Attached is an ACSII Code Chart for the Olympia Electronic Compact with D80 interface. Please note that the typewriter keyboard has several characters which are not part of the normal ASCII Code Set. These characters are printable by using the substitute ASCII characters which are all listed in the ASCII Code Chart.

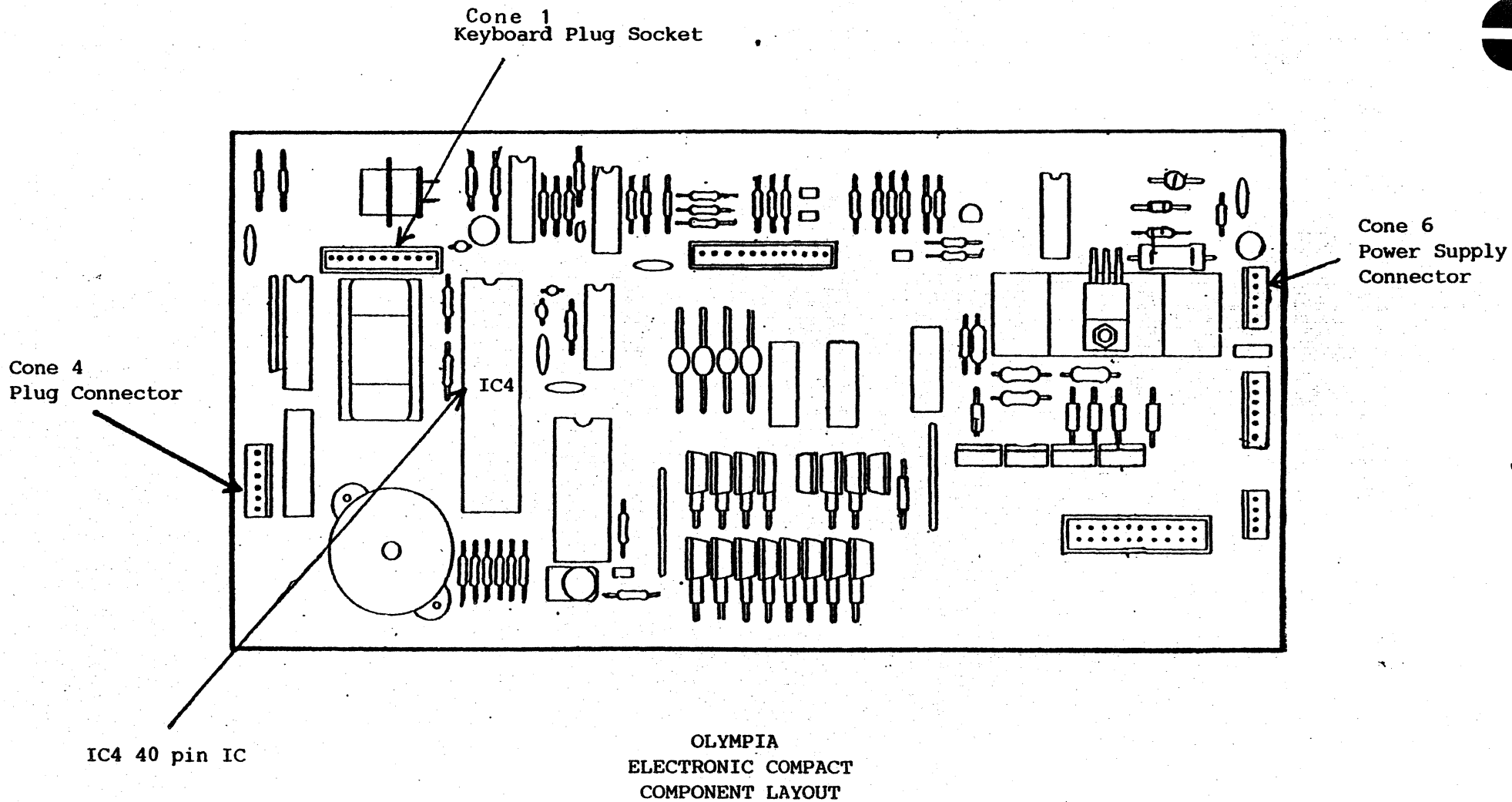


ILLUSTRATION #1



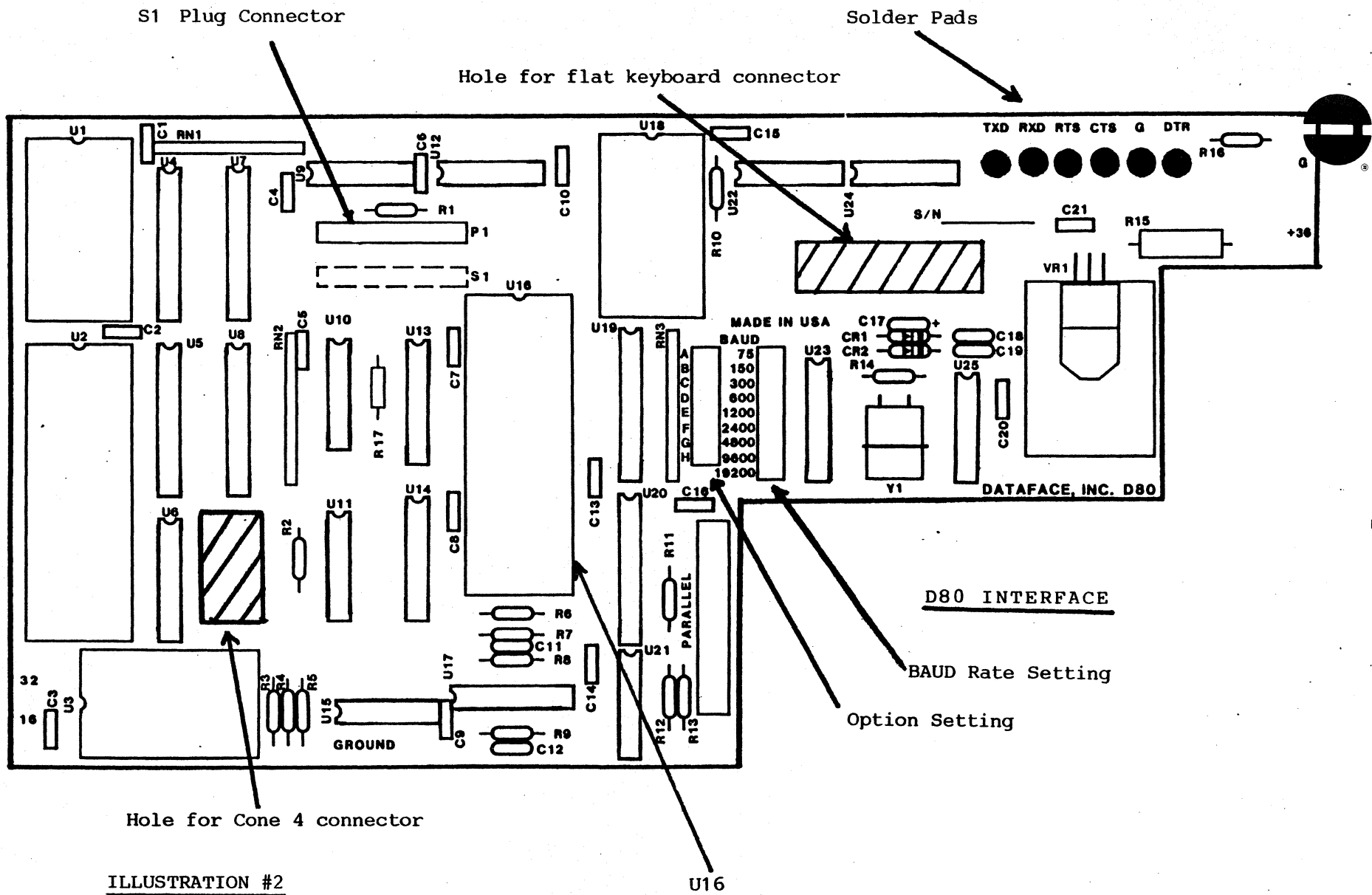


ILLUSTRATION #2



D80 Interface Code Set

ASCII CODE

Dec.	Hex.	ASCII	D80 Output	Description
3	3	ETX	ETX	End of Text
6	6	ACK	ACK	Acknowledge
7	7	BEL	Bell & Mar. Release	Ring Bell & Margin Release
8	8	BS	Back Space	
9	9	HT	Horizontal Tab	
10	A	LF	Line Feed (Option)	Jumper Selectable enable
12	C	FF	Form Feed	
13	D	CR	Carr.- ret. & LF	Carriage Return only if LF is enabled
17	11	DC1	X-ON	
19	13	DC3	X-OFF	
32	20	SP	Space	Horizontal Space
33	21	!	!	Exclamation Point
34	22	"	"	Quotation Mark
35	23	#	#	Number Sign
36	24	\$	\$	Dollar Sign
37	25	%	%	Percent Sign
38	26	&	&	Ampersand
39	27	'	'	Acute accent or apostrophe
40	28	((Open Parenthesis
41	29))	Closed Parenthesis
42	2A	*	*	Astrisk
43	2B	+	+	Plus Sign
44	2C	,	,	Comma
45	2D	-	-	Hyphen or Minus Sign
46	2E	.	.	Period
47	2F	/	/	Slash
48	30	0	0	Number 0
49	31	1	1	Number 1
50	32	2	2	Number 2
51	33	3	3	Number 3
52	34	4	4	Number 4
53	35	5	5	Number 5
54	36	6	6	Number 6
55	37	7	7	Number 7
56	38	8	8	Number 8
57	39	9	9	Number 9
58	3A	:	:	Colon
59	3B	;	;	Semicolon
60	3C	<	±	Less than symbol changes to plus/minus
61	3D	=	=	Equal
62	3E	>	°	Greater than symbol changes to degree
63	3F	?	?	Question Mark



D80 Interface Code Set

ASCII CODE

Dec.	Hex.	ASCII	D80 Output	Description
3	3	ETX	ETX	End of Text
6	6	ACK	ACK	Acknowledge
7	7	BEL	Bell & Mar. Release	Ring Bell & Margin Release
8	8	BS	Back Space	
9	9	HT	Horizontal Tab	
10	A	LF	Line Feed (Option)	Jumper Selectable enable
12	C	FF	Form Feed	
13	D	CR	Carr.- ret. & LF	Carriage Return only if LF is enabled
17	11	DC1	X-ON	
19	13	DC3	X-OFF	
32	20	SP	Space	Horizontal Space
33	21	!	!	Exclamation Point
34	22	"	"	Quotation Mark
35	23	#	#	Number Sign
36	24	\$	\$	Dollar Sign
37	25	%	%	Percent Sign
38	26	&	&	Ampersand
39	27	'	'	Acute accent or apostrophe
40	28	((Open Parenthesis
41	29))	Closed Parenthesis
42	2A	*	*	Astrisk
43	2B	+	+	Plus Sign
44	2C	,	,	Comma
45	2D	-	-	Hyphen or Minus Sign
46	2E	.	.	Period
47	2F	/	/	Slash
48	30	0	0	Number 0
49	31	1	1	Number 1
50	32	2	2	Number 2
51	33	3	3	Number 3
52	34	4	4	Number 4
53	35	5	5	Number 5
54	36	6	6	Number 6
55	37	7	7	Number 7
56	38	8	8	Number 8
57	39	9	9	Number 9
58	3A	:	:	Colon
59	3B	;	;	Semicolon
60	3C	<	±	Less than symbol changes to plus/minus
61	3D	=	=	Equal
62	3E	>	°	Greater than symbol changes to degree
63	3F	?	?	Question Mark



D80 Interface Code Set

SCII CODE

ec.	Hex.	ASCII	D80 Output	Description
3	3	ETX	ETX	End of Text
6	6	ACK	ACK	Acknowledge
7	7	BEL	Bell & Mar. Release	Ring Bell & Margin Release
8	8	BS	Back Space	
9	9	HT	Horizontal Tab	
10	A	LF	Line Feed (Option)	Jumper Selectable enable
12	C	FF	Form Feed	
13	D	CR	Carr.- ret. & LF	Carriage Return only if LF is enabled
17	11	DC1	X-ON	
19	13	DC3	X-OFF	
32	20	SP	Space	Horizontal Space
33	21	!	!	Exclamation Point
34	22	"	"	Quotation Mark
35	23	#	#	Number Sign
36	24	\$	\$	Dollar Sign
37	25	%	%	Percent Sign
38	26	&	&	Ampersand
39	27	'	'	Acute accent or apostrophe
40	28	((Open Parenthesis
41	29))	Closed Parenthesis
42	2A	*	*	Astrisk
43	2B	+	+	Plus Sign
44	2C	,	,	Comma
45	2D	-	-	Hyphen or Minus Sign
46	2E	.	.	Period
47	2F	/	/	Slash
48	30	0	0	Number 0
49	31	1	1	Number 1
50	32	2	2	Number 2
51	33	3	3	Number 3
52	34	4	4	Number 4
53	35	5	5	Number 5
54	36	6	6	Number 6
55	37	7	7	Number 7
56	38	8	8	Number 8
57	39	9	9	Number 9
58	3A	:	:	Colon
59	3B	;	;	Semicolon
60	3C	<	±	Less than symbol changes to plus/minus
61	3D	=	=	Equal
62	3E	>	°	Greater than symbol changes to degree
63	3F	?	?	Question Mark



Dec.	Hex.	ASCII	D80 Output	Description
64	40	@	@	At Sign
65	41	A	A	Capital A
66	42	B	B	Capital B
67	43	C	C	Capital C
68	44	D	D	Capital D
69	45	E	E	Capital E
70	46	F	F	Capital F
71	47	G	G	Capital G
72	48	H	H	Capital H
73	49	I	I	Capital I
74	4A	J	J	Capital J
75	4B	K	K	Capital K
76	4C	L	L	Capital L
77	4D	M	M	Capital M
78	4E	N	N	Capital N
79	4F	O	O	Capital O
80	50	P	P	Capital P
81	51	Q	Q	Capital Q
82	52	R	R	Capital R
83	53	S	S	Capital S
84	54	T	T	Capital T
85	55	U	U	Capital U
86	56	V	V	Capital V
87	57	W	W	Capital W
88	58	X	X	Capital X
89	59	Y	Y	Capital Y
90	5A	Z	Z	Capital Z
91	5B	[[Open Bracket
*92	5C	\	\$	Back Slash symbol changes to section
93	5D]]	Close Bracket
*94	5E	^	¢	Caret symbol changes to cent sign
95	5F	_	_	Underscore
*96	60	~	¶	Grave accent symbol changes to paragraph
97	61	a	a	Letter a
98	62	b	b	Letter b
99	63	c	c	Letter c
100	64	d	d	Letter d
101	65	e	e	Letter e
102	66	f	f	Letter f
103	67	g	g	Letter g
104	68	h	h	Letter h
105	69	i	i	Letter i
106	6A	j	j	Letter j
107	6B	k	k	Letter k
108	6C	l	l	Letter l
109	6D	m	m	Letter m
110	6E	n	n	Letter n
111	6F	o	o	Letter o



Dec.	Hex.	ASCII	D80 Output	Description
.12	70	p	p	Letter p
.13	71	q	q	Letter q
.14	72	r	r	Letter r
.15	73	s	s	Letter s
.16	74	t	t	Letter t
.17	75	u	u	Letter u
.18	76	v	v	Letter v
.19	77	w	w	Letter w
.20	78	x	x	Letter x
.21	79	y	y	Letter y
.22	7A	z	z	Letter z
.23	7B	{	1/2	Left brace symbol changes to 1/2
.24	7C		1/4	Vertical bar symbol changes to 1/4
.25	7D	}	2	Right brace symbol changes to superscript 2
.26	7E	~	3	Tilde symbol changes to superscript 3
.27	7F	DEL	DEL	Delete last character
*7;85	1B;55 or	ESC U	Index	1/2 Line feed positive
or27;117	1B;75			
*7;68	1B;44 or	ESC D	Rev. Index	1/2 Line feed negative
or27;100	1B;64			
*7;32	1B;20	ESC SP	1/2 Space	Horizontal Half Space

* All codes preceded by the asterisk convert a ASCII character to a character present on the typewriter daisy wheel which is not part of the ASCII code set.



REFERENCE CHART

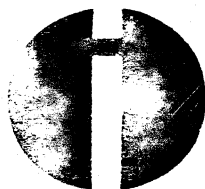
OLYMPIA ELECTRONIC COMPACT CABLES

<u>COMPUTER</u>	<u>SERIAL CABLE NUMBER</u>	<u>PARALLEL CABLE NUMBER</u>
Altos Computer	20X	--
Apple II with SSM-AIO Interface	5X	10
Apple II with SSM-ASIO Interface	4X	--
Apple II with SSM-APIO Interface	--	7
Apple II with CCS-7710A Interface	4X	--
Apple II with CCS-7728/7729 Interface	--	9
Apple II with Mountain CPS Card	--	11
Apple II with Super Serial Card	4X	--
Apple II with A2B0002 Parallel Card	--	11
Apple II with EPSON Interface Card	--	5
Apple III	5X	--
Atari 400 with 850 Interface Adaptor (Parallel)	--	1
Atari 800 with 850 Interface Adaptor	--	1
Basis 108	5X	--
Billings Computer	--	6
Commercial Computer XP-1	4X	--
Commodore PET with TNW1000 Interface	4X	--
Commodore 8032 with TNW1000 Interface	4X	--
Commodore 64 with CX 6401 Interface	--	13
Commodore VIC-20 with CX 6401 Interface	--	13
CPT 8000	5X	--
Compaq	--	6
Eagle II, III, IV	5X	12
Heathkit	4X	--
Hewlett-Packard 85	20X	--
Hewlett-Packard 86	--	12
Hewlett-Packard 125	5X	--
Hewlett-Packard 300	5X	--
Hewlett-Packard 2640B	20X	--
IBM-PC	--	6
Intertec Superbrain II	20X	--
Kaypro II	5X	12
NEC PC 8001A	--	4
Northstar-Advantage/Horizon	20X	--
Ohio Scientific	20X	--
Olympia OPC	5X	--
Osborne 01	20X	--
Panasonic HHC	5X	--
Phillips/MICOM 2000	5X	--
Quasar HHC	5X	--
Radio Shack TRS80-I	--	8
Radio Shack TRS80-II, 12	--	9
Radio Shack TRS80-III	--	8
Radio Shack TRS80-16	--	9
Radio Shack TRS80-100	--	12
Sanyo MBC 1000	--	12
Sanyo MBC 2000/3000	--	3
Sharp ZL 6000	20X	--
Sharp ZL 6100	20X	--
SWIP 6809 (Southwest Technical Products)	20X	--
SSB Chiefton	5X	--
Texas Instrument TI 99-4A	20X	2
Texas Instrument DS 990-4	20X	--
Vector Graphics VIP, 1600, 2600, 2800, 305, 5005	4X	--
Victor 9000	5X	--
Wang 2200T	--	12
Wicat 150	4X	--
Xerox 820	20X	--
Xerox 820II	20X	--
Zenith Z89	4X	--

Olympia Service

electronic compact

Funktionsbeschreibung
Description of function
Description de fonctionnement
Descripción de Funciones



Olympia International

Olympia Werke AG · Wilhelmshaven · Central Service Department · Tel. 04421/781

1/14/042/10

List of Contents

1. Technical data
2. General characteristics
3. Description of function
 - 3.01 Power pack
 - 3.02 Switching-on routine
 - 3.03 Keyboard, keyboard scanning
 - 3.04 Microcomputer
 - 3.05 Control circuit board
 - 3.06 Delay circuit, Reset circuit
 - 3.07 Shift
 - 3.08 Buzzer
 - 3.09 Hammer solenoid, Impression
 - 3.10 Expander circuit
 - 3.11 Motors, Driver circuit
 - 3.12 Photo interrupters
 - 3.13 Printing
 - 3.14 Ribbon lift, Ribbon transport
 - 3.15 Correction tape lift, transport
 - 3.16 Paper feed
4. Adjustments, measurements
 - 4.01 Chassis, horizontal drive
 - 4.02 Chassis, paper injector
 - 4.03 Printer
 - 4.04 Printer, ribbon, correction ribbon
 - 4.05 Motor excitation, impression, resistance of coils
5. Disassembly and assembly
 - 5.01 Housing
 - 5.02 Printer
 - 5.03 Ribbon mechanism
 - 5.04 Printer head
 - 5.05 Selection motor
 - 5.06 Printer PCB, flat cable
 - 5.07 Platen
 - 5.08 Drive unit (wire and pulley)
 - 5.09 Horizontal motor
 - 5.10 Keyboard with control PCB
 - 5.11 Keyswitch, Keyboard diodes
 - 5.12 Power pack
 - 5.13 Fuses
6. Lubrication
7. Trouble shooting
8. Acceptance check

- 9. Foldouts, circuit diagrams, layouts
- A Ribbon lift, feed
- B Printerhead
- C Block circuit diagram
- D Circuit diagram power pack
- E Layout power pack
- F Circuit diagram control PCB
- G Layout control PCB
- H Circuit diagram keyboard
- I Layout keyboard
- J Circuit diagram printer PCB
- K Layout printer PCB
- L Connector diagram

1. Technical Data

Type of machine Electronic typewriter with typewheel

Approvals UL, CSA, CEE, VDE

Voltage

Primary circuit 115V / 60Hz or 220V / 50Hz \pm 15%

Secondary circuit UH = + 36V

UL = + 12V

ULL = + 6V

UC = + 5V

GND = \emptyset - potential control PCB

Consumption

60 W Rated load

21 W Stand-by

Motors

1 Stepping motor 36V/12V

Typewheel selection

1 Stepping motor 36V/12V/6V

Horizontal drive (Printer)

1 Stepping motor 36V/6V

Vertical drive (Index, paper feed)

1 Stepping motor 36V/6V

Ribbon

Fuses

115V / 60Hz

220V / 50Hz

Primary circuit

1 1,25A slow-blow
1 Thermal fuse 125°C

1 1,25A slow-blow
1 Thermal fuse 125°C

Secondary circuit

1 1,25A slow-blow (VH)
1 2,5A slow-blow (UL)
1 2,0A slow-blow (ULL)
1 Thermal fuse 125°C

1 1,25A slow-blow (UM)
1 2,5A slow-blow (UL)
1 2,0A slow-blow (ULL)

Printer

Typewheel with 96 or 100 characters, interchangeable, positioning by stepping motor, typing speed 11 cps, impression control switchable 3 grades, original + 4 copies, Typing pitch

Pica 10/inch = 2.54 mm

Elite 12/inch = 2.2 mm

Micro 15/inch = 1.69 mm

Ribbons	<p>Special cassette Correctable carbon ribbon (lift-off), colour code yellow 13 mm x 105 m, 80,000 strikes Carbon ribbon normal, colour code red 13 mm x 105 m, 80,000 strikes Carbon ribbon multi, colour code blue 13 mm x 105 m, 320,000 strikes</p>
Correction ribbon	<p>Lift-off ribbon 7 mm x 7 m, 1700 corrections</p>
Keyboard	<p>40 alphanumeric keys, mechanical switch, buffer memory 11 characters, repeat function on every key except dead keys</p> <p>Function keys: Margin release key, Margin set key (L&R), Back space key*, Correction key*, Relocation key, Tab set key, Tab clear key, Index key* Reverse index key*, Return key*, Shift key (L&R), Shift lock key (LED), Express key, Space bar*, Half space key, Repeat key</p> <p>Key with * repeats its function by pressing the key deeper or pressing the repeat key after the operation of each key.</p> <p>Slide switches: Pitch selector 10, 12, 15 Line space selector 1, 1-1/2, 2 Impression control 3 grades</p>
Paper holder	<p>Platen size Length 346 mm (13.62 in) Diameter 40.3 mm (1.59 in) Paper capacity 355.6 mm (14 inches) Typing capacity 292.1 mm (11.5 in) Pica 115 characters Elite 138 characters Micro 172 characters Line spacing 4.23 mm at selection 1, variable line spacer, paper injector, paper end gauge, paper release lever</p>
Electronic control	<p>Single chip microcomputer System 8049 (or microprocessor 8039 with external EPROM)</p>
Correction memory TAB memory	<p>46 characters (46 spaces) 16 settings</p>

Present margin	Left 20 Right 85 on Pica
Self demonstration for service	Prints out all characters, space, back space, correction, carrier return, relocation express
Dimension	Width 491 mm (19.3 in) Length 376 mm (14.8 in) Height 137 mm (5.4 in)
Weight	9 kg

2. General characteristics

This electronic typewriter model ELECTRONIC COMPACT consists of the following six major assemblies

- Chassis and platen unit
- Keyboard
- Printer assembly
with typewheel motor, hammer solenoid, photo interrupters for typewheel and printer home position, ribbon feed mechanism, correction mechanism
- Power pack
to transform AC to regulated DC
- Control Print Circuit Board
with 8 bit microcomputer for controlling all functions, driver device for stepping motors and hammer solenoid, buzzer
- Housing

3. Description of function

3.01 Power pack (Circuit Diagram D)

The power pack is transforming the power voltage with the ferro-magnetic constant voltage transformer T1. This transformer is keeping its iron core with a resonance circuit within the saturation phase, so that the voltage changes within permissible range of +15% will not influence the secondary voltages.

At the power input, a filter consisting of coil L1 and capacitor C1 works against interfering frequencies.

The primary winding in the constant voltage transformer T1 is protected by a thermal fuse which functions at 125°C and a delay fuse 1.25A.

Voltage for the secondary circuit is rectified by the bridge rectifiers D1 and D2. The ripple voltage generated in the secondary circuit is smoothed by the capacitors C4, C5, C6, C8. High frequency noise is attenuated by the capacitor C7.

5V DC for the microcomputer system (UC) is regulated from the 12V (UL) via ICI.

3.02 Switching-on routine

All control lines outgoing from the CPU (IC4) are set to logic 0 (+5V) when switching on the machine (See 3.06).

The printer is moved to the left until the arm of reset plate is pulled out of the photo interrupter PH2. After recognizing the left end, the horizontal step motor is activated by the microcomputer so as to move the printer 20 spacings to the right from 0 on the margin scale (on Pica). This pre-set margin is programmed to set at 20 on the left, 85 on the right (on Pica).

The typewheel is turned by the switching-on routine to the basic position via its stepping motor.

The ribbon step motor also moves to its base position.

3.03 Keyboard, Key scanning

The key switch modules are mechanical contact switches and they close and open at the cross points of the key matrix 8x9 (See circuit Diagram H).

When a key is depressed, the contact is closed and effecting the connection between the columns and rows. The microprocessor IC4 is scanning the lines Sp 0 ... Sp 8 and Ze 0 ... Ze 8 every 12.6 ms in the BCD code. Its output pin 35 ... 38 send the scanning pulse one after another to the columns Sp 0 ... Sp 8 via the binary decoder IC 5 by tapping 4 ports to 10 with H-signal (+5V). The signal scanned forms

an octal code, which is read via the keyboard buffer IC 1 by the input pin 12 ... 19 of the IC 4 (See Circuit Diagram F). A signal is recognized as correct after two times scanning for one time key operation. The octal codes (8 bits data) of the last 11 characters or functions are memorized in the RAM of IC 4 as the key operation memory (key buffer memory). At the same time, the 8 bits data in the IC 4 is the address for the command which is written in the 2K-ROM (or EPROM IC 2). The command makes the microcomputer activating the machine functions via the driver circuit and the actuators.

3.04 Microcomputer

The 8 bits microcomputer 8049 is a single chip type computer with N-MOS system. It is replaced during the introduction by the pin-compatible microprocessor 8039 (Identification IC 4 on the control circuit board, see Diagram F) with external EPROM IC 2. The microcomputer is including the ALU, 2K x 8 bits programme memory, 128 x 8 bits RAM data memory, 27 I/O lines (3x8 bits I/O ports, 1 interrupt input and 2 test inputs), multiplex address/data bus. The internal clock generator in CPU is clocked by means of a quartz with 6 MHz.

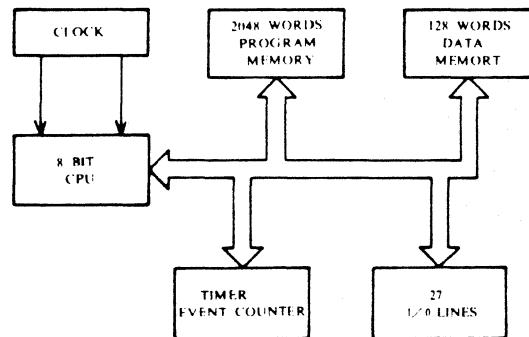


Fig-1

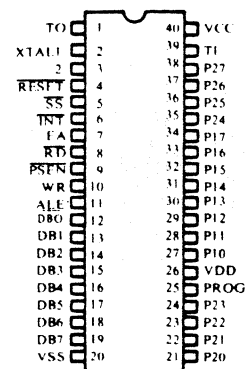


Fig-2

The IC 4 processes the information from the keyboard, the operation keys and photo interrupters and controls stepping motors and buzzer (See Circuit Diagram F).

IC-usage

3.05 Control circuit board
(Circuit Diagram F)

The IC components of the control circuit board are:

- IC 1 - Keyboard buffer
- IC 2 - EPROM (programme memory) 2716 D
- IC 3 - Address latch (octale 3-state D-latch)
- IC 4 - CPU
- IC 5 - 4 to 10 decoder
- IC 6 - I/O expander
- IC 7 - NOR Gate 4001 BC for CPU reset and delay-1
NOR Gates for shift control (flip flop)-2
- IC 8 - NAND Gate for buzzer
- IC 9
- IC 10 - Inverter for driver circuit activation
- IC 11
- TRA1 - Transistor Array 2004C

The control circuit board includes the drivers for the motors and the hammer solenoid beside the control components (See G).

The plug arrangement is:

- Cone 1 Keyboard output Ze
- 2 Keyboard input Sp
- 3 Horizontal motor (printer)
- 4 Vertical motor (index)
- 5 Printer PCB
- 6 Power pack
- 7 Paper injector switch

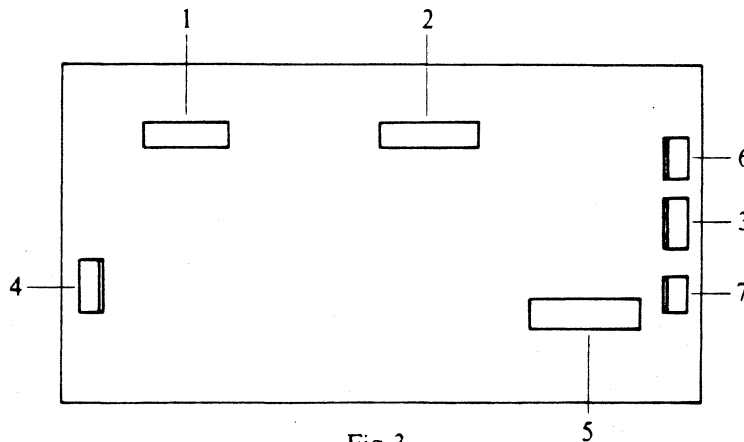


Fig-3

3.06 Delay circuit, Reset circuit (Circuit Diagram F)

Since the voltage UL +12V and then UC +5V are not soon available when switching on the machine, a switching-on delay circuit is effected to UC +5V which activates the motors and the hammer solenoid.

The CPU (IC 4) has H-level at its pin 33 and the NOR gate IC 7 at pin 13 when the machine is switched on. During increasing of the UL to +12V, the Zener diode ZD 1 gives 4.5V (UL-7.5V) to the base of transistor Tr 3. And its collector comes to L-level when the UL reaches 10V or more. The L-level goes to the pin 12 of NOR gate IC 7. The L-level is led to the base of Tr 31 from the output of IC 7 and the Tr 31 is opened. In the meantime Tr 6 for the driver circuit still keeps opening.

Then the capacitor C 2 is charged, the reset input pin 4 of CPU comes to H-level and the CPU initiates its programme. After the CPU has initiated the programme, the pin 33 comes to L-level and the pin 13 of IC 7 also comes to L-level. The output of IC 7 comes to H-level. Then the transistor Tr 31 and Tr 6 open and the control voltage +5V is switched through to the driver circuit.

When the machine is switched off or when the UL drops below 9V, Tr 3 opens and pin 12 of IC 7 comes to H-level. The output of IC 7 comes to L-level. Then the transistors Tr 31 and Tr 6 open and the control voltage +5V for the driver circuit is switched off.

The switched-through transistor (Tr 3) gives H-level to the base of Tr 4, which makes the pin 4 of CPU L-level via the reset line. Then the reset is effected by means of the capacitor C 2.

3.07 Shift (Circuit Diagram F)

The emitter of transistor Tr 1 has H-level from the CPU (IC 4) via the pin 9 of IC 5.

When pressing the shift lock key, +5V goes to the pin 1 of IC 7 via the cone 1 pin 9 and the cone 2 pin 1, and the flip flop is set. Since the output of flip flop comes to H-level and one of the TRA 1 is inverted, L-level goes to the LED via the cone 1 pin 10 and the LED lights on. In the meantime H-level goes to the keyboard diode D Ø via the collector of Tr 1 and cone 2 pin 3, and goes to the keyboard buffer IC 1 via the cone 1 pin 4. Thus the key scanning from CPU detects the shift lock key being depressed.

When one of the shift keys is depressed, +5V goes to the pin 6 of IC 7 via the cone 2 pin 1, and the flip flop is reset. Since +5V goes through the diode D 2 and inverts one of the TRA 1, L-level goes to the LED via the cone 1 pin 10 and the LED lights on. And the key scanning from CPU detects the shift key being depressed. While the shift key is depressed, the current keeps flowing via D 2 to TRA 1 and the LED keeps lighting on. However, the output of IC 7 keeps L-level.

When the shift key is released, the input of the IC 7 comes to L-level and the output is keeping its L-level. Since the base of Tr 1 comes to H-level and it opens, the LED has no voltage and lights off. In the meantime L-level goes to the keyboard diode D Ø via the cone 2 pin 3, and goes to the keyboard buffer IC 1 via

cone 1 pin 4. Thus the key scanning from CPU detects the shift key being not depressed.

3.08 Buzzer (Circuit Diagram F)

The buzzer is operated by a single shot multi-vibrator consisting of the lower 2 NAND gates of the IC 8.

The CPU (IC 4) applies a L-impulse to the multi-vibrator from the pin 34. A H-level is formed for about 0.5 second at the pin 3 of IC 8 and operates the oscillator (higher 2 NAND gates) which activates the buzzer BUZ via the transistor Tr 2.

3.09 Hammer solenoid, Impression (Circuit Diagram F)

The CPU (IC 4) applies continuously H-level to its pin 31. The base of T 29 comes to L-level via one of TRA 1. It locks and keeps the hammer solenoid. The pin 31 of CPU comes to L-level for character printing. The base of Tr 29 comes to H-level with +5V from Tr 6. Then the current from +36V flows to the magnet coil via the cone 5 pin a8 and to the collector of Tr 29 from another end of the magnet coil via the one 5 pin b7. Thus the striking of plunger for printing is activated.

After striking, the Zener diode ZD 6 limits the fly-back voltage to 51V.

The current flows the solenoid for constant printing is limited by the Tr 30 under the control of the Tr 29 base. The total printing impression can be adjusted by the variable resistor VR 1, which changes the volume of current flowing to the hammer solenoid.

Impression

The different type contour of characters is considered so that the current will flow to the hammer solenoid for a different time. It is divided into 3 stages:

- Normal : All normal capital and small letters and symbols.
- Strong : Large space letters (for example Ww Mm & \$).
- Weak : Small space symbols (for example ,.-_').

The necessary time for the concerned characters are filed in the ROM of CPU or EPROM. It controls the output time of L-level from the CPU.

The print impression can be selected with the slide switch on the keyboard according to the number of copies. It also controls the output time of L-level from the CPU.

- Position 1 Normal impression
No contact and therefore no signal to the CPU.
- Position 2 Higher impression
Slide switch contact S2 in the keyboard matrix is closed. The CPU detects it by key scanning as described in paragraph 3.03.

This makes the output time of L-level 0.38 ms longer from the pin 31.

- Position 3 Highest impression
Slide switch contact S1 in the keyboard matrix is closed. The output time of L-level is 0.59 ms longer.

3.10 Expander circuit

Since the 8039 (IC 4) has only 27 I/O lines, extension of the output lines port 20 ... 23 (pin 21 ... 24) is effected to the ribbon, vertical, typewheel and horizontal motors via the I/O expander IC 6.

The IC 6 has a programme port with one line, 4 input and 4 output ports each with 4 lines. The 4 output ports operate the driver circuit.

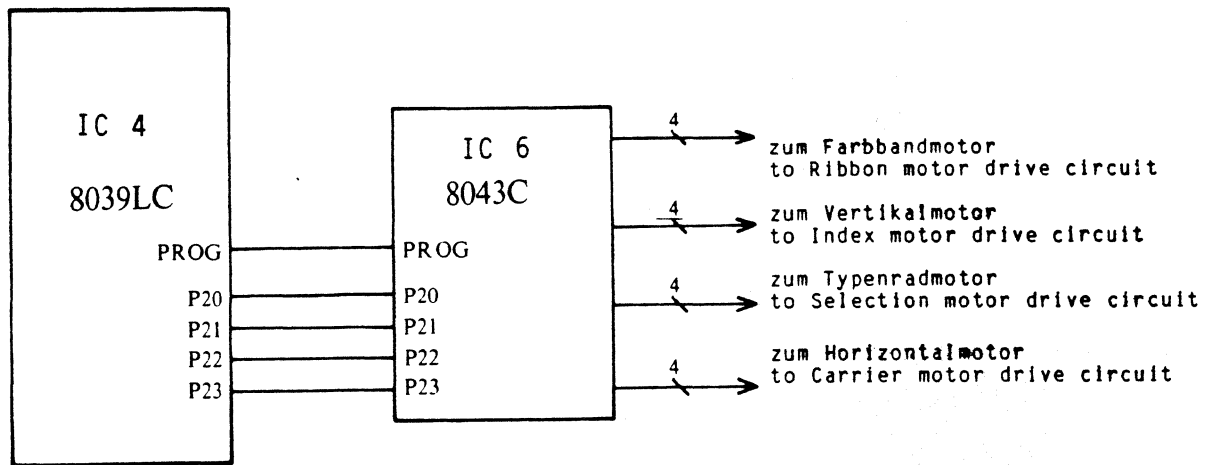


Fig-4

3.11 Motors, driver circuit

The stepping motors make movements with following step spaces:

Typewheel positioning

1 full step of motor = 3.6° = 1 spoke of typewheel

Horizontal positioning

1 full step of motor = 7.5° = $1/60$ in = 0.423 mm

6 full steps of motor = 1 pitch 10 cpi = 2.54 mm

5 full steps of motor = 1 pitch 12 cpi = 2.12 mm

4 full steps of motor = 1 pitch 15 cpi = 1.69 mm

Vertical positioning

1 full step of motor = 7.50 = 1/72 in = 0.3528 mm
 8 full steps of motor = 1 line spacing = 1/6 in = 4.23 mm
 12 full steps of motor = 1-1/2 line spacing = 1/4 in = 6.35 mm
 16 full steps of motor = 2 line spacing = 1/3 in = 8.46 mm

Ribbon motor

For cassette ribbon feed and lift,
 11 steps = 82.5° from basic position
 in both directions

For correction tape feed and lift,
 30 steps = 225° from basic position in one
 direction and back.

For the typewheel motor, a bit pattern is transmitted from the CPU via the port 10 ... 13 of IC 6 to the 4 control lines. It is inverted by the inverter IC 9 and switches on the basis of Tr 12 ... Tr 15. The motor works by changing the bit patterns in order.

Above description also applies to other stepping motors under the consideration of each switching time and driving device.

Bitmuster/Timing Chart

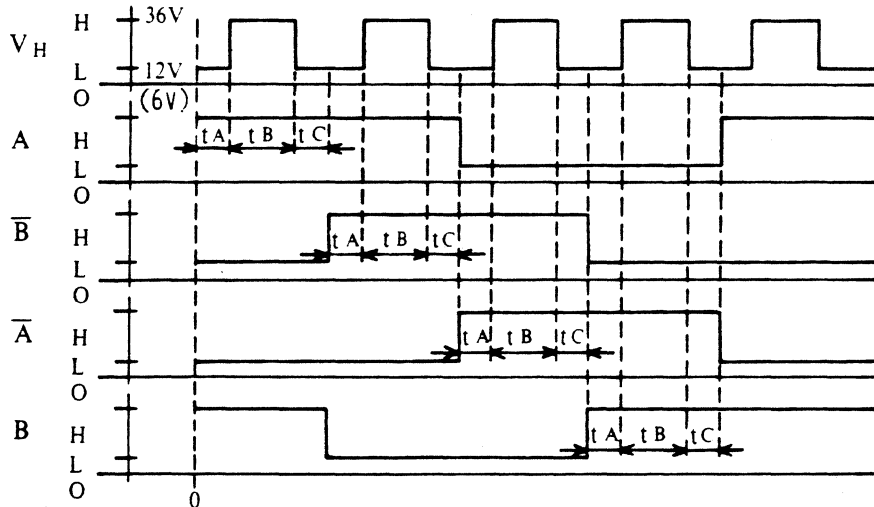


Fig. 5

$t_A = 10 \mu\text{s}$ const, $t_B = x \text{ ms}$ const, $t_C = 130 \mu\text{s} \dots 5 \text{ ms}$
 Typewheel motor $x = 500 \text{ ms}$, horizontal motor $x = 1.3 \text{ ms}$,
 vertical motor $x = 1.6 \text{ ms}$

The power control for motors is effected from the port 1 of CPU to the basis of Tr 8 ... Tr 11 via inverting in the transistor arrey TRA 1. Since the horizontal motor needs 3 different voltages, Tr 7 is activated exclusively for this motor.

During motor functioning the operation voltage switches continuously between VHH and VHL via the transistors Tr 7 ... Tr 11 (See Fig. 5).

Motors	Operation voltage		Keeping voltage
	VHH	VHL	
Typewheel motor	36 V	12 V	0 V
Horizontal motor	36 V	12 V	6 V
Vertical motor	36 V	6 V	0 V
Ribbon motor	36 V	6 V	0 V

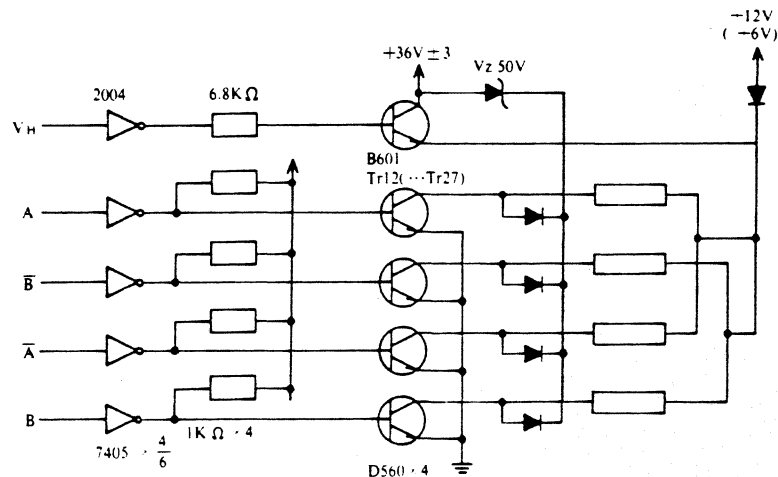


Fig. 6

3.12 Photo interrupters

The basic positions of the step motors except the vertical motor are detected by the CPU via the photo interrupters.

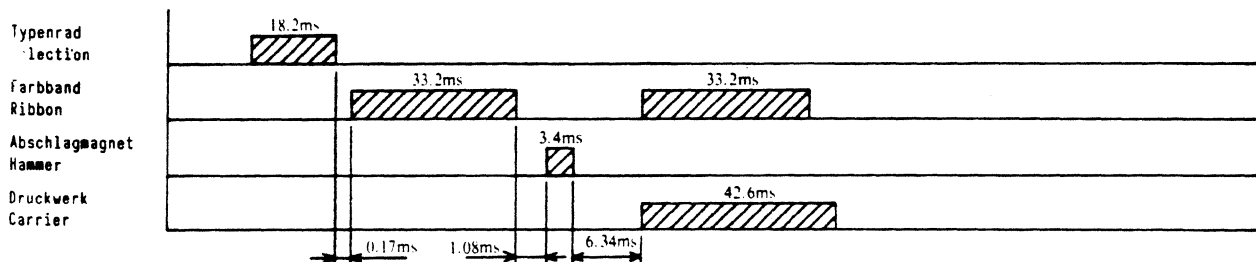
Motor	Photo interrupter
Typewheel motor	PH 3 on the printer head
Horizontal motor	PH 2 on the printer PCB
Ribbon motor	PH 1 on the printer PCB

When printer head is pulled backward for ejection of the typewheel, its arm releases the reset crank and the reset plate leaves the PH 2 (See Drawing B).

3.13. Character printing

After pressing a key (paragraph 3.03), the typewheel motor controlled by the CPU (paragraph 3.11) brings the typewheel to the position for printing of the selected character. The shortest turning distance from the last typewheel position will be selected. At the same time the ribbon lift and feed are effected by the ribbon motor. After a certain waiting time, the hammer solenoid is powered and strikes the plunger with the hammer and the typewheel spoke against the platen. Then the carrier transport starts the spacing step selected by the pitch selector slide switch. At the same time the ribbon is lowered. If no further signal of key operation follows, the typewheel turns back after 1.3 sec. to its home position (See Fig 7).

Typenabdruck/Typing



Korrektur/Correction

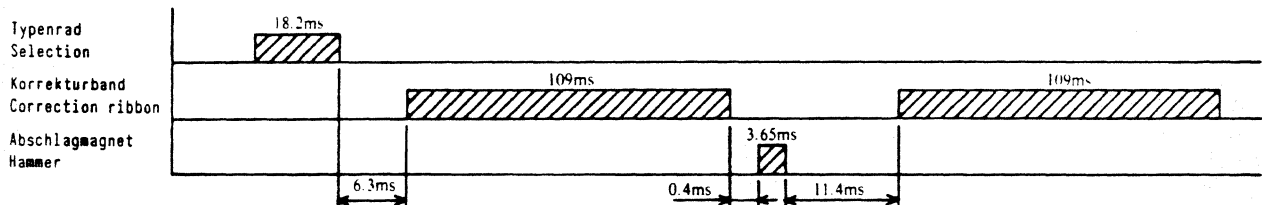


Fig-7

3.14 Ribbon transport, ribbon lift

The ribbon motor A1 moves from its home position 11 steps = 82.5° in one direction. The ribbon lift cam A2 swings the ribbon center guide-R B4 via the cam follower and the ribbon lift crank B5. The center guide-L is turned together by means of the tooth connection. Thus the ribbon is lifted to the printing position. The ribbon feed cam A5 moves the ribbon feed arm A6 via the cam follower and the cam lever A7. The ribbon feed arm pushes the finger plate, so that the feed wheel A8 turns counterclockwise. The ribbon is transported by the rubber roller A9. The ribbon feed spring A10 turns the ribbon feed pulley A11 and the used ribbon is wound up. After printing, the ribbon motor turns back its home position. For

the next character printing, the motor will move 11 steps in the opposite direction.

The ribbon change lever A12 can sense the type of ribbon cassette. If a normal carbon ribbon cassette is used, the arm of ribbon change lever gets into a opening of the cassette and enables the full stroke of the ribbon feed arm A6 for 4 teeth on the feed wheel A8. In the meantime, the multi-carbon ribbon cassette has no opening on the referring section it pushes the ribbon change lever, so that the transport stroke will be 1 tooth only.

3.15 Correction tape transport and lift

When pressing the correction key, the information from the keyboard matrix is transmitted to the CPU (paragraph 3.03). The typewheel motor and the ribbon motor are activated according to the 46-correction memory stored in the RAM range.

The ribbon motor turns counterclockwise 30 steps = 225° from its basic position. The correct cam A13 lifts the correct arm A14 at the end of the movement. At the same time the correct feed pawl A15 feeds the correct feed ratchet A16 and the correction tape is transported. The brake spring A17 keeps the correction tape tension at the correct tape spool.

After the correction performed, the ribbon motor turns back to its home position.

3.16 Paper feed

If the paper bail shaft is pulled forward beyond its pressure point for activating of the paper feed, the angle of right paper bail arm closes the first contact S 10 of the paper feed switch.

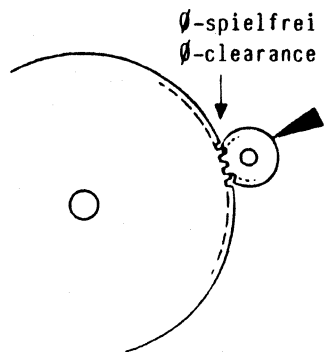
The key scanning by the CPU transmits H-level via the decoder IC 5, connector 7 pin 1, switch S 10, buffer IC 1 to the input pin 17 of CPU (see paragraph 3.03). Then the horizontal motor activated in single function.

When pulling the paper bail further forward, the second contact is closed. H-level is transmitted via the cone 7 pin 3, switch S 11 buffer IC 1 to the input pin 19 of the CPU. Thus the horizontal motor is activated in repeat function.

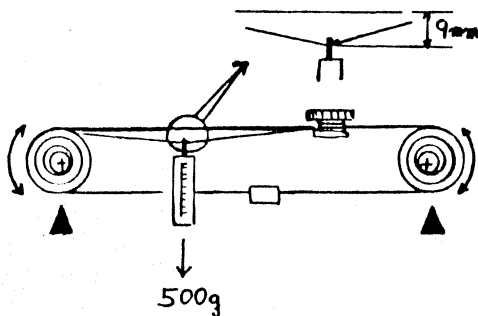
The horizontal motor drives the platen via the drive gear, drive pulley, drive cog belt and platen pulley.

The index key (forward) and the reverse index key (backward) activates the corresponding platen movement via the contacts on the keyboard matrix.

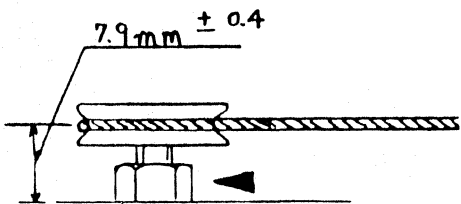
4.01 Chassis, horizontal drive



Function/assembly : Horizontal motor
 Clearance between : Pinion of horizontal motor / Drive pulley
 Clearance : \emptyset mm, \emptyset -clearance
 Adjustment : Repositioning of horizontal motor
 Note : Motor must have slight heaviness at 4 points of way of printer by manual movement of the drive wire.

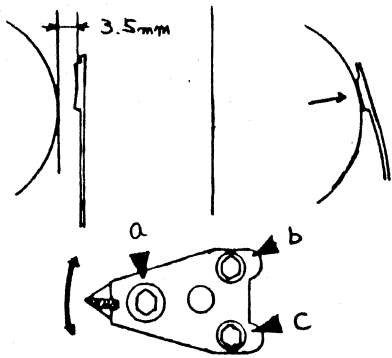


Function/assembly : Tension of drive wire
 Clearance : 9 mm slack by 5 N (500g) load
 Adjustment : Both tension pulleys should be adjusted equally (symmetrically) to outside
 Note : The wire must be parallel to the chassis support. For assembly see 5.08
 Gauge : Spring balance



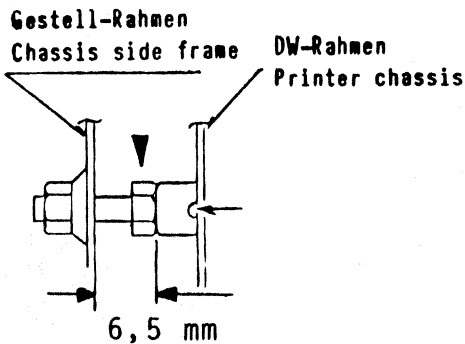
Function/assembly : Drive wire / Chassis support
 Clearance : 7.9 ± 0.4 mm
 Adjustment : Adjust the eccentric bearing screw after slacken-off the nut.
 Note : The height of both tension pulleys should be even so that the wire will be parallel to chassis support.

4.01 Chassis, horizontal drive

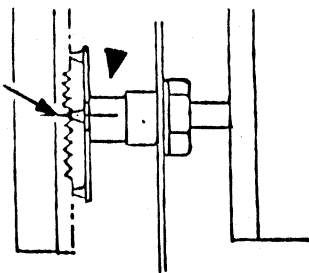


Function : Printing, type distance
 Clearance between : Typewheel / Platen
 Clearance : 3.5 mm
 Adjustment : At adjustplate even left and right by slacken-off the set screws
 Screw c is fixed fulcrum, screws a and b must be loosed

Function : Motion adjustment
 Clearance : Printout uniform of complete characters
 Adjustment : Screw b is fixed fulcrum, screws a and c must be loosed.

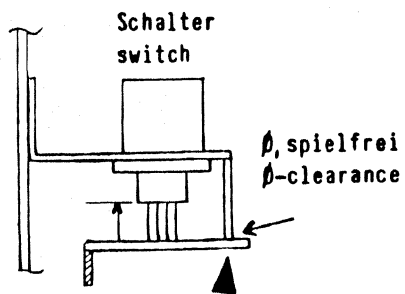


Function/assembly : Final position of printer / Chassis frame
 Clearance between : Chassis frame outside / Adjust screw
 Clearance : $\approx 6,5$ mm
 Adjustment : Screw on $\approx 6,5$ mm. Position the printer to the left end so that the guide hole of reset plate will be hidden half. Excite the horizontal motor (see 4.05.1) and adjust the screw again so that the guide hole will be hidden half.

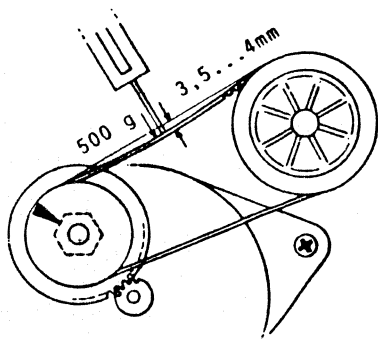


Function : Line space detent
 Clearance between : Platen pulley / Variable spring
 Clearance : When vertical motor is excited (see 4 05.1), the tips of the variable spring must engage in teeth of platen pulley.
 Adjustment : Excite the vertical motor, slacken off the nut (spanner size 17 mm), turn the bushing (spanner size 10 mm) of variable spring.

4.02 Chassis, paper injector

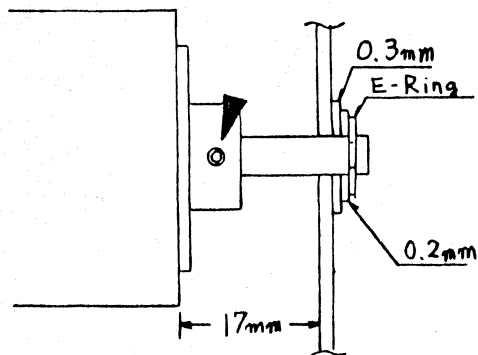


Function/assembly : Paper injector switch
 Clearance between : Paper injector switch final position / Paper bail arm right
 Clearance : 0 mm, contact
 Adjustment : Adjust the paper bail arm right
 Note : If switch is pressed into second stage, the paper bail arm must contact the switch holder just before final position.



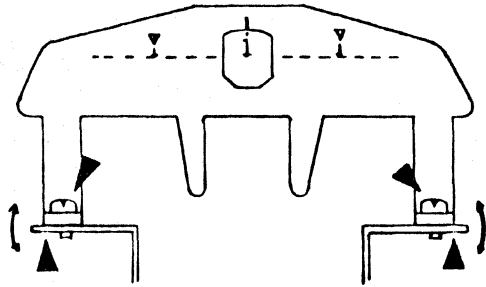
Function/assembly : Tension of drive belt / Vertical drive pulley
 Clearance : 3.5 ... 4 mm slack at 5N (500g) load
 Adjustment : At eccentric bearing screw and nut (spanner size 13 mm)
 Note : Ensure detent of platen and engagement of motor pinion / drive pulley

Function : Vertical motor pinion / drive pulley
 Clearance : 0.1 mm backlash
 Adjustment : Repositioning of vertical motor
 Note : Motor must be able to be rotated by hand freely.

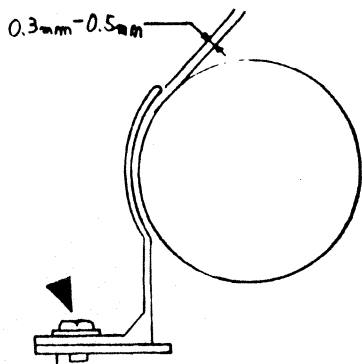


Function/assembly : Platen / Chassis plate
 Clearance between : Right side of rubber portion / inside of chassis plate
 Clearance : 17 mm distance
 0.02 mm lateral play of platen
 Adjustment : 2 set screws right and 2 set screws left on platen

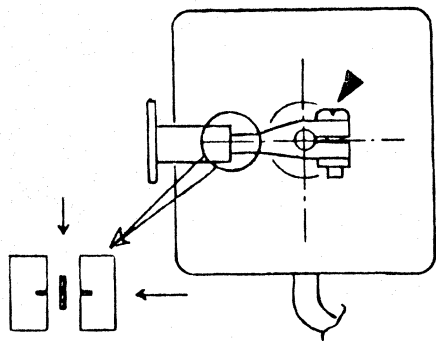
4.03 Printer



Function/assembly : Line locator / Printer chassis
 Clearance between : Line locator / typing line
 Clearance : Adjust after typing lilili lilili
 Adjustment : Lateral : Repositioning after slacken-off the screws
 Height : Forming the arms of printer chassis

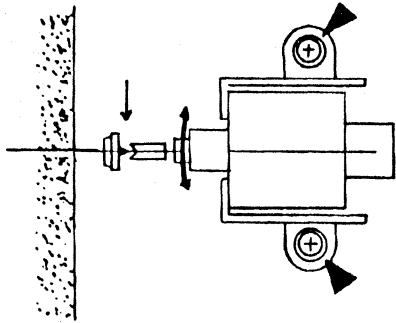


Function/assembly : Line locator
 Clearance between : Line locator / platen
 Clearance : 0.3 ... 0.5 mm
 Adjustment : Repositioning of the line locator



Function/assembly : Typewheel motor / Photo interruptor
 Clearance : Position detector must be in the middle of the light barrier if motor is in home position.
 Adjustment : Repositioning of position detector
 Note : Excitation of typewheel motor (see 4.05.1)

4.03 Printer



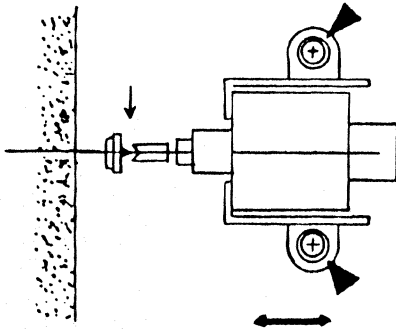
Function/assembly : Printerhead, hammer solenoid

Clearance between : Hammer / Typewheel

Clearance : The notch of hammer must strike the prism of the spoke central.

Adjustment : Excitation of typewheel motor (see 4.05.1) and
Repositioning of solenoid bracket

Note : Ensure printout of complete characters (see 4.01.1, 4.03.5).
A clearance of typewheel must exist.



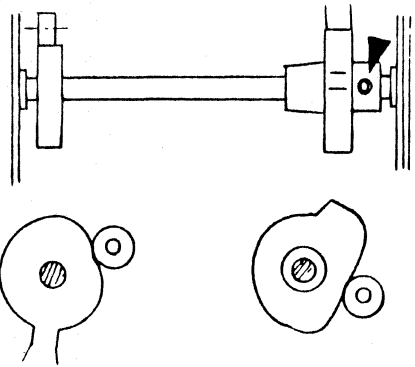
Function : Printing

Clearance : Printout uniform of complete characters (see 4.01.1)

Adjustment : Excitation of typewheel motor (see 4.05.1)
Repositioning of solenoid bracket
Move the hammer forward to the platen: bottom of characters
darker
Move the hammer rearwards: top of characters darker

Note : A clearance of typewheel must exist.

4.04 Printer, Ribbon/Correction Ribbon

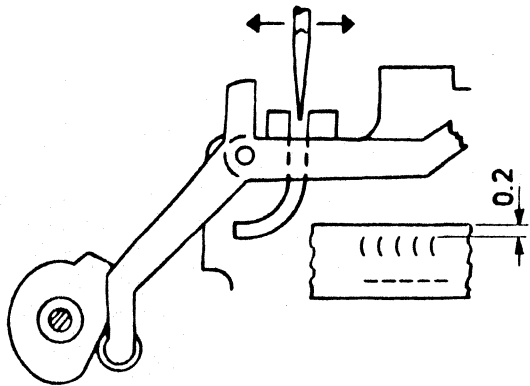


Function/assembly : Ribbon lift cam, ribbon feed cam / printer chassis

Clearance : Home position see drawing

Adjustment : Excitation of ribbon motor (see 4.05.1), 3 socket screws
slacken-off
Repositioning of the ribbon lift cam

Note : Center position is reached, if height of two strokes is equal.



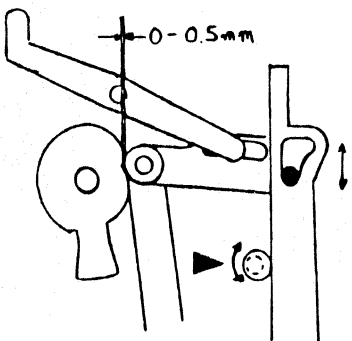
Function/assembly : Ribbon height / printer head

Clearance between : Upper edge of carbon ribbon / printout of characters

Clearance : min. 0.2 mm at ((pica

Adjustment : By forming the bearing arm of center guide lift crank.
Widening of adjusting slot raises carbon ribbon.
Narrowing of adjusting slot lowers carbon ribbon.

Note : Underscoring stroke must impact on carbon ribbon.
Bottom edge of raised carbon ribbon must overlap top edge of correction ribbon.



Function/assembly : Follower arm home position / cam shaft (feed cam)

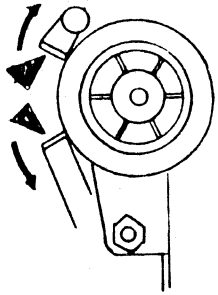
Clearance between : Cam shaft / Cam follower

Clearance : 0 ... 0.5 mm

Note : In basic position

Adjustment : With eccentric screw at printer chassis

4.04 Printer, Ribbon/Correction Ribbon

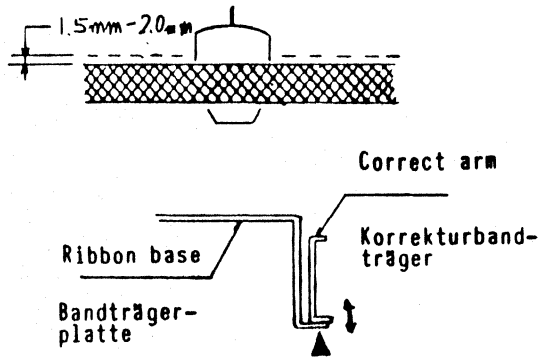


Function/assembly : Ribbon feed / ribbon base

Clearance : Ribbon feed gear
 4-2/3 teeth for correctable carbon ribbon
 1-2/3 teeth for multicarbon ribbon

Adjustment : See fine-adjustment of follower arm home position (4.04.3).

Note : Following multicarbon ribbon adjustment correct if necessary.

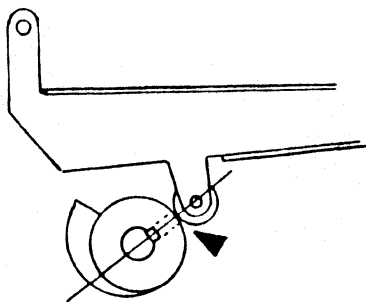


Function/assembly : Correction ribbon - basic position

Clearance between : Edge of the ribbon / line locator scale

Clearance : 1.5 ... 2.0 mm

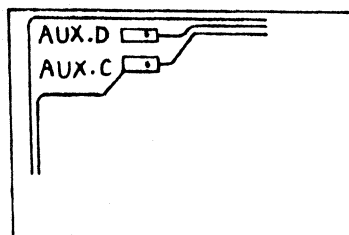
Adjustment : By forming the stopper portion on right side of ribbon base



Function/assembly : Correction ribbon lift

Adjustment : Excitation of ribbon motor (see 4.05.1)
 Repositioning of correct cam so that neutral surface
 of cam contacts the cam follower of correct cam

4.05 Motor excitation, impression, resistance of coils

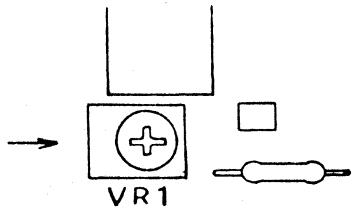


Function/assembly : Stepping motors / Keyboard PCB

Adjustment : Excitation (hold at the stepped point) of all stepping motors with lower voltage VHL (see 3.11) for mechanical adjustments

Release : By shorting the contact points Aux D and Aux C under surface of keyboard PCB at right side of keyboard (with metal tape)

Note : Excitation of motors should be completed within 10 min, or the motors will heat up!



Function/assembly : Impression / Control PCB

Adjustment : Variable resistor VR 1 on control PCB
Turning clockwise: Higher impression
Turning counterclockwise: Lower impression

Resistance of coils :

Typewheel motor	18 Ohm
Horizontal motor	18 Ohm
Vertical motor	36 Ohm
Ribbon motor	36 Ohm
Hammer solenoid	7 Ohm

(at each winding)

5. Disassembly and assembly

5.01 Housing

1. Pull out the platen knob and remove the top cover.
2. Loosen the bottom pan fastening screws (2 pcs) at the rear side of the main cover.
3. Latch off the main cover from the bottom pan by pressing both lower sides of the main cover at the same time. Remove the main cover by lifting off from the right side.
4. Remove 4 nuts which fasten the chassis to the bottom pan.
5. Assemble in the reverse sequence.

5.02 Printer

1. Remove the housing.
2. Remove the keyboard assembly if necessary (see 5.10).
3. Disconnect the flat cable from the control board and remove the cable clamps.
4. Remove the wire holder set screws (2 pcs) from the bottom of the printer.
5. Remove the right side adjust plate after removing the screws and washers.
6. The printer unit will be removed from the guide shaft by pulling it out to right.
7. Assemble in the reverse sequence. Adjustment of ring and cylinder by the adjust plate is required after the installation (see 4.01.4)!

5.03 Ribbon mechanism

1. Remove the top cover.
2. Remove the ribbon feed spring B 10 and correct arm spring A 3.
3. Remove the ribbon base set screws (3 pcs) and a nut.
4. Remove the ribbon base unit from the printer.
5. Assemble in reverse sequence.

5.04 Printer head

1. Remove the ribbon base unit (see 5.03).
2. Unhook the toggle lever spring A 4 from the printer chassis.
3. Disconnect from printer PCB the connector sockets wired from the typewheel motor, hammer solenoid and photo-interrupter.
4. Remove the printer head unit after loosening the center screw and nut.
5. Assemble in the reverse sequence. Adjust the play between the center screw and the head frame shaft so that the printer head functions properly without any rickety.

5.05 Typewheel motor

1. Remove the printer head assembly (see 5.04).
2. Take the lead wires off the slits of printer head frame.
3. Remove the photo-interrupter B 10 by slacking-off set screw.
4. Remove the nut B 6 on right hand. Pull out the head frame

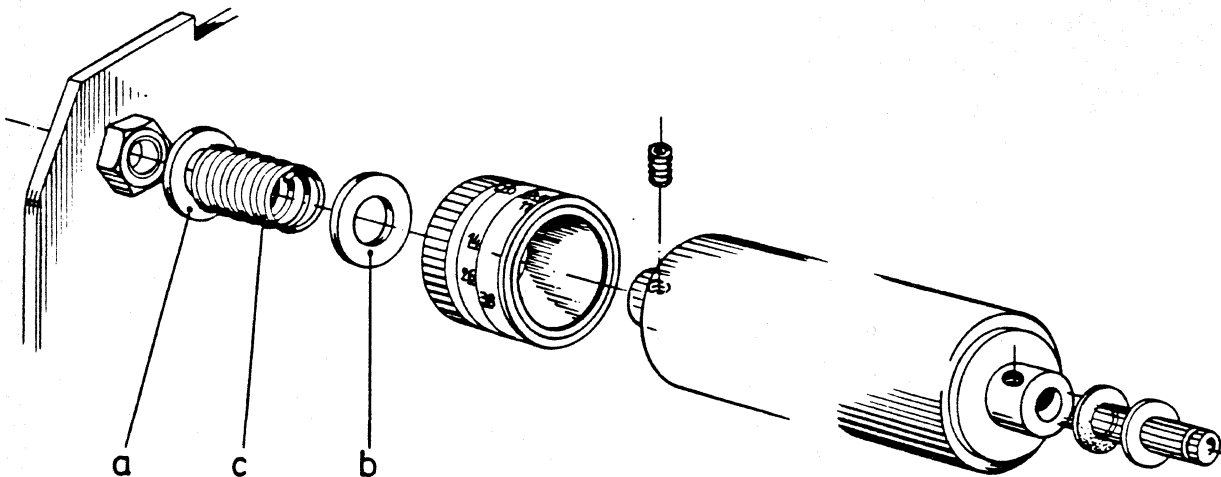
- shaft B 9 to left and remove the spacer B 7.
5. Remove the motor set nuts (3 pcs).
6. Remove the typewheel motor by pressing downward.
7. Assemble in the reverse sequence. Adjustment of positioning typewheel motor and photo-interrupter will be required (see 4.03.3).

5.06 Printer PCB, Flat Cable

1. Remove the printer assembly (see 5.02).
2. Remove the ribbon motor A 1 by slacking-off 2 screws and disconnect the connector socket 13 from the printer PCB.
3. Remove the cam shaft B 5 if it was not removed together with the ribbon motor.
4. Disconnect the connector sockets from the printer PCB. Remove the shoulder screw and tooth washer.
5. The printer PCB may be removed.
6. After slacking-off the flat cable holder, remove the flat cable. Ensure to avoid bending and rubbing the flat cable.
7. Assemble in the reverse sequence. Check the positioning of photo-interrupters.

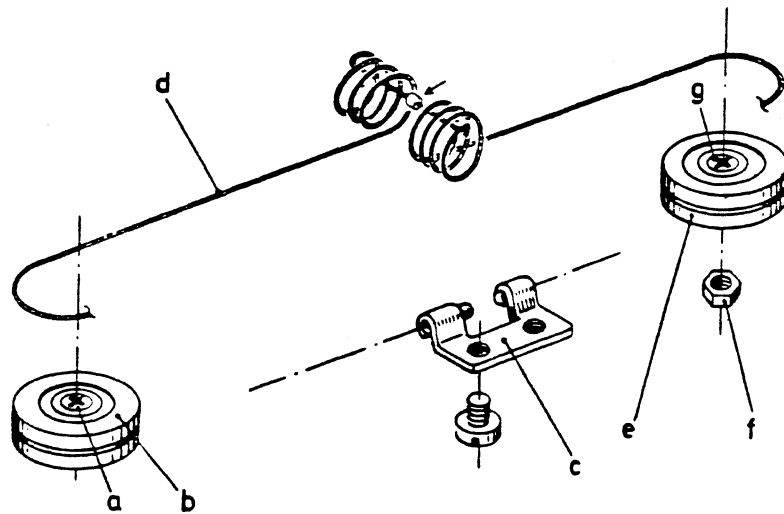
5.07 Platen

1. Move the paper end gauge to left and slacken-off the platen socket screws (2 pcs).
2. Pull out the platen knob comp. to left.
3. Remove the paper end gauge with washer and spring.
4. Remove the platen shaft set c-clip on the right side.
5. Lift off the platen to upper left.
6. Assemble in the reverse sequence. Ensure for adjustments 4.02.3.



5.08 Drive unit (wire and pulleys)

1. Remove the top cover.
2. Slacken-off the tension pulley set nuts left and right.
3. Slacken-off the drive wire by driving both eccentric tension pulley screws to the center.
4. Remove the drive wire from the wire holder and the tension pulleys.



5. Remove the drive pulley from the shaft after removing c-clip.
6. Pull the drive wire out of the drive pulley.
7. When assembling, ensure: The drive wire is divided into two parts by the metal stopper. Wind the longer end 3-1/2 turns clockwise and the shorter end 3-1/2 turns counter-clockwise around the drive gear. Ensure coils not crossed. When the drive wire is hooked around the tension pulleys, holding the wound wire by adhesive tape will be suggested.

5.09 Horizontal motor

1. Remove the housing.
2. Remove the keyboard unit (see 5.10).
3. Disconnect the connector cone 3 from the control PCB.
4. Remove the motor set screws (2 pcs) at rear of chassis.
5. Remove the motor from the bracket.
6. Assemble in the reverse sequence. Follow the adjustment for positioning motor in 4.05.1 !

5.10 Keyboard with control PCB

1. Remove the housing.
2. Remove the keyboard set screws (2 pcs) from the bottom pan.
3. Stand the keyboard up and disconnect the flat cable connector (cone 5) and 4 lead wire connectors (cone 3,4,6,7) from the control PCB.
4. Disconnect 2 flat cable connectors (cone 1,2).
5. Remove 4 control PCB set nuts and a tooth washer. Remove the board by holding edges.
Note: The control PCB should be wrapped up in conductive foil or aluminum foil for electrostatic shielding.
6. Assemble in the reverse sequence. Check all functions after the installation.

5.11 Key switch, Keyboard diodes

1. Remove the keyboard with the control PCB (see 5.10).
2. Pull out the individual key top straight upward.
3. Pull out the key switch straight upward after removing 2 soldered points on the reverse side of keyboard. 5 keys with repeat function have 4 soldered points.

4. The diode corresponding to each key will be accessible through the slit on the keyboard panel. Remove 2 soldered points of the diode.
5. Assemble in the reverse sequence.

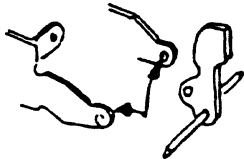
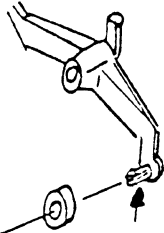
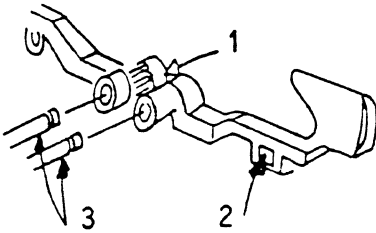
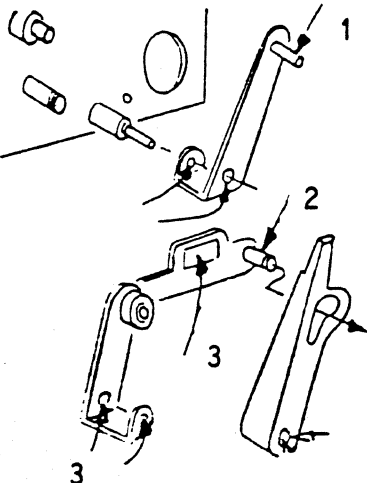
5.12 Power pack

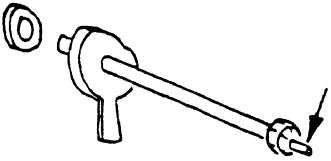
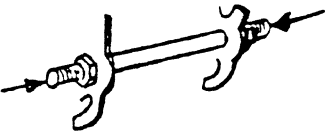
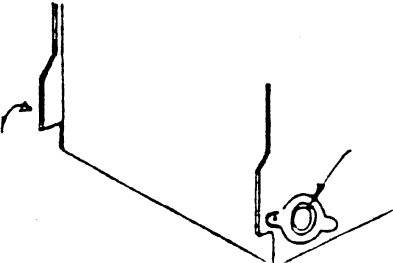
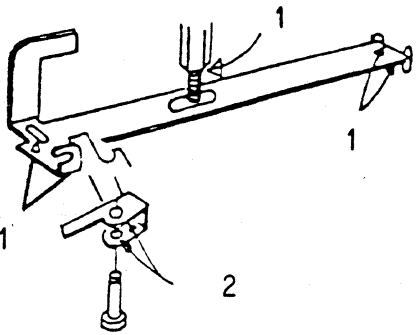
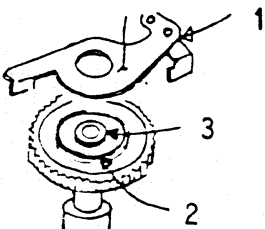
1. Disconnect the power supply cord from the outlet. Remove the housing.
2. Remove the switch cover by removing the switch cover set screw. Take out the switch and power inlet with wires.
3. Remove the wire clamps and disconnect the connector 6 from the control PCB (Remove the control PCB if necessary - see 5.10).
4. Remove the 4 power pack set screws located around the transformer.
5. Remove the power pack cover by slacking-off 2 set screws.
6. Remove the power pack from the bottom pan.
7. Assemble in the reverse sequence. Check electrical safety!

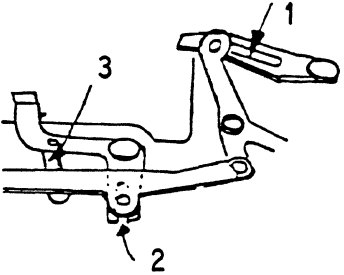
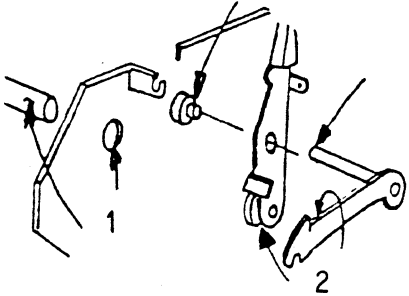

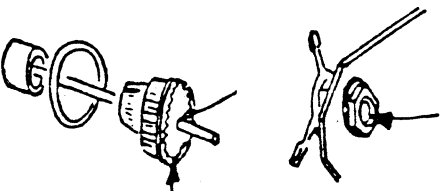
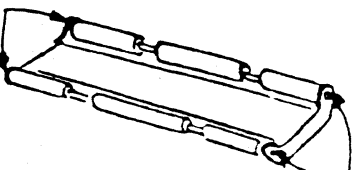
5.13 Fuses

1. Disconnect the power supply cord from the outlet. Remove the top cover.
2. Remove the power pack cover set screws (2 pcs). Remove the power pack through the room between the paper pan and the bottom pan.
3. Check the cause of the fuse functioned.
4. Assemble in the reverse sequence.

6. Schmierplan/Lubrication chart

	öl/Oil W	öl/Oil Mz	Fett/Grease FW	Fett/Grease F
 <p>Hammer-Lagerstellen Hammer bearings</p>			X	
 <p>Rolle am Farbband-Hubarm Roller at ribbon change lever</p>			X	
 <p>Farbbandheber (1 u. 2) Ribbon center guide Farbbandheber-Lagerstellen (3) Shaft for ribbon center guide</p>		X	X	
 <p>Farbbandtransport (1) Lagerstellen (2 u. 3) übrige Stellen Ribbon transport (1) pins, slot (2 & 3) other holes</p>	X		X X	X X

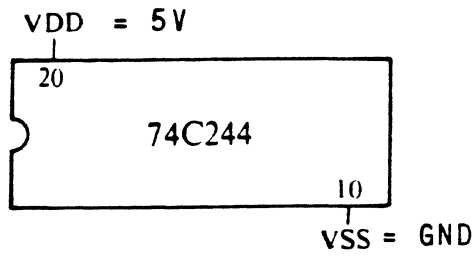
	Öl/Oil W	Öl/Oil Mz	Fett/Grease FW	Fett/Grease F
 <p data-bbox="717 646 1175 714">Bandtransportkurve Lager Cam shaft</p>			X	
 <p data-bbox="717 932 1019 999">Druckerachse Head frame shaft</p>			X	
 <p data-bbox="717 1213 1140 1281">Druckwerk-Gleitbuchsen Carrier slide bushes</p>	X			
 <p data-bbox="717 1486 1055 1554">Steuerschieber (1) Reset plate</p> <p data-bbox="717 1579 1000 1646">Steuerhebel (2) Reset crank</p>		X	X	
 <p data-bbox="717 1827 1230 1927">Farbband-Schaltrad (3) Ribbon feed roller (1 u. 2)</p>	X		X	

	Öl/Oil W	Öl/Oil MZ	Fett/Grease FW	Fett/Grease F
<p>Bestellnummern/Reference Number W = 4/511/0041 F = 4/521/0044 Mz = 4/502/0021 FW = 4/521/0107</p>				
 <p>Kassettenhalte-Mechanismus (1, 2, 3) Cassette hold mechanism</p>			X	
 <p>Papierlöser (1 u. 2) Paper release</p> <p>übrige Lagerstellen other bearing points</p>	X		X	
 <p>Papierhaltearm-Rastung Paper bail arm right</p>			X	
 <p>Schreibwalzenlager links u. rechts Platen bearing left and right</p> <p>Walzenrastfeder Variable spring for platen</p>			X	X
 <p>Papierführungsrollen Paper feed roller</p>			X	
<p>Alle übrigen Lager- u. Gleitstellen And all other bearing and sliding points</p>	X			

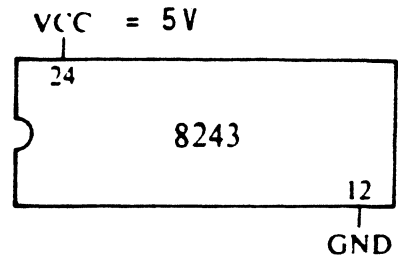
7. Trouble shooting

7.1 Supply voltage

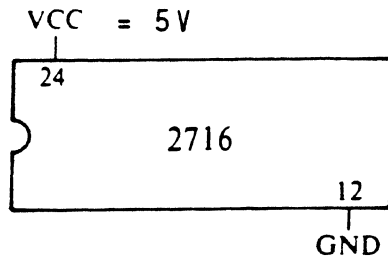
IC1



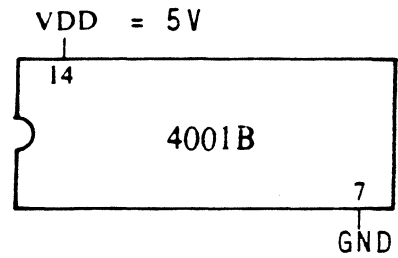
IC6



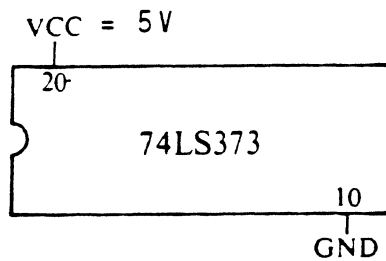
IC2



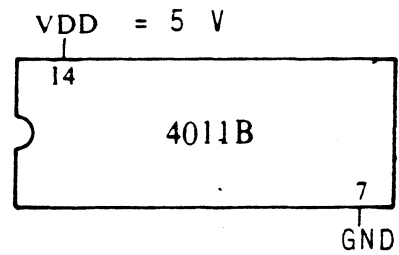
IC7



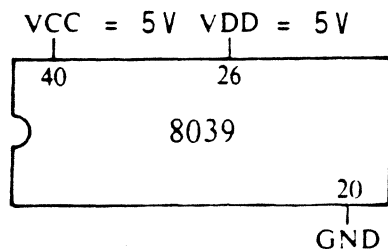
IC3



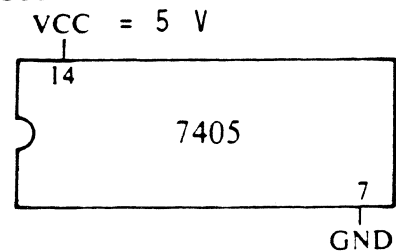
IC8



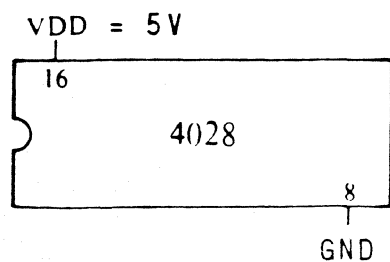
IC4



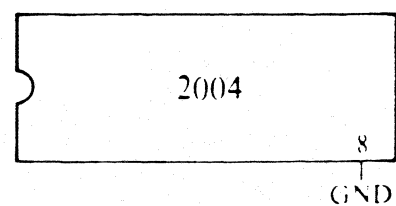
IC9..IC11



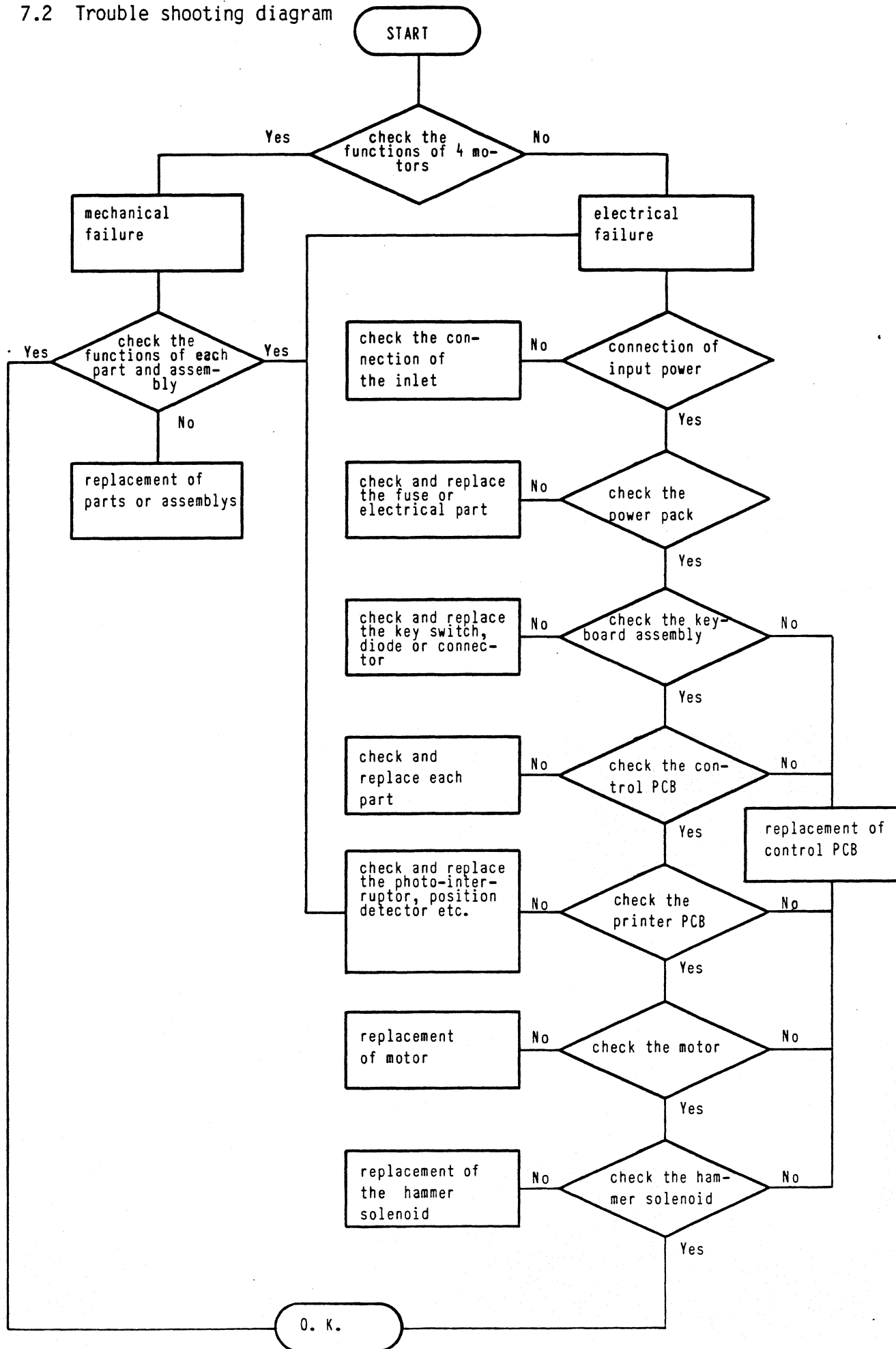
IC5



TRA1



7.2 Trouble shooting diagram



8. Acceptance check

1. Packing

Check the packing for signs of damage

2. Housing

Following the removal of the transit safety devices the housing should be checked for signs of damage

3. Operating controls

The operating controls such as the platen release lever, platen knobs, paper release lever, paper retaining bails etc. should be checked for signs of damage

4. Feed-in and transport of the paper

Check the correct feed-in and transport of the paper

5. Paper release

Check the paper release function. In the released setting it should be possible to reposition the original and four duplicates

6. Print

Commence the automatic reproduction of the range of characters by the simultaneous operation of the margin release and on/off keys, repeating this process for all the pitches and settings of the impression energy switch. During this process check the backspacing, printer return and correction functions.

7. Corrections

Corrections must be made so as to lift-off the complete character from the paper without leaving traces. The correction ribbon must transport one tooth and remain tensioned.

8. Ribbon lift/ribbon transport

Ribbon lift must take place correctly in both halves of the ribbon.

Check the transport of the ribbon for correction functioning depending on the type of cassette used.

9. Typewheel

Check the interchangeability and the freedom of movement of the typewheel

10. Keyboard functioning test

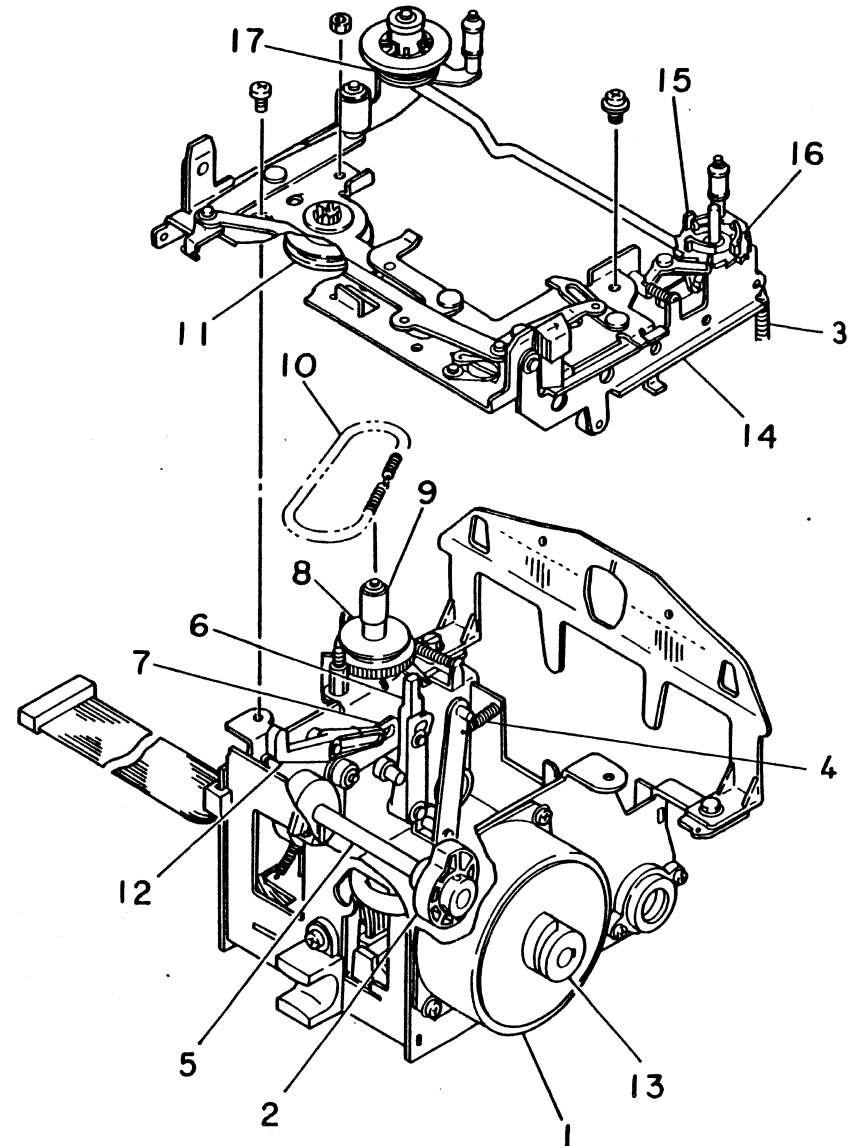
Check all the functions of the keyboard

Check :

- the operation of all keys, spacing trip, backspace key
- the shift and shift lock functions
- the set and clear functions of the tabulator

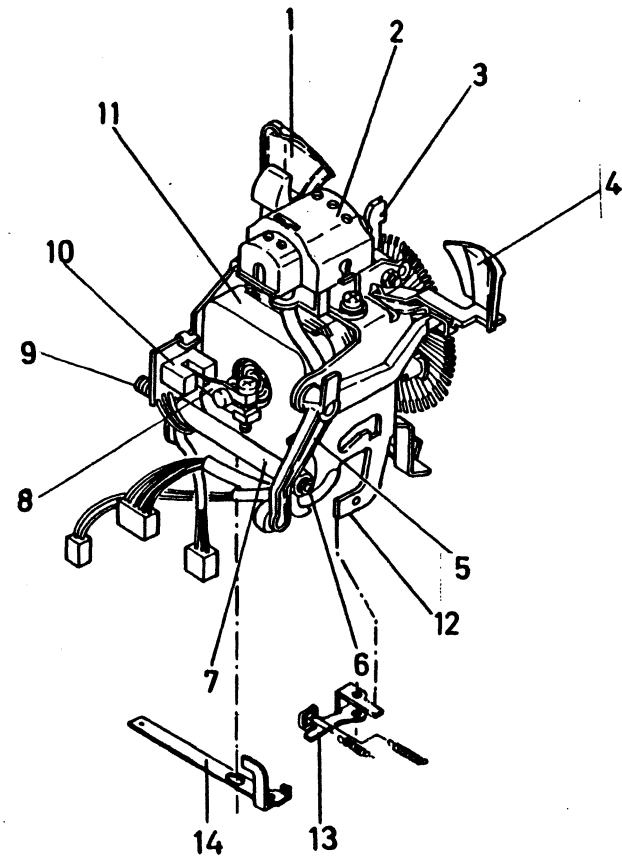
Farbbandhebung, -transport
 Ribbon lift, feed

- 1 Farbband Motor
Ribbon motor
- 2 Bandhubkurve
Ribbon lift cam
- 3 Zugfeder f. Korrekturbandträger
Correct arm spring
- 4 Zugfeder für Führungshebel
Toggle lever spring
- 5 Bandtransportkurve
Cam shaft
- 6 Transportarm
Ribbon feed arm
- 7 Koppel
Cam change lever
- 8 Bandschaltrad
Feed roller
- 9 Transportrolle
Rubber roller
- 10 Transportfeder
Feed spring
- 11 Transportrad
Ribbon feed gear
- 12 Transportwechsler
Ribbon change lever
- 13 Korrekturbandkurve
Correct cam
- 14 Korrekturbandträger
Correct arm
- 15 Transportklinke f. Korrektur
Feed pawl
- 16 Korrektorschaltrad
Correct feed ratchet
- 17 Bremsdrehfeder
Brake spring

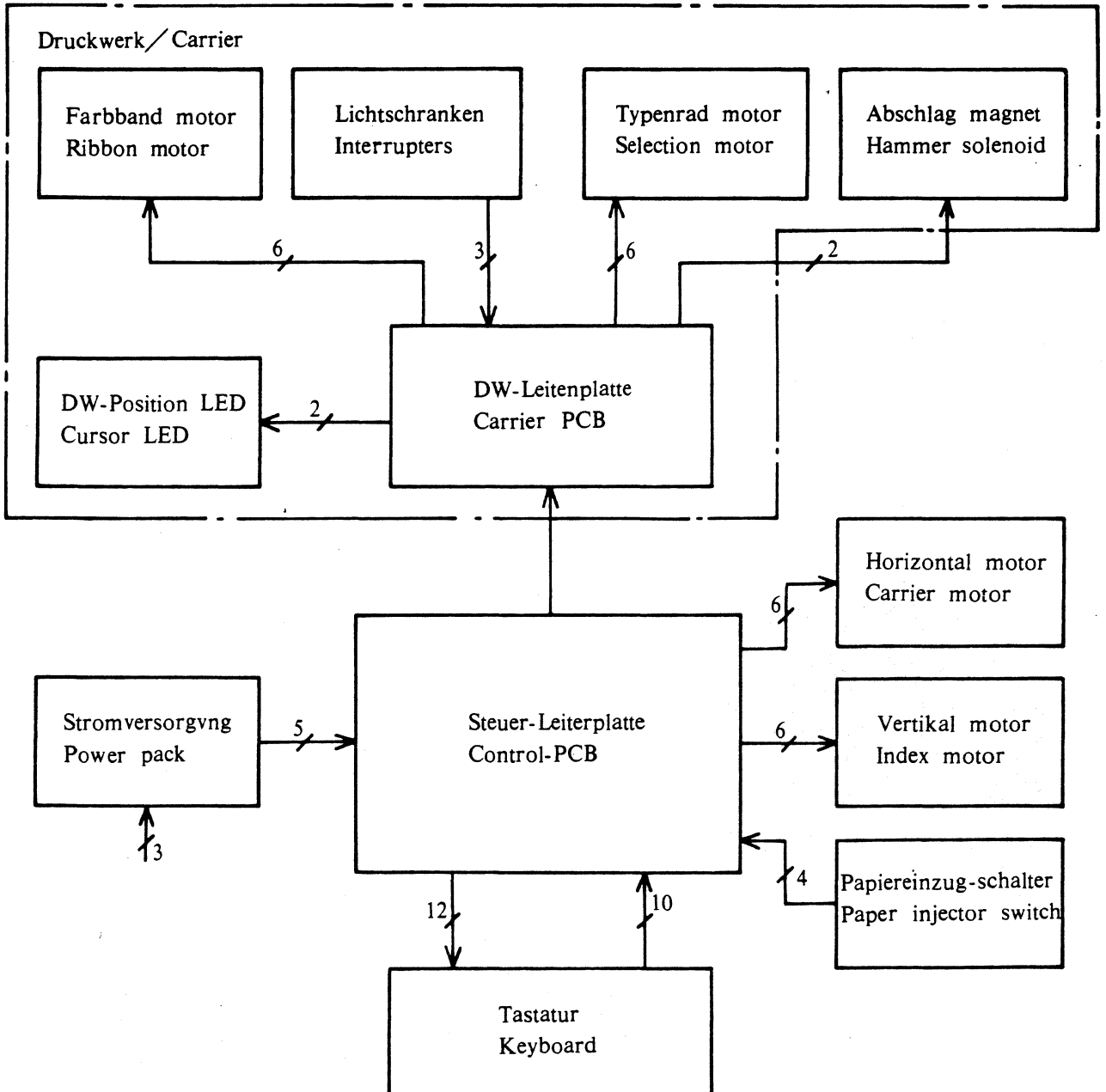


Druckwerkskern
Printer head

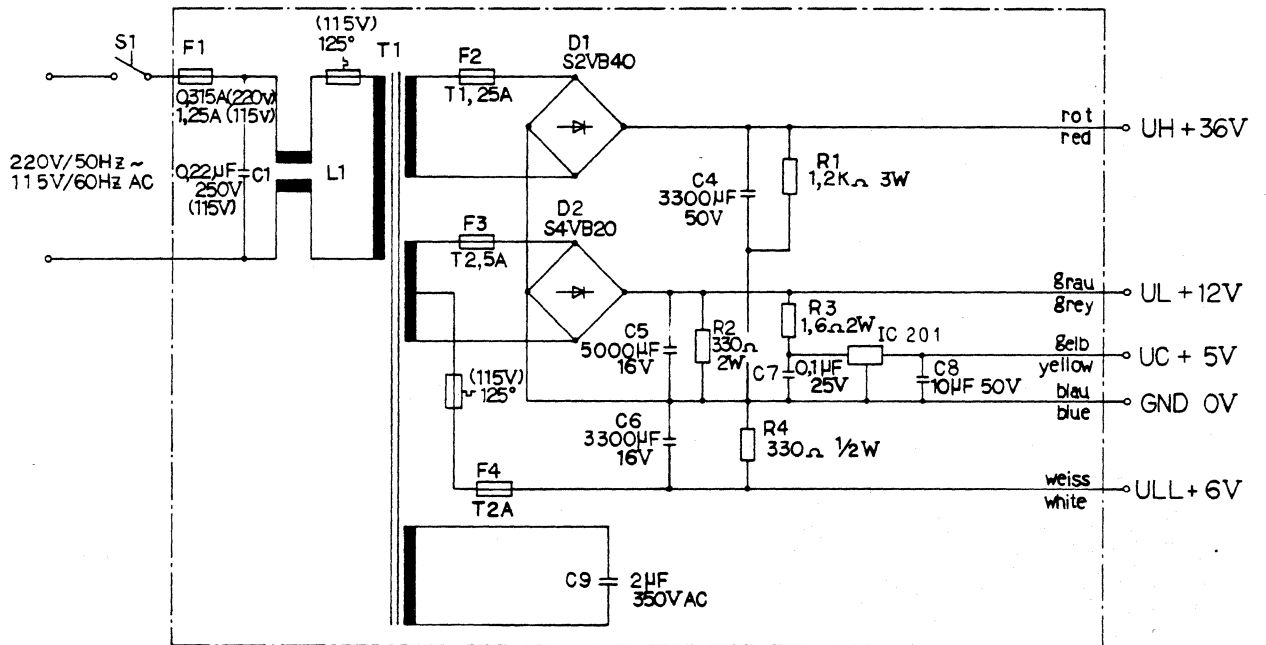
- 1 Farbbandheber links
Center guide left
- 2 Abschlagmagnet
Hammer solenoid
- 3 Hammer
hammer
- 4 Farbbandheber rechts
Center guide right
- 5 Farbbandhubarm
Center guide lift crank
- 6 Mutter
Nut
- 7 Distanzrohr
Spacer
- 8 Positionsfinder
Position detector
- 9 Druckerachse
Head frame shaft
- 10 Gabellichtschranke
Photo interrupter
- 11 Typenradmotor
Selection motor
- 12 Arm am Rahmen für
Druckwerkskern
Arm at printer head
chassis
- 13 Steuerhebel
Reset crank
- 14 Steuerschieber
Reset plate



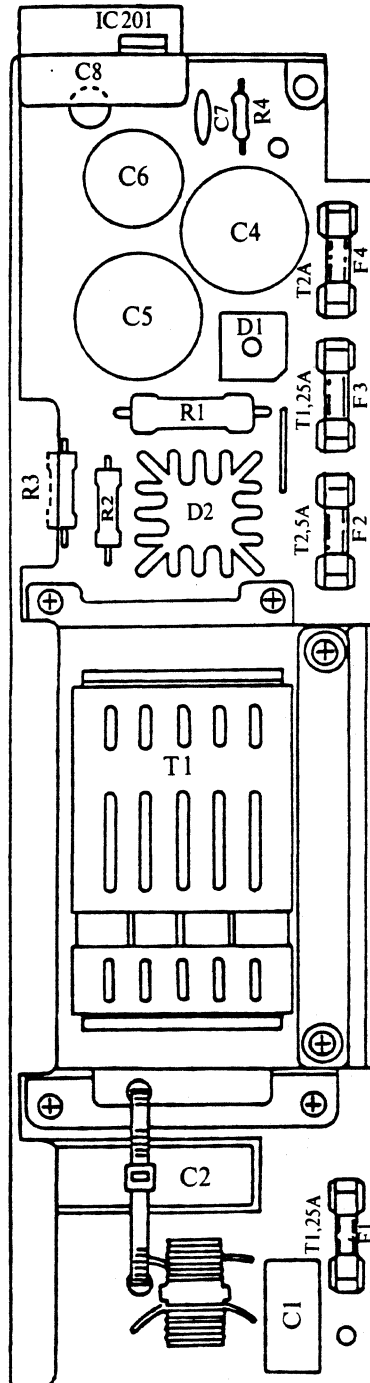
Blockschaltbild
Block circuit diagram



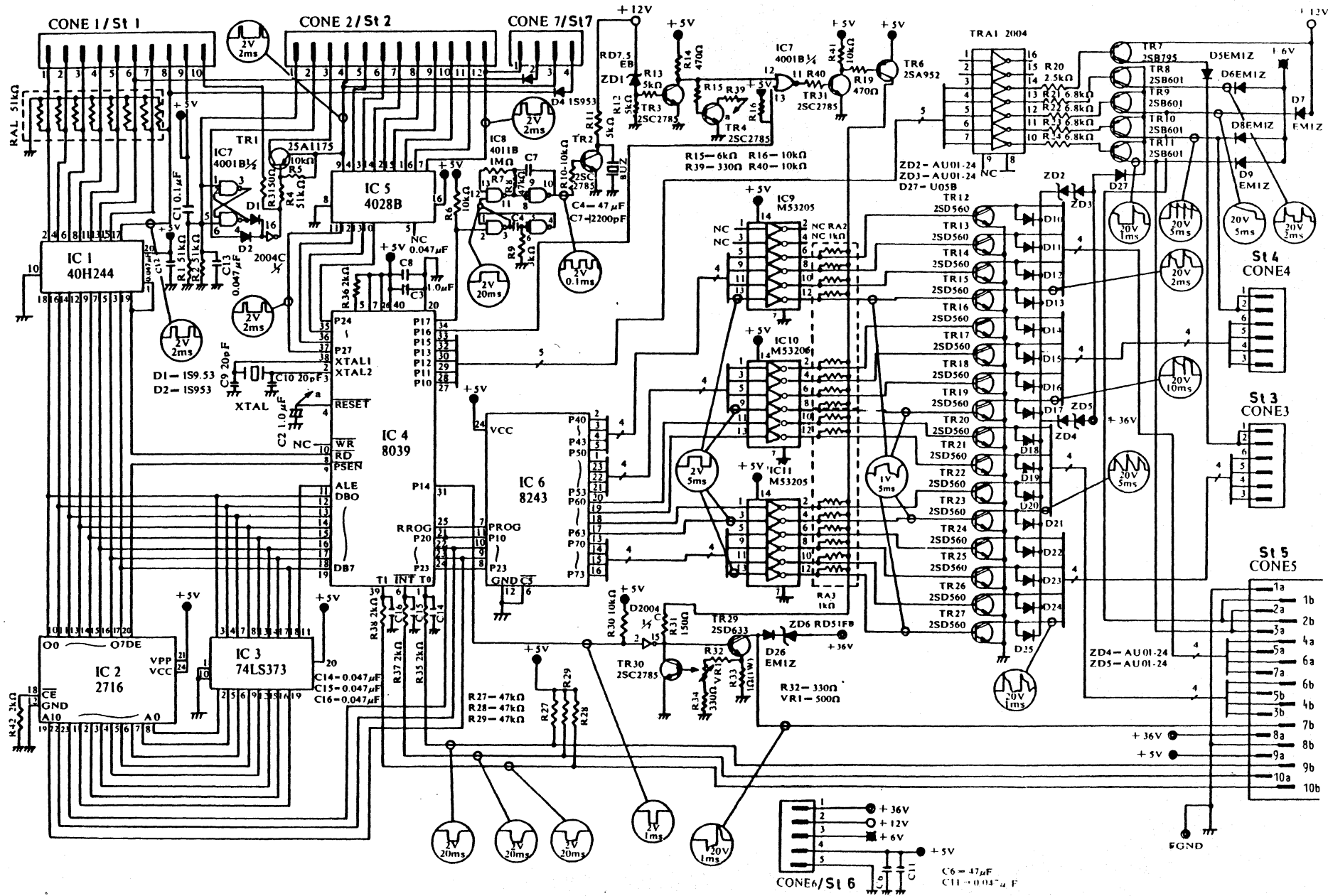
Stromlaufplan Stromversorgung
Circuit diagram power pack



Lageplan Stromversorgung
Layout of components, power pack

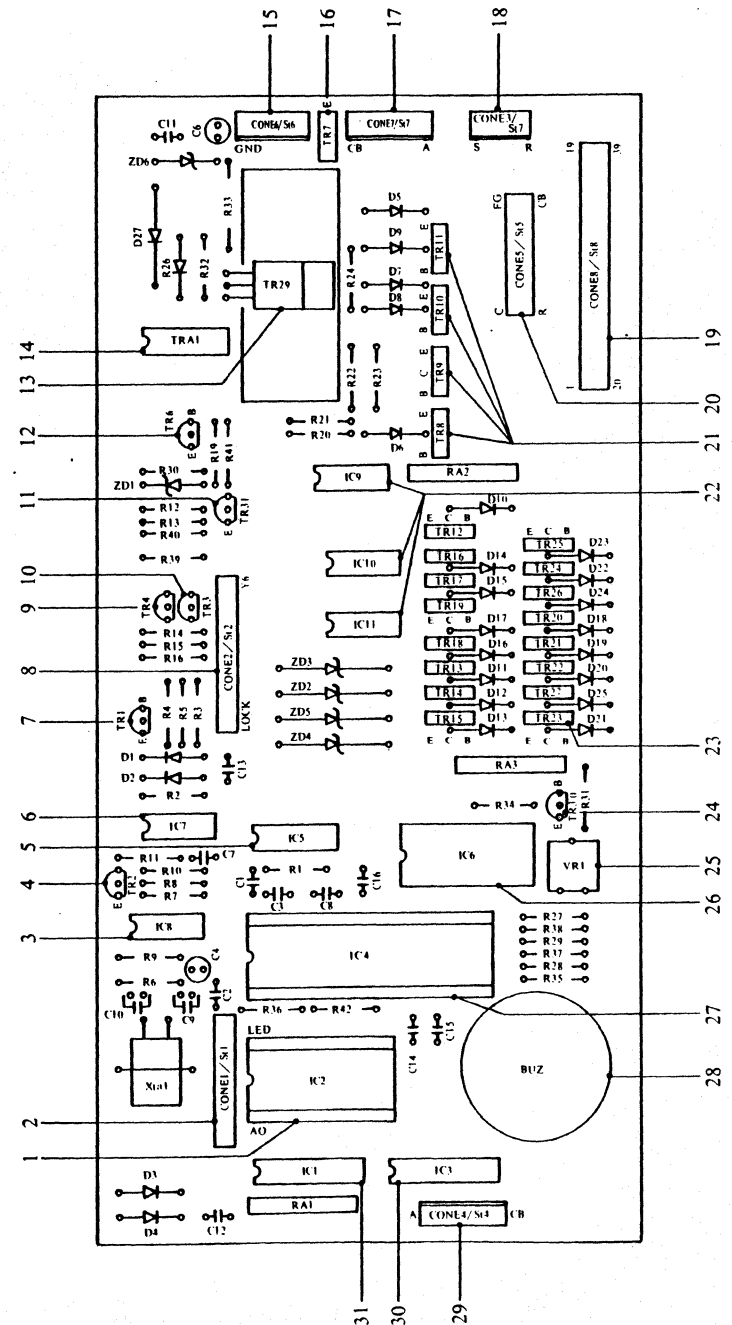


Stromlaufplan Steuer-Leiterplatte
Circuit diagram, control PCB

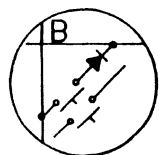
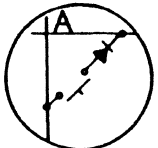
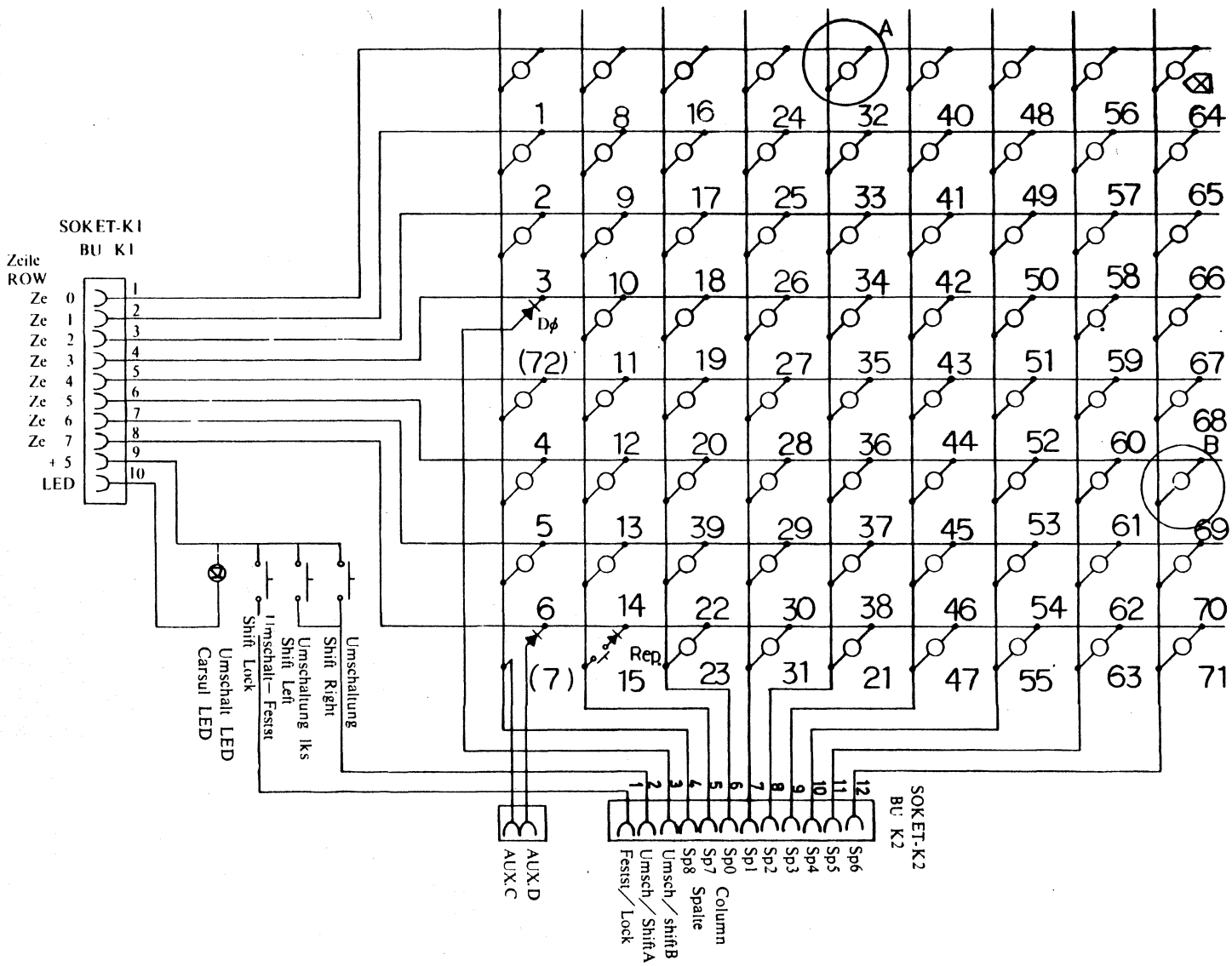


Lageplan Steuer-Leiterplatte
Layout of components, control PCB

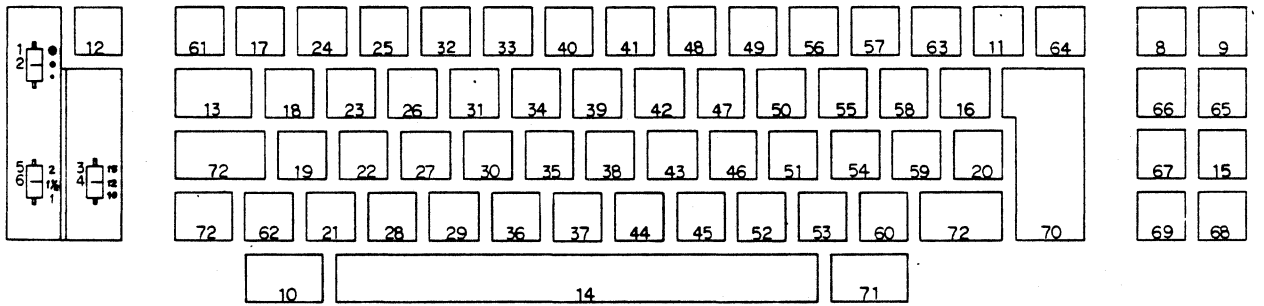
1	IC 2	EPROM
2	St 1 CONE 1	Stecker Tastatur Connector keyboard
3	IC 8	NAND-Gate Summer Buzzer
4	Tr 2	Summer-Transistor Buzzer-Transistor
5	IC 5	4 to 9 Decoder
6	IC 7	Input NOR Gate CPU reset
7	Tr 1	Transistor Umschaltung/Shift
8	St 2 CONE 2	Stecker Tastatur Connector keyboard
9	Tr 4	Transistor Reset CPU
10	Tr 3	Transistor 5 V-Verzögerung/Delay
11	Tr 31	Transistor 5 V-Verzögerung/Delay
12	Tr 6	Transistor 5 V-Verzögerung/Delay
13	Tr 29	Leistungstransistor Abschlagmagnet/Hammer drive transistor
14	TAR 1	Transistor-Array für Anpassung CPU an Leistungstransistoren Transistor-Array for matching CPU to power transistors
15	St 6 CONE 6	Stecker Stromversorgung Connector power supply
16	Tr 7	Transistor Transistor power down mode
17	St 3 CONE 3	Stecker Horizontalmotor Connector carrier motor
18	St 7 CONE 7	Stecker Papiereinzugsschalter Connector paper feed switch
19	St 8 CONE 8	Testanschluß für Leiterplatte Testpin for PCB
20	St 5 CONE 5	Stecker Druckwerks-Leiterplatte Connector carrier PCB
21	Tr 8...Tr 11	Leistungstransistoren Motoren Power transistors for motors
22	IC 9...IC 11	Inverter für Anpassung CPU an Motor-Treiberstufen Inverters for matching CPU to motor power transistors
23	Tr 12...Tr 27	Leistungstransistoren für Schrittmotoren Drive transistors for stepping motors
24	Tr 30	Transistor Abdruckkonstanz Constant current (impression)
25	VR1	Trimmer für Abdruckenergie Variable resistor for impression
26	IC 6	I/O Expander D 8243 C
27	IC 2	CPU 8 bit-Mikroprozessor 8039 CPU bit Microcomputer 8039
28	Buz	Summer/Buzzer
29	St 4 CONE 4	Stecker Vertikalmotor Connector indexmotor
30	IC 3	Octal 3-state latch für Adressen
31	IC 1	Tastaturbuffer (Octal 3-state bus buffer) for keyboard



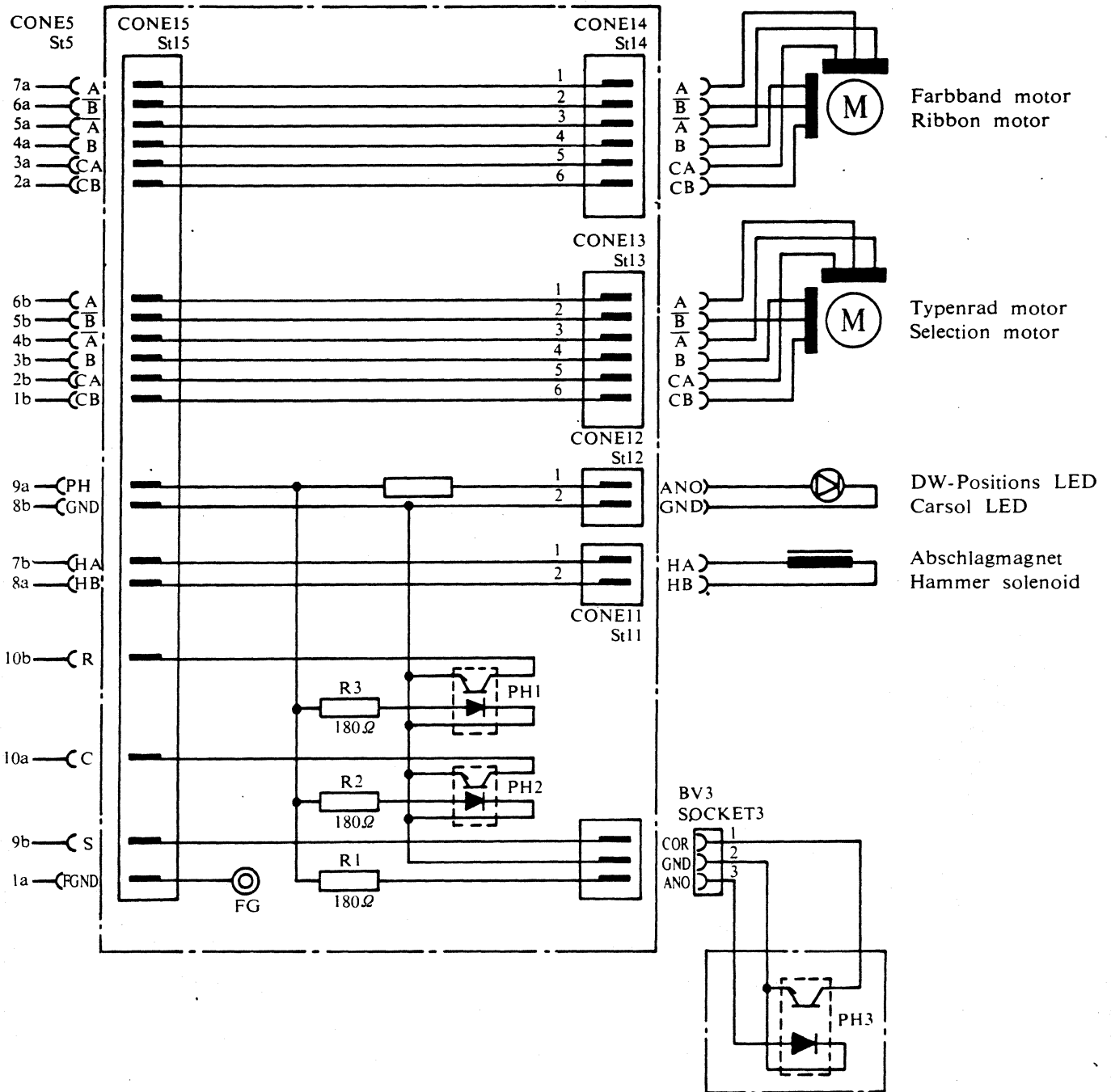
Stromlaufplan Tastatur
Circuit diagram, keyboard

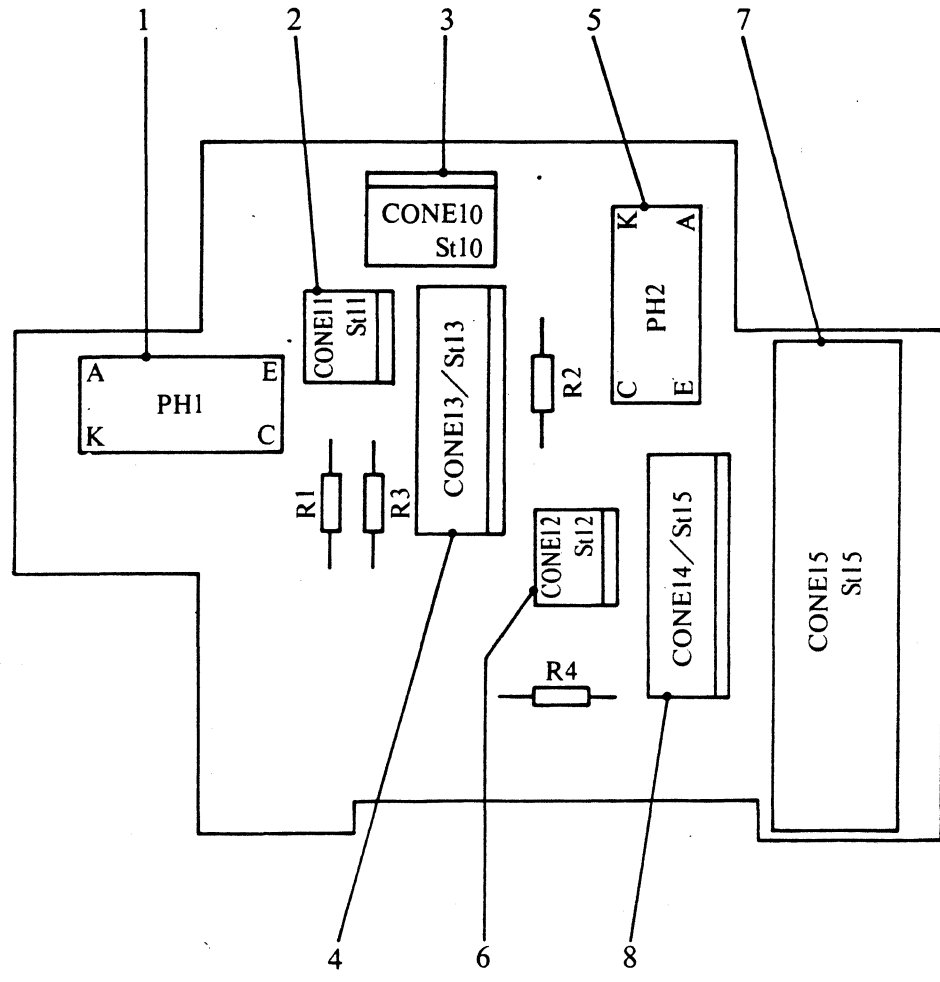


Lageplan Tastatur
Layout of components, keyboard



Stromlaufplan Druckwerk Circuit diagram carrier

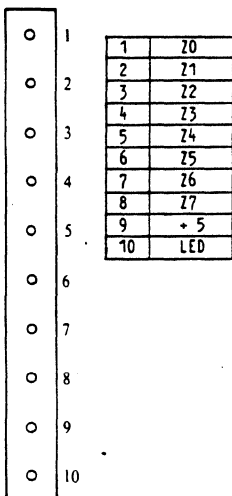




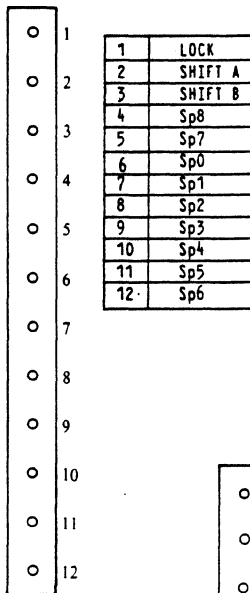
- | | | |
|---|------------------|---|
| 1 | PH 1 | Farbband-Lichtschanke/Ribbon sensor |
| 2 | St 11
CONE 11 | Stecker Abschlagmagnet
Connector Hammer solenoid |
| 3 | St 10
CONE 10 | Stecker Typenrad-Lichtschanke
Connector selection sensor |
| 4 | St 13
CONE 13 | Stecker Typenrad-Motor
Connector selection sensor |
| 5 | PH 2 | Druckwerk-Lichtschanke/Carrier sensor |
| 6 | St 14
CONE 14 | Stecker Farbbandmotor
Connector ribbon motor |
| 7 | St 15
CONE 15 | Stecker Steuer-Leiterplatte
Connector control PCB |
| 8 | St 12
CONE 12 | Stecker DW-Positions LED
Connector carsol LED |

Stecker-Anschlußplan Connection diagram

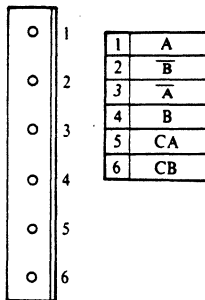
St1/CONE1
Tastatur/keyboard



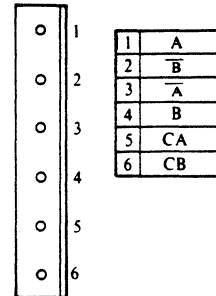
St2/CONE2
Tastatur/keyboard



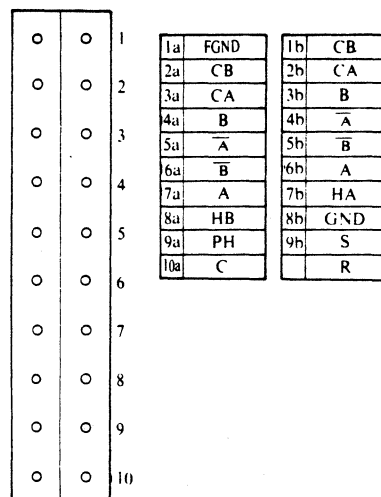
St3/CONE3
Horizontal motor
Carrier motor



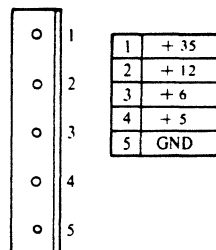
St4/CONE4
Vertikal motor
Index motor



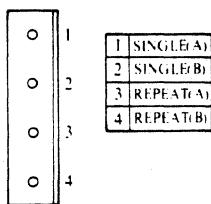
St5/CONES
Druckwerks-Leiterplatte
Carrier P.C.B



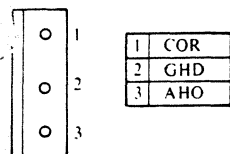
St6/CONE6
Stromversorgung
Powerpack



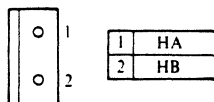
St7/CONE7
Papierinzugschalter
Paperfeed switch



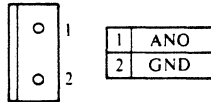
St10/CONE10
Typenrad-Lichtschanke
Selection sensor



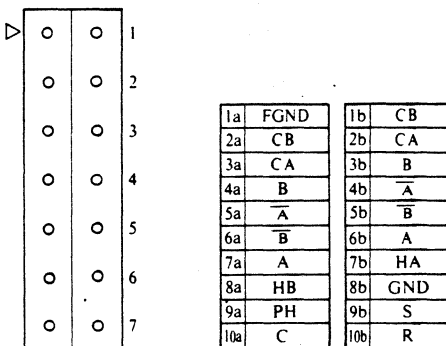
St11/CONE11
Abschlagmagnet
Hammer solenoid



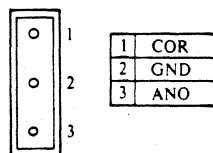
St12/CONE12
DW-Positions-LED
Carrol LED



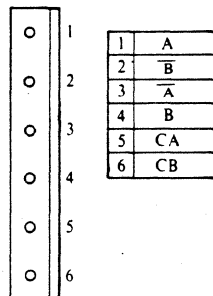
St15/CONE15
Steuer-Leiterplatte
Control P.C.B



Bu3/SOCKET3
Typenrad-Lichtschanke
Selection sensor



St13/CONE13
Typenrad motor
Selection motor



St14/CONE14
Farbbandmotor
Ribbon motor

