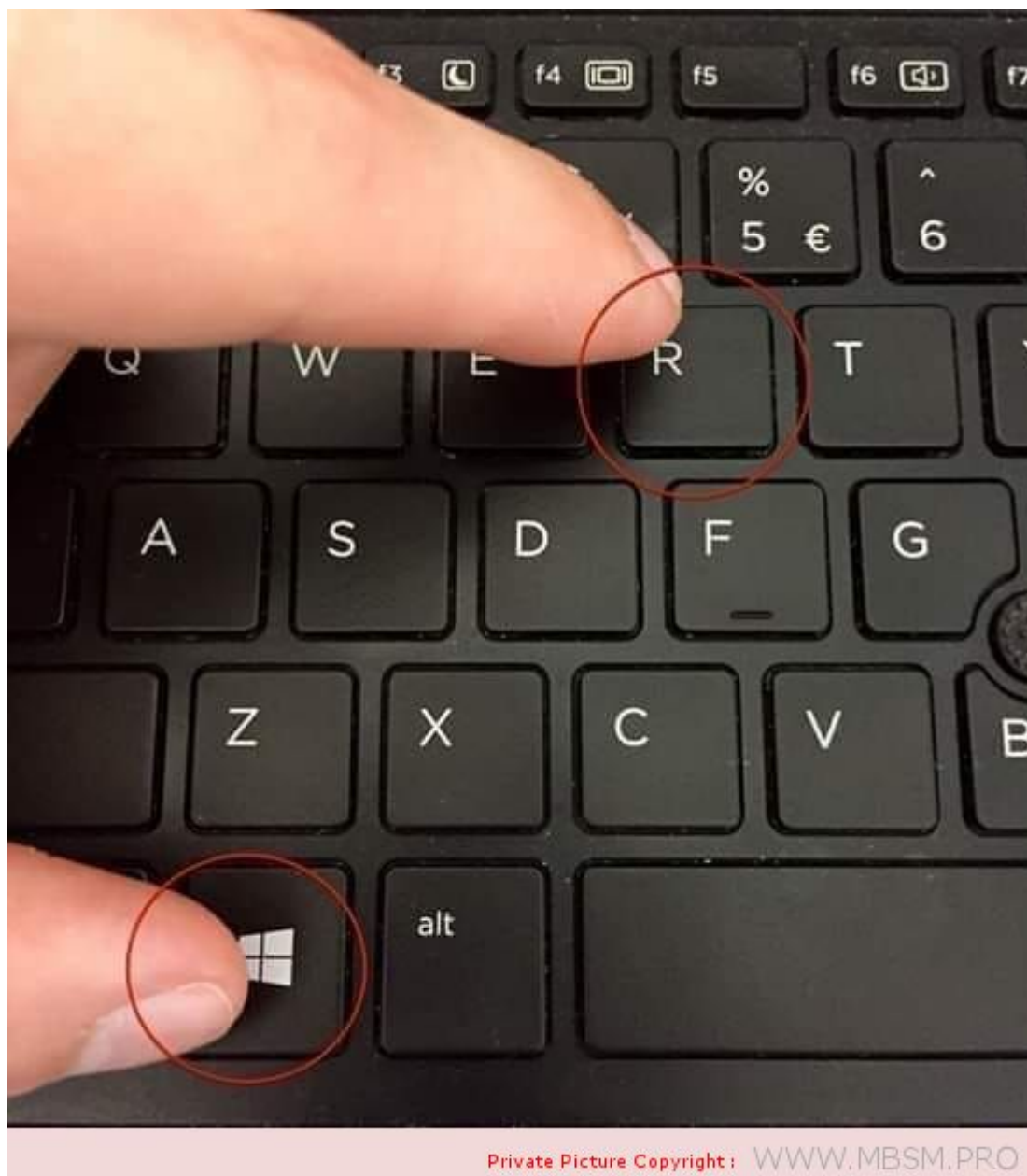


# Systeme de touches de raccourci important ,Clavier PC

written by Lilianne | 23 October 2020



Systeme de touches de raccourci important

Ctrl+A. ... .. Sélectionner tous

Ctrl+C. ... .. Copie

Ctrl+X. ... .. Coupe

Ctrl+V. ... .. Coller

Ctrl+Z. ... .. Annuler

Ctrl+G. ... .. Audacieux

Ctrl+U. ... .. Souligner

Ctrl+I. ... .. Italique

F1. ... .. Aide

F2. ... .. Renommer L'objet sélectionné

F3. ... .. Trouver tous les fichiers

F4. ... .. Ouvre le drop-Down de la liste de fichiers dans les boîtes de dialogue

F5. ... .. Rafraîchir la fenêtre actuelle

F6. ... .. Changement de focus dans Windows explorer

F10. ... .. Active les options de la barre de menu

Alt+Tab. ... .. Cycles entre applications ouvertes

Alt+F4. ... .. Quitter le programme, fermer la fenêtre actuelle

Alt+F6. ... .. Basculer entre les fenêtres du programme actuel

Alt+Entrée. ... .. Ouvre la boîte de dialogue des propriétés

Alt+Space. ... .. Menu du système pour la fenêtre actuelle

Alt +ç. ... .. Ouvre des listes de drop-Down dans

les boîtes de dialogue

Retour en arrière. ... .. Passer au dossier parent

Ctrl+Esc. ... .. . Ouvre le menu de démarrage

Ctrl+Alt+Suppr. ... .. . Ouvre le gestionnaire de tâches, redémarre l'ordinateur

Ctrl+Tab. ... .. . Déplacez-vous à travers les onglets de propriété

Ctrl+Shift+Drag. ... .. Créer un raccourci (aussi un clic droit, glisser)

Ctrl+Drag. ... .. Copier le fichier

Ces. ... .. Annuler la dernière fonction

Quart de travail. ... .. . Appuyez / maintenez le poste, insérez le CD-Rom pour contourner l'auto-Play

Shift+Drag. ... .. . Déplacer le fichier

Maj+F10.. ... .. . Ouvre le menu contextuel (même que le clic droit)

Maj+Suppr. ... .. Effacement complet supprimer (contourner la poubelle de recyclage)

Lettre de alt+underlined. ... . Ouvre le menu correspondant

## RACCOURCIS CLAVIER PC

Contrôle du curseur de document

À la maison. ... .. . Au début de la ligne ou à l'extrême gauche du champ ou de l'écran

Fin. ... .. . À la fin de la ligne, ou à l'extrême droite du champ ou de l'écran

Ctrl+Début. ... . Au sommet

Ctrl+End. ... . Au fond

Page up. ... . Déplace le document ou la boîte de dialogue sur une page

Page en bas. ... . Déplace le document ou la boîte de dialogue en bas d'une page

Les clés de la flèche. ... Déplacez-vous dans les documents, les boîtes de dialogue, etc.

Ctrl+ >. ... . Prochain mot

Ctrl+Shift+ >. ... . Sélectionne Le mot

Contrôle de l'arbre de Windows explorer

Clavier numérique \*. ... Agrandir tout sous la sélection actuelle

Clavier numérique +. ... Élargit la sélection actuelle

Clavier numérique -. ... Effondre la sélection actuelle

.. ... . Développez la sélection actuelle ou allez au premier enfant

%. ... . Effondrement de la sélection actuelle ou allez chez parent

Personnages spéciaux

" ouverture de la citation unique. ... Alt 0145

" fermeture de la citation unique. ... . Alt 0146

" ouverture de la double citation. ... Alt 0147

" fermeture de la double citation. ... . Alt 0148

– un tableau de bord. .... Tout 0150

– à dash. . . . . Alt 0151  
... Ellipse. ... . Alt 0133  
• Balle. ... . Alt 0149  
® marque d'inscription. ... Alt 0174  
© droit d'auteur. ... Alt 0169  
™ marque de commerce. ... . Alt 0153  
° symbole de degré. ... Alt 0176

Signe de centimes. ... Alt 0162

1 □ 4. ... Alt 0188

1 □ 2. ... Alt 0189

3 □ 4. ... Alt 0190

#### RACCOURCIS CLAVIER PC

En train de créer des images uniques dans un monde uniforme !  
En train de créer des images uniques dans un monde uniforme !

Ouais. . . . . Alt 0233

Ouais. . . . . Alt 0201

Ñ. . . . . Alt 0241

÷. ... Alt 0247

Options de menu de fichier dans le programme actuel

Alt + e modifier les options dans le programme actuel

F1 aide universelle (pour tous les programmes)

Ctrl + un select tout le texte

Ctrl + x coupe de l'article sélectionné

MAJ + del cut item sélectionné

Ctrl + c copier l'article sélectionné

Ctrl + ins copier l'article sélectionné

Ctrl + v coller

Shift + ins coller

À la maison, allez au début de la ligne actuelle

Ctrl + home aller au début du document

Fin aller à la fin de la ligne actuelle

Ctrl + fin aller à la fin du document

MAJ + mise à jour à la maison de la position actuelle au début de la ligne

MAJ + fin mise en avant de la position actuelle jusqu'à la fin de la ligne

Ctrl + f déplace un mot à gauche à la fois

Ctrl + g déplace un mot à la droite à la fois

Les clés de raccourci Microsoft ® Windows ®

Alt + onglet switch entre les applications ouvertes

Alt +

Shift + onglet

Basculer à l'envers entre ouvert

Applications

Alt + impression

Écran

Créer une photo d'écran pour le programme actuel

Ctrl + Alt + Del Reboot / Windows ® Gestionnaire de tâches

Ctrl + ESC apporte le menu de départ

Alt + ESC Switch entre les applications dans la barre des tâches

F2 renommer l'icône sélectionnée

F3 commence à trouver depuis le bureau

F4 ouvre la sélection de drive lors de la navigation

Contenu de rafraîchissement f5

Alt + F4 fermeture du programme ouvert

Ctrl + F4 fermeture de la fenêtre dans le programme

Ctrl + plus

Clé

Ajuster automatiquement les largeurs de toutes les colonnes

Dans Windows explorer

Alt + entrez la fenêtre des propriétés ouvertes de l'icône sélectionnée

Ou programme

Shift + F10 simuler un clic droit sur un article sélectionné

MAJ + del supprimer les programmes / fichiers en permanence

Changement de garde

Pendant le démarrage

Les fichiers du système de sécurité de démarrage ou de

contournement

Changement de garde

Pendant le démarrage

Lors de la mise en place d'un CD Audio, vous pourrez prévenir

Lecteur CD de jouer

Raccourcis winkey

Winkey + d apporte le bureau au sommet des autres fenêtres

Winkey + m minimise toutes les fenêtres

Winkey +

Shift + m

Annuler le minimiser fait par winkey + m

Et Winkey + d

Winkey + e ouvert Microsoft Explorer

Winkey + TAB CYCLE à travers des programmes ouverts sur la barre des tâches

Winkey + f afficher la fonctionnalité de recherche / recherche windows ®

Winkey +

Ctrl + f

Afficher la fenêtre de recherche d'ordinateurs

Winkey + F1 afficher l'aide Microsoft ® Windows ®

Winkey + R ouvre la fenêtre de course

Winkey +



Pause / pause

Ouvrez la fenêtre des propriétés du système

Winkey + u open utilitaire manager

Winkey + l verrouille l'ordinateur (Windows Xp ® & plus tard)

Outlook ® raccourcis clavier

Alt + s envoyez l'e-mail

Ctrl + c copie texte sélectionné

Ctrl + x coupe le texte sélectionné

Ctrl + p boîte de dialogue d'impression ouverte

Ctrl + k nom complet / e-mail tapé dans la barre d'adresse

Ctrl + b audacieuse sélection mise en évidence

Ctrl + I Italicize sélection mise en avant

Ctrl + u souligne la sélection mise en avant

Ctrl + R réponse à un e-mail

Ctrl + F en avant un e-mail

Ctrl + n crée un nouvel e-mail

Ctrl + shift + a créer un nouveau rendez-vous à votre calendrier

Ctrl + shift + o ouvre la boîte d'envoi

Ctrl + shift + J'ouvre la boîte de réception

Ctrl + shift + k ajouter une nouvelle tâche

Ctrl + shift + c crée un nouveau contact

Ctrl + maj+ j crée une nouvelle entrée de journal

Mot ® raccourcis clés

Ctrl + un sélectionner tous les contenus de la page

Ctrl + b audacieuse sélection mise en évidence

Ctrl + c copie texte sélectionné

Ctrl + x coupe le texte sélectionné

Ctrl + n ouvert nouveau / document blanc

Ctrl + o options ouvertes

Ctrl + p ouvre la fenêtre d'impression

Ctrl + F Open trouver boîte

Ctrl + I Italicize sélection mise en avant

Ctrl + k insérer le lien

Ctrl + u souligne la sélection mise en avant

Ctrl + v coller

Ctrl + y refaire la dernière action exécutée

Ctrl + Z annuler la dernière action

Ctrl + g trouve et remplace les options

Ctrl + h trouver et remplacer les options

Ctrl + j justifie l'alignement du paragraphe

Ctrl + l aligner le texte ou la ligne sélectionné sur la gauche

Ctrl + q aligner le paragraphe sélectionné sur la gauche

Ctrl + e alignement sélectionné

---

**www.mbsm.pro , Picture  
, Traditionnel, from , Chebba  
, Mahdia , Tunisia ,**

written by mahdi miled | 23 October 2020

محلها اللبسة العربي وشبابنا

#اللبسة التقليدية الشابة

صور جميلة من إنتاج نادي الصورة بدار الثقافة الشابة

---

**www.mbsm.pro , free, For  
windows, Personal Renamer ,  
Easy filerenaming, Portable  
Bulk File Renamer, Folder  
monitor, All in one,**

written by mahdi miled | 23 October 2020

www.mbsm.pro , free, For windows, Personal Renamer , Easy  
filerenaming, Portable Bulk File Renamer, Folder monitor, All  
in one,

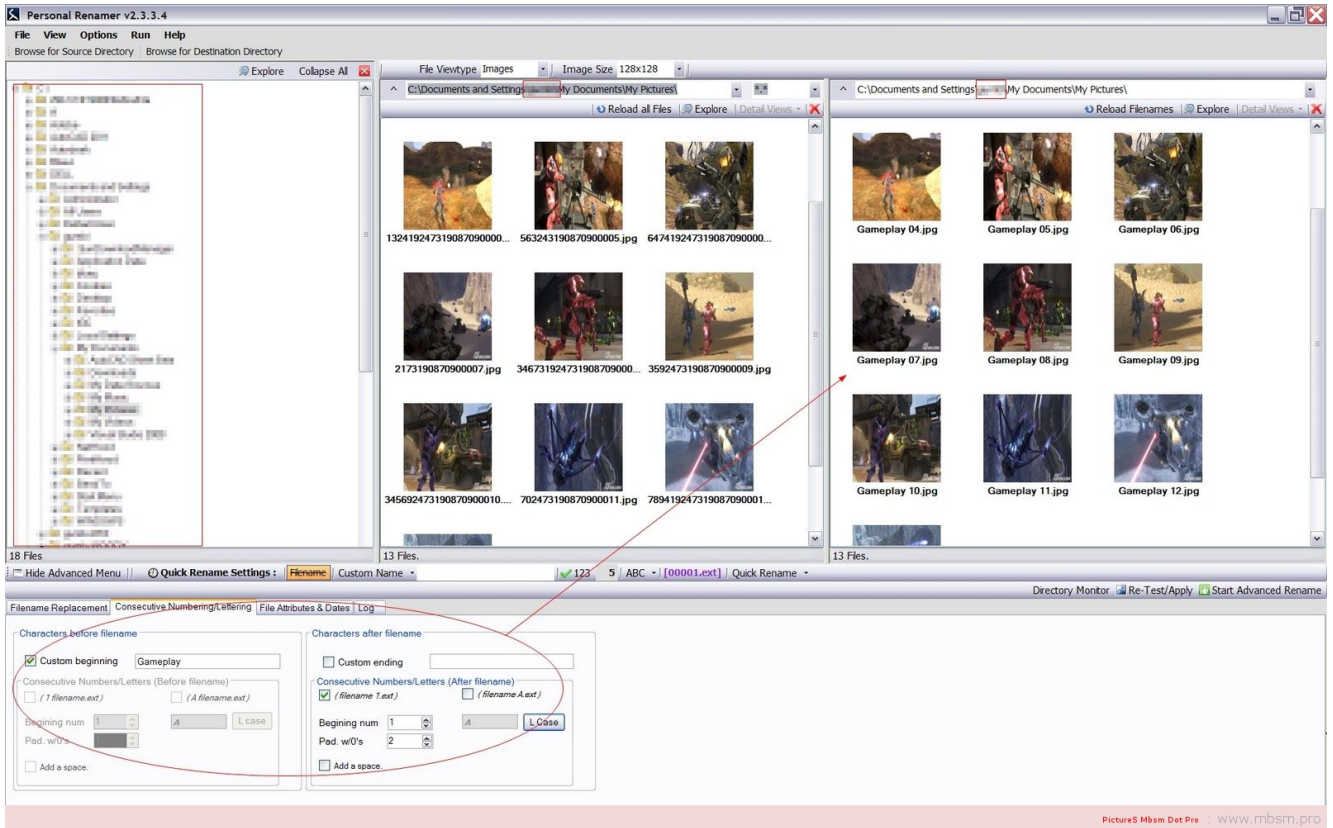
**Personal Renamer is being upgraded,**

**and now has an official website  
Please  
visit [www.personalrenamer.com](http://www.personalrenamer.com)**

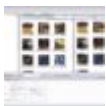
Many have waited for this release, more specifically for the addition of the service monitor which has been added to the program in this release. Personal Renamer has always had the option to monitor a directory and rename files but with this latest addition users can have Personal Renamer monitor a directory invisibly the background, and more importantly while logged out. This is a very powerful and useful addition. Other new features include Undo and the option to apply saved settings when program starts up.

Download Version 2.4.0.0 (Service Beta)

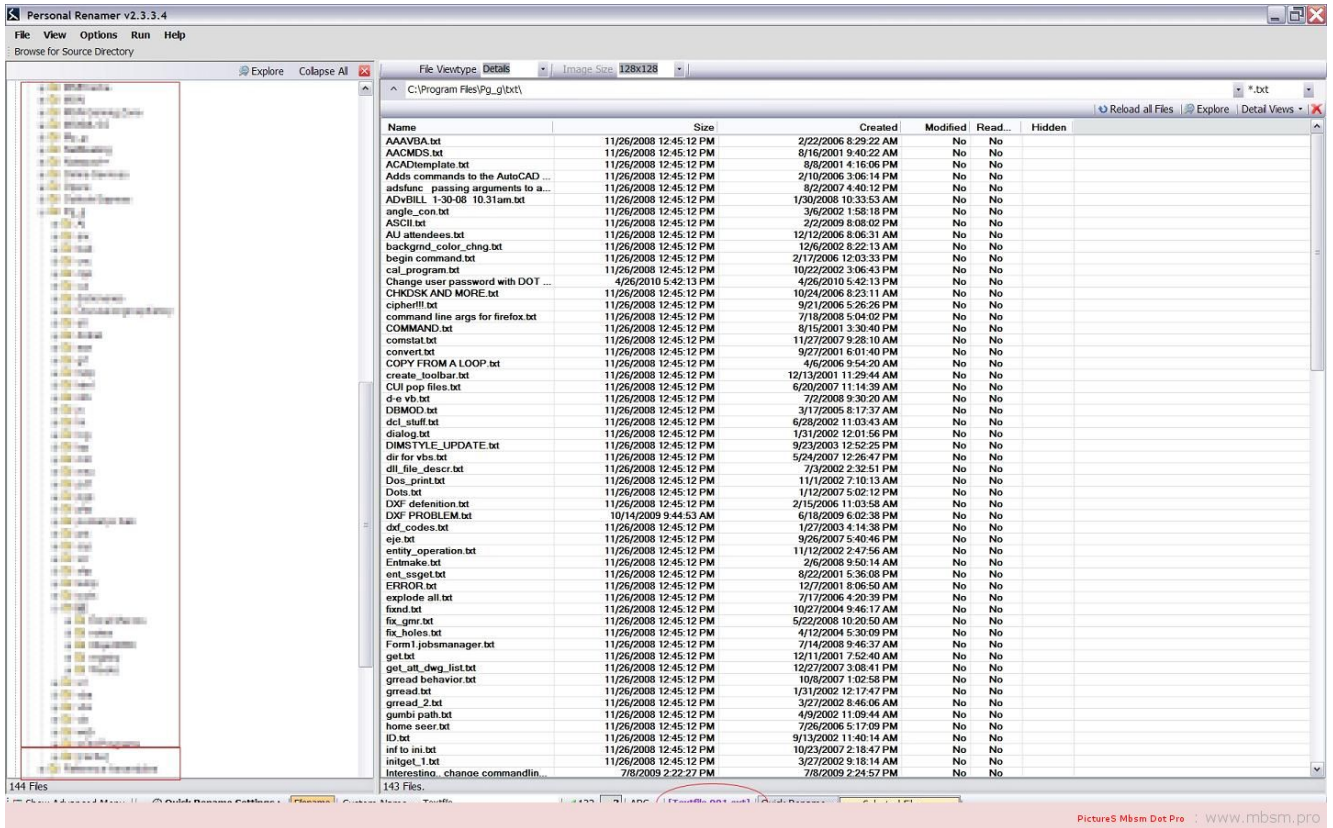
[www-mbsm-pro-Personal-Renamer-Easy-filerenaming-Portable-Bulk-File-Renamer-Folder-monitor-All-in-one-1.jpg](#) (279 KB)



www-mbsm-pro-Personal-Renamer-Easy-filerenaming-Portable-Bulk-File-Renamer-Folder-monitor-All-in-one-1.jpg (223 KB)



www-mbsm-pro-Personal-Renamer-Easy-filerenaming-Portable-Bulk-File-Renamer-Folder-monitor-All-in-one-2.jpg (253 KB)



www-mbsm-pro-Personal-Renamer-Easy-filerenaming-Portable-Bulk-File-Renamer-Folder-monitor-All-in-one-2.jpg (261 KB)



Mbsm.pro , extension  
 Unshorten.It sur Google  
 Chrome et Firefox pour

# vérifier les liens et trouver rapidement et facilement leur adresse d'origine

written by Lilianne | 23 October 2020



Vous pouvez utiliser l'extension Unshorten.It sur Google Chrome et Firefox pour vérifier les liens et trouver rapidement et facilement leur adresse d'origine au lieu de copier le lien et d'ouvrir le site vous-même et de le coller là.

C'est bien si votre temps est précieux et que vous voulez sauver quelques secondes de votre vie, car tout ce que vous avez à faire est de cliquer avec le bouton droit de la souris

sur n'importe quel raccourci, puis sur Unshorten ce lien pour obtenir l'information que vous voulez

crome  
firefox

---

# **www.mbsm.pro , Practical Electronics for Inventors, Fourth Edition**

written by mahdi miled | 23 October 2020

**Practical Electronics for Inventors, Fourth Edition**

by: Paul Scherz, Dr. Simon Monk

Abstract: A fully updated, no-nonsense guide to electronics. Advance your electronics knowledge and gain the skills necessary to develop and construct your own functioning gadgets. Written by a pair of experienced engineers and dedicated hobbyists, Practical Electronics for Inventors, Fourth Edition, lays out the essentials and provides step-by-step instructions, schematics, and illustrations. Discover how to select the right components, design and build circuits, use microcontrollers and ICs, work with the latest software tools, and test and tweak your creations. This easy-to-follow book features new instruction on programmable logic, semiconductors, operational amplifiers, voltage regulators, power supplies, digital electronics, and more. Coverage includes:

- Resistors, capacitors, inductors, and transformers
- Diodes, transistors, and integrated circuits
- Optoelectronics, solar cells, and phototransistors
- Sensors, GPS modules, and touch screens
- Op amps, regulators, and power supplies
- Digital electronics, LCDs, and logic gates



Microcontrollers and prototyping platforms • Combinational and sequential programmable logic • DC motors, RC servos, and stepper motors • Microphones, audio amps, and speakers • Modular electronics and prototypes

## Book Details

Title: Practical Electronics for Inventors, Fourth Edition

Publisher: McGraw-Hill Education: New York, Chicago, San Francisco, Athens, London, Madrid, Mexico City, Milan, New Delhi, Singapore, Sydney, Toronto

Copyright / Pub. Date: 2016 McGraw-Hill Education

ISBN: 9781259587542

## Authors:

Paul Scherz is a Systems Operation Manager who received his B.S. in physics from the University of Wisconsin. He is an inventor/hobbyist in electronics, an area he grew to appreciate through his experience at the University's Department of Nuclear Engineering and Engineering Physics and Department of Plasma Physics.

Dr. Simon Monk has a bachelor's degree in cybernetics and computer science and a Ph.D. in software engineering. He spent several years as an academic before he returned to industry, co-founding the mobile software company Momote Ltd. He has been an active electronics hobbyist since his early teens and is a full-time writer on hobby electronics and open-source hardware. Dr. Monk is author of numerous electronics books, including Programming Arduino, Hacking Electronics, and Programming the Raspberry Pi.

Description: A fully updated, no-nonsense guide to electronics. Advance your electronics knowledge and gain the

skills necessary to develop and construct your own functioning gadgets. Written by a pair of experienced engineers and dedicated hobbyists, Practical Electronics for Inventors, Fourth Edition, lays out the essentials and provides step-by-step instructions, schematics, and illustrations. Discover how to select the right components, design and build circuits, use microcontrollers and ICs, work with the latest software tools, and test and tweak your creations. This easy-to-follow book features new instruction on programmable logic, semiconductors, operational amplifiers, voltage regulators, power supplies, digital electronics, and more. Coverage includes:

- Resistors, capacitors, inductors, and transformers
- Diodes, transistors, and integrated circuits
- Optoelectronics, solar cells, and phototransistors
- Sensors, GPS modules, and touch screens
- Op amps, regulators, and power supplies
- Digital electronics, LCDs, and logic gates
- Microcontrollers and prototyping platforms
- Combinational and sequential programmable logic
- DC motors, RC servos, and stepper motors
- Microphones, audio amps, and speakers
- Modular electronics and prototypes

## Table of Contents

### A. ABOUT THE AUTHORS

### B. PREFACE

### C. ACKNOWLEDGMENTS

#### 1. Introduction to Electronics

#### 2. Theory

#### 3. Basic Electronic Circuit Components

#### 4. Semiconductors

#### 5. Optoelectronics

#### 6. Sensors

#### 7. Hands-on Electronics

#### 8. Operational Amplifiers

#### 9. Filters

#### 10. Oscillators and Timers

#### 11. Voltage Regulators and Power Supplies

- 12. Digital Electronics
- 13. Microcontrollers
- 14. Programmable Logic
- 15. Motors
- 16. Audio Electronics
- 17. Modular Electronics
- A. Power Distribution and Home Wiring
- B. Error Analysis
- C. Useful Facts and Formulas

## Tools & Media

figure (1 036)

table (64)

## Expanded Table of Contents

### A. ABOUT THE AUTHORS

PREFACE PRELIMINARIES

ABOUT THE TECHNICAL EDITORS

### B. PREFACE

PREFACE PRELIMINARIES

Notes about the Fourth Edition

### C. ACKNOWLEDGMENTS

1. Introduction to Electronics

CHAPTER PRELIMINARIES

2. Theory

CHAPTER PRELIMINARIES

Theory of Electronics

Electric Current

Voltage

A Microscopic View of Conduction (for Those Who Are Interested)

Resistance, Resistivity, Conductivity

Insulators, Conductors, and Semiconductors

Heat and Power

Thermal Heat Conduction and Thermal Resistance

Wire Gauges

Grounds

Electric Circuits

Ohm's Law and Resistors

Voltage and Current Sources

Measuring Voltage, Current, and Resistance

Combining Batteries

Open and Short Circuits

Kirchhoff's Laws

Superposition Theorem

Thevenin's and Norton's Theorems

AC Circuits

AC and Resistors, RMS Voltage, and Current

Mains Power

Capacitors

Inductors

Modeling Complex Circuits

Complex Numbers

Circuit with Sinusoidal Sources

Power in AC Circuits (Apparent Power, Real Power, Reactive Power)

Thevenin's Theorem in AC Form

Resonant Circuits

Lecture on Decibels

Input and Output Impedance

Two-Port Networks and Filters

Transient Circuits

Circuits with Periodic Nonsinusoidal Sources

Nonperiodic Sources

SPICE

3. Basic Electronic Circuit Components

CHAPTER PRELIMINARIES

Wires, Cables, and Connectors

Batteries

Switches

Relays

Resistors

Capacitors

Inductors

Transformers

Fuses and Circuit Breakers

4. Semiconductors

CHAPTER PRELIMINARIES

Semiconductor Technology

Diodes

Transistors

Thyristors

Transient Voltage Suppressors

Integrated Circuits

5. Optoelectronics

CHAPTER PRELIMINARIES

A Little Lecture on Photons

Lamps

Light-Emitting Diodes

Photoresistors

Photodiodes

Solar Cells

Phototransistors

Photothyristors

Optoisolators

Optical Fiber

6. Sensors

CHAPTER PRELIMINARIES

General Principles

Temperature

Proximity and Touch

Movement, Force, and Pressure

Chemical

Light, Radiation, Magnetism, and Sound

GPS

7. Hands-on Electronics

CHAPTER PRELIMINARIES

Safety

Constructing Circuits

Multimeters

## Oscilloscopes

The Electronics Laboratory

## 8. Operational Amplifiers

### CHAPTER PRELIMINARIES

Operational Amplifier Water Analogy

How Op Amps Work (The “Cop-Out” Explanation)

Theory

Negative Feedback

Positive Feedback

Real Kinds of Op Amps

Op Amp Specifications

Powering Op Amps

Some Practical Notes

Voltage and Current Offset Compensation

Frequency Compensation

Comparators

Comparators with Hysteresis

Using Single-Supply Comparators

Window Comparator

Voltage-Level Indicator

Instrumentation Amplifiers

Applications

## 9. Filters

### CHAPTER PRELIMINARIES

Things to Know Before You Start Designing Filters

Basic Filters

Passive Low-Pass Filter Design

A Note on Filter Types

Passive High-Pass Filter Design

Passive Bandpass Filter Design

Passive Notch Filter Design

Active Filter Design

Integrated Filter Circuits

## 10. Oscillators and Timers

### CHAPTER PRELIMINARIES

RC Relaxation Oscillators

The 555 Timer IC

Voltage-Controlled Oscillators

Wien-Bridge and Twin-T Oscillators

LC Oscillators (Sinusoidal Oscillators)

Crystal Oscillators

Microcontroller Oscillators

11. Voltage Regulators and Power Supplies

CHAPTER PRELIMINARIES

Voltage-Regulator ICs

A Quick Look at a Few Regulator Applications

The Transformer

Rectifier Packages

A Few Simple Power Supplies

Technical Points about Ripple Reduction

Loose Ends

Switching Regulator Supplies (Switchers)

Switch-Mode Power Supplies (SMPS)

Kinds of Commercial Power Supply Packages

Power Supply Construction

12. Digital Electronics

CHAPTER PRELIMINARIES

The Basics of Digital Electronics

Logic Gates

Combinational Devices

Logic Families

Powering and Testing Logic ICs

Sequential Logic

Counter ICs

Shift Registers

Analog/Digital Interfacing

Displays

Memory Devices

13. Microcontrollers

CHAPTER PRELIMINARIES

Basic Structure of a Microcontroller

Example Microcontrollers

Evaluation/Development Boards

Arduino

Interfacing with Microcontrollers

14. Programmable Logic

CHAPTER PRELIMINARIES

Programmable Logic

FPGAs

ISE and the Elbert V2

The Elbert 2 Board

Downloads

Drawing Your FPGA Logic Design

Verilog

Describing Your FPGA Design in Verilog

Modular Design

Simulation

VHDL

15. Motors

CHAPTER PRELIMINARIES

DC Continuous Motors

Speed Control of DC Motors

Directional Control of DC Motors

RC Servos

Stepper Motors

Kinds of Stepper Motors

Driving Stepper Motors

Controlling the Driver with a Translator

A Final Word on Identifying Stepper Motors

16. Audio Electronics

CHAPTER PRELIMINARIES

A Little Lecture on Sound

Microphones

Microphone Specifications

Audio Amplifiers

Preamplifiers

Mixer Circuits

A Note on Impedance Matching

Speakers

Crossover Networks

Simple ICs Used to Drive Speakers



Audible-Signal Devices  
Miscellaneous Audio Circuits  
17. Modular Electronics  
CHAPTER PRELIMINARIES  
There's an IC for It  
Breakout Boards and Modules  
Plug-and-Play Prototyping  
Open Source Hardware  
A. Power Distribution and Home Wiring  
APPENDIX PRELIMINARIES  
Power Distribution  
A Closer Look at Three-Phase Electricity  
Home Wiring  
Electricity in Other Countries  
B. Error Analysis  
APPENDIX PRELIMINARIES  
Absolute Error, Relative Error, and Percent Error  
Uncertainty Estimates  
C. Useful Facts and Formulas  
APPENDIX PRELIMINARIES  
Greek Alphabet  
Powers of 10 Unit Prefixes  
Linear Functions ( $y = mx + b$ )  
Quadratic Equation ( $y = ax^2 + bx + c$ )  
Exponents and Logarithms  
Trigonometry  
Complex Numbers  
Differential Calculus  
Integral Calculus

1

1. <https://www.amazon.com/Practical-Electronics-Inventors-Fourth-Scherz/dp/1259587541> [back]

www-mbsm-pro-Practical-Electronics-for-Inventors-Fourth-Edition1.png (273 KB)

FOURTH EDITION

# PRACTICAL ELECTRONICS FOR INVENTORS

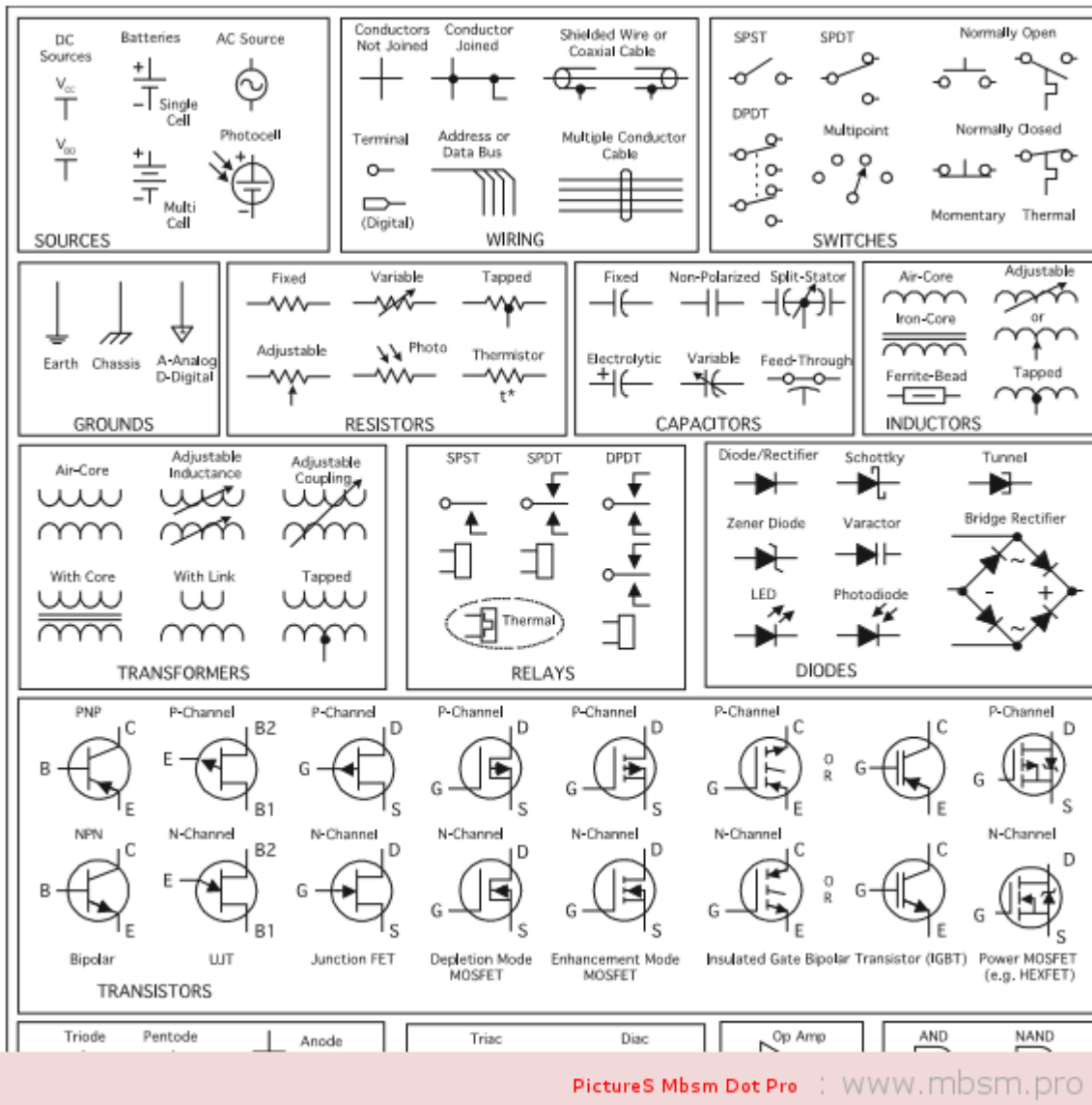


PictureS Mbsm Dot Pro : [www.mbsm.pro](http://www.mbsm.pro)

[www-mbsm-pro-Practical-Electronics-for-Inventors-Fourth-Edition1.png](#) (239 KB)



www-mbsm-pro-Practical-Electronics-for-Inventors-Fourth-Edition2.png (121 KB)



www-mbsm-pro-Practical-Electronics-for-Inventors-Fourth-Edition2.png (111 KB)





www-mbsm-pro-Practical-Electronics-for-Inventors-Fourth-Edition3.png (146 KB)

### Resistor Labels

**Conversion Calculator**

k = 1,000 ; M = 1,000,000

1MΩ = 1,000,000 Ω = 1 x 10<sup>6</sup>Ω

1kΩ = 1,000 Ω = 1 x 10<sup>3</sup>Ω

**Examples:**

3.3 kΩ = 3,300 Ω = 3.3 x 10<sup>3</sup>Ω

22 kΩ = 22,000 Ω = 22 x 10<sup>3</sup>Ω

2 MΩ = 2,000,000 Ω = 2 x 10<sup>6</sup>Ω

1.68 MΩ = 1,680,000 Ω = 1.68 x 10<sup>6</sup>Ω

#### Resistor Color Code

Color	Sig. Fig.	Decimal Multiplier	Tolerance (%)
Black	0	1	-
Brown	1	10	1
Red	2	100	2
Orange	3	1,000	-
Yellow	4	10,000	-
Green	5	100,000	0.5
Blue	6	1,000,000	0.25
Purple	7	10,000,000	0.1
Gray	8	100,000,000	-
White	9	1,000,000,000	-
Gold	-	0.1	5
Silver	-	0.01	10
No Color	-	-	20

#### Body Color

The body color of a resistor typically doesn't carry meaning, except in some instances where it may specify temperature coefficient. However, if you find resistors within a circuit that are white/gray or blue in color, they may be non-flammable or fusible resistors. Care must be taken when entering such resistors.

### 4-Band Resistor Code (Most Common)

**Label Meaning**

Red Black Orange Gold  
20 x 1,000 = 20k Ω ± 5%

First Digit: Black, Second Digit: Orange, Multiplier (x of zeros): Gold, % Tolerance: Gold

---

### 5-Band Resistor Code (3-digit)

**Label Meaning**

Purple Blue Green Brown Brown  
675 x 10 = 6750 Ω ± 1%

First Digit: Purple, Second Digit: Blue, Third Digit: Green, Multiplier (x of zeros): Brown, % Tolerance: Brown

---

### 5-Band Resistor Code (Reliability)

**Label Meaning**

Yellow Purple Green Silver Brown  
47 x 100,000 = 4.7 MΩ ± 10%

1% Reliability/1000 Hr — Brown

Color	Reliability (%/1000 Hr)
Brown	1
Red	0.1
Orange	0.01
Yellow	0.001

First Digit: Yellow, Second Digit: Purple, Multiplier (x of zeros): Green, Reliability: Silver, % Tolerance: Brown

---

### 6-Band Resistor Code

**Label Meaning**

Purple Red Blue Black Brown Red  
276 x 1 = 276Ω ± 1%

TC of 50 ppm — Red

Color	Temp. Coeff.
Brown	100 ppm
Red	50 ppm

First Digit: Purple, Second Digit: Red, Third Digit: Blue, Temp. Coeff.: Black, % Tolerance: Brown

### Surface Mount Resistor Code

#### 3-digit Label

**Label Meaning**

101: 10 and 1 zero = 100 Ω

105: 10 and 5 zero = 1,000,000 Ω

224: 22 and 4 zeros = 220,000 Ω

1R0: 1.0 and no zeros = 1 Ω

22R: 22.0 and no zeros = 22 Ω

R10: 0.1 and no zeros = 0.1 Ω

The first two digits represent significant figures; the last digit specifies the multiplier. For values under 100 Ω, the letter R is substituted for one of the significant digits and represents a decimal point.

---

#### 4-digit Label

**Label Meaning**

1001: 100 and 1 zero = 1000 Ω

22R0: 22.0 and no zeros = 22 Ω

The first three digits represent significant figures; the last digit specifies the multiplier. R represents a decimal point.

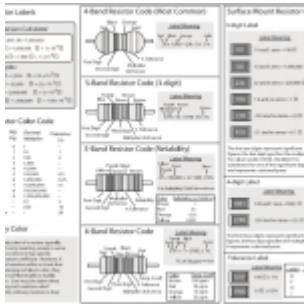
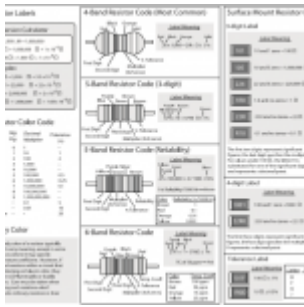
---

#### Tolerance Label

Label Meaning	Letter	Tolerance
101F	D	±0.5 %
	F	±1.0 %

PictureS Mbsm Dot Pro : www.mbsm.pro

www-mbsm-pro-Practical-Electronics-for-Inventors-Fourth-Edition3.png (134 KB)



www-mbsm-pro-Practical-Electronics-for-Inventors-Fourth-Edition4.png (193 KB)

# Capacitor Markings

**Capacitance Conversion Calculator**

$1 F = 1 \times 10^6 \mu F = 1 \times 10^9 nF = 1 \times 10^{12} pF$   
 $1 \mu F = 1 \times 10^{-6} F = 1 \times 10^3 nF = 1 \times 10^6 pF$   
 $1 nF = 1 \times 10^{-9} F = 1 \times 10^{-3} \mu F = 1 \times 10^3 pF$   
 $1 pF = 1 \times 10^{-12} F = 1 \times 10^{-6} \mu F = 1 \times 10^{-3} nF$   
 $F = \text{Farad}, \mu = \text{micro}, n = \text{nano}, p = \text{pico}$

$1000 \mu F = 1,000,000 nF = 10 \times 10^8 pF$   
 $100 \mu F = 100,000 nF = 10 \times 10^7 pF$   
 $10 \mu F = 10,000 nF = 10 \times 10^6 pF$   
 $1 \mu F = 1,000 nF = 10 \times 10^5 pF$   
 $0.1 \mu F = 100 nF = 10 \times 10^4 pF$   
 $0.01 \mu F = 10 nF = 10 \times 10^3 pF$   
 $0.001 \mu F = 1 nF = 10 \times 10^2 pF$

**Tantalum**

**Label meaning 1**

1st significant figure in  $\mu F$   
2nd significant figure in  $\mu F$   
Multiplier (See table)  
Voltage

Color	S.F.	Multiple	Voltage
Black	0	1	10V
Brown	1	10	
Red	2	100	
Orange	3	1000	
Yellow	4		6.3V
Green	5		16V
Blue	6		20V
Violet	7		
Gray	8	0.01	25V
White	9	0.1	3V
Pink			35V

**Label meaning 2**

Marking	Actual
22	22 $\mu F$ , 16 V

**Mylar (Polyester Film)**  
**Polypropylene**  
**Dipped Mica**

**Label meaning**

Marking	Actual
.001K*	0.001 $\mu F$ , $\pm 10\%$
104K	0.1 $\mu F$ , $\pm 10\%$
22J*	0.22 $\mu F$ , $\pm 5\%$
472K	0.0047 $\mu F$ , $\pm 10\%$
221J	220 pF, $\pm 5\%$
470J	47 pF, $\pm 5\%$
102J	1000 pF, $\pm 5\%$
103F	0.01 $\mu F$ , $\pm 1\%$
223F	0.022 $\mu F$ , $\pm 1\%$

**Ceramic Disc Capacitors**

22 pF  $\pm 20\%$  1000V  
Temp. Char.  $0.033 \mu F \pm 20\%$  -56% to +22% variation from +10°C to +85°C  
.1Z 0.1  $\mu F$  -20% +80% 100V  
121K 120 pF  $\pm 10\%$   
4R7D 4.7 pF  $\pm 0.5 pF$

X7R 10K 1 kV 10 pF  $\pm 10\%$   $\pm 15\%$  variation from -55°C to 125°C  
K5U 474M 0.47  $\mu F \pm 20\%$  +22% to -70% variation from +25°C to 85°C  
Z5P 2200 K 20 pF  $\pm 20\%$  50V AC 400V DC 2200 pF  $\pm 10\%$   $\pm 10\%$  variation from +10°C to +85°C  
200 nZ 12V 200 nF -20°C to +80°C 12V DC  
N2200 47 pF  $\pm 20\%$  Neg. Temp. Coeff. of 2200 ppm/°C

**Multiplier Code**

Numeric Character	Decimal Multiplier (pF)
0	None
1	10
2	100
3	1000
4	10,000

**EIA Capacitor Tolerance Codes**

Letter	$\leq 10 pF$	$\geq 10 pF$
B	$\pm 0.1 pF$	-
C	$\pm 0.25 pF$	-
D	$\pm 0.5 pF$	-
E	-	$\pm 25\%$
F	-	$\pm 1\%$
G	-	$\pm 2\%$
H	-	$\pm 2.5\%$
J	-	$\pm 5\%$
K	-	$\pm 10\%$
M	-	$\pm 20\%$
P	-	-0 + 100%
S	-	-20 + 50%
W	-	-0 + 200%
X	-	-20 + 40%
Z	-	-20 + 80%

**Ceramic Disc (European Markings)**

**Label Meaning**

Marking	Actual	Marking	Actual
p68	0.68 pF	22p	22 pF
1p0	1.0 pF	n10	0.1 nF
4p7	4.7 pF	n27	0.27 nF

Label: p = picofarads, n = nanofarads; location of p or n signifies decimal point.

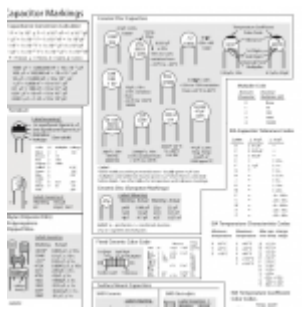
**Fixed Ceramic Color Code**

Color	S.F.	Tolerance	Temp. Coeff. ppm/°C
Black	0	$\pm 20\%$	2.0 pF
Brown	1	$\pm 1\%$	-30
Red	2	$\pm 2\%$	-40
Orange	3	$\pm 3\%$	-50
Yellow	4	$\pm 4\%$	-50
Green	5	$\pm 5\%$	-50
Blue	6	$\pm 5\%$	-50
Violet	7	$\pm 5\%$	-50
Gray	8	0.01	0.25 pF
White	9	0.1	1.0 pF

**Surface Mount Capacitors**

PictureS Mbsm Dot Pro : [www.mbsm.pro](http://www.mbsm.pro)

www-mbsm-pro-Practical-Electronics-for-Inventors-for-Inventors-Fourth-Edition4.png (178 KB)







International\_Women's\_Day\_mbsm\_dot\_pro.jpg (189 KB)



International\_Women's\_Day\_mbsm\_dot\_pro2.png (34 KB)

أعترف يا قلبي أنك تحب كل النساء  
أعترف أنك لست من الحمقى ولا من الجبناء  
ولست طاغوت دين يجالس السفهاء  
أنت يا قلبي تعشق جنس الطيبة والوفاء  
وتاجا من النور على رؤوس النبلاء  
نساء صنعن بأيديهن التاريخ ولبين النداء  
ورفعن راية المجد عالية في غياهب السماء  
سَأَعِيشُ رَغْمَ الدَّاءِ والأَعْدَاءِ كَالنَّسْرِ فوقَ القِمَّةِ الشَّمَاءِ  
أزنو إلى الشَّمْسِ المِضِيئَةِ..، هازناً بالسُّحُبِ، والأمطارِ، والأنواءِ  
أعترف يا قلبي أنك تحب إهتزاز الثورة  
على صدور الشرفاء  
وأنَّ أُمِّي هي مناضلة بل هي أجمل النساء...



International\_Women's\_Day\_mbsm\_dot\_pro2.png (33 KB)

يا قلبي أنتك تحب كل النساء  
 يا أنتك لست من الحمقى ولا من الجبناء  
 يا طافوت دين يجلس السفهانة  
 يا قلبي تمسك جنس الطيبة والوقاة  
 من التور على رؤوس التبالاة  
 صنعن بأيديهن التارويخ والبريق النداء  
 يا راية المجد عالية في غياض السماعة  
 من زلفم الذم والأفهام كلنشر فوق الفتنة الشخانة  
 يا شخص المجيبة... هارئة بالشخب، والأعطار، والأكواد  
 يا قلبي أنتك تحب إهناز الثورة  
 سدور الشرفاء  
 أي هي مباحلة بل هي أجمل النساء...

[الشاعر التونسي منير بن صالح ميلاد](#)

يا قلبي أنتك تحب كل النساء  
 يا أنتك لست من الحمقى ولا من الجبناء  
 يا طافوت دين يجلس السفهانة  
 يا قلبي تمسك جنس الطيبة والوقاة  
 من التور على رؤوس التبالاة  
 صنعن بأيديهن التارويخ والبريق النداء  
 يا راية المجد عالية في غياض السماعة  
 من زلفم الذم والأفهام كلنشر فوق الفتنة الشخانة  
 يا شخص المجيبة... هارئة بالشخب، والأعطار، والأكواد  
 يا قلبي أنتك تحب إهناز الثورة  
 سدور الشرفاء  
 أي هي مباحلة بل هي أجمل النساء...

[الشاعر التونسي منير بن صالح ميلاد](#)

International\_Women's\_Day\_mbsm\_dot\_pro.jpg1.jpg (185 KB)



International\_Women's\_Day\_mbsm\_dot\_pro.jpg1.jpg (44 KB)

