الاستهلال:

بسم الله الرحمن الرحيم

قال تعالي:

لَقَدْ أَرْسَلْنَا رُسُلَنَا بِالْبَيِّنَاتِ وَأَنزَلْنَا مَعَهُمُ الْكِتَـابَ وَالْمِيـزَانَ لِيَقُـومَ النَّـاسُ بِالْقِسْـطِ وَأَنزَلْنَـا الْحَدِيـدَ فِيـهِ بَـأْسٌ شَـدِيدٌ وَمَنَـافِعُ لِلنَّـاسِ وَلِيَعْلَمَ اللَّـهُ مَـن يَنصُـرُهُ وَرُسُـلَهُ بِـالْغَيْبِ إِنَّ اللَّـهَ قَوِيٌّ عَزِيزٌ

الاية (25) من سورة الحديد

Dedication

Dedicated to:

- My Family

  My parents.

- My wife

- thanks to my brother Ali who has been help me in work shop until I completed this work.

With my love and respect

Nadir abdalrazig siddig

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Dr. Elkhawad Ali Elfaki

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Nadir abdalrazig siddig

ABSTRACT

The control unit of model F-V0-A2F milling machine that belongs to the Mechanical Engineering Department of Sudan University of Science and Technology was rehabilitated.

The control unit under study controls the motion of the stepper motors driving the linear axis X, Y, Z, in addition to the spindle motor and the coolant system, via a programmed typed through its key boards.

The power supply and the stepper motors driving circuits were replaced by those obtained from a crippled lathe machine. Anew control cabinet was build. MACH3 software was configured and used as an interfacing program. The rehabilitated milling machine was tested and found to perform nicely.

تجريد :-

وحدة التحكم ماركة F-V0-A2F التي اعيد تأهيلها تنتمي لقسم الهندسة الميكانيكية جامعة السودان للعلوم والتكنولوجيا.

وحدة التحكم تحت الدراسة تتحكم في حركة الموتورات الخطوية وتحريكها في محاور خطية هي X,Y,Z الاضافة الي موتور عمود الدوران الرئيسي ونظام التبريد بواسطة كتابة البرنامج من خلال لوحة التحكم التابعة لها.

مصدر الطاقة وقاعدة دوائر موجهات الموتورات الخطوية اخذت من ماكينة خراطة معطلة.كما بنيت غرفةتحكم جديدة . برنامج MACH3 عولج واستخدم كواجهة للبرمجة. ماكينة التفريز المؤهلة اختبرت واعطت نتائج جيدة.

LIST OF ABBREVIATIONS

ABBREVIATION	***DECODING***
CAM	***Computer aided manufacturing***
CCW	***Counter clock wise***
CNC	***Computerized numerical control***

COM	***Communication***
Config	***Configuration***
CPR	***Cycles per revolution***
CW	***Clock wise***
DC	***Direct current***
Dir	***Direction***
DNC	***direct numerical control***
Dp	***Diametric pitch***
DRO	***Digital Read Out***
EDM	***Electrical discharge machining***
EStop	***Emergency stop***
GB	***Gaga bite***
HMI	***Human-machine interaction*,**
ID	***Internal diameter***
LPT	***Line print terminal***
MB	***Mega bite***
MDI	***Manual Data Input***
MPG	***Manual pulse generator***
NC	***Numerical Control***
Ns	***Number of teeth***
OD	***Outside diameter grinding***
PC	***personal computer***
PLC	***Programmable logic control***
RS-232c	***Serial communications protocol***
t p	***Tooth pitch***
Tpi	***Teeth per inch***
TTL	***Transistor transistor logic***
USB	***Universal Serial Bus***
Lo	***LOW***

LIST OF SYMBOLS

SYMBOLS	*MEANS*
A	***A axis of machine***
B	***B axis of machine***
C	***C axis of machine***

D	***Tool radius compensation number***
F	***Feed rate***
G	***G-code***
H	***Tool length offset index***
I	***X offset in G87 canned cycle***
J	***Y axis offset for arcs***
K	***Z axis offset for arcs***
K	***Z offset in G87 canned cycle***
L	***Number of repetitions in canned cycle/subroutines***
L	***L1/l2:tool offset settings/fixture offset (with G10)***
M	***M code***
N	***Line number***
O	***Subroutine label number***
P	***Dwell time in a canned cycle***
P	***Dwell time with G4***
P	***Tool /fixture number (with G10)***
P	***Tool radius(with G41/G42)***
Q	***Feed increment in G83 canned cycle***
Q	***Repetition of subroutine call***
R	***Arc radius***
R	***Canned cycle retract level***
S	***Spindle speed***
T	***Tool selection***
X	***X-axis of machine***
Y	***Y axis of machine***
Z	***Z axis of machine***

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