



**TOGETHER**  
*for a sustainable future*

## OCCASION

This publication has been made available to the public on the occasion of the 50<sup>th</sup> anniversary of the United Nations Industrial Development Organisation.



**TOGETHER**  
*for a sustainable future*

## DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

## FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

## CONTACT

Please contact [publications@unido.org](mailto:publications@unido.org) for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at [www.unido.org](http://www.unido.org)



D03173



United Nations Industrial Development Organization

Distr.  
LIMITED

ID/WG.87/21  
10 September 1971

ORIGINAL: ENGLISH

Regional Seminar on Machine Tools  
in Developing Countries of  
Europe, Middle East and North Africa

Slatni Pjassazi (Golden Sands) near  
Varna, Bulgaria, 18 to 27 October 1971

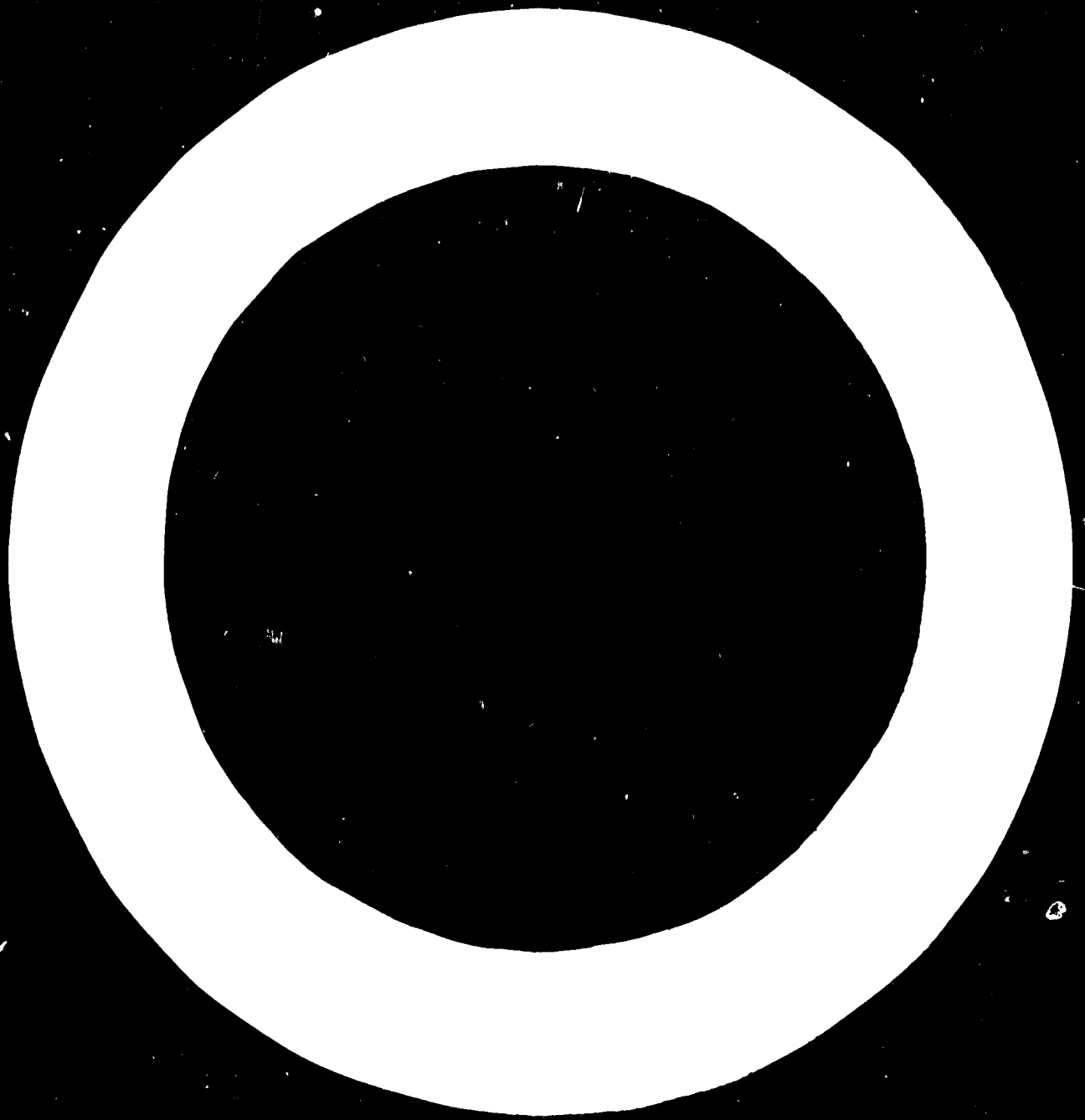
COUNTRY STUDY REPORT  
ON  
THE MACHINE TOOL INDUSTRY  
IN  
UNITED ARAB REPUBLIC <sup>1/</sup>

by

I. J. YASSEEN  
Chairman  
Helwan Military & Machine Tool Industries Co  
Helwan

<sup>1/</sup> The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche.



## PART - I

### POlicIES AND GENERAL ASPECTS

#### 1- Status of Machine tool in the Country.

##### a) Status before 1955 :-

Before 1955 the machine tools were used in the different industries for the following uses :

- Production of simple items of spare parts for machines & equipment into service.
- Production of some products either needed for the local consumption or for other industries.
- Training purposes in polytechnical schools.
- Pressings of some products.

The majority of these machine tools consists mainly of general purpose machines mainly :

- Centre lathes.
- Drilling machines specially bench & pillar drills.
- Small percentage of milling & grinding machines.
- Presses & sheet <sup>metal</sup> working machines.

The use of other types of machine tools was comparatively limited.

##### b) Preparation for the 1<sup>st</sup> 5 year plan of industrialization:-

When the UAR authorities started to put the national plan of economic development to the aim of doubling the national income in 10 years, it was taken into consideration elaborating a complete plan of industry in the different fields mainly

- Engineering industries.
- Metallurgical industries.
- Spining & weaving.
- Food industry.
- Electric & electronic industry.
- Chemical industry ... etc.

To elaborate the plan, it was essential at that time to study :-

- The status of the different existing industrial factories & companies.
- The existing man power & its skill.
- The national resources.
  
- Number, age, quality & types and precision of the machine tools in service .
- Investment needed for executing the industrial plan.

It was clear that it is of vital importance to introduce the industry of machine tools in UAR. in the frame of the 1<sup>st</sup> five year plan of industrialization.

c) The existing stock machine tools :-

The existing stock machine tools in UAR is the sum of the following :

- Machine tools that exists before elaborating the plans of industrial development. These machine tools were imported from the developed Countries & they are mainly general purpose machines.
- Imported machine tools from other countries within the needs of the pre-fixed plans of industrial development.
- Machine tools produced in UAR.

About 80% of the existing machine tools are used in the different industries either for production purposes or in the maintenance shops. About 10% are used in the training centers & the remaining 10% are used in small private production shops.

#### Demand, Production, import & export :

a) Demand & imports:

Statistics shows that the demand for the machine tools

is increasing with a big rate specially for the following:-

- General purpose heavy machine tools.
- Grinding machines of different kinds & capacities.
- Special purpose machine tools needed for different engineering industries.
- Precision machine tools for manufacture of special cutting tools, jigs & fixtures.

Although the imported machine tools do not show the volume of the domestic <sup>demand</sup>, yet it gives the general tendency for the demand. List N<sup>o</sup> 1 attached herewith shows the imports from the different machine tools which participate in the plans for industrial development.

The expected demand will be as follows in thousand pounds:

1975	5.200
1980	6.500

b) Domestic production :

The production of machine tools in UAR started on 1964. The existing plan covers only general purpose machines such as :

- Production of centre lathes.
- " " pillar drills.
- " " bench drilling machines.
- " " milling machines.
- " " shaping machines.
- " " turret lathes.
- " " small eccentric presses.
- " " double wheel grinders.

The following plans of industrial development as regards the extension of in the machine tool building will cover the following lines up to 1980.

- Adding the production of new types & capacities of the a/m groups of machine tools.
- Introduction of semi-automatic & automatic machines.

List N<sup>o</sup> 2 shows the value of machine tools produced since 1965 evaluated in Egyptian currency.

c) Exports :

The quantity of machine tools produced are below the domestic demand from the types stated in list N<sup>o</sup> 2 .

So all the quantities produced are used locally in the different industries.

It is planned that a part of the future production will be exported in quantities starting from 1973. It is also planned that the volume of export from the machine tools will be about 500 thousand Egyptian pounds after 1975.

Ancillary Industries.

During the elaboration of the industrial development plans, it was foreseen to erect ancillary industries to supply the machine building industry with its major needs of production.

Now in the UAR exists the following ancillary industries which covers all the needs of the machine tool industry :

- Foundry covers all the casted parts iron, steel castings and precision casted parts.
- Foundry for the malleable C.I. parts.
- Forging plants for the manufacture of all forgings (die or free forgings).
- Non-ferrous plan for the manufacture of all non-ferrous materials & castings.
- Factories for the production of painting materials, plastic parts together with all consumable materials.

Moreover, there exists also other ancillary industries that cover a part of the following materials:

- Ball bearings(few items).
- Fastening parts.
- Standard cutting (par) tools.
- Special cutting tools, jigs & fixtures.
- Electric motors & components.
- Commercial sheets & bars.

Now 80% by value from the needs of production are procured locally. The remaining 20% are imported from different countries.

Governmental Policy.

In general the policy of the UAR authorities can be summarised in the following points :-

- The machine tool industry is added to the group of industries of 1st priority.



- Extensions should be carried out in parallel with the concerned ancillary industries such as foundries, forging plant, .... etc. to the aim of supplying the machine tool industry with more than 90% .
- Domestic production from machine tools should share with about 60 - 70% from the demand of the general purpose machine tools .
- Priorities in production programme should be based on domestic demand together with the production cost in comparison with the world prices.
- Putting some financial measures in favour to industry specially during the first year of production.

2- External technical assistance in the development of the machine tool industry in UAR .

It was foreseen when elaborating the plan for the industrial development that the UAR should refer to a developed country to assist the UAR in establishing the machine tool industry on scientific basis taking into consideration the following points :-

- Economical points of view.
- Submitting technical & technological documents for the machine tools as per the production programme.
- Rendering the technical assistance either by its training group of UAR personnel abroad or by deputing experts whenever necessary.
- Delivery of machines & equipment needed for the annual production programme.
- As the financial burden is a main factor in taking a decision either for starting this industry or carrying out any future extension, so the developed countries should offer credit facilities with a reasonable annual interest .

In the a/m frame the USSR is rendering technical assistance to UAR & in accordance with the terms of the agreements concluded between both countries.

3- Co-operation and technical assistance needed.

a) With the foreign companies:

It is well understood that although the development in the field of producing numerically controlled machine tools is now playing a key role in the machine tool industry, yet the general purpose machine tools such as, to centre lathes,

drilling machine, milling machines... etc are still needed in growing quantity even in the developed countries.

It is proposed that the developing countries should share in producing the general purpose machine tools. This can be started by joint agreements between the developed & developing countries to the aim that the developed countries should have their needs from the developing countries.

The advantages of this proposal are :-

- Possibility of increasing the quantity produced from each type of machine tool & hence decreasing the production cost.
- Possibility of exporting machine tools to the developed countries.
- Increasing the technical know-how of the developing countries.
- The developed countries will concentrate upon the production of more complicated, and precise machine tools.

Moreover, the ties & cooperation between the developing countries should grow in future in the machine tool industry.

b) Technical assistance required by UAR from UNIDO:

In the field of training & of staff;

- Upgrading of semi-skilled workers.
- Training of Foremen.
- " Technicians.
- " Engineers & specialists.

In the Engineering field :

- Development of technological processes.
- Applying upto date techniques of motion & time study.
- Studying the difficulties facing the machine tool industry and finding the ways to overcome same.

In the research and industrial development field :

- Assistance in establishing research laboratories & centers for the machine tool industry.
- Assistance in erecting a design centre for the machine tool building industry complete with a proto-type factory.

## P A R T - I I

### TECHNICAL ASPECTS

#### 1- Problems in the development and utilization of machine tools.

##### a) Design and adaptation:

The machine tool industry in the developing countries generally starts with the cooperation of a developed country. Hence the initial designs & technology are imported from abroad.

There is always a considerable period since the start of production upto the factory reaches the projected capacity.

So the machine tool industry in the developing countries always faces the problem of obsolescence due to the rapid development in the developed countries.

##### b) Production of proto-types:

In some cases the developing countries succeed to introduce new simple modifications or designs.

The production of the prototypes is one of the most important problems that hinders the progress of the machine tool industry in the developing countries.

##### c) Under-utilization and its causes:

As the machine tool industry in the developing countries depends mainly on the domestic consumption, so the production programmes covers small quantities from different types.

Such production programme affects the proper utilization of the machine tools in the following points :-

- Difficulty of loading of machines & workers.
- Using the general purpose machines and a simple technology requires skilled labour specially in the main professions such as turners, grinders, fitters, tool makers & millers.
- Such professions are widely needed in all other industries & hence the labour turn-over is higher than the normal percentage.
- Manufacture of special tools jigs & fixtures needs precise machine tools & hence higher skilled workers are needed.
- Shortage of spare parts of the imported machine tools results in stoppages of some of the machine tools.

-As the domestic acillary industries do not cover all the needs of production, so there is under-utilization due to shortage of some materials which are imported from other countries.

d) Ways and means for effective utilization:

In my opinion the most important means of effective utilization should be by concluding joint long term agreement with one or more of the developed countries fulfill the following points :-

- Increasing the annual quantity produced from each type of machine tool .
- Applying new technology.
- Long term agreement for exportation.
- Training of the technical staff i.e foremen, engineers..etc
- Special care should be given to development, design, researches, technology.... etc.

e) Training of local personnel :

It is understood that the trained personnel plays a key role in any industry.

As great quantity are needed so the training should cover the following main points :

- Erection of training centers for new camars in the main professions needed for the machine tool industry.
- Putting system for up-grading of personnel in different professions.
- Training of technologists.
- Training of engineers

2-Consideration for introduction of numerically controlled machine tools in UAR.

It is expected that the numerically controlled machine tools will be used in future in UAR with increasing quantities.

The following problems should be studied & covered:

- a-High initial cost of NC machine tools & its relation with the mass production & marketing .
- b-Training on running of these machines.
- c-Maintenance & repair for these machines.

IMPORTS OF MACHINE TOOLS

52/53 - 66/67

(Last Year)

	62/63		63/64		64/65		65/66		66/67		Mean	
	value	%	value	%	value	%	value	%	value	%	value	%
Centre lathes	328	54.5	211		136		274		170		224	
Turret lathes	37	6.2	23		49		104		194		82	
Others	8	1.3	56		24		58		45		38	
<b>Total</b>	<b>373</b>	<b>62.0</b>	<b>290</b>	<b>68.0</b>	<b>209</b>	<b>43.3</b>	<b>436</b>	<b>49.0</b>	<b>409</b>	<b>57.0</b>	<b>344</b>	<b>55.0</b>
Bench drills	29		18		16		33		12		21	
Miller drills	11		6		12		8		6		9	
Radial drills	25		7		16		67		49		33	
Others	-		17		1		15		8		8	
<b>Total</b>	<b>65</b>	<b>10.8</b>	<b>48</b>	<b>11.25</b>	<b>45</b>	<b>9.3</b>	<b>123</b>	<b>13.7</b>	<b>75</b>	<b>10.0</b>	<b>71</b>	<b>11.4</b>
Shapers	14		2		8		24		16		13	
Planers	6		-		1		2		8		4	
Others	-		-		-		5		-		1	
<b>Total</b>	<b>20</b>	<b>3.5</b>	<b>2</b>	<b>0.47</b>	<b>9</b>	<b>1.9</b>	<b>31</b>	<b>3.4</b>	<b>24</b>	<b>3.0</b>	<b>18</b>	<b>2.9</b>
Milling M/Cs	82	13.6	32	7.50	166	34.3	132	14.7	127	17.0	108	17.3
Grinding M/Cs	47	7.9	38	8.93	57	11.0	122	13.6	65	9.0	65	10.5
Sawing M/Cs	13	2.2	16	3.75	1	0.2	51	5.6	10	1.5	18	2.9
<b>Total</b>	<b>600</b>	<b>100</b>	<b>426</b>	<b>100</b>	<b>483</b>	<b>100</b>	<b>895</b>	<b>100</b>	<b>710</b>	<b>100</b>	<b>624</b>	<b>100</b>
Other types & capacities	457		1156		1114		1399		1888		1182	
<b>G. Total</b>	<b>1057</b>		<b>1582</b>		<b>1597</b>		<b>2294</b>		<b>2598</b>		<b>1806</b>	

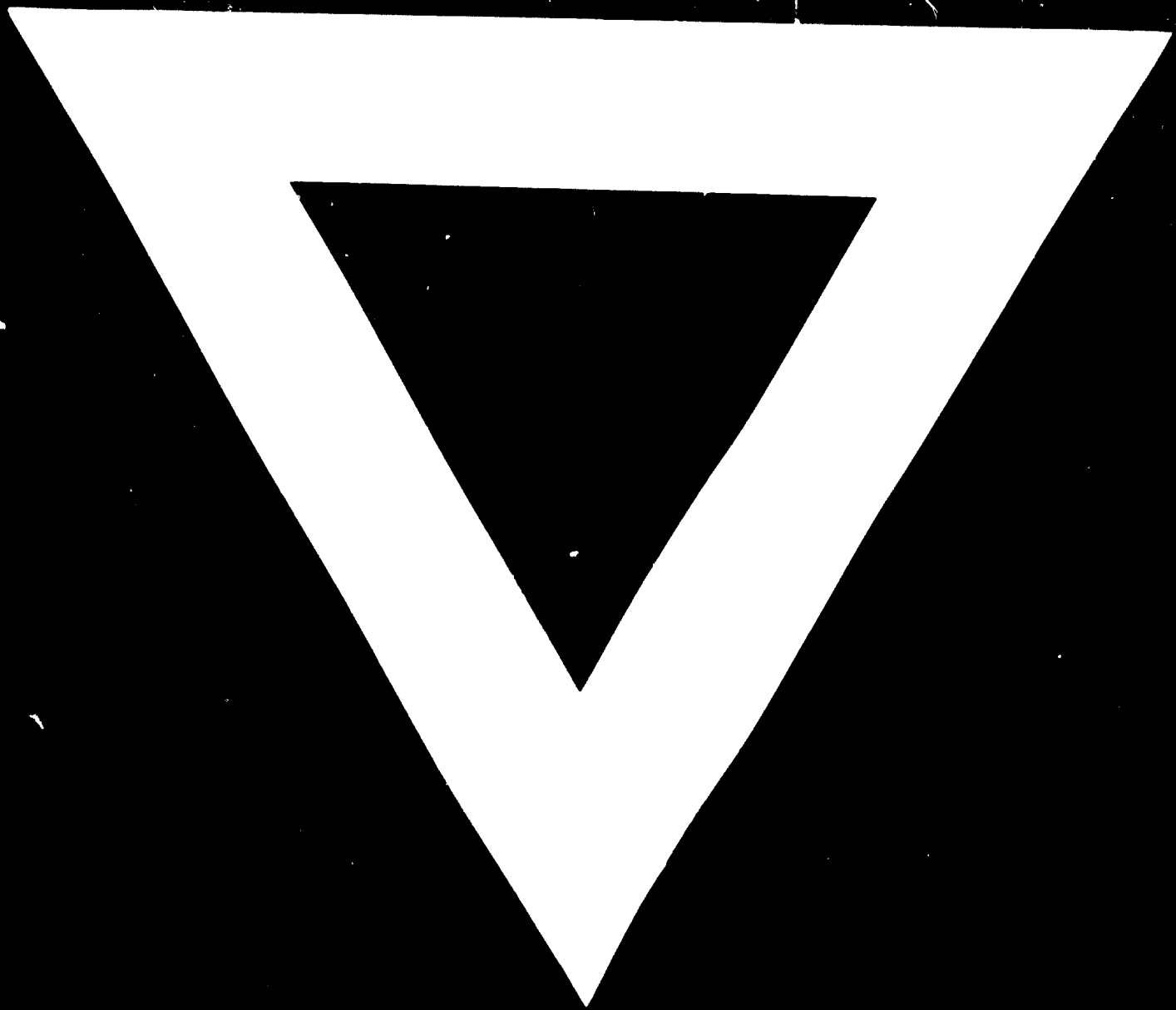
M A C H I N E T O O L S P R O D U C E D I N U A R .

(value in 000's L.R)

	64/65	65/66	66/67	67/68	68/69	69/70	70/71	Total	
								Sum	%
Centre lathes	151	192	283	348	525	568	795	2862	73.7
Bench drill	56	7	28	34	34	52	75	284	7.5
Pillar drills	-	53	39	76	95	76	91	431	11.3
Shapers	-	-	-	-	20	84	71	176	4.5
Milling M/Cs	-	-	-	-	21	-	67	84	2.15
Grinding M/Cs	-	-	-	-	-	6	26	34	0.85
<b>T o t a l</b>	<b>207</b>	<b>252</b>	<b>350</b>	<b>458</b>	<b>695</b>	<b>786</b>	<b>1121</b>	<b>3871</b>	<b>100</b>

Remarks :-

- Expected value of machine tools produced during 75/76 3 million L.R.
- " " " " " " 79/80 4.5 million L.R.
- Programs will cover new types, capacities & groups.



**7 . 8 . 73**