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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

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PHILIPPINES

Technical report: Manpower Development for the Secondary Wood Processing Industries*

Prepared for the Government of the Philippines
by the United Nations Industrial Development Organization

Based on the work of Peter J. E. Lomax
Consultant in Manpower Development

Backstopping Officer: Antoine V. Bassili
Industrial Management and Rehabilitation Branch

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* This document has not been edited.

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I N T R O D U C T I O N

It was decided at a meeting of representatives of the Furniture Industry in the Philippines, the management of the PRODEX II Project and Mr. Bassili of UNIDO, Vienna, that a 2½ man/month of the expert component of the project be devoted to a survey of present training and educational practice in the Philippines in relation to the manpower needs of the furniture industry.

The survey would result in the preparation of a Manpower Development Plan for the furniture industry, and, time permitting, the preparation of a model syllabus and training manual for use in future elaboration of the Development Plan.

The job description is attached as Appendix I.

The manpower development consultant, Peter J. E. Lomax, arrived in Manila on 25 January 1991 and departed on 4 April 1991, as a consequence of a two-day extension agreed with Mr. Newman, UNIDO Country Director in Manila. This extension is to compensate for two days public holiday in Holy Week which were taken as two days of unpaid local leave.

During the course of the work, it became apparent to the consultant that greater emphasis could profitably be placed on trying to lay the ground work to the Development Plan rather than on writing syllabus and training material. This was discussed in an exchange of fax messages with UNIDO, Vienna which resulted in the consultant being given a degree of discretion in the implementation of paragraphs 3, 4, 5 and 6 of the Job Description. In the event it was in fact possible that in the remaining two weeks to complete most of the objectives in these paragraphs.

The management of PRODEX II, Mr. Francis Lopez arranged a preliminary round of visits to educational and training establishments and to a representative selection of furniture factories. Ms. Jean Roxas of PRODEX II was allocated to the consultant throughout the assignment as his assistant. As information was collected, visits were arranged as appropriate to follow-up lines of inquiry. A list of all establishments visited, and names and titles of persons met is attached as Appendix II.

Appendix III contains a list of organisations, their acronyms.

Mr. Francis Lopez informed the consultant that he had asked the Chamber of Furniture Industries in the Philippines (CFIP) to provide a counterpart to work with the consultant. No CFIP or industry counterpart has worked with the consultant.

Rather than discuss each visit, the next section of this report describes the overall picture that was built up.

An early meeting with CFIP representatives took place at which a timetable and programme of work was agreed; namely that by 21st February, the consultant would be ready to present proposals for a Manpower Development Plan. Thereafter he would make himself available to work with CFIP on a syllabus.

The presentation of the proposed Manpower Development Plan was made, as agreed on 21st February, and was repeated in Pampanga and Cebu. The Manpower Development Plan Report, is attached as Appendix IV.

F I N D I N G S

A. Education and Training Institutions

The Department of Education, Culture and Sports (DECS) dominates the education and training system through its strong influence, both general and particular, on the curriculum used and the training of teachers and instructors.

Delivery of education and training as far as it has a bearing on the furniture industry is through five government agencies or groups of institutions, and two non-government establishments.

1. National Manpower Youth Council (NMYC) was set up originally to provide industrial training. It has a nationwide network of generally spacious training centres which deliver courses on demand from trainees. Since the mid-80s, NMYC has been given the large extra responsibility of catering to the out of school youth composed of 6 million 17 - 25 years old, 2 million of whom are unemployed and less than 6 percent of whom receive any vocational training. This is reported to have diverted a significant part of NMYC effort away from a purely industrial training approach towards a "job creation" policy.

2. Technical Education Institutes (TEI) and Schools of Arts and Trades (SAT) exist to provide a technical and vocational route for high-school graduates going to industry. Although these are nominally autonomous government institutions, their teaching policies appear to be largely under DECS' influence. Manila Technician Institute claims to be the best of this group and to have a good reputation from industry who are pleased to take all their graduates.

3. Vocational Schools or Trade Schools that provide secondary education are reported as being phased-out.

4. Universities provide degree level courses in Industrial Design and Interior Design. These have an insignificant practical content and less than 10 percent of the time is devoted to subjects partially or marginally relevant to the furniture industry.

5. The last group consist of Cottage Industry Technology Centre (CITC) and Philippine Trade Training Centre (PTTC), under the Department of Trade and Industry (DTI), and the Forest Research and Development Institute (FRDI) under the Department of Science and Technology (DOST). All three are well equipped but do not see themselves primarily as training centres. Their training activities are specialised to one or two topics and generally consist of short four to five day seminars.

In addition to these, there exist three non-government training establishments. The Don Bosco Academies, the CFIP Training Centre in Dapitan, and the Dual-Tech Training Centre.

The former are religious foundations devoted to helping those who are unable to afford an education and have not graduated from high-school, to receive training in a trade that will enable them to build a career. Don Bosco at Cebu currently runs a one year Furniture Making course. All these trainees have been offered jobs before the course is finished. Proposals have been submitted to German aid agencies for assistance to upgrade this course and start a two year course. The proposal includes a request for two expatriate instructors for 5 years. Don Bosco in Pampanga does not run any courses in furniture, but has expressed willingness to do so with the necessary help.

The Dapitan Training Centre is nominally run by the CFIP. In practice, it is run by a German Master Craftsman on his family prawn farm. It provides a high quality two-year residential Furniture craft course for 12 trainees who are sponsored to a total of P36,000 each by companies. There are more willing sponsors than pupils.

The Dual-Tech Training Centre is a private sector establishment funded by the Hans Seidel foundation of Germany and the S.E. Asian Science Foundation Inc. It runs engineering craft courses of 2 ½ years to provide a group of about 100 companies with skilled manpower. Trainees are recruited by Dual-Tech from the poorer levels of society having high school graduation. The trainees spend two days a week at the centre and four days on-the-job training at company placements selected by the Centre's six Industrial coordinators, who also monitor the on-the-job training by fortnightly visits to the companies. Company supervisors receive instructor training to enable them to carry out the on-the-job training effectively. The Centre employs 12 instructors with a minimum of three years industrial experience; 5 years instructing in their specialty, and an engineering degree. They receive further training in Germany on-and-off-the-job. The Centre retains its instructors by offering a "competitive" salary.

Dual-Tech with Kabuhayan Foundation Inc. and S.E. Asian Science Foundation Inc. are looking for land to build a Furniture Training Centre for 300 trainees following the same system. It is planned this will start in 1992.

Currently they are advising Manila Technician Institute about using the Dual-Tech system, but not about either syllabus or instructor selection and training.

B. Education and Training System

As previously stated, the system is dominated by the educational establishment. All tertiary education requires high school graduation for entry. Industrial and vocational training is regarded as a part of tertiary education. Hence all below high school graduates are effectively barred from industrial training in the government system.

Furniture Making is classified as a part of "Woodworking" which in turn is a part of "Construction". As stated, NMYC runs courses on demand from trainees or would-be trainees. There was universal agreement by all government agencies that high school graduates do not want to take up woodworking. It is perceived as, low status, low pay and precarious - not to say an unsafe job.

There is no demand - so there are no courses. Manila Technician Institute are hoping to overcome this in their proposed three-year Furniture Making pilot course starting in June 1991. Because they always have a surplus of applicants for other courses it is intended to put part of this surplus into to the three-year course. Appendix V gives details and the background of this course.

Generally, the system will not train those who might be willing - those whom it will train are not willing.

The non-government system draws its furniture trainees from the poorer levels not usually having high school graduation. It is thus able to produce trained workers that the industry is eager to employ. The number are so small - less than 25 annually - as to have an imperceptible impact on the industry as a whole.

The Government part of the training system, like the educational part, is pupil or trainee led. By this is meant that the onus of finding trainees for courses lies with the institutions. Industry is the recipient of those trained in the subjects which are "popular" with the youth. There is no mechanism for measuring, much less matching industry needs. Moreover industry bears little, if any, costs. As result, it has very little say or influence on training matters. All is decided and arranged by the educational establishment.

C. Training Facilities

As previously stated, the system is dominated by the educational establishment, which determines the training of teachers and instructors. A typical career history for an instructor is likely to be:

- Elementary School
- High School
- University
- Teacher Training (including 2 to 6 months industrial secondment)
- Appointment as Instructor

One or two instructors met had some overseas training, but only one claimed any extensive practical industrial experience, earning his living at an industrial job. It is doubtful if there are more than one or two people who are available and qualified to run a Furniture craft course.

In most training centres, woodworking machines and facilities are poor. Dapitan Training Centre is an object lesson in how to train well with scanty selection of machines. Under impetus of strong demand and vigorous management, much could be done by relocating existing machines and relatively a modest local currency expenditure. CITC and FRDI are well equipped, but are not primarily training institutions.

In most centres visited, space was not likely to be a constraint.

D. Aid Projects

No organisation was identified with a responsibility to coordinate aid funded projects either with each other or with local projects. In the recent past, currently and proposed, there are eleven projects having some impact on

industrial training in general and the furniture industrial training in particular, Appendix VI gives further details of these.

The most significant of those, from a manpower development point of view, is the ILO project PHI/88/037 which has as its objective the establishment of a system of industrial apprenticeship. The consultant has been able to establish a link between PRODEX II and this ILO project. The management of PRODEX II has now been invited to a series of seminars organised by this project (see appendix VII).

Whilst there is no reason to doubt that each project on its own is, or will be successful, it is doubtful that their sum make a contribution as great as would be achieved if they all fitted into a pre-determined, agreed, and coherent plan.

E. The Furniture Industry

The industry is desperately trying to develop itself from a cottage jobbing origin into, a large batch, high quality and internationally competitive industry. Some companies have made considerable progress. The management in most of the companies visited expressed their frustration at the lack of the knowledge that they felt needed to compete successfully internationally. All were concerned at the threat from other South East Asian producers, and the dwindling supplies of rattan.

The factories visited displayed to greater or lesser degree the absence of the industrial know-how needed for an efficient production operation. This manifested itself in many ways: poor housekeeping, absence of machine guards, disorderly storage, under-utilised machinery, poor lighting, etc.

The exporting companies in the industry are mostly reacting to the random demand of overseas buyers. They do so by relying heavily on sub-contracting and casual labour. The industry has thus got itself a reputation as an unreliable employer.

Traditionally, the village carpenter/furniture maker does not appear to have been considered either particularly skillfull or engaged in an activity needing any great aptitude. Thus, it is not commonly held that furniture making requires any training. One learns as one goes along, seems to be both the belief and the practice. The small cottage workshop usually did not have the management to seize the exporting opportunities of the last five years. Businessmen and entrepreneurs from outside the industry did see the opportunities and invested in factories. These people did not have any experience of industry, whether furniture or any other. For these reasons, there is not pool of industrial know-how on which the industry can draw, nor afford to release any there might be, as instructors.

The industry has not so far made its voice heard effectively, particularly in the field of manpower development. As there is no representative body, this is to be expected (CFIP has less than 300 members out of an estimated population of 15,000 enterprises). There are signs that some groupings are beginning to take form and are becoming more active in seeking training, and other matters of mutual concern. So far however, there is no full time paid and qualified officer employed collectively by either a group or the industry as a whole, to develop and run systematic training scheme.

F. The Industry Manpower

The statistical information available is not detailed nor reliable, and considerable estimating has been necessary to arrive at the following.

Employment in the whole industry	230,000
Employment in the export sector	80,000
of which 60% are direct workers	48,000

These sub-divide into five categories in the following estimated proportions:

75% Rattan workers
10% Carvers
6% Cabinet Makers
6% Machinist
3% Finishers

Labour turnover has been taken as 8 percent. This is about 50 percent lower than would be expected in similar circumstances in a fully industrialised country.

To provide a basis for calculation, a target of achieving parity in international competitiveness in 5 years was used. This was converted into training terms as 25 percent of the direct labour force needing to have received some formal training at the end of five years, i.e. an annual increase of 5 percent.

These two requirements, replacing losses and increasing the competence of the labour force, require that 13 percent of the direct labour force be trained annually. The volume of training needed annually can now be calculated and is shown below.

	Annual Training Requirement (13 % of direct labour force)
Rattan workers	3,960
Carvers	524
Cabinet Makers	374
Machinist	374
Finishers	187
	6,240

These figures give a measure - albeit a very approximate one - of the magnitude of the training task.

P R O P O S A L S

The full proposals for a Manpower Development Plan are given in Appendix IV. A brief outline is given below.

1. NMYC to provide the lead for the Plan by appointing a senior executive to implement, manage and control the Plan.

2. NMYC, in conjunction with selected non-government training institutions, to provide the delivery system.

3. A substantial injection of industrial furniture manufacturing know-how in the form of 12 instructors to be obtained, initially by the service of expatriate instructors for not less than three years.

4. A four level training and career structure to be standardised for the industry, consisting of, Semi-skilled, Skilled, Master and Technician levels. Entry to be only at Semi-skilled and Skilled levels.

5. Furniture and Cabinet Making training to be established as a separate subject as against a sub-section of "Construction", with its own series of syllabus covering all four levels of the industry.

6. All training centres to conform to the provisions of the syllabus, and overall Plan.

7. Companies to recruit their own trainees, send them for training and pay all, or a substantial portion of the costs.

R E C O M M E N D A T I O N S

1. That UNDP, in its coordinating capacity, establish close contact with the NMYC/ILO Apprenticeship Project and that the apprenticeship system cater for the needs of the industry serviced by the PRODEX II project. The implementation of these measures should be monitored by UNDP on a regular (monthly) basis.

2. That, as a result of this mission, the NMYC/ILO Apprenticeship Project should:

- o include Furniture craft amongst its occupations for its pilot scheme planned for end of 1993;
- o use its good offices with NMYC and others to encourage the early implementation of the of Manpower Development Plan along the lines proposed, as an important precursor to the final apprenticeship scheme.

3. That PRODEX II resources be concentrated to those company groupings identified as most likely to be willing and able and able to implement a coherent and systematic Manpower Development scheme.

4. That the appointment of a full-time counterpart from either a training institution offering a furniture craft course or middle-management from industry be a mandatory requirement for the provision of future consultancy to the Furniture Industry.

5. That requests for training or equipment aid from any source in the Furniture Industry be:

- o a viable, comprehensively presented proposal;
- o part of an overall Manpower Development Scheme;
- o critically evaluated by a specialist at UNIDO Headquarters before being approved.

APPENDIX I

JOB DESCRIPTION

DG/PHI/87/007/11-17 (J-12209)

Post title: Consultant in manpower development for the secondary wood processing industries.

Duration: 2.5 months.

Duty station: Manila, with travel in the Philippines.

Date required: As soon as possible.

Purpose of the project: To develop and implement export strategies for four products (natural fibres, wooden furniture, builders' woodwork and wooden toys), to develop product adaptation, improve production and disseminate the experience to the industry and to build up improved trade information and collection system and procedures.

Duties: Under the direction of the National Project Manager, and in collaboration with the National experts for wooden furniture, builders' woodwork and wooden toys, he will review the manpower qualifications of the secondary wood processing industry, the existing training facilities, and based on this assessment, elaborate a long range, modular training programme to meet the sector's needs. In particular, he will be expected to:

1. Survey the needs of the secondary wood processing industry for trained manpower at all levels by visiting a representative sample of firms and existing vocational and technical schools, studying the curriculae used.
2. Based on the above survey, draw up a plan for manpower development at all levels, that could be implemented in a modular approach, be it in the establishment of various facilities, or in the training of technical staff of the plants.
3. Draft the curriculae for the various modules and determine the equipment and teaching aids needed to implement each module of the proposed programme.
4. To the extent that time permits it, draft some of the manuals to be used in implementing the proposed programme. (These could serve as a model for future manuals prepared locally to implement the programme.)
5. Conduct short seminars for managers from industry to promote the proposed programme and ensure the collaboration of industry for the overall success of the proposed programme.
6. Prepare a technical report containing his findings and recommendations as well as details of the proposed programme, the curriculae, the sample manuals the investment and operational costs, etc.

APPENDIX II

List of Institutions and Companies Visited and Persons Met

AGENCY/COMPANY	CONTACT PERSON
Training Institutions	
Asian Institute of Management Paseo de Roxas, Makati	Ms. Kuku Lopez Marketing Coordinator
Bureau of Technical Vocational Education (DECS)	Dr. A. Guiang Director
CFIP Dapitan Furniture Training Centre Dapitan, Zamboanga del Norte	Mr. Bernhard Forster
Cottage Industries Technology Centre (CITC) Marikina, Metro Manila	Ms. Emeline Navera Director
	Mr. Jorge Mundo Chief, Woodworking Division
Don Bosco Training Institute Bacolor, Pampanga	Fr. Roilo Alcasid Rector
Don Bosco Woodworking Centre Labangon, Cebu	Fr. Patrick Buzon Rector
	Bro. Justin Legaspi Technical Director
Dual Tech Training Centre Mantrade, Makati	Mr. Elizer Mejia Director, Proj. Mgt. and Dev't
	Mr. Honorio Grupo Technical Scheme Chief
Forest Products Research and Development Institute (DOST) Los Banos, Laguna	Mr. Felix Moredo Science Research Specialist
	Mr. Arnaldo Mosteiro Consultant, Coco Wood Processing & Utilization
Honorio Ventura College of Arts and Trades (DECS) Pampanga	Mr. Ernesto Nicdao President
	Dean 2 instructors

National Industrial Manpower Training Council (DTI)	Mr. Franklin Bonoan Chief, Policy Planning Div.
National Manpower and Youth Council (DOLE) Taguig, Metro Manila	Mr. J. R. Lacson Director General
	Mr. N. R. Galma Director (DOLE)
	Mr. V. Guillermo Deputy Director
	Mr. Loreto Purisma Exec. Director, Industrial Manpower Office
	Mrs. Fely Zurbano OIC. Training Tech. Div.
	Mr. Francisco Sucor Mr. J. P. Pons 2 instructors
NMYC, Region III (DOLE) Pampanga	Mr. Jose P. Cruz, Jr. Director
NMYC Regional Training Centre (DOLE), Guiguinto, Bulacan	Mr. August Capio Training Centre Chief
	Mr. Castro Skill Certification Off.
NMYC Regional Training Centre (DOLE) Mariveles, Bataan	Mr. Jose Santos Centre Manager
	Mr. Celestino Lopez Instructor
NMYC Regional Training Centre (DOLE), Archbishop Reyes St., Cebu	Mr. C. Gellekanao, Jr. Regional Director, NMYC Region VII
	Mssrs. Jose Villagonzalo, Esteban Meleccio, Alberto Ceniza
	2 instructors
Nissan Service Training Centre Quezon City	Mr. Fil Castillo Head, Technical Services
Manila Technician Institute Taguig, Metro Manila	Mr. Federico Ramos Executive Director
	Mr. John Calamiong Head of Civil Engineering

Mapua Institute of Technology (DECS), Intramuros, Manila	Mr. Nicholas Ricafrente Dean
Marikina Institute of Science and Technology (DECS) Nat'l. Centre for Technical Educ. Marikina, Metro Manila	Mr. Ambrosio Ibalan Director
Philippine Trade Training Centre (DTI), Pasay City	Ms. Angelina Angeles Executive Director 1 Technician
Product Development and Design Centre Phils. (DTI) CCP Complex, Manila	Ms. Minerva Franco Executive Director 1 Designer
University of Santo Tomas (DECS) Espana, Manila	Ms. Yolanda Reyes Asst. Dean Mr. Celino Santiago Head, Industrial Design 1 Professor of Interior Design

<u>Furniture Companies</u>

AKKA Wood	Mr. Armin Tinio President and President, CFIP Pampanga
Arnolds Woodworks International Marilao, Bulacan	Mr. Edmundo Cabatit Production Manager
Asian Arts/CFIP Cebu Chapter Cebu	Mr. Ike Flores President and President, CFIP Cebu
Berben Wood Industries Mandaue City, Cebu	Mr. Antonio Chiu General Manager Mr. Goh Lip Koon Production Manager
Carlos Antonio Disenos Mandaue City, Cebu	Mr. Mark Cancio Operations Manager
Cruzwood Industries Angeles City, Pampanga	Mr. Ruperto Cruz Owner
Designs Ligna Taguig, Metro Manila	Mr. Nicolas de Lange Marketing Director

Filipinas Furniture Angeles City, Pampanga	Mr. Hermie Yusi President
Furnitureville Guagua, Pampanga	Mr. Florentino Torres Owner
JB Woodcraft Guagua, Pampanga	Mr. Jose & Mr . Myrna Bituin Owners
JC Carpenters Las Pinas, Metro Manila	Mr. J. Carpio Owner
Mehatibel Furniture	Ms. Josephine Booth Lahug, Cebu City President
	Mr. Robert Booth Vice President
Santo Cristo Bulacan	Mr. Andres Cruz Owner
Simbulan Industries Baliwag, Bulacan	Mr. Renato Simbulan President
<u>Others</u>	
Bureau of Export Trade Promotion (DTI), Makati, Metro Manila	Mr. Benicio Eusebio Director
	Mr. Francis Norman Lopez Project Manager
	Ms. Mary Jean Roxas Trade & Industry Dev't Specialist I
Board of Investments (DTI) Makati, Metro Manila	Mr. Emilio Jaranilla Director, Forest Based Industries Department
	Mr. Dennis Miralles Chief
Chamber of Furniture Industries of the Philippines Pasig, Metro Manila	Mr. Eduardo Baluyut President
	Mr. Romualdo Sta. Ana Vice President
	Mr. Gerry Cancio Head, Technical Committee
	Ms. M. David Natividad

CFIP Cebu City	Ms. Cherry Sumaljag Secretariat
ILO Makati, Metro Manila	Dr. Gust ILO Country Director
	Mr. Rudiger Hobohm Adviser Apprenticeship Training
	Mr. Glen Newton Adviser, Apprenticeship Training

Exhibitions :

Manila F.A.M.E. Furniture Fair

Cebu Furniture Fair

Makati Furniture Showrooms

Private Visits :

Mr. Augustin Cancio - past CFIP Founder and President

Mr. Horatio Brion - Furniture Industry Consultant

Seminars to Outline Manpower Development Plan Proposals

1. 21 February 1991 at CFIP Office, Manila

E. Paluyut	CFIP President
R. Sta. Ana	CFIP Vice President
R. Secson	CFIP Board Member
G. Cancio	CFIP Board Member
Alice Galvan	PTTC
R. Limbago	PTTC
Y. Robillos	FPRDI-DOST
G. Casula	NMYC-DOLE
M. Duplito	NMYC-DOLE
A. Guiang	DECS-BTVE Director
P. Cabuboy	DECS-BTVE
E. Jaranilla	BOI-DTI
M. Palma	BOI-DTI
L. Reyes	BOI-DTI
V. Pita	BETP-DTI
E. Dimagiba	BETP-DTI
F. Lopez	BETP-PRODEX II
J. Roxas	BETP-PRODEX II
E. Monteagudo	BETP-PRODEX II

2. 15 March 1991. Furniture Industry representative at Pampanga:

Armin Tinio	CFIP Pres., Pampanga
A. Carpio	NMYC Reg. II Centre Chief
F. Torres	Furnitureville
Arnaldo Tinio	Akkawood
P. Pineda	Peter's Custombuilt
A. Torres	A & B Interiors
T. Dungca	Dungca's Furniture
R. Nocete	Manor Furniture
M. Yusi	Filipinas Furniture
L. Gozun	Verawood
A. Bravo	UPISSI
D. Abilles	UPISSI
A. Reyes	DTI Region III
A. Ramirez	DTI Pampanga
J. Roxas	BETP-PRODEX II

3. 18 March 1991. Furniture Industry representatives at Cebu

C. Gellekanaa	Director, NMYC Cebu
S. Corke	NMYC
S. Loyson	Mindanao Rattan Corp.
J. Legaspi	Don Bosco
R. Vorguez	OTI Cebu
H. Steegan	Pacific Traders
L. Fruelda	?
J. Ongifie	APY Cane Inc.
L. Boobner	Castilla Ind. Corp.
A. Climaco	Castilla Ind. Corp.
R. Booth	Mehitabel
R. Lim	Tradewinds Rattan
B. Uboapine	Interior Craft
A. Satitos	Sandos Lumber
B. Flores	Asian Arts, CFIP President

APPENDIX III

List of Organisations, Acronyms and their Relationships

The relationships of divisions to Departments are only shown to the extent relevant to this project and are not intended to be comprehensive for each Department.

1. Government Departments

DECS (Department of Education, Culture and Sports) under which:

- BTVE (Bureau of Technical and Vocational Education)
- NCTESD (National Centre of Technical Education and Staff Development)

DOLE (Department of Labour and Employment) under which:

- NMYC (National Manpower Youth Council)

DOST (Department of Science and Technology) under which:

- FPRDI (Forest Products Research and Development Institute)

DTI (Department of Trade and Industry) under which:

- BETP (Bureau of Export Trade Promotion)
- BOI (Board of Investments)
- NIMTC (National Industrial Manpower Training Council)
- CITC (Cottage Industry Technical Centre)
- PTTC (Philippine Trade Training Centre)
- PDDCP (Product Development and Design Centre of the Philippines)

2. Autonomous Government Institutions

MTI (Manila Technician Institute)

TEI (Technical Education Institutes)

SAT (Schools of Arts and Trades)

APPENDIX IV

MANPOWER DEVELOPMENT PLAN REPORT

1. INTRODUCTION

1.1 Background

As a result of the meeting between the management of PRODEX II (BETP), representatives of the Furniture Industry and UNIDO representative, it was agreed that a component aimed at preparing a Manpower Development Plan be included in the PRODEX II project. This report is the outcome of that agreement which was based on an acknowledgement that the present ad hoc training systems were not producing the improvement in level of manpower competence considered necessary.

There is a history of attempts to rationalize the training for the industry going back over several years. There exist at least six reports and studies which draw conclusions similar to those in this report. The recommendations these reports make have so far not been implemented. Additionally, various other projects have done work with the furniture industry or with institutions that deliver training to the industry. As far as can be ascertained, these projects have not been coordinated, to each other, to what has gone before or to what is planned to follow. In addition to the current PRODEX II programme, there exist an ILO industrial apprentice project, and a proposal for a German funded programme for upgrading the Don Bosco Academy furniture course in Cebu. A request for funds has also been submitted to UNDP for funding a locally organized and manned train-the-trainer course, and South East Asia Science Foundation Inc. is funding a private training venture.

A consequence of this situation is that one set of proposals or plans interferes with another.

Annex I lists these reports and projects.

1.2 Work Plan

Only some three to four weeks were allocated to developing these proposals. The only practical method of collecting the information needed was by visits and unstructured interviews with representative companies, and training and educational institutions. The visits were selected by PRODEX II in consultation with representatives of the industry. However, the consultant was able to add or delete visits as appeared appropriate to him.

Statistical data used are not satisfactory because the base information either doesn't exist (e.g. number of companies) or is of doubtful accuracy (e.g. numbers employed). The figures in this report, apart from the export values, must therefore be treated with caution and as indicating orders of magnitude.

2. FACTORS DETERMINING PRESENT SITUATION.

2.1 Export Performance

The economic significance of the industry lies mainly with those companies (some 300) that export the majority of their production. It is this sector that BETP is seeking to promote. Therefore it is with this sector that all that follows is concerned.

The industry's export performance is summarized below.

Year	Total value ($M)	% Rattan	% Wood	% Other
1985	83.7	70	7	23
1986	89.3	69	9	22
1987	130.4	73	9	19
1988	183.7	75	10	15
1989	203.7	68	14	18
1990 (est.)	190.0	64	16	20

The proportion of wood furniture exports has more than doubled in the six years - and more than quintupled in value. The industry is expecting this trend to continue, and possibly accelerate as supplies of rattan get scarcer, and other countries enter the rattan market.

2.2 Nature of the Industry

The salient feature of the industry is its origin from cottage production supplying unsophisticated local buyers with custom made furniture. Even now there is no developed distribution and retail system to supply local demand with a standard range of products.

Export demand for large numbers of identical items for a sophisticated international market found the industry quite unprepared. Valiant and partly successful action has been taken by companies to adapt to this demand. However, there has been of no coherent and systematic acquisition of the necessary industrial know-how to effect this transformation.

Generally the firms that have realised and taken the export opportunities are those whose managements or founders are primarily entrepreneurs. There is a very little industrial production know-how or experience amongst the industry's leaders. Moreover, most are first generation firms so there is little detailed know-how at first line management or shop floor level - other than that which has been acquired by trial and error. As the industry has grown from, and large sections are still at, the cottage level of production the "custom and practice" that does exist is not appropriate to the needs of efficient large batch production.

Export production volume by the individual company is a reaction to more or less random demands of visiting buyers. The general lack of a forward export marketing and sales plan and volume targets, results in very large surges in demand on individual factories. These are met by a combination of sub-contracting to small workshops or individuals and employment of casual labour. In turn this causes problems of control, quality and costing.

These surges in demand and the lack of industrial know-how amongst senior mangers result in a poor selection and utilization of both space and machinery.

At this stage of development the industry is still a fragmented collection of companies, jealous of their perceived secrets, competing for labour, and open for exploitation by an unscrupulous overseas buyer. It is doubtful that there is a body or group of companies that can be considered to be representative, in any practical sense of the word, of the industry as a whole.

The industry does not collect manpower statistics. The information that is available from national sources is of a very generalized nature and incomplete. This makes a numerical description difficult (see 2.3 and 5.1).

It may be asked, "How has an industry as described been able to more than double export value in five years?".

The industry's competitive advantages lie in: low prices, the novelty of good manual craft skills (rattan and carving), and imaginative designs. The last two have been perhaps the most important factors in opening the door to exporting particularly to the US which takes over half, but a diminishing proportion, of total exports. These are wasting assets; novelty wears off, and designs can be copied.

The price advantage is being attacked by other South East Asian producers, some of whom may have a greater depth of industrial production know-how in other industries that they are transferring to furniture manufacture.

The signs are that time may be running out on the export boom that the industry has enjoyed, unless rapid action is taken to transform the industry into a modern industrial producer capable of competing head-on with the best internationally.

There are no indications that such a transformation is envisaged or planned on an industry-wide basis. A few firms are coming to appreciate the need and are looking for solutions.

2.3 Industry Manpower

The characteristics of the industry described above have a marked impact on both existing employees and the pool of potential future employees.

Existing Employees: The National Statistics Office's (NSO) 1990 employment figures for industry give the breakdown by educational attainment as follows:

- Non-high school Graduates 64%
- High school Graduates or University Undergraduates 32%
- University Graduates or Equivalent 4%

The majority of shop floor workers in the industry are drawn from the poorer, less educated sector of the population. Their skills are self-taught by exposure to woodworking activities. An insignificant number have received any structured off-the-job training. All employers visited stated that training was done in-company. Typically a machine operator was said to require three to four months such training, whereas a wood carver might need 3-4 years. This suggests that on-the-job training is not structured.

Workers appeared to be manually dexterous, within the circumference of their knowledge, and able to work hard - not necessarily effectively.

Generally pay levels were reported as being low, at least till the employee was judged to have reached a high level of competence. Competence often seemed to be equated to length of service. There was no evidence of a known and generally accepted pay or salary structure. It was claimed that pay at shop-floor levels were comparable to other local industries.

Except for long serving or persons considered specially skilled, employment is precarious due to the surges in demand described above. However, anyone having a good level of skill or knowledge - particularly in rattan - is able to earn between three to five times more overseas. The effect of this is a loss said to be significant not only in terms of the loss to the Philippine rattan industry but also in the gain of skill to foreign competitors.

There is an almost total disregard for even the most basic safety standards. The incidents of accidents was said not to be high. If this is the case, it is a result of luck, not management.

The prosperity of the industry in recent years of booming exports has been largely confined to the owners. Some companies expressed a concern that this may be building up resentment amongst the workforce. In such a short visit, it was not possible to evaluate the actual or potential significance of this or to what extent it may be related or effected by wider social phenomenon.

First line and junior management are normally obtained by promotion and long service from the shop floor. Their trainer is experience. Some companies make use of short three to four day seminars for training at this level. These seminars take the form of lectures by members of the industry or instructors from various institutions. It is reported that they are interesting but do not provide much help in dealing with practical production problems.

Degree level graduates are beginning to be recruited in some of the larger or more advanced companies. These recruits are products of a generalized and academic course of studies. From the curriculum of the degree course in Industrial Design, it is hard to see what these recruits have to offer companies in the short to medium term until they gain practical experience - which, by definition, will not provide them with any greater knowledge than that available within their employing company.

Potential Employees. These are drawn from a group identified as "out-of-school youth" in the 15 to 24 year age bracket, of which, about one third or 2 million are unemployed. The composition of this group, by educational attainment is:

- Non-High school Graduate 58%
- High school Graduate or University Undergraduate 41%
- University Graduate or Equivalent less than 1%

Of the total "out-of-school youth" of 6 million, less than 7 percent have received any vocational training and of these, less than 0.1 percent have received vocational training in a "Construction" course part, of which, covers General Woodworking.

This amply confirms reports from institutions visited that "woodworking" is an occupation to be avoided because it: has a low status; is dirty and dangerous; employment is precarious; is not an activity requiring skill or knowledge (this perception arises from familiarity and childhood involvement with backyard carpentry and cottage workshops). What was seen of vocation teaching in woodwork at a trade school i.e. secondary school, would only have reinforced this perception in the pupils.

High school graduates do not enrol voluntarily in woodworking courses. Some high school graduates do enter the industry directly, without training. As the educational system, and to a large extent, the training system have high school graduation as an entry requirement to both academic and vocational courses, the non-high school graduates also must perforce enter directly without training. This requirement originates from the premise that non-high school graduates are not "trainable". This expression seems to be used in the sense of "not sufficiently educated" rather than in its more usual meaning.

Thus the structure of the training system ensures that the industry will only receive untrained entrants.

A model for a solution to these difficulties does exist at the Don Bosco Academies (see 2.4).

2.4 Training and Educational Structure

The National Manpower Youth Training Council (NMYC) has a nationwide network of training centres. The amount of equipment - particularly furniture making equipment - in the centres varies considerably. Nevertheless, they are an asset that could be put to greater use than is done at present. NMYC has also had contact and help from the ILO over the years and an ILO team is currently working to establish an apprenticeship scheme. The NMYC as originally constituted was intended to deliver industrial training. It has since been given the task of dealing with "out-of-school youth". This has absorbed its resources, changed its objectives and weakened its industrial orientation.

NMYC is not currently active as a trainer for the furniture industry for four reasons: (1) its attention and resources have been turned to the "out-of-school youth" sector; (2) demand for its courses from both individuals and industry is non-existent; (3) furniture making is not recognized as a clearly differentiated subject, it is classed as a sub-section of "construction"; and, (4) it is not sufficiently equipped in terms of tools and machines, nor instructors. It is worth noting that the NMYC's willingness and ability to run supervisor course based on ILO methodology is not called upon by the industry.

Vocational institutes (i.e. post-high school) are a part of the Department of Education, Culture and Sports (DECS) and as such, are fundamentally educational institutions whose vocational curriculum are heavily biased to academic subjects. Entry to their courses requires high school graduation. Their instructors are products of the educational system and it is doubtful that any have industrial experience beyond short periods of secondment during their teacher training.

Vocational Schools and Trade Schools (i.e. secondary schools) are also part of DECS and are being phased out, leaving the High School as the only education route for 12 to 17 year olds.

Technical Institutes were set up about a decade ago specifically to fill an identified gap in Philippine industry at middle management and technician level. Manila Technical Institute has been the leader in time and quality, and has allegedly built up a good reputation with industry. It, and the other 24 Technical Institutes are semi-autonomous under a Board of Governors and are not within the Department of Education Culture and Sports(DECS). A three-year dual system (i.e. part-time) pilot course in Furniture and Cabinet Making is planned for June, 1991. This will be preceded by a 40-day Train-the-Trainer course. Selected teachers, instructors and professors from the technical institutes will attend so that the three-year course can be offered elsewhere. By the end of the mission, the identity of these potential trainers was not known - nor was the Train-the-Trainers syllabus available to the consultant.

Entry to the course requires high school graduation, but Manila Technical Institute expect to be able to fill the course because every year, they get more applicants than there are places on the courses they already run. They will fill the Furniture & Cabinet Making course with this "surplus".

Curiously, although the Technical Institutes are not within DECS, the syllabus for this course has been prepared by DECS and the instructional staff of Manila Technician Institute had not so far been consulted on its content.

Philippine Trade Training Centre (PTTC) is housed in a prestigious building primarily aimed at exhibitions and conferences. It does have a well equipped furniture testing laboratory and does run short seminar type courses on quality control, furniture design, finishing and management subjects.

Forest Products Research and Development Institute (FPRDI), which is under the Department of Science and Technology (DOST) is primarily devoted to the timber extraction and primary wood working industries, but does have a well equipped machine shop and does run short timber drying courses of relevance to the industry.

The Department of Trade and Industry (DTI) through its National Industrial Manpower Training Council (NIMTC) operates the Cottage Industry Technology Centre (CITC) with two objectives: It provides specialist facilities mostly in the form of machining capacity which a cottage industry can use to supplement its own; and secondly, it runs short courses in a range of handicraft subjects, including furniture, of interest to cottage industries. Although physically equipped to do so, it does not run extended courses to train craftsman and it is doubtful if it would consider this to be part of its function. It does have an instructor in furniture subjects who has spent several extended periods of training in Japan. The furniture related courses that it offers are usually short, ten days or less, and judging from the syllabus, are of the lecture and demonstration type with limited hands-on learning opportunities.

The Chamber of Furniture Industries of the Philippines (CFIP) operates a Training Centre in Dapitan in Northern Mindanao. In practice, it is run autonomously by a German master craftsman in furniture on his family prawn farm. The course lasts two years with an intake of twelve students mostly selected from local youths who may or may not, have graduated from high

school. The students are sponsored by companies for two years at the centre to a total amount of P36,000. The sponsoring company guarantees employment for a further two years at an agreed and increasing wage. In return the students and parents agree to be so bound, but do not contribute financially. This scheme provides high quality training. It is popular with the companies as evidenced by the excess of willing sponsors to available students.

Don Bosco Academies are independent religious foundations. Two of these were visited in Cebu and Pampanga. Although only Cebu is equipped and running a furniture course, both immediately impressed as working, well run, disciplined, and purposeful training institutions of a standard not seen elsewhere, except at Dapitan. As religious institutions, their work is aimed at helping the less fortunate members of society build a career. They draw trainees from non high school graduates and those whose family finances would debar them from any career training. Don Bosco Pampanga has no furniture making facilities but expressed willingness to start a Furniture course given some help . At Cebu, Don Bosco run a one-year Furniture Making course. All the students have already been given jobs by local firms before the course is even half completed.

A proposal has been submitted to the German aid agencies for help to upgrade this course and to establish a two-year course. The proposal includes the full time services of two expatriate instructors for five years.

3. CONSTRAINTS ON MANPOWER DEVELOPMENT

As previously mentioned, there have been a number of attempts to establish Manpower Development on a systematic basis. None have progressed beyond the proposal and discussion stage. The reasons for this are now examined in order to identify the action needed to avoid a similar frustration.

3.1 Training and Educational Structure

Responsibility is split between four government departments: Education (DECS); Labour (DOLE); Trade (DTI); and Science and Technology (DOST). In turn, these have one or more divisions with an interest in manpower questions. Within the divisions, one or more sections have action, advice or monitoring, functions related to training. In consequence it is extremely difficult to identify which particular individual carries the ultimate responsibility for any particular activity. It may be an exaggeration to say that in the end no one has responsibility, but the structure certainly encourages such a view. It is noteworthy that only two institutions (Training Centre, Dapitan and Don Bosco Academies) are entirely separate from this structure, and are headed by individuals who accept responsibility for all aspects of the operation of their establishments. These are also the institutions actually doing training and producing people the industry is eager to employ.

3.2 Industrial Training Objectives

Apart from the case of two independent institutions, there are no clear industrial objectives either in terms of quality, quantity or organization. The training structure, if it can be referred to as such, is heavily influenced by educational attitudes of theoretical vigour and of developing the "whole man" to be a useful member of society. The fact that the purpose of industrial training is the process of equipping the individual to carry out

a specific job in a relatively narrow skill and knowledge band is not recognised nor applied. The main reason for this is that there is insufficient depth of knowledge of industrial requirements in the system for it to be able to formulate training objectives with the precision needed to counter the views of a large and powerful educational establishment. A generally held respect for academic learning as an abstraction supports the educational influence.

3.3 Industrial Knowledge

In most of the factories visited, there was evidence of an absence of the purposefulness and organisation exhibited by efficient production units. This is recognized by the owners and managers of the better companies, and they express their frustration at not being able to bridge this - in some cases - quite narrow gap. The necessary industrial know-how needed to operate an internationally competitive industry does not exist to a sufficient extent to make an impact. This being the case, it follows that the industry does not have the personnel from whom industrial training instructors can be drawn. Neither does the educational establishment; their instructors and vocational teachers having spent their lives in academic institutions. Thus there are few, if any, technically competent instructors. Such as there may be, are able to get much better terms of employment in industry than as instructors in training centres. Further, it is reported that instructors and vocational teachers are not keen to volunteer to train as woodworking instructors.

3.4 Manpower Statistics

There are no detailed statistics of employment in the industry. Planning of the volume of training needed is based on figures for total employed varying from 250,000 (industry estimate in Ten Year Plan) to the National Statistics Office 1990 figure of 65,900 and on "guestimates" of the breakdown by occupation. This not only leads to uncertainly but also to disagreement amongst the numerous parties involved who may be working on different numbers. (See also 5.1)

3.5 Furniture Career Structure

Furniture and Cabinet Making is not recognized in the education and training structure as a subject separate from General Woodworking, which itself is but a component of "Construction". There is no generally accepted pattern of progression for people within the industry and consequently no standards of competence and performance nor definition of jobs. The would-be new entrant does not see, and cannot be shown, any worthwhile pattern of progression or work to engage his ambitions or meet his expectations for status, job satisfaction or pay.

There is a view, though not a universal one, in the industry that first line and middle management and technician jobs can be satisfactorily filled by graduates from a tertiary course. No such course that might equip someone for these job was encountered. This view also ignores the need for good practical industrial experience - particularly at the industry's present state of development.

3.6 Coordination of Resources

Given the numerous interested parties: the lack of agreed and defined objectives and starting points; the absence of individual responsibility; there is very little effective coordination. This is seen most clearly in the unrelated requests for, and use of, foreign aid. Currently, or recently, two separate projects have been funded by Japanese aid; one currently by UNIDO; one by South East Asian Science Foundation; one currently by ILO; one being requested from Germany; funds for yet another, being requested from UNDP. This is in addition to the fellowships study tours and overseas training offered. All these impinged on the general training situation and specifically on the furniture industry. No agreed overall plan into which this expenditure of wealth fits has been encountered.

3.7 Funding

There is an expectation that training should be funded by government or aid agencies. This view probably arises from not distinguishing education which has the general community as "client" from training which has a small well defined industry as "client". Industry also tends to adopt this view. Hence, industry has a low commitment and no leverage to impose its requirements on the system, and can only lament the absence of suitable training. As the system neither perceives, nor treats industry as the client, it tends not to consult the industry.

3.8 Management

The preceding paragraphs describe a situation lacking management and direction. Responsibility is spread so diffusely through the structure as to be diluted beyond the point of effectiveness. The NMYC has an understanding of the principles of training and the arrangements most closely matching those needed to deliver effective training nationwide. It does not appear to have any powerful executive head in charge of industrial training who can bring order and purpose to the present fragmented system.

The Furniture industry does not have anyone to perform the same essential task for the industry.

4. REQUIREMENTS OF A MANPOWER DEVELOPMENT PLAN

The preceding sections have foreshadowed the requirement of a Manpower Development Plan for the Furniture Industry. These are:

- the appointment of a full time Industrial Training Chief Training Executive with the status and ability to get action.
- the creation and definition of a career structure with definition of competence and jobs at the various levels.
- the provision by industry of a large proportion of the funding needed, subsequently supplemented with government or aid subsidy.
- the injection of industrial know-how in a quantity sufficient to lift the industry to internationally competitive levels by the fifth year of the start of the plan.

- o the creation of a good quality standardized system of training and delivery at the main furniture making centres.

- o the coordination and allocation of training activities between and within Departments.

Broadly speaking, there are two ways of achieving all except the last, of these requirements:

either, set up a national system of training for the furniture industry;

or, concentrate resources on training and developing the manpower in a few selected companies.

5. A NATIONAL MANPOWER DEVELOPMENT PLAN

5.1 Volume of Training

Estimates derived from export value and separately from partial surveys carried out in 1984 and 1987 indicate a labour force of about 80,000 in companies who contribute a significant portion of their output to export and a total industry work force of 146,000. Annex II gives details of the basis for these estimates. Other estimates range as high as 230,000. The 1990 National Statistics Office gives a census figure of 65,900.

The figure of 80,000 will be used for the exporting company sector on which interest is concentrated. Approximately 40 percent of these will be indirect workers, leaving 48,000 direct workers requiring some degree of training. An estimate has been made - nothing else being available - to break this figure into broad occupational categories as follows:

75%	Rattan	36,000
10%	Carvers	4,800
6%	Cabinet Makers	2,880
6%	Machinists	2,880
3%	Finishing	1,440
		48,000

There is no data or information, other than rather conflicting anecdotal evidence, on labour turnover, either for companies or the industry as a whole. It was decided to use a figure of 8 percent per year as being about 50 percent lower than might be expected in a fully industrialized country. This indicates an overall requirement of 3,840 new entrants per year to maintain the present position. If the target of parity in international competitiveness in five years, is accepted, it must be re-phrased in training terms. It proposed that in training terms, the target be that 25 percent of direct labour has received some kind of formal training in 5 years time. In other words, 5 percent of the labour force requires training every year in addition to the 8 percent required for replacement. The overall training requirement is therefore 13 percent or 3,840 + 2,400 = 6,240 per annum broken down as follows:

Category	Total in	8% Annual	5% Annual	Total
Rattan	36,000	2,880	1,800	4,680
Carvers	4,800	384	240	624
Cabinet Makers	2,880	230	144	374
Machinists	2,880	230	144	374
Finishing	1,440	116	72	188
Total	**48,000**	**3,840**	**2,400**	**6,240**

These figures compare with the 1,350 per annum total for wooden furniture given in an undated (thought to be 1989) NMYC report entitled "Furniture Industry Training Plan". However, an NIMTC report of December 1988 entitled "Manpower Development Plan and Training Programme for the Furniture Industry" states "...the furniture sub-sector is targeted to generate an average of 17,320 new jobs yearly in the period 1989 - 1992." (i.e. 4,330 per annum in addition to the total in the table above).

5.2 Training Objectives

The training objective proposed above must be supplemented to include the standards to be achieved as follows:

> "By the end of 5 years, 25 percent of the furniture industry's manpower will have received formal training appropriate to their job levels."

Job levels required to be defined, as follows:

Semi-skilled: Able to perform one task or closely related group of tasks at the required quality and quantity. Able to recognize faults and problems so as to report to a supervisor. Not expected to take independent action or decisions.

Skilled: Able to perform any task within his discipline including preparation, setting-up, and choosing the best method and tools, at the required quality and quantity. Able to recognize and rectify faults and problems. Expected to take correct independent action in the majority of situations.

"Master": Able to perform four of the five activities[1] at or near Skilled level but not necessarily at full production speed. Able to recognize and resolve inter-section difficulties, and oversee a small group of skilled or semi-skilled workers. This is the lowest level at which Instructors can be recruited.

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[1] See diagram on page 30.

Technician: Able to perform four of the five activities[1] at or near skilled level but at less than production speed. Able to plan production, and design methods in terms of construction design, jigging, routing, tool requirements, ahead of start of production. Able to carry out supervisory duties.

Each level includes the ability to do the work of all lower levels.

The detail competencies at each level will need to be described. From these, a syllabus for each course of training can be prepared.

The proportion and number of workers needed annually at each level is estimated as follows:

		Rattan	Wood
Semi-skilled	70%	3,276	1,092
Skilled	20%	936	312
Master	6%	281	94
Technician	4%	187	62
		4,680	1,560

5.3 Instructors

It is possible to calculate the number of instructors required to train 6,240 people annually.

Training times will vary, with the level of competence and versatility required, from one-week to ten-weeks per year. Using a weighted average of 10 days for the training needed per person, the man/training days needed is 6,240 x 10 = 62,400 man/training days per annum. With classes averaging 15 trainees the instructor/days per annum needed will be:

62,400 : 15 = 4,160 instructor/days per annum

Each instructor can realistically be expected to spend 50 percent of his time or 115 days per annum actually instructing. Hence the number of instructors required is:

4,160 : 115 = 36 instructors.

It will be understood from the assumptions made in arriving at these figures that they may well be in error by 50 percent either way. At this stage, the most that can be said is that the order of 36 instructors are needed, a quarter of whom need, say 10, to be for the wooden furniture sector. In section 5.5 these results will be refined to match the capacities of the delivery system.

Before any effective training can be started in Rattan and Carving, present practice needs to be critically examined. In the case of Carving, a detailed skills analysis is required to identify the component skills needed

so that appropriate skill practices can be devised to build up to the total skill. Until this is done, training is not feasible. In the case of Rattan, the highly labour intensive manufacturing methods need reviewing and industrial methods engineered. There is little point in training to perpetuate existing methods, at least till it is proved that there are no others.

For these reasons, training requirements in these two areas are not considered beyond this point - although it will be seen that the proposed structure can accommodate these skills, provided it is expanded accordingly.

The functions and objective of an industrial training instructor for the Furniture Industry are quite different from those of a vocational teacher in an educational establishment. A much greater depth of practical ability is essential from the instructor and this requirement takes precedence over educational standard. To highlight this difference an "Instructor Man Specification" is attached as Annex III. From the diagram below, it will be seen that the competencies required of an instructor are not reached till "Master" level.

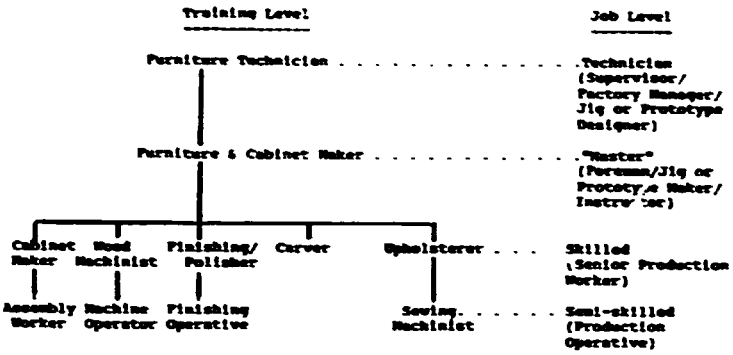
It is unlikely that this level of practical competence is available in the training system. If any such are available in industry, they may not wish to be instructors till the status and pay of an instructor is raised to reflect his value.

The only practical method of obtaining instructors of the right calibre to rapidly inject the industrial know-how in a quantity sufficient to lift the industry to internationally competitive level, is to recruit from overseas. The alternative of sending instructors overseas for extended training would result in at least a year delay, and runs the risk that the trainee instructors would find more rewarding employment overseas.

It is interesting to compare the criteria used to recruit instructors by two engineering training centres in the private sector. In both cases a minimum of three years practical experience working in the engineering industry is required. In one case, five years instructing in the relevant specialisation and an engineering degree is also required. In another, apprenticeship or equivalent is required. Both, subsequent to recruitment, carry out in-house instructor training plus extended periods of overseas training - in one case, repeated with annual refresher/updating overseas training. One recruits by public advertisement and retains good instructors after one year probation by paying competitive salaries. In both cases, the training centres are managed full time by practical individuals with industrial experience and frequent contact with the companies served. Both centres are judged to be producing high grade workers that meet their industry's needs. Both provide an object lesson in good training practice.

5.4 Manpower Development and Career Structure

The structure proposed is most simply explained in diagram form as follows:



Entry into the structure is either at semi-skilled or skilled level, requiring elementary graduation as a minimum but with preference given to second, third, or failed fourth year high school levels. The decision of entry standard rests mainly in the hands of individual companies who will recruit trainees directly for their workforce for training through the system. (See 5.5).

The training for Semi-skilled will be specific to particular operations and consequently of short duration - two weeks at the most. For illustration purposes, a training manual has been prepared for such a course. There is no restriction in the structure on how many such courses an individual can be sent to attend. The objective of these courses is to produce operators who can achieve full production efficiency within one week of returning to their own active production job, compared with the three or four months reported to be required by current in-company methods. See Annex IV.

Entry to the Skilled level will entail following a two year programme consisting of 40 to 50 days per year off-the-job training, the balance following a structured in-company programme of gaining practical experience in all production activities. The division of time between on and off-the-job training is a matter to be settled by the training centre in conjunction with the companies it serves. The company will liaise closely with the training establishment throughout this period to monitor the relevance of the off-the-job training and to coordinate the in-company programme to the progress through the course syllabus. On the successful completion of the two year course the trainee will acquire the status and pay of a Skilled man. This needs to be made significantly higher than that of a Semi-skilled employee, both as an incentive to attract entrants and reward competence, and to ensure the company makes good use of his skills. Annex V gives an outline syllabus for such a course.

The company can advance the Skilled worker to "Master by releasing him for further year of an on-and-off-the-job training. Whereas the initial two-year course concentrates on developing and implanting manual skill competencies, the third year starts to introduce a greater depth of knowledge of the underlying technology and introduces basic supervisory and work planning skills. It will also aim to develop practical skills in the areas outside the specialization of the first two years i.e. a wood machinist will increase his skills in cabinet making, finishing and carving. Successful completion will earn the status and pay of "Master" and the probability of early promotion to an appropriate job level. Annex VI gives an outline syllabus for such a course.

Companies will select particularly competent individuals from amongst "Masters" in their employ to be trained as Technicians. Progression to this level should be restricted to "Masters" with at least one year's experience in a job appropriate to that level. The same pattern of on-and-off-the-job training will be followed. The off-the-job training concentrating on supervisory skills, production management, structural design of furniture and jigs. The on-the-job component should aim at completing an overall production project such as: re-designing a "concept" design for production, specifying tools, equipment, production method and costs of batch production, design of all jigs and fixtures, and if practical, construction of a complete set of jigs and a production prototype. Annex VII gives an outline syllabus for such a course.

5.5 Delivery System

The necessary ingredients of the delivery system are first and foremost, competent and experienced industrial instructors; secondly, training centres; and thirdly, adequate tools and equipment. In the NMYC supplemented by the Don Bosco Academies, Dapitan Training Centres and certain Technical Institutes, there exists a good network of centres. The equipment levels vary considerably. However, there is enough unused equipment at various locations both in industry and in training centres in the country to provide the majority of the needs at seven or eight strategically situated centres. These might be termed Furniture Training Centres. It is not being suggested that they should be used exclusively for furniture training. Once this unused equipment is re-distributed, it will be possible to assess what extra is needed. Only then should the purchase of new equipment be funded. As the Dapitan Training Centre is not very strategically placed, consideration should be given to converting it to running the "Masters" one year course. Thus both making better use of the German Master Craftsman's expertise, and enabling him to act as monitor of the quality of training being provided up to the Skilled level.

Each Furniture Training Centre must agree with its local furniture industry as to how the on and off-the-job training elements will be divided. In terms of training capacity, each centre is capable of running two Skilled level courses of 15 trainees per year per instructor (80 instructor/man days per year). Two instructors per centre at 8 centres would therefore train 15 students x 4 courses x 8 centres = 480 Skilled men every two years, or 240 a year.

Each Furniture Training Centre must also provide the short Semi-skilled Operators course. As it is not practical to have many machines of the same type in each centre, these courses will have to be mixed. Thus a five-day course for 12 people would be made up of two people undergoing training on routers; 2 on narrow band saw; 2 on cross-cut; etc. Each centre (with 2 instructors) will have 70 instructor/man days left unused after allocating 160 to the skill courses. This will enable each centre to run 14 courses per annum each of 12 trainees, thus producing 168 Semi-skilled per annum Therefore, 8 centres can train 1,344 Semi-skilled workers per annum

The annual requirements estimated in 5.2 are 1,092 say, 1,100 Semi-skilled and 468 Skilled and above for wood furniture. Thus, although the proposed system can meet the Semi-skilled requirements, it is only capable of meeting just over half of the Skilled numbers. (This gives a good measure of

the magnitude of the training effort required to even partially meet requirements.)

However, unlike present practice, the delivery system will be demand led. Individual companies will recruit their own trainees to train to Skilled status using the system outlined. The training centres respond to this demand by providing the appropriate off-the-job training. It is recognized that initially a "pump priming" operation will be needed by helping companies with recruitment. At this stage, it is difficult to assess how quickly industry will take up the opportunities. Demand will start slowly and build up in later years as the commercial benefits become apparent. It is proposed therefore, that initially, only four centres be equipped as previously described and manned by three instructors rather than two. This will provide extra instructor capacity to get the whole system going and *perpetuating itself by training local instructors to gradually take over and move into extra centres over a period of two to three years.*

In the first year, 672 Semi-skilled will be trained and no Skilled. in the second year, another 672 Semi-skilled will be trained plus 240 Skilled. By this time, another 24 Instructors will have been trained.

5.6 Training Management

The assembly of all the elements that compose the proposed Manpower Development Plan will require active and vigorous management. The appointment of an individual full-time with the authority and who carries the responsibility is a necessary and indispensable condition to implementing these proposals. Such a Training Chief Executive cannot operate in a vacuum. It is proposed that he work under the auspices of NMYC with access to their administrative back-up thus avoiding the creation of a new separate agency and bureaucracy. However, he will require a substantial degree of autonomy to be able to work with non-governmental organizations and industry. He will need considerable industrial experience at a senior level - not necessarily in the furniture industry. An ideal candidate might be someone with practical experience in a public utility or a large multi-national company who appreciates the workings of government agencies and has practical industrial experience. His authority would derive from his personal status and from the fact that he reports directly to a very senior level in NMYC.

A job specification for such a post is attached as Annex VIII.

5.7 Funding.

For convenience, funding for: (a) equipment and tools; (b) course running and; (c) instructors are considered separately.

As previously stated, the Furniture Centre must be equipped firstly, using the machines and tools now in the NMYC system; secondly, by bringing the unused but working machines in industry and elsewhere into the centres by local purchase at favourable rates to the centres. Only when these possibilities have been exhausted should new machines and tools be purchased - and only then to supplement any gaps in range of basic machines (see Annex IX). Sophisticated and complex high capacity machines should be avoided in the first years as these are not generally available in the industry, and are not necessary for instruction on the two-year course. Funding for any purchases

is more likely to be forthcoming from Government or aid agencies once the Furniture Centres are established, and can be shown to be producing results.

Funding for the running of the courses must come from industry for at least, three reasons.

- o industrial training is a manufacturing cost - either a hidden cost in lost output, waste material, accidents, and general inefficiency, or on explicit cost, planned, controlled, and costed expenditures built into the selling price.

- o companies must be committed and involved in training generally. Payment will ensure this.

- o companies must monitor and satisfy themselves that training remains relevant to their needs. Payment will ensure companies to do this too.

On the evidence of current courses, the running cost of training is ₱125/student/hour. Using this figure, the cost to industry of the proposed training can be estimated as follows:

Semi-skilled: 672 trainees x 5 days x 6 hrs x ₱125
= ₱2,520,000 per annum

Skilled : 240 trainees x 40 days x 6 hrs x ₱125
= ₱7,200,000 every 2 years or;
= ₱3,600,00 per annum

Total annual cost to the industry for running course is P6,120,000.

This represent 0.1 percent of the industry's annual export earnings. The industry should be prepared to find this level of funding to secure its future. If not, it has no basis for asking, expecting, or receiving, any funding for anywhere else.

It might be worth noting that the United Kingdom Training Boards were mandated to raise *compulsory* training levies from companies between 0.75 percent and 1.25 percent (of payroll) annually. The levy for the furniture industry ranged between 0.8 and 0.9 percent.

The cost of employing 12 expatriate instructors of the right calibre will be of the order of $1,000,000 per annum The industry should meet some of the funding - say the Philippine currency component. The balance could be requested from aid agencies. These are likely to be more responsive if presented with a systematic and coherent Manpower Development Plan, in which the contributions of industry, Philippine government and foreign aid are clearly quantified and allocated to the various elements of the plan.

6. COMPANY DEVELOPMENT

An alternative to a Manpower Development Plan was proposed by Mr. Benicio Eusebio, the Director of BETP, in discussion with the writer, namely that effort and resources be concentrated on a few selected companies to make them leaders and pace-makers for the whole industry. Japanese practice was instanced as a very successful application of such policy.

Whilst it is considered that the elaboration of such a policy lies outside the consultant's remit, it needs to be examined in the context of manpower development. There is little doubt that the switching of resources from 12 instructors to two full-time expatriate furniture production specialist executives in each of six factories would transform the selected companies' production efficiency. Equally there is no doubt that this would present few if any of the administrative and inter-agency difficulties such as besiege the proposals herein. Hence it would be capable of rapid implementation. Someone would have the invidious and highly unpopular task of selecting the chosen few.

It is difficult to quantify how long it would take for the benefits to percolate from the selected companies into the industry at large, and what impact they would have on the industry as a whole. The spread would be more rapid and the impact greater if the chosen companies establish their own high quality training centres and were then prepared to suffer relative large losses of trained personnel to the rest of the industry. If the losses were not large, others would not benefit, negating the wider purpose.

How this would work could depend greatly on the cultural context. Whereas the Japanese are said to be willing and accustomed to sacrificing personal advantage to the greater benefit of all, this did not seem to the consultant, based on his brief acquaintance, to be a distinguishing feature of the Filipino character. Others are better able to judge.

Leaving this consideration aside, if like the Japanese electronic industry in the 1960s, the Philippine furniture industry was starting in the competitive race with a view to winning in 20 years time, the pacemaker strategy would probably work. However, the consultant believes that the Philippine furniture industry is already in the race and is facing a short term challenge - five years, possibly - of being beaten by several competitors now hard on its heels. If this is a correct diagnosis, strategies that will have a significant impact within that period are needed. The pacemaker will have a rapid impact, but within a five-year period only on the selected companies. It is likely to take two to three years to get the selected companies to top international standards of efficiency. Only then can their pacemaker effect begin to start percolating out to the rest of the industry.

In summary, the pacemaker company development strategy is easy to start, probably high risk, and aimed at long term results.

The Manpower Development Plan is difficult to start, is safe, and will start yielding accumulating results from the second year. Hopefully it will also link in with other training developments in the country.

The overall costs are likely to be similar but the costs per trainee will be much higher.

ANNEX I.

List of Reports and Projects. Past. Present and Prospective Relating to Industry Training Generally or the Furniture Industry Specifically

1. Reports.

Except for the last, these documents are not dated. The dates attributed to them have been surmised from internal evidence.

- Furniture Industry Training Plan - (NMYC, 1989?);
- Ten-Year Sector Development Plan - Furniture Industry Volume I. (Economic Development Foundation and CFIP 1986?);
- Philippine Furniture Industry - (DTI 1990?);
- Proposal for the Establishment of a Furniture Industry Training Board - (CFIP 1990?);
- Terms of Reference for a Feasibility Study of an Integrated Formal Training Institute for Secondary and Tertiary Wood Processing Sector. (BOI?);
- Manpower Development Plan and Training Programme for Furniture Industry (NIMTC, December 1988).

2. Projects.

- Upgrading CITC - Japanese funds
- Establishing PTTC - Japanese funds
- Supply of Woodworking Machinery - Canadian Funds
- PRODEX I and II - UNDP Funds
- NMYC/ILO Apprenticeship Project - UNDP Funds
- Philippine-Australian Technical Vocational Education Project - Funding not known
- Don Bosco, Cebu course upgrading - Proposal with German aid agencies
- Dual-Tech Furniture Training Ctr.- Private Foundation Funding
- CFIP Training Centre Dapitan - partial German funding
- Provision of training funds on request - USAID

ANNEX II

Furniture Industry Manpower Estimates and Calculations

1. Manpower employed in exporting.

The total furniture export value for 1990 is estimated at US$190,0000,000. Assuming a value of US $ 4,000 annually/direct worker employed, the total direct workers employed in export is:

$$= \frac{190,000,000}{4,000} = 47,500 \text{ employees.}$$

Add 40 percent indirect workers to give:

Total employed = 79,200 employees say, 80,000 employees.

2. Manpower employed throughout the furniture industry.

The 1987 Ten-Year Development Plan quotes the following data:

5,798	Companies in the Cottage industry sector employ	45,053
289	Companies with ₱ 1,000,000 p.m. turnover employ	19,585
329	Cebu based companies employ	67,000

It is not clear to what extent the second and third categories overlap. Assuming there is no overlap, the total employed is 131,638. If a 10 percent increase has occurred since 1987, the current total employed is now 145,802, say 146,000.

This may be a low value if the estimate of a total 15,000 companies quoted in the 1987 report is accepted. If the total number of companies for which the report gives the employment levels (5,798 + 289 + 329) is deducted from 15,000, the result is 9,584 "missing" companies for which no employment data is given. These missing companies are probably of the cottage industry type, i.e. employing an average of 8 people (45,053 employees : 5,798 companies) or 76,672 employees (9,584 "missing" companies x 8).

Adding this to the original gives 131,638 + 76,672 = 208,310.

If the same 10 percent increased assumed previously is applied, this gives a current total employed of 229,141, say 230,000.

ANNEX III

Knowledge and skill specification for instructors conducting courses in furniture craft up to skill level

NOTE: This is not a syllabus either for an instructor course or furniture course, nor does it set the standard of skill and knowledge that a graduate of furniture course at skill level should or will have.

1. To be free of all other commitments throughout, before, and after the course, for a period adequate for preparation and follow-up.
2. To have not less than three years practical experience working in production at skill or "Master" level in a wood or wood carcass furniture factory employing not less than 100 employees and exporting 50 percent or more of its production.
3. To possess the majority of the skills and knowledge defined in the attached schedule distributed as follows:

Industrial know-how	(1)	Safety
	(9)	Quality
	(10)	Material handling
	(11)	Jigs
- and any two from:		
Preparation	(2)	Drying
	(3)	Timber selection
	(4)	Rough milling
	(5)	Marking out
- and any two from:		
Production	(6)	Machining
	(7)	Assembly
	(8)	Finishing.

4. To be physically fit and able to distinguish shades of colour.
5. To have undergone a period of training in instructional techniques.
6. To have high school graduation, preference to be given only to tertiary qualifications in technical or science subject.

TASK	SKILLS/ABLE TO:	KNOWLEDGE/KNOWS AND UNDERSTANDS:
1.SAFETY	- fit guards correctly. - spot unsafe conditions. - spot unsafe activities. - raise safety standards. - inculcate safe work habits. - use handtools safely. - use machines safely. - use spray and finishing equipment safely. - stack, unstack, and lift work correctly.	- anatomy of accidents. - effect of discipline and work habits on safety. - cost of accidents. - employer/employee responsibilities. - personal safety habits. - safety and machines. - safety and finishing. - safety and handtools. - safety and material handling. - guards and safety accessories. - causes of fire. - cost of fires. - lighting requirements.
2.DRYING	- recognize the "feel" of timber moisture - stack, stick, destick and store timber correctly. - determine moisture content using moisture meter or oven method. - determine relative humidity with wet and dry bulb. - operate kiln. - identify timber degrade from drying.	- timber structure, technology and behaviour. - wood species and characteristics. - drying processes, equipment and instruments. - principles of relative humidity and its effect on timber. - principles of drying schedules. - causes of timber degrade from drying.
3.TIMBER SELECTION	- recognize and differentiate timber defects. - assess quality and value of purchased timber. - measure and judge timber size. - assess utilization. - select individual species. - handle raw material. - grade undried and dried timber.	- timber grading. - nominal and actual timber sizes. - timber faults and their effects on production and quality. - percentage raw material recovery. - timber costs.
4.ROUGH MILLING AND SAWING	- set the machines. - identify machining problems, faults and correct them. - apply "when to saw, when not to saw" principles.	- purpose of rough milling and sawing. - machine capacities in terms of accuracy, volume and sizes. - identification and selection of machines to use. - rationale of sawing. - selection of cutters and saws.

TASK	SKILLS/ABLE TO:	KNOWLEDGE/KNOWS AND UNDERSTANDS:
5.MARKING OUT	- visualize and maximize the layout of shapes and patterns. - mark-out patterns accurately. - maintain correct ratio of pieces.	- necessary cutting allowance. - effect of grain directions, patterns and colour. - scope for laminating and other techniques on increasing timber utilization. - use of off-cuts.
6. MACHINING Circular Saw Machines Cross cut Swing cross cut Table saw Edger/Ripper Multi-rip Mitre-saw Bladed Machines Jointer/Planer Thicknesser Combination Planer Moulders Vertical Spindle Machines Router Spindle moulder Shaper Borer Mortiser Combination Machines Single end tenoner Double-end tenoner 4, 5 & 6 Cutters Sanders/Abrasives Narrow belt Wide belt Dise Drum Portable sanders	- set machines for volume production. - operate machines for volume production. - remove and fit blades and saws. - hand feed or power feed machines. - receive machine output. - detect machine malfunctions and their cause. - detect unsatisfactory work pieces. - make and fit wooden throats. - carry out machine lubrication routines. - identify different sand paper grade visually and by touch. - hone jointer and thicknesser blades. - set the bandsaw blade. - fit blades into cutter blocks. - manipulate jigs on machines. - drawing cutter profiles. - hand-grinding profile cutters.	- construction and characteristics of machines. - operational capabilities of machines. - machine setting. - criteria of machine capacity. - machine speed and feed speed relationships. - principles of power feeding and hand feeding. - inherent machine accuracy. - machine selection. - planning sequence of machining operations. - saw types, operation and uses. - principles of saw tooth cutting action. - geometry of blades. - types of cutter blocks. - methods of blade setting. - machining defects and their cause. - principles of sanding and surface finish. - principles of lubrication. - machine lubrication requirements. - pulley and belt tensioning. - dust extraction systems.

TASK	SKILLS/ABLE TO:	KNOWLEDGE/KNOWS AND UNDERSTANDS:
7. ASSEMBLY	- use handtools. - care for handtools. - sharpen and grind handtools. - make all common furniture joints with handtools. - apply and use glues. - use fixings. - install hardware. - use manual, hydraulic and pneumatic clamps and vices. - use assembly jigs. - assemble components. - recognize defective components.	- types and uses of joints. - types and uses of glues. - types and uses of fixings. - types and uses of fittings and hardware. - types of manual, hydraulic and pneumatic clamps and vices. - installation of fittings and hardware. - construction of drawers and runners. - furniture styles, designs and construction. - characteristics of styles. - identification/selection/ characteristics/applications of sharpening stones and grinding wheels. - application of assembly jigs. - component interchangeability.
8.FINISHING	- use spray guns, brushes, cotton balls or rags, dipping. - measure out and mix finishing material. - wet and dry sanding. - match colour and grain patterns. - use stains to colour-match. - use grain fillers. - use bleaches. - dismantle and clean spray guns. - comprehend manufacturers' specifications. - estimate usage rate of mixes. - use appropriate abrasives. - carry out viscosity and other physical tests on materials. - identify actual and potential defects on finishes. - compare standards of finishes between different articles of furniture.	- types, characteristics and uses of finishing materials e.g. abrasives, stains, paints, lacquer, varnishes, etc. - methods of application of finishing materials. - identification and selection of appropriate finishing processes and equipment. - effects of atmospheric conditions on finishes. - preparation of finishing materials. - methods of recording finishing material preparation. - effect of grain texture and colour on quality finish. - techniques of wet and dry sanding. - equipment for wet and dry sanding. - extent to which sanding should or should not be done. - operation of compressor and compressed air. - proportioning ingredients. - behaviour and storage life of finishing mixes.

TASK	SKILLS/ABLE TO:	KNOWLEDGE/KNOWS AND UNDERSTANDS:
9.QUALITY	- use measuring instruments. - identify actual and potential sub-standard work. - evaluate surface finish. - evaluate workmanship standards. - recognize source of faults. - raise standards of workmanship. - establish and operate inspection and control systems. - monitor quality standards. - differentiate colours and shapes, by eye. - recognize incongruities in styles.	- principles of standardization and interchangeability. - principles of tolerances. - effect of timber and raw material quality on product quality. - degree of accuracy achievable by different processes. - workshop measuring and gauging. - use of jigs as gauges. - quality in detail design. - short and long-term strength of joints. - "fail-safe" design. - surface finish evaluation. - colour comparison and matching. - establishment of standards. - causes of poor or reject work. - customer standards and expectations. - hardware quality and its relation to the furniture quality. - need for good lighting.
10.MATERIAL HANDLING	- arrange work and workplace layout. - organize movements of batches. - organize storage of batches. - stack components. - supervise assistant. - minimize obstructions. - prevent accumulation of "dead" material. - enforce gangway discipline. - mark out gangways.	- principles of workflow. - principles of workstudy. - methods of transport and its application: . pallet . trolleys . forklift . dead and live rolls . ground and overhead conveyors - sequencing of batches. - use of storage areas. - machine layout and space requirements. - batch identification and control.
11.JIGS	- make jigs. - use jigs correctly. - spot wear and faults in jigs.	- principles of jig making. - design factors. - construction factors. - cost of jigs vs. no jigs. - safety of jigs. - levels of accuracy possible. - deterioration and wear of jigs. - storage of jigs. - materials and hardware requirements.

ANNEX IV

Model Training For a Semi-skilled Level Course for Narrow Band saw operatives

1. Introduction

The methods of using a Narrow Band Saw presented in this manual are not the only ones possible. However instruction in alternative methods - especially 'short cuts' is to be avoided unless there is absolute certainty that they are as safe and as efficient as those shown herein.

This Manual is for the use of the Instructor and should not be given to trainees as an alternative to receiving instruction from an experienced and qualified Instructor.

This Manual contains:

Training Specification - what a trainee should *be able to do* after training;

Instructional Material for the Instructor in the form of Illustrations and text;

Tests - to check the trainee has understood instructions and can perform the skills in the Training Specification. Tests may need to be modified or replaced with others by the Instructor, to meet particular circumstances;

Record Sheet - to record the test results and Instructor for each trainee. A copy of these should normally be shown to the trainee *and* be sent to his company manager.

2. Training Specification

2.1 Describe the mechanical operation of the machine and name its principal parts.

2.2 Recognize the need to change a blade when it becomes blunt or defective, or when a change in the nature of its work requires it, and report the fact to his supervisor.

2.3 Carry out routine inspection of the saw, cleaning brush, and effectiveness of extraction and report any defects to his supervisor.

2.4 Recognize the correct features of guarding the machine; use the guards properly and adjust the top saw guides correctly for a given workpiece.

2.5 Describe where the component being sawn fits into the furniture and describe either material or machine faults that are accepted and those that are not.

2.6 Set up and operate on straight cuts using a safe positioning of hands or use of a push stick as appropriate.

2.7 Recognize those features of feeding work into a saw that produce good and poor quality surface finish.

2.8 Mark outcurved saw cuts involving "breaking-in" using a pattern and cut accurately to the line using safe positioning of the hands.

2.9 Saw to a stopped line accurately and withdraw cut work back through the saw blade, having due regard to the safety factors.

2.10 Fit work to jigs, and, using jigs, produce accurately sawn components using a safe positioning of hands.

2.12 Carry out routine oiling and greasing of the machine.

[The following items are <u>not</u> part of the Training specification at Semi-skilled level, but would be added to give the Training specification at the Skilled level.]

2.13 Remove the blade from the machine with due regard to safety

2.14 Coil the blade and tie it correctly for transporting.

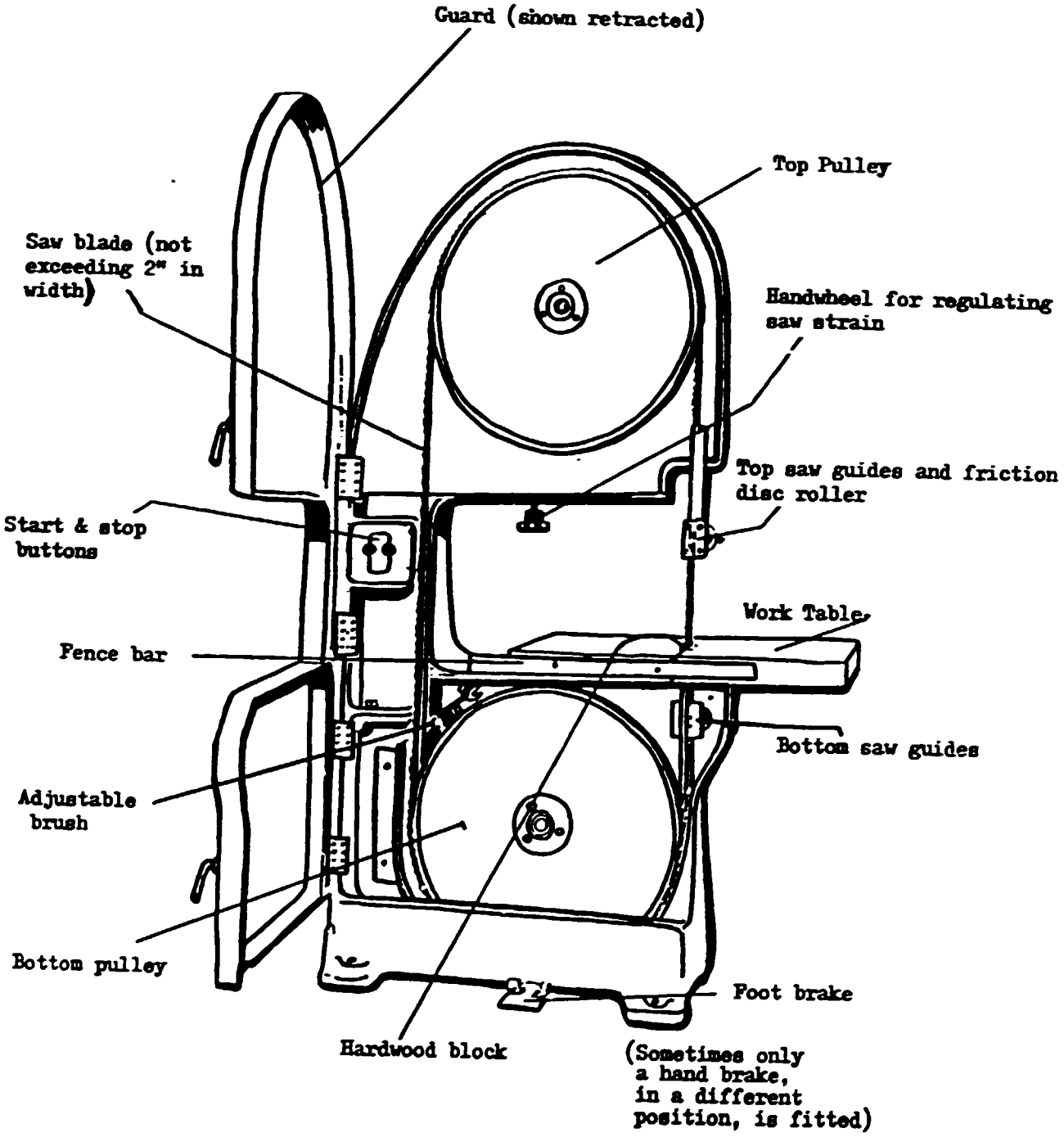
2.15 Select the correct blades for any given type of material or or species, depth of cut, radius of curvature, and fit the new blade with due regard to safety.

2.16 Apply the correct strain to the blade.

2.17 Set the machine table at an angle and produce accurately bevelled work.

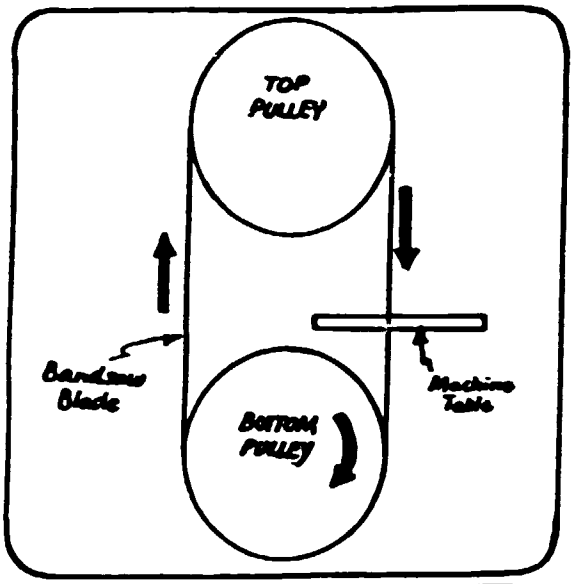
2.18 Make and fit a new table block/throat to the machine table.

TYPICAL NARROW BANDSAW



Locations of items will vary according to the type of machine in use. The Trainee should learn the location of these features on the machines in use in the company.

GUARDING THE SAW

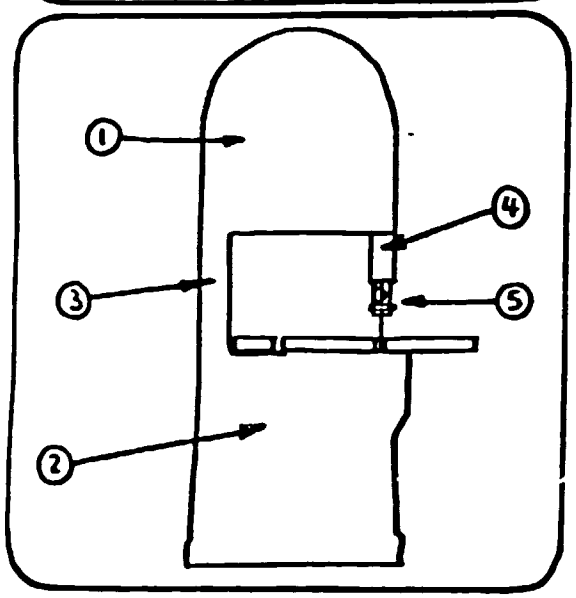


Show the trainee a typical saw blade and explain that it is a strip of steel with the teeth form cut into one edge. When welded together the strip of steel becomes a continuous loop which is mounted on two pulleys.

The bottom pulley is driven by the electric motor, and the top pulley, which is used to strain the blade, is rotated by the saw blade itself.

Each pulley has a slightly convex rubberised surface which is in contact with the flat part of the saw blade.

The direction of cut is always downwards, through the machine table.



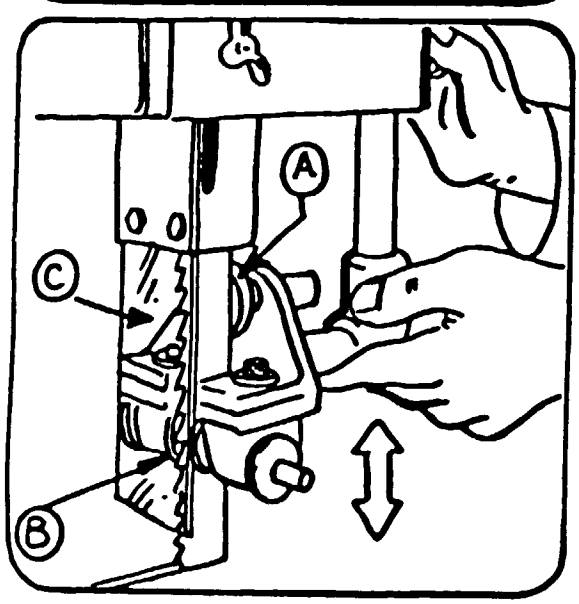
Instruct the trainee that the guarding requirements for the narrow bandsaw as follows:

a) The top and bottom pulleys must be enclosed on both sides (1&2).

b) The up and running part of the blade must be totally enclosed.

c) The down running part of the blade must be guarded on two sides at least (the edge facing the operator and the outside edge of the blade) between the top pulley and the saw guides and thrust wheel (4).

d) The top saw guides and the thrust wheel (5) should be capable of easy adjustment.



When working, the guides and thrust wheel must always be adjusted as close to the workpiece as possible. Demonstrate this to the trainee.

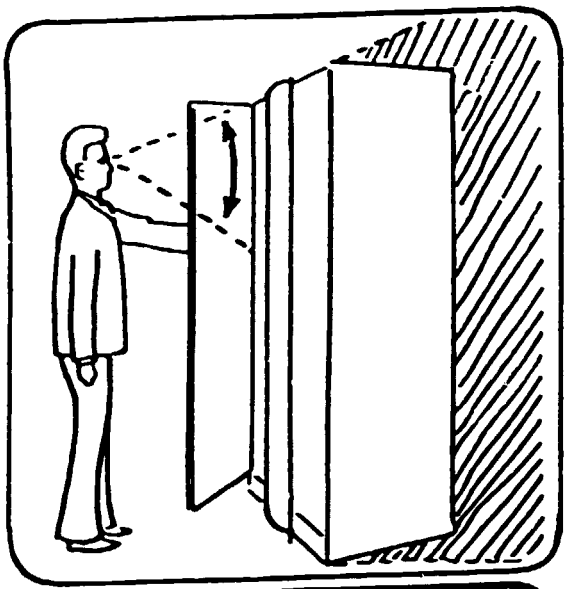
The actual arrangements will vary in design from one machine to the next. Essentially all should consist of:

A) The thrust wheel which is sited 1/2 mm from the back of the blade. (See the machine for the actual position).

B) The top saw guides.

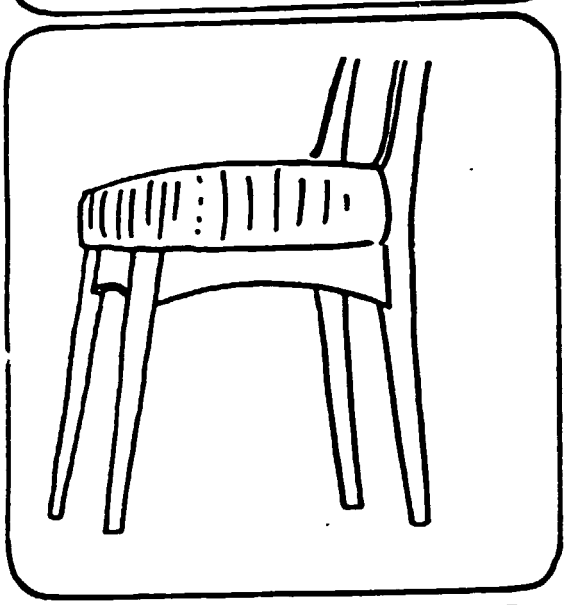
C) The Perspex face plate.

FAULTS IN TIMBER



Explain to the trainee that some faults in timber and timber materials are acceptable depending on the quality standards which his company requires. Tell him that his job may depend on the ability of his employer to sell the products that he is helping to manufacture. It is therefore most important that the trainee is told the standards of quality required by the firm.

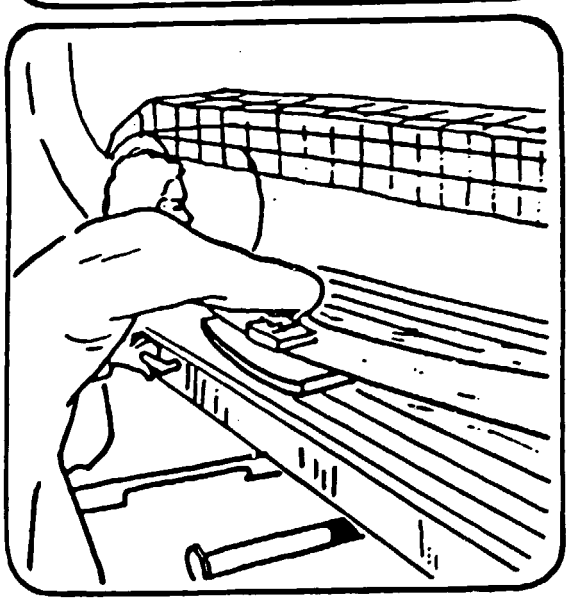
Some guidelines are therefore important. Show him the piece being machined will eventually go in the finishied product. Stress that if the piece is within a custom's normal line of vision then good quality timber and workmanship may be essential.



If the piece being machined goes on the back or somewhere where it cannot be readily seen, tell the trainee that good quality may still be important, but it may be possible to allow certain material faults to pass.

Where strength is important in the piece being machined, such as in a chair part, quality takes on another aspect (eg. strength as well as appearance).

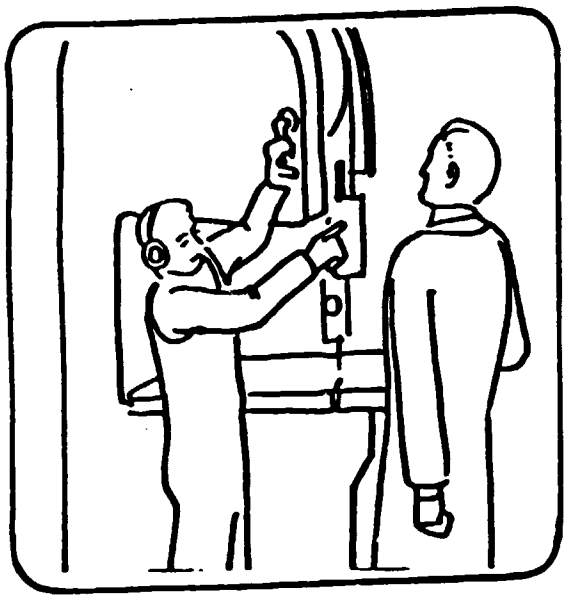
Repeat that it is important for the trainee to learn where the piece goes on the finished product and to check with supervision as to what are acceptable material faults.



Indicate to the trainee that some of the pieces machined on the narrow bandsaw may receive subsequent work on other machines.

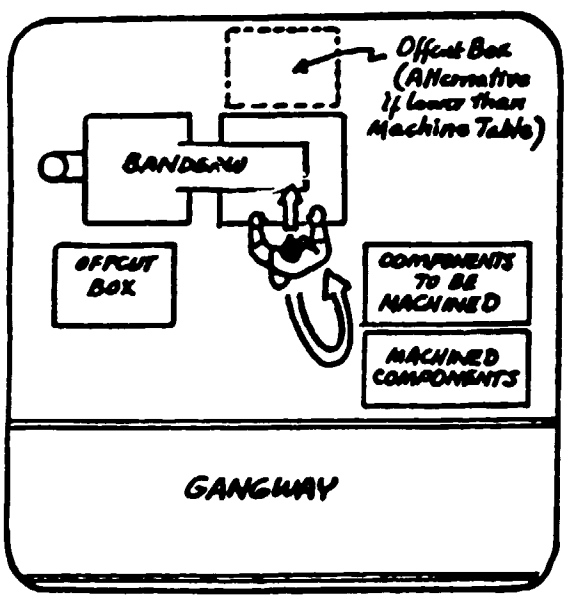
Tell him to find out which operations follow his and see of these are likely to remove some of the material faults.

WORKPLACE LAYOUT



SAFETY

It is the Operator's responsibility to report defective equipment. If there appears to be something wrong with the machine or with the guarding of it, report the facto to the Foreman right away.



There are a number of ways in which a workplace can be laid out around the Narrow Bandsaw. Whichever layout is normally adopted, the following points should be highlighted with the trainee:

1. There should be a clear space around the machine work table to allow freedom and safety when sawing.

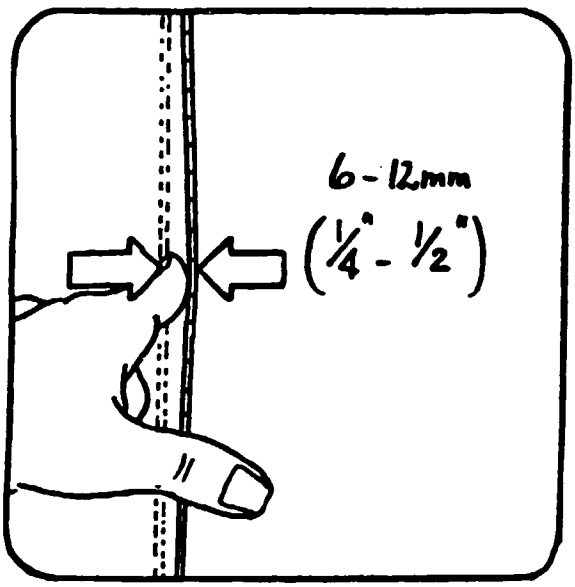
2. Pallets should be so arranged that the movement of the operator in picking up and stacking components is kept to a minimum.

(Point out to tne trainee that it is important to keep down the proportion of time he spends on picking up and stacking).

3. There should be a box (or another pallet) in which to place waste, or usable offcuts.

4. Gangways should be kept clear.

5. The floor area around the machine should be kept clean and free of obstructions



CHECKING SAW TENSION

Before starting the machine always check the saw blade tension.

1. Apply a 'reasonable' sideways pressure to the blade.

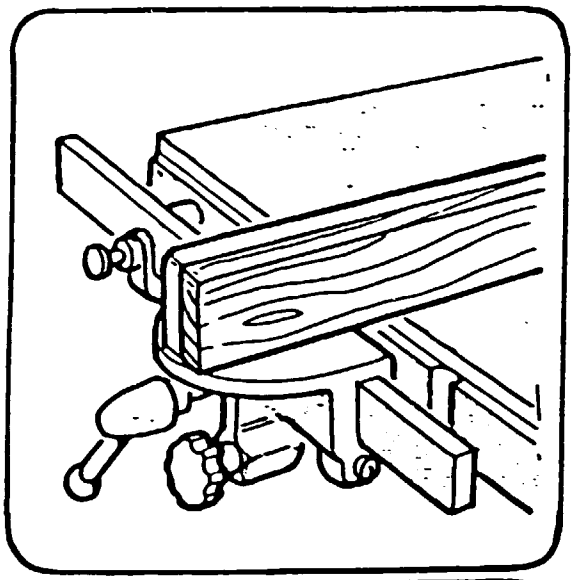
2. If the tension is correct, the blade will deflect 6-12mm (about the thickness of a pencil).

3. If it deflects more, or less, report the fact to your supervisor.

Demonstrate this procedure to the Trainee. Emphasize that excessive strain on the blade can cause it to snap when the machine is started up. Insufficient strain can result in the blade slipping on the pulley.

SAFETY

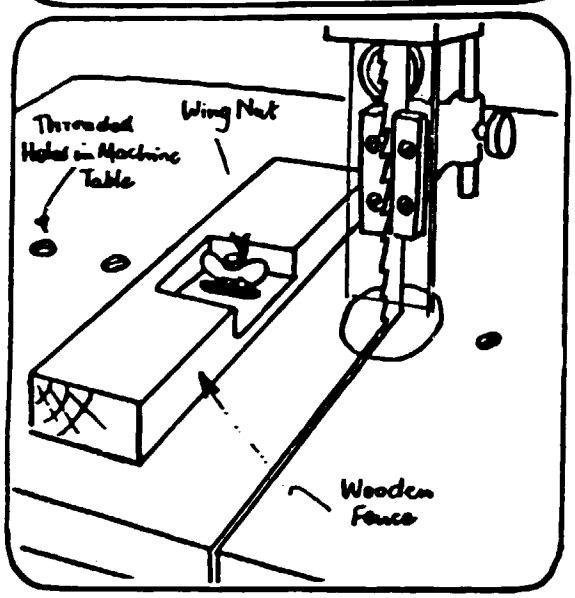
Some people will ease the strain off the blade at the end of the day to prolong hte life of the blade. It is therefore VITAL to check the strain on a blade before you ever switch on the machine.



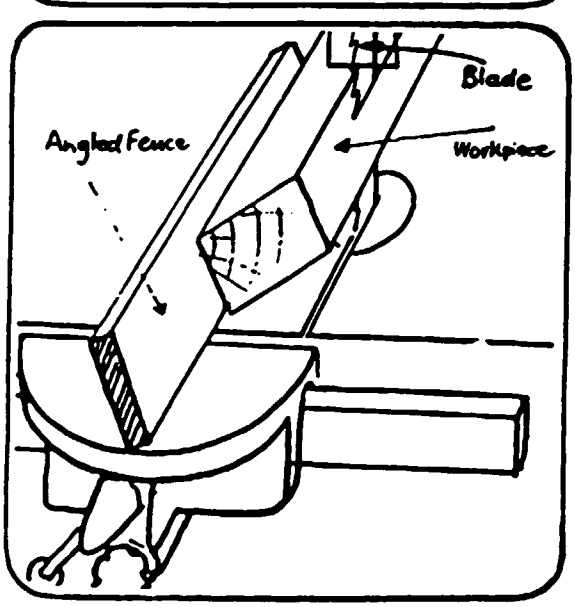
USES AND LIMITATIONS

With the machine switched off and isolated, explain the versatility of the narrow bandsaw to the trainee by briefly pointing out that:

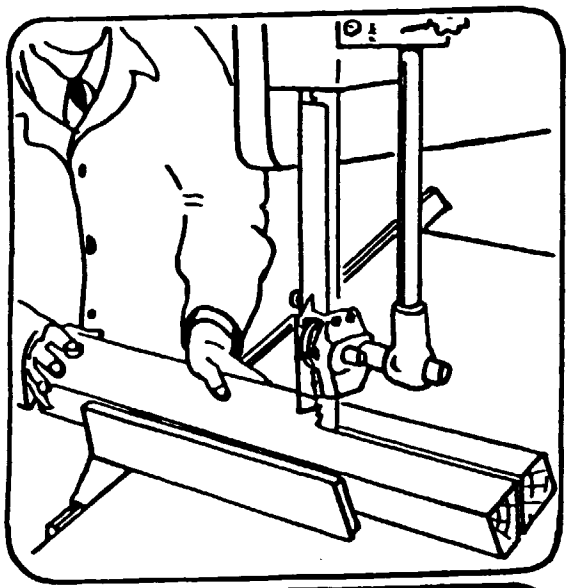
1. Narrow bandsaws are usually supplied with a fence attachment. This enables very accurate straight cuts to be made without marking out the workpiece.



2. Point out to the trainee that if the narrow bandsaw is not supplied with a fence attachment one can still be made and fitted to the machine as shown. Threaded holes are usually already bored in the machine table. A timber fence can then be made so that a screw with a wing nut welded to it may be inserted through it into one of the threaded holes in order to secure it to the work table.



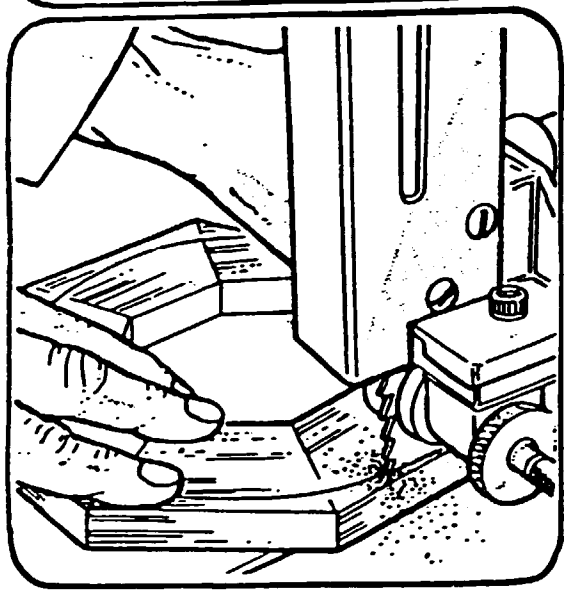
3. When a fence is provided with the narrow bandsaw it is usually capable of being tilted as shown. Demonstrate this to the trainee on your bandsaw and explain that this enables work held flush with the surface of the fence to be BEVEL CUT.



USES AND LIMITATIONS

4. Some machines are designed so that the work table is capable of being tilted through 45 degrees. This is an alternative method of producing Bevel Cuts.

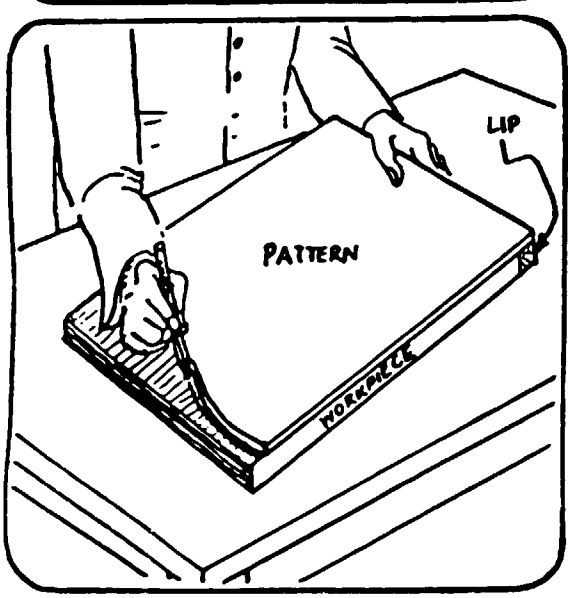
If your machine is like this, demonstrate tilting the table to the trainee. Explain that a Supervisor or Senior Wood Machinist will fit and set any fences needed. The trainee must understand how they are fixed so he can spot if they move and report the fact to his Supervisor.



5. Tell the trainee that the narrow bandsaw has the ability to enable a curved cut to be made in timber.

This diagram shows a complete circle being sawn.

Explain that because the blade is a CONTINUOUS LOOP, the narrow bandsaw CANNOT cut a hole in the middle of a board.



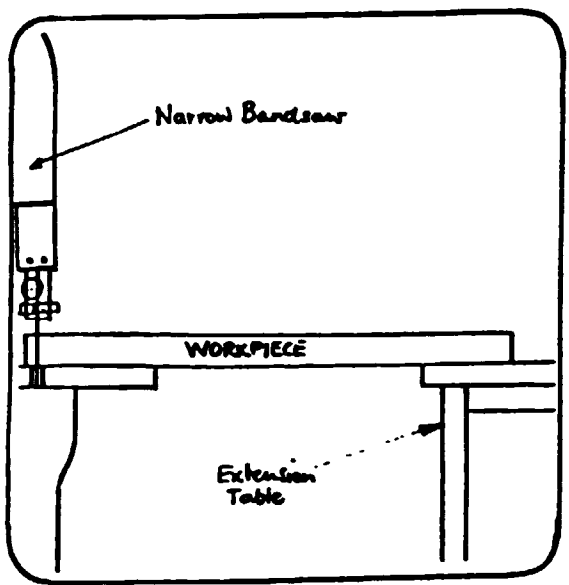
6. Explain that shaped cuts usually follow a penciled line on the workpiece.

This pencil line is usually drawn by laying a plywood pattern over the workpiece. (Note the LIP on the back of the pattern which locates it accurately on the workpiece).

This operation is known as MARKING OUT. Emphasize the importance of accurate Marking Out.

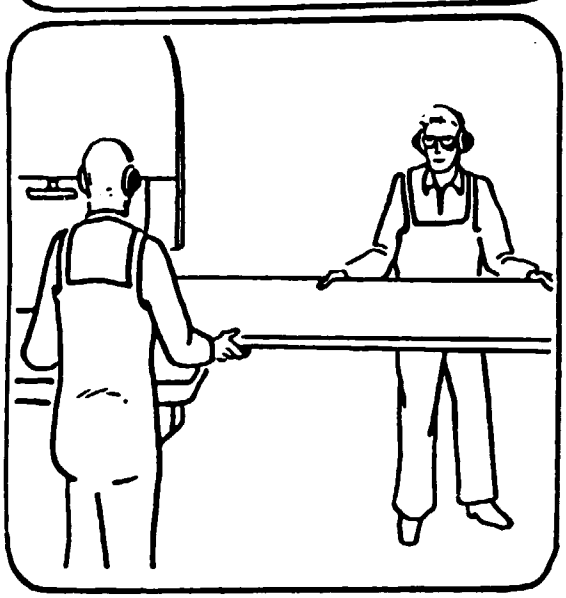
SAFETY

Try to avoid MARKING OUT on the Machine Table. Use a separate Table whenever possible



USES AND LIMITATIONS

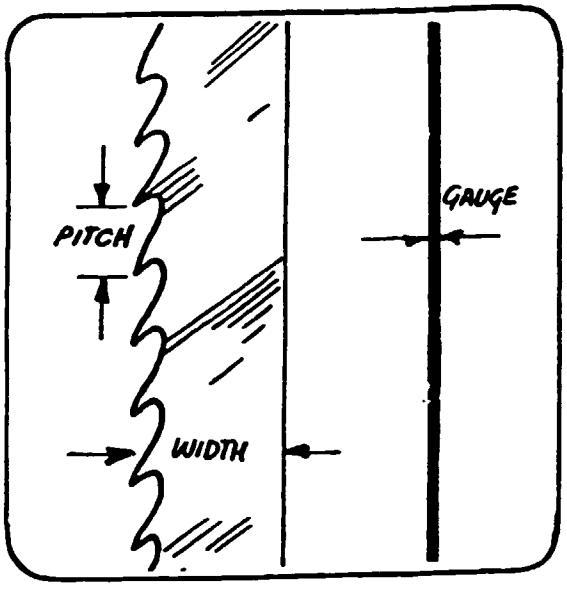
7. Indicate to the trainee that on the side of the narrow bandsaw nearest to the casting there is obviously a limit to the size of workpiece which can be fed into the machine (usually about 730 m/m - 28"-29"). Tell him that pieces longer than this are fed from the other side of the saw when the use of an extension table will be necessary because of the tendency for large pieces to tip.



8. Particularly heavy or awkward work may be unsafe without assistance. Remind the trainee to ask for help where necessary but stress that the assistant should do no more than support work. He must not attempt to influence the way in which the operator feeds the work to the saw.

SAFETY

Assistants must stand well away from the sawblade.



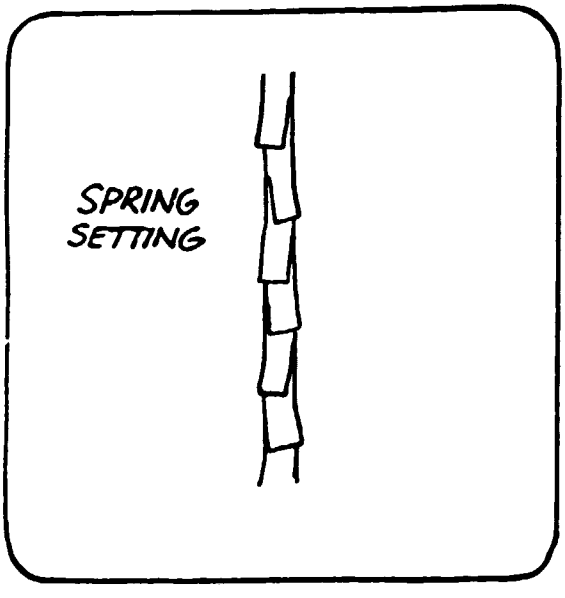
CHOICE OF BLADE

Blade Characteristics

Tell the trainee that the distance between the tip of one tooth and the next is called PITCH but that blades are recognised more by the following features:

- o The width
- o The gauge
- o The number of teeth per inch.

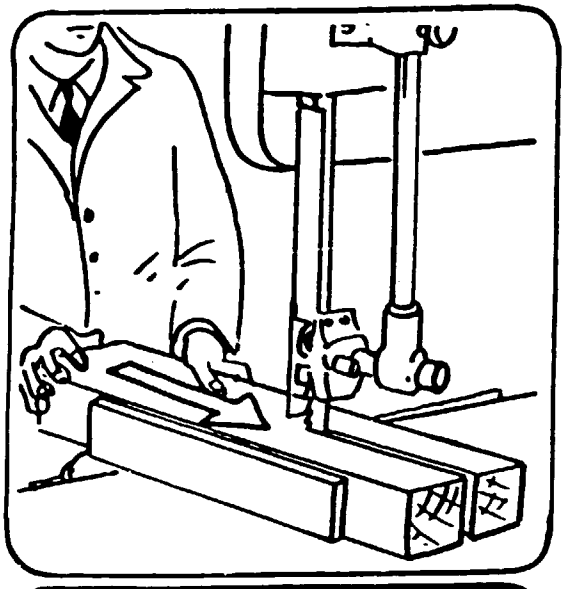
Point out these features on a typical saw blade used in your company.



Show the trainee how the tips of teeth are bent in alternate directions. Explain that this is called SPRING SETTING and that it is done, as is the blade sharpening, by qualified saw doctor.

If your company uses flexible back blades show how the middle tip in each group of three is not bent and explain that this is in order to improve the cutting quality of the blade.

Explain that as the saw is used, the cutting tips wear down and become rounded. Show a freshly sharpened blade and a blunt one. Explain that blunt saw will not cut accurately.

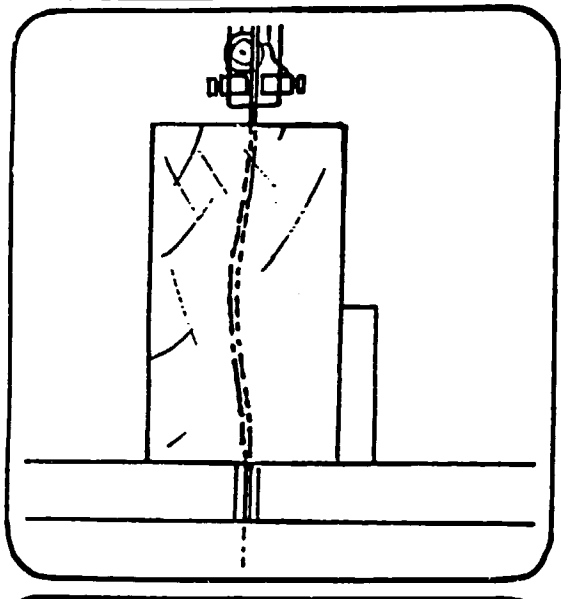


RECOGNISING A BLUNT BLADE

Explain that one indicator of when a saw is becoming blunt is when excessive pressure has to be applied in order to cut the work.

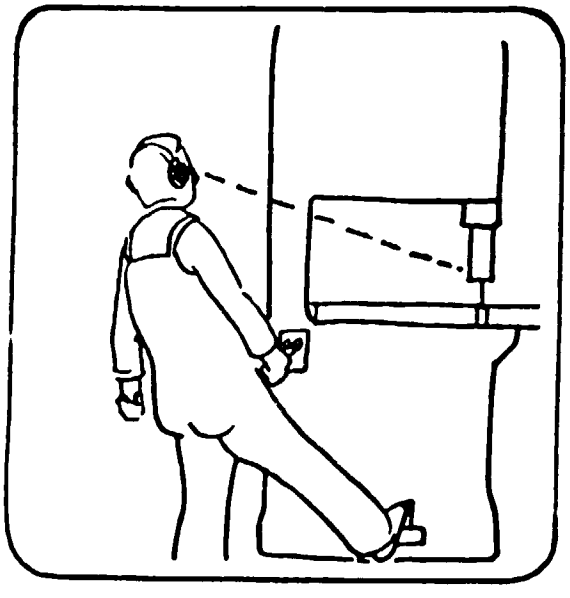
When YOU find it necessary to change a blade for this reason demonstrate to the trainee what cutting with a blunt saw feels like. Then let nim feel the difference when a new saw has been fitted.

If the blade is very blunt, it may put scorch marks on the timber.



Explain that another indicator of when the saw is becoming blunt is when the saw deviates from its line of cut or when it produces a 'dished' cut in the timber.

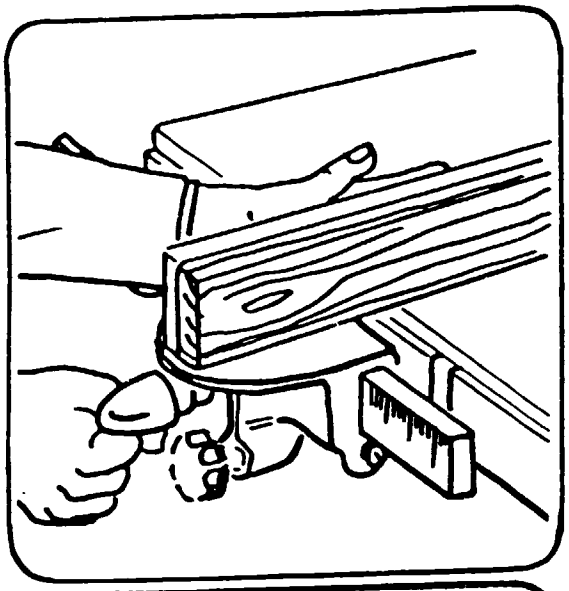
Point out that this is not always an indication of bluntness and that such an effect may be due to feeding the work piece too fast, the incorrect choice of blade, the blade being under strained, or a badly shaped saw blade. Tell the trainee that if any of these things happen, he must report it to his Supervisor to adjust his rate of feed to compensate.



Tell the trainee that sometimes, he can use his ears to learn when a blade is about to break. A regular clicking noise is a goon indication.

When this occurs, tell him to SWITCH OFF the machine, apply the brake SLOWLY and keep as clear of the machine table area as possible.

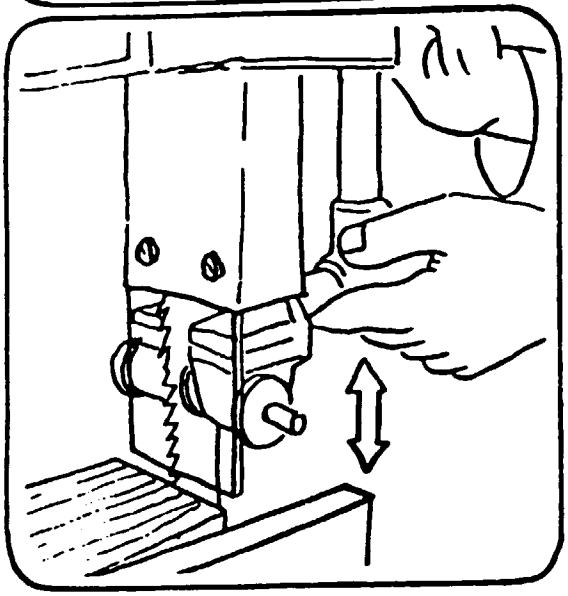
Then when the machine has stopped, put the ISOLATOR in the OFF position and and tell the trainee to report it to his Supervisor. If you have a cracked blade, show it to the trainee so that he knows what it looks like.



SAWING TO A FENCE

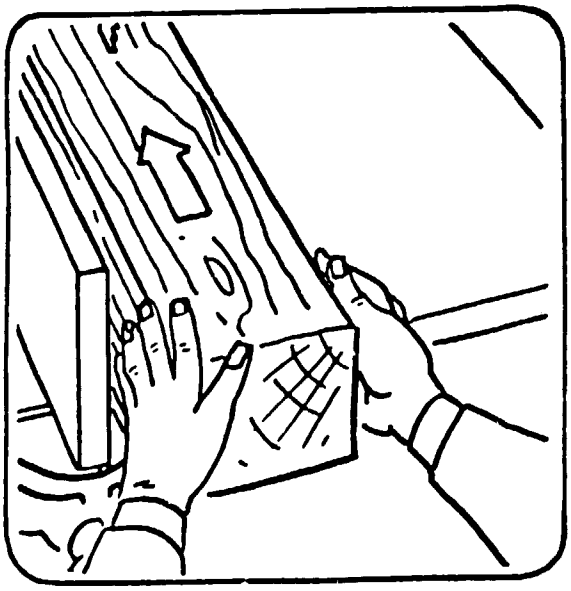
Instruct the trainee how to use the fence for accurate cutting. Tell him that some bandsaws have a graduated scale on the fence bar. This enables the size of the piece to be cut to be easily measured. Point out the scale on your saw if there is one.

Also point out that allowance must be made for the spring set of the blade.



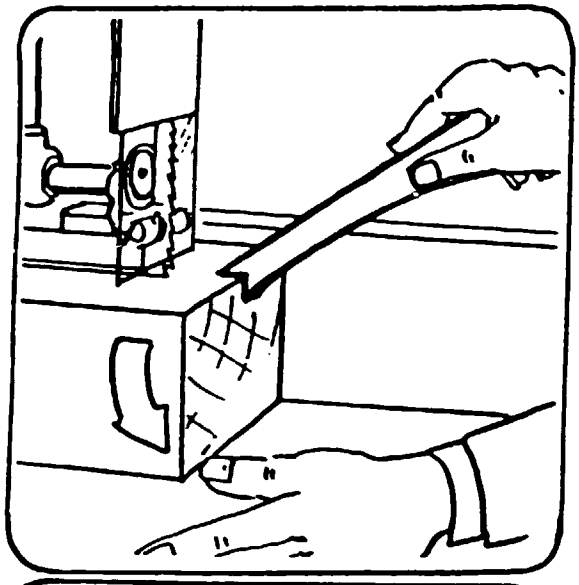
The next step is to tell the trainee to check the thickness of the pieces he is going to machine and to raise or lower the top support guide arrangement so that it is as close as practicable to the upper surface of the work to be machined without actually touching it.

Now the machine may be switched on and allowed to run up to working speed.



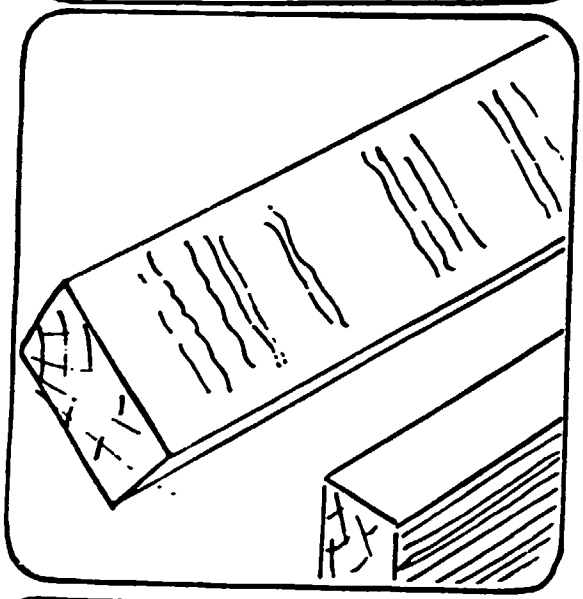
Emphasize to the trainee that it should never be necessary to apply hard pressure when feeding work into the bandsaw. If it is, then the blade is blunt and should be changed.

On work of the size shown here, the Right hand should lightly set against the Right hand fact of the material, whilst the Left hand applies what pressure is required to feed the work.



SAWING TO A FENCE

Ensure that towards the end of the cut a properly designed PUSH STICK is used by the trainee to push the work thorugh the machine. Point out that the push stick should be located at a point on the edbe of the material between the blade and the fence.



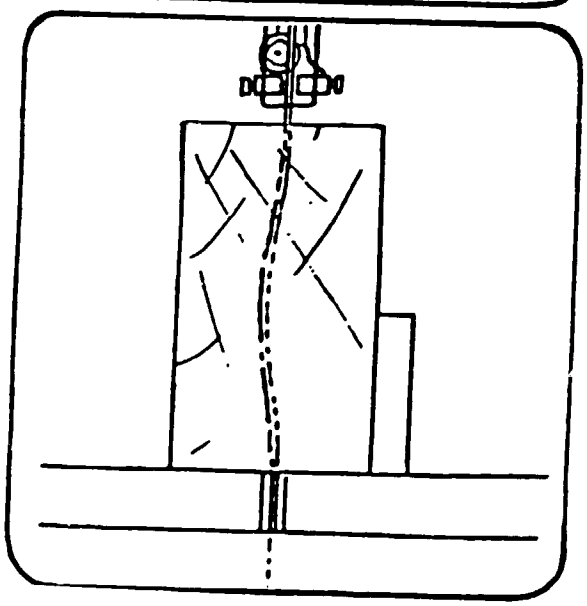
Speed of feed

Tell the trainee that the aim is to ahcieve a smooth continuous speed of feed.

If the speed is too slow or the trainee keeps stopping and starting, a ribbed effect may be produced on the sawn surface.

If the speed of feed is too fast the balde may belly or be forced back on to the thrust wheel and heat will be generated in the sawblade. This can lead to serious cracks developing on the back edge of the blade especially on wide blades.

Even worse, the blade might be pushed off the pully wheels.

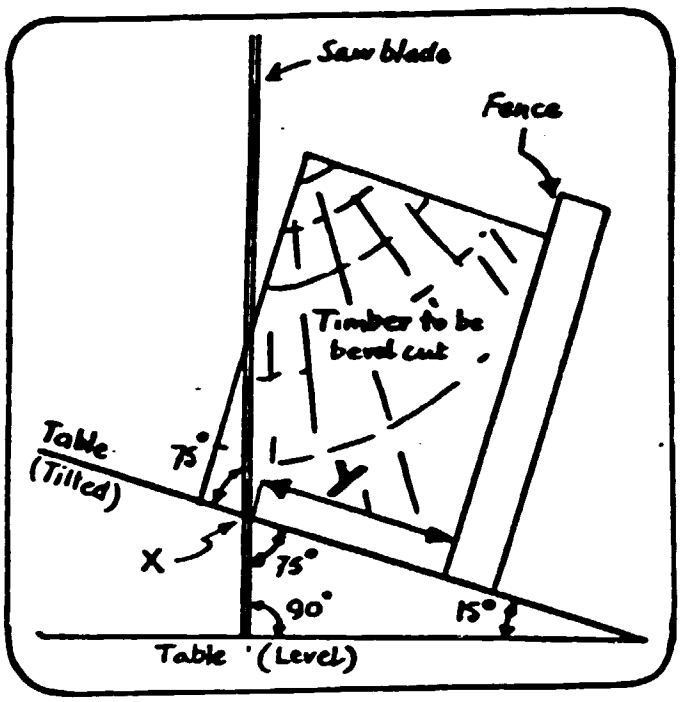


Experience will tell the trainee what an ideal cutting speed is, but generally speaking, the thinner the timber the faster it can be cut. Thick timber requires a slower feed speed and on really deep cutting care must be taken to avoid "dishing" which is caused by the blade bellying.

NB. Ensure that the trainee understands that after making his first cut he should check the measurement for accuracy and that on long runs this checking should be repeated at intervals.

BEVEL SAWING TO A FENCE

Instruct the trainee how to cut an angle or bevel on a piece of wood once the Supervisor or senior machinist has set the machine for the job.



MINIMISING SAW BREAKAGES

To minimise the breakage of saws instruct the trainee:

(a) If possible not to allow the bandeaus to attain maximum running speed too rapidly.

(N.B. Modern machines have a dual switch; one to start the saw and one to increase speed. They should not be put on simultaneously because this places an excessive strain on the blade.)

(b) Not to apply the brake too fiercely except in an emergency.

(c) Not to start the machine if the saw tension is too tight.

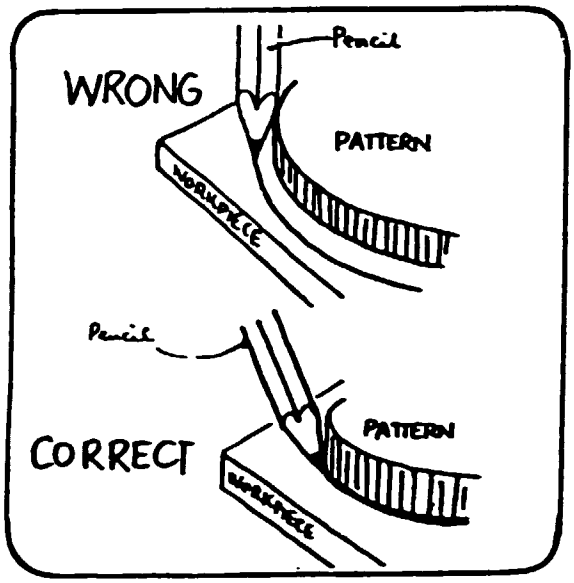
CHOICE OF BLADE

Emphasise that for STRAIGHT WORK the WIDEST BLADE AVAILABLE is used.

Explain that for CURVED WORK the blade selected must be suitable for the RADIUS OF CURVE to be cut. As a rough guide only the following table may be useful. Ensure that the trainee makes out a copy of this table for his own reference.

Tell the trainee that blade changes will be done only by the Supervisor or senior machinist.

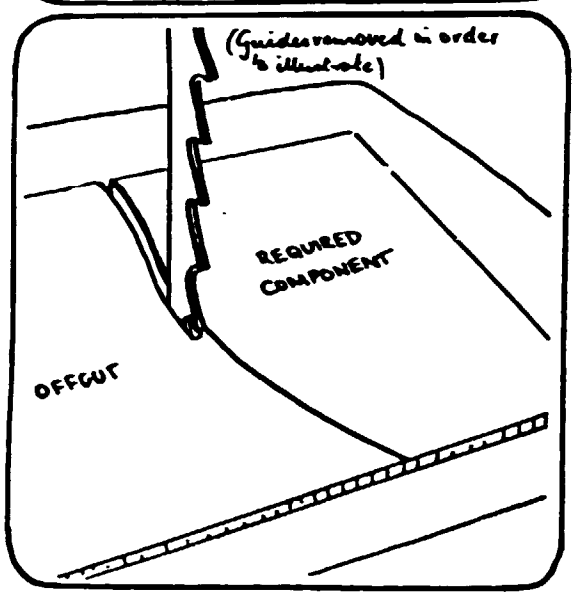
Width of Blade	mm	5	10	12	15	20	25	30	40	45	50
	ins	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4	2
Min. Radius of cut	mm	20	40	60	75	115	200	305	500	600	750
	ins	3/4	1 1/2	2 1/2	3 3/4	5 1/2	8	12	20	24	30



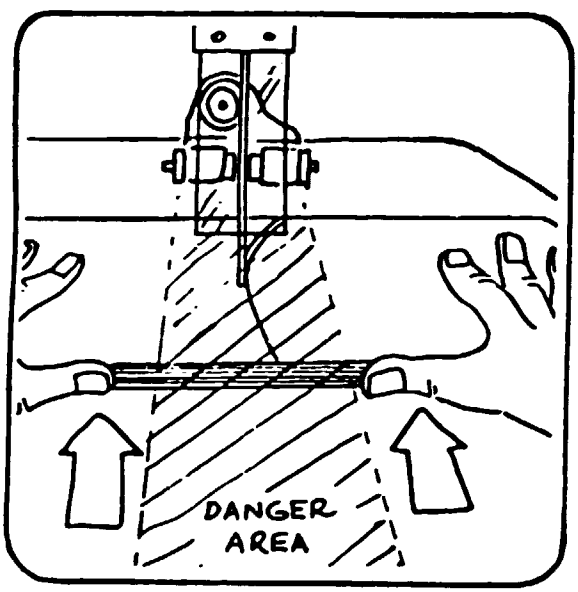
SIMPLE FREEHAND SAWING

Tell the trainee that the cutting of a freehand line is usually achieved by first marking out the line to be sawn by using a pattern.

Emphasise that it is necessary to ensure that the line drawn conforms exactly with the pattern. If the line is drawn in an incorrect way the thickness of the pencil may make the line larger than the pattern and cutting will produce a wrongly dimensioned component.

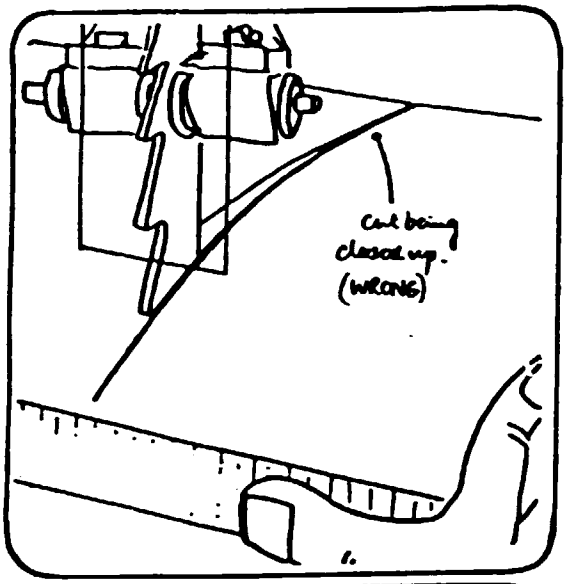


Point out that when cutting to a line, it is important to follow the line as closely as possible with the saw and to ensure that the line remains on the component and NOT on the offcut.



SAFETY

When feeding freehand work keep both hands clear of the danger area, but retain control of the workpiece.

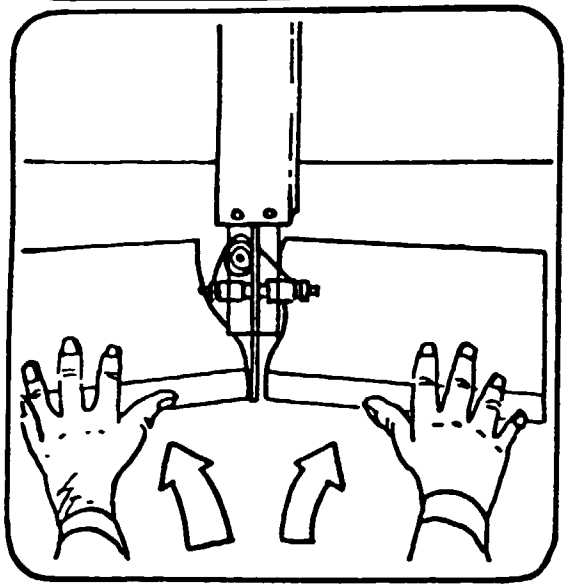


SIMPLE FREEHAND SAWING

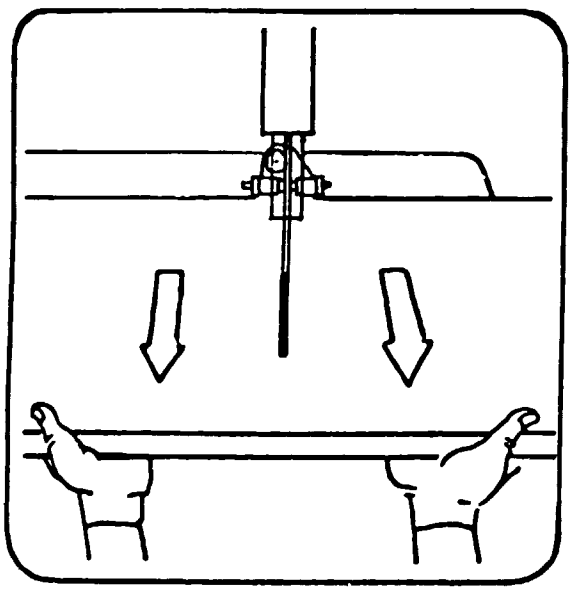
Teach the trainee that care should be taken to maintain an even feed pressure with both hands in order to avoid closing the gap made by the saw in the workpiece.

Point out that such a closure will tend to pinch the blade.

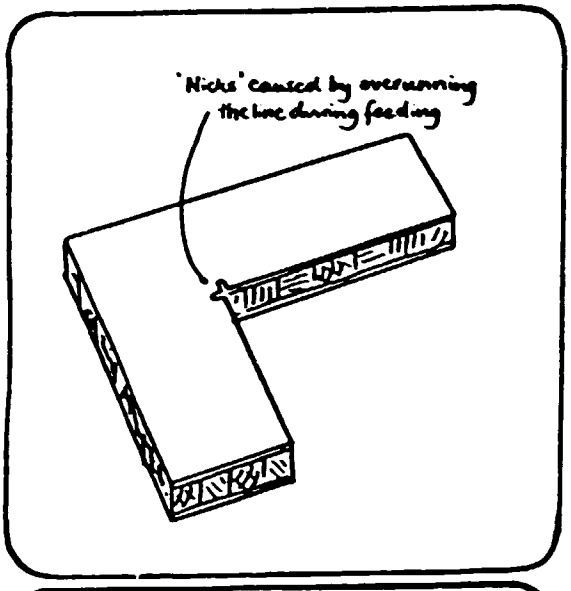
Allow the trainee to mark out pieces from patterns and to cut them freehand under your supervision. Check the cut outs with the original, pointing out any deviations.



Tell the trainee to take extra care when emerging from completing a freehand cut. A light outward pressure as the blade is about to emerge ensures that the work is fed clear of the blade and that the hands remain in a safe position.



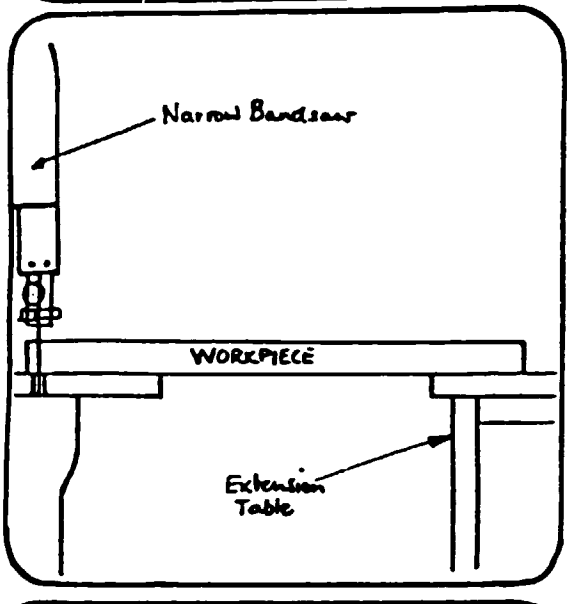
When occasionally it is necessary to withdraw the work piece without goin completely across it with the blade instruct the trainee that extreme care should be exercised when withdrawing work through the saw cut. This will avoid pinching or pulling the blade forward.



SIMPLE FREEHAND SAWING

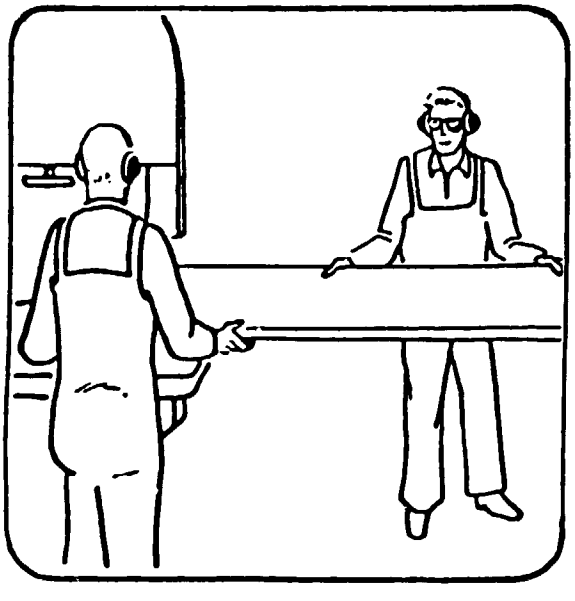
An example where work has to be withdrawn before the completion of a through cut is the production of an 'L' shaped piece of sheet material.

Stress that care needs to be taken not to cut beyond pencil lines, in order to avoid 'Nicks' in the right angle of the 'L'.

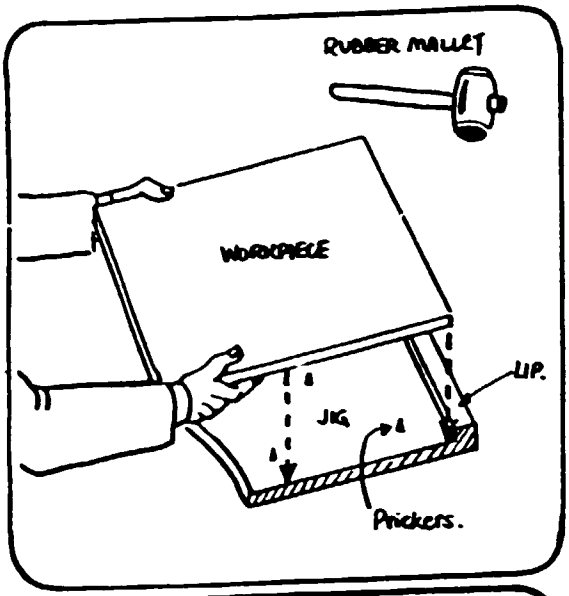


Re-emphasise, when dealing with large work pieces:

1. The need to use an extension table which is reasonably level with the machine's table.



2. To call for assistance, through the supervisors, when needed.



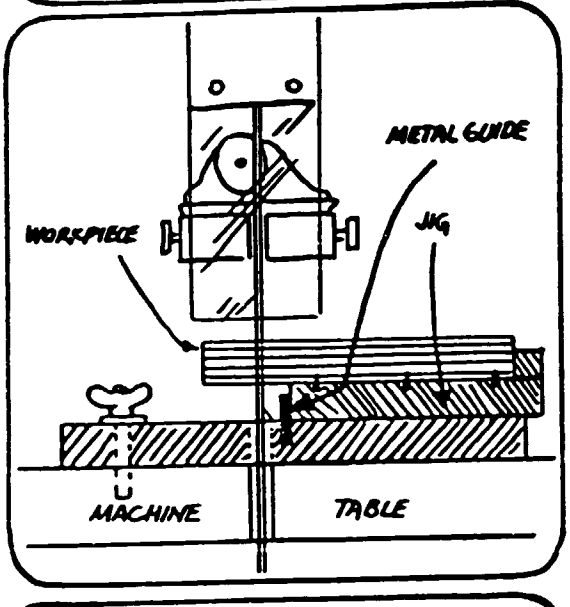
SAWING USING JIGS

An alternative to marking out work and cutting freehand is to put the work in a jig. The shape of which determines the shape of the cut. If you use jigs show the trainee a selection and indicate to him

(1) The lip on the back of the jig which ensures the correct location of the work piece.

(2) The pricker points that give grip to the work piece.

(3) The rubber mallet used to tap the work piece down on to the prickers.

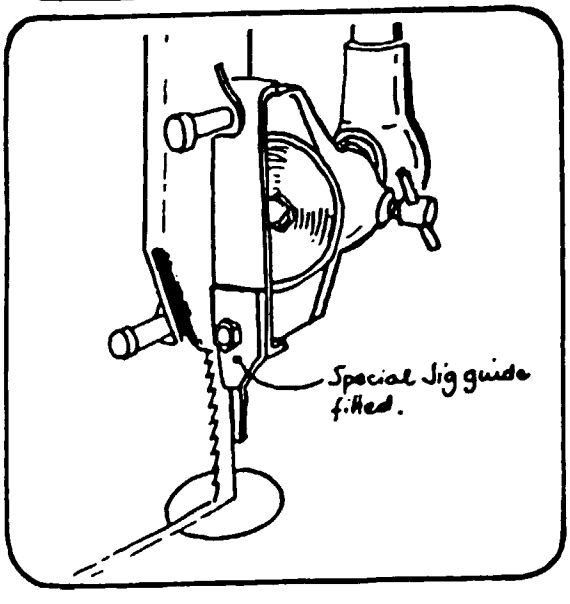


Tell the trainee that there are two methods of cutting a work piece with the use of a jig.

(1) Where the saw guides have no extension piece.

In this case a wooden false table is screwed on to the machine table and a metal guide is inserted into it as shown.

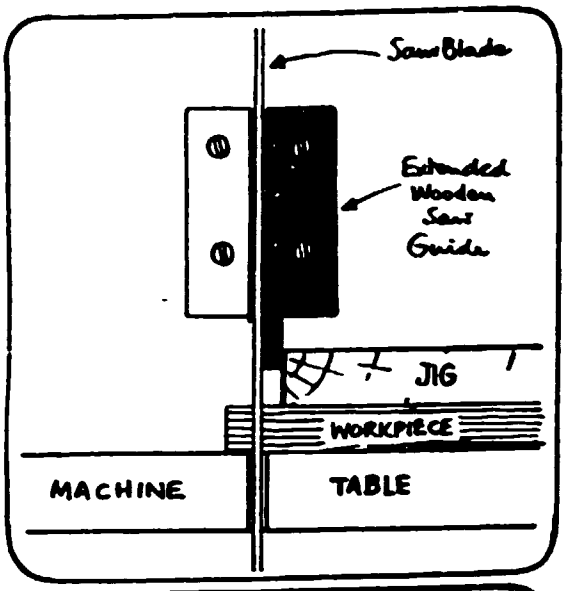
The jig is tapped on to the work piece and they are then both turned upside down with the jig up against the metal guide. The guide is held against the jig whilst the work piece is fed into the band saw with the saw guides lowered as close to it as possible.



(2) Where the saw guides are fitted with an extension piece as indicated.

Here the guide is extended downwards so that it touches the jig which this time is on top of the work piece.

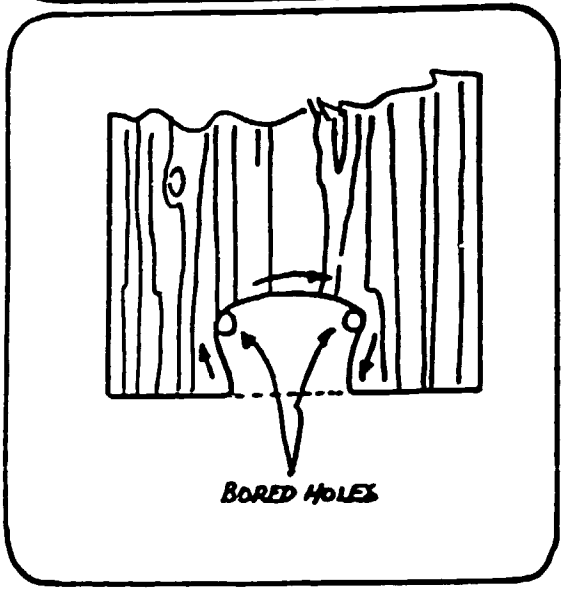
Explain to the trainee that in both cases, so long as the guide is kept hard up against the jig, the shape of the cut will be the same as that of the jig.



COMPLEX FREEHAND SAWING

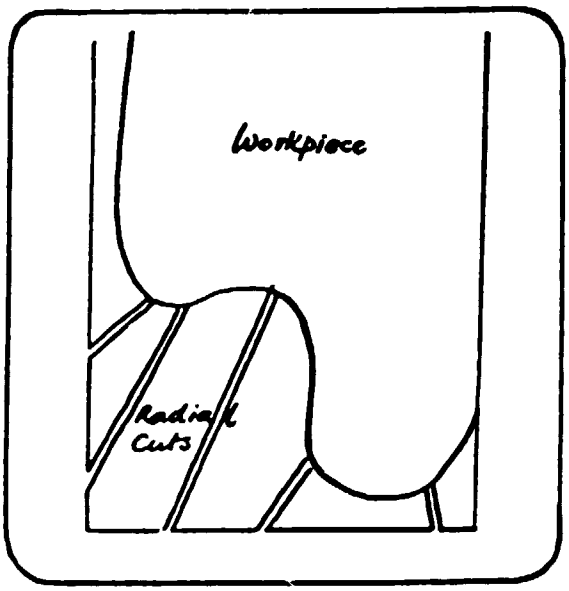
Encourage the trainee to practise the method of cutting by jig that your company adopts.

Remind the trainee that the work piece will finish rather larger than the jig itself and tell him that the jig maker will have allowed for this when making it.



Curve Cutting

Reference to the table on page 19 will indicate to the trainee the minimum radius that each blade width will cut where it is necessary to cut a curve with a radius that each blade width will cut. Where it is necessary to cut a curve with a radius that is too small for the blade that is on the saw, explain to the trainee the method of boring holes as indicated before commencing the cut. Tell him that this will enable the piece to be turned easily whilst still allowing the blade to run freely.



Show the trainee how, where it is necessary to cut a series of narrow curves in succession which cannot be accommodated by the blade, several radial cuts will enable them to be broken up into small sections that the blade can cope with.

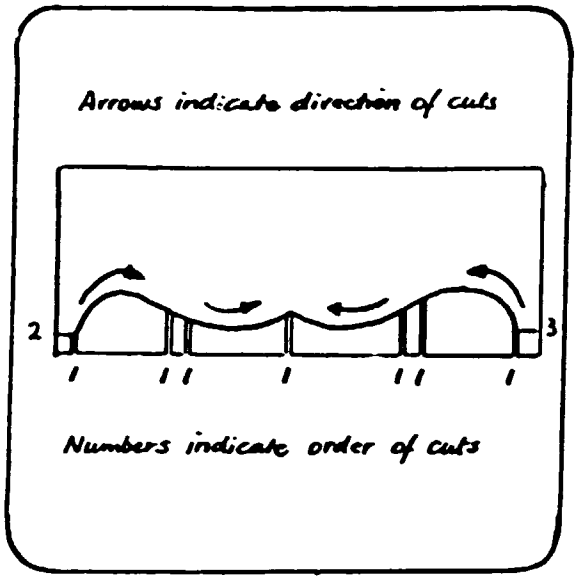


FIG 1.

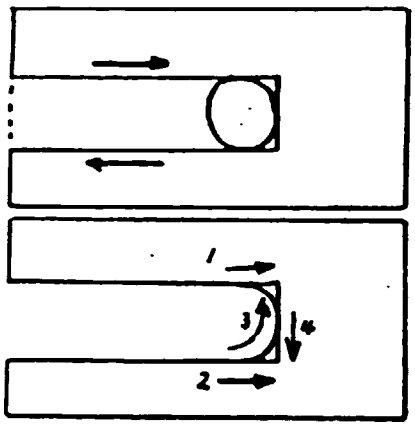
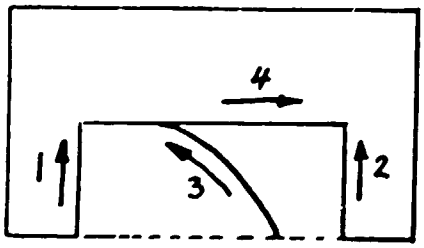


FIG.2



IRREGULAR CURVE CUTTING

When cutting irregular curves, tell the trainee that it is best done by breaking them up by radial cuts at right angles to the curves as indicated. This will enable the saw to be freed and avoid back-tracking.

Tell the trainee also that where a series of cuts have to be made, the first cut should be the shortest and if possible straight. Remind him that this is because it is easier to back a band saw out of a short cut than out of a long one, and much easier to back it out of a straight cut than out of a curved one.

Point out that such radial cuts must not cross the line of the curves, because if they do they will show as nicks on the finished job.

Corner Cutting

To facilitate the cutting of squares corners as indicated on the left, explain to the trainee that a small hole will enable him to cut the corners as shown.

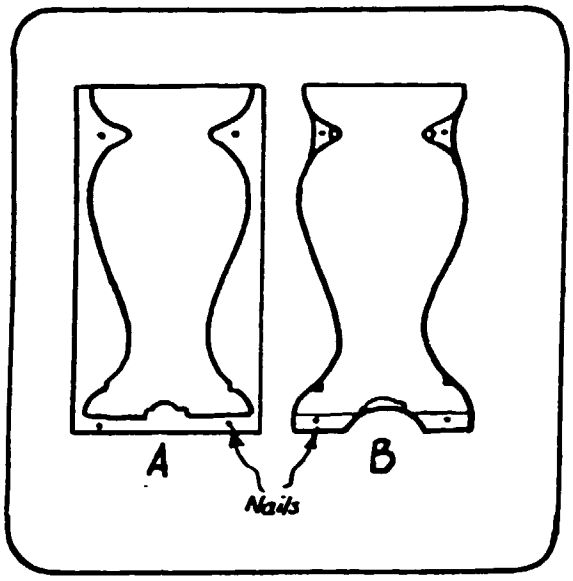
The supervisor will arrange for such holes to be bored if they are necessary.

Cutting from Different Directions

Show the trainee how to cut into a piece of timber or board from different directions as shown on the left.

Remind him to make the shortest cuts first and make his cuts straight if possible.

Show him how to make the short radial cut (3) after cutting (1) and (2) in



COMPLEX FREEHAND SAWING

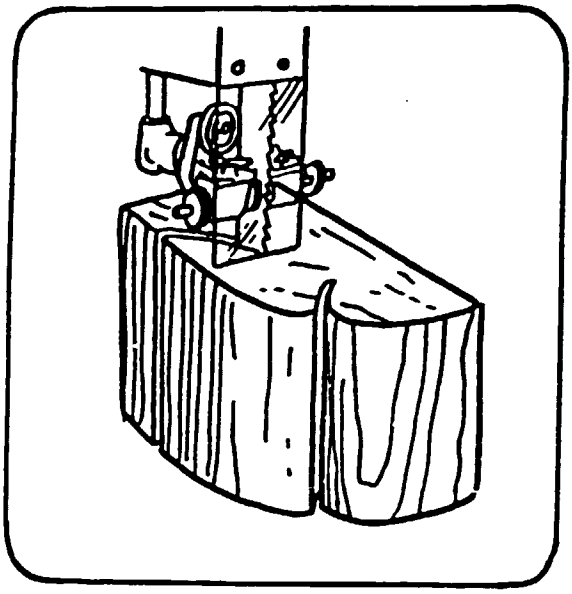
Multiple Sawing

This can be done in two ways:

(1) By cutting out two or more identical pieces simultaneously.

Show the trainee how to nail the pieces to be cut out together driving the nails into the waste wood as far away from the edges to be cut as possible as shown in A. Then cut out either by using a jig or by free hand employing the method indicated in B.

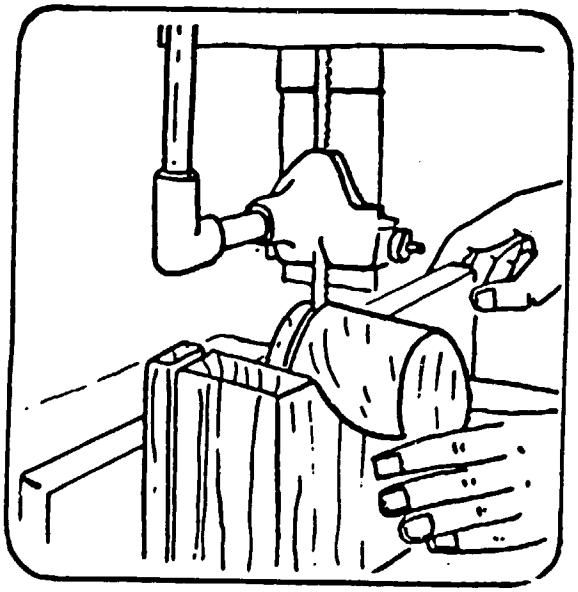
Ensure that the trainee drives the nails in straight to obviate the possibility of damage occurring to the sawblade.



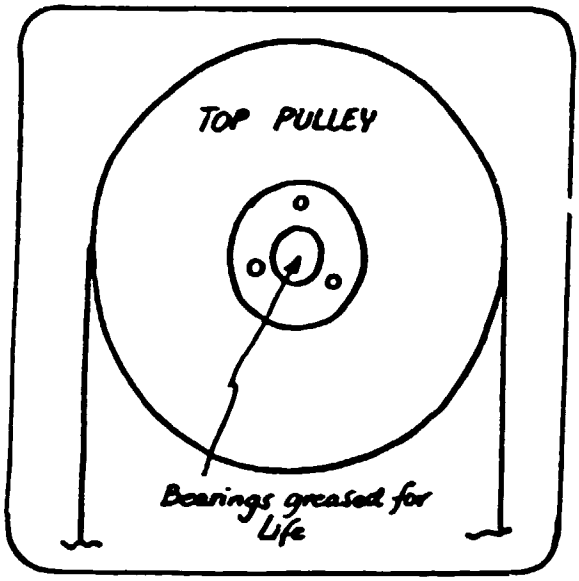
Multiple sawing

(2) By cutting two or more pieces from a solid block or a number of pieces of board that have glued together.

Show the trainee how the pattern is drawn on to the block which is then cut to the desired shape.



Then demonstrate the method of cutting the required number of pieces out from the block using either the bandsaw with the fence set so that correct thickness is cut in each case.

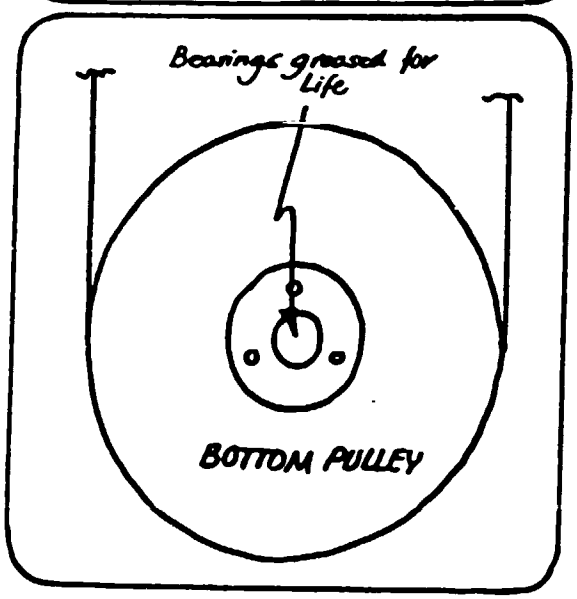


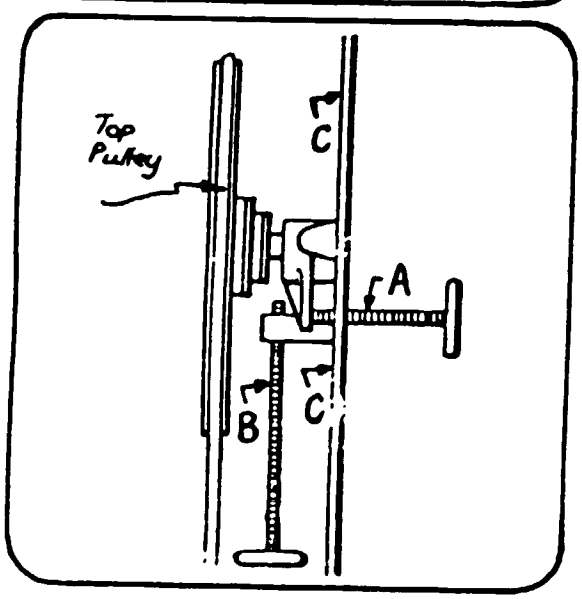
OILING AND GREASING

Explain to the trainee:

Very little oiling is necessary with the narrow bandsaw because the main moving parts - the top and bottom pulley bearings are greased for life on modern machines.

When dealing with the few parts that do require oiling, it is important to stress to the trainee that over-oiling is almost as bad as not oiling at all. It is also important that all parts requiring oil should be kept clean and be wiped before applying fress oil.

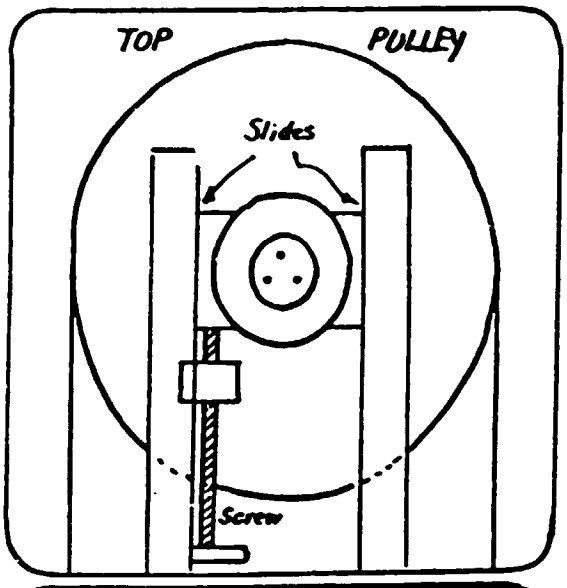




The tracking screw (A) and the straining adjusting screw (B) will require a small amount of oil weekly as will the slides (C).

N. B. In some machines there is a cup for oiling the slides, in which case this should be replenished when emplty (usually annually).

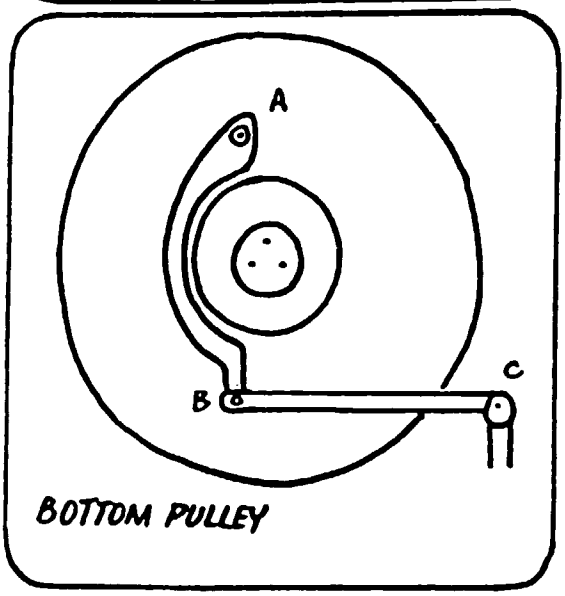
Indicate both tracking screw and the straining adjusting screw to the trainee and demonstrate oiling.



OILING AND GREASING

Demonstrate to the trainee how the straining adjusting screw lowers or raises the top pulley against slides (A) which require oiling weekly.

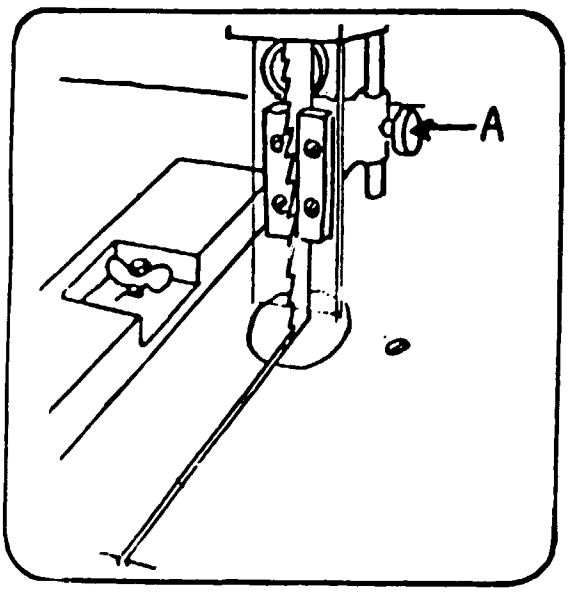
As already stated, in some machines, there is a cup for the oil that requires periodic replenishment. Indicate the slides to the trainee and demonstrate how tightening or slackening the screw increases or decreases the stress of the blade. Show trainee the slides behind the top pulley.



Explain to the trainee that brakes on narrow bandsaws vary in design, but they all have the same purpose, that of stopping the bottom pulley from rotating after the current has been switched off.

Some work on the lever principle as shown and others work on a lever and spring. In all cases, tell the trainee that they must be kept clean and all moving parts includir the spring must be oiled weekly if nec sary.

Demonstrate how the brake works and how to oil it.



The guard adjusting screw (A) must always be free, clean and lightly oiled.

Point out this screw to the trainee and demonstrate cleaning and oiling.

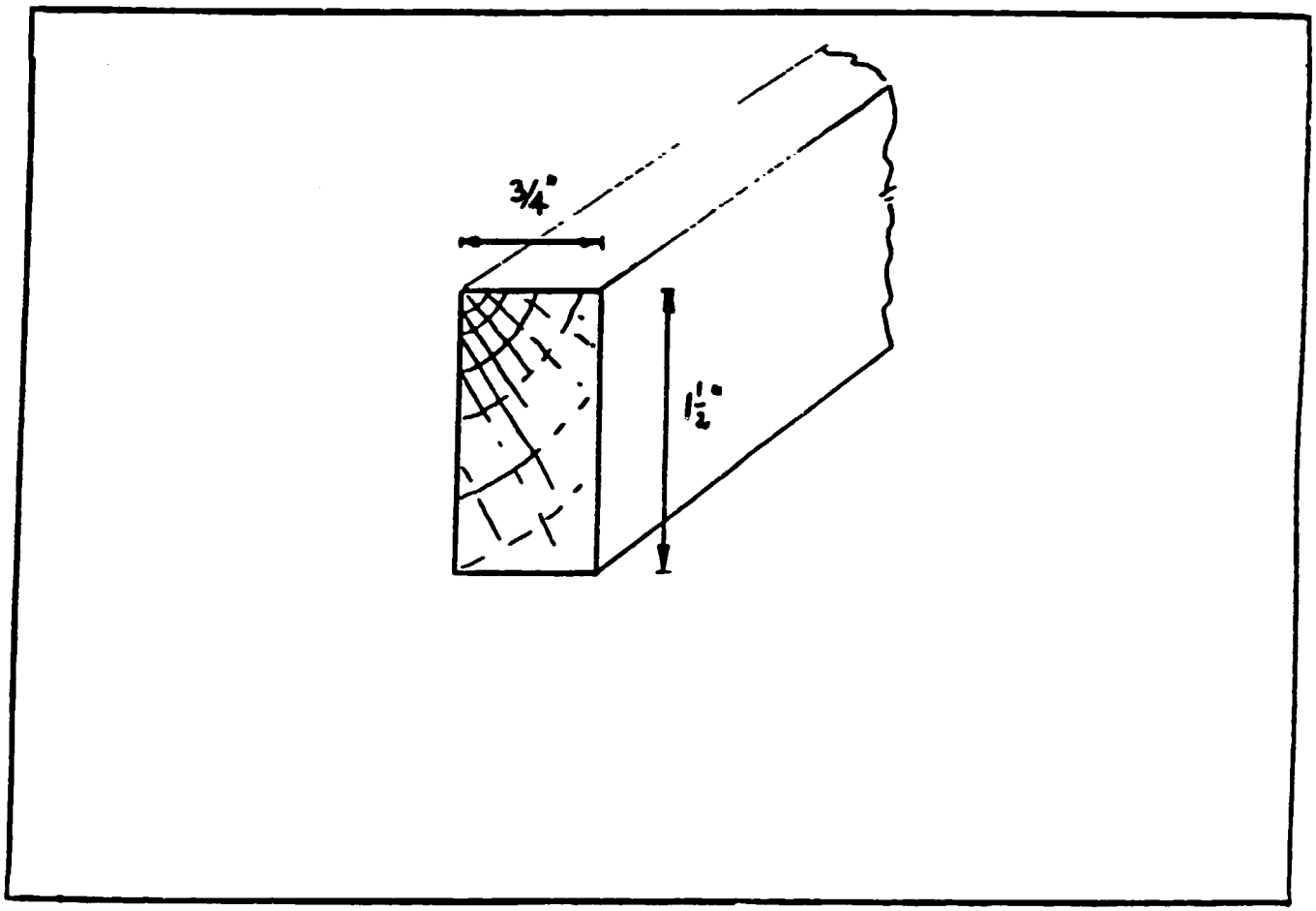
Example of Test: 1

MACHINE: NARROW BANDSAW

PURPOSE: To check that the trainee can rip stock, using a fence, to a given dimension and to acceptable quality and quantity.

POINTS TO OBSERVE:

- Safe positioning of both hands.
- Use of the push stick.
- Speed of feed.
- Quality of finished sawn edge.
- Accurately dimensioned.



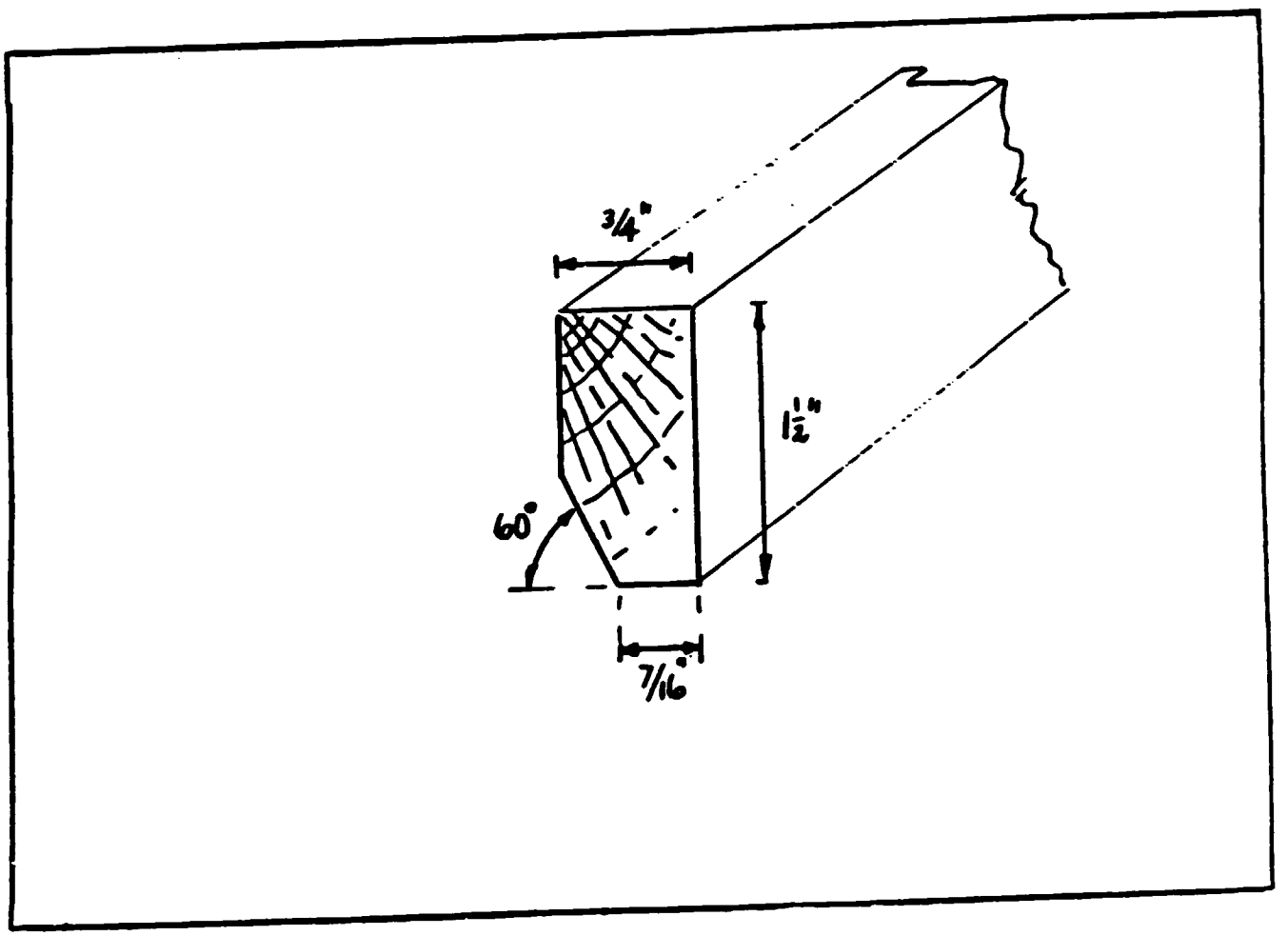
Example of Test: 2

MACHINE: NARROW BANDSAW

PURPOSE: To check that the trainee can bevel cut a piece of softwood to a given dimension and to acceptable quality and quantity standards.

POINTS TO OBSERVE:

- Safe positioning of both hands.
- Use of the push stick.
- Speed of feed.
- Quality of finished sawn edge.
- Accurately dimensioned.



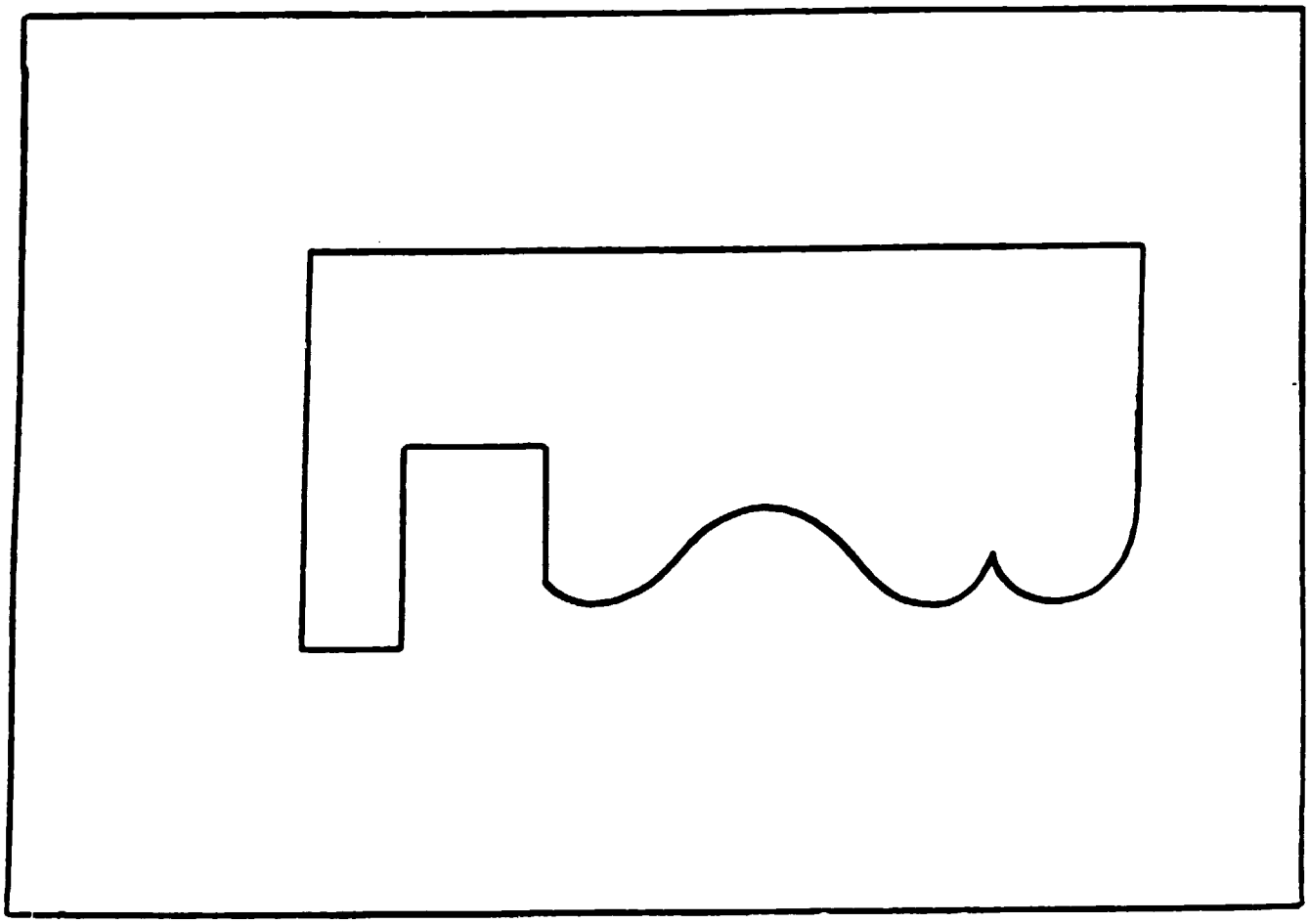
Example of Test: 3

MACHINE: NARROW BANDSAW

PURPOSE: To check that the trainee can mark out a complex curve on sheet material to a given pattern and cut to a line to acceptable quality and quantity standards.

POINTS TO OBSERVE:

- Accurately drawn form pattern.
- Correct adjustment and use of guards.
- All necessary drill holes and radial cuts made.
- Correct sequence of cutting followed.
- Safe positioning of hands.
- Safe withdrawal of work past the blade.
- Even feed pressure and no blade pinching.
- Accuracy and quality of final component.



TRAINEE TEST RECORD

TRAINEE NAME: _____

TRAINEE'S COMPANY: _____

COURSE TITLE: _____

INSTRUCTOR: _____ Date(s): _____

	GRADE			
	1	2	3	4
Test 1				
Safe positioning of both hands				
Use of the push stick				
Speed of feed.				
Quality of finished sawn edge.				
Accurately dimensioned.				
Test 2				
Safe positioning of hands				
Use of push stick				
Speed of feed.				
Quality of finihsed sawn edge				
Accurately dimensioned.				
Test 3				
Accurately drawn from pattern				
Correct adjustment and use of guards				
All necessary drill holed and radial cuts made.				
Correct sequence of cutting followed.				
Safe positioning of hands.				
Safe withdrawal of work past the blade.				
Even feed pressure and no blade pinching.				
Accuracy and quality of final component.				

_____

Instructor's signature

ANNEX V

Outline Model Syllabus for a two-year
Skill Level Course for Wood Machinists

1. Introduction

The course is composite, consisting of not less than 325 hours a year instruction off-the-job in a Training Institution, and the rest of the time is spent in-company undergoing training and gaining experience to match the progress through the syllabus. Both components are essential elements and a trainee should not be considered to have reached Skilled level unless both components are thoroughly planned, executed and monitored.

The manner in which the time is divided between the two components is a matter for agreement between the Training Institution and the companies its serves. However, the minimum of 325 hours per year should not be condensed into less than two blocks separated by a gap of two months . The times shown against each topic in the syllabus are based on two years at this minimum figure, i.e. 650 hours total. The values given are to serve as a guide in preparing timetables.

2. Entry

Entry qualifications are largely determined by the company by its recruitment policy. However, the Training Institution can reject a trainee for admission if he or she is considered unsuitable for good reasons. Such reasons would be: illiteracy; total lack of knowledge of English; failure to carry out work set; serious indiscipline. Lack of formal academic qualifications, alone, should not be held to be "good reason".

3. Format

The syllabus is constructed in the form of objectives to be achieved. These objectives are reached partly by lectures, demonstration, guided practice in the Training Institution, and partly by guided practice on production work on the relevant machines in the company. The Instructor must guard against the "importation" of bad factory practice into the Training Institution Workshop, and avoid condoning such bad practice. A Training Manual similar, but at Skilled level, to that in Annex IV is needed for each of the machines.

Initially, lack of some machines may mean that institutions cannot cover all those listed. However, those marked with an asterisk in section 4.9 are essential and must be available if this course is to be offered.

Wherever the words "describe' or "explain" are used, they should be taken to include the meanings of "use", "operate", "set-up", etc. as appropriate.

4. Syllabus

4.1 Materials (First year subject) ---------- 25 hours

The trainee will be able to:

o Explain growth, structure and properties of timber;
o Identify Philippine timber species;
o Explain general methods of timber extraction and primary conversion;
o Describe the principles and methods of seasoning, drying and storing converted timber;
o Explain the reasons for drying timber and its relation to atmospheric humidity;
o Describe the characteristics, types and uses of sheet material available;
o Identify drying faults in timber and explain their cause;
o Describe how veneer is produced;
o Describe the use of veneer in sheet material, as decorative covering and for laminating;
o Describe the main characteristics of rattan and bamboo, and how these influence their use.

4.2 Adhesives (First year subject) ---------- 10 hours

The trainee will be able to:

o Describe types and characteristics of adhesives;
o Describe uses and methods of application of adhesives.

4.3 Drawing (First year subject) ---------- 25 hours

The trainee will be able to:

o Read and interpret isometric and orthnograhic drawings;
o Prepare cutting lists from drawings;
o Draw cutter profiles from drawings of sections;
o Check components sizes against scale drawing;
o Explain relationship of joint dimensions to component size and application;
o Design simple holding jigs.

4.4 Calculations (First year subject) ---------- 20 hours

The trainee will be able to:

o Add, divide, and multiply with and without electronic calculator in decimals and fractions of 1/4, 1/8, 1/16 and 1/32;
o Convert fractions to decimals and vice versa;
o Calculate volumes and areas of simple geometric shapes;
o Understand angular units of measurement.

4.5 Measurement (First year subject) ---------- 20 hours

The trainee will be able to:

o Measure accurately with a tape and carpenters rule in decimals and fractions (inch and metric units);
o Measure and transpose measurements with callipers, dividers and vernier;
o Measure and proportion liquids and powders;
o Measure right angles with square, and other angles with protractor.

4.6 Lubrication and Routine Maintenance
(First year subject) ---------- 10 hours

The trainee will be able to:

o Explain the need for lubrication in moving parts of machines and the damage caused by inadequate or incorrect lubrication;
o Explain the transmission of power from motor to cutter via pulleys, drive belts and gears;
o Explain the idea of "machine capacity" and the manifestations of overloads;
o Explain the need for machine cleanliness and regular routine maintenance.

4.7 Waste Extraction (second year subject) ---------- 10 hours

The trainee will be able to:

o Describe the necessity for waste and dust extraction;
o Explain the main types of waste and dust extraction;
o Describe some uses to which waste and dust can be put into;
o Identify fire hazards inherent in waste and dust management;

4.8 Electricity (Second year subject) ---------- 10 hours

The trainee will be able to:

o Define the basic units of electricity;
o Explain, in non-mathematical terms, the principles of current, power, voltage, and phases;
o Describe, in non-mathematical terms, the electrical requirements of woodworking machines;
o Describe the safety precautions needed to be observed with electricity and all electrical appliances;

4.9 Machining (First and Second year subject) ---------- 400 hours

For each machine listed below, the trainee will be able to:

o Explain its functions, capacity, accuracy of work and limitations;
o Identify the main parts and fences, guards and ancillary fitments;
o Describe the controls, their purpose and use;
o Describe the factors affecting the choice of machine for particular jobs;
o Describe the factors affecting the choice of cutting tools and blocks for a particular job or materials;
o Describe the different kinds of saws and cutters, and their cutting action;

o Describe the various methods of holding and mounting cutters and saws;
o Describe the procedures of setting up machines and their guards;
o Describe use of fixtures and jigs to hold work pieces for machining;
o Explain the relationship of feed speed, cutter speed, material and surface finish, and accuracy;
o Explain the purpose of dust and waste extraction;
o Describe the routine daily cleaning, lubrication and checking procedures;
o Explain the general electrical and electrical safety requirements of woodworking machinery;
o Set up and operate each machine safely and efficiently to perform a variety of different operations on each;

First Year
*Dimension saw
*Narrow band saw
*Cross cut/Radial cross cut
*Circular rip saw
*Surface planer (jointer)
*Narrow belt sander
Bench/pedestal Drill
Panel saw
Vertical band resaw

Second Year:
*Straight line edger
*Thicknesser, Planer, or Combination planer & thicknesser
*Single-end tenoner
*Router
*Mortiser
*Spindle moulder
Combination table narrow belt sander & disk/bobbin sander
Wide belt sander
4, 5, or 6 Sided planer moulder

4.10 Toolroom (Millwrighting)
(Second year subject) ---------- 100 hours

The trainee will be able to:

o Describe the ways a cutting edge cuts timber;
o Describe tooth forms, types, their application and characteristics;
o Explain the principle of saw clearance and ways it is achieved;
o Identify dull cutters and saws;
o Describe materials used for cutters, saws and tipping;
o Explain effects of centrifugal force and need for balancing and tensioning;
o Describe principles of grinding and grinding wheels;
o Explain effect of heat on various types of material used in cutters, saws, and tools;
o Sharpen saws and cutters by manual filing, and grinding, and tensioning;

4.11 Non-Technical Subjects ---------- 20 hours

Individual Institutions will devise their own programmes for this section from such subjects as: Religious Studies; Citizenship; Fitness and Health; Philippine Culture; etc.

5. Company 1st Year Block Company Training Programme

	Topic or Department	Time in weeks
a)	Induction and familiarisation to the company	1
b)	Timber yard - handling, measuring, stacking incoming timber	4
c)	Timber drying - pin and stack timber, handle wet and dry timber, assist in kiln operation and moisture determination	2
d)	Preparation - sorting, identifying, grading, stacking timber for production	2
e)	Rough milling I - moving stock and pallets, stacking, identifying and counting batches	3
f)	Rough milling II - receiving behind, machines, identifying faults, laying out work area	3
g)	Wood machining - receiving behind machines, feeding machines, assisting operator, taking and returning saws from tool room, assist setting-up on: dimension saw (5) narrow band saw (5) cross cut saw (5) circular rip saw (5) surface planer (5) narrow belt sander (5)	30
h)	Assembly - identify components and batches, assisting on variety of different products	3
i)	Carving - identify tools, assisting with roughing out	23
		Total 50 weeks

ANNEX VI

Outline Model Syllabus for One-Year Master Level Course

1. Introduction

This is a composite one-year course consisting of not less than 325 hours instruction off-the-job in a Training Institution, and the rest of the time spent in-company undergoing on-the-job training and gaining experience in those disciplines the trainee did not take at Skilled level. i.e. a Skilled a wood machinist would extend his knowledge in Cabinet making, Carving and Upholstery as appropriate in his company.

Both components are essential elements and a trainee should not be considered to have reached Master level unless both components are thoroughly planned, executed and evaluated.

The manner in which the time is divided between the two components is a matter for agreement between the Training Institution and the companies it serves. However the minimum of 325 hours should not be condensed into less than two blocks separated by a gap of two months. The times shown against each topic in the syllabus is given as a guide in preparing the time tables. Timetables should allow time for trainees to do their own information gathering and study.

2. Entry

Entry qualification is the successful completion of a course in a Furniture Subject at Skill level. Training institutions must not accept any qualification in lieu of this.

3. Format

The Syllabus is constructed in the form of objectives to be achieved. These objectives are reached partly by lectures, demonstration and guided practice in the Training institution and partly by extended supervised practice on production work on the relevant sections in the company. The instructor must guard against the "Importation" of bad factory practice into the Training Institution's workshop and avoid condoning such bad practice.

Wherever words such as "describe" and "explain" are used, they must be taken to include practical skills such as "use", "set-up", "operate" etc.

4. Syllabus

4.1 Machine Knowledge. One machine from each of the following four groups to be selected; Circular sawing machines; Horizontal cutter machines; Vertical cutter machines; and Sanding machines. ---------- 125 hours

At the end of the course the trainee will be able to:

- o Describe in detail the construction of the selected machines;
- o Explain the purpose and functions of the parts of the selected machines;

o Explain and evaluate the differing features of machines from different manufacturers;
o Describe the correct maintenance needs and installation requirements of the selected machines;
o Describe and use the range of cutting tools, blocks and machine accessories available for each machine selected;
o Describe and fit all safety guards and operating procedures for each machine selected;
o Quantify the production capacity and accuracy of each of the machines selected;
o Describe and specify the dust or waste extraction systems required for each machine selected;
o Explain and draw a range of dimensional gauges for checking components machined on the selected machines;
o Describe the selection of materials for use in jigs and gauges.

4.2 Joints ---------- 50 Hours

At the end of the course the trainee will be able to:

o Make and evaluate the range of machine made joints;
o Explain the use of each type of joint;
o Evaluate the relative strengths and cost of each type of joint;
o Describe the range and application of adhesives used with joints;
o Quantify the movement of timber radially, tangentially and axially with moisture content variation;
o Evaluate the effect of changes in atmospheric relative humidity on joints.

4.3 Component Design ---------- 50 Hours

At the end of the course the trainee will be able to:

o Explain the effect of component design on the costs of production;
o Explain the effect of component design on jig design and machine setting;
o Explain the effect of component design on timber utilisation;
o Redesign components to minimize, waste, hand work, and cost.

4.4 Drawing ---------- 50 Hours

o Set out in full size from drawings;
o Produce detail component schedules, showing sizes of blanks, volumes and quantities;
o Specify machine operations and sequence required for different components and joints.

4.5 Instructional Techniques ---------- 50 Hours

o Prepare a lesson plan;
o Interpret a syllabus;
o Explain the learning process and the learner's attitudes;
o Explain how to motivate and control trainees;
o Explain the setting and maintenance of standards;
o Explain the role and importance of feedback to learning;

o Demonstrate the ability to give instruction (to be done by giving instruction to 1st year trainees in the Training Institution).

ANNEX VII

Outline Model Syllabus for One-Year Technician Level Course

1. Introduction

This is a composite one-year course consisting of not less than 325 hours instruction off-the-job in a Training Institution, and time spent in-company carrying out a practical project. The nature of the project will vary according to the company. However in all cases it should result in either a production prototype on the jigs to be used in a production run of a new model, plus the material schedules, production details, and batch and unit costs.

Both components are essential elements and a trainee should not be considered to have reached Technician level unless both components are thoroughly planned, executed and evaluated.

The manner in which the time is divided between the two components is a matter for agreement between the Training Institution offering the course and the companies it serves. However its minimum of 325 hours should not be condensed into less than 2 blocks separated by a gap of 2 months. The times against each topic in the syllabus is given as a guide to preparing timetables. Timetables should allow some time for trainees to do their own information gathering and study.

2. Entry

Entry requirement is the successful completion of a course in a Furniture at Master level and preferably one year industry experience after reaching Master level. Training Institutions must not accept any qualification in lieu of Master.

3. Format

The syllabus is constructed in the form of objectives to be achieved. These objectives are reached partly by lectures, demonstrations, guided practice and the trainee's own study and research, and partly by the completion of the practical project.

The Instructor must guard against allowing the trainee to take "short cuts" or omit portions of the project on the grounds that it does not correspond with his company's practice or methods.

Whenever words such as "describe" and "explain" are used they must be taken to include practical skills such as "do", "use", "quantity" etc.

4. Syllabus

4.1 Production Planning and Control ---------- 80 hours

At the end of the course the trainee will be able to:

- o Describe the principles guiding the selection of economic batch size;
- o Describe the criteria affecting stock and ordering levels;

o Explain work scheduling. shop and machine loading and the economic effect of under and over loads;
o Explain two alternative systems of controlling and monitoring batch production;
o Design the paper work and administrative system for each of these systems;
o Describe the preparation, purpose, and use of production targets for the whole factory its sub-sections and individual operations.

4.2 Work and Time Study ---------- 40 Hours

At the end of the course, the trainee will be able to:

o Explain the principles of Work (or Method) Study;
o Describe the methods of recording work activities;
o Explain the principles of Time Study;
o Describe two alternative systems of obtaining and analyzing job times;
o Analyze a work situation in detail for method and in broader (but quantified) detail for time;
o Describe in what type of situation Work and Time Study should or should not be applied;
o Explain the possible indirect effects (favourable and unfavourable) on the work force of Work and Time Study;

4.3 Work Flow and Material Handling ---------- 50 Hours

At the end of the course the trainee will be able to:

o Describe the main types of production, their characteristics and application to various types of furniture;
o Explain how factory and machine layout differs for each type of production;
o Draw or construct a flow chart for an actual production situation;
o Explain the influence of storage areas, production volume and variety, and work station space on layout;
o Draw a factory layout for the three types of production; o Explain the significance of balancing machine and section production capacities;
o Explain various methods of handling material through the production process;
o Describe and evaluate a wide range of mechanical handling equipment and attachments;
o Explain the effect of material handling on cost;

4.4 Estimating, Costing and Budget ---------- 60 hours

At the end of the course the trainee will be able to:

o Explain the significance and differences in the compilation and use of Estimates, Costs and Budgets;
o Describe the main elements of direct and indirect cost and how they are obtained;
o Describe the data used in estimating and evaluate their reliability/accuracy;

o Describe the methods of budgeting and the significance of the budget to production;

4.5 Incentives ---------- 25 hours

At the end of the course, the trainee will be able to:

o Describe and evaluate two systems of monetary motivation;
o Describe and evaluate methods of non-monetary motivation;

4.6 Principles of Supervision ---------- 70 Hours

At the end of the course, the trainee will be able to:

o Explain the nature of supervisors' duties and responsibilities;
o Describe the supervisor's role and position in a company;
o Explain the formal and informal influence of a supervisor on the people in his section/department or factory;
o Prepare job descriptions for a supervisor, foreman and skill level workers;
o Prepare and monitor production and quality targets;
o Describe the basic principles of motivation;
o Describe the basic principles of formal and informal hierarchies and the dynamics of groups;
o Explain current Philippine labour and safety legislation and their practical application.

ANNEX VIII

Job Description - Training Chief Executive

The overall objective of the job of Training Chief Executive is to prepare or adopt a Manpower Development Plan for the Furniture Industry in the Philippines (or part thereof), obtain general agreement, and implement the Plan as a matter of urgency.

Duties:

1. To review and study:

   - o existing proposals for manpower development in the industry;
   - o present training recruitment practice;
   - o industry training needs quantitatively and qualitatively.

2. To devise a unified Manpower Development Plan for the industry to incorporate some or all of present practice and some, all, or none, of existing proposals, and which takes account of future government plans for industrial training.

3. To present, discuss and reach general agreement with the industry and Training Institutions on the Manpower Development Plan to be implemented.

4. To work with government and private institutions to implement the agreed Plan in the shortest possible time. In this work judgement is to be used between waiting to meet all desirable criteria in the Plan and the need to start training activities quickly.

5. To ensure that government and foreign aid funding is sought and used within the framework of the Plan and to avoid uncoordinated initiatives outside the Plan.

6. To seek and obtain government grants and overseas aid to supplement industry financing of the Plan.

7. To monitor and report in detail and in writing to the industry and Furniture Training Centres at not more than six monthly intervals on:

   - o progress of implementation
   - o training levels achieved and in what numbers
   - o expenditure and sources of income
   - o forecast expenditures and sources of income
   - o targets for next six months and how they will be achieved
   - o existing or anticipated problems and how they will be surmounted.

This Job Description does not indicate precisely the employing body. Once this is settled, the relationship of the Training Chief Executive will need to be stated. It is anticipated that the Chief Executive will have line relationship to the employing body and a staff relationship to the industry and training institutions.

ANNEX IX

Furniture Training Centre Machinery and Tool list

1. Machines

1st year Machines:

- o *Dimension Saw
- o *Narrow Band Saw
- o *Cross cut/Radial cross cut
- o *Circular Rip Saw
- o *Surface Planer (Jointer)
- o *Narrow Belt Sander
- o Bench/Pedestal Grill
- o Panel Saw
- o Vertical Band Saw

2nd year Machines:

- o *Straight Line Edger
- o *Thicknesser or Combination Thicknesser and Planner
- o *Single End Tenoner
- o *Router
- o *Mortiser
- o *Spindle Moulder
- o Combination Table Narrow Belt and Disk/Bobbin Sander
- o 4, 5, or 6 Sided Planner Moulder

* Machines marked thus are essential and need to be obtained for Furniture Training Centres. The other machines are desirable and should be obtained once THE essential inventory is available.

Estimated cost - Taiwan manufacture P 2,820,000
- European/Japanese manufacture P 5,300,000

These estimates are based on information supplied by:

Mayon Construction Supplies
315 Das Marinas St., Sta. Cruz, Manila

and

Intersales Corporation
9th Floor, Vernida IV Building,
Alfaro Street, Makati, Metro Manila

2. Tools.

For a group of 15 Trainees

15 Work benches fitted with a woodworking vice
15 Folding ruler
15 2m tape
15 Combination squares

15 Protractor set
6 Protractor square
6 24" Square
15 Dividers
15 Callipers
15 24" Cross cut Saws
15 Tenor Saw
15 Rip Saw
15 Plane
15 Rebating Plane
15 Shooting Plane
15 Bullnose plane
15 Spokeshave
15 Sets Chisels 1/4, 1/2, 3/4, 1"
15 Claw Hammer
15 Panel Hammer
15 Mallet
15 Screw Driver

Estimated cost P 500,000

3. General Workshop Tools and Equipment

4 Carpenters braces
4 Hand drills
4 Sets of augers, twist drills, covater sink and boring tools
6 Sets of 4 C. Clamps
6 Carpenters cramps

Estimated cost P 100,000

4. Timber Drying Equipment.

1 Laboratory kiln and controls
4 Moisture meters(various types)
1 Scale
1 Small electric oven

Estimated cost P 500,000

5. Drawing Instruments

15 Set of drawing instruments
15 T-squares
15 45 degree squares
15 60-30 degree squares
15 Protractors
15 Sets of Ogee stencils

Estimated cost P 50,000

6. Reference Material

The Workshop must have a reference library containing:

- o Furniture history and design books
- o Machine practice text books
- o Furniture and Cabinet making text books
- o Basic production engineering text books
- o Supervisory textbooks and manuals
- o Up-to-date machinery and tools manufacturers catalogues, leaflets, etc.
- o Up-to-date machinery and equipment price lists
- o Subscription to a trade or industrial furniture manufacturers journal (not a hobbyists publication)
- o Copies of any CFIP publications or circulars
- o Factory safety requirements and regulations
- o Labour codes and laws
- o Foreign furniture standards and requirements

Estimated cost P 50,000

APPENDIX V

Project to Establish a
Three Year Furniture Making Course

It has not been possible to trace the genesis of this project or obtain a copy of project proposals and objectives. As was first stated to the consultant, the plan was to run a Train-the-Trainers course for some 18 staff from the six selected schools who would then offer this 3-year course.

It was agreed at the CFIP meeting on 21st February 1991 that the first step was to prepare an Instructor's Specification to form the basis of both the selection of staff to attend the Train-the-Trainers course, and the preparation of the course syllabus and programme. The CFIP Vice President was very insistent that this work be done as priority with at least three working sessions per week. The first meeting was set for two days ahead. The Vice President, as CFIP representative and four others, three of whom had not been at the original meeting, attended. The work was not completed and the meeting reconvened the next day. On this occasion, no CFIP representative appeared, and only one other member of the working party attended. As the work was still not completed the meeting reconvened two days later. On this occasion, six people attended - one from the original meeting and four who had not hitherto attended any meetings. No CFIP representative, not even the CFIP Secretary attended this meeting.

It was quickly apparent that the new arrivals were unaware of the purpose of the meeting or of the details of the overall project. The CFIP Vice President sent a message to inform the meeting he would 'drop by' if he had time.

As it was obvious that no work could be done on this basis, the consultant excused himself and left the meeting to complete the Instructor Specification and other syllabus work independently. (These will be found as Appendices to the Manpower Development Plan Report.).

Other information not originally given, was subsequently discovered, namely: that CFIP were simultaneously making use of the advisory services of Dual-Tech Training Centre; that Manila Technical Institute would first run a pilot three-year course for at least one year with their own instructional staff before the three-year course would be made available to TEIs and SATs, not schools. The Chief Instructor who would run the 3-year course at MTI was not proposing to attend the Train-the-Trainer course and would have to detail one of his staff to attend as none were willing to become involved with "woodworking" on a voluntary basis.

It has not been possible to get either the names or the c.v. of the other instructors who are to attend the Train-the-Trainers course. A copy of the application form which is being used is attached.

Manila Technical Institute were not involved in preparing the 3-year course syllabus (attached), and have only seen it recently.

A proposal requesting funding for the Train-the-trainers course has been submitted to UNDP (attached). The consultant however feels that further in-depth study of such aspects as method of meeting the demand, design of course, selection of trainees, etc. is warranted.

PROJECT PROPOSAL

PROJECT TITLE:	Trainers' Technical Training for Woodworking
DURATION:	2 months (8 weeks)
PRODUCT COVERAGE:	Wooden furniture
LOCATION:	Cottage Industries Training Centre (CITC) Russet Street, SSS Village, Marinkina, M.M.
RATIONALE:	Wooden furniture is being groomed to make up for the slowing down of rattan furniture exports. However, various assessments indicated that while wooden furniture exports are increasing, the Philippines lag behind those of their ASEAN counterparts in productivity and efficiency. A major hindrance, according to industry studies is a dearth of properly-trained and technically-equipped workers which in turn is traced to the lack of trainers pool which the industry and training institutions could tap for training programmes. Not only will training be avenues for honing the craft but this will also prepare the work force for line production needed to further boost export corpetitiveness. To address the urgency of training needs, the Chamber of Furniture Industries of the Philippines (CFIP) initially proposed that a trainers' technical training for woodworking be conducted.
OBJECTIVES:	1. To develop a pool of trainers which can be tapped by the industry and all other training institutions for their training programmes. 2. To increase productivity and efficiency of the wooden furniture industry to enable the industry to boost its export capability. 3. To transfer technical know-how and other related information to a greater number of furniture firms throughout the country.
METHODOLOGY:	The proposed training of trainers for woodworking will zero-in on technical aspects of furniture production, raw material handling, machine operation and machine maintenance, furniture construction, and finishing. It is proposed that the eight-week seminar be conducted by local experts in the field using a curriculum prepared by the Furniture Industry Training Board. Facilities of the CITC in Marikina will be utilized. There will be a total of 18 participants from various regions. Selection of participants and local experts will be done by CFIP in coordination with the

Department of Education, Culture and Sports (DECS) and the National Manpower and Youth Council (NMYC).

ASSISTANCE REQUESTED: For this programme, the following are requested from UNDP:

Subsidy for the following:

. Plane fare for participants from the regions.
. Board and lodging for all participants (all will be billeted at CITC's dormitory).
. Trainers' fees/honoraria for resource persons.
. Power and water costs.
. Field trips.
. Materials/consumables
. Supplies/manuals
. Miscellaneous expenses.

These are costed as follows:

Plane fare		25,751
Board and lodging		161,280
P 160.00/day x 18 x 56 days	161,280	
Trainers' fees/honoraria (resource persons)		94,400
Honoraria 136 hours x P 500.00/hr.	68,000	
Trainer's fees 264 hrs x P 100/hr.	26,400	
Power and water costs		20,000
Supplies/manuals		7,060
Woodworking	4,260	
Manuals (P100/set x 18)	1,800	
Hand-outs	1,000	
Materials/consumables		46,722
Field trips		13,500
P 100/day x 5 days x 18 trainees	13,500	
Miscellaneous		15,400
Depreciation	5,500	
Administrative/personnel services	5,000	
Organizational/social activities	2,500	
Others	2,400	
Total		P 384,113
		$ 13,245*

* $ 1 = P 29,00

THREE YEAR TECHNICIAN CURRICULUM FOR FCM/WOODWORK TECHNOLOGY

1. Course Description

This course deals with the study of the principles and applications of Wood Science and Technology, Woodcraft Skills, Wood Operation and Techniques, Furniture Design and Standards, Carve Designs and Carving Processes, Industrial and Personal Safety Practices. Wood Attitudes and Factory Management.

Upon completion of the course, the trainee is prepared to construct and repair articles, such as store fixtures, household and office furniture and cabinets, fabricate and assemble wood products with the use of woodworking tools and machines, work from drawings and blue prints, apply finishes to final products, inspect and maintain orderliness of tools and machines, design and develop jigs and fixtures and make trial runs to determine the suitability of its use, prepare working drawings, inspect products for quality and supervise repair of defective parts, and may develop the ability to oversee production flow.

2. Curriculum Structure and Content

The FCM/Woodwork Technology follows the structure of the three-year technician curriculum operating on a trimestrial basis of 14 weeks per tem using the dual training system approach.

The common first year curriculum consists of three terms full time in-school training and industry orientation at the end of each term. Dual training starts in the second year wherein the students have to specialize on their chosen field, operating on a two-terms in-school training and one term in-plant training. This process continues up to the last term of the third year which qualifies the students for graduation.

First Year Term			Second Year Term			Third Year Term		
1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Full time In-school Training			2-terms in-school 1 term in industry			2-day in-school 4-day in-plant training/week		

2.2 Course content

2.2.1 Common First Year Curriculum

It covers basic sciences and engineering subjects like chemistry, physics, mathematics, drawing, engineering materials, measurement and electronic data processing. It also includes basic workshop subjects like

benchwork, woodworking, basic machining and basic electricity. It is further supported by mandated subjects like technical communication, social science and physical education.

2.2.2 Technology subjects

The second and third years of the curriculum provide specialization of technology subjects enhanced by in-plant training under the day-release scheme of the per week dual system which will consist of two days per week in-school training and four days in-plant training.

3. Entry Requirements

To be eligible for admission to the course, the applicant must:

3.1 be a high school graduate
3.2 be 16 to 23 years old
3.3 be physically fit
3.4 pass the technician admission test to be administered by

SUBJECT DESCRIPTIONS FOR FCM/WOODWORK TECHNOLOGY

FIRST YEAR

The Common First Year Curriculum being offered at MTI - Taguig is followed in this course so as not to alter its normal operation for Technician Education. It is also in the belief of the working committee that the said curriculum will be very helpful for students taking FCM/Woodwork Technology.

SECOND YEAR

The adoption of the dual training system starts on the second year wherein the students have to report to the school for formal instruction for two days in a week - 16 hours per week. The remaining four days of the week will be spent for in-plant training at 8 hours/day or 32 hours per week.

The success in the implementation of the dual training system lies primarily in the mutual cooperation of the school and the industry. Both venues of learning should agree on the areas of training in such a way that the industry provides the necessary hands-on complement to what the students have learned in school and vice-versa.

It is therefore noteworthy at this point that the second and third year curriculum and its descriptions presented here are subject for revision and enrichment by the group of implementors.

SUBJECT DESCRIPTION

- Wood Science and technology

Deals with study of wood materials and characteristics, lumber selection and grading, wood treatment and kiln drying, and engineered wood materials.

- Safety practices

Deals with personal and company safety practices, safe handling of tools, materials and equipment. It also deals with an in-depth study and application of First Aid.

- General Woodworking Processes

Deals with the basic processes in woodworking such as measuring, cutting, forming, joining and finishing. It engages the students in the safe use and proper care of woodworking handtools, portable power tools and machines. It also includes wood cuts and wood joints, and the different methods and techniques in the application of wood finishing materials.

- Machine and Tool Maintenance

Deals with the methods and procedures of sharpening and maintaining hand cutting tools, machine cutting tools, special machine blade, cutter and bits. It includes identifications of parts and supplies.

- Quality control

Deals with the selection and storage of materials, inspection of materials and processes, handling and storage of finished products, methods and procedures, repairing defective parts, methods and procedures.

- Fabrication and assembly of sash products

Deals with the methods and procedures in the fabrication of sash products and in assembling sash product parts which includes clamping technique, fabrication of jigs, and securing/fixing of parts.

- Wood factory management

Deals with the study of time and motion, forecasting and control, quality assurance and control, inventory management, factory layout and the basic principles of management.

- Bamboo Furniture Technology

Deals with bamboo species, structures, furniture designs and standards, materials treatment and parts preparation, veneering, jig design and construction, finishing and quality control.

- Rattan furniture technology

Deals with rattan structures and standards, furniture, systems of measurement, measurement and markings, material treatment, binding and weaving designs, decorative designs, rattan furniture assembly, finishing and quality control.

- Work ethics 1

Deals with the study of human virtues, humility and self knowledge, obedience and respect for authority, order and cheerfulness in work, thoroughness in work, punctuality and care for material things, cooperation and team work, sincerity and honesty.

- Work ethics 2

Deals with loyalty and commitment, generosity and self-giving, initiative and concern for others, the value of good habits, and man's duty of justice towards his neighbours.

- Portable power tools and processes

Deals with the principles of operations, nomenclature, accessories and uses of portable power tools such as circular and miter saw, planer, power hand drill, power jigsaw, power router and power sander.

- Stationary machine tools and processes

Deals with the principles of operations, nomenclature, accessories and uses of circular saw, radial saw, bandsaw, jig saw, jointer planer, thickness planer, wood shaper, router, drill press, mortiser, tenoner, wood lathe, and stationary sanding machine. It also covers the methods and procedures in the

actual use of machines in performing wood operations especially in fabrication and assembling of wood products.

- Furniture types, component styles and designs

Covers solid line furniture, period furniture and traditional furniture.

- Finishing tools and equipment, materials, types, composition and its uses

Deals with the principles of operation, nomenclature, accessories and uses of finishing tools and equipment such as sanders, compressors, spray guns, etc. It also covers finishing materials, types, composition and uses like putty, stain fillers, lacquers, paints, varnish, shellac etc.

- Furniture design and standards

Deals with basic principles of designs, furniture styles, colour harmony and furniture standards.

- Carve designs and carving processes

Covers carving tools, their uses and maintenance and the basic carving operations.

- Shop mathematics - costing and estimating

Deals with ratios and proportions, cost estimates, areas and volume, systems of measurement and trigonometric functions.

- Furniture jig design and construction

Deals with the construction of jigs for bench, for portable machine operation, for stationary machine operation, and for fitting and assembling. It includes designing and constructing jigs and moulder, and prototyping.

FCM/WOODWORK TECHNOLOGY

FIRST YEAR CURRICULUM

SUBJECTS	HOURS PER WEEK Lec.	Lab.	Credit
FIRST TERM			
- Workshop technology and practice	0	6	2
- Engineering measurement	1	3	2
- Technical drawing 1	0	3.75	1
- College Algebra, plane solid mensuration	5	0	4
- Chemistry 1	3.75	3.75	4
- Fundamentals of technical English	3.75	0	3
- HRD/Psychology	3.75	0	3
- Computer Fundamentals	2	0	2
- Physical Education 1	2	0	2
- Citizens' Military Training			1.5
TOTAL	21.25[1]	16.5	24.5[2]
SECOND TERM			
- Workshop technology and practice 2	0	6	2
- Basic electricity	2.5	3.75	3
- Technical drawing 2	0	3.75	1
- Plane spherical trigonometry with spherical geometry	5	0	4
- Chemistry 2	3.75	3.75	4
Speech arts for technical students	3.75	0	3
- Philippine Constitution	3.75	0	3
- Physical education 2	2	0	2
- Citizen Military Training			1.5
TOTAL	20.75[3]	17.25	23.5[4]

[1] 19.25 in Mss received from CFIP.

[2] 22.0 in Mss received from CFIP.

[3] 18.75 in Mss received from CFIP.

[4] 22.0 in Mss received from CFIP.

SUBJECTS	HOURS PER WEEK Lec.	Lab.	Credit
THIRD TERM			
- Workshop technology and practice 3	0	6	2
- Basic electricity 2	2.5	3.75	3
- Engineering materials	1	3.75	2
- Differential calculus	5	0	4
- Physics 2	3.75	3.75	4
- Technical report presentation	3.75	0	3
- Population education taxation and land reform.	3.75	0	3
- Physical education 3	2	0	2
TOTAL	21.75[5]	17.25[6]	23.0

SECOND YEAR CURRICULUM

SUBJECTS	HOURS PER WEEK Lecture	Lab.	Credit
FIRST TERM			
- Wood science and technology	2	1	2
- Safety practices	1	0	1
- General woodworking processes	1	3	2
- Integral calculus	5	0	4
- Drafting 3	0	3.75	1
TOTAL	9	7.75	10
SECOND TERM			
- Drafting 4	0	3	1
- Business writing	3	0	3
- Physical education 4	2	0	2
- Portable power tools and processes	2	5	3
- Work ethics	1	0	1
TOTAL	8	8	10
THIRD TERM			
- Industrial sociology/relations	3	0	3
- Stationary machine tools and processes	3	5	4
- Furniture types, components, styles and designs	3	0	3
- Finishing tools and equipment, materials, types, composition and uses	2	0	2
TOTAL	11	5	12

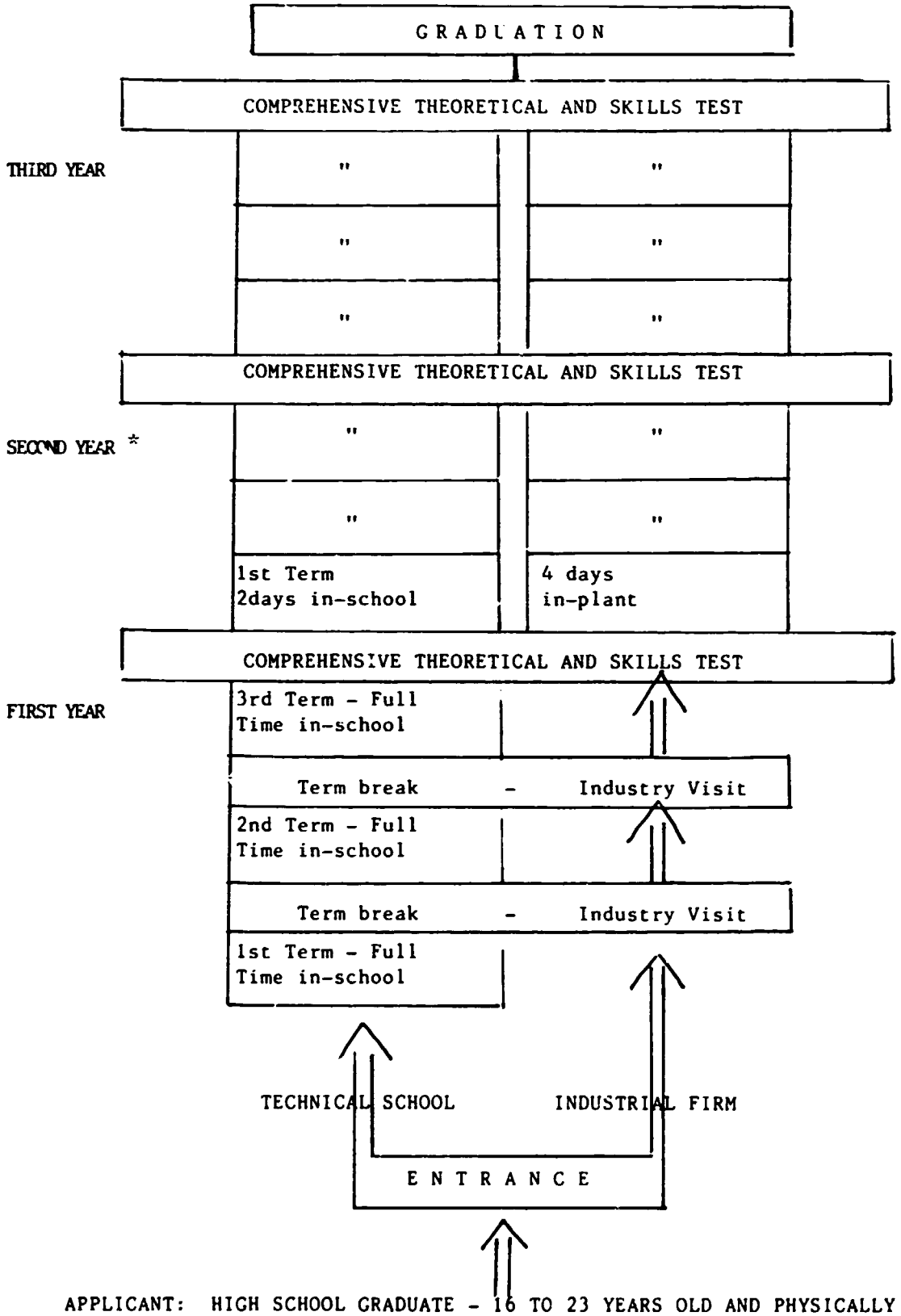
[5] 19.75 in Mss received from CFIP.

[6] 17.5 in Mss received from CFIP.

THIRD YEAR CURRICULUM

SUBJECTS	HOURS PER WEEK Lecture	Lab.	Credit
FIRST TERM			
- Furniture design and standards	2	3	3
- Carved designs and carving processes	2	3	3
- Shop mathematics, costing and estimating	2	0	2
- Productivity and work attitudes	3	0	3
TOTAL	9	6	11
SECOND TERM			
- Furniture jigs design and construction	2	3	3
- Machines and tools maintenance	1	2	1
- Quality control	2	0	2
- Fabrication and assembly of sash products	1	4	3
- Work ethics I	1	0	1
TOTAL	7	9	10
THIRD TERM			
- Wood factory management	3	0	3
- Bamboo furniture technology	2	3	3
- Rattan furniture technology	2	3	3
- Work ethics 2	1	0	1
TOTAL	8	6	10

PROGRAMME FLOW CHART



APPLICANT: HIGH SCHOOL GRADUATE - 16 TO 23 YEARS OLD AND PHYSICALLY FIT

*It is understood that this has now been changed (see page 90, point 2. Curriculum structure and content.

Department of Education, Culture and Sports
BUREAU OF TECHNICAL AND VOCATIONAL EDUCATION
University of Life Complex, Pasig, Metro Manila

TRAINING OF TRAINERS ON FURNITURE & CABINET MAKING TECHNOLOGY

NAME:_____ AGE:_____
SCHOOL/INSTITUTION:_____
ADDRESS:_____
FIELD OF SPECIALIZATION:_____
_____
_____
OTHER FIELDS:_____
_____
_____
_____

No. of years in Teaching field of specialization: _____
No. of Years in Present Load (please specify): _____
_____
No. of Years of Industry experience (please specify):_____
_____

Competence in	Highly competent	Competent	Fairly competent	Poor (no knowledge at all)
(a) Linear/volumetric mensuration				
(b) Other arithmetic operations				

Knowledge/fluency of oral and written English			
Excellent	Good	Fair	Poor

_____
SIGNATURE (print name)

N.B. This application form is filled out by the applicant.

APPENDIX VI

Aid Funded Projects Identified as having a bearing on Manpower Development.

1. P.T.T.C., was funded by the Japanese and consists of a very large prestigious conference centre on a prime site in Metro Manila. It also contains a well equipped laboratory for testing finishing materials, finishes on furniture and some mechanical impact and strength testing equipment. There are number of lecture rooms. PTTC's training activities are either on subjects that are associated with laboratory equipment or on commercial topics. It provides good exhibition facilities which are used by industries other than furniture.

2. C.I.T.C., was upgraded and equipped with Japanese funds to provide a resource centre to cottage and handicraft enterprises in a variety of materials. It is not confined to furniture. The Chief instructor has received three extended periods of training in Japan.

3. The Canadian government has provided a quality woodworking machinery which is in store in Pampanga - allegedly for want of a transformer and a training centre site.

4. PRODEX I and II, have been funded by UNDP and are aimed at helping a limited number of selected furniture companies upgrade their production and general management capabilities.

5. NMYC/ILO Strengthening the Apprenticeship Programme. This project started in early 1991 and aims at helping NMYC start an apprenticeship scheme for industry generally. It is intended that initially some 20 occupations will be selected for the pilot programme to start at the end of 1993. The full details are not known at the time of writing.

6. Train-the-Trainer Course for a proposed three year full- time Furniture Makers Course. It has not been possible to establish the origins of this project. A request for funding has been made to UNDP by CFIP.

7. Don Bosco Academy in Cebu. A proposal has been submitted to the German aid agency for funding and assistance to upgrade their present one year full-time woodworking course and establish a two to three year Furniture Course up to technician level.

8. Dual-Tech is funded by two private foundations and is planning to set up a new training centre in Metro Manila for up to 300 trainees on two year courses in Furniture subjects using a form of day release. Dual-Tech are in contact with the ILO consultants on the apprenticeship project.

9. The CFIP Training Centre receives limited funding from one of the German aid agencies.

10. USAID is reported to provide funds for individual training either locally or overseas.

11. The Philippine-Australia Technical and Vocational Education Project (PATVEP) is described as follows:

"PATVEP AIMS TO IMPROVE THE TRAINING OF TRADESPERSON AND TECHNICIANS IN SEVEN TRADE/TECHNOLOGIES TO MATCH INDUSTRY STANDARDS. THE PROJECT FOCUS ON THE UPGRADING OF THE CAPABILITIES OF THE BUREAU OF TECHNICAL AND VOCATIONAL EDUCATION (BTVE), OPERATIONALISING THE NATIONAL CENTRE FOR TEACHERS EDUCATION AND STAFF DEVELOPMENT (NCTESD), THE NINE SELECTED TECHNICAL EDUCATION INSTITUTES (TEIs) AND SCHOOLS OF ARTS AND TRADES (SATs), AND THE DECS REGIONAL OFFICES THROUGH MASSIVE STAFF DEVELOPMENT AND FACILITIES IMPROVEMENT."

Although the seven trade/technologies are not identified, it is believed woodworking is included as part of civil construction. As stated in the title, the evidence suggests this is an academic based programme, not industry based.

APPENDIX VII

STRENGTHENING THE APPRENTICESHIP PROGRAMME

Republika ng Pilipinas
Kagawaran ng Paggawa at Panghanapbuhay
Pambansang Sanggunian sa Laang-Bisig at Kabataan
(National Manpower and Youth Council)

NMYC-UNDP/ILO PHI/88/037
STRENGTHENING THE APPRENTICESHIP PROGRAM

08 March 1991

MS. MA. JEAN ROXAS
Planning Assistant II
Export Development Project
Bureau of Export Trade Promotion
Department of Trade & Industry
Solid Bank Bldg., Sen Gil Puyat Ave.,
Makati, Metro Manila

Dear *Ms. Roxas:*

The National Manpower and Youth Council (NMYC) thru the assistance of the United Nations Development Programme/International Labour Organization (UNDO/ILO) is implementing Project PHI/88/037 entitled Strengthening the Apprenticeship Program. The Project focuses on the evaluation of the Philippine Apprenticeship Program to gather inputs for policy recommendations and legislative actions towards an acceptable apprenticeship strategy for the country.

In this connection, we shall be conducting a series of workshops to be participated by representatives from industry, labor and government to culminate in a National Tripartite Congress on Apprenticeship in June. These workshops will seek to (i) make participants familiar with Apprenticeship models and (ii) solicit inputs from the participants on an appropriate model/approach for the Philippines which is our ultimate objective.

Recognizing your dedication towards the pursuit of productive gains in your sector, may we invite you as an observer to the following series of workshops herein outlined:

	SUBJECT	*SCHEDULE*	*VENUE*	*TIME*
Workshop 1	The Apprenticeship Concept	21 March	NMYC	8 A.M.- 5 P.M.
Workshop 2	Registration, Monitoring, Training & Administration	04 April	NMYC	8 A.M.- 5 P.M.
Workshop 3	Perspective on Financial Arrangements	18 April	NMYC	8 A.M.- 5 P.M.

Invited speakers/resource persons shall discuss particular topics and their experiences of the above subjects. The participants shall be divided into syndicate groups after which shall consider re the various aspects of apprenticeship following some discussion guides and come up with resolutions/recommendations. These shall then be consolidated for presentation to the National Tripartite Congress-a bigger body composed mainly of policy-makers and legislative representatives.

May we call on you to confirm your participation. Likewise, should you wish to seek for further details, we would be glad if you could find time to contact us at telephone nos. 817-4077, 87-24-54, & 87-21-28/fax no. 816-24-80.

We shall be looking forward to your favorable response to this invitation.

Regards.

Very truly yours,

RUDIGER HOBOHM

Chief Technical Adviser

REF.: RHEL.INVITE.IGLOISC

APPENDIX VIII

Bibliography

1. NMYC Publications.

"1988 Survey on Youth".
"Furniture and Cabinet Making Training Standard", 1990, 600 hours and 2 months industry immersion.
"Furniture and Cabinet Maker 3rd Class Training Recommendation", 1988, 304 hours.
"Furniture and Cabinet Making Trainers Guide", (undated).
"Furniture Upholstery Basic Level Course", (undated), 200 hours.
"Furniture and Cabinet Making Vol. I - Training Standards", (undated), 335 hours.
"National Trade Skill Standard for Furniture and Cabinet Maker", (undated).
"Woodworking Machine Operator Trade Skill Standard", (undated).
"Rattan Furniture Maker Trade Skill Standard", (undated).
"Bamboo Furniture Maker Trade Skill Standard", (undated).
"Wooden Sash Maker Trade Skill Standard", (undated).
"Wood Finisher Skill Standard", (undated).
"Furniture and Automotive Upholsterer Skill Standard", (undated).
"Rough and Finish Carpenter Skill Standard", (undated).

2. DECS Publications.

"Philippine-Australia Technical and Vocational Educational Pamphlet and Equipment Masterlist", 1991.
"Marikina Institute of Science and Technology Home Management and Technology Education (Centre for Woodworking) Syllabus", (undated), 400 minutes/week for 6 terms.
"Marikina General Woodworking Course Outline", (undated), duration not specified.
University of Santo Tomas 1988-91 Prospectus - "Architecture and Fine Arts".
Mapua Institute of Technology - "Bachelor of Science in Industrial Design Syllabus" (undated), 4 years.
Technological University of the Philippines, "Three Year Technical Curriculum for Civil Technology" (undated).
"The Desired Learning Competencies of the 1989 Secondary School English Programme", (undated).
"The Minimum Learning Competencies of the 1989 Secondary School Mathematics Programme", (undated).
"Furniture & Cabinet Making Vocation Course Syllabus for 3rd and 4th Year High School", (undated).

3. DTI Publications.

"Three Year Technician Curriculum for FCM/Woodwork Technology Syllabus", (undated - believed to be 1990).
"Training Course for Vocational Trainer - Furniture and Cabinet Making Technology Syllabus", (undated), 56 hours.
"Quality and Productivity Improvement, Standard and Inspection Syllabus", (undated), 56 hours.
"Jig Technology Course Syllabus", CITC, (undated). 80 hours.
"Millwright Course Syllabus", CITC, 1990, 40 hours.
"Furniture Finishing Course Syllabus", CITC, 1990, 40 hours.

"Woodworking Machine Operations Course Syllabus", CITC, 1990, 40 hours.
"Wood Furniture Making Course Syllabus", CITC, 1990.
"Furniture Making Technology (Wood Based) Course Syllabus", (undated), 120 hours.
"Joinery Construction and Assembly Course Syllabus", (undated), 80 hours.
Training notes comprising
- Hand Tools
- Saw Doctoring
- Measuring Tools
- Procedures for squaring stock on woodworking machines
- Furniture Finish
PTTC Information Leaflet.
PTTC Course Prospectus.
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