

WoodTECH 2019
Presentation for New Zealand and Australia
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Slide 1 – Introduction

Ladies and gentlemen, my thanks to the organizers of WoodTECH 2019 for inviting me to speak on this critical topic.

Should I run out of time for questions, or you wish to see more videos, please contact one of our team in the show hall later.

‘Selecting the Optimal Log Singulator for your Sawmill Infeed’.

SO, HOW DO WE ACCOMPLISH THIS?

Overview

Section

1. Specialty Log Singulators - Design Options.	}	Where we are now
2. Step Feeder, Log Singulators - Design Options.		
3. Comparing Step Feeder Features.	}	Where we should be going
4. GCAR Design - Step Feeder Features.		
5. Information and services that potential suppliers should provide.	}	How to get there
6. Summary - Selecting the optimal Log Singulator for your saw mill infeed.		
7. GCAR Design - Step Feeder Videos.	}	When we arrive

Slide 2 - The Overview: (from North America)

This slide summarizes the information and recommendation's I am about to present:

- Sections 1 & 2, Will identify 'where we are now'
- Sections 3 & 4, Will tell us 'where we should be going'
- Sections 5 & 6, Will show us 'how to get there'
- & Section 7, Will show us 'what it looks like, when we arrive'

Section 1. Specialty Log Singulators

The following seven design options are presently operating in Sawmill Infeeds in North America



1. Springer
Two stage, rotary screw design complete with log ending features to a live fence with a directional screw discharge into the take-a-way conveyor.



2. Rockwell
Multistage rotary arm with individual arm drives.

Slide 3 – Options 1 & 2, Springer and Rockwell:

- Both offer a variable elevation gain
- Both are simple rotary designs
- Springer zero-ends each log during its elevation & contains a directional screw discharge
- Neither are efficient at straightening skewed logs
- Neither can elevate short broken log ends



3. GCAR - VLS
Double acting, balanced reciprocating arm design, complete with a stop and loader discharge.



4. Timber Automation (LogPro)
Three connected profiles on each arm that reciprocate, to elevate, stop, then load, using a single drive.

Slide 4 – Options 3 & 4, GCAR - VLS and Timber Automation:

- This is an earlier GCAR design for very large logs
- The Timber Automation singulator shown is for tree length logs, but the design is similar for Saw Mill Infeeds
- Both have a fixed elevation gain
- Both are efficient at straightening skewed logs
- Neither can elevate short broken log ends
- Both are best employed on tree length logs due to their HD construction and low delivery speed



5. Linden – Log Ladder
Multistage reciprocating stop and loader arm design using individual drives.



6. Linden – Quadrant
Two stage, reciprocating single or double acting design, with a stop and loader discharge.



7. Linden – S.A. Step Feeder
Single acting, reciprocating, unbalanced design.

Slide 5 – Linden Options 5, 6 & 7:

Option 5, The Log Ladder:

- Has a large installed base
- Offers a low and variable elevation gain, useful for situations requiring minimal elevation change
- Not efficient at straightening skewed logs
- Not able to elevate short broken log ends

Option 6, The Quadrant Feeder:

- Has a fixed elevation gain
- Efficient at straightening skewed logs
- Able to elevate short broken log ends
- Available in an unbalanced single acting or a balanced double acting design
- Best employed on tree length logs due to their HD construction and low delivery speed

Option 7, The Single Acting Step Feeder:

- Has a fixed elevation gain**
- Contains heavy unbalanced steps, so best employed in low speed applications**
- Efficient at straightening skewed logs**
- Not able to elevate short broken log ends**

There are other Specialty Log Singulators available, usually manufactured locally for some specific application or customer.

Specialty Log Singulator Design Options 1 to 7, are operating successfully in many Saw Mill Infeeds in North America

HOWEVER, all 7 design options combined, only represent about 10% of the total Log Singulators operating in North American Saw Mill Infeeds. This is because the majority of Log Singulator applications use the following design:



1. Comact - Wave Feeder
Shallow faced, self cleaning,
double acting, step feeder.



2. Linden - Step Feeder
Steep faced, self cleaning,
double acting, step feeder.

Slide 6 - Section 2. Double Acting Step Feeder, Log Singulators

Options 1 & 2, The Comact Wave Feeder, and Linden Step Feeder:

- Both have hundreds of successful installations over many decades
- Both have self-cleaning surfaces able to elevate short broken log ends into the take-a-way conveyor
- Both process most log diets and feed speeds well, with Comact better at the smaller log and higher speed, and Linden better at the larger log and slower speed
- Linden is efficient at straightening skewed logs, Comact less so
- Both machines have structural and mechanical designs unsuitable for tree length or large diameter, dense wood applications. This large

log, dense wood design deficiency needs to be addressed in the SYP belt of the USA.

Comact, Linden, and GCAR Design, represent about 90% of Log Singulators installed feeding Saw Mill Infeeds in North America.

THEREFORE, the Saw Mill Industry has already selected the Self Cleaning, Double Acting Step Feeder as the Optimal Log Singulator for most Saw Mill Infeed applications. This is because this design cost effectively meets their requirements.

Section 1 & 2 have identified 'WHERE WE ARE NOW', Sections 3 & 4 will begin to tell us 'WHERE WE SHOULD BE GOING'



Where we should
go from here.....



Slide 7 - Section 3. Where we should go:

As a Consultant, I was often involved in the installation of Comact and Linden Step Feeders all across Canada.

During this 30 plus years of radical and continuous Saw Mill modernization, only minimal improvements to their Step Feeders were introduced during this period.

An opportunity for GCAR Design and others to provide the Saw Mill Industry with a modern and more robust Double Acting, Self-Cleaning, Step Feeder became available, and enabled the following Patented design features to be developed:

Item	Standard Step Feeder Design	GCAR Step Feeder Design
1. Difficult custom designs for unique situations	No	Yes
2. Suitable for large dense logs	No	Yes
3. Two step design to fit inside a standard shipping container	No	Yes
4. Dual module design for critical applications	No	Yes
5. Electrically interlocked safety pin	No	Yes
6. External drive and mechanism	No	Yes
7. Log singulating cams at every step	No	Yes
8. Shop mounted control devices	No	Yes

Slide 8 - Section 3. Comparing Step Feeder

Features:

This slide identifies some of the custom & standard GCAR Design features offered:

- In implementing item 1, we recently designed an Upper Module to fit over an Optimil ARC pivot mechanism, plus a design that included a drop-out transition skid in a dual module machine.
- For item 2, please watch the video at the end of the presentation, as a robust design is essential in parts of the world processing a dense log.
- Item 3 is in the late design stage
- Item 4 is now the standard for many of our customers Canter Infeed Systems

Items 5, 6, 7 and 8 are standard in all of our designs, and are described in the following section:

Section 4. GCAR Design – Step Feeder Features

The next 5 slides will describe some of the standard features in the GCAR Design Step Feeder that are important for a modern Saw Mill Infeed

Section 4: GCAR Design Step Feeder Features

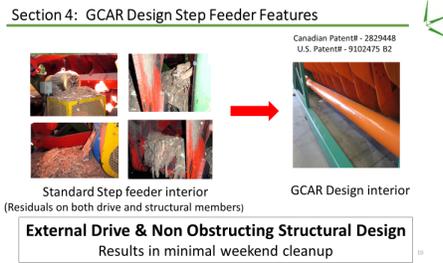
Canadian Patent # 2829448 U.S. Patent # 9102475 B2



Slide 9 - Worker Safety:

- Provides a safe, convenient and electrically interlocked safety pin.
- Only one drive to secure, to ensure a safe work environment
- A legal requirement in some jurisdictions

Safety should not be an option or an afterthought when it comes to your most valuable resource



Slide 10 - External drive and non-obstructing Structural design:

- This Wave Feeder was located after the Debarker, and shows one week of debris accumulation
- The GCAR Design eliminates drive components from inside the machine, and positions most frame members in non debris obstructing locations

However, small amounts of debris will still need to be removed occasionally.

Section 4: GCAR Design Step Feeder Features

Canadian Patent# - 2829448 U.S. Patent# - 9120475 B2



Slide 11 - External Drive and Mechanism:

- The external drive and modern components provide a quiet and reliable mechanism.
- An external drive and mechanism ensure safe monitoring during machine operation
- Enables convenient inspection and lubrication
- An effective worn part replacement schedule can be visually determined

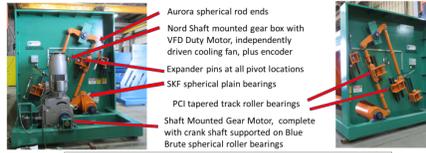


Slide 12 - Shop Mounted Control devices:

- Shop mounted control devices reduce total installation cost
- Enables convenient site wiring, accurate control device locations and custom mounting brackets
- The control system supplier can specify the devices and their locations, ahead of installation

Section 4: GCAR Design Step Feeder Features

Canadian Patent# - 2829448 U.S. Patent# - 9102475 B2
All critical threaded connections use Nord Lock washers



Quality drive components

Ensures machine reliability and drive efficiency

Slide 13 - Quality Drive Components:

- Only quality brand name drive components are used
- All components are generously sized and selected for their correct application
- Vee belts are eliminated using a shaft mounted reducer

Section 3 & 4 has told us 'WHERE WE SHOULD BE GOING', Sections 5 & 6 will show us, 'HOW TO GET THERE'



Potential suppliers should be able to provide:

- ✓ A history of satisfied customers as reference and successful installations similar to your requirements.
- ✓ A Log Singulator design to meet all of your project requirements for: process speed, log diet, necessary options and existing equipment compatibility.
- ✓ Site visits to view suitable installations and visits to the manufacturing plant before or during fabrication.
- ✓ Recommendations on various options and features being considered.
- ✓ A productivity and reliability warrantee on the Log Singulator proposed.

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Slide 14 - Section 5. Information & Services that all Potential Suppliers should provide:

- **Satisfied Customers**
- **Meets ALL project requirements**
- **Site & fab shop visits if requested**
- **Offers recommendations on options being considered**
- **Provides meaningful warrantees**

The Log Singulator supplier you choose, will become a critical contributor to your sawmill performance, therefore the following selection method should be used:

Section 6: Summary - Selecting the Optimal Log Singulator



Slide 15 - Section 6. The method for Selecting the Optimal Log Singulator for your Saw Mill Infeed:

- **Include ALL suitable designs**
- **Include necessary beneficial features**
- **Conduct a cost benefit analysis for each proposed design over the life of the project**

Be prepared, the cost benefit analysis will require effort to obtain the correct information on clean-up, maintenance, installation and up-set lost production costs, but worth the effort

After you have selected your Optimal Log Singulator, it is essential the successful Vendor co-ordinate with both the Consultant on structural support and refuse conveyor design, plus the Controls System supplier, to achieve your planned Saw Mill production goals

**Section 5 & 6 has shown us 'HOW WE GOT HERE',
& finally you are about to see 'WHAT IT LOOKS
LIKE, NOW YOU HAVE ARRIVED'**

**Section 7. GCAR Design - Step Feeder Videos:
The following two videos indicate the range of
applications that a custom GCAR Design Step
Feeder can accommodate.**



Slide 16 - Dual Module Step Feeder at Start-up
The upper module contains three steps & singulates the logs at each step. The lower module contains four steps & elevates two average diameter logs at each step. This machine is located in Northern Alberta, and is processing a small stud log, in a new high-speed, four-sided Canter application. The eventual goal of the smaller log sort was to reach 50 plus logs per minute. Note the operating sort bin discharges into a vee belt conveyor, and the other sort bin discharges onto the ARC vee flight conveyor.



Slide 17 - Single Module Step Feeder at Start-up
This Step Feeder contains three singulating steps. This machine is a retrofit to replace a competitors Step Feeder, and is located in the US Pacific North West. It is processing a dense large diameter log, up to 20 ft. long from an unregulated log deck at medium speeds to feed a log sorter. Note the directional screw discharge between the Step Feeder and the take-a-way conveyor.

Thank you



Anna Matheson, MSc, CRSP
V.P., Marketing, GCAR Design



George Goater
President, GCAR Design



Ian Groshens
Intern Engineer, GCAR Design

For more information,
approach the above in the show hall later or,
contact me at:
www.gcardesign.com

Slide 18 - Thank You