LOGGING INDUSTRY RESEARCH ORGANISATION

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TECHNICAL NOTE TN-24

"SYNCROFALKE" AUTOMATED SKYLINE HAULER

SUMMARY

The Syncrofalke hauler (manufactured by Mayr-Melnhof company in Leoben, Austria, Figure 1), is a truck mounted hauler with a 10 m tower and a loader arm for clearing the chute (and processing logs if fitted with a processing head). Its operation is automated, assisting small logging crews to work more effectively. The movement and functions of the slackpulling carriage can be controlled (via radio) by the breakerout during the positioning, slackpulling and break-out phases and by the hauler operator when landing the drag. The hauler has a computer system which controls the movement of the carriage during inhaul and outhaul. Neither the hauler operator or the breaker-out need to watch the approaching carriage as the computer system will stop it at a predetermined position. The hauler operator can perform other tasks (clearing the chute, processing) while the carriage is away from the landing. During the inhaul, landing and outhaul phases, the breaker-out can fell, process or pre-strop without distraction.

Automation of hauler operations frees up time for both the hauler operator and the breaker-out, and simplifies the hauler controls. This enables a small crew (as few as two people) to be used while maintaining high utilisation of the hauler.

HAULER SPECIFICATIONS

Tower height:	10 m
Engine power:	210 kW
Drivetrain:	hydrostatic
Skyline diameter:	18 mm
Mainrope diameter:	11 mm
Tailrope diameter:	11 m

Figure 1 - Syncrofalke

CONTROL SYSTEM

The distance travelled by the carriage and its speed are calculated using a sheave mounted on the tower which the mainrope runs through. This information is displayed on a small LED screen.

There are manual controls for the mainrope and tailrope speed, the brakes on the drums and the carriage functions. The breaker-out's radio control unit also controls the carriage and the movement of the ropes.

THE CARRIAGE

The radio-controlled hauler most commonly uses the carriage and rope configuration shown in Figure 2. The carriage incorporates a friction sheave driven off the skyline which charges an hydraulic accumulator while the carriage is moving. Pressure from the accumulator is then used to actuate both the skyline and mainrope clamps. The slackpulling drum holds 40m of 11mm tailrope, and is fixed to the mainrope sheave. Mainrope slack can be fed by pulling the tailrope off the slackpulling drum while the carriage is clamped to the skyline.

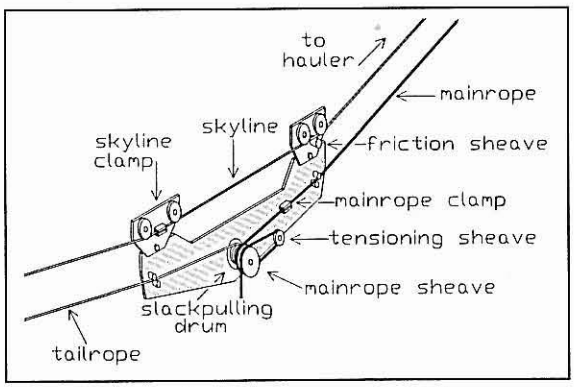

Figure 2 - Diagram of carriage

The carriage can also be used in a gravity return (shotgun) configuration. Slack can be pulled manually by the breaker-outs, or mechanically by using a slackpulling line which is wound onto the slackpulling drum and runs parallel with the mainrope to the hauler.

OPERATION

After the hauler is set up, the operator moves the carriage up to the tower and 'zeros' the distance travelled. The distance of the carriage from the tower is displayed during operation.

The outhaul distance can be specified in metres, or the computer can be instructed to stop the carriage at the last point the breaker-out sent it back from. As soon as the carriage is on its way, the operator is free to undertake other activities. The hauler and the loader arm are controlled from the same cab, which is able to be rotated. The breaker-out can continue working until the carriage arrives. After the load is pulled to the carriage, and the breaker-out instructs the computer to commence inhaul, the carriage will travel to within a preset distance of the hauler (typically 20m). The carriage waits until the hauler operator is ready to bring the load up to the landing.

This type of system has been in operation for several years. Recent advancements include the ability to inform the computer of locations where the carriage should progress at slower speeds, such as at intermediate supports. The carriage will automatically slow down before reaching the 'danger' region, proceed slowly, then speed up again. Both the distance and the speeds can be programmed.

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