

reads pressure from the main line out of the pumphouse and signals appropriate switches to meet and maintain conditions we have set. There are several other important features and functions of the panel:

1. RPM speed meter for variable speed pump with a manual/automatic selector and a manual speed control dial.
2. Solid state variable speed control card, solid state speed control card for jockey pump and 100 hp constant speed pump.
3. Stimulation mode card.
4. Hour meters for each pump to record running time.
5. Frictionless pressure transducer with quelling (no moving parts — nothing to wear out!).
6. Control module for each pump has dim-glow lights indicating status — required running or failed — as well as an on-off/manual/automatic control switch.
7. Lightning arrestor.
8. Phase monitoring relay with a lockout and automatic reset (after a predetermined time lapse).
9. Jockey pump and variable pump each have a thermal flow switch to monitor water movement in pipes from the pump. These switches are an integral part of the protection of the system. The constant speed pump has a mechanical flow switch.
10. High and low pressure alarms, again with the dim-glow indicator lights (these lights are used because they make it impossible to mistake a burned bulb for a normal operating condition).

I noted earlier that we wanted an alarm system to notify staff of any problems in the pumphouse. We installed a two function alarm transmitter and receiver tied to the control panel and a telephone in the pumphouse. When there is a failure the receiver picks this up from the control panel, selects the portion of a tape that defines the problem and activates a dialer that dials my office. If no one is present to receive the call, the dialer moves to the next number, and so on. When the call is received, the dialer is deactivated by pressing a certain number on a touch tone phone. If a dial phone is receiving the call, a gadget that duplicates

the numerical sound of a touch tone phone is used to shut off the dialer. Since one of the failures the alarm system is sensitive to is an electrical outage, the dialer is provided with a battery powered back up — no stones are left unturned! This feature is certainly valuable now, but I see it becoming absolutely essential when our distribution system is automated and no water man is on the property at night.

Pressure tanks are essential in a station such as this to dampen water surging to reduce the cycling of the jockey pump. We installed three 320 Well-X-Trol hydropneumatic tanks in the system. These tanks have a rubber bladder in them so that the pressure can be pre-set and the need for a compressor to constantly replenish the air supply is eliminated. The tanks were chosen with a minimum working pressure well above the level we require.

APCO air relief valves were installed on the high point of each pump housing. These valves permit the discharge of air from the pump column to the atmosphere and close automatically when water enter them. They worked flawlessly this past summer and eliminated one more nagging problem we had with our old equipment.

Twenty or so feet out from the pumphouse and on the main line we installed a fire hydrant. Its purpose has nothing to do with fire fighting, but rather is an easy way to create demand for water when troubleshooting problems, when there is a need to run a pump to check its operation during daytime hours, when checking control sequencing, etc. It really serves our purposes. Also, on the back side of the building, a one inch copper line with a hose adaptor was installed to allow for easy filling of one of the intake lines from a sprayer tank when getting the station ready in the spring.

Details of the building itself are shown on the accompanying drawings and are pretty much self-explanatory. It is poured, reinforced concrete structure approximately 28' square. The layout of the plumbing and equipment allows easy access for repairs and plenty of room to work. Warm air from motors and the air-cooled clutch is removed from the building by a large exhaust fan that is thermostatically controlled. Cool air is drawn in from the west side of the building, across the

equipment and exhausted on the north side. The building is heated during the winter months, for the sake of electrical equipment, by a small electric heater. Roof hatches were provided for easy removal of the equipment. All segments of the system were color coded and painted with quality industrial paint. The building and contents look good and the building is relatively easy to keep clean and sharp.

It is impossible to express how satisfied we are with the results of this pumphouse project and how rewarding it has been — I've been unable to think of a single, solitary item we wish we would have done differently. We accomplished all of the goals we set out to meet, and exceeded others. It has resulted in money savings for the Club, dramatic

improvement in our control of water use, more effective use of my time and total elimination of a significant "aggravation" factor. It has secured the golf course's needs for water for years to come and set the stage for the replacement of the remainder of our distribution system.

Let me extend to all Superintendents in the stat an open invitation for the "nickel" tour — it would be my pleasure.

Monroe S. Miller  
 Golf Course Superintendent  
 Blackhawk Country Club  
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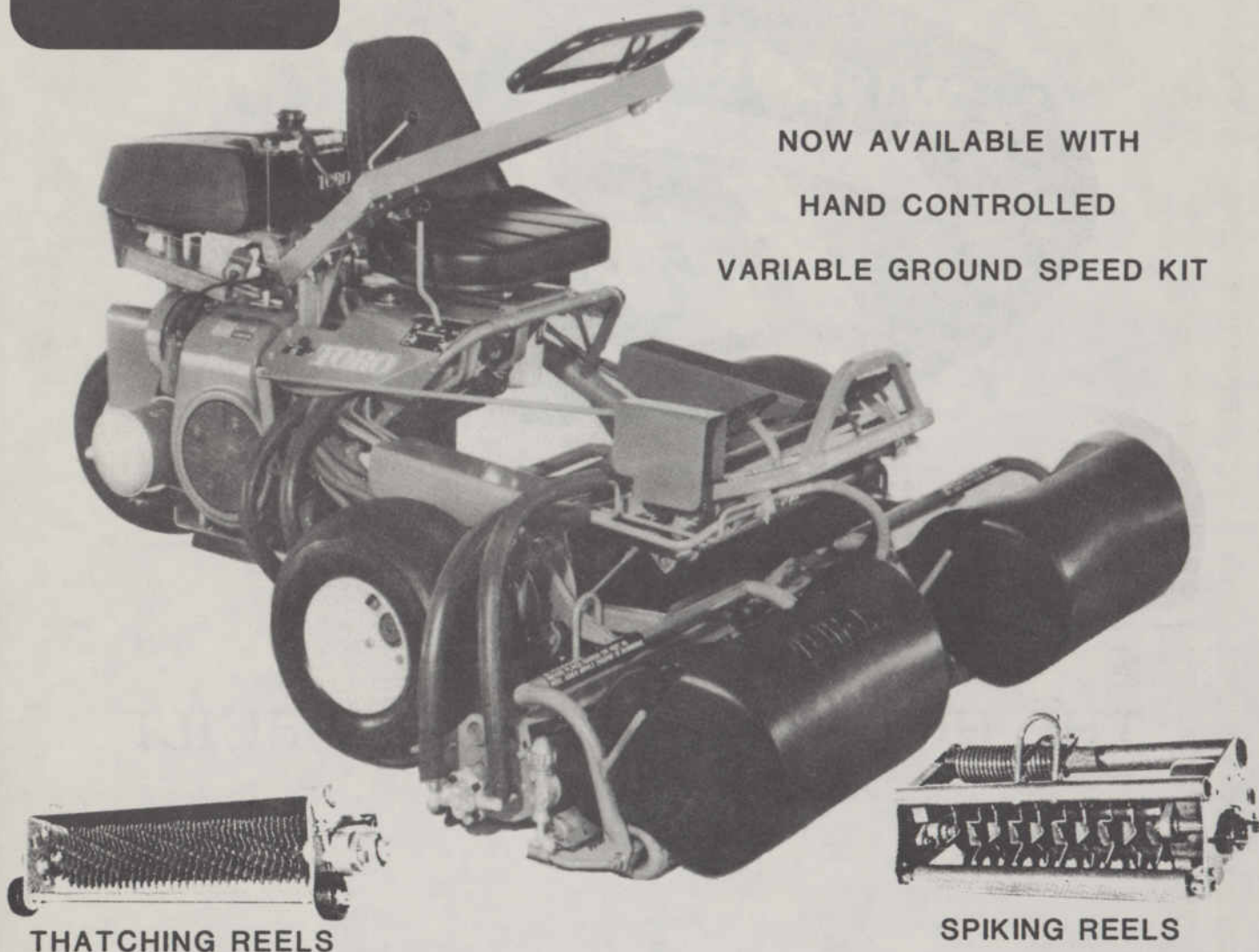
Aug. 15th Monday	The Ridges Inn & G.C. Wis. Rapids, Wi.	
Sept. 20 Tuesday	North Brook C.C. Luxemburg, Wi.	(Tentative) (Tournament Meeting)
Oct. 11th Tuesday	The Squires C.C. Port Washington, Wi.	
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