

# Extra Accuracy for Heathkit Clocks

## — a synchronous solution

Many amateurs have bought Heathkit® digital clocks for their stations. The clock kits are easy to build, can be wired

for Zulu (GMT) time, and are a necessary piece of equipment for amateurs who participate in traffic nets or MARS operations.

Older models of the digital clocks were six-digit versions displaying hours, minutes, and seconds. Later versions are four-digit types

which normally display only hours and minutes. These can be set to WWV time, after a fashion, by advancing the clock to the next minute, stopping the clock, and releasing it on the minute signal.

A much more accurate method of setting the model GS-1107 clock is to modify the clock for a seconds display. This allows the clock to be set exactly with the WWV signal. The seconds display is handy also for timing. The modification is relatively simple, consisting of cutting a trace on the PC board, wiring in a jumper wire, and replacing the snooze switch. An additional switch can be added to give a seconds display if the snooze feature must be retained. A similar modification can be done to any digital clock using the National MM5316 clock chip.

Perform the following modifications:

1. Cut the printed-circuit trace to pin 24, IC1 (clock IC) (see Fig. 1).

2. Add a strap from pin 32, IC1 to the PC trace previously connected to pin 24 (see Fig. 1).

3. Replace the spring-return snooze slide switch with a regular one-pole/two-position switch (Radio Shack 275-430). Wire the new switch the same as

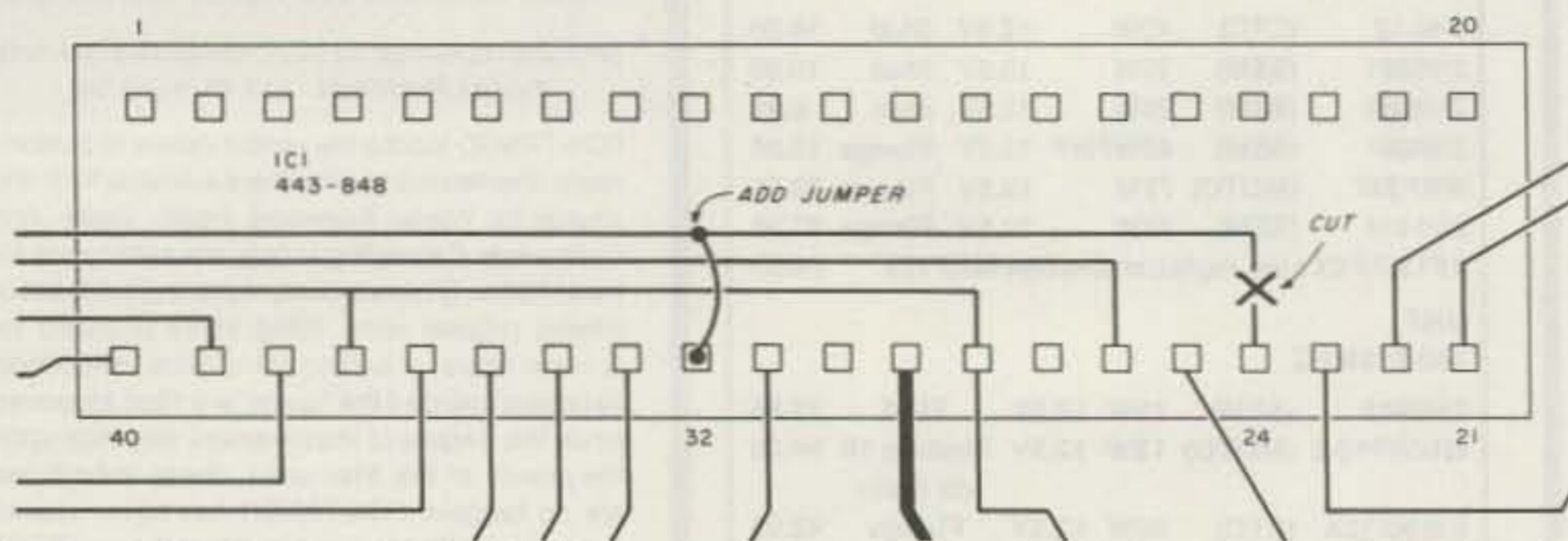


Fig. 1. Clock IC—printed circuit side.

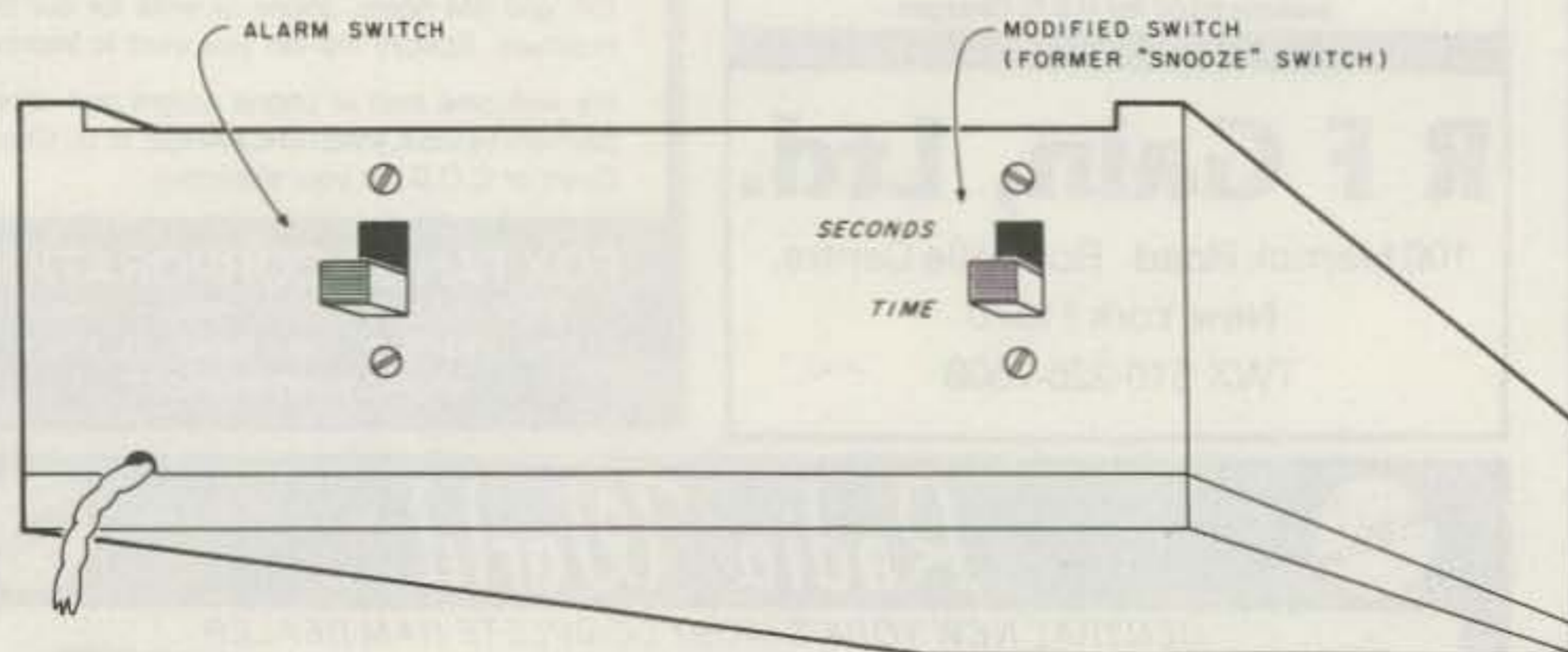


Fig. 2. GC-1107 clock—rear view.

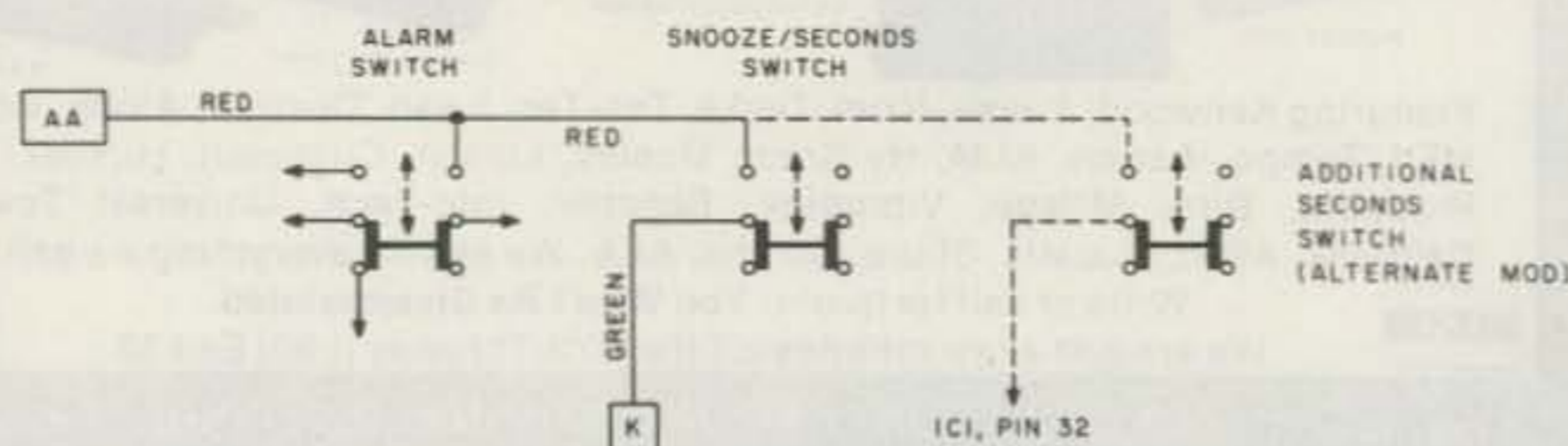


Fig. 3. Clock switch wiring.



the original switch (see Fig. 3).

● Snooze switch will now provide two displays:

a) "Time" display: normal 24-hour format.

b) "Seconds" display: digit 4 = blanked, digit 3 = minutes (units), digit 2 = 10s of seconds, digit 1 = seconds.

● When used in "seconds" display mode:

a) Slow switch: Will inhibit 60-cps input to the clock IC and prevent time from advancing.

b) Fast switch: Will reset seconds to zero without changing the minutes count.

c) Both switches at once: Will reset time to 12:00:00 am in 12-hour format; to 00:00:00 in 24-hour format.

● To set the clock to synchronize with WWV:

a) With former snooze switch in "time" display mode, set clock to current time plus one minute.

b) Switch to "seconds" display.

c) Depress fast switch (resets to X:00), release fast switch, and immediately depress slow switch (stops clock and holds time).

d) Upon receipt of the WWV tone (on the minute), release the slow switch.

e) Verify that the display changes from X:59 to Y:00 at the next WWV tone pulse (on the minute).

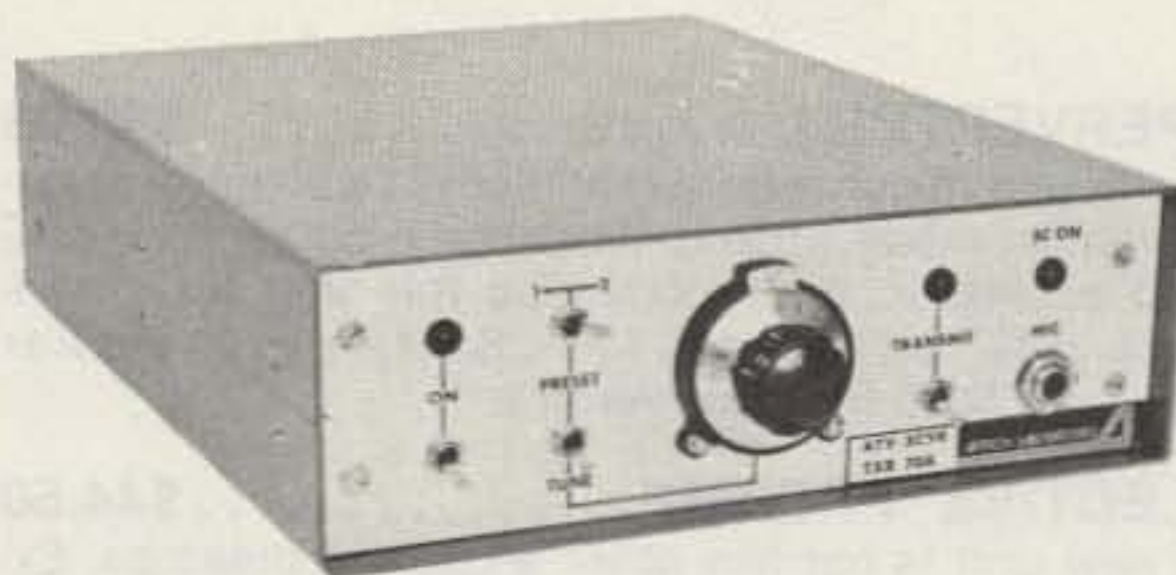
f) Set former snooze switch to "time" display mode.

If an additional switch is added for the "seconds" function, connect the center contact of the switch to pin 32 of IC1 (clock chip). Connect the normally-open contact of the switch to the wire which is common to the snooze and alarm switches (+22 V from power supply terminals AA, AB, AD, and AG)—see Fig. 3. ■

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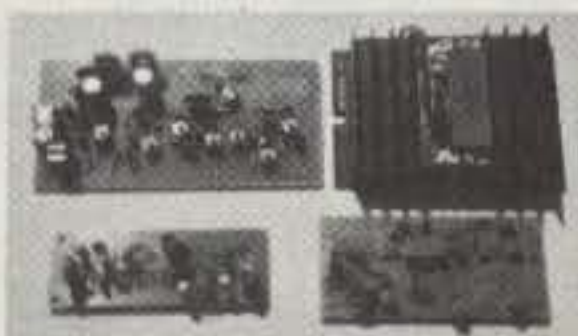
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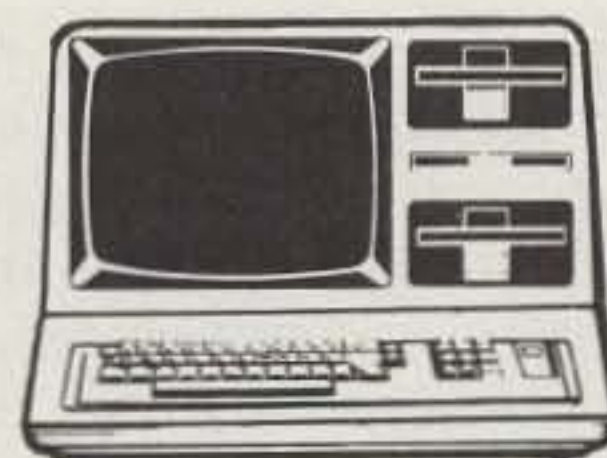
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