APPROXIMATE TIME, BY THE SOUTHERN CROSS

Les Isdale

(Based on an article printed in the Bulletin of the Royal Geographical Society of Australasia, Qld. Inc. Vol. 24 No. 5, May 1989)

Len Beadell demonstrated to the folk on the Centre Safari in 1988 that the Southern Cross when visible in the night sky gives a fair approximation of time. The trick, he says, is to regard the Cross as the hour hand of a giant clock, pivoted on the Celestial South Pole (CSP).

The CSP,as we all know (!) is close to a line from the head of the Cross through its foot, and about 4.5 lengths of the Cross beyond (see diagram). Some people (including Len) prefer to find the CSP one-third of the distance from Beta Hydri to the foot of the Cross, known as Acrux.

This is a 24-hour clock, with 24 at the top and 12 at the bottom. On this "sky clock" the usual 2 o'clock position reads 4 o'clock. Read off your time from this imaginary sky-clock. Maybe it's at 4 on your 24-hour clock. Let's say it's on the opposite side, at 4 hours to midnight, or 20 hours.

A little arithmetic now: we must subtract 2 hours for each month by which the day's date exceeds 1 April. It's 17 February? O.K. - that's May, June, July,.....-that's 10.5 months, equal to 21 hours. (There's a simple reason for all this. On 1 April each year the Southern Cross returns to the "midnight" position at midnight).

So - we take 21 hours from the 20 shown on the sky-clock. Can't be done? The answer is: one hour before midnight, or 11p.m. You would get the same result (with tidier arithmetic) by first adding 24 hours to our "sky time" :
(20 + 24) - 21 = 23 hours, or one hour to midnight - again, 11p.m.

The result will agree with your watch - but only if you are at some place like Wandoan, whose longitude is 150° East. That's because Australian Eastern Standard Time (AEST) which your watch shows is based on the time of the Sun's passing overhead at 150° E. - the Standard Meridian for our Time Zone. (Actually, we use the "Mean Midnight Sun", but that need not concern us here).

What you have found is Local Solar Time. What you want is AEST. How do you find that? - fairly simply. You will need to know your approximate longitude.

For example, Brisbane is at longitude 153°E., 3° east of the Standard Meridian. Each degree equates to 4 minutes in time. Brisbane will see the sun rise over water 12 minutes earlier than a similar observation at longitude 150° E.

It's as simple as that. Observed time in Brisbane is ahead of AEST by 12 minutes. For 11p.m.(observed from the "sky clock") we should read 10.48p.m.

At Birdsville of course, the opposite is true. Being 10° 39' (or 43 minutes) west of 150°, the town is on a de facto Daylight Saving Time all year round. Little wonder that the Bush is unwilling to advance its clocks by an hour in Summer!

In summary then -

SEQUENCE OF STEPS IN YOUR OBSERVATION

Origin date (constant):	1 April
Observation date:	17 February
Date difference (months):	10.5 months
Date diff. (hours) = (months) x (-2):	-21 hours
Observed time (24hr skyclock):	20 hours
Local Time (= 20 +24 - 21 hrs):	23 hours
12-hour clock time (**Local Solar**):	11 p.m.
Observer's longitude (Brisbane):	153 degrees E.
AEST Standard Meridian:	150 degrees E.
Longitude difference:	3 degrees
Time difference (= degrees x 4 minutes):	12 minutes

('East, least ,,, West, best'. The clock time is **less** because we are **East** of the AEST Std Meridian)

Local AEST Time (= 11 hrs - 12 mins): 10.48 p.m.

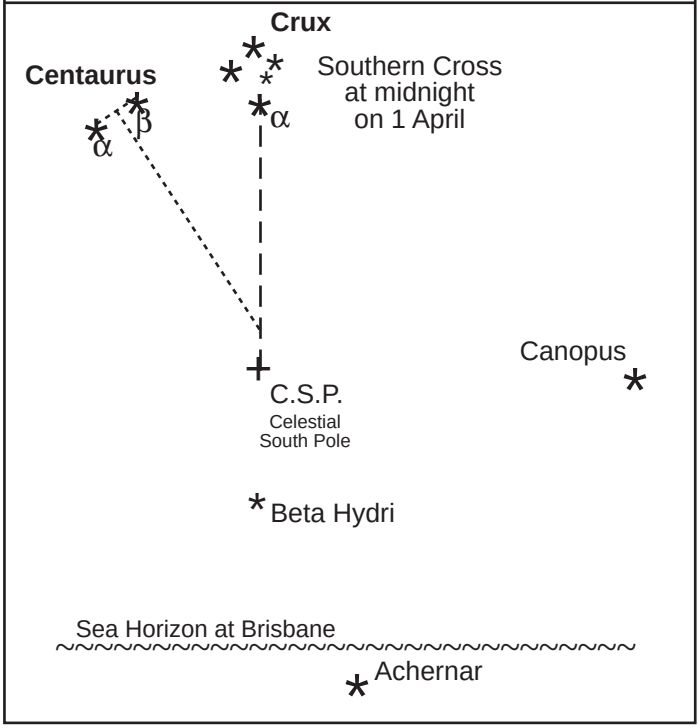
The above is nearly right, perfectly adequate as an amusing mental exercise when the night sky is clear. For the pedantic, these refinements must be admitted -

- Acrux (at the foot of the Southern Cross) on 1 April stands at 23H 46M,or 14 minutes before midnight;

- Acrux transits nearest to midnight on 29 March - 3 days earlier;

That should do it. If all else fails, just look at your watch.

SKY CHART



SKY CLOCK

In the attached example, the observed time 20 hours (Brisbane, 17 February) converts to 10.48pm Australian Eastern Standard Time.