Reducing Overseas Times to N.Z.

The International Date Line

THE basis upon which time is computed is the day, being the average time taken by the earth to revolve once about its axis. A fixed point must be taken, and this, for civil purposes, is the sun.

The earth, being a sphere, can have its surface divided longitudinally into strips by lines coming from the centre. If each one were a degree apart, there would be 360.

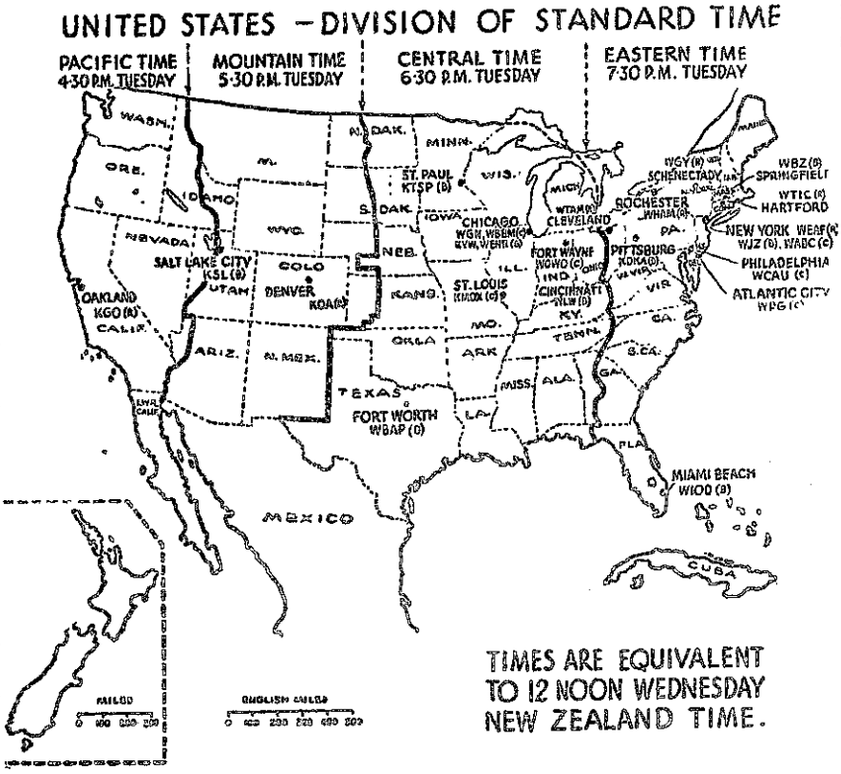
Now, if the time taken by the earth to revolve on its axis once is divided into 24 equal divisions, called hours, it will be seen that it takes exactly 4 minutes for the surface represented by one degree to pass the fixed point. Looking at it from another angle, it may be said that if two places are separated by one degree there will be 4 minutes difference in times. If each degree adhered to its own time imagine the confusion that would exist when it is realised that a degree of longitude at the Equator means a distance of only 66 miles.

To overcome this difficulty, the world is divided into time belts of 15 degrees each, and so representing one hour. Now, for any system there must be a starting point, and it is generally considered the starting point of the earth's longitudinal measurement is an imaginary line that runs through London, or rather Greenwich, and through the Poles. If we called Greenwich 0 degrees and went round the world, we would have our degrees numbered from 0 to 360, but we stop in the middle, and, if we go westward from the mid-point, we speak of the longitude as being west of Greenwich, and if we are going east, it is so many degrees east of Greenwich. It can be seen then, that the local time for any time belt can be computed from New Zealand time. New Zealand, which lies between 166 and 179 degrees of longitude, or in the 11 hours' belt, should then be 11 hours different from Greenwich time. New Zealand, being a small country and in the middle of this belt, takes its time as 11½ hours ahead of Greenwich.

By revolving the globe from west to east, it can be seen that places to the east of Greenwich will be ahead in time, and those to the west behind. Thus we are 11½ hours ahead of Greenwich.

If the world were to stand still and we could fly round it, our local time would change as we passed each hour belt. We would start from Greenwich, say, at 0 hours (12 midnight), would pass over Europe, Asia and America until we came back to Greenwich again at 24 hours. But the world does not stop still, and in this time the world has turned once and at Greenwich it is the day after we left. So at some part of our journey we must drop a day. The meridian at which we pick up this day is the one opposite Greenwich, and is known as the International Date Line. When we cross it going from west to east we add on a day. When coming from east to west we drop a day.

JUST before leaving time belts it might be remarked that America is divided into four time belts, Eastern Standard time, which is 5 hours behind Greenwich, or 16½ hours behind New Zealand; Central Standard Time, 6 hours behind Greenwich, 17½ hours behind New Zealand; Mountain Standard Time, 7 hours behind Greenwich, 18½ hours behind New Zealand; Pacific Standard Time, 8 hours behind Greenwich and 19½ hours behind New Zealand.



Time Calculation.

NOW, if we hear a station closing down at 1 a.m. on, say, Tuesday morning mountain time, what time would it be in New Zealand? Remembering that we are 18½ hours ahead, it would be 18½ + 1 = 19½ hours New Zealand time. If we name our hours the way we should, from 1 to 24, that time would be quite understandable, but we do not. We start at midnight and go on to 12 noon and then start back from 1 and work through the cycle again, only this time we call it p.m., so that 19½ hours would be 7.30 p.m. If the number in universal time is under 12, it is a.m., and if it is over 12 it is p.m..

So far then our computations had not taken us into anything difficult. If we hear a station will come on the air at 10 a.m. Pacific standard time, we shall still add on the 19½ hours that we are ahead. 10 a.m. plus 19½ hours is 29½ hours, therefore taking us into another day, so we subtract the 24 hours and are left with 5½. Therefore, in New Zealand it is 5.30 a.m. on the following day.

When times are given a p.m. we must add 12 on to bring them back to universal time. A station closes down at 11.30 p.m. Eastern standard time. What is that in New Zealand time? 10.30 p.m. Eastern standard time is really 22 hours universal time. Add on 16½ hours which we are ahead, and this brings us to 39 hours. It is over 24, so we must subtract 24 and call the time the following day 15 hours or 3 p.m. New Zealand time.

If we know that G5SW will commence their evening session at 8 p.m. we can easily find the New Zealand time. We are 11½ hours ahead, and must add that, remembering 8 p.m. is 20 hours universal time. 20 + 11½ hours = 31½ hours. Therefore we are in the next day at 7.30 a.m.

It might be mentioned here that mid-European time is 1 hour ahead of Greenwich, Eastern European, 2 hours ahead. A little difficulty enters in when we are trying to convert New Zealand time into overseas times. What is 5.30 a.m. New Zealand time in Eastern standard time? We must now subtract to determine Eastern standard time, and we can do it by the ordinary methods of subtraction.

$$\begin{array}{r} 5\frac{1}{2} \quad (+\ 24) \\ 16\frac{1}{2} \\ \hline 12\frac{1}{2} \end{array}$$

which will be 12.30 p.m. Eastern standard time, really 30 minutes past noon. As we have to bring another 24 hours into the little equation we must go back a day.

TO overcome this more or less difficult process of working out the times a mechanical device such as the DX clock can be used. This gives the New Zealand time for any other local time merely by rotating a disc. The date line here need not worry one a bit if he works the same way as in the equations. In finding out New Zealand times for the times of other countries, we rotate the disc so that the number of the hour in question is opposite the particular point or country. The arrow at "N.Z." points to our time. This is easy enough, but we must have some system of determining the date. The best plan is to follow the clock round the way the numbers go until the New Zealand time is arrived at. Do not, however, shift the centre disc or the arrow will not be right. If we pass 12 midnight we must add a day. Unless we go this long way round there will be a difficulty in date determination because it has to change at the points marked for Fanning Isles. If we want to bring New Zealand time to the time for other countries, work the opposite way to dodge the Fanning Islands, set the disc to the N.Z. time, and work back in an anti-clockwise direction until we come to the point marking the position of the town or country the time of which we wish to determine. If we pass 12 midnight, a day must be subtracted.

These remarks hold good for all places except between Fanning Isles and New Zealand, and as there are no broadcasting stations of any moment here they need not worry us. A little thought will soon indicate how their date is computed.