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16. Computer programmes for map grid reference conversion for Tasmania. Part 2. Australian Map Grid to Australian National Grid.

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The conversion programme (9A3; V=6879) has been compiled for the Wang 700 computer and is based on the Lands Department formula:

$$E = PX - QY + A(X^2 - Y^2) - 2BXY + E'$$
$$N = PY + QX + B(X^2 - Y^2) - 2AXY + N'$$

where E, N are the required coordinates in yards
X = easting in metres - 552 957.8
Y = northing in metres - 5 475 726.2
P = 1.09419695
Q = -0.01241749
A = 1.101×10^{-9}
B = -1×10^{-12}
E' = 550 197.01
N' = 965 009.85

The conversion formula is accurate to ±2 yards

The basic programme has been expanded to give the conversion of full metre coordinates, 100-m grid references or 10-m grid references to full yard coordinates, 100-yd grid references or 10-yd grid references.

OPERATION

Operating details are shown in Table 1. It is essential that references are keyed-in in the correct form.

When grid references are to be converted the grid letters must be given their numerical values and the remaining part of the reference given in decimal form.

B = 2	M = 1
C = 3	N = 2
D = 4	P = 3
E = 5	Q = 4
F = 6	R = 5
	S = 6

Grid reference	*Keyed as*	*Printed as*
BR327899	25.327899	BR327899
EN76620914	52.76620914	EN76620914

To leave a line space between entries key SF 15.

EXAMPLES OF PRINTOUT

A. *Full metre coordinates to full yard coordinates*

232752 5589856 201344 1093786
371444 5348352 350022 827942
576585 5209152 572662 673018

Table 1. OPERATING INSTRUCTIONS FOR PROGRAMME 9A3

CONVERSION FROM	CONVERSION TO: FULL YARD COORDINATES	CONVERSION TO: 100 yd GRID REFERENCE	CONVERSION TO: 10 yd GRID REFERENCE
FULL METRE COORDINATES	A (1) PRIME, GO (2) Key SF 00 (3) Key metres E, GO (4) Key metres N, GO To continue repeat operations (2)-(4).	B Alter programme *Step* *Alter to* 484 0006 504 MARK 505 0006 Operate as for A	C Alter programme *Step* *Alter to* 484 0006 533 MARK 534 0006 Operate as for B
100-METRE GRID REFERENCE	D Alter programme *Step* *Alter to* 210 C006 506 0200 637 MARK 638 0006 Operate as for E	E* (1) PRIME, GO (2) Key SF 01 (3) Key grid reference (4) GO To continue repeat operations (2)-(4).	F Alter programme *Step* *Alter to* 506 0008 533 MARK 534 0008
10-METRE GRID REFERENCE	G Alter programme *Step* *Alter to* 210 0006 535 0200 637 MARK 638 0006	H Alter programme *Step* *Alter to* 504 MARK 505 0006 535 0006 Operate as for I	I* (1) PRIME, GO (2) Key SF 02 (3) Key grid reference (4) GO To continue repeat operations (2)-(4).

*Full metre and yard coordinates may be printed in addition to the grid references by altering programme steps 634 and 640 to 0003.

B. *Full metre coordinates to 100-yd grid references*

```
232752 5589856   20/013938
371444 5348352   38/500279
576585 5209152   56/727730
```

C. *Full metre coordinates to 10-yd grid references*

```
232752 5589856   20/01349379
371444 5348352   38/50022794
576585 5209152   56/72667302
```

D. *100-m grid references to full yard coordinates*

```
BR328899   201398 1093833
CP714484   349974  827995
EN766092   572679  673070
```

E. *100-m grid references to 100-yd grid references*

```
BR328899   20/014938
CP714484   38/500280
EN766092   56/727731
```

F. *100-m grid references to 10-yd grid references*

```
BR328899   20/01409383
CP714484   38/49972800
EN766092   56/72687307
```

G. *10-m grid references to full yard coordinates*

```
BR32768986   201353 1093790
CP71444835   350018  827940
EN76580915   572657  673016
```

H. *10-m grid references to 100-yd grid references*

```
BR32768986   20/014938
CP71444835   38/500279
EN76580915   56/727730
```

I. *10-m grid references to 10-yd grid references*

```
BR32768986   20/01359379
CP71444835   38/50022794
EN76580915   56/72667302
```

E* *100-m grid references to 100-yd grid references, with full metre and yard coordinates*

```
BR328899   20/014938      232800 5589900   201398 1093833
CP714484   38/500280      371400 5348400   349974  827995
EN766092   56/727731      576600 5209200   572679  673070
```

I* *10-m grid reference to 10-yd grid references, with full metre and yard coordinates*

```
BR32768986   20/01359379      232760 5589860      201353 1093790
```