



## BPAY Formula Tech Tip

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## BPAY

### Modulus 10 version 1 Check Digit Verification System

BPAY™1 requires that all customer reference numbers conclude with a check digit, helping to ensure the accuracy of data delivered back to BPAY clients.

Modulus 10 is a formula that is acceptable to all financial institutions participating in BPAY.

***Note: A minimum of 6 check digit calculations must be submitted to the Bank for verification prior to printing of account notices.***

### Calculation/Verification

The check digit for BPAY is calculated using a 5 digit customer reference number (CRN).

PCSchool applies the Modulus 10 Formula are shown below. The example contains part A showing the formula being used to calculate a check digit, and Part B showing the formula being used to verify a check digit.

Prior to using BPay it will be necessary to send PCSchool your Family files. They will allocate unique BPay reference numbers to all families, based on the formulas below. This allocation takes about an hour. Contact PCSchool for more details.

Prior to using BPay you will need to insert your Biller Code into the System File. See Utilities, System File Maintenance.

### Example A

Calculated on a 5 digit customer reference number (CRN):

#### Step 1

To calculate the check digit, each digit in the CRN is multiplied by the 1 or 2 digit in the Modulus 10 Formula as shown below. Odd numbers multiplied by 2 and even numbers by 1.

When the result is 10 or more, the digits in the result are added together to give a single digit result.

	<u>CRN</u>	<u>Modulus 10 Formula</u>	<u>Result</u>
Customer Reference	0	2	0
Number	2	1	2
	9	2	18 = 9
	5	1	5
	1	2	2
		Total=	18

#### Step 2

All results are then added together and divided by 10.

If the result is not divisible by 10, the remainder is subtracted from 10 to arrive at the check digit.

If the result is divisible by 10, the check digit is zero.

Using the above example: 18 divided by 10, leaves a remainder of 8.  
10 minus 8, leaves a **check digit of 2**.

### Example B

When verifying the check digit (in this case 6), a '1' is applied against it in the formula.

	<b><u>CRN</u></b>	<b><u>Modulus 10</u></b>	<b><u>Result</u></b>
		<b><u>Formula</u></b>	
Customer Reference	0	2	0
Number	2	1	2
	9	2	18 = 9 (1 + 8) = 9
	5	1	5
	1	2	2
Check Digit	6	1	2
		Total	20

As 20 is divisible by 10, the customer reference number has been 'check digit verified' and proven valid.