

# Codeword Examples–

in support of Comment #107 on 802.3df D3.0

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# Comment #107

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*Cl* **172**      *SC* **172.2.4**                      *P***211**                      *L* **10**                      # **I-107**  
Dawe, Piers J G                                      NVIDIA  
*Comment Type*    **TR**                      *Comment Status*    **D**                                      *encoding example*

There is an informative Annex 119A, 200GBASE-R and 400GBASE-R PCS FEC codeword examples.

## *SuggestedRemedy*

As the Clause 172 PCS is subtly different to Clause 119, with partly different alignment markers and the block distribution and synchronised alignment marker groups of the two flow method, there are new opportunities for ambiguity and misunderstanding that 119A won't catch. So, please prepare a similar annex for Clause 172. Add text here and at the beginning of 172 and 169.2.3 mentioning it. Revise the amendment description on page 14.

Please prepare a plain-text file with the large tables for convenient reading into a program, and post it on the project web site for review with future drafts.

*Proposed Response*                      *Response Status*    **W**

PROPOSED REJECT.

A new annex as suggested would be an improvement to the draft. However, a contribution providing a complete proposal including values for the tables, start-up conditions, etc. is required.

# Proposed solution: Adding Annex 172A for 800GBASE-R PCS FEC example codewords

- Language in Annex 119A can be mostly reused
- Use the same example payload (scrambled idles), Flow 0 seed and PRBS9 seed(s) as 119A
- Flow 0 is mostly the same as for 400G in Table 119A–2 and Table 119A–5
  - Parts of alignment markers and the parity differ – indicated for flow 0 only by red bars
- Per 119A, italics show alignment markers, bold shows padding for the alignment markers
- There are further processing steps, not illustrated: distribution and interleaving in 172, and 32:8 restricted bit-level multiplexing in 173
- Detailed Example payload and initial states:
  - Data sent: scrambled idle.  
tx\_xcoded<0:256> = 007000000000000000780000000000000078000000000000007800000000000000
  - Scrambler seeds were different for the two flows:  
Flow 0: S<0:57> = 24E 6959 D0FA 5DBD  
Flow 1: S<0:57> = 1FB 5885 7D81 624F
  - PRBS9 seeds for AM padding were the same for both flows, P<0:8> = 0x100.
  - tx\_am\_sf<2:0> = {0,0,0}, for both flows.

# Errors in tx\_scrambled\_am<i:j> tables

- During AM mapping, it should follow 119.2.4.4.2 as below:

```
For all k=0 to 11
  For all j=0 to 7
    if even(k)
      am_mapped<160k+20j+9:160k+20j> = am_{2j}<10k+9:10k>
      am_mapped<160k+20j+19:160k+20j+10> = am_{2j+1}<10k+9:10k>
    else
      am_mapped<160k+20j+9:160k+20j> = am_{2j+1}<10k+9:10k>
      am_mapped<160k+20j+19:160k+20j+10> = am_{2j}<10k+9:10k>
```

- However the following were used, resulting errors in row 2-8 of tx\_scrambled\_am<i:j> for both flows.

```
For all k=0 to 11
  For all j=0 to 7
    if even(k)
      am_mapped<160k+20j+ 9:160k+20j  > = am_{2j}<10k+9:10k>
      am_mapped<160k+20j+19:160k+20j+10> = am_{2j+1}<10k+9:10k>
    else
      am_mapped<160k+20j+19:160k+20j+10> = am_{2j+1}<10k+9:10k>
      am_mapped<160k+20j+ 9:160k+20j  > = am_{2j}<10k+9:10k>
```



# RS(544,514) codewords A and B

This page has no changes compared to [dawe\\_3df\\_04\\_230926](#)

Index <i:j>	cxA<i:j>, Flow 0
<5439:5120>	A6A9AA6A9AA6A9AA6A9A64992649926499264992D886284BD280BA2609026519565D946559565196
<5119:4800>	6D5B56D5B56D5B56D5B57D936ED8B62D876CD9B6FB41F547DE7A6A07575BDEA014FDD8C499B97EE9
<4799:4480>	BCD56BC9A11D7D8256A6A999E2B1B315CA3131AA380C3B8A34339492684C810BD2EA92C331E3C619
<4479:4160>	401C8F61447E7EDCC66077D56AFED4815C9AFE6D8B691236C7F7A4894AA7ECDCEBC10380639D209
<4159:3840>	48B9904D84BDDC645B57BE9E96049F5CB27E7ACB40A8A0DE01AA509342C6CB8534AAEA22633BD93
<3839:3520>	3BFF204FC2FD8E502D0F4F285D750D83E51D13AB0DB043C68F7267B51CBF8F70ECC40896DC8CBE72
<3519:3200>	F95FC9B80795998ABB99CD56F5F37EFB6EC4E58D4BEB0FF21F679F490F9DD635A10C7B3FC2D5A52
<3199:2880>	56CFB4E62BB695B79D1BA97F405053DD2C9BEAB1F1C1653FF6E99AC88A3FDE99B4FB1F3F6C82945
<2879:2560>	F7BE0EFB07B9C6CACB8F9096B308258EF228B01FF7AFCBA189D2C7E71EED3F207F163B58EECOC02E
<2559:2240>	A8EEB169DD65CF86F319B82E36DAC8D8E09077DCA3009AC4A7569FFE11A96F735ED0F685E96028CE
<2239:1920>	E8265F8CDA9A39540A50936869A2A8267CE3ABC560BD80F08CBB0415749FACB149C42AFE68EBE9B
<1919:1600>	135A6E02COAA5807906AE384CB74F99F6CB700FA5480D25D52D208FBC295570F642C546E2685255A
<1599:1280>	0FBFFD27F056F2A147C33B6F561BB1DF9B994E0351D95C8F9B7D104470FF3463815D28A958106069
<1279:960>	9B3324B302D6AC9DB62A10823B86055E0BACC50F6F847E434C7414E0DCD0D206DA50E4D75DB65E3
<959:640>	2EE470AD0DE1092E04A8812B44A3DB0E7A77A9DCC7194FEA0DA61C433F4435891EE97DBE750C8D16
<639:320>	51543380F0881388B114962019A6962D0D13FC4552E1D6EE5CD6A408EAF6237F5FECD980292CD9C8
<319:0>	4FC29D9798C2C55370750272E393736FF6D38A3DF36A7A93002B47850A96CDE76854DA59062AD1B3

Index <i:j>	cxB<i:j>, Flow 0
<5439:5120>	A6A9AA6A9AA6A9AA6A9A64992649926499264992109A2C8A22ACAC250B426599565D946559765197
<5119:4800>	6D5B56D5B56D5B56D5B59DBB69DBB6FD936BD87695B98B52933A9D73B19571FCF51E72733ADF67EC
<4799:4480>	1FBD07455B4F238F0D7912780AE4841617E2A693857F8C049DED92A0C5A0CAA40D9798A89C6A164
<4479:4160>	621AAEC9A824EC9203458118BB4F4402C1635209D83314CA401576CEEBA30193FFAE9EAE9B4FEB74
<4159:3840>	940447D476FAE46BA3D97965681352E5E1087DED3CC7100984C74C2FBEA631DA8335E5832CEDFCE4
<3839:3520>	3F1ADD1FE9B232567A2041A7782A7AA62A1348F6C874FEB76F8145CB65AF1ED61554AE7CA3EF4B63
<3519:3200>	999453AC3B093278719A71F4AE09D404COA9F0014F09F279005A3A7FD289C4EB9B2C98F2C1EBOEFD
<3199:2880>	599CE431BEFD79C6542F4B572684F2A32D19EBCB2267BAD81FF1BA2F93274686A4F37361176C78DA
<2879:2560>	749AAB7CA1415E7EA8BD6B3B4026B13A65AF6317DEA7DDE1E0C8B2EBA5412FD1A83DA29055292039
<2559:2240>	5C08E6DB1B3EEEE0EECED94892079D98BEE35A6F6410294FE5866667D64598E5F680B711C33C3A08
<2239:1920>	E2FC9D1E0693FD2E999AC9C24FD4DBFC90338B490C6AC33A5A8111E5E0A631E0D229F75199927B
<1919:1600>	1D0A36924C20B4F749870EAB79F355A4E35A72BE70FF713A8B76B5693CDDFC9FD73802E6072736DF
<1599:1280>	7EADC1281094A1A8B599A41478B9075190836BD54BCA458B19862D4729EC9418414E51D233C8FC4C
<1279:960>	F41597EE58EAF5250E435D7710ABE4B27F820C4EEFFE7B331C27F3D623B942CBE1AC1E46815EDB4C
<959:640>	B784B2F192531E6308A04606029071929114E71AB62C36A9D71958111ED9D0D7D45D8E353823A7F4
<639:320>	E53C08DE057AD8F1D0BD114438370C05B05422875160140E51C056BC5075F5CFFBDBF211044D7A33
<319:0>	EFBCE3BC2198756E3F23CE3783B4D1085B12943E924B87EF67FED64D92E66AE99B5E579C0F8B1BCB

Index <i:j>	cxA<i:j>, Flow 1
<5439:5120>	A6A9AA6A9AA6A9AA6A9A64992649926499264992D886284BD280BA2609026519565D946559565196
<5119:4800>	6D5B56D5B56D5B56D5B57D936ED8B62D876CD9B6077EFA842E86550894AB215FEB02273B66468116
<4799:4480>	831A98355E22B271AA5959A5EDB273E5F63E326AC7F3C475CBB6B6D97B37EF42D156D3CCE1C39E6
<4479:4160>	401C8F61447E7EDCC8C3859D481E6F5DA7648166C37FB37C3EE4B28719774A5CA6C6AF6A8BB5FA37
<4159:3840>	E4544116469CC326A38AF61AF7FB21A50EF20AD25E949C26FA35DBF354F40144F4FC262325C13COD
<3839:3520>	AC015D6EA6EAE85DF128C7F4BD15625C360F80E0A18E4BDCD612ADAC6C73CDCF321DB85DDF1F66A
<3519:3200>	D27244FA401226FED3C5D040F547D72AFBF284F5EFE5178BC57679B5765BD227A0C9EFE1DFB2E21C
<3199:2880>	88B272591BFE8A82EFAA9DCFB46E0D5AC404CB7EE3507C446CB25FE1EE45519344E9CBB40AF40BE
<2879:2560>	FAB6B3694F1DF911A1D5341F0C77CCBCA21AC8AC7448270F35D07EADB725531491BCF0D9763E0668
<2559:2240>	C612485954D0A2FFD0C7DC69E6249258C2BE2C4D73E247D1619CDD5857AB0CE58FFC109A6FF7D3E
<2239:1920>	1D2685D529483C9369ACE7FE0A91106A921645FAE0199EFA2C2E7F935DD2656DCAF9EBFA25ADBAD7
<1919:1600>	486B0494108FB4106F2F307912AFC4AC7C85A4485187EAC46E11C980E15D4F7A0324E7630415FF43
<1599:1280>	2BDFE61FD4EF38B8AE2A3E09F7D981B73BD43969DA3F7FBA21C28EA837B7C8B58DF1645A06D7B66C
<1279:960>	3B74D3B69D695761D5D2B9CF4C1F43EFA6043FDFC7FAC5E211D5C268BCC6BB8E8519CFA66B64FFFD
<959:640>	8C8B1FA0D47618EB66B1BBC6EB6DCC59503627C0E208A010A70B19E8CFCF5D96B503E03EAA82156
<639:320>	EB829E17FFF236646D41150E6DEB666116DC6CD7F58AD747A3B0DA5A2462CB69323882F8C62F47C8
<319:0>	7C1101E2E9D7DE149660AA91354E2A473CF6434EB00C349782F3FF0E85F3DDEDEF69F4DBED4633BD

Index <i:j>	cxB<i:j>, Flow 1
<5439:5120>	A6A9AA6A9AA6A9AA6A9A64992649926499264992109A2C8A22ACAC250B426599565D946559765197
<5119:4800>	6D5B56D5B56D5B56D5B59DBB69DBB6FD936BD8766986849163C6A27C72658E030AE18D8CC5209813
<4799:4480>	2072F4B9A470EC7CF186E24405E744E62BEDA5537A8073FB621226D5F3A5F355BF26867576395E9B
<4479:4160>	621AAEC9A824EC9F024773AD49DB1923A11A072B72D35CBFFE8B6B3F65D29011F1520F9F632F74A61
<4159:3840>	788445A59A69497ED2227FFFC9DE81710E590B03D83115C1D05F0B472905722F0E880A9B6E24D3EA
<3839:3520>	748B884C2889C90065C10A2E65947942E7B26D7F4CC993180051531A8BC98744C3FFA19B0D3379F2
<3519:3200>	56CCE74431B66C6D8780EAE188C8E6A7EFF1D8D8213715D09919911C5591B3B0D78F350C9027538D
<3199:2880>	AA9B36DB732DED4A1F5BBD90C2453B42F79B2FFE2EE4D28B08707AC888A1BE8D8CB5D2A81A209279
<2879:2560>	1EB3528E842706A7BD1DBB5F57064167550179CF9EEF0139E666BE06D188C89A9FCF1CA4F72A381D
<2559:2240>	26CAD128708342A46816A1D4DF18072C0F256555643FCE759AD072A31AB56A56B9E7DF1987131121
<2239:1920>	DFAAF7DF88D38B9D146FE32E63759035CFF03B4A4E3A59389CFCADDB7952B601E0E0B906F5208FAF
<1919:1600>	314D86265D6294C14BC45E8F6D3325A6F4121306649AD820B29CBDB86EF6CEEFD083BOEBED0CEA83
<1599:1280>	0A54FED0AD524BBA3D0F9A624DDE884C89980D0049D78B4FF5ADC4EE988AB03ACD096152860BCB62
<1279:960>	187FDFA2E642E894F1064F0CCF7E28372E3BEB46315FDECCFE9B8BB812CA4A2ECO9B042918754CE
<959:640>	6B112395E20D8C818C69CF02CA6D51A180E05CA6023560B5A930EDF02E5FECB2D93B9A7B15EBC2D4
<639:320>	4BDD608BA0D92D8569B541D8C3BABB85366192367AE021E27BEF020103FF4BDEFDA3C4F3D386586F
<319:0>	6145268031843B34748CF604A47A190AAF03AEB9CC367B9364FAEC90878D81980D1B802A4F52995A

Thank you!