



CCS-NW Christmas & New Year quiz 2019

I hope you found this interesting and brain teasing last year. Anyway, I've done it again this year. Unfortunately, I misplaced my notebook with a few quiz ideas recently, so there is less variety than I'd intended.

Several of the questions related to places I've been and people I've talked to in the last 12 months and have found fascinating. So, unapologetically, there *is* rather a hardware bias. I'll see if I can make it "softer" in 2020.

Answers sometime in January. (**February. Apologies.**)

Good luck, Merry Christmas and Happy New Year to all.

Bob Geatrell

Chair CCS NW Group.

Were you paying attention?

A few questions relating to the presentations this year. Which presentation and to what do they refer? There may be more than one ...

1. What novel method was used to communicate about weather conditions at distance?
 - When Prof Ian Morison was a young man at Jodrell Bank, he would occasionally input jobs on a Remote Job Entry terminal and have the output (a message about the weather and travel conditions) output at his girlfriend's location.
2. What local legend did we see in film?
 - It's local if you live near Manchester. I certainly think the Avro Vulcan was (and is) legendary! This was in a film clip shown by Simon Lavington about the Ferranti Mark 1.
3. Complete ... "If the boss calls"?
 - According to Dik Leatherdale and Rod Brown, Brian Warboys of ICL said "If the boss calls ... ask him his name"
4. What or who spent longer than planned at the dry cleaners?
 - Also, according to Dik and Rod, Mary Lee Woods sent husband Tim Berners-Lee on a shopping trip taking young Tim in the pushchair. He returned with all the shopping. Then realised he'd left Tim behind. They found him at the dry cleaners
5. Bit slices were mentioned twice. By whom?
 - Ian Morison built a computer using bit-slices for Jodrell Bank. The Argus 700 of the Bloodhound control system also uses bit-slices in its processor.
6. Who had an underground practice site?
 - Lyons (LEO) had an underground shooting range.
7. Where was a Wren with a Finch?

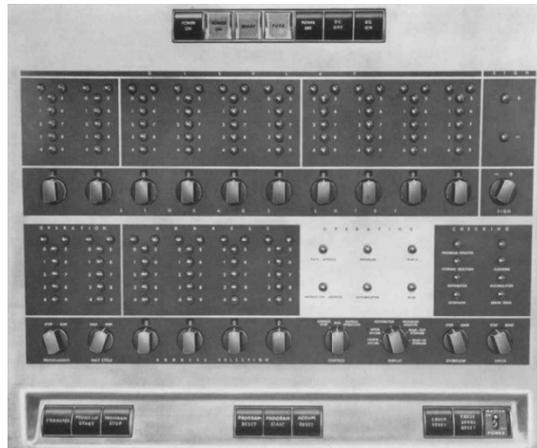
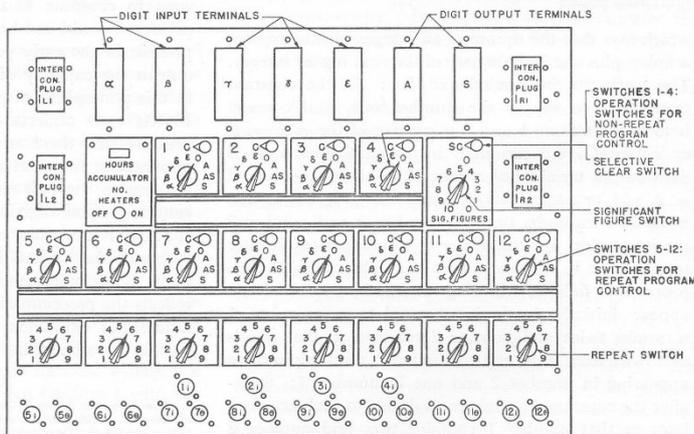


- Peter Harry said that the Bloodhound Argus had a damaged Wren disc drive, with a Finch interface. It's been replaced with a SCSI emulator and an SD card.
8. Where did the perforated sheets come in?
- These were the Zygalski sheets used by the Polish Cipher Bureau to help decrypt Enigma messages. Each had many windows and by overlaying them, possible decryptions were shown. (I missed this presentation, but it was in the slides!)
9. What was no longer in use, but was “spotted” one 12th October?
- “On 12th October the 3rd stage rocket that put Sputnik 1 into orbit (and which itself was in orbit) was conclusively detected” by Jodrell Bank in 1957
10. Why was the Bloodhound Control Post painted a khaki colour?
- Trick question. It was painted green but faded.
11. Dik and Rod (which I thought was a *highly* unlikely name for a double act!) gave us a belated Christmas song: “The 12 bugs of Christmas”. Can you fill in from the 5th day?

*“For the Fifth bug of Christmas, my manager said to me:
Ask for a **dump**.
Run with the **debugger**,
Try to **reproduce** it.
Ask them **how they did it**,
and see if they can **do it again**”*

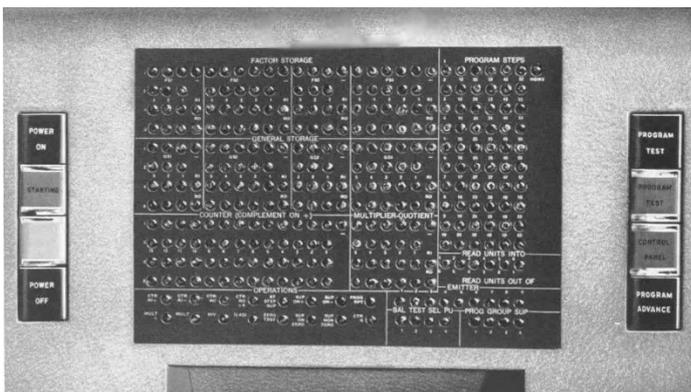
Consoles

You know that I like old consoles and control panels and the like. What are these: ?



#1 So many sockets, so many decimal switches. This is the front panel of a single accumulator unit from ENIAC

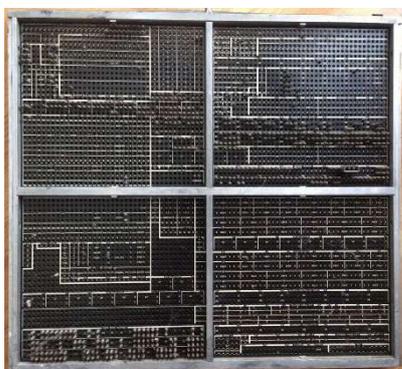
#2 Interesting "bi-quinary" display (not binary, not decimal, but 2x5) on the IBM 650 "Magnetic Drum Data Processing Machine"



#3 Control panel from a 1948 IBM 604 calculating card punch. Is this actually a computer? But then, what IS a computer??



#4 From the Marconi TAC "Transistorised Automatic Computer" this is the dual processor control desk



#5 "Control Panel" from an IBM 407 punched card "Accounting Machine". It's a plug board, wired up to configure machine operations.

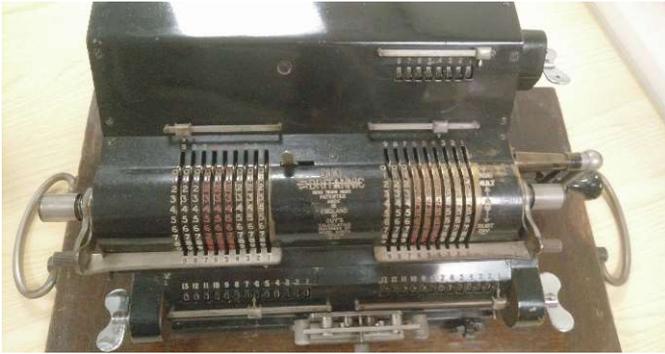


#6 Honeywell [DDP-116](#)
The first commercial 16-bit microcomputer

Some things I saw this year

I've had a few trips this year and seen some fascinating stuff. Can you identify these objects I saw?

I appreciate that this is a highly personal and eclectic mix. In many cases, it's probably impossible to know what they are, so award yourself points for any salient or interesting features you noted!



1. What. And whose?

Possibly hard to see from this scale of picture, but it's a Britannic Duo hand calculator. The sort of thing a mathematician may own.

This one belonged to a certain A M Turing. He paid £35 for it in 1951 when he was in Manchester

For a while, it was displayed in the Science and Industry Museum

This was at Manchester University for a Turing anniversary event

2. My first ever Computer



... was a DigiComp-1

I was given one of these when I was a teenager. A 3-bit binary computer with a "clock" (push the white plastic tab in and out) and the bits would change depending on the "AND" and "OR" conditions configured by those white pegs.

It was VERY fragile, and the rubber bands snapped frequently.

I saw one, and was reminded, at the Computer Sheds, near York.



3. May have been useful in the election?

This is a Neuron logic board from the Ferranti Orion.

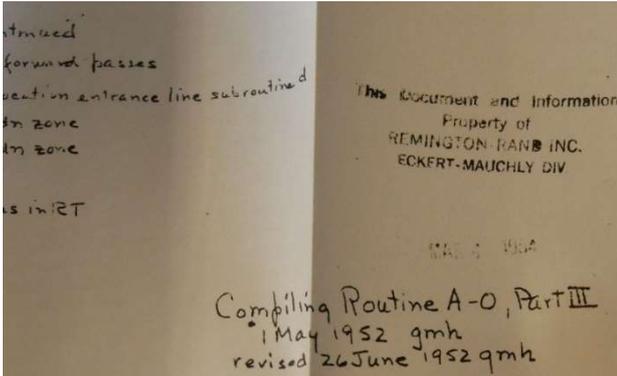
Uniquely, logic values were signified by current rather than voltage pulses. The round devices are ferrite rings with multiple signal wires threaded through and around them.

Because it may (e.g.) require pulses on 2 of 3 input wires to make a core switch its magnetic field, it could be used as a "majority logic" gate, rather than just the usual "OR" (1 of 3) or "AND" (3 of 3).

It was known as "Ballot box" logic, hence the question.

This one is an "025" board (you spotted the black/red/green colour code?) which is a timing waveform generator, rather than a logic gate.

(Computer Sheds)



4 Why “gmh”?

The story of the Eckert-Mauchly computer company reads like a novel. After creating ENIAC, the two left to create their own company. They were bought out and became a division of Remington Rand, but they went on to create UNIVAC

Although it's more like a modern linker, A-0 was the first to software to be given the name of “compiler”. The name was coined by its author: Dr Grace Murray Hopper (gmh!) (*Computer sheds*)



5. From a washing machine maker?? Was it better than Mercury??

This looks like some sort of brake drum, or even a cider or olive press wheel.

But the colour of the coating is a clue. This is an early magnetic drum.

It was used in the Bendix (hence “washing machine”) G-15, which was based on the design of Turing’s Pilot ACE.

The mercury delay lines of ACE were replaced by data recorded onto the rotating drum and read off about 350° later.

(Time-line Computer Archive, Wigton)



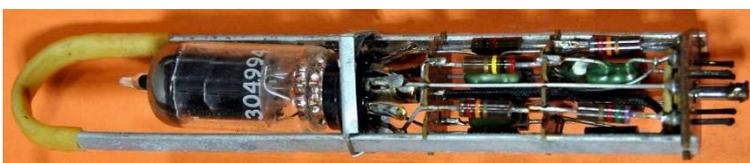
6. All geared up for a trip?

This is a complex analogue “computer”, squeezed into a small box for aeronautical use.

It’s a Ground Position Indicator (GPI Mk4) as used on the Vulcan.

The device with the red arrow has rotating disks on either side and small moveable “balls” (not easy to see) impinging on them forming “disk and ball” integrators.

(Time-line Computer Archive, Wigton)



#7 Early MSI

This is a neat form of pluggable vacuum tube unit used in the IBM 604 and several following punched-card based machines.

This example was part of a logic training aid (*Time-line*)



#8: Where might it have jumped?

I blurred "NASA" previously. This is part of the Apollo Guidance Computer. Its ROM was famously made from a "rope" of wires knitted through magnetic cores.

The Jumper was actually a blank module used during testing.

(Computer Sheds)



#9 a comput-Err?

The colour and form factor show that this is another piece of aeronautical equipment.

It's a Sperry T-1. An American manufactured version of the Mark XIV bombsight computer from the mid 1940s.

From the days before the world agreed to call them all "computers".

(Computer Sheds)

Resurrecting the past:

Some questions from the early days of the CCS

If you spotted that I'd taken the questions from "Resurrection" issues 1-6, then the answers come easily!

1. What was the first machine the society decide to restore?

"The machine the museum and society have selected as the first machine to restore is Pegasus, specifically machine number 18"

2. Why did the EDSAC designer decide that "half-words" were a good idea?

Maurice Wilkes decided that 36 bits was necessary to get the proposed accuracy of 10 Decimal Digits, But then: "I knew we were going to be short of memory, and I thought as we have got to have circuits for dealing with half words for instructions, we might as well make half words available for numbers. I thought that many numbers could be represented to half word accuracy". Still true to this day.

3. How could you recognise early electronic engineers in the way they approached a piece of equipment?

"... you can always recognise an early electronics engineer, since when he approaches a piece of equipment, the first thing he does is to put one hand firmly behind his back. This is to avoid touching both hands across a high voltage and getting a lethal shock passing through the heart!"

4. Who produced the first ALGOL translator?

"1960 - Dijkstra and Zonnefeld produce first Algol 60 translator."

5. During development of his storage tube, FC Williams tried a two-tube system. Why two?

"When Williams came back to Malvern, he then started setting up the two-tube experiment, which involved reading from one tube, storing on another tube, then reading back from the second, so cycling round on two tubes. While he was doing this, he discovered the anticipation effect ... That led to continuous regeneration and to his first patents in December 1946"

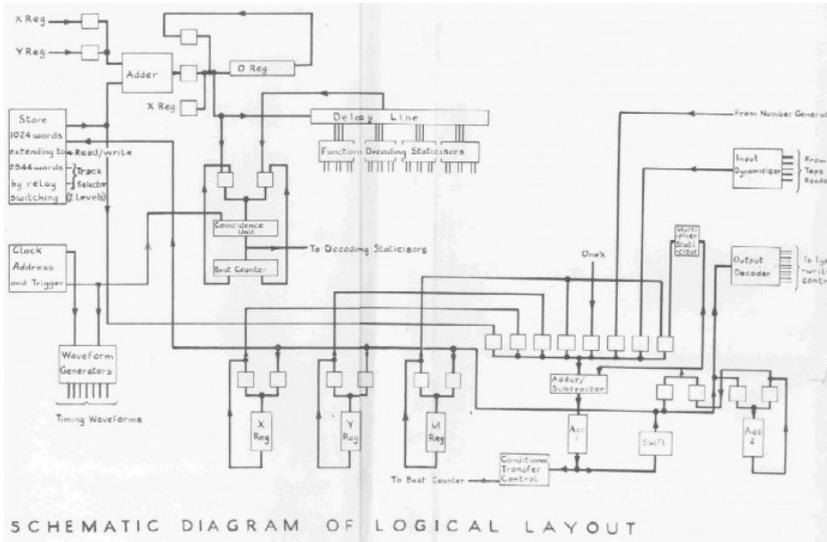


6. In 1993, the CCS had a reception to mark the 40th anniversary of the birth of which computer?

“The Society held an evening reception in the Fellows Room of the Science Museum on 22 April. It marked the 40th anniversary of the first public running of the Elliott 401 at the Physical Society Exhibition in 1953.”

Computer System diagrams

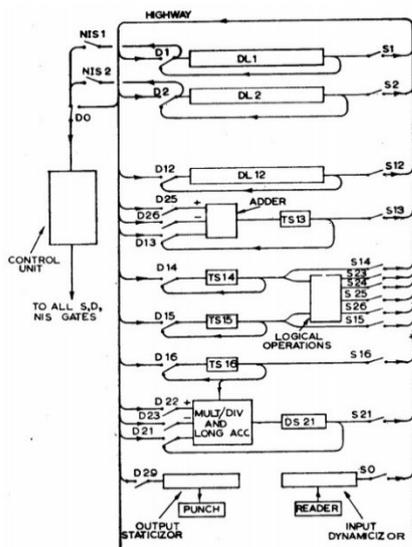
I know these are difficult, but can you recognise any of these early systems?



#1

Elliot 401

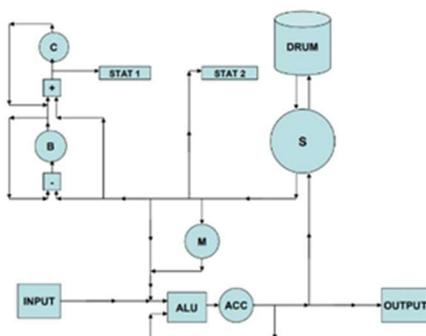
A machine with which the CCS has had a fated relationship. Only one was built. It now lives on (but permanently "off") on display in the Science Museum London



#2

The EE Deuce.

Showing its ACE parentage with thin rectangles for multiple delay line/stores



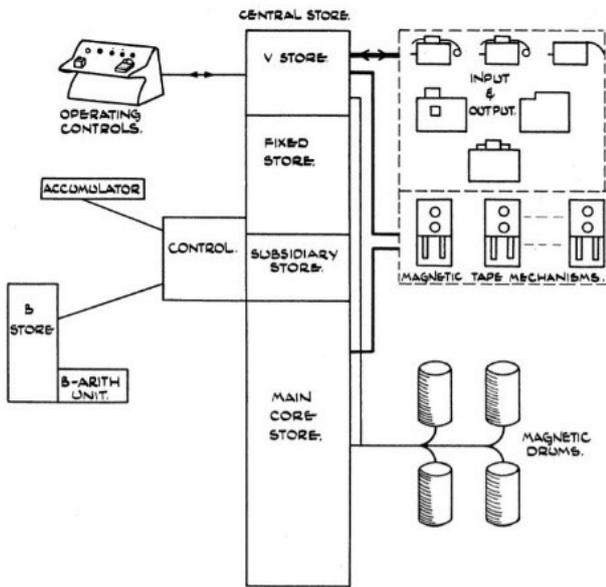
#3

Ferranti Mark 1

Note the circular representations of the (Williams tube) storage units. And the B (Index) lines/

(drawing from "Our Computer Heritage")

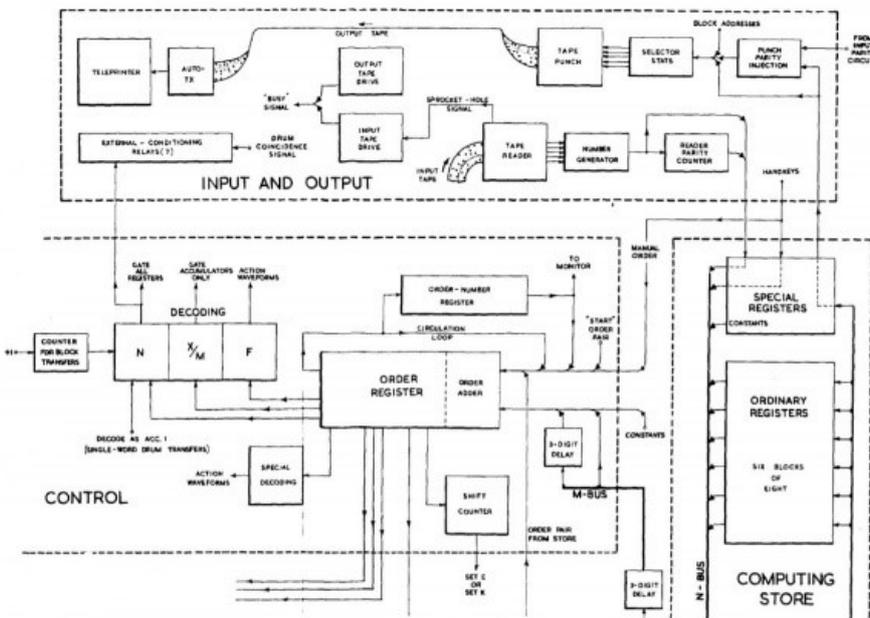
#4



Atlas

Lots of different store types and peripherals.

And an impressive looking console!



#5 (This is only a part as it's a big diagram)

Ferranti's Pegasus 1.

Lots of focus on (beautifully drawn) paper tapes.

And the Computing Store (blocks of registers) held in in delay lines

A few sums

In the course of trying to devour the entire "Internet of Old Computers", I came across some magazines from the 50s. Their idea of a Christmas Quiz was a maths puzzle. I think the world of computer puzzles has moved on from those days.

These are from 1954 and 1955. Give them a go.

These are from [Computers and Automation](http://bitsavers.trailing-edge.com/pdf/computersAndAutomation/), which have been scanned and saved for posterity <http://bitsavers.trailing-edge.com/pdf/computersAndAutomation/>

1954:

GREETING TO COMPUTERS

In the December issue we posed a "Numble" (a number puzzle for nimble minds) -- a "greeting to computers". It was:

$$\begin{array}{r}
 \text{M E R R Y} \\
 + \text{ X M A S} \\
 \hline
 = \text{R S M E Y} \\
 \\
 \text{H A P P Y} \\
 + \text{ N E W} \\
 + \text{ Y E A R} \\
 \hline
 = \text{H R R E S}
 \end{array}$$

$$\text{G E M} = \text{H E W}$$

and: 86986 14756 94379 55431 70

Solve for the digits -- each letter stands for just one digit 0 to 9.

The solution follows: Change W to M. Y plus S ends in Y; therefore S is zero. R plus M plus zero or one carried ends in M, which is different from S; therefore one is carried and R is 9. M plus one carried is R (9); therefore M is 8. Y plus M (8) plus R (9) ends in S (0); therefore Y is 3. A plus Y (3) plus zero, one, or two carried ends in R (9) with no carry; but two cannot be carried since the most P, N, E can be is 7,6,5, since R is 9 and M is 8; therefore A is 6 or 5. R (9) plus A (6,5) plus zero carried ends in E, which is therefore 5 or 4. E (5,4) plus X plus one carried ends in S (0), and therefore is 10; so X is 9 -- minus E or 4 or 5. Both A 5 and X 5 is a contradiction. Therefore A is 6, E is 5, and X is 4. The ten digits in order 0 to 9 are S, N, P, Y, X, E, A, (G, H), (M, W), R. The numerical part of the message is (M, W), A, R(M, W), A, N, X, (G, H), E, A, R, X, Y, (G, H), R, E, E, X, Y, N, (G, H), S, which with appropriate choices is quite clearly "WARM AND HEARTY GREETINGS".

1955:

GREETING TO COMPUTERS

In the December issue, we posed a "Numble" (a number puzzle for nimble minds) -- a "greeting to computers". It was:

$$\begin{array}{r}
 \text{times} \quad \text{M E R R Y} \\
 \quad \quad \quad \text{X M A S} \\
 \hline
 \text{O R T E E Y} \\
 \text{L C R A A Y} \\
 \text{P L A T T Y} \\
 \text{O R T E E Y} \\
 \hline
 \text{plus} \quad \text{S L Y X M P M O Y,} \\
 \quad \quad \text{S R E E A T X A Y C} \\
 \hline
 \text{P E A C E T O A L L}
 \end{array}$$

$$\text{S I X} = \text{C I S}$$

and we wish you 32763 61456 38856 156513 4

Solve for the digits -- each letter stands for just one digit 0 to 9.

The solution follows: Change S and C to X. Each of Y times X, A, M ends in Y; therefore Y is 5, and X, A, M are odd. None of X, A, M is one. M plus zero or one plus A ends in A; therefore M is 9, and X, A are 3, 7 or 7, 3. 0 plus one is X, and 0 plus Y produces a carry. 0(X minus 1) plus Y (5) equals X plus 4; therefore X cannot be 3 and must be 7. A is 3. 0 is 6. P (X plus one) is 8. Etc. The ten digits in order 0 to 9 are T, E, L, A, R, Y, 0, (X, C, S), P, M. The numerical part of the message is A, L, (S, C, X) 0, A, 0, E, R, Y, 0, A, P, P, Y, 0, E, 0, Y, E, A, R, which clearly is "ALSO A VERY HAPPY NEW YEAR".

We would like to know if any automatic digital computer has been programmed to solve this kind of puzzle.