Computer ◆ Conservation ◆ Society

CCS-NW Christmas & New Year quiz 2020

What a year!

I remember back in February, wondering if we should cancel the March lecture in Manchester. And then worrying if we had been too hasty. That was very soon taken out of our hands. And just when we thought it could not get any worse and we could try to enjoy Christmas, it did.

For the quizzes in the last couple of years, I used photos from places I visited during that year. This year, I have been on a few "virtual trips" via my laptop. It has been fascinating and has taken me down so many interesting rabbit holes. I have also received help and suggestions from several people. I will acknowledge them later, with the answers.

Try not to use Google too quickly, remember "You are only cheating yourself". (Did you cheat?)

I apologise for any errors, which will probably be mine. I will publish the answers sometime in January.

We all hope that you and your families are keeping healthy and fit. And sane.
Good luck, Merry Christmas, and Happy (and better) New Year to all.

Bob Geatrell

(Bob@Geatrell.co.uk)

Chair, CCS NW Group.

Were you paying attention?

A few questions relating to the presentations this year. Some are from Manchester talks, some from London and several were Zoom talks. So, do not worry, you may not have seen them all.

Firstly, we sadly mourn the passing of Olaf Chedzoy, who talked in London about his first few days as a programmer with the Ferranti Mark 1. Regardless of his advanced age, he had a delightful twinkle in his eye and entertained us all. I invited him to come to Manchester (health permitting) and give the same talk, where I know he would have been enthusiastically received. Sadly, I received a note from his son just a few days later informing me that Olaf had died peacefully in his chair – Bob Geatrell

1. Who was tied to a tank?
   - In "The demise of Ferranti", by Prof John Wilson. He showed a cartoon of Sir Derek Alun-Junes, tied to a missile on top of a tank.
2. Which computer took to the dance floor?
   - In "Origins of GENESYS", Brian Shearing showed a photo of a Pegasus system installed in what was once a ballroom.

3. Computor / Computer? (Let's call the whole thing off).
   - In "The first day as a programmer for the Manchester Mark 1", Olaf Chedzoy said they could not decide whether how spell it. I wonder what they made of "program(me)"?
4. What was a scritcher?
   - In "Universal cryptanalytic machine", Marek Grajek referred to the Autoscritcher and Superscritcher which were two US systems developed in the US to decrypt Enigma messages.
5. Where might you have seen a clod?
   - Olaf Chedzoy said that "clods" might appear on the screens of the Williams tubes when they were failing.
6. What had a mushroom on top?
   - In reviewing his "colourful" career in the IT business, Michael Grant showed a picture of an EWACS plane with the radar looking like "a mushroom on top".
7. What can be installed anywhere?
   - LEO Films. Apparently, the LEO could be installed "anywhere". Maybe not a broom closet?
8. Who had a fur hat?
   - Marconi talk, Manchester. "FUR HAT" was the code name of a Swedish Military Radar installation.
9. When did a lift cause a nuisance?
   - LEO Films. Intermittent problems were eventually found to be caused by electrical interference from a lift.
10. What or who went on the Manchester Guardian train?
    - GENESYS used the train to transfer input and output between London and the Atlas in Manchester. It was only feasible due to the early morning newspaper train.
11. What was in a container at Rotterdam?
    - In "The demise of Ferranti", by Prof John Wilson. No one really knows. Supposedly the auditors were told a shipment was in a container at Rotterdam. They located the container but neglected to check if there was actually anything inside.

Mechanicals

Even before (and after) electronics burst upon the scene, there were some amazing devices. Can you identify these?

#1

Tide Computer - The Doodson-Légé Tide Predicting Machine, currently in Liverpool.

#2

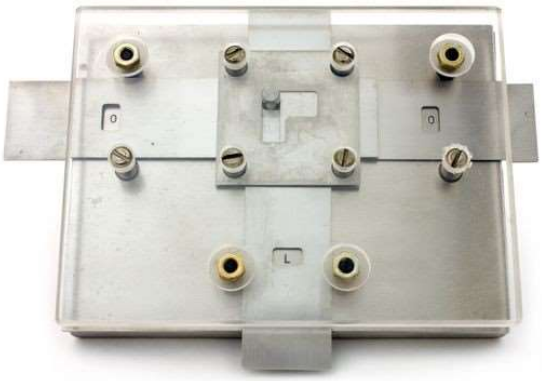
NOT Babbage's! This is Georg Scheultz's Difference Engine (in the Science Museum).

#3

The Antikythera mechanism, designed to calculate astronomical positions.

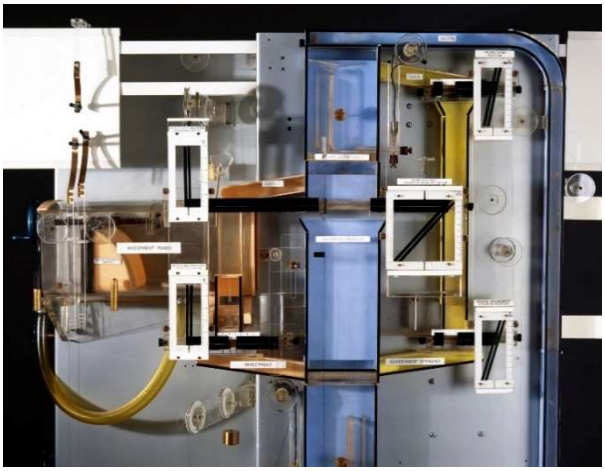
#4

A Planimeter, used for measuring areas of irregular shapes.



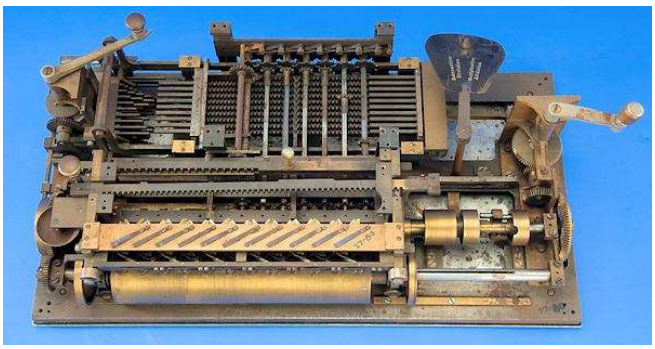
#5

A replica logic gate from Zuse's Z1



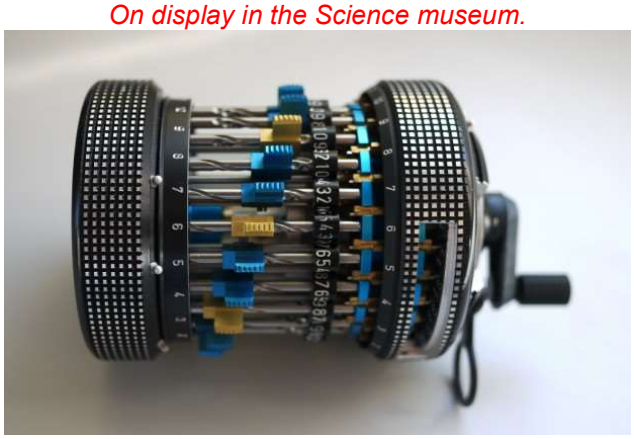
#6

Phillips Economics Analogue computer (aka MONIAC). On display in the Science museum.



#7

"Millionaire" calculator. This one is missing its cover. Very late 19th century



#8

The mid-20th century "Curta" calculator

Coding

Programming languages and other codes. Some old, some new, some easy, others …?

Can you identify:

(Thanks to Dik Leatherdale for many of the samples, including a shameless self plug)

1. Algol 60 . From "A Primer of Algol60 programming" – Dijkstra

```
begin real x,y,w;integer k;
      x := 5/13; y := 12/13;
      for k := 1 step 1 until 1000 do
      begin u := 0.6 × x − 0.8 × y;
            y := 0.8 × x + 0.6 × y;
            x := u;
      end
end
```

2. LISP 1.5

```
DEFINE ((
    (FACTORIAL (LAMDA (N) (COND ((ZEROP) N 1)
    (T (TIMES N (FACTORIAL (SUB1 N) ))) )))
    ))
```

3. SCL (VME's JCL) From "Series 39 VME – Using the system"

```
IF SUMMMARY = "YES"
THEN
   BEGIN
     ASSIGN_FILE(NAME=DATA, LNA=INPUT)
     CREATE_FILE(LNAME=OUTPUT)
     ENTER SELECT_DATA_SUMMARY
     SAVE_FILE(*OUTPUT)
   END
FI
```

4. CPL, Great-grandfather of C. From "CPL Elementary Programming Manual" – John Buxton

```
routine Gaussquad [real a , b , I , function f]
    ref I
    §   let s = (b - a)
          I := s(.27778 f[a + .11270s] +
                 .44444 f[a + .50000s] +
                 .27778 f[a + .88730s] )
                                        $
```

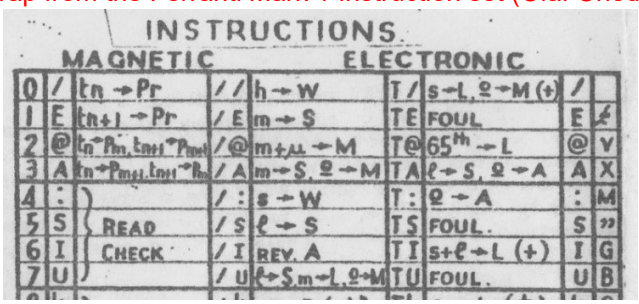
5. Algol 68. From "History of Programming Languages" – Charles Lindsey

```
proc innerproduct = (proc(int)real a, b, int k, ref real y) void:
  begin loc real s := 0;
    for i to k do s+ := a(i) * b(i) od;
    y := s
  end;
```

6. Compiler Compiler (Recently in Resurrection Iss 92)

```
ROUTINE [AS] ≡ SET MASK
     B3 = B1 & *00003700
     SHIFT B3 DOWN 4                ,| HALFWORD NUMBER IN THE LIST
     B3 = B3 + *00040000            ,| ADDRESS TO BE MODIFIED
     B5 = B1 & 15                   ,| BIT NUMBER
     B4 = 0.01
     SHIFT B4 UP B5
     (B3) = (B3) V B4
     END
```

7. A scrap from the Ferranti Mark 1 Instruction set (Olaf Chedzoy)



INSTRUCTIONS

MAGNETIC				ELECTRONIC				
0	/	$t_n \to P_r$	/ /	$h \to W$	T /	$s \to L, \varrho \to M (+)$	/	
1	E	$t_{n+1} \to P_r$	/ E	$m \to S$	T E	FOUL	E	¢
2	@	$t_n \to P_m, t_{n+1} \to P_{m+1}$	/ @	$m+\mu \to M$	T @	$65^{th} \to L$	@	¥
3	A	$t_n \to P_{m+1}, t_{n+1} \to P_m$	/ A	$m \to S, \varrho \to M$	T A	$\ell \to S, \varrho \to A$	A	X
4	:	)	/ :	$s \to W$	T :	$\varrho \to A$	:	M
5	S	READ	/ S	$\ell \to S$	T S	FOUL.	S	"
6	I	CHECK	/ I	REV. A	T I	$s+\ell \to L (+)$	I	G
7	U	)	/ U	$\ell \to S, m \to L, \varrho \to M$	T U	FOUL.	U	B

8. SQL – "Structured Query Language"

```
select studentID, FullName, sat_score, recordUpdated
 from student
 where (
       studentID between 1 and 5
       or studentID = 8
       or FullName like '%Maximo%'
       )
       and sat_score NOT in (1000, 1400);
```

9. IBM JCL "Job Control Language"

```
//STEP10 EXEC PGM=IEFBR14
//SYSPRINT DD SYSOUT=*
//SYSOUT DD SYSOUT=*
//SYSDUMP DD SYSOUT=*
//DD1 DD DSN=MATEKS.TEST.PS,
//DISP=(NEW,CATLG,DELETE),
//SPACE=(TRK,(1,1),RLSE),
//UNIT=SYSDA,
//DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=800)
//*
```

10. Javascript (creating HTML)

```
function entry(year, calleryear, text){
    if (text != "") {
        write_entry("<td colspan=3", year, calleryear, text)
    } else {
        write_entry("<td", year, calleryear, text)
    }
}
```

11. Mark 1 Autocode (Tony Brooker)

```
   n1 =  201
   n2 =  301
  v99 = 0
7 v98 = vn1 x vn2
  v99 = v99+v98
   n1 = n1+1
   n2 = n2+1
   j7, 280 >= n1
```

12. FORTRAN (ASA)

```
      DO 15 I=1,20
 5    IF (A(I)-B(I))10,15,15
10    A(I)=A(I)+1
      B(I)=B(I)-2
      GOTO 5
15    CONTINUE
```

13. COBOL. From "Series 39 VME – Using the system" - Dik Leatherdale (Thanks, Dik)

```
PROCESS-PARA.
    READ IN-FILE AT END
      MOVE "Y" TO EOF.
    IF EOF = "Y"
        NEXT-SENTENCE
    ELSE
        IF IN-VAR-2 IS NOT ZERO
            MOVE IN-REC TO OUT-REC
            WRITE OUT-REC.
```

14. Rapira (Russian for "rapier")

```
ПРОЦ СТАРТ()
    ВЫВОД: 'Привет, мир!!!'
КОН ПРОЦ
```

15. FORTRAN V

```
      DO (X) I=1,10
      DO (X) I=1,10
Y     A(I)=B(I) GOTO X
      GOTO X
Z     A(I)=0
X     CONTINUE
```

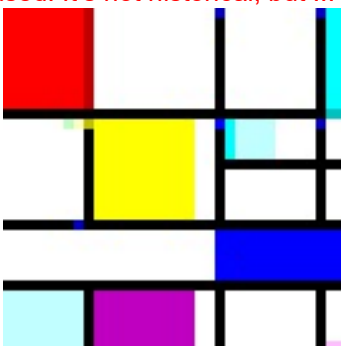
16. Postscript

```
/Times-Roman findfont
12 scalefont
setfont
newpath
100 200 moveto
(Hello World) show
```

17. BASIC, but in Chinese.

```
10 卜=0
20 入 水, 火
30 從 日 = 水 到 火
40 卜 = 卜+對數(日)
50 下一 日
60 印 卜
```

18. Piet – One of a number of “esoteric” languages, just to show that it doesn’t have to be character input based. It’s not historical, but ...

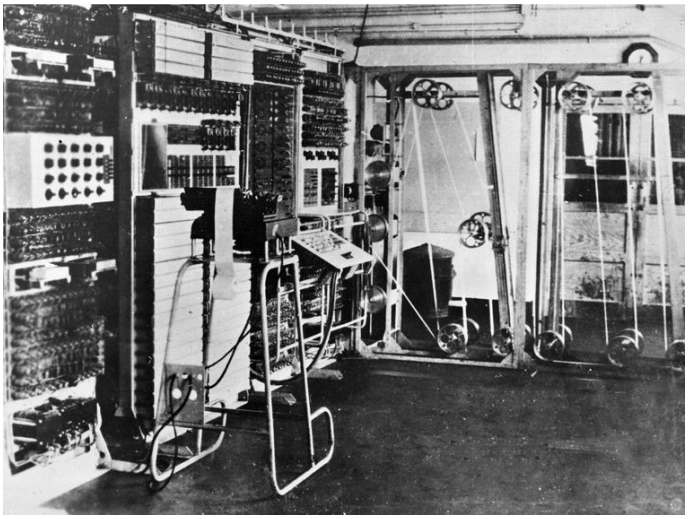


Manchester Computer Science (mainly)

Most (not all) of these photos are from the archives at the School of Computer Science at the University of Manchester. A few are directly related to the University, but most were used for illustrative purposes. Can you identify them and/or pick out any interesting features – equipment, locations, people?

The 3 colour photos below (which were converted to B&W for the quiz) are courtesy of Bill Barksfield. The comments are his.

The others (in black and white here) are from Jim Miles at the University of Manchester. See footnote[1].



#1

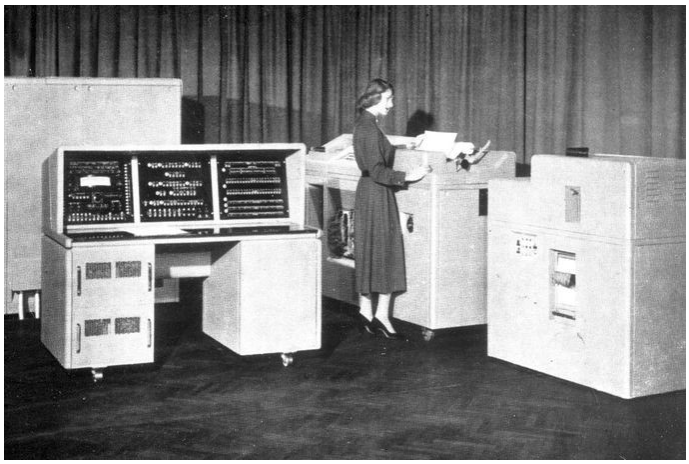
An easy one for starters – Colossus at Bletchley Park. This one had a "double bedstead" to speed operations.

#2

Metrovic MV950 computer. This was an engineered version based on Manchester's transistor computer.

#3

The URAL 2 built in the USSR from 1959, this example seen in the Technical Study Stores in Budapest



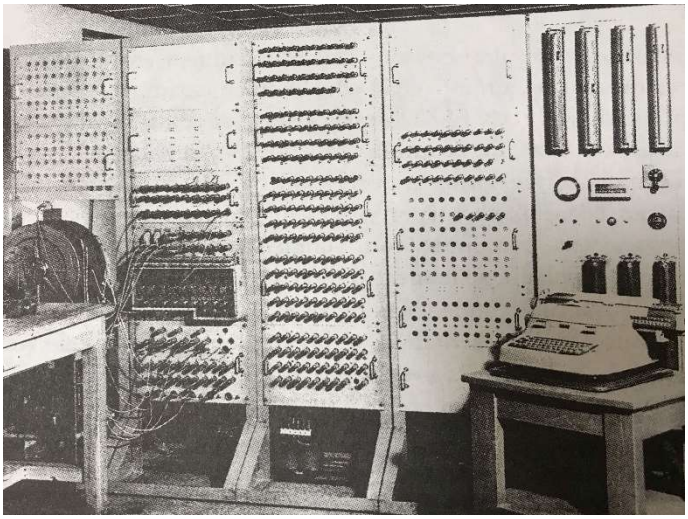
#4

HEC 4 or BTM / ICT 1201. The company changed names. Impressive parquet floor in the computer room

[1] The black and white images came from the University of Manchester's computing history image collection, some of which is visible via their image forum. If you register to use the forum you can browse the images and if you can identify any **accurate** details about them, you can add to comments such that the information will accumulate over time. To assist, go to: https://icarus.cs.man.ac.uk/history/index.php and click "Register". Registration must be approved by Jim Miles before you can use the site. This may take a little while.

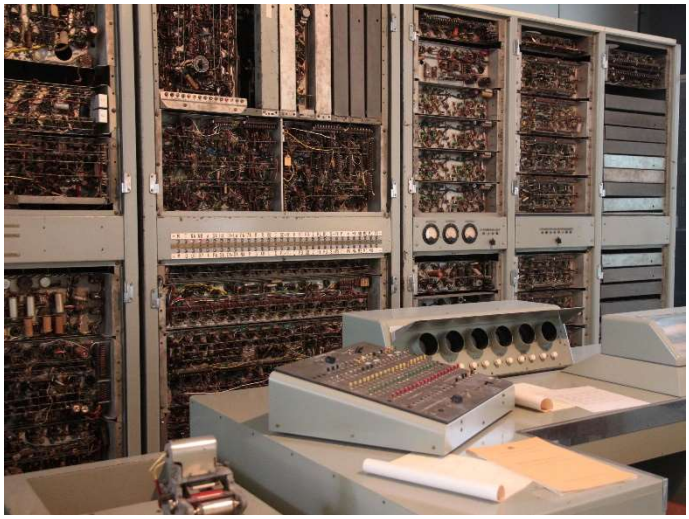
Please use your **real name** as a username so that comments are transparently attributed. Under "select timezone" please choose "select current time".

If you previously used the system created by Toby Howard in 2010, you will still have a username and any comments will have been preserved. In that case, please contact Jim.Miles@manchester.ac.uk to recover your logon details.



#5

ESKO – the first computer designed in Finland.



#6

CSIRAC seen in the Melbourne Museum in 2011, now on display at 'Scienceworks'

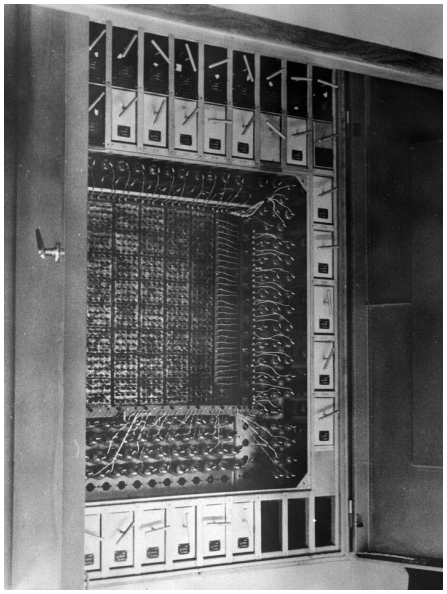
#7

Manchester University technologies[2] – Flip flops from Ferranti Mk1, Atlas and MU5. Approx. 10x speed improvement each time.

#8

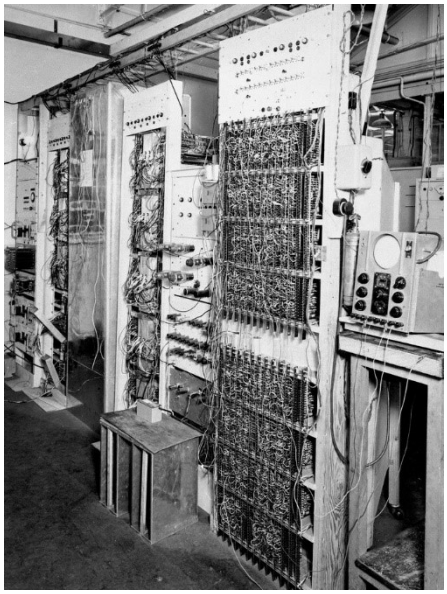
~1930s office scene. IBM Type 80 Model 1 Sorter (left) IBM Type 285 Tabulator (centre). Machine on right unknown, possibly another Type 80.

[2] The picture was taken in 1973~74 for Simon Lavington's book. "A History of Manchester Computers"



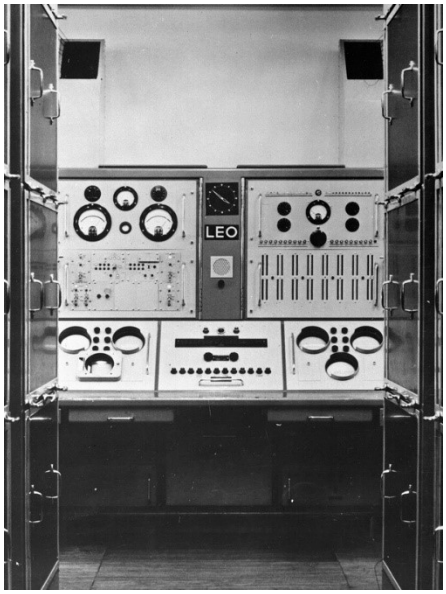
#9

EDSAC 2's microprogram store. A 32x32 array of cores



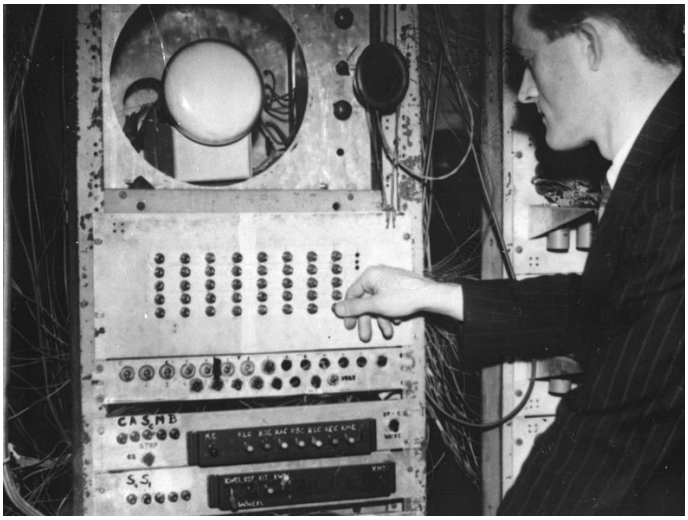
#10

Elliott Bros NICHOLAS experimental computer using nickel delay lines



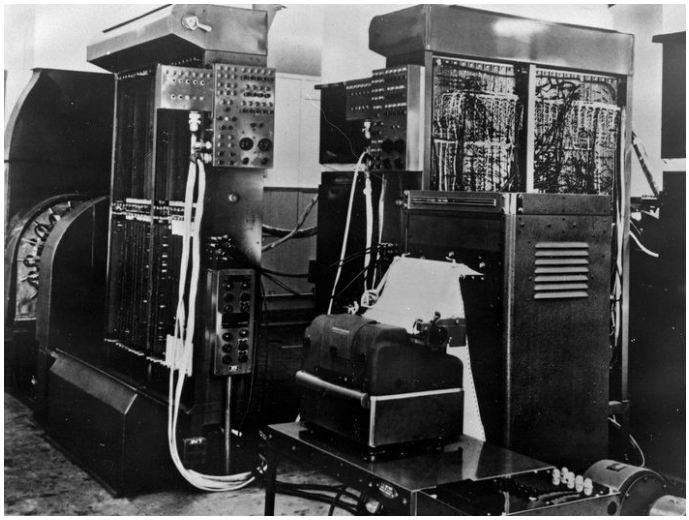
#11

LEO I Engineering console[3] (logo was blanked for the quiz)



#12

Tom Kilburn at the Baby "typewriter". The black oval was an intercom mechanism to the room containing the magnetic drum.



#13

BINAC – from the developers of ENIAC, before EDVAC or UNIVAC. A serial machine, storage drum visible at left.

[3] A huge number of LEO related photos are available at the Computing History Museum and using their impressive geographic viewer.

#14

The Robotron 300 made in East Germany from 1969, about 350 were delivered. An IBM 1401 clone I believe

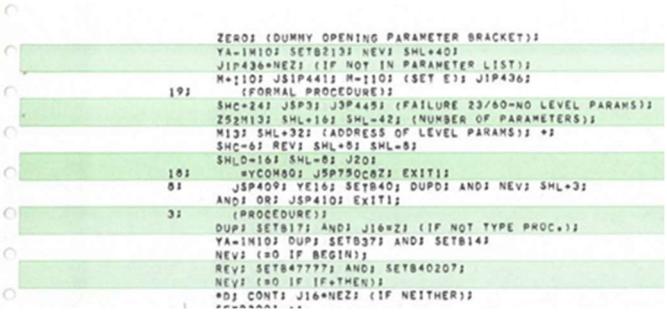
#15

A Mercury computer undergoing tests in the factory.

A mixed bunch

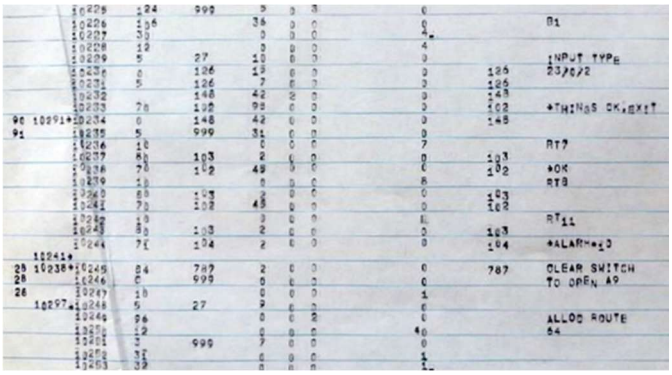
Thanks to David Holdsworth for most of these.

1. For which machines are these assembly language listings?



```
                ZERO; (DUMMY OPENING PARAMETER BRACKET);
                YA=1W10; SETB213; NEV; SHL+40;
                J1P436+NEZ; (IF NOT IN PARAMETER LIST);
                M=110; JS1P441; M=110; (SET E); J1P436;
19;                (FORMAL PROCEDURE);
                SHC+24; J5P3; J3P445; (FAILURE 23/60-NO LEVEL PARAMS);
                Z52M13; SHL+16; SHL-42; (NUMBER OF PARAMETERS);
                M13; SHL+32; (ADDRESS OF LEVEL PARAMS); +;
                SHC-6; REV; SHL+5; SHL-5;
                SHLD=16; SHL-8; J20;
16;                +YCOM80; J5P750C8Z; EXIT1;
8;               J5P409; YE16; SETB40; DUPD; AND; NEV; SHL+3;
                AND; OR; J5P410; EXIT1;
3;                (PROCEDURE);
                DUP; SETB17; AND; J16+NZ; (IF NOT TYPE PROC.);
                YA=1W10; DUP; SETB37; AND; SETB14;
                NEV; (=0 IF BEGIN);
                REV; SETB47777; AND; SETB40207;
                NEV; (=0 IF IF+THEN);
                +DJ CONT; J16+NEZ; (IF NEITHER);
```

KDF9 – part of Kidsgrove Algol



LEO III – (Intercode Translator)

2. Where was the last KDF9 switch off?
   - NPL – National Physical Laboratory
3. The CDC 1604 got its name from the ERA1103. How?
   - CDC 1604 got its name from the ERA1103 (essentially the same thing but built with valves) by adding 501 - being the address (501 Park Avenue) of CDC headquarters.
4. What does yacc stand for?
   - “Yet Another Compiler Compiler”.
5. How did the name of the IBM 7090 come about?
   - IBM 709”T” – Transistor version of the 709
6. What was the word-length on Atlas?
   - 48 bits
7. Ada is based on which earlier programming language?
   - Pascal

8. Whose work was this?

Diagram for the computation by the En

Number of Operation.	Nature of Operation.	Variables acted upon.	Variables receiving results.	Indication of change in the value on any Variable.	Statement of Results.	Data. $^1V_1$ ○ 0 0 1 [1]	$^1V_2$ ○ 0 0 2 [2]	$^1V_3$ ○ 0 0 4 [n]	$^0V_4$ ○ 0 0 0 [ ]
1	×	$^1V_2 \times {}^1V_3$	$^1V_4, {}^1V_5, {}^1V_6$	$\left\{ {}^1V_2 = {}^1V_2 \atop {}^1V_3 = {}^1V_3 \right\}$	$= 2n$	...	2	n	$2n$
2	−	$^1V_4 - {}^1V_1$	$^2V_4$	$\left\{ {}^1V_4 = {}^2V_4 \atop {}^1V_1 = {}^1V_1 \right\}$	$= 2n - 1$	1	...	...	$2n - 1$
3	+	$^1V_5 + {}^1V_1$	$^2V_5$	$\left\{ {}^1V_5 = {}^2V_5 \atop {}^1V_1 = {}^1V_1 \right\}$	$= 2n + 1$	1	...	...	...
4	÷	$^2V_5 \div {}^2V_4$	$^1V_{11}$	$\left\{ {}^2V_5 = {}^0V_5 \atop {}^2V_4 = {}^0V_4 \right\}$	$= \frac{2n-1}{2n+1}$	...	...	...	0
5	÷	$^1V_{11} \div {}^1V_2$	$^2V_{11}$	$\left\{ {}^1V_{11} = {}^2V_{11} \atop {}^1V_2 = {}^1V_2 \right\}$	$= \frac{1}{2} \cdot \frac{2n-1}{2n+1}$	...	2	...	...
6	−	$^0V_{13} - {}^2V_{11}$	$^1V_{13}$	$\left\{ {}^2V_{11} = {}^0V_{11} \atop {}^0V_{13} = {}^1V_{13} \right\}$	$= -\frac{1}{2} \cdot \frac{2n-1}{2n+1} = A_0$	...	...	...	...
7	−	$^1V_3 - {}^1V_1$	$^1V_{10}$	$\left\{ {}^1V_3 = {}^1V_3 \atop {}^1V_1 = {}^1V_1 \right\}$	$= n - 1 \ (= 3)$	1	...	n	...
8	+	$^1V_2 + {}^0V_7$	$^1V_7$	$\left\{ {}^1V_2 = {}^1V_2 \atop {}^0V_7 = {}^1V_7 \right\}$	$= 2 + 0 = 2$	...	2	...	...

- Ada Lovelace – this has been described as the “first published computer algorithm”

9. The IBM 1620 had the in-house name “CADET”. “CADET” was reverse engineered into an acronym. But what did “CADET” stand for?
   - “Can’t Add, Doesn’t Even Try”. It had no Adder circuits. It used store lookup tables to do addition.

10. What was Dijkstra's primitive for synchronisation called?
    - Semaphore

11. Which computer was used in the BBC Domesday project?
    - BBC Micro

12. The name “IBM” was famously reverse-engineered by IBM staff into what? (I‘m also aware of an acronym used elsewhere, but we’ll leave that one out)
    - “I’ve Been Moved”.

13. The name “ICL” was also famously reverse-engineered (by IBM staff??) into what?
    - “It Can’t Last”.

14. Which organisation was the last user of George3 in the UK?
    - British Steel, Rotherham

15. Who was the chief designer of Multivac?
    - Cheat question – It was a fictional creation of Isaac Asimov.