R. Dewitt = Components Talk Aug 25, '58

definition: - thing which computer cannot do without -
- not just a resistor, etc.

corporate policy on components: IBM's business is systems not components.

(1) Research: which might be applicable in machines. competitive advantage.
- patents, etc, Exploit new techniques (real reason.)

(2) Engineering: on critical parts only. — to get best at ultimate form.
- get view of ultimate costs.
- to get wise procurement policies — select vendors
- perhaps set up manufacturing if necessary

(3) Vendors: cooperative development (eg T.I.), lead time, etc.

Transistors — Bot Slide NPN, PNP post bipts, alloy, core drivers
Diodes
printed cards — plastic base printed.
magnetic cores.

alloy Trs. - fixed design — mostly production costs now — handling main cost,
cost $2.50 - $3.00 IBM dollars each,
- developed so could be done with one firing
- also leads done at same time.

Failure Rate .02 % per thousand hours (only 9 Rare failed in 608)
6 2/3 are intermittent contacts - should be fixed.
3 leaking cans " " "

Quality control: — hard to test for such small rates.
- test extremes at extreme ranges - study rates of change

quality saves money not costs money.
remove variations, etc.

Fast Drift Transistors: in plant
- a gradation of doping 1000/1 in .0001" between emitter & collector.
2 surfaces to treat.
PNP is easy to make due
NPN has been a problem
- emitter size 6 mils. - hard to make mechanically reliable. - some deterioration.
- should be as reliable as alloys eventually.

Drift Core Diodes: in model shop
NPN now, may switch to PNP
all big parts - temperature problems - will burnout if half selected
are looking at silicon transistors. - slower but better

Thyratron types: 4 regions (PNPN)
- have been set aside { point contact / gold bonded } hard to handle parts.
now working on junction model - much better. { half has speed of drift / half has " " alloy.
also controllable bi-stable device is being studied.

Micro Wave Logic: - high cost amplifiers are problem.
can use a junction diode

present generation – still individual components assembled

later ; – more function in one step – more printed circuits
– many devices on one piece – step along shifters, etc ;
– multiple gating, to control more things at once

Electro luminescence patches: printable but slow;
– input not electrically connected,

Ferrites : Phil Fox (second longest ever)
costs have been beat down 2 1¢ per tested core
much less than we can buy them . wiring costs 1½¢ more,
4 systems have been released.
– wide range of speeds & currents, – a trade off (speed, current, temperature)
Ferrite switch cores : – an automatic winding system

cores with multi-stable elements 3 way logic
may be able to go to 18 mil inside dia. (30 mil now)

Plated Nickel Iron alloys : 8 to 12 ns cycle.
– approximate medium speed memories. (Rand is working on high speed effort)
plate cores around printed wires –

Manganese-Bismuth . – a compact array – optical read outs – good for read only

Large buffers : ~1000 wds – might be better to use memory techniques

alloy Transistors – both electrodes are high voltage – can use resistance logic.

drift transistors – emitter is low voltage.

at present: Speed ~ $\frac{1}{(\text{Dia})^2}$ ← emitter dot

may be able to get speed without small dots – not yet,

Cost: eventually same as alloy – presently much more,

Western Electric drift trs. – concentric design

– @ 1.0 mpcs switching – circuits to use it?