

Department Meeting:

May 18/4, 58.

Topic: Dept 549: Circuits Level of Integration - Joe Logue

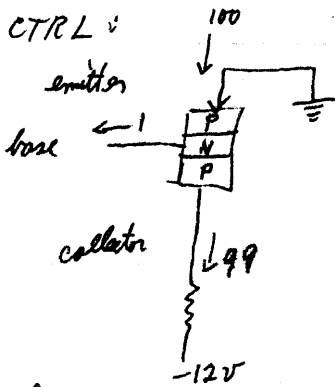
range from 024 → 7000.

to get: optimum cost - optimum performance.

Range of 7000: Drift current mode circs. ← used some way in circs.

785: alloy current mode circs. (non saturating)

~ 608
024: CTRL complementary Transistor resistor logic.

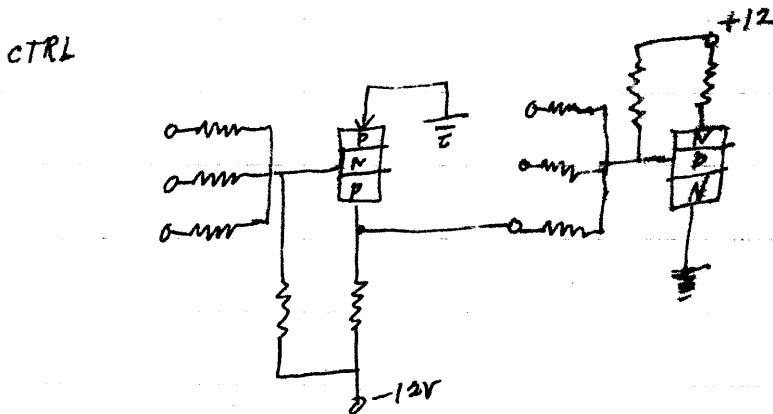


conducts if P is pos.

← one mill controls 99 mils

base resistance very large 5×10^{-6} ohms
 100×10^{-3} amps.

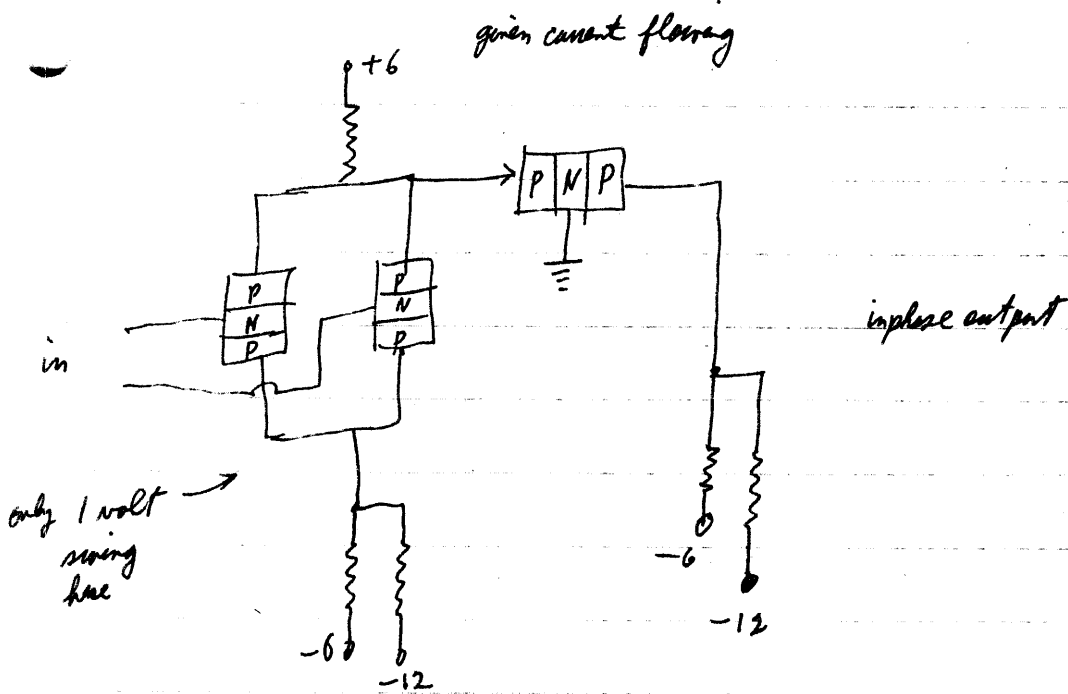
Speed
Alloy: 0.2-0.4 μ s



can get
 $Z \cdot A \cdot B + C \cdot D \cdot X$
with 2 transistors.

This instead of

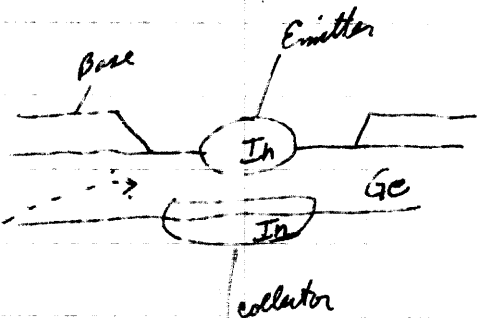
Permismake relay: faster than wire-contact. more reliable? used in 088, 305
will it go into production? to be decided end of this year.



These Transistors are not saturated

when saturated comes as output
lifetime 10-50 μ s

- current continues to flow until these are all collected.
- also capacitance between collector + base are higher - also α -cut-off freq. changes. (base width is effectively smaller)



another possibility: use CTRL with drifts, about 0.1 μ sec. speed.

Marginal checking

Power supplies $\pm 4\%$

CTRL $\pm 10\%$

drivers, relay drivers,

[Hot Spot, 1220F]

Manuals: 3 now out.

Some Transistors can hold off 200V. 10-30amps

GE Silicon Tra. 10 amps - 200-300V holdoff.

Diodes; another possibility
faster circ.
for 785?

Reliability.

In 608: 8 transistors have failed - most due to whiskers coming out.
- using 2 million hrs between failures.
- could "can" the circuits for no servicing

core logic: big disadvantage - no gain bandwidth
expensive & not as fast.

a combination of core for logic with transistors for gain.

1952-3: transistored 475 with point-contact Trs. - poor reliability.

SP. 1953: IBM went to alloy junctions. even though they were slower.

Machines were laid out, 607, 475, Data Transceiver. (604 was actually built in about 3 mos.)
Signal swing: low voltages.

on 608: demanded that we have both PNP's & NPN's. competitors went along with only one type PNP, eg Philco.

weak on Silicon Transistors: TI, Philco, GE, Raytheon are all doing better than IBM.

IBM quotes 44¢ per Tr in 1960-61 (about \$2.50 now.)

TI 83¢

Diode Logic: ? probably on its way out. - need larger signal swings and high current to operate diodes.

no. pluggable units in machine = "Standardization Factor"
no. of types

- This increases temps on transistors & makes them fail.
- cost is not much lower

RTA Test assembly

DC pulse circuits

120 nps delays due to

using better transistors: Philco microalloy transistors.

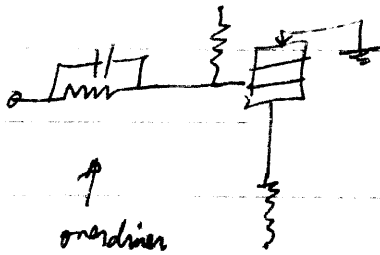
pulse T, an former logic,

8 to 15 nps delay per stage

poised down string,

DCTL direct coupled XSTR logic.

modified



can cause spikes due to partial changes. - go right thru C.