

Balansmodulators in fase type SSB exciter

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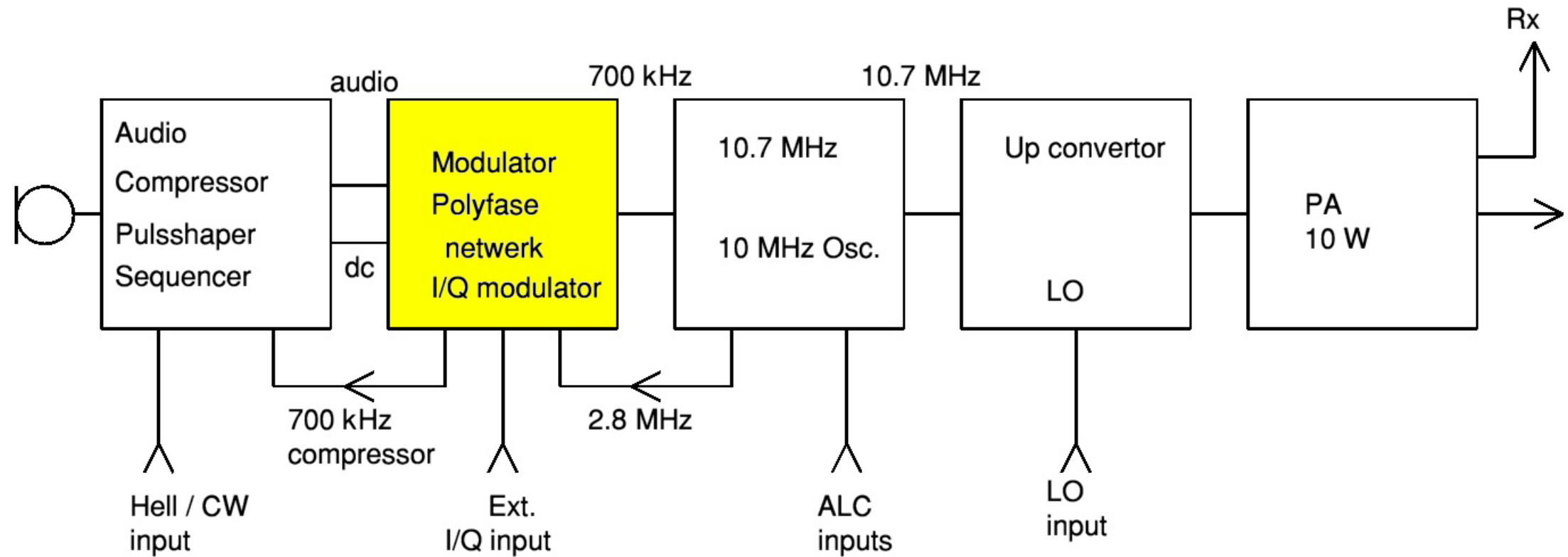
Problemen met bekende modulatorschakelingen

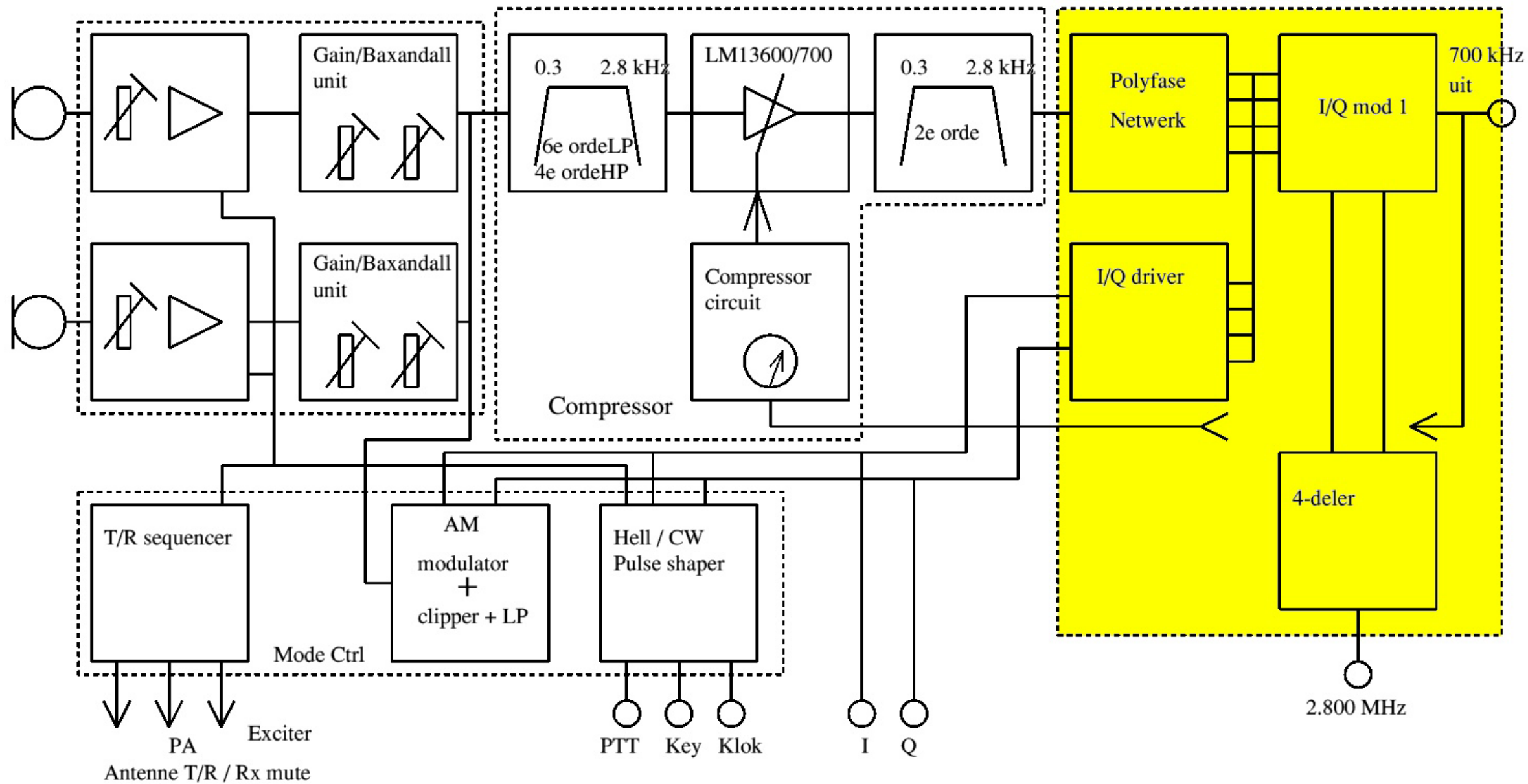
Oplossing met vierkwadranten analoge multiplier



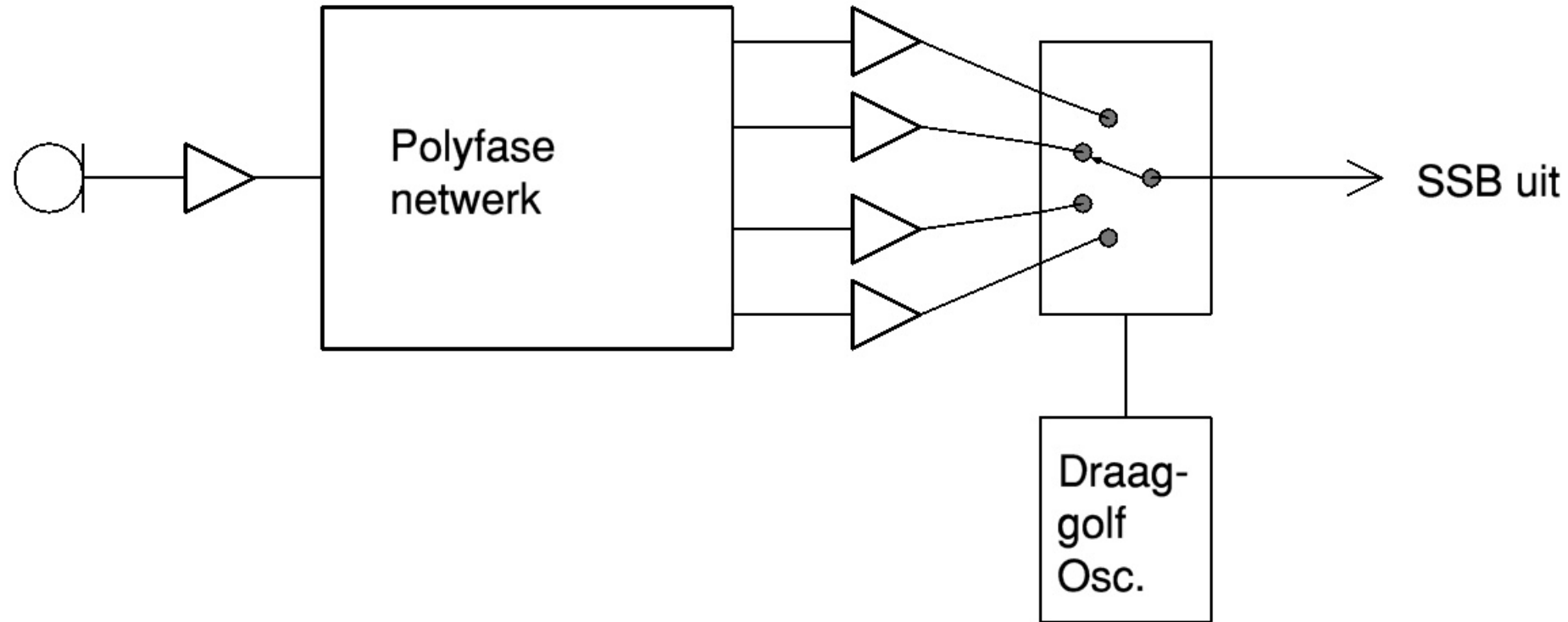


Blokschema Mult-mode HF Exciter

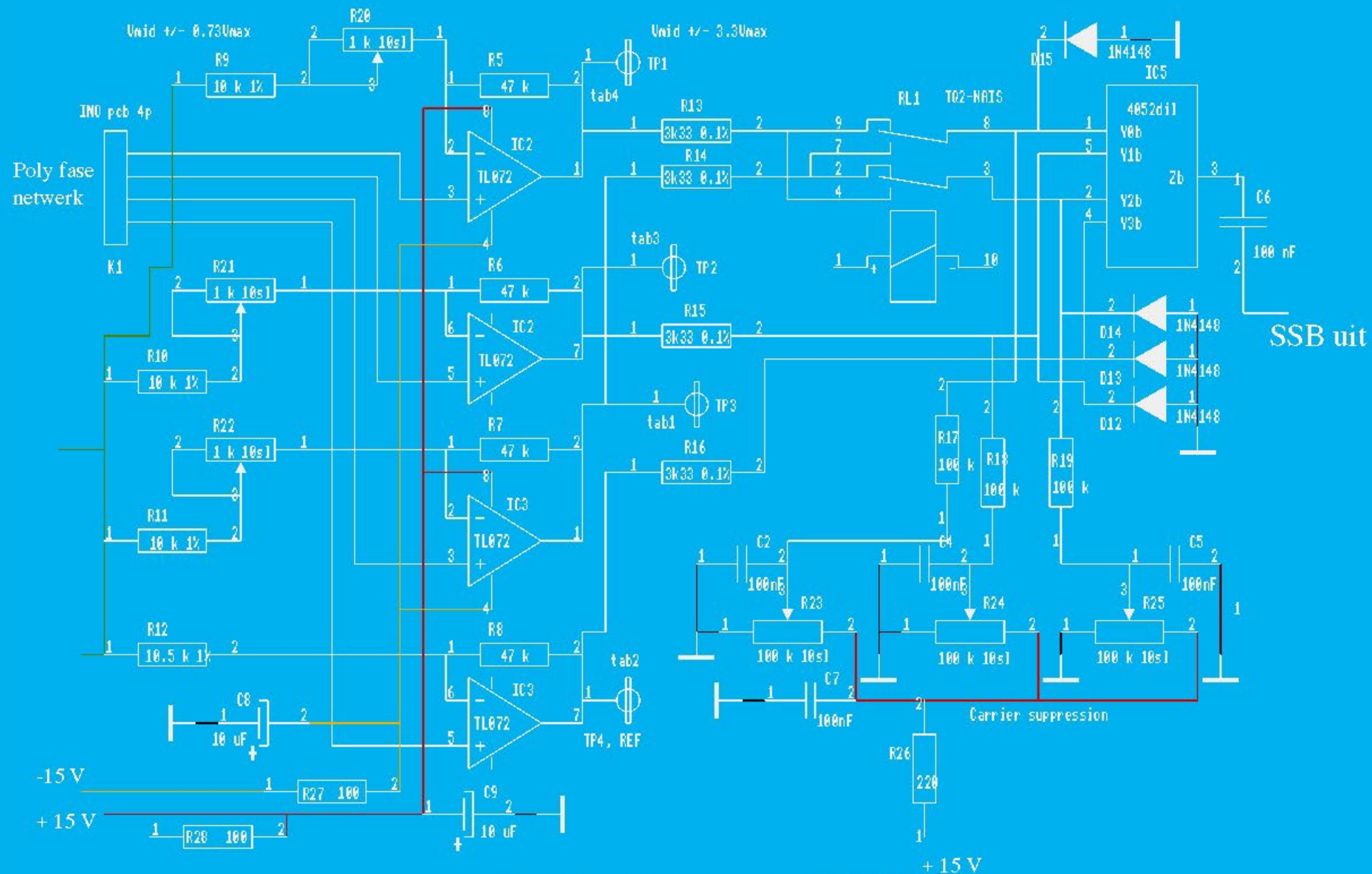




Principe SSB opwekking via fase methode en PFN.



- De fase methode is uitgevonden door Hartley
- Het polyfase netwerk is uitgevonden door M.J. Gingell in 1969.
- Pim Niessen, PA2PIM, heeft er in 1977 een afstudeer opdracht gewijd aan SSB opwekking met polyfase netwerk



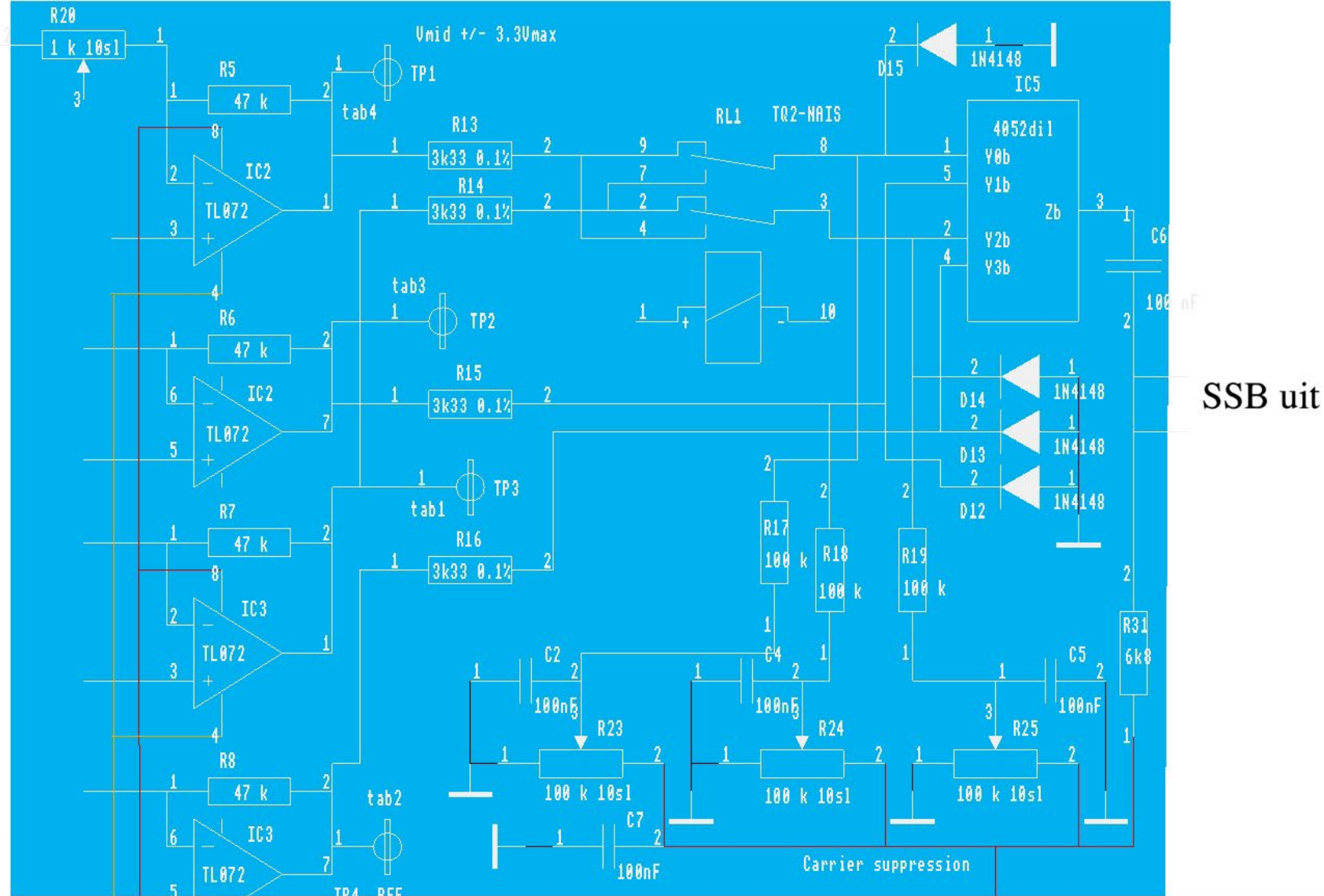
Eerste schakeling met de HEF 4052

PF 1

PF 2

PF 3

PF 4



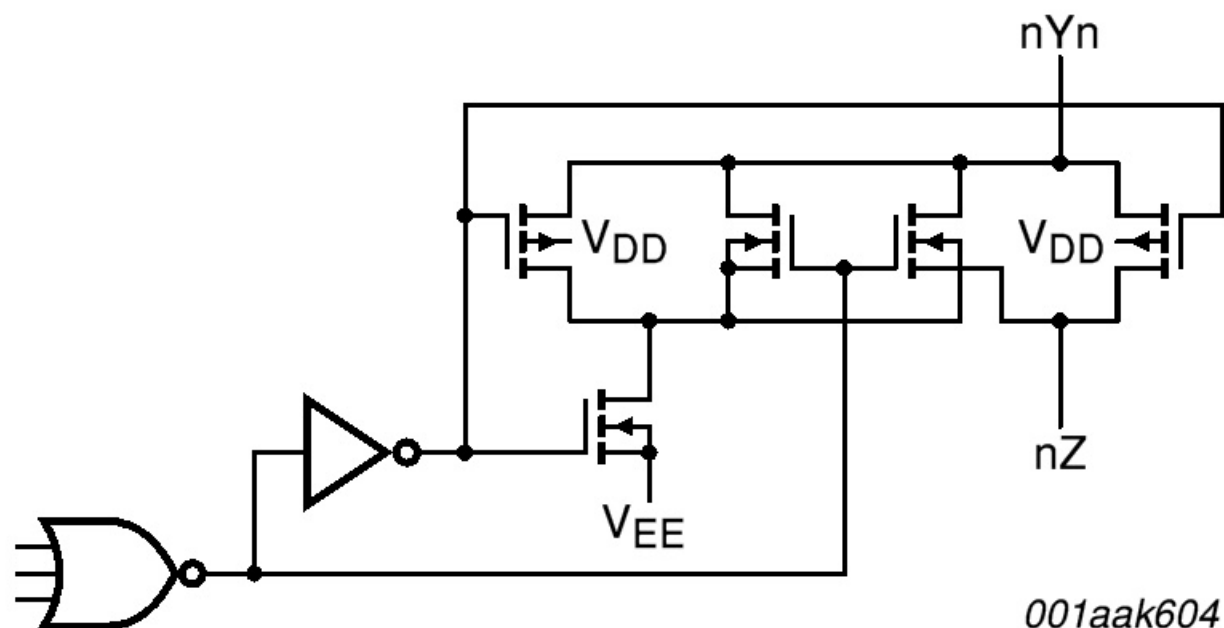


Fig 2. Schematic diagram (one switch)

- [1] To avoid drawing V_{DD} current out of terminal Z when switch current flows into terminals Y the voltage drop across the bidirectional switch must not exceed 0.4 V. If the switch current flows into terminal Z, no V_{DD} current will flow out of terminals Y, and in this case there is no limit for the voltage drop across the switch, but the voltages at Y and Z may not exceed V_{DD} or V_{EE} .

FST3253

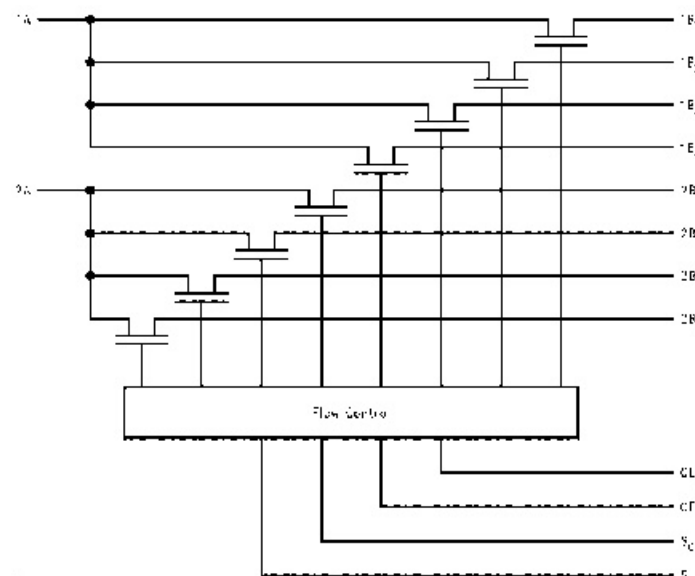
Dual 4:1 Multiplexer/Demultiplexer Bus Switch

General Description

The Fairchild Switch FST3253 is a dual 4:1 high-speed CMOS TTL-compatible multiplexer/demultiplexer bus switch. The low on resistance of the switch allows inputs to be connected to outputs without adding propagation delay or generating additional ground bounce noise.

When $\overline{OE}$ is LOW, S_0 and S_1 connect the A Port to the selected B Port output. When $\overline{OE}$ is HIGH, the switch is OPEN and a high-impedance state exists between the two ports.

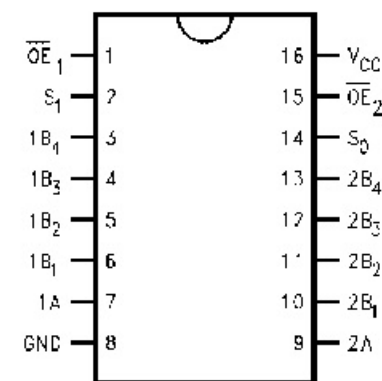
Logic Diagram



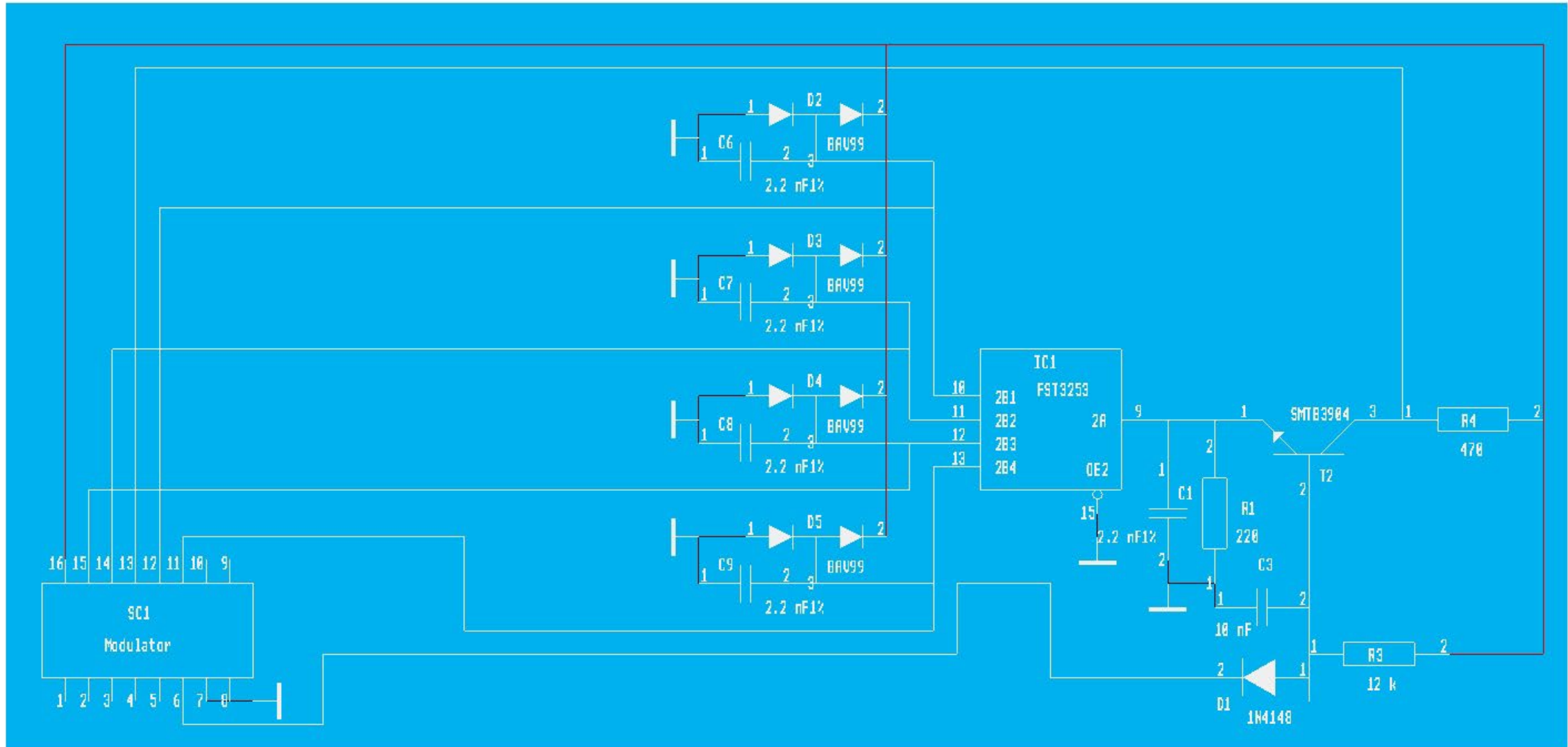
Features

- 4Ω switch connection between two ports.
- Minimal propagation delay through the switch.
- Low I_{CC} .
- Zero bounce in flow-through mode.
- Control inputs compatible with TTL level.

Connection Diagram



HEF 5052 vervangende subcircuit met FST3253

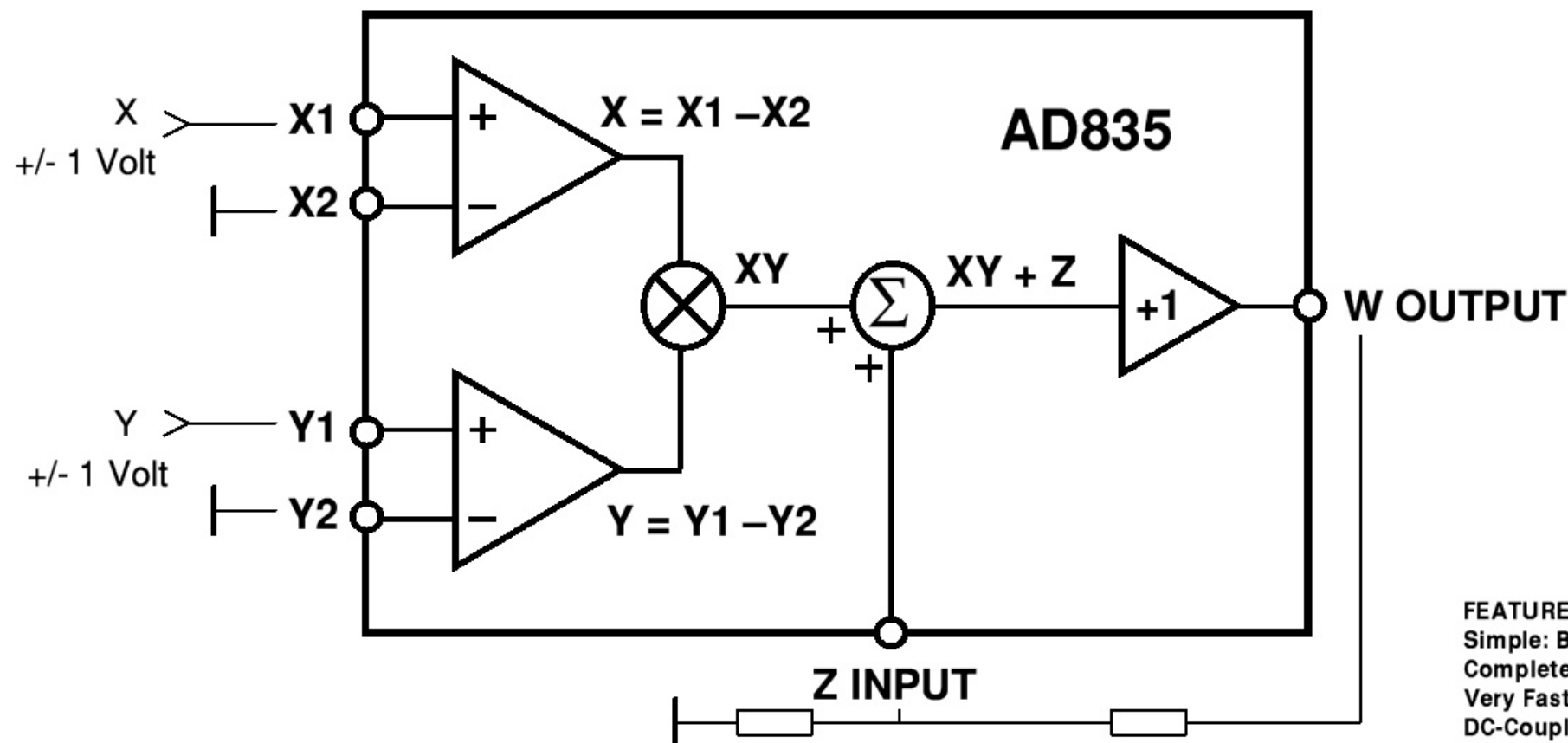


Ervaringen modulator met schakelmixers:

- De modulator met de schakelmixer (HEF 4052) werkte wel, bij een beetje uitsturing trad er vervorming op.
- Volgens fabrieksspecs konden er interne lekstromen ontstaan bij wat grotere ingangsspanningen.
- Nieuwe schakeling gemaakt met de FST3253, bekend uit vele ontvanger ontwerpen
- Hetzelfde probleem, nog iets erger!
- Probleem wordt veroorzaakt door de leegloopspanning op de niet-ingeschakelde ingangen.
- Oplossing: een echte analoge 4-kwadranten vermenigvuldiger toepassen.

AD835

250 MHz, Voltage Output
4-Quadrant Multiplier



$$W = \frac{(X1 - X2)(Y1 - Y2)}{U} + Z$$

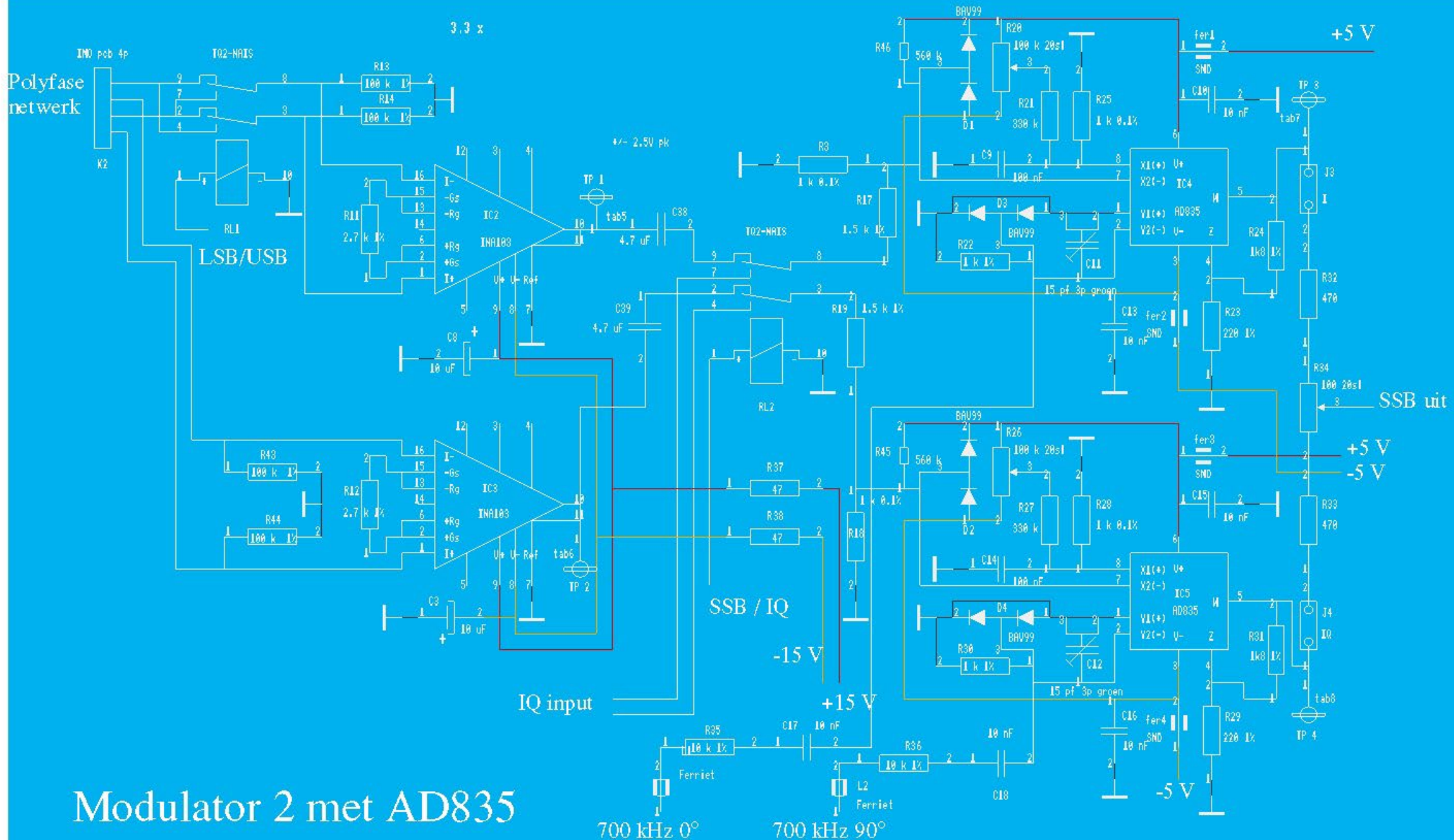
$$W = XY$$

FEATURES

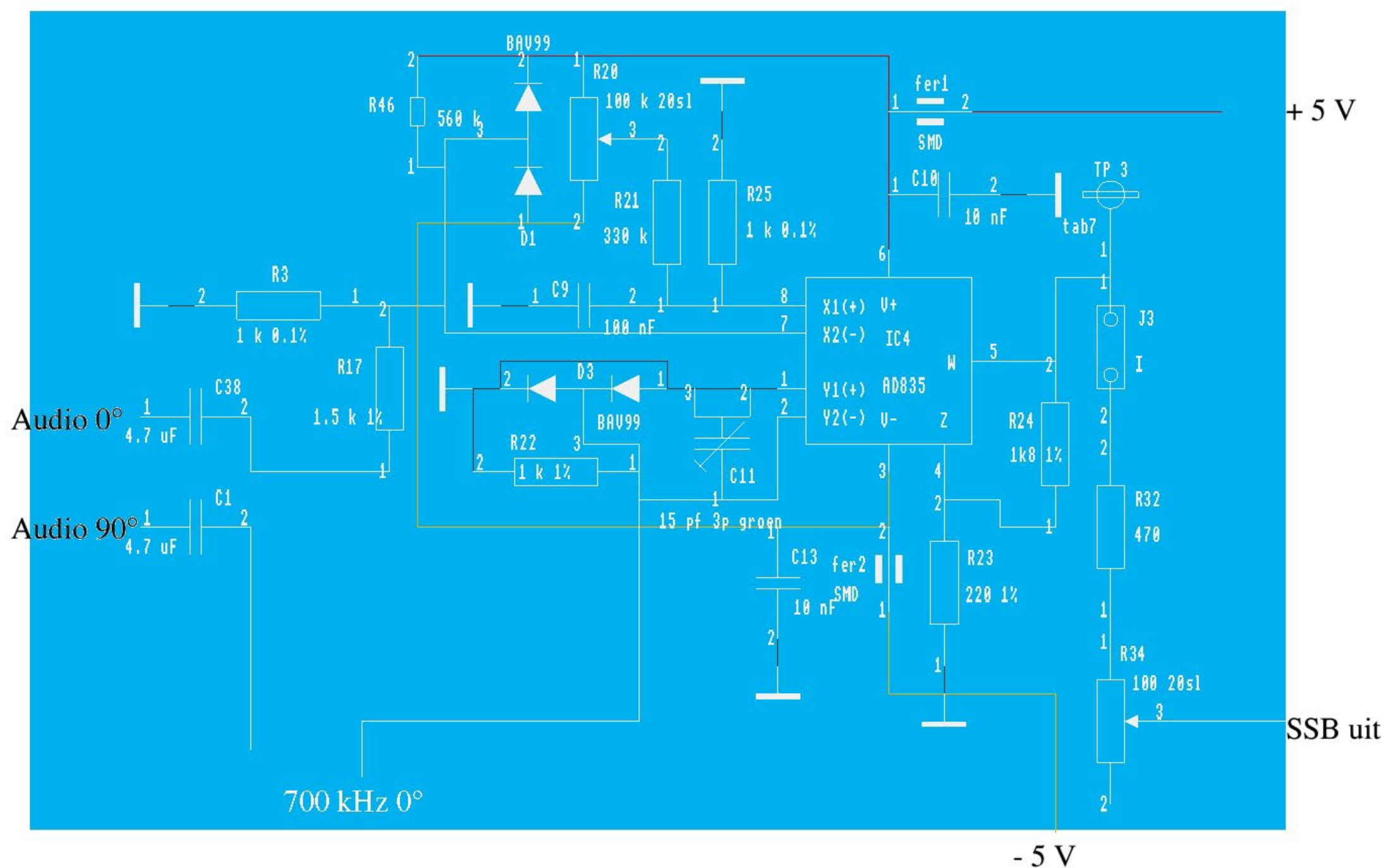
Simple: Basic Function is $W = XY + Z$
 Complete: Minimal External Components Required
 Very Fast: Settles to 0.1% of FS in 20 ns
 DC-Coupled Voltage Output Simplifies Use
 High Differential Input Impedance X, Y and Z Inputs
 Low Multiplier Noise: $50 \text{ nV}/\sqrt{\text{Hz}}$

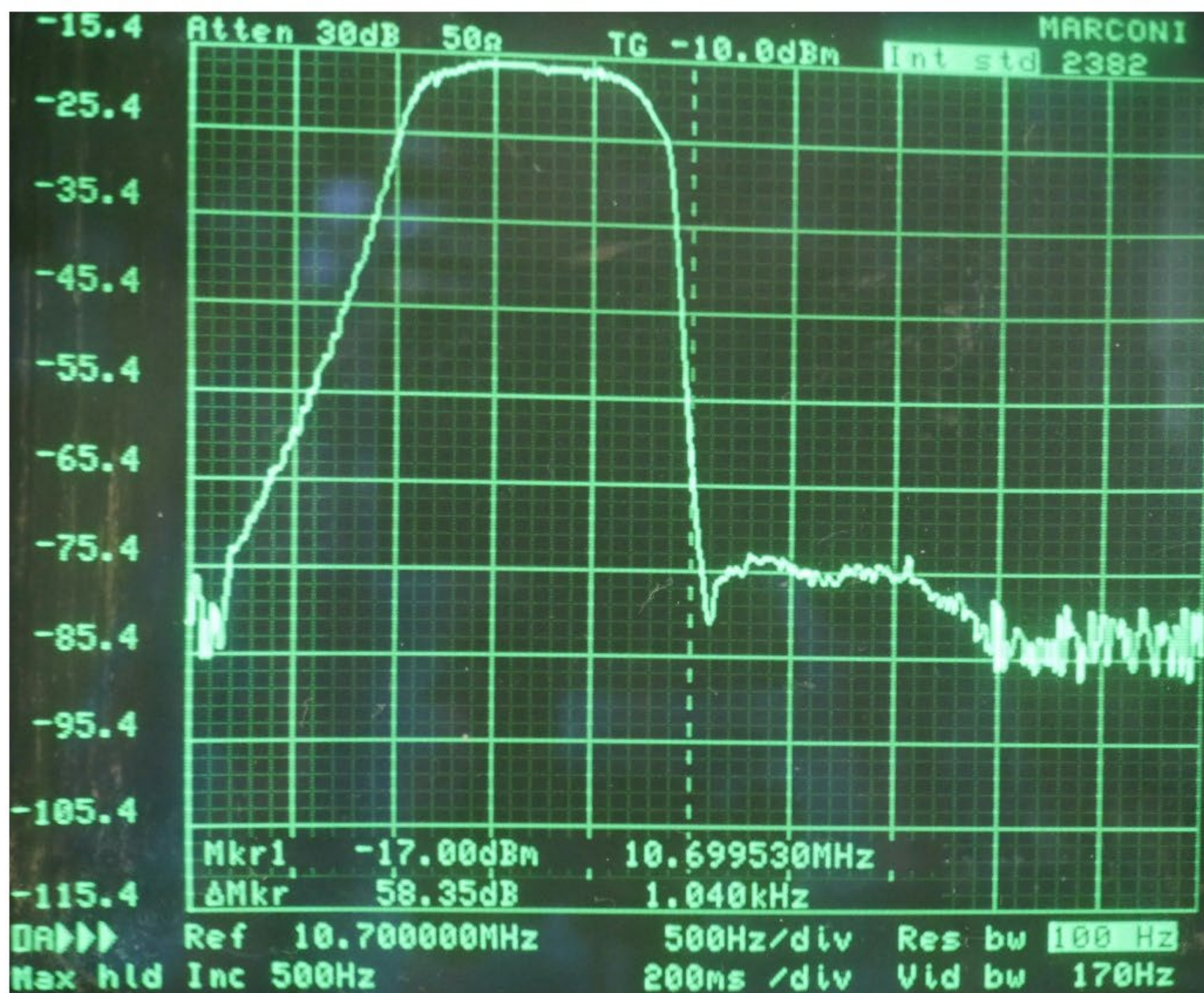
APPLICATIONS

Very Fast Multiplication, Division, Squaring
 Wideband Modulation and Demodulation
 Phase Detection and Measurement
 Sinusoidal Frequency Doubling
 Video Gain Control and Keying
 Voltage Controlled Amplifiers and Filters

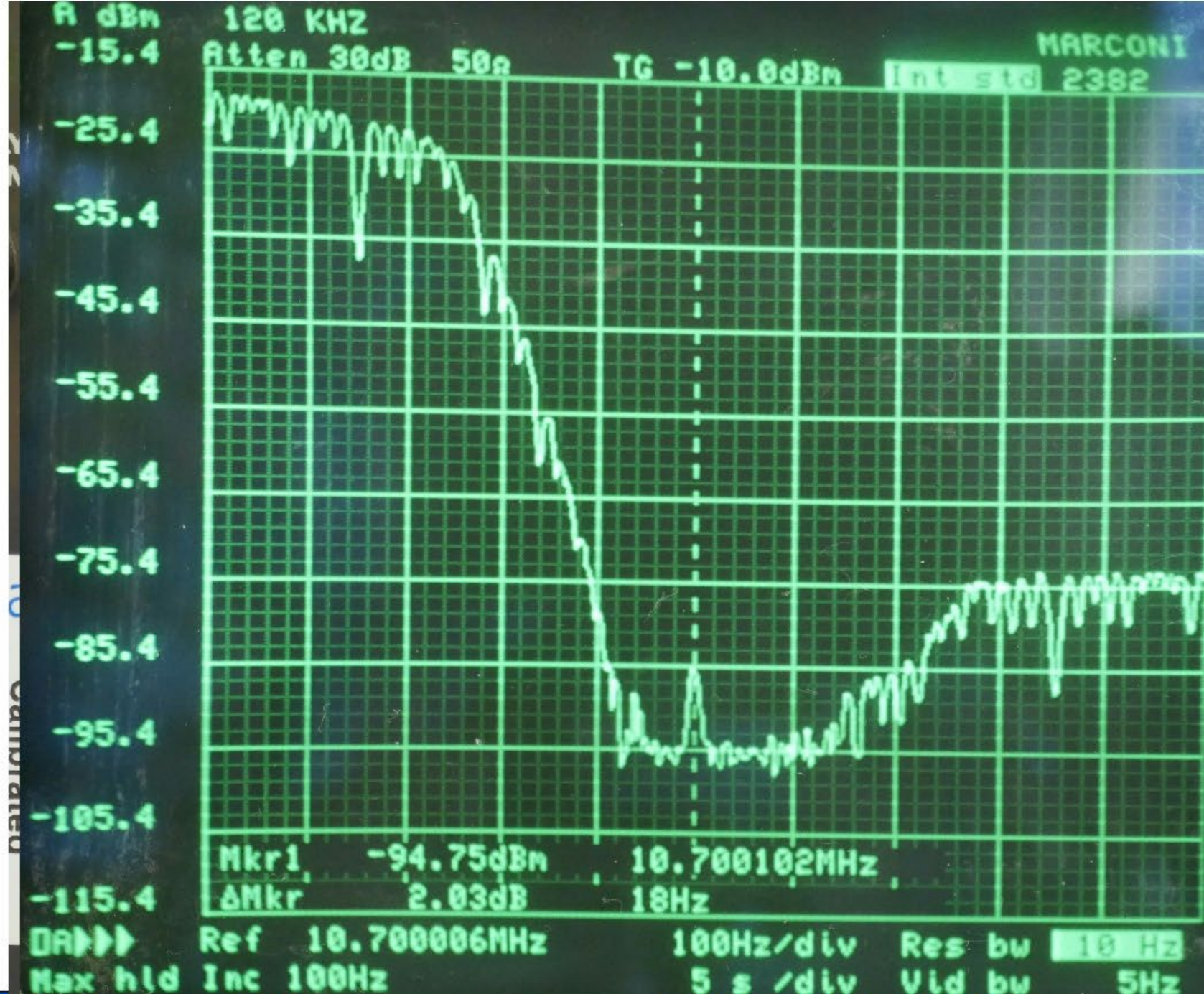


Modulator 2 met AD835





+/- 60 dB zijband
 onderdrukking



+/- 68 dB draaggolf
onderdrukking

THE END

Vragen en/of opmerkingen?