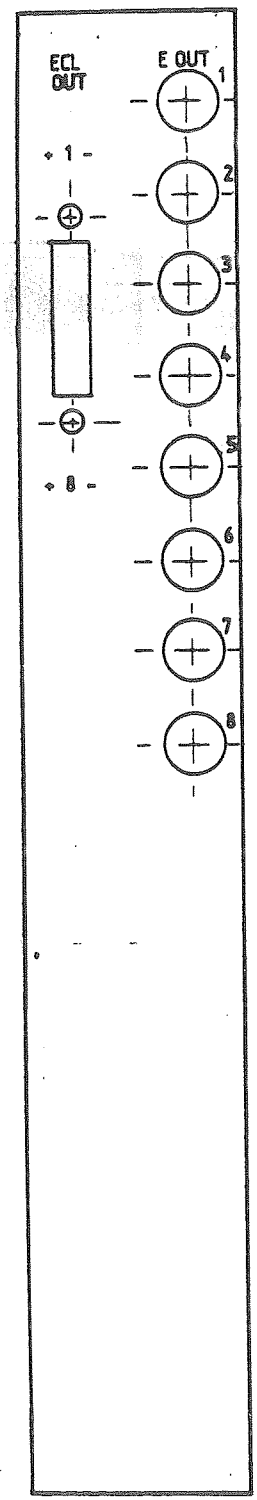
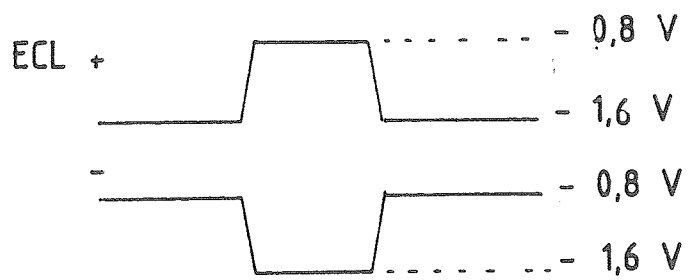
CF 8000

(REAR PANEL)



ANALOG OUT (AC COUPLED)

OUT B ; WIDTH= TB



DIFFERENTIAL LINE
LINE IMPEDANCE : 112.Ω

DELAY TIME : 2,4, ... 10 ns
USING 10 ns HYBRID DELAY PLUG IN

AVAILABLE ALSO :
6,12, ... 30ns (30 ns PLUG IN)
10,20,..... 50ns (50 ns PLUG IN)

CF 8000

OCTAL CONSTANT FRACTION DISCRIMINATOR

Specifications:

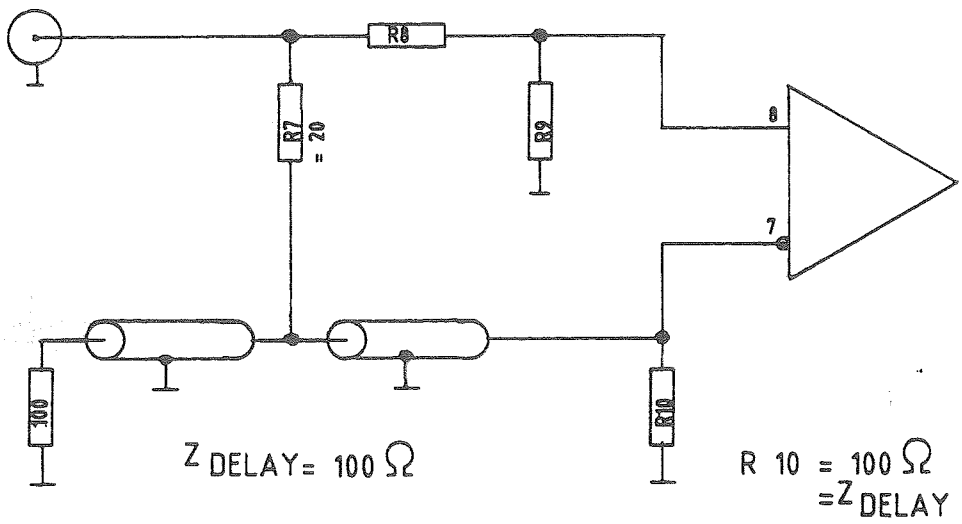
- 8 channels in a single width module
- fraction 0.2 on a resistor-network plug in; other fractions possible
- DC-coupling throughout for high countrate capability
- wide dynamic range of input signals (- 0mV to - 3V)
- threshold (of leading edge discriminator) adjustable from 0 to 1 Volt independently for every channel (caution: if threshold is between 0 and 30mV, coupling from one channel to the neighbouring channels may occur)
- testpoint on the frontpanel to monitor the threshold voltage for every channel
- internal hybrid-delay plug in; no external cabling necessary

  hybrid circuits for a delay of 2 to 10 ns, 5 steps, 6 to 30 ns, 5 steps and 10 to 50 ns, 5 steps are available
- automatic walk adjust using a gated baseline restorer (operational amplifier). No manual adjust necessary
- Dynamic range > 500 : 1
- walk less than $\pm$ 500 psec
- dead time = T_A adjustable on the frontpanel once per module (20ns .....200ns)
- second time constant T_B adjustable on the front panel once per module (20ns .....200ns)

- four outputs per channel
  - one FAST NIM OUT (- 20mA in 50 Ω)
    - width = T_A = deadtime (updating)
  - two FAST NIM OUT (2*(-20mA) in 50 Ω)
    - width = T_B
  - one ECL differential-line OUT on the rear panel
    - 2 x 8 pin connector width = T_B
- one AC-coupled ANALOG OUT per channel on the rear panel(Attenuation = 1:2)
- Common INHIBIT input: disables outputs B
  FAST NIM, 50 Ω terminated, theshold = -0.4V
- Multiplicity output, analog signal width = T_B
  amplitude = number of triggered channels times 50mV
- common OR output (FAST NIM, - 20mA in 50 Ω)
  - output signal, when one channel triggers
  - width = T_B
- analog sum of input signals
  (attenuation 1:20...)

CF 8000

SELECTING FRACTION



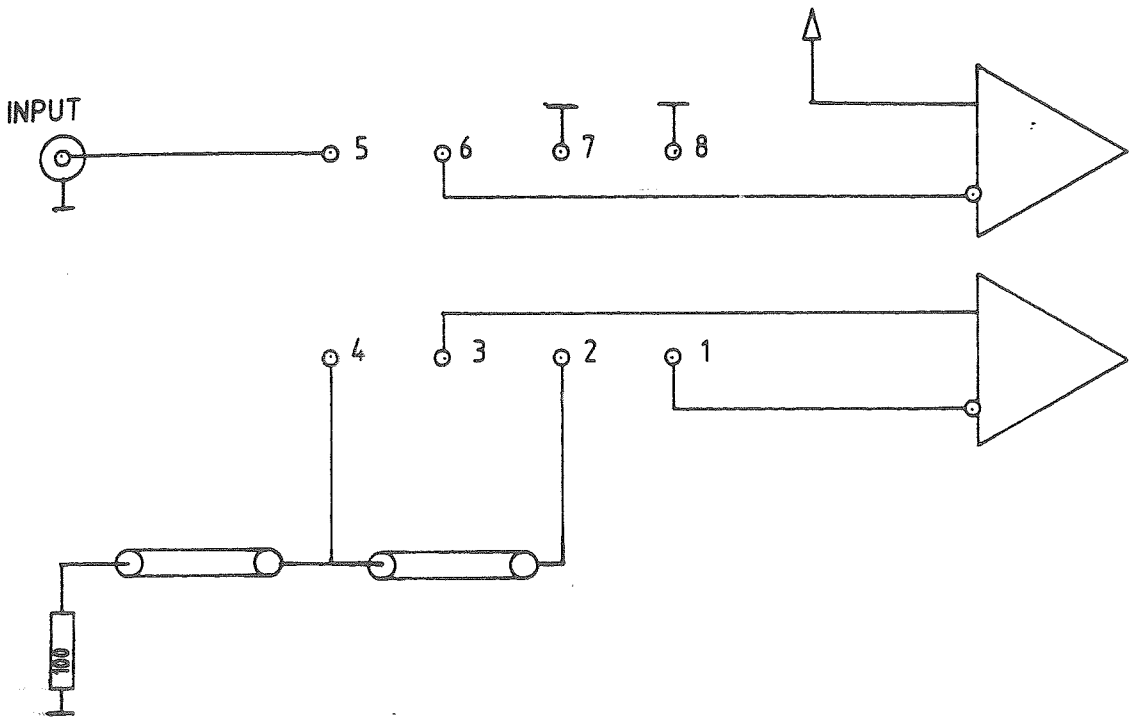
1.) $70\,\Omega \parallel (R8 + R9) = 50\,\Omega$

$R8 + R9 = 175\,\Omega$

2.) $R9 = 175\,\Omega \cdot \frac{50\,\Omega}{70\,\Omega} \cdot f = 125 \times f$

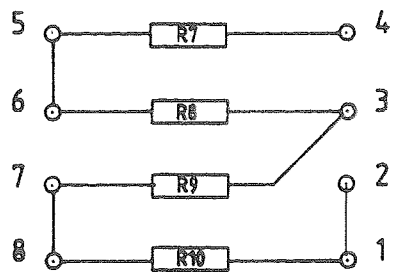
$R8 = 175 - R9$

		f = 0,2	f = 0,4
R7 =	20 Ω	20 Ω	20 Ω
R8 =	175 Ω - R9	150 Ω	125 Ω
R9 =	125 Ω x f	25 Ω	50 Ω
R10 =	100 Ω	100 Ω	100 Ω



A. TO CHANGE THE FRACTION

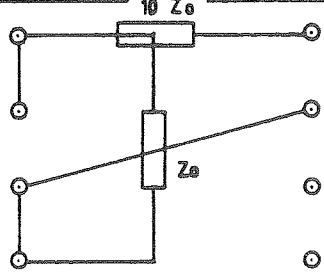
RESISTORS R3 AND R4 HAVE TO BE CHANGED USING THE FOLLOWING RELATION



CF

FRACTION= f
R7 = 20Ω
R10= 100Ω
R8 = 175Ω - R9
R9 = 125Ω·f

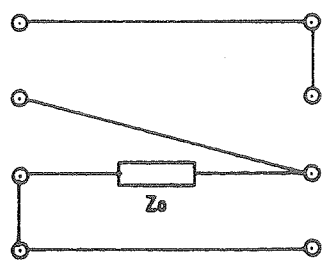
B. USING CF 8000 AS A LEADING EDGE DISCRIMINATOR



LE

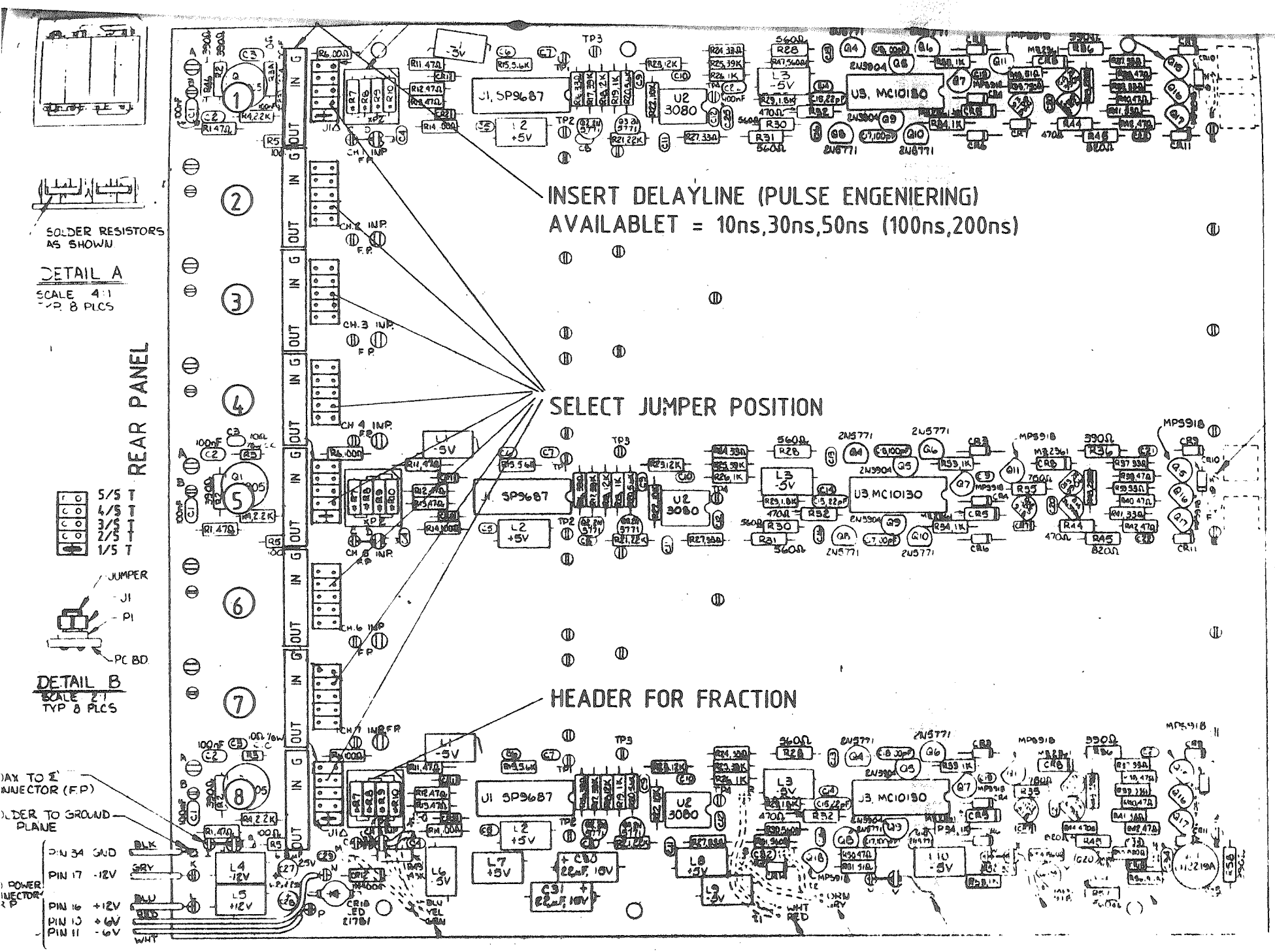
Zo = 50Ω

C. USING CF 8000 AS A ZERO CROSSING DISCRIMINATOR



Z/C

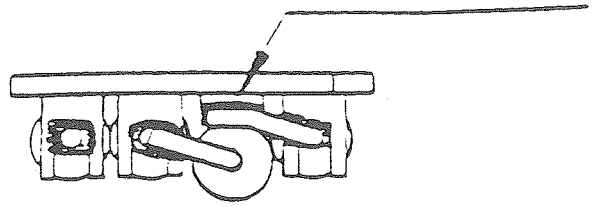
Zo = 50Ω

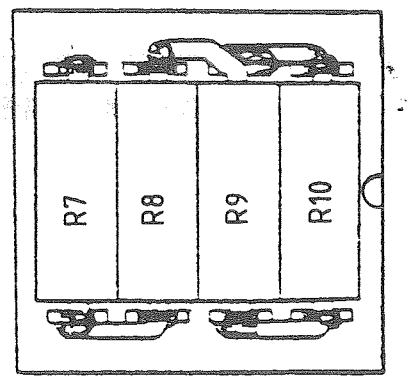

INSERT DELAYLINE (PULSE ENGENIERING)
AVAILABLET = 10ns,30ns,50ns (100ns,200ns)
SELECT JUMPER POSITION
HEADER FOR FRACTION
SOLDER RESISTORS AS SHOWN
DETAIL A
SCALE 4:1
TYP 8 PLCS
DETAIL B
SCALE 2:1
TYP 8 PLCS
REAR PANEL
FRONT PANEL
5/5 T
4/5 T
3/5 T
2/5 T
1/5 T
JUMPER
J1
P1
PC BD
U1 SP9687
U2 3080
U3 MC10130
CH.1 INP.
CH.2 INP.
CH.3 INP.
CH.4 INP.
CH.6 INP.
CH.7 INP.
PIN 34 GND
PIN 17 -12V
PIN 16 +12V
PIN 10 +6V
PIN 11 -6V

CF 8000

FRACTION PLUG IN

SOLDER RESISTORS
AS SHOWN





SOLDER RESISTORS
AS SHOWN.

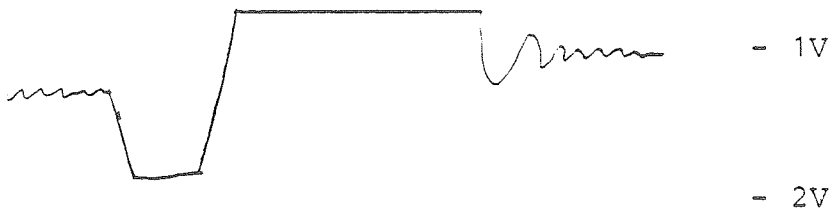
DETAIL A

SCALE: 4:1
TYP. 8 PLCS

Testprozedur CF 8000

Gerät: NIM-Crate mit ± 6 V,
Pulsgenerator: 2ns Anstieg -2 V
30 ns breit
entspr. Oszillograph (kann von GSI bereitgestellt werden)

1. Gerät einstecken, Ströme messen:
   -6 V : 1,15 A , + 6V : 250mA, - 12V : 40mA, + 12V : 40mA
2. TH Trimmer durchdrehen und dabei an Testpunkt Spannung messen. Spannung muß sich zwischen 0 V und ca. -0.9 bis -1 V variieren lassen. Spannung dann überall auf 100 mV einstellen.
3. Puls mit 2 nsec Anstiegszeit, 2 V Amplitude und 10 ns Breite an LN Buchse (rate ~ 1 MHz). Puls an TP 2 muss "symmetrisch" aussehen. (8x)

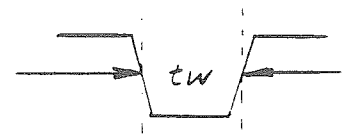


4a. Width-Trimmer TA durchdrehen und dabei 1 Ausgang (A) ansehen; Breite soll von 15 ns bis 250 ns variieren, dann Breite auf 100 ns einstellen.

4b. Width-Trimmer TB durchdrehen, 1 Ausgang (B) ansehen; Breite soll von 15 ns bis 250 ns variieren, dann Breite auf 50 ns einstellen.

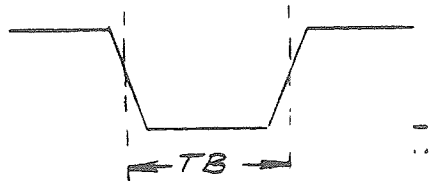
5. Alle OUT Buchsen ansehen: 8x A, 16x B.

$t_A \approx 100$ ns $t_B \approx 50$ ns



6. Test Σ out: Signal auf Eingang 1 geben, an Σ out muß Eingangssignal abgeschwächt sichtbar sein (Kabel mit 50 Ω abschließen) dgl. Eingang 2 bis 8

7. Test OR out: Signal auf Eingang 1 geben; an OR out muß Signal der Länge TB sichtbar sein



0 (Neg. NIM)

-0.7 V (Kabel mit 50 Ω abschl.'

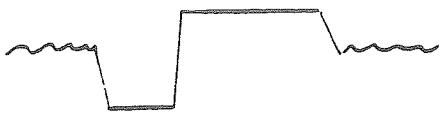
dgl. Eingang 2 bis 8

8. Test M out: Signal auf Eingang 1 geben; an M out muß abgeschwächtes neg. Signal (... mV) sichtbar sein (Länge TB)
(Kabel mit 50 Ω abschließen)
dgl. Eingang 2 bis 8

9. Test INH IN: Signal auf Eingang 1 geben, an Ausgang 1B erscheint Signal
Auf INH IN -0.8 geben (Modul wird bereitgestellt)
Signal verschwindet
dgl. Eingang 2 bis 8

10. Test ANALOG out: Signal auf Eingang 1 geben; an Analog out 1 erscheint Eingangssignal
dgl. Eingang 2 bis 8

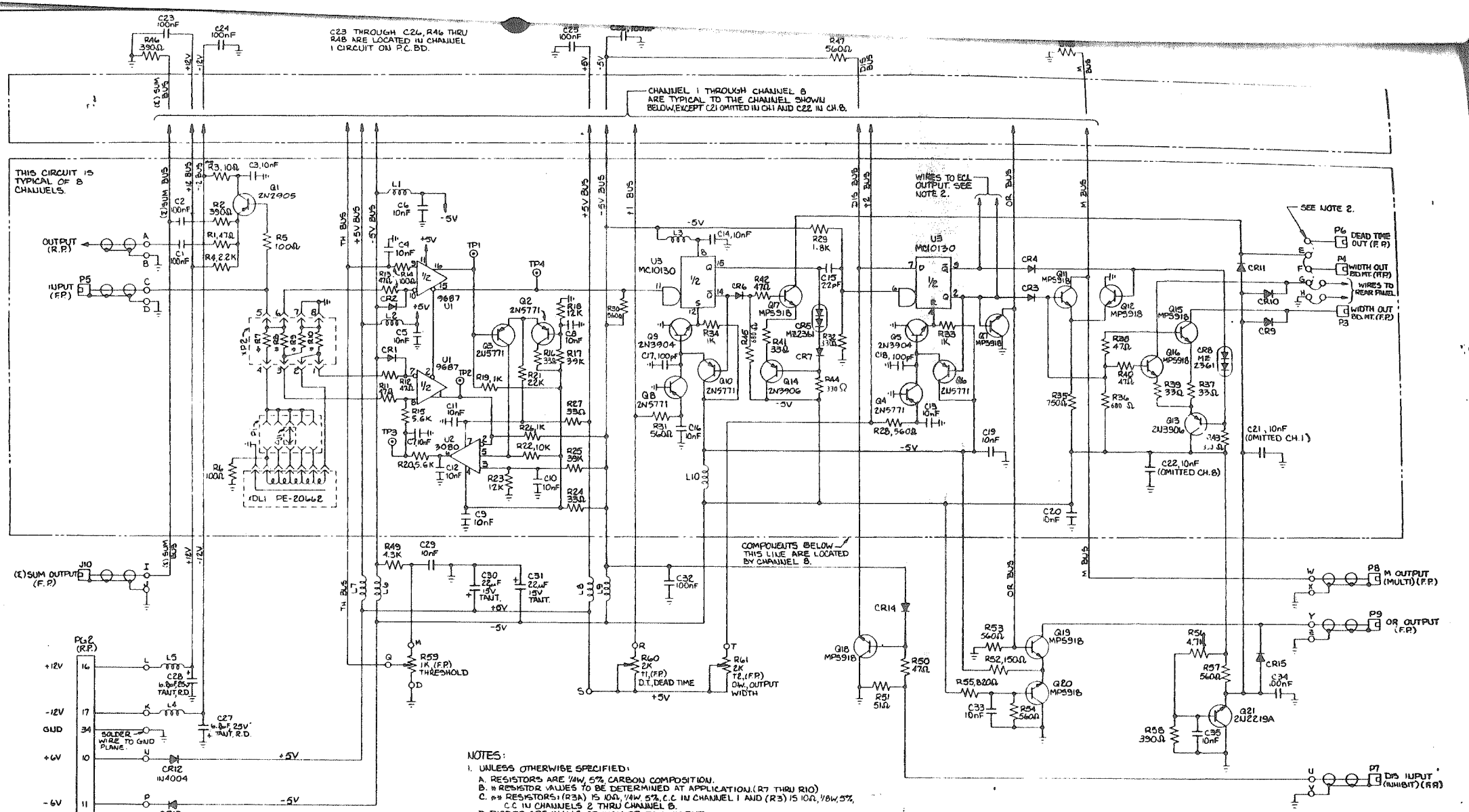
11. Test der Delays:
Signal auf Eingang 1 geben TP2 (Kanal 1 ansehen)
Signalform



Steckbrücke aur Position 1 (unten) t ≈ 2ns
" 2 t ≈ 4ns
usw. ...
5 t ≈ 10ns

dgl. Kanal 2 bis 8

12. TEST ECL Ausgänge: ECL Ausgang verbinden mit ECL-NIM-Converter(z.B. ECL 1601) Signal auf Eingang 1 geben.An NIM -Ausgang des Converters muß Signal der Länge T_B sichtbar sein.



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   A. RESISTORS ARE 1/4W, 5% CARBON COMPOSITION.
   B. ※ RESISTOR VALUES TO BE DETERMINED AT APPLICATION. (R7 THRU R10)
   C. ※※ RESISTORS: (R3A) IS 10Ω, 1/4W, 5%, C.C IN CHANNEL 1 AND (R3) IS 10Ω, 1/8W, 5%, C.C IN CHANNELS 2 THRU CHANNEL 8.
   D. DIODES ARE IN4148 OR IN914 OR EQUIVALENT.
   E. L1 THRU L10 ARE FERRITE CHOKES.
   F. Δ J1 PLACEMENT IN P1 TO BE DETERMINED AT TIME OF APPLICATION.
   G. ※ IN FRONT OF DLI AND P2 MEANS THEY ARE MOUNTED ON SOCKETS.
   H. O-WIRE CONNECTIONS FROM P.C. BD. TO FRONT AND REAR PANEL COMPONENTS.
2. JUMPERS SHOWN IN A DASHED LINE ARE FOR VERSION A; JUMPERS SHOWN IN A SOLID LINE ARE FOR VERSION B; NO JUMPERS WITH WIRES FROM U3 PINS 2 AND 3 GOING TO ECL OUTPUT (R.P.) ARE FOR VERSION C.
3. DESIGNATORS COMMON TO ALL 8 CHANNELS ARE: R1 THRU R45, C1 THRU C22 (C21 OMITTED IN CH.1 AND C22 IN CH.8) CR1 THRU CR11, Q1 THRU Q17, L1 THRU L3, U1 THRU U3, TP1 THRU TP4, AND A THRU H.
4. REFERENCE DRAWINGS: 21X6121 C-1 PARTS LIST
   21X6124 L-1 P.C. BD. ASSEMBLY

Z	O
TP4	
L10	
U3	
DL1	
CR15	
Q21	
C35	
R61	
LAST USED	NOT USED

DESIGNATORS

CF 8000

A	1/5	6902	R14 WAS 47Ω		
ENG LTR	DRAWN BY	SCHEDULED BY	DATE	CHANGES	

OCTAL CONSTANT FRACTION TRIGGER BOARD

SCHEMATIC

DRAWN BY BCH DATE 2-23-82
CHKD BY
APPD
ENG M. MAIER

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA

21X6124 S-8