RD 2000
Dual Fast Rate Divider
Operating and Service Manual

Printed in U.S.A.

Part Number 757800

4169 0895

EG&G-ESN

RD 2000

DUAL FAST RATE DIVIDER

FEATURES:

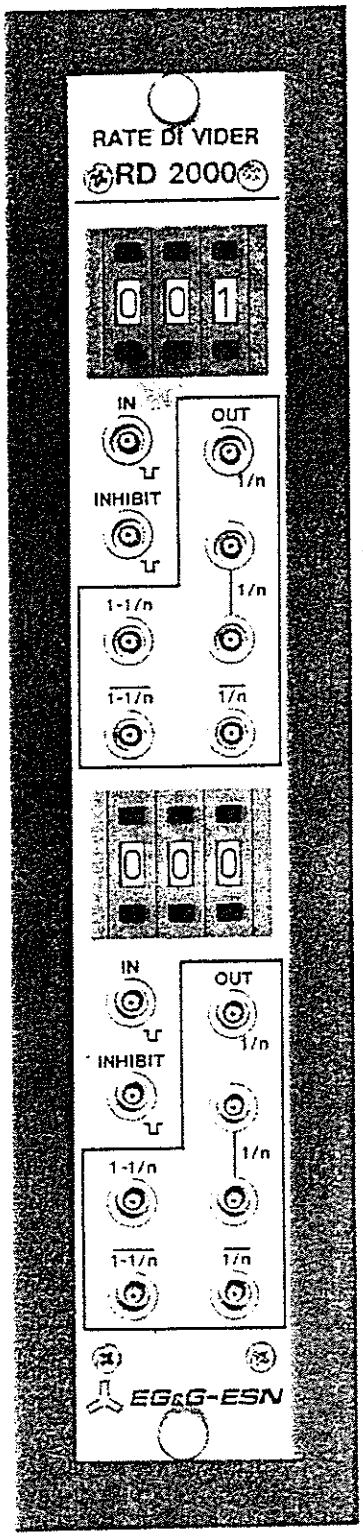
* Pulse rate division between 1000:1 and 1:1
* 40 MHz maximum input rate
* Propagation delay independent of ratio
* 1/n and 1-1/n outputs
* Inhibit input

APPLICATIONS:

* Coincidence experiments
* ADC Gating
* General-purpose rate reduction

The Model RD2000 is a single-width NIM module which incorporates two independent rate (frequency) dividers. All inputs and outputs are Fast NIM compatible. The 1/n output signal has a rate which is equal to the input signal rate divided by the front-panel setting "n", where "n" is any integer number between 1 and 1000 (Fig. 1). There is a single, 16mA 1/n output and a set of dual, bridged, 32mA 1/n outputs. The Model RD2000 also has a 1-1/n output for which each nth input is suppressed. The complement of both the 1/n and 1-1/n outputs is also provided, making a total of 6 outputs for each channel. All outputs have the same pulse width as the nth input pulse. The input-output propagation delay is typically 13 ns, and it is independent of the "n" setting.

An Inhibit input allows the gating-off of input pulses.



SPECIFICATIONS

RANGE OF n SETTING Any integer between 1 and 1000

MAXIMUM INPUT RATE 40 MHz

PROPAGATION DELAY Typically 13ns, independent of n setting.

INPUTS Negative Fast NIM signal; Impedance, 50 Ohms;
minimum amplitude, -500 mV; minimum width, 10 ns.

OUTPUTS Negative Fast NIM signal; all outputs source -16 mA except for the bridged 1/n outputs, which source -32 mA. Output width is nominally equal to input width. Risetime and falltime less than 4ns.

ELECTRICAL/MECHANICAL

POWER REQUIRED -6 V at 1200mA

DIMENSIONS Standard single-width NIM (3.4x22.1 cm front-panel).

WEIGHT 0.5 kg

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EG&G ESN NIM MODEL RD2000

DUAL FAST RATE DIVIDER

1. GENERAL DESCRIPTION

1.1 FEATURES:

* Pulse rate division between 1000:1 and 1:1
* 40 MHz maximum input rate
* Propagation delay independent of ratio
* 1/n and 1-1/n outputs
* Inhibit input

1.2 APPLICATIONS:

* Coincidence experiments
* ADC Gating
* General-purpose rate reduction

1.3 PURPOSE AND OPERATION

The model RD2000 is a single-width NIM module which incorporates two independent rate (frequency) dividers. All inputs and outputs are Fast NIM compatible. The 1/n output signal has a rate which is equal to the input signal rate divided by the front-panel setting "n", where "n" is any integer number between 1 and 1000 (Fig. 1). There is a single, 16mA 1/n output and a set of dual, bridged, 32mA 1/n outputs. The model RD2000 also has a 1-1/n output for which each nth input is suppressed. The compliment of both the 1/n and 1-1/n outputs is also provided, making a total of 6 outputs for each channel. All outputs have the same pulse width as the nth input pulse. The input-output propagation delay is typically 13 ns, and it is independent of the "n" setting.

An Inhibit input allows the gating-off of input pulses.

2. SPECIFICATIONS

2.1 PERFORMANCE

RANGE OF n SETTING Any integer between 1 and 1ØØØ

MAXIMUM INPUT RATE 4Ø MHz

PROPAGATION DELAY Typically 13ns, independent of n setting.

INPUTS Negative Fast NIM signal; Impedance, 5Ø Ohms; min. amplitude, -5ØØ mV; minimum width, 1Ø ns.

OUTPUTS Negative Fast NIM signal; all outputs source -16 mA except for the bridged 1/n outputs, which source -32 mA.Output width is equal to input width. Risetime and falltime less than 4ns.

2.2 ELECTRICAL/MECHANICAL

POWER REQUIRED -6 V at 12ØØmA

DIMENSIONS Standard single-width NIM (3.4x22.1 cm front-panel).

WEIGHT Ø.5 kg

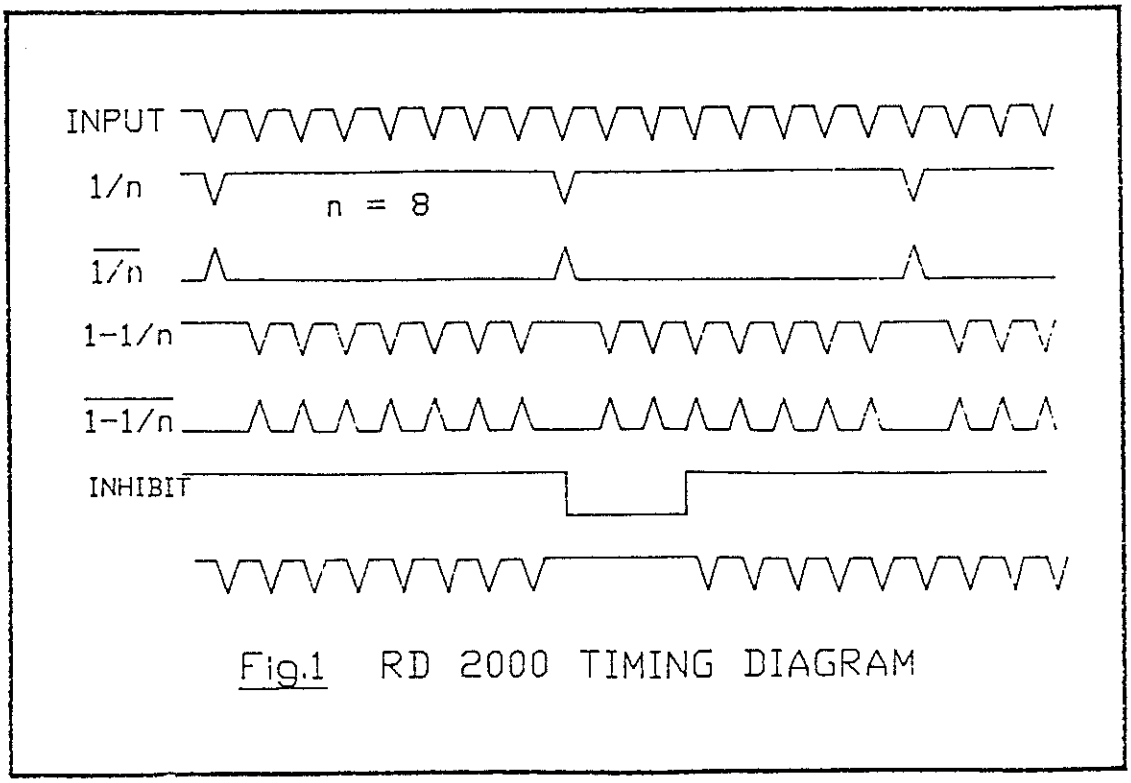
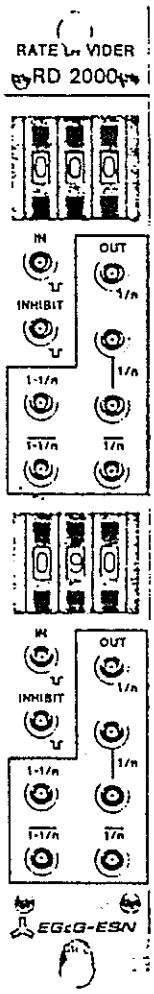


Fig.1 RD 2000 TIMING DIAGRAM

3. FRONT PANEL DIAGRAM



n SETTING
Determines rate division factor. Can be set for a ratio between 1 and 1000. A "000" setting gives a ratio of 1000.

IN
Signal input. Accepts only Fast NIM negative inputs.

INHIBIT
Inhibit input. Fast NIM negative signal gates off input signal.

1/n OUTPUT
18 mA Fast NIM signal having a rate equal to the signal input divided by n.

1/n OUTPUTS (COUPLED)
Same signals as 1/n Output except they are 36 mA Fast NIM outputs connected in parallel.

1/n OUTPUT
Logical compliment (inversion) of 1/n Output.

1-1/n OUTPUT
Fast NIM signal which skips every nth input pulse.

1-1/n OUTPUT
Logical compliment (inversion) of 1-1/n Output.

4. TEST PROCEDURE

Refer to Fig.1. To test the basic operation of the unit, follow this procedure:

1. If possible, connect the unit to a power supply with a current monitor to measure the current consumption of the module. Current should be approximately 1200 mA on the -6 V line.

2. With the dividing ratio, n, set to 003, connect a pulser signal to the input of one channel, and make a parallel connection to a dual-trace oscilloscope. Input pulses should have a width greater than 6 ns and an amplitude greater than -400 mV. Observe the 1/n output on an oscilloscope with 50 Ohm termination. The output pulses should have an amplitude greater than -600 mV, and they should come on every third input pulse. Insure that any signal between output pulses is less than -50 mV in amplitude.

3. Check the two coupled (36 mA) 1/n outputs. They should produce a signal with an amplitude approximately twice that of the 18 mA 1/n output.

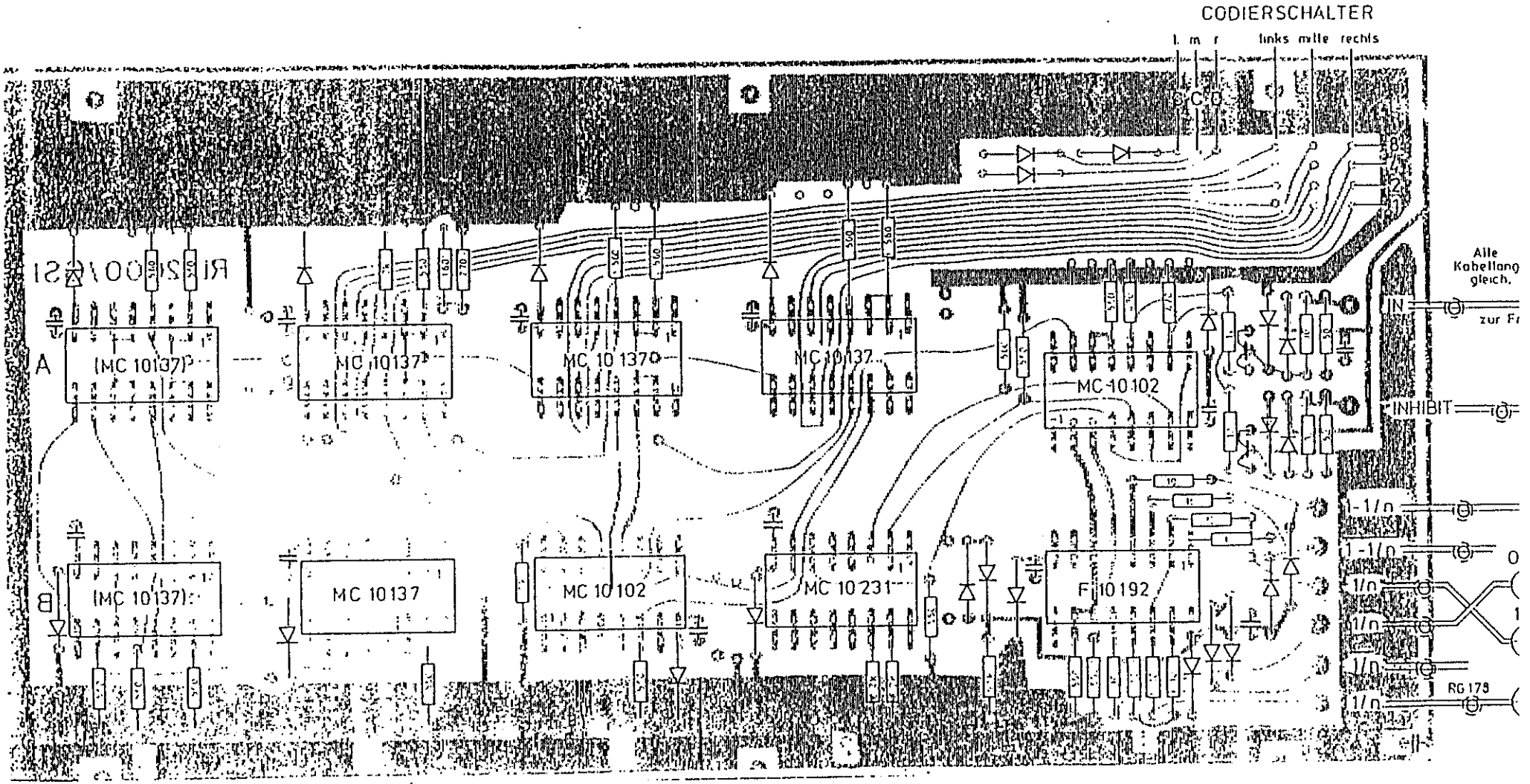
4. Check the 1/n output. It should produce the logical compliment (inverse) of the 1/n output.

5. Check the 1-1/n output. It should produce 2 output pulses for every 3 input pulses. The missing pulse should be coincident with the 1/n output pulses.

6. Check the 1-1/n output. It should produce the logical compliment (inverse) of the 1-1/n output.

7. With a separate pulser (or ESN GG8000 Gate Generator) provide a Fast NIM gating pulse to the Inhibit input. The 1-1/n output should cease outputs during the Inhibit gating pulse interval.

8. Repeat the above steps for channel 2 of the Model RD2000.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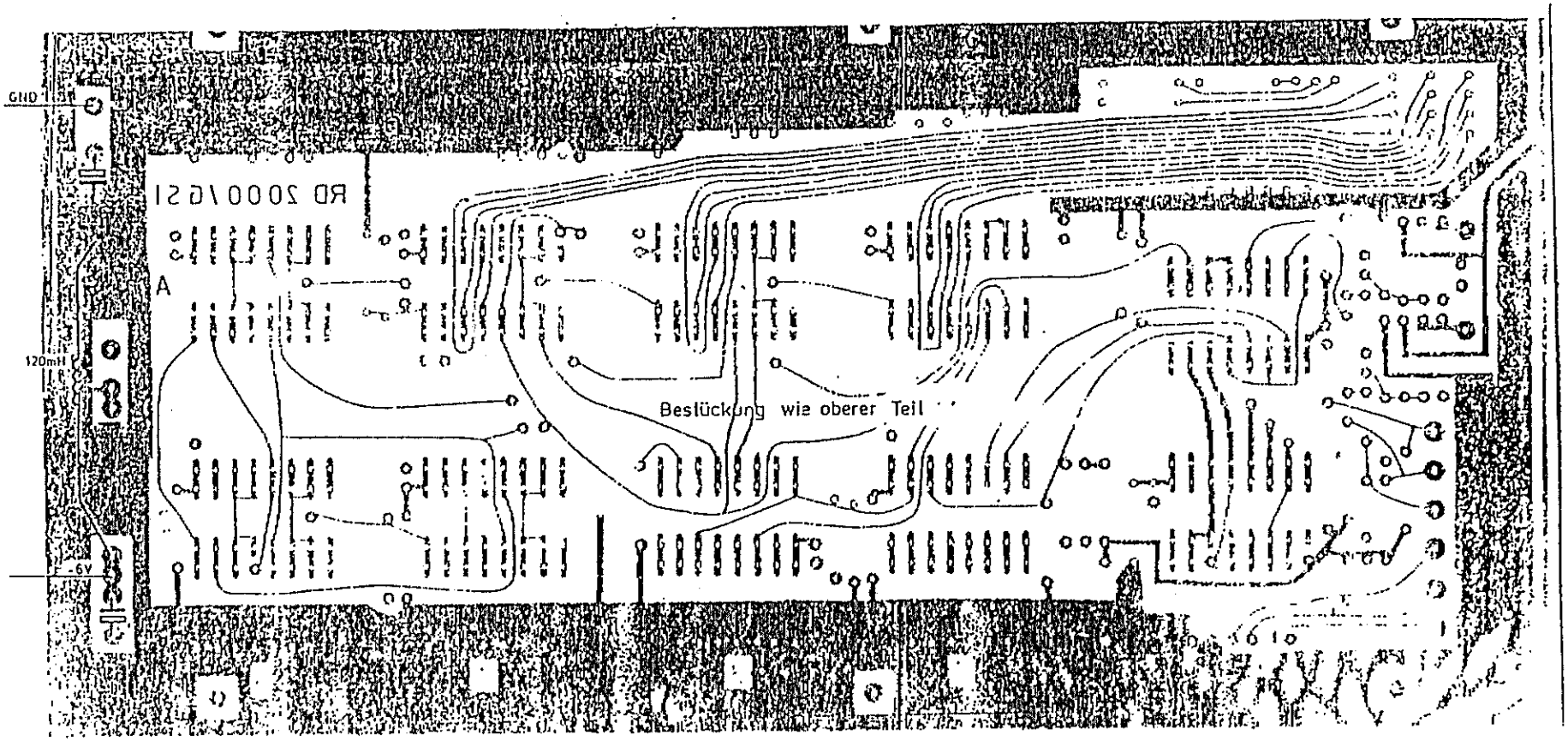
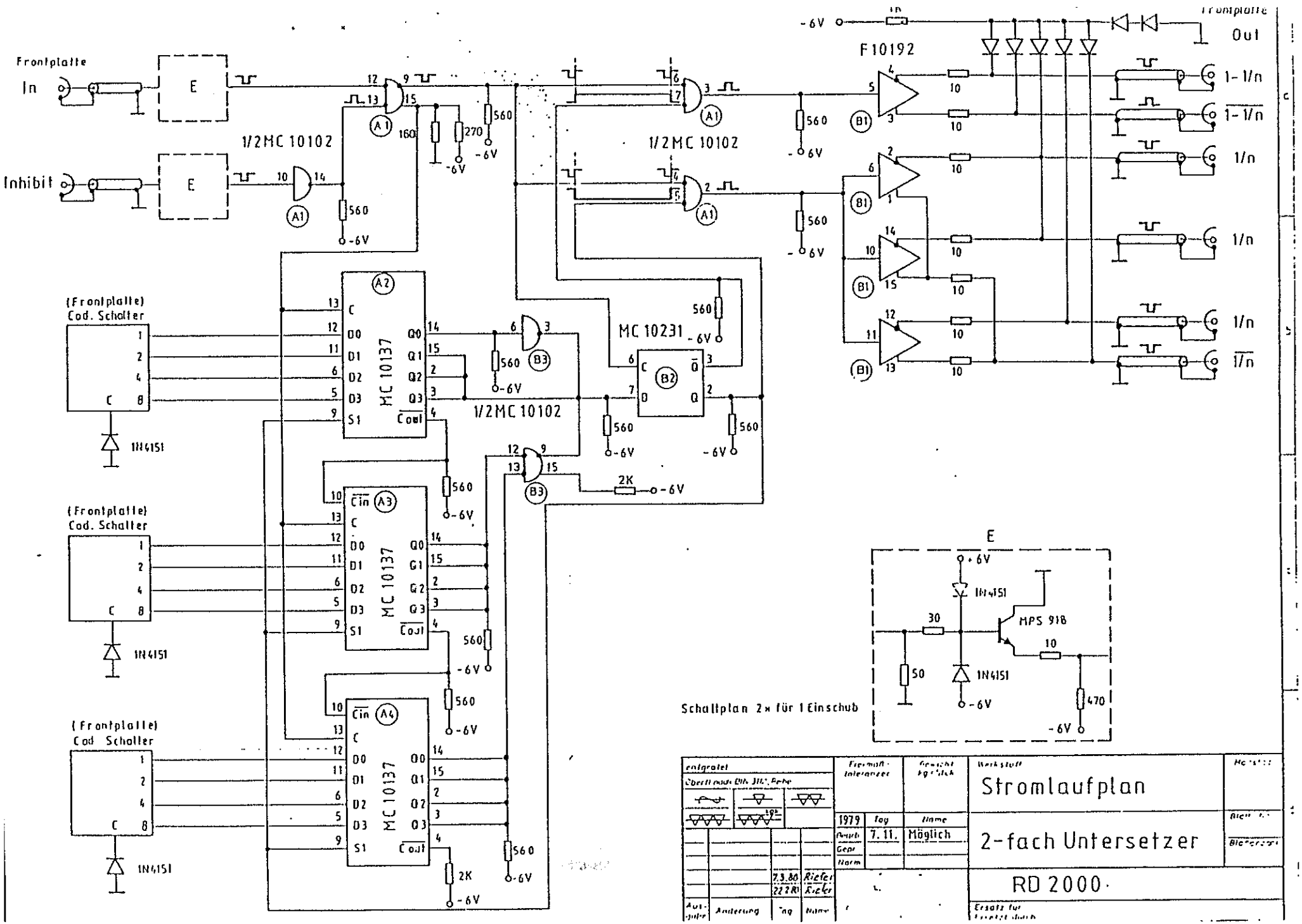
RG 178



Alle Dioden 1N4151
Alle nicht bezeichneten Kondensatoren 100nF
Alle Transistoren MPS 918



					Werkstoff: Stromlaufplan
			1979	Tag	Name
			Bearb.	7.11.	Möglich
			Gepr.		
			Norm		
		7.3.80	Riefer		2-fach Untersetzer
		22.2.81	Riefer		
	Änderung	Tag	Name		RD 2000

POS	QTY	PART #	TYPE	VALUE	FORM	DESCRIPTION	UNIT PRICE	TOTAL PRICE	COMMENTS
1	20	10027	WIDERSTAND	10 OHM	RM 10	R103,107,129-136 203,207,229-236			
2	4	10040	WIDERSTAND	33 OHM	RM 10	R102,106,202,206			
3	4	10051	WIDERSTAND	51 OHM	RM 10	R101,105,201,205			
4	2	10069	WIDERSTAND	160 OHM	RM 10	R110,210			
5	2	10078	WIDERSTAND	270 OHM	RM 10	R111,211			
6	4	10090	WIDERSTAND	470 OHM	RM 10	R104,108,204,208			
7	18	10096	WIDERSTAND	560 OHM	RM 10	R109,112,113,118,120 124-127,209,212,213 218,220,224-227			
8	4	10097	WIDERSTAND	560 OHM	RM 12,5	R116,117,216,217			
9	4	10098	WIDERSTAND	560 OHM	RM 15	R114,115,214,215			
10	2	10110	WIDERSTAND	1 K	RM 10	R128,228			
11	8	10120	WIDERSTAND	2 K	RM 10	R119,121-123,219 221-223			
12	18	12060	KONDENS.-VIELS.	100 nF	RM 2,5	C101-109,201-209			
13	4	12185	KONDENS.-TANTAL	10uF/25V	RM 5	C01-04			
14	1	13002	DROSSEL	100 uH		L02			
15	1	13004	DROSSEL	120uH/2A		L01			
16	40	14044	DIODE	1N 4151	RM 10	V101-107,109-121 201-207,209-221			
17	2	14045	DIODE	1N 4151	RM 15	V108,208			
18	4	15071	TRANSISTOR	2N 3904		V122,123,222,223			
19	4	16164	IC	MC 10102P		IC104,105,204,205			
20	2	16192	IC	MC 10192L		IC107,207			
21	6	16246	IC	MC 10137P		IC101-103,201-203			
22	2	16247	IC	MC 10231P		IC106,206			
23	16	18029	FEDERPIN	1,02		X101-115,201-215			
24	19	18030	FEDERPIN	1,32		X116-123,216-223 X01,02,03			
25	16	18031	SECHS-KANT-MUTTER						LEMO
26	16	18033	GOLDHAUBE						LEMO
27	16	18034	APARATEDOSE	1-POL.					GERADE
28	16	18035	ZAHNSCHEIBE						LEMO
29	1	18037	KONTAKTTRAEGER						AMP
30	1	18038	ABSCHIRMHAUBE						AMP
31	2	18040	ECKZENTRIERBUCHSE						

Zust	Änderung	Datum	Name

EG&G-ESN

BILL OF MATERIAL:

COMMENTS:

MODULE: RD 2000

DESCRIPTION: DUAL FAST RATE DIVIDER

OS	QTY	PART #	TYPE	VALUE	FORM	DESCRIPTION	UNIT PRICE	TOTAL PRICE	COMMENTS
32	2	18041	ECKZENTRIERSTIFT						
33	3	18165	STIFTKONTAKT						
34	4	19020	SCHRAUBE	M2,5 x 8					S-KS-HR
35	4	19042	SCHRAUBE	M3 x 10					KS-HR
36	2	19162	GEWINDENIETBUCHSE						
37	2	19163	RÄNDEL-SCHRAUBE						
38	1	19222	KASSETTE	1/12 NIM					
39	1	19246	FRONTPLATTE	1/12 NIM					RD 2000
10	4	19275	ISO-DISTANZHÜLSE	3,5 x 5					
11	1	20025	LEITERPLATTE						RD 2000
12	6	22023	CODIERSCHALTER			S101-103,201-203			
13	2	22034	ANSCHLUSSPLATTE	CODIERS.					LINKS
14	2	22035	ANSCHLUSSPLATTE	CODIERS.					RECHTS

ust	Änderung	Datum	Name	EG&G-ESN	BILL OF MATERIAL:	MODULE: RD 2000
					COMMENTS:	DESCRIPTION: DUAL FAST RATE DIVIDER

STANDARD WARRANTY FOR EG&G ESN INSTRUMENTS

EG&G ESN warrants that the items will be delivered free from defects in material or workmanship. EG&G ESN makes no other warranties, expressed or implied, and specifically no warranty of merchantability or fitness for a particular purpose.

The warranty is contingent upon the proper use of the equipment. The warranty will be voided (1) if adjustment, repair, or replacement is necessary because of unusual mechanical or electrical stress, neglect, misuse, failure of electric power, operation of the equipment beyond the limits of EG&G ESN published specifications, or causes other than ordinary use; or (2) if the equipment has been modified by the purchaser; or (3) where EG&G ESN decals or serial numbers have been erased or removed. If there is any doubt that an unusual operating condition may void the warranty, please contact the closest EG&G ESN Service Center before operating the unit.

LIMITATION OF LIABILTY

EG&G ESN's exclusive liability is limited to repairing or replacing at EG&G's option, items found by EG&G ESN to be defective in workmanship or materials within ONE (1) YEAR of the date of delivery. EG&G ESN's liability on any claim of any kind, including negligence, loss or damages arising out of connected with, or from the performance or breach thereof, or from the manufacture, sale, delivery, resale, repair, or use of any item or services covered by this agreement or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise to the claim. In the event EG&G ESN fails to manufacture or deliver items called for in this agreement or purchase order, EG&G ESN's exclusive liability and buyer's exclusive remedy shall be release of the buyer from the obligation to pay the purchase price. In no event shall EG&G ESN be liable for special or consequential damages.

REPAIR SERVICE

If it becomes necessary to return this instrument for repair, it is essential that an EG&G ESN service center be contacted in advance of its return. The service center must be informed either in writing, by telephone, or by telex, of the model number and the nature of the fault of the instrument being returned. Instruments that are returned should be packed so that they will withstand normal transit handling and must be shipped PREPAID via Air Parcel Post or Parcel Service to the nearest EG&G ESN repair center (see below). (In the case where the instrument did not function upon purchase, EG&G ESN will pay shipment costs both ways.) For return to the U.S.A. service center, please insure that the address label and the package include the Return Authorization Number assigned. Instruments returned that are damaged in transit due to inadequate packing will be repaired at the sender's expense, and it will be the sender's responsibility to make claim with the shipper. Instruments not in warranty will be repaired at the standard charge unless they have been grossly misused or mishandled, in which case the user will be notified prior to the repair being done. A quotation will be sent with the notification.

EG&G ESN SERVICE CENTERS

To arrange for the return of an instrument, contact:

In the USA: -

EG&G ORTEC
100 Midland Road
Oak Ridge, Tennesse 37380
USA
Telephone: (615) 482-4411
Telex: 55-9750
Telefax: (615) 483-0396

Outside the USA: -

EG&G ESN
Hohenlindener Str, 12
8000 München 80
West Germany
Telephone: (49)-89-92692-0
Telex: 52-8257
Telefax: (49)-89 910-1283

DAMAGE IN TRANSIT

Shipments should be examined immeadiately upon receipt for evidence of external or concealed damage. The carrier making delivery should be notified immeadiately of any such damage, since the carrier is normally liable for damage in shipment. Packing materials, waybills, and other such documentation should be preserved in order to establish claims. After such notification to the carrier, please notify EG&G ESN of the circumstances so that assistance can be provided in making claims and in providing replacement equipment if necessary.