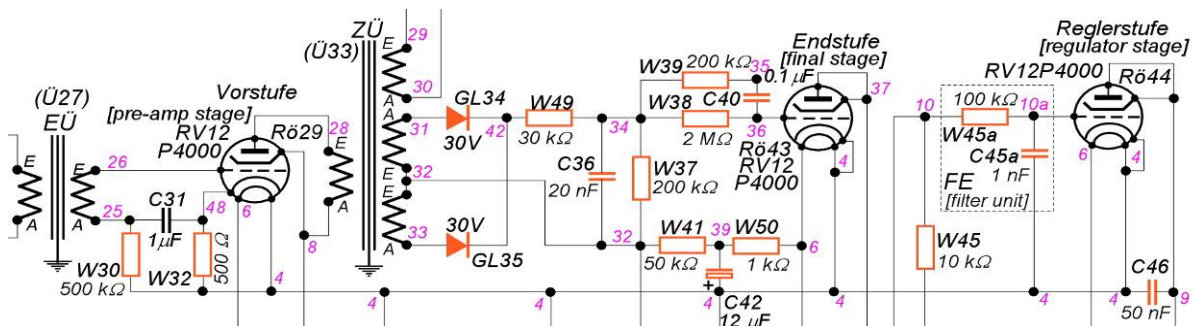
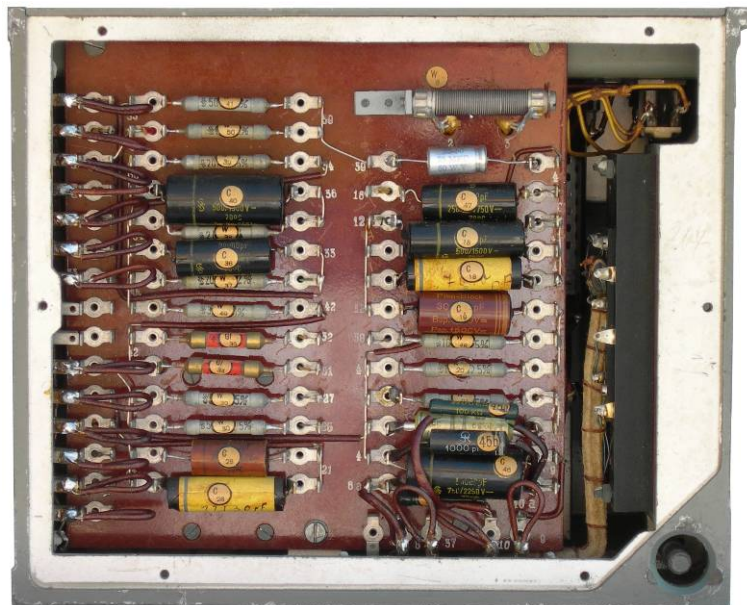


Schematic, Component-Layout and Connector Pin-Outs of the Hell Feldfernreiber



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LIST OF COMPONENTS FOR HELL FELD-FERNSCHREIBER TYPE 24A-32

W = "Widerstand" = resistor
 C = "Condensator" = capacitor
 D = "Drossel" = choke coil/inductor
 Rö = "Röhre" = tube/valve
 GL = "Gleichrichter" = diode
 U = "Umschalter" = selector switch
 Ü = "Übertrager" = transformer
 A = "Anfang" = start of transformer winding
 E = "Ende" = end of transformer winding

S = "Sicherung" or "Schmelzsicherung" = fuse
 L = "Lampe" = light bulb
 KL = "Klinke" = jack
 St = "Steckerbuchse" = female connector, jack
 ZT = "Zeichen-Taste" = character key
 PT = "Pause-Taste" = pause-character key
 MT = "Morse-Taste" = Morse key
 K = "Kontakt" = here: centrifugal regulator contact
 I = "Instrument"

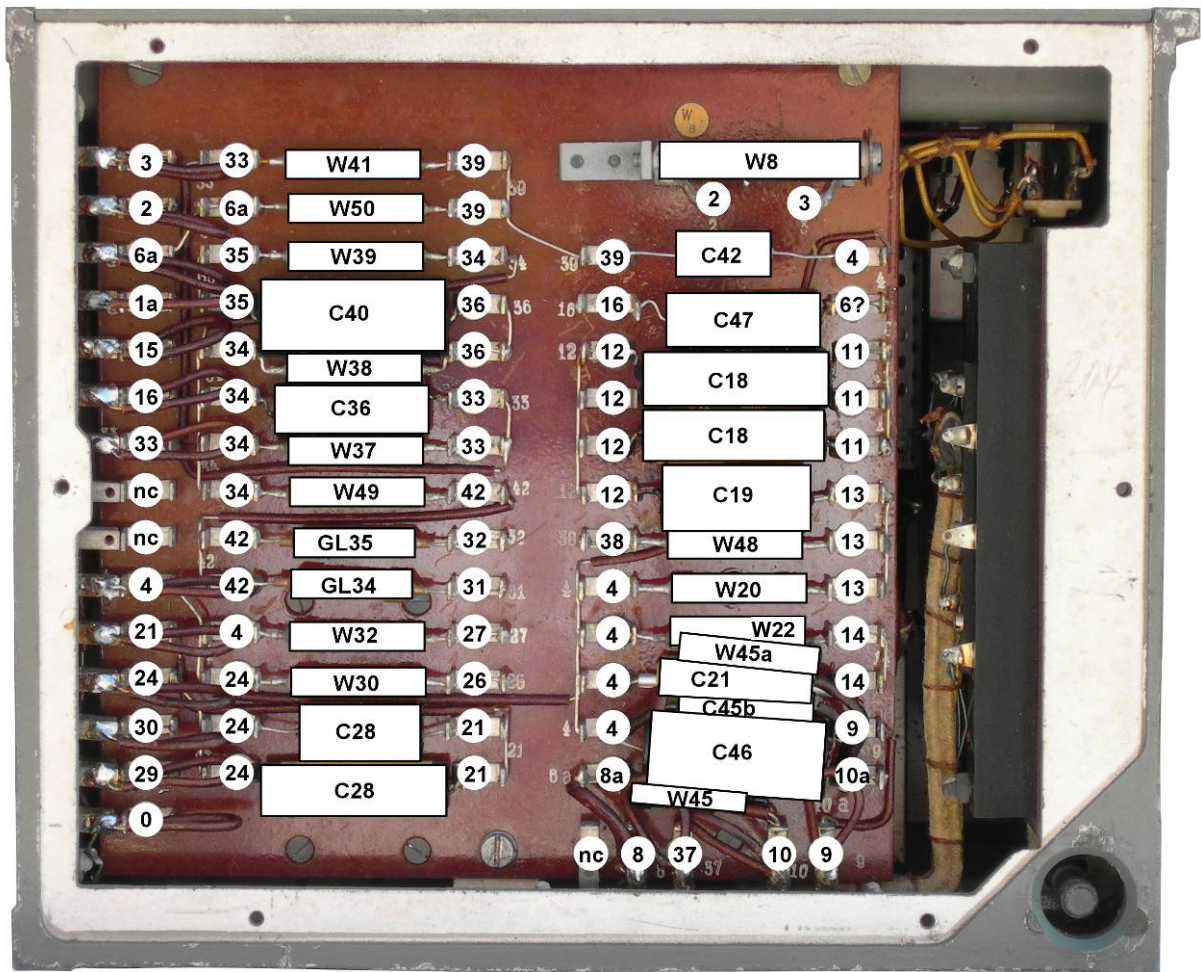
* W8	5 Ω – wire wound
* W20	500 kΩ 5%
* W21	500 Ω 5%
W24	5 kΩ - potentiometer
W25	30 kΩ
* W30	500 kΩ 5%
* W32	500 Ω 5%
* W37	200 kΩ 5%
* W38	2 MΩ 5%
* W39	200 kΩ 5%
* W41	50 kΩ 5%
* W45	10 kΩ
* W45a	100 kΩ 5%
* W48	100 kΩ 5%
* W49	30 kΩ 5%
* W50	1 kΩ 5%
W60	15 kΩ
W61	15 kΩ
W89	100 kΩ
C4	12 μF – electrolytic, 25/35 Vdc
C5	12 μF - electrolytic
C11	8 μF - electrolytic
C12	8 μF - electrolytic
* C18	50 nF (40 nF + parallel cap to tune tone gen.)
* C19	30 nF
* C22	12 μF - electrolytic
* C28	40 nF (30 nF + parallel capacitor to tune filter)
C31	1 μF
* C36	20 nF
* C40	0.1μF
* C42	12 μF – electrolytic
* C45b	1 nF
* C46	50 nF
* C47	50 nF
* C51	2μF
C62	12 μF – electrolytic
C63	12 μF – electrolytic
C64	0.25 μF
C65	0.25 μF
C66	10 μF – electrolytic
C67	10 μF – electrolytic
C68	2 nF
C69	500 pF
C70	200 pF
C71	200 pF

C76	12 μF - electrolytic
C77	200 cm [220 pF]
C78	200 cm [220 pF]
C79	200 cm [220 pF]
C80	200 cm [220 pF]
D13	choke; value unknown
D72	value unknown
D73	value unknown
D74	value unknown
D75	value unknown
D82	value unknown
D83	value unknown
D84	value unknown
D85	value unknown
D86	value unknown
D87	value unknown
Rö16	RV12P4000
Rö29	RV12P4000
Rö43	RV12P4000
Rö44	RV12P4000
* GL34	cuprous-oxide-on-copper diode, 30 V
* GL35	cuprous-oxide-on-copper diode, 30 V
Ü23 = LÜ	Line ("Leitung") transformer (Übertrager)
Ü17 = SÜ	Tone-generator ("Summer") transformer
Ü27 = EÜ	Receiver ("Empfänger") transformer
Ü33 = ZÜ	Intermediate ("Zwischen") transformer
S6	fuse, 6 ampere, 5x20 mm
L10	light bulb, bayonet base, 12 volt, 2 watt
U7	DP3T main switch (off/standby/on)
U9	SPST toggle switch ("Sammler"/ "Gleichrichter")
U26	SPST toggle switch (bandpass filter on/off)
U53	DPDT contacts driven by U7
St15	12-pin round connector
St52	center contact of 12-pin round connector
K1	nominal speed contact of centrifugal regulator
K2	over-speed contact of centrifugal regulator
I14	voltmeter, 0 – 15/200 Vdc

Unassigned component numbers: 3, 36, 54, 55, 56, 57, 58, 59.

Components marked with * are located on the circuit card at the rear of the Amplifier & Interconnect Unit.

CIRCUIT CARD COMPONENT LAYOUT AND NUMBERING



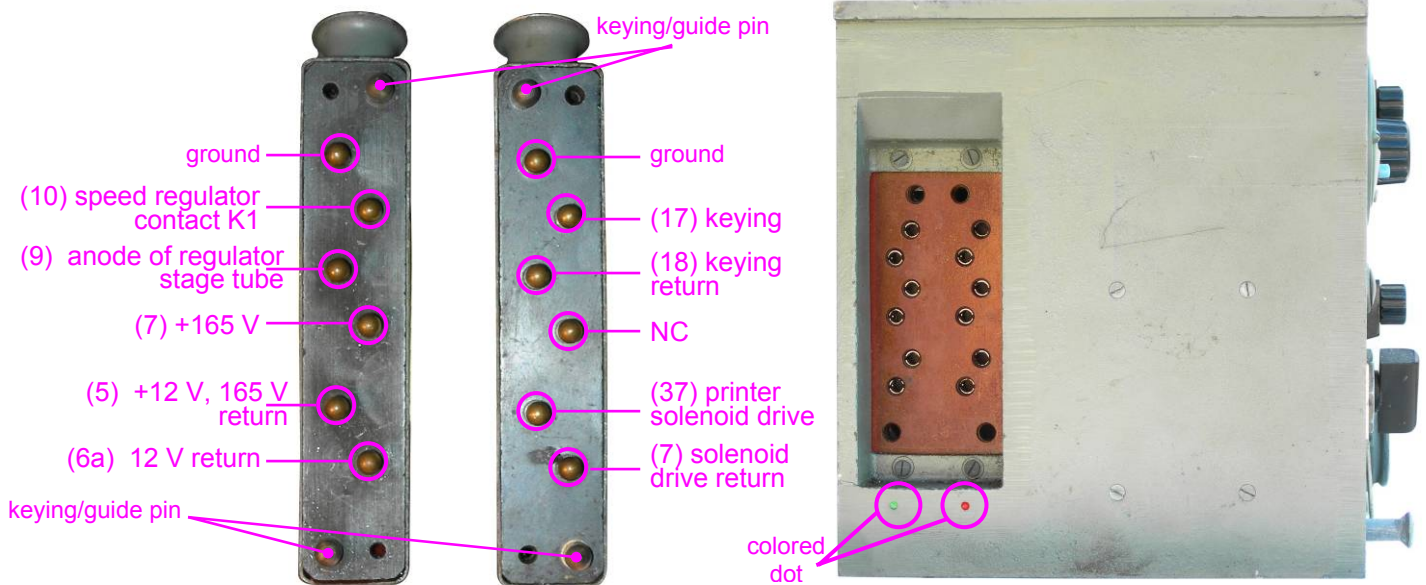
Rear view of the Hellschreiber's Amplifier & Interconnect Unit – cover removed

The annotated photo above shows numbered components and solder lugs on the pertinax circuit card board at the rear of the Amplifier & Interconnect Unit. These numbers correspond to component designators and points in the circuit diagram.

Connector blocks (such as the black one on the far right) also have connection numbers printed on them.

The photo above only shows 28 of the nearly 80 components listed.

PIN-OUT OF THE RECTANGULAR CONNECTORS



Two rectangular 6-pin connectors
 red dot + "vorn"
 motor-generator

green dot + "hinten"
 keyboard-drum

Corresponding connector socket

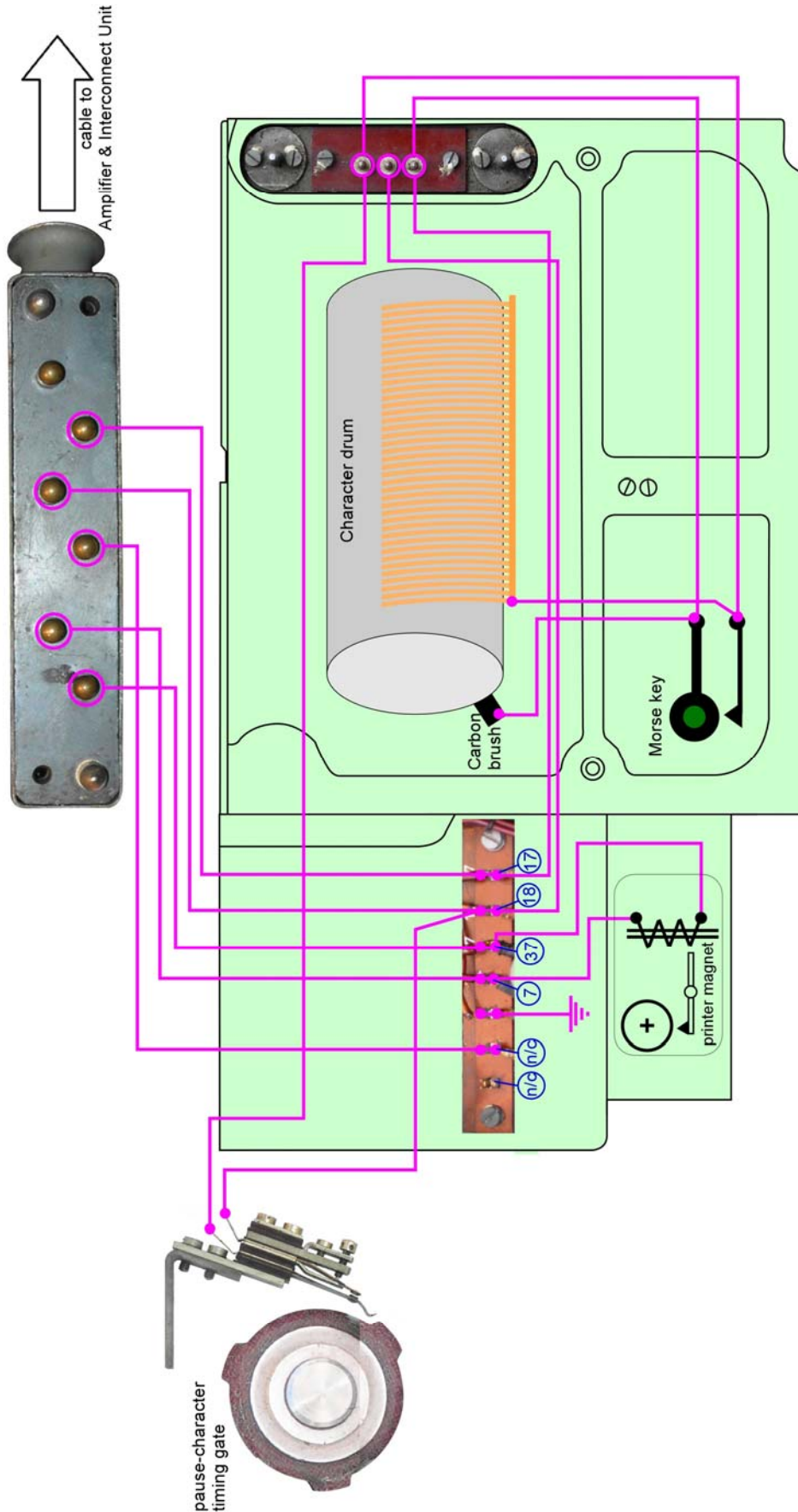
These two 6-pin connectors each terminate a cable:

- 1) from the Motor-Generator to the Amplifier & Interconnect Unit (marked **T 97** near the cable)
- 2) from the Keyboard-Drum Unit to the Amplifier & Interconnect Unit (marked **T 71**).

The connectors are keyed such that they cannot be swapped or installed up-side-down. They are also marked with a red dot and "**vorn**" ("front"), and with a green dot and "**hinten**" ("rear") respectively. Corresponding color dots are marked below the connector socket of the Amplifier & Interconnect Unit.

Connector pin references indicated above, correspond to numbered points in the circuit diagram.

INTERNAL WIRING OF THE FELD-HELLSCHREIBER



PIN-OUT OF THE (OPTIONAL) 12-PIN ROUND CONNECTOR

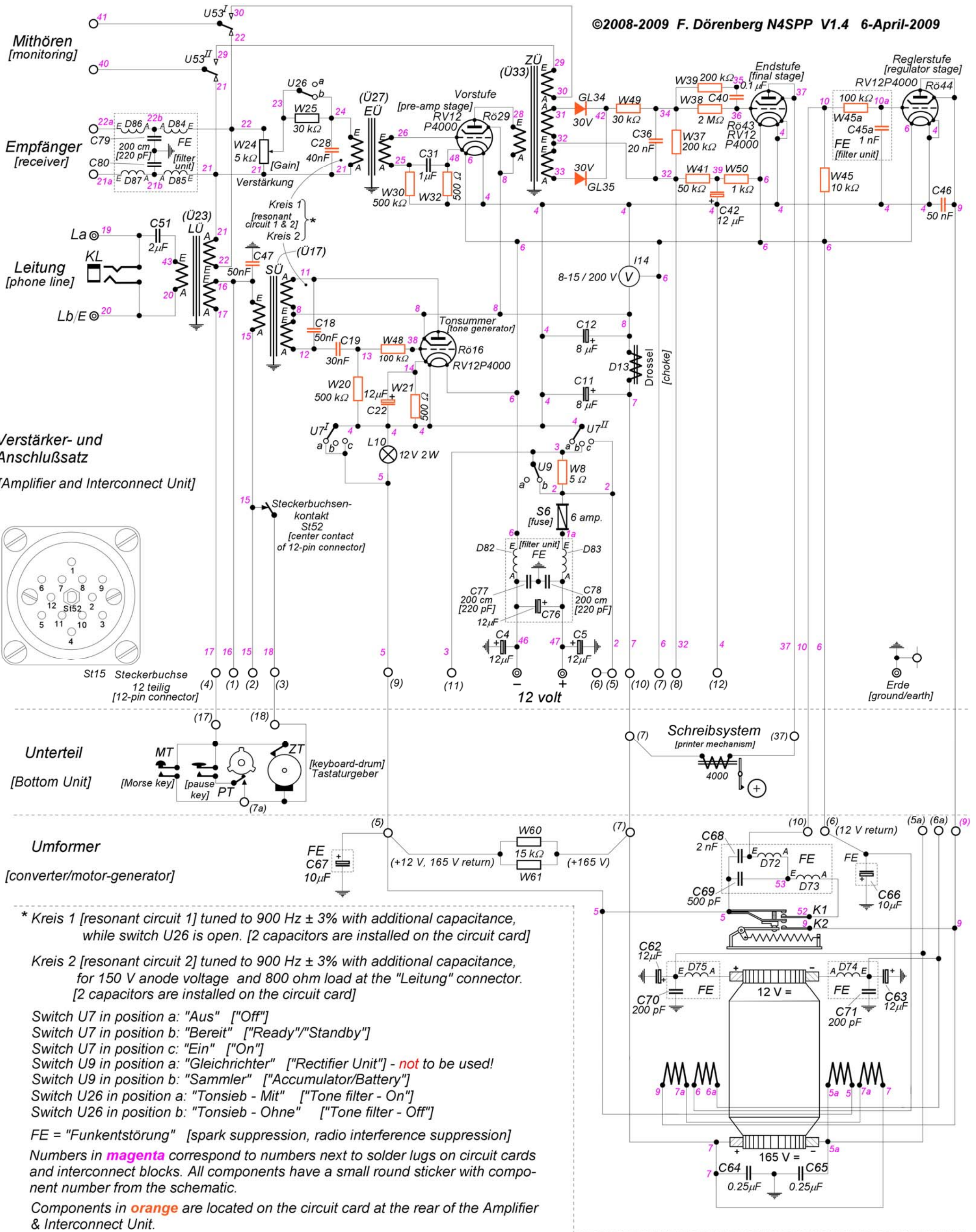


Optional 12-pin round connector on front panel of Amplifier & Interconnect Unit

Pin number:	Function/signal:
1	= continuous 900 Hz tone
2	= continuous 900 Hz tone, return
3	= keying signal output (character drum, Morse key)
4	= keying signal output, return (character drum, Morse key)
5	= +12 V (after fuse)
6	= pin 5
7	= 12 V return
8	= rectified received signal, common
9	= +12 V, when master switch is „EIN“ (“on”)
10	= +165 V
11	= +12 V after fuse + 5 ohm series resistor (resistor can be bypassed with “Sammler” switch)
12	= +12 V after fuse when master switch is „EIN“ (“on”) or after fuse + 5 ohm series resistor (resistor can be bypassed with “Sammler” switch) when master switch is „BEREIT“ (“standby”)
SW	= switch contact actuated by center pin of plug (St52 in schematic)

COMPLETE CIRCUIT DIAGRAM

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* Kreis 1 [resonant circuit 1] tuned to 900 Hz ± 3% with additional capacitance, while switch U26 is open. [2 capacitors are installed on the circuit card]

Kreis 2 [resonant circuit 2] tuned to 900 Hz ± 3% with additional capacitance, for 150 V anode voltage and 800 ohm load at the "Leitung" connector. [2 capacitors are installed on the circuit card]

- Switch U7 in position a: "Aus" ["Off"]
- Switch U7 in position b: "Bereit" ["Ready"/"Standby"]
- Switch U7 in position c: "Ein" ["On"]
- Switch U9 in position a: "Gleichrichter" ["Rectifier Unit"] - not to be used!
- Switch U9 in position b: "Sammler" ["Accumulator/Battery"]
- Switch U26 in position a: "Tonsieb - Mit" ["Tone filter - On"]
- Switch U26 in position b: "Tonsieb - Ohne" ["Tone filter - Off"]

FE = "Funkentstörung" [spark suppression, radio interference suppression]
 Numbers in **magenta** correspond to numbers next to solder lugs on circuit cards and interconnect blocks. All components have a small round sticker with component number from the schematic.
 Components in **orange** are located on the circuit card at the rear of the Amplifier & Interconnect Unit.

This annotated schematic was compiled from various sources, including the original 1941 German manual "Der Feldfernsehreiber". These sources are not all consistent.