WMS 60/(61)

Service Manual

*

October 1998

Contained information referring to the WMS 61 is not complete and preliminary!!
Enthaltene Informationen betreffend WMS 61 sind unvollständig und vorläufig!!

*

Last modification: C535WL1 added, new version 5.0 (note pages marked with "NEW")
Letzte Änderung: C535WL1 hinzu, neue Version 5.0 (Seiten mit Markierung "NEU" beachten)

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General Remarks

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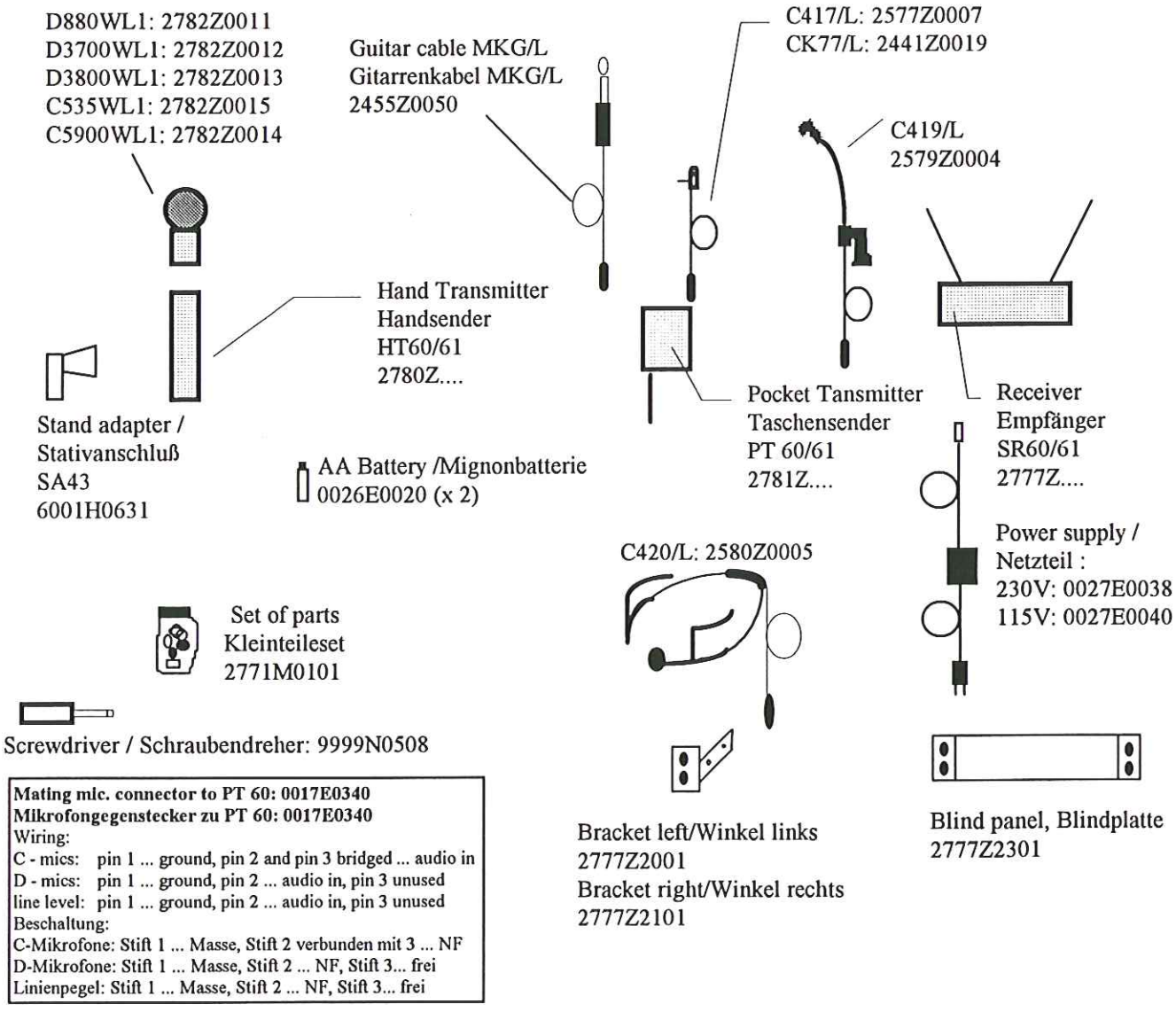
The complete WMS 60/61 range
Gesamtübersicht

WMS 60/61

WMS 60 HT - Set: 2771Z1060
WMS 60 PT - Set: 2774Z1060



Mating mic. connector to PT 60: 0017E0340
Mikrofongegenstecker zu PT 60: 0017E0340
Wiring:
C - mics: pin 1 ... ground, pin 2 and pin 3 bridged ... audio in
D - mics: pin 1 ... ground, pin 2 ... audio in, pin 3 unused
line level: pin 1 ... ground, pin 2 ... audio in, pin 3 unused
Beschaltung:
C-Mikrofone: Stift 1 ... Masse, Stift 2 verbunden mit 3 ... NF
D-Mikrofone: Stift 1 ... Masse, Stift 2 ... NF, Stift 3... frei
Linienpegel: Stift 1 ... Masse, Stift 2 ... NF, Stift 3... frei

HT-, PT-, SR-Variations:
The variation number following the letter Z in the order number indicates basic version (....Z90.. = internal version, unpacked, ...Z00.. = individually packed). Further the frequency band the WMS set is working in is determined by this number (....Z0001 to Z0025 or ....Z9001 to Z9025). Finally WMS 60 and 61 are differentiated by this number (....Z0001 to Z0011 and ....Z9001 to Z9011 = WMS 60, ...Z0012 to Z0025 and ....Z9012 to Z9025 = WMS 61).

HT-, PT-, SR-Versionen:
Die Zahl nach dem Buchstaben Z in der Bestellnummer kennzeichnet die Grundversion version (....Z90.. = interne unverpackte Version, ...Z00.. = individuell verpackt). Ferner ist das Frequenzband durch diese Nummer bestimmt (....Z0001 bis Z0025 oder ....Z9001 bis Z9025). WMS 60 und WMS 61 werden folgendermaßen gekennzeichnet: ....Z0001 bis Z0011 und ....Z9001 bis Z9011 = WMS 60, ...Z0012 bis Z0025 und ....Z9012 bis Z9025 = WMS 61).

ABBREVIATIONS — ABKÜRZUNGEN

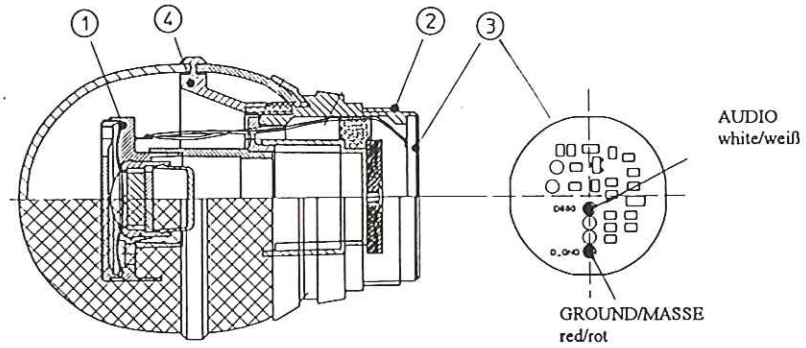
@	measured or specified at conditions ...	gemessen oder spezifiziert nach ...
°C	degrees centigrade (9/5*°C+32=°F)	Grad Celsius
µC	Microcontroller, microprocessor	Microcontroller, Microprocessor
A, mA, µA	Amperes, Milliamperes (*10^{-3}), Microamperes (*10^{-6})	Ampere, Milliampere (*10^{-3}), Microampere (*10^{-6})
AF	Audio Frequency	Niederfrequenz
AGND	Analog ground	Analog - Masse
CCITT	International committee for telecommunication	Internationales Kommittee für Telekommunikation
CSEE	Chip select EEPROM	
DIN	Data input	Dateneingang
DOUT	Data output	Datenausgang
ETSI	European committee for telecommunication	Europäisches Kommittee für Telekommunikation
FI	Filter	Filter
GND	Ground	Masse
Hz, kHz, MHz	cycles per second, kilocycles per sec. (*10^3), Megacycles per sec. (*10^6)	Hertz, Kilohertz (*10^3), Megahertz (*10^6)
IF	Intermediate Frequency	Zwischenfrequenz
LE_PLL	Latch enable - phase locked loop	
LO	Local oscillator	Lokaler Oszillator
NF	= AF, appears in certain drawings	Niederfrequenz
NTC	Neg. temperature coefficient (-resistor)	Neg. Temperaturkoefficient (Widerstand)
PTC	Pos. temperature coefficient (-resistor)	Pos. Temperaturkoefficient (Widerstand)
PWM	Pulse width modulation	Pulsweitenmodulation
RF, HF	Radio frequency, high frequency	Hochfrequenz
RS	Radio Signal	Empfangssignal
RSSI	Received signal strength indicator	Anzeigesignal der Empfangsfeldstärke
SAW	Surface wave filter	Oberflächenwellenfilter
SCLK	Serial Clock	Serielle Taktfrequenz
THD	Total harmonic distortion	Klirrfaktor
U_{ST}, U_{Steuer}	Control voltage	Steuerspannung
V, mV, µV	Volts, Millivolts (*10^{-3}), Microvolts (*10^{-6})	Volt, Millivolt (*10^{-3}), Microvolt (*10^{-6})
V_MIC	Microphone supply voltage	Mikrofonversorgungspannung
VCO	Voltage controlled oscillator	Spannungsgesteuerter Oszillator
ZF	= IF, appears in certain drawings	Zwischenfrequenz

Color code:

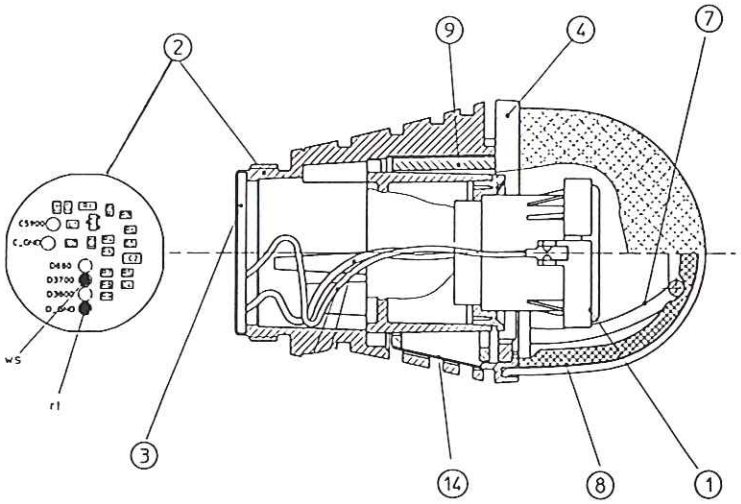
weiß	ws	white
schwarz	sw	black
grau	ga	grey
rot	rt	red
gelb	ge	yellow
grün	gn	green
blau	bl	blue
rosa	ra	pink
Schirm		screen, ground

WMS 60 Handheld Transmitter
Microphone Heads / Mikrofonköpfe

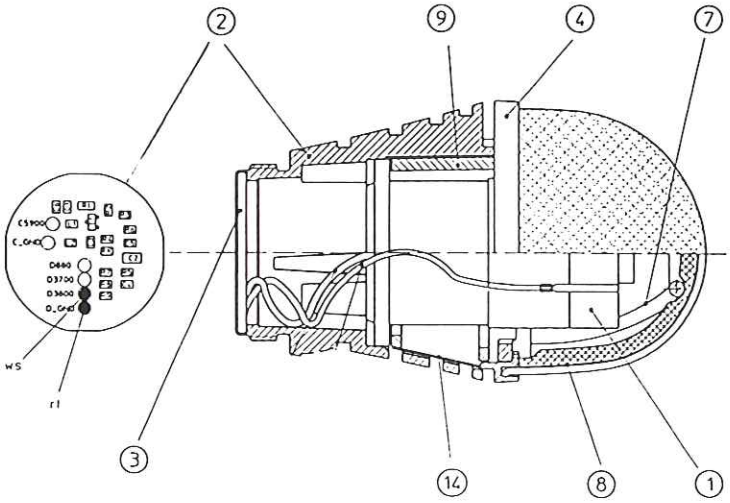
D880/WL1



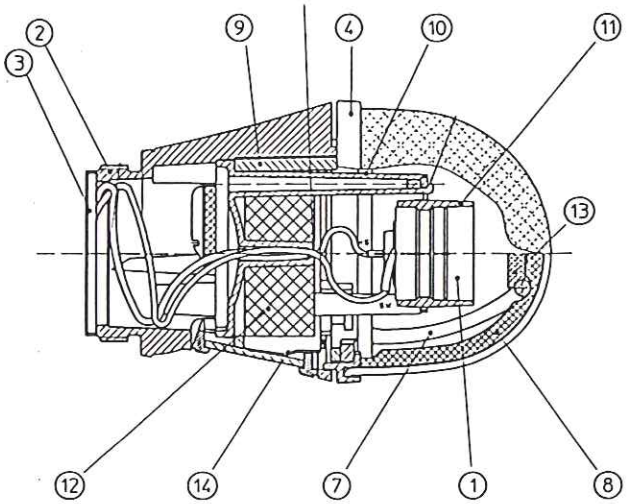
D3700/WL1

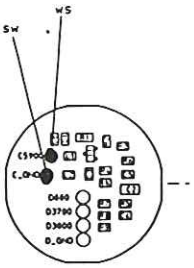


D3800/WL1

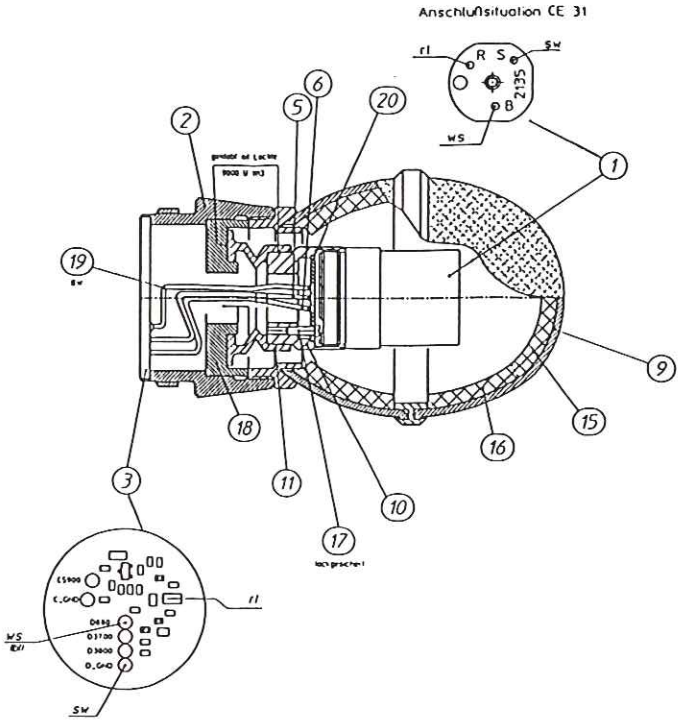


C5900/WL1

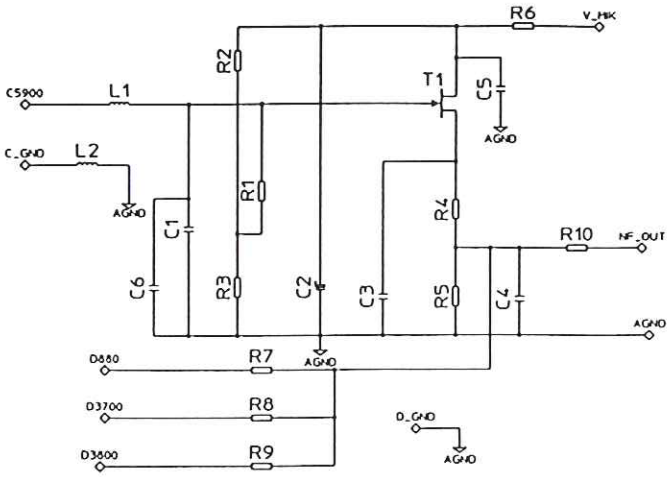




C535/WL1



Schematics / Schaltung



WMS 60 Handheld Transmitter

D880WL1: 2782Z0011 ... A
D3700WL1: 2782Z0012 ... B
D3800WL1: 2782Z0013 ... C

Microphone Heads / Mikrofonköpfe

C5900WL1: 2782Z0014 ... D
C535WL1: 2782Z0015 ... E

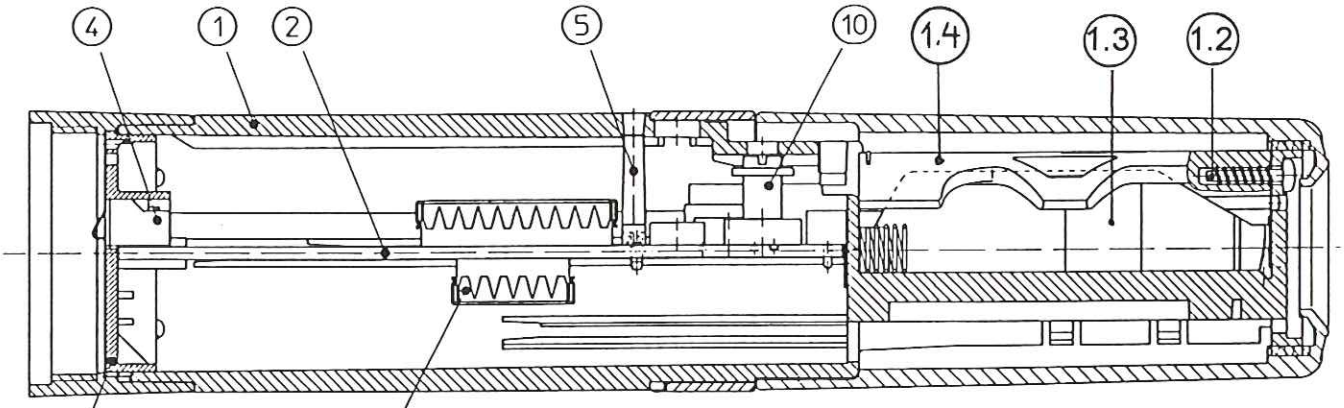
Description	Pos.	Part Number Teilenummer	A	B	C	D	E	Bezeichnung
Capsule	1	2610Z0014	1	-	-	-	-	Kapsel
Capsule DKC 24		2127Z0032	-	1	-	-	-	Kapsel DKC 24
Capsule DKC 24, comp.		2224Z0004	-	-	1	-	-	Kapsel DKC 24, komp.
Capsule CE33/8		2230Z0008	-	-	-	1	-	Kapsel CE33/8
Capsule CE31		2003Z0010	-	-	-	-	1	Kapsel CE31
Housing	2	2782Z0401	1	-	-	-	-	Gehäuse
		2782M0203	-	1	1	-	-	
		2782M0202	-	-	-	1	-	
		2782Z0901	-	-	-	-	1	
Board, complete	3	2782M0101	1	-	-	-	-	Print, komplett
		2782M0103	-	1	-	-	-	
		2782M0104	-	-	1	-	-	
		2782M0102	-	-	-	1	-	
		2782M0305	-	-	-	-	1	
Top grill	4	9999N0584	1	-	-	-	-	Gitterkappe
		2505M0101	-	1	1	1	-	
Support Basket	7	2505Z0501	-	1	1	1	-	Stützkorb
Popshield	8	2505Z1801	-	1	1	-	-	Popschutz
		2505Z1802	-	-	-	1	-	
Barrel	9	2505Z0301	-	1	1	1	-	Korb
Grid cap	9	2588M0202	-	-	-	-	1	Gitterkorb
Capsule holder	10	2516Z0301	-	-	-	1	-	Kapselhalter
		2588Z0101	-	-	-	-	1	
Capsule suspension	11	2516Z0401	-	-	-	1	-	Kapsellagerung
		2636Z0301	-	-	-	-	1	
Foam insert	12	2516Z0601	-	-	-	1	-	Schaumeinlage
Stopper	13	2516Z1501	-	-	-	1	-	Stoppel
Protective cover	14	2505Z1601	-	1	1	1	-	Sichtschutz
Foam insert	15	2135Z0801	-	-	-	-	1	Schaumeinlage
Foam insert	16	2135Z0901	-	-	-	-	1	Schaumeinlage
Screw	17	0920D1601	-	-	-	-	1	Schraube
Suspension holder	18	2636Z0201	-	-	-	-	1	Aufnahme für Lagerung
Capsule board	20	2135M0105	-	-	-	-	1	Kapselprint

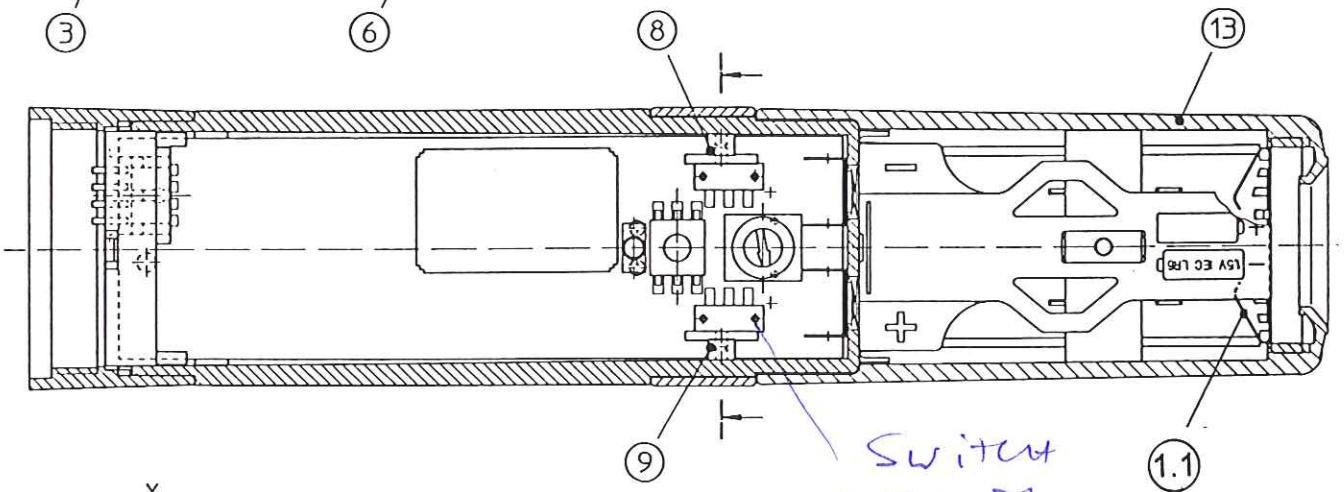
Grey shaded parts are **not available**. Depiction in drawings and parts list is only to make clear the internal construction of the heads. Board 3 and housing 2 are pressed together and cannot be separated. In case of a defect the complete head has to be exchanged. Before removing the top cap knock the microphone head at it's circumference onto a solid surface to loose the securing paint inside the thread between cap and housing. After repair the cap has to be secured again to avoid loosening of the cap when the capsule is taken off from the transmitter. The elastic suspension of the capsule is glued to the housing and can be peeled off using a small screwdriver or knife (except C5900). A new capsule's suspension can be glued with Loctite or the same.

Grau unterlegte Teile sind **nicht erhältlich**.Die Darstelllung in den Zeichnungen und der Stückliste dient nur der Verdeutlichung des Innenaufbaus. Der Print 3 ist mit dem Gehäuse 2 verpreßt und kann nicht entfernt werden. In Falle eines Defekts muß der gesamte Kopf getauscht werden. Vor dem Abschrauben der Kappe muß der Mikrofonkopf am Umfang einige Male auf eine feste Unterlage geschlagen werden um die Gewindesicherung zwischen Kappe und Gehäuse zu lösen. Nach Reparatur muß die Kappe wieder gesichert werden um zu verhindern, daß sich die Kappe beim Abschrauben vom Handsender löst. Die elastische Lagerung der Kapsel ist mit dem Gehäuse verklebt und kann mittels kleinem Schraubenzieher oder Messer herausgeschält werden (außer C5900). Eine neue Kapsel muß an ihrer Lagerung mit Sekundenkleber (Loctite, o.ä.) festgeklebt werden.

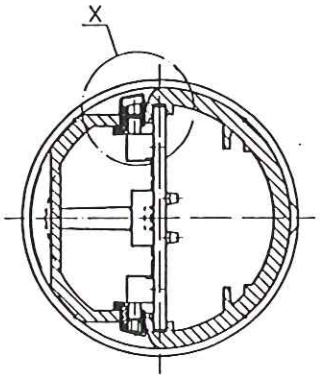
Handheld Transmitter / Handsender

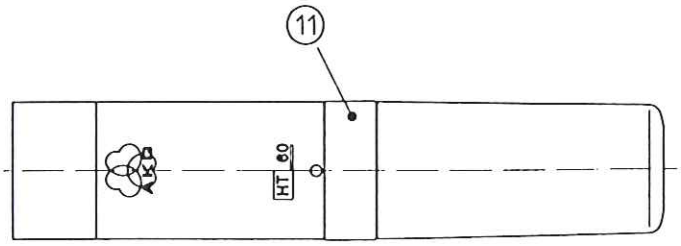
HT 60, HT61
2780Z00..

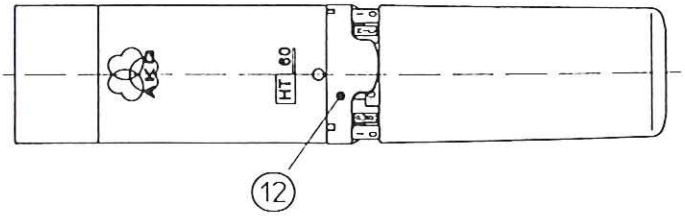


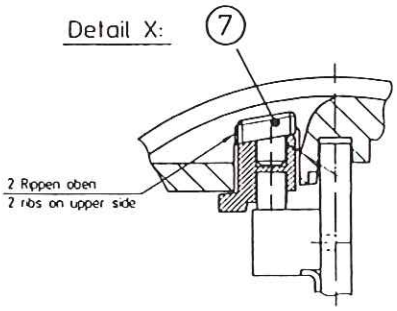


Switch
00406 0187
Loc 184522 J









Handheld Transmitter / Handsender

HT 60, HT61
2780Z00..

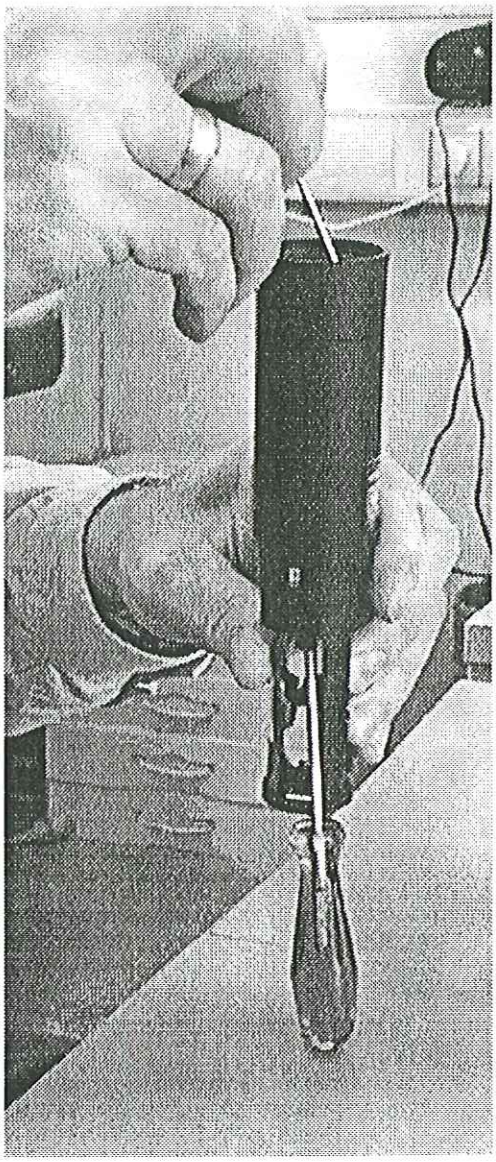
PARTS LIST

STÜCKLISTE

Description	*Pos.*	*Part Nbr. Teile-Nr.*	*Quantity / Stück*		*Bezeichnung*
			HT 60	HT61	
Housing, complete	1	2780M0302	1	1	Gehäuse, komplett
Battery contact	1.1	2780Z1401	1	1	Batteriekontakt
Screw KB 25x10	1.2	0099N2500	1	1	Schraube KB 25x10
Battery band	1.3	2780Z1601	1	1	Batterieband
Battery holder	1.4	2780Z0702	1	1	Batteriehalter
Transmitter board, complete	2*)	2780M01..	1	1	Sendeprint, komplett
Connector plate	3	2780Z0801	1	1	Steckerhalter
Connector	4	0013E0192	1	1	Steckverbinder
Light guide	5	2780Z1201	1	1	Lichtleiter
Cover for screen box	6	2777Z1801	2	2	Deckel für Schirmrahmen
Switch extender	7	2780Z1702	1	1	Schalterverlängerung
Switch extender, grey	8	2780Z1102	1	1	Schalternippel, grau
Switch extender, black	9	2780Z1101	1	1	Schalternippel, schwarz
Potentiometer extender	10	2781Z1702	1	1	Potentiometernippel
Closed ring	11	2780Z1501	1	1	Deckring
Cutaway ring	12	2780Z0901	1	1	Blendenring
Battery sleeve, black	13	2780Z0601	1	-	Batteriehülse, schwarz
Battery sleeve, grey	13	2780Z0602	-	1	Batteriehülse, grau
Stand adapter SA 43	--	6001H0631	1	1	Stativanschluß SA 43

*) see separate parts list of pages 45 *ff* and list of variations on page 11
*) siehe eigene Stückliste auf Seiten 45 *ff*, sowie Variantennummern auf Seite 11

Handheld Transmitter / Handsender HT 60, HT61



How to open the HT60/61:

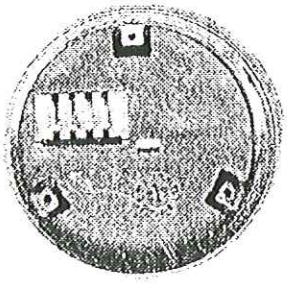
There is a special tool available at self costs of ATS 1200,-. This makes opening very easy. There is however a less elegant but useful way to open the mic using ordinary tools if you proceed as described (see also picture). You need a medium sized TORX or Phillips screwdriver. Insert the blade of the screwdriver to one of the helical battery springs. Press HT and screwdriver against a solid non slippery surface to build up a certain mechanic bias. With the small screwdriver supplied with every WMS 60 the three latches of the contact plate can be pushed inwards by inserting the screwdrive to the holes in the latches. Even more easy is to use a piece of thick stiff wire fitting into the holes. A slight click indicates that the latch is disengaged. After pushing the third latch towards the center, the complete electronic part can be pressed out from the housing.

Zerlegen des Handsenders:

Zum einfachen Öffnen stellen wir ein Spezialwerkzeug zum Selbstkostenpreis von ATS 1200,-- zur Verfügung. Es gibt jedoch auch einen weniger eleganten aber brauchbaren Weg, mit herkömmlichen Werkzeugen ans Ziel zu gelangen. Folgen Sie dazu nachstehender Anleitung (siehe auch Photo). Setzen Sie einen mittelgroßen Kreuzschlitz- oder TORX - Schraubendreher in eine der Batteriekontaktfedern ein. Drücken Sie nun das Mikrofon mit Schraubentdreher gegen eine rutschfeste Unterlage. Drücken Sie der Reihe nach die Sperrklinken am Steckerhalter nach innen, bis Ihnen ein leichtes Klicken das Ausrasten der jeweiligen Klinke anzeigt. Dazu können Sie den kleinen Schraubendreher verwenden, welcher jedem WSM 60 beigepackt ist. Noch besser verwenden Sie ein Stück steifen Drahtes, welchen Sie in die Löcher der Sperrklinken einsetzen. Nach Lösen aller drei Klinken kann der Print mit Steckerhalter aus dem Gehäuse gestoßen werden.

View to the contact side of the connector plate. The three latches have to be pressed in direction of the arrows.

Blick auf die Kontaktseite des Steckerhalters. Die drei Sperrklinken müssen in Pfeilrichtung gedrückt werden.



Handheld Transmitter / Handsender

HT 60, HT61

2780Z00..

Transmitter board, complete (Pos. 2), variation numbers and frequency bands

R729 is an indication component for the frequency set, otherwise it has no function.

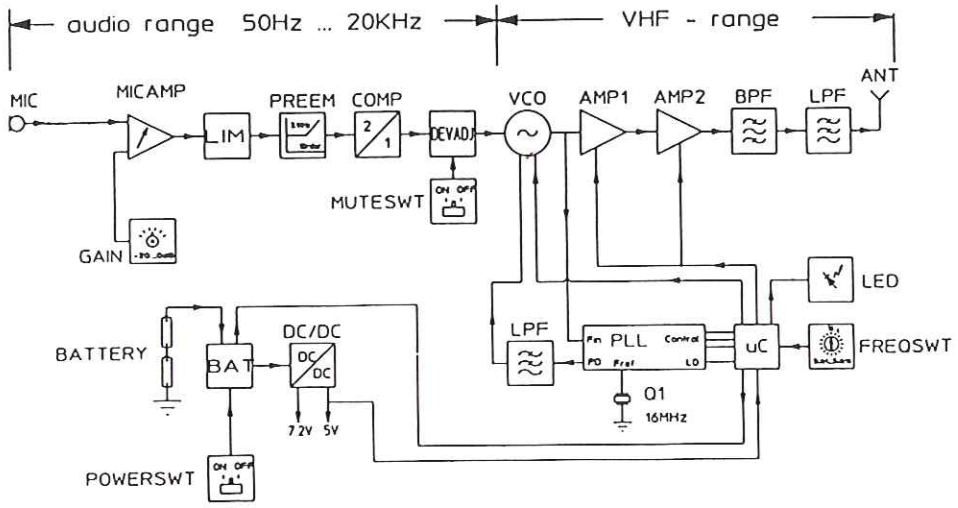
Sendeprint komplett (Pos. 2), Variantennummern und Frequenzbänder

R729 ist ein Identifikationsbauteil für das Frequenzset und hat keine elektronische Funktion

Variation Variante	*Type*	*Frequency set Frequenzset*	*Frequency Range / Frequenzbereich MHZ*	*R729 Ohm*
2780M0101	HT60	DK (Denmark)	138,250 ... 142,075	10
2780M0102	HT60	US1a (USA traveller)	169,445 ... 171,845	100
2780M0103	HT60	US1b (USA traveller)	169,505 ... 171,905	390
2780M0104	HT60	UK1 (UK)	173,800 ... 175,000	560
2780M0105	HT60	EUS7 (France 1, USA 7 and Europa)	176 ... 178	820
2780M0106	HT60	RS (Singapore)	180 ... 182	1000
2780M0107	HT60	EUS8a (Belgium 1, USA 8, Europa)	182 ... 184	2200
2780M0108	HT60	EUS8b (France 2, USA 8, Europa)	184 ... 186	4700
2780M0109	HT60	EUS11 (Netherlands, USA 11)	198 ... 200	22000
2780M0110	HT60	EUS12 (USA 12, Europa)	204 ... 206	39000
2780M0111	HT60	AT1 (Austria)	246,300 ... 248,600	100000
2780M0112	HT61	DK (Denmark)	138,250 ... 142,075	
2780M0113	HT61	US1a (USA traveller)	169,445 ... 171,845	
2780M0114	HT61	US1b (USA traveller)	169,505 ... 171,905	
2780M0115	HT61	UK1 (UK)	173,800 ... 175,000	
2780M0116	HT61	EUS7 (France 1, USA 7 and Europa)	176 ... 178	
2780M0117	HT61	RS (Singapore)	180 ... 182	
2780M0118	HT61	EUS8a (Belgium 1, USA 8, Europa)	182 ... 184	
2780M0119	HT61	EUS8b (France 2, USA 8, Europa)	184 ... 186	
2780M0120	HT61	EUS11 (Netherlands, USA 11)	198 ... 200	
2780M0121	HT61	EUS12 (USA 12, Europa)	204 ... 206	
2780M0122	HT61	AT1 (Austria)	246,300 ... 248,600	
2780M0123	HT61	EUS9 (USA 9, Europa)	190 ... 192	
2780M0124	HT61	EUS10 (USA 10, Europa)	196 ... 198	
2780M0125	HT61	EUS13 (USA 13, Europa)	214 ... 216	

Block Diagram

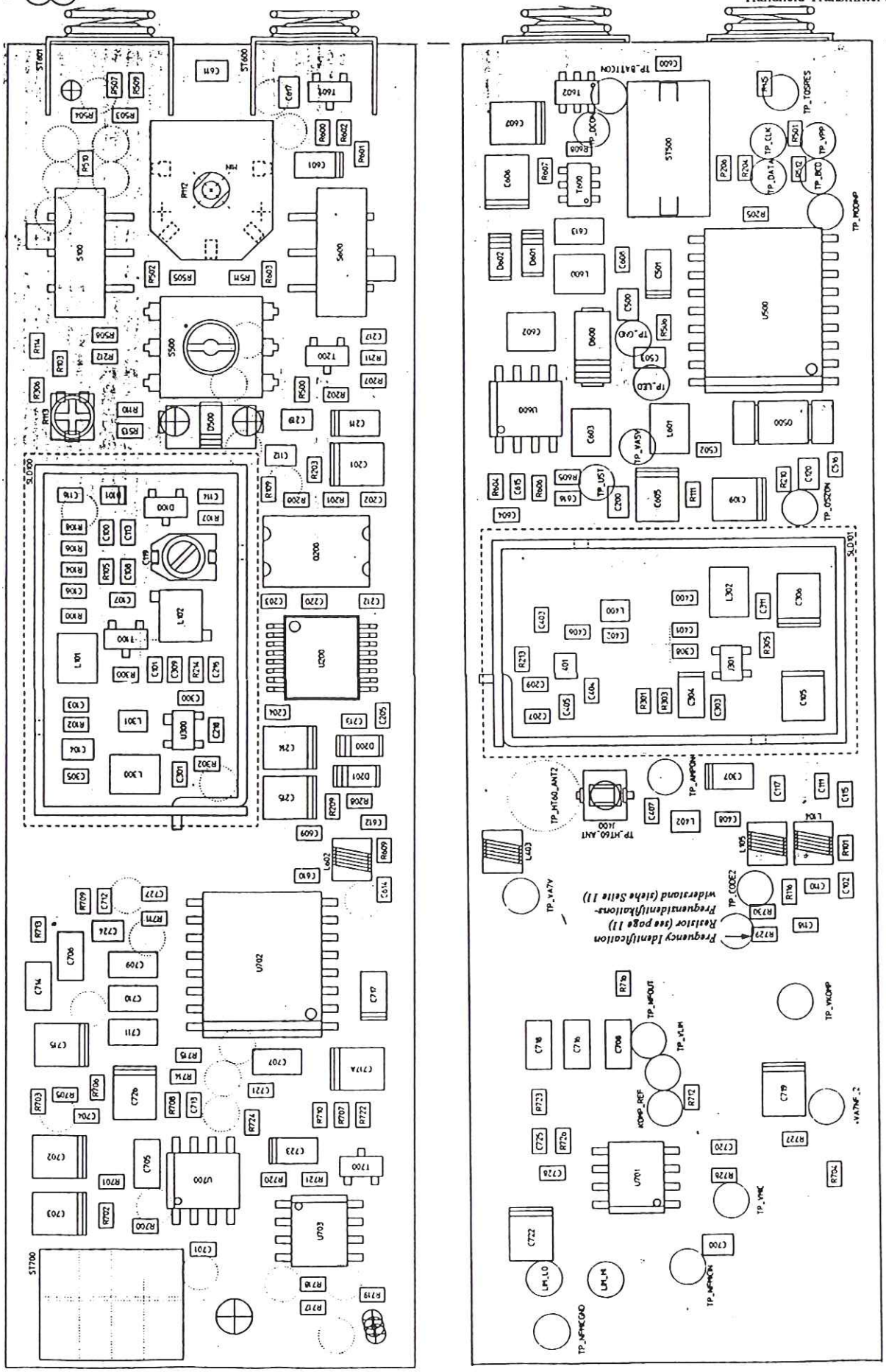
Blockschaltbild



Handheld Transmitter / Handsender

HT 60, HT61
2780Z00..

Page reserved for future supplements
Seite für künftige Ergänzungen reserviert

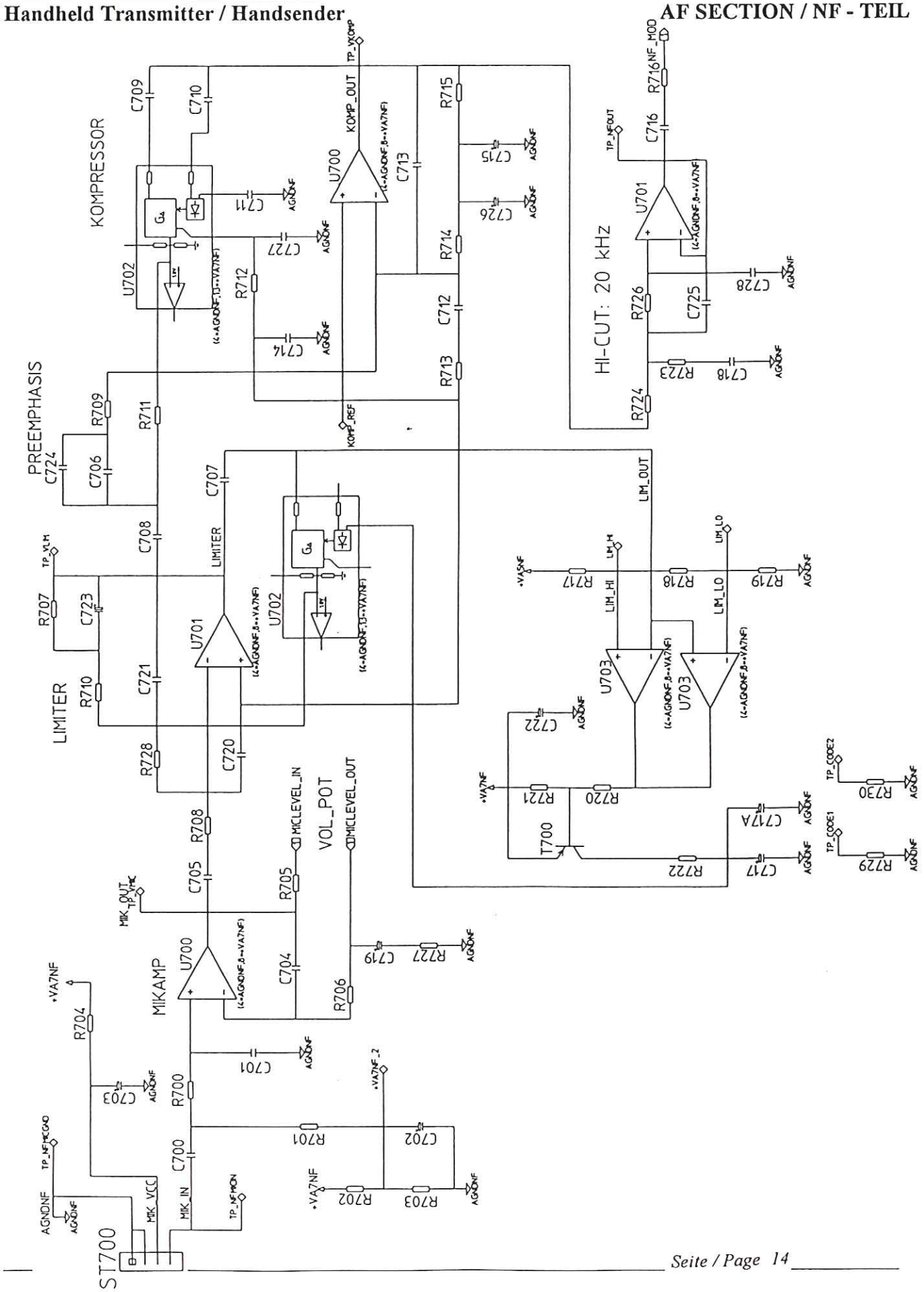


Handsender: Bauteilebestückung

Handheld Transmitter: Components Layout

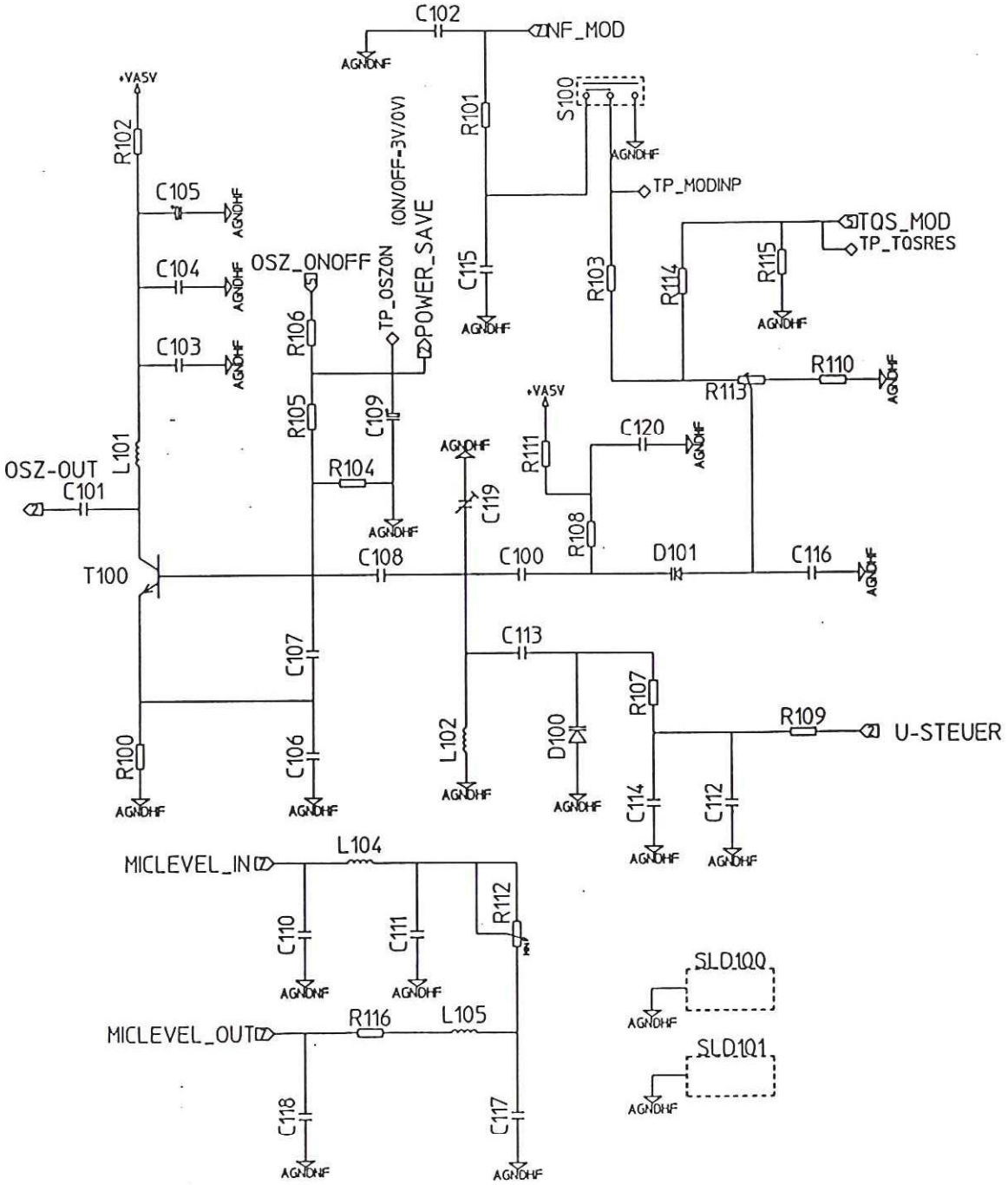
Handheld Transmitter / Handsender

AF SECTION / NF - TEIL

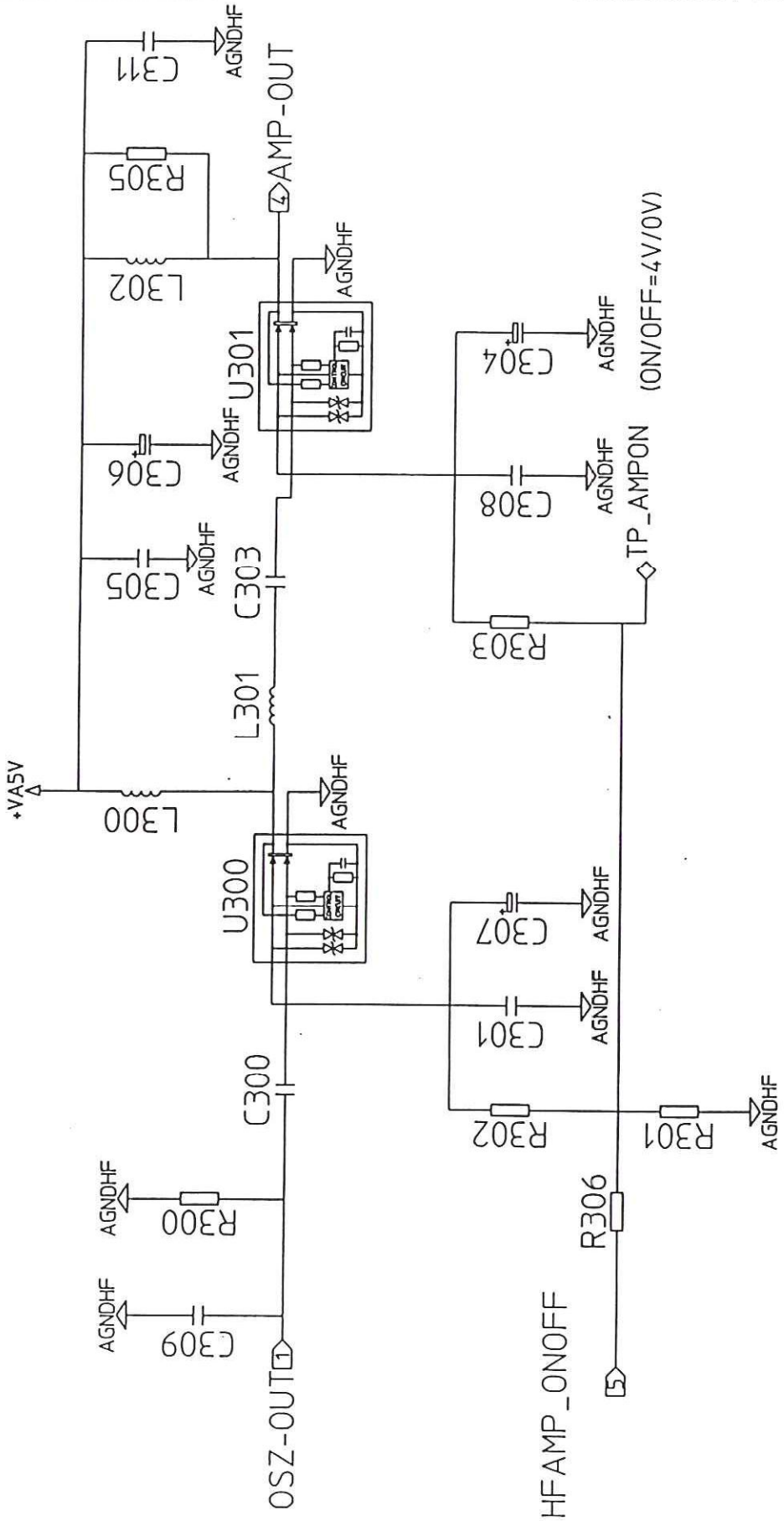


Handheld Transmitter / Handsender

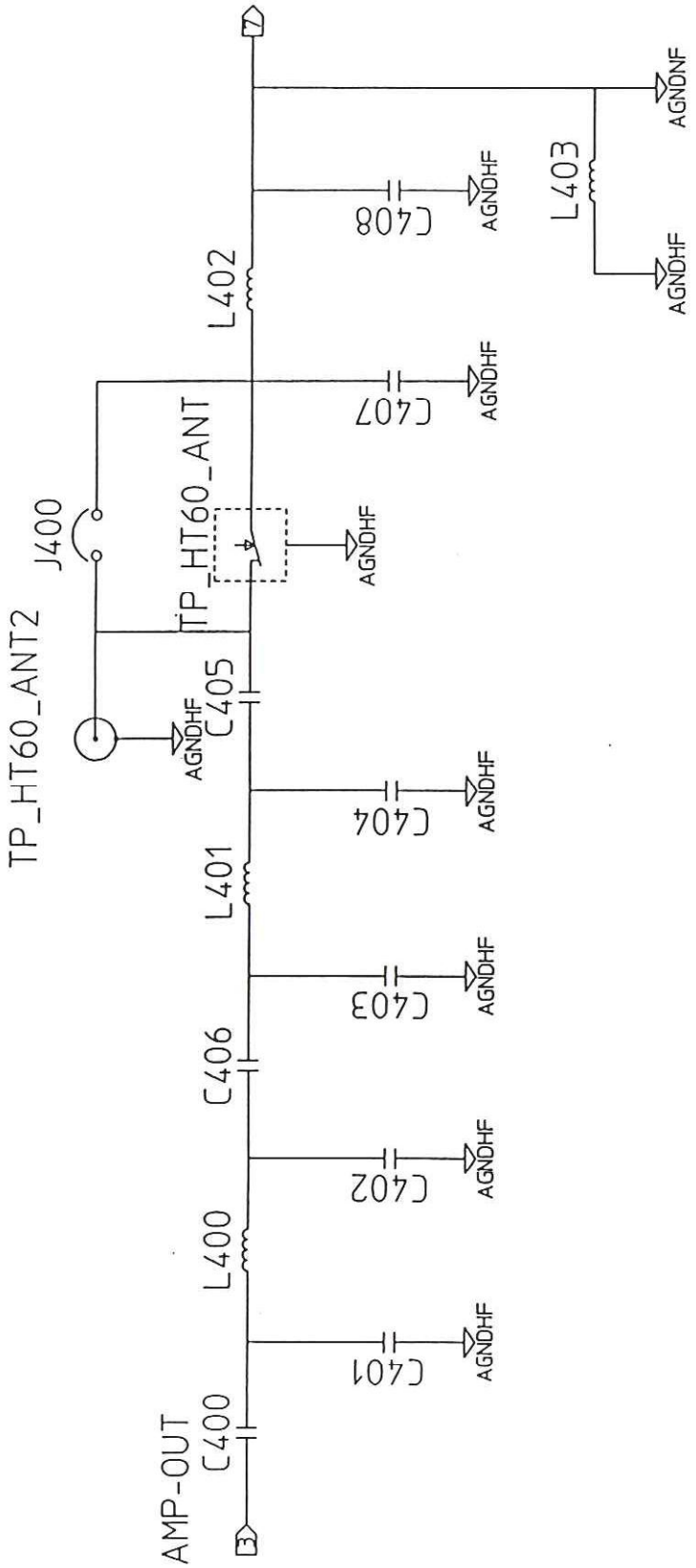
OSCILLATOR



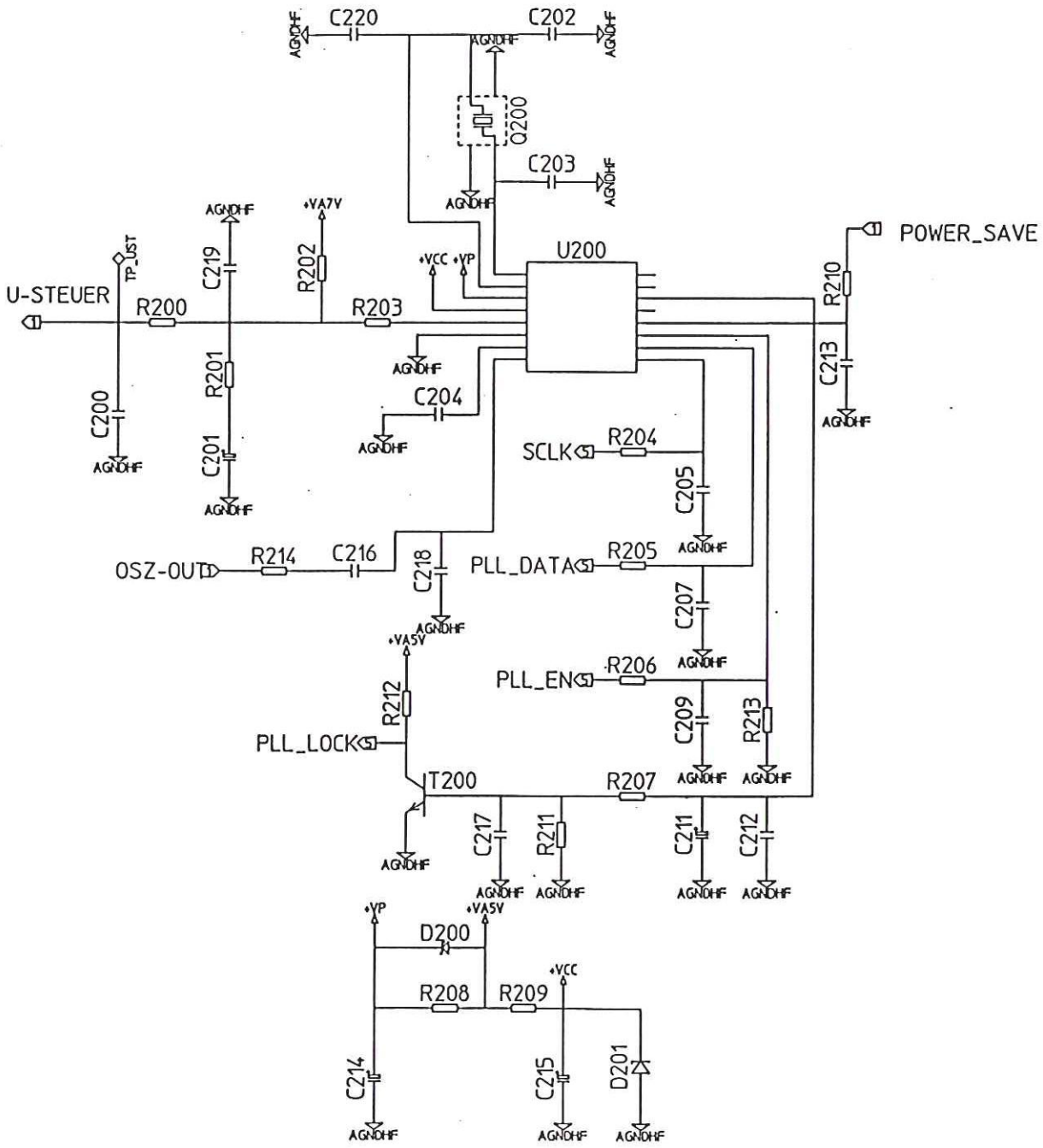
Handheld Transmitter / Handsender **AMPLIFIER / VERSTÄRKER**



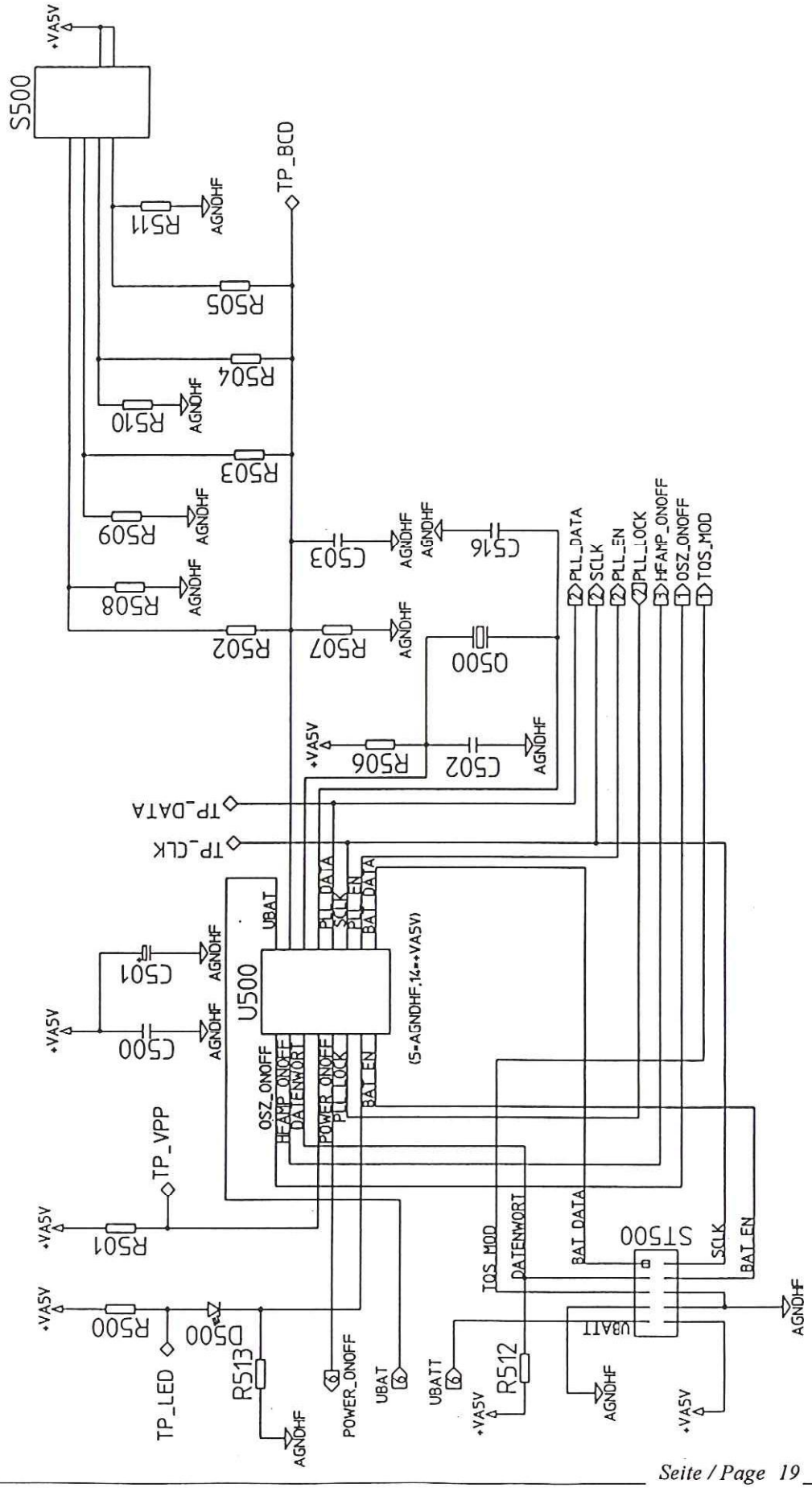
Handheld Transmitter / Handsender **FILTER**



Handheld Transmitter / Handsender — PLL

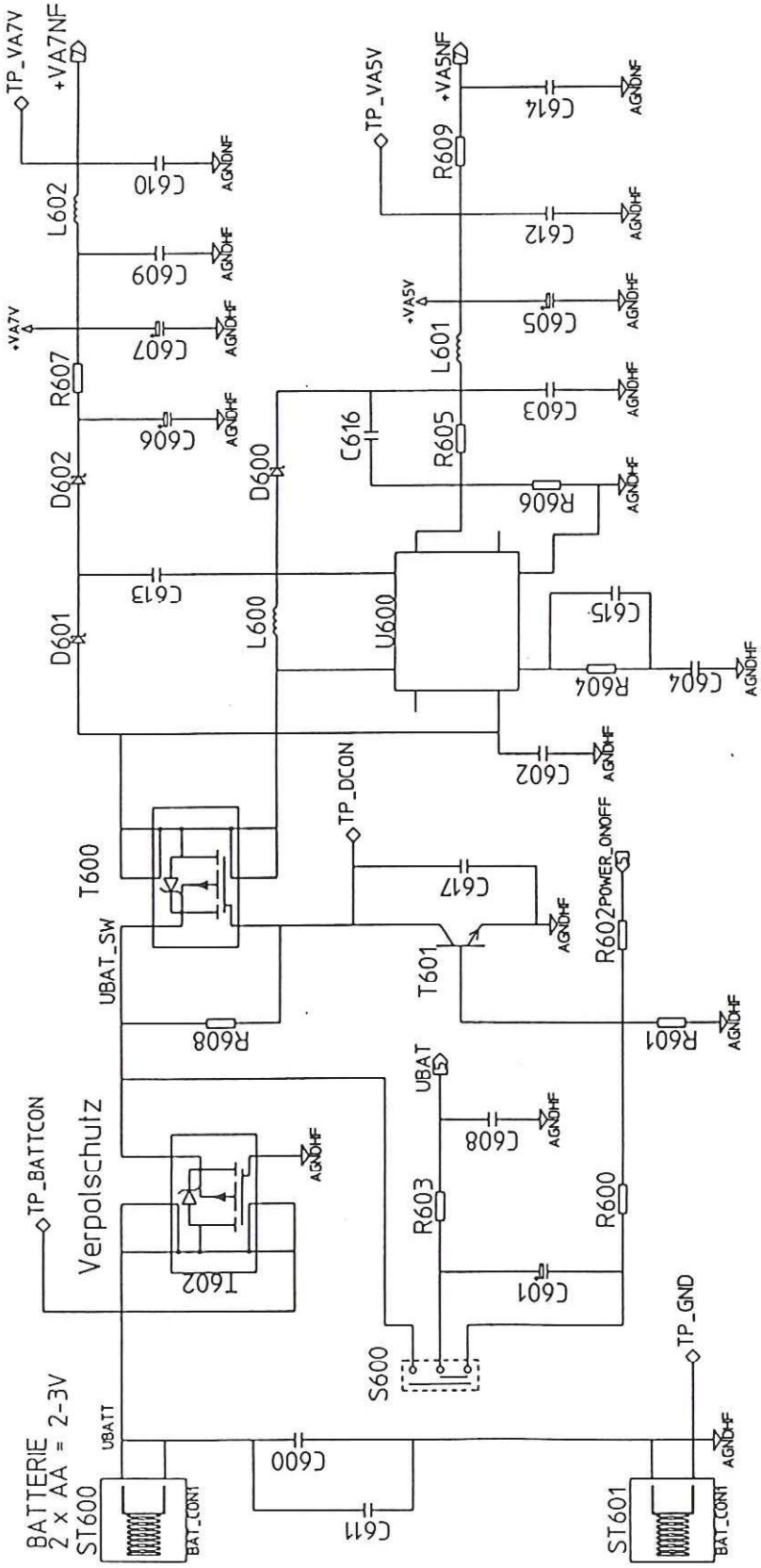


Handheld Transmitter / Handsender **MICROCONTROLLER**



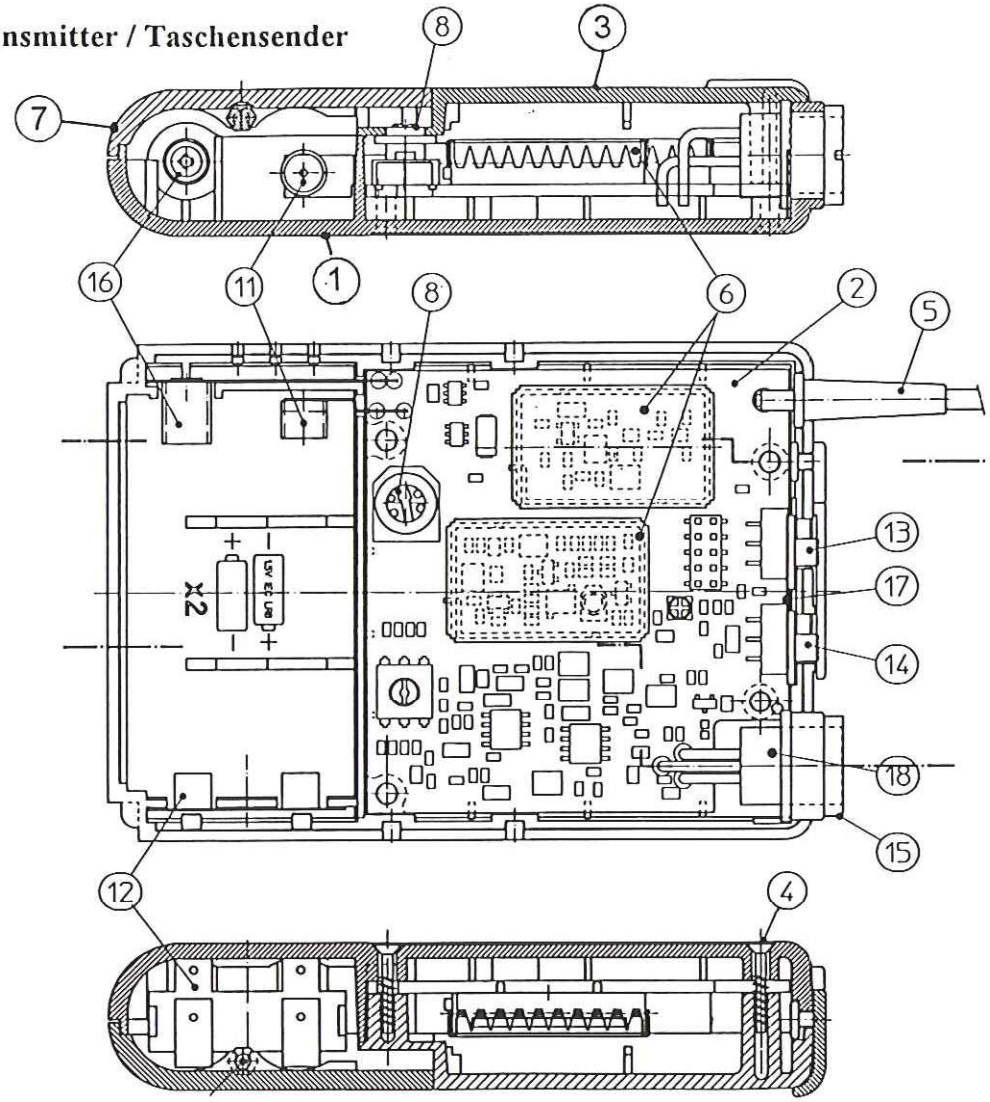
Handheld Transmitter / Handsender

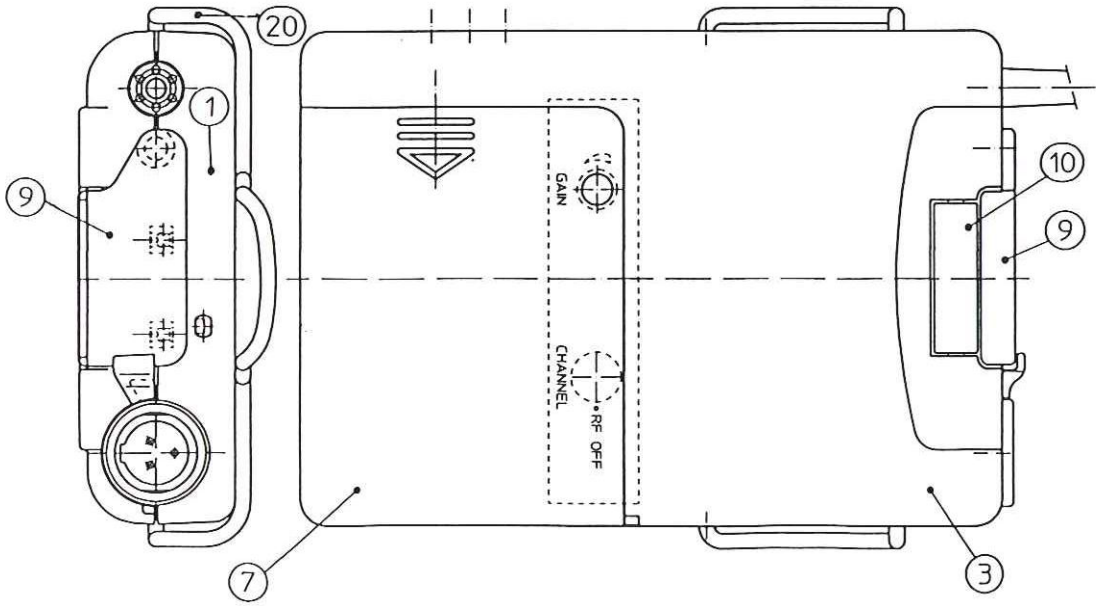
DC/DC CONVERTER



Pocket Transmitter / Taschensender

PT 60, PT61
2781Z00..





Pocket Transmitter / Taschensender

PT 60, PT61
2781Z00..

PARTS LIST — STÜCKLISTE

Description	*Pos.*	*Part Nbr. Teile-Nr.*	*Quantity / Stück*		*Bezeichnung*
			PT 60	PT 61	
Housing, lower	1	2781Z1201	1	1	Gehäuse, Unterteil
Transmitter board, complete	2*)	2781M01..		1	Sendeprint, komplett
Housing, upper	3	2781Z1103	1	-	Gehäuse, Oberteil
		2781Z1104	-	1	
Screw KB 22x12	4	0099N2209	4	4	Schraube KB 22x12
Antenna	5**)	2635M070.	1	1	Antenne
Cover for screen box	6	2777Z1801	2	2	Deckel für Schirmrahmen
Battery cover, printed	7	2781Z1403	1	-	Batteriedeckel, bedruckt
		2781Z1404	-	1	
Potentiometer extender	8	2781Z1701	1	1	Potentiometernippel
Switch cover	9	2781Z1501	1	1	Schalterabdeckung
Colour marker	10	2781Z0501	1	1	Farbcodeplättchen
Contact	11	9999N0598	1	1	Kontakt
Contact	12	9999N0597	1	1	Kontakt
Switch extender, grey	13	2780Z1102	1	1	Schalternippel, grau
Switch extender, black	14	2780Z1101	1	1	Schalternippel, schwarz
Ring nut	15	2781Z2001	1	1	Ringmutter
Contact	16	2781Z1601	1	1	Kontakt
Foil cover	17	2781Z1901	1	1	Folienabdeckung
Mini jack socket	18	0016E0370	1	1	Mini-Buchse
Screw driver	--	2781Z1801	1	1	Schraubendreher
Belt clip	20	2781Z1301	1	1	Gürtelspange
Additional extension for Pos 13, 14	--	2780Z1702	***)	***)	Zusatzverlängerung für Pos 13, 14

*) see separate parts list of pages 45 *ff* and list of variations on page 23
*) siehe eigene Stückliste auf Seiten 45 *ff*, sowie Variantennummern auf Seite 23

**) When ordering, please state required frequency set
**) Bei Bestellung, bitte benötigtes Frequenzset angeben

***) This part can be attached to the switch extenders 13 and 14 for easy operation of the switches. It is also included in the set of parts 2771M0101 (see page 3). Item is delivered in pairs.

***) Dieser Teil kann auf die Schalternippel 13 und 14 aufgesteckt werden, um leichtere Schaltbarkeit zu ermöglichen. Er ist auch im Kleinteileset 2771M0101 enthalten. Der Teil wird paarweise geliefert.

Pocket Transmitter / Taschensender

PT 60, PT61
2781Z00..

Transmitter board, complete (1), variation numbers and frequency bands

R729 is an indication component for the frequency set, otherwise it has no function.

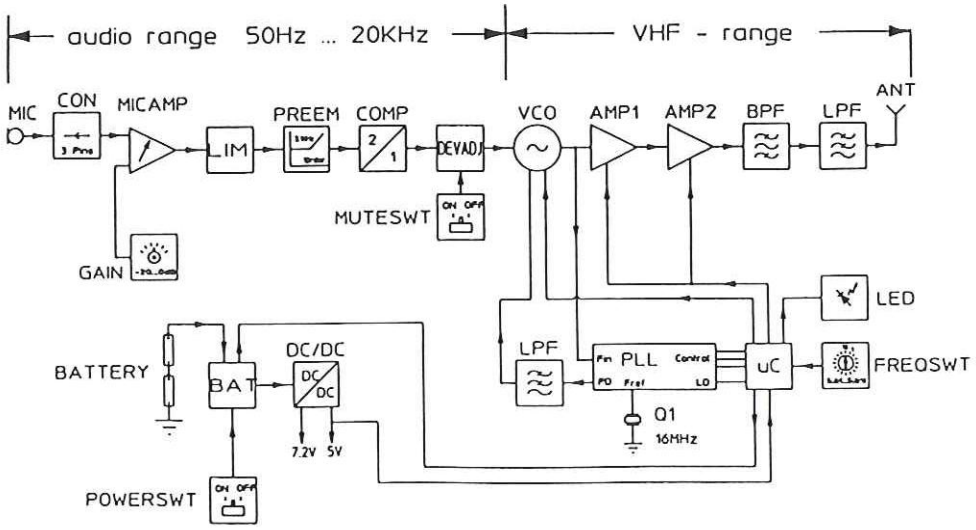
Sendeprint komplett (1), Variantennummern und Frequenzbänder

R729 ist ein Identifikationsbauteil für das Frequenzset und hat keine elektronische Funktion

Variation Variante	*Type*	*Frequency set Frequenzset*	*Frequency Range / Frequenzbereich MHZ*	*R729 Ohm*
2781M0101	PT60	DK (Denmark)	138,250 ... 142,075	10
2781M0102	PT60	US1a (USA traveller)	169,445 ... 171,845	100
2781M0103	PT60	US1b (USA traveller)	169,505 ... 171,905	390
2781M0104	PT60	UK1 (UK)	173,800 ... 175,000	560
2781M0105	PT60	EUS7 (France 1, USA 7 and Europa)	176 ... 178	820
2781M0106	PT60	RS (Singapore)	180 ... 182	1000
2781M0107	PT60	EUS8a (Belgium 1, USA 8, Europa)	182 ... 184	2200
2781M0108	PT60	EUS8b (France 2, USA 8, Europa)	184 ... 186	4700
2781M0109	PT60	EUS11 (Netherlands, USA 11)	198 ... 200	22000
2781M0110	PT60	EUS12 (USA 12, Europa)	204 ... 206	39000
2781M0111	PT60	AT1 (Austria)	246,300 ... 248,600	100000
2781M0112	PT61	DK (Denmark)	138,250 ... 142,075	
2781M0113	PT61	US1a (USA traveller)	169,445 ... 171,845	
2781M0114	PT61	US1b (USA traveller)	169,505 ... 171,905	
2781M0115	PT61	UK1 (UK)	173,800 ... 175,000	
2781M0116	PT61	EUS7 (France 1, USA 7 and Europa)	176 ... 178	
2781M0117	PT61	RS (Singapore)	180 ... 182	
2781M0118	PT61	EUS8a (Belgium 1, USA 8, Europa)	182 ... 184	
2781M0119	PT61	EUS8b (France 2, USA 8, Europa)	184 ... 186	
2781M0120	PT61	EUS11 (Netherlands, USA 11)	198 ... 200	
2781M0121	PT61	EUS12 (USA 12, Europa)	204 ... 206	
2781M0122	PT61	AT1 (Austria)	246,300 ... 248,600	
2781M0123	PT61	EUS9 (USA 9, Europa)	190 ... 192	
2781M0124	PT61	EUS10 (USA 10, Europa)	196 ... 198	
2781M0125	PT61	EUS13 (USA 13, Europa)	214 ... 216	

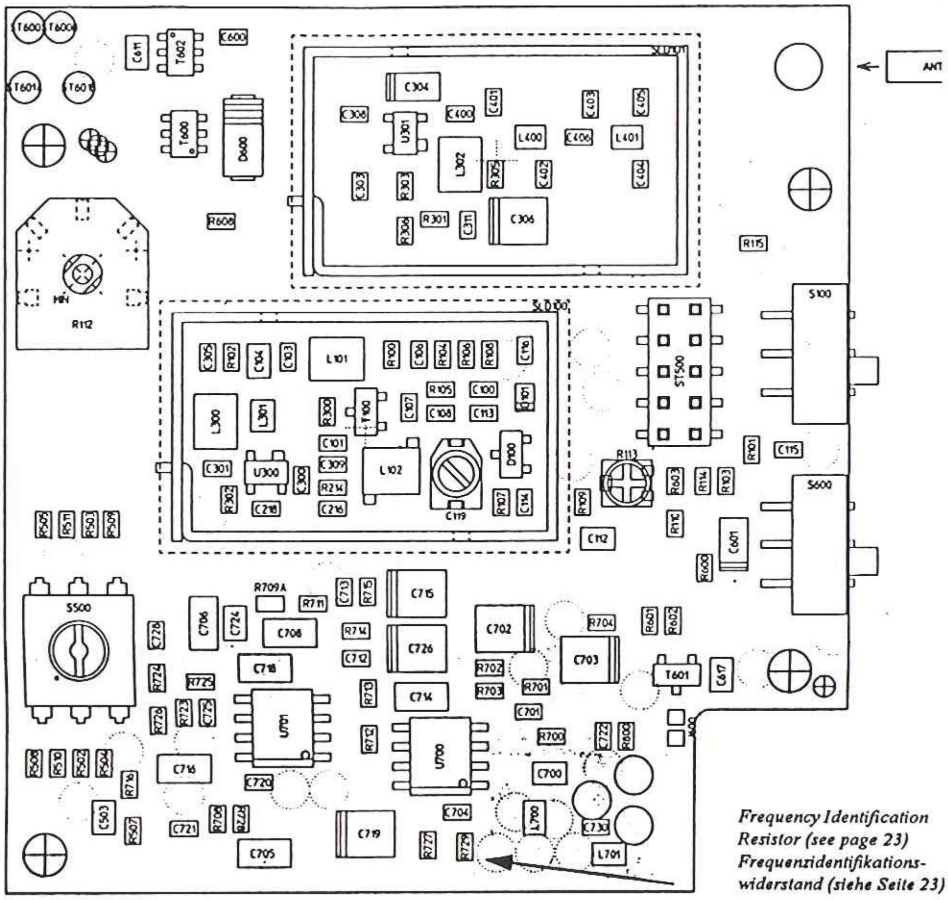
Block Diagram

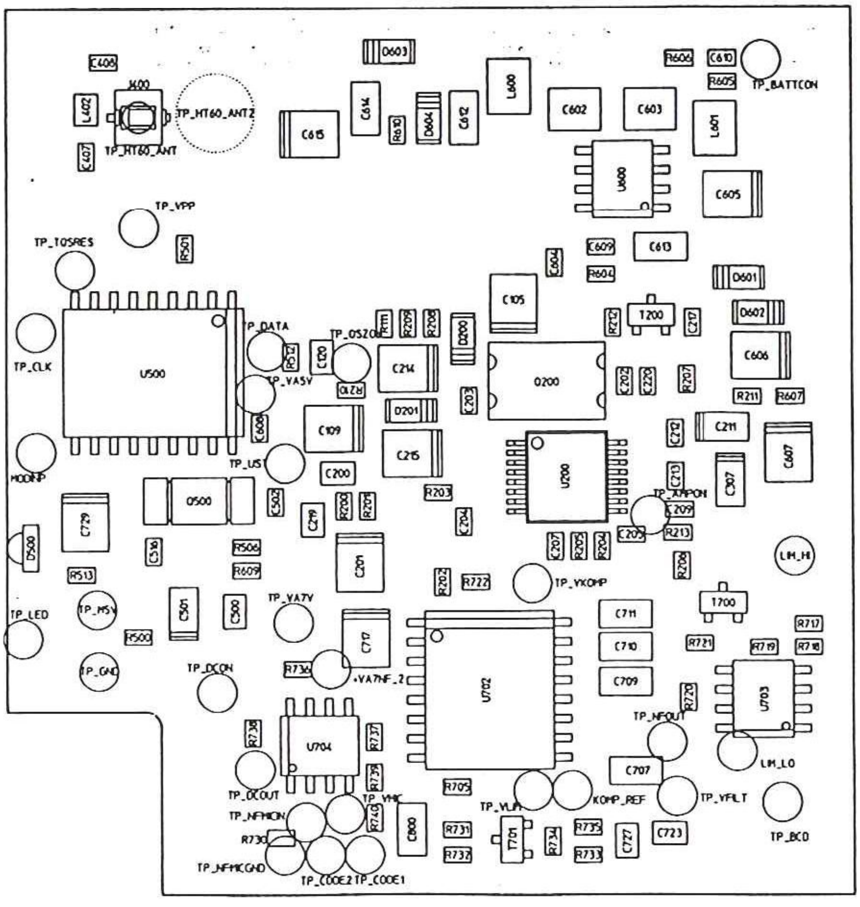
Blockschaltbild

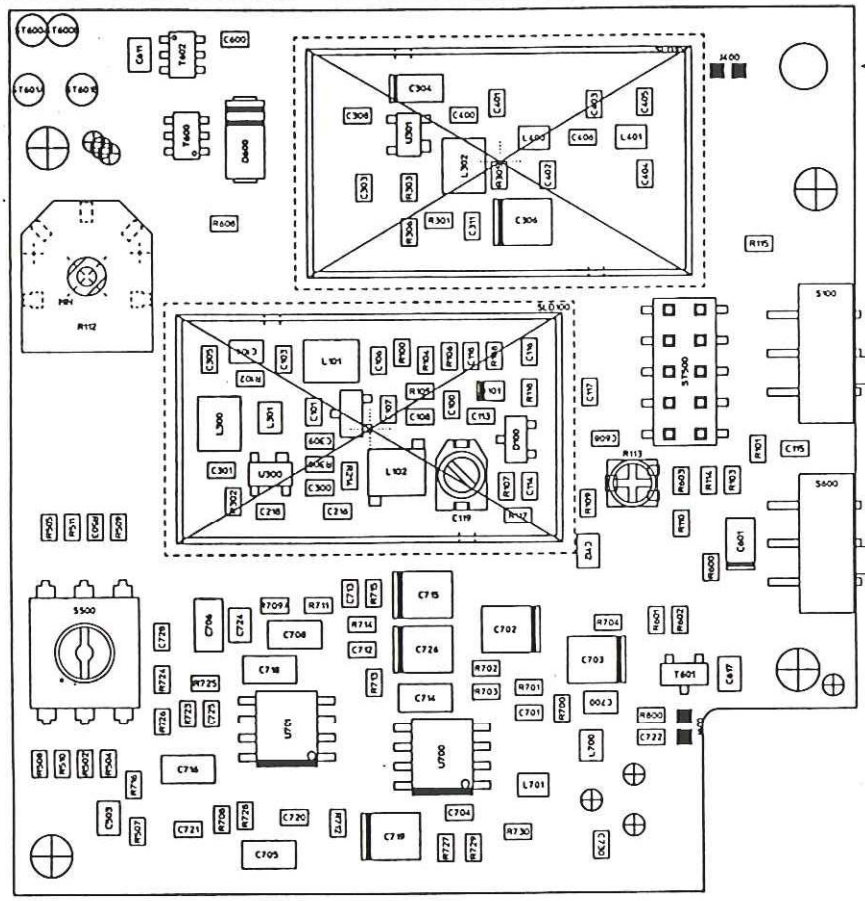


Taschensender: Bauteilebestückung

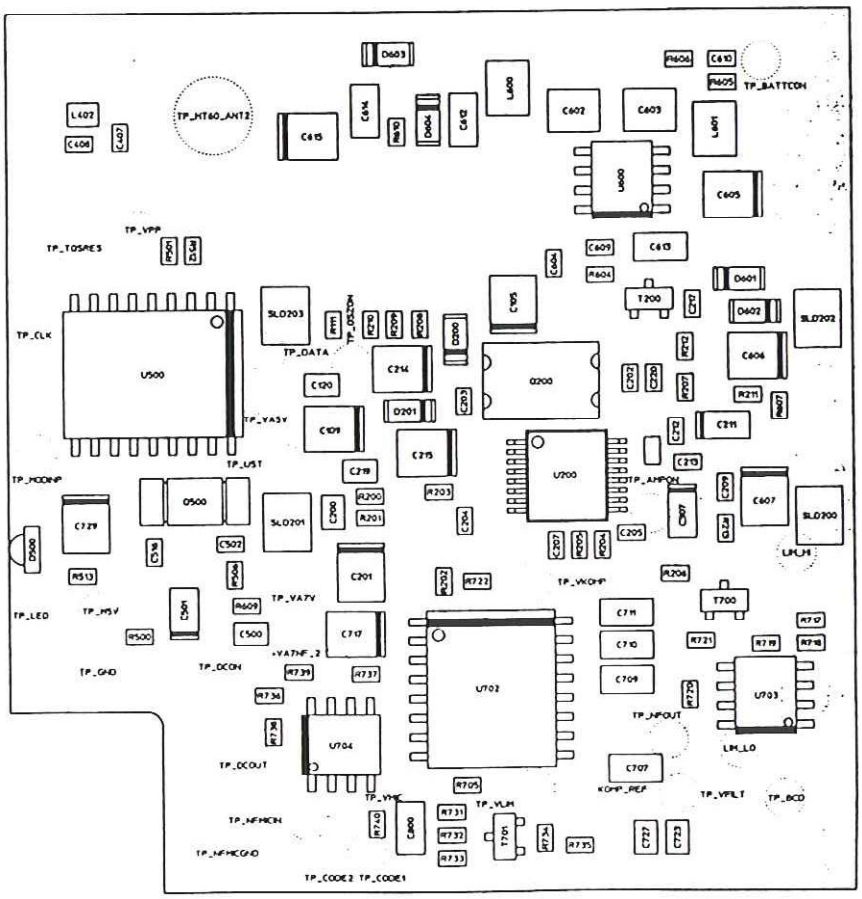
Pocket Transmitter: Component Layout







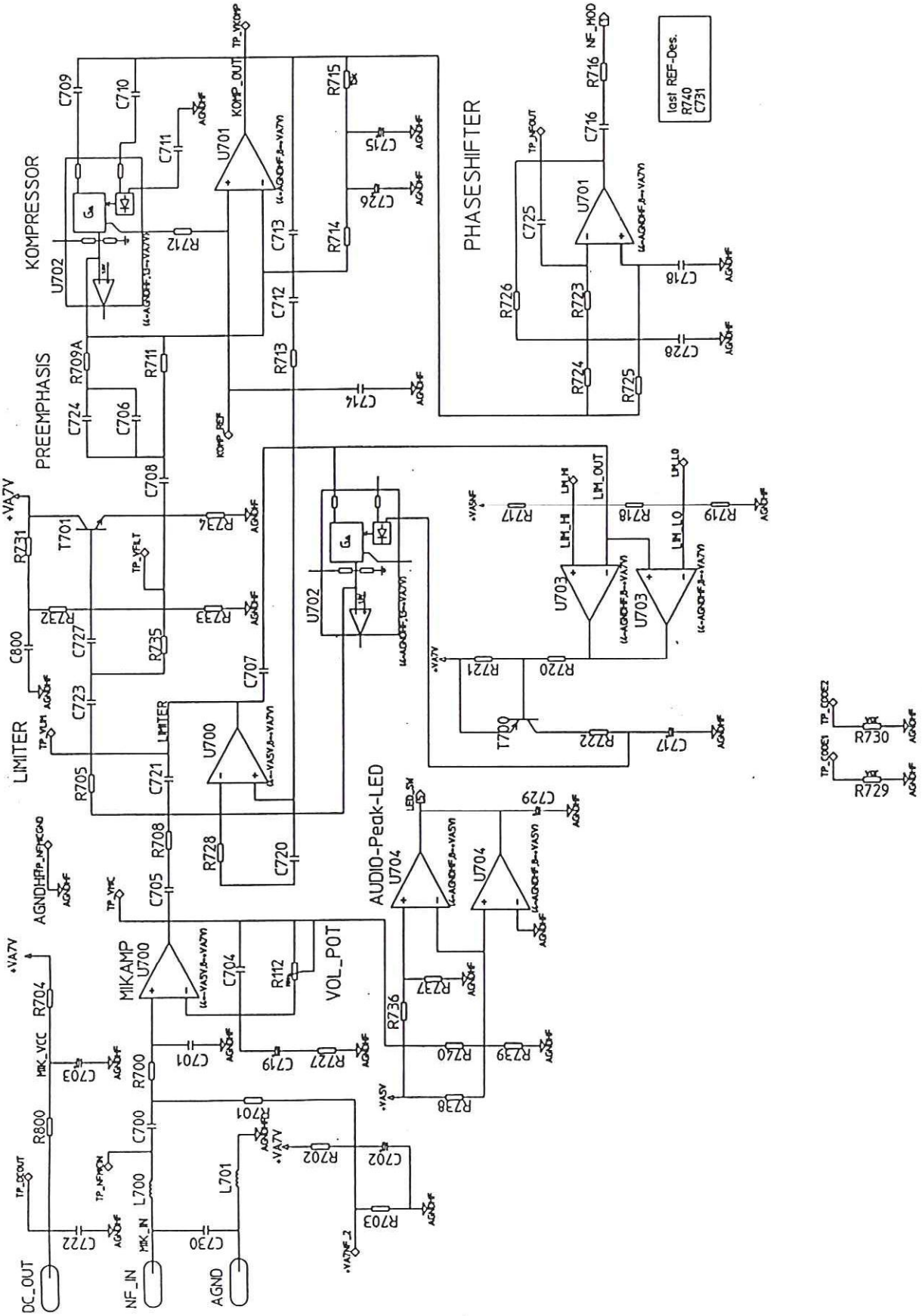
NEW / NEU
VERSION 5.0



Pocket Transmitter: Component Layout Taschensender: Bauteilebestückung

Pocket Transmitter / Taschensender

AF SECTION / NF - TEIL



Pocket Transmitter / Taschensender

AF SECTION / NF - TEIL

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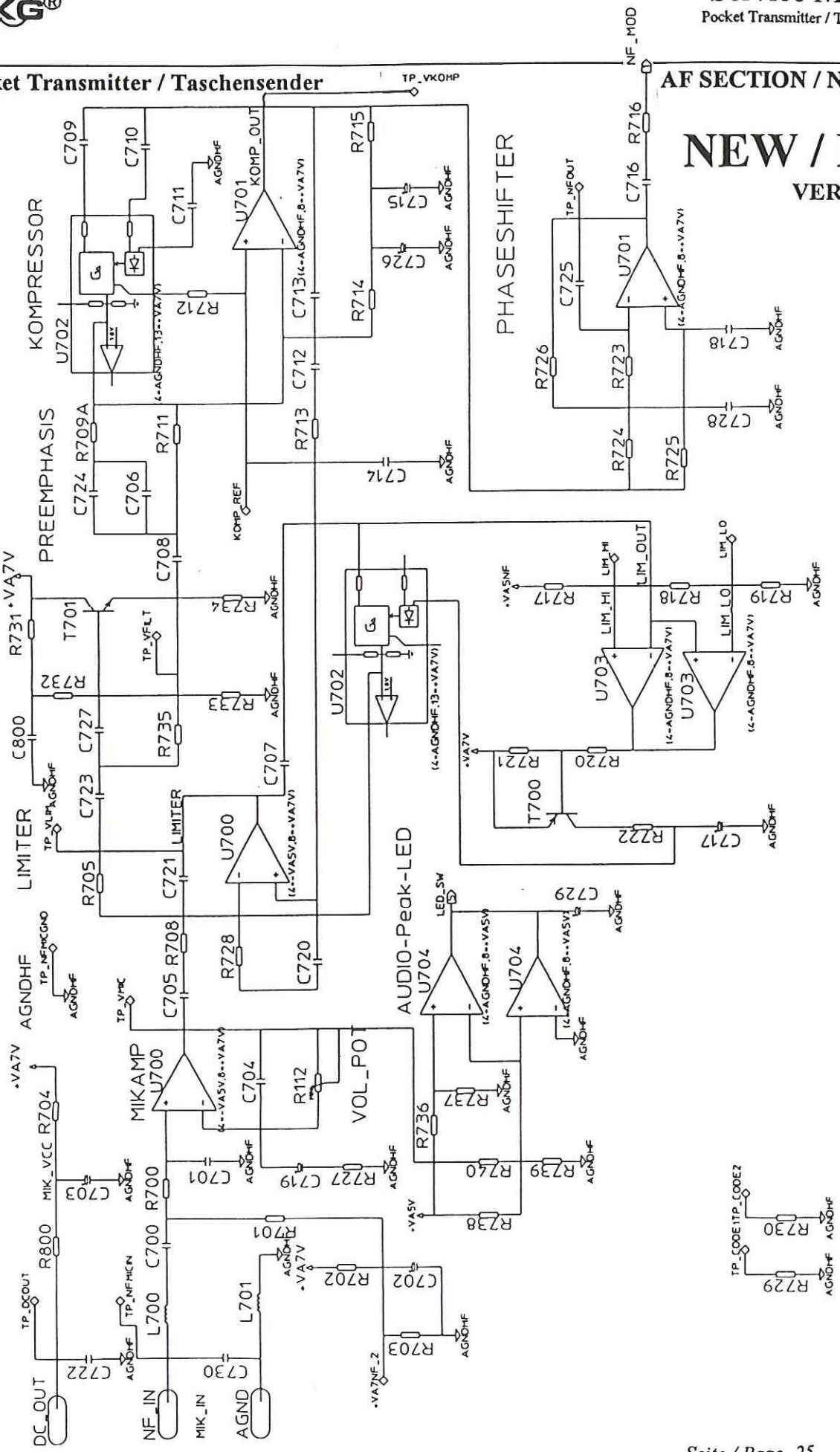
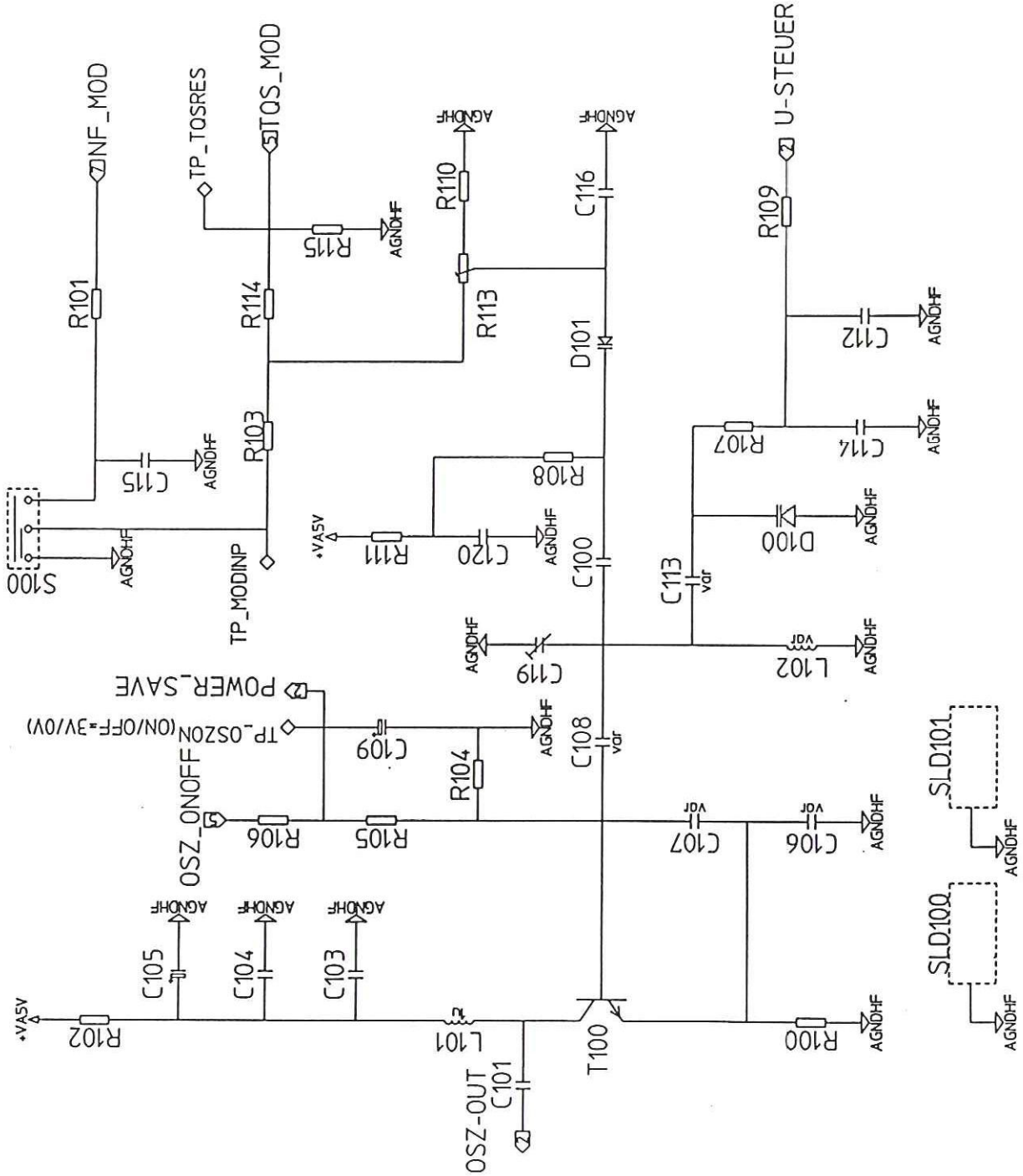


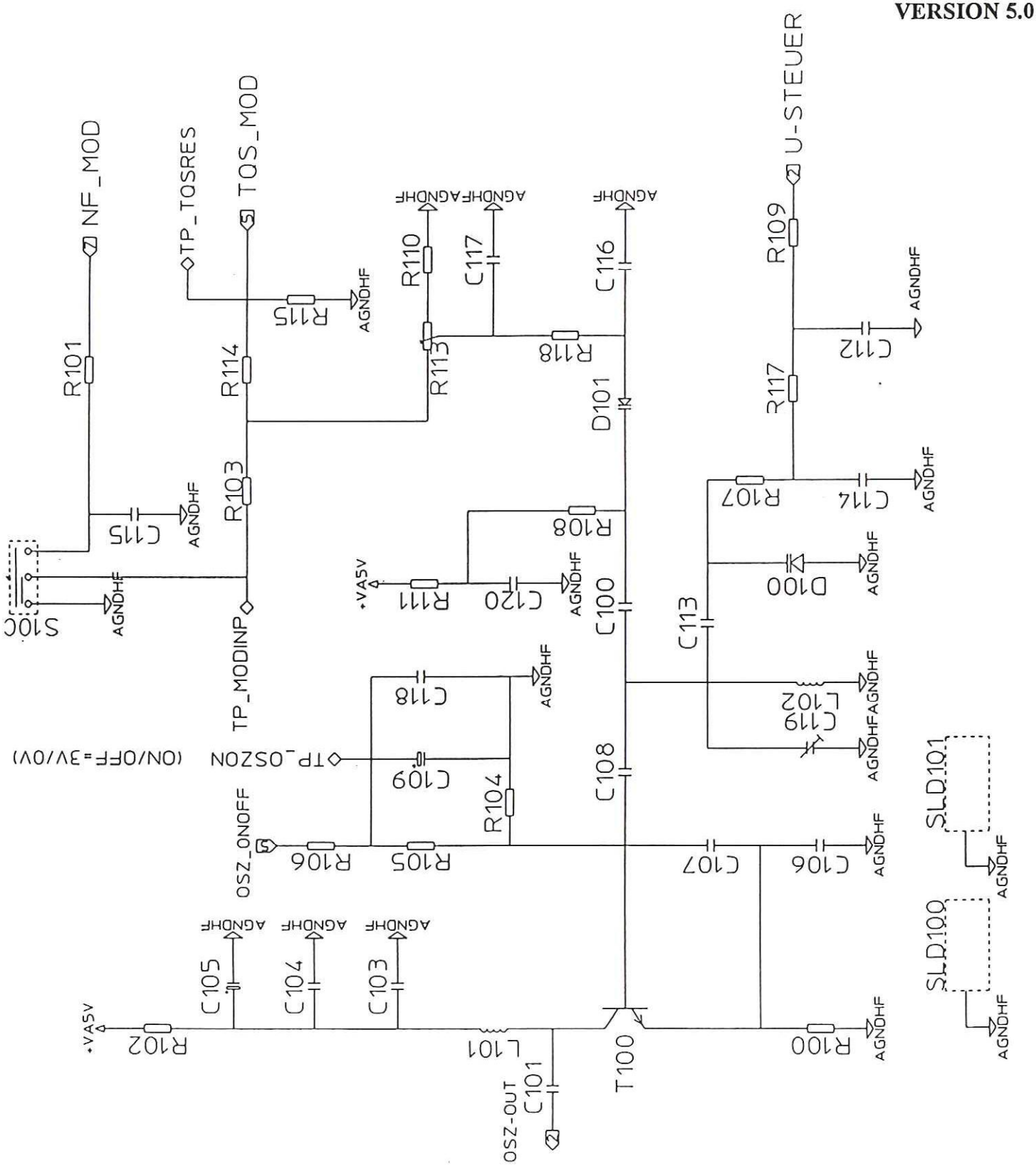
Pocket Transmitter / Taschensender **OSCILLATOR**



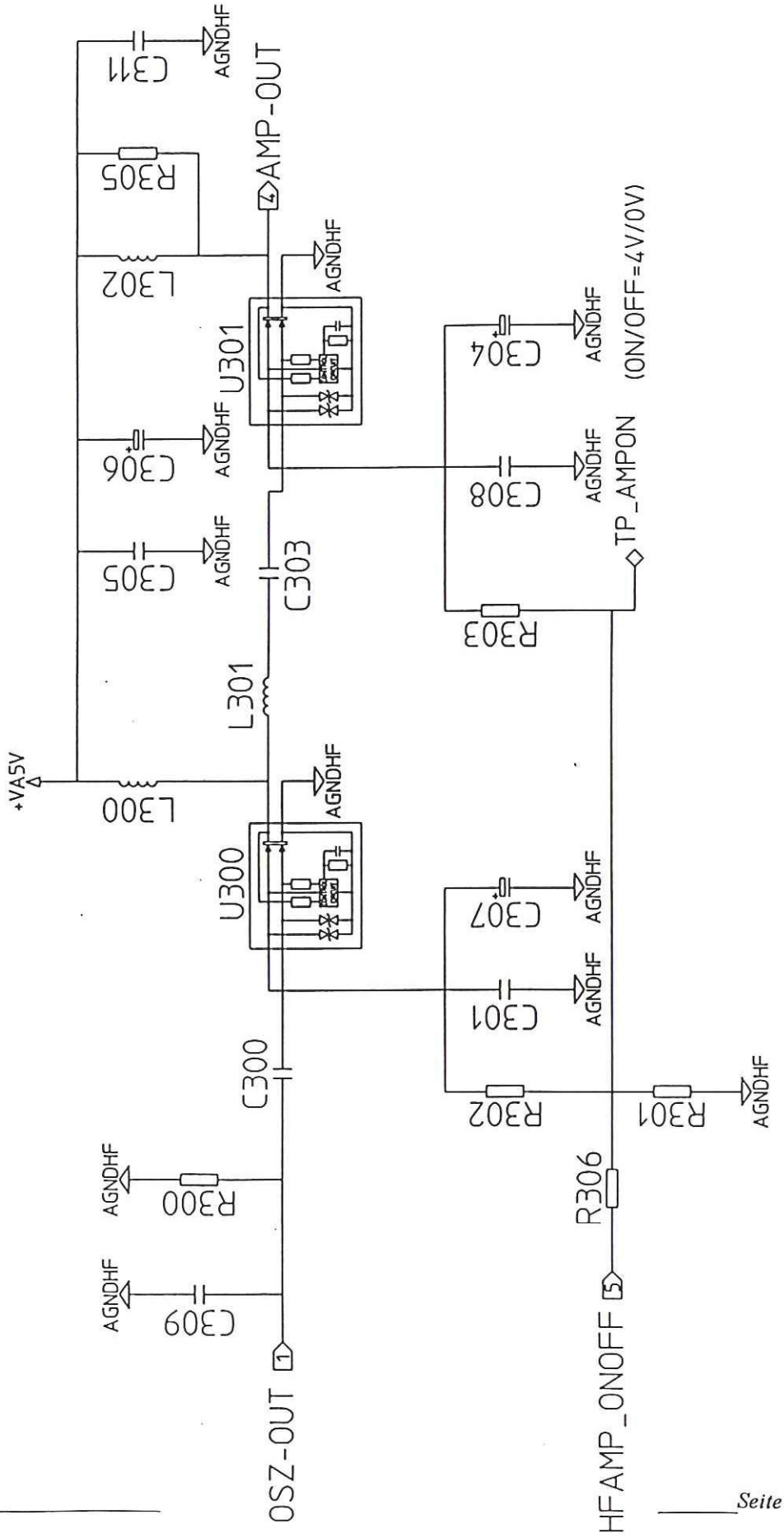
Pocket Transmitter / Taschensender **OSCILLATOR**

NEW / NEU

VERSION 5.0



Pocket Transmitter / Taschensender **AMPLIFIER / VERSTÄRKER**



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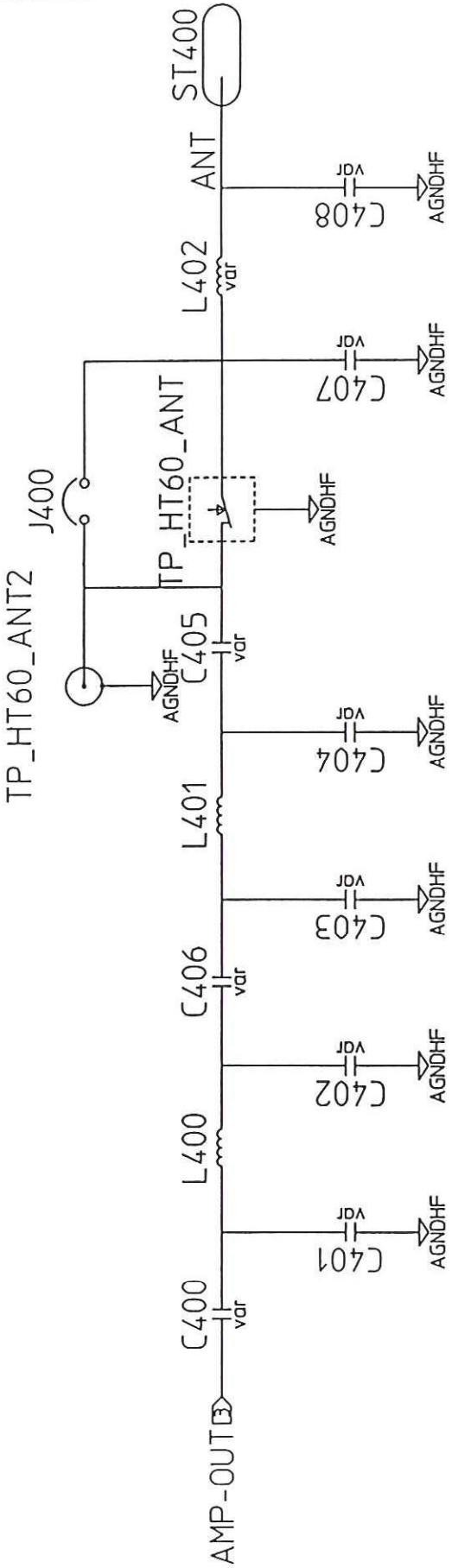

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Pocket Transmitter / Taschensender

FILTER

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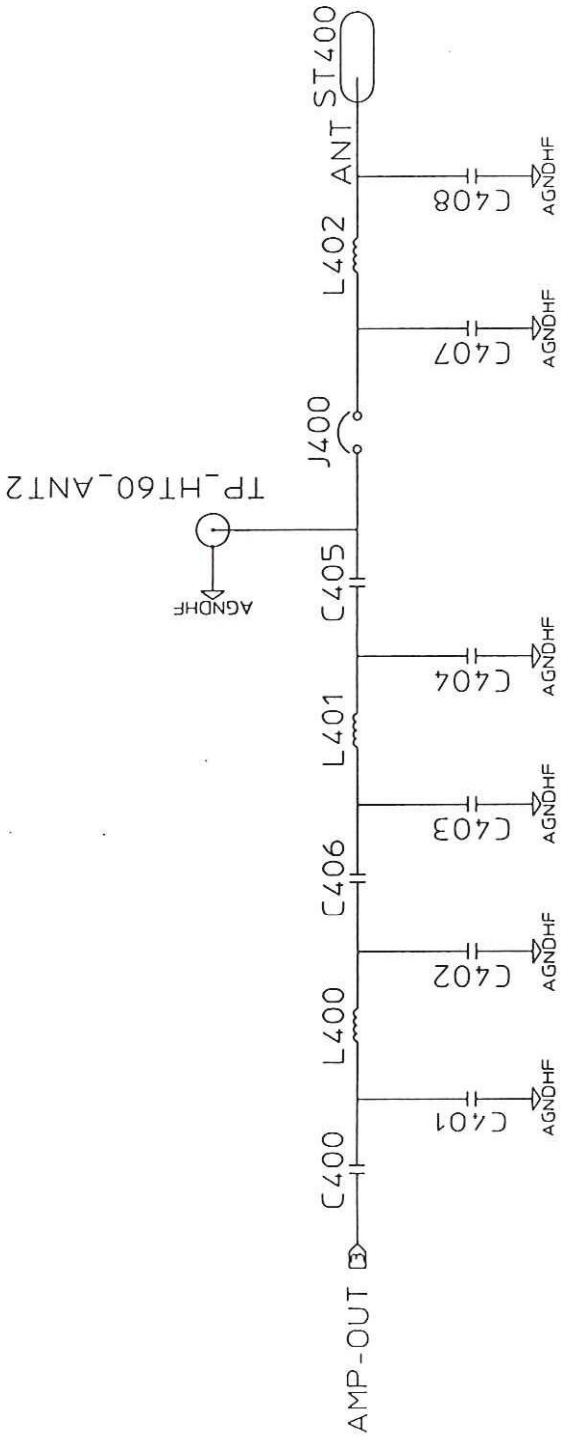
VERSION 5.0



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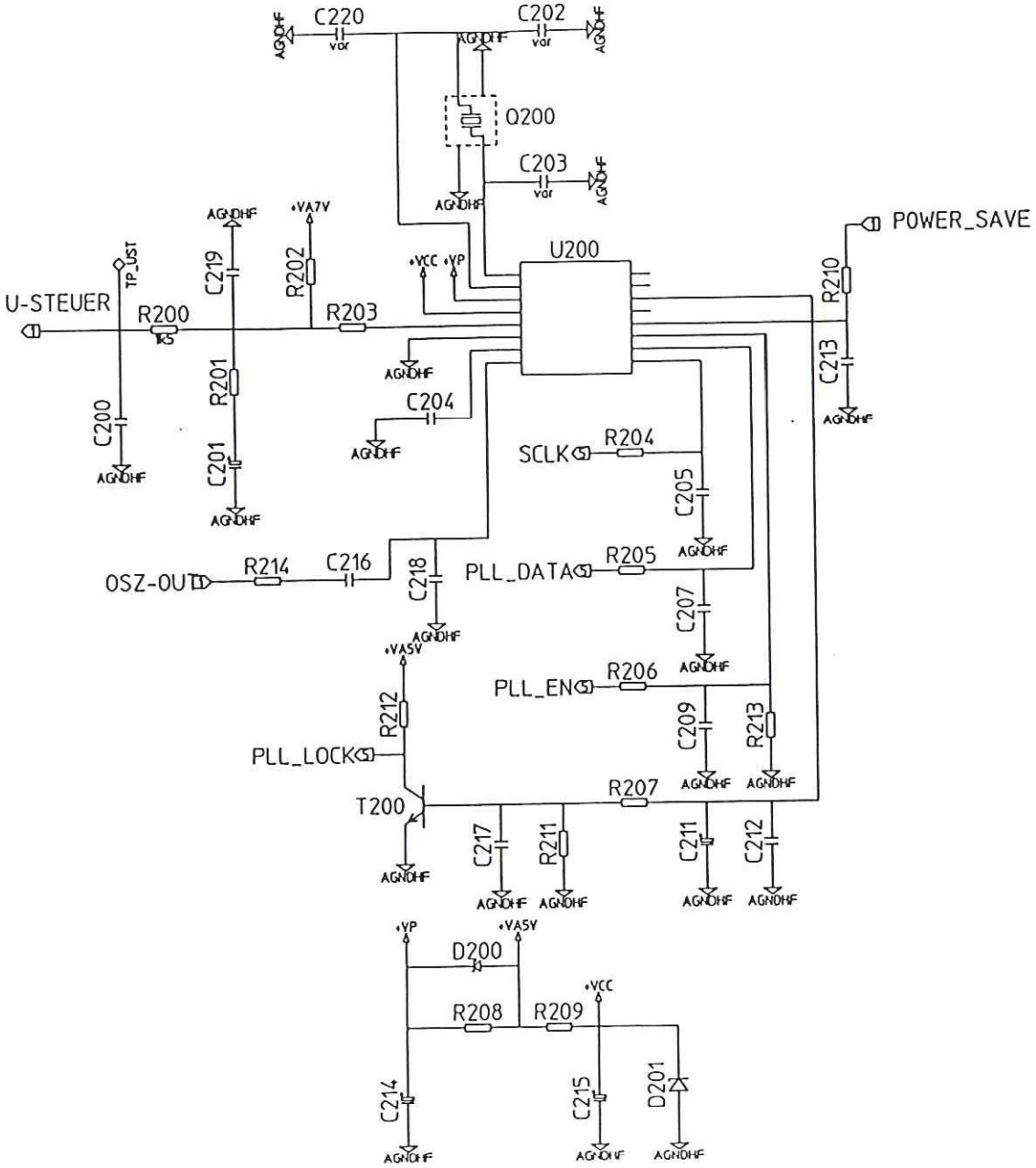

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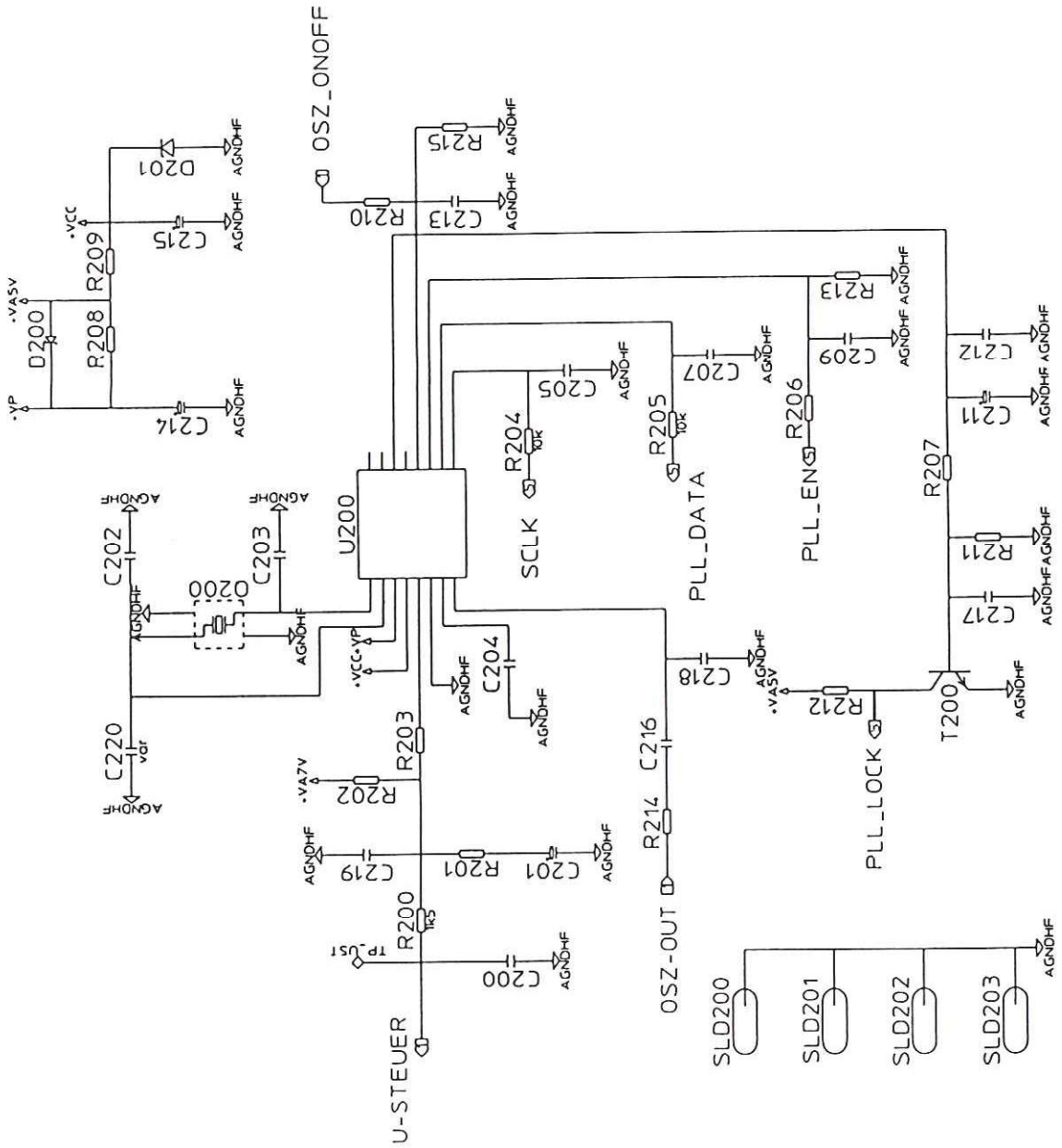
Pocket Transmitter / Taschensender **PLL**

NEW / NEU

VERSION 5.0



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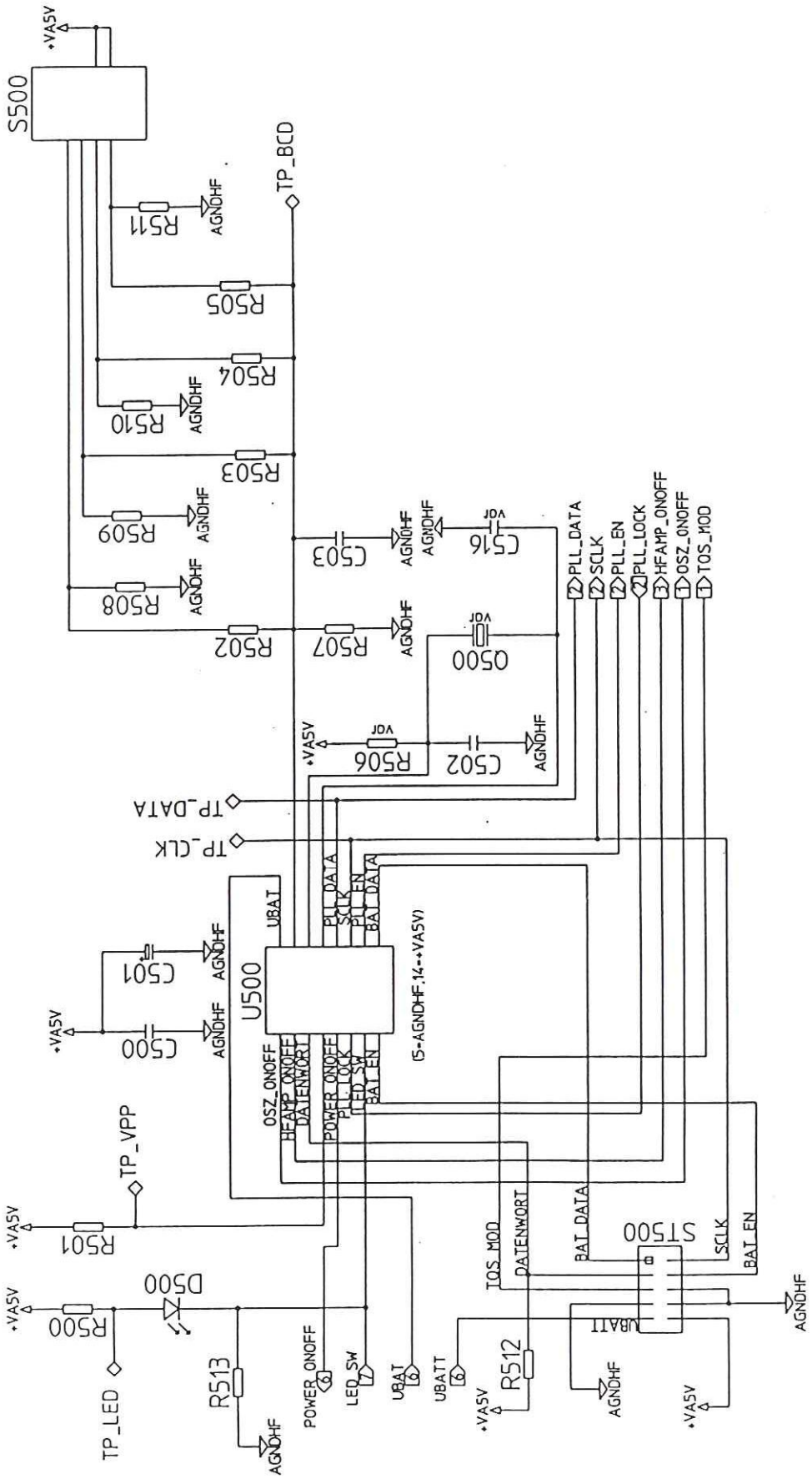

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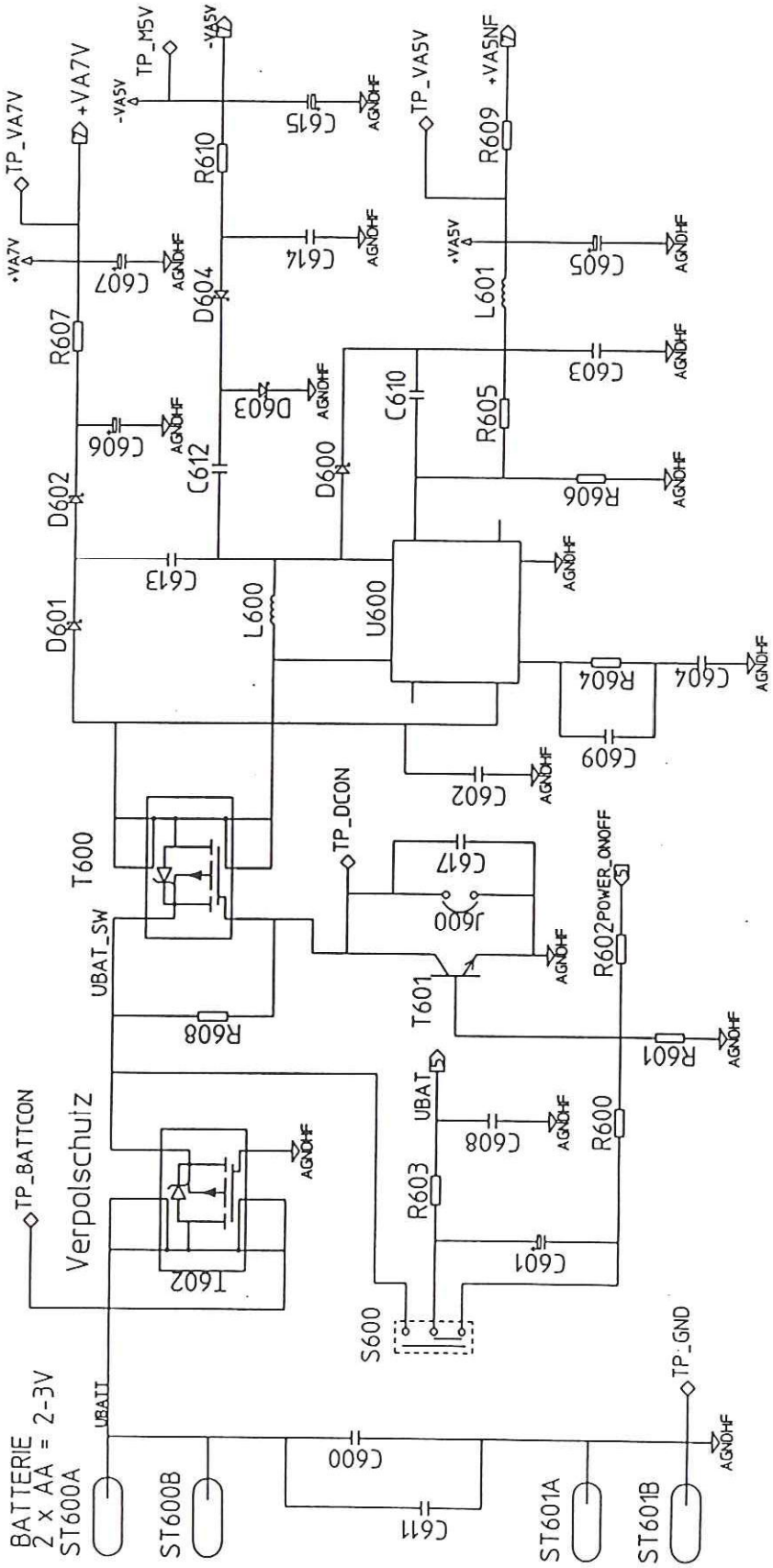
Pocket Transmitter / Taschensender

DC / DC CONVERTER



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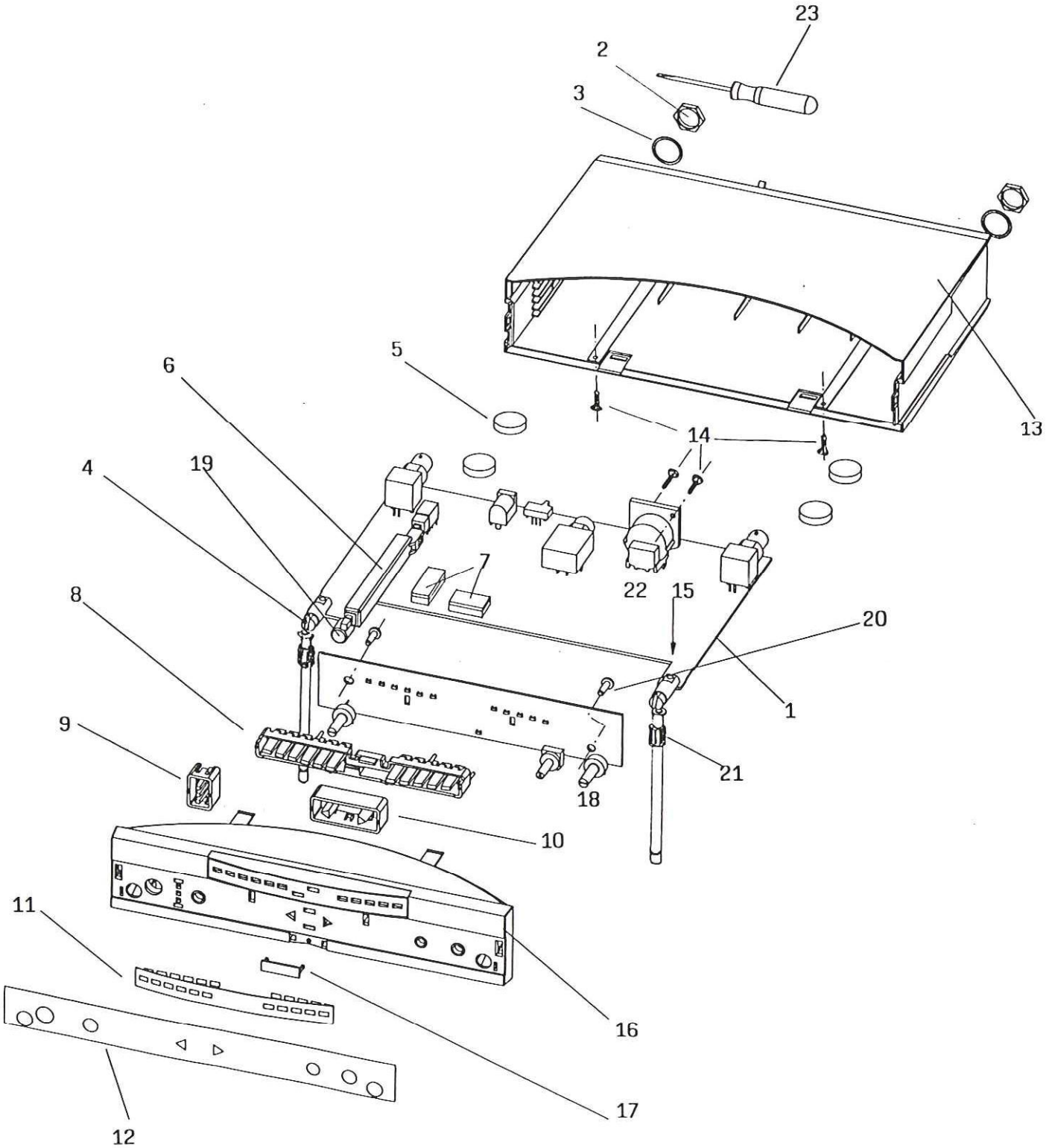
Receiver / Empfänger

SR 60, SR61
2777Z00..



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Receiver / Empfänger

SR 60, SR61

2777Z00..

PARTS LIST

STÜCKLISTE

Description	*Pos.*	*Part Nbr. Teile-Nr.*	*Quantity Stück*		*Bezeichnung*
			SR 60	SR 61	
Receiver board, complete	1*)	2777M01..		1	Empfängerprint, komplett
Nut	2	9999N0606	-	2	Mutter
Washer	3	9999N0605	-	2	Scheibe
Antenna	4	9999N0607	2	-	Antenne
Antenna	4	0018E0218	-	2	Antenne
Power supply, 230 volts	-	0027E0040	(1)†	(1)†	Netzteil, 230 Volt
Power supply, 115 volts	-	0027E0038	(1)†	(1)†	Netzteil, 115 Volt
Foot	5	9999N0603	4	4	Fuß
Power key extender	6**)	9999N0604	1	1	Schaltarm
Cover for screen box	7	2777Z1801	2	2	Deckel für Schirmrahmen
Light guide (11 x)	8	2777Z1301	1	1	Lichtleiter (11 x)
Light guide (3 x)	9	2777Z1302	-	1	Lichtleiter (3 x)
Light guide (2 x)	10	2777Z1303	1	1	Lichtleiter (2 x)
Label (Mute)	11	4725S0001	1	-	Schild (Mute)
Label (Mute)	11	4725S0002	-	1	Schild (Mute)
Label (front panel)	12	4726S0001	1	-	Schild (Frontplatte)
Label (front panel)	12	4726S0002	-	1	Schild (Frontplatte)
Housing	13	2777Z1101	1	-	Gehäuse
Housing	13	2777Z1102	-	1	Gehäuse
Screw KB30x8	14	0099N3008	4	4	Schraube KB30x8
Screw M3x10	15	7985D3006	2	2	Schraube M3x10
Front panel	16	2777Z1201	1	1	Frontplatte
Colour code insert	17	2777Z140. #	1	1	Farbcodeeinsatz
Potentiometer extender	18	0021E0590	2	2	Potentiometerachse
Pushbutton	19	0040E0641	1	1	Druckknopf
Screw KB22x8, for front panel	20	0099N2204	2	2	Schraube KB22x8, f. Frontpl.
Sleeve (protection for antenna)	21	2777Z2401	2	-	Hülse (Antennenschutz)
Toothed washer A3,2	22	6797D3200	2	-	Zahnscheibe A3,2
Screwdriver	23	9999N0508	1	1	Schraubenzieher

*) see separate parts list on pages 45 *ff* and list of variations on page 34
*) siehe eigene Stückliste auf Seiten 45 *ff* und Variantennummern auf Seite 34
**) glued to switch / verklebt mit Schalter
† ... depending on variation / abhängig von Variante,

... Versions of colour code insert (item 17) / Versionen des Farbcodeeinsatzes (Pos. 17)

2777Z1409	grey	grau	2777Z1404	orange	orange
2777Z1408	violet	violett	2777Z1403	red	rot
2777Z1407	blue	blau	2777Z1402	brown	braun
2777Z1406	green	grün	2777Z1401	black	schwarz
2777Z1405	yellow	gelb			

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Receiver / Empfänger

SR 60, SR 61

2777Z00..

How to open the SR60/61:

Undo all screws from the bottom of the receiver and from the XLR connector. Disengage plastic latches holding the front portion of the receiver. Access to these latches is from the bottom through two rectangular openings. The front panel with the printed circuit boards can then be pulled out from housing. To separate the front panel from the electronic part loose two screws fixing the display board (front board) and shift the main board out from front panel by pushing on to the antennas.

Repair hint: If you are uncertain about the correct position of the channel selector switch extender proceed as follows: Turn the switch until "channel zero" is reached. In this position all LED's except of the MUTE - LED are off. Insert the extender in a way that the little arrow on the front side of the extender points downwards.

Zerlegen des SR 60/61:

Lösen Sie alle Schrauben an der Unterseite des Empfängers, sowie an der XLR -Buchse. Rasten Sie die Schnapphaken an der Unterseite des Empfängers aus, um die Frontplatte vom Gehäuse zu lösen. Die Schnapphaken sind durch rechteckige Öffnungen an der Unterseite des Empfängers zugänglich. Ziehen Sie nun die Frontplatte mit der Elektronik aus dem Gehäuse heraus. Um die Frontplatte von den Printplatten zu trennen lösen Sie die beiden Schrauben am Displayprint (Frontprint) und stoßen Sie die Printplatten an den Antennen aus der Frontplatte.

Hinweis: Falls Sie sich über die richtige Lage der Kanalschalter - Achse nicht im Klaren sind, stellen Sie den Empfänger auf "Kanal Null". In dieser Position leuchten nur die MUTE - LED, allen anderen LED's bleiben dunkel. Setzen Sie nun die Achse so ein, daß der Pfeil an ihrer Frontseite genau nach unten zeigt.

Receiver board, complete (1), variation numbers and frequency bands

R3641 is an indication component for the frequency set. Otherwise it has no function

Empfängerprint komplett (1), Variantennummern und Frequenzbänder

R3641 ist ein Identifikationsbauteil für das Frequenzset und hat keine elektronische Funktion

Variation Variante	*Type*	*Frequency set Frequenzset*	*Frequency Range / Frequenzbereich MHZ*	*R3641 Ohm*
2777M0101	SR60	DK (Denmark)	138,250 ... 142,075	10
2777M0102	SR60	US1a (USA traveller)	169,445 ... 171,845	100
2777M0103	SR60	US1b (USA traveller)	169,505 ... 171,905	390
2777M0104	SR60	UK1 (UK)	173,800 ... 175,000	560
2777M0105	SR60	EUS7 (France 1, USA 7 and Europa)	176 ... 178	820
2777M0106	SR60	RS (Singapore)	180 ... 182	1000
2777M0107	SR60	EUS8a (Belgium 1, USA 8, Europa)	182 ... 184	2200
2777M0108	SR60	EUS8b (France 2, USA 8, Europa)	184 ... 186	4700
2777M0109	SR60	EUS11 (Netherlands, USA 11)	198 ... 200	22000
2777M0110	SR60	EUS12 (USA 12, Europa)	204 ... 206	39000
2777M0111	SR60	AT1 (Austria)	246,300 ... 248,600	100000
2777M0112	SR61	DK (Denmark)	138,250 ... 142,075	
2777M0113	SR61	US1a (USA traveller)	169,445 ... 171,845	
2777M0114	SR61	US1b (USA traveller)	169,505 ... 171,905	
2777M0115	SR61	UK1 (UK)	173,800 ... 175,000	
2777M0116	SR61	EUS7 (France 1, USA 7 and Europa)	176 ... 178	
2777M0117	SR61	RS (Singapore)	180 ... 182	
2777M0118	SR61	EUS8a (Belgium 1, USA 8, Europa)	182 ... 184	
2777M0119	SR61	EUS8b (France 2, USA 8, Europa)	184 ... 186	
2777M0120	SR61	EUS11 (Netherlands, USA 11)	198 ... 200	
2777M0121	SR61	EUS12 (USA 12, Europa)	204 ... 206	
2777M0122	SR61	AT1 (Austria)	246,300 ... 248,600	
2777M0123	SR61	EUS9 (USA 9, Europa)	190 ... 192	
2777M0124	SR61	EUS10 (USA 10, Europa)	196 ... 198	
2777M0125	SR61	EUS13 (USA 13, Europa)	214 ... 216	

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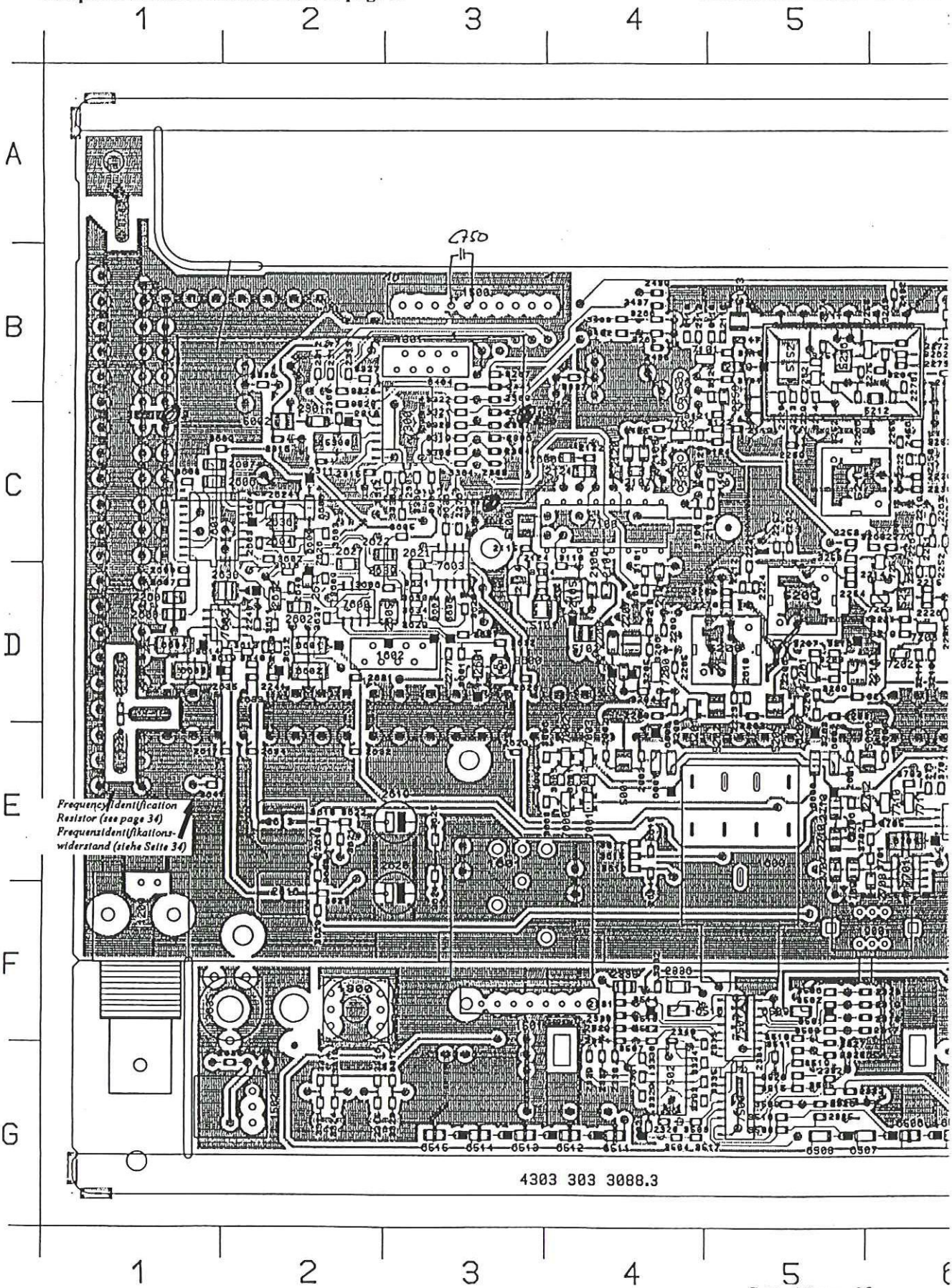
Receiver SR 60/61: Components Layout, Part I
Component location coordianates on page 37

Empfänger SR60/61: Bauteilebestückung, Teil I
Bauteilekoordinaten auf Seite 37



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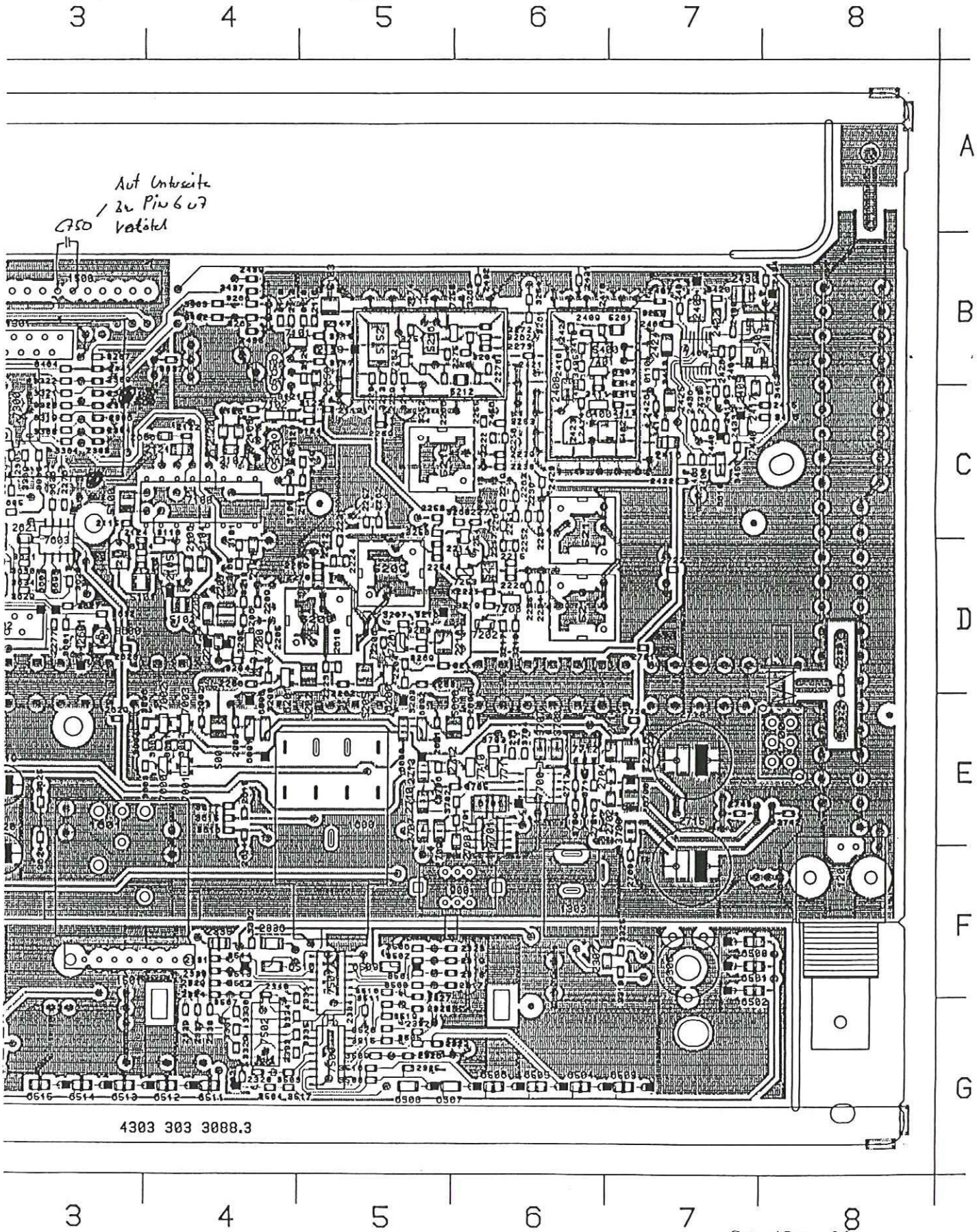
Receiver SR 60/61: Components Layout, Part II
Component location coordianates on page 37

Empfänger SR60/61: Bauteilebestückung, Teil II
Bauteilekoordinaten auf Seite 37



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Receiver SR 60/61: Main Board´s Component location coordianates
Empfänger SR60/61: Bauteilekoordinaten für Hauptprint

0110 B 6	2253 C 5	2413 C 7	2710 E 5	3312 G 3	3612 D 2	6504 G 6
0111 B 5	2254 D 5	2414 C 6	2711 E 6	3314 G 2	3613 D 2	6505 G 6
1200 F 1	2255 B 6	2415 C 8	2712 E 5	3315 G 2	3614 D 2	6506 G 6
1201 F 8	2256 D 5	2416 C 7	2713 E 5	3316 G 2	3615 E 4	6507 G 5
1300 F 2	2257 C 5	2417 C 7	2714 E 7	3317 C 3	3616 E 4	6508 G 5
1301 B 3	2258 B 5	2418 B 6	2715 F 7	3318 F 7	3617 E 4	6509 F 5
1303 F 6	2259 C 5	2419 C 7	2716 E 7	3319 C 3	3618 E 2	6510 F 4
1500 B 4	2260 D 1	2420 C 6	2717 E 6	3320 C 3	3619 D 2	6511 G 4
1501 F 4	2262 C 5	2421 B 6	2718 E 7	3321 C 3	3620 F 2	6512 G 4
1502 G 2	2263 C 6	2422 C 7	2720 E 7	3322 B 3	3621 E 2	6513 G 3
1600 E 5	2264 C 6	2423 C 6	2721 D 7	3323 G 3	3622 E 2	6514 G 3
1601 E 3	2266 B 5	2424 B 7	2722 D 7	3324 G 2	3623 F 2	6515 G 3
1602 D 2	2270 D 5	2425 C 7	2742 E 8	3325 F 7	3624 E 3	6601 D 2
1700 E 8	2271 C 6	2426 C 7	2743 E 7	3326 B 2	3625 E 3	6602 D 2
1900 F 6	2272 B 6	2427 B 6	3001 E 4	3327 B 2	3627 D 3	6603 D 1
2000 E 6	2273 B 6	2428 B 7	3002 E 4	3328 C 2	3628 D 3	6604 D 1
2001 E 5	2274 B 5	2430 D 7	3003 E 4	3329 G 4	3629 D 3	6606 D 3
2002 E 4	2275 B 5	2431 B 6	3004 E 4	3330 G 4	3630 D 3	6607 D 3
2003 E 4	2276 C 3	2432 B 6	3005 E 4	3331 G 4	3631 D 3	6608 C 2
2101 D 4	2277 D 3	2433 C 7	3006 E 4	3332 F 4	3632 D 3	6609 C 2
2104 D 4	2278 B 6	2434 B 8	3101 D 4	3333 G 4	3634 D 3	6610 C 7
2105 D 4	2300 C 2	2435 B 4	3104 D 3	3334 G 4	3635 F 2	6700 E 7
2106 D 4	2301 C 2	2436 C 7	3105 D 4	3335 G 4	3636 C 3	6701 E 6
2107 C 4	2302 F 7	2437 B 4	3109 C 4	3336 B 2	3637 D 2	7000 E 4
2108 C 4	2303 C 3	2438 C 7	3110 D 4	3337 B 4	3638 E 2	7001 E 4
2112 C 5	2304 C 3	2439 B 4	3115 B 5	3338 C 3	3639 C 1	7002 E 4
2113 B 4	2305 C 3	2440 C 7	3116 B 5	3400 C 7	3640 D 2	7003 E 4
2114 D 3	2306 C 3	2441 B 3	3117 B 5	3401 C 7	3641 E 1	7100 C 4
2115 C 3	2307 C 3	2456 C 6	3118 B 4	3402 B 4	3700 E 7	7101 B 4
2116 B 5	2308 C 3	2600 C 4	3119 C 5	3403 B 4	3701 E 6	7102 C 4
2117 B 5	2309 B 3	2601 D 3	3120 B 5	3404 B 3	3702 E 6	7200 D 4
2118 C 5	2310 C 2	2602 D 2	3121 C 5	3405 B 6	3703 E 6	7201 D 5
2119 B 5	2311 C 2	2603 C 2	3122 C 5	3406 B 6	3704 E 6	7202 D 6
2120 C 4	2312 B 2	2604 C 2	3123 C 4	3407 B 7	3705 E 6	7203 D 6
2121 C 4	2313 B 2	2605 D 3	3124 C 5	3410 B 6	3706 E 5	7252 B 5
2122 C 4	2314 B 2	2606 C 1	3125 C 4	3411 C 7	3707 E 6	7253 D 6
2123 D 3	2315 C 2	2607 C 1	3200 D 4	3413 B 7	3708 E 6	7254 C 6
2124 D 3	2316 C 2	2608 D 1	3203 D 5	3414 C 7	3709 E 6	7255 B 5
2200 D 4	2317 F 5	2609 D 1	3204 D 4	3415 C 7	3710 E 6	7300 C 3
2201 D 4	2318 F 5	2610 D 5	3205 D 4	3416 C 8	5000 E 6	7400 B 7
2202 D 5	2319 F 5	2611 D 2	3206 D 4	3420 B 7	5001 E 4	7401 B 6

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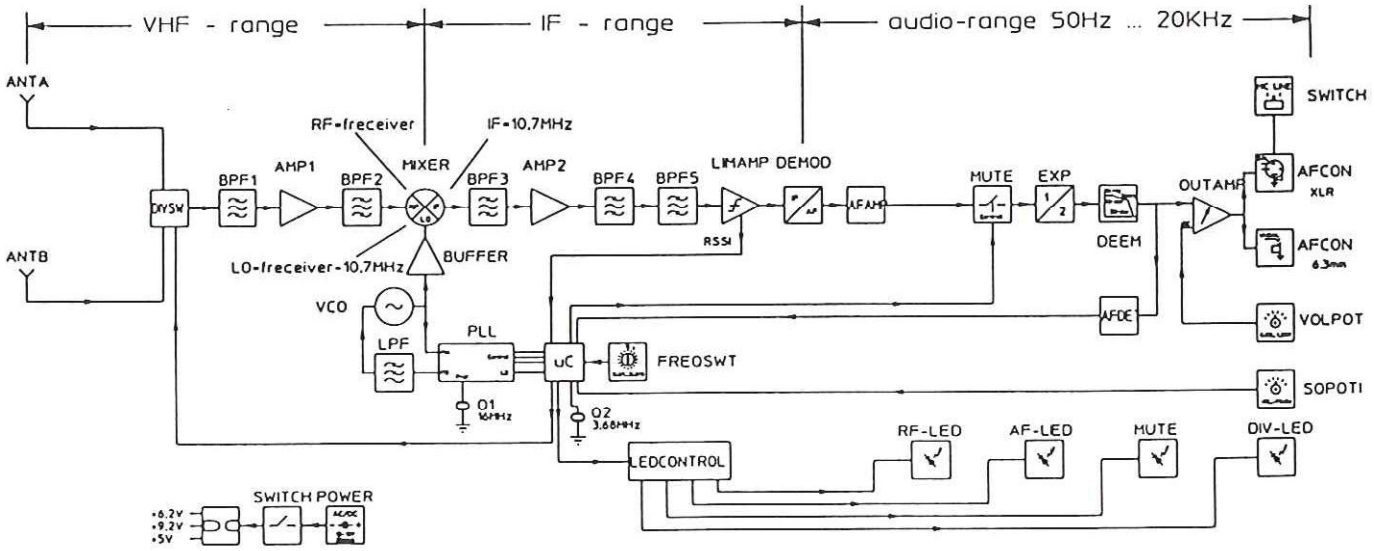
Receiver SR 60/61: Main Board´s Component location coordianates continued
Empfänger SR60/61: Bauteilekoordinaten für Hauptprint Fortsetzung

2203 D 5	2320 G 4	2612 D 2	3207 D 5	3450 C 7	5002 C 2	7440 C 7
2204 D 5	2321 G 4	2613 E 2	3208 D 5	3452 C 8	5100 C 3	7500 G 5
2205 D 4	2322 G 5	2614 E 4	3209 D 5	3500 F 5	5101 D 3	7501 F 5
2206 D 5	2323 F 5	2615 E 4	3210 D 4	3501 F 5	5102 D 4	7502 G 4
2207 D 4	2324 F 4	2616 F 2	3211 D 5	3502 F 5	5103 B 5	7600 D 2
2208 D 4	2325 G 5	2617 E 2	3213 B 5	3503 G 4	5151 C 4	7601 C 1
2209 D 4	2326 G 5	2618 E 2	3214 B 5	3504 G 4	5152 B 5	7602 D 2
2210 D 5	2327 F 5	2619 E 3	3216 D 5	3505 G 5	5153 B 4	7603 D 3
2212 D 5	2328 G 5	2620 F 3	3217 D 6	3506 F 5	5201 B 7	7700 E 6
2214 D 5	2329 F 4	2621 D 3	3218 D 6	3507 F 4	5202 D 5	7701 E 6
2215 D 6	2330 F 4	2622 C 3	3219 D 6	3508 G 5	5205 D 5	7710 E 6
2217 D 6	2331 F 4	2624 C 2	3220 D 1	3509 G 5	5208 D 4	7711 E 6
2219 C 6	2332 G 5	2625 G 2	3221 D 8	3510 F 5	5209 D 5	7712 E 6
2221 D 6	2333 G 4	2626 C 2	3250 C 5	3511 G 5	5210 D 6	

Block Diagram **Blockschaltbild**



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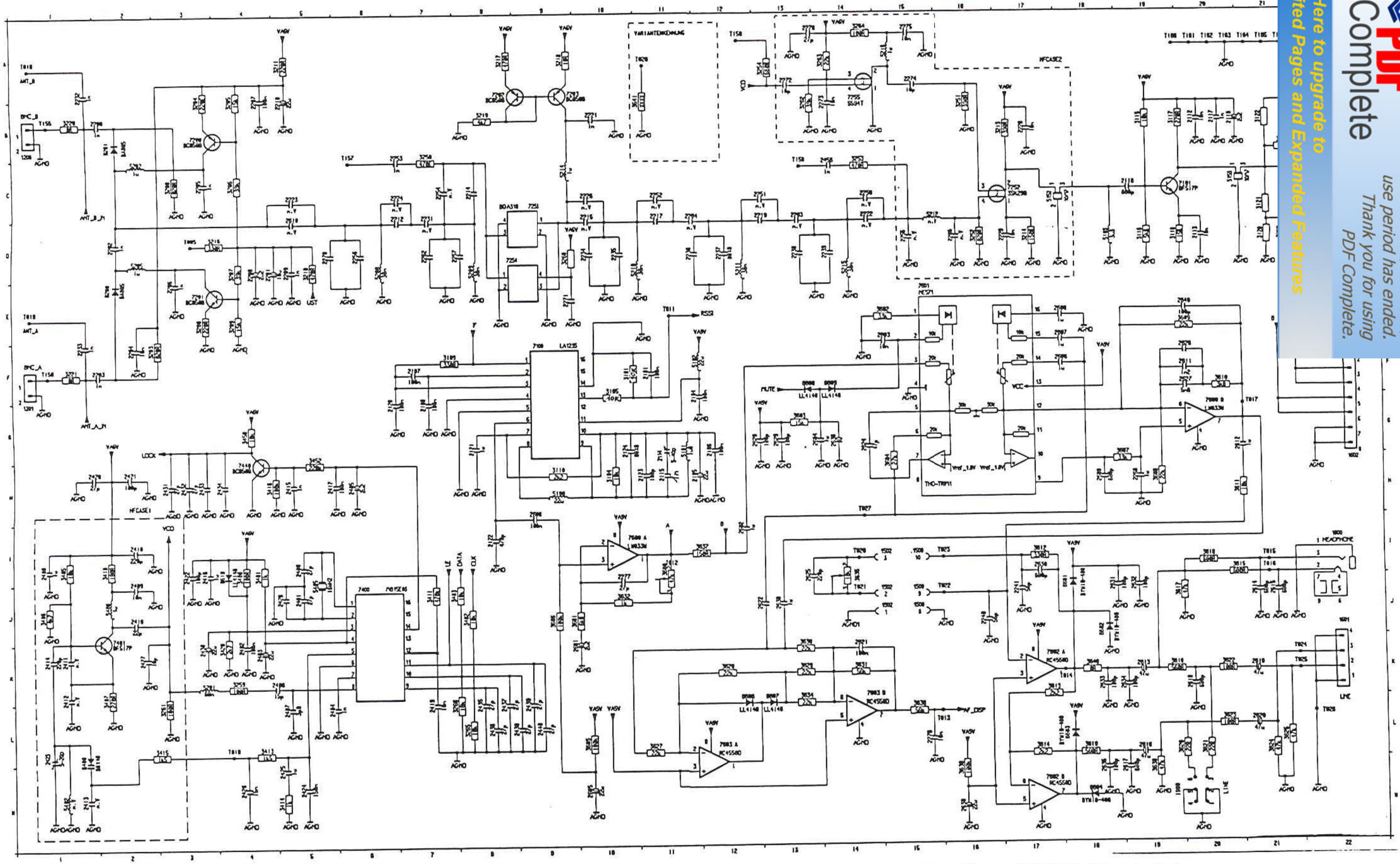

Receiver SR 60/61: Main Board

Empfänger SR60/61: Hauptprint

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Receiver SR 60/61: Main board's component location coordianates for schematics on previous page
Empfänger SR60/61: Bauteilekoordinaten für Hauptprint - Schaltbild auf vorhergehender Seite

1200	B 1	1900	W19	2116	C19	2202	D 2	2215	D10	2232	A 1	2251	C13	2263	D13
1201	G 1	2101	F11	2117	B20	2203	F 2	2217	D11	2233	F 1	2252	C11	2264	D11
1500	J15	2104	F11	2118	B22	2204	F 2	2219	D13	2234	D10	2253	C 7	2266	D16
1500	J15	2105	H11	2119	B20	2205	C 3	2221	B10	2235	D10	2254	C 7	2270	D 5
1500	I15	2106	G12	2120	G 6	2206	E 3	2222	D14	2236	D11	2255	D15	2271	E 9
1502	J14	2107	F 7	2121	G 8	2207	B 4	2223	C 5	2237	D12	2256	D 6	2272	A13
1502	J14	2108	G 7	2122	I 8	2208	D 4	2224	C 7	2238	D13	2257	D 8	2273	B14
1502	I14	2112	B20	2123	H11	2209	D 5	2226	C10	2239	D14	2258	D21	2274	A15
1600	I22	2113	D20	2124	G10	2210	B 5	2228	B17	2240	J16	2259	B22	2275	A15
1601	J22	2114	G11	2200	B 2	2212	D 7	2229	D17	2241	J17	2260	H19	2276	L15
1602	H22	2115	H11	2201	D 4	2214	C 8	2231	D 7	2250	C14	2262	D 7	2277	I10

2278	A13	2410	I 2	2421	H 2	2433	H 3	2602	I12	2613	K19	2625	I13	2636	G14
2400	I 5	2411	K 1	2422	I 3	2434	H 4	2603	F15	2614	J21	2626	F20	2638	W16
2401	J 5	2412	K 1	2423	L 1	2435	L 8	2604	G13	2615	J21	2627	F20	2639	J13
2402	K 4	2413	W 1	2424	W 5	2436	L 8	2605	W10	2616	L19	2628	G12	2640	E20
2403	K 4	2414	K 1	2425	W 5	2437	L 8	2606	F18	2617	W19	2629	G13	3101	F10
2404	L 5	2415	H 5	2426	W 4	2438	L 8	2607	F18	2618	K20	2630	I17	3104	H10
2405	H 6	2416	I 3	2427	K 2	2439	L 9	2608	E18	2619	K21	2631	J18	3105	F10
2406	K 5	2417	H 5	2428	J 5	2440	L 9	2609	H18	2620	L21	2632	J19	3109	F 7
2407	L 5	2418	J 2	2430	K 3	2456	C14	2610	D 5	2621	K14	2633	K18	3110	H 9
2408	I 1	2419	L 7	2431	H 3	2600	H 9	2611	F20	2622	J13	2634	K19	3115	B19
2409	J 2	2420	H 1	2432	H 3	2601	K 9	2612	G20	2624	G14	2635	W18	3116	D19

3117	B19	3204	B 3	3217	A 8	3260	D 9	3405	I 1	3452	G 5	3610	F20	3621	L20
3118	D19	3205	B 4	3218	A 9	3261	L 3	3406	J 1	3600	I11	3611	H20	3622	K20
3119	A22	3206	C 4	3219	B 8	3262	B13	3407	K 2	3601	J 9	3612	I17	3623	L20
3120	D21	3207	D 4	3220	B 1	3263	A14	3410	I 2	3602	E15	3613	K17	3624	L21
3121	C21	3208	E 3	3221	F 1	3264	A14	3411	J 7	3603	G13	3614	L17	3625	L21
3122	B21	3209	E 4	3250	B 7	3265	L 8	3413	L 4	3604	H15	3615	I20	3627	L11
3123	B21	3210	D 5	3251	B16	3266	L 7	3414	W 5	3605	L10	3616	I20	3628	K12
3124	B22	3211	A 5	3252	D16	3400	I 4	3415	L 3	3606	J 9	3617	J19	3629	K13
3125	C22	3213	B17	3253	C14	3401	I 4	3416	H 4	3607	G19	3618	K19	3630	K13
3200	C 3	3214	D17	3254	A13	3402	J 8	3420	K 4	3608	H19	3619	L18	3631	K14
3203	F 2	3216	D 4	3259	K 4	3403	J 7	3450	G 4	3609	E20	3620	L19	3632	J10

3634	K13	5103	D18	5212	D15	6602	J18	7200	B 3	7600	I10	T013	L16	T024	K21
3635	I14	5151	C22	5214	C 9	6603	L17	7201	E 3	7600	G20	T014	K18	T025	K21
3636	L15	5152	C17	5215	D14	6604	W18	7202	A 8	7601	E15	T015	I21	T026	L22
3637	I12	5153	C20	5216	A15	6606	L12	7203	A 9	7602	K17	T016	I21	T027	H14
3638	W19	5201	K 3	5400	J 2	6607	L13	7252	C17	7602	W17	T017	G21	T028	A11
3639	W16	5202	C 2	5402	W 1	6608	F13	7253	C 9	7603	L12	T018	A 1	T155	B 1
3640	K18	5205	D 2	5405	J 5	6609	F14	7254	D 8	7603	K14	T019	E 1	T156	F 1
3641	B11	5208	D 6	6200	E 2	6610	I 4	7255	B14	T005	D 3	T020	I14	T157	B 6
5100	H 9	5209	D 8	6201	B 2	7100	F 9	7400	J 6	T010	L 4	T021	J14	T158	A12
5101	G11	5210	D11	6400	L 1	7101	C20	7401	J 2	T011	E11	T022	J16	T159	C13
5102	F12	5211	D12	6601	J17	7102	C22	7440	H 4	T012	I11	T023	I16	T160	A22

T161	A20
T162	A20
T163	A20
T164	A21
T165	A21
T166	A21
T167	A22
T168	A19

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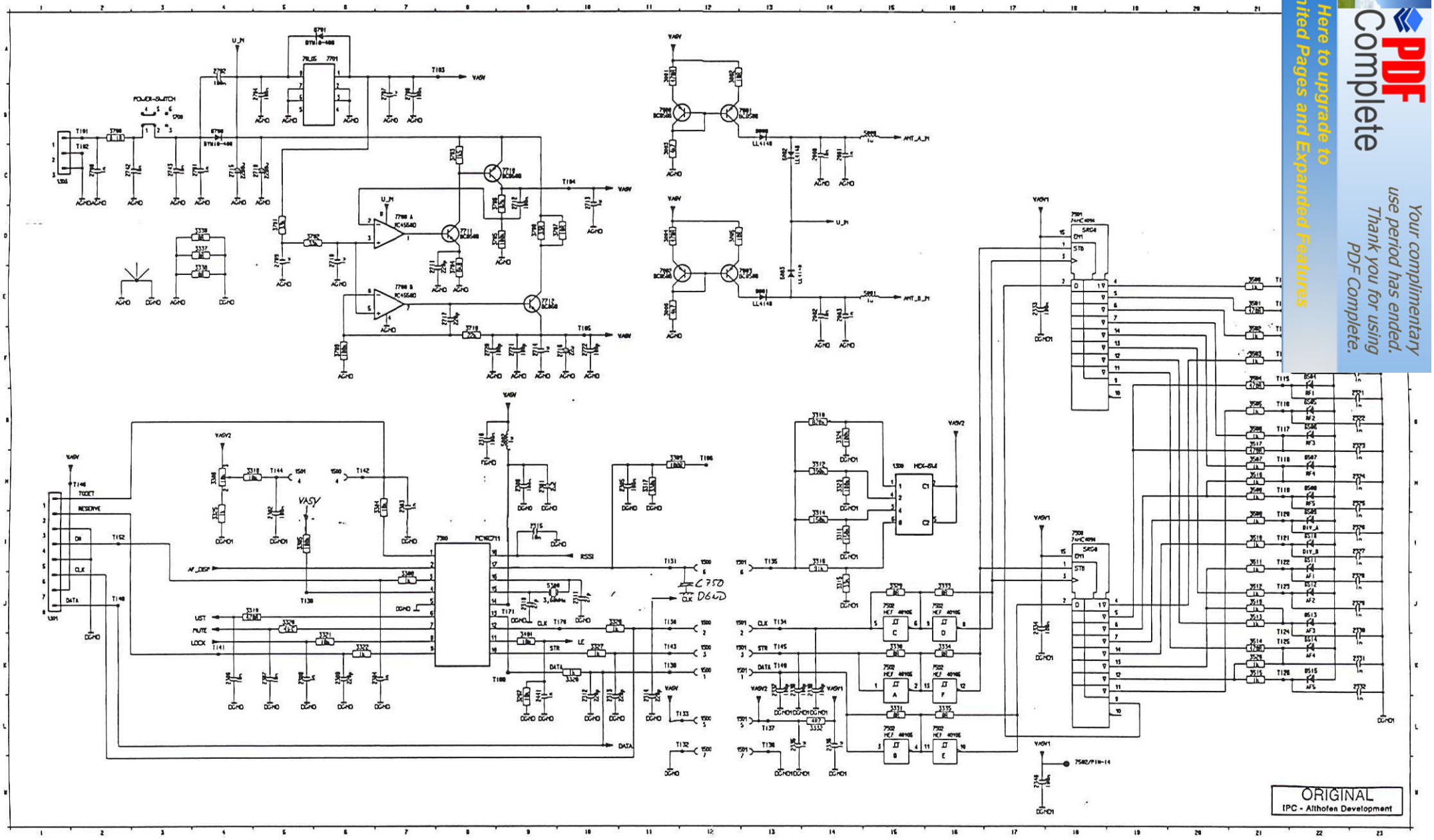

Receiver SR 60/61: Display Board **Empfänger SR60/61: Display Print**

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Receiver SR 60/61: Display board's component location coordianates for schematics on previous page
Empfänger SR60/61: Bauteilekoordinaten für Display Print - Schaltbild auf vorhergehender Seite

1300	H15	1500	I12	1501	L13	2302	I 5	2310	J 9	2318	E23	2328	I23	2334	J17
1301	J 1	1500	L12	1700	B 3	2303	H 7	2311	J10	2319	F23	2327	I23	2335	L13
1303	C 1	1501	K13	2000	C14	2304	K 7	2312	L10	2320	F23	2328	J23	2336	L14
1500	K12	1501	J13	2001	C14	2305	H11	2313	L10	2321	G23	2329	J23	2337	K13
1500	J12	1501	K13	2002	E14	2306	K 4	2314	L11	2322	G23	2330	J23	2338	K13
1500	K12	1501	H 5	2003	E14	2307	K 5	2315	I 9	2323	G23	2331	K23	2339	K14
1500	H 6	1501	L13	2300	H 9	2308	K 5	2316	G 8	2324	H23	2332	K23	2340	W17
1500	L12	1501	I13	2301	H 9	2309	K 6	2317	E23	2325	H23	2333	E17	2441	L 9

2700	C 2	2711	E 7	2720	F 8	3004	D11	3309	H11	3318	H 5	3326	J10	3334	K16
2701	C 4	2712	C 9	2721	F 9	3005	D12	3310	G14	3319	J 5	3327	K10	3335	L16
2702	A 4	2713	C10	2722	F10	3006	E11	3311	I14	3320	J 5	3328	K10	3336	E 4
2704	B 5	2714	F 9	2742	C 2	3267	L 9	3312	H14	3321	K 6	3329	J15	3337	D 4
2707	B 7	2715	C 4	2743	C 3	3304	H 7	3314	I14	3322	K 6	3330	K15	3338	D 4
2708	B 7	2716	F10	3001	A11	3305	I 5	3315	J14	3323	H14	3331	L15	3404	K 9
2709	D 5	2717	E 8	3002	A12	3306	H 4	3316	I14	3324	G14	3332	L14	3500	E21
2710	D 6	2718	C 5	3003	C11	3308	J 7	3317	H11	3325	I 4	3333	J16	3501	E21

3502	F21	3510	I21	3519	J21	3706	C 9	5300	J 9	6503	F22	6511	I22	7001	B13
3503	F21	3511	I21	3520	K21	3707	D10	6000	B13	6504	F22	6512	J22	7002	E11
3504	F21	3512	J21	3700	B 2	3708	D 9	6001	E13	6505	G22	6513	J22	7003	E13
3505	G21	3513	J21	3701	D 5	3709	F 6	6002	C13	6506	G22	6514	K22	7300	I 8
3506	G21	3514	K21	3702	D 6	3710	F 8	6003	E13	6507	H22	6515	K22	7500	I18
3507	H21	3515	K21	3703	C 8	5000	B15	6500	E22	6508	H22	6700	B 4	7501	D18
3508	H21	3516	H21	3704	E 8	5001	E15	6501	E22	6509	I22	6701	A 6	7502	K15
3509	I21	3517	G21	3705	D 9	5002	G 9	6502	F22	6510	I22	7000	B11	7502	L15

7502	J15	7711	D 8	T111	E21	T119	H21	T130	J11	T138	J 5	T146	H 2
7502	J16	7712	E 9	T112	E21	T120	I21	T131	I11	T139	K11	T149	J 2
7502	L16	T101	B 2	T113	F21	T121	I21	T132	L12	T140	K13	T152	I 2
7502	K16	T102	C 2	T114	F21	T122	I21	T133	L12	T141	K 4	T169	K 9
7700	D 7	T103	A 8	T115	F21	T123	J21	T134	J13	T142	H 6	T170	J10
7700	E 7	T104	C10	T116	G21	T124	J21	T135	I13	T143	K11	T171	J 9
7701	A 6	T105	F10	T117	G21	T125	K21	T136	L13	T144	H 5		
7710	C 9	T106	H12	T118	H21	T126	K21	T137	L13	T145	K13		

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LIST OF ELECTRONIC COMPONENTS
LISTE DER ELEKTRONISCHEN BAUTEILE

1.) HAND TRANSMITTER

1.) HANDSENDER

*****

2.) POCKET TRANSMITTER

2.) TASCHENSENDER

*****

3.) RECEIVER

3.) EMPFÄNGER

THIS PART IS AVAILABLE BY E-MAIL OR DISKETTE ONLY
DIESER TEIL IST NUR PER E-MAIL ODER DISKETTE ERHÄLTLICH

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This section of the WMS 60 Service Manual contains a collection of parts lists with electronic components. The meaning of the column names is:

"Ecode":	AKG part number
"Compname":	Designation or kind of component
"AKG Matchcode":	Type and dimensions
"Stück":	quantity per WMS 60 product

Following is an explanation of the component designations.

****

Dieser Teil des WMS 60 Service Manuals beinhaltet eine Sammlung der Stücklisten für elektronische Bauteile. Die Bedeutung der Spalten ist wie folgt:

"Ecode":	AKG Teilenummer
"Compname":	Bezeichnung oder Art des Bauteils
"AKG Matchcode":	Type und Bauteilwerte
"Stück":	Anzahl je WMS 60 Produkt

Nachstehend eine Erklärung der Bauteilbezeichnungen.

****

Designation of Capacitors:

(First three letters in partslists, column "AKG-Matchcode")

First letter always:
C = Capacitor

Second letter:
A = Aluminium
F = Foil
K = Ceramic
S = Special type
T = Tantalum
V = Variable

Third letter:
A = Axial leads
C = Chip
R = Radial leads
S = Special type

Bezeichnung der Kondensatoren:

(Erste 3 Buchstaben in Stücklistenspalte " AKG-Matchcode ")

Erster Buchstabe immer:
C = Kondensator

Zweiter Buchstabe:
A = Aluminium
F = Folie
K = Keramik
S = Spezialtype
T = Tantal
V = Variabel

Dritter Buchstabe:
A = Axiale Anschlüsse
C = Chipkondensator (SMD)
R = Radiale Anschlüsse
S = Spezialtype