

SHIPMATE

RS 7000

MARINE VHF RADIOTELEPHONE SERVICE MANUAL

NO: 9001A

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1. INTRODUCTION

RS 7000 is a marine VHF radiotelephone - designed for ship to ship, and ship to shore communication.

The radiotelephone consists of:

- a dual conversion super heterodyne receiver with FM detector and an audio amplifier.
- a transmitter with a max. output power of 25 W reducible to 1 W for low power.
- a modulator with compressor and active filter.
- a frequency synthesizer with all 55 international channels and up to 9 private channels.

RS 7000 operates semiduplex - or full duplex with a built in duplex filter.

The supply voltage can be 12 or 24 V.

2. SPECIFICATIONS

GENERAL

Frequency range:	156,025-157,425 MHz (TX/RX) 160,625-162,025 MHz (RX)
Channels:	55 Synthesized
Emission classification:	16 F3
Channel spacing:	25 KHz
Mode of operation:	SIMPLEX, SEMIDUPLEX, DUPLEX with opt. 03
Temperature range:	-20° C to +55° C
Frequency stability:	$\pm 10 \times 10^{-6}$
Supply voltage:	12 V Battery
Coaxial cable connector:	UHF plug PL-259
Current drain at 13,2 V DC:	Stand by: 1 amp. Transmit 25 W: 5,0A Transmit 1 W: 1,8A
Dual watch:	Channel 16 plus an operator selected channel
Weight:	7 Kg without options
Options:	01 Internal 24 V DC Power Pack 02 Internal SELCALL unit 03 Internal DUPLEX filter 04 External 110/220 V AC Power Pack

All measurements according to CEPT:

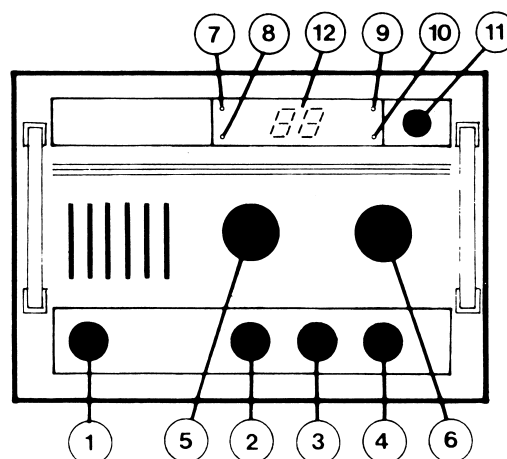
RECEIVER

Sensitivity:	0,3 μ V/12 dB SINAD
Selectivity:	70 dB
Intermodulation:	70 dB
Limiter:	1 dB
Blocking:	100 dB
Frequency response:	-6 dB/octave
Noise:	-40 dB
Output:	1 mW/200 ohm in micro- telephone 2 W/ 8 ohm in internal speaker 2 W/ 8 ohm in external speaker
Squelch:	Adjustable from 6 dB to 20 dB SINAD

TRANSMITTER

Output:	High: 20-25 W Low: 0,5-1 W
Spurious emission:	-70 dB
Frequency response:	6 dB/octave
Modulation:	± 5 KHz
Noise:	-40 dB

3. OPERATION



1. Mode switch with 5 positions:

OFF:

25 W: Normal operation. The transmitter power is 25 W except on channels with 1 W power limit.

1 W: The transmitter power is 1 W on all channels.

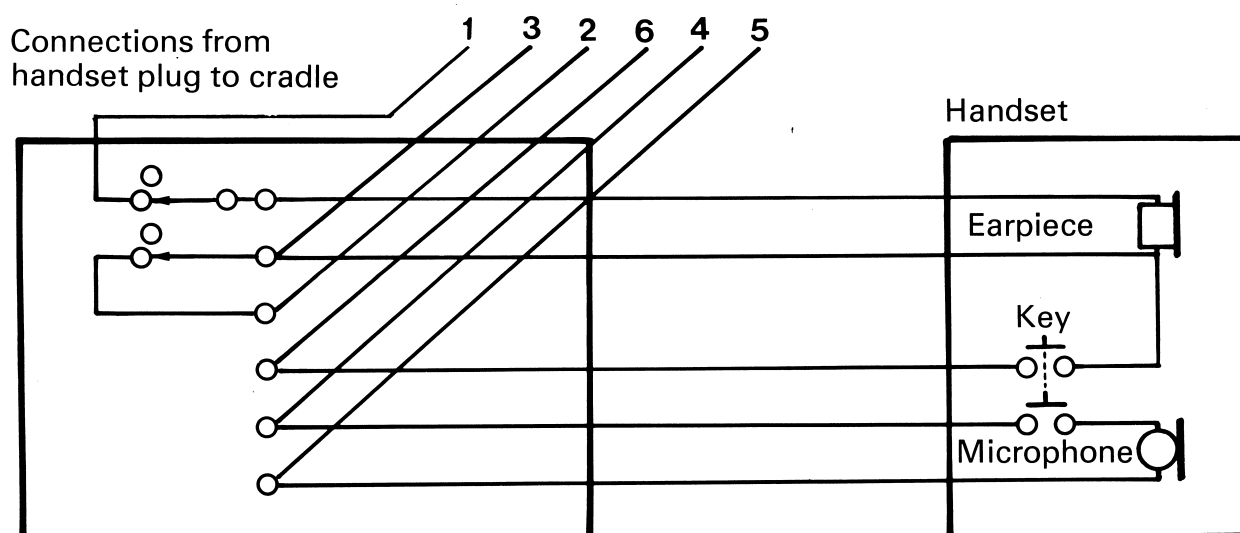
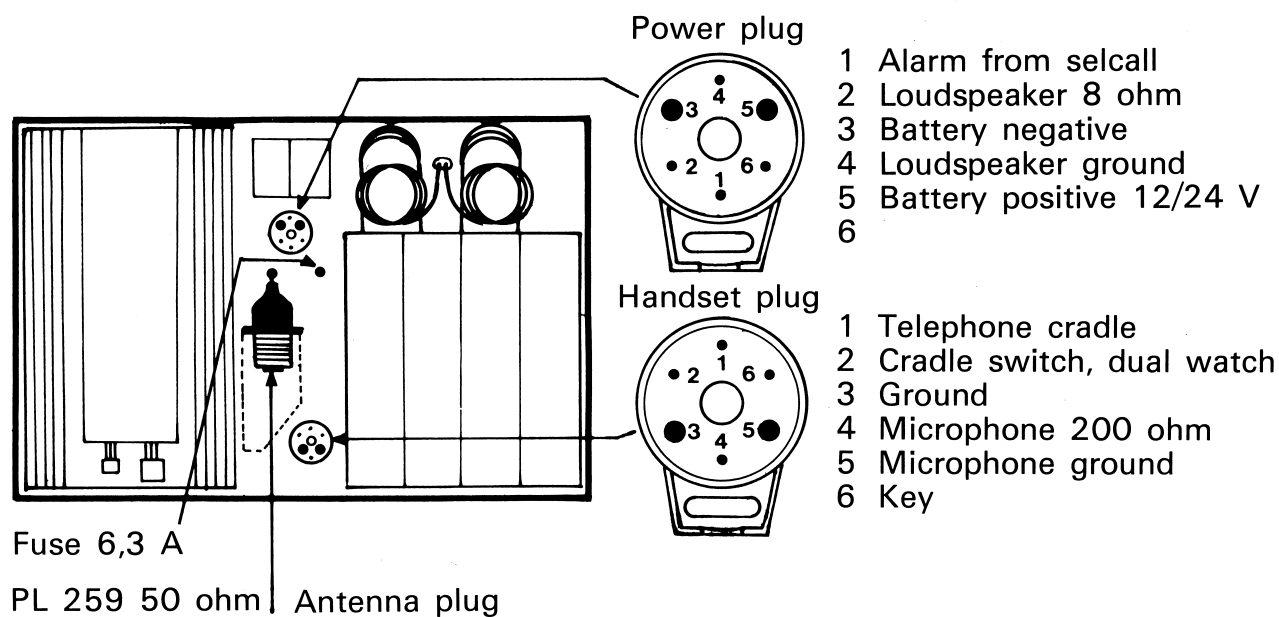
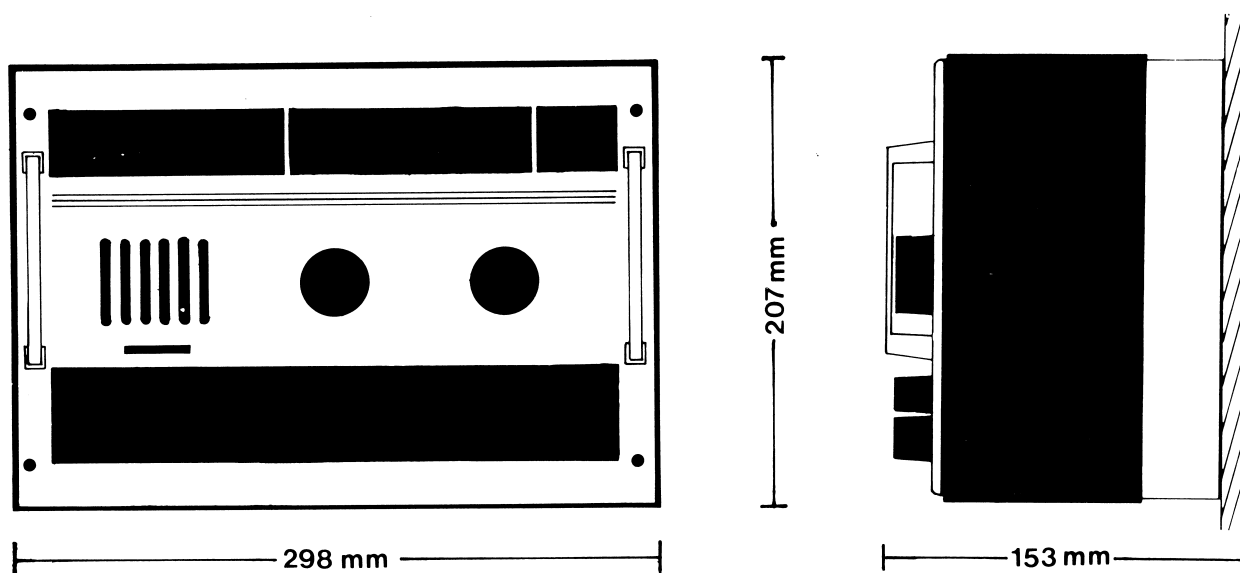
CH 16: Operation on the calling and distress channel. Transmitter power is 25 W. The CHANNEL 16 indicator will be illuminated and the channel selectors 5 and 6 are put out of function.

DUAL

WATCH: Operative when the handset is in the cradle and the squelch is adjusted so that white noise is muted. The receiver will switch to CH 16 for 0.1 second at 1 sec. intervals. If a signal appears on CH 16, the receiver will be locked on this channel. If the handset is taken out of the cradle, the radiotelephone operates as in »25 W« mode.

- Volume control for internal and external loudspeaker will have no influence on microtelephone and alarm signals.
- Squelch control. Will silence receiver noise in periods with no signal, when turned clockwise.
- Dimmer control. Regulates light intensity in LED display and indicators.
- Channel selector. Selects first channel digit.
- Channel selector. Selects second channel digit.
- Transmit indicator. Indicates that the transmitter is operating.
- CHANNEL 16 indicator. Indicates when the operating channel is 16 in DUAL WATCH or CH 16 mode.
- SELCALL indicator. Indicates that a selective tone call is received, either from your own test button or from a coast station.
- CQ/ALARM indicator. Indicates that a CQ/ALARM is given, either from your own test switch or from a coast station.
- TEST-ON/OFF switch. Pressing the switch down for approx. 1 second you can test your SELCALL and CQ/ALARM facility. The SELCALL and the CQ/ALARM indicators will be illuminated and a tone signal will be heard in the loudspeaker.
By pressing the switch upwards you will switch off the light in the SELCALL and the CQ/ALARM indicators.
- Channel indicator.

4. INSTALLATION

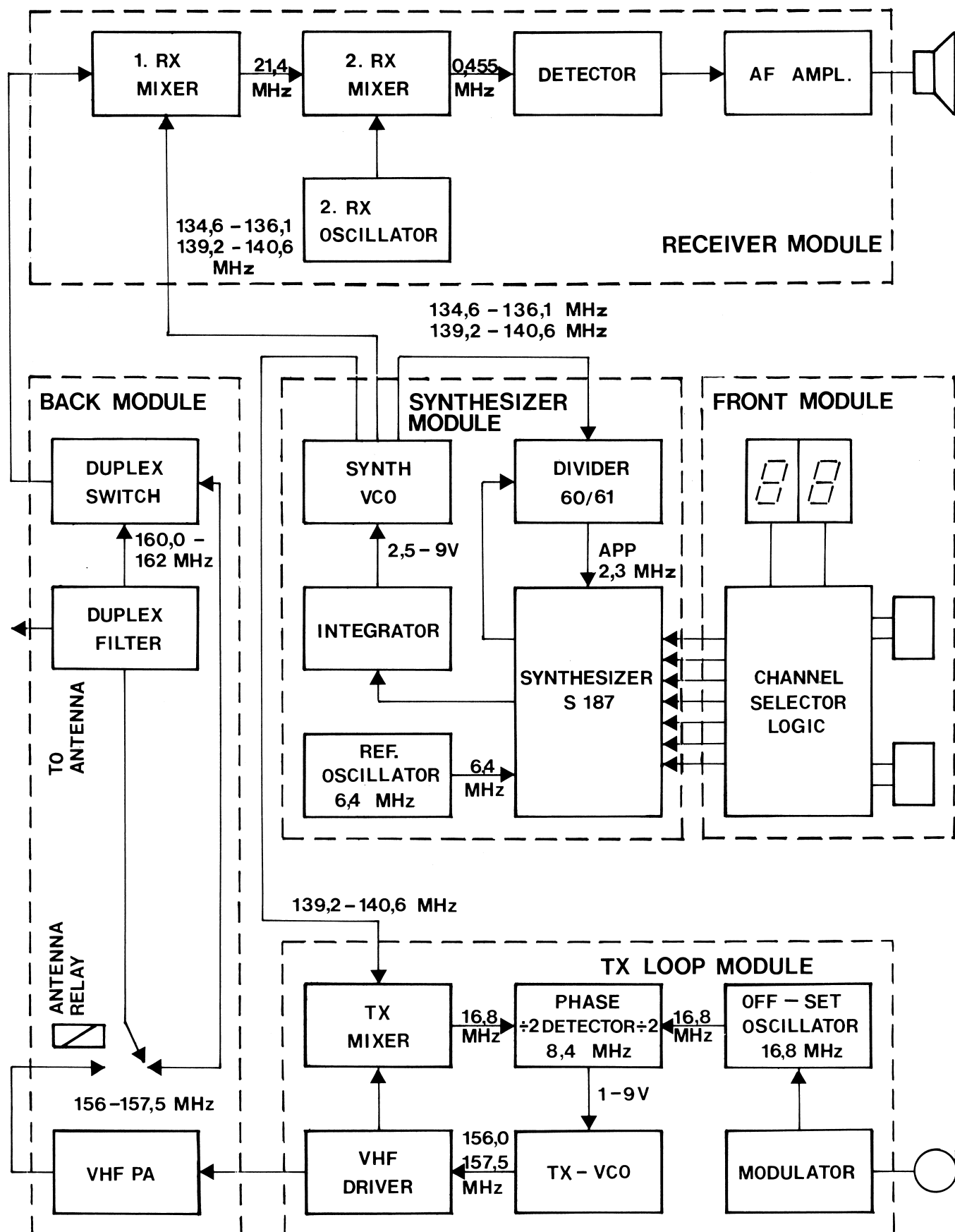


5. FREQUENCY TABLES

CH	CHANNEL	MODE SI DU	TX - FREQ MHz	RX - FREQ MHz	SY - FREQ MHz	DIV 60/61 M	DIV 61 A
1	1	x	156.050	160.650	139.250	92	50
2	2	x	.700	.700	.250	92	50
3	3	x	.100	.750	.300	92	52
4	4	x	.150	.800	.350	92	54
5	5	x	.200	.850	.400	92	56
6	6	x	.250	.900	.450	92	58
7	7	x	.300	.950	.500	93	0
8	8	x	.350	1.000	.550	93	2
9	9	x	.400	1.050	.600	93	4
10	10	x	.450	1.100	.650	93	6
11	11	x	.500	1.150	.700	93	8
12	12	x	.550	1.200	.750	93	10
13	13	x	.600	1.250	.800	93	12
14	14	x	.650	1.300	.850	93	14
15	15	x	.700	1.350	.900	93	16
16	16	x	.750	1.400	.950	93	18
17	17	x	.800	1.450	1.000	93	20
18	18	x	.850	1.500	1.050	93	22
19	19	x	.900	1.550	1.100	93	24
20	20	x	.950	1.600	1.150	93	26
21	21	x	1.000	1.650	1.200	93	28
22	22	x	1.050	1.700	1.250	93	30
23	23	x	1.100	1.750	1.300	93	32
24	24	x	1.150	1.800	1.350	93	34
25	25	x	1.200	1.850	1.400	93	36
26	26	x	1.250	1.900	1.450	93	38
27	27	x	1.300	1.950	1.500	93	40
28	28	x	1.350	2.000	1.550	93	42
29	29	x	1.400	2.050	1.600	93	44
30	30	x	1.450	2.100	1.650	93	46
31	31	x	1.500	2.150	1.700	93	48
32	32	x	1.550	2.200	1.750	93	50
33	33	x	1.600	2.250	1.800	93	52
34	34	x	1.650	2.300	1.850	93	54
35	35	x	1.700	2.350	1.900	93	56
36	36	x	1.750	2.400	1.950	93	58
37	37	x	1.800	2.450	2.000	93	60
38	38	x	1.850	2.500	2.050	93	62
39	39	x	1.900	2.550	2.100	93	64
40	40	x	1.950	2.600	2.150	93	66
41	41	x	2.000	2.650	2.200	93	68
42	42	x	2.050	2.700	2.250	93	70
43	43	x	2.100	2.750	2.300	93	72
44	44	x	2.150	2.800	2.350	93	74
45	45	x	2.200	2.850	2.400	93	76
46	46	x	2.250	2.900	2.450	93	78
47	47	x	2.300	2.950	2.500	93	80
48	48	x	2.350	3.000	2.550	93	82
49	49	x	2.400	3.050	2.600	93	84
50	50	x	2.450	3.100	2.650	93	86
51	51	x	2.500	3.150	2.700	93	88
52	52	x	2.550	3.200	2.750	93	90
53	53	x	2.600	3.250	2.800	93	92
54	54	x	2.650	3.300	2.850	93	94
55	55	x	2.700	3.350	2.900	93	96
56	56	x	2.750	3.400	2.950	93	98
57	57	x	2.800	3.450	3.000	93	100
58	58	x	2.850	3.500	3.050	93	102
59	59	x	2.900	3.550	3.100	93	104
60	60	x	2.950	3.600	3.150	93	106
61	61	x	3.000	3.650	3.200	93	108
62	62	x	3.050	3.700	3.250	93	110
63	63	x	3.100	3.750	3.300	93	112
64	64	x	3.150	3.800	3.350	93	114
65	65	x	3.200	3.850	3.400	93	116
66	66	x	3.250	3.900	3.450	93	118
67	67	x	3.300	3.950	3.500	93	120
68	68	x	3.350	4.000	3.550	93	122
69	69	x	3.400	4.050	3.600	93	124
70	70	x	3.450	4.100	3.650	93	126
71	71	x	3.500	4.150	3.700	93	128
72	72	x	3.550	4.200	3.750	93	130
73	73	x	3.600	4.250	3.800	93	132
74	74	x	3.650	4.300	3.850	93	134
75	75	x	3.700	4.350	3.900	93	136
76	76	x	3.750	4.400	3.950	93	138
77	77	x	3.800	4.450	4.000	93	140
78	78	x	3.850	4.500	4.050	93	142
79	79	x	3.900	4.550	4.100	93	144
80	80	x	3.950	4.600	4.150	93	146
81	81	x	4.000	4.650	4.200	93	148
82	82	x	4.050	4.700	4.250	93	150
83	83	x	4.100	4.750	4.300	93	152
84	84	x	4.150	4.800	4.350	93	154
85	85	x	4.200	4.850	4.400	93	156
86	86	x	4.250	4.900	4.450	93	158
87	87	x	4.300	4.950	4.500	93	160
88	88	x	4.350	5.000	4.550	93	162
89	89	x	4.400	5.050	4.600	93	164
90	90	x	4.450	5.100	4.650	93	166
91	91	x	4.500	5.150	4.700	93	168
92	92	x	4.550	5.200	4.750	93	170
93	93	x	4.600	5.250	4.800	93	172
94	94	x	4.650	5.300	4.850	93	174
95	95	x	4.700	5.350	4.900	93	176
96	96	x	4.750	5.400	4.950	93	178
97	97	x	4.800	5.450	5.000	93	180
98	98	x	4.850	5.500	5.050	93	182
99	99	x	4.900	5.550	5.100	93	184
100	100	x	4.950	5.600	5.150	93	186
101	101	x	5.000	5.650	5.200	93	188
102	102	x	5.050	5.700	5.250	93	190
103	103	x	5.100	5.750	5.300	93	192
104	104	x	5.150	5.800	5.350	93	194
105	105	x	5.200	5.850	5.400	93	196
106	106	x	5.250	5.900	5.450	93	198
107	107	x	5.300	5.950	5.500	93	200
108	108	x	5.350	6.000	5.550	93	202
109	109	x	5.400	6.050	5.600	93	204
110	110	x	5.450	6.100	5.650	93	206
111	111	x	5.500	6.150	5.700	93	208
112	112	x	5.550	6.200	5.750	93	210
113	113	x	5.600	6.250	5.800	93	212
114	114	x	5.650	6.300	5.850	93	214
115	115	x	5.700	6.350	5.900	93	216
116	116	x	5.750	6.400	5.950	93	218
117	117	x	5.800	6.450	6.000	93	220
118	118	x	5.850	6.500	6.050	93	222
119	119	x	5.900	6.550	6.100	93	224
120	120	x	5.950	6.600	6.150	93	226
121	121	x	6.000	6.650	6.200	93	228
122	122	x	6.050	6.700	6.250	93	230
123	123	x	6.100	6.750	6.300	93	232
124	124	x	6.150	6.800	6.350	93	234
125	125	x	6.200	6.850	6.400	93	236
126	126	x	6.250	6.900	6.450	93	238
127	127	x	6.300	6.950	6.500	93	240
128	128	x	6.350	7.000	6.550	93	242
129	129	x	6.400	7.050	6.600	93	244
130	130	x	6.450	7.100	6.650	93	246
131	131	x	6.500	7.150	6.700	93	248
132	132	x	6.550	7.200	6.750	93	250
133	133	x	6.600	7.250	6.800	93	252
134	134	x	6.650	7.300	6.850	93	254
135	135	x	6.700	7.350	6.900	93	256
136	136	x	6.750	7.400	6.950	93	258
137	137	x	6.800	7.450	7.000	93	260
138	138	x	6.850	7.500	7.050	93	262
139	139	x	6.900	7.550	7.100	93	264
140	140	x	6.950	7.600	7.150	93	266
141	141	x	7.000	7.650	7.200	93	268
142	142	x	7.050	7.700	7.250	93	270
143	143	x	7.100	7.750	7.300	93	272
144	144	x	7.150	7.800	7.350	93	274
145	145	x	7.200	7.850	7.400	93	276
146	146	x	7.250	7.900	7.450	93	278
147	147	x	7.300	7.950	7.500	93	280
148	148	x	7.350	8.000	7.550	93	282
149	149	x	7.400	8.050	7.600	93	284
150	150	x	7.450	8.100	7.650	93	286
151	151	x	7.500	8.150	7.700	93	288
152	152	x	7.550	8.200	7.750	93	290
153	153	x	7.600	8.250	7.800	93	292
154	154	x	7.650	8.300	7.850	93	294
155	155	x	7.700	8.350	7.900	93	296
156	156	x	7.750	8.400	7.950	93	298
157	157	x	7.800	8.450	8.000	93	300
158	158	x	7.850	8.500	8.050	93	302
159	159	x	7.900	8.550	8.100	93	304
160	160	x	7.950	8.600	8.150	93	306
161	161	x	8.000	8.650	8.200	93	308
162	162	x	8.050	8.700	8.250	93	310
163	163	x	8.100	8.750	8.300	93	312
164	164	x	8.150	8.800	8.350	93	314
165	165	x	8.200	8.850	8.400	93	316
166	166	x	8.250	8.900	8.450	93	318
167	167	x	8.300	8.950	8.500	93	320
168	168	x	8.350	9.000	8.550	93	322
169	169	x	8.400	9.050	8.600	93	324
170	170	x	8.450	9.100	8.650	93	326
171	171	x	8.500	9.150	8.700	93	328
172	172	x	8.550	9.200	8.750	93	330
173	173	x	8.600	9.250	8.800	93	332
174	174	x	8.650	9.300	8.850	93	334
175	175	x	8.700	9.350	8.900	93	336
176	176	x	8.750	9.400	8.950	93	338
177	177	x	8.800	9.450	9.000	93	340

6. CIRCUIT DESCRIPTION

6.1. BLOCK DIAGRAM



6.2. GENERAL

RS 7000 is composed of the following modules:

- Receiver
- Synthesizer
- Tx-loop and modulator
- Back module
- Front module

6.3. RECEIVER

The receiver is a double superhet with 1.IF 21.4 MHz and 2.IF 0.455 MHz.

The RF head comprises FET, T1 and tuning diodes D1 D2, D3, D4. The main selectivity is in the crystal filter on 21.4 MHz.

In the second I.F. there is a ceramic filter feeding the quadrature detector IC4. The AF is then fed to an active filter T 10 where only frequencies higher than 7 KHz are amplified. In the squelch detector D10 D11 the noise signal is compared with the threshold level from the squelch potentiometer, and depending on the signal - to noise level the AF-muting circuit T13 is blocked or opened. When the AF signal has passed the AF-deemphasis IC 2B and the muting circuit, it is amplified in the telephone amplifier T14, T15.

Then the signal enters the telephone level potentiometer and the loudspeaker muting circuit positioned on the front module.

In the monolithic loudspeaker amplifier IC3 the AF-signal is amplified to a max. of 4 Watts.

6.4. SYNTHESIZER

The synthesizer consists of a large scale MOS integrated circuit IC5, a highspeed divider IC2, IC3, IC4, a VCO T3 and a reference oscillator T10. The VCO signal is amplified by T2 and buffered by T9 and applied to the ECL divider IC2 where it is divided by 10 or 11 depending on the control voltage from IC5, pin 15. 4 J-K multivibrators in TTL logic IC3, IC4, form, together with IC2, a divide by 60 or 61 circuit. The frequency input for IC5 is about 2,5 MHz. In IC5 there are 3 counters.

M-counter

A-counter

Reference-counter

6.5. TX-LOOP

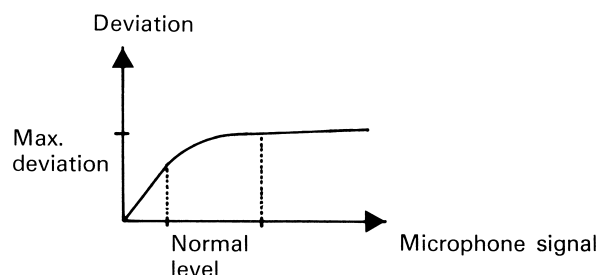
In the Tx-loop the synthesizer VCO frequency is controlling the Tx-VCO frequency. The difference between the Tx-VCO and the synthesizer is 16.8 MHz on duplex channels.

A signal from the synthesizer VCO and Tx-VCO T 16 is fed to the Tx-mixer T2. The IF signal at 16.8 MHz is amplified in T3, T4, T8 and the frequency is divided by 2 in IC1B before the phase detector IC2. The signal from the offset oscillator T5 on 16.8 MHz is also divided by 2 in IC1A before the phase detector IC2. The voltage from IC2 through the loop filter T19, T20 controls the Tx-VCO frequency. By means of the high frequency response of the loop filter, the modulation from the offset oscillator is directly transferred to the Tx-VCO. The Tx driver, T15 and T14, amplifies the Tx-VCO signal to a suitable level for the Tx power amplifier.

6.6. MODULATOR

The modulator consists of a preamplifier T13 with the preemphasis network, a compressor attenuator T12, a compressor amplifier IC3, a fullwave detector D5, D6, and an active low pass filter T10.

The microphone signal is amplified in the preamplifier and the compressor amplifier. If the signal after detection in the fullwave detector, is greater than the threshold voltage set by R79, R80 of the attenuator transistor T12, the signal will automatically be reduced to a constant level.

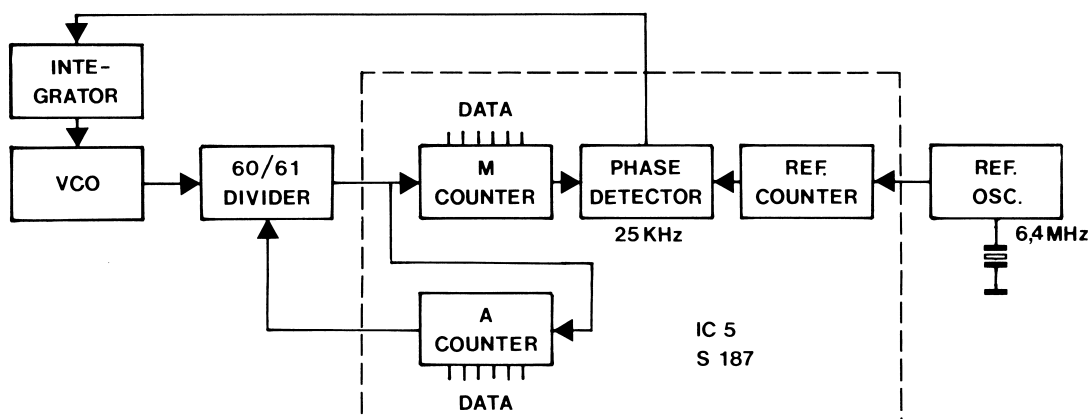


6.7. TX-POWER AMPLIFIER

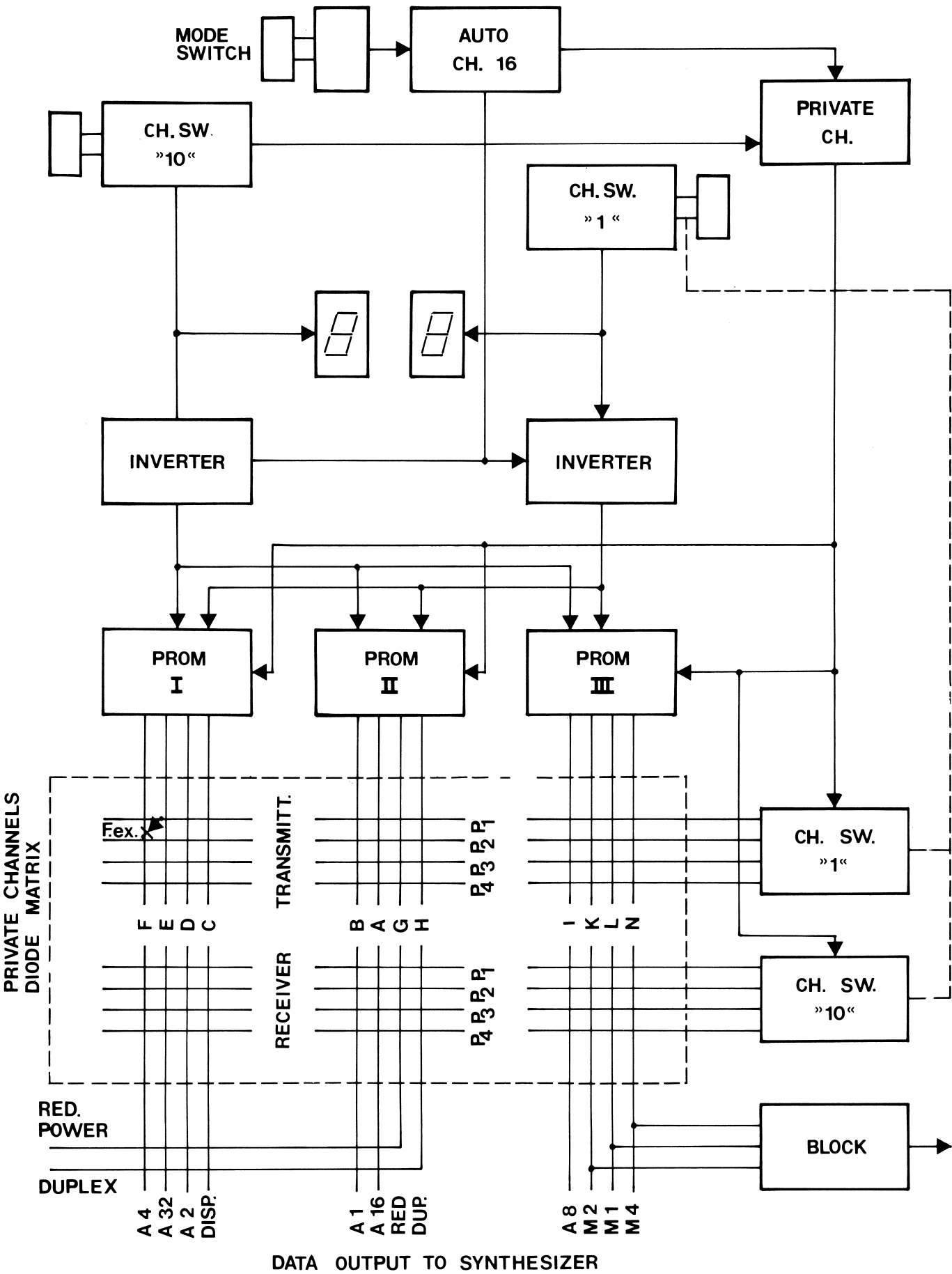
The Tx-power amplifier consists of two power transistors T30, T31. The tuned circuits are in stripline technique. The total gain is app. 20 dB.

6.8. DUPLEX SWITCH

The purpose of the duplex switch is to connect the receiver to the wanted branch on the duplex filter. The switching elements are the pinn diodes D10, D11 D12.



6.9. CHANNEL SELECTOR LOGIC



6.10. CHANNEL CODES

CHANNEL		ADD I	PROM I				ADD II	PROM II				ADD III	PROM III			
			A4	A32	A2	DISP		A1	A16	RED	DUP		A8	M2	M1	M4
1	r	63	0	1	1	1	119	0	1	1	0	119	0	0	0	1
1	t	127	0	1	1	1	127	0	1	1	0	127	0	0	0	1
2	r	190	1	1	0	1	231	0	1	1	0	246	0	0	0	1
2	t	254	1	1	0	1	239	0	1	1	0	254	0	0	0	1
3	r	62	1	1	1	1	103	0	1	1	0	118	0	0	0	1
3	t	126	1	1	1	1	111	0	1	1	0	126	0	0	0	1
4	r	189	0	1	0	1	215	0	1	1	0	245	1	0	0	1
4	t	253	0	1	0	1	223	0	1	1	0	253	1	0	0	1
5	r	61	0	1	1	1	87	0	1	1	0	117	1	0	0	1
5	t	125	0	1	1	1	95	0	1	1	0	125	1	0	0	1
6	r	188	0	1	0	1	199	0	1	1	1	244	1	0	1	0
6	t	252	0	0	0	1	207	0	0	1	1	252	0	0	1	1
7	r	60	0	0	1	1	71	0	0	1	0	116	0	0	1	1
7	t	124	0	0	1	1	79	0	0	1	0	124	0	0	1	1
8	r	187	0	0	0	1	183	0	0	1	1	243	0	1	0	0
8	t	251	1	0	0	1	191	0	0	1	1	251	0	0	1	1
9	r	59	0	0	1	1	55	0	0	1	1	115	0	1	0	0
9	t	123	1	0	1	1	63	0	0	1	1	123	0	0	1	1
10	r	183	1	0	0	1	243	0	0	1	1	231	0	1	0	0
10	t	247	0	0	0	1	251	0	0	1	1	239	1	0	1	1
11	r	55	1	0	1	1	115	0	0	1	1	103	0	1	0	0
11	t	119	0	0	1	1	123	0	0	1	1	111	1	0	1	1
12	r	182	0	0	0	1	227	0	0	1	1	230	1	1	0	0
12	t	246	1	0	0	1	235	0	0	1	1	238	1	0	1	1
13	r	54	0	0	1	1	99	0	0	1	1	102	1	1	0	0
13	t	118	1	0	1	1	107	0	0	1	1	110	1	0	1	1
14	r	181	1	0	0	1	211	0	0	1	1	229	1	1	0	0
14	t	245	0	0	0	1	219	0	1	1	1	237	0	0	1	1
15	r	53	1	0	1	1	83	0	0	0	1	101	1	1	0	0
15	t	117	0	0	1	1	91	0	1	0	1	109	0	0	1	1

CHANNEL		ADD I	PROM I				ADD II	PROM II				ADD III	PROM III			
			A4	A32	A2	DISP		A1	A16	RED	DUP		A8	M2	M1	M4
16	r	180	0	0	0	1	195	0	1	1	1	228	0	1	0	0
16	t	244	1	0	0	1	203	0	1	1	1	236	0	0	1	1
17	r	52	0	0	1	1	67	0	1	0	1	100	0	1	0	0
17	t	116	1	0	1	1	75	0	1	0	1	108	0	0	1	1
18	r	179	0	0	0	1	179	0	1	1	0	227	1	0	1	1
18	t	243	0	0	0	1	187	0	1	1	0	235	1	0	1	1
19	r	51	0	0	1	1	51	0	1	1	0	99	1	0	1	1
19	t	115	0	0	1	1	59	0	1	1	0	107	1	0	1	1
20	r	175	1	0	0	1	245	0	1	1	0	183	1	0	1	1
20	t	239	1	0	0	1	253	0	1	1	0	191	1	0	1	1
21	r	47	1	0	1	1	117	0	1	1	0	55	1	0	1	1
21	t	111	1	0	1	1	125	0	1	1	0	63	1	0	1	1
22	r	174	0	1	0	1	229	0	0	1	0	182	1	0	1	1
22	t	238	0	1	0	1	237	0	0	1	0	190	1	0	1	1
23	r	46	0	1	1	1	101	0	0	1	0	54	1	0	1	1
23	t	110	0	1	1	1	109	0	0	1	0	62	1	0	1	1
24	r	173	1	1	0	1	213	0	0	1	0	181	1	0	1	1
24	t	237	1	1	0	1	221	0	0	1	0	189	1	0	1	1
25	r	45	1	1	1	1	85	0	0	1	0	53	0	0	1	1
25	t	109	1	1	1	1	93	0	0	1	0	61	0	0	1	1
26	r	172	0	1	0	1	197	0	0	1	0	180	1	0	1	1
26	t	236	0	1	0	1	205	0	0	1	0	188	1	0	1	1
27	r	44	0	1	1	1	69	0	0	1	0	52	0	0	1	1
27	t	108	0	1	1	1	77	0	0	1	0	60	0	0	1	1
28	r	171	1	1	0	1	181	0	0	1	0	179	1	0	1	1
28	t	235	1	1	0	1	189	0	0	1	0	187	1	0	1	1

CHANNEL		ADD I	PROM I				ADD II	PROM II				ADD III	PROM III			
			A4	A32	A2	DISP		A1	A16	RED	DUP		A8	M2	M1	M4
60	r	143	0	1	0	1	244	1	1	1	0	151	0	0	0	1
60	t	207	0	1	0	1	252	1	1	1	0	159	0	0	0	1
61	r	15	0	1	1	1	116	1	1	1	0	23	0	0	0	1
61	t	79	0	1	1	1	124	1	1	1	0	31	0	0	0	1
62	r	142	1	1	0	1	228	1	1	1	0	150	0	0	0	1
62	t	206	1	1	0	1	236	1	1	1	0	158	0	0	0	1
63	r	14	1	1	1	1	100	1	1	1	0	22	0	0	0	1
63	t	78	1	1	1	1	108	1	1	1	0	30	0	0	0	1
64	r	141	0	1	0	1	212	1	1	1	0	149	1	0	0	1
64	t	205	0	1	0	1	220	1	1	1	0	157	1	0	0	1
65	r	13	0	1	1	1	84	1	1	1	0	21	1	0	0	1
65	t	77	0	1	1	1	92	1	1	1	0	29	1	0	0	1
66	r	140	0	0	0	1	196	1	0	1	0	148	0	0	1	1
66	t	204	0	0	0	1	204	1	0	1	0	156	0	0	1	1
67	r	12	0	1	1	1	68	1	1	1	1	20	1	0	1	0
67	t	76	0	0	1	1	76	1	0	1	1	28	0	0	1	1
68	r	139	0	0	0	1	180	1	0	1	1	147	0	1	0	0
68	t	203	1	0	0	1	188	1	0	1	1	155	0	0	1	1
69	r	11	0	0	1	1	52	1	0	1	1	19	0	1	0	0
69	t	75	1	0	1	1	60	1	0	1	1	27	0	0	1	1
70	r	135	1	0	0	1	240	1	0	1	1	135	0	1	0	0
70	t	199	0	0	0	1	248	1	0	1	1	143	1	0	1	1
71	r	7	1	0	1	1	112	1	0	1	1	7	0	1	0	0
71	t	71	0	0	1	1	120	1	0	1	1	15	1	0	1	1
72	r	134	0	0	0	1	224	1	0	1	1	134	1	1	0	0
72	t	198	1	0	0	1	232	1	0	1	1	142	1	0	1	1
73	r	6	0	0	1	1	96	1	0	1	1	6	1	1	0	0
73	t	70	1	0	1	1	104	1	0	1	1	14	1	0	1	1
74	r	133	1	0	0	1	208	1	0	1	1	133	1	1	0	0
74	t	197	0	0	0	1	216	1	1	1	1	141	0	0	1	1

CHANNEL		ADD I	PROM I				ADD II	PROM II				ADD III	PROM III			
			A4	A32	A2	DISP		A1	A16	RED	DUP		A8	M2	M1	M4
77	r	4	0	0	1	1	64	1	1	1	1	4	0	1	0	0
77	t	68	1	0	1	1	72	1	1	1	1	12	0	0	1	1
78	r	121	0	0	0	1	176	1	1	1	0	131	1	0	1	1
78	t	195	0	0	0	1	184	1	1	1	0	139	1	0	1	1
79	r	3	0	0	1	1	48	1	1	1	0	3	1	0	1	1
79	t	67	0	0	1	1	56	1	1	1	0	11	1	0	1	1
80	r	159	1	0	0	1	246	1	1	1	0	215	1	0	1	1
80	t	223	1	0	0	1	254	1	1	1	0	223	1	0	1	1
81	r	31	1	0	1	1	118	1	1	1	0	87	1	0	1	1
81	t	95	1	0	1	1	126	1	1	1	0	95	1	0	1	1
82	r	158	0	1	0	1	230	1	0	1	0	214	0	0	1	1
82	t	222	0	1	0	1	238	1	0	1	0	222	0	0	1	1
83	r	30	0	1	1	1	102	1	0	1	0	86	0	0	1	1
83	t	94	0	1	1	1	110	1	0	1	0	94	0	0	1	1
84	r	157	1	1	0	1	214	1	0	1	0	213	0	0	1	1
84	t	221	1	1	0	1	222	1	0	1	0	221	0	0	1	1
85	r	29	1	1	1	1	86	1	0	1	0	85	0	0	1	1
85	t	93	1	1	1	1	94	1	0	1	0	93	0	0	1	1
86	r	156	0	1	0	1	198	1	0	1	0	212	1	0	1	1
86	t	220	0	1	0	1	206	1	0	1	0	200	1	0	1	1
87	r	28	0	1	1	1	70	1	0	1	0	84	1	0	1	1
87	t	92	0	1	1	1	78	1	0	1	0	92	1	0	1	1
88	r	155	1	1	0	1	182	1	0	1	0	211	1	0	1	1
88	t	219	0	1	0	1	190	1	0	1	0	219	1	0	1	1
A16	r	151	0	0	0	1	242	0	1	1	1	199	0	1	0	0
A16	t	215	1	0	0	1	250	0	1	1	1	207	0	0	1	1

7.1. ALIGNMENT OF RECEIVER

Necessary measuring equipment.
Signal generator 0,1 μ - 10 mV 50 ohm.
Distortion meter.
Oscilloscope.
Frequency counter.

Set channel selectors on CH 18.
Check that the synthesizer frequency is 140.100 0 MHz \pm 500 Hz.
Connect a distortion meter across the loudspeaker terminals.
Connect a signal generator to the antenna connector and tune it to 161.500 0 MHz modulated with 1 KHz \pm 3 KHz deviation.
Connect an oscilloscope to TP1, frequency 455 KHz and sensitivity 0,1V/cm.
Use a non-loading test probe.
Increase the signal generator output until you see a signal in TP1.
Tune C4, C6, C13, C17, C28, C32, L5, L8, L9, L10 to max. signal in TP1.
If the signal in TP1 exceeds 500 mV pp, the signal generator output must be reduced.
L5, L8 and L10 are tuned to min. distortion of the IF signal.
L11 is tuned to max. AF-signal in the loudspeaker.
C4 and C6 are tuned to best S/N ratio.
Set channel selectors on CH 11.
Set signal generator on 156.550 MHz. Watch the signal in TP1.
Turn P1 to max. signal in TP1.
Requirement: Receiver sensitivity better than 0,4 μ V/12 dB SINAD.
Set squelch regulator in middle position.
Stop the signal generator. Turn P2 to muting threshold of RX.
Set squelch regulator max. clockwise.
Requirement: opening for a 20 dB SINAD signal.

7.2. ALIGNMENT OF SYNTHESIZER and V.C.O.

Necessary measuring equipment.
Frequency counter, min. 160 MHz.
Millivoltmeter with RF probe or voltmeter with diode probe.
Reference oscillator.

Connect frequency counter to IC6 Pin 13.
Adjust C46 to 6.400 00 MHz \pm 10 Hz.
Synthesizer VCO and drivers.

Set channel selector on CH 28.
Connect a voltmeter to TP1.
Adjust C11 to 4,5 V.
Connect MVTM to TP3.
Adjust L2 and L5 to max. signal.
Set channel selector on CH 16.
Adjust L5 to max. signal.
Requirement: More than 300 mV.
Connect MVTM to L4 output.
Adjust L4 to max. signal.
Requirement: More than 100 mV.
Connect MVTM to L1 output.
Adjust L1 to max. signal.
Requirement: More than 300 mV.
Select CH28.
Check the voltage in TP1 4,5 V.
Check the frequency on output on L1.
CH 16: 135.400 0 MHz.
CH 18: 140.100 0 MHz.
L6 is factory tuned.

7.3. ALIGNMENT OF TX-LOOP AND MODULATOR

Modulator and offset oscillator.

Necessary measuring equipment.
Tone generator.
Oscilloscope.
Deviation meter.
Frequency counter.
Turn L4 four turns down from top of the coilform.
Connect frequency counter to IC1 pin 1 (TP3).
Adjust L3 to 16.800 0 \pm 100 Hz.
Connect deviation meter to IC1 pin 1.
Connect a tone generator to the microphone terminals.
Input 100 mV/200 ohm 1 KHz.
Turn P2 to middle position.
Connect oscilloscope to IC3 pin 7 (TP4).
Requirement: 4-6 V pp.
Adjust P1 to deviation \pm 5 KHz.
Check that no frequency between 300-3000 Hz exceeds \pm 5 KHz.
Reduce tone generator input to 5 mV/1 KHz.
Adjust P2 to deviation \pm 3 KHz.
If a deviation meter is not available for 16.8 MHz the deviation can be checked on the driver output or antenna output.
Tx-loop and VHF driver.

Necessary measuring equipment.
Voltmeter with diode probe or RF-millivoltmeter.
Frequency counter.
Disconnect the cable to the VHF PA. and connect a 47 ohm resistor and a RF-voltmeter instead. Select CH 16 and key the transmitter on 1W.
Check the frequency is 156.800 0 MHz.
Connect a voltmeter to collector T19.
Adjust C94 to 5,2 V.
Adjust C81, C77 and L5 to max. driver output.
Requirement 3 V or 200 mW.
Connect oscilloscope to IC1 pin 6 (TP2).
Adjust L1 and L2 to max. signal.
Requirements 4 V pp 16.8 MHz.
If the bandwidth of the oscilloscope is 10 MHz a lower p-p value will be observed.

7.4. ALIGNMENT OF TX-POWER AMPLIFIER

Necessary measuring equipment.
Amp.meter 10 A.
50 ohm power meter for 25 W.
Oscilloscope.
Connect the oscilloscope to the supply terminal.
Set the power supply to 12,0 V.
Connect the power meter to the antenna connector.
Set the channel switches on CH 16.
Set the mode switch on 25 W.
Key the transmitter.
If the drive is OK the supply current will increase by at least 1 A.
Tune C56 and C63 to max. output.
Requirement: 20 W.
Adjustment by means of P3 in driver.
The maximum power can be adjusted by means of the resistor network P3 on the driver output.
The total supply current must not exceed 5.5 amp.
Set the mode switch to 1 W and check that the RF output is below 1 W.
Adjustment is by means of R21.

7.5. ALIGNMENT AND CODING OF SELCALL

Necessary measuring equipment.

AF generator.

Frequency counter.

RF generator.

Oscilloscope.

Adjust the AF generator using a frequency counter to the first tone in the code.

Connect the AF generator to the modulation input of the RF generator - CH16 deviation ± 1 KHz.

Short circuit pin 15-16 IC1.

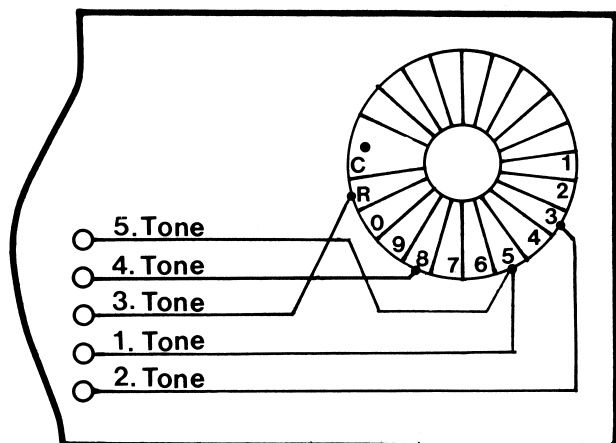
Connect oscilloscope to base of T6 and adjust L1 to maximum signal.

Disconnect the short circuit pin 15-16 IC1.

Connect oscilloscope to pin 13 IC1.

Time of high level 12-15 m sec. determined by R4.

Time of low level 270-350 m sec. determined by R8.



The code on the layout drawing is 53R85 = 53385

8. OPTIONS

8.1. 24V REGULATOR

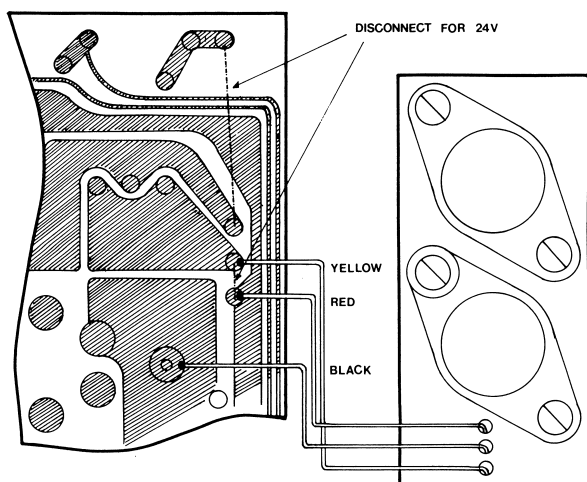
Consists of a cooling fin with a printed circuit board.

The fin must be mounted on 6 pcs. 5 mm stand off.

The three wires must be connected.

The short circuits must be opened.

Old version with big relays



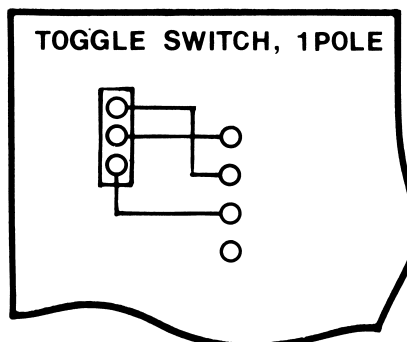
8.2. SELCALL

Consists of a printed circuit board and a toggle switch.

The board must be mounted on 4 pcs. 5 mm stand off.

The flat cable must be connected to the front module.

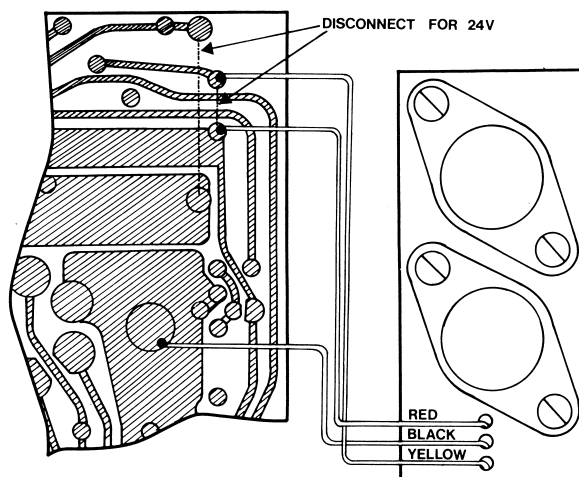
The toggle switch must be connected.

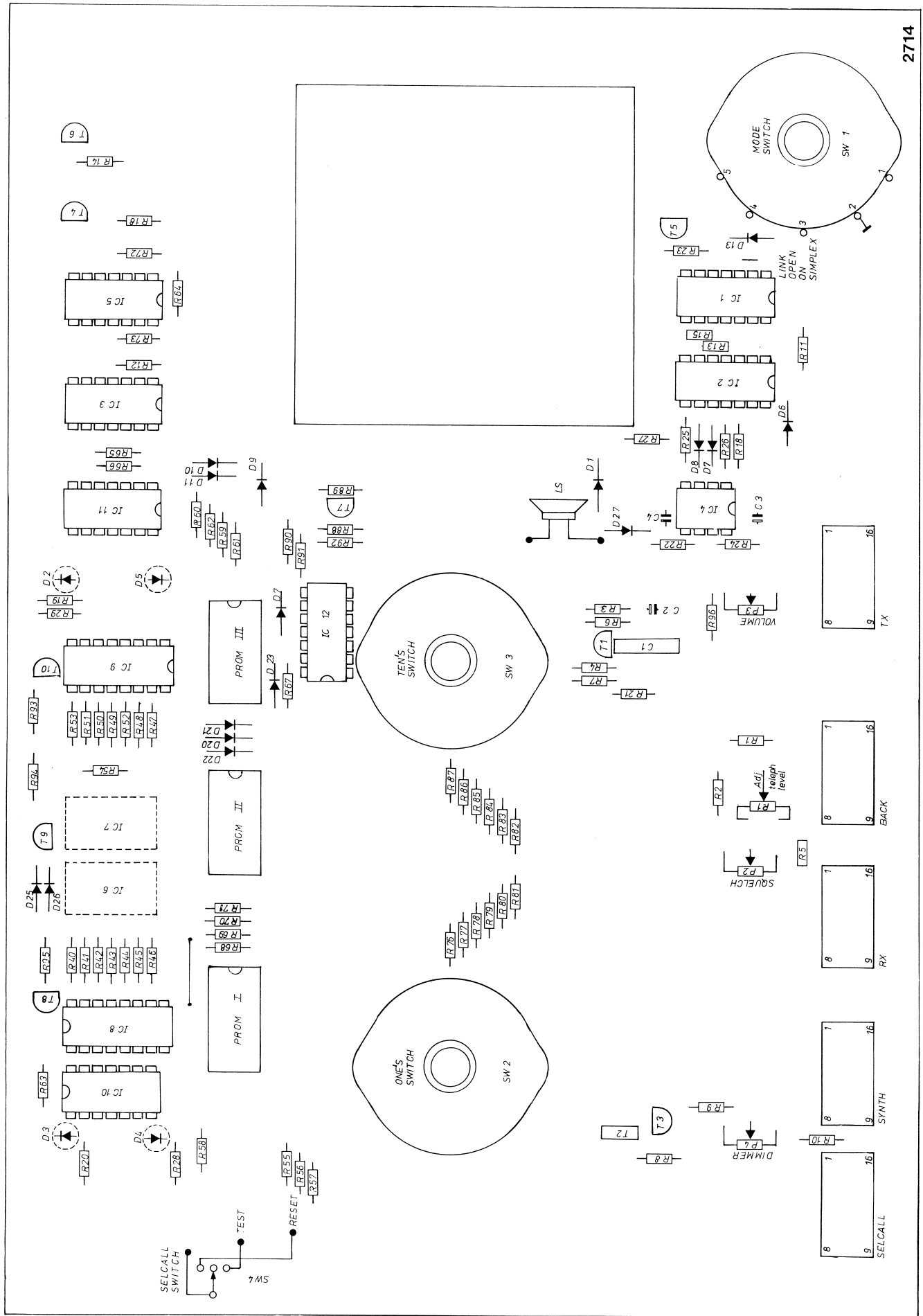


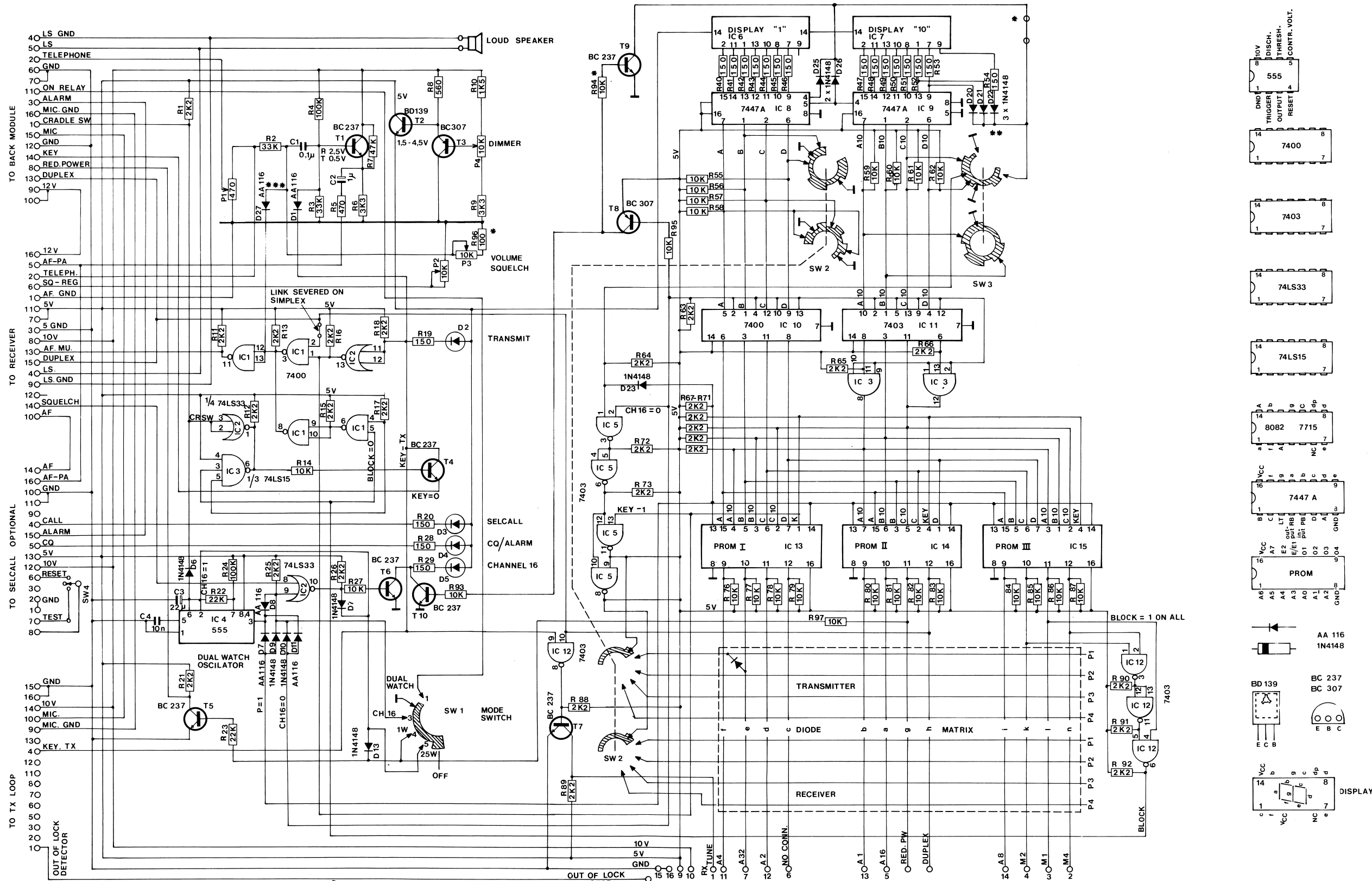
Tone Frequency

1	1124 Hz
2	1197 Hz
3	1275 Hz
4	1358 Hz
5	1446 Hz
6	1540 Hz
7	1640 Hz
8	1747 Hz
9	1860 Hz
0	1981 Hz
R	2110 Hz

New version



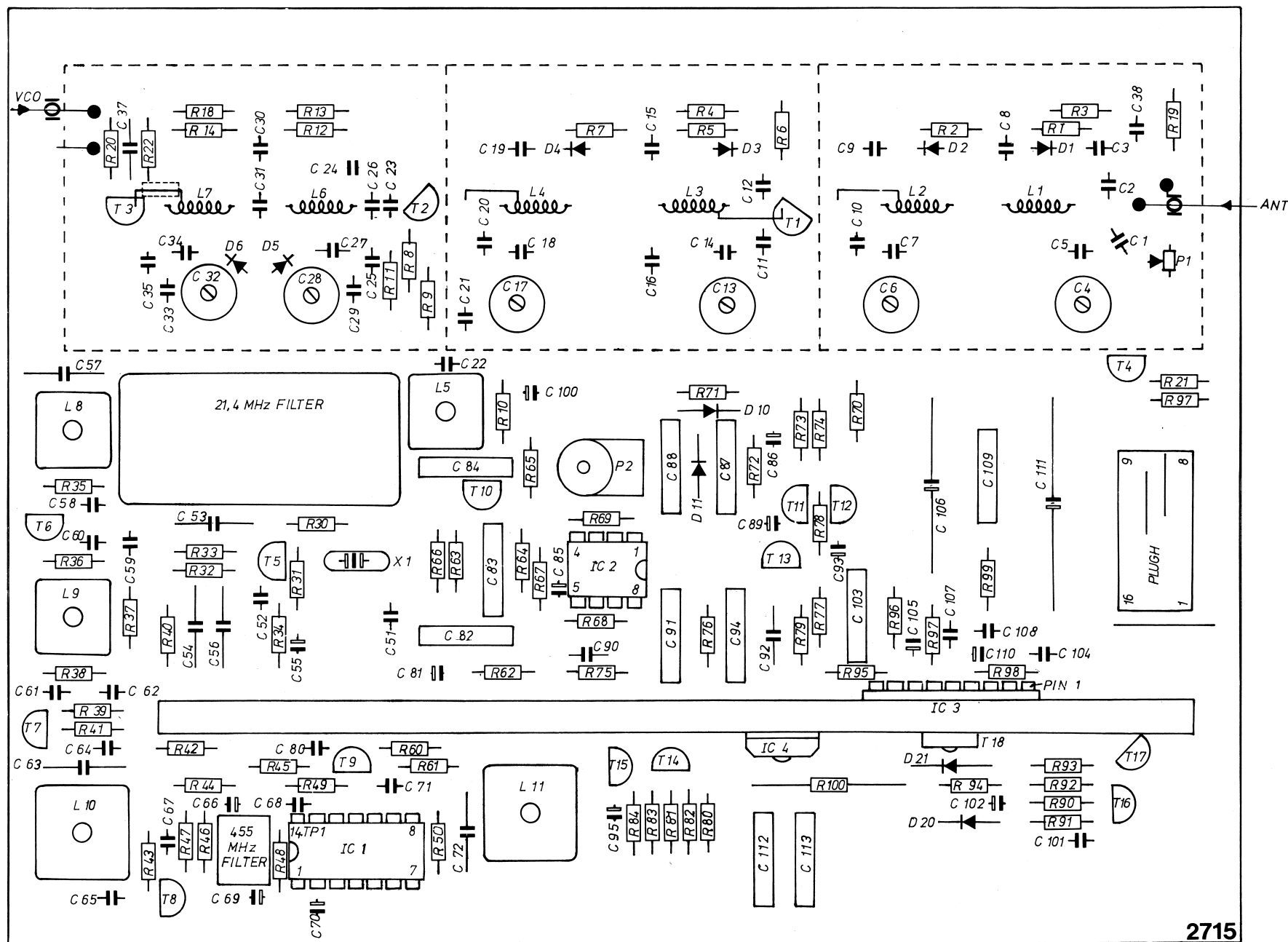




* ONLY CONNECTED IN GERMAN VERSION
 ** NOT CONNECTED IN GERMAN VERSION
 *** ONLY CONNECTED WHEN LOUDSPEAKER MUST BE MUTED WHEN HANDSET IS OUT OF CRADLE

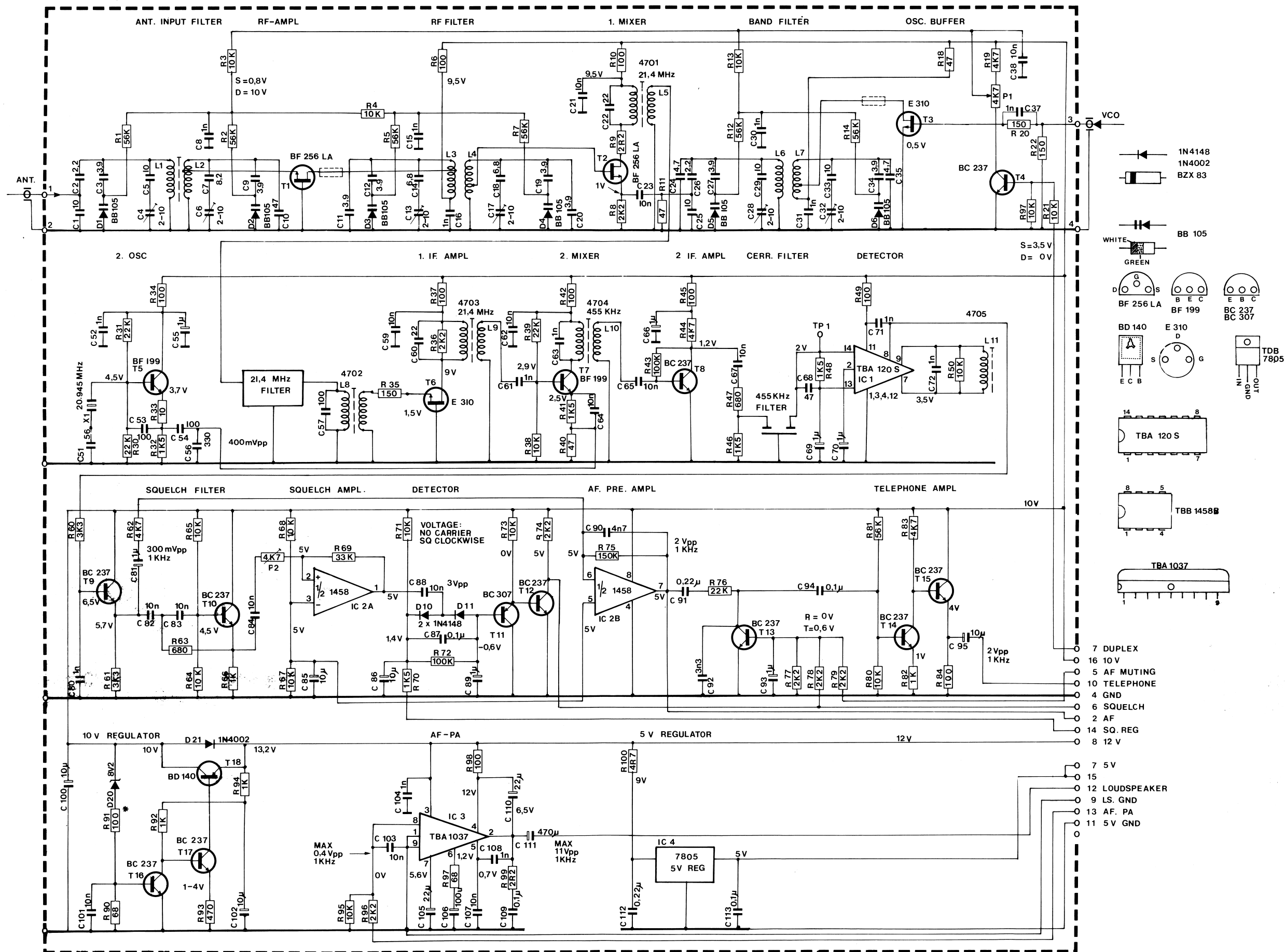
THIS PIN GOES TO GROUND ON STANDARD SET

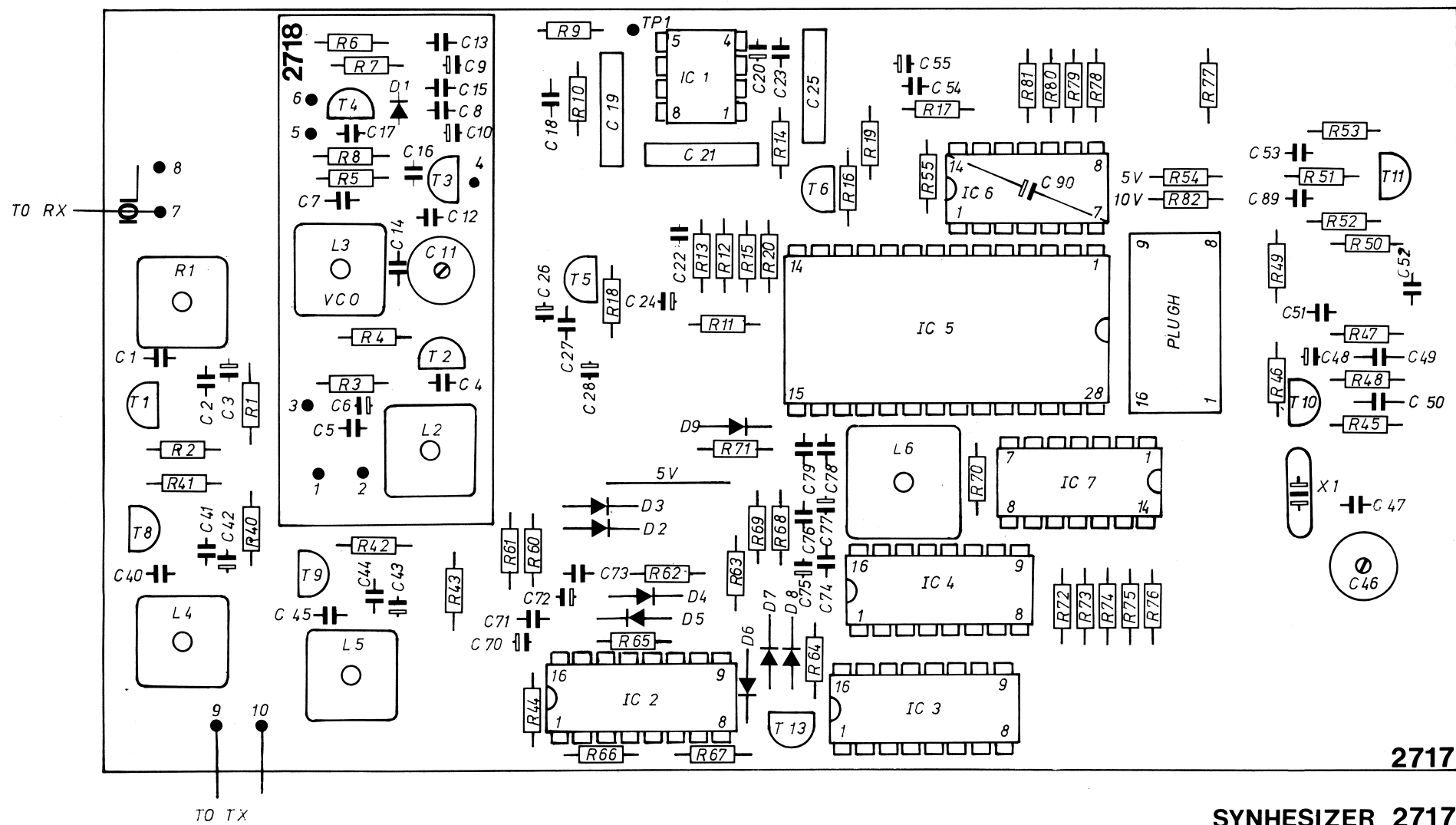
FRONT PANEL 2714
 DIAGRAM NO. 7001

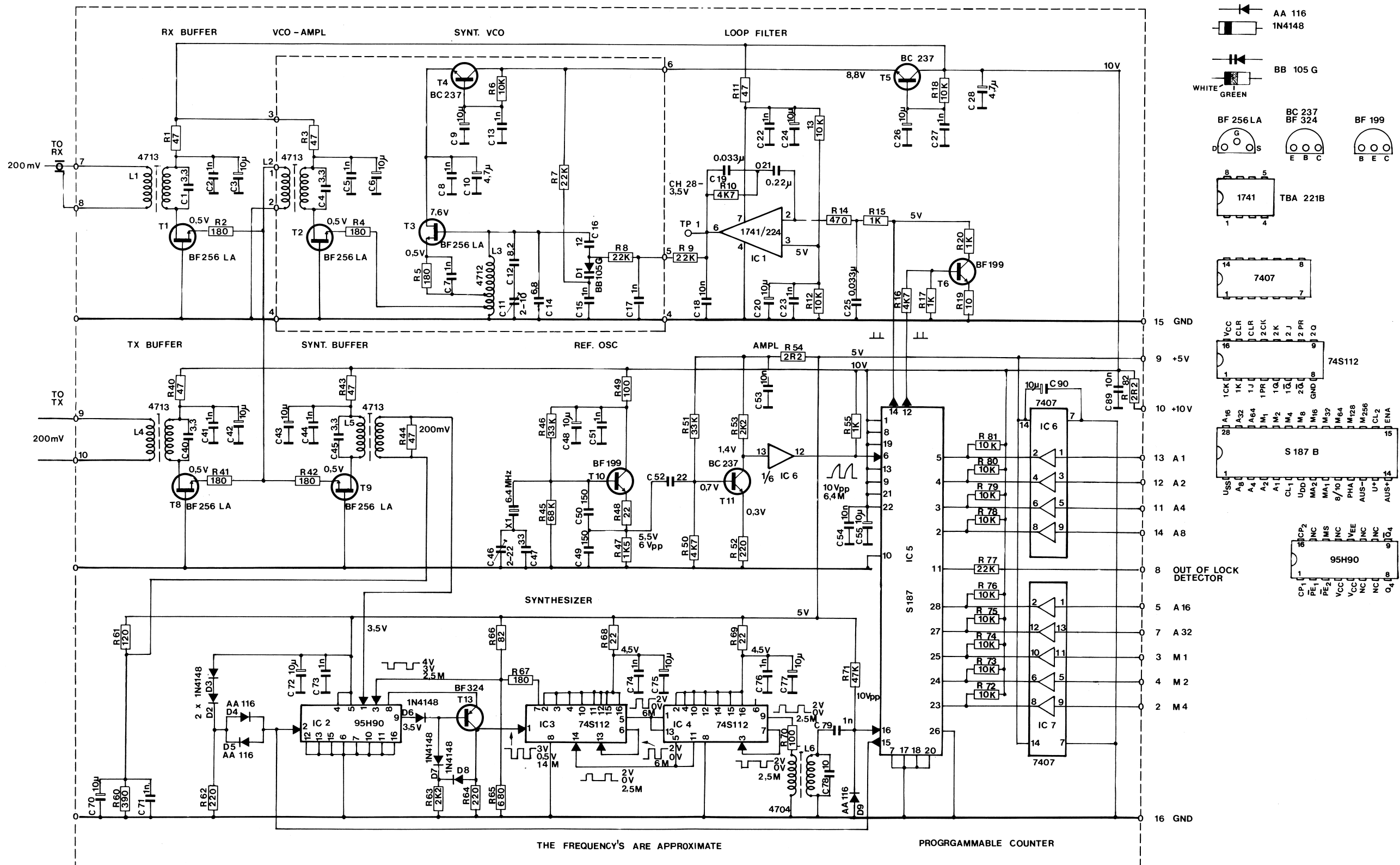


2715

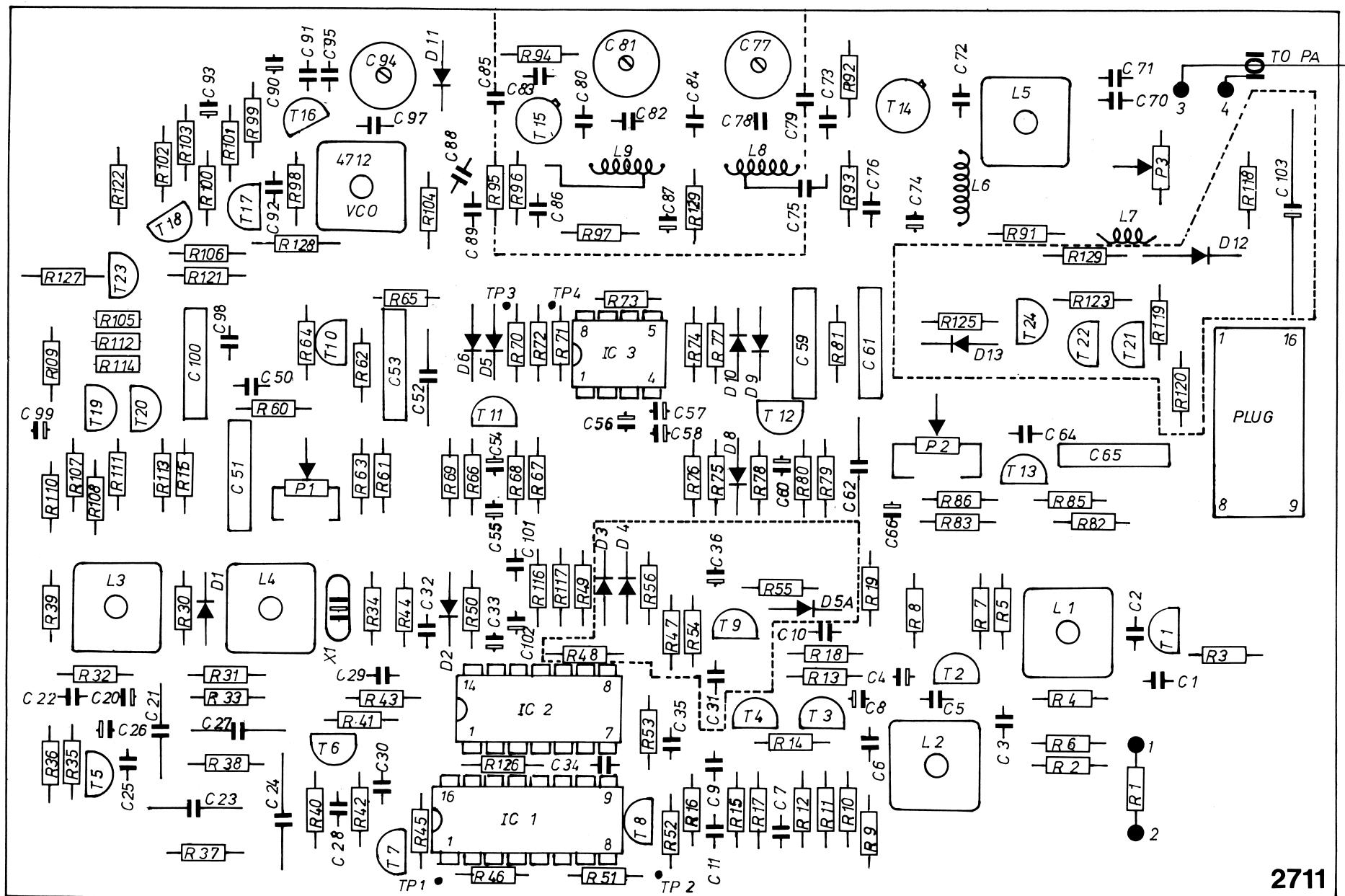
RECEIVER 2715





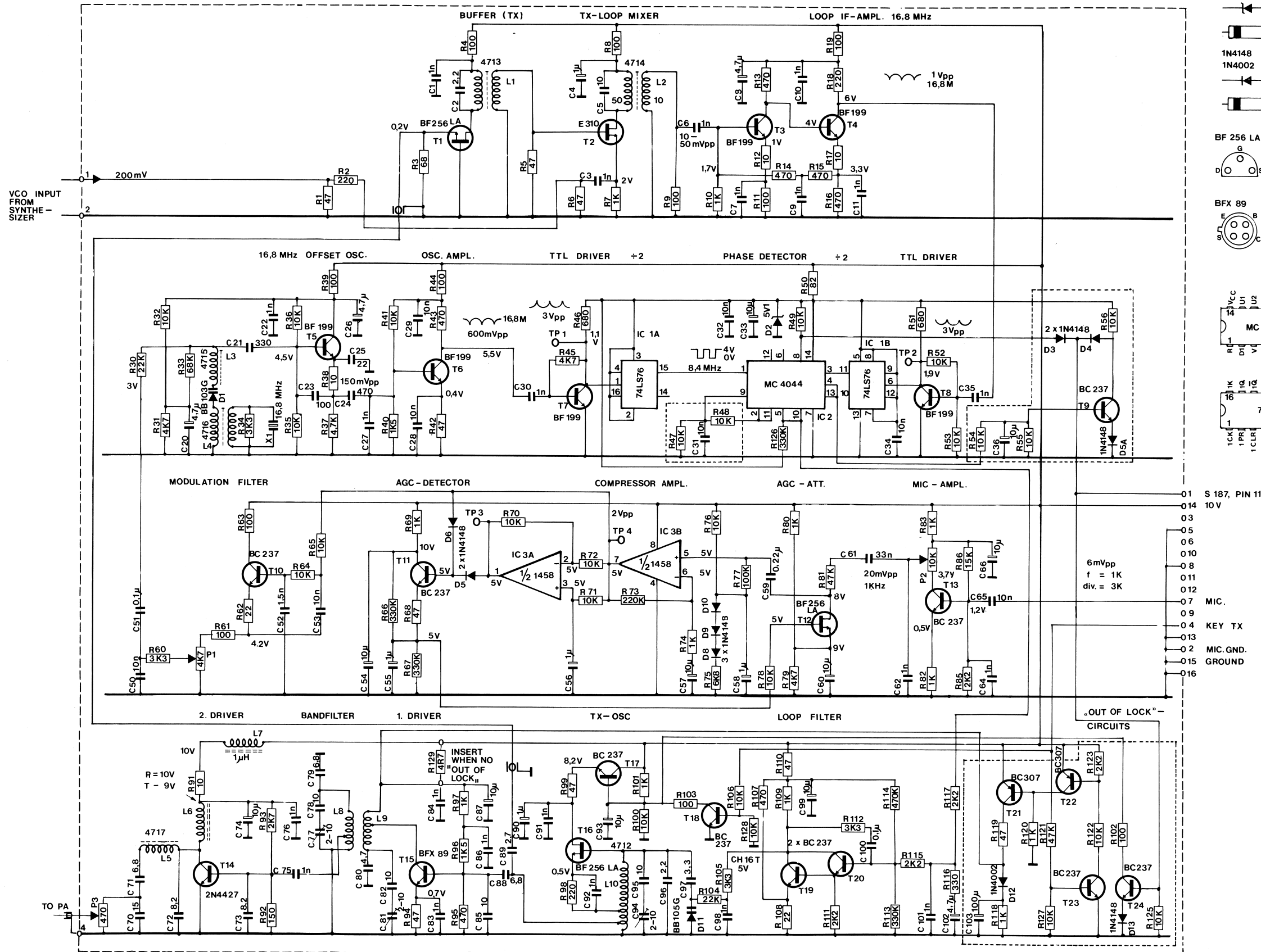


SYNTHESIZER 2717
VCO 2718
DIAGRAM NO. 7003

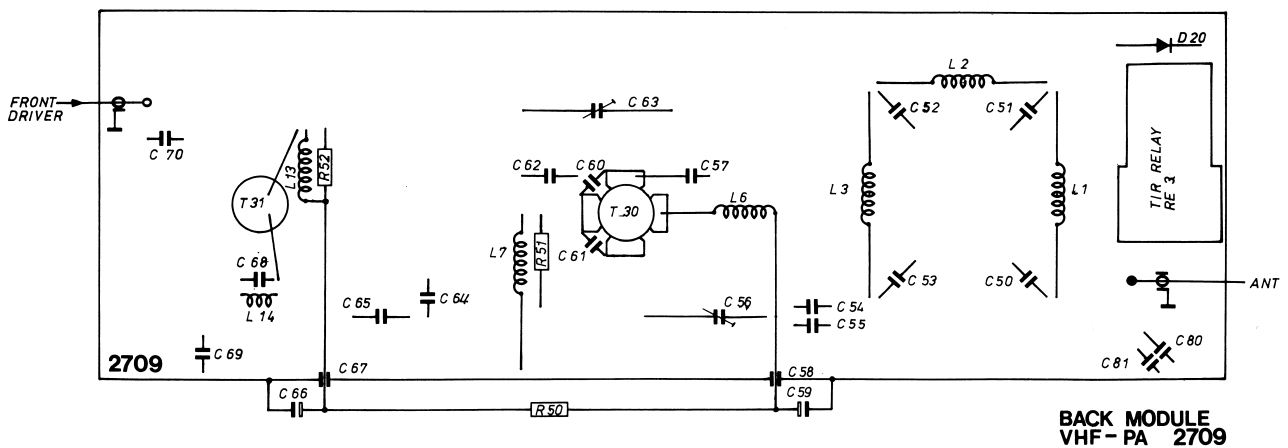
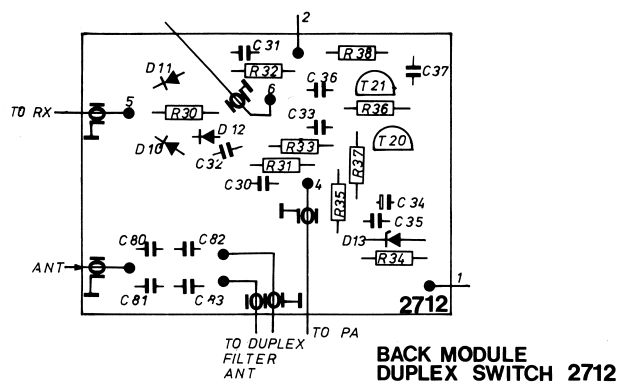
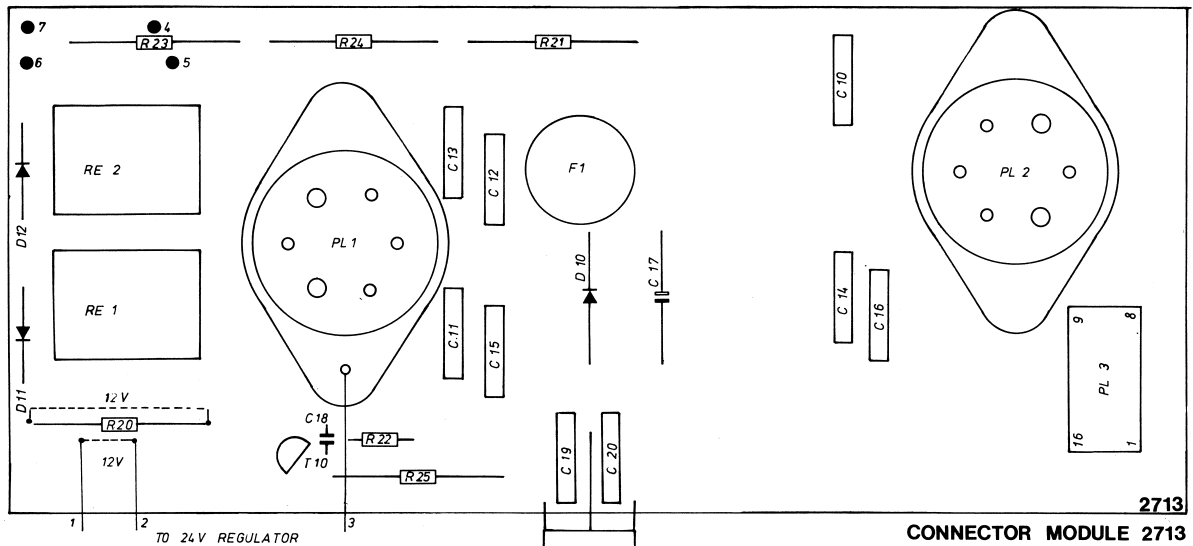
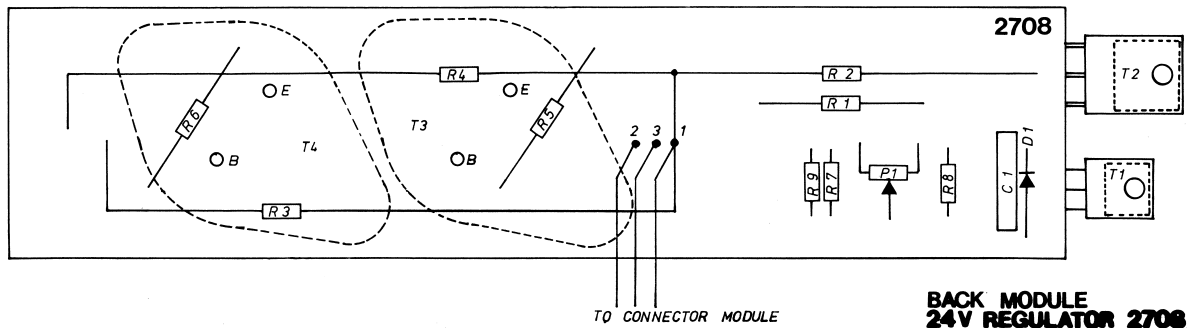


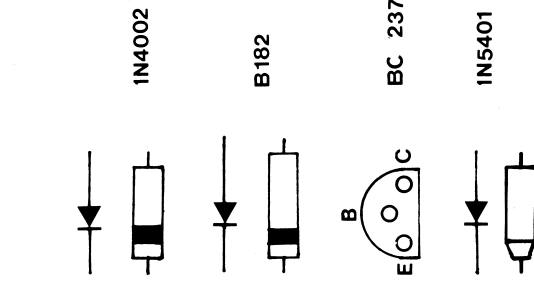
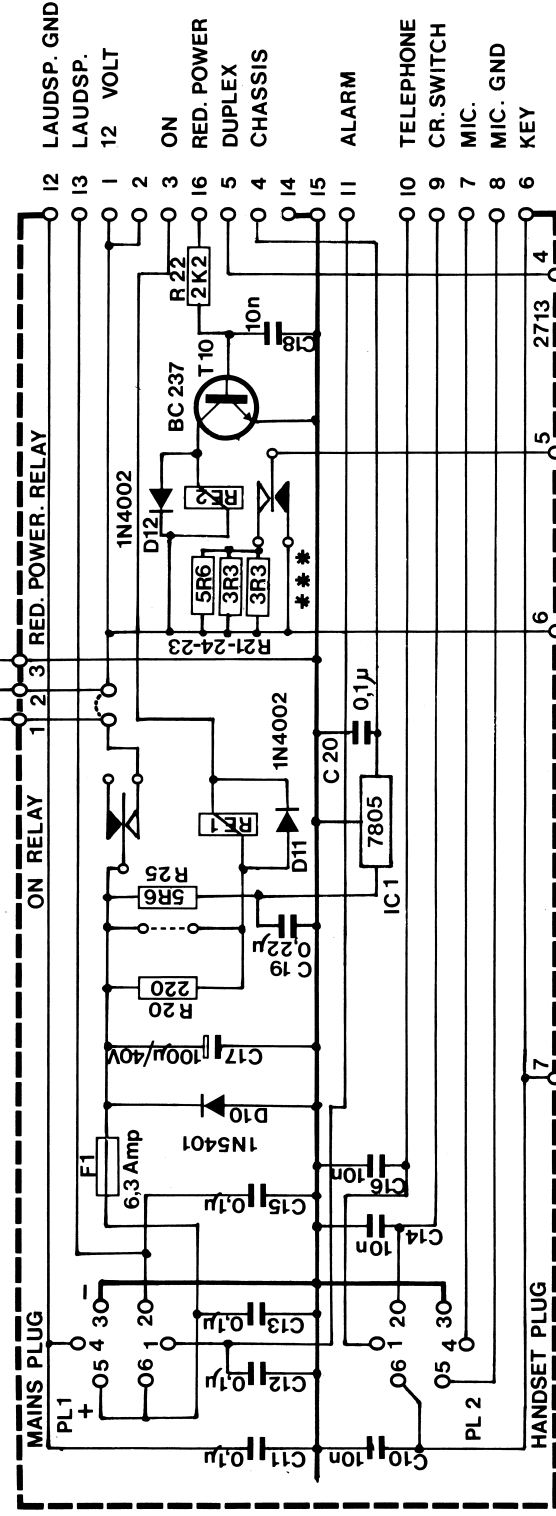
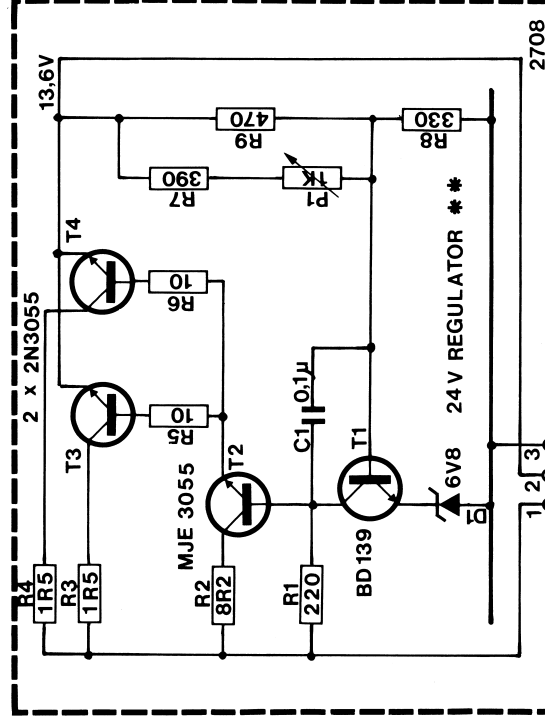
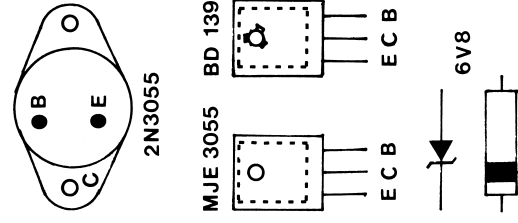
COMPONENTS WITHIN DOTTED LINES ONLY
FITTED TO SETS WITH OUT OF LOCK CIRCUIT.

**TX LOOP and
MODULATOR 2711**

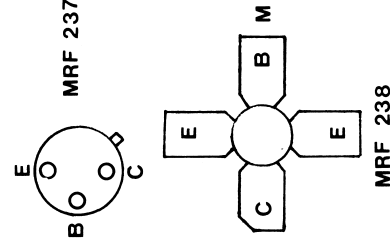
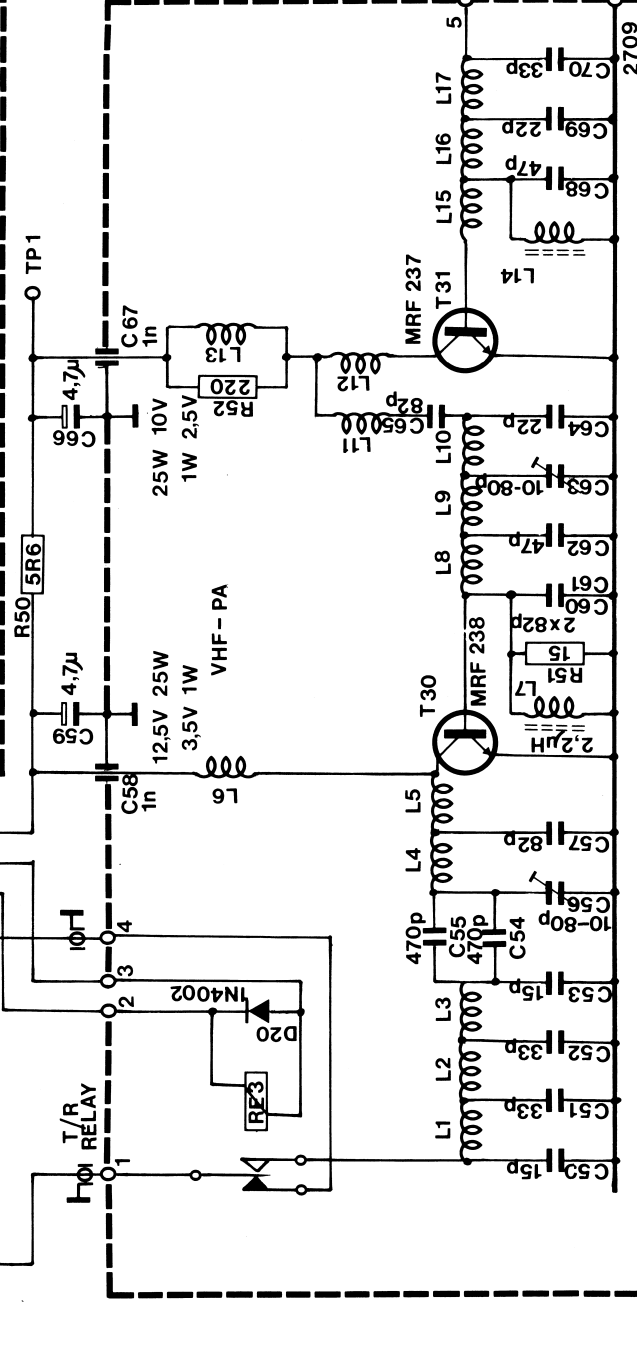
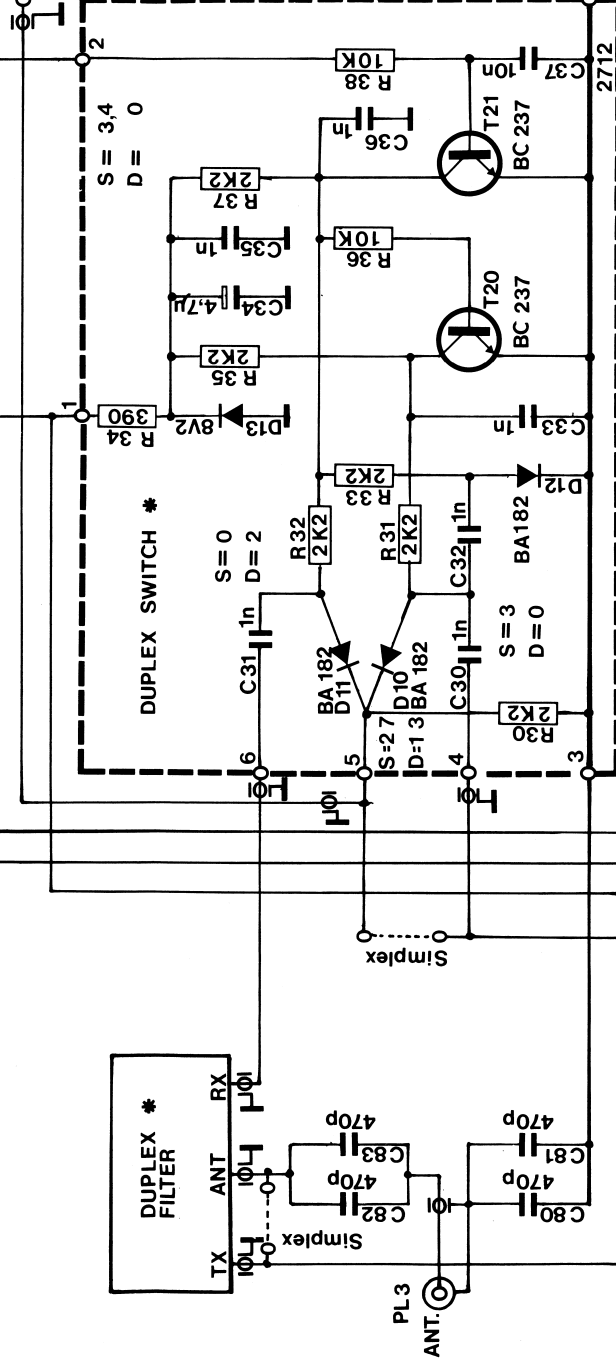


**TX LOOP and
MODULATOR 2711
DIAGRAM NO. 7004**



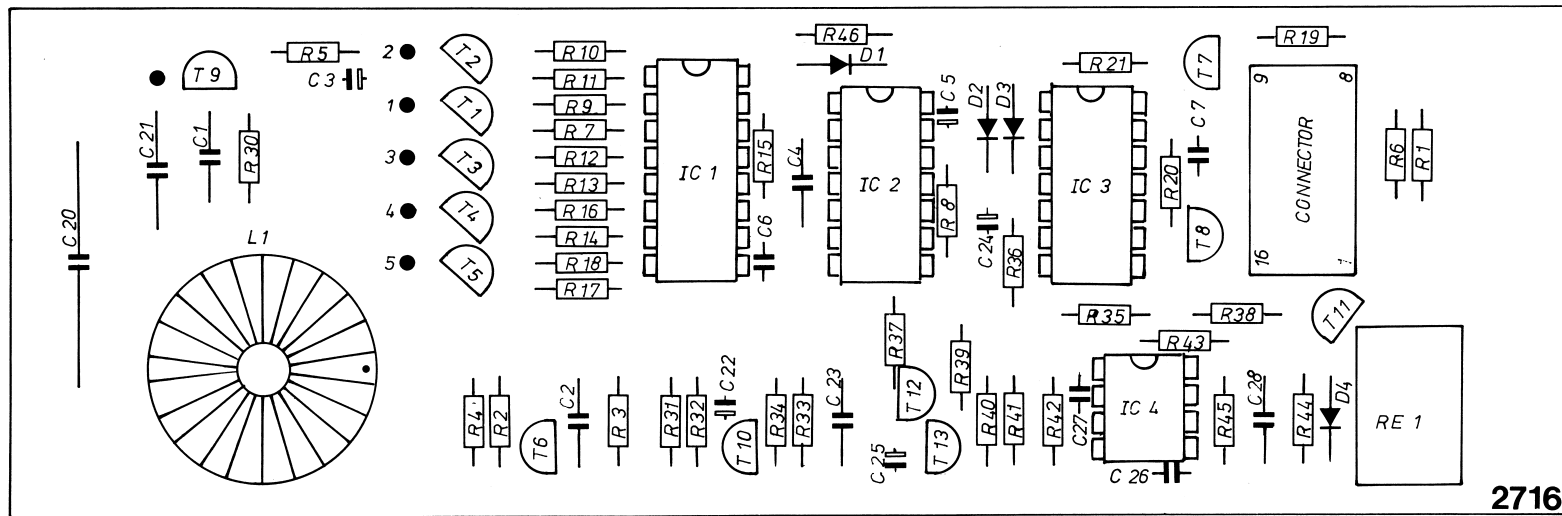


TO RX

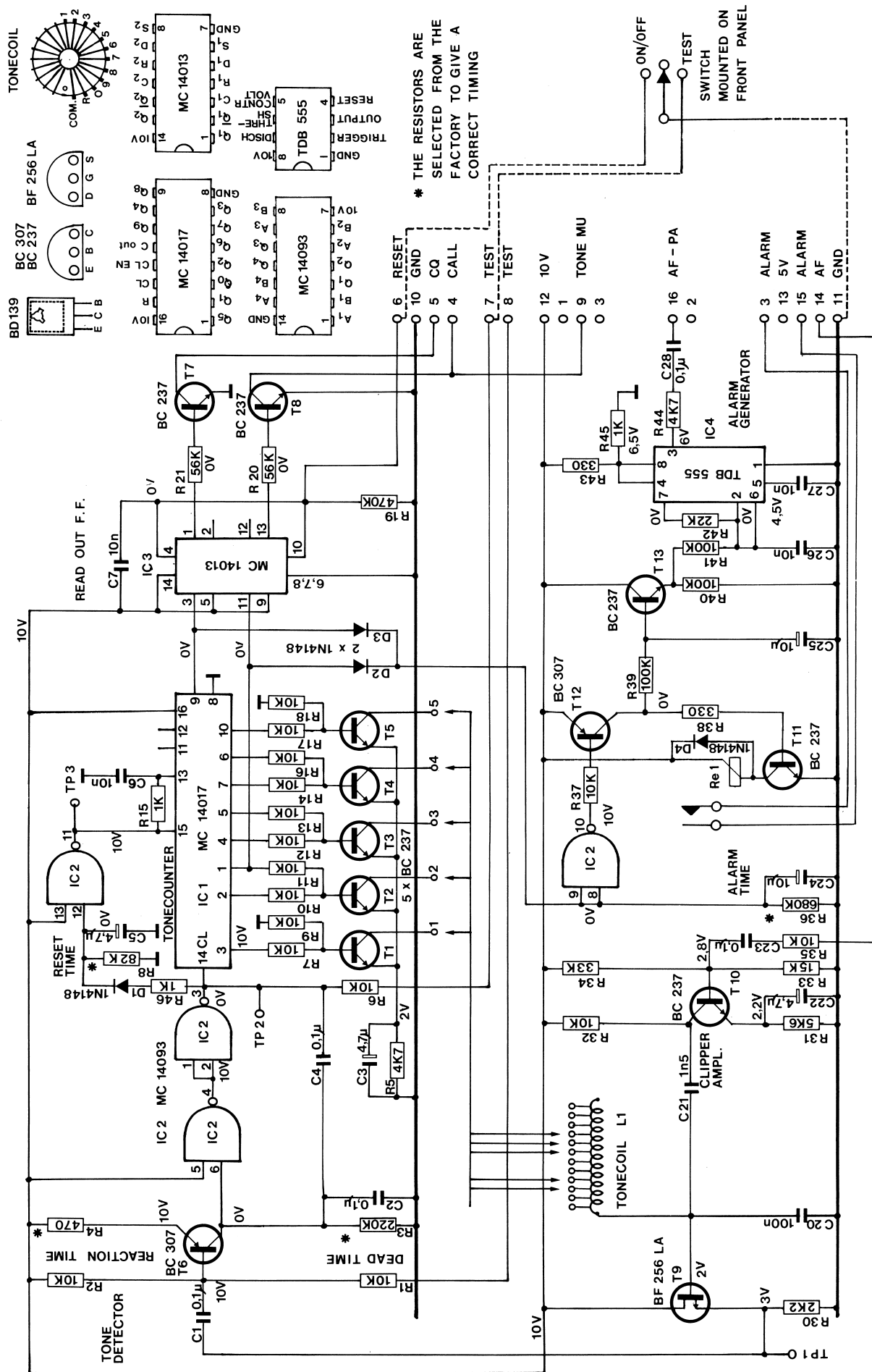


- * THE RS 7000 SIMPLEX DON'T HAVE THE DUPLEX SWITCH AND THE DUPLEX FILTER
- ** THE RS 7000 12V DON'T HAVE THE 24V REGULATOR
- *** POWER RESISTOR FOR REDUCED TRANSMITTER POWER

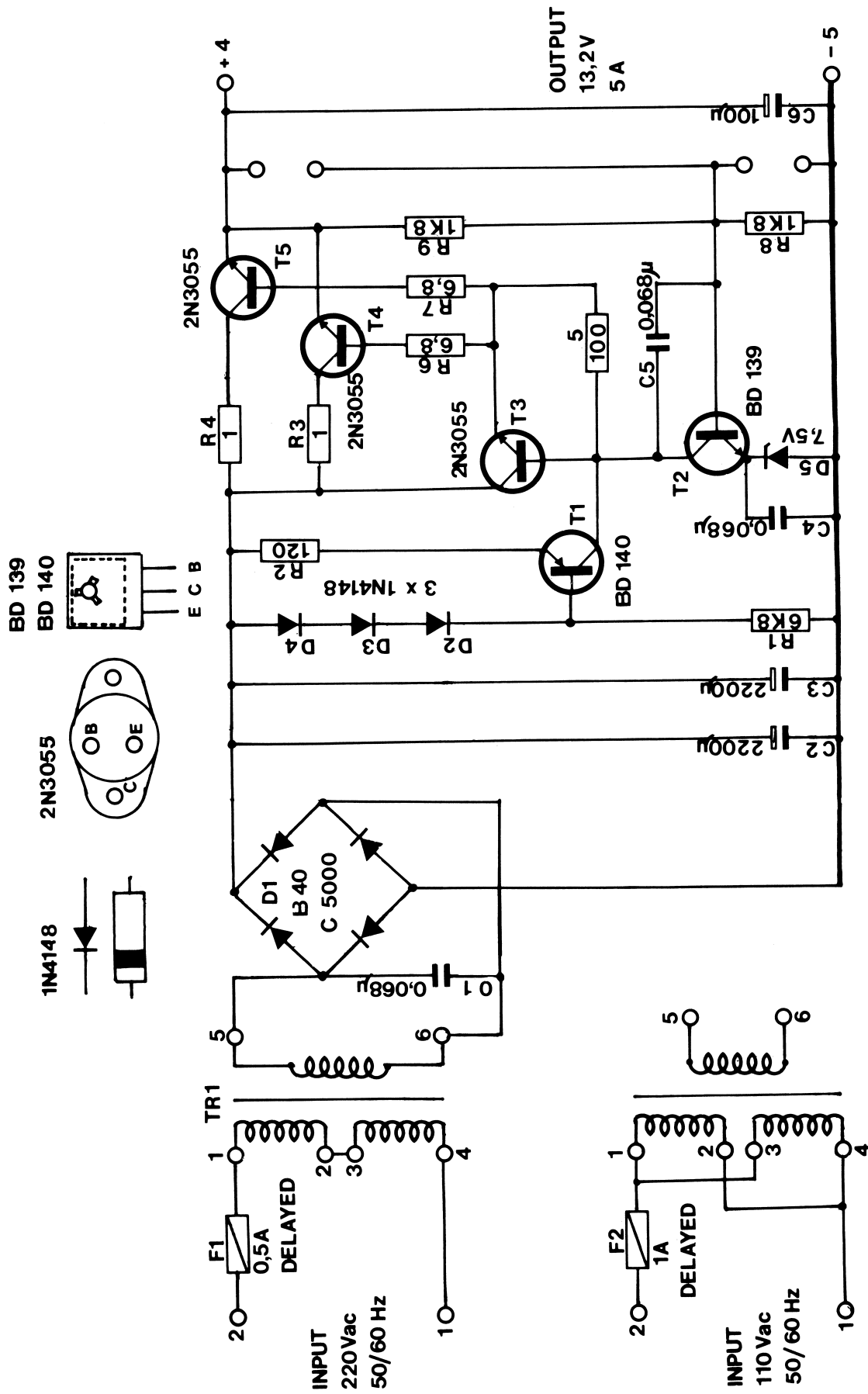
**BACK MODULE 2708, 2709,
2712 and 2713**
DIAGRAM NO. 7005



SELCALL 2716



SELCALL 2716
DIAGRAM NO. 7006



R09	Resistor	2,2 Kohm	Philips	2322	211	13222	T1	Transistor	Siemens	BC237B
R90	Resistor	2,2 Kohm	Philips	2322	211	13222	T2	Transistor	Siemens	BD139
R91	Resistor	2,2 Kohm	Philips	2322	211	13222	T3	Transistor	Siemens	BC307B
R92	Resistor	2,2 Kohm	Philips	2322	211	13222	T4	Transistor	Siemens	BC237B
							T5	Transistor	Siemens	EC237B
							T6	Transistor	Siemens	BC237B
P1	Trimmer	470 ohm	Philips	2322	410	03353	T7	Transistor	Siemens	BC237B
P2	Trimmer	10 Kohm	Philips	2322	350	70707				
P3	Trimmer	22 Kohm	Philips	2322	381	70728				
P4	Trimmer	10 Kohm	Philips	2322	350	70707				
C1	Capasitor poly.	0,1u	Philips	2222	344	21104	IC1	Integrated cercuit	Siemens	7400
C2	Capasitor tan.	1u/35V	Union Carbide	T399A105Mo35BS			IC2	Integrated cercuit	Texas	74LS33
C3	Capasitor tan.	22u/35V	Union Carbide	T399E475Mo35BS			IC3	Integrated cercuit	Texas	74LS15
C4	Capasitor cer.	10n	Ferroperm	9/0145,9			IC4	Integrated cercuit	Siemens	555
							IC5	Integrated cercuit	Siemens	7403
							IC6	Display	H.P.	5082-7751
							IC7	Display	H.P.	5082-7751
							IC8	Integrated cercuit	Texas	7447A
							IC9	Integrated cercuit	Texas	7447A
D1	Diode		Siemens	A4116			IC10	Integrated cercuit	Siemens	7400
D2	Light Diode		Litronic	MV209			IC11	Integrated cercuit	Siemens	7403
D3	Light Diode		Litronic	MV209			IC12	Integrated cercuit	Siemens	7403
D4	Light Diode		Litronic	MV209			IC13	Integrated cercuit	Siemens	7403
D5	Light Diode		Litronic	MV209			IC13	Prom I	R&S	
D6	Diode		Siemens	IN4148			IC14	Prom II	R&S	
D7	Diode		Siemens	A4116			IC15	Prom III	R&S	
D8	Diode		Siemens	A4116						
D9	Diode		Siemens	IN4148			SW1	Switch	R&S	SW17000
D10	Diode		Siemens	IN4148			SW2	Switch	R&S	SW27000
D11	Diode		Siemens	A4116			SW3	Switch	R&S	SW37000
D12	Diode		Siemens	IN4148						
D13	Diode		Siemens	IN4148						
D20	Diode		Siemens	IN4148						
D21	Diode		Siemens	IN4148						
D22	Diode		Siemens	IN4148						
D23	Diode		Siemens	IN4148						

	Receiver			R45	Resistor	100	ohm	Philips	2322	211	13101
R1	Resistor	56	Kohm	Philips	2322	211	13563				
R2	Resistor	56	Kohm	Philips	2322	211	13563				
R3	Resistor	10	Kohm	Philips	2322	211	13103				
R4	Resistor	10	Kohm	Philips	2322	211	13103				
R5	Resistor	56	Kohm	Philips	2322	211	13563				
R6	Resistor	100	ohm	Philips	2322	211	13101				
R7	Resistor	56	Kohm	Philips	2322	211	13563				
R8	Resistor	2,2	Kohm	Philips	2322	211	13222				
R9	Resistor	2,2	ohm	Philips	2322	211	13228				
R10	Resistor	100	ohm	Philips	2322	211	13101				
R11	Resistor	47	ohm	Philips	2322	211	13479				
R12	Resistor	56	Kohm	Philips	2322	211	13563				
R13	Resistor	10	Kohm	Philips	2322	211	13103				
R14	Resistor	56	Kohm	Philips	2322	211	13563				
R15	Resistor	47	ohm	Philips	2322	211	13479				
R16	Resistor	2,2	Kohm	Philips	2322	211	13222				
R17	Resistor	12	Kohm	Philips	2322	211	13123				
R18	Resistor	47	ohm	Philips	2322	211	13479				
R19	Resistor	4,7	Kohm	Philips	2322	211	13472				
R20	Resistor	10	ohm	Philips	2322	211	13109				
R21	Resistor	10	Kohm	Philips	2322	211	13103				
R22	Resistor	120	ohm	Philips	2322	211	13121				
R30	Resistor	22	Kohm	Philips	2322	211	13223				
R31	Resistor	22	Kohm	Philips	2322	211	13223				
R32	Resistor	1,5	Kohm	Philips	2322	211	13152				
R33	Resistor	10	ohm	Philips	2322	211	13109				
R34	Resistor	100	ohm	Philips	2322	211	13101				
R35	Resistor	150	ohm	Philips	2322	211	13151				
R36	Resistor	2,2	Kohm	Philips	2322	211	13222				
R37	Resistor	100	ohm	Philips	2322	211	13101				
R38	Resistor	10	Kohm	Philips	2322	211	13103				
R39	Resistor	22	Kohm	Philips	2322	211	13223				
R40	Resistor	47	ohm	Philips	2322	211	13479				
R41	Resistor	1,5	Kohm	Philips	2322	211	13152				
R42	Resistor	100	ohm	Philips	2322	211	13101				
R43	Resistor	100	Kohm	Philips	2322	211	13104				
R44	Resistor	4,7	Kohm	Philips	2322	211	13472				
				R46	Resistor	1,5	Kohm	Philips	2322	211	13152
				R47	Resistor	680	ohm	Philips	2322	211	13681
				R48	Resistor	1,5	Kohm	Philips	2322	211	13152
				R49	Resistor	100	ohm	Philips	2322	211	13101
				R50	Resistor	10	Kohm	Philips	2322	211	13103
				R60	Resistor	3,3	Kohm	Philips	2322	211	13332
				R61	Resistor	3,3	Kohm	Philips	2322	211	13332
				R62	Resistor	4,7	Kohm	Philips	2322	211	13472
				R63	Resistor	680	ohm	Philips	2322	211	13681
				R64	Resistor	10	Kohm	Philips	2322	211	13103
				R65	Resistor	10	Kohm	Philips	2322	211	13103
				R66	Resistor	1	Kohm	Philips	2322	211	13102
				R67	Resistor	10	Kohm	Philips	2322	211	13103
				R68	Resistor	10	Kohm	Philips	2322	211	13103
				R69	Resistor	33	Kohm	Philips	2322	211	13333
				R70	Resistor	1,5	Kohm	Philips	2322	211	13152
				R71	Resistor	10	Kohm	Philips	2322	211	13103
				R72	Resistor	100	Kohm	Philips	2322	211	13104
				R73	Resistor	10	Kohm	Philips	2322	211	13103
				R74	Resistor	2,2	Kohm	Philips	2322	211	13222
				R75	Resistor	150	Kohm	Philips	2322	211	13154
				R76	Resistor	22	Kohm	Philips	2322	211	13223
				R77	Resistor	2,2	Kohm	Philips	2322	211	13222
				R78	Resistor	2,2	Kohm	Philips	2322	211	13222
				R79	Resistor	2,2	Kohm	Philips	2322	211	13222
				R80	Resistor	10	Kohm	Philips	2322	211	13103
				R81	Resistor	56	Kohm	Philips	2322	211	13563
				R82	Resistor	1	Kohm	Philips	2322	211	13102
				R83	Resistor	4,7	Kohm	Philips	2322	211	13472
				R84	Resistor	100	ohm	Philips	2322	211	13101
				R90	Resistor	68	ohm	Philips	2322	211	13683
				R91	Resistor	100	ohm	Philips	2322	211	13101
				R92	Resistor	1	Kohm	Philips	2322	211	13102
				R93	Resistor	470	ohm	Philips	2322	211	13471
				R94	Resistor	1	Kohm	Philips	2322	211	13102
				R95	Resistor	10	Kohm	Philips	2322	211	13103
				R96	Resistor	2,2	Kohm	Philips	2322	211	13222

R97	Resistor	48	ohm	Philips	2322	211	13689	C35	Capasitor cer.	4,7pF	Ferroperm	9/ol16,9
R98	Resistor	100	ohm	Philips	2322	211	13101	C36	Capasitor cer.	1n	Ferroperm	9/ol29,8
R99	Resistor	2,2	ohm	Philips	2322	211	13228	C37	Capasitor cer.	1n	Ferroperm	9/ol29,8
R100	Resistor	4,7	ohm	Philips	1322	530	22478	C38	Capasitor cer.	10n	Ferroperm	9/ol45,9
								C50	Capasitor trim.	2-22pF	Philips	2222 808 11229
								C51	Capasitor cer.	47pF	Ferroperm	9/ol16,8
								C52	Capasitor cer.	1n	Ferroperm	9/ol29,8
C1	Capasitor cer.	10pF		Ferroperm	9/ol16,9			C53	Capasitor sty.	100pF	Philips	2222 425 41000
C2	Capasitor cer.	2,2pF		Ferroperm	9/ol16,9			C54	Capasitor sty.	100pF	Philips	2222 425 41000
C3	Capasitor cer.	3,9pF		Ferroperm	9/ol16,9			C55	Capasitor tan.	1u/35V	Union Carbide	T399Al05Mo35BS
C4	Capasitor trim.	2-10pF		Philips	2222 808	11109		C56	Capasitor sty.	330pF	Philips	2222 425 43300
C5	Capasitor cer.	10pF		Ferroperm	9/ol16,9			C57	Capasitor sty.	100pF	Philips	2222 425 41000
C6	Capasitor trim.	2-10pF		Philips	2222 808	11109		C58	Capasitor cer.	1n	Ferroperm	9/ol29,8
C7	Capasitor cer.	8,2pF		Ferroperm	9/ol16,9			C59	Capasitor cer.	10n	Ferroperm	9/ol45,9
C8	Capasitor cer.	1nF		Ferroperm	9/ol29,8			C60	Capasitor cer.	22pF	Ferroperm	9/ol16,9
C9	Capasitor cer.	3,9nF		Ferroperm	9/ol16,9			C61	Capasitor cer.	1n	Ferroperm	9/ol29,8
C10	Capasitor cer.	47nF		Ferroperm	9/ol16,9			C62	Capasitor cer.	10n	Ferroperm	9/ol45,9
C11	Capasitor cer.	3,9nF		Ferroperm	9/ol16,9			C63	Capasitor sty.	1n	Philips	2222 425 41001
C12	Capasitor cer.	3,9nF		Ferroperm	9/ol16,9			C64	Capasitor cer.	10n	Ferroperm	9/ol45,9
C13	Capasitor trim.	2-10nF		Philips	2222 809	05005		C65	Capasitor cer.	10n	Ferroperm	9/ol45,9
C14	Capasitor cer.	6,8nF		Ferroperm	9/ol16,9			C66	Capasitor tan.	1u/35V	Union Carbide	T399Al05Mo35BS
C15	Capasitor cer.	1n		Ferroperm	9/ol29,8			C67	Capasitor cer.	10n	Ferroperm	9/ol45,9
C16	Capasitor cer.	1n		Ferroperm	9/ol29,8			C68	Capasitor cer.	47pF	Ferroperm	9/ol16,8
C17	Capasitor trim.	2-10pF		Philips	2222 809	05005		C69	Capasitor tan.	1u/35V	Union Carbide	T399Al05Mo35BS
C18	Capasitor cer.	6,8pF		Ferroperm	9/ol16,9			C70	Capasitor tan.	1u/35V	Union Carbide	T399Al05Mo35BS
C19	Capasitor cer.	3,9pF		Ferroperm	9/ol16,9			C71	Capasitor cer.	1n	Ferroperm	9/ol29,8
C20	Capasitor cer.	3,9pF		Ferroperm	9/ol16,9			C72	Capasitor sty.	1n	Philips	2222 425 41001
C21	Capasitor cer.	10n		Ferroperm	9/ol45,9			C80	Capasitor cer.	1n	Ferroperm	9/ol29,8
C22	Capasitor cer.	22pF		Ferroperm	9/ol16,9			C81	Capasitor tan.	1u/35V	Union Carbide	T399Al05Mo35BS
C23	Capasitor cer.	10n		Ferroperm	9/ol45,9			C82	Capasitor poly.	10n	Philips	2222 344 21103
C24	Capasitor cer.	4,7pF		Ferroperm	9/ol16,9			C83	Capasitor poly.	10n	Philips	2222 344 21103
C25	Capasitor cer.	10pF		Ferroperm	9/ol16,9			C84	Capasitor poly.	10n	Philips	2222 344 21103
C26	Capasitor cer.	2,2pF		Ferroperm	9/ol16,9			C85	Capasitor tan.	10u/35V	Union Carbide	T399Gl06Mo35BS
C27	Capasitor cer.	3,9pF		Ferroperm	9/ol16,9			C86	Capasitor tan.	10u	Union Carbide	T399Gl06Mo35BS
C28	Capasitor trim.	2-10pF		Philips	2222 808	11109		C87	Capasitor poly.	0,1u	Philips	2222 344 21104
C29	Capasitor cer.	10pF		Ferroperm	9/ol16,9			C88	Capasitor poly.	10n	Philips	2222 344 21103
C30	Capasitor cer.	1n		Ferroperm	9/ol29,8			C89	Capasitor tan.	1u	Union Carbide	T399Al05Mo35BS
C31	Capasitor cer.	1n		Ferroperm	9/ol29,8			C90	Capasitor sty.	4,7n	Philips	2222 425 44701
C32	Capasitor cer.	2-10pF		Philips	2222 808	11109		C91	Capasitor poly.	0,22u	Philips	2222 344 21224
C33	Capasitor cer.	10pF		Ferroperm	9/ol16,9							
C34	Capasitor cer.	3,9pF		Ferroperm	9/ol16,9							

C92	Capasitor sty.	3,3n	Philips	2222	425	433o1	T9	Transistor	Siemens	BC237B
C93	Capasitor tan.	1u	Union Carbide	T399A1o5Kc35BS			T1o	Transistor	Siemens	BC237B
C94	Capasitor poly.	o,1u	Philips	2222	344	211o4	T11	Transistor	Siemens	BC3o7B
C95	Capasitor tan.	1ou	Union Carbide	T399G1o6Mo35BS			T12	Transistor	Siemens	BC237B
C1oo	Capasitor tan.	1ou	Union Carbide	T399G1o6Mo35BS			T13	Transistor	Siemens	BC237B
C1o1	Capasitor cer.	1on	Ferroperm	9/o145,9			T14	Transistor	Siemens	BC237B
C1o2	Capasitor tan.	1ou	Union Carbide	T399G1o6Mo35BS			T15	Transistor	Siemens	BC237B
C1o3	Capasitor poly.	1on	Philips	2222	344	211o3	T16	Transistor	Siemens	BC237B
C1o4	Capasitor cer.	1n	Ferroperm	9/o129,8			T17	Transistor	Siemens	BC237B
C1o5	Capasitor tan.	22u/35V	Union Carbide	T399G226Mo35BS			T18	Transistor	Siemens	BD14o-6
C1o6	Capasitor el lyt.	1oou/35V	Philips	2222	344	211o4				
C1o7	Capasitor cer.	1on	Ferroperm	9/o145,9						
C1o8	Capasitor cer.	1n	Ferroperm	9/o129,8						
C1o9	Capasitor poly.	o,1u	Philips	2222	344	211o4				
C11o	Capasitor tan.	22u	Union Carbide	T399G226Mo35BS						
C111	Capasitor el lyt.	47ou/35V	Philips	2222	344	24744	L1	Coil	R&S	
C112	Capasitor poly.	o,22u	Philips	2222	344	21224	L2	Coil	R&S	
C113	Capasitor poly.	o,1u	Philips	2222	344	211o4	L3	Coil	R&S	
							L4	Coil	R&S	
D1	Diode		Siemens	BB1o5			L5	Coil	R&S	47o1
D2	Diode		Siemens	BB1o5			L6	Coil	R&S	
D3	Diode		Siemens	BB1o5			L7	Coil	R&S	
D4	Diode		Siemens	BB1o5			L8	Coil	R&S	41o2
D5	Diode		Siemens	BB1o5			L9	Coil	R&S	47o3
D6	Diode		Siemens	BB1o5			L1o	Coil	R&S	47o4
D1o	Diode		ITT	1N4148			L11	Coil	R&S	47o5
D11	Diode		ITT	1N4148						
D2o	Diode		Siemens	8V2BZX83						
D21	Diode		ITT	1N4oo2			IC1	Integrated cir.	Siemens	TBA12o5
							IC2	Integrated cir.	Siemens	TBB1458B
							IC3	Integrated cir.	Siemens	TBA1o37
							IC4	Integrated cir.	Siemens	TDB78o5T
T1	Transistor		Texas	BF256LA						
T2	Transistor		Texas	BF256LA						
T3	Transistor		Siemens	BF199						
T4	Transistor		Siemens	BC237B			X1	Crystal	2o.945MHz	R&S
T5	Transistor		Siemens	BF199						
T6	Transistor		Siliconix	E31o						
T7	Transistor		Siemens	BF199						
T8	Transistor		Siemens	B199						

24V Regulator

C15	Capasitor poly.	o,luF	Philips	2222	344	211o4	
C16	Capasitor cer.	lon	Ferroperm	9/o145,9			
C17	Capasitor ellyt	loo uF	Philips	2222	o16	361o1	
C18	Capasitor cer.	lon	Ferroperm	9/o145,9			
D1o	Diode		Siemens	1N54o1			
D11	Diode		Siemens	1N4oo2			
D12	Diode		Siemens	1N4oo2			
T1o	Transistor		Siemens	BC237B			
F1	Fuse	6 Amp					

Duplex Switch

R3o	Resistor	2,2 Kohm	Philips	2322	211	13222	
R31	Resistor	2,2 Kohm	Philips	2322	211	13222	
R32	Resistor	2,2 Kohm	Philips	2322	211	13222	
R33	Resistor	2,2 Kohm	Philips	2322	211	13222	
R34	Resistor	39o ohm	Philips	2322	211	13391	
R35	Resistor	2,2 Kohm	Philips	2322	211	13222	
R36	Resistor	1o Kohm	Philips	2322	211	131o3	
R37	Resistor	22 Kohm	Philips	2322	211	13222	
R38	Resistor	1o Kohm	Philips	2322	211	131o3	
P1	Potentiom. trim.	1 Kohm	Philips	2322	41o	o3354	

Connector

C3o	Capasitor cer.	ln	Ferroperm	9/o129,8			
C31	Capasitor cer.	ln	Ferroperm	9/o129,8			
C32	Capasitor cer.	ln	Ferroperm	9/o129,8			
C33	Capasitor cer.	ln	Ferroperm	9/o129,8			
C34	Capasitor tan.	4,7u/35V	Union Carbide	T399E415Mo35BS			
C35	Capasitor cer.	ln	Ferroperm	9/o129,8			
C36	Capasitor cer.	ln	Ferroperm	9/o129,8			
C37	Capasitor cer.	lon	Ferroperm	9/o145,9			
R1	Resistor	22o ohm	Philips	2322	211	13221	
R2	Resistor	1o ohm	Philips	2322	211	131o9	
R3	Resistor	2,2 Kohm	Philips	2322	211	13222	
C1o	Capasitor cer.	lon	Ferroperm	9/o145,9			
C11	Capasitor poly.	o,luF	Philips	2222	344	211o4	
C12	Capasitor poly.	o,luF	Philips	2222	344	211o4	
C13	Capasitor poly.	o,luF	Philips	2222	344	211o4	
C14	Capasitor cer.	lon	Ferroperm	9/o145,9			

D10 Diode D20 Diode D21 1N4002

D11 Diode BA182
D12 Diode BA182
D13 Diode BA182
T30 Transistor Motorola MFR238
T31 Transistor Motorola MFR238

T20 Transistor BC237B
T21 Transistor BC237B

VHF PA

R50 Resistor 3W 5,6 ohm 2322 330 22568
R51 Resistor 15 ohm 2322 211 13150
R52 Resistor 220 ohm 2322 211 13221

C50 Capacitor cer. 15pF 9/0116,9
C51 Capacitor cer. 33pF 9/0116,8
C52 Capacitor cer. 33pF 9/0116,8
C53 Capacitor cer. 15pF 9/0116,9
C54 Capacitor cer. 470pF 9/0116,9
C55 Capacitor cer. 470pF 9/0116,9
C56 Capacitor trim. 10-80pF 566420
C57 Capacitor cer. 82pF 9/0121,9
C58 Capacitor cer. 1nF feed 9/0138,58
C59 Capacitor tan. 4,7u/35V T399E415Mo35BS
C60 Capacitor cer. 82pF 9/0121,9
C61 Capacitor cer. 82pF 9/0121,9
C62 Capacitor cer. 47pF 9/0116,8
C63 Capacitor trim. 10-80pF 566420
C64 Capacitor cer. 22pF 9/0116,9
C65 Capacitor cer. 82pF 9/0121,9
C66 Capacitor tan. 4,7u/35V T399E415Mo35BS
C67 Capacitor cer. 1nF 9/0178,58
C68 Capacitor cer. 47pF 9/0116,8
C69 Capacitor cer. 22pF 9/0116,9
C70 Capacitor cer. 33pF 9/0116,8

L1 Coil R&S
L2 Coil R&S
L3 Coil R&S
L4 Coil Stripline
L5 Coil Stripline
L6 Coil R&S
L7 Coil 2,2uH Ferroperm 1583
L8 Coil Stripline
L9 Coil Stripline
L10 Coil Stripline
L11 Coil Stripline
L12 Coil Stripline
L13 Coil R&S
L14 Coil R&S
L15 Coil Stripline
L16 Coil Stripline
L17 Coil Stripline

Synthesizer

R1	Resistor	47	ohm	Philips	2322	211	13479	R64	Resistor	220	ohm	Philips	2322	211	13681
R2	Resistor	180	ohm	Philips	2322	211	13181	R65	Resistor	680	ohm	Philips	2322	211	13829
R3	Resistor	47	ohm	Philips	2322	211	13479	R66	Resistor	82	ohm	Philips	2322	211	13181
R4	Resistor	180	ohm	Philips	2322	211	13181	R67	Resistor	180	ohm	Philips	2322	211	13479
R5	Resistor	180	ohm	Philips	2322	211	13181	R68	Resistor	47	ohm	Philips	2322	211	13479
R6	Resistor	10	Kohm	Philips	2322	211	13103	R69	Resistor	47	ohm	Philips	2322	211	13101
R7	Resistor	22	Kohm	Philips	2322	211	13223	R70	Resistor	100	ohm	Philips	2322	211	13473
R8	Resistor	22	Kohm	Philips	2322	211	13223	R71	Resistor	47	Kohm	Philips	2322	211	13103
R9	Resistor	22	Kohm	Philips	2322	211	13223	R72	Resistor	10	Kohm	Philips	2322	211	13103
R10	Resistor	4,7	Kohm	Philips	2322	211	13472	R73	Resistor	10	Kohm	Philips	2322	211	13103
R11	Resistor	470	ohm	Philips	2322	211	13479	R74	Resistor	10	Kohm	Philips	2322	211	13103
R12	Resistor	10	Kohm	Philips	2322	211	13103	R75	Resistor	10	Kohm	Philips	2322	211	13103
R13	Resistor	10	Kohm	Philips	2322	211	13103	R76	Resistor	10	Kohm	Philips	2322	211	13103
R14	Resistor	470	ohm	Philips	2322	211	13471	R77	Resistor	22	Kohm	Philips	2322	211	13223
R15	Resistor	1	Kohm	Philips	2322	211	13102	R78	Resistor	10	Kohm	Philips	2322	211	13103
R16	Resistor	4,7	Kohm	Philips	2322	211	13472	R79	Resistor	10	Kohm	Philips	2322	211	13103
R17	Resistor	1	Kohm	Philips	2322	211	13102	R80	Resistor	10	Kohm	Philips	2322	211	13103
R18	Resistor	10	Kohm	Philips	2322	211	13103	R81	Resistor	10	Kohm	Philips	2322	211	13103
R19	Resistor	10	Kohm	Philips	2322	211	13109	R82	Resistor	2R2		Philips	2322	211	13225
R20	Resistor	1	Kohm	Philips	2322	211	13102								
R40	Resistor	47	ohm	Philips	2322	211	13479	C1	Capasitor cer.	3,3pF		Ferroperm	9/ol16,9		
R41	Resistor	180	ohm	Philips	2322	211	13181	C2	Capasitor cer.	1n		Ferroperm	9/ol29,8		
R42	Resistor	180	ohm	Philips	2322	211	13181	C3	Capasitor tan.	10u/35V		Union Carbide	T399G106Mo35BS		
R43	Resistor	47	ohm	Philips	2322	211	13479	C4	Capasitor cer.	3,3pF		Ferroperm	9/ol16,9		
R44	Resistor	47	ohm	Philips	2322	211	13479	C5	Capasitor cer.	1n		Ferroperm	9/ol29,8		
R45	Resistor	68	Kohm	Philips	2322	211	13683	C6	Capasitor tan.	10u/35V		Union Carbide	T399G106Mo35BS		
R46	Resistor	33	Kohm	Philips	2322	211	13333	C7	Capasitor cer.	1n		Ferroperm	9/ol29,8		
R47	Resistor	1,5	Kohm	Philips	2322	211	13152	C8	Capasitor cer.	1n		Ferroperm	9/ol29,8		
R48	Resistor	22	ohm	Philips	2322	211	13229	C9	Capasitor tan.	10u/35V		Union Carbide	T399G106Mo35BS		
R49	Resistor	100	ohm	Philips	2322	211	13101	C10	Capasitor tan.	4,7u/35V		Union Carbide	T399E475Mo35BS		
R50	Resistor	4,7	Kohm	Philips	2322	211	13472	C11	Capasitor trim.	2-10pF		Philips	2222	808	11109
R51	Resistor	33	Kohm	Philips	2322	211	13333	C12	Capasitor cer.	8,2pF		Ferroperm	9/ol16,9		
R52	Resistor	220	ohm	Philips	2322	211	13221	C13	Capasitor cer.	1n		Ferroperm	9/ol29,8		
R53	Resistor	2,2	Kohm	Philips	2322	211	13222	C14	Capasitor cer.	6,8pF		Ferroperm	9/ol16,9		
R54	Resistor	2R2		Philips	2322	211	13225	C15	Capasitor cer.	1n		Ferroperm	9/ol29,8		
R55	Resistor	1	Kohm	Philips	2322	211	13102	C16	Capasitor cer.	10pF		Ferroperm	9/ol16,9		
R60	Resistor	390	ohm	Philips	2322	211	13391	C17	Capasitor cer.	1n		Ferroperm	9/ol29,8		
R61	Resistor	120	ohm	Philips	2322	211	13121	C18	Capasitor cer.	10n		Ferroperm	9/ol45,9		
R62	Resistor	220	ohm	Philips	2322	211	13221								
R63	Resistor	1	Kohm	Philips	2322	211	13102								

C19	Capasitor poly.	o,033u	Philips	2222	344	55333	C82	Capasitor cer.	lon	Ferroperm	9/ol45,9
C20	Capasitor tan.	lou/35V	Union Carbide	T399Glo6Mo35BS			C83	Capasitor cer.	lon	Ferroperm	9/ol45,9
C21	Capasitor poly.	o,22u	Philips	2222	344	21224	C84	Capasitor cer.	lon	Ferroperm	9/ol45,9
C22	Capasitor cer.	ln	Ferroperm	9/ol29,8			C85	Capasitor cer.	lon	Ferroperm	9/ol45,9
C23	Capasitor cer.	ln	Ferroperm	9/ol29,8			C86	Capasitor cer.	lon	Ferroperm	9/ol45,9
C24	Capasitor tan.	lou/35V	Union Carbide	T399Glo6Mo35BS			C87	Capasitor cer.	lon	Ferroperm	9/ol45,9
C25	Capasitor poly.	o,033u	Philips	2222	344	55333	C88	Capasitor cer.	lon	Ferroperm	9/ol45,9
C26	Capasitor tan.	lou/35V	Union Carbide	T399Glo6Mo35BS			C89	Capasitor cer.	lon	Ferroperm	9/ol45,9
C27	Capasitor cer.	ln	Ferroperm	9/ol29,8							
C28	Capasitor tan.	4,7u/35V	Union Carbide	T399E475Mo35BS							
C40	Capasitor cer.	3,3pF	Ferroperm	9/ol16,9			D1	Diode		Siemens	BBlo56
C41	Capasitor cer.	ln	Ferroperm	9/ol29,8			D2	Diode		ITT	1N4148
C42	Capasitor tan.	lou/35V	Union Carbide	T399Glo6Mo35BS			D3	Diode		ITT	1N4148
C43	Capasitor tan.	lou/35V	Union Carbide	T399Glo6Mo35BS			D4	Diode		Siemens	AAll6
C44	Capasitor cer.	ln	Ferroperm	9/ol29,8			D5	Diode		Siemens	AAll6
C45	Capasitor cer.	3,3pF	Ferroperm	9/ol16,9			D6	Diode		ITT	1N4148
C46	Capasitor trim.	2-22pF	Philips	2222	808	11229	D7	Diode		ITT	1N4148
C47	Capasitor cer.	33pF	Ferroperm	9/ol16,8			D8	Diode		ITT	1N4148
C48	Capasitor tan.	lou/35V	Union Carbide	T399Glo6Mo35BS			D9	Diode		Siemens	AAll6
C49	Capasitor cer.	150pF	Ferroperm	9/ol21,8							
C50	Capasitor cer.	150pF	Ferroperm	9/ol21,8							
C51	Capasitor cer.	ln	Ferroperm	9/ol16,9			T1	Transistor		Texas	BF2561A
C52	Capasitor cer.	22pF	Ferroperm	9/ol16,9			T2	Transistor		Texas	BF2561A
C53	Capasitor cer.	lon	Ferroperm	9/ol45,9			T3	Transistor		Texas	BF2561A
C54	Capasitor cer.	lon	Ferroperm	9/ol45,9			T4	Transistor		Siemens	BC237B
C55	Capasitor tan.	lou/35V	Union Carbide	T399Glo6Mo35BS			T5	Transistor		Siemens	BC237B
C70	Capasitor tan.	lou/35V	Union Carbide	T399Glo6Mo35BS			T6	Transistor		Siemens	BF199
C71	Capasitor cer.	ln	Ferroperm	9/ol29,8			T8	Transistor		Texas	BF2561A
C72	Capasitor tan.	lou/35V	Union Carbide	T399Glo6Mo35BS			T9	Transistor		Texas	BF2561A
C73	Capasitor cer.	ln	Ferroperm	9/ol29,8			T10	Transistor		Siemens	BF199
C74	Capasitor cer.	ln	Ferroperm	9/ol29,8			T11	Transistor		Siemens	BC237B
C75	Capasitor tan.	lou/35V	Union Carbide	T399Glo6Mo35BS			T13	Transistor		Siemens	BF324
C76	Capasitor cer.	ln	Ferroperm	9/ol29,8							
C77	Capasitor tan.	lou/35V	Union Carbide	T399Glo6Mo35BS							
C78	Capasitor cer.	10pF	Ferroperm	9/ol16,9			L1	Coil		R&S	4713
C79	Capasitor cer.	ln	Ferroperm	9/ol29,8			L2	Coil		R&S	4713
C80	Capasitor cer.	lon	Ferroperm	9/ol45,9			L3	Coil		R&S	4712
C81	Capasitor cer.	lon	Ferroperm	9/ol45,9			L4	Coil		R&S	4713
							L5	Coil		R&S	4713
							L6	Coil		R&S	4704

IC1	IC1	Integrated cir.	Motorola	MC1741	TX Loop and Modulator				
IC2	IC2	Integrated cir.	Farchild	95H9oDC	R1	Resistor	47 ohm	Philips	2322 211 1347o
IC3	IC3	Integrated cir.	Texas	74S112	R2	Resistor	22o ohm	Philips	2322 211 13221
IC4	IC4	Integrated cir.	Texas	74S112	R3	Resistor	68 ohm	Philips	2322 211 1368o
IC5	IC5	Integrated cir.	Siemens	5187	R4	Resistor	1oo ohm	Philips	2322 211 131o1
IC6	IC6	Integrated cir.	Siemens	74o7	R5	Resistor	47 ohm	Philips	2322 211 1347o
IC7	IC7	Integrated cir.	Siemens	74o7	R6	Resistor	47 ohm	Philips	2322 211 1347o
X1	X1	Crystal	R&S	6,4MHz	R7	Resistor	1 Kohm	Philips	2322 211 131o2
					R8	Resistor	1oo ohm	Philips	2322 211 131o1
					R9	Resistor	1oo ohm	Philips	2322 211 131o1
					R1o	Resistor	1 Kohm	Philips	2322 211 131o2
					R11	Resistor	1oo ohm	Philips	2322 211 131o1
					R12	Resistor	1o ohm	Philips	2322 211 131oo
					R13	Resistor	47o ohm	Philips	2322 211 13471
					R14	Resistor	47o ohm	Philips	2322 211 13471
					R15	Resistor	47o ohm	Philips	2322 211 13471
					R16	Resistor	47o ohm	Philips	2322 211 13471
					R17	Resistor	1o ohm	Philips	2322 211 131oo
					R18	Resistor	22o ohm	Philips	2322 211 13221
					R19	Resistor	1oo ohm	Philips	2322 211 131o1
					R3o	Resistor	22 Kohm	Philips	2322 211 13223
					R31	Resistor	4,7 Kohm	Philips	2322 211 131o3
					R32	Resistor	1o Kohm	Philips	2322 211 131o3
					R33	Resistor	68 Kohm	Philips	2322 211 13683
					R34	Resistor	3,3 Kohm	Philips	2322 211 13332
					R35	Resistor	1o Kohm	Philips	2322 211 131o3
					R36	Resistor	1o Kohm	Philips	2322 211 131o3
					R37	Resistor	4,7 Kohm	Philips	2322 211 13472
					R38	Resistor	1o ohm	Philips	2322 211 131oo
					R39	Resistor	1oo ohm	Philips	2322 211 131o1
					R4o	Resistor	1,5 Kohm	Philips	2322 211 13152
					R41	Resistor	1o Kohm	Philips	2322 211 131o3
					R42	Resistor	47 ohm	Philips	2322 211 1347o
					R43	Resistor	47o ohm	Philips	2322 211 13471
					R44	Resistor	1oo ohm	Philips	2322 211 131o1
					R45	Resistor	4,7 Kohm	Philips	2322 211 13472
					R46	Resistor	68o ohm	Philips	2322 211 13681
					R47	Resistor	1o Kohm	Philips	2322 211 131o3

R48	Resistor	10 Kohm	Philips	2322 211 13103	R94	Resistor	47 ohm	Philips	2322 211 13470
R49	Resistor	10 Kohm	Philips	2322 211 13103	R95	Resistor	470 ohm	Philips	2322 211 13471
R50	Resistor	82 ohm	Philips	2322 211 13820	R96	Resistor	1,5 Kohm	Philips	2322 211 13152
R51	Resistor	680 ohm	Philips	2322 211 13681	R97	Resistor	1 Kohm	Philips	2322 211 13102
R52	Resistor	10 Kohm	Philips	2322 211 13103	R98	Resistor	220 ohm	Philips	2322 211 13221
R53	Resistor	10 Kohm	Philips	2322 211 13103	R99	Resistor	47 ohm	Philips	2322 211 13470
R54	Resistor	10 Kohm	Philips	2322 211 13103	R100	Resistor	10 Kohm	Philips	2322 211 13103
R55	Resistor	10 Kohm	Philips	2322 211 13103	R101	Resistor	1 Kohm	Philips	2322 211 13102
R56	Resistor	10 Kohm	Philips	2322 211 13103	R102	Resistor	10 Kohm	Philips	2322 211 13103
R60	Resistor	2,2 Kohm	Philips	2322 211 13222	R103	Resistor	100 ohm	Philips	2322 211 13101
R61	Resistor	100 ohm	Philips	2322 211 13101	R104	Resistor	22 Kohm	Philips	2322 211 13223
R62	Resistor	22 ohm	Philips	2322 211 13220	R105	Resistor	3,3 Kohm	Philips	2322 211 13332
R63	Resistor	100 ohm	Philips	2322 211 13101	R106	Resistor	10 Kohm	Philips	2322 211 13103
R64	Resistor	10 Kohm	Philips	2322 211 13103	R107	Resistor	470 ohm	Philips	2322 211 13471
R65	Resistor	10 Kohm	Philips	2322 211 13100	R108	Resistor	10 ohm	Philips	2322 211 13100
R66	Resistor	330 Kohm	Philips	2322 211 13334	R109	Resistor	1 Kohm	Philips	2322 211 13102
R67	Resistor	330 Kohm	Philips	2322 211 13334	R110	Resistor	47 ohm	Philips	2322 211 13470
R68	Resistor	47 ohm	Philips	2322 211 13470	R111	Resistor	2,2 Kohm	Philips	2322 211 13222
R69	Resistor	1 Kohm	Philips	2322 211 13102	R112	Resistor	3,3 Kohm	Philips	2322 211 13332
R70	Resistor	10 Kohm	Philips	2322 211 13103	R113	Resistor	150 Kohm	Philips	2322 211 13154
R71	Resistor	10 Kohm	Philips	2322 211 13103	R114	Resistor	180 Kohm	Philips	2322 211 13184
R72	Resistor	10 Kohm	Philips	2322 211 13103	R115	Resistor	2,2 Kohm	Philips	2322 211 13222
R73	Resistor	220 Kohm	Philips	2322 211 13224	R116	Resistor	330 ohm	Philips	2322 211 13331
R74	Resistor	1 Kohm	Philips	2322 211 13102	R117	Resistor	2,7 Kohm	Philips	2322 211 13272
R75	Resistor	6,8 Kohm	Philips	2322 211 13682	R118	Resistor	1 Kohm	Philips	2322 211 13102
R76	Resistor	10 Kohm	Philips	2322 211 13103	R119	Resistor	47 ohm	Philips	2322 211 13470
R77	Resistor	100 Kohm	Philips	2322 211 13104	R120	Resistor	1 Kohm	Philips	2322 211 13102
R78	Resistor	10 Kohm	Philips	2322 211 13103	R121	Resistor	47 Kohm	Philips	2322 211 13473
R79	Resistor	10 Kohm	Philips	2322 211 13103	R122	Resistor	10 Kohm	Philips	2322 211 13103
R80	Resistor	2,2 Kohm	Philips	2322 211 13229	R123	Resistor	10 Kohm	Philips	2322 211 13103
R81	Resistor	47 Kohm	Philips	2322 211 13473	R124	Resistor	10 Kohm	Philips	2322 211 13103
R82	Resistor	1 Kohm	Philips	2322 211 13102	R125	Resistor	10 Kohm	Philips	2322 211 13103
R83	Resistor	1 Kohm	Philips	2322 211 13102					
R84	Resistor	150 ohm	Philips	2322 211 13151					
R85	Resistor	2,2 Kohm	Philips	2322 211 13222	C1	Capasitor cer.	1n	Ferroperm	9/0129.8
R86	Resistor	15 Kohm	Philips	2322 211 13153	C2	Capasitor cer.	2,2pF	Ferroperm	9/0116.9
R90	Resistor	100 ohm	Philips	2322 211 13101	C3	Capasitor cer.	1n	Ferroperm	9/0129.8
R91	Resistor	10 ohm	Philips	2322 211	C4	Capasitor tan.	1u/35V	Union Carbide	T399A105Mo35BS
R92	Resistor	150 ohm	Philips	2322 211 13151	C5	Capasitor cer.	10pF	Ferroperm	9/0116.9
R93	Resistor	2,7 Kohm	Philips	2322 211 13272	C6	Capasitor cer.	1n	Ferroperm	9/0129.8

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C1	Capacitor poly.	o,lu	Philips	2222 344 211o4		L1	Coil	Tonecoil	R&S
C2	Capacitor poly.	o,lu	Philips	2222 344 211o4					
C3	Capacitor tan.	4,7u/35V	Union Carbide	T399E475Mo35BS		IC1	Integrated cir.	Motorola	MC 14o17
C4	Capacitor poly.	o,lu	Philips	2222 344 211o4		IC2	Integrated cir.	Motorola	MC 14o93
C5	Capacitor tan.	4,7u/35V	Union Carbide	T399E475Mo35BS		IC3	Integrated cir.	Motorola	MC 14o13
C6	Capacitor cer.	lon	Ferroperm	9/o1459		IC4	Integrated cir.	Siemens	TDB 555
C7	Capacitor tan.	lu/35V	Union Carbide	T399Alo5Mo35BS					
C2o	Capacitor sty.	loon	Rifa	PFE 216 oo61of					
C21	Capacitor sty.	2n2	Philips	2222 425 422o2					
C22	Capacitor tan.	4,7u/35V	Union Carbide	T399E475Mo35BS					
C23	Capacitor poly.	o,lu	Philips	2222 344 211o4					
C24	Capacitor tan.	lou/35V	Union Carbide	UC KloE35					
C25	Capacitor tan.	lou/35V	Union Carbide	UC KloE35					
C26	Capacitor cer.	lon	Ferroperm	9/o1459					
C27	Capacitor cer.	lon	Ferroperm	9/o1459					
C28	Capacitor poly	o,lu	Philips	2222 344 211o4					
D1	Diode		Siemens	1N4148					
D2	Diode		Siemens	1N4148					
D3	Diode		Siemens	1N4148					
D4	Diode		Siemens	1N4oo2					
T1	Transistor		Siemens	BC 237B					
T2	Transistor		Siemens	BC 237B					
T3	Transistor		Siemens	BC 237B					
T4	Transistor		Siemens	BC 237B					
T5	Transistor		Siemens	BC 237B					
T6	Transistor		Siemens	BC 3o7B					
T7	Transistor		Siemens	BC 237B					
T8	Transistor		Siemens	BC 237B					
T9	Transistor		Texas	BF 256LA					
T1o	Transistor		Siemens	BC 237B					
T11	Transistor		Siemens	BD 139					
T12	Transistor		Siemens	BC 3o7B					
T13	Transistor		Siemens	BC 237B					