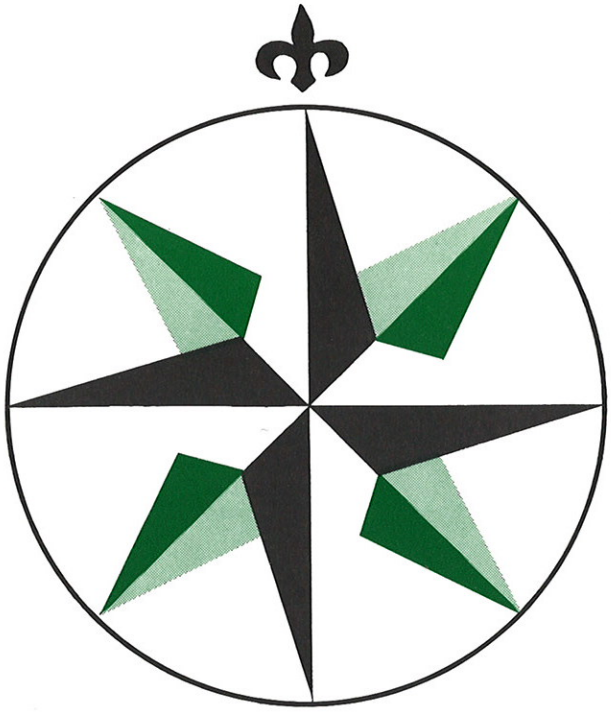
T 1135,



Sailor

Sailor

INSTRUKTIONSBOG FOR
SAILOR TRANSMITTER T1135

INSTRUCTION BOOK FOR
SAILOR TRANSMITTER T1135

INSTRUKTIONSBUCH FÜR
SAILOR TRANSMITTER T1135

INSTRUCTIONS POUR
SAILOR TRANSMITTER T1135

INSTRUCCIONES PARA
SAILOR TRANSMITTER T1135

A/S S. P. RADIO · AALBORG · DENMARK

CONTENTS

GENERAL DESCRIPTION

SAILOR T1135 is a 1250 Watt PEP SSB transmitter.

SAILOR T1135 has 50 ohm output impedance.

SAILOR T1135 has continuous frequency covering from 1.6 - 28 MHz.

SAILOR T1135 is constructed to be used together with aerial coupler AT1505.

SAILOR T1135 is automatically tuning the AT1505.

SAILOR T1135 can be supplied from DC power supply N1411
AC power supply N1410

SAILOR T1135 can be used in conjunction with exciter S1303 or S1304.

SAILOR T1135 fits into SAILOR 19" rack system.

SAILOR T1135 can operate automatic radiotelex in connection with exciter S1303 or S1304, scanning receiver R1121, and radiotelex modem ARQ H1240.

TECHNICAL DATA

Output Power:	1.6 - 4 MHz :	500W PEP	+0 dB -1.4 dB
	4 - 28 MHz AC:	1250W PEP	+0 dB -1.4 dB
	DC:	1000W PEP	+0 dB -1.4 dB
Intermodulation:	better than -31 dB		
Spurious Emissions:	better than -43 dB		
Temperature Range:	-15°C to +55°C.		
Mode of Operation:	dependent on the exciter in question		

PRINCIPLE OF OPERATION

The SAILOR transmitter T1135 is constructed to be used together with aerial coupler AT1505, exciters S1303 and S1304, receivers R1119, R1120 and R1121.

The RF signal from the exciter is amplified in a full-transistorized power amplifier delivering a power output of 650W PEP at 50 ohm. The power output from the power amplifier is fed through a directional coupler and then to a low pass filter section. The output power after the low pass filter section is 1250W PEP at 50 ohm and all harmonics are more than 43 dB below the fundamental for the frequency range 1.6 - 28 MHz.

The directional coupler is connected to a VSWR-calculator, which is calculating the reflections coefficient. The output is connected to the protection circuit and the TUNE LOGIC.

The protection circuit is controlling the drive level from the exciter so that the power amplifier is protected against excessive VSWR.

The tune logic is controlling the tune motor of the aerial coupler AT1505 and it is also controlling the power supply through transmitter start.

By means of the METER SWITCH it is possible to measure the aerial current, power output, and VSWR.

From S1303/04 a 5 bit frequency band code is received. This code is decoded and then controlling the low pass filter section and drive level adjusting. Furthermore it is controlling the data selection of the RAM. This RAM is programmable under tuning-up by means of the load switch and resonance switch. These switches are controlling the pre-settings of the aerial coupler AT1505 through the decoder and driver. The RAM has lithium battery back-up so the pre-settings of the load and resonance will be remembered for at least 5 years. If the aerial has been changed it is possible to change the pre-settings of load and resonance. The only necessary tool for tuning-up is a screw-driver and all tuning-up facilities are accessible from the front of the transmitter.

T1135/4-0-25089

PA UNIT 1
PA UNIT 2
POWER SPLITT
100
100
700W PEP
700W PEP
POWER COMBINER
1 : 2
DIRECTIONAL COUPLER
1350W PEP TO FILTER SWITCH IN H1238
V_R
V_F
1 : 2
POWER REDUCE
POWER REDUCE
TEMP
TEMP
PROTECTION UNIT
SUPPLY REDUCE TO P.S.
SUPPLY BLOCK TO P.S.
CT/HF CONTROL
POWER REDUCE
AC/DC CONTROL
RF INPUT FROM EXCITTER
TO FILTER SWITCH IN H1238
DECODER + DRIVER
DECODER
DRIVE LEVEL ADJUST
DECODER
DRIVE LEVEL
PROTECTION CIRCUIT
VSWR-CALCULATOR
9 x DRIVE LEVEL SELECTION
HANG TIME CONTROL
VSWR
RF ON
TRANSMITTER START
BLOCK
TO POWER SUPPLY
+22V
TUNE LAMP
TUNE
BLOCK
TRANSMITTER START
TUNE LOGIC
TUNING UP
INVALID TUNING
MAIN TUNING
POWER
VSWR
LOAD SWITCH
RESONANCE SWITCH
READ
AERIAL CURRENT/TUNE MOTOR
180° PULSE
INVALID TUNING
AERIAL CURRENT
AERIAL CURRENT CIRCUIT
IA
METER SWITCH
DUMMY LOAD (+22V)
+22V TO TH130 FOR AT1500 RELAYS
CONTROL 1
CONTROL 2
CONTROL 3
CONTROL 4
CONTROL 5
CONTROL 6
CONTROL 7
CONTROL 8
CONTROL 9
CONTROL 10
CONTROL 11
RAM
DECODER + DRIVER
T
V
X
Y
Z

TRANSMITTER T1135 (C)

TUNING-UP PROCEDURE FOR T1135

After installation of T1135/AT1505 it is necessary to set the pre-setting for AT1505 for the aerial in question.
The aerial length must be between 9 - 16 metres.

Before starting the tuning-up be sure that other aerials, crane derricks, booms, etc. are in the same position as when the ship is in open sea. If the ship is moored it must be away from cranes on land, high buildings, bridges, other ships and any other source of interference.

For tuning-up, use the below description and table 2. If it is not possible to tune when using table 2, then check for resonance in wires etc. If nothing is found then use table 2a for selection of resonance/load.

CHECK OF AERIAL LENGTH

Min. Length

It must be possible on 1.6 MHz (or a frequency very close to 1.6 MHz) to tune for an aerial current meter reading higher than 3 (meter switch in position "S", see fig. 1) either in resonance 4, 5, 6, or 7 and with Load 0. If it is not possible, the aerial is too short. This may cause problems with too high aerial voltages in the 4 MHz band.

Max. Length

If it is possible to tune the band 3.7 - 3.999 MHz, the aerial is not too long.

COARSE TUNING

1. Remove the filter at the front of T1135.

2. Set the uppermost switch at the extreme right in position AUTO, the second in position TUNE-UP and the fourth in position S.

3. Select the highest programmed frequency in each band listed in table 2.

4. Select the lowest permitted resonance number on the RESONANCE switch (see fig. 1) for the band in question according to table 2.

5. Select the lowest permitted load number on the LOAD switch (see fig. 1), for the band in question according to table 2.

6. Push the TUNE button on the exciter and wait until the tune lamp on the exciter stops lighting or starts to flash. (max. tune time 20 secs).

7. If the TUNE lamp stops lighting, then press the button INVALID TUNING (see fig. 1). (If the TUNE lamp starts to flash after pressing INVALID TUNING - don't care!)
   a. If the red lamp below the push button does not light up you have found a tuning with a voltage standing wave ratio (VSWR) less than 2 and can go to FINAL TUNING point 1.
   b. If the red lamp lights up, then select a resonance number higher according to table 2, and start from point 5.
   c. If the TUNE lamp starts to flash, select the next load number according to table 2. Now repeat point 6 and 7 until the highest load number is reached.

TUNING-UP PROCEDURE FOR T1135 cont.

8. Select the next resonance number on the RESONANCE switch and repeat point 5, 6, and 7.

FINAL TUNING

1. Set the uppermost switch in position MAN. and record the reading on the AERIAL CURRENT meter and switch off again.

2. Select the next higher load number.

3. Push the TUNE button and wait for the tuning.

4. Set the uppermost switch in position MAN. and record the reading on the AERIAL CURRENT meter and switch off again.

5. If the TUNE lamp starts to flash or the reading is less than under previous tuning, then press the button INVALID TUNING (if the TUNE lamp starts to flash after pressing INVALID TUNING - don't care!)
   a. If the red lamp does not light up, set the LOAD switch to the previous number and procede with BANDWIDTH CHECK point 1.
   b. If the red lamp lights up then select a number higher resonance and continue from point 3.

6. If the reading is higher then press the button INVALID TUNING.
   a. If the red lamp does not light up then select a number higher load and continue from point 3.
   b. If the red lamp lights up then select a number higher resonance and continue from point 3.

BANDWIDTH CHECK

1. Select the lowest frequency in the band according to table 2.

2. Push the TUNE button.

3. If the TUNE lamp stops lighting press the button INVALID TUNING.
   a. If the red lamp does not light up the tuning of this frequency band is completed. Go to point 6.
   b. If the red lamp lights up, select a higher resonance number and continue from point 2.

4. If the TUNE lamp starts to flash, try the possibilities 1 to 5 in the table below (when changing RESONANCE/LOAD press TUNE button and wait for the tuning), until the tune lamp stops flashing then go to point 3.

	RESONANCE	LOAD
1	one step up	the same
2	one step up	one step down
3	one step down	one step up
4	the same	one step up
5	the same	one step down

5. If it has been necessary to change RESONANCE or LOAD number then continue from point 2 on the highest frequency in the band.

TUNING-UP PROCEDURE FOR T1135 cont.

6. You have now found the right settings of RESONANCE/LOAD note the figures in the TUNING TABLE T1135/AT1505. Then press the button PROGRAMME! Now the settings of RESONANCE/LOAD switches are programmed into the memory. Put meter switch in position AERIAL CURRENT, TUNING switch in position MAN. and note the aerial current in the TUNING TABLE T1135/AT1505, and please send the copy to S. P. Radio. When all frequency bands have been programmed, then set the switches in position: AUTO, NORMAL, and AERIAL CURRENT. Replace the air filter.

THIS TUNING PROCEDURE HAS TO BE CARRIED OUT FOR ALL FREQUENCY BANDS IN WHICH THE EXCITER HAS PROGRAMMED FREQUENCIES!

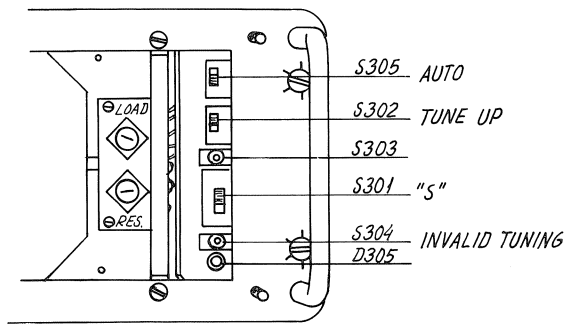


TABLE 2.

This table is based on several aerial measurements, but is must only be considered as a guide.

To make the table more complete it is most important that you fill in the TUNING TABLE FOR T1135 in the back of this manual and return it to S. P. Radio.

If it is not possible to tune the transmitter within the resonance and load numbers listed in table 2, then use TABLE 2a.

FREQUENCY BANDS in T1135 kHz	AERIAL LENGTH T1135													
	9 m		10 m		11 m		12 m		13 m		14 m		15 m	
	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load
1600.0 - 1799.9	4-6	1	4-6	0-1	4-6	0-1	4-6	0-1	4-6	0	4-6	0	4-6	0
1800.0 - 1999.9	4-6	0-1	4-6	0	4-6	0	4-6	0	4-6	0	4-6	0	4-6	0
2000.0 - 2199.9	4-6	0	4-6	0	4-6	0	4-6	0	4-6	0	4-6	0	4-6	0
2200.0 - 2399.9	4-6	0	4-6	0	4-6	0	4-6	0	4-6	0	4-6	0	4-6	0
2400.0 - 2599.9	4-6	0	4-6	0	4-6	0	4-6	0	4-7	0	4-7	0	4-7	0
2600.0 - 2799.9	4-6	0	4-6	0	4-6	0	4-6	0	4-7	0-1	4-7	0-1	4-7	0-1
2800.0 - 2999.9	4-7	0	4-7	0	4-7	0	4-7	0	4-7	0-1	4-7	0-1	4-7	0-1
3000.0 - 3099.9	4-7	0	4-7	0	4-7	0	4-7	0	4-7	0-1	4-7	0-1	4-7	0-1
3100.0 - 3399.9	4-7	0	4-7	0	4-7	0	4-7	0	4-7	0-1	4-7	0-1	4-7	0-1
3400.0 - 3699.9	4-7	0	4-7	0-1	4-7	0-1	4-7	0-1	4-7	0-1	4-7	1-2	4-7	1-2
3700.0 - 3999.9	4-7	0-1	4-7	0-1	4-7	0-2	4-7	0-2	4-7	0-3	4-7	0-3	4-7	0-4
4000.0 - 4299.9	5-7	0-2	5-7	0-2	5-7	0-2	5-7	0-2	5-8	0-3	5-8	1-7	5-8	1-7
4300.0 - 4599.9	5-7	0-2	5-8	0-2	5-8	0-2	5-8	0-2	5-8	0-3	5-8	1-8	5-8	1-9
4600.0 - 4999.9	5-8	0-2	5-8	0-2	5-8	0-2	5-8	0-3	5-9	7-10	5-9	7-10	6-9	7-10
5000.0 - 5499.9	6-8	0-2	6-9	2-5	6-9	5-10	6-9	5-10	6-9	5-10	6-9	5-10	6-9	2-5
5500.0 - 5999.9	6-9	1-3	6-9	5-10	6-9	5-10	6-10	5-10	6-9	5-10	6-9	2-6	6-9	2-6
6000.0 - 6399.9	6-9	1-5	6-9	5-9	7-9	5-9	7-9	5-10	7-9	4-8	7-9	4-8	7-9	4-8
6400.0 - 6999.9	6-9	4-8	6-9	5-9	7-9	4-8	7-9	4-8	7-9	4-8	7-9	4-8	7-9	3-6
7000.0 - 7599.9	6-9	4-8	6-9	4-8	7-9	3-6	7-9	4-8	7-9	4-8	7-9	4-8	7-9	2-5
7600.0 - 7999.9	6-9	4-8	6-9	4-8	6-9	2-6	7-9	2-6	7-9	2-6	7-9	2-6	7-9	2-4
8000.0 - 8499.9	6-9	3-6	6-9	4-8	6-9	1-4	7-9	1-4	7-9	1-4	7-9	1-4	7-9	2-4
8500.0 - 8999.9	7-10	3-6	7-10	2-6	7-10	2-5	7-10	1-4	7-10	1-4	7-10	1-4	7-10	1-4
9000.0 - 9499.9	7-11	3-6	7-10	2-6	7-10	2-5	7-10	1-4	7-10	1-4	7-10	1-4	7-10	1-4
9500.0 - 9999.9	7-11	2-5	7-11	1-4	7-11	1-4	7-11	1-4	7-10	0-3	7-10	0-3	7-10	0-3
10000.0 - 10499.9	7-11	2-5	7-11	1-4	7-11	1-4	7-11	0-3	7-11	0-3	7-11	0-3	7-11	0-3
10500.0 - 10999.9	7-11	1-4	7-11	1-4	7-11	0-3	7-11	0-3	7-11	0-3	7-11	0-3	7-11	0-3

TABLE 2 continued

FREQUENCY BANDS in T1135 kHz	AERI					
	9 m		10 m		11 m	
	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load
11000.0 - 11499.9	8-11	0-3	8-11	0-3	8-11	0-3
11500.0 - 11999.9	8-11	0-3	8-11	0-3	8-11	0-3
12000.0 - 12499.9	10-13	0-4	10-13	0-4	10-13	0-4
12500.0 - 12999.9	10-13	0-4	10-13	0-4	10-13	0-4
13000.0 - 13499.9	10-13	0-4	10-13	0-4	10-13	0-4
13500.0 - 13999.9	10-13	0-4	10-13	0-4	10-13	0-4
14000.0 - 14499.9	10-13	0-4	10-13	0-4	10-13	0-4
14500.0 - 14999.9	10-13	0-4	10-13	0-4	10-13	0-4
15000.0 - 15499.9	11-13	1-5	11-13	1-5	11-13	1-5
15500.0 - 15999.9	11-13	1-5	11-13	1-5	11-13	1-5
16000.0 - 16499.9	11-13	1-5	11-13	1-5	11-13	1-5
16500.0 - 16999.9	11-13	1-4	11-13	1-4	11-13	1-4
17000.0 - 17499.9	11-13	1-4	11-14	1-4	11-14	2-5
17500.0 - 17999.9	11-13	1-4	11-14	2-5	11-14	2-6
18000.0 - 18999.9	12-15	0-4	11-14	2-5	11-14	1-5
19000.0 - 19999.9	12-15	0-4	12-15	2-5	11-14	1-5
20000.0 - 20999.9	13-15	0-4	12-15	1-5	11-14	0-5
21000.0 - 21999.9	13-15	0-4	12-15	0-4	12-15	0-4
22000.0 - 22999.9	14-15	1-4	14-15	1-4	14-15	1-4
23000.0 - 23999.9	14-15	0-4	14-15	0-4	14-15	0-4
24000.0 - 24999.9	14-15	0-4	14-15	0-4	14-15	0-4
25000.0 - 25999.9	14-15	0-4	14-15	0-4	14-15	0-4
26000.0 - 26999.9	14-15	0-4	14-15	0-4	14-15	0-4
27000.0 - 27999.9	14-15	0-4	14-15	0-4	14-15	0-4
Fixed 2182	4-6	0	4-6	0	4-6	0

TABLE 2a.

This table covers all permitted RESONANCE and LOAD numbers.

FREQUENCY BANDS IN T1135 kHz	AERIAL LENGTH 9-15 m	
	Reso-nance	Load
1600.0 - 1799.9	4-7	0-1
1800.0 - 1999.9	4-7	0-1
2000.0 - 2199.9	4-7	0-1
2200.0 - 2399.9	4-7	0-1
2400.0 - 2599.9	4-7	0-1
2600.0 - 2799.9	4-7	0-2
2800.0 - 2999.9	4-7	0-2
3000.0 - 3099.9	4-7	0-2
3100.0 - 3399.9	4-7	0-6
3400.0 - 3699.9	4-7	0-6
3700.0 - 3999.9	4-7	0-6
4000.0 - 4299.9	5-7	0-10
4300.0 - 4599.9	5-7	0-10
4600.0 - 4999.9	5-7	0-10
5000.0 - 5499.9	5-7	0-9
5500.0 - 5999.9	5-8	0-9
6000.0 - 6399.9	6-9	0-9
6400.0 - 6999.9	6-9	0-9
7000.0 - 7599.9	6-10	0-9
7600.0 - 7999.9	6-11	0-9
8000.0 - 8499.9	6-11	0-9
8500.0 - 8999.9	6-11	0-8
9000.0 - 9499.9	7-11	0-8
9500.0 - 9999.9	8-12	0-8
10000.0 - 10499.9	8-12	0-8
10500.0 - 10999.9	9-12	0-8
11000.0 - 11499.9	9-12	0-8
11500.0 - 11999.9	9-12	0-7
12000.0 - 12499.9	10-13	0-7
12500.0 - 12999.9	10-13	0-7
13000.0 - 13499.9	10-13	0-7
13500.0 - 13999.9	10-13	0-7
14000.0 -14499.9	10-13	0-7
14500.0 - 14999.9	10-13	0-7

Table 2a continued

FREQUENCY BANDS IN T1135 kHz	AERIAL LENGTH 9-15 m	
	Reso-nance	Load
15000.0 - 15599.9	11-14	0-7
15500.0 - 15999.9	11-14	0-7
16000.0 - 16499.9	11-14	0-7
16500.0 - 16999.9	11-14	0-7
17000.0 - 17499.9	11-14	0-7
17500.0 - 17999.9	11-14	0-7
18000.0 - 18999.9	11-14	0-6
19000.0 - 19999.9	12-14	0-6
20000.0 - 20999.9	13-15	0-5
21000.0 - 21999.9	13-15	0-5
22000.0 - 22999.9	14-15	0-4
23000.0 - 23999.9	14-15	0-4
24000.0 - 24999.9	14-15	0-4
25000.0 - 25999.9	14-15	0-4
26000.0 - 26999.9	14-15	0-4
27000.0 - 27999.9	14-15	0-4
Fixed 2182	4-7	0-1

must only be considered

you fill in the TUNING TABLE
. Radio.

esonance and load numbers

LENGTH T1135								
	12 m		13 m		14 m		15 m	
d	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load
1	4-6	0-1	4-6	0	4-6	0	4-6	0
	4-6	0	4-6	0	4-6	0	4-6	0
	4-6	0	4-6	0	4-6	0	4-6	0
	4-6	0	4-6	0	4-6	0	4-6	0
	4-6	0	4-7	0	4-7	0	4-7	0
	4-6	0	4-7	0-1	4-7	0-1	4-7	0-1
	4-7	0	4-7	0-1	4-7	0-1	4-7	0-1
	4-7	0	4-7	0-1	4-7	0-1	4-7	0-1
	4-7	0	4-7	0-1	4-7	0-1	4-7	0-1
	4-7	0	4-7	0-1	4-7	0-1	4-7	0-1
1	4-7	0-1	4-7	0-1	4-7	1-2	4-7	1-2
2	4-7	0-2	4-7	0-3	4-7	0-3	4-7	0-4
2	5-7	0-2	5-8	0-3	5-8	1-7	5-8	1-7
2	5-8	0-2	5-8	0-3	5-8	1-8	5-8	1-9
2	5-8	0-3	5-9	7-10	5-9	7-10	6-9	7-10
10	6-9	5-10	6-9	5-10	6-9	5-10	6-9	2-5
10	6-10	5-10	6-9	5-10	6-9	2-6	6-9	2-6
9	7-9	5-10	7-9	4-8	7-9	4-8	7-9	4-8
8	7-9	4-8	7-9	4-8	7-9	4-8	7-9	3-6
6	7-9	4-8	7-9	4-8	7-9	4-8	7-9	2-5
6	7-9	2-6	7-9	2-6	7-9	2-6	7-9	2-4
4	7-9	1-4	7-9	1-4	7-9	1-4	7-9	2-4
5	7-10	1-4	7-10	1-4	7-10	1-4	7-10	1-4
5	7-10	1-4	7-10	1-4	7-10	1-4	7-10	1-4
4	7-11	1-4	7-10	0-3	7-10	0-3	7-10	0-3
4	7-11	0-3	7-11	0-3	7-11	0-3	7-11	0-3
3	7-11	0-3	7-11	0-3	7-11	0-3	7-11	0-3

TABLE 2 continued

	AERIAL LENGTH T1135													
	9 m		10 m		11 m		12 m		13 m		14 m		15 m	
FREQUENCY BANDS in T1135 kHz	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load	Reso-nance	Load
11000.0 - 11499.9	8-11	0-3	8-11	0-3	8-11	0-3	8-11	0-3	8-11	0-3	8-11	0-3	8-11	0-3
11500.0 - 11999.9	8-11	0-3	8-11	0-3	8-11	0-3	8-11	0-3	8-11	0-3	8-11	0-3	8-11	0-4
12000.0 - 12499.9	10-13	0-4	10-13	0-4	10-13	0-4	10-13	0-5	10-13	0-5	10-13	0-5	10-13	0-5
12500.0 - 12999.9	10-13	0-4	10-13	0-4	10-13	0-4	10-13	0-5	10-13	0-5	10-13	0-5	10-13	0-5
13000.0 - 13499.9	10-13	0-4	10-13	0-4	10-13	0-4	10-13	0-5	10-13	0-5	10-13	0-5	10-13	0-5
13500.0 - 13999.9	10-13	0-4	10-13	0-4	10-13	0-4	10-13	0-5	10-13	0-5	10-13	0-5	10-13	0-5
14000.0 - 14499.9	10-13	0-4	10-13	0-4	10-13	0-4	10-13	0-5	10-13	1-6	11-13	1-6	11-13	0-5
14500.0 - 14999.9	10-13	0-4	10-13	0-4	10-13	0-4	11-13	0-5	11-13	1-6	11-13	1-6	11-13	1-6
15000.0 - 15499.9	11-13	1-5	11-13	1-5	11-13	1-5	11-13	0-5	11-13	1-6	11-13	1-6	11-13	1-6
15500.0 - 15999.9	11-13	1-5	11-13	1-5	11-13	1-5	11-13	1-6	11-13	1-6	12-14	1-5	12-14	1-5
16000.0 - 16499.9	11-13	1-5	11-13	1-5	11-13	1-5	12-14	1-6	12-14	2-5	12-14	1-5	12-14	1-5
16500.0 - 16999.9	11-13	1-4	11-13	1-4	11-13	1-4	12-14	2-5	12-14	2-5	12-14	1-5	12-14	1-5
17000.0 - 17499.9	11-13	1-4	11-14	1-4	11-14	2-5	12-14	2-5	12-14	2-5	11-14	1-5	11-14	1-5
17500.0 - 17999.9	11-13	1-4	11-14	2-5	11-14	2-6	12-14	2-5	12-14	1-5	12-14	0-4	12-14	0-4
18000.0 - 18999.9	12-15	0-4	11-14	2-5	11-14	1-5	12-14	1-5	12-14	1-4	12-14	0-4	12-14	0-4
19000.0 - 19999.9	12-15	0-4	12-15	2-5	11-14	1-5	12-14	1-5	12-14	1-4	12-14	0-4	12-14	0-4
20000.0 - 20999.9	13-15	0-4	12-15	1-5	11-14	0-5	12-14	0-5	12-14	0-4	12-14	0-4	12-15	0-4
21000.0 - 21999.9	13-15	0-4	12-15	0-4	12-15	0-4	12-15	0-4	12-15	0-4	12-15	0-4	13-15	0-4
22000.0 - 22999.9	14-15	1-4	14-15	1-4	14-15	1-4	14-15	1-4	14-15	1-4	14-15	1-4	14-15	1-4
23000.0 - 23999.9	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4
24000.0 - 24999.9	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4
25000.0 - 25999.9	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4
26000.0 - 26999.9	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4
27000.0 - 27999.9	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4	14-15	0-4
Fixed 2182	4-6	0	4-6	0	4-6	0	4-6	0	4-6	0	4-6	0	4-6	0

TABLE 2a.

This table covers all permitted RESONANCE and LOAD numbers.

FREQUENCY BANDS IN T1135 kHz	AERIAL LENGTH 9-15 m	
	Reso-nance	Load
1600.0 - 1799.9	4-7	0-1
1800.0 - 1999.9	4-7	0-1
2000.0 - 2199.9	4-7	0-1
2200.0 - 2399.9	4-7	0-1
2400.0 - 2599.9	4-7	0-1
2600.0 - 2799.9	4-7	0-2
2800.0 - 2999.9	4-7	0-2
3000.0 - 3099.9	4-7	0-2
3100.0 - 3399.9	4-7	0-6
3400.0 - 3699.9	4-7	0-6
3700.0 - 3999.9	4-7	0-6
4000.0 - 4299.9	5-7	0-10
4300.0 - 4599.9	5-7	0-10
4600.0 - 4999.9	5-7	0-10
5000.0 - 5499.9	5-7	0-9
5500.0 - 5999.9	5-8	0-9
6000.0 - 6399.9	6-9	0-9
6400.0 - 6999.9	6-9	0-9
7000.0 - 7599.9	6-10	0-9
7600.0 - 7999.9	6-11	0-9
8000.0 - 8499.9	6-11	0-9
8500.0 - 8999.9	6-11	0-8
9000.0 - 9499.9	7-11	0-8
9500.0 - 9999.9	8-12	0-8
10000.0 - 10499.9	8-12	0-8
10500.0 - 10999.9	9-12	0-8
11000.0 - 11499.9	9-12	0-8
11500.0 - 11999.9	9-12	0-7
12000.0 - 12499.9	10-13	0-7
12500.0 - 12999.9	10-13	0-7
13000.0 - 13499.9	10-13	0-7
13500.0 - 13999.9	10-13	0-7
14000.0 -14499.9	10-13	0-7
14500.0 - 14999.9	10-13	0-7

Table 2a continued

FREQUENCY BANDS IN T1135 kHz	AERIAL LENGTH 9-15 m	
	Reso-nance	Load
15000.0 - 15599.9	11-14	0-7
15500.0 - 15999.9	11-14	0-7
16000.0 - 16499.9	11-14	0-7
16500.0 - 16999.9	11-14	0-7
17000.0 - 17499.9	11-14	0-7
17500.0 - 17999.9	11-14	0-7
18000.0 - 18999.9	11-14	0-6
19000.0 - 19999.9	12-14	0-6
20000.0 - 20999.9	13-15	0-5
21000.0 - 21999.9	13-15	0-5
22000.0 - 22999.9	14-15	0-4
23000.0 - 23999.9	14-15	0-4
24000.0 - 24999.9	14-15	0-4
25000.0 - 25999.9	14-15	0-4
26000.0 - 26999.9	14-15	0-4
27000.0 - 27999.9	14-15	0-4
Fixed 2182	4-7	0-1

SERVICE

1. MAINTENANCE

When the SAILOR Short Wave Programme 1000/B has been correctly installed, the maintenance can, depending on the environment and working hours, be reduced to a performance check at the service workshop at intervals not exceeding 5 years. A complete performance check list is enclosed in section 4. PERFORMANCE CHECK.

Also inspect the antennas, cables and plugs for mechanical defects, salt deposits, corrosion and any foreign bodies.

Along with each set a test sheet is delivered, in which some of the measurements made at the factory are listed. If the performance check does not show the same values as those on the test sheet, the set must be adjusted as described in section 5. ADJUSTMENT PROCEDURE.

Any repair of the set should be followed by a function check of the unit in question.

2. NECESSARY TEST EQUIPMENT

TX: T1127, T1127L, T1130, T1135
EXC: S1300, S1301, S1302, S1303, S1304
RX: R1119, R1120
PS: N1400, N1401, N1407, N1409, N1410, N1411

TX	EXC	RX	PS
X	X	X	X
X	X	X	
	X	X	
X			X
	X	X	

OSCILLOSCOPE:

Bandwidth	DC - 35 MHz
Sensitivity	2 mV/cm
Input impedance	1 Mohm/30 pF
Triggering	EXT-INT-ENVELOPE
E.g. PHILIPS type	PM3216

PASSIVE PROBE:

Attenuation	20 dB (10X)
Input resistance	10 Mohm
Input capacitance	15 pF
Compensation range	10 - 30 pF
E.g. PHILIPS type	PM8925

MULTIMETER:

Sensitivity DC (f.s.d.)	1V
Input impedance	10 Mohm
Accuracy (f.s.d.)	+/-2%
E.g. PHILIPS type	PM2505

MULTIMETER:

Sensitivity DC (f.s.d.)	0.3V & 3A
Input impedance	30 kohm/V
Accuracy (f.s.d.)	+/-1%
Current range	100 A
Voltage range	500V & 2.5 kV
E.g. Unigor type	A43
Shunt type	GE4277
H.T. probe type	GE4196

TONE GENERATOR:

Frequency range	200 - 3000 Hz
Output voltage	1V RMS
Output impedance	600 ohm
E.g. PHILIPS type	PM5107

2. NECESSARY TEST EQUIPMENT cont.:

TX	EXC	RX	PS
		X	
	X	X	
		X	
X			X
	X		

AF VOLTMETER:

Sensitivity (f.s.d.)	300 mV
Input impedance	4 ohm
Accuracy (f.s.d.)	+-5%
Frequency range	100 - 3000 Hz
E.g. PHILIPS type	PM2505

FREQUENCY COUNTER:

Frequency range	100 Hz - 30 MHz
Resolution	0.1 Hz at f 10 MHz
Accuracy	$1x10^{-7}$
Sensitivity	100 mV RMS
Input impedance	1 Mohm//25 pF
Single period range	1 sec.
Resolution	1 mSec.
E.g. PHILIPS type	PM6611 + PM9679

SIGNAL GENERATOR:

Frequency range	0.1 - 30 MHz
Output impedance	50/75 ohm
Output voltage	1 uV - 100 mV EMF
Modulation	AM, 30%, 1000 Hz
Ext. mod.	300 - 2700 Hz
Ext. mod. sensitivity	1V for M = 0.3
E.g. PHILIPS	PM5326

POWER SUPPLIES:

N1411/T1135, N1407/T1130, N1400/T1127

V_{out}	26.5V DC
I_{out} N1400/T1127	70A DC
I_{out} N1407/T1130	35A DC
I_{out} N1411/T1135	70A DC

E.g.

2 pcs. LAMBDA type (N1400/T1127, N1411/T1135)	LXS-G-24-0V-R
1 pc. LAMBDA type (N1407/T1130)	LXS-G-24-0V-R

POWER SUPPLIES:

S1300, S1301

V_{out} 1	22V
I_{out} 1	1.5A
V_{out} 2	-45V
I_{out} 2	-0.1A
E.g. SAILOR types	N1402
	N1402 spec. N1405

2. NECESSARY TEST EQUIPMENT cont.:

TX	EXC	RX	PS
	X	X	

R1119, R1120; S1302, S1303, S1304

V_{out} 1	22V
I_{out} 1	1A
V_{out} 2	8V
I_{out} 2	1A
V_{out} 3	-45V
I_{out} 3	-0.1A
E.g. SAILOR types	N1402 spec. N1405

TX	EXC	RX	PS
	X		

TEST BOX S1300/S1301:

S.P. type	S1300/01 Test box

TX	EXC	RX	PS
	X		

ARTIFICIAL KEY S1300TT/S1301:

S.P. type	Artificial key

TX	EXC	RX	PS
	X		

TEST BOX S1302/S1303/S1304:

S.P. type	S1302/03/04 Test box

TX	EXC	RX	PS
	X		

ARTIFICIAL KEY S1303/04:

S.P. type	Artificial key S1303/S1304

TX	EXC	RX	PS
X			

POWER METER:

Power range T1127	500W
Power range T1130	250W
Power range T1135	600W
Impedance	50 ohm
E.g. Bird Thruline Wattmeter	Model 43
Plug-in element T1127/T1135	500W 2-30 MHz
Plug-in element T1130	250W 2-30 MHz

TX	EXC	RX	PS
X			

RF AMMETER (Thermocross):

Current range	5A
E.g. Helweg Mikkelsen & Co. Copenhagen, Denmark type	TR-68x71, 5A

TX	EXC	RX	PS
	X		

DUMMY LOAD:

Impedance	50 ohm
Frequency range	0-30 MHz
Power range	
E.g. Fixed resistor 2 pcs. in parallel PHILIPS type	2322 212 13101

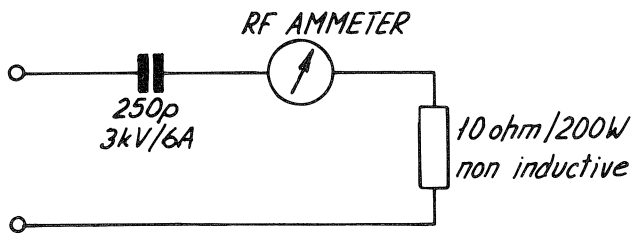
2. NECESSARY TEST EQUIPMENT cont.:

TX	EXC	RX	PS
X	X		
X			

DUMMY LOAD for HF bands, 4 - 25 MHz:

Impedance	50 ohm
Frequency range	4-25 MHz
Power range T1127/T1130	400W
Power range T1135	600W
SWR	1:1.2
E.g. Bird Termaline Coaxial Resistor	Model 8401

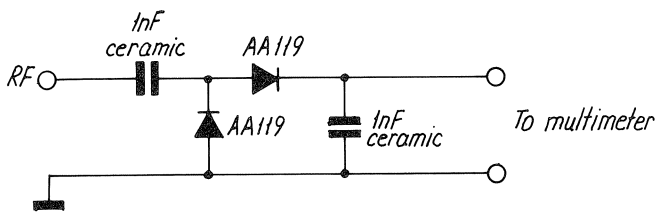
DUMMY LOAD for C.T. band 1.6 - 4 MHz:



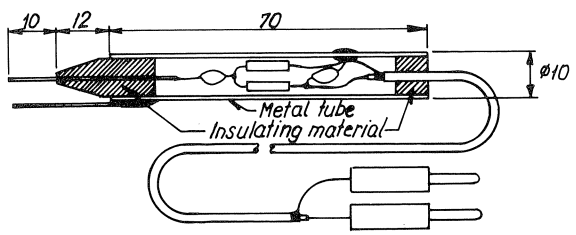
E.g. Draloric type 06-1291TD 20x50L 8KVs 250 pF ±20% R85

E.g. 10 pcs. Dale type PH-25A-17, 100 ohm, 5%, 25W

TEST PROBE



LAYOUT OF THE PROBE



3. TROUBLE-SHOOTING

Trouble-shooting should only be performed by persons with sufficient technical knowledge, who have the necessary test equipment at their disposal, and who have carefully studied the operation principles and structure of the unit in question.

Start to find out whether the fault is somewhere in the antenna circuit, the power source, or in the short wave set.

When the fault has been located to a certain unit look-up the PERFORMANCE CHECK list in the instruction book and make relevant performance check to incircle the fault. Then look-up the section CIRCUIT DESCRIPTION. This section contains schematic diagrams, description of the modules and pictures showing the location of the components. (ADJUSTMENT LOCATIONS).
Typical AC and DC voltages are indicated on the schematic diagrams.

No adjustment must take place unless the service workshop has the necessary test equipment to perform the ADJUSTMENT PROCEDURE in question.

After repair or replacement of a module, look-up the section NECESSARY ADJUSTMENTS AFTER REPAIR to see, whether the unit has to be adjusted or not.

The unit has to have a complete FUNCTION CHECK after repair.

4. PERFORMANCE CHECK FOR T1135

To carry out the performance check it is necessary to have a complete station consisting of: T1135, S1303/04, AT1505, H1238, N1410/11, H1275.

If the station is working as a 50 ohm transmitter without AT1505 then AT1505 is not necessary.

If S1304, then you have to take out the plug to the frequency check module (2500) located on frequency control module (2100).

When T1135 is working without AT1505, then exclude the below noted sections when doing the performance check:

4.1.1. to 4.1.5.
4.1.16. to 4.1.25.
4.1.27. to 4.1.46.
4.2.1. to 4.2.10.

4.1. TRANSMITTER CONTROL UNIT (300)

4.1.1. Check of Aerial Current Circuit.

4.1.2. Set meter switch S301 in position aerial current.

4.1.3. Connect terminal W4/3-2 to ground and terminal W5/3-2 +15V (IC101).

4.1.4. Switch the set on and check meter reading on the aerial current meter S130X is 3.5 ±0.5A.

4.1.5. Check of Power Meter Circuit

4.1.6. Set meter switch in position power.

4.1.7. Disconnect W41/3-4 and connect +8V to terminal W41/3-4.

4.1.8. Switch the set on.

4.1.9. Check that meter reading on aerial current meter on S130x is 3 ±0.5A.

4.1.10. Check of VSWR Meter Circuit

4.1.11. Set meter switch in position S.

4.1.12. Disconnect W41/3-4 and connect +8V to terminal W41/3-4.

4.1.13. Disconnect W39/3-4 and connect a 2 kohm resistor (two 1 kohm resistors in series) between terminal W41/3-4 and terminal W39/3-4 and 1 kohm resistor from terminal W39/3-4 to ground.

4.1.14. Switch the set on.

4.1.15. Check that the meter reading on the aerial current meter is 3 ±0.2, and the voltage in tp 12 is 4.8 ±0.2V.

4.1.16. Check of Tuning Switch

4.1.17. Disconnect the aerial (dummy load).

4. PERFORMANCE CHECK FOR T1135 cont.:

4.1.18. Switch the set on.

4.1.19. Key-in a frequency e.g. 1600 kHz.

4.1.20. Set the switch tuning in position Manual.

4.1.21. Check that the transmitter starts (+42/+38V, +28V and blower starts).

4.1.22. Switch the switch back to position Automat.

4.1.23. Key the transmitter with the microtelephone key.

4.1.24. Check that the transmitter starts (+42/+38V, +28V and blower starts)

4.1.25. **Check of Tune-up - Normal Switch and Programme Push Button.**
See performance check of tuner control unit (500).

4.1.26. **Check of Drive Level**
See performance check PA-unit (1200).

4.1.27. **Check of VSWR Reference Counter (IC318)**

4.1.28 Connect terminal W3/3-2 to ground.

4.1.29. Connect a voltmeter to tp 5.

4.1.30. Disconnect the two coaxial cables at the rear of T1135.

4.1.31. Disconnect W41/3-4 and connect +8V to terminal W41/3-4.

4.1.32. Disconnect W39/3-4 and connect a 2 kohm resistor from W41/3-4 to W29/3-4 and a 1 kohm resistor from W39/3-4 to ground.

4.1.33. Switch the set on.

4.1.34. Key-in a frequency e.g. 1600 kHz.

4.1.35. Press the tune button and check that the lamp lights up and the tune motor starts to run.

4.1.36. Check that the voltage on W37/3-2 is 1.5 $\pm$0.5V.

4.1.37. Check that the voltage at tp 5 is 1.2 $\pm$0.2V.

4.1.38. Press the button Invalid Tuning and check the voltage at tp 5 is 1.2 $\pm$0.2V.

4.1.39. Press the button Invalid Tuning and check that the voltage at tp 5 is 2.8 $\pm$0.3V.

4.1.40. Press the button Invalid Tuning and check that the voltage at tp 5 is 4.9 $\pm$0.5V.

4.1.41. Check that the tune lamp stops lighting, the tune motor stops and the voltage at W37/3-2 is 0V.

4.1.42. Press the button Invalid Tuning and check that the voltage at tp 5 is 6.1 $\pm$0.6V.

4. PERFORMANCE CHECK FOR T1135 cont.:

4.1.43. Press the button Invalid Tuning and check that the voltage at tp 5 is 7.5 ±0.8V.

4.1.44. Press the button Invalid Tuning and check that the voltage at tp 5 is 8.8 ±1V.

4.1.45. Press the button Invalid Tuning and check that the tune lamp starts to wink.

4.1.46. When pressing Invalid Tuning, check that the lamp Invalid Tuning lights up.

4.1.47. **Check of Transmitter Blocking.**

4.1.48. Press the tune button. The transmitter starts.

4.1.49. Select dummy load and check that the transmitter stops and the tune lamp starts to wink.

4.1.50. **Check of VSWR Protection Circuit**

4.1.51. Check that the voltage at the emitter of T322 is less than 10 mV.

4.1.52. Disconnect the 2 kohm resistor W41/3-4 and W39/3-4.

4.1.53. Connect a 1 kohm resistor between W41/3-4 and W39/3-4.

4.1.54. Check that the voltage at the emitter of T322 is 350 ±30 mV.

4.1.55. Check that the meter reading on the aerial current meter is 2 ±0.5V.

4.1.56. Disconnect the 1 kohm resistor from W39/3-4 to ground.

4.1.57. Connect a 2 kohm resistor from W39/3-4 to ground.

4.1.58. Connect the black coaxial at the rear of T1135.

4.1.59. Connect a dummy load 50 ohm/500W to the white coaxial socket at the rear of the T1135 and an oscilloscope with a 10:1 probe.

4.1.60. Set meter switch to power.

4.1.61. Check that the voltage at the emitter of T322 is 840 ±60 mV.

4.1.62. Short-circuit the terminal W39/3-4 to ground.

4.1.63. Press the tune button and note the peak to peak voltage.

4.1.64. Remove the short-circuit from W39/3-4 to ground and check that the peak to peak voltage decreases to between 0.63 to 0.75 times the value, previously noted.

4.2. TUNER CONTROL UNIT (500)

4.2.1. Switch the set on and select simplex narrow.

4.2.2. Set S302 in position tune-up.

4. PERFORMANCE CHECK FOR T1135 cont.:

4V.
OK

4.2.3. Key-in a frequency e.g. 1600 kHz.

4.2.4. Check that the voltage of the lithium battery B501 is more than 3V.

4.2.5. Set the switches RESONANCE and LOAD to 0, 1, 2 ... 15, and check that the control outputs 1 to 11 are in accordance with the table below.

(Valid from serial No. 261800).

Resonance and Load	the voltage at control output No. 1	2	3	4	5	6	7	8	9	10	11
0	0	0	22	22	0	22	0	0	0	0	0
1	0	0	0	22	0	22	0	0	0	0	22
2	0	0	22	0	0	22	0	0	0	22	0
3	0	0	0	0	0	22	0	0	0	22	22
4	0	0	22	22	0	22	0	0	22	0	0
5	22	0	22	22	22	22	0	0	22	22	0
6	22	22	22	22	0	22	0	22	0	0	0
7	22	22	0	22	0	22	0	22	22	0	0
8	22	22	22	0	0	22	0	22	22	22	22
9	22	22	0	0	0	22	22	0	22	22	22
10	22	22	22	22	22	22	22	22	22	22	22
11	22	22	0	22	22	22	22	22	22	22	22
12	22	22	22	0	22	22	22	22	22	22	22
13	22	22	0	0	22	22	22	22	22	22	22
14	22	22	22	22	22	0	22	22	22	22	22
15	22	22	0	0	22	0	22	22	22	22	22
Dummy Load	0	0	0	22	22	22	22	22	22	22	22

(Valid from serial No. 284451)

4.2.6. Select dummy load/heat and check that the code for dummy load is in accordance with the table above.

4.2.7. Set RESONANCE and LOAD to zero. Press the button named Programme. The code for zero is now programmed into the RAM.

4.2.8. Set switch S302 in position Normal.

4.2.9. Switch the set off/on a number of times.

4.2.10. Check that the code at the control outputs 1 to 11 is still ok.

4.3. CHECK OF PA-MODULE 1200

4.3.1. Check of DC Conditions

4.3.2. Remove the two coaxial cables at the rear of T1135.

4.3.3. Key-in a frequency, e.g. 1600 kHz and put the switch named Tuning in position Manual.

4.3.4. Check of supply voltage to PA-modules I and II.
+28V T1213: 28 ±1V
+42V/38V T1215: 42 ±1V/38 ±1V
Open Tx : 22 ±1V

4.3.5. Check of zero signal current.

4.3.6. Connect an ammeter in series with +28V to T1212 and check that the current is 150 - 200 mA.

4.3.7. Connect the ammeter in series with +28V to T1213 and check that the current is 150 - 200 mA.

4.3.8. Remove the wire open Tx and check that the current is zero Amp.

4.3.9 Remount open Tx wire.

4.3.10. Connect the ammeter in series with +42/+38V to T1214 and check that the current is 20 mA - 200 mA.

4.3.13. Check that the voltage on the basis of T1207 is 12.3 ±0.5V.

4.3.14. Remove open Tx wire and check that the voltage is less than 0.5V.

4.3.15. Remount open Tx wire.

4.3.16. Set the switch tuning to position Automat.

4.3.17. Switch the set off.

4.3.18. Not used.

4.3.19. Check of RF Conditions

4.3.20. Connect the coaxial cable from the exciter (black coaxial) to T1135, and connect a 50 ohm dummy load (600W mean power) to the output socket (marked white) at the rear side of T1135.

4.3.21. Connect the ammeter in series with +42V/+38V to T1214 (40 Amps).

4.3.22. Connect an oscilloscope with a 10:1 probe to the output socket of T1135.

4.3.23. Switch the set on and select following frequencies: 2199, 3099, 4299, 6399, 8499, 12699, 16899, 22399 and 25199 kHz.

4.3.24. Check at each frequency that the current is 20 to 30 Amps and the peak to peak output voltage is 550V to 700V and the envelope of the two tone test signal is ok when keying the transmitter by means of the switch named Tuning.

4.4. CHECK OF TEMPERATURE PROTECTION UNIT (1300)

4.4.1. Measure the temperature at R109 in PA-unit I (located on T1214). If the set has been switched off for some time, then the temperature can be set equal to room temperature.

4.4.2. Switch the set on and measure the voltage across R109 and calculate the voltage at pin 5 IC401b: $V_{pin3} = (100-T_A) \cdot 0.0075 \cdot V_{R109} + V_{R109}$.

T_A is the temperature at R109.

V_{R109} is the voltage across R109.

V_{pin5} is the voltage at pin 5 of IC401b.

4.4.3. Measure the voltage at pin 5 and check that it is equal to the calculated V_{pin5} $\pm 5\%$.

4.4.4. Measure the voltage at pin 3 IC401a and check that the voltage is $V_{pin5} \cdot 1.12$.

4.4.5. Unsolder R109 and insert a 4.7 kohm potentiometer instead of R109.

4.4.7. Connect the coaxial cable from the exciter (black coaxial) to T1135, and the 50 ohm dummy load (500W mean power) to the output socket (marked white) at the rear side of T1135.

4.4.8. Connect an oscilloscope with a 10:1 probe to the output socket of T1135 and a voltmeter to +42V/+38V to T1214.

4.4.9. Switch the set on and key-in the frequency e.g. 1600 kHz.

4.4.10. Set the switch (S305) to position Manual. You will now see the two tone test signal at the output.

4.4.11. Check that the voltages at W3/6-4 is 22V, pin 4 on IC401 is 15V, supply block is 22V, supply reduction is 0V and drive reduction is 22V.

4.4.12. Adjust the potentiometer until +42V/+38V to T1214 drops to 32 $\pm$2V/29 $\pm$2V and the output drops to approx. 40% of full power.

4.4.13. Check that the voltages at supply block is 22V, supply reduction is 22V and drive reduction is 0V.

4.4.14. Adjust the potentiometer for a higher value until the transmitter stops.

4.4.15. Check that the blowers are still running.

4.4.16. Check that the voltage supply block is 0V.

4.4.17. Repeat point 4.4.1. to 4.4.16. for PA-unit II.10

5. ADJUSTMENT PROCEDURE FOR T1135

To carry out the adjustment procedure it is necessary to have a complete station consisting of AT1505, H1238, S1303/4, and N1410/11.

For location of the modules, see point 9.

For location of test points and adjustments, see point 9

5.1. ADJUSTMENT OF TRANSMITTER CONTROL UNIT (300)

5.1.1. **Adjustment of SWR-Meter**

5.1.2. Disconnect V_F W41/3-4, V_R W39/3-4 and connect both terminals to +8V, see fig. 1.

5.1.3. Switch on the set and set S301 to position "S", see fig. 2.

5.1.4. Set R329a fully clockwise.

5.1.5. Adjust R318a fully clockwise and then counter clockwise until the aerial current meter shows just zero.

5.1.6. Disconnect V_R from +8V, see fig. 1, and do as shown in fig. 3.

5.1.7. Adjust R329a to a meter reading at the mark just above 3 on the aerial current meter.

5.1.8. **Adjustment of $\frac{VR}{VF}$ to drive Reduction Converter**

5.1.9. Disconnect V_F W41/3-4, V_R W39/3-4 and connect V_F to +8V and connect V_R as shown in fig. 3.

5.1.10. Connect a voltmeter (full scale deflection 3V) across R342a, see fig. 3.

5.1.11. Set R334a fully clockwise.

5.1.12. Adjust R334a counter clockwise until the meter reading stops decreasing.

5.1.13. **Adjustment of $\frac{VF}{VR}$ Comparator.**

5.1.14. Disconnect V_F W41/3-4, V_R W39/3-4 and connect V_F to +8V and connect V_R as shown in fig. 3.

5.1.15. Connect a voltmeter to pin 7 on IC318.

5.1.16. Use the push button Invalid Tuning (fig. 2) to clock the counter until pin 7 goes high then move the voltmeter to IC311C pin 13.

5.1.17. Adjust R345 fully counter clockwise.

5.1.18. Adjust R345 clockwise until pin 13 just goes high (15V).

5.1.19. **Adjustment of Power Meter Sensitivity.**

5.1.20. Set S301 to position power, see fig. 1.

5.1.21. Connect V_F W41/3-4 to +8V, see fig. 2.

5.1.22. Adjust R399 to a meter reading on the mark just above 3 on the aerial current meter.

5.1.23. **Adjustment of Aerial Current Meter Sensitivity.**

5.1.24. Connect a 10 ohm/250 pF dummy load in serial with a RF-ammeter to the aerial coupler.

5.1.25. Select 2182 kHz and perform a tune-up as described in chapter Tuning-up Procedure.

5.1.26. Set S301 to position Aerial Current, see fig. 1.

5.1.27. Key the transmitter in A3H mode and adjust R302 so that the reading on the aerial current meter is equal to the reading on the RF-ammeter.

5.1.28. **Adjustment of Drive Level, see point 5.4.10.**

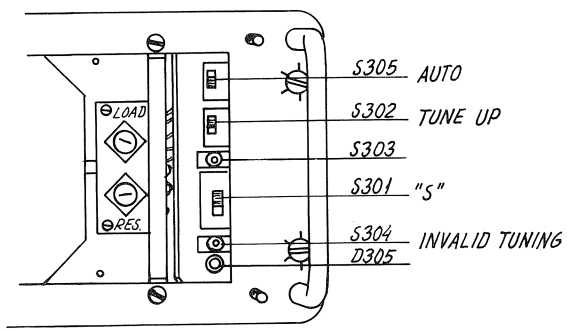


Fig. 1

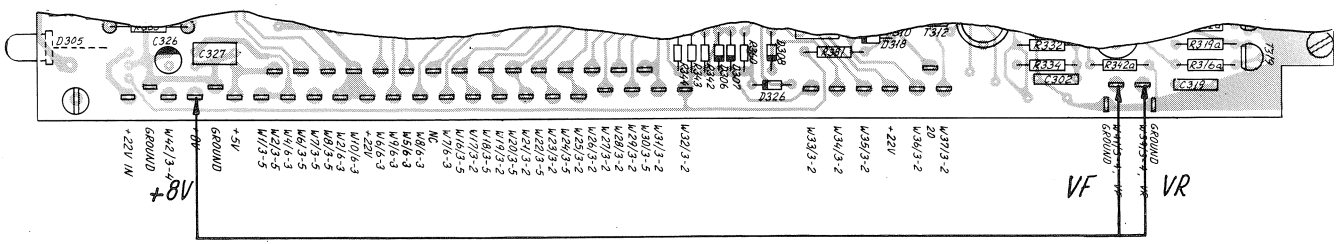


Fig. 2

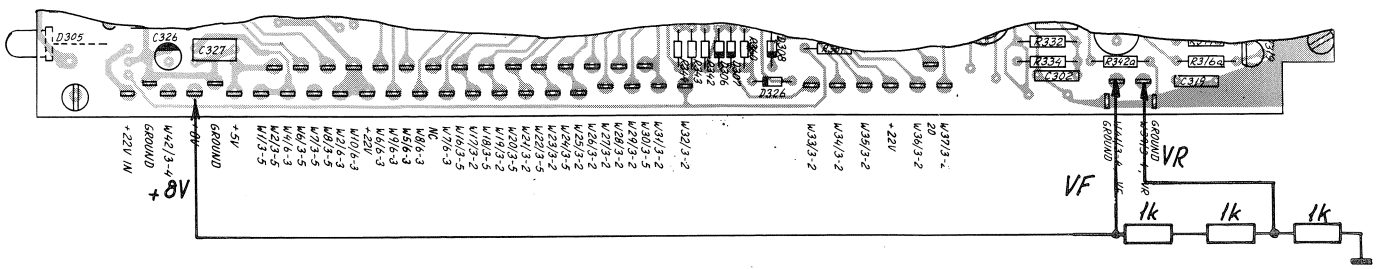


Fig. 3

5.2. COMBINER AND PROTECTION UNIT

5.2.1. **Adjustment of Temperature Protection Circuit**

5.2.2. Connect a voltmeter across temperature sensor 1 and temperature sensor 2.

5.2.3. Be sure that the heat sink is cool. Then switch the set on and measure the two voltages V_{Temp1} and V_{Temp2} immediately after switching on.

5.2.4. Measure the heat sink temperature (room temperature).

5.2.5. Calculate the voltage on pin 5 (V_{pin5}) and pin 10 (V_{pin10}) of IC1 from the two equations below.

$$V_{pin5} = (100 - T_A) \times 0.0075 \times V_{Temp1} + V_{Temp1}$$

$$V_{pin10} = (100 - T_A) \times 0.0075 \times V_{Temp2} + V_{Temp2}$$

T_A is the actual temperature of the heat sink.

V_{Temp1} and V_{Temp2} are the voltages across temperature sensor 1 and 2 respectively.

5.2.6. Adjust R21 for a voltmeter reading equal to the just calculated V_{pin5}.

5.2.7. Adjust R11 for a voltmeter reading equal to the just calculated V_{pin10}.

T1135

5.2.8. **Adjustment of VSWR Circuit**

5.2.9. Connect a voltmeter between terminal V_R and ground.

5.2.10. Connect a 50 ohm dummy load direct to the RF output from T1135.

5.2.11. Switch the set on and select a frequency near to 22 MHz.

5.2.12. Key the transmitter by means of the switch MAN. tuning and adjust C13 for a minimum voltmeter reading.

5.3. ADJUSTMENT PROCEDURE PA-UNIT

5.3.1. **Adjustment of Zero Signal Currents.**

5.3.2. Remove the two coaxial connectors at the rear of T1135.

5.3.3. Insert an ammeter in series with the driver supply +28V to T1212.

5.3.4. Set the switch S305, see fig. 1., to position Manual.

5.3.5. Adjust R1220 to a meter reading of 160 mA.

5.3.6. Insert the ammeter in series with the driver supply +28V to T1213 and check that the current is 160 mA $\pm$40 mA.

5.3.7. Insert the ammeter in series with PA-supply +42V/38V to T1214 and disconnect the PA-supply to T1215.

5.3.8. Set the switch S305, see fig. 1, in position Manual.

5.3.9. Check that the current is from 20 mA to 200 mA. If the current is lower than 20 mA then cut the jumper across R1248 and adjust R1232 to a meter reading of 50 mA.

5.3.10. **Adjustment of Drive Level.**

5.3.11. Disconnect the white coaxial at the rear of T1135 and connect a 50 ohm dummy load (600W) to T1135.

5.3.12. Connect an oscilloscope across the 50 ohm load (Vp-p approx. 650V) and connect a voltmeter to +42V/38V PA-supply.

5.3.13. Set the drive level potentiometer in question fully counter clockwise, see fig. 1.

5.3.14. Set the switch S305 (fig. 2) to position Manual.

5.3.15. Adjust the potentiometer clockwise until the two-tone output on the oscilloscope shows a slightly flat topped curve or +42V/38V starts to decrease.

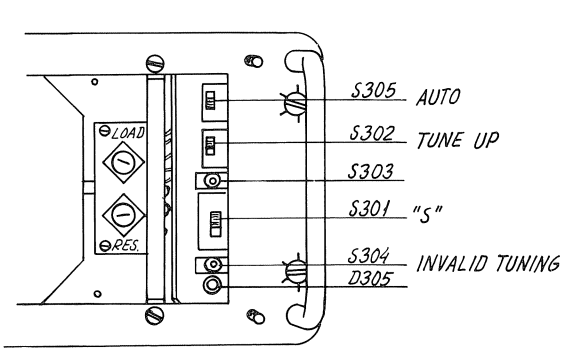


Fig. 1

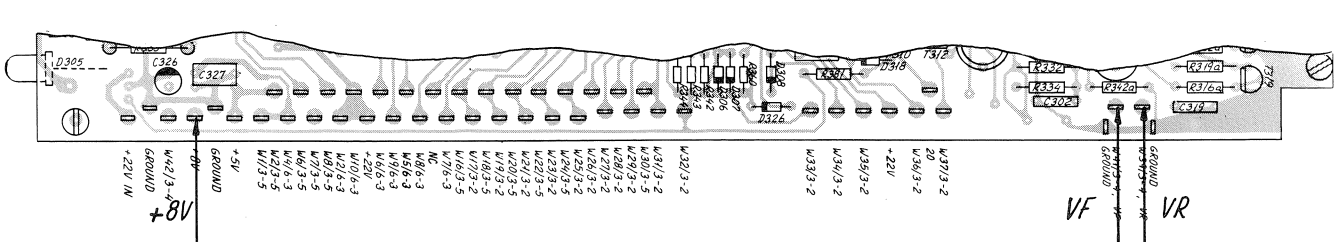


Fig. 2

6. NECESSARY ADJUSTMENTS AFTER REPAIR

In the following paragraphs reference is made to chapter 5. ADJUSTMENT PROCEDURE. When you have finished your repair, execute chapter 7. FUNCTION CHECK.

6.1. **Input Filter Module (200)**
No adjustments.

6.2. **Transmitter Control Unit Module (300)**
Execute 5.1.

6.3. **Combiner and Protection Unit Module (400)**
Execute 5.2.

6.4. **Tuner Control Unit Module (500)**
No adjustments.
Perform a complete tuning-up procedure for T1135.

6.5. **Supply Distribution Unit Module (600)**
No adjustments.

6.6. **L/R Switches Module (900)**
No adjustments.
Perform a complete tuning-up procedure for T1135.

6.7. **PA-Unit Module (1200)**
Execute 5.3.

7. FUNCTION CHECK

INITIAL SETTINGS

1. Remove the air filter at the front of the transmitter.
2. Set the METER SWITCH in position S (center position), see fig. 1.
3. Set POWER to Full.
4. Press TWO AERIALS DUPLEX push button
5. Press A3J push button.
6. Make sure that the aerials are connected to the aerial coupler.
7. Set MAIN SWITCH to ON.
8. Select the first frequency indicated in the frequency table or use table 1.

Table 1

1	1600.0	2	1911.1	3	2022.2	4	2233.3	5	2444.4
6	2655.5	7	2866.6	8	3177.7	9	3488.8	10	3799.9
11	4100.0	12	6200.0	13	8200.0	14	12300.0	15	16500.0

CHECKS

1. Press TUNE push button and read meter deflection at the end of tuning sequence. Check that the reading on the meter is more than 3. If not, **only technical staff**, perform tuning-up procedure for the transmitter.
2. Select the next frequency indicated in the frequency table or use table 1 and repeat point 1. and 2.
3. At the highest frequency, select TWO AERIAL SIMPLEX and repeat point 1.
4. Select ONE AERIAL SIMPLEX NORMAL and repeat point 1.
5. Select ONE AERIAL SIMPLEX NARROW and repeat point 1.
6. Select DUMMY LOAD/HEAT and select a frequency between 2200 - 2400 kHz.
7. Press TUNE push button and check meter reading approx. 2.5.
8. Select the same frequency on the receiver and the transmitter.
9. Select TWO AERIALS DUPLEX.
10. Select A3J on mode switches.
11. Set POWER REDUCTION to Low.
12. Press the TUNE push button.
13. Press NOISE GENERATOR and adjust RF-TUNE for max. METER deflection.
14. Key the transmitter and execute a modulation test by listening to your own speech.

7. **FUNCTION CHECK** cont.:

15. Press A3A push button.

16. Set FREQUENCY SELECTORS to the frequency 1 kHz below transmitter frequency.

17. Press NOISE GENERATOR and adjust RF-TUNE for max. METER reading.

18. Key the transmitter and check that a 1 kHz beat note is heard in the earphone.

19. Select ONE AERIAL SIMPLEX NORMAL.

20. Key the transmitter and check that the receiver is blocked.

21. Press the TEST ALARM push button and check that the alarm signal appears in the earphone.

22. Set DISTRESS to 2182 kHz.

23. Press TUNE push button BEWARE OF SILENT PERIOD ON DISTRESS FREQUENCY.

24. Repeat point 1.

25. Set METER SWITCH to position I_A, see fig. 1.

26. Mount the air filter at the front of the transmitter.

T1135
4-0-25340

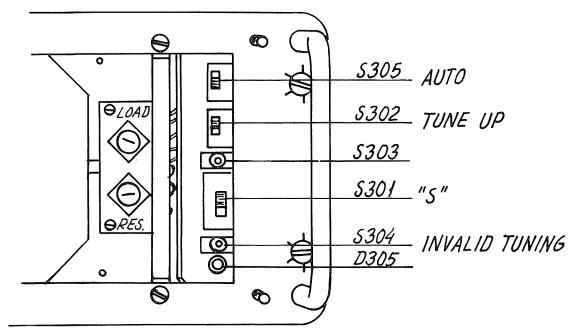
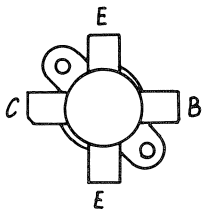


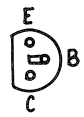
Fig. 1

8. PIN CONFIGURATIONS.

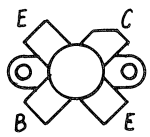
TRANSISTORS



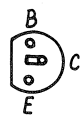
TH430
TOP VIEW



BC558
BC548
BC338
BC328
BC327
BOTTOM VIEW

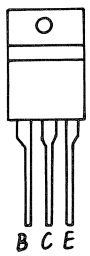


MRF426
TOP VIEW

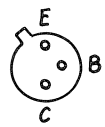


BC640
BC639
BOTTOM VIEW

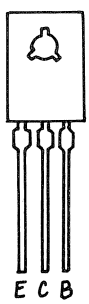
T1130/T1135



BDX53
FRONT VIEW



BC141
2N3553
BOTTOM VIEW

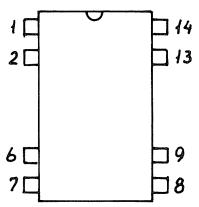


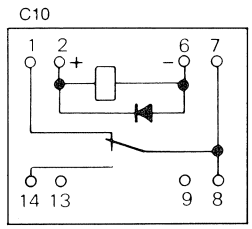
2N5190
BD138
FRONT VIEW

DIL REED RELAY

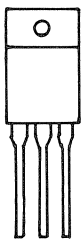
V23100-V4324-C10

TOP VIEW



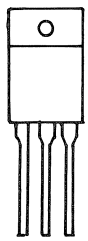


INTEGRATED CIRCUITS



LM340T-15/7815
LM340T- 8/7808
LM340T- 5/7805

FRONT VIEW



LM317T

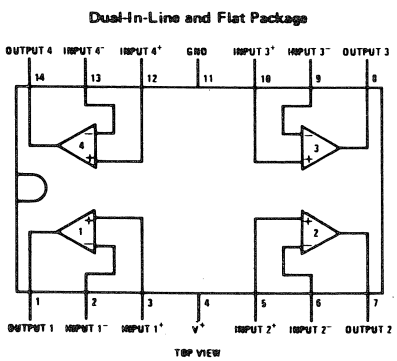
FRONT VIEW

LM78L15ACZ

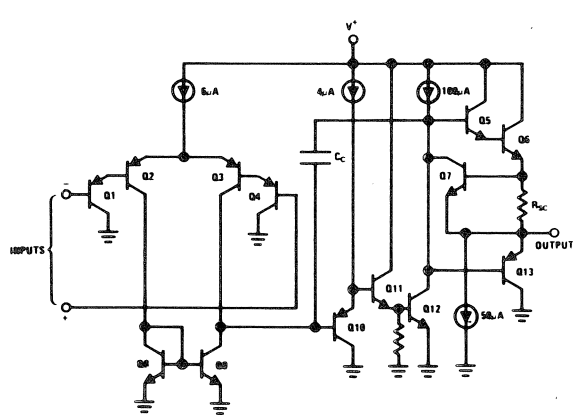
BOTTOM VIEW

LM324 LOW POWER QUAD OPERATIONAL AMPLIFIERS

CONNECTION DIAGRAM



SCHEMATIC DIAGRAM (EACH AMPLIFIER)

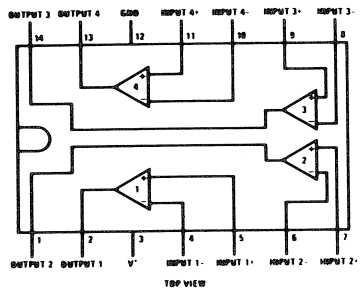


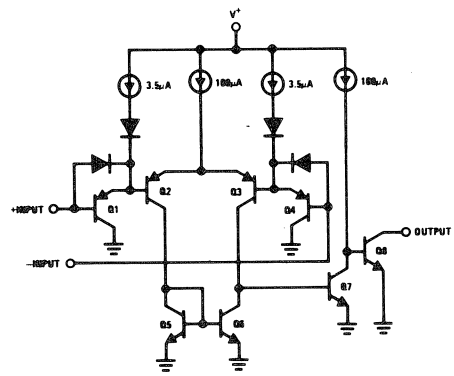
8. **PIN CONFIGURATIONS** cont.

LM339N

4 x VOLTAGE COMPARATORS

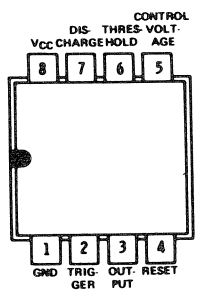
SCHEMATIC AND CONNECTION DIAGRAM

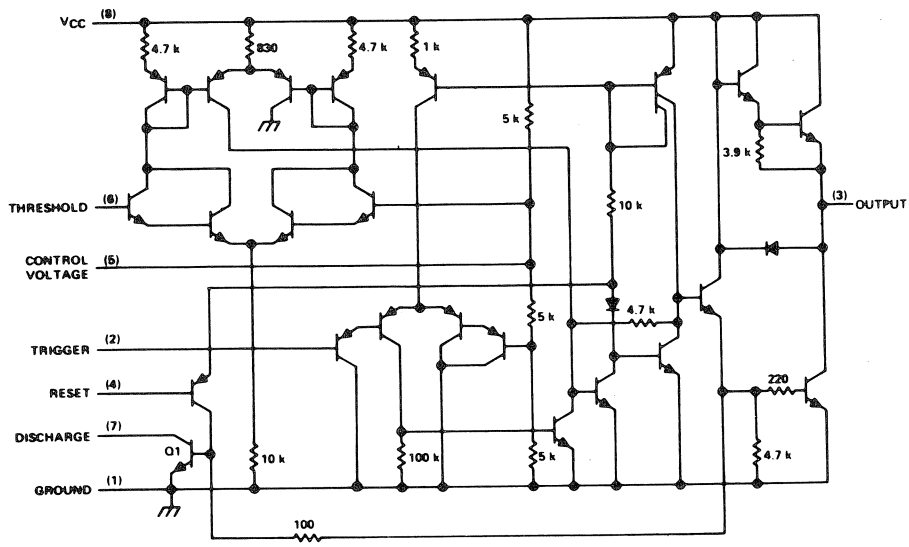




555 PRECISION TIMER

SCHEMATIC

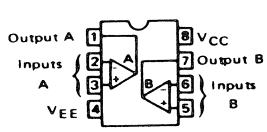




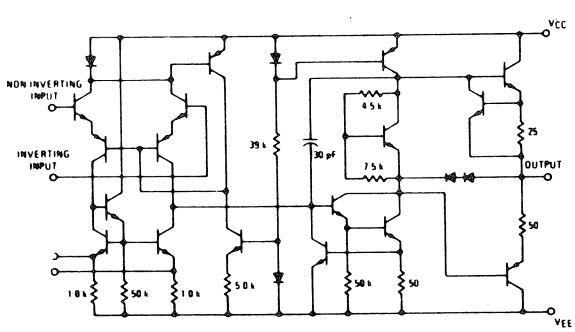
Resistor values shown are nominal and in ohms.

MC1458CP DUAL OPERATIONAL AMPLIFIER

CONNECTION DIAGRAM



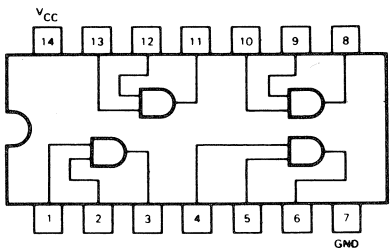
EQUIVALENT CIRCUIT SCHEMATIC



8. **PIN CONFIGURATIONS** cont.

SN74LS00

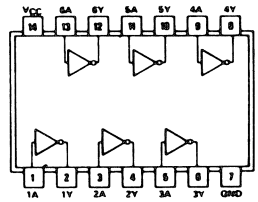
QUAD 2-INPUT NAND GATE



J Suffix — Case 632-07 (Ceramic)
N Suffix — Case 646-05 (Plastic)

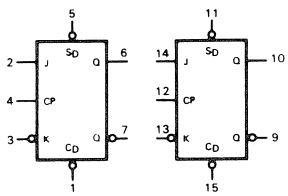
SN7406N

HEX INVERTER (OPEN COLLECTOR)



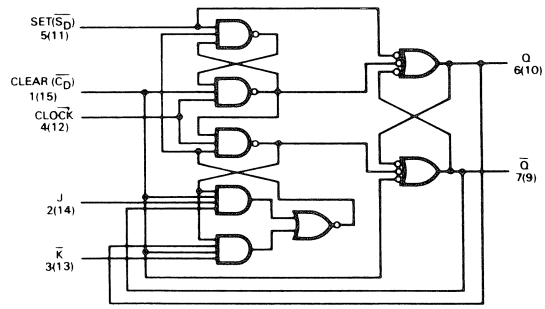
SN74LS109A

DUAL JK POSITIVE EDGE-TRIGGERED FLIP-FLOP



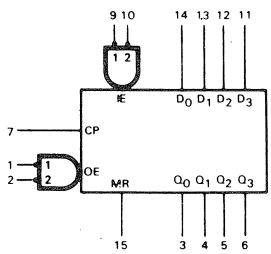
V_{CC} = Pin 16
GND = Pin 8

J Suffix — Case 620-08 (Ceramic)
N Suffix — Case 648-05 (Plastic)

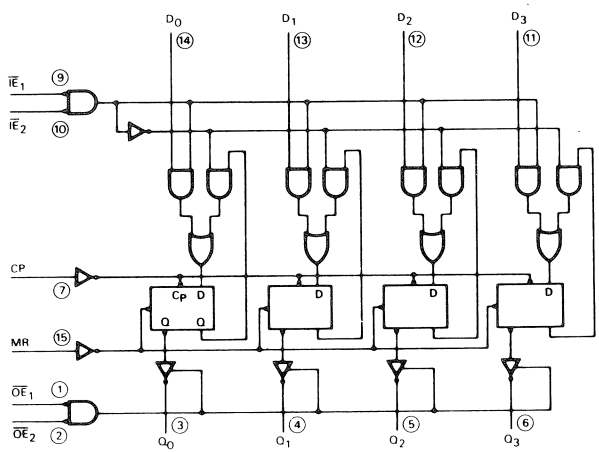


SN74LS173A

4-BIT D-TYPE REGISTER WITH 3-STATE OUTPUTS



V_{CC} = Pin 16
GND = Pin 8

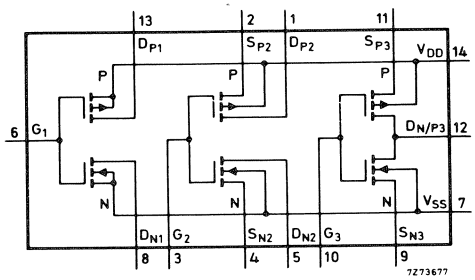


V_{CC} = Pin 16
GND = Pin 8
◯ = Pin Numbers

T1130/T1135

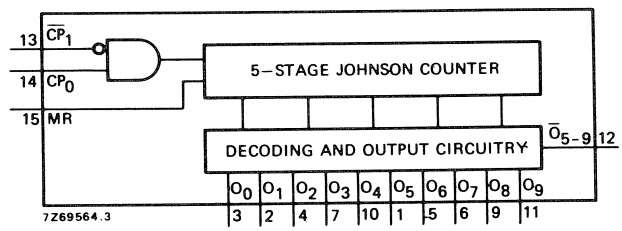
MC14007UB

DUAL COMPLEMENTARY PAIR AND INVERTER



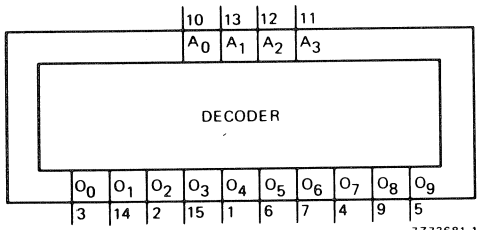
MC14017B

5-STAGE JOHNSON COUNTER



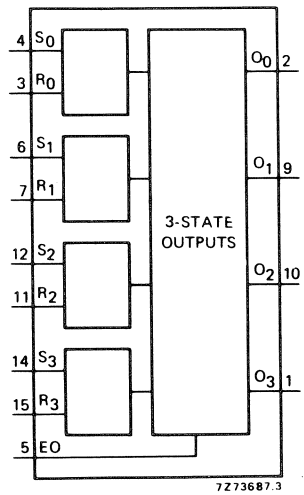
MC14028B

1-OF-10 DECODER



MC14043

QUADRUPLE R/S LATCH WITH 3-STATE OUTPUTS



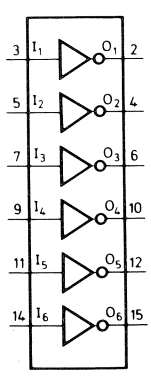
FUNCTION TABLE

inputs			output
EO	S_n	R_n	O_n
L	X	X	Z
H	L	H	L
H	H	X	H
H	L	L	latched

H = HIGH state (the more positive voltage)
L = LOW state (the less positive voltage)
X = state immaterial
Z = high impedance state

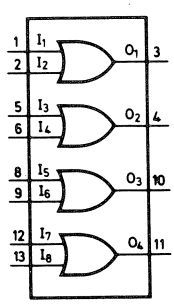
MC14049B

HEX INVERTING BUFFERS



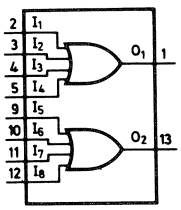
MC14071B

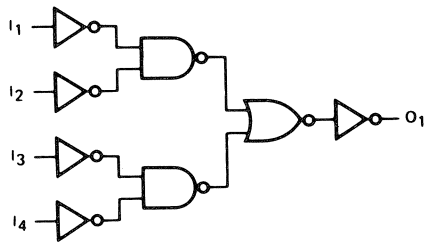
QUADRUPLE 2-INPUT OR GATE



MC14072B

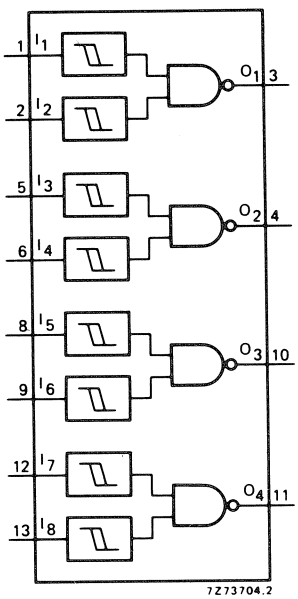
DUAL 4-INPUT OR GATE





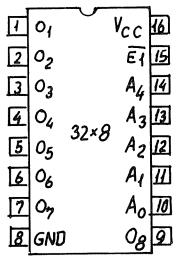
MC14093B

QUADRUPLE 2-INPUT
NAND SCHMITT TRIGGER



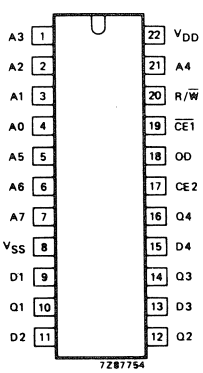
6330-1/63S080

PROM



PCD5101P/MCM51L01

256 x 4-BIT STATIC RAM



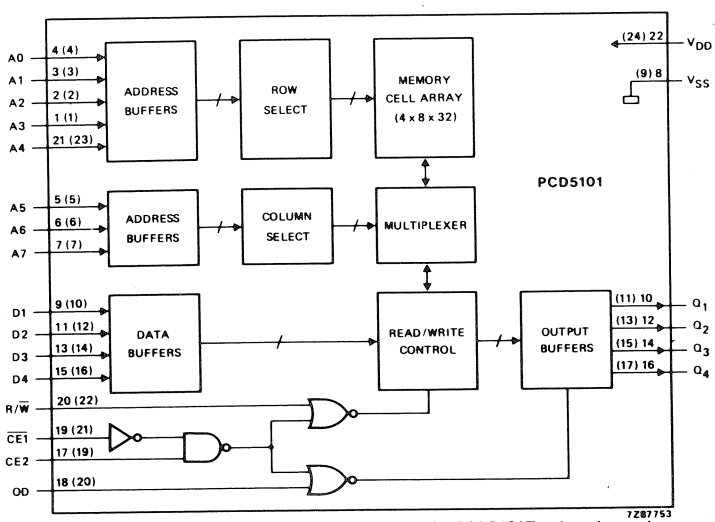
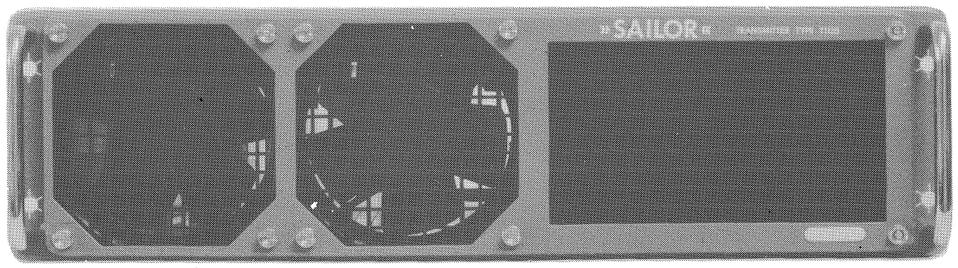


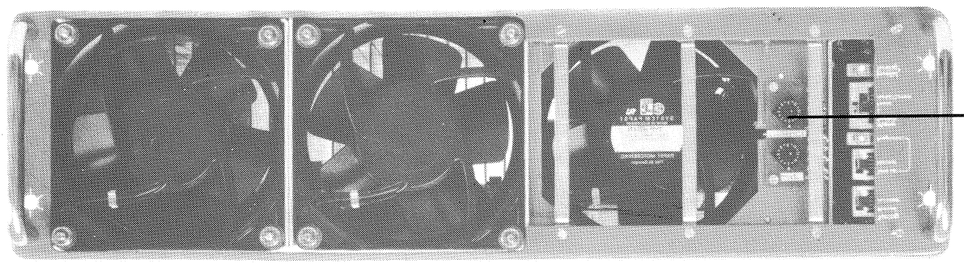
Fig. 1 Block diagram: pin numbers in parentheses are for PCD5101T; other pin numbers are applicable to PCD5101P.

9. ADJUSTMENT, MODULE AND TESTPOINT LOCATIONS.

FRONT VIEW

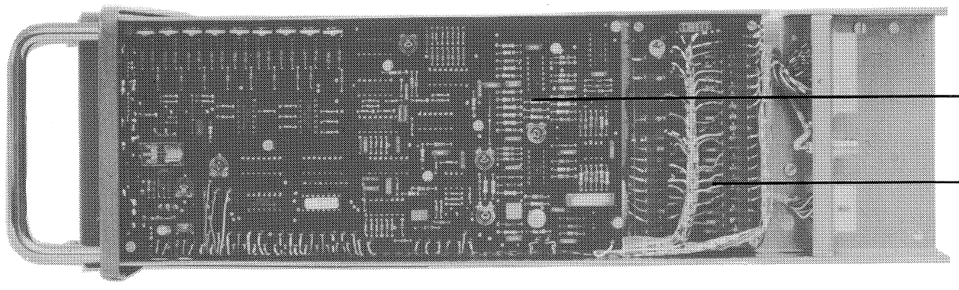


FRONT VIEW WITH AIR FILTER REMOVED



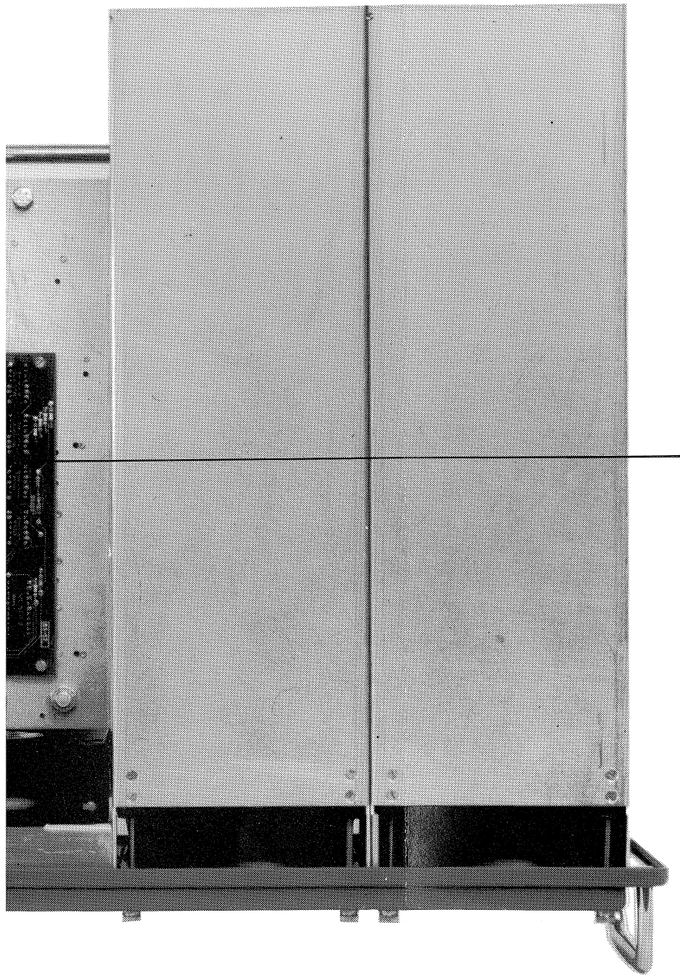
L/R SWITCHES
(MODULE 9/900)

RIGHT SIDE VIEW

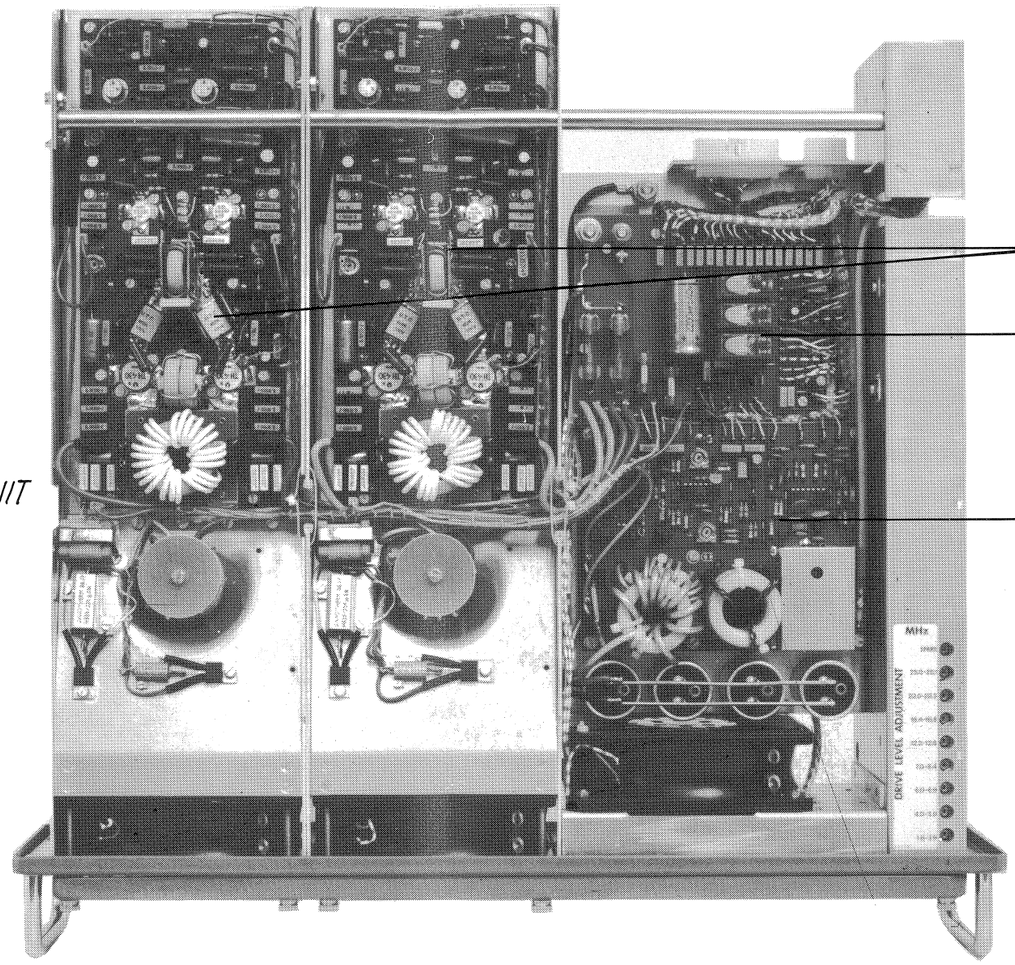


TRANSMITTER CONTROL UNIT
(MODULE 3/300)
INPUT FILTER UNIT
(MODULE 2/200)

TOP VIEW



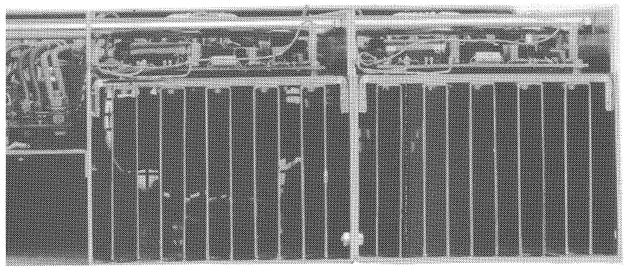
TUNER
CONTROL UNIT



P.A. UNIT
(MODULE 12/1200)

SUPPLY DISTRIBUTION UNIT
(MODULE 6/600)

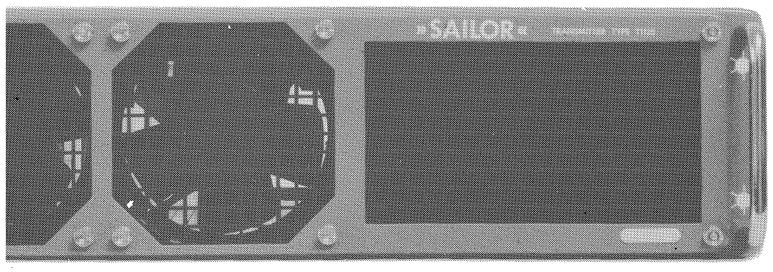
COMBINER AND PROTECTION UNIT
(MODULE 4/400)



TESTPOINT LOCATIONS

T1135
892, 897, 898
4-8-25345, 4-8-25348

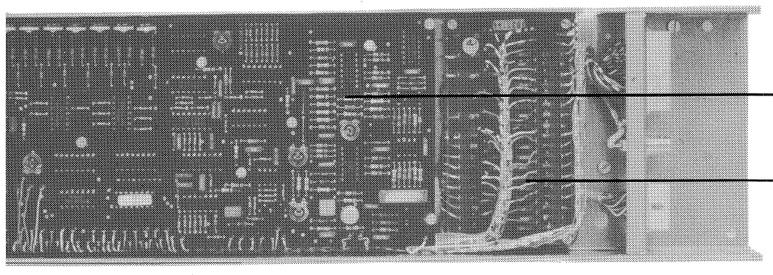
IODULE AND TESTPOINT LOCATIONS.



WITH AIR FILTER REMOVED

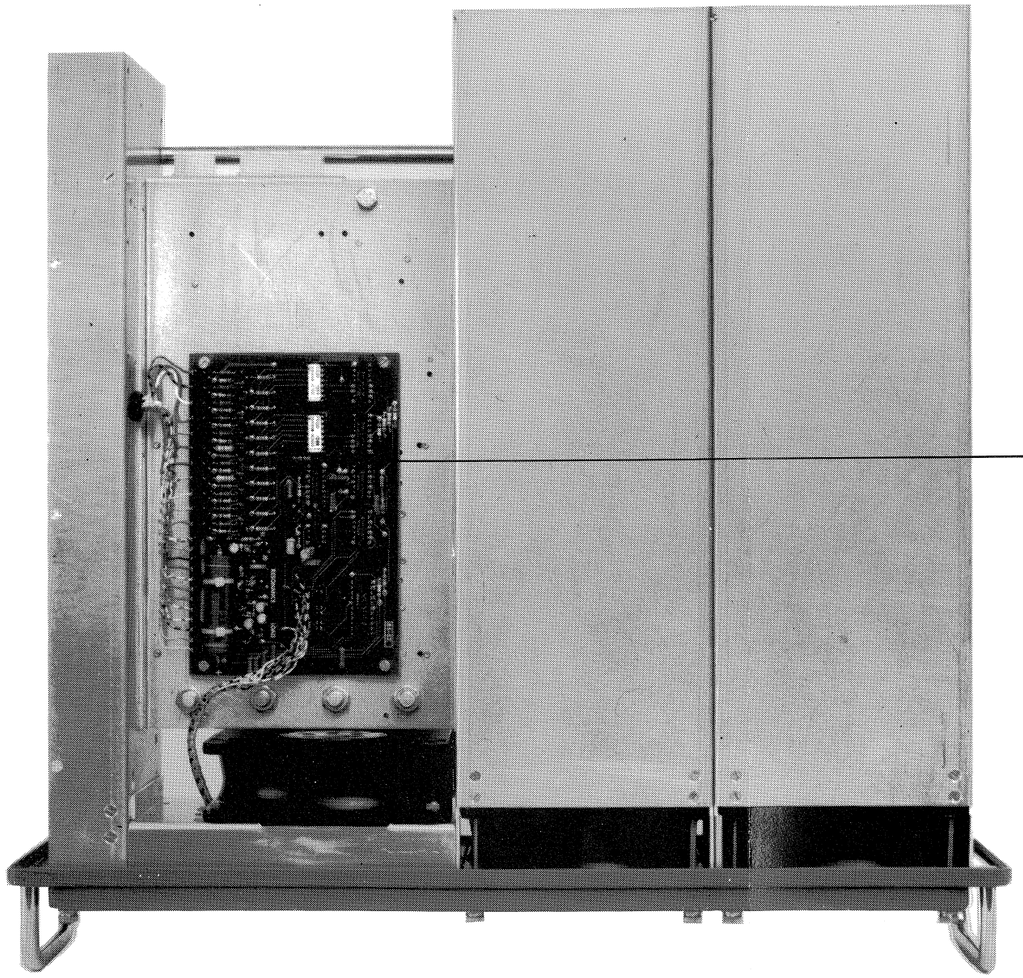
L/R SWITCHES
(MODULE 9/900)

IEW

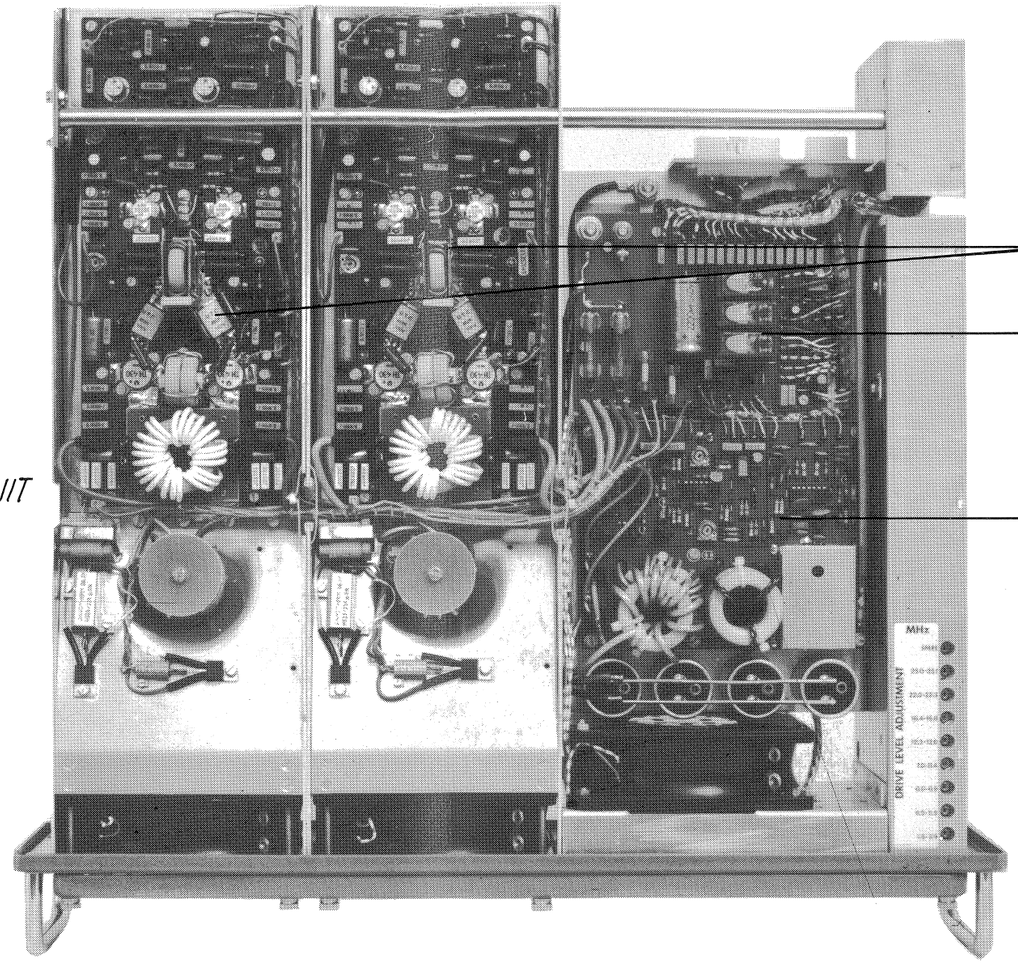


TRANSMITTER CONTROL UNIT
(MODULE 3/300)
INPUT FILTER UNIT
(MODULE 2/200)

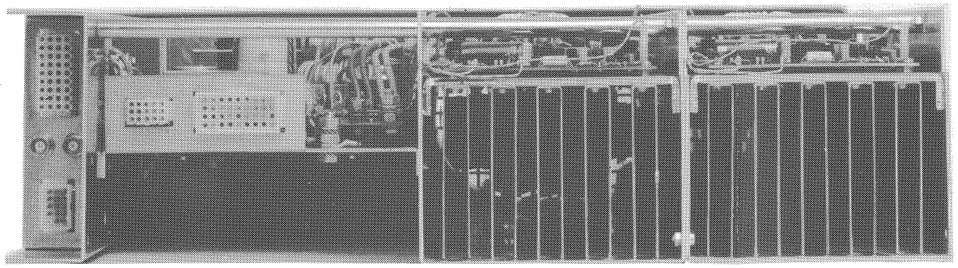
BOTTOM VIEW



TOP VIEW



REAR VIEW



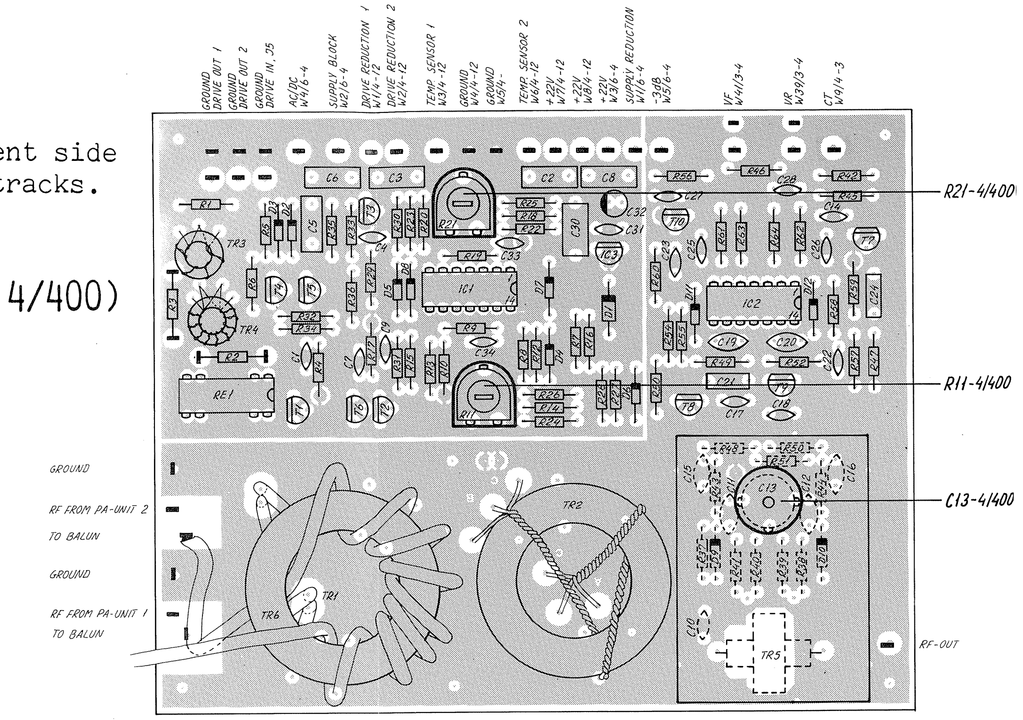
ADJUSTMENT, MODULE AND TESTPOINT LOCATIONS

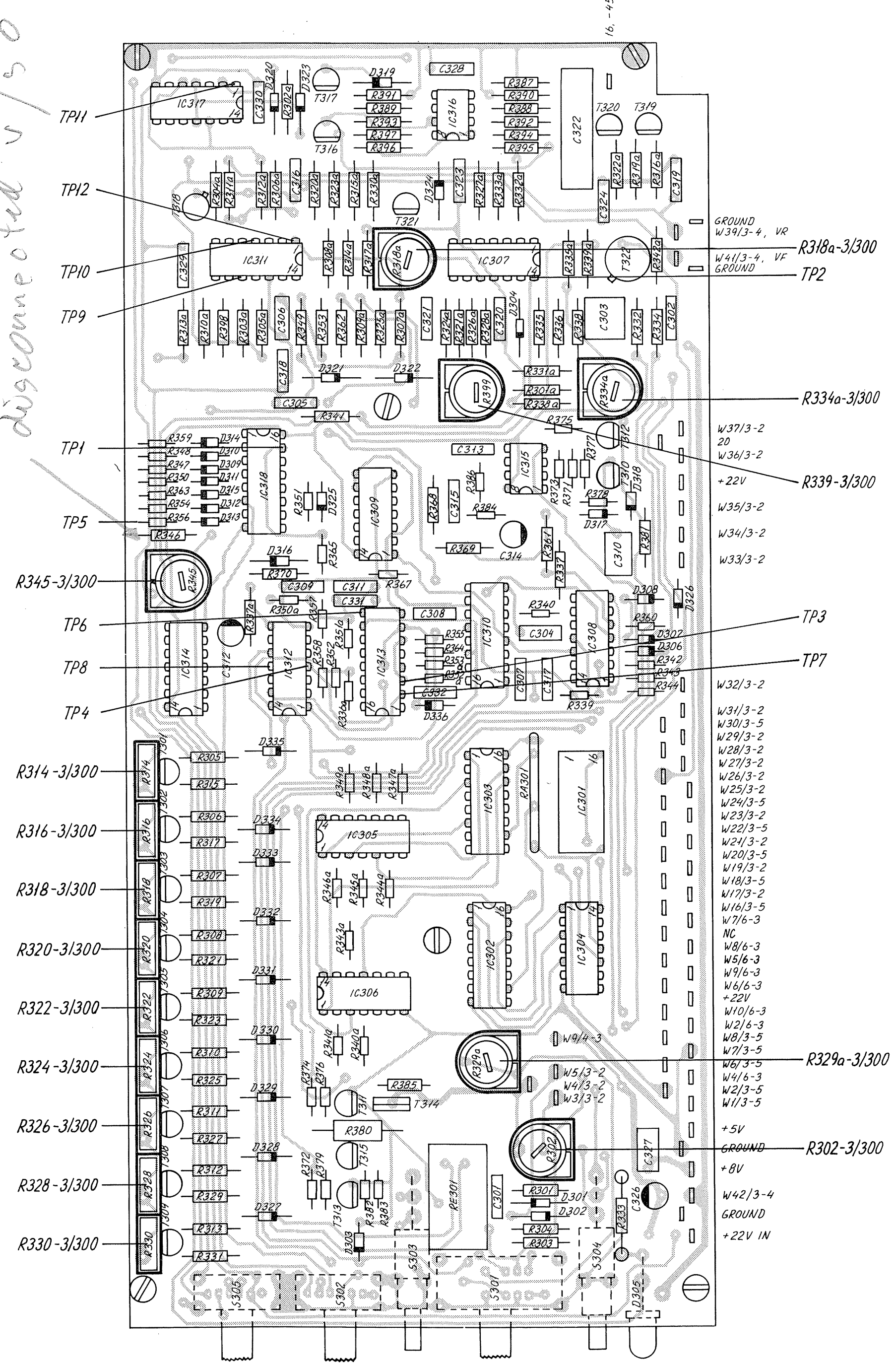
T1135A
4-8-23108 , 4-8-24970
4-8-23135 , 4-8-23243

disconnected v/50w feeder to tuner

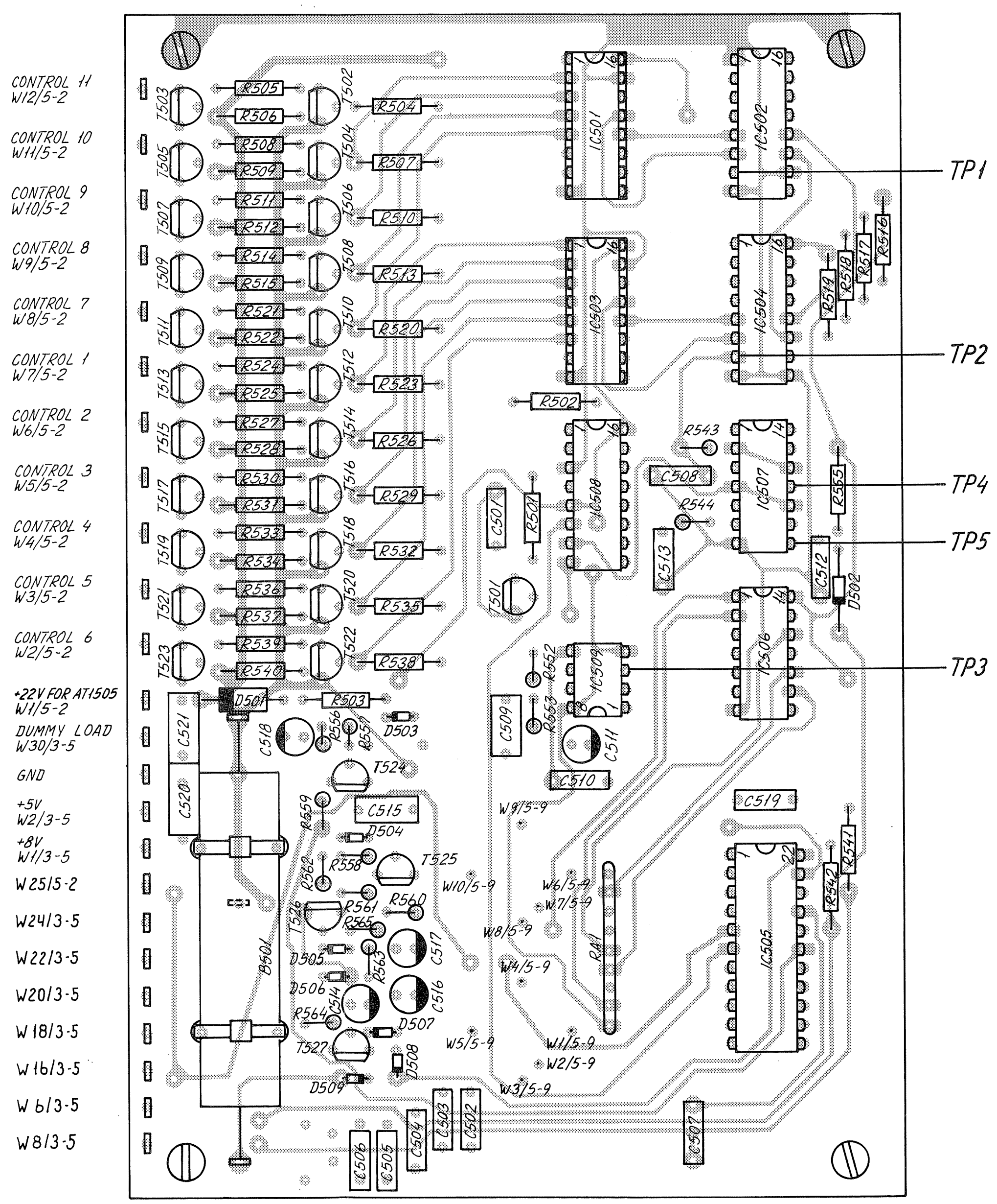
View from component side
with upper side tracks.

COMBINER AND PROTECTION UNIT (MODULE 4/400)

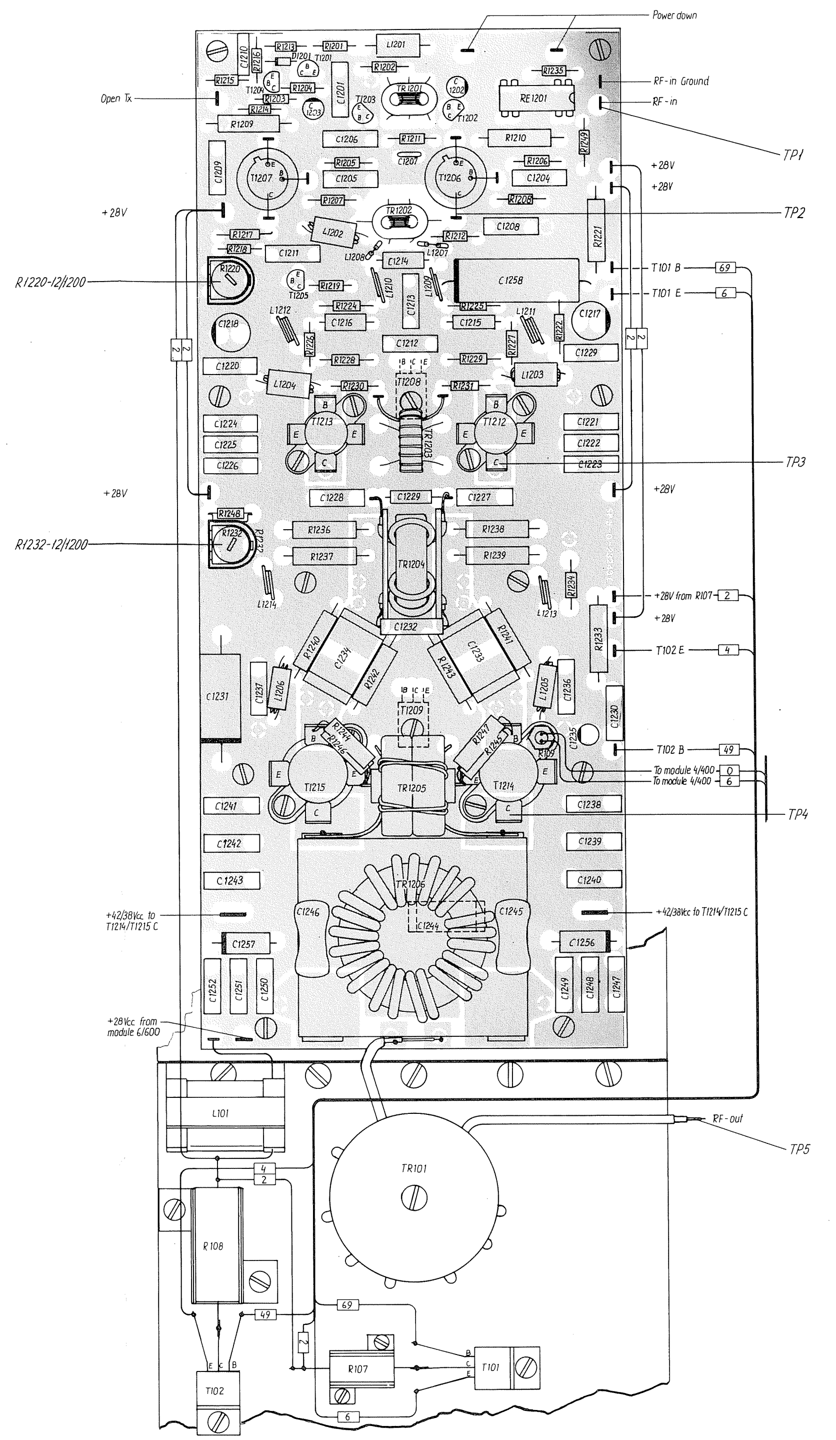




View from component side
with upper side tracks.



View from component side
with upper side tracks.



View from component side
with upper side tracks.

P.A. UNIT MODULE (12/1200)

TRANSMITTER CONTROL UNIT (MODULE 3/300)

TUNER CONTROL UNIT (MODULE 5/500)

ADJUSTMENT, MODULE AND TESTPOINT LOCATIONS

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMB
	TRANSMITTER T1135	MAIN CHASSIS MODULE 1/100	ESPERA	1250W TRANSMITTER	801135
-2	INPUT FILTER	MODULE 2 / 200	ESPERA	PRINT NR.5-0-23244	607040
-3	TRANSMITTER CONTROL UNIT	MODULE 3 / 300	ESPERA	PRINT NR.5-0-23108I	606972
-4	COMBINER & PROTECTION	MODULE 4 / 400	ESPERA	PRINT NR 5-0-24970D MONT.TG.TL310 3-0-25605	600808
-5	TUNER CONTROL T1135	MODULE 5 / 500	ESPERA	PRINT NR.5-0-23135E	600806
-6	SUPPLY DISTRIBUTION UNIT	MODULE 6 / 600	ESPERA	PRINT NR 5-0-24976C	600810
-9	LOAD/RESONANCE SWITCH	MODULE 9 / 900	ESPERA	PRINT NR.5-0-24972A	600812
PA1	POWER AMPLIFIER UNIT	T1135 MODULE 12 / 1200	ESPERA	700822 PA-ENHED T1135	700822
PA2	POWER AMPLIFIER UNIT	T1135 MODULE 12 / 1200	ESPERA	700822 PA-ENHED T1135	700822
C1-1	CAP. ELECTROLYTIC	2200uF -10/+30% 63V	ERO*	EY 02 BD 422 J	14.868
C2-1	CAP. ELECTROLYTIC	2200uF -10/+30% 63V	ERO*	EY 02 BD 422 J	14.868
C3-1	CAP. ELECTROLYTIC	2200uF -10/+30% 63V	ERO*	EY 02 BD 422 J	14.868
C4-1	CAP. ELECTROLYTIC	2200uF -10/+30% 63V	ERO*	EY 02 BD 422 J	14.868
IC101	VOLTAGE REGULATOR	LM340T-15	NATIONAL	LM340T-15	31.090
IC102	VOLTAGE REGULATOR	MC7805CT	NATIONAL*	LM340-T5	31.250
IC103	VOLTAGE REGULATOR	ADJUSTABLE 1.5A	NATIONAL*	LM317T	31.055
IC104	INTEGRATED CIRCUIT	MC7808CT	MOTOROLA	MC7808CT	31.255
IC301	PROM 06B6	IC301 T1135	ESPERA	PROM T1135 06B6 IC301	700920
J5	BNC CHASSIS		RODAN*	51-K-504-200-A1	78.442
J6	BNC CHASSIS		RODAN*	51-K-504-200-A1	78.442
L101	TRAFO	TD4660	TRADANIA	TD4660	22.160
MO101	FAN 24VAC 50Hz	125XR218L000	*ETRI	125XR218L000	60.027
MO102	FAN 24VAC 50Hz	WITH Ø4mm HOLES	ESPERA	2-0-23765A *	206945
MO103	FAN 24VAC 50Hz	WITH Ø4mm HOLES	ESPERA	2-0-23765A *	206945
R1-1	RESISTOR	100 OHM 5% 25W	ARCOL	NHS-25-100-5% & Lmax=17nH/25MHz	06.375
R2-1	RESISTOR	100 OHM 5% 25W	ARCOL	NHS-25-100-5% & Lmax=17nH/25MHz	06.375
R3-1	RESISTOR	100 OHM 5% 25W	ARCOL	NHS-25-100-5% & Lmax=17nH/25MHz	06.375
R4-1	RESISTOR	100 OHM 5% 25W	ARCOL	NHS-25-100-5% & Lmax=17nH/25MHz	06.375
R107	RESISTOR	82 OHM 5% 10W	ARCOL	HS-10	06.372
R108	RESISTOR	22 OHM 5% 25W	ARCOL	HS-25	06.358
R109	RESISTOR TEMP.SENSOR	2kO AT 25 CENTIGRADE	SIEMENS	Q62705-K56 (KTY11-2D)	07.150
T101	TRANSISTOR	BDX53	MOTOROLA*	BDX53	29.122
T102	TRANSISTOR	BDX53	MOTOROLA*	BDX53	29.122
TR101	TRANSFORMER	TL298	S.P.RADIO	6-0-23120	400298

T1135 A
12/87

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMB
	INPUT FILTER	MODULE 2 / 200	ESPERA	PRINT NR.5-0-23244	607040
C201	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C203	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C205	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C207	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C209	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C211	CAPACITOR MKT	1nF 10% 400V	SIEMENS	B32510-D6102-K000	11.360
C212	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C213	CAPACITOR MKT	1nF 10% 400V	SIEMENS	B32510-D6102-K000	11.360
C214	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C215	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C216	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C217	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C218	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C219	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C220	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C221	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C222	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C223	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C224	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C225	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C226	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C227	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C228	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C229	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C230	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C231	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C232	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C233	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C234	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C235	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C236	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C237	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C238	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C239	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C240	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
FP201	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP202	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP203	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP204	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP205	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP206	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMB
FP207	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP208	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP209	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP211	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP212	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP213	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP214	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP215	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP216	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP217	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP218	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP219	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP220	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP221	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP222	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP223	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP224	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP225	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP226	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP227	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP228	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP229	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP230	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
R201	RESISTOR	47 OHM 5% 0.33W	PHILIPS	2322 181 33479	01.666
R202	RESISTOR	47 OHM 5% 0.33W	PHILIPS	2322 181 33479	01.666
R203	RESISTOR	47 OHM 5% 0.33W	PHILIPS	2322 181 33479	01.666
R204	RESISTOR	47 OHM 5% 0.33W	PHILIPS	2322 181 33479	01.666
R205	RESISTOR	47 OHM 5% 0.33W	PHILIPS	2322 181 33479	01.666
R206	RESISTOR	47 OHM 5% 0.33W	PHILIPS	2322 181 33479	01.666

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	TRANSMITTER CONTROL UNIT	MODULE 3 / 300	ESPERA	5-0-23108J	606972
C301	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
C302	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
C303	CAPACITOR MKT	680nF 10% 63V	ERO*	MKT 1818-468/065	11.186
C304	CAPACITOR MKT	150nF 10% 63VDC	PHILIPS	2222 371 18154	11.089
C305	CAPACITOR MKT	10nF 5% 250VDC	ERO	MKT 1818-310/25 4-G	11.167
C306	CAPACITOR MKT	47nF 10% 250VDC	PHILIPS	2222 371 48473	11.166
C307	CAPACITOR MKT	1000pF 10% 400VDC	ERO	MKT 1818-210/63 5-G	11.139
C308	CAPACITOR MKT	1000pF 10% 400VDC	ERO	MKT 1818-210/63 5-G	11.139
C309	CAPACITOR MKT	3.3nF 10% 630V	ERO	MKT1818	11.144
C310	CAPACITOR MKT	470nF 10% 63V	ERO*	MKT 1818-447/065	11.185
C311	CAPACITOR MKT	1000pF 10% 400VDC	ERO	MKT 1818-210/63 5-G	11.139
C312	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ELNA	RJ2-35-V-100-M-T12	14.512
C313	CAPACITOR MKT	10nF 5% 250VDC	ERO	MKT 1818-310/25 4-G	11.167
C314	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ELNA	RJ2-35-V-100-M-T12	14.512
C315	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
C316	CAPACITOR MKT	3.3nF 10% 630V	ERO	MKT1818	11.144
C317	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
C318	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
C319	CAPACITOR MKT	10nF 5% 250VDC	ERO	MKT 1818-310/25 4-G	11.167
C320	CAPACITOR MKT	1000pF 10% 400VDC	ERO	MKT 1818-210/63 5-G	11.139
C321	CAPACITOR MKT	1000pF 10% 400VDC	ERO	MKT 1818-210/63 5-G	11.139
C322	CAPACITOR MKT	1uF 10% 63V	ERO*	MKT1818	11.138
C323	CAPACITOR MKT	10nF 5% 250VDC	ERO	MKT 1818-310/25 4-G	11.167
C324	CAPACITOR MKT	10nF 5% 250VDC	ERO	MKT 1818-310/25 4-G	11.167
C326	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ELNA	RJ2-35-V-100-M-T12	14.512
C327	CAPACITOR MKT	0.22uF 10% 63V	ERO*	MKT1818	11.090
C328	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
C329	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
C330	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
C331	CAPACITOR MKT	10nF 5% 250VDC	ERO	MKT 1818-310/25 4-G	11.167
C332	CAPACITOR MKT	10nF 5% 250VDC	ERO	MKT 1818-310/25 4-G	11.167
D301	DIODE SCHOTTKY	BAT 43	THOMSON-CSF	BAT43	27.600
D302	DIODE SCHOTTKY	BAT 43	THOMSON-CSF	BAT43	27.600
D303	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D304	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D305	LIGHT EMITTING DIODE	MV5052 5mm RØD	GI	MV5052	25.505
D306	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D307	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D308	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D309	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D310	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
D311	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D312	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D313	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D314	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D315	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D316	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D317	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D318	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D319	DIODE ZENER	15V 5% 0.4W	PHILIPS	BZX79C15	26.561
D320	DIODE SCHOTTKY	BAT 43	THOMSON-CSF	BAT43	27.600
D321	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D322	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D323	DIODE SCHOTTKY	BAT 43	THOMSON-CSF	BAT43	27.600
D324	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D325	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D326	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D327	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D328	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D329	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D330	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D331	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D332	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D333	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D334	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D335	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D336	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
IC302	BCD-TO-DECIMAL DECODER	MC14028BCP	SIGNETICS*	HEF4028BP	33.125
IC303	BCD-TO-DECIMAL DECODER	MC14028BCP	SIGNETICS*	HEF4028BP	33.125
IC304	INTEGRATED CIRCUIT	7406N	TEXAS	7406N	33.521
IC305	INTEGRATED CIRCUIT	7406N	TEXAS	7406N	33.521
IC306	INTEGRATED CIRCUIT	7406N	TEXAS	7406N	33.521
IC307	QUAD OP.AMP.	324	TEXAS	LM324N	31.065
IC308	QUAD 2-INP.NAND SCHM.TRI	MC14093BCP	SIGNETICS*	HEF 4093 BP	33.300
IC309	QUAD 2-INP.NAND SCHM.TRI	MC14093BCP	SIGNETICS*	HEF 4093 BP	33.300
IC310	INTEGRATED CIRCUIT	MC14049UBCP	MOTOROLA	MC14049UBCP	33.185
IC311	INTEGRATED CIRCUIT	QUAD VOLTAGE COMPERATOR	TEXAS*	LM339N	31.075
IC312	QUAD 2-INPUT "OR" GATE	MC14071BCP	SIGNETICS*	HEF 4071 BP	33.245
IC313	QUAD R-S LATCH	MC14043BCP	*SIGNETICS	HEF 4043 BP	33.160
IC314	DUAL 4-INPUT "OR" GATE	MC14072BCP	SIGNETICS*	HEF 4072 BP	33.250
IC315	INTEGRATED CIRCUIT	MC1455P1	TEXAS*	NE 555 P	31.205
IC316	INTEGRATED CIRCUIT	DUAL OPERATIONAL AMP.	TEXAS	MC1458P	31.215
IC317	INTEGRATED CIRCUIT	MC14007UBCP	MOTOROLA	MC14007UBCP	33.030
IC318	INTEGRATED CIRCUIT	MC14017BCP	PHILIPS*	HEF4017BP	33.085
R301	RESISTOR MF	22k OHM 5% 0.4W	PHILIPS	2322 181 53223	01.233

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POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R302	POTENTIOMETER TRIMMING	10 KOHM 20% 0.05W	PHILIPS	2322 410 03357	07.578
R303	RESISTOR MF	1k5 OHM 5% 0.4W	* PHILIPS	2322 181 53152	01.204
R304	RESISTOR MF	820 OHM 5% 0.4W	PHILIPS	2322 181 53821	01.197
R305	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R306	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R307	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R308	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R309	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R310	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R311	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R312	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R313	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R314	POTENTIOMETER TRIMMING	4.7K 10% .5W	PHILIPS*	2322 482 32472	07.667
R351	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R316	POTENTIOMETER TRIMMING	4.7K 10% .5W	PHILIPS*	2322 482 32472	07.667
R317	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R318	POTENTIOMETER TRIMMING	4.7K 10% .5W	PHILIPS*	2322 482 32472	07.667
R319	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R320	POTENTIOMETER TRIMMING	4.7K 10% .5W	PHILIPS*	2322 482 32472	07.667
R321	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R322	POTENTIOMETER TRIMMING	4.7K 10% .5W	PHILIPS*	2322 482 32472	07.667
R323	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R324	POTENTIOMETER TRIMMING	4.7K 10% .5W	PHILIPS*	2322 482 32472	07.667
R325	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R326	POTENTIOMETER TRIMMING	4.7K 10% .5W	PHILIPS*	2322 482 32472	07.667
R327	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R328	POTENTIOMETER TRIMMING	4.7K 10% .5W	PHILIPS*	2322 482 32472	07.667
R329	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R330	POTENTIOMETER TRIMMING	4.7K 10% .5W	PHILIPS*	2322 482 32472	07.667
R331	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R332	RESISTOR MF	22k OHM 5% 0.4W	PHILIPS	2322 181 53223	01.233
R333	RESISTOR MF	2k7 OHM 5% 0.5W	PHILIPS	2322 156 12702	01.410
R334	RESISTOR MF	150 OHM 5% 0.4W	* PHILIPS	2322 181 53151	01.179
R335	RESISTOR MF	270k OHM 5% 0.4W	* PHILIPS	2322 181 53274	01.260
R336	RESISTOR MF	680k OHM 5% 0.4W	* PHILIPS	2322 181 53684	01.270
R337	RESISTOR MF	1M OHM 5% 0.4W	* PHILIPS	2322 181 53105	01.275
R338	RESISTOR MF	330k OHM 5% 0.4W	* PHILIPS	2322 181 53334	01.262
R339	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R340	RESISTOR	1.8 MOHM 5% .33W	PHILIPS	2322 180 73185	01.782
R341	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R342	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R343	RESISTOR	1 MOHM 5% .33W	PHILIPS	2322 180 73105	01.776
R344	RESISTOR	1.8 MOHM 5% .33W	PHILIPS	2322 180 73185	01.782
R345	POTENTIOMETER TRIMMING	10 KOHM 20% 0.05W	PHILIPS	2322 410 03357	07.578

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R346	RESISTOR MF	18k OHM 5% 0.4W	* PHILIPS	2322 181 53183	01.231
R347	RESISTOR	100 KOHM 5% 0.33W	PHILIPS	2322 180 73104	01.751
R348	RESISTOR	100 KOHM 5% 0.33W	PHILIPS	2322 180 73104	01.751
R349	RESISTOR MF	39k OHM 5% 0.4W	* PHILIPS	2322 181 53393	01.239
R350	RESISTOR	68 KOHM 5% 0.2W	PHILIPS	2322 180 13683	01.746
R351	RESISTOR	100 KOHM 5% 0.33W	PHILIPS	2322 180 73104	01.751
R352	RESISTOR	100 KOHM 5% 0.33W	PHILIPS	2322 180 73104	01.751
R353	RESISTOR MF	10M OHM 5% 0.4W	* PHILIPS	2322 181 53106	02.301
R354	RESISTOR	47 KOHM 5% .33W	PHILIPS	2322 180 73473	01.742
R355	RESISTOR	100 KOHM 5% 0.33W	PHILIPS	2322 180 73104	01.751
R356	RESISTOR	33 KOHM 5% .33W	PHILIPS	2322 180 73333	01.738
R357	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R358	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R359	RESISTOR	22 KOHM 5% .33W	PHILIPS	2322 180 73223	01.734
R360	RESISTOR	1 MOHM 5% .33W	PHILIPS	2322 180 73105	01.776
R361	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R362	RESISTOR MF	3k3 OHM 5% 0.4W	PHILIPS	2322 181 53332	01.212
R363	RESISTOR	15 KOHM 5% .33W	PHILIPS	2322 180 73153	01.730
R364	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R365	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R367	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R368	RESISTOR MF	18k OHM 5% 0.4W	* PHILIPS	2322 181 53183	01.231
R369	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R370	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R371	RESISTOR	5.6 KOHM 5% .33W	PHILIPS	2322 180 73562	01.719
R372	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R373	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R374	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R375	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R376	RESISTOR	5.6 KOHM 5% .33W	PHILIPS	2322 180 73562	01.719
R377	RESISTOR	5.6 KOHM 5% .33W	PHILIPS	2322 180 73562	01.719
R378	RESISTOR	680 OHM 5% .33W	PHILIPS	2322 180 73681	01.696
R379	RESISTOR	5.6 KOHM 5% .33W	PHILIPS	2322 180 73562	01.719
R380	RESISTOR PMF	150 OHM 5% 1.6W	PHILIPS	2322 191 31501	04.179
R381	RESISTOR MF	1k0 OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R382	RESISTOR	1.8 KOHM 5% 0.33W	PHILIPS	2322 180 73182	01.707
R383	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R384	RESISTOR	2.2 MOHM 5% .33W	PHILIPS	2322 180 73225	01.783
R385	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R386	RESISTOR	3.9 MOHM 5% 0.33W	BEYSCHLAG	MBA 0204-00-BX-3M9 5%	02.636
R387	RESISTOR MF	3k3 OHM 5% 0.4W	PHILIPS	2322 181 53332	01.212
R388	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R389	RESISTOR MF	1k0 OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R390	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R391	RESISTOR MF	15k OHM 5% 0.4W	* PHILIPS	2322 181 53153	01.229
R392	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R393	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R394	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R395	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R396	RESISTOR MF	1k0 OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R397	RESISTOR MF	6k8 OHM 5% 0.4W	PHILIPS	2322 181 53682	01.220
R398	RESISTOR MF	33k OHM 5% 0.4W	PHILIPS	2322 181 53333	01.237
R399	POTENTIOMETER TRIMMING	10 KOHM 20% 0.05W	PHILIPS	2322 410 03357	07.578
R301A	RESISTOR MF	39k OHM 5% 0.4W	* PHILIPS	2322 181 53393	01.239
R302A	RESISTOR MF	1k0 OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R303A	RESISTOR MF	3k9 OHM 5% 0.4W	PHILIPS	2322 181 53392	01.214
R304A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R305A	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R306A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R307A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R308A	RESISTOR MF	1M OHM 5% 0.4W	* PHILIPS	2322 181 53105	01.275
R309A	RESISTOR MF	3k3 OHM 5% 0.4W	PHILIPS	2322 181 53332	01.212
R310A	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R311A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R312A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R313A	RESISTOR MF	3k3 OHM 5% 0.4W	PHILIPS	2322 181 53332	01.212
R314A	RESISTOR MF	5k6 OHM 5% 0.4W	PHILIPS	2322 181 53562	01.218
R315A	RESISTOR MF	10M OHM 5% 0.4W	* PHILIPS	2322 181 53106	02.301
R316A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R317A	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R318A	POTENTIOMETER TRIMMING	4.7 KOHM 20% 0.05W	PHILIPS	2322 410 03356	07.575
R319A	RESISTOR MF	22k OHM 5% 0.4W	PHILIPS	2322 181 53223	01.233
R320A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R321A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R322A	RESISTOR MF	22k OHM 5% 0.4W	PHILIPS	2322 181 53223	01.233
R323A	RESISTOR MF	8k2 OHM 5% 0.4W	PHILIPS	2322 181 53822	01.222
R324A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R325	RESISTOR MF	3k3 OHM 5% 0.4W	PHILIPS	2322 181 53332	01.212
R326A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R327A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R328A	RESISTOR MF	47k OHM 5% 0.4W	PHILIPS	2322 181 53473	01.241
R329A	POTENTIOMETER TRIMMING	10 KOHM 20% 0.05W	PHILIPS	2322 410 03357	07.578
R330A	RESISTOR MF	820 OHM 5% 0.4W	PHILIPS	2322 181 53821	01.197
R331A	RESISTOR MF	3k3 OHM 5% 0.4W	PHILIPS	2322 181 53332	01.212
R332A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R333A	RESISTOR MF	1M OHM 5% 0.4W	* PHILIPS	2322 181 53105	01.275
R334A	POTENTIOMETER TRIMMING	100 OHM 0.05W	PHILIPS	2322 410 03351	07.559
R335A	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R336A	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R337A	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R338A	RESISTOR MF	120 OHM 5% 0.4W	* PHILIPS	2322 181 53121	01.177
R339A	RESISTOR MF	120k OHM 5% 0.4W	PHILIPS	2322 181 53124	01.252
R340A	RESISTOR	2.7 KOHM 5% 0.33W	PHILIPS	2322 180 73272	01.711
R341A	RESISTOR	2.7 KOHM 5% 0.33W	PHILIPS	2322 180 73272	01.711
R342A	RESISTOR MF	82 OHM 5% 0.4W	* PHILIPS	2322 181 53829	01.172
R343A	RESISTOR	2.7 KOHM 5% 0.33W	PHILIPS	2322 180 73272	01.711
R344A	RESISTOR	2.7 KOHM 5% 0.33W	PHILIPS	2322 180 73272	01.711
R345A	RESISTOR	2.7 KOHM 5% 0.33W	PHILIPS	2322 180 73272	01.711
R346A	RESISTOR	2.7 KOHM 5% 0.33W	PHILIPS	2322 180 73272	01.711
R347A	RESISTOR	2.7 KOHM 5% 0.33W	PHILIPS	2322 180 73272	01.711
R348A	RESISTOR	2.7 KOHM 5% 0.33W	PHILIPS	2322 180 73272	01.711
R349A	RESISTOR	2.7 KOHM 5% 0.33W	PHILIPS	2322 180 73272	01.711
R350A	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R351A	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R352A	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
R353A	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 180 73103	01.726
RA301	RESISTOR ARRAY	8x10k OHM 5% 1/8W	MURATA	RG LD 8 X 103 J	08.630
RE301	RELAY	24VDC 2SH. 2A.	ERNI	HB2-DC-24V	21.191
S301	SWITCH	MSS225OR	ALCO	MSS225OR	43.090
S302	SWITCH	MSS225OR	ALCO	MSS225OR	43.090
S303	PUSHBUTTON SWITCH	SPDT 1A	C&K	8125 SD9AV2BE	43.582
S304	PUSHBUTTON SWITCH	SPDT 1A	C&K	8125 SD9AV2BE	43.582
S305	SWITCH	MSSA235OR	ALCO	MSSA235OR	43.091
T301	TRANSISTOR	BC327-25	PHILIPS*	BC327-25	28.046
T302	TRANSISTOR	BC327-25	PHILIPS*	BC327-25	28.046
T303	TRANSISTOR	BC327-25	PHILIPS*	BC327-25	28.046
T304	TRANSISTOR	BC327-25	PHILIPS*	BC327-25	28.046
T305	TRANSISTOR	BC327-25	PHILIPS*	BC327-25	28.046
T306	TRANSISTOR	BC327-25	PHILIPS*	BC327-25	28.046
T307	TRANSISTOR	BC327-25	PHILIPS*	BC327-25	28.046
T308	TRANSISTOR	BC327-25	PHILIPS*	BC327-25	28.046
T309	TRANSISTOR	BC327-25	PHILIPS*	BC327-25	28.046
T310	TRANSISTOR	BC338	PHILIPS	BC338	28.056
T311	TRANSISTOR	BC338	PHILIPS	BC338	28.056
T312	TRANSISTOR	BC338	PHILIPS	BC338	28.056
T313	TRANSISTOR	BC338	PHILIPS	BC338	28.056
T314	TRANSISTOR	BD138	PHILIPS*	BD138	29.057
T315	TRANSISTOR AF	PNP TO-92 BC328	MOTOROLA	BC328	28.050
T316	TRANSISTOR	BC338	PHILIPS	BC338	28.056
T317	TRANSISTOR AF	PNP TO-92 BC328	MOTOROLA	BC328	28.050
T318	TRANSISTOR RF SWITCH	2N2369A	PHILIPS	2N2369A	28.315
T319	TRANSISTOR	BC338	PHILIPS	BC338	28.056

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POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
T320	TRANSISTOR	BC338	PHILIPS	BC338	28.056
T321	TRANSISTOR	BC338	PHILIPS	BC338	28.056
T322	TRANSISTOR	BC141-10	THOMSON*	BC141-10	28.021

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMB
	COMBINER & PROTECTION	MODULE 4 / 400	ESPERA	PRINT NR 5-0-24970D MONT.TG.TL310 3-0-25605	600808
C1-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C2-4	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C3-4	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C4-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C5-4	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C6-4	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C7-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C8-4	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C9-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C10-4	CAPACITOR CERAMIC	5.6 pF +-.5pF NPO 400V	FERROPERM	9/0112,9	15.545
C12-4	CAPACITOR CERAMIC	56pF 5% NPO	#KCK	HE60SJCH560J	15.111
C12-4	CAPACITOR CERAMIC	110 pF 10% NPO 500V	KCK	HM11SJCH111K	15.140
C13-4	CAPACITOR TRIMMING	8-80pF POLYKA	DAU	109.4601.080	17.200
C14-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C15-4	CAPACITOR CERAMIC	220pF 5% NPO	KCK	HE11SJCH221J	15.155
C16-4	CAPACITOR CERAMIC	220pF 5% NPO	KCK	HE11SJCH221J	15.155
C17-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C18-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C19-4	CAPACITOR CERAMIC	110 pF 10% NPO 500V	KCK	HM11SJCH111K	15.140
C20-4	CAPACITOR CERAMIC	110 pF 10% NPO 500V	KCK	HM11SJCH111K	15.140
C21-4	CAPACITOR MKT	150nF 10% 100V	SIEMENS	B32510-D1154-K000	11.222
C22-4	CAPACITOR CERAMIC	1nF 20% 500V	*KCK	HM60SJYD102M	15.160
C23-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C24-4	CAPACITOR MKT	150nF 10% 100V	SIEMENS	B32510-D1154-K000	11.222
C25-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C26-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C27-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C28-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C30-4	CAPACITOR MKT	470nF 10% 63V	ERO*	MKT1822-447/065	11.048
C31-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C32-4	CAPACITOR ELECTROLYTIC	10uF 20% 35V	ERO*	EKI 00 AA 210 F	14.512
C33-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
C34-4	CAPACITOR CERAMIC	10nF -20/+80% 50V	#KCK	HE70SJYF103Z	15.170
D1-4	DIODE	1N4002	ITT*	1N4001/2/3/4/5/6/7	25.100
D2-4	DIODE	1N4148	ITT*	1N4148	25.131
D3-4	DIODE	1N4148	ITT*	1N4148	25.131
D4-4	DIODE	1N4148	ITT*	1N4148	25.131
D5-4	DIODE	1N4148	ITT*	1N4148	25.131
D6-4	DIODE	1N4148	ITT*	1N4148	25.131
D7-4	DIODE	1N4148	ITT*	1N4148	25.131

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMB
D8-4	DIODE	1N4148	ITT*	1N4148	25.131
D9-4	DIODE Ge	AA143	ITT	AA143 EJ BRUGES,BANDLAGT KLM	25.265
D10-4	DIODE Ge	AA143	ITT	AA143 EJ BRUGES,BANDLAGT KLM	25.265
D11-4	DIODE	1N4148	ITT*	1N4148	25.131
D12-4	DIODE	1N4148	ITT*	1N4148	25.131
IC1-4	QUAD OP.AMP.	LM324N	MOTOROLA*	LM324N	31.065
IC2-4	QUAD OP.AMP.	LM324N	MOTOROLA*	LM324N	31.065
IC3-4	VOLTAGE REGULATOR	LM78L15ACZ	NATIONAL	LM78L15ACZ 5% PL.HUS	31.140
R1-4	RESISTOR MF	100 OHM 5% 0.4W	* PHILIPS	2322 181 53101	01.175
R2-4	RESISTOR MF	5.1 OHM 5% 0.4W	* PHILIPS	2322 181 53518	01.142
R3-4	RESISTOR MF	470 OHM 5% 0.4W	* PHILIPS	2322 181 53471	01.191
R4-4	RESISTOR MF	2.2k OHM 5% 0.4W	* PHILIPS	2322 181 53222	01.208
R5-4	RESISTOR MF	4.7k OHM 5% 0.4W	* PHILIPS	2322 181 53472	01.216
R6-4	RESISTOR MF	5.6k OHM 5% 0.4W	* PHILIPS	2322 181 53562	01.218
R7-4	RESISTOR	18.2 KOHM 1% 0.4W	*PHILIPS	2322 156 11823	03.431
R8-4	RESISTOR MF	15k OHM 5% 0.4W	* PHILIPS	2322 181 53153	01.229
R9-4	RESISTOR	191 OHM 1% 0.4W	*PHILIPS	2322 156 11911	03.381
R10-4	RESISTOR	1.65 KOHM 1% Q.4W	*PHILIPS	2322 156 11652	03.230
R11-4	POTENTIOMETER TRIMMING	22 KOHM 20% 0.75W	AB ELECTRONIC	HC-10	07.716
R12-4	RESISTOR MF	390k OHM 5% 0.4W	* PHILIPS	2322 181 53394	01.264
R13-4	RESISTOR MF	390k OHM 5% 0.4W	* PHILIPS	2322 181 53394	01.264
R14-4	RESISTOR MF	15k OHM 5% 0.4W	* PHILIPS	2322 181 53153	01.229
R15-4	RESISTOR MF	10k OHM 5% 0.4W	* PHILIPS	2322 181 53103	01.225
R17-4	RESISTOR	18.2 KOHM 1% 0.4W	*PHILIPS	2322 156 11823	03.431
R17-4	RESISTOR MF	5.6k OHM 5% 0.4W	* PHILIPS	2322 181 53562	01.218
R18-4	RESISTOR MF	15k OHM 5% 0.4W	* PHILIPS	2322 181 53153	01.229
R19-4	RESISTOR	191 OHM 1% 0.4W	*PHILIPS	2322 156 11911	03.381
R20-4	RESISTOR	1.65 KOHM 1% 0.4W	*PHILIPS	2322 156 11652	03.230
R21-4	POTENTIOMETER TRIMMING	22 KOHM 20% 0.75W	AB ELECTRONIC	HC-10	07.716
R22-4	RESISTOR MF	390k OHM 5% 0.4W	* PHILIPS	2322 181 53394	01.264
R23-4	RESISTOR MF	390k OHM 5% 0.4W	* PHILIPS	2322 181 53394	01.264
R24-4	RESISTOR MF	220 OHM 5% 0.4W	* PHILIPS	2322 181 53221	01.183
R25-4	RESISTOR MF	15k OHM 5% 0.4W	* PHILIPS	2322 181 53153	01.229
R26-4	RESISTOR MF	12k OHM 5% 0.4W	* PHILIPS	2322 181 53123	01.227
R27-4	RESISTOR MF	22k OHM 5% 0.4W	* PHILIPS	2322 181 53223	01.233
R28-4	RESISTOR MF	10k OHM 5% 0.4W	* PHILIPS	2322 181 53103	01.225
R29-4	RESISTOR MF	10k OHM 5% 0.4W	* PHILIPS	2322 181 53103	01.225
R30-4	RESISTOR MF	5.6k OHM 5% 0.4W	* PHILIPS	2322 181 53562	01.218
R31-4	RESISTOR MF	5.6k OHM 5% 0.4W	* PHILIPS	2322 181 53562	01.218
R32-4	RESISTOR MF	33k OHM 5% 0.4W	* PHILIPS	2322 181 53333	01.237
R33-4	RESISTOR MF	6.8k OHM 5% 0.4W	* PHILIPS	2322 181 53682	01.220
R34-4	RESISTOR MF	6.8k OHM 5% 0.4W	* PHILIPS	2322 181 53682	01.220

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMB
R35-4	RESISTOR MF	22 OHM 5% 0.4W	* PHILIPS	2322 181 53229	01.158
R36-4	RESISTOR MF	22 OHM 5% 0.4W	* PHILIPS	2322 181 53229	01.158
R37-4	RESISTOR MF	3.9k OHM 5% 0.4W	* PHILIPS	2322 181 53392	01.214
R38-4	RESISTOR MF	100 OHM 5% 0.4W	* PHILIPS	2322 181 53101	01.175
R39-4	RESISTOR MF	100 OHM 5% 0.4W	* PHILIPS	2322 181 53101	01.175
R40-4	RESISTOR MF	100 OHM 5% 0.4W	* PHILIPS	2322 181 53101	01.175
R41-4	RESISTOR MF	100 OHM 5% 0.4W	* PHILIPS	2322 181 53101	01.175
R42-4	RESISTOR MF	47k OHM 5% 0.4W	* PHILIPS	2322 181 53473	01.241
R43-4	RESISTOR MF	56k OHM 5% 0.4W	* PHILIPS	2322 181 53563	01.243
R44-4	RESISTOR MF	56k OHM 5% 0.4W	* PHILIPS	2322 181 53563	01.243
R45-4	RESISTOR MF	22k OHM 5% 0.4W	* PHILIPS	2322 181 53223	01.233
R46-4	RESISTOR MF	100k OHM 5% 0.4W	* PHILIPS	2322 181 53104	01.250
R47-4	RESISTOR MF	100k OHM 5% 0.4W	* PHILIPS	2322 181 53104	01.250
R48-4	RESISTOR MF	220k OHM 5% 0.4W	* PHILIPS	2322 181 53224	01.258
R49-4	RESISTOR MF	180k OHM 5% 0.4W	* PHILIPS	2322 181 53184	01.256
R50-4	RESISTOR MF	470k OHM 5% 0.4W	* PHILIPS	2322 181 53474	01.266
R51-4	RESISTOR MF	220k OHM 5% 0.4W	* PHILIPS	2322 181 53224	01.258
R52-4	RESISTOR MF	150k OHM 5% 0.4W	* PHILIPS	2322 181 53154	01.254
R53-4	RESISTOR MF	330k OHM 5% 0.4W	* PHILIPS	2322 181 53334	01.262
R54-4			PHILIPS	2322 181 53395	01.289
R55-4	RESISTOR MF	220k OHM 5% 0.4W	* PHILIPS	2322 181 53224	01.258
R56-4	RESISTOR MF	100k OHM 5% 0.4W	* PHILIPS	2322 181 53104	01.250
R57-4	RESISTOR MF	180k OHM 5% 0.4W	* PHILIPS	2322 181 53184	01.256
R58-4	RESISTOR MF	1k OHM 5% 0.4W	* PHILIPS	2322 181 53102	01.200
R59-4	RESISTOR MF	220k OHM 5% 0.4W	* PHILIPS	2322 181 53224	01.258
R60-4			PHILIPS	2322 181 53395	01.289
R61-4	RESISTOR MF	100k OHM 5% 0.4W	* PHILIPS	2322 181 53104	01.250
R62-4	RESISTOR MF	100k OHM 5% 0.4W	* PHILIPS	2322 181 53104	01.250
R63-4	RESISTOR MF	47 OHM 5% 0.4W	* PHILIPS	2322 181 53479	01.166
R64-4	RESISTOR MF	47 OHM 5% 0.4W	* PHILIPS	2322 181 53479	01.166
RE1-4	RELAY	24V 0.25A	SIEMENS	V23100-V4324-C10	21.068
T1-4	TRANSISTOR	BC548	ITT*	BC548 A/B/C	28.070
T2-4	TRANSISTOR	BC548	ITT*	BC548 A/B/C	28.070
T3-4	TRANSISTOR	BC548	ITT*	BC548 A/B/C	28.070
T4-4	TRANSISTOR	BC640	PHILIPS	BC640	28.124
T5-4	TRANSISTOR	BC548	ITT*	BC548 A/B/C	28.070
T6-4	TRANSISTOR	BC639	MOTOROLA*	BC639	28.120
T7-4	TRANSISTOR	BC548	ITT*	BC548 A/B/C	28.070
T8-4	TRANSISTOR	BC548	ITT*	BC548	28.070

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMB
T9-4	TRANSISTOR	BC548	ITT*	A/B/C BC548	28.070
T10-4	TRANSISTOR	BC548	ITT*	A/B/C BC548	28.070
TR1	INPUT POWER SPLITTER	TL457	ESPERA	A/B/C 6-0-25042	400457
TR2	OUTPUT IMPEDANCE TRANSF.	TL459	ESPERA	6-0-25044D	400459
TR3-4	OUTPUT POWER COMBINER	TL458	ESPERA	6-0-25043A	400458
TR4	INPUT IMPEDANCE TRANSF.	TL456	ESPERA	6-0-25041	400456
TR5-4	TRANSFORMER	TL310	BB	6-0-23162E	400310

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	TUNER CONTROL T1135	MODULE 5 / 500	ESPERA	5-0-23135E	600806
C501	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
C502	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
C503	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
C504	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
C505	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
C506	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
C507	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
C508	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
C509	CAPACITOR MKT	220nF 10% 100V	SIEMENS	B32560-D1224-K000	11.376
C510	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
C511	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ELNA	RJ2-35-V-100-M-T12	14.512
C512	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
C513	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
C514	CAPACITOR ELECTROLYTIC	1uF 20% 50VDC	ELNA	RJ2-50-V-010-M-T12	14.506
C515	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C516	CAPACITOR ELECTROLYTIC	1uF 20% 50VDC	ELNA	RJ2-50-V-010-M-T12	14.506
C517	CAPACITOR ELECTROLYTIC	1uF 20% 50VDC	ELNA	RJ2-50-V-010-M-T12	14.506
C518	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ELNA	RJ2-35-V-100-M-T12	14.512
C519	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
C520	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C521	CAPACITOR MKT	100nF 10% 100V	SIEMENS*	B32510-D1104-K000	11.219
C522	CAPACITOR MKT	10nF 10% 400V	SIEMENS	B32510-D6103-K000	11.381
D501	DIODE V.F.R.	100VDC 2A(AV)	PHILIPS*	BYV27-100	27.114
D502	DIODE SCHOTTKY	BAT 43	THOMSON-CSF	BAT43	27.600
D503	DIODE ZENER	6.2V 5% 0.4W BZX79C6V2	PHILIPS*	BZX79C6V2	26.533
D504	DIODE ZENER	4.3V 5% 0.4W BZX79C4V3	PHILIPS	BZX79C4V3	26.521
D505	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D506	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D507	DIODE ZENER	6.2V 5% 0.4W BZX79C6V2	PHILIPS*	BZX79C6V2	26.533
D508	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
D509	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	PHILIPS	BAV21	25.340
IC501	INTEGRATED CIRCUIT	PROM	ESPERA	PROM 1EF4 23135A-IC501	706968
IC502	INTEGRATED CIRCUIT	74LS173AN	TEXAS	74LS173AN	34.022
IC503	INTEGRATED CIRCUIT	PROM	ESPERA	PROM 1DBB 23135B-IC503	706969
IC504	INTEGRATED CIRCUIT	74LS173AN	TEXAS	74LS173AN	34.022
IC505	INTEGRATED CIRCUIT	PCD5101P	PHILIPS	PCD5101P	31.550
IC506	INTEGRATED CIRCUIT	74LS09N	TEXAS	74LS09N	33.530
IC507	INTEGRATED CIRCUIT	74LS00N	TEXAS	74LS00N	33.501
IC508	INTEGRATED CIRCUIT	74LS109N	TEXAS*	SN74LS109AN	33.831
IC509	INTEGRATED CIRCUIT	MC1455P1	TEXAS*	NE 555 P	31.205
R501	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R502	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R503	RESISTOR MF	100k OHM 5% 0.4W	PHILIPS	2322 181 53104	01.250
R504	RESISTOR MF	8k2 OHM 5% 0.4W	PHILIPS	2322 181 53822	01.222
R505	RESISTOR MF	2k7 OHM 5% 0.4W	PHILIPS	2322 181 53272	01.210
R506	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R507	RESISTOR MF	8k2 OHM 5% 0.4W	PHILIPS	2322 181 53822	01.222
R508	RESISTOR MF	2k7 OHM 5% 0.4W	PHILIPS	2322 181 53272	01.210
R509	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R510	RESISTOR MF	8k2 OHM 5% 0.4W	PHILIPS	2322 181 53822	01.222
R511	RESISTOR MF	2k7 OHM 5% 0.4W	PHILIPS	2322 181 53272	01.210
R512	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R513	RESISTOR MF	8k2 OHM 5% 0.4W	PHILIPS	2322 181 53822	01.222
R514	RESISTOR MF	2k7 OHM 5% 0.4W	PHILIPS	2322 181 53272	01.210
R515	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R516	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R517	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R518	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R519	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R520	RESISTOR MF	8k2 OHM 5% 0.4W	PHILIPS	2322 181 53822	01.222
R521	RESISTOR MF	2k7 OHM 5% 0.4W	PHILIPS	2322 181 53272	01.210
R522	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R523	RESISTOR MF	8k2 OHM 5% 0.4W	PHILIPS	2322 181 53822	01.222
R524			BEYSCHLAG	MBB 0207-00-BX-820R 5%	03.197
R525	RESISTOR MF	1kO OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R526	RESISTOR MF	8k2 OHM 5% 0.4W	PHILIPS	2322 181 53822	01.222
R527	RESISTOR MF	2k7 OHM 5% 0.4W	PHILIPS	2322 181 53272	01.210
R528	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R529	RESISTOR MF	8k2 OHM 5% 0.4W	PHILIPS	2322 181 53822	01.222
R530			BEYSCHLAG	MBB 0207-00-BX-820R 5%	03.197
R531	RESISTOR MF	1kO OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R532	RESISTOR MF	8k2 OHM 5% 0.4W	PHILIPS	2322 181 53822	01.222
R533	RESISTOR MF	2k7 OHM 5% 0.4W	PHILIPS	2322 181 53272	01.210
R534	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R535	RESISTOR MF	8k2 OHM 5% 0.4W	PHILIPS	2322 181 53822	01.222
R536	RESISTOR MF	2k7 OHM 5% 0.4W	PHILIPS	2322 181 53272	01.210
R537	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R538	RESISTOR MF	8k2 OHM 5% 0.4W	PHILIPS	2322 181 53822	01.222
R539	RESISTOR MF	2k7 OHM 5% 0.4W	PHILIPS	2322 181 53272	01.210
R540	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R541	RESISTOR MF	1kO OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R542	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R543	RESISTOR	100 OHM 5% 0.33W	PHILIPS	2322 184 43101	01.675
R552	RESISTOR	33 KOHM 5% 0.33W	PHILIPS	2322 184 43333	01.737
R553	RESISTOR	3.3 KOHM 5% 0.33W	PHILIPS	2322 184 43332	01.712

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R554	RESISTOR	100 OHM 5% 0.33W	PHILIPS	2322 184 43101	01.675
R555	RESISTOR MF	1kO OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R556	RESISTOR	390 OHM 5% 0.33W	PHILIPS	2322 184 43391	01.689
R557	RESISTOR MF	1kO OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R558	RESISTOR	2.7 KOHM 5% 0.33W	PHILIPS	2322 184 43272	01.710
R559	RESISTOR	560 OHM 5% 0.33W	PHILIPS	2322 184 43561	01.693
R560	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 184 43103	01.725
R561	RESISTOR MF	1kO OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R562	RESISTOR	47 OHM 5% 0.33W	PHILIPS	2322 184 43479	01.666
R563	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 184 43103	01.725
R564	RESISTOR	390 OHM 5% 0.33W	PHILIPS	2322 184 43391	01.689
R565	RESISTOR	1 KOHM 5% 0.33W	PHILIPS	2322 184 43102	01.700
R566	RESISTOR	10 KOHM 5% 0.33W	PHILIPS	2322 184 43103	01.725
RA501	RESISTOR ARRAY	8x10k OHM 5% 1/8W	MURATA	RG LD 8 X 103 J	08.630
T501	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T502	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T503	TRANSISTOR	BC327	MOTOROLA	BC327	28.045
T504	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T505	TRANSISTOR	BC327	MOTOROLA	BC327	28.045
T506	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T507	TRANSISTOR	BC327	MOTOROLA	BC327	28.045
T508	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T509	TRANSISTOR	BC327	MOTOROLA	BC327	28.045
T510	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T511	TRANSISTOR	BC327	MOTOROLA	BC327	28.045
T512	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T513	TRANSISTOR	BC327	MOTOROLA	BC327	28.045
T514	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T515	TRANSISTOR	BC327	MOTOROLA	BC327	28.045
T516	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T517	TRANSISTOR	BC327	MOTOROLA	BC327	28.045
T518	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T519	TRANSISTOR	BC327	MOTOROLA	BC327	28.045
T520	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T521	TRANSISTOR	BC327	MOTOROLA	BC327	28.045
T522	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T523	TRANSISTOR	BC327	MOTOROLA	BC327	28.045
T524	TRANSISTOR	BC558	PHILIPS	BC558	28.097
T525	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T526	TRANSISTOR	BC558	PHILIPS	BC558	28.097
T527	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMB
	SUPPLY DISTRIBUTION UNIT	MODULE 6 / 600	ESPERA	PRINT NR 5-0-24976C	600810
C1-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C2-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C3-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C4-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C5-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C6-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C7-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C8-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C9-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C10-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C11-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C12-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C13-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C14-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C15-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C16-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C17-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C18-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C19-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C20-6	CAPACITOR ELECTROLYTIC	2200uF-10/+50% 40V	ERO*	EG 00 MG 422 G	14.720
C21-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
C22-6	CAPACITOR ELECTROLYTIC	47uF 20% 25V	ERO*	EKI 00 BB 247 E	14.524
C23-6	CAPACITOR ELECTROLYTIC	10uF 20% 35V	ERO*	EKI 00 AA 210 F	14.512
C24-6	CAPACITOR MKT	100nF 10% 100V	ERO*	MKT1818	11.180
D1-6	DIODE	1N4002	ITT*	1N4001/2/3/4/5/6/7	25.100
D2-6	DIODE	1N4002	ITT*	1N4001/2/3/4/5/6/7	25.100
D3-6	DIODE	1N4002	ITT*	1N4001/2/3/4/5/6/7	25.100
F1-6	FUSE	3.15A M Ø5x20mm	WICKMANN	919201	45.552
F2-6	FUSE	3.15A M Ø5x20mm	WICKMANN	919201	45.552
F3-6			WICKMANN	314020	45.631
F4-6			WICKMANN	314020	45.631
FP1-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP2-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP3-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP4-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP5-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP6-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP7-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP8-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP9-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP10-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180

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POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMB
FP11-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP12-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP13-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP14-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP15-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP16-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP17-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP18-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
FP19-6	FERRITE BEAD	Ø3,7xØ1.2x3.5mm GRADE 3B	PHILIPS	4322 020 34400	35.180
R1-6	RESISTOR	18 KOHM 5% 0.33W	BEYSCHLAG	MBA 0204-00-BX-18K 5%	01.732
R2-6	RESISTOR	15 KOHM 5% .33W	BEYSCHLAG	MBA 0204-00-BX-15K 5%	01.730
R3-6	RESISTOR	18 KOHM 5% 0.33W	BEYSCHLAG	MBA 0204-00-BX-18K 5%	01.732
R4-6	RESISTOR	2.2 kOHM 5% 0.33W	BEYSCHLAG	MBA 0204-00-BX-2K2 5%	01.709
R5-6	RESISTOR	1.18 KOHM 1% 0.4W	*PHILIPS	2322 156 11182	03.226
R6-6	RESISTOR	215 OHM 1% 0.25W	PHILIPS	2322 150 52151	02.202
RE1-6	RELAY	24V DC 10A 2 SK	PASI	KS/U-3-C BV998	21.015
RE2-6	RELAY	24V DC 18A 1 SL.	PASI	KH/A-3 BV936	21.009
RE3-6	RELAY	24V DC 10A 2 SK	PASI	KS/U-3-C BV998	21.015
T1-6	TRANSISTOR	BC639	MOTOROLA*	BC639	28.120
T2-6	TRANSISTOR	BC640	PHILIPS	BC640	28.124

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMB
	LOAD/RESONANCE SWITCH	MODULE 9 / 900	ESPERA	PRINT NR.5-0-24972A	600812
S1-9	SWITCH ROTARY	16 POS. HEX CODE	AB ELECTRONIC	235H / 932 351 0005	42.010
S2-9	SWITCH ROTARY	16 POS. HEX CODE	AB ELECTRONIC	235H / 932 351 0005	42.010

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	POWER AMPLIFIER	MODULE 12 / 1200	ESPERA	5-0-23243G / 2-0-23243	607049
C1201	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1202	CAPACITOR ELECTROLYTIC	1uF 20% 50VDC	ERO	EKI 00 AA 110 H M9	14.506
C1203	CAPACITOR ELECTROLYTIC	1uF 20% 50VDC	ERO	EKI 00 AA 110 H M9	14.506
C1204	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1205	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1206	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1207	CAPACITOR CERAMIC	150pF 10% N150 25VDC	FERROPERM	150pF +-10% 9/0116.8-25V	15.840
C1208	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1209	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1210	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
C1211	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1212	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1213	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1214	CAPACITOR POLYSTYRENE	560pF 1% 630VDC	PHILIPS	2222 431 85601	10.433
C1215	CAPACITOR POLYSTYRENE	1n1F 1% 160VDC	PHILIPS	2222 429 81102	10.351
C1216	CAPACITOR POLYSTYRENE	1n1F 1% 160VDC	PHILIPS	2222 429 81102	10.351
C1217	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
C1218	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
C1219	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1220	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1221	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1222	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1223	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1224	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1225	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1226	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1227	CAPACITOR MKP	33 nF 10% 250V	ERO*	MKP1841	13.100
C1228	CAPACITOR MKP	33 nF 10% 250V	ERO*	MKP1841	13.100
C1229	CAPACITOR POLYSTYRENE	100pF 1% 630VDC	PHILIPS	2222 431 81001	10.400
C1230	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1231	CAPACITOR ELECTROLYTIC	470uF -10/+50% 10V	ERO*	EB 00 GC 347 C	14.570
C1232	CAPACITOR CERAMIC	2400 pF 10% 1kV RF	#UNILATOR	102/1/2401K/CEO	18.152
C1233	CAPACITOR CERAMIC	4800 pF 10% 100V RF	#UNILATOR	102/4801K/MGO	18.155
C1234	CAPACITOR CERAMIC	4800 pF 10% 100V RF	#UNILATOR	102/4801K/MGO	18.155
C1236	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1237	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1238	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1239	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1240	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1241	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1242	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C1243	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1822-410/01 5	11.073
C1244	CAPACITOR CERAMIC	270 pF 10% 25KV	#UNILATOR	TYPE 101-STRIP LEAD	18.150
C1245	CAPACITOR MICA	15nF 10% 100VDC	N-T-D	SDM20 C 153 K 1	18.145
C1246	CAPACITOR MICA	15nF 10% 100VDC	N-T-D	SDM20 C 153 K 1	18.145
C1247	CAPACITOR MKP	33 nF 10% 250V	ERO*	MKP1841	13.100
C1248	CAPACITOR MKP	33 nF 10% 250V	ERO*	MKP1841	13.100
C1249	CAPACITOR MKP	33 nF 10% 250V	ERO*	MKP1841	13.100
C1250	CAPACITOR MKP	33 nF 10% 250V	ERO*	MKP1841	13.100
C1251	CAPACITOR MKP	33 nF 10% 250V	ERO*	MKP1841	13.100
C1252	CAPACITOR MKP	33 nF 10% 250V	ERO*	MKP1841	13.100
C1255	CAPACITOR ELECTROLYTIC	1uF 20% 50VDC	ERO	EKI 00 AA 110 H M9	14.506
C1256	CAPACITOR ELECTROLYTIC	10uF -10/+50% 63VDC	PHILIPS	2222 030 38109	14.546
C1257	CAPACITOR ELECTROLYTIC	10uF -10/+50% 63VDC	PHILIPS	2222 030 38109	14.546
C1258	CAPACITOR ELECTROLYTIC	470uF -10/+50% 40V	ERO	EB 00 HE 347 G	14.576
D1201	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	TFK	BAV21	25.340
L1201	CHOKE	2.2uH 10%	FERROPERM	1582	20.131
L1202	COIL	TL067	S.P.RADIO	6-0-20854A 400067=20.053	400067
L1203	COIL	TL067	S.P.RADIO	6-0-20854A 400067=20.053	400067
L1204	COIL	TL067	S.P.RADIO	6-0-20854A 400067=20.053	400067
L1205	COIL	TL067	S.P.RADIO	6-0-20854A 400067=20.053	400067
L1206	COIL	TL067	S.P.RADIO	6-0-20854A 400067=20.053	400067
L1207	COIL	TL306	ESPERA	6-0-23128	400306
L1208	COIL	TL306	ESPERA	6-0-23128	400306
L1209	COIL	TL305	S.P.RADIO	6-0-23127	400305
L1210	COIL	TL305	S.P.RADIO	6-0-23127	400305
L1211	COIL	TL304	S.P.RADIO	6-0-23126	400304
L1212	COIL	TL304	S.P.RADIO	6-0-23126	400304
L1213	COIL	TL301	S.P.RADIO	6-0-23123	400301
L1214	COIL	TL301	S.P.RADIO	6-0-23123	400301
R1201	RESISTOR MF	180 OHM 5% 0.4W	PHILIPS	2322 181 53181	01.181
R1202	RESISTOR MF	10 OHM 5% 0.4W	PHILIPS	2322 181 53109	01.150
R1203	RESISTOR MF	680 OHM 5% 0.4W	PHILIPS	2322 181 53681	01.195
R1204	RESISTOR MF	680 OHM 5% 0.4W	PHILIPS	2322 181 53681	01.195
R1205	RESISTOR MF	820 OHM 5% 0.4W	PHILIPS	2322 181 53821	01.197
R1206	RESISTOR MF	820 OHM 5% 0.4W	PHILIPS	2322 181 53821	01.197
R1207	RESISTOR MF	470 OHM 5% 0.4W	PHILIPS	2322 181 53471	01.191
R1208	RESISTOR MF	470 OHM 5% 0.4W	PHILIPS	2322 181 53471	01.191
R1209	RESISTOR PMF	82 OHM 5% 3W	PHILIPS	2322 195 13829	04.672
R1210	RESISTOR PMF	82 OHM 5% 3W	PHILIPS	2322 195 13829	04.672

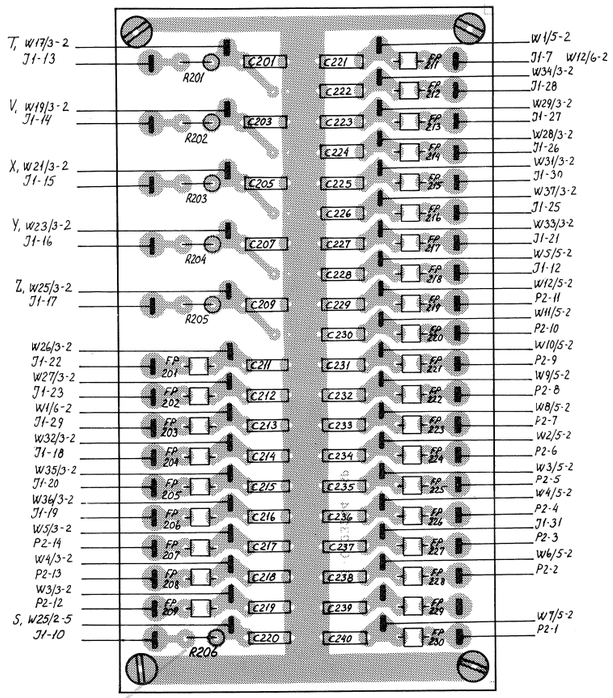
POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R1211	RESISTOR MF	15 OHM 5% 0.4W	PHILIPS	2322 181 53159	01.154
R1212	RESISTOR MF	22 OHM 5% 0.4W	PHILIPS	2322 181 53229	01.158
R1213	RESISTOR MF	1k78 OHM 1% 0.25W	PHILIPS	2322 157 11782	02.205
R1214	RESISTOR MF	2k67 OHM 1% 0.25W	PHILIPS	2322 157 12672	02.209
R1215	RESISTOR MF	15k OHM 5% 0.4W	PHILIPS	2322 181 53153	01.229
R1216	RESISTOR MF	1k8 OHM 5% 0.4W	PHILIPS	2322 181 53182	01.206
R1217	RESISTOR MF	1k8 OHM 5% 0.5W	PHILIPS	2322 156 11802	01.404
R1218	RESISTOR MF	3k3 OHM 5% 0.4W	PHILIPS	2322 181 53332	01.212
R1219	RESISTOR MF	10 OHM 5% 0.4W	PHILIPS	2322 181 53109	01.150
R1220	POTENTIOMETER TRIMMING	22 OHM 20% 0.75W	AB ELECTRONIC	HC-10	07.705
R1221	RESISTOR PMF	2k2 OHM 5% 3W	PHILIPS	2322 195 13222	04.708
R1222	RESISTOR MF	22 OHM 5% 0.4W	PHILIPS	2322 181 53229	01.158
R1224	RESISTOR MF	8R2 OHM 5% 0.4W	PHILIPS	2322 181 53828	01.147
R1225	RESISTOR MF	8R2 OHM 5% 0.4W	PHILIPS	2322 181 53828	01.147
R1226	RESISTOR MF	2R2 OHM 5% 0.4W	PHILIPS	2322 181 53228	01.133
R1227	RESISTOR MF	2R2 OHM 5% 0.4W	PHILIPS	2322 181 53228	01.133
R1228	RESISTOR MF	18 OHM 5% 0.4W	PHILIPS	2322 181 53189	01.156
R1229	RESISTOR MF	18 OHM 5% 0.4W	PHILIPS	2322 181 53189	01.156
R1230	RESISTOR MF	33 OHM 5% 0.4W	PHILIPS	2322 181 53339	01.162
R1231	RESISTOR MF	33 OHM 5% 0.4W	PHILIPS	2322 181 53339	01.162
R1232	POTENTIOMETER TRIMMING	22 OHM 20% 0.75W	AB ELECTRONIC	HC-10	07.705
R1233	RESISTOR PMF	2k2 OHM 5% 3W	PHILIPS	2322 195 13222	04.708
R1234	RESISTOR MF	22 OHM 5% 0.4W	PHILIPS	2322 181 53229	01.158
R1235	RESISTOR MF	15 OHM 5% 0.4W	PHILIPS	2322 181 53159	01.154
R1236	RESISTOR PMF	6R8 OHM 5% 3W	PHILIPS	2322 195 13688	04.648
R1237	RESISTOR PMF	6R8 OHM 5% 3W	PHILIPS	2322 195 13688	04.648
R1238	RESISTOR PMF	6R8 OHM 5% 3W	PHILIPS	2322 195 13688	04.648
R1239	RESISTOR PMF	6R8 OHM 5% 3W	PHILIPS	2322 195 13688	04.648
R1240	RESISTOR PMF	2R7 OHM 5% 3W	PHILIPS	2322 195 13278	04.634
R1241	RESISTOR PMF	2R7 OHM 5% 3W	PHILIPS	2322 195 13278	04.634
R1242	RESISTOR PMF	2R7 OHM 5% 3W	PHILIPS	2322 195 13278	04.634
R1243	RESISTOR PMF	2R7 OHM 5% 3W	PHILIPS	2322 195 13278	04.634
R1244	RESISTOR PMF	10 OHM 5% 3W	PHILIPS	2322 192 31009	04.650
R1245	RESISTOR PMF	10 OHM 5% 3W	PHILIPS	2322 192 31009	04.650
R1246	RESISTOR PMF	10 OHM 5% 3W	PHILIPS	2322 192 31009	04.650
R1247	RESISTOR PMF	10 OHM 5% 3W	PHILIPS	2322 192 31009	04.650
R1248	RESISTOR MF	10 OHM 5% 0.4W	PHILIPS	2322 181 53109	01.150
R1249	RESISTOR MF	220 OHM 5% 0.4W	PHILIPS	2322 181 53221	01.183
RE1201	RELAY	24V 0.25A	SIEMENS	V23100-V4324-C10	21.068
T1201	TRANSISTOR AF	PNP TO-92 BC328	MOTOROLA	BC328	28.050
T1202	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T1203	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T1204	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
T1205	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
T1206	TRANSISTOR RF MED.POWER	NPN TO-39 2N3553	PHILIPS	2N3553	29.315
T1207	TRANSISTOR RF MED.POWER	NPN TO-39 2N3553	PHILIPS	2N3553	29.315
T1208	TRANSISTOR	2N5190	MOTOROLA*	2N5190	29.318
T1209	TRANSISTOR	2N5190	MOTOROLA*	2N5190	29.318
T1212	TRANSISTOR RF POWER	MRF426 MATCHED PAIR (hFE)	MOTOROLA	MRF 426 hFE SORTED 1SET=2PCS	29.266
T1213	TRANSISTOR RF POWER	MRF426 MATCHED PAIR (hFE)	MOTOROLA	MRF 426 hFE SORTED 1SET=2PCS	29.266
T1214	TRANSISTOR RF POWER	TH430 MATCHED PAIR (HFE)	THOMSON	SD 1728-15 PAR 1SET=2PCS GRP:C,D,E,F,G	29.268
T1215	TRANSISTOR RF POWER	TH430 MATCHED PAIR (HFE)	THOMSON	SD 1728-15 PAR 1SET=2PCS GRP:C,D,E,F,G	29.268
TR1201	COIL	TL308	S.P.RADIO	6-0-23130	400308
TR1202	COIL	TL307	S.P.RADIO	6-0-23129	400307
TR1203	COIL	TL303	S.P.RADIO	6-0-23125	400303
TR1204	COIL	TL302	S.P.RADIO	6-0-23124	400302
TR1205	TRANSFORMER	TL300	S.P.RADIO	6-0-23122B	400300
TR1206	COIL	TL299	S.P.RADIO	6-0-23121A	400299

CIRCUIT DESCRIPTIONS AND SCHEMATIC DIAGRAMS

T1130/T1135

T1130/T1135
4-0-23244D 4-6-23244A



View from component side with
with lower side tracks.

OK

DRIVE LEVEL/RE6,

DRIVE LEVEL,

OPEN TX,

TUNE,

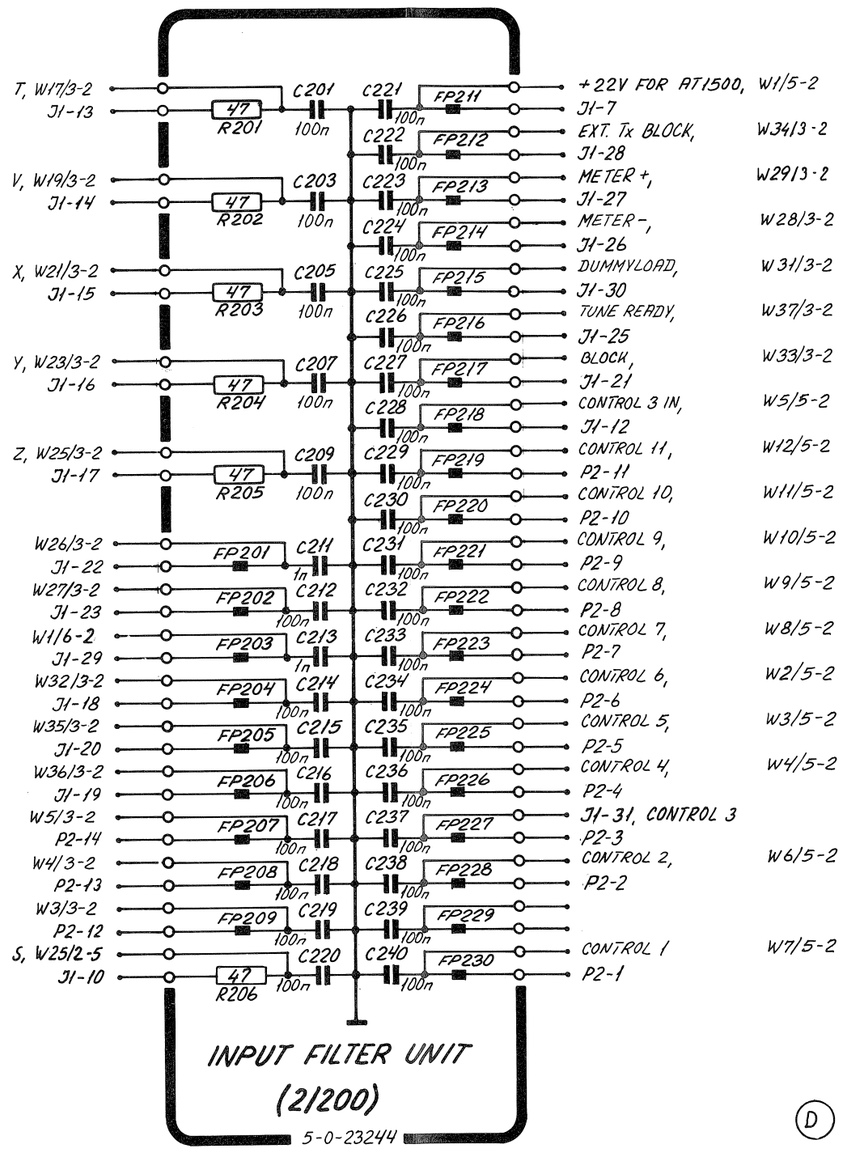
TRANSMITTER START,

TUNE LAMP,

AERIAL CURRENT,

MOTOR/AERIAL CURRENT,

INVALID TUNING /180°,



(D)

INPUT FILTER UNIT (MODULE 2/200)

CIRCUIT DESCRIPTION TRANSMITTER CONTROL UNIT

The transmitter control unit consists of four circuits:

Meter switch S301
Drive level and filter selector
Tune logic
VSWR calculator, protection circuit

METER SWITCH

By means of the meter switch it is possible to switch the aerial current meter between aerial current, power and standing wave ration.
The aerial current detector is placed inside the aerial coupler AT1500. The detector gives a DC output voltage which is led to the transmitter control unit W4/3-2 and W5/3-2.
The meter sensitivity for small currents is set by means of R301 and R302, and for higher currents, the diode D302 starts to conduct and thus reduces the meter sensitivity.
Power is measured by the directional coupler (400). The output voltage from module 400 is led to W41/3-2, and the meter sensitivity is set by R301a and R399. Full power is set to a meter reading of approx. 3 on the meter. When the output power is zero, the voltage on W41/3-2 is 1.5V. In order to get the meter to show zero, the diodes D321 and D322 are put in to give a voltage drop of 1.5V.
The standing wave ratio is calculated in the VSWR calculator and amplified in IC307c. VSWR = ∞ gives zero reading on the meter and is adjusted by R318a. VSWR = 1 gives max. reading and is adjusted by R329a. The meter shows zero reading until the output power is more than 20W. This is controllled by the comparator IC311d.

DRIVE LEVEL AND FILTER SELECTOR

The exciter gives a five bit frequency band code T,V,X,Y,Z. This code is decoded in IC301 into one four bit code and one three bit code. The last output from IC301 gives a block output when T,V,X,Y,Z is either one or zero. The four bit code goes to IC303 which is a 4 to 10 line decoder, selecting one of the nine drive level potentiometers. The three bit code goes to IC302, which is a 4 to 10 line decoder, selecting one of the 6 relays for lowpass filter switching on module 400. For the code see table 1.

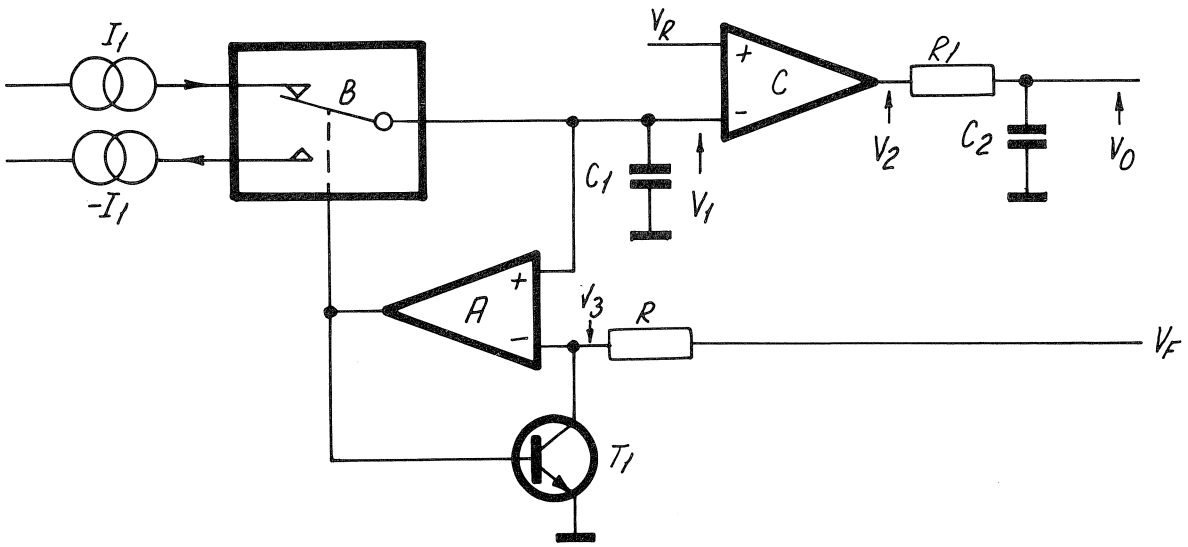
TUNE LOGIC

The tune logic takes care of controlling the tune sequence and blocking of the power supply to the PA-module.
A tune sequence always starts with a tune signal from the exciter on W32/3-2. The tune signal resets the tune logic and starts up the tune sequence. In the aerial coupler AT1500 there are some presettings, which are set by the tuner control unit, and a variometer controlled by a motor. When tuning, this motor drives the variometer. For every half turn, the variometer takes the same value. If we now look at the VSWR at the output of the power amplifier it will variate and reach the same value every half turn. If now the presettings are set correct, resonance in AT1500 will occur for every half turn, and VSWR will have a minimum value. This minimum value is compared with a reference value from the reference counter IC318.

On the first full turn it will be VSWR = 1.5; on the next it will be VSWR = 1.7, and so on.
When the VSWR, measured at the output of the PA module, is less than the reference VSRW from IC318, the tune sequence will stop.
On the next pages you will find the block diagram and a time table showing tune and blocking sequences.
When the transmitter is blocked, the tune lamp on the exciter will wink to indicate that the transmitter is blocked. To cancel the blocking of the transmitter, a tune pulse is needed.
When the transmitter under an automatic tune-up procedure is unable to find a VSWR less than 5, the tune lamp will start to wink. But the transmitter will still be able to transmit with reduced power.

VSWR CALCULATOR, PROTECTION CIRCUIT
The VSWR calculator consists of IC316, IC317, IC311a, IC311b, and T318. Actually it is not calculating the VSWR but it is calculating the reflection coefficient $\rho = \frac{VR}{V_F}$. V_R = reflected voltage and V_F = forward voltage from the directional coupler (400).

BLOCK DIAGRAM OF THE DIVIDER

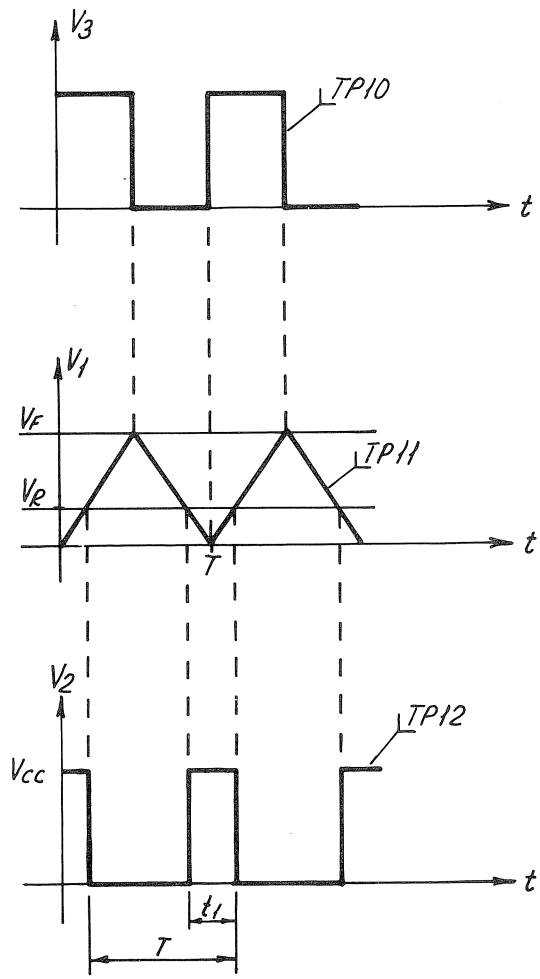


C_1 is charged (IC316b, T317) or discharged (IC316a, T316) with a constant current, depending on the position of the analog switch B (IC317) which is controlled by the comparator A.
When V_1 is less than V_F, C_1 is charged with I_1 until $V_1 = V_F$. Then B switches and C_1 is decharged with $-I_1$, and T_1 is switched on.
C_1 is decharging until $V_1 = 0$. V_1 is now a triangle wave with a period time T depending on V_F, $T = \frac{2 \times VF \times C1}{I_1}$ (see wave forms below).

V_1 is compared with V_R in comparator C (IC311b). The output V_2 has the same period time as V_1 and a pulse with T_1 depending on V_R, $T_1 = \frac{2 \times VR \times C1}{I_1}$ (see wave forms below).

V_2 is fed into mean value detector R_1 and C_2. The mean value of V_2 is $\frac{Vcc \times T1}{T} = Vcc \times \frac{VR}{V_F} = Vo$.

This means that Vo is proportional to $\frac{VR}{V_F}$. Below is shown the wave forms with numbers referring to the diagram.



CIRCUIT DESCRIPTION TRANSMITTER CONTROL UNIT cont.:

V_2 is mean value rectified (R321a, C320) and then fed to the meter amplifier (IC307c). The meter amplifier inverts the mean value, so when $Vcc \times \frac{VR}{V_F} = 0$, then the output voltage is 13.5V, and when $Vcc \times \frac{VR}{V_F} = Vcc$, the output voltage is zero.

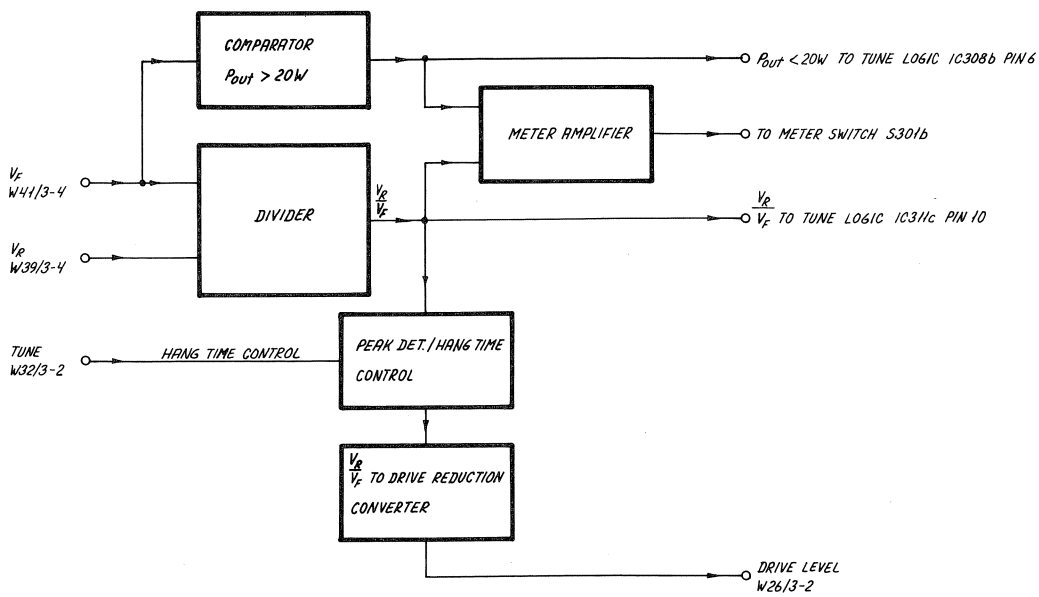
V_2 is also mean value rectified by R324a and C321 and fed into a peak value detector (IC307b, T321), the hang time is controlled by T320, T319. When tuning, T320 is off and C323 is determining the hang time. When no tuning, T320 is on, and the hang time is controlled by C322, giving a long hang time. Thus when speaking to the microphone, the output voltage of the peak detector is constant.

The output of the peak detector is fed to a voltage to current converter (IC307a), T322). The output of this is connected to the drive level adjusting circuit. When the current floating through T322 is zero, the drive level is max. When the current floating through T322 is 23 mA, the drive level is reduced approx. 10 dB.

IC311d is a comparator and the output of this is zero, when $V_F \leq 1.6V$ Pout $\leq$ 20W. When P > 20W, the output goes high and thus allows the tuning logic to use the VSWR.

T1130/T1135 B
4-0-24123

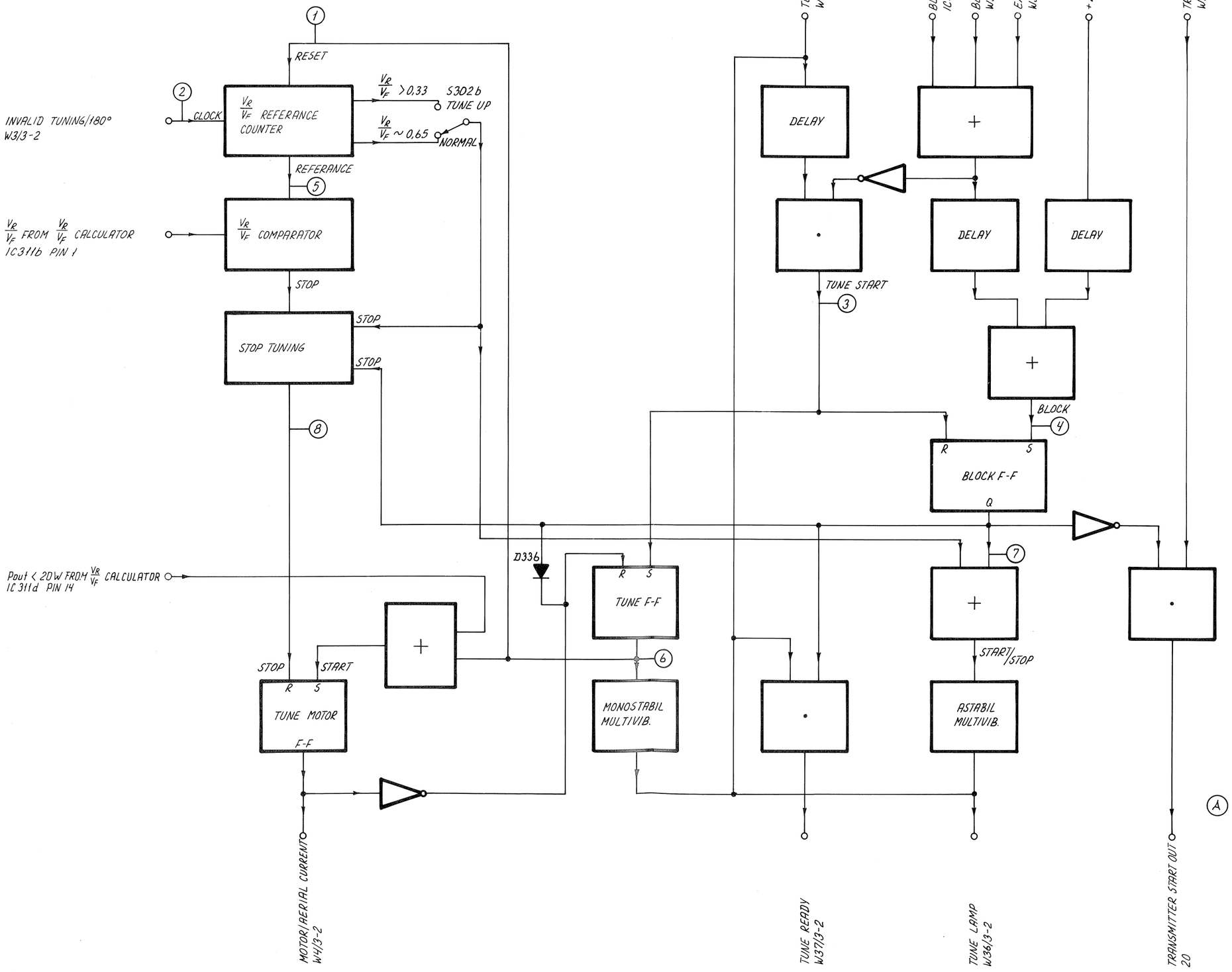
BLOCK DIAGRAM WSWR CALCULATOR



T1130 A\T1135 A
4-0-24124A 4-0-24125A

BLOCK DIAGRAM
TUNE LOGIC

VALID FROM SERIAL No. 307246



TIME TABLE FOR 1

BLOCK, W33/3-2 · · · · ·
EXT. BLOCK, W34/3-2 · ·
+22V · · · · · · · · ·
TUNE, W32/3-2 · · · · ·
TUNE LAMP, W36/3-2 · ·
TUNE READY · · · · ·
INVALID TUNING/180°, W3/3
MOTOR/AERIAL CURRENT ·
(1) RESET TO REFERANCE CL
(2) CLOCK TO REFERANCE C
(3) TUNE START · · · · ·
(4) BLOCK · · · · · · ·
(0) V_{cc} BLOCK · · · · ·

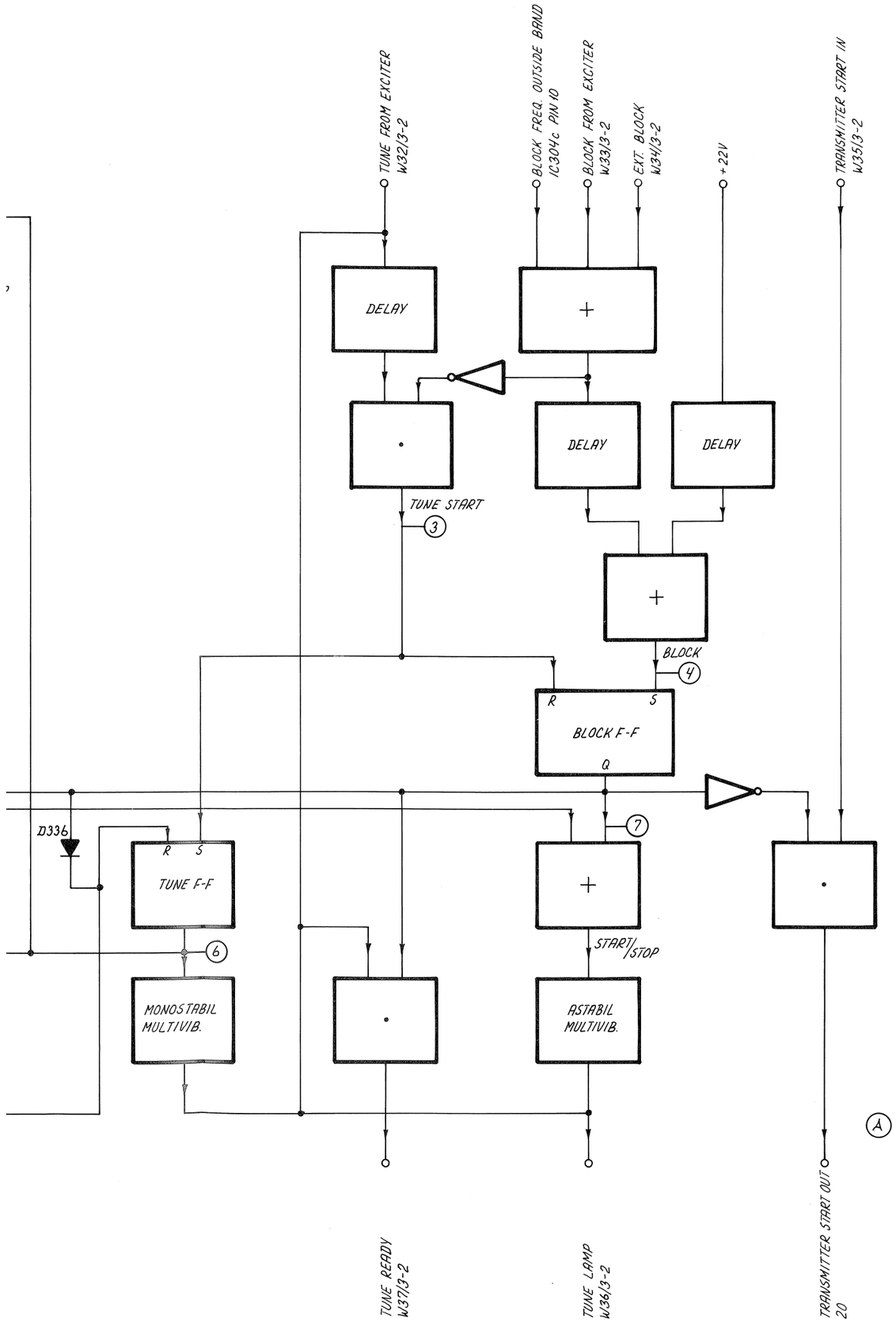
(5) REFERANCE · · · · ·
(6) · · · · · · · · · ·
(7) · · · · · · · · · ·
(8) · · · · · · · · · ·
TRANSMITTER START IN ·
TRANSMITTER START OUT ·

(9) $\frac{V_R}{V_F}$ · · · · · · · ·

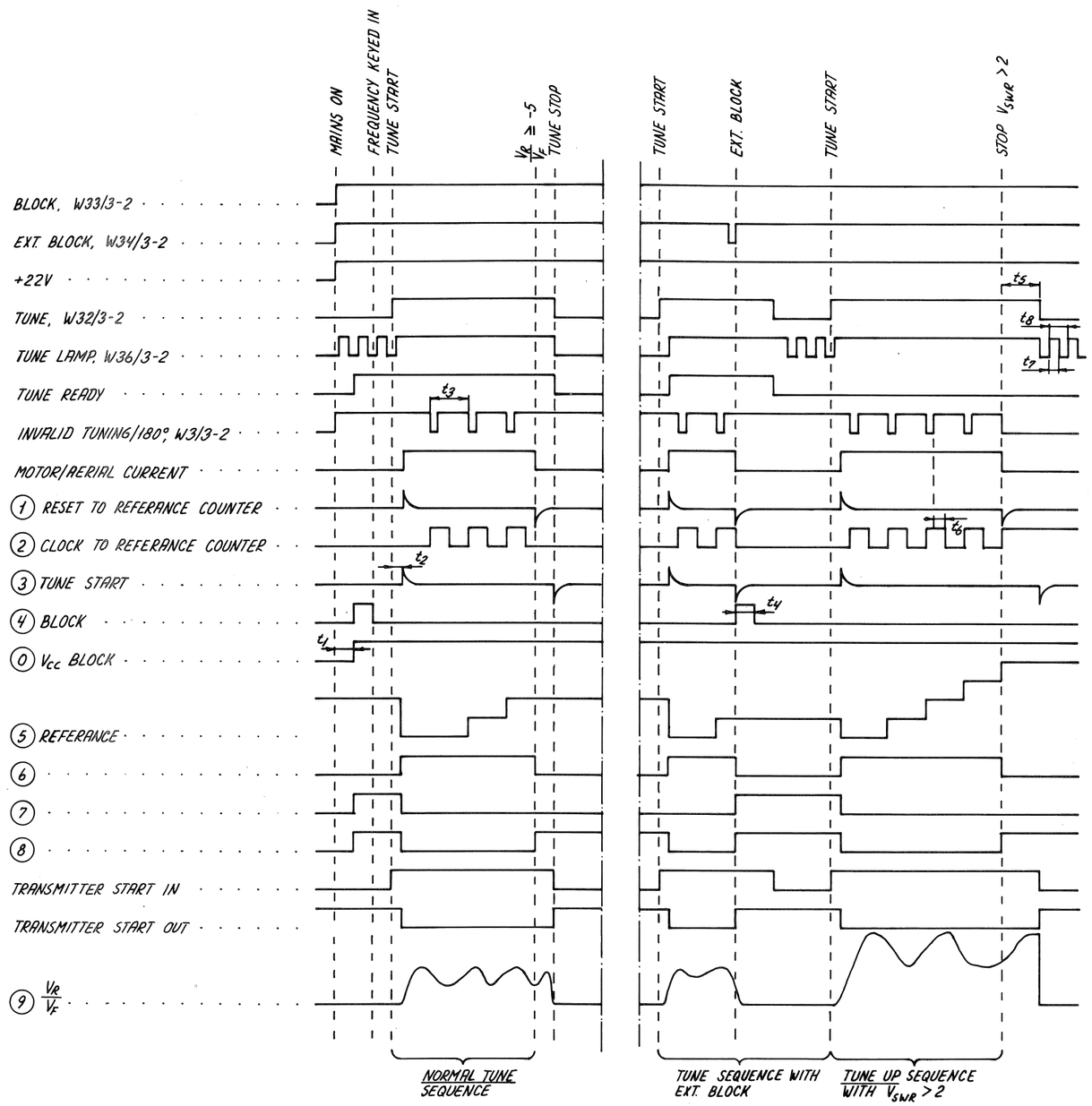
Table 1a. Standard Prom. (check sum: 06B6)

Frequency MHz	Z Y X V T	Output of IC301 pin number: 1 2 3 4 5 6 7 9	Selected drive level potentiometer	Low-pass filter
1.6 - 1.799	1 0 1 1 0	0 0 0 0 1 0 1 0	R330	7
1.8 - 1.999	1 0 0 0 1	0 0 0 0 1 0 1 0	R330	7
2.0 - 2.199	0 1 0 0 0	0 0 0 0 1 0 1 0	R330	7
2.2 - 2.399	0 0 0 0 1	0 0 0 0 1 0 1 0	R330	7
2.4 - 2.599	0 0 0 1 1	0 0 0 0 1 0 1 0	R330	7
2.6 - 2.799	0 0 1 0 0	0 0 0 0 1 1 0 0	R330	8
2.8 - 2.999	0 0 1 0 1	0 0 0 0 1 1 0 0	R330	8
3.0 - 3.099	1 0 0 1 0	0 0 0 0 1 1 0 0	R330	8
3.1 - 3.399	1 0 0 1 1	0 0 0 0 1 1 0 0	R330	8
3.4 - 3.699	1 0 1 0 0	0 0 0 0 1 1 0 0	R330	8
3.7 - 3.999	1 0 1 0 1	0 0 0 0 1 1 0 0	R330	8
4.0 - 4.299	0 0 1 1 0	1 0 0 0 1 1 0 0	R328	8
4.3 - 4.599	0 0 1 1 1	1 0 0 0 0 1 0 0	R328	4
4.6 - 4.999	0 0 0 1 0	1 0 0 0 0 1 0 0	R328	4
5.0 - 5.499	1 1 0 1 1	1 0 0 0 0 1 0 0	R328	4
5.5 - 5.999	1 0 1 1 1	1 0 0 0 0 1 0 0	R328	4
6.0 - 6.399	0 1 0 0 1	0 1 0 0 0 1 0 0	R326	4
6.4 - 6.999	0 1 0 1 0	0 1 0 0 0 1 0 0	R326	4
7.0 - 7.599	1 1 0 0 0	1 1 0 0 0 1 0 0	R324	4
7.6 - 7.999	1 1 0 0 1	1 1 0 0 0 1 0 0	R324	4
8.0 - 8.499	0 1 0 1 1	1 1 0 0 0 1 0 0	R324	4
12.3 - 12.699	0 1 1 0 0	0 0 1 0 1 0 0 0	R322	5
16.4 - 16.899	0 1 1 0 1	1 0 1 0 1 0 0 0	R320	5
22.0 - 22.399	0 1 1 1 0	0 1 1 0 0 0 0 0	R318	6
25.0 - 25.199	1 1 0 1 0	1 1 1 0 0 0 0 0	R316	6
2.182 Fixed	1 0 0 0 0	0 0 0 0 1 0 1 0	R330	7
Block	0 0 0 0 0	1 1 1 1 1 1 1 1		
Block	1 1 1 1 1	1 1 1 1 1 1 1 1		
Spare	0 1 1 1 1	0 0 0 1 0 0 0 0	R314	6
Spare	1 1 1 0 0	0 0 0 1 0 0 0 0	R314	6
Spare	1 1 1 0 1	0 0 0 1 0 0 0 0	R314	6
Spare	1 1 1 1 0	0 0 0 1 0 0 0 0	R314	6

T1135



TIME TABLE FOR TUNING SEQUENCE



$38mS < t_1 < 163mS$
$25mS < t_2 < 108,8mS$
$3s < t_3 < 7s$
$0,5mS < t_4 < 2mS$

$0,5S < t_5 < 1,6S$
$210mS < t_6 < 350mS$
$0,35S < t_7 < 1S$
$0,5S < t_8 < 1,8S$

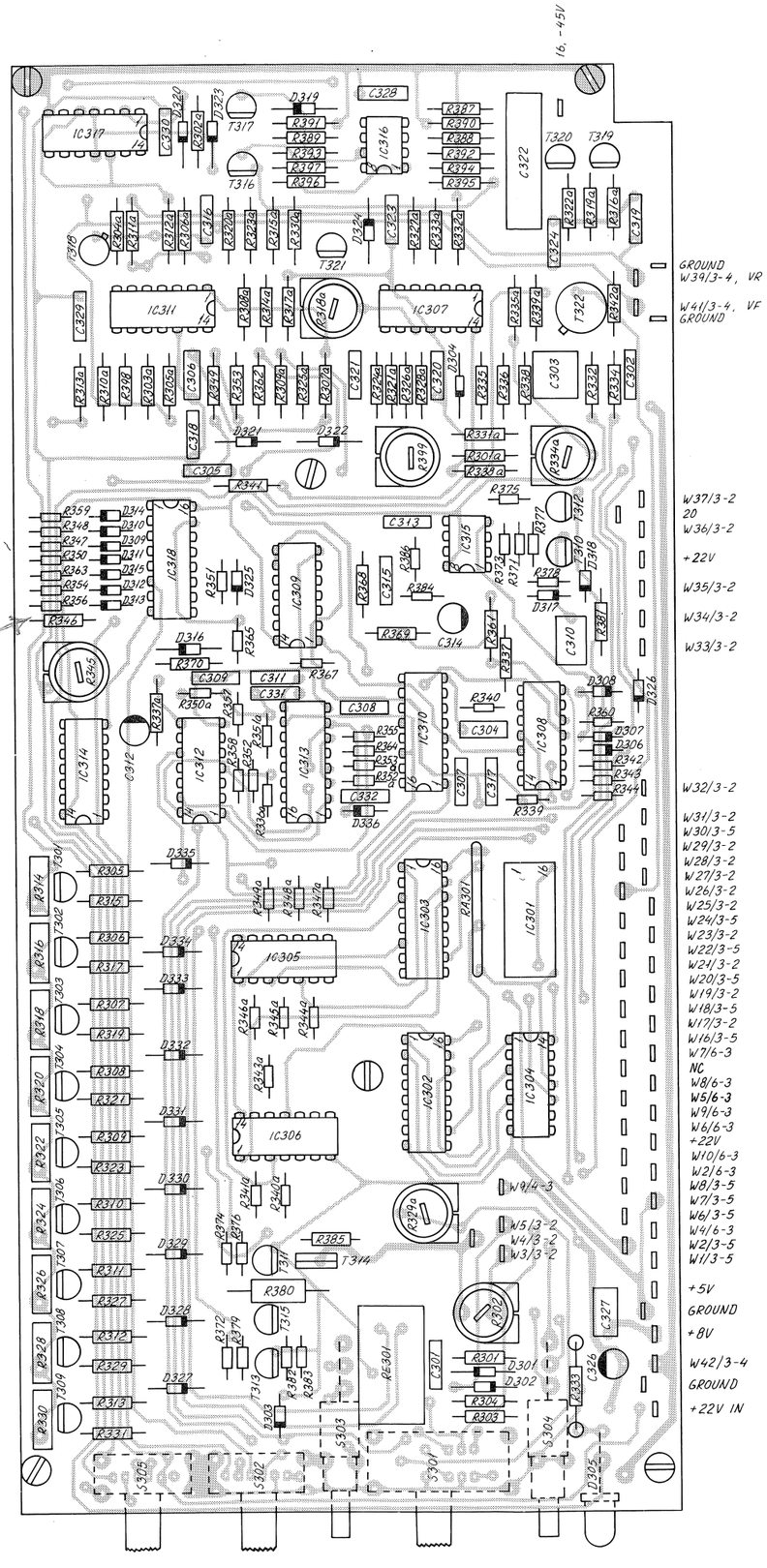
Table 1a. Standard Prom. (check sum: 06B6)

Frequency MHz	Z Y X V T	Output of IC301 pin number: 1 2 3 4 5 6 7 9	Selected drive level potentiometer	Low-pass filter
1.6 - 1.799	1 0 1 1 0	0 0 0 0 1 0 1 0	R330	7
1.8 - 1.999	1 0 0 0 1	0 0 0 0 1 0 1 0	R330	7
2.0 - 2.199	0 1 0 0 0	0 0 0 0 1 0 1 0	R330	7
2.2 - 2.399	0 0 0 0 1	0 0 0 0 1 0 1 0	R330	7
2.4 - 2.599	0 0 0 1 1	0 0 0 0 1 0 1 0	R330	7
2.6 - 2.799	0 0 1 0 0	0 0 0 0 1 1 0 0	R330	8
2.8 - 2.999	0 0 1 0 1	0 0 0 0 1 1 0 0	R330	8
3.0 - 3.099	1 0 0 1 0	0 0 0 0 1 1 0 0	R330	8
3.1 - 3.399	1 0 0 1 1	0 0 0 0 1 1 0 0	R330	8
3.4 - 3.699	1 0 1 0 0	0 0 0 0 1 1 0 0	R330	8
3.7 - 3.999	1 0 1 0 1	0 0 0 0 1 1 0 0	R330	8
4.0 - 4.299	0 0 1 1 0	1 0 0 0 1 1 0 0	R328	8
4.3 - 4.599	0 0 1 1 1	1 0 0 0 0 1 0 0	R328	4
4.6 - 4.999	0 0 0 1 0	1 0 0 0 0 1 0 0	R328	4
5.0 - 5.499	1 1 0 1 1	1 0 0 0 0 1 0 0	R328	4
5.5 - 5.999	1 0 1 1 1	1 0 0 0 0 1 0 0	R328	4
6.0 - 6.399	0 1 0 0 1	0 1 0 0 0 1 0 0	R326	4
6.4 - 6.999	0 1 0 1 0	0 1 0 0 0 1 0 0	R326	4
7.0 - 7.599	1 1 0 0 0	1 1 0 0 0 1 0 0	R324	4
7.6 - 7.999	1 1 0 0 1	1 1 0 0 0 1 0 0	R324	4
8.0 - 8.499	0 1 0 1 1	1 1 0 0 0 1 0 0	R324	4
12.3 - 12.699	0 1 1 0 0	0 0 1 0 1 0 0 0	R322	5
16.4 - 16.899	0 1 1 0 1	1 0 1 0 1 0 0 0	R320	5
22.0 - 22.399	0 1 1 1 0	0 1 1 0 0 0 0 0	R318	6
25.0 - 25.199	1 1 0 1 0	1 1 1 0 0 0 0 0	R316	6
2.182 Fixed	1 0 0 0 0	0 0 0 0 1 0 1 0	R330	7
Block	0 0 0 0 0	1 1 1 1 1 1 1 1		
Block	1 1 1 1 1	1 1 1 1 1 1 1 1		
Spare	0 1 1 1 1	0 0 0 1 0 0 0 0	R314	6
Spare	1 1 1 0 0	0 0 0 1 0 0 0 0	R314	6
Spare	1 1 1 0 1	0 0 0 1 0 0 0 0	R314	6
Spare	1 1 1 1 0	0 0 0 1 0 0 0 0	R314	6

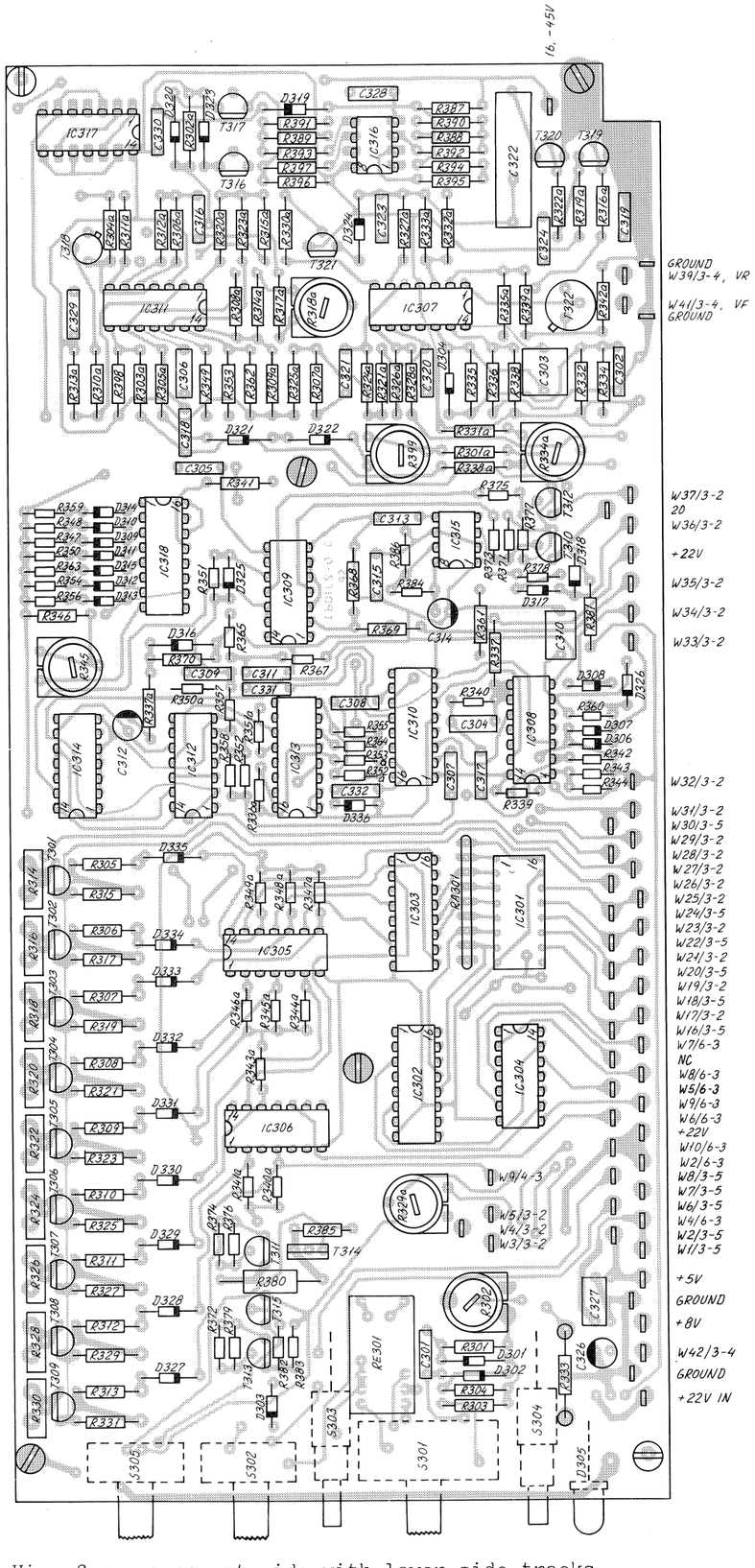
T1135

Table 1b. Continuously covering - Prom. (check sum: 053A)

Frequency MHz	Z Y X V T	Output of IC301 pin number 1 2 3 4 5 6 7 9	Selected drive level potentiometer	Low pass filter
1.6 - 1.999	1 0 1 1 0	0 0 0 0 1 0 1 0	R330	7
2.0 - 2.199	0 1 0 0 0	0 0 0 0 1 0 1 0	R330	7
2.2 - 2.599	1 0 0 0 1	0 0 0 0 0 0 1 0	R330	7
2.6 - 2.999	0 0 0 0 1	0 0 0 0 1 1 0 0	R330	8
3.0 - 3.099	0 0 0 1 1	0 0 0 0 1 1 0 0	R330	8
3.1 - 3.699	0 0 1 0 0	0 0 0 0 1 1 0 0	R330	8
3.7 - 3.999	0 0 1 0 1	0 0 0 0 1 1 0 0	R330	8
4.0 - 4.299	1 0 0 1 0	1 0 0 0 1 1 0 0	R328	8
4.3 - 4.999	1 0 0 1 1	1 0 0 0 0 1 0 0	R328	4
5.0 - 5.999	1 0 1 0 0	1 0 0 0 0 1 0 0	R328	4
6.0 - 6.999	1 0 1 0 1	0 1 0 0 0 1 0 0	R326	4
7.0 - 7.999	0 0 1 1 0	0 1 0 0 0 1 0 0	R326	4
8.0 - 8.499	0 0 1 1 1	1 1 0 0 0 1 0 0	R324	4
8.5 - 8.999	0 0 0 1 0	1 1 0 0 1 0 0 0	R324	5
9.0 - 9.999	1 1 0 1 1	0 0 1 0 1 0 0 0	R322	5
10.0 - 10.999	1 0 1 1 1	0 0 1 0 1 0 0 0	R322	5
11.0 - 11.999	0 1 0 1 0	0 0 1 0 1 0 0 0	R322	5
12.0 - 12.999	1 1 0 0 0	0 0 1 0 1 0 0 0	R322	5
13.0 - 13.999	1 1 0 0 1	0 0 1 0 1 0 0 0	R322	5
14.0 - 14.999	0 1 0 1 1	1 0 1 0 1 0 0 0	R320	5
15.0 - 15.999	0 1 1 0 0	1 0 1 0 1 0 0 0	R320	5
16.0 - 16.999	0 1 1 0 1	1 0 1 0 1 0 0 0	R320	5
17.0 - 17.999	1 1 1 1 0	0 1 1 0 0 0 0 0	R318	6
18.0 - 19.999	0 1 1 1 0	0 1 1 0 0 0 0 0	R318	6
20.0 - 21.999	1 1 0 1 0	1 1 1 0 0 0 0 0	R316	6
22.0 - 23.999	0 1 1 1 1	1 1 1 0 0 0 0 0	R316	6
24.0 - 25.999	1 1 1 0 0	0 0 0 1 0 0 0 0	R314	6
26.0 - 27.999	1 1 1 0 1	0 0 0 1 0 0 0 0	R314	6



View from component side with upper side tracks.

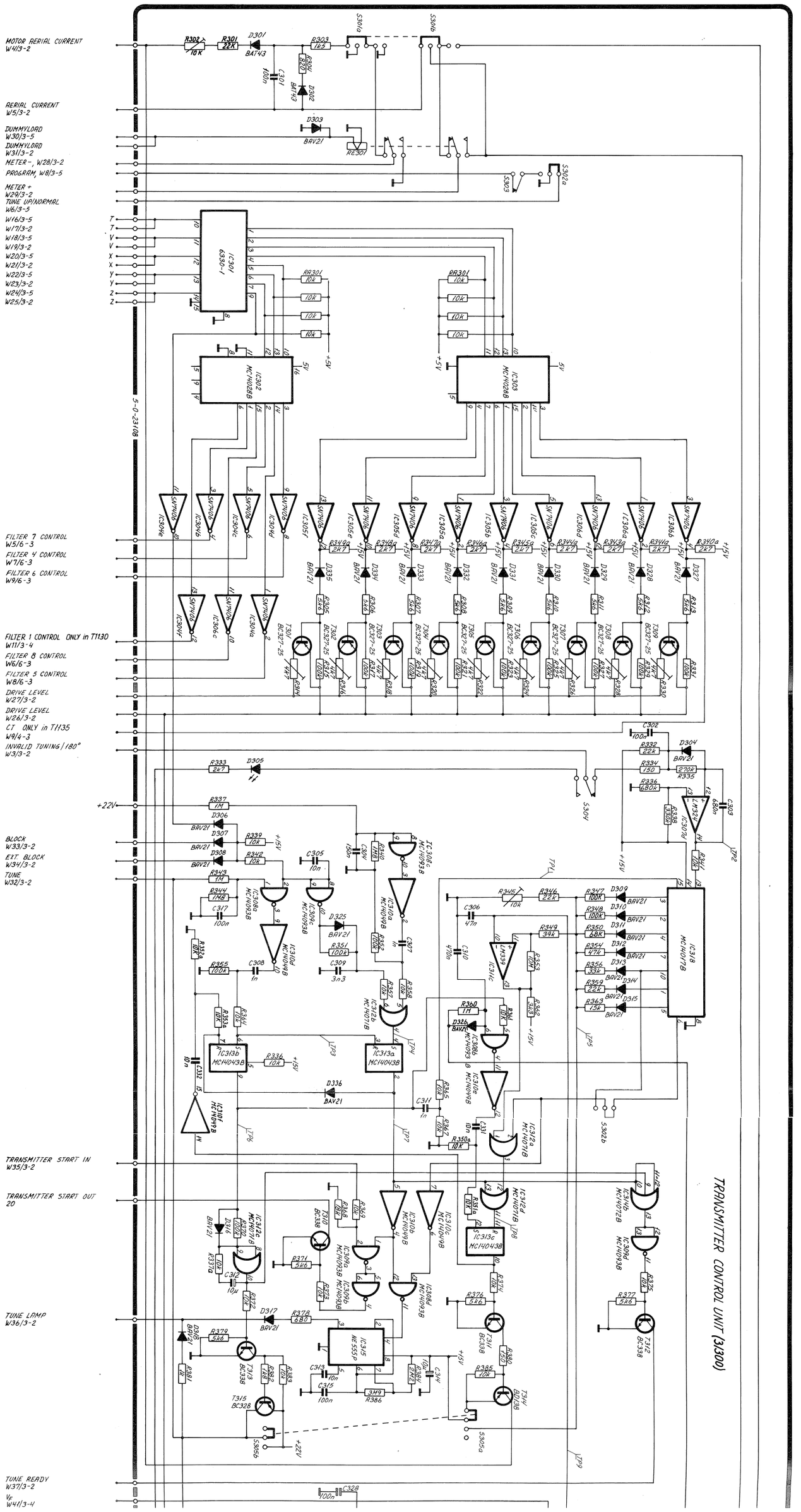


View from component side with lower side tracks.

TRANSMITTER CONTROL UNIT (MODULE 3/300)

T1135
4-6-23108J

T1130/T1135
4-0-23108G



CIRCUIT DESCRIPTION FOR COMBINER AND PROTECTION UNIT

This unit consists of three circuits:

1. Power splitter TR3, transformer TR4 and a 1 dB attenuator, which is activated when the transmitter is supplied from N1411.
   A power combiner TR1 and transformer TR2.

2. Temperature protection circuits for the output amplifiers. One circuit (IC1d, IC1c) protecting power unit 1, and one circuit (IC1a, IC1b) protecting power unit 2.
   The two circuits are then combined with the diodes D4, D5, D7, and D8.
   If the temperature of one power unit gets higher than 100°C the supply voltage to the power amplifiers will be reduced approx. 3 dB and the RF input will also be reduced with approx. 3 dB. If the temperature gets higher than 120°C the power supply will be blocked and the blowers will run continuously until the temperature gets below 115°C.
   The temperature sensors have a positive temperature coefficient and are placed in the bottum of a voltage divider. The voltage at pin 9 of IC1c will rise when the temperature of the sensor is rising. When the voltage at pin 9 gets higher than the voltage at pin 10 (+ = 100°C), then the output at pin 8 will change to zero. T2 will stop conducting and thus reduce the supply voltage for the power unit with approx. 3 dB. T5 will stop conducting and T6 will start conducting and activate the relays RE1201 at the inputs of the power units. This will reduce the driver by approx. 3 dB. When the temperature rises further the voltage at pin 13 of IC1d will get higher than the voltage at pin 12 (t = 120°C), then the output at pin 14 will change to zero.
   T3 will stop conducting. T4 will also stop conducting and the power supply to the power units will be blocked. The voltage comperators have a hysteresis of approx. 5°C.

3. This unit measures the forward travelling wave and the reflected wave (directional coupler) on the transmission line.
   The directional coupler consists of a current transformer TR5. This transformer is loaded with two times 50 ohm forming a center tap. The voltage across one of the 50 ohm loads is proportional to the current in the transmission line. Into the center tap a voltage is fed which is proportional to the voltage on the transmission line. The current ratio of the current transformer and the voltage ratio of the voltage divider are adjusted so that when the transmission line is loaded with 50 ohm, the voltage from the voltage divider is equal to the voltage across one of the 50 ohm loads in the current transformer. The voltage measured from ground to one end of the current transformer will be equal to zero (reflected voltage V_R) and at the other end the voltage will be two times the voltage across one 50 ohm load (forward voltage V_F).
   When the transmission line is misloaded the reflection coefficient will be equal to $\frac{VR}{VF}$.
   The V_F and V_R are detected with a quasi effective value detector (D9, C15, R48 and D10, C16, R49) which gives an output voltage proportional to the effective value of V_F and V_R. The output of the detector is buffered and peak rectified in IC2, the output voltage V_F and V_R are now DC-voltage proportional to the peak of the effective value of the voltage on the transmission line. This means that V_F^2 will be proportional to the peak envelope power. These two voltages are fed to the reflection coefficient calculator in the transmitter control unit.

TRANSMITTER CONTROL UNIT (3/300)

1V/Div. 10µsec/Div — 0V

1V/Div 10µsec/Div.

5V/Div 10µsec/Div

IC318 MC14017B

IC307d LM324

IC314b MC14072B

IC309d MC14093B

T312 BC338

IC312a MC14071B

IC312d MC14071B

IC313c MC14066B

IC313a MC14066B

IC313b MC14066B

IC310a MC14049B

IC310b MC14049B

IC310c MC14049B

IC310d MC14049B

IC310e MC14049B

IC310f MC14049B

IC308a MC14093B

IC308b MC14093B

IC308c MC14093B

IC308d MC14093B

IC309a MC14093B

IC309b MC14093B

IC309c MC14093B

IC312b MC14071B

IC312c MC14071B

IC315 NE555P

IC316a LM458

IC316b LM458

IC317 MC14007B

IC311a LM339

IC311b LM339

IC311c LM339

IC311d LM339

IC307a LM324

IC307b LM324

IC307c LM324

T310 BC338

T311 BC338

T312 BC338

T313 BC338

T314 BD138

T315 BC328

T316 BC338

T317 BC328

T318 2N2368

T319 BC338

T320 BC338

T321 BC338

T322 BC141-10

IC102 LM340T5

IC101 LM340T15

D301–D305 BAV21

D306–D308 BAV21

D309–D315 BAV21

D316 BAV21

D317 BAV21

D318 BAV21

D319 BZX79C15

D320 BAT43

D321 1N4148

D322 1N4148

D323 BAT43

D324 1N4148

D325 BAV21

D326 BAV21

S304

S305a

S305b

S302b

TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12

+15V +22V +8V +5V -15V -92V

1,6V 1,9V 4,6V 0,882V 0V

FILTER 6 CONTROL W6/6-3

FILTER 5 CONTROL W8/6-3

DRIVE LEVEL W27/3-2

DRIVE LEVEL W26/3-2

CT ONLY in T1/35 W9/4-3

INHIBIT TUNING (180°) W33/3-2

BLOCK W33/3-2

EXT. BLOCK W34/3-2

TUNE W32/3-2

TRANSMITTER START IN W35/3-2

TRANSMITTER START OUT 20

TUNE LAMP W36/3-2

TUNE READY W37/3-2

Vk W41/3-4

-15V 16

W7/3-5

W40/3-4

Vk W39/3-4

+5V W2/3-5

+8V 29 +8V W1/3-5

+22V +22V W9/3-4 +22V 28

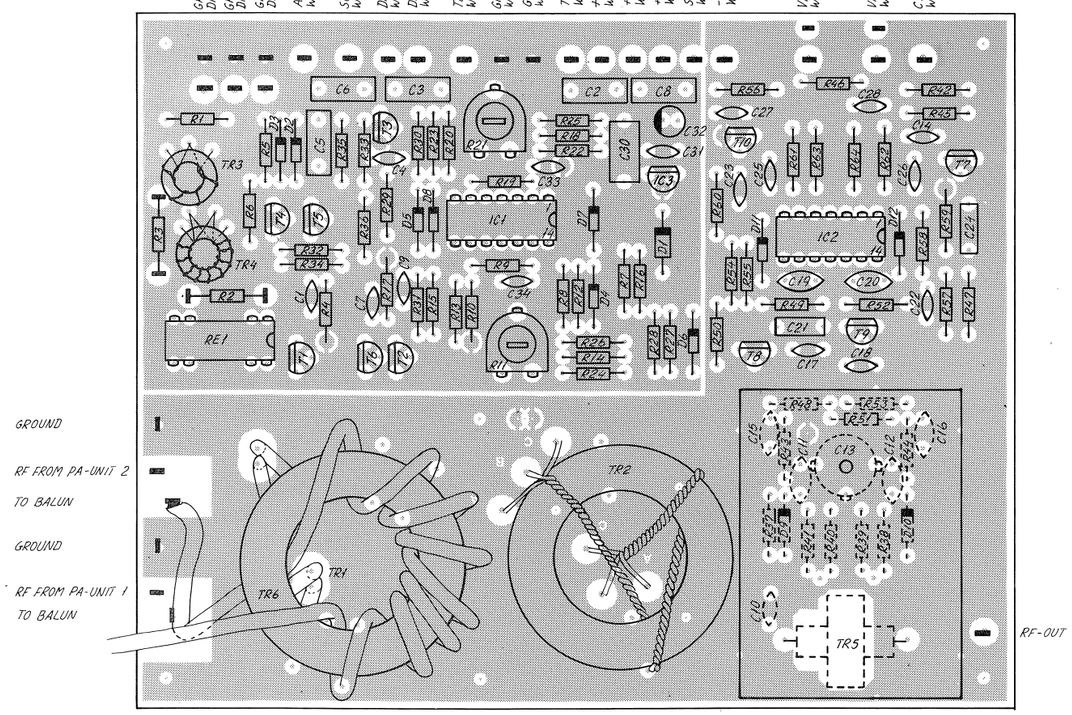
(G)

TEST CONDITIONS:

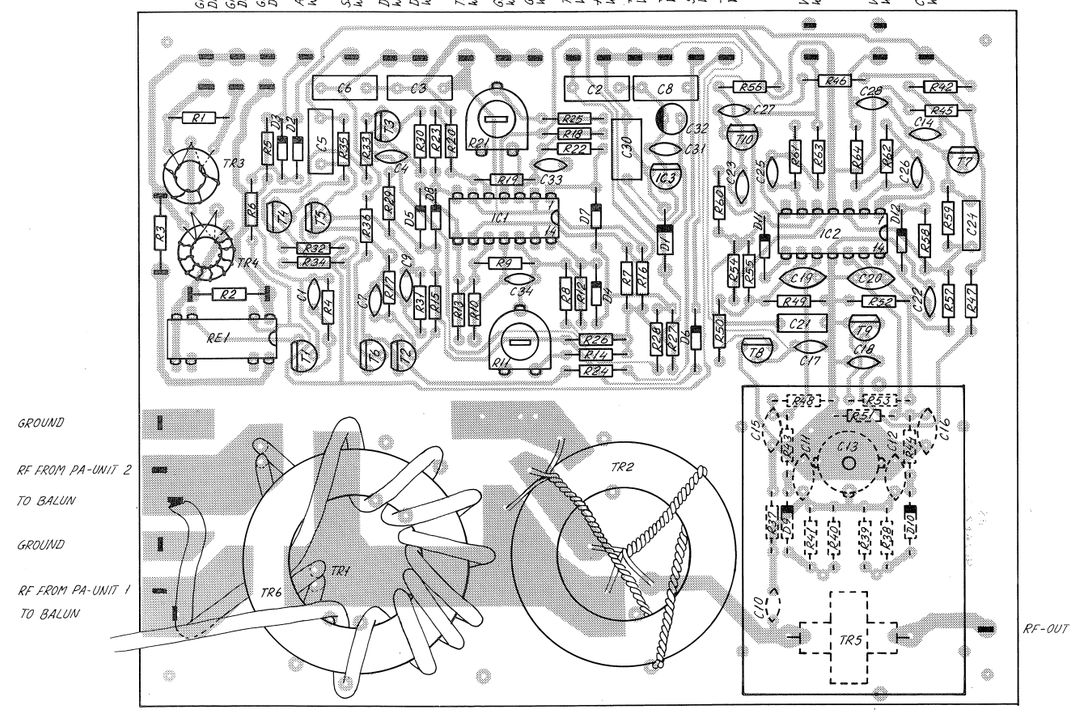
Frequency:	6.200 MHz
Mode:	TUNE T1135 connected to 50 ohm dummy load.
⦿ xxx V:	Measured with diode probe.
DC Voltmeter:	Measured without RF, meter input impedance ≥ 100 kohm.

TRANSMITTER CONTROL UNIT (MODULE 3/300)

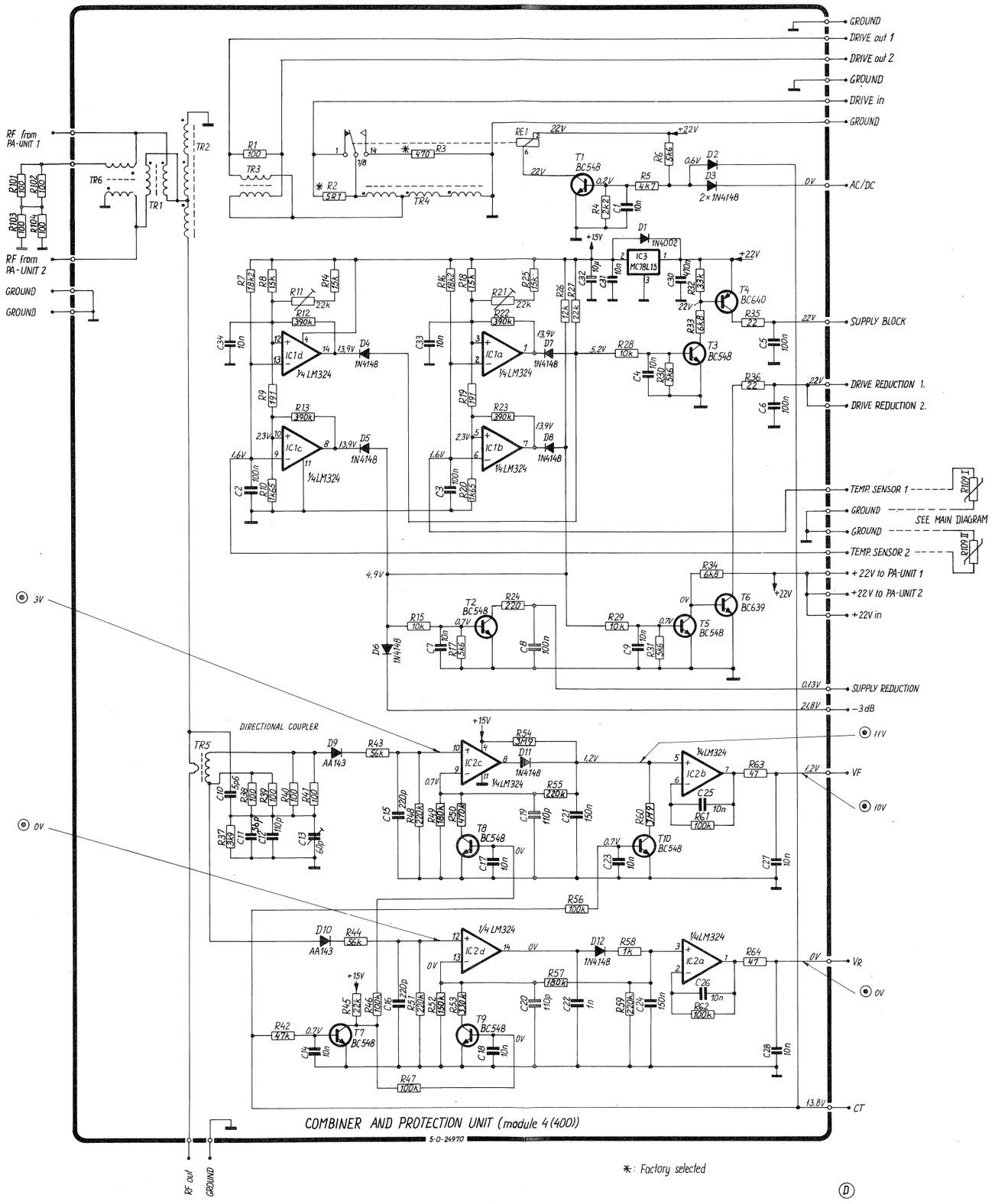
T1135 A
4-6-24970A, 4-0-24970D



View from component side with upper side tracks.



View from component side with lower side tracks.



TEST CONDITIONS:

Frequency:	6.200 MHz
Mode:	TUNE T1135 connected to 50 ohm dummy load.
◉ xxx V:	Measured with diode probe.
DC Voltmeter:	Measured without RF, meter input impedance ≥ 100 kohm.

COMBINER AND PROTECTION UNIT (MODULE 4/400)

CIRCUIT DESCRIPTION FOR TUNER CONTROL UNIT T1130/T1135

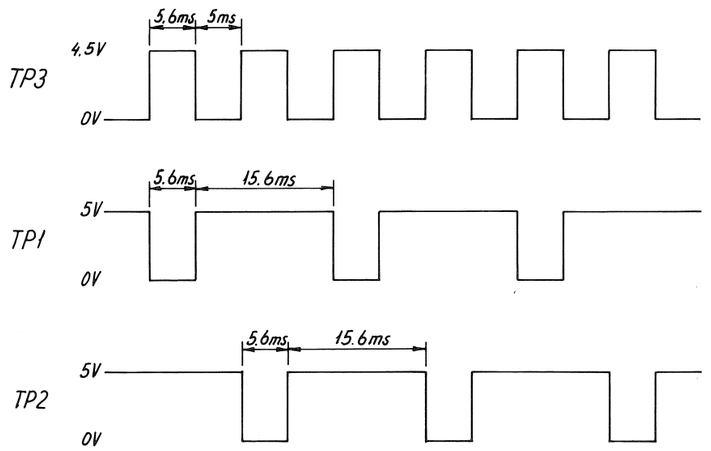
This unit takes care of controlling the presettings of the aerial coupler AT150X.

The input is a five bit bandcode coming from the exciter. This bandcode selects an address in the RAM IC505. Each address consists of two four bit words selected by pin 5. These two words are set by S501 RESONANCE and S502 LOAD. S501 and S502 are multiplexed into the RAM. The inputs and outputs of the RAM are connected in parallel. When programming the RAM pin 18 (output disable) is high (TUNE-UP position) and every time the push button PROGRAMME is activated pin 20 (read/write) goes low and the settings of S501/S502 are programmed into the RAM. If pin 18 is low (NORMAL position) it is not possible to programme the RAM. The multiplexing is controlled by a J-K flip-flop IC508 and IC509 as a clock generator. The outputs from the RAM go to two latches where the information are held so the outputs are steady (no multiplexing). The outputs from the latches go to two PROM's which converts the two times four bit codes to an eleven bit code for the presetting of the aerial coupler AT150X. Each output of the PROM's is buffered with two transistors.

When dummy load is selected there will be 22V on the wire dummy load (W 30/3-5) and T501 will conduct, and pin 14 on IC501/IC503 will be low. Now a special code will be set for AT150X, and AT150X will act as dummy load.

The power supply for the RAM consists of T524, T525, T526 and T527. The power supply is constructed so that, when switching on, pin 17 of the RAM is kept low, until pin 22 has reached 5V. When switching off, pin 17 will go low before the voltage on pin 22 drops. When switching off,the Litium Battery B501 will supply the RAM and all data in the RAM will be preserved. The Litium Battery will have a life of 9 years.

TIMING DIAGRAM

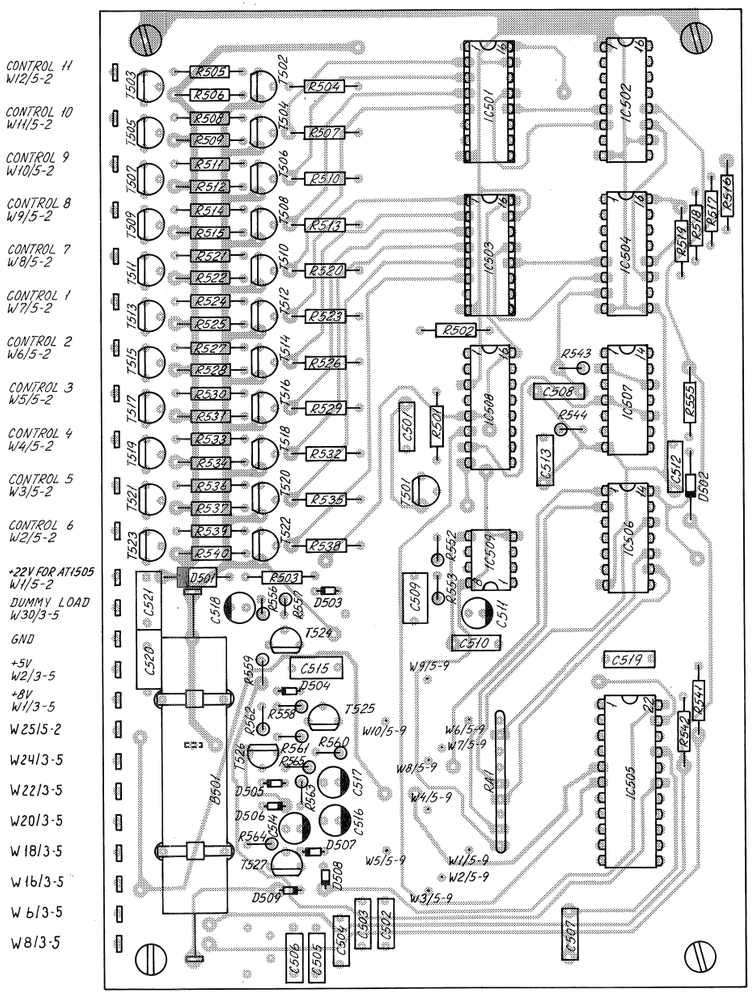


T11 35

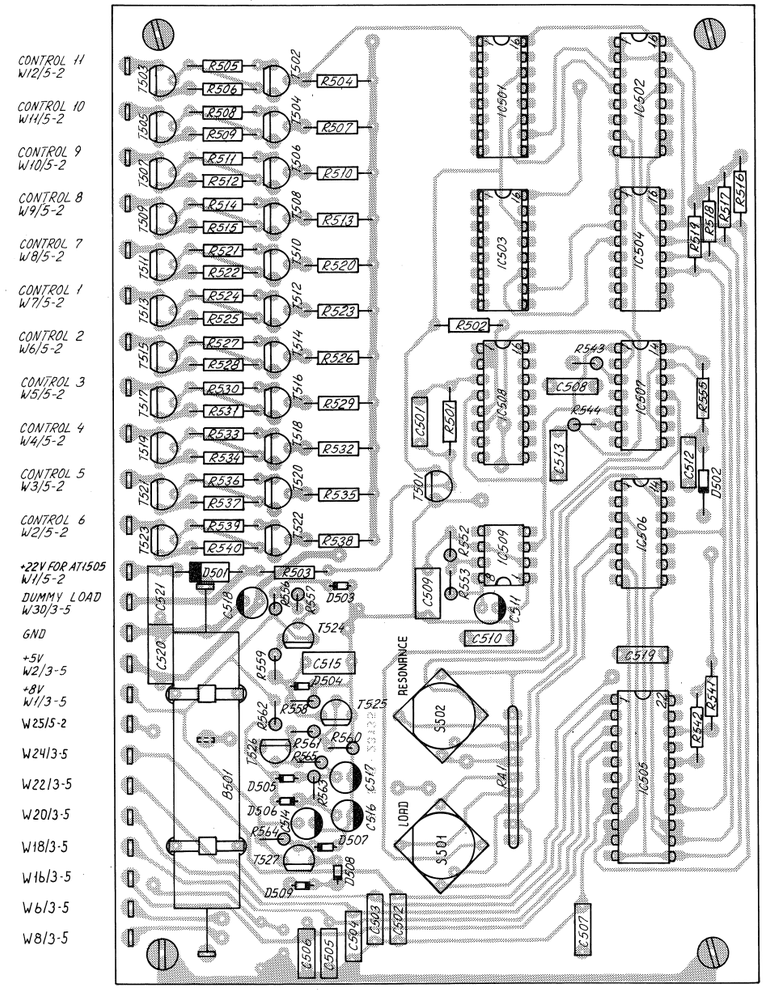
TUNER CONTROL UNIT (MODULE 5/500)

L/R SWITCHES (MODULE 9/900)

TUNER CONTROL UNIT (MODULE 5/500)

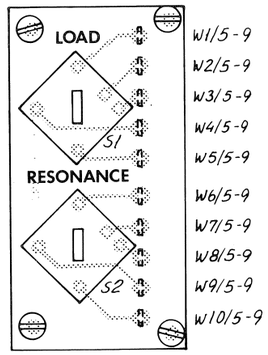


View from component side with upper side tracks.



View from component side with lower side tracks.

L/R SWITCHES (MODULE 9/900)



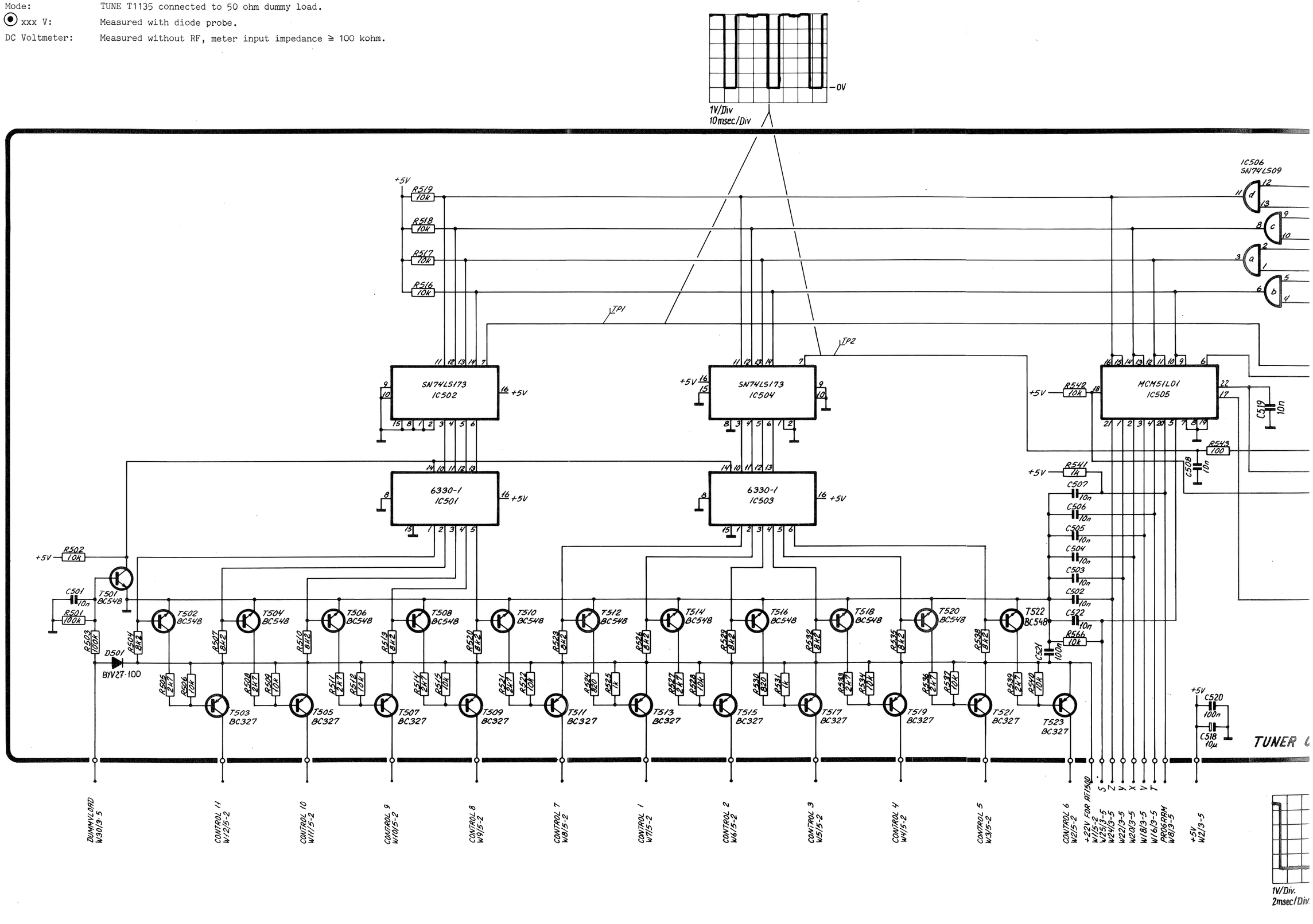
View from component side with lower side tracks.

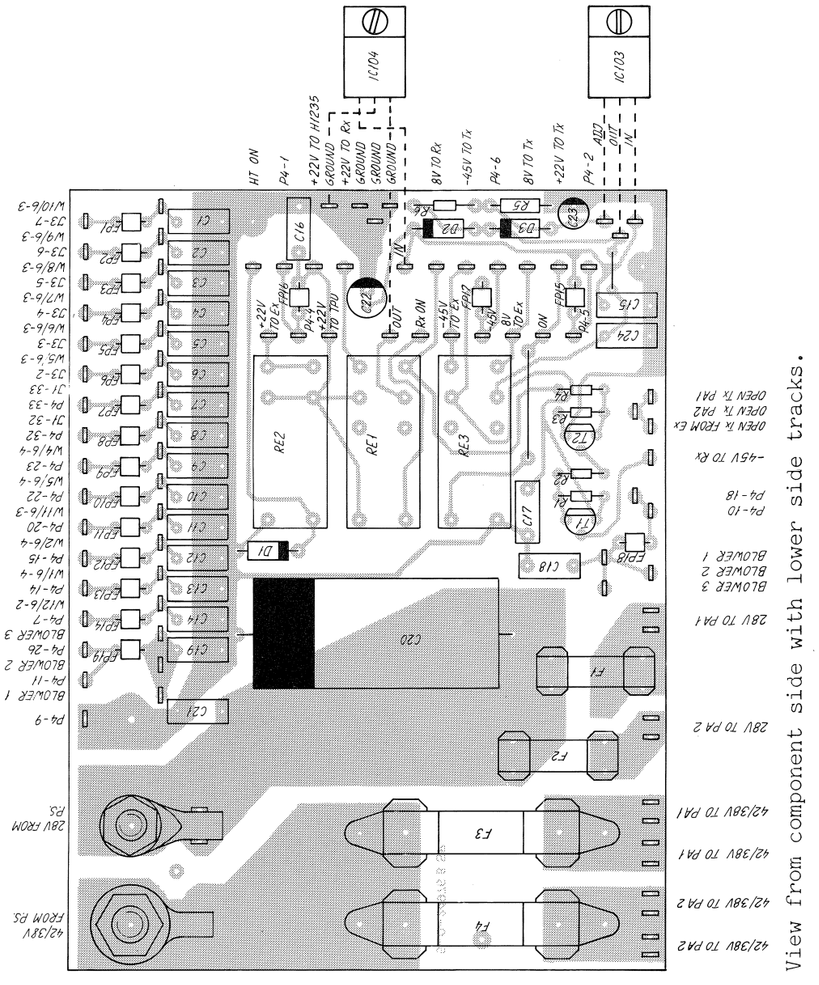
TUNER CONTROL UNIT (MODULE 5/500)
L/R SWITCHES (MODULE 9/900)

T1135 A
4-6-24972, 9-0-24972,
4-6-23135E

TEST CONDITIONS:

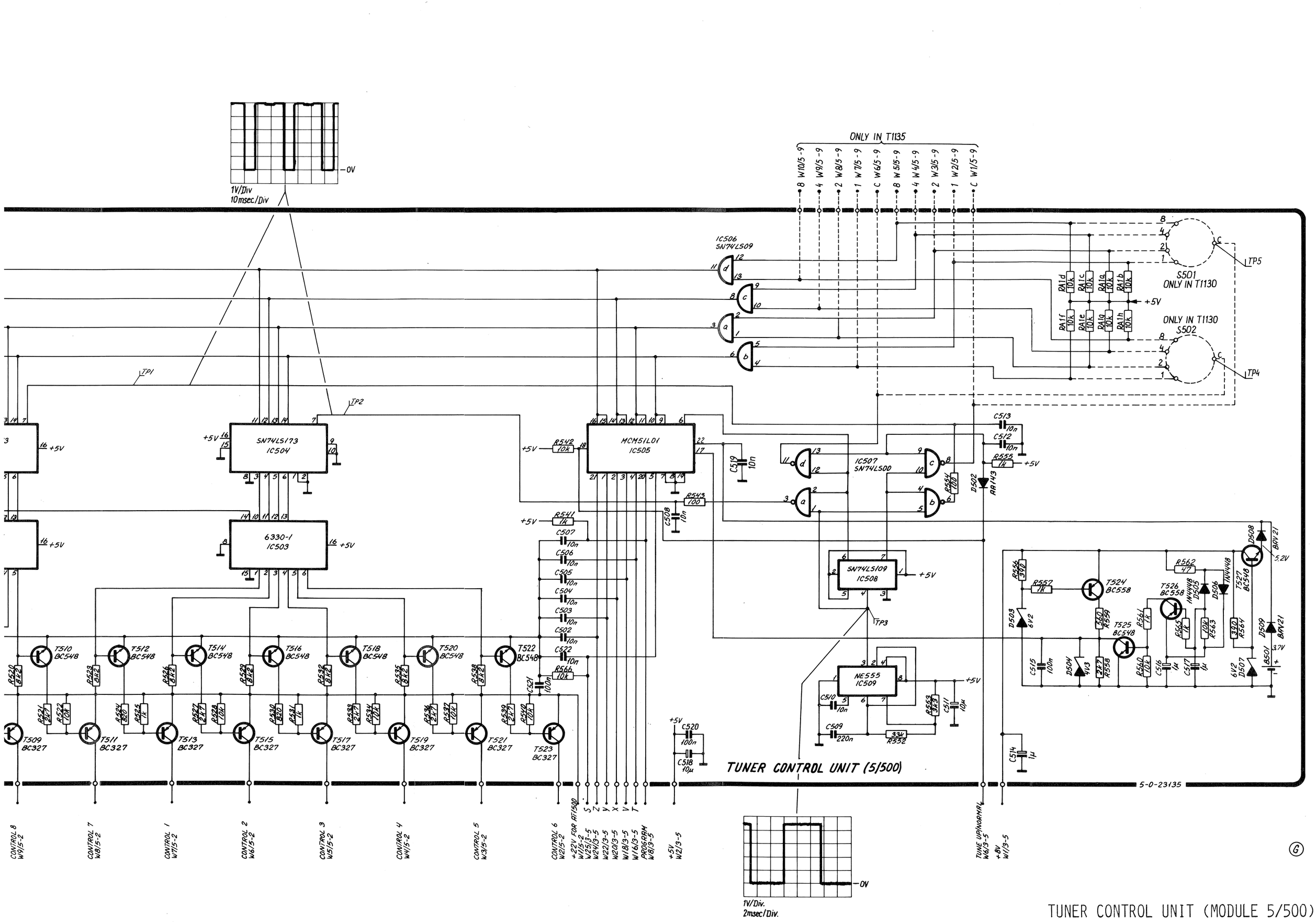
Frequency:	6.200 MHz
Mode:	TUNE T1135 connected to 50 ohm dummy load.
⦿ xxx V:	Measured with diode probe.
DC Voltmeter:	Measured without RF, meter input impedance ≧ 100 kohm.



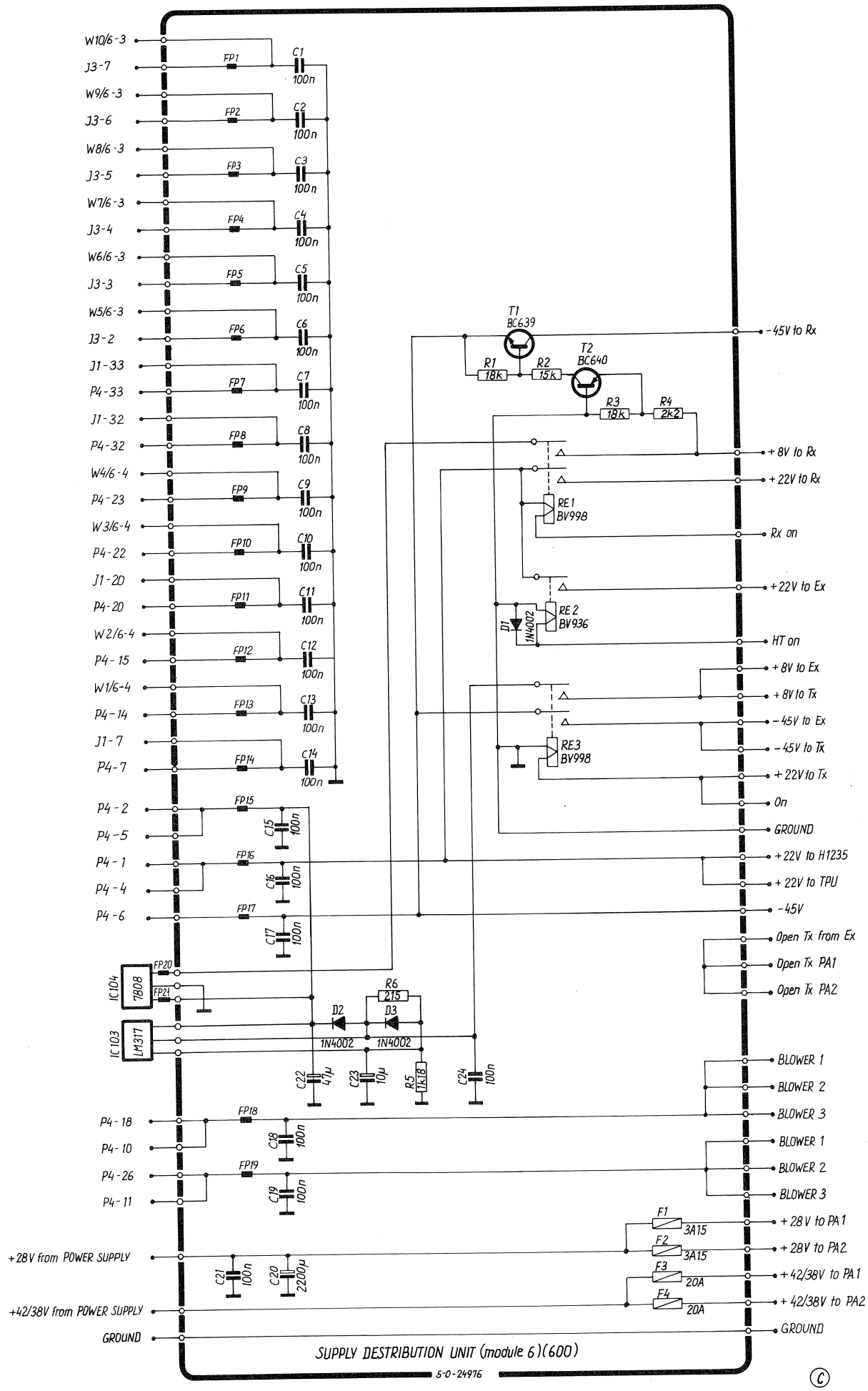


View from component side with lower side tracks.

SUPPLY DISTRIBUTION UNIT (MODULE 6/600)


0V
1V/Div
10msec/Div
ONLY IN T1135
W10/5-9
W9/5-9
W8/5-9
W7/5-9
W6/5-9
W5/5-9
W4/5-9
W3/5-9
W2/5-9
W1/5-9
IC506 SN74LS09
TP5
S501
ONLY IN T1130
RA1d 10k
RA1c 10k
RA1a 10k
RA1b 10k
+5V
RA1f 10k
RA1e 10k
RA1g 10k
RA1h 10k
ONLY IN T1130
S502
TP4
TP1
TP2
SN74LS173 IC504
6330-1 IC503
MCM5IL01 IC505
R542 10k
C519 10n
C513 10n
C512 10n
R555 1k
IC507 SN74LS00
R554 100
D502 AA143
R543 100
C508 10n
R541 1k
C507 10n
C506 10n
C505 10n
C504 10n
C503 10n
C502 10n
C522 10n
R566 10k
C521 100n
SN74LS109 IC508
TP3
NE555 IC509
C510 10n
C509 220n
33k R552
R553 3k3
C511 10µ
C520 100n
C518 10µ
T510 BC548
T512 BC548
T514 BC548
T516 BC548
T518 BC548
T520 BC548
T522 BC548
R520 2k2
R523 2k2
R526 2k2
R529 2k2
R532 2k2
R535 2k2
R538 2k2
R521 2k7
R522 10k
R524 820
R525 1k
R527 2k7
R528 10k
R530 820
R531 1k
R533 2k7
R534 10k
R536 2k7
R537 10k
R539 2k7
R540 10k
T509 BC327
T511 BC327
T513 BC327
T515 BC327
T517 BC327
T519 BC327
T521 BC327
T523 BC327
R556 390
R557 1k
T524 BC558
R562 47
T526 BC558
1N4448 D505
D506 1N4448
T527 BC548
D508 BAV21
5.2V
D503 6V2
R559 360
T525 BC548
R561 1k
R565 1k
R563 10k
R564 330
D509 BAV21
3.7V
B501
D504 4V3
R558 2k7
R560 10k
C516 1µ
C517 1µ
6V2 D507
C515 100n
C514 1µ
TUNER CONTROL UNIT (5/500)
5-0-23135
CONTROL 8 W9/5-2
CONTROL 7 W8/5-2
CONTROL 1 W7/5-2
CONTROL 2 W6/5-2
CONTROL 3 W5/5-2
CONTROL 4 W4/5-2
CONTROL 5 W3/5-2
CONTROL 6 W2/5-2
+22V FOR RF1500 W1/5-2
W25/3-5
W24/3-5
W22/3-5
W20/3-5
W18/3-5
W16/3-5
PROGRAM W8/3-5
+5V W2/3-5
TUNE UP/NORMAL W6/3-5
+8V W1/3-5
S
Z
Y
X
V
T
0V
1V/Div.
2msec/Div.
TUNER CONTROL UNIT (MODULE 5/500)

T1135 4-0-24976C



SUPPLY DISTRIBUTION UNIT (MODULE 6/600)

CIRCUIT DESCRIPTION PA-UNIT T1130/T1135

The power amplifier has a power gain of 45 dB.

The predriver is a push-pull class A amplifier, consisting of T1206 and T1207 with a power gain of 15 dB.

The transistors T1202 and T1203 are blocking transistors. When they are switched on, T1206 and T1207 are cut off and the gain is less than 0 dB. The predriver is blocked when open TX is low.

The driver is a push-pull class B amplifier, consisting of T1212 and T1213 (matched pairs) with a power gain of 17 dB.

The bias supply regulator consists of T1208 and T101. T1208 is mounted on the heatsink in good terminal contact with the driver transistors. T1208 gives temperature compensation of the zero signal current in the driver and R1220 adjusts the zero signal current.

The output amplifier is a push-pull class B amplifier, consisting of T1214 and T1215 (matched pairs) with a power gain of 13 dB.

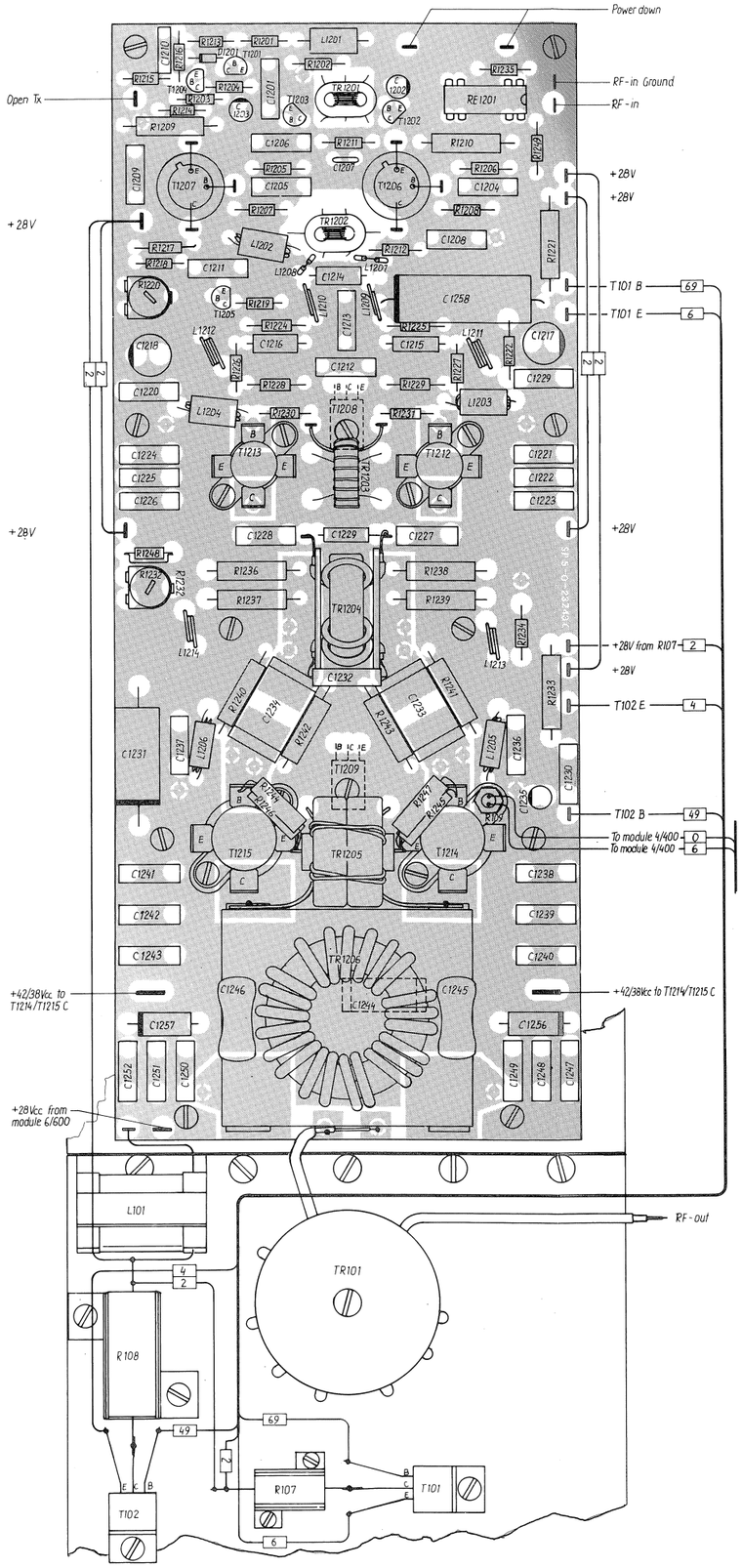
The bias supply regulator consists of T1209 and T102. T1209 is mounted on the heatsink in good terminal contact with the output transistors. T1209 gives temperature compensation of the zero signal current in the output transistors and R1232 adjusts the zero signal current.

At the input there is a relay controlled attenuator (R1249, R1235 and RE1201). This attenuator is controlled from the temperature protection unit (1300).

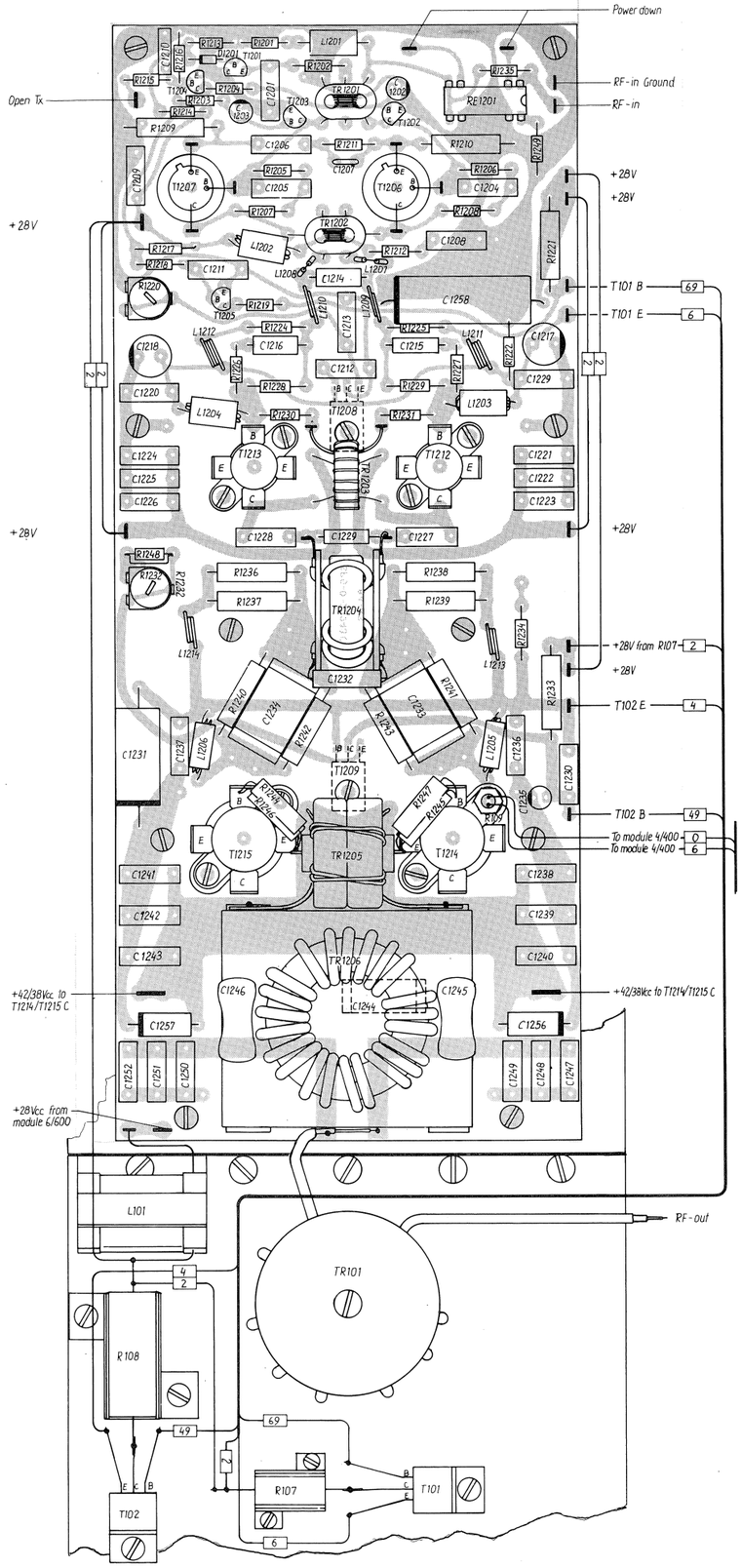
SERVICE NOTE!

When replacing the output transistors of T1130/T1135 you must always use transistors of the same group (T1130 2 pcs., T1135 4 pcs.).

When replacing the driver transistors of T1130/T1135 you must always use transistors of the same group in each module (T1130 2 pcs., T1135 2x2 pcs.).



View from component side with upper side tracks.

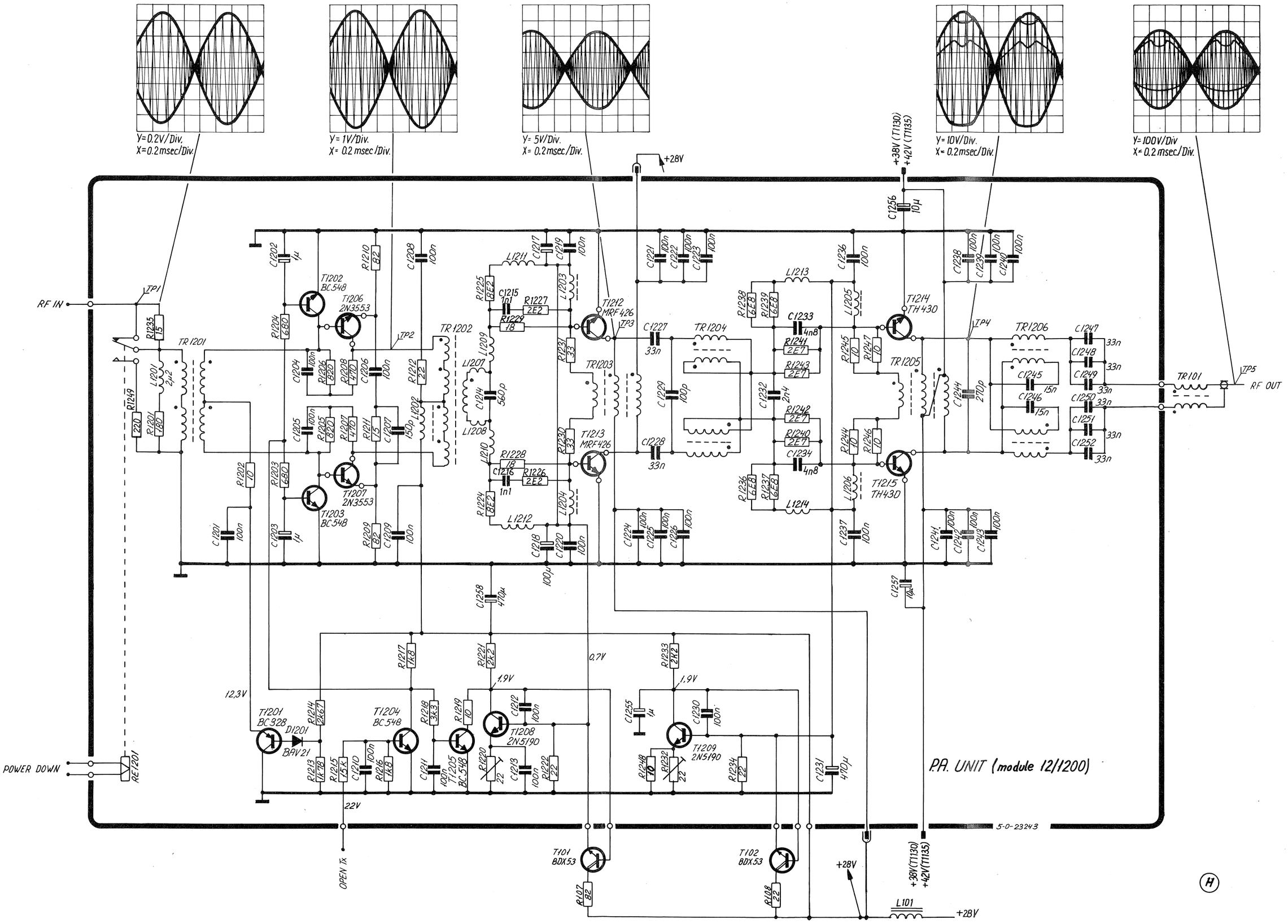


View from component side with lower side tracks.

T1130/T1135
4-6-23243A

P.A. UNIT MODULE (12/1200)

T1130/T1135
4-0-23234H



P.A. UNIT (MODULE 12/1200)

T1135 4-0-25046C

TRANSMITTER CONTROL UNIT (module 3/300)

5-0-23108

Motor/Aerial Current W4/3-2
Invalid Tuning / 180° W3/3-2
CT W9/4-3
Aerial Current W5/3-2

+22V, +15V, +8V, +5V, +8V, +5V, +8V

IC101, IC102

TUNE UP/NORMAL, PROGRAM, +22V, +22V

FILTER 3 control, FILTER 6 control, FILTER 7 control, FILTER 5 control, FILTER 4 control

T, V, X, Y, Z

DRIVE LEVEL/Reg., DRIVE LEVEL, METER+, METER-, DUMMY LOAD, DUMMY LOAD, TUNE, BLOCK, BLOCK, TRANSMITTER START in, +22V, TUNE LAMP, TRANSMITTER START out, TUNE READY

VF, Vp, -45V Tx

INPUT FILTER (module 2/200)

5-0-23244

J1-13, J1-14, J1-15, J1-16, J1-17, J1-22, J1-23, J1-29, J1-18, J1-20, J1-19, P2-14, P2-13, P2-12, J1-10

W17/3-2, W19/3-2, W21/3-2, W23/3-2, W25/3-2, W26/3-2, W27/3-2, W1/6-2, W32/3-2, W35/3-2, W36/3-2, W5/3-2, W4/3-2, W3/3-2, W25/5-2

W1/5-2, W34/3-2, W29/3-2, W28/3-2, W31/3-2, W37/3-2, W33/3-2, W5/5-2, W12/5-2, W11/5-2, W10/5-2, W9/5-2, W8/5-2, W2/5-2, W3/5-2, W4/5-2, J1-31, W6/5-2, W7/5-2

W12/6-2, J1-7, J1-28, J1-27, J1-26, J1-30, J1-25, J1-21, J1-12, P2-11, P2-10, P2-9, P2-8, P2-7, P2-6, P2-5, P2-4, P2-3, P2-2, P2-1

J1 To H1238

Jack 1

1	+ 22V to Rx
2	+ 8V to Rx
3	- 45V to Rx
4	+ 22V to Ex
5	+ 8V to Ex
6	- 45V to Ex
7	+ 22V for AT1505
8	Rx on
9	GROUND to Rx
10	S
11	GROUND
12	Control 3in
13	T
14	V
15	X
16	Y
17	Z
18	Tune

COMBINER and PROTECTION UNIT (module 4/400)

5-0-24970

DRIVE out 1, DRIVE out 2, DRIVE in, AC/DC, SUPPLY BLOCK, Drive Reduction 1, Drive Reduction 2, Temp. Sensor 1, GROUND, GROUND, Temp. Sensor 2, +22V, +22V, Supply Reduction, -3dB, VF, +22V, VR, CT

J5

W4/6-4, W2/6-4, W1/4-12, W22/4-12, W23/4-12, W4/4-12, W5/4-12, W6/4-12, W7/4-12, W8/4-12, W1/6-4, W5/6-4, W41/3-4, W3/6-4, W39/3-4, W9/4-3

R101 100, R102 100, R103 100, R104 100

RF from PA-UNIT 1, RF from PA-UNIT 2, RF out, J6

TUNER CONTROL UNIT (module 5/500)

5-0-23135

Load: S, C, 1, 2, 4, 8
Resonance: C, 1, 2, 4, 8
Program Tune up/normal
T, V, X, Y, Z
+8V, +5V, GROUND, DUMMY LOAD, +22V for AT1500, TUNER control 6, TUNER control 5, TUNER control 4, TUNER control 3, TUNER control 2, TUNER control 1, TUNER control 7, TUNER control 8, TUNER control 9, TUNER control 10, TUNER control 11

W25/5-2, W1/5-9, W2/5-9, W3/5-9, W4/5-9, W5/5-9, W6/5-9, W7/5-9, W8/5-9, W9/5-9, W10/5-9, W8/3-5, W6/3-5, W16/3-5, W18/3-5, W20/3-5, W22/3-5, W24/3-5, W1/3-5, W2/3-5, W7/3-5, W30/3-5, W1/5-2, W2/5-2, W3/5-2, W4/5-2, W5/5-2, W6/5-2, W7/5-2, W8/5-2, W9/5-2, W10/5-2, W11/5-2, W12/5-2

L/R SWITCHES (module 9/900)

LOAD: W1/5-9, W2/5-9, W3/5-9, W4/5-9, W5/5-9 → 1, 2, 4, 8, C
RESONANCE: W6/5-9, W7/5-9, W8/5-9, W9/5-9, W10/5-9 → 1, 2, 4, 8, C

5-0-24972

P2 To H1238

Plug 2

1	TUNER control 1
2	TUNER control 2
3	TUNER control 3
4	TUNER control 4
5	TUNER control 5
6	TUNER control 6
7	TUNER control 7
8	TUNER control 8
9	TUNER control 9
10	TUNER control 10

J3 To H1238

Jack 3

1	
2	FILTER 7 control
3	FILTER 8 control
4	FILTER 4 control
5	FILTER 5 control
6	FILTER 6 control
7	+ 22V
8	
9	
10	

PA-UNIT 1 (module 12/1200)

PA-UNIT 2 (module 12/1200)

5-0-23243

Open Tx, +28V, +42V, RF out, DRIVE Reduction 1, +22V, RF in, R109, W34/4-12, W6/4-12, T1214, T101 BDX53, T102 BDX53, TR101, R107 82, R108 22, L101

SUPPLY DISTRIBUTION UNIT (module 6/600)

5-0-24976

+28V, +28V, +42V, +42V, +42V, +42V
Blower 3, Blower 2, Blower 1
P4-18, P4-10, J1-3, W1/6-2
-45V, Rx, Open Tx, from Ex, Open Tx, PA2, Open Tx, PA1
P4-9 GROUND

V.ind, V.out, Adj → IC103

P4-2, P4-5, W2/6-3, J1-35, W4/6-3, J1-5, P4-6, J1-36, J1-6, W42/3-6, J1-2, J1-8, P4-11, P4-26, Blower 2, Blower 1, +22V, Rx, +22V, Rx, +22V, H1235, J1-1, J1-34, W36/4-4, P4-4, P4-1, J1-4, J1-24

+22V, Tx, Open Tx, +8V, Tx, +8V, Ex, -45V, -45V, Ex, -45V, Tx, +8V, Rx, Rx, on, Blower 3, +22V, Ex, HT, on

W12/6-2, W1/6-4, W2/6-4, W1/6-3, W5/6-4, W4/6-4, J1-32, J1-33, W5/6-3, W6/6-3, W7/6-3, W8/6-3, W9/6-3, W10/6-3

Vout, GND, Vin → IC104

+28V, +42V, GROUND

C1, C2, C3, C4 4x2200µ

P4-7, P4-14, P4-15, P4-20, P4-22, P4-23, P4-32, P4-33, J3-2, J3-3, J3-4, J3-5, J3-6, J3-7

P4 to Power Supply

Plug 4 to POWER SUPPLY

1	+ 22V
2	Supply for 8V Reg.
3	
4	+ 22V
5	Supply for 8V Reg.
6	- 45V
7	+ 22V to AT1505
8	
9	GROUND
10	Blower I
11	Blower II
12	
13	
14	Supply Reduction
15	Supply Block.
16	
17	
18	Blower I

PA1 M0 101 Blower

PA2 M0 102 Blower

M0 103 Rack Blower

J5 RF in

J6 RF out

MAIN SCHEMATIC DIAGRAM

MAIN SCHEM

TRANSMITTER CONTROL UNIT
(module 3/300)
5-0-23108

INPUT FILTER (module 2/200)
5-0-23244

COMBINER and PROTECTION UNIT
(module 4/400)
5-0-24970

L/R SWITCHES
(module 9/900)
5-0-24972

TUNER CONTROL UNIT (module 5/500)
5-0-23135

SUPPLY DISTRIBUTION UNIT (module 6/600)
5-0-24976

PA-UNIT 1
(module 12/1200)
5-0-23243

PA-UNIT 2
(module 12/1200)
5-0-23243

J1 To H1238

P2 To H1238

J3 To H1238

P4 to Power Supply

Jack 1

1	+22V to Rx	19	Tune Lamp
2	+8V to Rx	20	TRANSMITTER start
3	-45V to Rx	21	Block
4	+22V to Ex	22	Drive level/reg.
5	+8V to Ex	23	Drive level
6	-45V to Ex	24	HT on
7	+22V for AT1505	25	Tune ready
8	Rx on	26	Meter -
9	GROUND to Rx	27	Meter +
10	S	28	Ext. Tx Block
11	GROUND	29	Open Tx
12	Control 3in	30	Dummy load
13	T	31	Control 3 to AT 1505
14	V	32	Start PU1
15	X	33	+Batt.
16	Y	34	+22V
17	Z	35	On
18	Tune	36	-45V

Plug 2

1	TUNER control 1	11	TUNER control 11
2	TUNER control 2	12	Invalid Tuning /180°
3	TUNER control 3	13	Motor/Aerial Current
4	TUNER control 4	14	Aerial Current
5	TUNER control 5	15	
6	TUNER control 6		
7	TUNER control 7		
8	TUNER control 8		
9	TUNER control 9		
10	TUNER control 10		

Jack 3

1		11	
2	FILTER 7 control	12	
3	FILTER 8 control	13	
4	FILTER 4 control	14	
5	FILTER 5 control	15	
6	FILTER 6 control		
7	+22V		
8			
9			
10			

Plug 4 to POWER SUPPLY

1	+22V	19	
2	Supply for 8V Reg.	20	TRANSMITTER start out
3		21	
4	+22V	22	-3dB
5	Supply for 8V Reg.	23	AC/DC
6	-45V	24	
7	+22V to AT1505	25	
8		26	Blower II
9	GROUND	27	
10	Blower I	28	
11	Blower II	29	
12		30	
13		31	
14	Supply Reduction	32	Start PU1
15	Supply Block.	33	+Battery
16		34	
17		35	
18	Blower I	36	

MAIN SCHEMATIC DIAGRAM T1135 ©

MAIN SCHEMATIC DIAGRAM T1135