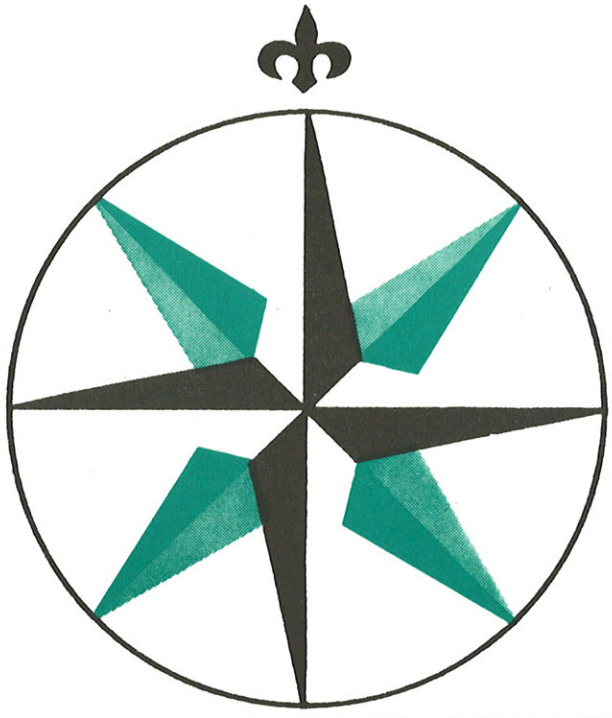

Sailor

Sailor

INSTRUKTIONSBOG FOR SAILOR S1300

INSTRUCTION BOOK FOR SAILOR S1300

A/S S. P. RADIO · AALBORG · DENMARK

CONTENTS:

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GENERAL DESCRIPTION

SAILOR S1300 is a telephony exciter for use in conjunction with the transmitter T1127.

SAILOR S1300 can be programmed for 240 channels free selected in the frequency range 1.6 - 4.0 MHz and the 4, 6, 8, 12, 16, 22 and 25 MHz maritime HF bands.

SAILOR S1300 channel programming is extremely easy and can be carried out with normal hand tools, no instruments are required.

SAILOR S1300 uses a digital synthesizer for frequency generation. The frequency stability is controlled from one 10 MHz TCXO.

A

SAILOR S1300 produces completely finished signals on the transmission frequency.

SAILOR S1300 has possibility for the following transmission modes A3J, A3A and A3H.

SAILOR S1300 is provided with a built-in alarm signal generator for distress calls.

SAILOR S1300 fits into SAILOR 19" rack system.

SAILOR S1300 is supplied from N1400 (24V DC) or N1401 (AC mains).

SAILOR S1300 is prepared for connection to telex.

TECHNICAL DATA

The exciter S1300 delivers USB signals on the channel frequency.

Number of channels:		240 channels free selected in the maritime MF and HF bands (resolution 100 Hz).
Frequency range:	MF:	1.6 - 4.0 MHz
	HF:	4, 6, 8, 12, 22 and 25 MHz maritime bands.
Frequency stability:		
Temperature range $0^{o}C$ to $+40^{o}C$:		Less than ± 1 ppm (±25 Hz)
Long term stability	:	Less than ± 1 ppm (±25 Hz) per year
Short term stability	:	Less than ± 2 Hz
Mode of operation:		A3J, A3A and A3H
Distress call:		Automatic A3H on 2182 kHz Two-Tone-Alarm: 1300 and 2200 Hz with a duration of 45 secs.
Output power:		1 Watt PEP/50 ohm
Output power reduction:		Three steps: 0 dB, 6 dB and 12 dB
Modulation:		350 - 2700 Hz with compressor
Operation Temperature range:		$-15^{o}C$ to $+55^{o}C$

A

TECHNICAL DATA for connections on REAR-CONTACT-BOARD.

AF FROM TELEX TO TX: R_{IN} = 600 ohm

$-10\ dBm \leq P_{IN} \leq 10\ dBm$

$250\ mV_{RMS} \leq V_{IN} \leq 2,5 V_{RMS}$

AF FROM RECEIVER TO TELEX: R_{OUT} = 600 ohm

P_{OUT} = 0 dBm

V_{OUT} = 750 mV_{RMS}

COMMON FOR RT & TT: Max. consumption is 75 mA at +60V connection.

TT FROM TELEX: $I_{max.}$ = 50 mA

RF FROM TELEX: $I_{max.}$ = 25 mA

TRANSMITTER START: $I_{max.}$ = 210 mA Voltage between the opened contact is 22V.

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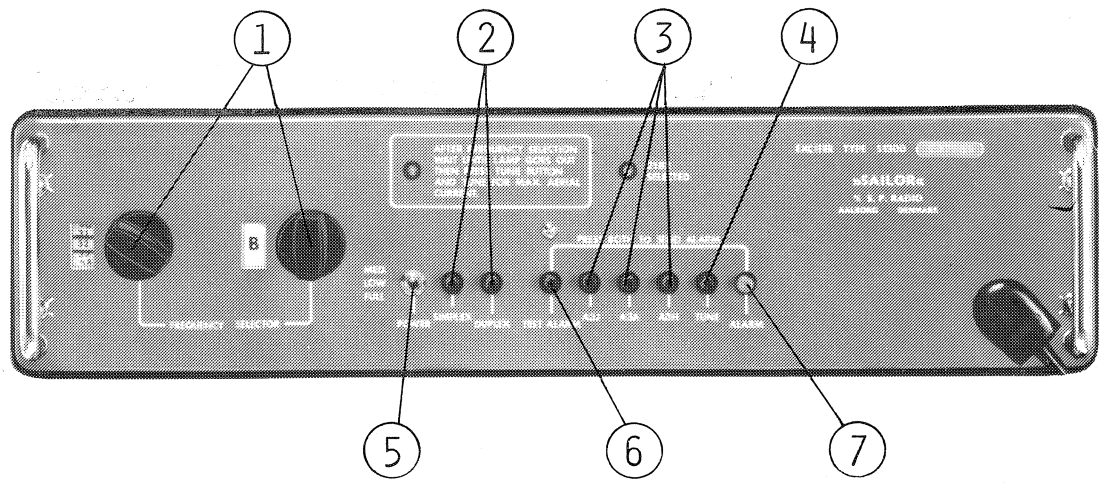
TECHNICAL DATA FOR TELEGRAPHY AND TELEX

Data for SAILOR short-wave station.

Output power A1:	200 W PEP (1.6 - 4 MHz)
	400 W PEP (4 - 25 MHz)
Output power A2H:	400 W PEP (1.6 - 4 MHz)
	800 W PEP (4 - 25 MHz)
Output power TELEX:	
Simplex TOR mode	400 W PEP (1.6 - 4 MHz)
	800 W PEP (4 - 25 MHz)
Broadcast mode	200 W PEP (1.6 - 4 MHz)
	400 W PEP (4 - 25 MHz)

CONTROLS



(1) FREQUENCY SELECTORS

By means of the Frequency Selectors, 240 pre-programmed frequencies can be selected in four groups A-B-C-D with 60 positions in each group.

(2) SIMPLEX, DUPLEX

Press button SIMPLEX for Single-Frequency Operation.
Press button DUPLEX for Two-Frequency Operation.

(3) A3J, A3A and A3H

Select transmission mode A3J, A3A or A3H.

(4) TUNE

For tuning of Transmitter T1127, press button TUNE and a two-tone signal is generated.

(5) POWER

For reducing the RF-output-Power in three steps.
FULL = 0 dB, MED = -6 dB, LOW = -12 dB.

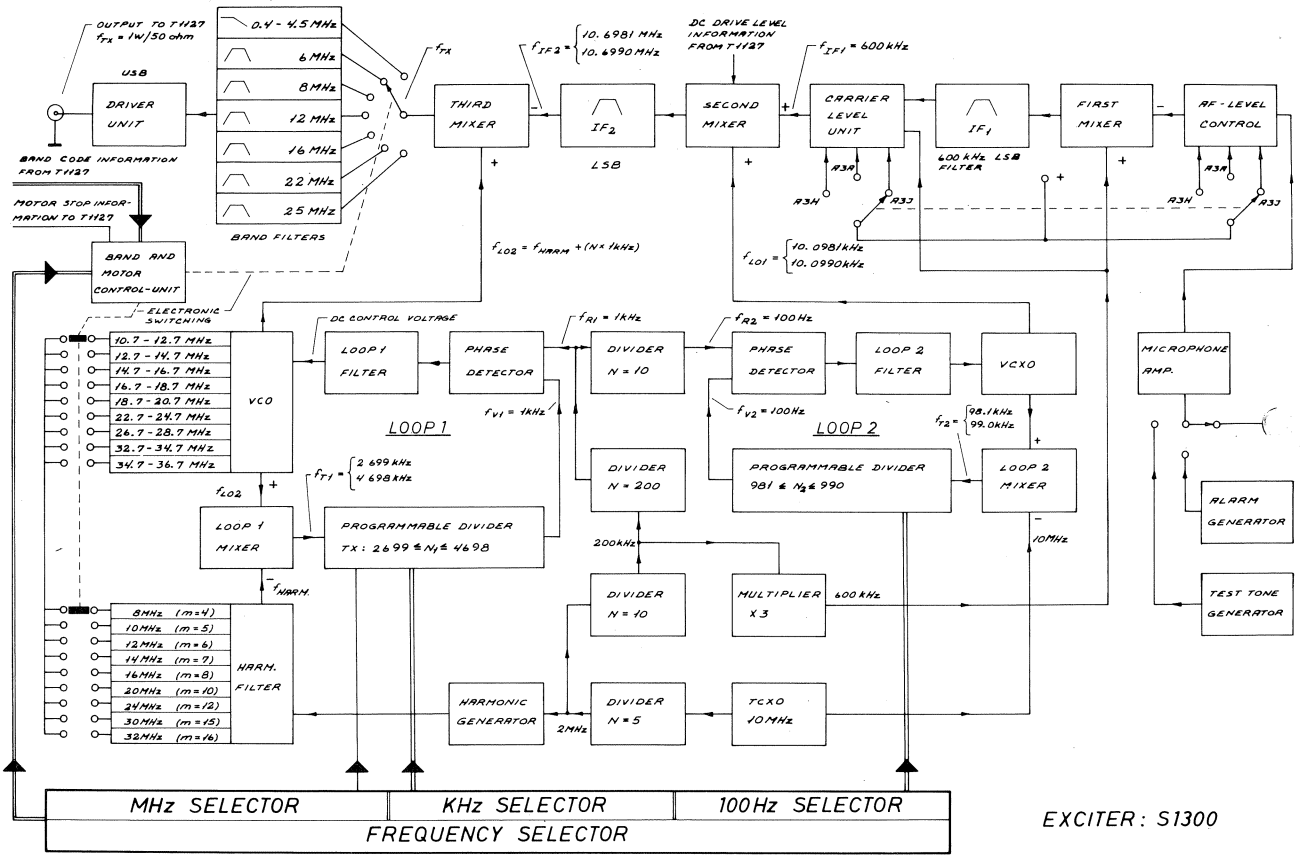
(6) TEST ALARM

Press button TEST ALARM and the two-tone-alarm signal will be heard in the microtelephone handset.

(7) ALARM

Press both buttons TEST ALARM (6) and ALARM (7) for transmitting two-tone-alarm signal in the DISTRESS frequency 2182 kHz.

PRINCIPLE OF OPERATION



A 1/4

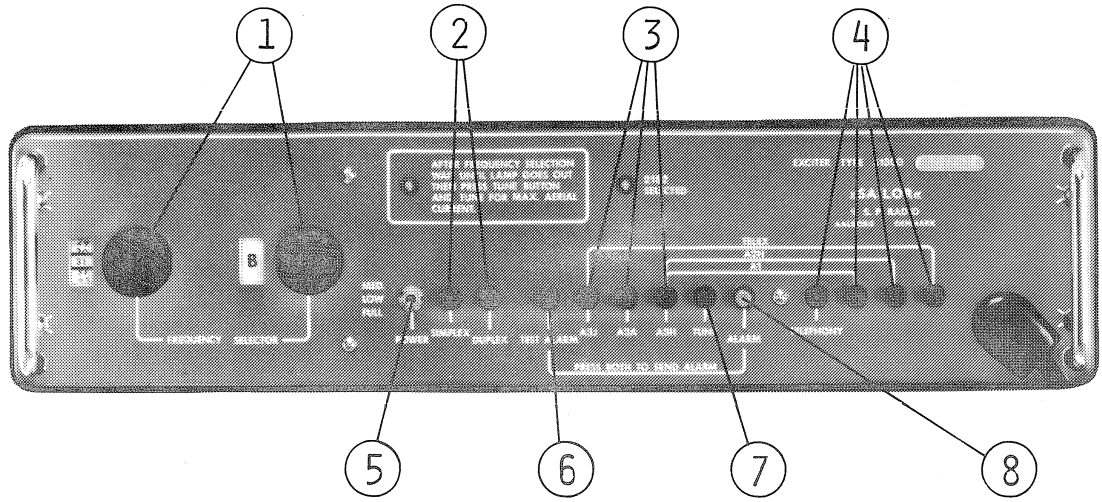
EXCITER S1300

The SAILOR Exciter S1300 is fully synthesized and delivers USB signals on the carrier frequency.

The signal from the Microphone, the Alarm Generator or the Test-Tone-Generator is fed to the Microphone Amplifier, where the necessary amplification, amplitude limitation and filtering will take place. The amplitude limitation is performed by a compressor stage, which regulates the amplification, so that the amplitude will always be kept below a certain max. level. The AF-signal is fed via the AF Level-Control to the first Mixer. The AF-Level-Control is determining the right AF level in the modes A3J, A3A and A3H. The First Mixer is a balanced modulator where a 600 kHz double-side-band signal is generated. The DSB-signal is then fed through the 600 kHz LSB crystal-filter and out we have a lower-side-band signal to the Carrier-Level-Unit.

In the Carrier-Level-Unit reinsertion of 600 kHz carrier for A3A and A3H takes place. The 600 kHz signal is then passed on to the Second-Mixer which also receive the local-oscillator-signal f_{LO1} from Loop 2. The Second-Mixer also receives a DC Drive Level Information from T1127 which can attenuate the output from the mixer to the wanted drive level. The output from the Second-Mixer is an LSB-signal f_{IF2} and it passes through a crystal filter to the Third Mixer.

CONTROLS



(1) FREQUENCY SELECTORS

By means of the Frequency Selectors, 240 pre-programmed frequencies can be selected in four groups A-B-C-D with 60 positions in each group.

(2) SIMPLEX, DUPLEX

Press button SIMPLEX for Single-Frequency Operation.
Press button DUPLEX for Two-Frequency Operation.

(3) A3J, A3A and A3H

Select transmission mode A3J, A3A or A3H.

(4) TELEPHONY-TELEGRAPHY-TELEX

TELEPHONY: To be activated for normal telephony use.

TELEGRAPHY: Activate the buttons A1 or A2H together with the button A3H (5) .
The telegraph key is now connected to transmitter.

TELEX: Activate the button TELEX together with the button A3J (5)
The teleprinter is now connected via the Simplex TOR equipment to the receiver and transmitter.

(5) POWER

For reducing the RF-output-Power in three steps.
FULL = 0 dB, MED = -6 dB, LOW = -12 dB.

(6) TEST ALARM

Press button TEST ALARM and the two-tone-alarm signal will be heard in the microtelephone handset.

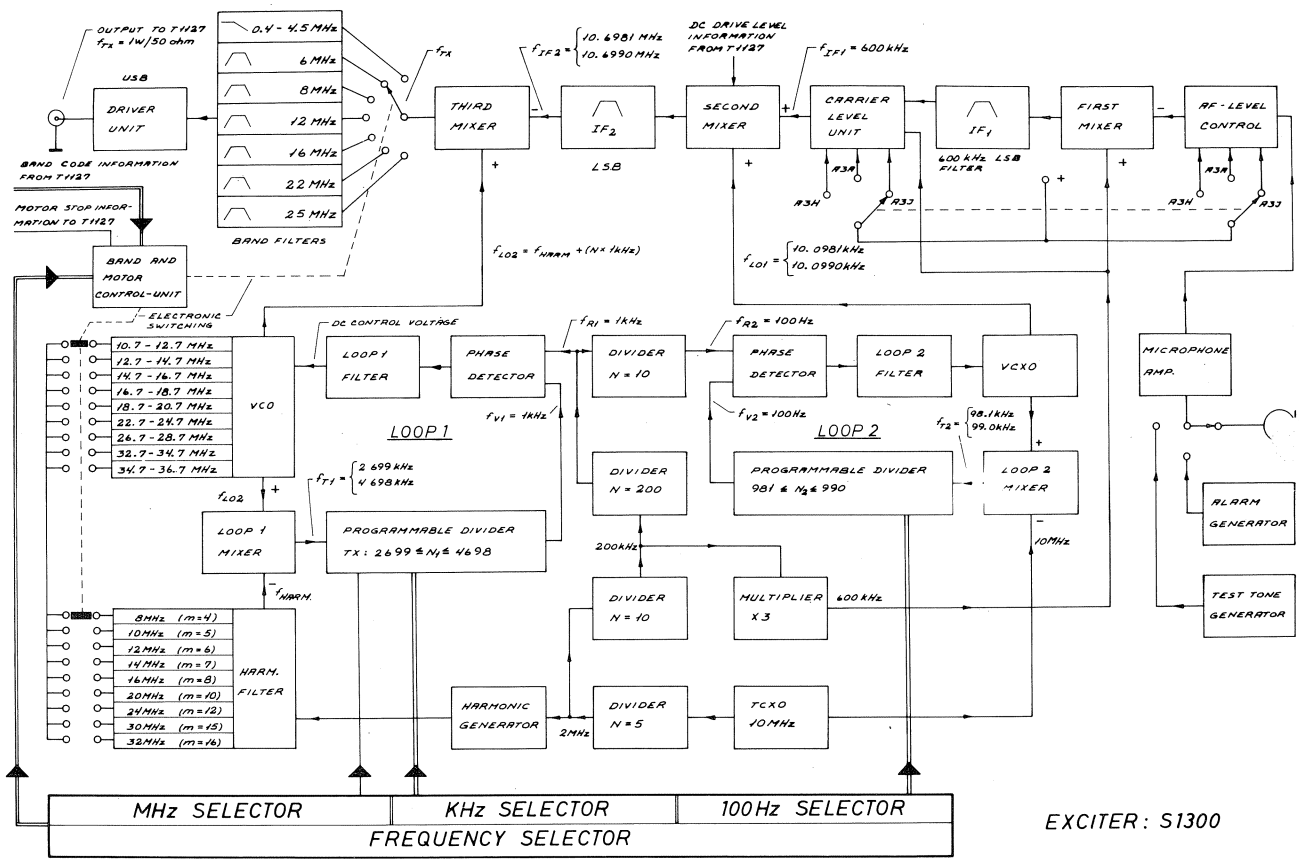
7 TUNE

For tuning of Transmitter T1127, a two-tone signal is generated.

(8) ALARM

Press both TEST ALARM (6) and ALARM (7) for transmitting two-tone alarm signal on the DISTRESS frequency 2182 kHz.

PRINCIPLE OF OPERATION



EXCITER: S1300

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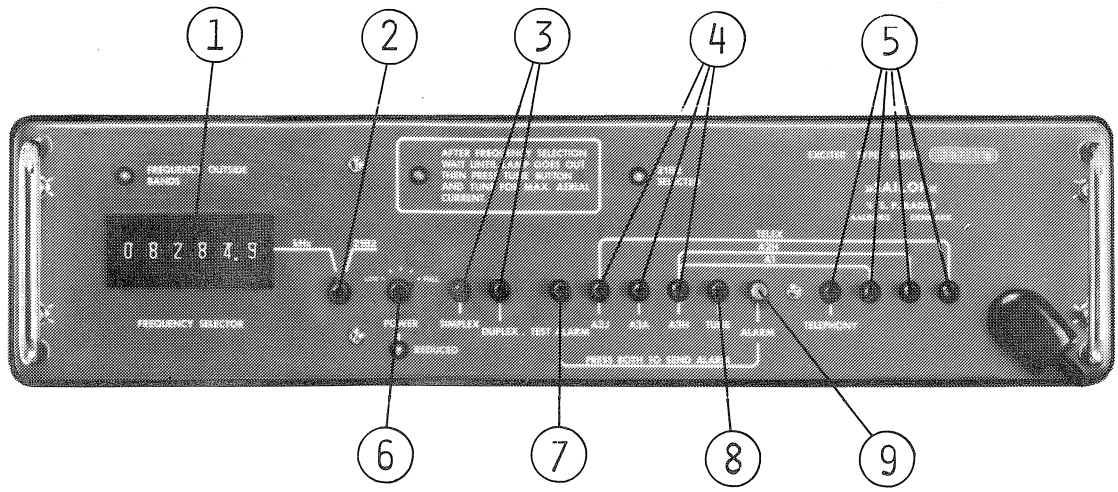
EXCITER S1300

The SAILOR Exciter S1300 is fully synthesized and delivers USB signals on the carrier frequency.

The signal from the Microphone, the Alarm Generator or the Test-Tone-Generator is fed to the Microphone Amplifier, where the necessary amplification, amplitude limitation and filtering will take place. The amplitude limitation is performed by a compressor stage, which regulates the amplification, so that the amplitude will always be kept below a certain max. level. The AF-signal is fed via the AF Level-Control to the first Mixer. The AF-Level-Control is determining the right AF level in the modes A3J, A3A and A3H. The First Mixer is a balanced modulator where a 600 kHz double-side-band signal is generated. The DSB-signal is then fed through the 600 kHz LSB crystal-filter and out we have a lower-side-band signal to the Carrier-Level-Unit.

In the Carrier-Level-Unit reinsertion of 600 kHz carrier for A3A and A3H takes place. The 600 kHz signal is then passed on to the Second-Mixer which also receive the local-oscillator-signal f_{LO1} from Loop 2. The Second-Mixer also receives a DC Drive Level Information from T1127 which can attenuate the output from the mixer to the wanted drive level. The output from the Second-Mixer is an LSB-signal f_{IF2} and it passes through a crystal filter to the Third Mixer.

CONTROLS



1 FREQUENCY SELECTOR

For selection of the transmitting frequency in the maritime bands.

2 DISTRESS (2182 kHz)

For selection of the distress frequency 2182 kHz.

3 SIMPLEX, DUPLEX

Press button SIMPLEX for Single-Frequency Operation.
Press button DUPLEX for Two-Frequency Operation.

4 A3J, A3A and A3H

Select transmission mode A3J, A3A or A3H.

5 TELEPHONY-TELEGRAPHY-TELEX

TELEPHONY: To be activated for normal telephony use.

TELEGRAPHY: Activate the buttons A1 or A2H together with the button A3H (5) .
The telegraph key is now connected to transmitter.

TELEX: Activate the button TELEX together with the button A3J (5) .
The teleprinter is now connected via the Simplex TOR equipment to the receiver and transmitter.

6 POWER

For reducing the RF-output-Power in four 5 dB steps to about -20 dB.

7 TEST ALARM

Press button TEST ALARM and the two-tone-alarm signal will be heard in the microtelephone handset.

8 TUNE

For tuning of Transmitter T1127, a two-tone signal is generated.

9 ALARM

Press both TEST ALARM (6) and ALARM (7) for transmitting two-tone alarm signal on the DISTRESS frequency 2182 kHz.

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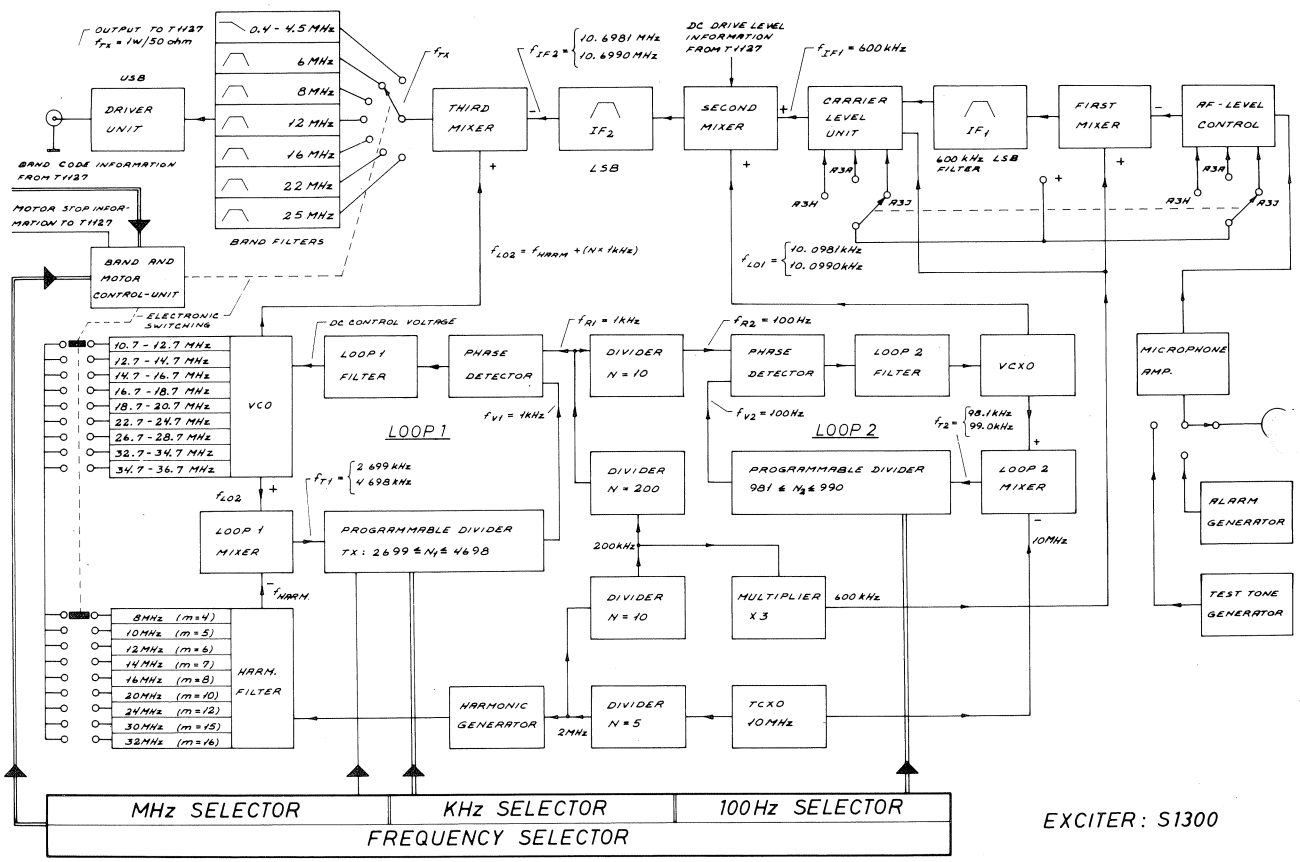
PRINCIPLE OF OPERATION



EXCITER: S1300

A 1/4

EXCITER S1300

The SAILOR Exciter S1300 is fully synthesized and delivers USB signals on the carrier frequency.

The signal from the Microphone, the Alarm Generator or the Test-Tone-Generator is fed to the Microphone Amplifier, where the necessary amplification, amplitude limitation and filtering will take place. The amplitude limitation is performed by a compressor stage, which regulates the amplification, so that the amplitude will always be kept below a certain max. level. The AF-signal is fed via the AF Level-Control to the first Mixer. The AF-Level-Control is determining the right AF level in the modes A3J, A3A and A3H. The First Mixer is a balanced modulator where a 600 kHz double-side-band signal is generated. The DSB-signal is then fed through the 600 kHz LSB crystal-filter and out we have a lower-side-band signal to the Carrier-Level-Unit.

In the Carrier-Level-Unit reinsertion of 600 kHz carrier for A3A and A3H takes place. The 600 kHz signal is then passed on to the Second-Mixer which also receive the local-oscillator-signal f_{LO1} from Loop 2. The Second-Mixer also receives a DC Drive Level Information from T1127 which can attenuate the output from the mixer to the wanted drive level. The output from the Second-Mixer is an LSB-signal f_{IF2} and it passes through a crystal filter to the Third Mixer.

PRINCIPLE OF OPERATION cont.:

Third Mixer is a double balanced mixer where both the local oscillator signal f_{LO2} and 2nd IF-signal f_{IF2} is suppressed. The output from the mixer is the carrier frequency f_{TX}, with the upper side-band. The band filter section serves the purpose of removing all undesired mixing products and the signal passes from the Band-Filters to the Driver-Unit where the final amplification to max. 1 Watt PEP/50 ohm takes place.

FREQUENCY GENERATION

The necessary frequencies are generated by two frequency synthesizers according to the Phase Locked Loop principle.

Local oscillator signal f_{LO2} to Third Mixer is generated in the Phase Locked Loop 1 and has a resolution of 1 kHz.

Local oscillator signal f_{LO1} to Second Mixer is generated in the Phase-Locked Loop 2 and has a resolution of 100 Hz.

LOOP 1

The voltage controlled oscillator (VCO) generates the necessary local oscillator frequencies in nine 2 MHz bands electronically selected by the MHz Selector via the Band and the Motor Control Unit. Inside each 2 MHz band the VCO-frequency f_{LO2} can be varied by means of a DC control voltage from the Phase-Detector. The DC control voltage is filtered in the Loop 1 Filter.

The Phase Detector receives two signals, one variable frequency f_{V1} and one reference frequency f_{R1}. The reference frequency f_{R1} is a result of the 10 MHz TCXO frequency being divided down to 1 kHz.

The variable frequency f_{V1} is generated from the VCO frequency f_{LO2} in the following way:

In the Loop 1 Mixer the counter frequency f_{T1} is produced from the VCO frequency f_{LO2} and the frequency f_{HARM} which is a multiple of 2 MHz. The 2 MHz signal is generated from the 10 MHz TCXO

$$f_{T1} = f_{LO2} - f_{HARM} = f_{LO2} - (m \times 2\ \text{MHz}) = N_1 \times 1\ \text{kHz}$$

For every 2 MHz band a new f_{HARM} is selected of the MHz Selector and it always results in a variation of 2 MHz of the frequency f_{T1} to the Programmable Divider.

The frequency f_{T1} is divided down by the dividing figure N_1 in the Programmable-Divider to the variable frequency f_{V1}

$$f_{V1} = f_{T1}/N_1 = 1\ \text{kHz}$$

The working principle in a Phase-Locked-Loop is as follows:

If there is a phase error between the variable frequency f_{V1} and the reference frequency f_{R1}, the regulation system has the characteristic that the DC-Control Voltage will correct the VCO frequency and consequently the variable frequency f_{V1}, so that f_{V1} will always follow the reference frequency f_{R1} in phase

$$f_{R1} = f_{V1} = 1\ \text{kHz}$$

PRINCIPLE OF OPERATION cont.:

The VCO frequency f_{LO2} is now phase locked on a fixed frequency to the reference frequency f_{R1} and has therefore the same accuracy as this.

Changing of the VCO frequency f_{LO2} by e.g. 1 kHz can be performed by changing the dividing figure N_1 in the Programmable Divider by one.

$$f_{LO2} = f_{HARM} + (N_1 \times 1\ kHz)$$

Principle of programming is as follows:

The Programmable Divider contains a counter circuit, which is counting down from a start figure $2000 + P_1$ and stops at the stop figure S_1. Each time the counter reaches the stop figure S_1, a pulse (f_{V1}) is given to the Phase Detector, and the counter will start counting down again from the start figure $2000 + P_1$. Division of f_{T1} by N_1 has now been achieved

$$f_{V1} = f_{T1}/N_1;\ N_1 = 2000 + P_1 - S_1$$

A special code from the MHz Selector to the Band and Motor-control-unit selects the right 2 MHz band for the VCO and Harmonic Filter.

Inside each 2 MHz band the programmable figure P_1, is encoded from the Frequency Selector (MHz and kHz positions) in BCD-code representing the direct frequency reading of the 2 MHz band.

Start-figure: $2000 + P_1$ 0 P_1 1999

Stop-figure : $S1 = -699$

$N_1 = 2000 + P_1 - S_1 = P_1 + 2699$

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Output frequency from Loop 1:

$f_{LO2} = m \times 2\ MHz + (P_1 + 2699) \times 1\ kHz \quad 4 \leq m \leq 16$

LOOP 2

Phase Locked Loop 2 has a frequency variation of 1 kHz with a resolution of 100 Hz and the working principle is the same as for Phase Locked Loop 1. Principle of programming is as follows:

The frequency shift in Loop 2 is controlled from the 100 Hz Selector.

The Programmable Divider is counting up from the start figure P_2 to the stop figure S_2.

The 100 Hz Selector is encoding the start-figure P_2 in BCD-code to the Programmable Divider.

Start figure : $0 \leq P_2 \leq 9$

Stop figure : $S_2 = 990$

Dividing figure : $N_2 = S_2 - P_2 = 990 - P_2$

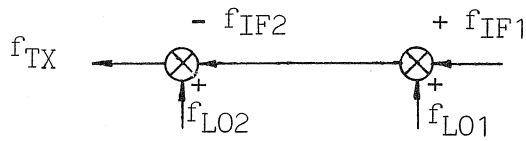
PRINCIPLE OF OPERATION cont.:

Output frequency from Loop 2:

f_{LO1} = 10 MHz + (N_2 x 0,1 kHz) = 10 MHz + ((990 - P_2) x 0,1 kHz);

f_{LO1} = 10,099 MHz - (P_2 x 0,1 kHz);

CARRIER FREQUENCY f_{TX} FROM EXCITER S1300



f_{IF1} = 0,600 MHz;

f_{LO1} = 10.099 MHz - (P_2 x 0,1 kHz);

f_{IF2} = f_{IF1} + f_{LO2} = 10,699 MHz - (P_2 x 0,1 kHz)

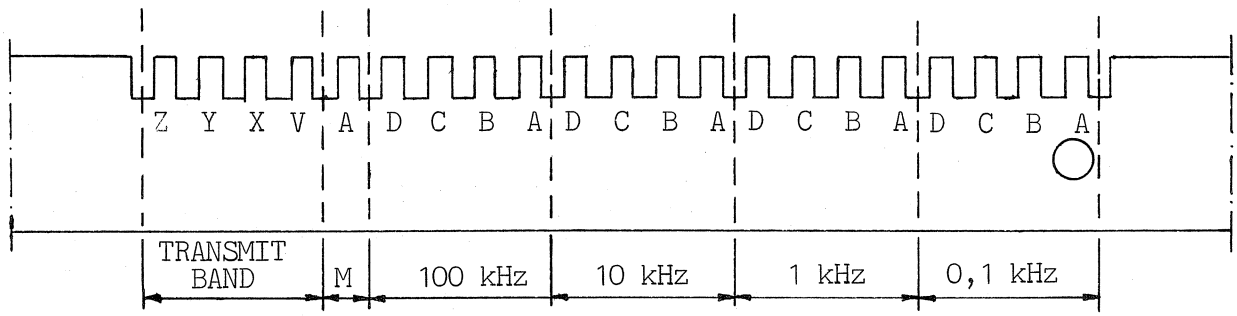
f_{LO2} = m x 2 MHz + (P_1 + 2699) x 1 kHz $4 \leq m \leq 16$

f_{TX} = f_{LO2} - f_{IF2} = (m - 4) x 2 MHz + (P_1 + (0,1 x P_2)) x 1 kHz

FREQUENCY PROGRAMMING

PROGRAMMING OF CARRIER FREQUENCIES

The Programming strip is carrying information for the frequency synthesizer and for selecting one of the 19 transmitter bands.



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The Programming Strip has 21 bits. The drawing of the Programming Strip shows where the information for transmitter bands, MHz, 100 kHz, 10 kHz, 1 kHz and 0,1 kHz are located.

FREQUENCY PROGRAMMING cont.:

HOW TO PROGRAM A CARRIER FREQUENCY:

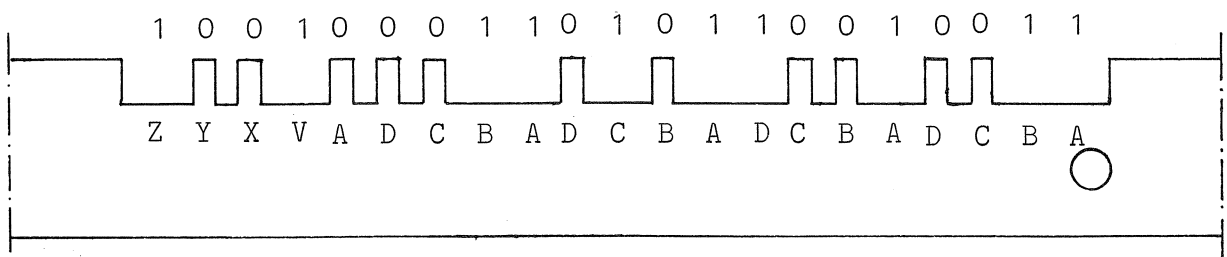
Find the frequency in the Programming Table and read directly the programming of the transmitter band code, MHz code, and 100 kHz code. For 10 kHz, 1 kHz, and 0,1 kHz the decimal number for each decade must be converted to a 4 bits BCD code. Use convertion table from decimal to BCD.

Convertion Table	
Decimal	BCD
	DCBA
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001

A 2/3

Programming example:

Carrier frequency 12359,3 kHz.

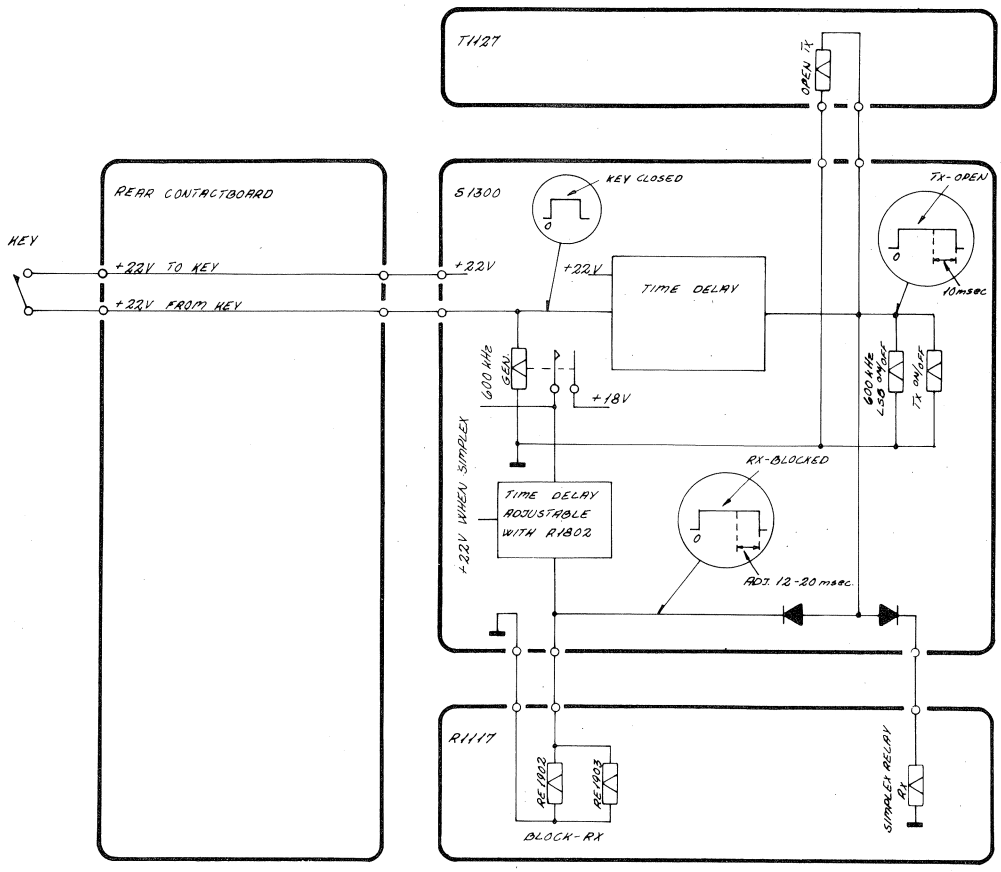


Binary "1": Cut the bit off with a nippers.

PROGRAMMING TABLE

Carrier Frequencies	Programming Code					
kHz	zyxv	M A	100 DCBA	10 DCBA	1 DCBA	0,1 DCBA
1 600.0 to 1 699.9	0001	1	0110			
1 700.0 to 1 799.9	0001	1	0111			
1 800.0 to 1 899.9	0001	1	1000			
1 900.0 to 1 999.9	0001	1	1001			
2 000.0 to 2 099.9	0001	0	0000			
2 100.0 to 2 199.9	0001	0	0001			
2 200.0 to 2 299.9	0001	0	0010			
2 300.0 to 2 399.9	0001	0	0011			
2 400.0 to 2 499.9	0001	0	0100			
2 500.0 to 2 599.9	0001	0	0101			
2 600.0 to 2 699.9	0001	0	0110			
2 700.0 to 2 799.9	0001	0	0111			
2 800.0 to 2 899.9	0010	0	1000			
2 900.0 to 2 999.9	0010	0	1001			
3 000.0 to 3 099.9	0010	1	0000			
3 100.0 to 3 199.9	0011	1	0001			
3 200.0 to 3 299.9	0011	1	0010			
3 300.0 to 3 399.9	0011	1	0011			
3 400.0 to 3 499.9	0100	1	0100			
3 500.0 to 3 599.9	0100	1	0101			
3 600.0 to 3 699.9	0100	1	0110			
3 700.0 to 3 799.9	0101	1	0111			
3 800.0 to 3 899.9	0101	1	1000			
3 900.0 to 3 999.9	0101	1	1001			
4 000.0 to 4 099.9	0110	0	0000			
4 100.0 to 4 199.9	0110	0	0001			
6 200.0 to 6 299.9	0111	0	0010			
8 100.0 to 8 199.9	1000	0	0001			
8 200.0 to 8 299.9	1000	0	0010			
12 300.0 to 12 399.9	1001	0	0011			
12 400.0 to 12 499.9	1001	0	0100			
16 400.0 to 16 499.9	1010	0	0100			
16 500.0 to 16 599.9	1010	0	0101			
22 000.0 to 22 099.9	1011	0	0000			
22 100.0 to 22 199.9	1011	0	0001			
25 000.0 to 25 099.9	1100	1	0000			
Distress 2 182.0	1110	0	0001	1000	0010	0000
Special	1101					

PRINCIPAL DESCRIPTION OF TELEGRAPHY MODE



TELEGRAPHY:

See principal diagram above.

PULSE SHAPING

When the KEY is pressed and released the transmission starts and stops. An RC-network on MODE-SWITCH-UNIT shapes the transmitter output signal. The switch off time of the transmitter is delayed 10 msecs in order to produce the correct output signal shape.

FULL BREAK-IN

The receiver is blocked for a time period of about 23 msecs after the KEY is released. This secures full break-in on the receiver.

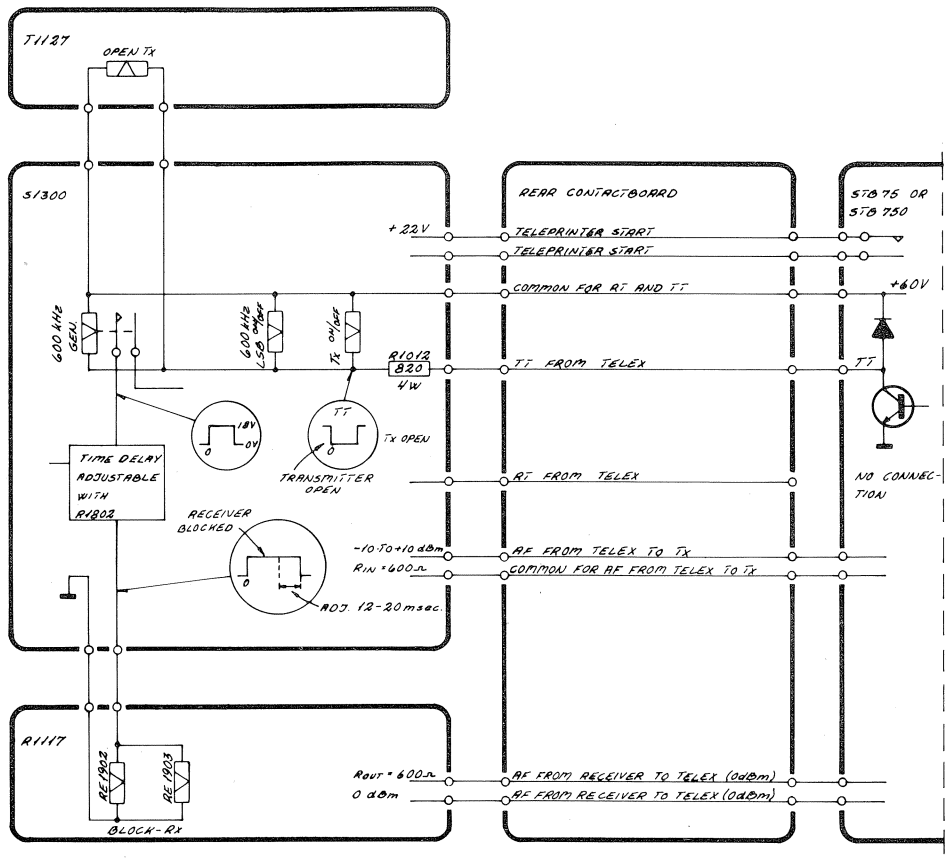
INSTALLATION

All connections are done on the REAR CONTACTBOARD placed on the mounting plate.

PRINCIPAL DESCRIPTION OF TELEX MODE

TELEX

The SAILOR Short-Wave Station is designed to be connected to a TELEPRINTER via a SIMPLEX TOR equipment. The control signals to the exciter match with Philips Simplex TOR equipment STB75/STB750.
See the principal diagram below.



TELEPRINTER START

By means of these terminals it is possible to start the transmitter from Simplex TOR equipment.

The station is switched on as described in the OPERATING INSTRUCTIONS. After that the station is controlled from the Simplex TOR equipment. When a CALL-CODE is received, the TOR short-circuits the terminals TELEPRINTER START and the station is immediately ready to send answer.

TT FROM TELEX

This information is used to switch the station between transmit and receive mode. When the TT information goes low the transmitter is open and the receiver is blocked. When the TT information goes high the transmission stops immediately and the receiver is blocked for another 15-25 msecs controlled from the DELAY-UNIT (adjustable with R1802). This delay must last until the transmitter output is less than the sensitivity of the receiver. The delay is pre-adjustable from the factory to 18 msecs, which secures a good reception with only 20 dB attenuation between the transmitter and receiver aerials.

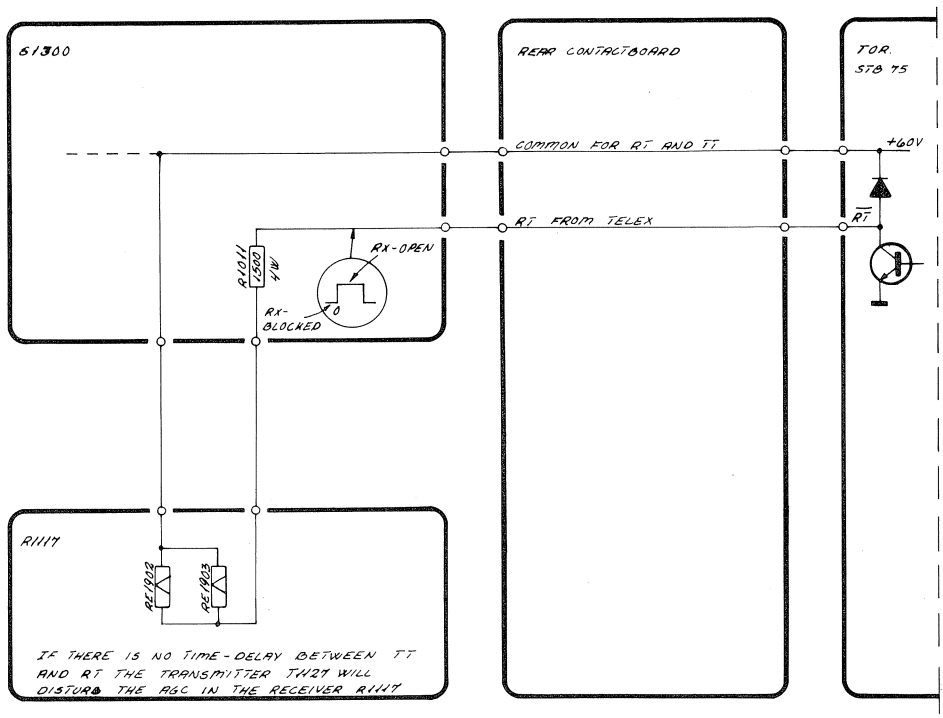
COMMON FOR RT & TT

It shall be connected to +60V in STB75/STB750. If another voltage source is to be used the resistor R1012 (820 ohm) on MODE-SWITCH-UNIT must be changed.

$$R1012 = \frac{V - 24}{0,045} \qquad \text{(ohm)}$$

SEPARATE BLOCKING OF RECEIVER

See principal diagram below.



RT FROM TELEX

This terminal is normally not connected, but if it is necessary the receiver can be blocked directly from STB75/STB750 (see principal diagram of separate blocking of the receiver).

The following must be changed in S1300:

a) On the FILTER-board (900) the brown/black wire from pin 29 in the Molex-plug must be moved from ground to the free terminal beside the white/orange wire.
b) The grey/black wires from RX-block on A2H-OSC. and DELAY UNIT (1800) must be disconnected from the printed circuit board, but they shall remain interconnected. NOTE! It is RT in STB75/STB750 that must be used.

If there is no delay between TT and RT, the transmitter will affect the AGC-voltage in the receiver.
If RT FROM TELEX is used R1011 must be changed too.

$$R1011 = \frac{V - 24}{0,025} \qquad \text{(ohm)}$$

INSTALLATION

All connections are done on the REAR CONTACTBOARD placed on the mounting plate.

SERVICE

1. MAINTENANCE

A

1.1.
When the SAILOR SHORT WAVE SET type 1000 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 the PERFORMANCE CHECK section.

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 measurings 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 under ADJUSTMENT PROCEDURE.

Any repair of the set should be followed by a FUNCTION CHECK of the unit in question.

2. NECESSARY TEST EQUIPMENT

T1127	N140X	S1300	R1117	
X	X	X	X	OSCILLOSCOPE:
				Bandwidth 0-25 MHz
				Sensitivity 2mV/cm
				Input impedance 1 Mohm//30 pF
				Triggering EXT-INT-ENVELOPE
				E.g. PHILIPS PM3212
X		X	X	PASSIVE PROBE:
				Attenuation 10x
				Input resistance DC 10 Mohm
				Input capacitance 15 pF
				Compensation range 10 pF - 30 pF
				E.g. PHILIPS PM 9396
		X	X	MULTIMETER:
				Sensitivity (f.s.d.) 1V
				Input impedance 10 Mohm
				Accuracy (f.s.d.) ±2%
				E.g. PHILIPS PM2503
X	X			MULTIMETER:
				Input impedance 30 Kohm/V
				Current range 100A
				Voltage range 0 ...500V, and 2,5 kV
				E.g. Unigor A43, with probe and shunt

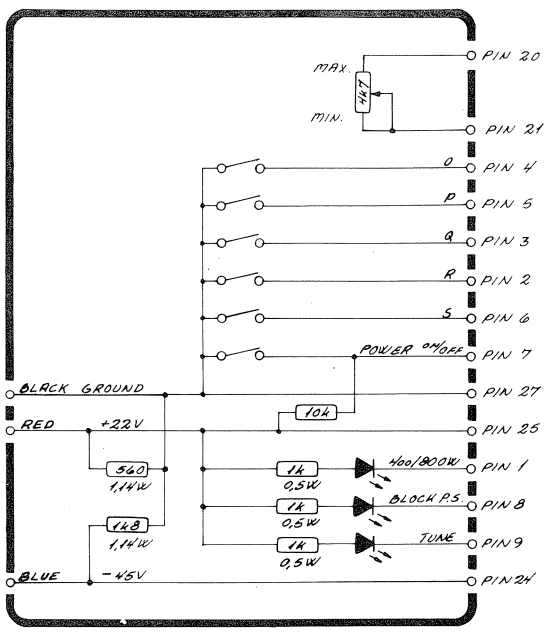
NECESSARY TEST EQUIPMENT cont.:

T1127	N140X	S1300	R1117		
		X		TONEGENERATOR:	
				Frequency range	200 - 3000 Hz
				Output	1V RMS
				Output impedance	≦ 600 ohm
				E.g. PHILIPS	PM5107
			X	AF VOLTMETER:	
				Sensitivity (f.s.d.)	300 mV
				Input impedance	≧ 4 ohm
				Accuracy (f.s.d.)	±5 %
				Frequency range	100 Hz - 5 kHz
				E.g. PHILIPS	PM2503
		X	X	FREQUENCY COUNTER:	
				Frequency range	100 Hz - 40 MHz
				Resolution	0,1 Hz at f ≧ 10 MHz
				Accuracy	$1 \cdot 10^{-7}$
				Sensitivity	100 mV RMS
				Input impedance	1 Mohm
				Single period measurement range	1 sec.
				resolution	1 mS
				E.g. PHILIPS	PM6611 + PM9679
			X	SIGNAL GENERATOR	
				Frequency range	550 kHz - 30 MHz R1118: 100 kHz - 30 MHz
				Output impedance	50/75 ohm
				Output voltage	1 uV - 100 mV EMF
				Modulation	AM, 30%, 1000 Hz
				E.g. PHILIPS	PM5326

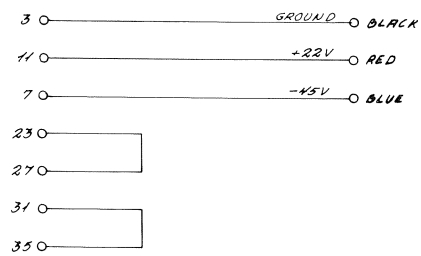
T1127	N140X	S1300	R1117	
				POWER SUPPLIES
X				T1127:
				V_{out} 26,5V DC
				I_{out} 60A DC
				E.g. 2 pcs. LAMBDA type LMG24
		X	X	R1117/S1300:
				V_{out} 1 22V
				I_{out} 1 1,5A
				V_{out} 2 -45V
				I_{out} 2 0,2A
				E.g. SAILOR POWER SUPPLY type N1402
		X		TEST BOX S1300:
				SP type S1300/01 TEST BOX
X				POWER METER:
				Power range 500W
				E.g. Bird Thruline Wattmeter Model 43 plug-in element 500W 2-30 MHz impedance 50 ohm
X				RF-AMMETER (Thermocross)
				Current range 5A
				E.g. HELWEG MIKKELSEN & CO. Copenhagen, Denmark type TR-68x71 5A
X		X		DUMMY LOAD for HF bands, 4 MHz to 25 MHz
				Impedance 50 ohm
				Frequency range 0-25 MHz
				Power range 500W
				E.g. BIRD Termaline Coaxial resistor Model 8401

NECESSARY TEST EQUIPMENT cont.:

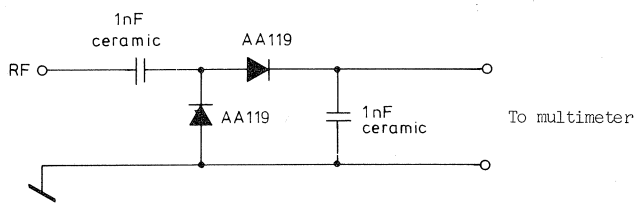
SCEMATIC DIAGRAM FOR TESTBOX S1300/1301.



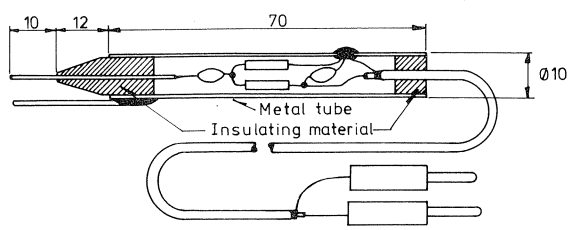
Connections to N1402



DIODE PROBE



LAYOUT OF THE PROBE



NECESSARY TEST EQUIPMENT cont.:

FREQUENCY TABLE FOR TEST STRIPS

Programming Code							Programming Code						
Pos.	zyxv	M A	100 DCBA	10 DCBA	1 DCBA	0,1 DCBA	Pos.	zyxv	M A	100 DCBA	10 DCBA	1 DCBA	0,1 DCBA
1A	0101	0	0000	0000	0000	0101	10A	1100	1	1001	1001	1001	0000
1B	0100	0	0000	0000	0000	0000	10B	1100	0	0000	0000	0000	0000
1C	0010	0	0000	0000	0000	1001	10C	1111	0	0000	0000	0000	0000
1D	0001	0	0000	0000	0000	0000	10D	0000	0	0000	0000	0000	0000
2A	0001	0	0010	0000	0000	0000	11A	0101	0	0000	0000	0000	0000
2B	0001	1	0110	0000	0000	0000	11B	0110	0	0100	0000	0000	0000
2C	0001	1	0110	0000	0000	0000	11C	0101	1	0000	0000	0000	0000
2D	0011	0	0000	0000	0000	0000	11D	0110	1	0000	0000	0000	0000
3A	0001	1	1000	1000	1000	1000	12A	0111	0	0010	0000	0000	0000
3B	0001	0	0100	0100	0100	0100	12B	0111	0	0010	0110	0011	0000
3C	0110	0	0010	0010	0010	0010	12C	0111	0	0011	0010	0101	0000
3D	0111	0	0011	0000	0000	0000	12D	0000	0	0000	0000	0000	0000
4A	1000	0	0011	0000	0000	0000	13A	1000	0	0001	1001	0101	0000
4B	1001	0	0011	0000	0000	0000	13B	1000	0	0011	0001	0101	0000
4C	1010	0	0011	0000	0000	0000	13C	1000	0	0100	0011	0101	0000
4D	1011	0	0001	0001	0001	0001	13D	0000	0	0000	0000	0000	0000
5A	1100	1	0011	0000	0000	0000	14A	1001	0	0011	0011	0000	0000
5B	0000	0	0000	0000	0000	0000	14B	1001	0	0100	1001	0001	0000
5C	1101	0	0100	0000	0000	0000	14C	1001	0	0110	0101	0010	0000
5D	1110	0	0001	1000	0010	0000	14D	0000	0	0000	0000	0000	0000
6A	1101	1	1001	1001	1001	0000	15A	1010	0	0100	0110	0000	0000
6B	1101	0	0000	0000	0000	0000	15B	1010	0	0110	0110	0000	0000
6C	0010	1	1001	1001	1001	0000	15C	1010	0	1000	0101	1001	0000
6D	0010	0	0000	0000	0000	0000	15D	0000	0	0000	0000	0000	0000
7A	0110	1	1001	1001	1001	0000	16A	1011	0	0000	0000	0000	0000
7B	0110	0	0000	0000	0000	0000	16B	1011	0	0001	0101	0110	0000
7C	0111	1	1001	1001	1001	0000	16C	1011	0	0011	0001	0001	0000
7D	0111	0	0000	0000	0000	0000	16D	0000	0	0000	0000	0000	0000
8A	1000	1	1001	1001	1001	0000	17A	1100	1	0000	0111	0000	0000
8B	1000	0	0000	0000	0000	0000	17B	1100	1	0000	1001	0000	0000
8C	1001	1	1001	1001	1001	0000	17C	1100	1	0001	0001	0000	0000
8D	1001	0	0000	0000	0000	0000	17D	0000	0	0000	0000	0000	0000
9A	1010	1	1001	1001	1001	0000	18A	1101	0	0101	1001	0101	0000
9B	1010	0	0000	0000	0000	0000	18B	1101	0	0101	1001	1000	0000
9C	1011	1	1001	1001	1001	0000	18C	1101	0	0110	0000	0001	0000
9D	1011	0	0000	0000	0000	0000	18D	0000	0	0000	0000	0000	0000

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 our whether the fault is somewhere in the antenna circuit, the power source, or in the short wave set.

For help with trouble-shooting in the short wave set there is a built-in test meter and test meter switch, located behind the air filter on the power supply.

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 CIRCUIT DESCRIPTION. This section contains scematic diagrams, description of the modules and pictures showing the location of the components. (ADJUSTMENT LOCATIONS).
Typical AC and DC voltages are indicated on the scematic 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 the module look up the section NECESSARY ADJUSTMENTS AFTER REPAIR to see, whether the unit has to be adjusted or not.

Anyway the unit has to have a complete FUNCTION CHECK after repair.

A

TROUBLE-SHOOTING IN THE FREQUENCY GENERATING CIRCUIT

LOOP 1

If the fault has been located to LOOP 1 the following hints can be used for trouble-shooting.

If there is no output signal from the VCO the fault has to be found in the VCO-UNIT.

If the output frequency from the VCO is lower than the low frequency limits or higher than the high frequency limits of the 2 MHz band in question, the phase locked loop 1 is out of lock. For VCO frequencies look-up the section PRINCIPLE OF OPERATION.

1. Check the LOOP 1 MIXER output signal on the terminal "Loop 1 out".
   a. If there is no output signal, the failure is on LOOP 1 MIXER, HARMONIC FILTER UNIT or VCO-UNIT.
   b. If the output frequency is approx. 2 MHz or approx. 5 MHz, the VCO-UNIT LOOP 1 MIXER and the HARMONIC FILTER UNIT are apparently ok.

2. Check that the frequency on the phase/frequency detector IC106, pin 1 is 1 kHz.

3. Check the Loop 1 Programmable Divider.
   a. If the frequency on the input terminal "Loop 1 In" is approx. 2 MHz and the frequency on the phase/frequency detector IC106, pin 3 is lower than 1 kHz, the programmable divider is apparently ok.
   b. If the frequency on the input terminal "Loop 1 In" is approx. 5 MHz and the frequency on the phase/frequency detector IC106, pin 3 is higher than 1 kHz, the programmable divider is apparently ok.

4. Check the phase/frequency detector IC106.
   a. Measure 1.5V DC on the terminal "PD1 (1.5V) out" on DIVIDER-UNIT.
   b. If the input frequency on IC106, pin 3 is higher than 1 kHz and the DC-voltage on the terminal "PD1 out" on DIVIDER-UNIT is approx. 0.7V, the phase/frequency detector is apparently ok.
   c. If the input frequency on IC106, pin 3 is lower than 1 kHz and the DC-voltage on the terminal "PD1 out" on DIVIDER-UNIT is approx. 2.3V, the phase/frequency detector is apparently ok.

5. Check the integrator IC202 on LOOP 1 FILTER & $\pm$18V SUPPLY-UNIT.
   a. If the DC voltage on the terminal "PD1 In" is approx. 0.7V and the DC voltage on output terminal of IC202, pin 6 is approx. -4V, the integrator IC202 is apparently ok.
   b. If the DC voltage on the terminal "PD1" is approx. 2.3V and the DC voltage on the output terminal of IC202, pin 6 is approx. -17V, the integrator IC202 is apparently ok.

6. If the failure has not been found yet the 1 kHz loop filter IC201 and the wirings to the VCO must be checked.

TROUBLE-SHOOTING cont.:

LOOP 2

If the fault has been located to LOOP 2 the following hints can be used for trouble-shooting.

If there is no output signal from the VCXO and LOOP 2 FILTER on the terminal "VCXO out" , the failure has to be found in the VCXO.

If the output frequency from the VCXO and LOOP 2 FILTER on the terminal "VCXO out" is lower than 10.098 MHz or higher than 10.099 MHz, the phase locked loop 2 is out of lock.

1. Check the output signal on VCXO and LOOP 2 FILTER terminal "Loop 2 out".
   a. If there is no output signal, the failure is in the loop 2 mixer or the 10 MHz injection signal is missing.
   b. If the output frequency is slightly lower than 98 kHz or slightly higher than 99 kHz, the VCXO, LOOP 2 mixer and the 10 MHz injection signal are apparently ok.

2. Check that the frequency on the phase/frequency detector IC113, pin 1 is 100 Hz.

3. Check the LOOP 2 Programmable Divider.
   a. If the frequency on the input terminal "Loop 2 In" is approx. 97 kHz and the frequency on the phase/frequency detector IC113, pin 3 is slightly lower than 100 Hz, the programmable divider is apparently ok.
   b. If the frequency on the input terminal "Loop 2 In" is approx. 100 kHz and the frequency on the phase/frequency detector IC113, pin 3 is slightly higher than 100 Hz, the programmable divider is apparently ok.

4. Check the phase/frequency detector IC113.
   a. Measure 1.5V DC on the terminal "PD2 (1.5V)" on the DIVIDER-UNIT.
   b. If the input frequency on IC113, pin 3 is lower than 100 Hz and the DC voltage on the terminal "PD2 Out" on DIVIDER-UNIT is approx. 0.7V, the phase/frequency detector is apparently ok.
   c. If the input voltage on IC113, pin 3 is higher than 100 Hz and the DC voltage on the terminal "PD2 Out" on DIVIDER-UNIT is approx. 2.3V the phase/frequency is apparently ok.

5. Check the integrator IC601 on VCXO and LOOP 2 FILTER.
   a. If the DC voltage on the terminal "PD2 In" is approx. 0.7V and the DC voltage on output terminal of IC601, pin 6 is approx. 17V, the integrator IC601 is apparently ok.
   b. If the DC voltage on the terminal "PD2 In" is approx. 2.3V and the DC voltage on the output terminal of IC601, pin 6 is approx. 1V, the integrator IC601 is apparently ok.

6. If the failure has not yet been found the 100 Hz loop filter must be checked.

4. PERFORMANCE CHECK FOR S1300

Before executing performance check the exciter must be connected to power supplies +22V and -45V via the testbox S1300/01. The output connector shall be loaded with 50 ohm, and the exciter shall be activated by a microphone key plug with a capacitor in it for connection to tonegenerator.

For necessary frequency codes the supplied set of programming strips must be mounted in the frequency selector, in position 1 to 18 corresponding to the numbers printed on the strips.

4.1.1.
Connect voltmeter to TP1

4.1.2.
Check the voltage to be within 18V ±0.2V.

4.1.3.
Connect voltmeter to TP2

4.1.4.
Check the voltage to be within -18V ±0.2V

4.1.5.
Connect voltmeter between TP1 and TP3

4.1.6.
Check the voltage to be within 100 mV

4.1.7.
Connect voltmeter to TP31

4.1.8.
Check the voltage to be within 5V ±0.2V

4.1.9.
Connect frequency counter to TP4

4.1.10.
Check the frequency to be within 10 000 000 Hz ±1 Hz

4.2.
MOTOR CONTROL PRINT
In the positions 1A to 5D (both incl.) the motor control circuit is checked. In fig. 1 is shown the truth table for the motor control code to be tested

4.2.1.
Set "POWER ON/OFF" to "1"

4.2.2.
Set the frequency selector to 1A

4.2.3.
Code the corresponding motor code on the Test Box S1300/01

4.2.4.
Check that the LEDs on the test box is lighting as indicated in fig. 1. Note that for incorrect code is TUNE lamp lighing instead of BLOCK P.S.

4.2.5.
Go to next position as indicated in fig. 1, and go through 4.2.3., 4.2.4. and 4.2.5. until 5D is done.

4.2.6.
In position 5D 2182 lamp on exciter front panel must be lighting

4.2.7.
In the same position set "POWER ON/OFF" to "0", and check that BLOCK P.S. turns off.

See table on next page.

Pos.	s r q p o	Block P.S.	tune	400/800W	Frequency
1A	1 0 1 0 1	x			
1B	1 0 1 0 0	x			
1C	1 0 0 1 0	x			
1D	0 0 0 0 0	x			
2A	0 0 0 0 1	x			
2B	0 0 0 1 1	x			
2C	0 1 0 1 1	x			
2D	1 0 0 1 1	x			
3A	0 1 1 0 0	x			1888.8
3B	0 0 0 1 0	x			2444.4
3C	1 0 1 1 0	x		x	4222.2
3D	1 0 1 1 1	x		x	6300.0
4A	1 1 0 0 0	x		x	8300.0
4B	1 1 0 0 1	x		x	12300.0
4C	1 1 0 1 0	x		x	16300.0
4D	1 1 0 1 1	x		x	22111.1
5A	1 1 1 0 0	x		x	25300.0
5B	Ø Ø Ø Ø Ø			x	
5C	1 1 1 0 1	x			
5D	1 1 1 1 0	x			

x indicates light in the corresponding LED on the test box

Ø indicates don't care

4.2.8.
In position 10C shall only 400/800W LED be lighting.

4.3.
FREQUENCY SELECTION

4.3.1.
Connect frequency counter to TP21 via 1:10 probe. Mode A3H.

4.3.2.
Check the frequency from position 3A to 5A (both incl.), and compare with the frequencies in fig. 1.

4.4.
HARMONIC FILTER AND VCO
Load TP26 with 68 ohm

4.4.1.
Connect frequency counter to TP30

4.4.2.
Connect voltmeter to TP6

4.4.3.
Connect voltmeter to TP7

In the positions 6A to 10B (both incl.) check the above mentioned test points.

ad. 4.4.1. In the positions A and C: 4698 kHz and in the positions B and D: 2699 kHz.

ad. 4.4.2. In all positions below 3,5V.

ad. 4.4.3. In the positions A and C: 15V $\pm$1V and in the positions B and D: above 5V.

Disconnect 68 ohm load on TP26.

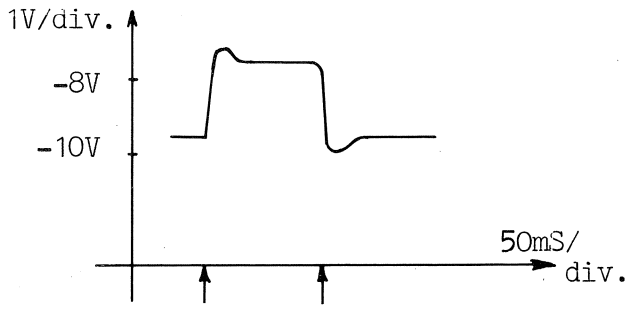
4.5.
STEP RESPONSE

4.5.1.
Connect oscilloscope to TP7

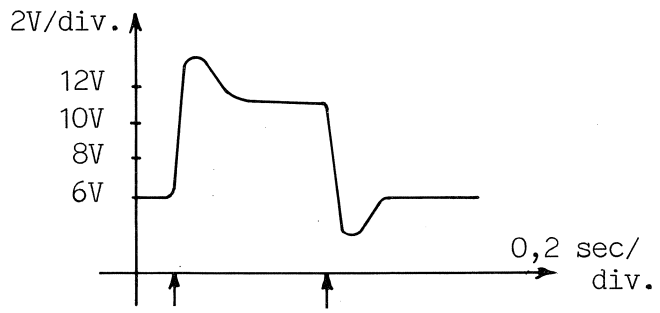
4.5.2.
In position 2D short-circuit black/yellow control wire on divider board to ground. Step response is seen on oscilloscope, compare to fig. 2.

4.5.3.
Connect oscilloscope to TP8

4.5.4.
In position 2D short-circuit grey control wire to divider board to ground. Step response is seen on oscilloscope compare to fig. 3.



Connect Disconnect Fig. 2.



Connect Disconnect Fig. 3.

4.6.
LEVEL CONTROL

4.6.1.
Connect oscilloscope to TP29 via 1:10 probe

4.6.2.
Check the voltage to be above 1,7V pp. in position 1A

4.6.3.
Connect oscilloscope to TP27 via 1:10 probe.

4.6.4.
Check the voltage to be above 1,6V pp. in position 1A

4.6.5.
Connect oscilloscope to TP28 via 1:10 probe

4.6.6.
Check the voltage to be above 2,5V pp. in position 1A

4.6.7.
Connect voltmeter to TP8

4.6.8.
Check the voltage to be within 8V to 9,5V in position 1A

4.6.9.
Check the voltages to be below 13V in position B

4.6.10.
Check the voltage to be above 5V in position 1C

4.7.
MICROPHONE AMPLIFIER

4.7.1.
Connect oscilloscope to TP12

4.7.2.
In position A3J and 1A connect tone-generator, 1000 Hz, to microphone plug

4.7.3.
Turn tonegenerator output control fully counter clockwise, and then clockwise until the level on TP12 just is constant. This limitation shall happen at approx. 300 mV pp. measured on TP25.

4.7.4.
Add 10 dB to tonegenerator output (1V pp), and check that the measured signal is approx. symmetrical clipped.

4.8.
ATTACK- AND DECAY TIME

4.8.1.
Connect oscilloscope to TP24

PERFORMANCE CHECK FOR S1300 cont.:

4.8.2.
By connection and disconnection of the tonegenerator signal the measured voltage shall be as shown on fig. 4.

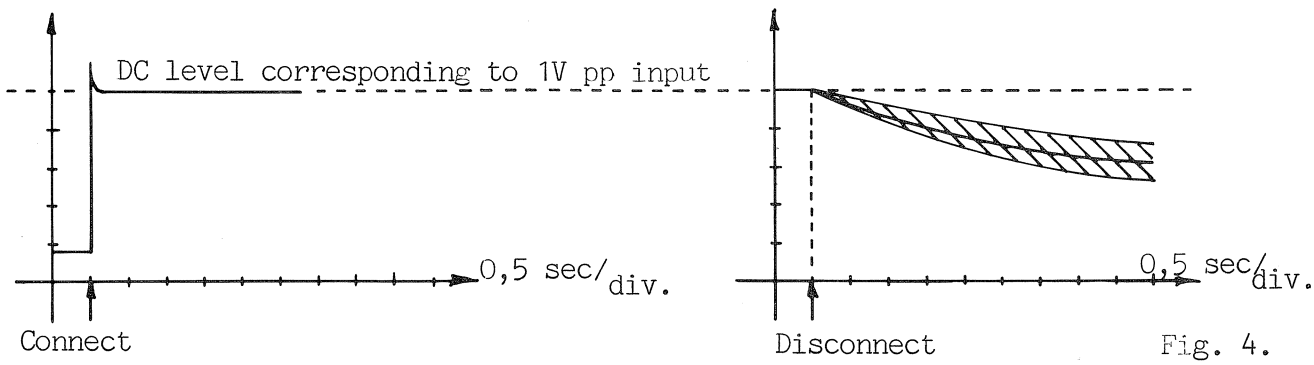


Fig. 4.

4.9.
OUTPUT LEVEL

4.9.1.
Connect oscilloscope to TP21 via 1:10 probe.

4.9.2.
In position 1A, tune, full power and power level potentiometer fully clockwise.
Measure the voltage to be within 18V pp. and 21V pp.

4.10.
POWER REDUCTION

4.10.1.
Connect diode probe to TP21

4.10.2.
In position 1A, tune and full power. Check that the power level potentiometer can change output level between 10 dB and 13 dB.

4.10.3.
With power level potentiometer fully clockwise, check the difference between full and medium power to within 5 dB and 7 dB. And the difference between full and low power to be within 12 dB and 14 dB.

4.11.
A3H AND A3A

4.11.1.
Connect oscilloscope to TP21 via 1:10 probe.

4.11.2.
In position 1A, tune and full power. Adjust power level potentiometer until there is full deflection (8 cm) on oscilloscope screen.

4.11.3.
Change to A3H, without modulation. Check A3H carrier, now seen, to be within 4 cm and 4,5 cm.

4.11.4.
Connect tonegenerator, 1000 Hz and 1V pp. to microphone plug.

4.11.5.
Check the output in A3H, A3A and A3J to be within 7 cm pp. and 8 cm pp. on oscilloscope.

4.12.
BANDPASS FILTER UNIT

Lowpass filter and bandpass filters are checked as described in adjustment procedure 5.9.1. - 5.9.4.

PERFORMANCE CHECK FOR S1300 cont.:

4.13.
ALARM GENERATOR

The alarm signal generator is checked as described in adjustment procedure 5.6.1. - 5.6.2.

4.14.
FREQUENCY RESPONSE

Frequency responses from microphone plug to output socket is measured as described in adjustment procedure 5.7.1. and 5.7.3.

4.15.

At last the exciter is tested with handset, output is checked on TP21 with oscilloscope.
In position 5D press alarm and test alarm at the same time.
The distress signal can now be seen on the oscilloscope. The time from start of alarm signal until it automatically disappears is checked by a watch to be within 35 secs. and 55 secs.

APPENDIX TO ADJUSTMENT PROCEDURE FOR S1300

In the exciters S1300 with numbers between 157510 and 157809 is mounted an early version of the mixer unit. Therefore it is necessary to modify the adjustment procedure as follows:

Deleted:

5.4.5., 5.4.6., 5.4.8., 5.4.9., 5.4.10. and 5.4.12.

Added:

5.4.8.. Adjust L1108, L601, L1601, L1603 (in collector of T1604) and L1604 to max.

5.4.12. Adjust R1151 to 2.8V pp.

In part 5.8. the only modification is in point 5.8.4. and 5.8.5., where L1602 now is L1603 (connected to output of FL1601 via C1614). There are two coils L1603 because of a failure in the diagram.

P.S. Note the supplied test strip 2A. Because of a failure on the original strip number 2, please destroy it and replace it with the new one, number 2A.

5. ADJUSTMENT PROCEDURE FOR S1300

Before adjustment of the exciter, the set of programming strips must be mounted in the frequency selector in the positions 1 to 18 corresponding to the numbers printed on the strips.

The following adjustment steps are all starting with information about channel selected, and operation mode of the exciter, e.g. 1A, tune.

The trimming cores are factory sealed. In order to break the seal, use normal cellulose thinner.

5.1.
DC ADJUSTMENTS

5.1.1.
Connect voltmeter to TP1

5.1.2.
Adjust R902 to +18V

5.1.3.
Connect voltmeter to TP2

5.1.4.
Adjust R209 to -18V

5.1.5.
Connect voltmeter between TP1 and TP3

5.1.6.
Adjust R214 to less than 100 mV

5.1.7.
Disconnect brown wire to TP22, and insert amperemeter.

5.1.8.
Adjust R1536 to 285 mA

5.1.9.
Reconnect brown wire to TP22

5.2.
MICROPHONE AMPLIFIER

5.2.1.
1A, tune. Connect tonegenerator, 1000 Hz and 300 mV pp. measured on TP25.

5.2.2.
Connect oscilloscope to TP12

5.2.3.
Turn R1201 full counter clockwise, and then clockwise until the measured level is just constant.

5.2.4.
Add 10 dB to tonegenerator output 1V pp.

5.2.5.
Adjust R1224 for symmetrical clipping

5.2.6.
Connect oscilloscope to TP13

5.2.7.
Change to tune position

5.2.8.
Adjust R1232 to 80 mV pp.

5.3.
TCXO

5.3.1.
Connect frequency counter to TP4

5.3.2.
Adjust R112 to 10.000.000 Hz.

5.4.
SIGNAL PATH

5.4.1.
1A, A3J, with no input from tonegenerator. Connect oscilloscope to TP9 via 1:10 probe

5.4.2.
Adjust L101, L1101 and L1103 for max.

5.4.3.
Adjust R1125 and C1123 for min. This adjustment shall be repeated until the measured signal is almost a 1,2 MHz Sine.

5.4.4.
Turn power level potentiometer fully clockwise

5.4.5.
Connect oscilloscope to TP23 via 1:10 probe

5.4.6.
Adjust R1625 to min.

5.4.7.
1A, tune, full power. Connect oscilloscope to TP21 via 1:10 probe. If the signal is clipped, reduce output until it is undistorted.

5.4.8.
Adjust L1108, L601, L1603 and L1604 for max.

5.4.9.
Connect oscilloscope to TP17 via 1:10 probe and set output to max.

5.4.10.
Adjust R1151 to 350 mV pp.

5.4.11.
Connect oscilloscope to TP20 via 1:10 probe

5.4.12.
Adjust R1631 to 2,8V pp.

5.4.13.
Connect oscilloscope to TP21 via 1:10 probe

5.4.14.
Adjust R1534 to 21V pp.

5.5.
A3H CARRIER

5.5.1.
1A, tune and full power. Connect oscilloscope to TP21 via 1:10 probe

5.5.2.
Adjust power level potentiometer to full screen (8 cm)

5.5.3.
Change to A3H without modulation. Adjust the A3H carrier now seen to 4,25 cm with R1109.

5.6.
ALARM GENERATOR

5.6.1.
1A, test alarm. Short-circuit C1301. One of the two alarm tones can now be measured on TP11. By removing and establishing the short-circuit, the alarm generator can be changed to the other tone. If necessary the tones may be adjusted on L1301: 2200 Hz $\pm$15 Hz and L1302: 1300 Hz $\pm$10 Hz.

5.6.2.
Disconnect the established short-circuits

5.6.3.
Connect frequency counter, in time period position, to TP10.

5.6.4.
Adjust R1301 to 250 mS $\pm$ 10 mS.
Under adjustment the alarm generator will stop after about 45 secs. For restart, release test alarm push button, and activate it again.

——— " ———

The following filter adjustments shall only be carried out when some repair is done around a filter.

5.7.
600 kHz SSB FILTER

5.7.1.
1A, tune. Connect oscilloscope to TP21 via 1:10 probe.

5.7.2.
Adjust L1106 and L1107 for max.

5.7.3.
Control of filter response is carried out in mode A3J, with tonegenerator connected to microphone plug, output 1V pp measured on TP25.

Frequency response is measured with diode probe on TP21. Max. permissible ripple is 2 dB in the frequency range 500 Hz - 2500 Hz, -6 dB frequencies is approx. 350 Hz and 2700 Hz.

5.7.4.
Go through 5.4.9. - 5.4.14.

5.8.
10,7 MHz FILTER

5.8.1.
18B, A3H without modulation. Disconnect innercore of coaxial cable W1/6-16

5.8.2.
Connect point 1 to point 5 on mixerboard with an external wire.

5.8.3.
Connect oscilloscope to TP19 via 1:10 probe.

5.8.4.
Adjust L1601 and L1602 to max.

5.8.5.
Adjust slightly L1601 and/or L1602 until the amplitude is the same within ± 0,25 dB, in the positions 18A, 18B and 18C

5.8.6.
Remove wire between 1 and 5 ,reconnect W1/6-16.

5.8.7.
Go through 5.4.9. - 5.4.14.

5.9.
BAND FILTER UNIT
LOWPASS FILTER

5.9.1.
11A, B, C and D, tune. Connect diode-probe to TP21.

5.9.2.
Adjust power level potentiometer until 7,75V, corresponding to +20 dB on the decibel scale, is attained.

Repeat adjustment of L1513 and L1514 until output difference is below 0,5 dB in the positions A, B and C, and output level in position D is 3 dB below the deflection in position A.

BANDPASS FILTERS

5.9.3.
11A, tune. Connect diode probe to TP21

5.9.4.
Adjust power level potentiometer to +20 dB (7,75V)

The frequencies for bandpass filter adjustments is chosen so that center frequency is in position B, and band-limits in position A and C.

Every single bandpass filter shall be adjusted to max. output. The output must be within ± 0,25 dB in A and C relative to B. And the deflection on the center frequency, position B, shall be between 19,0 dB and 20,5 dB.
The test frequencies for the bandpass filters is arranged as follows: pos. 12 is 6 MHz, pos. 13 is 8 MHz ...
and pos. 17 is 25 MHz.

5.9.5.
Go through 5.4.9. - 5.4.14.

6. NECESSARY ADJUSTMENTS AFTER REPAIR FOR S1300

In the following paragraphs is referred to the necessary adjustment- and performance check paragraphs in chapter 4 and 5.

6.1.
DIVIDER UNIT

6.1.1.
Execute 4.1.8., 5.3. and adjust L101 as described in 5.4.1. and 5.4.2.

6.1.2.
Control 4.3.1., 4.3.2., 4.5. and 4.9.

6.2.
LOOP 1 FILTER & ±18V POWER SUPPLY.

6.2.1.
Execute 5.1.1. - 5.1.6. (both incl.).

6.2.2.
Control 4.4., 4.5.1. and 4.5.2.

6.3.
VCO UNIT, HARMONIC FILTER OR LOOP 1 MIXER.

6.3.1.
Control 4.3., 4.4., 4.5.1. and 4.5.2.

6.4.
VCXO AND LOOP 2 FILTER

6.4.1.
Execute 5.4.7. - 5.4.14. (both incl.) without adjusting L1108, L1603 and L1604.

6.4.2.
Control 4.6.5. - 4.6.10. (both incl.).
Control 4.5.3. and 4.5.4.

6.5.
MOTOR CONTROL UNIT.

6.5.1.
Control 4.2. and 4.3.

6.6.
FILTER UNIT

6.6.1.
Execute 5.1.1., 5.1.2., 5.1.5. and 5.1.6.

6.7.
MODE SWITCH UNIT

6.7.1.
Perform a FUNCTION CHECK 7.

6.8.
SSB GENERATOR

6.8.1.
Execute 5.4. and 5.5., without adjusting L101, L601, L1603 and L1604.

6.9.
MICROPHONE AMPLIFIER

6.9.1.
Execute 5.2. and 5.4.9. - 5.4.14. (both incl.).

6.9.2.
Control 4.8.

6.10.
ALARM SIGNAL GENERATOR

6.10.1.
Execute 5.6.

6.10.2.
Control 4.15.

6.11.
DRIVER UNIT OR BANDPASS FILTER

6.11.1.
Execute 5.1.8., 5.1.9. and 5.9., no coil adjustment will generally be necessary.

6.12.
MIXER UNIT

6.12.1.
Execute 5.4.4. - 5.4.14. (both incl.) without adjusting L1108 and L1601.

7. FUNCTION CHECK FOR S1300

7.1.1.
Connect S1300/01 Test Box, power supplies, 50 ohm load and tonegenerator via key plug to exciter.

7.1.2.
Connect frequency counter to output connector via 1:10 probe.

7.1.3.
Set exciter to A3H, full power, power level potentiometer fully clockwise and no modulation.

7.1.4.
Measure a frequency in every band.
In CT two: one below and one above 2 MHz. And compare to the frequency table on T1127 or in the operating instruction manual. The frequency accuracy shall be within 0,5 ppm.

7.2.1.
Change to tune position.

7.2.2.
Connect diode probe to output connector.

7.2.3.
Go through the above mentioned channels and check the voltage to be within 16V and 20V.

7.2.4.
Control that power level potentiometer control range is approx. 12 dB.

7.2.5.
With power level potentiometer fully clockwise control the difference between full- and medium power to be within 5 dB and 7 dB. And the difference between full- and low power to be within 12 dB and 14 dB.

7.3.1.
Change to A3J. Choose a channel below 10 MHz.

7.3.2.
Supply 1000 Hz and 1V RMS to microphone plug.

7.3.3.
Adjust power level potentiometer until meter deflection is 7,75V corresponding to +20 dB.

7.3.4.
Change tonegenerator frequency between 500 Hz and 2500 Hz, and control that the output amplitude ripple is below 2 dB. Check that -6 dB frequencies is approx. 300 Hz and 2700 Hz.

7.3.5.
Turn tonegenerator to 1000 Hz.

FUNCTION CHECK FOR S1300 cont.:

7.3.6.
Disconnect diode probe, and connect oscilloscope to output connector.

7.3.7.
Change to tune position.

7.3.8.
Adjust power level potentiometer to full deflection on oscilloscope - screen (8 cm).

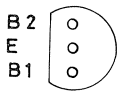
7.3.9.
Check that the amplitude is within 7 cm and 8 cm in the positions A3J, A3H and A3A.

7.4.1.
Change frequency selector to position 1 (distress).

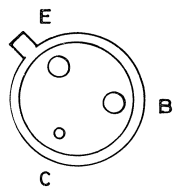
7.4.2.
Press alarm and test alarm at the same time. The distress signal can now be seen on the oscilloscope. The time from start of alarm signal until it automatically disappears shall be between 35 secs. and 55 secs.

Check that power switch is disabled under alarm transmission.

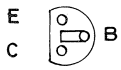
BOTTOM VIEW



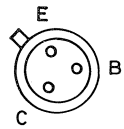
2N4871



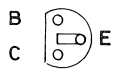
BFW 17A



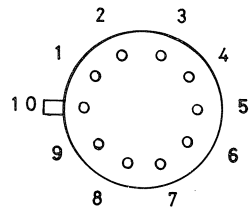
BC 328-25
BC 338
BC 547
BC 548 A,B,C
BC 556 A
BC 558 A,B,C



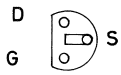
2N2368



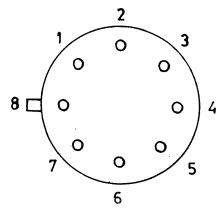
BF 199
BF 494



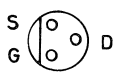
CA 3019



BF256 A,B,C



LM3053

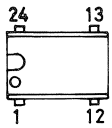


E310

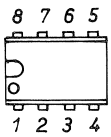
A 1/2

PIN CONFIGURATIONS

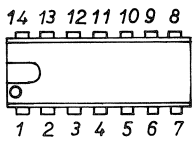
TOP VIEW



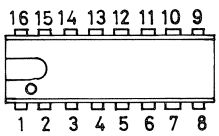
MC 14515 BCB



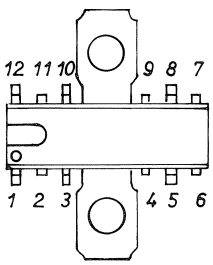
LM 308N
MC 1455 P1
MC 1458



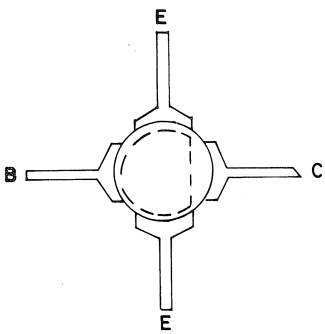
LM 324
LM 3086
MC 4044
MC 14077 B CP
MC 14081 B CP
SN 7407N
SN 7410N
SN 7472N
SN 74LS 20N
SN 74LS27N
SN 74 LS 290N



MC 14519 B CP
MC14530B CP
SN 74LS109N
SN 74LS192N
SN 74LS390N

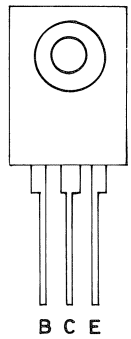


TCA 940

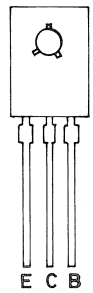


2N5641

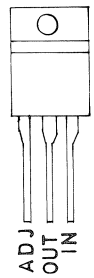
FRONT VIEW



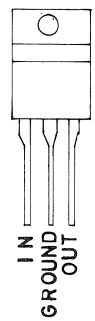
BD 577



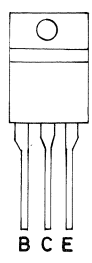
BD138
BD139



LM317 T



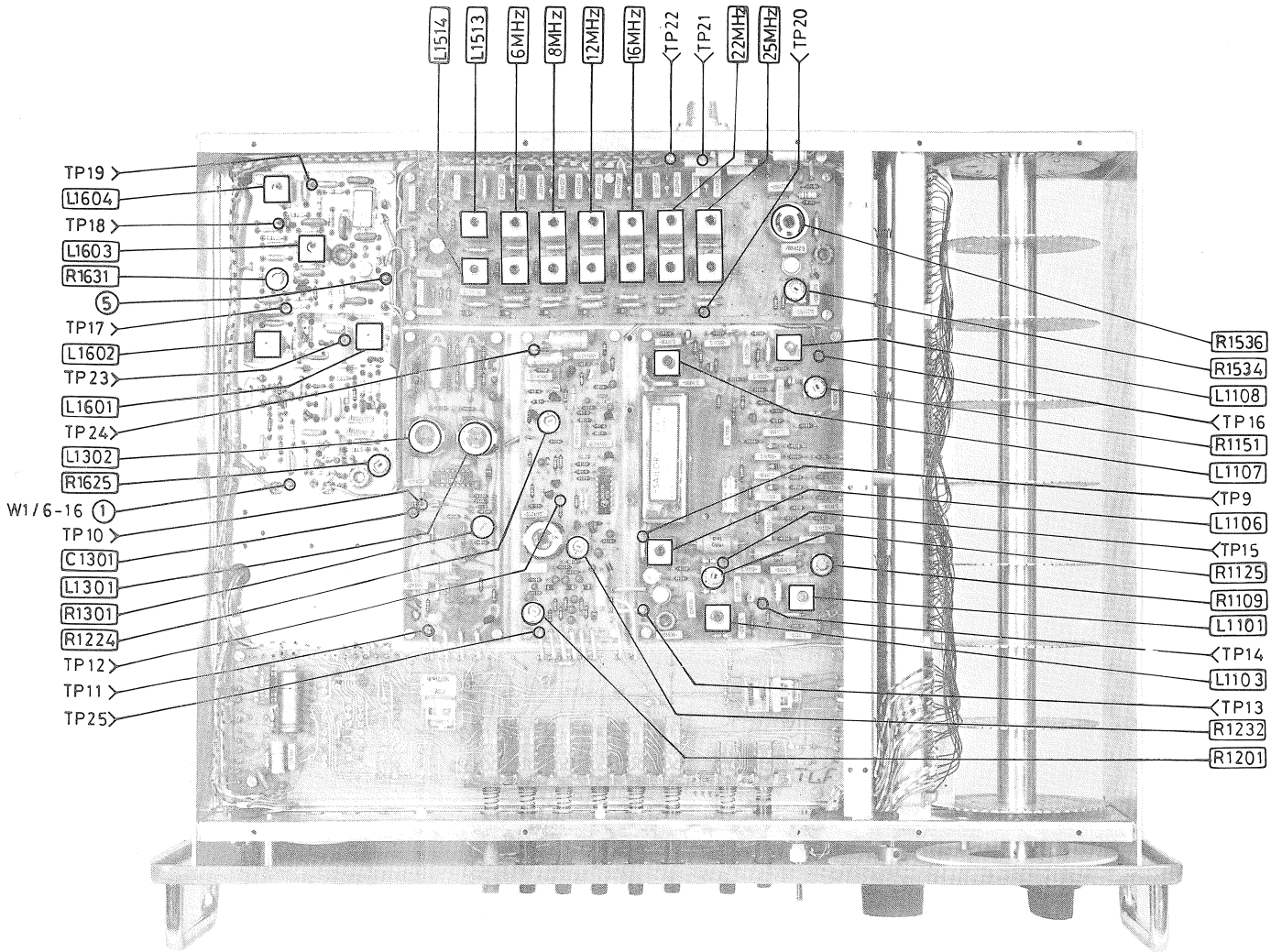
MC 7805 CT
MC 7818 CT

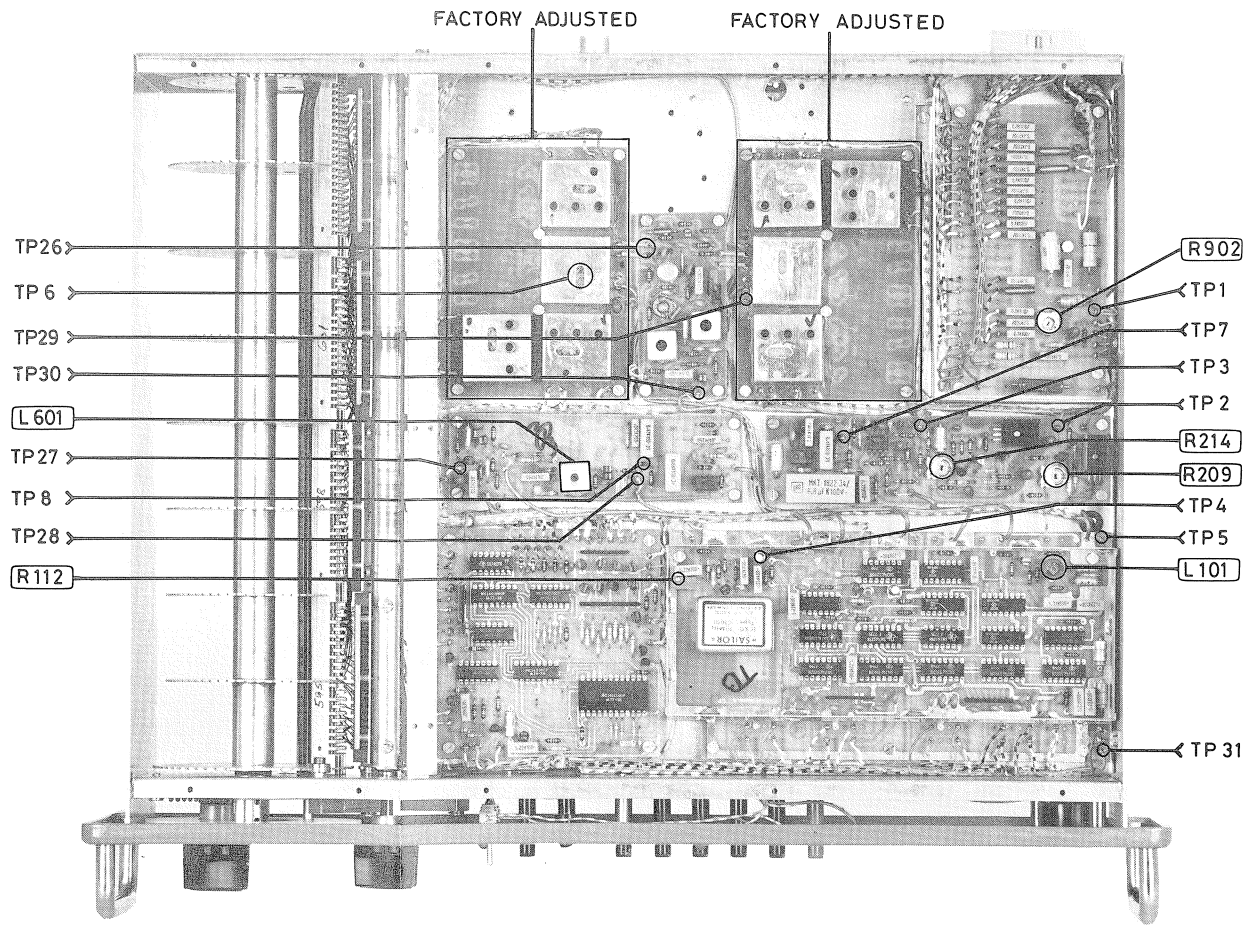


BD 241

A 2/2

PIN CONFIGURATIONS



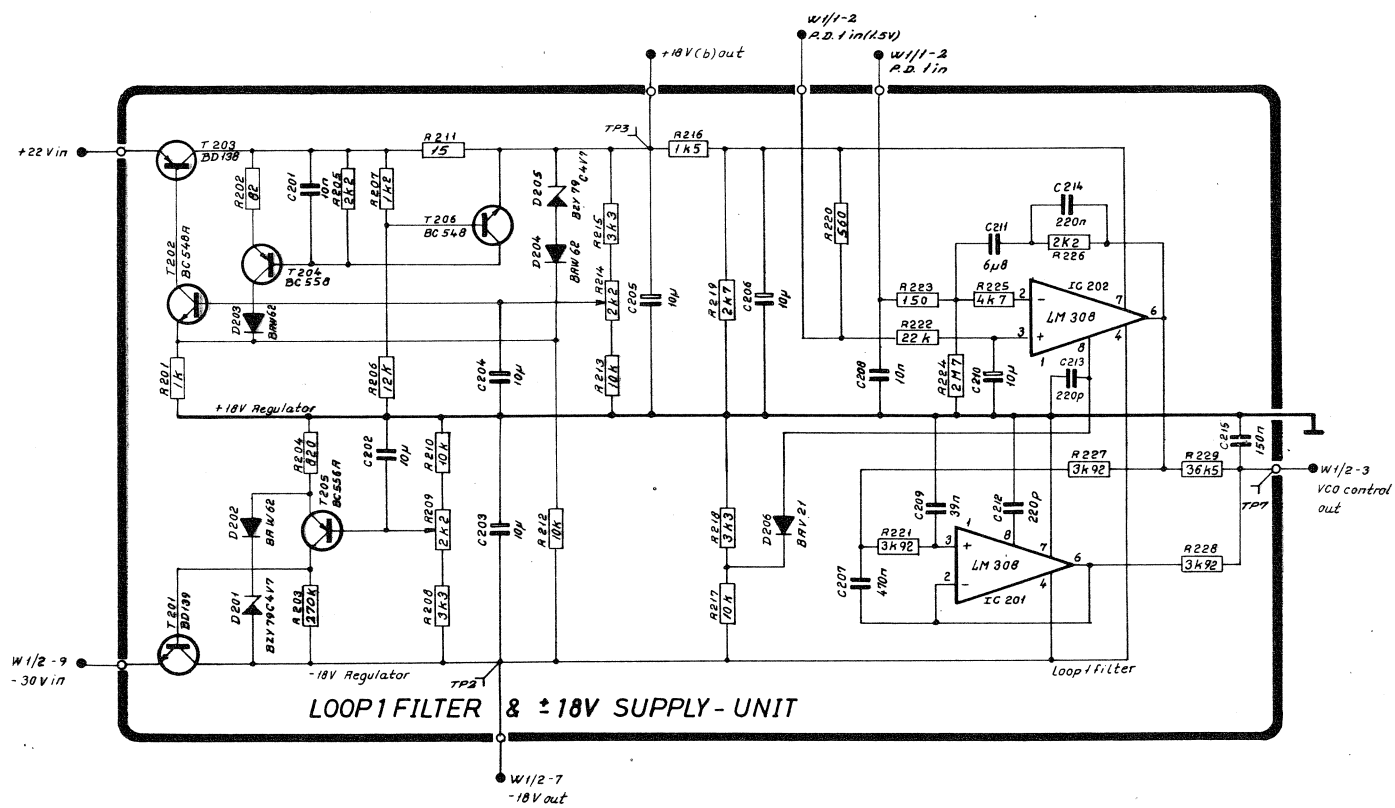


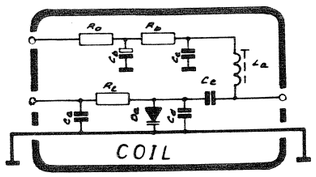
ADJUSTMENT LOCATIONS S 1300

A

DIVIDER - UNIT

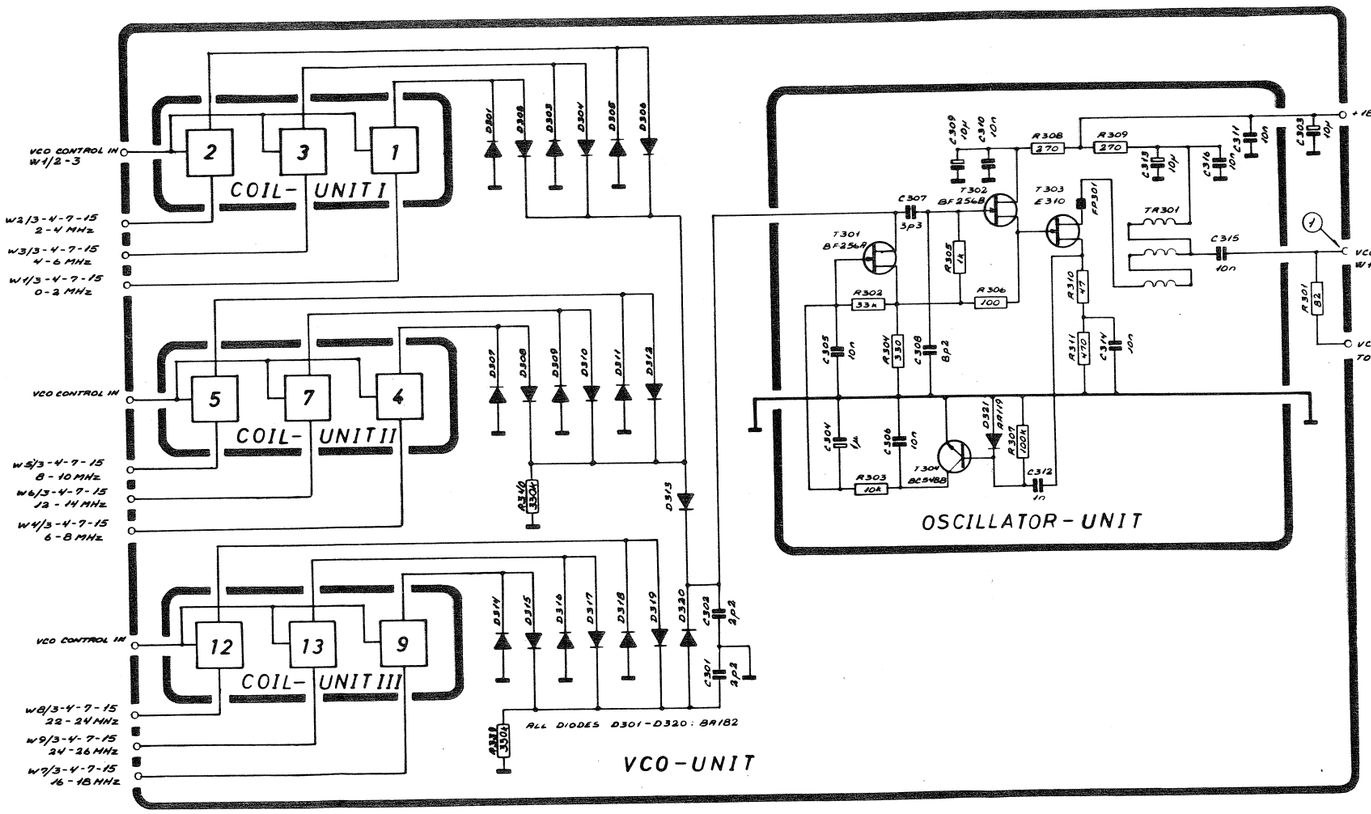
S1300
R1117

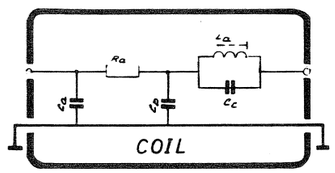

W1/1-2
P.D. 1 in (1.5V)
W1/1-2
P.D. 1 in
+18V(b) out
+22V in
T 203
BD 138
T 202
BC 548A
T 204
BC 558
T 206
BC 548
D 203
BAW 62
D 204
BAW 62
D 205
BZV 79 C4V7
TP3
R 211
15
R 216
1K5
R 220
560
C 214
220n
C 211
6µ8
2K2
R 226
R 223
150
R 225
4K7
IC 202
LM 308
R 222
22 K
C 208
10n
R 224
2M7
C 240
10µ
C 213
220p
+18V Regulator
C 215
150n
R 227
3K92
R 229
36K5
W1/2-3
VCO control
out
TP1
T 205
BC 558A
D 202
BAW 62
D 201
BZV 79C4V7
T 201
BD 139
W1/2-9
-30V in
-18V Regulator
TP2
C 209
39n
C 212
220p
R 221
3K92
IC 201
LM 308
C 207
470n
R 228
3K92
D 206
BAY 21
Loop 1 Filter
LOOP 1 FILTER & ± 18V SUPPLY - UNIT
W1/2-7
-18V out



COIL UNIT	COIL	R_a (Ω)	R_b (Ω)	R_c (Ω)	C_a (nF)	C_b (µF)	C_c (nF)	C_d (pF)	C_e (pF)	L_a	D_a
I	1	R312 470	R321 47	R330 5k6	C317 10n	C320 10µ	C329 10n	C338	C347 120	L301 TL208	D322 BB113
	2	R313 470	R322 47	R331 5k6		C321 10µ	C330 10n	C339 4p7	C348 100	L302 TL209	D323 BB113
	3	R314 470	R323 47	R332 4k7		C322 10µ	C331 10n	C340 8p2	C349 82	L303 TL210	D324 BB113
II	4	R315 470	R324 47	R333 3k9	C318 10n	C323 10µ	C332 10n	C341 10p	C350 68	L304 TL211	D325 BB113
	5	R316 470	R325 47	R334 3k3		C324 10µ	C333 10n	C342 8p2	C351 56	L305 TL212	D326 BB113
	7	R317 470	R326 47	R335 3k3		C325 10µ	C334 10n	C343 10p	C352 47	L306 TL213	D327 BB113
III	9	R318 470	R327 47	R336 3k3	C319 10n	C326 10µ	C335 10n	C344 5p6	C353 39	L307 TL214	D328 BB113
	12	R319 470	R328 47	R337 4k7		C327 10µ	C336 10n	C345 8p2	C354 33	L308 TL216	D329 BB113
	13	R320 470	R329 47	R338 6k8		C328 10µ	C337 10n	C346 5p6	C355 27	L309 TL215	D330 BB113

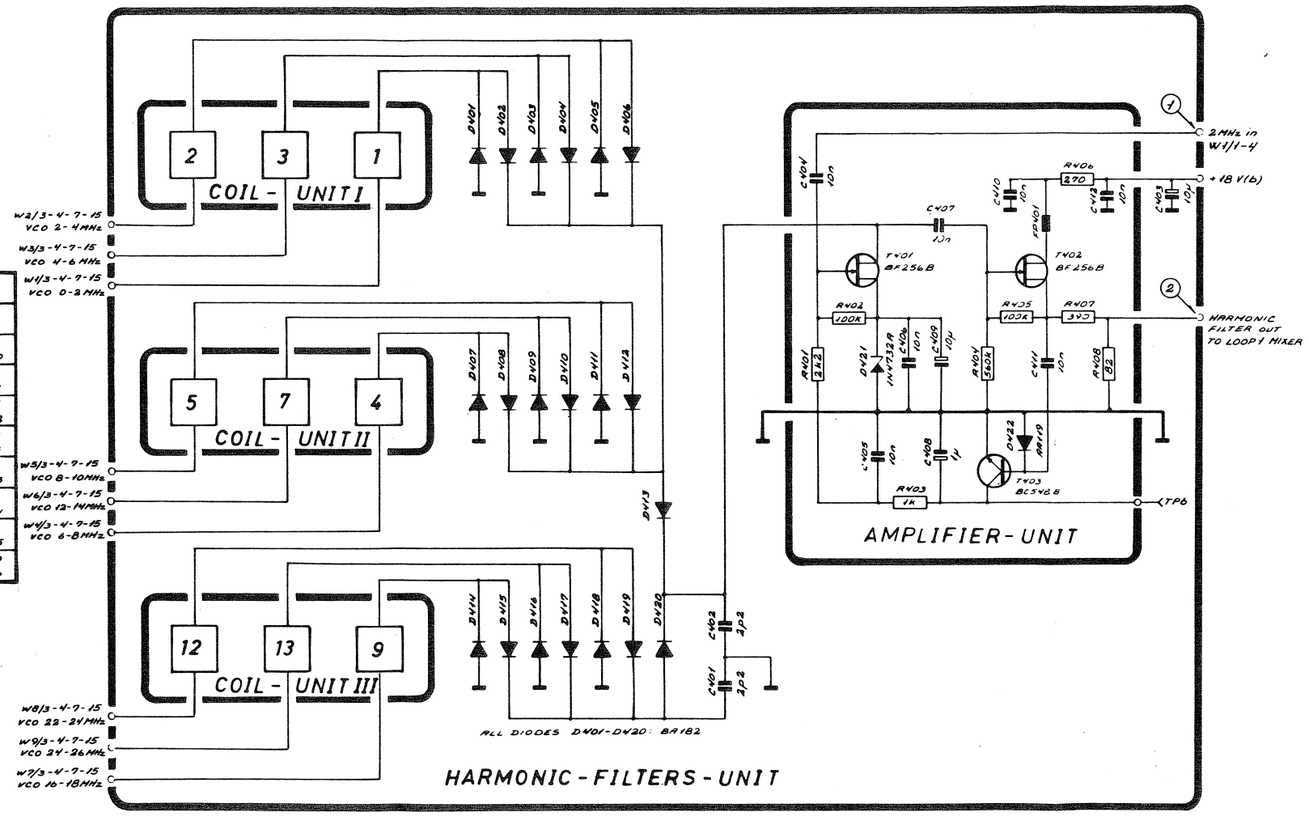
TABLE FOR COMPONENTVALUES OF COILS



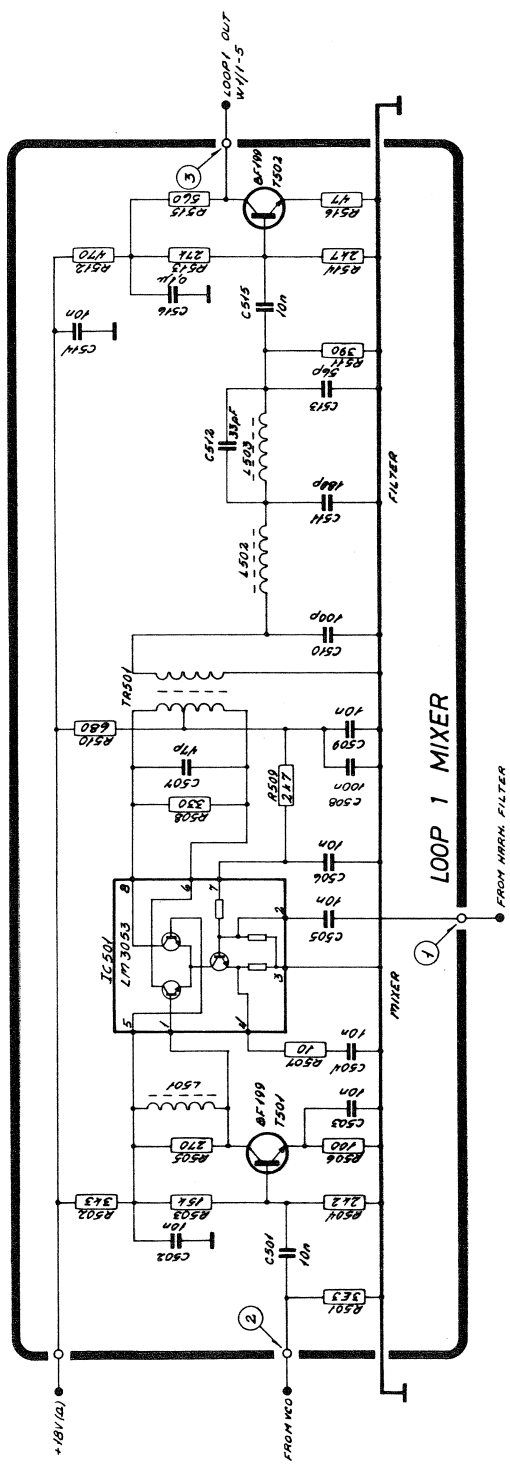


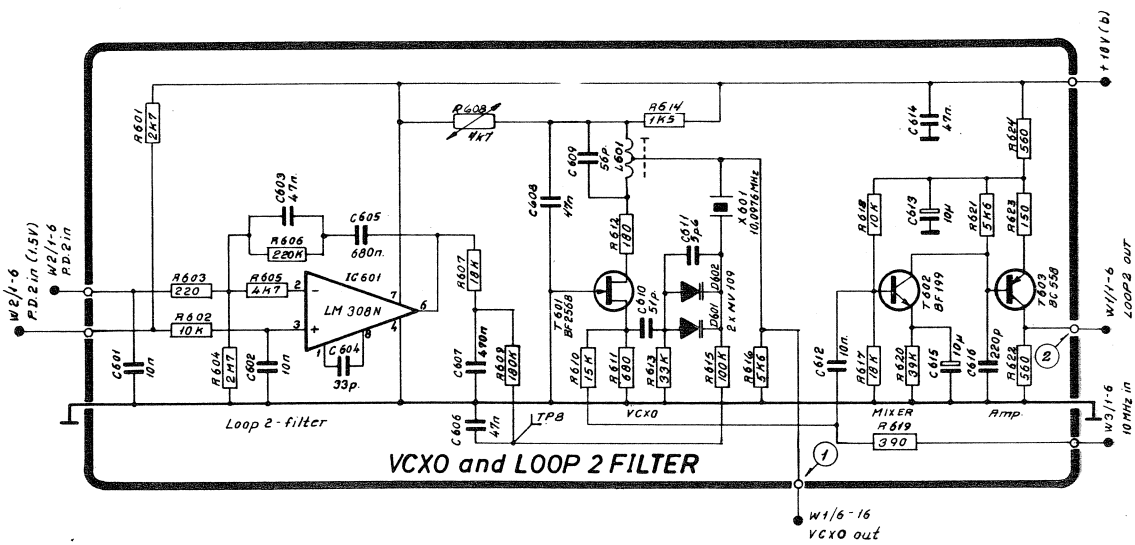
COIL UNIT	COIL	R_a (Ω)	C_a (nF)	C_b (nF)	C_c (pF)	L_a
I	1	R409 470	C413 10	C422 10	C431 270	L401 TL199
	2	R410 470	C414 10	C423 10	C432 220	L402 TL200
	3	R411 470	C415 10	C424 10	C433 220	L403 TL201
II	4	R412 470	C416 10	C425 10	C434 180	L404 TL202
	5	R413 470	C417 10	C426 10	C435 180	L405 TL203
	7	R414 470	C418 10	C427 10	C436 110	L406 TL203
III	9	R415 470	C419 10	C428 10	C437 100	L407 TL204
	12	R416 470	C420 10	C429 10	C438 82	L408 TL205
	13	R417 470	C421 10	C430 10	C439 91	L409 TL206

TABLE FOR COMPONENT VALUES OF COILS



S1300


LOOP 1 MIXER
FROM MARK. FILTER
FILTER
MIXER
LOOP1 OUT
W/I1-5
+18V(A)
FROM VCO
BF199
LM3053
TG501
TR501
L501
L502
L503
C501
C502
C503
C504
C505
C506
C507
C508
C509
C510
C512
C513
C514
C515
C516
R501
R502
R503
R504
R505
R506
R507
R508
R509
R510
R512
R514
R515
R516
10n
100p
180p
33pF
56p
0.1µ
4n7
470
680
330
10
270
254
242
343
390
247
274
560
47
100n
4k7



VCXO
Loop 2

S1300

MOTOR - CONTROL - UNIT

W1/7-9-10 +100 W/BOOM CONTROL

+5V

INTERFACE - BUFFERS

IC 701 SN 74 04 N

W4/7-8 Z - BAUDSELECT
W3/7-8 Y - BAUDSELECT
W2/7-8 X - BAUDSELECT
W1/7-8 V - BAUDSELECT
W4/1-7-8 A - 1 MHz
W1/1-7-8 D - 100 kHz
W2/1-7-8 C - 100 kHz
W3/1-7-8 B 100 kHz

W5/7-9 O - MOTORCONTROLWIRE
W6/7-9 P - MOTORCONTROLWIRE
W4/7-9 Q - MOTORCONTROLWIRE
W3/7-9 R - MOTORCONTROLWIRE
W7/7-9 S - MOTORCONTROLWIRE

T701 BC 548
R703 3k9
¼ x IC 704
RELAY DRIVER

+15V
RR703 10k
R718 1k
R719 1k
R720 1k
R721 1k
R722 1k
R727 100k
R728 100k
R729 100k
R730 100k
R731 100k
C704 0,1µF
C705 0,1µF
C706 0,1µF
C707 0,1µF
C708 0,1µF

DATA SELEKTOR IC 702 MC 14519 B

IC 706 MC 14530 B

R715 10k
5 x BAV 21
D701 D702 D703 D704 D705

¼ x IC 704 MC 14077 B

IC 703 MC 14077 B

¼ x IC704
D706 D707 D710 D711 D712 BAV 21
R732 10k +15V
COMPARATOR

R714 5k6
R705 5k6
820

W1/3-4-7-15 VCO 0-2 MHz
W2/3-4-7-15 VCO 2-4 MHz
W3/3-4-7-15 VCO 4-6 MHz
W4/3-4-7-15 VCO 6-8 MHz
W5/3-4-7-15 VCO 8-10 MHz
W6/3-4-7-15 VCO 12-14 MHz
W7/3-4-7-15 VCO 16-18 MHz
W8/3-4-7-15 VCO 22-24 MHz
W9/3-4-7-15 VCO 24-26 MHz

T702 T703 T704 T705 T706 T707 T708 T709 T710
10k
RA701
RA702 820
R708 R709 R710 R711 R712 R713 R714 5k6
9 x BC 328-25
R706 820
R701 390
+18V SUPPLY TO VCO

T711 BC 338-25
+15V OUT
R707 82Ω
C701 220nF
C702 10µF
+15V POWER SUPPLY

DATA 3 DATA 2 DATA 1
IC 707 MC 14515 B
4-16 LINE-DECODER
1 +15V
23

¼ x IC 705
¼ x IC705 MC 14081 B
RELAY - DRIVERS

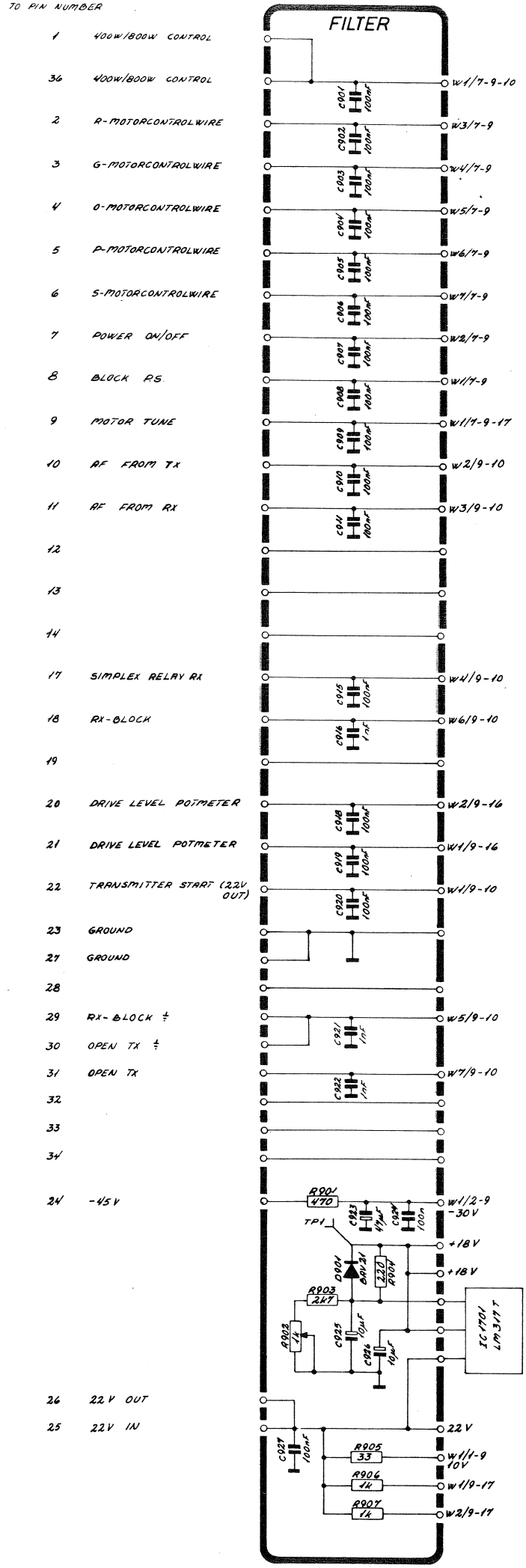
R723 3k9
R724 100k
R726 1k
C703 10nF
R725 3k9
T714 T715 BC 548
D708 D709 BAV 21

W1/7-9-17 MOTOR - TUNE
W2/7-9 POWER ON/OFF
W1/7-9 BLOCK P.S.

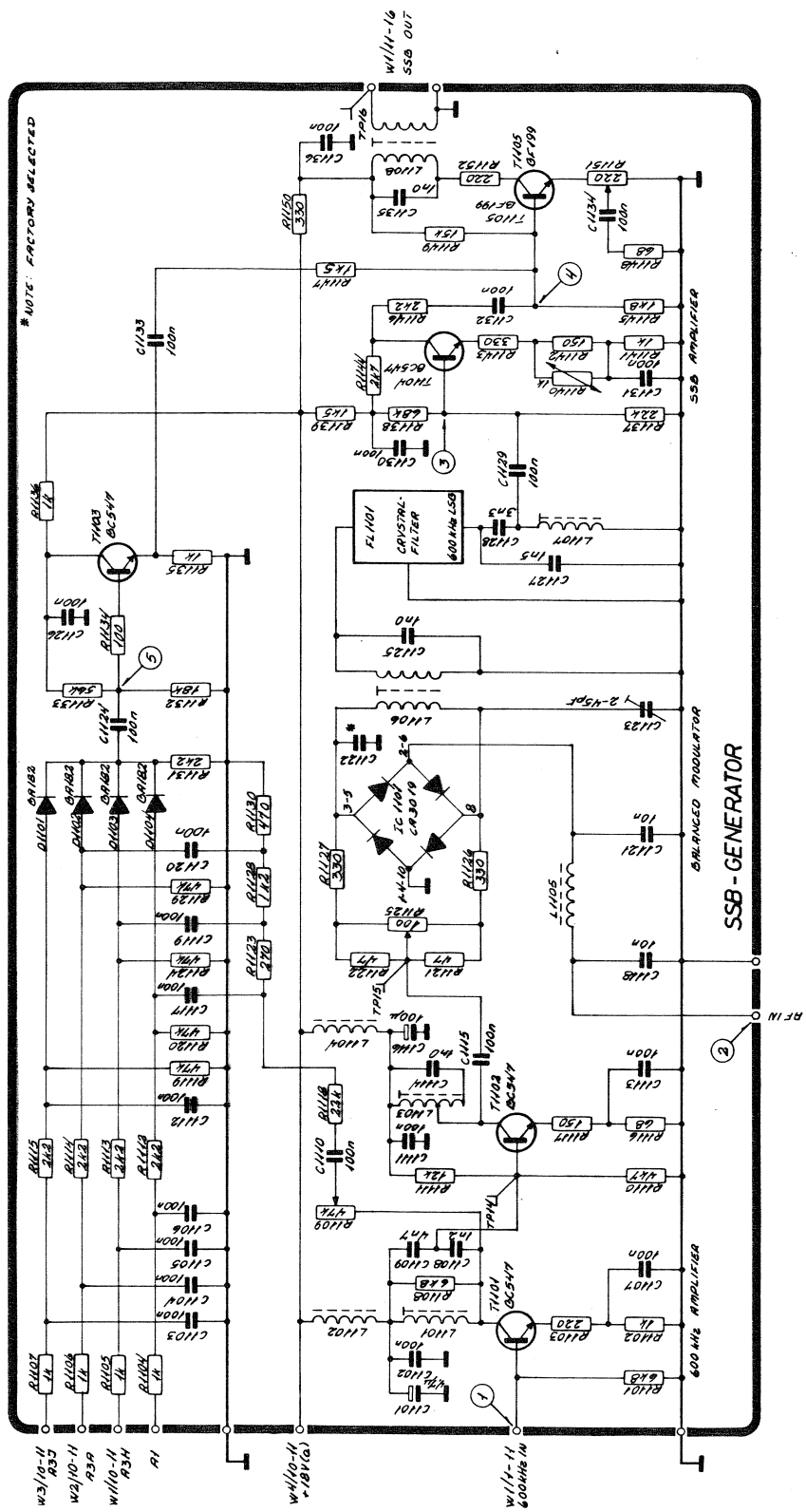
R716 10Ω
R717 5k6
T712 T713 BC 548

-18V
+18V(b)
+18V(a)
W1/7-10-17 D WHEN 2.182

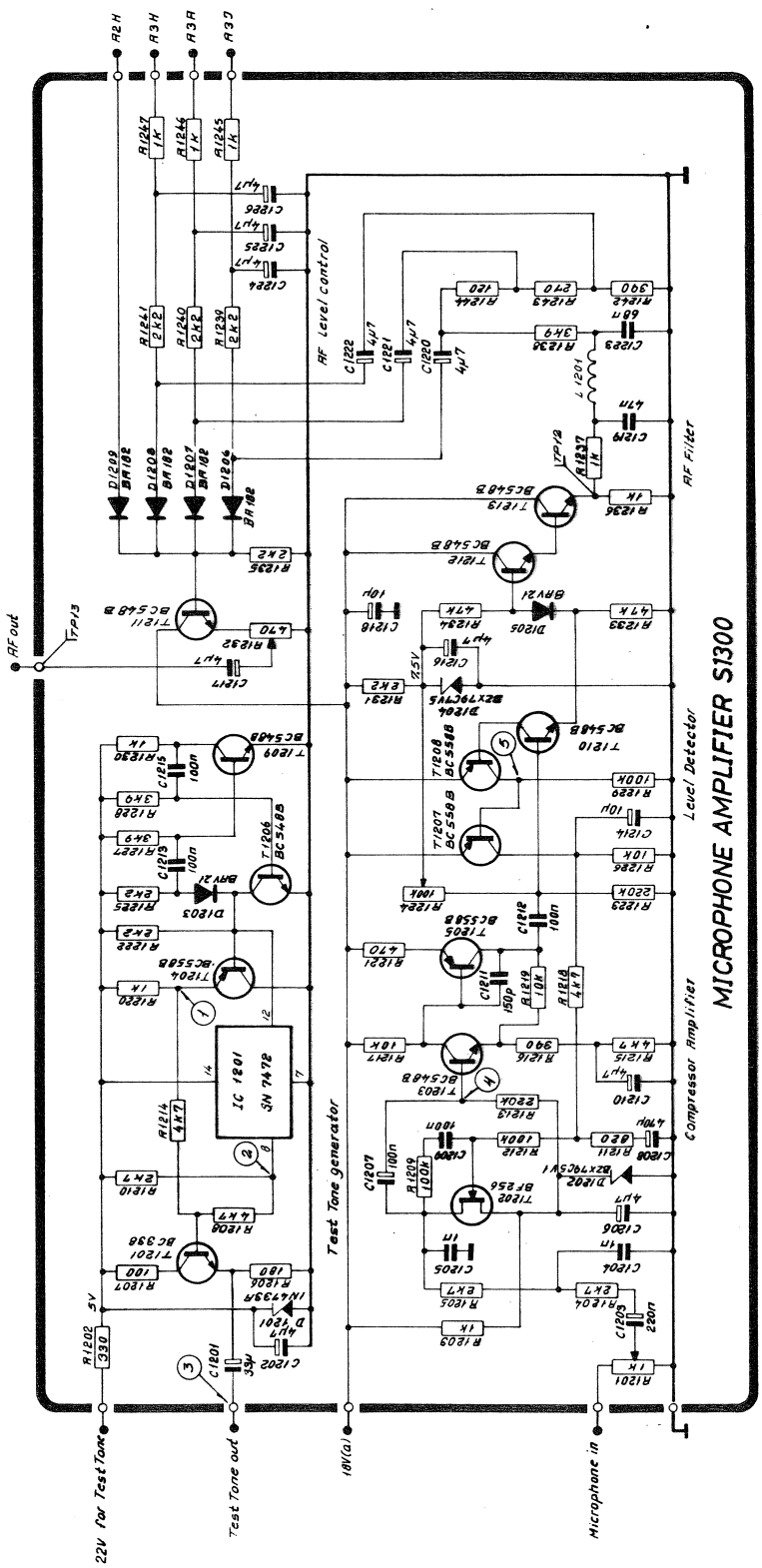
1

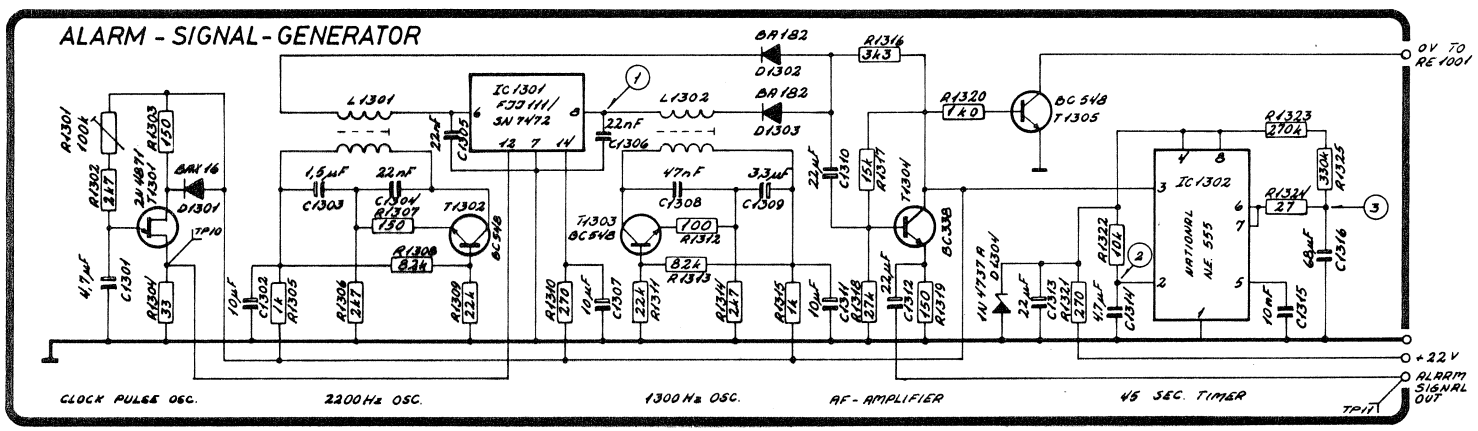

TO PIN NUMBER
FILTER
1 400W/800W CONTROL
36 400W/800W CONTROL
2 R-MOTORCONTROLWIRE
3 G-MOTORCONTROLWIRE
4 O-MOTORCONTROLWIRE
5 P-MOTORCONTROLWIRE
6 S-MOTORCONTROLWIRE
7 POWER ON/OFF
8 BLOCK R.S.
9 MOTOR TUNE
10 AF FROM TX
11 AF FROM RX
12
13
14
17 SIMPLEX RELAY RX
18 RX-BLOCK
19
20 DRIVE LEVEL POTMETER
21 DRIVE LEVEL POTMETER
22 TRANSMITTER START (22V OUT)
23 GROUND
27 GROUND
28
29 RX-BLOCK ÷
30 OPEN TX ÷
31 OPEN TX
32
33
34
24 -45 V
26 22 V OUT
25 22 V IN
C901 100nF
C902 100nF
C903 100nF
C904 100nF
C905 100nF
C906 100nF
C907 100nF
C908 100nF
C909 100nF
C910 100nF
C911 100nF
C915 100nF
C916 1nF
C918 100nF
C919 100nF
C920 100nF
C921 1nF
C922 1nF
C923 1µF
C924 100n
C925 10µF
C926 10µF
C927 100nF
R901 470
R902 1k
R903 2k7
R904 220
D901 BAW31
TP1
IC1701 LM317T
R905 33
R906 1k
R907 1k
W1/7-9-10
W3/7-9
W4/7-9
W5/7-9
W6/7-9
W7/7-9
W2/7-9
W1/7-9
W1/7-9-17
W2/9-10
W3/9-10
W4/9-10
W6/9-10
W2/9-16
W1/9-16
W1/9-10
W5/9-10
W7/9-10
W1/2-9 -30V
+18V
+18V
22V
W1/1-9 10V
W1/9-17
W2/9-17

S1300


SSB - GENERATOR
BALANCED MODULATOR
SSB AMPLIFIER
600 kHz AMPLIFIER
* NOTE: FACTORY SELECTED
W1/11-16 SSB OUT
RF IN
W3/10-11 A3S
W2/10-11 A3A
W1/10-11 A3H
A1
W4/10-11 +18V(a)
W1/11-11 600kHz IN

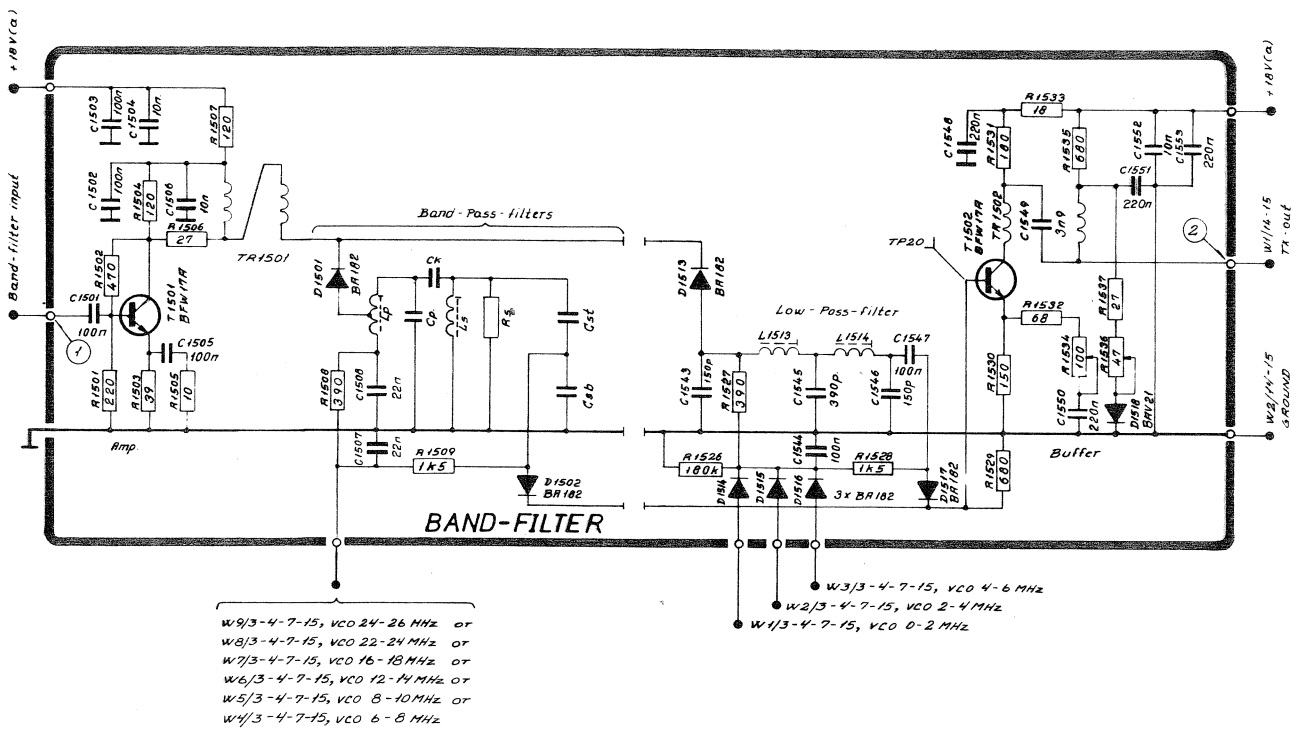
S1300

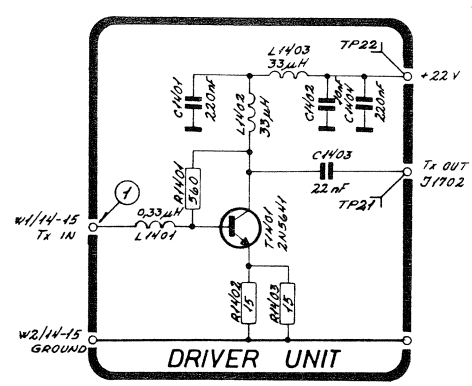

MICROPHONE AMPLIFIER S1300
AF Filter
Level Detector
Compressor Amplifier
AF Level control
Test Tone generator
AF out
22V for TestTone
Test Tone out
18V(a)
Microphone in
IC 1801 SN 7472

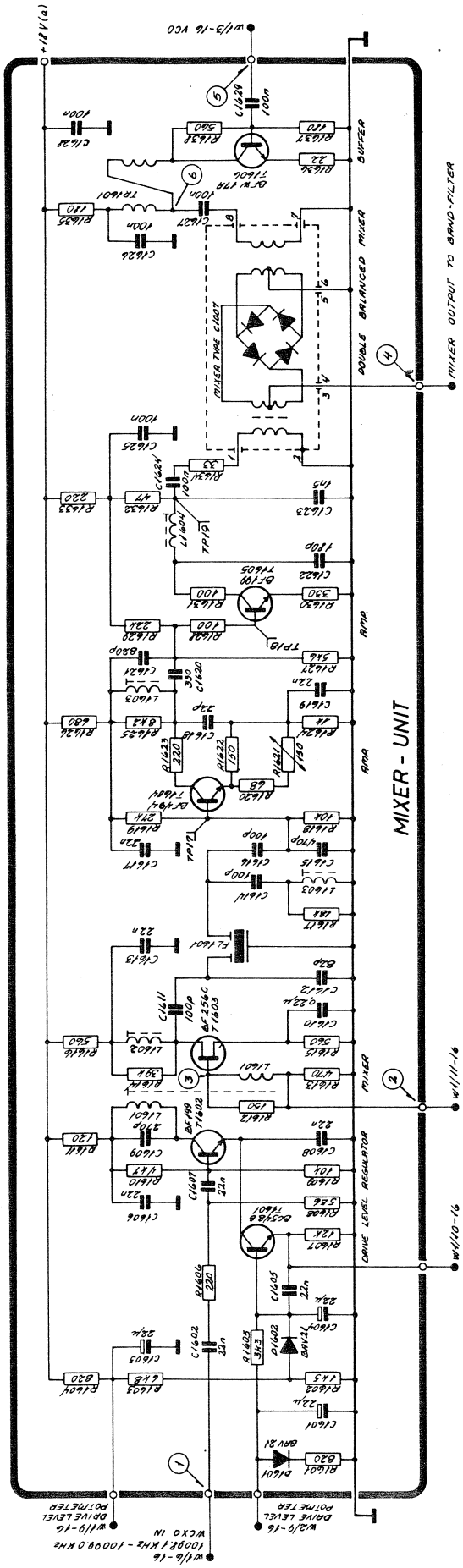

ALARM - SIGNAL - GENERATOR
CLOCK PULSE OSC.
2200 Hz OSC.
1300 Hz OSC.
AF - AMPLIFIER
45 SEC. TIMER
0V TO RE 1001
+22 V
ALARM SIGNAL OUT
TP17
IC 1301 FJJ 1111 / SN 7472
IC 1302 NATIONAL NE 555
BA 182
BAX 16
BC 548
BC 338
1N 4737 A
L 1301
L 1302
R 1301 100k
R 1302 2k7
R 1303 150
R 1304 33
R 1305 1k
R 1306 2k7
R 1307 150
R 1308 8.2k
R 1309 22k
R 1310 270
R 1311 22k
R 1312 100
R 1313 82k
R 1314 2k7
R 1315 1k
R 1316 3k3
R 1317 15k
R 1318 27k
R 1319 150
R 1320 1k0
R 1321 22k
R 1322 10k
R 1323 270k
R 1324 27
R 1325 330k
R 1326 270
R 1327 270
C 1301 4,7µF
C 1302 10nF
C 1303 1,5µF
C 1304 22nF
C 1305 22nF
C 1306 22nF
C 1307 10nF
C 1308 47nF
C 1309 3,3µF
C 1310 22µF
C 1311 10nF
C 1312 22µF
C 1313 22µF
C 1314 4,7µF
C 1315 10nF
C 1316 68µF
D 1301
D 1302
D 1303
D 1304
T 1301 2N 4871
T 1302 BC 548
T 1303 BC 548
T 1304 BC 338
T 1305 BC 548
TP 10

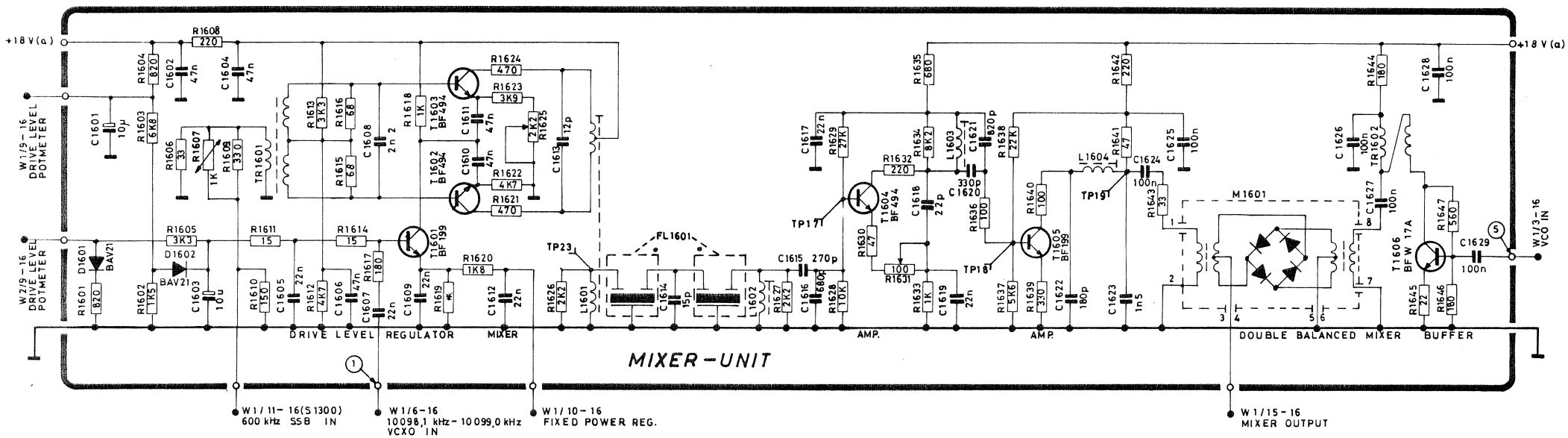
Component tabel for Band-Pass-Filters

BAND	Lp	Cp	Ck	Ls	Rs	Csb	Cst
25 MHz	L 1501	C 1509 62pF	C 1510 3,3 pF	L 1502	R 1510 non	C 1511 180pF	C 1512 91pF
22 MHz	L 1503	C 1515 75 pF	C 1516 4,3 pF	L 1504	R 1513 non	C 1517 220pF	C 1518 110pF
16 MHz	L 1505	C 1521 91pF	C 1522 5,1 pF	L 1506	R 1516 non	C 1523 270pF	C 1524 130pF
12 MHz	L 1507	C 1527 120pF	C 1528 7,5 pF	L 1508	R 1519 15 k ohm	C 1529 330pF	C 1530 180pF
8 MHz	L 1509	C 1533 180 pF	C 1534 11 pF	L 1510	R 1522 15 k ohm	C 1535 510 pF	C 1536 270 pF
6 MHz	L 1511	C 1539 220pF	C 1540 18 pF	L 1512	R 1525 22 k ohm	C 1541 680 pF	C 1542 330 pF

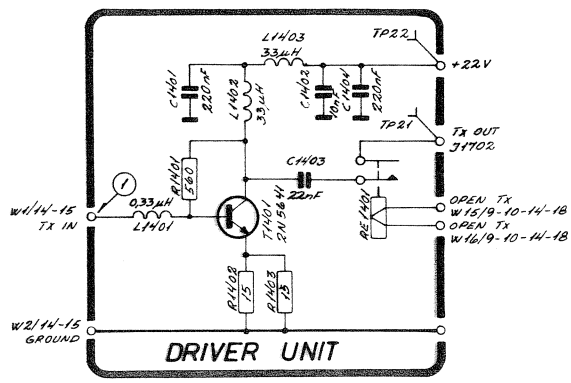


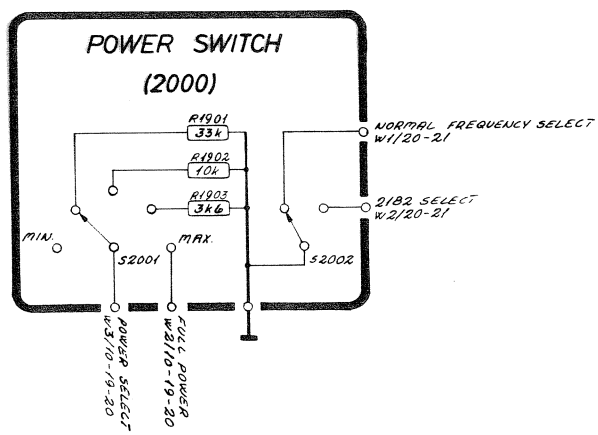


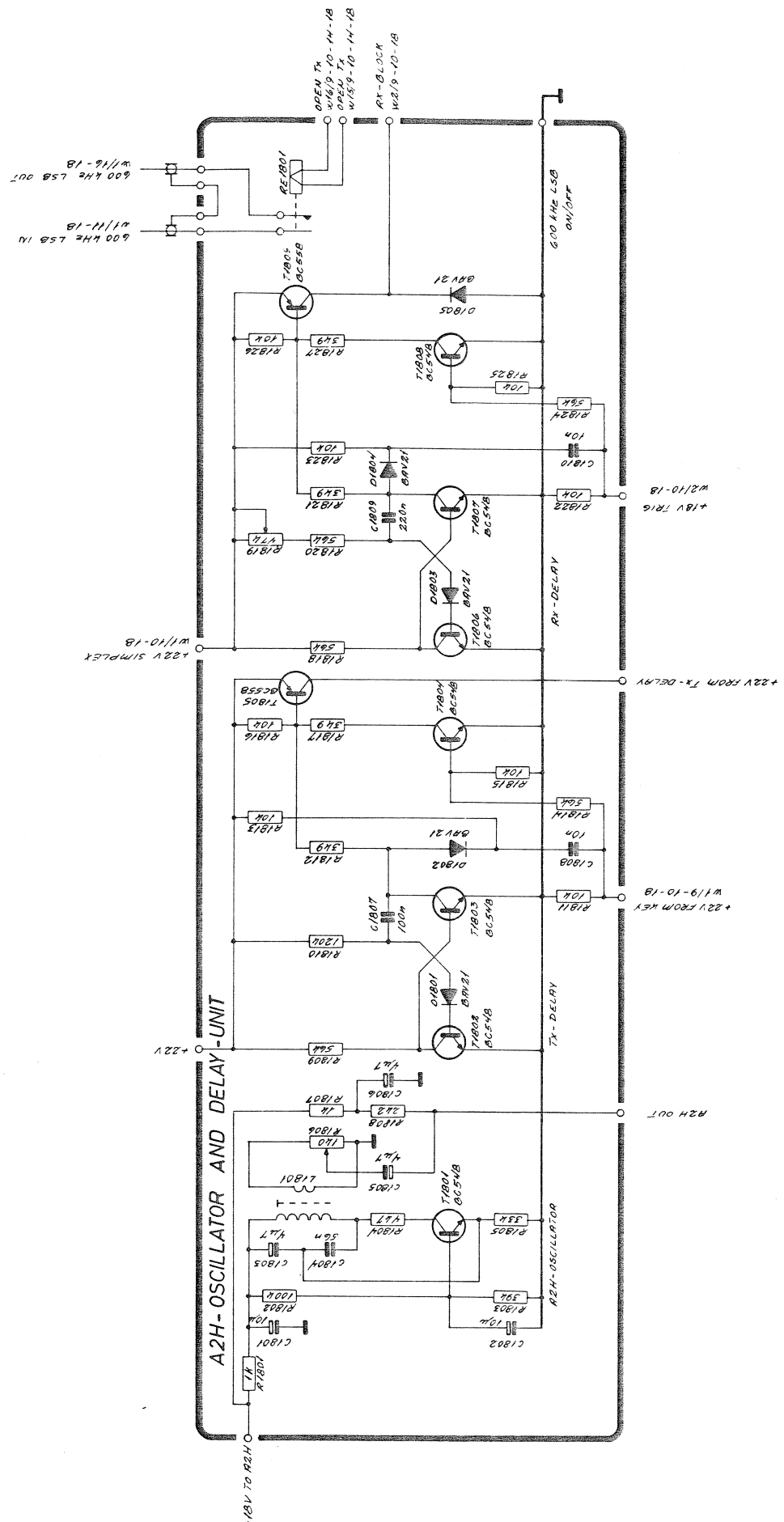

MIXER - UNIT
+18V(a)
w1/3-16 VCO
MIXER OUTPUT TO BAND-FILTER
DOUBLE BALANCED MIXER
BUFFER
AMP
AMP
MIXER
DRIVE LEVEL REGULATOR
w1/11-16 600 KHz SSB IN.
w1/10-16 FIXED POWER REG.
w2/9-16 DRIVE LEVEL POTMETER
w1/9-16 DRIVE LEVEL POTMETER
w1/6-16 10092 KHz - 10098.0 KHz VCXO IN
MIXER TYPE CIRCUIT
BF256C
BF199
BC548/849
BSW174
BF199
BF199
BF199
BAV21
BAV21
BAV21
BAV21
BAV21



* R1619
- 12K IN EXCITERS WITH 3 POS. POWER SWITCH
- 27K IN EXCITERS WITH 5 POS. POWER SWITCH


L1403
33µH
TP22
+22V
C1401
220nF
L1402
33µH
C1403
10nF
C1404
220nF
TP21
Tx OUT
J1702
R1401
560
C1403
22nF
0,33µH
L1401
W1/14-15
Tx IN
TH1401
2N 5684
RE 1401
OPEN Tx
W15/9-10-14-18
OPEN Tx
W16/9-10-14-18
R1402
15
R1403
15
W2/14-15
GROUND
DRIVER UNIT


POWER SWITCH
(2000)
R1901
33k
R1902
10k
R1903
3k6
NORMAL FREQUENCY SELECT
W1/20-21
2182 SELECT
W2/20-21
MIN.
MAX.
S2001
S2002
W3/10-19-20
POWER SELECT
W18/10-19-20
FULL POWER


A2H-OSCILLATOR AND DELAY-UNIT
RX-DELAY
TX-DELAY
A2H-OSCILLATOR
600 kHz LSB ON/OFF
OPEN TX w/6/9-10-14-18
OPEN TX w/15/9-10-14-18
RX-BLOCK w2/9-10-18
600 kHz LSB IN w1/11-18
600 kHz LSB OUT w1/16-18
+18V TRIG w2/10-18
+22V FROM TX-DELAY
+22V FROM KEY w1/9-10-18
+22V SIMPLEX w1/10-18
+22V
A2H OUT
+18V TO A2H
RE1801
D1805 BAV21
T1805 BC558
T1804 BC548
T1807 BC548
T1806 BC548
T1803 BC548
T1808 BC548
T1802 BC548
T1801 BC548
D1804 BAV21
D1803 BAV21
D1801 BAV21
D1802 BAV21
C1809 220n
C1807 100n
C1810 10n
C1808 10n
C1811 10n
C1806 4µ7
C1805 4µ7
C1804 56p
C1803 4µ7
C1802 10µ
C1801 10µ
L1801
R1827 3k9
R1826 10k
R1825 10k
R1824 5k6
R1823 10k
R1822 10k
R1821 3k9
R1820 56k
R1819 47k
R1818 56k
R1817 3k9
R1816 10k
R1815 10k
R1814 56k
R1813 10k
R1812 3k9
R1811 10k
R1810 120k
R1809 56k
R1808 2k2
R1807 1k
R1806 1k0
R1805 33k
R1804 4k7
R1803 39k
R1802 100k
R1801 10k

CIRCUIT DESCRIPTION

FREQUENCY SELECTOR UNIT S1301

The FREQUENCY SELECTOR UNIT together with the pushbutton switches S1703 - S1708 permits free frequency selection within the maritime bands.

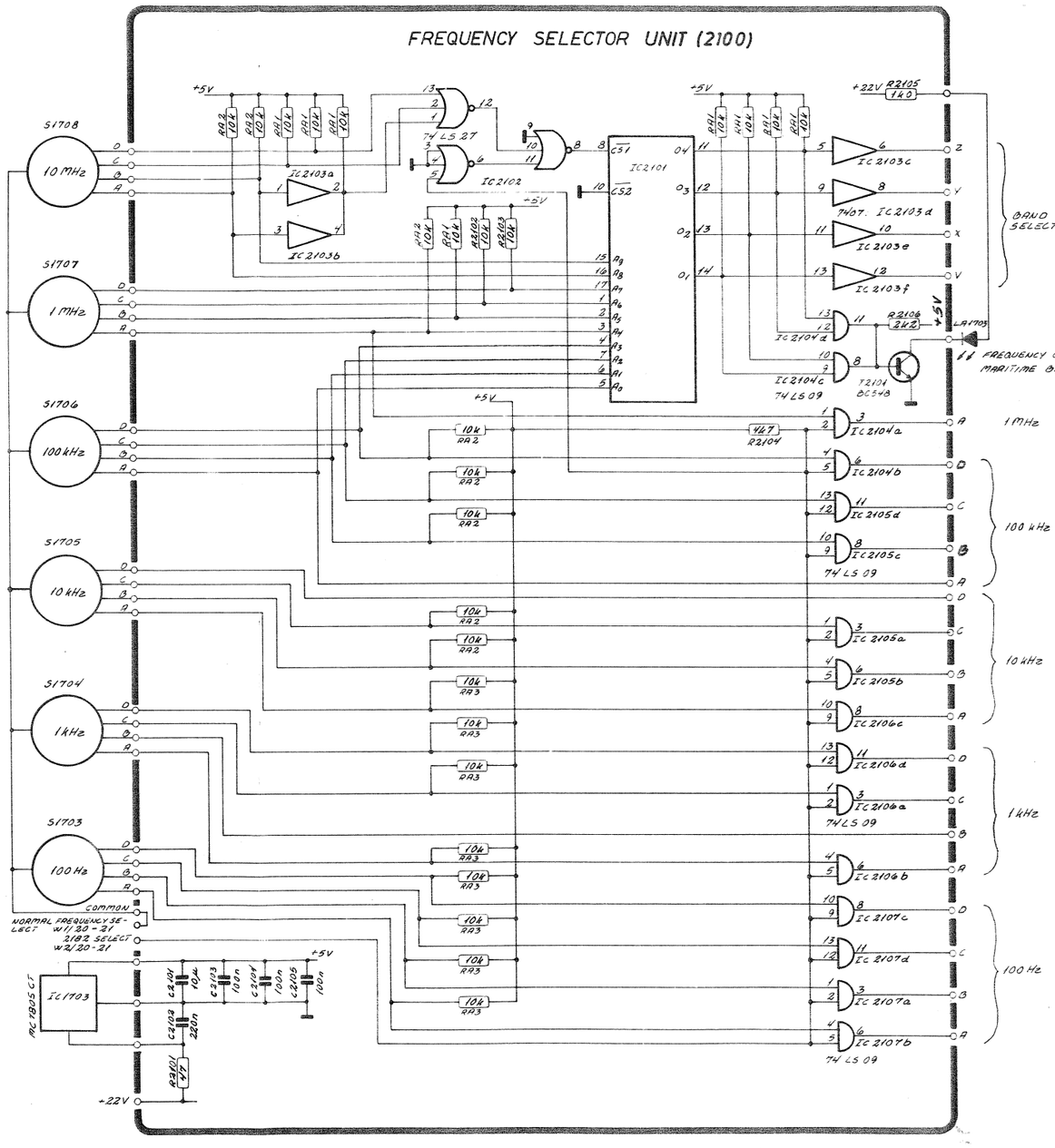
The FREQUENCY SELECTOR UNIT converts the BCD information from the pushbutton switches into the appropriate code for the frequency synthesizer and the transmitter band selection.

The PROM IC2101 converts the information from the 10 MHz, 1 MHz and 100 kHz pushbutton switches into the band selection code (VXYZ).

The 10 kHz, 1 kHz and 0.1 kHz pushbutton switches control the frequency synthesizer directly.

The 2182 kHz selector switches off the ground for S1703 - S1708 and all the outputs from these switches will go to the high level. The 2182 kHz selector also grounds the appropriate AND-gates and thereby programs the synthesizer to 2182 kHz.

The PROM (IC2101) selects the VCXO-code for 2182 kHz.



a DIVIDER UNIT S1300/R1117 1/3

Symbol	Description			Manufact.	
R101	Resistor 15Kohm	±5%	0,33W	Philips	2322 211 13153
R102	Resistor 15Kohm	±5%	0,33W	Philips	2322 211 13153
R103	Resistor 560 ohm	±5%	0,33W	Philips	2322 211 13561
R104	Resistor 15Kohm	±5%	0,33W	Philips	2322 211 13153
R105	Resistor 560 ohm	±5%	0,33W	Philips	2322 211 13561
R106	Resistor 5,6Kohm	±5%	0,33W	Philips	2322 211 13562
R107	Resistor 1,8Kohm	±5%	0,33W	Philips	2322 211 13182
R108	Resistor 10Kohm	±5%	0,33W	Philips	2322 211 13103
R109	Resistor 1,8Kohm	±5%	0,33W	Philips	2322 211 13182
R110	Resistor 820 ohm	±5%	0,33W	Philips	2322 211 13821
R111	Resistor 220 ohm	±5%	0,33W	Philips	2322 211 13221
R112	Preset potentiometer 2Kohm	±10%	0,5 W	Bourns	3299 W-1-202
R113	Resistor 820 ohm	±5%	0,33W	Philips	2322 211 13821
R114	Resistor 470 ohm	±5%	0,33W	Philips	2322 211 13471
R115	Resistor 10Kohm	±5%	0,33W	Philips	2322 211 13103
R116	Resistor 1,2Kohm	±5%	0,33W	Philips	2322 211 13122
R117	Resistor 2,2Kohm	±5%	0,33W	Philips	2322 211 13222
R118	Resistor 560 ohm	±5%	0,33W	Philips	2322 211 13561
R119	Resistor 22Kohm	±5%	0,33W	Philips	2322 211 13223
R120	Resistor 270 ohm	±5%	0,33W	Philips	2322 106 33271
R121	Resistor 1,8Kohm	±5%	0,33W	Philips	2322 211 13182
R122	Resistor 10Kohm	±5%	0,33W	Philips	2322 211 13103
R123	Resistor 220 ohm	±5%	0,33W	Philips	2322 106 33221
R124	Resistor 2,2Kohm	±5%	0,33W	Philips	2322 211 13222
R125	Resistor 1Kohm	±5%	0,33W	Philips	2322 211 13102
R126	Resistor 220 ohm	±5%	0,33W	Philips	2322 211 13221
R127	Resistor 680 ohm	±5%	0,33W	Philips	2322 211 13681
R128	Resistor 12Kohm	±5%	0,33W	Philips	2322 211 13123
R129	Resistor 6,8Kohm	±5%	0,33W	Philips	2322 211 13682
R130	Resistor 1Kohm	±5%	0,33W	Philips	2322 211 13102
R131	Resistor 820 ohm	±5%	0,33W	Philips	2322 211 13821
RA101	Resistor array 8x10Kohm	±5%	0,125W	ITT	VR8,10Kohm ±5%
RA102	Resistor array 8x10Kohm	±5%	0,125W	ITT	VR8,10Kohm ±5%

MODULE NO: 100

a DIVIDER UNIT S1300/R1117 2/3

Symbol	Description	Manufact.	
C101	Capacitor, polyester 10nF±20% 250V	Philips	2222 344 40103
C102	Capacitor, tantalum 10uF-20/+50% 16V	ERO	ETP 2E
C103	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C104	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C105	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C106	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C107	Capacitor, ceramic 12pF NP0±5% 400V	Ferroperm	9/0112.9
C108	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C109	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C110	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C111	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C112	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C113	Capacitor, ceramis 10nF-20/+80% 32V	Ferroperm	9/0145.9
C114	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C115	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C116	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C117	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C118	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C119	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C120	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C121	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C122	Capacitor, ceramic 10nF-20/+80% 32V	Ferroperm	9/0145.9
C123	Capacitor, polyester 220nF±20% 100V	Philips	2222 344 24224
C124	Capacitor, polyester 15nF±20% 250V	Philips	2222 344 40153
C125	Capacitor, polyester 47nF±20% 250V	Philips	2222 344 40473
C126	Capacitor, polyester 220nF±20% 100V	Philips	2222 344 24224
C127	Capacitor, polyester 220nF±20% 100V	Philips	2222 344 24224
C128	Capacitor, electrolytic 10uF-10/+100% 40V	Siemens	B41313-A7106-V
C129	Capacitor, electrolytic 10uF-10/+100% 40V	Siemens	B41313-A7106-V
C130	Capacitor, polyester 220nF±20% 100V	Philips	2222 344 24224
C131	Capacitor, polyester 47nF±20% 250V	Philips	2222 344 40473
C132	Capacitor, polyester 220nF±20% 100V	Philips	2222 344 24224
C133	Capacitor, polyester 220nF±20% 100V	Philips	2222 344 24224
C134	Capacitor, polyester 220nF±20% 100V	Philips	2222 344 24224
C135	Capacitor, polyester 220nF±20% 100V	Philips	2222 344 24224
C136	Capacitor, polystyrene 1,2nF±5% 63V	Philips	2222 424 21202
C137	Capacitor, polystyrene 6,8nF±5% 63V	Philips	2222 424 26802
L101	Coil	S.P.	TL 235

a DIVIDER UNIT S1300/R1117 3/3

Symbol	Description	Manufact.	
D101	Diode, zener 12V ±5% 0,4W	Philips	BZX 79 C12
D102	Diode, silicon	Philips	BAW 62
T101	Transistor	Philips	2N2368
T102	Transistor	Philips	2N2368
T103	Transistor	Philips	BF199
T104	Transistor	Philips	2N2368
T105	Transistor	Philips	BF199
IC101	Integrated circuit	Texas	SN74LS192N
IC102	Integrated circuit	Texas	SN74LS192N
IC103	Integrated circuit	Texas	SN74LS192N
IC104	Integrated circuit	Texas	SN74LS192N
IC105	Integrated circuit	Texas	SN74LS192N
IC106	Integrated circuit	Motorola	MC4044P
IC107	Integrated circuit	Texas	SN74LS390N
IC108	Integrated circuit	Texas	SN74LS20N
IC109	Integrated circuit	Texas	SN74LS27N
IC110	Integrated circuit	Texas	SN74LS109N
IC111	Integrated circuit	Texas	SN74LS390N
IC112	Integrated circuit	Texas	SN74LS390N
IC113	Integrated circuit	Motorola	MC4044P
IC114	Integrated circuit	Texas	SN7410N
IC115	Integrated circuit	Texas	SN74LS290N
X0101	TCXO 10,0 MHz	S.P.	C1001
S101	Switch for 2182 (R1117 only)	Petrick	7-3-21412

MODULE NO: 200

a	LOOP 1 FILTER & ±18V SUPPLY UNIT S1300/R1117			1/2
Symbol	*Description*		*Manufact.*	
R201	Resistor	1Kohm ±5% 0,33W	Philips	2322 211 13102
R202	Resistor	82 ohm ±5% 0,33W	Philips	2322 211 13829
R204	Resistor	820 ohm ±5% 0,33W	Philips	2322 211 13821
R205	Resistor	2,2Kohm ±5% 0,33W	Philips	2322 211 13222
R206	Resistor	12Kohm ±5% 0,33W	Philips	2322 211 13123
R207	Resistor	1,2Kohm ±5% 0,33W	Philips	2322 211 13122
R208	Resistor	3,3Kohm ±5% 0,33W	Philips	2322 211 13332
R209	Preset potmeter cermet	2,2Kohm ±20% 0,5W	Philips	2322 482 20222
R210	Resistor	10Kohm ±5% 0,33W	Philips	2322 211 13103
R212	Resistor	10Kohm ±5% 0,33W	Philips	2322 211 13103
R213	Resistor	10Kohm ±5% 0,33W	Philips	2322 211 13103
R214	Preset potmeter cermet	2,2Kohm ±20% 0,5W	Philips	2322 482 20222
R215	Resistor	3,3Kohm ±5% 0,33W	Philips	2322 211 13332
R216	Resistor	1,5Kohm +5% 0,33W	Philips	2322 211 13152
R217	Resistor	10Kohm ±5% 0,33W	Philips	2322 211 13103
R218	Resistor	3,3Kohm ±5% 0,33W	Philips	2322 211 13332
R219	Resistor	2,7Kohm ±5% 0,33W	Philips	2322 106 33272
R220	Resistor	560 ohm ±5% 0,33W	Philips	2322 211 13561
R221	Resistor	3,92Kohm ±1% 0,25W	Vitrohm	471-0
R222	Resistor	22Kohm ±5% 0,33W	Philips	2322 211 13223
R223	Resistor	150 ohm ±5% 0,33W	Philips	2322 211 13151
R224	Resistor	2,7Mohm ±5% 0,33W	Philips	2322 211 12275
R225	Resistor	4,7Kohm ±5% 0,33W	Philips	2322 211 13472
R226	Resistor	2,2Kohm ±5% 0,33W	Philips	2322 211 13222
R227	Resistor	3,92Kohm ±1% 0,25W	Vitrohm	471-0
R228	Resistor	3,92Kohm ±1% 0,25W	Vitrohm	471-0
R229	Resistor	36,5Kohm ±1% 0,25W	Vitrohm	471-0
	S1300 only			
R203	Resistor	270Kohm ±5% 0,33W	Philips	2322 211 13274
R211	Resistor	15 ohm ±5% 0,33W	Philips	2322 211 13159
	R1117 only			
R203	Resistor	150Kohm ±5% 0,33W	Philips	2322 211 13154
R211	Resistor	12 ohm ±5% 0,33W	Philips	2322 211 13129

a LOOP 1 FILTER & ±18V SUPPLY UNIT S1300/R1117 2/2

Symbol	*Description*	*Manufact.*	
C201	Capacitor ceramic 10nF-20/+80% 32V	Ferroperm	9/0145,9
C202	Capacitor tantalum 10uF-20/+50% 25V	Ero	ETP-3F
C203	Capacitor tantalum 10uF-20/+50% 25V	Ero	ETP-3F
C204	Capacitor tantalum 10uF-20/+50% 25V	Ero	ETP-3F
C205	Capacitor electrolytic 10uF- 10/+100% 40V	Siemens	B41313-A7106V
C206	Capacitor tantalum 10uF-20/+50% 25V	Ero	ETP-3F
C207	Capacitor polycarbonate 470nF ±10% 100V	Philips	2222 344 21474
C208	Capacitor ceramic 10nF-20/+80% 32V	Ferroperm	9/0145,9
C209	Capacitor polystyrene 39nF ±1% 63V	Philips	2222 424 43903
C210	Capacitor tantalum 10uF-20/+50% 25 V	Ero	ETP-3F
C211	Capacitor polyester 6,8uF ±10% 100V	Philips	2222 344 25685
C212	Capacitor ceramic 220pF ±20% 400V	Ferroperm	9/0129,9
C213	Capacitor ceramic 220pF ±20% 400V	Ferroperm	9/0129,9
C214	Capacitor polyester 220nF ±10% 100V	Philips	2222 344 25224
C215	Capacitor polyester 150nF ±10% 100V	Philips	2222 344 25154
T201	Transistor	Philips	BD139
T202	Transistor	Philips	BC548A
T203	Transistor	Philips	BD138
T204	Transistor	Philips	BC558
T205	Transistor	Philips	BC556A
T206	Transistor	Philips	BC548
D201	Diode, zener 4,7V ± 5% 0,4W	Philips	BZX79C4V7
D202	Diode, silicon	Philips	BAW62
D203	Diode, silicon	Philips	BAW62
D204	Diode, silicon	Philips	BAW62
D205	Diode, zener 4,7V ± 5%	Philips	BZX79C4V7
D206	Diode, silicon	Philips	BAV21
IC201	Intergrated circuit	National	LM308N
IC202	Intergrated circuit	National	LM308N

MODULE NO: 300 AND 400

a	VCO-UNIT AND HARMONIC FILTER-UNIT S1300/R1117		1/1
Symbol	*Description*	*Manufact.*	
	The units are factory adjusted and sealed and can only be repaired at the factory		
	Module No: 300	S.P.	VCO-UNIT S1300/R1117
	Module No: 400	S.P.	HARMONIC FILTER-UNIT S1300/R1117

a	LOOP 1 MIXER S1300/R1117			1/1
Symbol	*Description*		*Manufact.*	
R501	Resistor	3.3 ohm ± 5% 0.33W	Philips	2322 211 13338
R502	Resistor	3.3kohm ± 5% 0.33W	Philips	2322 211 13332
R503	Resistor	15kohm ± 5% 0.33W	Philips	2322 211 13153
R504	Resistor	2.2kohm ± 5% 0.33W	Philips	2322 211 13222
R505	Resistor	270 ohm ± 5% 0.33W	Philips	2322 211 13271
R506	Resistor	100 ohm ± 5% 0.33W	Philips	2322 211 13101
R507	Resistor	10 ohm ± 5% 0.33W	Philips	2322 211 13109
R508	Resistor	330 ohm ± 5% 0.33W	Philips	2322 211 13331
R509	Resistor	2.7kohm ± 5% 0.33W	Philips	2322 211 13272
R510	Resistor	680 ohm ± 5% 0.33W	Philips	2322 211 13681
R511	Resistor	390 ohm ± 5% 0.33W	Philips	2322 211 13391
R512	Resistor	470 ohm ± 5% 0.33W	Philips	2322 211 13471
R513	Resistor	27kohm ± 5% 0.33W	Philips	2322 211 13273
R514	Resistor	2.7kohm ± 5% 0.33W	Philips	2322 211 13272
R515	Resistor	560 ohm ± 5% 0.33W	Philips	2322 211 13479
R516	Resistor	47 ohm ± 5% 0.33W	Philips	2322 211 13479
C501	Capacitor ceramic	10nF-20/+80% 32V	Ferroperm	9/0145.9
C502	Capacitor ceramic	10nF-20/+80% 32V	Ferroperm	9/0145.9
C503	Capacitor ceramic	10nF-20/+80% 32V	Ferroperm	9/0145.9
C504	Capacitor ceramic	10nF-20/+80% 32V	Ferroperm	9/0145.9
C505	Capacitor ceramic	10nF-20/+80% 32V	Ferroperm	9/0145.9
C506	Capacitor ceramic	10nF-20/+80% 32V	Ferroperm	9/0145.9
C507	Capacitor ceramic	47pF±2% 100V	Philips	2222 638 34479
C508	Capacitor polyester	100nF±20% 100V	Philips	2222 344 24104
C509	Capacitor ceramic	10nF-20/+80% 32V	Ferroperm	9/0145.9
C510	Capacitor ceramic	100pF±2% 100V	Philips	2222 638 34101
C511	Capacitor polystyrene	180pF±1% 500V	Philips	2222 427 41801
C512	Capacitor ceramic	33pF±2% 100V	Philips	2222 638 34339
C513	Capacitor ceramic	56pF±2% 100V	Philips	2222 638 34569
C514	Capacitor ceramic	10nF-20/+80% 32V	Ferroperm	9/0145.9
C515	Capacitor ceramic	10nF-20/+80% 32V	Ferroperm	9/0145.9
C516	Capacitor polyester	100nF±20% 100V	Philips	2222 344 24104
L501	Coil		S.P.	TL 059
L502	Coil	12uH±5%	Kaschke	220/5
L503	Coil	12uH±5%	Kaschke	220/5
TR501	Transformer		S.P.	TL198
T501	Transistor		Philips	BF199
T502	Transistor		Philips	BF199
IC501	Integrated circuit		N.S.	LM 3053

MODULE NO: 600

a VCXO AND LOOP 2 FILTER FOR S1300 1/2

Symbol	Description	Manufact.	
R601	Resistor 2,7 Kohm ±5% 0,33W	Philips	2322 211 13272
R602	Resistor 22 Kohm ±5% 0,33W	Philips	2322 211 13223
R603	Resistor 220 ohm ±5% 0,33W	Philips	2322 211 13221
R604	Resistor 2,7 Mohm ±5% 0,33W	Philips	2322 211 13275
R605	Resistor 4,7 Kohm ±5% 0,33W	Philips	2322 211 13472
R606	Resistor 220 Kohm ±5% 0,33W	Philips	2322 211 13224
R607	Resistor 18 Kohm ±5% 0,33W	Philips	2322 211 13183
R608	Resistor NTC 4,7Kohm ±5% 0,5 W	Philips	2322 635 02472
R609	Resistor 180 Kohm ±5% 0,33W	Philips	2322 211 13184
R610	Resistor 15 Kohm ±5% 0,33W	Philips	2322 211 13153
R611	Resistor 680 ohm ±5% 0,33W	Philips	2322 211 13681
R612	Resistor 180 ohm ±5% 0,33W	Philips	2322 211 13181
R613	Resistor 33 Kohm ±5% 0,33W	Philips	2322 211 13333
R614	Resistor 1,5 Kohm ±5% 0,33W	Philips	2322 211 13152
R615	Resistor 100 Kohm ±5% 0,33W	Philips	2322 211 13104
R616	Resistor 5,6 Kohm ±5% 0,33W	Philips	2322 211 13562
R617	Resistor 18 Kohm ±5% 0,33W	Philips	2322 211 13183
R618	Resistor 10 Kohm ±5% 0,33W	Philips	2322 211 13103
R619	Resistor 390 ohm ±5% 0,33W	Philips	2322 211 13391
R620	Resistor 39 Kohm ±5% 0,33W	Philips	2322 211 13393
R621	Resistor 5,6 Kohm ±5% 0,33W	Philips	2322 211 13562
R622	Resistor 560 ohm ±5% 0,33W	Philips	2322 211 13561
R623	Resistor 150 ohm ±5% 0,33W	Philips	2322 211 13151
R624	Resistor 560 ohm ±5% 0,33W	Philips	2322 211 13561
C601	Capacitor ceramic 10nF-20/+80% 32V	Ferroperm	9/0145,9
C602	Capacitor tantalum 10uF-20/+50% 25V	ERO	ETP-3F
C603	Capacitor polyester 47nF±10% 100V	Philips	2222 344 25473
C604	Capacitor ceramic 33pF ±2% 100V	Philips	2222 642 34339
C605	Capacitor polyester 680 nF ±10% 100V	Philips	2222 344 25684
C606	Capacitor polyester 47nF ±10% 100V	Philips	2222 344 25473
C607	Capacitor polyester 470nF ±10% 100V	Philips	2222 344 25474
C608	Capacitor polyester 47nF ±20% 100V	Philips	2222 344 24473
C609	Capacitor ceramic 56pF ± 2% 100V	Philips	2222 642 34569
C610	Capacitor polyester 51pF ± 1% 500V	Philips	2222 427 45109
C611	Capacitor ceramic 5,6pF ± 0,25pF63V	Draloric	3x4 N150/1B
C612	Capacitor ceramic 10nF-20/+80% 32V	Ferroperm	9/0145,9
C613	Capacitor tantalum 10uF-20/+50% 25V	Ero	ETP-3F

a VCXO AND LOOP 2 FILTER S1300 2/2

Symbol	*Description*	*Manufact.*	
C614	Capacitor polyester 47nF ±20% 100V	Philips	2222 344 24473
C615	Capacitor tantalum 10uF -20/+50% 25V	Ero	ETP-3F
C616	Capacitor polystyrene 220pF ±5% 500V	Philips	2222 427 22201
L601	Coil	S.P.	TL 257
T601	Transistor	Philips	BF256B
T602	Transistor	Philips	BF199
T603	Transistor	Philips	BC558
D601	Diode varicap.	Motorola	MV109
D602	Diode varicap.	Motorola	MV109
IC601	Integrated circuit	N.S.	LM 308N
X601	Crystal f=10097.600 kHz	S.P.	C 1010

MODULE NO: 700

a MOTOR CONTROL UNIT S1300 1/3

Symbol	Description			Manufact.	
R701	Resistor	390 ohm	±5% 0,33W	Philips	2322 211 13391
R702	Resistor	10Kohm	±5% 0,33W	Philips	2322 211 13103
R703	Resistor	3.9Kohm	±5% 0,33W	Philips	2322 211 13392
R704	Resistor	5,6Kohm	±5% 0,33W	Philips	2322 211 13562
R705	Resistor	5,6Kohm	±5% 0,33W	Philips	2322 211 13562
R706	Resistor	820 ohm	±5% 0,33W	Philips	2322 211 13821
R707	Resistor	8,2Kohm	±5% 0,33W	Philips	2322 211 13822
R708	Resistor	5,6Kohm	±5% 0,33W	Philips	2322 211 13562
R709	Resistor	5,6Kohm	±5% 0,33W	Philips	2322 211 13562
R710	Resistor	5,6Kohm	±5% 0,33W	Philips	2322 211 13562
R711	Resistor	5,6Kohm	±5% 0,33W	Philips	2322 211 13562
R712	Resistor	5,6Kohm	±5% 0,33W	Philips	2322 211 13562
R713	Resistor	5,6Kohm	±5% 0,33W	Philips	2322 211 13562
R714	Resistor	5,6Kohm	±5% 0,33W	Philips	2322 211 13562
R715	Resistor	10Kohm	±5% 0,33W	Philips	2322 211 13103
R716	Resistor	10Kohm	±5% 0,33W	Philips	2322 211 13103
R717	Resistor	5,6Kohm	±5% 0,33W	Philips	2322 211 13562
R718	Resistor	1Kohm	±5% 0,33W	Philips	2322 211 13102
R719	Resistor	1Kohm	±5% 0,33W	Philips	2322 211 13102
R720	Resistor	1Kohm	±5% 0,33W	Philips	2322 211 13102
R721	Resistor	1Kohm	±5% 0,33W	Philips	2322 211 13102
R722	Resistor	1Kohm	±5% 0,33W	Philips	2322 211 13102
R723	Resistor	3,9Kohm	±5% 0,33W	Philips	2322 211 13392
R724	Resistor	100Kohm	±5% 0,33W	Philips	2322 211 13104
R725	Resistor	3,9Kohm	±5% 0,33W	Philips	2322 211 13392
R726	Resistor	1Kohm	±5% 0,33W	Philips	2322 211 13102
R727	Resistor	100Kohm	±5% 0,33W	Philips	2322 211 13104
R728	Resistor	100Kohm	±5% 0,33W	Philips	2322 211 13104
R729	Resistor	100Kohm	±5% 0,33W	Philips	2322 211 13104
R730	Resistor	100Kohm	±5% 0,33W	Philips	2322 211 13104
R731	Resistor	100Kohm	±5% 0,33W	Philips	2322 211 13104
R732	Resistor	10Kohm	±5% 0,33W	Philips	2322 211 13103
RA701	Resistor, array	8x10Kohm	±5% 0,125W	ITT	VR8,10Kohm ±5%
RA702	Resistor, array	8x820 ohm	±5% 0,125W	ITT	VR10,820ohm±5%
RA703	Resistor, array	8x10Kohm	±5% 0,125W	ITT	VR8,10Kohm ±5%

a MOTOR CONTROL UNIT S1300 2/3

Symbol	Description	Manufact.	
C701	Capacitor, polyester 220nF±20% 100V	Philips	2222 344 24224
C702	Capacitor, electrolytic 10uF-10/+100% 25V	Siemens	B41313-A5106-V
C703	Capacitor, polyester 10nF±20% 250V	Philips	2222 344 40103
C704	Capacitor, tantalum 0.1uF-20/+50% 35V	Ero	ETP 1A
C705	Capacitor, tantalum 0.1uF-20/+50% 35V	Ero	ETP 1A
C706	Capacitor, tantalum 0.1uF-20/+50% 35V	Ero	ETP 1A
C707	Capacitor, tantalum 0.1uF-20/+50% 35V	Ero	ETP 1A
C708	Capacitor, tantalum 0.1uF-20/+50% 35V	Ero	ETP 1A
D701	Diode, silicon	Philips	BAV 21
D702	Diode, silicon	Philips	BAV 21
D703	Diode, silicon	Philips	BAV 21
D704	Diode, silicon	Philips	BAV 21
D705	Diode, silicon	Philips	BAV 21
D706	Diode, silicon	Philips	BAV 21
D707	Diode, silicon	Philips	BAV 21
D708	Diode, silicon	Philips	BAV 21
D709	Diode, silicon	Philips	BAV 21
D710	Diode, silicon	Philips	BAV 21
D711	Diode, silicon	Philips	BAV 21
D712	Diode, silicon	Philips	BAV 21
T701	Transistor	Philips	BC548
T702	Transistor	Philips	BC328-25
T703	Transistor	Philips	BC328-25
T704	Transistor	Philips	BC328-25
T705	Transistor	Philips	BC328-25
T706	Transistor	Philips	BC328-25
T707	Transistor	Philips	BC328-25
T708	Transistor	Philips	BC328-25
T709	Transistor	Philips	BC328-25
T710	Transistor	Philips	BC328-25
T711	Transistor	Philips	BC338-25
T712	Transistor	Philips	BC548
T713	Transistor	Philips	BC548
T714	Transistor	Philips	BC548
T715	Transistor	Philips	BC548

MODULE NO: 700

a MOTOR CONTROL UNIT S1300 3/3

Symbol	*Description*	*Manufact.*	
IC701	Integrated circuit	Texas	SN7407N
IC702	Integrated circuit	Motorola	MC14519B CP
IC703	Integrated circuit	Motorola	MC14077B CP
IC704	Integrated circuit	Motorola	MC14077B CP
IC705	Integrated circuit	Motorola	MC14081B CP
IC706	Integrated circuit	Motorola	MC14530B CP
IC707	Integrated circuit	Motorola	MC14515B CP

a FILTER-UNIT FOR S1300 1/2

Symbol	Description	Manufact.	
R901	Resistor 470 ohm ±5% 1.14W	Philips	2322 214 13471
R902	Preset potmeter, cermet 1Kohm±20% 0.5W	Philips	2322 482 20102
R903	Resistor 2.7kohm ±5% 0.33W	Philips	2322 211 13272
R904	Resistor 220 ohm ±5% 0.33W	Philips	2322 211 13221
R905	Not used		
R906	Resistor 1kohm ±5% 0.5 W	Philips	2322 212 13102
R907	Resistor 1kohm ±5% 0.5 W	Philips	2322 212 13102
C901	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C902	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C903	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C904	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C905	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C906	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C907	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C908	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C909	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C910	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C911	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C912	Not used		
C913	Not used		
C914	Not used		
C915	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C916	Capacitor polycarbonate 1nF ±20% 630V	Ero	KC 1849 210/6
C917	Not used		
C918	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C919	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C920	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C921	Capacitor polycarbonate 1nF ±20% 630V	Ero	KC 1849 210/6
C922	Capacitor polycarbonate 1nF ±20% 630V	Ero	KC 1849 210/6
C923	Caoacitor electrolytic 47uF-10/+50% 63V	Siemens	B41283-C8476-T
C924	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C925	Capacitor tantalum 10uF-20/+50% 25V	Ero	ETP 3F
C926	Capacitor electrolytic 10uF-10/+100%40V	Siemens	B41313-A7106-V
C927	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C928	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C929	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C930	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C931	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C932	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104

MODULE NO: 900

a FILTER UNIT FOR S1300 2/2

Symbol	*Description*	*Manufact.*	
C933	Capacitor polycarbonate 1nF±20% 630V	Ero	KC 1849 210/6
C934	Capacitor polycarbonate 1nF±20% 630V	Ero	KC 1849 210/6
D901	Diode, silicon	Philips	BAV 21

a MODE SWITCH UNIT S1300 1/2

Symbol	Description	Manufact.	
R1001	Resistor 10kohm ± 5% 0.33W	Philips	2322 211 13103
R1002	Resistor 18kohm ± 5% 0.33W	Philips	2322 211 13183
R1003	Resistor 47kohm ± 5% 0.33W	Philips	2322 211 13473
R1004	Resistor 330 ohm ± 5% 1.14W	Philips	2322 214 13331
R1005	Resistor 68 ohm ± 5% 0.33W	Philips	2322 211 13689
R1009	Resistor 1.5kohm ± 5% 0.33W	Philips	2322 211 13152
R1011	Resistor 1.5kohm ± 5% 4W	Philips	2322 330 22152
R1012	Resistor 820 ohm ± 5% 4W	Philips	2322 330 22821
R1013	Resistor 470 ohm ± 5% 0.33W	Philips	2322 211 13471
C1001	Capacitor, tantalum 4.7uF-20/+50% 35V	Ero	ETP 2E
C1002	Capacitor, electrolytic 470uF-20/+50% 25V	Philips	2222 017 16471
C1003	Capacitor, polyester 100nF ± 10% 100V	Philips	2222 344 25104
C1004	Capacitor, polyester 10nF ± 20% 250V	Philips	2222 344 40103
C1005	Capacitor, polyester 10nF ± 20% 250V	Philips	2222 344 40103
C1006	Capacitor, polyester 10nF ± 20% 250V	Philips	2222 344 40103
C1007	Capacitor, tantalum 10uF-20/+50% 25V	Ero	ETP 3F
FP1001	Ferrit bead	Kaschke	K3/1200/0.1Hz 4/2/7A
FP1002	Ferrit bead	Kaschke	K3/1200/0.1Hz 4/2/7A
FP1003	Ferrit bead	Kaschke	K3/1200/0.1Hz 4/2/7A
D1001	Diode, silicon	Philips	BAV 21
D1002	Diode, silicon	Philips	BAV 21
D1003	Diode, silicon	Philips	BAV 21
D1004	Diode, silicon	Philips	BAV 21
D1005	Diode, silicon	Philips	BAV 21
D1006	Diode, silicon	Philips	BAV 21
D1007	Diode, silicon	Philips	BAV 21
D1008	Diode, silicon	Philips	BAV 21
D1009	Diode, silicon	Philips	BAV 21
D1010	Diode, silicon	Philips	BAV 21
D1011	Diode, silicon	Philips	BAV 21
D1012	Diode, silicon	Philips	BAV 21
D1013	Diode, silicon	Philips	BAV 21
D1014	Diode, silicon	Philips	BAV 21
D1015	Diode, silicon	Philips	BAV 21
D1016	Diode, silicon	Philips	BAV 21
D1017	Diode, silicon	Philips	BAV 21
D1018	Diode, silicon	Philips	BAV 21

a MODE SWITCH UNIT S1300 2/2

Symbol	*Description*	*Manufact.*	
D1019	Diode, silicon	Philips	BAV 21
D1020	Diode, silicon	Philips	BAV 21
RE1001	Relay	Siemens	V23154-N0721-B110
RE1002	Relay	Pasi	MS/K BV863
RE1003	Relay	Siemens	V23154-N0721-B110
RE1004	Relay	Siemens	V23100-V4024-A001
T1001	Transistor	Philips	BC 558
S1001	Switch	S.P.	Draw. 7-3-21386
S1002	Switch	S.P.	Draw. 7-3-20060
S1003	Switch	S.P.	Draw. 7-3-21487
	S1300 only:		
R1006	Resistor 2.2kohm ± 5% 0.33W	Philips	2322 211 13222
R1007	Resistor 1.2kohm ± 5% 0.33W	Philips	2322 211 13122
R1010	Resistor 3.0kohm ± 5% 0.33W	Philips	2422 211 13302
	S1301 only:		
R1007	Resistor 820 ohm ± 5% 0.33W	Philips	2322 211 13821
R1010	Resistor 2.2Kohm ± 5% 0.33W	Philips	2322 211 13222

a SSB-GENERATOR S1300 1/3

Symbol	Description			Manufact.	
R1101	Resistor	6,8 Kohm ±5%	0,33W	Philips	2322 211 13682
R1102	Resistor	1 Kohm ±5%	0,33W	Philips	2322 211 13102
R1103	Resistor	220 ohm ±5%	0,33W	Philips	2322 211 13221
R1104	Resistor	1 Kohm ±5%	0,33W	Philips	2322 211 13102
R1105	Resistor	1 Kohm ±5%	0,33W	Philips	2322 211 13102
R1106	Resistor	1 Kohm ±5%	0,33W	Philips	2322 211 13102
R1107	Resistor	1 Kohm ±5%	0,33W	Philips	2322 211 13102
R1108	Resistor	6,8 Kohm ±5%	0,33W	Philips	2322 211 13682
R1109	Preset potmeter cermet	47Kohm ±20%	0,5 W	Philips	2322 482 20473
R1110	Resistor	4,7 Kohm ±5%	0,33W	Philips	2322 211 13472
R1111	Resistor	12 Kohm ±5%	0,33W	Philips	2322 211 13123
R1112	Resistor	2,2 Kohm ±5%	0,33W	Philips	2322 211 13222
R1113	Resistor	2,2 Kohm ±5%	0,33W	Philips	2322 211 13222
R1114	Resistor	2,2 Kohm ±5%	0,33W	Philips	2322 211 13222
R1115	Resistor	2,2 Kohm ±5%	0,33W	Philips	2322 211 13222
R1116	Resistor	68 ohm ±5%	0,33W	Philips	2322 211 13689
R1117	Resistor	150 ohm ±5%	0,33W	Philips	2322 211 13151
R1118	Resistor	33 Kohm ±5%	0,33W	Philips	2322 211 13333
R1119	Resistor	47 Kohm ±5%	0,33W	Philips	2322 211 13473
R1120	Resistor	47 Kohm ±5%	0,33W	Philips	2322 211 13473
R1121	Resistor	47 ohm ±5%	0,33W	Philips	2322 211 13479
R1122	Resistor	47 ohm ±5%	0,33W	Philips	2322 211 13479
R1123	Resistor	270 ohm ±5%	0,33W	Philips	2322 211 13271
R1124	Resistor	47Kohm ±5%	0,33W	Philips	2322 211 13473
R1125	Preset potmeter cermet	100 ohm±20%	0,5 W	Philips	2322 482 20101
R1126	Resistor	330 ohm ±5%	0,33W	Philips	2322 211 13331
R1127	Resistor	330 ohm ±5%	0,33W	Philips	2322 211 13331
R1128	Resistor	1,2 Kohm ±5%	0,33W	Philips	2322 211 13122
R1129	Resistor	47 Kohm ±5%	0,33W	Philips	2322 211 13473
R1130	Resistor	470 ohm ±5%	0,33W	Philips	2322 211 13471
R1131	Resistor	2,2 Kohm ±5%	0,33W	Philips	2322 211 13222
R1132	Resistor	18 Kohm ±5%	0,33W	Philips	2322 211 13183
R1133	Resistor	56 Kohm ±5%	0,33W	Philips	2322 211 13563
R1134	Resistor	100 ohm ±5%	0,33W	Philips	2322 211 13101
R1135	Resistor	1 Kohm ±5%	0,33W	Philips	2322 211 13102
R1136	Resistor	1 Kohm ±5%	0,33W	Philips	2322 211 13102
R1137	Resistor	22 Kohm ±5%	0,33W	Philips	2322 211 13223
R1138	Resistor	68 Kohm ±5%	0,33W	Philips	2322 211 13683
R1139	Resistor	1.5 Kohm ±5%	0,33W	Philips	2322 211 13152

MODULE NO: 1100

Symbol	*Description*	*Manufact.*	
R1140	Resistor NTC 1kohm ±10% 0.5W	Philips	2322 642 12102
R1141	Resistor 1kohm ± 5% 0.33W	Philips	2322 211 13102
R1142	Resistor 150 ohm ± 5% 0.33W	Philips	2322 211 13151
R1143	Resistor 330 ohm ± 5% 0.33W	Philips	2322 211 13331
R1144	Resistor 2.7Kohm ± 5% 0.33W	Philips	2322 211 13272
R1145	Resistor 1.8Kohm ± 5% 0.33W	Philips	2322 211 13782
R1146	Resistor 2.2Kohm ± 5% 0.33W	Philips	2322 211 13222
R1147	Resistor 1.5Kohm ± 5% 0.33W	Philips	2322 211 13152
R1148	Resistor 68 ohm ± 5% 0.33W	Philips	2322 211 13689
R1149	Resistor 15Kohm ± 5% 0.33W	Philips	2322 211 13153
R1150	Resistor 350 ohm ± 5% 0.33W	Philips	2322 211 13331
R1151	Preset pot.meter cermet 220 ohm±20% 0.5W	Philips	2322 482 20221
R1152	Resistor 220 ohm ± 5% 0.33W	Philips	2322 211 13221
C1101	Capacitor tantalum 4.7uF-20/+50% 35V	Ero	ETP 2E
C1102	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1103	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1104	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1105	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1106	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1107	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1108	Capacitor polystyrene 1,2nF ±5% 125V	Philips	2222 425 21202
C1109	Capacitor polystyrene 4,7nF ±5% 125V	Philips	2222 425 24702
C1110	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1111	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1112	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1113	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1114	Capacitor polystyrene 1nF ± 5% 125V	Philips	2222 425 21002
C1115	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1116	Capacitor electrolytic 100uF-20/+50% 25V	Siemens	B41283-B5107-T
C1117	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1118	Capacitor polyester 10nF ±20% 250V	Philips	2222 344 40103
C1119	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1120	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 20103
C1121	Capacitor polyester 10nF ±20% 250V	Philips	2222 344 40103
C1122	If fitted:		
	Capacitor ceramic 27pF ± 5% 400V	Ferroperm	9/0112.9
C1123	Capacitor trimmmer teflon 2.5-45pF NPO	DAU	107-5901 045
C1124	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1125	Capacitor polystyrene 1nF ± 5% 125V	Philips	2222 425 21002

a SSB-GENERATOR S1300 3/3

Symbol	Description	Manufact.	
C1126	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1127	Capacitor polystyrene1,5nF ± 5% 125V	Philips	2222 425 21502
C1128	Capacitor polystyrene3,3nF ± 5% 125V	Philips	2222 425 23302
C1129	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1130	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1131	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1132	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1133	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1134	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
C1135	Capacitor polystyrene 1nF ± 5% 125V	Philips	2222 425 21002
C1136	Capacitor polyester 100nF ±20% 100V	Philips	2222 344 24104
L1101	Coil	S.P.	TL013
L1102	Coil	Prahn	1580/9K
L1103	Coil	S.P.	TL 020
L1104	Coil 1mH	Prahn	1580/9K
L1105	Coil 1mH	S.P.	TL 076
L1106	Coil	S.P.	TL 026
L1107	Coil	S.P.	TL 013
L1108	Coil	S.P.	TL 220
T1101	Transistor silicon	Philips	BC 547
T1102	Transistor silicon	Philips	BC 547
T1103	Transistor silicon	Philips	BC 547
T1104	Transistor silicon	Philips	BC 547
T1105	Transistor silicon	Philips	BF 199
D1101	Diode, switch	Philips	BA 182
D1102	Diode, switch	Philips	BA 182
D1103	Diode, switch	Philips	BA 182
D1104	Diode, switch	Philips	BA 182
IC1101	Integrated circuit	RCA	CA3019
TL1101	LSB crystal filter 600 kHz	S.P.	C1002

MODULE NO: 1200

a MICROPHONE AMPLIFIER S1300 1/3

Symbol	*Description*	*Manufact.*	
R1201	Preset pot.meter, cermet 1Kohm ±20%0,5W	Philips	2322 482 20102
R1202	Resistor 330 ohm ±5% 1,15W	Philips	2322 214 13331
R1203	Resistor 1Kohm ±5% 0,33W	Philips	2322 211 13102
R1204	Resistor 2,7Kohm ±5% 0,33W	Philips	2322 211 13272
R1205	Resistor 2,7Kohm ±5% 0,33W	Philips	2322 211 13272
R1206	Resistor 180 ohm ±5% 0,33W	Philips	2322 211 13181
R1207	Resistor 100 ohm ±5% 0,33W	Philips	2322 211 13101
R1208	Resistor 4,7Kohm ±5% 0,33W	Philips	2322 211 13472
R1209	Resistor 100Kohm ±5% 0,33W	Philips	2322 211 13104
R1210	Resistor 2,7Kohm ±5% 0,33W	Philips	2322 211 13272
R1211	Resistor 820 ohm ±5% 0,33W	Philips	2322 211 13821
R1212	Resistor 100Kohm ±5% 0,33W	Philips	2322 211 13104
R1213	Resistor 220Kohm ±5% 0,33W	Philips	2322 211 13224
R1214	Resistor 4,7Kohm ±5% 0,33W	Philips	2322 211 13472
R1215	Resistor 4,7Kohm ±5% 0,33W	Philips	2322 211 13472
R1216	Resistor 390 ohm ±5% 0,33W	Philips	2322 211 13391
R1217	Resistor 10Kohm ±5% 0,33W	Philips	2322 211 13103
R1218	Resistor 4,7Kohm ±5% 0,33W	Philips	2322 211 13472
R1219	Resistor 10Kohm ±5% 0,33W	Philips	2322 211 13103
R1220	Resistor 1Kohm ±5% 0,33W	Philips	2322 211 13102
R1221	Resistor 470 ohm ±5% 0,33W	Philips	2322 211 13471
R1222	Resistor 2,2Kohm ±5% 0,33W	Philips	2322 211 13222
R1223	Resistor 220Kohm ±5% 0,33W	Philips	2322 211 13224
R1224	Preset potmeter, cermet 100Kohm±20%0,5W	Philips	2322 482 20104
R1225	Resistor 2,2Kohm ±5% 0,33W	Philips	2322 211 13222
R1226	Resistor 10Kohm ±5% 0,33W	Philips	2322 211 13103
R1227	Resistor 3,9Kohm ±5% 0,33W	Philips	2322 211 13392
R1228	Resistor 3,9Kohm ±5% 0,33W	Philips	2322 211 13392
R1229	Resistor 100Kohm ±5% 0,33W	Philips	2322 211 13104
R1230	Resistor 1Kohm ±5% 0,33W	Philips	2322 211 13102
R1231	Resistor 2,2Kohm ±5% 0,33W	Philips	2322 211 13222
R1232	preset potmeter cermet 470 ohm ±20%0,5W	Philips	2322 482 20471
R1233	Resistor 47Kohm ±5% 0,33W	Philips	2322 211 13473
R1234	Resistor 47Kohm ±5% 0,33W	Philips	2322 211 13473
R1235	Resistor 2,2Kohm ±5% 0,33W	Philips	2322 211 13222
R1236	Resistor 1Kohm ±5% 0,33W	Philips	2322 211 13102
R1237	Resistor 1Kohm ±5% 0,33W	Philips	2322 211 13102

a MICROPHONE AMPLIFIER S1300 2/3

Symbol	Description			Manufact.	
R1238	Resistor 3.9kohm ±5%		0.33W	Philips	2322 211 13392
R1239	Resistor 2.2kohm ±5%		0.33W	Philips	2322 211 13222
R1240	Resistor 2.2kohm ±5%		0.33W	Philips	2322 211 13222
R1241	Resistor 2.2kohm ±5%		0.33W	Philips	2322 211 13222
R1242	Resistor 390 ohm ±5%		0.33W	Philips	2322 211 13391
R1243	Resistor 270 ohm ±5%		0.33W	Philips	2322 211 13271
R1244	Resistor 120 ohm ±5%		0.33W	Philips	2322 211 13121
R1245	Resistor 1kohm ±5%		0.33W	Philips	2322 211 13102
R1246	Resistor 1kohm ±5%		0.33W	Philips	2322 211 13102
R1247	Resistor 1kohm ±5%		0.33W	Philips	2322 211 13102
C1201	Capacitor tantalum	33uF-20/+50%	10V	Ero	ETP 3G
C1202	Capacitor tantalum	4.7uF-20/+50%	35V	Ero	ETP 2E
C1203	Capacitor tantalum	220nF-20/+50%	35V	Ero	ETP 1A
C1204	Capacitor ceramic	1nF-20/+80%	40V	Ferroperm	9/0129.8
C1205	Capacitor ceramic	1nF-20/+80%	40V	Ferroperm	9/0129.8
C1206	Capacitor tantalum	4.7uF-20/+50%	35V	Ero	ETP 2E
C1207	Capacitor tantalum	100nF-20/+50%	35V	Ero	ETP 1A
C1208	Capacitor electrolytic	470uF-10/+50%	10V	Siemens	B41283-A3477-T
C1209	Capacitor polyester	100nF ±20%	100V	Philips	2222 344 24104
C1210	Capacitor tantal	4.7uF-20/+50%	35V	Ero	ETP 2E
C1211	Capacitor ceramic	150pF ±10%	25V	Ferroperm	9/0121.8
C1212	Capacitor polyester	100nF ±20%	100V	Philips	2222 344 24104
C1213	Capacitor polyester	100nF ±20%	100V	Philips	2222 344 24104
C1214	Capacitor electrolytic	10uF-10/+50%	63V	Siemens	B41283-A8106-T
C1215	Capacitor polyester	100nF ±20%	100V	Philips	2222 344 24104
C1216	Capacitor tantalum	4.7uF-20/+50%	35V	Ero	ETP 2E
C1217	Capacitor tantalum	4.7uF-20/+50%	35V	Ero	ETP 2E
C1218	Capacitor tantalum	10uF-20/+50%	25V	Ero	ETP 3F
C1219	Capacitor polyester	47nF ±10%	250V	Philips	2222 344 41473
C1220	Capacitor tantalum	4.7uF-20/+50%	35V	Ero	ETP 2E
C1221	Capacitor tantalum	4.7uF-20/+50%	35V	Ero	ETP 2E
C1222	Capacitor tantalum	4.7uF-20/+50%	35V	Ero	ETP 2E
C1223	Capacitor polyester	68nF ±10%	250V	Philips	2222 344 41683
C1224	Capacitor tantalum	4.7uF-20/+50%	35V	Ero	ETP 2E
C1225	Capacitor tantalum	4.7uF-20/+50%	35V	Ero	ETP 2E
C1226	Capacitor tantalum	4.7uF-20/+50%	35V	Ero	ETP 2E
L1201	Coil			S.P.	TL 219

MODULE NO: 1200

a MICROPHONE AMPLIFIER S1300 3/3

Symbol	*Description*	*Manufact.*	
T1201	Transistor	Philips	BC 338
T1202	Transistor	Philips	BF 256 B
T1203	Transistor	Philips	BC 548B
T1204	Transistor	Philips	BC 548B
T1205	Transistor	Philips	BC 548B
T1206	Transistor	Philips	BC 548B
T1207	Transistor	Philips	BC 558B
T1208	Transistor	Philips	BC 558B
T1209	Transistor	Philips	BC 548B
T1210	Transistor	Philips	BC 548B
T1211	Transistor	Philips	BC 548B
T1212	Transistor	Philips	BC 548B
T1213	Transistor	Philips	BC 548B
D1201	Diode, zener 5.1V ±5% 1W	Motorola	1N4733A
D1202	Diode, zener 5.1V ±5% 0.4W	Philips	BZX79 C5V1
D1203	Diode, silicon	Philips	BAV 21
D1204	Diode, zener 7.5V ±5% 0.4W	Philips	BZX79 C7V5
D1205	Diode, silicon	Philips	BAV 21
D1206	Diode, switch	Philips	BA 182
D1207	Diode, switch	Philips	BA 182
D1208	Diode, switch	Philips	BA 182
D1209	Diode, switch	Philips	BA 182
IC1201	Integrated circuit	Texas	SN7472N

a ALARM SIGNAL GENERATOR S1300 1/2

Symbol	Description		Manufact.	
R1301	Preset pot.meter 100Kohm ±20%	0,1W	Philips	2322 410 43311
R1302	Resistor 2,7Kohm ±5%	0,33W	Philips	2322 211 13272
R1303	Resistor 150 ohm ±5%	0,33W	Philips	2322 211 13151
R1304	Resistor 33 ohm ±5%	0,33W	Philips	2322 211 13339
R1305	Resistor 1Kohm ±5%	0,33W	Philips	2322 211 13102
R1306	Resistor 2,7Kohm ±5%	0,33W	Philips	2322 211 13272
R1307	Resistor 150 ohm ±5%	0,33W	Philips	2322 211 13151
R1308	Resistor 82Kohm ±5%	0,33W	Philips	2322 211 13823
R1309	Resistor 22Kohm ±5%	0,33W	Philips	2322 211 13223
R1310	Resistor 270 ohm ±5%	0,33W	Philips	2322 211 13271
R1311	Resistor 22Kohm ±5%	0,33W	Philips	2322 211 13223
R1312	Resistor 100 ohm ±5%	0,33W	Philips	2322 211 13101
R1313	Resistor 82Kohm ±5%	0,33W	Philips	2322 211 13823
R1314	Resistor 2,7Kohm ±5%	0,33W	Philips	2322 211 13272
R1315	Resistor 1Kohm ±5%	0,33W	Philips	2322 211 13102
R1316	Resistor 3,3Kohm ±5%	0,33W	Philips	2322 211 13332
R1317	Resistor 15Kohm ±5%	0,33W	Philips	2322 211 13153
R1318	Resistor 27Kohm ±5%	0,33W	Philips	2322 211 13273
R1319	Resistor 150 ohm ±5%	0,33W	Philips	2322 211 13151
R1320	Resistor 1Kohm ±5%	0,33W	Philips	2322 211 13102
R1321	Resistor 270 ohm ±5%	1,14W	Philips	2322 214 13271
R1322	Resistor 10Kohm ±5%	0,33W	Philips	2322 211 13103
R1323	Resistor 270Kohm ±5%	0,33W	Philips	2322 211 13274
R1324	Resistor 27 ohm ±5%	0,33W	Philips	2322 211 13279
R1325	Resistor 330Kohm ±5%	0,33W	Philips	2322 211 13334
C1301	Capacitor tantalum 4,7uF-20/+50%	35V	Ero	ETP 2E
C1302	Capacitor tantalum 10uF-20/+50%	25V	Ero	ETP 3F
C1303	Capacitor tantalum 1,5uF-20/+50%	35V	Ero	ETP 1B
C1304	Capacitor polystyren 22nF ±1%	125V	Philips	2222 425 42203
C1305	Capacitor polyester 22nF ±10%	250V	Philips	2222 344 41223
C1306	Capacitor polyester 22nF ±10%	250V	Philips	2222 344 41223
C1307	Capacitor tantalum 10uF-20/+50%	25V	Ero	ETP 3F
C1308	Capacitor polystyren 47nF ±1%	125V	Philips	2222 425 44703
C1309	Capacitor tantalum 3,3uF-20/+50%	35V	Ero	ETP 2D
C1310	Capacitor tantalum 22uF-20/+50%	16V	Ero	ETP 3G

MODULE NO: 1300

Symbol	*Description*	*Manufact.*	
C1311	Capacitor tantalum 10uF-20/+50% 25V	Ero	ETP 3F
C1312	Capacitor tantalum 22uF-20/+50% 16V	Ero	ETP 3G
C1313	Capacitor tantalum 22uF-20/+50% 16V	Ero	ETP 3G
C1314	Capacitor tantalum 4,7uF-20/+50% 35V	Ero	ETP 2E
C1315	Capacitor polyester 10nF ±10% 250V	Philips	2222 344 41103
C1316	Capacitor tantalum 68uF ±10% 16V	Ero	ETQ 5
L1301	Coil	SP	TL022
L1302	Coil	SP	TL021
D1301	Diode, silicon	Philips	BAX 16
D1302	Diode, switch	Philips	BA182
D1303	Diode, switch	Philips	BA182
D1304	Diode, zener, 7,5V ±5% 1W	Motorola	1N4737A
T1101	Transistor	Motorola	2N4871
T1102	Transistor	Philips	BC548
T1103	Transistor	Philips	BC548
T1104	Transistor	Philips	BC338
T1105	Transistor	Philips	BC548
IC1301	Integrated circuit	Texas	SN 7472 N
IC1302	Integrated circuit	Motorola	MC 1455 P1.

a DRIVER-UNIT FOR S1300 1/1

Symbol	*Description*	*Manufact.*	
R1401	Resistor 560 ohm ±5% 1,14W	Philips	2322 214 13561
R1402	Resistor 15 ohm ±5% 0,5 W	Philips	2322 212 23159
R1403	Resistor 15 ohm ±5% 0,5 W	Philips	2322 212 23159
C1401	Capacitor polyester 220nF ±20% 100V	Philips	2222 344 24224
C1402	Capacitor ceramic 10nF -20/+80% 32V	Ferroperm	9/0145,9
C1403	Capacitor polyester 22nF ±20% 250V	Philips	2222 344 40223
C1404	Capacitor polyester 220nF ±20% 100V	Philips	2222 344 24224
L1401	Coil 330nH ±10%	Ferroperm	1582/7
L1402	Coil 33uH ±10%	Ferroperm	1583
L1403	Coil 33uH ±10%	Ferroperm	1583
T1401	Transistor, h_{FE}> 10 for(V_{CE},I_C=(5V,0,25A)	Motorola	2N5641, ZRF0132
RE1401	If fitted		
	Relay	Siemens	V23100-V4024-A001

MODULE NO: 1500

a BANDFILTER S1300 1/4

Symbol	Description		Manufact.	
R1501	Resistor	220 ohm ±5% 0,33W	Philips	2322 211 13221
R1502	Resistor	470 ohm ±5% 0,33W	Philips	2322 106 33471
R1503	Resistor	39 ohm ±5% 0,33W	Philips	2322 211 13399
R1504	Resistor	120 ohm ±5% 0,33W	Philips	2322 211 13121
R1505	Resistor	10 ohm ±5% 0,33W	Philips	2322 211 13109
R1506	Resistor	27 ohm ±5% 0,33W	Philips	2322 211 13279
R1507	Resistor	120 ohm ±5% 0,5 W	Philips	2322 212 13121
R1508	Resistor	390 ohm ±5% 0,33W	Philips	2322 106 33391
R1509	Resistor	1,5Kohm ±5% 0,33W	Philips	2322 211 13152
R1510	Not mounted			
R1511	Resistor	390 ohm ±5% 0,33W	Philips	2322 106 33391
R1512	Resistor	1,5Kohm ±5% 0,33W	Philips	2322 211 13152
R1513	Not mounted			
R1514	Resistor	390 ohm ±5% 0,33W	Philips	2322 106 33391
R1515	Resistor	1,5Kohm ±5% 0,33W	Philips	2322 211 13152
R1516	Not mounted			
R1517	Resistor	390 ohm ±5% 0,33W	Philips	2322 106 33391
R1518	Resistor	1,5Kohm ±5% 0,33W	Philips	2322 211 13152
R1519	Resistor	15Kohm ±5% 0,33W	Philips	2322 211 13153
R1520	Resistor	390 ohm ±5% 0,33W	Philips	2322 106 33391
R1521	Resistor	1,5Kohm ±5% 0,33W	Philips	2322 211 13152
R1522	Resistor	15Kohm ±5% 0,33W	Philips	2322 211 13153
R1523	Resistor	390 ohm ±5% 0,33W	Philips	2322 106 33391
R1524	Resistor	1,5Kohm ±5% 0,33W	Philips	2322 211 13152
R1525	Resistor	22Kohm ±5% 0,33W	Philips	2322 211 13223
R1526	Resistor	180Kohm ±5% 0,33W	Philips	2322 211 13184
R1527	Resistor	390 ohm ±5% 0,33W	Philips	2322 106 33391
R1528	Resistor	1,5Kohm ±5% 0,33W	Philips	2322 211 13152
R1529	Resistor	680 ohm ±5% 0,33W	Philips	2322 211 13681
R1530	Resistor	150 ohm ±5% 0,33W	Philips	2322 211 13151
R1531	Resistor	180 ohm ±5% 0,33W	Philips	2322 211 13181
R1532	Resistor	68 ohm ±5% 0,33W	Philips	2322 211 13689
R1533	Resistor	18 ohm ±5% 0,33W	Philips	2322 211 13189

a BANDFILTER S1300 2/4

Symbol	Description	Manufact.	
R1534	Preset pot.meter,cermet 100 ohm±20% 0,5W	Philips	2322 482 20101
R1535	Resistor 680 ohm± 5% 0,5W	Philips	2322 212 13681
R1536	Preset pot.meter 47 ohm±10% 3W	A.B.Metal	115 Q 7
R1537	Resistor 27 ohm± 5%0,33W	Philips	2322 211 13279
C1501	Capacitor polyester 100 nF ±20% 100V	Philips	2222 344 24104
C1502	Capacitor polyester 100 nF ±20% 100V	Philips	2222 344 24104
C1503	Capacitor polyester 100 nF ±20% 100V	Philips	2222 344 24104
C1504	Capacitor ceramic 10 nF -20/+80% 32V	Ferroperm	9/0145,9
C1505	Capacitor polyester 100 nF ±20% 100V	Philips	2222 344 24104
C1506	Capacitor ceramic 10 nF -20/+80% 32V	Ferroperm	9/0145,9
C1507	Capacitor polyester 22 nF ±20% 250V	Philips	2222 344 40223
C1508	Capacitor polyester 22 nF ±20% 250V	Philips	2222 344 40223
C1509	Capacitor polystyrene 62 pF ±2% 500V	Philips	2222 427 36209
C1510	Capacitor ceramic 3,3 pF ±0,25pF NPO 400V	Ferroperm	9/0112,9
C1511	Capacitor polystyrene 180 pF ±2% 500V	Philips	2222 427 31801
C1512	Capacitor polystyrene 91 pF ±2% 500V	Philips	2222 427 39109
C1513	Capacitor polyester 22 nF ±20% 250V	Philips	2222 344 40223
C1514	Capacitor polyester 22 nF ±20% 250V	Philips	2222 344 40223
C1515	Capacitor polystyrene 75 pF ±2% 500V	Philips	2222 427 37509
C1516	Capacitor ceramic 4,3pF ±0,25pF NPO 400V	Ferroperm	9/0112,9
C1517	Capacitor polystyrene 220 pF ±2% 500V	Philips	2222 427 32201
C1518	Capacitor polystyrene 110 pF ±2% 500V	Philips	2222 427 31101
C1519	Capacitor polyester 22 nF ±20% 250V	Philips	2222 344 40223
C1520	Capacitor polyester 22 nF ±20% 250V	Philips	2222 344 40223
C1521	Capacitor polystyrene 91 pF ±2% 500V	Philips	2222 427 39109
C1522	Capacitor ceramic 5,1pF ±0,25pF NPO 400V	Ferroperm	9/0112,9
C1523	Capacitor polystyrene 270 pF ±2% 500V	Philips	2222 427 32701
C1524	Capacitor polystyrene 130 pF ±2% 500V	Philips	2222 427 31301
C1525	Capacitor polyester 22 nF ±20% 250V	Philips	2222 344 40223
C1526	Capacitor polyester 22 nF ±20% 250V	Philips	2222 344 40223

a BANDFILTER S1300 3/4

Symbol	Description	Manufact.	
C1527	Capacitor polystyrene 120 pF ±2% 500V	Philips	2222 427 31201
C1528	Capacitor ceramic 7,5 pF ±0,25pF NPO 400V	Ferroperm	9/0112,9
C1529	Capacitor polystyrene 330 pF ±2% 500V	Philips	2222 427 33301
C1530	Capacitor polystyrene 180 pF ±2% 500V	Philips	2222 427 31801
C1531	Capacitor polyester 22 nF ±20% 250V	Philips	2222 344 40223
C1532	Capacitor polyester 22 nF ±20% 250V	Philips	2222 344 40223
C1533	Capacitor polystyrene 180 pF ±2% 500V	Philips	2222 427 31801
C1534	Capacitor ceramic 11 pF ±5%NPO 400V	Ferroperm	9/0112,9
C1535	Capacitor polystyrene 510 pF ±2% 250V	Philips	2222 426 35101
C1536	Capacitor polystyrene 270 pF ±2% 500V	Philips	2222 427 32701
C1537	Capacitor polyester 22 nF ±20% 250V	Philips	2222 344 40223
C1538	Capacitor polyester 22 nF ±20% 250V	Philips	2222 344 40233
C1539	Capacitor polystyrene 220 pF ±2% 500V	Philips	2222 427 32201
C1540	Capacitor ceramic 13 pF ±5%NPO 400V	Ferroperm	9/0112,9
C1541	Capacitor polystyrene 680 pF ±2% 250V	Philips	2222 426 36801
C1542	Capacitor polystyrene 330 pF ±2% 500V	Philips	2222 427 33301
C1543	Capacitor polystyrene 150 pF ±2% 500V	Philips	2222 427 31501
C1544	Capacitor polyester 100 nF ±20% 100V	Philips	2222 344 24104
C1545	Capacitor polystyrene 390 pF ±2% 250V	Philips	2222 426 33901
C1546	Capacitor polystyrene 150 pF ±2% 500V	Philips	2222 427 31501
C1547	Capacitor polyester 100 nF ±20% 100V	Philips	2222 344 24104
C1548	Capacitor polyester 220 nF ±20% 100V	Philips	2222 344 24224
C1549	Capacitor polystyrene 3,9 nF ±5% 63V	Philips	2222 424 23902
C1550	Capacitor polyester 220 nF ±20% 100V	Philips	2222 344 24224
C1551	Capacitor polyester 220 nF ±20% 100V	Philips	2222 344 24224
C1552	Capacitor ceramic 10 nF -20/+80% 32V	Ferroperm	9/0145,9
C1553	Capacitor polyester 220 nF ±20% 100V	Philips	2222 344 24224
L1501	Coil	S.P.	TL 247
L1502	Coil	S.P.	TL 248
L1503	Coil	S.P.	TL 245
L1504	Coil	S.P.	TL 246
L1505	Coil	S.P.	TL 243
L1506	Coil	S.P.	TL 244
L1507	Coil	S.P.	TL 241
L1508	Coil	S.P.	TL 242
L1509	Coil	S.P.	TL 239

a BANDFILTER S1300 4/4

Symbol	*Description*	*Manufact.*	
L1510	Coil	S.P.	TL 240
L1511	Coil	S.P.	TL 237
L1512	Coil	S.P.	TL 238
L1513	Coil	S.P.	TL 236
L1514	Coil	S.P.	TL 236
T1501	Transistor	Philips	BFW17A
T1502	Transistor	Philips	BFW17A
D1501	Diode, switch	Philips	BA182
D1501	Diode, switch	Philips	BA182
D1502	Diode, switch	Philips	BA182
D1503	Diode, switch	Philips	BA182
D1504	Diode, switch	Philips	BA182
D1505	Diode, switch	Philips	BA182
D1506	Diode, switch	Philips	BA182
D1507	Diode, switch	Philips	BA182
D1508	Diode, switch	Philips	BA182
D1509	Diode, switch	Philips	BA182
D1510	Diode, switch	Philips	BA182
D1511	Diode, switch	Philips	BA182
D1512	Diode, switch	Philips	BA182
D1513	Diode, switch	Philips	BA182
D1514	Diode, switch	Philips	BA182
D1515	Diode, switch	Philips	BA182
D1516	Diode, switch	Philips	BA182
D1517	Diode, switch	Philips	BA182
D1518	Diode, silicon	Philips	BAV21
TR1501	Transformer	S.P.	TL 249
TR1502	Transformer	S.P.	TL 250

MODULE NO: 1600

a MIXER UNIT S1300 1/3

Symbol	Description	Manufact.	
R1601	Resistor 820 ohm ± 5% 0.33W	Philips	2322 211 13821
R1602	Resistor 1.5kohm ± 5% 0.33W	Philips	2322 211 13152
R1603	Resistor 6.8kohm ± 5% 0.33W	Philips	2322 211 13682
R1604	Resistor 820 ohm ± 5% 0.33W	Philips	2322 211 13821
R1605	Resistor 3.3kohm ± 5% 0.33W	Philips	2322 211 13332
R1606	Resistor 33 ohm ± 5% 0.33W	Philips	2322 211 13339
R1607	Resistor NTC 1kohm±10% 0.5W	Philips	2322 642 12102
R1608	Resistor 330 ohm ± 5% 0.33W	Philips	2322 211 13331
R1609	Resistor 220 ohm ± 5% 0.33W	Philips	2322 211 13221
R1610	Resistor 150 ohm ± 5% 0.33W	Philips	2322 211 13151
R1611	Resistor 15 ohm ± 5% 0.33W	Philips	2322 211 13159
R1612	Resistor 4.7kohm ± 5% 0.33W	Philips	2322 211 13472
R1613	Resistor 3.3kohm ± 5% 0.33W	Philips	2322 211 13332
R1614	Resistor 15 ohm ± 5% 0.33W	Philips	2322 211 13159
R1615	Resistor 68 ohm ± 5% 0.33W	Philips	2322 211 13689
R1616	Resistor 68 ohm ± 5% 0.33W	Philips	2322 211 13689
R1617	Resistor 180 ohm ± 5% 0.33W	Philips	2322 211 13181
R1618	Resistor 1kohm ± 5% 0.33W	Philips	2322 211 13102
R1619	Resistor 12kohm ± 5% 0.33W	Philips	2322 211 13123
R1620	Resistor 1.8kohm ± 5% 0.33W	Philips	2322 211 13182
R1621	Resistor 470 ohm ± 5% 0.33W	Philips	2322 211 13471
R1622	Resistor 4.7kohm ± 5% 0.33W	Philips	2322 211 13472
R1623	Resistor 3.9kohm 0.33W	Philips	2322 211 13392
R1624	Resistor 470 ohm ± 5% 0.33W	Philips	2322 211 13471
R1625	Preset pot.meter cermet 2.2kohm±20% 0.5W	Philips	2322 482 20222
R1626	Resistor 2.2kohm ± 5% 0.33W	Philips	2322 211 13222
R1627	Resistor 2.2kohm ± 5% 0.33W	Philips	2322 211 13222
R1628	Resistor 10kohm ± 5% 0.33W	Philips	2322 211 13103
R1629	Resistor 27kohm ± 5% 0.33W	Philips	2322 211 13273
R1630	Resistor 47 ohm ± 5% 0.33W	Philips	2322 211 13479
R1631	Preset pot.meter cermet 100 ohm±20% 0.5W	Philips	2322 482 20101
R1632	Resistor 220 ohm ± 5% 0.33W	Philips	2322 211 13221
R1633	Resistor 1kohm ± 5% 0.33W	Philips	2322 211 13102
R1634	Resistor 8.2kohm ± 5% 0.33W	Philips	2322 211 13822
R1635	Resistor 680 ohm ± 5% 0.33W	Philips	2322 211 13681
R1636	Resistor 100 ohm ± 5% 0.33W	Philips	2322 211 13101
R1637	Resistor 5.6kohm ± 5% 0.33W	Philips	2322 211 13562
R1638	Resistor 22kohm ± 5% 0.33W	Philips	2322 211 13223
R1639	Resistor 330 ohm ± 5% 0.33W	Philips	2322 211 13331
R1640	Resistor 100 ohm ± 5% 0.33W	Philips	2322 211 13101
R1641	Resistor 47 ohm ± 5% 0.33W	Philips	2322 211 13279

a MIXER UNIT S1300 2/3

Symbol	Description	Manufact.	
R1642	Resistor 220 ohm ± 5% 0.33W	Philips	2322 211 13221
R1643	Resistor 33 ohm ± 5% 0.33W	Philips	2322 211 13339
R1644	Resistor 180 ohm ± 5% 0.33W	Philips	2322 211 13181
R1645	Resistor 22 ohm ± 5% 0.33W	Philips	2322 211 13229
R1646	Resistor 180 ohm ± 5% 0.33W	Philips	2322 211 13181
R1647	Resistor 560 ohm ± 5% 0.33W	Philips	2322 211 13561
	S1300 only:		
R1619	Resistor 12kohm ± 5%	Philips	2322 211 13123
	S1301 only:		
R1619	Resistor 27kohm ± 5%	Philips	2322 211 13273
C1601	Capacitor, tantalum 10uF-20/+50% 25V	Ero	ETP 3F
C1602	Capacitor, polyester 47nF ±20% 250V	Philips	2222 344 40473
C1603	Capacitor, tantalum 10uF-20/+50% 25V	Ero	ETP 3F
C1604	Capacitor, polyester 47nF ±20% 250V	Philips	2222 344 40473
C1605	Capacitor, polyester 22nF ±20% 400V	Philips	2222 344 54223
C1606	Capacitor, polyester 47nF ±20% 250V	Philips	2222 344 40473
C1607	Capacitor, polyester 22nF ±20% 400V	Philips	2222 344 54223
C1608	Capacitor polystyrene 2.2nF ± 5% 160V	Philips	2222 425 22202
C1609	Capacitor, polyester 22nF ±20% 400V	Philips	2222 344 54223
C1610	Capacitor, polyester 47nF ±20% 250V	Philips	2222 344 40473
C1611	Capacitor, polyester 47nF ±20% 250V	Philips	2222 344 40473
C1612	Capacitor, polyester 22nF ±20% 400V	Philips	2222 344 54223
C1613	Capacitor, ceramic 12pF ± 5% 400V	Ferroperm	9/0112.9
C1614	Capacitor, ceramic 15pF ± 5% 400V	Ferroperm	9/0112.9
C1615	Capacitor, polystyrene 270pF± 2% 630V	Philips	2222 427 32701
C1616	Capacitor, polystyrene 680pF± 2% 250V	Philips	2222 426 36801
C1617	Capacitor, polyester 22nF ±20% 400V	Philips	2222 344 54223
C1618	Capacitor, ceramic 22pF ±10% 400V	Ferroperm	9/0112.9
C1619	Capacitor, polyester 22nF ±20% 400V	Philips	2222 344 54223
C1620	Capacitor, polystyrene 330pF± 2% 630V	Philips	2222 426 36801
C1621	Capacitor, polystyrene 820pF± 2% 630V	Philips	2222 426 38201
C1622	Capacitor, polystyrene 180pF± 2% 630V	Philips	2222 427 31801
C1623	Capacitor, polystyrene 1.5nF± 2% 160V	Philips	2222 425 31502
C1624	Capacitor, polyester 100nF±20% 100V	Philips	2222 344 24104
C1625	Capacitor, polyester 100nF±20% 100V	Philips	2222 344 24104
C1626	Capacitor, polyester 100nF±20% 100V	Philips	2222 344 24104
C1627	Capacitor, polyester 100nF±20% 100V	Philips	2222 344 24104
C1628	Capacitor, polyester 100nF±20% 100V	Philips	2222 344 24104

MODULE NO: 1600

a MIXER UNIT S1300 3/3

Symbol	*Description*	*Manufact.*	
C1629	Capacitor, polyester 100nF±20% 100V	Philips	2222 344 24104
L1601	Coil	S.P.	TL 264
L1602	Coil	S.P.	TL 265
L1603	Coil	S.P.	TL 254
L1604	Coil	S.P.	TL 255
TR1601	W.B. Trafo	S.P.	TL 266
TR1602	W.B. Trafo	S.P.	TL 256
T1601	Transistor	Philips	BF 199
T1602	Transistor	Philips	BF 494
T1603	Transistor	Philips	BF 494
T1604	Transistor	Philips	BF 494
T1605	Transistor	Philips	BF 199
T1606	Transistor	Philips	BFW 17A
D1601	Diode, silicon	Philips	BAV 21
D1602	Diode, silicon	Philips	BAV 21
FL1601	Crystal filter 10.697 MHz	S.P.	C1012
M1601	Mixer, double balanced	S.P.	C1007

a MAIN CHASSIS S1300 1/1

Symbol	Description		Manufact.	
LA1701	Diode, light emitting		Xciton	XC 5053Y
LA1702	Diode, light emitting		Xciton	XC 5053Y
IC1701	Voltage regulator		National	LM317T
IC1702	Voltage regulator		Motorola	MC7805CT
S1701	Switch		Cherry	E62 10HS PDT
S1702	Switch		C&K	7103 SYZQ
J1701	Socket		Hirschmann	Meb 60 H-DK
J1702	Coax-socket		K.V.Hansen	SO 239
P1701	Plug		Hirschmann	Mes 60 BZ
P1702	Plug		Molex	03-06-2364
MC1701	Microphone cartridge	50 ohm	GNT	AN1-52001
TC1701	Telephone cartridge	200 ohm	Holmco	6890 350A3
R1701	Resistor 33 ohm ± 5%	10W	Danotherm	HS 10
	S1301 only:			
LA1703	Diode, light emitting		Xciton	XC 5053Y
IC1703	Voltage regulator		Motorola	MC 7805CT
S1703	Switch		GEFE	C4.5KST1
S1704	Switch		GEFE	C4.5KST1 (spec.)
S1705	Switch		GEFE	C4.5KST1
S1706	Switch		GEFE	C4.5KST1
S1707	Switch		GEFE	C4.5KST1
S1708	Switch		GEFE	C4.5KST1

a A2H - OSCILLATOR & DELAY UNIT S1300 1/2

Symbol	Description		Manufact.	
R1801	Resistor 1kohm ± 5%	0.33W	Philips	2322 211 12102
R1802	Resistor 100kohm ± 5%	0.33W	Philips	2322 211 12104
R1803	Resistor 39kohm ± 5%	0.33W	Philips	2322 211 12393
R1804	Resistor 4.7kohm ± 5%	0.33W	Philips	2322 211 12472
R1805	Resistor 33kohm ± 5%	0.33W	Philips	2322 211 12333
R1806	Preset pot.meter 1kohm ± 20%	0.5W	Philips	2322 482 20102
R1807	Resistor 1kohm ± 5%	0.33W	Philips	2322 211 12102
R1808	Resistor 2.2kohm ± 5%	0.33W	Philips	2322 211 12222
R1809	Resistor 56kohm ± 5%	0.33W	Philips	2322 211 12563
R1810	Resistor 120kohm ± 5%	0.33W	Philips	2322 211 12124
R1811	Resistor 10kohm ± 5%	0.33W	Philips	2322 211 12103
R1812	Resistor 3.9kohm ± 5%	0.33W	Philips	2322 211 12392
R1813	Resistor 10kohm ± 5%	0.33W	Philips	2322 211 12103
R1814	Resistor 56kohm ± 5%	0.33W	Philips	2322 211 12563
R1815	Resistor 10kohm ± 5%	0.33W	Philips	2322 211 12103
R1816	Resistor 10kohm ± 5%	0.33W	Philips	2322 211 12103
R1817	Resistor 3.9kohm ± 5%	0.33W	Philips	2322 211 12392
R1818	Resistor 56kohm ± 5%	0.33W	Philips	2322 211 12563
R1819	Preset pot.meter 100kohm ±20%	0.5W	Philips	2322 482 20104
R1820	Resistor 56kohm ± 5%	0.33W	Philips	2322 211 12563
R1821	Resistor 3.9kohm ± 5%	0.33W	Philips	2322 211 12392
R1822	Resistor 10kohm ± 5%	0.33W	Philips	2322 211 12103
R1823	Resistor 10kohm ± 5%	0.33W	Philips	2322 211 12103
R1824	Resistor 56kohm ± 5%	0.33W	Philips	2322 211 12563
R1825	Resistor 10kohm ± 5%	0.33W	Philips	2322 211 12103
R1826	Resistor 10kohm ± 5%	0.33W	Philips	2322 211 12103
R1827	Resistor 3.9kohm ± 5%	0.33W	Philips	2322 211 12392
C1801	Capacitor tantalum 10uF-20/+50%	25V	Ero	ETP 3F
C1802	Capacitor tantalum 10uF-20/+50%	25V	Ero	ETP 3F
C1803	Capacitor tantalum 4.7uF-20/+50%	35V	Ero	ETP 2E
C1804	Capacitor polystyrene 56nF ± 1%	63V	Philips	2222 444 45603
C1805	Capacitor tantalum 4.7uF-20/+50%	35V	Ero	ETP 2E
C1806	Capacitor tantalum 4.7uF-20/+50%	35V	Ero	ETP 2E
C1807	Capacitor polyester 100nF ±10%	100V	Philips	2222 344 25104
C1808	Capacitor polyester 10nF ±20%	400V	Philips	2222 344 54103
C1809	Capacitor polyester 220nF ±10%	100V	Philips	2222 344 25224
C1810	Capacitor polyester 10nF ±20%	400V	Philips	2222 344 54103

MODULE NO: 1800

a A2H - OSCILLATOR & DELAY UNIT S1300 2/2

Symbol	*Description*	*Manufact.*	
L1801	Coil	S.P.	TL 267
D1801	Diode, silicon	Philips	BAV 21
D1802	Diode, silicon	Philips	BAV 21
D1803	Diode, silicon	Philips	BAV 21
D1804	Diode, silicon	Philips	BAV 21
D1805	Diode, silicon	Philips	BAV 21
D1806	Diode, silicon	Philips	BAV 21
T1801	Transistor	Philips	BC 548
T1802	Transistor	Philips	BC 548
T1803	Transistor	Philips	BC 548
T1804	Transistor	Philips	BC 548
T1805	Transistor	Philips	BC 558
T1806	Transistor	Philips	BC 548
T1807	Transistor	Philips	BC 548
T1808	Transistor	Philips	BA 548
T1809	Transistor	Philips	BC 558
RE1801	Relay	Siemens	V23100-V4024-A001

a — POWER SWITCH S1301 — 1/1

Symbol	*Description*			*Manufact.*	
R2001	Resistor	33kohm ± 5%	0.33W	Philips	2322 211 13333
R2002	Resistor	10kohm ± 5%	0.33W	Philips	2322 211 13103
R2003	Resistor	3.6kohm ± 5%	0.33W	Philips	2322 211 13362
S2001	Switch			Jeanrenaud	RBP 12 FA.2.5.NCC
S2002	Switch			Jeanrenaud	RBP 12 FA.4.2.NCC

MODULE NO: 2100

a FREQUENCY SELECTOR S1301 1/1

Symbol	Description	Manufact.	
R2101	Resistor 47 ohm ± 5% 4W	Philips	2322 330 22479
R2102	Resistor 10kohm ± 5% 0.33W	Philips	2322 211 13103
R2103	Resistor 10kohm ± 5% 0.33W	Philips	2322 211 13103
R2104	Resistor 4.7kohm ± 5% 0.33W	Philips	2322 211 13472
R2105	Resistor 1kohm ± 5% 0.5W	Philips	2322 212 13102
R2106	Resistor 2.2kohm ± 5% 0.33W	Philips	2322 211 13222
RA2101	Resistor array 8x10 kohm ± 5% 0.125W	ITT	VR8, 10kohm 5%
RA2102	Resistor array 8x10 kohm ± 5% 0.125W	ITT	VR8, 10kohm 5%
RA2103	Resistor array 8x10 kohm ± 5% 0.125W	ITT	VR8, 10kohm 5%
C2101	Capacitor, electrolytic 10uF-10/+100%40V	Siemens	B41313-A7106-V
C2102	Capacitor, polyester 220nF ± 20% 100V	Philips	2222 344 24224
C2103	Capacitor, polyester 100nF ± 20% 100V	Philips	2222 344 24104
C2104	Capacitor, polyester 100nF ± 20% 100V	Philips	2222 344 24104
C2105	Capacitor, polyester 100nF ± 20% 100V	Philips	2222 344 24104
T2101	Transistor	Philips	BC 548
IC2101	Integrated circuit	Motorola	GMM 7643
IC2102	Integrated circuit	Texas	74LS27
IC2103	Integrated circuit	Texas	7407
IC2104	Integrated circuit	Texas	74LS09
IC2105	Integrated circuit	Texas	74LS09
IC2106	Integrated circuit	Texas	74LS09
IC2107	Integrated circuit	Texas	74LS09

SIMPLEX DUPLEX TEST ALARM A3J A3A A3H TUNE ALARM

THE SWITCHES AND RELAYS ARE SHOWN IN RELEASED POSITION

5-0-21413

MODE - SWITCH - UNIT (1000)

POWER SELECT

DIVIDER - UNIT (100)

LOOP 1 FILTER & ±18V SUPPLY - UNIT (200)

FILTER (900)

VCO - UNIT (300)

SSB - GENERATOR (1100)

MICROPHONE AMPLIFIER (1200)

ALARM SIGNAL GENERATOR (1300)

BAND - FILTER (1500)

MIXER-UNIT (1600)

DRIVER - UNIT (1400)

A3H - RELAY

TRANSMIT - RELAY

2182 RELAY

600 kHz ONJOFF RELAY

P1702

LARM

MODE - SWITCH - UNIT (1000)

POWER SELECT

DIVIDER - UNIT (100)

IC 1702 MC 7805 CT

2182 SELECTED

AFTER FREQUENCY SELECTION WAIT UNTIL LAMP GOES OUT. THEN PRESS TUNE BUTTON AND TUNE FOR MAX. AERIAL CURRENT

MOTOR - CONTROL - UNIT (700)

FREQUENCY - SELECT - SWITCH (800)

THE SWITCH IS SHOWN UNPROGRAMED

LOOP 1 FILTER & ±18V SUPPLY - UNIT (200)

VCXO AND LOOP2 FILTER (600)

FILTER (900)

VCO - UNIT (300)

LOOP 1 MIXER (500)

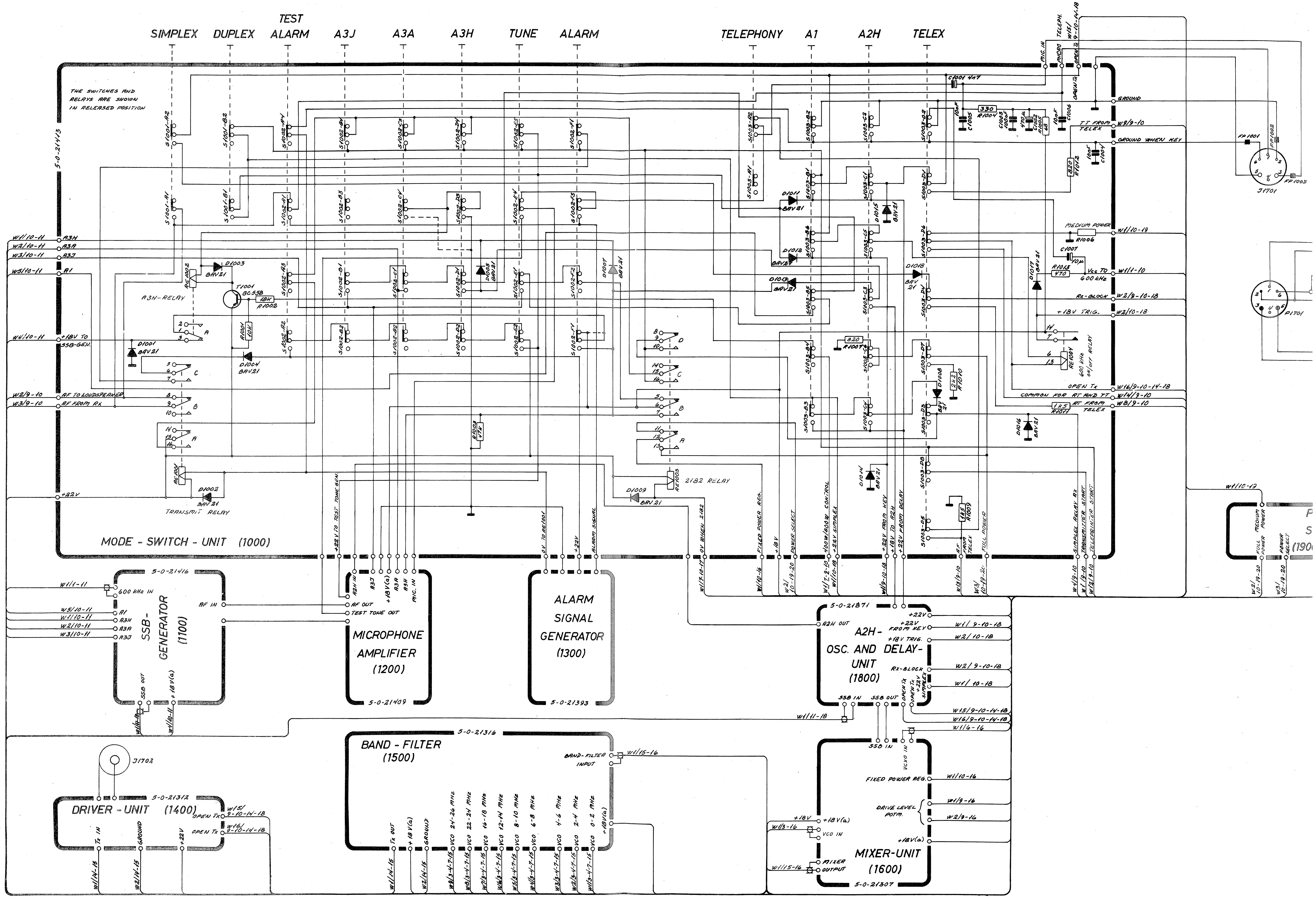
HARMONIC-FILTER (400)

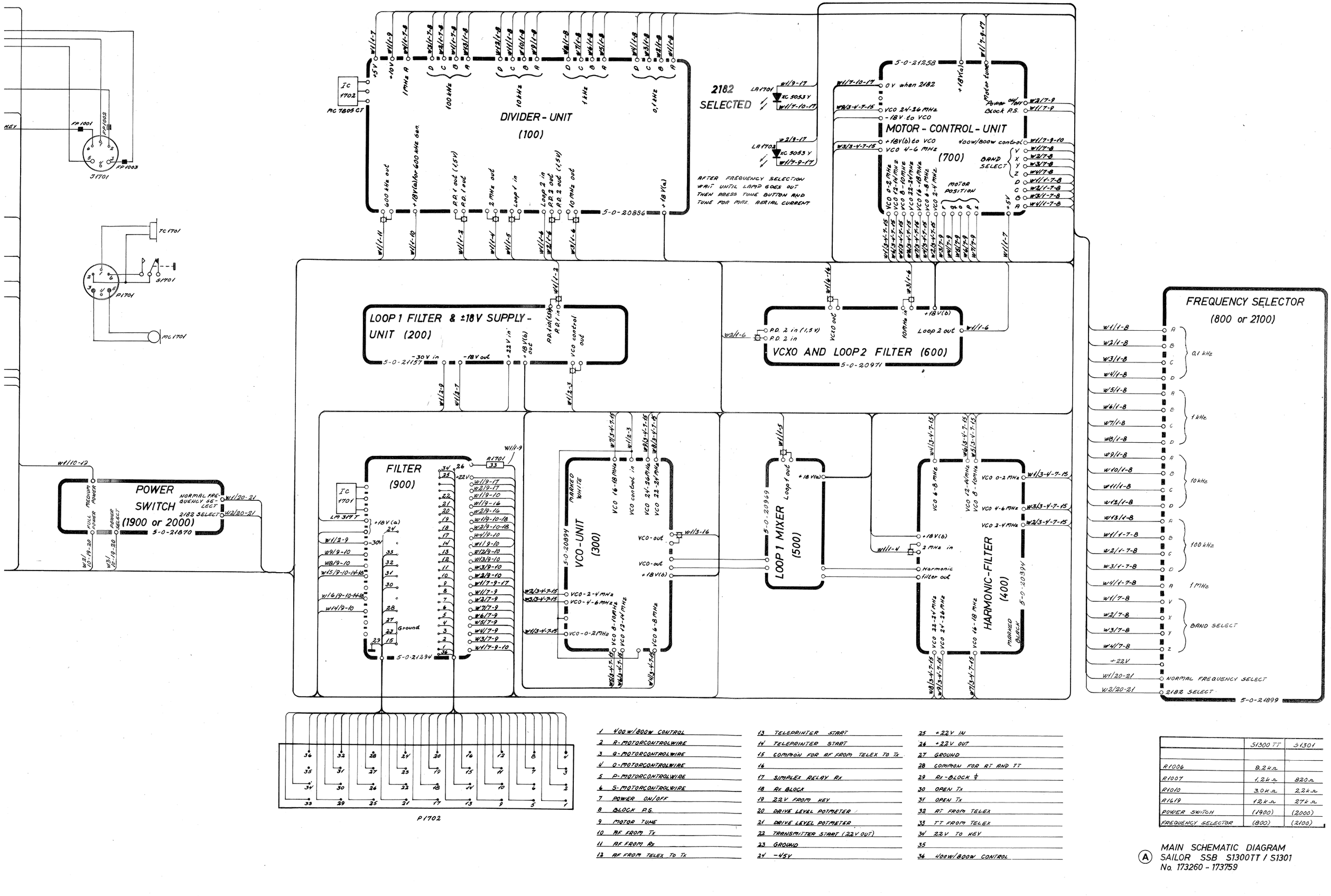
MIXER-UNIT (1600)

P1702

1	400 w/800w CONTROL	13		25	+22V IN
2	P-MOTORCONTROLWIRE	14		26	+22V OUT
3	Q-MOTORCONTROLWIRE	15		27	GROUND
4	O-MOTORCONTROLWIRE	16		28	
5	P-MOTORCONTROLWIRE	17	SIMPLEX RELAY Rx	29	Rx-BLOCK ½
6	S-MOTORCONTROLWIRE	18	Rx BLOCK	30	OPEN Tx ½
7	POWER ON/OFF	19		31	OPEN Tx
8	BLOCK P.S.	20	DRIVE LEVEL POTMETER	32	
9	MOTOR TUNE	21	DRIVE LEVEL POTMETER	33	
10	RF FROM Tx	22	TRANSMITTER START (22V OUT)	34	
11	RF FROM Rx	23	GROUND	35	
12		24	-45V	36	400w/800w CONTROL

(B) MAIN SCHEMATIC DIAGRAM
SAILOR SSB S1300


SIMPLEX
DUPLEX
TEST ALARM
A3J
A3A
A3H
TUNE
ALARM
TELEPHONY
A1
A2H
TELEX
THE SWITCHES AND RELAYS ARE SHOWN IN RELEASED POSITION
5-0-21413
A3H-RELAY
TRANSMIT RELAY
2182 RELAY
600 kHz ON/OFF RELAY
MODE - SWITCH - UNIT (1000)
+18V TO SSB-GEN.
AF TO LOUDSPEAKER
AF FROM RX
+22V
MIC. IN
MICRO
OPEN TX
TELEPH.
W15/9-10-14-18
GROUND
TT FROM TELEX
GROUND WHEN KEY
MEDIUM POWER
VCC TO 600 kHz
RX-BLOCK
+18V TRIG.
OPEN TX
COMMON FOR RT AND TT
RT FROM TELEX
J1701
P1701
J1702
+22V TO TEST TONE GEN.
0V TO RE1001
ALARM SIGNAL
0V WHEN 2182
FIXED POWER REG.
POWER SELECT
400W/800W CONTROL
+22V SIMPLEX
+22V FROM KEY
+18V TO A2H
+22V FROM DELAY
AF FROM TELEX
FULL POWER
SIMPLEX RELAY RX
TRANSMITTER START
TELEPRINTER START
SSB-GENERATOR (1100)
5-0-21416
600 kHz IN
AF IN
SSB OUT
MICROPHONE AMPLIFIER (1200)
5-0-21409
AF OUT
TEST TONE OUT
ALARM SIGNAL GENERATOR (1300)
5-0-21393
A2H-OSC. AND DELAY-UNIT (1800)
5-0-21871
A2H OUT
SSB IN
DRIVER-UNIT (1400)
5-0-21312
TX IN
BAND-FILTER (1500)
5-0-21316
BAND-FILTER INPUT
TX OUT
VCO 24-26 MHz
VCO 22-24 MHz
VCO 16-18 MHz
VCO 12-14 MHz
VCO 8-10 MHz
VCO 6-8 MHz
VCO 4-6 MHz
VCO 2-4 MHz
VCO 0-2 MHz
MIXER-UNIT (1600)
5-0-21307
VCXO IN
VCO IN
FIXED POWER REG.
DRIVE LEVEL POTM.
MIXER OUTPUT
MEDIUM POWER
FULL POWER
POWER SELECT
(1900)



1	400 w/800w CONTROL
2	R-MOTORCONTROLWIRE
3	G-MOTORCONTROLWIRE
4	Q-MOTORCONTROLWIRE
5	P-MOTORCONTROLWIRE
6	S-MOTORCONTROLWIRE
7	POWER ON/OFF
8	BLOCK P.S.
9	MOTOR TUNE
10	RF FROM Tx
11	RF FROM Rx
12	RF FROM TELEX TO Tx
13	TELEPRINTER START
14	TELEPRINTER START
15	COMMON FOR RF FROM TELEX TO Tx
16	
17	SIMPLEX RELAY Rx
18	Rx BLOCK
19	22 V FROM KEY
20	DRIVE LEVEL POTMETER
21	DRIVE LEVEL POTMETER
22	TRANSMITTER START (22 V OUT)
23	GROUND
24	-45 V
25	+22 V IN
26	+22 V OUT
27	GROUND
28	COMMON FOR RT AND TT
29	Rx-BLOCK ÷
30	OPEN Tx
31	OPEN Tx
32	RT FROM TELEX
33	TT FROM TELEX
34	22 V TO KEY
35	
36	400W/800W CONTROL

	S1300 TT	S1301
R1006	8,2 k Ω	
R1007	1,2 k Ω	820 Ω
R1010	3,0 k Ω	2,2 k Ω
R1619	12 k Ω	27 k Ω
POWER SWITCH	(1900)	(2000)
FREQUENCY SELECTOR	(800)	(2100)

Ⓐ MAIN SCHEMATIC DIAGRAM
SAILOR SSB S1300TT / S1301
No. 173260 - 173759