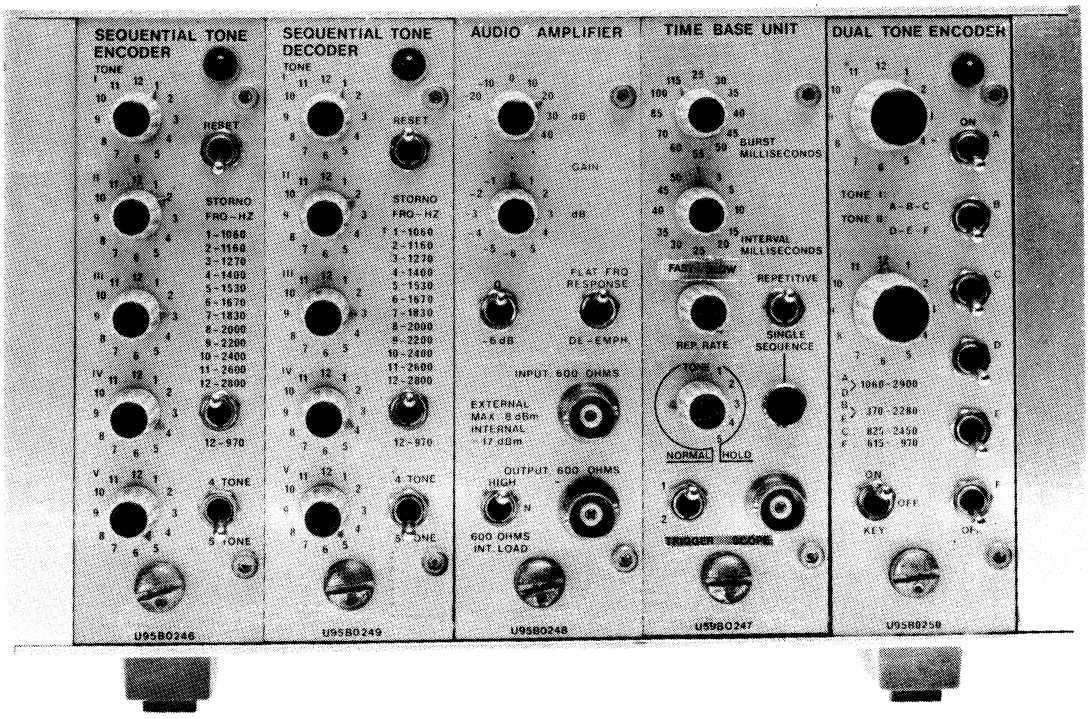
TONE SIGNALING

TEST GENERATOR

TS-G13

U95B0251



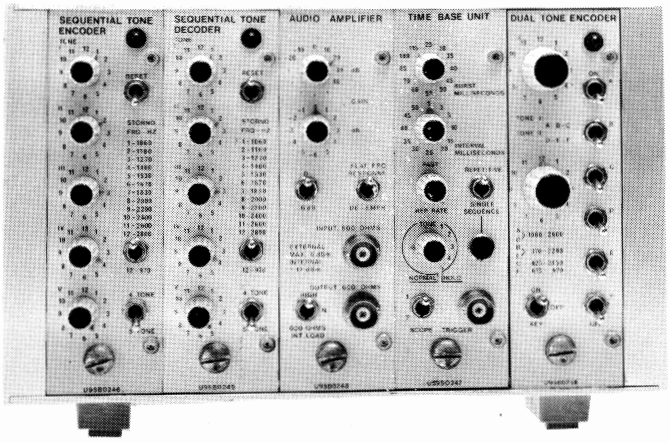
Storno

CONTENTS

Storno

TONE SIGNALING TEST GENERATOR

TS - G13



ABOUT STORNO'S G13 TONE SIGNALING TEST GENERATOR

The G13 Test Generator consists of a mainframe with an independent power supply operating from a 220 or 240 V, 50 Hz mains and a loudspeaker for aural monitoring of tones as they are processed by the G13. A back-panel switch, next to the speaker grille, turns the speaker on and off.

The standard version of the G13 Test Generator includes five plug-in modules :

U95B0246	Sequential Tone Encoder
U95B0247	Time Base Unit
U95B0248	Audio Amplifier
U95B0249	Sequential Tone Decoder
U95B0250	Dual Tone Encoder

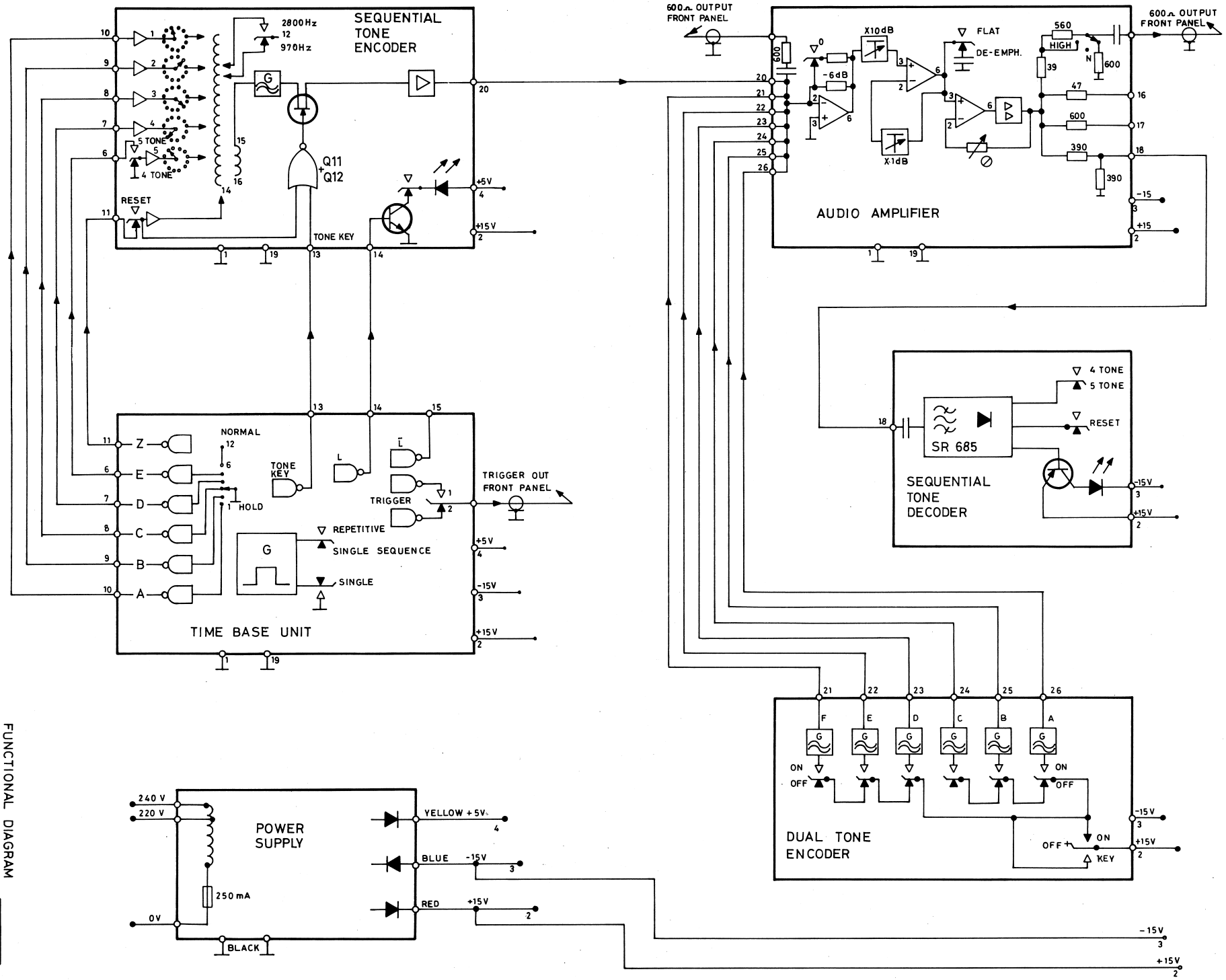
You need only this one special-purpose instrument in addition to the usual test instruments that you already have on your shop bench and you are adequately equipped to make any performance check on all Stornophone 600, 700 and 800 standard tone equipment. More important, you will be sure of what you are measuring, precise levels and accurate, stable frequencies instantly selected by the setting of a switch – none of the uncertainty which so often results in costly, annoying call-backs.

To test tone receivers using CCIR tones, as is the case with many mobile units operating over public carrier systems, all you need to do is slide any unused module out of the mainframe and in its place plug in a U95B0284 CCIR Sequential Tone Encoder.

Another feature of the G13 is its versatility. Any plug-in can be inserted in any of the five connector positions. This means that for service organisations having other, special requirements the G13 mainframe can be outfitted with any combination of modules desired.

Several instruments can be grouped together in a rack system, as it is possible to order a modified version of the G13 mainframe that fits right into a standard 19" rack. This will easily double the capacity of each mainframe; each plug-in takes up only 1 1/2" of rack width (front panel height is 5").

Talk with Storno's service advisers or with our instrument laboratory to determine just how Storno's programme of specially-developed instruments, many of which cannot economically be substituted by other commercially available equipment, can enhance the reliability of your service facility.



FUNCTIONAL DIAGRAM
TS-G13 U95B 0251

D401.936

Storno

TONE SIGNALING TEST GENERATOR
TS - G13

GENERAL DESCRIPTION

Purpose

Tone signaling systems for selective calling and identification call for specialized test equipment that is not generally available. Now Storno has combined the most necessary test equipment in a handy unit designed for servicing and repair work on tone systems.

Range

The unit will test

Dual (and single) tone burst decoders
Sequential tone burst encoders
Sequential tone burst decoders

For technical details, see specifications.

General

The Tone Signaling Test Generator is housed in a light-weight, half rack-width aluminium cabinet fitted with a tilt up stand. The self-contained power supply is mounted on the rear panel, the fixed line cord protruding through this. The cabinet front opening accepts five plug-in units (any plug-in fits into any position).

Functional Units

1. SEQUENTIAL TONE BURST ENCODER (S/N U95B0246)

Any 4- or 5-tone code using the Storno tone system frequencies (CCIR also available; CCIR unit: S/NU95B0284) can be set up with five front panel 12-position switches. The encoder's oscillator is controlled by the Time Base Unit and the audio is available at the output connector of the Audio Amplifier. With 4-tone systems (toggle switch to 4-tone pos.) only tones no. 1 to 4 are operable. Two different frequencies can be selected as tone no. 12.

2. TIME BASE UNIT (S/N U95Bo247)

This basic plug-in unit controls timing and general operation of the Sequential Tone Encoder. Separate panel controls for tone burst duration and interval between bursts allow precise timing for checking the critical integrating and resetting time constants of the sequential tone decoder under test. Single or repetitive burst trains are available with front panel control of repetition rates. A trigger pulse for an oscilloscope is available at a front panel connector. The operator may choose between two different time delays for start of burst train after triggering.

For static tests any of the five pre-programmed tones of the Sequential Encoder can be selected by turning the NORMAL - HOLD switch to a HOLD tone no. position.

3. AUDIO AMPLIFIER (S/N U95B0248)

This basic plug-in unit has input and output connectors for the audio signals on the front panel. Internally generated signals go to a summing amplifier, which also connects to the external input through a 600 ohm resistor. Thus internally and externally generated signals can be mixed without interaction. Note, that all plug-in decoders are permanently connected internally to the amplifier output in such a way that external loads will not disturb the signal level at this point.
Gain controls with steps of 10 dB and 1 dB allow a wide range of input and output levels to be used. A toggle switch normally set to 0 dB reduces gain by 6.0 dB for checking of sensitivity margin of decoders.

Another switch selects either flat frequency response or standard de-emphasis, i.e. a simple low-pass RC filter with f_c = 1 kHz and a slope of 6 dB per octave, ultimately.

Storno

Max. undistorted output is +20 dBm (20 V_{pp}), obtained with the output switch in "HIGH", where the internal impedance is 40 ohms. With the output switch in the medium position, N, max. output is 20 V pp behind 600 ohms, corresponding to +10 dBm relative to 600 Ω. The bottom position connects an internal load resistor of 600 ohms across the output (used when testing decoders with high impedances).

Input impedance is 600 ohms and max. input level is +8 dBm.

4. SEQUENTIAL TONE BURST DECODER (S/N U 95 B0249)

This unit accepts 4 or 5-tone sequential tone burst codes according to the Storno or CCIR System. The panel controls are the same as on the corresponding Encoder. When a signal of correct coding and acceptable level is applied a red light on the front panel will go on. The decoder is reset automatically after approx. 1 second or 10 seconds, as selected by front panel control.

The encoder has a built-in pre-emphasis network corresponding to the one described under "audio amplifier". The nominal sensitivity (minimum triggering level) is +3 dBm with a safety margin of 6 dB.

The decoder uses a slightly modified Storno subunit (SR685).

5. DUAL TONE ENCODER (S/N U 95B0250)

This unit uses six oscillators arranged in two groups. One out of up to twelve frequencies can be selected by a front panel switch for each group. Oscillators, A, B, C, belonging to the upper selector switch and D, E, F, belonging to the lower switch, are activated by a bank of toggle switches. Only two oscillators can be on at the same time. Manual keying is used and output is indicated by the red panel light.

Note!
Output level from each oscillator to the audio amplifier input is -17 dBm. To obtain correct level for a dual tone signal the gain must be reduced 6 dB.

Frequencies no. 1 to 12:

A - 1060, 1160, 1270, 1400, 1530, 1670, 1830, 2000, 2200, 2400, 2600, 2900 Hz (Storno Standard);

B - 370, 450, 550, 675, 825, 1010, 1240, 1520, 1860, 2280 Hz;

C - 825, 1010, 1240, 1435, 1520, 1750, 1860, 1980, 2000, 2135, 2280, 2450 Hz;

D - same as A (Storno Standard);

E - same as B;

F - 615, 675, 735, 805, 885, 970 Hz (Storno Extended).

Note!
The sequential burst frequencies are the same as A, except for tone no. 12 which may be 2800 or 970 Hz.

TONE SIGNALING TEST GENERATOR

TS-G13

SPECIFICATIONS

TIME BASE UNIT U95B0247

Pulse Sequence Timing

(variable in 12 steps)

Tone Bursts	Intervals
25 ms	1 ms
30 ms	3 ms
35 ms	5 ms
40 ms	10 ms
45 ms	15 ms
50 ms	20 ms
55 ms	25 ms
60 ms	30 ms
70 ms	35 ms
85 ms	40 ms
100 ms	45 ms
115 ms	50 ms

Pulse Trains Available

(single mode or repetitive mode)

Single sequences: triggered manually from a front panel push button.

Repetitive sequences: repetition rate variable between 400 ms and 2 s by means of a front panel control.

POWER SUPPLY UNIT U95B0245

Line Voltage

220 V or 240 V	+10% / –20%

Output Voltages

+15 V ± 0.5 V	280 mA max.
–15 V ± 0.5 V	280 mA max.
+ 5 V ± 0.25 V	400 mA max.

DUAL TONE ENCODER U95B0250

Oscillator Frequencies (in Hz)

A, D	B, E	C	F
1060	370	825	615
1160	450	1010	675
1270	550	1240	735
1400	675	1435	805
1530	825	1520	885
1670	1010	1750	970
1830	1240	1860	
2000	1520	1980	
2200	1860	2000	
2400	2280	2135	
2600		2280	
2900		2450	

Frequency Accuracy

With Tone 1 adjusted to <0.5% accuracy, all tones will be accurate to 1%.

Output level

–17 dBm

Distortion

< 3%

Storno

SEQUENTIAL TONE DECODER U95B0249

Tone Frequencies

Storno Std.

970 Hz
1060 Hz
1160 Hz
1270 Hz
1400 Hz
1530 Hz
1670 Hz
1830 Hz
2000 Hz
2200 Hz
2400 Hz
2600 Hz
2800 Hz

Frequency Stability

Better than ± 1%

AUDIO AMPLIFIER U95B0248

Attenuation

Coarse: –20 dBm to +40 dBm
in 7 steps of 10 dBm each

Fine: –6 dBm to +5 dBm
in 12 steps of 1 dBm each

Plus one step of –6 dBm for testing marginal sensitivity values.

Input

Ext. input impedance: 600 Ω ± 1%
Int. input impedance: app. 0 Ω
Ext. input sensitivity: max. +8 dBm
Int. input sensitivity: max. –17 dBm

Output

Ext. output impedance: 600 Ω ± 1%
Int. output impedance at pin 18: 390 Ω ± 1%
Int. output impedance at pin 17: 600 Ω ± 1%
Int. output impedance at pin 16: 47 Ω ± 5%

Frequency Response

Choice of flat response or
6 dBm / octave (f_c = 1000 Hz)

SEQUENTIAL TONE ENCODER U95B0246

Tone Sequence Signal

4 or 5 tone sequences (tone duration and interval determined by signals from Time Base Unit)

Tone Frequencies

Storno Std.

970 Hz
1060 Hz
1160 Hz
1270 Hz
1400 Hz
1530 Hz
1670 Hz
1830 Hz
2000 Hz
2200 Hz
2400 Hz
2600 Hz
2800 Hz

Frequency Stability

Better than 1%

SEQUENTIAL TONE ENCODER U95B0284

Tone Sequence Signal

4 or 5 tone sequences

Tone Frequencies

CCIR

1124 Hz
1197 Hz
1275 Hz
1358 Hz
1446 Hz
1540 Hz
1640 Hz
1747 Hz
1860 Hz
1981 Hz
2110 Hz

Frequency Stability

Better than 1%

TONE SIGNALING TEST GENERATOR
TS-G13

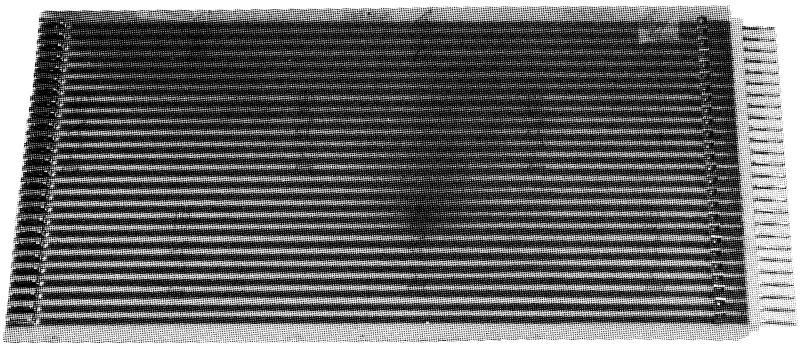
SERVICE NOTES

SERVICE BOARD U95B0378

In order to service individual plug-in units properly, some means of operating the modules outside of the mainframe is necessary.

The Service Board, S/N U95B0378, is one good way of accomplishing this. The Service Board plugs into the mainframe in place of the module to be tested, and the module can then be plugged into the protruding end of the Service Board.

In addition, solder lugs on the PCB allow an extension cable and connector to be fitted where more flexibility is desired.



POWER SUPPLY UNIT U95B0245

The design of the power supply with its three supply lines (+15V , –15V , and +5V) was kept simple by utilizing three integrated 5-volt regulators, LM309K. Each regulator is rated for an available output current in excess of 1 A and incorporates current limiting features to keep the output current within a safe value and automatic thermal shutdown to prevent overheating.

LM309K comes in a TO-3 package, the case is the negative lead (normally ground). To regulate the +15V supply the case should be at approximately +10V, and for the –15V supply the case would be at –5V potential, as measured from the system ground.

R_{adj} , two resistors of about 3.3 kΩ value each, parallel R_2 and R_4 and are used to adjust for correct output voltages on the +15V and –15V lines, respectively.

AUDIO AMPLIFIER U95B0248

Input buses 20, 21, 22, 23, 24, 25, and 26 are all tied together and brought to the input of the first Operational Amplifier, IC1. There is no interference or cross talk between the various input loads as they all look into a virtual short circuit at the Op Amp inverting input.

Notice that any input signal at this point will consist of a current applied to approx. zero impedance. Therefore, no observable voltage can be expected at the input of the Op. Amp.

With the frequency response switch, SW4, set for FLAT FREQ. RESPONSE the gain of the Audio Amplifier will be the sum of the settings of SW1, SW2, and SW3. For instance:

with S1 set at 0
and S2 set at –10
and S3 set at +3
Amplifier gain = –7 dB

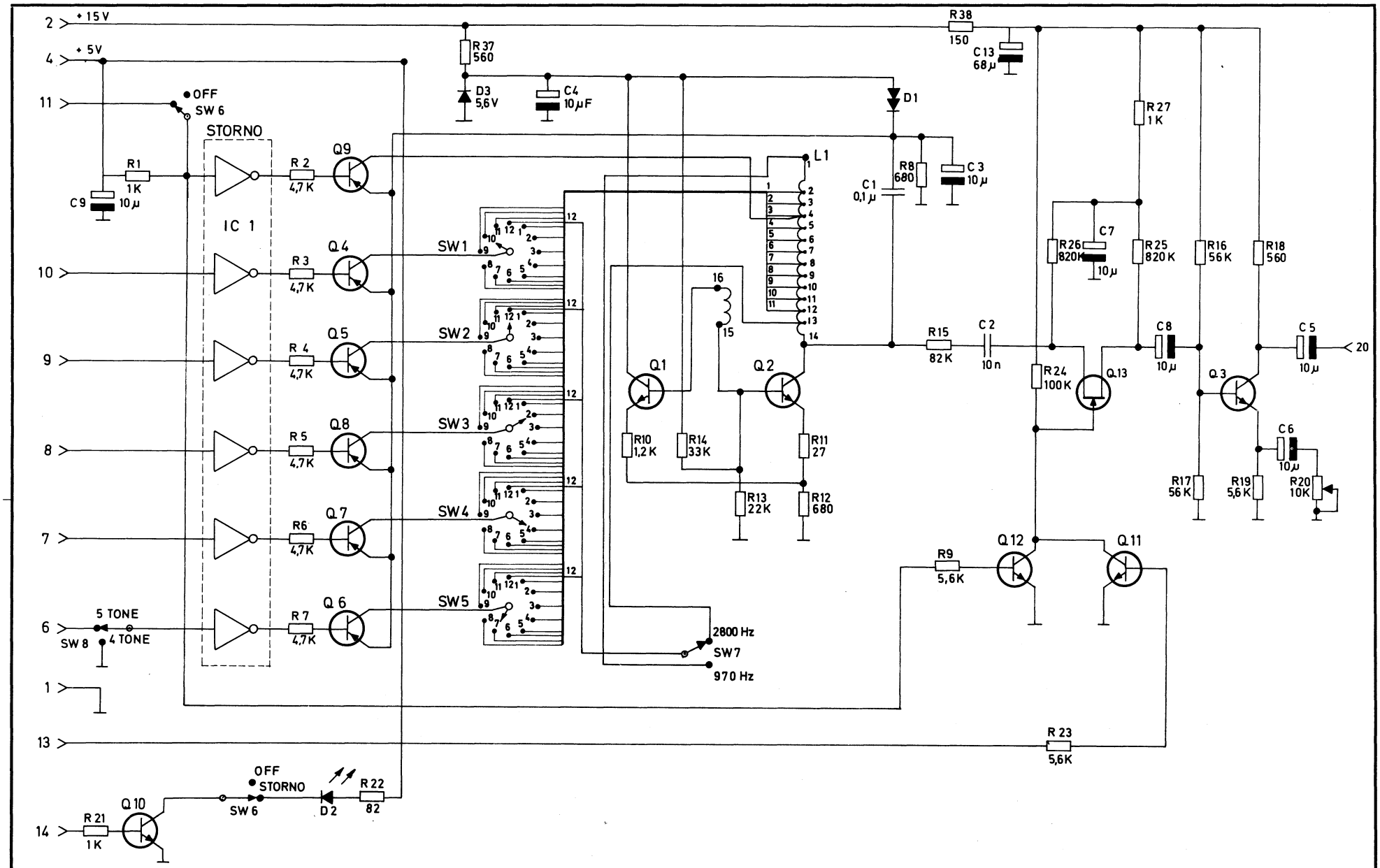
TESTING THE AUDIO AMPLIFIER:

TEST FOR	SET PANEL CONTROLS	CORRECT RESULT	TEST POINT	CORRECTION
DC OFFSET no input signal	SW2 one position counter-clockwise from the –20 dBm position (input grounded)	0 V ± 0.1 V	BUS 16	Adjust with R14
GAIN test signal 110 mV rms, 1000 Hz to INPUT connector	SW1, 2, 3 to 0 dBm SW4 to FLAT FRQ. RESPONSE SW5 to 600 OHMS INT. LOAD	110 mV rms (–17 dBm)	OUTPUT 600 OHM connector	Adjust with R48
DE-EMPHASIS slope f_c = 1000 Hz input signal 110 mV rms, 1000 Hz	SW1, 2, 3 to 0 dBm SW5 to 600 OHMS INT. LOAD SW4 to DE-EMPH. position	Output amplitude should remain unchanged at 110 mV rms (–17 dBm)	OUTPUT 600 OHM connector	Poor test result indicates that C4 (47 nF 2%) is faulty
DISTORTION input signal 110 mV rms, 1000 Hz	SW4 in either position SW5 to HIGH Adjust SW1, 2, 3 to increase output signal until clipping occurs (should be symmetric). Then back down to obtain the greatest, undistorted amplitude possible.	20 V pp undistorted output signal (observe with oscilloscope)	OUTPUT 600 OHM connector	Poor test result indicates faulty transistors Q1 / Q2

TIME BASE UNIT ADJUSTMENTS			
Function	Control Set-up	Adjust	Requirement
Tone Burst Duration Time	SW6 to 100 ms SW6 to 25 ms	P1 P3	Clock HIGH for 100 ms Clock HIGH for 25 ms
Repeat above adjustments until settings of both P1 and P3 are accurate.			
Tone Burst Interval Time	SW5 to 50 ms SW5 to 1 ms	P4 P2	Clock LOW for 50 ms Clock LOW for 1 ms
Repeat above adjustments until settings of both P2 and P4 are accurate.			
Repetition Rate	P5 (front panel) fully counterclockwise fully clockwise	P5	 400 ms ± 100 ms between pulse trains 2 s ± 500 ms between pulse trains
If REP. RATE is out of tolerance check values of C7 and C8 (68 µF 20%).			

ADJUSTING DUAL TONE ENCODER OUTPUT LEVELS			
NOTE: For proper results, the Audio Amplifier must be accurately adjusted.			
TEST SET-UP		ADJUSTMENT	REQUIREMENT
Audio Amplifier	Dual Tone Encoder		Audio Amplifier Output
For all tests	Switch ON one at a time	If necessary, adj. pot.	Measure w/AC Voltmeter
SW2 to +20 dBm	A	T1	0 dBm (774.6 mV rms)
SW3 to – 3 dBm	B	T2	
SW1 to 0 dBm	C	T3	
SW4 to FLAT	D	T4	
SW5 to 600 OHM	E	T5	
INT. LOAD	F	T6	

ADJUSTING THE SEQUENTIAL TONE ENCODER					
NOTE: For proper results, the Audio Amplifier must be accurately adjusted.					
PLUG-IN UNIT	Set Controls for:			Requirement	Adjustment
Time Base Unit	SW7 to HOLD 1			Make all measurements w/AC Voltmeter at Audio Amplifier Output Connector	Once set, controls on Time Base Unit and Audio Amplifier remain untouched throughout following tests
Audio Amplifier	SW2 to +20 dBm SW3 to – 3 dBm SW1 to 0 dBm SW4 to FLAT SW5 to 600 OHM INT. LOAD				
Sequential Tone Encoder U95B0246 (Storno Std.)		a.	SW1 to 1400 Hz	0 dBm	If necessary, adjust R20
		b.	SW1 to pos. 12 SW7 to 12=970 Hz	0 dBm ± 0.3 dBm	Tolerance check
		c.	SW1 to pos. 12 SW7 to 12=2800Hz		
Sequential Tone Encoder U95B0284 (CCIR)		a.	SW8 to FLAT SW1 to 1540 Hz	0 dBm	If necessary, adjust R20
		b.	SW8 to PRE-EMPH. SW1 to 1540 Hz	Output should remain unchanged at 0 dBm	Pre-emphasis slope test. Adjustable with R35 (check tolerance of C12)
		c.	SW8 to FLAT SW1 to 1124 Hz	0 dBm ± 0.3 dBm	Tolerance check
		d.	SW8 to FLAT SW1 to 2110 Hz		



f e d c b a	Ny tegning ændring	PHB sign.	23/1-94 dato	materiale dim. råvægt gr./stk.	overflade:	tegn. til orientering værktøj A prøveserie P produktion	sign. dato	Storno	konstr. 23.1.94 PHB godk.	Tilhører:

DIAGRAM
SEQUENTIAL TONE ENCODER
U95B0246

Tegn. nr. 506.418 A3

Storno

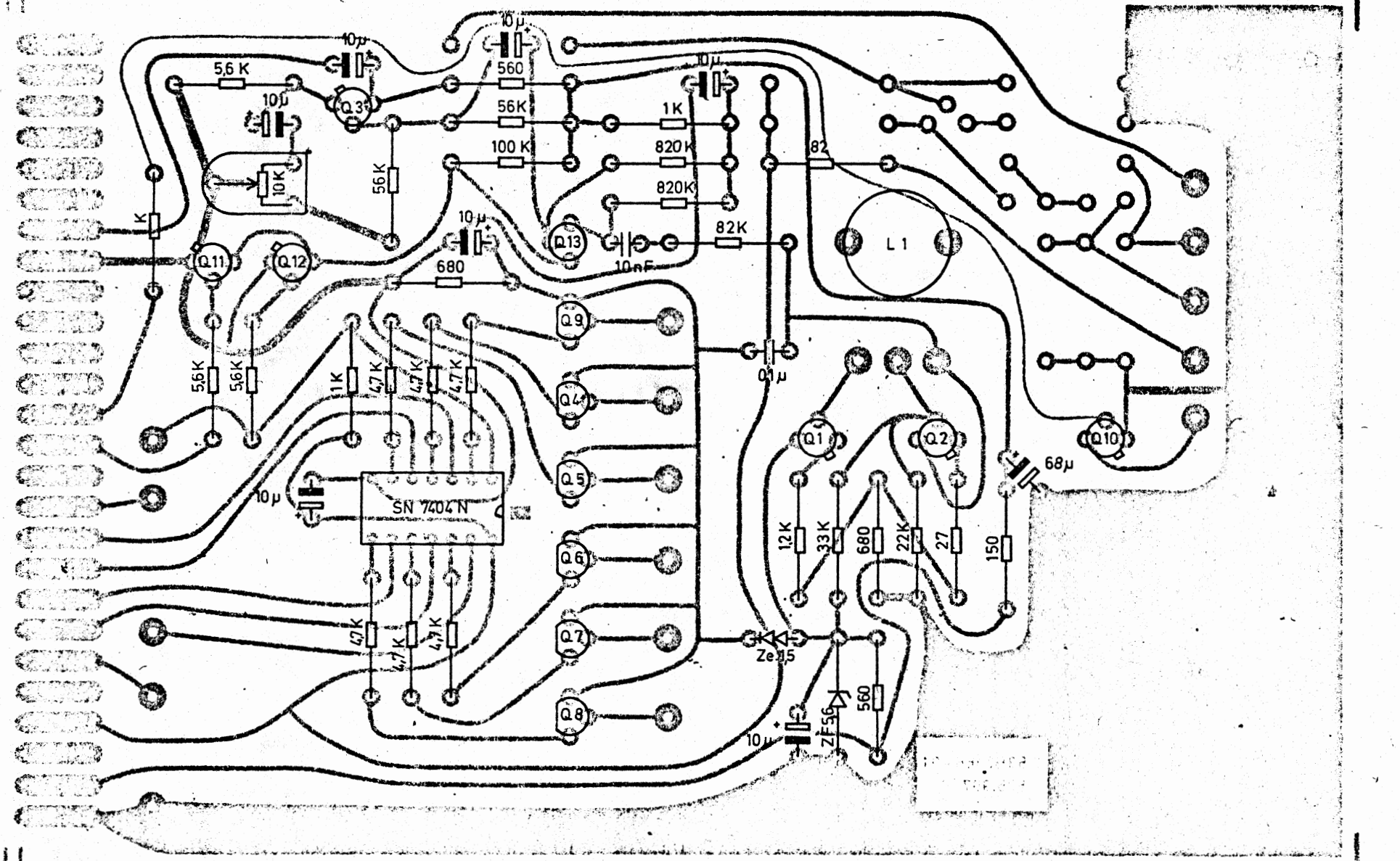
TYPE	NO.	CODE	DATA
	R 1	80.5249	Resistor carbon film 1 kΩ 5% 1/8W
	R 2-7	80.5257	Resistor carbon film 4.7 kΩ 5% 1/8W
	R 8	80.5247	Resistor carbon film 680 Ω 5% 1/8W
	R 9	80.5258	Resistor carbon film 5.6 kΩ 5% 1/8W
	R 10	80.5250	Resistor carbon film 1.2 kΩ 5% 1/8W
	R 11	80.5230	Resistor carbon film 27 Ω 5% 1/8W
	R 12	80.5247	Resistor carbon film 680 Ω 5% 1/8W
	R 13	80.5265	Resistor carbon film 22 kΩ 5% 1/8W
	R 14	80.5267	Resistor carbon film 33 kΩ 5% 1/8W
	R 15	80.5272	Resistor carbon film 82 kΩ 5% 1/8W
	R 16	80.5270	Resistor carbon film 56 kΩ 5% 1/8W
	R 17	80.5270	Resistor carbon film 56 kΩ 5% 1/8W
	R 18	80.5246	Resistor carbon film 560 Ω 5% 1/8W
	R 19	80.5258	Resistor carbon film 5.6 kΩ 5% 1/8W
	R 20	86B5042	Trimmer potentiometer 10 kΩ
	R 21	80.5249	Resistor carbon film 1 kΩ 5% 1/8W
	R 22	80.5236	Resistor carbon film 82 Ω 5% 1/8W
	R 23	80.5258	Resistor carbon film 5.6 kΩ 5% 1/8W
	R 24	80.5273	Resistor carbon film 100 kΩ 5% 1/8W
	R 25	80.5284	Resistor carbon film 820 kΩ 5% 1/8W
	R 26	80.5284	Resistor carbon film 820 kΩ 5% 1/8W
	R 27	80.5249	Resistor carbon film 1 kΩ 5% 1/8W
	R 37	80.5446	Resistor carbon film 560 Ω 5% 1/4W
	R 38	80.5239	Resistor carbon film 150 Ω 5% 1/8W
	C 1	76.5068	Capacitor polystyr 0.1 µF 1%
	C 2	76.5070	Capacitor polystyr 10 nF
	C3-10	73.5109	Capacitor tantal 10 µF 16 V
	C 13		Capacitor tantal 68 µF
	L 1	61.1140	Tone Coil, Storno frequencies Brun Grön Gul Svart
	Q1-3	99.5121	Transistor BC107
	Q4-9	99.5144	Transistor BC214L
	Q10-12	99.5121	Transistor BC107
	Q 13	99.5204	Transistor 2N4303
	D 1	99.5209	Stab. diode ZE 1.5
	D 2	99.5009	LED diode HP 5082-4440
	D 3	99.5114	Zener diode 5.6 V
	IC 1	14B5022	SN7404N Integrated circuit

TYPE	NO.	CODE	DATA
	SW 1 to SW 5	47.5047	Rotary Switch ELMA
		49.5027	Knob for switch
		49.5028	Cap Insert for knob
		49.5029	Pointer for knob
	SW 6	47B5031	Toggle Switch
	SW7, 8	47B5028	Toggle Switch
		41B5026	Receptacles (AMP)
		37B0011	Module Locking Cam
		20B5031	Screw for above
		24B5001	Washer for above
		28B5003	Retaining Pin for above

SEQUENTIAL TONE ENCODER U95B0246

X401.898

FS-G13

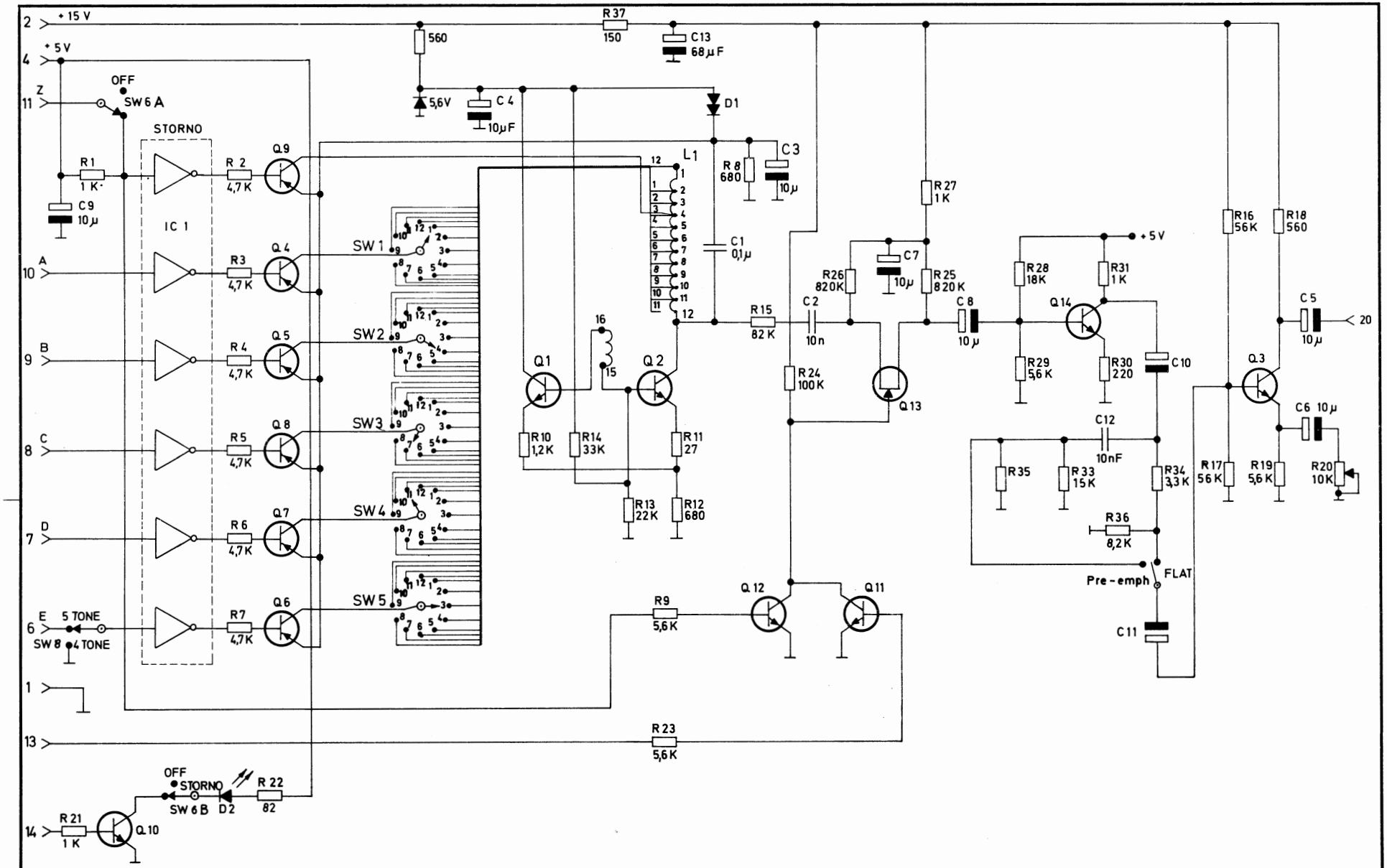


SEQUENTIAL TONE ENCODER U95B0246

53B0366-01

Dato. 4.1.74. PHB.

KOMPONENTPLACERING, 505.997 / 3



f				materiale	overflade:	tegn. til	sign. dato	Storno	konstr. 16.1.84 PHB	Tilhører:	DIAGRAM SEQUENTIAL TONE ENCODER CCIR U95B0284 - 00
e						orientering			godk. B.J.		
d						værktøj					
c						A prøveserie					
b						P produktion					
a				dim.							
	ændring	sign.	dato	råvægt gr./stk.							Tegn. nr. 507.179 A 3

TYPE	NO.	CODE	DATA
	C1	76.5068	0.1 µF 1% polystyr
	C2	76.5070	10 nF polystyr
	C3-11	73.5109	10 µF tantal 16V
	C12	76.5070	10 nF polystyr
	C13	73.5106	68 µF tantal
	R1	80.5249	1 kΩ 5% carbon film 1/8W
	R2-7	80.5257	4.7 kΩ 5% carbon film 1/8W
	R8	80.5247	680 Ω 5% carbon film 1/8W
	R9	80.5258	5.6 kΩ 5% carbon film 1/8W
	R10	80.5250	1.2 kΩ 5% carbon film 1/8W
	R11	80.5230	27 Ω 5% carbon film 1/8W
	R12	80.5247	680 Ω 5% carbon film 1/8W
	R13	80.5265	22 kΩ 5% carbon film 1/8W
	R14	80.5267	33 kΩ 5% carbon film 1/8W
	R15	80.5272	82 kΩ 5% carbon film 1/8W
	R16-17	80.5270	56 kΩ 5% carbon film 1/8W
	R18	80.5246	560 Ω 5% carbon film 1/8W
	R19	80.5258	5.6 kΩ 5% carbon film 1/8W
	R20	86B5042	10 kΩ Trimmer potentiometer
	R21	80.5249	1 kΩ 5% carbon film 1/8W
	R22	80.5236	82 Ω 5% carbon film 1/8W
	R23	80.5258	5.6 kΩ 5% carbon film 1/8W
	R24	80.5273	100 kΩ 5% carbon film 1/8W
	R25-26	80.5284	820 kΩ 5% carbon film 1/8W
	R27	80.5249	1 kΩ 5% carbon film 1/8W
	R28	80.5264	18 kΩ 5% carbon film 1/8W
	R29	80.5258	5.6 kΩ 5% carbon film 1/8W
	R30	80.5241	220 Ω 5% carbon film 1/8W
	R31	80.5249	1 kΩ 5% carbon film 1/8W
	R33	80.5263	15 kΩ 5% carbon film 1/8W
	R34	80.5255	3.3 kΩ 5% carbon film 1/8W
	R36	80.5260	8.2 kΩ 5% carbon film 1/8W
	R37	80.5239	150 Ω 5% carbon film 1/8W
	R38	80.5446	560 Ω 5% carbon film 1/4W
	L1	61.1097	Tone Coil, CCIR frequencies

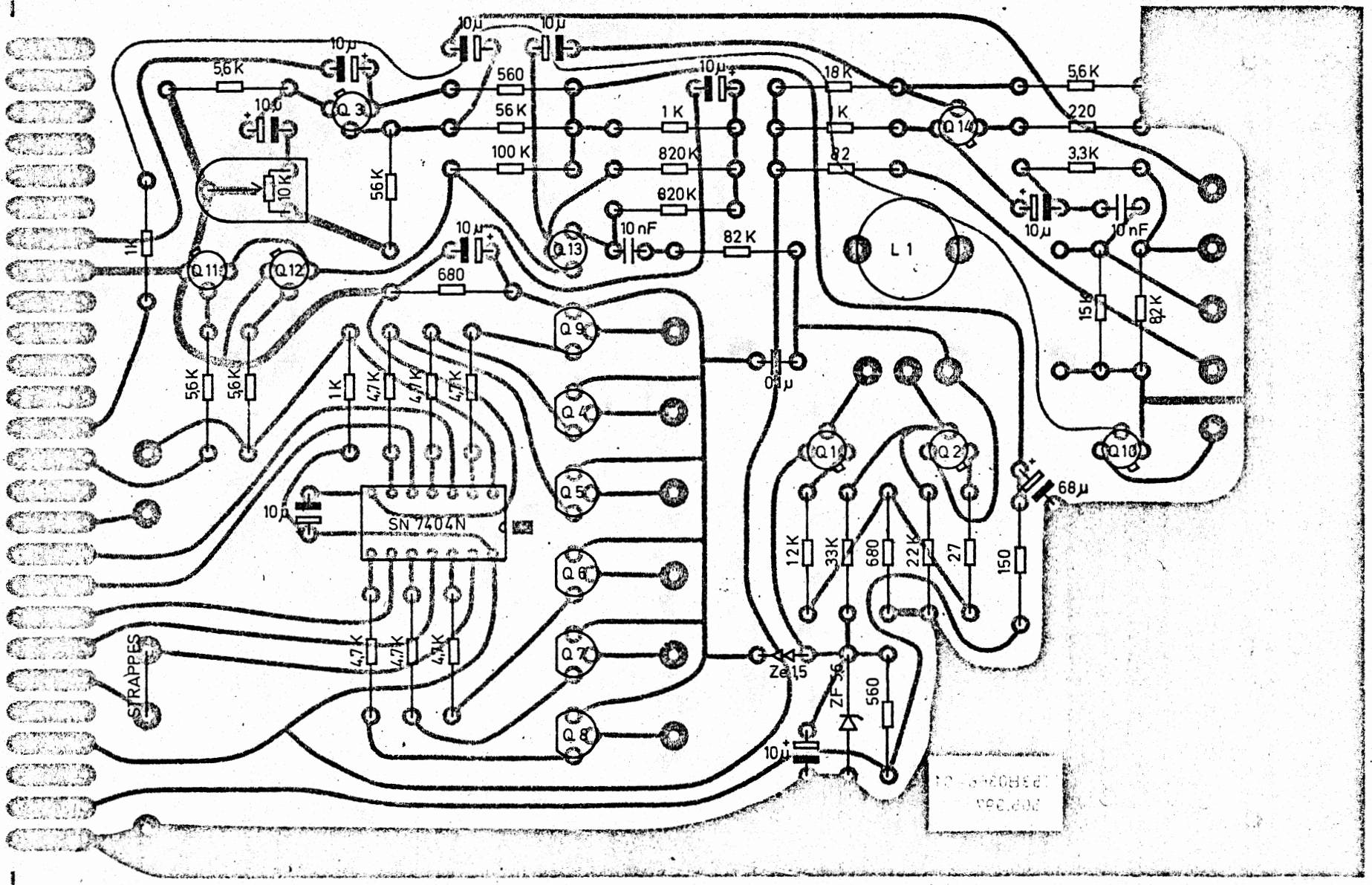
Storno

TYPE	NO.	CODE	DATA
	Q1-3	99.5121	Transistor BC107
	Q4-9	99.5144	Transistor BC214L
	Q10-12	99.5121	Transistor BC107
	Q13	99.5204	Transistor 2N4303
	Q14	99.5121	Transistor BC107
	D1	99.5209	Stab. diode ZE 1.5
	D2	99B5009	LED diode HP 5082-4440
	D3	99.5114	Zener diode 5.6 V
	IC1	14B5022	Integrated circuit SN7404N
	SW1-5	47.5047	Rotary switch ELMA
		49.5047	Knob for rotary switch
		49.5028	Cap insert for knob
		49.5029	Pointer for knob
	SW6-8	47B5043	Toggle switch ON-OFF-ON SPDT
	SW9-15	47B5028	Toggle switch ON-OFF-ON DPDT
		41B5026	Receptacles (AMP)
		37B0011	Module Locking Cam
		20B5031	Screw for above
		24B5001	Washer for above
		28B5003	Retaining pin for above

SEQUENTIAL TONE ENCODER U95B0284

X401.913

FS-G13

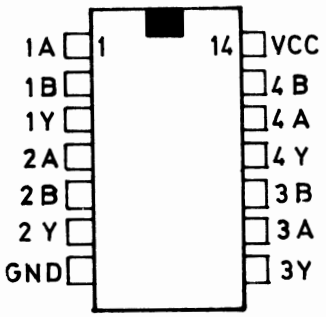


SEQUENTIAL TONE ENCODER , CCIR, U95B0284.

53B0366-01

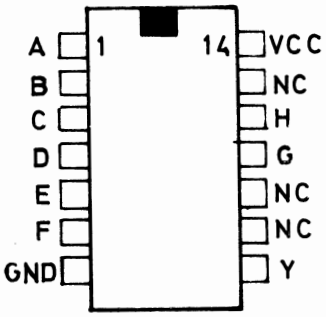
Dato. 9.1.1974. PHB.

QUAD 2 INPUT
NAND GATE
SN 7400 N



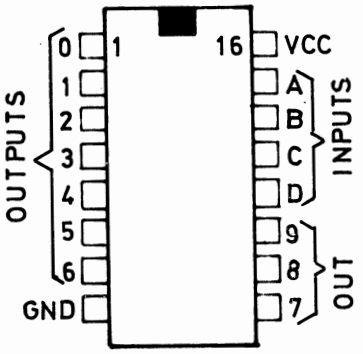
IC: 1, 2, 3, 7
8, 9, 14.

8 INPUT POSITIVE
NAND GATE
SN 7430 N



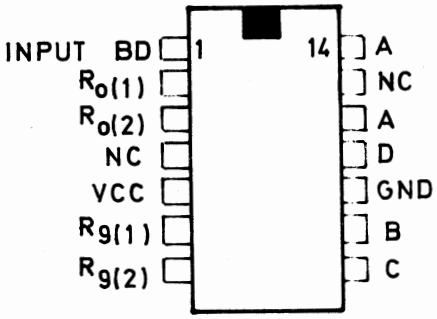
IC : 4 .

4-LINE-TO-10-LINE
DECODER 1 of 10
SN 7442 N



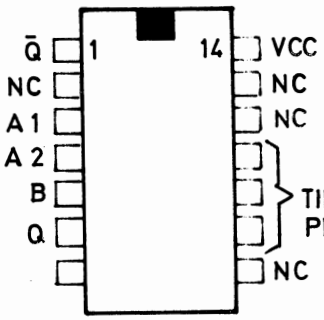
IC: 5 .

DECADE COUNTER
SN 7490 N



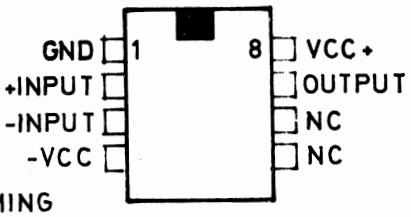
IC : 6.

MONOSTAB. MV.
SN 74121 N



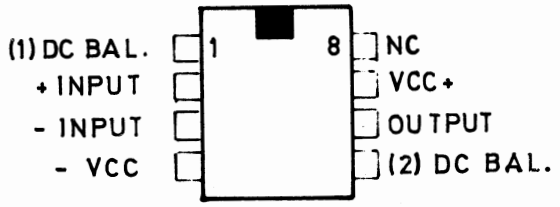
IC:15.

COMPARATOR
72810 P



IC:10,11.

OP-AMP
LM 301 AN



IC: 12,13.

Storno

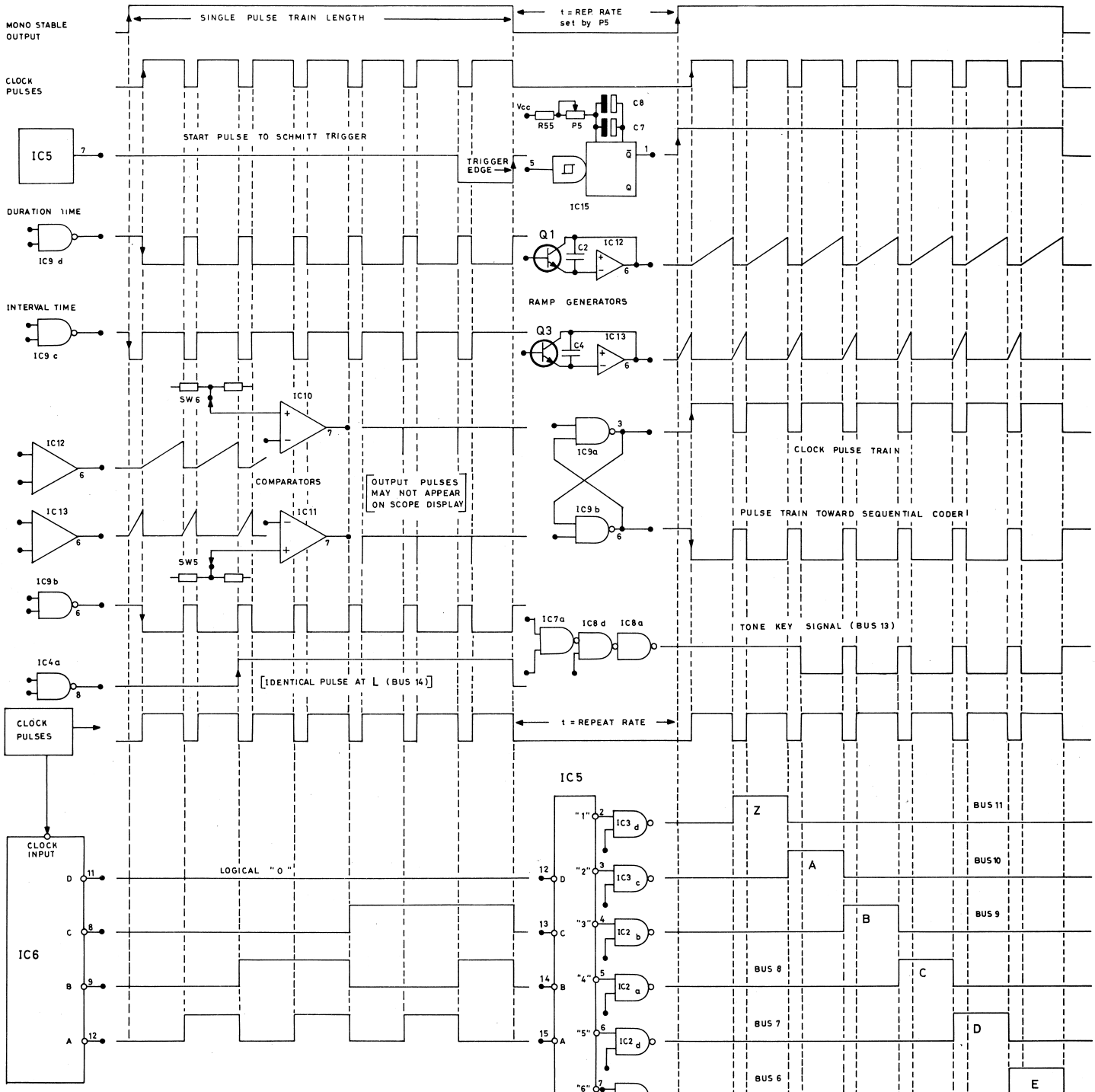
konstr./tegn. F.B.N.
godk. 29-10-72
komp liste

PIN LOCATION for IC's on TIME BASE CIRCUIT

SEE DWG. NO. 506.502

KODE

TEGN NR 506.503. A1

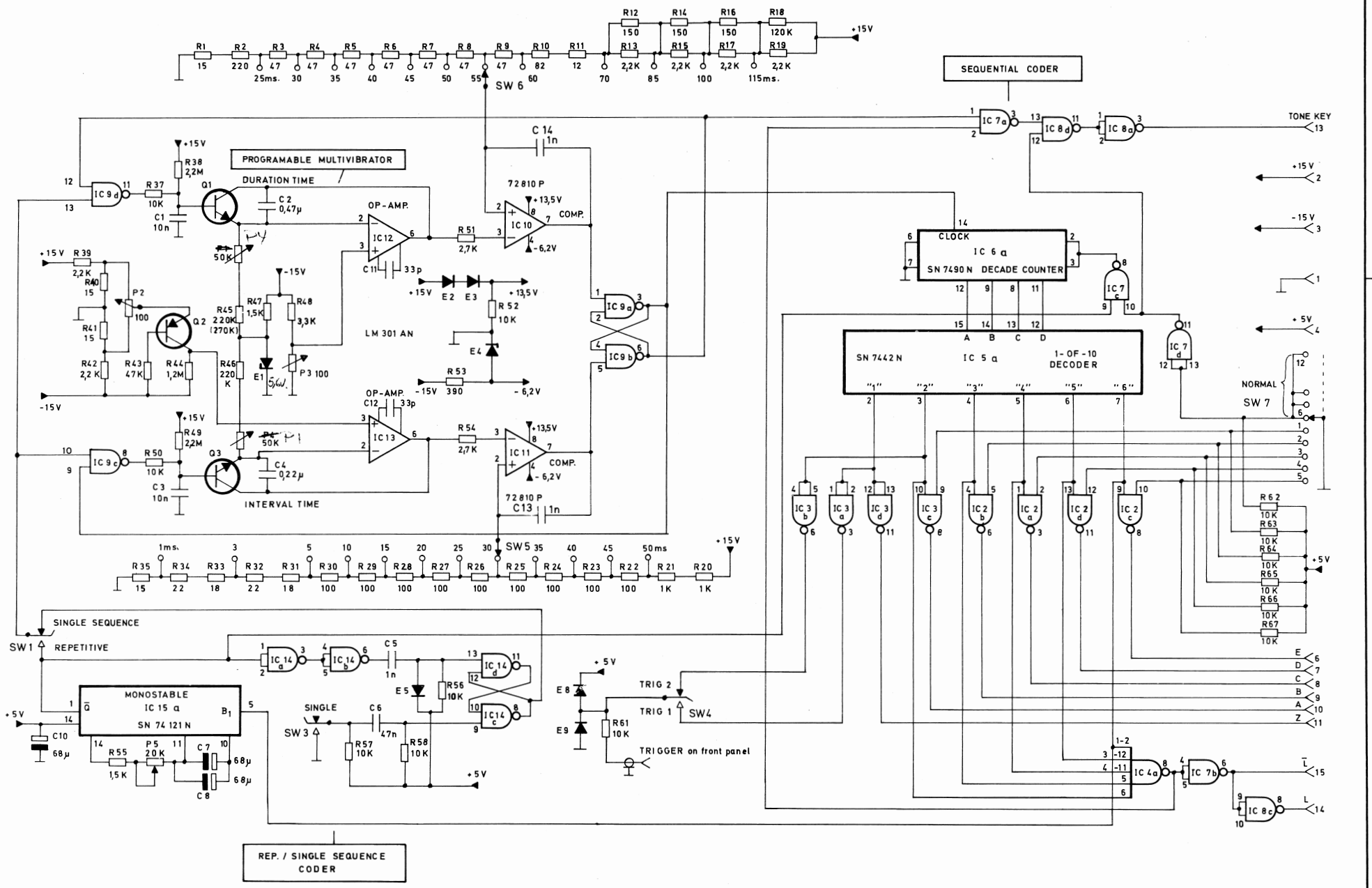


TRUTH TABLE

SN 7490 (IC6) BCD DECADE COUNT SEQUENCE					SN7442 (IC5) 1-OF-10 DECIMAL DECODER OUTPUT						
CLOCK	OUTPUT				DIGIT	1	2	3	4	5	6
COUNT	D	C	B	A	IC PIN NO.	2	3	4	5	6	7
0	0	0	0	0		1	1	1	1	1	1
1	0	0	0	1		0	1	1	1	1	1
2	0	0	1	0		1	0	1	1	1	1
3	0	0	1	1		1	1	0	1	1	1
4	0	1	0	0		1	1	1	0	1	1
5	0	1	0	1		1	1	1	1	0	1
6	0	1	1	0		1	1	1	1	1	0

LOGIC CLEARS WHEN OUTPUT "6" (PIN 7) OF IC5 GOES ZERO.

SEQUENTIAL PULSE GENERATION		
TS-G13 U95B 0251	D401.935	STORNO



IC. oversigt: Se tegning no: 506.503

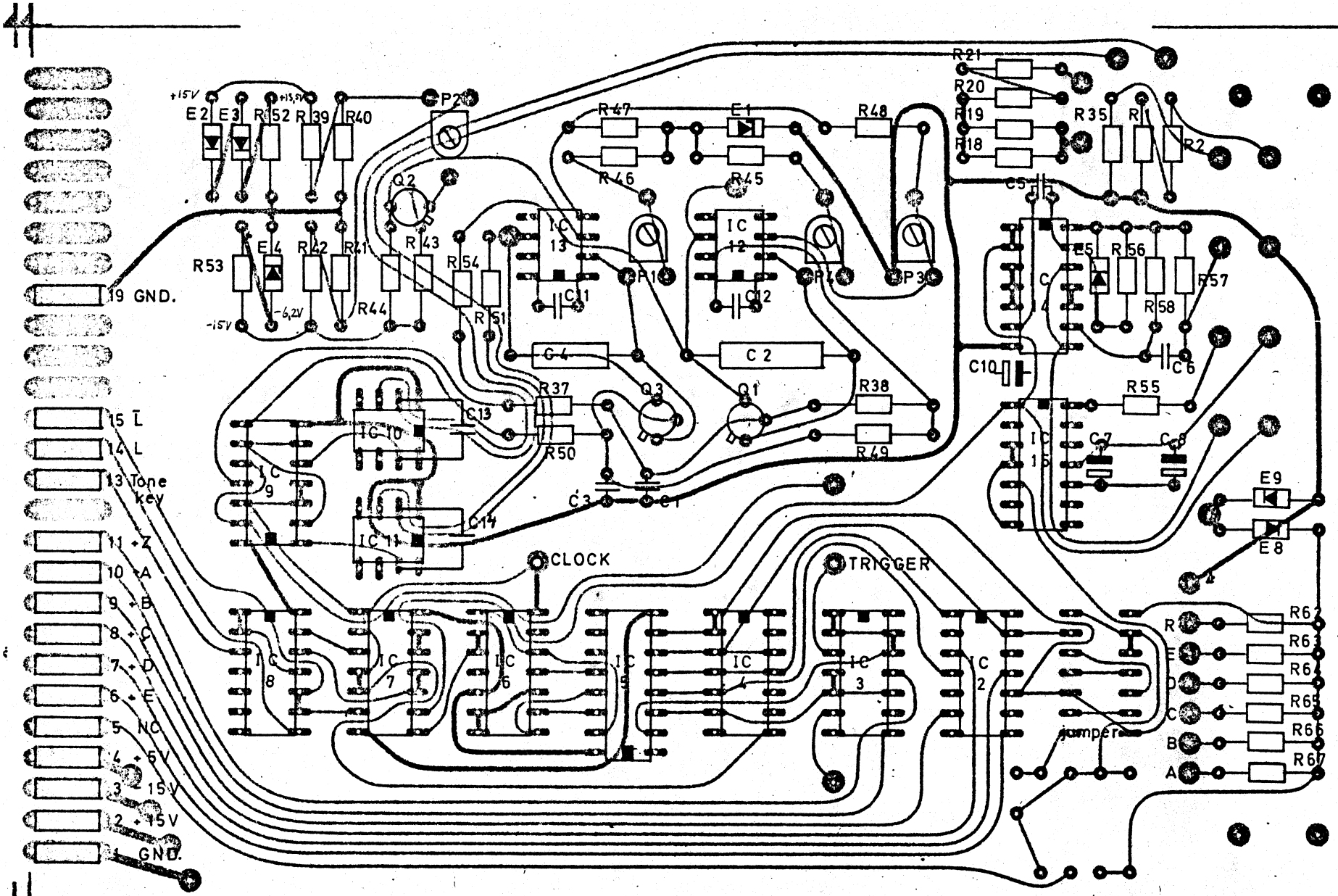
Rett: 29.1.1974.PHB.

konstr. B.J.
godk. F.B.N.
Tilhører: AFD. 5330
29-10-72

TIMEBASE UNIT

U95B0247

Tegn. nr. 506.502 A2



KOMPONENT PLACERING FOR TIMEBASE UNIT
U95 B0247

506.068/3

TYPE	NO.	CODE	DATA
	C1	76.5070	10 nF 10% polyest FL 50V
	C2	76.5076	0.47 µF 10% polyest 100V
	C3	76.5070	10 nF 10% polyest FL 50V
	C4	76.5074	0.22 µF 10% polyest 100V
	C5	76.5069	1 nF 10% polyest FL 50V
	C6	76.5072	47 nF 10% polyest FL 50V
	C7	73.5106	68 µF 20% tantal 16V
	C8	73.5106	68 µF 20% tantal 16V
	C10	73.5106	68 µF 20% tantal 16V
	C11	74.5116	33 pF ±5% ceramic TB 160V
	C12	74.5116	33 pF ±5% ceramic TB 160V
	C13	76.5069	1 nF 10% polyest FL 50V
	C14	76.5069	1 nF 10% polyest FL 50V
	R1	89B5005	15 Ω 1% metal film 1/8W
	R2	89B5022	220 Ω 1% " " 1/8W
	R3-9	89B5010	47 Ω 1% " " 1/8W
	R10	80.5236	82 Ω 5% carbon film 1/8W
	R11	80.5226	12 Ω 5% " " 1/8W
	R12	89B5019	150 Ω 1% metal film 1/8W
	R13	89B5045	2.2 kΩ 1% " " 1/8W
	R14	89B5019	150 Ω 1% " " 1/8W
	R15	89B5045	2.2 kΩ 1% " " 1/8W
	R16	89B5019	150 Ω 1% " " 1/8W
	R17	89B5045	2.2 kΩ 1% " " 1/8W
	R18	80.5274	120 kΩ 5% carbon film 1/8W
	R19	89B5045	2.2 kΩ 1% metal film 1/8W
	R20, 21	89B5038	1 kΩ 1% " " 1/8W
	R22-30	89B5018	100 Ω 1% " " 1/8W
	R31	80.5228	18 Ω 5% carbon film 1/8W
	R32	89B5007	22 Ω 1% metal film 1/8W
	R33	80.5228	18 Ω 5% carbon film 1/8W
	R34	89B5007	22 Ω 1% metal film 1/8W
	R35	89B5005	15 Ω 1% " " 1/8W
	R37	80.5261	10 kΩ 5% carbon film 1/8W
	R38	80.5489	2.2 MΩ 5% " " 1/4W
	R39	80.5253	2.2 kΩ 5% " " 1/8W
	R40, 41	80.5227	15 Ω 5% " " 1/8W
	R42	80.5253	2.2 kΩ 5% " " 1/8W
	R43	80.5269	47 kΩ 5% " " 1/8W
	R44	80.5486	1.2 MΩ 5% " " 1/4W
	R45	80.5277	220 kΩ 5% " " 1/8W
	(or)	80.5278	270 kΩ 5% " " 1/8W
	R46	80.5277	220 kΩ 5% " " 1/8W
	R47	80.5251	1.5 kΩ 5% " " 1/8W
	R48	80.5255	3.3 kΩ 5% " " 1/8W
	R49	80.5489	2.2 MΩ 5% " " 1/4W

Storno

TYPE	NO.	CODE	DATA
	R50	80.5261	10 kΩ 5% carbon film 1/8W
	R51	80.5254	2.7 kΩ 5% " " 1/8W
	R52	80.5261	10 kΩ 5% " " 1/8W
	R53	80.5444	390 Ω 5% " " 1/4W
	R54	80.5254	2.7 kΩ 5% " " 1/8W
	R55	80.5251	1.5 kΩ 5% " " 1/8W
	R56-58	80.5261	10 kΩ 5% " " 1/8W
	R61-67	80.5261	10 kΩ 5% " " 1/8W
	P1	86B5047	50 kΩ trimming potentiometer
	P2	86B5041	100 Ω " "
	P3	86B5041	100 Ω " "
	P4	86B5047	50 kΩ " "
	P5	86.5043	20 kΩ " "
	E1	99.5114	Zener diode 5.6 V 1/4W
	E2, 3	99.5237	Diode 1N4148
	E4	99.5011	Zener diode 6.2 V 1/4W
	E5	99.5237	Diode 1N4148
	E8, 9	99.5237	Diode 1N4148
	Q1	99.5121	Transistor BC107
	Q2	99.5251	Transistor BC177
	Q3	99.5121	Transistor BC107
	IC2, 3	14B5023	Integrated circuit SN7400N
	IC4	14B5020	" " SN7430N
	IC5	14B5025	" " SN7442N
	IC6	14B5026	" " SN7490N
	IC7,8,9	14B5023	" " SN7400N
	IC10,11	14B5027	" " 72810P
	IC12,13	14B5012	" " LM301AN
	IC14	14B5023	" " SN7400N
	IC15	14B5024	" " SN74121N

TIME BASE UNIT U95B0247 FS-G13

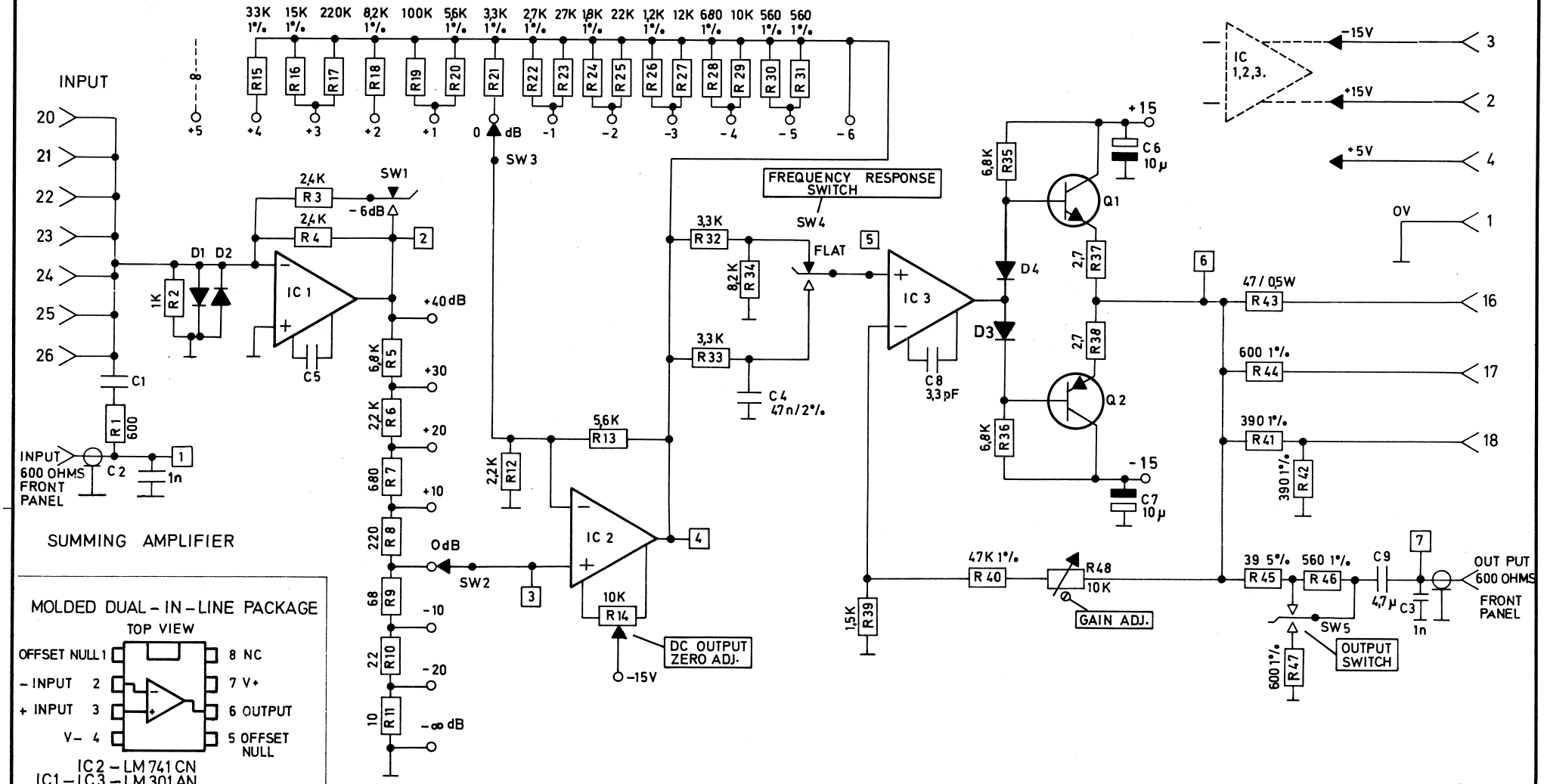
X401.899

TYPE	NO.	CODE	DATA
	SW1	47B5028	Toggle switch ALCO
	SW3	47.5054	Push button micro switch
	SW4	47B5028	Toggle switch ALCO
	SW5	47.5047	Rotary switch ELMA
	SW6	47.5047	Rotary switch ELMA
	SW7	47B5034	Rotary switch ELMA
		49.5027	Knob for ELMA switch
		49.5028	Cap insert for knob
		49.5029	Pointer for knob
		37B0011	Module locking cam
		20B5031	Screw for above
		24B5001	Washer for above
		28B5003	Retaining pin for above
		41B5063	BNC connector
		41B5026	Receptacles (AMP)

Storno

TYPE	NO.	CODE	DATA

TIME BASE UNIT U95B0247 FS-G13


INPUT
SUMMING AMPLIFIER
ATTENUATOR 10dB/STEP
INTERMEDIATE AMPL. WITH ATTENUATOR 1dB / STEP
OUTPUT AUDIO AMPLIFIER
IN / OUTPUT CONNECTOR
FREQUENCY RESPONSE SWITCH
DC OUTPUT ZERO ADJ.
GAIN ADJ.
OUTPUT SWITCH
OUT PUT 600 OHMS FRONT PANEL
INPUT 600 OHMS FRONT PANEL
IC 1,2,3.
-15V
+15V
+5V
0V
+15
-15
IC 1
IC 2
IC 3
Q1
Q2
D1
D2
D3
D4
SW1
SW2
SW3
SW4
SW5
FLAT
+40dB
+30
+20
+10
0dB
-10
-20
-∞dB
MOLDED DUAL-IN-LINE PACKAGE
TOP VIEW
OFFSET NULL 1
- INPUT 2
+ INPUT 3
V- 4
8 NC
7 V+
6 OUTPUT
5 OFFSET NULL
IC2 - LM741CN
IC1 - IC3 - LM301AN
BOTTON VIEW
TO-5
2N3053 - 2N2905A
Q1 — Q2
materiale
overflade:
tegn. til
orientering
værktøj
A prøveserie
P produktion
sign. dato
konstr. PHB
godk. FBN
Tilhører:
DIAGRAM
AUDIO AMPLIFIER U95B0248
Tegn. nr. 506.431
A3

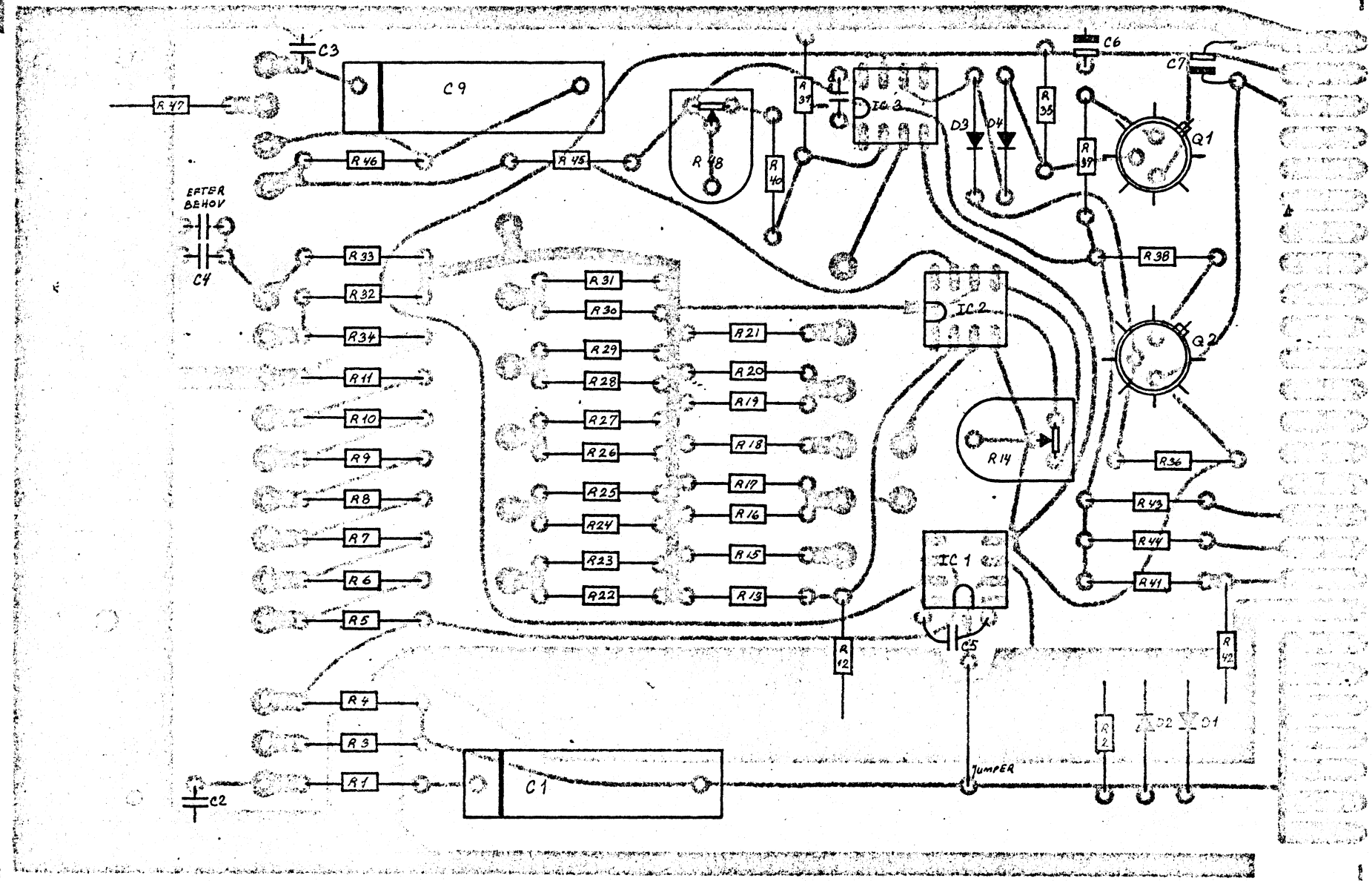
TYPE	NO.	CODE	DATA
	C1	76.5082	4.7 µF polyest 100V
	C2, 3	74.5155	1 nF ceramic
	C4	76.5072	47 nF 2% polyest 50V
	C5	74.5135	10 pF ceramic
	C6, 7	73.5109	10 µF tantal 16V
	C8	74.5129	3.3 pF ceramic N150 250V
	C9	76.5082	4.7 µF polyest 100V
	R1	89B5033	600 Ω 1% metal film 1/8W
	R2	80.5249	1 kΩ 5% carbon film 1/8W
	R3, 4	89B5082	2.4 kΩ 1% metal film 1/8W
	R5	89B5053	6.8 kΩ 1% " " 1/8W
	R6	89B5045	2.2 kΩ 1% " " 1/8W
	R7	89B5034	680 Ω 1% " " 1/8W
	R8	89B5022	220 Ω 1% " " 1/8W
	R9	89B5013	68 Ω 1% " " 1/8W
	R10	89B5007	22 Ω 1% " " 1/8W
	R11	89B5001	10 Ω 1% " " 1/8W
	R12	89B5045	2.2 kΩ 1% " " 1/8W
	R13	89B5052	5.6 kΩ 1% " " 1/8W
	R14	86B5042	10 kΩ 20% trimming potentiometer
	R15	89B5063	33 kΩ 1% metal film 1/8W
	R16	89B5058	15 kΩ 1% " " 1/8W
	R17	80.5277	220 kΩ 5% carbon film 1/8W
	R18	89B5054	8.2 kΩ 1% metal film 1/8W
	R19	80.5273	100 kΩ 5% carbon film 1/8W
	R20	89B5052	5.6 kΩ 1% metal film 1/8W
	R21	89B5083	3.6 kΩ 1% " " 1/8W
	R22	89B5048	2.7 kΩ 1% " " 1/8W
	R23	80.5266	27 kΩ 5% carbon film 1/8W
	R24	89B5043	1.8 kΩ 1% metal film 1/8W
	R25	80.5265	22 kΩ 5% carbon film 1/8W
	R26	89B5041	1.2 kΩ 1% metal film 1/8W
	R27	80.5262	12 kΩ 5% carbon film 1/8W
	R28	89B5034	680 Ω 1% metal film 1/8W
	R29	80.5261	10 kΩ 5% carbon film 1/8W
	R30,31	89B5032	560 Ω 1% metal film 1/8W
	R32,33	89B5049	3.3 kΩ 1% " " 1/8W
	R34	89B5054	8.2 kΩ 1% " " 1/8W
	R35,36	80.5259	6.8 kΩ 5% carbon film 1/8W
	R37,38	80.5218	2.7 Ω 5% " " 1/8W
	R39	89B5042	1.5 kΩ 1% metal film 1/8W
	R40	89B5066	47 kΩ 1% " " 1/8W
	R41,42	89B5029	390 Ω 1% " " 1/8W
	R43	80.5433	47 Ω 5% carbon film 1/4W
	R44	89B5033	600 Ω 1% metal film 1/8W
	R45	80.5432	39 Ω 5% carbon film 1/4W

Storno

TYPE	NO.	CODE	DATA
	R46	89B5032	560 Ω 1% metal film 1/8W
	R47	89B5033	600 Ω 1% " " 1/8W
	R48	86B5042	10 kΩ 20% trimming potentiometer
	D1-4	99.5028	Diode 1N4148
	Q1	99.5128	Transistor NPN 2N3053
	Q2	99.5215	Transistor PNP 2N2905
	IC1	14B5012	Op Amp LM301AN
	IC2	14B5011	Op Amp LM741CN
	IC3	14B5012	Op Amp LM301AN
	SW1	47B5028	Toggle Switch JBT JMT123
	SW2, 3	47B5034	Rotary Switch ELMA 01-12
	SW4	47B5028	Toggle Switch JBT JMT123
	SW5	47B5040	Toggle Switch JBT JMT121
		49.5027	Knob for ELMA switch
		49.5028	Cap Insert for knob
		49.5029	Pointer for knob
		41B5063	Coaxial Connector for front panel
		41B5026	Receptacles (AMP)
		37B0011	Module Locking Cam
		20B5031	Screw for above
		24B5001	Washer for above
		28B5003	Retaining Pin for above

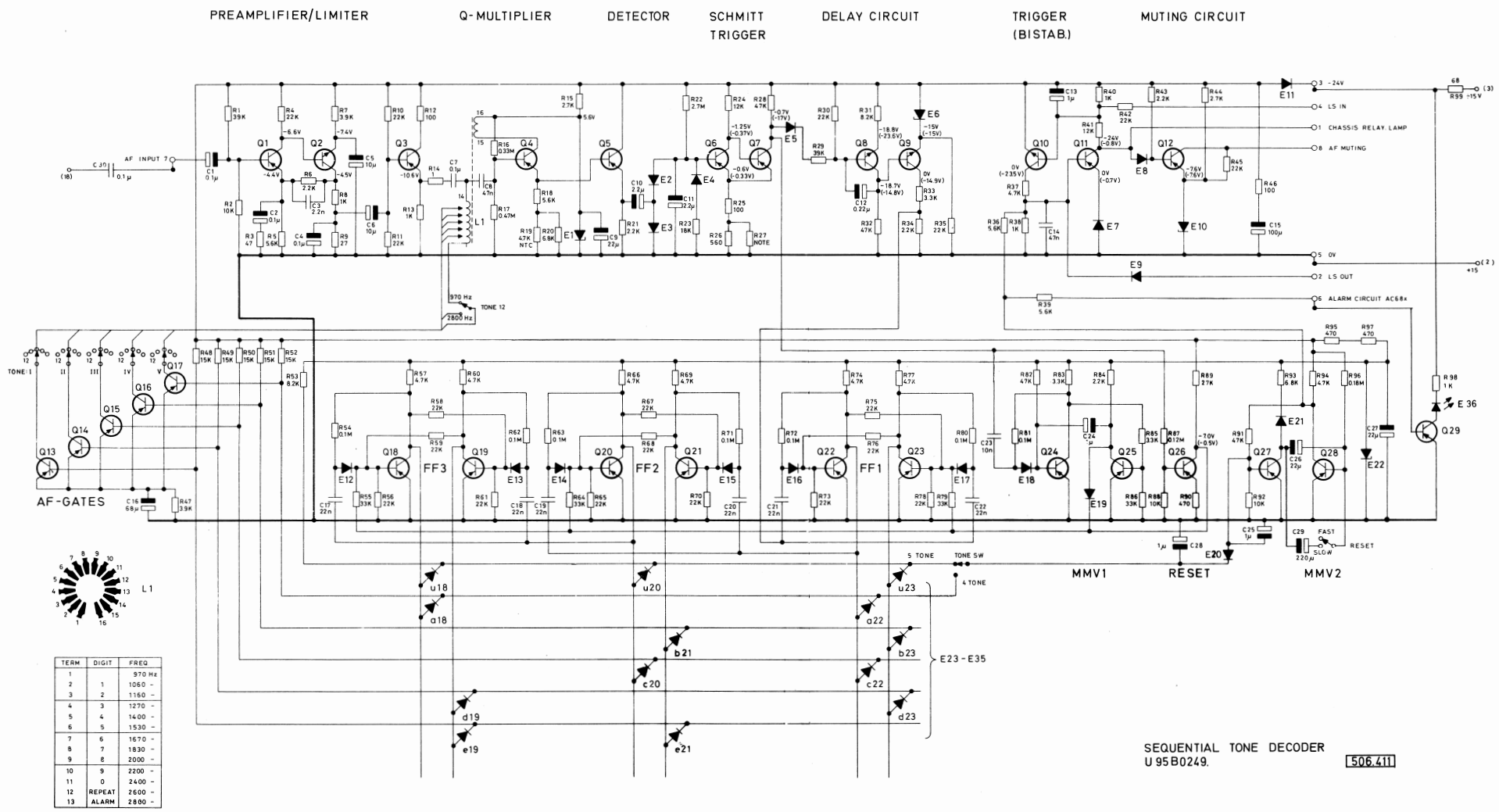
AUDIO AMPLIFIER U95B0248

X401.900



AUDIO AMPLIFIER U95B0248

KOMPONENTPLAC. 505.996/3



TERM	DIGIT	FREQ
1		970 Hz
2	1	1060 -
3	2	1160 -
4	3	1270 -
5	4	1400 -
6	5	1530 -
7	6	1670 -
8	7	1830 -
9	8	2000 -
10	9	2200 -
11	0	2400 -
12	REPEAT	2600 -
13	ALARM	2800 -

TYPE	NO.	CODE	DATA
	C28	73.5114	1 µF tantal 35V
	C29	73.5049	220 µF ellyt 15/20V
	C30	76.5073	0.1 µF 10% ellyt 100V
	R98	81.5049	1 kΩ 5% carbon film 1/2W
	R99	81.5035	68 Ω 5% carbon film 1/2W
	E36	99.5009	LED diode HP5082-4440
	Q29	99.5144	Transistor BC214L
	SR	10.2521	Sequential Tone Receiver SR685
	SW1-5	47.5047	Rotary Switch ELMA
		49.5047	Knob for switch
		49.5028	Cap Insert for knob
		49.5029	Pointer for knob
	SW6-8	47B5028	Toggle Switch ALCO
		47B5026	Receptacles (AMP)
		37B0011	Module Locking Cam
		20B5031	Screw for above
		24B5001	Washer for above
		28B5003	Retaining Pin for above

Storno

TYPE	NO.	CODE	DATA

SEQUENTIAL TONE DECODER U95B0249

X401.911

FS-G13

TYPE	NO.	CODE	DATA			
	C1	76.5068	0.1 µF	1%	polystyr TB	63V
	C2	76.5059	2.2 nF	10%	polystyr FL	50V
	C3	73.5109	10 µF	20%	tantal	15V
	C4	76.5069	1 nF	10%	polyest	50V
	C5	76.5072	47 nF	10%	polyest FL	50V
	C6	73.5126	4.7 µF	20%	tantal	35V
	C7	76.5068	0.1 µF	1%	polystyr TB	63V
	C8	76.5059	2.2 nF	10%	polystyr FL	50V
	C9	73.5109	10 µF	20%	tantal	15V
	C10	76.5069	1 nF	10%	polyest	50V
	C11	76.5070	10 nF	10%	polyest	50V
	C12	76.5072	47 nF	10%	polyest FL	50V
	C13	73.5126	4.7 µF	20%	tantal	35V
	C14	76.5068	0.1 µF	1%	polystyr TB	63V
	C15	76.5059	2.2 nF	10%	polystyr FL	50V
	C16	73.5109	10 µF	20%	tantal	15V
	C17	76.5059	2.2 nF	10%	polystyr FL	50V
	C18	76.5072	47 nF	10%	polyest FL	50V
	C19	73.5126	4.7 µF	20%	tantal	35V
	C20	76.5068	0.1 µF	1%	polystyr TB	63V
	C21	76.5059	2.2 nF	10%	polystyr FL	50V
	C22	73.5109	10 µF	20%	tantal	15V
	C23	76.5069	1 nF	10%	polyest	50V
	C24	76.5072	47 nF	10%	polyest FL	50V
	C25	73.5126	4.7 µF	20%	tantal	35V
	C26	76.5068	0.1 µF	1%	polystyr TB	63 V
	C27	76.5059	2.2 nF	10%	polystyr FL	50V
	C28	73.5109	10 µF	20%	tantal	15V
	C29	76.5069	1 nF	10%	polyest	50V
	C30	76.5070	10 nF	10%	polyest	50V
	C31	76.5072	47 nF	10%	polyest FL	50V
	C32	73.5126	4.7 µF	20%	tantal	35V
	C33	76.5068	0.1 µF	1%	polystyr TB	63V
	C34	76.5059	2.2 nF	10%	polystyr FL	50V
	C35	73.5109	10 µF	20%	tantal	15V
	C36	76.5059	2.2 nF	10%	polystyr FL	50V
	C37	76.5072	47 nF	10%	polyest FL	50V
	C38	73.5126	4.7 µF	20%	tantal	35V
	R1	80.5246	560 Ω	5%	carbon film	1/8W
	R2	80.5250	1.2 kΩ	5%	" "	1/8W
	R3	80.5266	27 kΩ	5%	" "	1/8W
	R4	80.5262	12 kΩ	5%	" "	1/8W
	R5	80.5273	100 kΩ	5%	" "	1/8W
	R6	80.5261	10 kΩ	5%	" "	1/8W
	R7	89.5009	4.7 kΩ	20%	NTC resistor	0.6W
	R8	80.5260	8.2 kΩ	5%	carbon film	1/8W

TYPE	NO.	CODE	DATA			
	R9	80.5257	4.7 kΩ	5%	carbon film	1/8W
	R10	80.5263	15 kΩ	5%	" "	1/8W
	R11	80.5277	220 kΩ	5%	" "	1/8W
	R12	80.5277	220 kΩ	5%	" "	1/8W
	R13	80.5262	12 kΩ	5%	" "	1/8W
	R14	80.5249	1 kΩ	5%	" "	1/8W
	R15	80.5246	560 Ω	5%	" "	1/8W
	R16	80.5250	1.2 kΩ	5%	" "	1/8W
	R17	80.5266	27 kΩ	5%	" "	1/8W
	R18	80.5262	12 kΩ	5%	" "	1/8W
	R19	80-5269	47 kΩ	5%	" "	1/8W
	R20	80.5261	10 kΩ	5%	" "	1/8W
	R21	89.5009	4.7 kΩ	20%	NTC resistor	0.6W
	R22	80.5260	8.2 kΩ	5%	carbon film	1/8W
	R23	80.5257	4.7 kΩ	5%	" "	1/8W
	R24	80.5269	47 kΩ	5%	" "	1/8W
	R25	80.5277	220 kΩ	5%	" "	1/8W
	R26	80.5277	220 kΩ	5%	" "	1/8W
	R27	80.5262	12 kΩ	5%	" "	1/8W
	R28	80.5249	1 kΩ	5%	" "	1/8W
	R29	80.5246	560 Ω	5%	" "	1/8W
	R30	80.5250	1.2 kΩ	5%	" "	1/8W
	R31	80.5266	27 kΩ	5%	" "	1/8W
	R32	80.5262	12 kΩ	5%	" "	1/8W
	R33	80.5273	100 kΩ	5%	" "	1/8W
	R34	80.5261	10 kΩ	5%	" "	1/8W
	R35	89.5009	4.7 kΩ	20%	NTC resistor	0.6W
	R36	80.5260	8.2 kΩ	5%	carbon film	1/8W
	R37	80.5257	4.7 kΩ	5%	" "	1/8W
	R38	80.5263	15 kΩ	5%	" "	1/8W
	R39	80.5277	220 kΩ	5%	" "	1/8W
	R40	80.5277	220 kΩ	5%	" "	1/8W
	R41	80.5262	12 kΩ	5%	" "	1/8W
	R42	80.5249	1 kΩ	5%	" "	1/8W
	R43	80.5246	560 Ω	5%	" "	1/8W
	R44	80.5250	1.2 kΩ	5%	" "	1/8W
	R45	80.5266	27 kΩ	5%	" "	1/8W
	R46	80.5262	12 kΩ	5%	" "	1/8W
	R47	80.5273	100 kΩ	5%	" "	1/8W
	R48	80.5261	10 kΩ	5%	" "	1/8W
	R49	89.5009	4.7 kΩ	20%	NTC resistor	0.6W

DUAL TONE ENCODER U95B0250 FS-G13

X401.912

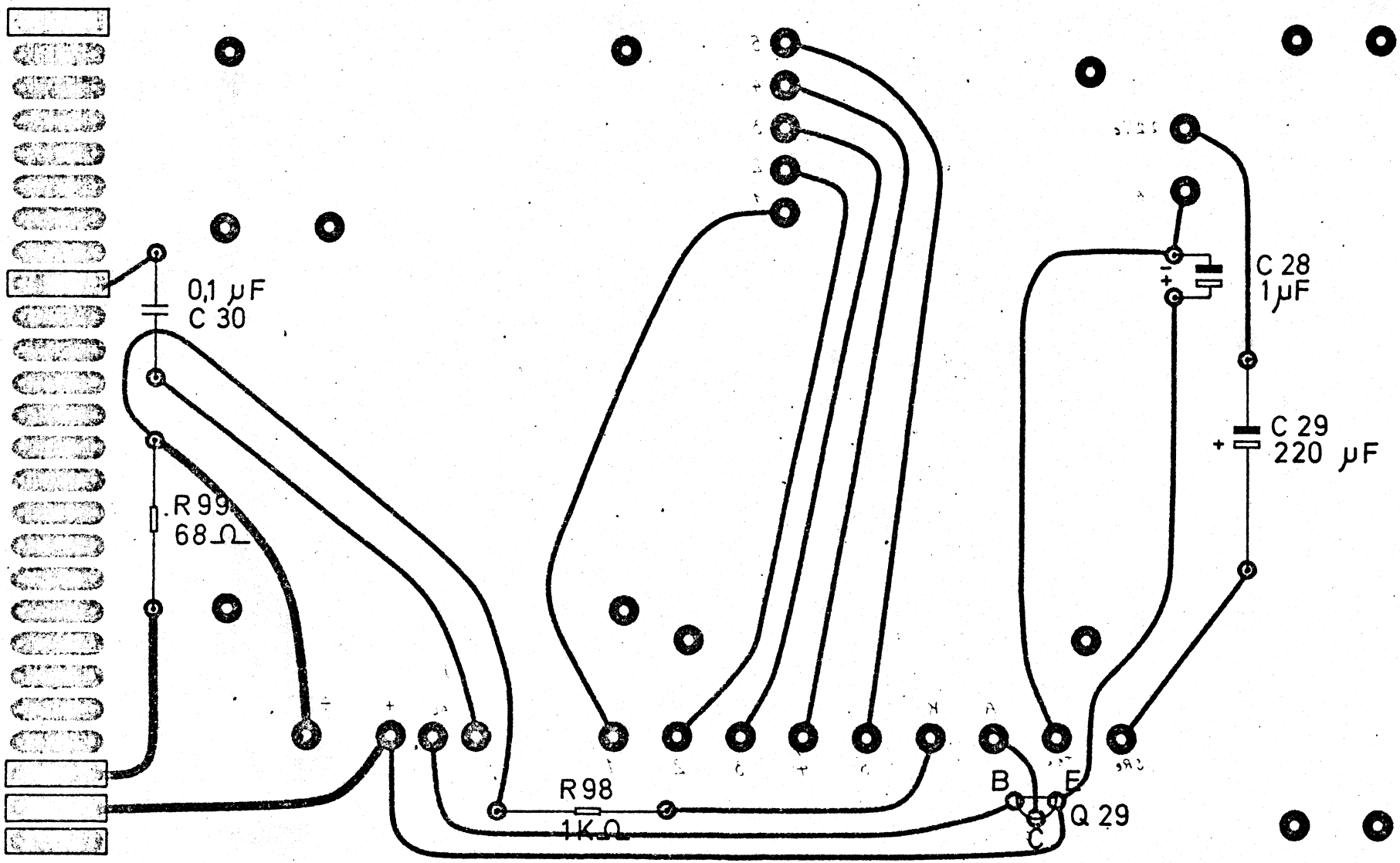
TYPE	NO.	CODE	DATA
	R50	80.5260	8.2 kΩ 5% carbon film 1/8W
	R51	80.5257	4.7 kΩ 5% " " 1/8W
	R52	80.5263	15 kΩ 5% " " 1/8W
	R53	80.5277	220 kΩ 5% " " 1/8W
	R54	80.5277	220 kΩ 5% " " 1/8W
	R55	80.5262	12 kΩ 5% " " 1/8W
	R56	80.5249	1 kΩ 5% " " 1/8W
	R57	80.5264	560 Ω 5% " " 1/8W
	R58	80.5250	1.2 kΩ 5% " " 1/8W
	R59	80.5266	27 kΩ 5% " " 1/8W
	R60	80.5262	12 kΩ 5% " " 1/8W
	R61	80.5269	47 kΩ 5% " " 1/8W
	R62	80.5261	10 kΩ 5% " " 1/8W
	R63	89.5009	4.7 kΩ 20% NTC resistor 0.6W
	R64	80.5260	8.2 kΩ 5% carbon film 1/8W
	R65	80.5257	4.7 kΩ 5% " " 1/8W
	R66	80.5269	47 kΩ 5% " " 1/8W
	R67	80.5277	220 kΩ 5% " " 1/8W
	R68	80.5277	220 kΩ 5% " " 1/8W
	R69	80.5262	12 kΩ 5% " " 1/8W
	R70	80.5249	1 kΩ 5% " " 1/8W
	R71	80.5246	560 Ω 5% " " 1/8W
	R72	80.5250	1.2 kΩ 5% " " 1/8W
	R73	80.5266	27 kΩ 5% " " 1/8W
	R74	80.5262	12 kΩ 5% " " 1/8W
	R75	80.5273	100 kΩ 5% " " 1/8W
	R76	80.5261	10 kΩ 5% " " 1/8W
	R77	89.5009	4.7 kΩ 20% NTC resistor 0.6W
	R78	80.5260	8.2 kΩ 5% carbon film 1/8W
	R79	80.5257	4.7 kΩ 5% " " 1/8W
	R80	80.5263	15 kΩ 5% " " 1/8W
	R81	80.5277	220 kΩ 5% " " 1/8W
	R82	80.5277	220 kΩ 5% " " 1/8W
	R83	80.5262	12 kΩ 5% " " 1/8W
	R84	80.5249	1 kΩ 5% " " 1/8W
	R85	80.5250	1.2 kΩ 5% " " 1/8W
	T1-6	86.5039	10 kΩ potentiometer lin. 0.1W
	E1-18	99.5028	Diode OA200 or 1N4148
	E19	99B5009	LED diode HP5082-4440
	Q1-12	99.5117	Transistor 2N2924 or BC167A

Storno

TYPE	NO.	CODE	DATA
	LA	61.840	Tone Coil
	LB	61.1085	Tone Coil
	LC	61.928	Tone Coil
	LD	61.840	Tone Coil
	LE	61.1085	Tone Coil
	LF	61.1005	Tone Coil
	SW1 to SW6	47B5028	Toggle Switch JBT JMT123
	SW7	47B5041	Toggle Switch JBT JMT131
	SW	47B5044	Rotary Switch ELMA 12 pos. 3 decks
		49.5022	Knob for ELMA switch
		49.5035	Pointer for knob
		49.5045	Cap Insert for knob
		37B0011	Module Locking Cam
		20B5031	Screw for above
		24B5001	Washer for above
		28B5001	Retaining Pin for above
		41B5026	Receptacles (AMP)

DUAL TONE ENCODER U95B0250 FS-G13

X401.912



KOMPONENTPLACERING 506.030/3

TYPE	NO.	CODE	DATA	
SR685		10.2521	Sequential Tone Receiver	
SR6851		10.2522	Sequential Tone Receiver CCIR	
	C1	73.5089	0.1 µF 20% Tantal	35V
	C2	73.5089	0.1 µF 20% Tantal	35V
	C3	76.5059	2.2 nF 10% polyest. FL	50V
	C4	73.5089	0.1 µF 20% Tantal	35V
	C5	73.5109	10 µF 20% "	16V
	C6	73.5109	10 µF 20% "	16V
	C7	76.5068	0.1 µF 1% polystyr TB	63V
	C8	76.5072	47 nF 10% polyest. FL	50V
	C9	73.5127	22 µF 20% Tantal	16V
	C10	73.5102	2.2 µF 20% Tantal	35V
	C11	73.5102	2.2 µF 20% Tantal	35V
	C12	73.5118	0.2 µF 20% Tantal	35V
	C13	73.5114	1 µF 20% Tantal	35V
	C14	76.5072	47 nF 10% polyest. FL	50V
	C15	73.5071	100 µF -10 +100% elco	35V
	C16	73.5106	68 µF 20% Tantal	15V
	C17	76.5071	22 nF 10% polyest. FL	50V
	C18	76.5071	22 nF 10% " FL	50V
	C19	76.5071	22 nF 10% " FL	50V
	C20	76.5071	22 nF 10% " FL	50V
	C21	76.5071	22 nF 10% " FL	50V
	C22	76.5071	22 nF 10% " FL	50V
	C23	76.5070	10 nF 10% " FL	50V
	C24	73.5114	1 µF 20% Tantal	35V
	C25	73.5114	1 µF 20% "	35V
	C26	73.5127	22 µF 20% "	16V
	C27	73.5127	22 µF 20% "	16V
	R1	80.5268	39 kΩ 5% carbon film	1/8W
	R2	80.5261	10 kΩ 5% " "	1/8W
	R3	80.5233	47 Ω 5% " "	1/8W
	R4	80.5265	22 kΩ 5% " "	1/8W
	R5	80.5258	5.6 kΩ 5% " "	1/8W
	R6	80.5253	2.2 kΩ 5% " "	1/8W
	R7	80.5256	3.9 kΩ 5% " "	1/8W
	R8	80.5249	1 kΩ 5% " "	1/8W
	R9	80.5230 1	27 Ω 5% " "	1/8W
	R10	80.5265	22 kΩ 5% " "	1/8W
	R11	80.5265	22 kΩ 5% " "	1/8W
	R12	80.5237	100 Ω 5% " "	1/8W
	R13	80.5249	1 kΩ 5% " "	1/8W
	R14	80.5213	1 Ω 5% " "	1/8W
	R15	80.5254	2.7 kΩ 5% " "	1/8W
	R16	80.5279	0.33 MΩ 5% " "	1/8W
	R17	80.5281	0.47 MΩ 5% " "	1/8W

Storno

TYPE	NO.	CODE	DATA	
	R18	80.5258	5.6 kΩ 5% carbon film	1/8W
	R19	89.5009	4.7 kΩ 20% NTC	0.6W
	R20	80.5259	6.8 kΩ 5% carbon film	1/8W
	R21	80.5253	2.2 kΩ 5% " "	1/8W
	R22	80.5490	2.7 MΩ 10% " "	1/4W
	R23	80.5264	18 kΩ 5% " "	1/8W
	R24	80.5262	12 kΩ 5% " "	1/8W
	R25	80.5237	100 Ω 5% " "	1/8W
	R26	80.5246	560 Ω 5% " "	1/8W
	R27	80.52xx	Adjusted/tilpasset	
	R28	80.5269	47 kΩ 5% carbon film	1/8W
	R29	80.5268	39 kΩ 5% " "	1/8W
	R30	80.5265	22 kΩ 5% " "	1/8W
	R31	80.5260	8.2 kΩ 5% " "	1/8W
	R32	80.5269	47 kΩ 5% " "	1/8W
	R33	80.5255	3.3 kΩ 5% " "	1/8W
	R34	80.5253	2.2 kΩ 5% " "	1/8W
	R35	80.5265	22 kΩ 5% " "	1/8W
	R36	80.5258	5.6 kΩ 5% " "	1/8W
	R37	80.5257	4.7 kΩ 5% " "	1/8W
	R38	80.5249	1 kΩ 5% " "	1/8W
	R39	80.5258	5.6 kΩ 5% " "	1/8W
	R40	80.5249	1 kΩ 5% " "	1/8W
	R41	80.5262	12 kΩ 5% " "	1/8W
	R42	80.5265	22 kΩ 5% " "	1/8W
	R43	80.5253	2.2 kΩ 5% " "	1/8W
	R44	80.5254	2.7 kΩ 5% " "	1/8W
	R45	80.5265	22 kΩ 5% " "	1/8W
	R46	80.5237	100 Ω 5% " "	1/8W
	R47	80.5256	3.9 kΩ 5% " "	1/8W
	R48	80.5263	15 kΩ 5% " "	1/8W
	R49	80.5263	15 kΩ 5% " "	1/8W
	R50	80.5263	15 kΩ 5% " "	1/8W
	R51	80.5263	15 kΩ 5% " "	1/8W
	R52	80.5263	15 kΩ 5% " "	1/8W
	R53	80.5060	8.2 kΩ 5% " "	1/8W
	R54	80.5073	0.1 MΩ 5% " "	1/8W
	R55	80.5267	33 kΩ 5% " "	1/8W
	R56	80.5065	22 kΩ 5% " "	1/8W
	R57	80.5257	4.7 kΩ 5% " "	1/8W
	R58	80.5265	22 kΩ 5% " "	1/8W
	R59	80.5265	22 kΩ 5% " "	1/8W

TONE SEQUENTIAL RECEIVER
SEKVENSTONEMODTAGER

X400.285

SR685, SR6851

TYPE	NO.	CODE	DATA
	R60	80.5257	4.7 kΩ 5% carbon film 1/8W
	R61	80.5265	22 kΩ 5% " " 1/8W
	R62	80.5273	0.1 MΩ 5% " " 1/8W
	R63	80.5273	0.1 MΩ 5% " " 1/8W
	R64	80.5267	33 kΩ 5% " " 1/8W
	R65	80.5265	22 kΩ 5% " " 1/8W
	R66	80.5257	4.7 kΩ 5% " " 1/8W
	R67	80.5265	22 kΩ 5% " " 1/8W
	R68	80.5265	22 kΩ 5% " " 1/8W
	R69	80.5257	4.7 kΩ 5% " " 1/8W
	R70	80.5265	22 kΩ 5% " " 1/8W
	R71	80.5273	0.1 MΩ 5% " " 1/8W
	R72	80.5273	0.1 MΩ 5% " " 1/8W
	R73	80.5265	22 kΩ 5% " " 1/8W
	R74	80.5257	4.7 kΩ 5% " " 1/8W
	R75	80.5265	22 kΩ 5% " " 1/8W
	R76	80.5265	22 kΩ 5% " " 1/8W
	R77	80.5257	4.7 kΩ 5% " " 1/8W
	R78	80.5265	22 kΩ 5% " " 1/8W
	R79	80.5267	33 kΩ 5% " " 1/8W
	R80	80.5273	0.1 MΩ 5% " " 1/8W
	R81	80.5273	0.1 MΩ 5% " " 1/8W
	R82	80.5269	47 kΩ 5% " " 1/8W
	R83	80.5255	3.3 kΩ 5% " " 1/8W
	R84	80.5253	2.2 kΩ 5% " " 1/8W
	R85	80.5255	3.3 kΩ 5% " " 1/8W
	R86	80.5267	33 kΩ 5% " " 1/8W
	R87	80.5274	0.12 MΩ 5% " " 1/8W
	R88	80.5261	10 kΩ 5% " " 1/8W
	R89	80.5266	27 kΩ 5% " " 1/8W
	R90	80.5245	470 Ω 5% " " 1/8W
	R91	80.5269	47 kΩ 5% " " 1/8W
	R92	80.5261	10 kΩ 5% " " 1/8W
	R93	80.5259	6.8 kΩ 5% " " 1/8W
	R94	80.5257	4.7 kΩ 5% " " 1/8W
	R95	80.5245	470 Ω 5% " " 1/8W
	R96	80.5276	0.18 MΩ 5% " " 1/8W
	R97	80.5245	470 Ω 5% " " 1/8W
SR685	L1	61.1129	Tone coil
SR6851	L1	61.1097	Tone coil CCIR
	E1	99.5114	Zenerdiode 5.6V 5% 1/4W
	E2	99.5136	Diode AA119
	E3	99.5136	Diode AA119
	E4	99.5028	Diode 1N914
	E5	99.5028	Diode 1N914
	E6	99.5042	Zenerdiode 9.1V 5% 1/4W

Storno

TYPE	NO.	CODE	DATA
	E7	99.5020	Diode 1N4004
	E8	99.5020	Diode 1N4004
	E9	99.5136	Diode AA119
	E10	99.5075	Zenerdiode 7.5 5% 1/4W
	E11	99.5020	Diode 1N4004
	E12	99.5028	Diode 1N914
	E13	99.5028	Diode 1N914
	E14	99.5028	Diode 1N914
	E15	99.5028	Diode 1N914
	E16	99.5028	Diode 1N914
	E17	99.5028	Diode 1N914
	E18	99.5028	Diode 1N914
	E19	99.5028	Diode 1N914
	E20	99.5028	Diode 1N914
	E21	99.5028	Diode 1N914
	E22	99.5146	Zenerdiode 6.8V 5% 1/4W
	E23	99.5028	Diode 1N914
	E24	99.5028	Diode 1N914
	E25	99.5028	Diode 1N914
	E26	99.5028	Diode 1N914
	E27	99.5028	Diode 1N914
	E28	99.5028	Diode 1N914
	E29	99.5028	Diode 1N914
	E30	99.5028	Diode 1N914
	E31	99.5028	Diode 1N914
	E32	99.5028	Diode 1N914
	E33	99.5028	Diode 1N914
	E34	99.5028	Diode 1N914
	E35	99.5028	Diode 1N914
	Q1	99.5144	Transistor BC214L
	Q2	99.5143	Transistor BC107
	Q3	99.5144	Transistor BC214L
	Q4	99.5144	Transistor BC214L
	Q5	99.5144	Transistor BC214L
	Q6	99.5144	Transistor BC214L
	Q7	99.5144	Transistor BC214L
	Q8	99.5143	Transistor BC107
	Q9	99.5143	Transistor BC107
	Q10	99.5143	Transistor BC107
	Q11	99.5144	Transistor BC214L
	Q12	99.5142	Transistor AC128

TONE SEQUENTIAL RECEIVER
SEKVENSTONEMODTAGER

SR685, SR6851

X400.285

TYPE	NO.	CODE	DATA
	Q13	99.5144	Transistor BC214L
	Q14	99.5144	Transistor BC214L
	Q15	99.5144	Transistor BC214L
	Q16	99.5144	Transistor BC214L
	Q17	99.5144	Transistor BC214L
	Q18	99.5144	Transistor BC214L
	Q19	99.5144	Transistor BC214L
	Q20	99.5144	Transistor BC214L
	Q21	99.5144	Transistor BC214L
	Q22	99.5144	Transistor BC214L
	Q23	99.5144	Transistor BC214L
	Q24	99.5144	Transistor BC214L
	Q25	99.5144	Transistor BC214L
	Q26	99.5144	Transistor BC214L
	Q27	99.5144	Transistor BC214L
	Q28	99.5144	Transistor BC214L

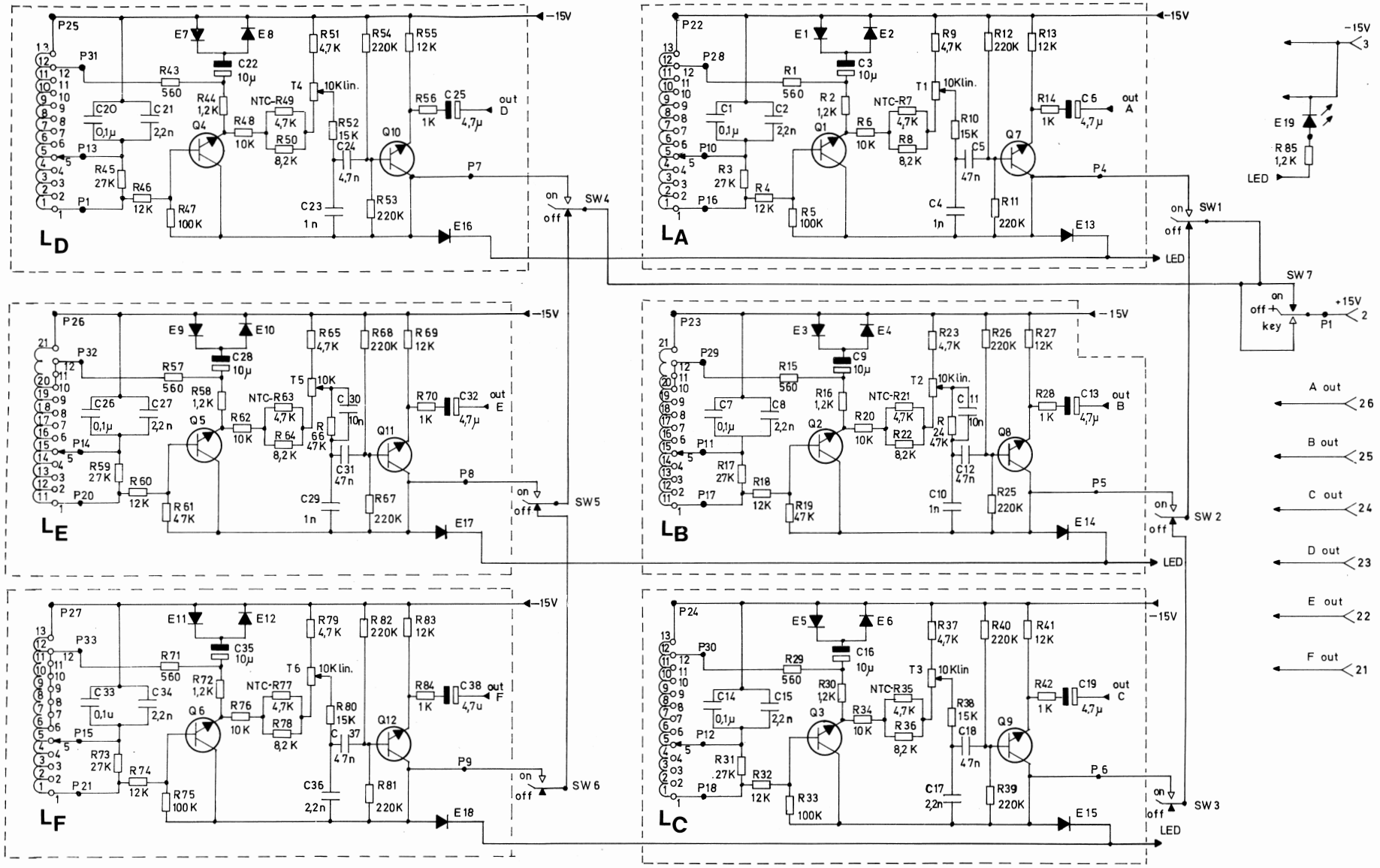
Storno

TYPE	NO.	CODE	DATA

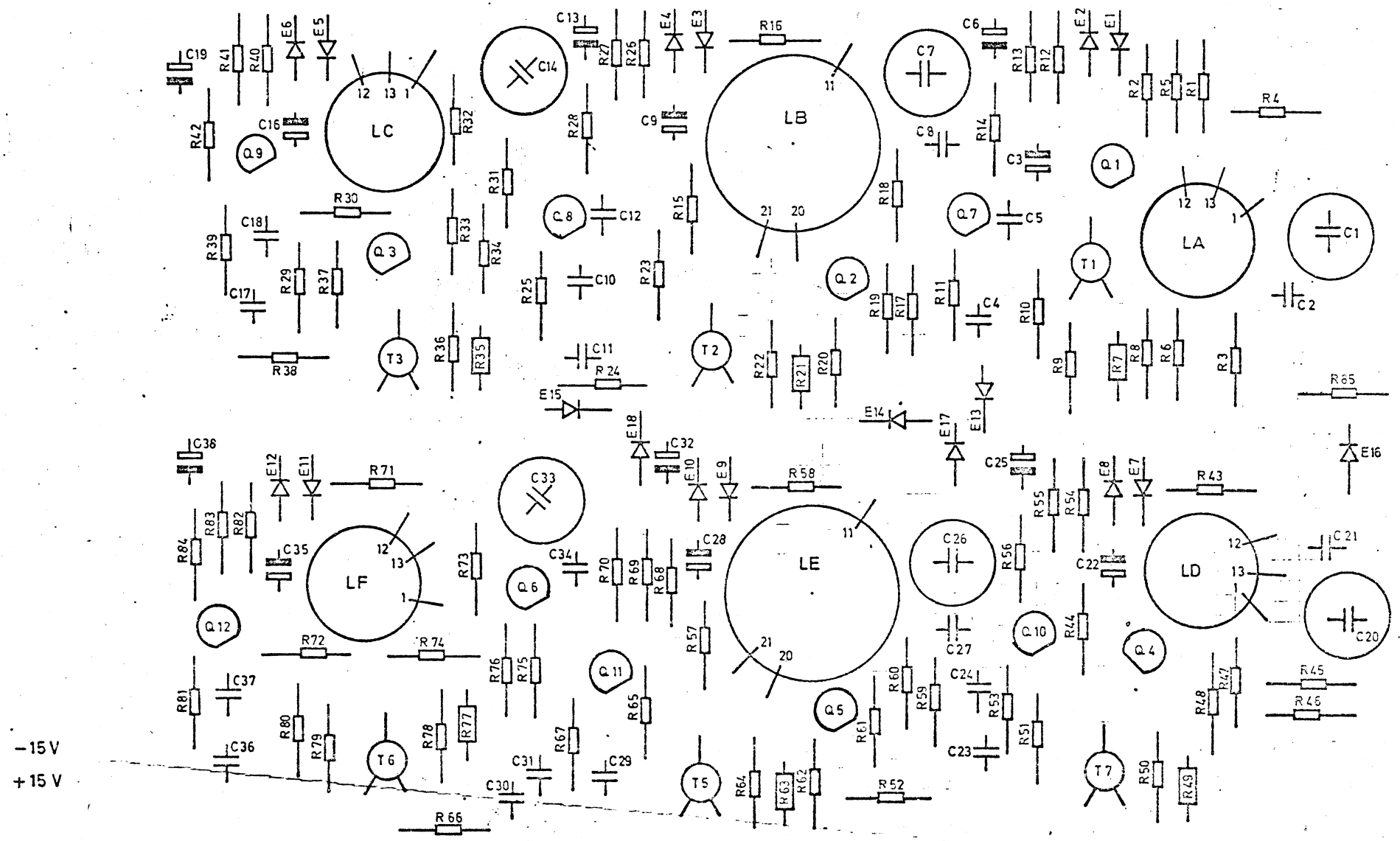
TONE SEQUENTIAL RECEIVER
SEKVENSTONEMODTAGER

SR685,
SR6851

X400.285



f	tegnet rent	FBN	12-1072	materiale	overflade:	tegn. til	sign. dato	Sterno	konstr. BJ	godk. 12-1072	Tilhører: AFD. 5330
e						orientering					
d						værktøj					DUAL TONE ENCODER
c				dim.		A prøveserie					U95 B0250-00
b				råvægt	gr./stk.	P produktion					
a	ændring	sign.	dato								Tegn. nr. 506466 A2



DUAL TONE ENCODER
U95B0250
Dato. 6.2.74. PHB.

TYPE	NO.	CODE	DATA			
	C1	76.5068	0.1 µF	1%	polystyr TB	63V
	C2	76.5059	2.2 nF	10%	polystyr FL	50V
	C3	73.5109	10 µF	20%	tantal	15V
	C4	76.5069	1 nF	10%	polyest	50V
	C5	76.5072	47 nF	10%	polyest FL	50V
	C6	73.5126	4.7 µF	20%	tantal	35V
	C7	76.5068	0.1 µF	1%	polystyr TB	63V
	C8	76.5059	2.2 nF	10%	polystyr FL	50V
	C9	73.5109	10 µF	20%	tantal	15V
	C10	76.5069	1 nF	10%	polyest	50V
	C11	76.5070	10 nF	10%	polyest	50V
	C12	76.5072	47 nF	10%	polyest FL	50V
	C13	73.5126	4.7 µF	20%	tantal	35V
	C14	76.5068	0.1 µF	1%	polystyr TB	63V
	C15	76.5059	2.2 nF	10%	polystyr FL	50V
	C16	73.5109	10 µF	20%	tantal	15V
	C17	76.5059	2.2 nF	10%	polystyr FL	50V
	C18	76.5072	47 nF	10%	polyest FL	50V
	C19	73.5126	4.7 µF	20%	tantal	35V
	C20	76.5068	0.1 µF	1%	polystyr TB	63V
	C21	76.5059	2.2 nF	10%	polystyr FL	50V
	C22	73.5109	10 µF	20%	tantal	15V
	C23	76.5069	1 nF	10%	polyest	50V
	C24	76.5072	47 nF	10%	polyest FL	50V
	C25	73.5126	4.7 µF	20%	tantal	35V
	C26	76.5068	0.1 µF	1%	polystyr TB	63 V
	C27	76.5059	2.2 nF	10%	polystyr FL	50V
	C28	73.5109	10 µF	20%	tantal	15V
	C29	76.5069	1 nF	10%	polyest	50V
	C30	76.5070	10 nF	10%	polyest	50V
	C31	76.5072	47 nF	10%	polyest FL	50V
	C32	73.5126	4.7 µF	20%	tantal	35V
	C33	76.5068	0.1 µF	1%	polystyr TB	63V
	C34	76.5059	2.2 nF	10%	polystyr FL	50V
	C35	73.5109	10 µF	20%	tantal	15V
	C36	76.5059	2.2 nF	10%	polystyr FL	50V
	C37	76.5072	47 nF	10%	polyest FL	50V
	C38	73.5126	4.7 µF	20%	tantal	35V
	R1	80.5246	560 Ω	5%	carbon film	1/8W
	R2	80.5250	1.2 kΩ	5%	" "	1/8W
	R3	80.5266	27 kΩ	5%	" "	1/8W
	R4	80.5262	12 kΩ	5%	" "	1/8W
	R5	80.5273	100 kΩ	5%	" "	1/8W
	R6	80.5261	10 kΩ	5%	" "	1/8W
	R7	89.5009	4.7 kΩ	20%	NTC resistor	0.6W
	R8	80.5260	8.2 kΩ	5%	carbon film	1/8W

Storno

TYPE	NO.	CODE	DATA			
	R9	80.5257	4.7 kΩ	5%	carbon film	1/8W
	R10	80.5263	15 kΩ	5%	" "	1/8W
	R11	80.5277	220 kΩ	5%	" "	1/8W
	R12	80.5277	220 kΩ	5%	" "	1/8W
	R13	80.5262	12 kΩ	5%	" "	1/8W
	R14	80.5249	1 kΩ	5%	" "	1/8W
	R15	80.5246	560 Ω	5%	" "	1/8W
	R16	80.5250	1.2 kΩ	5%	" "	1/8W
	R17	80.5266	27 kΩ	5%	" "	1/8W
	R18	80.5262	12 kΩ	5%	" "	1/8W
	R19	80-5269	47 kΩ	5%	" "	1/8W
	R20	80.5261	10 kΩ	5%	" "	1/8W
	R21	89.5009	4.7 kΩ	20%	NTC resistor	0.6W
	R22	80.5260	8.2 kΩ	5%	carbon film	1/8W
	R23	80.5257	4.7 kΩ	5%	" "	1/8W
	R24	80.5269	47 kΩ	5%	" "	1/8W
	R25	80.5277	220 kΩ	5%	" "	1/8W
	R26	80.5277	220 kΩ	5%	" "	1/8W
	R27	80.5262	12 kΩ	5%	" "	1/8W
	R28	80.5249	1 kΩ	5%	" "	1/8W
	R29	80.5246	560 Ω	5%	" "	1/8W
	R30	80.5250	1.2 kΩ	5%	" "	1/8W
	R31	80.5266	27 kΩ	5%	" "	1/8W
	R32	80.5262	12 kΩ	5%	" "	1/8W
	R33	80.5273	100 kΩ	5%	" "	1/8W
	R34	80.5261	10 kΩ	5%	" "	1/8W
	R35	89.5009	4.7 kΩ	20%	NTC resistor	0.6W
	R36	80.5260	8.2 kΩ	5%	carbon film	1/8W
	R37	80.5257	4.7 kΩ	5%	" "	1/8W
	R38	80.5263	15 kΩ	5%	" "	1/8W
	R39	80.5277	220 kΩ	5%	" "	1/8W
	R40	80.5277	220 kΩ	5%	" "	1/8W
	R41	80.5262	12 kΩ	5%	" "	1/8W
	R42	80.5249	1 kΩ	5%	" "	1/8W
	R43	80.5246	560 Ω	5%	" "	1/8W
	R44	80.5250	1.2 kΩ	5%	" "	1/8W
	R45	80.5266	27 kΩ	5%	" "	1/8W
	R46	80.5262	12 kΩ	5%	" "	1/8W
	R47	80.5273	100 kΩ	5%	" "	1/8W
	R48	80.5261	10 kΩ	5%	" "	1/8W
	R49	89.5009	4.7 kΩ	20%	NTC resistor	0.6W

DUAL TONE ENCODER U95B0250 FS-G13

X401.912

TYPE	NO.	CODE	DATA
	R50	80.5260	8.2 kΩ 5% carbon film 1/8W
	R51	80.5257	4.7 kΩ 5% " " 1/8W
	R52	80.5263	15 kΩ 5% " " 1/8W
	R53	80.5277	220 kΩ 5% " " 1/8W
	R54	80.5277	220 kΩ 5% " " 1/8W
	R55	80.5262	12 kΩ 5% " " 1/8W
	R56	80.5249	1 kΩ 5% " " 1/8W
	R57	80.5264	560 Ω 5% " " 1/8W
	R58	80.5250	1.2 kΩ 5% " " 1/8W
	R59	80.5266	27 kΩ 5% " " 1/8W
	R60	80.5262	12 kΩ 5% " " 1/8W
	R61	80.5269	47 kΩ 5% " " 1/8W
	R62	80.5261	10 kΩ 5% " " 1/8W
	R63	89.5009	4.7 kΩ 20% NTC resistor 0.6W
	R64	80.5260	8.2 kΩ 5% carbon film 1/8W
	R65	80.5257	4.7 kΩ 5% " " 1/8W
	R66	80.5269	47 kΩ 5% " " 1/8W
	R67	80.5277	220 kΩ 5% " " 1/8W
	R68	80.5277	220 kΩ 5% " " 1/8W
	R69	80.5262	12 kΩ 5% " " 1/8W
	R70	80.5249	1 kΩ 5% " " 1/8W
	R71	80.5246	560 Ω 5% " " 1/8W
	R72	80.5250	1.2 kΩ 5% " " 1/8W
	R73	80.5266	27 kΩ 5% " " 1/8W
	R74	80.5262	12 kΩ 5% " " 1/8W
	R75	80.5273	100 kΩ 5% " " 1/8W
	R76	80.5261	10 kΩ 5% " " 1/8W
	R77	89.5009	4.7 kΩ 20% NTC resistor 0.6W
	R78	80.5260	8.2 kΩ 5% carbon film 1/8W
	R79	80.5257	4.7 kΩ 5% " " 1/8W
	R80	80.5263	15 kΩ 5% " " 1/8W
	R81	80.5277	220 kΩ 5% " " 1/8W
	R82	80.5277	220 kΩ 5% " " 1/8W
	R83	80.5262	12 kΩ 5% " " 1/8W
	R84	80.5249	1 kΩ 5% " " 1/8W
	R85	80.5250	1.2 kΩ 5% " " 1/8W
	T1-6	86.5039	10 kΩ potentiometer lin. 0.1W
	E1-18	99.5028	Diode OA200 or 1N4148
	E19	99B5009	LED diode HP5082-4440
	Q1-12	99.5117	Transistor 2N2924 or BC167A

Storno

TYPE	NO.	CODE	DATA
	LA	61.840	Tone Coil
	LB	61.1085	Tone Coil
	LC	61.928	Tone Coil
	LD	61.840	Tone Coil
	LE	61.1085	Tone Coil
	LF	61.1005	Tone Coil
	SW1 to SW6	47B5028	Toggle Switch JBT JMT123
	SW7	47B5041	Toggle Switch JBT JMT131
	SW	47B5044	Rotary Switch ELMA 12 pos. 3 decks
		49.5022	Knob for ELMA switch
		49.5035	Pointer for knob
		49.5045	Cap Insert for knob
		37B0011	Module Locking Cam
		20B5031	Screw for above
		24B5001	Washer for above
		28B5001	Retaining Pin for above
		41B5026	Receptacles (AMP)

DUAL TONE ENCODER U95B0250 FS-G13

X401.912

Storno

konstr./tegn.

godk.

komp.liste

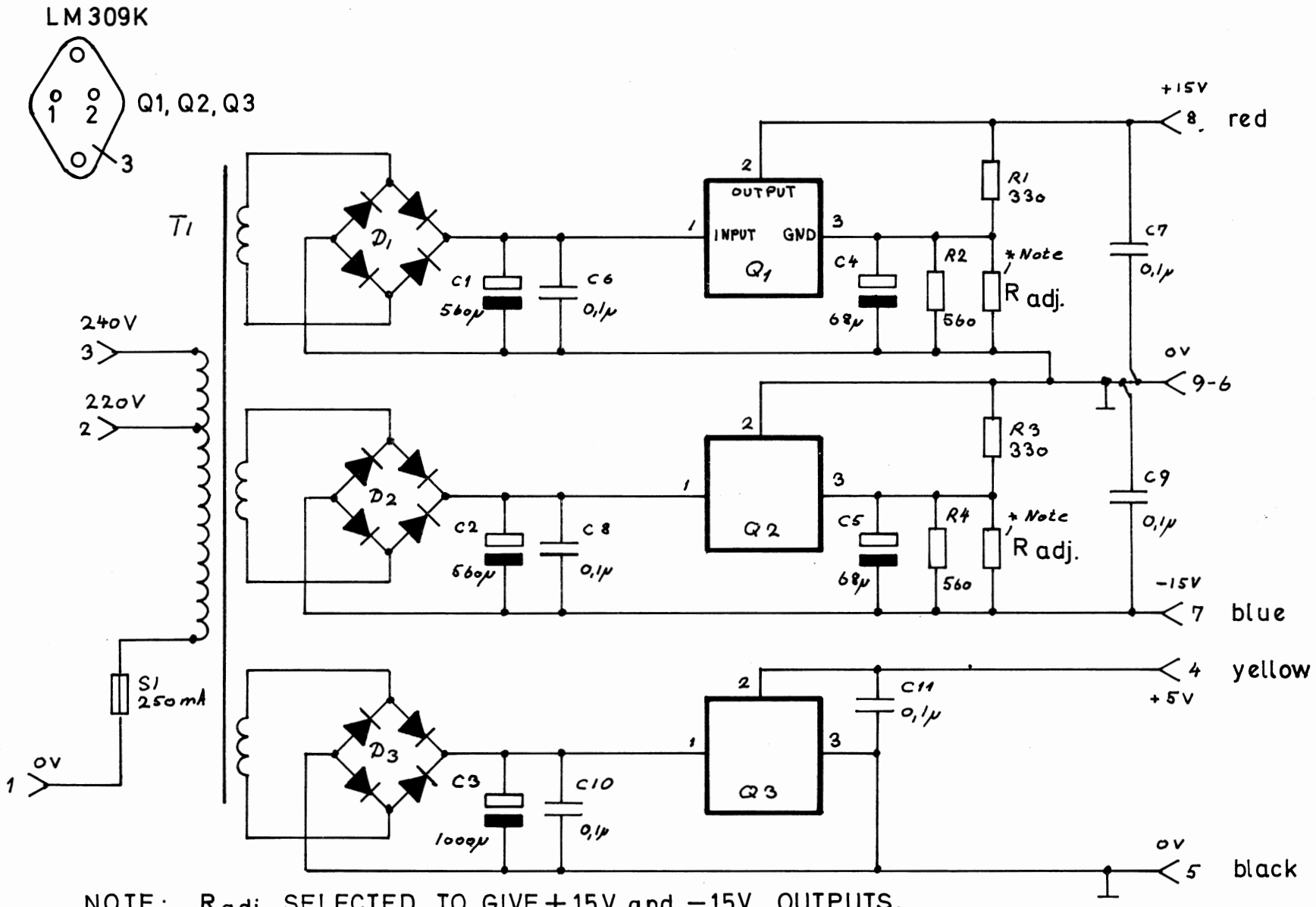
P.S. for TONE SIGNALING TEST GENERATOR

KODE

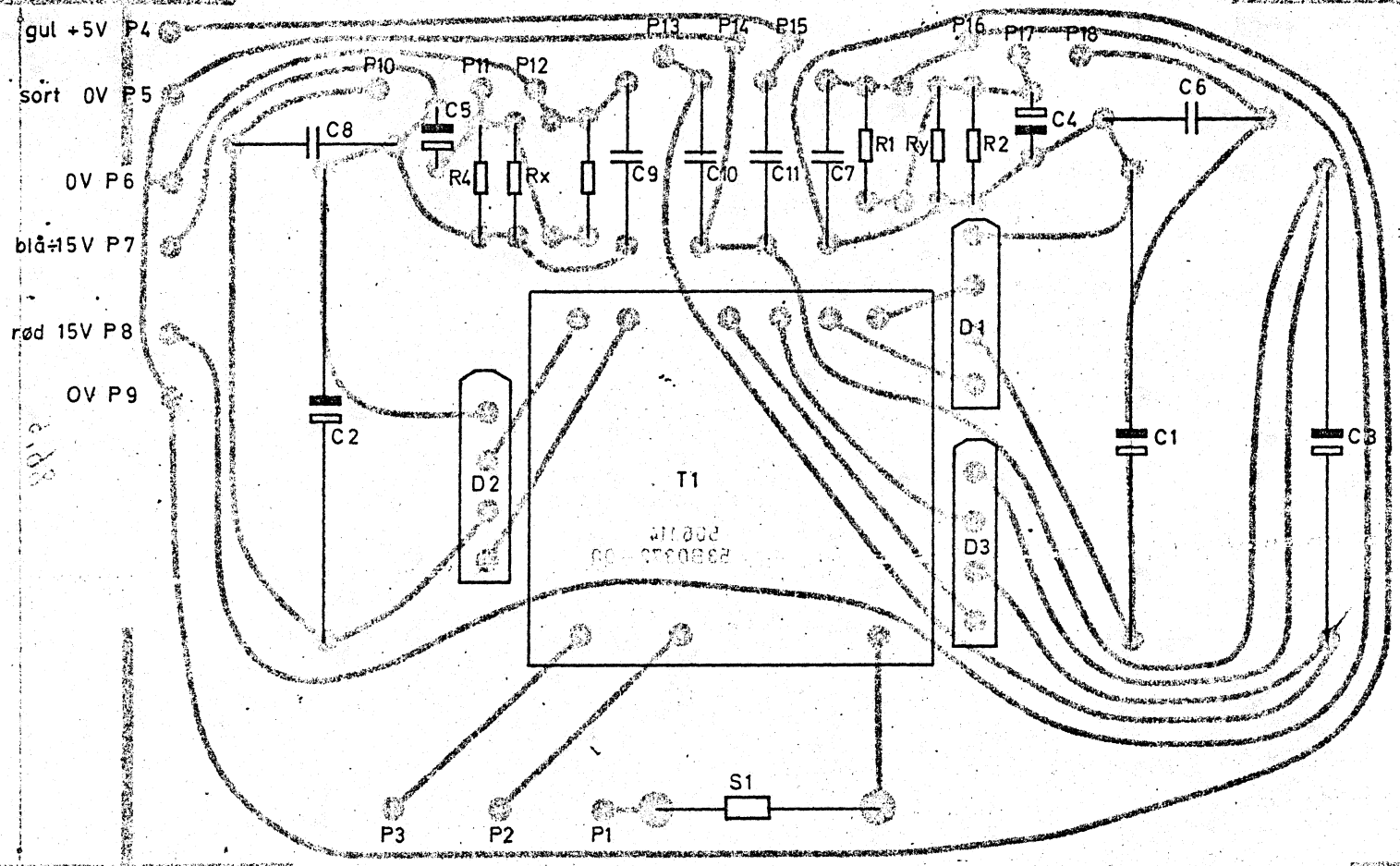
TEGN. NR.

506.436

A 4



NOTE: $R_{adj.}$ SELECTED TO GIVE +15V and −15V OUTPUTS.
VALUE FOR EACH RESISTOR approx. 3.3 kΩ.



POWER SUPPLY UNIT U95BO245

DATO: 13.4.73. PHB

KOMPONENTPLACERING 506.114/3

PREAMPLIFIER/LIMITER

Q-MULTIPLIER

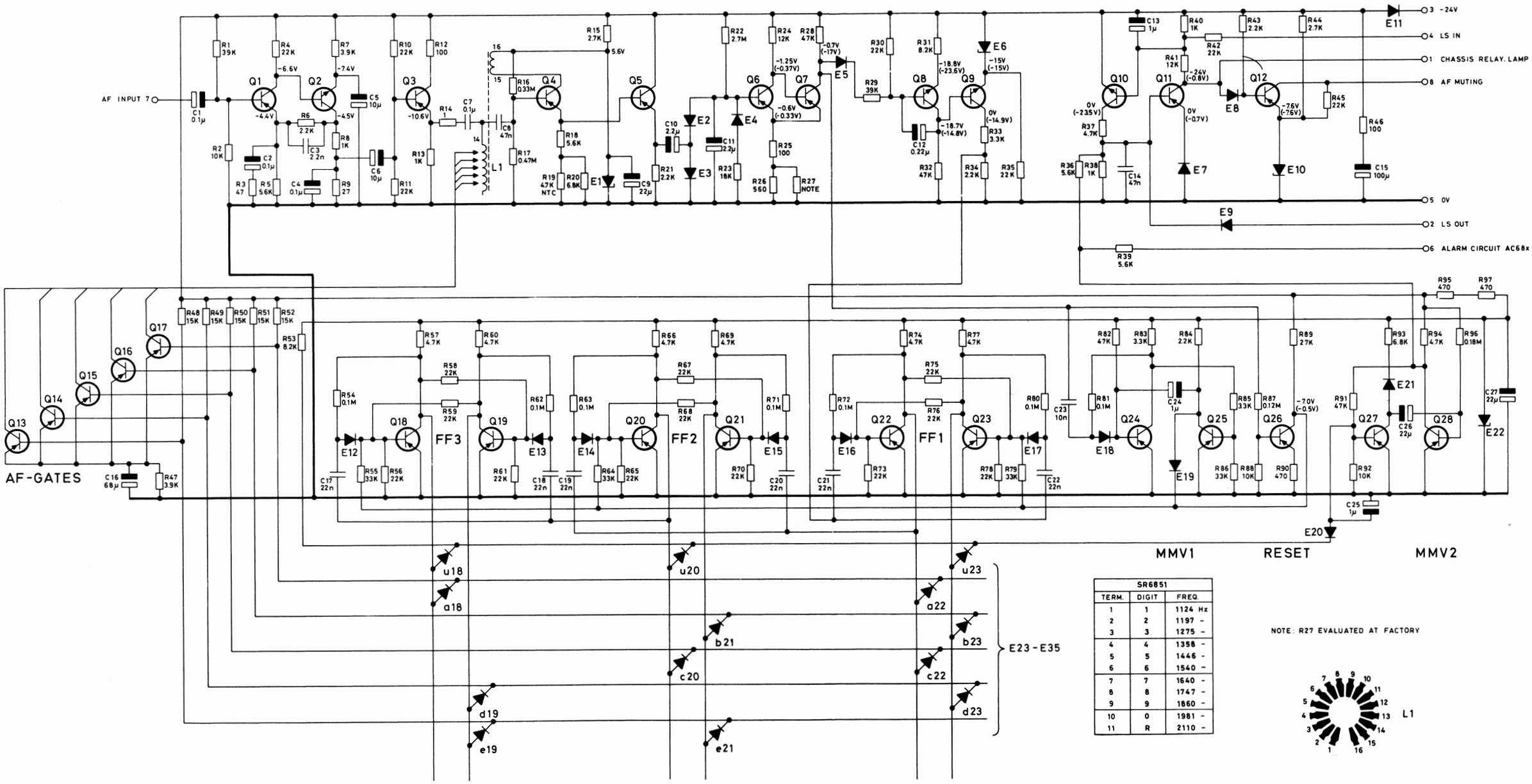
DETECTOR

SCHMITT TRIGGER

DELAY CIRCUIT

TRIGGER (BISTAB.)

MUTING CIRCUIT



SR6851		
TERM.	DIGIT	FREQ.
1	1	1124 Hz
2	2	1197 -
3	3	1275 -
4	4	1358 -
5	5	1446 -
6	6	1540 -
7	7	1640 -
8	8	1747 -
9	9	1860 -
10	0	1981 -
11	R	2110 -

NOTE: R27 EVALUATED AT FACTORY

TONE SEQUENTIAL RECEIVER
SEKVENSTONEMODTAGER

SR6851

D401.243

TYPE	NO.	CODE	DATA
	R60	80.5257	4.7 kΩ 5% carbon film 1/8W
	R61	80.5265	22 kΩ 5% " " 1/8W
	R62	80.5273	0.1 MΩ 5% " " 1/8W
	R63	80.5273	0.1 MΩ 5% " " 1/8W
	R64	80.5267	33 kΩ 5% " " 1/8W
	R65	80.5265	22 kΩ 5% " " 1/8W
	R66	80.5257	4.7 kΩ 5% " " 1/8W
	R67	80.5265	22 kΩ 5% " " 1/8W
	R68	80.5265	22 kΩ 5% " " 1/8W
	R69	80.5257	4.7 kΩ 5% " " 1/8W
	R70	80.5265	22 kΩ 5% " " 1/8W
	R71	80.5273	0.1 MΩ 5% " " 1/8W
	R72	80.5273	0.1 MΩ 5% " " 1/8W
	R73	80.5265	22 kΩ 5% " " 1/8W
	R74	80.5257	4.7 kΩ 5% " " 1/8W
	R75	80.5265	22 kΩ 5% " " 1/8W
	R76	80.5265	22 kΩ 5% " " 1/8W
	R77	80.5257	4.7 kΩ 5% " " 1/8W
	R78	80.5265	22 kΩ 5% " " 1/8W
	R79	80.5267	33 kΩ 5% " " 1/8W
	R80	80.5273	0.1 MΩ 5% " " 1/8W
	R81	80.5273	0.1 MΩ 5% " " 1/8W
	R82	80.5269	47 kΩ 5% " " 1/8W
	R83	80.5255	3.3 kΩ 5% " " 1/8W
	R84	80.5253	2.2 kΩ 5% " " 1/8W
	R85	80.5255	3.3 kΩ 5% " " 1/8W
	R86	80.5267	33 kΩ 5% " " 1/8W
	R87	80.5274	0.12 MΩ 5% " " 1/8W
	R88	80.5261	10 kΩ 5% " " 1/8W
	R89	80.5266	27 kΩ 5% " " 1/8W
	R90	80.5245	470 Ω 5% " " 1/8W
	R91	80.5269	47 kΩ 5% " " 1/8W
	R92	80.5261	10 kΩ 5% " " 1/8W
	R93	80.5259	6.8 kΩ 5% " " 1/8W
	R94	80.5257	4.7 kΩ 5% " " 1/8W
	R95	80.5245	470 Ω 5% " " 1/8W
	R96	80.5276	0.18 MΩ 5% " " 1/8W
	R97	80.5245	470 Ω 5% " " 1/8W
SR685	L1	61.1129	Tone coil
SR6851	L1	61.1097	Tone coil CCIR
	E1	99.5114	Zenerdiode 5.6V 5% 1/4W
	E2	99.5136	Diode AA119
	E3	99.5136	Diode AA119
	E4	99.5028	Diode 1N914
	E5	99.5028	Diode 1N914
	E6	99.5042	Zenerdiode 9.1V 5% 1/4W

Storno

TYPE	NO.	CODE	DATA
	E7	99.5020	Diode 1N4004
	E8	99.5020	Diode 1N4004
	E9	99.5136	Diode AA119
	E10	99.5075	Zenerdiode 7.5 5% 1/4W
	E11	99.5020	Diode 1N4004
	E12	99.5028	Diode 1N914
	E13	99.5028	Diode 1N914
	E14	99.5028	Diode 1N914
	E15	99.5028	Diode 1N914
	E16	99.5028	Diode 1N914
	E17	99.5028	Diode 1N914
	E18	99.5028	Diode 1N914
	E19	99.5028	Diode 1N914
	E20	99.5028	Diode 1N914
	E21	99.5028	Diode 1N914
	E22	99.5146	Zenerdiode 6.8V 5% 1/4W
	E23	99.5028	Diode 1N914
	E24	99.5028	Diode 1N914
	E25	99.5028	Diode 1N914
	E26	99.5028	Diode 1N914
	E27	99.5028	Diode 1N914
	E28	99.5028	Diode 1N914
	E29	99.5028	Diode 1N914
	E30	99.5028	Diode 1N914
	E31	99.5028	Diode 1N914
	E32	99.5028	Diode 1N914
	E33	99.5028	Diode 1N914
	E34	99.5028	Diode 1N914
	E35	99.5028	Diode 1N914
	Q1	99.5144	Transistor BC214L
	Q2	99.5143	Transistor BC107
	Q3	99.5144	Transistor BC214L
	Q4	99.5144	Transistor BC214L
	Q5	99.5144	Transistor BC214L
	Q6	99.5144	Transistor BC214L
	Q7	99.5144	Transistor BC214L
	Q8	99.5143	Transistor BC107
	Q9	99.5143	Transistor BC107
	Q10	99.5143	Transistor BC107
	Q11	99.5144	Transistor BC214L
	Q12	99.5142	Transistor AC128

TONE SEQUENTIAL RECEIVER
SEKVENSTONEMODTAGER

SR685,
SR6851

X401.285

TYPE	NO.	CODE	DATA	
SR685		10.2521	Sequential Tone Receiver	
SR6851		10.2522	Sequential Tone Receiver CCIR	
	C1	73.5089	0.1 µF 20% Tantal	35V
	C2	73.5089	0.1 µF 20% Tantal	35V
	C3	76.5059	2.2 nF 10% polyest. FL	50V
	C4	73.5089	0.1 µF 20% Tantal	35V
	C5	73.5109	10 µF 20% "	16V
	C6	73.5109	10 µF 20% "	16V
	C7	76.5068	0.1 µF 1% polystyr TB	63V
	C8	76.5072	47 nF 10% polyest. FL	50V
	C9	73.5127	22 µF 20% Tantal	16V
	C10	73.5102	2.2 µF 20% Tantal	35V
	C11	73.5102	2.2 µF 20% Tantal	35V
	C12	73.5118	0.2 µF 20% Tantal	35V
	C13	73.5114	1 µF 20% Tantal	35V
	C14	76.5072	47 nF 10% polyest. FL	50V
	C15	73.5071	100 µF -10 +100% elco	35V
	C16	73.5106	68 µF 20% Tantal	15V
	C17	76.5071	22 nF 10% polyest. FL	50V
	C18	76.5071	22 nF 10% " FL	50V
	C19	76.5071	22 nF 10% " FL	50V
	C20	76.5071	22 nF 10% " FL	50V
	C21	76.5071	22 nF 10% " FL	50V
	C22	76.5071	22 nF 10% " FL	50V
	C23	76.5070	10 nF 10% " FL	50V
	C24	73.5114	1 µF 20% Tantal	35V
	C25	73.5114	1 µF 20% "	35V
	C26	73.5127	22 µF 20% "	16V
	C27	73.5127	22 µF 20% "	16V
	R1	80.5268	39 kΩ 5% carbon film	1/8W
	R2	80.5261	10 kΩ 5% " "	1/8W
	R3	80.5233	47 Ω 5% " "	1/8W
	R4	80.5265	22 kΩ 5% " "	1/8W
	R5	80.5258	5.6 kΩ 5% " "	1/8W
	R6	80.5253	2.2 kΩ 5% " "	1/8W
	R7	80.5256	3.9 kΩ 5% " "	1/8W
	R8	80.5249	1 kΩ 5% " "	1/8W
	R9	80.5230 1	27 Ω 5% " "	1/8W
	R10	80.5265	22 kΩ 5% " "	1/8W
	R11	80.5265	22 kΩ 5% " "	1/8W
	R12	80.5237	100 Ω 5% " "	1/8W
	R13	80.5249	1 kΩ 5% " "	1/8W
	R14	80.5213	1 Ω 5% " "	1/8W
	R15	80.5254	2.7 kΩ 5% " "	1/8W
	R16	80.5279	0.33 MΩ 5% " "	1/8W
	R17	80.5281	0.47 MΩ 5% " "	1/8W

Storno

TYPE	NO.	CODE	DATA	
	R18	80.5258	5.6 kΩ 5% carbon film	1/8W
	R19	89.5009	4.7 kΩ 20% NTC	0.6W
	R20	80.5259	6.8 kΩ 5% carbon film	1/8W
	R21	80.5253	2.2 kΩ 5% " "	1/8W
	R22	80.5490	2.7 MΩ 10% " "	1/4W
	R23	80.5264	18 kΩ 5% " "	1/8W
	R24	80.5262	12 kΩ 5% " "	1/8W
	R25	80.5237	100 Ω 5% " "	1/8W
	R26	80.5246	560 Ω 5% " "	1/8W
	R27	80.52xx	Adjusted/tilpasset	
	R28	80.5269	47 kΩ 5% carbon film	1/8W
	R29	80.5268	39 kΩ 5% " "	1/8W
	R30	80.5265	22 kΩ 5% " "	1/8W
	R31	80.5260	8.2 kΩ 5% " "	1/8W
	R32	80.5269	47 kΩ 5% " "	1/8W
	R33	80.5255	3.3 kΩ 5% " "	1/8W
	R34	80.5253	2.2 kΩ 5% " "	1/8W
	R35	80.5265	22 kΩ 5% " "	1/8W
	R36	80.5258	5.6 kΩ 5% " "	1/8W
	R37	80.5257	4.7 kΩ 5% " "	1/8W
	R38	80.5249	1 kΩ 5% " "	1/8W
	R39	80.5258	5.6 kΩ 5% " "	1/8W
	R40	80.5249	1 kΩ 5% " "	1/8W
	R41	80.5262	12 kΩ 5% " "	1/8W
	R42	80.5265	22 kΩ 5% " "	1/8W
	R43	80.5253	2.2 kΩ 5% " "	1/8W
	R44	80.5254	2.7 kΩ 5% " "	1/8W
	R45	80.5265	22 kΩ 5% " "	1/8W
	R46	80.5237	100 Ω 5% " "	1/8W
	R47	80.5256	3.9 kΩ 5% " "	1/8W
	R48	80.5263	15 kΩ 5% " "	1/8W
	R49	80.5263	15 kΩ 5% " "	1/8W
	R50	80.5263	15 kΩ 5% " "	1/8W
	R51	80.5263	15 kΩ 5% " "	1/8W
	R52	80.5263	15 kΩ 5% " "	1/8W
	R53	80.5060	8.2 kΩ 5% " "	1/8W
	R54	80.5073	0.1 MΩ 5% " "	1/8W
	R55	80.5267	33 kΩ 5% " "	1/8W
	R56	80.5065	22 kΩ 5% " "	1/8W
	R57	80.5257	4.7 kΩ 5% " "	1/8W
	R58	80.5265	22 kΩ 5% " "	1/8W
	R59	80.5265	22 kΩ 5% " "	1/8W

TONE SEQUENTIAL RECEIVER
SEKVENSTONEMODTAGER

X401.285

SR685,
SR6851

TYPE	NO.	CODE	DATA
	Q13	99.5144	Transistor BC214L
	Q14	99.5144	Transistor BC214L
	Q15	99.5144	Transistor BC214L
	Q16	99.5144	Transistor BC214L
	Q17	99.5144	Transistor BC214L
	Q18	99.5144	Transistor BC214L
	Q19	99.5144	Transistor BC214L
	Q20	99.5144	Transistor BC214L
	Q21	99.5144	Transistor BC214L
	Q22	99.5144	Transistor BC214L
	Q23	99.5144	Transistor BC214L
	Q24	99.5144	Transistor BC214L
	Q25	99.5144	Transistor BC214L
	Q26	99.5144	Transistor BC214L
	Q27	99.5144	Transistor BC214L
	Q28	99.5144	Transistor BC214L

Storno

TYPE	NO.	CODE	DATA

TONE SEQUENTIAL RECEIVER
SEKVENSTONEMODTAGER

SR685,
SR6851

X401.285