Sailor

Sailor

INSTRUKTIONSBOG FOR
SAILOR RM2150/51

INSTRUCTION BOOK FOR
SAILOR RM2150/51

INSTRUKTIONSBUCH FÜR
SAILOR RM2150/51

INSTRUCTIONS POUR
SAILOR RM2150/51

INSTRUCCIONES PARA
SAILOR RM2150/51

A/S S. P. RADIO · AALBORG · DENMARK

S. P. RADIO A/S - SAILOR MARINERADIO

PORSVEJ 2 . DK-9200 AALBORG SV . DENMARK . TELEPHONE 98 18 09 99 . TELEX 69 789 . TELEFAX 98 18 67 17 . REG. NO. 61 531

FOR YOUR INFORMATION

We regret that the final instruction manual is not yet ready and therefore send you a preliminary instruction manual.

If you wish to receive the final edition please fill in the following details and return the card to us. You will then receive the final instruction manual as soon as it is ready.

Nr. 10225

Please send me a complete instruction manual for SAILOR equipment

type: _____ serial No. _____

The set will be used in the following environment:

(name and type of ship etc.) _____

_____

Instruction manual to be sent to:

Company: _____

Name: _____

Street/P. O. Box: _____

City: _____

Country: _____

When you have filled in this card please return it to:

S. P. Radio A/S
After-sale Service Department
Porsvej 2
9200 Aalborg SV
Denmark

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CONTENTS

1. INTRODUCTION.

SAILOR Compact HF SSB RM2150/51 is the DSC and TELEX scanning receiver with built–in DSC and TELEX modem.

It has been developed on the basis of S.P.Radio`s many years of experience with short wave communication equipment.

It has the same high reliability as all SAILOR equipment is known for.

It has been constructed so that it fits in with other units in the SAILOR Compact Programme 2000.

SAILOR HF SSB PROGRAMME 2000 CONSISTS OF THE FOLLOWING UNITS:

RE2100:	Control unit with integral receiver and exciter.
T2130:	250W PEP SSB transmitter with integral power supply for RE2100. Supply voltage 24V DC.
AT2110:	250W PEP aerial coupler for outdoor use.
N2160:	12V DC power supply for T2130.
N2161:	110/220/240V AC, 50 Hz power supply for T2130.
N2165:	AC/DC power supply for RM2150/RM2151

1.1. GENERAL DESCRIPTION

SAILOR HF SSB RM2150/51 is an all solid state constructed microcomputer controlled SSB short wave radio modem.

SAILOR HF SSB RM2150/51 covers the frequency range 100 kHz to 30 MHz.

SAILOR HF SSB RM2150/51 is a scanning receiver with integral DSC and TELEX modem.

SAILOR HF SSB RM2150/51 has a special serial input/output (SP-BUS) enabling RM2150/51 to communicate with the other units in the Compact 2000 programme.

SAILOR HF SSB RM2150/51 is fully synthesized and has a high stability reference oscillator (TCXO).

SAILOR HF SSB RM2150/51 has an easy-to-read display with controlable backlight.

SAILOR HF SSB RM2150/51 has a push-button keyboard offering an attractive tactile feeling and a safe finger-guide in the metal front. The keyboard is fitted with night-illumination of the lettering.

SAILOR HF SSB RM2150/51 is a fully automatic ARQ telex unit with HF SSB RE2100 and the terminal equipment H2098A/H2099/H1253B. The terminal equipment can be replaced by a personal computer.

SAILOR HF SSB RM2150/51 is a fully automatic DSC unit with HF SSB RE2100.

SAILOR HF SSB RM2150/51 has a user-controlled address book with 100 quick-select complete DSC calls.

SAILOR HF SSB RM2150/51 has a read-out in alpha numerical display of received DSC information. Printer not necessary.

SAILOR HF SSB RM2150/51 has easy to understand menu-controlled DSC calls.

1.2 TECHNICAL DATA

SYSTEMS SPECIFICATIONS.

Communication protocol	DSC: CCIR Rec. 493-4(class A), 541-3 Telex: CCIR Rec. 625, 476-3, 490, 491(1978), CCITT Rec. 130.
Other Rec's:	In compliance with ETSI, CEPT, MPT, FTZ and FCC.
Modes of operation:	ARQ, FEC, SELEC, and DSC.
Line signal:	Two tone keyed, 100 baud synchronous. DSC: 10 unit code, 7 bits information and 3 bits parity. TELEX: 7 unit code, constant 4B/3Y ratio.
Call codes:	DSC: 9 digits station inditification. TELEX: 5 digits and 9 digits with dual ship ID-codes for individual and group calls.
Keys:	All keys are back- illuminated.
Display:	" lines 24 characters LCD display with adjustable backlight and view angle.
Acoustic Alarm:	DISTRESS and URGENCY alert, alert for other type of received calls. Warning for wrong or missing entries.
Scanning facilities:	10 scan programmes containing up to 6 different frequencies.
Dialing directory:	50 registers for name (11 characters) and telephone no. (16 digits). 50 registers for call station data, selfcall no. (9 digits), position and call frequencies.
Call stacks:	The 5 last received ordinary calls. The 20 last received DISTRESS calls.
Program memory:	384 kByte main memory in EPROM. 512 kByte volatile RAM. 64 kByte Non-volatile RAM (battery back-up). 32 kByte Non-volatile EEPROM.

1.2 TECHNICAL DATA cont.:

RECEIVER SPECIFICATIONS.

Receive System:	Double conversion super heterodyne 1st IF 70 Mhz. 2nd IF 10,73 Mhz.
Frequncy Range:	100 Khz to 29999,9 Khz.
Antenna impedance:	50 Ohm
Frequency Stability:	Better than 0.39 ppm.
IF selectivity:	Passband ripple better than 1 dB. 3 dB bandwidth at +/-150 Hz to +/- 350 Hz. 60 dB bandwidth at +/- 750 hz.
Sensitivity:	DSC calling sensitivity -18dB/V. TELEX calling sensivity. -18dB/V. (CEPT metod of test.)
Adjacent Channel:	40 dB at +/- 500Hz
Selectivity:	(CEPT metod of test).
Automatic gain control:	Less than 2 db variation of detector output level for 90dB input signal varition (0 dB/V to 90 dB/V). Fast attack time and slow decay time.
Blocking:	Better than 55 dB for unwanted signals in the band 1 kHz to 3 kHz away from the wanted signal. Better than 75 dB for unwanted signals more than 3 kHz away from the wanted signal. (CEPT metod of test).
Co-channel rejection:	Less than 6 dB. (CEPT metod of test).
Intermodulation:	IP3 better than 8 dBm. (CEPT metod of test).
Spurious and IF Rejection:	Better than 70 db. (CEPT metod of test).
Spurious Emission:	Better than 1nW at antenna connector.
Audio Power:	1 Watt into 8 ohm, less than 10% distor.

1.2 TECHNICAL DATA cont.:

LOCAL INTERFACE.

Printer interface:	Parallel centronics.
Remote control:	CCITT Rec V.10 SPECIAL (RS-423, T-BUS), multidrop addressing for control of transmitter and data equipment control/polling.
Navigator interface:	NMEA 0183.
Terminal interface:	CCITT Rec. V.24/V.28 (rs-232C)
External alarm:	Alarm output, rs-410 type N (open drain).

LINE INTERFACE

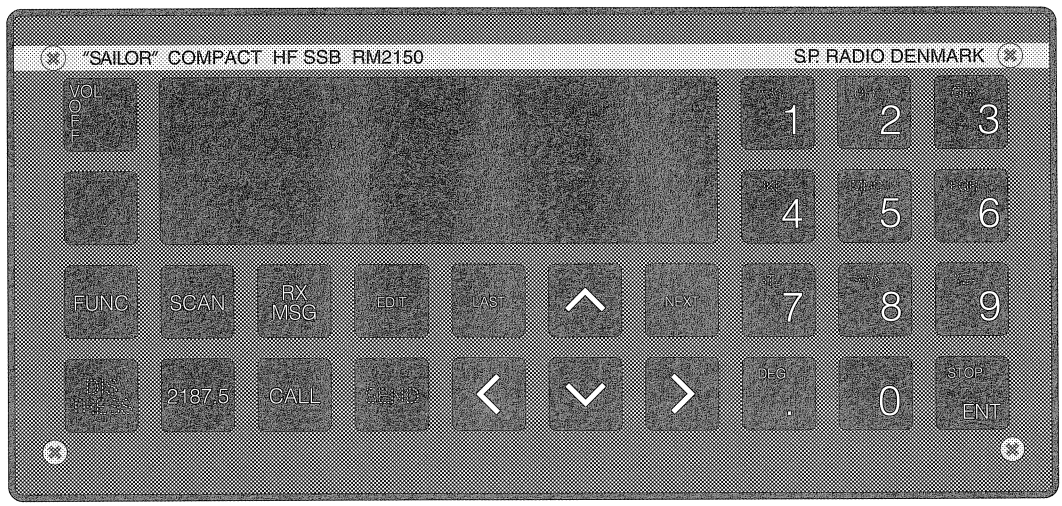
Tone frequencies:	1700+/-85 Hz, accaracy within 0.5 Hz.
Modulation:	Phase-continous AFSK keying.
Frequency stability:	Better than 0.1 Hz.
Filter tracking:	Adaptive tracking within +/-85 Hz.
Decision filtering:	Bit-slicing with multipath correction.
Demodulation filter:	4 pole bessel.
RX-tone input:	Strap selectable internal/external. +10 dBm to -20 dBm, continious adjustable, 600 Ohm balanced.
RX dynamic range:	35 dB.
TX-tone output:	+10dBm to -20 dBm, continious adjustable, 600 Ohm balanced.
Free-signal detection:	Automatic detection and handling of free-signals.
Radio control input:	RS-410 type N.
Radio control output:	RS-410 type N (open drain).

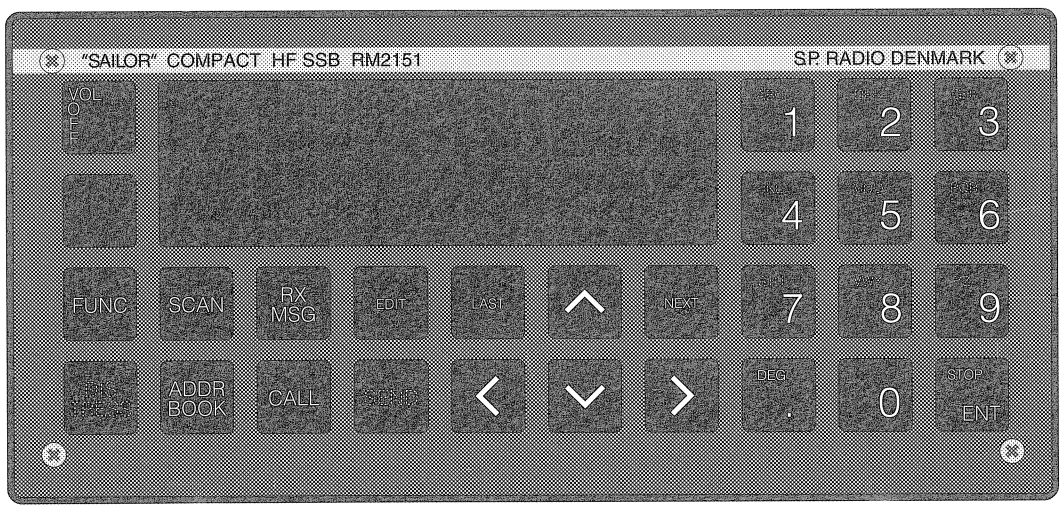
1.2 TECHNICAL DATA cont.:

GENERAL.

DC power source:	+18Vdc +/-5%, 0.5 Amp. -18Vdc +/-5%, 0.2 Amp. +9Vdc +/-5%, 0.5 Amp.
Ambient temperature:	-15˚C to 55˚C operating. -20˚C to 70˚C storage.
Relative humidity:	95% non-condensing.
Vibration:	IEC, CEPT and MPT 1204.
Dimension:	H*W*D, 98 mm * 210 mm * 300 mm.
Weight:	3.7 Kg.

1.3. CONTROLS





VOL OFF

Volumen control and on/off switch for the mains.

FUNC

Access to the functions <Display>,<Pos>,<Stns>,<Time>,
<Test>,<Options>,<Print> and <Sun>.

<Display>: Give access to the display set up menu.
<Pos>: Give access to the postion set menu.
<Stns>: Give access to key data in the station table.
<Time>: Give access to set the internal clock.
<Test>: Give access to the internal/external test menu.
<Options>: Give access to the radiomodem set up menu.
<Print>: Give access to a printer set up and a print menu.
<Sun>: Give access to key in the number of sun-spots, used in the MUF-program.

DIS TRESS

Give access to the distress menu or
transmits the distress signal when **distress** and **send** are activated simultaneously.

1.3. CONTROLS cont.:

Give acces to the scan menu or to the scan edit menu when **scan** and then the **edit** key is activated.

Give access to make a DSC call to a telecom subscriber with data from the Address book or to edit the address book contents when **addr book** and then the **edit** key is activated

Give access to a message book of received DSC calls, distress as well as ordinary calls.
MSG

Give access to make a DSC call to a telecom. subscriber with keyed in data or to make any other DSC call when **call** and then the **edit** key is activated.
A distress relay call can be compssed when **call** and then the **edit** key is activated.

Used in combination with other keys.
Scan and **edit** give access to edit a scan programme.
Addr book and **edit** give access to edit data storred in the address book.
Call and **edit** give access to compose a DSC call of any kind.

When activated the DSC call will be transmitted.
Transmits the distress signal when **distress** and **send** are activated simultaneously.

Next is used to activate the next display menu, **last** is used to activate the previous display menu.

When activated the cursor will move in counter clock-wise direction. If the cursor is placed in a writing -space and the left arrow is used, the cursor will move one step to the left and the information will be deleted.

When the up/down arrow show in the display menu the up/down key can be used to extend the display menu.

When the up/down arrow show in the display menu the up/down key can be used to extend the display menu.

When activated the cursor will move in the clock-wise direction.

Digits from o to 9 or letters from A to Z.

Terminate a key-in sequence and stop a transmission of a Distress or ordinary DSC call.

Set the decimal point or the deg sign.

1.4. PRINCIPLE OF OPERATION AND BLOCK DIAGRAM

MAIN PROCESSOR UNIT

FILTER UNIT

DISPLAY UNIT

This unit contains an alpha-numerical display of 2*24 characters.

SYNTHESIZER UNIT

This unit contains all frequency generating parts.
The reference oscillator which is a temperature compensated crystal oscillator (TCXO) with a frequency of 10,73152 MHz.
The receiver needs two LO-signals. These signals are generated in two separate PLL's, one having output frequencies from 70 MHz to 100 MHz and the other having output frequency of 59,26912 MHz.
The synthesizer which covers from 70 MHz to 100 MHz is a fractional synthesizer with a resolution of 10 Hz. This PLL is used as LO-injection to the first mixer at the receiver front end.

RECEIVER FRONT END UNIT

This unit contains input protection circuit, input filters, 1st mixer and 70 MHz IF filter.
The input filter is a mixture of lowpass, highpass and bandpass filter to obtain max. performance in the entire band from 100 kHz to 30 MHz.
The mixer is a FET mixer with high level LO-injection to give the mixer good high signal quality. This mixer converts the incoming radio signal to a 70 MHz IF signal. The mixer is followed by a 70 MHz bilitic quartz filter with a bandwith of 15 kHz.

RECEIVER UNIT

This unit contains all necessary circuits to convert the 70 MHz IF signal to an audio signal.
The 70 MHz IF signal from the front end is fed to the second mixer which converts the signal to a 10,73 MHz second IF signal. This 2nd IF signal is fed through a high order monolitic quartz filter to the input of the 10,73 MHz IF amplifier. The gain of this amplifier is regulated from the AGC amplifier/detector. The IF amplifier is followed by a ceramic filter to reduce the wideband noise. From the ceramic filter the signal is fed to the signal detector, which operates as an SSB demodulator. The AF signal from the demodulator is fed through a lowpass/highpass filter unit to an amplifier from which the output signal is about 0 dBm/ 600 ohm.

POWER UNIT

This unit produces all the necessary supply voltages for the modules in RM2150/51.
The input voltages from N2165 is +18V, -18V and +9V. These voltages pass through seven series regulators to produce the necessary supply voltages to RM2150/51.

RF in/out
to T2130

RECEIVER FRONT END (MODULE 2)

Mute
Rx/Tx Switch
Highpass Filter
Shift reg.
0.385MHz Lowpass Filter
0.385-1.6MHz Bandpass Filter
1.6-4.5MHz Bandpass Filter
4.5-9MHz Bandpass Filter
9-18MHz Bandpass Filter
18-30MHz Bandpass Filter
30MHz Lowpass Filter
1.st Mixer
1.st LO Buffer
70MHz Filter
LO1 Rx 70-100 MHz

RECEIVER (MODULE 1)

2.nd Mixer
2.nd Lo-buffer
Telex Filter
IF AMP
F_{LO2} =59.28912MHz
AGC Buffer
Hang Time AGC
Hang Time AGC
AGC Detector
AGC AMP
300kHz BW
IF AMP
Demodulator
Fc=10.73152MHz
A0 A1 A2 A3 A4 A5 A6 A7
Shift Register
1950Hz LP Filter
1450Hz HP Filter
600 ohm Buffer

KEYBOARD UNIT (MODULE 6)

DISPLAY UN

+5.7V
LCD DISPLAY 2 x 24 CHARACTERS
LED BACKLIGHT
VIEWING AN
D/A Converter
D/A Converter
HEX REGISTER
ON/OFF
SPEAKER VOL
-BATT
+5.7V
BL FROM M PROCES

POWER UNIT (MODULE 8)

+9V
-18V
+18V
+5VA
+5VB
+5.5V BL
-15VA
-15VB
+15VA
+15VB

SYNTHESIZER (MODULE 3)

Rx
TCXO
Buffer
2nd Divider
Reference Divider
Phase detector
Loop Filter
Control logic
Reset
VAPI
Sample/Hold
100-92.5MHz VCO I
92.5-85MHz VCO II
85-77.5MHz VCO III
77.5-70MHz VCO IV
VCO-Buffer
LO-Buffer
Rx/Tx Switch
Rx
Tx
Prescaler buffer
Prescaler
Current Mirror
A/D Converter
Programmed divider
1/n Curr. Logic
Fraction register
Adder overflow
Sum latch clock
Shift reg.
Modulus Control Logic
2nd Divider
Reference Divider
Phase detector
Loop Filter
VCO 1
VCO 2
VCO-Buffer
LO-Buffer
Rx
Prescaler buffer
Programmed divider
Prescaler

+18V
-9V
+18V

POWER SUPPLY on/off
+18V
-9V
+18V
LINE IN
LINE OUT
EXT. SPEAKER
RX MUTE
TRANS-MITTER CONTR.

FILTER BOARD (MODULE 5)

Tx MOD
FcK 4785Hz +-80Hz
Rx mix
Mix 0
RX/TX
W1
RX OUT
GAIN
OVER LOAD
TX EN
W6
Tx out
Tx level
HTX
SPKR CLK
SPKR GATE
Tx OUT
+15V
Fo = 3170Hz
Mark filter
Fo = 3000Hz
Space filter
PETIME
-5V ANL
-7.5V
DEMOD
SELECT
HTX
SPEAKERGATE
TX EN
RX/TX
LATCH
SELECT

RECEIVER (MODULE 1)

Telex Filter
IF AMP
FLO2 =59.28912MHz
300kHz BW
IF AMP
Demodulator
Fc=10.73152MHz
1950Hz LP Filter
1450Hz HP Filter
600 ohm Buffer
AGC Buffer
AGC Detector
AGC AMP
A0 A1 A2 A3 A4 A5 A6 A7
Shift Register
Hang Time AGC
Hang Time AGC

KEYBOARD UNIT (MODULE 6)

POWER UNIT (MODULE 8)

+9V
-18V
+18V
+5VA
+5VB
+5.6V BL
-15VA
-15VB
+15VA
+15VB

DISPLAY UNIT (MODULE 7)

+5.7V
LCD DISPLAY 2 x 24 CHARACTERS
8 BIT DATA
RW
RS
LED BACKLIGHT
D/A Converter
VIEWING ANGLE
D/A Converter
DELAY 1
E
HEX REGISTER
8 BIT DATA
ARDY
DELAY 2
ON/OFF
-BATT
SPEAKER VOL
+5.7V
-5.7V
BL FROM MAIN PROCESSOR
DISPCS
D/ACS

MAIN PROCESSOR (MODULE 4)

WATCH DOG
MICRO-PROCES-SOR 80188
16 BIT ADDRESS BUS
DEMULTI-PLEXER
PROM
EEPROM
SRAM
BATTERY SUPPLY
MULTI-PLEXER
DRAM
8 BIT DATA BUS
TIMER
I/O ADDRESS DECODER
PROGRAMABLE INTERVAL TIMER
I/O BUFFER
DISPLAY
I/O BUFFER
KEYBOARD
I/O BUFFER
SPI
I/O BUFFER
FILTER
DATA
CLOCK
RECEIVER
FRONT END
SYNTHESIZER
CLOCK
LED INDICSTORS
STRAP FIELD
PARALLEL INTERFACE
2 X USART
USART
I/O BUFFER
SP-BUS INTERFACE
SERIAL INTERFACE
OPTO-COUPLER
SP-BUS
RS-232C CONSOLE
NMEA INTERFACE
PRINTER
TO DISPLAY
BL
+15VA
-15VA
+5VA
-5.7V Regulator
VCC

FILTER BOARD (MODULE 5)

Tx MOD
FcK 4785Hz +-80Hz
Rx mix
Mix 0
Fo = 3170Hz
Mark filter
Fo = 3000Hz
Space filter
-5V ANL
-7.5V
+15VA
-15VA
+5VA
DEMOD
SELECT
5
PETIME
RX/*TX
RX OUT
TX EN
OVER LOAD
GAIN
W1
W6
Tx out
HTX
SPKR CLK
SPKR GATE
Tx level
Tx OUT
+15V
AF TO AMP
VOL. CONTROL
AF FROM AMP
INTERNAL LOUDSPEAKER
POWER SUPPLY on/off
+18V
-9V
+18V
LINE IN
LINE OUT
EXT. SPEAKER
RX MUTE
3
TRANS-MITTER CONTR.
9
HTX
SPEAKERGATE
TX EN
RX/TX
9
LATCH
SELECT
5

LO-Buffer
Rx/Tx Switch
Rx
Tx
Prescaler
Programmed divider
Modulus Control Logic
Rx

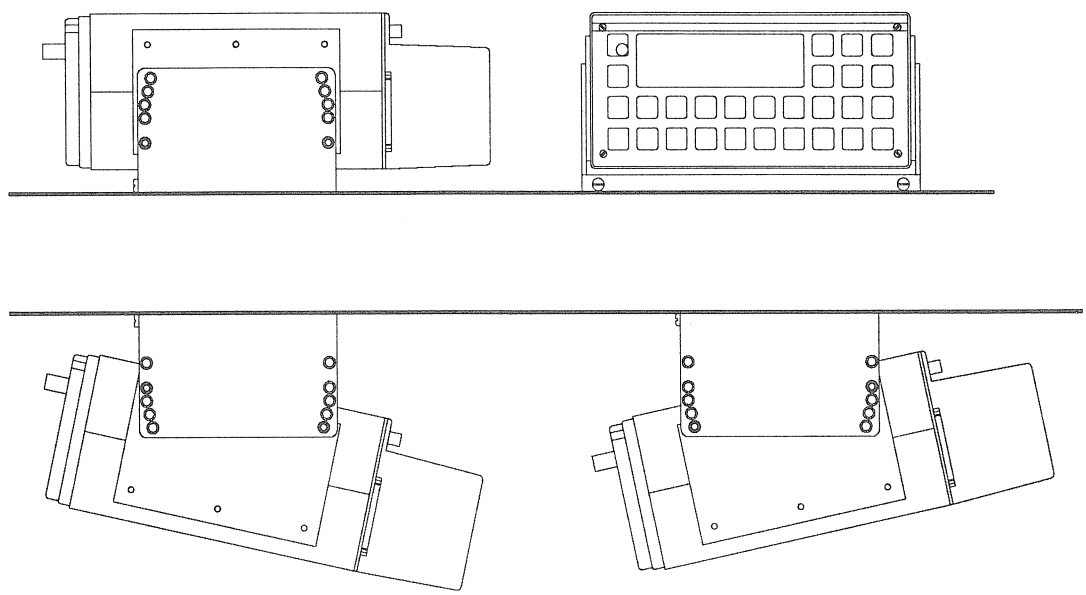
BLOCK DIAGRAMME

CONTENTS

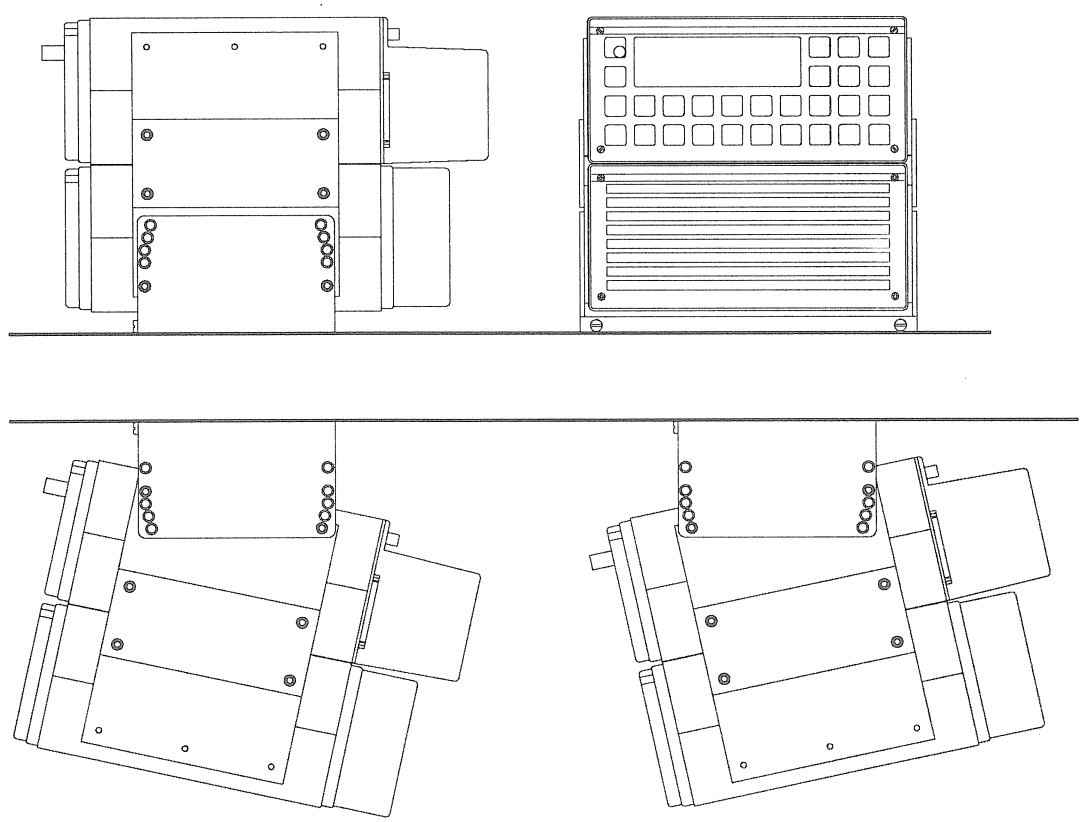
2. INSTALLATION

2.1. MOUNTING POSSIBILITIES

TABLETOP AND DECKHEAD



Mounting bracket H2055 which offers the same possibilities for the loudspeakers H2054 and H2074.

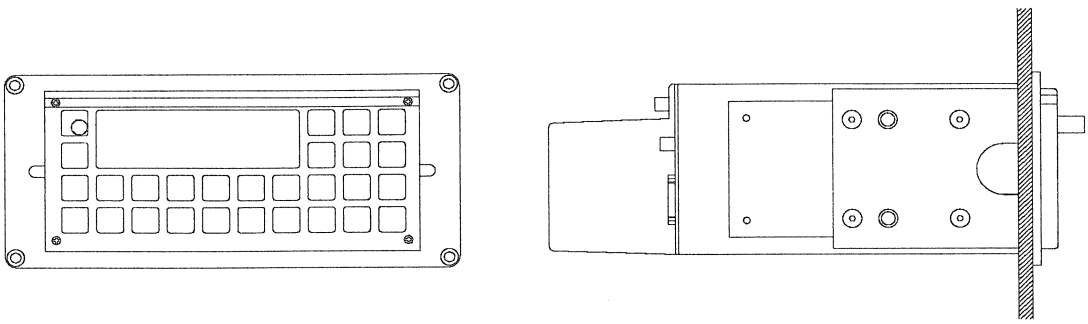


Mounting kit H2068 and H2055

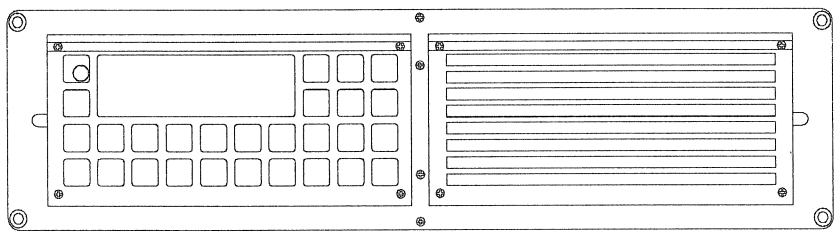
RM2150/51
4-0-27434 4-0-27435

2.1. MOUNTING POSSIBILITIES cont.:

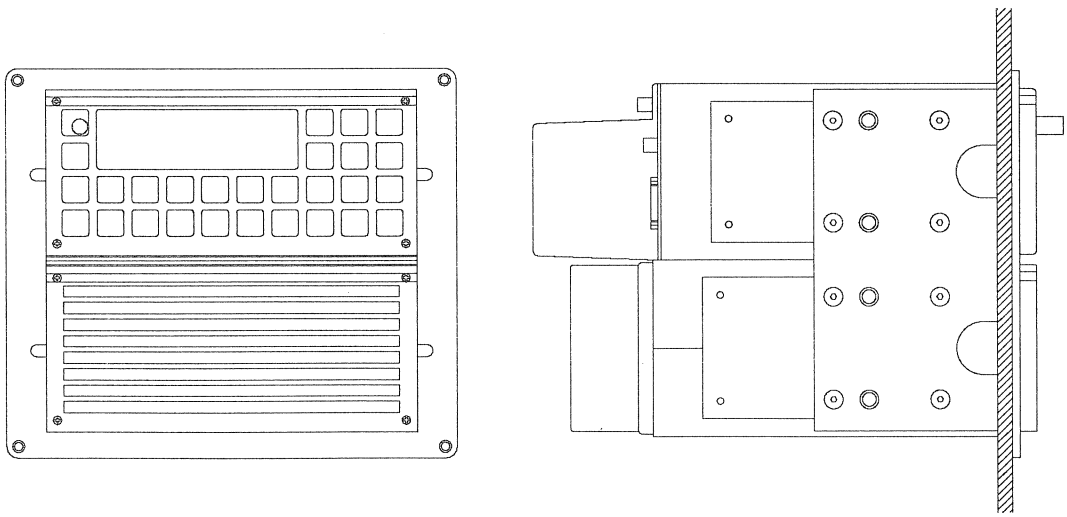
BULKHEAD AND CONSOLE



Mounting kit H2063 which offers the same possibilities for the loudspeakers H2054 and H2074.



Mounting kit H2062 or



Mounting kit H2064.

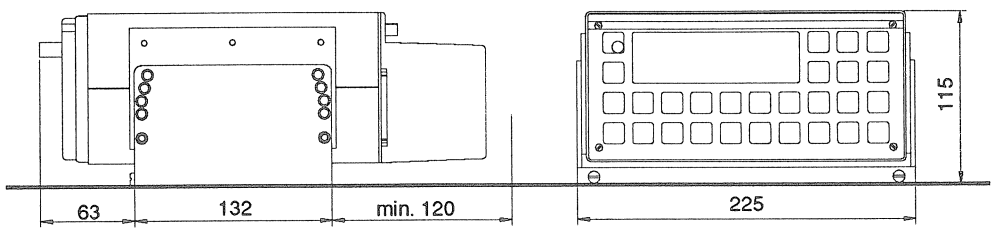
IN CONJUNCTION WITH OTHER SAILOR EQUIPMENT

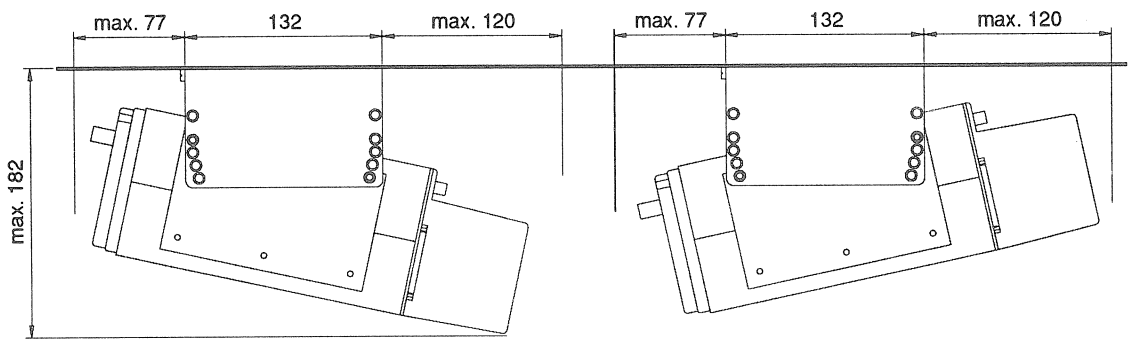
Look up the INSTALLATION section for the SAILOR unit in question.

2.2. DIMENSIONS AND DRILLING PLAN

UNIVERSAL MOUNTING BRACKET H2055

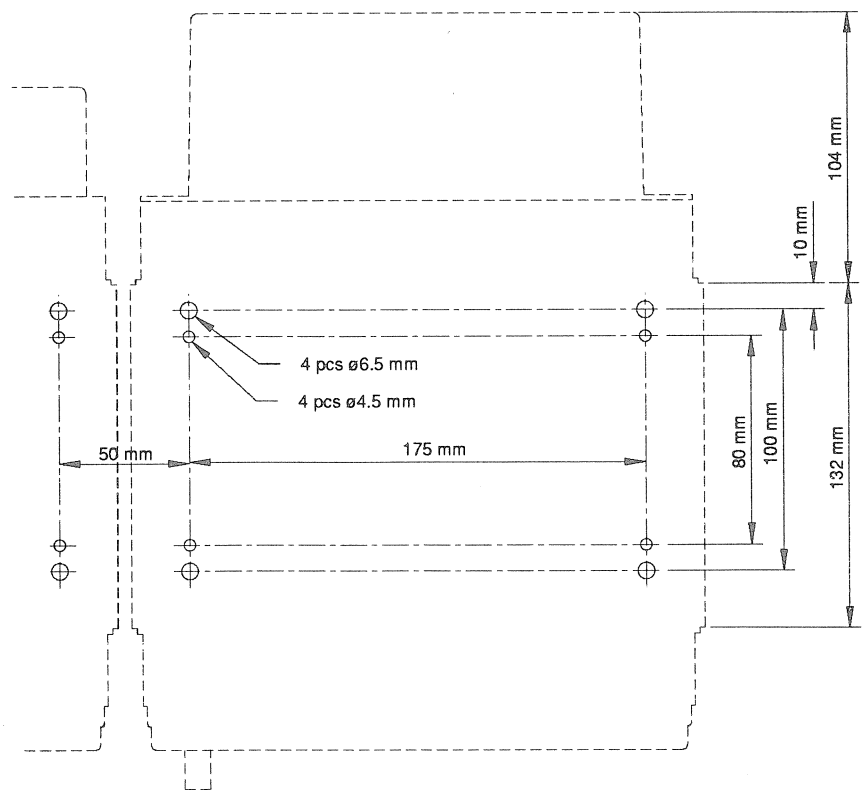
permits a wide variety of installation possibilities, such as tabletop, bulkhead or deckhead. For other possibilities such as console installation, the SAILOR 19" rack or all units in the Compact programme assembled on the bulkhead, see special information concerning installation of the Compact programme.



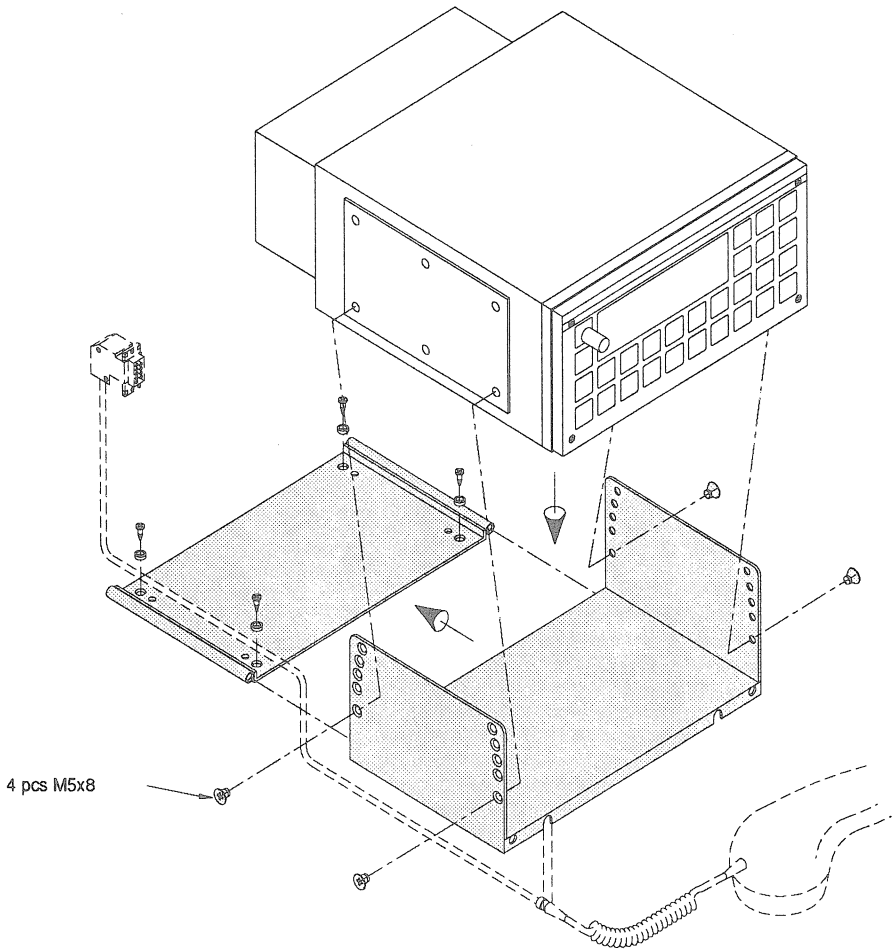


WEIGHT

Mounting kit H2055:	1.5 kg
Loudspeaker H2054:	5.5 kg
Loudspeaker H2074:	4.0 kg
HF SSB RM2150/51:	4.0 kg



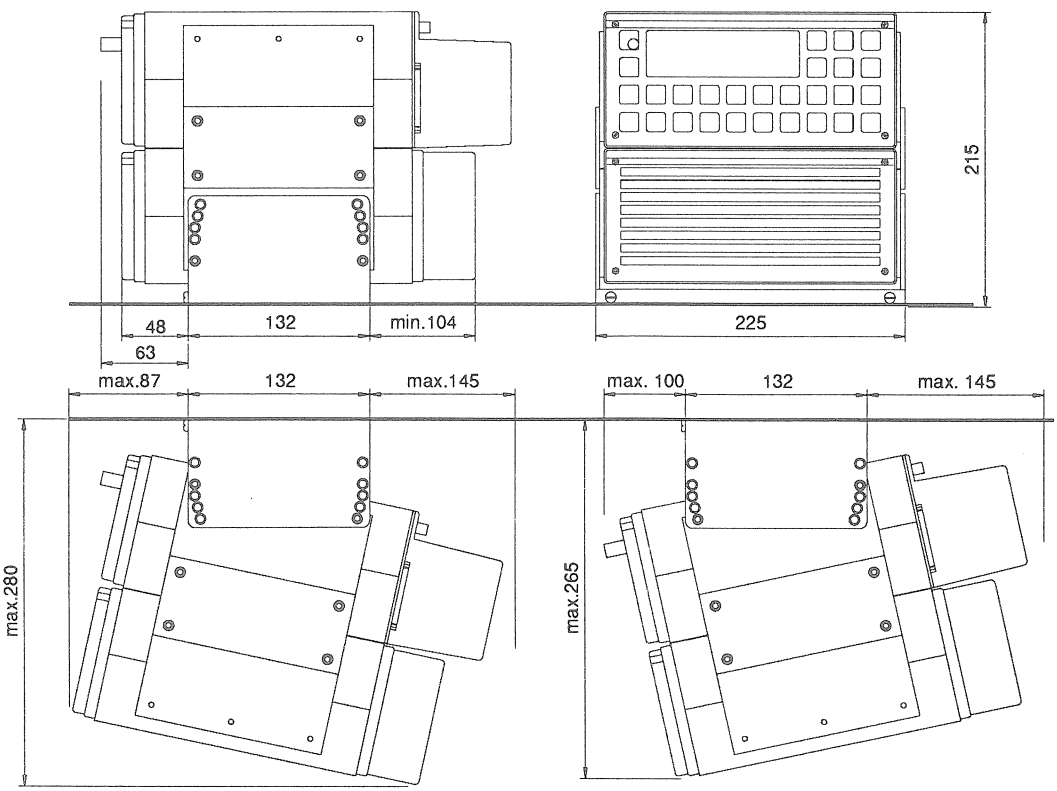
2.2. DIMENSIONS AND DRILLING PLAN cont.:



WEIGHT

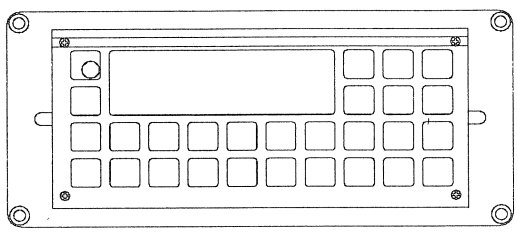
Lashing kit H2068:	1.5 kg
Mounting kit H2055:	1.5 kg
Loudspeaker H2054:	5.5 kg
Loudspeaker H2074:	4.0 kg
HF SSB RM2150/51:	4.0 kg

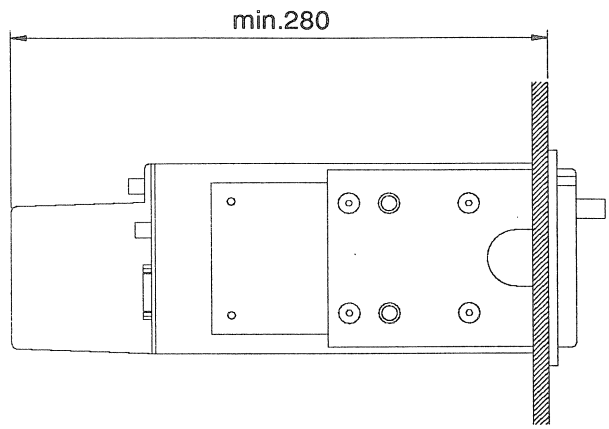
MOUNTING KIT H2068 AND H2055

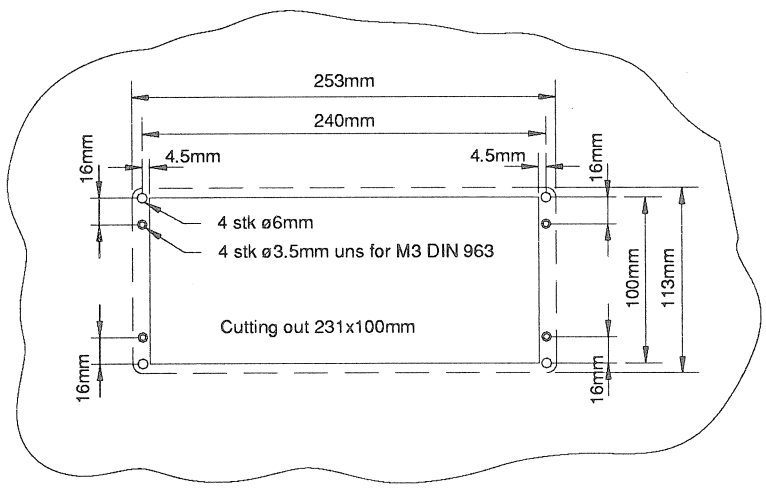


2.2. DIMENSIONS AND DRILLING PLAN cont.:

MOUNTING KIT H2063





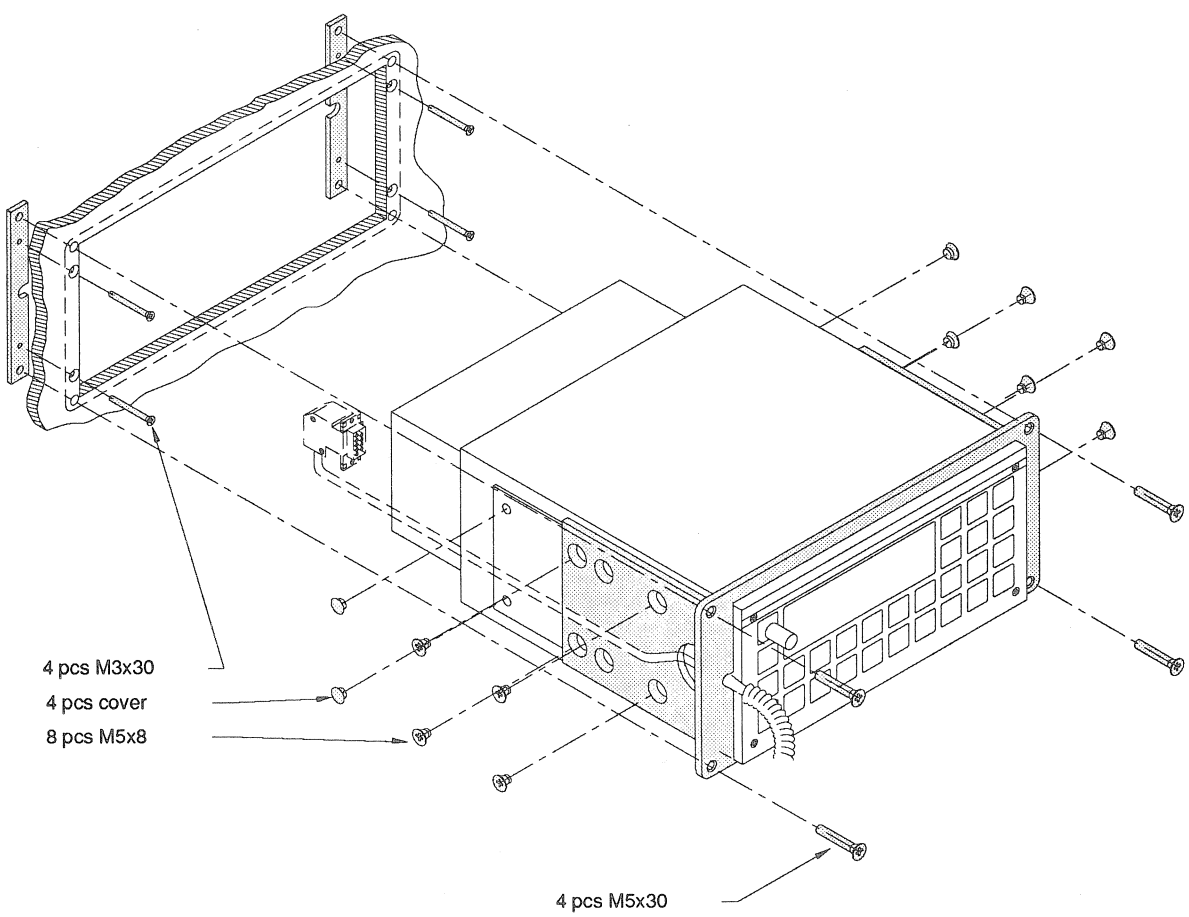


Free distance must be kept to allow free air circulation ambient temperature max. 40°C.

WEIGHT

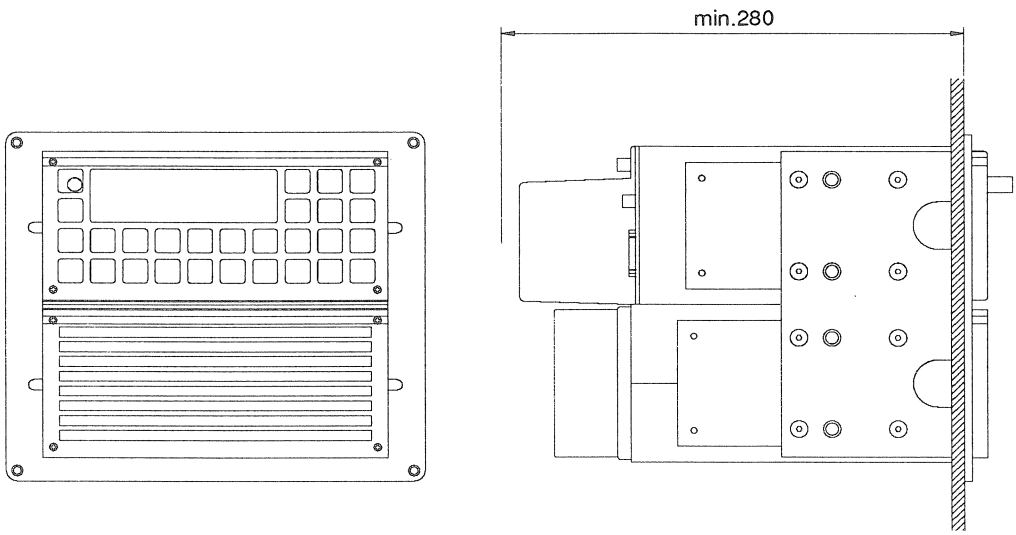
Mounting kit H2063:	1.0 kg
Loudspeaker H2054:	5.5 kg
Loudspeaker H2074:	4.0 kg
HF SSB RM2150/51:	4.0 kg

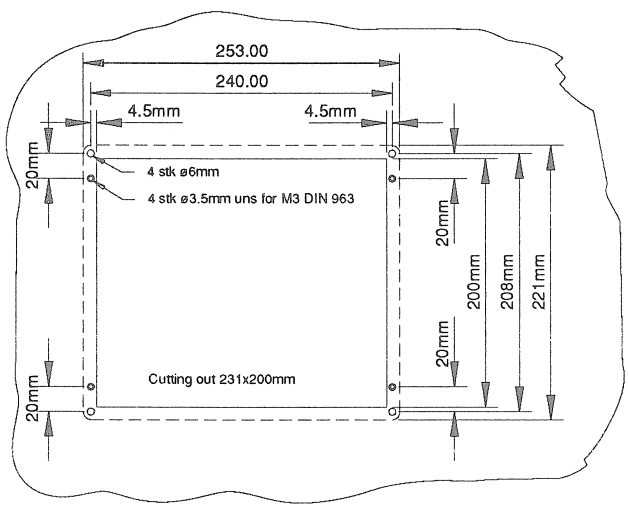
RM2150/51
4-0-27443 4-0-27444
4-0-27445



2.2. DIMENSIONS AND DRILLING PLAN cont.:

MOUNTING KIT H2064

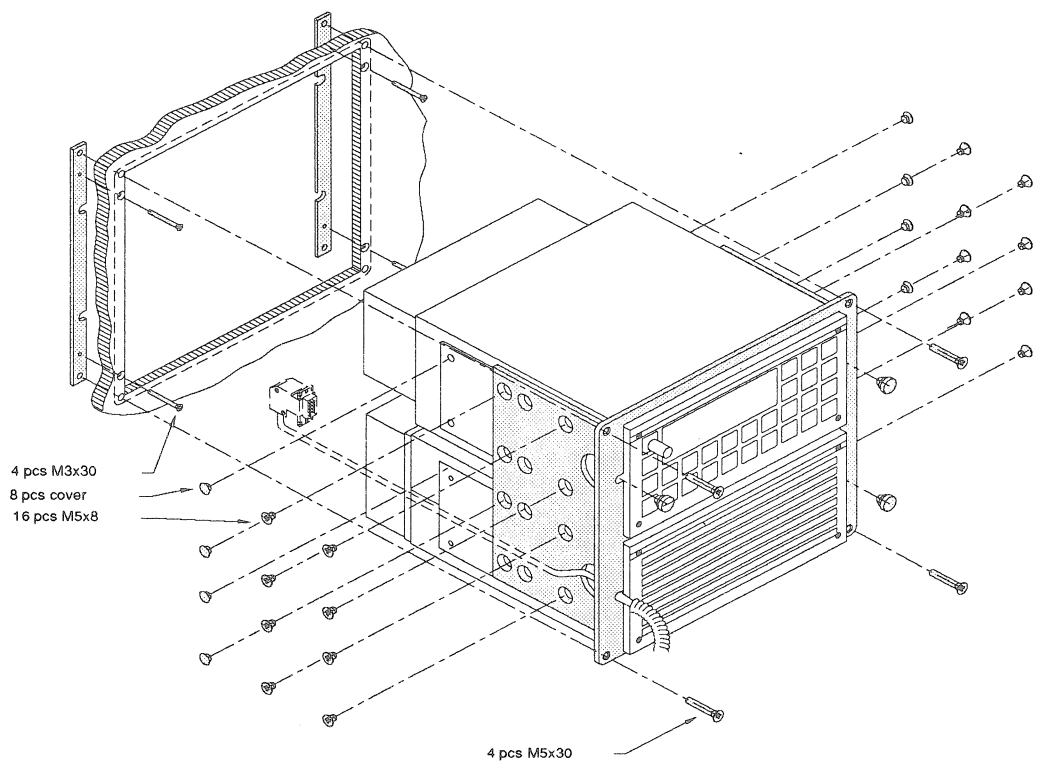




Free distance must be kept to allow free air circulation ambient temperature max. 40°C.

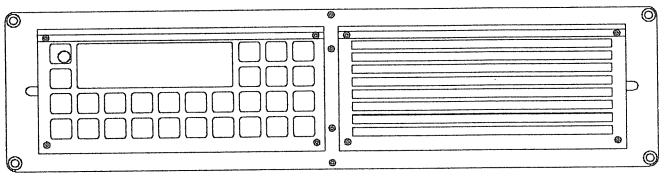
WEIGHT

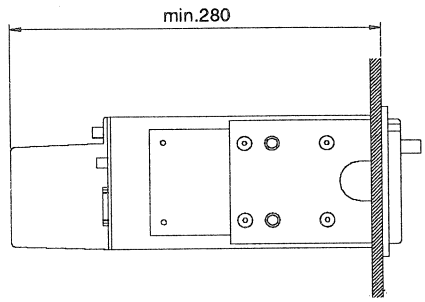
Mounting kit H2064:	1.5 kg
Loudspeaker H2054:	5.5 kg
Loudspeaker H2074:	4.0 kg
HF SSB RM2150/51:	4.0 kg

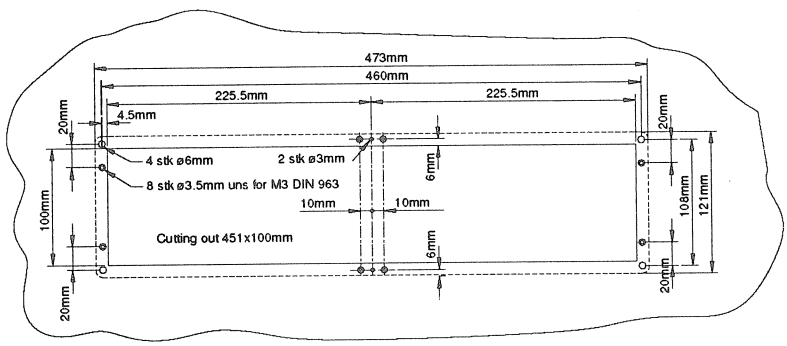


2.2. DIMENSIONS AND DRILLNG PLAN cont.:

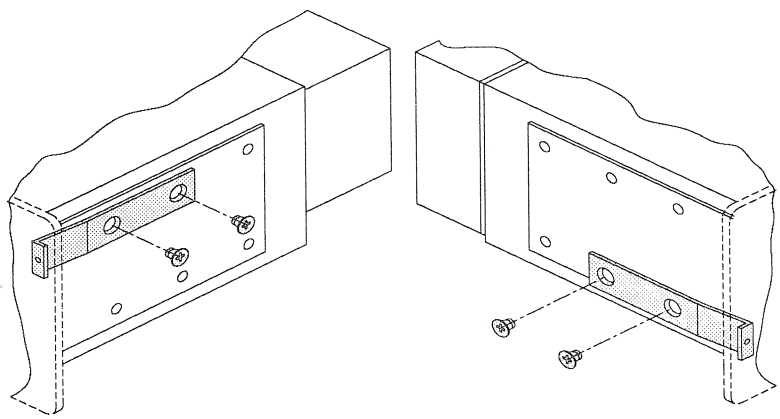
MOUNTING KIT H2062







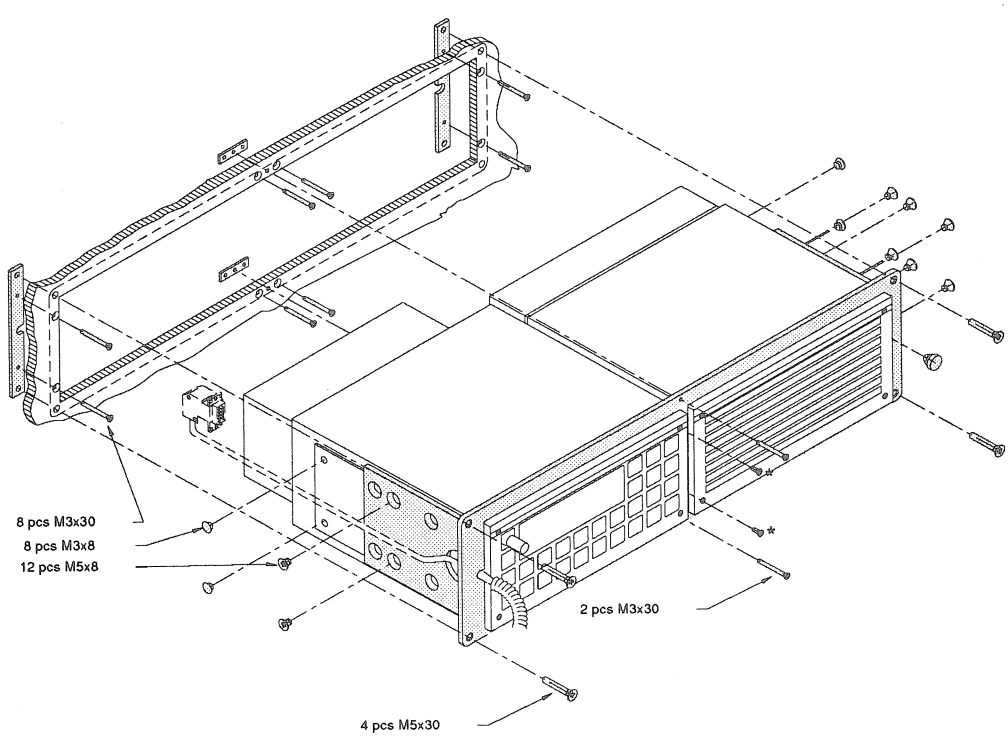
RM2150/51
4-0-27449 4-0-27450
4-0-27451 4-0-27452



Free distance must be kept to allow free air circulation ambient temperature max. 40°C.

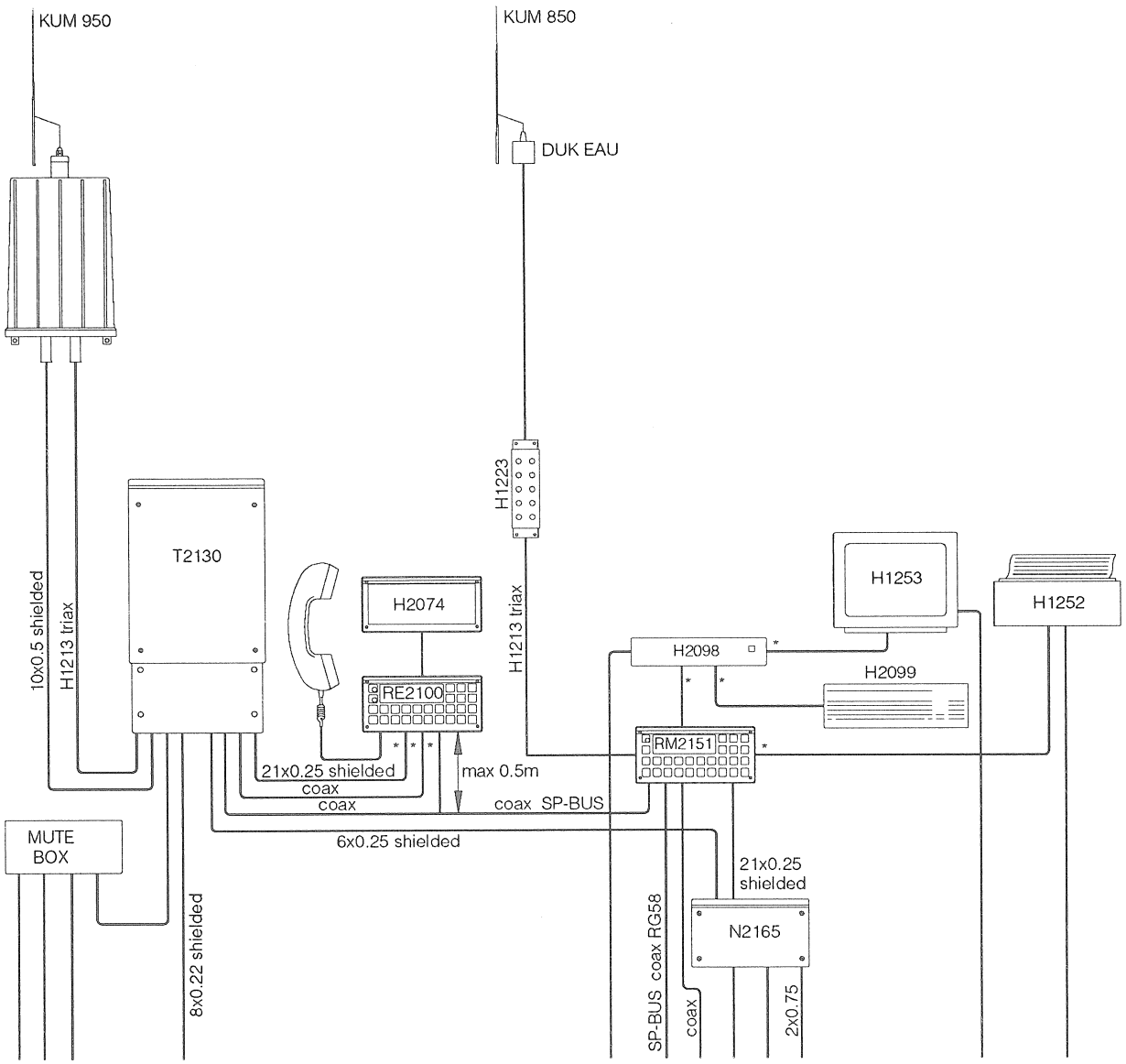
WEIGHT

Mounting kit H2062:	1.5 kg
Loudspeaker H2054:	5.5 kg
Loudspeaker H2074:	4.0 kg
HF SSB RM2150/51:	4.0 kg

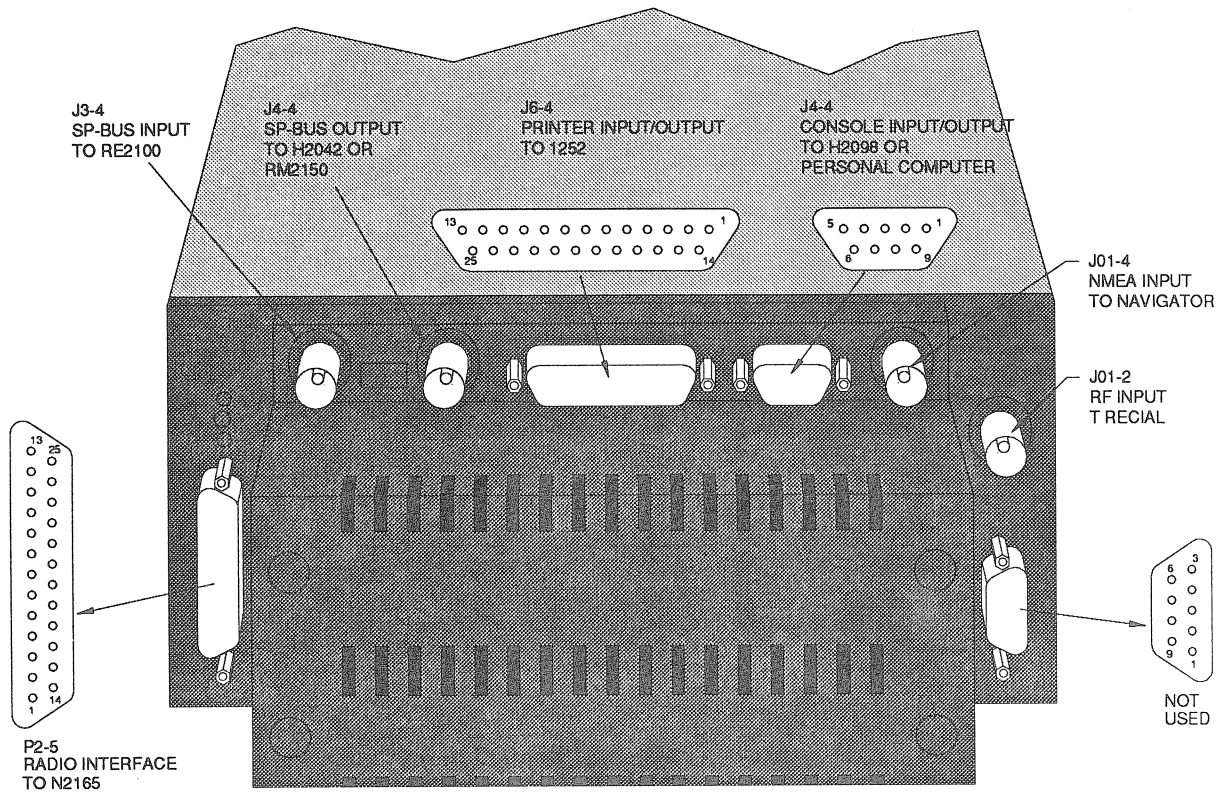


2.3. ELECTRICAL CONNECTIONS AND ASSEMBLING

The main cable plan for a radio installation with DSC and TELEX can be as illustrated below.



2.4 ELECTRICAL CONNECTIONS FROM RM2151



POWER SUPPLY INTERFACE

RADIOTELEX MODEM		POWER SUPPLY		
RM2150/51		N2165		
P2-5			COLOUR	SIGNAL
INPUT	1	ST3-12	BLACK	RX MUTE
INPUT	2	ST3-8	BROWN	ALARM IN
INPUT	3	ST3-13	RED	TX READY
OUTPUT	4	ST3-7	PINK	EXT.ALARM
	5	SHIELD	SHIELD	GROUND
OUTPUT	6	ST1-2	YELLOW	SP INTERRUPT
OUTPUT	7	ST3-9	GREEN	ALARM OUT
OUTPUT	8			SCAN STOP
OUTPUT	9	ST1-5	BLUE	AF TO TX COMMEN
INPUT	10	ST3-4	VIOLET	-18V DC
INPUT	11	ST3-5	GREY	+9V DC
INPUT	12	ST3-3	WHITE	+18V DC
OUTPUT	13	ST3-1	BROWN/PINK	SUPPLY ON/OFF
OUTPUT	14	ST1-9	BROWN/YELLOW	RX MUTE
OUTPUT	15	ST1-3	BROWN/GREEN	TX KEY
OUTPUT	16	ST1-1	BROWN/GREY	HIGH TENSION
OUTPUT	17	ST1-6	WHITE/PINK	
OUTPUT	18	ST1-4	WHITE/YELLOW	AF TO TX
INPUT	19			LINE IN 1
INPUT	20			LINE IN 2
OUTPUT	21	ST1-7	WHITE/GREEN	
	22	ST3-6	WHITE/BLUE	GROUND
	23	ST3-14	WHITE/GREY	GROUND
OUTPUT	24	ST1-8	GREY/PINK	EXT SPEAKER
INPUT	25	ST3-2	RED/BLUE	-BATT

2.4 ELECTRICAL CONNECTIONS FROM RM2151 CONT.:

PRINTER INTERFACE

RADIOTELEX MODEM	LINE PRINTER	
RM2150/51	H1252	
J06-4		SIGNAL
1	1	STROBE
2	2	DATA 0
3	3	DATA 1
4	4	DATA 2
5	5	DATA 3
6	6	DATA 4
7	7	DATA 5
8	8	DATA 6
9	9	DATA 7
10	10	ACKNOWLEDGE
11	11	BUSY
12	12	PAPER END
13	13	SELECT
14	14	AUTO FEED
15	32	ERROR
16	31	INITIALIZE
17	36	SELECT IN
18	33	GROUND
19	19	GROUND
20	21	GROUND
21	23	GROUND
22	25	GROUND
23	27	GROUND
24	29	GROUND
25	30	GROUND

The printer connector is a parallel printer port (Centronics).

TERMINAL INTERFACE

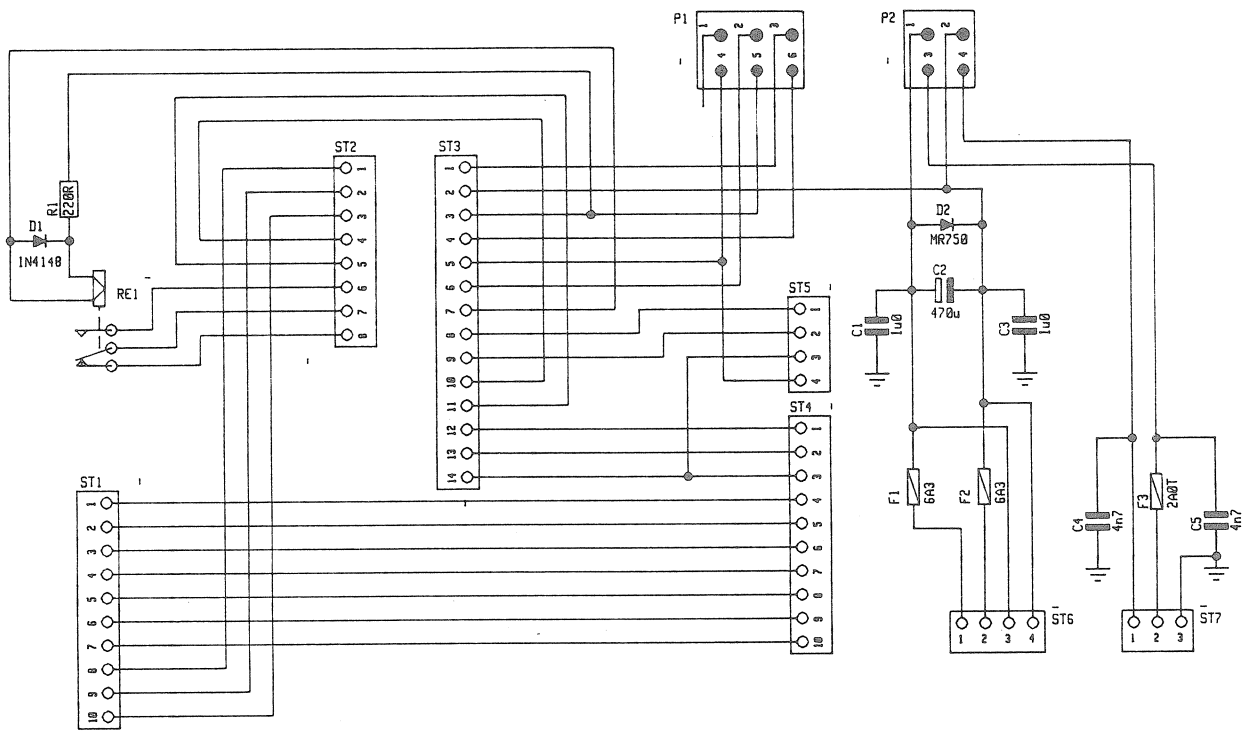
RADIOTELEX MODEM	MESSAGE TERMINAL	
RM2150/51	H2098	
J02-4		SIGNAL
1	1(8)	DATA CARRIER DETECT
2	2(3)	RECEIVE DATA
3	3(2)	TRANSMITTED DATA
4	4(20)	DATA TERMINAL READY
5	5(7)	GROUND
6	6(6)	DATA SET READY
7	7(4)	REQUEST TO SEND
8	5(5)	CLEAR TO SEND
9	9(22)	RING INDICATOR

Pin numbers in parentheses refer to the standard 25 pol connector defined in the CCITT Ree. V25 and in EIA RS-232C. The Message Terminal Radiotelex modem uses a 9 pole connector as used on IBM AT and compatible computers.

2.5 ELECTRICAL CONNECTIONS TO N2165

When the Radiotelex modem/DSC watch receiver is used in connection with the 250W HFSSB transmitter, it is necessary to use the power supply N2165 to interconnect the transmitter and the radiotelex modem. When the radiotelex modem/DSC watch receiver is used in connection with a 600/1200 W HF SSB transmitter, no ekstra power supply is necessary. This transmitter has an internal power suppl which can be used for the radiotelex modem.

N2165 CONNECTION BOARD



RM2150/51 INTERFACE

N2165	RM2150/51		
ST 1	P2-5	COLOUR	SIGNAL
1	16	BROWN/GREY	HIGH TENSION
2	6	YELLOW	SP-BUS INTERRUPT
3	15	BROWN/GREEN	TX KEY
4	18	WHITE/YELLOW	AF TO TX
5	9	BLUE	AF TO TX COMMEN
6	17	WHITE/PINK	
7	21	WHITE/GREEN	
8	24	GREY/PINK	EXT SPEAKER
9	14	BROWN/YELLOW	MUTE
10			SPARE

RM2150/51 INTERFACE

N2165	RM2150/51		
ST 3	P2-5	COLOUR	SIGNAL
1	13	BROWN/PINK	SUPPLY ON/OFF
2	25	RED/BLUE	-BATT
3	12	WHITE	+18V
4	10	VIOLET	-18V
5	11	GREY	+9V
6	22	WHITE/BLUE	GROUND
7	4	PINK	EXT.ALARM
8	2	BROWN	ALARM IN
9	7	GREEN	ALARM OUT
10			LINE IN
11			LINE IN
12	1	BLACK	RX MUTE
13	3	RED	TX READY
14	23	WHITE/GREY	GROUND

2.5 ELECTRICAL CONNECTIONS TO N2165 cont.:

TRANSMITTER INTERFACE

N2165	TRANSMITTER		
ST 4		COLOUR	SIGNAL
1			EXT.MUTE
2			TX READY
3			GROUND
4			HIGH TENSION
5			SP-BUS INTERRUPT
6			TX KEY
7			AF TO TX
8			AF TO TX COM.
9			
10			

REMOTE ALARM UNIT INTERFACE

N2165	C2149		
ST 5		COLOUR	SIGNAL
1			ALARM IN
2			ALARM OUT
3			GROUND

EXTERNAL ALARM INTERFACE

N2165		
ST 2	COLOUR	SIGNAL
1		SPARE
2		SPARE
3		SPARE
4		LINE IN
5		LINE IN COM.
6		EXT. -ALARM NO.
7		EXT. -ALARM C.
8		EXT. -ALARM NC.

CONTENTS

3. SERVICE

3.1. MAINTENANCE

PREVENTIVE MAINTENANCE

If the HF SSB RM2150/51 has been installed in a proper way the maintenance can, dependent on the environments and working hours, be reduced to a performance check at the service workshop at intervals, not exceeding 12 months. A complete performance check list is enclosed in this manual, chapter 3.5 PERFORMANCE CHECK.
Inspection of the antenna, cables, and plugs for mechanical defects, salt deposits, corrosion, and any foreign bodies shall be done at regular intervals not exceeding 12 months.

Along with each RM2150/51 a test sheet is delivered in which all the measurements, made in the test department of the factory, are listed. If the control measurings made in the service workshop should not show the same values as those listed in the test sheet, the set must be adjusted as specified in chapter 3.7. ADJUSTMENT PROCEDURE.

3.2. ALIGNMENT INSTRUCTIONS

INTRODUCTION

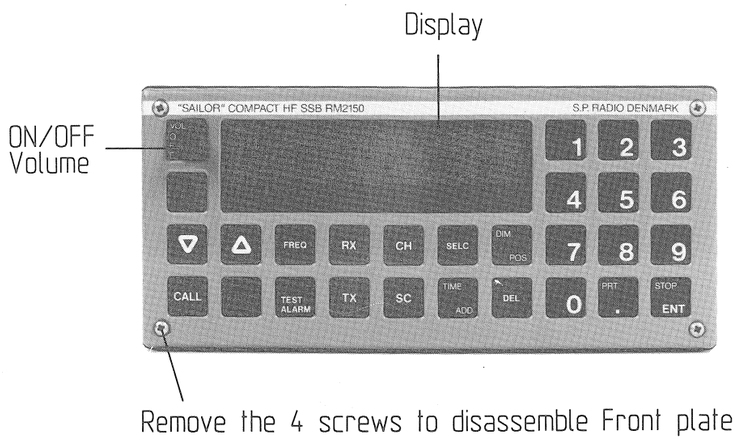
The measuring values indicated in chapter 5. CIRCUIT DESCRIPTION AND SCHEMATIC DIAGRAMS are typical values and as indicated it will be necessary to use instruments in absolute conformity with the below list:

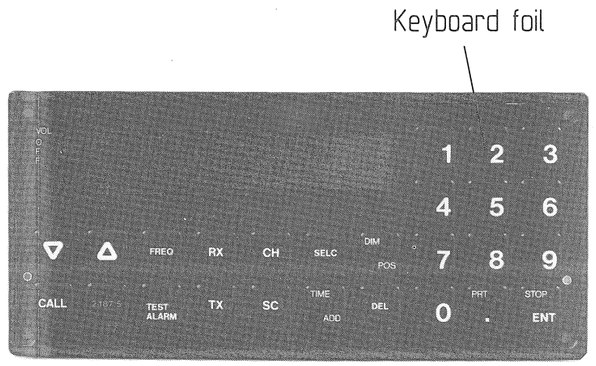
3.3. PROPOSAL FOR NECESSARY TEST EQUIPMENT

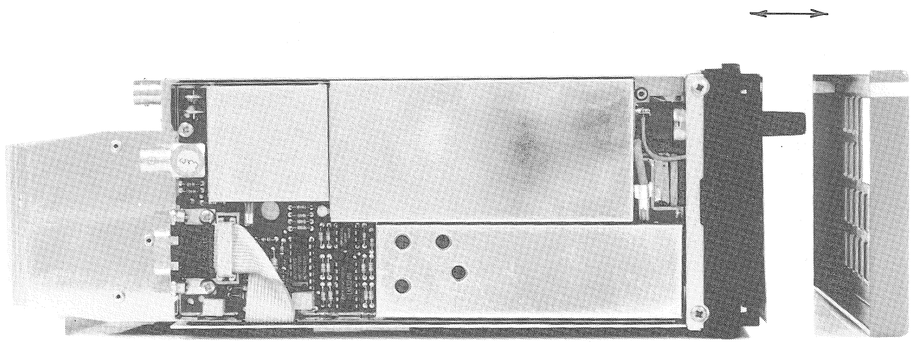
OSCILLOSCOPE:	
Bandwidth	DC–35 MHz
Sensitivity	2mV/div
Output Impedance	1 Mohm//20 pF
E.g. Philips type	PM3050
PASSIVE PROBE:	
Attenuator	20 dB
Input Impedance	10 Mohm//15 pF
Compensation Range	10–30 pF
E.g. Philips type	PM8936/091
MULTIMETER:	
Sensitivity DC (f.s.d.)	100 mV
Input Impedance	10 Mohm
Accuracy DC (f.s.d.)	1.5%
E.g. Philips type	PM2505
FREQUENCY COUNTER:	
Frequency Range	100 Hz – 120 MHz
Resolution	1 Hz at ▫f = 100 MHz
Accuracy	$1 \cdot 10^{-7}$
Sensitivity	100 mV RMS
Input Impedance	1 Mohm/30 pF
E.g. Philips type	PM6669/031
HF SIGNAL GENERATOR:	
Frequency Range	100 kHz – 100 MHz
Output Voltage:	0dB/µV – 120 dB/µV
Output Impedance	50 ohm
Type of Modulation	AM
Modulation Frequency	External
E.g. Marconi type	2019
LF SIGNAL GENERATOR:	
Frequency Range	10 Hz – 10 kHz
Output Voltage	20 mV_{RMS} – 1 V_{RMS}
Output Impedance	600 ohm
Output Waveform	sine wave
E.g. Philips type	PM5110
LF DISTORTION METER:	
Frequency Range	▫f = 1200 Hz
Distortion Range (f.s.d.)	1–10%
Input Impedance	100 kohm
Accuracy (f.s.d.)	3%
E.g. Hewlett–Packard	HP 8903B

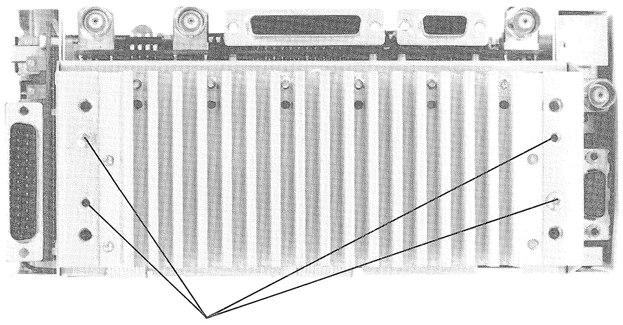
CONTENTS

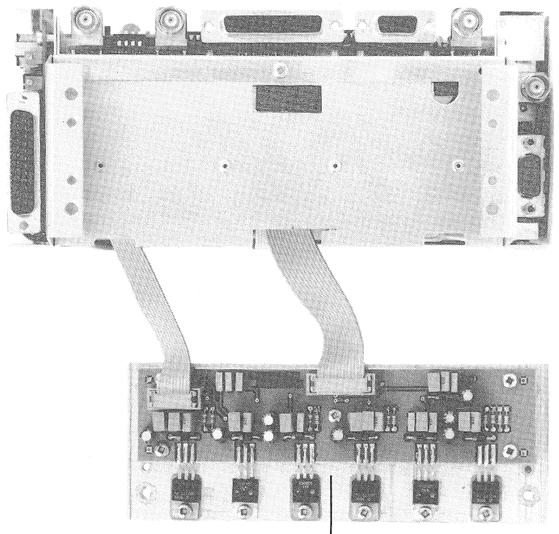
4.1 MECHANICAL DISASSEMBLING AND MODULE LOCATION.





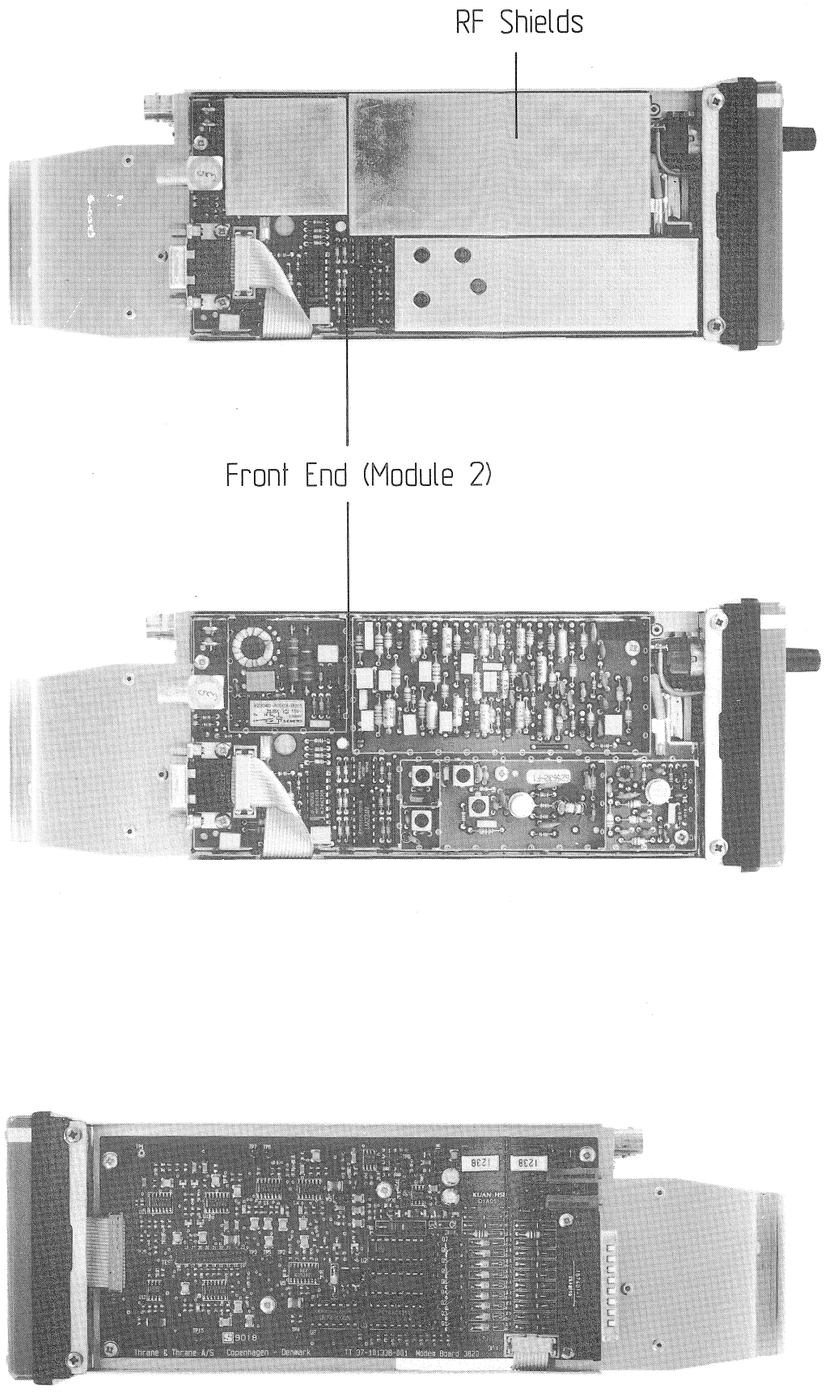


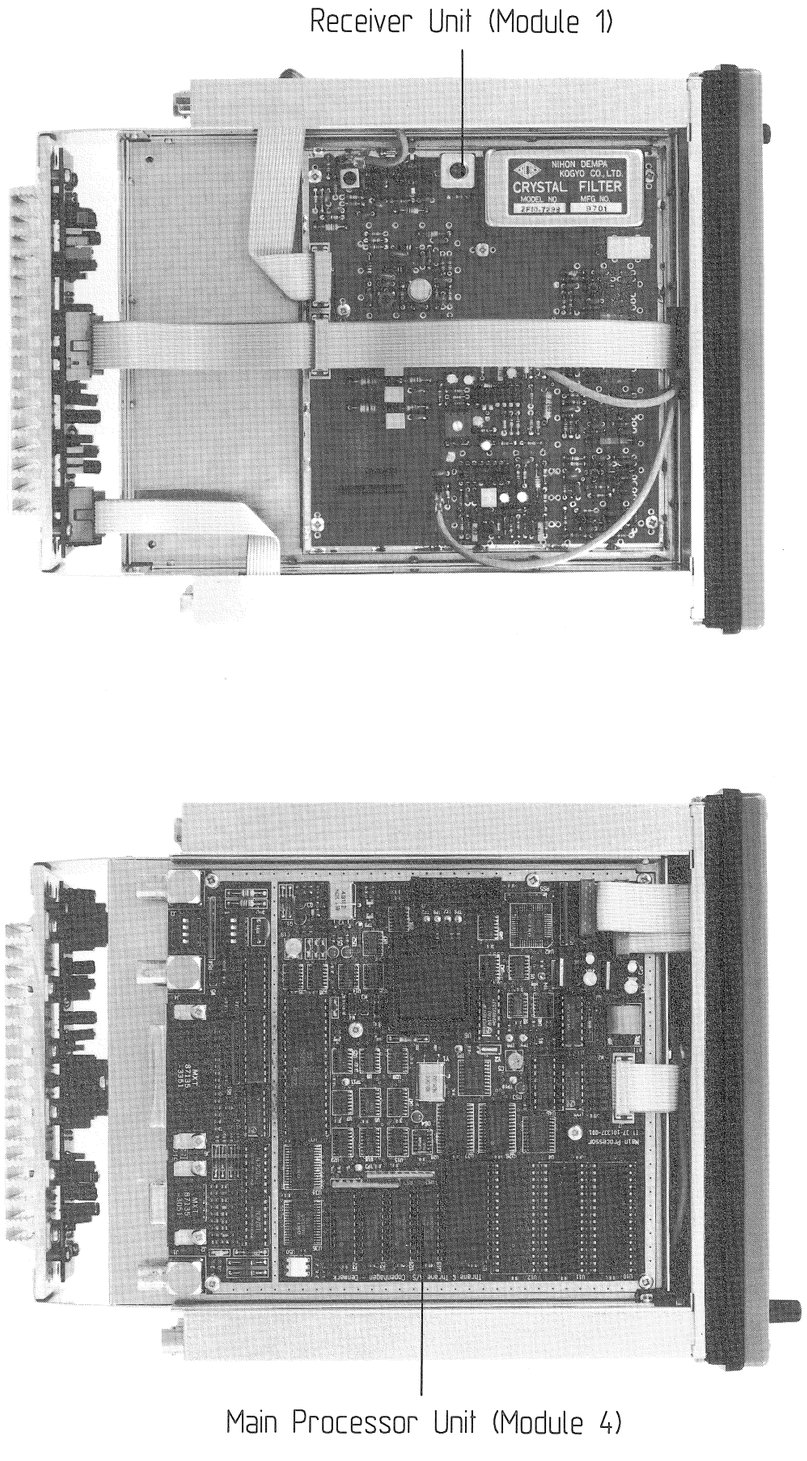




MECHANICAL DISASSEMBLING AND MODULE LOCATION RM2150

4.1 MECHANICAL DISASSEMBLING AND MODULE LOCATION.





RM2150 4-0-26541
501081 501080 501082
501084 501083

MECHANICAL DISASSEMBLING AND MODULE LOCATION RM2150

CONTENTS

5. CIRCUIT DESCRIPTION AND SCHEMATIC DIAGRAMS

5.1. RECEIVER UNIT (MODULE 1)

The receiver unit consists of a 70.0 MHz to 10.7 MHz mixer followed by a TELEX filter and a gain regulated amplifier. From the gain regulated amplifier the signal is fed to the detector and to the AGC amplifier. From the detector the low frequency signal is fed through a low/high pass filter to the 600 ohm output buffer.

SECOND MIXER AND CRYSTAL FILTER

The signal from the 70 MHz selectivity (module 2) is led through the balanced transformer TR01 to the gates of the J-FET mixer transistors Q01 and Q02.
The second LO signal 59.3/80.7 MHz from the frequency synthesizer (module 3) is led through the amplifier transistor Q03 and the band pass filter (L03, L07, L10 and C07, C09, C15) to the sources of mixer transistors Q01 and Q02. The LO signal level at the sources of the mixer transistors is approx 17 dBm.
The mixer 10.7 MHz output signal from the drains is fed through a balanced transformer TR02 to the crystal filter. The capacitor C26 controls the resonance frequency of TR02.

IF AMPLIFIER

The 10.7 MHz signal from the crystal filter is fed to the input of the IF amplifier.
The 10.7 MHz IF amplifier consists of the transistors Q04, Q05, Q08, Q10, Q11 and the filter FL02 in cascade Q04, Q05, Q08 and Q10 are dual gate MOS-FET's with the IF signal fed to gate 1. Gate 2 of the transistors Q04, Q05 and Q08 is connected to the output of the AGC detector. The output voltage from the AGC detector is used to control the gain of the IF amplifier which is necessary to protect the signal detector from overload.
From the drain of Q08 the IF signal is amplified in Q10 and fed through the ceramic filter FL02, which reduces the noise bandwidth to about 300 kHz, to the emitter follower Q11. From the emitter of Q11 the IF signal is fed to the signal detector and to the AGC amplifier.

AGC GENERATOR

The IF signal is fed through the common emitter amplifier Q09 to the AGC detector consisting of the transistor Q07 and the network R42, R48 and C54 which together is a voltage detector. The voltage gain of Q09 and the detector level of Q07 controls the output level of the IF amplifier, the level at the emitter of Q11.
The output voltage from the AGC detector is via the diode D04 and the buffer amplifier U1.2 fed to gate 2 of Q04, Q05 and Q08 as a fast gain control voltage. A slow gain control of the IF amplifier is obtained by supplying the AGC detector output voltage to the amplifier U1.1. U1.1 buffers the charging of C91 through the diode D08 and the resistor R99. The voltage on C91 is fed through the diode D07 to the input of the amplifier U1.1, where it is added to the AGC detector voltage. The charging and discharging of C91 is slow compared to the charging and discharging of C54. This means that the network C54, R42 and R48 ensures noise immunity and the network C91, R99 and R98 will decrease distortion.
The transistor Q12 is when conducting discharging the capacitor C91 which means that the slow AGC is inoperative, this is used when the receiver is scanning. Q12 is controlled by the signal at (U03/pin7).

SIGNAL DETECTOR

The signal detector U02 consists of a limiting amplifier and a signal mixer.

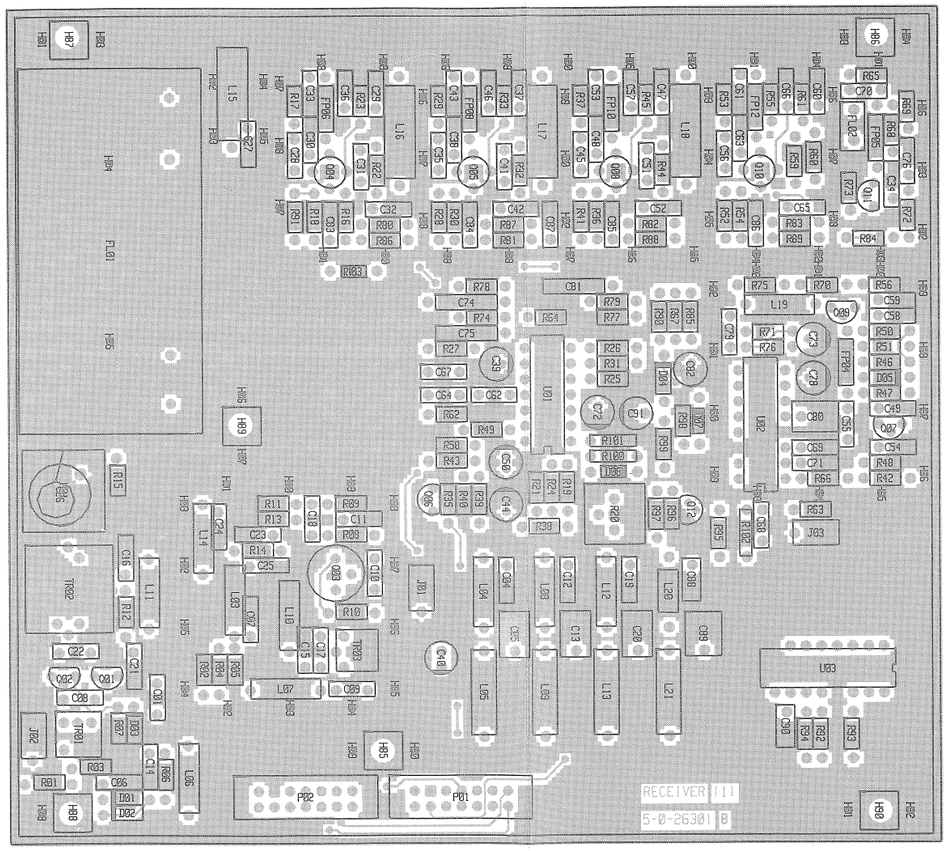
A 10.73152 MHz signal, the synthesizer reference signal, is connected to (U02/pin1), this signal is fed through the limiting amplifier to the injection port of the mixer. The IF signal is from the emitter of Q11 fed to the signal port (U02/pin 9) of the mixer. The output signal (U02/pin 6) from the mixer contains an audio frequency component which is fed to the AF FILTERS.
The signal detector can be muted by a 5 volt DC signal from (U03/pin 4) supplied to (U02/pin 5).

AF FILTERS AND AF BUFFER AMPLIFIER

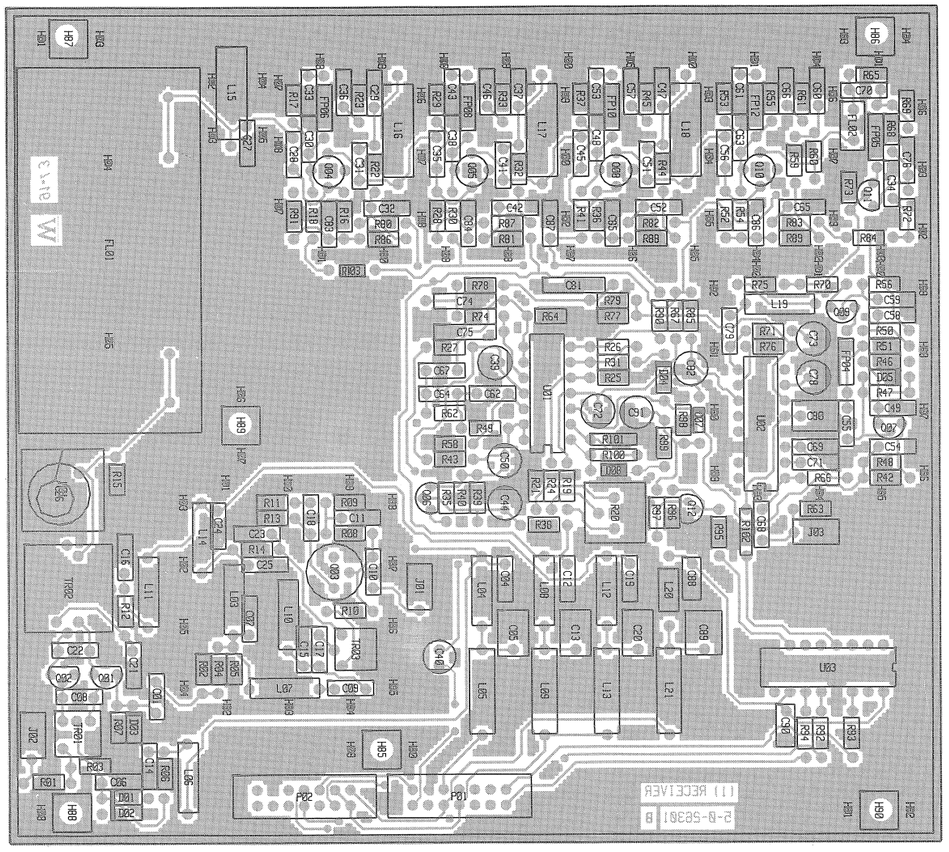
To reduce noise from the non-tuned IF amplifier, the AF signal from the signal detector is led through two active filters in cascade.
The AF filters are built as two 3rd order filters, one low pass filter with a 3 dB cut-off frequency at 2250 Hz and one highpass filter with a 3 dB cut-off frequency at 1200 Hz.
The output from the AF filters is fed through the buffer transistor Q06, which buffers the 0 dBm AF signal to a 600 ohm load.

COMPONENT LOCATION RECEIVER UNIT (MODULE 1)

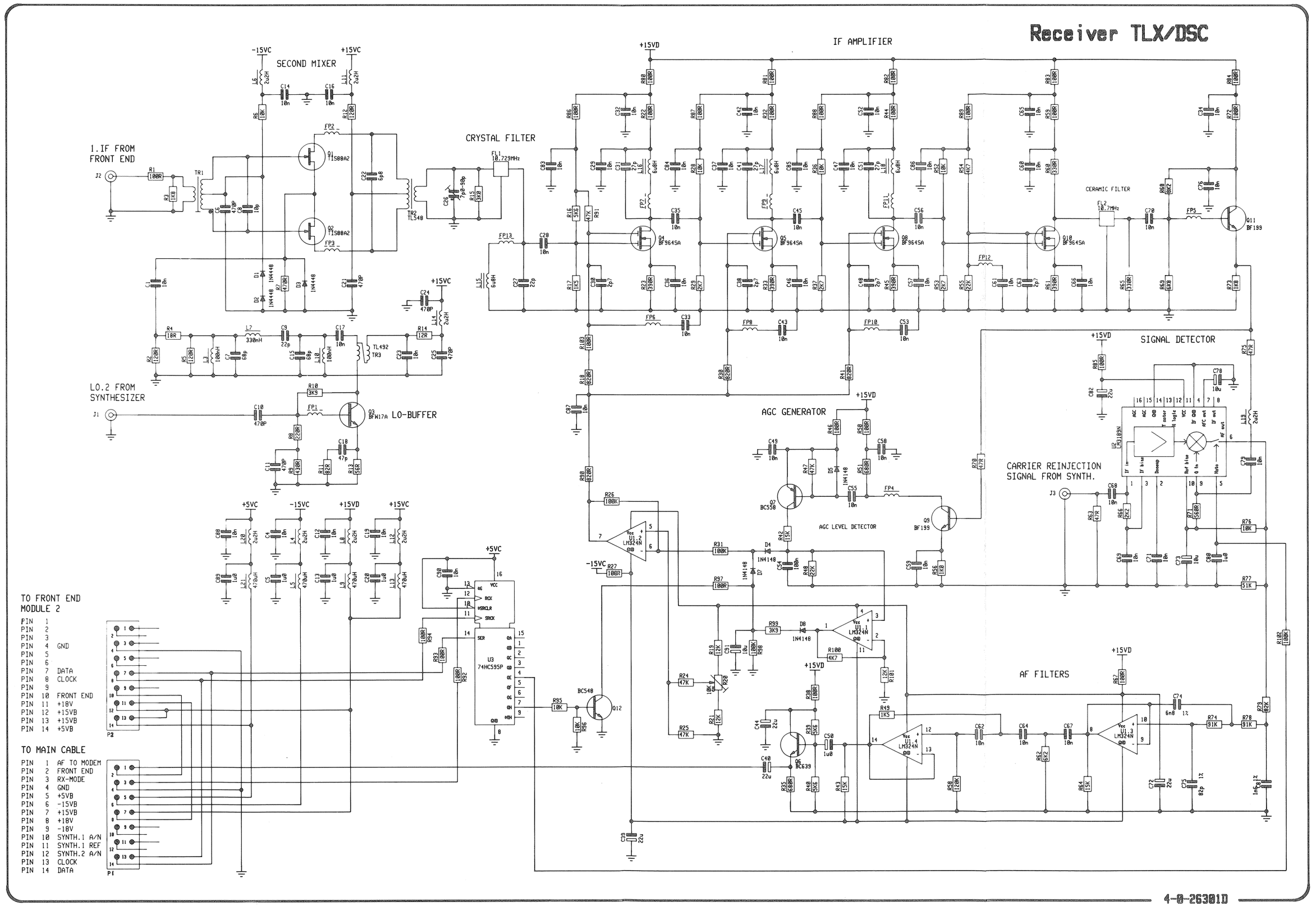
5.1 COMPONENT LOCATION RECEIVER UNIT (MODULE 1) cont.:



Seen from the component side with upper side tracks.



Seen from the component side with lower side tracks.


Receiver TLX/DSC
SECOND MIXER
-15VC
+15VC
1.IF FROM FRONT END
J2
TR1
TR2 TL540
CRYSTAL FILTER
FL1 10.729MHz
Q1 TIS88A2
Q2 TIS88A2
D1 1N4448
D2 1N4448
D3 1N4448
TL492 TR3
LO.2 FROM SYNTHESIZER
J1
Q3 BFW17A LO-BUFFER
IF AMPLIFIER
+15VD
Q4 BF964SA
Q5 BF964SA
Q8 BF964SA
Q10 BF964SA
CERAMIC FILTER
FL2 10.7MHz
Q11 BF199
SIGNAL DETECTOR
U2 UK3189N
CARRIER REINJECTION SIGNAL FROM SYNTH.
J3
AGC GENERATOR
Q7 BC558
Q9 BF199
AGC LEVEL DETECTOR
D4 1N4148
D5 1N4148
D7 1N4148
D8 1N4148
U1.1 LM324N
U1.2 LM324N
U1.3 LM324N
U1.4 LM324N
AF FILTERS
Q12 BC548
Q6 BC639
U3 74HC595P
+5VC
-15VC
+15VD
TO FRONT END MODULE 2
PIN 1
PIN 2
PIN 3
PIN 4 GND
PIN 5
PIN 6
PIN 7 DATA
PIN 8 CLOCK
PIN 9
PIN 10 FRONT END
PIN 11 +18V
PIN 12 +15VB
PIN 13 +15VB
PIN 14 +5VB
P2
TO MAIN CABLE
PIN 1 AF TO MODEM
PIN 2 FRONT END
PIN 3 RX-MODE
PIN 4 GND
PIN 5 +5VB
PIN 6 -15VB
PIN 7 +15VB
PIN 8 +18V
PIN 9 -18V
PIN 10 SYNTH.1 A/N
PIN 11 SYNTH.1 REF
PIN 12 SYNTH.2 A/N
PIN 13 CLOCK
PIN 14 DATA
P1
4-0-26301D

5.2. RECEIVER FRONT END UNIT (MODULE 2)

This module consists of a transmit/receive relay and the receiver front end. The front end consists of a receiver input protection circuit, a radio frequency filter unit, a radio frequency to first intermediate frequency (70 MHz) mixer, and a first IF (70 MHz) filter unit.

AERIAL/EXCITER SWITCH

The aerial signal enters the receiver through the aerial/exciter socket J01, when relay RE02 is in RX position. The exciter signal from the power module (8) is connected to relay RE02 through the EX socket J04. When relay RE02 is in TX position the exciter signal will pass through the aerial/exciter socket J01 and a coax cable to the HF power amplifier in T2130. Switching between RX and TX with RE02 is controlled from the microprocessor through register U01 and Q02.

INPUT PROTECTION

Protection of the pre-filters and the first mixer is done with R02, R03, TR01 and the circuit around D05, and it guaranties that the voltages to the pre-filters cannot be higher than about 4.5V. In addition the RX input is grounded with relay RE01 when the transceiver is switched off.

PRE-FILTERS

The pre-filters consist of the following units:

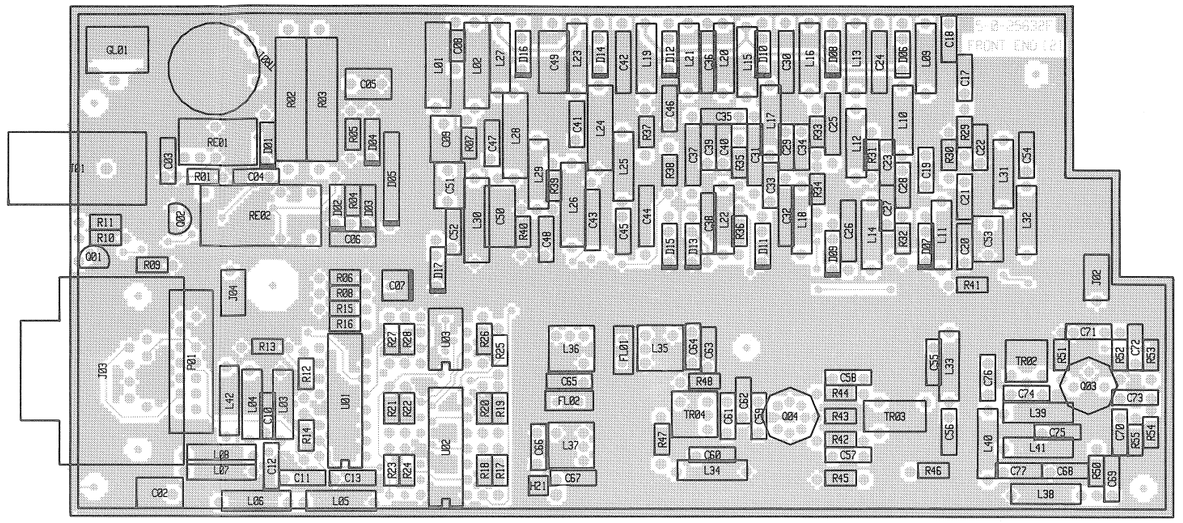
-	100 kHz	HPF consisting of L01-L02 and C08
-	385 kHz	LPF (1) consisting of L29, C49-C50 and D16-D17
-	385 kHz - 1.6 MHz	BPF (2) consisting of L24-L26, C42-C44 and D14-D15
-	1.6 MHz - 4.5 MHz	BPF (3) consisting of L20-L22, C36-C38 and D12-D13
	4.5 MHz - 9 MHz	BPF (4) consisting of L16-L18, C30-C32 and D10-D11
-	9 MHz - 18 MHz	BPF (5) consisting of L12-L14, C24-C26 and D08-D09
-	18 MHz - 30 MHz	BPF (6) consisting of L09-L11, C18-C20 and D06-D07
-	30 MHz	LPF consisting of L31-L33, and C54-C56

The switching between the filters is controlled from the microprocessor through U01, U02 and U03.

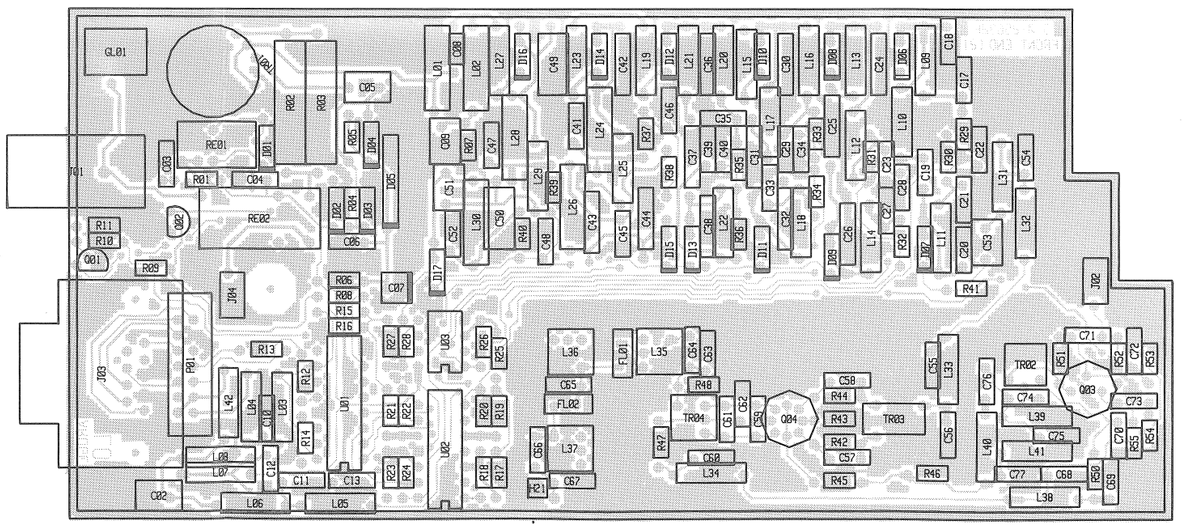
FIRST MIXER AND IF-FILTER

The first mixer is an active J-FET mixer with good, large signal properties and low noise factor.
The signal is led through the balanced transformer TR03 to the sources of the dual J-FET Q04. The first LO signal from the frequency synthesizer (module 3) is led through the LO buffer (Q03) to give about +17 dBm signal to the gates of the two J-FET transistors. The mixed signals are fed through the balanced output transformer TR04 to the two high order bilitic crystal filters FL01 and FL02 where the wanted 70 MHz signal is selected. The selected signal is then fed on to the receiver PCB (module 1).

5.2. COMPONENT LOCATION RECEIVER FRONT END UNIT (MODULE 2)



View from component side with upper side tracks.



View from component side with lower side tracks.

TEST CONDITIONS

Receiver Frequency: f_{RX} = 2058.24 kHz

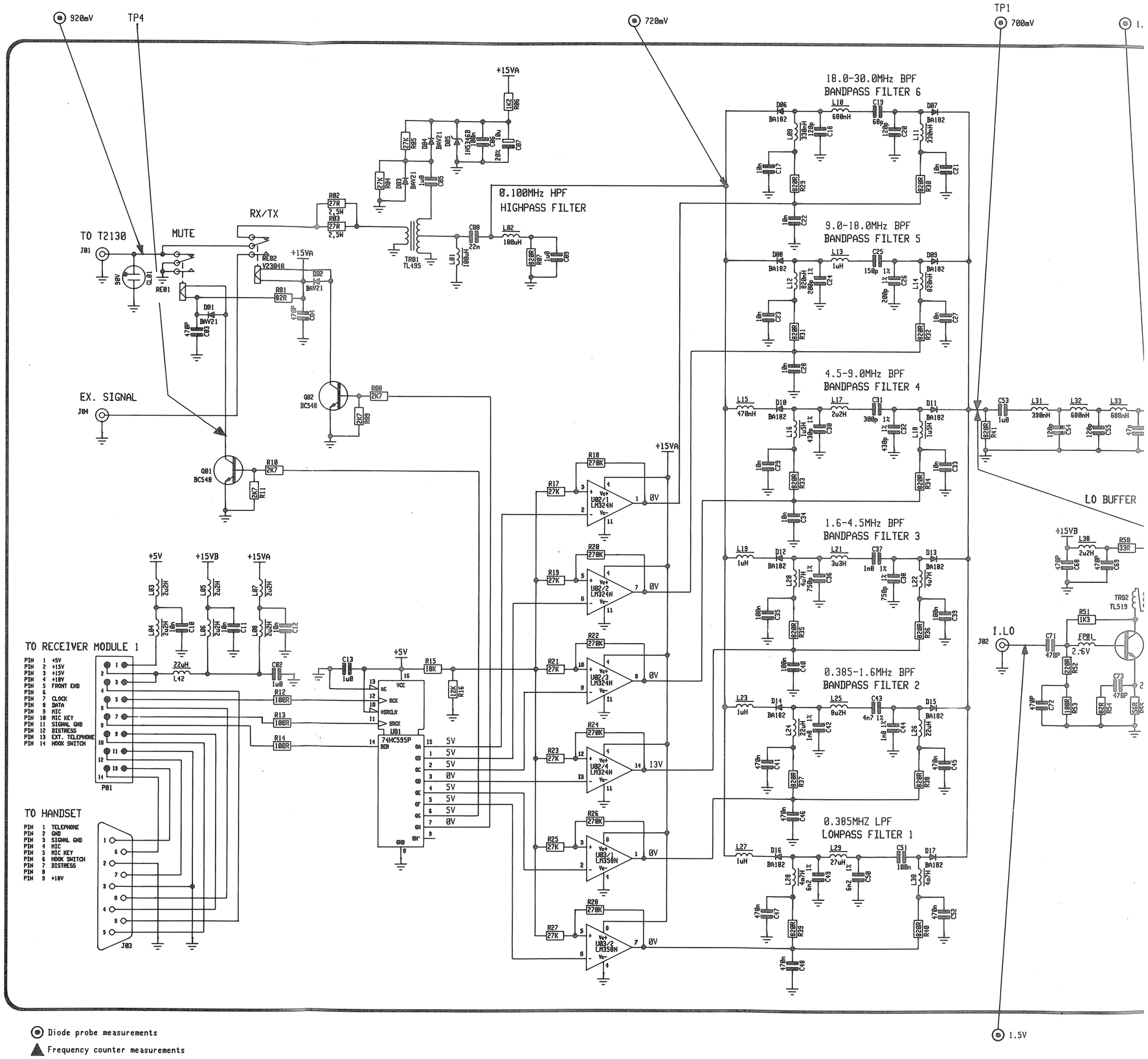
Receiver Mode: J3E/USB

Generator frequency: f_G = 2059.24 kHz

Generator level: V_G = 117 dB/µV ⇒ P_G = 4 dBm

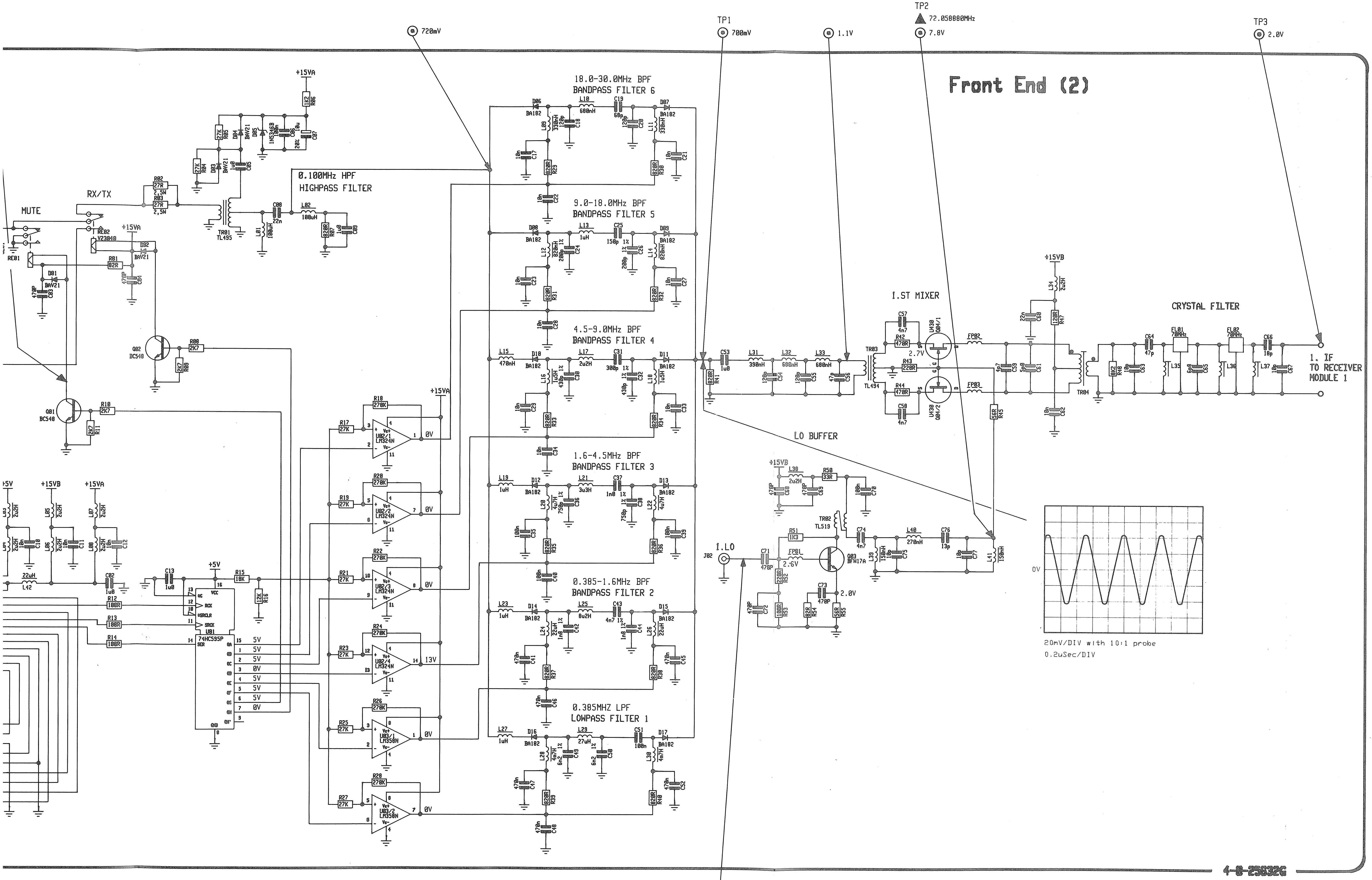
Generator mode: CW

The generator signal must be fed to the aerial socket at the Front End Unit.



Diode probe measurements

Frequency counter measurements


Front End (2)
TP1
TP2
TP3
72.058880MHz
720mV
700mV
1.1V
7.8V
2.0V
1.5V
18.0-30.0MHz BPF
BANDPASS FILTER 6
9.0-18.0MHz BPF
BANDPASS FILTER 5
4.5-9.0MHz BPF
BANDPASS FILTER 4
1.6-4.5MHz BPF
BANDPASS FILTER 3
0.385-1.6MHz BPF
BANDPASS FILTER 2
0.385MHZ LPF
LOWPASS FILTER 1
0.100MHz HPF
HIGHPASS FILTER
MUTE
RX/TX
1.ST MIXER
CRYSTAL FILTER
1. IF
TO RECEIVER
MODULE 1
LO BUFFER
1.LO
74HC595P
LM324N
LM358N
BC548
BFW17A
TL495
TL494
TL519
20mV/DIV with 10:1 probe
0.2uSec/DIV
4-8-25632G

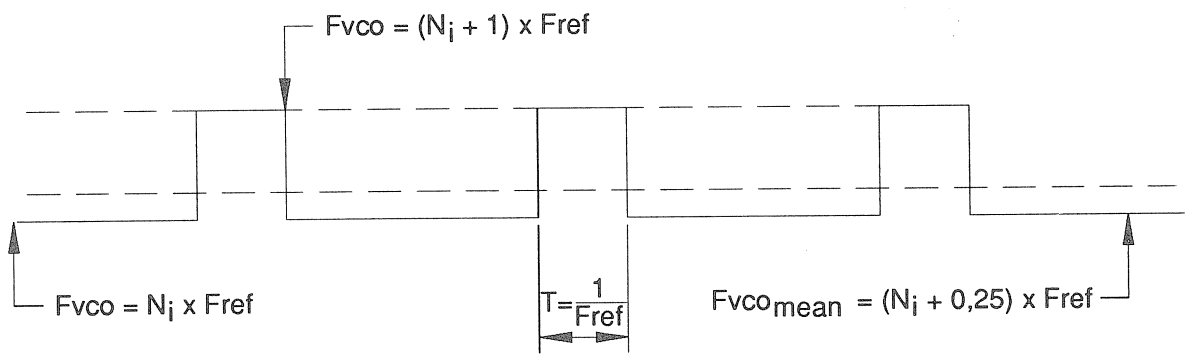
ts
urements

5.3. SYNTHESIZER UNIT (MODULE 3)

The synthesizer unit consists of two phase locked loops. Phase locked loop 1 generates the signal used as injection to the first mixer in the front end module and as the injection to the second mixer in the exciter unit. The PLL1 signal has a frequency range from 70 MHz to 100 MHz in steps of 10 Hz.
Phase locked loop 2 generates the injection signal to the first mixer in the exciter unit and the injection signal to the second mixer in the receiver unit. The PLL2 signal changes between two frequencies 80.7 MHz and 59.3 MHz when the transmitted or received sideband is changed between upper and lower sideband.

PHASE LOCKED LOOP 1

PLL1 operates as a fractional synthesizer. This means that the dividing figure in the loop can be set to a non-integer number, making it possible to get a frequency resolution at the VCO output which is smaller than the reference frequency in the loop. The reference frequency is 40.96 kHz and the frequency resolution is 10 Hz. The reference frequency is derived from a TCXO, which oscillates at 10.73152 MHz. Furthermore the TCXO signal is used as carrier signal for both detector in the receiver and SSB generator in the exciter.
The principle in a fractional synthesizer is that the integer number dividing figure N_i in the loop is changed at particular times to (N_i+1) determined by the value of fraction number F. By this method the mean frequency of the VCO is increased as illustrated in the example below:



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In the example the integer dividing figure is changed every fourth reference cycle implying an increase in mean VCO frequency.

Because of the change in the integer number, dividing figure spurious sidebands occur at the VCO output. These sidebands have to be reduced and this is done through a correction signal fed to the phase detector. The correction signal is generated in the API (Analog Phase Interpolator) circuit.

VOLTAGE CONTROLLED OSCILLATORS

The frequency range from 70-100 MHz is covered with four independent oscillators:

VCO I : 70 - 77.5 MHz
VCO II : 77.5 - 85 MHz
VCO III : 85 - 92.5 MHz
VCO IV : 92.5 - 100 MHz

The oscillators are in principle identical and each of them is built-up around an earthed drain FET amplifier, where the output signal is fed back to the input by means of two capacitors. The ratio of the capacitors determines the amount of feed-back in the oscillator. The oscillator frequency is determined by the LC circuit located on the gate of the FET, and the tuning of oscillator frequency is done by means of variable capacitance diodes.
The output signal from the VCO's is led through switch diodes D2, D5, D7, and D10 to a common buffer amplifier Q13, which buffers the VCO signal for prescaler buffer and LO buffer respectively.
Selection of the wanted VCO circuit is done by Q1, Q3, Q4, Q6, Q7, Q9, Q10, and Q12. The control of these transistors is done by serial to parallel register U1.

5.3. SYNTHESIZER UNIT (MODULE 3) cont.:

PASSIVE LOOP FILTER

The components R28, R31, C11, C51, C54, and L22 constitute a chebychev lowpass filter with cut-off frequency equal to approximately 10 kHz.
The major task of the passive filter is to prevent spurious signals arised from the phase detector and divider circuit, to modulate the VCO and generate sidebands to the VCO output signal.

ACTIVE LOOP FILTER

The filter consists of U16, C66, R33, and R38. The filter secures stabilization in the loop system and is of vital importance in determination of the loop system bandwidth.

PHASE DETECTOR

The phase detector is of the sample and hold type. The detector consists of a sequential phase detector followed by the current switch, the ramp generator and the sample and hold circuit.
U26 together with U27 form the sequential phase detector which converts the phase difference between the reference signal and the signal from the programmable divider to a square wave signal measurable on U26 pin 6. The duty cycle of the square wave signal is inverse proportional to the phase difference.
The sequential phase detector controls the current switch, which is built-up around Q25, D17, R93, D16, and D15. When the signal on basis of Q25 is at high state, D16 is switched on, the potential on the cathode of D15 is increased, and D15 is switched off.
When the signal on basis of Q25 is at low state, D16 is switched off, the potential on the cathode of D15 is decreased, and D15 is switched on. The amount of current flowing through D15 and D16 respectively is determined by the current mirror circuit described elsewhere.

The ramp generator, built-up around U21 and C112, integrates the current drawn from U21 pin 2 in regard to time. The ramp generator output voltage is then linear in regard to the size of current flowing through the switch diode D15 and the period of time the diode is switched on.
Q24 connected in parallel to C112 constitutes a switch, which resets the ramp generator by discharging C112.
The switch is open when the gate voltage is at low state and vice versa.
The ramp generator and current switch connected with the sequential phase detector imply a phase detector where the output voltage, in a certain period of time in every reference cycle, is linear in regard to the phase difference between the reference signal and the signal from the programmable divider. In this period the output voltage has to be sampled and held and this is done by the sample & hold circuit, consisting of U19, R64, C95, Q19, and R77.
Q19 functions as the switch, which carries out the sampling. The switch is open when the gate voltage is at low state and vice versa.
C95 is charged to the phase detector voltage through R77 when the sample switch is closed, and carries out the hold function when the sample switch is open.
The voltage on C95 is led to the active loop filter through the voltage follower U19.

CURRENT MIRROR

The current mirror is built-up around transistor array U20 and the circuit generates reference circuit for the phase detector and the API-circuit.
The current mirror is so designed that the ratio between reference current for phase detector and API-circuit respectively will be kept as a constant regardless of the temperature. A change in one of the currents will be reflected or mirrored into the other.
The nominal value of reference current for the API circuit can be adjusted by means of potentiometer R88.

CONTROL SIGNAL LOGIC

The circuit is built-up around one 8-bit counter U32, which is clocked by the input signal to the reference divider. The clock frequency is 5.36576 MHz.
The counter is reset by the output signal from the reference divider.

5.3. SYNTHESIZER UNIT (MODULE 3) cont.:

The control logic delivers reset signal to the ramp generator and sample signal for the sample & hold circuit. The output signals from the circuit are generated through detection of which state the 8-bit counter is in, and the detection is done by means of the logical circuitry formed by U25 and U29.

API CIRCUIT

The circuit delivers signal to the modulus control logic and correction signal (API voltage) for the phase detector. The circuit is built-up around a 12-bit digital accumulator constituted by U2, U3, U4, U7, U8, U9, and U12 containing a fraction register, a binary adder, and a sum latch.
Overflow information from the binary adder is led to the modulus control logic and implies a change in the integer number dividing figure in one reference cycle.
In every reference cycle the contents of the accumulator is renewed by clocking the sum latch, the clocking is controlled by the control logic circuit.
The output from the binary adder is led to a 12-bit D/A converter U14, which in connection with OP. AMP U18 generates the API voltage.
The reference current to the D/A converter is derived from the reference current to the phase detector by means of the current mirror and is led through the current switch and current buffer & filter to the D/A converter.
D11, D12, Q16, and Q15 constitute the current switch, which adjusts the mean value of the reference current to the D/A converter as a function of the integer number dividing figure in the loop.
When the signal on basis of Q15 is at high state, D11 is switched on and D12 off and vice versa, and by changing the duty cycle of a square wave signal on basis of Q15 the mean value of the current to the D/A converter can be adjusted.
Control of the current switch is carried out by the 1/N correction logic, which as a function of the output from the programmable divider and the output from the prescaler produces a square wave signal measurable on U13 pin 13 where the duty cycle is varied as function of the integer number loop dividing figure so that the duty cycle increases for decreasing VCO frequency and vice versa.
From the current switch the current is led to buffer & filter constituted by Q14, C84, and C85, which buffers and filters out the reference current to the D/A converter.

MODULUS CONTROL LOGIC

The modulus control logic is constituted by U28 and U23, which as a function of overflow signal from the accumulator, prescaler output, modulus control signal from the programmable divider and output from the 1/N correction logic, generates modulus control signal for the prescaler.
The circuit does not effect the modulus control signal from the programmable divider when the loop dividing figure includes a fraction part, the prescaler modulus shall be changed in one prescaler output period from 32 to 33, if there is a reference cycle where overflow signal is given from the digital accumulator. This change of prescaler modulus implies the needed change of dividing figure to increase the mean frequency of the VCO with a fraction of the reference frequency, and the change is timed through the modulus control logic.

DIVIDER CIRCUITS

The programmable divider consists of a dual modulus prescaler U22 dividing by 32/33 and a programmable divider included in U24. The integer number dividing figure is latched into U24.

The reference divider consists of a D-FF U31 followed by the programmable reference divider U30.
The division ratio of U31 is 2 and the division ratio of U30 is 131. This implies a total division ratio of 262.

BUFFER CIRCUITS

The VCO signal is led from the VCO buffer into LOI buffer and prescaler buffer.
The LOI buffer consists of Q17 and Q22 and the buffer generates the necessary power level for both receiver and exciter modules.
The output of the buffer is led to relay RE01, which feeds the signal to receiver and exciter respectively, dependent upon whether the transceiver is in transmit or receive mode.
The control of RE01 is carried out by serial to parallel register.

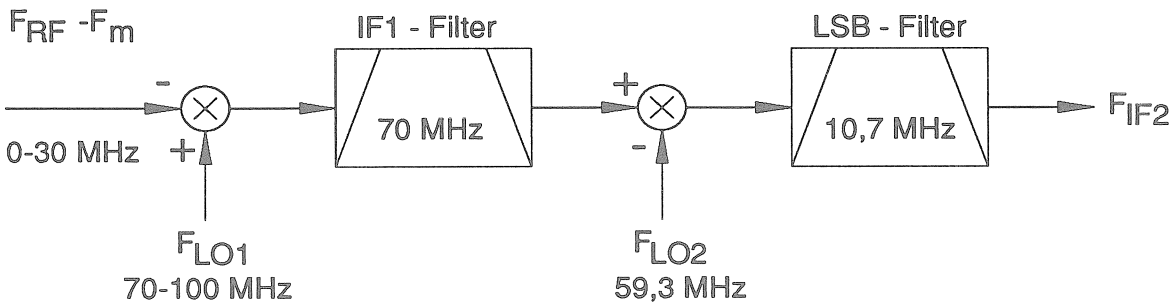
5.3. SYNTHESIZER UNIT (MODULE 3) cont.:

The prescaler buffer consists of Q18 and Q21 and the major task of the circuit is to prevent spurious signals created in the prescaler from being added to the VCO signal and through that imply spectral impurity of the LOI signal.
The TCXO signal is led to the TCXO buffer, which consists of Q27 and Q26.
The buffer delivers signal for the reference divider and carrier reinjection signal for both receiver and exciter modules.

PHASE LOCKED LOOP 2

The change between transmitted and received upper and lower sideband is generated by a frequency change in PLL2 as illustrated below.

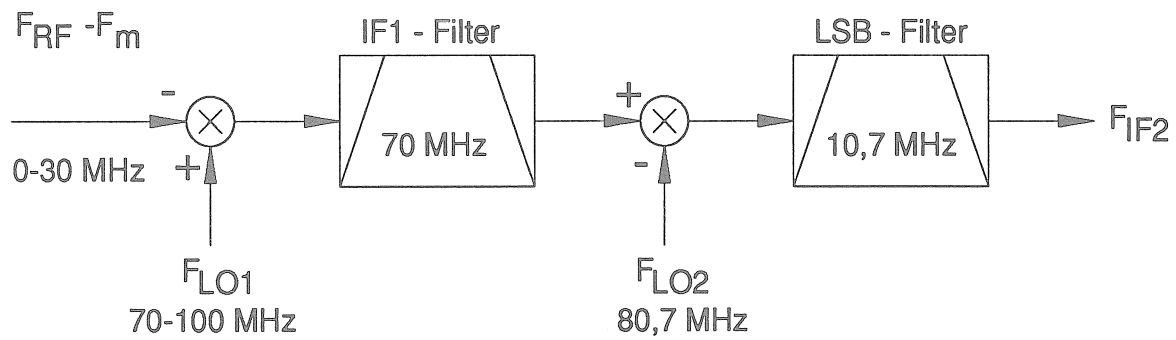
USB Receiver



f_m = Modulation frequency
$f_{IF2} = f_{LO1} - f_{LO2} - f_{RF} - f_m$.

The modulation frequency f_m changes sign meaning that a received upper sideband signal will pass through the 10.7 MHz lower sideband IF-filter.

LSB Receiver

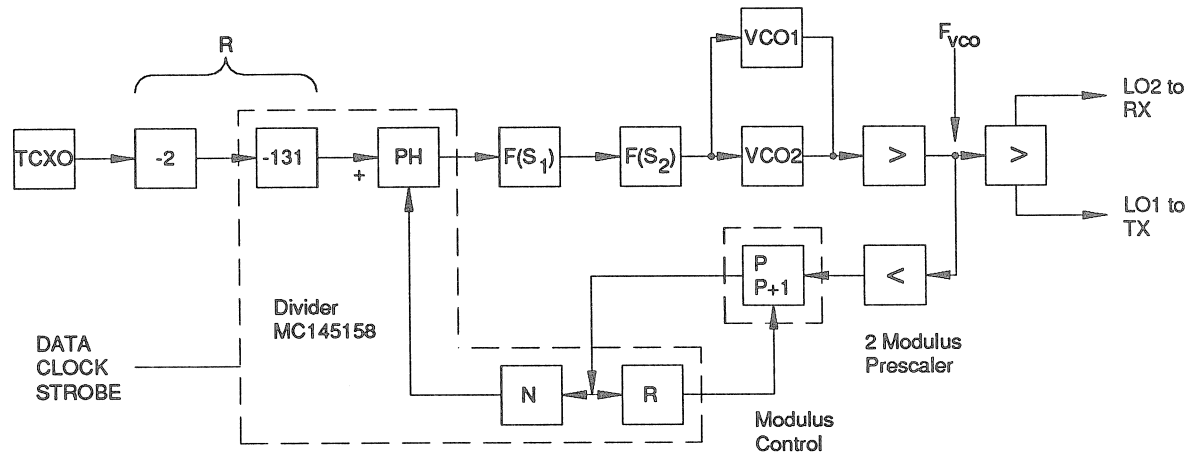


f_m = Modulation frequency
$f_{IF2} = f_{LO2} - f_{LO1} + (f_{RF} - f_m)$

The modulation frequency f_m does not change sign meaning that a received lower sideband signal will pass through the 10.7 MHz lower sideband IF filter.

5.3. SYNTHESIZER UNIT (MODULE 3) cont.:

Block Diagram of USB/LSB Synthesizer



From the block diagram it can be shown that the output frequency f_{VCO} has the following function of f_{TCXO}:

$f_{VCO} = f_{TCXO} \frac{1}{R}(N \ P + A)$ P chosen to 32.

f_{TCXO} = 10.73152 MHz

When upper sideband is chosen the following counts are read into the divider U35. R = 2 x 131, N = 45, A = 7, this gives N P + A = 1447 and the lock frequency is f_{VCO} = 59,269.120 MHz.

When lower sideband is chosen the following counts are read into the divider U35. R = 2 x 131, N = 61, A = 19, this gives N P + A = 1971 and the lock frequency is f_{VCO} = 80,732.160 MHz.

VOLTAGE CONTROLLED OSCILLATOR

The circuit contains two similar VCO's. One is active in LSB mode and the other is active in USB mode.
The oscillator which is active in the LSB mode is built around the transistor Q30. Coil L31, parallelled with C130 and C129 in combination with the variable capacitor D19 form the main part of the frequency determining elements.
D20 and R120 which are connected to the gate of the oscillator transistor prevent the gate source voltage from becoming positive which will cause the oscillator noise to increase.
To activate the oscillator U01 - pin Qg is "LOW" which means that transistor Q28 is off and the transistors Q29, Q31 are on supplying the oscillator transistor with DC voltage.
The oscillator which is active in the USB mode is built around the transistor Q33. Coil L37 parallel with C150 and C149 in combination with the variable capacitor D22 form the main part of the frequency determining elements.
D23 and R133 which are connected to the gate of the oscillator transistor prevent the gate source voltage from becoming positive which will cause the oscillator noise to increase.
To activate the oscillator U01. Pin Qg is "high" which means that the transistors Q32 and Q35 are on supplying the oscillator transistor with DC voltage.
When one oscillator is supplied with DC voltage the other is off.
The DC supply to the oscillator switches the diode D21 or D24 on and thereby supplies DC voltage to the oscillator buffer transistor Q36. From this transistor the local oscillator signal is fed to the prescaler buffer and to the output local oscillator buffer.

5.3. SYNTHESIZER UNIT (MODULE 3) cont.:

PRESCALER BUFFER

From the oscillator buffer transistor Q36 the signal is fed through the network consisting of R159 and C180 to the grounded basis transistor Q38. The local oscillator signal is amplified here and fed through the attenuator R168/R170 and the amplifier transistor Q40. The result is an amplitude stabilized signal which is fed to the prescaler U36.

PRESCALER AND DIVIDER

The programmable divider consists of a dual modulus divider U36, dividing by 32/33 and a programmable divider included in U35.
The division ratio is determined by the number latched into U35 and together with U36 the divider works as a conventional dual modulus divider with the modulus control from U35 controlling the prescaler U36.
The reference frequency divider is included in U35.
The reference frequency input on pin 1 has the frequency 5,365.760 MHz and the reference division ratio R read into U35 is 131 leading to a reference frequency of 40.96 kHz which can be monitored on pin 13. This 40.96 kHz signal is used as the reference signal to the phase detector. The variable frequency to the phase detector is the VCO frequency divided with the read in "division ratio". This ratio is 1447 when USB mode is chosen, and by LSB mode 1971 leading to the two phase lock frequencies in USB of 59,269.120 MHz and in LSB mode 80,732.160 MHz.

PHASE DETECTOR AND LOOP FILTER

The phase detector is an integrated part of U35. The input reference frequency f_R is 40.96 kHz which can be monitored on pin 13 and the input variable frequency f_V can be monitored on pin 3. The three-state output of the phase detector produces a loop error signal which is used with the loop filter to control the VCO. The phase detector output is for frequency $f_V > f_R$ or f_V leading, negative pulses. For frequency $f_V < f_R$ or f_V lagging, positive pulses and for $f_V = f_R$ and phase coincidence, the output is in high impedance state.
The loop filter consists of two parts. The first part of the loop filter built around the amplifier U34 and the R/C network R118 and C131 take care of the loop characteristic. The second part of the filter consisting of L34, L35 and C141/C143/C146 is a passive lowpass filter which removes the remaining part of the 40.96 kHz reference signal from the VCO control signal.

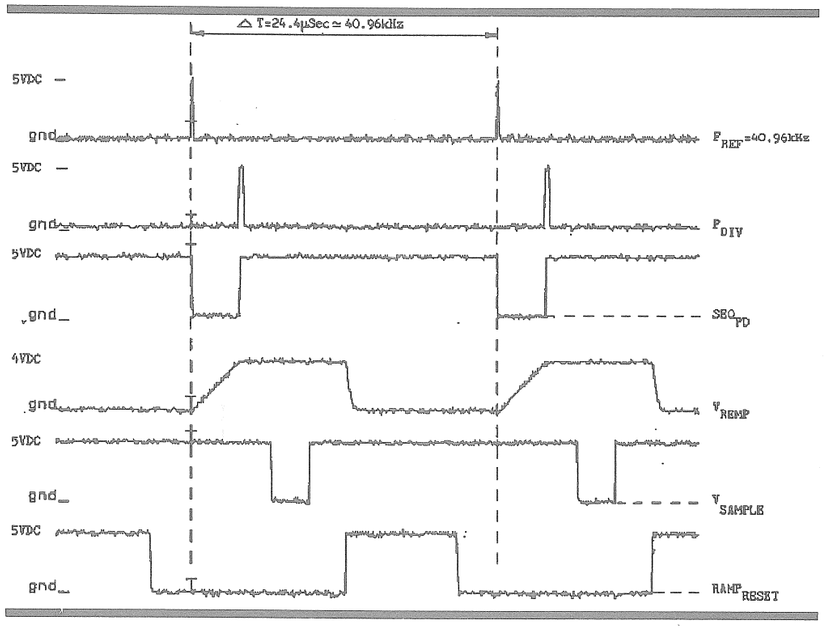
OUTPUT LOCAL OSCILLATOR BUFFER

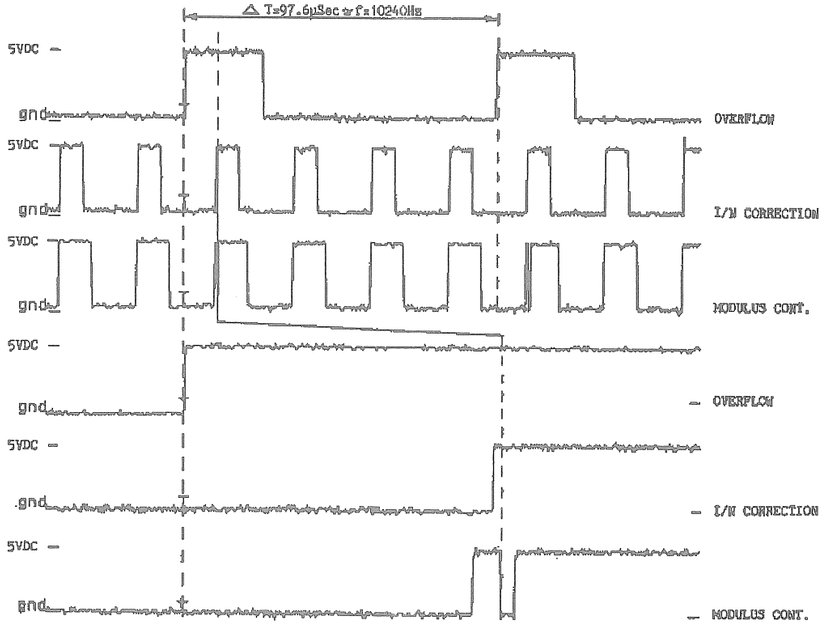
From the oscillator buffer transistor Q36 the VCO signal is amplified in transistor Q34 and filtered in the lowpass filter consisting of C176, L40, and C177. Before the signal is fed to the output terminal it is amplified in transistor Q37 and fed through the relay RE2.
When the relay is activated the VCO signal is fed into the first mixer on the transmitter module. The diode D26 is conducting and thereby grounding the remaining part of the signal to the receiver module. When the relay RE2 is not activated the diode D26 is reversed and the VCO signal is fed to second mixer on the receiver module.

SYNTHESIZER WAVEFORMS

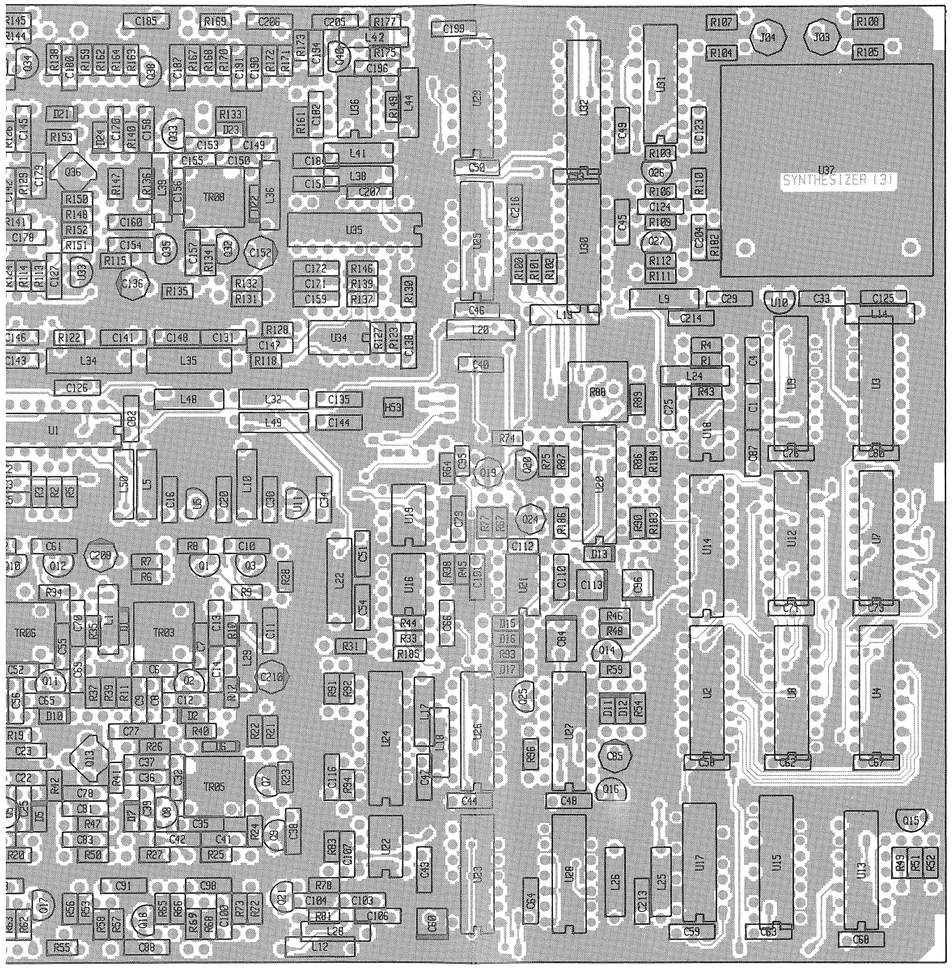
The below waveforms are identified with a signal name, which can be found in the diagram of the synthesizer module (3).

TEST CONDITIONS
Frequency setting f_{RX} = 2058.24 kHz
Mode = J3E/USB

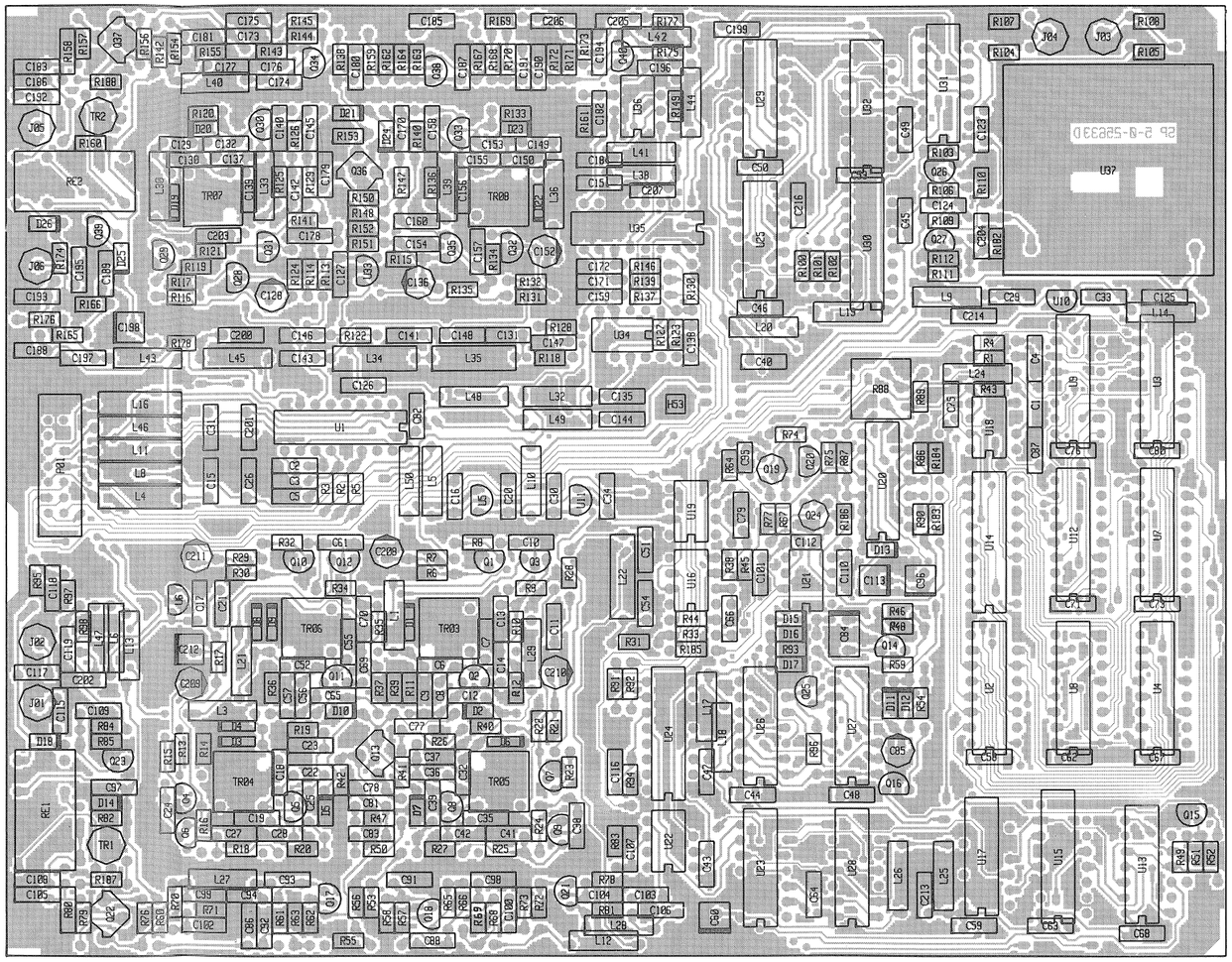




)CATION SYNTHESIZER UNIT (MODULE 3)



with upper side tracks.



Seen from the component side with lower side tracks.

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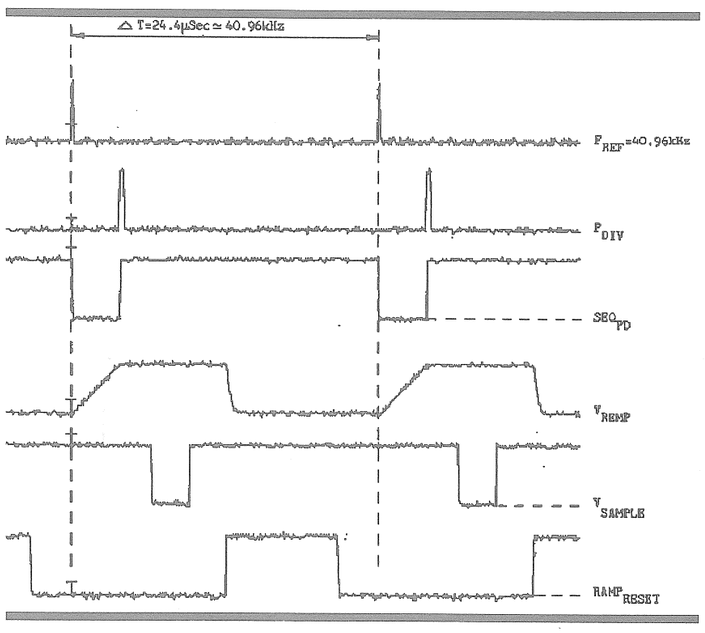
THESIZER UNIT (MODULE 3) cont.:

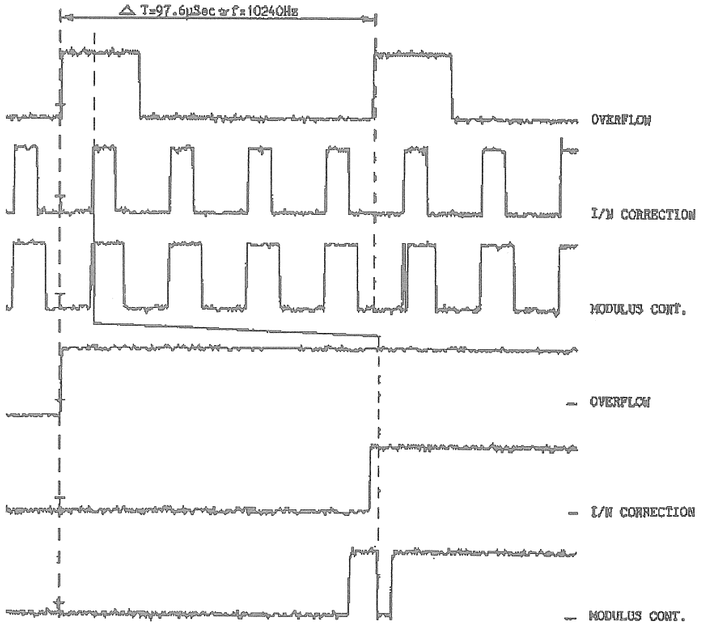
ZER WAVEFORMS

waveforms are identified with a signal name, which can be found in the diagram of the module (3).

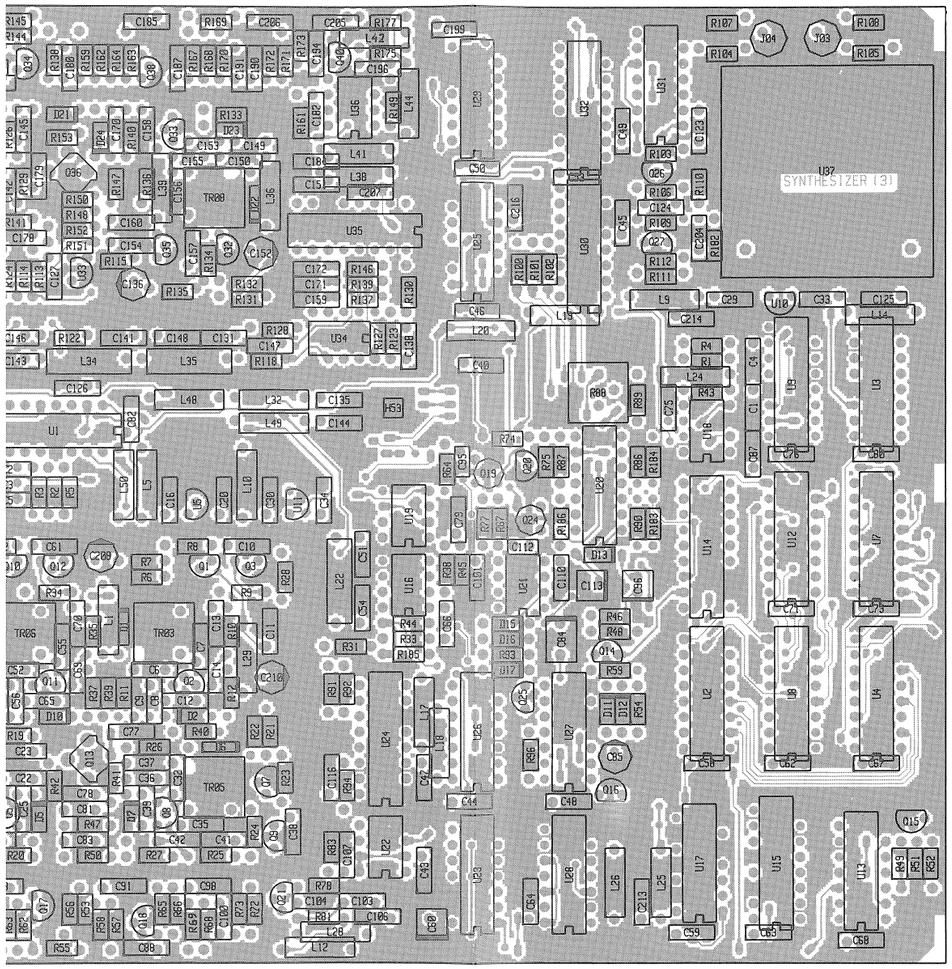
DITIONS

setting f_{RX} = 2058.24 kHz
= J3E/USB

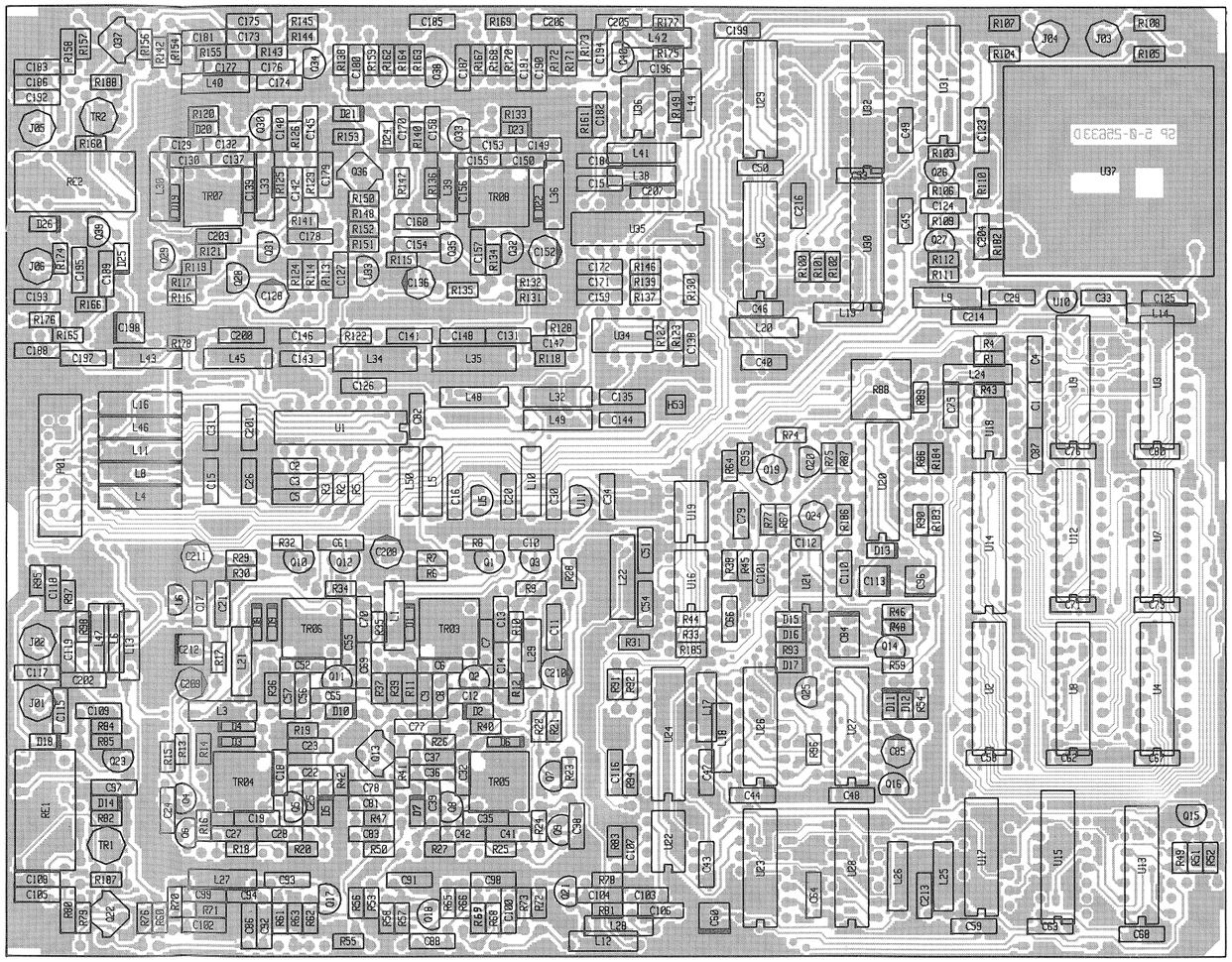




)CATION SYNTHESIZER UNIT (MODULE 3)



with upper side tracks.



Seen from the component side with lower side tracks.

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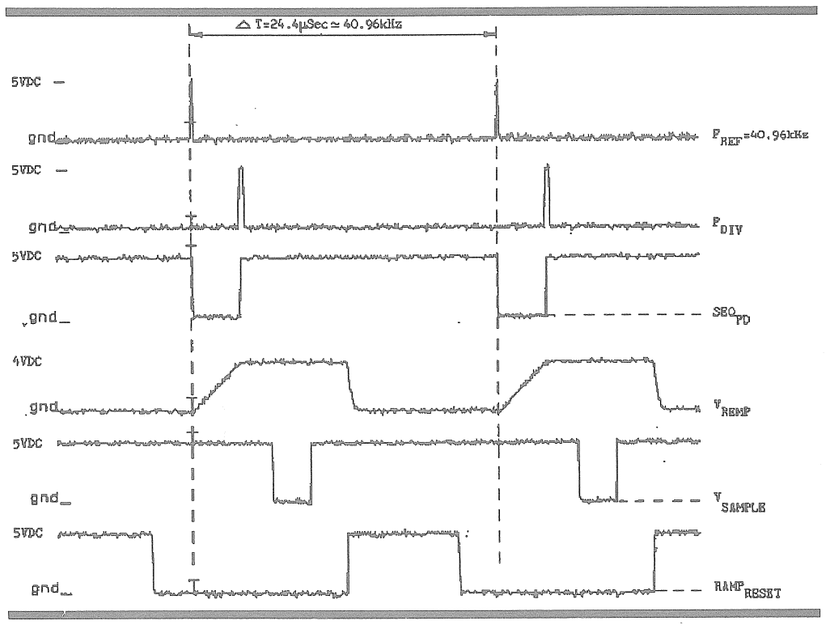
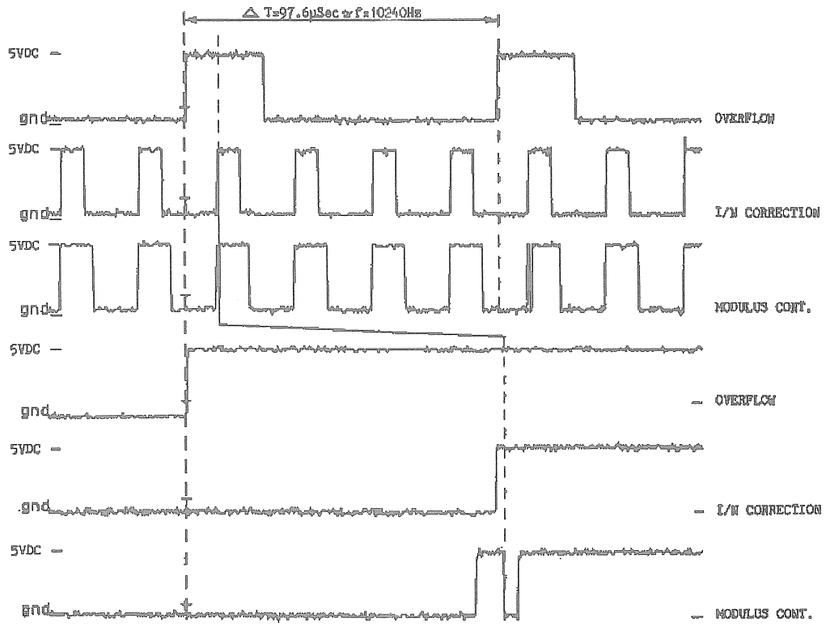
SYNTHESIZER WAVEFORMS

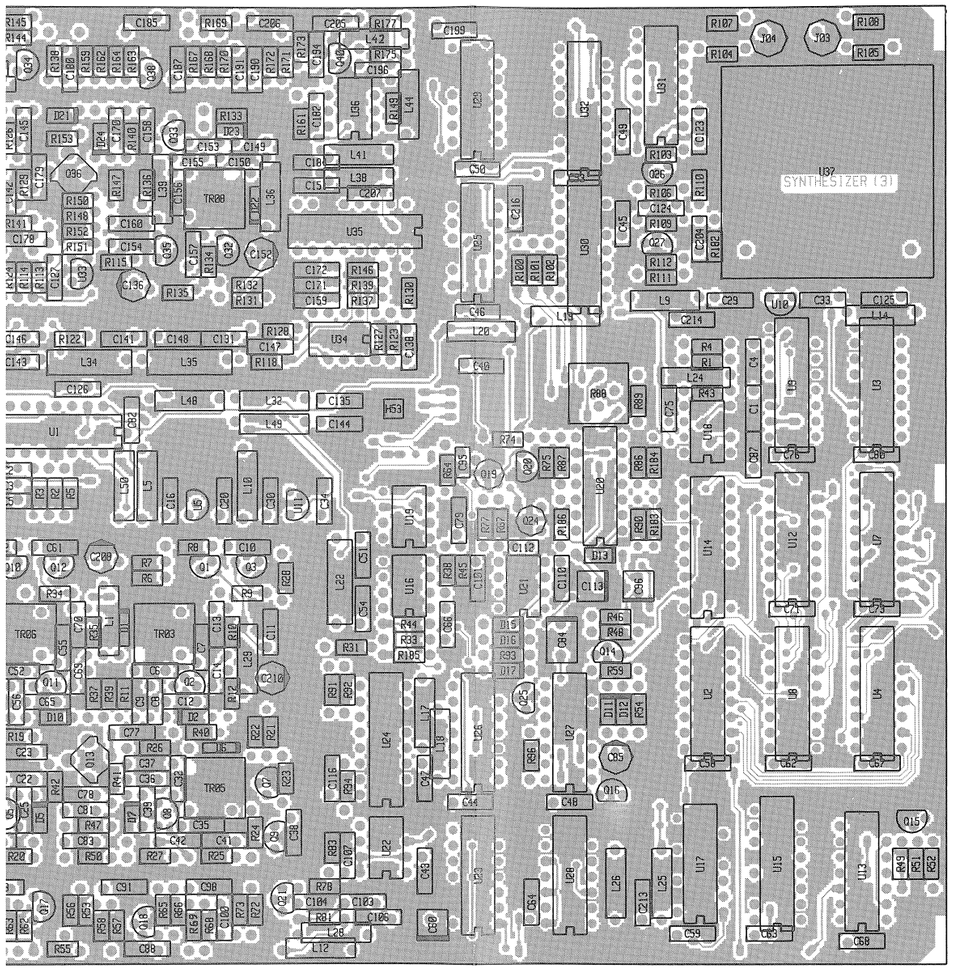
The below waveforms are identified with a signal name, which can be found in the diagram of the synthesizer module (3).

TEST CONDITIONS
Frequency setting f_{RX} = 2058.24 kHz
Mode = J3E/USB

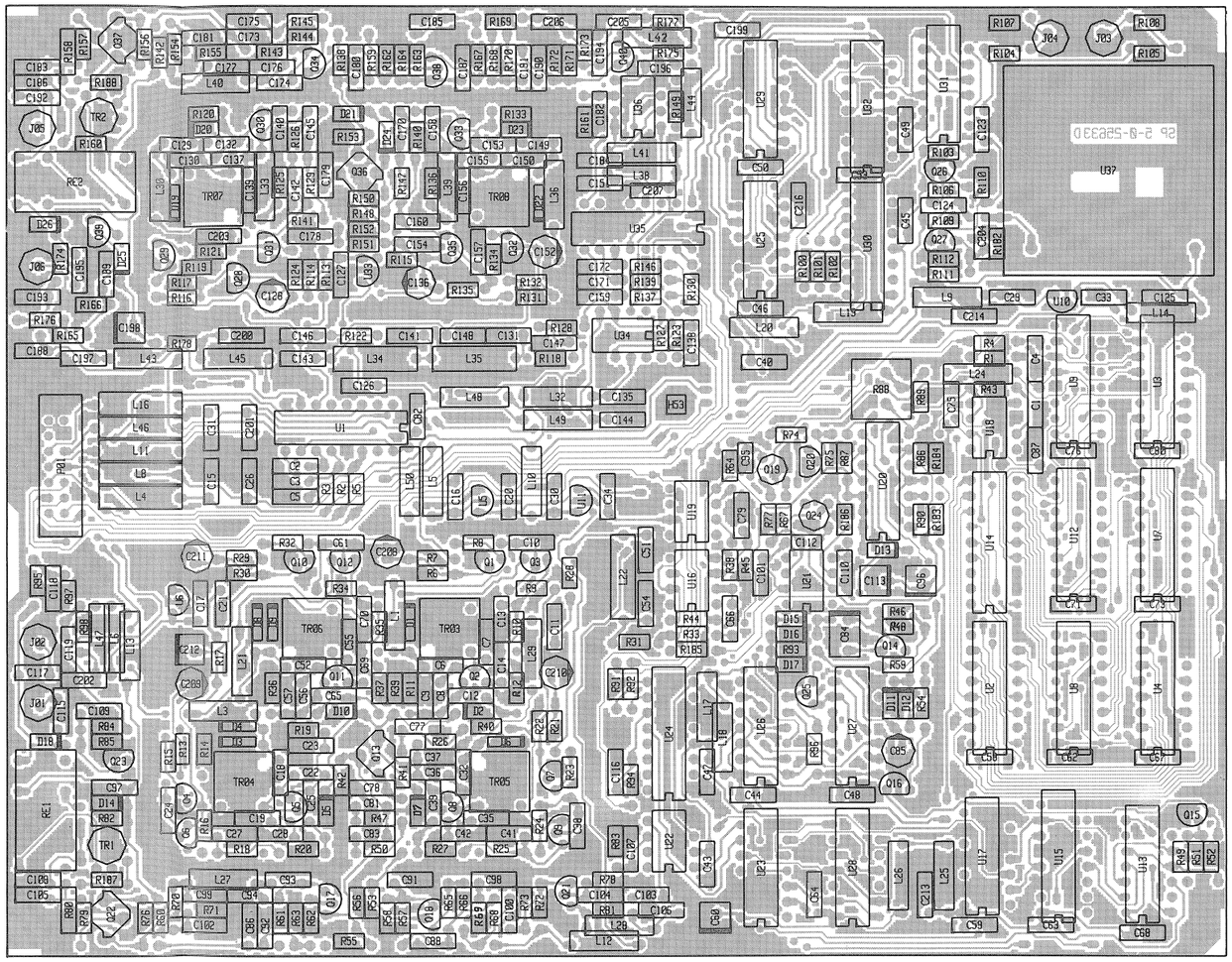




)CATION SYNTHESIZER UNIT (MODULE 3)



with upper side tracks.



Seen from the component side with lower side tracks.

RM2150/51 5-0-25633D / 4-6-25633E

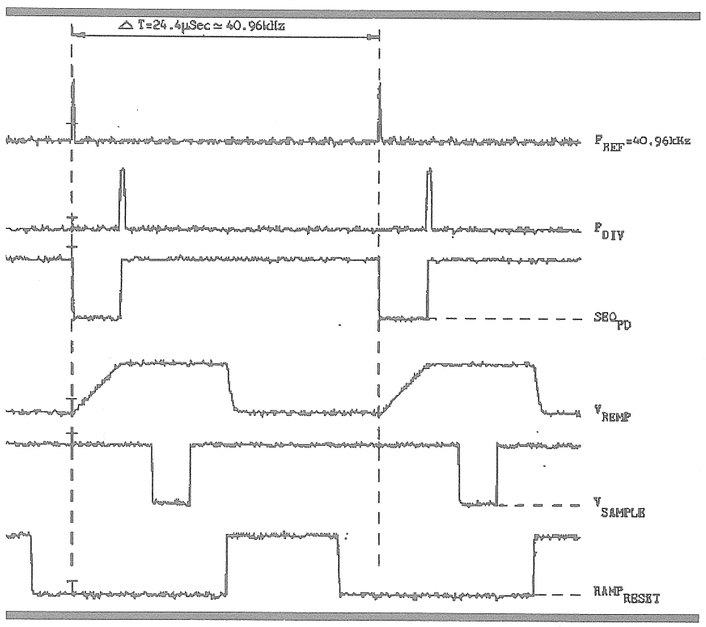
THESIZER UNIT (MODULE 3) cont.:

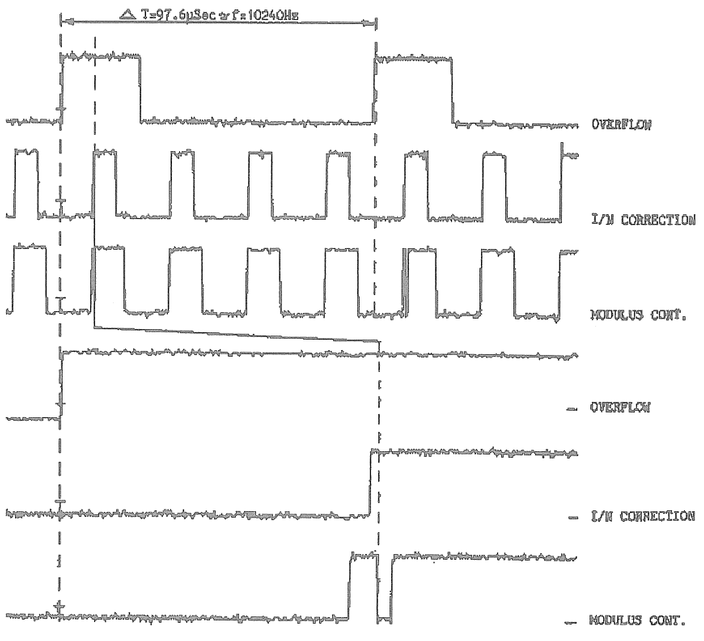
ZER WAVEFORMS

waveforms are identified with a signal name, which can be found in the diagram of the module (3).

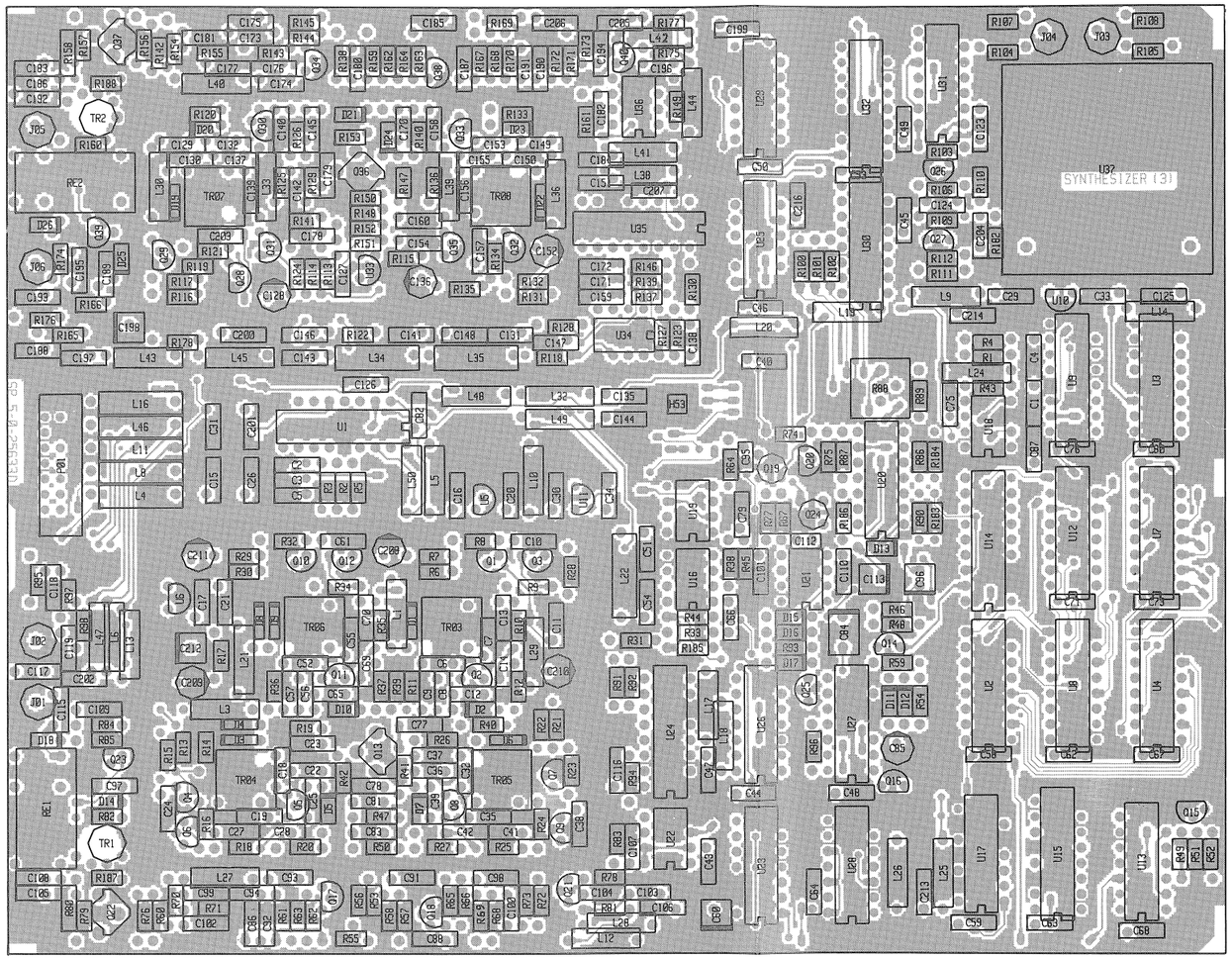
DITIONS

setting f_{RX} = 2058.24 kHz
= J3E/USB

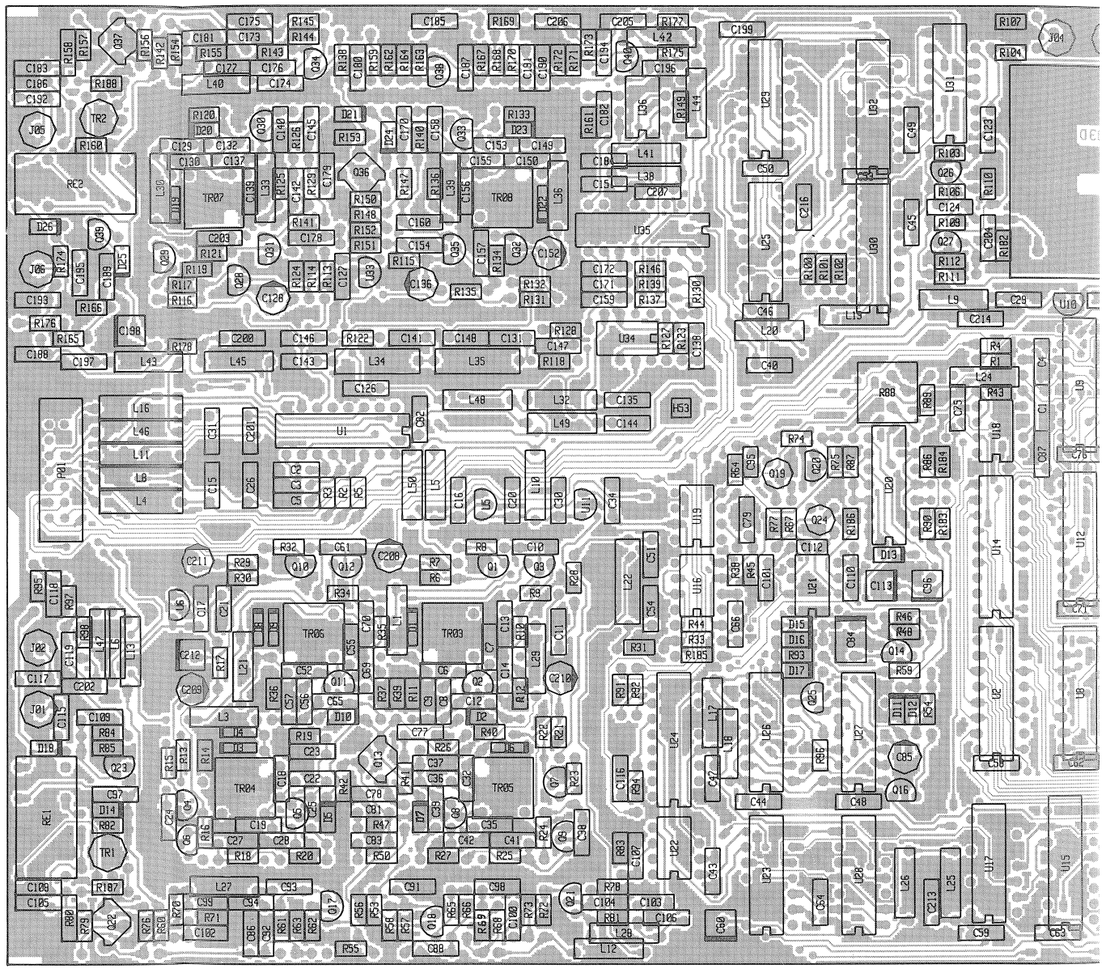




5.3. COMPONENT LOCATION SYNTHESIZER UNIT (MODULE 3)

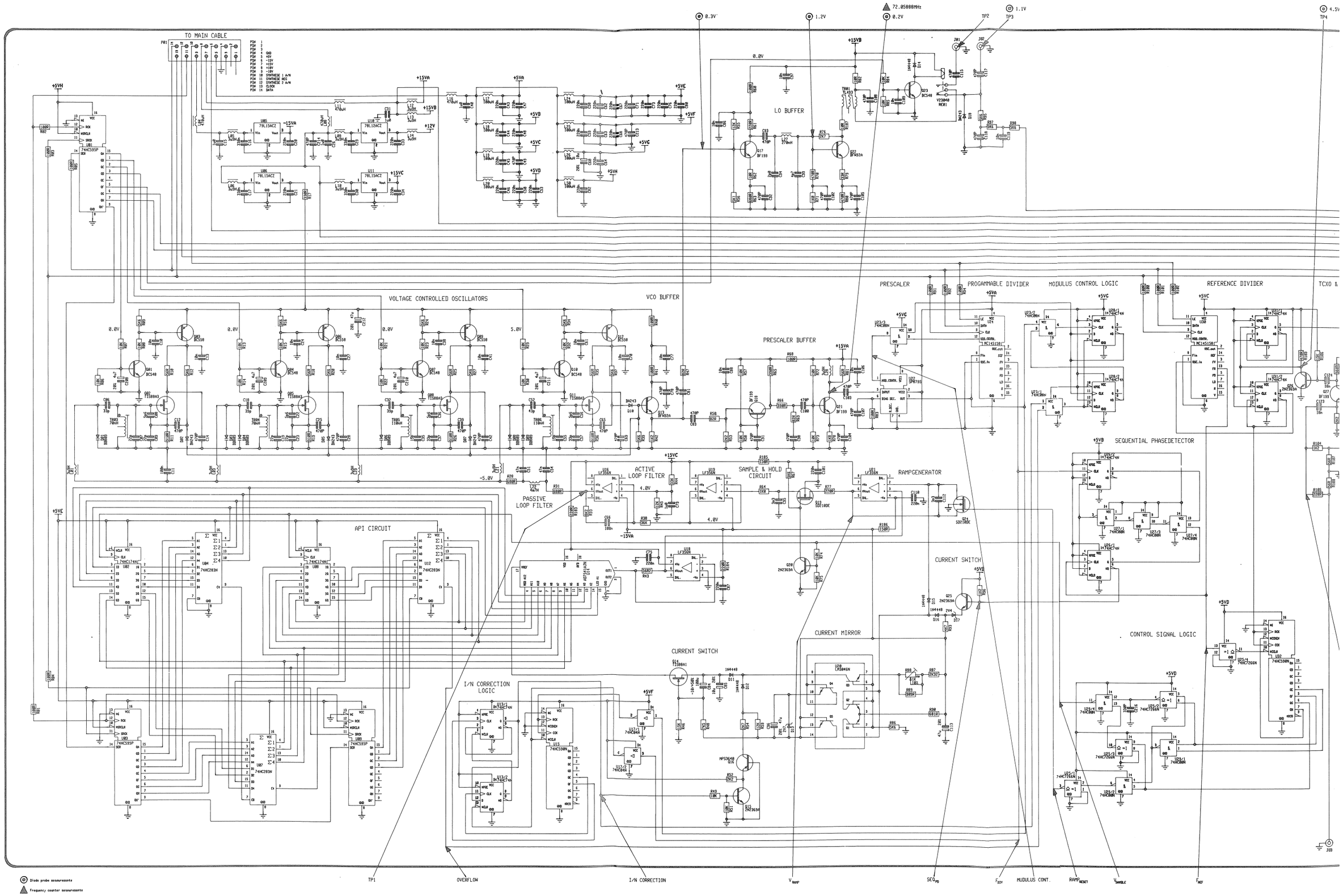


Seen from the component side with upper side tracks.



Seen from the component side with lower side tracks.

RE2100 / R2122 / RM2150/51
4-0-25633F



Synthesizer Unit (3)

0.3V
1.2V
72.85888MHz
0.2V
TP2
TP3
1.1V
4.5V
TP4
TP5
3.3V
59.26912MHz
0.35V
+5VB
+5VE
+5VF
+5VC
+5VA
+5VD
+12V
-6.0V
5.0V
4.0V
0.0V

LO BUFFER
VCO BUFFER
PRESCALER BUFFER
PRESCALER
PROGRAMMABLE DIVIDER & PHASEDETECTOR
PROGAMMABLE DIVIDER
MODULUS CONTROL LOGIC
REFERENCE DIVIDER
TCXO & TCXO-BUFFER
ACTIVE LOOP FILTER
VOLTAGE CONTROLLED OSCILLATOR
SEQUENTIAL PHASEDETECTOR
SAMPLE & HOLD CIRCUIT
RAMPGENERATOR
CURRENT SWITCH
CURRENT MIRROR
CONTROL SIGNAL LOGIC
PASSIVE LOOP FILTER

CORRECTION
V_{RAMP}
SEQ$_{PD}$
f_{DIV}
MODULUS CONT.
RAMP$_{RESET}$
V_{SAMPLE}
F_{REF}
0.6V
0.5V
1.4V
0.85V
TP6
TP7
1.3V
J03
J04
J05
J06

4-8-25833F

SYNTHESIZER MODULE 3

5.4. MAIN PROCESSOR UNIT (MODULE 4)

INTRODUCTION

The following part gives a description of the circuit principles on the CPU board and the Filter board, referring to the schematics and component lists.

Control lines which are active at a logic high level, will be printed like **THIS**.

Control lines which are active at a logic low level, will be printed like **!THIS**.

TT-3820A MAIN PROCESSOR BOARD

The main processor board includes the host processor circuits for the complete control of

- Display Module
- Keyboard Module
- Filter Module
- Receiver set-up and control, SPI-BUS

Memory Configuration

- 3x128 Kbyte of programme memory
- 64 Kbyte RAM disk (battery backed-up)
- 32 Kbyte NON volatile system configuration memory
- 512 Kbyte scratch pad memory combined with text- and input/output buffer memory.

Various

- CCITT V.24/V.28 serial input/output circuit
- T-BUS interface
- Parallel Centronic Printer interface,
- NMEA 0183 interface

CIRCUIT SCHEMATIC PAGE 1 OF 7

The CPU (U6) used on the Main Processor Board is an 8 bit 10 MHz 80188 processor with multiplexed data and lower address bits.

The CPU clock frequency is generated using a 20 MHz crystal connected directly to the processor.

Control signals and address bits from the CPU are buffered in U4 and U8 by means of the **ALE** signal.

The U5 and U7 forms the I/O mapped chip selects not supplied by the CPU.

The U3 is a combined watch-dog, battery switchover and chips select protection.

Battery Power — The voltage on V_{out} (pin 2) will always be whatever is highest of the supply voltage (pin 3) and the battery voltage (pin 1).

Chip Select — When the supply voltage (pin 3) drops below 4.65 volts the **!CE** signal (pin 12) goes high to block chips select signals to the SRAM U26 and U27.

Watch Dog — For proper software operation the **WDI** input (pin 11) needs to be toggled every 1.6 seconds. If not a 50 msec **!RESET** signal will be issued on pin 15 restarting the microprocessor.

U1A and U2A forms a circuit for controlling the watch–dog function. The first activation of the chip select signal U5 pin 15 will enable the watch–dog. The jumper W1 can disable the watch–dog function if inserted during start–up.

CIRCUIT SCHEMATIC PAGE 2 OF 7

U10, U11 and U12 form the programme memory available on the main processor board (3x128 Kbyte). The programme memory layout is as follows:

U13 is an EEPROM containing system configuration and data which needs to be stored in NON volatile memory.

U7B, U9B, U14, U16A/B/C and U17A form a circuit for protecting part of the EEPROM. To be able to write into the protected part of the EEPROM two keys on the keyboard have to be pressed simultaneously to provide the **!E2WR** signal.

The W4 strap determines which part of the EEPROM to be protected.

The dynamic RAM consists of the RAM circuits U19, U20, U21 and U22, the read/write row/column address gate circuits U15, U18 and U23, the pulse forming network U1B, U7D, U9C/D/E/F, U24A and U25.

The RAM circuits are each organized as 4x256 Kbyte. The refresh of the DRAM is done by the microprocessor using DMA. R12 and C4 ensure the right timing of the **!RAS** and **!CAS** signals to the RAM circuits and multiplexing the row/column addresses.

CIRCUIT SCHEMATIC PAGE 3 OF 7

The static RAM consists of the RAM circuits U26 and U27 together with chip select protecting circuit U28A/B/C and U29A. U26, U27, U28 and U29 are all powered by battery power and the **CSDIS** signal coming from U3 will disable the chip select signals to U26 and U27 if the supply voltage drops below 4.65 volts.

The RAM circuits are each organized as 8x32 Kbyte.

U30 is a dedicated real time clock circuit accessible on a serial basis. The U30 is battery powered to keep running continuously. The timing is based on a 32.768 kHz crystal and for fine tuning C5 can be adjusted for a 128 Hz signal in TP8.

CIRCUIT SCHEMATIC PAGE 4 OF 7

The NMEA 0183 interface consists of U31, U35 and U50. U50 provides the optically isolation and U31 is a Universal Serial Asynchronous Receiver/Transmitter (USART) in which only the receiver part is used. U35 divides the system clock by 16 before feeding the clock signal to the USART. Internally the USART divides the clock signal by 64 to achieve a baud rate of 4800.

The programmable timer U36 generates 2 auxiliary clock signals for the demodulator/modulator. The clock signals are derived from the system clock of 4.1952 MHz.

The last part of the programmable timer is used to measure the period time of the incoming space tone detected in the demodulator. U17B and U39B are converting the analog space signal to a logical TTL gate for controlling the period measurement counter.

The system clock oscillator consists of U38A/B and the frequency is based on a 4.9152 MHz crystal. The U38B serves as buffer for the oscillator signal. For fine tuning C19 can be adjusted for 4.9152 MHz in TP13.

The U37 contains 2 Serial Communications Controllers serving the console port J2 and T–BUS port J3 and J4, and interface circuits U24C/D/E, U32 and U34A are converting between TTL levels to/from the SCC and the CCITT V.24/V.28 levels. U24B/F, U33A, Q1, Q2 and Q3 form the network to interface between TTL levels to/from the SCC and the CCITT V.10 levels.

To ensure the output voltage on the T–BUS to be either +5V or –5V two voltage regulators U40 and U41 are supplying +5.7V and –5.7V to the Q1 and Q3.

CIRCUIT SCHEMATIC PAGE 5 OF 7
U42 contains 3 input/output ports.

Port A used as an input port reading 2x4 DIP switches.

Port B used as an input port reading the keyboard columns and the serial data line to the real time clock circuit U30.

Port C used for controlling 3 LEDs DS2, DS3 and DS4, also control of the keyboard light using U33F and Q4, selecting rows for scanning the keyboard

U38F and U43A ensure the hardware protection for writing in the EEPROM. The **!E2WR** is only generated if a key from column 0 and column 1 are pressed simultaneously.

The Centronics printer port J6 consists of U44, U45 and part of U46. The status signals from the printer are read using the U44 buffer and the 8 data bits are latched on U45. Two outputs on the U46 latch are used for the control signals to the printer.

One output of the U46 latch is used for serial data for the real time clock circuit U30.

The SPI–BUS (J7) consists of 5 outputs from U46 and 2 outputs from U47. The 5 outputs on U46 are select signals and 3 of these needs to be inverted (U33C/D/E). The 2 outputs on U47 are clock signal and data signal.

The rest of the outputs on U47 are used as follows

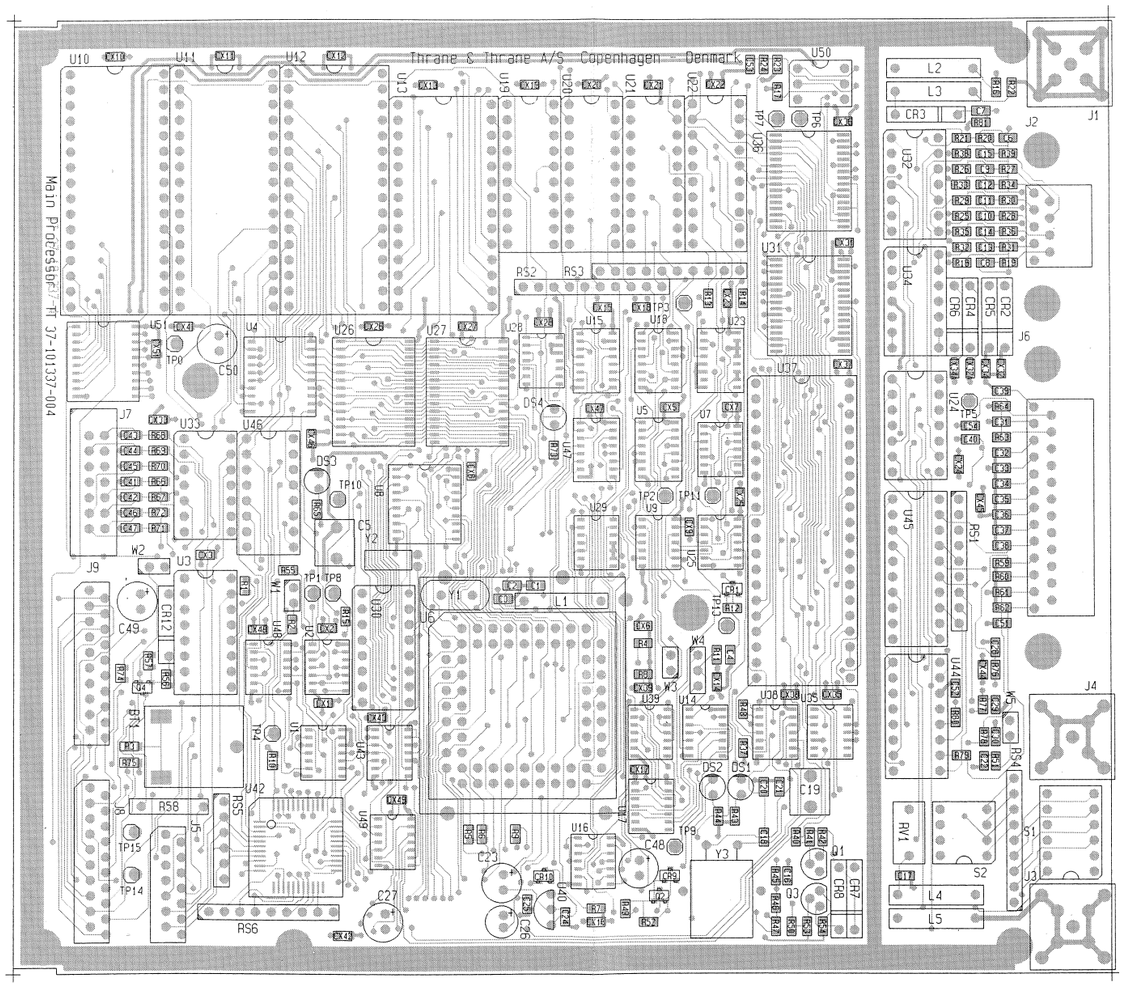
!PECLR	used for clearing the 2 flip/flops (U17B and U39A) in the period time measurement
!E2DI, !E2EN	Disable and enable signal for writing in the EEPROM
DSRTTL, RITTL	Control signals for the console port J2.
CLK_CLK	Serial Clock signal for the real time clock circuit U30.

CIRCUIT SCHEMATIC PAGE 6 OF 7
The filter port interface consists of U2B/C, U16D, U48, U49A and U43A. U16D, U48 and U49A are used to buffer the address lines **A0**, **A1**, **A2** and the control signals **!WR** and **!RD** in order to keep these lines at a constant level when not accessing the Filter Module. U43B is used for controlling the address line buffers and the bidirectional data buffer U2B/C.

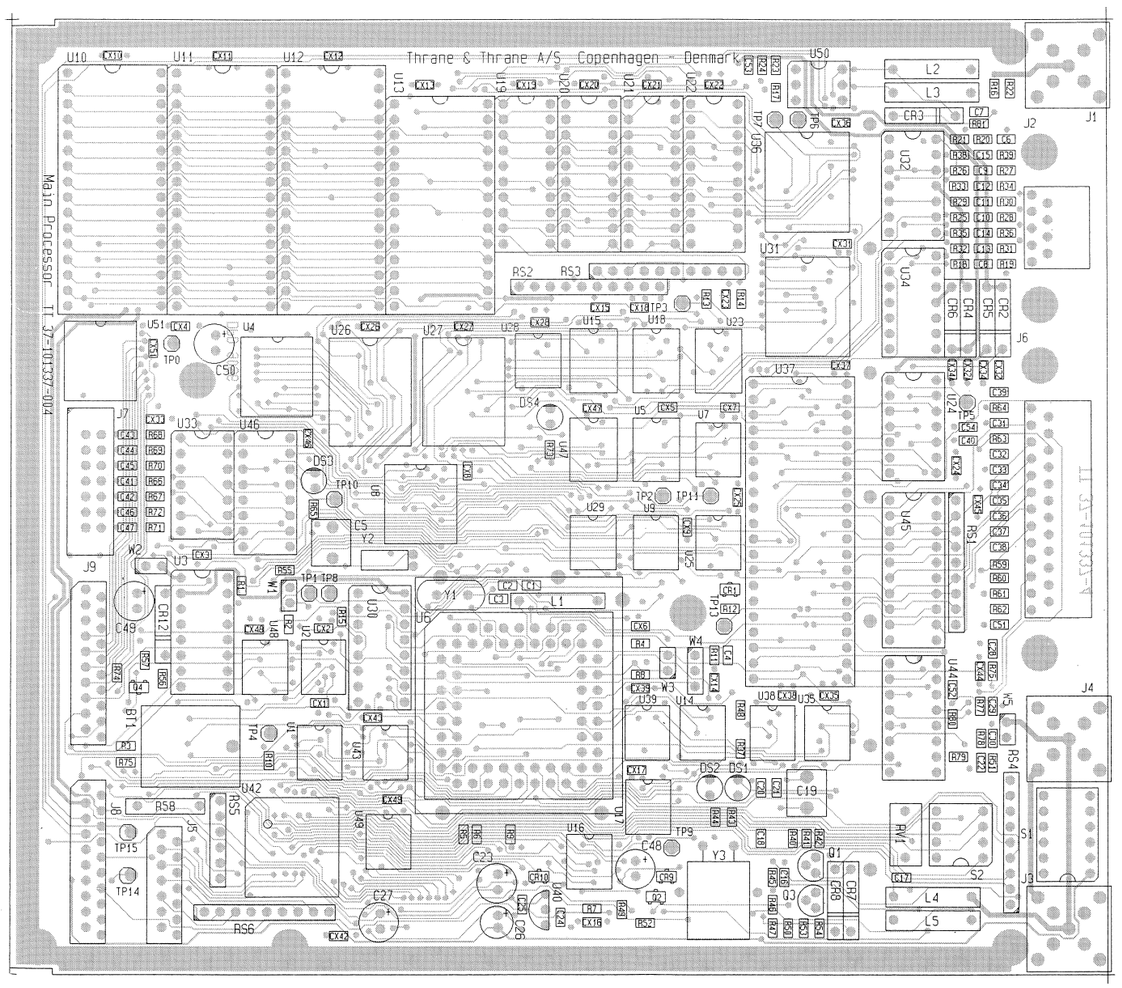
The display port interface consists of U38B/E, U39B, U43C, U49C/D and U51. The display module used is not capable of interfacing directly to the microprocessor so U38D/E, U39B, U43C and U49C are generating the required timing signals. U51 is a 8 bit bidirectional data buffer enabling writing and reading to and from the Display Module.

CIRCUIT SCHEMATIC PAGE 7 OF 7
This sheet only the decoupling capacitors used on the CPU board.

5.4 COMPONENT LOCATION MAIN PROCESSOR UNIT (MODULE 4)



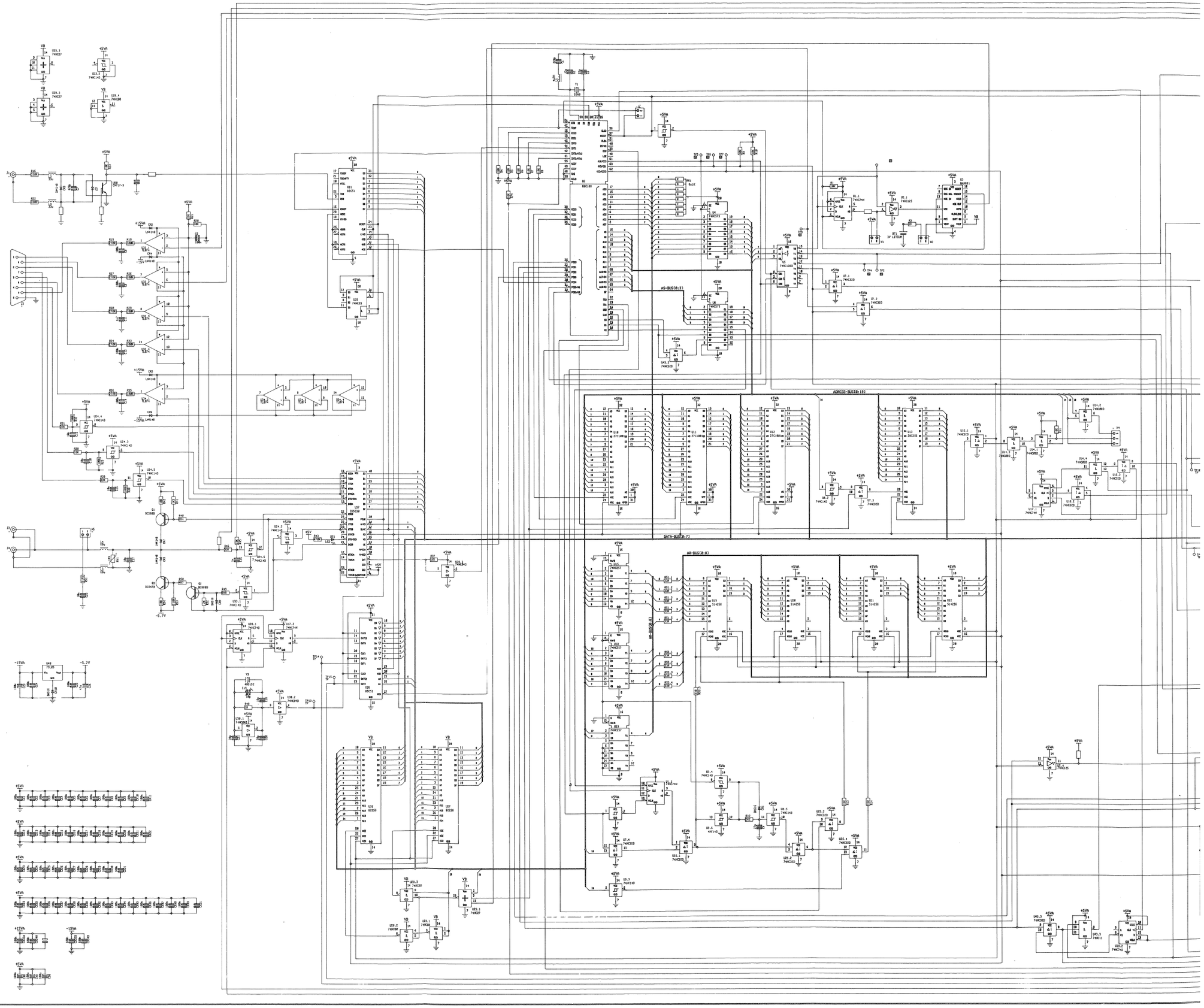
View from component side with upper side tracks.



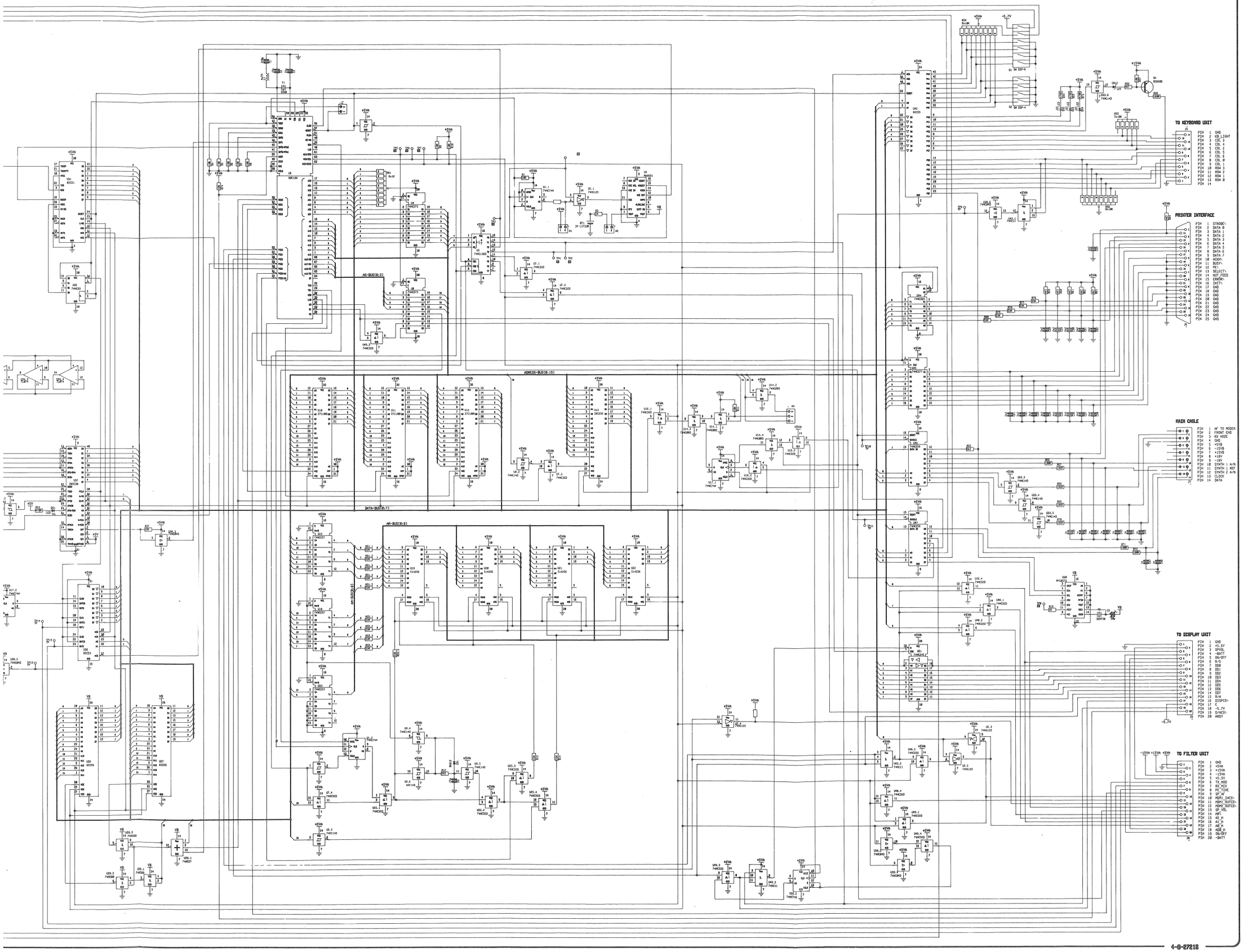
View from component side with lower side tracks.

5.4 MAIN PROCESSOR UNIT (MODULE 4)

Main Processor Unit (4)

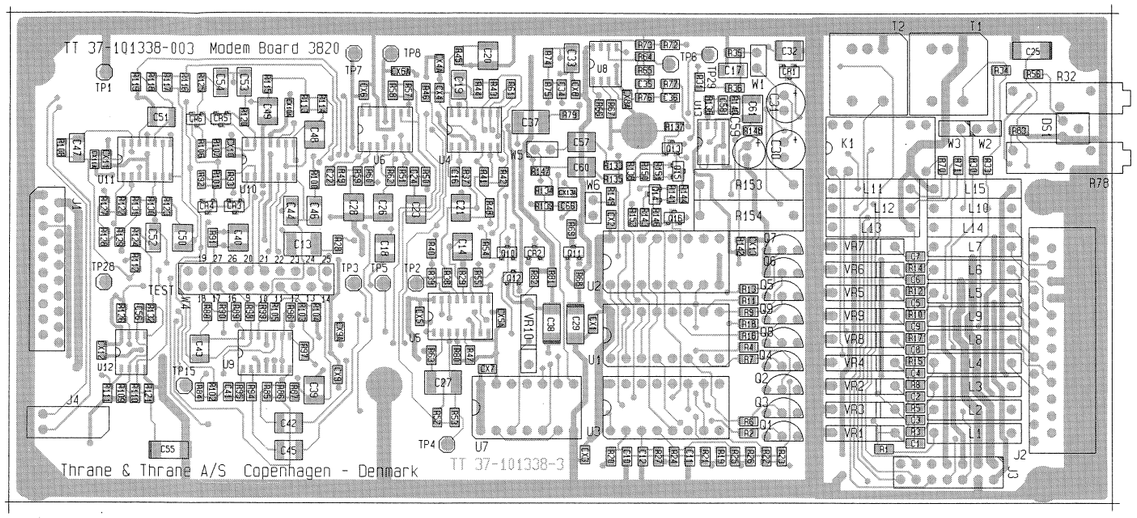


Main Processor Unit (4)

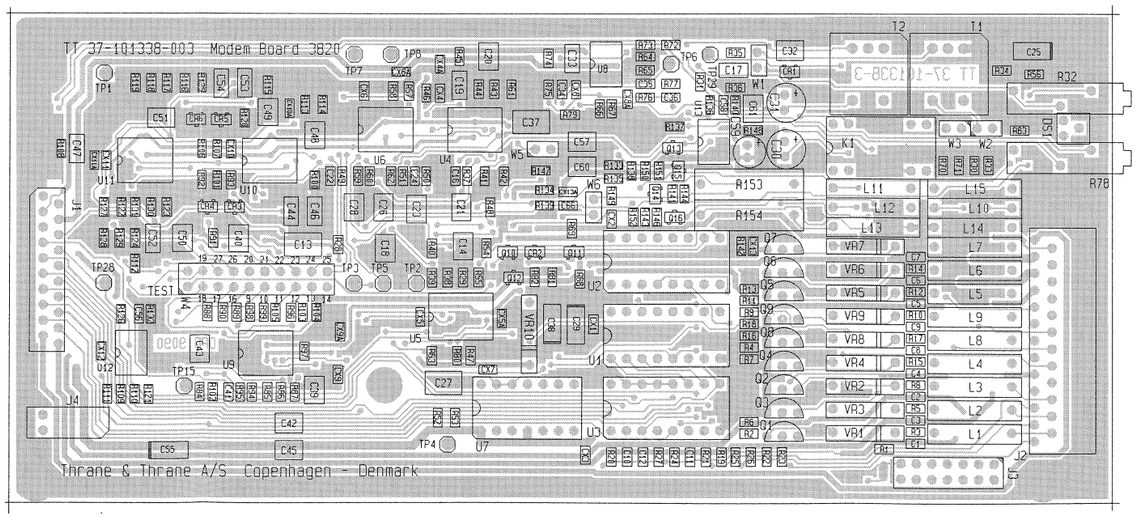


MAIN PROCESSOR UNIT
MODULE 4

5.5 COMPONENT LOCATION FILTER UNIT (MODULE 5)



View from component side with upper side tracks.



View from component side with lower side tracks.

FILTER

TO MAIN PROCESSOR

PIN 1 GND
PIN 2 Vcc
PIN 3 +15VA
PIN 4 -15VA
PIN 5 +5.5V BL
PIN 6 TX MOD
PIN 7 RX MIX
PIN 8 PE TONE
PIN 9 SPEAKER CLK
PIN 10 MDR1 DATCS
PIN 11 MDR1 CLKCS
PIN 12 MDR2 CLKCS
PIN 13 SPEAKER VOL
PIN 14 RR
PIN 15 A2 M
PIN 16 A1 M
PIN 17 A0 M
PIN 18 ADD M
PIN 19 ON/OFF
PIN 20 -BATT

RADIO INTERFACE

PIN 1 RX mute
PIN 2 Alarm in
PIN 3 TX ready
PIN 4 External alarm
PIN 5 Ground
PIN 6 SP interrupt
PIN 7 Alarm out
PIN 8 Scan stop
PIN 9 Line out 2
PIN 10 -18V DC
PIN 11 +9V DC
PIN 12 +18V DC
PIN 13 Supply on/off
PIN 14 RX mute
PIN 15 TX key
PIN 16 High tension
PIN 17 Data (I8255)
PIN 18 Line out 1
PIN 19 Line in 1
PIN 20 Line in 2
PIN 21 Clock (I8255)
PIN 22 Ground
PIN 23 Ground
PIN 24 Ext speaker
PIN 25 -Batt

TO POWER SUPPLY

PIN 1 +18V
PIN 2 -18V
PIN 3 +9V
PIN 4 GND
PIN 5 +5VA
PIN 6 +5.5V BL
PIN 7 +15VA
PIN 8 -15VA
PIN 9
PIN 10 AF TO FILTER
PIN 11 AF TO AMP
PIN 12 VOL. CONT.
PIN 13 CON FROM AMP
PIN 14 AF FROM AMP

FOR REFERENCE ONLY

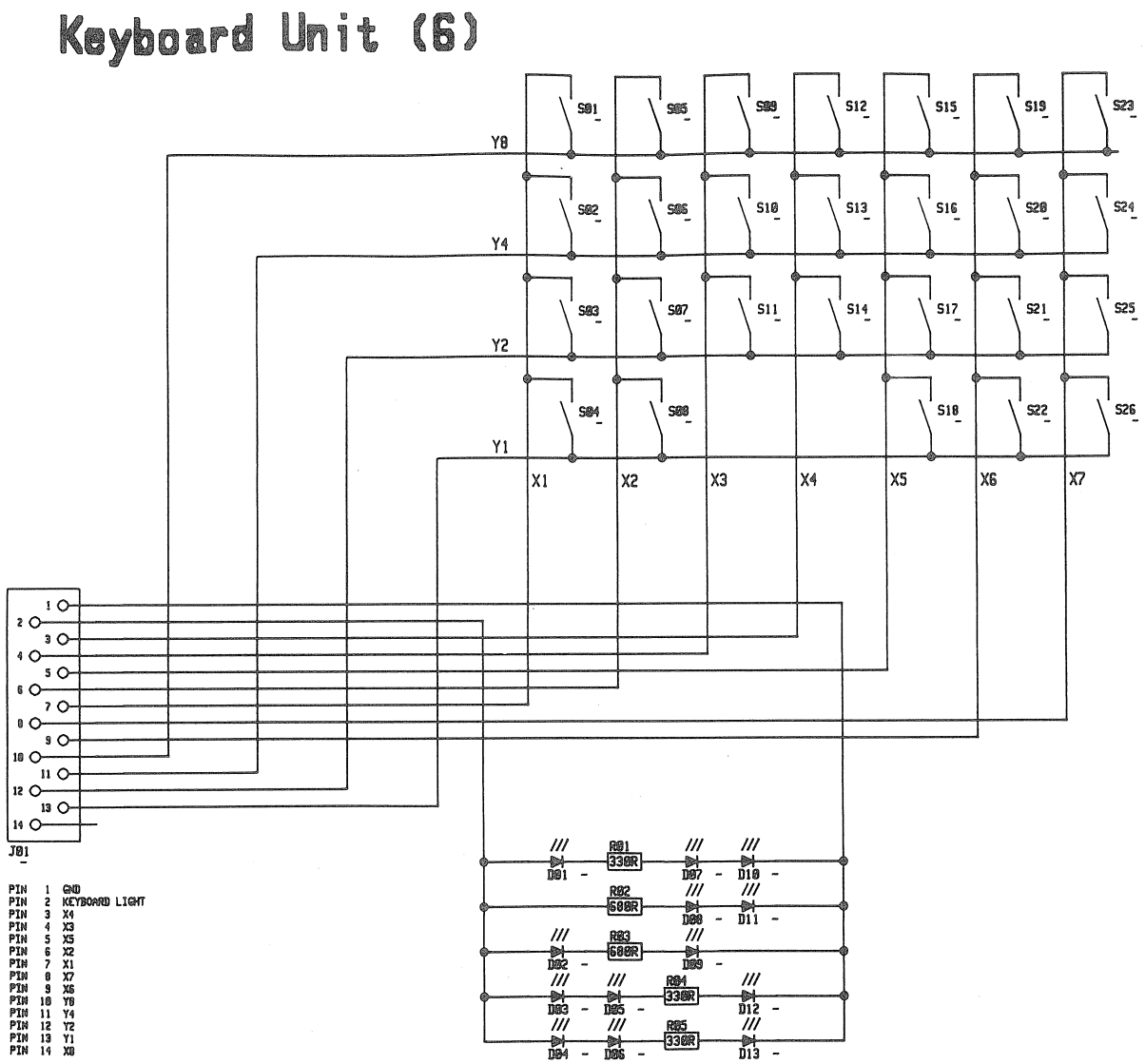
SPEAKER

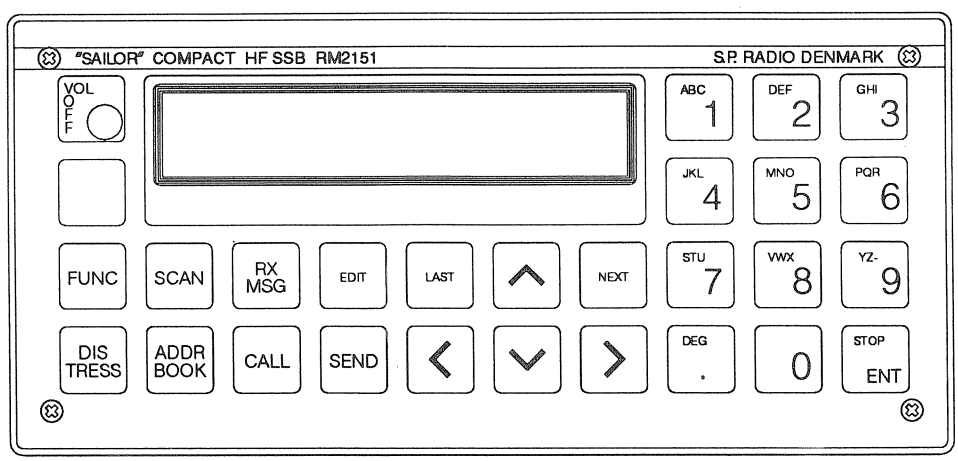
4-0-27215

FILTER UNIT MODULE 5

5.6 KEYBOARD UNIT (MODULE 6)

The keyboard consist of a 4*8 matrix of which 26 keys are used.
The 4 rows is set high alternately and by reading the output on the 8 columnes it is possible to determine which key has been activated. This schanning of the keyboard take place 100 times per second.
The keyboard can be illuminated by 13 LED's. The voltage accross the LED's are controlled by a transistor Q04 placed on the MAIN PROCESSOR board (module 4) and the current in each LED is roughly 8,5 mA.





5.7. DISPLAY UNIT (MODULE 7)

An LCD display of 2*24 characters with LED backlight is used to read-out information to the operator.

DISPLAY MODULE

The display module has a dot-matrix 2*24 character LCD display and a CMOS LCD driver controller built in. The controller has a built-in character generator and a display data RAM. All the display functions are controlled by instructions from the MAIN PROCESSOR.

DISPLAY INTERFACE

The module is interfaced with the MAIN PROCESSOR (module 4) through the cable terminals P04.
The display E signal is fed through a delay circuit consisting of U05/1, 2 and 3 to pin 5 in J01.
The signal at pin 16 in P04 is fed through the delay circuit consisting of U04/1, 2, 5, 6 and the resistor/capacitor R26/C6 to pin 20 in P04.

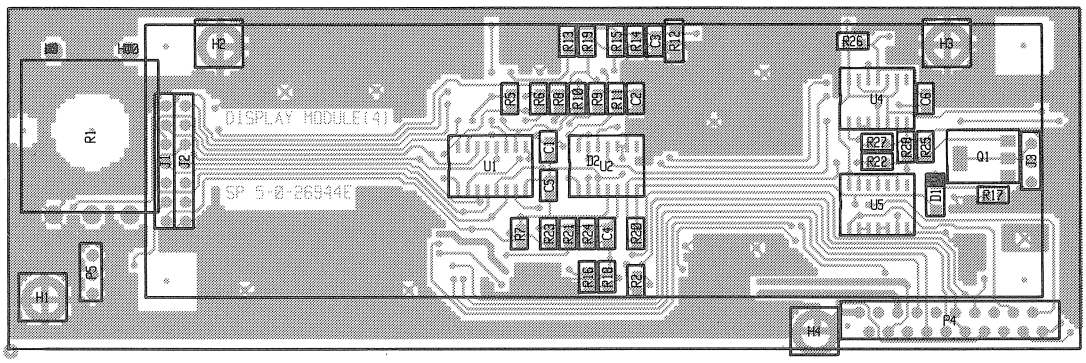
BRIGHTNESS CONTROL

Brightness or viewing angle control is performed by a four bit digital to analog converter consisting of the circuit built around U01 and U02/3,4. U01 is a parallel input/output latch with the output pins Q1-Q2-Q3-Q4 connected to the resistors R06, R08, R09 and R10 which are connected to the inverting input of the amplifier U2/3, this circuit is a 16 step D/A converter. The output of the D/A converter is through a divide by 2 circuit, consisting of the resistors R16 and R18, fed to the non-inverting input of the amplifier U2/4. The inverting input of the same amplifier U02/4 is connected to a resistor network consisting of R13, R11 and the NTC resistor R12, this circuit compensates for the temperature change of the brightness control.
The output of U02/4 is connected to the display brightness control pin 3.

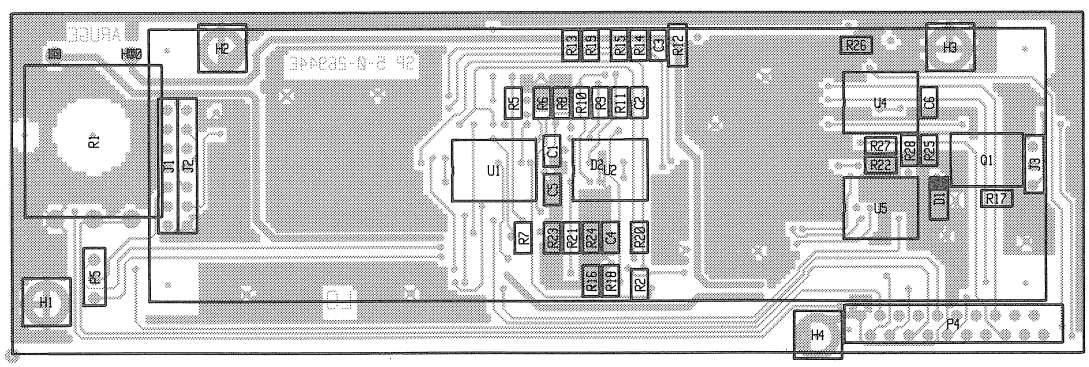
BACKLIGHT CONTROL

The current through the backlight LED's are controlled by the transistor Q01. The emitter of Q01 is through the resistor R22 connected to the inverting input of the amplifier U02/2. The non-inverting input of U02/2 is through the resistors R21 and R23 connected to the output of U01 (Q5 and Q6). The current through the backlight LED's is the same as the current through the resistor R25, this means that the voltage across R25 is dependent of the current through the LED's. The gain of the amplifier U02/2 is 100 times, this means that the voltage across R25 is the same as the voltage across R24, this voltage is controlled by the output pin's Q5 and Q6 of U01. This means that the current through the backlight LED's can be controlled by U01 in four steps, with step 1 as 0 mA and step 4 as 180 mA.

5.7 COMPONENT LOCATION DISPLAY UNIT (MODULE 7)

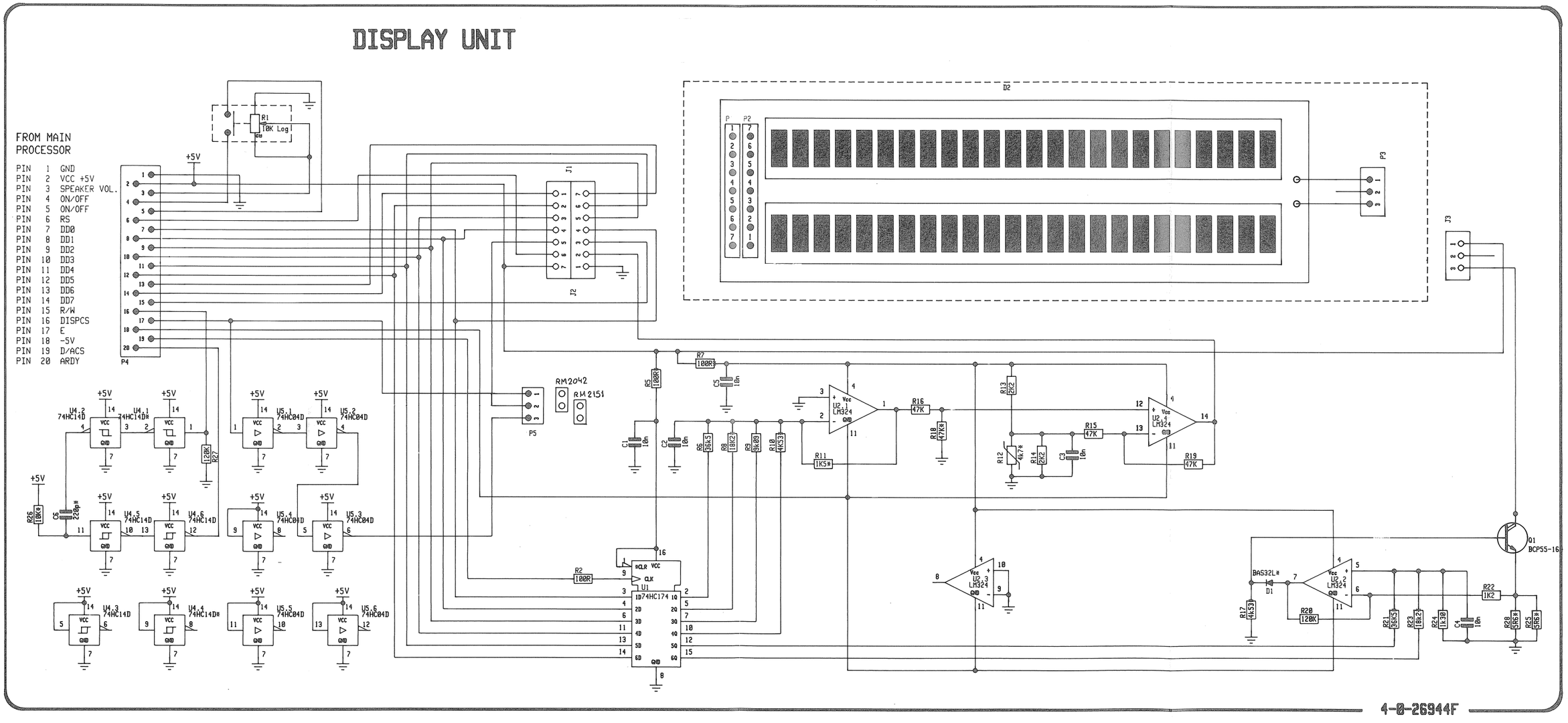


Seen from component side with upper side tracks.

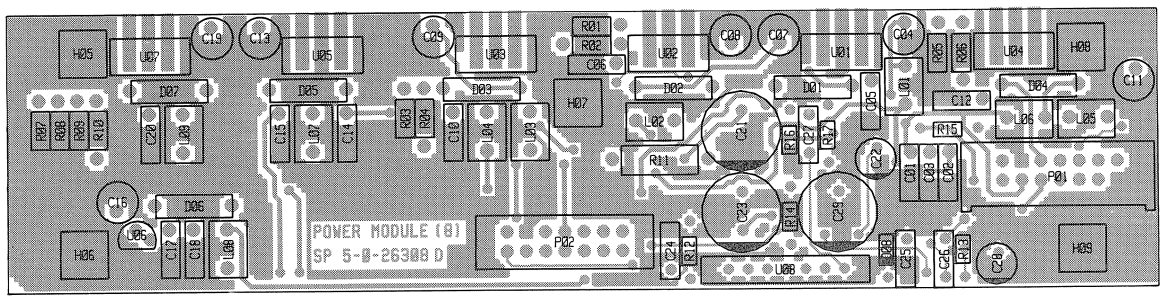


Seen from component side with lower side tracks.

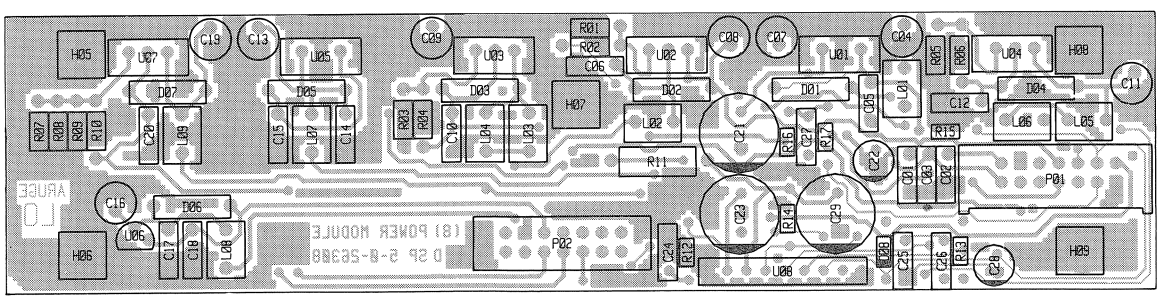
5.7 DISPLAY UNIT (MODULE 7)



5.8 COMPONENT LOCATION POWER UNIT (MODULE 8)



Seen from component side with upper side tracks.



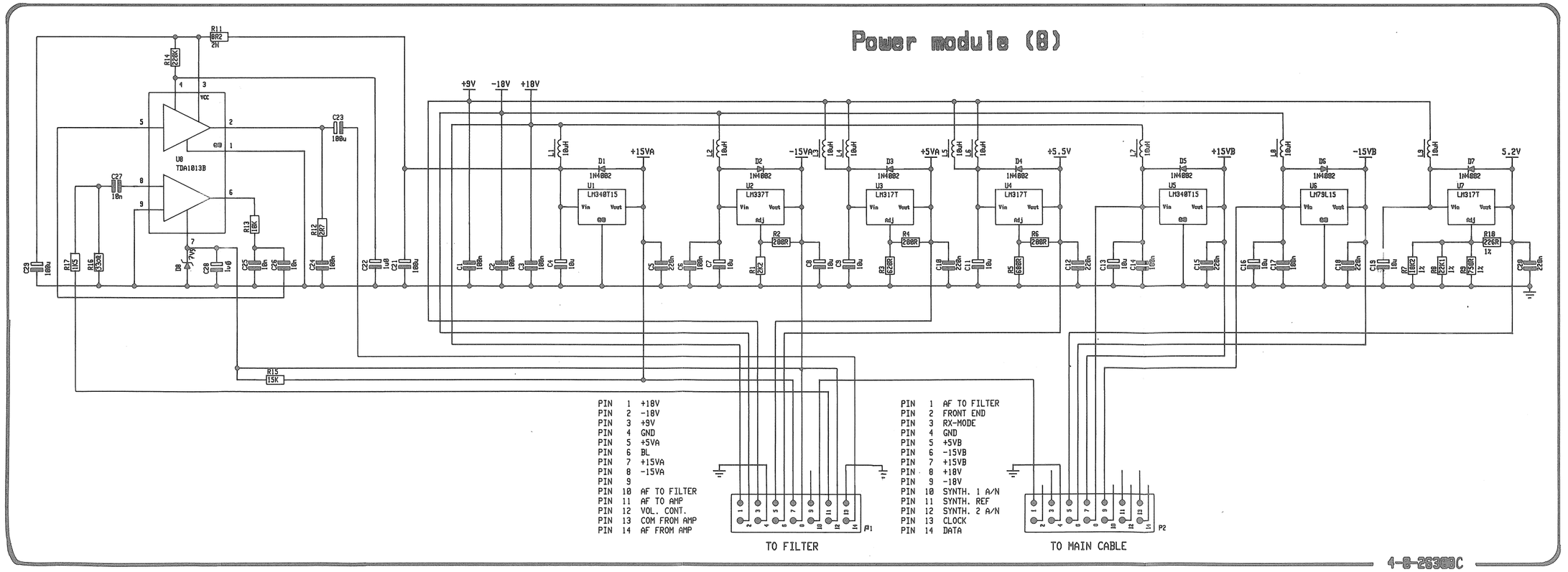
Seen from component side with lower side tracks.

5.8. POWER UNIT (MODULE 8)

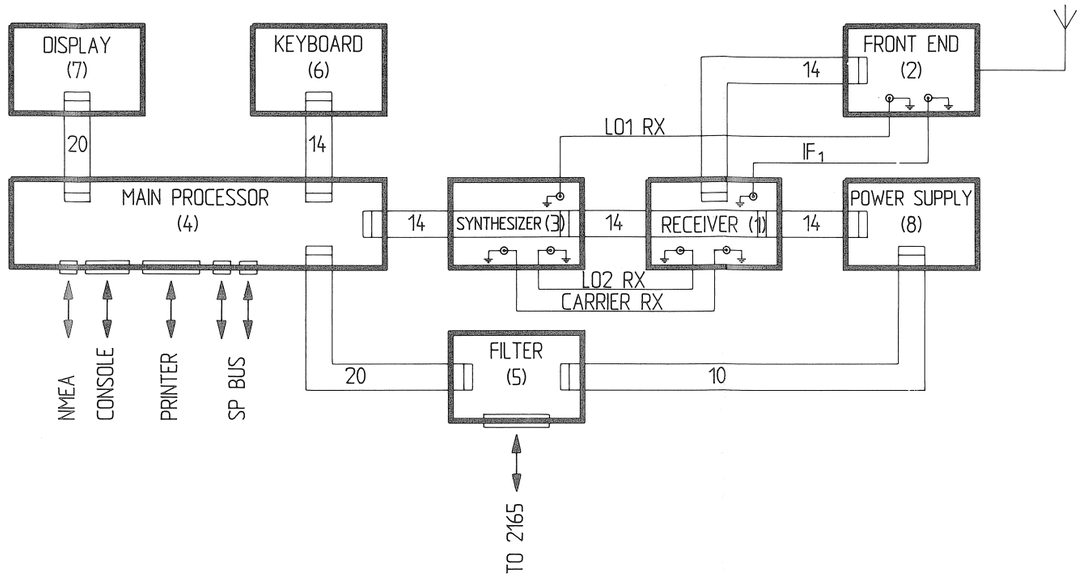
From the external power supply the power unit is supplied with +9V, +18V and -18V. This voltages are through the seven regulators filtered, stabilizied and fed to the other units.

REGULATORS

The regulators U01, U02, and U03 supply the main processor and the filter unit with +15V, -15V and +5V and the regulator U04 supply the display backlight with +5,5V. The regulators U05, U06 and U07 supply the receiver, the front end and the synthesizer unit with +15V, -15V and 5,2V. The regulator U07 can be adjusted by cutting one of the resistors R07 or R08.



5.9. INTERCONNECTION CABLE PLAN



CABLE 1:
MAIN CABLE-RM2150/51

	POWER SUPPLY (8)	RECEIVER (1)	SYNTHESIZER (3)	MAIN PROCESSOR (4)
1	AF TO MODEM	1	1	1
2	FRONT END	2	2	2
3	RX-MODULE	3	3	3
4	GND	4	4	4
5	+5VB	5	5	5
6	-15VB	6	6	6
7	+15VB	7	7	7
8	+18V	8	8	8
9	-18V	9	9	9
10	SYNTHESIZER 1 A/N	10	10	10
11	SYNTHESIZER REF	11	11	11
12	SYNTHESIZER 2 A/N	12	12	12
13	CLOCK	13	13	13
14	DATA	14	14	14

CABLE 2:
FILTER TO POWER MODULE

	POWER SUPPLY (8)	MODEM (5)
1	+18V	1
2	-18V	2
3	+9V	3
4	GND	4
5	+5VA	5
6	+3.5V	6
7	+15VA	7
8	-15VA	8
9	NC	9
10	AF TO MODEM	10

CABLE 3:
FRONT END TO RECEIVER MODULE

	RECEIVER (1)	FRONT END (2)
1	NC	1
2	NC	2
3	NC	3
4	GND	4
5	NC	5
6	NC	6
7	DATA	7
8	CLOCK	8
9	NC	9
10	FRONT END	10
11	+18V	11
12	+15VB	12
13	+15VB	13
14	+5VB	14

CABLE 4:
FILTER TO MAIN PROCESSOR MODULE

	MODEM (5)	DISPLAY (7)
1	GND	1
2	+5VA	2
3	+15VA	3
4	-15VA	4
5	BL	5
6	TX MODULATION	6
7	RX MIX	7
8	PE-TIME	8
9	SPEAKER AF	9
10	MDM1 INCS	10
11	MDM1 OUTCS	11
12	MDM2 OUTCS	12
13	-BATT	13
14	MASTER RESET	14
15	A2 TO MODEM	15
16	A1 TO MODEM	16
17	A0 TO MODEM	17
18	ADD MODEM	18
19	ON/OFF	19
20	SPEAKER VOL.	20

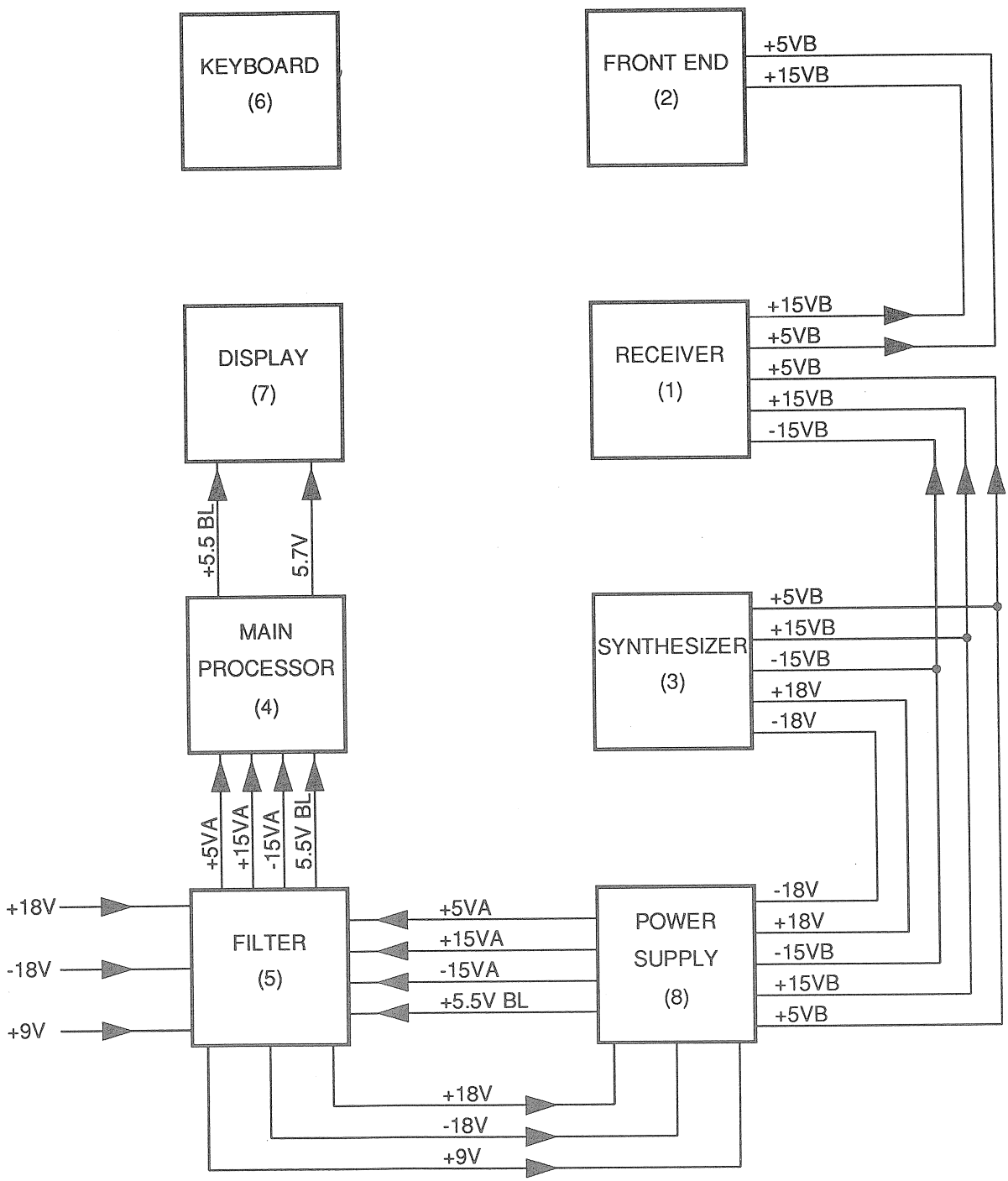
CABLE 5:
MAIN PROCESSOR TO DISPLAY MODULE

	DISPLAY (7)	MAIN PROCESSOR (4)
1	GND	1
2	Vcc + 5.5V	2
3	SPEAKER VOL.	3
4	-BATT	4
5	ON/OFF	5
6	RS	6
7	DD0	7
8	DD1	8
9	DD2	9
10	DD3	10
11	DD4	11
12	DD5	12
13	DD6	13
14	DD7	14
15	R/W	15
16	DISPCS	16
17	E	17
18	-5.7V	18
19	D/ACS	19
20	ARDY	20

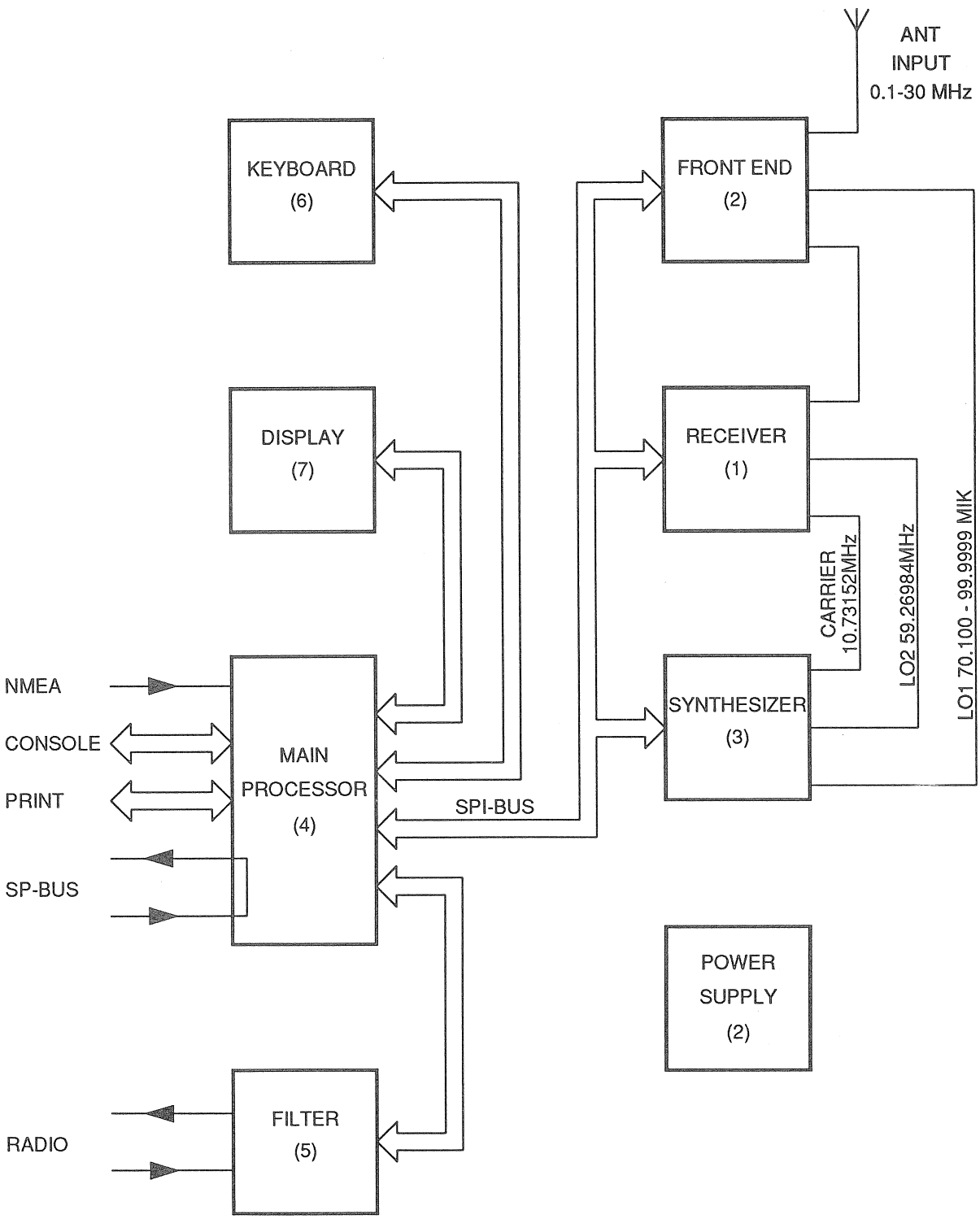
CABLE 6:
MAIN PROCESSOR TO KEYBOARD MODULE

	MAINPROCESSOR (4)	KEYBOARD (6)
1	GND	1
2	KEYBOARD LIGHT	2
3	COLUMN 3	3
4	COLUMN 4	4
5	COLUMN 2	5
6	COLUMN 5	6
7	COLUMN 6	7
8	COLUMN 0	8
9	COLUMN 1	9
10	ROW 3	10
11	ROW 2	11
12	ROW 1	12
13	ROW 0	13
14	NC	14

5.9.1 BLOCK DIAGRAM SUPPLY CABLING



5.9.2 CABLE BLOCK DIAGRAM



CONTENTS

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	MF/HF DSC WATCHKEEPING	RECEIVER RM2150	S.P. RADIO A/S	MF/HF DSC MODEM RM2150 SAILOR GREEN	802150
VARIOUS	INTERCONN. CABLE, FEMALE	SUB D 22 POLES L=10m	ELFAC	3-0-27584	164.192
VARIOUS	1/4 BOX CABINET	SAILOR GREEN		200101 GRØN RILSAN	20010100
VARIOUS	FRONTPLATE RM2150	SAILOR GREEN		226329 LAK	22616300
VARIOUS	COAX CABLE BNC/PL259	LENGHT 2m	ESPERA	506090	506090
VARIOUS	COAX CABLE RE2100 (BLUE)	LENGHT 10m	ESPERA	3-0-27082	527082
VARIOUS	COAX CABLE BNC/BNC (BLUE)	LENGTH 1M	ESPERA	0-0-27115	527115
VARIOUS	HANDSET HOLDER F. C2140 &	REMOTE CONTROLLED RE2100	ESPERA	0-0-26233	726233
VARIOUS	OPERATION MANUAL	RM2150 ENGLISH	HESTBECH & CO.		B2150GB
VARIOUS	SERVICE AND SALES AGENTS	ADRESSES WORLD WIDE	S.P.RADIO A/S		F1000GB
VARIOUS	MANUAL RM2150/51 ENGLISH		S.P.RADIO A/S		M2150GB

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	TELEX/DSC MODEM and	SCANNING RECEIVER RM2151	S.P. RADIO A/S	TELEX / DSC MODEM RM2151 SAILOR GREEN	802151
VARIOUS	INTERCONN. CABLE, FEMALE	SUB D 22 POLES L=10m	ELFAC	3-0-27584	164.192
VARIOUS	1/4 BOX CABINET	SAILOR GREEN		200101 GRØN RILSAN	20010100
VARIOUS	FRONTPLATE RM2151	SAILOR GREEN		226303 LAK	22630300
VARIOUS	COAX CABLE BNC/PL259	LENGHT 2m	ESPERA	506090	506090
VARIOUS	COAX CABLE RE2100 (BLUE)	LENGHT 10m	ESPERA	3-0-27082	527082
VARIOUS	COAX CABLE BNC/BNC (BLUE)	LENGTH 1M	ESPERA	0-0-27115	527115
VARIOUS	MESSAGE HANDLING & CONTRO	SOFTWARE MSDOS/TELEX	BCP HARDWARE	TT-10205A / Ver.1.19 DOS (21-08-92)SP MASTER C1107	55.115
VARIOUS	CABLE RS232	25-9 POLES L=2m	RUDOLPH SCHMIDT	Art.Nr: 163-303	56.063
VARIOUS	HANDSET HOLDER F. C2140 &	REMOTE CONTROLLED RE2100	ESPERA	0-0-26233	726233
VARIOUS	OPERATION MANUAL	RM2150 ENGLISH	HESTBECH & CO.		B2150GB
VARIOUS	OPERATION MANUAL	RM2151 ENGLISH	HESTBECH & CO.		B2151GB
VARIOUS	SERVICE AND SALES AGENTS	ADRESSES WORLD WIDE	S.P.RADIO A/S		F1000GB
VARIOUS	MANUAL RM2150/51 ENGLISH		S.P.RADIO A/S		M2150GB

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	BASE UNIT TELEX/DSC MODEM	RM2150/51	ESPERA		702150
VARIOUS	LOUDSPEAKER	8 OHMS 1W Ø45mm	PEITONE	45S02A4	46.053
VARIOUS	KNOB BLACK	Ø9.5xØ6x27mm	SANDER PLAST	TG.0-3-25750A	48.689
VARIOUS	COAX CABLE Ø3x5,8cm		ESPERA	3-0-26086	526086
VARIOUS	COAX CABLE Ø3x51,5cm		ESPERA	3-0-26096	526096
VARIOUS	INTERCONNECTION CABLE	14 POLES L=71mm	ESPERA	3-0-26924A	526924
VARIOUS	INTERCONNECTION CABLE	20 POLES L=118mm	ESPERA	3-0-26926A	526926
VARIOUS	COAX CABLE Ø3x19,5cm		ESPERA	3-0-26927	526927
VARIOUS	COAX CABLE Ø3x24,5cm/RED		ESPERA	3-0-26928	526928
VARIOUS	INTERCONNECTION CABLE	14 POLES L=125mm	S.P.RADIO	3-0-27587	527587
VARIOUS	INTERCONNECTION CABLE	2 POLES L=110mm	S.P.RADIO	3-0-27590	527590
VARIOUS	INTERCONNECTION CABLE	14 POLES L=138mm	3M	3-0-26922	56.048
VARIOUS	INTERCONNECTION CABLE	4x14 POLES L=368mm	3M	3-0-26923	56.049
-1	RECEIVER TLX/DSC MODULE 1	RM2150/51		5-0-26301C / 1-0-26301	626301
-2	Rx FRONT END MODULE 2	RE2100	ESPERA	5-0-25632G	625632
-3	SYNTHESIZER MODULE 3	R2122, RM2150/51	ESPERA	625633 w. 1.3ppm TCXO	727071
-4	MAIN PROCESSOR BOARD	RM2150/51	THRANE & THRANE	60-101337S 37-101337-00X	55.150
-5	FILTER BOARD	RM2150/RM2151	THRANE & THRANE	60-101338S 37-101338-001	55.151
-6	KEYBOARD MODULE 6	RE2100/C2140	ESPERA	5-0-25636E	625636
-7	DISPLAY PRINT	RM2042 / RM2150 / RM2151	ESPERA	5-0-26944E	626944
-8	POWER SUPPLY	RM2150/51	ESPERA	POWER SUPPLY RM2150/51	726308

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	RECEIVER TLX/DSC MODULE 1	RM2150/51		5-0-26301C / 1-0-26301	626301
C1-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C4-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C5-1	CAPACITOR MKT	1uF 5% 63VDC	PHILIPS	2222 370 79105	11.190
C6-1	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C7-1	CAPACITOR CERAMIC	68pF 5% N150 50VDC	NKE	DT 380 758S PH 680 J 50V FLAT PACK	15.115
C8-1	CAPACITOR CERAMIC	10pF 5% N470 50VDC	NKE	DT 330 758S TH 100 D 50V FLAT PACK	15.848
C9-1	CERAMIC CAPACITOR	22pF 5% N150 50VDC	NKE	DT 340 758S PH 220 J 50V FLAT PACK	15.075
C10-1	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C11-1	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C12-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C13-1	CAPACITOR MKT	1uF 5% 63VDC	PHILIPS	2222 370 79105	11.190
C14-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C15-1	CAPACITOR CERAMIC	68pF 5% N150 50VDC	NKE	DT 380 758S PH 680 J 50V FLAT PACK	15.115
C16-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C17-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C18-1	CAPACITOR CERAMIC	47pF 5% N150 50VDC	NKE	DT 360 758S PH 470 J 50V FLAT PACK	15.100
C19-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C20-1	CAPACITOR MKT	1uF 5% 63VDC	PHILIPS	2222 370 79105	11.190
C21-1	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C22-1	CAPACITOR CERAMIC	6p8F +-0.5pF N150 50VDC	NKE	DT 330 758S PH 6R8 D 50V FLAT PACK	15.020
C23-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C24-1	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C25-1	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C26-1	CAPACITOR TRIMMING	9-80pF PTFE	DAU	109.6901.090	17.205
C27-1	CERAMIC CAPACITOR	22pF 5% N150 50VDC	NKE	DT 340 758S PH 220 J 50V FLAT PACK	15.075
C28-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C29-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C30-1	CAPACITOR CERAMIC	2p7F +/-0.25pF N150 50VDC	NKE	DT 330 758S PJ 2R7 C 50V FLAT PACK	15.001
C31-1	CAPACITOR CERAMIC	27pF 5% N150 50VDC	NKE	DT 350 758S PH 270 J 50V FLAT PACK	15.076
C32-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C33-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C34-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C35-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C36-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C37-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C38-1	CAPACITOR CERAMIC	2p7F +/-0.25pF N150 50VDC	NKE	DT 330 758S PJ 2R7 C 50V FLAT PACK	15.001
C39-1	CAPACITOR ELECTROLYTIC	22uF 20% 25VDC	ERO	EKI 00 AA 222 E MOE	14.514
C40-1	CAPACITOR ELECTROLYTIC	22uF 20% 25VDC	ERO	EKI 00 AA 222 E MOE	14.514
C41-1	CAPACITOR CERAMIC	27pF 5% N150 50VDC	NKE	DT 350 758S PH 270 J 50V FLAT PACK	15.076
C42-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C43-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C44-1	CAPACITOR ELECTROLYTIC	22uF 20% 25VDC	ERO	EKI 00 AA 222 E MOE	14.514
C45-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C46-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C47-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C48-1	CAPACITOR CERAMIC	2p7F +/-0.25pF N150 50VDC	NKE	DT 330 758S PJ 2R7 C 50V FLAT PACK	15.001

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C49-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C50-1	CAPACITOR ELECTROLYTIC	1uF 20% 50VDC	ERO	EKI 00 AA 110 H MOE	14.506
C51-1	CAPACITOR CERAMIC	27pF 5% N150 50VDC	NKE	DT 350 758S PH 270 J 50V FLAT PACK	15.076
C52-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C53-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C54-1	CAPACITOR MKT	100nF 5% 63VDC	PHILIPS	2222 370 79104	11.135
C55-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C56-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C57-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C58-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C59-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C60-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C61-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C62-1	CAPACITOR MKT	10nF 5% 63VDC	PHILIPS	2222 370 89103	11.134
C63-1	CAPACITOR CERAMIC	2p7F +/-0.25pF N150 50VDC	NKE	DT 330 758S PJ 2R7 C 50V FLAT PACK	15.001
C64-1	CAPACITOR MKT	10nF 5% 63VDC	PHILIPS	2222 370 89103	11.134
C65-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C66-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C67-1	CAPACITOR MKT	10nF 5% 63VDC	PHILIPS	2222 370 89103	11.134
C68-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C69-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C70-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C71-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C72-1	CAPACITOR ELECTROLYTIC	22uF 20% 25VDC	ERO	EKI 00 AA 222 E MOE	14.514
C73-1	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C74-1	CAPACITOR POLYSTYRENE	6.8nF 1% 63V	#PHILIPS	2222 428 86802	10.221

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C75-1	CAPACITOR POLYSTYRENE	82pF 1% 630V	#PHILIPS	2222 431 88209	10.398
C76-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C78-1	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C79-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C80-1	CAPACITOR MKT	1uF 5% 63VDC	PHILIPS	2222 370 79105	11.190
C81-1	CAPACITOR POLYSTYRENE	1,6nF 1% 250V	#PHILIPS	2222 430 81602	10.356
C82-1	CAPACITOR ELECTROLYTIC	22uF 20% 25VDC	ERO	EKI 00 AA 222 E MOE	14.514
C83-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C84-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C85-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C86-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C87-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C88-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C89-1	CAPACITOR MKT	1uF 5% 63VDC	PHILIPS	2222 370 79105	11.190
C90-1	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C91-1	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
D1-1	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.146
D2-1	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.146
D3-1	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.146
D4-1	DIODE	1N4148 HIGH SPEED	PHILIPS	1N4148-143	25.131
D5-1	DIODE	1N4148 HIGH SPEED	PHILIPS	1N4148-143	25.131
D7-1	DIODE	1N4148 HIGH SPEED	PHILIPS	1N4148-143	25.131
D8-1	DIODE	1N4148 HIGH SPEED	PHILIPS	1N4148-143	25.131
FL1-1	CRYSTAL FILTER	TERLEX Fc=10.7298MHz	NDK	C1080	40.037
FL2-1	CERAMIC FILTER	Fc=10.7MHz +/-30kHz	MURATA	SFE 10.7 MS2-A	41.511
FP1-1	FERRITE BEAD	Ø3.7xØ1.2x3.5mm GRADE 4B1	PHILIPS	4322 020 34420	35.181
FP2-1	FERRITE BEAD	Ø3.7xØ1.2x3.5mm GRADE 4B1	PHILIPS	4322 020 34420	35.181
FP3-1	FERRITE BEAD	Ø3.7xØ1.2x3.5mm GRADE 4B1	PHILIPS	4322 020 34420	35.181
FP4-1	FERRITE BEAD INDUCTOR		MURATA	BL01RN1-A62T5	35.188
FP5-1	FERRITE BEAD INDUCTOR		MURATA	BL01RN1-A62T5	35.188
FP6-1	FERRITE BEAD INDUCTOR		MURATA	BL01RN1-A62T5	35.188
FP7-1	FERRITE BEAD	Ø3.7xØ1.2x3.5mm GRADE 4B1	PHILIPS	4322 020 34420	35.181
FP8-1	FERRITE BEAD INDUCTOR		MURATA	BL01RN1-A62T5	35.188
FP9-1	FERRITE BEAD	Ø3.7xØ1.2x3.5mm GRADE 4B1	PHILIPS	4322 020 34420	35.181
FP10-1	FERRITE BEAD INDUCTOR		MURATA	BL01RN1-A62T5	35.188

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
FP11-1	FERRITE BEAD	Ø3.7xØ1.2x3.5mm GRADE 4B1	PHILIPS	4322 020 34420	35.181
FP12-1	FERRITE BEAD INDUCTOR		MURATA	BL01RN1-A62T5	35.188
FP13-1	FERRITE BEAD	Ø3.7xØ1.2x3.5mm GRADE 4B1	PHILIPS	4322 020 34420	35.181
J1-1	SOCKET COAX	HORISONTAL FOR PCB MOUNT.	TAIKO	TMP-J01X-A2	78.517
J2-1	SOCKET COAX	HORISONTAL FOR PCB MOUNT.	TAIKO	TMP-J01X-A2	78.517
J3-1	SOCKET COAX	HORISONTAL FOR PCB MOUNT.	TAIKO	TMP-J01X-A2	78.517
L3-1	CHOKE FIXED	100nH 10%	SIEMENS	B78108-T3101-K	20.335
L4-1	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L5-1	CHOKE FIXED	470uH 5%	FASTRON	SMCC-471J-02	20.318
L6-1	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L7-1	CHOKE FIXED	330nH 10%	FASTRON	MICC-R33K-02	20.341
L8-1	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L9-1	CHOKE FIXED	470uH 5%	FASTRON	SMCC-471J-02	20.318
L10-1	CHOKE FIXED	100nH 10%	SIEMENS	B78108-T3101-K	20.335
L11-1	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L12-1	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L13-1	CHOKE FIXED	470uH 5%	FASTRON	SMCC-471J-02	20.318
L14-1	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L15-1	CHOKE FIXED SHILDED	6u8H 10%	FRONTIER ELECT.	1501-23 K AMMO PACK	20.143
L16-1	CHOKE FIXED SHILDED	6u8H 10%	FRONTIER ELECT.	1501-23 K AMMO PACK	20.143
L17-1	CHOKE FIXED SHILDED	6u8H 10%	FRONTIER ELECT.	1501-23 K AMMO PACK	20.143
L18-1	CHOKE FIXED SHILDED	6u8H 10%	FRONTIER ELECT.	1501-23 K AMMO PACK	20.143
L19-1	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L20-1	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L21-1	CHOKE FIXED	470uH 5%	FASTRON	SMCC-471J-02	20.318
P1-1	PLUG	2x7 POLES	3M	3598-6002 / 7614-6002 JL	78.254
P2-1	PLUG	2x7 POLES	3M	3598-6002 / 7614-6002 JL	78.254
Q1-1	TRANSISTOR N-CHAN. JFET	TIS88A2	MOTOROLA	TM00 044-2	29.736
Q2-1	TRANSISTOR N-CHAN. JFET	TIS88A2	MOTOROLA	TM00 044-2	29.736
Q3-1	TRANSISTOR RF	BFW17A PNP TO-39	SGS	BFW17A	29.151
Q4-1	TRANSISTOR MOSFET	DUAL GATE N-CHAN.BF964SA	TFK	BF964SA	28.240
Q5-1	TRANSISTOR MOSFET	DUAL GATE N-CHAN.BF964SA	TFK	BF964SA	28.240
Q6-1	TRANSISTOR AF	NPN BC639 TO-92	PHILIPS	BC639	28.120
Q7-1	TRANSISTOR AF	BC558 PNP TO-92	PHILIPS	BC558 (-A/-B/-C)	28.095
Q8-1	TRANSISTOR MOSFET	DUAL GATE N-CHAN.BF964SA	TFK	BF964SA	28.240
Q9-1	TRANSISTOR RF	BF199	PHILIPS	BF199	28.178
Q10-1	TRANSISTOR MOSFET	DUAL GATE N-CHAN.BF964SA	TFK	BF964SA	28.240
Q11-1	TRANSISTOR RF	BF199	PHILIPS	BF199	28.178
Q12-1	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
R1-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R2-1	RESISTOR MF	120 OHM 5% 0.33W	PHILIPS	2322 180 73121	02.450
R3-1	RESISTOR MF	1k8 OHM 5% 0.33W	PHILIPS	2322 180 73182	02.478
R4-1	RESISTOR MF	18 OHM 5% 0.33W	PHILIPS	2322 180 73189	02.430
R5-1	RESISTOR MF	120 OHM 5% 0.33W	PHILIPS	2322 180 73121	02.450
R6-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R7-1	RESISTOR MF	470 OHM 5% 0.33W	PHILIPS	2322 180 73471	02.464
R8-1	RESISTOR MF	220 OHM 5% 0.33W	PHILIPS	2322 180 73221	02.456
R9-1	RESISTOR MF	430 OHM 5% 0.33W	PHILIPS	2322 180 73431	02.463
R10-1	RESISTOR MF	3k9 OHM 5% 0.33W	PHILIPS	2322 180 73392	02.486
R11-1	RESISTOR MF	82 OHM 5% 0.33W	PHILIPS	2322 180 73829	02.446
R12-1	RESISTOR MF	120 OHM 5% 0.33W	PHILIPS	2322 180 73121	02.450
R13-1	RESISTOR MF	56 OHM 5% 0.33W	PHILIPS	2322 180 73569	02.442
R14-1	RESISTOR MF	12 OHM 5% 0.33W	PHILIPS	2322 180 73129	02.426
R15-1	RESISTOR MF	3kO OHM 5% 0.33W	PHILIPS	2322 180 73302	02.483
R16-1	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R17-1	RESISTOR MF	1k5 OHM 5% 0.33W	PHILIPS	2322 180 73152	02.476
R18-1	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R19-1	RESISTOR MF	12k OHM 5% 0.33W	PHILIPS	2322 180 73123	02.498
R20-1	PRESET CERMET	10k OHM 10% 0.5W	BOURNS	3386P-1-103	07.889
R21-1	RESISTOR MF	12k OHM 5% 0.33W	PHILIPS	2322 180 73123	02.498
R22-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R23-1	RESISTOR MF	390 OHM 5% 0.33W	PHILIPS	2322 180 73391	02.462
R24-1	RESISTOR MF	47k OHM 5% 0.33W	PHILIPS	2322 180 73473	02.512
R25-1	RESISTOR MF	47k OHM 5% 0.33W	PHILIPS	2322 180 73473	02.512
R26-1	RESISTOR MF	100k OHM 5% 0.33W	PHILIPS	2322 180 73104	02.520
R27-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R28-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R29-1	RESISTOR MF	2k7 OHM 5% 0.33W	PHILIPS	2322 180 73272	02.482
R30-1	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R31-1	RESISTOR MF	100k OHM 5% 0.33W	PHILIPS	2322 180 73104	02.520
R32-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R33-1	RESISTOR MF	390 OHM 5% 0.33W	PHILIPS	2322 180 73391	02.462
R35-1	RESISTOR MF	680 OHM 5% 0.33W	PHILIPS	2322 180 73681	02.468
R36-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R37-1	RESISTOR MF	2k7 OHM 5% 0.33W	PHILIPS	2322 180 73272	02.482
R38-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R39-1	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R40-1	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R41-1	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R42-1	RESISTOR MF	15k OHM 5% 0.33W	PHILIPS	2322 180 73153	02.500
R43-1	RESISTOR MF	15k OHM 5% 0.33W	PHILIPS	2322 180 73153	02.500
R44-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R45-1	RESISTOR MF	390 OHM 5% 0.33W	PHILIPS	2322 180 73391	02.462
R46-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R47-1	RESISTOR MF	47k OHM 5% 0.33W	PHILIPS	2322 180 73473	02.512
R48-1	RESISTOR MF	22k OHM 5% 0.33W	PHILIPS	2322 180 73223	02.504
R49-1	RESISTOR MF	1k5 OHM 5% 0.33W	PHILIPS	2322 180 73152	02.476
R50-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R51-1	RESISTOR MF	680 OHM 5% 0.33W	PHILIPS	2322 180 73681	02.468
R52-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R53-1	RESISTOR MF	2k7 OHM 5% 0.33W	PHILIPS	2322 180 73272	02.482
R54-1	RESISTOR MF	4k7 OHM 5% 0.33W	PHILIPS	2322 180 73472	02.488
R55-1	RESISTOR MF	22k OHM 5% 0.33W	PHILIPS	2322 180 73223	02.504
R56-1	RESISTOR MF	1kO OHM 5% 0.33W	PHILIPS	2322 180 73102	02.472
R58-1	RESISTOR MF	120k OHM 5% 0.33W	PHILIPS	2322 180 73124	02.522
R59-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R60-1	RESISTOR MF	330 OHM 5% 0.33W	PHILIPS	2322 180 73331	02.460
R61-1	RESISTOR MF	390 OHM 5% 0.33W	PHILIPS	2322 180 73391	02.462
R62-1	RESISTOR MF	6k2 OHM 5% 0.33W	PHILIPS	2322 180 73622	02.491
R63-1	RESISTOR MF	47 OHM 5% 0.33W	PHILIPS	2322 180 73479	02.440
R64-1	RESISTOR MF	15k OHM 5% 0.33W	PHILIPS	2322 180 73153	02.500
R65-1	RESISTOR MF	330 OHM 5% 0.33W	PHILIPS	2322 180 73331	02.460
R66-1	RESISTOR MF	2k2 OHM 5% 0.33W	PHILIPS	2322 180 73222	02.480
R67-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R68-1	RESISTOR MF	8k2 OHM 5% 0.33W	PHILIPS	2322 180 73822	02.494
R69-1	RESISTOR MF	6k8 OHM 5% 0.33W	PHILIPS	2322 180 73682	02.492
R70-1	RESISTOR MF	47 OHM 5% 0.33W	PHILIPS	2322 180 73479	02.440
R71-1	RESISTOR MF	560 OHM 5% 0.33W	PHILIPS	2322 180 73561	02.466
R72-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R73-1	RESISTOR MF	1k8 OHM 5% 0.33W	PHILIPS	2322 180 73182	02.478
R74-1	RESISTOR MF	91k OHM 5% 0.33W	PHILIPS	2322 180 73913	02.519
R75-1	RESISTOR MF	47 OHM 5% 0.33W	PHILIPS	2322 180 73479	02.440
R76-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R77-1	RESISTOR MF	50k OHM 5% 0.33W	PHILIPS	2322 180 73513	02.513
R78-1	RESISTOR MF	91k OHM 5% 0.33W	PHILIPS	2322 180 73913	02.519
R79-1	RESISTOR MF	82k OHM 5% 0.33W	PHILIPS	2322 180 73823	02.518
R80-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R81-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R82-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R83-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R84-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R85-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R86-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R87-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R88-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R89-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R90-1	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R91-1	RESISTOR MF	47k OHM 5% 0.33W	PHILIPS	2322 180 73473	02.512

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R92-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R93-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R94-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R95-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R96-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R97-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R98-1	RESISTOR MF	100k OHM 5% 0.33W	PHILIPS	2322 180 73104	02.520
R99-1	RESISTOR MF	3k9 OHM 5% 0.33W	PHILIPS	2322 180 73392	02.486
R100-1	RESISTOR MF	4k7 OHM 5% 0.33W	PHILIPS	2322 180 73472	02.488
R101-1	RESISTOR MF	12k OHM 5% 0.33W	PHILIPS	2322 180 73123	02.498
R102-1	RESISTOR MF	100k OHM 5% 0.33W	PHILIPS	2322 180 73104	02.520
R103-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
TR1-1	TRANSFORMER	ADJUSTABLE Fr=70MHz	MITSUMI	L-2M7-D3/DM-7141	38.438
TR2-1	COIL	TL548	ESPERA	6-0-26460	400548
TR3-1	TRANSFORMER	TL492	S.P.RADIO	6-0-25811	400492
U1-1	QUAD OP.AMP.	324	TEXAS	LM324N	31.065
U2-1	FM IF SYSTEM	3189	NATIONAL	LM3189N	31.752
U3-1	8 BIT SHIFT REG.SERIAL IO	74HC595	NATIONAL	MM74HC595N	34.502

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	Rx FRONT END MODULE 2	RE2100	ESPERA	5-0-25632G	625632
VARIOUS	DISTANCE DISC	TO-5	RADIO PARTS	R.P.Nr: 316310	30.556
C2-2	CAPACITOR MKT	1uF 5% 63VDC	PHILIPS	2222 370 79105	11.190
C3-2	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C4-2	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C5-2	CAPACITOR MKT	1uF 5% 63VDC	PHILIPS	2222 370 79105	11.190
C6-2	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C7-2	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C8-2	CAPACITOR MKT	22nF 5% 250VDC	PHILIPS	2222 371 49223	11.174
C9-2	CAPACITOR MKT	1uF 5% 63VDC	PHILIPS	2222 370 79105	11.190
C10-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C11-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C12-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C13-2	CAPACITOR MKT	1uF 5% 63VDC	PHILIPS	2222 370 79105	11.190
C17-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C18-2	CAPACITOR CERAMIC	120pF 2% N150 100VDC	PHILIPS	2222 683 34121	15.143
C19-2	CAPACITOR CERAMIC	68pF 2% N150 100VDC	PHILIPS	2222 683 34689	15.120
C20-2	CAPACITOR CERAMIC	120pF 2% N150 100VDC	PHILIPS	2222 683 34121	15.143
C21-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C22-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C23-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C24-2	CAPACITOR POLYSTYRENE	200pF 1% 630VDC	PHILIPS	2222 431 82001	10.408
C25-2	CAPACITOR POLYSTERENE	150pF 1% 630VDC	PHILIPS	2222 431 81501	10.405
C26-2	CAPACITOR POLYSTYRENE	200pF 1% 630VDC	PHILIPS	2222 431 82001	10.408
C27-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C28-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C29-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C30-2	CAPACITOR POLYSTYRENE	430pF 1% 630VDC	PHILIPS	2222 431 84301	10.428
C31-2	CAPACITOR POLYSTYRENE	300pF 1% 630VDC	PHILIPS	2222 431 83001	10.414
C32-2	CAPACITOR POLYSTYRENE	430pF 1% 630VDC	PHILIPS	2222 431 84301	10.428

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C33-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C34-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C35-2	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C36-2	CAPACITOR POLYSTYRENE	750pF 1% 250VDC	PHILIPS	2222 430 87501	10.347
C37-2	CAPACITOR POLYSTYRENE	1n00F 1% 250VDC	PHILIPS	2222 430 81002	10.350
C38-2	CAPACITOR POLYSTYRENE	750pF 1% 250VDC	PHILIPS	2222 430 87501	10.347
C39-2	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C40-2	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C41-2	CAPACITOR MKT	470nF 5% 63VDC	PHILIPS	2222 370 79474	11.187
C42-2	CAPACITOR POKYSTYRENE	1n80F 1% 160VDC	PHILIPS	2222 429 81802	10.282
C43-2	CAPACITOR POLYSTERENE	4n70F 1% 63VDC	PHILIPS	2222 428 84702	10.217
C44-2	CAPACITOR POKYSTYRENE	1n80F 1% 160VDC	PHILIPS	2222 429 81802	10.282
C45-2	CAPACITOR MKT	470nF 5% 63VDC	PHILIPS	2222 370 79474	11.187
C46-2	CAPACITOR MKT	470nF 5% 63VDC	PHILIPS	2222 370 79474	11.187
C47-2	CAPACITOR MKT	470nF 5% 63VDC	PHILIPS	2222 370 79474	11.187
C48-2	CAPACITOR MKT	470nF 5% 63VDC	PHILIPS	2222 370 79474	11.187
C49-2	CAPACITOR POLYSTYRENE	6n20F 1% 63VDC	PHILIPS	2222 428 86202	10.220
C50-2	CAPACITOR POLYSTYRENE	6n20F 1% 63VDC	PHILIPS	2222 428 86202	10.220
C51-2	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C52-2	CAPACITOR MKT	470nF 5% 63VDC	PHILIPS	2222 370 79474	11.187
C53-2	CAPACITOR MKT	1uF 5% 63VDC	PHILIPS	2222 370 79105	11.190
C54-2	CAPACITOR CERAMIC	120pF 2% N150 100VDC	PHILIPS	2222 683 34121	15.143
C55-2	CAPACITOR CERAMIC	120pF 2% N150 100VDC	PHILIPS	2222 683 34121	15.143
C56-2	CAPACITOR CERAMIC	47pF 2% N150	PHILIPS	2322 683 34479	15.102
C57-2	CAPACITOR CERAMIC	4n7F 20% CL2 50VDC	NKE	DT 380 758S D 472 M 50V FLAT PACK	15.165
C58-2	CAPACITOR CERAMIC	4n7F 20% CL2 50VDC	NKE	DT 380 758S D 472 M 50V FLAT PACK	15.165
C59-2	CAPACITOR CERAMIC	4p7F +-0.25pF N750 50VDC	NKE	DT 330 758S UJ 4R7 C 50V FLAT PACK	15.872
C60-2	CAPACITOR MKT	22nF 10% 100VDC	PHILIPS	2222 370 88223	11.175
C61-2	CAPACITOR CERAMIC	5p0F +/-0.25pF N470 50VDC	NKE	DT 330 758S TH 5R0 C 50V FLAT PACK	15.847
C62-2	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C63-2	CAPACITOR CERAMIC	10pF +/-0.5pF N150 50VDC	NKE	DT 340 758S PH 100 D 50V FLAT PACK	15.035
C64-2	CAPACITOR CERAMIC	47pF 5% N150 50VDC	NKE	DT 360 758S PH 470 J 50V FLAT PACK	15.100
C65-2	CAPACITOR CERAMIC	6p8F +-0.5pF N150 50VDC	NKE	DT 330 758S PH 6R8 D 50V FLAT PACK	15.020
C66-2	CAPACITOR CERAMIC	18pF 5% N150 50VDC	NKE	DT 340 758S PH 180 J 50V	15.061

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C67-2	CAPACITOR CERAMIC	10pF +/-0.5pF N150 50VDC	NKE	FLAT PACK DT 340 758S PH 100 D 50V FLAT PACK	15.035
C68-2	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C69-2	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C70-2	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C71-2	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C72-2	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C73-2	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C74-2	CAPACITOR CERAMIC	4n7F 20% CL2 50VDC	NKE	DT 380 758S D 472 M 50V FLAT PACK	15.165
C75-2	CAPACITOR CERAMIC	10pF +/-0.5pF N150 50VDC	NKE	DT 340 758S PH 100 D 50V FLAT PACK	15.035
C76-2	CAPACITOR CERAMIC	13pF 5% N150 50VDC	NKE	DT 340 758S PH 130 J 50V FLAT PACK	15.051
C77-2	CAPACITOR CERAMIC	10pF +/-0.5pF N150 50VDC	NKE	DT 340 758S PH 100 D 50V FLAT PACK	15.035
D1-2	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	TFK	BAV21	25.340
D2-2	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	TFK	BAV21	25.340
D3-2	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	TFK	BAV21	25.340
D4-2	DIODE GENERAL PURPOSE	BAV21 200V/0.25A	TFK	BAV21	25.340
D5-2	DIODE ZENER	9V1 5% 5W 1N5346B	MOTOROLA	1N5346B	26.964
D6-2	DIODE SWITCH	BA182	PHILIPS	BA182	25.375
D7-2	DIODE SWITCH	BA182	PHILIPS	BA182	25.375
D8-2	DIODE SWITCH	BA182	PHILIPS	BA182	25.375
D9-2	DIODE SWITCH	BA182	PHILIPS	BA182	25.375
D10-2	DIODE SWITCH	BA182	PHILIPS	BA182	25.375
D11-2	DIODE SWITCH	BA182	PHILIPS	BA182	25.375
D12-2	DIODE SWITCH	BA182	PHILIPS	BA182	25.375
D13-2	DIODE SWITCH	BA182	PHILIPS	BA182	25.375
D14-2	DIODE SWITCH	BA182	PHILIPS	BA182	25.375
D15-2	DIODE SWITCH	BA182	PHILIPS	BA182	25.375
D16-2	DIODE SWITCH	BA182	PHILIPS	BA182	25.375
D17-2	DIODE SWITCH	BA182	PHILIPS	BA182	25.375
FL1-2	CRYSTAL FILTER	Fc=70MHz,BILIT	NDK	70N20B D360B 1SET=2PCS	40.031
FL2-2	CRYSTAL FILTER	Fc=70MHz,BILIT	NDK	70N20B D360B 1SET=2PCS	40.031
FP1-2	FERRITE BEAD	Ø3.7xØ1.2x3.5mm GRADE 4B1	PHILIPS	4322 020 34420	35.181

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
FP2-2	FERRITE BEAD	Ø3.7xØ1.2x3.5mm GRADE 4B1	PHILIPS	4322 020 34420	35.181
FP3-2	FERRITE BEAD	Ø3.7xØ1.2x3.5mm GRADE 4B1	PHILIPS	4322 020 34420	35.181
GL1-2	NEON LAMP	90V 5kA/5A	SIEMENS	B1-C90/20L-Q69-X184	45.074
J1-2	RECEPTACLE	BNC RIGHT ANGLE	ROSENBERGER	51K-201-400 A4	78.443
J2-2	SOCKET COAX	PCB MOUNT.	TAIKO	TMP-J02X-A1	78.516
J3-2	SOCKET 9 POLES	SUB D RIGHT ANGLE	AMP	343705-2	78.167
J4-2	SOCKET COAX	PCB MOUNT.	TAIKO	TMP-J02X-A1	78.516
L1-2	CHOKE FIXED	100uH 5%	FASTRON	SMCC-101J-02	20.310
L2-2	CHOKE FIXED	100uH 5%	FASTRON	SMCC-101J-02	20.310
L3-2	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L4-2	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L5-2	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L6-2	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L7-2	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L8-2	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L9-2	CHOKE FIXED	330nH 10%	FASTRON	MICC-R33K-02	20.341
L10-2	CHOKE FIXED	680nH 10%	FASTRON	MICC-R68K-02	20.345
L11-2	CHOKE FIXED	330nH 10%	FASTRON	MICC-R33K-02	20.341
L12-2	CHOKE FIXED	820nH 10%	FASTRON	MICC-R82K-02	20.346
L13-2	CHOKE FIXED	1uOH 10%	FASTRON	MICC-1ROK-02	20.347
L14-2	CHOKE FIXED	820nH 10%	FASTRON	MICC-R82K-02	20.346
L15-2	CHOKE FIXED	470nH 10%	FASTRON	MICC-R47K-02	20.342
L16-2	CHOKE FIXED	1u5H 10%	FASTRON	MICC-1R5K-02	20.349
L17-2	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L18-2	CHOKE FIXED	1u5H 10%	FASTRON	MICC-1R5K-02	20.349
L19-2	CHOKE FIXED	1uOH 10%	FASTRON	MICC-1ROK-02	20.347
L20-2	CHOKE FIXED	4u7H 10%	FASTRON	MICC-4R7K-02	20.355
L21-2	CHOKE FIXED	3u3H 10%	FASTRON	MICC-3R3K-02	20.353
L22-2	CHOKE FIXED	4u7H 10%	FASTRON	MICC-4R7K-02	20.355
L23-2	CHOKE FIXED	1uOH 10%	FASTRON	MICC-1ROK-02	20.347
L24-2	CHOKE FIXED	22uH 5%	FASTRON	SMCC-220J-02	20.302
L25-2	CHOKE FIXED	8u2H 10%	FASTRON	MICC-8R2K-02	20.358
L26-2	CHOKE FIXED	22uH 5%	FASTRON	SMCC-220J-02	20.302
L27-2	CHOKE FIXED	1uOH 10%	FASTRON	MICC-1ROK-02	20.347
L28-2	CHOKE FIXED	4m7H 5%	FASTRON	SMCC-472J-02	20.330
L29-2	CHOKE FIXED	27uH 10%	FASTRON	MICCS-270K-02	20.364
L30-2	CHOKE FIXED	4m7H 5%	FASTRON	SMCC-472J-02	20.330
L31-2	CHOKE FIXED	390nH 10%	FASTRON	MICC-R39K-02	20.340
L32-2	CHOKE FIXED	680nH 10%	FASTRON	MICC-R68K-02	20.345
L33-2	CHOKE FIXED	680nH 10%	FASTRON	MICC-R68K-02	20.345
L34-2	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L35-2	COIL RF	586nH ADJUSTABLE	MITSUMI	L-2M7-D3/DM-8100	38.439
L36-2	COIL RF	586nH ADJUSTABLE	MITSUMI	L-2M7-D3/DM-8100	38.439
L37-2	COIL RF	586nH ADJUSTABLE	MITSUMI	L-2M7-D3/DM-8100	38.439

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
L38-2	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L39-2	CHOKE FIXED	150nH 10%	FASTRON	MICC-R15K-02	20.337
L40-2	CHOKE FIXED	270nH 10%	FASTRON	MICC-R27K-02	20.339
L41-2	CHOKE FIXED	150nH 10%	FASTRON	MICC-R15K-02	20.337
L42-2	CHOKE FIXED	22uH 5%	FASTRON	SMCC-220J-02	20.302
P1-2	PLUG	2x7 POLES	3M	3598-6002 / 7614-6002 JL	78.254
Q1-2	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
Q2-2	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
Q3-2	TRANSISTOR RF	BFW17A PNP TO-39	SGS	BFW17A	29.151
Q4-2	TRANSISTOR FET DUAL	N-CHANNEL J-FET U430	SILICONIX	U430	29.717
R1-2	RESISTOR MF	82 OHM 5% 0.33W	PHILIPS	2322 180 73829	02.446
R2-2	RESISTOR PMF	27 OHM 5% 3W	PHILIPS	2322 195 13279	04.660
R3-2	RESISTOR PMF	27 OHM 5% 3W	PHILIPS	2322 195 13279	04.660
R4-2	RESISTOR MF	27k OHM 5% 0.33W	PHILIPS	2322 180 73273	02.506
R5-2	RESISTOR MF	27k OHM 5% 0.33W	PHILIPS	2322 180 73273	02.506
R6-2	RESISTOR MF	1k2 OHM 5% 0.33W	PHILIPS	2322 180 73122	02.474
R7-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R8-2	RESISTOR MF	2k7 OHM 5% 0.33W	PHILIPS	2322 180 73272	02.482
R9-2	RESISTOR MF	2k7 OHM 5% 0.33W	PHILIPS	2322 180 73272	02.482
R10-2	RESISTOR MF	2k7 OHM 5% 0.33W	PHILIPS	2322 180 73272	02.482
R11-2	RESISTOR MF	2k7 OHM 5% 0.33W	PHILIPS	2322 180 73272	02.482
R12-2	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R13-2	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R14-2	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R15-2	RESISTOR MF	18k OHM 5% 0.33W	PHILIPS	2322 180 73183	02.502
R16-2	RESISTOR MF	12k OHM 5% 0.33W	PHILIPS	2322 180 73123	02.498
R17-2	RESISTOR MF	27k OHM 5% 0.33W	PHILIPS	2322 180 73273	02.506
R18-2	RESISTOR MF	270k OHM 5% 0.33W	PHILIPS	2322 180 73274	02.530
R19-2	RESISTOR MF	27k OHM 5% 0.33W	PHILIPS	2322 180 73273	02.506
R20-2	RESISTOR MF	270k OHM 5% 0.33W	PHILIPS	2322 180 73274	02.530
R21-2	RESISTOR MF	27k OHM 5% 0.33W	PHILIPS	2322 180 73273	02.506
R22-2	RESISTOR MF	270k OHM 5% 0.33W	PHILIPS	2322 180 73274	02.530
R23-2	RESISTOR MF	27k OHM 5% 0.33W	PHILIPS	2322 180 73273	02.506
R24-2	RESISTOR MF	270k OHM 5% 0.33W	PHILIPS	2322 180 73274	02.530
R25-2	RESISTOR MF	27k OHM 5% 0.33W	PHILIPS	2322 180 73273	02.506
R26-2	RESISTOR MF	270k OHM 5% 0.33W	PHILIPS	2322 180 73274	02.530
R27-2	RESISTOR MF	27k OHM 5% 0.33W	PHILIPS	2322 180 73273	02.506
R28-2	RESISTOR MF	270k OHM 5% 0.33W	PHILIPS	2322 180 73274	02.530
R29-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R30-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R31-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R32-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R33-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R34-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R35-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R36-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R37-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R38-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R39-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R40-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R41-2	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R42-2	RESISTOR MF	470 OHM 5% 0.33W	PHILIPS	2322 180 73471	02.464
R43-2	RESISTOR MF	220 OHM 5% 0.33W	PHILIPS	2322 180 73221	02.456
R44-2	RESISTOR MF	470 OHM 5% 0.33W	PHILIPS	2322 180 73471	02.464
R45-2	RESISTOR MF	56 OHM 5% 0.33W	PHILIPS	2322 180 73569	02.442
R47-2	RESISTOR MF	120 OHM 5% 0.33W	PHILIPS	2322 180 73121	02.450
R48-2	RESISTOR MF	8k2 OHM 5% 0.33W	PHILIPS	2322 180 73822	02.494
R50-2	RESISTOR MF	33 OHM 5% 0.33W	PHILIPS	2322 180 73339	02.436
R51-2	RESISTOR MF	1k3 OHM 5% 0.33W	PHILIPS	2322 180 73132	02.475
R52-2	RESISTOR MF	220 OHM 5% 0.33W	PHILIPS	2322 180 73221	02.456
R53-2	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R54-2	RESISTOR MF	82 OHM 5% 0.33W	PHILIPS	2322 180 73829	02.446
R55-2	RESISTOR MF	56 OHM 5% 0.33W	PHILIPS	2322 180 73569	02.442
RE1-2	RELAY	12VDC 1SH. 2A.	MILTRONIC AB	OUC-S-112D	21.300
RE2-2	RELAY	15V DC 2A 1SH.	SIEMENS	V23040-A0003-B201	21.062
TR1-2	TRANSFORMER	TL495	S.P.RADIO	6-0-25788A R. 890206/LKC	400495
TR2-2	TRANSFORMER	TL519	ESPERA	6-0-25721	400519
TR3-2	TRANSFORMER	TL494	S.P.RADIO	6-0-25813	400494
TR4-2	TRANSFORMER	ADJUSTABLE Fr=70MHz	MITSUMI	L-2M7-D3/DM-7141	38.438
U1-2	8 BIT SHIFT REG.SERIAL IO	74HC595	NATIONAL	MM74HC595N	34.502
U2-2	QUAD OP.AMP.	324	TEXAS	LM324N	31.065
U3-2	DUAL OP AMP	LM358N	TEXAS	LM358P	31.100

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	SYNTHESIZER MODULE 3	RE2100, TCXO: 0.34ppm	ESPERA	625633 w. 0.34ppm TCXO	727070
-1	SYNTHESIZER MODULE 3	RE2100	ESPERA	5-0-25633D	625633
X01-3	TCXO C1089A	10.73152MHz 0.34ppm	STC	C1089A	41.028

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	SYNTHESIZER MODULE 3	RE2100	ESPERA	5-0-25633D	625633
C6-3	CAPACITOR CERAMIC	33pF 5% N150 50VDC	NKE	DT 350 758S PH 330 J 50V FLAT PACK	15.092
C7-3	CERAMIC CAPACITOR	22pF 5% N150 50VDC	NKE	DT 340 758S PH 220 J 50V FLAT PACK	15.075
C8-3	CAPACITOR CERAMIC	5p6F +/-0.5pF N150 50VDC	NKE	DT 330 758S PH 5R6 D 50V FLAT PACK	15.013
C9-3	CERAMIC CAPACITOR	22pF 5% N150 50VDC	NKE	DT 340 758S PH 220 J 50V FLAT PACK	15.075
C10-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C11-3	CAPACITOR MKT	100nF 5% 63VDC	PHILIPS	2222 370 79104	11.135
C12-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C13-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C14-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C15-3	CAPACITOR MKT	1uF 10% 63VDC	PHILIPS	2222 370 78105	11.137
C16-3	CAPACITOR MKT	330nF 10% 63VDC	PHILIPS	2222 370 78334	11.189
C17-3	CAPACITOR MKT	330nF 10% 63VDC	PHILIPS	2222 370 78334	11.189
C18-3	CAPACITOR CERAMIC	39pF 5% N150 50VDC	NKE	DT 360 758L PH 390 J 50V FLAT PACK	15.090
C19-3	CERAMIC CAPACITOR	22pF 5% N150 50VDC	NKE	DT 340 758S PH 220 J 50V FLAT PACK	15.075
C20-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C21-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C22-3	CAPACITOR CERAMIC	5p6F +/-0.5pF N150 50VDC	NKE	DT 330 758S PH 5R6 D 50V FLAT PACK	15.013
C23-3	CERAMIC CAPACITOR	22pF 5% N150 50VDC	NKE	DT 340 758S PH 220 J 50V FLAT PACK	15.075
C24-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C25-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C26-3	CAPACITOR MKT	1uF 10% 63VDC	PHILIPS	2222 370 78105	11.137
C27-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C28-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C29-3	CAPACITOR MKT	330nF 10% 63VDC	PHILIPS	2222 370 78334	11.189
C30-3	CAPACITOR MKT	330nF 10% 63VDC	PHILIPS	2222 370 78334	11.189

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C31-3	CAPACITOR MKT	1uF 10% 63VDC	PHILIPS	2222 370 78105	11.137
C32-3	CAPACITOR CERAMIC	39pF 5% N150 50VDC	NKE	DT 360 758L PH 390 J 50V FLAT PACK	15.090
C33-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C34-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C35-3	CAPACITOR CERAMIC	15pF 5% N150 50VDC	KCK	RT-HE40-SK PH 150 J AMMO PACK	15.055
C36-3	CAPACITOR CERAMIC	5p6F +/-0.5pF N150 50VDC	NKE	DT 330 758S PH 5R6 D 50V FLAT PACK	15.013
C37-3	CAPACITOR CERAMIC	33pF 5% N150 50VDC	NKE	DT 350 758S PH 330 J 50V FLAT PACK	15.092
C38-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C39-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C40-3	CAPACITOR MKT	1uF 10% 63VDC	PHILIPS	2222 370 78105	11.137
C41-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C42-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C43-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C44-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C45-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C46-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C47-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C48-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C49-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C50-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C51-3	CAPACITOR MKT	47nF 5% 63VDC	PHILIPS	2222 370 79473	11.156
C52-3	CAPACITOR CERAMIC	43pF 5% N150 50VDC	NKE	DT 360 758S PH 430 J 50V FLAT PACK	15.097
C53-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C54-3	CAPACITOR MKT	47nF 5% 63VDC	PHILIPS	2222 370 79473	11.156
C55-3	CAPACITOR CERAMIC	15pF 5% N150 50VDC	KCK	RT-HE40-SK PH 150 J AMMO PACK	15.055
C56-3	CAPACITOR CERAMIC	5p6F +/-0.5pF N150 50VDC	NKE	DT 330 758S PH 5R6 D 50V FLAT PACK	15.013
C57-3	CAPACITOR CERAMIC	33pF 5% N150 50VDC	NKE	DT 350 758S PH 330 J 50V FLAT PACK	15.092
C58-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C59-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C60-3	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C61-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V	15.170

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
				FLAT PACK	
C62-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C63-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C64-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C65-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C66-3	CAPACITOR MKT	100nF 5% 63VDC	PHILIPS	2222 370 79104	11.135
C67-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C68-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C69-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C70-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C71-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C73-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C75-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C76-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C77-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C78-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C79-3	CAPACITOR MKT	1uF 10% 63VDC	PHILIPS	2222 370 78105	11.137
C80-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C81-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C82-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C83-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C84-3	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
C85-3	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C86-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C87-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C88-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C91-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C92-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C93-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C94-3	CAPACITOR CERAMIC	1p8F +/-0.25pF NPO 100VDC	PHILIPS	2222 683 09188	15.008
C95-3	CAPACITOR MULTILAYER	3n3F 2% NPO 50DC	VITRAMON	VP32 BA332GA-T-AMMO PACK	16.295
C96-3	CAPACITOR ELECTROLYTIC	47uF 20% 25VDC	ERO	EKI 00 BB 247 E MOE	14.524

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C97-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C98-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C99-3	CAPACITOR CERAMIC	4p7F +-0.25pF N150 50VDC	KCK	RT-HE40 SK PH 4R7 C AMMO PACK	15.005
C100-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C101-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C102-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C103-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C104-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C105-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C106-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C107-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C108-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C109-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C110-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C112-3	CAPACITOR MULTILAYER	3n3F 2% NPO 50DC	VITRAMON	VP32 BA332GA-T-AMMO PACK	16.295
C113-3	CAPACITOR ELECTROLYTIC	47uF 20% 25VDC	ERO	EKI 00 BB 247 E MOE	14.524
C115-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C117-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C118-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C119-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C123-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C124-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C125-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C126-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C127-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C128-3	CAPACITOR ELECTROLYTIC	4.7uF 20% 50VDC	ERO	EKI 00 AA 147 H MOE	14.510
C129-3	CERAMIC CAPACITOR	22pF 5% N150 50VDC	NKE	DT 340 758S PH 220 J 50V FLAT PACK	15.075
C130-3	CAPACITOR CERAMIC	36pF 5% N150 50VDC	NKE	DT 350 758S PH 360 J 50V FLAT PACK	15.088
C131-3	CAPACITOR MKT	39nF 5% 63VDC	PHILIPS	2222 370 79393	11.155
C132-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C135-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C136-3	CAPACITOR ELECTROLYTIC	47uF 20% 25VDC	ERO	EKI 00 BB 247 E MOE	14.524
C137-3	CAPACITOR CERAMIC	2p7F +/-0.25pF N150 50VDC	NKE	DT 330 758S PJ 2R7 C 50V FLAT PACK	15.001
C138-3	CAPACITOR MKT	22nF 5% 100VDC	PHILIPS	2222 370 89223	11.169
C139-3	CAPACITOR CERAMIC	13pF 5% N150 50VDC	NKE	DT 340 758S PH 130 J 50V FLAT PACK	15.051
C140-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C141-3	CAPACITOR MKT	68nF 5% 63VDC	PHILIPS	2222 370 79683	11.178
C142-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C143-3	CAPACITOR MKT	39nF 5% 63VDC	PHILIPS	2222 370 79393	11.155
C144-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C145-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C146-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C147-3	CAPACITOR MKT	22nF 5% 100VDC	PHILIPS	2222 370 89223	11.169
C148-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C149-3	CAPACITOR CERAMIC	36pF 5% N150 50VDC	NKE	DT 350 758S PH 360 J 50V FLAT PACK	15.088
C150-3	CAPACITOR CERAMIC	43pF 5% N150 50VDC	NKE	DT 360 758S PH 430 J 50V FLAT PACK	15.097
C151-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C152-3	CAPACITOR ELECTROLYTIC	4.7uF 20% 50VDC	ERO	EKI 00 AA 147 H MOE	14.510
C153-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C154-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C155-3	CAPACITOR CERAMIC	2p7F +/-0.25pF N150 50VDC	NKE	DT 330 758S PJ 2R7 C 50V FLAT PACK	15.001
C156-3	CAPACITOR CERAMIC	20pF 5% N150 50VDC	KCK	RT HE40 SM PH 200 J AMMO PACK	15.065

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C157-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C158-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C160-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C170-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C173-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C174-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C175-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C176-3	CAPACITOR CERAMIC	10pF +/-0.5pF N150 50VDC	NKE	DT 340 758S PH 100 D 50V FLAT PACK	15.035
C177-3	CAPACITOR CERAMIC	6p8F +-0.5pF N150 50VDC	NKE	DT 330 758S PH 6R8 D 50V FLAT PACK	15.020
C178-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C179-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C180-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C181-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C182-3	CAPACITOR CERAMIC	1nOF 10% CL2 500VDC	NKE	DT 360 758L B 102 K 500V FLAT PACK	15.160
C183-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C184-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C185-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C186-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C187-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C188-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C189-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C190-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C191-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V	16.095

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
				FLAT PACK	
C192-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C193-3	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C194-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C195-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C196-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C197-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C198-3	CAPACITOR ELECTROLYTIC	47uF 20% 25VDC	ERO	EKI 00 BB 247 E MOE	14.524
C199-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C200-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C201-3	CAPACITOR MKT	1uF 10% 63VDC	PHILIPS	2222 370 78105	11.137
C202-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C203-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C204-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C205-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C206-3	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C207-3	CAPACITOR CERAMIC	10nF -20/+80% CL2 50VDC	NKE	DT 350 758L F 103 Z 50V FLAT PACK	15.170
C208-3	CAPACITOR ELECTROLYTIC	4.7uF 20% 50VDC	ERO	EKI 00 AA 147 H MOE	14.510
C209-3	CAPACITOR ELECTROLYTIC	4.7uF 20% 50VDC	ERO	EKI 00 AA 147 H MOE	14.510
C210-3	CAPACITOR ELECTROLYTIC	4.7uF 20% 50VDC	ERO	EKI 00 AA 147 H MOE	14.510
C211-3	CAPACITOR ELECTROLYTIC	4.7uF 20% 50VDC	ERO	EKI 00 AA 147 H MOE	14.510
C212-3	CAPACITOR ELECTROLYTIC	47uF 20% 25VDC	ERO	EKI 00 BB 247 E MOE	14.524
C213-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C214-3	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V FLAT PACK	16.095
C216-3	CAPACITOR CERAMIC	330pF 20% 500VDC	NKE	DT350465 758S B 331M 500V FLAT PACK	16.093
D1-3	DIODE CAPACITANCE	4.5pF/28VDC	PHILIPS	BB809	26.125
D2-3	DIODE SWITCH	BA243	TFK	BA243	25.386
D3-3	DIODE CAPACITANCE	4.5pF/28VDC	PHILIPS	BB809	26.125
D4-3	DIODE CAPACITANCE	4.5pF/28VDC	PHILIPS	BB809	26.125
D5-3	DIODE SWITCH	BA243	TFK	BA243	25.386

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
D6-3	DIODE CAPACITANCE	4.5pF/28VDC	PHILIPS	BB809	26.125
D7-3	DIODE SWITCH	BA243	TFK	BA243	25.386
D8-3	DIODE CAPACITANCE	4.5pF/28VDC	PHILIPS	BB809	26.125
D9-3	DIODE CAPACITANCE	4.5pF/28VDC	PHILIPS	BB809	26.125
D10-3	DIODE SWITCH	BA243	TFK	BA243	25.386
D11-3	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D12-3	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D13-3	DIODE ZENER	2V7 5% 0.4W BZX79C2V7	PHILIPS	BZX79C2V7	26.506
D14-3	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D15-3	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D16-3	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D17-3	DIODE ZENER	2V4 5% 0.4W BZX79C2V4	PHILIPS	BZX79C2V4	26.505
D18-3	DIODE SWITCH	BA243	TFK	BA243	25.386
D19-3	DIODE CAPACITANCE	4.5pF/28VDC	PHILIPS	BB809	26.125
D20-3	DIODE SCHOTTKY BARRIER	70V/15mA 1N5711/5082-2800	SGS-THOMSON	1N5711	27.500
D21-3	DIODE SWITCH	BA243	TFK	BA243	25.386
D22-3	DIODE CAPACITANCE	4.5pF/28VDC	PHILIPS	BB809	26.125
D23-3	DIODE SCHOTTKY BARRIER	70V/15mA 1N5711/5082-2800	SGS-THOMSON	1N5711	27.500
D24-3	DIODE SWITCH	BA243	TFK	BA243	25.386
D25-3	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D26-3	DIODE SWITCH	BA243	TFK	BA243	25.386
J1-3	SOCKET COAX	VERTICAL FOR PCB MOUNT.	TAIKO	TMP-J01X-V6	78.518
J2-3	SOCKET COAX	VERTICAL FOR PCB MOUNT.	TAIKO	TMP-J01X-V6	78.518
J3-3	SOCKET COAX	VERTICAL FOR PCB MOUNT.	TAIKO	TMP-J01X-V6	78.518
J4-3	SOCKET COAX	VERTICAL FOR PCB MOUNT.	TAIKO	TMP-J01X-V6	78.518
J5-3	SOCKET COAX	VERTICAL FOR PCB MOUNT.	TAIKO	TMP-J01X-V6	78.518
J6-3	SOCKET COAX	VERTICAL FOR PCB MOUNT.	TAIKO	TMP-J01X-V6	78.518
L1-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L3-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L4-3	CHOKE FIXED	470uH 5%	FASTRON	SMCC-471J-02	20.318
L5-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L6-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L8-3	CHOKE FIXED	470uH 5%	FASTRON	SMCC-471J-02	20.318
L9-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L10-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L11-3	CHOKE FIXED	470uH 5%	FASTRON	SMCC-471J-02	20.318
L12-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L13-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L14-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L16-3	CHOKE FIXED	470uH 5%	FASTRON	SMCC-471J-02	20.318
L17-3	CHOKE FIXED	100uH 10%	FASTRON	MICCS-101K-02	20.371
L18-3	CHOKE FIXED	100uH 10%	FASTRON	MICCS-101K-02	20.371
L19-3	CHOKE FIXED	100uH 10%	FASTRON	MICCS-101K-02	20.371
L20-3	CHOKE FIXED	100uH 10%	FASTRON	MICCS-101K-02	20.371

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
L21-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L22-3	CHOKE FIXED	4m7H 5%	FASTRON	SMCC-472J-02	20.330
L24-3	CHOKE FIXED	100uH 10%	FASTRON	MICCS-101K-02	20.371
L25-3	CHOKE FIXED	100uH 10%	FASTRON	MICCS-101K-02	20.371
L26-3	CHOKE FIXED	100uH 10%	FASTRON	MICCS-101K-02	20.371
L27-3	CHOKE FIXED	270nH 10%	FASTRON	MICC-R27K-02	20.339
L28-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L29-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L30-3	CHOKE FIXED	10uH 10%	FASTRON	MICC-100K-02	20.359
L32-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L33-3	CHOKE FIXED	1u5H 10%	FASTRON	MICC-1R5K-02	20.349
L34-3	CHOKE FIXED	4m7H 5%	FASTRON	SMCC-472J-02	20.330
L35-3	CHOKE FIXED	4m7H 5%	FASTRON	SMCC-472J-02	20.330
L36-3	CHOKE FIXED	10uH 10%	FASTRON	MICC-100K-02	20.359
L38-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L39-3	CHOKE FIXED	2u2H 10%	FASTRON	MICC-2R2K-02	20.351
L40-3	CHOKE FIXED	0.56uH 10%	FASTRON	MICC-R56K-02	20.344
L41-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L42-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L43-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L44-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L45-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L46-3	CHOKE FIXED	470uH 5%	FASTRON	SMCC-471J-02	20.318
L47-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L48-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L49-3	CHOKE FIXED	3u9H 10%	FASTRON	MICC-3R9K-02	20.354
L50-3	CHOKE FIXED	100uH 10%	FASTRON	MICCS-101K-02	20.371
P1-3	PLUG	2x7 POLES	3M	3598-6002 / 7614-6002 JL	78.254
Q1-3	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
Q2-3	TRANSISTOR JFET	TIS88A3 TO-92	MOTORPLA	TM 00 044-3	29.737
Q3-3	TRANSISTOR AF	BC558 PNP TO-92	PHILIPS	BC558 (-A/-B/-C)	28.095
Q4-3	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
Q5-3	TRANSISTOR JFET	TIS88A3 TO-92	MOTORPLA	TM 00 044-3	29.737
Q6-3	TRANSISTOR AF	BC558 PNP TO-92	PHILIPS	BC558 (-A/-B/-C)	28.095
Q7-3	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
Q8-3	TRANSISTOR JFET	TIS88A3 TO-92	MOTORPLA	TM 00 044-3	29.737
Q9-3	TRANSISTOR AF	BC558 PNP TO-92	PHILIPS	BC558 (-A/-B/-C)	28.095
Q10-3	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
Q11-3	TRANSISTOR JFET	TIS88A3 TO-92	MOTORPLA	TM 00 044-3	29.737
Q12-3	TRANSISTOR AF	BC558 PNP TO-92	PHILIPS	BC558 (-A/-B/-C)	28.095
Q13-3	TRANSISTOR RF	BFW92A	TFK	BFW92A	29.160
Q14-3	TRANSISTOR N-CHAN. JFET	TIS88A1	MOTOROLA	TM 00 044 -1	29.735
Q15-3	TRANSISTOR RF SWITCH	2N2369A	MOTOROLA	2N2369A	28.315
Q16-3	TRANSISTOR RF SWITCH	MPS3640	MOTOROLA	MPS-3640	28.405

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
Q17-3	TRANSISTOR RF	BF199	PHILIPS	BF199	28.178
Q18-3	TRANSISTOR RF	BF199	PHILIPS	BF199	28.178
Q19-3	TRANS. MOSFET N-CHANNEL	ENHANCEMENT SD210/BSD214	SILICONIX	SD210DE	29.719
Q20-3	TRANSISTOR RF SWITCH	2N2369A	MOTOROLA	2N2369A	28.315
Q21-3	TRANSISTOR RF	BF199	PHILIPS	BF199	28.178
Q22-3	TRANSISTOR RF	BFW92A	TFK	BFW92A	29.160
Q23-3	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
Q24-3	TRANS. MOSFET N-CHANNEL	ENHANCEMENT SD210/BSD214	SILICONIX	SD210DE	29.719
Q25-3	TRANSISTOR RF SWITCH	2N2369A	MOTOROLA	2N2369A	28.315
Q26-3	TRANSISTOR RF SWITCH	2N2369A	MOTOROLA	2N2369A	28.315
Q27-3	TRANSISTOR RF	BF199	PHILIPS	BF199	28.178
Q28-3	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
Q29-3	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
Q30-3	TRANSISTOR JFET	TIS88A3 TO-92	MOTORPLA	TM 00 044-3	29.737
Q31-3	TRANSISTOR AF	BC558 PNP TO-92	PHILIPS	BC558 (-A/-B/-C)	28.095
Q32-3	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
Q33-3	TRANSISTOR JFET	TIS88A3 TO-92	MOTORPLA	TM 00 044-3	29.737
Q34-3	TRANSISTOR RF	BF199	PHILIPS	BF199	28.178
Q35-3	TRANSISTOR AF	BC558 PNP TO-92	PHILIPS	BC558 (-A/-B/-C)	28.095
Q36-3	TRANSISTOR RF	BFW92A	TFK	BFW92A	29.160
Q37-3	TRANSISTOR RF	BFW92A	TFK	BFW92A	29.160
Q38-3	TRANSISTOR RF	BF199	PHILIPS	BF199	28.178
Q39-3	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
Q40-3	TRANSISTOR RF	BF199	PHILIPS	BF199	28.178
R1-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R2-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R3-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R4-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R5-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R6-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R7-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R8-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R9-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R10-3	RESISTOR MF	56 OHM 5% 0.33W	PHILIPS	2322 180 73569	02.442
R11-3	RESISTOR MF	910 OHM 5% 0.33W	PHILIPS	2322 180 73911	02.471
R12-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R13-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R14-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R15-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R16-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R17-3	RESISTOR MF	330 OHM 5% 0.33W	PHILIPS	2322 180 73331	02.460
R18-3	RESISTOR MF	56 OHM 5% 0.33W	PHILIPS	2322 180 73569	02.442
R19-3	RESISTOR MF	910 OHM 5% 0.33W	PHILIPS	2322 180 73911	02.471
R20-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R21-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R22-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R23-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R24-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R25-3	RESISTOR MF	56 OHM 5% 0.33W	PHILIPS	2322 180 73569	02.442
R26-3	RESISTOR MF	910 OHM 5% 0.33W	PHILIPS	2322 180 73911	02.471
R27-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R28-3	RESISTOR MF	680 OHM 5% 0.33W	PHILIPS	2322 180 73681	02.468
R29-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R30-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R31-3	RESISTOR MF	680 OHM 5% 0.33W	PHILIPS	2322 180 73681	02.468
R32-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R33-3	RESISTOR MF	8k2 OHM 5% 0.33W	PHILIPS	2322 180 73822	02.494
R34-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R35-3	RESISTOR MF	56 OHM 5% 0.33W	PHILIPS	2322 180 73569	02.442
R36-3	RESISTOR MF	910 OHM 5% 0.33W	PHILIPS	2322 180 73911	02.471
R37-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R38-3	RESISTOR MF	36k OHM 5% 0.33W	PHILIPS	2322 180 73363	02.509
R39-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R40-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R41-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R42-3	RESISTOR MF	1k2 OHM 5% 0.33W	PHILIPS	2322 180 73122	02.474
R43-3	RESISTOR MF	56R2 OHM 1% 0.25W	PHILIPS	2322 157 15629	02.222
R44-3	RESISTOR MF	33k OHM 5% 0.33W	PHILIPS	2322 180 73333	02.508
R45-3	RESISTOR MF	12k OHM 5% 0.33W	PHILIPS	2322 180 73123	02.498
R46-3	RESISTOR MF	15k OHM 5% 0.33W	PHILIPS	2322 180 73153	02.500
R47-3	RESISTOR MF	82 OHM 5% 0.33W	PHILIPS	2322 180 73829	02.446
R48-3	RESISTOR MF	7k5 OHM 5% 0.33W	PHILIPS	2322 180 73752	02.493
R49-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R50-3	RESISTOR MF	82 OHM 5% 0.33W	PHILIPS	2322 180 73829	02.446
R51-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R52-3	RESISTOR MF	2k2 OHM 5% 0.33W	PHILIPS	2322 180 73222	02.480
R53-3	RESISTOR MF	2k2 OHM 5% 0.33W	PHILIPS	2322 180 73222	02.480
R54-3	RESISTOR MF	2k7 OHM 5% 0.33W	PHILIPS	2322 180 73272	02.482
R55-3	RESISTOR MF	12k OHM 5% 0.33W	PHILIPS	2322 180 73123	02.498
R56-3	RESISTOR MF	5k1 OHM 5% 0.33W	PHILIPS	2322 180 73512	02.489
R57-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R58-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R59-3	RESISTOR MF	12k OHM 5% 0.33W	PHILIPS	2322 180 73123	02.498
R60-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R61-3	RESISTOR MF	220 OHM 5% 0.33W	PHILIPS	2322 180 73221	02.456
R62-3	RESISTOR MF	10 OHM 5% 0.33W	PHILIPS	2322 180 73109	02.424
R63-3	RESISTOR MF	680 OHM 5% 0.33W	PHILIPS	2322 180 73681	02.468
R64-3	RESISTOR MF	1k0 OHM 5% 0.33W	PHILIPS	2322 180 73102	02.472

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R65-3	RESISTOR MF	390 OHM 5% 0.33W	PHILIPS	2322 180 73391	02.462
R66-3	RESISTOR MF	390 OHM 5% 0.33W	PHILIPS	2322 180 73391	02.462
R67-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R68-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R69-3	RESISTOR MF	82 OHM 5% 0.33W	PHILIPS	2322 180 73829	02.446
R70-3	RESISTOR MF	470 OHM 5% 0.33W	PHILIPS	2322 180 73471	02.464
R71-3	RESISTOR MF	1k0 OHM 5% 0.33W	PHILIPS	2322 180 73102	02.472
R72-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R73-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R74-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R75-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R76-3	RESISTOR MF	2k7 OHM 5% 0.33W	PHILIPS	2322 180 73272	02.482
R77-3	RESISTOR MF	220 OHM 5% 0.33W	PHILIPS	2322 180 73221	02.456
R78-3	RESISTOR MF	1k8 OHM 5% 0.33W	PHILIPS	2322 180 73182	02.478
R79-3	RESISTOR MF	33 OHM 5% 0.33W	PHILIPS	2322 180 73339	02.436
R80-3	RESISTOR MF	470 OHM 5% 0.4W	PHILIPS	2322 181 53471	01.191
R81-3	RESISTOR MF	56 OHM 5% 0.33W	PHILIPS	2322 180 73569	02.442
R82-3	RESISTOR MF	10 OHM 5% 0.33W	PHILIPS	2322 180 73109	02.424
R83-3	RESISTOR MF	100k OHM 5% 0.33W	PHILIPS	2322 180 73104	02.520
R84-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R85-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R86-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R87-3	RESISTOR MF	2k32 OHM 1% 0.25W	PHILIPS	2322 157 12322	02.225
R88-3	PRESET CERMET	1k0 OHM 10% 0.5W	BOURNS	3386P-1-102	07.886
R89-3	RESISTOR MF	909 OHM 1% 0.25W	PHILIPS	2322 157 19091	02.218
R90-3	RESISTOR MF	681 OHM 1% 0.25W	PHILIPS	2322 157 16811	02.223
R91-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R92-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R93-3	RESISTOR MF	4k7 OHM 5% 0.33W	PHILIPS	2322 180 73472	02.488
R94-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R95-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R96-3	RESISTOR MF	1k2 OHM 5% 0.33W	PHILIPS	2322 180 73122	02.474
R97-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R98-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R100-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R101-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R102-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R103-3	RESISTOR MF	470 OHM 5% 0.33W	PHILIPS	2322 180 73471	02.464
R104-3	RESISTOR MF	1k2 OHM 5% 0.33W	PHILIPS	2322 180 73122	02.474
R105-3	RESISTOR MF	220 OHM 5% 0.33W	PHILIPS	2322 180 73221	02.456
R106-3	RESISTOR MF	15k OHM 5% 0.33W	PHILIPS	2322 180 73153	02.500
R107-3	RESISTOR MF	56 OHM 5% 0.33W	PHILIPS	2322 180 73569	02.442
R108-3	RESISTOR MF	56 OHM 5% 0.33W	PHILIPS	2322 180 73569	02.442
R109-3	RESISTOR MF	560 OHM 5% 0.33W	PHILIPS	2322 180 73561	02.466

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R110-3	RESISTOR MF	2k2 OHM 5% 0.33W	PHILIPS	2322 180 73222	02.480
R111-3	RESISTOR MF	4k7 OHM 5% 0.33W	PHILIPS	2322 180 73472	02.488
R112-3	RESISTOR MF	6k8 OHM 5% 0.33W	PHILIPS	2322 180 73682	02.492
R113-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R114-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R115-3	RESISTOR MF	220 OHM 5% 0.33W	PHILIPS	2322 180 73221	02.456
R116-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R117-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R118-3	RESISTOR MF	300 OHM 5% 0.33W	PHILIPS	2322 180 73301	02.459
R119-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R120-3	RESISTOR MF	56k OHM 5% 0.33W	PHILIPS	2322 180 73563	02.514
R121-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R122-3	RESISTOR MF	300 OHM 5% 0.33W	PHILIPS	2322 180 73301	02.459
R123-3	RESISTOR MF	36k OHM 5% 0.33W	PHILIPS	2322 180 73363	02.509
R124-3	RESISTOR MF	1k0 OHM 5% 0.33W	PHILIPS	2322 180 73102	02.472
R125-3	RESISTOR MF	270 OHM 5% 0.33W	PHILIPS	2322 180 73271	02.458
R126-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R127-3	RESISTOR MF	18k OHM 5% 0.33W	PHILIPS	2322 180 73183	02.502
R128-3	RESISTOR MF	36k OHM 5% 0.33W	PHILIPS	2322 180 73363	02.509
R129-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R130-3	RESISTOR MF	18k OHM 5% 0.33W	PHILIPS	2322 180 73183	02.502
R131-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R132-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R133-3	RESISTOR MF	56k OHM 5% 0.33W	PHILIPS	2322 180 73563	02.514
R134-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R135-3	RESISTOR MF	1k0 OHM 5% 0.33W	PHILIPS	2322 180 73102	02.472
R136-3	RESISTOR MF	270 OHM 5% 0.33W	PHILIPS	2322 180 73271	02.458
R137-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R138-3	RESISTOR MF	47 OHM 5% 0.33W	PHILIPS	2322 180 73479	02.440
R139-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R140-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R141-3	RESISTOR MF	100k OHM 5% 0.33W	PHILIPS	2322 180 73104	02.520
R142-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R143-3	RESISTOR MF	220 OHM 5% 0.33W	PHILIPS	2322 180 73221	02.456
R144-3	RESISTOR MF	10 OHM 5% 0.33W	PHILIPS	2322 180 73109	02.424
R145-3	RESISTOR MF	1k0 OHM 5% 0.33W	PHILIPS	2322 180 73102	02.472
R146-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R147-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R148-3	RESISTOR MF	100k OHM 5% 0.33W	PHILIPS	2322 180 73104	02.520
R150-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R151-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R152-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R153-3	RESISTOR MF	1k2 OHM 5% 0.33W	PHILIPS	2322 180 73122	02.474
R154-3	RESISTOR MF	470 OHM 5% 0.33W	PHILIPS	2322 180 73471	02.464

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R155-3	RESISTOR MF	1kO OHM 5% 0.33W	PHILIPS	2322 180 73102	02.472
R156-3	RESISTOR MF	2k7 OHM 5% 0.33W	PHILIPS	2322 180 73272	02.482
R157-3	RESISTOR MF	47 OHM 5% 0.33W	PHILIPS	2322 180 73479	02.440
R158-3	RESISTOR MF	390 OHM 5% 0.4W	PHILIPS	2322 181 53391	01.189
R159-3	RESISTOR MF	82 OHM 5% 0.33W	PHILIPS	2322 180 73829	02.446
R160-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R161-3	RESISTOR MF	100k OHM 5% 0.33W	PHILIPS	2322 180 73104	02.520
R162-3	RESISTOR MF	2k2 OHM 5% 0.33W	PHILIPS	2322 180 73222	02.480
R163-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R164-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R165-3	RESISTOR MF	5k6 OHM 5% 0.33W	PHILIPS	2322 180 73562	02.490
R166-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R167-3	RESISTOR MF	390 OHM 5% 0.33W	PHILIPS	2322 180 73391	02.462
R168-3	RESISTOR MF	390 OHM 5% 0.33W	PHILIPS	2322 180 73391	02.462
R169-3	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R170-3	RESISTOR MF	82 OHM 5% 0.33W	PHILIPS	2322 180 73829	02.446
R171-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R172-3	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R173-3	RESISTOR MF	1k8 OHM 5% 0.33W	PHILIPS	2322 180 73182	02.478
R174-3	RESISTOR MF	15k OHM 5% 0.33W	PHILIPS	2322 180 73153	02.500
R175-3	RESISTOR MF	56 OHM 5% 0.33W	PHILIPS	2322 180 73569	02.442
R176-3	RESISTOR MF	2k2 OHM 5% 0.33W	PHILIPS	2322 180 73222	02.480
R177-3	RESISTOR MF	47 OHM 5% 0.33W	PHILIPS	2322 180 73479	02.440
R178-3	RESISTOR MF	33 OHM 5% 0.33W	PHILIPS	2322 180 73339	02.436
R182-3	RESISTOR MF	56 OHM 5% 0.33W	PHILIPS	2322 180 73569	02.442
R183-3	RESISTOR MF	220 OHM 5% 0.33W	PHILIPS	2322 180 73221	02.456
R184-3	RESISTOR MF	220 OHM 5% 0.33W	PHILIPS	2322 180 73221	02.456
R185-3	RESISTOR MF	150 OHM 5% 0.33W	PHILIPS	2322 180 73151	02.452
R186-3	RESISTOR MF	150 OHM 5% 0.33W	PHILIPS	2322 180 73151	02.452
R187-3	RESISTOR MF	10 OHM 5% 0.33W	PHILIPS	2322 180 73109	02.424
R188-3	RESISTOR MF	10 OHM 5% 0.33W	PHILIPS	2322 180 73109	02.424
RE1-3	RELAY	15V DC 2A 1SH.	SIEMENS	V23040-A0003-B201	21.062
RE2-3	RELAY	15V DC 2A 1SH.	SIEMENS	V23040-A0003-B201	21.062
TR1-3	TRANSFORMER	TL493	S.P.RADIO	6-0-25812	400493
TR2-3	TRANSFORMER	TL493	S.P.RADIO	6-0-25812	400493
TR3-3	TRANSFORMER RF	70nH ADJUSTABLE	TOKO	E526HN-110440	38.408
TR4-3	TRANSFORMER RF	70nH ADJUSTABLE	TOKO	E526HN-110440	38.408
TR5-3	TRANSFORMER RF	110nH ADJUSTABLE	TOKO	E526-110436	38.407
TR6-3	TRANSFORMER RF	110nH ADJUSTABLE	TOKO	E526-110436	38.407
TR7-3	TRANSFORMER RF	70nH ADJUSTABLE	TOKO	E526HN-110440	38.408
TR8-3	TRANSFORMER RF	110nH ADJUSTABLE	TOKO	E526-110436	38.407
U1-3	8 BIT SHIFT REG.SERIAL IO	74HC595	NATIONAL	MM74HC595N	34.502
U2-3	HEX D-FLIP-FLOP w.CLEAR	74HC174	TEXAS	SN74HC174N	34.504
U3-3	8 BIT SHIFT REG.SERIAL IO	74HC595	NATIONAL	MM74HC595N	34.502

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
U4-3	4-BIT BIN. FULL ADDERS	WITH FAST CARRY 74HC283	TEXAS	SN74HC283N	34.540
U5-3	NEG. VOLTAGE REG. FIXED	-15V 5% 0.1A 79L15AC	MOTOROLA	MC79L15ACP	31.143
U6-3	VOLTAGE REGULATOR	15V 5% 0.1A 78L15AC	MOTOROLA	MC78L15ACP	31.140
U7-3	4-BIT BIN. FULL ADDERS	WITH FAST CARRY 74HC283	TEXAS	SN74HC283N	34.540
U8-3	HEX D-FLIP-FLOP w.CLEAR	74HC174	TEXAS	SN74HC174N	34.504
U9-3	8 BIT SHIFT REG.SERIAL IO	74HC595	NATIONAL	MM74HC595N	34.502
U10-3	VOLTAGE REGULATOR	12V 5% 0.1A 78L12AC	MOTOROLA	MC78L12ACP	31.139
U11-3	VOLTAGE REGULATOR	15V 5% 0.1A 78L15AC	MOTOROLA	MC78L15ACP	31.140
U12-3	4-BIT BIN. FULL ADDERS	WITH FAST CARRY 74HC283	TEXAS	SN74HC283N	34.540
U13-3	DUAL D-FF POS TRIG.	74HC74	TEXAS	SN74HC74N	34.501
U14-3	12-BIT D/A CONVERTER		NATIONAL	DAC1220LCN	32.810
U15-3	8-BIT BIN.COUNT.3-ST OUT	74HC590	TEXAS	SN74HC590N	34.530
U16-3	OPERATIONAL AMPLIFIER	JFET INPUT LF356	NATIONAL	LF356N	31.076
U17-3	HEX INVERTERS	74HC04	TEXAS	SN74HC04N	34.520
U18-3	OPERATIONAL AMPLIFIER	JFET INPUT LF356	NATIONAL	LF356N	31.076
U19-3	OPERATIONAL AMPLIFIER	JFET INPUT LF356	NATIONAL	LF356N	31.076
U20-3	TRANSISTOR ARRAY	3046	NATIONAL	LM3046N	31.025
U21-3	OPERATIONAL AMPLIFIER	JFET INPUT LF356	NATIONAL	LF356N	31.076
U22-3	32/33 MODULUS PRESCALER		PLESSEY	SP8795BDP	32.851
U23-3	QUAD 2-INP.POS.AND GATE	74HC08	TEXAS	SN74HC08N	34.517
U24-3	SERIAL INPUT PLL SYNTHES.	MC145158P2	MOTOROLA	MC145158P2	33.492
U25-3	QUAD EXCL.NOR GATE	74HC266	TEXAS	SN74HC7266N	34.500
U26-3	DUAL D-FF POS TRIG.	74HC74	TEXAS	SN74HC74N	34.501
U27-3	QUAD 2-INPUT NAND GATE	74HC00	TEXAS	SN74HC00N	34.515
U28-3	DUAL D-FF POS TRIG.	74HC74	TEXAS	SN74HC74N	34.501
U29-3	QUAD 2-INPUT NAND GATE	74HC00	TEXAS	SN74HC00N	34.515
U30-3	SERIAL INPUT PLL SYNTHES.	MC145158P2	MOTOROLA	MC145158P2	33.492
U31-3	DUAL D-FF POS TRIG.	74HC74	TEXAS	SN74HC74N	34.501
U32-3	8-BIT BIN.COUNT.3-ST OUT	74HC590	TEXAS	SN74HC590N	34.530
U33-3	VOLTAGE REGULATOR	15V 5% 0.1A 78L15AC	MOTOROLA	MC78L15ACP	31.140
U34-3	OPERATIONAL AMPLIFIER	JFET INPUT LF356	NATIONAL	LF356N	31.076
U35-3	SERIAL INPUT PLL SYNTHES.	MC145158P2	MOTOROLA	MC145158P2	33.492
U36-3	32/33 MODULUS PRESCALER		PLESSEY	SP8795BDP	32.851

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	KEYBOARD MODULE 6	RE2100/C2140	ESPERA	5-0-25636E	625636
D1-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
D2-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
D3-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
D4-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
D5-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
D6-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
D7-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
D8-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
D9-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
D10-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
D11-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
D12-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
D13-6	DIODE LIGHT EMITTING	SUB MINIATURE YELLOW	H.P.	HLMP-7019	25.649
J1-6	SOCKET	2x7 POLES	AMP	1-215079-4	78.196
R1-6	RESISTOR MF	330 OHM 5% 0.33W	PHILIPS	2322 180 73331	02.460
R2-6	RESISTOR MF	680 OHM 5% 0.33W	PHILIPS	2322 180 73681	02.468
R3-6	RESISTOR MF	680 OHM 5% 0.33W	PHILIPS	2322 180 73681	02.468
R4-6	RESISTOR MF	330 OHM 5% 0.33W	PHILIPS	2322 180 73331	02.460
R5-6	RESISTOR MF	330 OHM 5% 0.33W	PHILIPS	2322 180 73331	02.460
S1-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S2-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S3-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S4-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S5-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S6-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S7-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S8-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S9-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S10-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S11-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S12-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S13-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S14-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S15-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S16-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S17-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S18-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S19-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S20-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S21-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S22-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
S23-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S24-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S25-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601
S26-6	SWITCH KEYBOARD	12x12mm	ALPS	SKHCAD (KHC 10904)	43.601

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	DISPLAY PRINT	RM2042 / RM2150 / RM2151	ESPERA	5-0-26944E	626944
C1	CAPACITOR CERAM. SMD 0805	10nF 10% X7R 50VDC	MURATA	GRM40 X7R 103 K 50 PT REEL a 4000 STK	328.336
C2	CAPACITOR CERAM. SMD 0805	10nF 10% X7R 50VDC	MURATA	GRM40 X7R 103 K 50 PT REEL a 4000 STK	328.336
C3	CAPACITOR CERAM. SMD 0805	10nF 10% X7R 50VDC	MURATA	GRM40 X7R 103 K 50 PT REEL a 4000 STK	328.336
C4	CAPACITOR CERAM. SMD 0805	10nF 10% X7R 50VDC	MURATA	GRM40 X7R 103 K 50 PT REEL a 4000 STK	328.336
C5	CAPACITOR CERAM. SMD 0805	10nF 10% X7R 50VDC	MURATA	GRM40 X7R 103 K 50 PT REEL a 4000 STK	328.336
C6	CAPACITOR CERAM. SMD 0805	220pF 5% NPO 50VDC	MURATA	GRM40 COG 221 J 50 PT REEL a 4000 STK	323.090
D1	DIODE	BAS32L	PHILIPS	BAS32L	340.032
D2	DISPLAY LCD RM215x	2x24 CHARACTERS	SANYO	LCM 5023-31HE3	25.710
J1	SOCKET STRIP	7 POLES	ADV. INTERCONNEC	LNB-007-04-TG LSS-007-04-TG	78.835
J2	SOCKET STRIP	7 POLES	ADV. INTERCONNEC	LNB-007-04-TG LSS-007-04-TG	78.835
J3	SOCKET STRIP	3 POLES	ADV. INTERCONNEC	LNB-003-04-TG LSS-003-04-TG	78.831
J5	PLUG	1/10" SIL SQ.PINS 3 POLES	AMP	0-826629-3 (0-826647-3)	78.323
P1	Ø PIN STRIP	7 POLES	ADV. INTERCONNEC	KSA-007-80-G	78.376
P2	Ø PIN STRIP	7 POLES	ADV. INTERCONNEC	KSA-007-80-G	78.376
P3	Ø PIN STRIP	3 POLES	ADV. INTERCONNEC	KSA-003-80-G	78.372
P4	INTERCONNECTION CABLE	20 POLES L=87mm	ESPERA	3-0-26925A	526925
Q1	TRANSISTOR LF	BCP55-16 NPN SMD	SIEMENS	BCP55-16	345.355
R1	POTENTIOMETER	10k OHM 10% 0.1W LOG	NOBLE	V90-10155-D	08.257
R2	RESISTOR SMD 0805	100 OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 100R REEL a 5000 STK	302.036
R5	RESISTOR SMD 0805	100 OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 100R REEL a 5000 STK	302.036
R6	RESISTOR SMD 0805	36k5 OHM 1% 50mW	PHILIPS	2322 734 2/63653 REEL a 5000 STK	302.524
R7	RESISTOR SMD 0805	100 OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 100R REEL a 5000 STK	302.036
R8	RESISTOR SMD 0805	18k2 OHM 1% 50mW	PHILIPS	2322 734 2/61823 REEL a 5000 STK	302.495
R9	RESISTOR SMD 0805	9k09 OHM 1% 50mW	DRALORIC	CR 0805 K 9091 F G4 REEL a 5000 STK	302.462
R10	RESISTOR SMD 0805	4k53 OHM 1% 50mW	PHILIPS	2322 734 2/64532 REEL a 5000 STK	302.433

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R11	RESISTOR SMD 0805	1k5 OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 1k5 REEL a 5000 STK	302.050
R12	RESISTOR NTC	4K7 OHM 10% 0.25W	SIEMENS	B57621-C472-K62	306.810
R13	RESISTOR SMD 0805	2k2 OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 2k2 REEL a 5000 STK	302.052
R14	RESISTOR SMD 0805	2k2 OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 2k2 REEL a 5000 STK	302.052
R15	RESISTOR SMD 0805	47k OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 47k REEL a 5000 STK	302.068
R16	RESISTOR SMD 0805	47k OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 47k REEL a 5000 STK	302.068
R17	RESISTOR SMD 0805	4k53 OHM 1% 50mW	PHILIPS	2322 734 2/64532 REEL a 5000 STK	302.433
R18	RESISTOR SMD 0805	47k OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 47k REEL a 5000 STK	302.068
R19	RESISTOR SMD 0805	47k OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 47k REEL a 5000 STK	302.068
R20	RESISTOR SMD 0805	120k OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 120k REEL a 5000 STK	302.073
R21	RESISTOR SMD 0805	36k5 OHM 1% 50mW	PHILIPS	2322 734 2/63653 REEL a 5000 STK	302.524
R22	RESISTOR SMD 0805	1k2 OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 1k2 REEL a 5000 STK	302.049
R23	RESISTOR SMD 0805	18k2 OHM 1% 50mW	PHILIPS	2322 734 2/61823 REEL a 5000 STK	302.495
R24	RESISTOR SMD 0805	1k30 OHM 1% 50mW	DRALORIC	CR 0805 K 1301 F G4 REEL a 5000 STK	302.381
R25	RESISTOR SMD 0805	5R6 OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 5R6 REEL a 5000 STK	302.021
R26	RESISTOR SMD 0805	10k OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 10k REEL a 5000 STK	302.060
R27	RESISTOR SMD 0805	120k OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 120k REEL a 5000 STK	302.073
R28	RESISTOR SMD 0805	5R6 OHM 5% 0.1W	ROHM	MCR 10 JZ0 J 5R6 REEL a 5000 STK	302.021
U1	INTEGRATED CIRCUIT	74HC174D	TEXAS*	SN74HC174D	355.252
U2	QUAD OP.AMP.	LM324	TEXAS	LM324D	350.530
U4	INTEGRATED CIRCUIT	74HC14D	TEXAS*	SN74HC14D	355.213
U5	INTEGRATED CIRCUIT	74HC04D	TEXAS*	SN74HC04D	355.205
W1	SHUNT CONNECTOR	FEMALE 2 POLES	SAMTEC	SNT-100-BK-G	78.325

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
	POWER SUPPLY MODULE 8	RM2150/51		5-0-26308D	626308
C1-8	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C2-8	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C3-8	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C4-8	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C5-8	CAPACITOR MKT	220nF 20% 63VDC	ERO	MKT 1826-422/06 6-G	11.183
C6-8	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C7-8	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C8-8	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C9-8	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C10-8	CAPACITOR MKT	220nF 20% 63VDC	ERO	MKT 1826-422/06 6-G	11.183
C11-8	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C12-8	CAPACITOR MKT	220nF 20% 63VDC	ERO	MKT 1826-422/06 6-G	11.183
C13-8	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C14-8	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C15-8	CAPACITOR MKT	220nF 20% 63VDC	ERO	MKT 1826-422/06 6-G	11.183
C16-8	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C17-8	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C18-8	CAPACITOR MKT	220nF 20% 63VDC	ERO	MKT 1826-422/06 6-G	11.183
C19-8	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ERO	EKI 00 AA 210 F MOE	14.512
C20-8	CAPACITOR MKT	220nF 20% 63VDC	ERO	MKT 1826-422/06 6-G	11.183
C21-8	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
C22-8	CAPACITOR ELECTROLYTIC	1uF 20% 50VDC	ERO	EKI 00 AA 110 H MOE	14.506
C23-8	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
C24-8	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C25-8	CAPACITOR MKT	10nF 20% 100VDC	PHILIPS	2222 370 38103	11.168
C26-8	CAPACITOR MKT	10nF 20% 100VDC	PHILIPS	2222 370 38103	11.168
C27-8	CAPACITOR MKT	10nF 20% 100VDC	PHILIPS	2222 370 38103	11.168
C28-8	CAPACITOR ELECTROLYTIC	1uF 20% 50VDC	ERO	EKI 00 AA 110 H MOE	14.506
C29-8	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
D1-8	DIODE RECTIFIER	1N4002 100V/1A	THOMSON	1N4002 (03/04/05/06/07)	25.100
D2-8	DIODE RECTIFIER	1N4002 100V/1A	THOMSON	1N4002 (03/04/05/06/07)	25.100
D3-8	DIODE RECTIFIER	1N4002 100V/1A	THOMSON	1N4002 (03/04/05/06/07)	25.100
D4-8	DIODE RECTIFIER	1N4002 100V/1A	THOMSON	1N4002 (03/04/05/06/07)	25.100
D5-8	DIODE RECTIFIER	1N4002 100V/1A	THOMSON	1N4002 (03/04/05/06/07)	25.100
D6-8	DIODE RECTIFIER	1N4002 100V/1A	THOMSON	1N4002 (03/04/05/06/07)	25.100
D7-8	DIODE RECTIFIER	1N4002 100V/1A	THOMSON	1N4002 (03/04/05/06/07)	25.100
D8-8	DIODE ZENER	7.5V 5% 0.4W BZX79C7V5	PHILIPS	BZX79C7V5	26.539
L1-8	CHOKE FIXED	10uH 5%	NEOSID	00 6122 00 AMMO PACK	20.118
L2-8	CHOKE FIXED	10uH 5%	NEOSID	00 6122 00 AMMO PACK	20.118

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
L3-8	CHOKE FIXED	10uH 5%	NEOSID	00 6122 00 AMMO PACK	20.118
L4-8	CHOKE FIXED	10uH 5%	NEOSID	00 6122 00 AMMO PACK	20.118
L5-8	CHOKE FIXED	10uH 5%	NEOSID	00 6122 00 AMMO PACK	20.118
L6-8	CHOKE FIXED	10uH 5%	NEOSID	00 6122 00 AMMO PACK	20.118
L7-8	CHOKE FIXED	10uH 5%	NEOSID	00 6122 00 AMMO PACK	20.118
L8-8	CHOKE FIXED	10uH 5%	NEOSID	00 6122 00 AMMO PACK	20.118
L9-8	CHOKE FIXED	10uH 5%	NEOSID	00 6122 00 AMMO PACK	20.118
P1-8	PLUG	2x7 POLES	3M	3598-6002 / 7614-6002 JL	78.254
P2-8	PLUG	2x7 POLES	3M	3598-6002 / 7614-6002 JL	78.254
R1-8	RESISTOR MF	2k2 OHM 5% 0.33W	PHILIPS	2322 180 73222	02.480
R2-8	RESISTOR MF	200 OHM 5% 0.33W	PHILIPS	2322 180 73201	02.455
R3-8	RESISTOR MF	620 OHM 5% 0.33W	PHILIPS	2322 180 73621	02.467
R4-8	RESISTOR MF	200 OHM 5% 0.33W	PHILIPS	2322 180 73201	02.455
R5-8	RESISTOR MF	680 OHM 5% 0.33W	PHILIPS	2322 180 73681	02.468
R6-8	RESISTOR MF	200 OHM 5% 0.33W	PHILIPS	2322 180 73201	02.455
R7-8	RESISTOR MF	18k2 OHM 1% 0.25W	PHILIPS	2322 157 11823	02.233
R8-8	RESISTOR MF	22k1 OHM 1% 0.25W	PHILIPS	2322 157 12213	02.234
R9-8	RESISTOR MF	750 OHM 1% 0.25W	PHILIPS	2322 157 17501	02.240
R10-8	RESISTOR MF	226 OHM 1% 0.25W	PHILIPS	2322 157 12261	02.213
R11-8	RESISTOR PMF	8R2 OHM 5% 2W	PHILIPS	2322 194 13828	04.130
R12-8	RESISTOR MF	2R7 OHM 5% 0.33W	PHILIPS	2322 180 73278	02.410
R13-8	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R14-8	RESISTOR MF	220k OHM 5% 0.33W	PHILIPS	2322 180 73224	02.528
R15-8	RESISTOR MF	15k OHM 5% 0.33W	PHILIPS	2322 180 73153	02.500
R16-8	RESISTOR MF	330 OHM 5% 0.33W	PHILIPS	2322 180 73331	02.460
R17-8	RESISTOR MF	1k5 OHM 5% 0.33W	PHILIPS	2322 180 73152	02.476
U1-8	POS. VOLTAGE REG. FIXED	15V/1A MC7815/LM340T	MOTOROLA	MC7815CT	31.090
U2-8	NEG. VOLTAGE REG. ADJUST.	Io=1.5A LM337T	MOTOROLA	LM337T	31.070
U3-8	POS. VOLTAGE REG. ADJUST.	Io=1.5A LM317T	MOTOROLA	LM317T	31.055
U4-8	POS. VOLTAGE REG. ADJUST.	Io=1.5A LM317T	MOTOROLA	LM317T	31.055
U5-8	POS. VOLTAGE REG. FIXED	15V/1A MC7815/LM340T	MOTOROLA	MC7815CT	31.090
U6-8	NEG. VOLTAGE REG. FIXED	-15V 5% 0.1A 79L15AC	MOTOROLA	MC79L15ACP	31.143
U7-8	POS. VOLTAGE REG. ADJUST.	Io=1.5A LM317T	MOTOROLA	LM317T	31.055
U8-8	AF POWER AMPLIFIER	TDA1013A	PHILIPS	TDA1013A	31.455

PARTS LIST

REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
	60-101337		3820 Main Proc. Board		
			Diagram 93-101337		
			Comp. Drawing 37-101337-004		
01	37-101337-004	1	PCB, 3820 Main Proc. Board	56	TT 37-101337-004
BT1	20-200237-030	1	Battery, Lithium 3V 160mAh	M049	CR-1/3N-PSP
C1	Not Used	0		56	
C2	22-200058-339	1	Cap. SMD, Cer 33pF/50V 5%	M004	0805 5A 330 JA3 TR
C3	22-200058-229	1	Cap. SMD, Cer 22pF/50V 5%	M004	0805 5A 220 JA3 TR
C4	22-200058-279	1	Cap. SMD, Cer 27pF/50V 5%	M000	2222 861 15279
C5	22-200254-209	1	Capacitor, Var 20pF/100V Red	M006	TZ 03 R 200 E
C6	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
C7	22-200058-471	3	Cap. SMD, Cer 470pF/50V 5%	M004	0805 5A 471 JA3 TR
C8	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
C9	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
C10	22-200058-102	8	Cap. SMD, Cer 1nF/50V 5%	M004	0805 5A 102 JA3 TR
C11	22-200246-472	1	Cap. SMD, Cer 4n7F/50V 10%	M004	0805 5C 472 KA3 TR
C12	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
C13	22-200246-103	4	Cap. SMD, Cer 10nF/50V 10%	M004	0805 5C 103 KA3 TR
C14	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
C15	22-200246-103		Cap. SMD, Cer 10nF/50V 10%	M004	0805 5C 103 KA3 TR
C16	22-200058-102		Cap. SMD, Cer 1nF/50V 5%	M004	0805 5A 102 JA3 TR
C17	22-200246-103		Cap. SMD, Cer 10nF/50V 10%	M004	0805 5C 103 KA3 TR
C18	22-200058-189	1	Cap. SMD, Cer 18pF/50V 5%	M000	2222 861 15189
C19	22-200091-109	1	Capacitor, Var 10pF/300V	M000	2222 809 05216
C20	22-200058-399	2	Cap. SMD, Cer 39pF/50V 5%	M000	2222 861 15399
C21	22-200058-399		Cap. SMD, Cer 39pF/50V 5%	M000	2222 861 15399
C22	22-200246-103		Cap. SMD, Cer 10nF/50V 10%	M004	0805 5C 103 KA3 TR
C23	22-200043-101	5	Capacitor, Elct 100uF/25V	M003	CE SEM 1E 101 6.3x11
C24	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
C25	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
C26	22-200043-479	1	Capacitor, Elct 47uF/25V	M003	CE SEM 1E 470 5x11
C27	22-200043-101		Capacitor, Elct 100uF/25V	M003	CE SEM 1E 101 6.3x11
C28	22-200246-222	16	Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C29	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C30	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C31	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C32	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C33	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C34	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C35	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C36	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C37	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C38	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C39	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C40	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C41	22-200058-102		Cap. SMD, Cer 1nF/50V 5%	M004	0805 5A 102 JA3 TR
C42	22-200058-102		Cap. SMD, Cer 1nF/50V 5%	M004	0805 5A 102 JA3 TR
C43	22-200058-102		Cap. SMD, Cer 1nF/50V 5%	M004	0805 5A 102 JA3 TR

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PARTS LIST

REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
C44	22-200058-102		Cap. SMD, Cer 1nF/50V 5%	M004	0805 5A 102 JA3 TR
C45	22-200058-102		Cap. SMD, Cer 1nF/50V 5%	M004	0805 5A 102 JA3 TR
C46	22-200058-471		Cap. SMD, Cer 470pF/50V 5%	M004	0805 5A 471 JA3 TR
C47	22-200058-471		Cap. SMD, Cer 470pF/50V 5%	M004	0805 5A 471 JA3 TR
C48	22-200043-101		Capacitor, Elct 100uF/25V	M003	CE SEM 1E 101 6.3x11
C49	22-200043-101		Capacitor, Elct 100uF/25V	M003	CE SEM 1E 101 6.3x11
C50	22-200043-101		Capacitor, Elct 100uF/25V	M003	CE SEM 1E 101 6.3x11
C51	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C52	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
C53	22-200058-102		Cap. SMD, Cer 1nF/50V 5%	M004	0805 5A 102 JA3 TR
C54	22-200246-222		Cap. SMD, Cer 2n2F/50V 10%	M004	0805 5C 222 KA3 TR
CR1	23-200197-016	3	Diode SMD, BAS16	M000	BAS16-215 A6
CR2	23-200028-148	7	Diode, 1N4148	M030	1N4148
CR3	23-200028-148		Diode, 1N4148	M030	1N4148
CR4	23-200028-148		Diode, 1N4148	M030	1N4148
CR5	23-200028-148		Diode, 1N4148	M030	1N4148
CR6	23-200028-148		Diode, 1N4148	M030	1N4148
CR7	23-200028-148		Diode, 1N4148	M030	1N4148
CR8	23-200028-148		Diode, 1N4148	M030	1N4148
CR9	23-200197-016		Diode SMD, BAS16	M000	BAS16-215 A6
CR10	23-200197-016		Diode SMD, BAS16	M000	BAS16-215 A6
CX1	22-200249-104	55	Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX2	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX3	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX4	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX5	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX6	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX7	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX8	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX9	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX10	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX11	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX12	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX13	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX14	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX15	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX16	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX17	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX18	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX19	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX20	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX21	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX22	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX23	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX24	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX25	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX26	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX27	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX28	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX29	Not Used			56	
CX30	Not Used			56	

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PARTS LIST

REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
CX31	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX33	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX35	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX36	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX37	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX38	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX39	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX42	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX43	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX44	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX45	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX46	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX47	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX48	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX49	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX50	Not Used			56	
CX51	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX32A	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX32B	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX34A	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
CX34B	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136	CM21 Y5V 104 Z50 AT
DS1	23-200025-002	4	Diode, Led Red 3mm	M013	SLH34-VR3
DS2	23-200025-002		Diode, Led Red 3mm	M013	SLH34-VR3
DS3	23-200025-002		Diode, Led Red 3mm	M013	SLH34-VR3
DS4	23-200025-002		Diode, Led Red 3mm	M013	SLH34-VR3
H1	31-200152-000	3	Jumper, 2 Pole	M008	90059-0009
H2	31-200152-000		Jumper, 2 Pole	M008	90059-0009
H3	31-200152-000		Jumper, 2 Pole	M008	90059-0009
H4	41-200791-001	1	Frame, 3820A Shield	18	227556
H5	41-200792-001	1	Frame, 3820A Shield	18	226306
H6	41-200793-001	1	Frame, 3820A Shield	18	226305
H7	41-200794-001	1	Cover, 3820A Shield	18	227555
H8	41-200795-001	1	Cover, 3820A Shield	18	226304
H9	20-200551-000	1	Insulator, Crystal HC-18+Gnd	M020	NKS-4738
J1	31-200472-004	3	Connector, BNC Rig.Angle Male	M095	51K-201-400A4
J2	31-200136-009	1	Connector, 9-Pole D Female	M008	87135-3051
J3	31-200472-004		Connector, BNC Rig.Angle Male	M095	51K-201-400A4
J4	31-200472-004		Connector, BNC Rig.Angle Male	M095	51K-201-400A4
J5	31-200633-014	1	Connector, 14 Pol Female	M034	1-215079-4
J6	31-200136-025	1	Connector, 25-Pole D Female	M008	87135-3351
J7	31-200632-014	1	Connector, 14 Pol Male	M055	3598-6002
J8	31-200630-020	2	Connector, 20 Pol Female	M034	2-215079-0
J9	31-200630-020		Connector, 20 Pol Female	M034	2-215079-0
L1	Not Used			56	
L2	25-200108-339	2	Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L3	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L4	25-200108-689	2	Coil, 68uH/150mA 10%	M118	MICC-680K-02
L5	25-200108-689		Coil, 68uH/150mA 10%	M118	MICC-680K-02
Q1	26-200034-560	1	Transistor, PNP BC560B	M000	BC560B
Q2	26-200090-860	2	Transistor SMD, PNP BC860B	M000	BC860B-215 4F

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REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
Q3	26-200033-547	1	Transistor, NPN BC547B	M000	BC547B
Q4	26-200090-860		Transistor SMD, PNP BC860B	M000	BC860B-215 4F
R1	21-200210-103	15	Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R2	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R3	21-200210-102	3	Resistor SMD, Cer 1K 5%	M013	MCR10 1K
R4	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R5	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R6	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R7	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R8	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R9	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R10	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R11	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R12	21-200210-222	2	Resistor SMD, Cer 2K2 5%	M013	MCR10 2K2
R13	21-200210-339	2	Resistor SMD, Cer 33R 5%	M013	MCR10 33R
R14	21-200210-339		Resistor SMD, Cer 33R 5%	M013	MCR10 33R
R15	21-200210-102		Resistor SMD, Cer 1K 5%	M013	MCR10 1K
R16	21-200210-331	2	Resistor SMD, Cer 330R 5%	M013	MCR10 330R
R17	21-200210-683	1	Resistor SMD, Cer 68K 5%	M013	MCR10 68K
R18	21-200210-101	12	Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R19	21-200210-271	5	Resistor SMD, Cer 270R 5%	M013	MCR10 270R
R20	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R21	21-200210-273	1	Resistor SMD, Cer 27K 5%	M013	MCR10 27K
R22	21-200210-331		Resistor SMD, Cer 330R 5%	M013	MCR10 330R
R23	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R24	21-200210-333	11	Resistor SMD, Cer 33K 5%	M013	MCR10 33K
R25	21-200210-104	3	Resistor SMD, Cer 100K 5%	M013	MCR10 100K
R26	21-200210-101		Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R27	21-200210-271		Resistor SMD, Cer 270R 5%	M013	MCR10 270R
R28	21-200210-333		Resistor SMD, Cer 33K 5%	M013	MCR10 33K
R29	21-200210-101		Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R30	21-200210-271		Resistor SMD, Cer 270R 5%	M013	MCR10 270R
R31	21-200210-333		Resistor SMD, Cer 33K 5%	M013	MCR10 33K
R32	21-200210-104		Resistor SMD, Cer 100K 5%	M013	MCR10 100K
R33	21-200210-101		Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R34	21-200210-271		Resistor SMD, Cer 270R 5%	M013	MCR10 270R
R35	21-200210-101		Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R36	21-200210-271		Resistor SMD, Cer 270R 5%	M013	MCR10 270R
R37	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R38	21-200210-104		Resistor SMD, Cer 100K 5%	M013	MCR10 100K
R39	21-200210-333		Resistor SMD, Cer 33K 5%	M013	MCR10 33K
R40	21-200210-242	1	Resistor SMD, Cer 2K4 5%	M013	MCR10 2K4
R41	21-200210-152	1	Resistor SMD, Cer 1K5 5%	M013	MCR10 1K5
R42	21-200210-109	2	Resistor SMD, Cer 10R 5%	M013	MCR10 10R
R43	21-200210-471	4	Resistor SMD, Cer 470R 5%	M013	MCR10 470R
R44	21-200210-471		Resistor SMD, Cer 470R 5%	M013	MCR10 470R
R45	21-200210-333		Resistor SMD, Cer 33K 5%	M013	MCR10 33K
R46	21-200210-333		Resistor SMD, Cer 33K 5%	M013	MCR10 33K
R47	21-200210-202	2	Resistor SMD, Cer 2K0 5%	M013	MCR10 2K0
R48	21-200210-105	2	Resistor SMD, Cer 1M 5%	M013	MCR10 1M
R49	21-200210-682	1	Resistor SMD, Cer 6K8 5%	M013	MCR10 6K8
R50	21-200210-472	8	Resistor SMD, Cer 4K7 5%	M013	MCR10 4K7

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REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
R51	21-200210-519	1	Resistor SMD, Cer 51R 5%	M013	MCR10 51R
R52	21-200210-202		Resistor SMD, Cer 2K0 5%	M013	MCR10 2K0
R53	21-200210-511	1	Resistor SMD, Cer 510R 5%	M013	MCR10 510R
R54	21-200210-109		Resistor SMD, Cer 10R 5%	M013	MCR10 10R
R55	21-200210-222		Resistor SMD, Cer 2K2 5%	M013	MCR10 2K2
R56	21-200210-472		Resistor SMD, Cer 4K7 5%	M013	MCR10 4K7
R57	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R58	21-200010-181	1	Resistor, Film 180R/0.4W 5%	M000	2322 181 53181
R59	21-200210-472		Resistor SMD, Cer 4K7 5%	M013	MCR10 4K7
R60	21-200210-472		Resistor SMD, Cer 4K7 5%	M013	MCR10 4K7
R61	21-200210-472		Resistor SMD, Cer 4K7 5%	M013	MCR10 4K7
R62	21-200210-472		Resistor SMD, Cer 4K7 5%	M013	MCR10 4K7
R63	21-200210-472		Resistor SMD, Cer 4K7 5%	M013	MCR10 4K7
R64	21-200210-472		Resistor SMD, Cer 4K7 5%	M013	MCR10 4K7
R65	21-200210-471		Resistor SMD, Cer 470R 5%	M013	MCR10 470R
R66	21-200210-101		Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R67	21-200210-101		Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R68	21-200210-101		Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R69	21-200210-101		Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R70	21-200210-101		Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R71	21-200210-101		Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R72	21-200210-101		Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R73	21-200210-471		Resistor SMD, Cer 470R 5%	M013	MCR10 470R
R74	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R75	21-200210-102		Resistor SMD, Cer 1K 5%	M013	MCR10 1K
R76	21-200210-333		Resistor SMD, Cer 33K 5%	M013	MCR10 33K
R77	21-200210-333		Resistor SMD, Cer 33K 5%	M013	MCR10 33K
R78	21-200210-333		Resistor SMD, Cer 33K 5%	M013	MCR10 33K
R79	21-200210-333		Resistor SMD, Cer 33K 5%	M013	MCR10 33K
R80	21-200210-333		Resistor SMD, Cer 33K 5%	M013	MCR10 33K
R81	21-200210-105		Resistor SMD, Cer 1M 5%	M013	MCR10 1M
RS1	21-200024-102	1	Resistor, Sil 8x1K 1/8W 2%	M010	EXBF9E102G
RS2	21-200220-339	2	Resistor, Sil 5x33R 1/8W 2%	M010	EXBF10V330G
RS3	21-200220-339		Resistor, Sil 5x33R 1/8W 2%	M010	EXBF10V330G
RS4	21-200024-103	2	Resistor, Sil 8x10K 1/8W 2%	M010	EXBF9E103G
RS5	21-200294-103	1	Resistor, Sil 5x10K 1/8W 5%	M010	EXBF6E103G
RS6	21-200024-103		Resistor, Sil 8x10K 1/8W 2%	M010	EXBF9E103G
RV1	21-200126-714	1	Varistor, SIOV 14V ϕ=9mm	M010	ERZ-C07DK220
S1	33-200151-006	1	Switch, DIP 6 Pole, DIL-12	M037	AUTO-DIP ADE 06
S2	33-200151-004	1	Switch, DIP 4 Pole, DIL-8	M037	AUTO-DIP ADE 04
TP0	31-200103-000	2	Terminal, Test Point ϕ=1.3mm	71	1358
TP1	Not Used			56	
TP2	Not Used			56	
TP3	Not Used			56	
TP4	Not Used			56	
TP5	Not Used			56	
TP6	Not Used			56	
TP7	Not Used			56	
TP8	Not Used			56	

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PARTS LIST

REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
TP9	Not Used			56	
TP10	Not Used			56	
TP11	Not Used			56	
TP12	Not Used			56	
TP13	31-200103-000		Terminal, Test Point ϕ=1.3mm	71	1358
TP14	Not Used			56	
TP15	Not Used			56	
U1	24-200084-074	3	IC TTL SMD, 74HCT74	M000	PC74HCT74T
U2	24-200084-125	1	IC TTL SMD, 74HCT125	M000	PC74HCT125T
U3	24-200263-691	1	IC Watchdog, 691 +/-10%	M120	MP691P
U4	24-200084-573	2	IC TTL SMD, 74HCT573	M000	PC74HCT573T
U5	24-200084-138	1	IC TTL SMD, 74HCT138	M000	PC74HCT138T
U6	24-200629-188	1	IC CPU, 80C188 10MHz PLCC	M070	N80C188
U7	24-200084-032	5	IC TTL SMD, 74HCT32	M000	PC74HCT32T
U8	24-200084-573		IC TTL SMD, 74HCT573	M000	PC74HCT573T
U9	24-200084-014	1	IC TTL SMD, 74HCT14	M000	PC74HCT14T
U10	24-200270-100	3	IC EPROM, 27C1001 200nS	M031	M27C1001-20F1
U11	24-200270-100		IC EPROM, 27C1001 200nS	M031	M27C1001-20F1
U12	24-200270-100		IC EPROM, 27C1001 200nS	M031	M27C1001-20F1
U13	24-200102-256	1	IC Memory, 28256 250nS	M059	X28C256P-25
U14	24-200084-008	1	IC TTL SMD, 74HCT08	M000	PC74HCT08T
U15	24-200084-257	3	IC TTL SMD, 74HCT257	M000	PC74HCT257T
U16	24-200084-032		IC TTL SMD, 74HCT32	M000	PC74HCT32T
U17	24-200084-074		IC TTL SMD, 74HCT74	M000	PC74HCT74T
U18	24-200084-257		IC TTL SMD, 74HCT257	M000	PC74HCT257T
U19	24-200271-256	4	IC DRAM, 514256 120nS	M033	HM514256P-80nS
U20	24-200271-256		IC DRAM, 514256 120nS	M033	HM514256P-80nS
U21	24-200271-256		IC DRAM, 514256 120nS	M033	HM514256P-80nS
U22	24-200271-256		IC DRAM, 514256 120nS	M033	HM514256P-80nS
U23	24-200084-257		IC TTL SMD, 74HCT257	M000	PC74HCT257T
U24	24-200031-014	2	IC TTL, 74HCT14	M000	PC74HCT14P
U25	24-200084-032		IC TTL SMD, 74HCT32	M000	PC74HCT32T
U26	24-200245-256	2	IC SRAM SMD, 62256 120nS	M033	HM62256LFP-12
U27	24-200245-256		IC SRAM SMD, 62256 120nS	M033	HM62256LFP-12
U28	24-200244-000	1	IC TTL SMD, 74HC00	M009	SN 74HC00 D
U29	24-200244-027	1	IC TTL SMD, 74HC27	M000	PC 74HC27 T
U30	24-200223-573	1	IC Clocks, PCF 8573	M000	PCF 8573 P
U31	24-200243-251	1	IC PER SMD, 82C51	M051	MSM82C51A-2GS
U32	24-200077-074	2	IC Analog, TL074	M009	TL074CN
U33	24-200031-014		IC TTL, 74HCT14	M000	PC74HCT14P
U34	24-200077-074		IC Analog, TL074	M009	TL074CN
U35	24-200084-093	1	IC TTL SMD, 74HCT93	M000	PC74HCT93T
U36	24-200243-253	1	IC PER SMD, 82C53 5MHz	M051	MSM82C53-5GS
U37	24-200410-530	1	IC PER, Z85C30	M082	Z85C30 08 PSC
U38	24-200084-004	1	IC TTL SMD, 74HCT04	M000	PC74HCT04T
U39	24-200084-074		IC TTL SMD, 74HCT74	M000	PC74HCT74T
U40	24-200132-905	1	IC Analog, 79L05	M030	LM320LZ-5
U42	24-200243-255	1	IC PER SMD, 82C55	M051	MSM82C55A-5GS
U43	24-200084-011	1	IC TTL SMD, 74HCT11	M000	PC74HCT11T
U44	24-200031-365	1	IC TTL, 74HCT365	M000	PC74HCT365P
U45	24-200031-377	1	IC TTL, 74HCT377	M000	PC74HCT377P

PARTS LIST

REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
U46	24-200031-259	1	IC TTL, 74HCT259	M000	PC74HCT259P
U47	24-200084-259	1	IC TTL SMD, 74HCT259	M000	PC74HCT259T
U48	24-200084-032		IC TTL SMD, 74HCT32	M000	PC74HCT32T
U49	24-200084-032		IC TTL SMD, 74HCT32	M000	PC74HCT32T
U50	24-200127-173	1	IC Opto, CNY17-3	M029	CNY17-III
U51	24-200084-245	1	IC TTL SMD, 74HCT245	M000	PC74HCT245T
VR12	23-200085-120	1	Diode Zener, BZX79-C12V	M000	BZX79-C12V
W1	31-200140-001	11	Pin Header, 1-Pole Male Single	M008	90120-0800(Only 1 Pin)
W2	31-200140-001		Pin Header, 1-Pole Male Single	M008	90120-0800(Only 1 Pin)
W3	31-200140-001		Pin Header, 1-Pole Male Single	M008	90120-0800(Only 1 Pin)
W4	31-200140-001		Pin Header, 1-Pole Male Single	M008	90120-0800(Only 1 Pin)
W5	31-200140-001		Pin Header, 1-Pole Male Single	M008	90120-0800(Only 1 Pin)
XU6	31-200282-068	1	Socket, IC 68 pole PLCC	M170	PLCCB-068-PS-T
XU10	31-200115-032	3	Socket, IC 32 pole	M025	DILB 32P108IT
XU11	31-200115-032		Socket, IC 32 pole	M025	DILB 32P108IT
XU12	31-200115-032		Socket, IC 32 pole	M025	DILB 32P108IT
XU13	31-200115-028	1	Socket, IC 28 pole	M025	DILB 28P108T
XU19	31-200115-020	5	Socket, IC 20 pole	M025	DILB 20P108T
XU20	31-200115-020		Socket, IC 20 pole	M025	DILB 20P108T
XU21	31-200115-020		Socket, IC 20 pole	M025	DILB 20P108T
XU22	31-200115-020		Socket, IC 20 pole	M025	DILB 20P108T
XU24	31-200115-014	4	Socket, IC 14 pole	M025	DILB 14P108T
XU32	31-200115-014		Socket, IC 14 pole	M025	DILB 14P108T
XU33	31-200115-014		Socket, IC 14 pole	M025	DILB 14P108T
XU34	31-200115-014		Socket, IC 14 pole	M025	DILB 14P108T
XU37	31-200115-040	1	Socket, IC 40 pole	M025	DILB 40P108T
XU44	31-200115-016	2	Socket, IC 16 pole	M025	DILB 16P108T
XU45	31-200115-020		Socket, IC 20 pole	M025	DILB 20P108T
XU46	31-200115-016		Socket, IC 16 pole	M025	DILB 16P108T
XU50	31-200116-006	1	Socket, IC 6 pole	M121	KM376-6
Y1	20-200752-201	1	Crystal, 20.1 MHz 50ppm (AT-51)	68	HC49US 20.1MHz 16pF P
Y2	20-200224-327	1	Crystal, Watch 32.768 K Hz.	M020	MU-206 32.768 K Hz.
Y3	20-200107-049	1	Crystal, 4.9152 MHz Parallel	M020	NR-18 4.9152MHz 16pF P
Ø1	84-101337-000	1	3820 Main Proc.,PCB Assembling	56	60-101337 Assembling
Ø1	84-101337-100	1	3820 Main Proc.,Extra Hardware	56	60-101337, Hardwares

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PARTS LIST

MFR CODE	NAME ZIPCODE, CITY	ADDRESS COUNTRY
31564111	Thrane & Thrane A/S 2860 Søborg	Tobaksvejen 23A Denmark
43714471	Promax A/S 2630 Tåstrup	Klovtoftegade 46
44683111	Dankrystal A/S 2765 Smørum	Skebjergvej 4, Søager Denmark
98180999	S.P. Radio A/S 9200 Ålborg SV	Porsvej 2
M000	Philips P.O. Box 218	P.O. Box 218 Netherlands
M003	Maroon Electronics Co. LTD. Tokyo	Tokyo Japan
M004	AVX Hants GU124LT Aldershot	Hants GU124LT Aldershot United Kingdom
M006	Murata	
M008	Molex GU 11 3 ST Aldershot	GU 11 3 ST Aldershot United Kingdom
M009	Texas Instruments MS 54 Dallas TX 75265	MS 54 Dallas TX 75265 U.S.A.
M010	Panasonic 8000 Århus C	Sandstrase 3 Germany
M013	R-OHM Electronics GmbH Muhlenstrase 70	Muhlenstrase 70 Germany
M020	NDK 151 Tokyo	151 Tokyo Japan
M025	Burndy Electra N.V. B 2800 Mechelen	B 2800 Mechelen Belgique
M029	Toshiba 105 Tokyo	105 Tokyo Japan
M030	National Semiconductor Troy NY 12181-1440	Troy NY 12181-1440 U.S.A.
M031	SGS 2000 Frederiksberg	Via C Olivetti 2 Italy
M033	Hitachi	
M034	AMP Deutschland GmbH 6070 Christiansfeld	AMPeresstrasse 7-11 Germany
M037	Alcoswitch North Andover MA 01845	North Andover MA 01845 U.S.A.

PARTS LIST

MFR CODE	NAME ZIPCODE, CITY	ADDRESS COUNTRY
M049	Varta Batterie AG D-3000 Hannover 21	D-3000 Hannover 21 West Germany
M051	Oki	
M055	3M	
M059	XICOR Inc. CA 95035, Milpitas	CA 95035, Milpitas U.S.A.
M070	Advanced Micro Devices Inc. Sunnyvale, Clifornia 94088	Sunnyvale, Clifornia 94088 U.S.A.
M082	Zilog	
M095	ROSENBERGER	
M118	Fastron Haydnstrasse 11	Haydnstrasse 11 West Germany
M120	Supertex Inc.	U.S.A.
M121	Seifert Electronic GmbH D-5828 Ennepetal 1	D-5828 Ennepetal 1 W. Germany
M136	Kyocera	Japan
M170	Robinson Nugent	

PARTS LIST

REF.D.	PART NO.	QTY	DESCRIPTION	MFRC MFR PART NO.
	60-101338		3820 Filter Board	
			Diagram 93-101338	
			Comp. Drawing 37-101338-003	
01	37-101338-003	1	PCB, 3820 Filter Board	56 TT 37-101338-003
C1	22-200249-104	32	Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
C2	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
C3	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
C4	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
C5	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
C6	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
C7	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
C8	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
C9	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
C10	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
C11	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
C12	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
C13	22-200053-474	3	Cap. SMD, Cer 470nF/50V 10%	M004 1812 5C 474 KAA TR
C14	22-200054-472	16	Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C16	22-200058-102	4	Cap. SMD, Cer 1nF/50V 5%	M004 0805 5A 102 JA3 TR
C17	22-200250-473	8	Cap. SMD, Cer 47nF/50V 5%	M004 1206 5C 473 JA3 TR
C18	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C19	22-200250-473		Cap. SMD, Cer 47nF/50V 5%	M004 1206 5C 473 JA3 TR
C20	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C21	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C22	22-200069-339	2	Cap. SMD, Cer 33pF/50V 2%	M004 0805 5A 330 GA3 TR
C23	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C24	22-200069-339		Cap. SMD, Cer 33pF/50V 2%	M004 0805 5A 330 GA3 TR
C25	22-200258-688	4	Cap. SMD, Tantal 6u8F/20V 20%	M117 293D 685 X0020 C 2T
C26	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C27	22-200053-474		Cap. SMD, Cer 470nF/50V 10%	M004 1812 5C 474 KAA TR
C28	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C29	22-200258-688		Cap. SMD, Tantal 6u8F/20V 20%	M117 293D 685 X0020 C 2T
C30	22-200045-109	2	Capacitor, Elct LL 10uF/25V	M003 CE 04W 1E 100MD 6.3x11
C31	22-200045-109		Capacitor, Elct LL 10uF/25V	M003 CE 04W 1E 100MD 6.3x11
C32	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C33	22-200261-222	1	Cap. SMD, Cer 2n2F/50V 5%	M004 1206 5A 222 JA3 TR
C34	22-200058-102		Cap. SMD, Cer 1nF/50V 5%	M004 0805 5A 102 JA3 TR
C35	22-200058-681	1	Cap. SMD, Cer 680pF/50V 5%	M004 0805 5A 681 JA3 TR
C36	22-200058-102		Cap. SMD, Cer 1nF/50V 5%	M004 0805 5A 102 JA3 TR
C37	22-200053-474		Cap. SMD, Cer 470nF/50V 10%	M004 1812 5C 474 KAA TR
C38	22-200258-688		Cap. SMD, Tantal 6u8F/20V 20%	M117 293D 685 X0020 C 2T
C39	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C40	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C41	22-200058-151	1	Cap. SMD, Cer 150pF/50V 5%	M004 0805 5A 151 JA3 TR
C42	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C43	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C44	22-200250-473		Cap. SMD, Cer 47nF/50V 5%	M004 1206 5C 473 JA3 TR
C45	22-200251-104	4	Cap. SMD, Cer 100nF/50V 10%	M004 1210 5C 104 KA3 TR
C46	22-200250-473		Cap. SMD, Cer 47nF/50V 5%	M004 1206 5C 473 JA3 TR

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PARTS LIST

REF.D.	PART NO.	QTY	DESCRIPTION	MFRC MFR PART NO.
C47	22-200250-473		Cap. SMD, Cer 47nF/50V 5%	M004 1206 5C 473 JA3 TR
C48	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C49	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C50	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C51	22-200054-472		Cap. SMD, Cer 4n7F/63V 1%	M015 VJ1210 A 472 F X AT
C52	22-200250-473		Cap. SMD, Cer 47nF/50V 5%	M004 1206 5C 473 JA3 TR
C53	22-200250-473		Cap. SMD, Cer 47nF/50V 5%	M004 1206 5C 473 JA3 TR
C54	22-200250-473		Cap. SMD, Cer 47nF/50V 5%	M004 1206 5C 473 JA3 TR
C55	22-200258-688		Cap. SMD, Tantal 6u8F/20V 20%	M117 293D 685 X0020 C 2T
C56	22-200246-223	1	Cap. SMD, Cer 22nF/50V 10%	M004 0805 5C 223 KA3 TR
C57	22-200251-104		Cap. SMD, Cer 100nF/50V 10%	M004 1210 5C 104 KA3 TR
C58	22-200058-102		Cap. SMD, Cer 1nF/50V 5%	M004 0805 5A 102 JA3 TR
C59	22-200043-339	1	Capacitor, Elct 33uF/25V	M003 CE SEM 1E 330 5x11
C60	22-200251-104		Cap. SMD, Cer 100nF/50V 10%	M004 1210 5C 104 KA3 TR
C61	22-200251-104		Cap. SMD, Cer 100nF/50V 10%	M004 1210 5C 104 KA3 TR
C62	Not Used			56
C63	Not Used			56
C64	Not Used			56
C65	22-200061-223	1	Capacitor, Cer 22nF/50V 10%	M004 SR 21 5C 223 KAA
C66	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CR1	23-200197-016	6	Diode SMD, BAS16	M000 BAS16-215 A6
CR2	23-200197-016		Diode SMD, BAS16	M000 BAS16-215 A6
CR3	23-200197-016		Diode SMD, BAS16	M000 BAS16-215 A6
CR4	23-200197-016		Diode SMD, BAS16	M000 BAS16-215 A6
CR5	23-200197-016		Diode SMD, BAS16	M000 BAS16-215 A6
CR6	23-200197-016		Diode SMD, BAS16	M000 BAS16-215 A6
CR7	Not Used			56
CR8	Not Used			56
CX1	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX2	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX3	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX4	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX5	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX6	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX7	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX8	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX9	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX10	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX11	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX12	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX13	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX4a	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX6a	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX8a	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX9a	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX11a	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
CX13a	22-200249-104		Cap. SMD, Cer 100nF/50V +80%	M136 CM21 Y5V 104 Z50 AT
DS1	23-200232-002	1	Diode, Led Red/Holder ø=3mm	M058 09-1010-60
H1	31-200152-000	4	Jumper, 2 Pole	M008 90059-0009
H2	31-200152-000		Jumper, 2 Pole	M008 90059-0009

PARTS LIST

REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
H3	31-200152-000		Jumper, 2 Pole	M008	90059-0009
H4	Not Used	0		56	
H5	31-200152-000		Jumper, 2 Pole	M008	90059-0009
H6	Not Used			56	
H7	Not Used			56	
J1	31-200630-020	1	Connector, 20 Pol Female	M034	2-215079-0
J2	31-200135-025	1	Connector, 25-Pole D Male	M008	87136-3351
J3	31-200632-014	1	Connector, 14 Pol Male	M055	3598-6002
J4	31-200859-002	1	Connector, 2-Pole angle male	M034	171826-2
K1	33-200594-001	1	Relay, Reed D1A05-1	M135	D1A05-1 (D)
L1	25-200108-339	12	Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L2	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L3	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L4	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L5	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L6	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L7	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L8	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L9	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L10	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L11	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L12	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
L13	25-200108-109	2	Coil, 10uH/250mA 10%	M118	MICC-100K-02
L14	25-200108-109		Coil, 10uH/250mA 10%	M118	MICC-100K-02
L15	25-200108-339		Coil, 33uH/190mA 10%	M118	MICC-330K-02 (Reel)
Q1	26-200122-000	9	Transistor, N-MOSFET 2N7000	M026	2N7000
Q2	26-200122-000		Transistor, N-MOSFET 2N7000	M026	2N7000
Q3	26-200122-000		Transistor, N-MOSFET 2N7000	M026	2N7000
Q4	26-200122-000		Transistor, N-MOSFET 2N7000	M026	2N7000
Q5	26-200122-000		Transistor, N-MOSFET 2N7000	M026	2N7000
Q6	26-200122-000		Transistor, N-MOSFET 2N7000	M026	2N7000
Q7	26-200122-000		Transistor, N-MOSFET 2N7000	M026	2N7000
Q8	26-200122-000		Transistor, N-MOSFET 2N7000	M026	2N7000
Q9	26-200122-000		Transistor, N-MOSFET 2N7000	M026	2N7000
Q10	26-200089-848	1	Transistor SMD, NPN BC848B	M000	BC848B-215 1K
Q11	26-200089-817	3	Transistor SMD, NPN BC817-25	M000	BC817-25 215 6B
Q12	26-200090-807	1	Transistor SMD, PNP BC807-25	M000	BC807-25 215 5B
Q13	26-200089-817		Transistor SMD, NPN BC817-25	M000	BC817-25 215 6B
Q14	26-200090-807	2	Transistor SMD, PNP BC807-25	M000	BC807-25 215 5B
Q15	26-200089-817		Transistor SMD, NPN BC817-25	M000	BC817-25 215 6B
Q16	26-200090-807		Transistor SMD, PNP BC807-25	M000	BC807-25 215 5B
R1	21-200210-399	8	Resistor SMD, Cer 39R 5%	M013	MCR10 39R
R2	21-200210-102	14	Resistor SMD, Cer 1K 5%	M013	MCR10 1K
R3	21-200210-399		Resistor SMD, Cer 39R 5%	M013	MCR10 39R
R4	21-200210-102		Resistor SMD, Cer 1K 5%	M013	MCR10 1K
R5	21-200210-399		Resistor SMD, Cer 39R 5%	M013	MCR10 39R
R6	21-200210-102		Resistor SMD, Cer 1K 5%	M013	MCR10 1K
R7	21-200210-102		Resistor SMD, Cer 1K 5%	M013	MCR10 1K
R8	21-200210-399		Resistor SMD, Cer 39R 5%	M013	MCR10 39R
R9	21-200210-102		Resistor SMD, Cer 1K 5%	M013	MCR10 1K

PARTS LIST

REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
R10	21-200210-399		Resistor SMD, Cer 39R 5%	MO13	MCR10 39R
R11	21-200210-102		Resistor SMD, Cer 1K 5%	MO13	MCR10 1K
R12	21-200210-399		Resistor SMD, Cer 39R 5%	MO13	MCR10 39R
R13	21-200210-102		Resistor SMD, Cer 1K 5%	MO13	MCR10 1K
R14	21-200210-399		Resistor SMD, Cer 39R 5%	MO13	MCR10 39R
R15	21-200210-399		Resistor SMD, Cer 39R 5%	MO13	MCR10 39R
R16	21-200210-102		Resistor SMD, Cer 1K 5%	MO13	MCR10 1K
R17	21-200210-159	1	Resistor SMD, Cer 15R 5%	MO13	MCR10 15R
R18	21-200210-102		Resistor SMD, Cer 1K 5%	MO13	MCR10 1K
R19	21-200210-103	22	Resistor SMD, Cer 10K 5%	MO13	MCR10 10K
R20	21-200210-224	4	Resistor SMD, Cer 220K 5%	MO13	MCR10 220K
R21	21-200210-104	4	Resistor SMD, Cer 100K 5%	MO13	MCR10 100K
R22	21-200210-104		Resistor SMD, Cer 100K 5%	MO13	MCR10 100K
R23	21-200210-103		Resistor SMD, Cer 10K 5%	MO13	MCR10 10K
R24	21-200210-224		Resistor SMD, Cer 220K 5%	MO13	MCR10 220K
R25	21-200210-104		Resistor SMD, Cer 100K 5%	MO13	MCR10 100K
R26	21-200210-103		Resistor SMD, Cer 10K 5%	MO13	MCR10 10K
R27	21-200210-224		Resistor SMD, Cer 220K 5%	MO13	MCR10 220K
R28	21-200210-222	5	Resistor SMD, Cer 2K2 5%	MO13	MCR10 2K2
R29	21-200210-472	2	Resistor SMD, Cer 4K7 5%	MO13	MCR10 4K7
R30	21-200210-101	7	Resistor SMD, Cer 100R 5%	MO13	MCR10 100R
R31	21-200210-103		Resistor SMD, Cer 10K 5%	MO13	MCR10 10K
R32	21-200238-204	1	Resistor, Var 200K, Multi	MO07	3006 P-1-204
R33	21-200210-101		Resistor SMD, Cer 100R 5%	MO13	MCR10 100R
R34	21-200210-561	1	Resistor SMD, Cer 560R 5%	MO13	MCR10 560R
R35	21-200210-182	2	Resistor SMD, Cer 1K8 5%	MO13	MCR10 1K8
R36	21-200210-103		Resistor SMD, Cer 10K 5%	MO13	MCR10 10K
R37	21-200210-101		Resistor SMD, Cer 100R 5%	MO13	MCR10 100R
R38	21-200210-101		Resistor SMD, Cer 100R 5%	MO13	MCR10 100R
R39	21-200204-300	1	Resistor SMD, Cer 300K 1%	MO13	MCR10FW 300K
R40	21-200203-184	1	Resistor SMD, Cer 18K4 1%	MO13	MCR10FW 18K4
R41	21-200202-215	1	Resistor SMD, Cer 2K15 1%	MO13	MCR10FW 2K15
R42	21-200203-277	1	Resistor SMD, Cer 27K7 1%	MO13	MCR10FW 27K7
R43	21-200202-604	1	Resistor SMD, Cer 6K04 1%	MO13	MCR10FW 6K04
R44	21-200203-152	1	Resistor SMD, Cer 15K2 1%	MO13	MCR10FW 15K2
R45	21-200204-330	5	Resistor SMD, Cer 330K 1%	MO13	MCR10FW 330K
R46	21-200210-101		Resistor SMD, Cer 100R 5%	MO13	MCR10 100R
R47	21-200210-109	4	Resistor SMD, Cer 10R 5%	MO13	MCR10 10R
R48	21-200203-187	1	Resistor SMD, Cer 18K7 1%	MO13	MCR10FW 18K7
R49	21-200210-102		Resistor SMD, Cer 1K 5%	MO13	MCR10 1K
R50	21-200203-149	1	Resistor SMD, Cer 14K9 1%	MO13	MCR10FW 14K9
R51	21-200210-102		Resistor SMD, Cer 1K 5%	MO13	MCR10 1K
R52	21-200210-103		Resistor SMD, Cer 10K 5%	MO13	MCR10 10K
R53	21-200210-223	1	Resistor SMD, Cer 22K 5%	MO13	MCR10 22K
R54	21-200210-221	3	Resistor SMD, Cer 220R 5%	MO13	MCR10 220R
R55	21-200210-102		Resistor SMD, Cer 1K 5%	MO13	MCR10 1K
R56	21-200210-101		Resistor SMD, Cer 100R 5%	MO13	MCR10 100R
R57	21-200210-224		Resistor SMD, Cer 220K 5%	MO13	MCR10 220K
R58	21-200210-222		Resistor SMD, Cer 2K2 5%	MO13	MCR10 2K2
R59	21-200203-100	19	Resistor SMD, Cer 10K0 1%	MO13	MCR10FW 10K0
R60	21-200203-100		Resistor SMD, Cer 10K0 1%	MO13	MCR10FW 10K0

PARTS LIST

REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
R61	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R62	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R63	21-200210-222		Resistor SMD, Cer 2K2 5%	MO13	MCR10 2K2
R64	21-200210-823	2	Resistor SMD, Cer 82K 5%	MO13	MCR10 82K
R65	21-200210-473	2	Resistor SMD, Cer 47K 5%	MO13	MCR10 47K
R66	21-200204-110	5	Resistor SMD, Cer 110K 1%	MO13	MCR10FW 110K
R67	21-200204-150	1	Resistor SMD, Cer 150K 1%	MO13	MCR10FW 150K
R68	21-200210-272	3	Resistor SMD, Cer 2K7 5%	MO13	MCR10 2K7
R69	21-200210-569	1	Resistor SMD, Cer 56R 5%	MO13	MCR10 56R
R70	21-200210-109		Resistor SMD, Cer 10R 5%	MO13	MCR10 10R
R71	21-200210-109		Resistor SMD, Cer 10R 5%	MO13	MCR10 10R
R72	21-200210-479	2	Resistor SMD, Cer 47R 5%	MO13	MCR10 47R
R73	21-200210-109		Resistor SMD, Cer 10R 5%	MO13	MCR10 10R
R74	21-200210-393	2	Resistor SMD, Cer 39K 5%	MO13	MCR10 39K
R75	21-200203-365	1	Resistor SMD, Cer 36K5 1%	MO13	MCR10F 36K5M
R76	21-200203-680	2	Resistor SMD, Cer 68KO 1%	MO13	MCR10FW 68KO
R77	21-200203-680		Resistor SMD, Cer 68KO 1%	MO13	MCR10FW 68KO
R78	21-200238-503	1	Resistor, Var 50K, Multi	MO07	3006 P-1-503
R79	21-200210-823		Resistor SMD, Cer 82K 5%	MO13	MCR10 82K
R80	21-200210-104		Resistor SMD, Cer 100K 5%	MO13	MCR10 100K
R81	21-200210-272		Resistor SMD, Cer 2K7 5%	MO13	MCR10 2K7
R82	21-200210-479		Resistor SMD, Cer 47R 5%	MO13	MCR10 47R
R83	21-200210-182		Resistor SMD, Cer 1K8 5%	MO13	MCR10 1K8
R84	21-200204-330		Resistor SMD, Cer 330K 1%	MO13	MCR10FW 330K
R85	21-200204-110		Resistor SMD, Cer 110K 1%	MO13	MCR10FW 110K
R86	21-200203-120	2	Resistor SMD, Cer 12KO 1%	MO13	MCR10FW 12KO
R87	To be defined	4			56
R88	21-200204-110		Resistor SMD, Cer 110K 1%	MO13	MCR10FW 110K
R89	21-200203-120		Resistor SMD, Cer 12KO 1%	MO13	MCR10FW 12KO
R90	To be defined				56
R91	21-200204-330		Resistor SMD, Cer 330K 1%	MO13	MCR10FW 330K
R92	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R93	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R94	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R95	21-200210-393		Resistor SMD, Cer 39K 5%	MO13	MCR10 39K
R96	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R97	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R98	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R99	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R100	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R101	21-200202-499	2	Resistor SMD, Cer 4K99 1%	MO13	MCR10FW 4K99
R102	21-200204-330		Resistor SMD, Cer 330K 1%	MO13	MCR10FW 330K
R103	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R104	21-200210-221		Resistor SMD, Cer 220R 5%	MO13	MCR10 220R
R105	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R106	21-200203-100		Resistor SMD, Cer 10KO 1%	MO13	MCR10FW 10KO
R107	21-200202-499		Resistor SMD, Cer 4K99 1%	MO13	MCR10FW 4K99
R108	21-200210-303	1	Resistor SMD, Cer 30K 5%	MO13	MCR10 30K
R109	21-200210-103		Resistor SMD, Cer 10K 5%	MO13	MCR10 10K
R110	21-200210-103		Resistor SMD, Cer 10K 5%	MO13	MCR10 10K
R111	21-200210-222		Resistor SMD, Cer 2K2 5%	MO13	MCR10 2K2

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REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
R112	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R113	21-200204-110		Resistor SMD, Cer 110K 1%	M013	MCR10FW 110K
R114	21-200203-137	2	Resistor SMD, Cer 13K7 1%	M013	MCR10FW 13K7
R115	To be defined			56	
R116	21-200204-110		Resistor SMD, Cer 110K 1%	M013	MCR10FW 110K
R117	21-200203-137		Resistor SMD, Cer 13K7 1%	M013	MCR10FW 13K7
R118	To be defined			56	
R119	21-200204-330		Resistor SMD, Cer 330K 1%	M013	MCR10FW 330K
R120	21-200203-100		Resistor SMD, Cer 10KO 1%	M013	MCR10FW 10KO
R121	21-200203-100		Resistor SMD, Cer 10KO 1%	M013	MCR10FW 10KO
R122	21-200203-100		Resistor SMD, Cer 10KO 1%	M013	MCR10FW 10KO
R123	21-200203-100		Resistor SMD, Cer 10KO 1%	M013	MCR10FW 10KO
R124	21-200210-102		Resistor SMD, Cer 1K 5%	M013	MCR10 1K
R125	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R126	21-200210-222		Resistor SMD, Cer 2K2 5%	M013	MCR10 2K2
R127	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R128	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R129	21-200210-221		Resistor SMD, Cer 220R 5%	M013	MCR10 220R
R130	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R131	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R132	21-200210-102		Resistor SMD, Cer 1K 5%	M013	MCR10 1K
R133	21-200210-473		Resistor SMD, Cer 47K 5%	M013	MCR10 47K
R134	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R135	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R136	21-200210-223		Resistor SMD, Cer 22K 5%	M013	MCR10 22K
R137	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R138	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R139	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R140	21-200210-683	1	Resistor SMD, Cer 68K 5%	M013	MCR10 68K
R141	21-200210-472		Resistor SMD, Cer 4K7 5%	M013	MCR10 4K7
R142	21-200210-101		Resistor SMD, Cer 100R 5%	M013	MCR10 100R
R143	21-200210-152	2	Resistor SMD, Cer 1K5 5%	M013	MCR10 1K5
R144	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R146	21-200210-153	1	Resistor SMD, Cer 15K 5%	M013	MCR10 15K
R147	21-200210-272		Resistor SMD, Cer 2K7 5%	M013	MCR10 2K7
R148	21-200210-223		Resistor SMD, Cer 22K 5%	M013	MCR10 22K
R149	21-200210-392	1	Resistor SMD, Cer 3K9 5%	M013	MCR10 3K9
R150	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R151	21-200210-103		Resistor SMD, Cer 10K 5%	M013	MCR10 10K
R152	21-200210-152		Resistor SMD, Cer 1K5 5%	M013	MCR10 1K5
R153	21-200020-109	2	Resistor, Film 10R/2W 5%	M000	PR02 10R
R154	21-200020-109		Resistor, Film 10R/2W 5%	M000	PR02 10R
T1	25-200260-600	2	Transformer, Line 600 Ohm	M021	LO4 EE 13
T2	25-200260-600		Transformer, Line 600 Ohm	M021	LO4 EE 13
T3	Not Used			56	
TP1	31-200103-000	2	Terminal, Test Point ϕ=1.3mm	71	1358
TP2	Not Used	0		56	
TP3	Not Used			56	
TP4	31-200103-000		Terminal, Test Point ϕ=1.3mm	71	1358
TP5	Not Used			56	
TP6	Not Used			56	

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REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
TP7	Not Used			56	
TP8	Not Used			56	
TP9	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP10	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP11	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP12	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP13	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP14	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP15	Not Used			56	
TP16	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP17	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP18	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP19	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP20	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP21	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP22	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP23	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP24	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP25	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP26	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP27	31-200141-001		Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
TP28	Not Used			56	
TP29	Not Used			56	
TP30	Not Used			56	
U1	24-200031-259	2	IC TTL, 74HCT259	M000	PC74HCT259P
U2	24-200031-259		IC TTL, 74HCT259	M000	PC74HCT259P
U3	24-200031-251	1	IC TTL, 74HCT251	M000	PC74HCT251P
U4	24-200199-074	5	IC Analog SMD, TL074	M009	TL074 CD
U5	24-200198-053	1	IC CMOS SMD, 4053	M000	HEF 4053 BT
U6	24-200199-074		IC Analog SMD, TL074	M009	TL074 CD
U7	24-200032-000	1	IC TTL, 74HC00	M009	SN74HC00N
U8	24-200200-072	2	IC Analog SMD, TL072	M009	TL072CD
U9	24-200199-074		IC Analog SMD, TL074	M009	TL074 CD
U10	24-200199-074		IC Analog SMD, TL074	M009	TL074 CD
U11	24-200199-074		IC Analog SMD, TL074	M009	TL074 CD
U12	24-200198-372	1	IC Analog SMD, TLC372	M009	TLC372 CD
U13	24-200200-072		IC Analog SMD, TL072	M009	TL072CD
VR1	23-200088-620	9	Diode Zener, BZV85-C62V	M000	BZV85 C62V
VR2	23-200088-620		Diode Zener, BZV85-C62V	M000	BZV85 C62V
VR3	23-200088-620		Diode Zener, BZV85-C62V	M000	BZV85 C62V
VR4	23-200088-620		Diode Zener, BZV85-C62V	M000	BZV85 C62V
VR5	23-200088-620		Diode Zener, BZV85-C62V	M000	BZV85 C62V
VR6	23-200088-620		Diode Zener, BZV85-C62V	M000	BZV85 C62V
VR7	23-200088-620		Diode Zener, BZV85-C62V	M000	BZV85 C62V
VR8	23-200088-620		Diode Zener, BZV85-C62V	M000	BZV85 C62V
VR9	23-200088-620		Diode Zener, BZV85-C62V	M000	BZV85 C62V
VR10	23-200085-130	1	Diode Zener, BZX79-C13V	M000	BZX79-C13V
W1	31-200140-001	6	Pin Header, 1-Pole Male Single	M008	90120-0800(Only 1 Pin)
W2	31-200140-001		Pin Header, 1-Pole Male Single	M008	90120-0800(Only 1 Pin)
W3	31-200140-001		Pin Header, 1-Pole Male Single	M008	90120-0800(Only 1 Pin)
W4	31-200141-001	20	Pin Header, 1-Pole Male Dual	M008	90131-0800(Only 1 Pin)
W5	31-200355-001	4	Angle Header, Male Single	M008	90121-0800(Only 1 Pin)

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REF.D.	PART NO.	QTY	DESCRIPTION	MFRC	MFR PART NO.
W6	31-200355-001		Angle Header, Male Single	M008	90121-0800(Only 1 Pin)
XU3	31-200115-016	1	Socket, IC 16 pole	M025	DILB 16P108T
Ø1	84-101338-000	1	3820 Filt.Board,PCB Assembling	56	60-101338 Assembling
Ø1	84-101338-100	1	3820 Filt.Board,Extra Hardware	56	60-101338, Hardwares

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PARTS LIST

MFR CODE	NAME ZIPCODE, CITY	ADDRESS COUNTRY
31564111	Thrane & Thrane A/S 2860 Søborg	Tobaksvejen 23A Denmark
43714471	Promax A/S 2630 Tåstrup	Klovtoftegade 46
M000	Philips P.O. Box 218	P.O. Box 218 Netherlands
M003	Maroon Electronics Co. LTD. Tokyo	Tokyo Japan
M004	AVX Hants GU124LT Aldershot	Hants GU124LT Aldershot United Kingdom
M007	Bourns Zugerstrasse	Zugerstrasse Switzerland
M008	Molex GU 11 3 ST Aldershot	GU 11 3 ST Aldershot United Kingdom
M009	Texas Instruments MS 54 Dallas TX 75265	MS 54 Dallas TX 75265 U.S.A.
M013	R-OHM Electronics GmbH Muhlenstrase 70	Muhlenstrase 70 Germany
M015	Vitramon HP100HH Buckinghamshire	HP100HH Buckinghamshire United Kingdom
M021	TDK	
M025	Burndy Electra N.V. B 2800 Mechelen	B 2800 Mechelen Belgique
M026	Siliconix CA 95054 Santa Clara	CA 95054 Santa Clara U.S.A.
M034	AMP Deutschland GmbH 6070 Christiansfeld	AMPeresstrasse 7-11 Germany
M055	3M	
M058	ELMA Electronic AG CH-8620 Wetzikon	CH-8620 Wetzikon Swiss
M117	Spraque Electric Company Worcester Mass 01606	Worcester Mass 01606 U.S.A.
M118	Fastron Haydnstrasse 11	Haydnstrasse 11 West Germany
M135	KVAN HSI.	U.S.A.
M136	Kyocera	Japan

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